

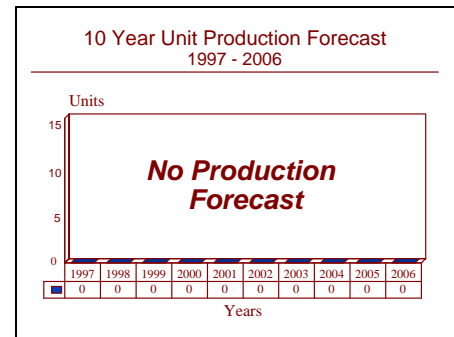
ARCHIVED REPORT

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ALQ-155(V) - Archived 3/98

Outlook

- In service; on-going logistics support
- Spare parts/repair sustained while B-52s remain operational
- No replacement planned



Orientation

Description. Airborne jammer power management system.

Sponsor

US Air Force
AF Systems Command
Aeronautical Systems Center
ASC/PAM
Wright Patterson AFB, Ohio (OH) 45433-6503
USA
Tel: +1 513 255 3767

Contractors

Northrop Grumman Corp
Electronic Systems Division
600 Hicks Rd
Rolling Meadows, Illinois (IL) 60008-1098
USA
Tel: +1 708 269 9600
Fax: +1 708 870 5713

Status. In service, ongoing logistics support.

Total Produced. Approximately 300 units were produced. There are 94 B-52Hs and 14 MC-130Es in service and carrying the system.

Application. B-52H, MC-130E.

Price Range. The estimated cost is US\$370,000 each.

Technical Data

| | | |
|----------------------|----------|--------|
| Dimensions | Metric | US |
| Weight per aircraft: | 296.5 kg | 653 lb |
| Characteristics | | |
| LRUs per aircraft: | 21 | |
| Antennas: | 12 | |
| Coverage: | 360° | |

Design Features. The ALQ-155(V) provides enhanced protection of the B-52 by improving the ability of the defensive avionics system to automatically jam radar signals. The main components are the set-on transmitter/receiver, the signal processor, the liquid cooler (dual heat exchanger), and the control indicator programmer.

Antennas for the system are located on the underside of the B-52 fuselage, just aft of the cockpit. There are separate antennas for the lower and upper portions of the frequency band. Because each transmitter comes with its own integral receiver, accurate setting of the jammer frequency is possible. This insures a better effective radiated power density.

The ALQ-155(V) features automatic frequency control in all modes and ECM techniques, field programmable computer-managed and software-controlled ECM, and automatic signal hand-off from the ALR-46 radar warning receiver as well as optimum jammer response. The system has a hybrid receiver and central receiver, programmable noise optimization, and higher power than earlier systems. It is compatible with an electronically steerable antenna.

The B-52H carries one ALQ-155 per aircraft. The MC-130E carries four ALQ-155/ALT-28s.

Operational Characteristics. The ALQ-155(V) maintains surveillance, warns the countermeasures operator of a threat, and automatically passes these data to

a processor. The processor assigns jamming power to counter the highest priority threat automatically. The ALQ-155(V) can control at least five ALT-28s, or 10 jamming units. The system maintains automatic frequency control in all operational modes and for a wide variety of ECM techniques. The system can be operated automatically, semiautomatically, or manually. It has a twelve transmitter upload capability.

B-52 Defensive Avionics. The B-52 carries one of the most powerful countermeasures suites of any aircraft. During Red Flag exercises, the bomber consistently showed that it could readily disable an extensive ground threat system with ease. It consists of:

- ALQ-172(V)2 active countermeasures set, including a steerable antenna system, two per aircraft.
- ALQ-155 jammer power management system.
- ALT-28 CW jammer, eight per aircraft.
- ALT-32 noise barrage jammer, one low band, two high band systems per aircraft.
- ALT-16 jammer, two per aircraft.
- ALR-20A radar warning receiver.
- ALR-46 digital warning receiver to analyze terminal threat data.
- ALQ-122 false target generator.
- ALE-20 flare dispenser.
- ALE-24 chaff dispenser
- ALQ-153 tail warning set, one per aircraft.

Variants/Upgrades

Upgrades have capitalized on developing technology to adapt the system to changing threats. They have included frequency agility, pulse repetition interval trackers, cover

pulse jamming, false target generation, coherent and non-coherent jamming, and downlink jamming.

Program Review

Background. The ALQ-155(V) developed out of the RIVET ACE ECM modification of B-52G/H aircraft in the early 1970s. Early ALT-28 noise jammers were controlled manually by an electronics warfare officer who, using his surveillance system, had to identify and evaluate a threat, then manually tune the jamming transmitter to the proper frequency.

Development of the ALQ-155 took approximately three and a half years, ending with flight demonstrations in January 1978. Northrop received its first ALQ-155 production contract in December 1977. The following month, Boeing was contracted to provide Group A kits to accommodate the ALQ-155 into the B-52G/H aircraft.

Approximately 14 ALQ-155(V)/ALT-28 systems were installed on MC-130E Special Operations Forces aircraft. The USAF is installing the ALQ-172(V)2 on MC-130H Combat Talon II aircraft.

On June 17, 1992, Secretary of the Air Force Donald B. Rice announced "*The Bomber Roadmap*," the plan for the manned bomber in the changed world threat climate. With the force being freed from the demands of nuclear deterrence, the Air Force would concentrate on conventional capabilities and the rapid response to regional threats.

The B-2 Stealth bomber became the main penetrating platform and was assigned the most demanding missions.

Low-level penetration will be a major tactic of the Stealth bomber as it makes direct attacks on targets in high-threat targets arenas. The B-1B would be used as either a penetration or standoff platform, adding mass and precision to composite strike packages. The B-1B would be assigned targets in low-to medium-threat arenas.

All B-52Gs have been retired, and an enhanced fleet of B-52Hs will launch standoff weapons or perform direct attacks on low-threat arenas. New weapons capabilities and modified avionics are adapting these aircraft for their totally conventional role. A long-term plan is to go to a fleet of 66 B-52H aircraft in the active inventory.

Funding

Funding is for Operations & Maintenance support.

Recent Contracts

No recent DoD contracts over US\$million recorded. Solicitations for on-going repair work and logistics support continue.

Timetable

| | | |
|-----|------|--|
| | 1975 | Initial contract to Northrop for the development of the ALQ-155(V) |
| Jan | 1979 | First production version delivered |
| | 1983 | Last of 300 ship sets delivered |
| | 1985 | ALQ-155(V)/ALT-28 integration on B-52G/H completed |
| | 1991 | B-52 combat operations in the Persian Gulf |
| Jun | 1992 | Bomber Roadmap released |
| | 1994 | Have Nap capability added, the last B-52Gs retired |
| | 1997 | Conventional weapons upgrades complete |

Worldwide Distribution

This is a US only program.

Forecast Rationale

Since the delivery of the last systems, ALQ-155(V) production has focused on spares and internal upgrades to the hardware. The B-52 is a proven performer in both test and training environments, so the Air Force has no plans for major upgrades or enhancements. Development and production money will be focused on upgrading the bombers' weapon systems and reliability/maintainability.

The B-52 is now a conventional rather than nuclear bomber. The B-1B and B-2 are now the primary penetrating bombers while the B-52H serves as a stand-off missile launcher and heavy/saturation bombing conventional missions. A mine-laying capability was added. The mission change will have some impact on extending the life of the bombers. This will combine with

budget constraints and discourage significant future upgrades to the B-52 ECM system. Avionics and aircraft upgrades are considered more cost-effective.

The current B-52 ECM suite, including the ALQ-155 (V), will probably remain in service for the life of the bombers that remain in the active inventory. Air Force structural modifications, according to reports, are being considered to extend the life of the B-52 until 2030-40. Although this plan is probably overly optimistic, there is little doubt that the old workhorse will remain in service well into the next century. The B-52s that remain in the fleet have spent most of their lives sitting on alert, and undergoing meticulous maintenance and frequent report maintenance. They are unusually low-hour airframes, considering their age.

Maintaining the remaining B-52 fleet into the next decade will insure that a spare parts and repair activity is needed as long as B-52s are operational and the ALQ-155(V) is used. The old war-horses are doing well, considering many of the airplanes are older than their pilots.

Ten-Year Outlook

No further production is planned.

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