BAC - Aerospatiale
Concorde
CHARTS & TABLES

FUEL SYSTEMS

Concorde, like most airliners, has multiple fuel tanks, which are detailed below. The only difference is that during flight fuel is transferred from tank to tank to maintain trim and balance of the aircraft as it does not have a full tailplane which would be used on a subsonic airliner to perform this task. Also for supersonic flight the Center of Gravity is critical and required to be moved for different speeds.

The fuel is also used as a heat sink for cooling purposes. Surplus heat from the air conditioning and hydraulic systems from the constant speed drive and generator and also from the engine lubricating oil is rejected through heat exchangers to the fuel.

FUNCTION	TANK #	CAPACITY (litres/gallons)	QUANTITY (kg/lbs)
Engine Supply	1	5,300/	4,198/
	3	5,770/	4,570/
	2	5,770/	4,570/
	4	5,300/	4,198/
Main Storage Tanks	5	9,090/	7,200/
	6	14,630/	11,587/
	7	9,350/	7,405/
	8	16,120/	12,838/
Auxiliary Tanks	5A	2,810/	2,225/
	7A	2,810/	2,225/
Transfer and Reserve Tanks	9	14,010/	11,096/
	10	15,080/	11,943/
	11	13,150/	10,415/
Totals		**119,280/**	**94,470 /**

Concorde Take-Off Data						
Airport	**Rwy**	**Length**(ft)	**V1**	**Vr**	**V2**	**pitch index**
Heathrow	27L	11,978	168	199	220	13
J F Kennedy	31L	14,573	167	201	222	13
Charles De Gaulle	27	12,008	166	201	222	13
Toronto	24L	9,498	156	190	211	13.5
* uncorrected values based on OAT=0c, Rwy=Dry, Pressure=Stnd, Wind=Still						

AIRSPEED AND ALTITUDE LIMITS

Maximum Operating Cruise Speed	Mach 2.04 (around 1350MPH)
Maximum Permissible Range	4500 Miles (3900 Naut' Miles)
Average Take-off speed	250MPH
Average Landing speed	185MPH
Maximum landing gear speed	270Kts (Mach 0.7)
Maximum operating altitude	60,000Ft
Normal type pressure	230 PSI
Maximum visor down speed	325Kts (Mach 0.8)
Maximum nose down (5 degrees) speed	325Kts (Mach 0.8)
Maximum nose down (12.5 degrees) speed	270 Kts (Mach 0.7) below 20,000ft
Maximum speed for landing light extension	270 Kts
Maximum fuel jettison speed	Mach 0.93
Maximum speed for windscreen wiper operation	325Kts (Mach 0.8)
Maximum positive incidence (angle of attack)	16.5 Degrees
Maximum negative incidence (angle of attack)	-5.5 Degrees (Above Mach 1.0)

TEMPERATURE AND PRESSURE LIMITS

Maximum Total Temperature (TMO)	127 Degrees Celsius (on nose)
Maximum Oil temp for start and takeoff	125 Degrees Celsius
Maximum Oil temp for takeoff and 5min transient	195 Degrees Celsius
Maximum Oil temp Continuous operation	190 Degrees Celsius
Minimum Oil temp for starting	-35 Degrees Celsius
Minimum Oil temp for advance above idle	-20 Degrees Celsius
Minimum Oil Pressure for continued operation	5 PSI
Minimum Oil Pressure for take off	10 PSI
Minimum Fuel temp for start up	-40 Degrees Celsius
Minimum Fuel temp for advance above idle	-40 Degrees Celsius
Maximum Fuel temp for continued operation	50 Degrees Celsius
Maximum Fuel pressure at Engine inlet	20 PSIA
Maximum Fuel pressure at Engine inlet	7 PSI

AUTOLAND MAX WINDS

HEAD	25 KTS
TAIL	10 KTS
CROSS	15 KTS

NORMAL CHECKLIST

PRELIMINARY COCKPIT CHECKLIST

TECHNICAL LOG	CHECK
GROUND POWER	ON
EQUIPMENT BAY COOLING PANEL	CHECK/SET
OXYGEN PANEL	CHECK/SET
DRAIN MAST HEATERS	CHECK/SET
INS 1, 2 & 3	SELECT ALIGN, TEST & PRESENT POSITION
AIR DATA COMPUTERS	ON
COCKPIT EMERGENCY EQUIPMENT Fire axe, asbestos gloves, portable oxygen masks and Pack, life jackets (5), Fire extinguisher, smoke Goggles (4) and escape ropes (2)	CHECK
DOCUMENTATION STOWAGES	CHECK

BEFORE START CHECKLIST

MASTER CB's	SET/CHECKED
OXYGEN	CHECKED 100%
DV WINDOWS	CLOSED
FLIGHT CONTROL INVERTERS	ON
ANTI-STALL SYSTEMS	ON
RADAR/INSTRUMENT SWITCHES	RAD
INSTRUMENT TRANSFER SWITCHES	SET
QNH/AA/ALTIMETERS	SET / CROSS CHECKED
NAV RADIOS	SET
TRANSPONDER	XPDR
BRAKES	PARK/CHECKED
NAV LIGHTS	AS REQUIRED
THROTTLE MASTERS	MAIN/ALT
GROUND HYDRAULICS CHECK OUT	YELLOW, YELLOW/OFF
FUEL HEATERS	AUTO
ENGINE RECIRCULATING VALVES	SHUT
SECONDARY AIR DOORS	AUTO
BATTERIES	ON / Normal
INS 1, 2 & 3	LOADING CHECKED
NAV MODE/MIX ASI BUGS, PITCH INDEX & 3/4 REHEAT PLACARD	SET
FUEL FLOW & P7 BUGS	SET
CLOCK AND TLA BUGS	SET
SEAT BELT SIGNAL	ON
BRIEFING Aide-Memoir: MEL/DDM/A.P. Status, AIS/ ATIS, Sig. Wx./ Anti-Icing, Take-off Alternate, R/W, Surface conditions / Length, Terrain, Performance / Reheats / Rolling T/O, SSA / MSA, Transition Altitude, SID / Noise Abatement, AFCS /	STATED
Radio Aids, Emergencies	REVIEW

LOADSHEET	CHECKED
ZFW & ZFCG	SET/CHECKED
FUEL REM. & A/C WEIGHT	SET/CHECKED
LOAD LIMITS	SET
START CLEARANCE	OBTAIN
DOOR LIGHTS	CHECKED
MASTER WARNING	RECALL
ANTI-COLLISION LIGHTS	ON
THROTTLES	IDLE
ENGINE FEED PUMPS	ON
FLIGHT DECK DOOR	LOCKED
CLEARANCE TO START	OBTAIN
AG ONLY BATTERIES	ON
GALLEY SWITCHES	OFF
1ST ENGINE	START
BATTERIES	NORMAL
START ENGINE	AS REQUIRED

PUSHBACK CHECKLIST

N^{O}s 3 & 2 ENGINES	STARTED
HYDRAULICS	CHECKED
GROUND EQUIPMENT	CLEAR
PUSHBACK	
N^{O}s 4 & 1 ENGINES	STARTED
PUSHBACK CHECKLIST	COMPLETE

AFTER START CHECKLIST

NOSEWHEEL STEERING	CHECKED
FLIGHT CONTROL, AFCS & TRIMS	CHECKED
STAB & FEEL	ENGAGED
ENGINE ANTI-ICE/ENGINE SCHEDULE	AS REQUIRED
BRAKE FANS	ON
IDLE SWITCHES	LOW
DOOR WARNINGS	TESTED/OFF
ENGINE FEED PUMPS	ALL ON
HYDRAULICS	CHECKED
ELECTRICS	CHECKED: GREEN BYPASS
GROUND EQUIPMENT	CLEAR
AFTER START CHECKLIST	COMPLETE

TAXI CHECKLIST

VISOR / NOSE	DOWN / 5 DEG
BRAKES	CHECKED / NORM
FLIGHT INSTRUMENTS	CHKD / NO FLAGS
FLIGHT CONTROLS / EFC	CHECKED / LIGHT OFF
TRIMS	SET
C.G. MOVEMENT	AS REQD
ENGINE RATING MODE	TAKE-OFF
AUTO IGNITION	ON
THROTTLES	CHECKED
DRAIN MAST HEATER	ON
ENGINE FLIGHT RATING	CLIMB
PRESS STATIC HEATERS	ON
ADS & STBY HEATERS	Tt INHIB / ON
AIR INTAKES	CHECKED / SET
ENGINE CONTROL SCHEDULE	CHECKED
ENG 4 T/O N1 LIMITER	88%
AIR CONDITIONING	CHECKED / SET
FUEL LP PROTECTION SWITCH	ARMED
FUEL CONSUMED INDICATORS	CHECKED
ENGINE FEED PUMPS	ALL ON
CROSSFEED VALVES	SHUT
ANTI-SKID ‘R’ LTS / TRYE LTS	OFF
REVERSE ASOV’s	CHECKED/18-24o/NORM
ENGINE O/HEAT	AS REQUIRED
SEATS & HARNESS	LOCKED, PWR OFF & SEC
TRIM TANKS CONTENTS	CHECKED
DE-AIR PUMPS	ON
TAKE-OFF CG SWITCH	AS REQUIRED
CG POSITION	CHECKED
MAIN TRANSFER PUMPS	AS REQUIRED
CABIN / SLIDES	SECURE / ARMED
TAXY CHECKLIST	COMPLETE

BEFORE TAKE-OFF CHECKLIST

BRIEFING, T/O DATA	UPDATED
CABIN CREW CALL	3 PRESSES
LANDING LIGHTS	AS REQUIRED
TRANSPONDER	SET
WHEEL LIGHTS	OFF
OVERLOAD MI	BLACK
MASTER WARNING	RECALL / INHIBIT
T/O MONITOR	ARMED
REHEAT	ON
NOZZLE OVERRIDE LIGHTS	OFF
PITCH INDEX	CHECKED
RADAR	AS REQUIRED
BRAKE FANS	OFF
BEFORE TAKE-OFF CHECKLIST	COMPLETE

AFTER TAKE-OFF CHECKLIST

LANDING GEAR	UP:LIGHTS OFF NEUTRAL
LANDING LIGHTS	OFF / RETRACT
MASTER WARNING	RECALL
ADS & STBY HEATERS	ON
ENGINE RATING MODE	FLIGHT
PRESSURISATION	CHECKED
SECONDARY AIR DOORS	OPEN:LIGHTS OFF
NOSE / VISOR	UP / LOCKED
AFTER TAKE-OFF CHECKLIST	COMPLETE

At M = 0.7 CLIMB CHECKLIST

ALTIMETERS	SET
FUEL TRANSFER	AFT
TAKE-OFF CG SWITCH	NORMAL
BRAKE FANS	OFF
ENGINE CONTROL SCHEDULE	NORMAL
SEAT BELT SIGNS	AS REQUIRED
TAXI TURN LTS	OFF
NOZZLE OVERRIDE LIGHTS	OFF
SECONDARY AIR DOOR SWITCHES	OPEN
SECONDARY NOZZLES	MODULATING
CLIMB CHECKLIST	COMPLETE

TRANSONIC CHECKLIST

AUXILARY INLETS	SHUT
SECONDARY NOZZLES	<15 DEG
REHEAT	ON
FUEL TRANSFER	TRANSFER AFT
At M = 1.0	
PRESS STATIC HEATERS	OFF
ENGINE ANTI-ICE	OFF
WING & INTAKE ANTI-ICING	OFF
TRANSPARENCY DE-ICE, DEMIST	OFF
At M = 1.1	
SECONDARY NOZZLES	0.5 DEG
NOZZLE OVERRIDE LIGHTS	OFF
At M = 1.3	
INTAKES	CHECKED
At M = 1.7	
REHEAT	OFF
AFCS	SET
When Fuel Transfer Is Complete	
FUEL TANK PRESSURE	CHECKED
DE-AIR PUMPS	OFF
TANK 9 + 10 LLC	SET 8,000 KG
TANKS 5A, 7A	TRANSFER
TANK 1 & 4 SWITCH	AFT TRIM (AS REQ)
At FL500	
ENGINE FLIGHT RATING	CRUISE
TRANSONIC CHECKLIST	COMPLETE

DECELERATION AND DESCENT CHECKLIST

WARNING AND LOG DISPLAY	**CHECKED**
BRIEFING Aide-Memoir: Decl. Point, ADD's/MEL, AIS/ATIS, Sig.Wx., Terrain/SSA/MSA, Transition Level, STAR, Approach / Go- Around/Radio Aids, R/W State / Stopping / Airfield, Fuel Capability / Alternate, AWO	**STATED**
SAFTEY ALTITUDE	**CHECKED**
ASI BUGS	**SET**
ALTIMETERS	**SET / CROSS CHECKED**
RADIO ALTIMETERS	**DH SET**
AT DECELERATION POINT	
ENGINE RECIRC VALVES	**OPEN**
THROTTLES	**18o**
TANKS 1 & 4	**NORM**
TANK 11 HYDRAULIC PUMPS	**OFF**
FUEL TRANSFER	**TRANSFER FWD**
ENGINE FLIGHT RATING	**CLIMB**
At M = 1.5	
THROTTLES	**32o**
At M = 1.3	
INTAKES	**CHECKED**
At M = 1.00	
THROTTLES	**AS REQD**
PRESSURISATION	**SET**
PRESS STATIC HEATERS	**ON**
TRANSPARENCY DE-ICE, DEMIST	**ON**
THROTTLE MASTER SWITCH	**OTHER SELECTION**
DECELERATION AND DESCENT CHECKLIST	**COMPLETE**

APPROACH CHECKLIST

CABIN CREW CALL	15 MINUTES
LANDING BRIEFING	UPDATE
TAXI TURN LTS	ON
RAD / INS SWITCH	RAD
SEAT BELT SIGN	ON
ENGINE RATING MODE	TAKE OFF
ENGINE RECIRC VALVES	SHUT
ENGINE CONTROL SCHEDULE	APPROACH
SECONDARY AIR DOOR SWS	AUTO
ENGINE FEED PUMPS	ALL ON
CROSS FEED VALVES	SHUT
SSB	AS REQUIRED
BATTERIES / d.c. split SWITCH	AS REQUIRED
FUEL / WEIGHT / CG	CHECKED
ASI BUGS	UPDATE
SEATS & HARNESS	LOCKED PWR OFF& SEC
VISOR / NOSE	DOWN / 5 DEG
ALTIMETERS / RAD ALT	QNH SET / UPDATE
APPROACH CHECKLIST	COMPLETE

LANDING CHECKLIST

LANDING GEAR	4 GREENS
NOSE	DOWN & GREEN
BRAKES	CHECKED / NORMAL
ANTI-SKID	CHECKED
AUX INLETS	OPEN / X-HATCH
YELLOW SYSTEM	CHECKED
LANDING CHECKLIST	COMPLETE

AFTER LANDING CHECKLIST

TYRE LIGHT	OBSERVE
BRAKE FANS	AS REQUIRED
MASTER WARNING	INHIBIT
NOSE	5 DEG
FLIGHT CONTROL INVERTERS	OFF LIV
RADAR	OFF
SSB	CLOSED
RAMP SPILL MASTER SWS	MAN
REVERSE ASOVs	CHKD/18-24o/NORM
INBOARD ENGINES	AS REQUIRED
AUTO IGNITION	OFF
PRESS STATIC HEATERS	OFF
ADS AND STBY HEATERS	OFF
DRAIN MAST HEATERS	AS REQUIRED
WING & INTAKE ANTI-ICING	OFF
W/SHIELD EMERG DE-ICE SWS	OFF / GAURDED
TRANSPONDER	XPDR
PRESSURISATION	CHECKED
SECONDARY AIR DOORS	AUTO, SHUT and LIGHTS OFF
BATTERY/DC SPLIT SWS	ON / normal
BRAKE TEMP LIGHTS	CHECKED
SLIDES	DOORS RO MANUAL
TANK 9 SHUT DOWN FUEL	4,000 KG
AFTER LANDING CHECKLIST	COMPLETE

PARKING CHECKLIST

BRAKES	PARK
LIGHTS & TRANSPARENCIES	OFF / RETRACT: OFF
NOSE / VISOR	AS REQUIRED
EMERGENCY GENERATOR SELECTOR	AUTO
BATTERIES	ON
GROUND POWER	ON
HP VALVES	SHUT
THROTTLE MASTERS	OFF
ANTI-COLLISION LIGHTS	OFF
FASTEN SEAT BELTS	OFF
ENGINE ANTI-ICING	OFF
IGNITION	OFF
GROUND CONDITIONONG	AVAILIBLE
FUEL PANEL	GROUND STATE
BATTERIES	BATT OFF
INS	POST FLT INFO
TRANSPONDER	STANDBY
CHOCKS	IN POSITION
BRAKE FANS	AS REQUIRED
RADIATION METER	NOTED
INS	RELOAD (TRANSIT)
FLIGHT DECK DOOR	UNLOCKED
FLIGHT DOCUMENTS	RETAINED
PARKING CHECKLIST	COMPLETE

STOPOVER CHECKLIST

AIR DATA COMPUTERS	OFF
INS	OFF
FLIGHT CONTROL INVERTERS	PWR OFF
OXYGEN	OFF
GROUND POWER	AS REQUIRED
MASTER C/B's	TRIP
EMERGENCY LIGHTS	OFF
STOPOVER CHECKLIST	COMPLETE

FLIGHT ENGINEER'S LEAVING PANEL CHECKLIST

CABIN TEMPERATURE	STABLE
CG	CHECKED
TRIM TRANSFER	CHECKED
FUEL TRANSFER	SAFE
ENGINE FEED PUMPS	ALL ON
CROSSFEED	SHUT
JETTISON SYSTEM	VALVES SHUT/ COVER CLOSED
EMERGENCY GENERATOR	NORM / GRD BYPASS
LEAVING PANEL CHECKLIST	COMPLETE

LANDING WEIGHT (1,000 KG)

KTS	VREF
96	150
98	152
100	154
102	155
104	157
106	158
106	160
110	161
111	162
115	165
120	168
125	172
130	175
135	179
140	182
145	185
150	188
155	191
160	194
165	197
170	201
175	204
180	207

NOTE: When calculating the RELAND reference speed use a landing weight equal to take-off weight minus 3,500kg.

CONFIGURATION	ABNORMAL INCREMENT	VT MAX
3 ENGINE	5	10
2 ENGINE	5	17
NO THROTTLE	7	17
TOTAL LOSS OF ELECTRICAL TRIM OR PITCH AUTOSTAB OR ELECTRIC FLIGHT CONTROL	10	17

CONSTANT ALT. DECELERATION AND DESCENT TO FL410 AND M1.00

ISA + 5 DEG C AND ABOVE

PROCEDURE

DECELERATE TO 350 KT IAS AT CONSTANT ALTITUDE, DESCEND AT 350 KT TO FL410, DECELERATE AT CONSTANT ALTITUDE TO M1.00

FLIGHT LEVEL	FUEL (KG)	TIME (MIN)	MEAN TAS (KT	DISTANCE COVERED NM										
				TAILWIND KT						HEADWIND KT				
				100	80	60	40	20	SA	20	40	60	80	100
600	950	7.8	853	123	121	118	116	114	111	108	106	102	100	97
590	940	7.7	854	121	118	116	114	112	109	107	104	101	98	96
580	930	7.6	846	119	116	114	112	110	107	105	102	99	96	94
570	900	7.4	848	116	114	111	110	108	105	103	100	97	95	92
560	900	7.4	838	114	112	109	108	106	103	101	99	96	93	91
550	910	7.3	837	113	110	108	107	105	102	100	98	95	93	90
540	910	7.2	843	111	109	107	105	103	101	98	96	94	92	90
530	900	7.0	842	108	106	104	102	100	98	96	93	91	89	87
520	890	6.8	840	105	103	101	99	97	95	93	91	80	87	85
510	880	6.6	838	101	99	98	96	94	92	90	88	86	84	82
500	870	6.3	840	98	96	94	92	90	88	86	85	83	81	79
490	830	5.9	836	91	89	87	86	94	82	80	79	77	75	73
480	780	5.6	816	94	82	81	79	78	76	74	73	71	69	68
470	740	5.2	810	78	76	75	73	72	70	69	67	66	64	63

TEMPERATURES BELOW ISA + 5 DEG

OBTAIN DISTANCE FROM TABLE AND CORRECT BY + 1 N.ML PER 1 DEG C BELOW ISA + 5 DEG C.

CONSTANT ALTITUDE DECELERATION AND DESCENT

ISA + 5 DEG C AND ABOVE

FLIGHT LEVEL	MEAN TAS(KT)	FUEL (KG)	TIME (MIN)	DISTANCE COVERED NM		
				50 KT HEAD	ZERO WIND	50 KT TAIL
600	618	2690	19	174	189	204
580	609	2630	19	172	186	201
560	603	2570	18	169	184	198
540	597	2550	18	166	180	194
520	590	2530	18	161	174	188
500	579	2510	17	155	167	181
480	564	2430	17	143	155	168
460	470	1850	13	91	101	110
450	467	1820	13	89	98	107
430	456	1770	12	83	92	101
410	445	1720	12	78	86	95
390	438	1670	11	73	81	89
370	430	1620	11	69	76	84
350	418	1580	10	65	71	79
330	410	1550	10	61	67	75
310	406	1520	9	57	63	69
290	400	1490	9	52	58	64
270	395	1460	8	48	54	59
250	382	1430	8	44	49	54
230	375	1400	7	40	45	50
210	367	1370	7	37	41	45
190	364	1340	6	33	37	41
170	354	1300	6	30	33	37
150	341	1270	5	27	29	32
130	326	1240	5	23	25	28
110	322	1210	4	20	22	24
100	316	1190	4	19	20	22
90	377	1120	2	11	12	14
70	372	900	1	8	9	10
50	367	600	1	5	6	7
30	362	200	1	2	2	3

IN FLIGHT PERFORMANCE CLIMB
SUPERSONIC CLIMB 4 ENGINES

TEMPERATURE ISA to ISA+10	DATA MASSE (Tonnes) /CT(Kg) D / T (nm) (min)	THRUST SETTINGS FLIGHT CLIMB REHEAT ON M=0.93 to M=1.7	CLIMB LAW ^{V}MO

Flight Level						
502	114/ 10900 205/15	110/ 10300 190/14	105/ 9700 176/13	101/ 9200 164/12	96/ 8700 152/12	92/ 8200 142/11
490	115/ 10300 179/14	110/ 9800 166/13	106/ 9200 155/12	101/ 8880 145/11	97/ 8300 135/11	92/ 7900 126/10
470	115/ 9500 146/12	111/ 9000- 137/11	106/ 8600 128/11	102/ 8200 120/10	97/ 7800 112/ 9	93/ 7400 105/ 9
450	116/ 8900 122/11	111/ 8500 114/10	107/ 8000 108/ 9	102/ 7700 101/ 9	98/ 7300 95/ 8	93/ 6900 89/ 8
432	117/ 8200 100/ 9	112/ 7900 94/ 9	107/ 7500 89/ 8	103/ 7200 83/ 8	98/ 6800 79 / 7	93/ 6500 74/ 7
410	117/ 7600 85/ 8	113/ 7200 80/ 8	108/ 6900 76/ 8	103/ 6600 71/ 7	99/ 6300 67/ 7	94/ 6000 63/ 6
390	118/ 7000 74/ 8	113/ 6700 70/ 7	109/ 6400 66/ 7	104/ 6100 62/ 6	99/ 5800 59/ 6	94/ 5600 55/ 6
370	119/ 6400 65/ 7	114/ 6100 61/ 7	109/ 5900 57/ 6	104/ 5600 54/ 6	100/ 5400 51/ 6	95/ 5100 48/ 5
350	119/ 5900 56/ 6	114/ 5600 53/ 6	110/ 5400 50/ 6	105/ 5200 47/ 5	100/ 4900 44/ 5	95/ 4700 41/ 5
330	120/ 5300 47/ 5	115/ 5100 45/ 5	110/ 4900 42/ 5	105/ 4700 39/ 5	100/ 4500 37/ 4	96/ 4300 34/ 4
310	120/ 4900 41/ 5	115/ 4700 38/ 5	110/ 4500 36/ 4	106/ 4300 34/ 4	101/ 4200 32/ 4	96/ 4000 30/ 4
290	120/ 4500 36/ 4	116/ 4300 34/ 4	111/ 4200 32/ 4	106/ 4000 30/ 4	101/ 3900 28/ 4	96/ 3800 27/ 3
280	121/ 4400 34/ 4	116/ 4200 32/ 4	111/ 4000 30/ 4	106/ 3900 28/ 4	101/ 3800 27/ 3	96/ 3600 25/ 3
270	121/ 4200 32/ 4	116/ 4100 30/ 4	111/ 3900 29/ 4	106/ 3800 27/ 3	101/ 3700 25/ 3	96/ 3500 24/ 3
260	121/ 4100 31/ 4	116/ 4000 29/ 4	111/ 3800 27/ 3	106/ 3700 26/ 3	101/ 3600 24/ 3	97/ 3400 23/ 3
250	121/ 4000 29/ 4	116/ 3800 28/ 4	111/ 3700 26/ 3	106/ 3600 25/ 3	101/ 3500 23/ 3	97/ 3400 22/ 3
240	121/ 3900 27/ 4	116/ 3700 26/ 3	111/ 3600 24/ 3	106/ 3500 23/ 3	102/ 3400 22/ 3	97/ 3300 20/ 3
230	121/ 3800 26/ 3	116/ 3600 24/ 3	111/ 3500 23/ 3	107/ 3400 22/ 3	102/ 3300 20/ 3	97/ 3200 19/ 3
TAKE-OFF	125	120	115	110	105	100

IN FLIGHT PERFORMANCE CLIMB
SUPERSONIC CLIMB 4 ENGINES

TEMPERATURE ISA to ISA+10	DATA MASSE (Tonnes) /CT(Kg) D / T (nm) (min)	THRUST SETTINGS FLIGHT CLIMB REHEAT ON M=0.93 to M=1.7	CLIMB LAW ^{V}MO

Flight Level						
502	149/35700 1047/65	149/30900 873/55	148/26500 709/46	147/22800 573/38	145/20000 474/32	142/17900 406/28
490	157/28300 715/48	155/24500 586/40	153/21500 487/34	151/19200 415/30	147/17500 362/26	144/16000 321/24
470	164/21200 420/32	161/19200 366/28	157/17600 324/25	154/16200 291/23	150/15100 264/21	146/14100 242/19
450	167/17700 420/32	163/16500 264/22	160/15400 241/21	156/14400 222/19	151/13600 206/18	147/12800 191/17
432	170/15300 204/19	166/14400 191/18	161/13600 179/17	157/12900 169/16	153/12200 159/15	148/11600 149/14
410	171/13900 175/17	167/13100 164/16	163/12400 154/15	158/11700 144/14	154/11100 136/13	149/10600 128/13
390	172/12700 154/16	168/12000 144/15	164/11400 135/14	159/10800 127/13	155/10200 119/12	150 9700 112/12
370	173/11700 135/14	169/11000 126/13	165/10400 118/13	160/ 9900 11/12	156/ 9400 104/11	151/ 8900 98/10
350	174/10500 117/13	170/10000 109/12	166/ 9400 102/11	161/ 8900 96/11	156/ 8500 90/10	152/ 8100 84/ 9
330	176/ 9300 98/11	171/ 8800 92/10	167/ 8400 86/10	162/ 7900 81 / 9	157/ 7600 76/ 9	153/ 7200 71/ 8
310	177/ 8300 83/10	172/ 7800 77/ 9	167/ 7500 73/ 9	163/ 7100 68/ 8	158/ 6800 64/ 8	153/ 6500 61/ 7
290	178/ 7400 71/ 9	173/ 7100 67/ 8	168/ 6800 63/ 8	163/ 6500 60/ 7	159/ 6200 56/ 7	154/ 5900 53/ 6
280	178/ 7100 67/ 8	173/ 6800 63/ 8	168/ 6500 59/ 7	164/ 6200 56/ 7	159/ 5900 53/ 6	154/ 5700 50/ 6
270	173/ 6800 63/ 8	173/ 6500 60/ 7	169/ 6200 56/ 7	164/ 6000 53/ 7	159/ 5700 50/ 6	154/ 5500 47/ 6
260	178/ 6300 58/ 7	174/ 6300 57/ 7	169/ 6000 53/ 7	164/ 5700 50/ 6	159/ 5500 48/ 6	155/ 5300 45/ 6
250	179/ 6300 58/ 7	174/ 6100 54/ 7	169/ 5800 51/ 6	164/ 5600 48/ 6	160/ 5300 46/ 6	155/ 5100 43/ 5
240	179/ 6100 53/ 7	174/ 5800 50/ 6	169/ 5600 48/ 6	165/ 5400 45/ 6	160/ 5200 42/ 5	155/ 5000 40/ 5
230	179/ 5900 50/ 6	174/ 5600 47/ 6	170/ 5400 44/ 6	165/ 5200 42/ 5	160/ 5000 40/ 5	155/ 4800 38/ 5
TAKE-OFF	185	180	175	170	165	160

IN FLIGHT PERFORMANCE CRUISE
ALL ENGINES – CRUISE CONTROL CHART
PREFERRED SUPERSONIC SPEED
FL520

Aircraft Weight Tonnes	Temperature Deg Celsius Relative to ISA								
	-30	-20	-15	-10	-5	0	5	10	15
165	99.28 2.00/1065 6117	101.62 2.00/1093 6300							
160	98.75 2.00/1065 5930	101.06 2.00/1093 6111	102.18 2.00/1107 6198						
155	98.26 2.00/1065 5765	100.57 2.00/1093 5941	101.69 2.00/1107 6027						
150	97.78 2.00/1065 5765	100.08 2.00/1093 5771	101.20 2.00/1107 5856	102.33 2.00/1120 5939					
145	97.36 2.00/1065 5453	99.64 2.00/1093 5620	100.75 2.00/1107 5702	101.87 2.00/1120 5783	102.94 2.00/1134 5862				
140	96.93 2.00/1065 5453	99.20 2.00/1093 5468	100.31 2.00/1107 5548	101.41 2.00/1120 5628	102.48 2.00/1134 5706	103.52 2.00/1147 5783			
135	96.51 2.00/1065 5168	98.78 2.00/1093 5327	99.87 2.00/1107 5404	100.95 2.00/1120 5482	102.02 2.00/1134 5558	103.06 2.00/1147 5634	104.04 2.00/1160 5708		
130	96.10 2.00/1065 5030	98.35 2.00/1093 5186	99.4 2.00/1107 5261	100.50 2.00/1120 5336	101.56 2.00/1134 5410	102.59 2.00/1147 5485	103.62 2.00/1160 5561	104.37 1.96/1147 5525	
125	95.73 2.00/1065 4912	97.97 2.00/1093 5065	99.06 2.00/1120 5212	100.13 2.00/1120 5212	101.19 2.00/1134 5286	102.22 2.00/1147 5362	103.23 2.00/1160 5439	103.96 1.96/1147 5395	
120	95.36 2.00/1065 4793	97.58 2.00/1093 4943	98.68 2.00/1107 5014	99.76 2.00/1120 5087	100.82 2.00/1134 5162	101.84 2.00/1147 5239	102.84 2.00/1160 5317	103.56 1.96/1147 5264	
115	95.08 2.00/1065 4700	97.29 2.00/1093 4852	98.38 2.00/1107 4927	99.47 2.00/1120 5001	100.54 2.00/1134 5076	101.58 2.00/1147 5153	102.60 2.00/1160 5231	103.27 1.96/1147 5167	104.02 1.91/1137 5118
110	94.80 2.00/1065 4607	96.99 2.00/1093 4762	98.08 2.00/1107 4839	99.18 2.00/1120 4915	100.26 2.00/1134 4989	101.32 2.00/1147 5066	102.35 2.00/1160 5145	102.98 1.96/1147 5070	103.74 1.91/1131 5027
105	94.56 2.00/1065 4538	96.77 2.00/1093 4690	97.85 2.00/1107 4766	98.92 2.00/1120 4841	100.01 2.00/1134 4917	101.09 2.00/1147 4995	102.14 2.00/1160 5075	102.75 1.96/1147 4992	103.45 1.91/1131 4935
100	94.33 2.00/1065 4470	96.55 2.00/1093 4617	97.61 2.00/1107 4693	98.67 2.00/1120 4767	99.76 2.00/1134 4844	100.86 2.00/1147 4924	101.94 2.00/1160 5004	102.53 1.96/1147 4915	103.17 1.91/1131 4844
95	94.10 2.00/1065 4409	96.37 2.00/1093 4560	97.45 2.00/1107 4636	98.52 2.00/1120 4710	99.60 2.00/1134 4785	100.69 2.00/1147 4863	101.76 2.00/1160 4941	102.33 1.96/1147 4849	102.89 1.91/1131 4753

N2 **(Percent)**
Mach No/TAS **(Knots)**
Fuel Flow per Engine **(Kilograms per Hour)**

IN FLIGHT PERFORMANCE CRUISE
ALL ENGINES – CRUISE CONTROL CHART
PREFERRED SUPERSONIC SPEED
FL540

Aircraft Weight Tonnes	Temperature Deg Celsius Relative to ISA								
	-30	-20	-15	-10	-5	0	5	10	15
165	100.93 2.00/1065 6174								
160	100.32 2.00/1065 5963								
155	99.73 2.00/1065 5767								
150	99.14 2.00/1065 5570	101.46 2.00/1093 5737							
145	98.58 2.00/1065 5394	100.89 2.00/1093 5556	102.00 2.00/1107 5631						
140	98.02 2.00/1065 5218	100.32 2.00/1093 5376	101.44 2.00/1107 5454						
135	97.54 2.00/1065 5065	99.83 2.00/1093 5219	100.94 2.00/1107 5295	102.06 2.00/1120 5371					
130	97.05 2.00/1065 4912	99.33 2.00/1093 5062	100.44 2.00/1107 5136	101.55 2.00/1120 5210	102.62 2.00/1134 5203	103.67 2.00/1147 5355			
125	96.59 2.00/1065 4771	98.86 2.00/1093 4918	99.96 2.00/1107 4990	101.04 2.00/1120 5061	102.11 2.00/1134 5132	103.15 2.00/1147 5202	104.14 2.00/1160 5268		
120	96.13 2.00/1065 4631	98.86 2.00/1093 4774	99.47 2.00/1107 4843	100.54 2.00/1120 4911	101.59 2.00/1134 4980	102.63 2.00/1147 5049	103.66 2.00/1160 5118		
115	95.71 2.00/1065 4508	97.95 2.00/1093 4650	99.05 2.00/1107 4717	100.12 2.00/1120 4784	101.15 2.00/1134 4852	102.21 2.00/1147 4922	103.22 2.00/1160 4992	103.95 1.96/1147 4954	
110	95.30 2.00/1065 4386	97.52 2.00/1093 4525	98.62 2.00/1107 4591	99.70 2.00/1120 4657	100.77 2.00/1134 4724	101.79 2.00/1147 4795	102.79 2.00/1160 4867	103.50 1.96/1147 4823	
105	94.98 2.00/1065 4292	97.20 2.00/1093 4432	98.29 2.00/1107 4502	99.38 2.00/1120 4569	100.46 2.00/1134 4638	101.50 2.00/1147 4709	102.53 2.00/1160 4781	103.19 1.96/1147 4726	103.90 1.91/1131 4678
100	94.67 2.00/1065 4197	96.87 2.00/1093 4339	97.96 2.00/1107 4412	99.06 2.00/1120 4482	100.15 2.00/1134 4552	101.22 2.00/1147 4623	102.26 2.00/1160 4696	102.87 1.96/1147 4629	103.61 1.91/1131 4591
95	94.41 2.00/1065 4132	96.64 2.00/1093 4272	97.73 2.00/1107 4343	98.81 2.00/1120 4412	99.90 2.00/1134 4480	100.97 2.00/1147 4552	102.03 2.00/1160 4625	102.62 1.96/1147 4551	103.31 1.91/1131 4504

N2 **(Percent)**
Mach No/TAS **(Knots)**
Fuel Flow per Engine **(Kilograms per Hour)**

IN FLIGHT PERFORMANCE CRUISE
ALL ENGINES – CRUISE CONTROL CHART
PREFERRED SUPERSONIC SPEED
FL560

Aircraft Weight Tonnes	Temperature Deg Celsius Relative to ISA								
	-30	-20	-15	-10	-5	0	5	10	15
165									
160									
155									
150	100.75 2.00/1065 5627								
145	100.09 2.00/1065 5423								
140	99.44 2.00/1065 5220								
135	98.80 2.00/1065 5835	101.12 2.00/1093 5184							
130	98.17 2.00/1065 4850	100.47 2.00/1093 4996	101.58 2.00/1107 5067						
125	97.62 2.00/1065 4691	99.90 2.00/1093 4833	101.02 2.00/1107 4903	102.13 2.00/1120 4970					
120	97.06 2.00/1065 4532	99.34 2.00/1093 4671	100.45 2.00/1107 4739	101.55 2.00/1120 4807	102.63 2.00/1134 4874				
115	96.55 2.00/1065 4389	98.81 2.00/1093 4525	99.91 2.00/1107 4590	101.00 2.00/1120 4656	102.06 2.00/1134 4721	103.10 2.00/1147 4785	104.10 2.00/1160 4843		
110	96.03 2.00/1065 4246	98.29 2.00/1093 4378	99.38 2.00/1107 4442	100.44 2.00/1120 4505	101.50 2.00/1134 4568	102.53 2.00/1147 4631	103.56 2.00/1160 4695		
105	95.57 2.00/1065 4123	97.81 2.00/1093 4254	98.90 2.00/1107 4317	99.98 2.00/1120 4380	101.04 2.00/1134 4442	102.07 2.00/1147 4506	103.09 2.00/1160 4570	103.80 1.96/1147 4531	
100	95.11 2.00/1065 4000	97.33 2.00/1093 4130	98.43 2.00/1107 4193	99.52 2.00/1120 4254	100.58 2.00/1134 4315	101.61 2.00/1147 4380	102.62 2.00/1160 4446	103.33 1.96/1147 4403	
95	94.77 2.00/1065 3912	96.98 2.00/1093 4039	98.07 2.00/1107 4103	99.16 2.00/1120 4166	100.25 2.00/1134 4230	101.31 2.00/1147 4296	102.34 2.00/1160 4363	103.00 1.96/1147 4309	103.60 1.91/1131 4234

N2 **(Percent)**
Mach No/TAS **(Knots)**
Fuel Flow per Engine **(Kilograms per Hour)**

IN FLIGHT PERFORMANCE CRUISE
ALL ENGINES – CRUISE CONTROL CHART
PREFERRED SUPERSONIC SPEED
FL580

Aircraft Weight Tonnes	Temperature Deg Celsius Relative to ISA								
	-30	-20	-15	-10	-5	0	5	10	15
165									
160									
155									
150									
145									
140									
135	100.39 2.00/1065 5079								
130	99.66 2.00/1065 4867								
125	98.95 2.00/1065 4677	101.26 2.00/1093 4813							
120	98.24 2.00/1065 4486	100.53 2.00/1093 4620	101.66 2.00/1107 4690						
115	97.61 2.00/1065 4323	99.90 2.00/1093 4454	101.02 2.00/1107 4520	102.11 2.00/1120 4576					
110	96.99 2.00/1065 4160	99.26 2.00/1093 4287	100.37 2.00/1107 4350	101.47 2.00/1120 4412	102.54 2.001134 4472				
105	96.41 2.00/1065 4015	98.67 2.00/1093 4139	99.78 2.00/1107 4200	100.86 2.00/1120 4260	101.92 2.00/1134	102.96 2.001147 4377			
100	95.83 2.00/1065 3870	98.09 2.00/1093 3991	99.18 2.00/1107 4050	100.25 2.00/1120 4108	101.30 2.00/1134 4167	102.33 2.00/1147 4225	103.36 2.00/1160 4284		
95	95.34 2.00/1065 1749	97.57 2.00/1093 3870	98.67 2.00/1107 3930	99.75 2.00/1120 3989	100.82 2.00/1134 4047	101.86 2.00/1147 4106	102.89 2.00/1160 4166	103.61 1.96/1147 4129	

N2 (Percent)
Mach No/TAS (Knots)
Fuel Flow per Engine (Kilograms per Hour)

IN FLIGHT PERFORMANCE CRUISE
ALL ENGINES – CRUISE CONTROL CHART
PREFERRED SUPERSONIC SPEED
FL600

Aircraft Weight Tonnes	Temperature Deg Celcius Relative to ISA								
	-30	-20	-15	-10	-5	0	5	10	15
165									
160									
155									
150									
145									
140									
135									
130									
125	100.59 2.00/1065 4728								
120	99.77 2.00/1065 4512								
115	98.98 2.00/1065 4317	101.30 2.00/1093 4441							
110	98.19 2.00/1065 4123	100.49 2.00/1093 4246	101.61 2.00/1107 4308						
105	97.51 2.00/1065 3958	99.78 2.00/1093 4078	100.90 2.00/1107 4137	101.98 2.00/1120 4188					
100	96.82 2.00/1065 3793	99.08 2.00/1093 3909	100.18 2.00/1107 3966	101.27 2.00/1120 4022	102.34 2.00/1134 4077				
95	96.17 2.00/1065 3648	98.42 2.00/1093 3761	99.52 2.00/1107 3816	100.60 2.00/1120 3816	101.66 2.00/1134 3926	102.69 2.00/1147 3979	103.70 2.00/1160 4027		

N2 **(Percent)**
Mach No/TAS **(Knots)**
Fuel Flow per Engine **(Kilograms per Hour)**

Phoenix Simulation Software

Graham Waterfield
Founder Member
Visual Models,
Project Planning and Co-ordination

Alex Bashkatov
Founder Member,
Gauge programming
Panel Utilities

Robert Kirkland
Founder Member
Researcher and Administration

Antony Waterfield
Virtual Cockpits
Utility Programming

Mike Hambly
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Flight Dynamics Programming

Lena Bashkatov
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