

LOCKHEED MARTIN



## AN/APG-145

*Advanced Airborne Surveillance Radar*



*Design innovation the world over*

# *AN/APS-145*

## *Advanced Airborne Surveillance Radar*

The APS-145 Advanced Airborne Surveillance Radar is the most reliable, cost effective, high power radar available. This sophisticated system is the latest in a long line of airborne early warning systems from Lockheed Martin. Its predecessors, the APS-120, APS-125, and APS-138 have helped make the Northrop Grumman E-2C Hawkeye the most reliable carrier-based aircraft in the world. Over 100 E-2C's have been completing nearly 100 percent of their missions, day in and day out, for more than 2 decades. The APS-145 carries on the tradition adding several significant features found in no other airborne surveillance radar.

Exceptional performance, unparalleled reliability, and unique environmental management capability make the APS-145 the most desirable advanced airborne surveillance radar in the world.

A complete surveillance system designed to meet broad challenges in diverse environments

The APS-145 is a high-power UHF Doppler radar. It utilizes a rotating antenna within a circular radome mounted atop the aircraft to simultaneously detect and track multiple threats on the sea, in the air, over land, and the critical land-sea interface. While its primary platform is the E-2C, it is easily adaptable to other aircraft, including the Lockheed Martin C-130 and P-3.

The APS-145 extends the performance of previous airborne surveillance radars to unprecedented levels. Its range is a full 40 percent beyond that of the APS-138 – greater than any airborne surveillance radar in the world. It will monitor and track more than 20,000 targets simultaneously. Sophisticated jam avoidance and ECCM techniques assure

unparalleled performance in dense EMI and jamming environments. Adaptive signal processing provides superior target detection and tracking in complex target environments.

### **Elegant Automation**

The APS-145 handles itself with discipline in any environment. It is the first and only radar to incorporate automatic performance optimization. The APS-145 adapts to dynamic operating conditions automatically over varied terrain – with no operator intervention. That means the operator is never spending time performing routine functions at the expense of the tactical mission. And it means that the APS-145 is always performing at its best over changing geographical and electromagnetic conditions.

### **Made For Your Mission**

The APS-145 combines sophistication, performance, and reliability. Its automation and Environmental Management System (EMS) capability sets it apart from any radar in the world.

From detection of small, low speed targets as required for drug interdiction, to long-range detection and tracking of advanced high speed military aircraft and missiles with low radar cross sections, there is simply no better, more



cost-effective airborne surveillance radar than the APS-145. Whatever your mission, this radar is up to the task.

## *Environmental Management: Unique to the APS-145*

**Over Land:** Aircraft are tracked regardless of terrain and target density. Ground vehicles can be tracked when target densities are lower.

**On the Sea:** The APS-145 is capable of tracking all tactically important objects, from large ships to patrol boats, from fast moving aircraft to stationary platforms.

**Over-The-Horizon (OTH):** The surveillance coverage is expanded far beyond most ground-based radars. This allows for advanced warning of incoming threats, including the hard-to-detect low flyers, and command and control information for regions far from the home base.

**Land-Sea OTH Interfaces:** The radar simultaneously monitors and tracks tactical targets within the Land, Sea, and OTH regions. It continuously modifies its signal

processing and track algorithms to suit the environment anywhere in the world, over 5000 times per scan, with no operator intervention.

Separating ships and low-flying aircraft radar returns from sea reflections is a unique and



challenging test for any airborne radar system. Through its unique Environmental Management System (EMS), the APS-145 tailors its performance to match the dynamic operating environment encountered during mission performance. When conditions change, the radar's operating parameters are

automatically optimized, so performance is always the best it can be.

The automatic optimization of the APS-145 allows operators to direct their attention to the tactical mission by eliminating their need to constantly adjust the radar to match the prevailing geographic and electromagnetic conditions. Even with the most adept operators, manual systems simply cannot deliver this kind of performance.

### **Constant Evaluation**

EMS partitions the radar coverage into more than 5000 range and azimuth related cells. With each scan, the radar's parameters are adapted according to an updated assessment of the environmental conditions for each cell.

Additionally the fine-grain terrain map stored in memory can be customized before or during a mission to include special environments the system may encounter – it covers over 1 million square miles! This future ensures that the radar is always uniquely optimized for its specific mission.



## *More Advanced Features Than Other Airborne Surveillance Radars*

The APS-145 continues in the tradition of the APS-138, with more capable technological and operational features. The APS-145 provides enhanced performance in the following areas:

### ***40 percent greater range:***

The range of the APS-145 is 40 percent greater than the APS-138 radar, increasing the continuous surveillance volume to 6 million cubic miles.

### ***Increased scan-to-scan correlation:***

Long a feature of Lockheed Martin AEW systems, scan-to-scan correlation is greatly expanded in the APS-145 to maintain over 20,000 tracks and provide far more detailed target information to the processor. The result is greatly improved performance in all operational environments.

### ***Enhanced operation in dense signal environments:***

The APS-145 maintains operation in dense signal environments where others fail. Detection and tracking are fully automatic.

### ***Automatic frequency evaluation and selection:***

APS-145 finds its way through dense and dynamic electromagnetic interference conditions with automatic channel monitoring and selection. EMI impact is continuously assessed, and the clearest operating frequency is automatically selected.

### ***Continuous target identification:***

The APS-145 incorporates a triple Pulse Repetition Frequency (PRF) feature which allows for continuous detection of all targets over the entire tactical area; over land, sea and the horizon, simultaneously.

## ***The Most Cost-Effective Solution To Airborne Surveillance***

The APS-145 broadens the capabilities of airborne surveillance, and introduces features never before available. Best of all, the APS-145 is extremely cost effective,

especially compared to larger systems that promise more but don't include all of the APS-145's features and capabilities. This type of performance is what you would expect from Lockheed Martin. We've been developing AEW systems since the beginning. From the APS-10 Search Radar in 1943 that led to the APS-20 in 1945, our expertise continues to produce advanced airborne surveillance solutions. Today our crowning achievement is the APS-145; the most capable, cost effective AEW system in the world. It's available today and built for tomorrow's threat. Whatever your mission, the APS-145 is ready.

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