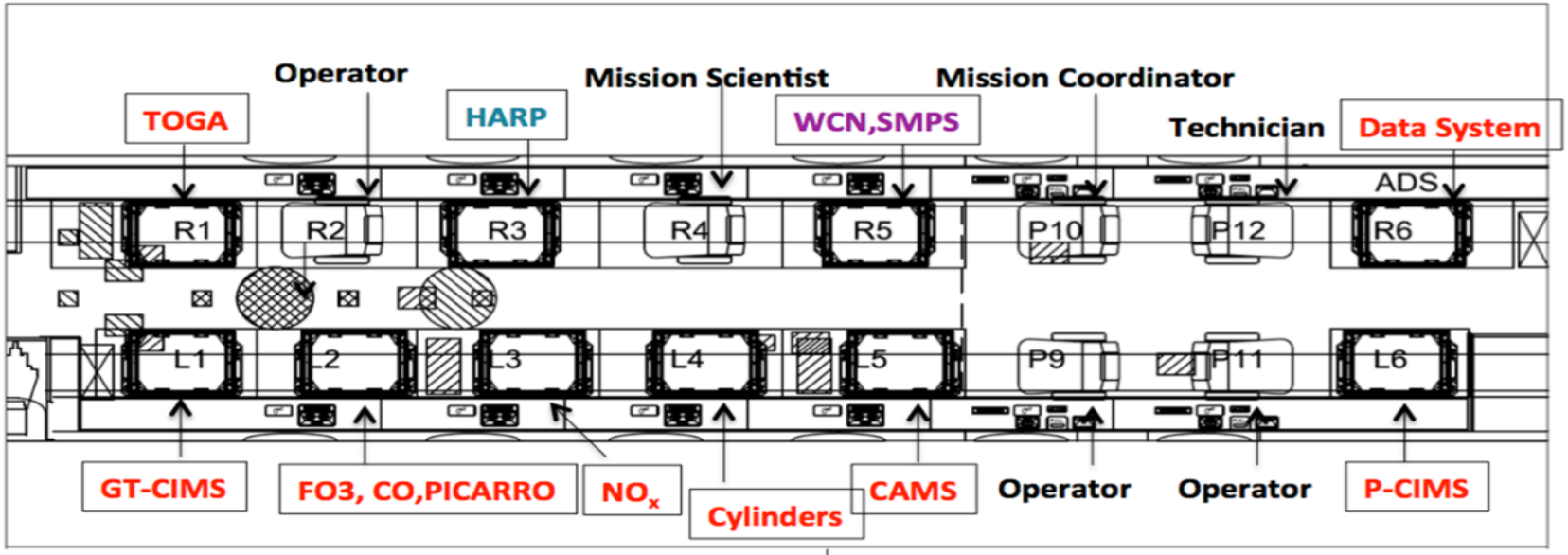
GV Facility

* Payload (Instruments, Crew, Layout)
* Flight Pattern Segments

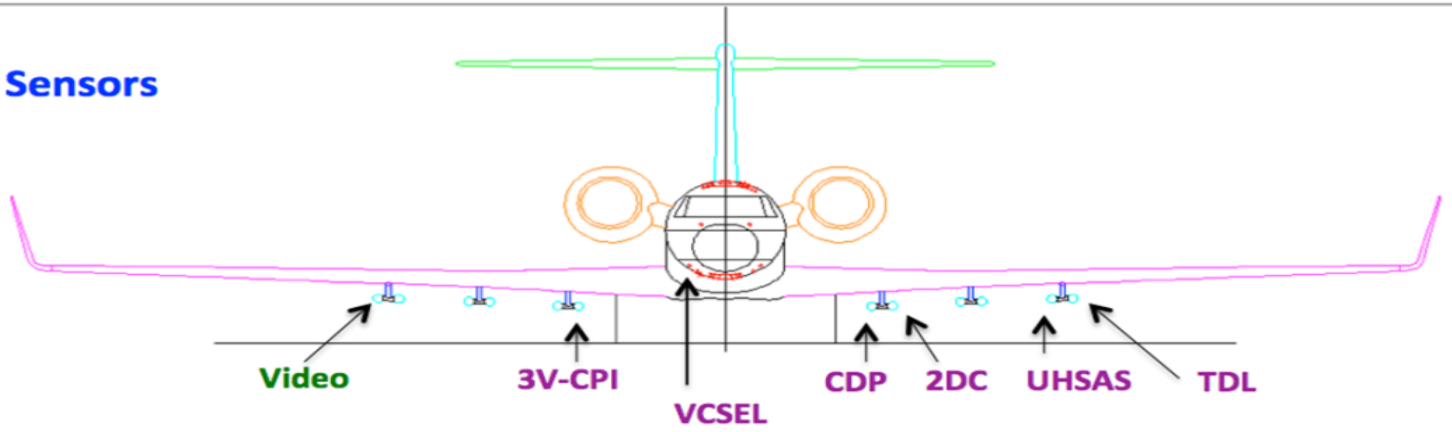
GV Payload

Instrument	PI	Species /Parameter	Method
O_3 CL	Weinheimer	O_3	CL
NO_x CL	Weinmeimer	NO, NO_2	CL
VUV CO	Campos	CO	VUV fluorescence
PICARRO	Flocke	CO_2, CH_4	CRDS
TOGA	Apel	VOCs, OVOCs, halocarbons	GC/MS
GTCIMS	Huey	HNO_3, HNO_4, SO_2, HCl	CIMS
P-CIMS	Heikes/O'Sullivan	H_2O_2, CH_3OOH	CIMS
CAMS	Fried	HCHO	IR laser spectroscopy
HARP	Hall	Actinic flux, spectral irradiance	Collection, dispersion spectroscopy
VCSEL	Zondlo	H_2O vapor	Laser spectroscopy
CLH	Avallone	H_2O total	TDL spectroscopy
SMPS	Smith/Rogers	Aerosol size distribution	Particle mobility
WCN	RAF	Aerosol number	Optical particle counting
UHSAS	RAF	Aerosol size dist 0.1-1 µm	Laser optical scattering
CDP	RAF	Cloud particle size dist 2-50 µm	Laser optical scattering
2D-C	RAF	Cloud particle imager 25-1600 µm	Diode array images
3V-CPI	RAF	Cloud particle imager 10-1280 µm	Orthogonal scattering plus diode array images
Various	RAF	Lat, long, P, T, DP, speeds, winds	various
DV	RAF	Video images – forward view	Digital camera
ADS	RAF	Data collection system	
Crew: Mission Scientist, Mission Coordinator, 3 Instrument PIs, ADS Technician, Pilot, Co-Pilot			

GV Cabin and Wingstores Layouts

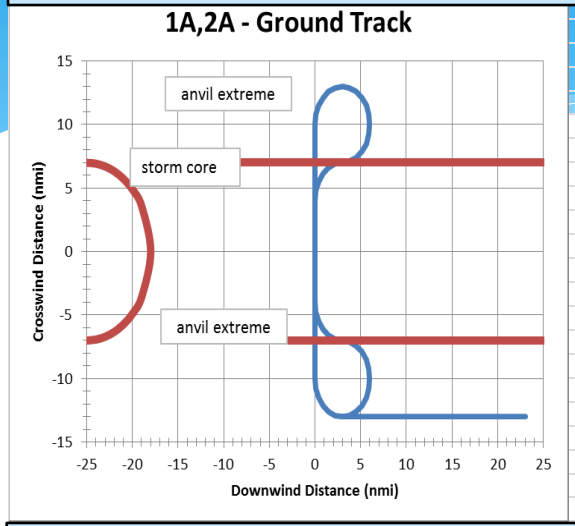


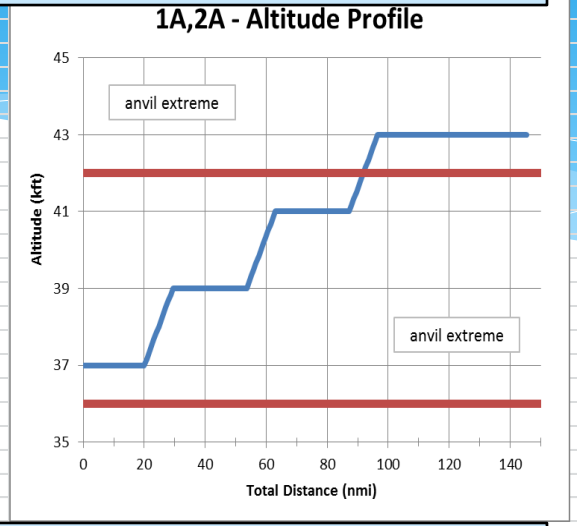
Wing Pod Sensors

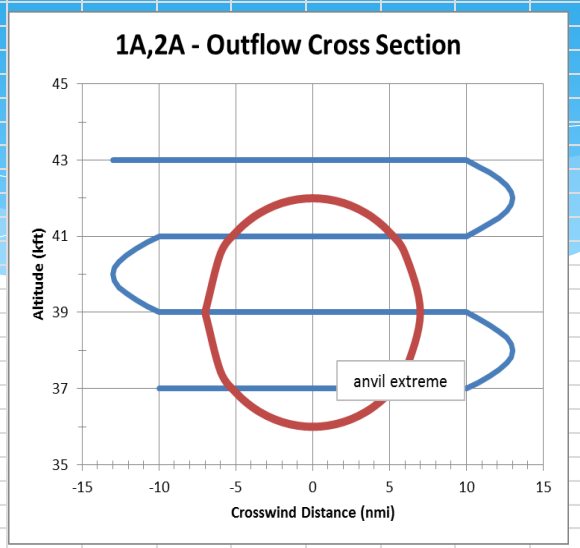


Flight Pattern Segments (1)

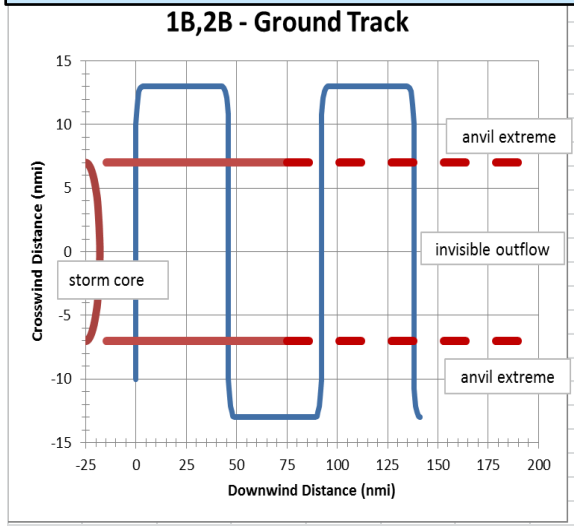
Cross Anvil, Cross Fresh Outflow, Cross Aged Outflow

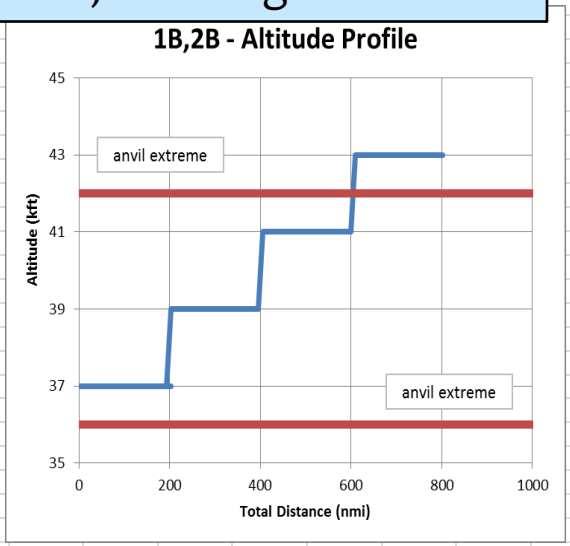


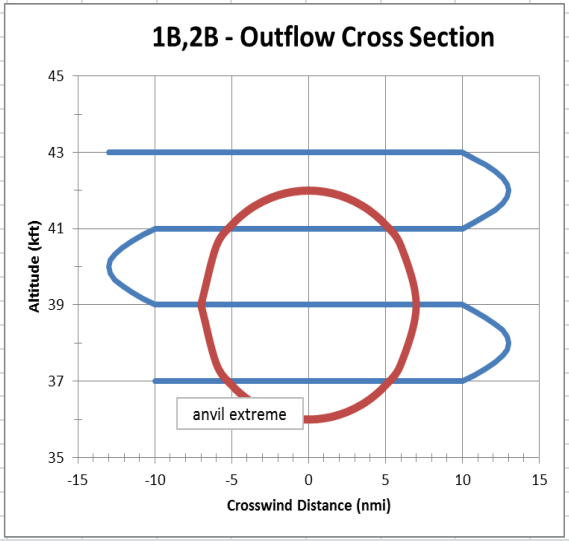




Cross Anvil, Cross Fresh Outflow, Cross Aged Outflow

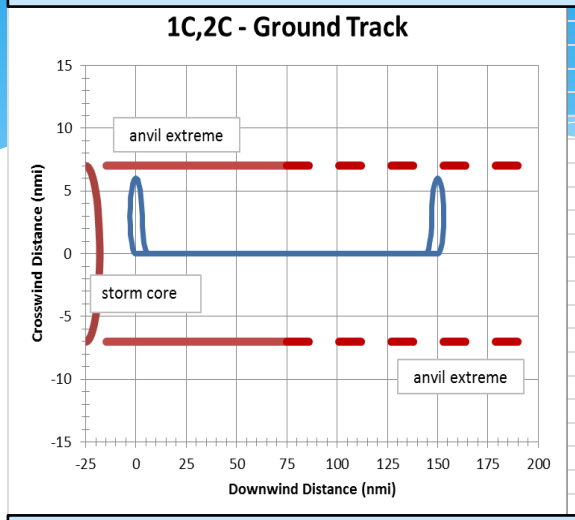


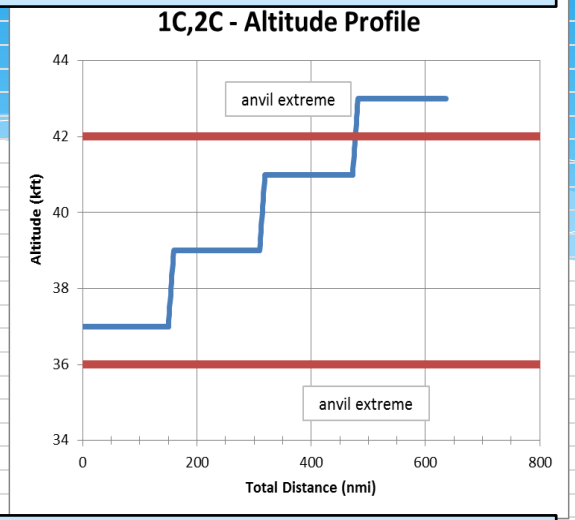


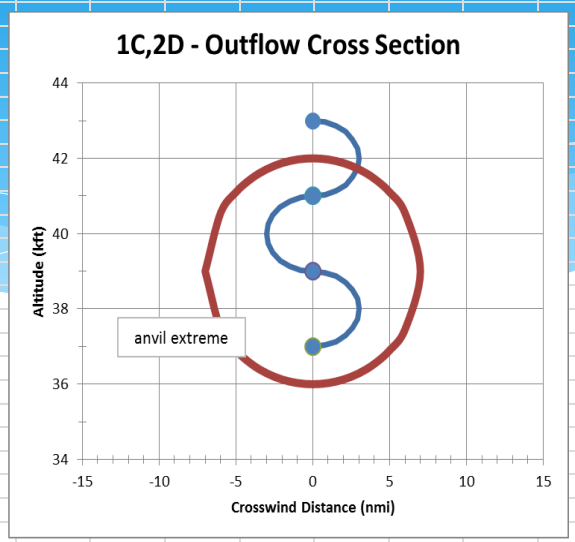


Flight Pattern Segments (2)

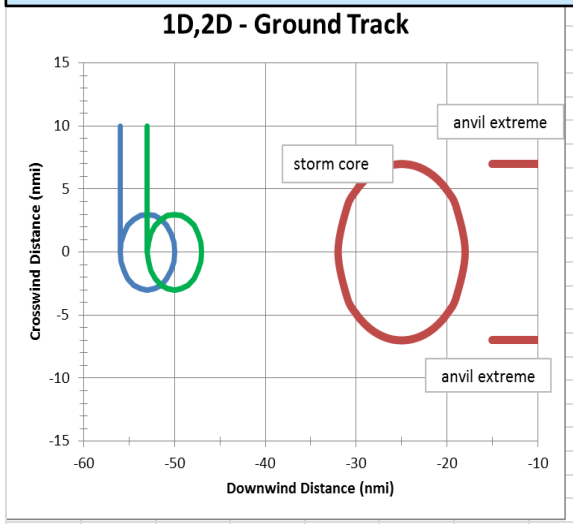
Axial Anvil, Axial Fresh Outflow, Axial Aged Outflow

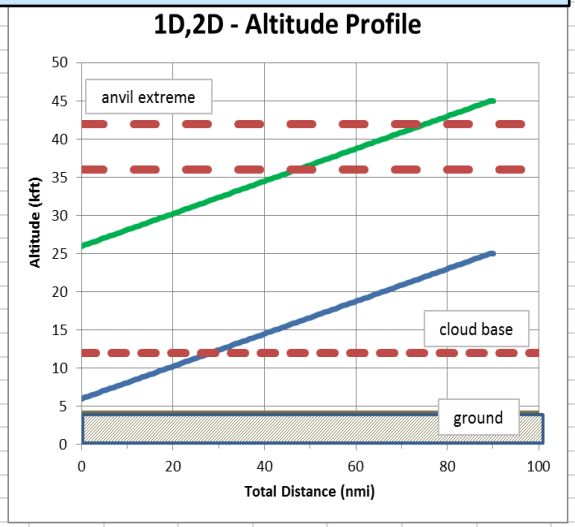


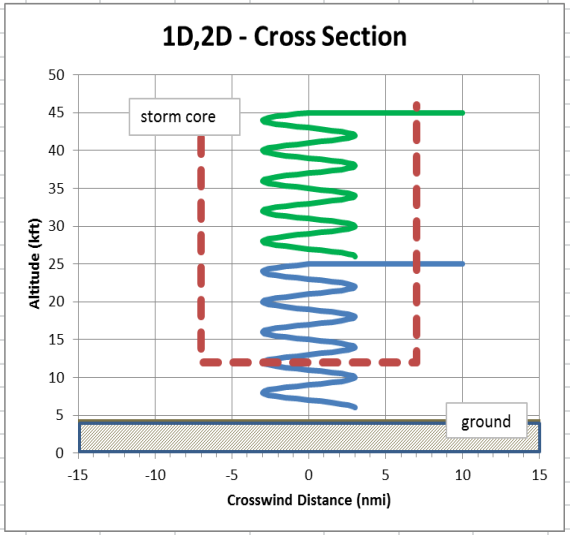




Profiles: Upwind, Anvil, Fresh Outflow, Aged Outflow

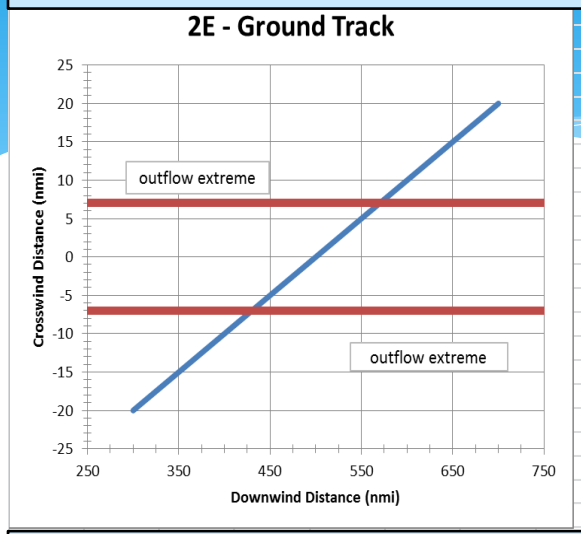


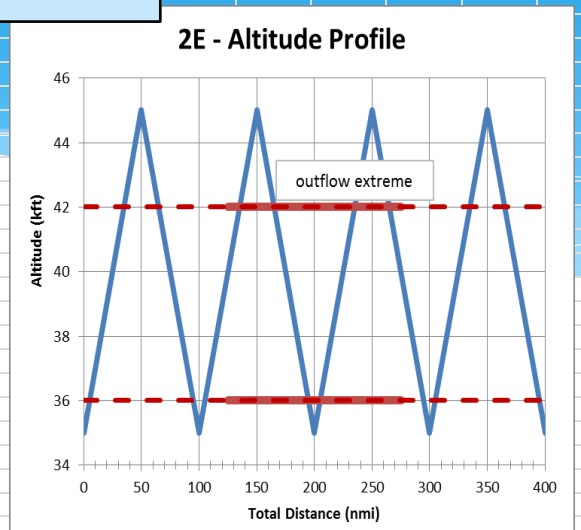


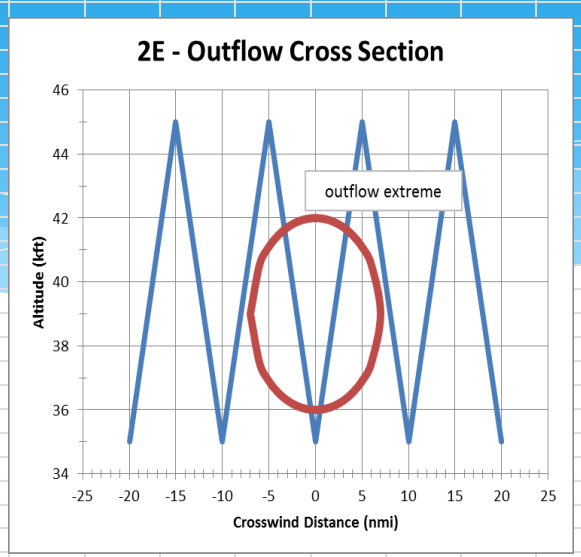


Flight Pattern Segments (3)

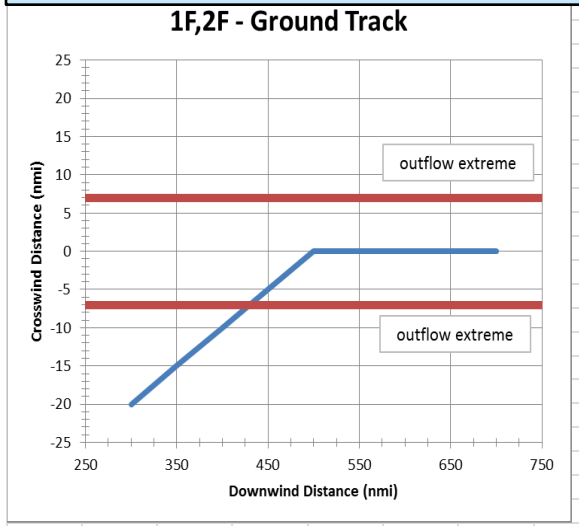
Porpoise to Locate Aged Outflow

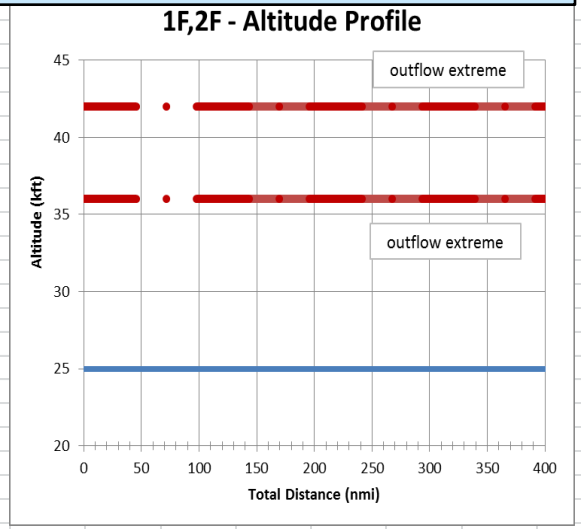


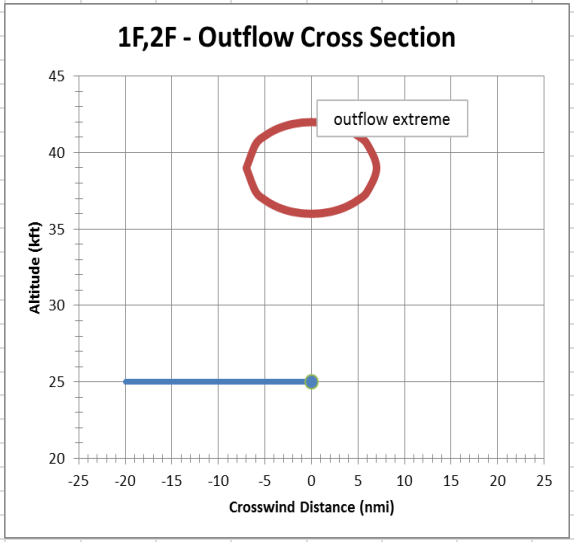




Remote Sensing of Fresh Outflow, Aged Outflow (DC-8)

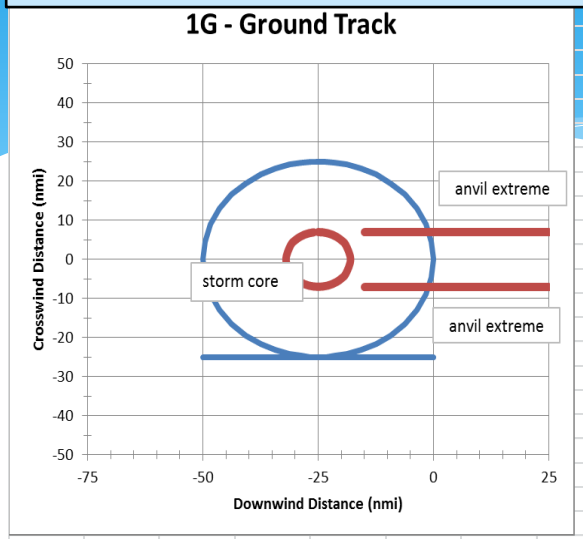


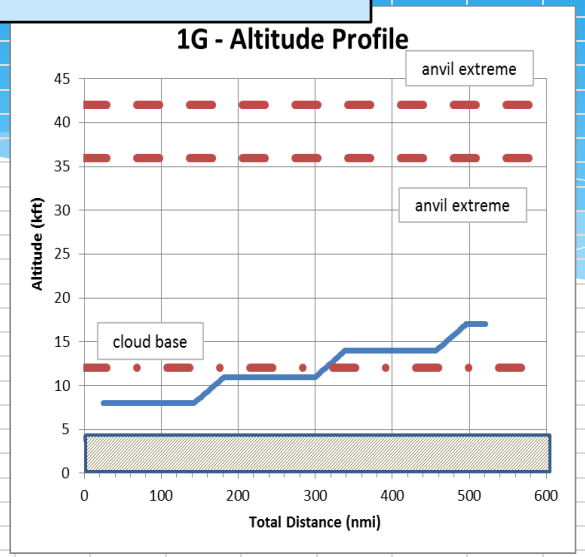


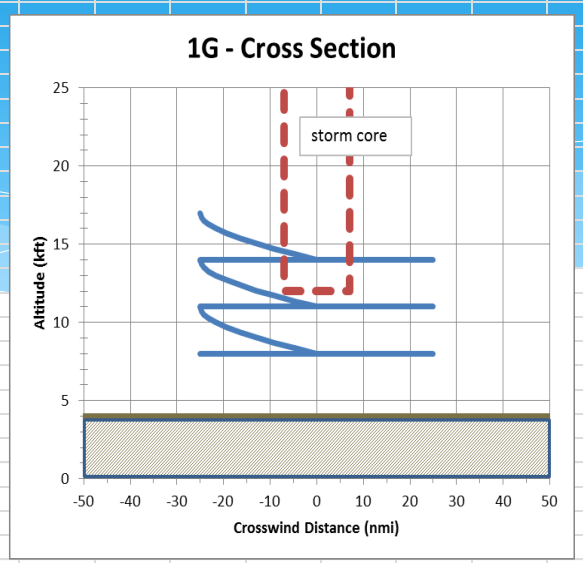


Flight Pattern Segments (4)

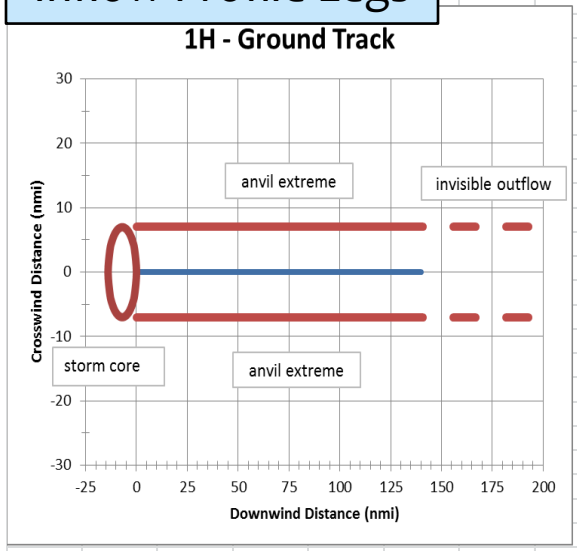
Storm Vicinity Bouldary Layer & Mid-Altitude

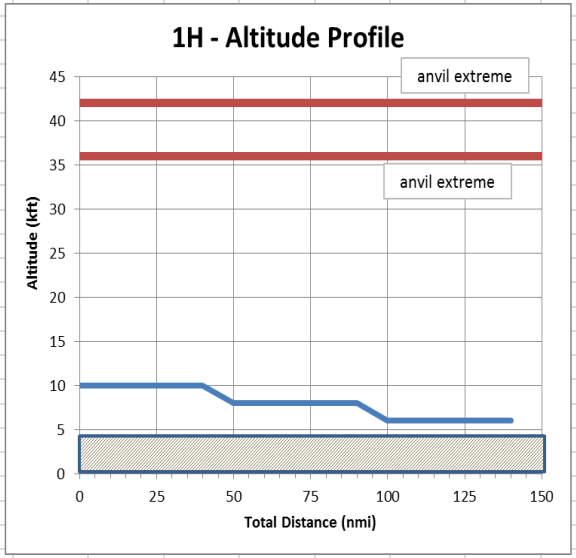


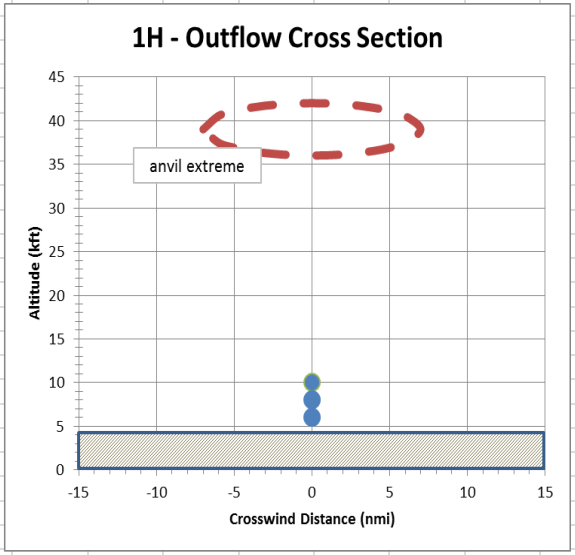




Inflow Profile Legs

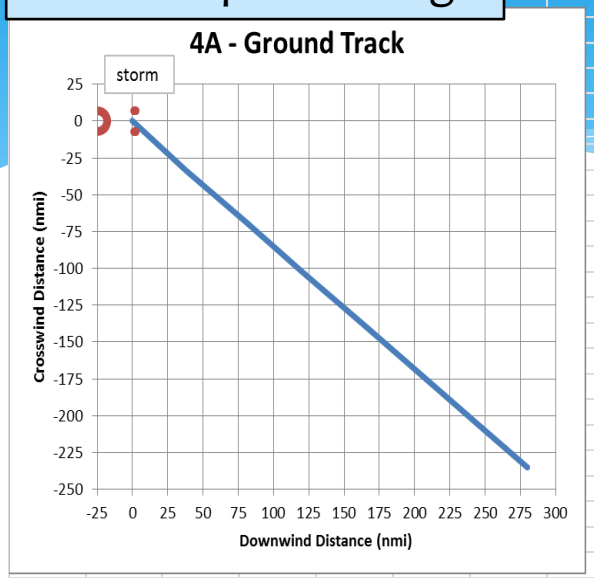


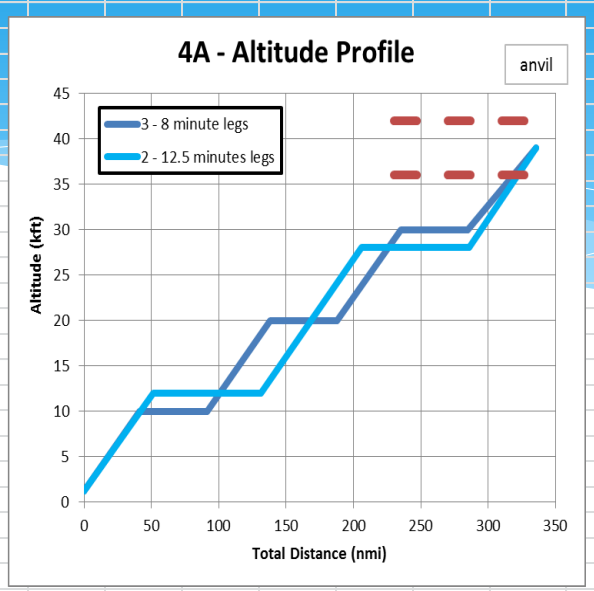




Flight Pattern Segments (5)

Intercomparison Legs





Intercomparison Species

DC3 potential intercomparisons
20 February 2012

= 3 platforms
=2 platforms

Intercomparable species	GV		DC-8		Falcon	
Ozone						
O3	FO3	O3	CSD CL DIAL HSRL	O3 O3 profiles	X	O3
Reactive Nitrogen						
NO2	CL NOx	NO2	CSD CL TD-LIF	NO2 NO2		
NO	CL NOx	NO	CSD CL	NO	X	NO
HNO3	GT-CIMS	HNO3	SAGA CIT-CIMS	HNO3 HNO3		
NOy			CSD CL	NOy	X	NOy
PAN			GT-CIMS	PANs	CIMS	PANs
			TD-LIF	ΣANs, ΣPNs		
	GT-CIMS	HNO4	CIT-CIMS	HNO4		
Carbon						
HCHO	CAMS	HCHO	DFGAS ISAF	HCHO HCHO		
CH3CHO	TOGA	CH3CHO	PTR-MS	CH3CHO		
CO	UV Fluorescence	CO	DACOM	CO	X	CO
CO2	PICARRO	CO2	AVOCET	CO2	PICARRO	CO2
CH4	PICARRO	CH4	DACOM	CH4	PICARRO	CH4
CH3CN	TOGA	CH3CN	PTR-MS	CH3CN		
			CIT-CIMS	organic acids (Table 2)		
			CIT-CIMS	selected OVOCs (Table 2)		
			CIT-CIMS	isoprene hydroxynitrates, hydroxyperoxides, dihydroxyepoxides		
VOCs, OVOCs, CFCs, etc (Table 2)	TOGA	VOCs, OVOCs, CFCs	WAS PTR-MS	Hydro and halo carbons Fast OVOC and NMHC	canisters	VOCs, halocarbons
HOx and Peroxides						
Peroxides	P-CIMS	Peroxides	CIT-CIMS	Peroxides		
			ATHOS	OH, HO2		
Radiation						
Spectral Irradiance	HARP	Irradiance	SSFR	Solar and near IR Irradiance		
Actinic Flux	HARP	Actinic Flux	CAFS	Actinic flux		
Broadband Irradiance	RAF-Irradiance	broadband UV, shortwave, IR	BBR	Broadband solar and IR		

Intercomparison Species

DC3 potential intercomparisons
20 February 2012

= 3 platforms
=2 platforms

Intercomparable species	GV		DC-8		Falcon	
Water						
H_2O vapor	VCSEL	water vapor	DLH	Water vapor		
	RAF-EDPC	water vapor				
Dew/Frost point	RAF-DPX	Dew/Frost Point temperature	X	Dew/Frost Point temperature		
	CU Total Water	total water				
Other						
SO2	GT-CIMS	SO2	GT-CIMS	SO2		
	GT-CIMS	HCl				
			CIT-CIMS	HCN		
			DACOM	N2O		
Cloud Droplet & Particle Size						
Particle Number, >10nm	CN	particle number, >10nm	CN	particle number, >10nm	3 x CPC	particle number, >5nm
Particle Number, >10nm, heated			CN	particle number, >10nm, heated	3 x CPC	particle number, >10 nm, non-volatile
			CN	particle number, >3nm		
Particle Size	SMPS	particle size distribution, 10-500nm	SMPS	particle size distribution, 10-300nm		
			SPEC	Aerosol parameters		
Particle Size	UHSAS	particle size distribution, 60-1000nm	UHSAS	particle size distribution, 60-1000nm	UHSAS-A	particle size distribution 70-1000nm
			UHSAS	particle size distribution, dry and humidified		
					PCASP-100X	particle size distribution 140-1000nm
			LAS	particle size distribution, 0.1-5 um		
			APS	particle size distribution, 0.5-5um		
			DASH-SP	f(RH)		
			APR-2	clouds & precipitation		
	3V-CPI	cloud particle imaging				
	2D-C	cloud particle imaging				
Cloud Particle Size	CDP	cloud droplet size distribution	FCDP	cloud droplet size distribution	FSSP-300	size distribution 0.4-20um
					2 x Grimm OPC 1.29	size distribution 0.25-2um (total/non-volatile)

Intercomparison Species

DC3 potential intercomparisons
20 February 2012

= 3 platforms
=2 platforms

Intercomparable species	GV		DC-8		Falcon	
Particle Composition and Optical Properties						
			PALMS	Single particle composition		
			AMS	Aerosol mass spectra		
			Anderson-Neph	Aerosol scattering (Total, submicron), f(RH) @450, 550, 700 nm		
			Anderson-PSAP	Aerosol absorption (Total, nonvolatile) @467, 530, 660 nm		
			Brock-Filter	Total absoption @467, 530, 660 nm		
			Brock-Photoacoustic	Total (@405, 532, 660 nm), RH @ 532 (dry, 85% RH), λ dependence, BC-clear coatings (@532), BC-brown coatings (@405 nm)		
			Brock-CRD	aerosol extinction (dry @405, 532, 660 nm; wet @75%, 95% RH, λ dependence, gas-phase @405, 532, 660 nm)		
			PI-Neph	polarized phase function		
			DIAL-HSRL	aerosol backsctter profiles		
			DIAL-HSRL	depolarization profiles		
			DIAL-HSRL	aerosol extinction profiles		
			CCN	CCN number		
			Dibb-filters	bulk inorganic ions (Table 3)		
			Dibb-filters (+Weber)	organic compounds (Table 3)		
			Dibb-mist chamber	fine sulfate		
					3-lambda-PSAP	absorption coefficient
			LARGE	Aerosol measurements - includes Martin Polar Neph		
Black Carbon			HD-SP2	Black carbon aerosol, dry & wet	SP2	black carbon
Meteorology						
Winds	RAF-WINDS	wind direction & speed	MMS	wind direction & speed	X	wind direction & speed
Temperature	RAF-ATX	temperature	MMS	temperature	X	temperature
Pressure	RAF-PSXC	corrected static pressure	MMS	corrected static pressure	X	corrected static pressure