



[industry and technology]

NEW CHINOOK for Spain's Army Airmobile Force

A complete overhaul of the transport helicopter will keep it in service until almost the middle of the century



The fuselage in the cabin section has been reinforced with corrosion protection treatment.

A mechanic checks the maintenance panel, where hydraulic pressures and temperatures, among other data, are monitored.



THE first brand new *CH-47F* (Foxtro) *Chinook* helicopter has been added to the aircraft inventory of the Spanish Army Air-mobile Force (FAMET). The official reception ceremony took place on 28 January at *Colonel Maté* base in Colmenar Viejo, about 30 kilometres north of Madrid. In attendance were the Spanish Defence Minister, Margarita Robles, and the new US Ambassador to Spain, Julissa Reynoso.

The recently appointed Director General for Armament and Materiel, Vice Admiral Aniceto Rosique, signed the document that officially transferred ownership of the new aircraft to the Helicopter Depot & Maintenance Centre (PCMHEL) of the Army's Lo-

gistic Support Command, represented at the ceremony by its chief commander, Lieutenant General Fernando García y García de las Hijas.

The delivery to the FAMET of the first refurbished *CH-47* marks the end of an initial process that began on 7 August 2018. That was the date on which the Spanish Council of Ministers authorised the modernisation of the entire *Chinook* fleet for an initial multiannual expenditure ceiling of €820 million, which could rise to €1,054.9 million with additional contracts.

At the same time, a process has been launched that is expected to culminate in the second half of 2024, with the delivery of the last of the 17 aircraft that will make up the *CH-47F* fleet.

One after another, they will roll off the Boeing Rotorcraft Systems assembly line in Philadelphia, Pennsylvania. With their new capabilities, these helicopters will form an even more powerful air branch of the Army.

Since 1973, the *CH-47* has been the Army's main workhorse for transporting troops and cargo by air. The upgrade of the twin-engine heavy-lift helicopter to the Foxtro configuration has been one of the FAMET's priorities. Its refurbishment has been carried out to meet the standard that is being used in the US Army, six other NATO countries (Canada, Greece, Italy, the Netherlands, Turkey and the United Kingdom) and a dozen other nations around the world, facilitating interoperability in overseas operations with



The on-board equipment is digital and the two pilots have five screens that provide them with the data and information necessary to control the flight.

allies or friendly nations that also have *Chinooks*.

UNTIL MID CENTURY

The head of the modernisation programme at the Directorate General for Armament and Material (DGAM) is Colonel Santiago Álvarez Herrero. As a helicopter pilot with around 1,500 flying hours, most of them in the *CH-47D* (Delta), and a helicopter maintenance officer, he has in-depth knowledge of the tactical performance and the inner mechanical workings of the aircraft. In his opinion, the Fox-trot version is “a great technological leap forward for the FAMET, which will gain enhanced capabilities”. With regard to the extended operational life that the renovation entails, Colonel Álvarez Herrero considers that the helicopters will remain in service “until beyond 2040 and, quite possibly, even 2050”.

The modernisation process is expected to take about 24 months. This period includes the manufacture of the chassis, the assembly of the on-board equipment and the *Honeywell T55-GA-714A* engines with a digital control system and dynamic components being sent from Spain — blades, transmissions and rotor heads — as well as

the disassembly of the aircraft and its preparation for transport by sea to Spain.

After leaving the factory, being flight tested and accepted by the US Army on behalf of the DGAM through the FMS cooperation system, the first refurbished Fox-trot was disassembled, prepared for transport and embarked in Baltimore, from where it departed in early November on a ship contracted by DSV, the logistics operator of the Ministry of Defence. It arrived in Santander on 28 November and, the following day, left by road in a special convoy for the main FAMET base, where it was assembled and put back into flight, a process which, with the corresponding checks, took several weeks.

TECHNOLOGY MADE IN SPAIN

Colonel Álvarez Herrero points out that the fleet overhaul involves introducing technologies that make it the same as that of the United States “except in several critical arrays in which it differentiates substantially”, namely the rotor brake, the FRIES (Fast Rope Insertion & Extraction System), the *PR4G* communications equipment and, especially, the electronic warfare system.

All four are “unique FAMET demands” but, while the first two are installed on the Boeing production line, the other two will be integrated on board once the aircraft are in Spain, which will bring them up to the standard already in place in Spain’s *NH90* tactical transport and *Tiger* attack helicopter fleet. At the US factory, the helicopters are being prepared to accommodate the national equipment that will be installed at the main base in Colmenar Viejo, “work which, for the fleet as a whole, will continue throughout 2025”, indicates the programme head.

The most advanced of all this equipment is the electronic warfare system, which formed the basis of a €35 million contract awarded to the Spanish company Indra. This contract is for the development, production and installation of a system that should “detect and counter threats to ensure the *CH-47F*’s survivability in combat missions and high-risk situations”.

Indra’s electronic defence system has already been fitted on *NH-90* and *Tiger* aircraft. It consists of the *ALR-400FD* radar alerter, the InWarner laser and anti-missile warning sensor and the *InShield* countermeasures system, which uses chaff and flare dispensers to protect the aircraft during take-off, landing and low-altitude flights. *InShield* also uses laser beams that scramble the infrared guidance system of in-flight missiles to divert them.

The radio communications component is another Spanish improvement to be incorporated. It includes satellite links and an advanced Thales *PR4G* radio in UHF and frequency hopping mode, equipped with NATO’s SA-TURN anti-jamming mode.

OPERATING FROM SHIPS

The fast-rope insertion & extraction system (FRIES) is a method to rapidly deploy troops on the ground from a hovering helicopter. It consists of a rope equipped with a safety system that allows soldiers to drop from the rear ramp of the aircraft.

The rotor brake located on the combination transmission is installed on all Spanish *Chinooks* to enable them to operate on ships. The reason for this

Fleet renewal will be completed in the second half of 2024 when the last of the 17 CH-47Fs is delivered

is that, once the engines have stopped, the high inertia of the 15-metre-long blades causes them to continue rotating for a long time, which limits movement on board ships.

Indra also took on the upgrading of the simulation system implemented at the Spanish Army's Aviation Academy (ACAVIET) in Colmenar Viejo. This is a full motion system with a fixed trainer and a set of computer-based lessons (CBITS) to train pilots and mechanics of the Delta version. It is now being adapted to the Foxtrot model as a result of a €30-million contract signed in January 2021. In this way, the FAMET reduces actual flying hours by 30%.

A third contract that has not yet been formalised, but which the Spanish technology company is expected to take on from the beginning of 2023, consists of equipping the Chinooks with an Automated Mission Planning System (AMPS), which will involve adapting what has already been developed for the NH-90 and Tiger.

DELIVERY IN THREE YEARS

It is expected that the fleet renewal process will be completed by the end

of 2024. By that time, the Boeing Helicopters factory will have finished manufacturing the 17 aircraft and flight tested them, while the US Army will have received them in the US on behalf of the DGAM.

The helicopters will then be transported to Spain and handed over to the Spanish Army. At the end of this transition, the FAMET will have 17 CH47Fs and four CH-47Ds in operation and ready to be deployed on missions until the final Delta quartet is gradually withdrawn from service.

"The plan is for four more Foxtrots to arrive this year, another seven in 2023 and the final five in 2024, the last of them flying in Spain by August of that year", Colonel Álvarez Herrero states.

However, it is possible that the delivery schedule could be delayed due to any COVID-19 restrictions that might continue, Boeing staff may be impacted, cargo container availability problems could persist, and shipping lines could see freight rates constrained.

The CH-47F is a modular construction aircraft with a front cabin, cargo cabin, rear fuselage and rear pylon, where the rear rotor is attached. It

features numerous structural improvements and is largely manufactured with composite materials and reinforced with corrosion protection treatment, giving it a useful life of around 10,000 flying hours, resulting in less effort and reduced sustainment costs.

Its on-board equipment is fully digital and its two pilots have five colour displays that provide them with the data and information necessary for flight control and mission accomplishment.

Navigation aids include inertial GPS, radio navigation system (VOR), precise landing assistance (ILS), a flight data recorder and a Digital Advanced Flight Control System (DA-FCS) that provides essential assistance to the crew in controlling the helicopter in all flight conditions.

It is equipped as standard with Collins Aerospace's Common Avionics Architecture System (CAAS), which integrates communication, navigation and mission subsystems through its flexible Flight2™ system. It also incorporates the Improved Vibration Control System (IVCS).

Juan Pons
Photos: Pepe Díaz

A sexagenarian on the front line

THE *Chinook* is the US Army's primary heavy-lift helicopter. Its design dates back to 1957 and its maiden flight took place in 1961. Throughout its operational life, it has proven its reliability and capabilities in every theatre in which the US Armed Forces have fought, from Vietnam to Afghanistan.

The Spanish Army began using it in 1973. All Spanish *Chinooks* are assigned to the 5th Transport Helicopter Battalion (BHELTRA V) at the main FAMET base in Colmenar Viejo (Madrid). The aircraft can accommodate 33 seated and secured passengers, 24 stretchers



or up to 10 tonnes of cargo. With a cruising speed of 140 knots (252 km/h) and a range of 630 kilometres without refuelling, it can take off from its Madrid base and reach any point on the Iberian Peninsula.

Spain sent three CH-47Ds to the mission in Afghanistan (pictured here at the Herat base). Subsequently, three more aircraft were sent to Iraq, where for two and a half years, until

January 2021, they flew a total of more than 2,100 hours and carried tens of thousands of soldiers and over 1,000 tonnes of cargo for the international coalition against *Daesh*.