ARCHIVED REPORT

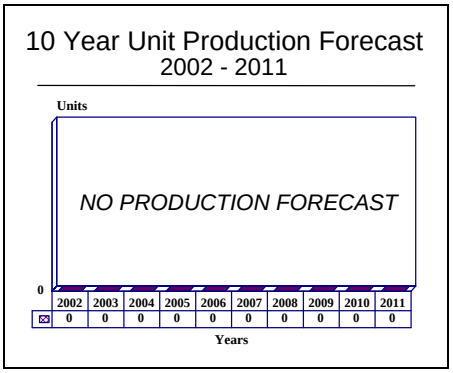
For data and forecasts on current programs please visit

www.forecastinternational.com or call +1 203.426.0800

TRN-26 TACAN - Archived 11/2003

Outlook

- No further production expected
- System still in operation around the world, thus ongoing spares and support work available
- This report will be archived in 2003 unless there is any new development within the market



Orientation

Description. Air traffic control (ATC) beacon transponder set.

Sponsor

US Air Force - Sacramento Air Logistics Center
5241 Arnold Avenue, Suite 3
McClellan AFB, California (CA) 95652-1089
USA

Contractors

Raytheon Co
Command, Control, Communications and Information Systems
1001 Boston Post Road
Marlborough, Massachusetts (MA) 01752
USA
Tel: +1 978 440 1687 (Military ATC)
Web site: http://www.raytheon.com

Status. In service with ongoing maintenance and support. No further production is expected.

Total Produced. An estimated 263 TRN-26 TACAN systems have been produced for global customers.

Application. The TRN-26 is a small, full-service, lightweight, highly mobile, tactical air navigation system.

Price Range. The unit price of a TRN-26 system was estimated at US$1.3 million (in FY92 dollars).

Technical Data

Design Features. The TRN-26 is a transportable air traffic control (ATC) beacon transponder set. The system has a range of at least 100 nautical miles, an azimuth accuracy of plus or minus one degree, and a range accuracy of plus or minus 125 feet. The system comes in single or dual configurations, with a remote control also available. Single, dual, and minimum system configurations are possible. The dual system uses two RT-959s and two ID-1661s instead of one of each.

The TRN-26 system's main components are as follows:

Radio Receiver-Transmitter, RT-959. The RT is a lightweight, low cube unit that has been designed to supply many continuous hours of unattended operation. The RT is unique, using first pulse timing, a logarithmic infrared (IF) amplifier, and a 6 dB down decoder, which ensures highly accurate interrogation signal processing. The transmitter's output of 400 watts, when coupled to the antenna, gives a nominal 1 kW effective radiated power (ERP). Any one of 126 TACAN channels is available.

Radio Frequency Monitor, ID-1661. This monitor has a dual function in which it also acts as a test set. It is a high-performance unit capable of very high accuracy, resolution, and stability. Sixteen parameters are continuously monitored and analyzed in detail. A fault memory is supplied to store data on failed or out-of-tolerance system parameters in order to reduce system mean time to repair (MTTR). In the dual system, parallel operation of the monitors supplies increased system on-air time. The test set operations of the monitor are able to provide a display of important parameters in digital and analog modes for alignment and checkout.

Control-Transfer Group, OK-141. This group supplies power distribution, automatic transfer and shutdown, control, and interconnection of all electronic elements. In the dual configuration, either transponder can serve as the primary. Also, test point facilities and local visual and aural features are provided. This unit is used only in the single and dual configurations.

Antenna, AS-2394. The small and lightweight antenna is a medium-gain, high-band antenna. It uses unique radio frequency (RF) geometry, thus compensating for its small size and giving it a performance that equals antennas with twice its aperture.

Alarm Indicator, BZ-187. The alarm indicator is a unit that provides remote status of the system while it is slaved to the control-transfer group. It functions through a single pair of field cables that can be up to three miles long. The unit shows any status change of the system, such as transfer or shutdown. Provisions to assure a fail-safe mode of operation are incorporated.

High-Power Receiver-Transmitter (HP R/T). E-Systems recognized the need for enlarged TACAN service volumes and thus created an improved High Power TACAN Receiver-Transmitter to replace the existing RT-959 and to provide the end user with higher service volume and performance.

The HP R/T is designed to satisfy the needs of tactical or fixed-base operations. It produces 4,000 watts of TACAN signal and improved receiver sensitivity (70 percent replies at -94 dBm), resulting in real mean range increases for the pilot. The unit's frequency utility is expanded by the availability of 126 X and Y mode channels developed by a frequency synthesizer and selectable on the R/T front panel. The need for channel selection and tuning is minimal. The HP R/T has an operational range in excess of 250 nautical miles with an azimuth accuracy of plus or minus one degree and a range accuracy of plus or minus 125 feet.

The TRN-26 system's modular design has been retained to facilitate retrofit installation of the HP R/T. The conversion of a standard TRN-26 to the improved high-power system can be carried out in a single day, and units do not need to be returned to the manufacturer for modification.

US Air Force TRN-26 TACAN Air Traffic Control beacon transponder set

TRN-26 TACAN

Source: US Air Force

Program Review

The TRN-26 has been the US standard for mobile tactical air navigation (TACAN) since the early 1970s. This TACAN system uses a building-block concept and is deployable and operable in assorted configurations ranging from a minimum system with no redundancy to a complete dual automatic station.

The TRN-26 system is designed to supply normal TACAN service, range, bearing, and identification in accordance with MIL-STD 291 requirements. It meets United States Air Force (USAF) flight inspection criteria as laid out in Air Force Manual 55-8. The TRN-26 is also compatible with International Civil Aviation Organization (ICAO) requirements.

NASA bought the first HP system for installation at White Sands, New Mexico, for use in the Space Shuttle program. In December 1992, two contracts were awarded to E-Systems, covering three TRN-26 systems (one for installation at White Sands, two as part of an FMS to Egypt) and spares.

The TRN-26 continues to be used throughout the world; however, the USAF, which acquired 40 systems in the past, declared the TRN-26 obsolete and has replaced the system. The only activity seen for this system is likely to be spares to keep it running until other users replace the system.

Funding

No funding has been identified.

Recent Contracts

No recent contracts over US$5 million have been identified.

Timetable

Year	Major Development
FY 1968	First contract award by US Air Force; development begun
FY 1973	Racal signs exclusive agreement to distribute TRN-26 in UK
FY 1979	Improved version introduction
FY 1983	High-power version introduction
FY 1986	Racal receives US$1.3 million contract to upgrade the Royal Air Force's TRN-26s
FY 1987	Contract for two low-power TRN-26s
FY 1988	Order for two TRN-26s for FMS requirement, delivered by Jan 1989
FY 1990	Production switch to (and continue at) low rate of production and spares support
FY 1997	US Air Force renders the TRN-26 obsolete

Worldwide Distribution

In addition to the **US** (40), the TRN-26 is in service in 30-40 countries. Known international customers include **South Africa**, **Egypt**, **Germany** (5), **Thailand** (18), the **UK Royal Air Force** (22), and unspecified countries along the Mediterranean and the Far East. It was reportedly also procured by NATO.

Forecast Rationale

The TRN-26 Tactical Air Navigation (TACAN) system is a transportable air traffic control (ATC) beacon transponder set. It was developed and instituted as the US TACAN standard early in the 1970s and was finally judged obsolete by the US Air Force in 1997. In addition to US procurement, the TRN-26 has been acquired and utilized by many other nations. Some of the known purchasers of this system include South Africa, Egypt, Germany, Thailand, and the UK. The system has enjoyed widespread popularity over its lifetime, but its increasing obsolescence portends a less than prosperous future. While the TRN-26 TACAN may still be in use in some nations, the system is quickly becoming antiquated. At this time, no further production of the system is foreseen.

Barring any unexpected activity, this report will be archived in 2003.

Ten-Year Outlook

The forecast chart has been omitted. Barring any sudden surge in activity, this report will be archived in November 2003.

* * *