

LEONARDO ELECTRONICS

LINAPS

LASER INERTIAL NAVIGATION ARTILLERY POINTING SYSTEM

LINAPS Artillery Pointing System is a revolutionary self-contained gun mounted navigation, pointing and weapon management system for all Artillery and Mortar platforms, which is now in full service with the UK, Italy, UAE, Saudi Arabia, Canada, Oman, South Africa, India, Algeria, Poland and New Zealand.

It has been successfully deployed on Operations in the Gulf and Afghanistan with the British and Canadian Army's. LINAPS enables rapid and accurate artillery deployment in all weather conditions both day and night.

OPERATIONAL ADVANTAGES

- No surveying of gun emplacement
- No setting up of aiming posts or selecting known distant objects
- Faster into action time
- Improved accuracy and repeatability
- Easy deployment
- Easy concealment
- Easy night deployment
- Easy to use
- Minimal training

WEAPON MANAGEMENT

- NATO and other ballistic calculations
- Accurate direct fire using ballistic kernel
- Interfacing and control of other gun sensors e.g. muzzle velocity radar and laser rangefinder (LRF)
- Interfaces to a range of radio types

KEY BENEFITS

- Continuous and accurate 3D self location with and without GPS
- Continuous determination and display of gun barrel direction and elevation
- Operational under all weather conditions and at all times of day and night
- Operates during helicopter lift
- 115 A hour power source to provide 24 hours continuous operation
- Bright and flexible man-machine interface

TECHNICAL SPECIFICATIONS

ACCURACY POINTING AND POSITIONING

Horizontal Position

INS/GPS	5m CEP
INS/Odometer	20m or 0.20% of distance travelled (whichever is the larger)

Vertical Position

INS/GPS	5m PE
INS/Odometer	15m or 0.15% of distance travelled (whichever is the larger)
Heading Pointing	<1 mil
Roll Elevation	< 0.5 mil

Initialisation Time

Static	10 minutes
"On the Move"	LINAPS can be moved 90 seconds from switch-on; 10 minutes to full performance assuming GPS available

MUZZLE VELOCITY RADAR (MVR)

- The Muzzle Velocity Radar is a rugged, compact and light weight system consisting of only one unit
- The system is designed to be mounted on howitzers and other gun systems, interfacing directly to the Fire Control Computer
- Calculates the muzzle velocity using Fast Fourier Transform (FFT) and digital signal processing. FFT based calculation enables the system to measure on all ammunition types and calibres
- Up to 12 user selectable transmitting frequencies

FIN 3120 INERTIAL NAVIGATION UNIT (INU)

Navigation and pointing information for LINAPS is provided by the FIN3120 INU. The INU is a rugged, unjammable navigation system based on strap-down Ring Laser Gyro technology specifically designed for artillery applications. It provides a hybrid navigation solution combining data from other sensors such as GPS and the vehicle odometer in a Kalman Filter to provide a continuous and precise navigation solution.

Whilst the INU uses GPS in its main navigation mode, it is capable of providing accurate back-up navigation using odometer data, should GPS be unavailable. A Military grade P(Y) Code GPS with antenna built into the cover of the FIN3120 is offered as standard for approved users.

An optional C/A code version is also available. FIN 3120 also generates accurate angular information -elevation, roll and azimuth.

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The capability to withstand high levels of gun fire shock has been designed into the equipment. FIN 3120 has been demonstrated at levels of gunfire shock in excess of 300g peak.

GUN LAYING UNIT (GLU)

The GLU forms the heart of LINAPS. It is a highly capable product combining a touch-sensitive sunlight readable display that provides the man-machine interface for the control and display facilities of the GMS. Its powerful processor enables fire control and ballistic calculations to be carried out as well as the capability to interface with other additional sensors and equipment.

This provides a navigation and fire control system with minimal hardware content and provides a unique single box solution for managing key management functions:

- NATO and other ballistic calculations
- Accurate rapid gun laying
- Autonomous GPS/INS navigation
- Interface and management of additional on gun sensors
- Flexible radio interface

BATTERY POWER MODULE (BPM)

LINAPS is powered from a gun-mounted Battery Power Module (BPM) based on lithium ion technology with a capacity of 115 amp hours. A single fully charged BPM is able to power LINAPS for in excess of 24 hours continuous operation.

The BPM incorporates an integral DC charger, providing 20A charging capability with a charge time of 7 hours. Accurate indications of BPM status is provided both on a 5 LED display and on the GLU.

DETACHMENT COMMANDERS DATA TERMINAL (DCDT)

The DCDT is a ruggedised, portable, tablet-style computer configured with Windows® 10 operating system mounted in the cab of the GTV or on a tripod at the gun.

Main features of the DCDT are:

- Links BCP to GLU for the passage of ballistic target data using the Gun Display Software (GDS) hosted within the DCDT
- Reads the MVI data and sends it to the BCP using the GDS
- Provides display for position and steering information to the driver
- Has the ability to add multi-layer mapping to show routes, waypoints, restricted areas

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