

2010 TACAN

Technical Specification

System Configurations: Dual Transponder, dual Monitor, fixed or mobile.

Transmitter		
Frequency	962 MHz - 1213 MHz	
Frequency Stability	± 0.001%	
Channels	252 (X and Y)	
RF Pulse Spectrum, Spurious Outputs and Harmonics	To relevant international standards (STANAG 5034 Ed 3. MIL-STD 291C and ICAO Annex 10)	
Pulse Rise Time, Pulse Fall Time and Pulse Duration	To relevant international standards (STANAG 5034 Ed 3. MIL-STD 291C and ICAO Annex 10)	
Ident Rate	To relevant international standards (STANAG 5034 Ed 3. MIL-STD 291C and ICAO Annex 10)	
Pulse Pair Spacing	X channel - 12 µs ± 0.1 µs Y channel - 30 µs ± 0.1 µs	
Main Reference	X channel - 12 pairs of pulses at 30 µs ± 0.1 µs Y channel - 13 single pulses at 30 µs ± 0.1 µs	
Auxiliary Reference Pulse Group	X channel - 6 pairs of pulses at 24 µs ± 0.1 µs Y channel - 13 single pulses at 15 µs ± 0.1 µs	
Pulse Repetition Rate	Up to 5400 pulse pairs per second	
Equalising Pair	Transmitted 100 µs ± 10 µs after each identity pulse	
Pulse Coding Precedence	1) Main reference group 2) Auxiliary reference group 3) Identity signal 4) Distance replies 5) Random pulse pairs	
Distance Reply Signal	X Mode - 50 µs Y Mode - 56 µs	
Distance Accuracy	Typically ± 50 feet (±15 meters)	
Reply Delay Time Stability	Input Signal	Delay Signal
	0 to -10 dBm	± 0.5 µs
	-10 to -70 dBm	± 0.1 µs
	-70 to -91 dBm	± 0.8 µs
Peak Output Power	0 - 5 kW programmable	

General	
Status Indication	Full local and remote indication
System Monitoring (BITE)	Complete dual system monitoring by microprocessors
Remote/Local Control	Fully Windows compatible RMM system and optional separate remote and control panel, Local Diagnostics Unit, LDU
Antenna	The system is designed for <ul style="list-style-type: none"> E-Scan (Electronically modulated) - Fernau, Rantec or dB Systems M-Scan (Mechanical rotating)
Power Supply	AC - 115/230 VAC ± 10% 47/63 Hz with battery back up

Dimensions/Weight	
Dimensions	600 mm wide 600 mm deep 1930 mm high
Auxiliary Cabinet (Optional)	600 mm wide 600 mm deep 1350 mm high
Weight	215 kg

Environmental	
Temperature	Operating: -10°C to +50°C Storage: -30°C to +60°C
Humidity	0% to 95% RH over temperature range 20°C to 45°C (non condensing)
Altitude	0 - 3,000 metres above MSL

Reliability	
MTBO	>100,000 hrs (Field Data)
MTBF	>12,000 hours (MIL-HDBK-217F) (Theoretical)
MTTR	<10 minutes

EMC/RFI and Safety	
	Compliant with the R&TTE Directive 1999/5/EC
	Designed to meet the relevant Mil - Std 461/472 specifications

Receiver	
Frequency	1025 MHz to 1150 MHz (1 MHz channels Mil-Std 291C)
Sensitivity	-94 dBm for 70% reply efficiency typical



2010 TACAN



The Fernau 2010 is the Number One TACAN on the market today, outselling all other manufacturers Tacans put together. Customers value the superb reliability, the low cost of ownership, and the responsive support from the Fernau team.

The 2010 is now widely deployed through out the World with such prestigious customers as the US Air Force, NATO and key Airforces in Europe, Middle and Far East. Several Navies around the world also use the 2010.

The 2010 is now available in either single rack or dual rack versions. In the single rack version all the modules, including the antenna control unit, are conveniently housed in a compact 19-inch enclosure.

The Company reserves the right to change specifications without notice @ February 2008

State of the Art

Fernau's philosophy is to keep all our products at the leading edge of technology and the 2010 is no exception. Utilising DSP technology, hardware monitoring and soft-fail RF power amplifiers the 2010 is the most advanced TACAN beacon available today.

Pulse shape and spectrum are controlled by an agile digital feedback control loop, which keeps the TACAN within permissible limits in all operating conditions.

The 2010 TACAN fully complies with STANAG 5034, Mil-Std 291C and ICAO Annex 10 and is suitable for independent siting as well as co-location with all existing VOR and DVOR systems. The 2010 is unique in that it meets all the relevant European and US specifications, including environmental and EMC.

High Power

The 2010 is the most powerful TACAN available today. Variable power levels up to 5 kW are provided. Due to the high gain of the Fernau e-scan antenna the 2010 is capable of an operational range in excess of 300 nautical miles.



Mobile Tacan

Flexibility and Mobility

The 2010 can be supplied in single or dual transponder configurations in fixed and mobile /deployable versions. The mobile TACAN is completely compatible with road and C130 transportation platforms. The 2010 TACAN operates in TACAN, silent, demand and DME-only modes.

Reliability

Fernau's total commitment to equipment reliability and superior maintenance systems has resulted in the 2010 TACAN setting new standards in reliability. In-service MTBOs in excess of 100,000 hours are typical and because of this we can offer extended warranty packages for up to 15 years at minimal extra cost, giving the customer peace of mind and very low cost of ownership.

Remote Maintenance and Monitoring (RMM)

The 2010 TACAN has a powerful integrated monitoring and maintenance system which can be displayed on a local or remote PC or both. The RMM system's display screens show operating parameters, overall system status, LRU status, alarm limits, diagnostics and test, amplifier status, transmitter control status and other information. Fernau has tailored many systems around specific customer's operational requirements. The LRU status screen indicates which module is faulty, while the history logging facility allows maintenance engineers to judge the optimum time for repair. Each monitor checks that the system performs in accordance with ICAO Annex 10 and is able to change certain system parameters to allow in-depth analysis and testing of the TACAN from a remote location using the RMM system.

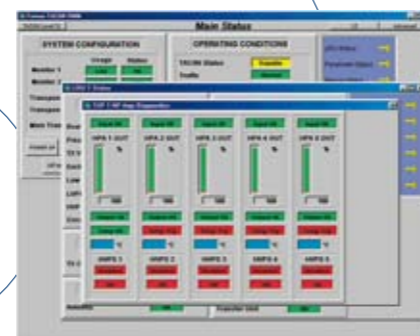
RMM Features

- ◆ Fully Windows compatible.
- ◆ Centralised RMM option.
- ◆ Up to 400 sites monitored from a central RMM station.
- ◆ User password protection.
- ◆ History logging for all sites.
- ◆ Full RMM diagnostics for each site.
- ◆ Dial-up/leased line
- ◆ LAN/ Satellite link/ Fibre optic connection option.

Remote Control

Full control of the TACAN can be performed from a remote location either by the RMM PC or the optional Remote Control and Status Indicator unit, RCSI. RMM system also provides for control of power, ident, presettable alarm limits, monitor test functions, routine tests and printouts. The TACAN is fully compatible with the USAF 2238 Remote Control system.

RMM Screens



Single Rack Variant

Maintenance

All Line Replaceable Units, LRUs, are plug-in and accessed from the front of the TACAN cabinet. By using the RMM or LDU system for fault indication, it only takes a few minutes to identify and replace a faulty module.

All LRUs have unique pin configurations to prevent a module being inserted incorrectly. The TACAN features a powerful BITE system which continually monitors the 2010 system and gives an alarm indication in the event of module failure, system transfer or shutdown, thus reducing site visits to an absolute minimum.

Where a site visit is required, the RMM system provides the fault location enabling rapid identification of the spares required. The equipment allows for "hot swap" of modules allowing equipment to remain operational while a module is being replaced.

Antenna

The 2010 system is capable of operating with most TACAN antennas. However for improved reliability and range, we recommend Fernau's own electronically scanned antenna which fully complies with all relevant international standards.

The Tacan antenna is designed to be mounted on our purpose designed GRP tower. However interface plates are available for mounting on lattice masts and other existing towers.

The antenna has an impressive track record of unparalleled reliability proven in the harshest of environments. An industry leading MTBF of >100,000 hours is standard and BITE allows rapid fault isolation to LRU level.

With low power consumption and high gain, the Fernau e-scan antenna reduces operating costs for the customer.



Vortac

Local Diagnostics Unit, LDU

A Local Diagnostics Unit is now available as an option. The LDU uses a compact high resolution touch screen LCD which allows full local access to all the features of the RMM. Alongside the LCD is a Local Status Indicator, LSI, which provides a very user friendly and intuitive user interface showing the operational status of the Tacan.



LDU

Logistic Support

Fernau has many years of experience providing logistics support for key customers around the World. Fernau can provide support from the UK or in-territory. Spares parts may be located on customers' premises or in strategic locations. Automatic email call-off ensures that spare parts are dispatched within 24 hrs. Fernau provides a Customer Helpline which is manned 24 hours a day with technical personnel.

We typically provide support packages for 15-20 years for the whole operational life of the equipment. This can be offered on either on a regular fee basis or an upfront extended warranty basis. Many of our customers require support to provide specific levels of equipment availability and Fernau has considerable experience in providing this type of support package. As part of the logistics support package Fernau can also provide additional services which include site survey, installation, system commissioning, safety cases, training, spares and repairs.



Ground Tacan Installation