

By Hal Andrews

HUP/H-25 Retriever

When the first helicopters joined the Navy during WW II—with the Coast Guard operating as part of the Navy—aviation personnel had different mindsets. One group saw no future for helicopters, citing the limited capabilities of the pioneer rotary wing aircraft. Another group believed there was no limit to what helicopters could do, and set out to prove that they could be more effective than airplanes or surface vehicles in many rescue situations. A third Navy group took a more balanced view.

In early 1943, a Navy Commander in Chief directive addressing ship-based antisubmarine warfare (ASW) operations initiated the third group's activities in helicopter developments. Later that year, the Coast Guard expressed interest in a helicopter with greater lifting capabilities than the current models. These led to various Navy Bureau of Aeronautics (BUAER)-conceived rotor research projects, and a late 1944 contract with the P-V Engineering Forum for developing and testing prototypes of the company's proposed tandem-rotor design, the XHRP-1. A larger twin-rotor, twin-engine prototype was also ordered from McDonnell Aircraft.

As the first XHRP prototype began flight testing in March 1945, the Chief of Naval Operations forwarded requirements to BUAER for a helicopter designed to meet Navy carrier-based rescue and utility needs. These included being able to take off from a small shipboard platform with three people on board for a 100-mile search or utility mission.

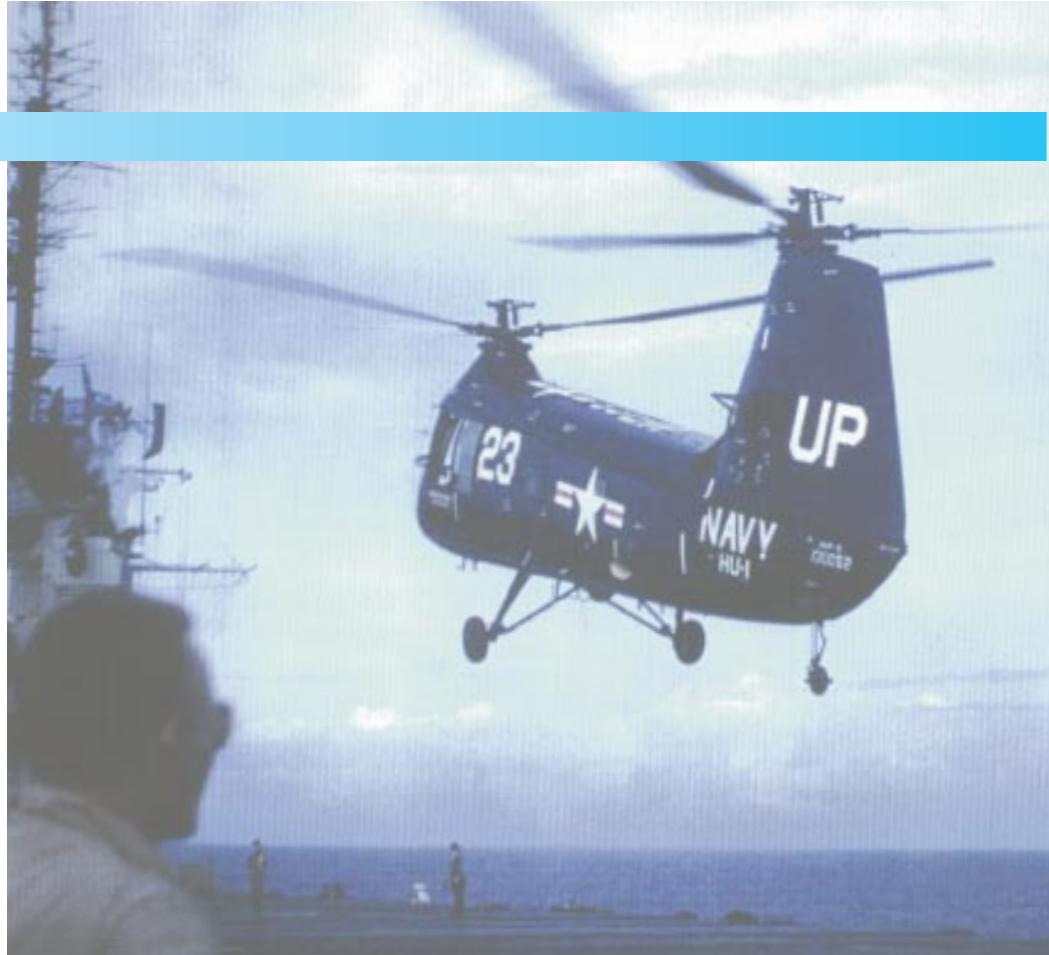
In late 1945, two companies were selected to each build two flyable prototypes and one for ground testing.

Sikorsky's XHJS-1 design followed its single main plus tail rotor pattern. P-V Engineering Forum, soon reorganized as Piasecki Helicopter Corporation (later Vertol and now Boeing), came up with a new tandem-rotor design for the XHJP-1, using large rotor overlap to decrease its length. The prototypes completed Navy trials and a competitive fly-off evaluation in 1948, and the XHJP-1 was selected for production as the HUP-1 (with the change in the Navy's utility designator to "U").

The HUP's Continental R-975 radial air-cooled engine was unique in Navy service. Frequently called the "tank engine," the R-975 traced its lineage to the Wright 420-hp R-975 used in F9C *Sparrowhawk* airship fighters in the early 1930s, which Continental converted to a fan-cooled engine for WW II Army tanks.

With an initial order for seven aircraft, the HUP-1 closely followed the XHJP-1's design with its large vertical fin pylon raising the rear rotor far enough above the front rotor for adequate tip clearance. The aircraft was all metal, except for wooden rotor blades and balloon fabric covering the nonstructural rear

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Above, an HU-1 HUP-2 hovers over the deck in preparation for landing. Opposite, student pilots learn the intricacies of flying the venerable HUP-2.

half of the pylon. The XHJP-1's small horizontal tail surfaces were replaced with larger ones with tip-mounted vertical fins for forward flight stability. Large intakes at the base of the pylon took in cooling air ducted forward to the engine, after which the air was ducted out a



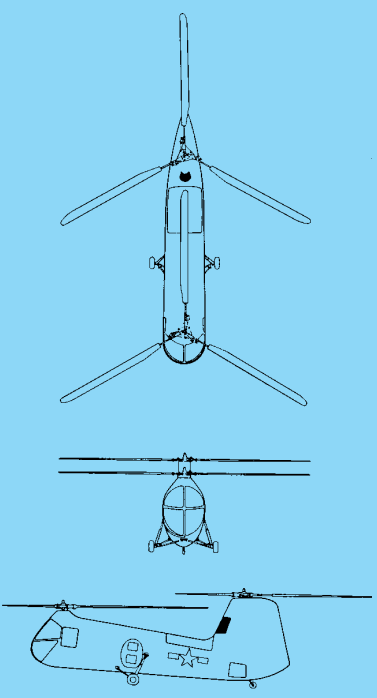
Above, XHJP-1; below, HUP-4



bottom fuselage exit.

While production got under way, Piasecki and Sperry were developing a helicopter autopilot using an XHJP-1. With the autopilot, and a separately developed dipping sonar, HUPs would be the Navy's interim antisubmarine warfare (ASW) helicopter. As the HUP-2, using an uprated 550-hp R-975 engine, the autopilot would provide stability in dipping hovers as well as in forward flight. The tail surfaces were then eliminated.

With delays in development of the ASW systems, production deliveries of HUPs, now named *Retrievers*, shifted to non-ASW HUP-2s in January 1952. Thirty-two HUP-1s had been delivered from late 1950 on, with Helicopter Utility Squadron 2 introducing HUP fleet operations after receiving its first aircraft in January 1951. Along with contracts for additional standard and ASW-equipped -2s, the Navy ordered 70



HUP-2

Rotor Diameter 35'
Fuselage Length 31'10"
Height 12'6"
Engine: Continental R-975-42	. 550 hp
Maximum Speed 96 kn
Maximum Range 340 nm
Service Ceiling 12,700'
Weight: Empty 4,121 lbs
Maximum Takeoff	.. 6,100 lbs
Crew Two
Passengers Three

rotor blades and upgraded R-975 engines. A final attempt was made to overcome power limitations by installing Wright 700-hp R-1300 engines in two HUP airframes as HUP-4s, though no further action followed flight testing.

The HUP's service continued through the 1950s, in single rescues as well as multiple aircraft rescue operations. HUPs were best known for plane guard duty with carriers, including the *Forrestal*-class attack carriers joining the fleet. Standard crew for these plane guard missions was one pilot (in the left seat) and one aircrewman to assist in rescues. A single HUP would maintain position off the carrier's starboard side at flight deck level during day VFR (visual flight rules) operations, often flying sideways to enable the pilot to watch the action.

With delays in their successor's development, 50 of the Army's H-25As were transferred to the Navy in the late 1950s, operating as HUP-3s interchangeably with HUP-2s. From 1961 on, operating numbers declined. In 1962, HUP-2s and -3s became UH-25Bs and Cs, respectively, in the Department of Defense redesignation. The Cs were essentially phased out in 1963, the remaining Bs following

by the end of August 1964. They had fulfilled the goals of their original designers in good measure.

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Below right, HUP-1. At the right forward end of the cabin was a unique feature of the HUP: a two-by-four-foot floor hatch opening downward through which an internal hydraulic hoist could pick up personnel and cargo, or load stretchers. The copilot's seat was folded up to enable use of the hatch.

H-25As for the Army in 1951, with the paper designation HUP-3. The Army would use these *Flying Mules* as troop and cargo helicopters, pending receipt of their larger Piasecki H-21s then being developed. Nineteen additional HUP-2s were added to Navy contracts to cover transfers to France and Canada.

Production deliveries continued through 1952 and 1953. Navy and Marine Corps air stations and reserve units began using them for search and rescue as well as utility, and for training at Helicopter Training Unit 1. The initial HUP-2 ASW versions were

delivered in late spring 1953, some going to Helicopter Antisubmarine Squadron 3, along with other units for evaluation. Here, as elsewhere, the HUP was found to be underpowered and the H-25s were stripped of ASW gear in 1954, flying as basic -2s for utility service.

Production deliveries concluded in 1954, totaling 336 HUPs. Changes were incorporated as experience was gained, including larger inlets for cooling air, metal

