

8. Real Time Display

The IRIS Real Time Display allows the instantaneous viewing of data as they are acquired. The real time display is made in an X-Window on either the radar workstation which is controlling the signal processor, or a networked workstation. The rays of data (e.g., 1 degree) are 'painted' on the display as the antenna scans, with no perceptible delay. Both PPI and RHI display styles are supported.

A real time display is used in a variety of ways:

- It provides observers with immediate feedback on the weather situation.
- For manual TASK operation, it provides radar operators with immediate feedback during manual antenna control (e.g., using handwheels or the antenna utility). This is useful for probing rapidly changing weather features such as a developing hook echo, or weak echo region.
- For system managers, the real time display provides excellent feedback for tuning the signal processor parameters.
- For system managers and radar operators, real time display is another way to verify that the system is operating properly and generating high-quality data.

Real time display is not practical for remote unattended radar sites with low-bandwidth network connections (e.g., <100 KBytes/sec).

To start the real time display:

Choose **Menus→Real Time Display** from the IRIS menu bar. You do not need to be connected to an IRIS server to start the display. The real time display will appear in the DEFAULT configuration with a blank (black) background. If data currently are being sent by the radar workstation, then within two seconds, the display will start to paint and the green LED in the upper corner of the display will flash. The real time display receiver can also be invoked in the IRISNet menu by clicking on your particular site (where you are sitting)

The real time display receiver can also be invoked in the IRISNet menu by clicking on YOUR particular site (where you are sitting) and then selecting the real time display icon.

Another way to start the real time display is to type the following command into a terminal window:

```
rtdisp
```

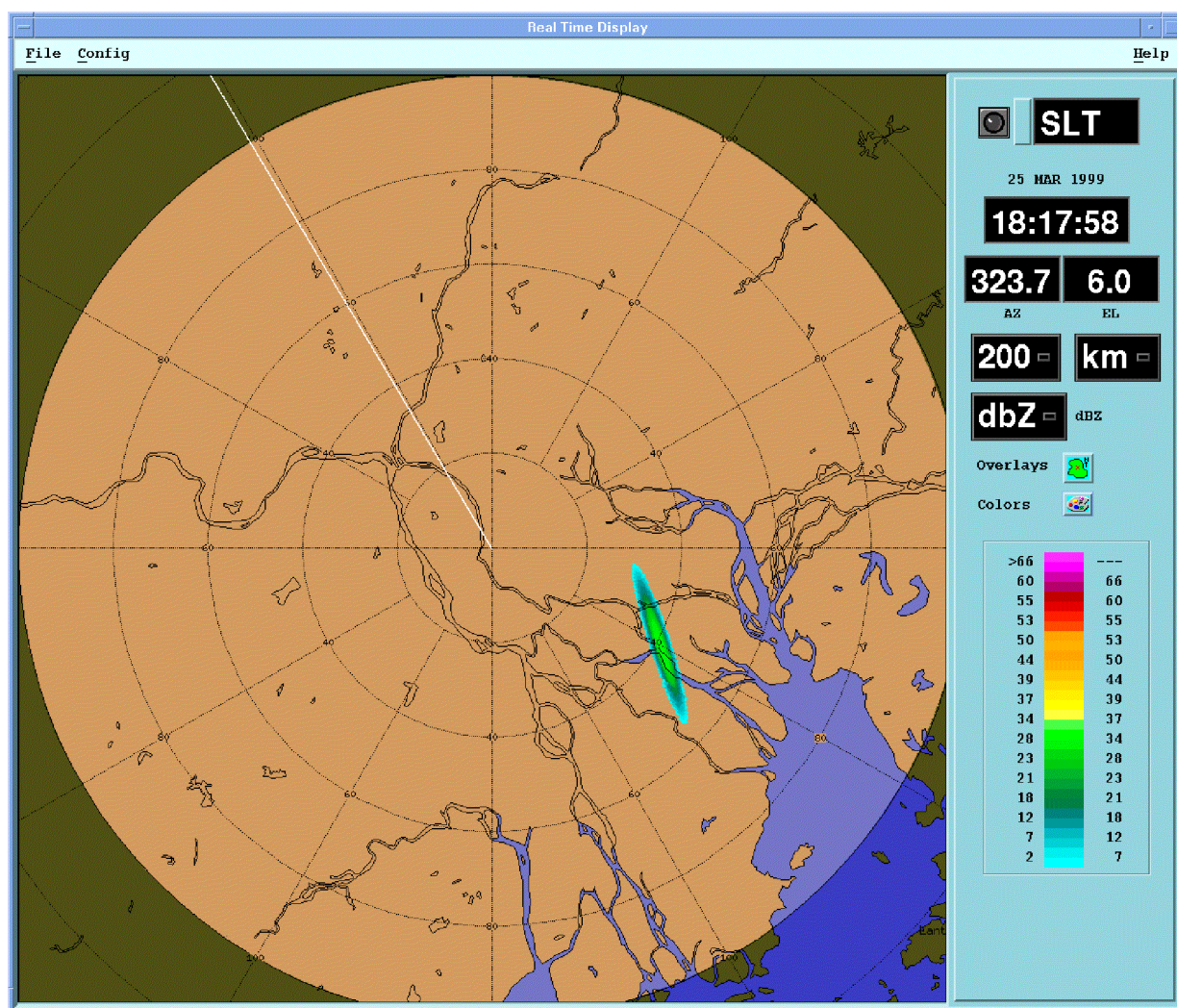
You may only have one real time display invoked from an IRIS menu bar. To get another, you can use the command approach.

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8.1 Real Time Display Menu Features



File and Config

The **File** menu allows you to open and save files and print real time display images. Saved config files are stored in the \${IRIS_CONFIG} directory with name *.rtdisp”.



Note: Whenever the Real Time Display is started it loads the configuration called **DEFAULT**.



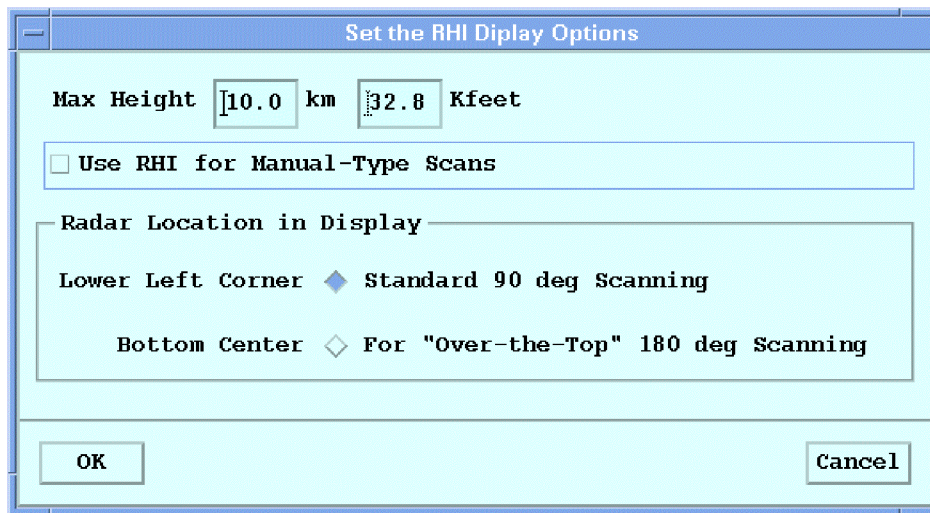
Important: **Save as ...** is used to store your custom display configuration. Be sure to invoke **File->Save as** if you want to save your changes permanently.

The **Config** menu allows you to change some basic parameters.



Ranges modifies the list of available display ranges.
RHI Options to set the appearance of RHI displays
Text Colors Choose color for text in AZ/EL, etc. display.
Sweep Line to enable/disable a line showing the radar sweep

The “Ranges” and “Text Color” menus are self-explanatory. The “RHI Display Opt ...” menu is shown below:



The height can be specified either in km or Kfeet, the latter is used if the horizontal range scale is selected to be nautical miles. The aspect ratio will adjust automatically. By default, IRIS Manual scans are displayed in PPI format. The button in the menu overrides this causing manual scans to be displayed in RHI format. Finally, the user can select either a standard 90 degree scan or an “Over the top” 180 degree scan depending on the antenna capabilities. Note that all of these settings are saved



Status LED

The LED at the top of the display shows the status of the data stream to the real time display.

- Fixed red on startup indicates that no data are being sent, or that data have not been received for five minutes (time-out). Refer to Section 8.2 to diagnose why data are not being sent.
- Flashing green indicates that data are currently being received.
- Fixed green indicates that data are not currently being received, but data have been received within the last five minutes.



SLT

Site ID Field for Multiple Radars

This field shows the three letter radar site ID. For installations that have more than one radar, this field can be used to select which radar will be viewed on the real time display.

If you have multiple radars, click on the button to the right of the LED to get a list of sites. As in the example is shown below. Select the site that you want to display.

Site Status and Selection						
Site Name	Site	SiteID	Task Name	Status	Data	
SIGMET, humid	HUM	20	PPIVOL_C	OK	dBZ	V
SIGMET, sleet	SLT	30	PPIVOL	OK	dBZ	V W

18:17:58

Time Display

The data time (not the local workstation time) is displayed to the nearest second in large format numerals. This will update approximately once per second when data are arriving. When no data are arriving, the display time will not update so that the time will reflect the data that remain on the screen. The date of the data is displayed in smaller characters above the time.

The large format numerals are designed to be read from several meters distance. The color of the numerals can be changed using **Config→Set Colors**.

AZ/EL Display

Azimuth and elevation angles are displayed to the nearest tenth degree in large format numerals. This will update approximately once per second when data are arriving. When no data are arriving, the angles will not update so that the elevation angle will reflect the data that remain on the screen.

The large format numerals are designed to be read from several meters distance. The color of the numerals can be changed using **Config→Set Colors**.

Maximum Range

One of four maximum ranges can be selected by clicking on the numerical field under the AZ/EL display. To set these ranges and the units, use **Config→Set Ranges**.

The large format numerals are designed to be read from several meters distance. The color of the numerals can be changed using **Config→Set Colors**.

Data Selection for Display

Click on this field to select the type of data for display. The choices are:

- dBZ
- Velocity
- Width

After you make your selection, the display will reset and start painting the new data type.



Caution: If the radar system IRIS is not configured to collect and transmit the selected data type, then no data will be displayed. See Section 8.2 for information on configuring the real time display output from the radar IRIS.

The large format numerals are designed to be read from several meters distance. The color of the numerals can be changed using **Config→Set Colors**.

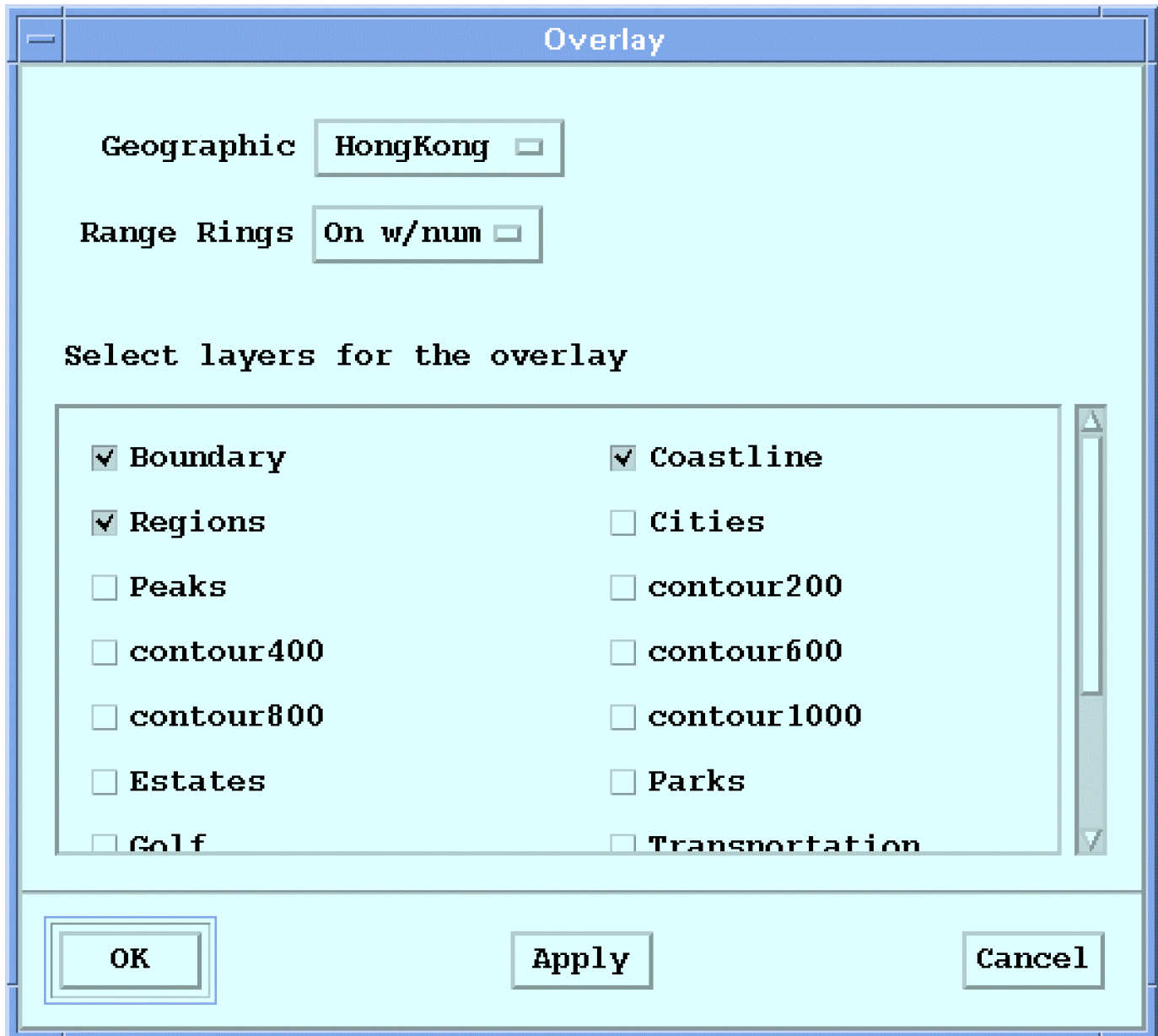


Overlays

The overlay features for the real time display include:

- Geographic overlays.
- Range rings or lat/lon lines.

Either or both of these options can be accessed by clicking the **Overlays** button to access the Overlays submenu.



Click on **Geographic** to select from a list of available overlays, or **Off**.

Click on **Range Rings** to select among:

- Off

- On
- On with numeric labels
- Latitude/Longitude grid (with numeric labels)



Color Scale

The colors used to represent the data can be modified. Click on the **Colors** button to get the Color submenu.

The dialog box is titled "Data Product Color Scale Configuration". It contains the following fields and controls:

- Color Scale Definitions** (Section Header)
- Data Type**: A dropdown menu showing "dBZ".
- Display Units**: A text box containing "-32 to 96 dBZ".
- Color Scale**: A dropdown menu showing "Default".
- Color Set**: A dropdown menu showing "Default".
- Levels**: A text box containing "16".
- First Level/Step**: Two text boxes, the first containing "96.0" and the second containing "50.0".
- Buttons**: "OK", "Apply", and "Cancel" buttons at the bottom.

This menu is described in the Color Scale Tool section of the *IRIS Product & Display Manual* of this manual. After making a change, the display will reset and be painted with the new color scale.



Note: Entering a level step of 0 for velocity has the special meaning to display the full unambiguous velocity range. This range is not known until data are received. The velocity color scale will show all zeroes in this case until data are received.

8.2 Configuring the Real Time Display Transmitter

This section summarizes how to configure the data transmission from the radar site. Configuration requires operator privileges.

Real Time Display Overview

The real time display data are output by the IRIS system that is at the radar site. Ray-by-ray output packets are sent over the network using a UDP broadcast message approach. Real time display at the local radar workstation essentially bypasses the network.

This approach allows many workstations to monitor the real time display, without any additional burden on the network traffic after the first one. The number of data parameters and range bins can be tuned to match the available bandwidth of the network. A benchmark configuration is illustrated below:

- Transmitted Parameters Reflectivity only (1 byte)
- Number of Bins 500
- Scan Rate 4 RPM (24 degrees per second)
- Scan Resolution 1 degree

In this case the data rate is 12 KBytes/sec or 96 KBits/sec. This means that real time display can easily be done for Ethernet (10 MBits/sec) or T1 (1 MBit/sec) connections. However, for slower speed connections it would be necessary to reduce the number of bins, increase the resolution and/or slow the scan rate. Keep in mind that the radar is probably also sending processed or RAW products over the network link so the bandwidth requirement for these must also be considered.

Another consideration is that the maximum number of bin-moments that can be transmitted is ~1500. For example, it is not possible to send 1024 bins of dBZ, velocity and width. In the event that greater than 1500 are specified, the number of bins will be automatically trimmed so that the total number of bin-moments does not exceed 1500.

Setup Utility Configuration

The **setup/RVP** utility has several questions relating to both the transmitter and receiver ends of the real time display, i.e.,

- What data are to be sent (dBZ, V, W) by the transmitter.
- The maximum number of range bins to be transmitted (up to 1024).
- The socket port is used for transmission and reception (typically set to 30730).
- What IP broadcast addresses are to be used for transmission.

Refer to the **setup section** 9.2.9 for more information.