

Helicopter

INTERNATIONAL

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The Canadian Coast Guard now has all seven of its new Bell 412EPI helicopters on strength, replacing legacy Model 412s on maritime safety and support operations, including the maintenance of marine navigation and telecommunication aids.

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THE RECENT decision by a US Court of Appeal to strike down the Federal Aviation Administration (FAA) requirement for civil-operated drones in the model-flying category to be registered and carry identifying marks, is a worrying step backwards for aviation safety. In its judgement the Court decided that the 2012 FAA Modernisation and Reform Act clearly stated that FAA "may not promulgate any rule or regulation regarding a model aircraft". So what now?

Small drones, in particular quadcopters, have become amazingly popular among hobbyists in recent years. Indeed, when the FAA introduced the rule at the end of 2015, almost 300,000 owners registered in the first month. Not only did this offer an opportunity to identify irresponsible drone operators in the event of an accident but, perhaps more importantly, it offered education and safety training access to new purchasers. That is all now, if you'll excuse the pun, up in the air.

Equally frustrating however is the absence of drone legislation elsewhere, as other authorities such as the European Aviation Safety Agency (EASA) ponder on what to do, whilst appearing to be all but helpless to stop these small aircraft invading airport air space and flying at heights where they pose a real risk to full size machines. For helicopters, often flying at low altitudes and operating from heliports and helipads away from major airports, the risks are doubly concerning.

Like many laws, those governing model aircraft are way out of date. It is a hobby no longer confined to balsa wood, stretched paper and a propeller driven by a rubber band. Whether it falls to the FAA, EASA or some other law-making body, someone needs to take control of the situation. Modern drones can seriously damage your health.



This issue of Helicopter INTERNATIONAL brings to a close our 40th anniversary year, which began in 1977 with a magazine not dissimilar to today's publication but using considerably inferior technology. There was no internet, no personal computers and communication was by letter, telephone or telex - remember that anyone?

News gathering and dissemination has changed much in the intervening years and, after 40 years at the helm, we need to take stock of our future direction, both for the magazine and personally. We're not deserting our first love - helicopters - but you might see some changes as we enter our 41st year. Wish us "bon voyage".

Elfan ap Rees

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Hiller revival?

Industry sources suggest that the Hiller Aircraft Corporation is in the process of being purchased from its current owners in Taiwan by a Chinese company, interested in reviving production of the UH-12E Soloy turbine variant. The deal would include acquiring the Soloy conversion supplementary type certificates (STC) and intellectual property rights, which were sold to Hiller in the mid-1990s.

Following the death of the previous Taiwanese owner, his family has proved to be reluctant to sell their Hiller and Soloy investment or to licence others to use the Soloy STC. As a consequence new turbine conversions of the UH-12 ended in 1995 and Hiller spares have also become increasingly difficult to obtain. Previously Soloy had sold some 190 Hiller turbine conversion kits and the company is likely to show a real interest in any change of ownership of Hiller, particularly as the company also holds the STC for the Soloy-Bell 47 conversion.

Here again sales ceased in the mid-1990s and, although Scott's Bell was interested in launching a turbine version with the Soloy kit married to the Rolls-Royce RR300 engine three-four years ago, the project had to be abandoned after Hiller refused to assign the STC.

Spitzer Helicopter Leasing buys Cabri G2s

The US distributor for the Guimbal Cabri G2 light helicopter, Precision Helicopters, signed an agreement at the recent Heli Expo to supply up to 10 aircraft to Spitzer Helicopter Leasing, which plans to introduce the type to the lease market. Spitzer has already signed up Revolution Aviation in Orange County, California as its first customer.

Revolution currently operates nine Robinson helicopters and sees the Cabri G2 as ideal for students wanting to move on to aircraft like the Airbus Helicopters AS350 or EC120, with a similar three-bladed main rotor rotation, central cyclic and fenestron tail rotor system. Spitzer says leasing will allow the company to operate the most advanced two-seat helicopter available, without the financial pressure of a direct purchase. Revolution will take delivery of its Cabri G2 in June, when the helicopter will become the first of its type in the Los Angeles area.

Precision Helicopters, which operates several Cabri G2s in its own fleet to replace the Schweizer S-300 helicopter, says it has already logged over 4,000 hours on training flights and notes that maintenance costs over the past two years have been vastly reduced, compared to the S-300. A 100 hour inspection for example takes eight-to-10 man hours



Above: Industry sources suggest the Soloy-Hiller UH-12ET could make a comeback after 20 years out of production.

compared to 40-50 hours with the S-300, whilst serviceability has run at 90 percent compared to 77 percent.

Since taking delivery of its first Cabri G2 in February 2014, and despite a 12 month delay before the Federal Aviation Administration certificated the type, the company has sold 21 aircraft into the US market and expects another 12 to come from the Guimbal factory this year. By 2018 this would make the United States the biggest Cabri G2 market.

Last year Guimbal delivered 52 aircraft worldwide from its Aix-en-Provence facility in southern France, with the type having now logged over 120,000 flight hours and the 200th G2 due to be delivered this May.

Helicentre upgrades survey fleet

Helicentre Aviation, based at Leicester Airport, is upgrading its utility helicopter fleet operating on the National Grid gas pipeline survey contract. Following discussions with National Grid, the company is to replace leased Bell 206 helicopters with three especially equipped Robinson R44 Raven IIs.

Helicentre Aviation has been operating the Bell 206 on the contract since 2010 and in 2013 secured a new eight year agreement. The

company operates the contract nationwide from Leicester and Wolverhampton on a 52 week/year basis, flying more than 2,000 hours per annum on task, but now wants to update the fleet.

Operating the fuel-injected R44 Raven II, with a rebuild profile every 18 months, is seen as the best way to keep the fleet current, alongside investment in crew training and on-site maintenance facilities in conjunction with East Midlands Engineering. Three Raven II helicopters will be dedicated to the contract, with avionics including on board iPads providing mapping and enhanced operational safety features, the Lynx NGT-9000+ Traffic Avoidance System with inflight traffic overlays onto moving maps, and multiple 8.33kHz compliant radios.

Several other Robinson approved modifications, such as five-point safety harnesses, will also be fitted and integrated flight tracking systems, already used on the company's training aircraft, will provide the ground operations base with flight-following capability.

Leonardo to flight test NGCT technology...

Leonardo Helicopters is reported to be planning to re-engineer the first prototype AW609 tiltrotor at its Casina Costa plant in Italy, to act as a sub-scale prototype for aspects of the Next Generation Civil Tiltrotor (NGCT) project, being developed with support from the European Clean Sky 2 programme. The company has been working on the project since 2000 and originally hoped to begin flight trials in 2019, but delays in the AW609 certification programme have been taking priority.

Now Leonardo has set out a revised development programme for the 19-22 passenger 11 tonne class NGCT, slipping the original first flight schedule from 2021 to 2023 and meanwhile looking to develop several new technology insertions on test benches and in flight trials. These include new proprotor blades and new wings and ailerons, optimised for hover and cruise modes to improve efficiency by up to 15 percent. The AW609 will be modified to test these elements.

The NGCT will also introduce engines fixed in the horizontal mode, with only the gearbox and proprotor tilting for vertical flight similar to the layout adopted by Bell Helicopter for its V-280, but possibly with the outboard wing section tilting as well, to reduce the impact of downdraft from the proprotors on the wing.



Above: Arista Aviation has sold four refurbished Sikorsky Black Hawks for export use, with N236AA recently displayed at HeliExpo in Dallas (K. Swartz).

UH-60 entering civil market

More than 140 surplus Sikorsky UH-60A Black Hawk helicopters marketed by the government General Services Administration have so far been acquired to date by some 30 commercial companies from US Army stocks. The manufacturer is now keen to ensure operators register with the company to receive after-market support. This includes receiving alert service bulletins, on-site maintenance training, and advice on used and overhauled parts.

US Federal Aviation Administration regulations restrict the use of military surplus aircraft to a limited range of utility operations, such as fire fighting and external lift but not passenger transport, unless that is directly connected with the limited role. This might include, for example the movement of fire fighters to tackle or escape a wildfire situation.

To highlight the support offered, Sikorsky hosted a meeting with commercial operators in early March at HeliExpo in Dallas, where

there were several UH-60As on static display already modified for utility and potential export military roles.

These included N684DN of Rogerson-Kratos, N160AQ of Unical, N60FW of Global Aviation Solutions and N60XP from Firehawk Helicopters. Also displayed was N236AA from Arista Aviation, located in Enterprise, Alabama which is a Part 145 repair station offering aircraft as well as overhaul and modification facilities for the UH-60A. During the Show, this company announced the first commercial sale of UH-60As for use outside the United States, with a contract signed with the International Defence and Aerospace Group (IDAG) for four aircraft. IDAG specialises in worldwide aircraft sales, support, training and contract logistics.

Other recent EH-60A and UH-60A civil registrations in the United States have included three aircraft for Windrotor Aviation in Lakeview, Oregon and five to Brown Helicopters in Pensacola, Florida as well as one to Crestline, California and more for Arista.

Diamond helicopter project

Austrian fixed-wing manufacturer Diamond Aircraft unveiled its first rotary wing project at Aero Friedrichshafen at the beginning of April.

...AW609 break up report concluded

Italian air accident investigators have concluded their review of the fatal in-flight break up of the second Leonardo AW609 tiltrotor prototype in October 2015, which killed two of the company's test pilots and delayed development and certification progress of the aircraft. The surviving AW609 was grounded after the accident and the type was only cleared to resume flight testing in January this year.

The break up occurred during a high speed flight test, repeating previous similar tests that had already been carried out with the first prototype. The investigators say that the cause was flawed flight control laws in the software leading to interaction of the fly-by-wire flight control system with pilot control inputs, which may have inadvertently prolonged initial aircraft oscillations and intensified the sequence that led to the break up. During the event, the AW609 reached a side slip angle of 10.5 degrees, well above the 4 degree maximum and so allowing the starboard proprotor to strike the wing leading edge multiple times severing hydraulic and fuel lines that led to a fire.

Subject to the recommendations in the final report, Leonardo now hope to achieve AW609 certification initially in the United States during 2018, with European certification following thereafter.

The four-seat Dart 280 helicopter, powered by a 280hp 4-stroke engine using diesel or turbine fuel, is aimed at the Robinson R44 transport and training markets.

Initial illustrations depict a design with a swept-tip, three-blade main rotor and shrouded electric-powered tail rotor, with a retractable tricycle landing gear. The fuselage, including a tail plane with end plate fins, would be largely of composite construction. Diamond envisages the Dart 280 having a maximum take off weight of 1350kg (2500lb), including a 560kg (1235lb) payload.

A first flight is scheduled for late 2018-early 2019, with certification anticipated about 12 months later. However industry observers suggest that, despite Diamond's success in the fixed-wing general aviation field, the new helicopter programme may be somewhat ambitious in terms of time scale and development costs.

Air Methods takeover

Air Medical and tourism helicopter company Air Methods Corporation has entered into a definitive agreement to be acquired by affiliates of American Securities LLC. The deal sees American Securities purchasing all outstanding shares of Air Methods for \$43.00 per share in cash, 1 20.4 percent premium over the 31 January 2017 stock price of \$35.70 per share.

The transaction is dependent on more than 50 percent of the Air Methods common shares being tendered and clearance by antitrust legislation, but the Air Methods board have unanimously recommended the deal to its shareholders. The expected closure date for the transaction is by the end of June. However the GrantLaw Firm, a New York based company specialising in representing wronged shareholders and consumers announced only three days after the Air Methods statement that it was investigating the proposed private acquisition by American Securities Ltd.

American Securities is a major US private equity firm which, with its affiliates, has approximately \$15 billion under management, with offices in New York and Shanghai. The Air Methods group includes its air medical division, which is the largest provider of air ambulance services in the United States, the United Rotorcraft Division, which specialises in the design and manufacture of air medical interiors, and the Tourism Division which embraces Sundance Helicopters and Blue Hawaiian Helicopters offering tours and charter flights.

The total Air Methods aviation fleet included in the deal covers around 500 helicopters and fixed wing aircraft owned, leased or maintained by the company.

Norway updates on EC225LP failure

The Norwegian Accident Investigation Board has issued a follow up report into the loss of the Airbus Helicopters EC225LP LN-OJF on 26 April 2016, confirming that the cause was a fatigue fracture in one of the eight second-stage planet gears in the epicyclic module of the main gearbox. However the investigators have also said that the failure was without warning and that onboard systems were unable to detect the degradation of the gear before it failed.

The report states that the observed failure mode of crack initiation, followed by propagation with limited spalling, appears to differ from what was expected or foreseen during the design and certification of the main rotor gearbox, and was unlikely to be detected by the approved maintenance procedures and monitoring systems in place at the time. The Board has also noted that there were marked similarities between the crash of LN-OJF and the crash of an AS332L2 Super Puma, G-REDL, off the Scottish coast in 2009 and also notes the loss of an older SA330J Puma in 1980 in Brunei, where again the main rotor separated in flight.

Following the report Airbus Helicopters issued a statement, noting that at the time of the 2009 accident, where significant parts were never recovered, the information now available was not known and that, between 2009 and 2016, only two second-stage planet gears across the fleet had to be replaced due to spalling or micro-pit damage. None of the damaged gears were subjected to laboratory analysis. Since the 2016 accident, the company has carried out a worldwide survey on detection technologies of cracks inside an epicyclic train for relevant industries, but concluded that no solution currently exists for such degradation detection.

Meanwhile the Norwegian Board is continuing its investigation, with an emphasis on the certification process and certification specifications for large rotorcraft, related to catastrophic failure and requirements for safety barriers. The Board also wants to understand how and why two similar catastrophic accidents could happen to nearly identical helicopters only seven years apart, including assessment of the follow up on the G-REDL safety recommendations and the continuing airworthiness clearance of the gearbox.

FAA proposes Pt.27 changes

The US Federal Aviation Administration (FAA) has issued a proposed policy change for new Pt.27 categories to facilitate the accelerated certification of new safety technologies on rotary-wing aircraft, with the reclassification of



New Bell 429 sales

Nakanihon Air Services (NNK) has ordered two Bell 429 helicopters to add to its current fleet of 13 Bell helicopters, including the Models 206, 430, 204 and 412 that are utilised in various roles in Japan.

NNK is also an authorised Bell customer service facility and carries out completions work on many of the Bell helicopters entering Japan. The two new Model 429s will join a previously purchased example in service with the Doctor Heli Helicopter Emergency Medical Service (HEMS) network, and will be delivered later this year.

Bell has also signed a purchase agreement with the Arizona Department of Public Safety Aviation Bureau for a single Bell 429, for delivery this year. This aircraft will be configured for search and rescue, border protection and law enforcement missions, and was selected following a technical flight evaluation of several twin-engined, hoist capable contenders, with a specific emphasis placed on hot and high performance standards.

helicopter types under four district categories. The revised policy proposal follows calls from the helicopter industry to rewrite certification guidelines, that date back to 1999 and take no account of more recent safety advances, in particular relating to IFR systems for single-engine helicopters.

Under the FAA proposal, Pt.27 rotorcraft, defined as having a maximum gross weight up to 3200kg (7,000lb) and carrying up to nine passengers, would be broken down to cover piston engine types with five or fewer occupants (including crew), single turbine types up to 1800kg (4000lb) maximum gross weight (MGW) with five or fewer occupants, single turbine between 1815kg (4,001lb) to 3200kg (7,000lb) MGW with six or more occupants, and twin turbine-engined types meeting the Pt.27 definition. The FAA proposes a graduated level of safety based on rotorcraft class, similar to that currently employed for Part 23 aeroplanes.

Whilst industry officials have broadly welcomed the proposal as a starting point for change, some are disappointed that it does not fully address the safety issues needed to deal with IMC and IFR operations in single-engined helicopters, including cost-effective equipment and training requirements. The lack of IFR certified systems in this helicopter category has been identified as a major factor in accident statistics since 2003, often due to low level flight into terrain in an effort to avoid

IMC conditions or loss of control due to inadvertently entering IMC conditions.

The deadline for comments on the proposal ended on 20 April.

Erickson Crane order

Erickson Aircrane has received an order from the Republic of Korea Forest Service (KFS) to remanufacture a Sikorsky S-64 Sky Crane to its S-64E configuration for fire fighting and heavy-lift operations. The aircraft is due to join three other S-64E helicopters operated by the KFS in December this year.

The new S-64E equipment will include a foam cannon and a fire fighting tank, which can hold up to 10,000 (2650gall) of water or retardant with a foam injection capability. The aircraft can also be equipped with a hover pump snorkel or a ram hydrofoil sea snorkel, both of which allow for shallow water intake of fresh or sea water in 30-45 seconds. Pilots can choose from eight different computerised coverage drop levels, to maximise the suppression effect for individual fire situations.

If required, the S-64E can also be reconfigured within a few hours for alternative heavy lift missions with the tank removed, providing specialist lift and placement capabilities for construction, powerline installations and other infrastructure projects. Uniquely for these missions, the helicopter features an aft-facing pilot seat allowing very precise positioning of external loads.



Above: e-volo has launched a two-seat Model 2X version of its electric-powered Volocopter.

Two-seater electric Volocopter

German manufacturer e-volo has launched a two-seat version of its all-electric powered Volocopter multi-rotor helicopter, aimed at the ultralight air sports market but with an eye to future urban mobility systems. The new design is based on the experimental single-seat Volocopter VC200 prototype, which has been test flying since November 2013.

e-volo believes the new Volocopter 2X two-seat variant will be eligible for multicopter type certification under the new German ultra light category, that is due to come into effect in 2018. Anyone with a sport pilot license endorsed for multicopter will then be able to fly the aircraft. In the meantime and pending a full production launch, e-volo plans to use several pre-production 2X models for flight trials and demonstrations including, by 2018, flying taxi pilot projects under special permits.

The company claims that the Volocopter concept is extremely safe and easy to fly, with automatic height and position control, and believes the technology also allows for remote controlled and even autonomous flights in the future. However for the first flying taxi projects, the company assumes the 2X will remain pilot-controlled to meet the currently applicable regulations. For commercial services however, e-volo will need to obtain more stringent airworthiness certification and is investing in development of a four-seat Volocopter 4X, which it hopes will win European Aviation Safety Agency and US Federal Aviation Administration approval.

The 2X features a battery replacement system to allow for quick changes and continued operation, but the company has not yet revealed the actual endurance between battery changes. Previously this has limited the flight options and range of the VC200 prototype and could be an issue with the heavier 2X version.

However e-volo is already working on a

hybrid power system, which could extend the endurance to over one hour.

It is also expected that the new aircraft will initially augment the AW109 Trekker utility variant, first flown last year as a skid-equipped version in the 3 tonne class.

ATL reports profit rise

Aviation Training International (ATIL), the joint venture between Boeing and Leonardo which provides attack helicopter training for the British Army Apache helicopter crews, ground crews and maintenance personnel, saw a rise in pre-tax profits last year as turnover climbed to almost £22 million. The pre-tax profit for 2016 was £4.7 million, up from £4.5 million in 2015. The turnover increased from £20.5 million in 2015 to £21.9 million last year.

ATIL has its headquarters at Sherborne in Dorset, with training centres at Arborfield in Berkshire, Middle Wallop in Hampshire and Wattisham in Suffolk. However during the year ATIL began work to relocate its operations at Arborfield to an extended facility at Wattisham, the main base for the Army Air Corps Apache fleet. The new facility is due to be completed in April with the first course to begin this summer.

ATIL has a 20 year contract with the UK Minister of Defence, which is due for renewal this September. The company had previously submitted its formal priced proposal in August 2016 and has since received notification from MoD of its intention to extend. The new contract is set to run from October 2017.

Leonardo AW209 deferred

Leonardo Helicopters is deferring its new AW209 twin-engined helicopter project, pending more clarity on likely certification changes to FAR Pt.27 by the Federal Aviation Administration and European Aviation Safety Agency regulators. The revisions are expected to be performance based, rather than strictly weight based as at present.

First revealed by Leonardo Group chief executive Mauro Moretti, whilst testifying to an Italian parliamentary committee in May 2016, very little has been said by the company since. However it is known that the provisional AW209 design is close to the upper limit for the existing Pt.27 rules, which have already been challenged by Bell Helicopter with the Model 429.



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Cox Health buys MD900 for MD902 conversion

US medical provider Cox Health in Springfield, Missouri has purchased an MD Helicopters MD900, previously operated by the Netherlands Police, for full conversion to MD902 standard and reconfiguration to the air ambulance role. The work will be carried out by the manufacturer's factory service centre in Mesa, Arizona and by United Rotorcraft, which will provide the multi-function air medical interior, including an exclusive replacement structural floor and patient loading system.

The upgrade to MD902 standard will see the installation of new Pratt & Whitney PW207E turboshaft engines with revised engine air intakes, an integrated instrument display system, improved NOTAR inlet design and a more powerful stabiliser control system. MD Helicopters will also install a wire strike protection system, a Night scanner Plus retractable search light, new avionics including the Garmin GMX200 multi-function display, a GNS 430W GPS/Nav/Comms and an Outerlink satellite tracking system. The aircraft will also become the first commercial MD902 to receive the new Genesys Aerosystems IDU-680 integrated all-glass cockpit, announced at Heli-Expo 2017. This features three high-resolution LCD displays, 3D synthetic vision, Helicopter terrain awareness and warning system, night vision capabilities, ADS-B traffic displays, navigation aids, custom engine monitoring and other modifications. Retrofitting with the new glass cockpit, which has yet to be certified, is expected to be completed by the end of 2017 fiscal year.

Cox Health already operates one MD902 helicopter, N902LC, covering an area up to 482 km (300 miles) away from its Springfield base. This aircraft has been in service since 2007 and the additional helicopter will service a recently expanded Cox Health network, including the Citizens Memorial Hospital in Bolivar, Missouri whilst maintaining a standardised air medical fleet. Initial delivery of the new MD902 is scheduled for late June.

- The Italian Competition Authority launched an investigation in late March into the local helicopter rescue and forest fire fighting services, following allegations that the companies involved have been operating a cartel. The Authority has already carried out initial inspections at the various company premises, in association with the Antitrust special unit of the Financial Police and expects to complete the investigation over the next 18 months.

Seven companies, plus the Italian Helicopter Association, are being investigated for the alleged sharing out of contracts and fixing public tenders for helicopter emergency medical services and forest fire fighting business. The companies include Airgreen, Babcock Italy (formerly Inaer Aviation Italy) Elifriulia, Eliossola, Elitellina, Heliwest and StarWork Sky.

- The UK National Police Air Service (NPAS) effectively closed its base at Warton in Lancashire on 20 March following a final shift by the crew of the Airbus Helicopters EC135 and the aircraft's departure. The base is one of three being closed, following budget cuts and a reorganisation of services.

Wattisham in East Anglia and the Durham Tees Valley base are also being run down, but NPAS claims that the reduction in bases will not materially change reaction times to call-outs, with the percentage of population within a 20 minute radius remaining unchanged and the percentage within 30 minutes decreasing by only one percent.

- Waypoint Leasing has signed an agreement with Mackay Helicopters in North Queensland, Australia to supply two Airbus Helicopters H135s for the company's marine pilot transfer operations. The transaction further diversifies Waypoint's business into the utility support helicopter sector and away from the oil and gas and air medical services leasing that has seen a downturn over the past two years.

- Bristow Helicopters began search and rescue operations with the Leonardo Helicopters AW189 on 31 March, following delays in securing key certification aspects for the Full Ice Protection System (FIPS). The first AW189s are replacing CHC AW139 helicopters on the UK south coast, which have been operated under an interim contract with the Maritime and Coastguard Agency. That expires in July.

For the new contract Bristow has already built a dedicated SAR base at Lee-on-Solent, from where it will be able to cover the busy coastal leisure and commercial shipping in the area. In addition a Bristow AW189 SAR transition team has been at the Lee-on-Solent base since January preparing for the handover and the existing Lee-on-Solent crews have



Above: The first of four Leonardo Helicopters AW169s for the Scandinavian Air Ambulance arrived in Sweden on 7 April.

now begun induction and training with the company to transition onto the new aircraft over the coming months. The first live AW189 call-out occurred later on the very first day. The next base to put the AW189 in service will be at Prestwick, followed by Lydd in Kent, St Athan in Glamorgan and finally Inverness in Scotland.

Bristow won the UK Maritime and Coastguard Agency contract to provide a nationwide SAR service in 2013, replacing seven military SAR bases with a civilian service under a phased approach throughout 2015 and 2016, and also taking over three CHC bases. In addition to Lee-on-Solent, bases at Stornoway and Sumburgh, operating the Sikorsky S-92 are also set to become part of the new contract from July.

- MD Helicopters marked 70,000 accident free flight hours by the Huntington Beach Police air support unit, in early February with a special commendation. The unit began flying MD500E helicopters in 1984, converting to the MD520N between 1992 and 2002.

Three MD520N are currently in service, with their signature NOTAR no-tail-rotor technology, which has eliminated the risk of tail rotor strikes or loss of tail rotor effectiveness, reduced vibration levels and incidentally introduced lower external noise levels. These factors are all claimed to benefit the Huntington Beach Police air support unit operations in the urban Californian environment.

Last year the unit's three helicopters responded to over 5500 calls for service.

- The HELP Appeal charity, that provides significant grants to fund the construction or upgrade of emergency helicopter landing pads at major trauma centres and accident & emergency hospitals throughout England and Scotland, has provided £1 million to build a new helipad at Aintree University Hospital in Liverpool. Approved last December by the local authority, work on constructing the new landing facility began at the beginning of March.

Currently air ambulance helicopters have to use playing fields some distance from the hospital to deliver trauma victims and other

patients, with a road transfer to the urgent care and trauma centre taking up to 30 minutes. The new helipad is on land adjacent to the Emergency department, minimising the transfer time when it comes into operation this summer. The facility will be operational during daylight hours only and primarily used by the North West Air Ambulance Trust, which operates three Airbus Helicopters EC135s covering the region from bases at Barton Airport in Manchester, Blackpool and in Birkenhead on the Wirral.

- AMS Heli Design, headquartered at Grand Prairie in Texas, but with engineering, design and manufacturing facilities in Cape Town, South Africa introduced its lightweight emergency medical services kit for the Leonardo Helicopters AW119 and AW109 at the recent Heli Expo Show in Dallas. The system has already been ordered by the South African Red Cross for installation on the AW119Kx.

AMS has made extensive use of composites and carbon fibre in the manufacture of the new interior, which it claims can be fully removed in less than 10 minutes if necessary. The kit is installed using the existing helicopter floor seat attachment points and is a single unit, including a base unit to hold medical supplies, back wall cargo mounting rails for medical monitoring equipment, roof panelling with oxygen and electrical outlets, and a robust swivel unit and stretcher which can be articulated for easy access through the cabin sliding door. A 3500l oxygen bottle is installed in the cargo hold.

The kit is fully compatible with hoist operations and, in addition to being installed on three AW119Kx in South African Red Cross service, is also to be installed on five more helicopters due to enter service with this operator by the end of 2018.



Above: The first of three Airbus Helicopters H145s for the Wales Air Ambulance (WAA) entered service at the beginning of April. Based at Dafen in Carmarthenshire and operated by Babcock Mission Critical Services, the helicopter has replaced an EC135 that was introduced in 2009. The second and third aircraft will enter service, based at Caernarfon and Welshpool, in the coming months. All three helicopters are equipped for night operations.

The WAA is also retaining one EC135, based in Cardiff, for neonatal, paediatric and adult transfers across Wales.

● The first of four Leonardo Helicopters AW169s for the Scandinavian Air Ambulance contract, SE-JSG c/n 69043, arrived in Sweden on 7 April. The second aircraft for the contract, SE-JRA c/n 69044, should follow shortly. Three of the four helicopters, operated by Babcock Mission Critical Services, will be based at Gällivare, Lycksele and Östersund, replacing the current Airbus Helicopters AS365N Dauphins. The fourth AW169 will serve as a backup.

Meanwhile orders for the aircraft continue to climb, with one of the latest being placed by the Argentinian National Gendarmerie, for one AW169 to provide law enforcement and border patrol support. This aircraft will feature a night vision goggle compatible cockpit, cabin roof hooks and wire strike equipment, with provisions for a cargo hook, external public address system, rescue hoist, search light, FLIR, and fast roping and rappelling systems. Due to be delivered later this year, it follows the first commercial AW169s to enter service in Argentina and Brazil respectively.

● LifeFlight of Maine has taken delivery of a new Leonardo Helicopters AW109SP for emergency medical service (EMS) missions in the state. Completions work on the aircraft, registered N901WM, including the EMS fit, has already been carried out.

● The US Department of the Interior and US Forest Service (USFS) are facing criticism from aerial fire fighting contractors after issuing a new specification for a Type I restricted category helicopter that can only be met by the Sikorsky Black Hawk. In addition, due to budget cuts, the USFS has decided not to renew options on several Type I contracts that only began last year.

A new request for bids, which closed on 17 March for the May-September 2017 fire fighting season, called for a 12-passenger twin-engine helicopter with a 259km/h (140kt) cruising speed, dual aft-sliding doors and a wheeled landing gear with shock absorbers. The critics say this can only be met by US Army surplus UH-60 Black Hawks, which would limit bidding opportunities to less than a handful of operators.

At a meeting during Heli Expo in early March, officials refused to answer questions on the subject, claiming that to do so would give those contractors present an unfair advantage in the bidding process.

● The latest Leonardo Helicopters AW169 for the UK market arrived in the country from Italy on 20 April. The aircraft, registered G-HHEM and the 49th from the production line at Vergiate, is destined for the Essex & Herts Air Ambulance Trust.

● The US State of North Dakota has passed a regulation on how medical insurance companies pay for air ambulance bills in the state. The law, introduced in mid-April, is aimed at protecting patients in critical medical situations from unexpected costs in excess of their insurance cover.

Complaints to the state insurance department from families faced with often ruinous bills from air ambulance operators after insurance companies introduced cost capping for services have totalled more than \$1.6 million since 2013, but this does not include the hundreds of complaints made direct to insurers. Balance bills levied by the air ambulance operators have ranged as high as \$67,000.

The new regulation requires insurance companies and hospitals to ensure the use of

ambulance providers that have a contract with the patients health plan, and for hospitals to notify patients in non-emergency situations of their health insurance company for inter-hospital transfers.

● Beijing Yugao Aviation Group has signed an order for a Bell 429 helicopter, to be used in the emergency medical services (EMS) role. The aircraft is the company's first aircraft, and the order follows the recent delivery of the first ever HEMS Bell 429 delivery in China to Reignwood Investments,

Delivery of the first HEMS aircraft to Reignwood followed the installation of a medical interior by United Rotorcraft, including a machined aluminium floor, additional medical crew seating and product improvements for patient care and access. In addition the helicopter is equipped with a rescue hoist and other programme specific support equipment.

● The Devon and Cornwall Police are to launch a dedicated 24 hour unmanned aerial vehicle (UAV) unit this summer, tasked with assisting in searches for missing people, scene photography and helping with major crime investigations. The service will also be shared with the neighbouring force in Dorset and be run from nine police stations across the three counties.

Devon and Cornwall Police began trialling UAVs in November 2015, acquiring four DJI Inspire 1 drones equipped with HD Cameras. Other forces in the UK are also using similar UAV technology, and are expected to follow suit, with dedicated units to counterbalance recent cutbacks to police budgets and staff numbers.

● Russian Helicopters has delivered a new Mil Mi-17V-5, registered 5Y-DCI, to the Republic of Kenya Ministry of Interior, for law enforcement operations with the National Police. The aircraft, built at the Kazan Aviation facility, was ceremonially handed over in Nairobi on 29 March.

The helicopter is the first Mi-17V5 to enter service with the National Police, which has previously operated only the older Mi-17 variant.

● Air Medical Group Holdings (AMGH), headquartered in Lewisville, Texas is to acquire the Air Medical Resource Group (AMRG) of South Jordan, Utah which has operations in 15 US States, including Alaska and Hawaii. With the acquisition, AMGH will add 62 bases and new geographic areas to its customer service footprint.

AMRG companies include Aeromed, Alaska Regional Life Flight, Eagle Air Med, Hawaii Life Flight, Guardian Flight, Gallup Med Flight, Valley Med Flight and Wiregrass Life Flight.

Regional News

- ASIA PACIFIC REPORT

● PT Dirgantara Indonesia (PTDI) delivered the 50th H225 rear fuselage to Airbus Helicopters on 15 March, part of a sub-contract programme launched in 2008 which achieved full production in 2011. The company has also delivered six main fuselages and manufactured more than 4,000 elementary parts for the centre and rear fuselage sections, for assembly in country.

PTDI has a 40 year cooperative history with Airbus Helicopters, with the two companies collectively delivering close to 200 helicopters to customers in Indonesia to date.

● The Changhe Aircraft Industry subsidiary of AVIC in China announced in late March that the AC313 heavy-lift civil helicopter has passed all airworthiness tests and is now set for certification by the Chinese civil aviation authorities. The final test was carried out at Jingdezhen in Jiangxi province on 24 March, when a pre-production AC313, B-00XY was required to fly in heavy rain, at altitudes of up to 500m (1640ft), at speed and in the hover.

Previously the AC313 had completed hot/high trials on the Qinghai-Tibet plateau in 2010 and 2011, and further trials as part of the certification process to prove performance and payload capabilities. In service the aircraft, derived originally from the Aerospatiale SA321 Super Frelon, is expected to be deployed for emergency rescue operations, medevac and disaster relief, forest fire fighting support and passenger transport missions.

● The Hunter New England Health Authority in New South Wales, Australia has come under criticism after failing to upgrade or build new helipads at eight hospitals to receive new Leonardo Helicopters AW139s, which began operating emergency medical services in the region in early March.

The four AW139 helicopters have replaced smaller Kawasaki BK117s previously used in the area, but the heavier downwash threatens damage to adjacent structures, leading to alternative sites having to be identified. Whilst these sites are all claimed to be within seven minutes of the designated hospitals, work is now ongoing to find permanent solutions. Hospitals in northern New South Wales affected include those at Moree, where flights have moved to the local airport, and at Barraba, Bingari, Gunnedah, Quirindi and Wee Waa, where again local airfields, sports grounds and private sites are being used. Two other helipads at Boggabri and Emmaville are no longer in use although plans are in hand to find alternatives.

The region's biggest hospital in Tamworth is not affected, as it has a brand new helipad built for the AW139 operations and, despite the glitch, the aircraft themselves have been well received by the local population and politicians.

● Waypoint Leasing has placed a Leonardo Helicopters AW139, previously leased to CHC Helicopters, with PT Air Born Indonesia under a new long term lease to support mining operations in the country.

Based at Sultan Aji Muhammad Sulaiman airport, Balikpapan in East Kalimantan, Air Born was established in 2010 and specialises in remote air transport charter work for a number of mineral companies in the region. The company operates a mixed fleet of fixed-wing Twin Otter utility aircraft and MBB Bo105 helicopters, along with a single Bell 430 for executive flights.

Since 2013, Waypoint now has 22 aircraft on lease to utility operators worldwide, part of its portfolio of more than 140 aircraft with 28 customers in 30 countries. The company also has firm and option orders for more than 110 helicopters, valued at more than \$1.3 billion, to be delivered over the next five years.



Above: The Leonardo Helicopters AW119Kx demonstrator, in Nepal in late March-early April for high altitude trials, completed a landing at 5565m (18,260ft) in ISA+15 conditions on the shoulder of Mount Changri Nup on 3 April. The aircraft also reached a cruise height of 73152m (24,000ft) in ISA+15 conditions, equivalent to a density altitude of 8108m (26,600ft) at minus 18 degrees C, whilst flying in the Everest region.

Earlier the AW119Kx had departed from Kathmandu at maximum take off weight with passengers and full fuel, climbing to 5273m (17,300ft) en route to Kukla, where the passengers were disembarked prior to the further high altitude tests. The crew also successfully tested the Hover Out of Ground Effect (HOGE) with three passengers on board at 4450m (14,600ft) in ISA +15 conditions, followed by a 360 degree turn in Hover in Ground Effect (HIGE) at 4115m (13,500ft) before returning to Kathmandu at the end of the day.

● Rotortrade in Kuala Lumpur, Malaysia has announced an agreement with Helang Flying Academy (HFA) for the sale of several Airbus Helicopters H120 (EC120B) aircraft. The first helicopter is due for delivery this month and will shortly be followed by a second aircraft. Eventually up to eight H120s are planned to enter service with HFA by early 2018.

HFA is a joint venture with Defence Conseil International (DCI), the French company which promotes the international transfer of French military know how and training. HFA was set up in September 2016 with Malaysian partner Major Flagship Sdn Bhd. The company will use the H120 for ab-initio pilot training, with the centre taking advantage of DCI experience with the Helidax military training school in France, which also operates an H120 fleet.

DCI estimates that the new Malaysian academy will train around 30 pilots from Malaysia and neighbouring countries over the next two years, and ultimately supply more than 50 percent of the demand for ab-initio training in Malaysia.

● Bell announced at Rotorcraft Asia in Singapore on 18 April, the first sale of a Model 407GXP to an Indonesian customer. Air Pacific Utama has been a Bell customer for more than 20 years, and will operate the new helicopter on charter work. The company has also signed up to the Bell Customer Advantage Plan, which offers a fixed cost per flight hour service option and protects the residual value of its aircraft.

Air Pacific Utama was founded in 1996 as an airline operator, but in recent years has only flown helicopters, with its main base at Jakarta Heliport. Its mixed fleet includes one Bell 206L-4, two Model 407s, one Model 429 and one Airbus Helicopters EC135P2.

● Australia became the second country to issue an airworthiness certificate for the Bell 505 Jet Ranger X, when the Civil Aviation Safety Authority confirmed the approval at the end of February. The certification followed the initial type certificate being issued in Canada earlier this month.

Australian Bell Helicopter representative Hawker Pacific already holds orders for eight Model 505s to be delivered in the next 12 months, including five in Australia and three in New Zealand. The company's staff are currently completing training on the new type and their first customer, Nautilus Aviation in Ciarns, Queensland is scheduled to receive Australia's first Jet Ranger X in mid-2017.

Military Helicopter News

May - June 2017



The Korean Aerospace Industries Surion utility transport helicopter is entering service in increasing numbers with the Republic of Korea armed forces. At least 100 are operational with the Army, with further examples on order for both the Army and Marines.

Sea Venom anti-shiping missile drop tests

MBDA has announced the successful air carriage and jettison trials of its Sea Venom/ANL (Anti Navire Léger) anti-shiping missile, which is scheduled to replace the legacy Sea Skua and French AS15TT missiles.

The joint Anglo-French development programme is using an Airbus Helicopters AS565M Panther for flight tests of the new missile and will carry out live firing in France later this year, but the air carriage and jettison trials were carried out at Boscombe Down in the UK during March, using a Westland Lynx HMA Mk.8 helicopter transferred from No. 815 Naval Air Squadron at RNAS Yeovilton, just weeks before the type was officially retired. The aircraft involved, ZF558, was delivered to Boscombe on 2 March for the compatibility trials, which took place at the end of the month.

Sea Venom missiles, fitted with telemetry kits, were involved in the tests, including dropping two of the missiles over the Larkhill range close to Boscombe Down. The missile is already scheduled to arm the UK naval successor to the Lynx, the Leonardo Helicopters Wildcat HMA Mk.2, but could also now be made available to continuing Lynx and Super Lynx operators. These include Brazil, which is currently upgrading its Lynx Mk.21As to the Super Lynx configuration.

VH-92 to fly this summer

Sikorsky Aircraft and the US Navy are expected to carry out the first flight of the US Presidential VH-92 helicopter this summer, following completion of the first of two Engineering Development Model (EDM) pre-production aircraft. Both helicopters are due to undergo a year of manufacturer qualification trials before delivery to the Naval Air Test Centre at Patuxent River, Maryland.

The VH-92 is based on the civil certificated S-92, requiring only the role modifications to be cleared before entry into service. These include secure communications equipment to meet government specifications and survivability enhancements. Sikorsky expects to integrate these changes and install the executive cabin interior, without exceeding the civil certified weight limits or reducing the specified performance targets set by the Marine Corps for the presidential role. The company has already increased the take off maximum gross weight by 544kg (1200lb) to 12,564kg (27,700lb) and built in a margin for an anticipated upgrade in engine power.

The VH-92 will be operated by the US Marine Corps HMX-1 WVIP squadron, assigned exclusively to the transport of the US President, vice president and other heads of state. In addition to the two pre production



aircraft, a further 21 VH-92s are due to be procured by 2023, replacing the 11 Sikorsky VH-3D Sea Kings and eight VH-60N White Hawks currently in HMX-1 service.

Meanwhile the first four production VH-92s are already under construction on the Sikorsky S-92 build line and the Marine Corps expects to declare initial operating capability with these aircraft in FY2020.

Ukraine seeks joint helo programme

The Ukrainian government is discussing with Poland the possible joint development and modernisation of helicopters for their armed forces. Both countries currently operate legacy fleets of Russian Mil helicopters which need upgrading or replacing. However Ukraine in particular cannot sustain the development of new helicopters on its own and is seeking partnerships.

Above: Drop tests of the MBDA Sea Venom missile were carried out from a Westland Lynx at the end of March, paving the way for sales of the weapon to Super Lynx operators overseas.

The continuing dispute with Russia regarding the annexing of the Crimea region and parts of eastern Ukraine by Russian-backed forces is also having an impact on the country's economy and its aerospace industry. Russia has already been funding the United Engine Corporation to develop and produce its own version of the TV7-117V turboshaft engine, previously supplied by Ukraine's Motor Sich plant. Developed from the Klimov TV7-117 turboprop engine, the TV7-117V powers the Mil Mi-28, Mi-38, Mi-171 and the Kamov Ka-52. Now Russia expects to meet all its own engine needs by 2020, ending any cooperation with Motor Sich.

US approves \$280 million FMS helicopter deals

The US State Department approved at the end of April a series of possible foreign military helicopter sales (FMS) starting with nine Bell 429 twin-engined helicopters for the Slovakian government at an estimated cost of \$150 million. The utility configured aircraft would be used primarily for border protection duties.

Included in the sale offer are Wescam MX-10 cameras and other mission equipment, navigation and communications avionics spares and support equipment and training. The deal is now subject to Congress approval. Previously Bell delivered two Model 429s in 2015 to the Slovakian Police law enforcement missions.

In a second agreement, the State Department has awarded an FMS contract to Boeing, to add two CH-47F Chinooks to the previous order for the Royal Netherlands Air Force (RNLAf) for 12 aircraft, signed in 2012. The approximate value of the new contract is estimated at around \$51.3 million. Deliveries of all 14 CH-47Fs should be completed by 31 December 2020, bringing the total in service with the RNLAf to 20 aircraft and enabling the retirement of 11 older CH-47Ds, which have been in service since the mid-1990s.

The 14 new CH-47F are equipped with a mission package for the special operations role, with the Honeywell Avionics control and management system, Block 6 cockpit avionics, the Northrop Grumman AAR-54 RWR, Terma (Chase) and FN Herstal M3M 0.50cal air defence systems, and the Robertson extended range fuel tankage.

The State Department has also approved the possible sale of five Boeing CH-47D heavy lift helicopters to the Greek government, together with seven Common Missile Warning Systems and 12 Honeywell T55-GA-714A turboshaft engines, plus mission equipment, avionics and support. This agreement, announced on 28 April, is valued at \$80 million.

The nine aircraft will come from surplus US Army stocks and increase the Greek military Chinook fleet to 26 aircraft, including seven previously purchased in 1999 under a US Foreign Military Sales programme.



Above: Sikorsky recently resumed flight testing of the S-97 Raider compound helicopter, with a series of high speed flights away from the Palm Beach airport boundary.

SB-1D Defiant flight delayed

Sikorsky-Boeing have admitted that their SB-1 Defiant joint multi-role demonstrator will not now make its maiden flight this year, but is rescheduled to fly during the first half of 2018.

The partnership says there are no showstoppers in the programme, only that it has been focusing on development work in its systems integration laboratory and on the propulsion test bed. It says this risk reduction work will benefit the eventual flight test programme by providing the team with more confidence from the start. The flight trials, which will include envelope expansion and proving the flight characteristics of the compound coaxial rotor design, are expected to take up to 12 months, but should not have a negative impact on the Joint Service Future Vertical Lift Programme.

Meanwhile Sikorsky renewed flight testing of the smaller scale S-97 Raider coaxial rotor helicopter in March, with a series of flights beyond the airport perimeter to demonstrate its high speed potential and manoeuvrability.

MQ-8C Fire Scout completes initial sea trials

The Northrop Grumman MQ-8C Fire Scout unmanned air vehicle (UAV), which is based on

the Bell 407 helicopter, returned ashore to the US Naval Air Test Centre at Patuxent River, Maryland on 11 April after completing initial testing aboard the littoral combat ship, USS *Montgomery*.

The trials team from VX-20 Air Test and Evaluation Squadron carried out more than 27 take offs and landings to verify the MQ-8C launch and recovery procedures, and to test interoperability between the UAV and the ship. This included the Fire Scout's capability to operate without degradation from electromagnetic interference, as well as confirming pitch, roll and wind limits. The US Navy will now prepare for the initial operational test and evaluation phase, due to be carried out this autumn.

The MQ-8C provides a longer endurance (8 hours on station) and range of 278km (150nm) than the previous smaller MQ-8B, and also enjoys a greater payload of 317kg (700lb). In service it will complement the manned Sikorsky MH-60 helicopter, by extending the capability of ship-based operations.

USAF revises UH-1N replacement

The US Air Force held an industry conference on 8-9 May to further explain its requirements and schedule for the replacement of Bell UH-1N helicopters, used to support and defend the Minuteman III missile sites across the Montana and North Dakota region, and to provide VIP transport in the Washington DC area. The Air Force requires 84 new helicopters for the role, but has confused potential

bidders with parts of the specification.

The second draft request for proposals was issued on 19 April, but this included a call for the selected helicopter to be capable of hovering at 1829m (6,000ft) in temperatures up to 35 degrees C, a requirement which none of the contenders could easily match.

The delivery timetable also appears to have slipped again, this time to the second quarter of 2021. The main contenders continue to be the Bell UH-1Y, Leonardo MH-139 and the Sikorsky HH-60U.

ALAT releases serviceability figures

The French Army (ALAT) Airbus Helicopters Tiger attack helicopter fleet improved its operational capability rate to 25.6 percent in 2016, up 1.4 percent over the previous year. France currently operates a mixed fleet of 39 Tiger HAP escort helicopters and about 21 Tiger HAD attack variants, with a further ten of the latter still to be delivered. Maintenance costs in 2016 totalled Euro 88.61 million.

By contrast the ALAT fleet of AS532UL Cougar helicopters went through a bad serviceability patch last year, with only a 9.9 percent operational capability rate. This compares to 12.2 percent in 2015. The ALAT has 26 AS532UL on strength, with an average age of 26.3 years and a 2016 maintenance bill of Euro 40.27 million. The 17 newer NH90 in service last year also showed a slight decline in operational availability, down to 41.4 percent from 47.6 percent in 2015.

Referring to the figures, the Defence Ministry has blamed an unnecessary complex maintenance system shared out between government offices, service wings and private sector contractors, and recently launched a new plan to boost average availability to 50 percent by 2019.

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Dragonfly Pictures promote tandem rotor UAV

Dragonfly Pictures, which is developing the DP14 Hawk tandem-rotor unmanned aerial system (UAS) with a 2m (6ft) long by 51cm (20inch) wide cargo bay, is promoting the vehicle to the US Army as a potential unmanned medevac solution. The helicopter can carry a payload of 195kg (430lb) over a distance of around 322km (200 miles), at cruising speed of 132km/h (82mph).

The DP14 uses onboard LIDAR or 3D laser scanning and advanced algorithms to autonomously navigate in complex and restricted environments, with course corrections, obstacle avoidance and landing site selection, flying nap of the earth and beyond line of sight to reach its destination. The aircraft is now part of a trial being carried out by the US Army Medical Research and Materiel Command, to evaluate alternatives to manned and full-size helicopters for casualty evacuation from future battlefields.

CLASSIFIED

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- DATELINE: 17th MAY 2017

TOP SECRET

■ German operator Motorflug has begun pilot training for the military training centre at the Buckeburg army base, following a four year contract award announced last December. The school will operate six Bell 206B JetRangers, modified to a common avionics standard, and carrying out basic ab initio training before pilots move onto the Airbus Helicopters EC635.

The company expects to log some 15,400 flight hours with the Bell 206B over the duration of the contract, with maintenance carried out at their base in Achum.

■ Leonardo signed a new cooperation agreement with the Polish Armaments Group (PGZ) on 2 March, aimed at further enhancing the collaboration between the two companies in the helicopter field, started in 2015. This includes determining new areas of potential industrial and business around the upcoming Polish military helicopter programmes.

Leonardo is offering the AW101, AW149 and W-3PL Gluzec helicopters to meet the new rotary-wing requirements, with its PZL Swidnik subsidiary playing a major role in its proposals, including technology transfer and new skilled job creation alongside the Polish company's current manufacturing work. A partnership with PGZ could see the Group also being involved in component production, manufacturing and servicing elements of the helicopter programme.

■ The US Air Force has deferred the deployment of CV-22 Osprey tiltrotors to Japan until FY2020, after the Defence Department previously announced plans to operate the type at Yokota air base from next year as part of a Pacific rebalance of US Forces.

Initially three CV-22s were to be deployed this year, building up to 13 at the base by 2021 in new hangars and headquarters facilities built on the east side of the Yokota flight line. The delay is reported to be due to trained aircrew and manpower shortages.

■ Boeing have been awarded a \$3.4 billion contract by the US Department of Defence to upgrade 244 AH-64D Apache attack helicopters to the latest AH-64E standard, and to deliver 24 new-build aircraft to the Qatar Air Force with training and support. The estimated completion date is 30 June 2022. The five year contract is the first multi-year agreement for the AH-64E variant since deliveries began in 2011, and Qatar is one of seven foreign countries that have ordered this variant.

■ The Royal Canadian Air Force (RCAF) grounded its CH-148 Cyclone variants of the S-92 on 12 March, following an uncommanded change in the descent rate of a CH-148 during a training sortie three days earlier. Although the aircraft self-corrected and landed safely,



the decision was made to ground the fleet whilst the cause was investigated. The aircraft remain grounded as we closed for press.

11 CH-148s have so far been delivered to the RCAF, although six are with Sikorsky for upgrading and modifications and two are also being used by the manufacturer for operations and maintenance training of RCAF personnel.

■ The Royal Air Force took delivery on 22 March of its first Boeing Chinook HC.Mk.5 helicopter, one of eight being upgraded from long range HC.Mk.3 aircraft under the UK Ministry of Defence Project Julius modernisation programme. All 46 legacy Chinook HC.Mk.2 and Mk.3 variants are being upgraded with a common cockpit under the programme, at a cost of over £400 million.

The initiative includes installing a digital automatic flight control system, moving map displays, new sensors and other modifications, to bring the aircraft up to the same standard as the more recently delivered 14 new HC.Mk.6 aircraft.

■ The UK Army Air Corps (AAC) has reorganised its attack helicopter force, to provide two regiments held at continuous readiness for operational deployments. Previously No.3 and No.4 Regiments took it in turns to be on readiness for 12 months, with the interim year being spent on training.

With more crew and training experience now available, but with continuing pressures on the fleet, the AAC is now training alongside operational readiness and has assigned the two regiments to specific support roles. No. 3 Regiment will be tasked to support the armoured infantry and strike brigades in the British Army No.3 (UK) Division. No. 4 Regiment will support 16 Air Assault Brigade and the Royal Marines 3 Brigade.

The new arrangement will provide significant elements of the Army with attack helicopter support, which has been absent in recent years due to priorities given to supporting light air assault and amphibious units or operations in Afghanistan.

Above: Despite the replacement of the Sikorsky S-61A Nuri for Malaysian SAR operations, some are still being upgraded for Army support. This newly refurbished Nuri is displayed at the LIMA exhibition in March.

■ The Royal Malaysian Air Force celebrated the completion of 10,000 flying hours with its fleet of 12 Airbus Helicopters H225Ms at the LIMA Exhibition in Langkawi on 22 March.

The first aircraft entered service in 2012 for search and rescue and humanitarian operations, replacing legacy Sikorsky S-61A Nuri helicopters. RMAF H225M pilots who have completed 1,000 and 500 flying hours were presented with awards at the same ceremony.

■ The Pakistan government has signed a new contract for the purchase of additional Leonardo AW139 intermediate medium twin-engined helicopters for delivery from early 2018. The Pakistan Air Force and Army already operate a number of AW139s for utility transport and other roles.

The additional aircraft will also be used for transport, search and rescue, and emergency medical service across the country. Leonardo Helicopters says this latest contract is a further step towards the completion of fleet renewal programmes spread across several batches, plus logistic support and training.

Although the number of AW139s ordered under the new contract has not been revealed, total sales of the type world wide recently passed the 1,000 mark, with more than 250 customers in over 70 nations and nearly 900 aircraft in service.

■ RUAG Aviation integrated a pilot assistance and helicopter safety solution on an Airbus Helicopters EC635 of the Swiss Air Force earlier this year, for use in the NATO-sponsored Degraded Visual Environment (DVE) trials held at Alggialo in February. The Sferion based solution, initially developed by Airbus DS Electronics & Border Security, is specifically configured to be integrated into any helicopter platform.



World Military Helicopter Inventory 2017

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The World Military Helicopter Inventory is compiled annually from a variety of independent sources and personal observation. Updates and corrections are welcome and personal confidentiality guaranteed. E-mail changes should be forwarded to office@aviapress.co.uk

ABKHAZIA

3 x Mil Mi-8MTV
3 x Mi-24

AFGHANISTAN

10 x Bell UH-1H
3 x HAL Cheetal
27 (+30) MDH MD530F
78 x Mi-17
3 (+1) (12 stored) x Mi-35

ALBANIA

Air Force
3 x Aerospatiale AS350B
4 x SA316B
3 x Agusta A109C
6 x Agusta-Bell AB205A
7 x AB206C
4 x Airbus Helicopters AS532AL
10 x MBB Bo105 E4
1 x Mil Mi-8T

ALGERIA

Air Force
4 x Aerospatiale SA330
8 x AgustaWestland AW101
5 x Bell 206L
3 x 412 EP
9 x AS355N
6 x Hughes 269A
3 x Kamov Ka-27
20 x Mil Mi-2
12 x Mi-8
38 x Mi-171
32 x Mi-24 Mk.III
9 (+5) x Mi-26 T2
8 (+34) x Mi-28N

Navy

2 x AgustaWestland AW139
6 x Super Lynx

ANGOLA

Air Force
6 x Aerospatiale SA342M
3 x AS365C
7 x AS565UA
6 x AgustaWestland AW109M
8 x Bell 212
12 x IAR 316B
10 x Mil Mi-8
36 x Mi-17/171
4 x Mi-171Sh
15 x Mi-24/35

ARGENTINA

Air Force
4 x Aerospatiale SA315B
1 (+29) x Avicopter Z-11
1 x Bell UH-1H
7 x 212
2 x (+4) 412 EP
2 x Boeing Vertol CH-47C (stored)
4 (+6) x Helibras HB350B
3 x MDH MD500D
7 x 500M
1 x 530F
2 x Mil Mi-171
1 x Sikorsky S-61R (stored)
2 x S-76B

Army

5 x Aerospatiale SA315B
3 x AS532C-3
5 x Agusta A109AA (stored)
(+20) x Agusta-Bell 206C
28 x Bell UH-1H
12 x Huey II
5 x OH-58A/206
1 x 212

Navy

2 x Agusta-Sikorsky ASH-3H
4 x Airbus Helicopters AS555N
4 x Helibras HB350B
4 x Sikorsky UH-3H

Coast Guard

1 x Aerospatiale AS330
1 (+1) Airbus Helicopters H225
4 x AS355NP
3 x AS565MA
2 x MDH MD500M
1 x Schweizer TH-300C

ARMENIA

Air Force
3 x Mil Mi-2 (+3 stored)
6 x Mi-8
2 x Mi-9
11 x Mi-24P/K/R

AUSTRALIA

Army
22 x Airbus Helicopters Tiger
15 x Bell 206B
5 x Boeing Vertol CH-47D
10 x CH-47F
17 (+24) x NH Industries MRH-90
34 x Sikorsky S-70A-9

Navy
13 x Aerospatiale AS350B (+9 stored)
+15 Airbus Helicopter H135
3 x Bell 429
6 x NH Industries MRH-90
15 x Sikorsky S-70B-2
24 x MH-60R

AUSTRIA

Air Force
24 x Aerospatiale SA316B (+8 stored)
23 x Agusta-Bell AB212
10 x Bell OH-58
9 x Sikorsky S-70A
(+3 x UH-60M)

AZERBAIJAN

Air Force
1 x AgustaWestland AW101
7 x Mil Mi-2
13 x Mi-8
20 (+18) Mi-17
22 x Mi-35M

BAHAMAS

Defence Force
No helicopters currently on strength

BAHRAIN

Air Force
12 x Agusta-Bell AB212
4 x Bell 412
16 x AH-1E
2 x TAH-1P
1 x 430

BAHRAIN continued

4 x MBB Bo105C
2 x Sikorsky S-70A
9 x UH-60M
1 x S-92

Navy

2 x MBB Bo105 CBS-4

BANGLADESH

Air Force

2 x AgustaWestland AW139
6 x Bell 206L
13 x 212

Army

2 x Airbus AS365N3+
3 x Bell 206L
12 x 212
23 x Mil Mi-17/171
2 x Mi-17-IV
7x Mi-171Sh

Navy

3 x Avicopter Z-9
2 x AgustaWestland AW109E

BARBADOS

Defence Force

No helicopters currently on strength

BELARUS

Army Aviation

11 x Mil Mi-6 (stored)
40 (+ 52 stored) x Mi-8
1 x Mi-9
12 x Mi-17MTV-5
1 x Mi-172
26 x Mi-24P/V/R (+30 stored)
1x Mi-26 (+ 9 stored)

BELGIUM

Air Force

4 x Westland Sea King Mk.48
10 x Agusta A109HA
13 x A109HO
4 x NH Industries NH90TTH

Navy

3 x Aerospatiale SA316B
4 x NH90NFH

BELIZE

Defence Force

2 x Bell UH-1H
1 x 407

BENIN

Air Force

4 x Agusta A109BA
2 x Airbus Helicopters AS555

BHUTAN

Air Force

2 x Mil Mi-8

BOLIVIA

Air Force

2 x Aerospatiale SA315B
1 x Aerospatiale SA316B

BOLIVIA continued

1 x AS332B
2 x AS350B3
6 x Airbus Helicopters AS332C1e
6 x Avicopter H425
6 x Bell UH-1H
7 x Huey II
2 x EC145
5 x Helibras HB315B
(+ 5) Mil Mi-17
6 x Robinson R44

Army

1 x Helibras HB315B

BOSNIA & HERZEGOVINA

Air Force

6 x Aerospatiale SA341H/L
7 x Bell UH-1H (+ 5 stored)
2 x UH-1V
4 x Mil Mi-8T/MTV
1 x Mi-17
5 x Mi-24 (stored)
1 x Mi-34 (stored)

BOTSWANA

Defence Force

11 x Aerospatiale AS350B/BA/B3
1 x Agusta-Bell AB412
1 x Airbus Helicopters AS555
5 x Bell 412SP
1 x 412EP

BRAZIL

Air Force

2 x Airbus Helicopters EC135
7 (+ 9) x Airbus Helicopters EC725
29 x Bell UH-1H
11 x 206B
27 x Helibras HB350B
8 x HB355B
4 x Hughes OH-6A
6 x MDH MD500D
12 x Mil Mi-35M (AH-2)
16 x Sikorsky UH-60L

Army

34 x Aerospatiale AS565K
8 x AS532UE
20 x AS550A2
6 (+ 10) x Airbus Helicopters EC725
16 x Helibras HB350L
4 (+ 6) x Sikorsky S-70A-36

Navy

5 x Aerospatiale AS332F1
2 x AS532F1
4 x Agusta-Sikorsky SH-3H
3 (+ 13) x Airbus Helicopters EC725
15 x Bell 206B
10 x Helibras HB350B
8 x HB355F
4 x Sikorsky SH-3A/SH-3B
6 x S-70B (MH-16)
13 x Westland Lynx Mk. 21A

BRUNEI

Air Force

5 x Bell 206B
6 x MBB Bo105C
2 x Sikorsky S-70C
12 x S-70i

BULGARIA

Air Force

6 x Bell 206B3
12 x Airbus Helicopters AS532AL
3 x Mil Mi-17 (+ 3 stored)
2 x Mi-24V (+ 4 stored)

Border Guard

14 x Kamov Ka-26

Navy

3 x Airbus Helicopters AS565MB
(+ 3 stored) Mil Mi-14

BURKINA FASO

Air Force

1 x Aerospatiale AS350B
2 x AS565
3 x Mil Mi-8
2 x Mi-35

BURUNDI

Army

3 x Aerospatiale SA316B
2 x SA342L
1 x AS350B
2 x Mil Mi-24

CAMBODIA

Air Force

12 x Avicopter Z-9
2 x Airbus Helicopters AS350B
1 x AS365N
3 x Mil Mi-8
5 x Mi-17
3 x Mi-24
2 x Mi-26 (stored)

CAMEROON

Air Force

2 x Aerospatiale SA330F/I
3 x AVIC Z-9WE
2 x Bell 06B3
1 x Bell 412EP
2 x Mil Mi-171V
3 x Mi-17V5
4 x Mi-24

Government

1 x Airbus Helicopters AS332L1
1 x AS565

CANADA

Armed Forces

12 x Bell 206B (CH-139)
95 x 412CF (CH-146)
15 x Boeing CH-47F
14 x AgustaWestland AW101 (CH-149)
27 x Sikorsky SH-3A (CH-124)
11 (+17) x H-92 (CH-148)

CAPE VERDE

Army

2 x Harbin Z-9

CENTRAL AFRICAN REPUBLIC

Air Force

1 x Aerospatiale AS550
1 x Mil Mi-8

CHAD

Air Force

2 x Aerospatiale SA316B
6 x Airbus Helicopters AS550C2
6 x Mil Mi-17
5 x Mi-35

CHILE

Air Force

5 x Aerospatiale SA315B
1 x AS332L
1 x AS350B
18 Bell UH-1H
4 x 206B
1 x 212
12 x 412EP
2 x Hiller UH-12E
4 x UH-12L-4
6 x MBB Bo105LS
5 x MDH MD530F
1 x Sikorsky S-70A-39
(+6) S-70i

Army

13 x Aerospatiale SA315B (3 x stored)
5 x AS350B
2 x SA330H/L
3 x AS532C
10 x H215
21 x Bell UH-1H
1 x Helibras HB355
17 x MDH MD530F
1 x Sikorsky S-76A

Navy

3 x Airbus Helicopters AS365N2
4 x AS365F
6 x AS532SC
2 x AS532L
6 x Bell 206
1 (+8) x 412
4 x MBB Bo105CB/LS

CHINA

Air Force

3 x Aerospatiale SA315B
6 x Airbus Helicopters AS332L1
3 x Airbus Helicopters EC225
7 x AS350B
15 x SA316B
5 x SA321J/Z-8

Army

8 x Aerospatiale SA342L-1
7 x Avicopter Z-8
91 x Z-9 (AS565)
78 x WZ-9 (combat)
95 x Z-10
59 x Z-11
12 x Z-19
89 (+61) x Harbin HC120
30 x Mi-8
54 x Mi-17
69 x Mi-17U5
84 x Mi-171E
2 x Mi-26TS
19 x Sikorsky S-70C

Navy

12 x Aerospatiale SA321J/Z-8
25 x Z-9 (AS565)
3 x Ka-28 (SAR)
14 x Ka-28 (ASW)
9 x Ka-31

COLOMBIA

Air Force

27 x Aerospatiale SA315B
6 x Bell UH-1H
7 x Huey II
12 x 205A1
24 (+7) OH-58A
15 x 206
10 x 212
1 x 412
12 x Enstrom F-28F
16 x MDH MD500D/E/G/M
32 x Sikorsky UH-60A/L

Army

27 x Bell UH-1N
23 x Huey II
11 x Mil Mi-17
9 x Mi-17MD
33 (+14) x Sikorsky UH-60L
8 x S-70i

Naval Air Arm

2 x Aerospatiale AS555N
2 x Bell 212
3 x 412
2 (+2) x 412EP
4 x MBB Bo105CB
1 x BK117
1 x Robinson R22

COMORES

Air Force

1 x Aerospatiale AS350B (stored)
1 x Mil Mi-14P

CONGO

Air Force

3 x Aerospatiale SA318C
1 x SA365C
3 x Mil Mi-2
1 x Mil Mi-8/17
3 x Mi-24/35

CONGO DEMOCRATIC REPUBLIC

Air Force

3 x Aerospatiale SE3160
3 x SA316B
9 x SA330
1 x AS332L
6 x Bell 47G
6 x Mil Mi-17
3 x Mil Mi-24
1 (+1) x Mi-26

COSTA RICA

Air Force

2 x MDH MD500E
2 x MD600N

CROATIA

Air Force

5 x Aerospatiale SA341
8 x Bell 206B-3
16 x Bell OH-58D
6 x UH-1H/212
4 x MDH MD500D
2 x Mil Mi-2
3 x Mi-8S/T

CROATIA continued

6 x Mil Mi-8MTV-1
1 x Mi-17
10 x Mi-171Sh
7x Mi-24D/V (stored)

Navy

2 x Mil Mi-8

Coast Guard

4 x Mil Mi-8

CUBA

Air Force

2 x Mil Mi-2
14 x Mi-14
10 x Mi-17 (+6 stored)
4 x Mi-24D (+7 stored)

Navy

4 x Kamov Ka-28

CYPRUS

Air Force

6 x Aerospatiale SA342L-1
3 x AgustaWestland AW139
2 x Bell 206L
11 x Mil Mi-24VK2
2 x PZL-Swidnik Kania (stored)

CZECH REPUBLIC

Air Force

4 x Mil Mi-2 (+ 17 stored)
1 x Mi-9
12 x Mi-17 (+ 5 stored)
16 x Mi-171
12 x Mi-24V (stored)
10 x Mi-35
10 x PZL-Swidnik W3

Border Guard

17 x Mil Mi-2
9 x Mi-8

DENMARK

Air Force

12 x Aerospatiale AS3550C2
14 x AgustaWestland AW101
6 x Westland Lynx Mk. 80
(+ 9) x Sikorsky MH-60R

DJIBOUTI

Air Force

2 x Aerospatiale AS355F
1 x Mil Mi-8T
1 x Mi-17
3 x Mi-24V

DOMINICAN REPUBLIC

Air Force

1 x Aerospatiale SA365C (stored)
10 x Bell 206A-1
8 x Huey II
2 x UH-1H
3 x Schweizer 333

Army

8 x Bell OH-58A/C
4 x Robinson R22
2 x R44

Navy

2 x Bell OH-58C

ECUADOR

Air Force

3 x Aerospatiale SA316B
3 x Airbus Helicopters AS350B
2 x AS332L
2 x AS532C
24 x Bell UH-1H
8 x TH-57
2 x 206B

Army

3 x Aerospatiale SA315B
1 x SA316B
1 x SA319B
5 x SA330L (stored)
7 x SA342L
5 x Airbus Helicopters AS532C
5 x AS350B2
2 (+5) AS550C3
1 x Bell 214B
9 x Mil Mi-17-1

Navy

1 x Aerospatiale SA319B
5 x Bell 206B
1 x 230
4 x 430
2 x Helibras HB350B
(+ 2) x Kaman SH-2G

EGYPT

Air Force

4 x Aerospatiale SA342K
75 x SA342L
3 x Agusta-Sikorsky AS-61
2 x AgustaWestland AW139
34 x Boeing AH-64D
10 x AH-64E
16 (+6) x CH-47D
16 x Hiller UH-12E
41 x Mil Mi-8T
3 x Mi-17-1V
1 x Sikorsky VH-3A
4 x Sikorsky S-70A
5 x Westland Commando Mk. 1
16 x Commando Mk. 2
1 x Commando Mk. 2B
4 x Commando Mk. 2E

Navy

12 x Aerospatiale SA342L
(+46) Kamov Ka-52K
9 x Kaman SH-2G(E)
10 x Mil Mi-8

EIRE

Air Corps

1 x Aerospatiale SA342L
1 x AS355N
6 x AgustaWestland AW139
2 x EC135

EL SALVADOR

Air Force

11 x Bell UH-1H (+25 stored)
2 x UH-1M (+4 stored)
4 x Bell 412EP
5 x Hughes 269A (+1 stored)
1 x MDH MD500D
3 x MD500E

EQUATORIAL GUINEA

National Guard

2 x Aerospatiale SA316B
1 x AgustaWestland A109A
2 x Enstrom 480B
1 x Mil Mi-172
4 x Mi-24V
1 x Mi-26
1 x Sikorsky S-92

ERITREA

Air Force

1 (+2) x Agusta-Bell 412
4 x Mil Mi-17
1 x Mi-35

ESTONIA

Air Force

4 x Robinson R44

Border Guard

3 x AgustaWestland AW139

ETHIOPIA

Air Force

5 x Aerospatiale SA316B
1 x SA330
4 x Agusta-Bell AB204B
10 x HAL Chetak
6 x IAR 316B
2 x Mil Mi-2
21 x Mi-8/Mi-17
2 x Mi-14
9 x Mi-35

Army

5 x Bell UH-1H
(The majority of the Ethiopian helicopter fleet is believed to be unserviceable)

FIJI

Air Force

No helicopters currently on strength

FINLAND

Army

2 x MDH MD500D
1 x MD500E
20 x NH Industries NH90TTH

Frontier Guard

3 x Aerospatiale AS332L
2 x AS332L1e
5 x Agusta Bell AB206B
4 x AB412
1 (+3) x AgustaWestland AW119Ke

FRANCE

Air Force

24 x Aerospatiale SA330B/H
6 x AS332L
3 x Airbus Helicopters AS532C
41 x AS555AN
3 x AS565
10 (+1) x EC725
Army
94 x Aerospatiale SA330B/H (+ stored a/c)
56 x SA341F (+ stored a/c)
29 x SA342L

FRANCE continued

139 x SA342M
26 x AS532UL
18 x AS555UN
39 x Airbus Helicopters Tiger HAP
21 (+10) x Tiger HAD
8 x EC725R
20 (+54) x NH Industries NH90

Navy

16 x Aerospatiale SA316B
4 x AS565F
6 x AS365N
2 x Airbus Helicopters EC225
2 A3365N3+
22 x AS565MA
13 (+14) x NH Industries NH90 NFH
14 (+17 stored) x Westland Lynx HAS Mk.4

GABON

Army Aviation

4 x Aerospatiale SA330C/H
3 x SA342L
1 x Airbus Helicopters AS350B
1 x AS355F
1 x AS332L
1 x EC120
2 x EC135
1 x Bell 412SP

GAMBIA

No helicopters currently on strength

GEORGIA

Air Force

8 x Bell UH-1H
(2x) Airbus Helicopters EC725
1 x Mil Mi-2
16 x Mi-8
2 x Mi-14
7 x Mi-24D

GERMANY

Air Force

3 x Airbus Helicopters AS532U2
82 x Bell UH-1D
66 x Sikorsky CH-53G/GS

Army

15 x Airbus Helicopters EC635
4 x (+11) x H145M
79 x Bell UH-1D
28 (+28) Tiger UHT
50 (+45) x NH Industries NH90TTH

Navy

(+18) x NH Industries NH90NFH
22 x Westland Lynx HAS Mk. 88A
21 x Sea King HAS Mk. 41

GHANA

Air Force

2 x Aerospatiale SA316B
2 x Agusta A109E
4 x AVIC Z-9
2 x Bell 412
1 x Mil Mi-2
3 (+?) x Mi-17V-5
4 x Mi-171SH
(+4) x Mi-35

GREECE

Air Force

14 x Agusta-Bell AB205A
1 x AB206A
4 x Airbus Helicopters AS532C
8 (+2) x AS532A2
6 x Bell 47G-3B
2 x OH-13
4 x 212

Army

49 x Agusta-Bell AB205A
16 x AB206A
1 x AB212
2 x Bell 47G-5
41 x UH-1H
12 x Boeing AH-64A+
10 x AH-64DHA
15 x Boeing Vertol CH-47DG
6 (+5) x CH-47D
20 x Nardi-Hughes NH-300
5 (+15) x NH Industries NH90

Navy

2 x Aerospatiale SA319B
7 x Agusta-Bell AB212 ASW
2 x AB212EW
11 x Sikorsky S70B-6

Coast Guard

4 x Airbus Helicopters AS532C1
5 x AS565N3

GUATEMALA

Air Force

3 x Bell UH-1D
7 x UH-1H
4 x Huey II
1 x 206B
3 x 206L
2 x 212
6 x 412
3 x Sikorsky S-76A

GUINEA REPUBLIC

Air Force

1 x Aerospatiale AS350B
1 x SA316B
1 x SA330
1 x SA342K
1 x IAR 330L
2 x MDH MD500MD
2 x Mil Mi-8
4 x Mil Mi-24D

GUINEA BISSAU

Air Force

1 x Aerospatiale SE313B
2 x SA316B

GUYANA

Defence Force

2 x Aerospatiale SA319B
2 x Bell 206B
1 x 412

HAITI

No helicopters currently on strength

HONDURAS

Air Force

1 x Bell 47G (stored)
4 x UH-1B (stored)
4 x UH-1H
1 x 412EP
7 x 412SP
5 x Hughes TH-55A (stored)
2 x MDH MD500D
(+7) x Sikorsky UH-60A

HONG KONG

Government Flying Service

3 x Airbus Helicopters AS332L2
4 x EC155B

HUNGARY

Air Force

32 x Mil Mi-2
5 x Mi-8S
39 x Mi-8T (stored)
(+30) x Mi-17V5
7 x Mi-17
2 x Mi-17PP
4 x Mi-24D/V (+29 stored)
2 x Mi-24P (+4 stored)
3 x Robinson R22

ICELAND

Coast Guard

2 x Aerospatiale AS332L
1 x AS350B
1 x AS565
1 x MDH MD500D

INDIA

Air Force

3 x AgustaWestland AW101
6 x Airbus Helicopters SA365N
(+15) x Boeing CH-47F
(+22) x AH-64E
37 x HAL Chetak
23 x Cheetah
10 x Cheetal
57 (+55) x Dhruv
45 x Mil Mi-8
76 x Mi-17
151x Mi-17V5
2 x Mi-26
15 x Mi-35

Army

66 x HAL Cheetah
20 x Cheetal
150 (+100) x Dhruv
17 (+58) x Rudra
80x Chetak
20 x Lancer
(+4) x LCH

Navy

32 x HAL Chetak
8 (+16) x Dhruv
4 x Hughes 300B
5 x Kamov Ka-25
4 (+11 stored) x Ka-28
14 x Ka-31

INDIA continued

6 x Sikorsky UH-3H
(+16) x S-70B
11xWestland Sea King Mk. 42/42A (stored)
17 x Sea King Mk. 42B
6 x Sea King Mk. 42C

Coast Guard

17 x HAL Chetak
4 (+16) x Dhruv
(+12) Mil Mi-17V5

INDONESIA

Air Force

1 x Aerospatiale SE313B
12 x Airbus Helicopters EC120
2 x SA318C
8 x SA330B/L
3 x SA330SM
6 x H225M
2 x 204B
2 x 206
1 x 412
21 x Hughes 300C
12 x MDH MD500D
5 x Nurtanio-Aerospatiale NAS332B
15 x NAS332L/L2
15 x Nurtanio-MBB NBo105C
10 x Sikorsky S-58T
1 x S-61A
7 x Soloy-Bell 47G (+4 stored)

Army

5 x Aerospatiale SE3160
(+1) x Airbus Helicopters AS350B3
6 x AS555NP
6 x AS550C3
3 (+9) x H125M
21 x Bell 205A
6 x 212
(+8) x Boeing AH-64E
19 (+10) x Nurtanio-Bell NB412
28 x Nurtanio-MBB NBo105
16 (+6) x Mil Mi-17-V5
8 x Mil Mi-35
14 x Schweizer 269C
6 x Sikorsky S-300C

Navy

3 x Aerospatiale SE3160
(+11) x Airbus Helicopters AS565MBe
4 x AS532SC
5 x EC120
2 x Mil Mi-2
4 x Nurtanio-Bell NB412
6 x Nurtanio-MBB NBo105C (+7stored)
8 x Westland Wasp HAS 1 (stored)

IRAN

Air Force

3 x Agusta Bell AB206
5 x AB212
2 x Agusta-Sikorsky AS-61/A-4
20 x Bell 214C
2 x Boeing Vertol CH-47C
7 x IDI Shabaviz
15 (+10) x Shahed 274
6 x Shahed 285
5 x Mil Mi-17

IRAN continued

Army

23 x Agusta Bell AB205A
73 x AB206
69 x Bell AH-1J
145 x 214A
36 x Boeing Vertol CH-47C
27 x Mil Mi-17

Navy

4 x Agusta-Bell AB205
12 x AB206A
19 x AB212ASW
12 x Agusta-Sikorsky ASH-3D
5 x Mil Mi171
1 x Sikorsky HH-53H
7 x RH-53D

(Note: A number of Iranian aircraft are unserviceable)

IRAQ

Army

6 x Aerospatiale SA342M
22 x Airbus Helicopters EC635
10 x Bell 206B
9 x OH-58
12 x 407
20 x Armed 407
(+12) x 412EP
14 x Huey II
+12 x Kamov Ka-52
16 x Mil Mi-17
21 x Mi-171E
15 x Mi-28NE
2 (+2) x Mi-28UB
13 x Mi-35M
2 x PZL-Swidnik W-3 Sokol

ISRAEL

Air Force

1 x Aerospatiale SA366G
8 x SA565SA
12 x Agusta-Bell AB206
47 x Bell AH-1E/F/S (31 stored)
(+6) x Bell Boeing V-22
45 (+2) x Boeing AH-64A/D
35 x MDH MD500M/D (stored)
23 x Sikorsky CH-53 Yasur
20 x CH-53D (stored)
49 x UH-60A/L
(+5) x SH-60F

ITALY

Air Force

32 x Agusta-Bell AB212AM/CO
15 x AgustaWestland HH-139
4 (+8) x AW101
2 x AW139
2 x Nardi-Hughes NH500D
42 x NH500E

Army

22 x Agusta A109EOA
48 x A129CBT
65 x Agusta-Bell AB205A
44 x AB206C
18 x AB212
22 x AB412
27 x Boeing Vertol CH-47C
6 (+10) CH-47F
30 (+30) x NH Industries NH90TTH

ITALY continued

Navy

1 x Agusta A109E
49 x Agusta-Bell AB212ASW
8 x AgustaWestland AW101ASW
4 x AgustaWestland AW101AEW
4 x AgustaWestland AW101UT
6 x AgustaWestland AW101ASH
23 (+23) x NH Industries NH90NFH
2 (+8) x NH90TTH
6 x Agusta-Sikorsky ASH-3D/H (stored)

Carabinieri

23 x Agusta A109
2 x A109E
41 x Agusta-Bell AB206
32 x AB412

IVORY COAST

Air Force

2 x Airbus Helicopters AS365C (stored)
2 x IAR 330L
3 x Mil Mi-24 V/P

JAMAICA

Defence Force Air Wing

4 x Bell UH-1H
2 x 412EP
4 x 407

JAPAN

Air Self-Defence Force

(+16) x Bell-Boeing MV-22
2 x Kawasaki BK117
25 x CH-47JA
34 x Sikorsky UH-60J
14 (+35) x UH-60JA
Ground Self-Defence Force
3 x Airbus Helicopters EC225
14 x Boeing AH-64DJP
30 x Enstrom 480B
75 (+8 stored) x Fuji-Bell AH-1S
150 x UH-1J
38 x Kawasaki OH-1
181 x Kawasaki-Hughes OH-6D
1 x OH-6J (50 stored)
4 x TH-55J (10 stored)
34 x CH-47J
38 (+7) x CH-47JA
25 x Mitsubishi-Sikorsky UH-60JA

Maritime Self-Defence Force

15 x Airbus Helicopters TH135
10 x Hughes OH-6D
2 x Kawasaki CH-101
8 (+3) x MCH-101
9 x OH-6J
9 x Kawasaki-Vertol KV107 (stored)
46 x SH-60J
48 (+2) x SH-60K
19 x UH-60J

JORDAN

Air Force

8 x Aerospatiale SA342
10 x Airbus Helicopters AS332L
6 x AS350B3
9 (+4) x EC635
25 x Bell AH-1F

JORDAN continued

35 x UH-1H
(+18) X Boeing AH-6i
3 x MBB Bo105S
6 x MDH MD500D (stored)
6 x MD530F
8 x Robinson R44
5 x Sikorsky S-70C
8 x UH-60A
8(+12) x UH-60L
2 x UH-60M

KAZAKHSTAN

Air Force

+2 x Airbus Helicopters EC145
(+20) x EC725
2 (+4) Bell Huey II
4 x Mil Mi-2
6 x Mi-6 (stored)
10 (+47 stored) x Mi-8
12 (+12) x Mi-17V5
34 x Mi-24
(+4) x Mi-35M
4 x Mi-26 (+5 stored)

KENYA

Air Force

2 x Aerospatiale SA330L
7 x Avicopter Z-9WE
6 (+2) x Bell Huey II
8 x IAR330
2 x MDH MD500D
14 x 500MD
15 x 500MD(TOW)
8 x 500ME
(+12) x MD530F
5 x Mil Mi-17
5 (+11) x Mi-28

KOREA (NORTH)

Army Air Force

1 x Hughes 300C
83 x MDH 500D/E
60 x Mil Mi-2
20 x Mi-4
20 x Mi-8
10 x Mi-14
30 x Mi-17
48 x Mi-24
2 x Mi-26

KOREA (SOUTH)

Air Force

2 x Aerospatiale AS332L
2 x Bell UH-1N
3 x 412
6 x Boeing Vertol HH-47D/Model 414
7 x Kamov Ka-32
48 x MDH MD500MD
3 x Sikorsky S-92
12 x UH-60P

Army

6 x Bell AH-1J
59 x AH-1F
43 x UH-1H
12 (+24) x Boeing AH-64E
30 x Boeing Vertol CH-47D/Model 414
6 x MH-47E

KOREA (SOUTH) continued

12 x MBB Bo105
122 x Hanjin-MDH MD500MD
100 (+70) KAI Surion
68 x MDH MD500MD
129 x Sikorsky UH-60P
65 x UH-60P
3 x UH-60L

Navy/Marines

6 x Aerospatiale SA319B
(+8) x AgustaWestland AW159
2 x Bell 206B
4 x UH-1H
(+30) x KAI Surion
23 x MDH MD500MD
21 x Westland Lynx 99/99A

KUWAIT

Air Force

7 x Aerospatiale SA330H
8 x SA342K
7 x SA342L
5 x Airbus AS532SC
(+30) x H225M
16 x Boeing AH-64D
3 x Sikorsky S-92

KYRGHYZSTAN

Air Force

6 x Mil Mi-8
2 x Mi-8MTV
15 x Mi-24

LAOS

Air Force

4 x Avicopter Z-9
approx. 12 x Bell UH-1D/H
6 x Kamov Ka-32T
2 x Mil Mi-6 (stored)
9 x Mi-8
11 x Mi-17
1 x Mi-26

LATVIA

Air Force

3 x Mil Mi-2 (+2 stored)
4 x Mi-8MTV-1

LEBANON

Air Force

4 x Aerospatiale SA316B
3 x SA330L
(+7) x AS332
9 x SA341
2 x SA342L
7 x Agusta-Bell AB212
15 (+6 stored) x Bell UH-1H
10 (+15) x Huey II
10 x IAR SA330SM6
(+6) Mil Mi-24
4 x Robinson R44
3 x Sikorsky S-61N

LESOTHO

Defence Force Air Wing

2 x Agusta-Bell AB412
1 x Bell 412EP
1 x MBB Bo105LS
1 x Mil Mi-2
1 x Soloy-Bell 47

LIBERIA

Air Force

3 x HAL Chetac
3 x Mil Mi-2 (Stored)
2 x Mi-17

LIBYA

Air Force

4 x Aerospatiale SA316B
2 x Agusta A109A
1 x Agusta-Bell AB212
1 x Agusta-Sikorsky AS-61A
20 x Mil Mi-2
5 x Mi-8/17
29 x Mi-35

Army

10 x Aerospatiale SA316B
40 x SA342L
3 x Agusta-Bell AB206A
2 x AB212
8 x Bell 47G-4A
6 x Boeing Vertol CH-47C+

Navy

10 x Aerospatiale SA321G (stored)
11 x Mil Mi-14

(Note: A number of Libyan aircraft are unserviceable or destroyed)

LITHUANIA

Air Force

2 (+1) x Airbus Helicopters AS365N3
7 (+3) x Mi-8

MACEDONIA

Air Force

2 x Bell UH-1H
4 x 206B
6 x Mi-17
8 x Mi-24V

MADAGASCAR

Air Force

2 x Mil Mi-8 (stored)

MALAWI

Army

2 x Aerospatiale SA330
4 x SA341B
1 x Airbus Helicopters AS350L
1 x AS332L
1 x AS532UL

MALAYSIA

Air Force

22 x Aerospatiale SE3160/SA316B
2 x Agusta-Sikorsky AS-61N1
12 x Airbus Helicopters EC725
3 x Bell 47G (stored)
(+10) x Mil Mi-17Sh
28 x Sikorsky S-61A
2 x S-70C

Army

11 x Agusta A109LUH
(+6) x MD Helicopters MD530G

Navy

6 x Airbus Helicopters AS555N
1 x Mil Mi-8
6 x Westland Super Lynx 300

MALDIVES

2 x HAL Dhruv

MALI

Air Force

1 x Airbus Helicopters AS350B (stored)
1 x AS332L2
1 x Avicopter Z-9A
1 x H215
1 x Mil Mi-8
2 x Mi-24D
1 x Mi-35M

MALTA

Helicopter Flight

3 x Aerospatiale SA316B (+2 stored)
3 x AgustaWestland AW139
2 x Nardi-Hughes NH500C (stored)

MAURITANIA

Air Force

3 x Aerospatiale SA316B
2 x AgustaWestland AW109E
2 x Avicopter Z-9A
4 x MDH MD500M

MAURITIUS

Coast Guard

1 x Airbus Helicopters AS350B
1 x HAL Dhruv
2 x HAL Chetac

MEXICO

Air Force

5 x Aerospatiale SE3160
2 x SA330J
11 x Airbus Helicopters EC725
2 x AS355F
4 x AS332L
1 x Agusta A109A
5 x AW109SP
5 x Bell 47G
5 x 205
46 x 206B
7 x 206L
15 x 407GXP
22 x 212
11 x 412
21 x MDH MD530F
10 x Mil Mi-8
20 x Mi-17
1 x Mi-26 (stored)
4 x Sikorsky CH-53 2000
6 x Sikorsky S-70A-24
6 (+12) x UH-60M

Navy

2 x Airbus Helicopters AS355F
2 x AS565N3
4 x AS565MB
4 (+6) x AS565MBE
3 x EC725
4 x (+7 stored) x MBB Bo105CBS-5
4 x MDH MD500E
6 x MD902CE
2 x Mil Mi-2
22 x Mi17-IV
4 x x Mi-17V-5
4 x Mi-24P
1 x Robinson R44
5 x Schweizer 300C
3 (+7) x Sikorsky UH-60M

MOLDOVA

Air Force

8 x Mil Mi-8
12 x Mil Mi-24D (stored)

MONACO

Government

2 x Agusta-Bell AB206A

MONGOLIA

Air Force

11 x Mil Mi-8
2 x Mi-171
12 x Mi-24

MONTENEGRO

Air Force

13 x Aerospatiale SA341/SA342
5 x Mil Mi-8T

MOROCCO

Air Force

27 x Aerospatiale SA330C
18 x SA342K
6 x SA342L
46 x Agusta-Bell AB205A
20 x AB206B
2 x AB212
2 x Bell 212
9 x Boeing Vertol CH-47C (stored)
3 x CH-47D

Navy

3 x Airbus Helicopters AS565MB

MOZAMBIQUE

Air Force

3 x Aerospatiale SA316B
4 x Bell 47G-5
5 x 205A
5 x 206B
2 x Mil Mi-8
4 x Mi-25

MYANMAR

Air Force

10 x Aerospatiale SA319B
14 x Bell 205A/UH-1H
6 x 206
20 x Mil Mi-2
28 x Mi-17
10 (+50) x Mi-35
12 x PZL W-3 Sokol

NAMIBIA

Air Force

2 x AgustaWestland AW139
1 (+2) x HAL Chetak
3 x Cheetah
2 x Mil Mi-8
2 x Mi-24

NEPAL

Army

2 x Airbus Helicopters AS332L
1 x AS350B3
2 x HAL Cheetah (stored)
2 x Chetak (stored)
1 x Dhruv (stored)
2 x Lancer (stored)
3 (+2) x Mil Mi-17

NETHERLANDS

Air Force

4 x Aerospatiale SE3160
8 x Airbus Helicopters AS532U2
23 x Boeing AH-64D (+6 stored)
11 x CH-47D
6 (+14) x CH-47F

Navy

16 (+4) x NH Industries NH90NFH

NEW ZEALAND

Air Force/Army/Navy

5 x AgustaWestland A109LJH
4 x Bell 47G/OH-13
8 x NH Industries NH90

NICARAGUA

Air Force

1 x Mil Mi-2 (stored)
12 x Mi-17

NIGER

3 x Aerospatiale SA342
2 x Mil Mi-17
2 x Mi-24

NIGERIA

Air Force

10 x Aerospatiale SA316B (stored)
6 x SA341
4 x SA330 (stored)
5 x Airbus Helicopters AS332M1
3 x EC135
4 x AgustaWestland AW139
2 x AW101
10 x AW109LJH
2 x MBB Bo105C (stored)
15 x Bo105D (stored)
3 (+1) x Mil Mi-171
(+12) x Mi-171Sh
5 x Mi-35P
2 (+10) x Mi 35M
2 (+4) Robinson R66

Navy

2 x AgustaWestland AW109E
1 x AW139
1 x Airbus Helicopters AS365N2
(+12) x AS550C
2 x Westland Lynx Mk. 89

NORWAY

Air Force

(+16) x AgustaWestland AW101
18 x Bell 412SP
6 (+8) x NH Industries NH90NFH
12 x Westland Sea King Mk.43B

OMAN

Air Force

2 x Airbus Helicopters AS332L
1 x AB212
2 x AgustaWestland AW139
15 x Super Lynx 300
5 x Bell 205A
3 x 206
2 x 212
9 (+10) x NH Industries NH90

PAKISTAN

Air Force

6 x Aerospatiale SE3160
16 x SA316B
4 x SA319B
1 x SA330J
2 x AgustaWestland AW139
1 x Bell 412
4 x Mil Mi-171Sh

Army

1 x Aerospatiale SE3160
28 x SA315B
23 x SA316B
35 x SA330F//SM
12 x Agusta-Bell AB205
5 x AgustaWestland AW139
9 x Airbus Helicopters AS550B3
(+10) x AS550C3
12 x Bell 47G/OH-13S
38 x AH-1F/S
(+12) x AH-1Z
6 x UH-1H
5 (+10) x Huey II
10 x 206
(+40) x 407
38 (+2) x 412EP
3 x Changhe Z-10
5 x IAR 330 XM
1 x MDH MD530F
10 x Mil Mi-8
2 x Mil Mi-14PG
44 (+10) x Mi-17
(+4) x Mi-35
13 x Schweizer TH-300C
(+10) x TH-333

Navy

13 x Aerospatiale SA316B
10 x Avicopter Z-9EC
(+7) x Westland Sea King Mk.4
6 x Sea King Mk. 45

PANAMA

Naval Air Service

6 ((+2) x AgustaWestland AW139
2 x 407
4 x UH-1H
3 (2+) x 412 EP
1 x Airbus Helicopters EC145
1 x MDH MD500E
1 x Sikorsky S-76C

PAPUA NEW GUINEA

Air Force

4 x Bell UH-1H
1 x Nurtanio - MBB NB0105

PARAGUAY

Air Force

4 x Bell 47G
1 x 427
7 x UH-1H
2 x Helibras HB350B
2 x Hiller UH-12E
2 x UH-12SL-4

Navy

3 x Helibras HB350B

PERU

Air Force

7 x Aerospatiale SE3160
12 x Bell 47G
8 x UH-1H
(+16) x Huey II
8 x 206B
8 x 212
1 x 412EP
3 x 412
3 x Helibras HB350B
10 x MBB Bo105C (stored)
6 x Bo105LS
5 x Mil Mi-17 (+2 stored)
5 x Mi-171
10 x Mi-25 (+5 stored)
2 x Mi-35
6 x Schweizer 300C

Army

5 x Agusta A109K
1 x Bell 412
7 x Enstrom 28F
1 (+2) x F280FX
9 x Mil Mi-2
22 x Mi-17
24 x Mi-171sh-P
1 x Mi-26 (+2 stored)
1 x Robinson R44II

Navy

5 x Agusta-Bell AB212AS
2 x AB412
3 x AB412SP
3 x Agusta-Sikorsky ASH-3D
3x Bell 206B
(+2) x 412EP
6 x Enstrom F28F
(+5) x Kaman SH-2G
3 x Mil Mi-8T
3 (+13) x Sikorsky UH-3H
(Many helicopters unserviceable)

PHILIPPINES

Air Force

8 x AgustaWestland AW109E
23 x Bell UH-1H (+57 stored)
14 x 205A
3 x 412
8 x 412EP
9 x MBB Bo105C
9 x MDH MD500
18 x MD520MG
8 x PZL Swidnik W3 Sokol
1 x Sikorsky S-70A-5
10 x S-76/H-76

Navy

6 x MBB Bo105C
3 (+2) x AW109E

POLAND

Air Force

2 x Bell 206B
2 x 412
5 x Guimbal Cabri G2
8 x Mil Mi-2
14 Mi-8
16 x PZL W3
5 x W3WA
25 x SW-4

POLAND continued

Land Forces

68 x Mil Mi-2
45 x Mi-8
5 (+5) x Mi-17
14 x Mi-24D
15 x Mi-24W
17 x PZL W-3W Sokol
8 x W-3PL
15 x W-3WA
1 x W-3PPD

Navy

4 x Kaman SH-2G
1 x Mil Mi-2D
1 x Mi-8MTV-1
8 x Mi-14L/PS (+5 stored)
1 x Mi-17
2 x PZL W-3TM Sokol
6 x W-3RM Anakonda

PORTUGAL

Air Force

6 x Aerospatiale SA316B
3 x SA330CS1 (+7 stored)
12 x AgustaWestland EH101

Army

(+50) x Bell UH-1H
(10+) x NH Industries NH90

Navy

5 x Westland Lynx Mk.95

QATAR

Air Force

11 x Aerospatiale SA342L
18 (+3) x AgustaWestland AW139
(+24) x Boeing AH-64E
3 x Westland Commando Mk. 2A
1 x Commando Mk. 2C
12 x Commando Mk. 3
(+22) x NH Industries NH90

ROMANIA

Air Force

3 x Aerospatiale SA365N (stored)
20 x IAR316B (+30 stored)
14 x IAR330
24 x IAR330SOCAT
5 x Mil Mi-8 (stored)

Navy

5 x IAR 316B
3 x IAR330

RUSSIA

Air Force

3 x Airbus Helicopters AS350B3
2 x AS355NP
4 x Kamov Ka-27PS
8 x Ka-50
48 (+120) x Ka-52
36 x Ka-226V
12 x Kazan Ansat
100 x Mil Mi-2
350 x Mi-8
29 x Mi-8AMTSh
3 (+15) x Mi-8M TPR-1
25 x Mi-9

RUSSIA continued

250 x Mi-24V/P
20 Mi-24PN
40 (+2) x Mi-26 (+60 stored)
88 (+24) x Mi-28N
22 (+27) x Mi-35

Military Transport Aviation

96 x Mil Mi-2
95 x Mi-8

Naval Aviation

87 x Kamov Ka-27
43 x Ka-29
4 (+2) x Ka-31
(+32) x Ka-52K
1 x Kazan Ansat
25 x Mi-8
20 x Mil Mi-14

RWANDA

Air Force

1 x Aerospatiale AS355F
1 x AS565
9 x Mil Mi-17V-5
3 (+5) x Mi-24

SAUDI ARABIA

Air Force

8 x Agusta-Bell AB205
27 x AB212
8 x AB412EA
8 x Bell 412EP
3 x Agusta-Sikorsky AS-61A
2 x AgustaWestland AW101
11 x Airbus Helicopters AS532A2
(+12) x EC725

Army

15 x Bell 406CS
45 x Boeing AH-64D/E
24 x AH-6i
(+48) x CH-47F
12 x MDH MD530F
35 x Sikorsky UH-60A/L
(+72) x UH-60M
8 x S-333

National Guard

12 x Boeing AH-64E
12 x AH-6i
24 x Sikorsky UH-60M

Navy

27 x Airbus Helicopters AS565SA
6 x AS565MB
20 x AS532SC
(+10) x NH Industries NH90NFH
(+10) x Sikorsky MH-60R

SENEGAL

Air Force

(+1) x AgustaWestland AW139
2 x Aerospatiale AS355F
1 x SA316B
5 x SA318C
1 x SA330F
1 x SA341F
2 x Bell 47G
2 x Mil Mi-2
2 x Mi-17
1 x Mi-24V
2 x Mi-35P

SERBIA & MONTENEGRO

Air Force

12 x Aerospatiale SE3160
3 x SA341G
9 x Airbus Helicopters H145M
2 x Kamov Ka-28
6 x Mil Mi-8 (+20 stored)
1 x Mi-17
2 x Mi-17V-5
2 x Mi-24V (stored)
27 x Soko-Aerospatiale SA341H
18 x Soko-Aerospatiale SA342L

Navy

1 x Aerospatiale SA341G
6 x Mil Mi-14

SEYCHELLES

Defence Force Air Wing

2 x HAL Chetak

SIERRA LEONE

Defence Force

2 x Aerospatiale SA316B
2 x Mil Mi-17
1 x Mi-24V

SINGAPORE

Air Force

18 x Airbus Helicopters AS332M
14 x AS532UL
5 x EC120
(+16) x H225M
20 x Boeing AH-64D
16 x Boeing Vertol CH-47SD
(+10) x CH-47F
6 (+2) x Sikorsky S-70B

SLOVAKIA

Air Force

6 x Mil Mi-2
2 x Mi-8
13 x Mi-17
4 x Mi-171
2 x Schweizer 300C
(+9) x Sikorsky UH-60M

SLOVENIA

Air Force

1 (+2) x Agusta A109E
4 x Airbus Helicopters AS532AL
3 x Bell 206B
8 x 412HP/EP

SOMALIA

Government

4 x Agusta-Bell AB212

SOUTH AFRICA

Air Force

26 x Agusta A109LUH
11 x Denel Rooivalk
47 x Denel/IAR SA330 Oryx
4 x MBB BK117A (+4 stored)
4 x Westland Super Lynx 300

SOUTHERN SUDAN

Army Air Force

8 x Mil Mi-17V-5
1 x Mi-172
12 x Mi-24

SPAIN

Air Force

1 x Aerospatiale SA330J
4 x Agusta-Bell AB205
4 x AB206A
2 x Airbus Helicopters AS532AL
9 x AS532B
4 x AS532M
7 x Bell UH-1H
15 x EC120
(+6) NH Industries NH90
8 x Sikorsky S-76C

Army

6 x Agusta-Bell AB212
30 x UH-1H
13 x OH-58B
8 x Boeing Vertol CH-47C/414
9 x CH-47D
10 (+8) x Airbus Helicopters Tiger HAD
6 x Tiger HAP
17 x AS532B
15 x AS532UL
16 (+6) x EC135
6 (+6) x EC135
57 x MBB Bo105
5 (+11) x NH Industries NH90TTH

Navy

7 x Agusta-Bell AB212ASW
11 x MDH MD500M
(+8) x NH Industries NH90NFH
9 x Sikorsky SH-3D/G
3 x SH-3D(AEW)
12 x SH-60B
(+6) x SH-60F

SRI LANKA

Air Force

2 x Aerospatiale SA365C
6 x Bell 206A/B
11 x 212
14 x 412
15 x Mil Mi-17 (+6 stored)
9 x Mi-24

Navy

1 x HAL Chetak

SUDAN

Air Force

2 x Aerospatiale SA316B
5 x Agusta-Bell AB205
5 x AB212
15 x IAR 330J
8 x MBB Bo105
2 x Mil Mi-2
20 x Mil Mi-8
33 x Mi-25

SURINAM

Air Force

3 x Hindustan Aeronautics SA316B

SWAZILAND

Government

3 x Aerospatiale SA316B

SWEDEN

Armed Forces

20 x Agusta A109M (Hkp 15A/B)
10 x AB206B (Hkp 6B) (stored)
20 x MBB Bo105CBS (Hkp9A) (stored)
10 (+8) x NH Industries NH90HC
15 x Sikorsky UH-60M

SWITZERLAND

Air Force

15 x Airbus Helicopters AS332L-1
11 x AS532UL
20 x EC635
2 x EC135

SYRIA

Air Force

3 x Aerospatiale SA342K
62 x SA342L
10 x Mil Mi-2
10 x Mi-6 (stored)
56 x Mi-8
22 x Mi-17
25 x Mi-24D (stored)
30 x Mi-35

Navy

5 x Kamov Ka-25
2 x Ka-28
11 x Mil Mi-14

(Note: A substantial number of helicopters have been destroyed in the civil war and current fleet numbers are unconfirmed).

TAIWAN

Air Force

3 (+17) x Airbus Helicopters EC725
10 x Bell 47G
15 x UH-1H
16 x MDH MD500M
13 x Sikorsky S-70C
4 x S-70C-6

Army

61 x Bell AH-1W
39 x OH-58D
40 x UH-1H
29 x TH-67
3 x Boeing Vertol Model 234
8 x CH-47SD
29 x AH-64E
19 x Hughes 300C (stored)
10 x MDH MD500M
4 x (+80) x Sikorsky UH-60M

Navy

9 x MDH MD500MD-ASW
18 x Sikorsky S-70C(M)-1

Marine Corps

6 x MDH MD500M

TAJIKISTAN

Air Force

14 x Mil Mi-8
5 x Mi-24

TANZANIA

Air Wing

1 x Agusta-Bell AB205A
2 x AB206B
2 x AB412
2 x Bell 206L-1

THAILAND

Air Force

6 (+2) x Airbus Helicopters EC725
24 x Bell UH-1H
1 x UH-1N
6 x 206B
2 x 212
2 x 214ST
2 x 412
3 x 412 HP
8 (+12) x 412EP
1 x Robinson R22B
5 x Sikorsky S-58T (stored)
3 x S-92
2 (+3) x UH-60L

Army

4 (+4) x AgustaWestland AW139
4 x AW189
8 x Airbus Helicopters AS550C3
6 x EC145T2
1 (+11) x H145M
5 x Bell UH-72A
7 x AH-1F
48 x UH-1D/H (+62 stored)
3 x 206B
2 x 206L
11 x 212 (+23 stored)
2 x Boeing CH-47D
16 x Enstrom 480B
5 x Mil Mi 17V-5
20(+37stored)xSchweizer-HughesTH-300C
12 x Sikorsky S-70A
3 (+3) x UH-60M/UH-60L

Navy

5 x Airbus Helicopters H145M
4 x Bell UH-1H
5 x 212
5 x 214ST
6 x Sikorsky S-70B-7
2 x MH-60S
6 x S-76B
2 x Westland Super Lynx 300

Transnistria

Air Force

4 x Mil Mi-2
5 x Mi-8
6 x Mi-24

TOGO

Air Force

1 x Aerospatiale SA315B
2 x SA318C
(+5) x SA34M
1 x AS332L

TONGA

Defence Force

No helicopters currently on strength

TRINIDAD & TOBAGO

Defence Force

4 x AgustaWestland AW139
1 x Aerospatiale SA341H
1 x MBB Bo105C
2 x Sikorsky S-76

TUNISIA

Air Force

4 x Aerospatiale SE3130
4 x SA316B
1 x SA330
6 x SA342
6 x AS550
1 x AS565
16 x Agusta-Bell AB205A
19 x Bell UH-1H
6 (+18) x OH-58D
3 x 412
3 x Sikorsky HH-3E
(+12) x UH-60M

TURKEY

Air Force

15 x Airbus Helicopters AS532UL
74 x Bell UH-1H
4 x UH-1H(EW)
6 x Sikorsky S-70
1 x S-92

Army

28 x Airbus Helicopters AS532UL
63 x Agusta-Bell AB205A
20 x AB206B
3 x AB212
17 (+42) x TAI T129
4 x Bell OH-58B
10 x AH-1P
11 x AH-1S
5 x AH-1W
4 x TAH-1P
92 x UH-1H
(+11) x Boeing CH-47F
86 x Sikorsky S-70A
5 x S-70A-28DSAR
(+80) x UH-60M

Navy

9 x Agusta-Bell AB212AS
3 x AB212EW
19 x Sikorsky S-70B

Coast Guard

1 x Agusta A109A
3 x Agusta-Bell AB206B
13 x AB412EP

Jandarma

5 x Agusta-Bell AB47
15 x AB 205A
8 x AB206A
1 x 212
17 x Mil Mi-17V-IV
29 x Sikorsky S-70A
(+20) x UH-60M

TURKMENISTAN

Air Force

2 x AgustaWestland AW101
5 x AW109E
(+5) x AW139
1 x Airbus Helicopters AS332L2
1 x EC145
10 x Mil Mi-8
10 x Mi-24
2 x Sikorsky S-92

UGANDA

Defence Force

4 x Agusta-Bell AB206
1 x Bell 206
4 x Mil Mi-17
1 (+6) x Mi-24

UKRAINE

Air Force

10 x Mil Mi-2
19 x Mi-8
4 x Mi-9
26 x Mi-24

Army Aviation

20 x Mil Mi-2 (+30 stored)
30 x Mi-6 (stored)
50 x Mi-8 (+150 stored)
8 x Mi-9
70 x Mi-24 (+207 stored)
10 x Mi-26 (+8 stored)

Navy

3 x Ka-27 (+7 stored)
4 x Ka-29 (stored)
3 x Mil Mi-8 (stored)
3 x Mi-14 (+1 stored)

Ongoing conflict in Ukraine reports at least 10 Mil Mi-8 8/17/24 destroyed

UNITED ARAB EMIRATES

Air Force

2 x Aerospatiale SA341
3 x Agusta Bell AB412SP
15 x AgustaWestland AW139
6 x AB412HP
13 x Airbus Helicopters AS350B3
1 x EC115
4 x AS365N3
2 x AS332L
6 x AS532SC
6 x AS550C-3
6 x AS565UB
7 x AS565SB
1 x Bell 206L
1 x 212
1 x 222
29 x 407GX
27 x Boeing AH-64D/E
(+9) x AH-64E
7 x CH-47C+
10 (+6) x CH-47F
7 x MBB Bo105
3 x Bo105S
2 x BK117
60 x Schiebel S-100
20 x Sikorsky UH-60L/M
16 (+26) x UH-60M
1 x S-76A

UNITED KINGDOM

Air Force

24 x Aerospatiale Puma HC.2
25 x AS350B/HT.1
1 x Agusta A109SP
10 x Bell Griffin HT.1
3 x Griffin HAR.2
8 x Boeing Vertol Chinook HC. Mk.3/5
38 x HC. Mk.4
14 x HC.Mk.6

UNITED KINGDOM continued

Army

14 (+8 stored) x Aerospatiale SA341B/AH1
9 x AS350BB
9 x AgustaWestland Lynx AH 9A
34 x Wildcat
50 x WAH-64D (+16 stored)
8 x Bell 212
6 x Eurocopter AS365N3

Navy

30 x AgustaWestland Merlin HM Mk.1/2
(+8 stored)
28 x AgustaWestland Merlin HC3/3A/3i
7 x Westland Lynx HMA.8
28 x Wildcat HM.2
8 x Sea King ASAC.7

UNITED STATES OF AMERICA

Air Force

2 x Bell HH-1H
3 x UH-1H
27 x TH-1H
15 x HH-1N
57 x UH-1N
48 (+4) x Bell-Boeing CV-22
4 x Mil Mi-8MTV
87 (+21) x Sikorsky HH-60G
10 x MH-60G
6 x HH-60U
(+112) x HH-60W

Army

350 (+75) x Airbus Helicopters UH-72A
51 x Bell UH-1H
264 x OH-58A/C
335 (+30) x OH-58D
180 x TH-67A
8 x Boeing MQ-18A
492 x Boeing AH-64D
142 (+56) x AH-64E
100 x Boeing CH-47D
340 (+32) x CH-47F
68 (+7) x MH-47G
1 x Kamov Ka-32T
15 x MDH (Hughes) AH-6J
26 x MH-6J
10 x MH-6M
10 x MD500
2 x Mil Mi-2
2 x Mi-14
5 x Mi-17
3 x Mi-24
559 x Sikorsky UH-60L
200 x HH-60L/MH-60L
540 (+343) x UH-60M
190 (+229) x HH-60M/MH-60M

Marine Corps

73 x Bell AH-1W
46 (+143) x AH-1Z
126 (+34) x UH-1Y
255 x Bell-Boeing MV-22B
146 x CH-53E
(+26) x CH-53K
1 x UH-3H
11 VH-3D
8 x VH-60N
(+21) x VH-92A

UNITED STATES OF AMERICA continued

Navy

5 x Airbus Helicopters TH-72A
30 x Bell TH-57B
86 x TH-57C
1 x UH-1N
(+44) x Bell-Boeing V-22
23 x Northrop Grumman MQ-8B
2 (+27) x MQ-C
28 x MH-53E
40 x HH-60H
214 (+66) x MH-60R
275 x MH-60S
2 x NSH-60B

Coast Guard

99 x Aerospatiale MH-65D
42 x Sikorsky MH-60T

URUGUAY

Air Force

3 x Airbus Helicopters SA365N2
3 x Bell UH-1H (+ 7 stored)
4 x 212

Navy

2 x Bell 47G-2
1 x Helibras HB355F2
6 x MBB Bo105P

UZBEKISTAN

Air Force

2 x Airbus AS532M
10 x AS550
59 .x Mil Mi-8
43 x Mi-24
1 x Mi-26

VENEZUELA

Air Force

1 x Aerospatiale AS355F
4 x AS532B
9 x AS532AC
5 x AS550/HB350B
1 x Bell UH-1B
6 (+10) x Enstrom 480B
7 x UH-1H
2 x UH-1N
7 x 206L-1
2 x 212
2 x 412
2 x Mil Mi-172

Army

1 x Aerospatiale AS555
3 (+1) x AS532M2
8 x Agusta A109A
3 x Agusta-Sikorsky AS-61D
1 x Bell 47G
8 x UH-1H
2 x 205A-1
1 x 206B
1 x 206L
3 x 412SP
11 x Mil Mi-8
24 x Mi-17-IV
3 x Mi-26
10 x Mi-35

VENEZUELA continued

Navy

5 x Agusta-Bell AB212ASW
(+8) x Avicopter Z-9
3 x Bell 206B
1 x 212
6 x 412EP

National Guard

3 x Agusta A109A
9 x Aerospatiale AS355F
11 x Bell 206B/L
12 x 412EP/SP
4 x Enstrom 280FX

VIETNAM

Air Force

5 x Bell UH-1H (+15 stored)
36 x Boeing Vertol CH-47A (stored)
2 x Kamov Ka-32
15 x Mil Mi-6 (stored)
53 x Mi-8/17
30 x Mi-24D
(Note: Most US equipment is probably unserviceable)

Navy

2 x Airbus Helicopters EC225
7 x Kamov Ka27

YEMEN

Air Force

2 x Aerospatiale SA316B
2 x Agusta-Bell AB205
6 x AB206
5 x AB212
3 x Bell Huey II
3 x Kamov Ka32
44 x Mil Mi-8
(+10) x Mi-17
12 x Mi-24D

ZAMBIA

Air Force

16 x Agusta-Bell AB47G-4A
12 x AB205A
3 x AB206
2 x AB212
1 x Avicopter Z-9
5 x Mil Mi-8

ZIMBABWE

Air Force

3 x Aerospatiale SE3160
8 x SA316B (+27 Stored)
2 x AS332L (stored)
2 x Agusta-Bell AB412 (stored)
9 x AB412 Griffon (stored)
2 x Mil Mi-8
4 x Mi-24



the first 24 Sikorsky CH-53K heavy-lift helicopters for the US Marine Corps. An initial contract will approve two aircraft this year, followed by 22 through FY2021.

The initial projected production cost of \$122 million per aircraft had been challenged by US Congress members, even though the estimate is expected to reduce to \$87 million on average per aircraft and \$105 million each including spares and support, once full production gets underway post 2021. However, with the Marines having a requirement for up to 200 CH-53Ks, pressure is being put on Sikorsky owners Lockheed Martin to bring down the price still further.

This could be especially relevant if the company is to win export orders against the Boeing CH-47F Chinook, which is seen as the main competitor.

■ US Congress representatives in Sikorsky Aircraft's home state of Connecticut are pressuring the Israeli government to order the CH-53K heavy-lift helicopter, claiming in a letter that purchasing the new aircraft would strengthen the country's "qualitative military edge, which is central to our bilateral security cooperation relationship". The letter goes on to suggest that Israel "stands to strengthen our strategic partnership with the continued use of common airframes".

The latter comment refers to the fleet of used Sikorsky CH-53 helicopters that Israel has purchased over the years from surplus US Marine Corps stocks and modified to its own Yas'ur configuration. The country has a need to replace these aircraft but has yet to make any decisions with what or when. Currently the US Marine Corps is the only customer for the CH-53K, with a programme to acquire 200 units at an average price of \$87 million each, not including support costs.

Securing additional customers could bring down the high price which has been criticised in some Congressional quarters, and ensure production and job security for Connecticut workers.

■ The Czech Ministry of Defence is looking to double its budget from \$240 million to \$480 million (12 billion Koruna) for the acquisition of new armed transport helicopters. The aircraft are required to replace aged Mil Mi-17 helicopters in service with the Czech Air Force.

Among the contenders for the eventual order are the Bell UH-1Y and Sikorsky S-70i/UH-60, as well as the Leonardo Helicopters AW139M and the Airbus Helicopters H145M. About 12 helicopters are expected to be ordered initially, although longer term this could increase if the Air Force plans to replace all its Russian Mi-17/171 fleet.

Above: The Pakistan government is continuing to order the Leonardo Helicopters AW139 for various roles. This example was test flying in Italy in March, prior to delivery for VIP duties.

For the DVE whiteout trials, the modified EC635 operated out of the Swiss Air Force base at Alpnach, where RUAG Aviation also has a helicopter maintenance and overhaul facility. The EC635 is now being utilised as a capability demonstrator for further live trials in DVE situations, with the aim of further contributing to enhanced vision and safety for military and helicopter emergency operators in bad weather circumstances.

■ The Panamanian Naval Air Service (SENAN), which operates six Leonardo Helicopters AW139s, recently passed the 5,000 flight hours milestone less than four years since the first aircraft was delivered in mid-2013. The aircraft are configured for multi-role operations, including search and rescue, medical evacuation and coastal patrols.

In addition to missions within the Republic of Panama, the aircraft are also available for disaster relief operations elsewhere in the region, with two recently deployed on such missions in Central America. Later this year two more aircraft will be added to the fleet, fully configured for anti-smuggling and defence operations.

SENAN also operates one Leonardo Helicopters AW109S GrandNew in an EMS configuration, and capable of transporting patients from remote locations with limited accessibility.

■ The Royal New Zealand Air Force temporarily introduced flying restrictions on its fleet of NH Industries NH90 helicopters, after one of the aircraft suffered an inflight loss of power in one engine on 16 April. The helicopter, which was about to fly offshore over Cloudy Bay with nine personnel on board, diverted safely to a private airstrip near Blenheim for a precautionary landing.

After the incident NH90 pilots were restricted from flying over water, mountains and populated areas pending the results of an

investigation. The RNZAF operates eight NH90 helicopters, powered by Safran RTM322-01/09 turboshaft engines, from its base at Ohakea, to support a variety of missions carried out by all three military services and other government agencies.

■ Elbit Systems has received an approximately \$50 million contract from the US Navy to supply its Helmet Display and Tracker System (HDTS) for the Sikorsky MH-60S helicopter. The contract includes an initial order valued at \$14.2 million for deliveries up to June 2021.

The HDTS, together with its Continuously Computed Impact Point (CCIP) algorithm, provides pilots and crews with line-of-sight helmet tracking, integrating targeting symbology in the weapons system and increasing the accuracy of weapons delivery, whilst also enhancing crew situational awareness and interaction with the flight navigation system. The day/night helmet mounted displays provide full colour symbology, allowing pilots to keep "heads up eyes out" while also seeing key flight information.

With the new systems flight crews will also know exactly where the pilots are looking and where they are pointing the weapons.

■ Héli-Union is opening a new helicopter maintenance centre in Pau, south west France for the regular inspection and overhaul of Airbus Helicopters AS332/AS532s in service with the French military. The new facility, covering a 2500sq.m (26910 sq.ft) footprint, will create more than 30 jobs and be capable of receiving four helicopters at once.

Pau Airport was chosen for the new centre because of its strategic location, within walking distance from the base of the main client, the French Army (ALAT). The centre manager will be Laurent Marie, who has 27 years experience with the company. Héli-Union Pau should become operational by June.

■ Despite concerns regarding escalating costs, the US Department of Defence has given a green light to low-rate production of

TAI unveils T625

Turkish Aerospace Industries unveiled the T625 Turkish Light Utility Helicopter (TLUH) at the IDEF 2017 exhibition in Istanbul in early May. Developed largely indigenously by TAI, through leveraging technical expertise acquired through the T129 attack helicopter programme developed in cooperation with Leonardo Helicopters, the project has been underway since 2013.

The five-six tonne category helicopter is designed to meet both civil and military transport requirements, with seating for up to 12 passengers and options for air ambulance and search and rescue variants.

In its military form it is expected to replace Turkey's fleet of ageing Bell UH-1H transports. Powered by two LHTEC CTS800 turboshafts, each rated at 1373shp, the helicopter is predicted to have a maximum cruise speed of 306km/h (165kt) and a range of more than 740km (460 miles), with a service ceiling of up to 6096m (20,000ft). The avionics system will be supplied by the Turkish defence electronics company Aseslan, whilst the hydraulic systems and retractable landing gear actuation have been developed by CESA in Spain.

The first flight is expected in the fourth quarter of 2018, with European Aviation Safety Agency certification targeted for 2020.

US Army field test new AH-64 blade fold kit

The US Army South Carolina National Guard 1-151st Attack Reconnaissance Battalion, at McEntire Joint National Guard base, has recently completed field testing of a new blade folding kit for the Boeing AH-64 Apache helicopter. The 1-151st Battalion conducted the original blade folding testing on the current kit, so it made sense to have them come back and test the new system.

The new kit reduces the amount of time and resources needed to fold the blades for transportation in a cargo aircraft. The current kit requires 10-11 personnel and the use of a hoist, while the new kit requires only 4-5 persons and no additional equipment. Because none of the blades have to be removed and transported separately, the new kit also speeds up the reassembly of the aircraft when it arrives at the destination, expediting the ability to field an operational helicopter.

The trial at McEntire was the fourth and final test of the new kit and the first time soldiers conducted the exercise away from the test facility at Huntsville, Alabama. It included multiple folding and unfolding of the blades to gain familiarity with the kit,



before loading the helicopter onto a Boeing C-17 transport aircraft for a period of touch and go landings to test the robustness of the system.

The kit will now enter production and be rolled out to all Apache units in the US Army, initially focusing on the AH-64E units first.

RN Wildcat deployed to Caribbean

A Royal Navy Wildcat helicopter detachment has recently spent time at the US Naval Air Station at Jacksonville, before leaving on a seven month deployment aboard the Royal Fleet Auxiliary tanker, RFA *Wave Knight* in the Caribbean on counter narcotics operations. The helicopter was initially air freighted to Jacksonville by C-17 transport from the UK and then reassembled for flight testing on 10 May.

Following flight clearance, the helicopter crew partnered with the local US Coast Guard to exchange tactics and procedures, including the use of airborne force to stop and arrest suspect traffickers at sea. The Wildcat is a step change from the Westland Lynx previously operated by the Royal Navy on counter narcotics missions in the Caribbean, with a surveillance radar offering 322km (200miles) range and 360 degree vision compared with 80km (50 miles) and 180 degrees on the Lynx.

US Army still wants OH-58D replacement

The US Army is to continue to push for a light armed reconnaissance solution as part of the joint services Future Vertical Lift (FVL) programme, despite funding limitations and other FVL partners giving priority to a medium-lift aircraft. Current FVL development covers five capability sets, with only Set 1 aimed at replacing the retired Bell OH-58D Kiowa armed reconnaissance helicopters.

Set 3, which replaces the H-60 Black Hawk, AH-64 Apache and AH-1Z/UH-1Y, is seen as the highest joint service priority, with at least 3,000 aircraft needed. Set 2 would provide a more tactical attack helicopter, whilst Set 4 covers the heavy-lift sector, replacing the Boeing CH-47 and Sikorsky CH-53K post 2050.

Currently the Army is replacing the OH-58D with manned-unmanned teaming, using the AH-64E with drone aircraft, but officials now believe this still leaves a significant gap in the reconnaissance and security role which a Set 1 configuration could fill.

Above: Turkish Aerospace Industries unveiled the indigenous T625 utility helicopter at the beginning of May, aimed at both the military and commercial markets.

The Wildcat also has a larger cabin, which can be of particular value in the event of being called on to provide humanitarian assistance during the Caribbean hurricane season.

More MD530s for Kenya

The Kenyan government has entered a request with the US government for the purchase of 12 MD Helicopters MD530G1s, to operate in the light attack role. The \$253 million foreign military sale request includes the provision of 24 12.7mm FN Herstal machine gun pods with 400,000 rounds of ammunition, 24 seven-tube M260 launchers for 70mm rockets, and 5568 rockets with a range of up to 8000m (26,247ft).

The helicopters are being supplied as a contribution towards combatting the al Shabab terrorist organisation and supporting the African Union mission in neighbouring Somalia. The Kenyan Air Force already operates a number of older MD500MD/MD (Tow) helicopters, which need replacing with variants offering improved hot/high performance and new generation mission systems.



LASD under fire -

Investigations exposed fraud around ex-US Navy H-3 returns

By Elfan ap Rees

THE LOS Angeles County Sheriff's Department (LASD) has been under fire for allegedly selling off four General Electric T58-GE-402 turboshaft engines owned by the US Navy, along with other components including fuel controls, and replacing them with unserviceable units with no accompanying valid paperwork. Whilst there is no evidence that any individuals within the LASD profited from a sale, the allegations suggest that a deliberate effort was made by parties involved to mislead Navy officials and defraud the US government to the tune of around \$1 million.

The saga began in 2013 when Navy officials called for the return of six Sikorsky H-3 Sea King helicopters, that had been on loan to the LASD for more than a decade to boost law enforcement and search and rescue capabilities in the Los Angeles area. This recall followed the purchase by the LASD of several replacement Aerospatiale AS332L Super Pumas. The six Sea Kings were returned as the Super Pumas entered service, beginning in December 2011, and ending with the final helicopter being collected on 13 June 2013.

To carry out the exercise, US Navy officials contracted Clayton International, which specialises in Sikorsky H-3 support, to oversee the return of the aircraft and their powerplants. Clayton had also acted as a consultant to the LASD for 14 years, so was well informed on the subject matter. In addition to provision of the six aircraft, the Navy had also provided eight engines for spares recovery and 25 extra serviceable engines for use on the aircraft. However, as the returns of aircraft and spares progressed, Clayton president Mike Stille became concerned that major components appeared to be missing from the shipments, including main rotor gearboxes and four engines that he had previously seen with their respective paperwork during a visit to the LASD in February 2013.

Subsequently by late June 2013, Clayton's had received all six aircraft plus an additional shipment of six engines, but with some paperwork missing. For two of the engines it was apparent that the fuel controls were old and unserviceable, whilst the four engines Stille had seen on his visit now had the identity labels missing, and allegedly consisted of various old components bolted back together, but carrying the original engine serial number



plates from the four good engines. An investigation by Stille among the Sea King community revealed that the LASD had apparently sold two fuel control units to the Croman Corporation, which had traded in two timed-out units to replace them. The \$52,000 payment however went direct to Rotor Maxx in British Columbia, Canada to cover bills owed by LASD for overhaul work.

By following a paperwork trail on the engine parts Stille also discovered that they matched components previously stored in the Clayton warehouse, that had been delivered to Rotor Maxx as part of a Navy deal with Sikorsky under the S-61T Triton programme for the Department of State. Stille claims that this allowed the Canadian company to assemble overhauled engines from the major components of the four serviceable powerplants purchased from LASD, but using the data plates from the old engines delivered from the Clayton stock pile. Since Sikorsky were paying up to \$300,000 for each engine overhaul this suggested that Rotor Maxx profited from the alleged LASD fraud.

Defending their actions, LASD officials claimed that the agreement with the US Navy required them to return the right number of

Above: One of the ex-US Navy Sikorsky SH-3H helicopters operated by the Los Angeles County Sheriff's Department between 2001 and 2013. N950DF has since been registered to Clayton International.

items, never mind their provenance or condition and therefore the aviation unit was entitled to swap out engine and fuel control parts. It also transpired that the LASD earned \$652,000 in maintenance credits from the deal with Rotor Maxx. In the end the various agencies brought in to consider legal action, decided against any prosecutions because they couldn't prove any individual in the LASD had personally gained anything from the complex dealings. In any case the agencies had bigger fish to fry.

In the last four years 21 members of the LASD have been convicted of federal crimes, including the Sheriff himself and his deputy, on charges including corruption and obstruction of justice.



Below: A second SH-3H from LASD, N950SB, has been registered to the Croman Corporation since last year.



Canadian Senate recommends more helicopter investment

A Canadian Senate report issued on 8 May, regarding the country's defence capability gaps, includes several recommendations to enhance the Royal Canadian Air Force helicopter fleet and invest in new equipment. Members especially criticised the current need to rely on allied countries for assistance to meet Canada's obligations.

Highlighted was the lack of an attack helicopter capability and a recommendation to purchase 24 attack helicopters, as part of a replacement programme for 55 of the Bell CH-146 Griffon utility tactical helicopters. The RCAF is already considering upgrading or replacing its current fleet of 95 CH-146, but committee members argue that the aircraft has poor hot/high performance and is incapable of providing fully effective escort protection for the Boeing CH-147F Chinook heavy lift and combat search and rescue helicopter.

The report also recommends increasing the CH-147F fleet from 15 to 36 helicopters to support and sustain the ground forces, as the Army continues to develop its integrated forces concept, and to replace some ageing Griffon helicopters, tasked with domestic search and rescue duties, with the more capable Leonardo Helicopters CH-149 Cormorant. The committee suggests this could be achieved by converting the seven VH-71 airframes, acquired in 2011 for spares recovery, into serviceable SAR aircraft. This would increase the Cormorant fleet to 21 aircraft and allow the RCAF to eventually station seven each on the east and west coasts, and seven to replace the Griffons at No.8 Wing, Trenton in Ontario. In the interim the additional aircraft would provide relief during a phased upgrade programme for the existing CH-149 fleet.

Aussie Tiger clocks 2,000 hours

The Australian Army has logged 2,000 flight hours with Airbus Helicopters Tiger Armed Reconnaissance Helicopter (ARH) serial 001, the first of any Tiger in the global fleet to achieve this milestone. Delivered to the Army in December 2004, 001 is the only aircraft in the 22-strong Australian fleet fitted with specialist flight test instrumentation, which enables data collection for aircraft and fleet management under Australian conditions.

001 is one of five Tigers now based at the School of Army Aviation at Oakey, but previously carried out the initial ARH acceptance trials and the first 70mm rocket firings on the Cazaux test range in France in 2004, the first Hellfire missile firings from a Tiger on the Woomera test range in Australia, and subsequently the first Advanced Precision Kill Weapon System laser guided rocket firings at Woomera in 2016. Earlier this year 001 was also the first ARH embarked for ship trials on the LHD HMAS Canberra.

The five ARH Tigers at Oakey are maintained under contract by Airbus Group Australia Pacific and the 2,000 hour milestone was reached during a flight by 001 from Oakey to the Enoggera Gallipoli barracks in



Above: A Canadian Senate report is recommending that the country increases its helicopter commitment, including adding more Leonardo CH-149s to the active SAR fleet.

Brisbane. The pilot, Lt.Col. Dave Lynch was welcomed on arrival by the managing director of Airbus Group Australia Pacific, Tony Fraser.

UK commits to AH-64E contract

Boeing has received an initial contract to remanufacture 38 AH-64 Apache helicopters for the Army Air Corps. The Foreign Military Sales order, valued at \$488.1 million, also includes three crew trainers and associated spares, and is being procured through the US Army as contracting authority. A further 12 aircraft are expected to form a follow up order, bringing the total order to 50 helicopters.

The contract will effectively upgrade the UK Apache fleet to AH-64E standard, but with certain specific British equipment recovered from the existing aircraft and new modifications incorporated. The latter will include emergency flotation equipment, currently being trialled in the UK. The estimated completion date for the contract, which will be carried out at Boeing's Mesa plant, is 31 May 2024.

Currently the Army Air Corps has an active Apache Fleet of 42 aircraft, but with a further 25 in storage.



Afghanistan to receive Black Hawks

The US government is firming up on plans to transfer up to 159 Sikorsky UH-60 Black Hawk helicopters to the Afghan Air Force, to replace and add to the current Afghan fleet of 78 Mil Mi-17 armed transports. \$814 million has been allocated this year to bolster Afghan forces fighting terrorist organisations, including sufficient funds for 53 Black Hawks.

US politicians have previously criticised the use of Pentagon funds to purchase Russian helicopters, despite evidence that the rugged Mi-17 is well suited to the Afghan

hot/high and dusty environment. The Afghan forces also have considerable experience in operating the type, both in a transport and in an armed attack configuration. However US commanders point to recent accidents caused through poor maintenance and technical failures, as evidence of their over use and need for additional helicopter support.

With further US purchases of Mi-17s not an option, the introduction of the UH-60 with available US technical support, is seen as the most affordable and convenient route. The aim is to fund the 159 aircraft in tranches, with the Defence Department

initially receiving funding for 53 UH-60s this year, but having to reapply in future years for the next tranche of funding. The Black Hawks to be supplied will be refurbished surplus Army UH-60s. The first delivery is expected to take place in early 2019, with shipments running at about 30 aircraft per year.

US officials say that some of the Black Hawks will be armed variants and that any shortfall in attack/escort capability will be made up through the sale of a further batch of 30 armed MD Helicopters MD530G helicopters, and additional fixed-wing ground attack support.

Regional News

- NORTH AMERICA

● Kaman Aerosystems has announced another order for the K-Max helicopter, with two aircraft sold to Rotak Helicopter Services of Anchorage, Alaska. Both helicopters are scheduled for delivery in 2018. Previously Kaman announced launch orders from Lectern Aviation in China and Rotex in Switzerland for the first K-Max aircraft from the revived production line.

Kaman claims to have nearly sold all ten K-Max from the first production batch and is expected to make a decision on a follow-up batch in the coming months.

● Bell Helicopter confirmed at its pre-Heli Expo press conference that deliveries in 2016 fell by 35 percent in the commercial and foreign military market sector, with 114 aircraft delivered and annual revenue down from \$3.5 billion to \$3.2 billion. Domestic military sales represented 64 percent of the revenue, with 22 V-22 Ospreys, 18 UH-1Ys and 17 AH-1Zs delivered during the year.

Bell President Mitch Snyder said that a year end boost of interest in the Model 412 and Model 429 was cause for optimism in the year ahead, while the more recent certification of the Model 505 Jet Ranger X also boded well for 2017. Progress on the Super Medium Model 525 meanwhile appears to remain stalled however, with officials only repeating previous statements that the company hoped to resume flight testing in the coming months.

● Aircraft sales broker Avpro has signed exclusive agreements to remarket eight helicopters, including four Airbus Helicopters EC135P2/T2s configured for emergency medical service missions. Also for resale is a Sikorsky S-76+ and S-92A, both owned by financial institutions, a Leonardo Helicopters AW109E in a utility configuration and an AW109S Grand.

US Based Avpro had already completed sales of three helicopters in the first two months of this year, before signing the latest contracts.

● Brainerd Helicopters has become the launch customer for the BLR Aerospace Fast Fin modification of the Airbus Helicopters H125/AS350B3. The company purchased four systems last December.

Certificated in late 2016 by the Federal Aviation Administration, and subsequently also by the European Safety Agency, the H125 FastFin differs from the usual BLR system by not modifying the vertical fin. Instead it introduces an Advanced Tail boom Aerodynamic Cowling (ATAC), together with the tail boom strake and vortex generators. These improvements offer a useful load increase of up to 59kg (130lb) and a 10 percent greater pedal margin, giving easier control in precision hover operations and better management in the yaw axis in challenging cross winds.

The BLR system is available as a factory-installed option or new H125s, or as a retrofit kit for older aircraft.

● Cicaré Rotorcraft has appointed DEAGA USA as its exclusive North American distributor for the Argentinian company's range of ultralight helicopters, including the SVH4 ground based trainer, which already has US Federal Aviation Administration approval for up to 10 hours towards the PPL(H) qualification. DEAGA USA is currently establishing a sales and product support organisation at Falcon Field, Mesa in Arizona to service the US market.

The company is a subsidiary of DEA General Aviation Holdings, a Chinese public company that has interests in a variety of aviation products, including ultralight helicopter manufacturer Rotorschiemde



Above: Cicaré Rotorcraft has appointed DEAGA USA as its North American agent for the innovative SVH4 ground trainer and its ultralight helicopter line. (K.Swartz)

and engine manufacturers Hirth and Mistral. It already holds the Cicaré distributorships in China and South East Asia.

● Bell Helicopter Canada has completed deliveries of 22 new helicopters to the Canadian Coast Guard, with the hand over on 24 March of the last of seven Bell 412EPi ordered in April 2015. Previously in May 2014, the Coast Guard also ordered 15 Bell 429 helicopters, which entered service between April 2015 and February 2016.

Both types are configured for maritime safety and support operations, including ice reconnaissance, maintenance of marine navigation and telecommunication aids, personnel and cargo transfers, fisheries enforcement and rescue missions. The Model 429s are deployed on both the eastern and western coasts, whilst the Model 412EPi have replaced five legacy Model 412s on similar missions.

● Vector Aerospace has now carried out 16 conversions of Bell 407 helicopters in conjunction with Rolls-Royce, to modify the aircraft's M250-C47B powerplant under a Value Improvement Package (VIP) upgrade. The hot/high performance kit also enables operators to upgrade their M250-C47B engines to the same production standard M250-C47B/8 configuration installed in the current Bell 407GXP platform.

First introduced by Vector in 2012, the conversion programme modifies the M250-C47B's impeller, diffuser and first-stage turbine nozzle, decreasing fuel burn and reducing component wear and attrition. As a consequence, the VIP upgrade has demonstrated a five percent improvement in hot/high engine performance and a two percent reduction in fuel burn, with no change in the engine weight.

Vector is a member of the Rolls-Royce M250 FIRST network and an M250 authorised maintenance repair and overhaul centre, with full capability at its Richmond, British Columbia facility in Canada, and with branch locations in Dallas, Texas and Fleetlands in Gosport, UK.

● Newfoundland Helicopters in eastern Canada has taken delivery of a new Bell 407GXP helicopter for utility operations, adding to its fleet of four Model 206L-4 Long Rangers and a Model 407GX, also flown on utility work.

The company, based at Clarendville, Appleton and Deer Lake in the province, operates a range of charter and contract services, including corporate travel, tourism flights, filming and forestry, mining and hydro support. The company originated in 1996 to provide helicopter services across Newfoundland and Labrador.



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- OFFSHORE WORLDWIDE

- Royal Dutch Shell has given the go ahead to develop its Kaikias deepwater oil and gas field in the Gulf of Mexico, lifting the 18 month moratorium imposed by the company on new projects in July 2015.

The Kaikias field is located some 210km (130 miles) from the Louisiana coast and is estimated to hold more than 100 million barrels of recoverable oil. Development will take place in two phases, beginning with three wells to produce up to 40,000 barrels of oil equivalent per day and linked to the nearby Shell-operated Ursa production hub to save costs. Shell has reduced the project costs by about 50 percent, to generate profits from the field even if oil prices drop below \$40.00 a barrel.

- The first two Leonardo Helicopters AW189 helicopters to arrive in Brazil were unloaded on the dockside in Rio de Janeiro on 15 March. Both aircraft (c/n 49025 and 49028) are part of the Era Helicopters fleet and are scheduled for offshore oil and gas contract service with partner Aeroleo Taxi Aereo.

- The Bristow Group has announced that its US subsidiary has been awarded a contract with Shell Offshore Inc to provide medevac and search and rescue (SAR) services in the Gulf of Mexico. Bristow will provide a dedicated Leonardo Helicopters AW139 (N925VH) and a Sikorsky S-92 (N920VH) for the service, operating from a stand alone SAR facility previously used by VIH Cougar Helicopters and CHI Aviation at South Lafourche airport in Galliano, Louisiana.

The take over by Bristow of the SAR operation has been in the works for more than a year, since CHI Aviation closed its Galliano base in late 2015 after the ending of a SAR contract for Shell's arctic offshore drilling programme in Alaska. The service in the Gulf of Mexico was originally established by VIH Cougar Helicopters in 2005, initially with a hoist-equipped Sikorsky S-61N after the BP Thunder Horse production platform was threatened by a hurricane. This was followed by a long term SAR contract with BP and later Statoil, to provide a long range medevac/SAR capability to serve deepwater platforms beyond the range of US Coast Guard Airbus Helicopters MH-65s based in New Orleans and Houston.

Although a Canadian-owned company, Cougar was able to introduce the service utilising a NAFTA (North American Free Trade Agreement) speciality air services operating certificate and in 2009 upgraded the contract to an S-92 in the Gulf's first air conditioned helicopter hangar. In late 2010 the company launched a subscription-based offshore medevac/SAR service with the addition of an AgustaWestland AW139 to the fleet. Three years later CHI Aviation (Construction Helicopters Inc) took over Cougar's SAR business, after the US Department of Transport revoked the company's air operating certificate for allegedly being controlled by a non-US citizen. CHI continued the service in the Gulf until it shut down the operation in 2015.

The new Bristow service builds on the company's long history of SAR operations in the North Sea and worldwide offshore oil and gas sector experience and will provide a new challenger to Era Helicopters, which has three dedicated SAR AW139 helicopters serving offshore clients in the Gulf of Mexico from bases in Louisiana and Texas At Galliano, Bristow will have an advanced dispatch system, staffed by registered medical specialist who will provide pre-arrival medical instructions over the phone and prioritise and manage response efforts in the event that simultaneous call-outs are received. Shell will also join a new SAR consortium formed by Bristow, which aims to provide an unrivalled service and life saving capability to members, while reducing overall costs associated with SAR operations.

- Former military hangars at Alexandria airport in Louisiana are being used to store helicopters withdrawn from offshore contracts in the Gulf of Mexico during the current industry down turn. In mid March at least 14 aircraft were in store.

These included seven Sikorsky S-92s in PHI Inc colours, N925PH, N926PH, N927PH, N928PH, N929PH, N931PH and N932PH, which were flown into Alexandria between September 2016 and March 2017. Also present are Airbus Helicopters EC225s N109RR, N225EW, N412SG, N602JS and N781TC from Era Helicopters, alongside EC145 N968KC and Leonardo Helicopters AW139 N139EH.

Further along the Gulf coast at Acadiana airport in New Iberia, Bristow Helicopters has at least six helicopters in storage and up for disposal, including Sikorsky S-76C+/C++ N886BG, N887BG and 5N-BIL, previously flown in Brazil and Nigeria, and Bell 412s N523QK, N3885W and N31011 withdrawn from service in Mexico and Trinidad.

- Heliconia, headquartered in Morocco has taken delivery of two additional Leonardo Helicopters AW139s from Waypoint Leasing to support oil and gas operations in Northwest Africa.

The two aircraft, previously with another offshore operator, join a third AW139 leased from Waypoint in a mixed fleet of 17 helicopters, including Airbus Helicopters AS350B variants, AS355N, AS365N1 and Leonardo AW139s on both onshore and offshore operations.

- The CHC Group has signed a new contract with Providence Resources, to support an exploration well programme some 215km (133 miles) off the southwest coast of Ireland in the southern Porcupine Basin.

CHC will provide a dedicated Sikorsky S-92 helicopter flying out of Cork Airport from this June to the Druid/Dromberg prospect, working in conjunction with Lloyds Register (LR) as the wells project management company. The contract continues a relationship between CHC, Providence and LR.

- CHC Helicopter has secured a new offshore contract with Faroe Petroleum to support an exploration drilling programme in the Brasse Field, in the Norwegian North Sea. The service will begin this summer, using a Sikorsky S-92 helicopter flying from CHC's base in Bergen some 120km (74miles) east of the field.

Faroe holds a 50 percent share in the Brasse Field and recently announced a commitment to drilling an appraisal well on the discovery in mid-2017. A semi-submersible self-propelled drilling rig, Deepsea Bergen has already been contracted for the operation.

- Bristow Helicopters unmanned air systems (UAS) technology company Sky-Futures carried out a successful first interoperability trial between a Sikorsky S-92 helicopter and a UAS at Galliano in Louisiana on 27 March. The initial 20 minute trial was aimed at proving that manned helicopters and unmanned drones could operate safely in the same airspace with the aid of electronic conspicuous technology.

Sky-Futures operated an Asc Tec F8 UAS with a Ping-2020 ADS-B system mounted to its frame. The Ping-2020 is already approved by the US Federal Aviation Administration and is one of the smallest and lightest transponder systems available. Bristow operated the S-92, receiving the ADS-B signal using ForeFlight's Stratus 2S which displayed the UAS position and altitude on an Ipad carried by the pilots. During the trial the S-92 was hovered at 152m (500ft) altitude, whilst the AscTec drone was flown towards the helicopter, maintaining a horizontal distance of 61m (200ft) away from the aircraft but climbing in increments of 30m (100ft) to an altitude of 122m (400ft).

Sky-Future already uses drones for rig and platform inspection work and now equips them with ADS-B when operating offshore. The test showed that the S-92 pilots were able to monitor the position and height of the UAS during the entire flight, even though they didn't have actual visual contact, opening the door to potential complementary commercial operations in the future as well as improved situational awareness for aircrew.

- The North Denes airfield near Great Yarmouth, Norfolk, which provided a base for offshore helicopter operations for many years, has been put up for sale. Operated originally by British Airways Helicopters and more recently by CHC Helicopters, the airfield closed down two years ago, following a decline in business and the relocation of southern North Sea contracts to Norwich.

The 60 acre airfield includes a passenger terminal, offices, two hangars and an air traffic control facility but, apart from concrete helipads, is unsurfaced with two grass runways. However it seems unlikely that the site will continue in aviation use, with other commercial uses and redevelopment of the land seen as more likely, subject to local authority planning permission.

Helicopter History

Airbus Helicopters has relocated the X³ compound helicopter demonstrator from the Air & Space Museum at Le Bourget to the more local Museum of Aviation at Saint-Victoret, near the company's Marignane factory. The aircraft was transferred from Le Bourget in late March.

The X³ has joined several other legacy Airbus helicopters in the museum, including an AS332L2, EC155 SA342, SA313B, SA316B, SO1221-01 Djinn prototype, and the AS350B3 that became the first helicopter to land on the summit of Mount Everest.

★

A commemorative fly-in of Aerospatiale Gazelle helicopters took place on 8 April at the Army Air Corps Aviation Centre, Middle Wallop, to mark the 50th anniversary of the first flight. Aerospatiale chief helicopter test pilot Jean Boulet carried out the first flight of the prototype, registered F-WOFH, at Marignane on 7 April 1967.

Today production SA341 and SA342 Gazelles are still in service with 20 air arms worldwide, including front line service in the Middle East and with the French Army (ALAT). The Army Air Corps also retains 19 Gazelle AH1 helicopters in service, some deployed in Northern Ireland and at the BATUS training base in Canada. Other examples are operated by Qinetiq at Boscombe Down, whilst a number of ex-British, French and Yugoslav-assembled Gazelles fly in civil markings as far afield as the USA and Russia.

The privately organised fly-in had the support of the Museum of Army Flying at Middle Wallop.



Above: These two ALAT Aerospatiale SA342M were among a mix of military and civil Gazelle helicopters that flew into Middle Wallop on 8 April to celebrate the 50th anniversary of the first flight.

ROTARY PEOPLE

Erickson Inc has appointed **Andrew Mills** as interim president and chief executive officer of the company following the resignation of **Jeff Roberts** from the position, effective 5 May. Mills has 25 years experience in helicopter operations, including aerial work and will now lead the company through its restructuring, following the recent emergence of Erickson from the Chapter 11 bankruptcy process... The Leonardo Board of Directors officially appointed **Alessandro Profumo** as Chief Executive Officer at the annual shareholders meeting on 16 May, succeeding **Mauro Moretti** who had completed his term of office. Profumo, comes from a strong financial background, having led the Italian banking company Unicredit between 1998 and 2010 and expanded it into the international market through acquisition and growth. By 2010 Unicredit had grown from 15,000 employees to over 162,000 in 20 countries. The Italian finance ministry, which holds the controlling share in Leonardo and sanctioned the new appointment, now expects Profumo to use this international experience to build Leonardo's global business and revive the international order book... HeliOffshore has appointed **Lance Bospflug**, President and Chief Operating Officer of PHI Inc to its Board. Bospflug succeeds **Al Gonsoulin**, Chief Executive Officer of PHI Inc who was a founding member of the HeliOffshore safety organisation... Airbus Helicopters has appointed **Alain Flourens** as head of engineering and a member of the executive board, succeeding **Jean-Brice Dumont** who is moving to Airbus Commercial Aircraft. Flourens is currently head of the A380 commercial programme with Airbus and will join Airbus Helicopters on 1 July, before taking over from Dumont in September... The American Helicopter Society has elected **Dave Koopersmith**, vice president and general manager of Boeing Vertical Lift, as Chairman of its Executive Committee for 2017-18. **Daniele Romiti**, managing director of Leonardo Helicopters, is elected as President of the Committee and **Glenn Isbell Jr**, executive vice president of Bell Helicopter, joins the Board as Secretary/Treasurer... Captain **Le Trong Dong** has been promoted by the Vietnam Helicopter Corporation to Deputy Managing Director, based in Hanoi. He was previously Director of Vietnam Helicopter Company South, where he will be succeeded by Captain **Kiet Dang Hung**.



The Royal Navy Lynx - An Operational History by **Larry Jeram-Croft**. Published by **Pen and Sword**. Price: **£25.00 (UK)/\$44.95 (USA)**. Books about the Westland Lynx helicopter are not new and several have been published recently around its history and technical details. But this one is different, written by a former Royal Navy Lynx engineer and pilot, with a first hand perspective of front line service at sea over a period of 30 years.

Embellished with first hand accounts from colleagues of operations during the 1982 Falklands Conflict, the First Gulf War and other missions conducted during the aircraft's 40 years of Royal Navy service, this 289 page book tells not just the Lynx story but also the ingenuity, bravery and skills shown by those who flew and maintained them in conflict situations.

All-in-all a remarkable book and one you won't be able to put down.

Autogyros, Helicopters and Other V/STOL Aircraft Vols 1-3 by **Franklin D Harris**. Published by **NASA Special Publications**. Price: **N/A**. These mammoth tomes are not for the faint hearted and at first sight are clearly aimed at the technical sciences surrounding the subject matter. However if that is not your forte and you can get past various graphs, calculations and other detail, there is much in these three volumes to commend them to the true enthusiast or library.

Volume 1 gives an Overview of the subject and covers Autogyros, with reproduction of early Cierva reports and Air Ministry manuals for the C30 Rota, along with material relating to Hafner, Pitcairn and other autogyro pioneers of the period. Volume 2 (which is almost 1,000 pages!) is all about helicopters, with especial attention to experimental development and issues of vibration, noise, performance and costs, whilst Volume 3 (at almost 800 pages) covers Other V/STOL aircraft. This includes the work done by Canadair, Hiller, Vertol and others on compound, tilting, blown flap and other variants, as well of course covering the tiltrotor.

These books are good reference material for serious research, and therefore most likely to find their way into a aeronautical libraries rather than personal book collections. Enquiries from institutions should therefore be directed to the NASA Ames Research Centre (kristen.k.kallstrom@nasa.gov).



Books reviewed in HELICOPTER International are available by mail order from The Helicopter Museum. Please fax +44-1934-645230 for cost and postage details or e-mail: helimuseum@btconnect.com

Accident Spot

February

- Bell 206L-1 N519EH** of GM Leasing substantially damaged at Carson City airport when it rolled over during touch down training.
- Leonardo AW109E (Hkp15)** of Swedish Armed Forces damaged during night training mission near Sveg airport, Harjedalen, when it was struck by large bird which penetrated windscreen and struck pilot in the face. The night vision goggles he was wearing severely injured the pilot and the co-pilot had to take over and land the helicopter at the airport.
- Robinson R22 N7518G** of Middle River Aviation damaged during hover practice at Fallstrom when student pilot lost control and tail rotor struck ground, resulting in tail rotor gearbox and tail rotor separating from helicopter before instructor landed aircraft upright.
- Robinson R22 N7685H** of Cloud Nine Helicopters substantially damaged at North Palm Beach airport, Florida when it rolled over during landing practice, coming to rest on its side.
- Bell 206B N978RH** of Republic Helicopters written off after crashing into West Bay near Galveston, Texas during night IMC flight from oil tanker Eagle Vancouver to company heliport, Santa Fe. 1 fatal.
- Airbus EC135P2+ N135LG** of Air Methods substantially damaged in hard landing and dynamic rollover near Beattyville, Kentucky during attempt to touch down on helipad whilst avoiding nearby power lines. Pilot descended from 30m (100ft) at about 61m (200ft) per minute but was unable to arrest descent and helicopter bounced when it hit the ground before coming to rest on starboard side, with main rotor destroyed, tailboom fractured and nose section also damaged.
- MD Helicopters MD600N N245SE** of Aero Ownership North America Services destroyed during take off from La Aurora airport, Guatemala City when it impacted concrete runway, crushing forward fuselage. 4 fatal.
- Hughes OH-6A N664OZ** of USDA APHIS WA ATOC damaged at Price airport, Utah when refuelling truck approached from rear and struck main rotor blades during cool down period.
- Agusta-Bell AB412EP I-VFOV** of Vigili Del Fuoco suffered minor damage in emergency landing on mountainside slope, after fog rolled in during rescue exercise. Crew used hoist to access ground and cut away trees to clear space for landing.
- Bell 47D-1 N2875F** of PLuig written off in forced landing in a field near Archer City, Texas after pilot unintendedly pulled the mixture control and engine stopped. Helicopter fell from 30m (100ft) due to lack of height to enter full autorotation and impacted terrain. Skids collapsed, cockpit bubble smashed, main rotor blades broken and tail boom partially separated from main structure.
- Airbus AS350B-3 CC-ARK** of Helicoptero Calquin substantially damaged in forced landing during powerline inspection flight near Los Toros, Maule in Chile. Helicopter landed hard in scrub and tall grasses.
- Mil Mi-24P** of Libyan National Air Force destroyed by ground fire near Mabruk oil field, Sirte whilst attacking Benghazi Defence Brigade convoy. 2 fatal.

- Leonardo AW109E XA-SJC** of Helivan & Hawk substantially damaged in forced landing into wooded terrain shortly after departing from El Tajin airport, Mexico and 1km (0.6 miles) from the airfield.
- Robinson R66 RA-06375** of D. Rakitskaly written off when it crashed into Lake Teletskoye, Altai region shortly after take off on a tourism flight. 5 fatal.
- Mil Mi-24** of Algerian Air Force substantially damaged when it crashed in a field near Ksar El-Abtal, Setif province following technical malfunction.
- Robinson R44II VH-NFL** substantially damaged in heavy landing during training flight at Jandacot airport when main rotor severed tail boom.
- Airbus AS350BA ZK-HKW** of Way To GO Heli Services written off during fire fighting mission when it crashed on a steep slope in Port Hills, Christchurch, New Zealand. Helicopter overturned following impact, separating tail boom and coming to rest inverted. 1 fatal.
- Bell 429 N598PB** of T.Bailey destroyed in collision with terrain during IMC night flight from Bossier City, Louisiana. Helicopter struck trees followed by impact in muddy edge of Wallace Lake near Shreveport with 610m (2000ft) long debris field. 2 fatal.
- Bell 407 P2-HSE** of Niugini Helicopters substantially damaged at Kiunga airport, Papua New Guinea when pilot attempted normal take off while a slingline was attached to a load of drums of fuel. Helicopter crashed onto airfield and rolled onto port side.
- MD Helicopters H369E ZK-HRK** of Precision Helicopters substantially damaged when it crashed into trees and steep terrain in Walmarion Forest, near Raetihi, North Island whilst transporting beehives.
- Bell 47G-3B1 TI-BHA** substantially damaged agricultural flight at Guapiles, Costa Rica when it forced landed into crops due to a technical malfunction.
- Airbus AS350B-3 N413LP** of Helicorp Inc substantially damaged during practice autorotations when engine over revved during flare and caught fire. Aircraft landed safely but with fire damage to engine deck support structure and a portion of the tail rotor drive shaft.
- Hughes H369A N805LA** of Jim's Air Repair/Hansen Helicopters substantially damaged in autorotation to Pacific Ocean near Guam, following a loss of power whilst cruising at 305m (1,000ft) during fish-spotting mission. Rotor rpm dropped and helicopter struck water hard, with main rotor severing tail boom but aircraft remaining upright and floating on its pontoons.
- MD Helicopters MD530G-1 261** of Afghan National Army destroyed by Taliban insurgents after forced landing in Kunduz area and sustaining damage in roll over onto starboard side.
- Robinson R44 N44EK** of N44EK Inc substantially damaged when engine failed en route to Lincoln Park airport, New Jersey and pilot attempted to autorotate into parking lot at Chatham, New Jersey. Helicopter collided with garage roof and came to rest in parking lot with aft tail boom and tail rotor separated and main rotor blades bent down span wise.
- Aerospatiale SA341 UP-LA246** of P.Ustinov written off after impacting terrain in poor weather conditions during flight from Ayagoz, Kazakhstan. 1 fatal.

- Robinson R22 I-XXX** damaged after impacting snow-covered sloping terrain at Foppolo, Italy following loss of power whilst landing and subsequent roll over onto port side. Main rotor blades bent with minor damage to fuselage.
- Bell 407 N1371** of Westwind Helicopters destroyed when it impacted marshy water about 24km (15 miles) southwest of Houma, Louisiana en route from South Timbalier oil platform to Houma heliport base. Helicopter wreckage was mostly contained within 30m (100ft) radius and no evidence found of component failure. 1 fatal.
- Robinson R44 A2-HJR** substantially damaged when it struck power cables shortly after take off from playing field in Tutume, Botswana and crashed.

March

- Bell 206B N211CS** of West Valley Aviation substantially damaged during forced landing after loss of power near Firebaugh, California. Helicopter was flying at about 1.5m (5ft) over crop at approx 113km (70mph) during aerial application mission when engine failed and pilot attempted autorotation landing into freshly ploughed field. Main rotor struck tail boom which separated forward of tail rotor gearbox.
- Sikorsky S-76C+ +PR-MEY** of Omni Taxi Aereo substantially damaged during landing on mobile platform P-37 in the Campas Basin offshore Rio de Janeiro, when turbulence from structure caused loss of lift and helicopter landed hard, before turning sideways and sliding towards edge of helideck due to vessel movement. Pilot then deployed flotation gear to stop further sliding and in case aircraft went over the side.
- McDonnell Douglas MD369 ZK-XXX** of Alpine Springs Helicopters damaged in forced landing at Graf Creek near Arthurs Pass, South Island in New Zealand, following a loss of power.
- Leonardo AW139 I-TNCC** of Vigili del Fuoco substantially damaged during mountain rescue mission northwest of Trento, when it struck terrain in poor visibility and rolled over in snow on Mount Nambino at a height of 2650m (8694ft). Main rotor blades broken and nose section crushed in incident.
- Mil Mi-35 858** of Libyan National Air Force destroyed in an air strike at Ras Lanuf airbase, Sirte to prevent its use after being seized by Benghazi Shura militants.
- Bell 412EP JA97NA** of Nagono Air Rescue written off during training mission when it crashed and overturned in snow on Mount Hanchibuse at a height of 1700m (5577ft), following suspected rotor strike on trees in vicinity and sudden descent. Helicopter came to rest inverted with tail boom separated from fuselage, tail rotor missing and all four main rotor blades broken off and in pieces. 9 fatal.
- Sikorsky S-76C++ TC-HEZ** of Swan Aviation destroyed when it struck the Endem TV tower in poor visibility and crashed beside the D-100 highway in the Büyücekmece district of Istanbul. Helicopter had taken off from Atatürk airport six minutes previously and broke up when it struck the terrain, with tail section separated from main fuselage. 7 fatal.
- Robinson R44II G-DORM** of D.Marron written off when it crashed into garden of unoccupied house at Top Hill, near Carlingford in County Louth, Ireland.
- Kaman K1200 N675TH** of Timberline Helicopters damaged in incident at Julian, California.
- MD Helicopter MD530F XC-PEP** of Policia Estatal Preventiva destroyed in post impact fire,



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- after tail rotor clipped power line and separated during a search for a missing hiker on Centinela Hill near Mexicali, Baja, California. 4 fatal.
- 14 **Airbus AS350B3 JA500H** of Hirata Gakuen of Education Foundation substantially damaged at Kobe Airport, when pilot lost control during repositioning flight following touch and go training mission. Helicopter struck terrain and rolled onto its starboard side.
 - 14 **Sikorsky S-92 EI-ICR** of CHC Helicopters destroyed when it struck rocks on Blackrock island during night approach to Black Sod refuelling site, County Mayo and crashed into sea. Helicopter had been tasked to provide top cover for a search and rescue mission and was en route from Dublin when the accident occurred. 4 fatal.
 - 14 **McDonnell Douglas MD530F N530KD** of Rogers Helicopters written off in crash whilst slinging power cables in White County, south east of Chalmers, Indiana. Pilot was attempting to initially thread the sock line through the tower pylons in gusting winds, when helicopter fouled structure and fell inverted onto the terrain. 1 fatal.
 - 15 **Hindustan Aeronautics HAL316B Z1006** of Indian Air Force substantially damaged in forced landing on uneven terrain, following a technical problem during take off from Allahabad-Bamrauli air station on training flight. Helicopter rolled onto port side with damage to main rotor blades and partially severed tail section.
 - 15 **Bell 206B F-GPPH** of M.Malbrél written off when it struck terrain in field during approach to private helipad at Lissac-et-Mouret. 1 fatal.
 - 17 **Bell 206B PT-YHH** of Icarai Turismo destroyed in crash landing in Araucária, Paraná, Brazil. Helicopter came to rest upright on grass island at road intersection but with lower fuselage crushed and tail section separated.
 - 17 **Agusta-Bell AB206A VH-DPU** written off when it ditched into water and overturned whilst on approach to land at Keppel Creek, Curtis Island, Queensland for fishing expedition.
 - 18 **Robinson R44 JA7907** substantially damaged whilst landing at Ohdaira, in Itoigawa city, Niigata prefecture when it overturned following touchdown.
 - 21 **Hindustan Aeronautics HAL316B** of Indian Coast Guard damaged in emergency landing following bird strike during take off from INS Garuda naval base, Kochi. Helicopter landed hard on runway, sustaining damage to the landing gear.
 - 22 **Bell 206 ZS-XXX** substantially damaged at Mhlume, Swaziland when it struck powerline and crashed during crop spraying mission.
 - 22 **Robinson R44II CC-PNJ** written off when rotor blade struck flagpole during take off from car park at fruit packing plant in Parque Lantario, cerce de Chillán. Helicopter fell onto concrete and broke up.
 - 24 **McDonnell Douglas 369E G-MRRR** of Helos Aviation substantially damaged when it crashed into field on bank of River Thames at the Warren, Caversham, after pilot lost translational lift and tail rotor control during approach to private site. Helicopter came to rest on its side with the tail

boom and rotors separated and one skid collapsed.

- 26 **Mil Mi-2** of Ukraine Air Force written off in crash near Malyniuka, Donetsk Oblast after colliding with powerline. 5 fatal.
- 27 **Robinson R22 ZK-IHA** of N.Wilson destroyed in crash in mountainous terrain near Reefton, South Island.
- 29 **Airbus AS355F1 G-OHCP** of Helicopter Services destroyed when it struck mountainous terrain in poor visibility in the Rhinog mountains, Snowdonia whilst returning from attempted flight to Dublin over Irish Sea. 5 fatal.
- 30 **Airbus AS350B VH-KCE** of Somerbrook Pty substantially damaged during attempted landing at night in windy conditions at Wellcamp, Toowoomba in Queensland, when pilot lost control and helicopter struck terrain before rolling onto its starboard side. 

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Reports in Accident Spot are drawn from a number of sources, and the detail given may be provisional only, pending confirmation and official investigation. These factors should be taken into consideration when analysing the data provided.

Below: This Mil Mi-24 Hind of the Algerian Airforce was substantially damaged when it crashed in Setif Province following a reported technical malfunction.





Marketing Data

- CIVIL SALES

Region Type c/n Owner/Remarks

Australia

VH-EID	Robinson R44 Raven II	14059	Heliflite
VH-HIE	Robinson R44	2456	Whitsunday Air Services
VH-IGV	Robinson R22 Beta II	4425	Australian Helicopter Group
VH-IPE	Sikorsky S-92A	920038	HNZ Australia
VH-IPK	Sikorsky S-92A	920104	HNZ Australia
VH-IPX	Sikorsky S-92A	920116	HNZ Australia
VH-LWJ	Sikorsky S-92A	920255	Lloyd Helicopters
VH-LWQ	Sikorsky S-92A	920278	Lloyd Helicopters
VH-LWU	Sikorsky S-92A	920289	Lloyd Helicopters
VH-MHG	Robinson R22 Beta II	4730	Heliflite
VH-NPQ	Robinson R44 Cadet	20013	Heliflite
VH-OFA	Airbus Helicopters AS355F2	5423	Skyplan Australia
VH-WDL	Robinson R22 Beta II	4732	Heliflite
VH-WSO	Robinson R44	2458	Whitsunday Air Services
VH-WSO	Robinson R44	2458	Whitsunday Air Services
VH-XXQ	Bell 206L-1	45591	North Australian Helicopters
VH-WZU	Robinson R44	2457	Whitsunday Air Services
VH-YTT	Airbus Helicopters EC120B	1030	Little Archie

Austria

OE-XJO	Bell 412HP	36355	Heli Austria
OE-XMS	Robinson R44	30015	HUBI-Fly
OE-XOO	Airbus Helicopters EC135T3	1250	Heli Austria
OE-XRI	Bell 427	56009	Schider Helicopter Service

Belgium

OO-MML	Bell 407GX	54653	Meurrens Machinery
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Bermuda

VP-CBL	Sikorsky S-76C+	760561	Lobo Leasing
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Canada

C-FFCM	Robinson R66	0765	1364254 Alberta
C-FIRC	Airbus Helicopters AS350B3	4607	HELIOPS Alberta
C-FJHO	Airbus Helicopters AS350B3	7634	Jake Helicopter Corp
C-FKPE	Robinson R66	0776	Helico Store
C-FLFD	Sikorsky S-76C	761073	Canadian Helicopters
C-FLFN	Sikorsky S-76C	760594	Canadian Helicopters
C-FLFT	Sikorsky S-76C	760600	Canadian Helicopters
C-FTOZ	Sikorsky S-76C+++	760651	Eagle Copters
C-FVOC	MBB Bo105P	6183	Red Deer Auto Group
C-FVON	MBB Bo105P	6073	Red Deer Auto Group
C-FWA	Bell 206L-1	45448	A.Fipke
C-GCMD	Airbus Helicopters AS350B2	2286	Heli-Welders Canada
C-GELP	Guimbal G2 Cabri	1184	British Columbia Helicopters
C-GGWI	Sikorsky S-92A	920292	Cougar Helicopters
C-GHZV	Airbus Helicopters AS350B3	4584	Horizon Helicopters
C-GLAH	Airbus Helicopters AS350B2	2260	Access Helicopters
C-GMTZ	Robinson R66	0782	Grand Falls Aviation Service
C-GNDF	Bell 206L-1	45611	D.F. Capital Ltd
C-GRBZ	Bell 206B	3493	Richberry Management Group
C-GTUU	Guimbal G2 Cabri	1186	Synergy Flight Training

China

B-7092	Robinson R22 Beta II	4440	Inner Mongolia Gen Avia
B-70MM	Guimbal G2 Cabri	1161	Shanghai Xiaoxiang
B-70MN	Guimbal G2 Cabri	1160	Shanghai Xiaoxiang
B-70MP	Guimbal G2 Cabri	1162	Shanghai Xiaoxiang
B-70MQ	Guimbal G2 Cabri	1163	Shanghai Xiaoxiang
B-70PL	Robinson R44 Raven II	13926	Hebei GM Aviation
B-70PP	Leonardo Helicopters AW119 MkII	14921	Shanghai Jinhui
B-70PQ	Leonardo Helicopters AW119 MkII	14922	Shanghai Jinhui
B-70PS	Airbus Helicopters AS350B3e	8327	Hubei Tongcheng
B-70PT	Robinson R44 Raven II	14054	Inner Mongolia Gen Avia
B-70PU	Robinson R44 Raven II	14055	Inner Mongolia Gen Avia
B-70PV	Airbus Helicopters EC130T2	8291	Liaoning Oster
B-70PZ	Robinson R44 Raven II	14035	Nanjing Seoul
B-70QA	Robinson R44 Raven II	14036	Nanjing Seoul
B-70QP	Bell 407GX	54672	China Southern Airlines
B-70QQ	Airbus Helicopters AS350B3	7118	Hubei Ao Lan

Czech Republic

OK-AMS	Airbus Helicopters EC120B	1293	Aeropartner
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Dominican Republic

HI1020	Airbus Helicopters EC135P2	0284	Helidosa Aviation
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France

F-AVAZ	Sud Aviation SE313B	1442	Les Trois Ailes
F-HDFL	Airbus Helicopters EC120B	1523	Defense Conseil International
F-HEZA	Leonardo Helicopters AW139	31255	Heliconia Aero Solutions
F-HJMF	Airbus Helicopters AS350B3	8342	Stanair

Region Type

F-HLCH	Airbus Helicopters EC135T3	1254	SAF Helicopteres
F-HOLZ	Robinson R44 Raven II	14046	X-Fly
F-HPGT	Agusta-Bell AB206B	8326	Heli Technique
F-HSBN	Leonardo Helicopters AW139	31141	Heliconia Aero Solutions
F-HUSH	Robinson R44 Raven II	10272	Magnum Helicoptere
F-HYBD	Airbus Helicopters AS350B3	8261	Drycopter

Germany

D-HMFA	Bell 206B	3169	Motorflug Baden Baden
D-HMFB	Bell 206B	4373	Motorflug Baden Baden
D-HMFC	Bell 206B	3067	Motorflug Baden Baden
D-HMFD	Bell 206B	4195	Motorflug Baden Baden
D-HMFE	Bell 206B	2901	Motorflug Baden Baden
D-HMFF	Bell 206B	2967	Motorflug Baden Baden

Great Britain

G-CKBO	Airbus Helicopters EC225LP	2913	Wilmington Trust
G-CKCI	Guimbal G2 Cabri	1191	European Helicopters Importers
G-CKCX	Leonardo Helicopters AW169	96048	Waypoint Asset Leasing
G-CKDL	Robinson R22 Beta II	3848	Elicast
G-EMHN	Leonardo Helicopters AW109S	22154	Castle Air
G-HHEM	Leonardo Helicopters AW169	69049	Specialist Aviation Services
G-HSLA	Leonardo Helicopters AW109SP	22336	London Southend Airport Co
G-HUEZ	Hughes 500E	0544E	Falcon Helicopters
G-JWRN	Robinson R44 Raven II	13857	Heritage Automotive Holdings
G-LOLZ	Robinson R22 Beta	0655	Swift Helicopter Services
G-MCSF	Airbus Helicopters EC175B	5023	Babcock Mission Critical Serv.
G-ROON	Sikorsky S-76C	760781	Rooney Air
G-TOOZ	Airbus Helicopters EC120B	1428	C.J.Toohy
G-WPKR	Enstrom 280FX	2012	N.Ker

Italy

I-HELT	Airbus Helicopters AS350B3e		Heliwest
I-ROBS	Leonardo Helicopters AW169	69019	Airgreen

Japan

JA77AR	Robinson R66	0756	Clear Net
JA109A	Kawasaki BK117C-2	4044	Tokushima Authorities
JA310H	Airbus Helicopters AS350B	1732	Miyama & Partners
JA125Y	Robinson R44 Raven II	14047	Osaka Koku

Netherlands

PH-PHB	Enstrom 480	5024	Prince Helicopters
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New Zealand

ZK-HDA	Leonardo Helicopters AW139	31458	HNZ New Zealand
ZK-HIX	Bell 206B	4523	Heli Resources
ZK-HMT	Hughes 500D	0480D	TT Helicopters
ZK-HRZ	Bell 412	36008	Oceania Avation
ZK-HVA	Airbus Helicopters EC120B	1016	Fjordland Helicopters
ZK-HWL	Bell 206L-3	51054	Helicopter Charter Karamea
ZK-HYO	Airbus Helicopters AS350B2	4409	Mountain Helicopters
ZK-ICO	Bell 206L-3	51459	Air Safaris & Services
ZK-ICZ	Airbus Helicopters AS350B2	4883	The Helicopter Line
ZK-IMZ	Guimbal G2 Cabri	1178	Kapiti Districts Aero Club

Norway

LN-OIB	Sikorsky S-92A	920159	Bristow Norway
LN-OIC	Sikorsky S-92A	920197	Bristow Norway
LN-OPJ	Airbus Helicopters AS350B3	8356	Pegasus Helicopter
LN-OPJ	Airbus Helicopters EC130T2	8352	Skjolden Cruisekai
LN-OPK	Airbus Helicopters EC130T2	8355	Skjolden Cruisekai

Slovakia

OM-ATU	Bell 429	57281	Air Transport Europe
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South Africa

ZS-HDW	Bell 222UT	47506	Henley Air
ZS-HNC	Bell 412EP	36338	Ultimate Helicopters
ZS-HND	Bell 412EP	36340	Ultimate Helicopters
ZT-RBT	Robinson R66	0763	Montego Pet Nutrition
ZT-RBU	Robinson R44 Raven II	11359	West Dunes Aviation
ZT-RBX	Robinson R44 Raven II	4032	Bushveld Game Capture
ZT-RCC	Airbus Helicopters AS350B2	7061	Mesiglo
ZT-RCD	Robinson R22 Beta II	3558	Game Flight
ZT-RCF	Airbus Helicopters AS332L	2042	Starlite Aviation
ZT-RCH	Robinson R44 Raven II	10382	Shone's Electrical Aviation
ZT-RCO	Airbus Helicopters AS350B3	8225	MCC Aviation
ZT-RCT	Airbus Helicopters EC120B	1406	WIB Investments
ZT-RKB	Robinson R44 Raven II	14050	R.J.Burns
ZT-RKT	Bell 206B	3651	Land Link Real Estate
ZT-RSX	Airbus Helicopters AS350BA	1363	Silvercross Helicopter
ZT-RWB	Bell 407	53098	DRWRNRB
ZT-RXP	Bell 407GX	54659	Fourie's Poultry Farms
ZU-RMJ	Westland SA341D	1793	Shezphase

Sweden

SE-JRY	Airbus Helicopters EC120B	1189	Stockholm Helicopterjanst
SE-JSG	Leonardo Helicopters AW169	69043	Babcock Scandinavian Air Ambulance
SE-JVL	Robinson R44 Clipper II	11613	Bida Enterprise
SE-JVT	Airbus Helicopters AS350B3	8368	Scandair Helicopter
SE-JVU	Airbus Helicopters AS350B3	8370	Scandair Helicopter

Switzerland

HB-ZNJ	Airbus Helicopters AS350B3	4939	Yankee Lima Suisse
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● RAMM Aerospace in St. Laurent, Quebec has secured Transport Canada approval for its Robinson R44 replacement seat installation with detachable cushions, designed to reduce maintenance costs and increase storage under the seats. Supplementary Type Certification by the US Federal Aviation Administration and European Aviation Safety Agency is pending.

The replacement seat kit includes four individual flat seat pans that install onto the seat boxes. Each kit also includes four bottom and four backrest cushions with replaceable leather covers, allowing owners to replace only the cushions or covers as required, rather than scrap and replace an entire seat. The customer also has the option to store the cushions when not in use, further saving maintenance costs and providing a weight saving opportunity.

With this latest approval, RAMM Aerospace can now supply an entire R44 interior upgrade kit that includes pre-cut carpet or utility flooring and a wipe clean bulkhead/headliner to match the replacement seat installation.

● Simplex Aerospace has received a new order for its Sky Cannon high rise fire fighting system from China, for installation on an AVIC AC313 heavy lift helicopter. The new Model 580 SkyCannon uses the 4546l (1000 gall) Simplex Model 380A Fire Attack system as its water source, allowing currently installed systems already in use on the

AC313 to be retrofitted with the Sky Cannon option.

The Simplex SkyCannon was first delivered to the Tokyo Fire Department in late 2015, for use in conjunction with the Model 316 Fire Attack system on the Airbus H225 Super Puma. The AC313 system will be used initially in Beijing.

● Airwork New Zealand has secured a US Federal Aviation Administration supplemental type certificate for its MBB BK117B2 cargo hook and mirror kit. The kit has already been approved by Transport Canada and the Civil Aviation Authority of New Zealand.

The kit utilises the Onboard Systems cargo hook with a carrying capacity of up to 1200kg (2645lb), with the option of either hydraulic or manual release and can be connected to either an Airwork-manufactured or an original cargo sling. It comes with a stowage bracket for when not in use. The hydraulic release lever is installed on the collective.

The very light mirror system offers dual or single mirror options for viewing the cargo hook through the lower chin window, for improved visibility during sling operations.

● Heli-One has recently completed a dynamic components exchange for an Airbus Helicopters AS332, operated by a customer in Puerto Rico and reportedly operating a mixed fleet of AS332L1 and AS350B2 helicopters on utility missions. However the

only Super Puma currently registered in Puerto Rico is an AS332C, N5800Z, with the state electric power authority.

Heli-One provided an overhauled main gearbox and main rotorhead for the customer, using its pool of rotatable assets at its facility in Richmond, British Columbia.

● UTair Helicopter Services is now using the Sky Trac automated flight tracking services on 46 Mil Mi-8 helicopters, supporting international peace-keeping operations. The systems are being installed in partnership with Sky Trac's eastern Europe distributor Depicon, founded in 2012 and representing a number of aerospace avionics companies.

The UTair package includes SkyTrac's ISAT-200A satellite air asset tracking unit, CPD/DVI cockpit display panel and dispatch voice interface, and SkyWeb cloud-based data management services. Together these provide GPS position, altitude, heading and identity data at configurable reporting intervals of 0.5 to 3 minutes, with automated status reports sent to the operator. Crews can also send manual updates relating to the flight, using built-in quick messaging features.

UTair Helicopter Services operates over 320 helicopters on four continents worldwide, many of which are carrying out missions in relatively remote locations and over unforgiving terrain. Whilst the Skytrac system is being fitted into a relatively small proportion of the overall fleet, the Mil Mi-8 installation is contractually compliant with the United Nations requirements for peace-keeping operations.

● Curtiss-Wright Defence Solutions division has begun deliveries of its Fortress 757 flight recorder and a cockpit area microphone to Bell Helicopter Canada, to upgrade the cockpit electronics in the Canadian Armed forces fleet of Bell CH-146 Griffon multi-role utility helicopter.

95 CH-146 helicopters are currently in service and the Fortress 757 will provide the fleet with an updated cockpit flight recorder platform, ready to meet current regulations but also to support any future optional health and usage monitoring system installation. Curtiss-Wright is delivering the flight recorder from its manufacturing facility in Christchurch, Dorset and expects to complete the initial contract, valued at \$1.88 million, by mid-2018.

● Thales has introduced a new Compact Autopilot that it says weighs so little that it can be fitted to light helicopters, whilst providing the same functions as systems designed for larger helicopters, both hands-on and hands-off. The company says the new autopilot will substantially reduce pilot workload and enable better concentration on the mission in hand.

The Compact Autopilot is built upon the latest generation of smart actuator, that is designed to directly host the autopilot and flight director software, thus not requiring a separate main flight control computer. Two sets of three Thales Smart+ actuators provide a redundant dual autopilot, available in a 3 or 4 axis configuration with stability augmentation, attitude retention, altitude and heading holds, and the capability to include hover and departure modes.

Thales says the in-line actuators provide continuous stability without any cyclic stick displacement, and the proven simplex or duplex architecture meets the needs for all kinds of demanding IFR and VFR missions. At just 2kg (4lb) in weight, compared with 10kg (22lb) for the nearest comparable competitive stability augmentation system (SAS), the company sees the new autopilot as a major breakthrough in reducing the high accident record in the light helicopter sector.

The autopilot can be configured as stand alone with a control panel, or integrated with existing avionics. The system can be installed on the production line or as a retrofit.

● New Zealand company Eye in the Sky, established by Louisa Patterson after her son was killed in a 2015 helicopter crash, has introduced a lightweight crash resistant cockpit video/voice and data recorder for small helicopters, costing just \$4500.

Patterson, who also heads up air tour company Over the Top, personally funded development of the new hand-sized recorder and plans to donate all profits from sales to a local charity in New Zealand.

● Garmin received European Aviation Safety Agency approval in March of the GTX345 and GTX335 all-in-one ADS-B transponders for installation in general aviation aircraft and helicopters. Both systems incorporate the popular 4.5cm (1.75in) tall panel-mount transponder with bright, sunlight readable digital display.

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● The European Aviation Safety Agency issued a Type Certificate for the Robinson R44 Cadet two-seat variant in March, 11 months after the aircraft received its original US Federal Aviation Authority. Robinson delivered 12 Cadets last year and the EASA approval will now allow initial orders for three aircraft to be delivered to European customers.

The Cadet shares the same airframe engine and rotor system as the R44 Ravel I, but features a derated Lycoming O-5400-F1B5 powerplant and a 91kg (200lb) lower maximum gross weight. The base price is \$344,000 a \$40,000 saving over the price of the Raven I.

● The re-opened Cardiff Heliport hosted an open day on 9 April, giving the public an opportunity to visit the facility and meet the new tenants, including Whizzard Helicopters, Hover Helicopters, and the Wales Air Ambulance.

The heliport is situated in Cardiff Bay, a five minute drive from the city centre and provides hangarage, fuel and maintenance facilities, as well as a passenger lounge and conference room. Training and charter operations are also now available from the heliport.

● The recently established Cobham Helicopter Academy, headquartered at Basingstoke in the UK to provide a wide range of crew training in the military, parapublic and commercial sectors of the helicopter industry, has signed its first collaboration agreement, with maintenance, repair and overhaul provider Helisota.

Drawing on its past experience with the UK Defence Helicopter Flying School, Cobham is able to offer ab-initio pilot training through to more advanced tactical skills instruction and including search and rescue hoist skills and air medical, training. The partnership with Helisota, which specialises in the overhaul of Mil Mi-8/17 helicopters for a number of countries in Eastern Europe and beyond, is expected to offer new market opportunities for both companies.

● Leonardo Helicopters positioned an AW119x demonstrator, N499SM in Nepal in late March, for a two week tour and high altitude flights, to validate an extension of the type's certification to 7315m (24,000ft). This will allow operators to carry out helicopter rescue missions at previously unattainable altitudes.

The demonstrations began with flights from Kathmandu, which is located at 1280m (4,200ft), to several mountain base camps at higher altitudes carrying passengers including potential clients to test the helicopter's



capacity. These were being followed by high altitude aerial work, including trials transporting underslung loads using the cargo hook.

● Heli Charter UK, the Bell Helicopter independent dealer and retailer based in Manston, Kent is expected to be the first UK and European company to take delivery of the new Bell 505 Jet Ranger X. The aircraft is scheduled to be delivered in July this year.

● Reykjavik Helicopters took ownership of the first Airbus Helicopters H120 in Iceland on 15 April, when the aircraft was unloaded at the port. The helicopter will be used for sightseeing and charter flights around Iceland.

● UK company Heli Group took delivery of a new Airbus Helicopters AS355NP, registered G-PERX, at the manufacturer's Marignane facility in the south of France on 3 May. The aircraft will enter service for charter work.

● SAF Hélicoptères has taken delivery of three new Airbus Helicopters H135s for emergency medical services work, the first to be used in this role in France. The first aircraft is already operational in Toulouse and the second and third are due to be based at Alençon and Basançon.

SAF Hélicoptères operates 27 EC135s already on EMS missions, but the new H135 variant offers improved hot/high performance and an increased maximum take off weight, as well as new cockpit avionics and technology.

● Heli Austria has modified two Airbus Helicopters AS350B3e aircraft with the BLR Aerospace Fast-Fin tail boom kit, to enhance the handling and performance characteristics.

The two helicopters, registered OE-XAE and OE-XBE, received a tail boom aerodynamic cowling, with vortex generators on the port side and a tail boom strake on the starboard side under the modification programme. Installation of the kit promises an up to ten percent increase in available right pedal and up to 59kg (130lb) useful load increase in out-of-ground-effect hover.

Above: Bell Boeing appears to have developed a dedicated air ambulance variant of the V-22 Osprey tilt rotor...

The additional performance will be especially beneficial to Heli Austria, which typically operates in demanding high altitude terrain.

● Airbus Helicopters has begun studies for the installation of its advanced Blue Edge rotor blade technology on the H225 heavy lift helicopter and other aircraft in the company's product range. The Blue Edge blades are already used on the H160 helicopter, which is scheduled for certification next year.

The double-sweep blade tip configuration and other aerodynamic improvements introduced on the Blue Edge blade, reduces the vortex interaction between the spinning blades with noise reductions of up to four decibels and improved fuel efficiency. Tests on the EC155 also showed a useful payload increase, although this would be less beneficial on smaller helicopters.

● Marengo Swiss Helicopter has announced a new launch customer in Norway for the SKYe SH09 helicopter. Tronrud Engineering AS plans to operate the SH09 as a company transport and as a utility and logistics vehicle to support the development of the Eggemoen Aviation and Technology Park, situated 60km (37 miles) northwest of Oslo.

Tronrud first expressed interest in the SH09 in 2014, when the company signed a letter of intent at HeliExpo.

● The latest Guimbal Cabri G2 helicopter to be sold by UK distributor HeliGroup was handed over to private owner Darren Robinson at Oxford Airport on 18 May. Registered G-CKCI, the aircraft is fitted with the latest Aspen Avionics digital flight display.

It was immediately followed by the collection of the 200th production Cabri G2, G-IZOO, from the Guimbal factory in Aix-en-Provence on 20 May, painted in a Union Jack colour scheme.



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2007 - AW119 Koala	645 hrs	Blue, VIP white leather interior, Located Russia	1.550.000 USD
2013 - EC120B	1637 hrs	Blue with stripes, Comfortable cabin upholstery, Located Sweden	1.075.000 EUR
2016 - H125	400 hrs	Black Metallic with red stripes, First Aid Kit, Duals, Located Sweden	2.280.000 EUR

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