Quick Guide
to SATAID

Japan Meteorological Agency

SIGMET workshop Tokyo 2016
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SATAID (SATellite Animation and Interactive Diagnosis) is a sophisticated display program that enables visualization of meteorological information in spatial and temporal dimensions. This helps forecasters to continually analyze and monitor weather parameters and phenomena for improved meteorological services.
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1. Installing SATAID
### Installing SATAID Program

#### Installing SATAID

<table>
<thead>
<tr>
<th>File Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gmslpd.chm</td>
<td>2015/11/11 18:13</td>
</tr>
<tr>
<td>Gmslpd.exe</td>
<td>2016/01/28 14:14</td>
</tr>
<tr>
<td>GMSLPD.INI</td>
<td>2015/04/03 18:13</td>
</tr>
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<td>GMSLPD.WAV</td>
<td>1994/06/01 9:00</td>
</tr>
<tr>
<td>GMSLPD_MW.INI</td>
<td>2015/02/13 17:12</td>
</tr>
<tr>
<td>gmslpd_mw.vbs</td>
<td>2015/02/10 10:15</td>
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<td>Gmslpd64.exe</td>
<td>2016/01/28 14:14</td>
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<tr>
<td>gmslpd64_mw.vbs</td>
<td>2015/02/10 10:15</td>
</tr>
<tr>
<td>GSETUBEXE</td>
<td>2015/07/03 13:13</td>
</tr>
<tr>
<td>GSETUR.INF</td>
<td>2016/01/15 18:15</td>
</tr>
<tr>
<td>GSETUP_E.TXT</td>
<td>2015/06/23 13:13</td>
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<tr>
<td>Gsetup64.exe</td>
<td>2015/07/03 13:13</td>
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<tr>
<td>GSETUP64.INF</td>
<td>2016/01/15 18:15</td>
</tr>
<tr>
<td>IMGLIB.dll</td>
<td>2015/08/26 13:13</td>
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<tr>
<td>IMGLIB64.dll</td>
<td>2015/08/26 13:13</td>
</tr>
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<td>msMap2.dat</td>
<td>2011/08/01 18:18</td>
</tr>
<tr>
<td>msMap9.dat</td>
<td>2010/02/15 18:10</td>
</tr>
<tr>
<td>msMap30.dat</td>
<td>2010/02/16 14:10</td>
</tr>
<tr>
<td>RGBlist.dat</td>
<td>2016/02/09 18:15</td>
</tr>
<tr>
<td>STAINFDAT</td>
<td>1999/02/11 0:2</td>
</tr>
<tr>
<td>STRING.DAT</td>
<td>2011/08/01 18:18</td>
</tr>
<tr>
<td>TYPNAME.DAT</td>
<td>2003/08/04 11:13</td>
</tr>
</tbody>
</table>

For **32bit OS**: GMSLPD

For **64bit OS**: GMSLPD64

![User Account Control](image)

Click Yes
Installing SATAID Program

1. Click Yes
2. Click OK
3. Double click the icon
2. Controlling and Displaying Satellite Images
Selecting Satellite Images

<table>
<thead>
<tr>
<th>Band</th>
<th>Wavelength [μm]</th>
<th>Himawari Cloud*</th>
<th>Himawari Cast*</th>
<th>WIS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>0.46</td>
<td>○ (1 km)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>0.51</td>
<td>○ (1 km)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VS</td>
<td>0.64</td>
<td>○ (0.5 km)</td>
<td>○ (1 km)</td>
<td>○ (4 km)</td>
</tr>
<tr>
<td>N1</td>
<td>0.86</td>
<td>○ (1 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>N2</td>
<td>1.6</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>N3</td>
<td>2.3</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>I4</td>
<td>3.9</td>
<td>○ (2 km)</td>
<td>○ (2 or 4 km)</td>
<td>○ (4 km)</td>
</tr>
<tr>
<td>WV</td>
<td>6.2</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td>○ (4 km)</td>
</tr>
<tr>
<td>W2</td>
<td>7.0</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>W3</td>
<td>7.3</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td>8.6</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>O3</td>
<td>9.6</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>IR</td>
<td>10.4</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td>○ (4 km)</td>
</tr>
<tr>
<td>L2</td>
<td>11.2</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>12.3</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td>○ (4 km)</td>
</tr>
<tr>
<td>CO</td>
<td>13.3</td>
<td>○ (2 km)</td>
<td>○ (4 km)</td>
<td></td>
</tr>
</tbody>
</table>

*(*) spatial resolution

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Selecting Satellite Images

◆ Calculated Images
  • S1: Differential images 1 (IR – I2)
  • S2: Differential images 2 (I4 – IR)

◆ Colored Images
  • ElRc: Colored enhanced infrared images
  • ElRm: Monochrome enhanced infrared images
Controlling Animations

Drag to change animation duration (first/last image).

Start/Stop Animation.

Display previous image.

Display next image.

Play in reverse sequence.

Play in normal sequence.

Adjust animation speed.

Tips

Ctrl + ← or →

Specify current image as the first/last image of animation.
Zooming In/Out

◆ Method 1
- Display enlarged area.
  Click [Zoom] button and drag area.
- Return to whole image.
  Click [Normal] button.

◆ Method 2
- Zoom in: Ctrl + Shift + Left-Click
- Zoom out: Ctrl + Shift + Right-Click

Tip
Areas can be digitally designated with longitude/latitude information.
Ctrl + Shift + [Zoom]
Displaying RGB Images

1. Select Option.
2. Click RGB list.
3. Select RGB image.
4. Click Apply to display.
Displaying Coast/Grid Lines

Checkbox activation with [Ctrl] pressed: larger font for latitude/longitude figures
Checkbox activation with [Shift] pressed: with background color for latitude/longitude figures
Checkbox activation with [Ctrl] + [Shift] pressed: larger font with background color

Select latitude/longitude intervals.

[Map element] can be selected from the [Options] menu to add rivers/lakes/borders, etc.

The colors of these lines can be changed using [Line color] in the [Options] menu.
Changing Line Style

Click Map element... with Ctrl pressed.

The line style can be set here.

The line width can be set here.

Multi can be checked to enable line color change.

Latitude and longitude character size can be changed here.

Latitude/longitude background can be toggled on and off here.
3. Displaying NWP Data
Displaying NWP data

1. Check NWP to display a pop-up window
2. Select the desired elements
3. Click Exec to display

Shrink/extend window

Available NWP data

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Content</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Altitude</td>
<td>gpm</td>
</tr>
<tr>
<td>Wind</td>
<td>Wind barb</td>
<td>kt</td>
</tr>
<tr>
<td>Isotac</td>
<td>Isotach</td>
<td>kt</td>
</tr>
<tr>
<td>Temp</td>
<td>Air temperature</td>
<td>°C</td>
</tr>
<tr>
<td>T-TD</td>
<td>Dew-point depression</td>
<td>°C</td>
</tr>
<tr>
<td>P-Vel</td>
<td>Vertical p-velocity</td>
<td>hPa/h</td>
</tr>
<tr>
<td>Vort</td>
<td>Relative vorticity</td>
<td>10^-6/s</td>
</tr>
<tr>
<td>EPT</td>
<td>Equivalent potential temperature</td>
<td>K</td>
</tr>
<tr>
<td>VWS</td>
<td>Vertical wind shear</td>
<td>kt/1000ft</td>
</tr>
<tr>
<td>Rain</td>
<td>Precipitation (3 hours)</td>
<td>mm/3h</td>
</tr>
<tr>
<td>Psea</td>
<td>Sea level pressure</td>
<td>hPa</td>
</tr>
<tr>
<td>SSI</td>
<td>Showalter stability index</td>
<td>°C</td>
</tr>
<tr>
<td>RH</td>
<td>Relative humidity</td>
<td>%</td>
</tr>
<tr>
<td>Div</td>
<td>Horizontal divergency</td>
<td>10^-6/s</td>
</tr>
<tr>
<td>POT</td>
<td>Potential temperature</td>
<td>K</td>
</tr>
<tr>
<td>RiN</td>
<td>Richardson number</td>
<td>-</td>
</tr>
<tr>
<td>CAPE</td>
<td>Convective available potential energy</td>
<td>J/kg</td>
</tr>
<tr>
<td>PV</td>
<td>Potential vorticity</td>
<td>0.1PVU</td>
</tr>
<tr>
<td>Avor</td>
<td>Absolute vorticity</td>
<td>10^-6/s</td>
</tr>
<tr>
<td>Advc</td>
<td>Temperature advection</td>
<td>10^-6/s/h</td>
</tr>
<tr>
<td>Vadv</td>
<td>Relative vorticity advection</td>
<td>0.1°C/h</td>
</tr>
<tr>
<td>SH</td>
<td>Specific humidity</td>
<td>0/1g/kg</td>
</tr>
<tr>
<td>EXT</td>
<td>Extra element (diff. between levels)</td>
<td>undefined</td>
</tr>
</tbody>
</table>
1. Click the upper-left corner of the window to display a pop-up window.

2. Elements can be changed on the panel.

**Tips**

- When [Data file] is clicked, a CSV file of selected NWP elements is output.
- When [Last init.] is NOT selected, the earliest initial NWP data are displayed.
- When [Interpolation] is selected, forecast fields between forecast times can be interpolated and displayed (i.e. if [Interpolation] is NOT selected, NWP data are shown only every six hours).
Changing Colors/Line Types/Hatch Patterns

Initial time

Adjustment for NWP displaying

Time [min]: 0
Lat. [deg]: 0.0000
Lon. [deg]: 0.0000

Colors can be changed here.

Intervals between contours (isolines) can be selected here.
Displaying Forecast Values

The space between the red arrows becomes shorter.

Drag the red arrow to the right to select the forecast time.

Open NWP menu.

Satellite images are not shown while forecast time data are being displayed.
4. Displaying Observation Data
Displaying SYNOP/SHIP/TEMP Data

Select Surf.

Select a figure between 1,000 and 100.

SYNOP/SHIP

Click a site on the display to open a pop-up window for that site.

TEMP P

Click a site on the display to open a pop-up window for that site.
Displaying SYNOP/SHIP/TEMP Data

- Set data display thresholds.
- Select elements to be displayed.
- Set symbol color.

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Displaying ASCAT Data

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5. Customizing Display
Adjusting Gradation and Enhancing Color

1. Adjust brightness.
2. Change contrast.
3. Reset grayscale.

Select a radio button to change the grayscale setting.

- To select a range to be emphasized: Click on two arbitrary points.
- To clear the range to be emphasized: Right-click on the first point and left-click on the second.
Adjusting Gradation

Click on the display to adjust gradation.
6. Data Evaluation
When NWP data are displayed, estimated altitudes will be shown.
Brightness Evaluation

Vert.1 (Air temp.)
Wind, temperature and dew-point temperature

Vert.2 (Potential temp.)
Wind, potential temperature, equivalent potential temperature and saturated equivalent potential temperature

Vert.3 (wind)
Wind hodograph or scorer number

Vert.4 (Stability)
SSI, KI, CAPE and CIN

Vert.5 (Trajectory)
Trajectories with positions, altitudes, potential temperature and equivalent potential temperature changed over time.

Click the upper-left of the window
Movement (Vector) Evaluation

1. Check Measure
2. Check Move

Movement vector is automatically calculated.
Movement speed is also calculated.

Select the first point in the first image.
Select the second point in the next image.
Change the time as desired.

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When NWP data are displayed, a time-series graph of NWP data for the selected point will be shown.
Sync view:
Data in the graph are updated in synchronization with animation.

Fixed scale:
Upper- and lower-limit values on the scale are fixed, and can be changed in Scale setup. If this is left unchecked, actual maximum and minimum brightness values are shown.

Adjust size:
Graph sizes change in proportion to the window size.

NwpTbb:
If this is left unchecked, no brightness temperature graph is shown on the screen. Only NWP data are shown.
When NWP data are displayed, a cross-sectional graph of NWP data for the selected point will be shown.
Isolines (Contours)

1. Check Measur
2. Check Contour

Drag to specify a rectangular area
Isolines (Contours)

Click the upper-left of the window.

Select upper/lower value and interval.

Set up counter.

Select color.

Select line type.

Is Extra contour checked?

Yes (Hatch pattern shown)

No (No hatch pattern shown)

Select color.

Select line type.

Select hatch pattern.

Select upper/lower value and interval.
1. Check Measur
2. Check Hist

Click points on the display to specify a polygonal area.

Double-click the last point.
Histograms

Click the upper-left of the window.

Statistical values and a histogram are shown.

Brightness degrees (temp. for IR and reflectivity for VIS channel) are shown as numerical values.

Frequency distribution of brightness degrees is shown (the interval can be changed on the histogram setup menu).

A scatter diagram of brightness temp. or reflectivity together with regression lines is shown for two different image types at the same time.
7. Other Functions
Changing Window Size

The screen size window can be opened to change the size of the SATAID window by clicking on [Screen size] in the [Option] menu.

Window size can be specified using the width and height boxes (unit: pixels).

Window size is automatically adjusted to fit the display.
Creating Drawings

1. Check Draw

**Select line width.**
Select Thin, Standard or Thick.

**Spline drawing**
- Select the line width and check the [Curve] checkbox.
- Click on two or more points in the displayed image and double click on the end point.

**Partial erasure**
- Select the [Erase] checkbox.
- Click a line or a character string, etc. in the current image to erase it. The item will be displayed in reverse color, and will be erased if clicked again.

**Tip**
If neither [Curve] nor [Erase] is selected, freehand drawing is enabled.
Deleting Drawn Figures

Right-click on the figure.

Left-click on the Question mark.
Creating Drawings

1. Check Draw

2. Click Extra

3. Draw lines and arrows (fronts, troughs, or ridges), which can be created as with spline drawings.
   *Click the [Sn-front] button with [Ctrl] pressed to draw a stationary front in red and blue.

4. Draw polygons, closed curves, or cloud rims, which can be created as with spline drawings. In these figures, colors and hatched patterns can be changed.

5. Draw ellipses, circles, or flex oval. Colors can be changed and hatched patterns can be used for filling.

6. Paste cloud form symbols or vortex center symbols. (Drag a symbol to the desired point. The symbol size can be changed and the symbol can be reversed from left to right by dropping it with [Ctrl] pressed.)

7. Paste character strings. (Drag [Char] to the desired point. The character size can be changed.)

8. Paste wind barbs (Drag [Char] to the desired point after inputting WIND ddd (direction in 360 deg.) and fff (velocity). The wind barb size can be changed.)
### Creating Drawings

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High-level cloud (Ci)</td>
</tr>
<tr>
<td>2</td>
<td>Middle-level cloud (Cm)</td>
</tr>
<tr>
<td>3</td>
<td>Cumulus (Cu)</td>
</tr>
<tr>
<td>4</td>
<td>Cumulus Congestus (Cg)</td>
</tr>
<tr>
<td>5</td>
<td>Cumulonimbus (Cb)</td>
</tr>
<tr>
<td>6</td>
<td>Stratus</td>
</tr>
<tr>
<td>7</td>
<td>Stratus or Fog</td>
</tr>
<tr>
<td>8</td>
<td>Low-level vortex</td>
</tr>
<tr>
<td>9</td>
<td>Upper-level vortex</td>
</tr>
<tr>
<td>10</td>
<td>Center of typhoon with eye</td>
</tr>
<tr>
<td>11</td>
<td>Center of typhoon without eye</td>
</tr>
<tr>
<td>12</td>
<td>Waved cloud (Mountain wave)</td>
</tr>
<tr>
<td>13</td>
<td>Low-level vortex (Meso $\beta$-scale)</td>
</tr>
<tr>
<td>14</td>
<td>(Cross mark)</td>
</tr>
<tr>
<td>15</td>
<td>Light turbulence</td>
</tr>
<tr>
<td>16</td>
<td>Moderate turbulence</td>
</tr>
<tr>
<td>17</td>
<td>Severe turbulence</td>
</tr>
<tr>
<td>18</td>
<td>(Tilde mark)</td>
</tr>
<tr>
<td>19</td>
<td>Light icing</td>
</tr>
<tr>
<td>20</td>
<td>Moderate icing</td>
</tr>
<tr>
<td>21</td>
<td>Severe icing</td>
</tr>
</tbody>
</table>
Outputting Images

- **Print image**: Output the current image to a printer
- **Print screen**: Output the entire screen to a printer
- **Page setup**: Set the margins of the printing paper

- **Output bitmap**: Output the current image as a bitmap file
- **Output serial bitmaps**: Output images as bitmap files
- **Output animated GIF**: Output images as a Gif animation

(*BMP, JPG, PNG, TIF and other formats can be used.)

- **Copy the current image to the clipboard**
Check [Save values] to save the current settings to the initial value file in the program directory before exiting the program. The settings will be applied by default at the next startup.

Settings saved include:
- Animation speed
- Show/hide status of latitude/longitude lines
- Latitude/longitude line display intervals
- Show/hide status of coastlines
- Show/hide status of drawings
- Screen size
- Line colors
- Grayscale status set separately for image types