TOPLIS

USER MANUAL

TopSky plugin for Portugal vACC

Version 2.0

10 Jan 2024

Contents

Chapter 1

Introduction

1.1 Disclaimer

Although - as its name suggests - the TopSky plugin is based on TOPLIS and the TopSky ATM system, it is in no way affiliated with or endorsed by Thales Group or NAV Portugal. Similarities between plugin features and the real system are not entirely coincidental, but the plugin can not be used as a real world training aid.

1.2 Foreword

EuroScope, a controller client developed by Gergely Csernák for the VATSIM network, was first released for public use in September 2007. One of the biggest changes in version 3.1 was the possibility for the user community to customize the program to an even higher degree than was possible before by writing their own plugins that can be used to alter the way information is presented and even create completely new functionality into the program. This allowed creating very detailed simulations of all kinds of ATC systems without making the main program overly complex. Version 3.2 expands on these possibilities, making it possible to create even better plugins.

The base TopSky plugin is developed by Juha Holopainen. The TopSky plugin (a.k.a. The Plugin Formerly Known As “EUROCAT 2000 E”) started out as a very small project to create a couple of customized aircraft tag items, but as more information about the real system and the possibilities with the plugin development became available, it slowly grew to include an almost complete set of tag items, tag menus, graphical elements on the radar display and some additional functionality.[4]

The A-CDM plugin is developed by Roger Puig. CDM is an Euroscope plugin based on the real life CDM tool that allows us to improve the departure flows at airports.[6]

The IASsure plugin is developed and maintaned by Nick Müller. This plugin allows you to make better informed decisions based on aircraft speed without relying on pilot reports.[5]

Chapter 2

Systems

2.1 A-CDM

Airport CDM (A-CDM) aims to improve the efficiency and resilience of airport operations by optimising the use of resources and improving the predictability of air traffic.
It also allows the exchange of more accurate departure information, particularly target take-off times, with the European ATFCM network, leading to improved en-route and sectoral planning.[1]

2.1.1 Operation

The A-CDM plugin operates in a Master-Slave topology, in which the "CDM Master" will calculate the required data and distribute it to the slaved CDM positions. Due to this, it is mandatory that the "Master" ATC is the one at the lowest position, such as Delivery.

Warning	IF THERE IS NO ACTIVE "CDM MASTER" A-CDM WILL NOT BE OPERATIONAL

Warning	IF MORE THAN ONE POSITION ASSIGNS ITSELF AS "CDM MASTER" A-CDM WILL NOT BE OPERATIONAL

At the end of a session or controller swap, the "CDM MASTER" ATC should return himself to "CDM SLAVE" before the next controller takes over.

2.1.1.1 A-CDM Timeline

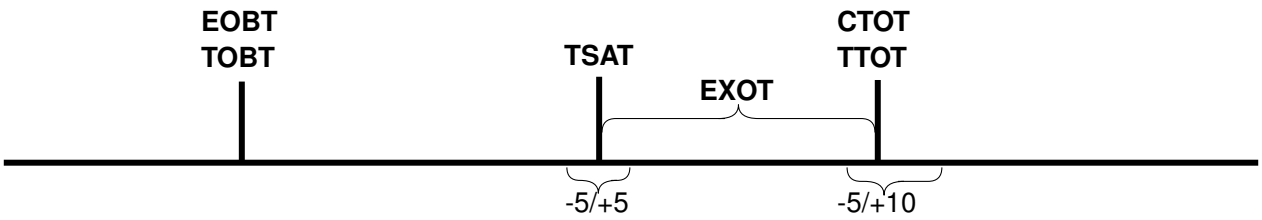


Figure 2.1: A-CDM timeline with delaying TSAT example

Each departure follows a timeline of events from the moment a Flight Plan is submitted until the flight is airborne. These events are called "Milestones".

The A-CDM calculation begins at Target Off Block Time (TOBT). TOBT is the time the aircraft is ready for startup, or push and start. This is typically the time at which the pilots reports "fully ready", or requests pushback or startup. In an optimal scenario this would match with the flight plan Estimated Off Block Time (EOBT, sometimes called ETD in other sources).

A-CDM will calculate a Target Take Off Time (TTOT) based on the TOBT, current departure rate, known traffic and Flow Restrictions. Each TTOT is separated from other TTOTs by the amount of time required to achieve the maximum defined departure rate. During moments of high traffic that, without a regulation, would exceed the airport departure rate capacity, the system will delay the TTOT in order to meet the required departure rate.

Different Stands have different Estimated Taxi Out Time (EXOT). A stand closer to the runway will have a shorter EXOT than another further away. The system adds EXOT to TOBT, to obtain TTOT.

Target Start-up Time (TSAT) is the time at which a flight may push back and start up.
If there is no delay, TSAT will be the same as TOBT.
If there is a delay, TSAT will the difference from TTOT - EXOT.
A TSAT has a validity window of -5 to +5 minutes, within which start-up approval may be issued.
A TSAT within the validity window will be colored in color1, or if outside the validity window color2.
Additionally, it will be colored in color5 the minute it expires, as an attention getter.
If a flight misses its TSAT, a new one must be assigned by right clicking the TSAT value in order to set TOBT to present time and restart the CDM calculation for the concerned flight.

During times of extraordinary demand, a Calculated Take-Off Time (CTOT) may be issued for a certain flight. The A-CDM operation remains the same, with the exception that it will try to match TTOT to CTOT. A CTOT has a validity window of -5 to +10 minutes of CTOT, during which Take Off clearance must be issued.

During some events, a manually created list of callsign and CTOT pairs may be created. These are Event CTOT, or ECTOT. ECTOT on their own do not contribute to A-CDM calculations, unless manually added as a CTOT to the flight.

Once A-CDM is made aware of the assignment of a CTOT to a flight, it will keep the same CTOT locked until a Ready Message (REA) is sent, even if the external source of the CTOT is updated with an improvement.

2.1.1.2 Examples

The system first attempts to calculate a departure with no delay, by adding EXOT to TOBT it obtains TTOT. For example, TAP123 reports "fully ready" at 12:00 (TOBT 12:00), sitting on a stand with 15 minutes of taxi time (EXOT 15 minute), the system predicts TAP123 will be able to take off at 12:15 (TTOT 12:15). Because there is no conflict, TSAT is equal to TOBT (TSAT 12:00)

A second flight, RYR456, reports "fully ready" at the very next minute (TOBT 12:01), but is on a stand very close to the runway with a shorter taxi time (EXOT 5 minutes, for example), the system predicts RYR456 will be able to take off at 12:06 (TTOT 12:06). Because there is no conflict, TSAT is equal to TOBT (TSAT 12:01).
Notice how RYR456 was ready for push and start after TAP123, yet, because of the very short taxi time, it will take off much sooner that TAP123.

A third flight, IBE789, also reports "fully ready" at 12:01 (TOBT 12:01), sitting on a stand with 15 minutes of taxi time (EXOT 15 minute), the system predicts IBE789 will be able to take off at 12:16 (TTOT 12:16). However, this TTOT is too close to TAP123 (TTOT 12:15) and must be delayed for separation.
The system calculates that according to the current departure rate, IBE789 must take off at 12:18 (TTOT 12:18). By subtracting the 15 minutes Estimated Taxi Out Time from the Target Take Off Time, the system obtains IBE789's Target Startup Time of 12:03 (TTOT - EXOT = TSAT, 12:18 - 15 = 12:03).
This is a very small delay, in fact so small that it falls within the TSAT window. IBE789 TSAT is 12:03, and because the TSAT window is +/- 5 minutes (11:58 - 12:08). IBE789 may be pushed back at anytime within this window.

A fourth flight, EJU321, is departing to the same destination as IBE789. This destination has limited capacity and can only accept arrivals in 15 minute intervals. The system will take care of this limitation, no intervention should be required.
EJU321 reports "fully ready" at 12:01 (TOBT 12:01), sitting on a stand with 15 minutes of taxi time (EXOT 15 minute), the system predicts EJU321 will be able to take off at 12:16 (TTOT 12:16). Because of the

restriction at destination, the earliest time that EJU321 can take off, while remaining separated of IBE789, is 12:33 (IBE789's TTOT, 12:18, + 15 minutes required separation at destination).
The system assigns a Calculated Take Off Time of 12:33 to EJU321 (CTOT 12:33). By subtracting the taxi time from this (EXOT 15 minutes), the system obtains TSAT 12:18 (CTOT - EXOT = TSAT, 12:33 - 15 = 12:18).
EJU321 must wait on the stand until the TSAT window (12:13 - 12:23) before being able to pushb and start.

2.1.1.3 Commands

Interaction with core A-CDM systems is done with classic command line inputs:

`.cdm reload`	Reloads all CDM configs
`.cdm refresh`	Forces a data refresh phase
`.cdm ctot`	Refreshes CTOT data
`.cdm save`	Saves data to `savedData.txt`
`.cdm load`	Loads `savedData.txt`
`.cdm master "airport"`	Become the master of the selected airport.
`.cdm slave "airport"`	Turn back to slave of the selected airport.
`.cdm refreshtime "seconds"`	Change refresh rate time in seconds (Default 30, MAX 99).
`.cdm customdelay "airport"/"runway" "time_start"`	Shifts all TSATs for selected airport and runway to start at the `time_start`. Wait some seconds to update after applied. (Ex. `.cdm customdelay LPPT/02 1100` All TSATs from LPPT runway 02 will start at 1100). To remove use `.cdm customdelay LPPT/02 9999`.
`.cdm lvo`	Toggle LVO on or off
`.cdm realmode`	Toggle realmode on or off
`.cdm remarks`	Toggle set TSAT to Euroscope scratchpad on or off
`.cdm rates`	Updates rates values from `rate.txt`
`.cdm flow`	Forces an update on ECFMP flow restrictions data, otherwise updated every 5 minutes.
`.cdm help`	Show all available commands

Table 2.1: A-CDM commands

2.1.2 A-CDM field descriptions

Data field	Description	Comments	Color
A	Alert	Flashes A if the aircraft is waiting for an action	color5
ASAT	Actual Start-Up Approval Time	Automatically records time of Start-Up Approval when inputting a Start-Up, Push-back, Taxi or DEPA Ground Status	color12
ASRT	Actual Start-Up Request Time	Used to record time of Ready or Start-Up Request	color10
CTOT	Calculated Take Off Time	Flow restrictions create CTOTs to planes affected with published MDIs from ECFMP	color11 If REA message has been sent: color2 If Manual or Event CTOT: color4 If Manual or Event CTOT, and Flow/CAD CTOT: color7
ECTOT	Event Calculated Take Off Time	Similar to *CTOT*, but originating from a manually compiled list of callsign and CTOT pairs. Needs to be manually added to *CTOT* to have an effect on A-CDM calculations.	color11
E	State	Depending on aircraft timming: P: EOBT more than 35 minutes in the future C: EOBT is less than 35min and TSAT not expired I: TSAT expired	color1
EOBT	Estimated Off Block Time	Same time as Flight Plan ETD or EOBT	color8 If a new EOBT is submitted by the pilot, and EOBT is different than TOBT: color4

Data field	Description	Comments	Color
Flow Message	ECFMP Flow Message	Description of the restriction impacting the flight	color8
Ready	Ready State Flag	Used to signal Ready state. Setting Ready also records time of Ready or Start-Up Request	Ready: color1 Not Ready: color7
TOBT	Target Off Block Time	On receipt of a new Flight Plan, TOBT is set to the same time as EOBT. If the Flight Plan is updated with a new EOBT, TOBT will not change automatically. If required, TOBT may be manually updated using the Edit TOBT function	From TOBT-35 to TOBT-5 color2 From TOBT-5 to TOBT+5: color1
TSAC	Target Start-Up Approval Communicated Time	Used to note down TSAT communicated to the flight	If TSAC within 5 minutes of TSAT: color1 If TSAT changed by more than 5 minutes: color4
TSAT	Target Startup Time	TTOT - EXOT	From EOBT-35 to TSAT-5: color2 From TSAT-5 to TSAT+5: color1 From TSAT+5 to TSAT+6: color5 After TSAT+6: color2
TTOT	Target Take Off Time		color9 If TTOT is locked due to a CDT restriction: color2

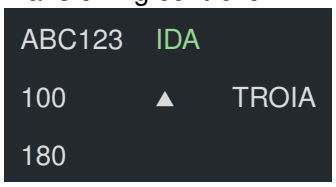
Table 2.2: A-CDM field descriptions

2.2 Coordination

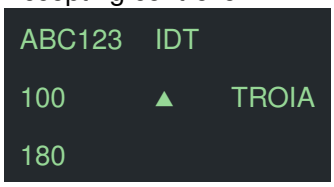
TopSky provides various ways to coordinate information between controllers.

The example track labels do not represent any specific setup and are only meant to highlight the items specific to each function. In the examples, aircraft ABC123 is assumed by “transferring controller” and the next sector is referred to as “accepting controller”. For reference, the example labels would look like these before any coordination (coordination point TROIA, entry/exit level FL180):

Transferring controller:



Accepting controller:



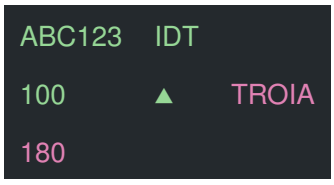
Some of the coordination functions (ROF, RTI and TIP) require very specific conditions to exist to be able to send the necessary messages between the controllers. TopSky attempts to check for this and either disables the function (grey text in the menu button) or creates a warning message if the conditions are lost during a coordination, but in some cases the coordination messages can get lost. In this case try the coordination again or manually coordinate.

2.2.1 PEL/COPN

A coordination is displayed by coloring the proposed values Proposition In or Proposition Out, depending on whether the coordination was sent or received, in the track label and the flight lists. Additionally, a message is displayed in the *Message In Window* for received coordinations and in the *Message Out Window* for coordinations sent by you.

To send a PEL (Planned Entry Level) coordination, left-click on the PEL value in the track label or a flight list. This opens a menu to select a value. To send a COPN (Entry Point) coordination, left-click on the COPN value in the track label or a flight list. This opens the *Waypoint Menu*. Select “Routing”. This opens a menu to select the desired point. The response of the coordination can be a counter-proposal as well, in which case the color of the values remain Proposition In.

An example track label, showing both the PEL and COPN being coordinated:



To answer an incoming coordination, left-click on a proposed value or the corresponding message in the *Message In Window*. This opens a menu where you can select the response (Accept, Refuse or Change). After the response, the track label and lists display depend on the answer:

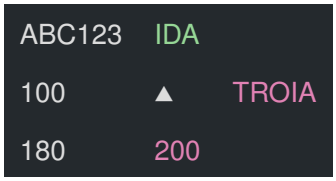
Accept:	Accepted values, sector state color
Refuse:	Original values, sector state color (due to EuroScope bug, should be Warning)
Change:	New proposed values in Proposition Out

2.2.2 XFL/COPX

A coordination is displayed by coloring the proposed values Proposition In or Proposition Out, depending on whether the coordination was sent or received, in the track label and the flight lists. Additionally, a message is displayed in the *Message In Window* for received coordinations and in the *Message Out Window* for coordinations sent by you.

To send an XFL (Exit Flight Level) coordination, left-click on the XFL value in the track label or a flight list. This opens a menu to select a value. To send a COPX (Exit Point) coordination, left-click on the COPX value in the track label or a flight list. This opens the *Waypoint Menu*. Select “Routing”. This opens a menu to select the desired point. The response of the coordination can be a counter-proposal as well, in which case the color of the values remain Proposition In.

An example track label, showing both the XFL and COPX being coordinated:



To answer an incoming coordination, left-click on a proposed value or the corresponding message in the *Message In Window*. This opens a menu where you can select the response (Accept, Refuse or Change). After the response, the track label and lists display depend on the answer:

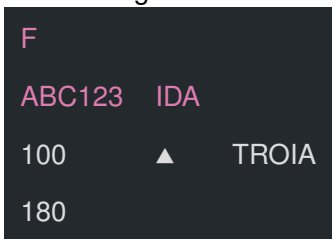
Accept:	Accepted values, sector state color
Refuse:	Original values, sector state color (due to EuroScope bug, should be Warning)
Change:	New proposed values in Proposition Out

2.2.3 Releases

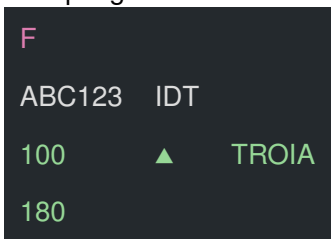
To communicate a release to the next controller, select the “Trf & release” option instead of “Transfer” in the *Callsign Menu* when transferring the aircraft. This opens the *Transfer & Release menu* to select the desired release condition. The available choices are “Climb”, “Descent”, “Turn” and “Full”. Selecting an option will start the transfer with the selected release condition.

The release will be displayed on line 0 of the track label (in Proposition In or Proposition Out during the transfer), showing the first letter of the release condition. The example labels below show a Full release:

Transferring controller:



Accepting controller:



After the accepting controller assumes the aircraft, the release indicator changes to sector state color. It remains in the transferring controller's label until it becomes *Unconcerned*, and in the accepting controller's label for 3 minutes.

Note	If a release is sent to a controller not using the TopSky plugin, it will only be displayed on your label. To the accepting controller it will look like a normal transfer.

2.2.4 HOP

The purpose of the HOP (Hand-Over Proposal) message is for the transferring controller to propose the flight for hand-over to the accepting controller, and/or to propose non-standard transfer conditions which require the approval of the accepting controller.

To send a HOP without any transfer conditions, select the *Handover Proposal (HOP)* option in the *Callsign Menu*.

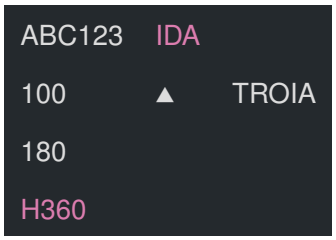
To send a HOP with a transfer condition (assigned heading, direct-to point or assigned speed):

1. open the AHDG or ASP menu and select the "HOP" option (found in the "More" folder)
    - See *Handover Proposal (HOP)* for indications
2. select the desired value (to select a direct-to point, select the "Point" option in the AHDG menu and then left-click on the point on the radar screen

The example labels below show a HOP with an assigned heading proposal:

Transferring controller:

- SI item and any proposed values in Proposition Out color
- Message in Message Out Window



Accepting controller:

- Callsign item and any proposed values in Proposition In color
- Message in Message In Window

The transferring controller should monitor both the track label and the *Message In Window* as there are three ways for the accepting controller to answer a HOP. In order of preference, they are:

- From the *Callsign Menu*, select "ROF". This sends a ROF message to the transferring controller.
    - See *Request On Frequency message* for indications
- Left-click on the AHDG, ASP or COPN item. This opens the *Combined Transfer Menu*. In it, select "Accept". This sends an Accept message to the transferring controller.

  - The labels on both controllers' screens return to normal sector state coloring
  - A message is put into the Message In Window for the transferring controller
  - A message is put into the Message Out Window for the accepting controller

- From the *Callsign Menu*, select "Assume". This assumes the aircraft (with the other two answers the aircraft remains assumed by the transferring controller)
  - The labels on both controllers' screens return to normal sector state coloring

Note	If a HOP is sent to a controller not using the TopSky plugin, it will only be displayed on your label. To the accepting controller it will look like a normal transfer. Any proposed values will be shown also on the accepting controller's label but they will not be colored as proposals. If a HOP is sent to a manually selected controller and is answered by either "Accept" or "ROF", the next controller is reset to the automatically calculated one. The correct controller needs to be manually selected again before transferring the aircraft.

2.2.5 ROF

The ROF (Request on Frequency) message is sent by the accepting controller to the transferring controller when a flight establises radio contact but the label has not yet been transfered to the downstream sector. The upstream sector should then transfer the label. The message may also be used as a reply to HOP to signify the acceptance of the flight under the proposed conditions.

Warning	ROF should not be used to request an early handover of a flight. ROF is a coordination tool that is context dependent, using it outside the prescribed scenarios or ir other unintended ways will cause unnecessary confusion.

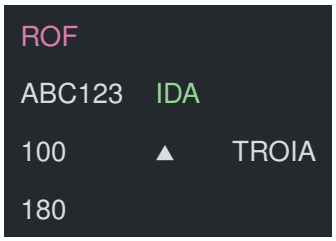
To send a ROF message, select the "ROF" option in the *Callsign Menu* of the aircraft in question. The example label below shows the indications when the message is sent (there are no indications in the accepting controller's track label):

Transferring controller:

- ROF text in Proposition In color
- Message in Message In Window

Accepting controller:

- ROF text in Proposition Out color
- Message in Message Out Window



The indications are removed when a "Transfer", "Trf & release" or "HOP" is performed.

Note	If a ROF is sent to a controller not using the TopSky plugin or the message fails to go through, an error message will be put into the Personal Queue Window. The message counter in the Global Menu will be highlighted in Warning color if the window is not open.

2.2.6 RTI/TIP

These messages are used to request/propose the transfer of a flight on an assigned heading, speed or rate of climb/descent. RTI (Request Tactical Instructions) is a request initiated by the accepting controller and TIP (Tactical Instructions Proposal) a proposal initiated by the transferring controller.

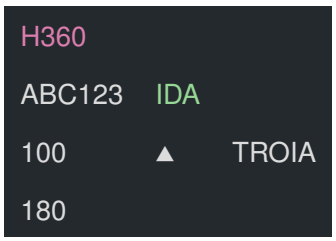
In the examples below the RTI message is used. For the TIP message, the indications and actions are the same, only the roles are reversed – the transferring controller sends and the accepting controller answers the message, so the message will appear in the other Message Window.
To send the RTI message:

1. open the AHDG, ASP or ARC menu and select the “RTI” option (found in the “More” folder)
2. select the desired value in the list (“Point” option in the AHDG menu is not available)

When the message is sent, the following indications are shown:

Transferring controller:

- Proposed value in Proposition In color
- Message in Message In Window



Accepting controller:

- Proposed value in Proposition Out color
- Message in Message Out Window

To answer the message, left-click on the proposed value on line 0. This opens the *Tactical Transfer Menu*) where you can either accept or reject the proposal. When clicking on “Accept”, the menu closes and the following indications are displayed:

Transferring controller:

- Accepted value in sector state color
- Relevant label field value in Information color (until the accepted value is set)
- Message in Message Out Window

Accepting controller:

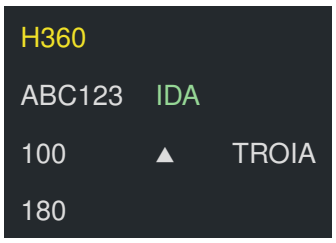
- Accepted value in sector state color
- Relevant label field value in Information color (until the accepted value is set)
- Message in Message In Window

When the accepted value has been set (either by going back to the Tactical Transfer menu and selecting “Apply” or setting the value some other way), the label field returns to the sector state color.

On the other hand, if “Reject” is chosen, the menu closes the indications are as follows:

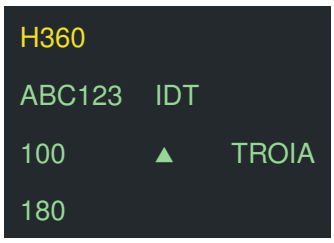
Transferring controller:

- Rejected value in Warning color
- Message in Message Out Window



Accepting controller:

- Rejected value in Warning color
- Message in Message In Window



A rejected coordination value will be removed from the label after 60 seconds.

Note	If an RTI or TIP is sent to a controller not using the TopSky plugin or the message fails to go through, an error message will be put into the Personal Queue Window. The message counter in the Global Menu will be highlighted if the window is not open.

2.2.7 Coordinating more than one value

It is possible to coordinate more than one value, either before or after the previous proposal has been answered. It is important to note that the label field on line 0 will only show the last proposal or answer. Regardless of this, all the relevant label fields will have the Information color for accepted but not yet set values.

For example, if you send an RTI with AHDG 360 (as in the above example) and then send another with ASP 300 (either immediately or after the first coordination is answered), the label field on line 0 will only show the ASP proposal. When opening the Tactical Transfer menu, all the proposals and accepted values are shown. If more than one proposal is active, clicking on “Accept” or “Reject” will send the same answer to all of them. Therefore, it is recommended to wait for an answer until sending another proposal unless the intention of the proposal is to get “all or nothing”.

2.2.8 Data stored in the flight strip annotation boxes

TopSky stores some data in the flight strip annotation boxes (the group of nine boxes in three columns on the right side of the strip). This enables you to send this data to the next controller, or any other controller by manually pushing the strip. In addition, TopSky automatically pushes the strip when a handoff proposal (HOP) is sent.

TopSky needs to be able to use four of the nine boxes for its functions. They are the boxes in the bottom row as well as the right-most box in the center row, marked with X’s in the picture below. Do not manually edit those boxes or use them to store any other data. The other boxes, marked by minus signs, are currently not used by TopSky in any way.

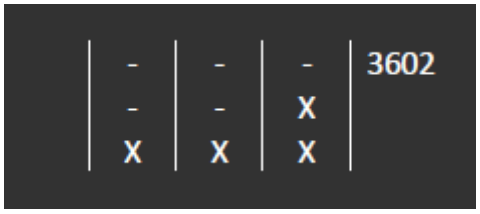


Figure 2.2: Unusable flight strip boxes

2.3 Datalink

TopSky uses *Hoppie's ACARS network*. A separate password (logon code) is needed, and it can be *requested from that site*.

TopSky supports Departure Clearance (DCL) and Controller-Pilot Data Link Communications (CPDLC).

To start using the data link functions, first connect to the VATSIM network. Then connect to the Hoppie network:

- Open the *CPDLC Setting Window*
- Enter/check the login callsign
- Enter/check your personal logon code
- Select whether to provide CPDLC or DCL services or both
- Left-click on the "Connect" button

The "Connect" button will change to "Online" with a green background. Wait at least 10 seconds to see if the connection is successful. Error messages regarding the connection will be shown in the *Personal Queue Window*.

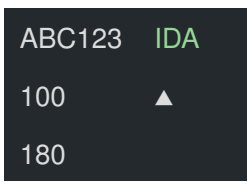
Warning	Attempting to connect with a CPDLC login callsign that is already in use will not fail instantly, and may take up to 10 seconds for the error message to be added to the *Personal Queue Window*

The Hoppie logon code expires after 120 days of inactivity. If that happens, the connection will fail and a new logon code has to be requested.

If the connection is lost, an error message dialog will be displayed in the center of the radar screen. Note that if multiple EuroScope instances are used, the proxy instances will not be able to access the CPDLC message windows or change the network connection status.

TopSky may sometimes fail to parse the message contents correctly. The longer the message, the more likely it is that the parsing will fail. When in doubt, open the message in the *CPDLC Current Message Window*.

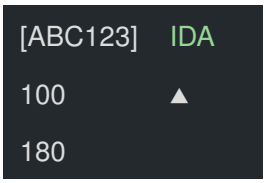
The example track labels do not represent any specific setup and are only meant to highlight the items specific to each function. In the examples, aircraft ABC123 is assumed by you, the next controller is "IDA", the aircraft is climbing through FL100, and its cleared level is FL180. This is the label before any messages arrive:



When the aircraft requests to start a CPDLC connection, it sends a "REQUEST LOGON" message. The message is displayed in the *CPDLC Current Message Window* and the Callsign field gets blinking square

brackets around it (not on proxy ES instances). TopSky automatically denies requests for aircraft not entering your sector. To approve the request, use the “Start CPDLC” button in the *Callsign Menu*. To deny the request, left-click on the message in the *CPDLC Current Message Window* and select “UNABLE”. It is also possible to accept if necessary, but the *Callsign Menu* is the primary way to do it.

When the request has been accepted, the Callsign field will get steady square brackets around it. This indicates that the aircraft is CPDLC connected and available to exchange CPDLC messages with.



To terminate the CPDLC connection of an aircraft, use the “End CPDLC” button in the *Callsign Menu*.

Note	While it is possible to answer any message in the *CPDLC Current Message Window* using the “Manual Reply” option, the track label menus should always be used to answer correctly recognized messages, as using the manual reply method will not update the track label values.

2.3.1 Departure Clearance (DCL)

ARINC-623 DCL is a service used in Europe and many other parts of the World. It is a direct ATC-to-pilot data link communication over the ACARS network.

The departure clearance functionality is built into the Departure List. A received clearance request is displayed in the list, and a clearance can be sent by opening the *Pre-Departure Clearance Window* via left clicking the RWY or SID fields of the Departure List.

A DCL follows a chronological sequence of events that must be completed in order to communicate a clearance.

2.3.1.1 Departure Clearance Request (RCD)

The aircraft sends a clearance request message (RCD). The message is also shown in the *CPDLC Current Message Window*:

> REQUEST PREDEP CLEARANCE ABC123 A320 TO ESSA AT LPPT STAND 221 ATIS PAPA

2.3.1.2 Flight System Message (FSM)

If the request is correctly formatted, TopSky will automatically send a flight system message (FSM) as a reply. Its content depends on whether all the requirements for a DCL are met (flight plan found, departure airport offers data link clearances, etc.). If so, the following reply message is sent to the aircraft:

> DEPART MESSAGE STATUS FSM 1312 221113 LPPT ABC123 RCD RECEIVED REQUEST BEING PROCESSED STANDBY

The List CLR tag item will show a “R” text in Warning color (Urgency if the request contained remarks text after the ATIS indicator. Check the message in the *CPDLC Current Message Window*. The text will start to blink two minutes before a timeout occurs if a clearance hasn’t been sent.

If a clearance is not sent before the timeout occurs, the data link clearance request is automatically rejected and a message is sent to the aircraft to revert to voice procedures.

> RCD REJECTED REVERT TO VOICE PROCEDURES

2.3.1.3 Departure Clearance Message (CLD)

The clearance is sent using the *Pre-Departure Clearance Window*, opened by left clicking the RWY or SID fields of the Departure List.

Note	Due to system limitations, the current ATIS letter should be manually added to the RMK field of the DCL, in the "ATIS X" format.

The clearance is sent using the “Send DCL” button. “Voice” rejects the data link clearance request and sends a message to the aircraft to revert to voice procedures.

> LPPT PDC 001 CLD 1314 221113 LPPT PDC 001 ABC123 CLRD TO ESSA OFF 02 VIA IXIDA5N SQUAWK 3251 ATIS:X QNH 1012

Once the clearance is sent, the List CLR item will change to “A”, and will start to blink if there is no reply from the aircraft two minutes before a timeout occurs.

If there is still no answer from the aircraft when the timeout occurs, the data link clearance is automatically rejected and a message is sent to the aircraft informing it that the received clearance has been cancelled.

> ACK NOT RECEIVED CLEARANCE CANCELLED REVERT TO VOICE PROCEDURES

2.3.1.4 Departure Clearance Readback (CDA)

A clearance can be answered to with either “WILCO” to accept it or “UNABLE” to reject it.

2.3.1.5 Flight System Message (FSM)

Once a reply is received, the List CLR item changes to a filled box (for WILCO) or clears it (for UNABLE). A message is automatically sent to the aircraft.

> ATC REQUEST STATUS FSM 1317 221113 LPPT ABC123 CDA RECEIVED CLEARANCE CONFIRMED

If an UNABLE reply is received, clearance must then be negotiated and delivered by voice. A message is automatically sent to the aircraft.

> CONTACT ATC BY VOICE REFUSE NOT SUPPORTED BY DATALINK

2.3.1.6 Abnormal operations

Most failure cases result from the message not being correctly formatted, and TopSky failing to recognize it correctly. Regardless of whether TopSky recognizes the message as belonging to a departure clearance sequence, it will be put into the *CPDLC Current Message Window*. In case the system fails, revert to voice communications.

2.3.2 Controller-Pilot Data Link Communications (CPDLC)

CPDLC is a means of communication between controller and pilot, using data link for ATC communications, and with the extra advantage of displaying data on the track labels and flight lists as well.

As the messages take significant amount of time to get through (receiving a reply to a clearance can take anything from seconds to a couple of minutes), using CPDLC should be limited to situations that are not time-critical. For this reason, it is mostly used in upper airspace area control sectors.

The messages are grouped to dialogs, with an opening message and subsequent replies. Some messages do not need a reply, while for others a specific reply is expected. The available replies are set automatically, so only the correct type of reply can be sent.

2.3.2.1 Allowed message types

TopSky supports for the following message types:

Uplink	**Downlink**
Level clearance	Level request
Heading clearance	Heading request
Direct-to clearance	Direct-to request
Speed clearance	Speed request
Squawk code assignment	MAYDAY/PAN/SQ7500
Squawk ident instruction	Free text
Voice contact instruction	
Free text	

Table 2.10: Supported CPDLC message types

2.3.2.2 Non-supported message types

TopSky does not support the following downlink message types. They will be automatically closed and a reply sent informing that the system does not support the message type:

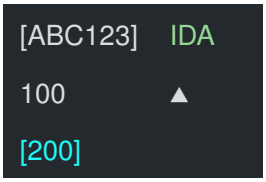
- Any requests containing “When can we expect”, “At pilots discretion” or “Own separation”
- Level requests for a cruise climb, block level, or any level request tied to a position or time

- Lateral requests for an offset, weather deviation or ground track
- Speed requests to maintain a speed range
- Voice contact requests
- Requests for a procedure name and/or type
- Position reports

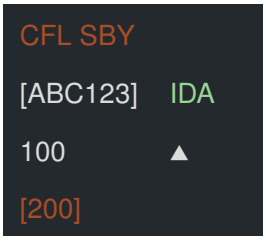
Note that a non-allowed message type can be classified as “free text” by TopSky if the message parser doesn’t recognize it as a non-allowed type. In this case the automatic reply will not be sent and it is recommended to use the "MESSAGE NOT SUPPORTED BY THIS ATS UNIT" message from the *Free Text Messages* set, and archiving the dialogue.

2.3.2.3 Uplink clearance sequence

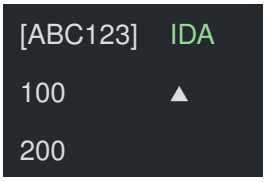
In this example a level clearance is used. The clearance is sent using the *CFL Menu*. To send the clearance using CPDLC, check that the “CPDLC” option is selected. Depending on the aircraft’s altitude, by default it may be selected or deselected. Send the clearance by selecting a level value.
In this case FL200 was selected, and the CPDLC message “CLIMB TO FL200” was sent to the aircraft. The uplinked value is shown in brackets and in CPDLC UM Clearance



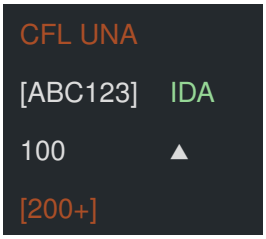
The aircraft has responded with “STANDBY”. The uplinked value changes to CPDLC Standby color, and a warning is inserted on line 0 of the label. The warning can be acknowledged by left-clicking on it:



The aircraft then eventually answers with “WILCO”. The CFL value is updated accordingly and the label field colors return to normal:

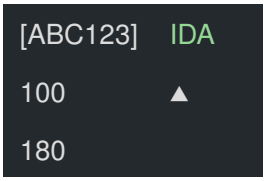


If the aircraft answers with “UNABLE”, a warning is inserted in line 0 of the label:



The "+" after the level indicates that there is a reason in the answer message, for example "DUE TO PERFORMANCE". The reason given is only accessible from the *CPDLC Current Message Window*.

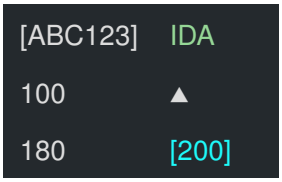
Left-clicking on the warning acknowledges it and the original CFL value is again shown in the label:



2.3.2.4 Downlink request sequence

This example shows a level request.

The aircraft has sent a level request for FL200. The value is shown in the PRFL (Pilot Requested Level) field in brackets and in CPDLC DM Request



The responses to a level request are sent using the *CFL Menu*, which offers the possibilities to respond with "STANDBY", "UNABLE" or a level clearance. In the last case the sequence then changes to an *Uplink clearance sequence*.

2.3.2.5 Free Text Messages

A set of premade free text messages is included for use in the *CPDLC Free Text Menu* and is acessible via the *Callsign Menu* or *CPDLC Current Message Window*:

Message	Purpose	Response Attribute
MESSAGE NOT SUPPORTED BY THIS ATS UNIT	Uncaught unsupported messages	Not required
SERVICE TERMINATED FREQ CHG APPROVED	Release to Unicom	Roger
CONTACT ME VIA VOICE	Raise a flight on the frequency	Roger

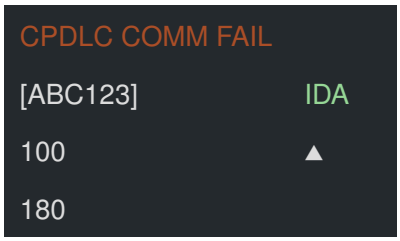
Message	Purpose	Response Attribute
REQUEST AGAIN WITH NEXT ATC UNIT	Defer requests onto the next sector	Not required

Table 2.11: CPDLC Free Text Messages

2.3.2.6 Abnormal operations

As with DCL messages, the most likely failure scenario is TopSky misinterpreting the contents of a received message, which can be verified on the *CPDLC Current Message Window*. Some other failure scenarios are presented below.

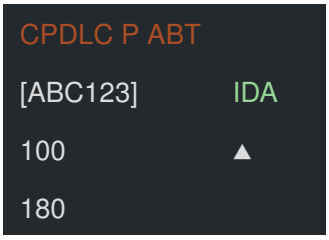
If TopSky has temporarily lost contact with the CPDLC server, “CPDLC COMM FAIL” will be inserted in line 0 of the labels of all CPDLC connected aircraft in CPDLC Failed



In case the server connection is not re-established within a certain time, the connection will be automatically closed and a warning message box will be presented. A new connection can be attempted at any time from the *CPDLC Setting Window*.

During temporary connection issues and also when the connection is automatically closed, the “AGCS” system label in the *General Information Window* will be displayed with Warning color until a connection is re-established.

If the CPDLC connection is terminated by the pilot, a “CPDLC P ABT” warning is inserted in line 0 of the label in CPDLC Failed

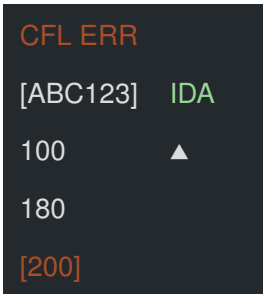


Left-clicking on the warning acknowledges it.

If an uplink clearance is not answered in time, a “<message type> P LATE” warning will be inserted in line 0 of the label in CPDLC Pilot Late

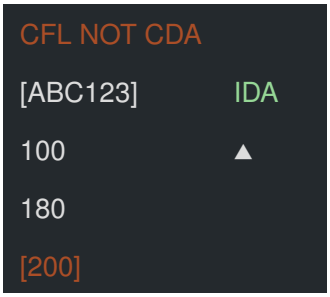
Left-clicking on it opens the *CPDLC Pilot Late Acknowledgement Menu* with options to either abort the clearance or manually mark it as aswered with “WILCO”. Manually marking should be done only after a satisfactory readback is obtained by voice.

If sending an uplink clearance failed, a “<message type> ERR” warning will be inserted in line 0 of the label in CPDLC Failed



Left-clicking acknowledges the warning and aborts the clearance, displaying the previous value in the label.

If an uplink clearance is sent successfully but you are not the Current Data Unit in the aircraft’s CPDLC system, a “<message type> NOT CDA” warning will be inserted in line 0 of the label in CPDLC Failed:



Left-clicking acknowledges the warning and aborts the clearance, displaying the previous value in the label.

2.4 Flight Plan Conflict Probe

Warning	The use of Safety Nets does not relieve the controller from manually identifying and correcting conflicts. Safety Nets are generally configured with conservative values in respect to minimum separations. Even so, the controller must be aware that it is impossible to configure Safety Nets to catch all possible conflict situations.

2.4.1 MTCD (Medium Term Conflict Detection)

General

The MTCD system is a tool that enables the controller to predict possible future conflicts between aircraft. The look-ahead time (prediction time) is set to 20 minutes and the separation distance that triggers the alert (prediction distance) to 7nm for sectors where 5nm separation is applied, and 10 where 8nm separation is applied.

In the lateral plane the system works by checking the aircraft's predicted route up to the defined prediction time and calculating if the separation with other aircraft will be less than the defined prediction distance.

In the vertical plane, TopSky predicts a climb or descent and accounts for buffer zones:

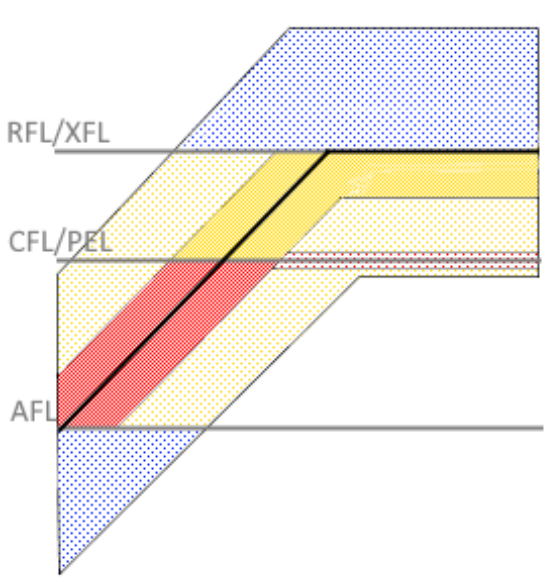


Figure 2.3: MTCD Vertical Path

- Conflicts (area with red shading)
  - detected within 4000ft around the predicted vertical path of the aircraft between AFL and CFL/PEL
  - current clearances may lead to a loss of separation
- Conflict risks (area with yellow shading)

  - detected within 4000ft around the predicted vertical path of the aircraft between AFL and RFL/XFL
  - current clearances will not lead to a loss of separation, but modifying the clearance to the predicted path (CFL=RFL/XFL) will create a conflict

- Potential predicted conflicts (area with light red shading)
  - detected between tracks with equal CFL/PEL values, maintaining the same AFL, when the predicted path contains further climb/descent
  - current clearances result in a loss of separation if further climb/descent is not given
  - at least one of the tracks must be *Assumed*

- Potential risks of conflict (area with light yellow shading)
  - detected within 10000ft but within the minimum and maximum levels of the predicted vertical path

- Potential conflicts (area with light blue shading)
  - detected within 10000ft, outside of the minimum and maximum levels of the predicted vertical path

For the predictions to be accurate, it's very important to keep the CFL and the aircraft's route updated at all times. For aircraft that have an assigned heading or a RAM warning, the system assumes that it will continue on its present track and ground speed for a specified time and stops the prediction there. The system is always disabled for flight plan tracks with an assigned heading.

MTCD is not available for aircraft on the ground until their state is set to "DEPA".

Conflict and Risk display on the track label

If there is a conflict or potential predicted conflict for the aircraft within the set warning parameters, a "•" in Urgency color is shown 10 minutes to loss of separation with a 7nm or 10nm separation minimum, depending on the sector.

The MTCD conflicts are also displayed in the *CARD*.

2.4.2 SAP (Segregated Area Probe)

General

Much like the MTCD system predicts future conflicts between aircraft, the SAP system predicts future intrusions into active areas. The system uses the same look-ahead time as the MTCD system. The future position predictions are done at one-minute intervals which means a very short intrusion into an active area may not be noticed by the system. The classification into risks and conflicts is the same as in MTCD: a conflict means that the current clearance will lead to the aircraft entering an active area, whereas a risk means that the current clearance will not lead to that but clearing the aircraft to its XFL or some other level beyond the current CFL may do so.

As with MTCD, keeping the CFL and the aircraft's route updated is important for the system's operation. For aircraft that have an assigned heading or a RAM warning, the prediction logic is the same as in the MTCD case. SAP is disabled for non-altitude reporting traffic that do not have a manually set AFL.

Conflict and Risk display on the track label

A conflict is shown by displaying the Military coordination indicator (“M”). Note that once the indicator is clicked and changes to inactive state, the system will not give further warnings for that aircraft as long as the indicator is in the inactive state. Click on the inactive indicator to re-arm the system once the aircraft has passed all the areas for which crossing clearance was given.

SAP conflicts are also shown in the *SAP Window*.

2.5 Monitoring Aids

Warning	The use of Safety Nets does not relieve the controller from manually identifying and correcting conflicts. Safety Nets are generally configured with conservative values in respect to minimum separations. Even so, the controller must be aware that it is impossible to configure Safety Nets to catch all possible conflict situations.

2.5.1 CLAM (Cleared Level Adherence Monitoring)

General

The CLAM system warns if an aircraft is not maintaining its cleared level and its vertical rate is not towards the cleared level. The alert is inhibited when the cleared level is lower than 100ft, and for aircraft in level flight, for 30 seconds after a new cleared level is set.

Alert Display

An alert is shown by displaying a circle around the aircraft position symbol and the text “CLAM” in the *ALRT* track label field. MSAW, APW and AIW alerts will have priority over a CLAM alert in the track label.

2.5.2 RAM (Route Adherence Monitoring)

General

The RAM system warns if an aircraft is deviating from its route by more than 1nm. The alert is inhibited 30nm from the departure and destination, and a larger cross-track error (5nm) is allowed near waypoints where the route makes a turn over 10° course change.

For aircraft on a direct-to clearance, the alert is given if the difference between the aircraft’s track and the direct track to the cleared point exceeds 5°. After a direct-to clearance is given, the alert is inhibited for 60 seconds or until the aircraft’s track is towards the point, whichever happens first.

Alert Display

An alert is shown by displaying a circle around the aircraft position symbol and the text “RAM” in the *ALRT* track label field. MSAW, APW, AIW and CLAM alerts will have priority over a RAM alert in the track label.

2.6 Safety Nets

Warning	The use of Safety Nets does not relieve the controller from manually identifying and correcting conflicts. Safety Nets are generally configured with conservative values in respect to minimum separations. Even so, the controller must be aware that it is impossible to configure Safety Nets to catch all possible conflict situations.

2.6.1 AIW (Airspace Infringement Warning)

General

The AIW system warns if an uncontrolled aircraft is already inside or going to enter controlled airspace within a defined time. The system will only scan correlated radar tracks.

Alert display

An alert is shown by displaying the text “AIW” in the *ALRT* track label field. MSAW and APW alerts will have priority over an AIW alert. The AFL item is also colored AIW intrusion and a one minute long prediction line is displayed in AIW intrusion color regardless of the prediction line settings.

2.6.2 APW (Area Proximity Warning)

General

The APW system warns if an aircraft is inside or about to enter a Temporary Segregated Airspace without clearance. The position of the aircraft is only predicted in 30 second intervals for performance reasons so very short future intrusions may not be noticed by the system. The areas are defined in an external text file and activated in the *Airspace Management Window*.

Alert display

An alert is shown by coloring the *CALLSIGN* item background or the text itself in Warning color, unless the *CALLSIGN* item has been manually highlighted. "APW" is displayed in the *ALRT* track label field. An MSAW alert will have priority over an APW alert.

2.6.3 MSAW (Minimum Safe Altitude Warning)

General

Note	MSAW is currently not implemented

The MSAW system alerts when an aircraft is flying at an altitude below the minimum safe altitude. The minimum safe altitude data is read from an external file. There is an adjustable buffer value in the system that allows some altitude variation below the safe altitude to inhibit nuisance alerts for aircraft flying at the minimum safe altitude and not staying exactly at that altitude.

Alert display

An alert is shown by displaying the text “MSAW” in the *ALRT* track label field.

2.6.4 STCA (Short Term Conflict Alert)

General

The STCA system is designed to alert the controller of a possible or actual loss of separation between aircraft. The alert is given between 60 seconds and 120 seconds before a loss of separation is predicted to happen, but it is dependent on the relative positions and movement of the aircraft. The alert will not be shown if both aircraft have STCA alerting inhibited (see the *Safety Nets Status Window*), are inside exclusion areas for parallel approaches, or when either aircraft is inside an active STCA inhibit area. LPPR, LPPT, LPCS, LPFR, LPMA and LPPS CTR are defined as STCA inhibit areas

In the vertical plane the STCA function will assume that an aircraft will level off at its cleared level. This will reduce the number of nuisance alerts caused by climbing and descending aircraft in busy airspace, but will delay the alert in case an aircraft continues through its cleared level. The alert will then be given only after the failure to level off is seen by the system.

Alert display

An alert is shown by coloring the *CALLSIGN* item background or the text itself in Urgency color. A one minute long prediction line is displayed in Urgency color regardless of the prediction line settings.

In addition to the above, the radar position symbol and history dots are displayed in Urgency color.

An aural alert can also be generated if the corresponding setting is enabled in the *Global Menu*.

2.7 Sector States

Depending on a set of conditions and relationships, each Flight Plan is defined as being in a certain state relative to each airspace volume. This is the so called Sector State. As a given flight progresses along its route it will go through a series of diferent Sector States relative to a given airspace volume.

Track presentation coloring depends on the flight sector state:

State	Color	Condition
Initial (Unconcerned)	Unconcerned	Track will not enter the active sector
Free (Unconcerned)	Unconcerned	Track is not assumed or on-contact with anyone
Notified	Concerned	Track will enter the active sector (> 15 min)
Coordinated	Coordination	Track will enter the active sector (< 15 min)
Assumed	Assumed	Track is assumed
On Contact	Assumed	Track is on-contact with you. Flight is considered as Uncontrolled
Transfer Initiated	Assumed	Track is being transferred to the next controller. *CALLSIGN* and *SI* are colored in Redundant color
Redundant	Redundant	Track has been transferred to the next controller but is still inside the active sector
Informed	Informed 1	Track will not enter the active sector but is relevant to it

Sector States are used to control label construction, placement in lists, filtering, coloring, Safety Net parameters and availability. For example, a Flight Plan in the *On Contact* state will not trigger an APW warning until already being inside a TSA and will be shown in the *Uncontrolled Lists*. The same flight but in the *Assumed* state will trigger the APW warning when less than 3nm of a TSA and will not be shown in the *Uncontrolled Lists*.

Coordinated tracks that have not departed yet are displayed as *Notified*.

Examples

Sector	LEM	NORL	CENL	SULL
Aircraft Position	✈ >15 minutes			
Sector State	-	*Notified*	*Notified*	*Notified*

Table 2.12: Flight Plan still faraway inside LEM crossing NORL, CENL and SULL

Sector	LEM	NORL	CENL	SULL
Aircraft Position	✈ <15 minutes			
Sector State	-	*Coordinated*	*Notified*	*Notified*

Table 2.13: Flight Plan entering NORL in less than 15 minutes

Sector	NORL	CENL	SULL
Aircraft Position	✈		
Sector State	*Assumed*	*Notified*	*Notified*

Table 2.14: Flight Plan assumed by NORL

Sector	NORL	CENL	SULL
Aircraft Position	✈		
Sector State	*Assumed*	*Coordinated*	*Notified*

Table 2.15: Flight Plan assumed by NORL and less than 15 minutes to CENL

Sector	NORL	CENL	SULL
Aircraft Position	✈		
Sector State	*Redundant*	*Assumed*	*Notified*

Table 2.16: Flight Plan transferred from NORL to CENL but still inside of NORL airspace

Sector	NORL	CENL	SULL
Aircraft Position		✈	
Sector State	*Unconcerned*	*Assumed*	*Notified*

Table 2.17: Flight Plan assumed by CENL and has left NORL airspace

Sector	LEM	NORL	CENL	SULL
Aircraft Position	✈ >15 minutes			
Sector State	-	*Unconcerned*	*Unconcerned*	*Notified*

Table 2.18: Flight Plan in LEM and will only cross SULL

Sector	LEM	NORL	CENL	SULL
Aircraft Position				
Sector State	-	*Unconcerned*	*Unconcerned*	*Unconcerned*

Table 2.19: Flight Plan does not enter any sector

2.8 Label field descriptions

Data field	Description	Comments	Color
Frequency dot	Frequency	"•", set from *Callsign Menu* Used to highlight a flight operating in a frequency other than the Sector Primary	Assumed
Mark dot	Mark	"•", set from *Callsign Menu* Used to highlight a particular flight	Information
+	Field 18 information	"+" if "STS/" found in FPL remarks field	
*	Unit	"*" if label units are different from the system units	Warning
A	Manual alerts	"A" if Manual alert(s) active	Warning
a	Attitude indicator	Climbing: up arrow Descending: down arrow Level flight or unknown: blank	
ADEP	Departure aerodrome	ICAO code, 4 characters	
ADES	Destination aerodrome	ICAO code, 4 characters	
AFL	Actual Flight Level	FL's with 3 digits Altitudes "A"+ 2 digits Heights "E"+ 2 digits, in hundreds of feet	AIW: AIW intrusion Manually set: Warning Mark All: CARD Mark All S-Highlight: Suite Highlight

Data field	Description	Comments	Color
AHDG	Assigned heading	List: Assigned heading (“H” + 3 digits) or direct-to point name Unselected label: - Assigned heading - Direct-to point name (hidden when direct to COPX) Selected label: - Assigned heading - Direct-to point name If a heading clearance or request is in progress via CPDLC, displays “[heading]”, followed by “+” if the request or answer contains a reason(i.e. DUE TO something). DEP list: Does not display the brackets for CPDLC status.	If a value is assigned and HOP: Proposition In If a tactical coordination value is accepted but not set: Information If a CPDLC uplink message has been sent: CPDLC UM Clearance If a CPDLC downlink message has been received: CPDLC DM Request If controller timeout has expired following a CPDLC downlink request: CPDLC Controller Late If a CPDLC warning has been raised: color of the warning
AIW	AIW alert (see also ALRT)	“AIW”	AIW intrusion
ALRT	Alert message	“MSAW”, “APW”, “AIW”, “CLAM”, “RAM” or “DUPE” (in this priority order)	MSAW and APW: Warning AIW: AIW intrusion
ALT1	Alternate aerodrome 1	ICAO code, 4 characters	
ALT2	Alternate aerodrome 2	Second alternate can be set by inserting “ALT2/XXXX” into the FPL remarks field	
APW	APW alert (see also ALRT)	“APW”	Warning

Data field	Description	Comments	Color
ARC	Assigned vertical rate	“R” + 2 digits, in 100’s of ft/min	If a value is assigned and HOP: Proposition In If a tactical coordination value is accepted but not set: Information
ARWY	Arrival runway	Arrival runway identifier	If manually assigned: Rwy Locked
ASP	Assigned speed	Mach “M”+ 2 digits “HS” for high speed clearance Speed 2 digits, in 10’s of knots If a speed clearance or request is in progress via CPDLC, displays “[speed]”, followed by “+” if the request or answer contains a reason.	If a value is assigned and HOP: Proposition In If a tactical coordination value is accepted but not set: Information If a CPDLC uplink message has been sent: CPDLC UM Clearance If a CPDLC downlink message has been received: CPDLC DM Request If controller timeout has expired following a CPDLC downlink request: CPDLC Controller Late If a CPDLC warning has been raised: color of the warning

Data field	Description	Comments	Color
ASSR	Assigned mode 3/A code	4 digits or “A”+ 4 digits. If a SQUAWK SSR message is in progress via CPDLC, displays the code in brackets, followed by “+” if the answer contains a reason. DEP list: Does not display the brackets for CPDLC status.	If different than TSSR: Warning If a CPDLC uplink message has been sent: CPDLC UM Clearance If a CPDLC warning has been raised: color of the warning
ATD	Actual Time of Departure	UTC time in “HHMM” format	
ATYP	Aircraft type	Type with max 4 characters	If highlighted: Warning
ATYP/W	Aircraft type / Wake Turbulence Category	Type with max 4 characters + “/” + WTC (“L”, “M”, “H”, “J” or “?”)	If highlighted: Warning
C	Inbound clearance	“C” if ADES needs inbound clearance	Active state: Information
CALLSIGN	Callsign	If more than one aircraft, suffixed by “+”. If correlated to a primary track or to a secondary track with no ASSR code and a non-discrete TSSR code, suffixed by “*”. If the flight is CPDLC connected, the callsign is displayed in brackets.	Priority order: STCA alert: Urgency HOP in: Proposition In Mark Own: CARD Mark Own Highlight: Warning Mark All: CARD Mark All S-Highlight: Suite Highlight If none of the above: Transfer in: Assumed Transfer out: Redundant

Data field	Description	Comments	Color
CFL	Cleared Flight Level	"CA" if Clear for App flag set "VA" if Visual App flag set See AFL field for number format. Unselected label: Not shown if equal to AFL If a level clearance is in progress via CPDLC, displays "[level]", followed by "+" if the answer contains a reason (i.e. DUE TO something). DEP list: Does not display the brackets for CPDLC status.	DEP list: For CTR, if CFL >PEL, for others if CFL >XFL: Warning If a CPDLC uplink message has been sent: CPDLC UM Clearance If a CPDLC warning has been raised: color of the warning
CFL/PEL	Cleared Flight Level or Planned Entry Level	PEL is shown for flights in "coordinated" and "ongoing coordination" states, CFL otherwise. "CA" if Clear for App flag set "VA" if Visual App flag set See AFL field for number format. Unselected label: PEL: Not shown if equal to AFL and no ongoing coordination. CFL: Not shown if equal to AFL If a level clearance is in progress via CPDLC, displays "[level]", followed by "+" if the answer contains a reason (i.e. DUE TO something).	PEL: Ongoing coordination: Proposition In Change just before ETN: Info Coord Coordination refused: Warning CFL: If a CPDLC uplink message has been sent: CPDLC UM Clearance If a CPDLC downlink message has been received: CPDLC DM Request If a CPDLC warning has been raised: color of the warning

Data field	Description	Comments	Color
CLR	Clearance received flag	If no clearance received and no data link clearance in progress: "□" If clearance requested via data link: “R” If waiting for answer from the aircraft for a sent data link clearance: “A” If clearance received: "■" “R” and “A” are blinking when less than 2 minutes are remaining to timeout	“R”: When request contains free text: Urgency Otherwise: Warning “A”: When blinking: Warning
COM	Communication type	“r” if voice receive only “t” if text only	Warning
COMP_CS	ICAO RTF call-sign	The decoded ICAO RTF callsign “???” if not in database	
COORD	Coordination message	“ROF” if a Request On Frequency message has been received from the next sector The last changed tactical co-ordination parameter value (AHDG, ASP or ARC)	Proposed: Proposition In Rejected: Warning
COPN	Entry point		Ongoing coordination: Proposition In Coordination refused: Warning

Data field	Description	Comments	Color
COPX	Exit point	DEP list: If logged in as CTR and flight not inside active sector, displays COPN (with holding): A holding clearance is displayed if there is no coordination. It shows the holding point name + " H" or for lat/lon point holdings, "POS H". For a TSA Hold clearance, the area name is shown.	Ongoing coordination: Proposition In Coordination refused: Warning
COPN/COPX	Entry point or Exit point	COPN is shown for flights in "coordinated" and "ongoing coordination" states, COPX in "assumed", "transfer initiated" and "redundant" phases. (with holding): A holding clearance is displayed if there is no coordination. It shows the holding point name + " H" or for lat/lon point holdings, "POS H". For a TSA Hold clearance, the area name is shown.	Ongoing coordination: Proposition In Coordination refused: Warning
CPDLC_E	CPDLC Emergency	CPDLC emergency messages: "SQ7500", "[MAYDAY]", or "[PAN]"	Urgency

Data field	Description	Comments	Color
CPDLC_W	CPDLC Warning	CPDLC warning messages: “COMM FAIL” for network failure "<type> ERR” for message failure "<type> NOT CDA” for NOT CURRENT DATA AUTHORITY response "<type> P LATE” for timeout "<type> SBY” for STANDBY response "<type> UNA” for UNABLE response <type> is the type of message: “AHDG” for heading clearance “CFL” for level clearance “COF” for communication transfer “DCT” for direct-to clearance “SQI” for SQUAWK IDENT message “SSR” for SQUAWK SSR message “VCI” for communication transfer	“COMM FAIL”, “ERR” or “NOT CDA”: CPDLC Failed “UNA”: CPDLC Unable “SBY”: CPDLC Standby “P LATE”: CPDLC Pilot Late
CRC	Computed vertical rate	2 digits, in 100’s of ft/min Value preceded by “C” for climbing, “D” for descending	
DHDG	Downloaded heading	Magnetic heading as downloaded from the aircraft via mode S DAPs. “H” + 3 digits.	
DIAS	Downloaded indicated airspeed	Indicated airspeed as downloaded from the aircraft via mode S DAPs. If marked as unreliable, “DIAS”.	
DMACH	Downloaded Mach number	Mach number as downloaded from the aircraft via mode S DAPs. If marked as unreliable, “DMACH”.	

Data field	Description	Comments	Color
DRC	Downloaded rate of climb/descent	Rate of climb/descent as downloaded from the aircraft via mode S DAPs. Not available on VATSIM (computed rate displayed instead, see CRC).	
DRWY	Departure runway	Departure runway identifier	Clearance flag not set: Proposition In Clearance flag set: Information
DSFL	Downloaded selected flight level	Selected flight level as downloaded from the aircraft via mode S DAPs. Blank, not available on VATSIM.	
DSQ	Departure sequence number		
EET	Estimated Elapsed Time	“HHMM”	
EMRG	Emergency	“HI” for squawk 7500 “CF” for squawk 7600, “EM” for squawk 7700	Urgency
EQUIP	FPL equipment field	Rough conversion to ICAO FPL (COM/NAV): COM/NAV equipment (SUR): “/” + surveillance equipment	
EST/DEP/ ABT	Manual departure	“EST” when clearance flag not set and ground state not “DEPA” “DEP” when clearance flag set or ground state “DEPA” but not yet departed “ABT” when departed	

Data field	Description	Comments	Color
ETA	Estimated Time of Arrival	UTC time in “HHMM” format or “HOLD” if flight in holding state	
ETD	Estimated Time of Departure	UTC time in “HHMM” format	
ETD/ATD	Estimated Time of Departure or Actual Time of Departure	For a departed aircraft, shows the actual departure, otherwise the estimated departure time. “HHMM”, both times taken from the FPL data	
ETN	Estimated time over COPN or sector entry time if no COPN	UTC time in “HHMM” format (sector entry): always entry time	
ETOHP	Estimated time over holding point or holding start time	UTC time in “HHMM” format	
ETX	Estimated time over COPX or sector exit time if no COPX	UTC time in “HHMM” format (sector exit): always exit time	
FCOPX	FIR COPX point		
FIELD15	Speed Level Route	The flight plan field 15 data (TAS, RFL and route). Max 360 characters	
FIELD18	Other information	The flight plan field 18 data (remarks). Max 360 characters	
FLTADD	Mode S transponder address	Mode S transponder hex address	
FLTID	Aircraft identification	Callsign as received via mode S	
GS	Ground Speed	"N"+3 digits, in knots	If highlighted: Warning

Data field	Description	Comments	Color
HP	Holding point	Holding point name or for lat/lon point holdings, “POS”. For a TSA Hold clearance, the area name is shown.	
I	Flight information	“I” if OP_TEXT has data	
Label	Label hidden flag	“■” if label displayed, “□” if label hidden	
M	Military coordination	“M” if military coordination is required	Active state: Warning
MALRT	Manual alerts	Displays alerts entered via the *Callsign Menu*	Warning
MSAW	MSAW alert (see also ALRT)	“MSAW”	Warning
MTCD	MTCD indicator	“•” if aircraft has an MTCD problem	Urgency
N/ATYP	Number of aircraft / Aircraft type	Unselected label: Number range 2 - 99 Selected label or List: Number range 1 - 99 Number can be set by prefixing the aircraft type in the FPL by “X/” where X is the number (max 99)	If highlighted: Warning

Data field	Description	Comments	Color
NPT	Next route point	When a DCT request or clearance via CPDLC is in progress: Displays the point name followed by "+" if the request contains a reason (i.e. DUE TO something) Otherwise: Next point on the route	If a CPDLC uplink message has been sent: CPDLC UM Clearance If a CPDLC downlink message has been received: CPDLC DM Request If controller timeout has expired following a CPDLC downlink request: CPDLC Controller Late If a CPDLC warning has been raised: color of the warning
NRAC	Number of aircraft	Number from 2 to 99 Extended label: "n" if 1 Other label or (List): blank if 1 Number can be set by prefixing the aircraft type in the FPL by "X/" where X is the number (max 99).	
NSSR	SSR warning	Displays ASSR if different from TSSR	If a CPDLC uplink message has been sent: CPDLC UM Clearance If a CPDLC warning has been raised: color of the warning
OP_TEXT	Flight information message	User entered text, stored in the flight strip	
OP_TEXT2	OP_TEXT2 message	User entered text, stored in the scratchpad	
P	No P-RNAV/RNAV1 capability	"P" if aircraft equipment is not indicating P-RNAV/RNAV1 capability and destination has arrival procedures requiring it	Information

Data field	Description	Comments	Color
PEL	Planned Entry Level	“CA” if Clear for App set “VA” if Visual App flag set See AFL field for number format.	Ongoing coordination: Proposition In Change just before ETN: Info Coord Coordination refused: Warning
PFREQ	Pilot monitored frequency	Displays your primary frequency when transfer of communications was done via CPDLC using the MONITOR option	CPDLC DM Request
PRFL	RFL requested by pilot via CPDLC	Displays “[requested level]”, followed by “+” if the request contains a reason (i.e. DUE TO something)	If a CPDLC downlink message has been received: CPDLC DM Request If controller timeout has expired following a CPDLC downlink request: CPDLC Controller Late If a CPDLC warning has been raised: color of the warning
PSSR	Previous mode 3/A code	If not known, shows ASSR if available. Format as ASSR field.	
R	No B-RNAV/RNAV5 capability	“R” if aircraft equipment is not indicating B-RNAV/RNAV5 capability	Not equipped: Urgency Unknown: Unknown

Data field	Description	Comments	Color
RFL	Requested Flight Level	See AFL field for format List: If an RFL request is in progress via CPDLC, displays "[requested level]", followed by "+" if the request contains a reason (i.e. DUE TO something). DEP list does not display the brackets for CPDLC status.	In flight lists: If a CPDLC downlink message has been received: CPDLC DM Request If controller timeout has expired following a CPDLC downlink request: CPDLC Controller Late If a CPDLC warning has been raised: color of the warning
RI	Release Indicator	"F" fully released "C" released for climb "D" released for descent "T" released for turns Incoming release disappears 3 min after track is assumed, outgoing when track is no longer redundant.	During transfer: Proposition In
ROUTE	Flight plan route	DEP list - part 1 shows first 15 characters, part 2 characters 16-30 If departing from defined airports: - first 30/45 characters (2 or 3 parts) If arriving at a clearance flag airport: - last 30/45 characters (2 or 3 parts) Else: - first 30/45 characters (2 or 3 parts)	
S	Mode S mismatch indicator	"S" if downloaded callsign is different than coupled flight plan callsign	Warning

Data field	Description	Comments	Color
SI	Sector Indicator	Assumed track: Next sector identifier or frequency. Displayed in brackets if a communications transfer is in progress via CPDLC, followed by "+" if the answer contains a reason. The frequency display is forced on during a transfer via CPDLC. Other tracks: Tracking controller identifier or frequency. List: Frequency display is not possible DEP list: Does not display the brackets for CPDLC status. Current: Displays always the current tracking controller id Previous: Displays the current tracking controller id unless it is you or the track is in redundant state Next: Displays the next controller id when assumed, or current when in redundant state	Priority order: Outgoing HOP: Proposition In Manually changed next sector: Warning Normal next sector: Coordination If a CPDLC communications transfer uplink message has been sent: CPDLC UM Clearance If a CPDLC warning has been raised: color of the warning
SID	Assigned or planned SID	SID identifier	If automatically assigned: Sid Star No Allocation If manually assigned: Sid Star Allocation
SQ	Arrival sequence number	A number from 1 to 50	

Data field	Description	Comments	Color
STAR	Assigned or planned STAR	STAR identifier	If not transmitted to flight: Sid Star No Allocation If readback received from flight: Sid Star Allocation
STS	Ground state	EuroScope default ground state	
TAS	Flight Plan TAS	See GS field for format	
TEXT2	OP-TEXT2 message	If more than 10 characters, then shows first 9 + “>”	
TRACK	Ground track	“T” + the aircraft’s current ground track in degrees magnetic	
TSSR	Aircraft transponded mode 3/A code	4 digits or “A”+ 4 digits	
V	Flight rules	“V” if VFR “Y” if first IFR and later VFR “Z” if first VFR and later IFR	
W	No RVSM capability	“W” if aircraft equipment is not indicating RVSM capability	Not equipped: Urgency Exempt: Information Unknown: Unknown
WTC	Wake turbulence category	“J” for Super “H” for Heavy “M” for Medium “L” for Light “?” for unknown Unselected label: Only displayed if not medium unless the field is highlighted	If highlighted: Warning

Data field	Description	Comments	Color
/WTC	Wake turbulence category	"/J" for Super "/H" for Heavy "/M" for Medium "/L" for Light "?" for unknown Unselected label: Only displayed if not medium unless the field is highlighted	If highlighted: Warning
XFL	Exit Flight Level	"CA" if Clear for App set "VA" if Visual App flag set See AFL field for number format. Unselected label: Not shown if equal to CFL/PEL and no ongoing coordination. DEP list: If logged in as CTR and flight not inside active sector, displays PEL. Otherwise displays XFL.	Ongoing coordination: Proposition In Coordination refused: Warning
Y	No 8.33kHz capability	"Y" if aircraft equipment is not indicating 8.33kHz capability	Not equipped: Urgency Exempt: Information Unknown: Unknown

Table 2.20: Label Field descriptions

Chapter 3

User Interface

3.1 Main Window

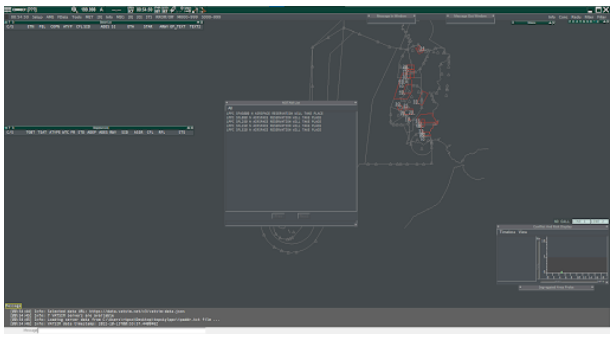


Figure 3.1: Main Window on initialization

TopSky should load with some preplaced windows similar to the above configuration

Note	Screen resolutions other than 1920x1080 will yield different results. Larger resolutions will bring preplaced windows towards the left and middle, while smaller resolutions may potentially place windows outside the screen. It is recommended for users experiencing difficulties related to their screen size to experiment and create custom settings in the TopSkySettingsLocal file containing revised window placements adjusted for their own screen. Refer to `TopSky_Developer_Guide_Settings.xlsx` for available settings

On initialization TopSky will load the *Global Menu* on top, *Sector List* and *Departure List* on the top left, *Message In Window* and *Message Out Window* on the top center right, *NOTAM List Window* on center, *CARD* and *SAP Window* on bottom right, plus legacy weather and controller lists on top right as well.

3.2 Global Menu

Figure 3.2: Global Menu

The Global Menu is located on the top edge of the radar screen. It displays the current UTC time and contains a number of submenus which are explained below.

3.2.1 Setup Menu

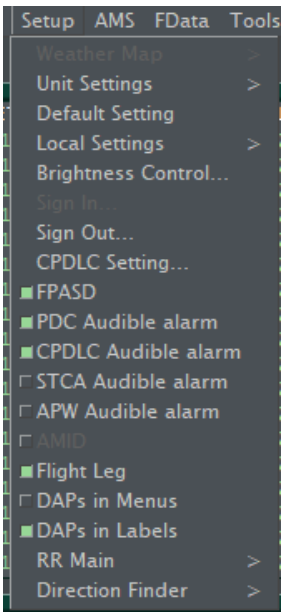


Figure 3.3: Setup Menu

Setup Menu allows for various adjustments. Each position will load its defined settings based on the active Primary Frequency.
Most used options are CPDLC Setting for CPDLC operations and Default Setting to reset options.

Unit Settings >	Opens the *Unit Settings submenu*
Default Setting	Resets all settings to their default values (keeps login callsign specific ones if they are active at the time). When clicked, a confirmation window will open, asking to confirm the reset.
Local Settings >	Opens the *Local Settings submenu*
Brightness Control >	Opens the *Brightness Control Window*

Sign In...	Loads personal settings. The settings are specified in the `TopSkySettingsLocal.txt` data file. When clicked, a confirmation window will open, asking to confirm the settings change.
Sign Out...	Clears any personal settings and resets all settings to their default values. When clicked, a confirmation window will open, asking to confirm the settings change.
CPDLC Setting...	Opens the *CPDLC Setting Window*
FPASD	Toggles on/off the display of flight plan tracks
PDC Audible alarm	Toggles on/off playing a sound for received PDC messages
CPDLC Audible alarm	Toggles on/off playing a sound for received CPDLC messages
STCA Audible alarm	Toggles on/off playing a sound for STCA alerts
APW Audible alarm	Toggles on/off playing a sound for APW alerts
AMID	Not implemented
Flight Leg	Toggles on/off the automatic display of the Flight Leg for a specified time when a track becomes assumed
DAPs in Menus	Toggles on/off the display of DAPs in menus
DAPs in Labels	Toggles on/off the display of DAPs in track labels
RR Main >	Opens the RR Main submenu
Direction Finder >	Opens the Direction Finder submenu

Unit Settings submenu

This submenu can be used to change the units used in TopSky. Any changes to the settings are session specific only, so they will be lost when exiting EuroScope.

Altitude	Selects the units used for altitudes and vertical rates • Nautical (feet, feet per minute) • Metric (meters, meters per second)

Flight level	Selects the units for flight levels – only applicable with metric altitudes • Nautical (hundreds of feet) • Metric (meters)
Distance	Selects the units used for distances • Nautical (nautical miles) • Metric (kilometers)
Speed	Selects the units used for speeds • Nautical (knots) • Metric (kilometers per hour)

Local Settings submenu

This submenu allows changing some of TopSky's settings. Any changes to the settings are session-specific only, so they will be lost when exiting EuroScope.

Vertical reference	Selects the pressure reference to be used at or below the transition altitude: • QNH Altitude above mean sea level • QFE Height above the aerodrome elevation (set/check it in the adjacent box)
Used equipment codes	Selects whether to use or disregard the equipment codes found in the flight plans: • All Use all codes • ICAO Use all codes when specified in ICAO format • ICAO-alt As ICAO, but force transponder to report altitude • None Disregard all codes
ASSR codes	Selects the transponder code source: • Plugin Plugin data file (reverts to ESE if no codes found) • ESE ESE file

	• Range Fixed code range
Groundspeed	Selects whether to use pilot client reported ground speed or a plugin calculated value. Normally the reported value should be used as it is more accurate and stable, but some clients report wrong values. If that causes problems, you can try selecting TopSky calculated value instead
Transfer confirmation	Selects when to display the Transfer Confirmation Window: • On Always when CFL is not equal to XFL • NotRFL When CFL is not equal to XFL unless XFL = RFL • Off Never, any CFL value is OK
CFL menu default value	Selects the default value for the CFL menu when it is opened: • XFL FSS or CTR: RFL if not yet reached, otherwise as below • Other: The XFL value, or current CFL value with no XFL • CFL The current CFL value • RFL The RFL value
FPCP inhibit	FPCP calculations start when tracks are within this time from entering active sector
STCA alert	Selects which aircraft display the STCA alert: • All All aircraft • Own+Co Only *Assumed* and *Coordinated* aircraft • Own Only *Assumed* aircraft
STCA alert sound	Selects which STCA alerts trigger the alert sound: • All All alerts • Own+Co Only alerts with *Assumed* and *Coordinated* aircraft involved • Own Only alerts with *Assumed* aircraft involved

APW alert	Selects which aircraft display the APW alert: • All All aircraft • Own+Co Only *Assumed* and *Coordinated* aircraft • Own Only *Assumed* aircraft
APW alert sound	Selects which STCA alerts trigger the alert sound: • All All alerts • Own+Co Only alerts for *Assumed* and *Coordinated* aircraft • Own Only alerts for *Assumed* aircraft
METAR source	Selects the METAR data source for TopSky windows that display METAR data
FPASD filter	Allows filtering of displayed FPASD tracks based on sector state • Coord Display tracks at least in the *Coordinated* state • Conc Display tracks at least in the *Notified* state • None Display all tracks

RR Main submenu

Rings On/Off	Toggles the range rings on/off
Point	Sets the rings centerpoint. Either click on the radar screen or enter the desired point in the text field. Fixes, VORs, NDBs and airports from the active sector file can be used as well as coordinates in the flight plan format (DD[N/S]DDD[E/W] or DDMM[N/S]DDDMM[E/W], e.g. 60N025E or 0811S00300W). Entering an empty text string resets the rings to be shown at the radar screen centerpoint.
Separation	Sets the separation between adjacent rings

Number	Sets the number of rings drawn
Highlight	Toggles highlight (drawn with solid line) of specified rings
Step	Sets interval of highlighted rings

Direction Finder submenu

Not operational.

3.2.2 AMS menu

Opens the *Airspace Management Window*.

3.2.3 FData menu

Opens the *Flight Plan Selection Window* and *Flight Plan Window*.

3.2.4 Tools menu

Flight Plan Lists >	Opens the *Flight Plan Lists submenu*
CARD...	Opens the *CARD*
SAP...	Opens the *SAP Window*
Vertical Aid Window...	Opens the *Vertical Aid Window*
Message In...	Opens the *Message In Window*
Message Out...	Opens the *Message Out Window*
CPDLC >	Opens the CPDLC submenu
LAT/LONG...	Opens the *Cursor Lat/Long Window*

Flight Plan Lists submenu

List options bar	Toggles the display of list options on the *Global Menu*
Sector List...	Opens the *Sector List*
Informed	Toggles the display of *Informed* aircraft
Concerned	Toggles the display of *Notified* and *Coordinated* aircraft
Redundant	Toggles the display of *Redundant* aircraft
Load Factor List...	Opens the *Load Factor List*

ETWR List...	Opens the *ETWR List*
<adep>	ETWR List departure airports filter
Uncont. List 1...	Opens the *Uncontrolled Lists*
<filter>	Uncontrolled 1 List state filter
<units>	Uncontrolled 1 List units filter
Uncont. List 2...	Opens the *Uncontrolled Lists*
<filter>	Uncontrolled 2 List state filter
<units>	Uncontrolled 2 List units filter
Lost List...	Opens the *Lost List*
Resectorisation List...	Opens the *Resectorisation List*
<lfunc>	Resectorisation List LFUNC filter
Traffic Mgmt. List 1...	Opens the *Traffic Management Lists*
<state>	Traffic Management List 1 flight plan state filter
<ades>	Traffic Management List 1 destination airports filter
<via>	Traffic Management List 1 route points filter
Traffic Mgmt. List 2...	Opens the *Traffic Management Lists*
<state>	Traffic Management List 2 flight plan state filter
<ades>	Traffic Management List 2 destination airports filter
<via>	Traffic Management List 2 route points filter

When enabled, the list options bar displays “Info Conc Redu Filter Filter” on the right edge of the *Global Menu*. The first three toggle the respective settings for the *Sector List* and are colored with the appropriate color when enabled, and the last two are displayed in VFR color when the corresponding *Uncontrolled Lists* are somehow filtered. Clicking on them opens the *Flight Plan Lists submenu* to change the filtering options.

Left-clicking <filter> cycles through “ALL” (no filtering), “ON-CONTACT” (only tracks *On Contact* with anyone), “ON-CONTACT-PPOS” (only tracks *On Contact* with you) and “FREE” (only tracks in the *Free* state).

Left-clicking <units> opens a text entry box to enter a comma-separated list of aerodrome ICAO codes to filter the list. When entered, the list will display a flight only if one of the entered codes is its departure or destination, or the code is found in *OP TEXT2*.

Left-clicking <lfunc>, <adep>, <ades> and <via> open text entry boxes to enter comma-separated lists for controlled ID’s, ICAO codes and point names respectively to filter the affected lists.

Left-clicking <state> toggles between “ALL” (no filtering), “SIMUL+TERM” (not started flight plans filtered), “NOTST+SIMUL” (terminated flight plans filtered) and “SIMUL” (not started and terminated flight plans filtered).

CPDLC submenu

- Microphone Check	Opens the *Microphone Check Menu*
- Current Messages...	Opens the *CPDLC Current Message Window*
- History Messages...	Opens the *CPDLC History Message Window*

3.2.5 MET menu

- Messages...	Opens the *Weather Messages Window*
- QNH/TL	Opens the *QNH/TL Window*

3.2.6 [0]

Not implemented (always shows a zero value).

3.2.7 Info menu

General Information...	Opens the *General Information Window*
Document Viewer...	Opens the *Document Viewer Window*
NOTAM...	Opens the *NOTAM List Window*
Aerodrome...	Opens the *Aerodrome Menu*
LFUNC Frequency Plan...	Opens the *LFUNC Frequency Plan Window*
Airport labels	Toggles airport labels selection
Fix labels	Toggles fix labels selection
NDB labels	Toggles NDB labels selection
VOR labels	Toggles VOR labels selection

When holding <ALT>, text labels will be displayed for airports, fixes, NDBs and VORs when the mouse cursor is placed over them. When one or more of the categories in the Info menu is selected, only those categories will display the labels. The “Label” buttons open submenus to select what information is shown on the corresponding labels. All the information is from the active sector file.

3.2.8 MSG menu

Notepad...	Opens the *Notepad Window*
Personal Queue...	Opens the *Personal Queue Window*
ATC Messages...	Opens the *ATC / Primary Frequency Messages Window*
Prim Freq Messages...	Opens the *ATC / Primary Frequency Messages Window*
NAT Track Messages...	Opens the *NAT Track Messages Window*
Text notes >	Opens the Text notes submenu

It is possible to insert text notes on the radar screen to act as reminders. They will stay fixed at the geographical coordinates they are inserted to, the coordinates defining the center point of the note.

When creating a note, a text entry field opens to enter the note text. When the [Enter] key is pressed, the note will be created at the current mouse cursor position.

The notes can be deleted one by one or all of them at the same time. When deleting one by one, the notes are boxed to display their click areas. Clicking on one will delete the note. Pressing the [Esc] key or selecting the “Delete...” menu item again will abort the operation.

Text notes submenu

Create...	Creates a new text note
Delete...	Deletes a single text note
Delete all	Deletes all text notes

3.2.9 [x] [x]

Shows x as the number of high priority messages on the left, and low priority messages on the right.

High priority messages are critical failures in TopSky code. Low priority messages are warnings about invalid data in TopSky data files

Open the *Personal Queue Window* to view the messages or see *Plugin Status submenu* for more detailed information on the problem(s). The number is limited to 99, and is shown on Global Menu Highlight background when the window is not open.

3.2.10 STS menu

Plugin Status >	Opens the *Plugin Status submenu*
Safety Nets Status...	Opens the *Safety Nets Status Window*
Divergence Detection Status...	Opens the *Divergence Detection Status Window*
MTCD Status...	Opens the *MTCD Status Window*
CPDLC Default Status	Toggles the CPDLC Default Status On/Off
Runway In Use	Opens the *Aerodrome Menu*
Supervisory >	Opens the *Supervisory submenu*
RWY line display...	Opens the *Aerodrome Menu*

Plugin Status submenu

Shows the version of TopSky as well as some information on the loaded data files. Each data file reports its state with one of the following indicators:

- OK	File contains usable information and no faults
- NO DATA	File not found or contains no usable information
- BAD DATA	File contains invalid data (in Warning color)

Depending on the file, there are one to three of the following buttons available:

- Reload	Reloads the data file
- View	Displays the data in the file on the radar display
- Save (Areas)	Saves a snapshot of the current area activation data
- Save set (Maps & MapsL)	Saves a list of currently active radar screen specific maps
- Load set (Maps & MapsL)	Loads a saved list of active screen specific maps

Left-clicking the Save button will save the currently set manual activation periods as well as the information if an area with automatic schedules is set to manual mode. The information is saved to the `TopSkyAreasManualAct.txt` file in the same folder as `TopSky.dll`. If the file already exists, TopSky will ask for confirmation as the save operation will overwrite any existing data.

Depending on the maps data file setup, the display state of some or all of the maps may be specific to each radar screen. The Save set and Load set functions can be used to transfer the display state of these maps from one radar screen to another.

Right-clicking the Reload button for Settings & SettingsL has a special purpose. It opens a text entry box to type in a callsign whose settings should be loaded instead of the real login callsign. When entered, the callsign will be displayed next to the “Reload” button, and whenever a VATSIM callsign change is

detected, an information popup is displayed to remind that TopSky settings are still forced to the manually entered callsign. This feature can be used for example to use settings for different positions on different EuroScope instances when providing top-down services, or to use settings for a specific position when logged in with an observer/staff/supervisor callsign. Clearing the entered callsign reverts to using the settings based on the actual login callsign.

Supervisory submenu

- Operations Rate... Opens the *Operations Rate Window*
- Predicted Traffic... Opens the *Predicted Traffic Window*

3.2.11 RRxxx/Off

Opens the *RR Main submenu*. If the rings are selected on,

“xxx” displays the distance between consecutive rings, otherwise “Off”.

3.2.12 Mxxx-yyy

Displays the status of the filters. If any filter is enabled and Quick Look is not toggled on, the color of the text is Global Menu Highlight.

Only the altitude filter status is shown. “xxx” displays the Lower filter value and “yyy” the Upper filter value, in hundreds of feet.

3.2.13 S000-999

Not implemented (shows static values).

3.3 Aircraft Position Symbol

The position symbol is drawn at the latest known position of the aircraft. The color of the symbol is the flight sector color for an unselected track and Track Highlight for a selected one.

Figure 3.4: Primary radar track

Figure 3.5: Controlled Secondary or Combined radar track

Figure 3.6: Uncontrolled Secondary or Combined radar track

Figure 3.7: Special Position Indication (Ident)

If a surveillance track does not receive position updates in over 30 seconds it becomes a Coasted track, position is no longer reliable.

Figure 3.8: Coasted track

If a Coasted track does not receive position updates for long enough, or it has originated outside of surveillance coverage, it becomes a FPASD track. FPASD tracks are not based on surveillance data but estimated based on Flight Plan data.

Figure 3.9: FPASD track

Except for the FPASD and Coasted tracks, a divergence alert will be drawn in case of a RAM or CLAM alert. This is a circle drawn around the symbol. Tracks with SPI active will not display this symbol.

Figure 3.10: Uncontrolled Secondary radar track with divergence alert

3.3.1 History dots

The history dots show the previous positions of the track. The number of displayed dots can be changed via the *Track Control Window*. The color of the dots is the flight sector color for an unselected track and Track Highlight for a selected one. History dots are not displayed for flight plan tracks.

3.3.2 Prediction Line

The prediction line draws the predicted ground track of the aircraft, based on its current track and ground speed. It is a two-color line, starting with Track Default at the position symbol and then alternating with Track Highlight with every segment representing one minute of flying time.
The default lenght of the prediction line is 2 minutes, and can be changed for all tracks via the *Track Control Window*, or for a single track via the *Prediction Line Menu*. Prediction lines are not displayed for flight plan tracks.

Figure 3.11: Selected track with 5 history dots and a 3-minute prediction line

3.4 Track Labels

There are four types of track labels that can be displayed: Standard, Reduced, Extended and Uncoupled. In addition, each label except the extended one has an unselected and a selected state, the selected state being shown when the mouse cursor is over the label.

3.4.1 Standard Track Label

The Standard label is shown for aircraft that are in or will enter the active sector.

Unselected Track

Line 0 ** V ALRT COM W Y R P M Mark dot Frequency dot A + C I S EMRG RI COORD NSSR CPDLC W CPDLC E TEXT2*

Line 1 *MTCD CALLSIGN PFREQ SI N/ATYP WTC TSSR*

Line 2 *AFL a CFL/PEL GS NPT ADES RFL*

Line 3 *XFL TRACK AHDG ASP ARC COPN/COPX FCOPX*

Line 4 *DSFL DHDG DIAS DRC DMACH*

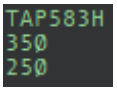


Figure 3.12: Unselected Standard Track

Selected Track

Line 0 ** V ALRT COM W Y R P M Mark dot Frequency dot A + C I S EMRG RI COORD NSSR CPDLC W CPDLC E TEXT2*

Line 1 *MTCD CALLSIGN PFREQ SI N/ATYP WTC TSSR*

Line 2 *AFL a CFL/PEL GS NPT ADES RFL*

Line 3 *XFL TRACK AHDG ASP ARC COPN/COPX FCOPX*

Line 4 *DSFL DHDG DIAS DRC DMACH*

Line 5 *OP TEXT*

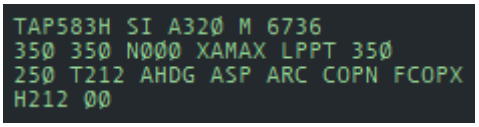


Figure 3.13: Selected Standard Track

3.4.2 Reduced Track Label

The Reduced label for aircraft that will not enter the active sector. Flights in Free, Initial, Notified or Unconcerned are automatically displayed with a Reduced Track Label.

Unselected Track

Line 0 *V ALRT COM W Mark dot S EMRG*

Line 1 *MTCD CALLSIGN SI N/ATYP WTC TSSR*

Line 2 *AFL a GS NPT ADES*

Line 3 *TRACK FCOPX*

Line 4 *DSFL DHDG DIAS DRC DMACH*

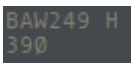


Figure 3.14: Unselected Reduced Track

Selected Track

Line 0 ** V ALRT COM W Mark dot Y R P M A + C I S EMRG NSSR CPDLC E TEXT2*

Line 1 *MTCD CALLSIGN SI N/ATYP WTC TSSR*

Line 2 *AFL a CFL/PEL GS NPT ADES RFL*

Line 3 *TRACK AHDG ASP FCOPX*

Line 4 *DSFL DHDG DIAS DRC DMACH*

Line 5 *OP TEXT*

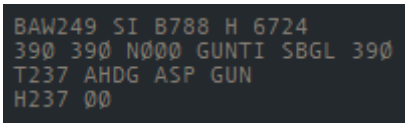


Figure 3.15: Selected Reduced Track

3.4.3 Extended Track Label

The Extended label can be opened from the Standard or Reduced label by right clicking on the *CALLSIGN* item, and stays open as long as the cursor is within the label area.

Line 0 ** V ALRT COM W Y R P M Mark dot Frequency dot A + C I S EMRG RI COORD NSSR CPDLC W CPDLC E TEXT2*

Line 1 *MTCD CALLSIGN PFREQ SI N/ATYP WTC* *TSSR ASSR PSSR*

Line 2 *AFL a CFL/PEL TRACK GS NPT ADES RFL* *FLTID FLTADD*

Line 3 *XFL TRACK AHDG ASP ARC COPN/COPX FCOPX*

Line 4 *DSFL DHDG DIAS DRC DMACH*

Line 5 *COMP CS*

Line 6 *ADEP ETD/ATD ADES EET*

Line 7 *FIELD15*

Line 8 *FILED18*

Line 9 *MALRT*

Line 10 *OP TEXT*

Line 11 *OP TEXT2*

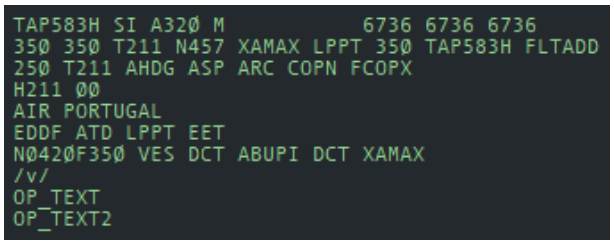


Figure 3.16: Extended Track

3.4.4 Uncoupled Track Label

The Uncoupled label is shown for radar tracks that aren't correlated with a flight plan.

Unselected Track

Line 0 *ALRT EMRG*

Line 1 *FLTID* or *TSSR*

Line 2 *AFL a GS*

Line 3 *DSFL DHDG DIAS DRC DMACH*

Figure 3.17: Unselected Uncoupled Track

Note	*FLTID* is displayed on line 1 only if a valid Mode-S Aircraft Identification is received. Otherwise, TSSR is displayed instead

Selected Track

Line 0 *ALRT EMRG*

Line 1 *FLTID TSSR*

Line 2 *AFL a GS*

Line 3 *DSFL DHDG DIAS DRC DMACH*

Note	*FLTID* is displayed on line 1 only if a valid Mode-S Aircraft Identification is received. Otherwise, only TSSR is displayed

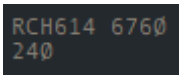


Figure 3.18: Selected Uncoupled Track

3.4.5 Line 0 Construction

Line 0 is constructed solely of indicators and warnings. Line 0 is only displayed when at least one of these indicators is active.

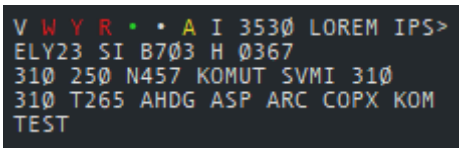


Figure 3.19: Example label with several line 0 alerts

Example Indication	Description	Label item
V	Y, Y or Z Flight Rules, same color as Track Label	*V*
MSAW	Minimum Safe Altitude Warning	*ALRT*
APW	Area Proximity Warning	*ALRT*
AIW	Area Intrusion Warning	*ALRT*
CLAM	Cleared Level Adherence Monitoring, same color as Track Label	*ALRT*
RAM	Route Adherence Monitoring, same color as Track Label	*ALRT*
DUPE	Duplicate SSR code	*ALRT*
/t	Communication Type Indicator	*COM*
W	RVSM Not Equipped	*W*

W	RVSM Exempt	*W*
W	RVSM Unknown	*W*
Y	8.33 Not Equipped	*Y*
Y	8.33 Exempt	*Y*
Y	8.33 Unknown	*Y*
R	RNAV5 Not Equipped	*R*
R	RNAV5 Unknown	*R*
P	RNAV1 Not Equipped	*P*
M	Military Coordination Required flag	*M*
•	Mark dot, used to highlight a certain flight by the ATC	*Mark dot*
•	Frequency dot, used to highlight a flight operating in a frequency other than the Sector Primary, same color as Track Label	*Frequency dot*
A	Manual alert(s) active	*A*
+	STS/ found in FPL remarks field, same color as Track Label	*+*
I	OP_TEXT has data, same color as Track Label	*I*
S	Mode S Callsign is different from coupled Flight Plan Callsign	*S*
EM	“HI” for A7500, “CF” for A7600, “EM” for A7700	*EMRG*
H270	Value in coordination, or ROF if a Request On Frequency message is received	*COORD*
3223	Displays ASSR if different from TSSR, same color as Track Label	*NSSR*
CPDLC P LATE	CPDLC Warning messages	*CPDLC W*
[MAYDAY]	CPDLC Emergency Downlink	*CPDLC E*
TEXT2	User entered text visible to everyone, same color as Track Label	*OP TEXT2*

Table 3.12: Line 0 Indications

3.4.6 Label Interaction

Label items may be interacted with either with a left or a right click.

3.4.6.1 Line 0

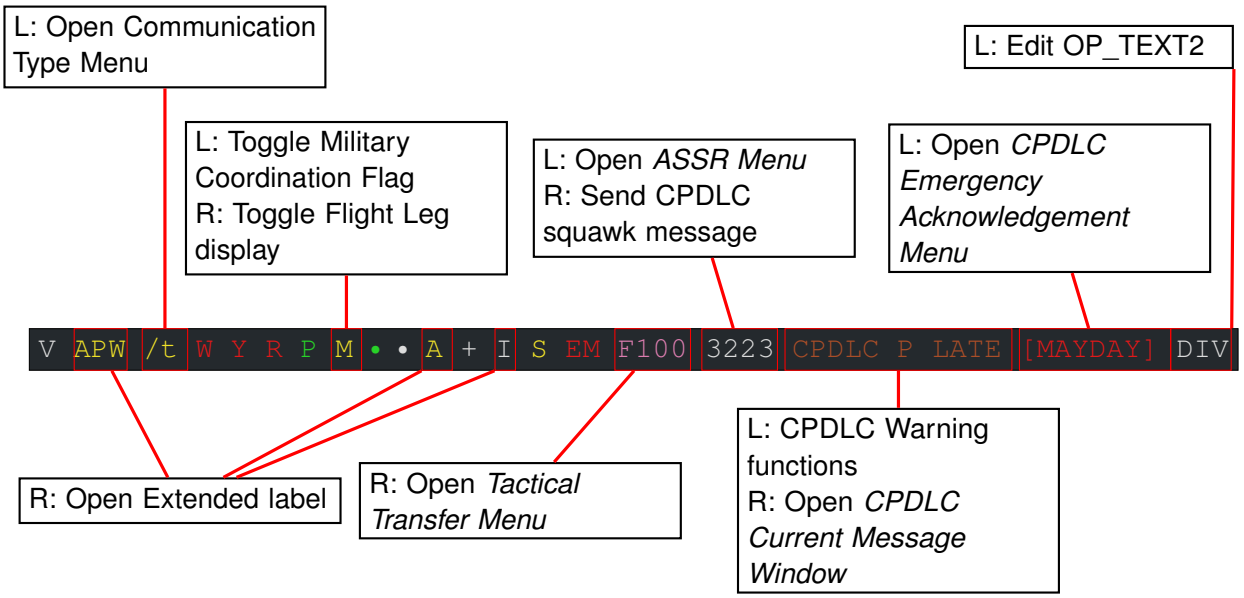


Figure 3.20: Line 0 label Interaction

3.4.6.2 Line 1

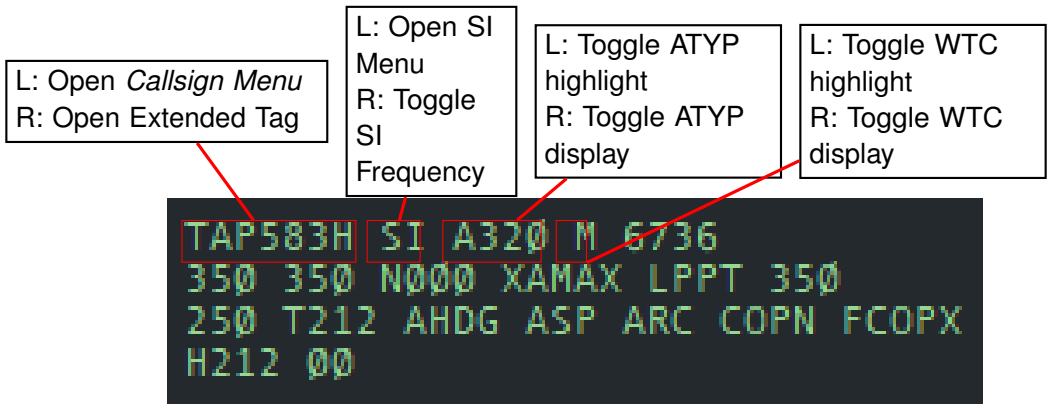


Figure 3.21: Line 1 label Interaction

Note	Not shown in the above example: When *PFREQ* is displayed R: Acknowledge PFREQ warning When *MTCD* is displayed R: Toggle Flight Leg display

3.4.6.3 Line 2

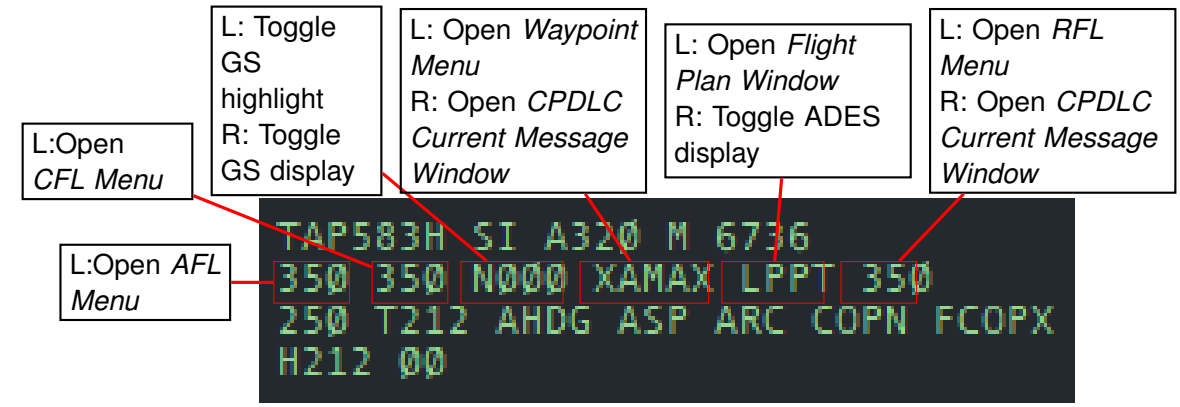


Figure 3.22: Line 2 label Interaction

3.4.6.4 Line 3

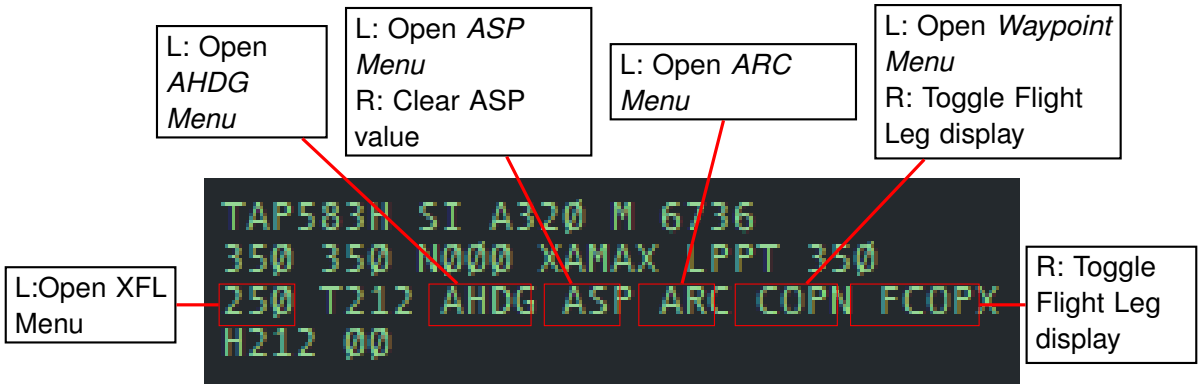


Figure 3.23: Line 3 label Interaction

3.4.6.5 Line 4

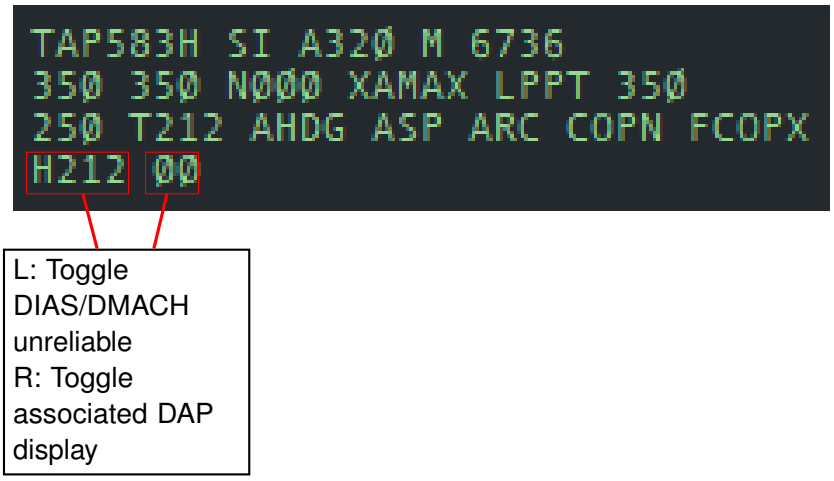


Figure 3.24: Line 4 label Interaction

3.4.6.6 Extended Label

The Extended label is constructed of extra elements when compared to a Standard Selected label, some of which are interactable. These extra elements that are interactable are detailed below. The remaining elements function the same as in the Standard Selected label.

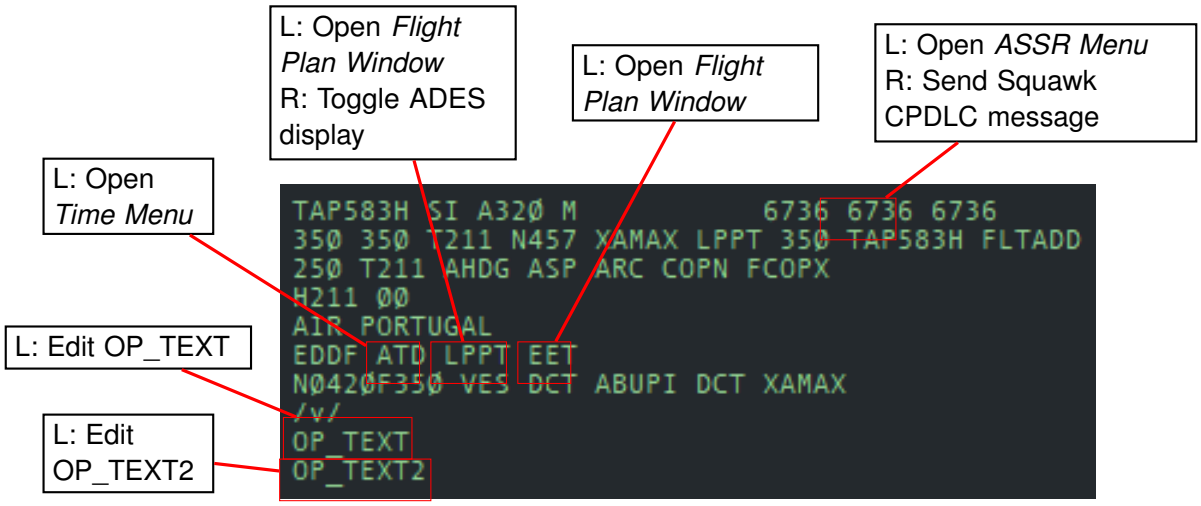


Figure 3.25: Extended Label Interaction

3.4.6.7 Uncoupled Label

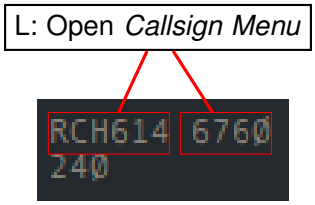


Figure 3.26: Uncoupled Label Interaction

3.4.7 Label Compaction

Label fields may be automatically supressed in certain conditions. This is called Label Compaction. Label Compaction only occurs in unselected labels. When a field is supressed, the remaining fields to the right will move left to the supressed field position. If all fields in a line are supressed, the next line is moved up to the supressed line position. Values being coordinated are exempted from Label Compaction.

The following Label Compaction rules are in place:

- If a field is empty it is supressed
- If AFL is the same as CFL, CFL is supressed
- If AFL is the same as CFL and XFL, CFL and XFL are supressed
- If AFL is the same as CFL, but different from XFL, only CFL is supressed
- If AFL is different from CFL, and CFL is the same as XFL, XFL is supressed
- If AFL is different from CFL, and CFL is different from XFL, no field is supressed
- If FCOPX is the same as NPT, NPT is supressed

3.5 Track Label Menus

These menus are opened from track label fields or flight lists. Except for the confirmation windows, they are closed automatically when a menu option is chosen or the mouse cursor leaves the menu area. Menu items shown with (X) represent an item that has an activated and a deactivated state. With the item activated, the item name is shown prefixed with the letter “X”. The mouse wheel can be used to scroll the selection lists in the menus.

Many of the menus have a default item or value, displayed with inverse video. The menu usually opens so that the default value is located under the mouse cursor for easy selection. Some menus contain items that open folders within the menu. They show a filled triangle before the item name (upright if the folder is closed, inverted if the folder is open). The “More” folder is opened automatically when the mouse cursor is placed over it or if the default item is in the “More” folder, other folders must be left-clicked to open.

3.5.1 Callsign Menu

Controlled Track

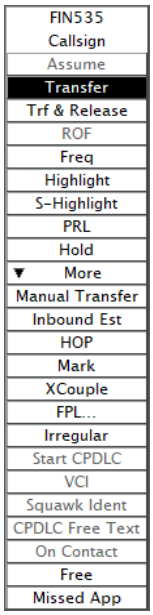


Figure 3.27: Callsign Menu

Assume	Assumes track
Refuse	Refuses the incoming transfer
Transfer	Initiates a transfer to the next sector
Trf & Release	Opens the *Transfer & Release menu*
ROF	Sends a *Request On Frequency message*
(X)Freq	Toggles the *Frequency dot*

(X)Highlight	Toggles the Callsign highlight
(X)S-Highlight	Toggles the Callsign+AFL fields highlight
PRL	Opens the *Prediction Line Menu*
(X)Hold	"Hold" opens the *Hold Menu*, "XHold" cancels a given holding clearance
▼ More	Shows additional less frequently used options
Manual Transfer	Opens the *Manual Transfer Menu*
(X)Inbound Est	Toggles the "Inbound Est" manual alert
HOP	Initiates a *Handover Proposal (HOP)*
(X)Mark	Toggles the *Mark dot*
(X)Couple	Uncorrelates/correlates the flight plan
FPL...	Opens the *Flight Plan Window*
(X)Irregular	Toggles the "Irregular" manual alert
Start/End CPDLC	Starts/Ends CPDLC connection with the aircraft
VCI	Opens the *VCI Menu*
Squawk Ident	Sends a "SQUAWK IDENT" CPDLC message to the aircraft
CPDLC Free Text	Opens the *CPDLC Free Text Menu*
Free	Releases track
On Contact	Sets track *On Contact*[1]
(X)Missed App	Toggles the "Missed App" manual alert

Besides the manual alerts, none of the selectable toggle options in this menu will be transmitted to other controllers, but the "Mark", "Freq" and highlight selections will be seen in your other EuroScope instances. A holding clearance is transmitted to the next controller when transferring the track. To correlate a flight plan, first click on the "Correlate" item, and then click on the radar position symbol of the desired radar track.

[1] Clicking "On Contact" for a track with "Y" or "Z" flight rules will also automatically change the flight rules in the VATSIM flight plan to VFR in order to make it uncontrolled. The displayed flight rules are not affected.

Uncontrolled Track

Figure 3.28: Uncontrolled Track Callsign Menu

On Contact	Sets track *On Contact*
Free	Releases track
Assume	Assumes track[1]
(X)Highlight	Toggles the Callsign highlight
(X)S-Highlight	Toggles the Callsign+AFL fields highlight
(X)Couple	Uncorrelates/correlates the flight plan
(X)Hold	"Hold" opens the *Hold Menu*, "XHold" cancels a given holding clearance
FPL...	Opens the *Flight Plan Window*
PRL	Opens the *Prediction Line Menu*

Uncorrelated Track

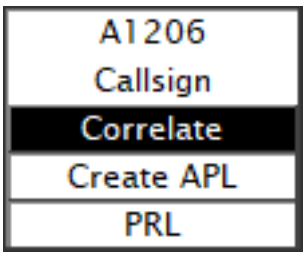


Figure 3.29: Uncorrelated Track Callsign Menu

[1] Clicking "Assume" for a track with "Y" or "Z" flight rules will also automatically change the flight rules in the VATSIM flight plan to IFR in order to make it controlled. The displayed flight rules are not affected.

Correlate	Correlates the radar track with the next clicked “Callsign” field
Create APL	Opens the *Create APL Window*
PRL	Opens the *Prediction Line Menu*

3.5.2 Transfer menu

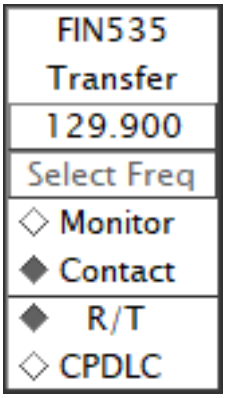


Figure 3.30: Transfer Menu

For CPDLC connected aircraft, the menu contains options related to the transfer. Left clicking on the frequency button initiates the transfer (and sends the CPDLC message if selected).

“Monitor” / “Contact” select which of the two CPDLC message types will be sent.

“R/T” / “CPDLC” select whether the transfer instruction is given via radio or as a CPDLC message.

3.5.3 Transfer Confirmation Window

Figure 3.31: Transfer Confirmation Window

If an aircraft has a defined XFL value and hasn’t been cleared to it (CFL is not equal to XFL), attempting to transfer the aircraft will open a Transfer Confirmation Window in the middle of the radar screen. While the window is open it will block all other attempts to click on items elsewhere on the radar screen. Either click on “Transfer” to transfer the aircraft regardless of the situation, or “Cancel” to cancel the transfer.

3.5.4 Transfer & Release menu

Figure 3.32: Transfer & Release menu

The Transfer & Release menu allows specifying a release condition for a track to be transferred. The transfer is initiated after selecting the desired condition (climb, descent, turn or full). The release will be shown on line 0 of the track label (C for climb, D for descent, T for turn and F for full). The transferring controller will see the label item until the track becomes unconcerned. The receiving controller will see the item for 3 minutes after the track is assumed.

Figure 3.33: CPDLC Transfer & Release menu

For CPDLC connected aircraft, the menu contains options related to the transfer:

“Monitor” / “Contact” select which of the two CPDLC message types will be sent.

“R/T” / “CPDLC” select whether the transfer instruction is given via radio or as a CPDLC message.

Warning	The “Trf & Release” option will show the release condition on the downstream side only if the next controller is using this plugin, in other cases the transfer will be shown as a normal transfer.

3.5.5 Request On Frequency message

See *ROF*. For the message to succeed, you must be seen as the next controller for the tracking controller. When sent, the text “ROF” is displayed in the track label on the tracking controller’s screen.

Warning	The “ROF” message is a feature specific to this plugin. It is an experimental feature and is not guaranteed to work all the time. When you send the message, check that it’s sent properly. 1. A successfully sent message will be displayed in the *Message Out Window* 2. If there is an error or the message fails to go through, a message will be put into the *Personal Queue Window*

3.5.6 Hold Menu

Figure 3.34: Hold Menu

The Hold menu allows you to enter a holding clearance, adding the aircraft to the *Holding List*. It displays for selection the points in the aircraft’s route that are ahead of its current position.

Left-clicking the empty box below the waypoint list opens a text entry box to enter any holding point name.

Left-clicking “Here” enters the present position coordinates as the holding point.

The holding point is automatically sent to your other EuroScope instances with a small delay and can be sent to other controllers by pushing the flight strip as the information is stored there.

3.5.7 Manual Transfer Menu

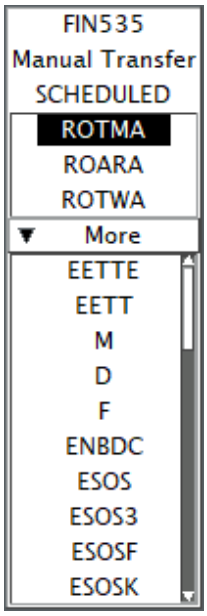


Figure 3.35: Manual Transfer Menu

The Manual Transfer menu allows transferring the aircraft to any controller. In the SCHEDULED list are the controllers that are in the current sector sequence sorted in the order the aircraft is planned to enter the controllers' sectors, with the next controller being the default item.

When opened, the "More" list displays all the other controllers for selection. Click on a controller ID to start the transfer. For CPDLC connected aircraft, clicking on a controller ID opens the *Transfer menu*

3.5.8 VCI Menu

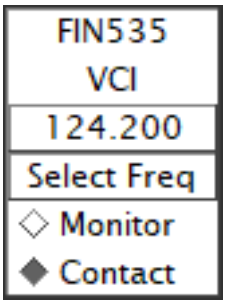


Figure 3.36: VCI Menu

Available only for CPDLC-connected aircraft and when more than one frequency has been set up by the controller, the VCI menu allows sending a CPDLC "contact" or "monitor" message without initiating a transfer.

The first button displays the primary frequency, left-clicking it will send the message with that frequency.

Left-clicking the “Select Freq” button will open a text entry box to enter any other frequency. If a valid frequency (set up as XMT TXT in EuroScope’s Voice communication setup dialog) is entered, the message will be sent with that frequency.

“Monitor” and “Contact” are used to select the type of message to be sent.

3.5.9 CPDLC Free Text Menu

See *Free Text Messages*. Left-clicking on a message sends it.

The menu closes when a message is sent or the cursor leaves the menu area.

3.5.10 Prediction Line Menu

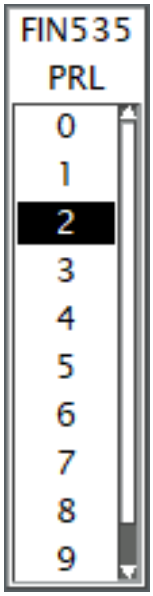


Figure 3.37: Prediction Line Menu

The Prediction Line menu allows displaying a PRL with a specific length for each aircraft even if the PRL selection is off in the Radar Menu.

The default value is the set PRL value if available, otherwise the PRL length value from the Track Control Window. Changing the PRL length value in the *Track Control Window* or changing the PRL setting in the *Radar Menu* will delete all manually set PRL lengths.

3.5.11 Sequence Number Menu

Figure 3.38: Sequence Number Menu

This menu is used to set an arrival sequence number. Values from 1 to 50 are available.

Warning	The sequence number will not be transmitted to other controllers except the next controller (during transfer) unless the flight strip is manually sent.

3.5.12 Waypoint Menu

Figure 3.39: Waypoint Menu

▲ Routing	Opens the “COPN point” or “COPX point” submenu (EuroScope default item)

▲ Arrival	Opens the “Assign STAR” submenu (EuroScope default item)
▲ Departure	Opens the “Assign SID” submenu (EuroScope default item)
▲ TSA Hold	Opens the TSA Hold submenu (not available if a holding clearance is active)
▲ Hold	Opens the Hold submenu (not available if a TSA holding clearance is active)

This menu gives access to functions related to the route of the aircraft. It is used to assign direct-to clearances, departure and arrival routes, holding clearances, and to coordinate the sector entry/exit point.

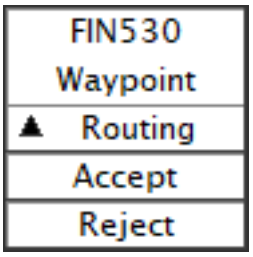


Figure 3.40: Waypoint Menu in Coordination

When an entry or exit coordination has been received, the menu opens looking like this instead. The options are:

▲ Routing	Opens the “COPN point” or “COPX point” submenu (EuroScope default item)
Accept	Accepts the coordination
Reject	Rejects the coordination

The submenu opened with “Routing” offers the same possibilities to accept or reject the coordination, but also the possibility to counter-propose a different point.

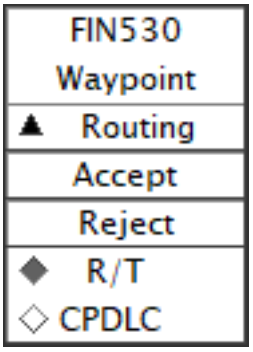


Figure 3.41: CPDLC DCT Request Downlink Waypoint Menu

When the aircraft is CPDLC-connected and the coordination is an exit coordination, the menu offers a choice between “R/T” and “CPDLC”. The chosen option decides how an accepted coordination is communicated to the aircraft.

With “CPDLC” selected, when “Accept” is clicked, in addition to the coordination being accepted, a “PROCEED DIRECT TO <point>” CPDLC message is sent to the aircraft.

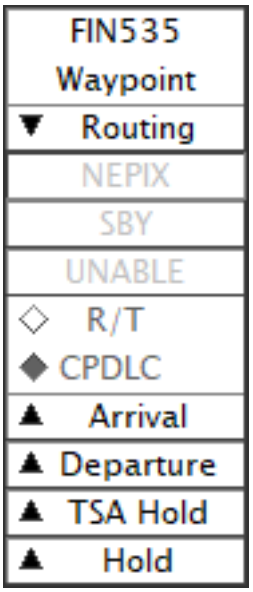


Figure 3.42: CPDLC Waypoint Menu

When a direct-to downlink request has been received, the menu can be used to answer it.

Point name	Sends a “PROCEED DIRECT TO <point>” CPDLC message
SBY	Sends a “STANDBY” CPDLC message
UNABLE	Sends an “UNABLE” CPDLC message

The “R/T” / “CPDLC” selection is fixed to “CPDLC”.

Warning	Clicking the point name will set the direct-to clearance without coordination

When there is no request in process and the aircraft has a direct-to point set, the menu can be used to send the clearance via CPDLC. In this case the menu opens like this except without the “SBY” and “UNABLE” buttons. Clicking the point name will send the “PROCEED DIRECT TO <point>” CPDLC message.

TSA Hold Submenu

The TSA Hold submenu allows you to enter a clearance to enter an active military area. It displays the active and preactive TSA type areas. If a clearance already exists, the menu will only give the option to remove it with the “XHold” item.

The clearance is automatically sent to your other EuroScope instances with a small delay and can be sent to other controllers by pushing the flight strip as the information is stored there. A TSA hold clearance will exclude the aircraft from all APW and SAP processing.

TSA Hold Submenu

If a holding clearance already exists, the menu will only give the option to remove it with the “XHold” item. See *Hold Menu* for other details.

3.5.13 AFL Menu

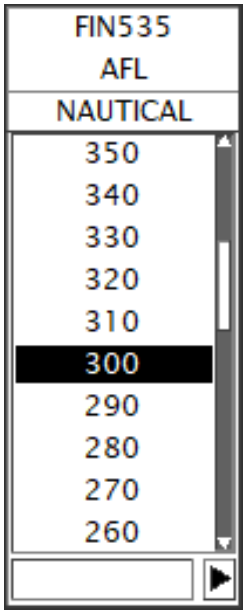


Figure 3.43: AFL Menu nautical units

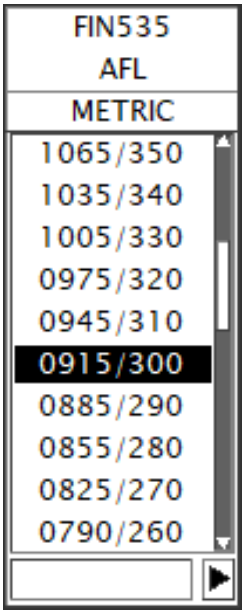


Figure 3.44: AFL Menu metric units

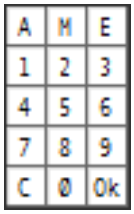


Figure 3.45: AFL Menu keyboard

This menu can be used to set the AFL value for aircraft that don’t have an altitude reporting transponder.

The default value is the previously set manual AFL value if set, otherwise the CFL value.

By default, the menu (as well as the AFL label item) is always showing nautical units, regardless of the system units or the selected units for the aircraft. If this behavior is selected off, the list units can be toggled with the “NAUTICAL” / “METRIC” item. There are three ways to set the AFL using this menu:

- Clicking a level value in the list
- Clicking the text entry box below the level list and entering the value there

- Clicking the right-pointing triangle to open a keyboard that can be used to type in the value using the mouse. “C” clears the entry and “Ok” sets the value.

Entering a metric value will also set the aircraft’s units to metric; a nautical value will set nautical units.

The accepted manual level entry formats for the AFL, CFL and RFL menus are as follows (“n” is a number):

“Annn” or “nnn”	Altitude in hundreds of feet
“Mnnnn” or “nnnn”	Altitude in tens of meters
“Mnnnnn” or “nnnnn”	Altitude in meters
“Ennn”	Height in hundreds of feet above aerodrome elevation
“Ennnn”	Height in tens of meters above aerodrome elevation
“Ennnnn”	Height in meters above aerodrome elevation

Regardless of whether the entered value is in meters or feet, and altitude or height, it will be converted to altitude in feet and the result is then rounded to the nearest 100 feet.

3.5.14 CFL Menu

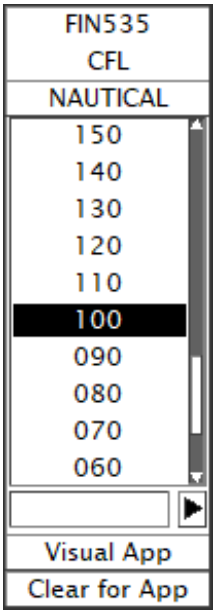


Figure 3.46: CFL Menu

In the track label the CFL menu is combined with the COPN altitude coordination menu and the CFL menu opens only when the aircraft is assumed. The default value is by default the XFL, but it can be changed to the current CFL or the RFL in the *Local Settings submenu*. Altitudes up to the transition altitude are prefixed with “A” in the nautical units list and with “M” in the metric units list. QFE heights are prefixed with “E” in both lists. Selectable values are from 500ft to FL650 with 500ft intervals up to the transition altitude, then 1000ft intervals up to FL410 and 2000ft intervals above it.

“Visual App” / “VA” and “Clear for App” / “CA” set the corresponding approach clearances.

The list units can be toggled with the “NAUTICAL” / “METRIC” item. There are three ways to set the CFL using this menu:

- Clicking a level value in the list or one of the two approach clearance items
- Clicking the text entry box between the level list and the approach clearance item and entering the value there
- Clicking the right-pointing triangle to open a keyboard that can be used to type in the value using the mouse. “C” clears the entry and “Ok” sets the value.

Entering a metric value will set the aircraft’s units to metric; a nautical value will set nautical units.

The aircraft’s RFL is displayed in the place of the “NAUTICAL”/”METRIC” item with format “R<RFL>”. Left-clicking the button still has the same effect (changes the displayed units).

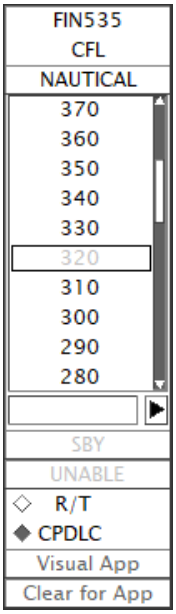


Figure 3.47: CPDLC CFL Menu

For CPDLC connected aircraft, the menu contains “R/T” and “CPDLC” options to select whether a level clearance is to be sent via radio or as a CPDLC message.

If a level request has been received from the aircraft, there are also “SBY” and “UNABLE” buttons to send those messages as a reply.

- When a level request downlink has been received, the “R/T” option is deselected and cannot be selected. The request must be replied to using CPDLC.

- When a level clearance uplink has been sent, the “CPDLC” option is deselected and cannot be selected. If a new level clearance must be sent before there is an answer to the uplink, it must be given via radio (doing so also closes the open uplink message).

3.5.15 RFL Menu

The RFL menu allows setting the requested flight level. The operation is similar to the AFL and CFL menus. The function for the “NEXT” button is not implemented.

3.5.16 AHDG Menu

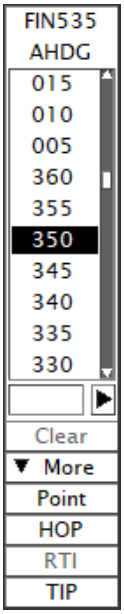


Figure 3.48: AHDG Menu

This menu includes items to set or clear an assigned heading or a direct route and to send a HOP. The initially highlighted heading value will be the closest one to the assigned heading if the aircraft has one, otherwise the closest one to the aircraft ground track, or the departure runway heading if the menu is opened from the *Departure List*. Clicking on a heading value will set it as the assigned heading. The assigned heading can also be set by typing it into the entry box, using the pop-up keyboard or by using the AHDG vector.

“Clear” removes an assigned heading or a direct route. For CPDLC connected aircraft, it sends the “RESUME OWN NAVIGATION” CPDLC message if the “CPDLC” option is selected.

“Point” lets you pick a direct-to point from the radar screen. Left-click on any point to set it as the direct-to point (available points are VORs, NDBs and waypoints, in that priority order). Pressing the [Esc] key or clicking on any clickable data field will abort the operation.

“HOP”, “RTI” and “TIP” are coordination functions (see *Handover Proposal (HOP)*, *Request Tactical Instructions (RTI) / Tactical Instructions Proposal (TIP)*). To use them, first click on the function’s button and then select the desired value from the list (for HOP also “Point” is available).

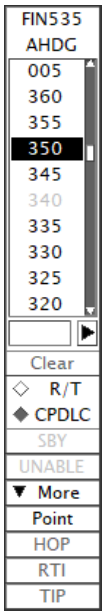


Figure 3.49: CPDLC AHDG Menu

For CPDLC connected aircraft, the menu contains additional buttons:

“R/T” and “CPDLC” select whether a heading/direct-to clearance is to be sent via radio or as a CPDLC message.

- When a heading request downlink has been received, the “R/T” option is deselected and cannot be selected. The request must be replied to using CPDLC.
- When a heading/direct-to clearance uplink has been sent, the “CPDLC” option is deselected and cannot be selected. If a new heading/direct-to clearance must be sent before there is an answer to the uplink, it must be given via radio (doing so also closes the open uplink message).

“SBY” and “UNABLE” send the corresponding answers to a downlink heading request message.

Warning	Clicking a point on the radar screen will set the direct-to clearance without coordination

3.5.17 Handover Proposal (HOP)

See *HOP*. For the receiving controller a HOP is identified by coloring the *CALLSIGN* field with Proposition In color in the label. For the sending controller the *CALLSIGN* field remains Assumed color and the *SI* field is shown in Proposition In color. Additionally, if there are proposed parameters they are also colored Proposition In in both controllers' labels.

There are three ways to answer a HOP and all of them involve accepting all proposed parameters. If one or more parameters are not acceptable, coordination must be done to find acceptable parameters or to revert to standard ones. The available ways, in order of preference, to accept the proposed parameters are:

Callsign Menu -> "ROF"	Sends a Request On Frequency message
Combined Transfer Menu -> "Accept"	Sends an Accept message
Callsign Menu -> "Assume"	Assumes the track

If the parameters are unacceptable to the receiving controller, the sending controller has the possibility to modify or clear them using the appropriate menus, or to cancel the whole HOP by assuming the track.

Warning	A HOP will only be shown correctly for controllers using this plugin. To other controllers it will be shown as a normal transfer without any special coloring of any data fields. This combined with the three possible ways to answer the HOP require the sending controller to pay special attention to the track to see what the result is.

Warning	If a HOP is sent to a manually selected controller, the next controller selection will be reset to the automatically calculated controller when an "ROF" or "Accept" answer is received. The correct controller must then be manually selected again for the transfer.

3.5.18 Request Tactical Instructions (RTI) / Tactical Instructions Proposal (TIP)

Certain tactical data (AHDG, ASP and ARC) can be coordinated using the *RTI/TIP* functions. Their only difference is that RTI is used for requesting the parameters when the aircraft is inbound to your sector and your sector is the next in the sector sequence, and TIP to propose the parameters to the next sector when the aircraft is assumed. Contrary to the *Handover Proposal (HOP)* function, these coordinations can be refused using the system, and they do not offer the aircraft for transfer.

When sent, the RTI/TIP is displayed on both controllers' screens by displaying the requested parameter on line 0 of the track label in Proposition In color.

To answer the RTI/TIP, left-click on the requested parameter on line 0 of the track label or the corresponding message in the *Message In Window*. This will open the *Tactical Transfer Menu*.

Warning	The “RTI” and “TIP” messages are features specific to this plugin. They are experimental features not guaranteed to work all the time. When you send these messages, check that they are sent properly. • A successfully sent message will be displayed in the *Message Out Window* and the requested parameter being shown above the track label • If there is an error or the message fails to go through, a message will be put into the *Personal Queue Window*.

3.5.19 AHDG Vector

The AHDG vector is another way of setting an assigned heading for an aircraft. To use the vector, left-click on the radar position symbol of the aircraft. This will start drawing the vector. When you’re satisfied with the heading value, left-click again to set it. Right-clicking will abort drawing the vector.

When the cursor is over a known point (VOR, NDB or waypoint), the name of that point is displayed instead of the heading value, and left-clicking will set a direct-to clearance to that point. To temporarily disable the known points functionality, keep the <ALT> key pressed while using the vector.

3.5.20 ARC Menu

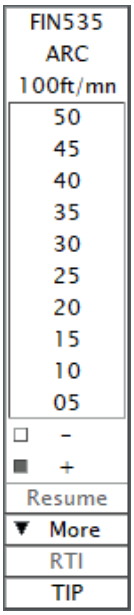


Figure 3.50: ARC Menu

The ARC menu allows assigning a rate of climb or descent to the flight plan. Selectable rates are 500-5000 ft/min (displayed in 100’s of ft/min), or 5-25 m/s. The menu units are always the same as the units used for the aircraft in general.

Left-clicking on a value assigns it. An assigned rate can be cleared by selecting the “Resume” item.

By default, the “+” option is selected, meaning that the clearance is a minimum rate of climb or descent. Deselecting the “+” makes the clearance an exact rate, and selecting the “-” option makes the clearance a maximum rate.

“RTI” and “TIP” are coordination functions (see *Request Tactical Instructions (RTI) / Tactical Instructions Proposal (TIP)*). To use them, first click on the function’s button and then select the desired value from the list.

Warning	The exact and maximum rate clearances are a feature specific to this plugin (the additional information is stored in the flight strip). To controllers not using TopSky, all assigned rate clearances will only show the rate value. Assigned rate clearances given by controllers not using TopSky will be displayed as minimum rate clearances.

3.5.21 ASP Menu

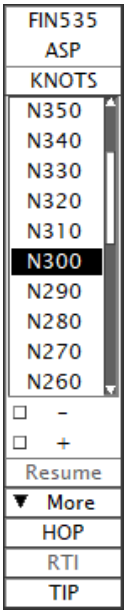


Figure 3.51: ASP Menu

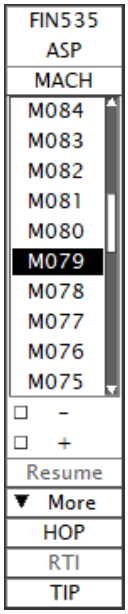


Figure 3.52: ASP Menu Mach option

The ASP menu allows setting an assigned speed or Mach number. The default value will be the closest value to the assigned one if set, otherwise TopSky will suggest the closest value to the aircraft’s present speed based on the ground speed (zero wind will be assumed). The menu will initially open in IAS mode if the aircraft’s CFL is below FL285, and in Mach mode if above it. The selectable values range from 100 to 400 knots and from M0.50 to M1.00.

The “+” and “-” options can be used to specify the clearance as a minimum/maximum speed.

The “Resume” item clears an assigned value. For CPDLC connected aircraft, it sends the “RESUME NORMAL SPEED” CPDLC message if the “CPDLC” option is selected.

When the “Resume” button below the list is replaced by a “HS” button, clicking it will set a clearance for “high speed”, displayed as “HS” in the ASP label field. For CPDLC connected aircraft, it sends the “NO SPEED RESTRICTION” CPDLC message if the “CPDLC” option is selected. The “Resume” button can be found at the bottom of the “More” list.

“HOP”, “RTI” and “TIP” are coordination functions (see *Handover Proposal (HOP)*, *Request Tactical Instructions (RTI) / Tactical Instructions Proposal (TIP)*). To use them, first click on the function’s button and then select the desired value from the list (for HOP also “Point” is available).

Entering a metric value will set the aircraft’s units to metric, a nautical value will set nautical units.

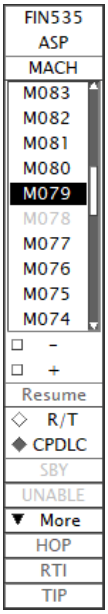


Figure 3.53: CPDLC ASP Menu

For CPDLC connected aircraft, the menu contains additional buttons:

R/T” and “CPDLC” select whether a speed clearance is to be sent via radio or as a CPDLC message.

- When a speed request downlink has been received, the “R/T” option is deselected and cannot be selected. The request must be replied to using CPDLC.
- When a speed clearance uplink has been sent, the “CPDLC” option is selected and cannot be deselected. If a new speed clearance must be sent before there is an answer to the uplink, it must be given via radio (doing so also closes the open uplink message).

SBY” and “UNABLE” send the corresponding answers to a downlink speed request.

Warning	The minimum and maximum speed clearances are a feature specific to this plugin (the additional information is stored in the flight strip). To controllers not using TopSky, all assigned speed clearances will only show the speed value. Assigned speed clearances given by controllers not using TopSky will be displayed as exact speed clearances.

3.5.22 ASSR Menu

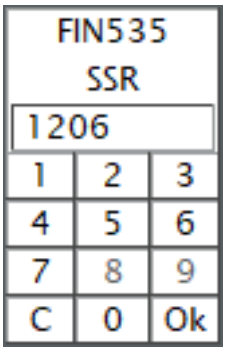


Figure 3.54: ASSR Menu

The ASSR menu allows assigning an SSR code to the flight plan. To enter a new code, type it by left-clicking the numbers. “C” clears the entered value and “Ok” assigns the code if it’s a valid one. To get an automatically assigned code, clear the value and then left-click on “Ok” with the entry box left empty.

3.5.23 Combined Transfer Menu

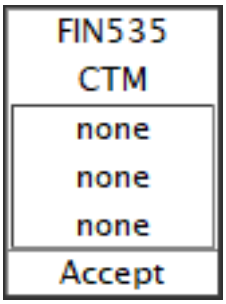


Figure 3.55: Combined Transfer Menu

The Combined Transfer menu displays the proposed transfer parameters for a *HOP*. It is opened by clicking on the *AHDG*, *ASP* or *COPN/COPX* items in the track label or flight list, or the list row displaying the HOP message in the *Message In Window*.

From top to bottom, the displayed values are the direct-to point, speed/Mach value, and the assigned heading value. If one or more of them are not proposed, the value will be replaced by the string “none” (the image above shows the menu for a HOP without any proposed parameters). Clicking on “Accept” will send a message to the upstream controller that the proposed parameters, if any, are all acceptable.

3.5.24 Tactical Transfer Menu

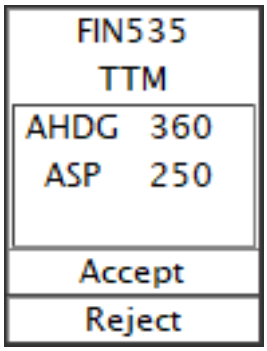


Figure 3.56: Tactical Transfer Menu

The Tactical Transfer menu is used to accept, reject or apply tactical data (*AHDG*, *ASP* and/or *ARC*). It is opened by left-clicking on a proposed or accepted parameter in the track label. The menu displays all proposed (in Proposition In color) and accepted (in sector state color) values.

Clicking on “Accept” will accept all proposed values and “Reject” will reject them. The menu is then closed.

Once a value is accepted, the respective label field will be colored Information until the value is set to the accepted one.

Note that the menu displays both sent and received coordinations, but you can naturally only accept/reject the received ones and apply values for aircraft that are assumed.

All tactical data coordinations (also any rejected ones) can be viewed in the *Tactical Info Window*, but they cannot be answered or applied there.

3.5.25 Aerodrome Menu

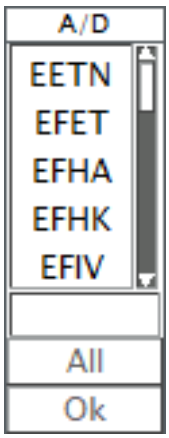


Figure 3.57: Aerodrome Menu

The Aerodrome menu is used to select the aerodrome(s) for aerodrome related windows and functions. The list contains all aerodromes with runways defined in the active sector file. To select an aerodrome, left-click on it or type its identifier into the text entry box below the list.

Selection of more than one aerodrome is possible when the menu was opened from the *Weather Messages Window*. In this case the “All” button is available and clicking on it will select all the aerodromes in the list.

Clicking on “Ok” will confirm the selection(s) and close the menu.

3.5.26 NPT Menu

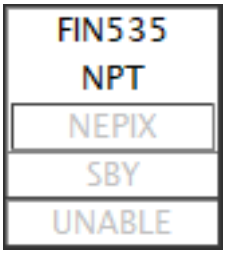


Figure 3.58: NPT Menu

The NPT menu is used to answer a direct-to downlink request using CPDLC. The menu contains three options:

Point name	Sends a “PROCEED DIRECT TO <point>” CPDLC message
SBY	Sends a “STANDBY” CPDLC message
UNABLE	Sends an “UNABLE” CPDLC message

The menu closes when an option is selected or the cursor leaves the menu area. If the aircraft cannot be cleared direct to the requested point but to another one, the request must be answered with “UNABLE” and a separate direct-to clearance must be given.

Warning	Clicking the point name will set the direct-to clearance without coordination

3.5.27 CPDLC Emergency Acknowledgement Menu

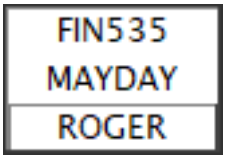


Figure 3.59: CPDLC Emergency Acknowledgement Menu

When a CPDLC emergency message has been received, this menu is used to respond to it (if applicable), and then acknowledge the situation. When a reply is required, the menu button will read “ROGER”. Left-clicking on it will send the “ROGER” CPDLC message and close the menu. When opening the menu again (or when a reply was not required), the button reads “Ack”. Left-clicking on it will acknowledge the emergency.

The menu is closed when the “ROGER”/“Ack” button is clicked or the cursor leaves the menu area.

3.5.28 CPDLC Pilot Late Acknowledgement Menu

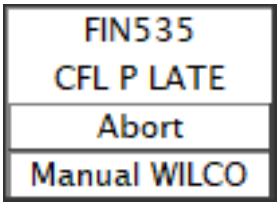


Figure 3.60: CPDLC Pilot Late Acknowledgement Menu

When there is no answer to a CPDLC uplink clearance, this menu can be used to resolve the situation. “Abort” discards the uplink and “Manual WILCO” simulates reception of a WILCO message.

3.5.29 Time Menu

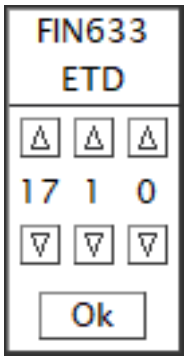


Figure 3.61: Time Menu

The Time menu is used to set/change the time value for ATD, EOBT, ETD and SLOT fields. Default values are:

ATD	Current time
EOBT	Current time
ETD	Current field value
SLOT	Current field value if any (ATD if different from ETD), current time otherwise

The up/down arrows are used to change the value, “Ok” sets the time.

3.5.30 Departure Sequence Menu

Figure 3.62: Departure Sequence Menu

The DSQ menu is used to select a specific departure sequence number to a flight. The list includes the possible numbers, and the current number is highlighted. Left-clicking on a number sets it, “Clear” removes the flight from the departure sequence.

Note	The departure sequence number is only stored locally, it is not sent to other controllers or even to other EuroScope instances.

3.6 Aircraft Lists

3.6.1 Departure List

The Departure List contains all departures still on the ground of the controlled aerodromes.

Item	Left Mouse	Right Mouse	Default Visibility
CALLSIGN	Open *Callsign Menu*	Toggle Flight Leg display	✓
EOBT	Edit EOBT	Edit EOBT	
TOBT	Edit TOBT	Edit TOBT	✓
TSAT	Ready TOBT	Set TOBT to now	✓
TSAC	Add TSAT to TSAC	Edit TSAC	
ASRT	Toggle ASRT	Toggle ASRT	
ASAT			
TTOT			
CTOT	Open CTOT Option list	Open CTOT Option list	
ECTOT	Add ECTOT to CTOT	ECTOT Option list	
Flow Message	Open *AHDG Menu*		
Ready	Toggle Ready		
ATYP			✓
WTC			✓
V			✓
Departure stand			✓
QNH	Edit OP TEXT	Edit OP TEXT	
ADEP	Open *Flight Plan Window*	Toggle Flight Leg display	✓
ADES	Open *Flight Plan Window*	Toggle Flight Leg display	✓
DRWY	Open *Pre-Departure Clearance Window*	Open *Pre-Departure Clearance Window*	✓
SID	Open *Pre-Departure Clearance Window*	Open *Pre-Departure Clearance Window*	✓
ASSR	Open *ASSR Menu*	Open *ASSR Menu*	✓
CFL	Open *CFL Menu*	Open *CFL Menu*	✓

Item	Left Mouse	Right Mouse	Default Visibility
RFL	Open *RFL Menu*	Open *RFL Menu*	✓
CLR	Toggle Clearance Acknowledged flag		✓
Ground state	Open Ground State Menu	Open Ground State Menu	✓
OP TEXT2	Edit OP TEXT2	Edit OP TEXT2	✓

Table 3.21: Departure List Construction

3.6.2 Sector List

Global Menu Tools -> Flight Plan Lists -> Sector List...
The Sector List contains all departed controlled aircraft in the following states:

- Informed[1]
- Concerned[1,2]
- Coordinated
- Transfer to me initiated
- Assumed
- Transfer from me initiated
- Redundant[1]

Item	Left Mouse	Right Mouse	Default Visibility
CALLSIGN	Open *Callsign Menu*	Open Extended Label	✓
ETN			✓
PEL	Open PEL Menu		✓
COPN	Open *Waypoint Menu*	Toggle Flight Leg display	✓
NRAC			
ATYP			✓
WTC			

[1] If corresponding selection made in the Global menu
[2] The display of concerned aircraft is limited to those entering the sector within 60 minutes

Item	Left Mouse	Right Mouse	Default Visibility
V			
CFL	Open *CFL Menu*		✓
AHDG	Open *AHDG Menu*		
ASP	Open *ASP Menu*	Clear ASP value	
TAS			
ETX			
XFL	Open XFL Menu		
COPX	Open *Waypoint Menu*		
RFL	Open *RFL Menu*		
ASSR	Open *ASSR Menu*	Send CPDLC Squawk message	
NSSR	Open *ASSR Menu*	Send CPDLC Squawk message	
ADEP			
SID	Open SID list		✓
DRWY	Open Runway list		
FCOPX		Toggle Flight Leg display	
ETX			
ADES	Open *Flight Plan Window*		✓
SI	Open SI list	Toggle SI frequency	
ADES	Open *Flight Plan Window*		✓
ETA			✓
STAR	Open STAR list		✓
ARWY	Open Runway list		✓
OP TEXT	Edit OP_TEXT		✓
OP TEXT2	Edit OP_TEXT2		✓

Table 3.22: Sector List Construction

3.6.3 Load Factor List

Global Menu Tools -> Flight Plan Lists -> Load Factor List. . .

The Load Factor List contains all departed controlled aircraft in the concerned state and all non-departed controlled aircraft in the concerned and coordinated states expected to enter the sector within 4 hours.

Item	Left Mouse	Right Mouse	Default Visibility
CALLSIGN	Open *Callsign Menu*	Open Extended Label	✓
ETN			✓
PEL	Open PEL Menu		✓
COPN	Open *Waypoint Menu*	Toggle Flight Leg display	✓
ADEP			✓
ADES	Open *Flight Plan Window*		✓
RFL	Open *RFL Menu*	Open *CPDLC Current Message Window*	✓
ASSR	Open *ASSR Menu*	Send CPDLC Squawk message	✓

Table 3.23: Load Factor List Construction

3.6.4 Uncontrolled Lists

Global Menu Tools -> Flight Plan Lists -> Uncontrolled List 1/2. . .

The Uncontrolled List contains all or a subset of Uncontrolled aircraft, depending on whether filters are set up.

Up to 2 lists can be displayed. Each list may be configured with different filtering options.

Item	Left Mouse	Right Mouse	Default Visibility
CALLSIGN	Open *Callsign Menu*	Open Extended Label	✓
ASSR	Open *ASSR Menu*	Send CPDLC Squawk message	✓
ADEP			✓
ATD	Open *Time Menu*		✓
ADES	Open *Flight Plan Window*	Toggle Flight Leg display	✓
SI[1]	Open SI list	Toggle SI frequency	✓
OP TEXT2	Edit OP_TEXT2		✓

Item	Left Mouse	Right Mouse	Default Visibility
C	Toggle Inbound clearance flag		

Table 3.24: Uncontrolled List Construction

3.6.5 ETWR List

Global Menu Tools -> Flight Plan Lists -> ETWR List...

The ETWR List contains notified and coordinated flights departing from specified airports

Item	Left Mouse	Right Mouse	Default Visibility
CALLSIGN	Open *Callsign Menu*	Open Extended Label	✓
ETN			✓
PEL	Open PEL Menu		✓
COPN	Open *Waypoint Menu*	Toggle Flight Leg display	✓
SID	Open *Pre-Departure Clearance Window*		✓
DRWY	Open *Pre-Departure Clearance Window*		✓
ATYP			✓
RFL	Open *RFL Menu*	Open *CPDLC Current Message Window*	✓
ASSR	Open *ASSR Menu*	Send CPDLC Squawk message	✓
ADEP			✓
ADES	Open *Flight Plan Window*		✓

Table 3.25: ETWR List Construction

3.6.6 Resectorisation List

Global Menu Tools -> Flight Plan Lists -> Resectorisation List. . .

The Resectorisation List contains all flights assumed or on-contact with specified LFUNCs.

[1] Labeled as LFUNC

Item	Left Mouse	Right Mouse	Default Visibility
CALLSIGN	Open *Callsign Menu*		✓
CFL	Open *CFL Menu*	Toggle Flight Leg display	✓

Table 3.26: Resectorisation List Construction

3.6.7 Traffic Management Lists

Global Menu Tools -> Flight Plan Lists -> Traffic Management List 1/2. . .

The Traffic Management List contains all Uncontrolled and Controlled flights at least in Coordinated State with specified destinations, and routing via specified points. The ETO over the point (or ETA if no point specified) must be within 30 minutes, and the destination must be specified to include uncontrolled flights in the list.

Up to 2 lists can be displayed. Each list may be configured with different filtering options.

Item	Left Mouse	Right Mouse	Default Visibility
COPN	Open *Waypoint Menu*	Toggle Flight Leg display	
PEL	Open PEL Menu		
SI	Open SI List	Toggle SI frequency	
CALLSIGN	Open *Callsign Menu*	Open Extended Label	✓
ASSR	Open *ASSR Menu*	Send CPDLC Squawk message	
AFL	Open *AFL Menu*		✓
a			
CFL	Open *CFL Menu*		
ATYP			✓
WTC			✓
TAS			
RFL	Open *RFL Menu*	Open *CPDLC Current Message Window*	
ETOHP[1]			✓
OP TEXT2[2]	Edit OP_TEXT2		✓
STAR	Open STAR list		✓

Item	Left Mouse	Right Mouse	Default Visibility
ARWY	Open Runway list		✓
HP	Open *Waypoint Menu*		✓

Table 3.27: Traffic Management List Construction

3.6.8 Lost List

Global Menu Tools -> Flight Plan Lists -> Lost List. . .

The list includes assumed flights that have previously been correlated to a radar track but radar contact has been lost. The list opens automatically whenever a flight is added into it, and will be closed automatically when empty. If manually opened, the list cannot be manually closed until it is empty.

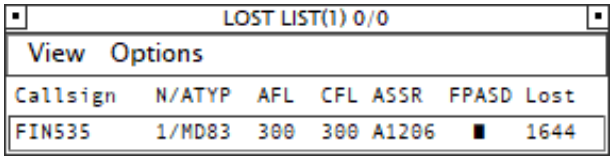


Figure 3.63: Lost List

Item	Type	Left Mouse	Right Mouse
Callsign	mandatory	Open *Callsign Menu*	
N/ATYP	optional		
AFL (last received)	optional		Toggle Flight Leg display
CFL	optional	Open *CFL Menu*	Toggle Flight Leg display
ASSR	mandatory	Open *ASSR Menu*	
FPASD	optional	Toggle FPASD track (when globally off)	
Lost (time)	optional		

[1]Labeled as ETO
[2]Labeled as EAT

Item	Type	Left Mouse	Right Mouse

Table 3.28: Lost List Construction

“View” opens the View menu:

Header	Toggle visibility of the list header line
Standard	Set the list in Standard mode (only mandatory fields shown)
Extended	Set the list in Extended mode

“Options” opens the Options menu to select which optional fields are shown in Extended mode. The “All” selection shows all fields without affecting the individual selections.

The rows are sorted based on “Lost” time in descending order.

When a flight is added into the Lost List, its FPASD selection is initially set to “on” regardless of the FPASD setting in the *Global Menu*.

3.6.9 Holding List

The Holding List contains aircraft in the *Assumed*, *Transfer Initiated* and *On Contact* states that have been given a holding clearance. The list is automatically displayed whenever there is at least one aircraft in the list.

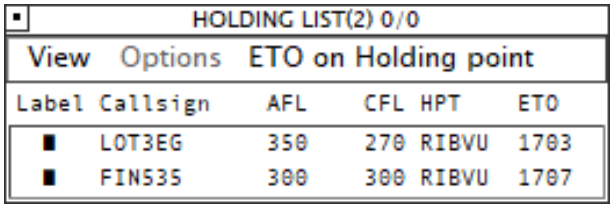


Figure 3.64: Holding List

“View” opens the View menu which contains only one item, “Header”. It toggles the visibility of the list’s header line.

“Options” is inaccessible as there are no selectable options in the holding list.

The list sorting option is displayed next to the “Options” label. Clicking on it opens a menu to select between the following sorting options:

“ETO on Holding point”	ETO at the holding point -> Holding point name -> Callsign
“Holding point”	Holding point name -> CFL -> Callsign

The ETO column initially displays the estimated time over the holding fix. Once the aircraft enters the holding, the displayed time is fixed to the holding start time. For present position holds and holding points whose positions are unknown, the time when the holding clearance was given is displayed.

Item	**Left mouse**	**Right mouse**
Label	Hide/display track label	
Callsign	Open *Callsign Menu*	
AFL	Open *AFL Menu*	Toggle Flight Leg display
(attitude indicator)		
CFL	Open *CFL Menu*	Toggle Flight Leg display
HPT	Open *Stack Manager Window*	
ETO		

Table 3.31: Holding List Construction

If a track label has been hidden, it will be automatically unhidden if the aircraft is cleared to leave the holding or an incoming coordination message for the flight is received.

3.6.10 Unsupported Lists

EuroScope’s default Sector Inbound, Sector Exit, Arrival, Startup, Taxi Out, Take-Off, ADC Sector, Taxi In, Flight Plan, and Conflict lists are not supported and should not be used.

3.7 Windows

TopSky includes a number of windows that are discussed in this chapter. All windows have the following common features:

- Dragging the title bar using the left mouse button will move the window
- Dragging the box in the bottom right corner with the left mouse button will resize the window
- Left-clicking the top right corner will close the window
- Left-clicking the title bar will position the window on the top of other windows
- Right-clicking the title bar will position the window below other windows

While resizing the windows always starts from the bottom right corner, it is also possible to resize the window to the direction of the top and/or left edges. To do this, continue dragging the bottom right corner until the cursor goes past the top or left edge. As all windows have a defined minimum size, nothing will seem to happen once you reach the minimum size until the cursor crosses the opposite edge, but then the resize operation will continue normally.

Some windows contain scrollbars to select values or change the items that are displayed:

- Dragging a scroll bar slider using the left mouse button will move the slider
- Left-clicking on the scrollbar background area outside the slider will move the slider by a predefined amount (in list windows, the view will be scrolled by the number of visible items)
- Right-clicking on the scrollbar background area outside the slider will position the slider to the clicked position
- Left-clicking on the arrow at the end of the slider will scroll the list by one line
- The mouse wheel can be used to scroll some scrollbars (most of the ones that have defined steps for scrolling, i.e. those with the arrows at the ends)

Other window-specific mouse function areas are explained below. All functions use the left mouse button unless otherwise specified. For each window, the way(s) to open it are listed below the chapter title.

3.7.1 Radar Menu

<ALT> + Right-click anywhere on the radar screen background

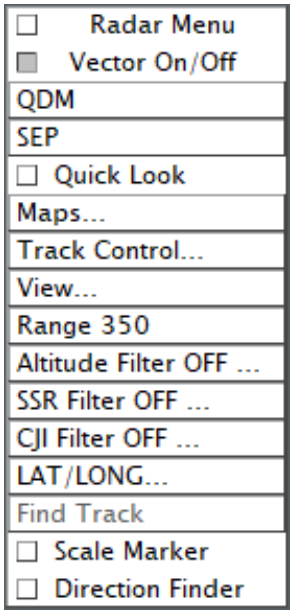


Figure 3.65: Radar Menu

Radar Menu	Toggles keeping the menu permanently displayed
Vector On/Off	Toggles all prediction lines on/off
QDM	Starts a new *QDM Vector*
SEP	Starts a new *Minimum Separation Tool*
Quick Look	Toggles function to bypass all filters and show all track labels
Maps...	Opens the *Maps Windows*
Track Control...	Opens the *Track Control Window*
View...	Opens the *View Window*
Range XXX	Opens the *Zoom Window* (XXX = distance: center -> right edge)
Altitude Filter X...	Opens the *Altitude Filtering Window*, displays the filter status
SSR Filter X...	Opens the *SSR Code Filtering Window*, displays the filter status
CJI Filter X...	Opens the *CJI Filtering Window*, displays the filter status
LAT/LONG...	Opens the *Cursor Lat/Long Window*

Find Track	Not implemented
Scale Marker	Toggles the Scale Marker on/off
Direction Finder	Toggles the Direction Finder position circles or lines on/off

The Radar Menu closes when a selection is made or the mouse cursor leaves the menu area (unless the “Radar Menu” option is selected on).

For all the filters, it is only possible to filter out *Unconcerned* tracks. Aircraft with transponder codes 7500, 7600 and 7700 and tracks with an active STCA, MSAW, APW or DUPE alert are also excluded from filtering. If a filter is active, the filter title in the Radar Menu will be shown in Selected color.

3.7.2 QDM Vector

To draw a new QDM vector:

- Left-click on the “QDM” menu item
- Left-click on the desired start point (radar track or fixed position)
- Left-click on the desired end point (radar track or fixed position)

The vector’s data label is located at the end of the line. The available click spots for a radar track are the radar track position symbol and all its label items that have a mouse function. The line end positions will attach to defined points more easily than for a random position (there is a small click area centered on the defined points). The defined points are the following, and are searched in this order:

- Radar track position symbols
- VORs in the active sector file
- NDBs in the active sector file
- Fixes in the active sector file
- Airports in the active sector file

Right-clicking will abort drawing the vector. To remove a QDM vector:

- Right-click on either end point of the line (midpoint of the line for lines between two radar tracks)

To adjust a QDM vector:

- Left-click on either end point. The selected end of the line will then attach to the mouse cursor.
- Left-click on the new desired end point (radar track or fixed position)

3.7.3 Scale Marker

Radar Menu -> Scale Marker

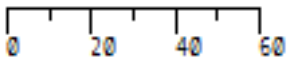


Figure 3.66: Scale Marker

Displays a range scale in the bottom right corner of the radar screen.

3.7.4 Minimum Separation Tool

The minimum separation tool displays the predicted minimum lateral separation between two radar tracks within the next 30 minutes, assuming both of them maintain their present ground tracks and speeds. Lines are drawn from the tracks' present positions to the positions where the tracks are predicted to be at the time of the minimum separation.
To draw minimum separation lines between two radar tracks:

- Left-click on the "SEP" menu item
- Left-click on the first radar track
- Left-click on the second radar track

Right-clicking will abort drawing the lines. The available click spots for a radar track are the radar track position symbol and all its label items that have a mouse function.

The minimum separation distance is by default displayed near the end of one of those lines. If the tracks are not converging, the lines will be drawn with an offline-defined length, and the label will display "DIV".

7 sets of lines can be simultaneously drawn (plus one from the *CARD*). When at least one set is drawn, a SEP List Window is opened:

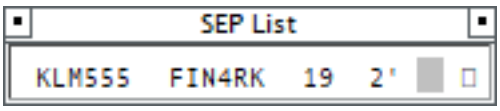


Figure 3.67: SEP List

The window lists the tracks, the minimum predicted separation, the time to the minimum separation, the line color and a locked/unlocked indicator for each set of lines. To remove the minimum separation lines:

- Left-click on the colored box for that set of lines in the SEP List Window
- Right-click on a line's end point
- Close the SEP List Window (this removes all minimum separation lines)

The lines will be automatically removed if one of the tracks is no longer available, or for unlocked lines, if the tracks start to diverge. If the tracks are diverging at the time the lines are created, they will be automatically locked.

To lock/unlock a set of lines:

- Left-click on the box right of the color indicator for that set of lines to toggle the locked/unlocked status. For a locked set of lines, the box will be filled.

To display vertical separation information on the lines:

- Right-click on the colored box for a set of lines to enable vertical separation display.
- Right-click again to hide the vertical separation labels
- Right-click once again to disable the vertical separation display

The letter “V” is shown inside the box when activated (“v” when labels have been hidden), and on both lines, two points are displayed, the first showing the point where the tracks’ vertical separation is calculated to become smaller than an offline-defined value, and the second the point after that where it is calculated to become greater.

The calculation is done using the tracks’ current vertical speeds.

- The vertical separation labels, when displayed, are similar to the minimum separation label but prefixed with “V”.
- If one or both points are beyond the minimum separation point, their calculation is extended forward up to an offline-defined time value.
- If a point is already passed or beyond the maximum displayed time, it will not be drawn.
- If the end point is beyond the maximum displayed time, a line will be drawn using SEP Vert color from the CPA to the end point or the maximum displayed time whichever is earlier.
- If the tracks are not predicted to be separated by less than the defined value within the prediction time, “V=” is displayed left of the minimum separation label.

3.7.5 View Window

Radar Menu -> View...

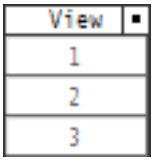


Figure 3.68: View Window

The View Window lists the available views. To select a view, left-click on it. The radar screen will be refreshed to show the required area. The first three views, labeled “1”, “2” and “3” are views that can be defined on the fly. To define a view for one of them, set the screen area as desired and then right-click on the number. The number will then change to Foreground color to indicate that it has a view defined for it. An already defined view (“1”, “2” or “3”) can be redefined to show a different screen area just by defining it again with a right-click.

3.7.6 Zoom Window

Radar Menu -> Range XXX

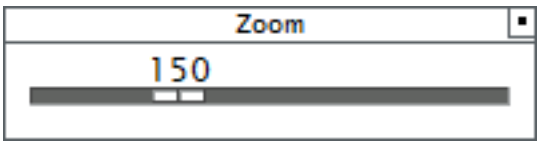


Figure 3.69: Zoom Window

The Zoom Window displays and enables to change the radar screen range.

3.7.7 Maps Windows

Radar Menu -> Maps...

Figure 3.70: Maps Windows

The Maps Window closes when the mouse cursor leaves the window area. If this is not desired, there is a hidden click spot in the top right corner of the menu (where the “close” button would be). Left-clicking in that area will disable the automatic closure of the menu and display the close button, which is then used to close the menu.

The Maps Window enables the display of predefined maps on the radar screen, some of which may be set up with automatic activation rules. The maps are arranged to folders. Clicking on a folder name shows the maps in that folder below the folder list.

The map names are displayed with the following colors (automatic options only available for maps with that capability):

sid_35	Not displayed
ppor_gnss_35	Automatic (not displayed)
ppor_17_d	Displayed

Left-clicking on a map name will change the state of a map one step
not displayed –> automatic (if applicable) –> displayed

Right-clicking in the other direction. Left or right double-clicking on any map name will change the states of all maps in that folder.

3.7.8 Track Control Window

Radar Menu -> Track Control...

The Track Control Window is used to set track and track label related options. Note that the PRL/Vector selection must be on in the Radar Menu to see the prediction lines. The Track Control Window closes when the mouse cursor leaves the window area. The selections are specific to the radar screen they are made on but whenever TopSky settings are reloaded either automatically (sign in/out, login callsign change when signed in) or manually the selections on all radar screens will revert to the default values.

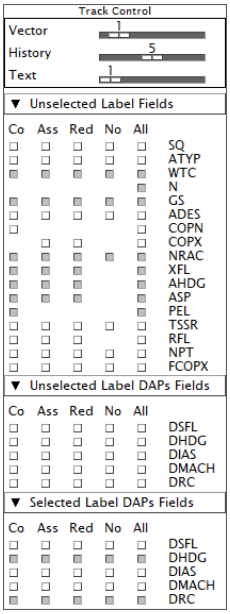


Figure 3.71: Track Control Window

Vector	Sets the length of the prediction line in minutes
History	Sets the number of history dots
Text	Changes the track label text size

X Label Fields Opens/closes the corresponding Label Fields section

The Label Fields sections allow controlling the visibility of certain track label fields in the unselected label, and for DAP items, also in the selected label. The visibility can be set depending on the state of the fight plan (*Coordinated*, *Assumed*, *Redundant* or *Notified*/*Unconcerned*).

The “All” buttons toggle all the state buttons for that field on/off.

Regardless of the settings here, the necessary label fields will be displayed in certain cases (for example in case of a COPX coordination request, the COPX field will be displayed).

3.7.9 Altitude Filtering Window

Radar Menu -> Altitude Filter [ON/OFF]...

The Altitude Filtering Window is used to filter the displayed track labels based on the aircrafts’ altitudes. It closes when the mouse cursor leaves the window area.

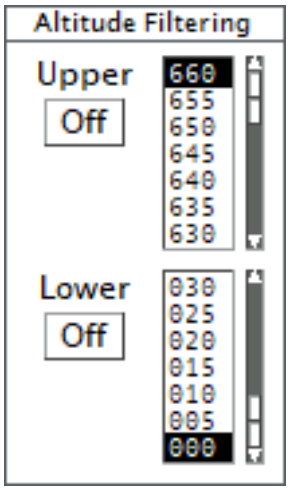


Figure 3.72: Altitude Filtering Window

To set the filtering limits, values from -1200ft to FL660 are available with 100ft steps up to 5000ft, then with 500ft steps up to FL660. Select the level and click on the filter on/off button to activate the limit. There are separate on/off buttons for the upper and lower limits, and it is possible to activate either one or both of them. Values at or below the transition altitude are considered to be altitudes (for example with a transition altitude of 5000ft, “050” means 5000ft and “055” means FL55).

3.7.10 CJI Filtering Window

Radar Menu -> CJI Filter [ON/OFF]...

Figure 3.73: CJI Filtering Window

The CJI Filtering Window closes when the mouse cursor leaves the window area.

The CJI Filtering Window is used to filter the displayed track labels based on controller ID's. The window shows the currently online controllers. To filter a controller's tracks, click on the controller ID in the list. A filtered ID will be shown in inverse video.

Clicking "All" will filter all controllers, and clicking "None" will clear all controller ID filters.

3.7.11 SSR Code Filtering Window

Radar Menu -> SSR Filter [ON/OFF]...

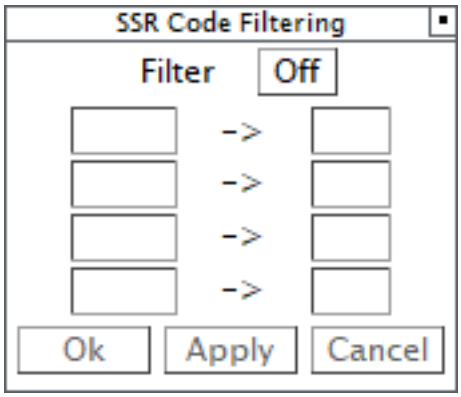


Figure 3.74: SSR Code Filtering Window

The SSR Code Filtering Window is used to filter the displayed track labels based on the aircrafts' SSR codes. Four different codes or code ranges can be set. The boxes on the left side of the window are the code range start boxes. The input syntax is a valid SSR code to be filtered. If filtering a range of codes is needed, enter the last two digits of the last code in the range to the box on the right. Entering an empty string will clear the box. For example, to filter codes 1400-1427, enter "1400" into one of the four boxes on the left and then "27" into the box next to it. Set the filter on by clicking on the filter on/off button.

All changes to the window must be applied using the buttons in the bottom of the window to take effect.

Ok	Applies the changes, closes the window
Apply	Applies the changes
Cancel	Cancels the changes

3.7.12 Brightness Control Window

Global Menu Setup -> Brightness Control...

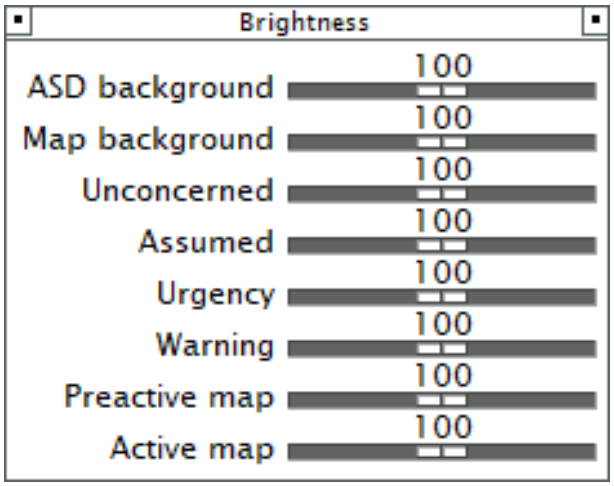


Figure 3.75: Brightness Control Window

The Brightness Control Window allows setting the brightness for some screen colors. The Map background slider only controls TopSky created maps.

3.7.13 CPDLC Setting Window

Global Menu Setup -> CPDLC Setting...

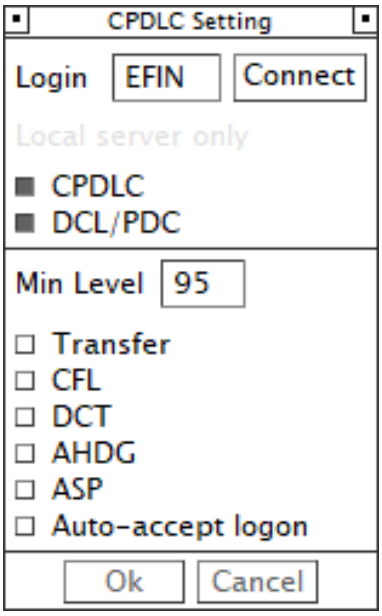


Figure 3.76: CPDLC Setting Window

The CPDLC Setting Window is used to begin/end the connection to the CPDLC network, and change some CPDLC related settings.

The “Connect” button becomes available once you are connected to the VATSIM network as a controller and both the Login (four-character callsign used for the CPDLC connection) and the Logon Code (your personal password to the Hoppie network) have been entered. Left-clicking on it connects TopSky to the CPDLC network. Once a connection has been established, the button background color changes to Information and the button text changes to “Online”. Once connected, left-clicking on the button disconnects TopSky from the CPDLC network.

Note	It is possible to have the Logon Code pre-filled by creating a text file called “TopSkyCPDLChoppieCode.txt” in the same folder as the plugin dll (TopSky.dll). The file should contain only the logon code, nothing else. As the file contains your personal logon code, do not share it.

If the VATSIM callsign is known when the window is opened, the CPDLC login callsign is pre-selected based on it. If necessary, the CPDLC login can be changed.

The “CPDLC” and “DCL” selections are used to define the offered services.

Sending a clearance via CPDLC can be the default setting in some of TopSky menus. For this to happen, the aircraft must be above the “Min Level” (FL) specified here, the selection button for the menu in question must be on, and the CPDLC Default Status (in *Global Menu->STS menu*) must be “On”. The “DCT” option does not do anything at the moment (DCT clearance via CPDLC is given using the “Point” option in the AHDG menu, so the “AHDG” option controls that as well). “Auto-accept logon” automatically accepts valid logon requests from tracks above “Min Level”.

When making changes to the “Min Level” or the menu selections, the “Ok” and “Cancel” buttons become active. Left-click on “Ok” to apply the changes or “Cancel” to abort.

3.7.14 Raw Video Control Window

Global Menu Setup -> Raw Video Control...

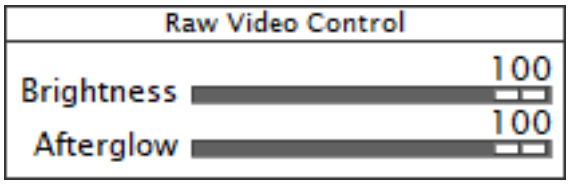


Figure 3.77: Raw Video Control Window

The Raw Video Control Window closes when the mouse cursor leaves the window area.

The Raw Video Control Window controls the brightness (in general) and afterglow (how fast the radar returns fade) of the raw video radar data.

3.7.15 Airspace Management Window

Global Menu AMS -> TSA...

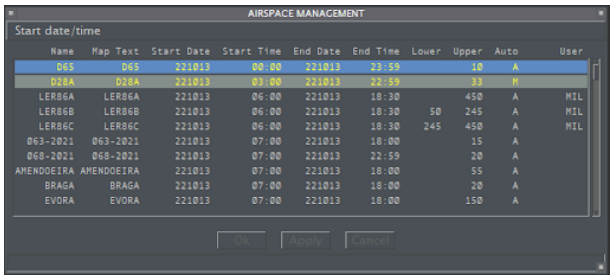


Figure 3.78: Airspace Management Window

This window is used for the activation and deactivation of the areas for the APW and SAP functionality. Each area can have a start time and/or an end time defined for its activation, or it can be activated without any time limits, making it active until deactivated manually. Additionally, lower and upper altitude limits are given. An area can have activation schedules defined in the area data file. Such areas will be automatically activated as long as their “Auto” option is selected (“A” in the “Auto” column). The “Auto” option cannot be selected for areas that don’t have an activation schedule defined in the area data file.

Dates will be shown in the format “yymmdd” and times in “hh:mm” and they must be entered in the same format. Entering an empty string for a date will clear it and the related time value and vice versa. When entering a time or date value to an empty field, the other value is automatically set to the current time/date value. Entering an empty string to the Map Text, Lower or Upper fields will reset the value to the default one from the data file.

Altitudes are shown in hundreds of feet if at or below the transition altitude, otherwise in flight levels. They must be entered in the same format.

An area's activation status can be inactive, pre-active or active. A pre-active area is an area that will become active within 30 minutes and is shown in Selected Period text on a TSA Preactive background. An active area is shown with Selected Period text on a TSA Active background. The APW system will not alert for a pre-active area, but for the SAP system a pre-active area is considered as being active.

The mouse click areas of the Airspace Management Window:

- Sorting option text (e.g. "Start date/time") Opens a pop-up menu to select a sorting option for the list
- Right-click to open an area pop-up menu
- Other fields Left-click to edit field (when edit function active)
- "Ok" button Applies the changes, closes the window
- "Apply" button Applies the changes
- "Cancel" button Cancels the changes

The sorting pop-up menu contains the following items:

- Start Date Sorts based on the Start Date/Time, earliest first
- Name Sorts alphabetically based on the Name field
- Map Text Sorts alphabetically based on the Map Text field

With the area pop-up menu opened, the area text row background changes to black. The menu contains the following items:

- ACTIVATE Clears any activation times and activates the area
- DEACTIVATE Clears any activation times and deactivates the area
- AUTO If an activation schedule is found in the area data file, sets the area to be activated automatically
- VALIDATE Not implemented
- EDIT Allows to change the area parameters
- COPY Not implemented
- DELETE Clears any activation times, returns label and altitude limits to their default values and deactivates the area

After any selection from the pop-up menu, "Ok", "Apply" or "Cancel" must be selected to apply or cancel the selection.

Preactive and active areas are displayed on the radar screen. A preactive area border is drawn in Preactive Map. An active area border is drawn in Active Map Type 4 border and, for areas with high operational impact, filled in a transparent Active RD Infill Map.

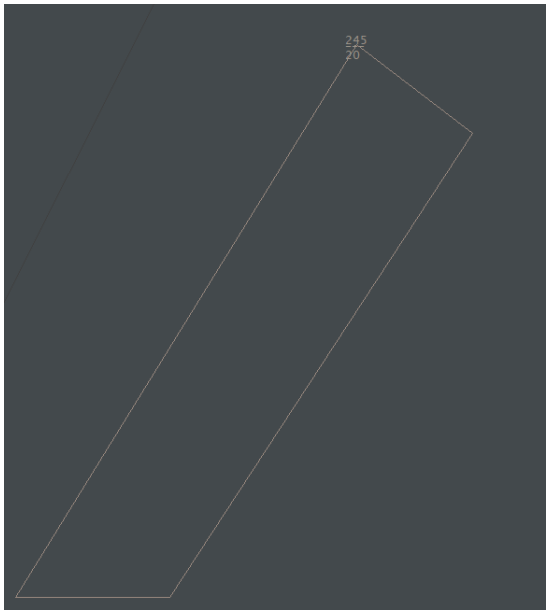


Figure 3.79: Preactive Area

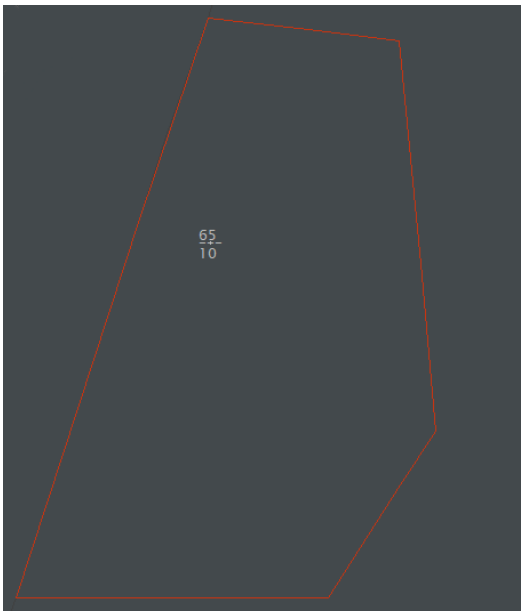


Figure 3.80: Active Area

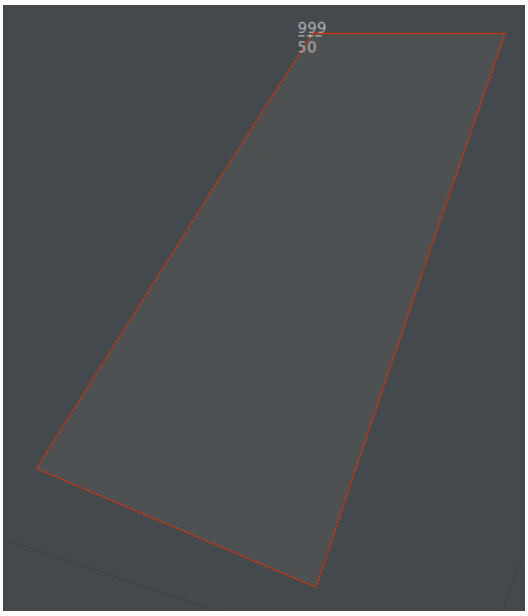


Figure 3.81: Active High Operational Impact Area

A predefined text label may also be displayed, showing information about the area. A very small “+” symbol will be drawn at that location. By holding the left mouse button down on that symbol, a full area label will be displayed, showing:

Name
Map text
Upper level limit
Start time ——— End time
Lower level limit
time in minutes until the area becomes active

3.7.16 Flight Plan Selection Window

Global Menu FlightData/FData -> Flight Plan Selection...

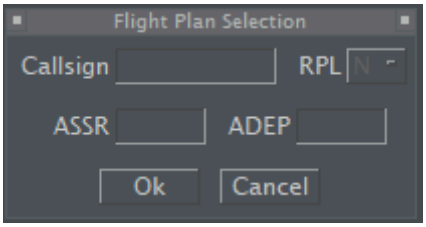


Figure 3.82: Flight Plan Selection Window

The Flight Plan Selection window is used to search for flight plans based on any combination of callsign, assigned transponder code and departure airport. All flight plans that are a match with all given information will be listed in the *Flight Plan Window*. and can be viewed using its “Prev” and “Next” buttons.

Clicking “Ok” will do the search and open the Flight Plan Window if it was closed, “Cancel” will clear the fields as well as any previously created flight plan list for the Flight Plan Window.

3.7.17 Flight Plan Window

Global Menu FData -> Flight Plan Window. . .
Flight Plan Selection Window -> Create a list of one or more flight plans
Callsign Menu -> More -> FPL. . .
“Open FPL Window” label function

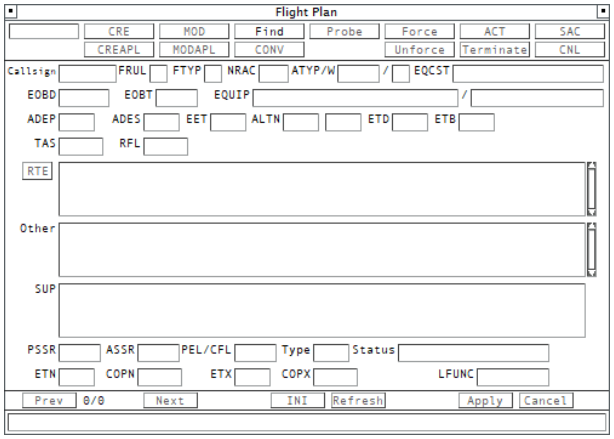


Figure 3.83: Flight Plan Window

The Flight Plan Window displays flight plan data as well as some system data related to the flight plan. It also allows creating new flight plans and modifying existing ones. The data in the window is not refreshed automatically; the time when the data was fetched is displayed in the top left corner.

The data fields show the following information:

Callsign	Callsign of the aircraft
FRUL	Flight rules (I, V, Y or Z)
FTYP	not available
NRAC	Number of aircraft
ATYP/W	Aircraft type and wake turbulence category
EQCST	Displays aircraft equipment status for certain equipment (W, Y, U, R and P) - “EQ” equipped, “NO” not equipped, “UN” unknown.
EOBD	Estimated Off-Block Date
EOBT	Estimated Off-Block Time

EQUIP	Equipment list - For flight plans with FAA equipment codes, a rough conversion to ICAO is shown in parentheses
ADEP	Departure aerodrome
ADES	Destination aerodrome
EET	Estimated Elapsed Time
ALTN	Alternate aerodrome(s)
ETD	Estimated Time of Departure
ETB	Estimated time to enter your sector
TAS	True Air Speed
RFL	Requested Flight Level
RTE	Route
Other	Flight plan remarks field
SUP	Supplementary information (endurance, PIC name)

The following system information regarding the flight plan is shown unless the initial plan is displayed:

PSSR	Previous SSR code
ASSR	Assigned SSR code
PEL/CFL	Planned Entry Level or Cleared Flight Level, depending on the flight's state
Type	Type of flight plan (APL or FPL)
Status	Status of the flight plan
ETN	Estimated time to COPN
COPN	Entry coordination point
ETX	Estimated time to COPX
COPX	Exit coordination point
LFUNC	Controller who is currently tracking the aircraft
0/0	Number of the displayed FPL in the list / total number of flight plans in the list

The following buttons are available:

CRE	Create a new full flight plan (FPL) Editable fields will be highlighted If a flight plan is being displayed, all data fields keep their values so a new flight plan can be created using an existing one as a base. If not, default values will be set to FRUL, NRAC, EQUIP and Other fields “Apply” creates the FPL, “Cancel” aborts the operation
MOD	Modify the currently displayed FPL Available fields will be highlighted “Apply” modifies the FPL, “Cancel” aborts the operation
Find	Find a flight plan Enter Callsign to find the flight plan, “Cancel” aborts the operation
Probe	Not implemented
Force	Force this aircraft to be included in the MTCD and SAP processing regardless of its sector state or any inhibition settings in the MTCD Status Window
ACT	Not implemented
SAC	Enter a slot time Enter the time to the ETD field, “Cancel” aborts the operation
CREAPL	Create a new abbreviated flight plan (APL) Editable fields will be highlighted “Apply” creates the APL, “Cancel” aborts the operation
MODAPL	Modify the currently displayed APL Editable fields will be highlighted “Apply” modifies the APL, “Cancel” aborts the operation
CONV	Convert an APL to an FPL Editable fields will be highlighted Default values will be set to FRUL, NRAC, EQUIP and Other fields “Apply” converts the APL, “Cancel” aborts the operation
Unforce	Cancel the forced inclusion of this aircraft in the MTCD and SAP processing
Terminate	Not implemented
CNL	Not implemented

RTE	Opens the Complete Route Window
Prev	Selects the previous flight plan in the list (see Flight Plan Selection Window)
Next	Selects the next flight plan in the list (see Flight Plan Selection Window)
INI	View the initial flight plan
	Complete Route Window is closed if it was opened
	Flight plan refresh time and system information will not be shown
	“CRE” starts to create a new flight plan based on the displayed initial flight plan, “Refresh” or “Cancel” shows the current flight plan again
Refresh	Refreshes the displayed information
Apply	Apply changes that were made
	Any errors will be displayed in the bottom row of the window
Cancel	Cancel any changes and quit the current operation

In TopSky the only difference between an APL and an FPL is that an APL can only contain the Callsign. If it contains any other information (controller-assigned values such as ASSR, CFL, etc. are not taken into account), it will be considered to be an FPL.

For the accepted CFL entry formats, see *AFL Menu*.

3.7.18 Complete Route Window

Flight Plan Window -> “RTE” button

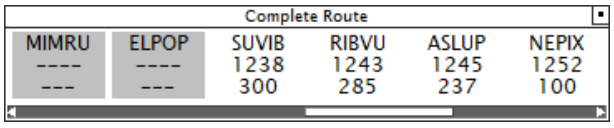


Figure 3.84: Complete Route Window

Displays the expanded route of the FPL currently shown in the *Flight Plan Window*. Already passed points are shown with Overflown color background. Points still ahead show the estimated time over the point and the calculated flight level below the point name.

3.7.19 Create APL Window

Callsign Menu (uncorrelated track only) -> “Create APL” item

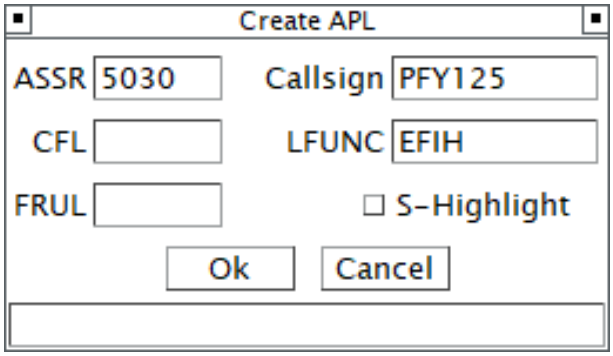


Figure 3.85: Create APL Window

The bottom area of the window will show status and error messages.

Enter all the available information (the only required field is the callsign) and click “Ok” to create the APL. “Cancel” will clear all the fields.

If the SSR field is left empty, a code will be automatically assigned from a dedicated APL code range. If no codes are available, an error message will be shown and a code must be manually entered.

For the accepted CFL entry formats, see *AFL Menu*.

Left-clicking on the FRUL field toggles the flight rules between “I” (IFR) and “V” (VFR). When the APL is successfully created, it is automatically assumed.

3.7.20 Stack Manager Window

Holding List... -> “HPT” item

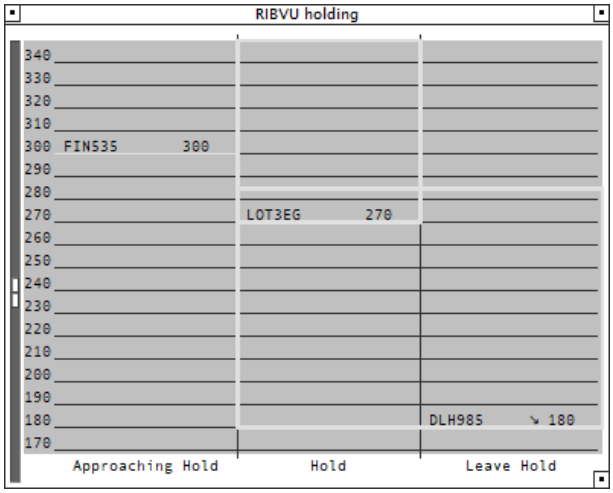


Figure 3.86: Stack Manager Window

The Stack Manager Windows give a quick look into the vertical positions of aircraft that have been given a holding clearance to the holding fix associated with the window in question.

The window is split into three columns:

Approaching Hold:	Aircraft approaching the holding area (more than 5 minutes flying time away from the holding fix)
Hold:	Aircraft in the holding area
Leave Hold:	Aircraft cleared to leave the holding

The window displays the aircraft labels at their cleared flight levels. For each aircraft the callsign, the vertical speed arrow if not in level flight ("#" in Warning color for aircraft without altitude information), the RVSM capability indicator if applicable, and the *CFL* is displayed. If there are more than one aircraft with the same *CFL*, only one callsign will be shown. A "+" symbol in SMW Overlap Box color after the *CFL* value indicates that there are more flights to be displayed. Clicking on the symbol will display a window with all the callsigns with that *CFL*.

For each aircraft an altitude box will be drawn that extends from *AFL* to *CFL*. Normally the color of the box is SMW Level Band, but in the Hold and Leave Hold columns if it is closer than 300ft or overlaps any other aircraft's box, the color will be SMW Overlap. For an aircraft with a CLAM alert, the box will be in SMW Overshoot color. A flight level reserved for an overflight is shown in SMW Overflight color. The altitude box of aircraft in the Leave Hold column extends into the Hold column as well.

Warning	If two Hold volumes overlap (such as PILIM and ABUSU), each Stack Manager Window will show only it's own traffic, the adjacent interfering traffic will not be displayed

Aircraft will be automatically removed from the Leave Hold column after 10 minutes, but they can also be manually removed by right-clicking the callsign.

Any number of Stack Manager Windows can be opened to monitor multiple holdings at the same time. For *CFL* at or below the transition altitude, the aircraft label is placed on the numerical value of the *CFL*, but the altitude box is always based on flight levels.

The mouse click areas of the Stack Manager Window:

Slider or view background area	Drag to adjust the lowest shown FL
Aircraft callsigns	Open *Callsign Menu* [1]
CFL	Open *CFL Menu* [2]
+ symbol	Open window to view all callsigns with that *CFL*

FL numbers	Toggle overflight status for that level

3.7.21 CARD

Global Menu Tools -> CARD..

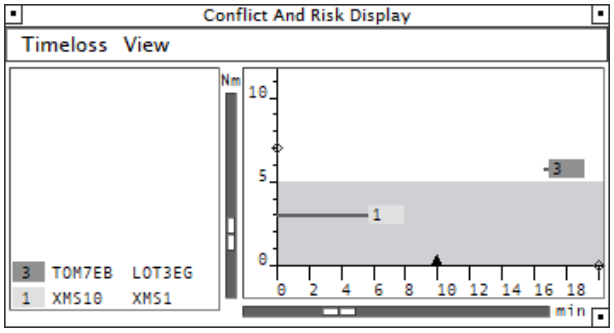


Figure 3.87: CARD

See *MTCD (Medium Term Conflict Detection)*. The CARD window presents the MTCD conflicts and conflict risks. It also allows setting some of the related parameters. It is divided into two parts:

On the left is the list area which includes all the detected conflicts and shows the concerned aircrafts' callsigns. A conflict or potential predicted conflict has an Urgency colored label and a risk or potential risk of conflict has a Warning one. Potential conflicts are displayed with Potential colored labels. The conflict numbers are shown in CARD Conflict Number color. An Urgency colored background on a callsign means that the aircraft also has a Short Term Conflict Alert. A highlighted callsign will be highlighted in this list as well. An acknowledged conflict (shown in Unconcerned color) will not display the MTCD warning in the track label. An acknowledged problem will be automatically de-acknowledged if the predicted minimum separation decreases by 1nm.

Hovering the mouse cursor over a conflict label will display the conflict on the radar screen.

On the right is the graphical display area that gives an overview to the severity and timeframe for each conflict. On the vertical (distance) axis the conflicts are placed to the predicted minimum separation and on the horizontal (time) axis the label is placed so that the left edge of the conflict number is at the time of closest point of approach. A line in CARD Time Vector color, extending to the left from the label, marks the time when the separation will decrease below the prediction distance. For fast closure rates the time from prediction distance to CPA may be too short to display the line. The conflict labels have the same mouse functions as the ones in the list area. If the label position would be outside the maximum time displayed in the window, the label is positioned at the maximum displayed time with a Foreground colored edge. The area below 5nm distance is drawn in Field Highlight color.

The mouse click areas of the CARD window:

[1] Right-clicking a callsign in the Leave Hold column immediately removes the aircraft from display.
[2] When opened from a Stack Manager Window, the default value in the CFL menu is the current CFL regardless of the setting in the *Local Settings submenu*.

“Timeloss” / “Distance”	Opens a pop-up menu to select the sorting option (Time to start of conflict / Predicted minimum separation)
“View” menu label	Toggle the View menu.
Vertical slider	Drag to adjust the distance scale
Horizontal slider	Drag to adjust the time scale
Diamond on vertical axis	Drag to adjust prediction distance
Diamond on horizontal axis	Drag to adjust prediction time
Triangle on horizontal axis	Drag to adjust warning time
Conflict number labels	Left-click to open Mark/ACK menu Right-click to toggle SEP (minimum separation lines)

From the “View” menu it is possible to toggle various MTCD related options:

List	Toggles display of the list area
Graphic	Toggles display of the graphical area
Grid	Toggles a nm/min grid on the graphical area
Risk	Toggles display of MTCD risks of conflict
Potential Predicted	Toggles display of MTCD potential predicted conflicts
Potential Risk	Toggles display of MTCD potential risks of conflict
Potential	Toggles display of MTCD potential conflicts
PLC	Toggles display of planner controller conflicts (conflict starts later than the triangle displayed on the time axis)
MTCD Ind	Toggles the display of the *MTCD* Mark on the track label
Notif	Toggles whether tracks in the *Notified* state are considered for MTCD
Unco	Toggles whether *Unconcerned* tracks are considered for MTCD

Future	Toggles whether FPASD tracks are considered for MTCD (flight plan tracks must be at least in the *Coordinated* state regardless of the “Notif” and “Unco" selections)

From the “Mark/ACK” menu it is possible to toggle conflict-specific options:

Mark All	Toggles marking the *CALLSIGN* and *AFL*’s of the concerned tracks with CARD Mark All color
Mark Own	Toggles marking the Callsigns of the concerned tracks with CARD Mark Own color
ACK	Toggles acknowledgement status
Address	Not implemented

3.7.22 SAP Window

Global Menu Tools -> SAP...

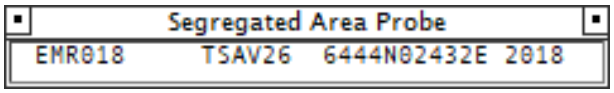


Figure 3.88: SAP Window

See *SAP (Segregated Area Probe)*. The SAP window lists the aircraft that have SAP conflicts. The list shows the aircraft callsign, the area it will enter and the coordinates and the time when it will enter it. Only the first entered area will be shown if the aircraft is predicted to enter more than one active area. Placing the mouse cursor over an aircraft line will show the aircraft’s route on the radar screen up to the first point of entering an active area or the first point where there is a risk of doing so if risks are selected to be displayed on the window. The list is sorted according to the entry time field, with the earliest time on top.

3.7.23 Vertical Aid Window

Global Menu Tools -> Vertical Aid Window...

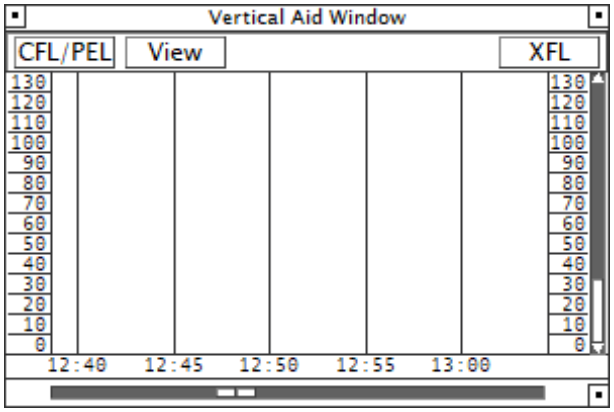


Figure 3.89: Vertical Aid Window

The Vertical Aid Window shows the predicted vertical trajectory of the selected aircraft (ASEL), starting from its current position (marked with a dot in VAW Track Position color), and the trajectories of all aircraft conflicting with it. The trajectories are displayed as calculated by EuroScope. The background color of the path area is by default the Inactive Sector color, but for the time the aircraft is predicted to be inside your sector the color will be the Active Sector color. Other sector boundary crossings are displayed with vertical lines in VAW Sector Limits color. The trajectory of the ASEL aircraft is drawn in VAW Profile color and the conflicting aircrafts' trajectories in Urgency (conflict or potential predicted conflict), Warning (risk or potential risk of conflict) or Potential (potential).

It is also possible to send PEL and XFL coordinations and set the CFL from this window using the two buttons:

CFL/PEL	Opens the PEL or *CFL Menu* depending on sector state
View	Toggles the View menu
XFL	Opens the XFL menu

From the "View" menu it is possible to toggle various MTCD related:

Risk	Toggles display of MTCD risks
Potential Predicted	Toggles display of MTCD potential predicted conflicts
Potential Risk	Toggles display of MTCD potential risks of conflict
Potential	Toggles display of potential conflicts
Notif	Toggles whether *Notified* tracks are shown
Unco	Toggles whether *Unconcerned* tracks are shown

The PEL and XFL values are displayed in Coordination color, or in Proposition In if being coordinated. After a refused coordination, the original value is shown in Warning color. The CFL value is displayed as a horizontal line across the screen.

3.7.24 Message In Window

Global Menu Tools -> Message In...

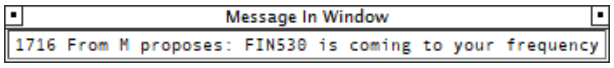


Figure 3.90: Message In Window

The Message In Window shows received coordination messages, sorted by time, with the newest ones at the top of the list. For the ones requiring an answer, it is possible to send it either from this window, the aircraft track label or any aircraft list where the relevant items are displayed. The messages will be automatically removed from the list when the track becomes *Unconcerned*, or for some messages, also based on a specific event.

The available message types are:

- “From <SI> proposes: <Callsign> is coming to your frequency”
  - Displayed when the track is being transferred to you
  - Removed when the transfer is complete or cancelled
- “From <SI> for <Callsign> proposes Request on downstream frequency”
  - Displayed when the next controller has sent a *ROF* message
  - Left-clicking on the line manually removed
  - Removed when a transfer is started
- “From <SI> for <Callsign> proposes Handover [HDG xxx] [DCT xxxxx] [SP xxx]”
  - Displayed when there is a *HOP* in progress
  - Left-clicking on the line opens the *Combined Transfer Menu*
  - Removed when the transfer is complete or cancelled
- “From <SI> for <Callsign> RTI [HDG xxx] [SP xxx] [ARC xx]”
  - Displayed when an *RTI/TIP* message has been received
  - Left-clicking on the line opens the *Tactical Transfer Menu*
- “From <SI> for <Callsign> TIP [HDG xxx] [SP xxx] [ARC xx]”
  - Displayed when a *RTI/TIP* message has been received
  - Left-clicking on the line opens the *Tactical Transfer Menu*
  - Removed when the track becomes *Assumed*

- “From <SI> for <Callsign> proposes HOP/RTI/TIP Accepted”
  - Displayed when an Accept message has been received to HOP, RTI or TIP
  - Left-clicking on the line manually removes it
- “From <SI> for <Callsign> proposes RTI/TIP rejected [by timeout]”
  - Displayed when a reject message has been received to RTI or TIP
  - Left-clicking on the line manually removes it
- “From <SI> for <Callsign> proposes [COPN xxxxx] [PEL xxx]”
  - Displayed when an entry coordination has been received
  - Left-clicking on a value opens the EuroScope default menu to answer
  - Removed when the track becomes Assumed
- “From <SI> for <Callsign> proposes [COPX xxxxx] [XFL xxx]”
  - Displayed when an exit coordination has been received
  - Left-clicking on a value opens the EuroScope default menu to answer an active coordination
- “From <SI>: <Callsign> will be squawking <ASSR>”
  - Displayed when a previous controller assigns a new SSR code for a track
  - Left-clicking on the line manually removes it

3.7.25 Message Out Window

Global Menu Tools -> Message Out...

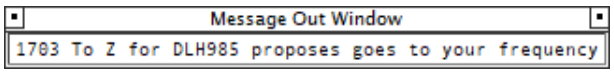


Figure 3.91: Message Out Window

The Message Out Window shows the coordination messages you have sent, sorted by time, with the newest ones at the top of the list. The messages will be automatically removed when the track becomes Unconcerned. To manually remove a line, left-click on it.

The available message types are:

- “To <SI> for <Callsign> proposes goes to your frequency”
  - Displayed when you transfer a track
- “To <SI> Request <Callsign> on frequency”
  - Displayed when you have sent a *ROF* message
- “To <SI> for <Callsign> proposes Handover [HDG xxx] [DCT xxxxx] [SP xxx]”

  - Displayed when you have sent a *HOP*

- “To <SI> for <Callsign> RTI [HDG xxx] [SP xxx] [ARC xx]”
  - Displayed when you have sent an *RTI/TIP* message
- “To <SI> for <Callsign> TIP [HDG xxx] [SP xxx] [ARC xx]”
  - Displayed when you have sent a *RTI/TIP* message
- “To <SI> for <Callsign> proposes HOP/RTI/TIP Accepted”
  - Displayed when you have sent an Accept message to HOP, RTI or TIP
- “To <SI> for <Callsign> proposes RTI/TIP rejected [by timeout]”
  - Displayed when you have sent a Reject message to RTI or TIP. “Rejected by timeout” will be sent automatically if the coordination is not answered within a specified time.
- “To <SI> for <Callsign> proposes [COPN xxxxx] [PEL xxx]”
  - Displayed when you have sent an entry coordination
- “To <SI> for <Callsign> proposes [COPX xxxxx] [XFL xxx]”
  - Displayed when you have sent an exit coordination
- “To <SI> for <Callsign> proposes will squawk <ASSR>”
  - Displayed when you have assigned a new SSR code and there is a next controller online for the track

3.7.26 Microphone Check Menu

Global Menu Tools -> CPDLC -> Microphone Check

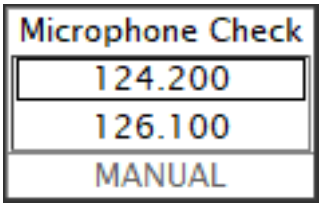


Figure 3.92: Microphone Check Menu

The Microphone Check menu is used to send a “CHECK STUCK MICROPHONE <frequency>” CPDLC message to all CPDLC connected aircraft when a stuck mic is suspected. The menu lists all frequencies selected for XMT TXT in EuroScope. Left-clicking on one sends the messages. Manual frequency entry is not available.

The menu closes when a frequency is selected or the cursor leaves the menu area.

3.7.27 CPDLC Current Message Window

Global Menu Tools -> CPDLC -> Current Messages...

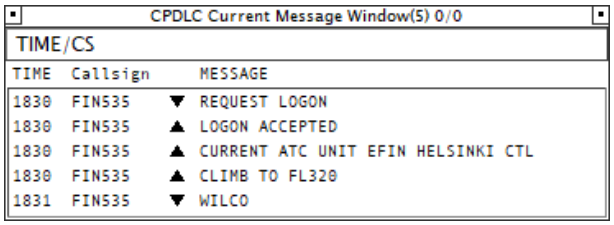


Figure 3.93: CPDLC Current Message Window

The *CPDLC Current Message Window* displays all sent and received CPDLC messages that have not been archived. Each line corresponds to one message, and contains the time the message was sent/received, the callsign of the aircraft, a filled triangle (pointing upward for uplink messages, downward for downlink messages) and the message text. If the message is too long to fit in the window, "..." is used to mark that there is more text in the message. Right-clicking on the message will open a small window that displays the entire message. The window will close automatically when the mouse cursor leaves its area.

The messages (for uplink clearances, also the responses) are color coded to display their status:

- Urgency for CPDLC emergency messages that have not been replied to
- CPDLC Failed for failed uplink messages
- CPDLC Unable for uplink clearances replied to with "UNABLE"
- CPDLC Standby for uplink clearances replied to with "STANDBY", and not timed out
- CPDLC UM Clearance for uplink clearances waiting for reply, and not timed out
- CPDLC Pilot Late for timed out uplink clearances
- CPDLC Discarded for discarded messages
- CPDLC DM Request for downlink requests waiting for controller reply, and not timed out
- CPDLC Controller Late for timed out downlink requests
- Foreground for other messages

Left-clicking on the current sorting option opens a popup to select the sorting order:

TIME/CS	Messages sorted according to send/receive time (default option)

DIALOG/CS	Messages grouped to dialogues, dialogues sorted by time of first message
CS/DIALOG	Messages sorted by callsign, messages with same callsign sorted by time

Left-clicking on a message opens a popup to select some actions for the message:

Archive	Closes the message dialogue if open, archives all messages in that dialogue
Discard	Closes the message dialogue and discards all the messages in it

If the message is “REQUEST LOGON”:

ACCEPT	Accepts the logon request
UNABLE	Denies the logon request

For other messages:

Manual	Reply Opens *Manual Reply Window*

Dialogues are never archived automatically, so make sure to manually archive dialogues when they are no longer relevant to keep the window from getting cluttered with messages.

Always reply to downlink requests using the relevant menu as it ensures correct formatting and type of message, and keeps the track label indications correct. The reply options here should only be used when a menu cannot be used, for example when the downlink was not parsed correctly and the request is therefore not shown on the track label.

3.7.28 Manual Reply Window

This window is used to send a manually composed reply to a CPDLC message (max 99 characters). Left-click on the area below the “Message text” label to enter the message and select one of the “Expected reply” options. Then left-click on “Send” to send the message.

The window closes automatically when the message is sent or the mouse cursor leaves the window area.

Warning	When replying to a downlink request using the Manual Reply Window, the track label is not updated accordingly. If the downlink had been recognized as a request, the request information is removed from the label, and if the reply is a clearance, it is not shown on the label, and the label values are not updated. Always use the label menus to answer a recognized downlink

3.7.29 CPDLC History Message Window

Global Menu Tools -> CPDLC -> History Messages...

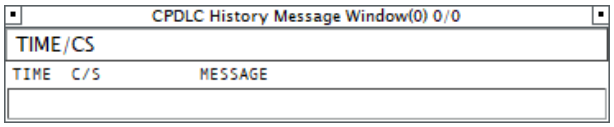


Figure 3.94: CPDLC History Message Window

The CPDLC History Message Window contains CPDLC messages that have been archived from the *CPDLC Current Message Window*.

3.7.30 Cursor Lat/Long Window

Global Menu Tools -> LAT/LONG...

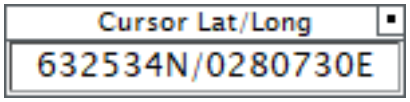


Figure 3.95: Cursor Lat/Long Window

Displays the latitude and longitude values of the cursor position.

3.7.31 Weather Messages Window

Global Menu MET -> Messages...

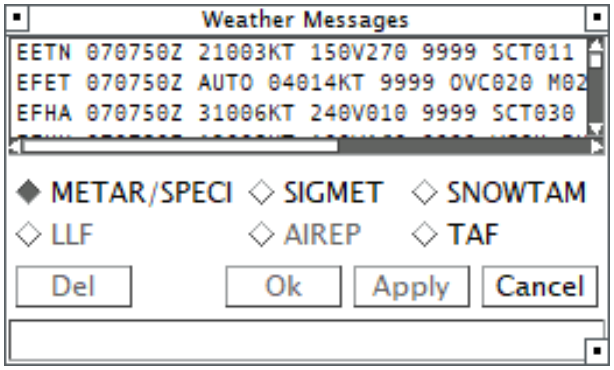


Figure 3.96: Weather Messages Window

The Weather Messages Window displays weather related messages. By default, METAR/SPECI messages are shown. To view other types of messages, left-click on the desired option button (the “LLF” and “AIREP” options are not available).

By default, with the “METAR/SPECI” option button chosen, this window displays the METARs you have requested to TopSky. Whenever a new METAR is received from the server it is added to the list (an old METAR is removed when a newer one is received from the same station). New METARs and TAFs are displayed in Warning color until the mouse cursor is positioned on them (for the decoded METAR, this applies only for the first row).

In addition, the window can display SIGMETs, SNOWTAMs and TAFs. The SIGMETs are retrieved when the “SIGMET” button is selected for the first time. Selecting the “SNOWTAM” or “TAF” option will open the *Aerodrome Menu* where the desired stations must be selected. Messages are automatically updated at 15 minute intervals - the status bar at the bottom displays the remaining time to the next automatic update when the mouse cursor is over the window area.

The messages are sorted alphabetically by the station identifier in the list.

The messages can be viewed in three modes (decoded only available for METARs):

- List (the default mode, showing one message per line)
- Single (showing only a single message)
- Single decoded (showing a single METAR in a decoded format)

To view a single message:

- Left-click on a METAR/SIGMET/SNOWTAM/TAF in the list
- Left-click on a decoded METAR

To view a single METAR in the decoded format:

- Right-click on a METAR in the list
- Right-click on a single METAR

To return to the list view:

- Left-click on a single METAR/SIGMET/SNOWTAM/TAF
- Right-click on a decoded METAR

To remove a METAR/SIGMET/TAF from the window:

- Display the METAR/SIGMET/TAF in the single or decoded mode
- Left-click on the “Del” button
- Left-click “Yes” in the confirmation window that opens (“No” cancels the operation)

3.7.32 QNH/TL Window

Global Menu MET -> QNH/TL...

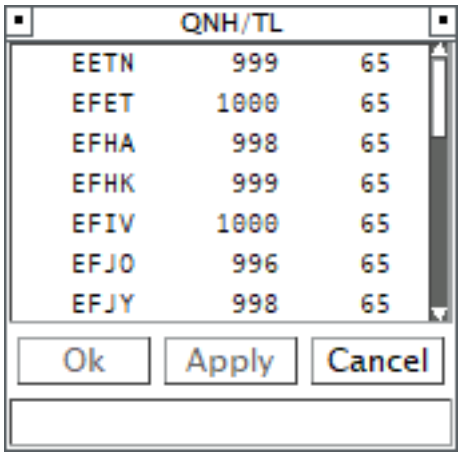


Figure 3.97: QNH/TL Window

The window displays the QNH values and corresponding transition levels for those airports that have a METAR displayed in the *Weather Messages Window*. The transition level tables are defined in a data file, and if a table can't be found for an airport in the list, a transition level will not be shown. The buttons in the window have no functionality.

3.7.33 General Information Window

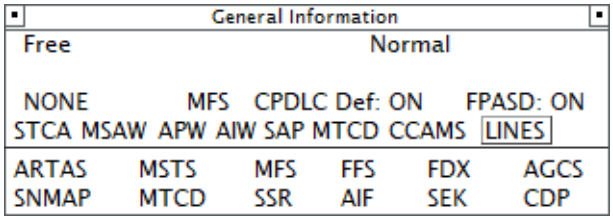


Figure 3.98: General Information Window

The General Information Window displays basic information on the system state. The following functionality is implemented in TopSky:

mode	"Free", "Operational", "Proxy", "Replay" or "Training" depending on the connection method
role	Own controller ID (between the mode and the "Normal" item)
QNH	Shows the local QNH value (below the "Normal" item when available)
CPDLC Def	Displays the state of the CPDLC Default setting

FPASD	Displays the state of the FPASD setting
Alert functions	Status of the alert functions. The function name is shown in Warning color if selected off or there's a fault in the data file.
CCAMS	Plugin selected as the code source: • Urgency color if the SSR data file contains no codes • Warning color if simulated traffic is not downloaded or ESE file or fixed range selected as the code source
AGCS	Warning color if Hoppie datalink comms are failed
MTCD	Warning color if prediction time is set to zero

3.7.34 Document Viewer Window

Global Menu -> Info -> Document Viewer...

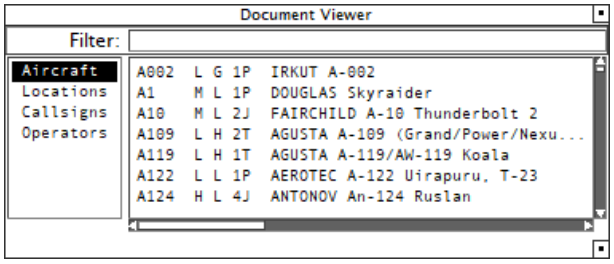


Figure 3.99: Document Viewer Window

The Document Viewer Window is used to browse and search for information in specific data files

- Aircraft - Information about aircraft types
  - Type designator
  - Wake turbulence category
  - Description (Amphibian, Gyrocopter, Helicopter, Landplane, Seaplane, Tiltrotor)
  - Engine count and type (Electric, Jet, Piston, Rocket, Turboprop/turboshaft)
  - Manufacturer and model
- Locations - Information about aerodromes
  - Location indicator
  - Location name
  - (State/Territory)
- Callsigns - Information about aircraft operators
  - Three-letter designator

  - Telephony designator
  - (Aircraft operating agency and notifying state)

- Operators - Information about aircraft operators
  - Three-letter designator
  - Aircraft operating agency and notifying state
  - (Telephony designator)

The information can be filtered using the “Filter” box. The list will only display lines containing the entered text string (case insensitive).

3.7.35 NOTAM List Window

Global Menu -> Info -> NOTAM...

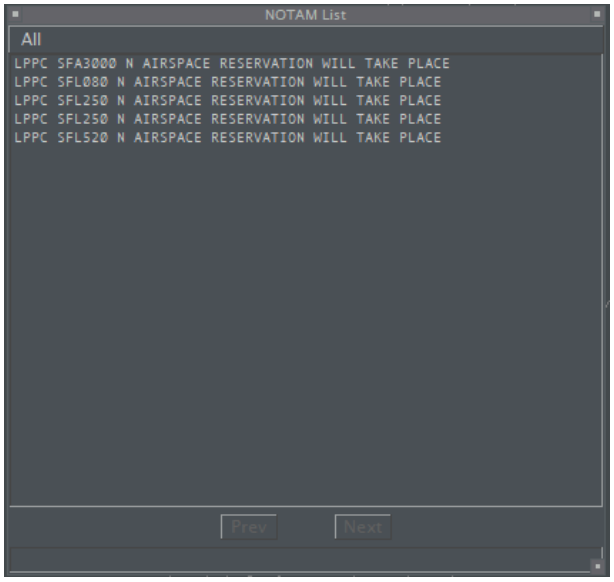


Figure 3.100: NOTAM List Window

The NOTAM List Window displays a list of received NOTAMs. The NOTAMs are retrieved when the window is first opened and the list will take a couple of seconds to populate. The NOTAMs are automatically updated every two hours. Each NOTAM shows the following information:

- Location ID (ICAO designator)
- Serial number
- Type (“N” = new, “R” = replaces earlier NOTAM, “C” = cancels earlier NOTAM)
- Abbreviated form of the NOTAM message contents

To see the actual NOTAM contents, left-click on a NOTAM line. To return back to the NOTAM list, left-click on the single NOTAM.

By default, the window displays all received NOTAMs. Left-clicking on the “All” label opens a menu where the displayed NOTAMs can be filtered by their validity periods. The other available options are “Today” and “Tomorrow”.

The NOTAM List is automatically displayed at startup in order to fetch the current FUA. It may be closed after loading.

3.7.36 Aerodrome Window

Global Menu -> Info -> Aerodrome...

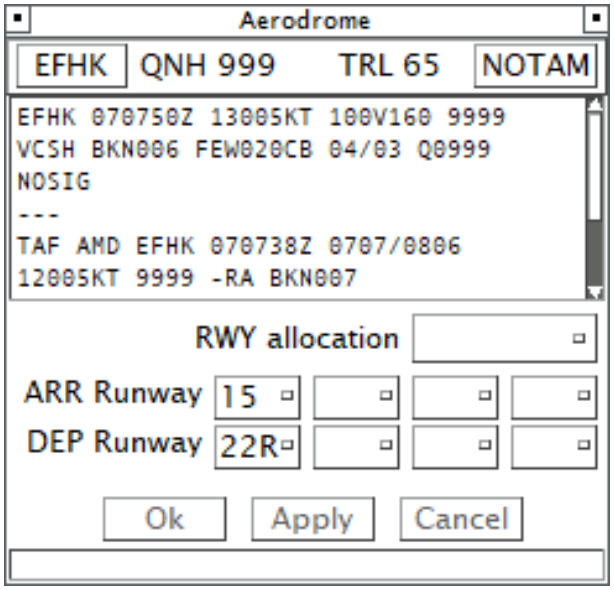


Figure 3.101: Aerodrome Window

The Aerodrome Window displays information about the selected airport.

Left-clicking on the airport ICAO code opens the *Aerodrome Menu* to select another airport, and left-clicking on the “NOTAM” button opens the *NOTAM List Window*, showing only the NOTAMs for the selected airport.

Below the header, the latest METAR and TAF for the airport are displayed. The QNH and TRL in the header are based on the METAR data.

The bottom part of the window displays the arrival and departure runway allocation at the selected airport. The runway selections are read-only in this window.

3.7.37 LFUNC Frequency Plan Window

Global Menu -> Info -> LFUNC Frequency Plan...

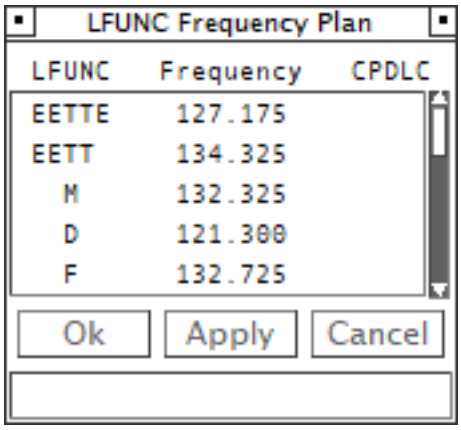


Figure 3.102: LFUNC Frequency Plan Window

The LFUNC Frequency Plan Window displays the currently online controllers and their primary frequencies as well as their CPDLC logon callsigns where applicable.

3.7.38 Notepad Window

Global Menu MSG -> Notepad...

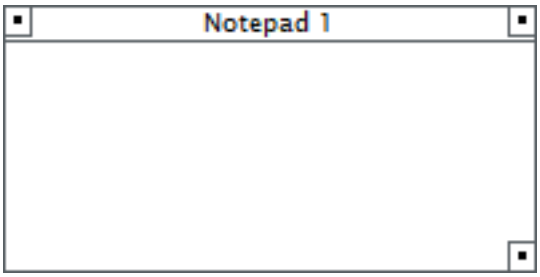


Figure 3.103: Notepad Window

The Notepad Windows can be used to display any user entered text. Multiple Notepad Windows can be opened simultaneously. To enter new text or edit the existing one, click on the window area. The text will be automatically wrapped, and if necessary, the "|" character can be used to force a line break. If the window is not large enough to fit all the entered text, it will display "..." in the end to indicate that there is more information.

3.7.39 Personal Queue Window

Global Menu MSG -> Personal Queue...

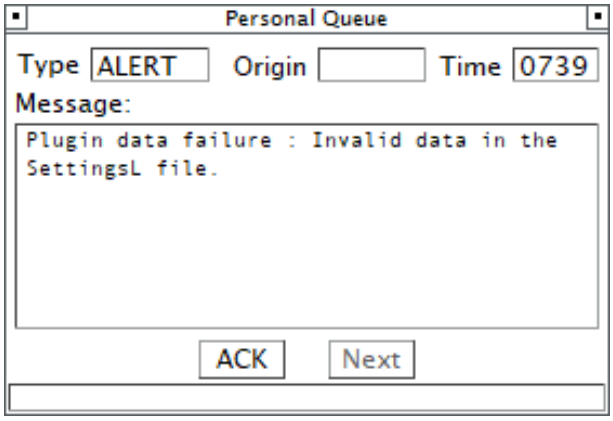


Figure 3.104: Personal Queue Window

The Personal Queue Window displays warning messages related to TopSky's operation: high priority messages informing about potential critical failures in TopSky code, and low priority messages informing about faults in TopSky's external data files or timeout alerts for coordination messages.

The window currently only displays "ALERT" type messages, and the origin for them is always empty. The time field displays the UTC time when the currently viewed message was created.

The high priority messages are always displayed first. Only when there are no more high priority messages in the list, are the low priority ones shown. To acknowledge a message, click on the "ACK" button. This removes the message from the list and displays the next one. The "Next" button moves the currently viewed message to the back of the list and displays the next message of the same priority.

3.7.40 ATC / Primary Frequency Messages Window

Global Menu MSG -> ATC Messages...
Global Menu MSG -> Prim Freq Messages...

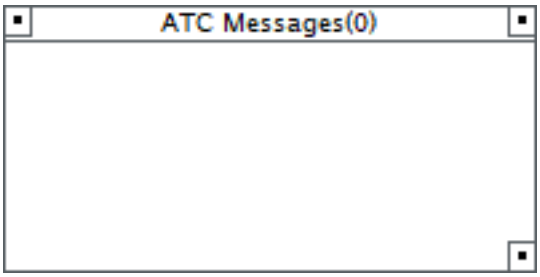


Figure 3.105: ATC / Primary Frequency Messages Window

These windows display up to 99 last messages transmitted on the relevant text channel ("ATC" or the primary frequency). Each message line displays a time stamp, the sender callsign (blank if you) and the message itself.

New incoming messages are displayed in Warning color until left-clicked to mark them as read. Left-double-clicking on any message will mark all messages in the window read. The windows do not resize

automatically to show all the messages in them, but the number in the title bar shows the total number of messages in the window. If the window is not wide enough to fit a complete message, it will display "..." in the end to indicate that there is more information. Holding a mouse button down on a message will display the entire message.

3.7.41 NAT Track Messages Window

Global Menu MSG -> NAT Track Messages...

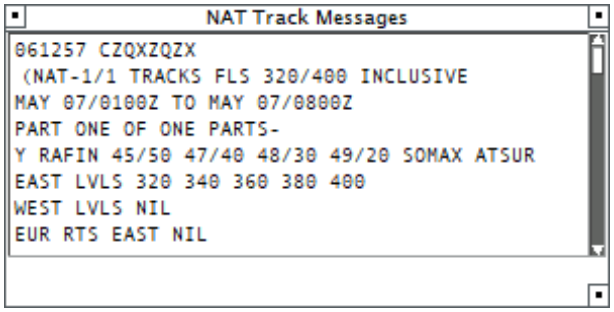


Figure 3.106: NAT Track Messages Window

The NAT Track Messages Window displays the downloaded track messages. The messages are downloaded when the window is opened the first time and then updated hourly. The tracks extracted from the messages can be displayed on the radar screen – they are placed to a "NAT" folder in the *Maps Windows*. Any named waypoints in the tracks that cannot be found in the active sector file are just skipped so the displayed tracks may not be accurate. The track letter is added to the name of the first and last waypoints in parentheses, so a missing track letter is a sure sign of at least some waypoints missing.

3.7.42 Safety Nets Status Window

Global Menu STS -> Safety Nets Status...

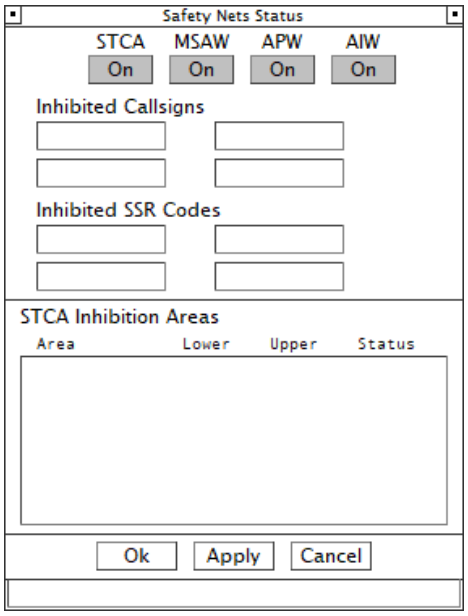


Figure 3.107: Safety Nets Status Window

Allows setting the status for the *STCA (Short Term Conflict Alert)*, *MSAW (Minimum Safe Altitude Warning)*, *APW (Area Proximity Warning)* and *AIW (Airspace Infringement Warning)* systems. The "On/Off" buttons control the corresponding system's status.

Below them, there are four entry boxes for callsigns to exclude specific callsigns from all the safety nets. The "*" wildcard can be used to match multiple callsigns. It causes all the callsigns that match up to the "*" to be a match (i.e. "ABC*" will match all callsigns that start with "ABC", but "*ABC" will match all callsigns as any characters after the "*" will be ignored).

Below the callsign fields, there are four SSR code boxes that can be used to exclude specific SSR codes from all the safety nets. The entered values must be 1-4 octal digits, and the system will match the number of digits entered (i.e. "2000" will match only code 2000, whereas "20" will match all codes in the range 2000-2077).

If there are STCA inhibition areas defined in the area data file, they will be listed in the area in the bottom part of the window. The area vertical limits (displayed in 100's of feet or meters+"m" depending on system units) can be edited by clicking on the values, and the area activation can be toggled by clicking on the area status.

All changes to the window must be applied using the buttons in the bottom of the window to take effect.

Ok	Applies the changes if any, closes the window
Apply	Applies the changes
Cancel	Cancels the changes

3.7.43 Divergence Detection Status Window

Global Menu STS -> Divergence Detection Status...

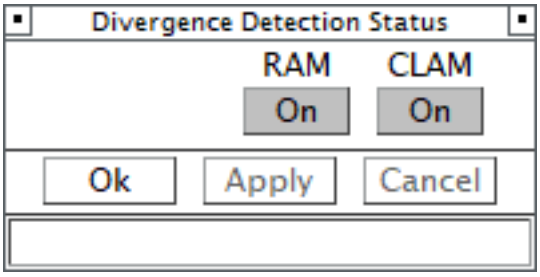


Figure 3.108: Divergence Detection Status Window

Allows setting the status for the *RAM (Route Adherence Monitoring)* and *CLAM (Cleared Level Adherence Monitoring)* alerting. The “On/Off” buttons control the corresponding system’s status. All changes must be applied using the buttons below to take effect.

Ok	Applies the changes if any, closes the window
Apply	Applies the changes
Cancel	Cancels the changes

3.7.44 MTCD Status Window

Global Menu STS -> MTCD Status...

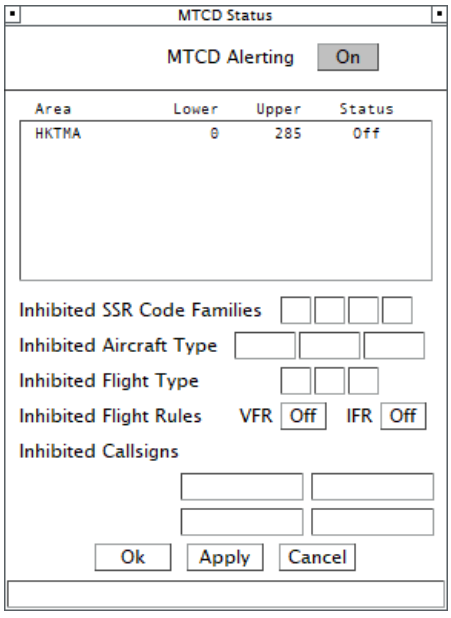


Figure 3.109: MTCD Status Window

Allows setting the status for the *MTCD (Medium Term Conflict Detection)* system. The “On/Off” button controls the system’s status.

If there are MTCD inhibition areas defined in the area data file, they will be listed in the area below the “On/Off” button. The area vertical limits (displayed in 100’s of feet or meters+”m” depending on system units) can be edited by clicking on the values, and the area activation can be toggled by clicking on the area status.

The rest of the inhibition settings affect both *MTCD (Medium Term Conflict Detection)* and *SAP (Segregated Area Probe)* systems:

Below the inhibit areas, there are four SSR code boxes that can be used to exclude specific SSR codes from MTCD/SAP processing. The entered values must be 1-2 octal digits, and the system will match the number of digits entered (i.e. “2” will match codes 2000-2777, whereas “20” will match codes 2000-2077).

Below the SSR codes, there are four ATYP boxes to exclude specific aircraft types. The entered text strings must be exact ICAO aircraft type designators (no partial matches or wildcards).

The flight type inhibit is not available due to network restrictions.

VFR or IFR flights can be excluded by selecting the respective “Inhibited Flight Rules” button to “On”.

Finally, there are four entry boxes to exclude specific callsigns. The “*” wildcard can be used to match multiple callsigns. It causes all the callsigns that match up to the “*” to be a match (i.e. “ABC*” will match all callsigns that start with “ABC”, but “*ABC” will match all callsigns as any characters after the “*” will be ignored).

All changes must be applied using the buttons below to take effect.

Ok	Applies the changes if any, closes the window
Apply	Applies the changes
Cancel	Cancels the changes

3.7.45 Runway in Use Window

Global Menu STS -> Runway In Use...

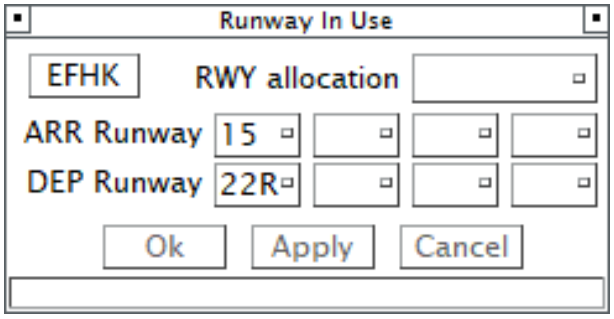


Figure 3.110: Runway in Use Window

The Runway In Use Window displays the arrival and departure runway allocation at the selected airport. Left-clicking on the airport ICAO code opens the *Aerodrome Menu* to select another airport. The runway selections are read-only in this window.

3.7.46 Operations Rate Window

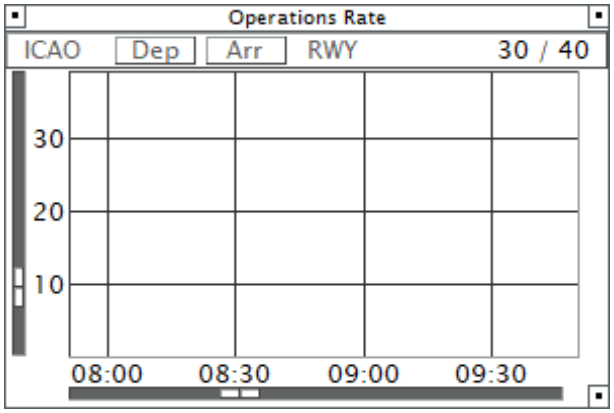


Figure 3.111: Runway in Use Window

The Operations Rate Window displays the predicted hourly operations rate at a specified airport. The data is displayed in 5-minute steps and shown up to 5 hours into the future. The arrival prediction is based on aircraft tracks as calculated by EuroScope. The departures are predicted to depart immediately if their ground status is set to “DEPA”, earliest in 5 minutes if “TAXI” and earliest in 10 minutes if “PUSH”, with a maximum departure rate of one aircraft per minute.

A number of these windows can be opened to simultaneously view multiple combinations of airport, departure/arrival state and runway(s).

In the area below the title bar, on the left is the ICAO identifier of the airport whose traffic is being monitored (a gray label “ICAO” is shown if no airport is selected yet).

The “Dep” and “Arr” buttons control whether departures and/or arrivals should be shown on the display (button background is shown in Selected color if selected on).

The “RWY” label allows entering one or more runway identifiers to filter traffic based on the assigned runway.

The numbers on the right side are the caution and warning limits. The rates are color coded so that a rate at or below the caution limit will be shown in Information color, a rate above that but at or below the warning limit in Warning and a rate above that in Urgency. When both arrivals and departures are selected for display, the departures are shown with a hatched color.

ICAO	Enter airport identifier
Dep	Toggle departures on/off
Arr	Toggle arrivals on/off

RWY	Enter runways
XX / XX	Enter caution and warning limits
Sliders	Change the rate number and time scales

3.7.47 Predicted Traffic Window

Global Menu STS -> Supervisory -> Predicted Traffic...

The Predicted Traffic Window shows the number of aircraft that are predicted to be inside a specified controller's airspace. The data is displayed in 5-minute steps and shown up to 5 hours into the future. The prediction is based on the sector ownership and the aircraft tracks are as calculated by EuroScope.

A number of these windows can be opened to simultaneously view multiple controllers' situation. In the area below the title bar, the left side shows the controller ID whose traffic is being monitored (a gray label "ID" is shown if no controller ID is selected yet). Left-click on the text to enter a new ID.

The numbers on the right side are the caution and warning limits. To change them, left-click on them and re-enter in the same format (warning can't be lower than caution, numbers must be separated by a forward slash). The traffic numbers are color coded so that a number at or below the caution limit will be shown in Information color, a number above that but at or below the warning limit in Warning and a number above that in Urgency.

The two sliders change the traffic number and time scales.

3.7.48 Runway Approach Line Window

Global Menu STS -> RWY line display... (opens the *Aerodrome Menu* for airport selection)

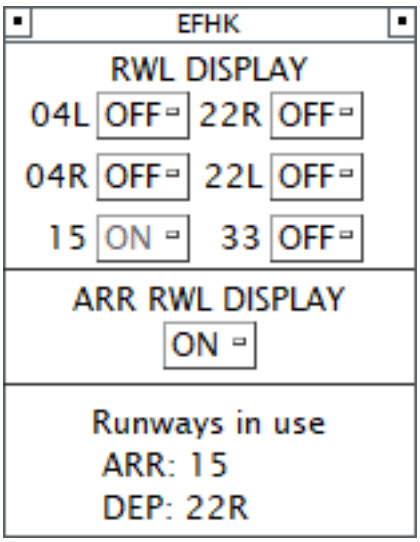


Figure 3.112: Runway Approach Line Window

The window contains selection buttons to toggle the display of the approach lines for the airport's runways, and a listing of the currently active runways for the airport. The "ARR RWL DISPLAY" option toggles the automatic display of all approach lines for runways that are selected active for arrival. The setting is global for all airports. The runway approach line is by default 20nm long and has 5 distance markers at 2nm intervals. The color of the line is different depending on whether the runway is active for arrivals or not.

3.7.49 Tactical Info Window

"Open Tactical Info Window" tag function

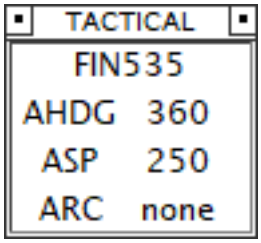


Figure 3.113: Tactical Info Window

The Tactical Info Window displays coordinated tactical data (AHDG, ASP and/or ARC). Proposed data is in Proposition In, rejected data in Warning and accepted data in sector state color. This window only displays the information, to answer or apply the data use the *Tactical Transfer Menu*.

3.7.50 Pre-Departure Clearance Window

"Open PDC Window" tag function

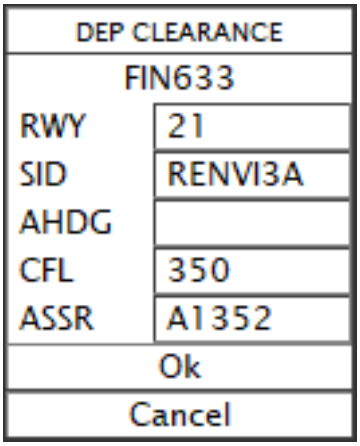


Figure 3.114: Pre-Departure Clearance Window

The Pre-Departure Clearance Window is used to issue departure clearances, either via R/T or datalink. The following data fields are displayed for review:

RWY	Departure runway (left-click to open RWY setup popup list)
SID	Assigned SID (left-click to open SID setup popup list)
AHDG	Assigned heading (left-click to open *AHDG Menu*)
NPT	Next route point (left-click to edit)
CFL	Cleared level (left-click to open *CFL Menu*)
ASSR	Assigned transponder code (left-click to open *ASSR Menu*)
START	Start-up clearance (left-click to toggle between “YES” and “NO”)
NFREQ	Next frequency (left-click to edit)
DFREQ	Departure frequency (left-click to edit)
RMK	Free text remarks to send with a datalink clearance (left-click to edit)

The NPT, NFREQ, DFREQ, START and RMK fields are only displayed if a datalink clearance has been requested and the clearance format (defined in the CPDLC data file) includes them.

The RWY field text is displayed in Proposition In color if the clearance has not yet been issued and the selected runway is not active for departure. The CFL level background is displayed in Warning color for DEL/GND/TWR/APP/DEP controllers when it is above XFL, and for CTR/FSS controllers when it is above PEL.

When the datalink clearance format includes the possibility to switch between “track” and “heading” modes, the “AHDG” label is displayed as a button. Left-click on it to toggle between “AHDG” and “TRACK”.

When the RMK field contains text, the window displays the full text if it is not longer than 8 characters, otherwise the 7 first characters + “. . . ”. Left-click to edit the text.

When the aircraft has requested a clearance via datalink, the two buttons in the window are:

Send DCL	Sends a departure clearance via datalink, closes the window
Voice	Sends an error message “REVERT TO VOICE PROCEDURE”, closes the window

When the aircraft has not requested a clearance via datalink, not enough data is entered, or the controller has used the “Voice” option above to abort the datalink clearance process, the buttons are:

Ok	Sets the clearance flag “On”, closes the window
Cancel	Sets the clearance flag “Off”, closes the window

The “Send DCL” and “Ok” buttons are active when at least the “RWY”, “CFL”, “ASSR”, all displayed frequency fields and the “NPT” field, if displayed, contain data.

3.7.51 Departure Coordination Window

“Toggle EST/DEP/ABT” function (when clearance flag not set and ground state not “DEPA”)

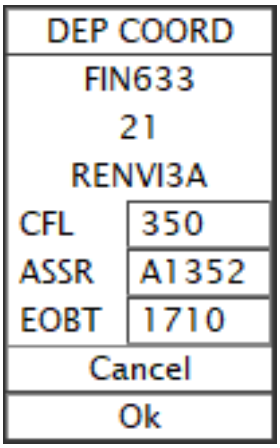


Figure 3.115: Departure Coordination Window

The Departure Coordination Window can be used to set the clearance flag. The window displays the aircraft callsign, departure runway and SID and allows setting the *CFL*, *ASSR* and *EOBT* values.

CFL	Opens the *CFL Menu*
ASSR	Opens the *ASSR Menu*
EOBT	Opens the *Time Menu*
Cancel	Disregards any changes, closes the window
Ok	Applies any changes, sets the clearance flag and closes the window

3.8 Flight Leg

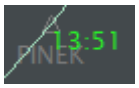
The Flight Leg displays the aircraft's planned track in one-minute steps. Each one-minute-long part of the path is colored according to the results of the *MTCD (Medium Term Conflict Detection)* and *SAP (Segregated Area Probe)* processing. The following colors are possible:

Urgency FL	MTCD and/or SAP conflic
Warning FL	MTCD and/or SAP risk
Potential FL	MTCD potential conflict
Information FL	MTCD and/or SAP processing available, no conflicts or risks detected
Flight Leg	No MTCD or SAP processing available for this part of the Flight Leg

If the aircraft has an assigned heading or is not following its route, the predictions only go up to 10 minutes and assume the aircraft continues on its present ground track. In this case the predicted track is shown as a dashed line when the flight leg is displayed.

The Flight Leg is displayed by clicking on various track label and list items depending on the setup and is either automatically removed from display when the mouse cursor leaves the label area or must be manually toggled off, depending on the function that was used to display it.

The label that's shown on each route point includes the following predefined fields

	Estimated Time Over the point
	Top of Climb
	Top of Descent

3.9 Keyboard Shortcuts

Some TopSky functions can be accessed using a keyboard shortcut. The available shortcuts and their keys are:

<ALT+F>	Open FPL Window for the selected flight
<ALT+E>	Open FPL Selection Window
<ALT+Q>	Start new QDM line
<ALT+U>	Inhibit active filters for 5 seconds (Quick Look)
<ALT+S>	Start a new minimum separation line
<ALT+C>	Reposition cursor at the center of the radar screen

Table 3.61: keyboard Shortcuts

“Selected flight” in the above means that the mouse cursor is over that flight’s track label. For the timed functions, activating the shortcut while the timer is running restarts the timer from zero.

3.10 Color Values

Color name	Color	Usage
Aircraft colors		
Assumed		Labels, Tracks
CARD Mark All		Labels
CARD Mark Own		Labels
Concerned		Labels, Tracks
Coordination		Labels, Tracks
Freq Indicator		Labels
Info Coord		Labels
Information		Labels, Windows
Informed 1		Labels, Tracks
Informed 2		Labels, Tracks
Informed 3		Labels, Tracks
Proposition Accepted		Labels
Proposition In		Labels
Proposition Out		Labels
Redundant		Labels, Tracks

Color name	Color	Usage
Rwy Locked		Labels
Sid Star Allocation		Labels
Sid Star No Allocation		Labels
Suite Highlight		Labels
Track Default		Tracks
Track Highlight		Tracks (when selected)
Unconcerned		Labels, Tracks
Unknown		Labels
Urgency		Labels, STCA callsign background on plugin windows/lists
VFR		Labels, Tracks
Warning		Labels, APW callsign background on plugin windows/lists, Windows
CPDLC colors		
CPDLC Controller Late		Labels, Windows
CPDLC Discarded		Windows
CPDLC DM Request		Labels, Windows
CPDLC Failed		Labels, Windows

Color name	Color	Usage
CPDLC Pilot Late		Labels, Windows
CPDLC Standby		Labels, Windows
CPDLC UM Clearance		Labels, Windows
CPDLC Unable		Labels, Windows
CPDLC Urgency		Labels, Windows
Aircraft related items on the radar screen		
AIW intrusion		AIW alert related items
CARD Min Sep		CARD SEP Tool
Flight Leg		Part of flight leg without MTCD and SAP coverage
FPLSEP Tool 1		Flight plan separation tool 1
FPLSEP Tool 2		Flight plan separation tool 2
FPLSEP Tool 3		Flight plan separation tool 3
FPLSEP Tool 4		Flight plan separation tool 4
FPLSEP Tool 5		Flight plan separation tool 5
Heading Vector		Heading vector
Information FL		Part of flight leg with no MTCD or SAP problems

Color name	Color	Usage
Potential FL		Part of flight leg with MTCD or SAP potential conflict
QDM		QDM vector
SEP Tool 1		Minimum separation tool 1
SEP Tool 2		Minimum separation tool 2
SEP Tool 3		Minimum separation tool 3
SEP Tool 4		Minimum separation tool 4
SEP Tool 5		Minimum separation tool 5
SEP Tool 6		Minimum separation tool 6
SEP Tool 7		Minimum separation tool 7
SEP Vert		Extensions of minimum separation tools
System Calculated TOC		TOC symbol on flight leg
System Calculated TOD		TOD symbol on flight leg
Urgency FL		Part of flight leg with MTCD or SAP conflict
Warning FL		Part of flight leg with MTCD or SAP risk
Map colors		
Active Map		Active TSA map border
Active Map Type 1		TSA map border/fill

Color name	Color	Usage
Active Map Type 2		TSA map border/fill
Active Map Type 3		TSA map border/fill
Active Map Type 4		TSA map border/fill
Active Map Type 5		TSA map border/fill
Active Map Type 6		TSA map border/fill
Active Map Type 7		TSA map border/fill
Active Map Type 8		TSA map border/fill
Active Map Type 9		TSA map border/fill
Active Map Type 10		TSA map border/fill
Active Map Type 11		TSA map border/fill
Active Map Type 12		TSA map border/fill
Active Map Type 13		TSA map border/fill
Active Map Type 14		TSA map border/fill
Active Map Type 15		TSA map border/fill
Active Map Type 16		TSA map border/fill
Active Map Type 17		TSA map border/fill
Active Map Type 18		TSA map border/fill

Color name	Color	Usage
Active Map Type 19		TSA map border/fill
Active Map Type 20		TSA map border/fill
Active RD Infill Map		Active R or D map fill
Active RD Map		Active R or D map border
Active Text Map		Active TSA map text
Auto Map Label		Auto-generated maps
Auto Map Symbol		Auto-generated maps
East NAT Map		Auto-generated maps, maps
Map 1		Maps
Map 2		Maps
Map 3		Maps
Map 4		Maps
Map Hotspot		Map hotspots
Map Border		Maps
Map Info		Range rings, range marker
Map Land		Maps
Map Symbol		Maps

Color name	Color	Usage
Preactive Map		Pre-active map border
Preactive Text Map		Pre-active map text
Predisplay Map		Pre-display map border
Rwy App Line Inuse		Runway approach line for runways in use
Rwy App Line Not Inuse		Runway approach line for runways not in use
TSA Border Highlight		Highlighted TSA map border
Weather Map		Weather radar data
West NAT Map		Auto-generated maps, maps
Window and menu colors		
Arm		Inactive window texts
Map Bright		Stack Manager Window, VAW
Background		Background
Border		Various lines in windows
BottomShadow		3D effects in windows
CARD Conflict Number		CARD conflict numbers
CARD Time Vector		CARD time vectors
Field Highlight		Selected field

Color name	Color	Usage
Flight Highlight		Selected item
Foreground		Window titles, menu items, active texts, close/min/resize boxes
Global Menu Highlight		Highlighted items in the Global Menu
Inactive Sector		CARD and VAW background
LatLong Info		Coordinate value in Lat/Long Window
Overflown		Overflown points in Complete Route Window
Potential		Potential conflicts in CARD/VAW
Select		Selected radio buttons and selection boxes
Selected		Active filters in Radar menu
Selected Group		Group of TSA areas in multi edit mode
Selected Period		Active areas text in area window
SMW Level Band		AFL-CFL boxes in SMW
SMW Overflight		Overflight lines in SMW
SMW Overlap		Overlapping AFL-CFL boxes in SMW
SMW Overlap Box		Multiple same CFL's box in SMW
SMW Overshoot		Level bust AFL-CFL boxes in SMW

Color name	Color	Usage
TopShadow		3D effects in windows
Trough		Slider area background
TSA Active		Active areas background in area window
TSA Filter		Active categories in area window
TSA Preactive		Pre-active areas background in area window
VAW Profile		Selected aircraft profile in VAW
VAW Sector Limits		Sector boundaries in VAW
VAW Track Position		Selected aircraft position in VAW
WM Active Fg		Active window title text
WM Bg		Window title bar background
WM Border		Window border line
WM Fg		Window texts
WM Frame		Window frame when dragging
Other colors		
Standard Line RDF		Direction Finder position circle or direction line
Text Notes		Text notes
A-CDM colors		

Color name	Color	Usage
color1		
color2		
color3		
color4		
color5		
color6		
color7		
color8		
color9		
color10		
color11		
color12		

Table 3.62: Color Names

Chapter 4

Known issues

4.1 GitHub Repository

TOPLIS is maintained in the *topskylppc GitHub repository*. An up to date list of known issues can be checked on the *issues page*, aswell as reporting new ones.

4.2 Airport and area hotspots block screen panning

If you happen to drag one of the airport or area hotspot symbols when trying to move the screen, the screen will not move.

4.3 ROF/RTI/TIP message availability limited

As there is no real plugin-to-plugin communication available, the availability and success of sending the ROF, RTI and TIP messages is somewhat limited.

4.4 Problems opening the Radar Menu

The default method of opening the Radar Menu (<ALT>+right-click) may not always work on Mac hardware. It's possible to adjust TopSky settings to try another combination, but the easiest way is to insert the following line to the TopSkySettingsLocal.txt file:

```
Shortcut\RadarMenu\Combo=0x00
```

The Radar Menu is then opened by right-clicking anywhere on the Global Menu.

Appendix A

Figures

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Appendix B

Tables

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Appendix C

Bibliography

Bibliography

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