GANDER OCEANIC AIR TRAFFIC SYSTEM

GOATS
USER'S GUIDE

2013.11

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Introduction

GOATS stands for Gander Oceanic Air Traffic System. It is a non-radar client that simulates the functionality of GAATS, and was designed for use by controllers on the VATSIM network to help manage transatlantic flights between North America and Europe using fully procedural air traffic control.

Development & Acknowledgments

Motivation for development was based on the need for a better way to manage procedural traffic on VATSIM. I really developed it for my own personal use, but I was encouraged to continue development for a broader audience by VATCAN's Jean-Francois Desrosiers. Initial development with Visual Basic 6 began in July 2013. In October, during the 2013 Cross the Pond event, a prototype of GOATS was used in parallel with cloud-based spreadsheet solutions, and was found to be superior in managing procedural traffic. The first beta tester was Luke Kakert.

Installation

GOATS is packaged in a single zip file; there is no installer. Extract the contents of the zip file to a folder of your choice. Removal of GOATS is as simple as deleting the files and/or the folder in which it was installed.

What's New

Version 1.0.xxx is the GOATS beta, so naturally everything is new in this version! Significant revisions are documented in the changes.txt file. Access the beta tester feedback form from the menu.

Running GOATS

When you run GOATS, the "New/Oceanic" window (Figure 1 (1)) takes up most of the left display; at the bottom left (2) is a history window. On the right are several command buttons (3), watch windows (4) & (5); and a digital scratchpad (6).

FEATURES

☒ **EASY-TO-USE**

> Simple and intuitive interface helps ATC manage traffic on NATs and random routes.

☒ **MULTIPLE FLIGHT DISPLAYS**

> View traffic by flight level, time, or alphabetically.

> Radar-like display of traffic in oceanic airspace helps with situational awareness

☒ **CONFLICT DETECTION**

> Automatic alerting for violations of lateral, longitudinal, and vertical separation standards

☒ **MULTI-PLAYER**

> Send and receive handoffs to other controllers with a click of the mouse.

☒ **VIEW DAILY NATS**

The New/Oceanic Window

In order to get the most out of GOATS, flight data should be entered under the following guidelines. An example using Air Canada flight 358 (ACA358) is presented in Figure 2.

Figure 1

The fields at the top, below the Reporting header, should reflect the most current position reported by the pilot. WPT1 is the waypoint the aircraft most recently reported crossing, or the NAT entry point for aircraft that are inbound to oceanic airspace. Waypoints (WPT1 and WPT2) can be up to five characters. GOATS recognizes 200 different oceanic waypoints (eg., YAY, LIMRI), and Concorde route waypoints (e.g., SM30W).

NAT waypoints, and other oceanic coordinates that represent whole degrees of latitude and longitude should be entered as a sequence of four numbers only (e.g., 5750 for the NAT waypoint 5750N, or 3645 for 36 degrees North, 45 degrees West). WPT1Z is the ZULU time the aircraft reported crossing the waypoint (e.g., 1840); this should be a four-digit number and should not include the letter Z. The aircraft flight level (FL) is entered as a three-digit number (e.g., 370) reflecting the aircraft's flight level in hundreds of feet. The mach airspeed of the aircraft should be entered as a two or three-digit integer. For example, Mach 0.73, enter 73 or 073; Mach 2.15, enter 215.

The fields below the Estimating header can be left blank for inbound aircraft.

If the Reporting fields are complete, and WPT2 contains a valid waypoint, then GOATS will, after pressing OK, automatically attempt to estimate the time to WPT2. Aircraft that have not entered oceanic airspace are so designated by checking the INBOUND checkbox; GOATS designates WPT1 as the NAT Entry point, and WPT1Z as the NAT Entry point time. Issuance of "not before" times, or block altitudes can be recorded in the Notes field.

Figure 2

TRK is the North Atlantic Track; random routes are designated with RR. (Note that GOATS will automatically designate aircraft as being on a random route if the FL is below 290 or above 410). The SELCAL field is used to record the aircraft's Selective Calling code. The DEST field contains the aircraft's ICAO or IATA destination code. The EQPT field contains the aircraft's equipment code, and is truncated to 4 characters. The controller can use the Notes field to record information unique to each aircraft, including "not before" times, block altitude, callsigns, etc.

The Search button is used to search for aircraft on the VATSIM network. Be careful with this function, because if it finds the aircraft on the network, it will overwrite any data entered in certain fields (eg., the flight plan field, FL, DEST, EQPT, and NOTES). Search capability requires network configuration, specifically the name of the server handling the request must be entered in the network dialog (See Multiplayer Network).

The Handoff button is used to handoff an aircraft's data to other GOATS clients. Handoff capability requires an active network connection (see Multiplayer Network).

Press the OK button to record the aircraft's data; the display changes to the Flight Level List, which is described in more detail below. Note the changes to the watch windows (Figure 3). The upper watch window sorts aircraft by time to the next waypoint. Aircraft designated with the INBOUND checkbox are listed below in the Inbounds watch window.

Flight Level List (FLL)

Press the FLL button to display the Flight Level List (Figure 3). This list is also displayed after pressing the OK button from the New/Oceanic display. The Flight Level List displays a summary of flight information for all active aircraft. The columns generally correspond with the New/Oceanic entries: callsign, WPT2 (or WPT1 if inbound), WPT2Z, flight level, and mach airspeed. This is followed by a sequence of flags, and Notes.
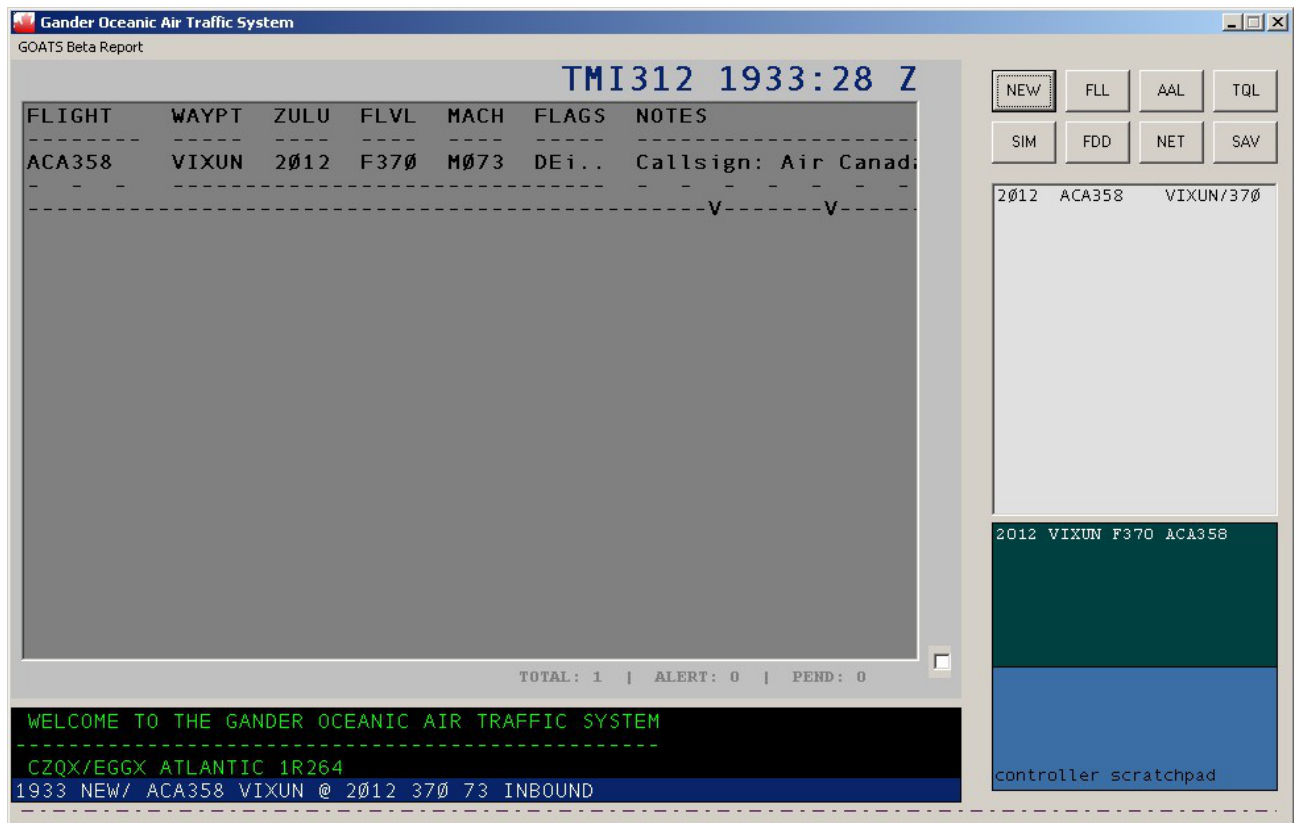

Figure 3

There are 5 flags: North Atlantic Track (random routes are designated with *), Direction of Flight (W or E), Inbound (i), Transfer, and Alert («).

Transfer flags are so designated:
        . - not transferred (indicates the aircraft originated with user).
        p - transfer pending (from another client).
        r - transfer received (from another client).
        s - transfer submitted to another client.

Double-click on any entry in the Flight Level List to open the View/Edit window for that aircraft.

The View/Edit Window

The View/Edit window is used to record a new position report, and to verify and correct previous entries. To open the View/Edit window (Figure 4), double click on any aircraft listed in the: Flight Level List (FLL); Alpha Aircraft List (AAL); or the Inbound watch window.

Figure 4

The View/Edit window presents the same information as was described for the New/Oceanic window. The difference is that the callsign can not be changed, and previously entered data are presented below the position report fields, leaving the position report fields blank.

New data, or changes to previous data are entered by filling in the blank fields. Fields that are left blank will not change the underlying data. A forward slash entered into a field will clear the underlying information for that field. Record the changes by pressing OK.

For example, suppose FDX409 makes the following position report: "Gander Radio Fedex 409 reporting 53 West 40 North at 2239 ZUlU, flight level 300, mach decimal 83, estimating 55 North 30 West at 2304 ZULU, 55 North 30 West thereafter." Because there was no change in the FL or Mach airspeed, these fields are left blank. Only information that has changed is entered in the form (Figure 5).

5

Figure 5

Note the hot spot over the WPT1 Z data label. To facilitate faster position reporting click on the hot spot to automatically assign WPT2 information to the blank WPT1 field, NEXT information to the blank WPT2 field, and the cursor to the blank WPT1Z field.

Alpha Aircraft List (AAL)

To view the Alpha Level List, press the AAL button. The Alpha Level List (Figure 6) displays a summary of flight information for all active aircraft. Aircraft are sorted alphabetically, and data are the same as that described in the section on the Flight Level List. Double-click on any entry in the AAL to open the View/Edit window for that aircraft.
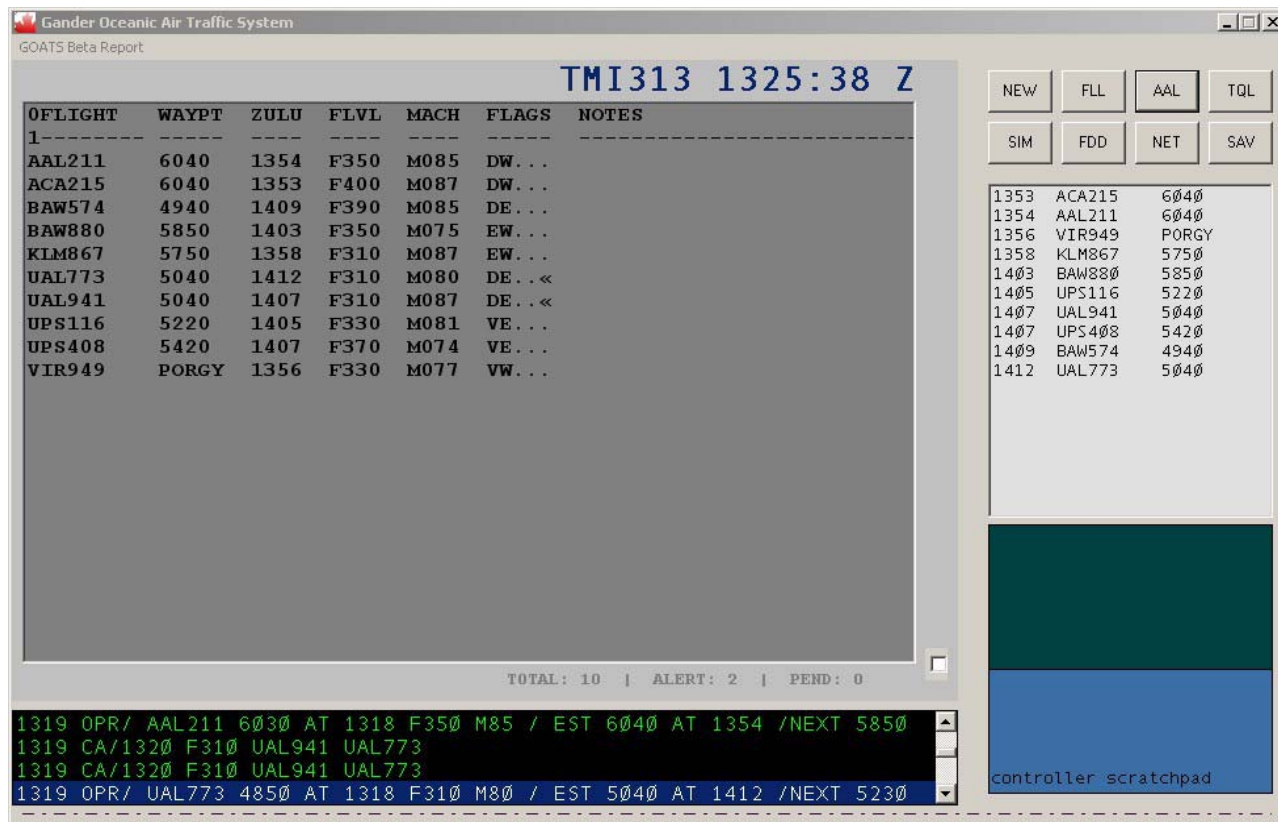
Figure 6

Transfer Queue List (TQL)

The Transfer Queue List displays the status of transferred aircraft (Figure 7). There are three sections: Pending Transfers; Received Transfers; and Sent Transfers. Each section lists the aircraft's callsign, next waypoint, estimated time, flight level, mach airspeed, and the facility from/to which they have been transferred

Double-click on any entry in the TQL to open the View/Edit window for that aircraft.

Pending transfers are displayed at the top of the list, and will not appear in the AAL or FLL until accepted. To accept a pending transfer, open the View/Edit window for that aircraft, then click on the red transfer alert area. After accepting a pending transfer, the TQL is displayed again, and the pending transfer is moved to the Received Transfers section.

Note that aircraft listed in the Pending Transfers and Sent Transfers sections are not displayed in the FLL and AAL windows.
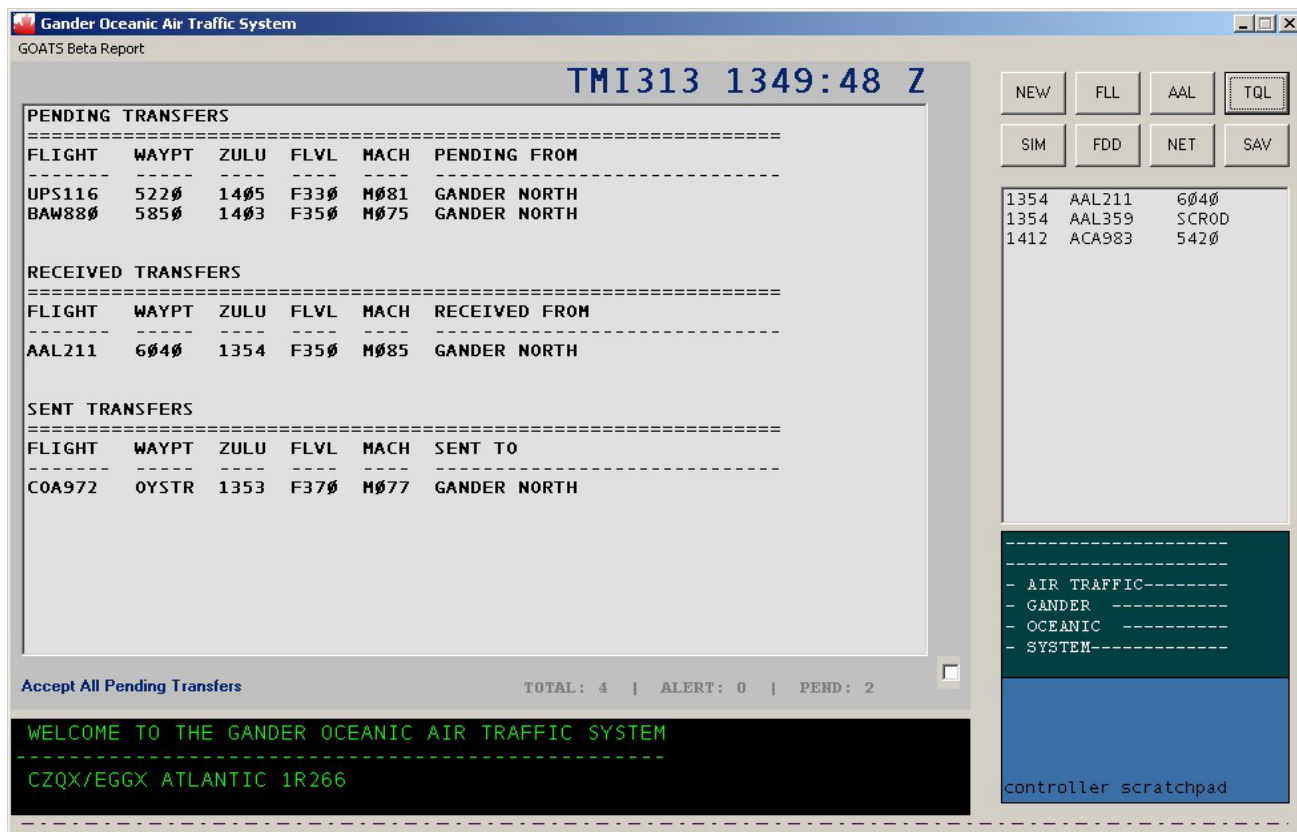
Figure 7

Multiplayer Network (NET)

Efficient coordination of air traffic with other controllers using GOATS is facilitated with a network connection. Press the NET command button to open the Network dialog (Figure 8); enter the appropriate authentication details and press Connect.

To transfer aircraft to other GOATS controllers, open the View/Edit window, and click on the Handoff button to open the Handoff dialog (Figure 9). Select a facility, then press the Handoff command button. If successful, a message box will display an acknowledgment, and the flight data will be moved to the TQL.

Note that a network connection is required for sending and receiving transfer data (i.e. handoffs).
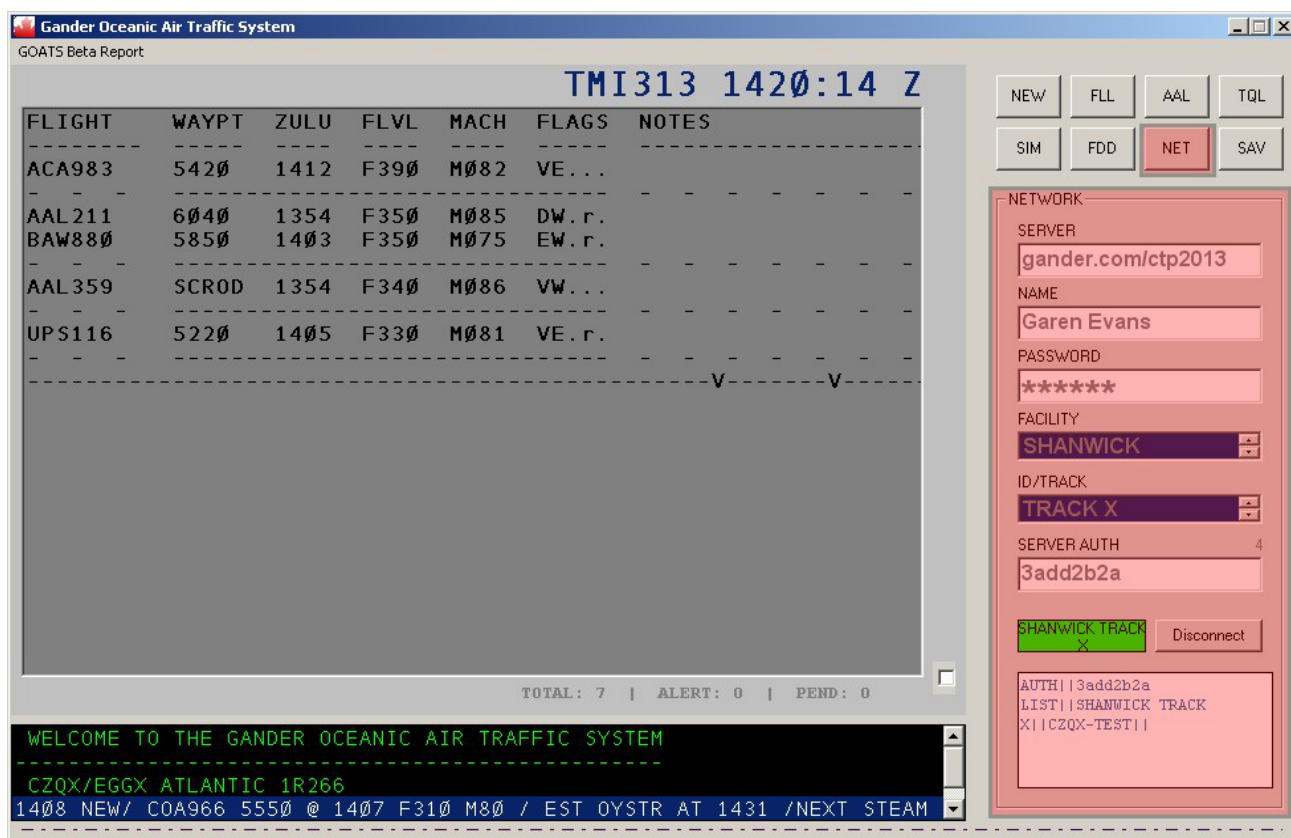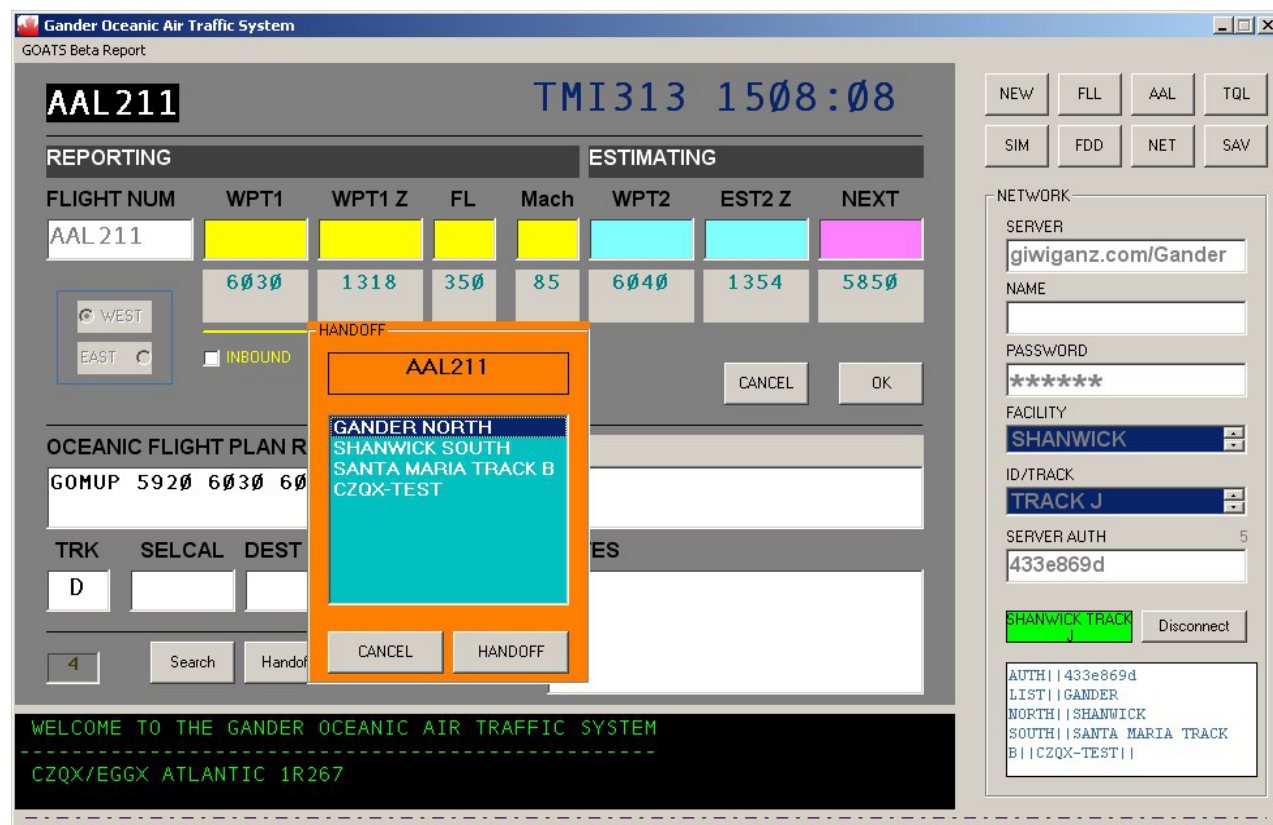
Figure 8

Figure 9

Watch Windows

There are two watch windows on the right side of the GOATS client (Figure 10). The upper watch window sorts aircraft by time to the next waypoint. The estimated time to cross the next waypoint is displayed along with the callsign of the aircraft, and the aircraft's next waypoint. If the aircraft is inbound, then the flight level is displayed next to the waypoint. Additionally, inbound aircraft are displayed in the lower, Inbounds watch window.

Double-click on aircraft in either watch window to open the View/Edit window for that aircraft.

Note that overdue aircraft are automatically highlighted in the upper watch window.
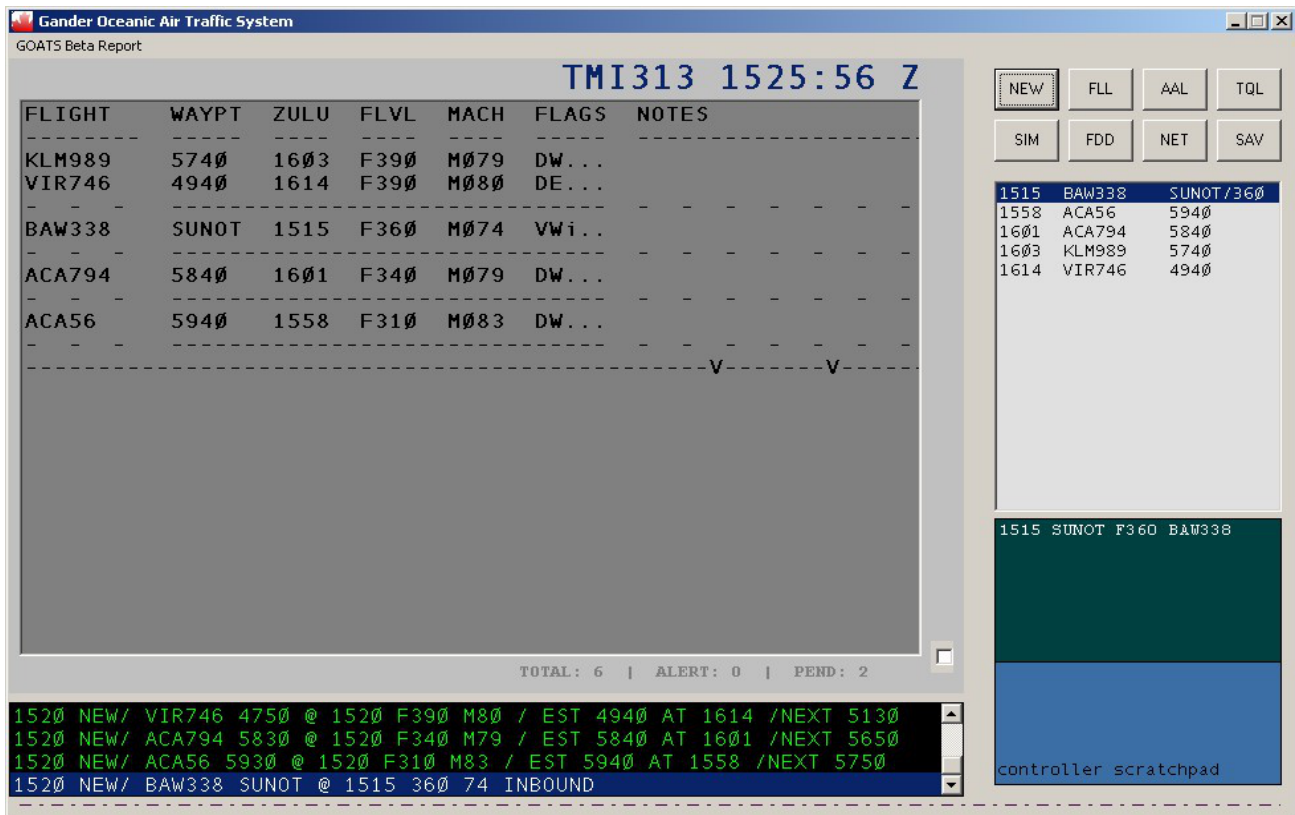

Figure 10

Flight Data Display (FDD)

The Flight Data Display displays a top-down graphical view of flight data (Figure 11). Aircraft tags include callsign, flight level, direction of flight symbol, mach airspeed, equipment, and destination. Red alert circles are displayed for aircraft with procedural conflict flags.
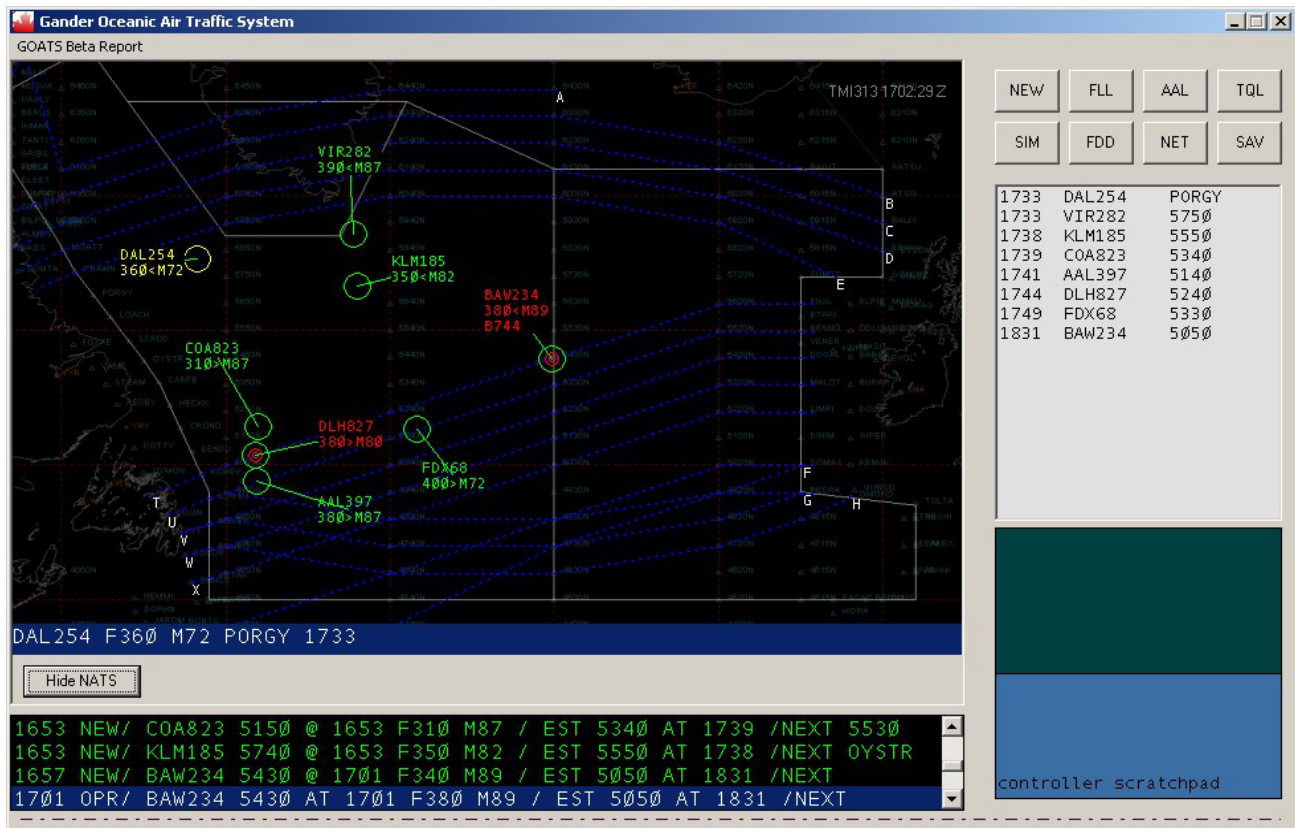
Figure 11

Click on any data tag to display pertinent information about the aircraft in the information bar at the bottom of the display. Double-click on any tag to open the View/Edit window for that aircraft. North Atlantic Tracks are toggled with the Show/Hide NATS button located below the information bar.

Note that although the FDD displays a radar-like picture of traffic in oceanic airspace, the display is fully procedural. Aircraft tags represent estimated positions based only on information provided by the pilot, and entered by the controller.

Procedural Conflict Alerts

Actual and predicted conflicts between aircraft are depicted as flags in the FLL and AAL windows, and with red alert circles in the FDD (Figure 12). Conflicts are automatically detected based on vertical, lateral, and longitudinal separation standards.

The vertical separation standard is 1000 feet at or below FL410 for RVSM aircraft, and 2000 feet for non-RVSM aircraft. The vertical separation standard is 2000 feet above FL410. The vertical separation standard is 4000 feet for supersonic aircraft. Currently, GOATS uses a vertical separation standard of 1000 feet for all aircraft.

The lateral separation standard is 60 nautical miles (NM) for aircraft at the same flight level on adjacent, parallel tracks. Furthermore, parallel tracks with one degree spacing must change no more than 2 degrees latitude per 10 degrees longitude. Currently, GOATS uses a lateral separation standard of 50 NM for all converging aircraft (see JO 7110.65U, Section 7, 8-7-4. Lateral Separation).

Figure 12

The longitudinal separation standard is 10 minutes for aircraft on the same track and flight level. Following aircraft that are faster than leading aircraft add 1 minute per 0.01 Mach. Following aircraft that are slower than leading aircraft subtract 1 minute per 0.02 Mach (5 minutes max). The longitudinal separation standard is 15 minutes for aircraft at the same flight level and on crossing tracks. Currently, GOATS uses a longitudinal separation standard of 10 minutes for all aircraft.

Save Session

Press the SAV common button to save the session; when next GOATS is started it will prompt you to optionally load the previous session. Similarly, sessions can be shared with other users by sharing the goat.dat file located in the Resources folder.

Beta-Specific Notes

The Enter and Escape keys should work as expected. The SIM command button will open the New/Oceanic window and prefill simulated data. Beta reports can be sent to me at garen.evans@gmail.com, or more simply by using the GOATS Beta Report functionality in the menu bar of the program.

Disclaimer

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