

*Globally secure, real-time peace of mind*

Satellite Authorisation Systems (Pty) Limited

AEEC Meeting Hamburg

November 2017

# ABOUT SATAUTH

- ▶ Aim
  - ▶ Build a flexible communications bridge
- ▶ Objectives
  - ▶ Minimal aircraft installation time - within a CK-A
  - ▶ Compact
  - ▶ Independent of aircraft systems
  - ▶ Enable secure data transmissions in real-time
  - ▶ Link aircraft to an established terrestrial infrastructure
- ▶ Result
  - ▶ A communications platform, responsive to changing requirements of the airline industry
  - ▶ A 156mm x 202mm x 76mm generic server, weighing 2.5kg
  - ▶ Secured communications via Satellite, Wi-Fi and GSM
  - ▶ Integrated computing platform, incorporating multiple applications (e.g. FDI, FCI )
  - ▶ A solution addressing current SARPs in relation to GADSS ADT concepts
  - ▶ Regulatory compliance with a ROI

# THE SATAUTH SYSTEM

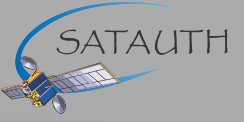
- ▶ EASA certified solution
- ▶ Installed on South African Airways (SAA) aircraft
- ▶ Transmitted across formerly known dark zones
- ▶ GADSS/ADT messages transmitted and verified
  - ▶ Automated distress triggers
  - ▶ Manual distress triggers
    - ▶ Flight operations
    - ▶ Flight crew
  - ▶ Always ON
- ▶ Battery life in excess of 65hrs (exceeds longest known flight duration by 3x)



# GADSS, ADT CONCEPTS

| GADSS                               | Requirement  |
|-------------------------------------|--|
| <i>Autonomous</i>                   | <ul style="list-style-type: none"> <li>• <i>No dependence on aircraft systems</i></li> </ul>                     |
| <i>Global tracking</i>              | <ul style="list-style-type: none"> <li>• <i>Worldwide coverage</i></li> </ul>                                    |
| <i>Tracking intervals</i>           | <ul style="list-style-type: none"> <li>• <i>From Jan 2021 every 3 mins</i></li> </ul>                            |
| <i>Automated Warnings</i>           | <ul style="list-style-type: none"> <li>• <i>Warning situation alerts</i></li> </ul>                              |
| <i>Automated emergency</i>          | <ul style="list-style-type: none"> <li>• <i>Automated distress identification</i></li> </ul>                     |
| <i>Manually activated emergency</i> | <ul style="list-style-type: none"> <li>• <i>By flight crew</i></li> <li>• <i>By flight operations</i></li> </ul> |

# AUTONOMOUS - RESILIENT TO AIRCRAFT FAILURES



Independent Location

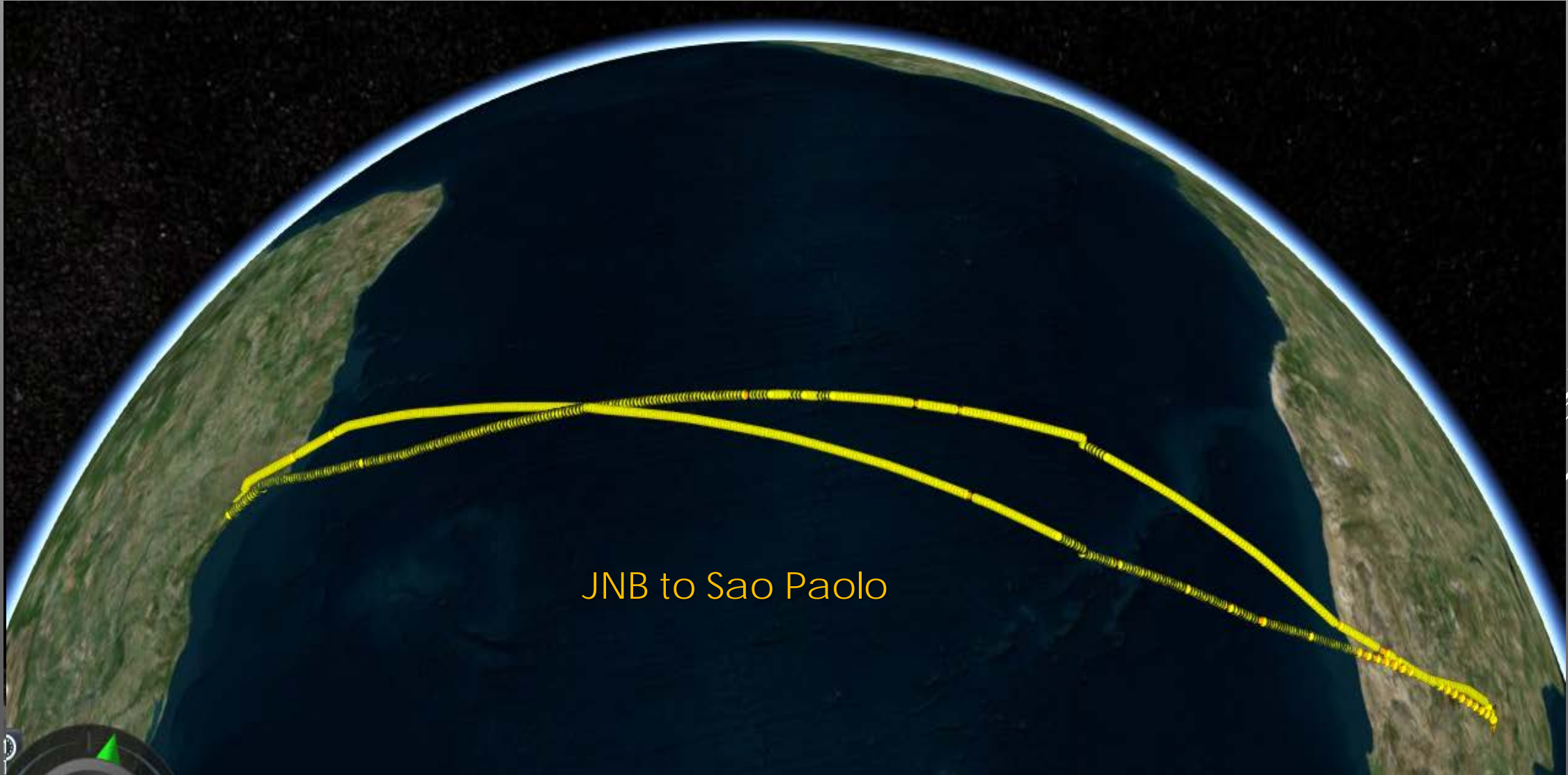
Independent Speed

Independent Bearing / Direction

Independent Altitude

Independently Powered

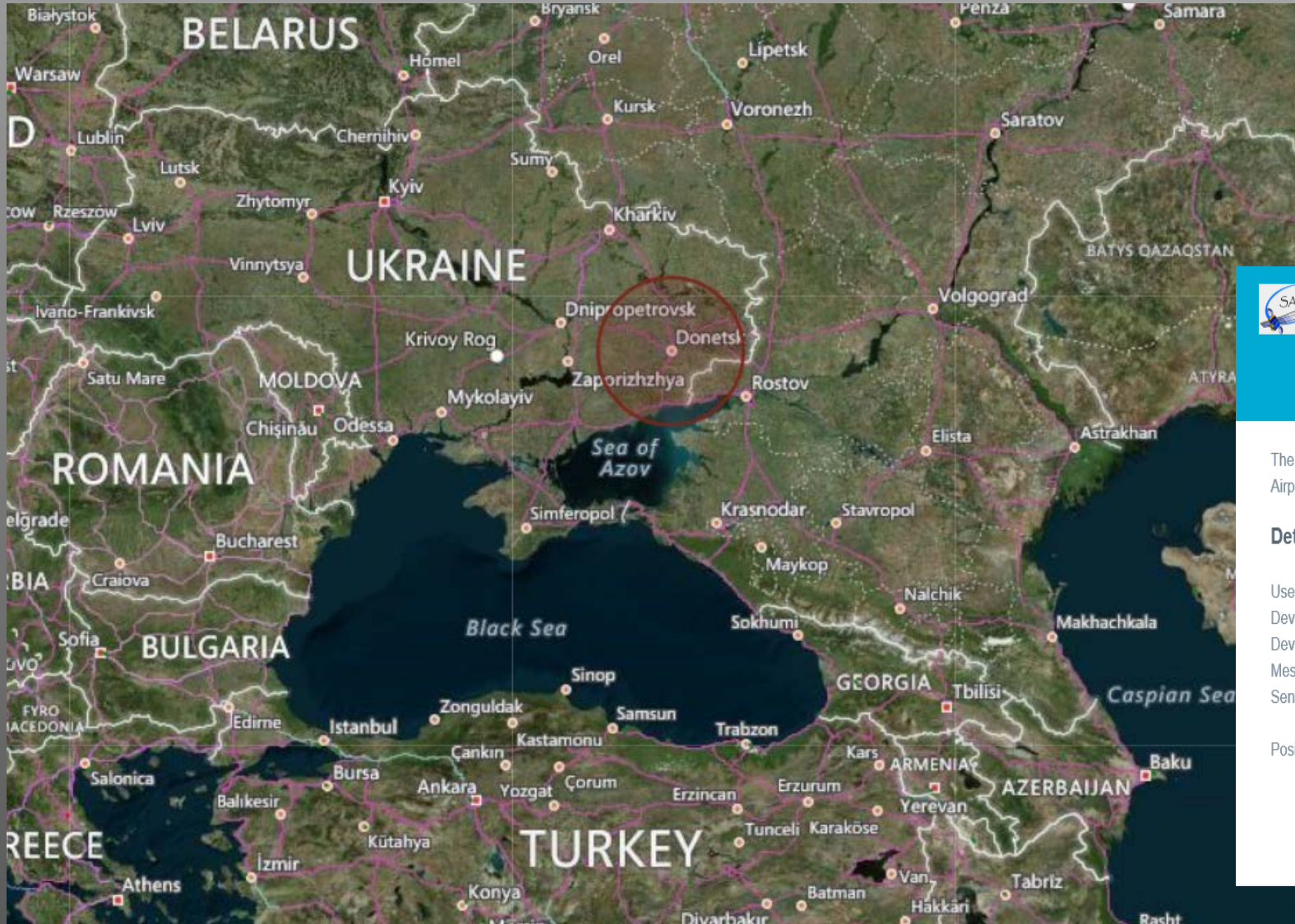
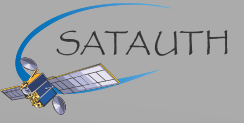
# WORLDWIDE COVERAGE



# CUSTOMISABLE TRACKING INTERVALS



# WARNING SITUATION ALERT



Home Devices List View Filter Help Options

Event Notifications New Event Notification

| Events | Applies to | Actions | Name | Summary                            |
|--------|------------|---------|------|------------------------------------|
| EVENTS |            |         |      | When the device enters NFZ Ukraine |

SATAUTH gap

## Geofence Crossed

The notification was sent because device left geofence VH Perth Intl Airport Australia.

**Details**

User: Janine Roux  
Device name: ZS-SXE 3330  
Device Id: 300234061183330  
Message: Automatic position report  
Sent at: 15 Sep 2017 09:44:49 (South Africa Standard Time)  
15 Sep 2017 07:44:49 (UTC)  
Position: 26°17'20"S 028°02'35"E

[View device on a map](#) [Log in to Portal](#)

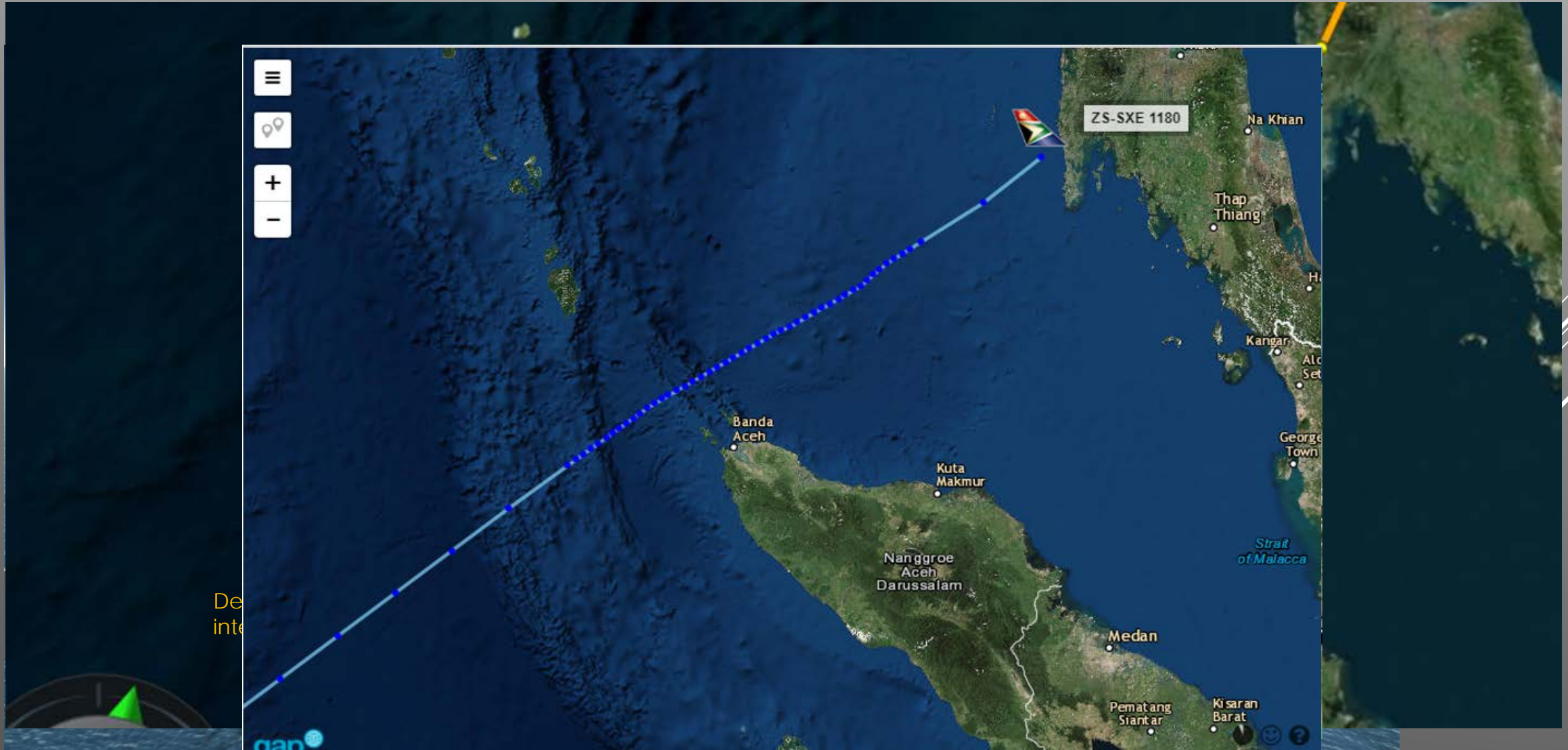
SAMPLE

nant Satellite  
is "Aircraft entering a No

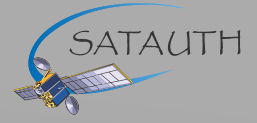


# AUTOMATED DISTRESS IDENTIFICATION

2017 7<sup>th</sup> September ZS-SXE JNB to HNK Default Interval 5 minutes



# EMERGENCY ACTIVATED BY FLIGHT OPERATIONS



The screenshot displays a flight tracking interface for aircraft ZS-SXE 1180. The main map area shows a flight path with several annotations: a yellow arrow points to a segment labeled "Remote Emergency De-Activation"; a red arrow points to a segment labeled "Remote Emergency Activation"; a green arrow points to a segment labeled "Last Default position interval"; and another green arrow points to a segment labeled "Resume Default position interval". The sidebar on the right, titled "Inbox", lists four data points with their respective coordinates, times, and other flight parameters. The first and second points are circled in green, and the third and fourth points are circled in red.

**Header:** SATAUTH powered by gap, Janine Roux

**Navigation:** Home, Devices, List View, Filter, Help

**Flight ID:** ZS-SXE 1180

**Inbox Options:**

- Position:** 33°4.61'S 109°42.58'E  
**Sent time local:** September 13, 2017 6:52:55 PM  
Bearing: 255  
Altitude: 8210  
Speed: 779 km/h  
Satellites: 10  
CSQ: 3  
Battery Voltage: 7.2  
Emergency State: None
- Position:** 32°55.63'S 110°23.32'E  
**Sent time local:** September 13, 2017 6:47:52 PM  
Bearing: 255  
Altitude: 8215  
Speed: 782 km/h  
Satellites: 10  
CSQ: 3  
Battery Voltage: 7.2  
Emergency State: None
- Position:** 32°46.20'S 111°4.95'E  
**Sent time local:** September 13, 2017 6:42:45 PM  
Bearing: 254  
Altitude: 8212  
Speed: 795 km/h  
Satellites: 11  
CSQ: 5  
Battery Voltage: 7.2  
Emergency State: None
- Position:** 32°45.82'S 111°6.58'E  
**Sent time local:** September 13, 2017 6:42:33 PM  
Bearing: 254







**Map Annotations:**

- Remote Emergency De-Activation
- Remote Emergency Activation
- Last Default position interval
- Resume Default position interval

**Map Labels:** ZS-SXE 1180

**Footer:** gap, Leaflet | Powered by Esri | Esri, HERE, Garmin, USGS, NGA

# SATAUTH RESPONSE TO THE GADSS CONCEPTS

| GADSS                        | Requirement  |
|------------------------------|--|
| Autonomous                   | <ul style="list-style-type: none"> <li>No dependence on aircraft systems</li> </ul>               |
| Global tracking              | <ul style="list-style-type: none"> <li>Worldwide coverage</li> </ul>                              |
| Tracking intervals           | <ul style="list-style-type: none"> <li>From Jan 2021 every 3 mins</li> </ul>                      |
| Automated Warnings           | <ul style="list-style-type: none"> <li>Warning situation alerts</li> </ul>                        |
| Automated emergency          | <ul style="list-style-type: none"> <li>Automated distress identification</li> </ul>              |
| Manually activated emergency | <ul style="list-style-type: none"> <li>By flight crew</li> <li>By flight operations</li> </ul>  |

# DATA SECURITY

- ▶ Access to data is limited to the airline, but can also be granted to nominated regulators e.g. ICAO, COSPAS-SARSAT
- ▶ Data is encrypted to AES (256-bit) and PCI3 standards
- ▶ Data is FIPS 140-2 compliant
- ▶ Customisable encryption
- ▶ By default, all tracking data is available in real-time, and retained for download and analysis
- ▶ Data is stored in secured servers and interfaces have built-in redundancy

# DATA RETRIEVAL FOR SIMULATION

- ▶ For simulation, data can be interfaced into 3<sup>rd</sup> party products

