

# MOVING MAP COMMANDER DISPLAY UNIT



## 1. OVERVIEW

The Moving Map Commander Display Unit (MMCDU) is designed for primary use in military ground moving vehicles as an important part of the C2I system. The MMCDU includes a color VGA 8", 800x600 pixels screen, a 4x4 keyboard and warning green-orange-red light display. Operator controls the unit via soft-keys, keyboard and/or touch screen. The main function of the unit consists in displaying of own position and azimuth, friend/foe subject position, and the graphic tactical information on map background. The MMCDU is originally developed for modernized MBT T-72 and can be adapted for any ground moving vehicle or helicopter. The own position information can be received from an external source (navigation computer) or from an internal MMCDU GPS receiver. Different maps in scale from 1:25 000 up to 1:200 000 can be stored in the removable map memory. The user can create his own map information using a standard PC environment.



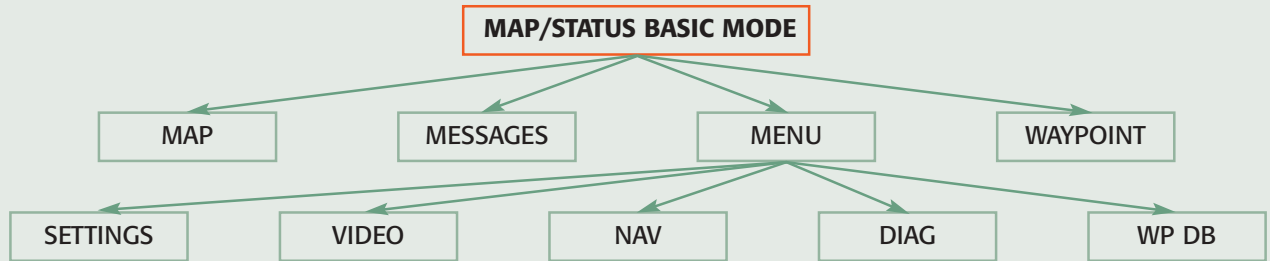
MMCDU Installed in T 72 M4 CZ Main Battle Tank

## 2. TECHNICAL DATA

Dimensions (T 72 MBT version):	max 300x170x100 mm without connectors
Weight (T 72 MBT version):	max. 4 kg without cables
Power:	nominal 24 V DC / 1A (2 A at – 30°C)
Power supply voltage range:	18 V – 33 V DC
Interface:	CAN Bus, RS 232, Ethernet TP/100 Mbit
Display:	color TFT 8", 800x600 pixels active screen 185 (height) x 130 (width) mm Backlighting, controlled brightness
Handling:	keyboard 4X4, touch screen
<b>Displayed maps</b>	
Scales:	1:50 000, 1:100 000 and 1:200 000 or other scales according to users needs
Grid:	UTM (ellipsoid WGS 84) or other users defined system (S 42)
Removable map memory:	CF-max. 6 GB – covered area approx 600x600 km on three maps (1:50 000, 1:100 000, 1:200 000)
Map orientation:	Fixed, North Up, Orthogonal Shift
Overlaid data on display:	Own Position and Hull/Turret Azimuth Friend/Foe Subjects Positions Graphic tactical information received from higher command level
Other displayed information:	Received text messages from higher command level Editor of own messages to higher command level Navigation system status information Other subsystems status information
<b>Environment</b>	
Operational temperature range:	-30°C to + 50°C
Storage temperature range:	-40°C to + 70°C
Vibrations:	6 g in range 40-500 Hz amplitude 2,5 mm in range 5-40 Hz
<b>Mechanical shock</b>	
Single:	500 g, 0,2 ms
Repeated:	20 g, 1 ms
<b>Reduced air pressure</b>	
Operational:	60 kPa
Storage:	12 kPa
Humidity:	98% at 25°C
Resistance against ammonia:	1 mg/m <sup>3</sup>

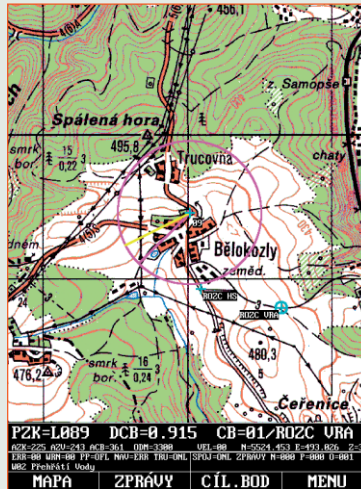
## 3. OPERATION

The operation mode is structured as follows:



### MAP/STATUS Basic Mode

The summary navigation and status information are displayed in this mode. The map background is always oriented north-up, own position is marked on the map as a point at the centre of a 1 km dia circle, violet line directs azimuth of the hull, yellow line directs azimuth of the turret. Other information is displayed alphanumeric under map.



Selected waypoint (CB): 01/ROZC VRA  
Distance to waypoint (DCB): 0.915 km  
Turn to the waypoint (PZK): 89° left  
Scale : 1:50 000

### MAP Mode

The operator can change the scale of the displayed map, select the displayed map area, control saturation of the color of map background ( gamma control), measure the distance between selected points.

### Messages Mode

The following message transmission can be performed :

- Receiving of text message from higher command level
- Transmitting own position information to the higher command level
- Editing and sending of text message to the higher command level
- Receiving and displaying of graphic tactical information on map background

### Waypoint Mode

Mode enables manual selection/change of waypoint from dBase of waypoints. Up to 100 waypoints can be stored in dBase.

### MENU Mode

Menu Mode is used for a detailed alphanumeric display of system parameters and for flexible entry in other modes according to user needs

## Setting

Operator can select in mode Setting following system parameters :

- 1 Change of waypoint when the system is closer than 100m to the actual waypoint
- MANUALLY
  - AUTHOMATICALLY +1
  - AUTHOMATICALLY -1

- 2 Selection of navigation mode
- GPS + INS (Basic NAV Mode)
  - GPS (GPS Only- servicing mode)
  - INS (Inertial, GPS not available)
  - RESTART (Emergency restart of NAV System-servicing mode)

- 3 Selection of position source
- EXTERNAL (Basic mode- position source is ext. NAV computer)
  - LOCAL GPS (Only for stand-alone MMCDU – position source is MMCDU internal GPS receiver)
  - MANUALLY (Position is manually entered from MMCDU keyboard)

## Video

TV standard picture from TV camera installed on vehicle is displayed on MMCDU in this mode.

## NAV

The mode is used for manual entry of navigation data into navigation system and enables displaying of status of all navigation sensors.

## DIAG

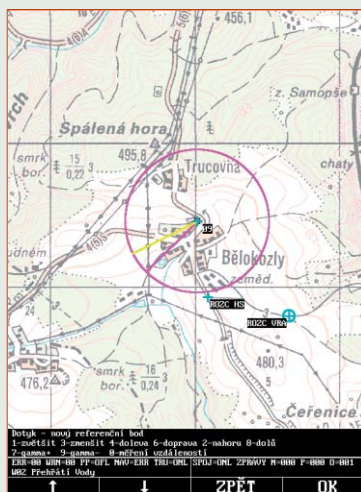
Data received from diagnostic system of the vehicle are displayed on MMCDU.

## WP DB

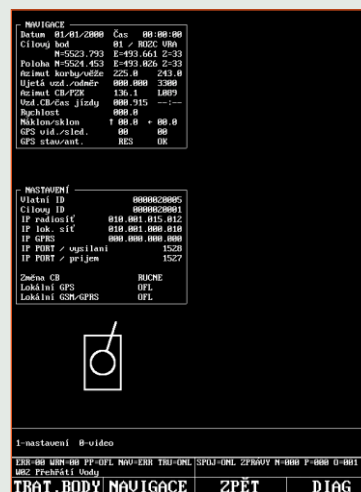
The operator can create/edit dBase of waypoints in this mode.



MAP Mode – Scale 1:100 000



Map Mode – Gamma control  
(map background suppressed)



Menu Mode

### About the company

The company Letecké přístroje Praha, s.r.o. (LPP, s.r.o., Flight Instruments Prague, Ltd.) was established in January 1993. The founders were former employees of the MIKROTECHNA HOLEŠOVICE, a.s., producer of the electromechanical instruments, and AVIONICS DIVISION of Aeronautical Test and Research Institute Prague. The company was founded by experienced specialists in development and production of electromechanical instruments and avionics systems. The owners structure remains up today unchanged – all shares are owned by 9 Czech citizens.

### The main activities of LPP at present are :

- land navigation systems
- vehicle diagnostic/health status systems
- production/service of flight instruments
- variable signs and advertisement devices
- precision machinery
- vetronics
- civilian voice warning systems

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