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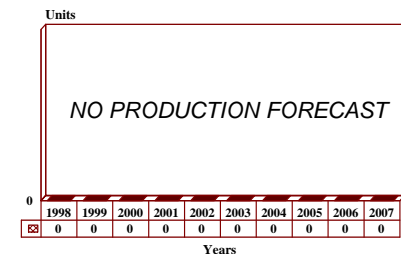
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ALQ-153(V) - Archived 5/99

Outlook

- The ALQ-153(V) is in service
- B-52 production complete, logistics support continues
- Market possibilities as part of upgraded jamming pod have dimmed

10 Year Unit Production Forecast
1998-2007



Orientation

Description. Airborne pulse-Doppler threat warning radar.

Sponsor

US Air Force
 Warner Robins Air Logistics Center
 Robins AFB, Georgia (GA) 31098
 USA
 Tel: +1 912 468 1001

Contractors

Northrop Grumman Corp
 Electronic Sensors & Systems Division
 P.O. Box 17319
 Baltimore, Maryland (MD) 21203-7319
 USA
 Tel: +1 410 765 1000
 Fax: +1 410 993 8771
 [Acquisition by Lockheed Martin pending/delayed]

Status. In service, ongoing logistics support.

Total Produced. A total of 321 systems were initially produced. An additional procurement of war readiness spares brought the total production to the equivalent of just under 500 units.

Application. B-52H.

Price Range. Estimated unit cost is US\$200,000.

Technical Data

	<u>Metric</u>	<u>US</u>
Dimensions		
Size		
RRT:	40.9 x 22.9 x 34.3 cm	16.1 x 9 x 13.5 in
ADSP:	45.7 x 25.4 x 16 cm	18 x 10 x 6.3 in
DDSP:	45.7 x 27.9 x 12.2 cm	18 x 11 x 4.8 in

	<u>Metric</u>	<u>US</u>
RFP:	66 x 20.3 x 15.2 cm	26 x 8 x 6 in
Antennas (2):	15.2 x 17.8 cm	6 (dia) x 7
Volume		
RRT:	0.2 m ³	0.8 ft ³
ADSP:	0.18 m ³	0.65 ft ³
DDSP:	0.15 m ³	0.55 ft ³
RFP:	0.2 m ³	0.72 ft ³
Antennas (2):	0.03 m ³	0.1 ft ³
Weight		
RRT:	10.4 kg	22.8 lb
ADSP:	21.6 kg	47.5 lb
DDSP:	16.8 kg	37.0 lb
RFP:	31.8 kg	70 lb
Antennas (2):	1.6 kg x 2	3.5 lb

Characteristics

LRUs:	Radar Receiver Transmitter (RRT) Analog Data Signal Processor (ADSP) Digital Data Signal Processor (DDSP) RF Processor (RFP) Antennas (2)
Demonstrated MTBF:	+200 hrs
Probability of detection:	100% in >600 missile firings

Design Features. Packaged as a compact pulse-Doppler system, the ALQ-153(V) is a highly reliable tail warning system that covers the entire spectrum of land-, sea-, and air-launched radar-guided anti-aircraft missiles. The system's modular design incorporates digital processing, frequency agile waveform, low-backlobe, non-scanning antenna and a solid state transmitter. There is one per aircraft.

Operational Characteristics. Located in a pod blister on the port tailplane of the B-52, the ALQ-153 uses a range-gated Doppler radar to provide detection and warning of air-to-air missile and aircraft threats approaching from the

rear. Once a threat is identified, tracked and assigned a priority, the ALQ-153 provides automatic management of expendable countermeasures (infrared flares and chaff) to decoy hostile missiles and aircraft.

The ALQ-153 chaff/decoy rejection capability has demonstrated a better than 99-percent probability of detecting threats at or beyond a specified range. The system requires a greatly reduced level of support compared to previous systems.

Variants/Upgrades

There are no specifically identified variants.

Program Review

Background. The ALQ-153 replaced the RCA ALQ-127 on B-52 aircraft. In 1976, The Air Force initiated competitive evaluation of the ALQ-153 Tail Warning Radar (TWR) against AIL's ALQ-154 system. Westinghouse and AIL began a flyoff competition for the new radar in 1975, with both firms receiving initial development pacts of about US\$2 million.

In December 1978, Westinghouse won a contract for the production and delivery of more than 300 systems over five years. The first two production lot deliveries began in April 1980. In late 1982, Westinghouse reported that the ALQ-153 had successfully completed its product reliability demonstration with a 200-hour Mean Time Between Failure, well above the 150 MTBF requirement.

In 1986, Westinghouse was awarded a US\$102,727,898 contract to supply LRUs (Line Replaceable Units) as spares and war reserve stocks for operational B-52s. Deliveries of these stocks were completed by February 1991. Quantities were as follows:

LRU QUANTITY

- RF receiver transmitter - 192
- Analog data signal processor - 159
- Digital data signal processor - 197

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 target 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.

B-52Gs have been retired, and an enhanced fleet of B-52Hs will launch standoff weapons or perform direct conventional weapons 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 maintain a fleet of 66 B-52H aircraft in the active inventory.

Missile Warning System Solicitation. On February 21, 1992, the Air Force announced that the Deputy for Reconnaissance and Electronic Warfare Systems (ASD/

RW) was seeking information from defense contractors on their ability to provide an off-the-shelf Missile Warning System (MWS) for integration with an ALQ-131 and/or ALQ-184 jamming pod for use on A-10 and/or F-111 aircraft. The Air Force said that it intended to study the feasibility of integrating an off-the-shelf MWS into a jamming pod. The proposed warning system would have to demonstrate its capability through US government sponsored/monitored tests. Proposed system costs and estimated cost per unit would be based on a production run of 200 systems. Respondents were not to include MWS-to-pod integration costs in per unit cost figures.

Contractor briefings were held at Wright Patterson AFB Ohio. In 1993, both ALQ-184 and ALQ-131 pods with built-in missile warning components included were exhibited at the Association of Old Crows EW symposium in Washington, DC.

Advanced Missile Warning System bidders' workshops were held at McDonnell Douglas Aerospace October 3-7, 1994, and at the Lockheed Fort Worth Company from October 25-28, 1994. The goal of the AMW program, as stated at the workshop, is to evolve existing system architectures into a system with a fit, function and interface that is transparently interchangeable across all USAF/USN platforms (aircraft/pods) identified in the Systems Requirements Document (SRD). One of the ideas floated was to include the ALQ-153 as a missile warning add-on to the ALQ-131 pod.

Flight tests of the ALQ-131 and ALQ-184 have been completed. Production is expected around the turn of the century. An estimated 200 missile warning pod installations are expected, primarily to support A-10 battlefield attack missions. The trend, though, is to use passive sensors for missile warning. There have been no indications of movement toward including the ALQ-153 on such a pod upgrade.

Funding

Current funding is from O&M accounts.

Recent Contracts

There are no recent contracts over US\$5 million listed.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1975	Development started
	1978	Westinghouse selected as prime contractor
	1980	First operational units delivered

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1985	Modification complete on B-52 fleet
	1989	Developed improved, smaller variant for missile warning
Feb	1991	War reserve stocks procurement completed
Jun	1992	Bomber Roadmap released
	1994	Have Nap capability added, the last B-52Gs retired
	1997	B-52 Conventional Weapons Upgrades complete

Worldwide Distribution

This is a US only program.

Forecast Rationale

The B-52 is now a conventional rather than nuclear bomber. The B-1B and B-2 are now the primary penetrating bombers. The B-52H serves as a stand-off missile launcher and heavy/saturation bomber. During the Persian Gulf War, the old bombers served well, dropping heavy loads of conventional bombs on Saddam Hussein's Republican Guards with devastating effect. In February 1998, 12 of the bombers were called back to Guam for possible missions against Iraq during Operation Desert Thunder.

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-172(V) is used.

The Air Force hopes that the latest series of upgrades to the old bombers will make it possible for them to remain in service through at least 2030, a very optimistic plan. But the old war-horses are doing well, considering many of the airplanes are older than their pilots.

The ALQ-153 is being evaluated as a future missile attack warning system (MAWS) for tactical fighters. Missile warning is a major emphasis item as the services try to provide additional self-protection from IR-guided missiles. This ongoing evaluation is indicative of the desire to get

an effective system installed on aircraft as soon as possible and with minimal developmental time and expense. Hundreds of Air Force, Navy and Marine Corps tactical aircraft could receive the selected system. At one point, the missile warning effort was stopped because of funding concerns, but it has been re-started.

Designers have said that with technology currently available, a much smaller variant can be designed. The company completed engineering work to modify the system for both forward and aft coverage capability. With minimum (less than 5 percent) hardware modifications and software changes, this capability is available for the ALQ-153 to meet combat requirements, and is packaged as a pod.

The improved and smaller ALQ-153 will still be an "active" system employing its Doppler radar, and as such will have to compete against "passive" systems such as the ALQ-199 and the ALQ-192, as well as variants of the AAR-47 and AAR-44, as well as the AAR-54. Low-observability concerns make a non-radiating threat warning system preferable to most planners.

The retirement of B-52Hs will reduce the need for ongoing support, although the remaining bombers will probably see operational life into the first decade of the 21st century. Maintaining the remaining B-52 fleet into the next decade will ensure that spare parts and repair activity is needed as long as the B-52 fleet is operational and the ALQ-153(V) is used.

Ten-Year Outlook

There are no announced plans for future production.

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