Hughes AH-64, the Advanced Attack Helicopter

Many military authorities believe that the helicopter cannot survive in the thick of a modern battle, or even on the edge of the battle area. The US Army has as much experience as any of the vulnerability of the helicopter to bullets and missiles, but it is trying hard to produce a helicopter which can play an effective part in a hot war in combination with other arms. Advanced Attack Helicopter is its name, and it is now taking shape as the Hughes AH-64.

The primary purpose of the AH-64 is to knock out tanks, but it also carries the new Hughes 30mm Chain Gun and rockets so that it can defend itself by suppressing small or soft targets without expending costly missiles. It can take an amazing amount of punishment and can operate at night or in poor visibility in any part of the world to which the USA might have to commit troops. AH-64 is now one of the US Army's highest priorities, with 536 examples due to be completed between December 1982 and March 1989.

Thus, while the British Army makes a virtue out of poverty and declines either to develop a thick-skinned night-capable helicopter or to hazard its missile-armed utility helicopters in "hot" combat, the US Army is going all the way to get as much aggression and as much survivability as possible at a high but controlled cost.

Tactically, the AH-64 is certainly not intended to fly into the front line and shoot it out at short range with tanks and infantry. The name of the game is fieldcraft, and only in nap-of-the-earth flying can the helicopter now find safety. In addition, the AH-64 must be considered as one component of a mixed force including artillery and supporting aircraft. The AH-64 will always attack from maximum range, and the combined force will always concentrate first on knocking out the most critical targets: the ZSU-23/4 radar-directed anti-aircraft guns which will be found from 500m to 1,500m behind the spearhead of an enemy advance. Fast developing as a second lethal threat is the heavily armed Hind D, which is apparently intended to suppress anti-tank helicopters.

Prime weapon for the AH-64 is the Rockwell Hellfire, a modular, supersonic, laser-seeking anti-tank weapon with a range up to 6,000m, greater than that of the 25mm anti-aircraft gun. Once a crew gets going in battle, says the US Army, it will not want to stop to reload. AH-64 will thus carry 16 Hellfires on four pylons. The missile will home on a laser designation projected from the launch helicopter, from a co-operating helicopter or aircraft, or by a man on the ground.

Hellfire can be launched unguided from behind a hill, picking up a laser designation on the other side. Targets can be coded so that all 16 Hellfires can be launched in salvo to home on individual targets. Hellfire is supersonic, so its time of flight and therefore the exposure time of the launcher are minimal. It has an active seeking head and requires only a steady target illumination for guidance. Hellfire has 50 per cent more range than Tow and can be launched more quickly over a wider arc.

Secondary armament for the AH-64 is the Hughes XM-230E1 Chain Gun, a 30mm cannon in which rounds are extracted from the storage drum in the centre fuselage, passed forward and down through ducts to the gun, and loaded by external electric power rather than the traditional recoil action. Honeywell is developing a new range of 30mm high-explosive, shaped-charge armour-piercing and practice rounds which will be interoperable with the French Defa and British Aden ammunition. A new range of 2-75in rockets with explosive, marker or chaff heads is being developed. AH-64 will also be able to carry long-range fuel tanks on its four pylons.

If Hellfire and the Chain Gun are AH-64's teeth, the aiming and vision systems are its jaws. The Target Acquisition and Designation System (TADS) contains in a chin-mounted turret an optical telescope, a forward-looking infra-red (FLIR), a high-definition television, a laser designator and ranger, and a laser and television tracker. The turret can look 120° to either side and 60° down or 30° up, controlled either by the co-pilot/gunner's sighting fixture or by either crewman's helmet-mounted sight.

Targets for Hellfire can thus be sought out and marked by laser, or the gun aimed in any light level from daylight through dust and smoke to darkness without starlight. The sight is of course stabilised for operation over long ranges, and targets can be tracked automatically. The laser designator can mark a target for other AH-64s or for Copperhead guided artillery shells. The laser tracker can seek out targets being designated by other aircraft or ground units.

Countermeasures are an essential element of AH-64 tactics. An AN/APR-59 radar warning and detection system will allow the crew to detect and locate enemy anti-aircraft radars. Chaff and IR decoys will help to mislead hostile missiles, and the "black-hole" exhaust cooler will much reduce the AH-64's IR signature. For navigation and automatic hovering the AH-64 carries a Singer self-contained Doppler navigator which can be updated using laser range and bearing relative to a known point.

Independently mounted above the TADS is the Pilot's