



## Update on Video Imaging Data Sets

HAIC-HIWC Science Meeting – November 11, 2015

*Presented by T. Ratvasky, NASA*

# HAIC-HIWC Campaign Video Imaging Data Sets

- Onboard video imaging data was recorded for general information on the flights and potentially for pilot education
- Allied Vision Technology Ethernet cameras in the flight deck
  - ▶ Windscreen – to capture water streaming while in HIWC conditions (Darwin only)
  - ▶ Instrument panel – to capture flight and engine instrument indications
- GoPro portable cameras
  - ▶ Pilots used to capture windscreen/instrument panel
  - ▶ Researchers used to capture images out the side window and in research screens



# Update on Darwin Campaign Video Data Sets

- No changes to Darwin video data set since the September 2014 meeting
  - ▶ Files sent to NCAR for additional archiving

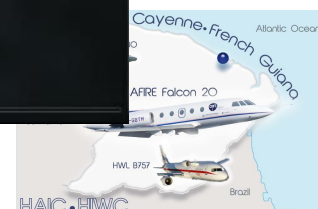
Flight No	Instrument Panel File	Size (GB)	Windscreen File	Size (GB)
FS140001	21,903 bmp images	136	N/A	
FS140005	CC20140221_0434_0715.AVI	2.2	CW20140221_0434_0715.AVI	24.9
FS140006	17,152 bmp images	106	65,989 bmp images	413
FS140009	CC20140129_2108_2345.AVI	20.1	CW20140129_2108_2345.AVI	75.5
FS140010	CC20140130_2005_2322.AVI	24.7	CW20140130_2005_2322.AVI	63.1
FS140011	CC20140130_0114_0214.AVI	13.4	CW20140130_0114_0214.AVI	32.8
FS140012	CC20140203_2035_2340.AVI	23.9	CW20140203_2035_2340.AVI	84.1
FS140013	CC20140203_0405_0631.AVI	36.7	CW20140203_0405_0631.AVI	55.8
FS140014	CC20140205_2033_2340.AVI	26.9	CW20140205_2033_2340.AVI	96.9
FS140015	CC20140206_2327_0226.AVI	7.9	CW20140206_2327_0226.AVI	10.6
FS140016	CC20140208_2102_0018.AVI	29.6	CW20140208_2102_0018.AVI	90.9
FS140017	CC20140208_0158_0345.AVI	20.0	CW20140208_0158_0345.AVI	64.9
FS140018	CC20140209_2048_2359.AVI	24.7	CW20140209_2048_2359.AVI	78.1
FS140019	CC20140210_2049_0014.AVI	25.5	CW20140210_2049_0014.AVI	62.7
FS140020	CC20140210_0207_0358.AVI	24.0	CW20140210_0207_0358A.AVI CW20140210_0207_0358B.AVI	30.5 39.6
FS140021	CC20140217_0627_0833.AVI	21.7	N/A	
FS140022	CC20140218_2143_0101.AVI	28.8	CW20140218_2143_0101.AVI	91.4
FS140023	N/A		N/A	

Flight No	Cabin	Size (GB)	Flight Deck	Size (GB)
FS140006	GOPR0181-GOPR0193.MP4	3.1	N/A	
FS140007	GOPR0194-GOPR0199.MP4, GOPR0203-GOPR0206.MP4	2.0	GOPR0200-GOPR0202.MP4	146
FS140015	GOPR0006-GP010010.MP4	14.7	N/A	
FS140016	N/A		GOPR0018-GOPR0024.MP4	4.8
FS140018	N/A		GOPR0014-GOPR0020.MP4	7.7
FS140019	N/A		GOPR0025-GP040031.MP4	22.5



# Update on Cayenne Campaign Video Data Sets

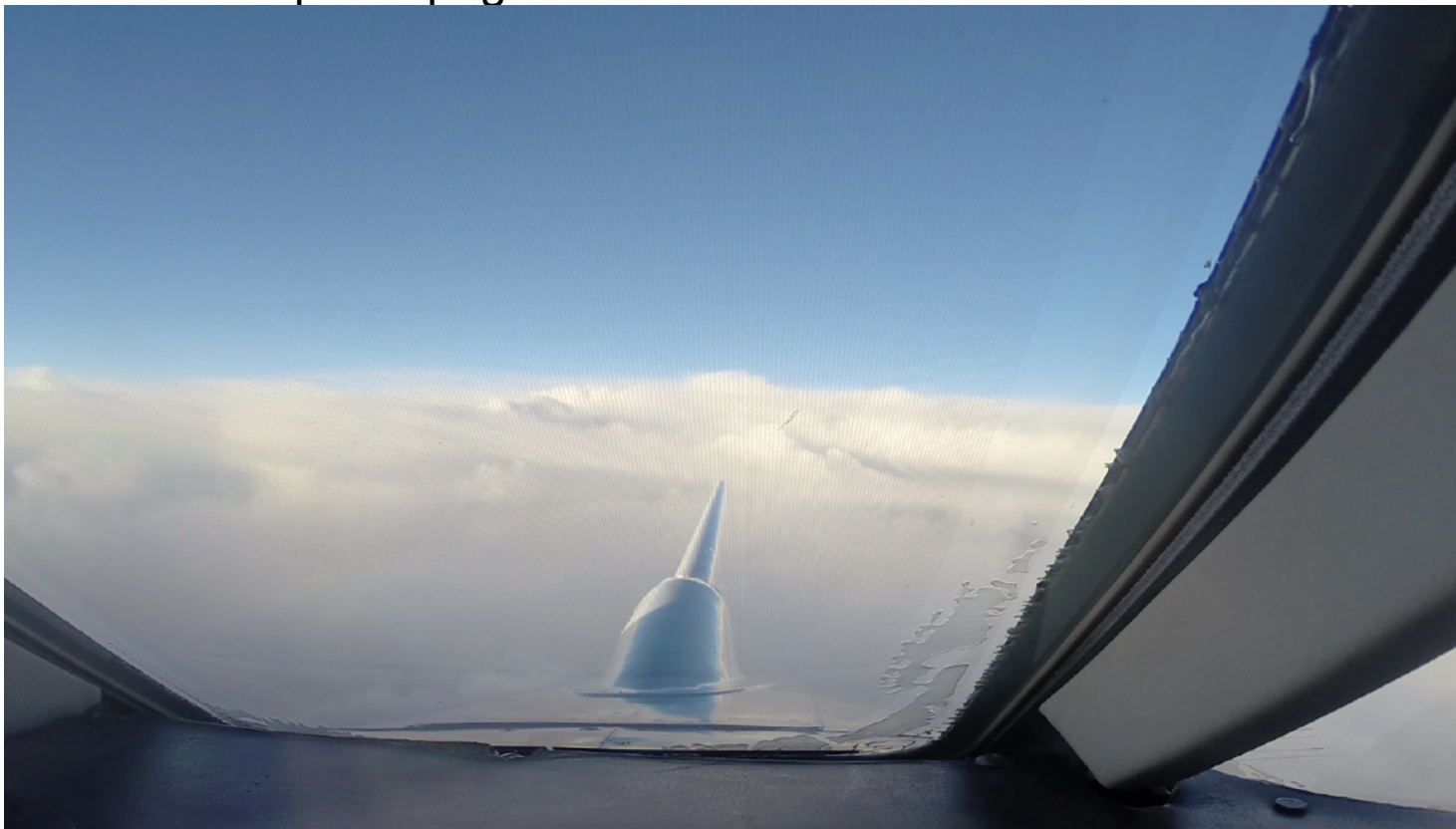
- Allied Vision Camera recorded instrument panel
  - ▶ improved date/time stamp
  - ▶ 1 frame/sec
  - ▶ Output: avi files





# Cayenne Campaign Video Imaging Data Sets

- GoPro recorded video and sound of windscreen
  - ▶ 59 frame/sec
  - ▶ Audio sample rate: 48 kHz
  - ▶ Output: Mpeg-4 video



# Cayenne Campaign Video Imaging Data Sets

- Panasonic handheld recorded some takeoff and landings
  - ▶ Output: Mts video



# Cayenne Campaign Video Imaging Data Sets

- Allied Vision and Panasonic video – ready to go – no processing

Date (UTC)	Flight No:	Allied Vision Cockpit Instrument Camera File	FileSize (GB)
9-May-2015	FS150009	None	
10-May-2015	FS150010	None	
12-May-2015	FS150011	None	
14-May-2015	FS150012	fs15001220150514134708.avi	28.6
15-May-2015	FS150013	fs15001320150515084238.avi	24
16-May-2015	FS150014	fs15001420150516081630.avi	22.5
16-May-2015	FS150015	fs15001520150516154151.avi	21.7
18-May-2015	FS150016	fs15001620150518192015.avi	23.3
19-May-2015	FS150017	fs15001720150519135727.avi	28.5
23-May-2015	FS150018	fs15001820150523085931.avi	28.1
23-May-2015	FS150019	fs15001920150523151227.avi	31.8
24-May-2015	FS150020	fs15002020150524084217.avi	21.8
25-May-2015	FS150021	fs15002120150525192023.avi	18.4
26-May-2015	FS150022	fs15002220150526081710.avi	22.2
26-May-2015	FS150023	fs15002320150526130328.avi	20.6
27-May-2015	FS150024	fs15002420150527081329.avi	23.1
28-May-2015	FS150025	fs15002520150528191134.avi	19.7
29-May-2015	FS150026	fs15002620150529083451.avi	20.5

Date (UTC)	Start Time UTC	Panasonic Video File	FileSize (MB)
9-May-2015	15:52	2015-05-09 AF A320 takeoff.mts	36.4
9-May-2015	16:06	2015-05-09 F20 takeoff.mts	143
10-May-2015	17:45	2015-05-10 Clouds over CAY 1.mts	161
10-May-2015	17:46	2015-05-10 Clouds over CAY 2.mts	51.3
10-May-2015	17:48	2015-05-10 Clouds over CAY 3.mts	71
10-May-2015	17:53	2015-05-10 CV580 Landing.mts	54.7
10-May-2015	17:57	2015-05-10 CV580 Taxi	220
12-May-2015	18:52	2015-05-12 CV580 Pre-Taxi.mts	40
12-May-2015	19:12	2015-05-12 CV580 Taxi 1.mts	155
12-May-2015	19:16	2015-05-12 CV580 Taxi 2.mts	66.8
12-May-2015	19:19	2015-05-12 CV580 Takeoff.mts	114
18-May-2015	19:12	2015-05-18 HWL B757 pre-taxi 1.mts	26.1
18-May-2015	19:15	2015-05-18 HWL B757 pre-taxi 2.mts	14.3
18-May-2015	19:17	2015-05-18 bird.mts	17.1
18-May-2015	19:27	2015-05-18 F20 takeoff.mts	72
18-May-2015	19:34	2015-05-18 HWL B757 pre-taxi 3.mts	99.8
18-May-2015	19:38	2015-05-18 HWL B757 Taxi 1.mts	56.3
18-May-2015	19:40	2015-05-18 HWL B757 Taxi 2.mts	64.4
18-May-2015	19:43	2015-05-18 HWL B757 Takeoff.mts	51.1

Total 356 GB





# Cayenne Campaign Video Imaging Data Sets

- GoPro files require processing to stitch sequential segments together.
  - ▶ 146 original files, 447 GB
  - ▶ Some are stitched together
  - ▶ Files sent to NCAR for additional archiving

Date (UTC)	Flight No:	GoPro Windscreen Camera Files	FileSize (GB)
9-May-2015	FS150009		
10-May-2015	FS150010	2015-05-10_F20 Windscreen.mp4	0.74
12-May-2015	FS150011	2015-05-12_F20 Windscreen.mp4	22.3
14-May-2015	FS150012	No files. GoPro not onboard.	
15-May-2015	FS150013	2015-05-15_F20 Windscreen.mp4	17.5
16-May-2015	FS150014	2015-05-16a_F20 Windscreen.mp4	26.3
16-May-2015	FS150015		
18-May-2015	FS150016		
19-May-2015	FS150017		
23-May-2015	FS150018	2015-05-23a_F20 Windscreen.mp4	9.73
23-May-2015	FS150019	2015-05-23b_F20 Windscreen.mp4	20.3
24-May-2015	FS150020	2015-05-24_F20 Windscreen.mp4	26.6
25-May-2015	FS150021		
26-May-2015	FS150022		
26-May-2015	FS150023		
27-May-2015	FS150024	2015-05-27_F20 Windscreen.mp4	27.2
28-May-2015	FS150025		
29-May-2015	FS150026		

Total 151 GB





# Cayenne Campaign Video Imaging Data Sets

## Video Data Assessment:

- Improved from Darwin campaign
  - ▶ Better time stamp on instrument panel video
  - ▶ AVI format and 1 FPS on instrument panel is sufficient
  - ▶ GoPro used for windscreen – capture image and sound of impacts
    - Better light sensitivity than Allied Vision camera used during Darwin
- Negatives
  - ▶ No timestamp on GoPro, but using portable clock, able to identify time of video within a few seconds.
  - ▶ GoPro shut down during flight most flights
    - enclosed in plastic case – heat up and shutdown issues
    - Battery life limited



# Cayenne Campaign Video Imaging Data Sets

- GoPro “Easter Eggs” from SAFIRE Flight Crew



# Cayenne Campaign Video Imaging Data Sets

End of Presentation

