



## Threat Radar Simulators

DRS TRAINING & CONTROL SYSTEMS, INC.



# Threat Radar Simulators

The effectiveness of a modern fighting force depends on the quality of the training and test programs. This means a modern, realistic EW threat environment is critical to effective evaluation of airborne systems and tactics. DRS Training & Control Systems offers an extensive line of practical, effective threat radar simulators for use on combat training and test ranges. These systems can be used in a variety of configurations to provide comprehensive training, tactics development, and evaluation of aircrew and aircraft systems. Mission scenarios can be generated to simulate war at sea, power projection ashore or simultaneous combined land/sea scenarios.

The systems can be structured to simulate early warning radar, shipboard AAA and missile fire control radar, and land-based AAA and missile fire control radar.

- Missile Seekers
- Anti-Aircraft Artillery (AAA)
- Surface-to-Air Missile (SAM)
- Ground Control Intercept (GCI)
- Airborne Intercept
- All Electronic Warfare (EW) Bands to 35 GHz
- Multiple PRF Modes
- Fully-Programmable Pulse Trains
- Mobile
- Fixed
- Shipboard
- Airborne
- Manned
- Unmanned
- Remote Operation



AN/MPS-T9



AN/MSQ-T13



AN/MPQ-T3A



3131 MTRS



# Model 3131 — Modular Threat Radar Simulator

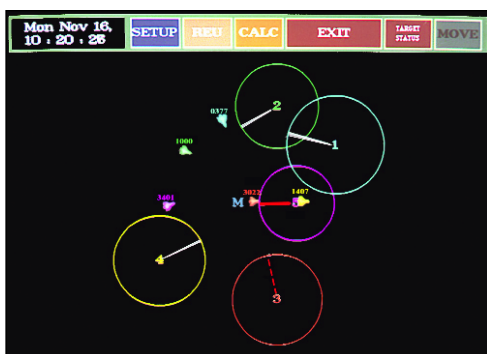
The Model 3131 Modular Threat Radar Simulator (MTRS) consists of a master controller and up to five remote emitters. Each remote emitter operates independently of the other with its own AC power generator.

The master control unit sends control commands via a UHF radio, fiber-optic or telephone line. Antenna mode control, RF pulse characteristics and frequency of operation for the desired mission are all under the command of a single operator.

EW bands up to 35 GHz (with programmable PRF and PRI) are controlled independently for each emitter, enabling a multiple threat scenario on the test range.

Various configurations of single- or dual-axis pedestals, parabolic or shaped antennas, track or guidance transmitters, and manual or slaved tracking make the MTRS one of the most versatile simulators available.

The system may be further enhanced with several options – an environmentally controlled operator shelter, an EW response monitor and IFF tracking system, and an optical television tracking system. The EW response monitor, using signals from a separate surveillance antenna, displays boresight camera video, gives RF spectrum displays of wideband and narrowband EW signals, and outputs a hard copy of the signals to a graphics plotter.



*Tactical Display Unit (TDU)*



*3131 MTRS Palletized Configuration*



*3131 MTRS Mobile Configuration*

# Advanced Threat Emitters

Our Advanced Threat Emitter Systems consist of RF transmitters operated through a remote control/display unit. The transmitters operate in the L-band (850 MHz to 942 MHz), S-band (2.1 GHz to 2.4 GHz), X-band (9.9 GHz to 10.2 GHz), and I-band (7.7 GHz to 8.5 GHz, 8.3 GHz to 8.9 GHz and 9.5 GHz to 10.5 GHz) frequency ranges. Each transmitter is furnished in an air-conditioned S-280 shelter. The interior of the shelter contains the frequency synthesizer, tunable klystron, klystron modulator, PRF generator, high-voltage power supply, liquid-to-air heat exchangers and all supporting subsystems. The transmitter antenna is mounted on the shelter roof.

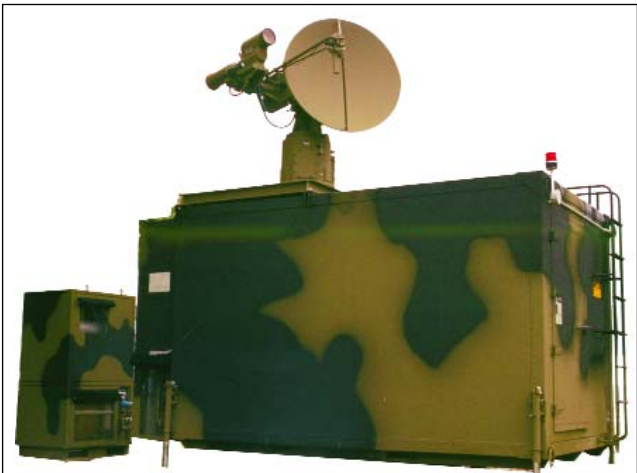
Local transmitter controls, status indicators and meters in each shelter enable complete local control of the transmitter. The system also can be

controlled by a custom Remote Control Console (RCC). The RCC is a computer-based system that provides the ability to remotely control and monitor the status

of all transmitters simultaneously.

The Advanced Threat Emitter systems have the following RF characteristics:

TECHNICAL CHARACTERISTICS				
	L-Band Emitter Model 3383 A	S-Band Emitter Model 3383 B	X-Band Emitter Model 3383 C	Multi-Threat Emitter
RF Peak Power	300 kW	150 kW	62 kW	62 kW
Max Duty Cycle	2.5%	2.4%	8.5%	10%
PRF	1-17,000 pps agile	1-30,000 pps agile	1-100,000 pps agile	1-150,000 pps agile
RF Modulation	0-8 MHz chirp	0-5 MHz chirp	Optional	Optional
Antenna Type	2 back-to-back sectional parabolas	sectional parabola	cylinder parabola	offset feed parabola
Gain	22 dB	30 dB	34 dB	40 dB
Polarization	1 horizontal, 1 vertical	horizontal	circular	RH-LH circular



Multi-Threat Emitter



X-Band Emitter



S-Band Emitter



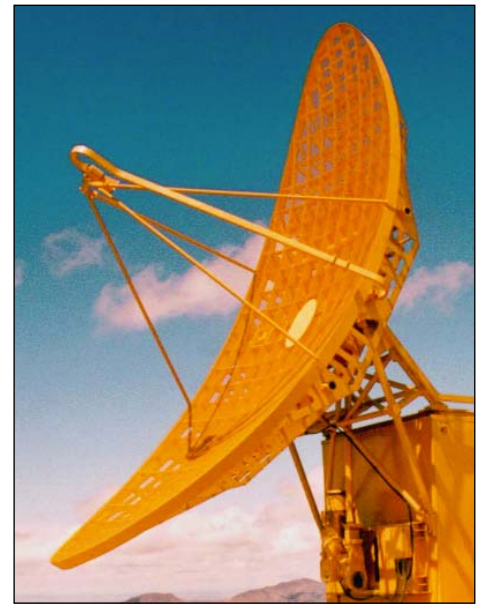
L-Band Emitter



# AN/FPS-127 — Height Finder Radar System

The AN/FPS-127 Height Finder Radar System consists of a single trailer-mounted van with an attached S-band height finder parabolic antenna. The antenna drive system continuously nods the antenna across a 30° elevation sector, while the antenna is directed in azimuth. The system contains a 1 MW dual-pulse width magnetron transmitter capable of a 0.1% duty cycle. The transmitter is adjustable in frequency across the S-band and is locked in frequency to the receiver's local oscillator. The receiver is adjustable in frequency with sensitivity greater than -107 dBm. The system also contains a signal processor with quadrature DMTI, Sensitivity Time Control, and a remote

panel for control and monitoring of azimuth, elevation, transmitter and receiver function.



AN/FPS-127 Height Finder Radar System

## Pulsed Doppler/Conventional Power Airborne Emitters

The Airborne Emitter, a microprocessor-controlled system, provides up to sixteen selectable computer programs. The programs activate the system and select from a 32-mode menu to control the PRF, number of iterations and stable or staggered modes, including staircase, ramp-up, ramp-down,

sinusoidal or random jitter. The antenna position and scan rates also can be modified during pre-flight programming. Following the selection of a program, execution of different modes is accomplished as preprogrammed on a time basis or antenna position.



### Conventional Power Airborne Emitter Specifications

Frequency (magnetron selectable)	7.8 - 17.5 GHz
Power	70 to 150 kW
Pulse Width	0.2 - 1.2 $\mu$ sec
Duty Cycle	0.001
PRF	5,000 max
Antenna Gain	26 dB nom
Antenna Rates	10° - 70° sec
Sector Width	120°
Boresight Angles	-30°, 0°, +30°

### Pulsed Doppler Airborne Emitter Specifications

Frequency (TWT selectable)	8 - 18 GHz
Power	200 W
Pulse Width	0.1 $\mu$ sec
Duty Cycle	1.0
PRF	1 pps - CW
Antenna Gain	26 dB nom
Antenna Rates	10° - 70° sec
Sector Width	120°
Boresight Angles	-30°, 0°, +30°

## AN/MPS-T9 Early Warning Radar Simulator

The AN/MPS-T9 Early Warning/Ground Control Intercept Radar Threat Simulator operates in both the E- and F-band frequencies. The T9 is housed in two mobile electronic shelters—the operations van and the antenna van. A multibeamed antenna configuration, mounted on a rotating structure, determines the target positions while scanning the azimuth plane.

The operations van contains the system's displays, controls and communication circuits, all of which are housed in a console/rack format.



*AN/MPS-T9 Operations Van*

The antenna van contains the antennas, slip-ring assembly, built-in-test equipment (BITE), IFF interrogator and six transmitter/modulator subsystems with their respective receivers. Each transmitter/modulator subsystem independently transmits 1 MW of peak power at its selected frequency. The transmitters cover the frequency band from 2.7 to 3.1 GHz.



*AN/MPS-T9 Early Warning/Ground Control Intercept Radar Threat Simulator*

## AN/MPQ-T3A — Multiple AAA/SAM Threat Radar Simulator System

The AN/MPQ-T3A Universal AAA/SAM Threat Radar Simulator consists of three target acquisition-and-track radars integrated into a single transportable van. The T3A simulates several threat radars providing realistic threats for use in aircrew training or test environments. Using the T3A, aircrews can be trained in the use of Radar Warning Receivers and ECM equipment and in the development of avoidance and distraction tactics against these threats.

The T3A transmitters emit at full ERP in the E-, I- and J-band frequencies. Target illuminators and missile guidance transmitters are supplied in J-band to enhance the SAM simulations. The system has full automatic tracking capability (accuracy better than 2 miles) and employs effective ECCM techniques. A resident minicomputer permits the programming of virtually unlimited combinations of antenna scan, PRF and pulse width.

The T3A system is configured in a 12-meter long, fifth-wheel type trailer suitable for towing over unimproved dirt roads. Leveling jacks and outriggers are included to permit deployment on a 17% slope and to ensure operation in winds up to 80 km/hr.



*The AN/MPQ-T3A Universal AAA/SAM Threat Radar Simulator (above) is configured in a 12-meter long, fifth-wheel type trailer complete with Control/Operator Consoles (left).*



The AN/MSQ-T13 is a surface-to-air missile simulator with fully validated threat parameters. Originally designed and produced for the U.S. Air Force, the T13 system is integrated into ranges at Nellis AFB, Spadeadam in the United Kingdom and the Polygone Range in France.

- Target Track Transmitter and Receivers
- Acquisition Transmitters and Receivers
- Antenna and Tracking Loop Functions
- CW Illuminator
- MTI Processors
- Acquisition and Track Displays



AN/MSQ-T13

## DRS TCS Field Operational Simulator Locations

Red Flag, Nellis AFB, Nevada

Naval Air Weapons Center, China Lake, California

Fallon Test Range, Fallon NAS, California

Pacific Missile Test Center, Pt. Mugu, California

Pinecastle Range, Orlando, Florida

Eielson AFB, Alaska

Spadeadam Range, United Kingdom

Polygone EW Range, France and Germany

Mountain Home AFB, Idaho

Cherry Point MAS North Carolina

Eglin AFB, Florida (TAWC)



AN/MSQ-T13

## Other DRS TCS Products and Services

Air Combat Training Systems

Display and Debriefing Subsystems

Digital Moving Target Indicator (DMTI)

Radar Transmitters

Radar Decoys

Intercommunication Systems

Integrated Logistics Support

Electronic Manufacturing Build-to-Print Capability

DRS Training & Control Systems is ISO 9001:2000 registered and has achieved an impressive record of on-time deliveries on Government contracts. Our successful record as a reliable supplier has been acknowledged worldwide for nearly four decades. Contact DRS TCS today and put our experience to work for you.





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