All-weather A-10 GRAHAM WARWICK reports from Farmingdale

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N January in Europe more than 60
per cent of the day is night. Poor
daylight visibility grounds close-
support aircraft for a further 20 per
cent of the day. But Soviet troops spend half their time on night manoeuvres. Their vehicles are well equipped with infra-red devices. Fair-child thus sees a need to expand A-10 operations into night and all but extreme weathers.

The US Air Force has no require-ment for an "enhanced A-10." So, using company and Defence Depart-ment independent research and de-velopment funds, Fairchild has built a two-seat Night/Adverse Weather A-10 evaluator. Early flight demon-stration was considered essential to provide a funding "wedge" in next year's budget, allowing deliveries to start early in 1983—when planned A-10 production ends.

Modification of a development A-10 began in April 1978 and took 13 months. Fairchild integrated the re-quired avionics, sensors and displays and installed a second seat for the weapon-system operator. The evalua-tor began five months of company flight-tests on May 4 this year. On October 1 the aircraft was returned to the Air Force, which will fly the evaluator until January.
Fairchild believes night/adverse weather close support requires a two-man crew; one to fly, the other to navigate, plan and acquire targets. To survive, the aircraft must fly low, making full use of terrain masking, at night and in poor visibility. Early in its studies the company decided that one man could not fly effectively in these conditions and handle navi-gation and target assessment.
The Air Force takes more convinc-ing and much of its test programme will concentrate on one-man operation of the evaluator's systems. Fairchild

argues that "not one round of ammunition or one pound of fuel" is sacrificed to make room for the second seat. The performance differ-ence is marginal, with a three-knot reduction in maximum speed and a six-mile decrease in combat radius. By using proven avionics, develop-ment is foreshortened and the cost kept down to $6-5 million a copy (flyaway cost in 1983-85 dollars, based on 200 aircraft).

Growth capability

The US Air Force A-10 system specification, laid down in December 1972, states that "the vehicle design shall allow for ease of growth to a two-place version for training (with combat capability), night/adverse weather attack , . ." So, when Fair-child leased an A-10 back from the Air Force for modification, the sur-gery required was not drastic. Also, on the evaluator, the sensors are podded so the structural changes are mainly concerned with the second seat.

Existing structure behind the cock-pit has been removed to accom-modate the aft seat. The decking above the ammunition drum has been strengthened to form the new cockpit floor. A sloping bulkhead with seat-support rails has been added. A new A-frame structure separates the two side-opening canopies, which come from the same mould. Fin height is increased 20in to compensate for the destabilising effect of the deeper front fuselage.
Aces II ejection seats are fitted, with the aft design eye ppsition lOin above and 64in behind the forward

Headin g Converted from a development A-10, the two seat Night/Adverse Weather evaluator
is a Fairchild private venture. Radar and forward-looking infra-red are the main sensors

datum. The evaluator has dual con-trols and the view over the nose is similar from both cockpits. Escape system actuation is a mixture of linear pyrotechnics and ballistic gas pressure. The former is an innova-tion on the A-10 and offers greater safety and reliability, is lighter and faster and is easier to install and maintain. Normal ejection sequences are forward initiation of dual ejection or aft initiation of self-ejection. These sequences can be reversed.

Front and rear cockpits have the same arrangement of flight controls. Pitch, roll and yaw circuits are com-mon, although the aft stick is four inches shorter. Flap and speed brake controls are fitted in both cockpits with control transfer via a takeover switch. Emergency extension of the undercarriage can be effected from the aft cockpit. The aft throttle quadrant is connected directly to the existing e.igine control cables and lacks idle and off stops.
A second environmental control system has been added to increase performance by 86 per cent. Both cockpits are unpressurised but cool-ing is required for the forward-look-ing infra-red sensor. The extra avionics and systems increase the electrical load by almost lOkVA and this is handled by two 30/40kVA generators. Adding the second seat displaces some avionics equipment which is relocated in the humped fairing behind the cockpits. Flight-test instrumentation is retained—one advantage of converting a develop-ment aircraft.

Fairchild defined the following avionics requirements: navigation, terrain avoidance, target detection, target classification, weapon delivery and display integration. The standard A-10 uses its manoeuvrability to avoid detection and prevent lock-on of