航空氣象現代化系統
The Advanced Operational Aviation Weather System (AOAWS)

多元化氣象產品顯示系統 (JAVA 版)
使用者手冊
ADVANCED JAVA-BASED MULTI-DIMENSIONAL DISPLAY SYSTEM (JMDS)
Users Manual

交通部民用航空局

Civil Aeronautics Administration (CAA)

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1 目的及其涵蓋之範圍 (Purpose and Scope)

多元化氣象產品顯示系統(Java 版) Advanced Java-based Multi-dimensional Display System (以下簡稱本系統、JMDS) 為民航局「航空氣象現代化計畫」的成果之一，其主要的目的為將氣象資料以較淺顯易懂的方式展現，以利航空相關單位應用於日常作業中。允許民航局外界或內部的使用者，只要有網路連線即可利用 JMDS 上網查 AOAWS 系統的氣象資訊。

The Advanced Java-based Multi-dimensional Display System (JMDS) is a deliverable of the Advanced Operational Aviation Weather System (AOAWS) Project for the Civil Aeronautics Administration (CAA). The goal of the system is to present weather information in an easier-to-understand fashion for use by the aviation community on a daily operational basis. The JMDS allows users with internet access to view weather information provided by the AOAWS system both inside and outside of the CAA.

JMDS 顯示的氣象產品分為即時觀測資料與預報資料兩大類:
即時觀測資料包括 MTSAT 衛星雲圖、氣象局雷達合成圖與來自桃園國際機場雷達之資料、機場地面觀測資料、空中報告資料等。
預報資料包括風場、温度場、結冰高度、相對濕度、亂流、積冰與 TITAN 系統之雷雨追蹤等。

The JMDS weather products include the following types:
Real time data: MTSAT satellite data, Meteosat satellite data, Radar mosaic from the Central Weather Bureau and Radar data from Tao-Yuan International Airport, Airport surface observational data, and aircraft reports.
Forecast data: winds, temperature, freezing level, relative humidity, turbulence, icing and TITAN Storm Tracks.

JMDS 同時具有將有用的相關資訊套疊一起 (如地形圖、助導航設施分佈圖、預報風場、及觀測資料同時顯示在同一個產品上) 的功能，以利決策支援的應用。

The JMDS also has the capability of overlaying data (such as displaying a terrain map, airport navigation sites/points, forecast winds, and observational data) over a selected product, which can be utilized to support decision-making analysis.

JMDS 以圖形及文字資料表現三維及四維的氣象產品，除可依據飛航空層觀看三維的資料外，也可根據設定的航路查看垂直剖面圖。另外也具有動畫的功能。

The JMDS uses graphics and text to display 3-dimensional and 4-dimensional weather products. It can show 3-D data by the flight level. It can also display vertical cross sections for a selected flight route. In addition, it has a movie feature.

JMDS 已安裝在航空氣象服務網，其網址為 http://aoaws.caa.gov.tw/htdocs/projects/aoaws/jmds/。

The JMDS is installed on the AOAWS web site and can be accessed from http://aoaws.caa.gov.tw/htdocs/projects/aoaws/jmds/.

本手冊的目的為說明 JMDS 各項功能的概觀及操作方式，以作為使用者在操作本系統之參考。請參照本手冊目錄以便查閱各章節之要點。

This document is intended to provide the user with an overview of the functionality of the JMDS. It also provides some operational illustrations for users. Please see the Table of Contents for the key topics of each chapter.

2 JMDS 硬體環境 (JMDS Hardware Environment)

JMDS 的硬體需求規格包含 1024*768 解析度之繪圖卡及螢幕，1GB 的記憶體及 25MB 硬碟空間用來安裝 JMDS 程式。傳送 JMDS 顯示的氣象產品需要至少 256 Kbps 的網路頻寬。

The JMDS hardware requirements are at minimum 1024*768 resolution graphic cards and monitor, 1GB of memory, and 25MB of hard drive space for installing JMDS software. Minimum bandwidth of 256Kbps is required to transfer the JMDS weather products.

3 JMDS 軟體環境 (JMDS Software Environment)

JMDS 需要 Java 7.0 或以上之版本。Java 可由 http://java.com 下載。Java 可在各主要電腦作業系統上安裝，包含最新版本的 Windows、Linux 及 MacOS X。

The JMDS requires Java 7 or newer to run. Java can be downloaded from http://java.com. Java can be installed on nearly all major operating systems, including recent versions of Windows, Linux, and MacOS X.

JMDS 必須透過網路來擷取資料。若上網需使用代理伺服器，則須在 Java 控制台的網路設定中設定使用代理伺服器。Java 一般會依據瀏覽器的設定來自動裝配其網路設定，但是如果遭到網路上的問題時就可能須要更改網路設定。

The JMDS must be able to access the network to gather data. If a proxy server is used for internet access, the proxy server must be configured in the Network portion of the Java Control Panel. Java will often automatically configure its network settings based on browser settings, but if network problems are encountered the Network settings may need to be changed.

4 JMDS 操作說明 (JMDS Operational Guide)

當第一次使用時，JMDS 會顯示一個視窗詢問你是否要執行 JMDS。這個視窗將會指出 JMDS 已經通過認證為來自可信任的來源。點選”執行(Run)”後，會顯示下載 JMDS 應用程式之程序，JMDS 應用程式會被下載及執行。

When the JMDS is first started, a window shows asking whether you want to run the JMDS. This window should indicate that the JMDS has been verified as being from a trusted source. Click “Run”, after which a window showing application download progress is shown. The JMDS application will be downloaded and started.

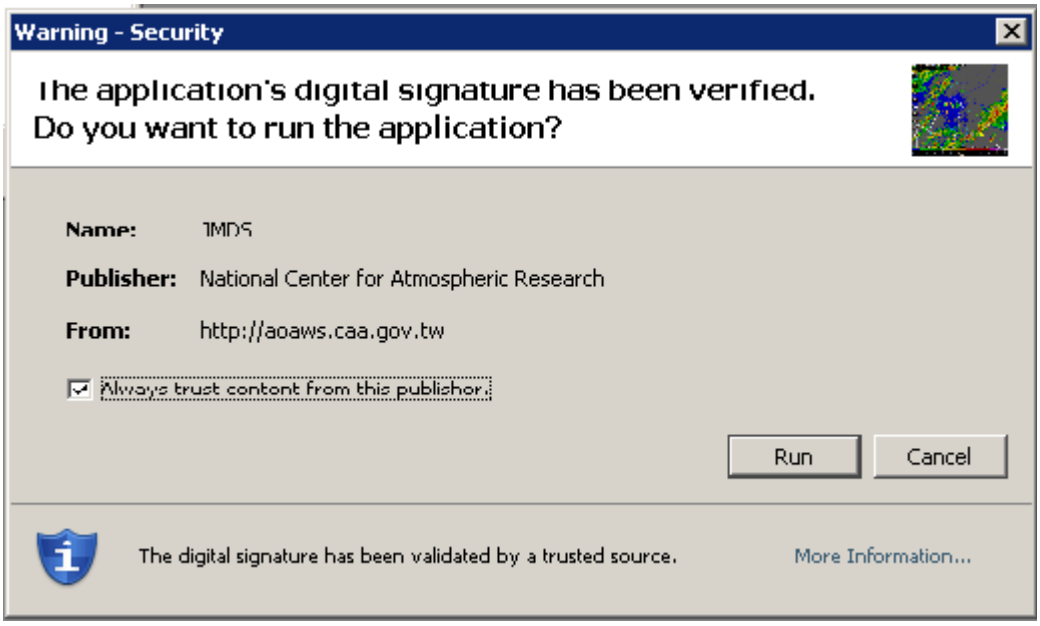


Fig. 4.0-1: Window asking permission to run the JMDS

圖 4.0-1: 詢問是否要執行 JMDS 視窗

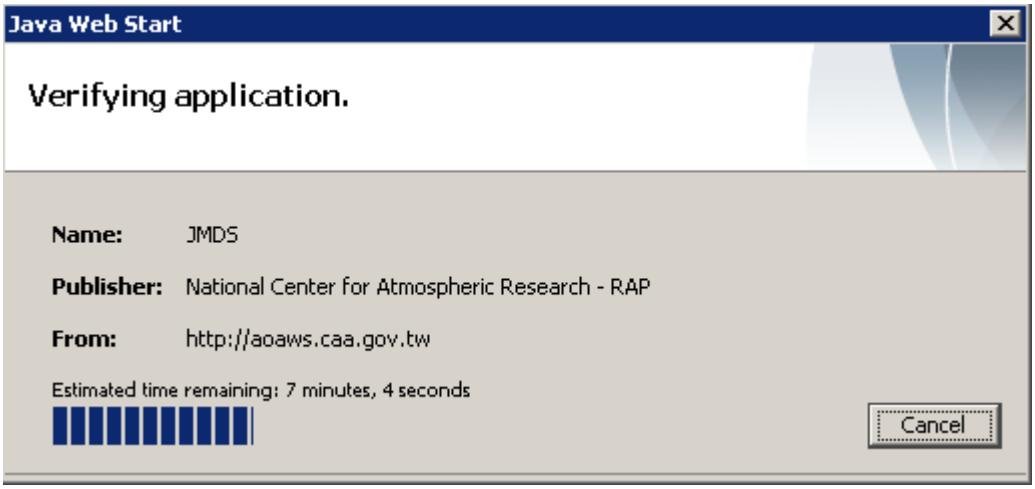


Fig. 4.0-2: Verifying application window

圖 4.0-2: 認證視窗

4.1 JMDS 概論 (JMDS Overview)

4.1.1 資料顯示 (Data Display)

JMDS 中央矩形區域是用來顯示所有產品及包含狀態資訊的地圖。其細節可參閱 4.14 節。

The large rectangular area in the center of the JMDS is used for data display and shows all visible products and maps with status information. Details on this can be found in Section 4.14 JMDS– the Main Display.

4.1.2 選單(Menus)

選單提供存取設定值及顯示選項。JMDS 目前設定值可被儲存，現行之產品、地圖和顯示區域等皆可透過設定調整。其細節可參閱 4.2 節。

The menus give access to configuration and display options. A JMDS configuration can be loaded, the currently visible products and maps may be changed, the current view area may be changed, and so on. Details of how to use the menus are described in Section 4.2 The JMDS menus.

4.1.3 工具列(Toolbar)

工具列包含許多按鈕。這些按鈕可被用來顯示和隱藏視窗、改變顯示區域和檢視顯示資料之詳細數據。其細節可參閱 4.3 節。

The toolbar includes a number of buttons. Some of these are used for showing and hiding windows, and some are used for inspecting and measuring detailed information in the data display. Details on this can be found in Section 4.3 The JMDS toolbar.

4.1.4 飛航空層刻度(Flight Level Scale)

飛航空層刻度用來選擇目前顯示產品所在之飛航空層。並不是所有的產品都有飛航空層刻度，無飛航空層供選擇的產品只會顯示 2D 的資料。飛航空層刻度其細節可參閱 4.4 節。

The flight level scale is used to select the flight level of the currently-displayed products. Not all products have flight levels, in which case this area will show “2D” to indicate that flight level selection is not available. The flight level scale is described in detail in Section 4.4 Flight Level Scale.

4.1.5 色階顯示 (Color Scale Display)

色階元件會顯示目前顯示產品之色階 (如相對溼度之色階)。其細節可參閱 4.5 節。

The color scale display shows the color scale for the currently-displayed product (such as the color mapping for Humidity). Details on this can be found in detail in Section 4.5 The Color Scale Display.

4.1.6 時間及動畫控制卷軸 (Time and Animation)

時間及動畫元件顯示目前的時間設定，此設定允許改變目前時間和動畫起訖時間。其細節可參閱 4.6 節。

The time and animation component displays the current time settings, allows for time changes, and for the starting and stopping of animation. Details on this can be found in Section 4.6 Time and Animation.

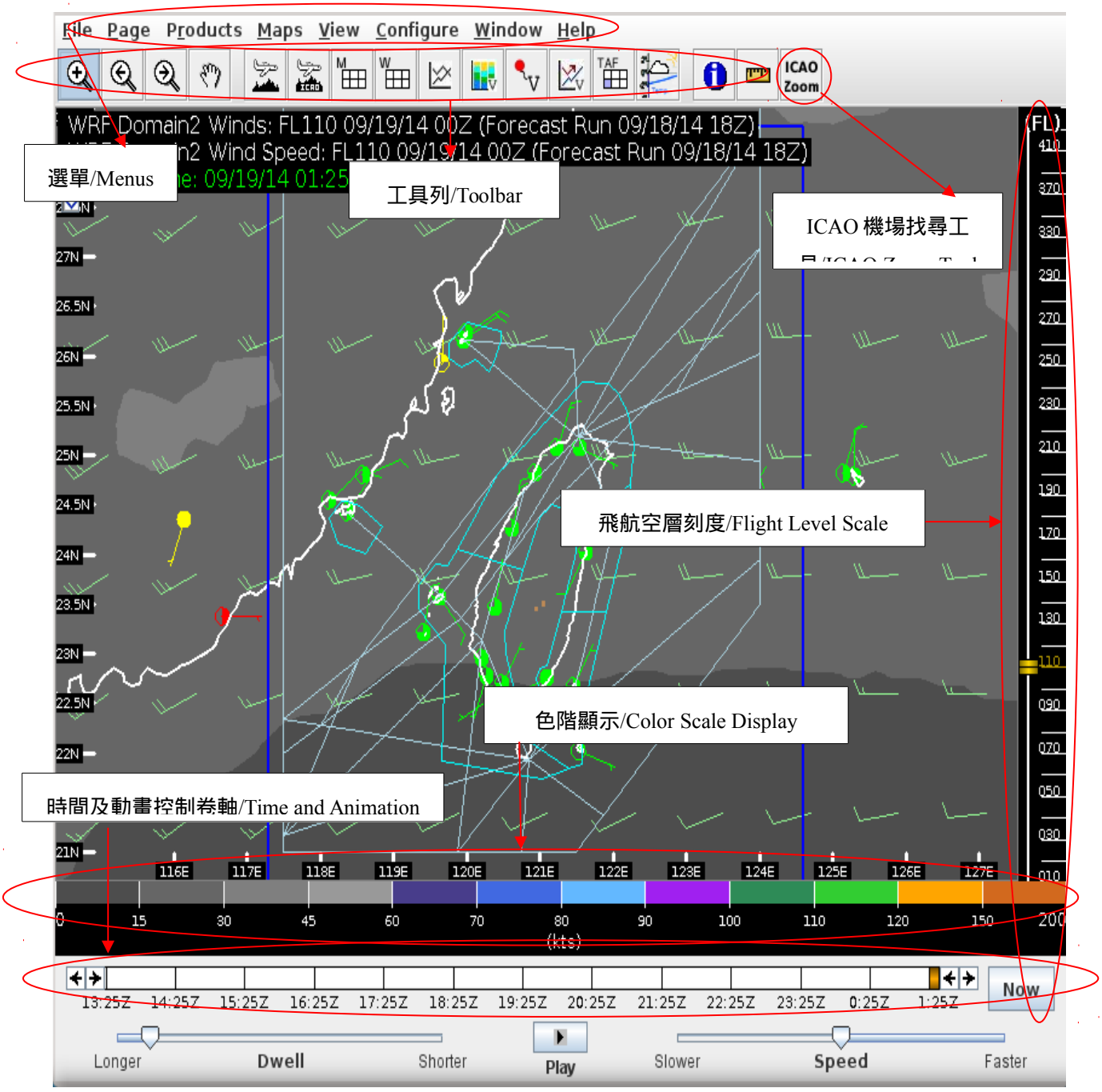


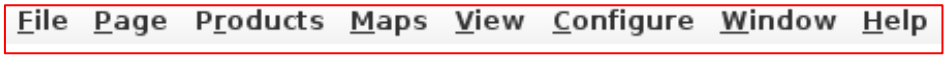
Figure 4.0-1: Major JMDS components

圖 4.1-1：JMDS 的主要元件

4.2 JMDS 的選單 (The JMDS menus)

下列 JMDS 選單位於 JMDS 視窗最上方並有數種用途。

The JMDS menus are located at the top of the JMDS window and are used for several purposes.



4.2.1 檔案選單(File Menu)

讀取 - 顯示出可供讀取的 JMDS 設定檔列表，包含預設設定、最近讀取的使用者設定或當地檔案系統中的任何設定檔。更詳細的 JMDS 設定資訊請參閱 4.15 節。

Load – Show the list of JMDS configuration files that may be loaded. This includes default configurations, recently loaded user configurations, or any configuration file on the local file system. See section 4.15 for more information on JMDS configuration.

儲存當前設定 - 將 JMDS 目前使用中的設定檔儲存至硬碟中，這個功能提供用戶建立一個自訂的 JMDS 設定檔的開始。

Save Current Configuration- Save the current configuration to disk. This includes any changes the user has made since starting the JMDS.

匯出影像 – 將目前的 JMDS 顯示畫面以便攜式網絡圖形 (Portable Network Graphics，PNG) 檔案匯出。

Export Image – Save a screenshot of the JMDS into a PNG (Portable Network Graphics) file.

列印影像 - 列印目前 JMDS 顯示畫面。將會顯現選擇印表機之對話視窗。

Print Image – Print a screenshot of the JMDS. A dialog will be shown to select a printer.

列印反相影像 – 列印目前 JMDS 顯示畫面之反相顏色圖檔。將會顯現選擇印表機之對話視窗。

Print Inverted - Print a screenshot of the JMDS with inverted colors. A dialog will be shown to select a printer.

Reset Application - Reset the JMDS to the current configuration. Any unsaved changes will be lost.

離開 - 離開 JMDS。這項功能與 JMDS 視窗正常關閉是一樣的效果。

Exit – Exit the JMDS. This is the same functionality as when the JMDS window is closed normally.

4.2.2 主要產品選單 (Page Menu)

主要產品選單會顯示可供選擇的產品列表。使用者可參考 AOAWS 產品手冊中的產品說明。在任一時間內，JMDS 只能顯示單一項產品。若開啟另一項產品，將會關閉目前使用示的產品。**注意**：這並不會影響其他選單的功能。

The Page menu shows a listing of available products. These products are described in the AOAWS Meteorological Product Manual. Only one product in this list may be shown at any time, turning on one will disable the currently visible product. **Note:** this does not affect any products from other menus.

4.2.3 產品選單 (Products Menu)

本選單中所包含的產品是可疊加的。從這個選單中，開啟產品將不會影響到其他產品，且本選單中產品的疊加數目是沒有限制的，皆可同時顯現。使用者可參考 AOAWS 產品手冊中的產品說明。

This menu contains a listing of products that may be overlaid on top of one another. Turning on products from this menu does not affect any other product and there is no restriction on how many products from this menu may be showing at the same time. These products are described in the AOAWS Meteorological Product Manual.

4.2.4 套圖選單 (Maps Menu)

本選單包含固定之套圖資訊列表。從這個選單中，開啟套圖將不會影響到其他產品，且本選單中套圖的疊加數目是沒有限制的，皆可同時顯現。使用者可參考 AOAWS 產品手冊中的套圖說明。

This menu contains a listing of static map overlays. Turning on maps from this menu does not affect any other product and there is no restriction on how many maps from this menu may be showing at the same time. These maps are described in the AOAWS Meteorological Product Manual.

4.2.5 顯示區域選單 (View Menu)

全球、廣域、範圍 1、範圍 2、範圍 3、FIR、區域、台灣、台北、歐洲衛星-0 度、歐洲衛星-57 度 、美洲衛星-東側、美洲衛星-西側– 用來改變目前顯示區域。每一個選項對應到不同的地理區域。

Global, **Wide**, **Domain 1**, **Domain 2**, **Domain 3**, **FIR**, **Region**, **Taiwan**, **Taipei, METEOSAT 0 deg, METEOSAT 57 deg, GOES East, GOES West** – changes the currently viewed area. Each of these options zooms to a different geographic region.

上一筆資料集 – 用來切換到上一筆產品顯示。使用與此項功能有關連的鍵盤快速鍵以便於比較兩項不同產品。

Last dataset – Switch to the last viewed product. The keyboard shortcut associated with this action can be useful when two products need to be compared to one another.

4.2.6 設定選單 (Configure Menu)

時間及動畫 – 開啟時間及動畫設定對話窗。

Time and Animation – Open the time and animation configuration dialog

顯示時間範圍

這部份包含設定時間範圍的項目以供 JMDS 選擇顯示資料之需要。這個時間範圍同時也使用在動畫時間視窗。時間範圍設定有動畫圖片間隔時間、時間範圍結束時間、及動畫張數。當這些設定值改變時，預覽的顯示時間範圍將會顯示在結果 (Results)區塊中。

Displayed Time Range

This section includes elements to configure the time range of selectable data for the JMDS. This time range is also used as the animation time window. The time range is specified by

the frame interval, the end time of the range, and a number of time frames. As these settings change, a preview of the displayed time range will be shown in the Results section.

動畫

這部份允許動畫/影片的設定。畫面延遲 (Frame delay) 表示圖與圖的最小間隔時間。這改變可提供較快或較慢的動畫呈現。影片暫留時間 (Movie dwell) 表示當動畫最後一張畫面結束後到重新播放動畫的最小間隔時間。

Movie

This section allows the configuration of animation/movie settings. The "Frame delay" is the minimum amount of time between each frame of animation. This may be changed to provide for faster or slower animation. The "Movie dwell" is the minimum amount of time that the animation will wait on the last frame of the animation loop before continuing to loop from the beginning.

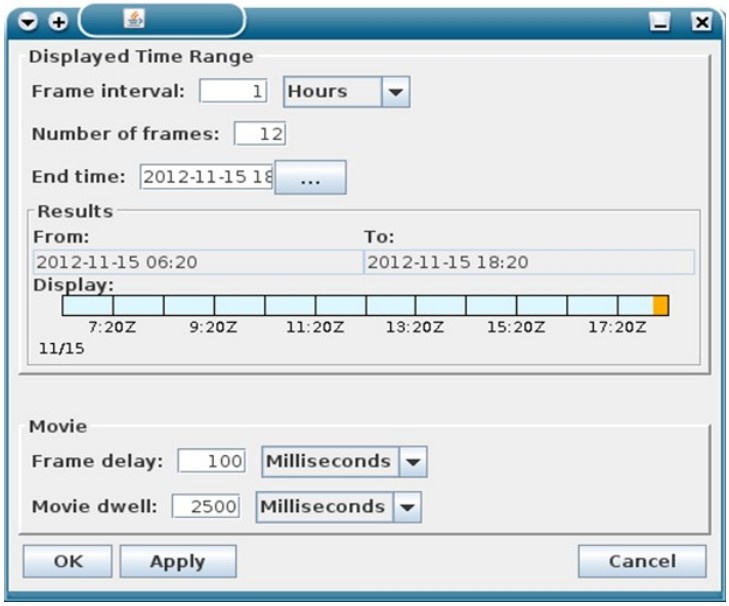


Figure 4.2.6-1 :Configure animation

圖 4.2.6-1：動畫設定

METAR 報文過濾：開啟目前顯示在 JMDS 上的 METARs 報文設定。具有顏色顯示的 METAR 報文過濾能夠定義雲冪高、能見度、風速、相對濕度與溫度的最小值和最大值標準。若符合第一項過濾標準，METAR 將會以第一項過濾條件和其相對應的顏色進行繪圖。若不符合第一條過濾標準，便使用第二項過濾條件。若仍然不符合第二項，則使用下一項條件。此步驟將會依過濾標準逐項執行，直到所有的條件都已經過檢查。每一項過濾條件的啟用順序可藉由點擊該列或過濾條件，然後點擊左側面板任一箭頭按鈕達成。

Filter METAR – Opens the configuration for the current filter set applied to METARs currently displayed in the JMDS. A METAR filter is associated with a color, and defined by several minimum and maximum value criteria, including ceiling, visibility, wind speed, relative humidity, and temperature. If the first filter's criteria are true, the METAR is drawn with the color associated

with the first filter. If that filter is false, the second filter is applied. If that filter is also false, the next filter is applied. This continues until every filter has been tested. The order in which filters are applied can be modified by clicking on a row/filter and then clicking one of the arrow buttons in the left panel.

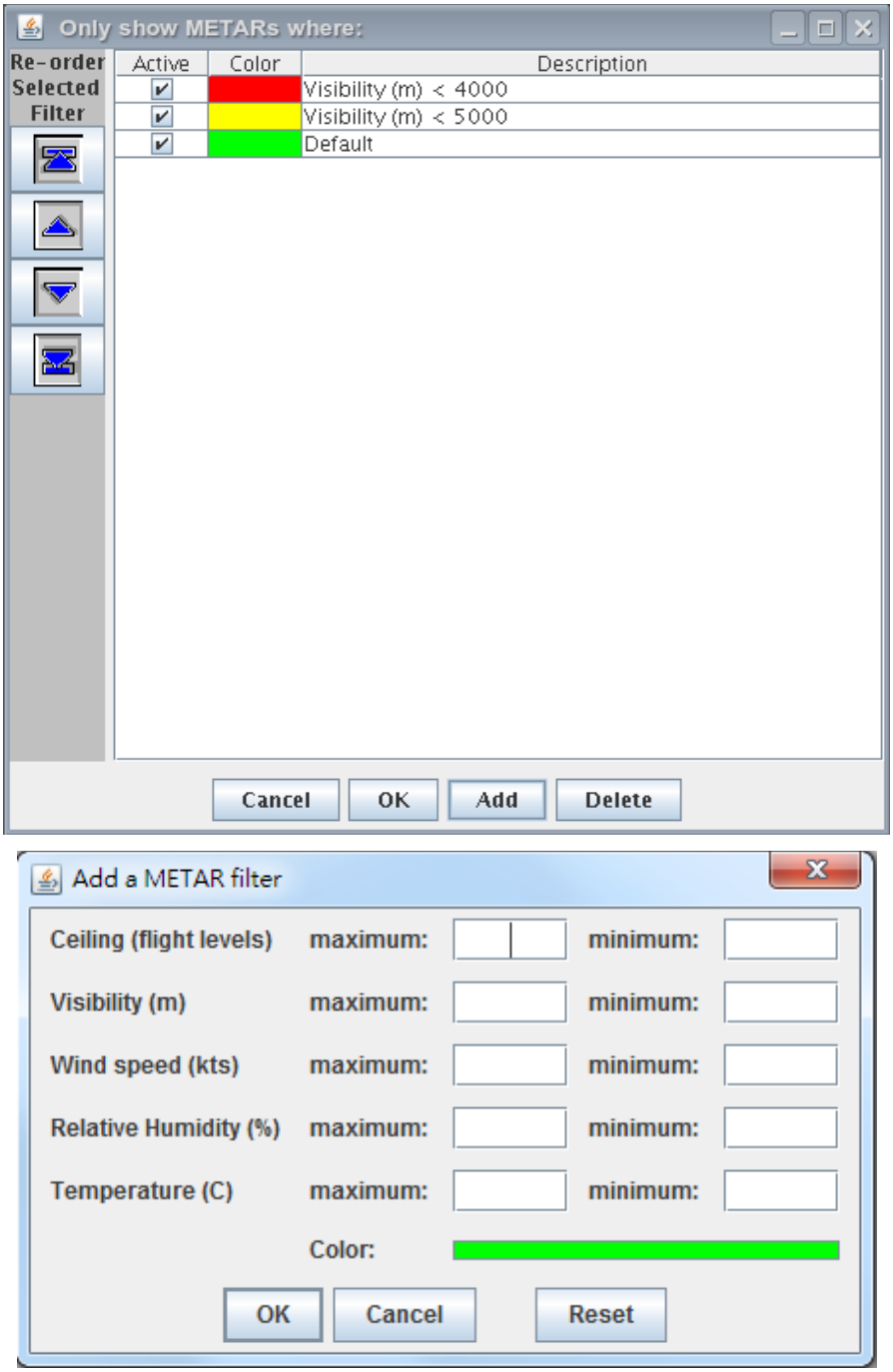


Figure 4.2.6-2: METAR Filters configuration

圖 4.2.6-2：METARs 報文設定

雷達警示區域：開啟雷達警示系統的設定。使用者可以自行定義每一個雷達警示區域的臨界 dBZ 值，並且可以藉由檢查項目的勾選，以決定開啟或關閉各雷達警示區域。

Radar Warning Areas – Opens the configuration for the radar warnings. The dBZ threshold at which the warning is triggered for each warning region may be configured, and individual warning regions may be enabled or disabled with the check boxes.

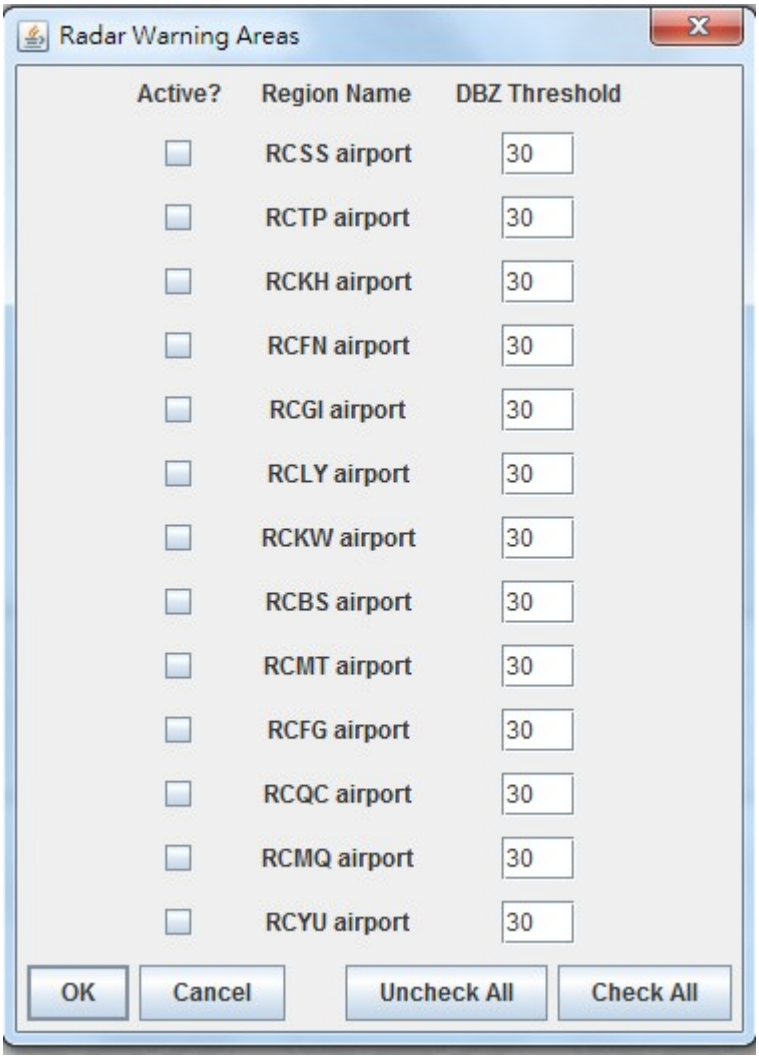


Figure 4.2.6-3 : Radar Warning configuration. Actual radar warning regions may differ

圖 4.2.6-3：雷達警示設定。實際的雷達警示區域設定內容可能會有不同。

事件重現 – 開啟事件重現模式設定對話視窗。當事件重現模式啟動時，只有在事件發生時間內可用的數據資料才會顯示在 JMDS 上。

Incident Reconstruction – Opens the incident reconstruction mode configuration dialog. When incident reconstruction mode is enabled, only data that was available as of the incident time will be shown on the JMDS.

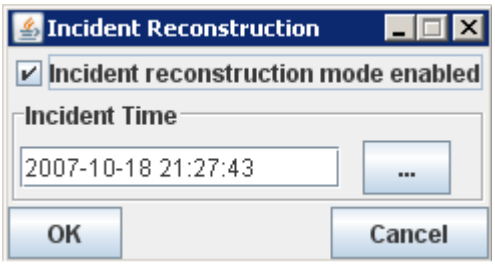
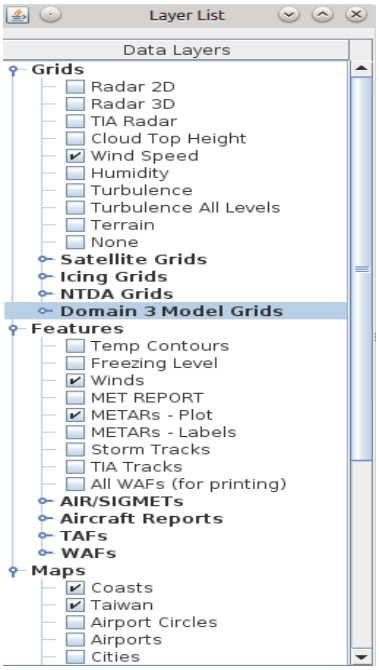


Figure 4.2.6-4 : Incident Reconstruction setup

圖 4.2.6-4：事件重現設定

Layer List – Opens the layer configuration window. This window displays a folding list of grid, feature, and map layers that can be turned on and off using checkboxes.



4.2.7 視窗選單(Window Menu)

此項選單提供額外的方式開啟數個子視窗。

This menu provides an additional means to open several of the display sub-windows.

垂直剖面圖 – 用來顯示垂直剖面圖視窗。若沒有藉由使用滑鼠點選剖面圖功能  和  ，將不會顯示數據資料。

Vertical Cross Section – Shows the vertical cross section window. No data will be shown if a cross section has not been chosen with the cross section mouse tool  and  .

斜溫圖 – 點選此項以顯示斜溫圖視窗，同 4.3.3 節視窗工具  。

Skew T – Shows the SkewT window if it is not currently visible, same with 4.3.3 window tool  .

機場預報選單 – 點選此項才能開啟機場預報選單對話視窗，同 4.3.3 節視窗工具  。

TAF Selector – Opens the TAF Selector dialog, same with 4.3.3 window tool 

.

機場地面觀測資料解碼表– 點選此項才能開啟機場地面觀測資料解碼表視窗，同 4.3.3 視窗工具 

。

Meteorogram – Opens the Meteorogram window, same with 4.3.3 window tool 

Decoded METARs – Opens the decoded METAR table window, same with 4.3.3 window tool 

.

高空風場及溫度場表– 點選此項才能開啟高空風場及溫度場表視窗，同 4.3.3 節視窗工具 

。

Winds/Temps Aloft – Opens the winds/temps aloft tool window, same with 4.3.3 window tool 

.

機場地面觀測資料時間序列圖工具– 點選此項才能開啟機場地面觀測資料時間序列工具視窗，同 4.3.3 節視窗工具 
。

METAR time history plot – Opens the METAR time history tool window, same with 4.3.3 window tool 
.

高度剖面時間變化圖工具– 點選此項才能開啟高度剖面時間變化工具視窗，同 4.3.3 節視窗工具 
。

Time/Height – Opens the time/height tool window, same with 4.3.3 window tool 
.

虛擬時間序列工具– 點選此項才能開啟虛擬時間序列工具視窗，同 4.3.3 節視窗工具 
。

Virtual Time Series – Opens the virtual time series tool window, same with 4.3.3 window tool 
.

機場預報– 點選此項才能開啟原始機場預報資料視窗。

TAFS – Opens a raw TAF display window.

原始機場地面觀測資料– 點選此項才能開啟原始機場地面觀測資料視窗。

RAW METARS – Opens a raw METAR display window

MET REPORTS – Opens a raw MET and SPECIAL report display window

飛機報告– 點選此項才能開啟飛機報告視窗。.

AIREPS – Opens a raw AIREP display window.

顯著危害天氣– 點選此項才能開啟顯著危害天氣視窗。

SIGMETS – Opens a raw SIGMET display window.

4.2.8 說明選單 (Help Menu)

參看說明 – 打開基本說明資訊視窗。

View Help – Opens a window with basic help information.

說明 – 在 JMDS 版本可打開詳細的資訊說明視窗。

About – Opens a window with detailed information on this version of the JMDS.

4.3 JMDS 工具列 (The JMDS toolbar)

Figure 4.3-1 :Tool Bar

圖 4.3-1：工具列

此 JMDS 工具列提供快速存取許多常用的工具，如放大、平移、網格檢視、距離及方位、和以滑鼠設定剖面圖功能等，這些工具在同一時間內只能有一個被啟動。

The JMDS toolbar allows quick access to many commonly-used actions. The Grid Inspector, Distance and Azimuth, and Cross Section tools affect mouse behavior and only one of these tools may be in use at any time.

4.3.1 縮放功能 (Zoom tools)

JMDS 有四種縮放工具，都可用來調整目前顯示的區域。下面將由左至右說明各工具使用方式。

There are four zoom tools, all used for changing the currently viewed area. They are described from left to right.


放大 – 這是當沒有使用其他工具時的預設工具。當使用這項工具，可按住滑鼠左鍵以拖曳出欲放大的範圍。

Zoom In – This is the default tool that is used when no other tools are enabled. When enabled, this tool zooms to the area defined by a mouse drag with the left mouse button.

 **上一個範圍** – 類似於網頁瀏覽器的上一頁按鈕，用來回到上一個範圍狀態。若沒有上一個範圍，則該工具不會有作用。

Previous Zoom – Similar to a web browser Back button, go back to the last zoom state. No action is taken if there are no previous zooms.

 **下一個**範圍- 類似於網頁瀏覽器的下一頁按鈕，用來到下一個範圍狀態。若沒有下一個範圍，則該工具不會有作用。

Next Zoom – Similar to a web browser Forward button, go to the next zoom state. No action is taken if there are no zooms to move forward to.

 **平移** – 當使用這項工具，按住滑鼠左鍵可用來拖曳可視區域至新的位置。

Pan – When enabled, the left mouse button may be used to drag the viewable area to a new location.

4.3.2 剖面圖工具 (Cross Section Tools)

剖面圖工具會開另一個視窗來顯示所選取可視資料的剖面圖。剖面圖說明資訊列在下列小節中。

The cross section tools allow a cross section of visible data to be selected and shown in a separate window. See section 4.7 for more information on cross sections.

 **剖面圖工具** - 當使用這項工具，可使用滑鼠左鍵點選路徑上的端點。路徑的結束方式可使用連按兩下滑鼠左鍵或按住滑鼠右鍵並選擇" Show Cross-section"。當路徑完成時，另一個視窗中會顯示路徑上所有飛航空層的資料。

Cross Section Tool – When enabled, this tool allows the selection of points along a path with the left mouse button. The path may be finished by double-clicking with the left mouse button or by pressing the right mouse button and selecting "Show Cross-section". When the path is completed, all the data along the path specified at all flight levels will be shown in a separate window.

 **站址剖面圖工具** -當使用這項工具，將開啟一個視窗用來輸入路徑上所有站址代號。站址代號間必須用逗號 (",") 或空白作為間隔。當路徑完成並按上確認鍵 (Apply)，另一個視窗中會顯示路徑上所有飛航空層的資料。

Station Cross Section Tool – When enabled, this tool opens a window that allows the selection of a path by station identifier. Station identifiers must be separated by commas (",") or spaces. When the path is completed and the Apply button is pressed, all the data along the path specified at all flight levels will be shown in a separate window.

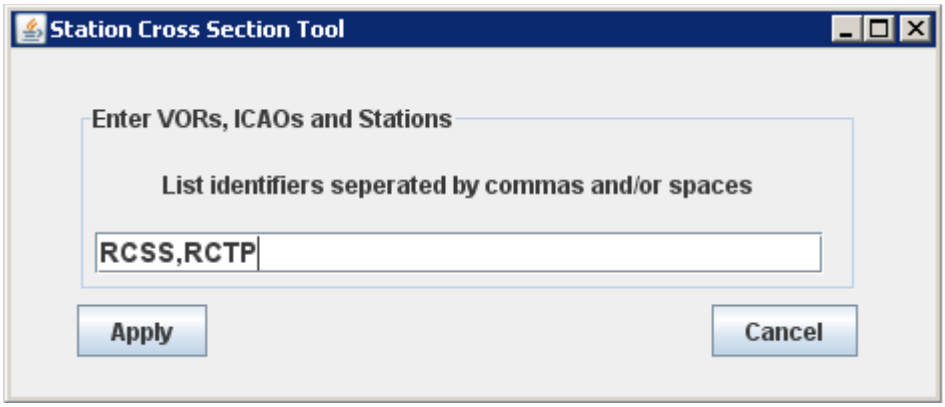


Figure 4.3.2-1 :Station cross section tool window

圖 4.3.2-1：測站剖面工具視窗

4.3.3 視窗工具 (Window Tools)

視窗工具用來顯示和隱藏個別視窗。各視窗工具皆對應到一個子視窗，當該視窗顯示出來時可見到其按鈕顯出該視窗被點選，當該視窗關閉則表示其按鈕未被點選。在下列的按鈕範例中，沒有任何的視窗工具被點選，因此不會有任何視窗顯示在 JMDS 上。

The window tools show and hide separate windows. Each window tool is linked to a sub-window, when the window is showing the button shows as being selected, and when the window is closed the button is unselected. In the screenshot below none of the window tools are selected and therefore none of the windows are showing in the JMDS.

視窗工具包含下列幾項

The window tools include the following:

1) 解碼後的 METAR 表工具 – 顯示和隱藏解碼後的 METAR 表視窗，其細節可參閱 4.8 節。 (Decoded METAR Table Tool - shows and hides the Decoded METAR Table window in section 4.8.)

2) 高空風場/溫度場表工具 – 顯示和隱藏高空風場/溫度場表視窗，其細節可參閱 4.9 節。 (Winds/Temperatures Aloft Table Tool – shows and hides the Winds/Temperatures Aloft window in section 4.9.)

3) 機場地面觀測時間序列圖工具 - 顯示和隱藏機場地面觀測時間趨勢圖視窗，其細節可參閱 4.10 節。 (METAR Time History Tool – shows and hides the METAR Time History window in section 4.10.)

4) 高度剖面時間變化圖工具 - 顯示和隱藏高度剖面時間變化圖視窗，其細節可參閱 4.11 節。

(Time/Height Profile Tool – shows and hides the Time/Height window in section 4.11.)


5) 虛擬探空圖/斜溫圖工具 - 顯示和隱藏虛擬探空圖/斜溫圖視窗，其細節可參閱 4.12 節。 (Virtual Sounding/Skew T Tool – shows and hides the Virtual Sounding/Skew T window in section 4.12.)


6)時間序列工具 - 當時間序列工具按鈕啟動後，它可以允許使用者在地圖上點擊任一點。當使用者在時間序列按鈕啟動下點擊地圖後，在時間序列視窗中，將會使目前從 Page 選單上所選擇的氣象產品，顯示在該點的時間序列圖上。(Time Series Tool) When enabled, the Time Series Tool button allows a location on the map to be clicked. When the map is clicked with this tool enabled, the time series window will be shown with a time series of the currently selected product from the Page menu. (Detail in section 4.13)

7)機場預報選單工具 – 顯示及隱藏機場預報選單視窗。 (TAF Selector Tool) – shows and hides the TAF Selector window in section 4.14.


(Meteorogram Tool) – shows and hides the Meteorogram window in section 4.15.

4.3.4 資訊工具 (Informational tools)

下列資訊工具提供些附設的有關 JMDS 顯示的說明。

The informational tools give additional information about products displayed in the JMDS.

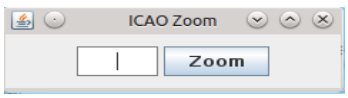

數值檢視工具 - 當使用這項工具時，將顯示在該區域中所有可視的網格點數值，遺失或損壞的資料則不會顯示。

Grid Inspector Tool – When enabled, this tool shows the values of all visible grids in the map area. Missing or bad data is not shown.


距離及方位 - 當使用這項工具時，用滑鼠左鍵在地圖上點選兩點，將會顯示兩點間的距離及方位。

Distance and Azimuth Tool – When enabled, two points may be selected on the map with the left mouse button and the distance and azimuth between the two points will be shown in the map area.

ICAO 工具將全球任何有 ICAO 站址代號顯示於視窗中心。填入 ICAO 站址代號至 ”Move To”的左側空格後，點選右側按鈕便可檢視屬於該 ICAO 站址代號的區域。



The ICAO (International Civil Aviation Organization) tool centers the view over any worldwide station with an ICAO id. Once the ICAO id is typed into the entry box on the left, the button on the right may be clicked to change the view to the location of that ICAO id. The ICAO tool also supports searching for waypoints using two to six character designations.

4.4 飛航空層刻度 (Flight Level Scale)

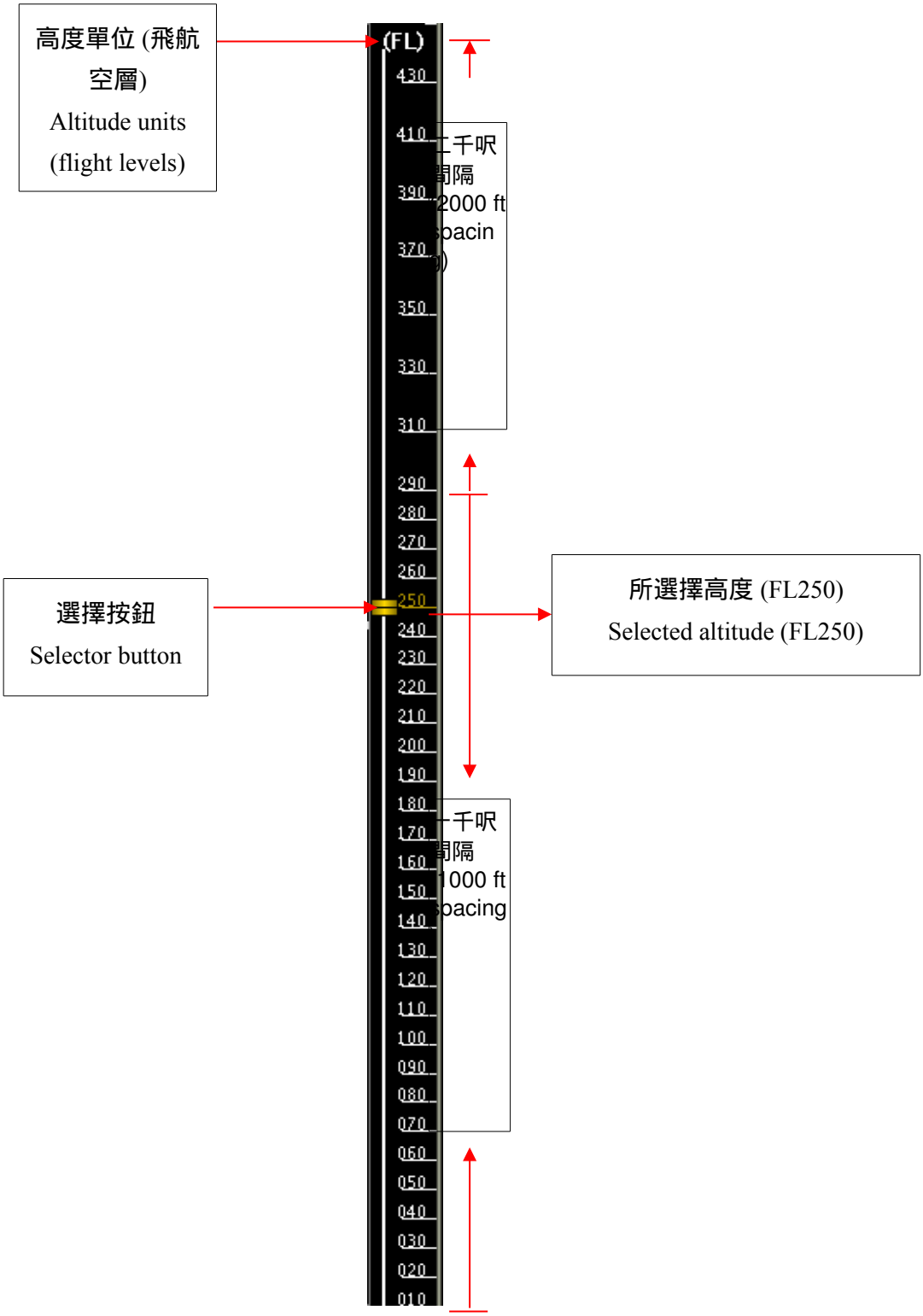


圖 4.4-1：飛航空層刻度顯示目前選擇之飛航空層為 FL250。飛航空層可選擇範圍從最小為 FL10 到最大為 FL430

Figure 4.4-1: Flight level scale currently showing a selected flight level of FL250. Minimum selectable altitude is FL10 and the maximum selectable altitude is FL430

飛航空層刻度是用來顯示和改變目前顯示產品的飛航空層值。不是所有的產品都包含飛航空層條件。目前產品可用的垂直飛航空層會列舉在現在飛航空層設定上。目前的飛航空層旁邊會有一個橙色的選擇按鈕，可選擇的飛航空層是以白線顯示。

The flight level scale is used to view and change the flight level of currently-displayed products. Not all products have a flight level component. The available vertical levels of the current product are listed and the current flight level setting is chosen with the orange selector button. The current flight level is shown in orange, and the available selectable flight levels are shown as white lines.

4.5 色階顯示 (Color Scale Display)

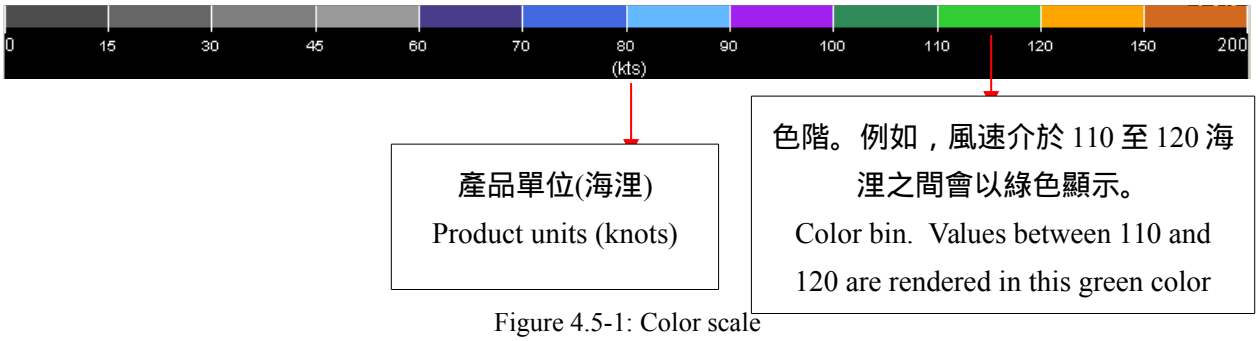


Figure 4.5-1: Color scale

圖 4.5-1：色階顯示

圖 4.5-1 為風速產品所使用的色階顯示。色階顯示描繪目前看見的產品的數值。如上圖，風速產品皆會以不同顏色表示不同的數值。例如，所有風速介於 110 至 120 海浬之間會以綠色顯示。色階顯示會隨著不同產品而調整，上圖僅為風速產品所使用的色階顯示。

Figure 4.5-1 shows the color scale display for the wind speed product. The color scale display shows how the currently-visible product values are rendered. In the image above, all values for the wind speed product will be rendered in the colors indicated. For example, in this case all wind speeds between 110 and 120 knots will be rendered in green. The color scale display will update whenever a different product is shown, so this color scale is only shown when the wind speed product is showing.

4.6 時間及動畫控制卷軸 (Time and Animation)

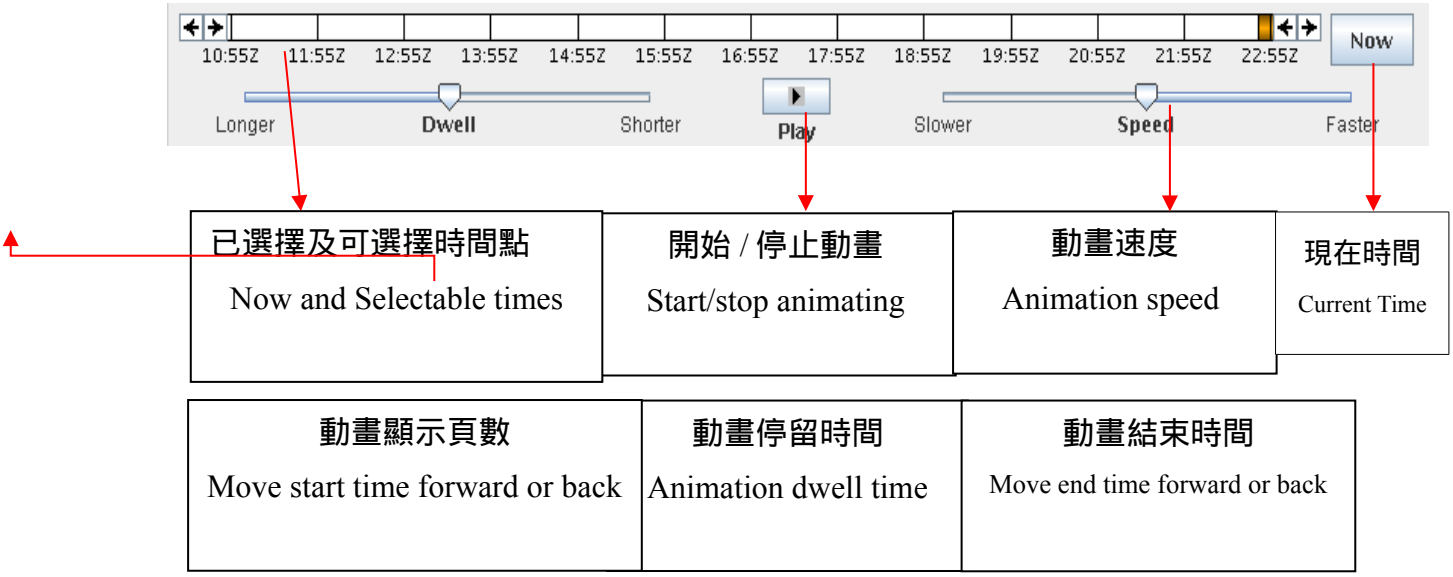


Figure 4.6-1: Animation time selections

圖 4.6-1：動畫時間的選取設定

JMDS 系統以預設的時間和動畫設定顯示產品及動畫。這個組件可以用來調整相關設定。在上面的圖 4.6-1 中，控制卷軸的上半部的為目前設定的時間和動畫，並具有目前選取時間、可選擇的時間視窗。左邊的那對箭號可讓使用者將動畫開始的時間往前或往後移動，而時間軸右邊的箭號則可以將動畫結束時間往前或往後移動。現在的選擇時間是以一個大的橘色盒子標示，而"Now"按鍵則會使系統直接顯示現在時間的資料。

The time and animation portion of the JMDS displays the selected time for visible products and animation settings. This component also allows these settings to be changed. In figure 4.6-1 above, the top portion of the time and animation component deals with the selected time and the selectable time window. The pair of arrows on the left of the time window allows the user to move the start time forward or back. The second pair of arrows on the right side of the time window allows the user to move the end time forward or back. The current selected time is shown with a large orange box. The "Now" button takes the users to the current time.

動畫模式可以使用"開始"按鈕啟用。啟用動畫時，會出現"停止"按鈕，將返回 JMDS 正常顯示模式（靜態）。動畫的速度以及可調節的停留時間（等待動畫序列之間的時間量）可直接移動滑桿進行調整。

Animation, or "movie mode", may be enabled using the "Play" button. When animation is enabled, a "Stop" button appears which will return JMDS to normal (static) display mode. The speed of the animation, as well as the dwell time (amount of time to wait between animation sequences) may be adjusted using the appropriate sliders.

使用者可在設定選單中設定部分比較少用的時間及動畫元件，如動畫撥放的間隔時間。可參考 4.2.6 節。

Some less common elements of time and animation may be configured through the Configure Menu, such as the delay between animation frames. This is described in section 4.2.6.

4.7 剖面圖 (Cross Section)

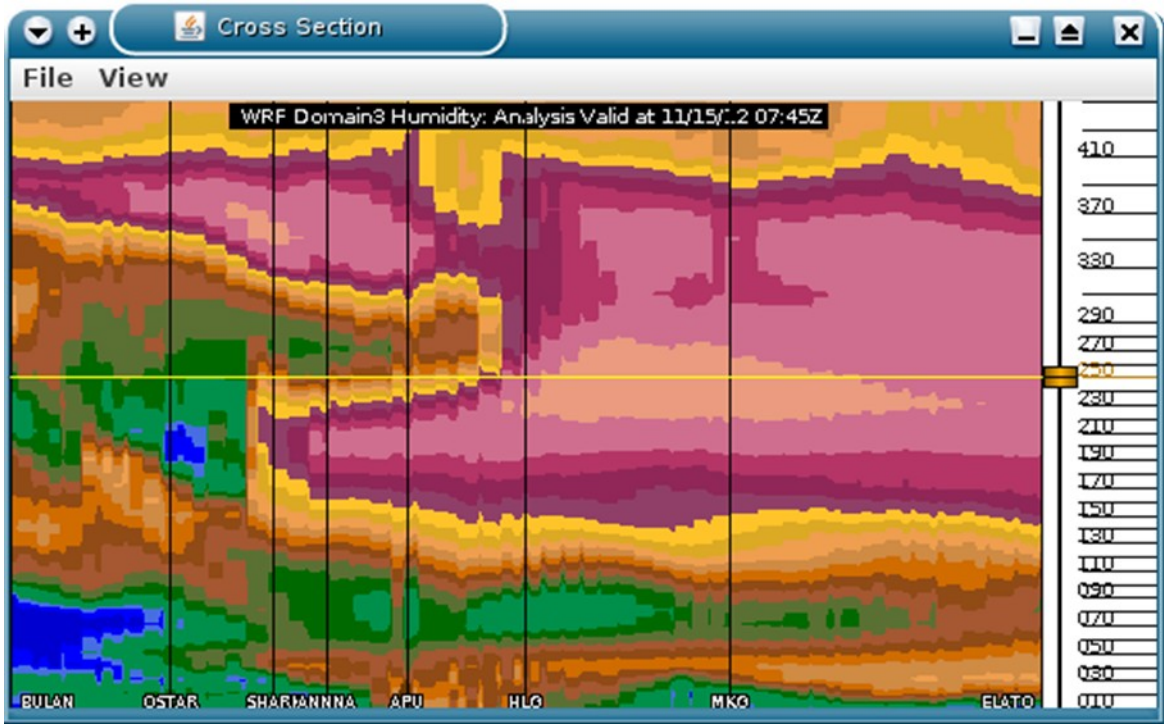


Figure 4.7-1: Cross section

圖 4.7-1：剖面圖

剖面圖視窗顯示產品的剖面圖。剖面圖路徑可藉由剖面圖工具或站址剖面圖工具來選擇，如 4.3.3 節所述。顯示資料包含所有在路徑上的垂直高度。目前所選擇的飛航空層顯示在右側，與 JMDS 主視窗中的飛航空層刻度具有相同的功能。在剖面圖視窗中的飛航空層刻度或主視窗的飛航空層刻度改變高度，都會改變兩視窗的飛航空層。

The cross section window shows a cross section of a product. The cross section path may be chosen with either the Cross Section Tool or the Station Cross Section Tool, both described above in section 4.3.3. The displayed data includes all vertical levels along the path. The currently selected altitude is shown on the right side; this is equivalent to the Flight Level Scale in the main JMDS window. Changing the flight level selection on either this flight level scale or the main flight level scale will change both flight levels.

若路徑上端點附近有導航點，導航點名稱將顯示在視窗上方。若沒有航點在附近，就用 S (開始)、E(結束)、和數目用來標示航點。這些名稱與在 JMDS 主視窗用來顯示剖面圖路徑上的名稱相同。

If there are nearby waypoints to points along the path, the waypoint names will be shown at the bottom of the cross section window. If no waypoints are nearby, “S” (start), “E” (end), and numbers will be used to label the waypoints. These names will correspond to waypoint names that are displayed in the main JMDS data display for the cross section path.

當執行剖面圖時，該路徑會被自動儲存。並可由選單中重新呼叫，但是在每次 JMDS 重新整理時會被移除。特定的航路剖面(已設定於 JMDS 設定檔中)可以由垂直剖面視窗選單中的Ｖ iew≯ Classic menu 中呼叫。

Cross section paths are automatically saved as they are created and may be recalled through the View menu. However, these are discarded every time the JMDS resets. “Classic” Flight Paths (as configured in the JMDS configuration file) may be selected from the View->Classics menu in the cross section window menu bar.

4.8 解碼後的 METAR 表 (Decoded METAR Table)

Decoded METARs for RCTP

Name	Time	Wdir	Wspd	Wgst	Vis	Weather	Ceil	Temp	Dewp	QNH
		deg	kt	kt	m		FL	C	C	hPa
RCTP	0400	020	009		9000			030	022	1004
RCTP	0330	020	008		9000			030	022	1004
RCTP	0300	010	007		10k+			030	022	1005
RCTP	0230	360	007		10k+			030	022	1005
RCTP	0200	350	006		10k+			029	022	1005
RCTP	0130	020	005		10k+			029	022	1005
RCTP	0100	360			10k+			029	022	1005
RCTP	0034	020			10k+			028	021	1005
RCTP	0030	010			9000			028	021	1005
RCTP	0000	080			8000			027	021	1005
RCTP	2337	240			5000	HZ		028	023	1006
RCTP	2330	230			6000			027	023	1005

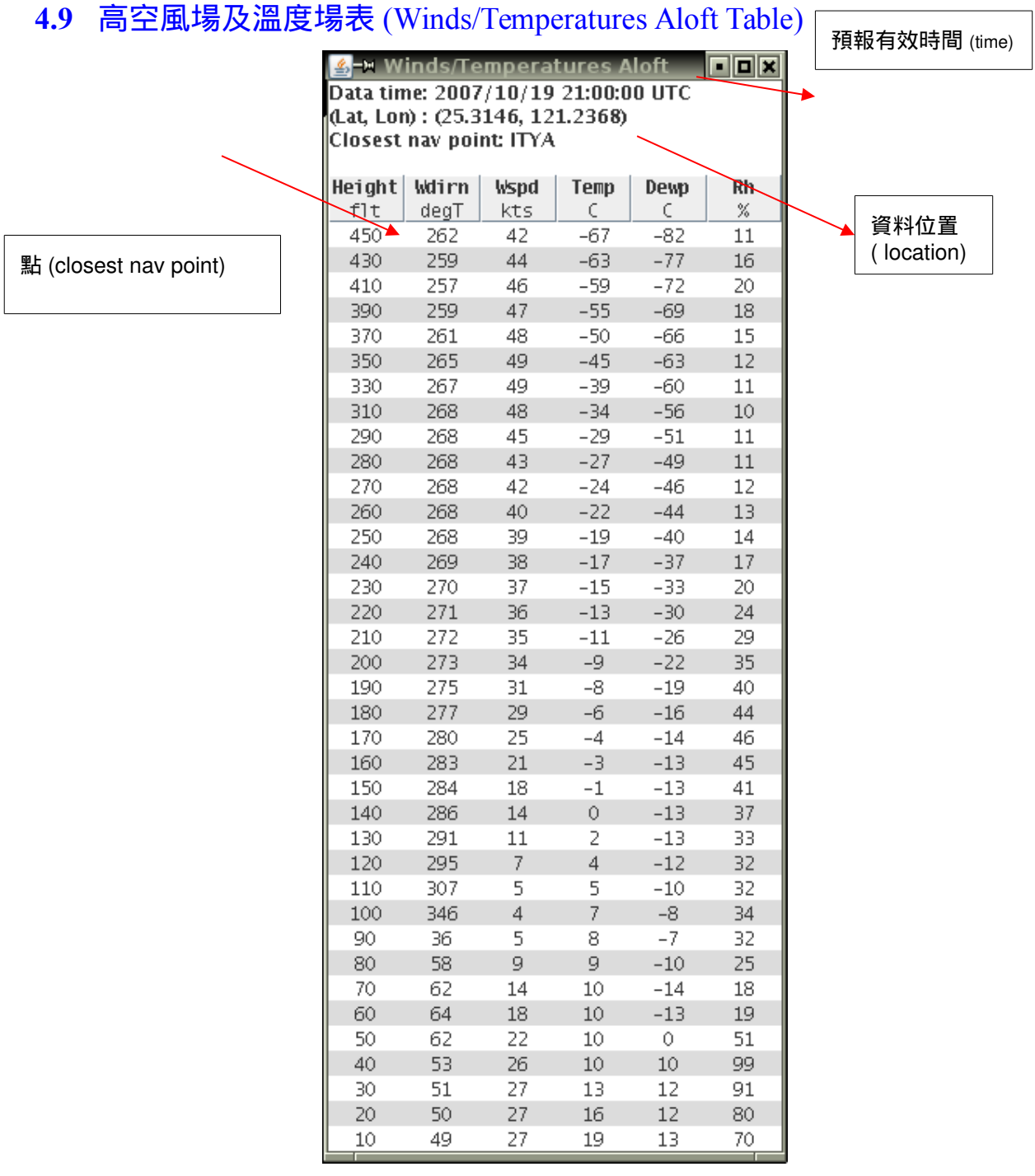
Figure 4.8-1: Decoded METAR table

圖 4.8-1：解碼後的 METAR 表

解碼後的 METAR 表視窗用數個解碼欄位來顯示來自單一機場觀測站近六小時內的資料。當這個視窗開啟時，用滑鼠左鍵在 JMDS 主視窗任何點點選將會更新該區域的顯示資料。

The decoded METAR window shows several decoded fields from a single METAR station over the last 6 hours. When this window is open, any left clicks in the main JMDS data display area will update the location of the displayed data.

4.9 高空風場及溫度場表 (Winds/Temperatures Aloft Table)



Height flt	Wdirn degT	Wspd kts	Temp C	Dewp C	Rh %
450	262	42	-67	-82	11
430	259	44	-63	-77	16
410	257	46	-59	-72	20
390	259	47	-55	-69	18
370	261	48	-50	-66	15
350	265	49	-45	-63	12
330	267	49	-39	-60	11
310	268	48	-34	-56	10
290	268	45	-29	-51	11
280	268	43	-27	-49	11
270	268	42	-24	-46	12
260	268	40	-22	-44	13
250	268	39	-19	-40	14
240	269	38	-17	-37	17
230	270	37	-15	-33	20
220	271	36	-13	-30	24
210	272	35	-11	-26	29
200	273	34	-9	-22	35
190	275	31	-8	-19	40
180	277	29	-6	-16	44
170	280	25	-4	-14	46
160	283	21	-3	-13	45
150	284	18	-1	-13	41
140	286	14	0	-13	37
130	291	11	2	-13	33
120	295	7	4	-12	32
110	307	5	5	-10	32
100	346	4	7	-8	34
90	36	5	8	-7	32
80	58	9	9	-10	25
70	62	14	10	-14	18
60	64	18	10	-13	19
50	62	22	10	0	51
40	53	26	10	10	99
30	51	27	13	12	91
20	50	27	16	12	80
10	49	27	19	13	70

Figure 4.9-1: Winds/Temperatures Aloft Table

圖 4.9-1：高空風場及溫度場表

高空風場及溫度場表以表格清單的方式顯示一個單點的 WRF 模式預報資料，包括風向、風速、溫度、露點和相對濕度。每排描述不同的高度。當這個視窗開啟時，用滑鼠左鍵在 JMDS 主視窗點選任何點將會更新該區域的顯示資料。

The winds/temps aloft table shows a tabular listing of the forecasted profile (WRF model) for a single point, including wind direction, wind speed, temperature, dewpoint, and relative humidity. Each row represents a different altitude. When this window is open, any left clicks in the main JMDS data display area will update the location of the displayed data.

4.10 機場地面觀測時間序列圖 (METAR Time History)

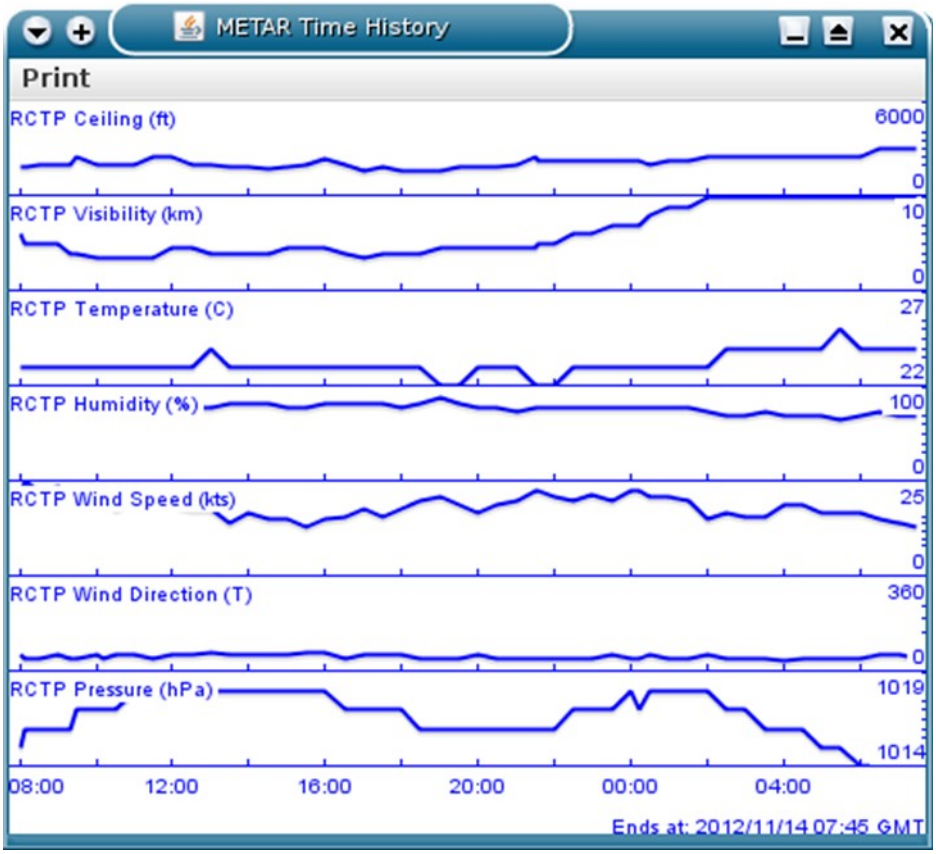


Figure 4.10-1: METAR Time HistoryWinds/Temperatures Aloft Table

圖 4.10-1：機場地面觀測時間序列圖

機場地面觀測時間序列圖視窗顯示數個來自單一機場觀測站最近二十四小時內的地面觀測時間序列圖。目前可供選取的資料場包括了：溫度、溼度、風速、風向及氣壓。當這個視窗開啟時，用滑鼠左鍵點選 JMDS 主視窗內任何點將會更新該區域的顯示資料。

The METAR time history window shows the time history from a single METAR station over the last 24 hours. The active fields are: temperature, humidity, wind speed, wind direction and

pressure. When this window is open, any left clicks in the main JMDS data display area will update the location of the displayed data.

4.11 高度剖面時間變化圖 (Time/Height Profile)

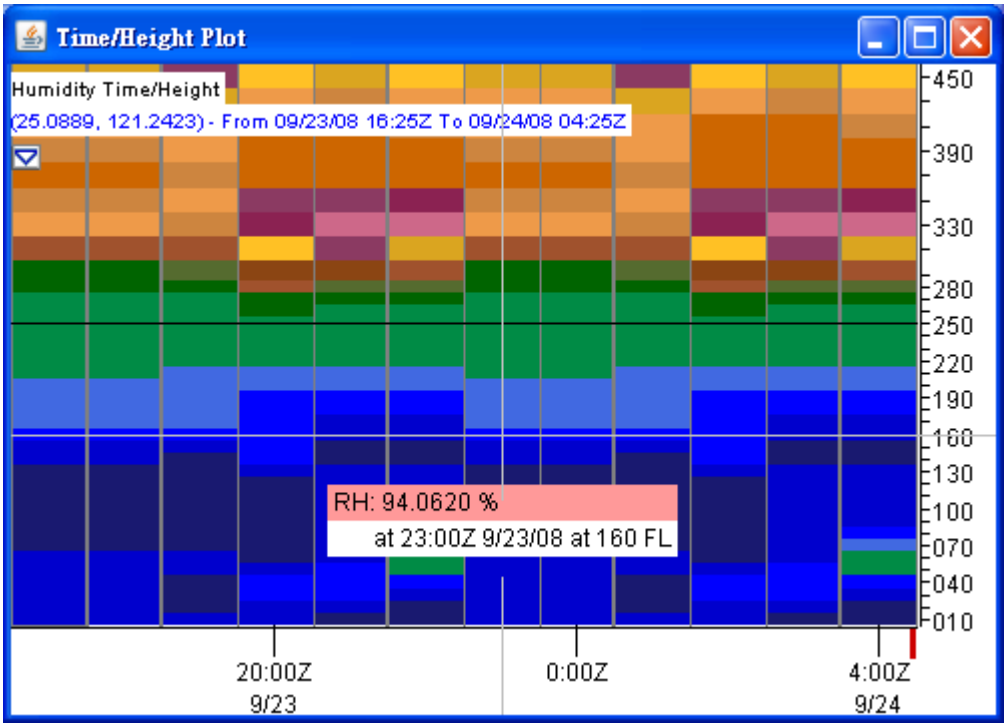


Figure 4.11-1: Time/Height Profile

圖 4.11-1：高度剖面時間變化圖

高度剖面時間變化圖視窗顯示目前可視 3D 產品十二小時的歷史資料。若目前可視產品沒有垂直資訊，將不會顯示資料並出現提示視窗並出現警告視窗。當這個視窗開啟時，用滑鼠左鍵在 JMDS 主視窗任何點點選將會更新該區域的顯示資料。時間座標上的紅色標示為目前時間。

The Time/Height window shows 12 hours of historical data for the currently visible 3D product. If the currently-visible product does not have vertical information, no data is displayed and an alert window is shown. When this window is open, any left clicks in the main JMDS data display area will update the location of the displayed data. The red mark in the time portion shows the current time (now).

4.12 虛擬探空圖/斜溫圖 (Virtual Sounding/Skew T)

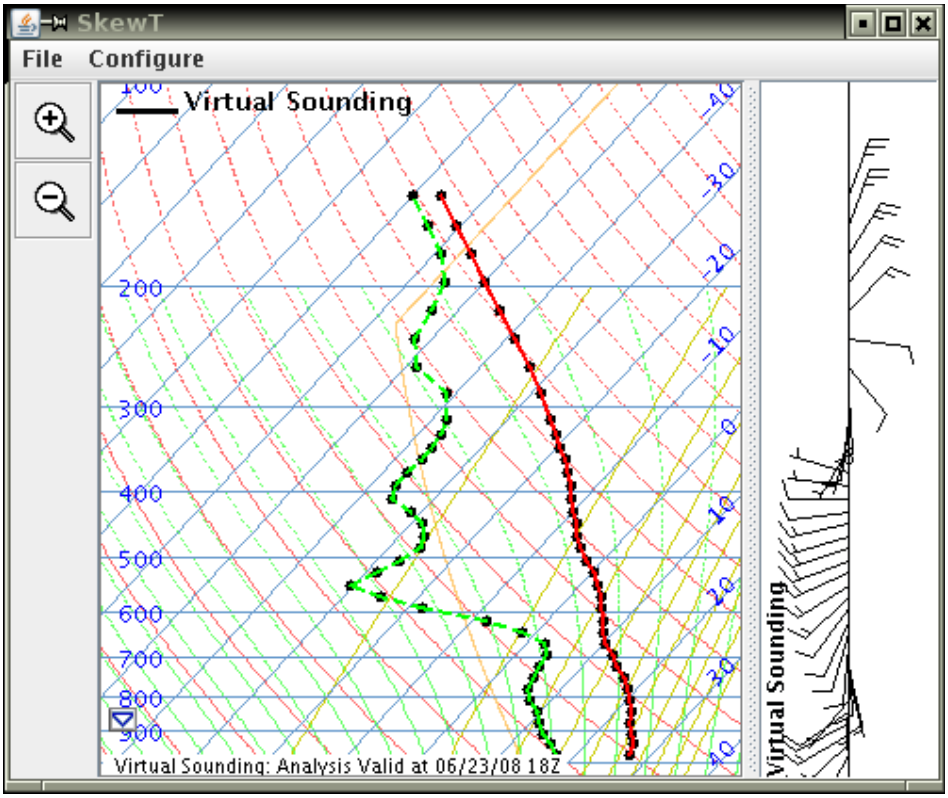


Figure 4.12-1: Virtual Sounding/Skew T

圖 4.12-1：虛擬探空圖/斜溫圖

根據高空風場及溫度顯示探空圖(斜溫圖)，也在圖中以風標表示各垂直高度的風向。紅線顯示的是“溫度”，綠線顯示的是“露點”。當這個視窗開啟時，用滑鼠左鍵在 JMDS 主視窗任何點點選將會更新該區域的顯示資料。

The virtual sounding/skewT window displays a sounding plot (SkewT) based on winds and temperatures aloft. This window also shows the wind barbs of each vertical level displayed in the plot. The red line indicates temperature and the green line is dew point temperature. When this window is open, any left clicks in the main JMDS data display area will update the location of the displayed data.

4.13 時間序列 (Time Series)

在視窗中，可以顯示在 Page 選單上任何氣象產品的時間序列圖，時間序列圖可用以多個位置及多個產品上，使其同時顯示在視窗上。時間序列圖預設為顯示 12 小時，但是可以在時間序列視窗中調整。此外，顯示時間序列的該點位置也會在主畫面上標示出來。

A window that may show the time series for any product in the Page menu. The time series for multiple locations and products may be shown together. 12 hours of data is shown by default, and this may be modified in the time series window. Time series locations will be marked on the main map.

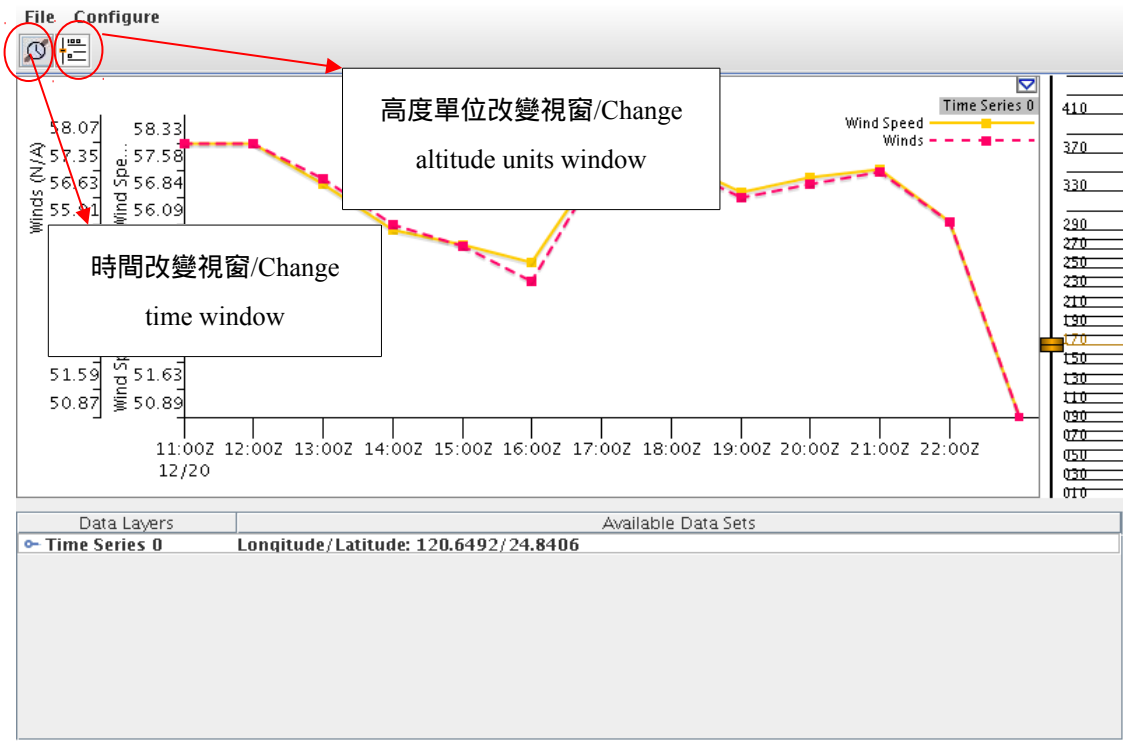


Figure 4.13-1 : Time series of radar data

圖 4.13-1：雷達資料的時間序列圖

4.14 機場預報選單(TAF Selector)

開啟機場預報選單對話視窗，可顯示未來數個預報時間之各種機場預報資料項目表單(全部、雲、預期的雲、天氣、預期的天氣、風和陣風)。開啟機場預報選單時系統將關閉所有網格產品，而這些產品將會在機場預報選單關閉時恢復。當滑鼠箭頭放置於表單上之任何一個選單項上方時，JMDS 上將會顯示該預報時間之該預報參數圖示。

Opens the TAF Selector dialog. Several different TAF data layers may be shown (All, Clouds, Tempo Clouds, Wx, Tempo Wx, Wind, and Gusts) for forecast periods into the future. Opening the TAF Selector turns off all gridded products, and these products are restored when the TAF Selector is closed. When the mouse cursor is placed over one of the TAF options, the JMDS shows the appropriate TAF layer at the selected time.

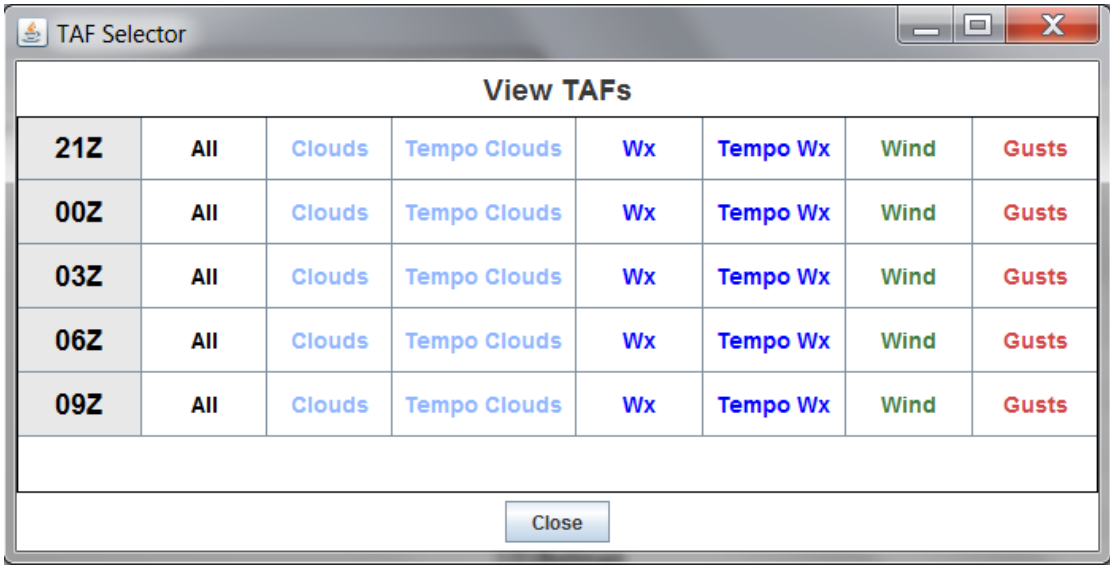


Figure 4.14-1 :TAF Selector
圖 4.14-1：機場預報選單

4.15 (Meteorogram Tool)

Opens the Meteorogram tool. When a METAR is clicked on the main display, METARs and TAFs issued for the click location are displayed as a time series of past and forecast weather conditions, with current time displayed as a vertical red line. The data can be viewed in Table, Icon, or raw text format depending on which tab is selected in the Meteorogram window. When this window is open, any left clicks in the main JMDS data display area will update the location of the displayed data.

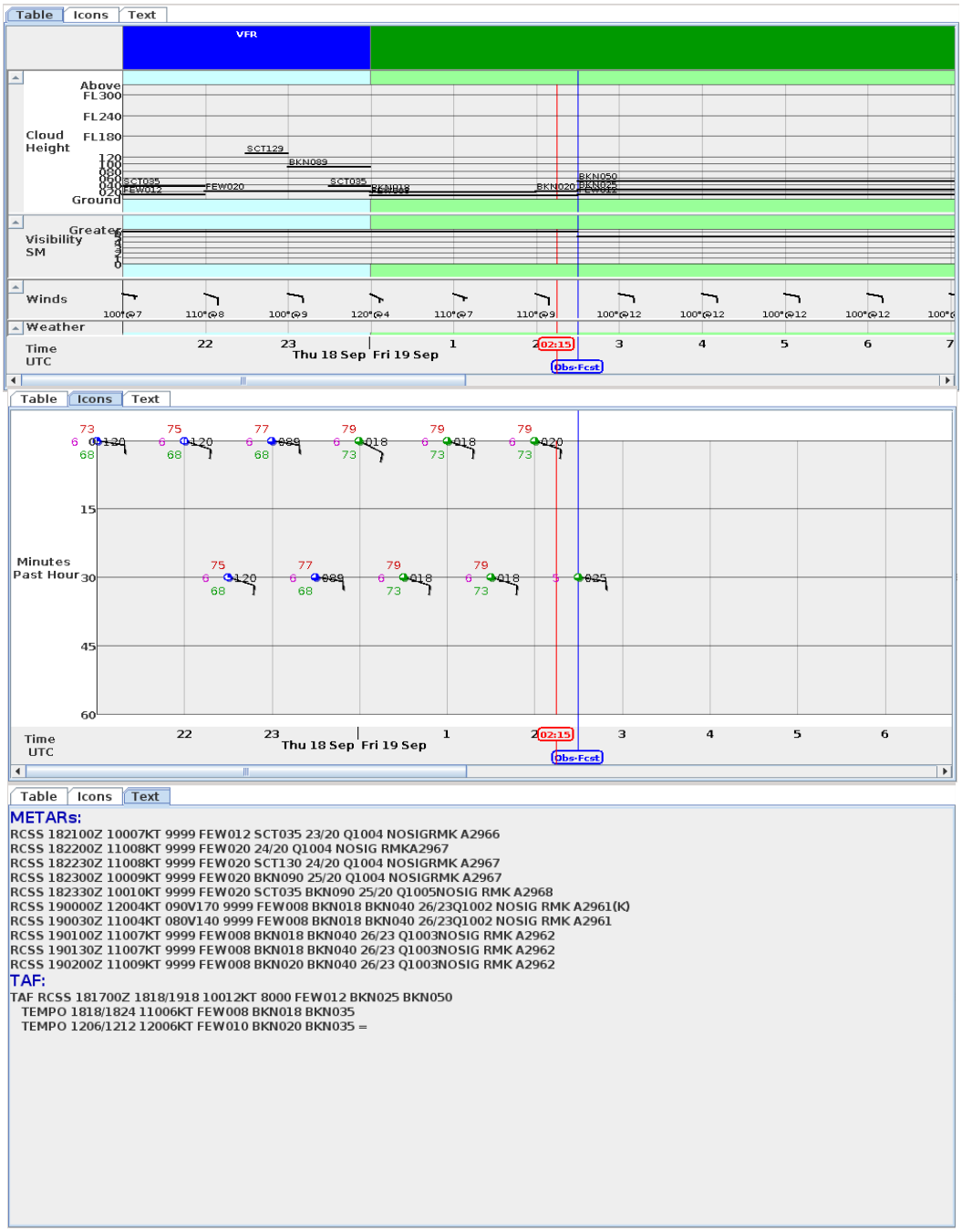


Figure 4.15-1 :Meteorogram Tool

4.16 JMDS 的主顯示視窗 (JMDS – the Main Display)

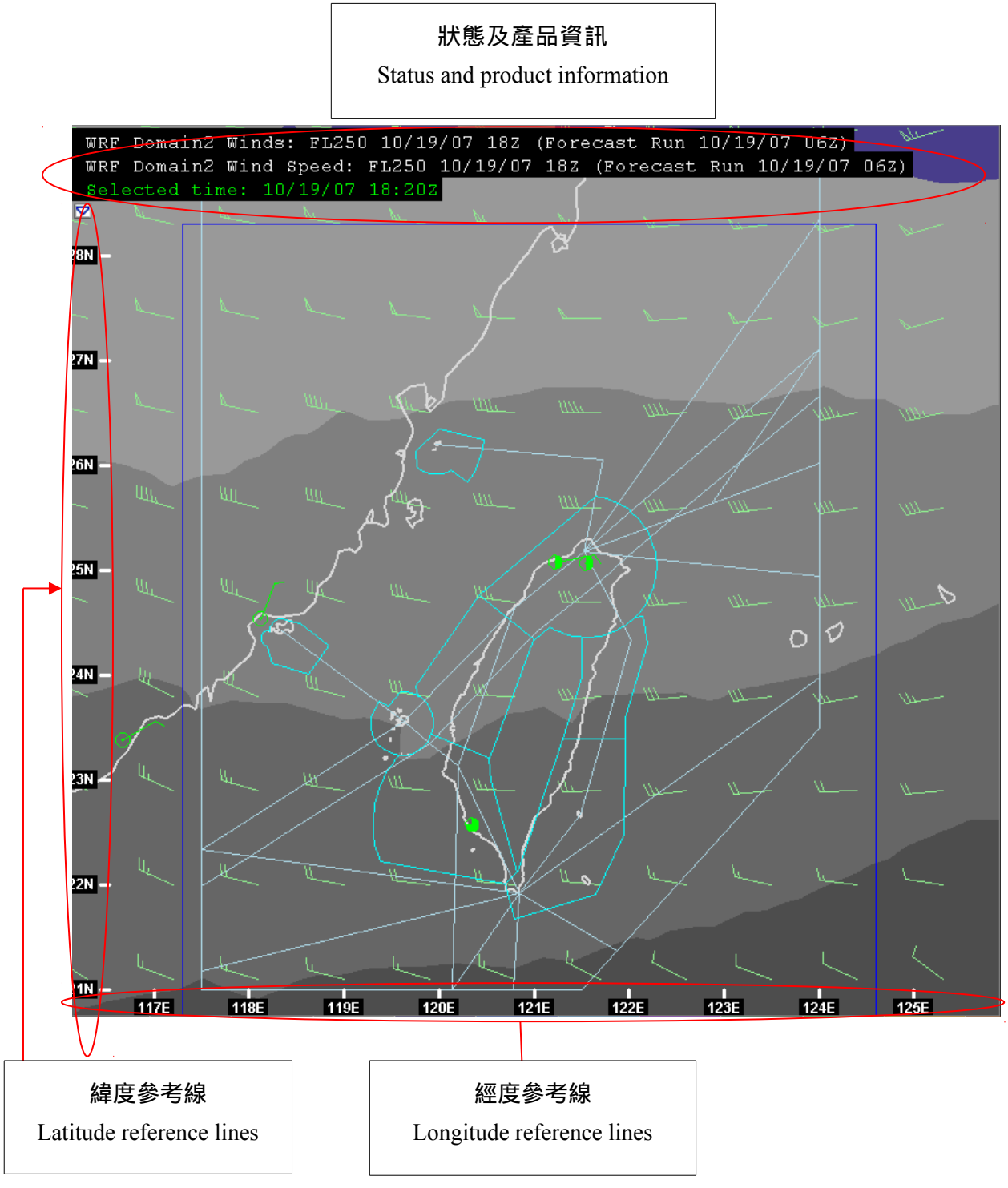


Figure 4.16-1 - JMDS – the Main Display

圖 4.16-1：JMDS 的主顯示視窗

JMDS 主要資料顯示部分呈現目前產品，顯示區域的經/緯度範圍，和顯示產品的相關狀態。

The main data display portion of the JMDS shows the current product, the longitude/latitude extent of the viewed area, and status associated with viewed products.

顯示狀態資訊包含：

Displayed status information includes:

選取的時間：JMDS 目前選取的時間。所有可視產品皆根據這個時間來顯示資料。時間及動畫元件也會同樣顯示這個選取的時間。

Selected Time: the currently selected time of the JMDS. All visible products show data based on this time. This is also shown in the Time and Animation component.

產品資訊：每個可視產品及網格的資訊，包含顯示資料的時間、顯示資料的飛航空層(若有)、資料範圍、或讀取資料時的錯誤訊息。在上圖中，產品資訊以白色文字顯示在左上角。當產品開啟或關閉，這部分資訊會對應著增加或減少。點選在狀態文字下的向下箭頭可瀏覽地圖的狀態和其他靜態資料。

Product Information: information on each visible product and grid, including the time of the displayed data, the flight level (if any) of the displayed data, the data domain of the data, and errors related to loading the data. In figure 4.14-1 above, product information includes the white text at the upper left. As products are turned on and off, this information will update with more or fewer entries. To view the status of maps and other static data as well, click on the down arrow below the status text.

歷史/預報模式：當選取的時間不是接近目前時間的可選時間區間時，JMDS 會變成歷史及預報模式。歷史和預報模式表示系統顯示系統不會去找新資料並且目前的時間視窗將不會改變。選擇接近現在的時間或按下現在按鈕便可離開預報或歷史模式。

History/Forecast Mode: the JMDS is put into history and forecast mode when the selected time is not the selectable time closest to now (the current time). Both history and forecast mode indicate that the display is no longer checking for new data and the current time window will not change. To leave forecast or history mode, select the time closest to now or press the “Now” button.

4.17 JMDS 系統設定(JMDS Configuration)

系統啟動時，將讀取 XML 格式系統設定檔案，這些系統設定檔案控制很多的顯示狀態：從視窗大小、位置、顏色到顯示資料的詳細描述。JMDS 系統提供的系統設定可被使用者用來發展適合自己系統設定的起點，因此系統提供的系統設定檔案將會詳細的自我解譯說明。在下面 4.16.3 節中，將提供詳細的系統設定檔案結構說明。

The JMDS is configured using an XML configuration file which is loaded at startup. These configuration files control numerous aspects of the display, from window size, placement, and colors, to detailed descriptions of the datasets available for viewing.

The default JMDS configurations provided can be used as a starting point for developing custom configurations. The default configuration files are heavily documented within the files themselves, and are intended to be self-explanatory. A brief description of the configuration file structure is provided in section 4.17.3 below.

4.17.1 讀取系統設定檔案(Loading Configuration files)

JMDS 系統提供的系統設定檔案，及終端使用者自己的系統設定檔案，可利用檔案(File) ->讀取選單(Load) 將設定檔案讀入 JMDS 系統，當讀入系統設定檔案後，系統將會重新設定應用程式，任何現有的設定將會不見。

Default JMDS configurations, as well as custom configurations located on the end-user file system, can be loaded into JMDS using the File->Load menu. Loading a configuration file resets the application, and any current settings are lost.

4.17.2 儲存現有的系統設定檔(Saving the current configuration)

一旦讀入系統設定檔案後，可利用檔案(File) ->儲存選單(**Save current configuration**)將系統設定檔儲存至使用者自己目錄的檔案(local file)內，此儲存的檔案可使用文字編輯器重新編輯，再重新讀入 JMDS 系統。

A configuration file can be saved to the local file system using the File->**Save current configuration**. This configuration file captures the state of the JMDS at the time of saving, including window position, size, open subwindows and their size/positions, and currently visible products, maps, and views. Saved files may be customized using any text editor, and reloaded into JMDS.

4.17.3 系統設定檔案說明(Configuration file description)

JMDS 系統設定檔是使用廣泛使用之標準 XML 格式(XML 格式說明，可從相關題目之線上參考得到)。就如前面的說明，JMDS 系統提供的系統設定檔案是自我解譯說明的檔案，提供使用者用來發展適合自己系統設定的起點。系統設定檔案可細分成以下幾個邏輯小節：

JMDS is configured using the widely-used XML standard (for a description of XML, see any of a number of online references on the topic). As stated previously, the default JMDS configuration files are self-documented and a good starting point for developing custom configurations. Briefly the configuration files are divided into the following logical sections:

- **階層設定** – 所有資料產品包括靜態地圖都在這裡設定，選項包括資料 URL 位置、變數名稱、顯示名稱、時間選擇策略等等。給定資料的選項也在這裡設定。

  Layer Configuration All gridded and non-gridded data products, as well as static maps, are defined here. Options include data URLs, field names, display names, time selection strategies, etc. Data-specific options are also configured here.

- **群組設定** – 選單及可視見的群組都在這裡設定，已經存在之主要產品(Page)次選單、產品次選單(Products)、及地圖次選單(Maps)可在這裡被定義，以做為協助有用資料產品及地圖的組合。產品也可以被歸類成數

個可視見的群組，例如產品(或地圖)群組可以歸類成可視見的群組與否，被開啟或關閉。

Group Configuration Menu and visibility groups are configured here. Sub menus of the existing “Page”, “Products” and “Maps” menus can be defined here to help organize available data products and maps. Products can also be grouped into visibility groups in this section as well. For example, a group of products (or maps) can be turned on/off simultaneously by grouping them into a visibility group

- **時間、動畫、高度、視窗及顯示設定** – 對於顯示大小、顯示位置、顏色、時區、高度單位及平面投影方式之選項皆在此節中設定。

  Time, Animation, Altitude, Window, and View Configuration Options related to display size, position, colors, time zone, altitude units, and view projection are defined in this section.

- **區域範圍設定** – 對於某個特定區域範圍的設定在此節中定義。在平面顯示區域定義每個區域四方邊界之緯度/經度，此種設定很容易放大事先定義及想要顯示之地圖區域。

  Area Configuration Areas of interest are defined in this section. Each Area defines a lat/lon bounding box to display in the plan view, making it easy to zoom to pre-defined map regions by choosing the desired area in the View menu.

- **剖面圖設定** – 設定檔中的剖面預設值是可以被改變的，每個剖面是由一條路徑或一組航點所定義出來的。

  Cross Section Configuration The predefined set of cross section can be altered in the configuration file. Each cross section is defined by a path and a set of waypoints.

- **工具設定** – 對於不同 JMDS 工具選項在此節中設定，設定項目包括：

  Tool Configuration Options for the various JMDS tools are configured here. These include:

  - 剖面圖(Cross Section)
  - 時間序列圖(Time Series)
  - 雷達警報圖(Radar Warnings)
  - 斜溫/虛擬探空圖(Virtual Soundings/ Skew T)
  - 時間/高度圖(Time / Height Profile)
  - (Meteorogram)
  - 解碼後的 METAR 表(Decoded METAR Table)
  - 機場地面觀測時間序列圖(METAR Time History)

- 機場預報選單(TAF Selector)
- 原始電報資料 (Raw Ascii Text)
- 探空資料(Sounding Text)
- METAR 顏色過濾器(METAR color filter)

- **色階設定**– 對於不同產品的色階設定在此節中設定。

  Colorscale Configuration Colorscales for the various gridded products are defined here.