HAI PREVIEW

eased back to about 2° and the climb was stabilised at the optimum speed of 84kt. I repeated this demonstration. Hand-ling highlighted the visual impact of the ground under late dusk conditions (surface texture is made up from 350 avail-able surfaces and heightened by 4,800 light points). The runway swept away below and the horizon extended as we climbed in a much flatter attitude than that with which I am familiar. We turned left to follow the black-grey outline of the river Don.

The aerodynamics of helicopters are, in a word, complex. One rule is simple— know your target attitude. Much as the display of angle-of-attack is a boon to fixed-wing operation so, I learned, aircraft pitch is the prime helicopter datum. At 1,500ft I levelled, flying North, with cyclic forward for acceleration. At 120kt I adjusted the attitude to 2° (which always maintains constant airspeed) and eased down on the collective to avoid further climb. Then, slowly increasing speed to 140kt, vibration became quite definite.

In level flight it was all too easy to drift back into using the cyclic like the control column on a fixed-wing aircraft. As we returned to the circuit, I was unconciously reverting to aeroplane habits. Turbulence was then introduced—first at the lOkt, and then at the 20kt gust level. A tandem-rotor helicopter is quite a different beast from a single-rotor machine; the axes of the two 60ft discs are separated by some 40ft and the gust effect reacts over an interval. Pitching motion can be induced and the unpracticed hand finds it quite difficult to control.

Evening Excursions

The faithful reproduction of the pitch and roll on the visual scene, and the very real surges of the motion were dis-concertingly believable. I found that frequent little checks back toward datum attitude, but not too far from the datum cyclic position, were essential to avoid the attitude excursions that I first allowed to get to 10° or more.
Downwind, the AFCS was again taken out. Mercifully, the turbulence was now off. I reverted to pencil-balancing control. It all looked a lot better at 1,000ft, where the odd 50ft either way was not too obvi-ous. I turned toward base—no problem. I rolled out for a base leg—and it all went to pieces.

I had neatly demonstrated the ultimate sin—crossing the yaw pedal control with the cyclic roll control. If I had held things steady I suppose that I could have claimed that I was making a passable demonstra-tion of control with a yaw hard-over. As it was, my attempt at recovery was so awful, with the motion/picture in sympathy, that I took the world's best remedial action: "You have control".

Steve suggested that he should demon-strate the run-on landing, with the AFCS still out for his own practice. He steadied on the ILS, reducing to 80kt. From 200ft decision height the speed was bled off to about 60kt approaching the flare. By some

The simulator has six motion axes and gives a very good simulation of helicopter vibration

20ft the cyclic stick was coming well back, killing the speed and raising the nose in ground effect. This was where any fixed-wing comparison ceased, as the machine slowed in the air under the effect of now

BAH's B V234 simulator prepares the company's pilots for the real thing

steadily increasing collective. On touching down, the vibration from this "reverse thrust" was apparent, as it slowed the 234 with the nose still high in the air. Coming to a stop, the nose was allowed to sink with the final lowering of collective.
From 4 n.m. on finals I was to repeat the exercise, with AFCS restored. I found it more difficult to flare than I expected. Having flown widebodies for some years, I expected the flare attitude and cockpit height to seem second nature. Raising the nose to 15° at low speed and then keeping it there cast my mind back to days on the early jets, when there was a cult of making the most of "aerodynamic braking". But I ended up with a cross between a run-on and a hover, and another cardinal sin— pushing forward so that the back wheels came off again.

The visual was finally set up for a rig platform. Suddenly the structure flashed up on the Wide. It was disconcerting. Somehow the grey mass was surrealistic and forbidding, as it surrounded and towered above.

The lift-off into the hover brought the feeling of obstructions all about. I felt relief as we slid outward and forward to transition away from the structure. The demonstration of landing back on clearly showed the need for slow and careful movements from some way out. The demonstration of engine failure and abor-ting the approach was electric—we swung away to the side with full power on the remaining engine, then a further slight descent, and transition to the go-around.

The feeling of proximity to obstructions dominated my own attempt at lift-off. Once the hover was initiated I did not want to hang around. I pulled the collective so that I departed vertically alongside the rig tower (which at least meant that I could keep my eye on it). A voice alongside me muttered disap-provingly about the possible need for a quick landing back on, should there be an engine failure.
A take-off with engine failure was finally demonstrated, to show the result of slow reflexes. We slid down, turning away slowly. The cockpit looked well clear of the deck, so did the front rotor, but suddenly the motion froze with the eye level about 15ft below the landing pad. The fuselage was angled away, but the rear rotor was still close enough for its 30ft radius to clip the edge.

Frequent small adjustments in flight, and small movements near the landing area are needed—and never have your hand off the cyclic stick. I was beginning to get the message by the end of one and a half hours.

I was impressed with the facility in which British Airways Helicopters has invested for the crews of its six BV234s. This is part of a considerable helicopter training organisation which is contracted to numerous other operators, in the UK
and overseas. There is instruction for
pilots, engineers, and others, not only on
both the S-61N and BV234 simulators,
but also on the three other types operated
by the company. C

FLIGHT International, 7 January 1984 17