Northrop EGM: from B-1B to F-5E B ,lack boxes may lack the glamour of

supersonic fighters, but both are
big business for Northrop. Elec-
tronic countermeasures (ECM) Systems
Division sales total $220-$230 million.
Most are to the US Air Force, but about 10 per cent are US Government Foreign Military Sales (FMS) contracts. Prin-cipal current programmes are:
• ALQ-135: F-15 Eagle internal ECM suite
» ALQ-155:
system
tALQ-161:

B-52 power-management

radio-frequency sur-
countermeasures

(CW)

BIB
veillance/ electronic
(RFS/ECM) suite
• ALQ-162(V): continuous-wave
jammer
• ALQ-17KV): F-5 conformal counter-measures system
• Pod-mounted ALQ-171(V) for other
export applications
• Mirts infrared jammer for helicopters and fixed-wing aircraft
• "Black" (i.e. classified) projects for
what are coyly described as "special aircraft".

More than 700 ALQ-135 ECM systems for the F-15 have now been delivered, and an update is under development. This will add three extra avionics boxes, new antennas buried in the wing leading edge, and an additional blade aerial to the array under the forward fuselage. As a result the Eagle ECM suite will cover a greater frequency range and will incorporate additional countermeasures techniques.
The 3,000-plus ALT-28 multiband jam-ming transmitters delivered for use on B-52s are also being updated. The original system used during the 1960s and early 1970s was manually operated, relying on the operator switching and tuning the individual transmitters to cover threats he detected using elec-tronic-surveillance receivers.

Add-on modules

Each ALT-28 is being fitted with an add-on "doghouse" module on its front panel. This houses the set-on receivers required to turn the ALT-28 into a power-managed ECM system. Each ALT-28 contains two jamming trans-mitters, so the doghouse module houses two set-on receivers. A single ALQ-155 processing unit controls five ALT-28 sets, a total of ten jammers.
The surveillance/warning receiver of the ALQ-155 detects potential threat signals, then passes the data to an associated processor for evaluation. The processor then assigns jamming power to deal with the highest priority threats in the most effective manner. Northrop has delivered 300 ALQ-155 shipsets; 300 processors and 3,000 set-on receivers. Changes to the B-1 RFS/ECM suite since the 1977 cancellation include extra high-frequency coverage and expanded signal processing. The original system covered Bands 6 and 7, and Band 8 has been added to extend the jammer's high-

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Detailed information on electronic countermeasures

equipment is seldom released, but Northrop has lifted
the wraps from its F-5 Conformal Countermeasures
System. DOUG RICHARDSO N reports from the USA.

The Conformal Countermeasures System (CCS) fits around the underfuselage pylo of the F-5E, so that a store may still be carried in the ventral position

frequency coverage.
Three travelling-wave-tube (TWT)
power sources in each transmitter pack-
age can each be operated on a 50 per
cent duty cycle, effectively doubling
power output to 400W, over 200W in normal mode. A technique known as in-phase power stacking allows the output of individual jamming sources to be com-bined, and power levels of up to l-2kW (3 x 400W) can be obtained from each transmitter package.
Since the potential threats handled

by the new Band 8 equipment use narrow pulse lengths, the TWT in this part of the system operates on a 10 per cent duty cycle, offering a power output of up to 2kW.
B-1 jamming transmitters use phased-array antennas, which required the diffi-cult development of high-power coherent transmitters. Even antenna feed length must be accurately controlled if the correct phase relationships are to be maintained.

The new ALQ-162(V) is a compact

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