



NATIONAL TRANSPORTATION SAFETY BOARD

**Office of Aviation Safety
Western Pacific Region**

DEBRIS FIELD INFORMATION

**NTSB Accident: WPR16FA158
Accident Date: August 2, 2016**

This document contains 7 embedded images

A. ACCIDENT

Location: Flagstaff, Arizona
Date: August 2, 2016
Aircraft: Piper Seneca II, N82806, Serial # 34-8170021
NTSB IIC: Michael Huhn

B. PARTICIPANTS:

Michael Huhn
Air Safety Investigator
National Transportation Safety Board
Western Pacific Region

Tom Vernon
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Air Safety Investigator
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AS-20 Division

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C. SUMMARY

The debris field was documented photographically, and about 58 significant components were tagged and their positions cataloged. A 2-D layout at the recovery facility (Air Transport in Phoenix) enabled positive identification of almost all tagged components.

All major components of the airplane were identified in the recovered wreckage. No evidence consistent with in-flight fire or in-flight structural failure was observed. The debris field pattern was consistent with a high energy impact. The flight path had a vertical component, but a significantly larger horizontal component; the flight path angle was likely between 10 and 30 degrees down. The right-left distribution of the airplane right and left components was consistent with the airplane not being inverted. The predominance of vertical stabilizer and right wing components appeared consistent with a right-wing-low attitude at the time of tree impact.

D. GENERAL INFORMATION

1.0 Location Information

- The accident site was located on USFS (Coconino National Forest) property on the east side of AZ Hwy 89A, about 3 miles south of the junction of 89A and I-17 in Flagstaff, AZ
- The first tree strike was located 2.64 nm, on a true bearing of 236°, from the KFLG Rwy 3 threshold
- The elevation of the location of the first tree struck ("Tree 0") was 6,948 ft msl
- The wreckage trajectory/debris field was oriented on a true heading of 042°

Geographic Coordinates

	Lat	Long
Tree 0	35° 06 22.008	111° 43 27.312
Main Wreckage (Cabin, wing roots, center spar)	35° 06 24.798	111° 43 24.972
End	35° 06 24.942	111° 43 23.316

- The site terrain was level, with moderately spaced trees and generally sparse undergrowth
- The debris field was oriented approximately parallel to Hwy 89A, and offset about 125 feet from the eastern edge of the highway

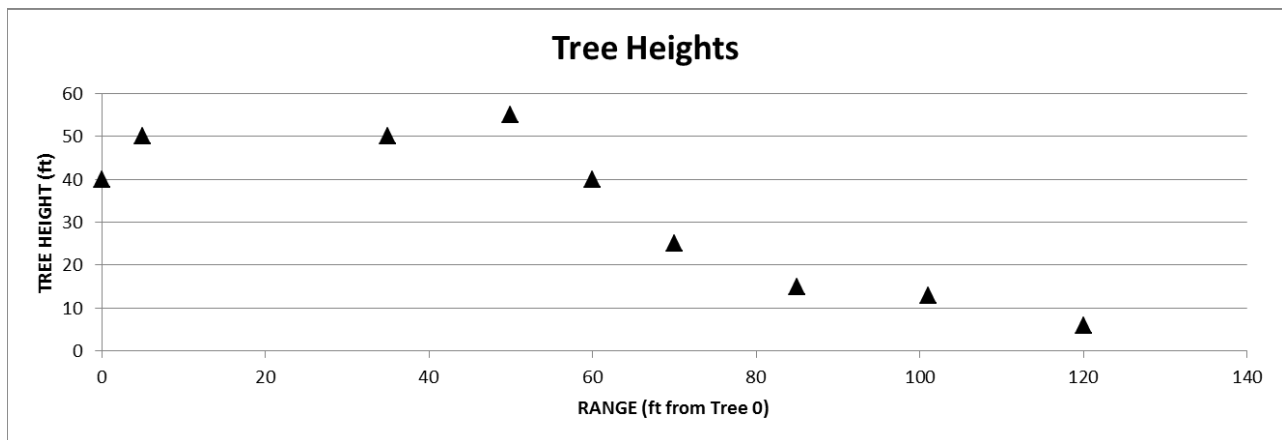
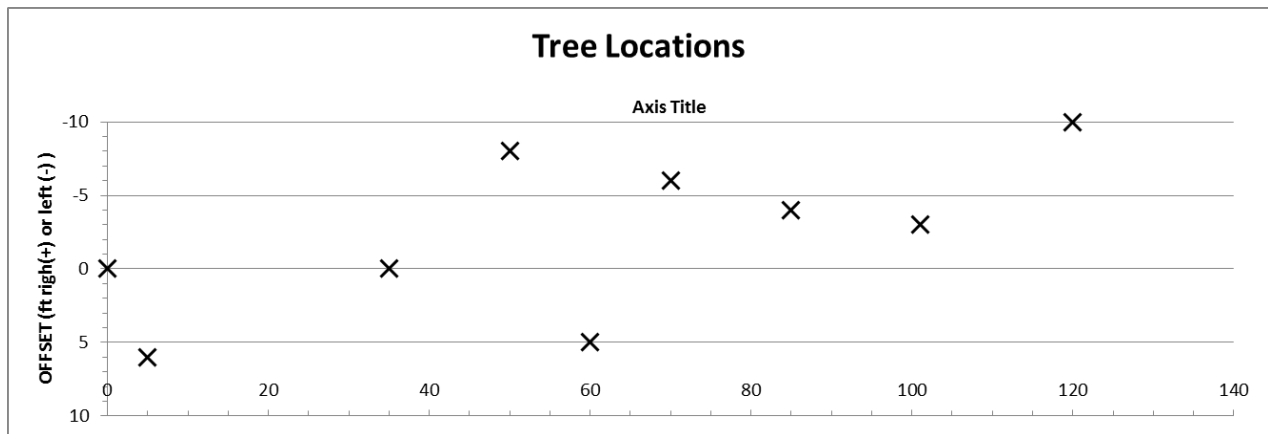
2.0 Dimensions & Methodology

- The approximate debris field shape could be contained in a long rectangle
 - Minor axis approximately 60 feet
 - Major axis approximately 600 feet
- A reference line was extended Tree 0 NE, parallel to the approximate wreckage path/direction of travel, through its approximated center. This value was termed "range"
- Offsets left (-) or right (+) of the reference line, combined with range, were used to denote the locations of components
- About 58 significant components were tagged and their locations catalogued, for generating the debris field map
- NOTE: The 58 tagged components represented only a very small fraction of the total quantity of debris field components; thus the debris field map is not necessarily representative of the entire debris field in terms of number of components or distribution density

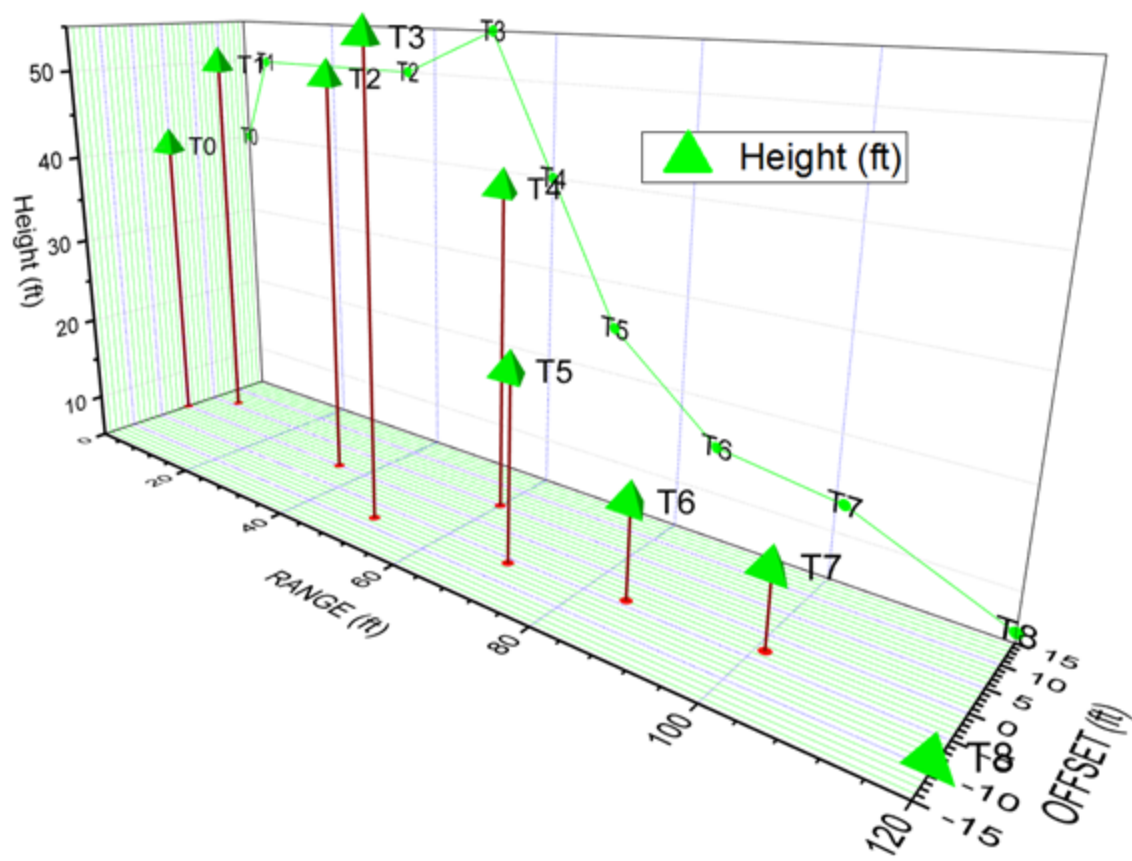
E. TREE INFORMATION

- The airplane "topped" (cut/broke off tops of) eight trees (including Tree 0)
 - These tree locations, and their remaining heights, were catalogued
- Several other trees bore minor to major impact scars, but only one of those was catalogued
- Tree fracture points not necessarily vertically coincident with airplane impact locations

ID #	TREE DESIGNATION or DESCRIPTION	Height (ft)	RANGE (ft)	OFFSET (ft)
T0	Tree 0 (First tree struck; Grid Origin)	40	0	0
T1	Tree 1	50	5	6
T2	Tree 2	50	35	0
T3	Tree 3	55	50	-8
T4	Tree 4	40	60	5
T5	Tree 5	25	70	-6
T6	Tree 6	15	85	-4
T7	Tree 7	13	101	-3
T8	Non Topped tree (w L Engine Impact 6 ft agl)	6	120	-10



- The trees appeared to be primarily mature pine trees, from about 50 to 80 feet tall
- The topped trees ranged from about 10 to 15 inches in diameter at their fracture points
- A cluster of tree tops, branches, and limbs was situated from about 70 to 100 feet from Tree 0, approximately straddling the reference line
 - The cluster was not a result of any efforts by the first responders or other personnel to gather or re-locate the debris
- Many smaller-diameter & shorter limbs were scattered throughout the first 100 feet of the debris field
- Many tree limbs (up to about 6 inches in diameter) exhibited clean, fresh, diagonally-cut ends consistent with being severed by the propellers



Orthographic View of Affected Trees



Figure 1 - Topped Trees (View back against flight direction)



Figure 2 - Debris Path and Tree Swath (View back against flight direction)



Figure 3 - Debris Path and Tree Swath (View back against flight direction)



Figure 4 - Exemplar Cut Limb



Figure 5 - Tree 8 (with L engine impact mark)



Figure 6 - Cluster of Tree Tops (with multiple R wing fragments)

F. CATALOGUED AIRPLANE ITEMS

ID #	PART NAME & DESCRIPTION	Height (ft)	RANGE (ft)	OFFSET (ft)	A/C LEFT, CENTER, or RIGHT	FLIGHT CONTROL or AERO SFC
1	Rotating Beacon Fragment (red)	0	34	-8	C	VS
2	R Wing Aileron & Flap Hinge/Bracket	0	40	0	R	F
3	Top of Vertical Stab (this was 1st piece of skin in debris field)	0	12	0	C	VS
4	Top Composite LE of V Stab	0	54	-6	C	VS
5	Right Inboard Fwd Cowl	0	62	-20	R	
6	Nose Landing Gear Strut	0	90	-15	C	
7	Cockpit Item	0	95	-15	C	
8	Right Outboard Flap Segment	0	98	-18	R	F
9	Left Composite Wing Tip	0	130	-22	L	W
10	Nose Gear Steering Link	0	150	-18	C	
11	Magneto (Slick 6324 sn12030482)	0	158	-8	L	
12	Magneto (Continental S6RSC-25P D12IA033R B(?)L-500556-101)	0	160	-5	R	
13	Engine Oil Sump	0	170	-7	L	
14	Vacuum Pump (PN AA42CW-6 sn N58317)	0	170	-6	R	
15	Rt Eng Accessory Case Sect w Oil Filter	0	167	-6	R	
16	Right Engine Fuel Manifold Valve	0	164	-6	R	
17	Magneto (Slick 6324 sn12030482)	0	185	-25	L	
18	Left Outboard Stabilator	0	190	-1	L	S
19	Left Flap (entire span)	0	200	-20	L	F
20	Right Stabilator w portion of left Stabilator	0	215	-3	R	S
21	Throttle Quadrant Instrument Panel	0	238	-12	C	
22	Cabin Forward Starboard Door	0	239	-10	R	
23	Wing Spar Aft Center with LMLG Wheel Well	0	250	-18	L	W
24	Left Outboard Aileron Segment	0	275	-10	L	A
25	Mid/Aft Cabin	0	280	0	C	
26	Left Nacelle, Eng Mt, Spar, Firewall	0	280	-15	L	
27	Base of Vertical Fin	0	282	-20	C	VS
28	Right Main Landing Gear	0	295	-25	R	
29	Left Spinner	0	350	-75	L	
30	Cockpit Item	0	410	-20	C	

ID #	PART NAME & DESCRIPTION	Height (ft)	RANGE (ft)	OFFSET (ft)	A/C LEFT, CENTER, or RIGHT	FLIGHT CONTROL or AERO SFC
31	Combustion Heater	0	340	25	C	
32	Magneto (Continental S6RSC-25P D121A0?3R BL-500556-101)	0	320	7	R	
33	ELT (Ameri-King PN 450001 TSO- C91A)	0	300	1	C	
34	Aft Tailcone Segment w Tail Tie Down	0	290	20	C	
35	Right Propeller	0	290	25	R	
36	Right Spinner (with Propeller Piston)	0	250	4	R	
37	Left Outboard Cowl	0	230	10	L	
38	Right Flap Inboard Segment	0	220	7	R	F
39	Rudder Lower Segment w/ Trim Tab	0	205	5	C	R
40	Left Propeller	0	190	5	L	
41	Right Flap Mid Segment	0	185	7	R	F
42	Nose Gear Tire & Tube (sans wheel)	0	220	50	C	
43	Upper Part of Starboard Cabin Door	0	150	12	R	
44	Right Composite Wing Tip	0	140	20	R	W
45	Right Outboard Aileron Segment	0	130	10	R	A
46	Left Engine (direct strike, tree 8)	0	135	5	L	
47	Composite Rudder Cap (w White Nav Light)	0	134	5	C	
48	Tow Bar Segment (embedded in tree)	0	108	7	C	
49	Part of Wing w/ Fuel Bladder UNK PART/SIDE	0	100	40	unk	
50	Right Outboard Cowl	0	85	50	R	
51	Right Outboard Wing Segment	0	60	20	R	W
52	R Wing Outbd Section w Fuel Port	0	50	30	R	W
53	Wing Part w/ Part Number	0	45	36	R	W
54	Wing Part w/ Tree Impact (Undetermined Part/Side)	0	44	38	unk	W
55	Wing Part with Fuel Line and Check Valve	0	46	40	R	
56	Right Inboard Aileron Segment	0	46	0	R	A
57	Fwd Bobweight (pitch control system)	0	130	-5	C	
58	Right Engine Starter (found in road)	0	560	-100	R	
900	6X2X1 Earth Gouge	0	140	-7	N/A	
901	Right Engine (deduced location)	0	285	-10	R	
902	Left Inboard Cowl (Undetermined location)	0	unk	unk	L	

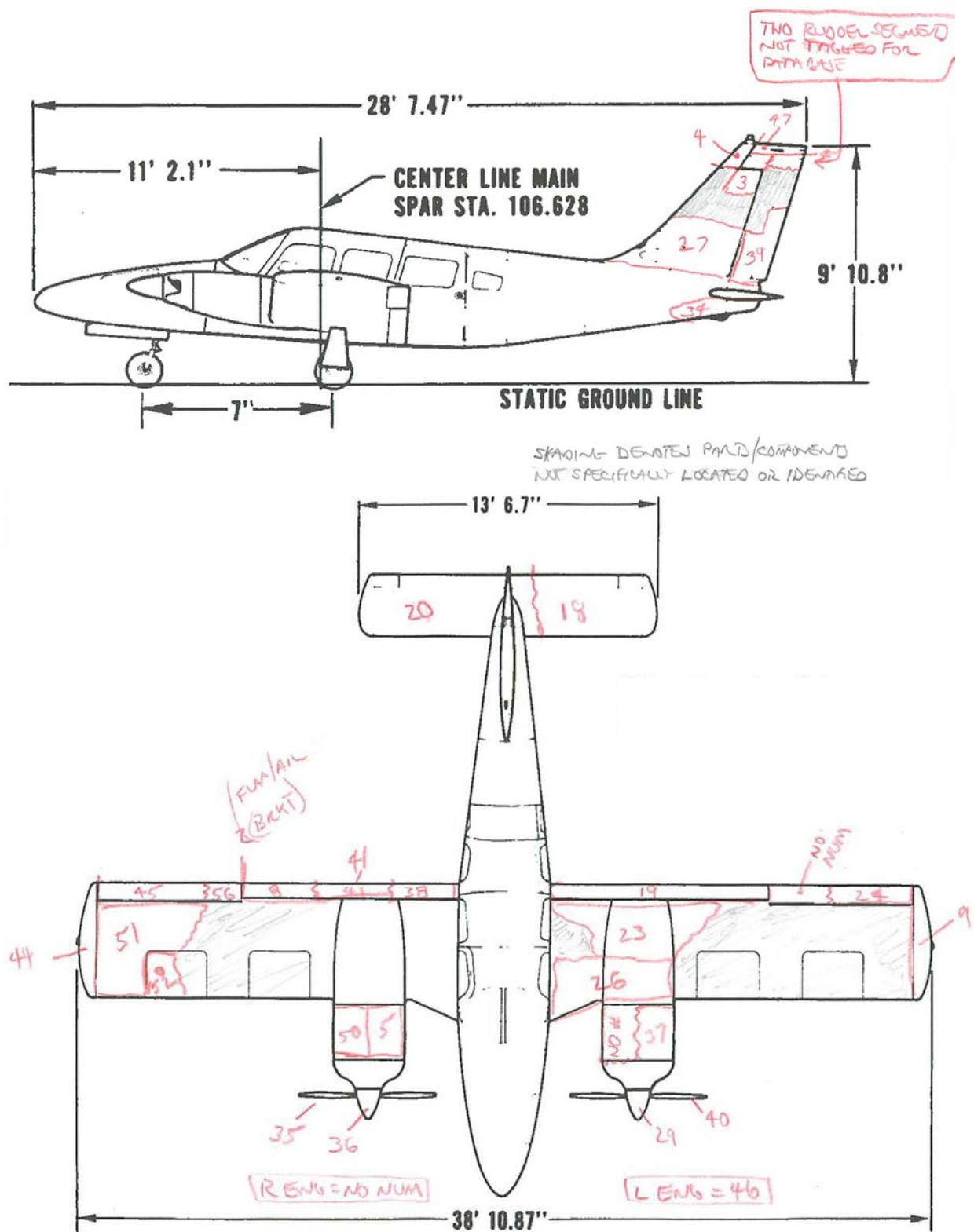
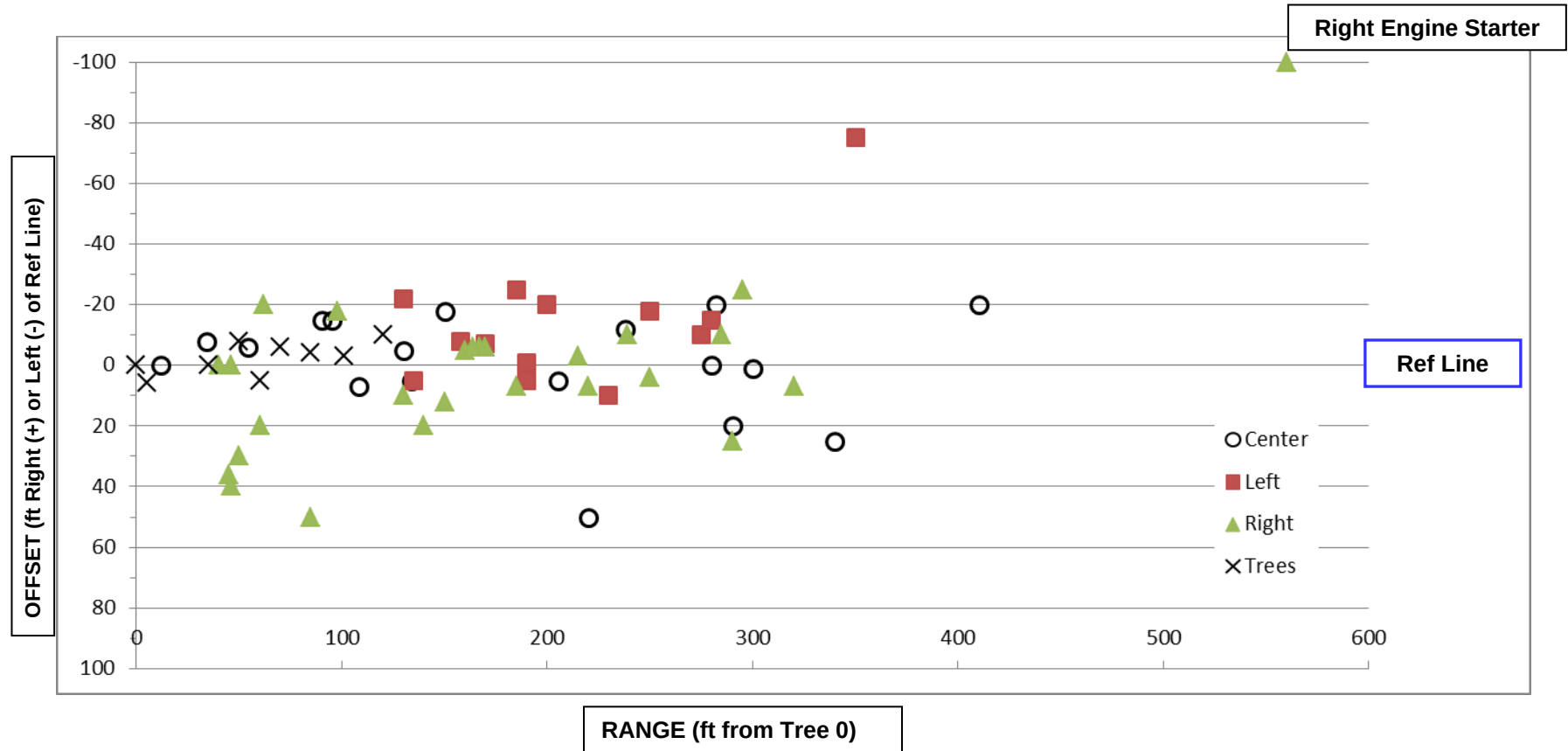
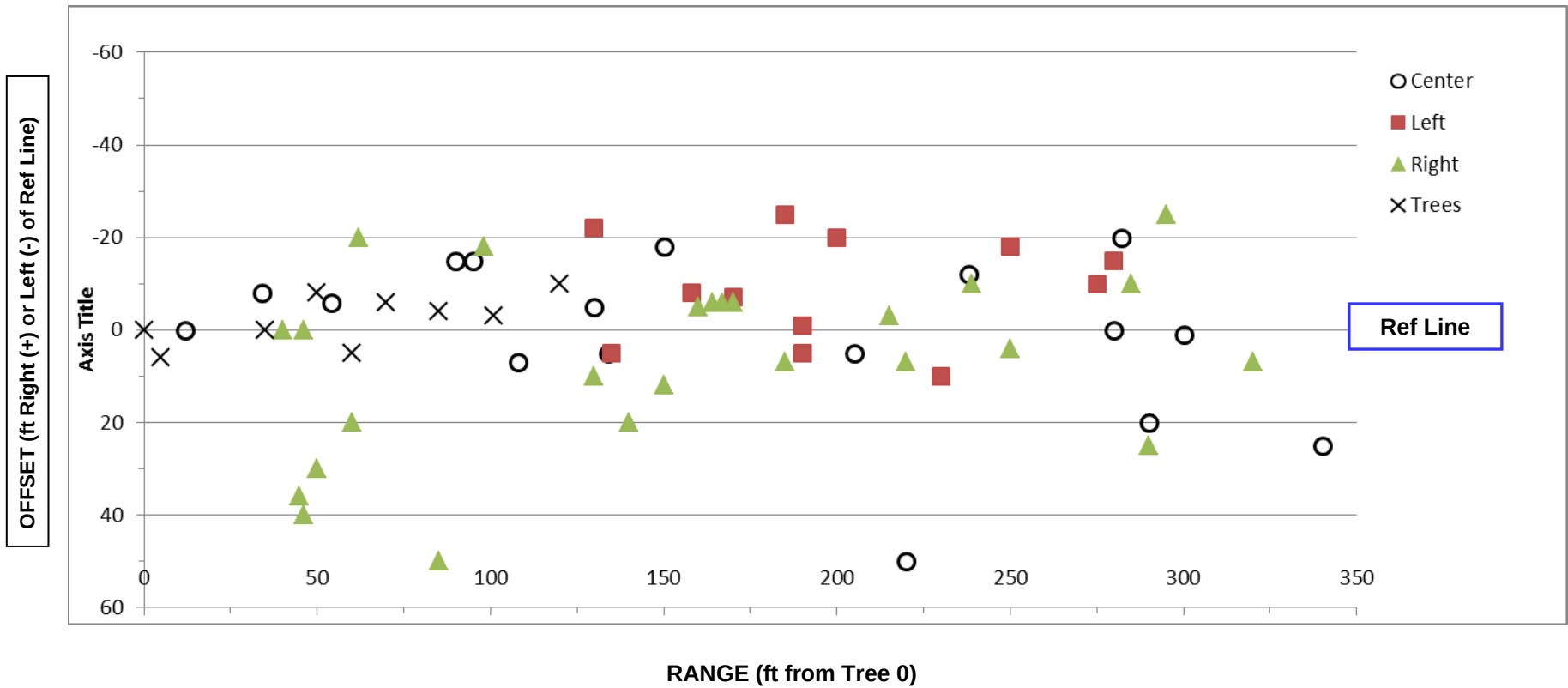


Figure 7 - Tagged Component Locations on Airplane

Map of Debris Field



Expanded Map of Debris Field



Debris Field Map with Flight Control Surfaces Noted

