ELECTRONIC WARFARE

Electronic Attack (EA)

Active

- Jamming
- Deception
- Active Cancellation
- EMP

Passive

- Chaff
- Towed Decoys
- Radar Reflectors
- Stealth

Active EA

- Jamming: limit the effectiveness of enemy communications and detection systems
- Deception: convey misleading information or deny valid information the enemy
- Active Cancellation: theoretical system – involves sampling radar signal, analyzing, and returning out of phase.
- EMP: electromagnetic radiation from a nuclear explosion or an electromagnetic bomb producing intense magnetic fluctuations.

Passive EA

- Chaff: thin bits of aluminum or plastic
- Infrared Countermeasures: flares
- Towed Decoys: act as preferential targets
- Radar Reflectors: concentrate the energy sent back the radar
- Stealth: make less visible to radar/detection
  - Vehicle shape
  - Non-metallic airframe
  - Radar absorbing paint
  - Visibility
  - Infrared

Electronic Protection

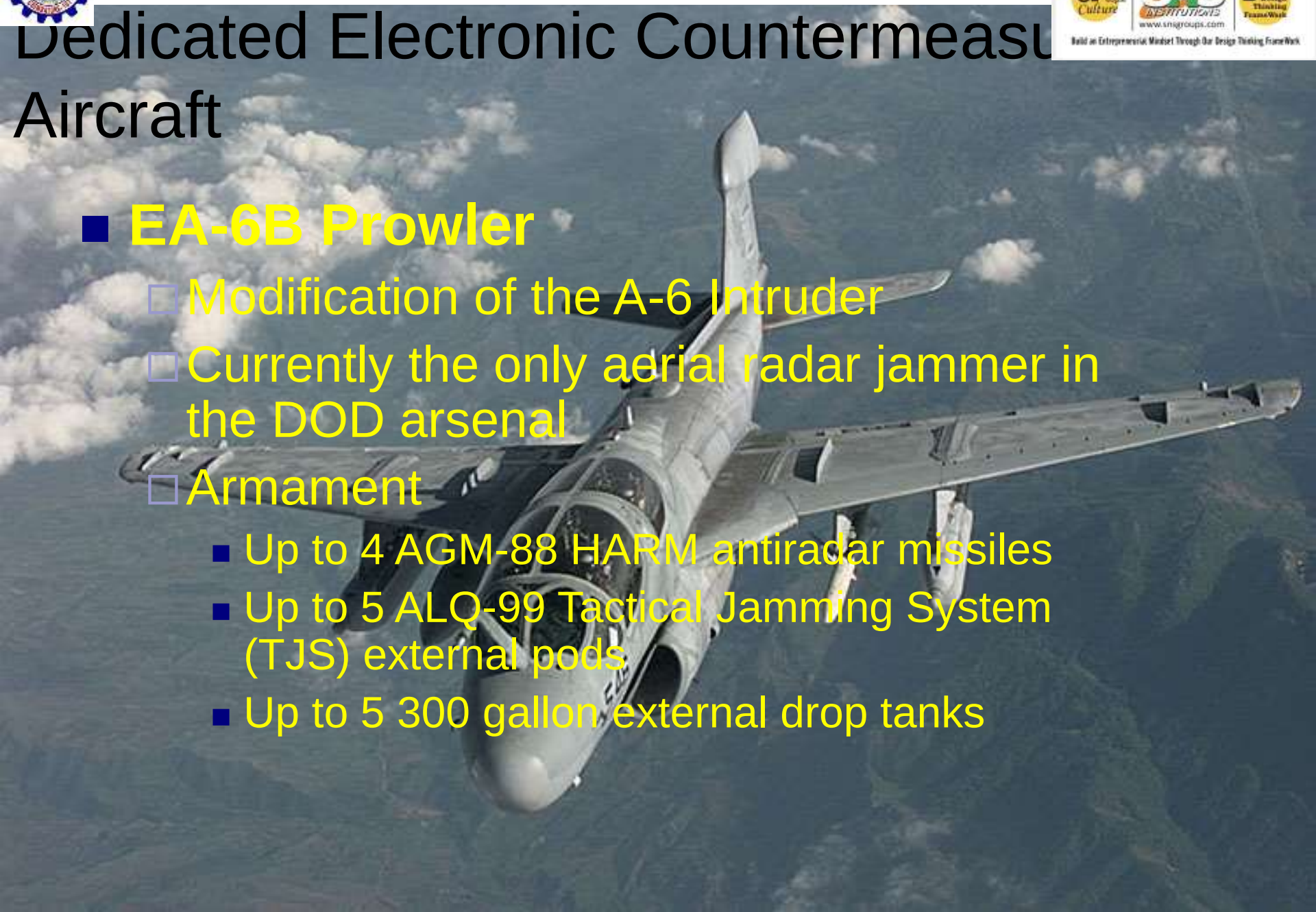
Active

- Technical modification to radio equipment

Passive

- Education of operators, enforcing strict discipline and modified battlefield tactics or operations.

Dedicated Electronic Countermeasu Aircraft



- **EA-6B Prowler**
  - Modification of the A-6 Intruder
  - Currently the only aerial radar jammer in the DOD arsenal
  - Armament
    - Up to 4 AGM-88 HARM antiradar missiles
    - Up to 5 ALQ-99 Tactical Jamming System (TJS) external pods
    - Up to 5 300 gallon external drop tanks

AN/ALQ-99

- Airborne integrated jamming system designed by EDO Corporation
- Intercepts, processes, and jams incoming radio transmissions
- Power
  - Maximum output: 6.8 kW
  - Power supplied through ram air turbine

Electronic Support (ES)

- Also referred to as Electronic Support Measures (ESM)
  - Search for, intercept, identify, and locate sources of radiated electromagnetic energy for the purpose of immediate threat recognition

3 groups

- Signals Intelligence (SIGINT)
- Communications Intelligence (COMINT)
- Electronics Intelligence (ELINT)

Signals Intelligence (SIGINT)

- Collection and analyzing of information from radar – and radio signals
  - Aircraft utilized to get intelligence about other nations military
  - SR-71, EP-3 (VQ Squadrons), U-2
    - Classified information

Communications Intelligence (COMINT)

- Listening into, analyzing and decoding of military radio-traffic, teletype and fax signals

Electronic Intelligence (ELINT)

- Collection and analyzing of radar, IFF, datalink, and missile firing signals.
  - Raytheon AN/APX – 100(V), IFF
  - Radar Warning Receivers (RWR)
    - Raytheon AN/ALR – 69(V)

Identification, Friend, or Foe (IFF)

- Facilitates rapid engagement of enemy aircraft, conserves air defense assets, and reduces risk to friendly aircraft.
  - Pilot enters code in which others can identify as friendly, enemy, neutral.

AN/APX -100(V)

General Description	
Primary Input Voltage:	18 to 30 Vdc
Input Power:	30 watts, nominal
Transmitter Frequency:	1090 ±0.5 MHz
Receiver Frequency:	1030 ±0.5 MHz
Peak Power Output:	500 watts ±3 dB under all conditions
Transmit Duty Cycle:	1% maximum
Receiver Bandwidth:	7 MHz, 6 dB down 22 MHz, ±90 dB down
Sensitivity (MTL):	-77 dBm (each channel)
Dynamic Range:	55 dB minimum
Reliability:	2,000 hour MTBF per MIL-STD-781
Dimensions (H × W × D):	5.375 × 5.375 × 8.375 inches (13.65 cm × 13.65 cm × 21.27 cm)
Weight:	10.0 pounds (4.5 kilograms)
Electromagnetic Compatibility:	U.S. DoD MIL-STD-461
Temperature Range:	Remote -54 to +95°C Class II (Panel -45 to +71°C Class II)
Equipment Specification:	U.S. DoD MIL-R-81876
Control Panel Dimensions (H × W × D):	3.64 × 5.75 × 5.25 inches (9.24 cm × 14.61 cm × 13.34 cm)

Data Link 16

- Military inter-computer that allows aircraft, ships, and army units to exchange their tactical picture in real time.
- Secure, high speed.
- New Terminal =MIDS FDL

Volume(ft^3)	0.45
Size (in)	13.5L x 7.2W x 7.62H
Weight (lb)	50
Input Power	115V, 3 Phase 400Hz
I/O Interface	IEEE 802.3 Ethernet
Cooling	Platform Supplied
TACAN	Internal
COST	$532K

Radar Warning Receiver (RWR)

- System shall detect, identify process and display AI, SAM, AAA weapon systems.
- Should provide situation awareness, threat identification and integrated diagnostics.
- Should provide the crew with the emitter mode and threat angle-of-arrival (AOA) information

AN/ALR – 69A(V)

Weight	42 lbs
Cost	$12.5K

- **Currently in C-130**
- **Antenna located under belly of Aircraft**
- **4 boxes located at each of the four quadrants of aircraft**
- **1 control unit**