RainStorm®

RainStorm is a photogrammetric commercial-off-the-shelf software tool designed to support targeting for precision guided weapons. The program integrates precise 3-D location and feature data, and digital terrain data using stereo and monoscopic imagery.

The software program uses all available imagery sources to locate a point relative to the Earth’s surface and derive precise latitude, longitude, elevation, and error estimates for precision munitions, including coordinate-seeking weapons. RainStorm automates and integrates the passing and sharing of this information to other targeting, visualization, and mission planning systems.

Easy-to-Use Interface

RainStorm’s easy-to-use interface provides easy access to the most often used commands. The status bar reports status messages, Web Services measurement (measurement) requests, latitude/longitude, elevation, Circular Error/Linear Error (CE/LE), zoom, and rotation; while the standardized toolbar enables quick access to the most frequently used tools to enhance productivity without being intrusive.

A variety of methods to manipulate image display, such as Zoom In On Region, and slider bar controls for image enhancements also adds to user productivity. The Auto Rotate Stereo and Auto Enhance options reduce workload and speed point mensuration by rotating stereo pairs, and enhancing image brightness and contrast automatically.

Graphical feature overlays provide a logical association of features. Features can be added to an overlay, which can then be toggled to display on selected imagery. Users can specify a variety of overlay properties. Additionally, graphic tooltips provide descriptions of graphical features by hovering the cursor over a graphic (such as a product boundary).

A dynamic overview locator allows the user to quickly navigate to areas outside of the currently displayed portion of the image.

Targets can be derived by several methods, including true Stereo, Anaglyph, Split-Screen, and Multiple image point mensuration.

Automated Tasks

During time-critical targeting, image registration is typically the most time-consuming process. RainStorm’s automatic tie point selection registers the target image to the stereo imagery using automatic feature extraction and correlation techniques to match the source imagery within seconds.

The assisted tie function automatically locates tie points in a second image when a tie point is selected in one of the images being registered.

Multiple aimpoint generation allows generation of a pattern of points over a geographical area, according to user-specified boundaries and total quantity or spacing between points. Resulting points can be added to a graphical overlay.

Enhanced User Toolset

Image Search allows a search for stored imagery. Imagery can be found by coordinate, reference peg, or the center of an open window.

Image Link synchronizes the location of multiple images by scroll bar movements, orientation, and/or display of stored features.

Reduced-Resolution Data Set (R-Set) generation provides a user faster access to reduced-resolution images to quickly locate targets.
NGA Validated

RainStorm is NGA-validated for point mensuration on both NGA stereo imagery and national imagery registered to NGA stereo imagery.

Input/Output

Supported image formats include national imagery transmission format (NITF) v2.1 and lower, JPEG/JPEG 2000, TIFF/GeoTIFF, and sun raster format (RAS).

The PowerPoint and HTML Export creates a snapshot of an image with all displayed features, overlays, and text blocks of target data.

Target data can be exported to a specified location on disk in Comma-separated Values (CSV), Cursor on Target (CoT), TARGSTI.rcv, XML, and American Standard Code for Information Interchange (ASCII) formats for import into other applications.

Imagery and graphical overlays can be exported in Geographic DXF, UTM DXF, screen capture, NITF chip, and Shape file.

Multiple Interfaces

An improved mensuration engine places measurement functions in a separate library to support point mensuration techniques. This architectural enhancement enables future versions of RainStorm to readily incorporate functions provided by the Common Geopositioning Services library, when available.

RainStorm supports a network centric environment.

RainStorm supports network centric processing, an essential component of Time-Critical Targeting. By using industry standards and the latest web service techniques, communication with RainStorm is virtually limitless. This allows collaboration with mission planning tools to compress the “kill chain.” Client-server web services efficiently coordinate available workstations to process mensuration requests, manage the workload, and keep an event log.

RainStorm’s Target Files Editor allows import and export of tasked target data from systems that generate target files such as Joint Mission Planning System and the Pracalon Guided Munitions Target Data Base (PGMTDB). RainStorm displays target data from the daily Air Tasking Order on reference imagery, giving the user a visual representation of the plan. The editor can be used to verify, confirm accuracy of, and edit/update targets. Updates can then be exported over a network as an RCV or XML file to other planning systems.

Cursor on Target is a data strategy for enabling DoD systems to exchange much needed time-sensitive information including location and “what,” “when,” and “where” information. The RainStorm CoT function allows users to send coordinate locations to a CoT server or to save the information in an XML file.

The Joint Targeting Toolbox Interface scheme allows a RainStorm operator to retrieve and process coordinate mensuration requests and provides an interface to the military.

The Socket-Based API (legacy API from RainDrop) provides a basic set of functions allowing interaction with the RainStorm application—used by NGA, FalconView, and others. The Socket API can now access RainStorm running on a different workstation by supplying the Internet protocol address of the target machine.

Extensible Markup Language (XML) provides an open interface to read and write XML documents via command line options.

RainStorm’s Web Services is an open interface used to retrieve and process coordinate mensuration requests—used by the Automated Deep Operations Coordination System, the Joint Global Command and Control System, TerraSight, and others.
### RainStorm® Options

**Customized Hardware**
- PCs built to your specifications
- Ruggedized systems
- Disk arrays
- Laptops

**Servers**
- Web server
- Database server
- Application server

**Training**
- In-house
- On-site
- Customized courses

**Custom Integration Services**
Northrop Grumman has the capability to design, develop, and support fully missionized systems and subsystems to satisfy a full array of customer needs. These capabilities provide military leaders with the solutions and systems necessary to link ground, air, and sea defense systems in near-real time on collaborative, command and control battle management and sensor platforms.

### Minimum Operating Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Platform</th>
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<tbody>
<tr>
<td>Windows XP/Win 7</td>
<td></td>
</tr>
<tr>
<td>300 MB Disk Space</td>
<td></td>
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<tr>
<td>512 MB Memory</td>
<td></td>
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<tr>
<td>1 GHz Processor</td>
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<tr>
<td>3-button Mouse</td>
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<tr>
<td>CD/DVD Reader</td>
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<tr>
<td>Stereo capable video card*</td>
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<tr>
<td>Stereo capable monitor (1024x768 at 120Hz)*</td>
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<tr>
<td>Stereo viewing equipment*</td>
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* Only required for stereo viewing

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### Features

- NGA Stereo Imagery Point Mensuration
- Stereo Pair Point Mensuration
- National Imagery Registration/Mensuration
- Uncontrolled Image Registration Mensuration (Six PointTie)
- Multiple Image Point Mensuration
- XML Interface
- Socket-Based Interface
- PC/UNIX Support
- Target Detail Report
- Excel/PowerPoint Export
- Split Screen Stereo Imagery Point Mensuration
- Enhanced User Interface
- Integrated Web Services
- Reduced Resolution Data Set (R-Set) Generation
- Community Sensor Model Support
- Auto Registration/Assisted Tie Points
- NITF Writing and Chipping
- PGMDB Interface
- Cursor on Target Interface
- Image Search – Speed Improvements
- Multiple Target Point Generation
- Image Display/ELT Enhancements
- Toolbar Slider Controls for Zoom, Rotate, Contrast and Brightness
- HTML Target Folder
- CGS Engine
- Digital Elevation Model (DEM)
- Collateral Damage Assessment Integration