

AN/MPQ-64F1 IMPROVED SENTINEL

Efficient Deployment – Minimal Crew

In its ground based configuration the Improved Sentinel radar system consists of an Antenna Transceiver Group (ATG) and the HMMWV based prime mover group (HVG). The system also includes an integrated identification friend or foe (IFF) capability that helps prevent fratricide. The Improved Sentinel is fully operational in minutes. It can be emplaced in less than 15 minutes and march ordered in less than 10 minutes by a two person crew. There is no need for any additional special ground handling equipment or personnel. Only a two person crew is required for full Sentinel operation; one operator and one maintainer. The highly transportable Improved Sentinel Radar meets today's force structure reductions by maximizing system deployability and survivability, while minimizing crew requirements.

Electronic Maintenance Manuals Ensure Accuracy

Improved Sentinel's comprehensive Interactive Electronic Technical Manuals (IETMs) ensure that end users have convenient access to current data for on-site repairs. Maintenance manuals and applicable schematics are easily accessed for quick and easy system diagnostic and expeditious repair. Distributed on CD-ROMs, IETMs can be run on any Windows-based laptop or desktop computer with a standard CD drive. Updates, when necessary, are distributed quickly to the field by providing a simple, revised CD-ROM that includes all previous information as well as the latest changes/improvements.

Sentinel's Proven Performance

With more than 200 Sentinel radars deployed worldwide, military forces have proven the reliability, maintainability, and availability of the Sentinel in combat, key asset protection, high profile events and training deployments. Sentinel demonstrations, tests, and worldwide deployments with the U.S. Army and international armed forces have confirmed the operational effectiveness of Sentinel against all air threats. Sentinel's AN/MPQ-64F1 configuration improves upon the standard configuration and greatly enhances the radar's capabilities.



AN/MPQ-64F1 Improved Sentinel

Specifications

Range Extension Improvement

- Improved target detection at extended ranges - especially cruise missiles (CM) and Unmanned Aerial Vehicles (UAV)
- Improved target detection for Rotary Wing (RW) and Fixed Wing (FW) aircraft
- Improved capability to cue targets beyond visual range

Signal Data Processor

- 10 slot VME-64x Rack with slots available for growth
- Multiple On-board computers

Receiver

- X-Band, single channel
- Single LRU

Exciter

- X-Band, DDS Technology
- Single Master Oscillator upconverted to generate frequency
- Single LRU

Transmitter

- X-Band, Multiple TWT
- Low/Mid/High PRFs

Motor Controller

- Digital Interface to the Signal Data Processor
- Improved DC Motor and Controller

New Operating Modes

- Full Coverage Mode - Surveillance from Horizon (terrain) to ~18 degrees, providing balanced height coverage
- Low Altitude Coverage Mode - Surveillance from Horizon to ~5 degrees, providing focused energy and fast revisit times for low altitude advanced target threats (cruise missiles, UAVs)

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AN/MPQ-64F1 IMPROVED SENTINEL

Protecting the Warfighter from today's advanced airborne threats



EXTENDED AIR DEFENSE MISSIONS

AIR COMMAND AND CONTROL MISSIONS

BATTLEFIELD SURVEILLANCE AND COORDINATION MISSIONS

COMBINED COMMAND AND CONTROL MISSIONS


ThalesRaytheonSystems

THE BEST... IS NOW BETTER...

Description:

The Improved Sentinel System

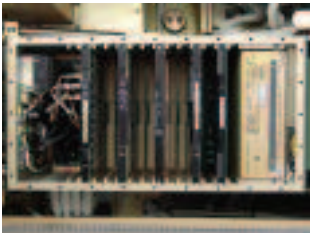
The world leader in dependable, easily maintained, highly mobile tactical air defense radar, the AN/MPQ-64F1 Improved Sentinel is a state of the art, three-dimensional, phased-array system that operates in the X-band frequency range. More than 20 years of engineering research, development, and implementation of modern radar and software technology have enhanced the quality of the Improved Sentinel Radar system.

Its primary mission is to automatically detect, track, identify, and report airborne threats, including helicopters, high speed attack aircraft, cruise missiles and unmanned aerial vehicles (UAVs). The Improved Sentinel is the standard for the alerting and cueing of targets to support a variety of weapons, including Stinger missile based SHORAD weapon systems, VSHORAD missile systems and air defense guns. This advanced tactical radar detects and tracks threat aircraft at several times the range of short-range weapons, providing early warning to ground crews and supporting maximum-range engagement of threats. The Sentinel's extended acquisition range is optimally suited for medium range engagements with missile systems such as HAWK and Beyond Visual Range Engagements (BVRE) with Surface Launched – Advanced Medium Range Air to Air Missile (SL-AMRAAM).

Sentinel System Components

Today's evolving threats have created the need for a longer range, extremely mobile and highly accurate 3D radar to alert and cue today's most advance Air Defense weapon systems. The Improved Sentinel provides the unmatched capability to exceed these requirements. The Improved Sentinel is equipped with new, modern COTS based electronics which ensures greater performance while implementing a low risk technology insertion. The Improved Sentinel Radar completed its initial fielding to the U.S. Military in April of 2006 and is now deployed worldwide.

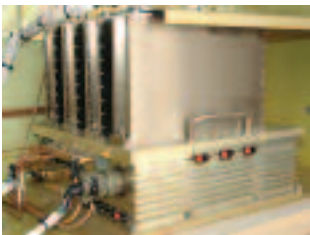
The Improved Sentinel Radar boasts an unmatched range extension improvement. Every major component of the radar is new and has undergone numerous hours of testing, verification and validation of its unparalleled extended range threat detection. Incorporation of the new components has resulted in a significant increase in early detection of cruise missiles, UAVs, Rotary Wing and Fixed Wing aircraft. This improvement also enhances the radar's capability to identify and respond to targets well beyond visual range.



Signal Data Processor

The new signal data processor of the Improved Sentinel has multiple On-Board Computers and is upgraded with a 10 slot VME-64x rack. Incorporation of the latest COTS technology brings improved A/D processing, faster radar control processing and additional slot availability for future growth of the radar.

The Improved Sentinel also includes a new Exciter and Receiver. The Exciter is an X-Band, Single Lowest Replaceable Unit (LRU) that utilizes a single master oscillator to generate frequency. This provides the benefit of lower noise that allows for improved detection in Clutter. The radar's Receiver is a Single Channel, X-Band Frequency, Single LRU which is designed to work in concert with the new Exciter.



Exciter

The X-Band Transmitter is modular and scalable from two to four TWT based Power Amplifiers for increased radar range and reliability.

The New DC Motor Controller has a new digital interface to the Signal Data Processor which provides selectable operator control of antenna direction and speed.



Receiver



Transmitter



DC Motor Controller

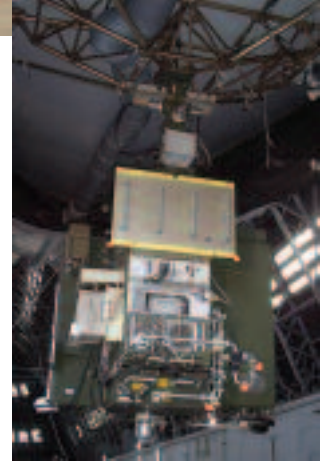
Elevated Sentinel and Tower/Platform Configurations

No other air defense radar is as versatile and adaptable as the Improved Sentinel Radar. It is readily available in an aerostat borne configuration, easily adaptable onto towers and platforms, in addition to its standard ground based tactical configuration. In the Elevated Sentinel configuration, the radar has been repackaged in a lightweight, highly effective system mounted to a 38 meter Aerostat, capable of extended deployments of up to 14 days of continuous operation. The Elevated Sentinel is ideally suited for extended range coverage of ~150km for air defense, early warning and/or air surveillance missions.

The Improved Sentinel can be mounted onto elevated platforms at any height. It can be placed on a platform in its trailer mounted configuration or palletized and hard mounted directly onto the platform itself. It can also be mounted inside a radome if desired. No other single radar provides this level of adaptability and versatility to meet the unique needs/requirements of the customer.



Elevated Sentinel Configuration



Fielded Tower/Platform Configurations

The Improved Sentinel is unsurpassed in mobility. The uniquely compact, lightweight configuration of the Improved Sentinel and its adaptable base allows the user a larger variety of inventoried vehicles that can either tow or carry the radar. This is critical in times of limited vehicle availability.

Countering Low Flying Threats

For securing urban or isolated sites from covert aerial threats, the Improved Sentinel Radar is second to none. The radar has proven experience protecting critical assets, key infrastructure and high profile events from airborne threats flying below the horizon of conventional long range air defense radars. The highly mobile Improved Sentinel Radar delivers accurate low-altitude surveillance of small to large airborne objects, including cruise missiles, domestic and military aircraft, UAVs, helicopters and small ultralight aircraft. The radar will detect, identify, classify and track aircraft (i.e., Fixed Wing, Rotary Wing, etc.) from the nap of the earth to 55° in elevation and 360° azimuth within an airspace search range of more than 75km.

Protection of Key and Vital Assets – Homeland Defense

When protection of strategic coastal and maritime areas is necessary, especially vital and economically important areas associated with exploration and production of petroleum, the Improved Sentinel is the key and critical radar system to employ for early warning and air surveillance over these important areas. The radar has proven experience providing air surveillance against airborne threats which, if not defeated, could seriously impact the economic infrastructure of an oil producing nation. The Radar is in use today with advanced air defense weapon systems protecting high value and key critical assets both in the U.S. and abroad.

Improved Sentinel – Counter-Rocket Artillery and Mortar Mode

As a Contractor Initiative, TRS has completed development of a new Counter-Rocket, Artillery, Mortars (C-RAM) mode developed for acquisition and tracking of RAM fire. Implementation of this radar mode provides the ability to detect RAM fire in-flight within a range, timeline and accuracy that provides a significant benefit to the warfighter. The C-RAM mode provides rapid information on the origin of hostile fire as well as an estimate of the impact point of the fire, which is useful to warn personnel of imminent danger.



Sentinel Maritime Configuration