HAI PREVIEW

Getting the rotary feeling
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ERHAPS there is no greater test of a
simulator than to see how the ab
initio pilot copes on it. When an
established fixed-wing pilot like myself, with built-in habits, is the ab initio pupil on a helicopter simulator, the test becomes a very subtle one.
I was invited to fly British Airways Helicopters' BV234 simulator at Aberdeen, to obtain a better under-standing of the rotary-wing pilot's envi-ronment. Because of the small degree of skill that I could acquire in Hhr, I antici-pate a response to my remarks from heli-copter pilots. But I was so impressed by what I saw that I will risk valid criticism of my absolute inexperience.
The Rediffusion simulator has six-axis motion, and the company has had to face the difficult task of providing the range of g-loading cues on which the helicopter pilot naturally relies down to quite low values. It does this with an uncanny level of realism, given the limitations of space which restrict the length of the hydraulic ram motion.

What is equally uncanny is the wide-angle infinity display equipment (Wide) SP1 visual system. I knew what to expect, having sampled the display at Farnborough last, but as I climbed into the captain's right-hand seat the realism of the side and back wrap-around had no less impact. I was actually on Runway 17 at Aberdeen—not just looking along it. Realism is backed up by keeping on full harness; no time for fixing shoulder straps in emergencies.

Steve Jowett, senior BV234 training captain, took me into the hover, with my fingers following through lightly on cyclic and collective. The tandem-rotor helicop-ter has two distinctive features that are quickly evident: the counter-rotation of the two rotors largely removes the need to oppose the yaw from power/lift changes using the foot pedals that, on other types, would control the tail rotor. The cyclic control is not cyclic at all in aircraft pitch, but operates by differential application of collective between the forward and rear rotors.

With the dual AFCS in, life is made rather easier. It was now my turn to imitate the demonstration of hover. I was told to hold cyclic about lm or 2in back from the neutral position, increase rotor r.p.m. by 2 per cent and lift the collective slowly. (In this machine rotor r.p.m. is "beeped" by a trigger on the collective handle).
As the collective torque showed about 35 per cent the nose started to lift. The cyclic position I had set is intended to establish the hover attitude of 4° nose-up. The forward rotor axis is 9° forward of vertical, and the rear 4.5°, so the aircraft does not go backwards in this attitude. The 234 was now hanging nose-up,

Fixed-wing air transport captain Harry Hopkins tries his hand as an ab initio helicopter pilot on British Airways helicopters' Chinook simulator.

wandering a little on the back wheels and
being juggled rather unsteadily with the
cyclic and pedals. A few more per cent saw
me airborne and suddenly working hard.
I had read somewhere that you should squeeze helicopter controls, not move them, and that little-and-frequent was the best technique. Hands-on education was proving the point. A rather drunken wallowing between the centre and left edge of the runway ensued as I pursued an elusive measure of lateral stability.
The corner of my eye caught forward movement. If it had not been for the wide visual view I might have been moving at ten knots before I noticed. I now eased back on the cyclic and waited for things to slow down again. Were we climbing? Should I lower the collective? The nose had risen to slow us but, as I rushed mentally through the effects of ground cushion with change of attitude, I let the back end touch the ground again. Score: machine one—fixed-wing pilot nil.

Another attempt at hovering brought

more reward. For brief periods the machine was steady over a spot, only to set off somewhere the moment that my confidence took my attention elsewhere. Steve Jowett took out one AFCS and I managed tolerably. So he took out the other one.

It was now very much like trying to keep a marble on top of an upturned saucer. What was worse, yaw control became very active. I heard some remark from my left that it was not a bad idea to jam the cyclic stick between the knees. Eventually, handling the cyclic like some-one trying to balance a pencil on end, I made my oscillations less sickening. I was told to set it down.

At 42,0001b, 6,5001b below MTOW, I was now to follow through on the take-off—from lift-off and hover, through tran-sition, to climb. From 15ft above the ground the nose was progressively lowered with the cyclic. As the discs tilted forward we accelerated accordingly. By 60kt, out of ground effect, the nose-down angle was

Rediffusion's
B V234 simulator
has a wide-angle
infinity display
(Wide) visual
system which gives
a very high degree
of realism. The
surface texture is
made up from 350
available surfaces
and 4,800 light
points. A wrap
around screen
allows both pilots to
see the same scene
and head movement
gives a real impres-
sion of parallax
between the cockpit
structure and the
scene

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