Moving Terrain

User Manual Version 6.4

Warnings

The greatest of care has been taken in the compilation of text and illustrations for this manual. Nevertheless, the possibility of errors cannot be completely excluded. No form of liability or legal responsibility can be assumed by either the publisher or the authors for incorrect information or its consequences. The publisher is grateful for comments, suggestions and corrections.

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Important advice on the use and possible risks involved with Moving Terrain:

You have acquired a high-performance system for navigational support that will make flying easier than ever before. However, we feel obligated to make you aware of all the associated risks that have been identified by our test pilots.

We have made every effort to ensure that the Moving Terrain system is safe and reliable. The system has been tested under all conceivable flying conditions. However, although neither you nor we may detect any further defects, **no liability is accepted for correct functioning of the system**.

Even if our system proves to be one hundred percent error-free there may still be **dangers due to operating errors** and in particular **manipulation of GPS accuracy** by the operator, the US Ministry of Defense. We are unable to make any kind of prediction or warranty with regard to the **future licensing policy of the GPS operator**.

The Moving Terrain system is a VFR device. It is not safe to fly with this navigational aid under instrument flight conditions unless you have all the mandatory navigational equipment in operation and are flying according to instrument flight rules on instrument routes.

Any non-IFR trained and licensed pilot who flies in IMC is risking his life – with or without Moving Terrain!

Under aviation regulations you are obliged to keep the appropriate **up-to-date charts in paper form on board**. Although we place great trust in the system, our pilots always have the latest ICAO charts at hand.

Manufacturer: Airplus Maintenance GmbH
Flughafen 28
D-88046 Friedrichshafen - Germany

WARRANTY AND LIABILITY ADVICE

This software is to faciliate your terrestic navigation only. It is not a certified aviation equipment and does not replace any aircraft instrument. You are explicitly cautioned to verify that the hardware employed is functioning correctly and does not interfere with the aircraft or other vessel in a hazardous manner. Data errors and computer errors are possible. This also pertains to the Enhanced Navigation Database data and procedures implied in the respective modules. Human error can make the moving map, navdata or any supplemental information incorrect. The pilot in command remains the final authority on the accuracy and sufficiency of the hardware and software.

Warranty and Liability Disclaimer:
The manufacturer, distributor or sales agent resume no liability as to the correct function of the software, the availability of a reference signal (GPS) or the validity of the charts, navdata or any supplemental information like airport information a.o. Never will the manufacturer, producer, sales representative and neither of their staff be liable to you for any consequential incidential or indirect damages (including damages for loss of business profits, business interruption, loss of business information and the like) arising from the use of or inability to use the software even if any of the staff mentioned above has been advised.

There is no warranty, express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose, regarding the software. The entire risk as to the results and performance of the hardware and software is assumed by you.

Notice:
For our Enhanced Navigation Database package a continuous improvement programm is being implemented. If applicable, please contact our Help Desk:
Tel: ++49 - 8376 - 9214-0

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Table of Contents

Quick Reference

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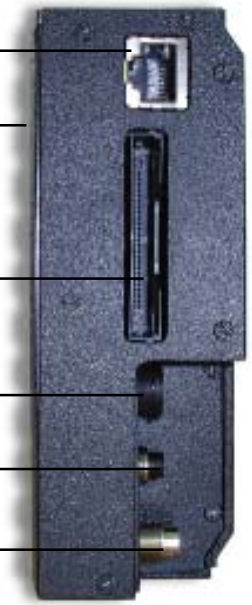
MT-VisionAir Equipment

Front view

Rear view

Side views



Right

Left

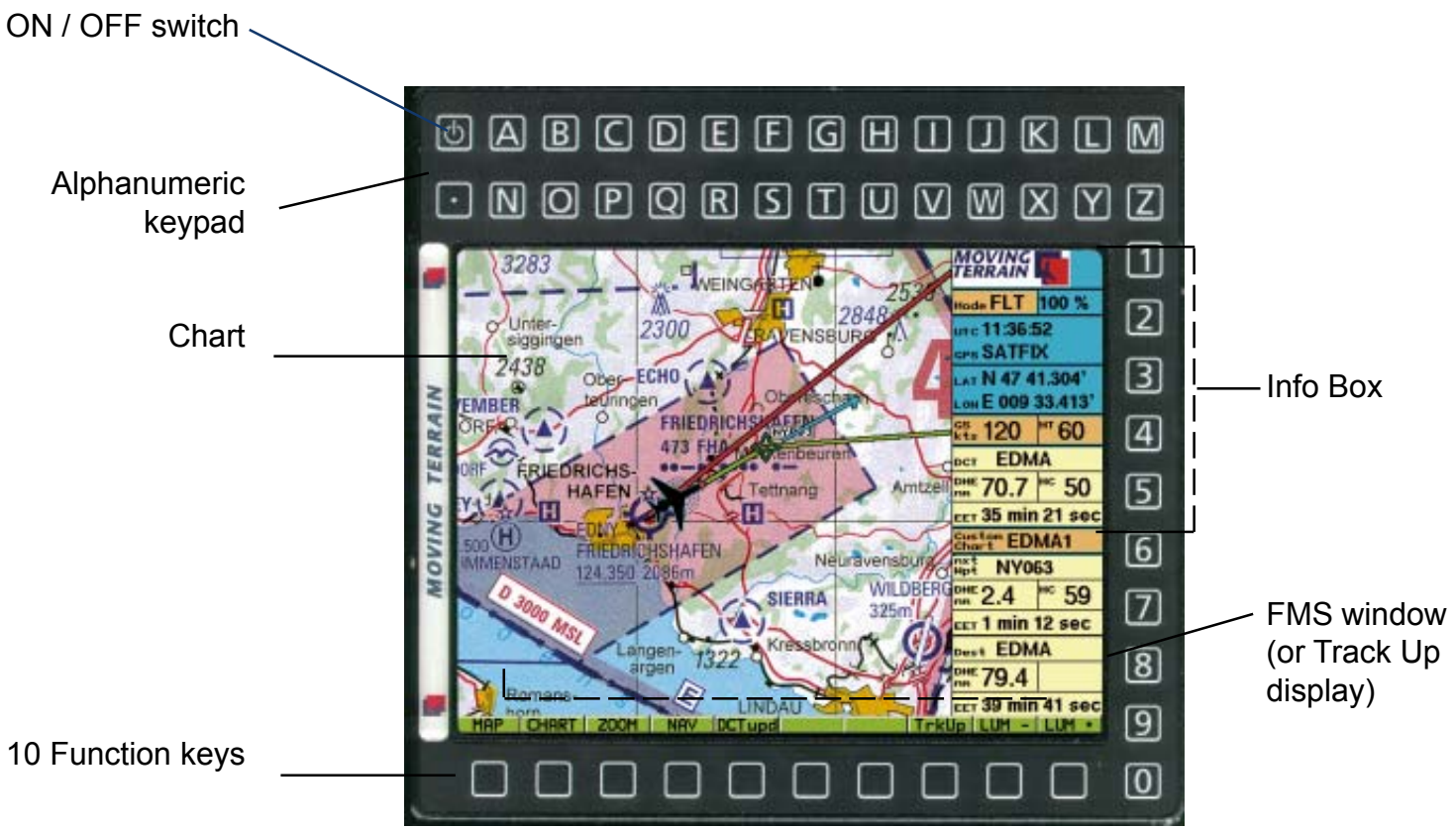
MT-Integral GPS for MT-VisionAir and MT-Ultra

Straight plug for installing GPS in panel

Large, straight DIN plug for MT-Ultra (see Installation Manual)

MT-Ultra Equipment

Front View



Rear view

Cable to Y-adapter:
power connection
GPS port

Rubber feet (for mobile use only)

Fan

Service flap (removed in illustration), closed with 3 bright screws

Connections: PS2 keyboard port VGA Port Remote display Parallel port LPT 1 Serial port COM 1

Connections

Connecting:	GPS		4-pole jack
	Power		2-pole connector (12-28 V aircraft system or 230V power supply unit)

Connecting a different GPS type:

- GPS must have a data output + cable (for transfer of data to your MT system).
- If this is not the case, please contact your GPS dealer to purchase a data cable.
- A special connector for MT systems must be soldered to the GPS.

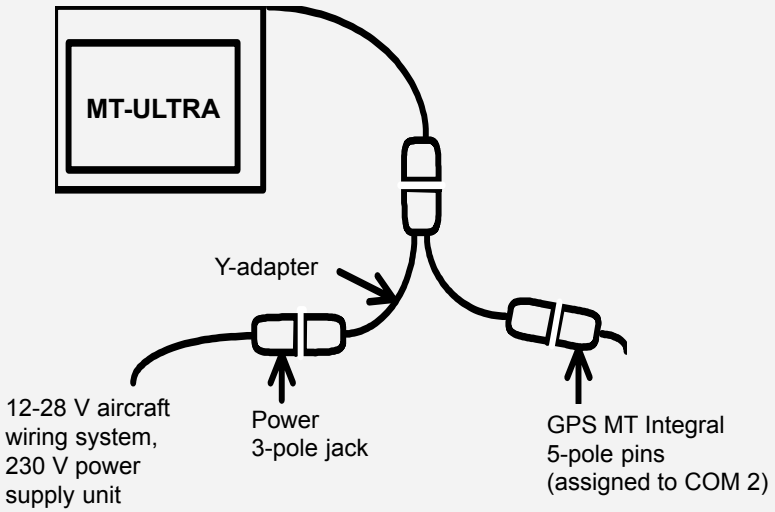
Switching on

Switching on: (also switching off)	**Key**		(bottom right) **Keep depressed for approx. 3 seconds**

Device starts up and lthe following screen will shortly appear:
(continue pg. 16)

Connections

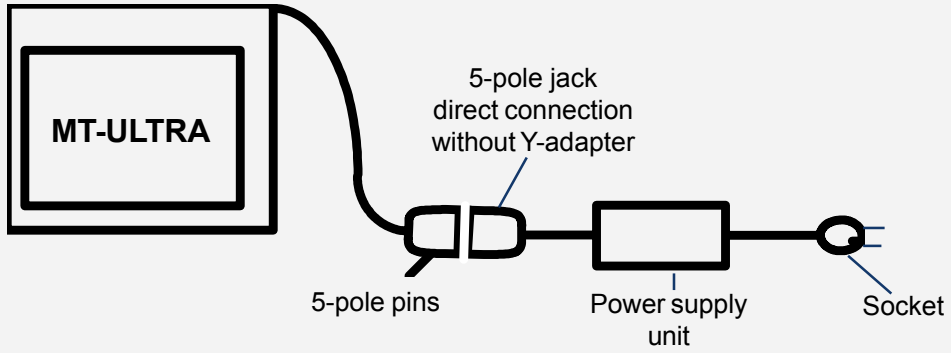
Connecting:



Connecting a different GPS type:

- GPS must have a data output + cable (for transfer of data to your MT system).
- If this is not the case, please contact your GPS dealer to purchase a data cable.
- A special connector for MT systems must be soldered to the GPS.

Direct connection of MT-Ultra via power supply unit to socket



Switching on

Switching on: **Key**  (top left)
(also switching off)

After the device is correctly plugged in and turned on:

AGREE	Press key
FLT	Press key

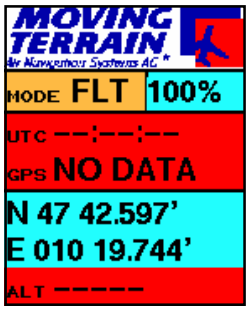
You are now in Flight Mode.

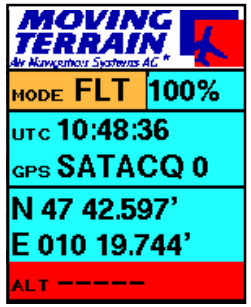
The map will now position itself via GPS, as long as sufficient satellites are available. As soon as the aircraft accelerates past 2 kts, the compass rose will turn into an airplane symbol.

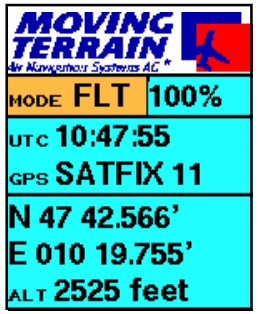
Other entries are not necessary. Have a good flight!

If your system does not immediately position itself on the map, keep an eye out on the following messages in the **Info Box:**

NO DATA : There is no connection to satellites.
SATACQ: Connection to GPS is OK, but not enough satellites to establish a good connection.
SATFIX 11: Positioning is possible. Number indicates the satellites found.
DISTORTED: Distorted data is received (i.e. incorrect protocol chosen)







The two basic modes are distinguished by:

Map Mode: The user controls the chart:
- Chart can be moved with direction keys (EAST/WEST/NORTH/SOUTH).
- GOTO function available at various levels.

Flight Mode: The GPS controls the chart:
- The chart cannot be moved by means of keys.
- Actual position is downloaded from sufficiently many satellites.

Saving custom settings:

Different settings can be saved on your device. They are automatically saved every 10 seconds. Therefore after simply switching off your device, all changed settings are saved. To revert to original factory settings, run the program to **AUX -> RESET.** The following settings are saved: MODE, Position, PreSelected Single Charts, Direct, Brightness, Last Route, Zoom Levels, View Settings (Off-center, etc.), Setttings for Modules.

Definitions:

Base Chart: A map consisting of several pages for larger regions. Displayed on the running system (a large map), available worldwide in a variety of scales. For example: ICAO Europa 1:1500 000, Heli Austria 1:300 000.

Single Chart: Single-page map for a specific field. Examples: Approach Charts, Area Charts or also self-digitalized maps. To digitalize your own charts, please contact Moving Terrain AG!

Navdata: Independent database from Base and Single Chart maps, with choices of VORs, NDBs, APTs and to generate VFR flight routes.

Module: Additional functions to the Moving Map function, which must separately be switched on. In the basic version, these functions are not included. Some functions are also not available with the MT-Ultra device.

Quick Reference

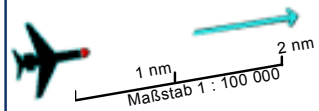
MT-Symbols

Position Symbol Position in the middle of the coordinate cross only in Map Mode. While using the direction keys (NORTH, EAST, etc), the cross changes color. The direction and speed of aircraft is also indicated.

Warning Symbol No GPS data received, only in Flight Mode.

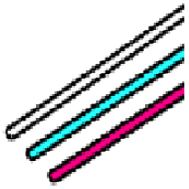
Warning Symbol Distorted GPS data received, only in Flight Mode.

Positions Symbol Displays the actual position using at least four satellites. Only in Flight Mode, when speed is under 2 knots.



Trend Vector Track of the aircraft (light blue arrow).

Aircraft Symbol Lights up after speed greater than 2 knots. The position is marked by the red dot.

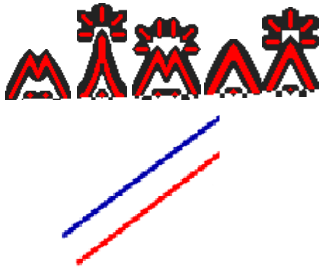


Direct Vector Cyan line = Vector from current position to selected point

Route Vectors

White lines	=	route
Magenta lines	=	active route segments

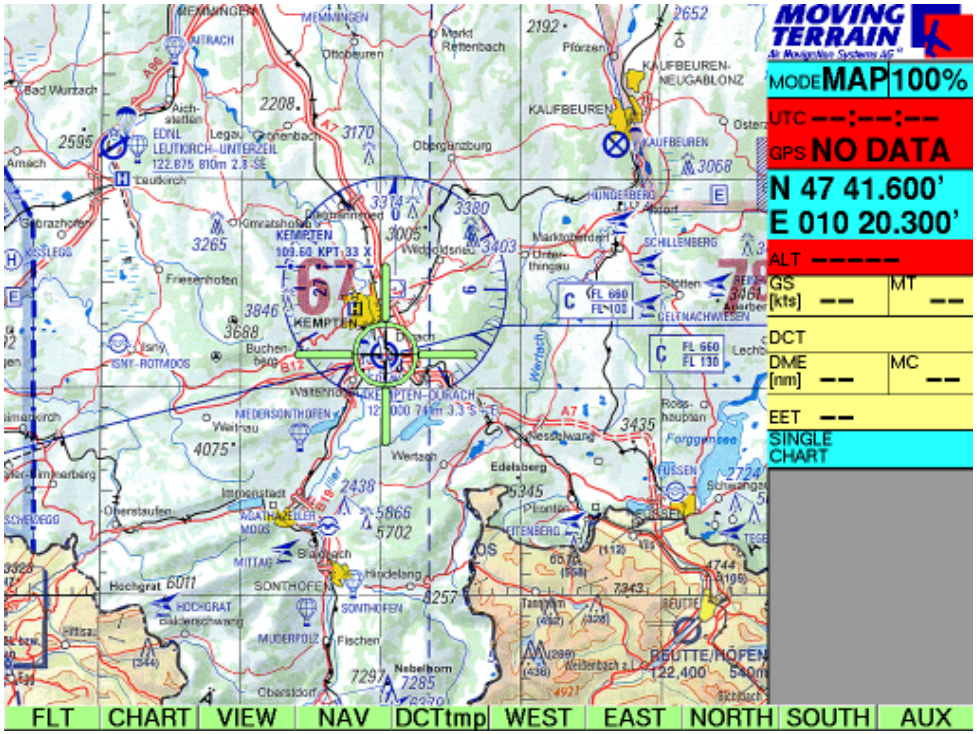
User Waypoint Green diamond: Identifier provided in box.



Obstacles Displayed on the map as layers if the corresponding databank exists:

blue	=	High voltage lines (only with databank)
red	=	Lifts (only with databank)

Basic Menu- MAP MODE



The Infobox

MT-Logo

MT-Mode | Zoom Level

GPS Data

Coordinates in WGS84

True Altitude (ft) above MSL

Groundspeed (kts) | Course (M°) above ground

Endpoint name of direct vector

Distance to destination (nm) | Course (M°) to destination

Estimated time of arrival

Single chart name

Function keys (green): These keys including their functions are described in the following pages.
The function keys are displayed on the left border in the next few pages on this manual for you as an aid. The corresponding category is highlighted.

Moving Terrain Map Mode Basic Layer. From here one can navigate through the several submenus.

FLT

CHART

VIEW

NAV

DCTtmp

Direction Keys

AUX

FLIGHT MENU

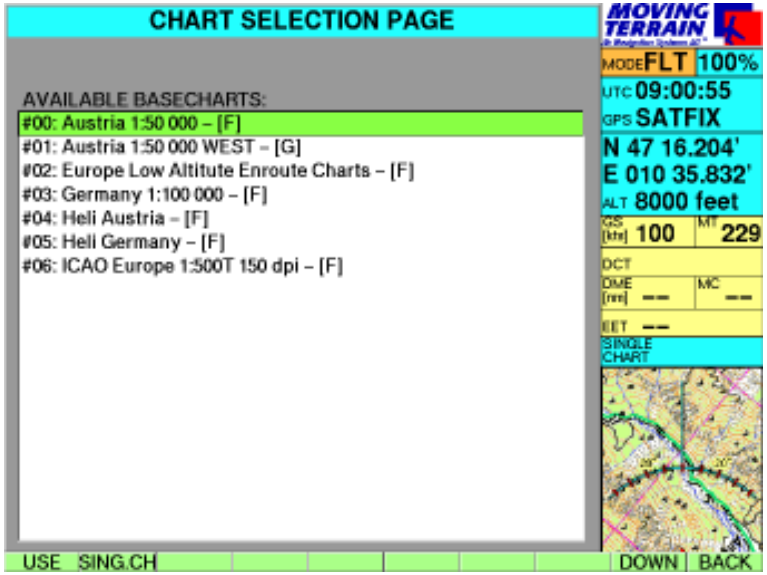
Flight Mode

- FLT Mode: The Moving Map is steered by GPS
- Some modules are only viewable in FLT mode (Rotating)
- The compass rose becomes viewable when activated
- The symbol changes (when speed greater than 2 kts) to the appropriate airplane or helicopter symbol

Function key	Description	Secondary Functions
MAP	Back to basic layer in Map Mode	
CHART	Chart Selection Menu	Singlecharts, Basecharts, EFB
VIEW	View Changer	**Basic:** Compass rose, zoom, hide infobox, off-center mode, MFD mode **Modules*:** Rotating Map
NAV	Nav Page	**Basis:** choose VFR Nav points (APT,VOR,NDB), establish User Waypoints **Module*:** Enhanced Navigation Database, Flight Planning, Enhanced Navigation Database Procedures (SID,STAR,APPROACH)
DCTupd	Direct Update - Direct updata of the current position to the chosen destination	
LUM-	Brightness settings	
AUX	Other settings / Switch to other MFD modules	**Basic:** Waypoints hide, more monitor settings, further modules reset settings, and exit program **Module*:** Track & Flt Log, TCAS, Stormscope, Satellite Radar

* Modules are discussed below in appropriate chapters

CHART SELECTION PAGE MENU



Funktionstaste	Beschreibung
USE	Activates the selected chart and closes the Chart Selection page
SIN.CH	Single Chart selection menu
UP / DOWN	Highlights selected charts
BACK	Back to the previous menu

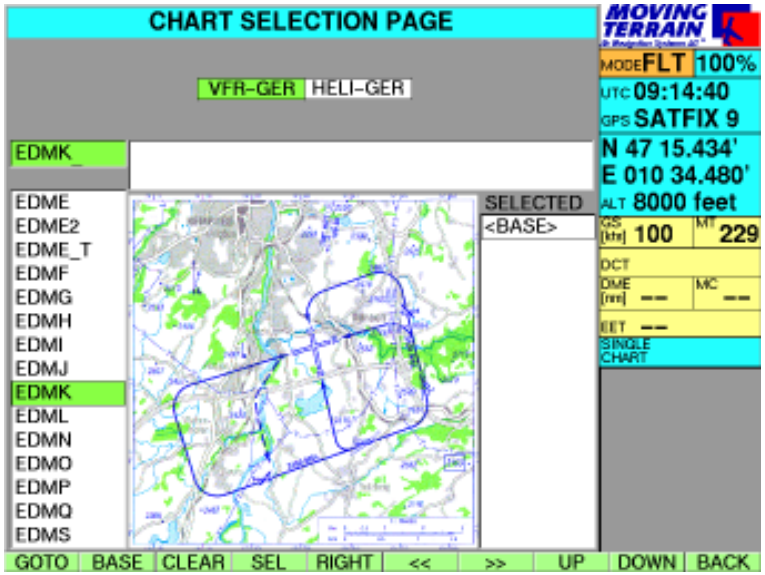
Base Chart Selection

- Switch on the Base Chart

- Also possible in FLT Mode

- In principle, any number of base charts can be installed

CHART SELECTION PAGE MENU



Function Key	Description
GOTO	Activates the previously selected map, displays it, and ends Flight Mode
BASE	Back to Base Chart selection
CLEAR	Erases the last-typed characters
SEL	Selects the previous map and copies the entry in the selected box, for faster access
RIGHT/LEFT	Changes between selected box und map selection box
<</>>	Changes the Single Chart Category i.e. VFR-GER and HELI-GER
UP /DOWN	Sets the highlighted line higher or lower
BACK	Ends the chart selection page

Single Chart Selection

- Map selection via the keyboard frame (maps are named according to ICAO)

- After a selection of several maps, the selected box contents are automatically saved every 15 seconds. The last saved selection is then kept after shutting down the device. To delete, exit program with AUX->RESET from the basic menu

- Confirmation in Flight Mode of the GOTO key exits the selection screen and the selected map is displayed

- In the selected box, the entry <BASE> is found by means of fading out the active single chart and displaying the base chart

- The chart page that was last exited from the Chart Selection Page is always shown

- Only one single chart can be active at a time, but several can be pre-selected

- Single charts are divided into categories such as HELI-GER and VFR-GER (see figure on left)

- If one map is pre-selected, a preview in the middle of the screen is displayed

VIEW MENU

Function Keys	Description
ZOOM+ / ZOOM-	Choose from different zoom levels, from 50% to 600%
MFD	Activate the MFD screen, display in Dedicated Mode
100 %	Zoom back to default setting
CRS- / CRS+	Fade out/in the compass rose
OFF-C / CENTR	Set the position symbol in the middle/off-center on the screen
INFO+ / INFO-	Fade in/out the info box
BACK	Back to the previous menu

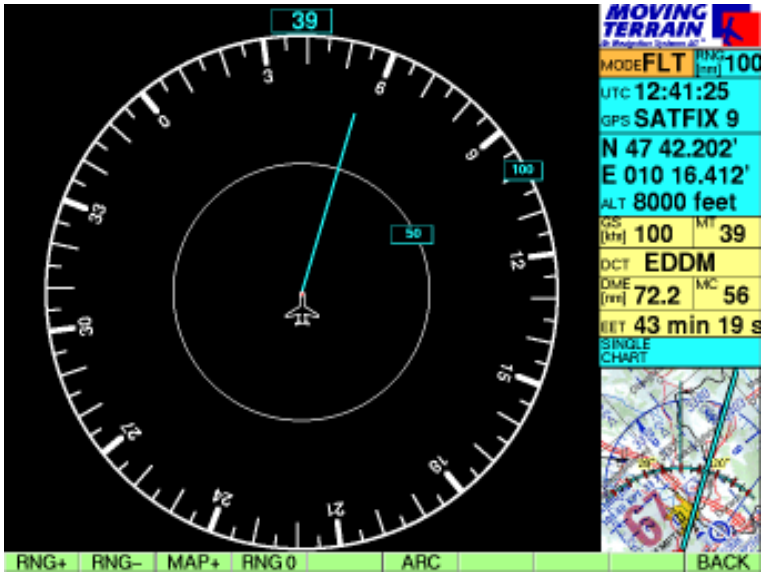
VIEW

- Display settings can be be changed in this menu

- The 50% zoom level can be used for a larger overview

- For better foresight, the „off-center“ symbol can be used

MFD MODE MENU



Function Key	Description
RNG+ / RNG-	Increase/Decrease range
MAP+	Close the MFD mode and display the map
RNG0	Set the range to default setting (10 nm)
ARC / 360	Change the display between a complete circle or an arc
BACK	Back to the previous menu, does not end the MFD!

MFD Screen

- Dedicated Screen: display of the MFD module without maps

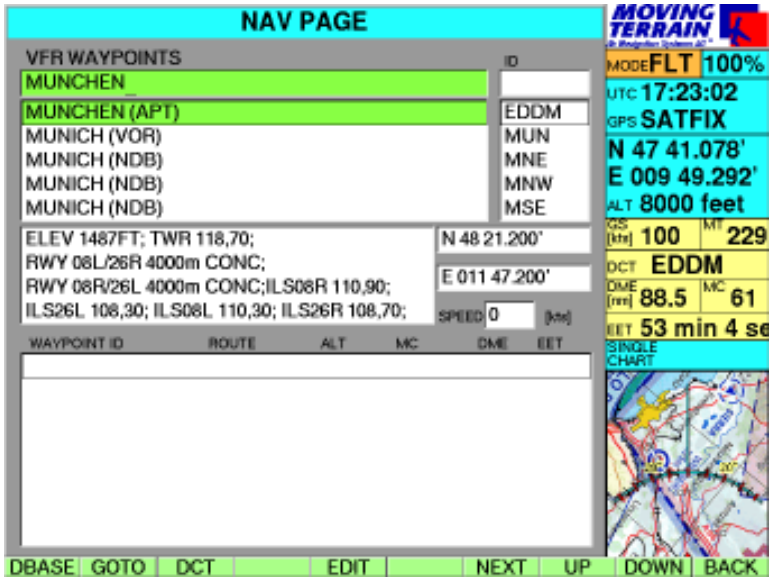
- Compass rose does not turn to the direction of flight

- The track is shown over the compass rose

- Direct and routes (only with an FMS module) are displayed

- User waypoints are shown

NAV PAGE MENU



Function Key	Description
DBASE	Select the highlighted database
GOTO	Jump to pre-selected Nav point (highlighted in green)
DCT	Set a direct vector to the pre-selected Nav point
EDIT	Edit a pre-selected entry (only user waypoints!)
NEXT	Switches the active field (Name -> ID)
BACK	Back the the previous menu

Nav Page

- Entry field left: Full name search

- Entry field right: ID search

- Below: Information field including telephone number, frequencies, runway info, etc.

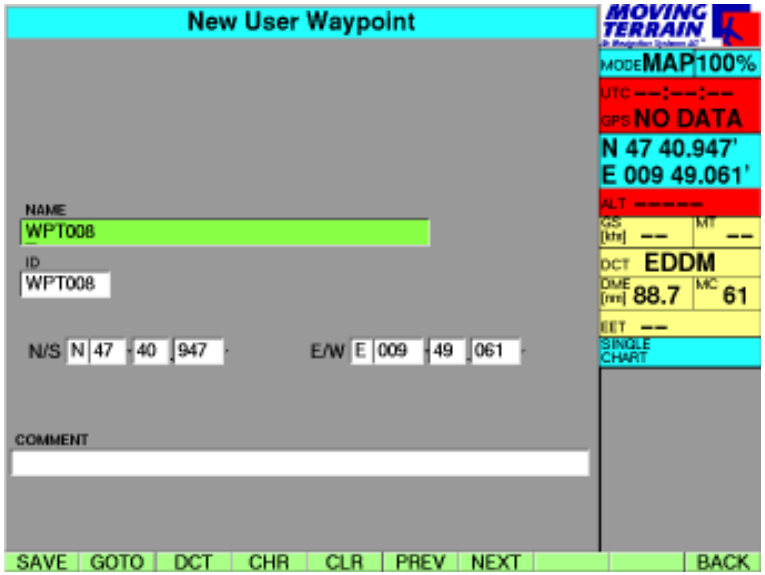
- Name entry on the mounted keyboard

- The lower field displays information on routes and flight planning (only with FMS module connection!)

- VFR Nav data are saved in each default start

- It's possible to set up several Nav databases with user waypoints; green stars display these on the map

NAV PAGE MENU



Function Key	Description
SAVE	Save the current user waypoint
GOTO	Jump to the pre-selected point from the user database, exit the Nav Page
DCT	Display a direct vector from the current position to the pre-selected destination
CHR	Display a character that cannot be entered with the mounted keyboard i.e. point, space, etc.
CLR	Delete the last entered character
PREV	Previous field
NEXT	Next field
BACK	Back to the map, exit Nav Page

Userwaypoints

- Name and ID can be entered

- The displayed coordinates correspond to the current position

- In the comment field, further information on the current point can be entered. This info will then be displayed on the Nav Page info field.

FLT
CHART
VIEW
NAV
DCTtmp
Direction Keys
AUX

Direct Temp

DCTtmp

- Sets up a direct vector at the current position

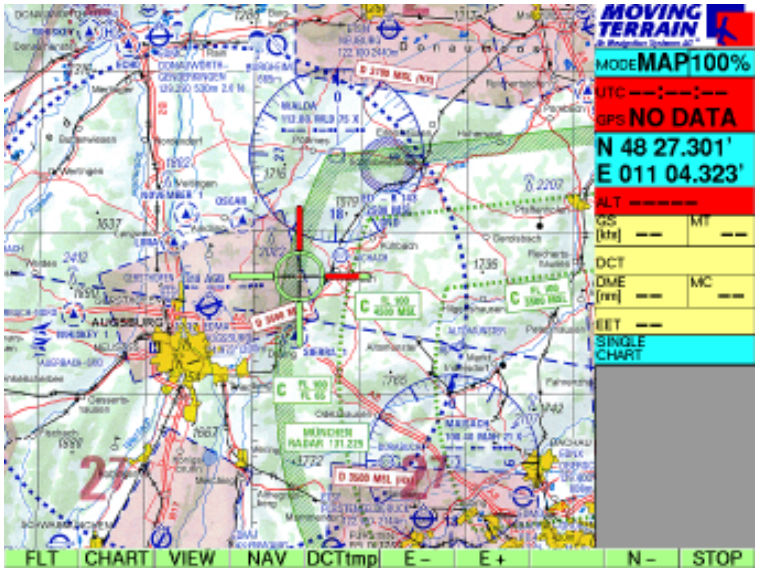
- Allows quick selection of a destination point on the map without specfying waypoints or loading databanks

- The DCTtmp vector head always remains in the middle of the map crosshair

- The direct is displayed as TMPFIX on the right information box

Function Key	Description
DCTupd	This key appears in Flight Mode. The direct vector head can be set up at the current position with this key.

GLIDING MAP MENU



Function Key	Description
EAST / E+ / E-	Increase/decrease speed in the easterly direction
WEST / W+ / W-	Increase/decrease speed in the westerly direction
SOUTH / S+ / S-	Increase/decrease speed in the southerly direction
NORTH / N+ / N-	Increase/decrease speed in the northerly direction
STOP	Stop gliding map

- This function in can be used in conjuction with the DCTtmp function to approach a specific point without the need of a database.

- The map moves with the selected speed and direction until an interruption of change from the user is entered.

- The crosshair in the middle shows the speed and direction of scrolling (red scale).

- A diagonal scrolling path can be chosen with the combination of the keys.

- The scroll speed can be stopped with the STOP button or increasingly pressing the corresponding speed reduction key i.e. with westerly movement, press the W- button.

AUX MENU

Function Key	Description
AUTH	When depressed for 3 seconds, the MT License Manager pops up where on can activated additional MT modules.
DATES	In the event of an available obstacle database, its date will be shown by pressing this key
SETUP	The display of the of the user waypoint symbol is activated/ deactivated on the map
SCR	Monitor settings such as brightness, contrast, night dimming, etc.
RESET	Shuts down the MT program and resets settings to the factory settings
BACK	Back to the main level

AUX

- Authorized/non-authorized modules are configured here (activated/deactivated). For example TCAS; STORMSCOPE, RADAR, TRACK

- By means of the RESET key can the software be set to factory settings

- The SCR key jumps to the screen menu, in which the LUM+/LUM- adjusts the brightness, as well as the NIGHT/DAY activates the night dimming mode of the device. The screen contrast settings can also be set here.

- The settings can also be carried out in Flight Mode

FAQs

Frequently asked questions:

Q: I have a SATFIX with several satellites but the map does not seem to move?
A: You need to be in Flight Mode to activate the moving map display function. In order to activate this function, press the FLT key in the main menu.

Q: My device does not position itself and NO DATA appears in the information box?
A: When using a GPS not provided by Moving Terrain, double check that it's turned on, check that the cable connections are correctly and snuggly plugged in, and if the GPS is sending the correct protocol.

Q: In which voltage range can the MT-VisionAir device be used?
A: From 12- 36 V.

Q: How much power is used with the MT-VisionAir?
A: Approximately 15 W.

Q: I have a chart that I would like to install into my device. Is this possible?
A: In principle, yes. If you send us the chart, we would be glad to make you an offer.

Q: How can I update my charts?
A: MT-VisionAir - Two possibilities:

1. Via the update chip, from which you can let us install the ordered charts
2. Send us your MT-VisionAir

MT-Ultra - Two possibilities:

1. You can acquire an update kit, order the appropriate chart from us and then install it on your own
2. Send us your MT-Ultra

FAQs

Q: How can I determine what software version I have?
A: When you start the system, the License Agreement page appears. On this page, the software version is stated in the top right corner.

Q. Where can I see my device's serial number?
A: When looking at the device from the backside, the serial number is printed on a label.

Q: When I want to acquire additional modules, do I need to send you my device?
A: We can activate several modules simply by telephone, fax, or email, for example, FMS; TRACK; ROTATING MAP, etc. However, other modules require an initial installation (and sometimes additional hardware components) at Moving Terrain.

Q: When I turn on the device, I don't see a map; only a grey background?
A: You are outside the boundaries of the map. For example, when you set the main Germany chart to a scale of 1:200 000 and your actual position is outside the map range, a grey background will appear.

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MT Flight Management System

MT Flight Management System

MT FMS consists of 3 components

- ✓ **Flight planning** via the Nav page
- ✓ **Display of the flight plan** = route on the chart
- ✓ **Flight management** in the FMS window

Flight planning

The flight plan consists of :

- ✓ individual waypoints from the various databases (VFR, IFR, USER, etc.)

and / or

- ✓ routes or route segments already saved.

Composition, storage and loading take place on the Nav Page.

Back on the chart, the FMS provides:

Flight management in FMS window (bottom right) -
Alternatively this window becomes the TrackUp display.

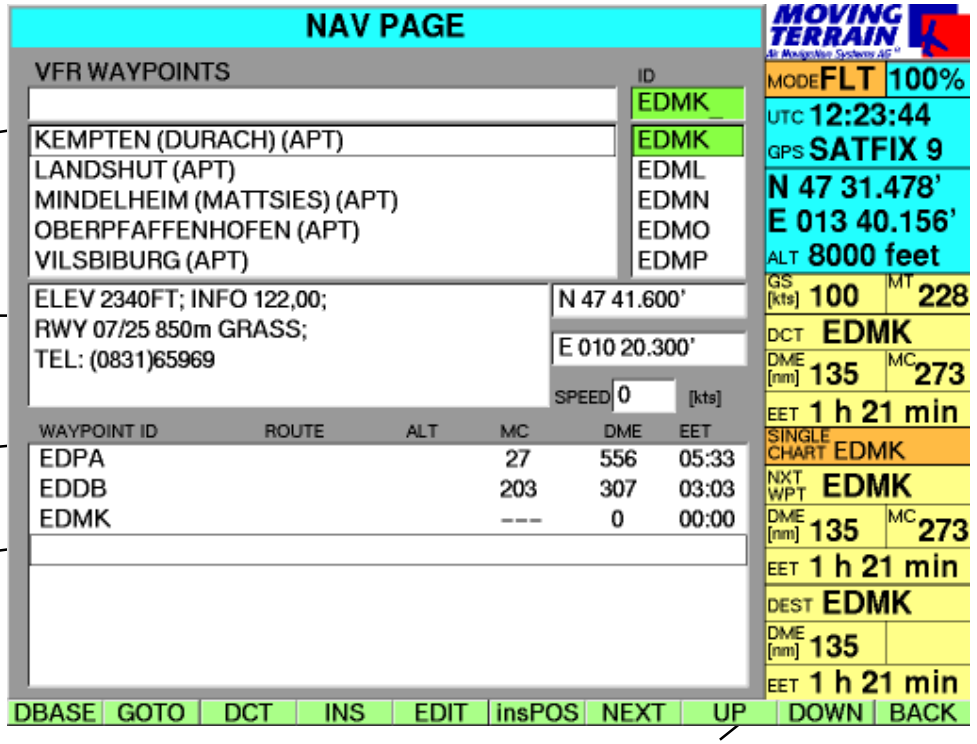
Switch-over knob **TrkUp**/**PLAN** in **VIEW** menu in Flight Mode.

The flight plan is displayed on the chart as a chain of vectors.

Choosing database waypoints

Every NavData point can be chosen (VFR, Enhanced Navigation Database, User).

✓ **NAV** Nav Page



Waypoint-Listing (without Umlauts, Ä=A!)

Infos

Speed

Flight Plan

FMS Window

✓ **Entry of names** via the mounted keyboard
✓ Make corrections with UP/DOWN keys; allows re-entry

Entry of Identifier (four-letter code)
✓ **NEXT**
✓ Entry of identifier in ID field

The coordinates always correspond to the highlighted waypoint, either in the waypoint field or in the flight plan field.
Coordinate entries cannot be distinguished on the page.

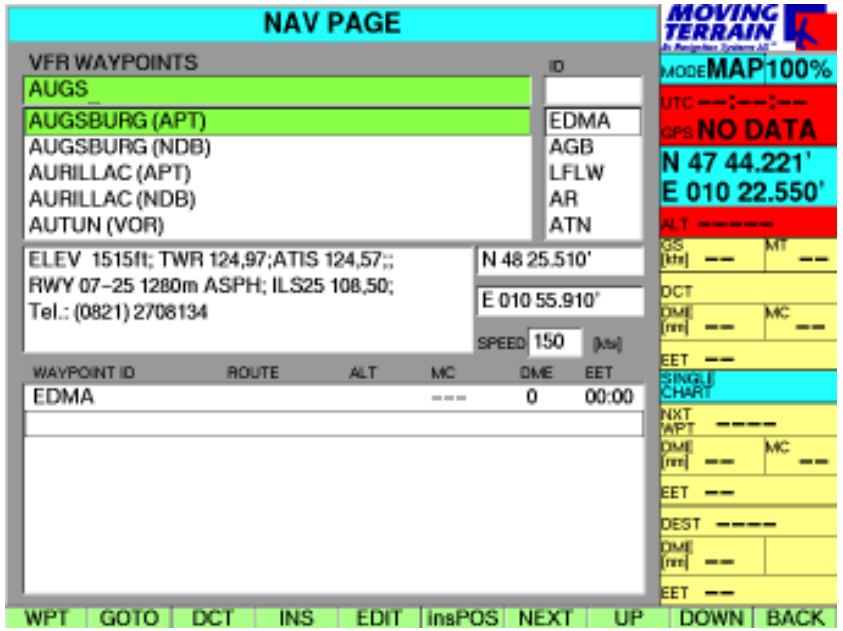
Setting up waypoints in the flight plan

✓ **INS** Waypoints are imported in the flight plan field (placed in the background)

Flight Planning

An Example

Flight plan Augsburg EDMA to Nuremberg EDDN via Walda VOR
Allersberg VOR
Röthenbach NDB



✓ **NAV** Nav page

Enter "AUGS..." => Augsburg (APT) will be highlighted

✓ **INS** Add to the flight plan

Enter "WAL..." => Walda (VOR) will be highlighted

✓ **INS** Add to the flight plan

WAYPOINT ID	ROUTE	ALT	MC	DME	EET
EDMA			39	12	00:04
WLD			---	0	00:00

Enter „ALLERS..." => Allersberg (VOR) will be highlighted

✓ **INS** Add to the flight plan

WAYPOINT ID	ROUTE	ALT	MC	DME	EET
EDMA			39	50	00:20
WLD			4	38	00:15
ALB			---	0	00:00

Enter "ROTHE..." => Rothenbach (NDB) will be highlighted ✓

INS Add to the flight plan

WAYPOINT ID	ROUTE	ALT	MC	DME	EET
EDMA			39	67	00:26
WLD			4	54	00:21
ALB			3	16	00:06
RTB			---	0	00:00

✓ **NEXT** Jump to ID box => database is now sorted by ID

Enter "EDDN" => Nuremberg (APT)

will be highlighted

✓ **INS** Add to the flight plan

WAYPOINT ID	ROUTE	ALT	MC	DME	EET
EDMA			39	74	00:29
WLD			4	61	00:24
ALB			3	23	00:09
RTB			276	7	00:02
EDDN			---	0	00:00

Flight Plan on the Nav page

WAYPOINT ID	ROUTE	ALT	MC	DME	EET
EDMA			39	74	00:29
WLD			4	61	00:24
ALB			3	23	00:09
RTB			276	7	00:02
EDDN			---	0	00:00

WAYPOINT ID Identifier entry

ROUTE Name of route / segments, particularly important for IFR planning

ALT Minimum flight altitude => IFR

MC Magnetic course

DME Accumulative calculation of (remaining) distance to destination (= last route point in the flight plan) in nautical miles

EET Estimated enroute time, calculated using speed in knots shown in the "speed" box. Speed is entered on the keyboard or imported in flight mode from the GPS (see chapter "Speed").

Flight plan on the chart

✓ **BACK** Return to chart

Flight plan = route = white lines from one waypoint to the next

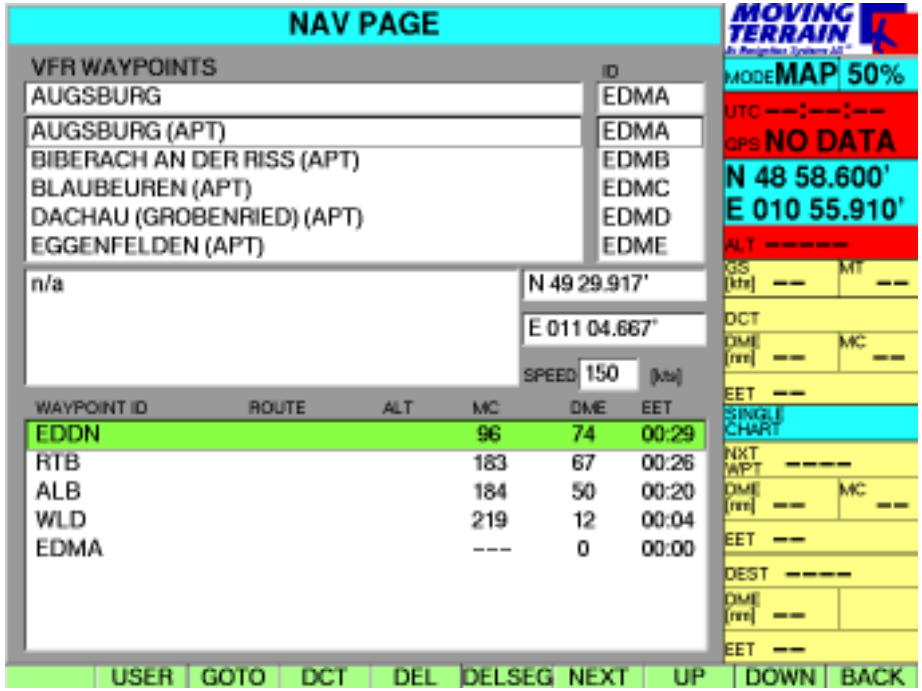
Active leg: Active part of the route from current position (to the next waypoint), shown in magenta

Waypoints => marked with green diamonds and ID: makes flight plan more comprehensible

Editing a Flight Plan

Deleting a waypoint

- ✓ **2 x NEXT** The highlighting bar is positioned in the flight plan box
- ✓ **USER** For loading, saving and deleting user routes, inverting routes
- ✓ **GOTO** "Jump" to the flight plan waypoint (in Map Mode) In Flight mode GOTO becomes ICPT, i.e. an interception course to the selected point is shown
- ✓ **DCT** Waypoint of the flight plan can become destination of the direct vector
- ✓ **DEL** Deletes highlighted waypoint
- ✓ **DELSEG** Deletes route/route segment from screen
- ✓ **NEXT** Goes to next box, "Speed", return to waypoint list
- ✓ **UP / DOWN** Selects waypoints, positions highlighting bar



Inserting a waypoint

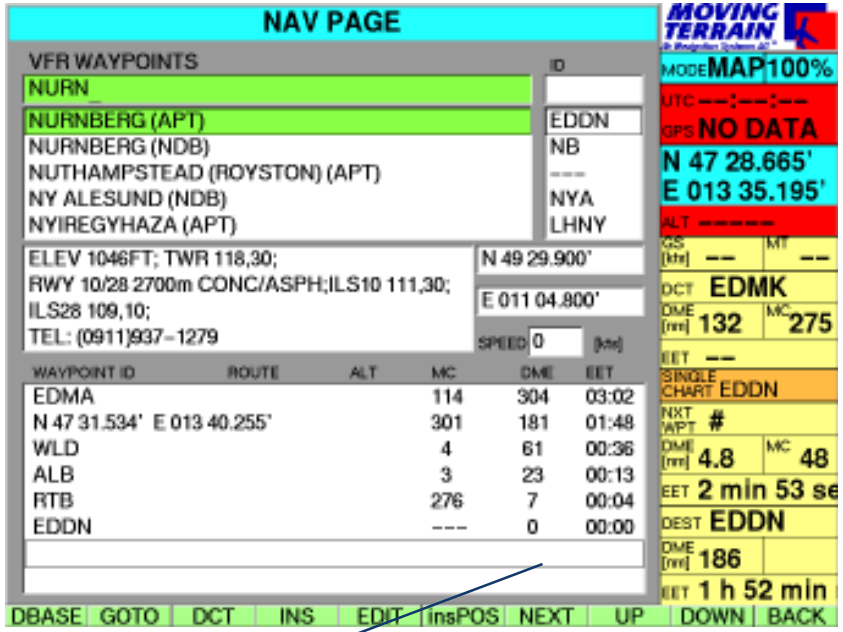
- ✓ Position colored bar on the waypoint of the flight plan ***before which*** the waypoint is to be inserted.
- ✓ **2 x NEXT** Return to waypoint database, select point
- ✓ **INS** Insert into route.

Insert Position = InsPOS

Example

After takeoff from Augsburg, the point NOVEMBER is to be flown over.
The point is not in the database.
Position highlighting bar on EDMA using **UP** / **DOWN** in the flight plan.

- ✓ **GOTO** Return to chart (white vectors mark the flight plan)
- ✓ Use **WEST/EAST/NORTH/SOUTH** buttons to move to the point NOVEMBER on the chart
- ✓ **NAV**
- ✓ Position highlighting bar in the flight plan (press **NEXT**)
- ✓ **UP/DOWN** Position highlighting bar on WLD (position ***before which*** the waypoint is to be inserted)
- ✓ **2 x NEXT** = replaces highlighting bar in waypoint box
- ✓ **insPOS** Inserts current position into plan



=> Effect on calculations

On the chart:

Note:

The position determined by GPS in flight mode can also be incorporated into the flight plan with **insPOS**.

Editing a flight plan

Manual setting of the NEXT WAYPOINT

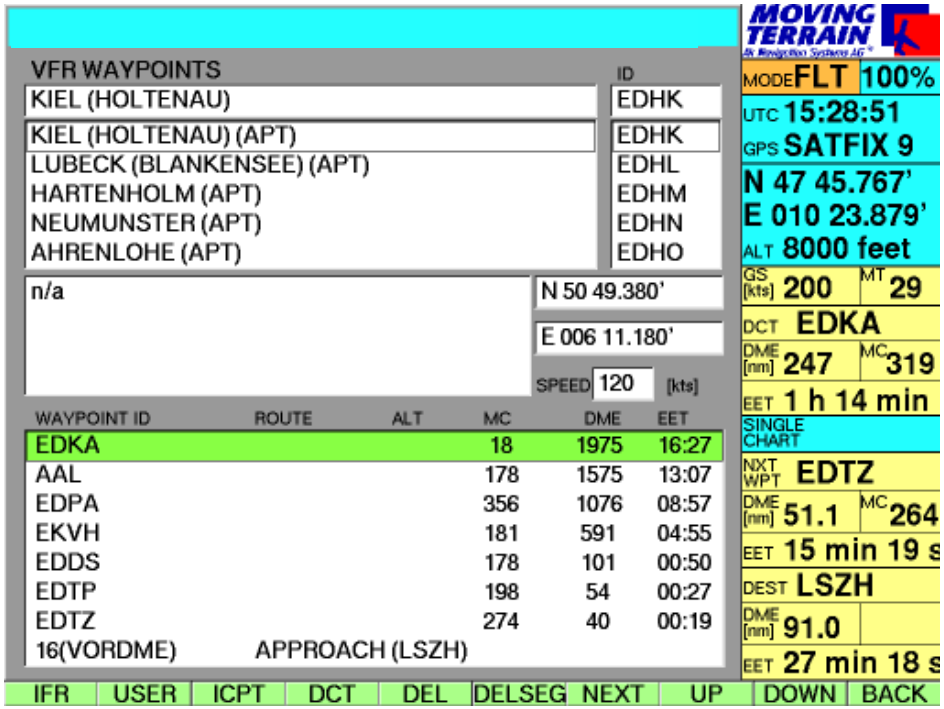
Pressing the key

✓ **ICPT**

defines the current position as the stating point for the route and the selected route point will become the next waypoint.

The route point above the selected point will be ignored

Note:
The ICPT key is only visible when FLIGHT mode is active and the cursor is in the flight planning box.



Deleting a route / route segment from the screen

✓ **DELSEG** **Deletes** a flight plan from the memory or loaded routes/route segments **from the screen** (not from the memory!) => particularly important in IFR planning.

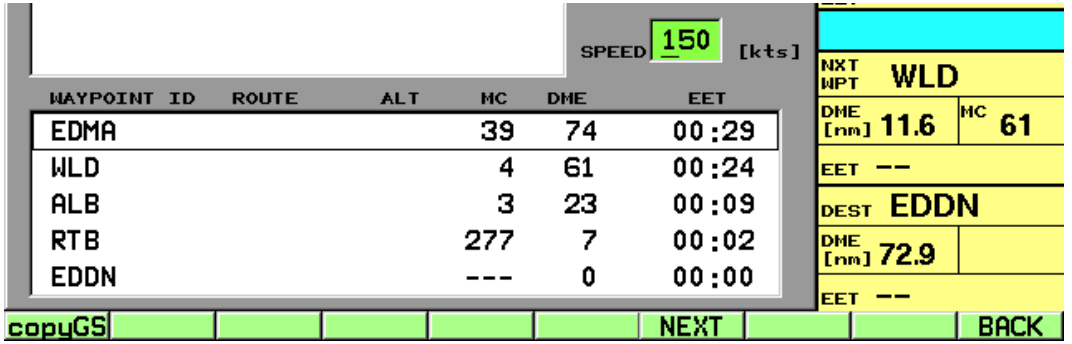
Routes (segments) are loaded additively.
Not all dots can be made visible on the screen.
=> If the calculations in the flight plan box are not correct, please make sure that only the desired route (only 1 x) is loaded (scroll through list with **UP** / **DOWN**!)

Field speed

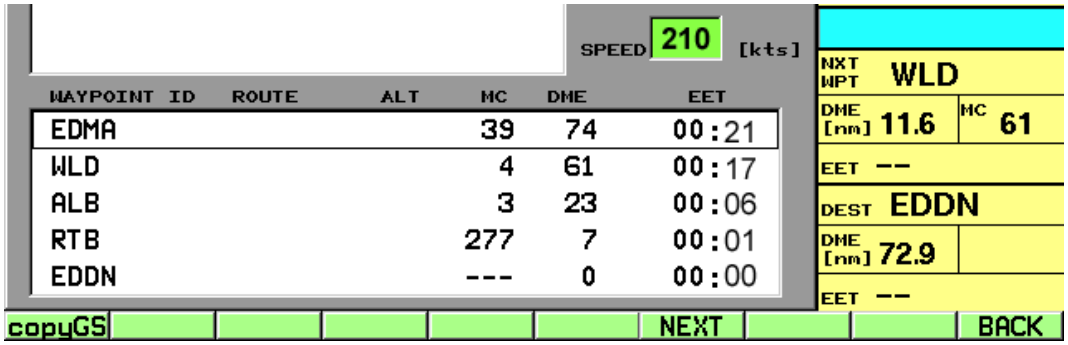
✓ **NEXT** (several times if needed) until highlighting bar is on SPEED

Enter average GS in this box
✓ using the keypad.

Calculation of EET (hh:mm) with the given speed.



GS 150 kts



GS 210 kts

Adjustment of EET to actual cruising speed

✓ **copyGS** Accepts GS from GPS => Updates EET during the flight.
CopyGS only available in flight mode (GPS signals).

Speichern und Laden von Flugplänen

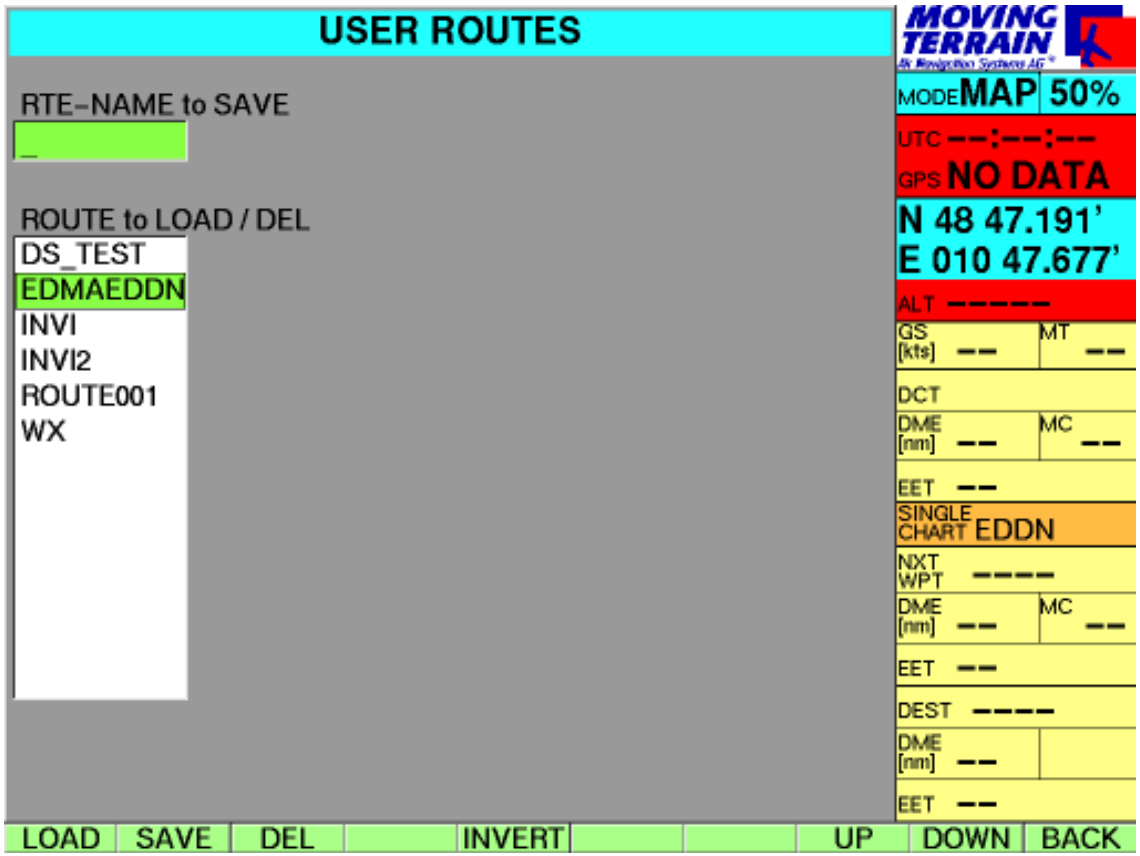
Route / Routen-segment speichern

Preparations: Set up a flight plan

- ✓ Highlighting bar must be positioned in the flight plan box
- ✓ **USER ROUTES page**
- ✓ Enter a name for the route
  - max. 8 characters
  - Assignment of a unique name makes it easier to find
  - Route001, Route002 => auxiliary name (predefined by system)

Made an error?

- ✓ **UP** / **DOWN**, then re-enter



- ✓ **SAVE** Adds saved route to the list
- ✓ **INVERT** Inverts a route already loaded into the flight planning box
- ✓ **BACK** Returns to NAV page

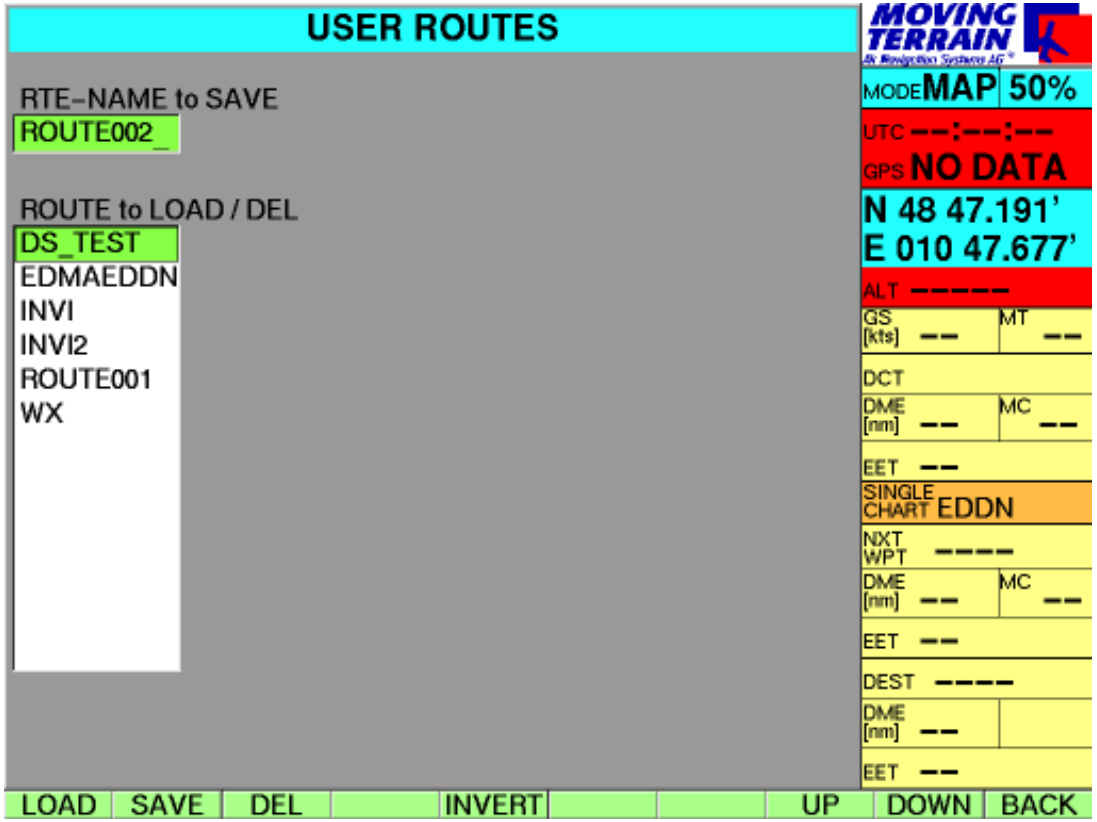
Loading routes / route segmets

Preparation: At least one flight plan must have been previously saved
✓ Highlighting bar must in be positioned in the flight plan box

✓ **USER** USER ROUTES Page

✓ **UP / DOWN** Route selection by positioning highlighting bar

✓ **LOAD**



Routes are loaded additively

If a route has already been loaded, the next route will be ***added*** or ***inserted before*** the highlighted flight plan.

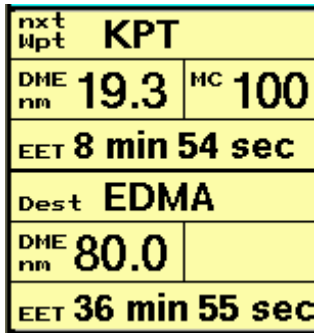
=> Easy **combination of route segments** (arrivals, departures, etc.) (esp. IFR planning)

Deleting Routes

✓ **DEL** Deletes the highlighted flight plan from the memory

FMS window

Flight management system



Next waypoint — Identifier

DME in nautical miles — Magnetic track over ground

Estimated enroute time: remaining time to next waypoint (at maintained GS)

Destination waypoint — Identifier

DME in nm: Remaining distance to destination on planned route in nautical miles*
EET to destination waypoint (at maintained GS)*

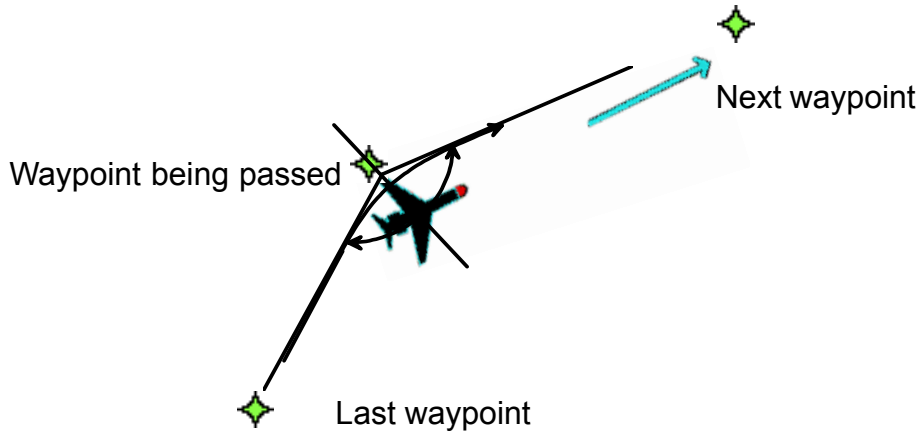
The information in the FMS window always relates to the current position shown on the chart, i.e.:

1. the position determined by the GPS receiver *or*
2. the targeted position on the chart in Map Mode.

When you switch to map mode in order to “explore” the surrounding area on the chart, waypoint data will be continuously recalculated.

Next waypoint

The waypoint ahead of your present position in the entered flight plan.
The system determines the next waypoint when it flies over or past a point in the flight plan. Specifically, flying past means flying over the bisector of the angle formed by the waypoints which are behind, level and ahead of you = next waypoint.

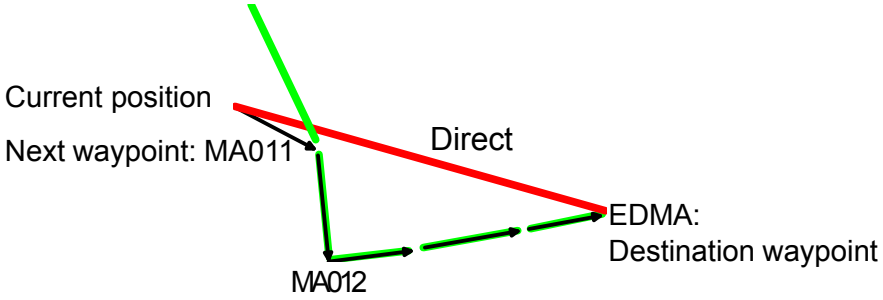


Destination waypoint

Calculation of navigational data DME, MC, EET

Switching to TrackUp window

The last point in flight planning (route destination).



Difference in route calculation DCT / flight plan

Direct: Shortest distance (great circle) between current position and destination (light-blue line)

Next waypoint: Data determined as direct to next waypoint.

Destination waypoint:
Direct from position to next waypoint. From here the route and time to destination are calculated point for point according to entered flight plan (specification of an MC is not necessary).

- ✓ Switch to TrackUp window in flight mode ✓ **TrkUp** return with ✓ **FMS**.
- ✓ Once a mode is active, it will always be displayed at all levels in map or flight mode.
- ✓ It will remain active until you change to another mode.

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MT Enhanced Navigation Database

MT Enhanced Navigation Database ENav Data

MT ENav Data

MT ENav Data based on the MT FMS module

Please read the information in the previous chapter about:

- ✓ **Flight planning** via the Nav page
- ✓ **Flight managementt** via the FMS window
- ✓ **Display of flight plan** = Route on the chart

In this part of the manual the emphasis is placed only on extension to include ENav Data navigation.

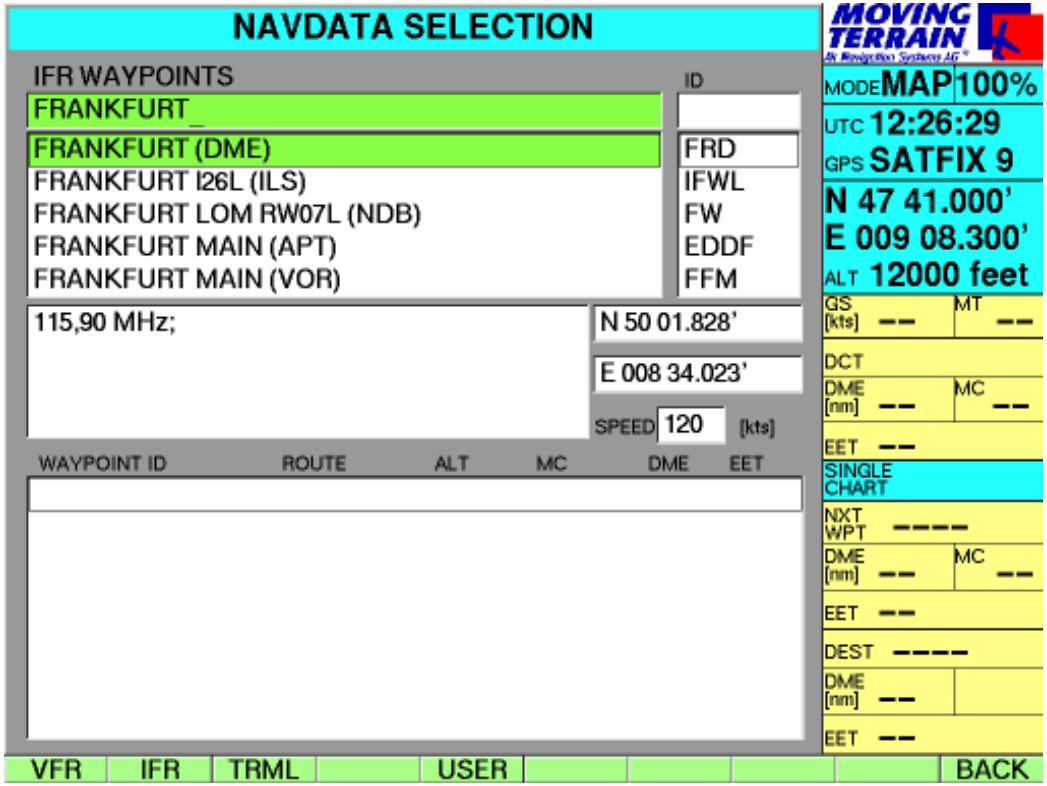
Stored Nav data can be retrieved in the Nav page:

- ✓ **NAV**
- ✓ **WPT**

✓ **ENav Database** consists of:

Enroute waypoints	(ENR)
Airports	(APT) *
VORs	(VOR)
NDBs	(NDB)
DME	(DME)
ILS	(ILS)
TACAN	(TAC)

* APTs with ENav Data procedure and **RWY longer than 4000 ft**



Enhanced Navigation Database Terminal Waypoints

✓ **TRML** Terminal waypoints are selected through the APT*

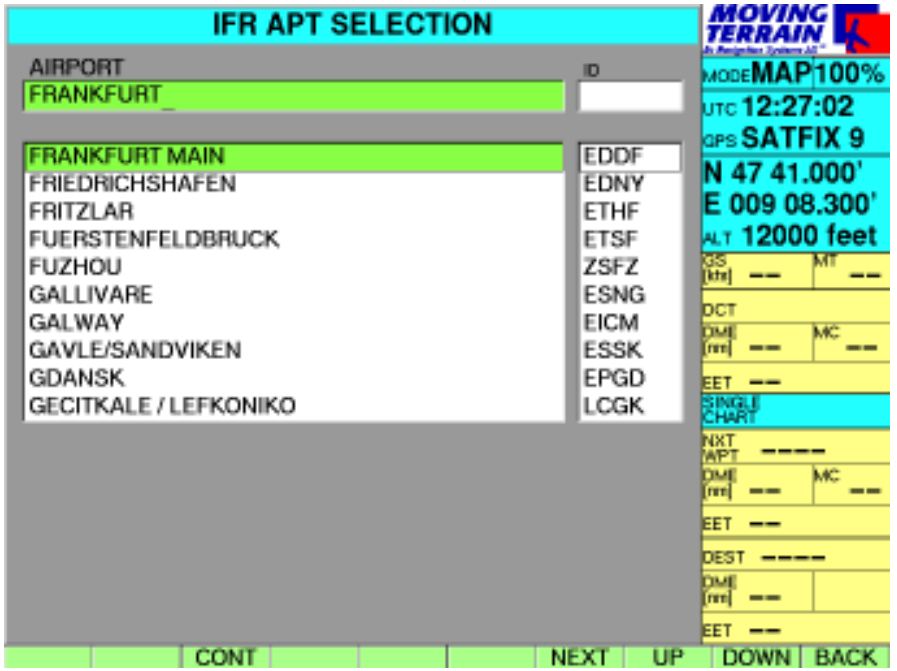
*APTs with ENav Data procedure and RWY longer than 4000 ft

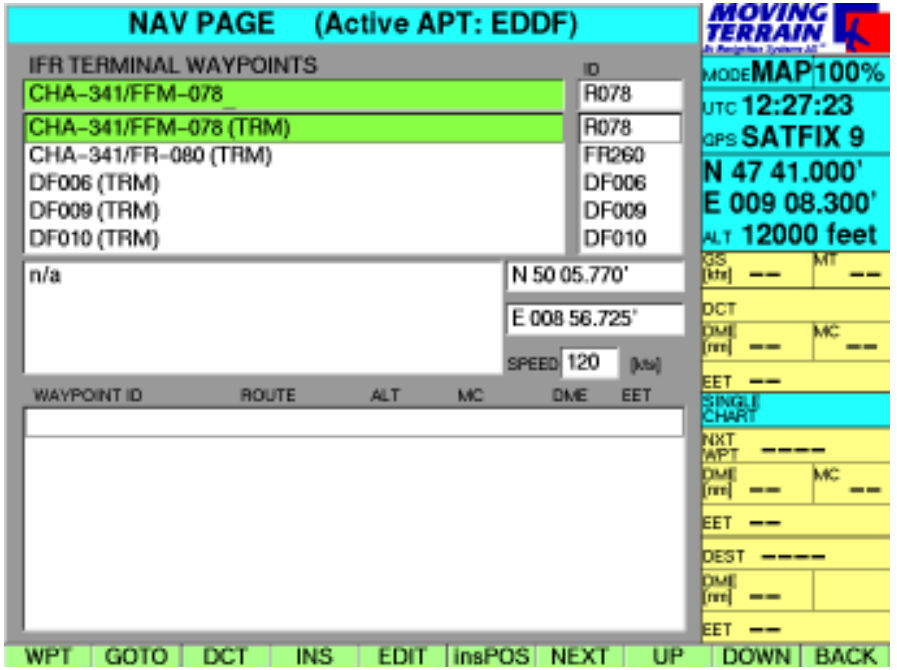
The airport must be selected on the:
IFR APT Selection Page
using the **UP** / **DOWN** keys on the integrated keypad
or
✓ **NEXT** ID box
Enter ID, then data by ID
= 4-letter-code
=> Highlighting bar must be on the desired airport

✓ **CONT**
Listing of terminal waypoints to the selected APT (by name or ID)
Select a waypoint

The terminal waypoint database contains
Terminal waypoints (TRM)
Locators (LOC)
Runway waypoints (RWY)

The "**Active APT**" relates to the:
Terminal waypoint database (TRML)





Enhanced Navigation Database Procedures

Active Airport

The „Active APT“ relates to: **Terminal Waypoint Databank**

Terminal procedure
- SIDs
- STARs
- Approaches

Once selected, the APT remains the “**active APT**” until you select a different one of quit the MT program.

“**Active APT**” simplifies your work: all selected the waypoints and procedures apply to this airport.
=> Your selection does not need to be repeated!

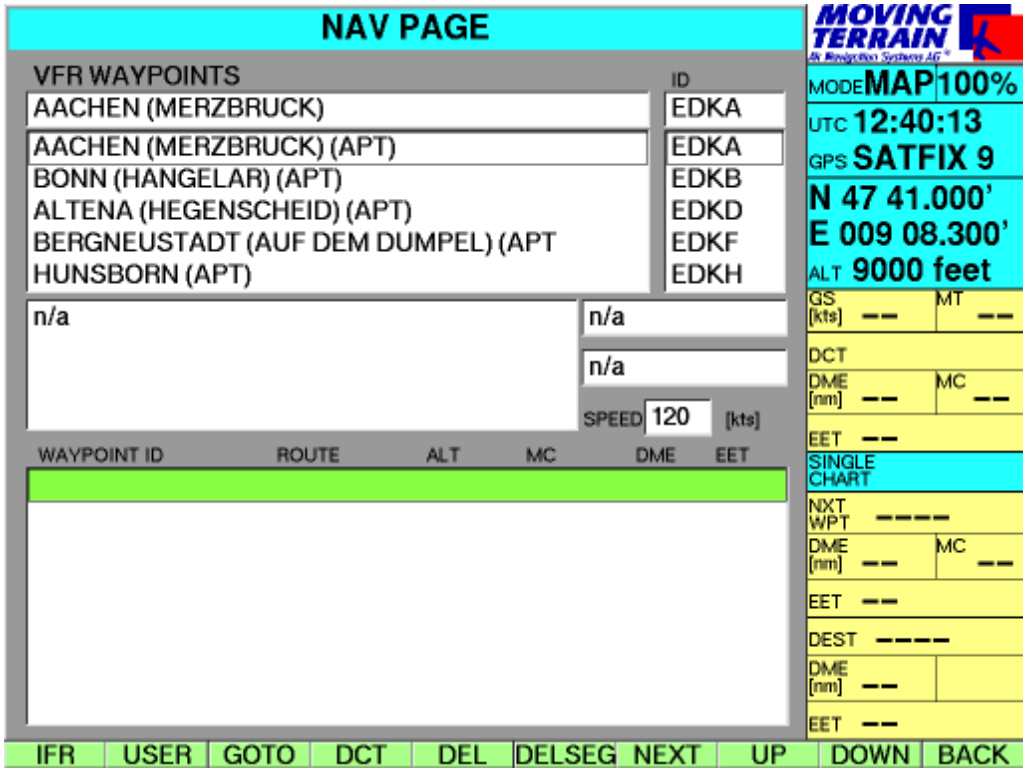
Enhanced Navigation Database Procedures

ENav Data procedures are basically treated as routes / route segments
(see FMS User Manual)

and are thus stored in their own completely separate database.

- ✓ **NAV**
- ✓ **NEXT**
- ✓ **NEXT** highlighting bar must be over flight plan window

- ✓ **IFR**



SIDs
STARs
Approaches

Loading
Procedures

The choice now includes:

- ✓ **SID** Standard Instrument Departures
- ✓ **STAR** Standard Arrival Routes
- ✓ **APPR** Approaches

Important: The SID, STAR and APPR keys are only visible if this procedure is available for the selected APT. For Eggenfelden (EDME) the STAR key would not be visible.

Example **SID**
The “active APT” has been preselected (in our example Friedrichshafen EDNY).

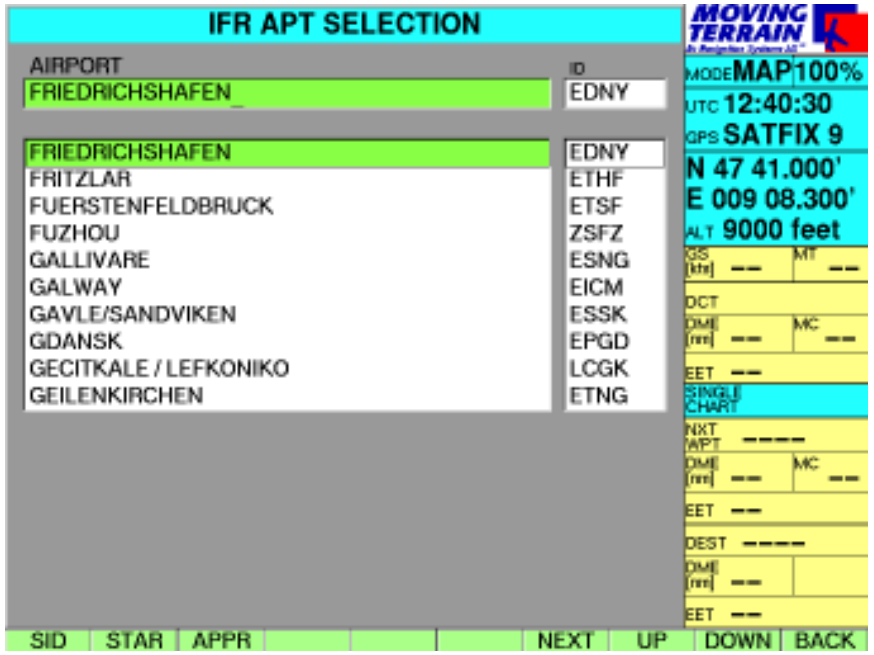
MT lists all procedures of one type (here **SID**)

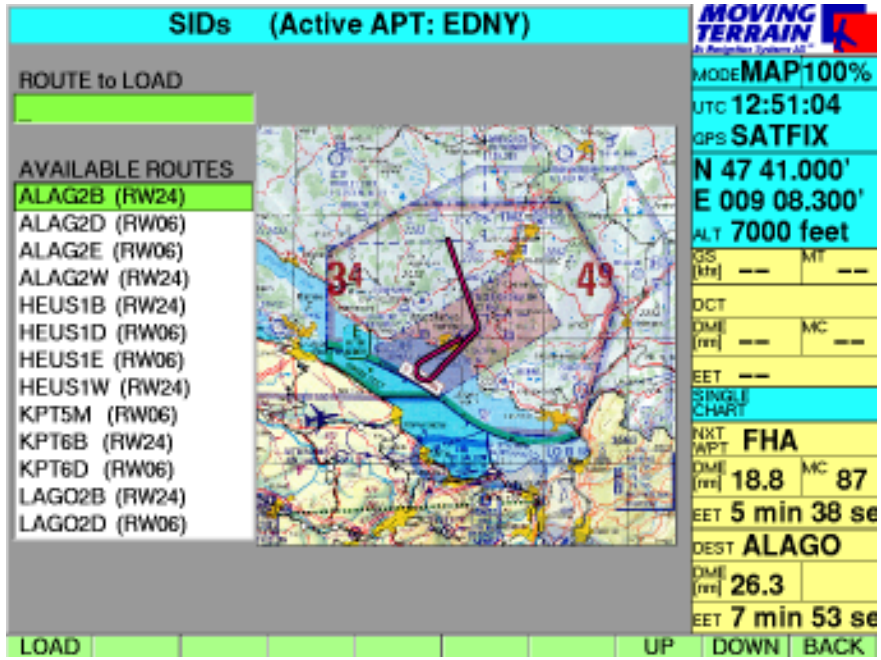
A detailed section on the chart gives you an overview of the procedure to be flown.

Scroll through the various procedures with **UP /DOWN**

Select the desired procedure by entering the name or scrolling **UP /DOWN**

- ✓ **LOAD** Example **ALAG2B**





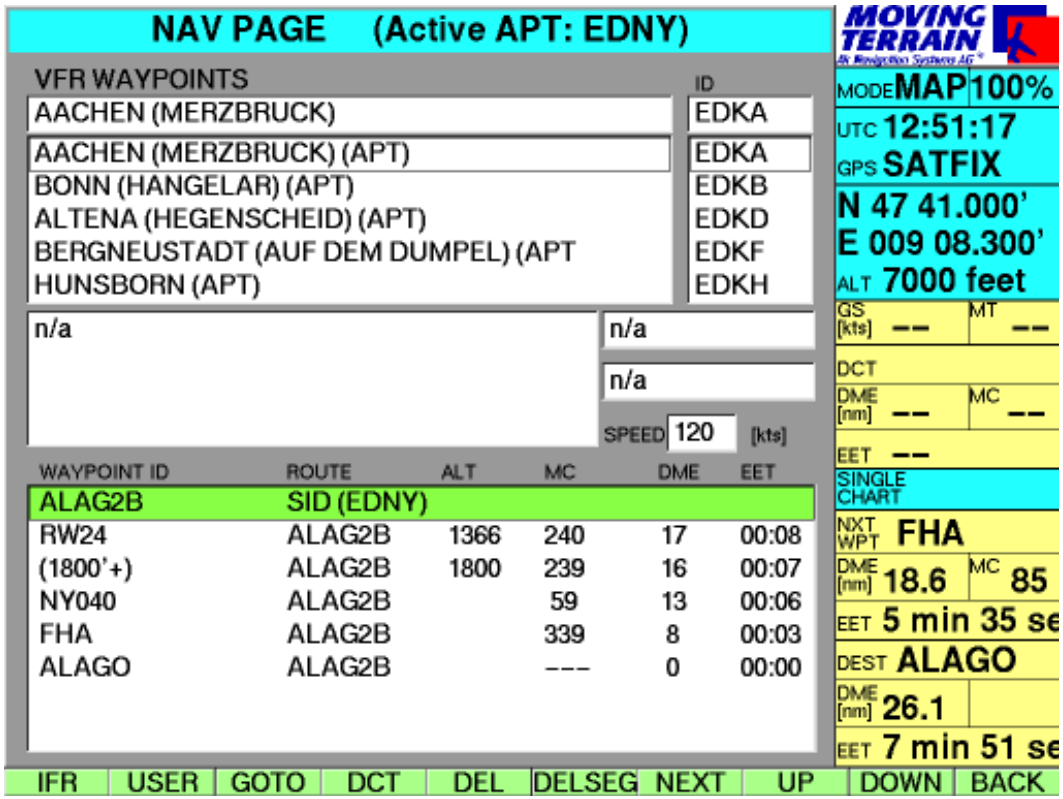
Once the procedure has been activated, you will see it in the route box as shown here.

The procedure consists of more waypoints than can be displayed in succession on the screen at one time.

Go to the start (title) of the route with **UP**

Go to the end of the route with **DOWN**

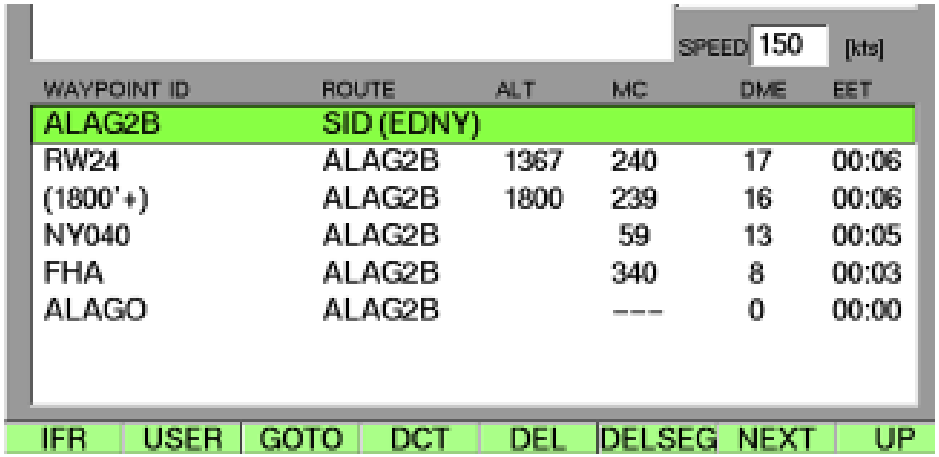
To see the route on the desired chart, press **GOTO** to jump to a point (map mode) marked with **UP/DOWN**



Display of the procedure on the Nav page

Description of the flight plan box:

Title of every route (procedure) saved in the fixed database



Example:
- Name of the route (6 characters)
  ALAG2B
- Type of procedure
  SID
- followed by APT in brackets
  (EDNY)

Below this is the waypoint listing

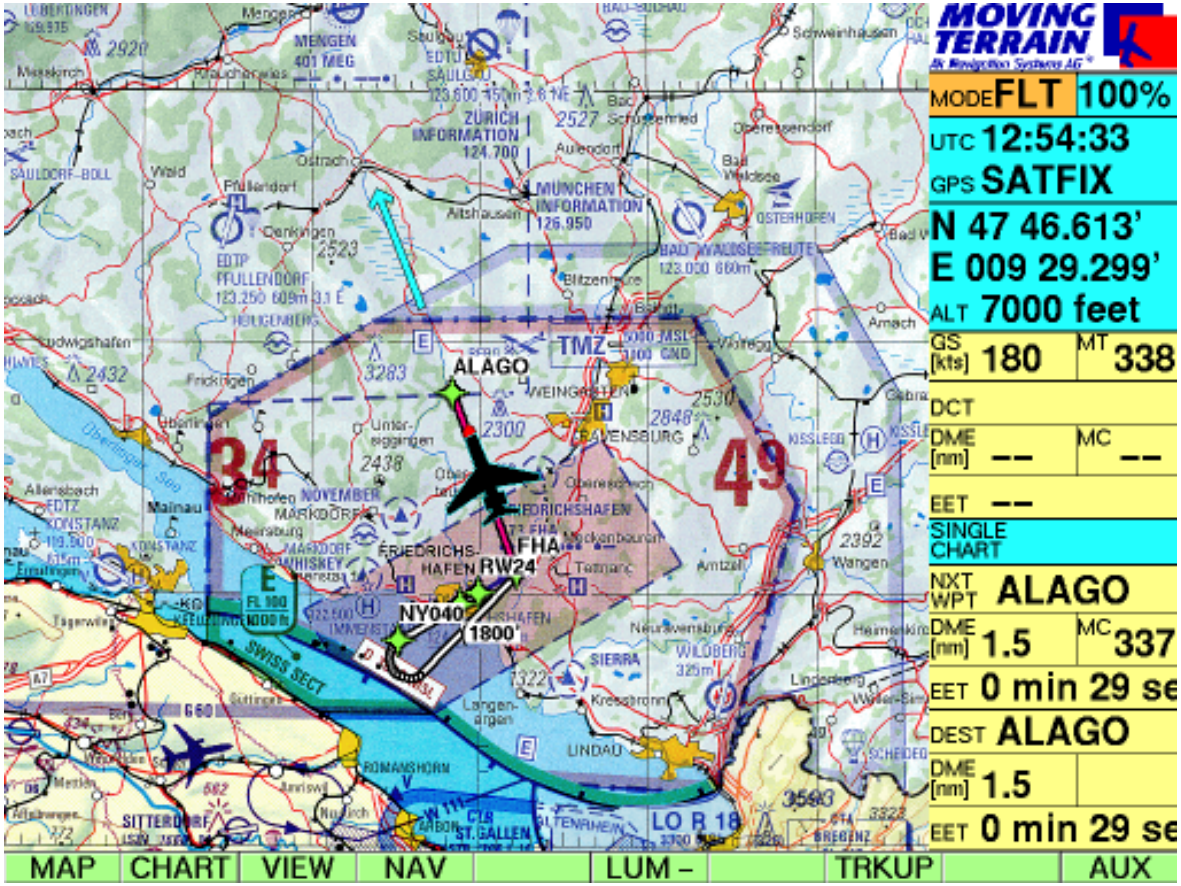
Waypoint ID
Name of the **route**
ALT Minimum altitude
MC Magnetic track
DME in nm
EET calculated from the GS entered in the “Speed” box

Recommended/ minimum altitudes

Minimum altitudes are provided by way of recommendation only.

EET calculation in the flight plan

Example SID ALAG2B Friedrichshafen



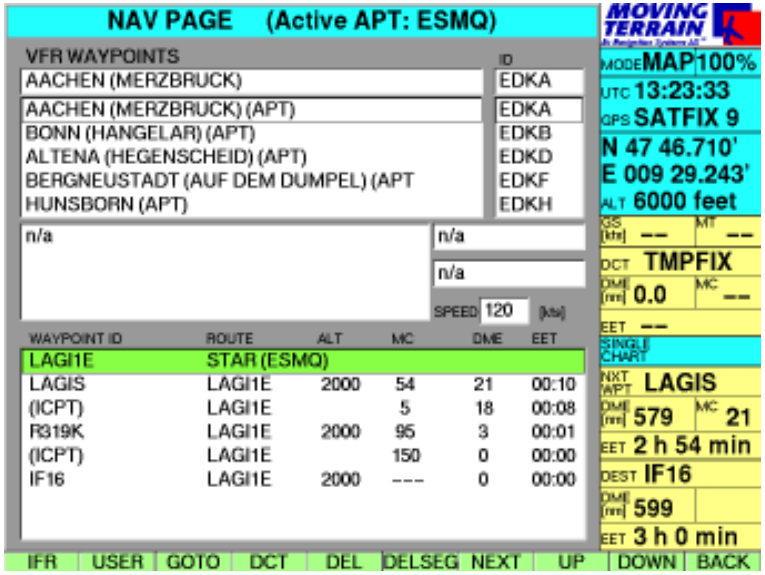
The route display is not a point-to-point guide, but rather the conversion of instructions into vectors that accurately project flight management onto the chart:

The display functions on charts of various scales, likewise on DFS approach charts.

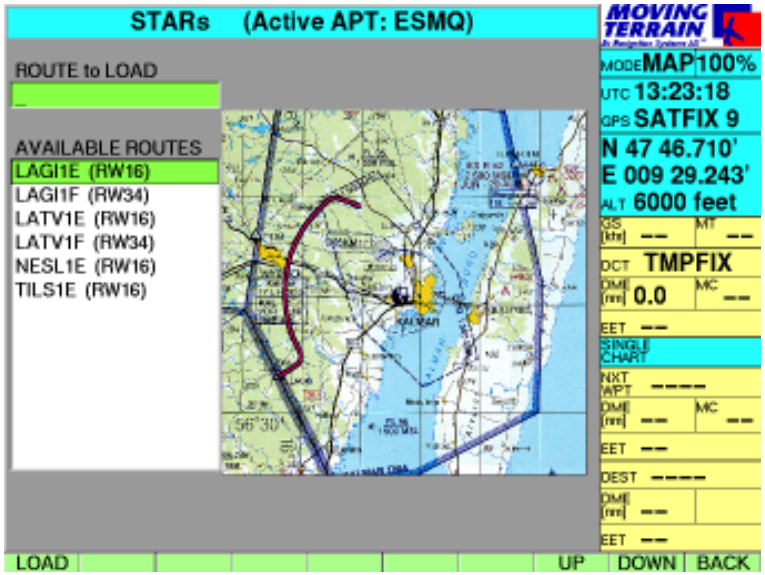
Besides the green routing, the IDs of the terminal waypoints are also shown. This ensures perfect orientation. The DCT to a waypoint further ahead can easily be traced on the chart and created on the NAV page at the touch of a button.

Example of a STAR

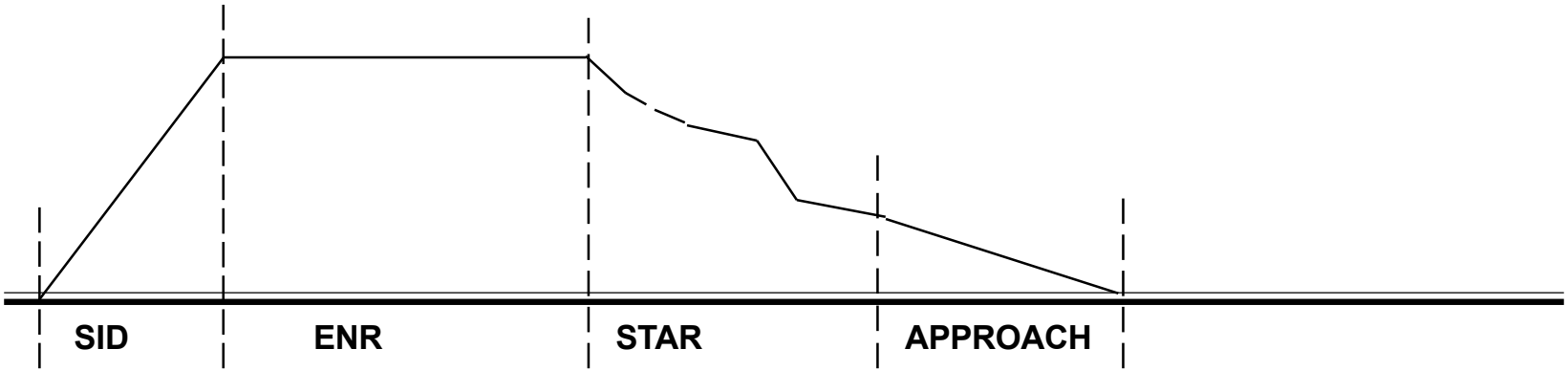
Example**STAR LAGI1E**
Kalmar (ESMQ)
on the Nav page



Eample **STAR LAGI1E**
Kalmar (ESMQ)
on the STAR page with preview



Example **STAR LAGI1E ARC DME**
Kalmar (ESMQ)
ARC DME on the chart



Route segments

SID, **STAR**, **APPR** are predefined procedures: - for finding in the database under the name
- for combining by additive loading.

Procedures are always tacked together **additively**.
Complete procedures cannot be inserted into a procedure which has already been loaded. In this case the newly selected procedure replaces the one originally selected (**DELSEG** is then superfluous).

Enroute

ENROUTE waypoints are addied individually to the route as required:
✓ **NAV**
highlighting bar must be in the route box ***on the point*** (waypoint or name of a procedure), ***before*** which the **ENROUTE** waypoints are to be inserted.

✓ **NEXT (2 x)**
✓ **WPT**
✓ **IFR** Selects WPT database ENav Data
Selects (**ENR)** waypoints

✓ **INS**

Subsequent enroute waypoints are treated as a **route segment**:
=> can be deleted altogether with **DELSEG**.

Inserting Waypoints

Single waypoints may be inserted into existing procedures (not complete procedures)

1. Highlight the waypoint of the RTE ***before*** which the new waypoint is to be inserted.
2. 2 x NEXT highlighting bar must be in the waypoint window
3. Select waypoints (name, ID or **UP** and **DOWN**)

If waypoints are inserted into fixed procedures, no procedure turns can be calculated and plotted for these points on the chart.
=> Plotting of **point-to-point guidance** known from VFR FMS flight management.

Deleting Waypoints

An individual waypoint can be deleted with
✓ **DEL** after it has been highlighted.

Since procedural instructions may be distorted by inserted or deleted waypoints, if a misleading display appears the finished procedure should be reloaded.

Deleting Complete Procedures

Procedures no longer required can be deleted with
✓ **DELSEG** aus dem Flight Plan (bleiben im Speicher bestehen).

Setting up and saving your own flight plans

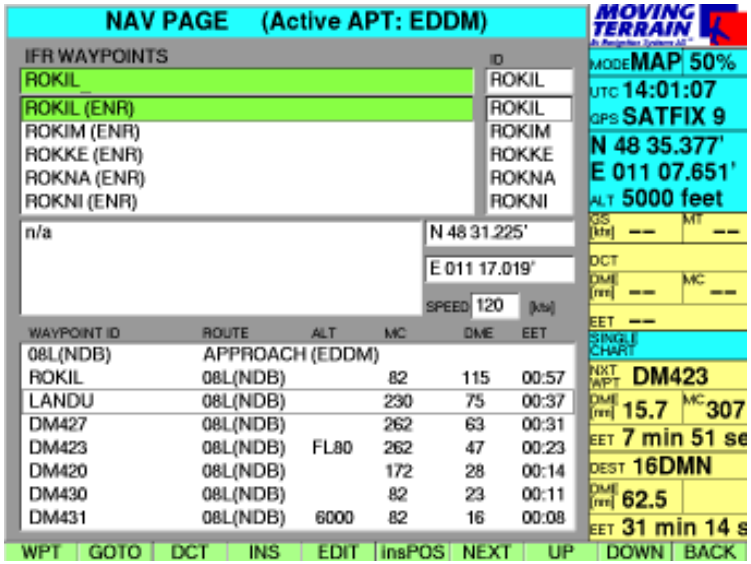
All ENav Data waypoints can be used to put together **USER** routes.

USER routes / route segments are displayed in point-to-point routing.

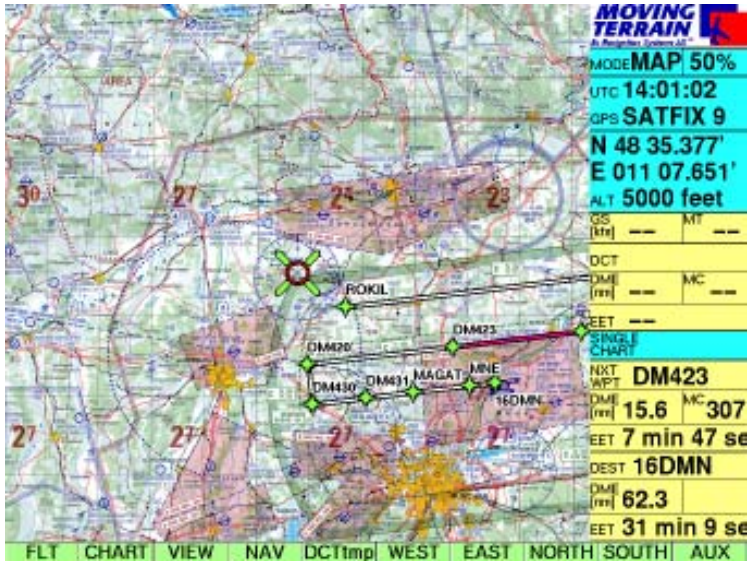
Waypoints may be inserted into an existing procedure

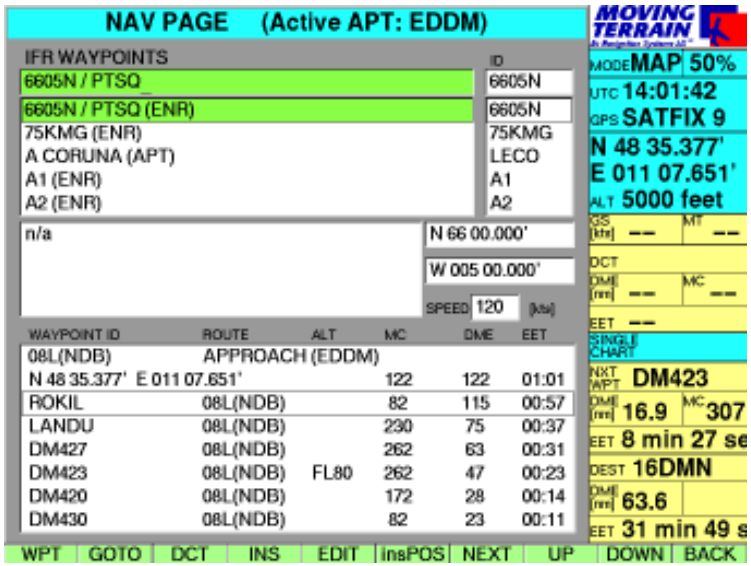
Example with InsPOS

No procedure turns are plotted on the chart, but the point-to-point routing already familiar from VFR FMS flight management.

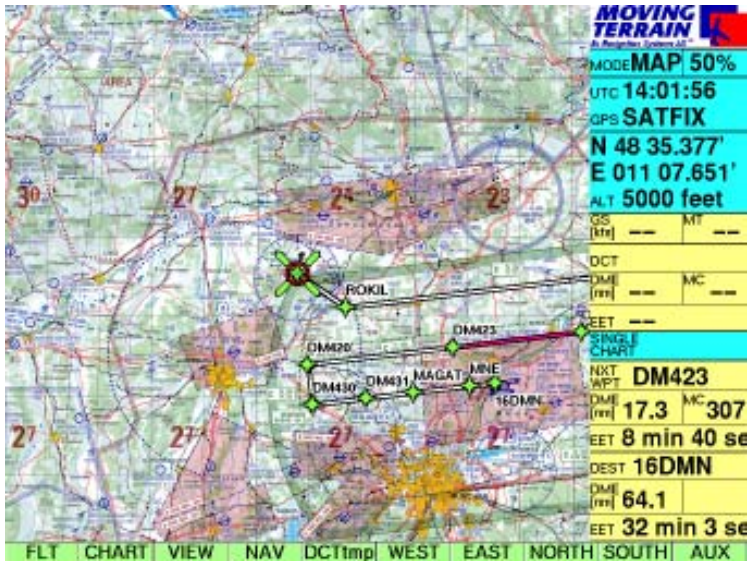


vorher

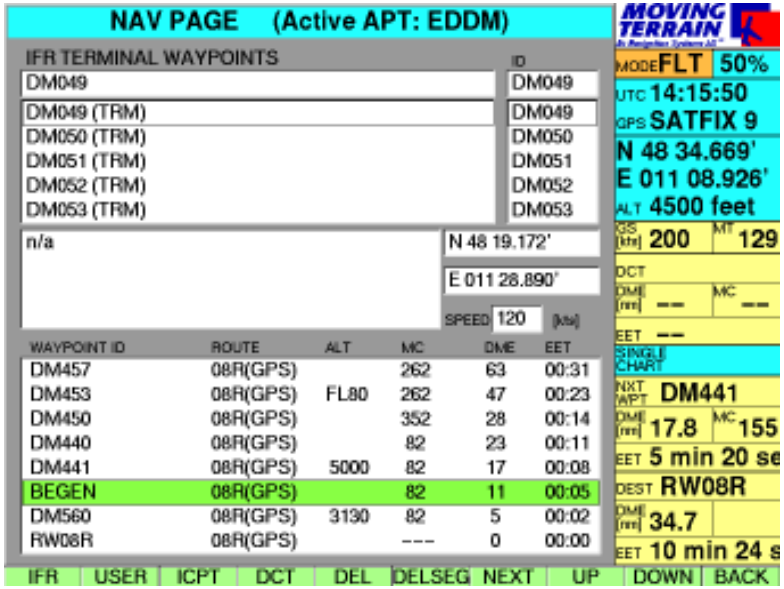


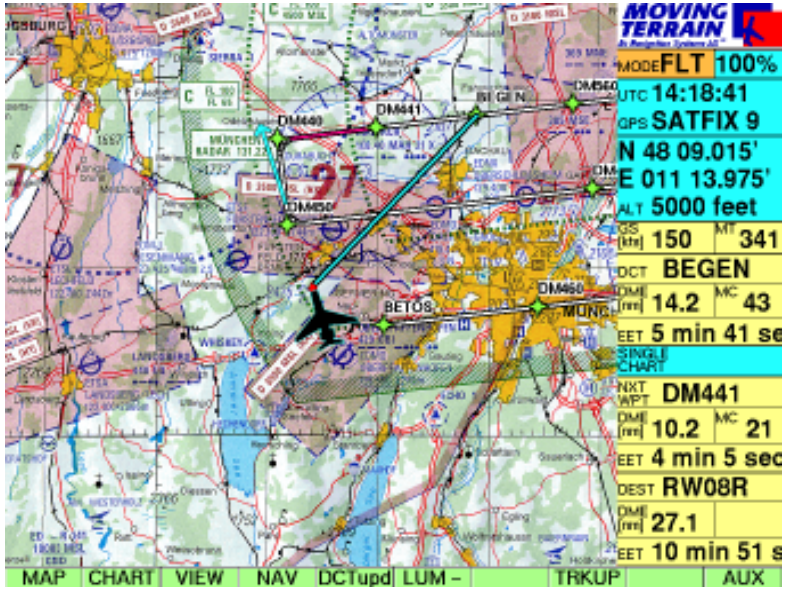


before **insPOS**



Example - Direct from the Flight Plan





Abbreviating GPS approach to waypoint BEGEN

- ✓ **NAV** Nav page
  highlight **Begen** in the flight plan box
- ✓ **DCT** The system immediately reverts to the chart
  - ✓ Light blue vector shows the path
  - ✓ Flight management in the info box

- ✓ **The course can be immediately corrected to the DCT.**

Flight Management in the FMS window

Please refer to page FMS - 12 for information on flight management in the FMS window.

Fight management to the NEXT waypoint by ENav Data navigation is only really practical during the ENROUTE part.

During landing and takeoff procedures the dots are sometimes so close together that point-to-point guidance is not possible.

During turns the NEXT waypoint cannot be determined by FMS.

MT Track / Automatic Logbook

MT Track / Automatic Logbook

MT Flight Recorder

MT Track = Flight path actually covered

- ✓ Start of recording with valid position (SATFIX) in flight mode
- ✓ Position (track points) recorded every 10 seconds
- ✓ Track is deleted when device is turned off. It must thus be saved beforehand if you wish to replay the track at some time in the future.

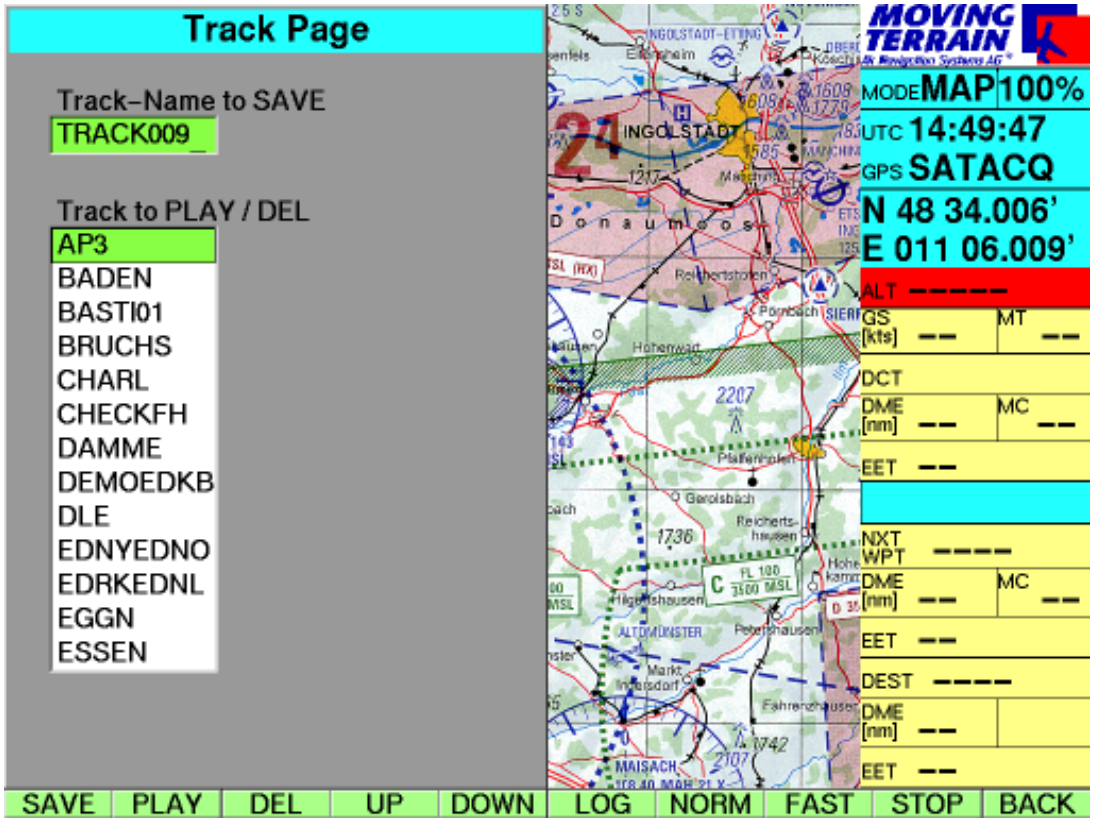
Saving and replaying a track

Retrieving the track page

- ✓ **AUX**
- ✓ **TRACK**

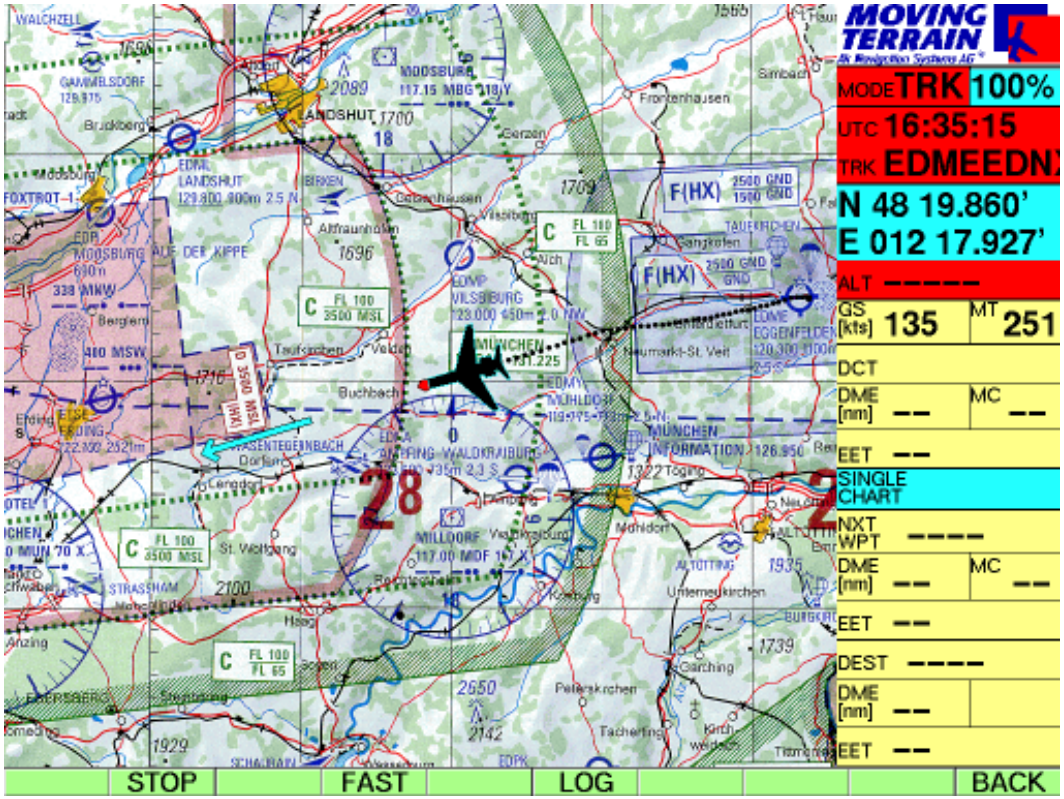
Key functions:

- ✓ **SAVE** Saves tracks you have just recorded (flown) – before switching off device! – under a unique name (or one provided by system)
- ✓ **PLAY** Replay a track
- ✓ **DEL** Delete a track
- ✓ **UP**
- ✓ **DOWN**



Replay mode with keys

- ✓ **FAST / NORM** Fastest possible/ delayed replay of recorded track
- ✓ **STOP** Ends replay
- ✓ **BACK** Returns to map mode
- ✓ **LOG** Flight log



Without interrupting replay mode you can

- ✓ **VIEW** Zoom into the chart, hide the info box
- ✓ **CHART** Change the base chart
- ✓ **CHART/SIN.CHA** Select a single chart
- ✓ **DCT** Select direct
- ✓ **NAV** Work with the Nav page.

Replay is ended when you change to Flight Mode.

MT Logbook

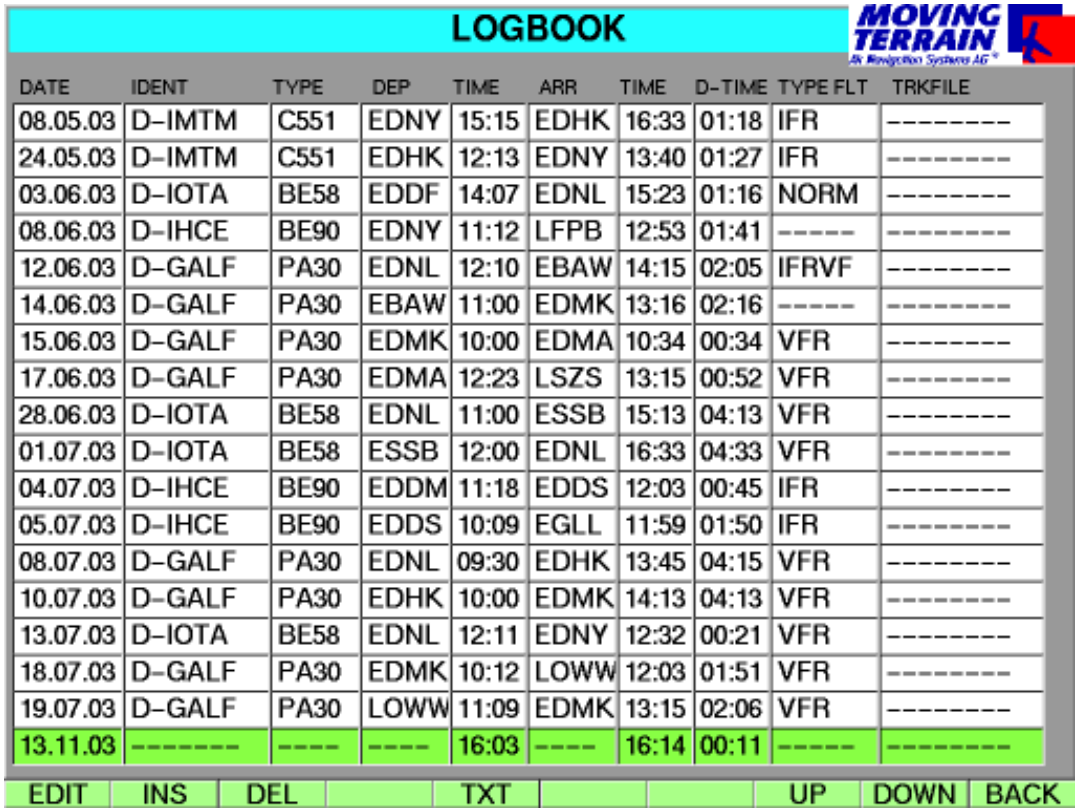
Automatic entries at speeds of > 40 knots

MT Automatic Flight Log

✓ **LOG**

The following data is assumed from the GPS:

- ✓ **DATE** Flight data
- ✓ **(Dep) TIME** Takeoff time: recorded when ground speed is greater than 40 knots
- ✓ **(Arr) TIME** Arrival time: Ground speed less than 40 knots
- ✓ **D-TIME** Total flying time HH:MM (calculated)



Completing the logbook

You can enter this data in the logbook:

- ✓ **IDENT** ID of your aircraft
- ✓ **TYPE** Aircraft type
- ✓ **DEP** ID of the departure airport
- ✓ **ARR** ID of the destination airport
- ✓ **TYPE FLT** 5 characters for your own notes e.g. IFR
- ✓ **TRACKFILE** Respective track stored in the MT system for replaying

Entries can be made in each line by pressing the key:

- ✓ **EDIT**

Enter data on the assigned keys of the integral keypad using the special characters:

- ✓ **_**
- ✓ **:**
- ✓ **.**

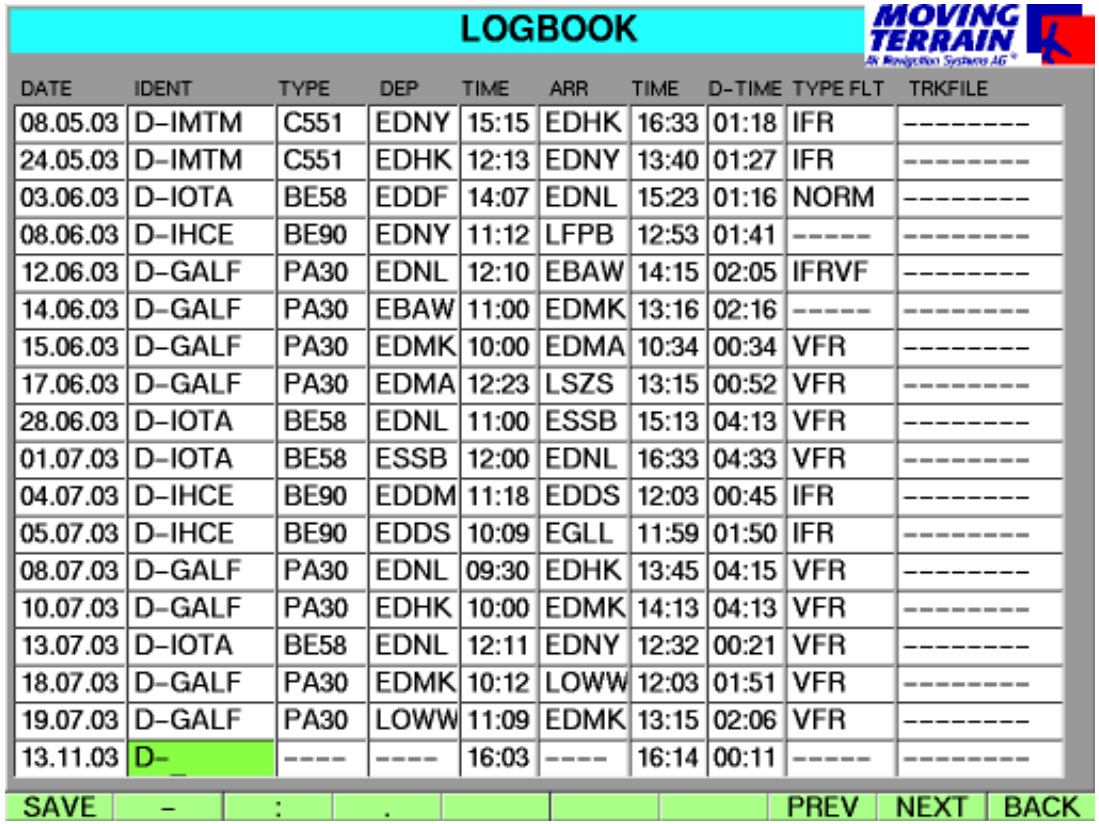
Move from one box to another with

- ✓ **PREV**
- ✓ **NEXT**

Confirm entries with

- ✓ **SAVE**

You will automatically be returned to the main page of the logbook.



If you wish to edit a further page, select it with:

- ✓ **UP** ✓ **DOWN**

Deleting / inserting flights

Delete whole entries with

- ✓ **DEL**

Insert flights with

- ✓ **INS**

Further processing as a TXT file

Press ✓ **TXT**
to enter the current status in a universally readable TXT file:
fltlog.txt in the MOVTER.PRO\TRACKS directory. You will then be able to edit this file.

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MT Rotating Chart

MT Rotating Chart

Fundamentals

Chart in 150% ZOOM only!

MT Rotating Chart

This module can only be activated on MT-VisionAir and MT-VisionAirEP

- ✓ **VIEW**
- ✓ **ROTATE**

In the main window the chart will rotate according to the direction in which you are flying.
All charts, base charts and single charts will be rotated independently of the scale.

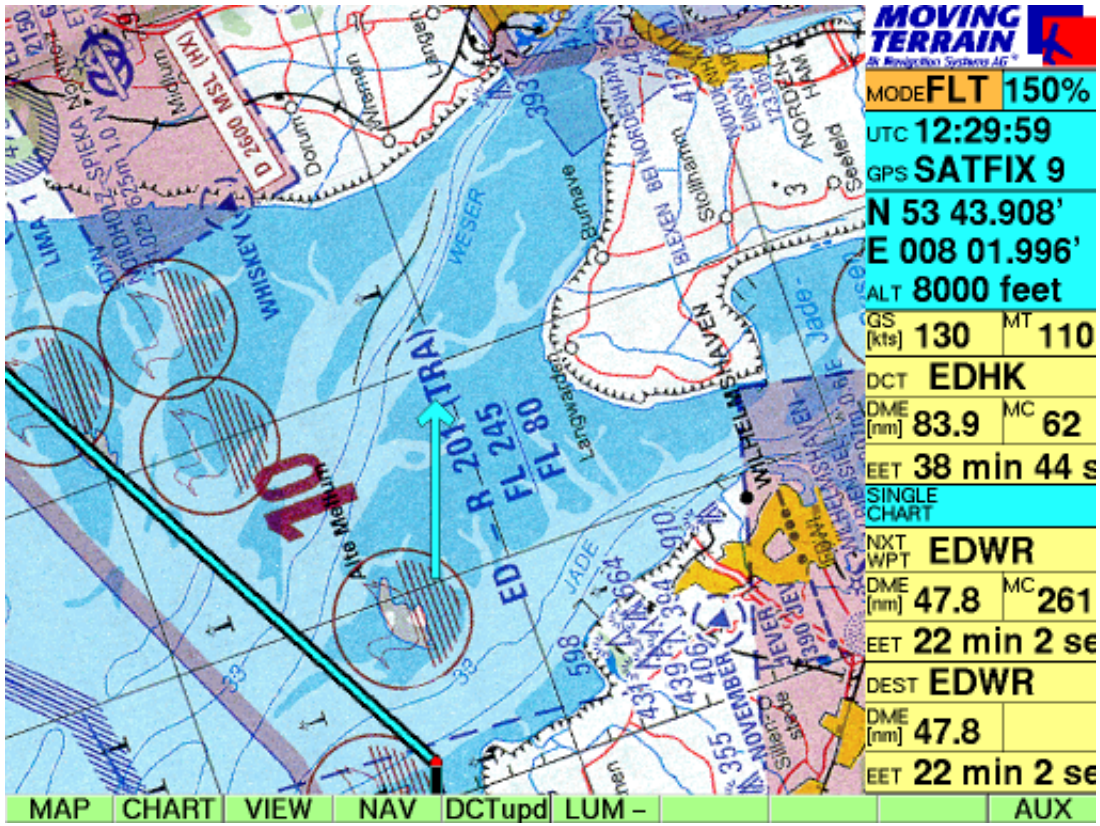
In flight mode the chart will be displayed in 150% ZOOM only (VisionAir can also display 75 %).

In map mode you have the option of zooming in or out of the chart

All Nav page functions are as usual.

You may switch to NorthUp mode at any time:

- ✓ **VIEW**
- ✓ **N-UP**



✓ Your own position can be shown in the center of the screen (upper Fig.)

- ✓ **CENTER** (in the VIEW bar)

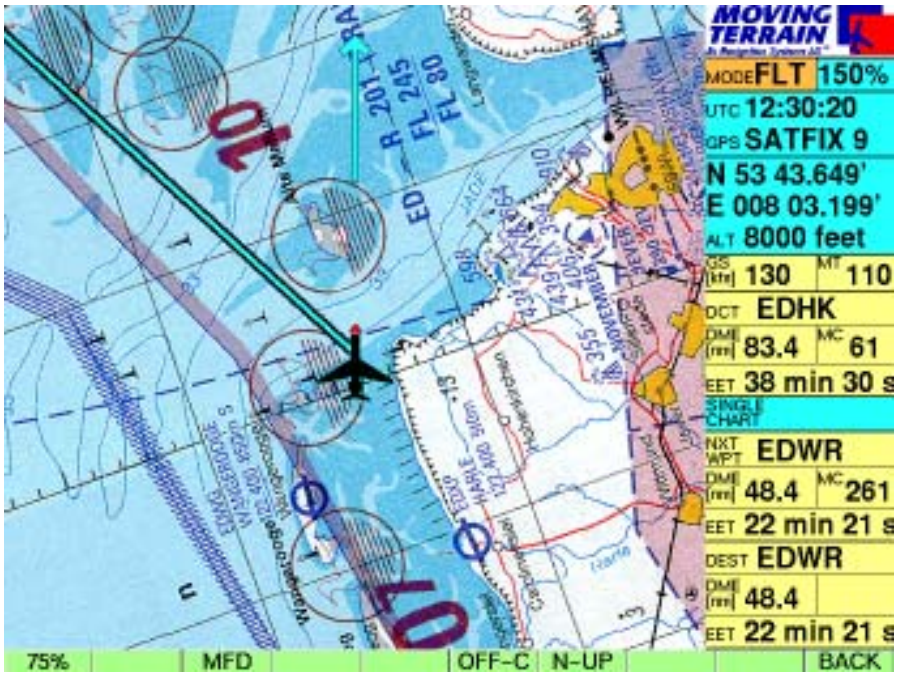
or at the lower edge (lower Fig.)

- ✓ **OFF-C** (in the VIEW bar)

✓ In rotating mode the chart can be displayed in two zoom stages:

- ✓ **75 %** (upper Fig.) - VisionAir only
- ✓ **150 %** (lower Fig.)

✓ The display can be returned to NorthUp mode by pressing **N-UP**



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MT Charting Module

MT Chart Program

With MT Chart you can reference your own charts (scans). Using the assigned coordinates these can be controlled from the MT main program. MT Chart is a Windows program.

Scanning

Before launching MT Chart, the needed chart must be scanned. For interfacing with Moving Terrain, the chart must be prepared as a bitmap file in Windows BMP format (files with ending *.BMP). In addition, color resolution must be 24-bit, i.e. 16 million colors = true colors.

Otherwise it does not matter whether you scan the chart with a hand-held scanner at home, at a service center close by or send it to us for conversion to this type of file. You may use any standard scanner, as long as your file is saved as a 24-bit BMP file. For good, color-accurate and undistorted results it is best to use a color flatbed scanner.

Your original charts must satisfy the following prerequisites:

- They must be **to scale** (not distorted)
- **Latitude / longitude** must be readable on the **grid** or other points must be capable of exact referencing.
- For large areas it is important to make sure that the chart is based on a **cylindrical projection** (e.g. Mercator). Conic (section) projections are not suitable.

The program also tolerates rotated scans. For the sake of clarity they should be north-up, although the software compensates for errors caused by rotation.

Referencing

Upon launching MT Chart you will see a special referencing symbol (diagonal crosshairs) in the center of the screen, an as yet empty Navdata box and three menu items. In the map (Alt + A) choose the “**Open**” function or press F2. The “**Load Custom Chart**” file dialog will appear. Now select the drive, directory and file (in BMP format!) you wish to reference. You can move within the rectangular areas with the direction arrows, to the next box by pressing the tabulator and back to the previous box by simultaneously pressing Shift and Tab.

Once you have selected the chart you wish to reference (its name must be visible in the single-line box under file name), confirm by pressing Enter. The file will then be automatically converted to the Moving Terrain MTC format. You now have the choice of deleting or saving the BMP file. From now on you will only need the MTC file. We recommend deleting the BMP file from your hard disk. If you lack the means to scan charts yourself and had the file created externally, it is advisable to make a backup copy on another storage medium before you start work.

Now comes the most important part in the preparation of your chart for using with Moving Terrain: referencing. The more carefully you perform this step, the better will be the results you achieve subsequently together with the GPS. For referencing you must exactly reference three points on the chart (longitude and latitude). Move the chart with the direction arrows or the right mouse button to place the referencing symbol at a point whose coordinates are known to you or which can be read off the chart. For visual approach charts we recommend, e.g. the grid at the edge of the chart. If no coordinates are provided on the chart (e.g. street map), you can also drive/fly/walk to several points on the chart and measure the coordinates with the GPS.

You must reference **3 points**. Please note: your reference points should be distributed as far as possible over the chart. They should not be too close together and not lie in a straight line. The MT program will also run if you have referenced only 2 points, but you will be forfeiting an important safety backup and verification of accuracy.

To create a reference point, move the desired chart point beneath the referencing symbol and select the referencing menu (Alt + R) or press F8. In the dialog that appears you can give this reference point a name and enter its coordinates (up to 1/1000 angular minute). Again you can move from one box to another by pressing the tabulator and to the previous box by simultaneously pressing Shift and Tab. The point can be saved by pressing Enter (Save). Save three points in this manner. The program will now evaluate the accuracy of your input and the deviation of the chart from the rectangular reference due to the projection. The following evaluations will be provided:

Comments:	very good	good	medium	poor but useful	unuseable
del psi *	0-1	1-2	2-6	6-10	>10

(* Del psi is an internal evaluation criterion calculated from the relative angles of rotation of the chart between

Confirm this message by pressing Enter. The referencing quality can also be seen at MAP/ INFO.

Now save the correctly referenced chart with the Save function in the map menu (Alt + A) or by pressing function key F3. This will save the chart in the Moving Terrain format together with your referencing and it is ready for use in the Moving Terrain program.

Further functions in MT Chart

Map menu

In addition to the functions as outlined in Chapter 3.1 – Open, for opening BMP or MTC files, Save for saving MTC files with referencing, and Info for showing the quality of your referencing – the map menu (Alt + A) also contains the following functions:

Goto...

This function is used to check the chart into which you have entered coordinates. The referencing symbol is displayed precisely over the point stipulated by you. However, if the coordinates are off the edge of your chart, an error message will be displayed.

Zoom...

As in the main Moving Terrain program you can also view your own charts, except in the standard display, at a magnification factor of 200% or a reduction factor of 50%.

The charts on your Moving Terrain system

The charts prepared with the MT Charting module are available as single charts on your system. They must first of all be copied into your system's \MOVTER.PRO\CUSTOM directory.

Saving single charts in the MT system

To replay self-digitized, referenced single charts on your MT-VisionAir:

Create a ZIP file (e.g. WINZIP) from your *.MTC files and name it

SINGLECH.ZIP

Any number of charts may be combined in this ZIP file.
Now copy the SINGLECH.ZIP to the existing directory

\DATA

on the Microdrive (Compact Flash Type II) prepared by Moving Terrain
That is all the preparation needed.
Now insert the microdrive (Compact Flash Type II) into the **switched off** MT-VisionAir device and switch it on. The updating process will start automatically.
Wait a few minutes (depending on the size of the file) until all the charts have been loaded onto the device.
Now **switch** the device **off** and remove the microdrive (Compact Flash Type II).

Importing single charts into your MT-VisionAir with a Microdrive or Compact Flash

Upon restart you can activate your single charts with

- ✓ **CHART**
- ✓ **SIN.CHA**

In the event that this procedure does not run correctly, the most probable reason is that insufficient space is available for the charts on your device's hard drive (or partition thereof). In this case please contact us. We will be pleased to help you find a solution.

To replay self-digitized, referenced single charts on your MT-ULTRA:

Start a burn prorgram in order to burn a CDR. Create a new directory on this CDR called **CUSTOM.** Now attach the *.MTC files you made in the directory CUSTOM. Burn the CD. Using the MT UPDATE UTILITY ,corresponding to your software version, you can now install the new charts you made onto your system. Choose option 1. Update from Moving Terrain CD in the update program.

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MT Special Coordinates

MT Special Coordinates

Fundamentals

Additional coordinate systems

Special Coordinates

Further coordinate formats are available in addition to the coordinates displayed in the latitude-longitude system.

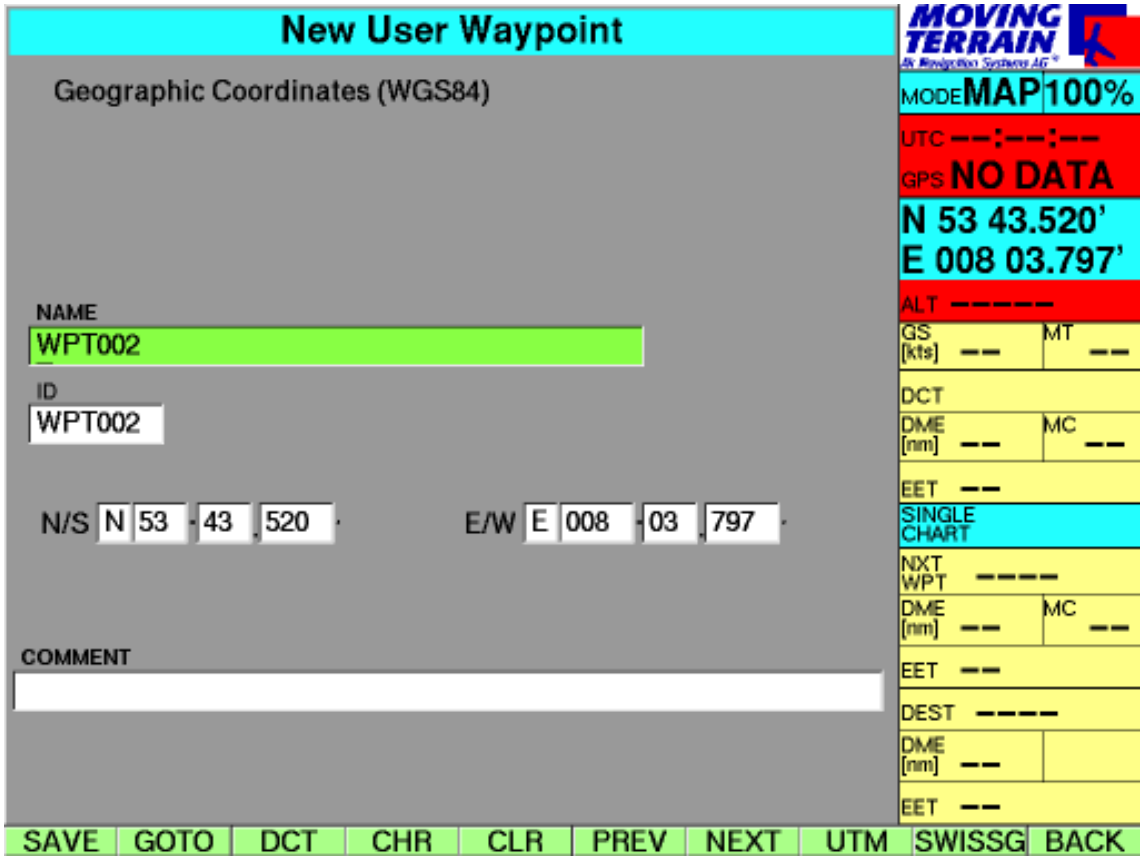
- ✓ **NAV**
- ✓ **EDIT**
- ✓ **NEW/MODIFY**

The choice now includes the following:

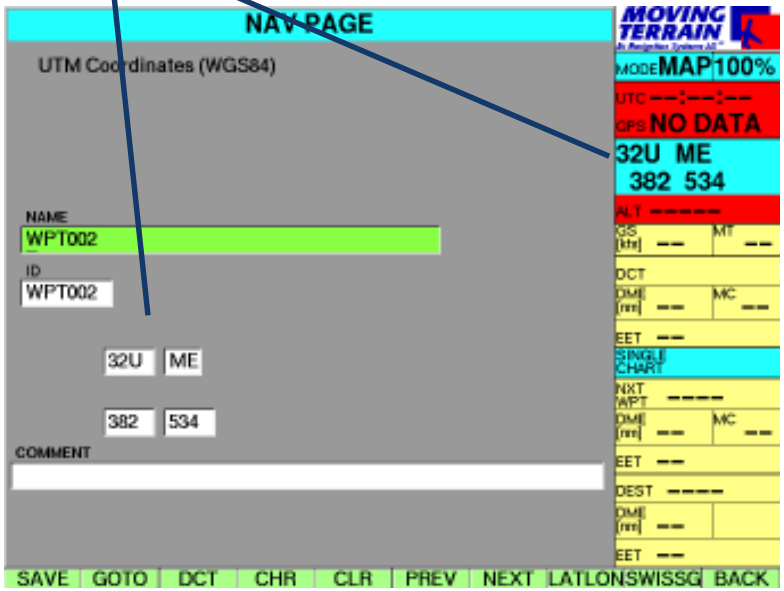
- ✓ **LAT/LON**
- ✓ **UTM**
- ✓ **SWISSG**

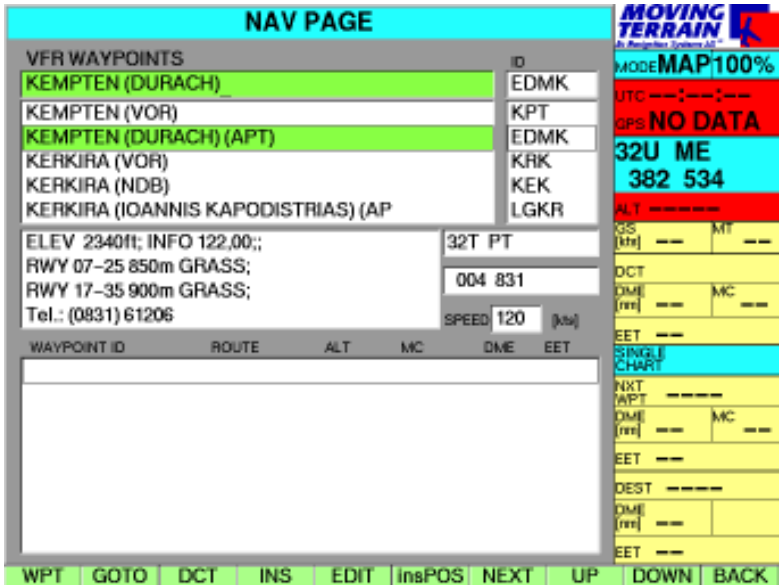
Once selected, a coordinate system remains active until it is switched off again.
The settings should be made when the system is started.

The coordinates must be entered into the INFO BOX in the selected format.

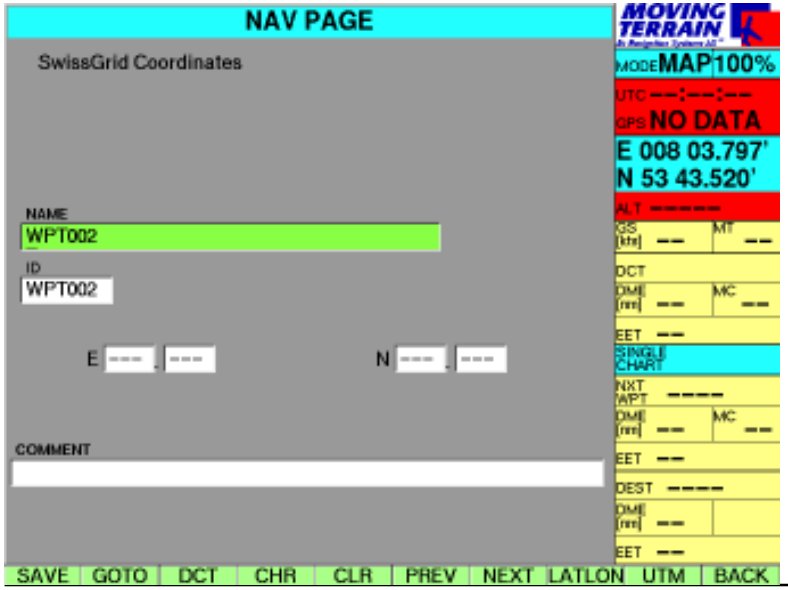


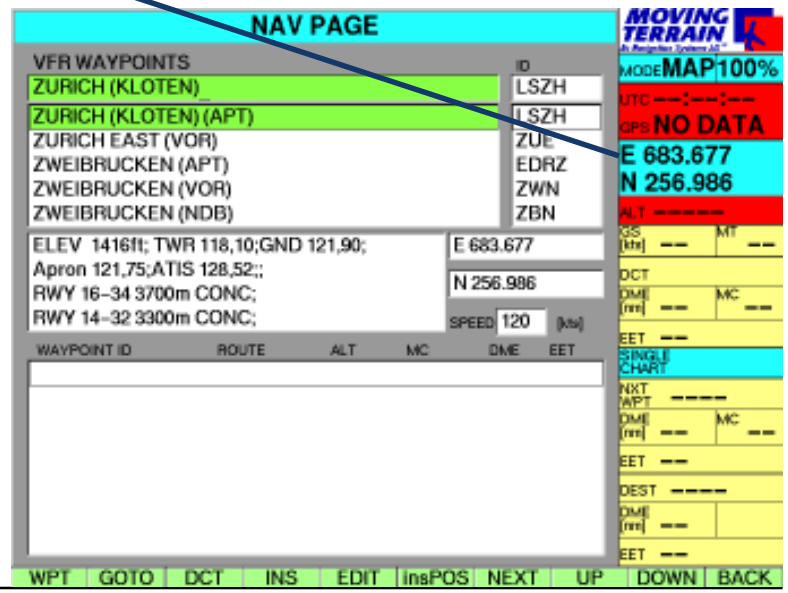
UTM:





SWISS Grid applies to Switzerland only





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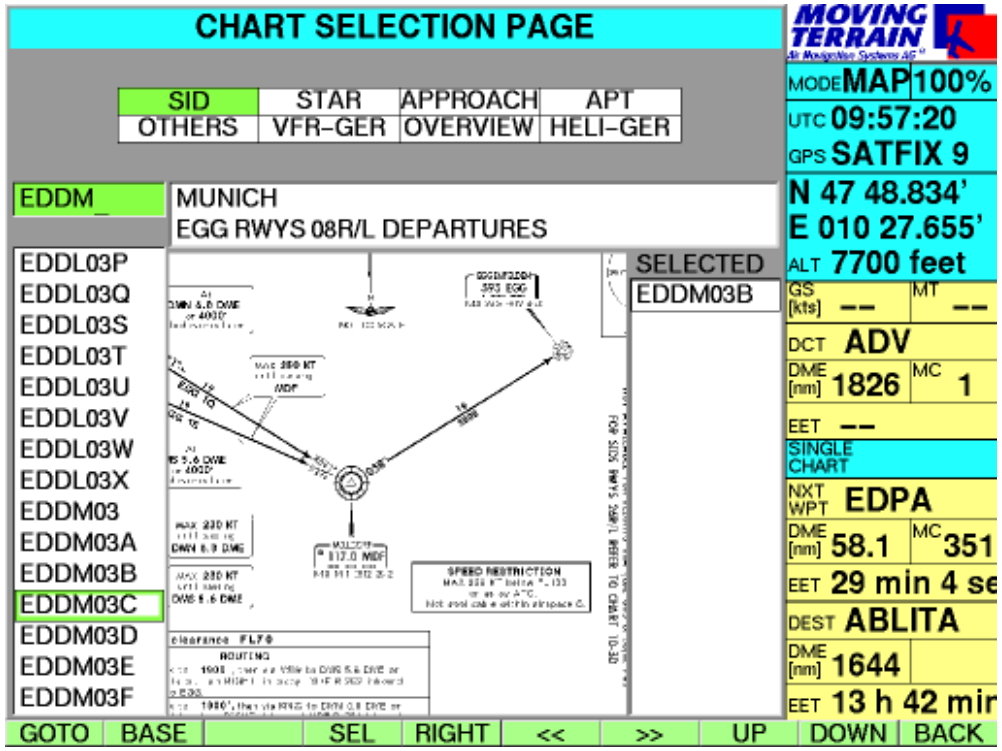
MT EFB - Electronic Flight Bag

Fundamentals

That means that if the MT-EFB is to be used, you must be a valid holder of a JeppView license and the appropriate sofware modification must be activated.
The initial installation of the maps can be done at Moving Terrain and can only be processed after a JeppView license and an actual JeppView CD, as well as sending us your MT VisionAir (EP).
The map updates can be installed on your own to ensure posession of the most updated Enhanced Navigation Database Charts.
More details can be find in the EFB-Update cube.

Calling up the Enhanced Navigation Database Charts

- ✓ **CHART**
- ✓ **SIN.CHA**
- ✓ **GOTO** jumps to selected chart.
  Note: functions only in MAP Mode.
- ✓ **BASE** changes Base Chart Selection Page
- ✓ **SEL** Several Enhanced Navigation Database charts can be pre-selected and are pasted in the Selected Box. The active map is always highlighted in green.
- ✓ **<</>>** Change the map category (SID,STAR, etc.)
- ✓ **UP, DOWN** Scroll up/down in the selected box
- ✓ **BACK** Back to the map and deactivate the Chart Selection Page.
- ✓ **RIGHT** Jump to the Selected Box



Viewing single Enhanced Navigation Database Charts

The Enhanced Navigation Database Charts are divided into 5 categories:

1. SID	=	Standard Instrumental Departures
2. STAR	=	Standard Arrivals
3. APPROACH	=	Approaches
4. APT	=	Airports
5. OTHERS	=	Noise, Parking, Take-off Minimas,...

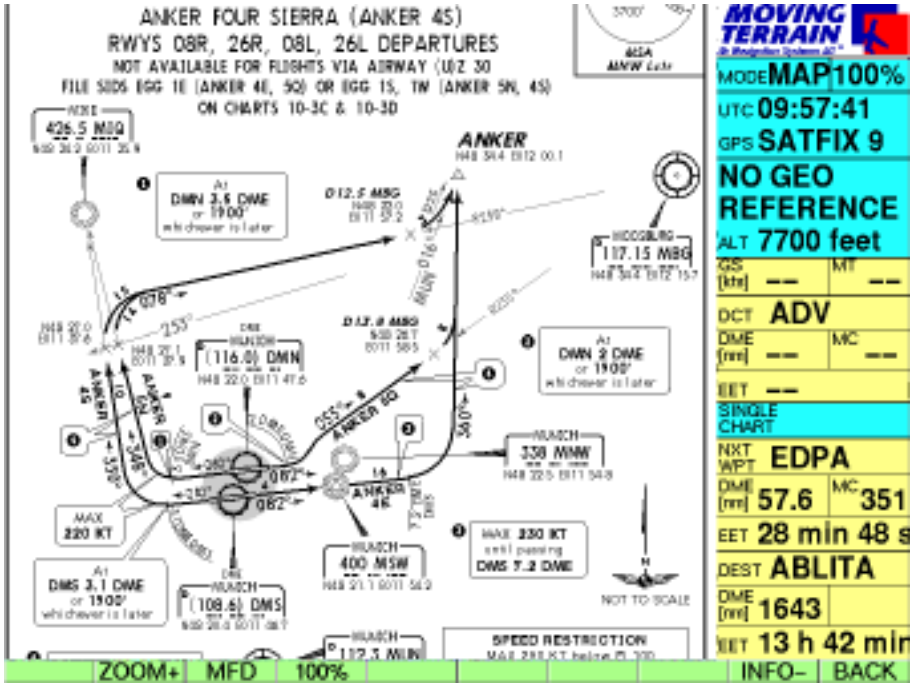
Viewing single Enhanced Navigation Database Maps:

✓ **GOTO**

Jump to the selected map.

The selected map is automatically entered in the Single Chart Selection Page.

Some charts are NOT TO SCALE, and therefore not suitable for referencing. In the infobox, NO GEO REFERENCE appears. The airplane symbol cannot be displayed on these non-referenced charts and the charts can only be seen in MAP MODE.



MT EFB

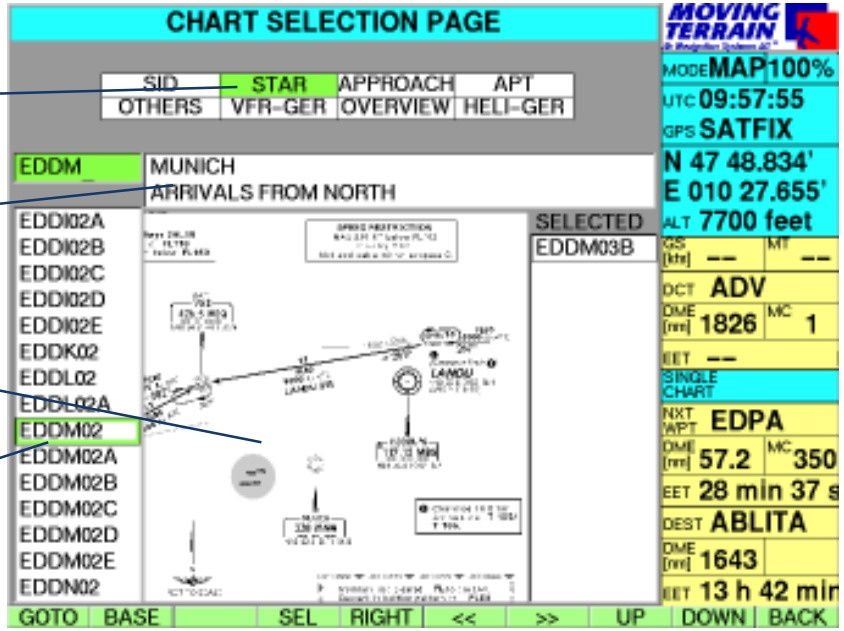
Enhanced Navigation Database Single Chart Selection Page

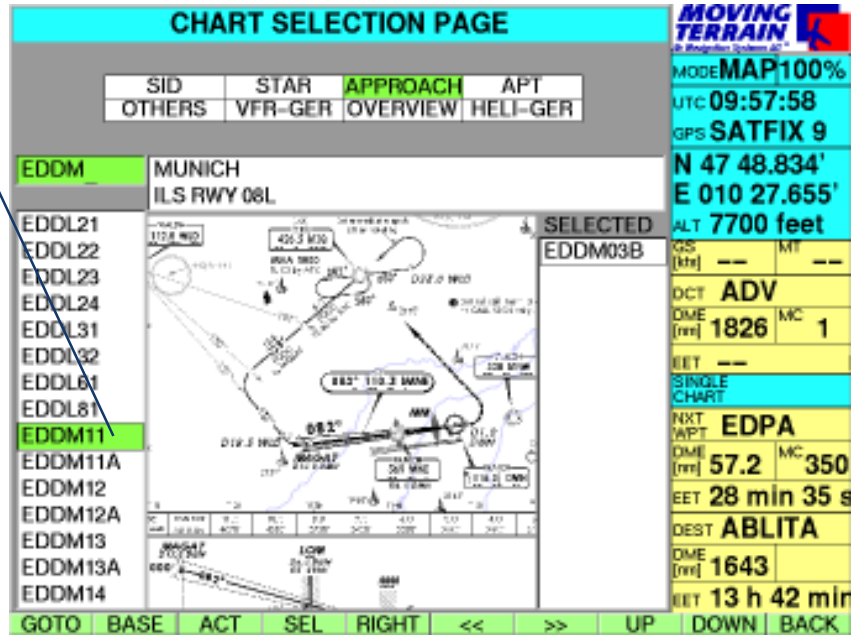
Enhanced Navigation Database Chart Category

Information about highlighted chart

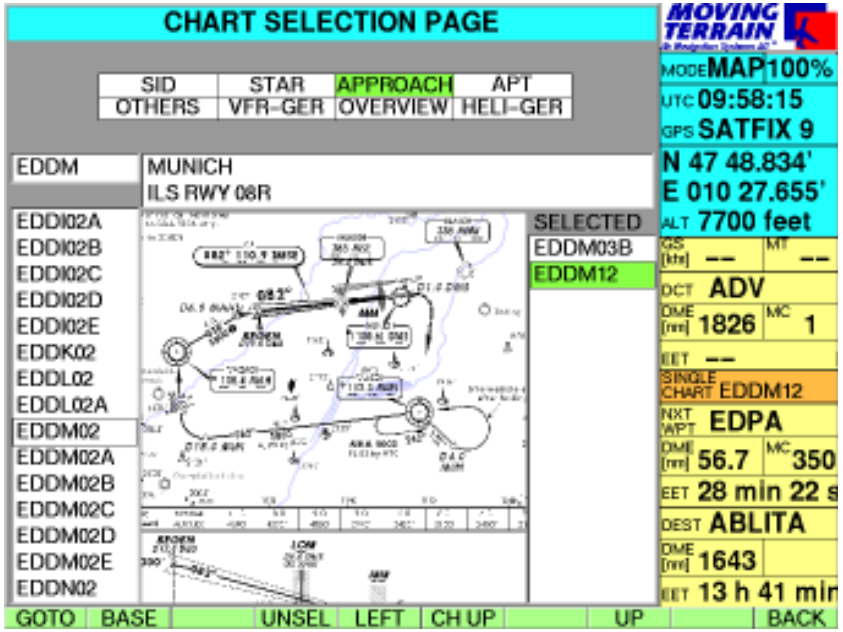
Preview of the selected chart

If the box is filled (completely highlighted in green), the chart is referenced. Otherwise, if the box is emty (only framed), the chart is not referenced (see the figures on right).





The loading of the referenced Enhanced Navigation Database Chart functions the same way as the VFR approach charts.

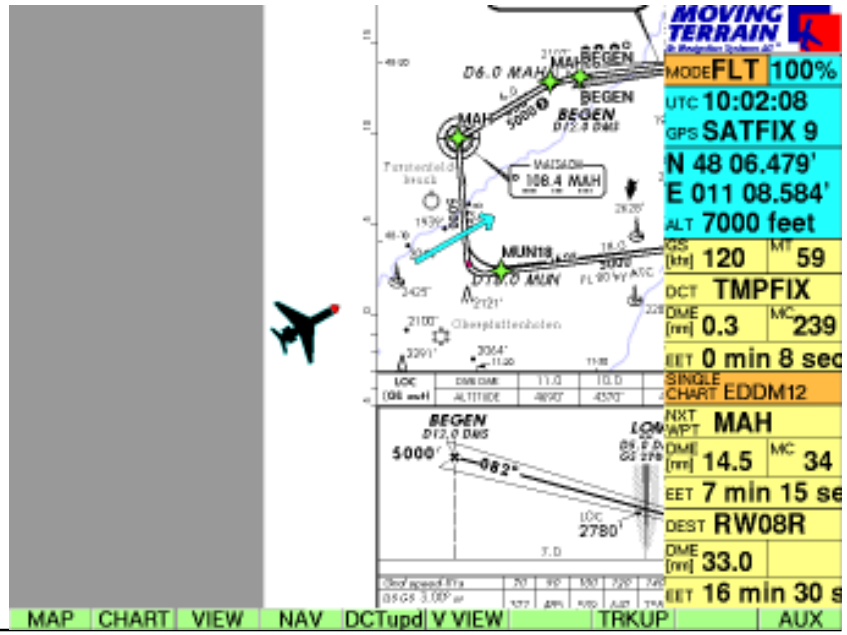


✓ **SEL**

The chart is copied and activated into the selected box. It is always the green-highlighted active chart in the Selected Box.

The active, referenced chart is automatically loaded as soon as entering the corresponding chart zone range.

A special function is available in FLT MODE when executing approaches.

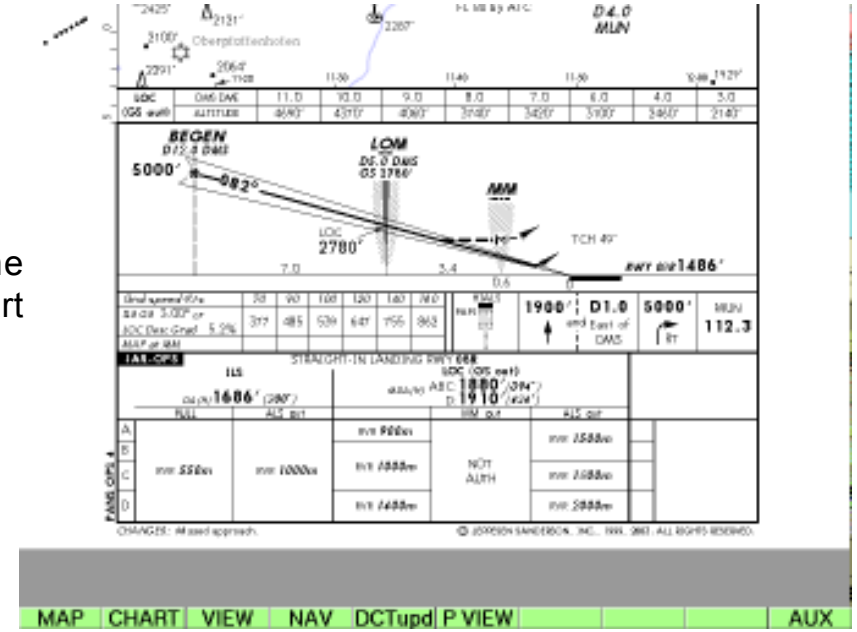


✓ **V VIEW**

Shows the glide path during the flight. The map continues to move in the background.

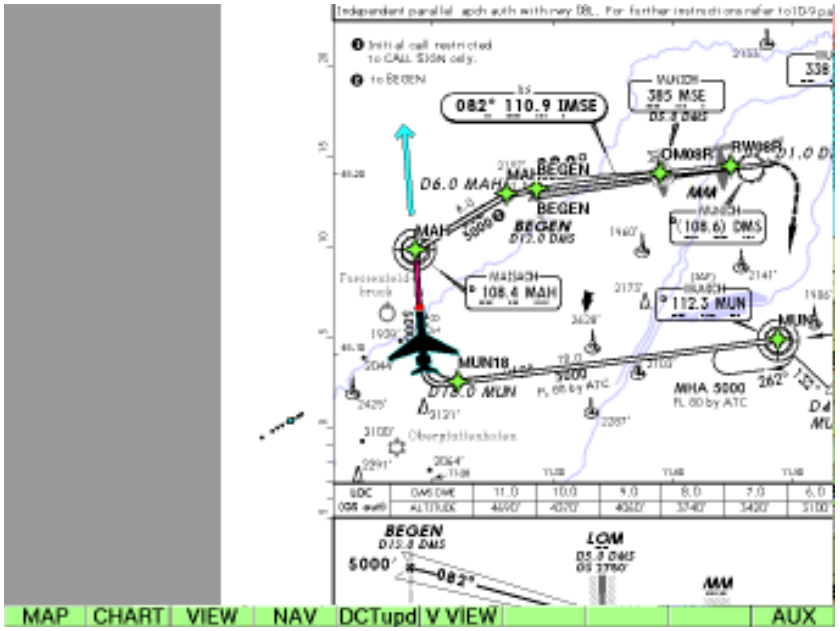
✓ **P VIEW**

Cycles through the glidepath view and the previous active chart (back to previous chart view).



The supplemental Enhanced Navigation Database Package 1 considerably simplifies Enhanced Navigation Database navigation.

In the right figure a route appears where a referenced Jeppesen chart is displayed.



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Data Updates, Charts and Program Versions

Update of Charts, Data and Program Versions

MT-VisionAir

Updates are made using a **microdrive** or **Compact Flash Type II**.
The data carriers must have either been purchased directly from us or submitted to us for configuration after purchase elsewhere.

The updating procedure itself is simple and convenient:

- Insert the microdrive into the switched-off device (reverse side up)

- Switch on the device. The update will run automatically and can be monitored on the basis of status reports shown on the display.

- When the final message “Update successful“ appears, switch the device off and remove the microdrive.

Your device now contains the latest data and is ready for operation.

In the event that the data carrier is not recognized when the device is switched on (this will be the case if Moving Terrain is launched!), switch the device off and try again. Data carriers sometimes have start-up problems.

During the update procedure all data will be loaded into the device from the data carrier. This may take some time. Please allow for this in your schedule and avoid performing the update at the last moment.

Data updates from the internet via Microdrive

To import data downloaded from the internet or received by e-mail to your MT-VisionAir device:

You will need a microdrive (Compact Flash) that has been **prepared by us**. Plug the microdrive into your office computer using the appropriate adapter.

We supply the data in the following forms:

VFR data:	The data is named VFR60.ZIP
ENav data	IFR60.ZIP
Obstacle data	OBSTACLE.ZIP

This data must be copied into the **\DATA** directory on your microdrive (Compact Flash). Do not unpack it!

Remove the microdrive (Compact Flash) from your office computer and adapter, plug it into the **switched-off** MT-VisionAir. When the device is switched on, the update will be started automatically. Once the procedure has been completed, switch the device off again, remove the microdrive and restart the device.

This procedure is basically the same as for single charts (*.MTC files) (see MT Charting).

MT-Ultra : Update of Data, Charts and Program Versions

MTUpdate Utility Version 6.0:
Instructions for the installation program

Basic concept:

A standard PC and the MT-Ultra device are connected via cable and software.
Data is read by a PC from a CD-ROM or directory on the hard drive and transferred to MT-Ultra by cable.

To enable the two devices to be connected, the PC must be booted up in DOS mode. This is in turn enabled by the enclosed disk.

Please follow the instructions carefully and **perform the installation step by step**. It is important to adhere to the sequence of individual steps to ensure successful installation.

- The program enables the following installations from Moving Terrain CDs:

  Installation of **base charts**
  Installation of **Navdata** (VFR and ENav Data, hospital data)
  Installation of **single charts** (special charts, e.g. hospital helipads)
  Installation of **obstacle data**
  Installation of later versions = **MT program updates**

- You can transfer self-generated data **from your computer's hard disk**:
  single charts (created with the MTChart program)

- You can transfer **from disk**:
  Navdata = **Hospital helipads (SPITAL)**
  = **USER**

Preparation

For the update you will need:

- PC or laptop with disk drive;
- Laplink cable;
- Keyboard with PS/2 connector (with MT version 3.6);
- Boot disk = MT Update Utility Disk from MT;
- CD-ROM from MT.

Setting up the connection between the devices

Important: Both devices must initially be switched off.

Step 1: Open the service cover at the rear of your MT-ULTRA device.

Step 2: Connect the 1st parallel port (printer port) of your PC (LPT 1) and the parallel port of the MT-Ultra device with the supplied Laplink cable.

Step 3: Switch on your MT-Ultra device. Wait until it has completely run up. Then press the AGREE key.

Step 4: Switch MT Ultra to the update mode:

a) If you have **Moving Terrain software version 5.0** or later, quit the program with **AUX** -> **QUIT** (keep pressed).

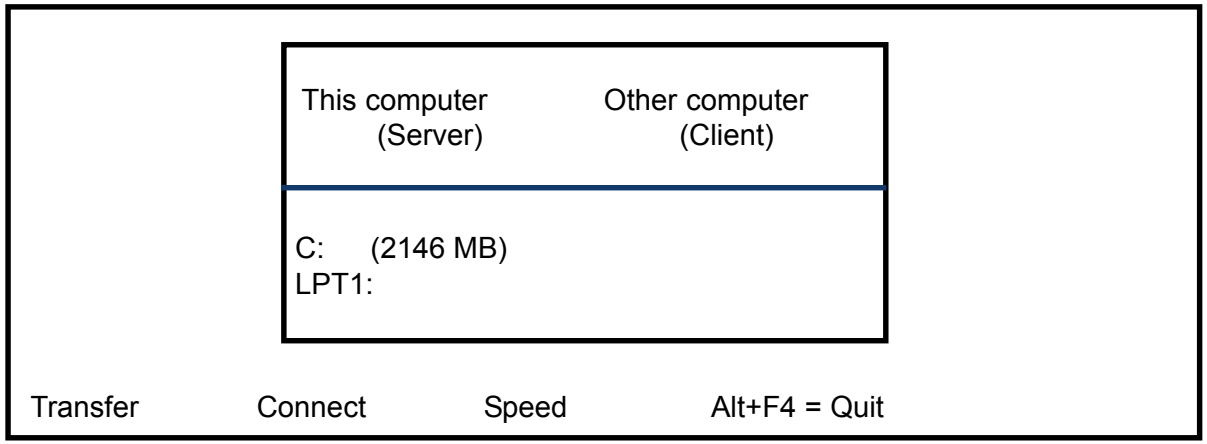
b) If you have **3.6x software** connect a standard PS/2 keyboard (adapter for other keyboards enclosed) to the respective keyboard outlet. Quit the MT program by keeping <F12> pressed for 5 seconds. Then press <ALT-F4> <ENTER> to exit Windows. At the DOS prompt enter the following line:

C:\>intersvr /lpt1 /v /x=a: /x=b: <ENTER>

or if you have a German DOS version and a US keyboard

C:\>intersvr &lpt1 &v &x)a> &x)b> <ENTER>

Independently of your MT software version, the following screen should appear:

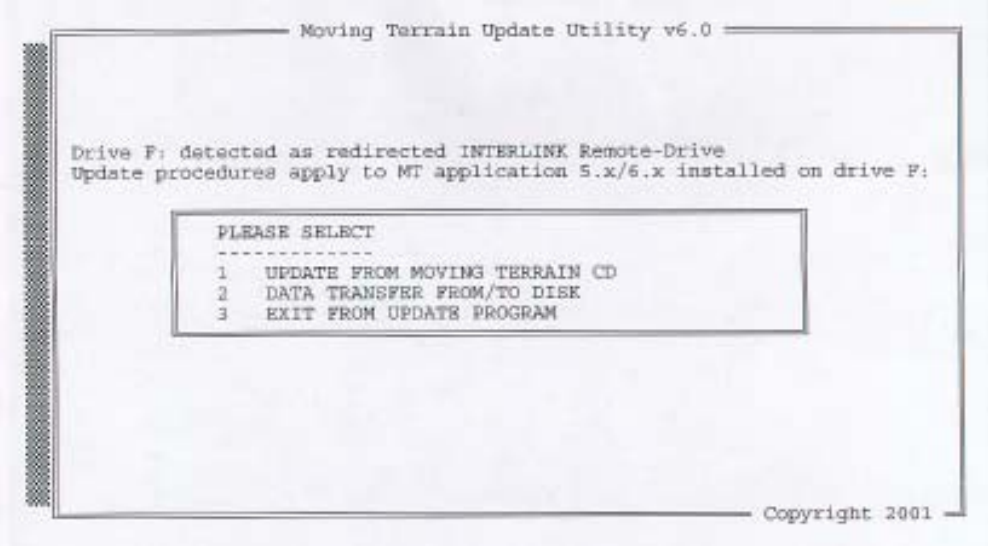


Your device is now ready to receive data.

Step 5: Insert the MT Update Utility disk into the disk drive of your PC.
Step 6: Switch on your PC.
Step 7: Set the keyboard options:

‘1’ = German keyboard
‘2’ = US keyboard
<ENTER>.

The program will now look for your MT application. Once successful, it will display the main menu:



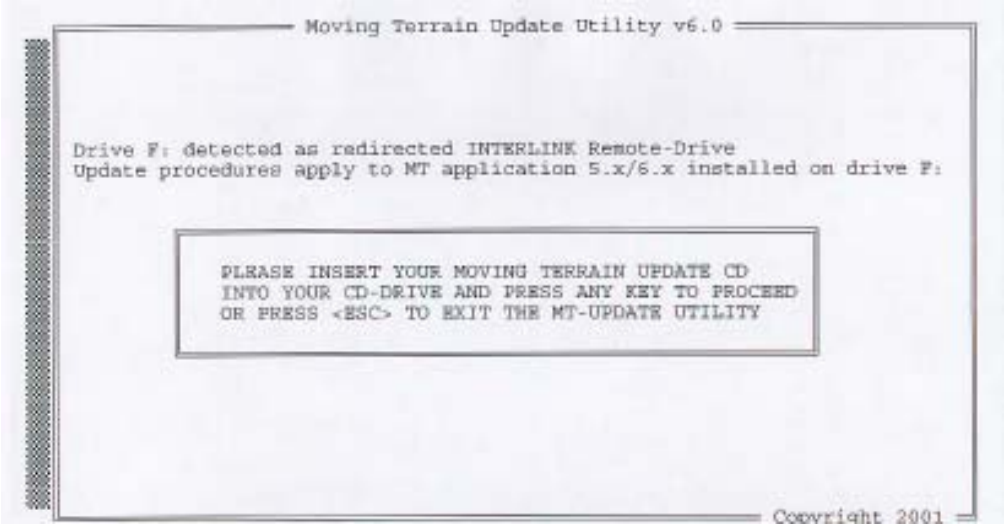
The two devices have been successfully connected.

Install Options

CD Installations

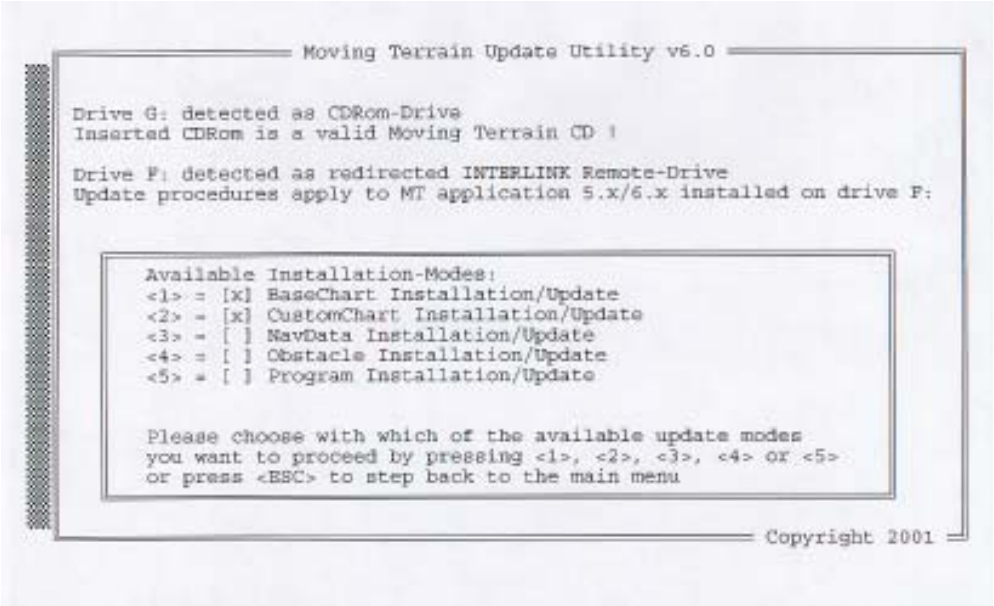
Now select the desired option by pressing the number preceding it.

To install data from a Moving Terrain CD select Option 1.
With the following screen you will be prompted to insert a Moving Terrain CD.



Insert the CD and press any key to continue the installation program.

Provided the CD is a valid MT installation CD, the program will display e.g. the following menu:

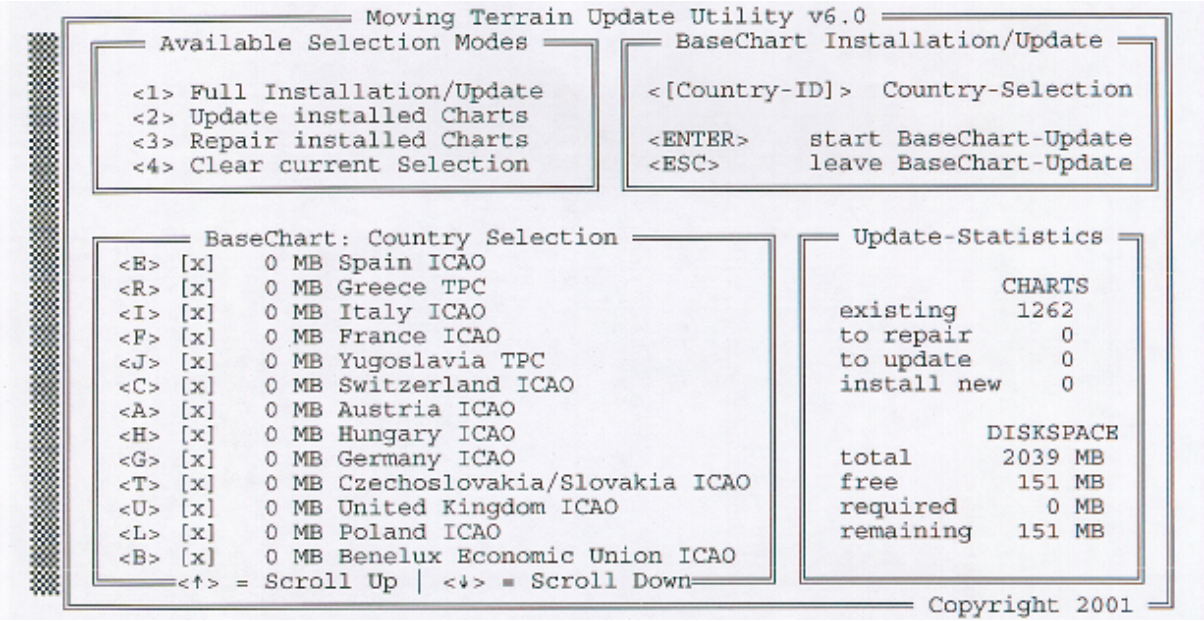


Base Charts Installation/Update

Active menu items are marked with an X.

- Now select your desired update or installation from the categories marked with (X) by **pressing number keys 1–5**.
- To return to the main menu press <ESC>.
- Obstacle installation/update is for the Rega version

Select 1: BaseChart Installation/Update



Make your choice on the number keys between:

<1> **Full installation/update**: Updates all existing charts and installation of new charts

<2> **Update installed charts**: Updates only existing charts (recommended for limited memory space)

<3> **Repair installed charts**: Repairs incomplete/defective charts.

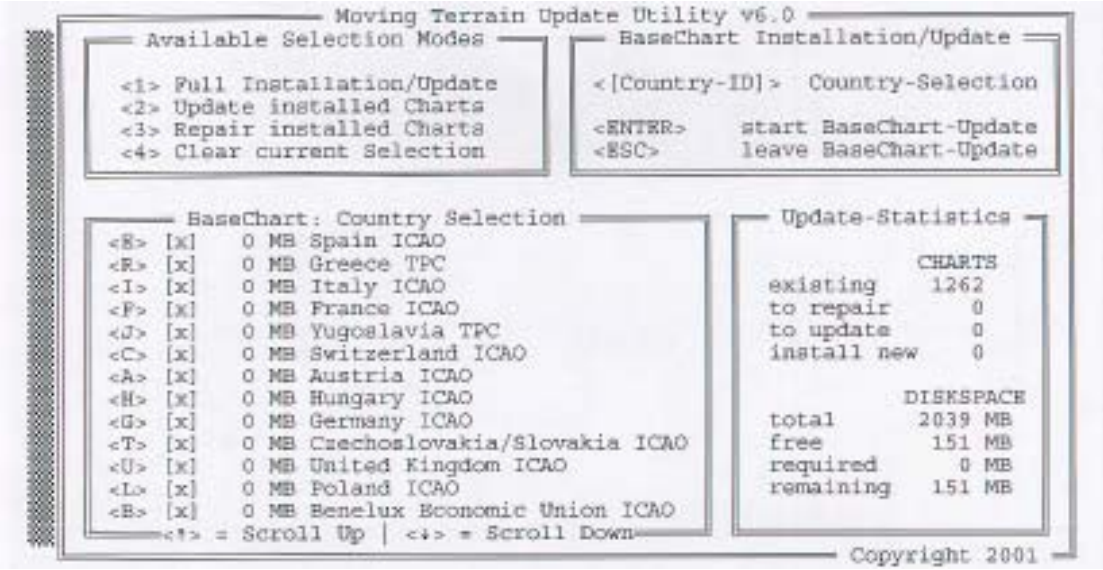
<4> **Clear current selection**: Deletes your current chart selection.

With this choice, a new window will open in the lower left half of the screen.
Activate the desired operation by **pressing ENTER**.

- The choice of countries enables you to put together precisely the combination you need for flight planning on your MT Ultra. Since your hard disk does not have unlimited space for the charts, you may need to limit your selection. All available countries will be shown in this list. Normally the complete data will be downloaded and the basic setting now active is for all countries.
- If you wish to define an individual choice, press <4> to deactivate the choice of all countries. Now you can select the countries applicable to you by pressing the respective letters (e.g. <E> for ICAO Spain, <G> for ICAO Germany).
- Please note: Since we fit together the available ICAO charts of European countries at their borders, the border zones can only be assigned to one country. For example, if you select Switzerland, you can be sure that the selected charts will not cover the complete territory, because the system has assigned some single files to France, Italy, Austria or Germany. In this case, please select the adjacent countries as well. If you want to fly into the Pyrennees, you should not forget to load the Spanish chart into your system.
- Exception: If you select Germany, the complete ICAO Germany will be loaded onto your system.

Important:
At the bottom right of your monitor you will see how much memory space is available on your device before and after installation (at least 10 MB must always be free!)

In this example installation cannot be started because insufficient space is available.



Wählen Sie 2: CustomChart Installation/Update
Sämtliche Custom Charts von einer MT CD werden installiert. Auch wenn Dateien den gleichen Namen haben, werden ältere durch neuere Versionen ersetzt. Eine Auswahl einzelner Custom Charts ist nicht möglich.

Wählen Sie 3: NavData Installation/Update
Navdaten von einer MT CD werden installiert, ältere Versionen werden durch neuere ersetzt.
(Gilt nur für Moving Terrain Standard VFR- und Enhanced Navigation Database**-Daten)**

Installation oder Update des Obstacle Layers (Option 4) (vgl. Update von Diskette)

Um auf Ihrem MT-Ultra einen Software-Update von Version 5.x auf 6.x, bzw. von Version 6.x auf eine neuere Version auszuführen, wählen Sie Option 5.

Wichtig: Die Userwaypoint-Datenbanken der beiden Grundversionen 5.x und 6.x sind inkompatibel. Es ist daher erforderlich, Ihre alte Datenbank zu löschen.
Sollten Sie bereits zahlreiche Userwaypoints angelegt haben, auf welche Sie in Zukunft nicht verzichten möchten, können Sie Ihre Datenbank auf Diskette sichern (s. hierzu auch Hauptmenüpunkt „Data Transfer from/to disk“ Option „Load User Waypoints from MT System“).
Zur Sicherheit erscheint nach Wahl der Option „Program Installation/Update“ bei Vorhandensein einer Userwaypoint Datenbank im 5.x-Format folgendes Fenster:

```
THE USERWPT DB CAN NOT BE READ BY THE NEW PROGRAM
AND MUST BE DELETED!!!
PLEASE SPECIFY IF IT SHOULD BE SAVED ON DISK [Y/N]
OR PRESS <ESC> TO STEP BACK TO THE MAIN MENU
```

Möchten Sie Ihre Datenbank zwecks späterer Konvertierung* auf Diskette sichern, so wählen Sie „Y“. Haben Sie bisher die Möglichkeit, eigene Wegpunkte aufzuzeichnen kaum verwendet oder Ihre Datenbank bereits auf Diskette gesichert, so wählen Sie „N“, im Zweifelsfall können Sie mit der Taste „ESC“ abbrechen und ins Hauptmenü zurückkehren. Es werden dann keinerlei Änderungen vorgenommen.

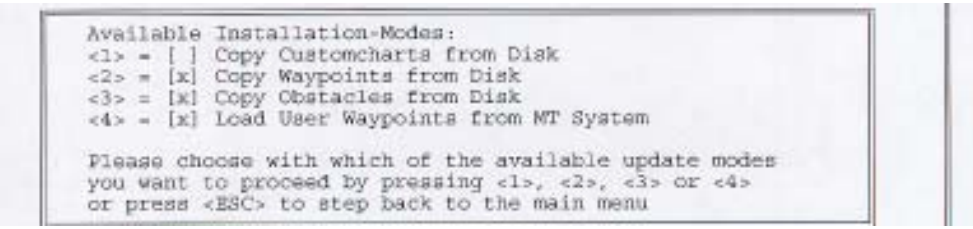
* Bei Bedarf kann bei uns ein Konvertierungs-Tool angefragt werden.

Registering the Moving Terrain version on your device

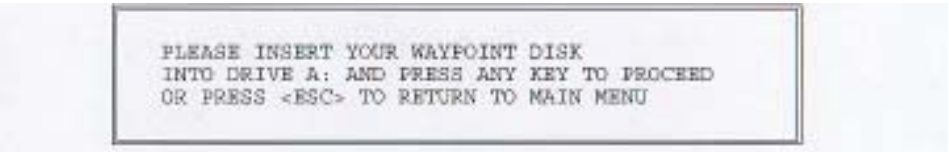
After installing a new program version, the device must be re-authorized (see Appendix: “Authorisation page”).

Installing/updating Navdata from disk

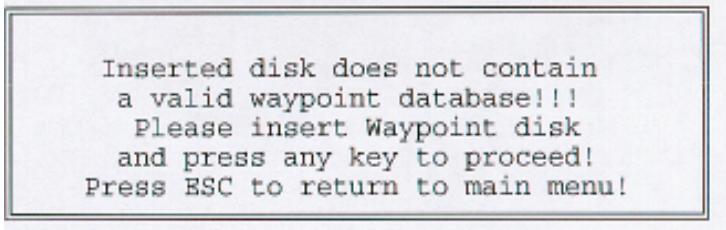
To installfrom a disk or backup of user waypoints select “Data transfer from/to disk” in the main menu 2:



Now select the desired installation.



The program will prompt you to insert the appropriate disk.
If you have inserted the wrong disk, the following error message will be displayed:



Now you may press ESC to return to the main menu or continue installation by inserting the valid disk and pressing any key.
Once installation has been completed, the program will prompt you to re-insert the update disk.

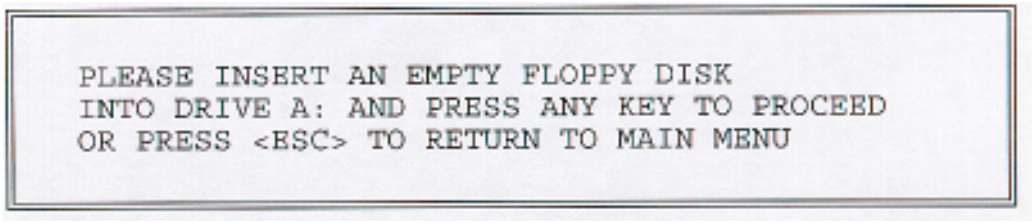
Installing/updating obstacles from disk

BackUp of USER waypoint databank

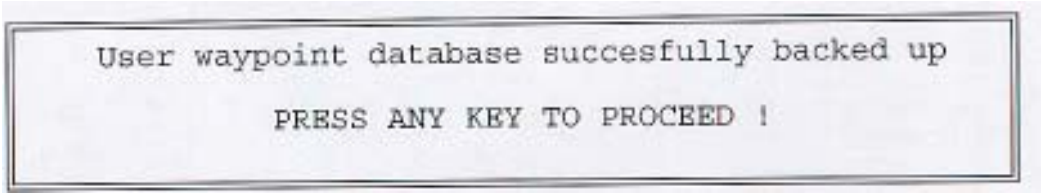
Select sub-item 3 “Copy Obstacle from Disk”

Important: Please quit the Update program only via the main menu EXIT in order to guarantee correct installation of the obstacle layer.

Please keep an empty disk at hand.
Select sub-item 4 “Load user waypoints from MT system”.

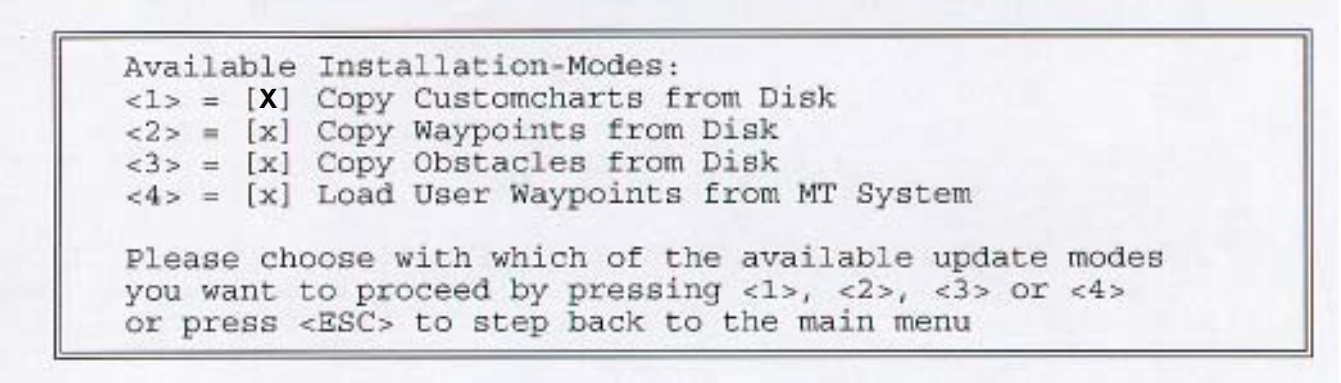


Now insert the empty disk and continue.



Installing single charts directly from the PC's hard drive

Important: Your referenced custom charts (*.mtc) must be stored in the directory **C:\MOVTER\CUSTOM.NEW**, otherwise the installation program will not find them. Please create a directory with this name on your PC's hard disk C: and save your custom charts to it.



Choose the option <Copy Customcharts from Disk>. The other functions given in this menu are not relevant for the serial version.

Completing the installation process

To finish the installation program choose option 3 in the main menu:
"Exit from Update Program"

Switch off the two devices and remove the interlink cable.

Remove the boot disk from your PC and keep it in a safe place. You will need it for further updates.

Close the service cover at the rear of your MT-Ultra with the three screws provided.

Authorization Page

Under

✓ **AUX** you will find:
✓**AUTH** Switch to Authorization Page

This function allows you to **enable further soft and/or hardware modules** on your system.
To enable these modules you will need a **code,** only obtainable from us.

✓ **AUTH** (**Keep pressed for approx. 3 seconds** = precaution against unintended activation!)
This will take you to the Moving Terrain Licence Manager.

```
Starting Moving Terrain License Manager
---------------------------------------

MOVING TERRAIN: <MTPRO.EXE> License Maintenance



=====================================================================
The base version of the MT Programm is now authorized at this site

The following OPTIONS are enabled:

FMS
Track
IFR
Obstacles
TCAS
Swiss Grid
=====================================================================

[A=Authorize] [Q=Quit]
Please Select from the menu above: a
Site Code: DD38 EE33 ECE6 2A80 07
Enter Site Key or '.' to quit:
```

Confirm with “Y”. Moving Terrain Licence Manager will now display information on modules currently enabled.

Close the MT License Manager by pressing “Q”.

Registration

Please enter the ‘site code’ in the enclosed form and fax it to Moving Terrain AG (08376 - 9214-14). Moving Terrain will send you your ‘site key’ by return fax.

This ‘site key’ must be entered and confirmed with <ENTER>. If you do not have a second keyboard, you may connect your PC keyboard temporarily to your MT-Ultra and use its ENTER key.

Please note: For version 6.1 d and later you will not need a 2nd keyboard. Confirm the site key by simply pressing a function key (buttons below the screen).

Finally, press ‘Q’ for QUIT to terminate the registration program and launch MT 6.x.

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MT-EFB Update

MT EFB - Electronic Flight Bag Update for JeppView Version 3

Abbreviations:

EFB - Electronic Flight Bag
CF - Compact Flash
MT - Moving Terrain

Introduction

Introduction

The following manual describes the updata process for the Jeppesen Enhanced Navigation Database Charts on the Moving Terrain EFB update device.

The following hardware is included with the package:
1 x MT-VisionAir Master Unit (if not already available)
1 x MT EFB Update PC System with 220V power cord
1 x KVM switch for the 2 PC connection to one monitor/keyboard/mouse
1 x EFB-Compact Flash

It is assumed that you possess a standard office computer with PS/2 keyboard and mouse, as well as a VGA-monitor. The enclosed KVM switch serves a connection to both computers (your office computer and the EFB Update System), to a keyboard, mouse, and monitor.

Preparation

Preparation

Before the actual update of the JeppView database, please load the current EFBTools for JeppView 3 to the current update of your Jeppesen CD from our web page. You will additionally require a PC with a compact flash card reader or a notebook with a PCMCIA slot and a compact flash adapter with internet access.

The EFBTools file is found as a ZIP file at www.moving-terrain.de -> EFB Tools -> EFB Tools for JeppView 3.x Disc ...:

EFB Tools Download

Sie benötigen ein entsprechendes EFB Update Kit, das Sie von uns erwerben können. Bitte laden Sie die Tools für die jeweilige JeppView Version mit der Revisionsnummer, die Ihrer aktuellsten JeppView CD entspricht.

EFB Tools Update				
MT-System	**Software**	**Version**	**Format**	**Datei-größe**
MT-VisionAir alle Units	**JeppView Version 2.x**			
	EFB Tools für JeppView V2.x Disc 17-2004, Issue Date 13 AUG 04	V 17-2004	ZIP	508KB
	EFB Tools für JeppView V2.x Disc 18-2004, Issue Date 27 AUG 04	V 18-2004	ZIP	508KB
	EFB Tools für JeppView V2.x Disc 19-2004, Issue Date 13 SEP 04	V 19-2004	ZIP	508KB
	EFB Tools für JeppView V2.x Disc 20-2004, Issue Date 24 SEP 04	V 20-2004	ZIP	508KB
	EFB Tools für JeppView V2.x Disc 21-2004, Issue Date 08 Oct 04	V 21-2004	ZIP	512KB
	EFB Tools für JeppView V2.x Disc 22-2004, Issue Date 22 Oct 04	V 22-2004	ZIP	512KB
	EFB Tools für JeppView V2.x Disc 23-2004, Issue Date Nov 04	V 23-2004	ZIP	514KB
	EFB Tools für JeppView V2.x Disc 24-2004, Issue Date 19 NOV 04	V 24-2004	ZIP	518KB
	JeppView Version 3.x			
	EFB Tools für JeppView V3.x Disc 01-2005, Issue Date 14 JAN 2005	V 01-2005	ZIP	380

Should the clicking of the download link result in an error message, please download required tools as follows:

Right-click with mouse on the desired link -> Save link as -> Choose directory, as described by the connection name -> Select.

You also need to save the EFBTools files for the Issue Nr/Date of the JeppView disc to the enclosed EFB compact flash in the main „*EFB-CF-drive*:\“ directory. You also need to replace the *EFB-CF-drive* to the drive directory letter that your EFB-CF currently installed on your laptop or PC, i.e. D:\.

Starting of the EFB Update System

Connect the EFB Update System with the power cord to the 220V-socket.

Connect the EFB Update System with the KVM switch in accordance with **Figure 1** and the Instruction Manual of the KVM switch to your office computer. Now with <ScrollLock+ScrollLock+Cursor Up> key sequence it is possible to switch between computer within 2 seconds.

Turn on the EFB Update System. If there is no indication of successful operation on the screen, wait 2 minutes for the computer to fully boot up, and then execute the switch key combination (<ScrollLock+ScrollLock+Cursor Up>).

Warning: The enclosed compact flash should not be inserted in the EFB Update System at this time.

Figure 1 Connection of EFB Update System, switch (middle) and office PC

The device serves exclusively for updating the Moving Terrain EFB data. Changing the hardware, operating system, or program settings could disable functionality and assistance from our MT colleagues will be needed.

Part 1 of the Update Procedure

Your EFB Update System initially starts with Windows XP operating system.
First double-click on the shortcut icon „EFB-Update“ on the desktop and follow the instructions on connecting the compact flash (CF) and the current JeppView Update CD (see **Figure 2**).
The current efbtool.zip file from our website should be located in the the compact flash main directory (in accordance with the Preparation section).

Figure 2. EFB Update System drives

After the compact flash and CD has been inserted, please do not touch or click on anything with the mouse or keyboard until the program has completely finished the updating process.

A confirmation message appears after a successful update installation. All programs will also close at this time.

Part 2 of the Update Procedure

Remove the compact flash from your PC (after being switched off), and insert the CF into the side slot of the MT-VisionAir while it is turned off. Then turn on device.

The EFB Update in the MT-VisionAir system is automatically conducted, and a confirmation message is displayed after update completion.

Important

1. Please notify us if you change the range zone of your JeppView area.

2. Do not install additional software on the EFB Update cube.

3. Please use Moving Terrain exclusively supplied components.