

# MMLS

## MICROWAVE LANDING SYSTEM

*The perfect all-weather landing solution for a wide assortment of military deployment missions & humanitarian relief efforts*



### ***Precision approach landing virtually anywhere, anytime***

Developed in partnership with the U.S. Air Force Electronic Systems Center, Textron Systems' Mobile Microwave Landing System (MMLS) is the world's only portable system of its kind in production today. Designed for rapid deployment, MMLS is ideal for providing aircraft landing guidance for military deployment, humanitarian relief, and every mission in between.

MMLS is ideally suited to U.S. military applications, providing aircraft landing guidance for a wide assortment of missions in remote, harsh and unprepared areas. Its compact size, rugged construction, transportability and all-weather capability make MMLS the perfect landing solution — even in the most severe weather conditions. Its successful deployment on ice runways used by the National Science Foundation in Antarctica is evidence of its adaptability in extreme climates.

# MICROWAVE LANDING SYSTEM



The U.S. Air Force uses MMLS for rapid, round the clock movement of cargo and troops, landing this C-17 aircraft in Tirana, Albania.

## Critical to the Mission

MMLS meets the military's strict mobility, survivability and three-man lift requirements and is capable of installation in less than two hours. The system is also fully compliant with International Civil Aviation Organization (ICAO) standards for Category I/II precision approach guidance and landing. MMLS has been flight-certified by the Federal Aviation Administration (FAA) at various locations worldwide.

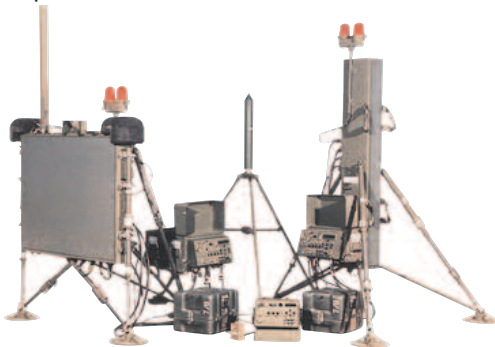
MMLS has been installed at both domestic and international air force bases around the globe for more than six years to support deployment of ground forces, medical evacuations, humanitarian relief and pilot training. The U.S. Air Force Mobility Command used MMLS to land C-130 and C-17 aircraft in military resupply and humanitarian operations recently performed in Bosnia, Kosovo, and Tirana (Albania). Additionally, multiple MMLS systems were utilized to support missions in conflict regions.

## The World's Most Versatile Landing System

Textron Systems' MMLS is based on microwave technology, making it less susceptible to the FM frequency and multi-path interference inherent in conventional Instrument Landing Systems (ILS). MMLS also provides wide guidance coverage and can accommodate up to five times more aircraft than the less versatile ILS systems. It outperforms ILS by

minimizing frequency modulation interference and by allowing near-vertical recoveries in small or congested landing areas.

Additionally, unlike traditional systems that support straight-in approaches only, MMLS provides all-weather straight-line, curved path and segmented approaches — even in topographically challenging areas.



Textron Systems' fielded MMLS employs azimuth and elevation antennas\* for center line and guide slope guidance; electronic control units; precision DME for distance guidance; and field monitors that continually verify the integrity of the MMLS signal. It accommodates a variety of changing conditions at deployment sites, such as wind and ground settling.

\*U.S. Patent No. 5,349,364  
Foreign Patents Issued and Pending

## MMLS Specifications

**Range** 15 nmi

### Angular Coverage

Azimuth  $\pm 40^\circ$

Elevation  $0.9^\circ$  to  $15^\circ$

### Beamwidth

Azimuth  $2.8^\circ$

Elevation  $2.2^\circ$

Az Bottom Side

Cut-Off  $5\text{dB}/^\circ$

### Accuracy (System) 95%

#### Azimuth

MCE  $\pm 17.0\text{ ft}^{(1)}$

PFN  $\pm 10.4\text{ ft}$

PFE  $\pm 27.4\text{ ft}^{(1)}$

CMN  $\pm 10.5\text{ ft}$

#### Elevation

MGE  $\pm 12^\circ^{(1)}$

PFN  $\pm 0.053^\circ$

PFE  $\pm 0.173^\circ^{(1)}$

CMN  $\pm 0.06^\circ$

<sup>(1)</sup> Including deployment errors

### Integrity

#### Time to Alarm

Azimuth  $< 5\text{ sec}$

Elevation  $< 2\text{ sec}$

#### Probability of

Bad Guidance  $10^{-7}$

#### Mean Time

to Repair  $< 30\text{ min}$

**Frangible** Yes (mounts)

**Transportable** Yes

**DME** DME/P

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