



Monopulse Beacon Test Set II

The Next Generation transponder radar verification and maintenance tool

Generates reply signals for up to 4,096 user defined targets, ICAO compliant Mode S COM A and COM B, Transponder test functions, Mode 4 capable, Complex target movement

Description

The current generation of Beacon Interrogator radars is monopulse capable, interfacing with both Air Traffic Control Radar Beacon Systems (ATCRBS) and Mode Select (Mode S) aircraft transponders. Flight status information, such as aircraft identification, location, airspeed, and heading, are provide to system managers through communications between the radar and an aircraft.

Advancements in technology have enabled new air service capabilities, including the retrieval of GPS enabled aircraft status information by ground stations, and have brought about the need for updated and more sophisticated radar maintenance and certification tools. Freestate Electronics has developed the second generation Monopulse Beacon Test Set, the MBTS II, to meet these requirements. The MBTS II provides the functions necessary to verify the performance of all transponder radar systems against the latest ICAO requirements and standards.

Features

- Two RF channels create monopulse replies for up to 4,096 independent targets
- ICAO and AIMS compatible ATCRBS, Mode 4, and Mode S signals
- Mode S COM A and COM B capable
- 1030 MHz Interrogator output and 1090 MHz Reply input for transponder verification
- Target replies triggered by internal, external, or decoded RF interrogations
- Azimuth position synchronized to either phased array or antenna pedestal APG data inputs
- Pulsed RF or CW operating modes
- LabVIEW® based operator control interface

Operation

MBTS functions are controlled by use of a laptop PC loaded with FSE virtual instrument software.

The characteristics of each pulsed RF reply are precisely controlled by digital signals from the Process Control and Communication module.

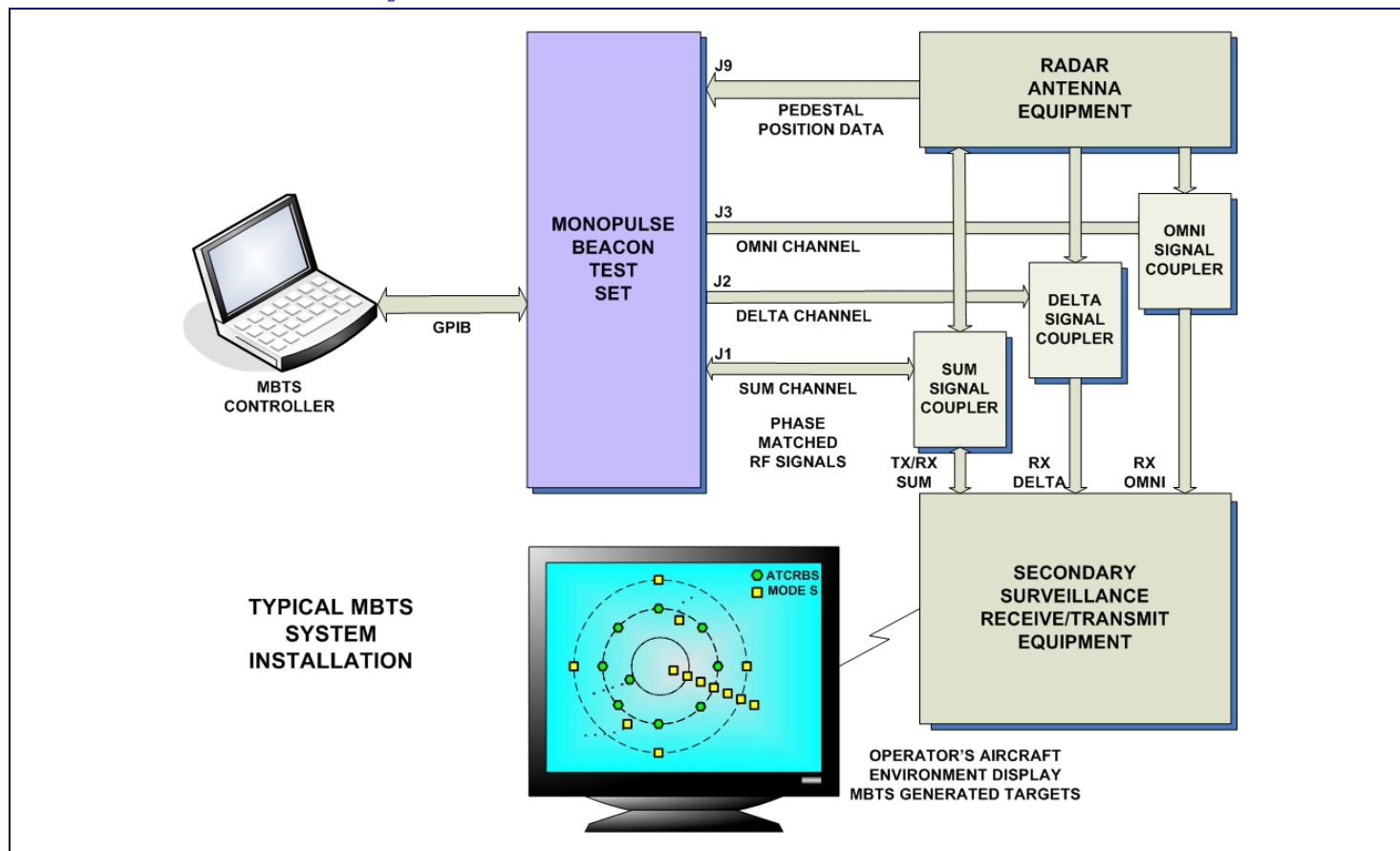
All reply parameters of each target aircraft, including transponder emulation capability, lockout state, and extended length message content, are stored as unique entities in program memory.

The optional second Reply Generator module enables complex target movement, including coincident target placement, and maximizes the number of targets which can be generated.

Construction

The MBTS electronics are housed in nine RF shielded VXI plug-in modules mounted in a standard 7-inch high, 19-inch wide, rackmount chassis. Typical module construction is indicated.





Technical Characteristics

Interrogation Input, Interrogation Output, and Reply Output Simulation Types Supported	ATCRBS 3/A, 2, B, or C; Mode 4 (no encryption functions); ATCRBS/Mode S All-Call; Mode S Only All-Call; Mode S Roll-Call, Mode S COM A and COM B Messaging
Target Reply RF Outputs (1080 MHz to 1100 MHz in 200 kHz Increments)	Two Channels (A and B) - Sum, Delta, and Omni
Target Reply RF Output Level	Sum, -85 dBm to +10 dBm, 0.5 dB steps, 0.1 dB fine adjust Delta/Sum Ratio, +12 dB to -42 dB Sum/Omni Ratio, +20 dB to -27 dB
User Designated Target Parameters	Range, Azimuth, Antenna Type, Altitude, SPI, Alert, F ₁ , F ₂ , ID, X, Speed, Heading, Amplitude, Register Content (COM B), Pulse Width, Pulse Spacing
Monopulse Signal Controls	Sum/Omni Ratio, Delta/Sum Ratio, and Delta/Sum Phase
Interrogation RF Output Level (1030 MHz)	-20 dBm to -83 dBm, 1 dB steps, 0.1 dB fine adjust
Azimuth Input Data	Balanced RS-422, Unbalanced 75 Ohm ACP/IACP and ARP, PRM phased array capable
Operating Modes	CW, Constant Range Ring, Azimuth Gated Target, Interrogation Generation/Reply Detect, Reference, BIT, and Boresight Calibration
Test Outputs	1090 MHz – Channel A and B (Sum, Delta and Omni) 70 MHz – Reply IF (Sum, Delta and Omni) 1060 MHz – MSSR Antenna Cal and Alignment Signal Demodulated DPSK, PAM, and LOG VIDEO
Control Interfaces	IEEE-488 and RS-232