

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

April 20, 2015

Flight Data Recorder – Addendum 2

Specialist’s Factual Report Addendum
By Christopher Babcock

1. EVENT

Location:	Bedford, Massachusetts
Date:	May 31, 2014, 2140 Eastern Daylight Time (EDT)
Aircraft:	Gulfstream GIV, N121JM
Operator:	Arizin Ventures, LLC
NTSB Number:	ERA14MA271

2. GROUP

A group was not convened.

3. SUMMARY

On May 31, 2014, about 2140 eastern daylight time, a Gulfstream Aerospace Corporation GIV, N121JM, operated by Arizin Ventures, LLC, crashed after a rejected takeoff and runway excursion at Laurence G. Hanscom Field (BED), Bedford, Massachusetts. The two pilots, a flight attendant, and four passengers were fatally injured. The airplane was destroyed by impact forces and a postcrash fire. The personal flight, which was destined for Atlantic City International Airport (ACY), Atlantic City, New Jersey, was conducted under the provisions of 14 *Code of Federal Regulations Part 91*. An instrument flight rules flight plan was filed. Night visual meteorological conditions prevailed at the time of the accident. This addendum documents selected parameters for 20 takeoffs prior to the accident.

4. DETAILS OF INVESTIGATION

This addendum shows selected data parameters plotted for the accident takeoff roll and 20 takeoffs prior for comparison purposes.

4.1. Time Correlation

The timing on all plots, except the accident takeoff, is in subframe reference number of the FDR. Timing on the plot from the accident takeoff is in the local eastern daylight time.

4.2. Engineering Units Conversions

The engineering units conversions used for the data contained in this report are based on documentation from the aircraft manufacturer. Where applicable, changes to the conversions have been made to ensure the parameters conform to the Safety Board's standard sign convention that climbing right turns are positive (CRT=+).¹

4.2.1. Parameters Provided and Verified

Appendix A lists the FDR parameters provided and verified in this addendum, including the associated plot label.

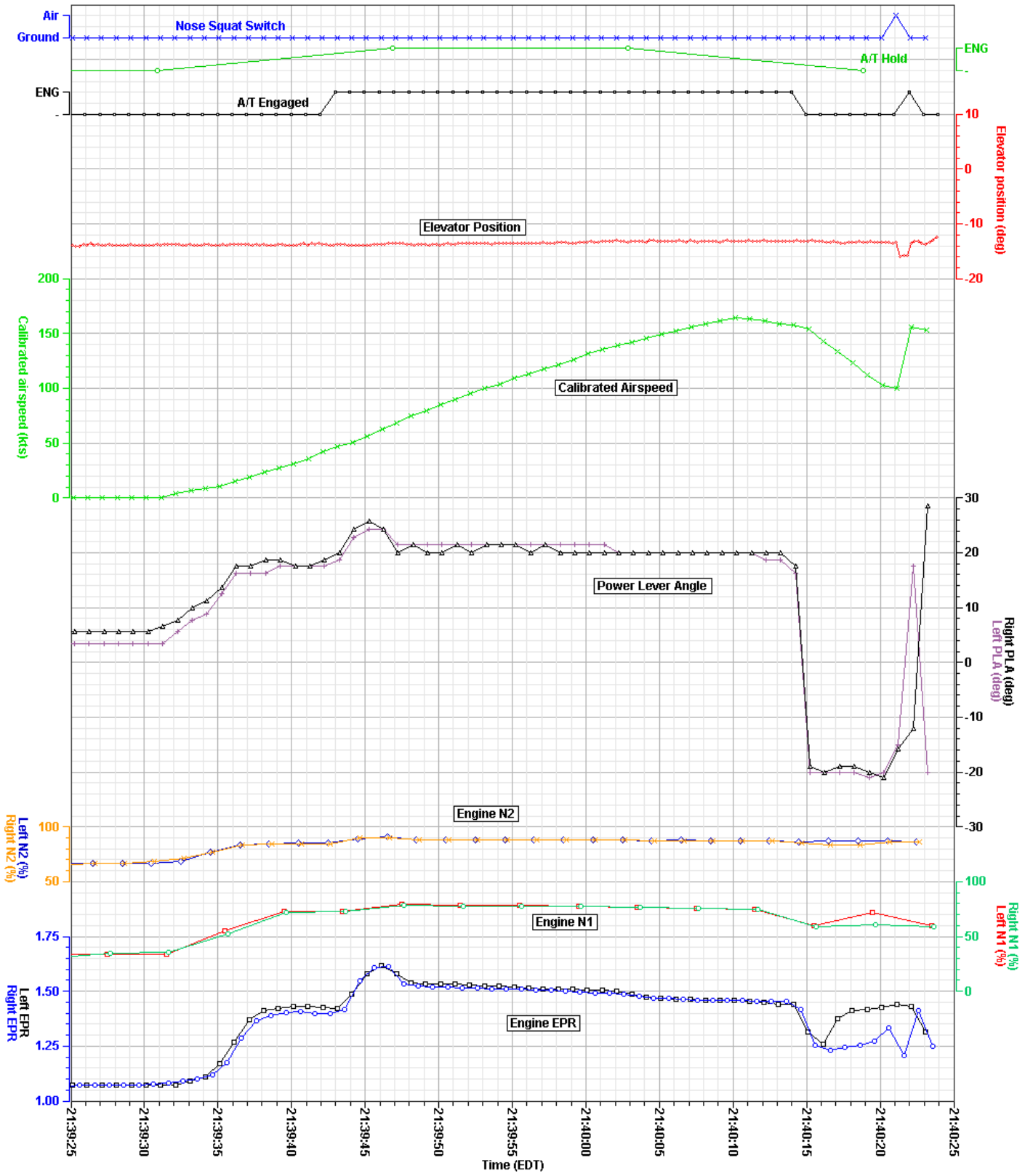
4.3. FDR Plot Description

Figure 1 contains data from the accident takeoff. Figures 2-21 contain data from the previous 20 takeoffs.

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¹ CRT=+ means that for any recorded parameter that indicates a climb or right turn, the sign is positive. Also, for any parameter recorded that indicates an action or deflection, if it induces a climb or right turn, the sign is positive. Examples: right roll=+, aileron trailing edge up=+, elevator trailing edge up=+.

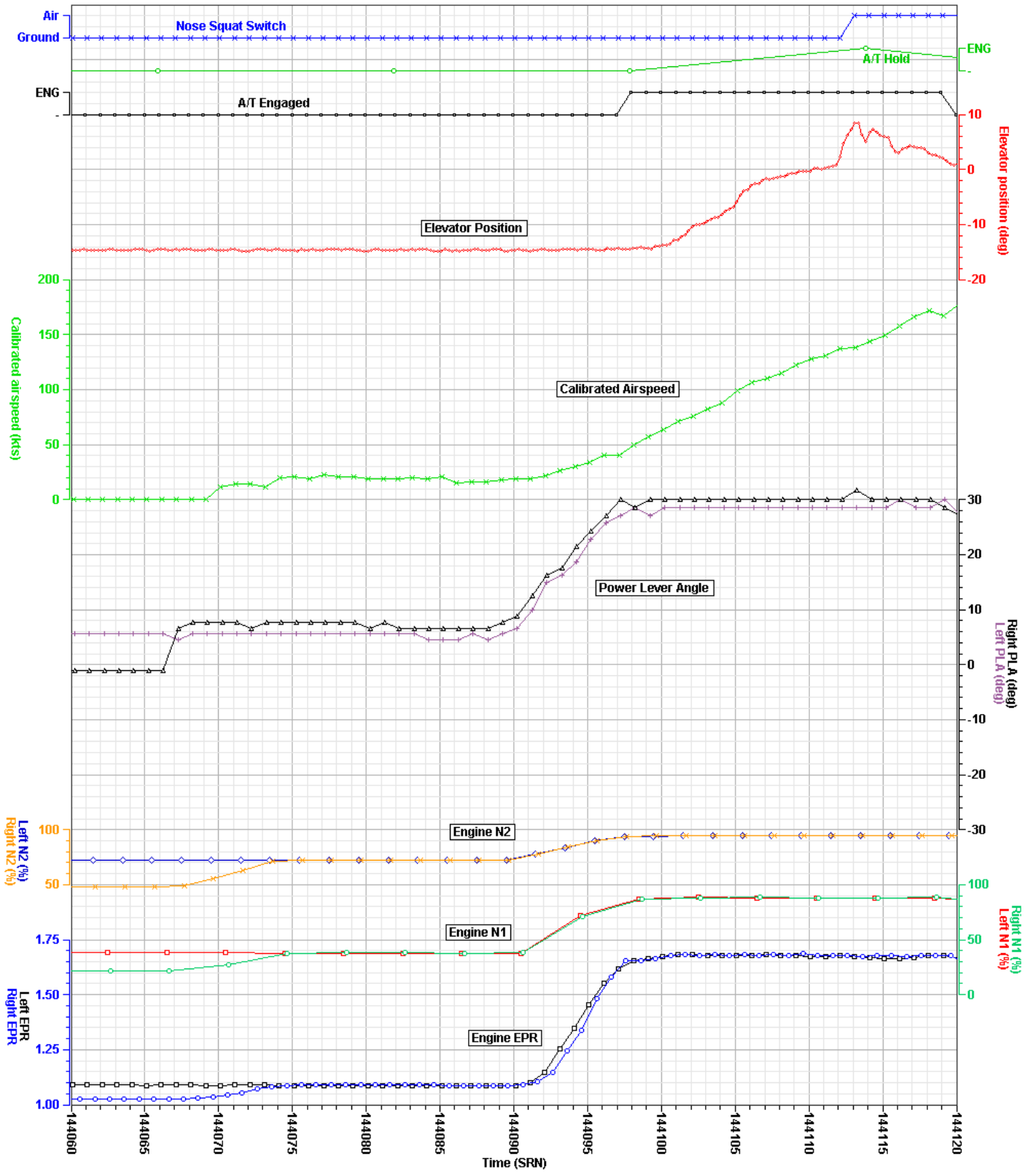
Gulfstream GIV, N121JM



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Figure 1. Accident takeoff.

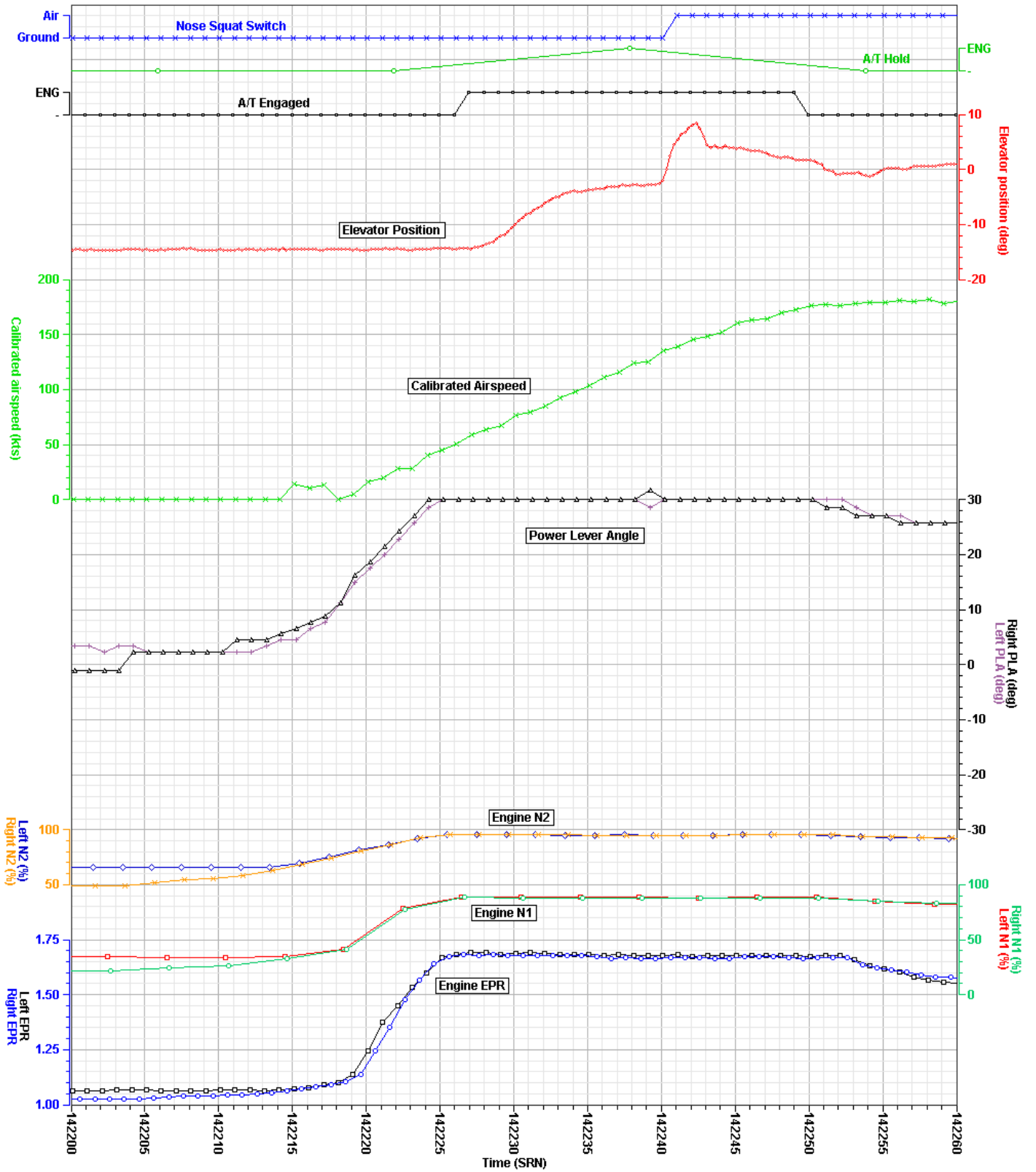
Gulfstream GIV, N121JM



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Figure 2. Flight prior to accident takeoff.

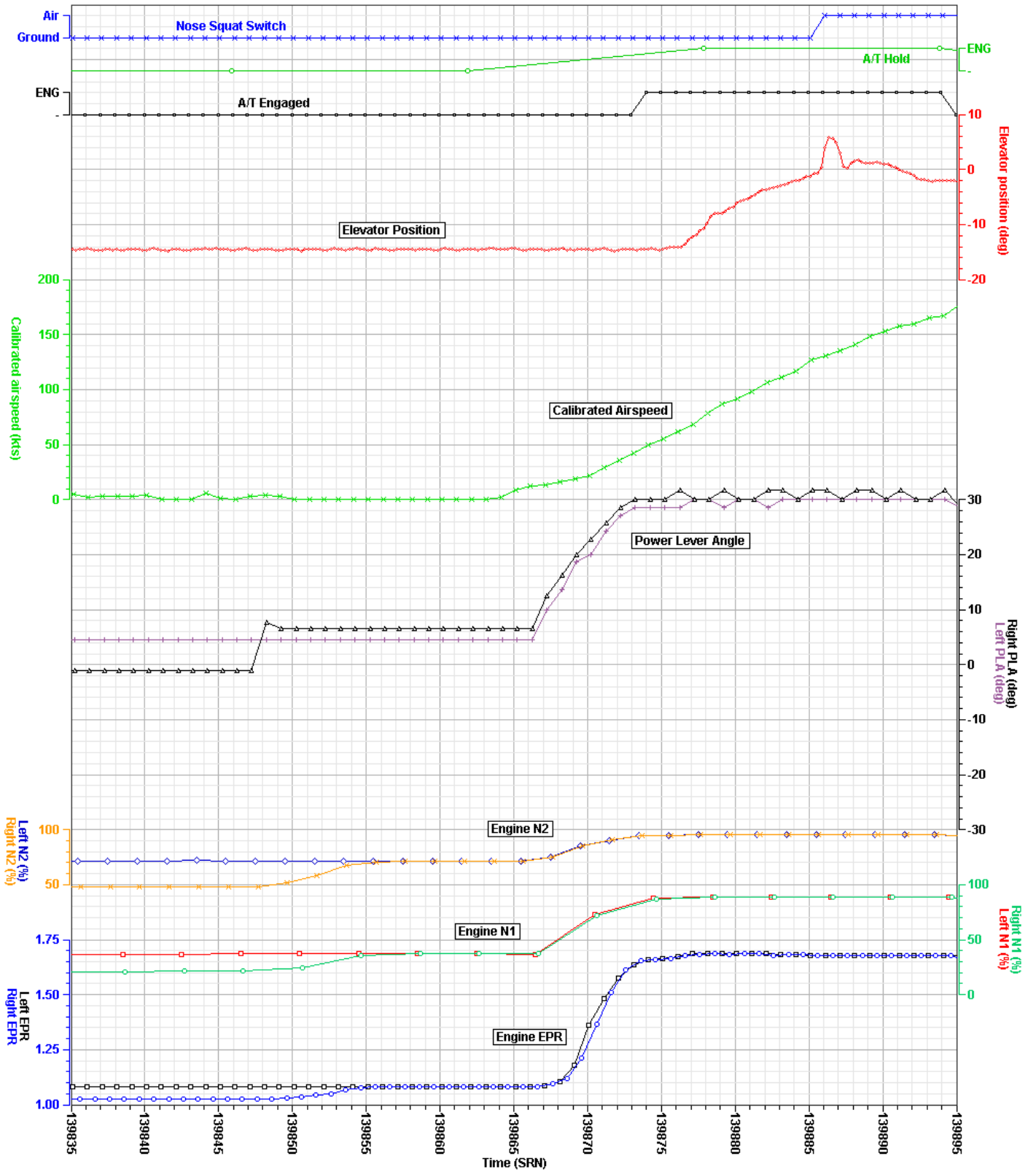
Gulfstream GIV, N121JM



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Figure 3. Two flights prior to accident takeoff.

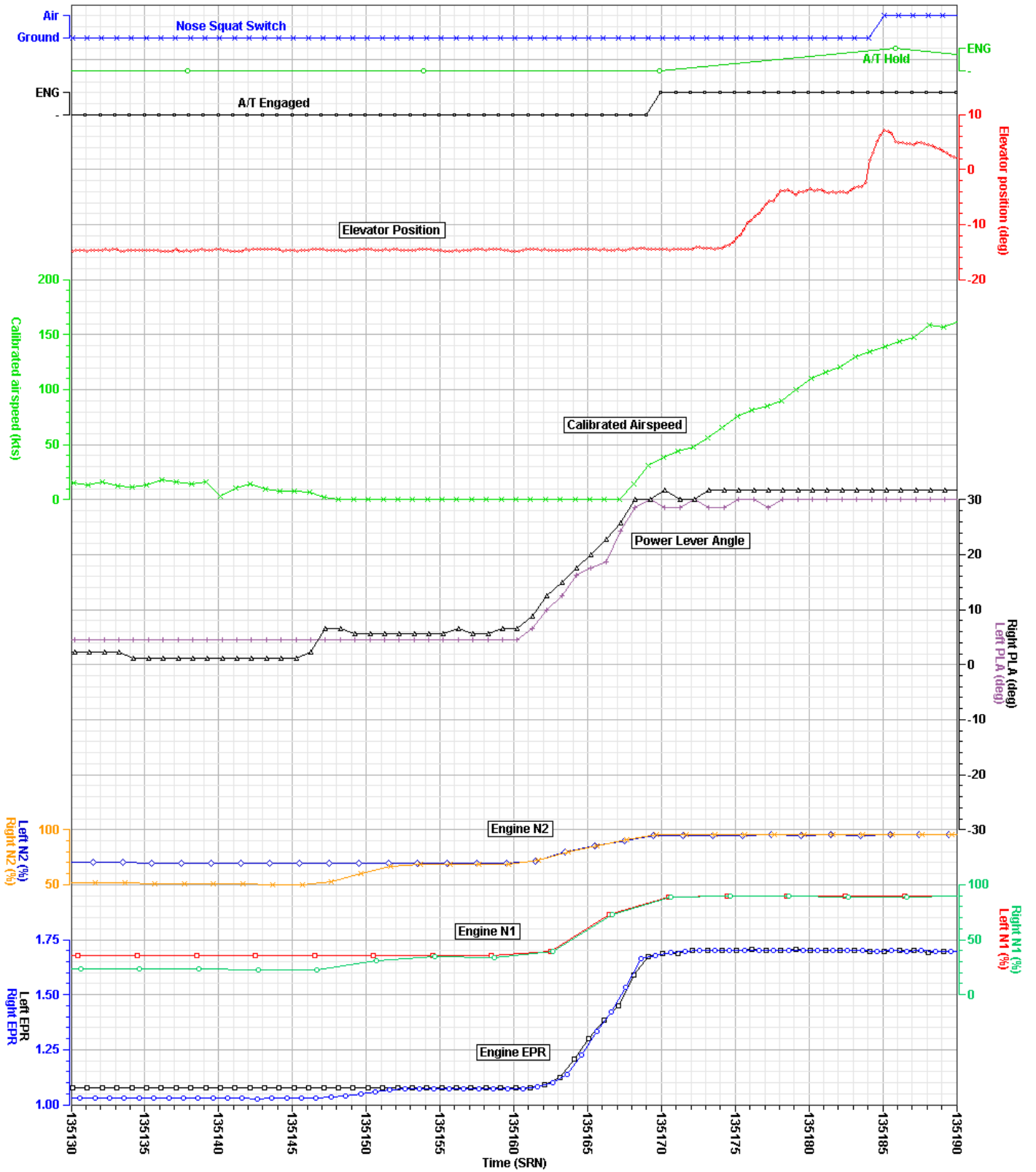
Gulfstream GIV, N121JM



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Figure 4. Three flights prior to accident takeoff.

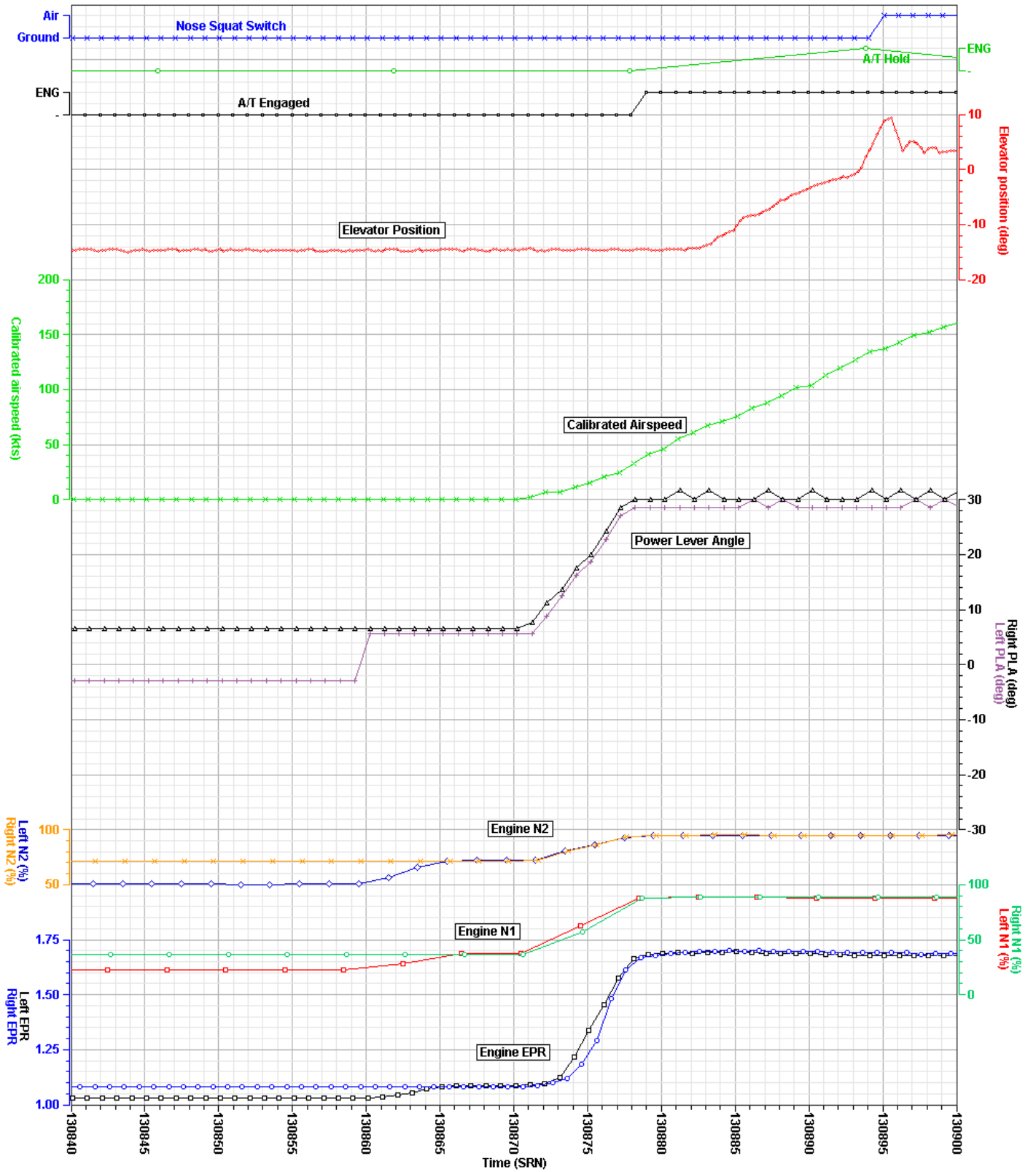
Gulfstream GIV, N121JM



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Figure 5. Four flights prior to accident takeoff.

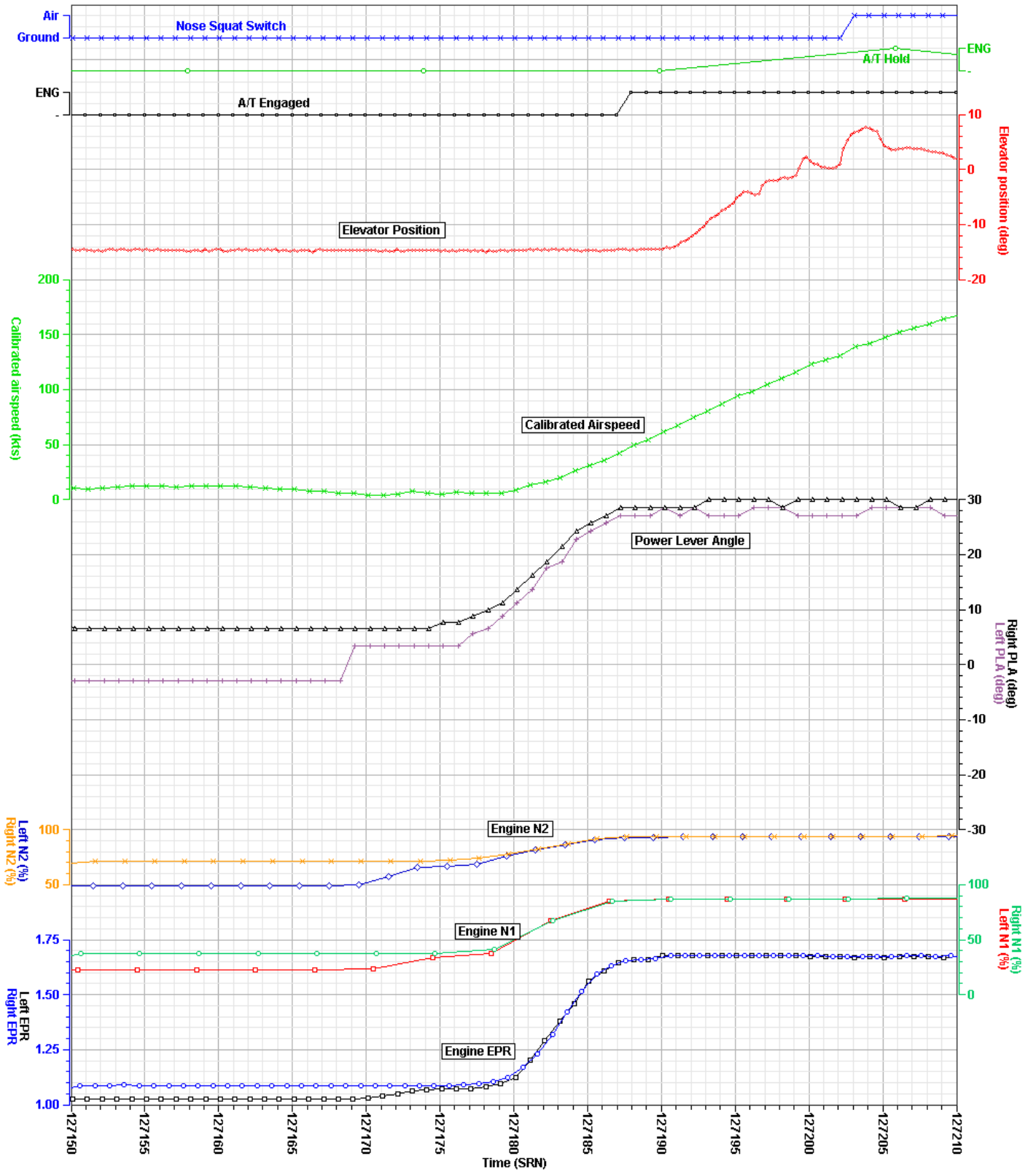
Gulfstream GIV, N121JM



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Figure 6. Five flights prior to accident takeoff.

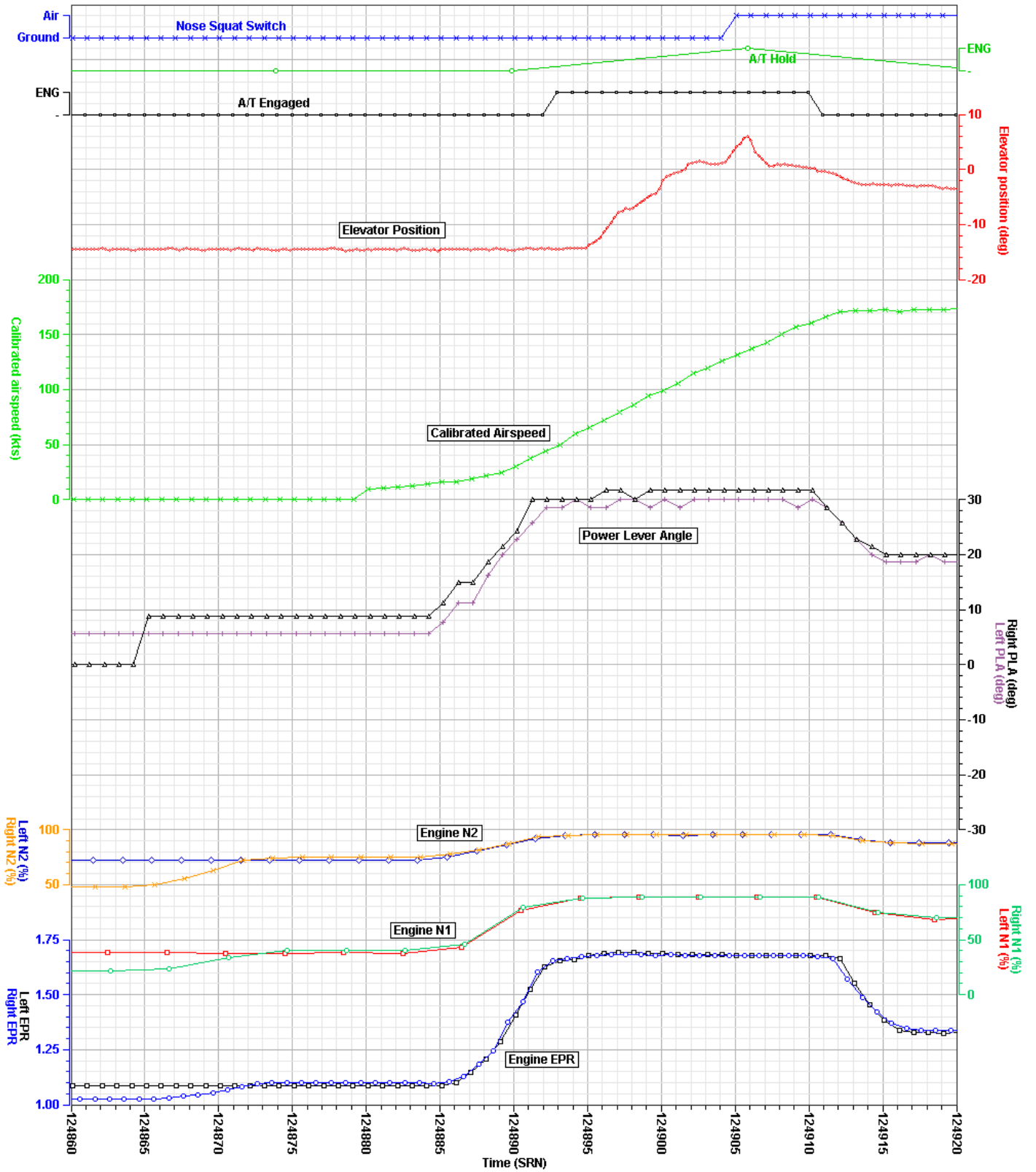
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Figure 7. Six flights prior to accident takeoff.

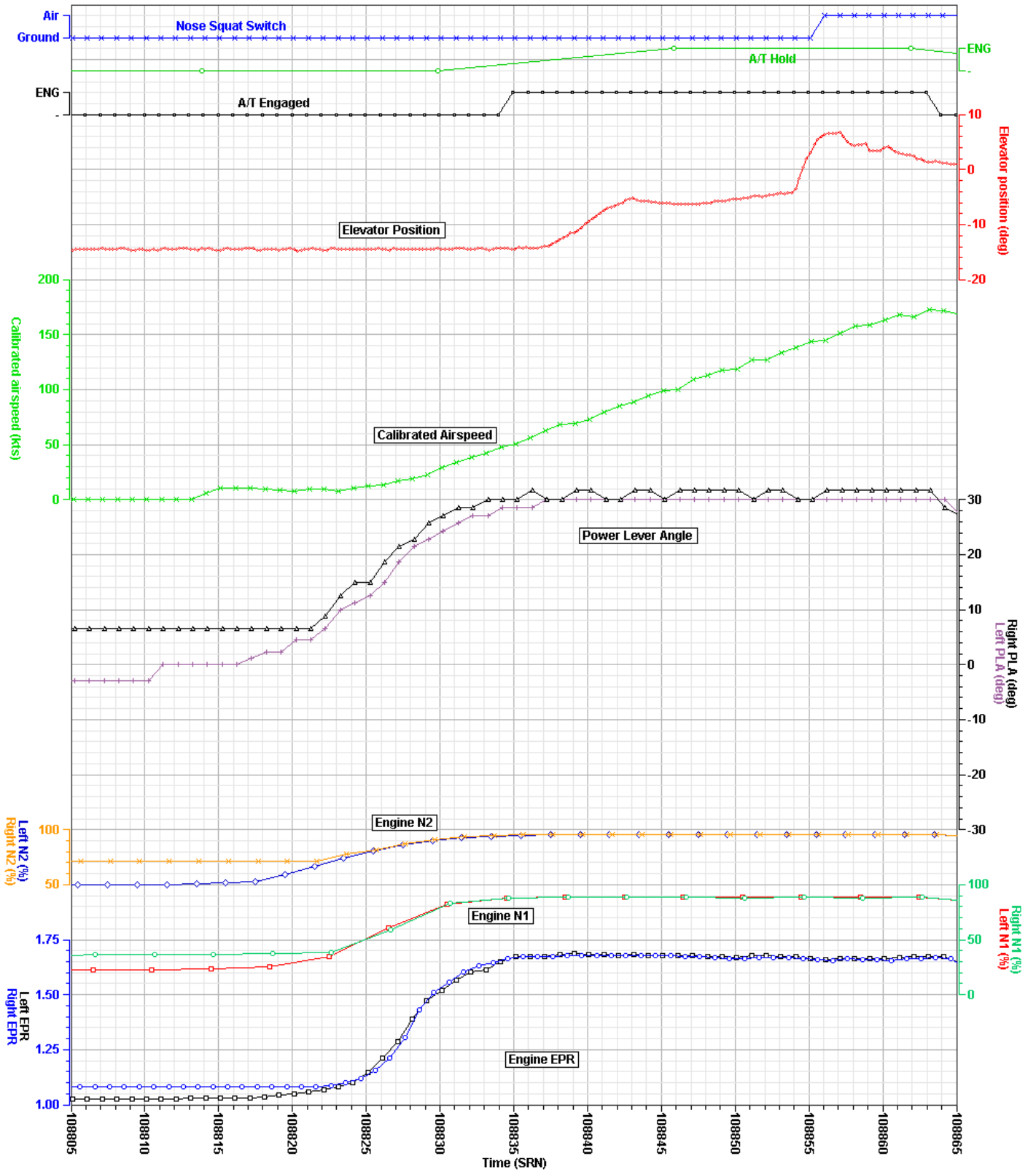
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Figure 8. Seven flights prior to accident takeoff.

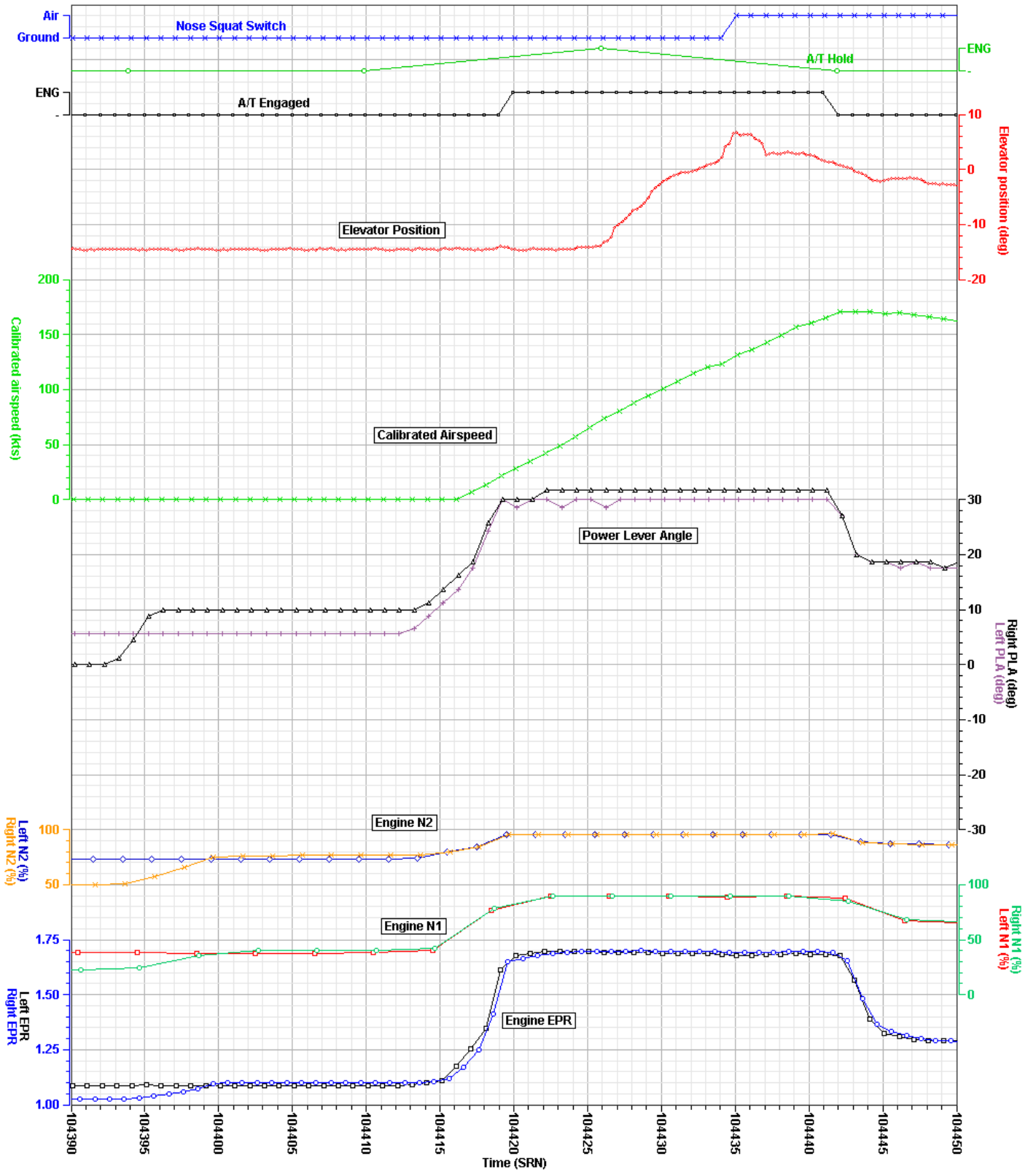
Gulfstream GIV, N121JM



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Figure 9. Eight flights prior to accident takeoff.

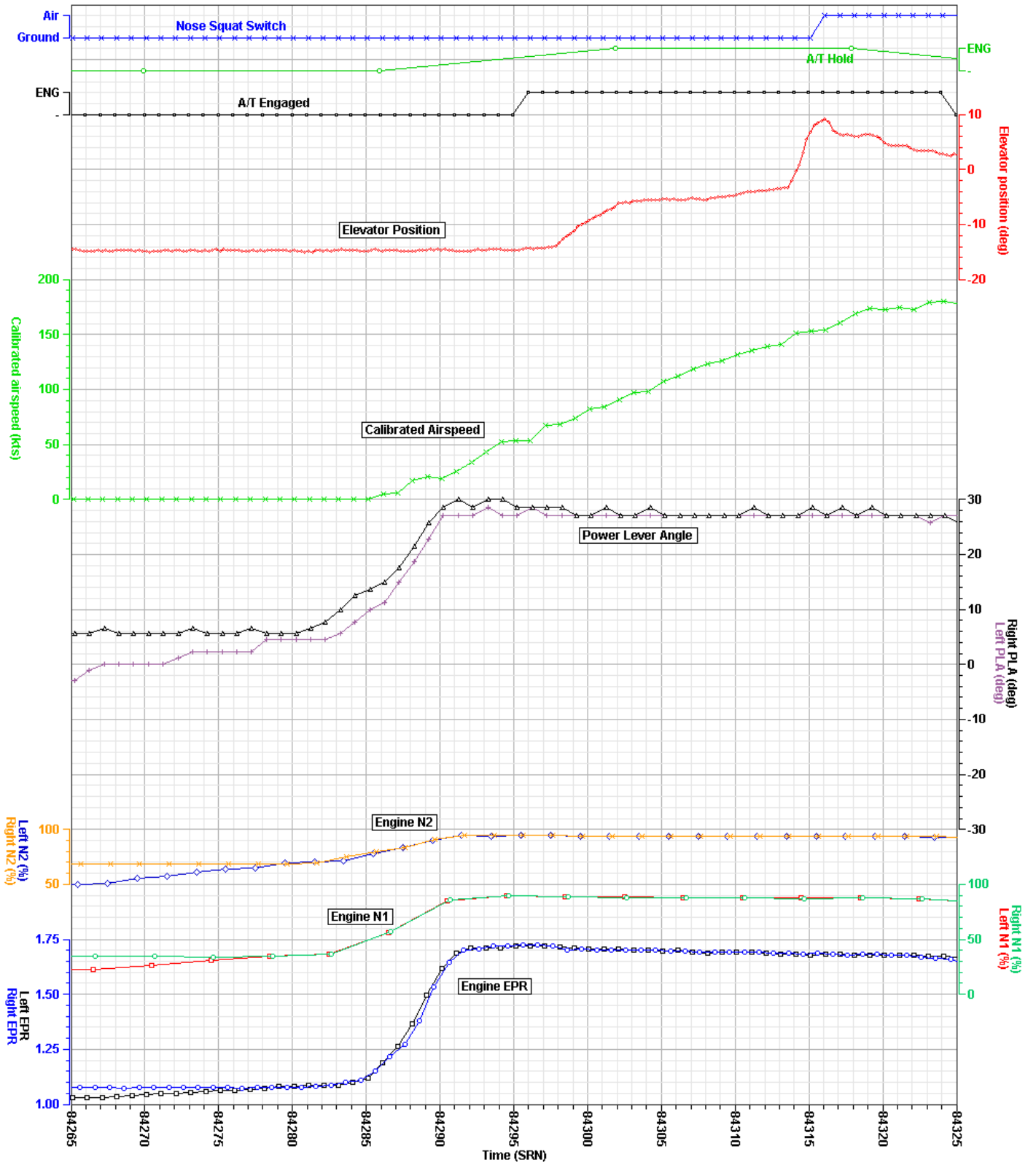
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Figure 10. Nine flights prior to accident takeoff.

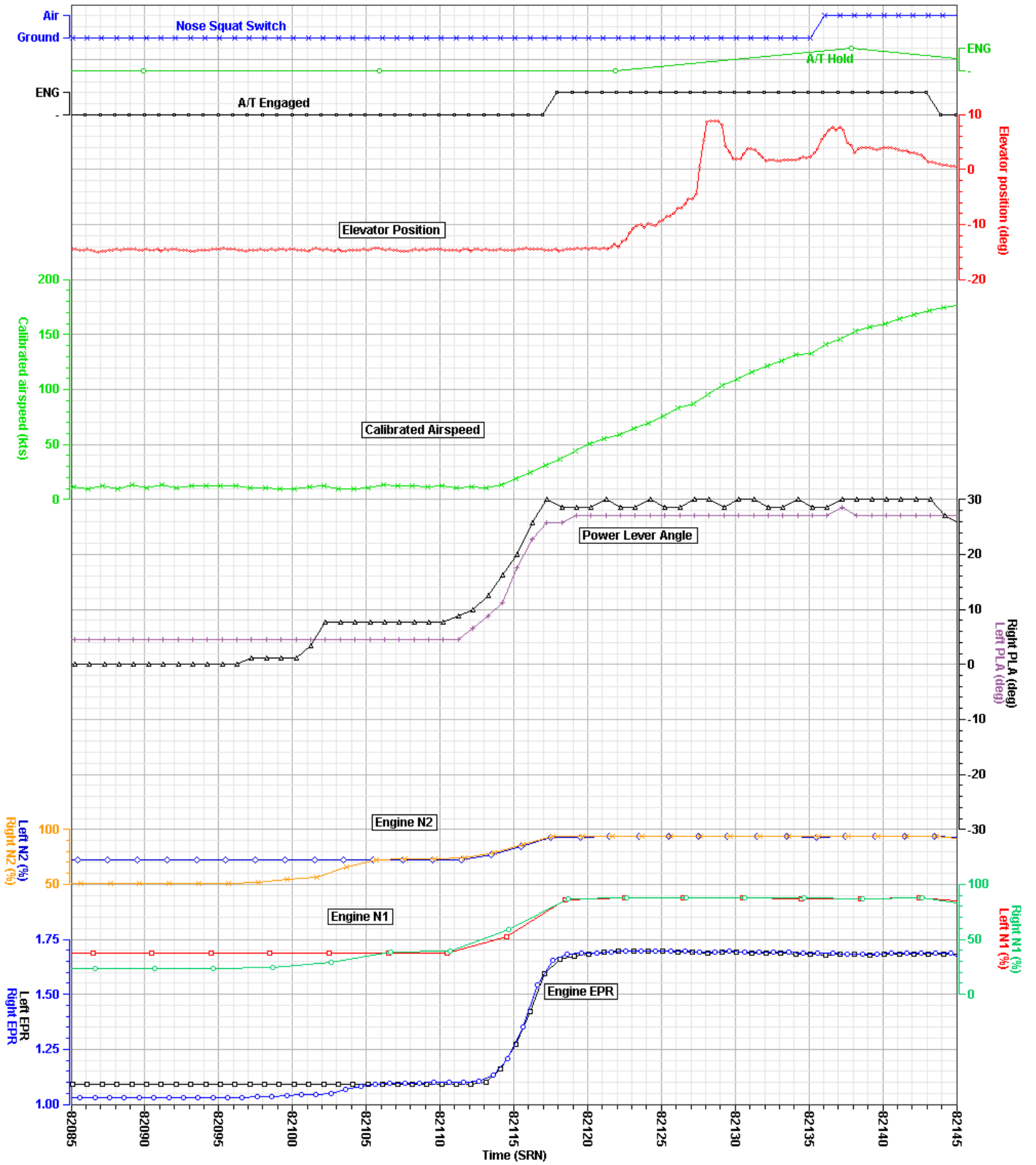
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Figure 11. Ten flights prior to accident takeoff.

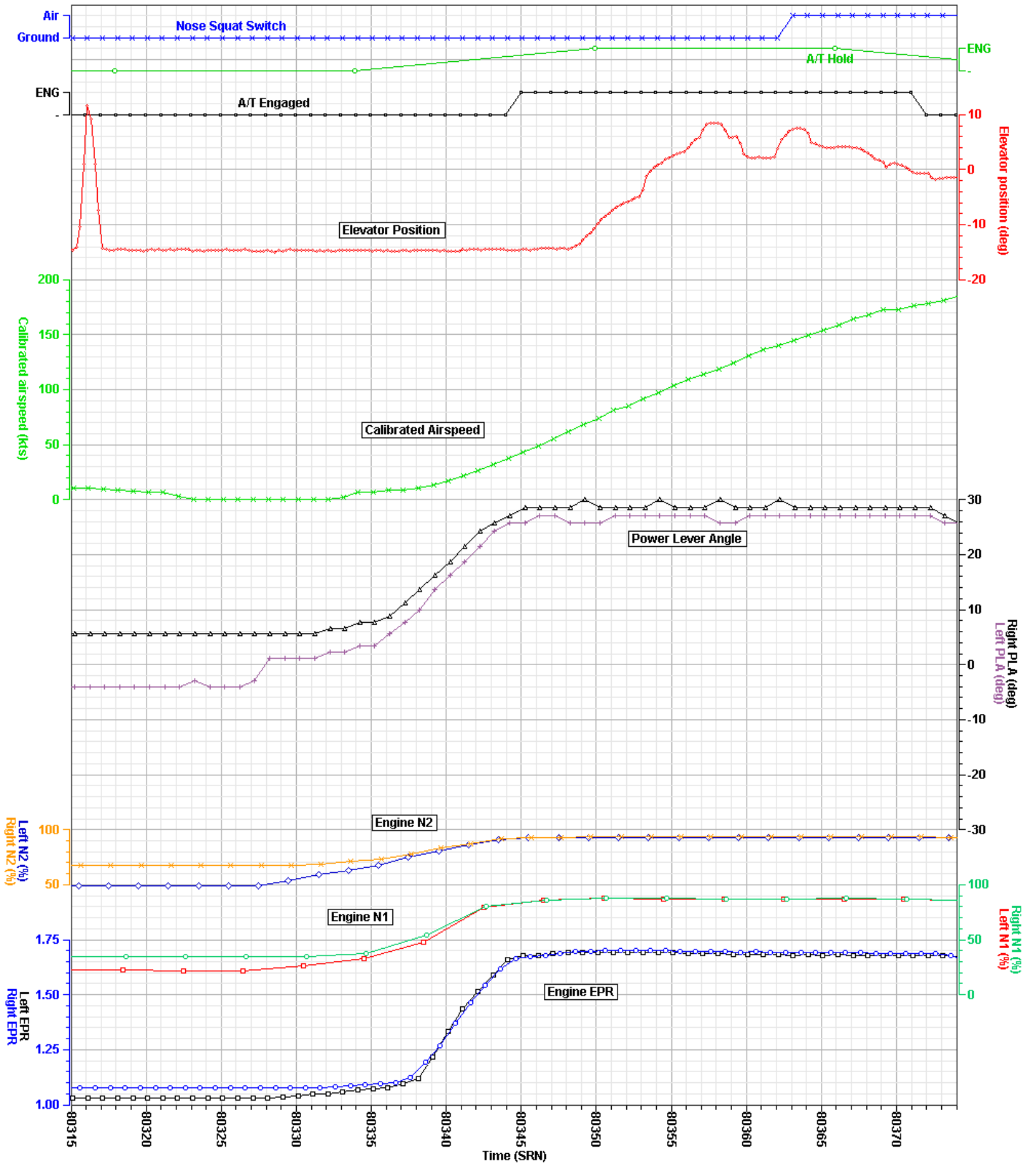
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Figure 12. Eleven flights prior to accident takeoff.

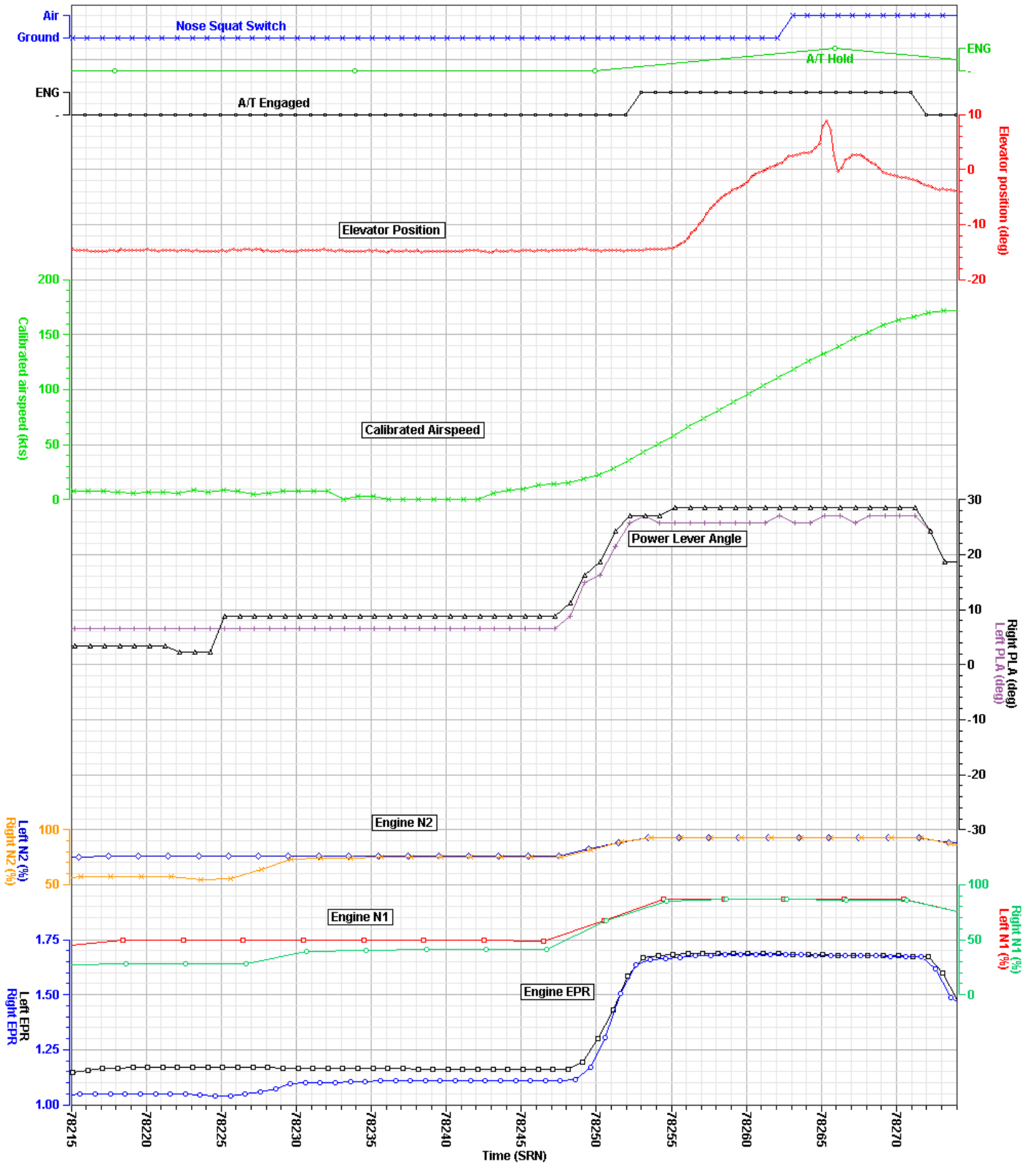
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Figure 13. Twelve flights prior to accident takeoff.

Gulfstream GIV, N121JM



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Figure 14. Thirteen flights prior to accident takeoff.

Gulfstream GIV, N121JM

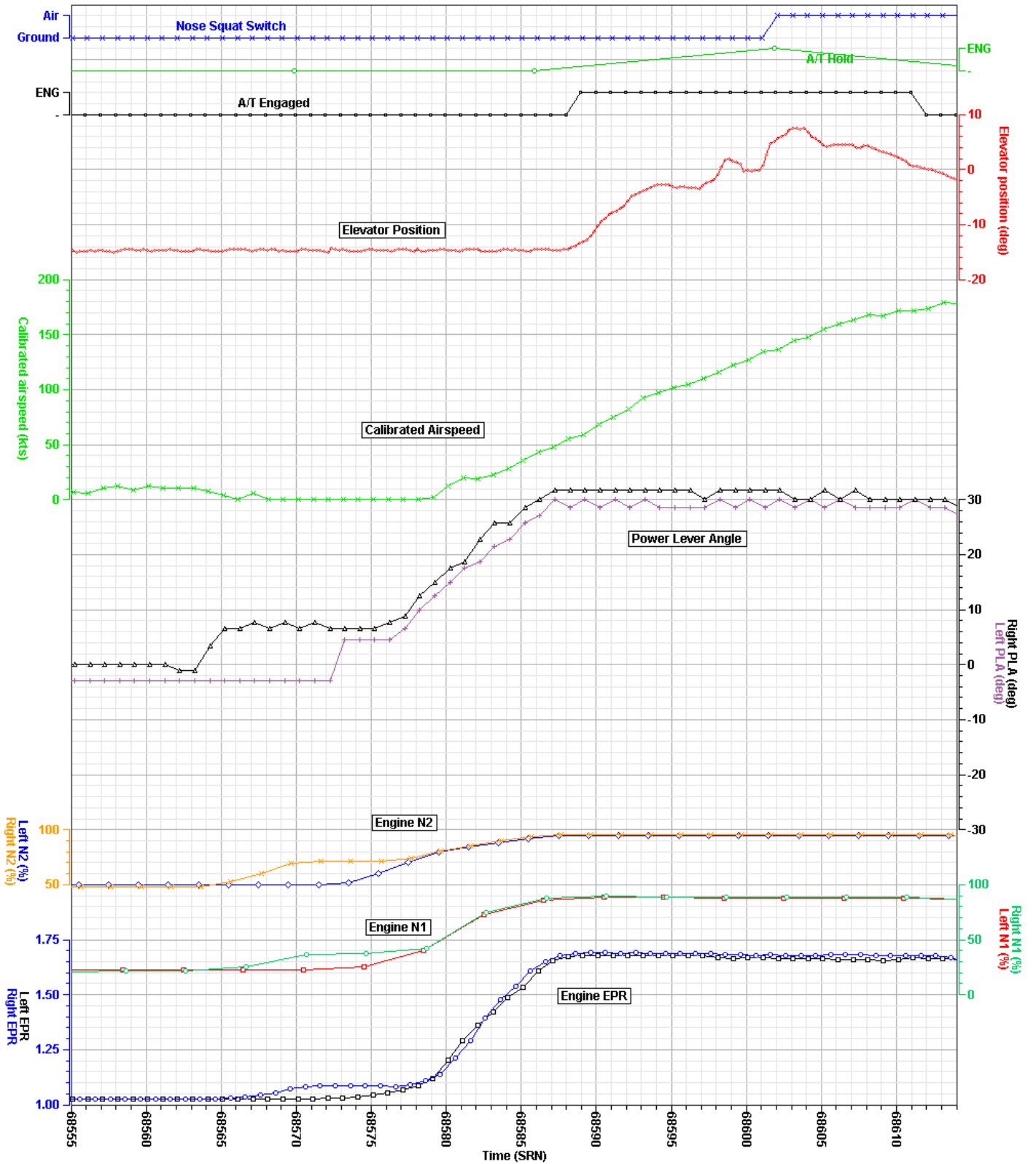
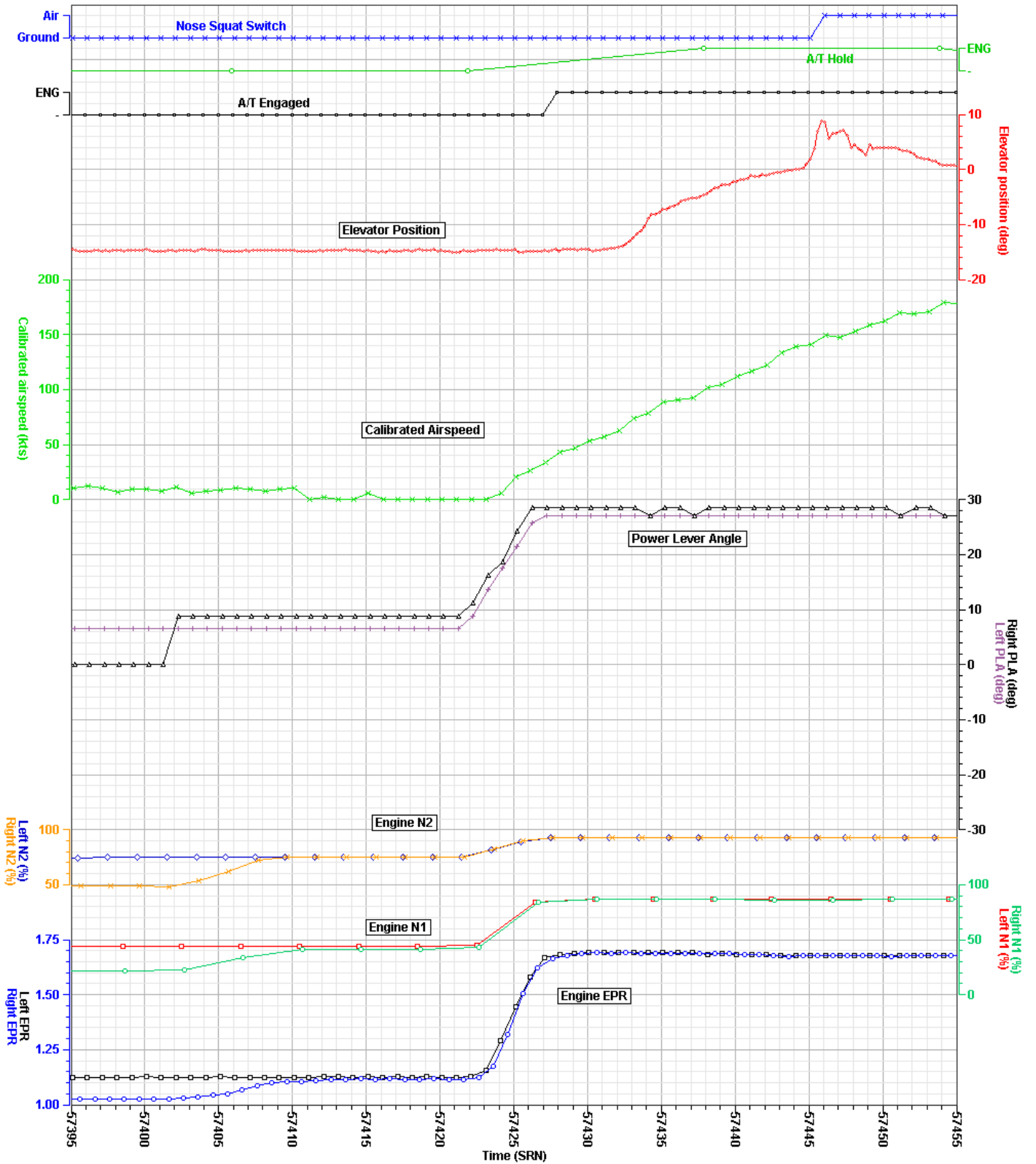


Figure 15. Fourteen flights prior to accident takeoff.

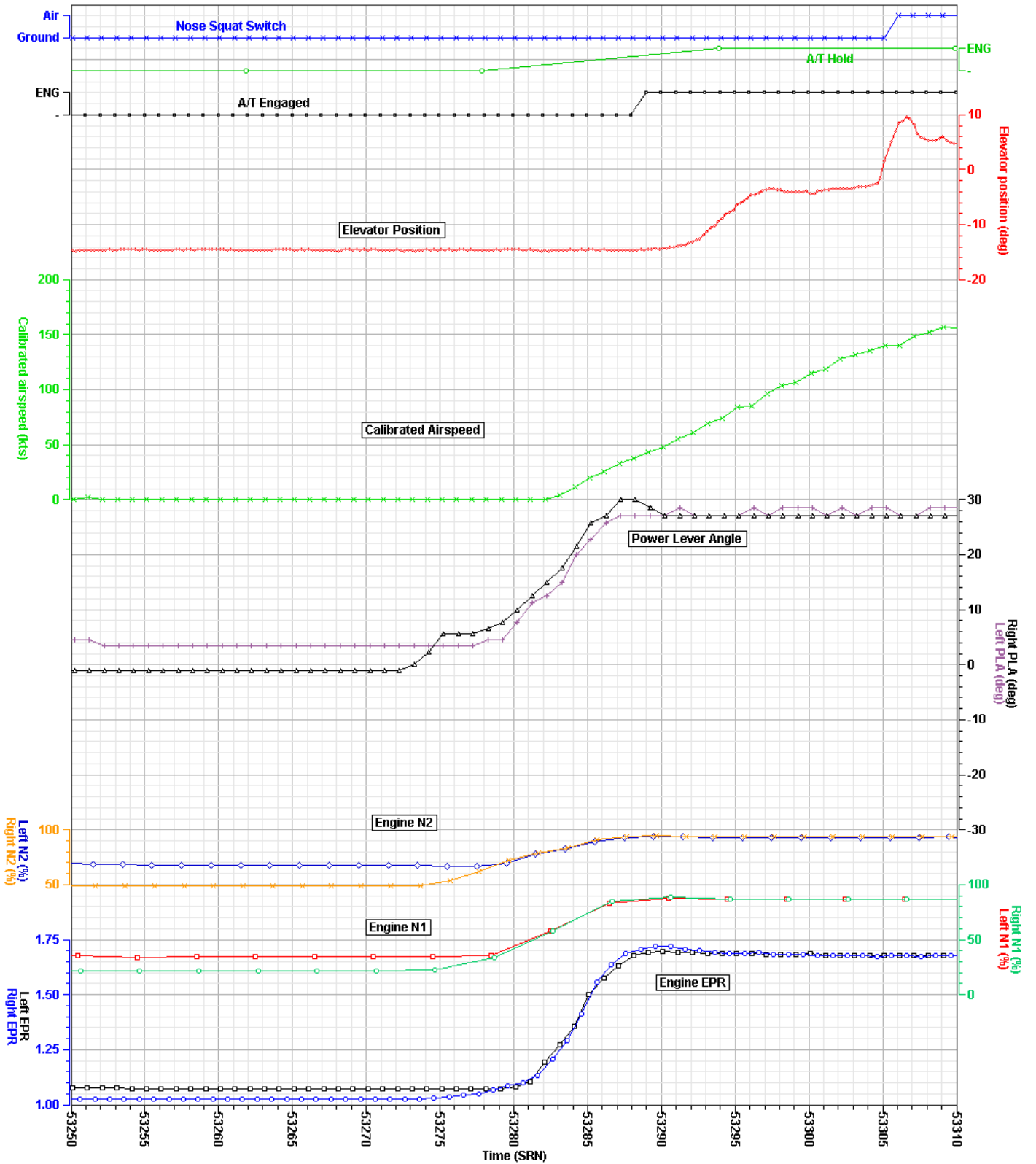
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Figure 16. Fifteen flights prior to accident takeoff.

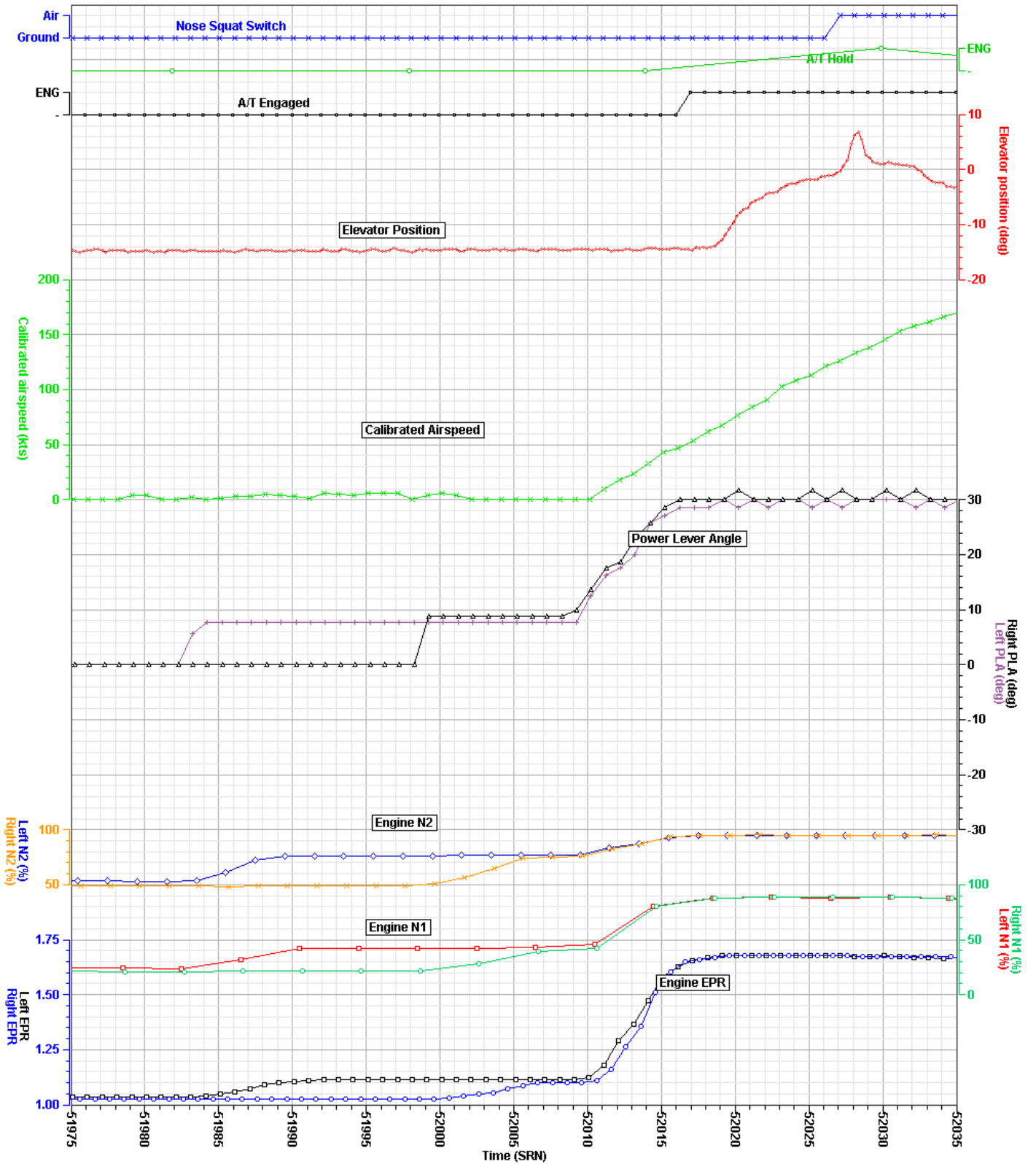
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Figure 17. Sixteen flights prior to accident takeoff.

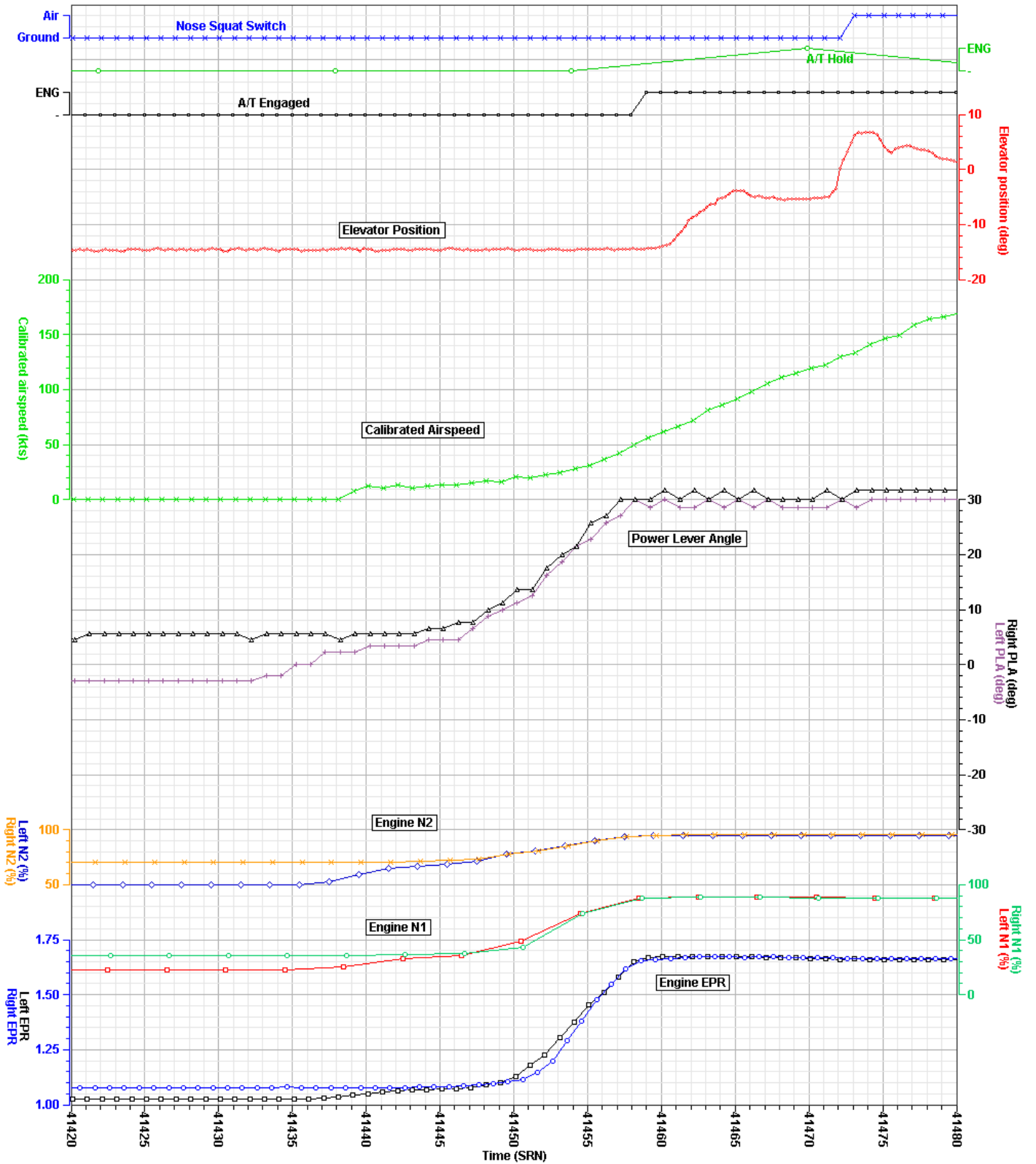
Gulfstream GIV, N121JM



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Figure 18. Seventeen flights prior to accident takeoff.

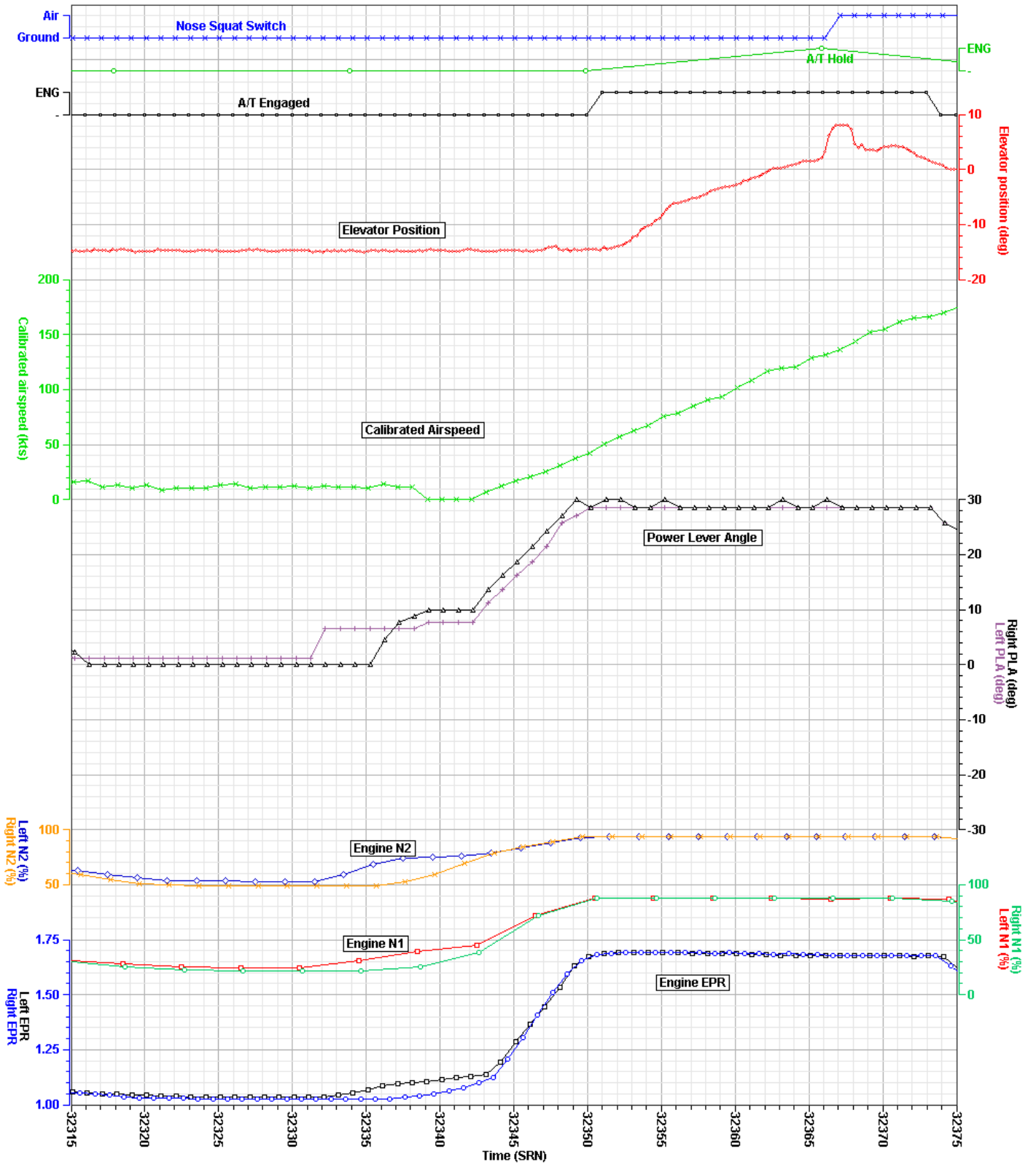
Gulfstream GIV, N121JM



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Figure 19. Eighteen flights prior to accident takeoff.

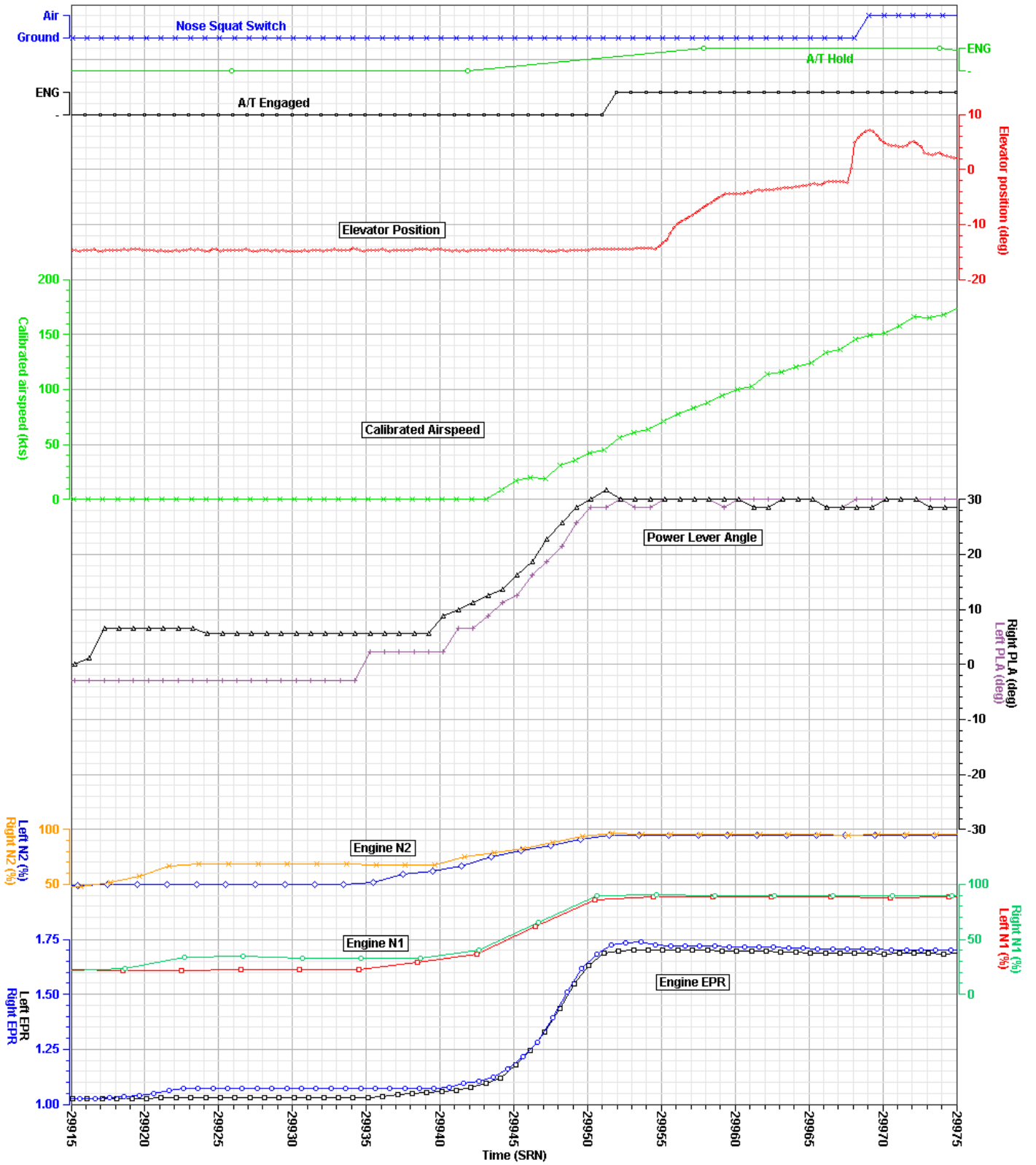
Gulfstream GIV, N121JM



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Figure 20. Nineteen flights prior to accident takeoff.

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Figure 21. Twenty flights prior to accident takeoff.

Appendix A

Table A-1. Provided and verified parameters.

Plot Label	Parameter Description	Sample Rate (Hz)
A/T Engaged	Autothrottle Engaged Discrete	1
A/T Hold	Autothrottle Hold Mode Discrete	1/16
Calibrated airspeed (kts)	Calibrated Airspeed	1
Elevator position (deg)	Elevator Deflection	4
Left EPR	Left Engine Pressure Ratio	1
Left N1 (%)	Left Engine N1 Speed	1/4
Left N2 (%)	Left Engine N2 Speed	1/2
Left PLA (deg)	Left Engine Power Lever Angle	1
Nose Squat Switch	Nose Gear Weight on Wheel Switch Discrete	
Right EPR	Right Engine Pressure Ratio	1
Right N1 (%)	Right Engine N1 Speed	1/4
Right N2 (%)	Right Engine N2 Speed	1/2
Right PLA (deg)	Right Engine Power Lever Angle	1

Table A-2. Unit abbreviations.

Units Abbreviation	Description
deg	degrees
kts	knots
discrete	discrete

NOTE: For parameters with a unit description of discrete, a discrete is typically a 1-bit parameter that is either a 0 state or a 1 state where each state is uniquely defined for each parameter.