

***Avionics Specialists of Alaska***

**1936 Merrill Field Drive**

**Anchorage, AK 99501**

**X95R014X**

**Additional Equipment List/Revised Weight and Balance**

<b>Registration:</b>	N911AA	<b>Date:</b>	03/21/11
<b>Make:</b>	Eurocopter	<b>Superceded Date:</b>	02/09/09
<b>Model:</b>	AS350-B3	<b>Work Order:</b>	9981
<b>Serial Number:</b>	3611	<b>Configuration:</b>	Skids
<b>A/C Gross Weight:</b>	4961		

	<b>Weight</b>	<b>Arm</b>	<b>Moment</b>
<b>Previous A/C Empty</b>	3,319.110	136.138	451,858.635

**Removed Items**

Transcal SSD120-20A-RS2232 Altitude Encoder	0.625	64.000	40.000
	3,318.485	136.152	451,818.635

**Installed Items**

Trans-Cal SSD120-30N-RS232 Altitude Encoder	0.375	63.000	23.625
Appareo Vision 1000	0.500	77.000	38.500
Appareo Vision 1000 Mount & Bracket	0.160	77.000	12.320
Appareo Vision 1000 GPS Antenna & Doubler	0.190	34.000	6.460
<b>New A/C Empty</b>	3,319.710	136.126	451,899.540

New A/C Empty Weight: **3,319.710**

New A/C Moment **451,899.540**

New A/C C.G.: **136.126**

New Useful Load: **1,641.290**

Above installation performed in accordance with current FAA regulations and manufacturers specifications and is approved for return to service.

\_\_\_\_\_  
Authorized Signature for

***Avionics Specialists of Alaska***

(a service of Evergreen Helicopters of Alaska, Inc.)

1936 Merrill Field Drive

Anchorage, AK 99501

X95R014X

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Base \_\_\_\_\_

DATE: 03.17.13	TAIL #: QVAA
CUSTOMER: AST	A/C TYPE: A-STAR

JET A	<input checked="" type="checkbox"/> JET A w/ADDITIVE	<input type="checkbox"/> DIESEL
AUTO <input type="checkbox"/>	OIL <input checked="" type="checkbox"/> : _____	OTHER _____

Gold Cap <input type="checkbox"/>	Lav <input type="checkbox"/>	Water <input type="checkbox"/>	GPU <input type="checkbox"/>	Hangar <input type="checkbox"/>
Initials: _____	Initials: _____	Initials: _____	Initials: _____	Initials: _____

SPECIAL REQUESTS: \_\_\_\_\_

REQUESTED FUEL AMOUNT: 710

Meter Reading 2 \_\_\_\_\_ Finish 22813490 Meter Reading 1 \_\_\_\_\_

Meter Reading 2 \_\_\_\_\_ Start 22813469 Meter Reading 1 \_\_\_\_\_

← Total Gallons → 21

Fueler's Initials: AT	Unit #: TK1	On A/C Time: 2024	Off A/C Time: 2029
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DID YOU SECURE OIL/FUEL CAPS AND PANELS?

Received by: (Customer) X

**From:** [Webb, Bruce](#)  
**To:** [Struhsaker, Georgia](#)  
**Cc:** [Buttner, Seth](#)  
**Subject:** RE: Talkeetna Investigation- W&B, Performance Info  
**Date:** Monday, June 17, 2013 8:26:52 AM

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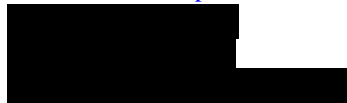
Georgia,

Of course you are correct regarding the departure mass...that's what I get for rushing the email out. Thanks for carefully checking my work!

Regarding the fuel indication; there is in fact Fuel Flow displayed within the VEMD (Vehicle Engine Multifunctional Display). Based upon a math model and the FADEC's known position of the fuel metering valve, as reported by the stepper motor and resolver, the pilot will see the ships fuel flow and time to flame out (end time). It is very easy to see and, in my experience, very accurate. Of course, there is also the standard fuel quantity gauge and low fuel light.

Bruce

Bruce A. Webb  
Chief Pilot  
American Eurocopter



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**From:** Struhsaker Georgia [REDACTED]  
**Sent:** Monday, June 17, 2013 11:43 AM  
**To:** Webb, Bruce  
**Cc:** Buttner, Seth  
**Subject:** RE: Talkeetna Investigation- W&B, Performance Info

Bruce,

Thanks for the information. On takeoff from Anchorage, the only occupant would have been the pilot, so the helicopter would have been within weight limits at that time (+340 for fuel and -390 for occupants so -50 lbs as compared to accident condition). The trooper got on at the first stop, Sunshine in Talkeetna, and the passenger Carl Ober got on at the second stop, the landing LZ.

The pilot reported to dispatch that he had 2 hours and 37 minutes of fuel on board when he called about 2 minutes after takeoff from Anchorage. Calculation using 50 gph and 143 gallons results in a fuel endurance of 2.86 hrs or 2 hrs 52 minutes. So the pilot's fuel report seems roughly consistent with taking off with a full tank. Was N911AA equipped with some sort of fuel totalizer that provided the pilot with a readout of fuel remaining or did it just have the standard fuel gauge (which I am very familiar with due to the Mosby case)?

Georgia

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**From:** Webb, Bruce [REDACTED]  
**Sent:** Monday, June 17, 2013 5:31 AM

**To:** Struhsaker Georgia  
**Cc:** Buttner, Seth  
**Subject:** RE: Talkeetna Investigation- W&B, Performance Info

Georgia,

	<u>Weight</u>	<u>Arm</u>	<u>Moment</u>
Aircraft Empty	3,319.7 lbs.	136.126"	451,899.540
Pilot	180.0 lbs.	61.02"	10,983.600
Left Front Seat Trooper	210.0 lbs.	61.02"	12,814.200
Passenger	180.0 lbs.	99.99"	17,998.200
Fuel	632.0 lbs.	136.81"	
86,463.920			
[Assuming full fuel at original departure point and flying 0.9 hours, plus 0.1 hours consumption for start-up / shut-down, and ground operations = 1.0 hours @ 50 GPH consumption. The ship holds 143 gallons when full (972 lbs.) less 50 gallons (340 lbs.) = 632 lbs. at time of accident]			
Baggage (Side Holds)	200.0 lbs.	125.98"	25,196.000
Baggage (Aft Hold)	75.0 lbs.	181.10"	13,582.500
<b>Totals:</b> <b>(Time of Accident)</b>	<b>4,796.7</b>	<b>129.03"</b>	<b>618,937.96</b>

\*\*\*The ship is within CG and Gross Mass

	+340.0 lbs.	136.81"	+46,515.40
<b>Totals:</b> <b>665,453.36</b> <b>(Departure from ANC)</b>	<b>5,136.7 lbs.</b>	<b>129.55"</b>	

\*\*\*The ship is within CG but over internal gross mass by 175.7 lbs.

\*\*\*The ship is capable of HOGUE at maximum gross mass (4961 lbs.) at 5,500' PA at 40°C  
\*\*\*The ship is capable of HIGE at maximum gross mass (4961 lbs.) at 7,250' PA at 40° C

Regards,  
Bruce

Bruce A. Webb  
Chief Pilot  
American Eurocopter

[REDACTED]  
[REDACTED]

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**From:** Struhsaker Georgia [REDACTED]  
**Sent:** Saturday, June 15, 2013 1:54 PM  
**To:** Buttner, Seth; Webb, Bruce; Sauer Aaron  
**Subject:** RE: Talkeetna Investigation- W&B, Performance Info

Seth and Bruce,

I propose 3 pm eastern/2 pm central/9 am Hawaii on Monday for a conf call. Let me know if that works and I can set up a call in line for us to use.

Aaron, If you are available feel free to join us.

Thanks, Georgia

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**From:** Buttner, Seth [REDACTED]  
**Sent:** Saturday, June 15, 2013 6:02 AM  
**To:** Webb, Bruce; Struhsaker Georgia; Sauer Aaron  
**Subject:** Re: Talkeetna Investigation- W&B, Performance Info

Likewise, we'll get that to you. Also, I will be out this Mon - Wed (actually out in Ashburn) but anytime Monday afternoon I could be available for a conf call, whatever is good for you, and Bruce, just let me know what time and I'm on it! Otherwise any time in July I'm wide open.  
-Seth

Sent from my BlackBerry

Seth D. Buttner  
Sr. Accident Investigator

American Eurocopter  
[REDACTED]  
Grand Prairie, TX 75052

[REDACTED]  
[REDACTED]  
[REDACTED]

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**From:** Webb, Bruce  
**Sent:** Friday, June 14, 2013 07:12 PM  
**To:** 'georgia.struhsaker@[REDACTED]'; Buttner, Seth  
**Cc:** 'sauera@[REDACTED]'; [REDACTED]>

**Subject:** Re: Talkeetna Investigation- W&B, Performance Info

Georgia,

I'll be in next week...I'm certain we can accommodate.

Bruce

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**From:** Struhsaker Georgia [REDACTED]  
**Sent:** Friday, June 14, 2013 06:53 PM  
**To:** Buttner, Seth; Webb, Bruce  
**Cc:** Sauer Aaron [REDACTED]  
**Subject:** Talkeetna Investigation- W&B, Performance Info

Hello Seth and Bruce,

I want to talk with both of you about the Alaska State Troopers helicopter accident (Talkeetna, 3/30/13) and give you an update on information obtained from recent interviews. I also have a few questions for you. I have been busy, and I know that both of you have also been busy. I will be in the office next week on Monday and Tuesday, and then I will be gone on leave until July 1. If we don't connect next week, our discussion can certainly wait until early July.

One thing I would like for you to do is calculate a weight and balance for the helicopter at the time of the accident. Also, based on the Talkeetna weather closest to the time of the accident and the accident site elevation of 740 feet, I would like the max weight for HIGE and HOGE. I don't think we have any issues here, I just want to cover the basics.

I have gathered the following information:

Helicopter empty weight and CG – see attached excel file 032111; this is the weight and balance done when the Appareo unit was installed; as far as I can tell, it is the most recent weight and balance for the helicopter.

Occupants – weights from Alaska driver's license records,

Pilot – Mel Nading, right front seat, 180 lbs

Passenger – Trooper Tage Toll, left front seat, 210 lbs

Passenger – Carl Ober, left rear seat (based on info from troopers on where an injured person would most likely be seated), 180 lbs

Baggage – 275 lbs, this is the estimated weight of the gear that the pilot carried in the helicopter, estimated by Trooper John Chiri who was a relief pilot for Mel Nading

Fuel – most recent fuel receipts from Signature Aviation attached; helicopter was last topped off on 3/17/2013, which was the last time it was flown prior to the night of the accident; so I assume it was full when it departed Anchorage en route to Talkeetna; the pilot reported to dispatch that he had 2 hours and 37 minutes of fuel on board when he called and told them he was en route to Talkeetna at 2116; assuming he called about 2 minutes after takeoff, is the pilot's fuel report consistent with

taking off with a full tank?

Flight Time – total 54 minutes according to Appareo data, 28 minutes from ANC to Sunshine (Talkeetna), 14 minutes from Sunshine to LZ, 12 minutes from LZ to accident site, accident occurs at 0720 UTC or 2320 local

Talkeetna Weather at 0714UTC/2314 local> SPECI PATK 310714Z AUTO 00000KT 7SM -SN BKN009 BKN013 OVC024 01/01 A3022 RMK AO2 RAE10UPB10E12SNB12 P0001 TSNO=

Thanks, Georgia

Georgia R. Struhsaker  
Senior Aviation Accident Analyst  
NTSB

[REDACTED]

[REDACTED]

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[REDACTED]