



# **USMC Ground Laser Target Designator II (USMC GLTD II) New Equipment Training**



## **Marine Corps Systems Command**



# SYSTEM DESCRIPTION



**The GLTD II (AN/PEQ-1B) is a lightweight, compact and man-portable laser target designator and rangefinder. It is capable of rangefinding an identified target out to 20 km and can designate out to 5 km for the purpose of delivery of Precision Guided Munitions (PGMs) or Laser Spot Trackers (LSTs). The GLTD II is tripod mounted, has a Picatinney rail in order to mount night vision or thermal sights and is powered by the BA-5590, BB-390 or vehicle power through the use of a vehicle power adapter with cables.**



# AGENDA



HARDWARE

SETUP

OPERATIONS

TROUBLESHOOTING

LASER THEORY  
& OPERATION







# *GLTD II OPERATOR COURSE(HARDWARE)*





## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **LEARNING OBJECTIVES**

**State the GLTD II's purpose and capabilities**

**Identify the GLTD II's major assemblies and components and state their functions**

**Identify the GLTD II's controls and state their functions**



## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II's PURPOSE**

**The GLTD II will be used by USMC MOS's 7502, 0302, 0802, 0861, and 0321 to designate stationary and moving ground targets for attack by laser-seeking PGM's and for attack by CAS aircraft equipped with laser spot trackers.**





## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II PHYSICAL CHARACTERISTICS**

**Weight:**

- System < 24.8 lb's (W/O batteries)
- Laser Marker < 12.7 lb's

**Dimensions:**

**13.2 x 11.2 x 5.2 in**

**Tripod Mountable**

**Externally Powered:**

**24 + 6 VDC**

**Rugged Watertight Cased Housing  
(2 hrs @ 3 m immersion)**

**Man Portable**



## ***GLTD II OPERATOR COURSE(HARDWARE)***



# **GLTD II OPERATIONAL CHARACTERISTICS**

### **Laser Category**

**1064nm, Class 4**

**(Designating and Ranging)  
(non-eye safe!)**

### **Designating Range Capability**

**Capable of exceeding 5000m  
in favorable conditions**

### **Distance Measurement Capability**

**200m to 19,995m**

### **Distance Accuracy**

**$\pm 5$ m (range given to the  
nearest 5m)**

### **Range Discrimination**

**35m separation (3 x 3m  
Targets)**





# **GLTD II OPERATIONAL CHARACTERISTICS**

- **Ranging Logic** **Selectable First/Last**
- **Power Sources** **Vehicle Power (28 VDC),  
5 ea. BA5590, BB390**
- **Beam Divergence**  **$\leq .3$  mrad (90% energy)**
- **Temperature Range**  
**Operational** **- 25.6° to 120°**  
**Storage (w/o Battery)** **- 70.6° to 160°**
- **Field of View** **5° Horizontal**  
**4.4° Vertical**



## **GLTD II LASER SAFETY CHARACTERISTICS**

### **GLTD II**

**(Class 4 Laser)**

<b>Unaided Viewing</b>	<b>20,500m</b>
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<b>Aided Viewing (7 X 50 binoculars)</b>	<b>40,000m</b>
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### **Laser Eye Protection Minimum Optical Density (OD)**

<b>Unaided Viewing</b>	<b>OD 4.1 @ 1064 nm</b>
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<b>Aided Viewing</b>	<b>OD 5.3 @ 1064 nm</b>
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## *GLTD II OPERATOR COURSE(HARDWARE)*



# GLTD II LASER SAFETY CHARACTERISTICS

### **! WARNING !**

THE GLTD II is equipped with a **Class 4**, 1064nm laser transmitter. Severe eye damage may result if fired while **RANGING OR DESIGNATING** in the direction of personnel within the stated ranges or at mirror like surfaces unless proper eye protection is used. Read all WARNINGS in the Operator's Manual.





# *GLTD II OPERATOR COURSE(HARDWARE)*



## **GLTD II ASSEMBLIES**



**Transmitter/Power Supply  
Assembly**

**Receiver/Optics  
Assembly**



## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II**

#### **Transmitter/Power Supply Assembly**

**The Transmitter/Power Supply Assembly comprises the left side of the operation housing of the GLTD II. The main function of the transmitter/power supply is to develop laser pulses when initiated by a FIRE button.**

#### **Receiver/Optics Assembly**

**The Receiver/Optics Assembly comprises the right housing of the GLTD II. The main functions of the Receiver/Optics Assembly are to provide the eyepiece visual optics, reticle and display, range finding components and Data Communications capability.**





## ***GLTD II OPERATOR COURSE(HARDWARE)***



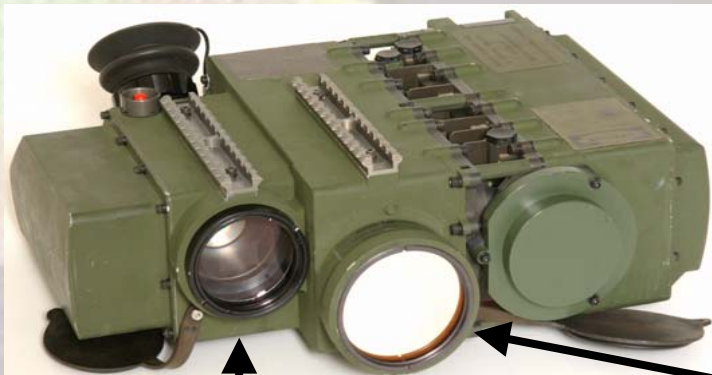
### **GLTD II OPTICAL COMPONENTS**



**Laser energy exits through the  
Laser output window lens**

**The target is viewed through the  
Receiver/Optics Assembly**

**The Receiver/Optics Assembly  
also receives energy from the  
target for range finding**



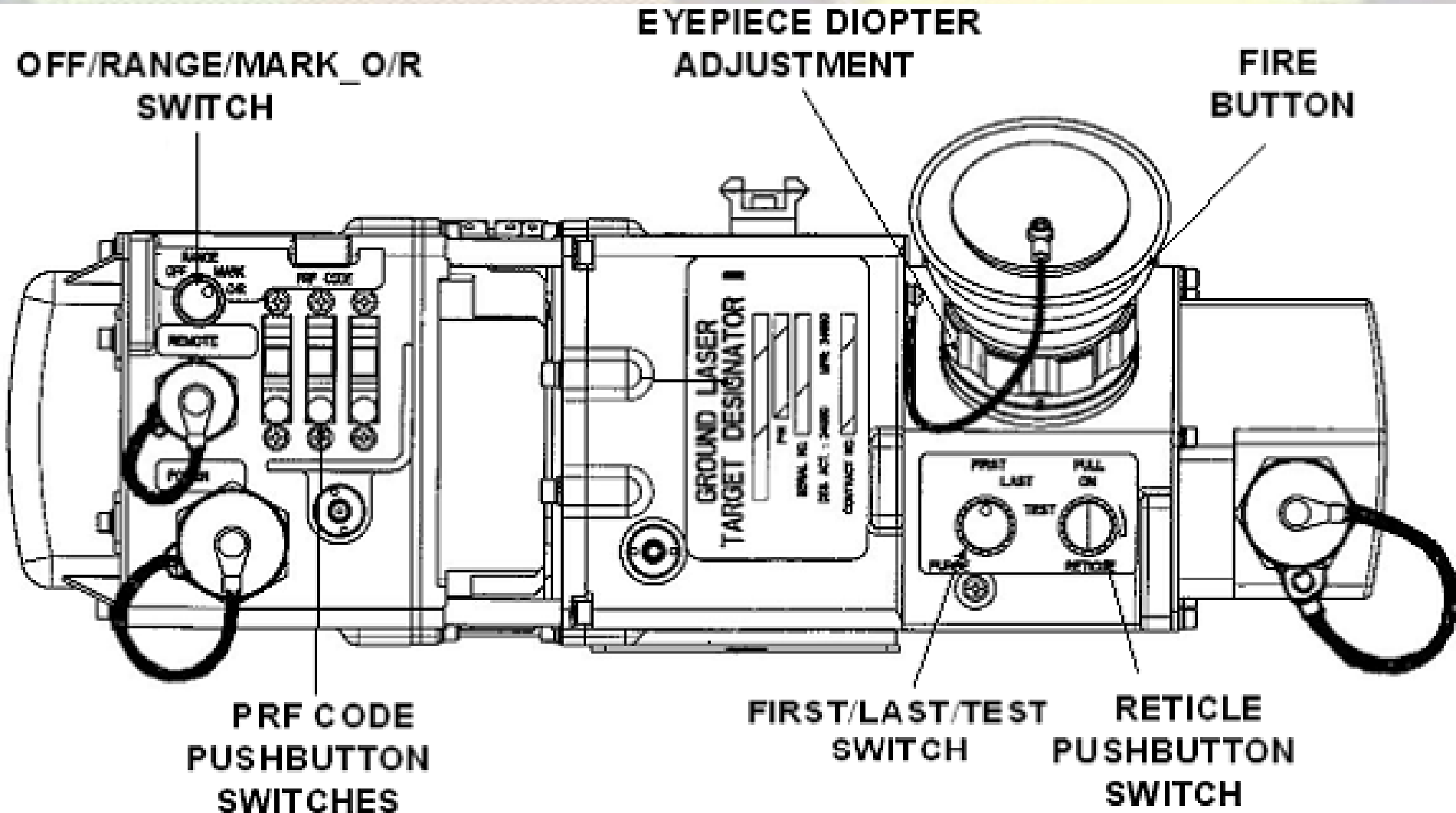
**Visual  
Objective/Receiver Lens**

**Laser Output  
Window Lens**





## GLTD II OPERATOR COURSE(HARDWARE)





## *GLTD II OPERATOR COURSE(HARDWARE)*



### GLTD II CONTROLS



**OFF/RANGE/MARK\_O/R  
Switch**

- 1.Turns OFF the GLTD II**
- 2. Selects the rangefinder only mode in the RANGE position**
- 3. Selects the laser designating function with rangefinding in the MARK position**
- 4. The O/R position is the same as the MARK position except the GLTD II will continue to operate if an over-temperature condition is reached**



## GLTD II OPERATOR COURSE(HARDWARE)

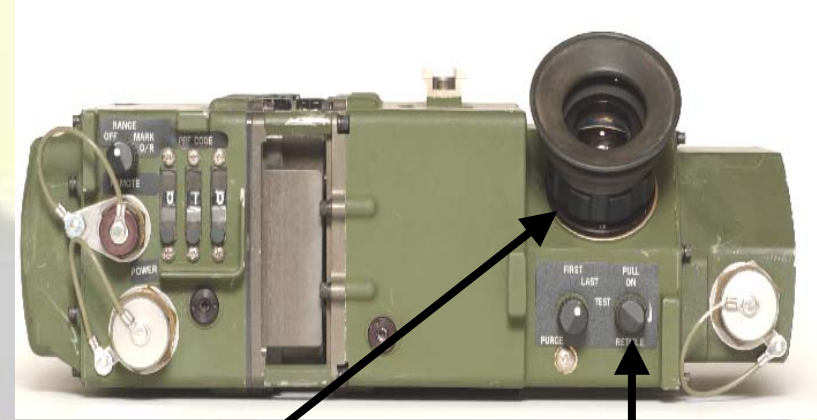


### GLTD II CONTROLS



**PRF Code Pushbuttons**

**Selects Pulse Repetition Frequency (Switches PRF) of the laser when in the MARK mode. The three pushbutton switches select the last three digits of a programmed PRF code .**



**Eyepiece Diopter Adjustment**

**Focuses the eyepiece within a range Adjustment of +2 to -6 Diopters of correction for viewing without the need for glasses.**

**Reticle Pushbutton Switch**

**Controls reticle illumination**





# GLTD II OPERATOR COURSE(HARDWARE)



## GLTD II CONTROLS



**First/Last/Test**

1. Switches between displaying the range to **FIRST** or **LAST** target detected for next laser pulse fired.
2. **TEST** position illuminates all the indicators in the eyepiece display to test the indicators operability

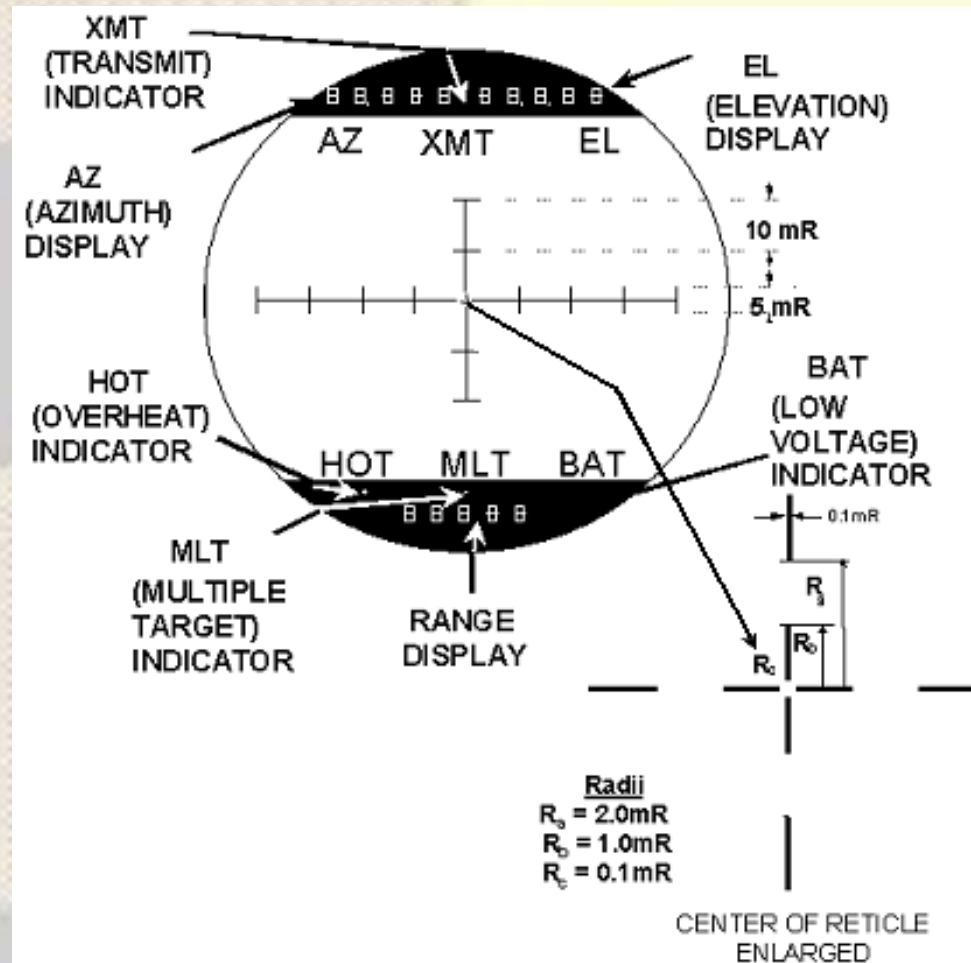


**Fire Button**

When pressed, the GLTD II outputs a single laser pulse if in the **RANGE** mode or continuous pulses, at the selected PRF, if in the **MARK** mode



## GLTD II DISPLAY CHARACTERISTICS





## **GLTD II DISPLAY CHARACTERISTICS**

### **XMT**

**Red LED dot illuminates in MARK and RANGE mode to indicate laser energy output acceptable for each firing of the laser.**

**Note: XMT indicator flickers at the PRF rate in MARK and RANGE**

### **HOT**

**Red LED dot illuminates to indicate the laser has overheated**

### **MLT**

**Red LED dot illuminates to indicate multiple targets have been detected by the range finder. No MLT illumination indicates a single target**





## GLTD II OPERATOR COURSE(HARDWARE)



# GLTD II DISPLAY CHARACTERISTICS

### **BAT**

Red LED illuminates to indicate that the external power source has a low voltage condition and that the GLTD II may not operate. When firing, the indicator will typically illuminate briefly following each laser pulse

### **Range Indicator**

Indicates the target range, in meters, as long as the FIRE button is pressed. Range is displayed in both RANGE and MARK mode

### **AZ and EL**

Not used in USMC configuration. “0” AZ and “0” EL will be displayed when a data cable is not used.



# *GLTD II OPERATOR COURSE(HARDWARE)*



## GLTD II SYSTEM COMPONENTS

**Storage Case**



**GLTD II**

**Field Case**







## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II SYSTEM COMPONENTS**



**Battery Bag**



**Battery Bag  
Power Cable**





# ***GLTD II OPERATOR COURSE(HARDWARE)***



## **GLTD II SYSTEM COMPONENTS**



**Vehicle Power Adapter**



**Vehicle Battery (Slave) Cable**



**Vehicle Power Cable**



# ***GLTD II OPERATOR COURSE(HARDWARE)***



## **GLTD II SYSTEM COMPONENTS**



**Tripod with Tripod Bag**



**150' Remote Firing Cable**



**10' Remote Firing Cable**



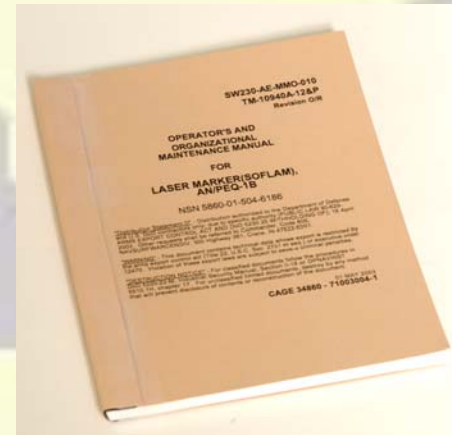
# *GLTD II OPERATOR COURSE(HARDWARE)*



## GLTD II SYSTEM COMPONENTS



**Lens Cleaning Kit**



**Maintenance Manual**





## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II SYSTEM COMPONENTS**



**AN/PVS-13**



**AN/PVS-17**



## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II STORAGE CASE**



**The GLTD II is provided with a hard sided standard military style transport cases for storing and transporting the system in boats, open trucks or as rail or air freight cargo. The case is constructed of molded polyethylene with fitted inserts and overpressure release valve.**



## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II FIELD CASE**



**The padded Field Case facilitates safe transportation of the GLTD II in a tactical environment**





## GLTD II OPERATOR COURSE(HARDWARE)



### GLTD II BATTERY BAG



Used to contain and transport up to 5 BA-5590 or BB-390 batteries



### ! Warning !

Do not mix batteries of different type or remaining energy level. Either condition may cause batteries to vent and/or cause harm to the operator and equipment.



## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II VEHICLE POWER ADAPTER/CABLE**



**Conditions 24 VDC vehicle power for use with the GLTD II**

**Connects to 24 VDC vehicle electrical system via a NATO Slave Receptacle**







## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II POWER CABLES**



**Conducts power from the Vehicle Power Adapter or Battery Bag to the GLTD II**

**Two cables are provided with the GLTDII system. Each is unique to the power source**







## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II TRIPOD & CASE**



**Provides a light weight stable platform for low level operations. Equipped with optional Snow Feet, a Pan/Tilt head for adjusting azimuth and elevation (shown attached), and carry case.**



## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **GLTD II REMOTE FIRING CABLES**



**Provides the capability to fire the GLTD II from a remote position once aimed at a stationary target**





## *GLTD II OPERATOR COURSE(HARDWARE)*



### **GLTD II LENS CLEANING KIT**



#### **! Warning !**

The materials included in the Lens Cleaning Kit are the only materials that should be used to clean the lenses of the GLTDII. Use of any other material may result in scratching of the lens.





## *GLTD II OPERATOR COURSE(HARDWARE)*



### **AN/PVS-13 AND/OR AN/PVS-17**



- **Attaches to the Picatinny Rail on the top surface of the GLTD II to provide night vision sighting capability**



**! Caution !**

**NVSs must be boresighted to the GLTD II prior to ranging or designating targets**



## ***GLTD II OPERATOR COURSE(HARDWARE)***



### **SUMMARY**

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