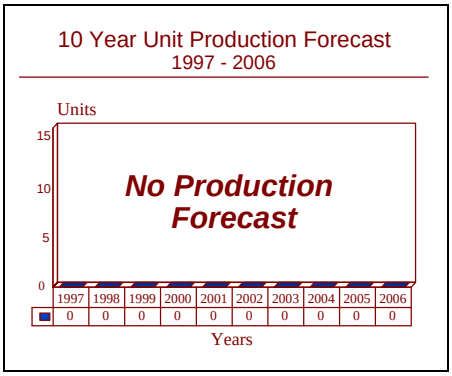
AXQ-14 - Archived 01/98

Outlook

- Production out to the mid-1990s to meet revised GBU inventory requirements
- Some modest export sales expected



Orientation

Description. Airborne missile data-link system for guided munitions delivery.

Sponsor
US Air Force
Development Test Center
Eglin AFB, Florida (FL) 32542-5434
USA
Tel: +1 904 882 3003

Contractors
Hughes Aircraft Corp
7200 Hughes Terrace
PO Box 80028
Los Angeles, California (CA) 90080-0028
USA
Tel: +1 310 568 7200
(Prime Development/Production)

Status. Production now complete.

Total Produced. Through 1996, approximately 3,952 weapon data links and 175 AXQ-14 data link pods were produced.

Application. Weapons data link used in conjunction with GBU-15(V)/B, flown on F-15 and F-111 aircraft.

Price Range. Unit price is estimated to be approximately US$30,000 based on a 1987 purchase.

Technical Data

Design Specifications. The AXQ-14 Weapon Control Data Link system is used as the communication tie between an aircraft carrying a GBU-15(V)/B glide bomb and the bomb itself. The AXQ-14 two-way data transmission system is part of the infrared thermal image homing head of the GBU-15(V)/B version bomb. (See report in *Ordnance & Munitions Forecast*.)

Hardware for the AXQ-14 Data Link system consists of an aerodynamically shaped Data Link Pod suspended from any standard stores station of the host aircraft. The interface between the Weapon Systems Officer (WSO) and the aircraft is provided by the control panel inside the cockpit.

Tailored to the individual requirements of each aircraft, the control panel accepts the standard configuration of an Aircraft Data Link Pod and a GBU-15(V)/B Weapon Data Link (WDL). The WDL is attached to the rear of the GBU-15(V)/B. It transmits the video signals from the weapon seeker to the control aircraft, and receives incoming commands from the aircraft and passes them to the weapon. The system transmits and receives in the D-band with reported jam-resistant capabilities.

Operational Characteristics. The AXQ-14 two-way data transmission system is pod-mounted and used in conjunction with the GBU-15(V)/B guided bomb. Carried under the aircraft's fuselage weapon station onboard both the F-4E and the F-111, the system weighs 182 kilograms (400 pounds) and is three meters (9.75 feet) in length.

It is approved for aircraft speeds of up to Mach 1+ and high-G flight maneuvers. During flight operations, the system receives TV images from the GBU-15(V)/B nose camera or infrared thermal image homing head, and transmits flight path correction signals to the glide bomb on its way to the target.

By utilizing the AXQ-14, attacking aircraft can release their bomb loads and veer away for escape or to commence another run at a different target. To confirm a successful mission, the AXQ-14 is equipped with a video recorder which can record target images taken by the homing head.

Extensive measures have been taken to protect the data transmission system, such as the use of various alternative frequencies for transmitting guidance signals and video images, autonomous target approach by the GBU-15(V)/B after acquisition, sharp focusing of the AXQ-14 phase antenna and various attack procedures, and profiles to reduce the flight/exposure time of the missile. However, the AXQ-14 is still susceptible to interference from hostile electronic countermeasures.

Variants/Upgrades

IDL. An Improved Data Link (IDL) was developed by the US Air Force as part of the Hard Target Munitions (PE#0604327F) program to provide enhanced resistance to hostile electronic countermeasures since the AXQ-14 is not jam-resistant. The IDL is designed to be interoperable with existing AXQ-14 equipped weapons.

The new data link was developed under a joint contract between the Harris Government Aerospace Systems Division and Magnavox Advanced Products and Systems Company. (The team worked out of Melbourne, Florida.) The contract was valued at approximately US$42 million. An option for the initial production award has been included in the contract.

Originally, Harris and Magnavox were to have competed against one another for all follow-on production awards, which could have exceeded 4,000 missile data links and 400 pod-mounted aircraft data links. The new data link enables the AGM-130 to attack, via remote control, heavily defended targets that require pinpoint accuracy when conventional flyover tactics are not possible. The system incorporates advanced anti-jam technology and video communications from the missile to the launch platform, as well as command and control signals. Development of Improved Data Link was completed in 1993.

The IDL is now nomenclatured as the ZSW-1, and consists of the aircraft-mounted Pod Data Terminal (PDT/RT-1624/ZSW-1), weapon-mounted Data Link Terminal (WDT/OA-9384/ZSW-1), and IDL peculiar support equipment.

Program Review

Background. The need for controlling a bomb after its release became apparent during the late 1960s in Southeast Asia. After the phenomenal success of the PAVEWAY laser-guided bombs, the USAF wanted to explore the prospects of using electro-optic and other technologies to guide bombs to various targets.

At that time, attack aircraft had two options when choosing a target: they could use relatively small guided missiles, or large unguided bombs. With the former, the missiles often hit the targets, but their small warheads caused little damage. They were also expensive. When large bombs in the 2,000 to 4,000-pound class were employed, they often missed their targets. The subsequent development of television-guided weapons combined the accuracy of the missiles with the destructive capabilities of the large bombs.

The GBU-15(V)/B glide bomb, or Modular Glide Weapon System, was first introduced in Southeast Asia in 1969. It weighs 907 kilograms (2,000 pounds) and has two warhead options: either an Mk 84 "iron" bomb or an SUU-53 dispenser. The Mk 84 is normally used against hardened targets, such as railways, bridges, and buildings. The SUU-54, containing 1,800 grapefruit-sized bomblets, is used against such targets as surface-to-air (SAM) sites.

The first GBU-15(V)/Bs were guided to their targets by way of a television camera mounted in the nose of the bomb. The pilot of the attacking aircraft had to first lock onto a target with the camera before releasing a bomb. This required the pilot to fly close enough to see the target, often exposing his aircraft to hostile surface-to-air weapons.

In the early 1970s, studies were begun to extend the range of the weapon and allow for stand-off weapon delivery capability. Use of a cruciform wing design considerably enhanced the range and maneuverability of the bomb. An important development, however, was the addition of the AXQ-14 Data Link to the glide bomb system.

The AXQ-14/GBU-15(V)/B combination has produced one of the most accurate weapon/guidance systems currently in the US inventory. In 1987, in the latest version of published follow-on test results, the GBU-15(V)/B scored 100-percent success against a variety of targets in differing conditions. According to the deputy director of the GBU-15 program, the GBU-15 has been 100-percent successful in every launch, a success rate he attributed directly to the AXQ-14 data link.

In June 1993, Rockwell signed a memorandum of understanding with Goldstar Corporation of South Korea covering marketing and potential co-production rights of the GBU-15 and AGM-130. Negotiations were to conclude nine months from the signing of the MoU, around March of 1994. No specific information has been provided concerning the potential number of AGM-130s Seoul may purchase, although the number could be considerable due to the rather large armored inventory possessed by the North Korea.

Today, following a shift of attention to the failed Tri-Service Stand-off Attack Missile (TSSAM) and the increasingly popular GBU-15 variant, the AGM-130, the program has lost most of its steam. The IDL will supersede the old data link on the AGM-130 as that missile system progresses.

Funding

No funding specific to the AXQ-14 available.

Recent Contracts

The last known contract award specifically for the AXQ-14 went to Hughes Aircraft Co; a US$16.5 million deal in September 1987 for 540 GBU-15(V)/B weapon data links and data (F08635-84-C-0123).

Timetable

	1972	GBU-15(V)/B concept initiated
	1973	GBU-15(V)/B development began
	1977	Testing begun on Data Link and Cruciform Wing Weapon (CWW) design; limited production begun on AXQ-14 data link
Sep	1980	Full-scale production of GBU-15(V)/B
Jan	1982	First production deliveries of GBU-15(V)/B
May	1982	First follow-on contract issued
Jul	1982	Integration of GBU-15(V)/B to Australian F-111 aircraft started
Mar	1987	Completion of Australian F-111 integration
	1990	Initial low rate AGM-130 production began
	1993	IDL development completed

Worldwide Distribution

The GBU-15(V) glide bomb is exclusively deployed by the **US Air Force**. Aircraft equipped with the AXQ-14 are the F-15 and F-111 series aircraft. In addition to the US Air Force, the AXQ-14 is employed by **Australia**, **Egypt**, and **Israel**.

Forecast Rationale

Despite the success of the GBU-15 and other laser-guided munitions used during the Gulf War, the budgetary pressures now facing the USAF and other services have taken their toll on remaining GBU-15 procurement. The war accelerated procurement to meet operational needs and to refill war stocks. This resulted in a total production of approximately 4,127 GBU-15(V)s and their accompanying AXQ-14 data links, through 1994.

However, with the introduction of the improved AGM-130, similar advances in data linking were mandatory. As a result, production of the non-jam-resistant AXQ-14 weapon data link is believed to have closed in late 1995. However, some export sales could extend the device's livelihood somewhat. For the most part, though, its role will be assumed by the Improved Data Link (IDL). A report on the new link, the ZSW-1, will likely replace this one in the next cycle.

Ten-Year Outlook

Production is believed to have ended; no further production is expected. This report will be dropped next year.

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