

**Target Generation Facility
(TGF)
Java Plan View Display Manual
Third Edition**

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1 Introduction

The Java Plan View Display (JPVD) provides a situational awareness. In addition, JPVD provides functionality to allow the user to customize the information displayed. This manual covers the Standard Version of JPVD and is available at www.faa.gov/go/tgf under “Java Plan View Display (JPVD) Manual”.

Several TGF components use a modified version of JPVD. TGF’s Integrated Scenario Development Environment (ISDE) has features that are not covered in this manual. TGF’s SimPilot Workstation (SPW) uses an embedded version of JPVD, which has limited features of the Standard Version of JPVD for example the SPW JPVD does not have any ability to change the communication connections.

2 JPVD

This Section contains a brief overview of the Java Plan View Display (JPVD). JPVD consists of several components, which are covered in greater detail later on in this manual.

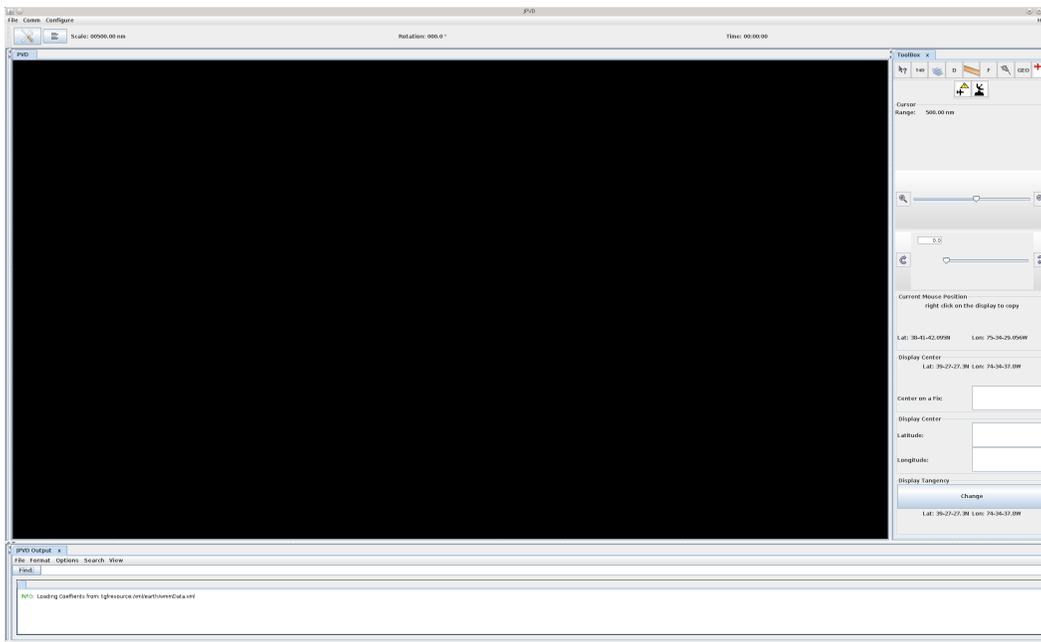


Figure 1 Overview of JPVD

2.1 Tabs and Windows

JPVD typically displays various Parts like its Tool Box, Plan View Display (PVD), and Messages as Tabs.

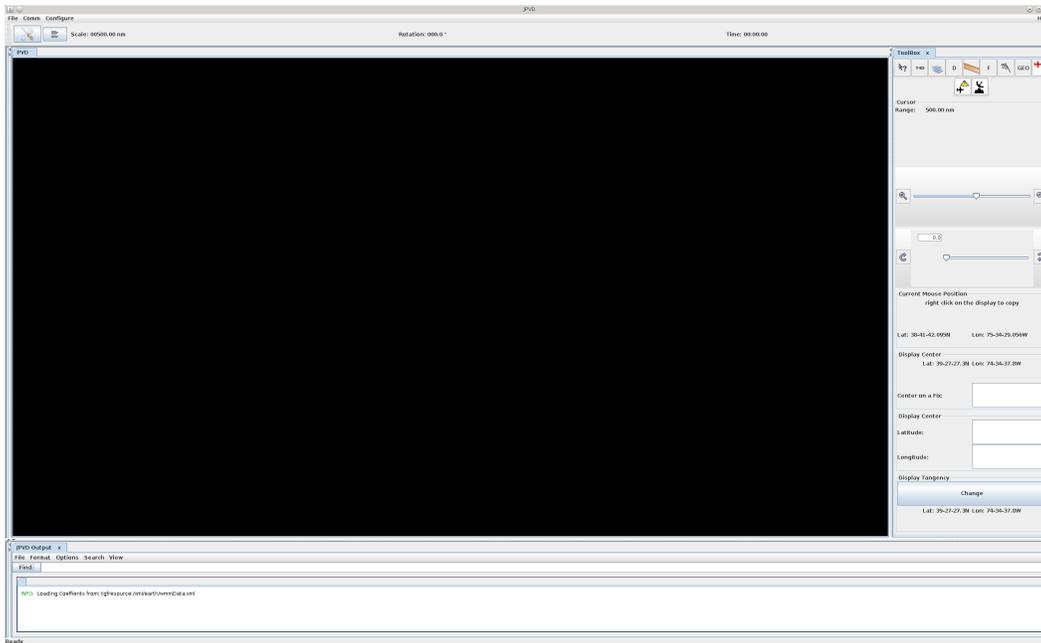


Figure 2 JPVD Tabs

In JPVD if you click and drag a Tab/Window, you should see an outline of the Tab/Window.

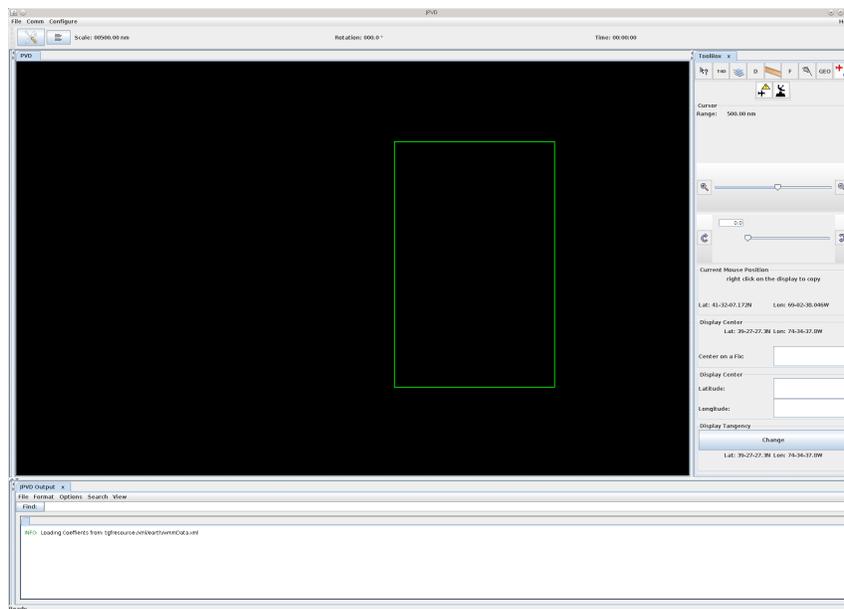


Figure 3 Moving Tab to another Section

If the Outline is green, then the Tab will move to Section of the JPVD beneath it.

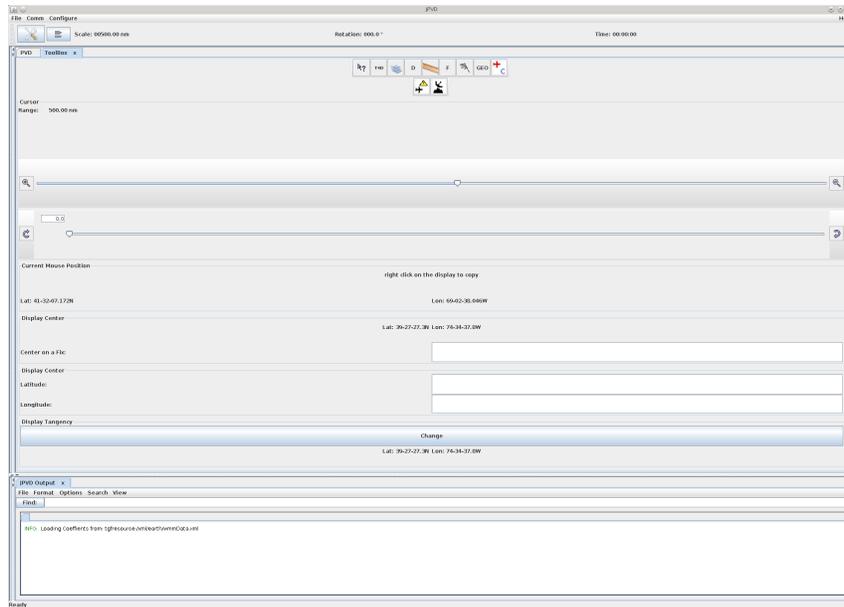


Figure 4 After Moving Tab into another Section

If the user is having difficulty moving a Tab to a Section of JPVD, then the user can try making the Section a little bigger by clicking on the Section Separator Bar and moving over the bar over a little. Afterwards, the user can try move the Tab to the Section again.



Figure 5 Section Separator Bar

If the Outline is red, then the Tab will open in an independent Window.

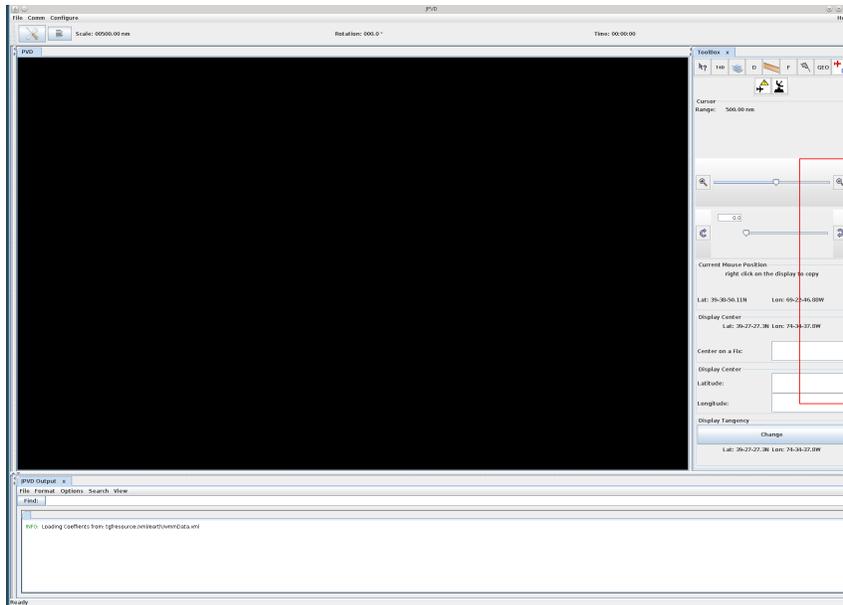


Figure 6 Moving Tab to external Window

Just click the X button on the Window to have it go back to the Section of the JPVD it came from.

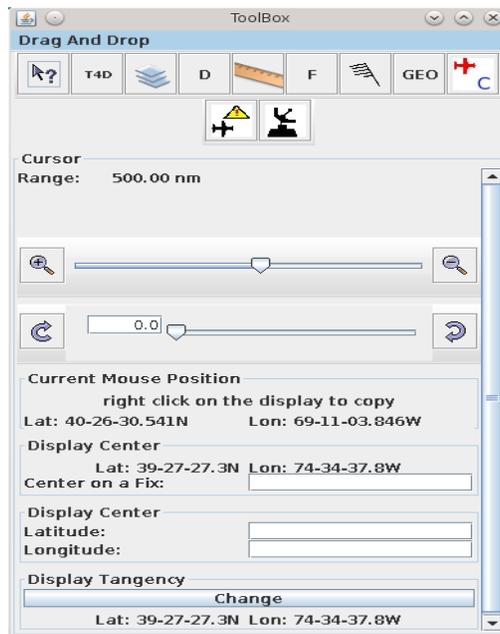


Figure 7 After Moving Tab to external Window

3 PVD

The Plan View Display (PVD) portion of JPVD is used to display Target information as well as Routes and other Airspace information.

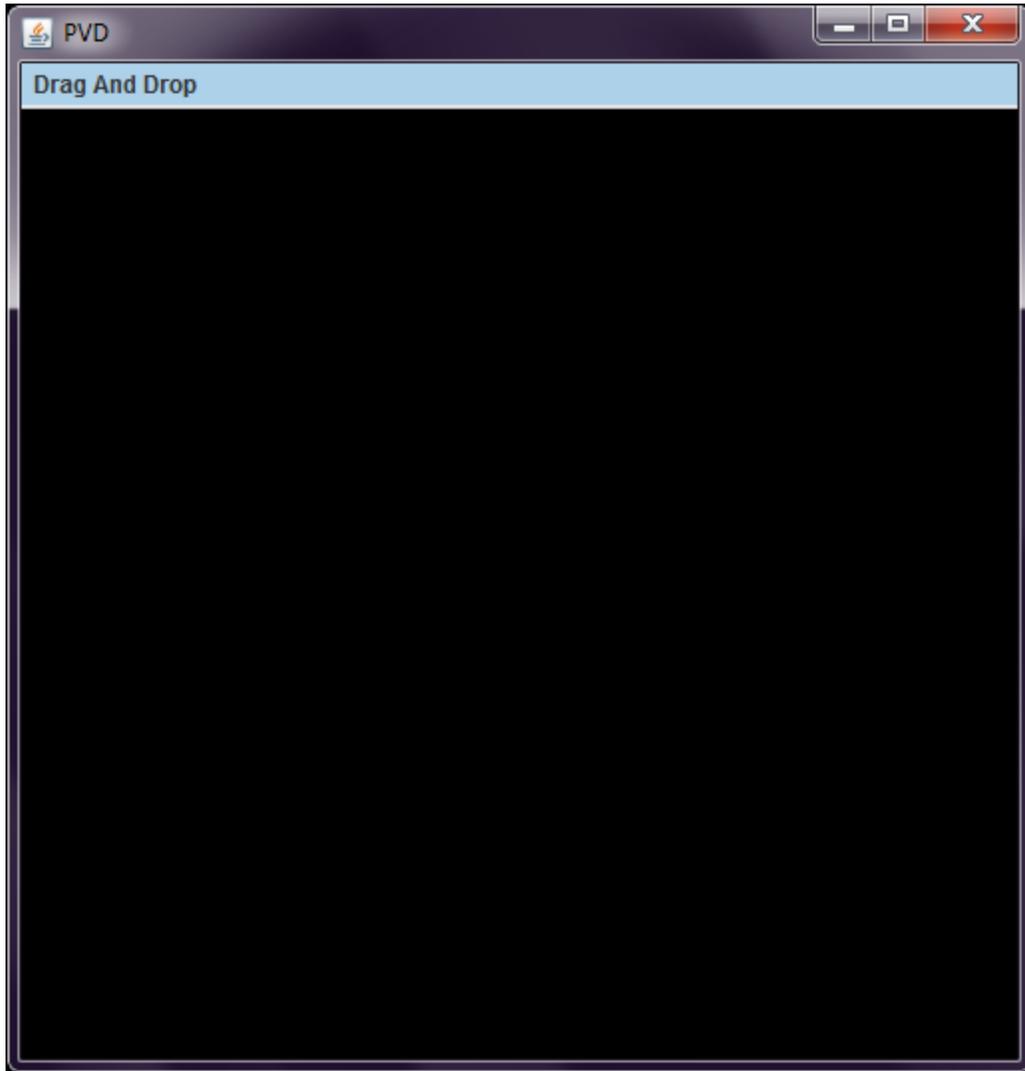


Figure 8 PVD

4 Menu Bar

This section covers the Menu Bar



Figure 9 Menu Bar

4.1 File Menu

This menu allows the user to open and save JPVD settings.

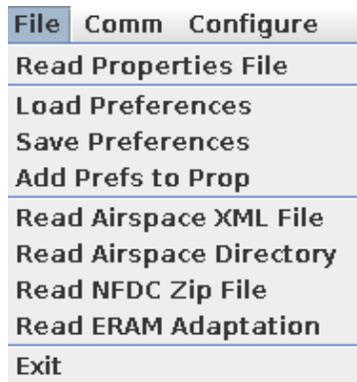


Figure 10 File Menu

4.1.1 Read Properties File

This is the main method of configuration for JPVD. Select an appropriate TGF properties file (usually found within the properties folder inside a project directory).

4.1.2 Load/Save Preferences

JPVD preferences are files that contain setup information for JPVD. Use these options to save and load the state of JPVD. The preference file contains XML data but will have a .jpvf extension. While JPVD may load a file with any extension, it is recommended using only files with the .jpvf extension.

4.1.3 Add Prefs to Prop

Sets the default JPVD Preference File in the currently loaded Scenario Properties file to the currently loaded JPVD Preference File.

4.1.4 Read Airspace XML File

This option allows the user to load in any TGF XML airspace data files into JPVD such as a Fix XML file.

4.1.5 Read Airspace Directory

The selected directory will be parsed for files matching the TGF standard names for airspace data. For example, the standard File name for the Fix data is Fix.xml. Please see the “Target Generation Facility (TGF) User’s Manual” at www.faa.gov/go/tgf for more information on TGF’s standard names for Airspace data files.

4.1.6 Read NFDC Zip File

The selected National Flight Data Center (NFDC) Zip File will be parsed for Airspace data.

4.1.7 Read ERAM Adaptation

The selected directory will be parsed for EnRoute Automation Modernization (ERAM) Adaptation data.

4.1.8 Exit

This menu item will close JPVD.

4.2 Comm Menu

This menu allows the user to configure JPVD's communication settings.

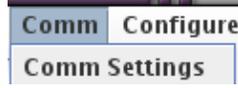


Figure 11 Comm Menu

4.2.1 Comm Settings

This menu item will display a window that allows the user to configure JPVD to receive data and communicate with different devices.

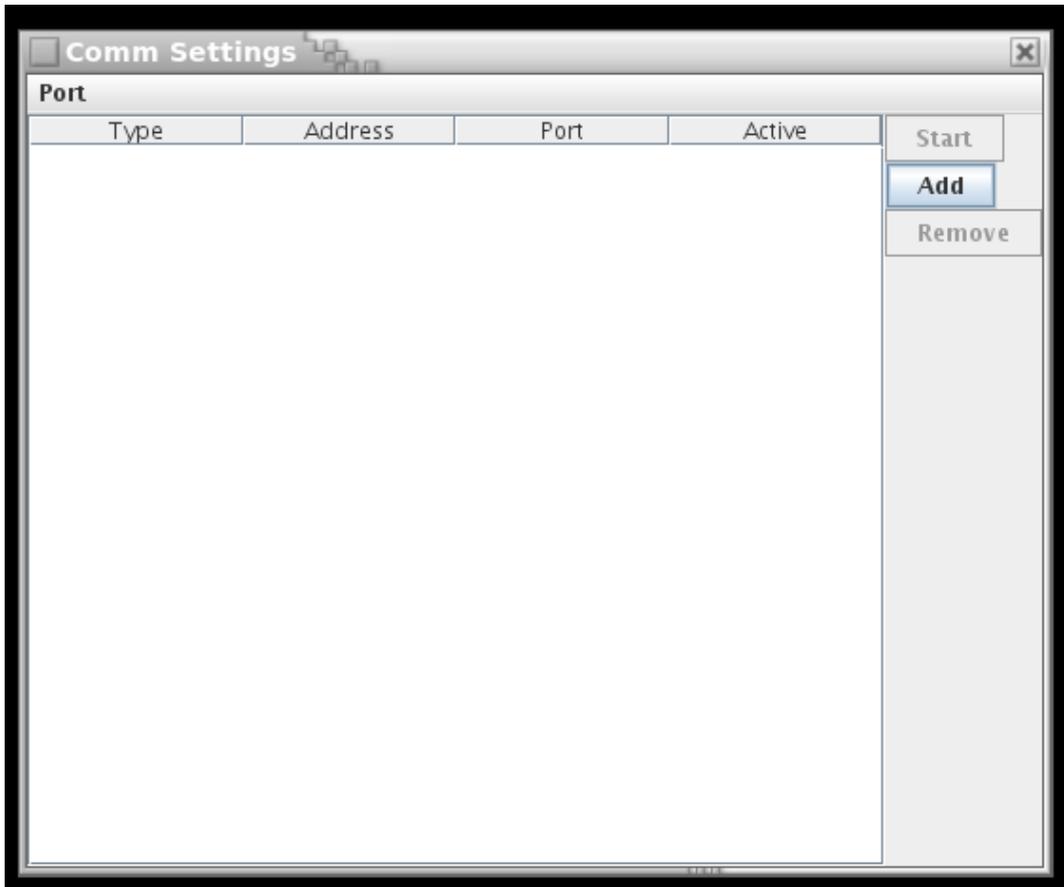


Figure 12 Comm Setting Window

4.2.1.1 Start/Stop

This button allows the user to start/stop receiving data from the currently selected connection. If the currently selected connection in the Comm Setting Window is not active (JPVD is currently not listening to this connection), then the “Start” button will be displayed. However, if the currently selected connection is Active, then the “Stop” button will be displayed. The “Start” button on the Comm Setting Window will allow JPVD to receive data from the currently selected connection, while the “Stop” button will stop JPVD from receiving data from the currently selected connection. The Start/Stop Button will be disabled if there is no currently selected connection.

4.2.1.2 Add

The “Add” button displays a window that allows the user to add a connection for JPVD to listen for data on. The user can select the connection’s expected type of data.

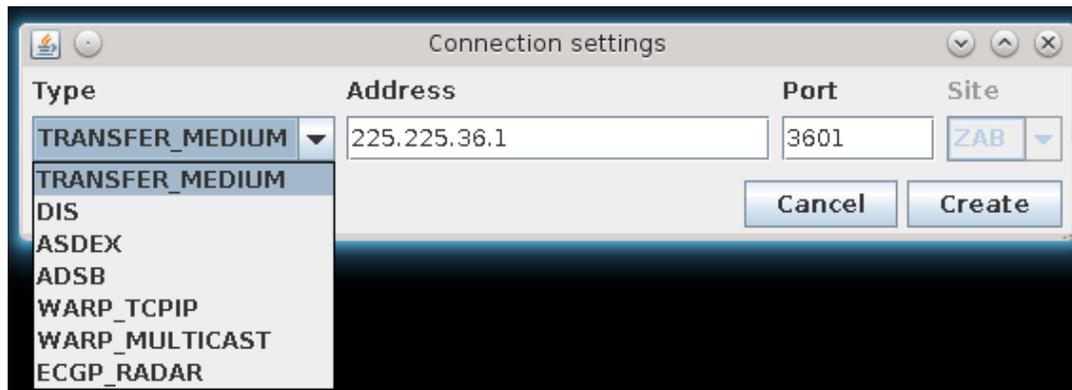


Figure 13 Connection Settings Window

JPVD can handle the following types of data:

- *TRANSFER_MEDIUM* – TGF data transfer messages
- *DIS* – Distributed Interactive Simulation (DIS) messages
- *ASDEX* – Airport Surface Detection Equipment - X (ASDEX) messages
- *ADSB* – Automatic dependent surveillance-broadcast (ADSB) messages
- *WARP_TCPIP* – Weather and Radar Processing (WARP) messages sent over a TCP IP connection
- *WARP_MULTICAST* – WARP messages sent over a multicast connection
- *ECGP_RADAR* – En Route Communications Gateway Protocol (ECGP) Radar messages

4.2.1.3 Remove

The “Remove” button allows the user to remove the currently selected connection. This button will be disabled if there is no currently selected connection.

4.3 Configure Menu

This menu allows the user to change what is displayed in JPVD, and how it is displayed. Most of the configure menu will display a window containing the data of a given type for example Fixes will display a window for configuring fixes. Unless a type of data is listed separately, a common window will be used. For more information on this common window, see Section 4.3.2 Airspace Data.



Figure 14 Configure Menu

4.3.1 Font

This menu item will display a window that allows the user to change the Typeface, Style, and Size of the Font used to display text data.



Figure 15 Font Window

4.3.2 Airspace Data

The following airspace data items use the same general interface to allow the user to select what data to display and how to display the data (listed in the order the data item appears in the Configure Menu):

- Fixes
- Radar
- Airports
- Runways
- RNAVs
- Ground Fixes
- Taxiways
- Airways
- Military Routes
- STARS
- SIDS

This common airspace window contains two lists, which contain all of the Airspace objects of a given type that have been loaded into the JPVD.

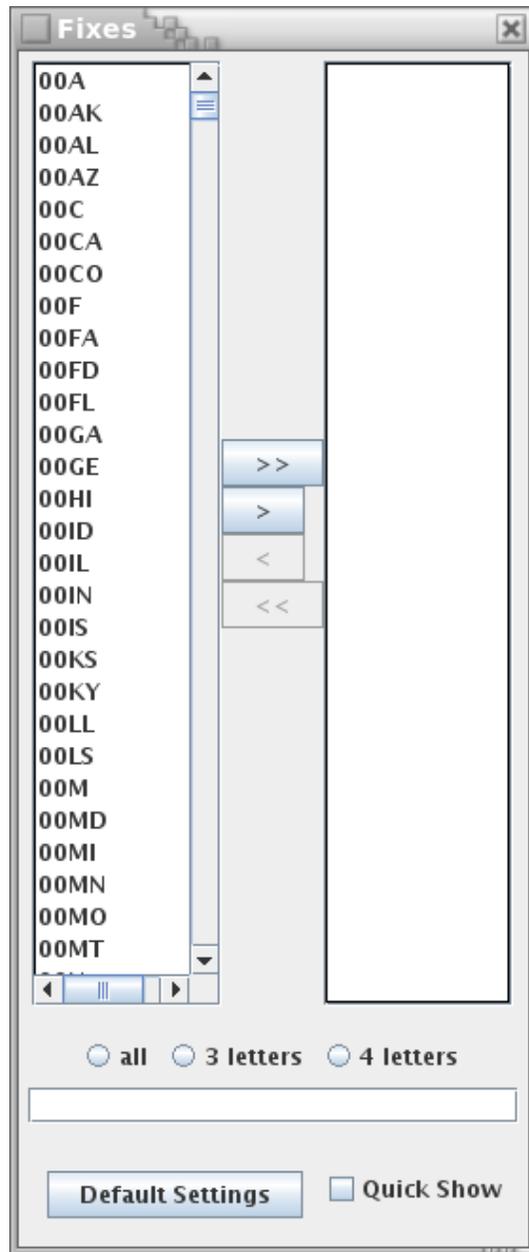


Figure 16 Sample Common Airspace Window

The list on the left contains all of the objects that are not currently displayed on the JPVD. This list can be narrowed down by number of letters, or subsets of the name using the Search Panel located near the bottom of the window.



Figure 17 Search Panel

The list on the right contains all of the Airspace objects that are displayed on the JPVD.

Items can be moved between the two lists by double clicking on them individually. The single arrows can be used to moves all selected objects, SHIFT and CTRL clicking to select multiple objects is supported.

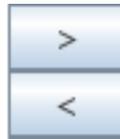


Figure 18 Single Arrow

The double arrows can be used to move all objects from one side to the other.



Figure 19 Double Arrow

At the very bottom of the Window is a button to configure the default settings for how to display an object. When an individual object is displayed if there are no custom settings, then the Default settings are used to display the object.



Figure 20 Default Settings Button

If this button is pressed, then it displays a window used to configure the settings for all object a given type.

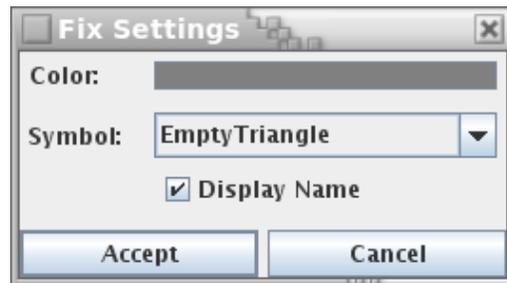


Figure 21 Sample Default Display Settings

This window works similar to the window used to configure the display settings for an individual object. For more information on the individual configuration window, please see Section 4.3.2.1 Common Display Settings.

The “Quick Show” button located next to the “Default Settings” button will quickly show all objects of a given type on JPVD.



Figure 22 Quick Show Button

4.3.2.1 Common Display Settings

Every Airspace object has a settings window that will pop up with all the variables a user is allowed to set for this particular display object. The user can set the default settings via the Default Setting button, or edit a single object's settings by right clicking on it when it is on the currently displayed list (the list on the right). Most times the user can specify the Color, Symbol, and Text to display for an object. If the user no longer wishes to use custom settings, then the user can press “Use Current Defaults” button to remove the object’s custom settings.

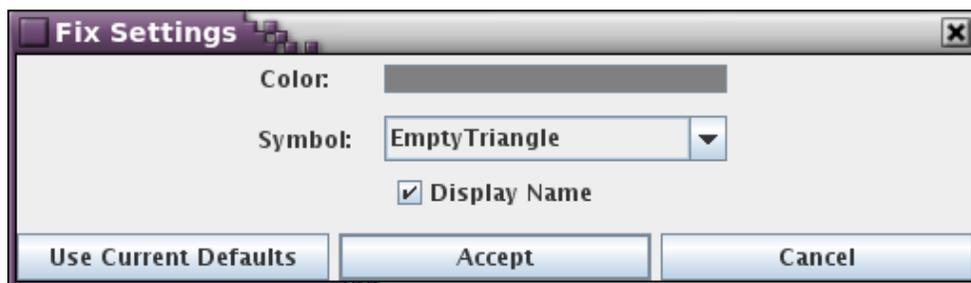


Figure 23 Sample Individual Display Settings

JPVD can display the following symbols to mark the location of an object:

- Dot
- Empty, Filled, or With a Dot
 - Circle
 - Square
 - Triangle
 - Inverted Triangle

4.3.2.2 Extended Display Settings

Some Display Settings have additional options. For example, the Display Settings for a Runway in addition to the Text and Color to display a Runway, the user can choose whether to display the Runway's Outer Marker, Glide Slope, Localizer, Instrument Landing System (ILS) Approach Plate and Missed Approach Procedure, Localizer Ray, and Center Line.

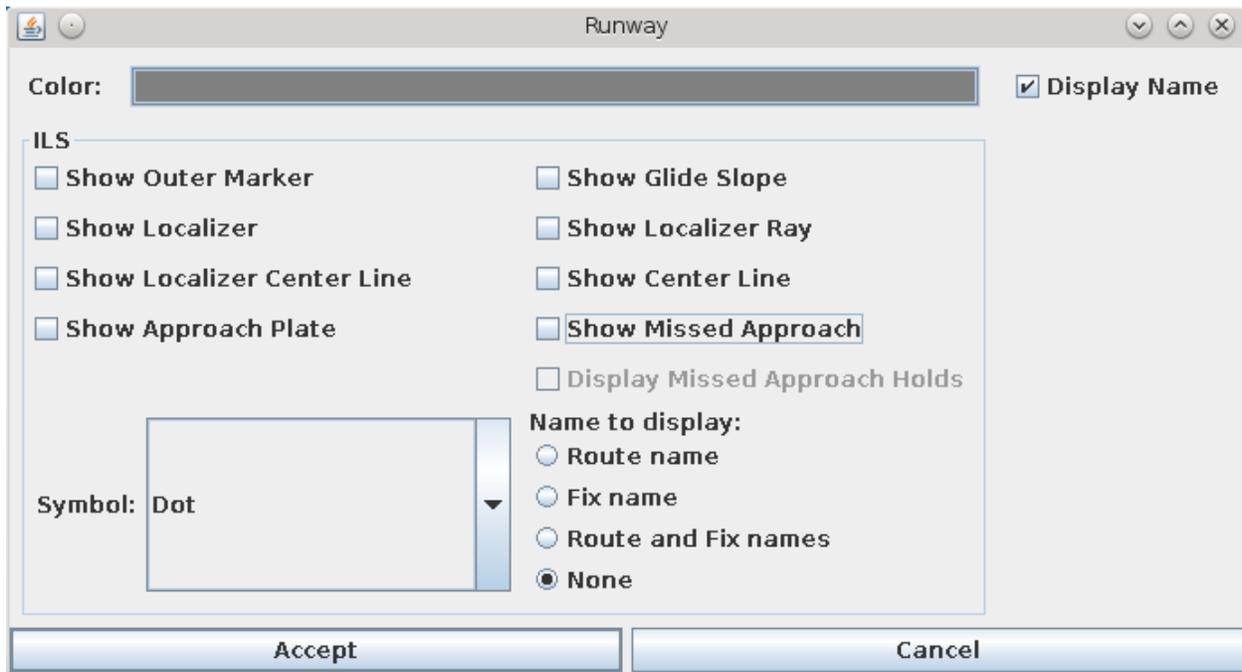


Figure 24 Runway Settings Window

Another example of a Display Settings that have additional options is the Display Settings for Routes. In addition to the standard settings, the user can choose whether to display a Routes SimPilot Commands, Altitude and Speed Restriction, and Holding Patterns.

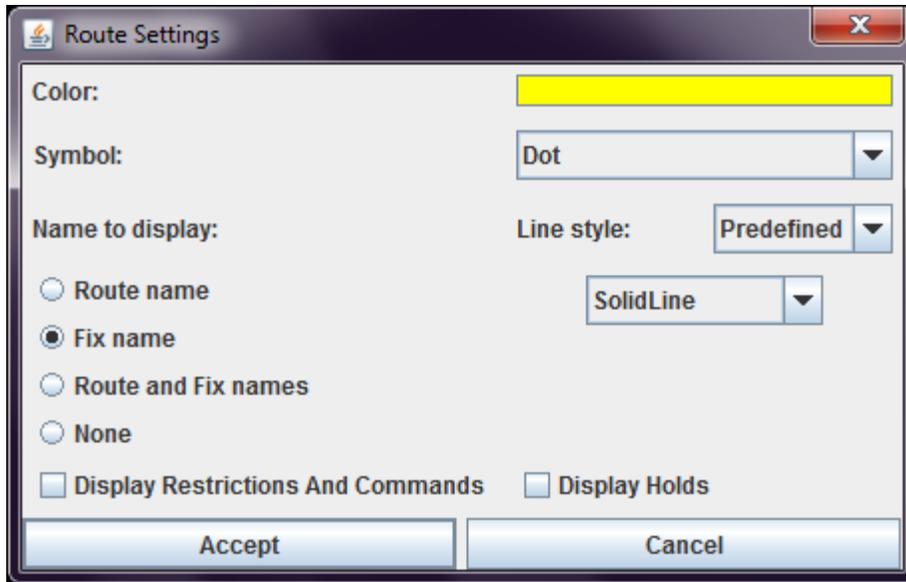


Figure 25 Route Settings Window

Below is a sample picture of a holding pattern.

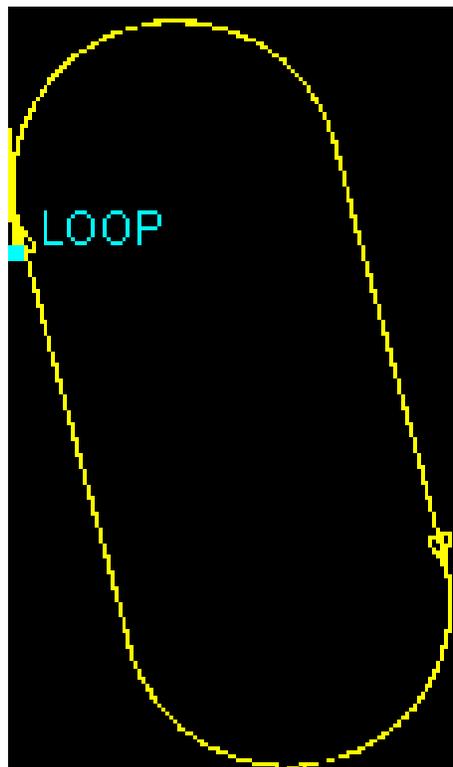


Figure 26 Sample Holding Pattern

Below is a Sample Route with commands and restrictions displayed. Fix LEFT has an Altitude Restriction to be at Flight Level 150 for Any Engine Type. Fix RIGHT has a

TGF SimPilot command to turn to a heading of 120 degrees. For more information on TGF SimPilot commands see “TGF Simulation Pilot Operations (SPO)” Manual at www.faa.gov/go/tgf for more information.

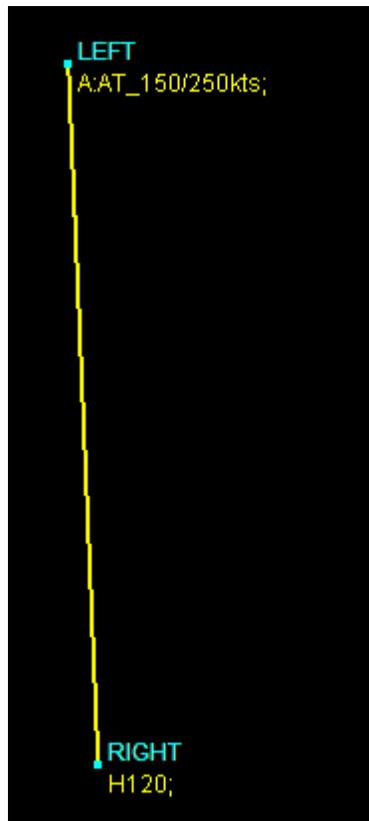


Figure 27 Sample Command and Restriction display

4.3.3 Ground Menu

If there is valid TGF Ground data loaded into JPVD, then this menu will have a sub-menu for each of the Airports where TGF Ground data was found. The Ground Airport menu has sub-menus that allow the user to configure Ground Fixes and Taxiways. Ground Fixes and Taxiways use the window described in Section 4.3.2 Airspace Data.

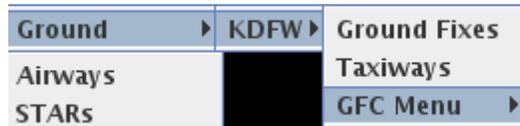


Figure 28 Ground Menu

4.3.3.1 GFC Menu

This menu allows the user to choose how or if to display Ground Fix Connections (GFC), which are the lines that connect ground fixes together. “Monochromatic” displays GFCs all in red. “Polychromatic” displays the GFC based on what type of fixes are at each end of a GFC. “Off” turns off the displaying of GFCs.



Figure 29 GFC Menu

4.3.4 Tracks

This menu item displays a window that allows the user to configure how tracks are displayed. Tracks include aircraft and ground vehicles.

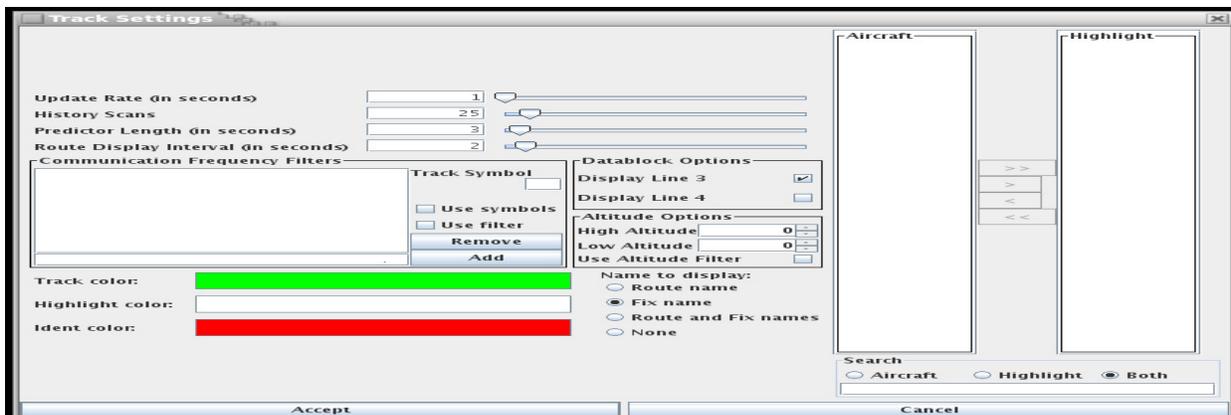


Figure 30 Track Settings Window

The user can change the following:

- How often JPVD will update the track information JPVD displays. The user can determine this by setting the update rate.
- How much of a history trail after the track should be displayed.
- How much of a predictor line for a track should be displayed
- How long to display a track's route when the user right clicks on the track.
- The "Datablock Options" Panel allows the user to do the following:
 - Whether to display the third line of a track's DataBlock. See Section 8 DataBlocks for more information what information this line in DataBlocks contains.
 - Whether to display the fourth line of track's DataBlock. See Section 8 DataBlocks for more information what information this line in DataBlocks contains.
- The "Altitude Options" Panel allows the user to specify the maximum and minimum altitude of tracks to display. To apply this filter check the "Use Altitude Filter" check box.
- The "Communication Frequency Filters" Panel allows the user to do the following:
 - The "Track Symbol" Field allows the user to specify a Symbol to display for tracks with currently selected frequency.
 - The "Use symbols" check box allows the user to specify whether to use the specified "Track Symbol" for a frequency. Note: If no symbol is provided, then the default track symbol is used.
 - The "Use filter" check box allows the user to specify whether to filter tracks based on the provided frequencies. Note: If this box is checked and no frequencies are specified, then all tracks will be filtered out.
 - The text field at the bottom of "Communication Frequency Filters" Panel allows the user to enter a frequency. If the frequency is already in the list of frequencies, then it will be selected.
 - The "Remove" button will remove the currently selected frequency from the list.
 - The "Add" button will add the frequency currently in the text filed at the bottom of "Communication Frequency Filters" Panel.
- Change the color that the following is displayed in:
 - Normal Track, which is a track that is not highlighted or indenting
 - Highlighted Track
 - An Track that is indenting
- What text to display when showing a track's route.
- On the right side of the window is a panel that acts similar to the Window described in Section 4.3.2 Airspace Data except that the list on the left is the tracks to use the "Normal Color" on, while the list on the right is the tracks to highlight using the provided "Highlight Color".
- Whether to "Accept" or "Cancel" the changes made in "Track Settings" Window.

4.3.5 Sectors

Since, Sectors have physical boundaries that change with altitude the Window used to configure Sectors works almost exactly like the Window described in Section 4.3.2 Airspace Data. The only exception is the Sector Altitude Filter Panel that can be used to filter information used to describe the physical layout of Sector based on Altitude. The slider on this panel can be used to indicate the minimum altitude of a physical layout to display. Next to this slider is label, which displays the current minimum altitude. "All" indicates that all physical layout information for a displayed Sector should be shown. Sectors can be filtered by Facility in addition to Id. Note: If there is a frequency in the loaded Airspace data associated with a Sector, then it will be displayed to the right of the Sector's Id and Facility (if available).



Figure 31 Sector Altitude Filter Panel

Below is a picture of the Sector Configuration Window.

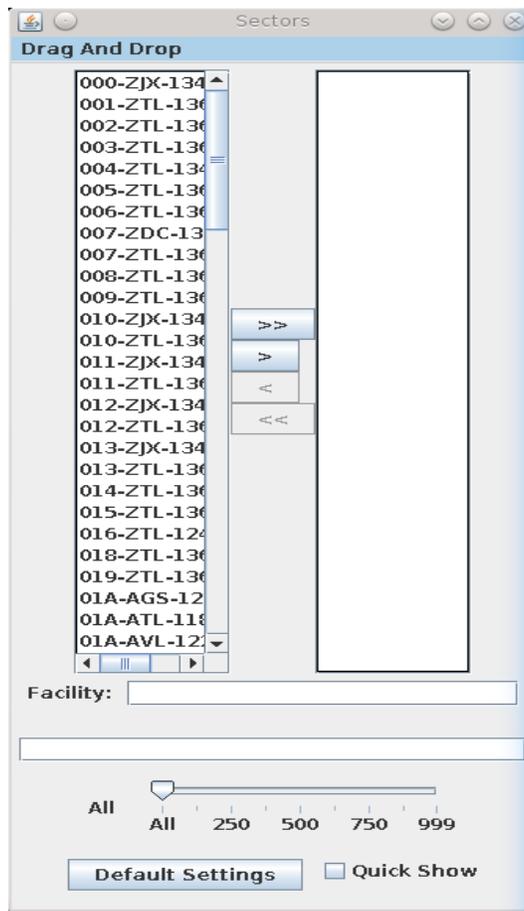


Figure 32 Sector Configure Window

4.3.6 ERAM Maps

This Menu item displays a window that allows JPVD to load an ERAM adaptation. Use the “File” menu on the window to specify an ERAM adaptation directory.

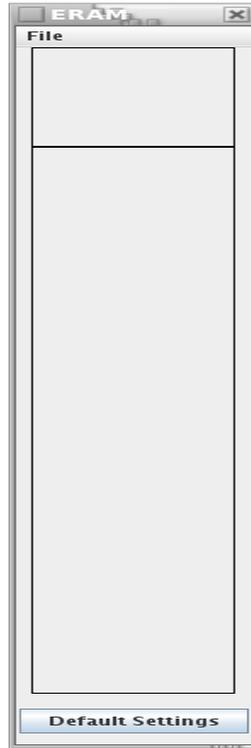


Figure 33 ERAM Map Window

Once an ERAM adaptation is loaded into JPVD the top half of the window will display a list of ERAM maps that can be displayed. JPVD will only allow one ERAM to be displayed at a time.

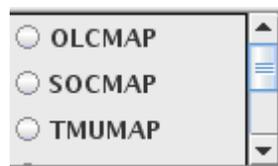


Figure 34 ERAM Maps

The bottom half of the window will display a list of sections of a map that can be displayed. Multiple sections of an ERAM map can be displayed at once.

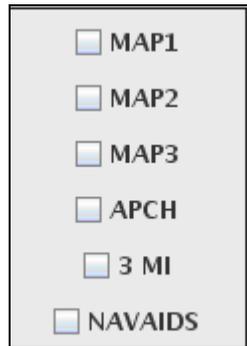


Figure 35 ERAM Map Sections

4.3.6.1 Display Settings

Click on the “Default Settings” button at the bottom of the ERAM Map Window to configure the display settings. The ERAM Map Display Settings allow the user to change to color intensity of the lines of a map are displayed at. The higher the intensity the brighter the lines will appear on JPVD.

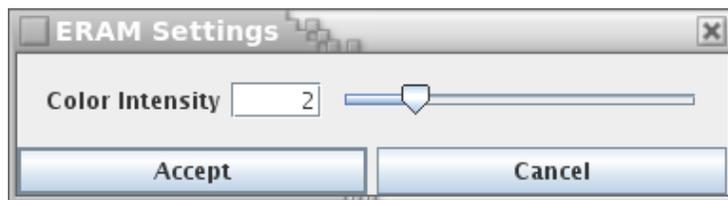


Figure 36 ERAM Map Display Settings

4.3.7 Pvd Map

This menu option displays a window that allows the user to load in and display various types of maps.

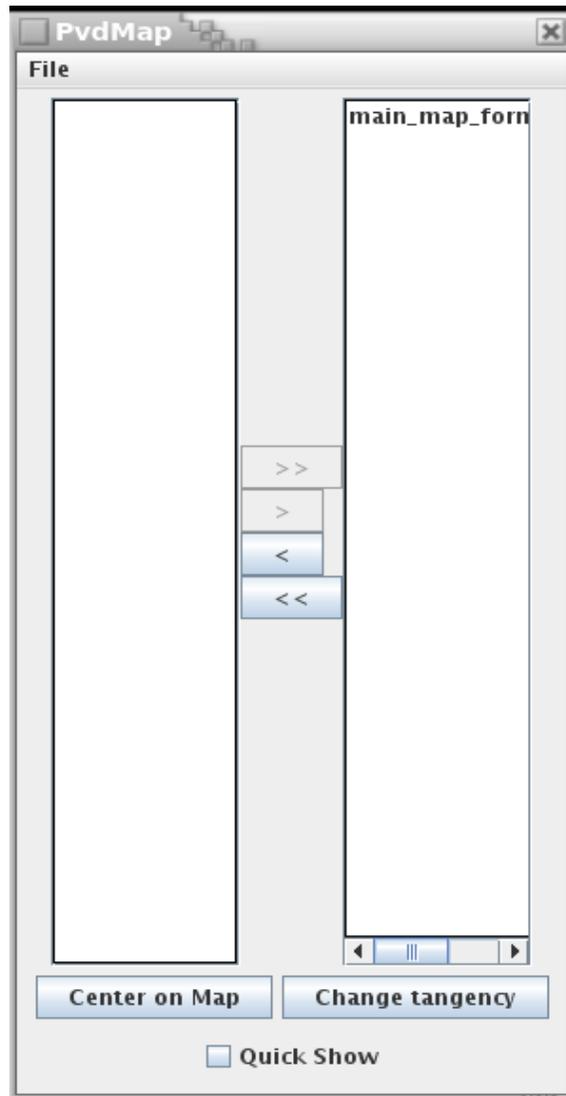


Figure 37 PvdMap Settings Window

The “File” menu has options to read in a TGF map file or a TGF Region XML file.

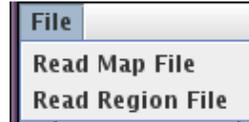


Figure 38 PvdMap File Menu

The “Read Map File” displays a window that allows the user to load a map into JPVD. The user can choose to specify one of the following map types to load:

- *GP* - Geographical Point (GP)
- *ASDEX* - Airport Surface Detection Equipment - X (ASDEX)
- *GEOMAP* - Geographical Map data
- *KML* - Keyhole Markup Language (KML)
- *PVD* - TGF PVD Lines files.
- *Auto-filter* - JPVD will attempt to determine the type of map being loaded based on its file extension.

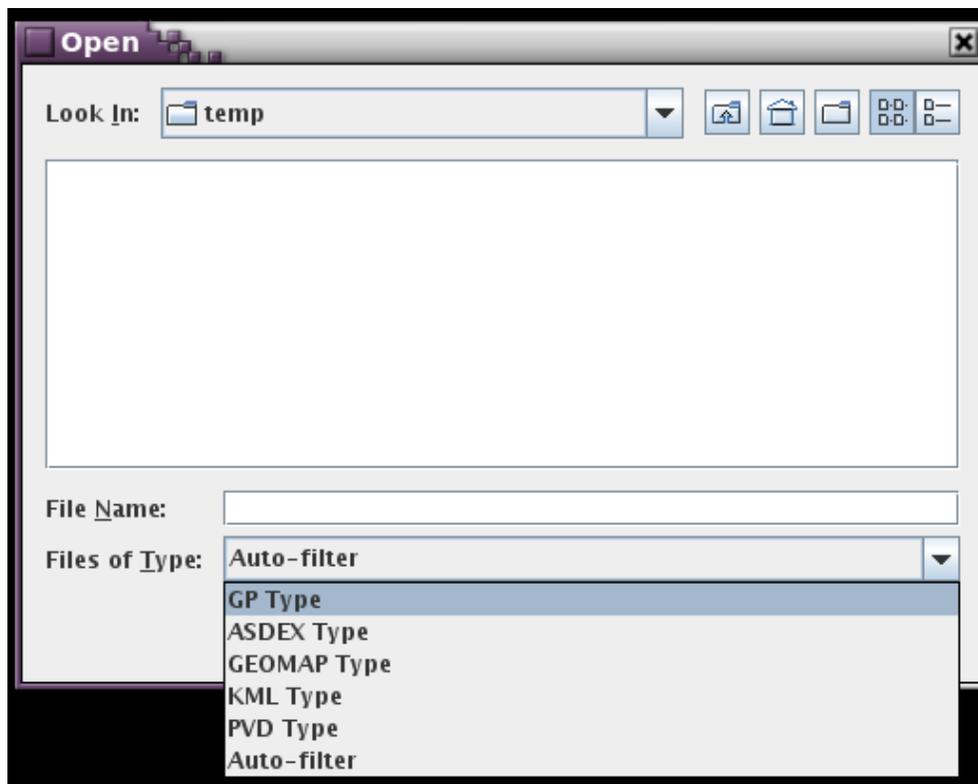


Figure 39 Map Open Window

The “Read Region File” displays a window that allows the user to load a TGF XML Region file into JPVD. Active Regions are displayed in a light red color, while Inactive Regions are displayed in gray.

Once the map is loaded into JPVD, the PvdMap Settings Window works almost exactly as the Window described in Section 4.3.2 Airspace Data. The only exception is the Map Button Panel, which features two buttons. The “Center on Map” button allows the user to center JPVD on the currently selected Map’s center. The “Change tangency” button allows the user to change JPVD’s point of tangency to the currently selected Map’s point of tangency.



Figure 40 Map Button Panel

The user can right click on a currently displayed map (any map in the right list) and a window displaying all the sections off the map is displayed. The user can choose to turn on/off individual or all sections of a map.



Figure 41 PVD Sections Window

4.3.8 Plats Display

The Plats Display Window allows the user to load a TGF Plat file into JPVD using the “Load Plats File” button. TGF’s Virtual Airport Immersion Environment (VAIE) can create satellite like views of modeled airports, which it stores in the plat format. This is useful in comparing the TGF airspace definition with the model VAIE loads.

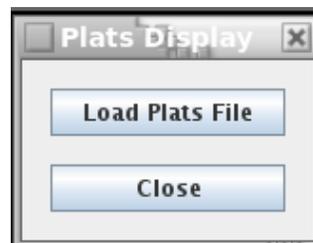


Figure 42 Plats Configure Window

Once the Plats data is loaded into JPVD the “Load Plats File” button changes to the “Clear All Plats” button. When “Clear All Plats” button is pressed JPVD clears out all Plats data and the button turns back into “Load Plats File” button.



Figure 43 Clear All Plats Button

If the “Close” button is pressed, then the Window is closed.

4.3.9 WARP Weather

JPVD can display WARP weather broadcasted via multicast or it can connect to a server via TCP. Please see Section 4.2.1 Comm Menu for more information on how to configure JPVD to receive WARP Weather data. The user can adjust the display of the Weather data.

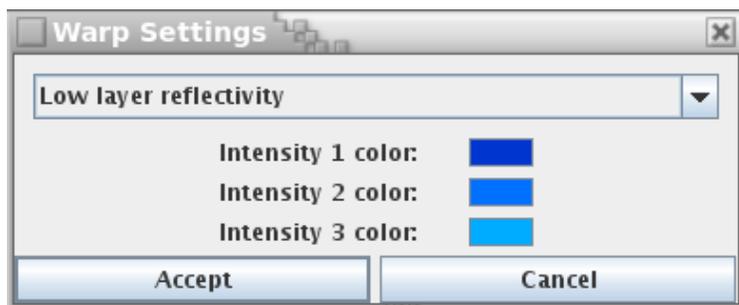


Figure 44 WARP Settings Window

The user can configure JPVD to show the following:

- *None* - Only lighting data is shown
- *Low layer reflectivity* - Show precipitation between 0 ft. to 24,000 ft.
- *Highest layer reflectivity* - Show precipitation between 24,000 ft. to 60,000 ft.
- *Composite reflectivity (optimal mosaic method)* - Show precipitation between 0 ft. to 60,000 ft. using the optimal mosaic method.
- *Composite reflectivity (maximum reflectivity method)* - Show precipitation between 0 ft. to 60,000 ft. using the maximum reflectivity method.

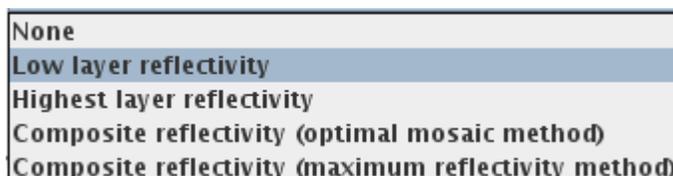


Figure 45 WARP Level Choices

4.3.9.1 Intensity Levels

The Intensity levels display the amount of precipitation. The more rain the higher the Intensity level:

- *Intensity 1* - 30 dBZ to 40 dBZ
- *Intensity 2* - 40 dBZ to 50 dBZ
- *Intensity 3* - More than 50 dBZ

JPVD does not display any precipitation below 30 dBZ.

4.3.10 Winds

This menu will display the JPVD Tool Box with the Winds Tool selected. For more information on the Winds Tool see Section 6.7 Winds.

4.4 Help Menu

This Menu allows the user to display a window that contains information about how to use JPVD.

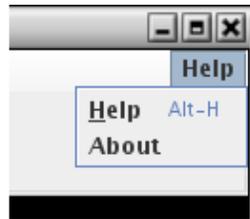


Figure 46 Help Menu

4.4.1 Help

This menu item will display a window that contains a brief explanation of how to use JPVD.

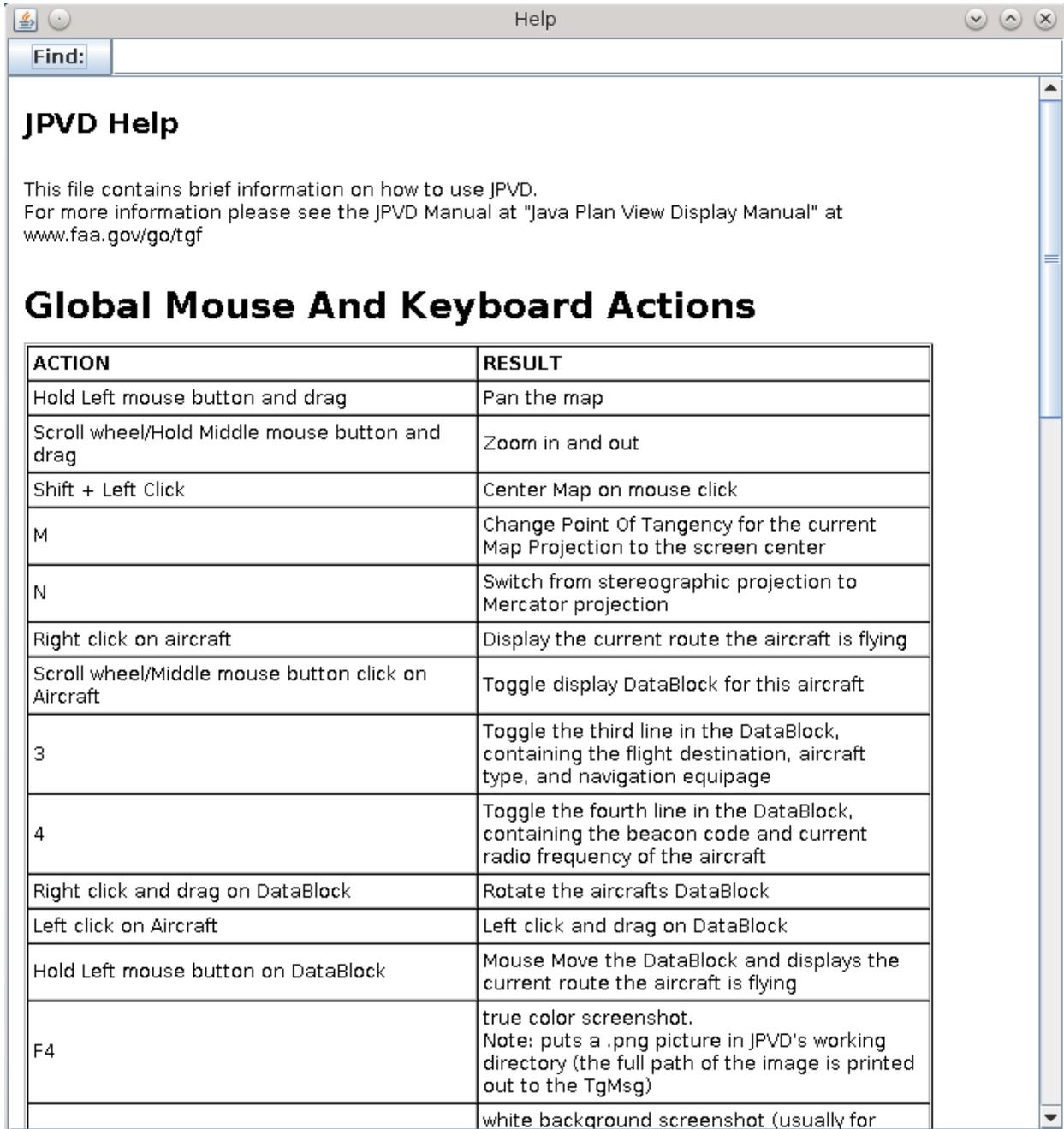


Figure 47 JPVD Help Window

4.4.2 About

This menu item will display a window that contains information about the jar file (if any) used to run JPVD. The information displayed is useful for when contacting TGF about problems with JPVD.



Figure 48 About Box

5 Tool Bar

The JPVD Tool Bar has several items on it:

1. A button to display JPVD's Tool Box (See Section 6 Tool Box for more information)
2. A button to display JPVD's Message Window (Section 7 for more information)
3. Information on the scale of the data displayed
4. Information on the rotation of the data displayed
5. Information on the current simulation time JPVD thinks it is



Figure 49 Tool Bar

6 Tool Box

If the user presses the Tool Box Button found on JPVD's Tool Bar (Section 5 Tool Bar), then a window containing various JPVD tools will be displayed.



Figure 50 Tool Box Button

The information displayed on the Tool Box Window will change depending on which of the tools is in use.

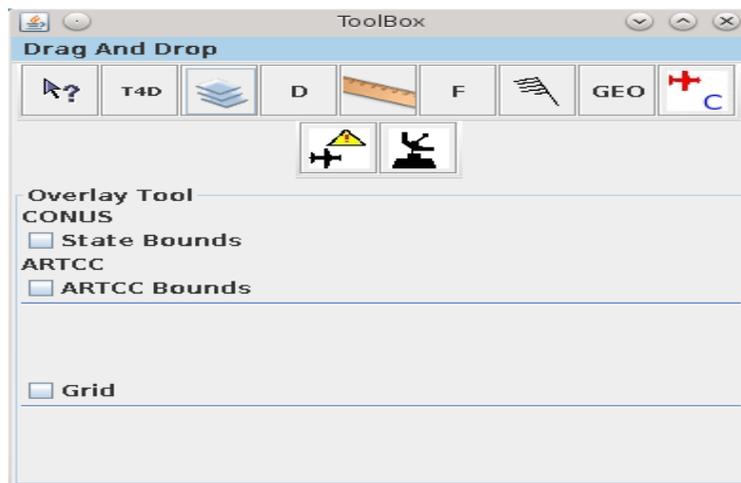


Figure 51 Tool Box Window

The buttons to access a tool are located near the top of the Tool Box Window. To use a specific Tool click on its corresponding button.

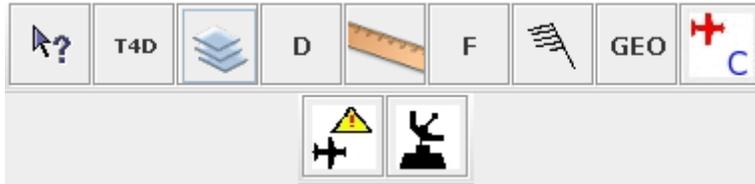


Figure 52 Tool Box Window: Tool Buttons

6.1 Cursor

To use the Cursor tool click on the Cursor button located in the Tool Box Window.

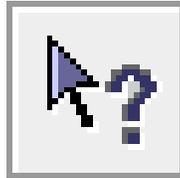


Figure 53 Cursor Button

The Cursor tool provides range and rotation sliders. In addition, this tool provides the Latitude and Longitude of the current mouse position. The “Display Center” panel displays the current Latitude and Longitude location of the point that is at the center of JPVD. To center on a Fix currently loaded into JPVD enter the name of the fix and hit enter. The “Display Tangency” panel displays the Point of Tangency that the map projection is currently using. The “Change” button changes JPVD’s Point of Tangency to the location of the point at the current center of the JPVD.

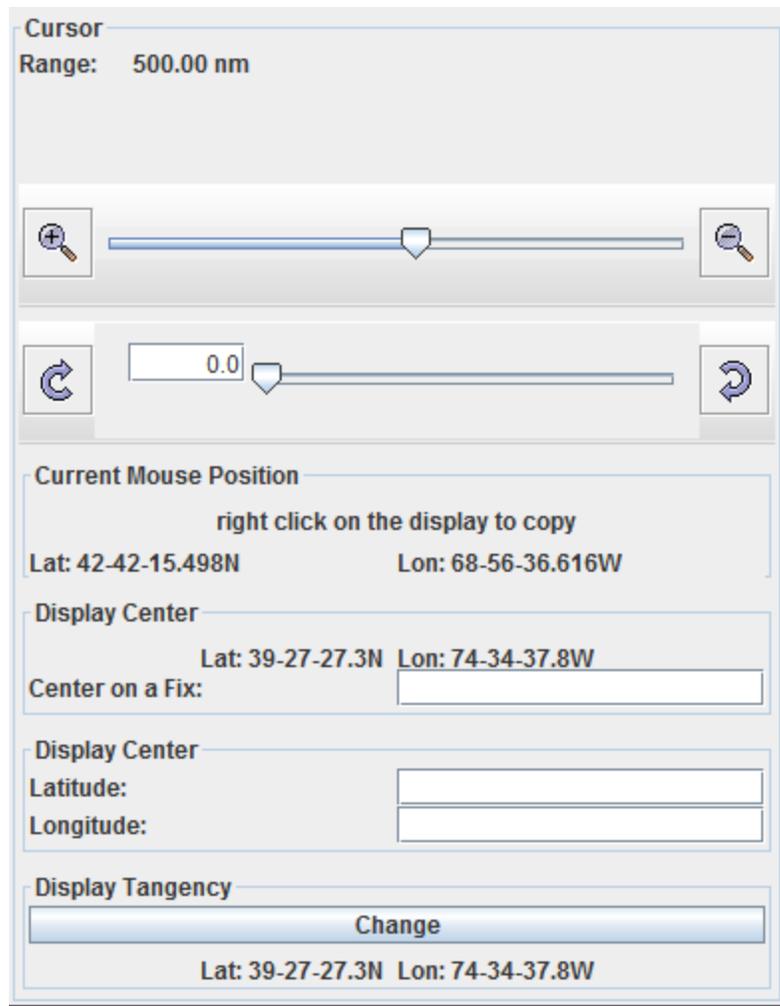


Figure 54 Cursor Tool

If the user is interested in using a particular position, then the user can right click anywhere on JPVD and it will push XML for the Point's Latitude and Longitude into the system clipboard. The text placed in the clipboard will look like example in the picture below.

```

<Latitude>32-52-55.183N</Latitude>
<Longitude>96-59-45.875W</Longitude>
<Decimals/>
<Latitude>32.881995</Latitude>
<Longitude>-96.996076</Longitude>

```

Figure 55 Clipboard Example

The Data pasted to the System Clipboard contains the Point in two formats. The first two elements are the Point's Latitude and Longitude in the standard TGF Latitude and Longitude format. The third element is a comment used to separate the two sets of

data. The last two elements are the Point's Latitude and Longitude as a degree decimal number.

6.2 Trajectories

To use the Trajectories tool click on the Trajectories button located in the Tool Box Window.



Figure 56 Trajectories Button

This tool allows the user to load/view trajectories from the following sources into JPVD:

- *T4D* – TGF simple XML position format
- *CMS* – Common Message Set data
- *Recording file* – TGF simulation recording
- *FMS* – Data from MITRE’s FMS tool
- *ASDI MySQL DB* – A database containing data extracted from ASDI data.
Please contact TGF for more information about this feature.

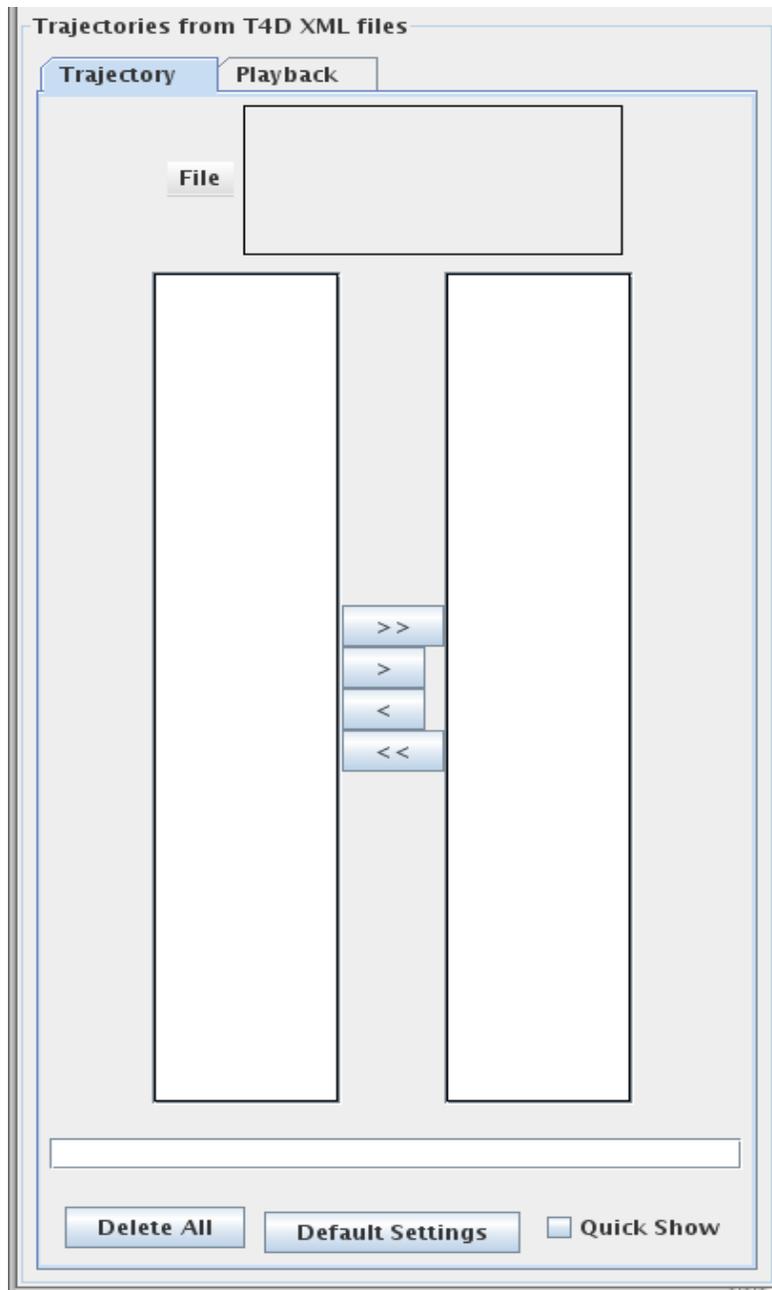


Figure 57 Trajectories Tool

The Trajectories Tool has two tabs Trajectory and Playback.

6.2.1 Trajectory Tab

The Trajectory Tab allows the user to load a file using the “File” button.

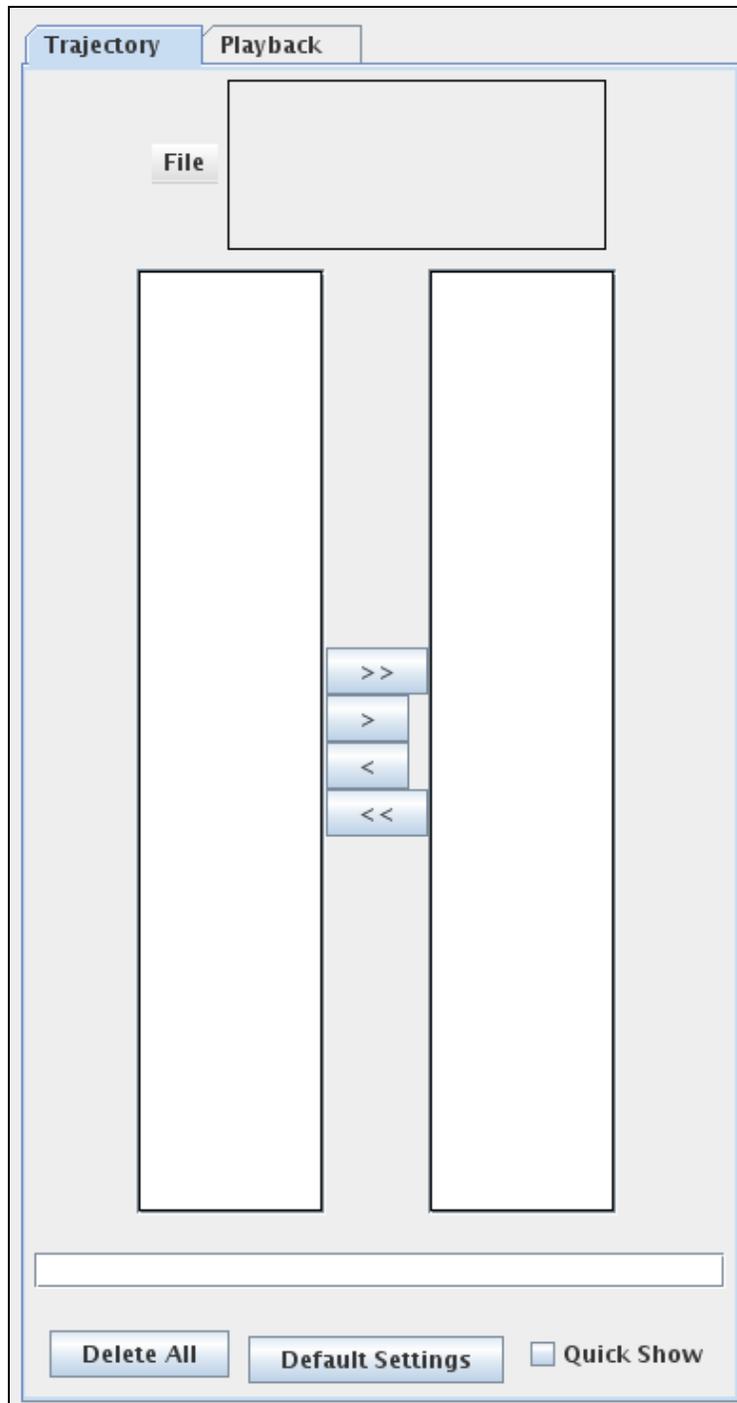
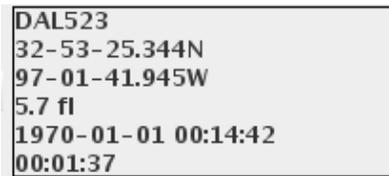


Figure 58 Trajectory Tab

Next to the “File” button is a panel that will display information about the trajectory point that the user’s mouse is currently over.



DAL523
32-53-25.344N
97-01-41.945W
5.7 fl
1970-01-01 00:14:42
00:01:37

Figure 59 Sample Trajectory Information

The rest of the Trajectory Tab works almost exactly as the Window described in Section 4.3.2 Airspace Data. The only exception is the “Delete All” button, which will clear all the trajectories currently loaded.

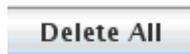


Figure 60 Delete All Button

6.2.2 Playback Tab

This tab allows the user to play the trajectories.

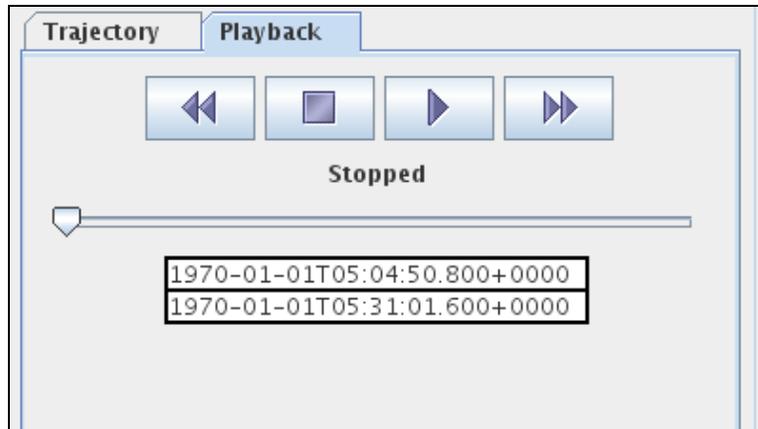


Figure 61 Playback Tab

The top part of the tab features the Time Manipulation Button Panel, which allows the user to manipulate time:

- Rewind - moves time backwards in increments of 5, 20, 60, and 300 seconds.
- Stop - stop the movement of time.
- Play - advance automatically moves time in 1-second increments.
- Fast Forward - moves time forward in increments of 5, 20, 60 and 300 seconds.



Figure 62 Time Manipulation Buttons Panel

Below the Time Manipulation Button Panel is a label that shows the current state of the clock.

Stopped

Figure 63 Current clock status

The Time Manipulation Slider allows the user to slide time back and forth.

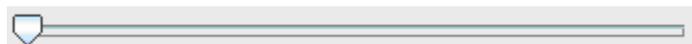


Figure 64 Time Manipulation Slider

Below the slider is the Trajectory Time Bounds Panel, which displays the minimum and maximum time found in the currently loaded trajectories.

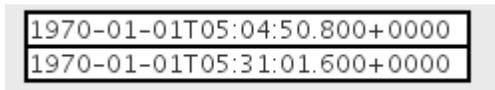


Figure 65 Trajectory Time Bounds Panel

6.3 Overlay

To use the Overlay tool click on the Overlay button located in the Tool Box Window.



Figure 66 Overlay Button

The Overlay tool allows for the display of some helpful maps in JPVD. The State Bounds and ARTCC Bounds check boxes toggle the display of the corresponding boundary maps. While the “Grid” check box activates a Latitude Longitude grid that changes granularity as the user zooms in and out.

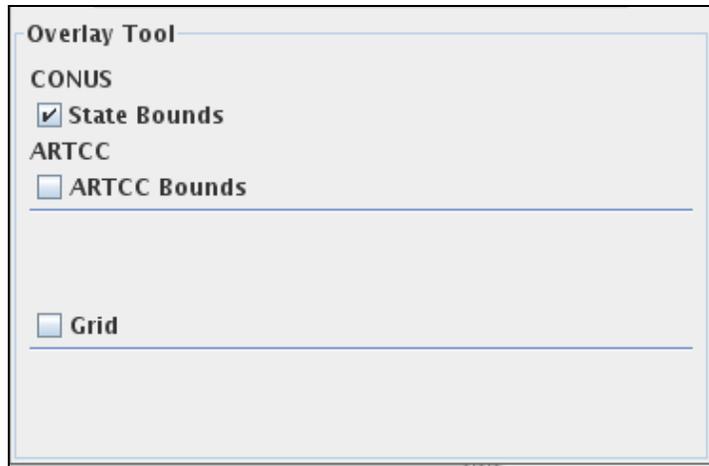


Figure 67 Overlay Tool

6.4 Drawing

To use the Drawing tool click on the Drawing button located in the Tool Box Window.

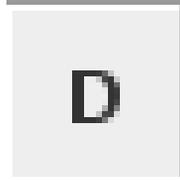


Figure 68 Drawing Button

The drawing tool allows the user to draw new shapes on JPVD. There are five drawing modes in the drawing tool, use the radio buttons to switch modes. When the user selects the drawing tool, they can immediately start drawing on the "Scratch layer" in freehand mode.

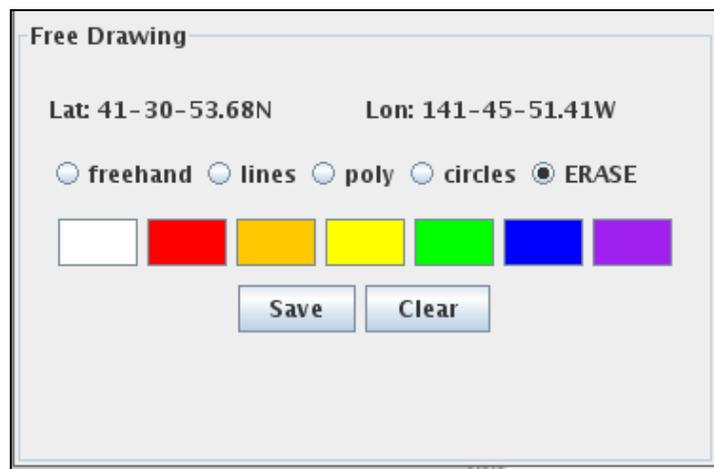


Figure 69 Draw Tool

The "Save" button will create a .jpv preference with the changes to the "Scratch layer". The "Clear" button will clear off any changes to "Scratch layer".

6.4.1 Freehand

This setting allows the user to draw freehand. Hold down the right mouse button and mouse around to draw freehand.

6.4.2 Lines

This setting allows the user to draw lines. Right click a starting point, and then right click an ending point.

6.4.3 Polygons

This setting allows the user to draw polygons. Right click to start and add more positions. When done left click the last position to finish the polygon.

6.4.4 Circles

This setting allows the user to draw circles. Right click to start a circle, then again at the radius.

6.4.5 Erase

This setting allows the user to erase lines on JPVD's Scratch Layer. The mouse cursor will change to a white square outline. Lines to be deleted will be highlighted in white, right click them to make them disappear

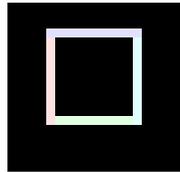


Figure 70 Erase Mouse Cursor

6.5 Ruler

To use the Ruler tool click on the Ruler button located in the Tool Box Window.



Figure 71 Ruler Button

The Ruler tool allows the user to get the distance and bearing between two points on the map. Click anywhere on JPVD to start a ruler. As the mouse moves around the tool will track mouse's movements and its relative bearing and distance to the start point. A second click locks the line in place on the screen. A third click starts the process all over again. The line will disappear if the user switches to another tool. The user can select the units to use when measuring the distance from the drop down menu at the bottom. The user can select whether to display the line drawn even if another JPVD Tool is selected via the Keep Displaying Line check box.

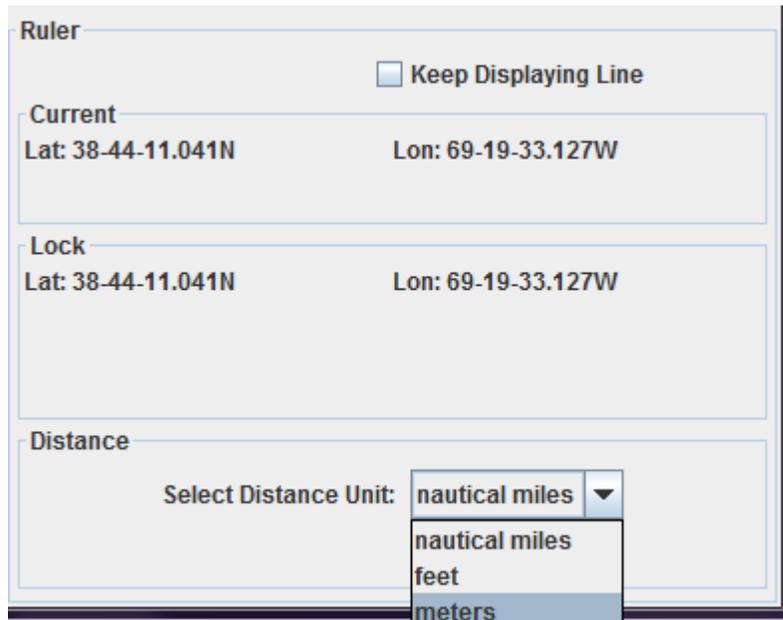


Figure 72 Ruler Tool

The text in the Latitude and Longitude areas is selectable, for copying outside of JPVD. Right clicking while a line is locked on the screen will push the line in TGF standard XML format onto the system clipboard. Below is a sample of the text placed into the clipboard.

```
<MapLine>  
  <StartPosition>  
    <Latitude>41-30-36.833N</Latitude>  
    <Longitude>077-52-50.76W</Longitude>  
  </StartPosition>  
  
  <EndPosition>  
    <Latitude>38-48-42.1N</Latitude>  
    <Longitude>072-02-32.551W</Longitude>  
  </EndPosition>  
</MapLine>
```

6.6 Track

To use the Track tool click on the Track button located in the Tool Box Window.

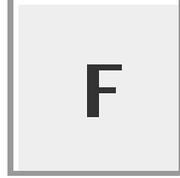


Figure 73 Track Button

This tool allows the user to follow an aircraft on JPVD by moving the center of JPVD to the aircraft's current position. To start tracking an aircraft click on the "Follow Aircraft" button and then click on the Aircraft to follow. To follow another aircraft just repeat the process. To stop tracking aircraft click on the "Stop Follow" button. Note: If an aircraft being tracked terminates, then JPVD will automatically stop tracking that aircraft. The user can choose whether JPVD should be oriented so that North or the Aircraft's current heading is up.

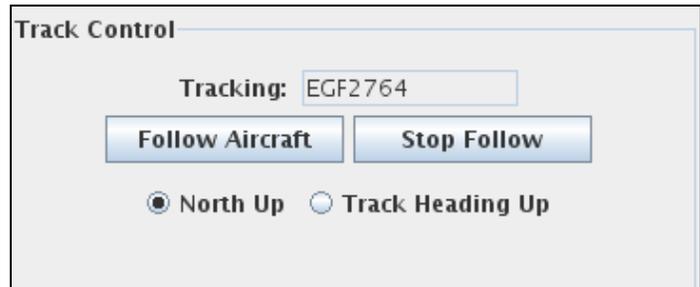


Figure 74 Track Tool

6.7 Winds

To use the Winds tool click on the Winds button located in the Tool Box Window.

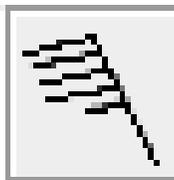


Figure 75 Winds Button

The Winds Tool allows JPVD to load any GRIB2 formatted file for displaying by clicking the “Load GRIB2” button and using the file chooser. Once the Wind data is loaded into JPVD the user can choose whether to display the data using the “Display Wind” box. If the box is checked, then the barbs representing the wind are displayed. Since, the wind data may change depending on the altitude the user can change the altitude displayed by using the slider bar. The slider bar altitude is in hundreds of feet. To apply the change to the altitude slider click on the “Change” button.

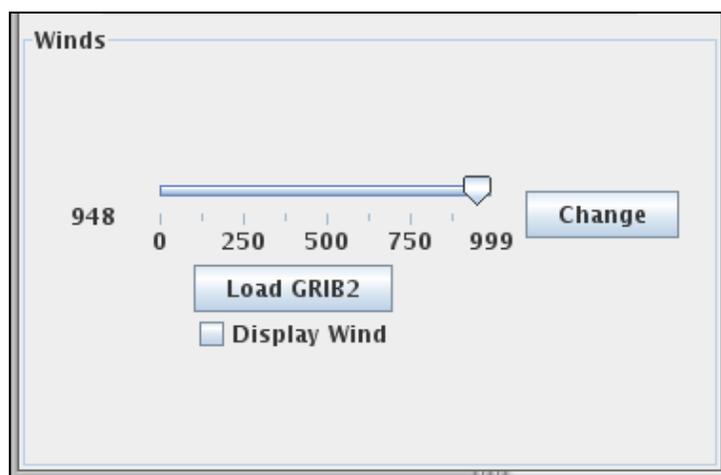


Figure 76 Winds Tool

Below is a sample of what the GRIB2 Winds look like in JPVD.



Figure 77 Sample GRIB2 Winds

6.8 GeoSector Filter

To use the GeoSector Filter tool click on the GeoSector Filter button located in the Tool Box Window.



Figure 78 GeoSector Filter Button

The GeoSector Filter tool allows the user to see how many aircraft are in a Geographical Sector (GeoSector) over a given period of time.

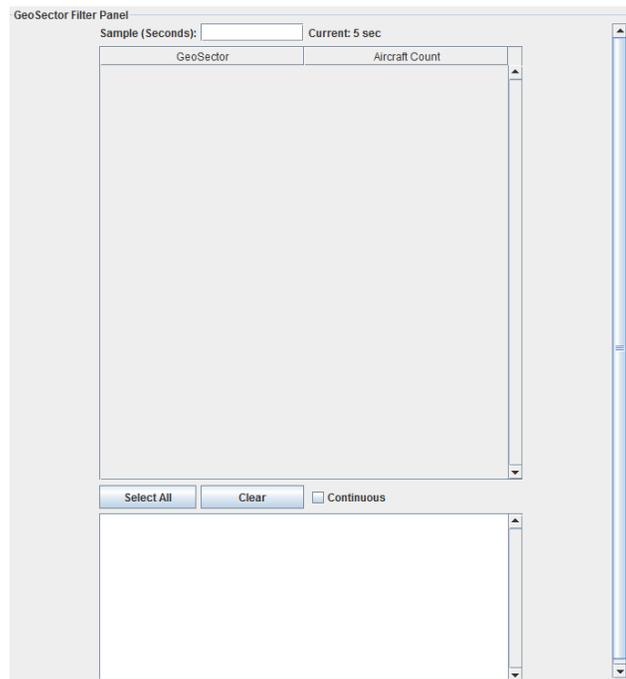


Figure 79 GeoSector Filter Tool

The GeoSectors that are in the load Airspace data are displayed at the bottom of the Tool. If a GeoSector has corresponding TGF Sector, then the TGF Sector's name is displayed. Otherwise, the GeoSector's Id and Facility (if available) is displayed. To select a GeoSector to generate data for click on the check box next the Sector's Id/Facility/Name.



Figure 80 GeoSector Selection List

The Sample Duration Panel allows the user to set often the period of time to count Aircraft.



Figure 81 Sample Duration Panel

Below is sample data for the GeoSector Filter

GeoSector	Aircraft Count
001	0
002	0
007	0
008	0
009	0
015	0
019	0
01A	0
01N	2
01S	0
01T	11
020	0
022	0
023	0
024	0
025	0
026	0
027	0
028	0
029	0
030	0
032	0
034	0
035	0
036	0
037	0
038	0

Figure 82 Sample Data Table

To quickly select all GeoSector, click on the Select All button.

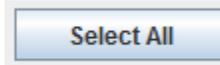


Figure 83 Select All

Click the Clear button to clear out information displayed.



Figure 84 Clear Button

If the user wishes to continue counting Aircraft in a GeoSector even when other JPVD Tools are selected, then the user should check the Continuous check box. When the Continuous check box is not selected, then when the user selects another JPVD tool the GeoSector Filter will stop counting Aircraft, until the user selects the GeoSector Filter again.



Figure 85 Continuous Button

6.9 Color Aircraft DataBlock

To use the Color Aircraft DataBlock tool click on the Color Aircraft DataBlock button located in the Tool Box Window.

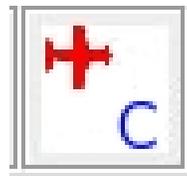


Figure 86 Color Aircraft DataBlock Button

The Color Aircraft DataBlock tool allows for the coloring of DataBlocks within an PVD on a per-aircraft basis. The Tool can also save out these color files to be used later in conjunction with TGF's SimPilot Workstations (SPWs) in order to highlight particular aircraft of interest in a simulation.

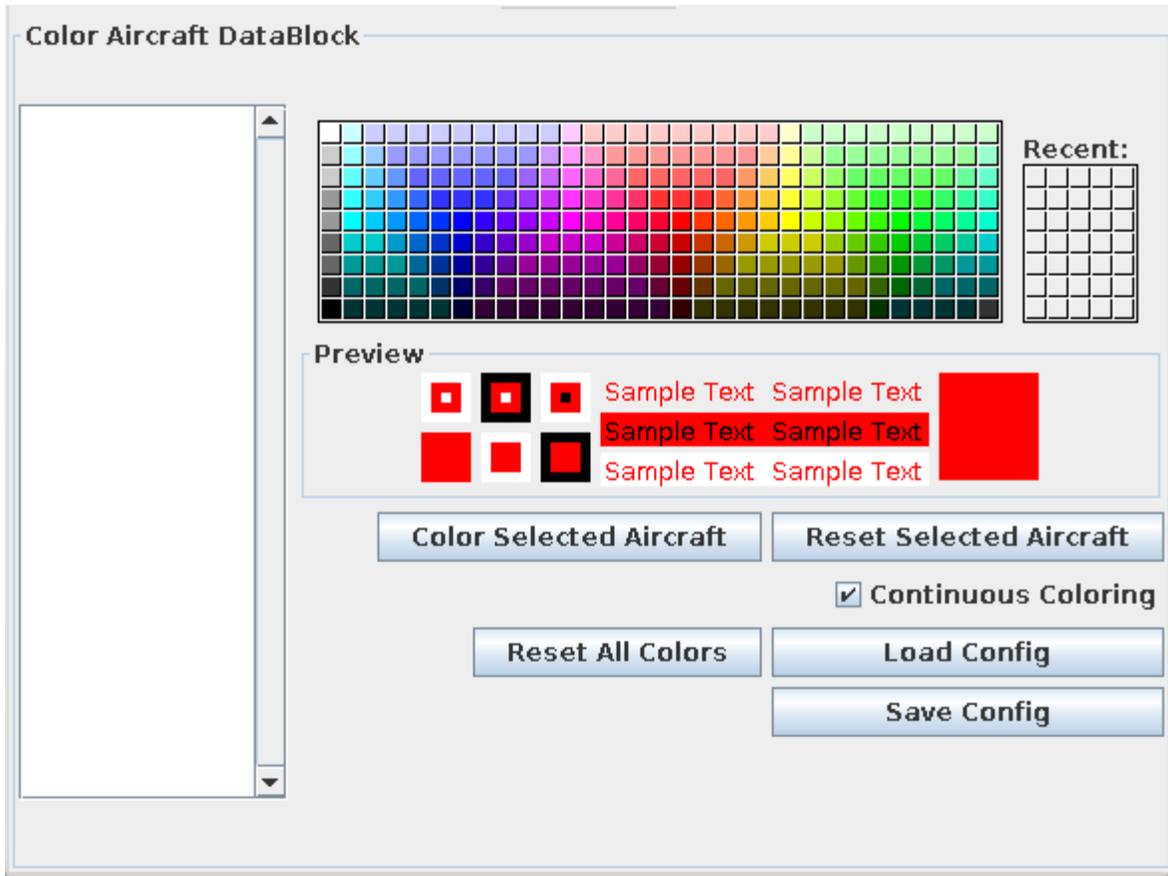


Figure 87 Color Aircraft DataBlock Tool

To change the color a Target's DataBlock will appear select the Target in the list on the left side of the window. Note: Only Targets for which JPVD is receiving updates will appear in the List of Targets.



Figure 88 List of Targets

Then select the color to display the Target's DataBlock in and click on the Color Selected Aircraft button.



Figure 89 Color Selected Aircraft Button

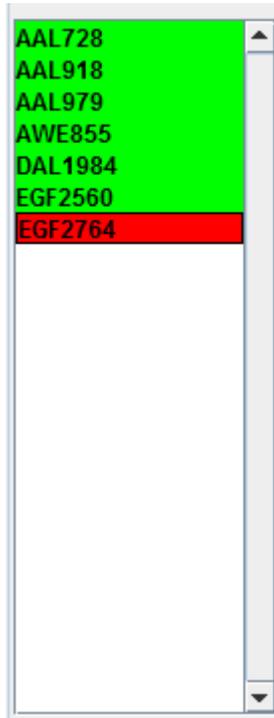


Figure 90 Sample of Target where color was changed.

If the user wishes to continue the Color Setting even when other JPVD Tools are selected, then the user should check the Continuous Coloring button. . When the Continuous check box is not selected, then when the user specified DataBlock coloring will stop, until the user selects the Tool again.



Figure 91 Continuous Coloring Check Box

To reset the selected Target's DataBlock then click on the Reset Selected Aircraft button.

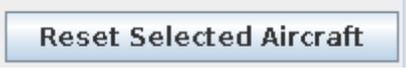


Figure 92 Reset Selected Aircraft Button

To reset the coloring of all DataBlocks then click on the Reset All Colors button.



Figure 93 Reset All Colors Button

To load a preexisting DataBlock coloring configuration file click on the Load Config button and select the desired file to load.



Figure 94 Load Config Button

To save the DataBlock coloring configuration click on the Save Config button and select where to the data to.



Figure 95 Save Config Button

6.10 Real Time Conflict

To use the Real Time Conflict tool click on the Real Time Conflict button located in the Tool Box Window.



Figure 96 Real Time Conflict Button

The Real Time Conflict tool provides visual cues as to when separation violations occur. This tool allows for the tracking of any number of Aircraft and allows for specification of how far apart Aircraft must be horizontally as well as vertically on a per Aircraft basis. Aircraft that are in conflict with tracked Aircraft are highlighted in a user specified color on the PVD for easy acquisition of violations. Tracked Aircraft will have a circle drawn around them based on their conflict radius to allow for easy visualization of where conflict boundaries are.

Realtime Conflict

Select Aircraft: ▼

Bracket Altitude (Ft):
+/-

Radius(nm)

Select Color

Add Aircraft

Update Rate(Sec): ▼

Acid	Radius(nm)	Color	Altitude(+/-ft)

Always Highlight

Clear Aircraft

Figure 97 Real Time Conflict Tool

The following are steps to add an Aircraft to track for conflicts:

1. Select the Aircraft's Id in the Combo Box
2. If the user wishes to look at other Aircraft in relation to their Altitude to the selected Aircraft's Altitude, then the user should check the Bracket Altitude checkbox and enter in the desired Altitude.
3. Set how close an Aircraft must be for a conflict to occur.
4. Select the color to display Conflict in.
5. Click the Add Aircraft Button.

Repeat the above steps to track additional Aircraft.



Figure 98 Selected Aircraft Before Add

The Update Rate Panel is used to determine how often Conflict information should be updated.



Figure 99 Update Rate Panel

Once an Aircraft is added the user can the radius, color, and altitude of what is a Conflict by clicking on the item and entering in a new value.

Acid	Radius(nm)	Color	Altitude(+/-ft)
USA7807	5.0		

Figure 100 Added Aircraft

The radius of area to watch for Conflicts is highlights by a circle. If a Conflict occurs, then the Conflict Aircraft's DataBlock will turn the selected color.

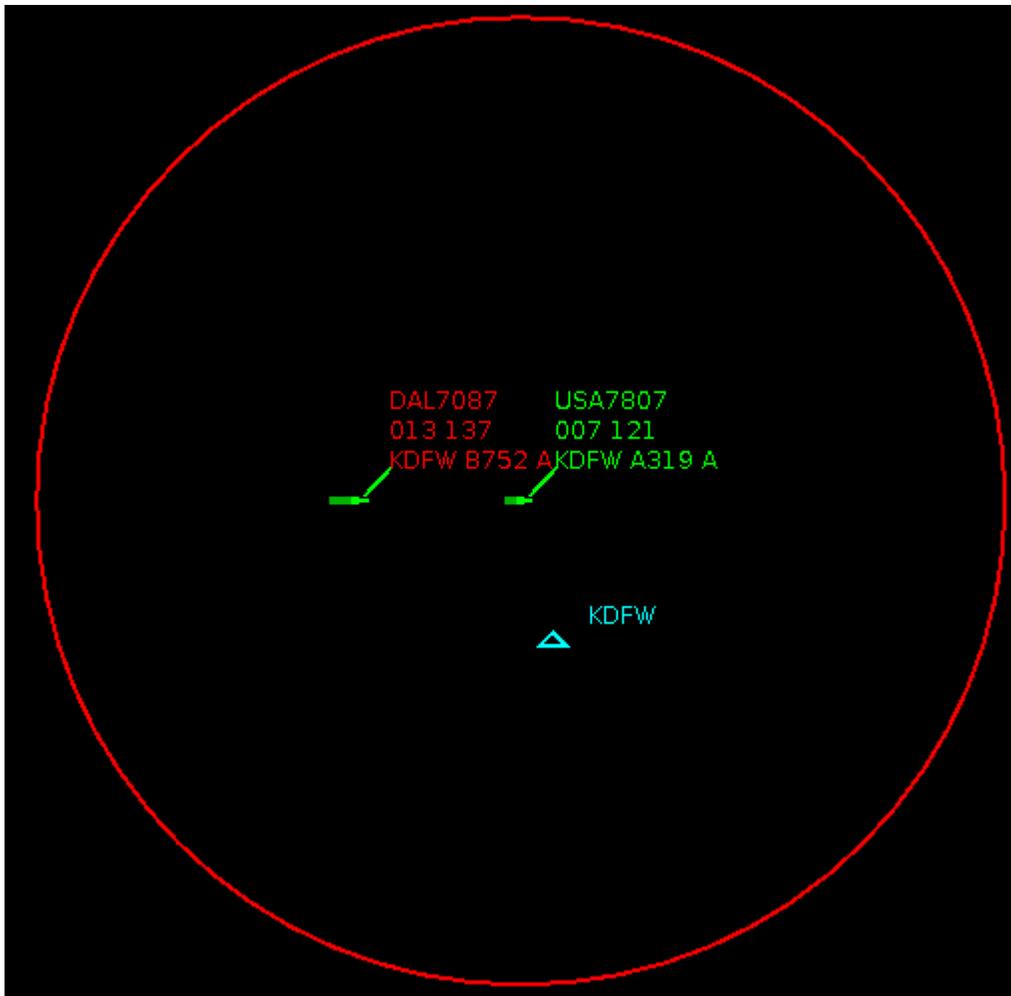


Figure 101 Conflict Alert

The Always Highlight check box is used to specify whether to continue highlighting conflicts even when the user has elected to look at another Tool in JPVD. . When the Always Highlight check box is not selected, then when the user selects another JPVD tool the Conflict Probe will stop, until the user selects the Tool again.



Figure 102 Always Highlight Check Box

To remove a Conflict Probe right click on the row and click on the Remove Row Menu.



Figure 103 Remove Row Menu

The Clear Aircraft button will clear all Conflict probes.

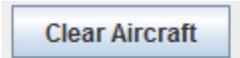


Figure 104 Clear Aircraft Button

6.11 Emulated Radar

To use the Emulated Radar tool click on the Emulated Radar button located in the Tool Box Window.

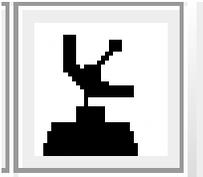


Figure 105 Emulated Radar Button

The Emulated Radar tool allows users to select any number of Fixes and Airports to use as emulated radars for aircraft highlighting. This plugin is good for scenario development where the user needs to make sure certain Aircraft are in range of certain radar locations, or perhaps just close enough to a desired Fix/Airport at a given time. Aircraft that are within the user specified distance and altitudes will have their DataBlocks highlighted the user specified color.

Emulated Radar

Point Selection Type
 Fix Airport

Name: N/A
 ICAO: N/A
 Type: N/A

Altitude Levels:
 Min(FL): 000 Max(FL): 999

Range(nm): 64

Select Color

Add Point

Update Rate(Sec): 1

Name	Radius	Color	Min FL	Max FL

Always Highlight Clear Points

Figure 106 Emulated Radar Tool

The following are steps to add an Emulated Radar:

1. Select the type of point the Emulated Radar will be based around.
2. Then click on the point in the PVD Window/Tab to make the Emulated Radar. The Emulated Radar Tool will display information about the point.
3. Set any Minimum and Maximum Altitude Flight Levels for the Emulated Radar.
4. Set the Nautical Mile Range of the Radar.
5. Select the color to display the DataBlock Tag of targets in the Emulated Radar's range and altitude limits.
6. Click on Add Point button to add the Emulated Radar.

Simply repeat the above steps to add additional Emulated Radars.

Point Selection Type

Fix Airport

Name: HURBS
 ICAO: N/A
 Type: SIMFIX

Altitude Levels:

Min{FL}: 000 Max{FL}: 999

Range{nm}: 64

Select Color

Add Point

Figure 107 Selected Point

The user can change the radius, color, and altitude boundaries by clicking on the item and entering in a new value.

Name	Radius	Color	Min FL	Max FL
FAXOS	64.0			

Figure 108 Added Emulated Radar

The Always Highlight checkbox is used to specify whether to continue highlighting the Emulated Radar information even when the user has elected to look at another Tool in JPVD. When the Always Highlight check box is not selected, then when the user

selects another JPVD tool the Emulated Radar will stop, until the user selects the Tool again.



Figure 109 Always Highlight Check Box

To remove an Emulated Radar right click on the row and click on the Remove Row Menu.



Figure 110 Remove Row Menu

To clear out all the Emulated Radars click on the Clear Points button.



Figure 111 Clear Points Button

7 Message Window

If the user presses the Message Button found on JPVD's Tool Bar (Section 5 Tool Bar), then a message window for JPVD will be displayed.



Figure 112 Message Button

The Message Window displays any of the following log messages that JPVD receives:

1. Debug - Log message used by TGF to debug JPVD. Most times these types of messages are disabled.
2. Info - Log message used to provide useful information to the user. For example, JPVD loaded an Airspace data file.
3. Warning - Log message used to warn the user that something occurred. For example, JPVD was unable to find a specified Airspace data file.
4. Error - Log message used to notify the user that something bad has happened. For example, JPVD attempted to load an Airspace data file that had incorrectly formatted data in it.

Please see the "Target Generation Facility (TGF) User's Manual" at www.faa.gov/go/tgf for more information on the Message Window.

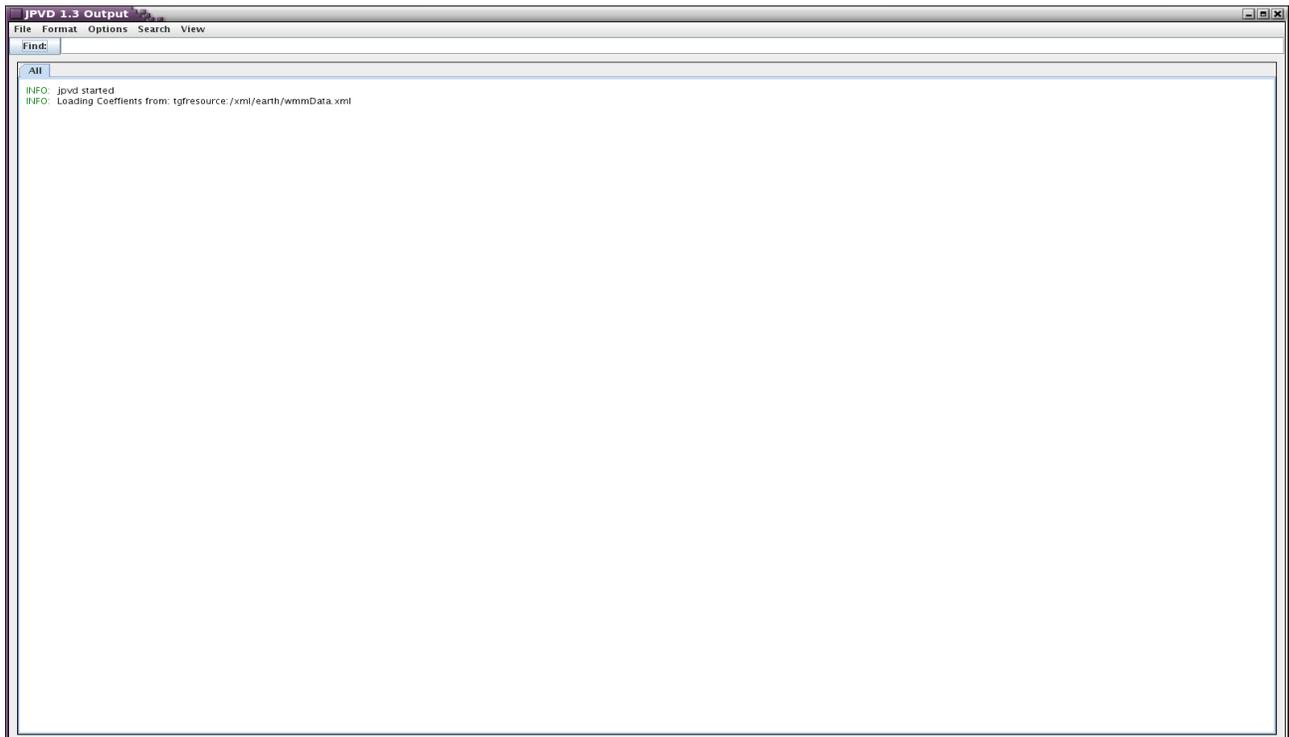


Figure 113 Message Window

8 DataBlocks

A Track in JPVD includes Aircraft and Ground Vehicles. All Tracks in JPVD have a DataBlock, which is used to display information about a Track.



Figure 114 Sample DataBlock

A DataBlock contains several lines of data. The following is a description of the information each line contains:

1. Line one of the DataBlock contains the Track's identifier or call sign.
2. Line two of the DataBlock contains the Track's current Mean Sea Level Altitude in hundreds of feet and the Track's Ground Speed in Knots.
3. Line three of the DataBlock contains the Track's Destination Fix, Track's Aircraft, or Vehicle Type, Equipment Code. If the Track is Data Comm equipped, then the letter D will appear after the Track's Equipment Code.
4. Line four of the DataBlock contains the Track's current Beacon Code and the Track's current Frequency.

Line three and four of the DataBlock can be optionally displayed. See Section 4.3.4 Tracks or Section 10 Common Mouse and Keyboard Actions for more information on how to turn on and off these lines.



Figure 115 Sample Track DataBlock with History Trail

If a Track is being filtered for some reason, then just a dot with any specified leader line/history trails will appear for the Track. See Section 4.3.4 Tracks for more information on how to filter Tracks.

An individual Track's DataBlock can be manipulated by either clicking on it with the mouse's middle button to turn on/off the DataBlock, or by clicking on it with the mouse's right button to move the DataBlock around.

9 Screenshot

JPVD provides two screenshot screen modes, both modes place a .png picture in the directory JPVD is running out of currently. The full path of the image is printed out to the Message Window (Section 7) and to a pop up window.



Figure 116 Screenshot Location Message

9.1 True Color Screenshot

Press F4 to get a true color screenshot of the current PVD.

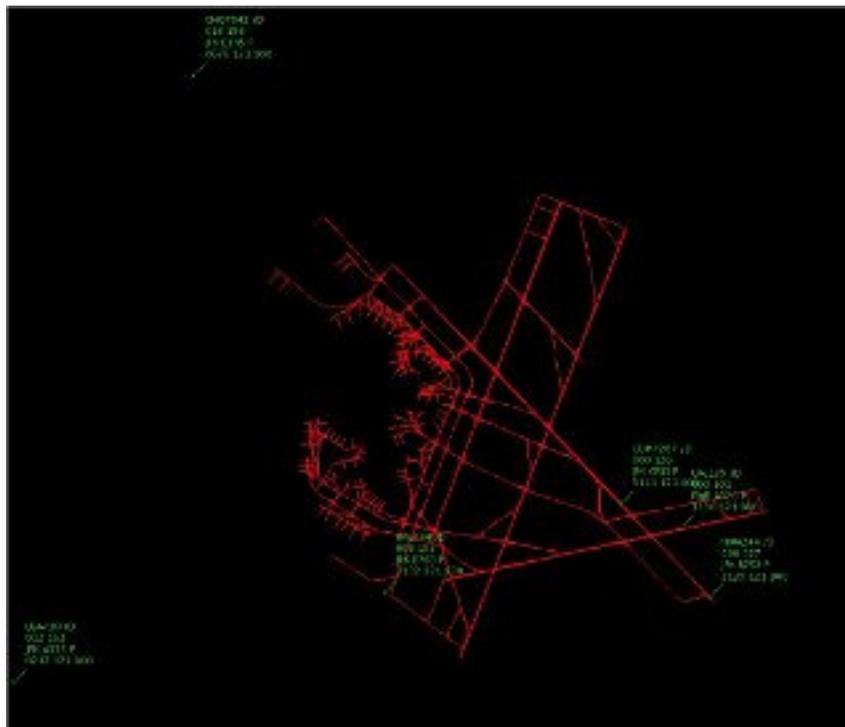


Figure 117 True Color Screenshot of PVD

10 Common Mouse and Keyboard Actions

The table below contains information on how use the Keyboard and Mouse works for most JPVD tools. Tool specific mouse and keyboard controls can be found in the Section 6 Tool Box.

ACTION	RESULT
3	Toggle the third line in the DataBlock. See Section 8 DataBlocks for more information.
4	Toggle the fourth line in the DataBlock. See Section 8 DataBlocks for more information.
F4	True Color Screenshot Note: Places a .png picture in JPVD's working directory and notifies user via pop window of the full path the image.
F5	White Background Screenshot (usually for printing) Note: Places a .png picture in JPVD's working directory and notifies user via pop window of the full path the image.
Hold Left mouse button and drag	Pan the map
Left click and drag on DataBlock	Changes the DataBlock's distance from a target.
M	If the current projection is Mercator, switches to stereographic. Then change Point Of Tangency for the current map projection to the screen center.
N	Switch from stereographic projection to Mercator projection
Right click and drag on Aircraft	Rotate the Aircraft's DataBlock
Right click on aircraft	Display the current Route the Aircraft is flying
Scroll wheel/Hold Middle mouse button and drag	Zoom in and out
Scroll Wheel/Middle mouse button click on Aircraft	Toggle display DataBlock for this Aircraft
Shift + Left Click	Center Map on mouse click

11 Command Line Options

JPVD can be started from a command terminal. To run JPVD type in “java -Xmx1000M -cp <full path and file name of TGF jar> faa.tg.jpvd.Jpvd” in a command line terminal for example “java -Xmx1000M -cp /tgf/lib/tgf.jar faa.tg.jpvd.Jpvd”.

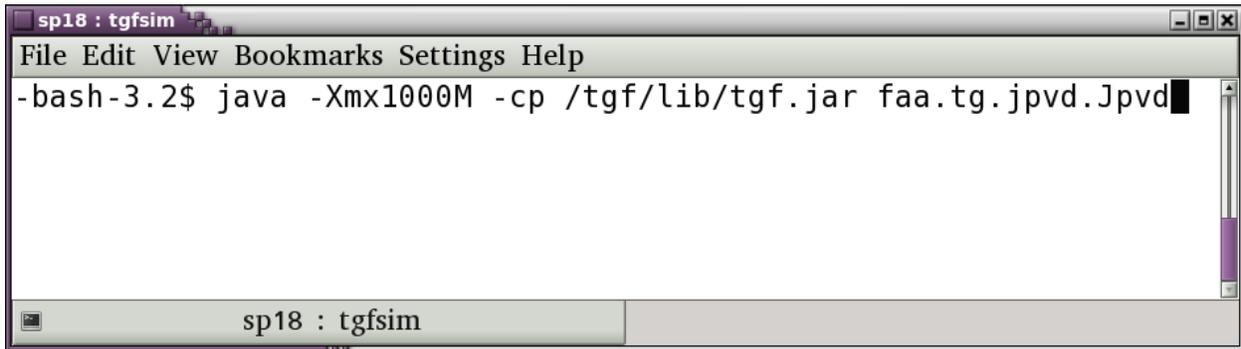


Figure 119 Sample Command Line

There are several optional command line arguments that can be used when starting JPVD, below is a table that contains information on both the short and long form of these various command line arguments. In addition, a short description of each set of command line arguments is provided.

Short Form	Long Form	Description
-c	--comm	Load given communication File. This option can be overwritten by other command line options.
-d	--dis	If present, then JPVD will be configured to listen to DIS Broadcast information.
-f	--filechooser	JPVD will display a window so that the user can select a TGF Scenario Properties file to load.
-j	--jpvd	Load given XML JPVD preferences file.
-m	--multicast_addr	A Multicast IP Address for listening to TGF Aircraft data on.
-o	--offset	The offset to transmit and receive data on.
-p	--properties	TGF Scenario Properties File to load
-sf	--specifiedfilechooser	JPVD will display a window so that the user can select an Airspace directory to load.
-sv	--ecgp-server	For ECGP Connections only, a colon separated ip_address:port is specified to receive the UDP unicast data. See Section 4.2 Comm Settings for more information.

Short Form	Long Form	Description
-wm	--WARP-multicast	<site>:<host>:<port> JPVD will connect to the specified group and port for WARP data
-wt	--WARP-tcpip	<site>:<host>:<port> JPVD will connect using TCP to the specified host and port for WARP data.
-X:g	--X:gui	Use a Graphical User Interface (GUI) to get command line options. Tries to use values stored in XML (if any) to fill in GUI.
-X:h	--X:help	Print command line arguments out the command terminal and exit.
-X:v	--X:version	Print version information out to the command terminal and exit.
-X:x	--X:xml	Use an XML file to fill in command line options. Either the given commandLine.XML file or if no file is specified with this option, then the default file used is /home/commandLineXml/faa.tg.jpvd.Jpvd_commandLine.XML.