

Project 2.2.3 Turbine Engine Design Data

Simulation	1	2	3	4	5	6	7	8	9	10
Pick a setting for each of these and lock them in for all trials. Make realistic choices!										
Engine type	Turbofan									
Flight Conditions										
Mach	.972									
Airspeed (mph)	660									
Altitude (ft)	30000									
Pressure (lbs/in ²)	4.373									
Temperature (°F)	-47.899									
Throttle (%)	99.93									
Afterburner (on/off)	off									
Design Variable	Change only one variable in each simulation.									
Inlet: pressure recovery	1	.99	1	1	1	1	1	1	1	1
Fan: pressure ratio	2	2	2	2	2	2	2	2	2	2
Fan: efficiency	1	1	1	1	1	1	1	1	1	1
Fan: bypass ratio	1	1	1	1	1	1	1	1	1	1
Compressor: stages	6	6	6	6	6	6	6	6	6	6
Compressor: CPR	8	8	8	8	8	8	8	8	8	8
Compressor: efficiency	1	1	1	1	1	1	1	1	1	1
Burner: fuel type	Jet-A									
Burner: max temperature (R)	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Burner: pressure ratio	1	1	1	1	1	1	1	1	1	1
Burner: efficiency	1	1	1	1	1	1	1	1	1	1
Turbine: stages	2	2	2	2	2	2	2	2	2	2
Turbine: efficiency	1	1	1	1	1	1	1	1	1	1
Nozzle: max temperature (R)	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Nozzle: efficiency	1	1	1	1	1	1	1	1	1	1
Nozzle: A8/A2	.281	.281	.281	.281	.281	.281	.281	.281	.281	.281
Engine size (ft ²)	4	4	4	4	4	4	4	4	4	4
Material	Change only one variable in each simulation.									
Inlet	Aluminum									
Compressor	Titanium	Titanium	Ceramic	Titanium	Titanium	Titanium	Aluminum	Titanium	Stainless Steel	Titanium
Burner	Nickel Alloy	Nickel Alloy	Nickel Alloy	Nickel Alloy	Nickel Crystal	Nickel Alloy	Nickel Alloy	Nickel Alloy	Nickel Alloy	Nickel Alloy
Turbine	Nickel Alloy	Nickel Alloy	Nickel Alloy	Nickel Alloy	Nickel Alloy	Ceramic	Nickel Alloy	Nickel Alloy	Nickel Alloy	Nickel Alloy
Nozzle	Nickel Alloy	Nickel Alloy	Nickel Alloy	Stainless Steel	Nickel Alloy	Nickel Alloy	Nickel Alloy	Titanium	Nickel Alloy	Passively Cooled
Data										
Average Weight	630.7	630.7	592.114	622.996	630.715	525.537	594.062	586.331	685.714	607.742
Thrust to Weight ratio	6.03	5.949	6.424	6.105	6.03	7.237	6.403	6.487	5.547	6.258
Temperatures (R), if overheated							1076			

Section 1	7.9 & 489	7.9 & 489	8 & 489	8 & 489	8 & 489	8 & 489	8 & 489	8 & 489	8 & 489	8 & 489
Section 2	15.8 & 597	15.8 & 597	16 & 597	16 & 597	16 & 597	16 & 597	16 & 597	16 & 597	16 & 597	16 & 597
Section 3	127 & 1076	127 & 1076	128.3 & & 1076	128.3 & & 1076	128.3 & & 1076	128.3 & & 1076	128.3 & & 1076	128.3 & & 1076	128.3 & & 1076	128.3 & & 1076
Section 4	127 & 2498	127 & 2498	128.3 & & 2093	128.3 & & 2500	128.3 & & 2500	128.3 & & 2500	128.3 & & 2500	128.3 & & 2500	128.3 & & 2500	128.3 & & 2500
Section 5	60.7 & 2093	60.7 & 2093	61.3 & 2093	61.4 & 2094	61.4 & 2094	61.4 & 2094	61.4 & 2094	61.4 & 2094	61.4 & 2094	61.4 & 2094
Section 6	41.7 & 1908	41.7 & 1908	42.1 & 1908	42.1 & 1910	42.1 & 1910	42.1 & 1910	42.1 & 1910	42.1 &	42.1 & 1910	42.1 & 1910
Section 7								42.1 &		
Section 8								42.1 & 1910		
TSFC	.78	.78	.78	.78	.78	.78	.78	.78	.78	.78

*For sections 1-8:
First number= Pres-psi
Second Number= Temp-R