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QUIET CLEAN GENERAL AVIATION TURBOFAN (QCGAT) TECHNOLOGY STUDY

FINAL REPORT

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For

National Aeronautics & Space Administration
Lewis Research Center
21000 Brookpark Road, Cleveland, OH 44135

GENERAL ELECTRIC

AIRCRAFT ENGINE GROUP

LYNN, MASSACHUSETTS

PREFACE

This investigation was conducted by the General Electric Company under Contract NAS3-19429, administered by the National Aeronautics and Space Agency, Lewis Research Center. Mr. G.K. Sievers was the NASA QCGAT Project Manager and provided technical direction for the program.

ABSTRACT

The preliminary design of an engine which satisfies the requirements of a quiet, clean, general aviation turbofan (QCGAT) engine is described in this report. Also an experimental program to demonstrate performance is suggested. During the experimental program, an engine based on T700-GE-700 engine core, will be designed, built, and tested at General Electric facilities. The engine would then be shipped to the Lewis Research Center of the NASA for their evaluation.

The T700 QCGAT engine preliminary design indicates that it will radiate noise at the same level as an aircraft without engine noise, have exhaust emissions within the EPA 1981 Standards, have lower fuel consumption than is now available in comparable size engines, and have sufficient life for five years between overhauls.

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INTRODUCTION

This report summarizes the work done under NASA contract NAS 3 - 19429, Quiet Clean General Aviation Turbofan (QCGAT). The work was performed according to the schedule shown in Figure 1. Task I examined selection of current turbofan technology for application to general aviation small turbofans using the T700-GE-700 turboshaft engine as a core. Task II included the preliminary design of a flight engine suitable for general aviation aircraft. Task III was the preparation of an experimental program to demonstrate operation of the turbofan engine in General Electric engine test facilities.

Individual oral presentations, summarizing results were made to NASA at the Lewis Research Center at the completion of each of the three tasks. This report documents results of the entire program.

The engine described offers small general aviation aircraft a quiet, low emission, long life, high flight-speed power plant with much lower fuel consumption than is presently available. It utilizes the latest small military helicopter core engine technology with a fan and reduction gear based on the NASA experimental Quiet Clean Short-Haul Experimental Engine (QCSEE) engine. By the time this small Quiet Clean General Aviation Turbofan (QCGAT) engine goes into service, in 1982, there will be a military base of 1800 T700-GE-700 engines produced and in service, with a total anticipated production in excess of 4700 units.

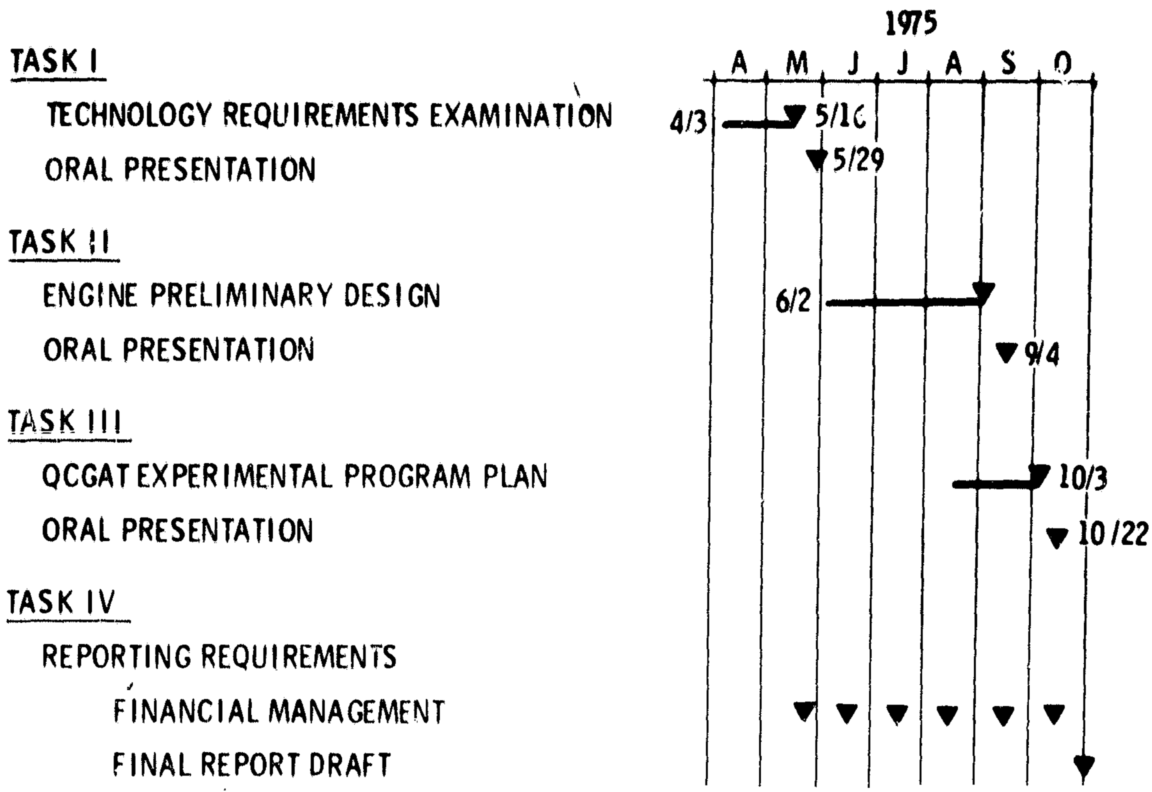


Figure 1. QCGAT Program Schedule.

SUMMARY

To satisfy the requirements of representative turbine-powered general aviation aircraft, General Electric selected a high by-pass ratio (10 to 1) turbofan engine using the T700-GE-700 turboshaft engine as a core. The T700-GE-700 engine is an advanced technology turboshaft engine designed for advanced helicopter applications. It is rated at 1145 kw (1536 shp) and, by its selection in advanced systems such as the Utility Tactical Transport Aircraft System (UTTAS) and the Advanced Attack Helicopter (AAH), is regarded as the current standard for advanced helicopter propulsion systems.

The T700-GE-700 engine employs turbine temperatures and other technology comparable to that of current large high by-pass engines. It has other characteristics, such as relatively high-pressure ratio, simplicity, compactness, and maintainability which make it attractive for use in a small turbofan engine. Furthermore, the T700-GE-700 engine cycle and combustor are compatible with low emissions. The size of the fan engine that results from this selection is in the 11.12 kN (2500-pound) thrust class, the lower portion of the thrust range of current business jet engines.

The by-pass 10-cycle was selected to favor low energy consumption and noise. The fan was sized and the engine rated such that a reasonable level of climb and cruise thrust can be achieved, making the engine suitable for a variety of aircraft types. Compared to current business jet turbofans, the engine is higher in by-pass ratio and lower in fan pressure ratio. The large improvement in specific fuel consumption over current engines will allow a substantial improvement in aircraft capability for a given size aircraft.

The selected fan is a scaled version of the QCSEE fixed pitch design, which will make data obtained in the QCSEE program useful for the QCGAT program. It is planned to scale the aerodynamic design directly and to change the mechanical design, including the gearing, only as appropriate to the small size of the T700-GE-700 engine turbofan. The T700-GE-700 engine low-pressure turbine can be used with only small modifications to the airfoils. The fan supercharges the T700-GE-700 engine core, but the QCGAT engine observes the design limitations of the T700-GE-700 engine and requires no structural changes. Figure 2 shows the T700 QCGAT engine. It has a new compact, low frontal area accessory gearbox, but only minor changes are required to accessories and fuel control to adapt them to turbofan operation. Composite materials are selected for several fan components, and a two-position fan discharge nozzle is included to minimize fuel consumption during cruise.

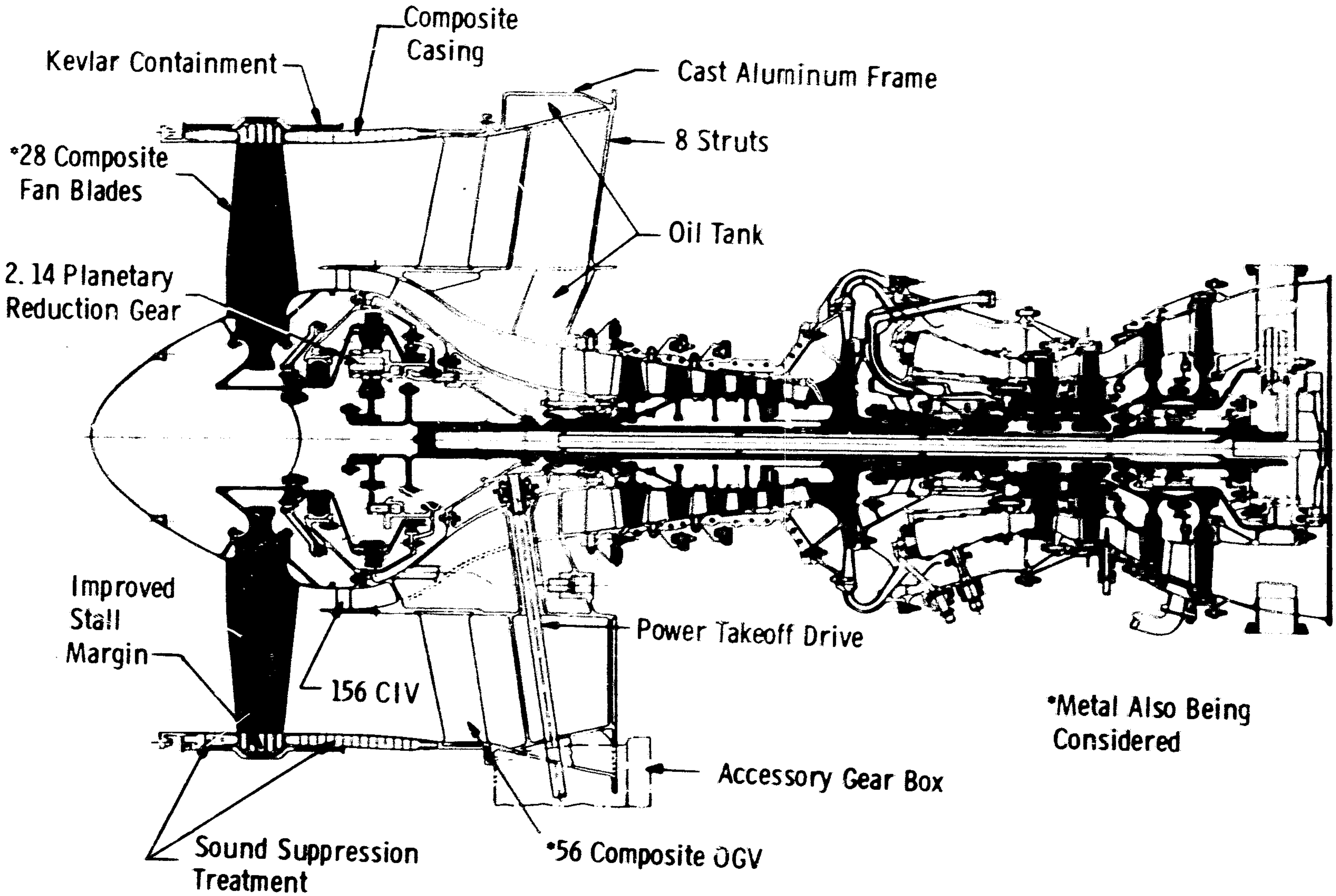


Figure 2. T700 Quiet Clean General Aviation Turbofan Engine.

The engine cycle and fan mechanical design have been selected to favor low noise levels, and noise suppression treatment is included in the fan casing. In addition, a typical nacelle configuration is presented which also includes noise suppression treatment. The total effect is to emit engine noise at levels which are very close to those of the representative aircraft alone (without the engine). This low noise level, which is about 20 dB below the current FAR 36-1969 noise rules, can be achieved by an engine design which has:

1. A fan with at least twice as many outlet guide vanes (OGV) as rotor blades.

2. A fan with at least two-chord spacing between rotor blades and OGV.

3. Low fan pressure ratio and tip speed.

4. High by-pass ratio and low core exhaust velocities.

5. Acoustic treatment.

Also low engine thrust required on approach is beneficial.

Figures 3 through 5 show current aircraft-radiated noise on takeoff, sideline, and approach. Shown also are figures of merit such as the FAR 36 noise rules and the estimated aircraft noise only. The radiated noise target for the T700 QCGAT engine is to equal or better the aircraft noise only. The figures indicate that the engine, when acoustically treated, will practically achieve that goal.

The combustion system employed in the QCGAT engine is a compact, annular configuration using air-atomizing fuel injectors in counterrotating swirlcup assemblies. A similar combustion system is employed in the TF34-GE-100 engine. Combustion system emissions levels predicted for the QCGAT engine cycle are based on engine emissions measurements from the GE12 engine (T700-GE-700 demonstrator), and the TF34-GE-100 engine, with refinements to compensate for the QCGAT engine cycle based on correlation equations similar to those developed for the NASA Clean Combustor Program.

Based on these analyses, the QCGAT engine will meet the 1981 EPA standards for Class T1 engines on NO_x and unburned hydrocarbons. Reduction of emissions of carbon monoxide from the T700-GE-700 engine combustion system, however, will be required at Idle conditions. Significant reductions in CO emissions by sector burning at Idle power have been estimated from data obtained using the techniques developed on the CF6 and F101 emissions reduction programs. A 47% reduction in CO emissions, and an 87% reduction in C_xH_y emissions are predicted, by using sector burning. The QCGAT engine will, therefore, have exhaust emissions well below the 1981 EPA standards.

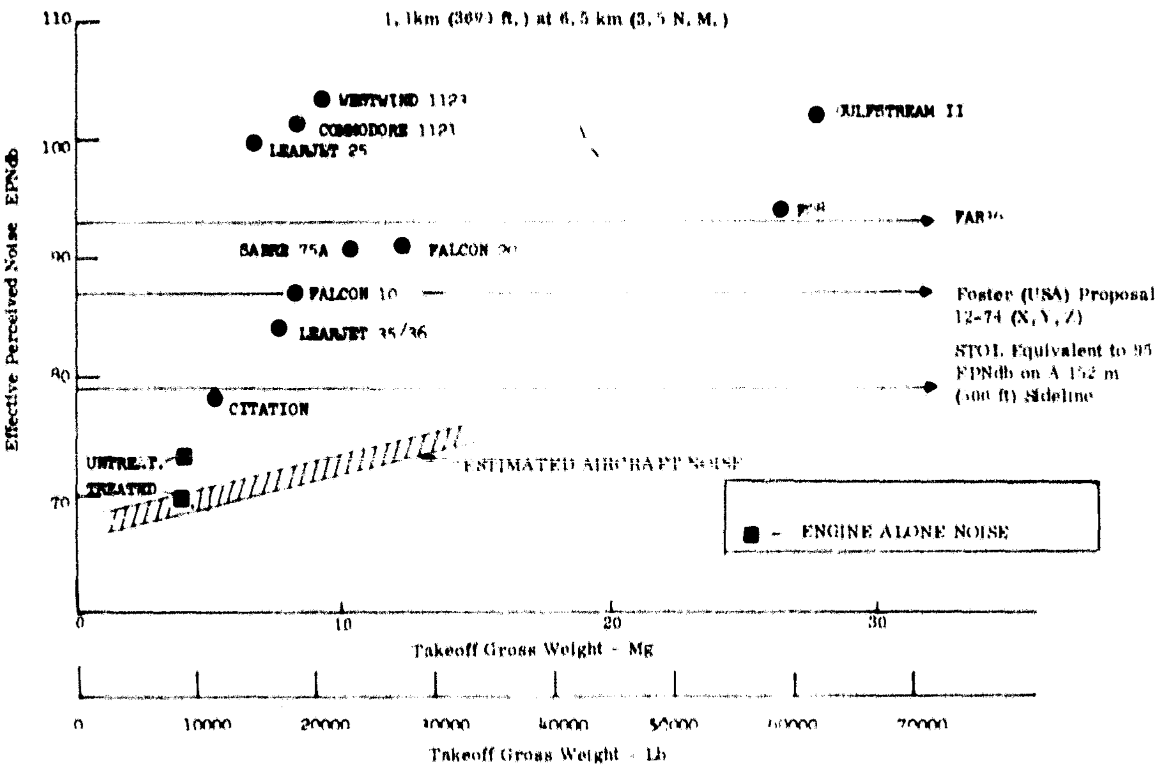


Figure 3. QCGAT Flight Noise Comparisons at Takeoff.

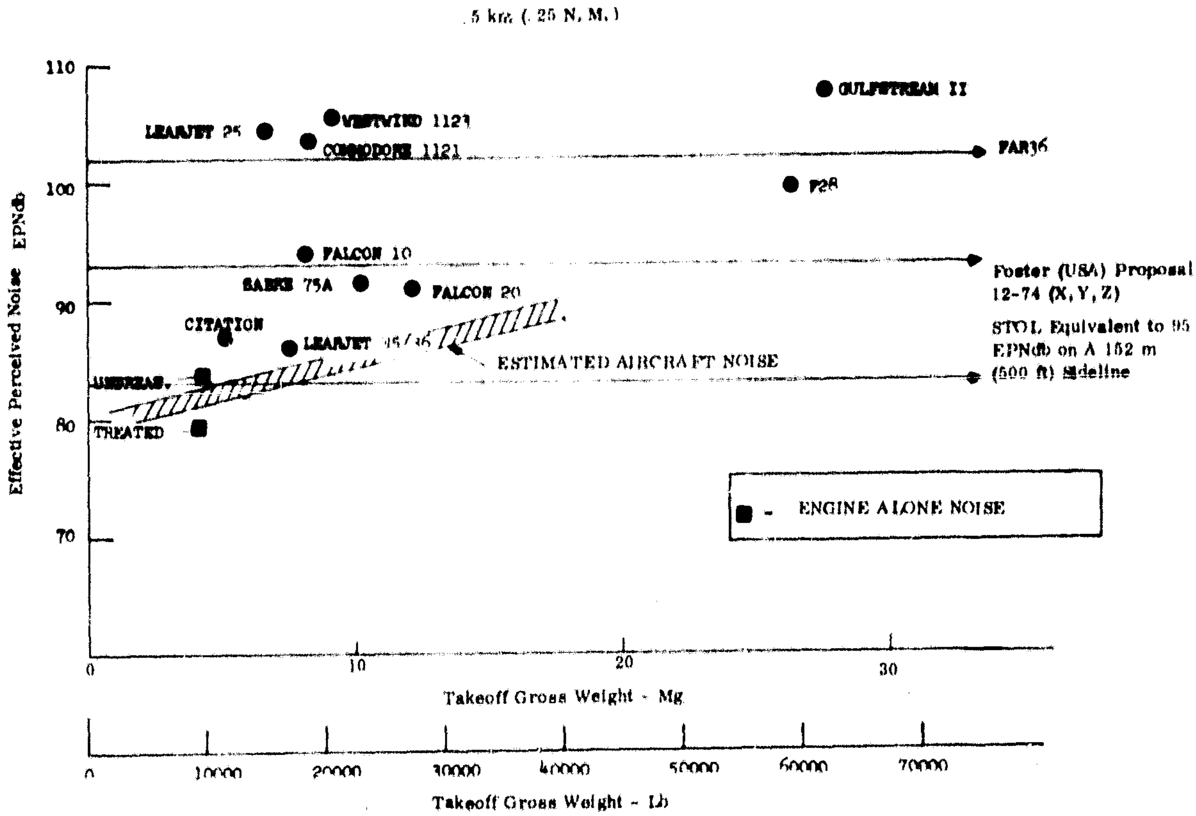


Figure 4. QCGAT Flight Noise Comparisons at Sideline.

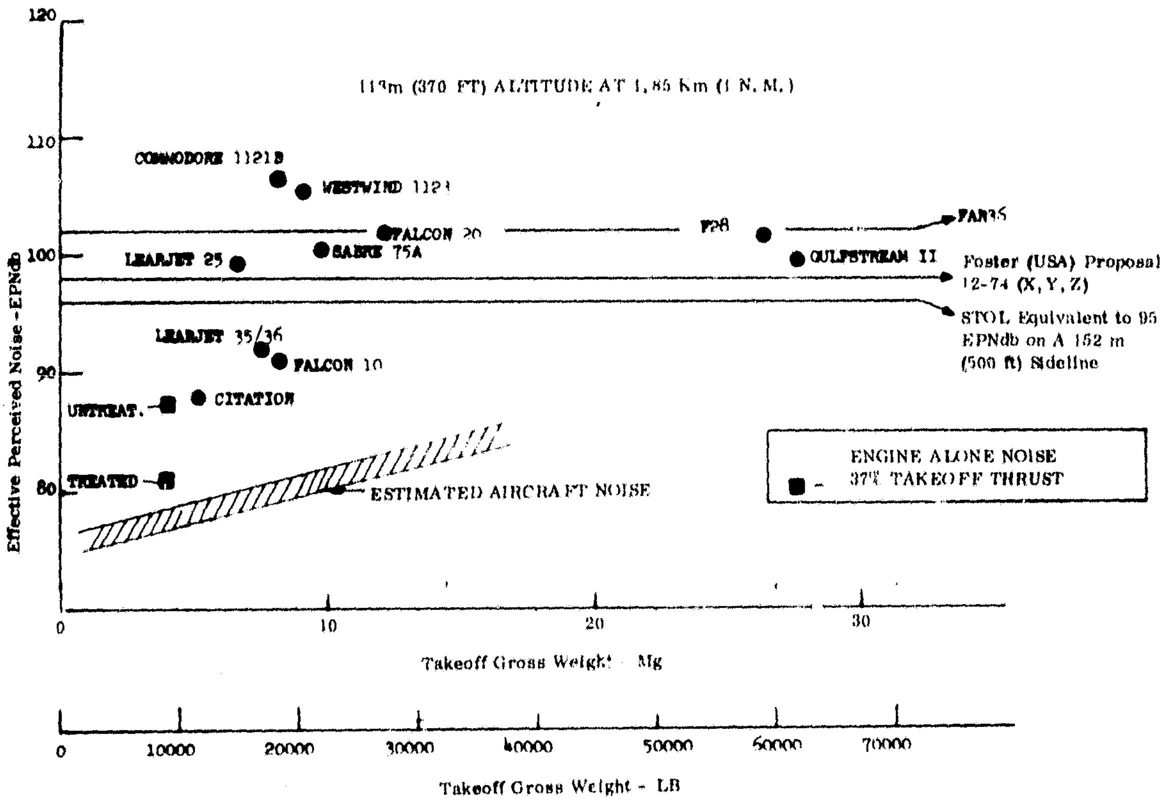


Figure 5. QCGAT Flight Noise Comparisons at Approach.

Table 1 is a breakdown of emissions for the various segments of the EPA class T1 Standards cycle. It shows the importance of the Idle segment of the cycle where sector burning makes a strong beneficial impact.

TABLE 1. T700 QCGAT ESTIMATED EMISSIONS
(Grams/Kilograms of Fuel)

	T700 Idle	Idle With Sector Burning	Takeoff	Climb	Approach
CO	43	22.8	2.0	2.4	9.3
C_xH_y	1.5	0.15	0.01	0.02	0.12
NO_x	3.6	3.6	14.9	13.4	8.1

During the experimental program developed in Task III, an experimental engine similar to the production engine of Task II will be designed, built, and tested. The engine will have a T700-GE-700 core with geared-fan, nacelle, cowl, two position fan exhaust nozzle, and complete sound suppression treatment. The flow path and acoustical requirements will conform to the requirements of the production engine but the engine will not have parts of composite materials and some hardware such as the oil tank, oil coolers, and piping and valves for combustor sector burning will not be of the final flight design.

A component test will be run on the fan reduction gear, which will be loaded by a water brake, to determine its sea level performance throughout its power and speed range. Also fan blades and vanes will be vibration tested and all parts mechanically tested to assure mechanical integrity in the design. A combustor component will be tested to evaluate its emissions performance.

The experimental program includes 90 hours of engine testing in General Electric facilities in Lynn, Massachusetts, and Peebles, Ohio, using one engine. Testing will include demonstrations of thrust, low SFC, low noise and low emissions as well as mechanical integrity. At the termination of the program, 30 months after start, the experimental engine and nacelle will be delivered to Lewis Research Center of NASA for additional testing in NASA facilities.

ENGINE SELECTION AND APPLICATION

It is generally recognized that general aviation fills an important transportation need by complementing the scheduled airlines and by serving areas not reached by normal domestic airlines flights. Both general aviation and the airlines will be adversely affected by fuel shortages and increased fuel costs. However, the relative position of general aviation for business travel may improve because of the continuation of scheduling difficulties, brought about by further reductions in the number of airline flights, which has taken place in the last several years.

In order to achieve expansion in general aviation, attention must be paid to the economic and environmental aspects of the aircraft and its propulsion. This includes low noise, low emissions and, very importantly, low fuel consumption. General Electric selected the T700 QCGAT engine to provide these qualities in a size applicable to the general aviation industry.

The T700 QCGAT engine has very low noise signatures because of the basic cycle and fan mechanical design. Low fan pressure ratio, high by-pass ratio, low core exhaust velocity, no inlet guide vanes and a low noise fan rotor/exit guide vane design are contributing factors. The low noise benefits that an aircraft installation gains from the engine are estimated for a Citation size aircraft in Table 2.

TABLE 2. T700 QCGAT (ENGINE ONLY)
PRELIMINARY NOISE ESTIMATES - GENERAL AVIATION AIRCRAFT

Takeoff Gross Weight = 5216 kg (11,500 lb)

Condition	2 Engines: T700 QCGAT Est. EPNdB	2 Engines: Current FAA Rule EPNdB	Equiv. to STOL Requirement EPNdB
Takeoff - 6.5 km (3.5 nmi) from brake release	69 (FAR 36-24)	93	76-81
Sideline - 0.5 km (0.25 nmi)	79* (FAR 36-23)	102	83
Approach - 113 m (370 ft) at 1.85 km (1 nmi) from threshold.	81 (FAR 36-21)	102	96

* The sideline noise estimate includes 1.5 EPNdB for aircraft fuselage shielding effects.

With the current T700-GE-700 core engine, the T700 QCGAT engine would meet the no smoke, C_xH_y and NO_x requirements and be within 28% of the CO requirement. The emissions for the T700 QCGAT engine are expected to meet the 1981 EPA Class T1 requirements with low risk as a result of sector burning at Idle.

The engine has significantly better specific fuel consumption at cruise than the best current general aviation turbofan engines. This reduction in fuel consumption allows the aircraft designer to build a smaller aircraft for a given need or permits more range from a given aircraft. An example of the savings that the T700 QCGAT engine provides is shown in Table 3, where an aircraft tailored to take advantage of the T700 QCGAT engine's low fuel consumption is compared to the Cessna Citation. A new aircraft designed to carry the same payload the same distance requires 771 kg (1700 lb) less gross weight than the Citation. Another measure of its merit is the 55% better passenger miles per pound of fuel for the T700 QCGAT powered aircraft than for the Citation. Flight characteristics of the aircraft are shown in Table 4, and the takeoff flight path is shown in Figure 6.

TABLE 3. REPRESENTATIVE T700 QCGAT TWIN ENGINE AIRCRAFT

	Units	T700 QCGAT Aircraft		Cessna Citation	
Takeoff Gross Weight (TOGW)	kg (lb)	4445	(9800)	5216	(11,500)
Wing Area	m^2 (ft^2)	20.4	(220)	24.1	(260)
Wing Span	m (ft)	13.7	(45)	-	-
Passenger Capacity (Crew + Passengers)	-		2 + 5		2 + 5
Fuel Load	kg (lb)	952	(2100)	1488	(3280)
Range (Full Passenger Load with Reserves)	km (nmi)	1389	(750)	1389	(750)
Thrust/Weight (.95 installed)			0.43		-
Speed - Long Range Cruise	Mach number		0.60		0.60
Max. Cruise	Mach number		0.65		-
Initial Cruise Altitude	km (ft)	107	(35,000)	107	(35,000)
Passenger km/kg Fuel			11.4		7.35
(Passenger miles/pound Fuel)			(2.8)		(1.8)

TABLE 4. T700 QCGAT REFERENCE AIRPLANE DESIGN AND FLIGHT PATH CHARACTERISTICS

Distance to 10.7 m (35 ft) Altitude = 849 m (2785 ft)

Distance to 45.7 m (150 ft) Altitude = 1164 m (3820 ft)

Takeoff Flight Path per Figure 6

Takeoff Mach Number = 0.21

Altitude at 6.5 km (3.5 nmi) = 1125 m (3690 ft)

Takeoff Thrust on 25°C (77°F) Day = 9697 N (2180 lb) per Engine

Approach Flight Path is Standard -3° Glide Slope

Approach Mach Number = 0.166

Approach Thrust = 2691 N (605 lb) = 37% Thrust at 56.6 m/s (185.7 ft/sec)

Altitude at 1.85 km (1 nmi) = 113 m (370 ft)

Landing Weight = 4246 kg (9360 lb)

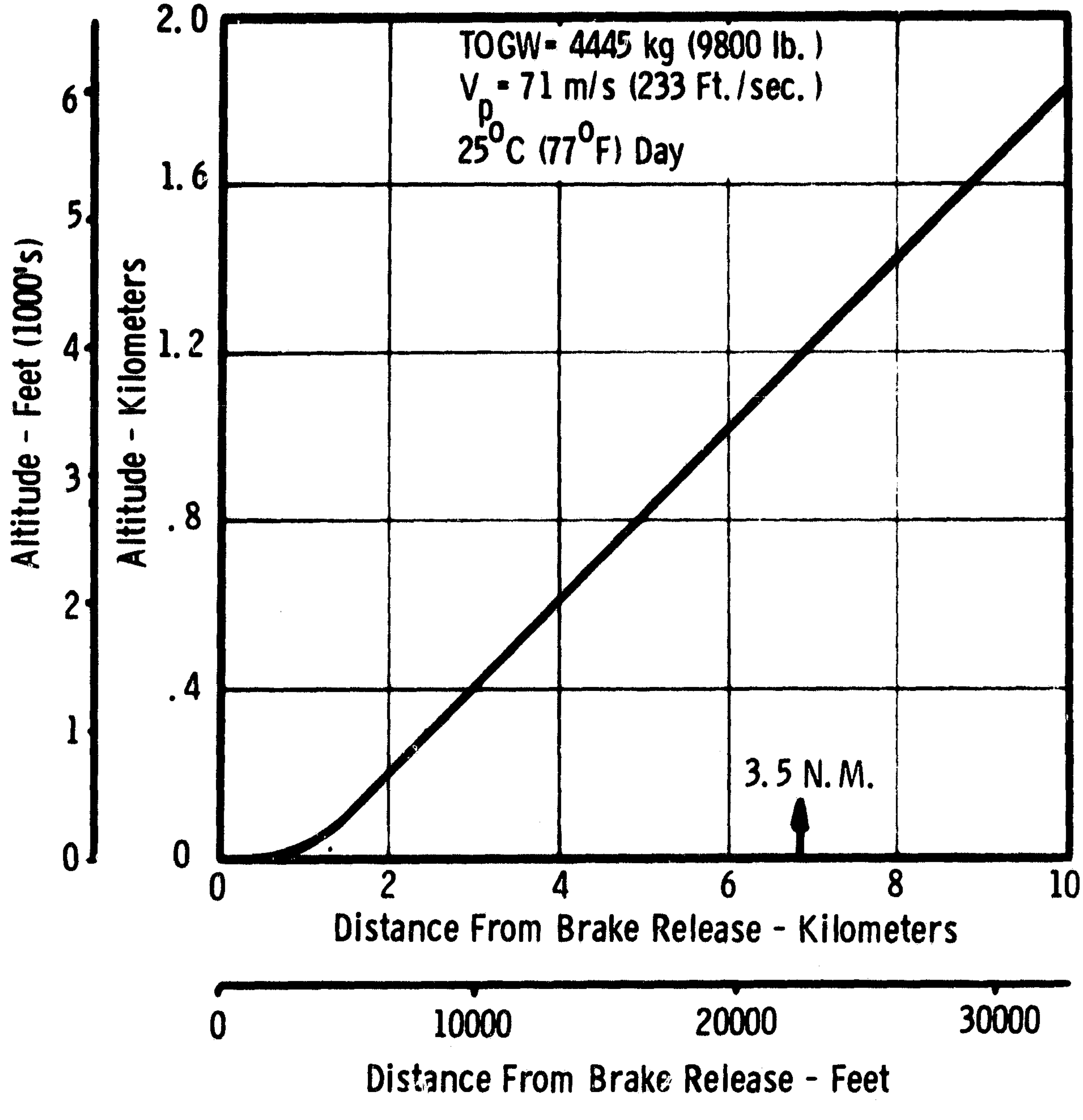


Figure 6. T700 Turbofan Takeoff Path.

T700 MILITARY ENGINE BASE AND COMMONALITY WITH QCGAT

The T700 QCGAT engine is a derivative of the T700-GE-700 turboshaft engine presently being qualified for service in the Utility Tactical Transport Aircraft Systems (UTTAS) and the Advanced Attack Helicopter (AAH). In addition, it will be certified for use in nonmilitary helicopters. Figure 7 shows the T700-GE-700 engine cross section and specification data. Both the core engine rotor and the free power turbine rotor are shown in solid black. Figures 8 and 9 show the T700-GE-700 Development program, the current status of engines shipped, and number of test hours accumulated through October, 1975.

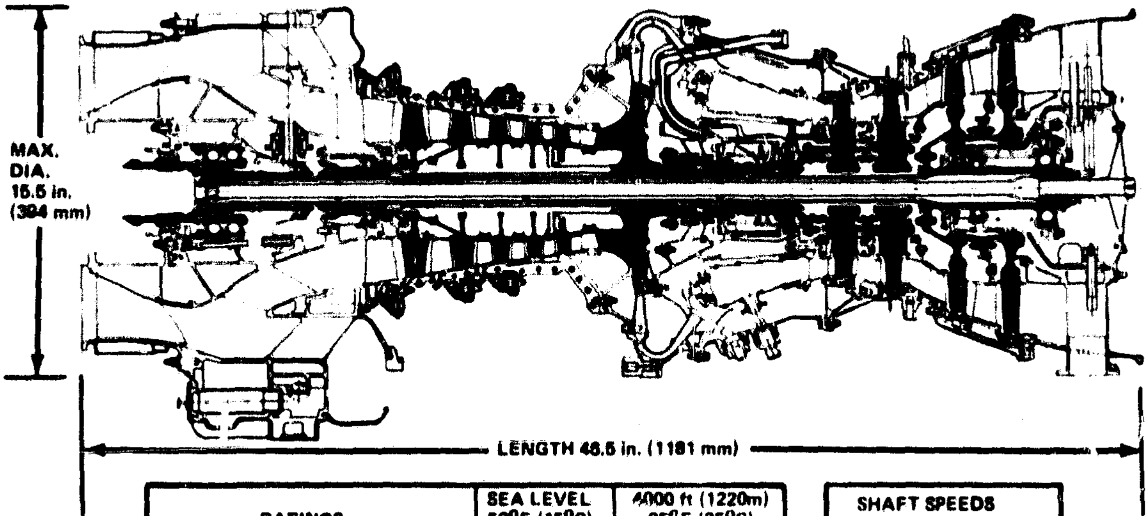
Nearly all of the parts in the T700 QCGAT core engine come directly from the T700-GE-700 military engine. In this way, it achieves commonality with a production base of 4700 engines (minimum current estimates). The value of these common parts will be approximately 43% of the T700 QCGAT engine cost.

The common parts include:

1. Axial and centrifugal compressors
2. Combustor
3. High-pressure turbine
4. Low-pressure turbine, except airfoils
5. Exhaust frame
6. Hydromechanical control
7. Alternator
8. Exciter
9. Igniters
10. $T_{4.5}$ Harness and Thermocouples
11. Fuel/Oil Coolers
12. Fuel Pump

Figure 10 shows a cross section of the engine and identifies the T700 common parts.

General Electric experience with commercial and business jet engines, which are derivatives of military engines (CF6-GE-6, CF6-GE-50, CJ805, CJ610, CF700, T58 and T64-GE-823) indicates that in addition to the unit part cost advantages due to the T700-GE-700 military engine base, there will be benefits of the continuing military product improvement programs. These will result in life, performance, quality, and reliability improvements based on the more demanding military helicopter flight experience.

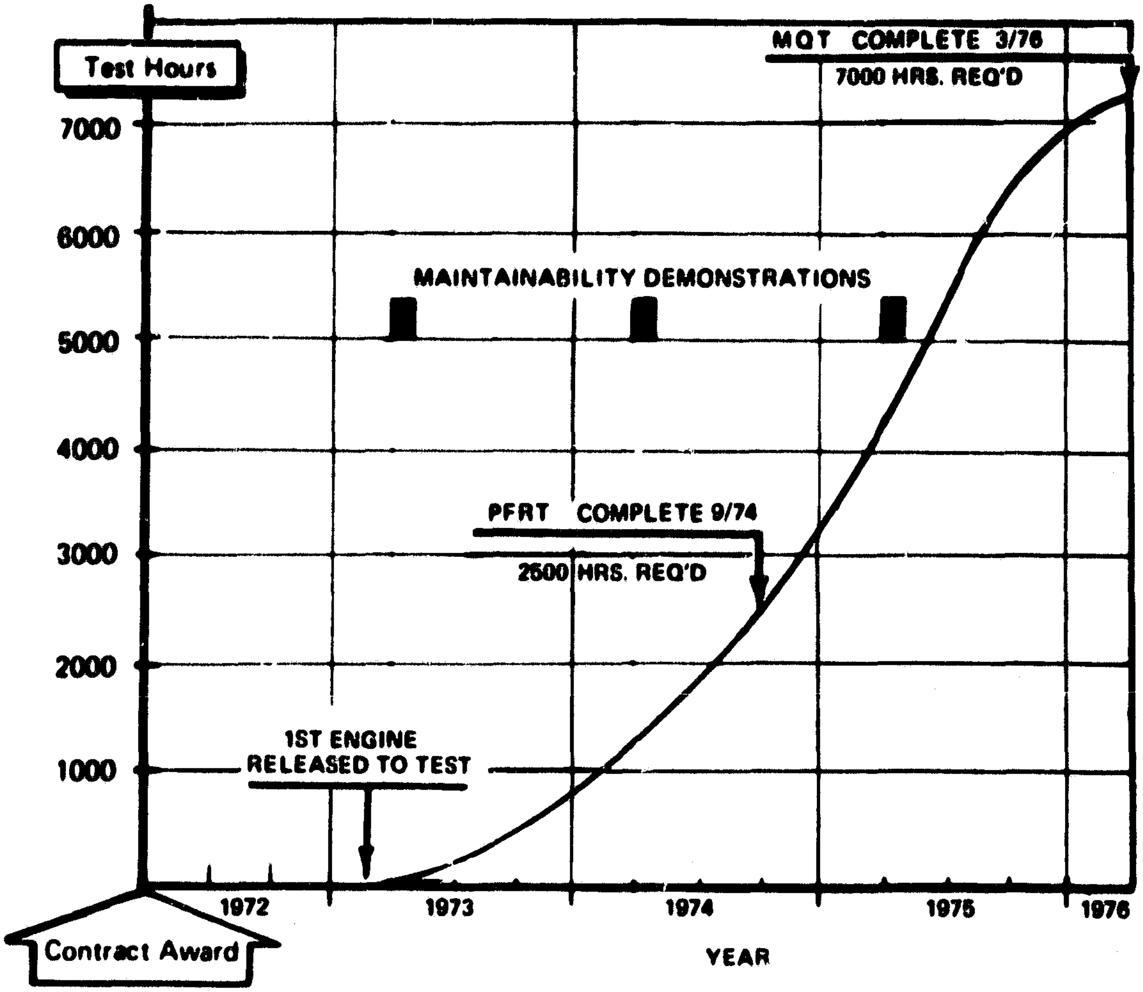


RATINGS	SEA LEVEL 59°F (15°C)	4000 ft (1220m) 95°F (35°C)
INTERMEDIATE SHP (TAKEOFF)	1536	1163
SFC	.469 (.213*)	.483 (.219)
MAXIMUM CONTINUOUS SHP	1250	868
SFC	.477 (.217)	.513 (.233)
75% MAX CONTINUOUS SHP	900	652
SFC	.520 (.236)	.563 (.256)
WEIGHT	415 lb. (188kg)	

(*Values in kg/shp/hr)

SHAFT SPEEDS
GAS GENERATOR
44,720 RPM (RATED)
OUTPUT SHAFT
20,000 RPM (RATED)
ALLOWED
(17,000–21,000 RPM)

Figure 7. Engine Specifications.



OCTOBER 1975 STATUS

97 ENGINES SHIPPED

1900 ENGINE FLIGHT HOURS

3600 ENGINE FIELD GROUND HOURS

6100 ENGINE FACTORY HOURS

Figure 8. Development - Qualification Test Program.

PLANNED FACTORY TESTING THROUGH MQT ...... 7000 HOURS

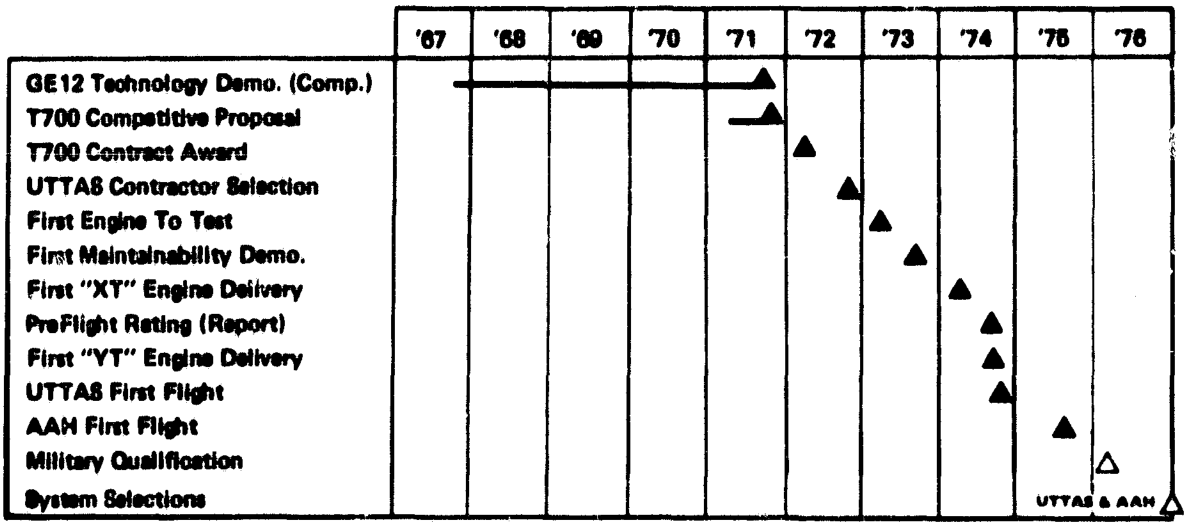


Figure 9. T700-GE-700 Engine Development for UTTAS/AAH.

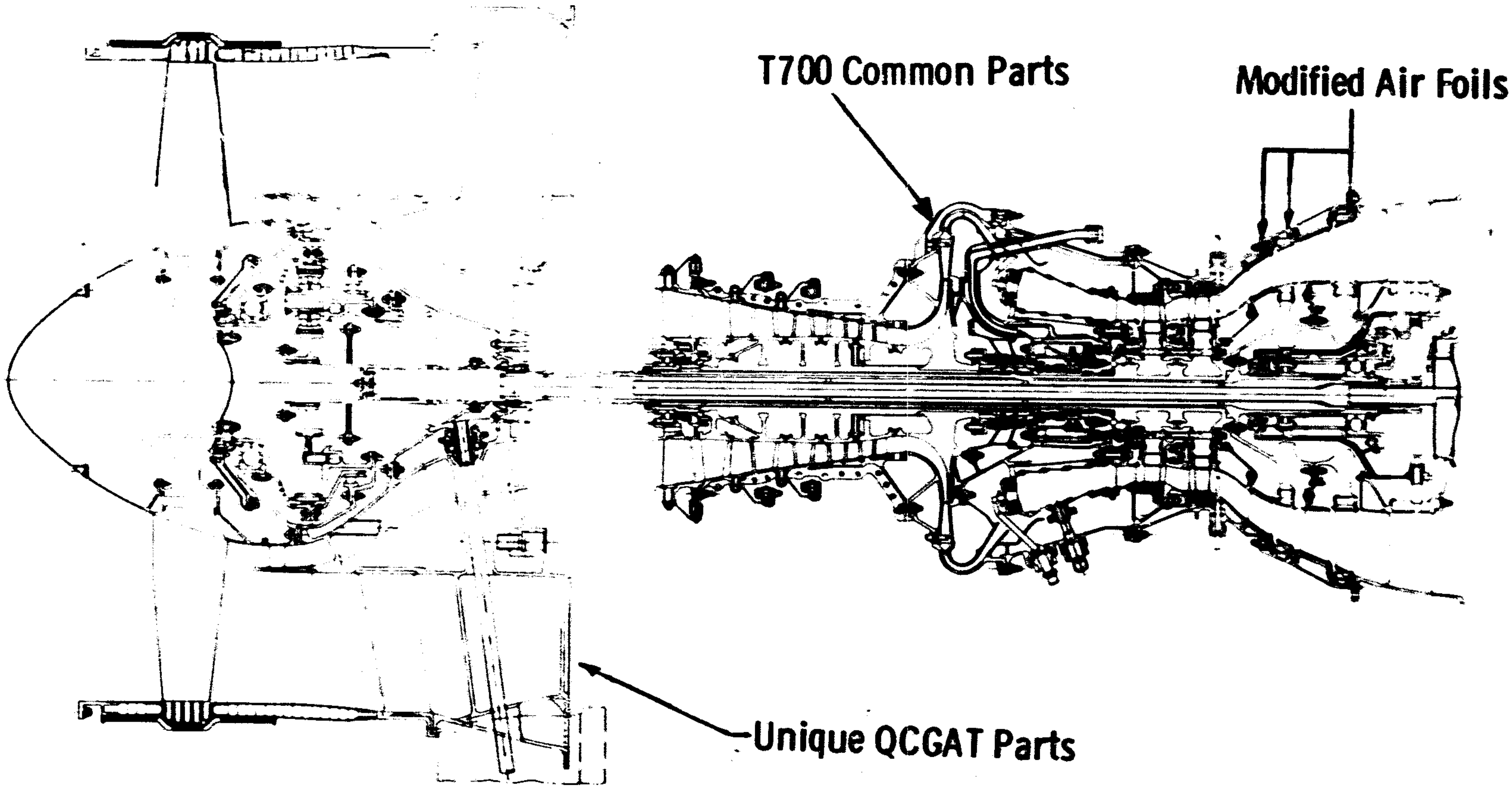


Figure 10. QCGAT Engine Showing QCGAT Unique and T700-GE-700 Engine Common Parts.

PERFORMANCE

A tentative flight envelope is shown on Figure 11. At sea level, the maximum Mach number is 0.4 which is probably higher than would be required for a quiet general aviation aircraft. The ceiling is at about 13.7 km (45,000 ft) which is appreciably higher than the 10.7 km (35,000 ft) cruise altitude which is expected, and the maximum Mach number of 0.8 is sufficiently greater than the 0.6 to 0.7 range where the aircraft will probably cruise for economical flight.

To improve fuel economy and increase climb and cruise thrust, the T700 QCGAT turbine inlet temperature is higher than that of the T700-GE-700 at corresponding part power ratings. However, take off ratings on hot days are set at the T700 maximum core RPM and $T_{4.1}$ conditions, to provide commonality with the military engine high temperature parts.

The higher temperatures must be traded off against engine life, which is discussed in the Engine Life Analysis section of this report. In order to achieve adequate life with high climb and cruise engine performance, the engine takeoff thrust is reduced at inlet temperatures below 30°C (86°F) by limiting maximum fuel flow. This effectively flat rates the engine. Full engine thrust is obtained at higher temperatures but the thrust is reduced to about the 30°C (86°F) value at colder temperatures. The effect of limiting fuel flow is shown on Figure 12 which also shows the part power thrust at sea level is limited on a cold day. Altitude performance is not affected by the fuel flow limit because fuel flows under all conditions are below the limit at altitude.

Increasing turbine inlet temperature increases takeoff hot day thrust, and climb and cruise performance. The flat rating results in approximately a 3,000 hour engine life which corresponds to about 5 years between overhauls with the expected aircraft usage. This is lower than the goal for the T700-GE-700 engine which is 5,000 hours, but it appears to provide a beneficial tradeoff with improved performance for the general aviation aircraft.

Some of the important engine design performance parameters are shown in Table 5. Tables 6 and 7 are the standard and hot day rating tables for the engine. Figure 13 shows engine net thrust as a function of altitude at maximum climb and maximum cruise thrusts and 0.4, 0.6, and 0.8 Mach numbers. Figure 14 shows the specific fuel consumption (SFC) in the same way.

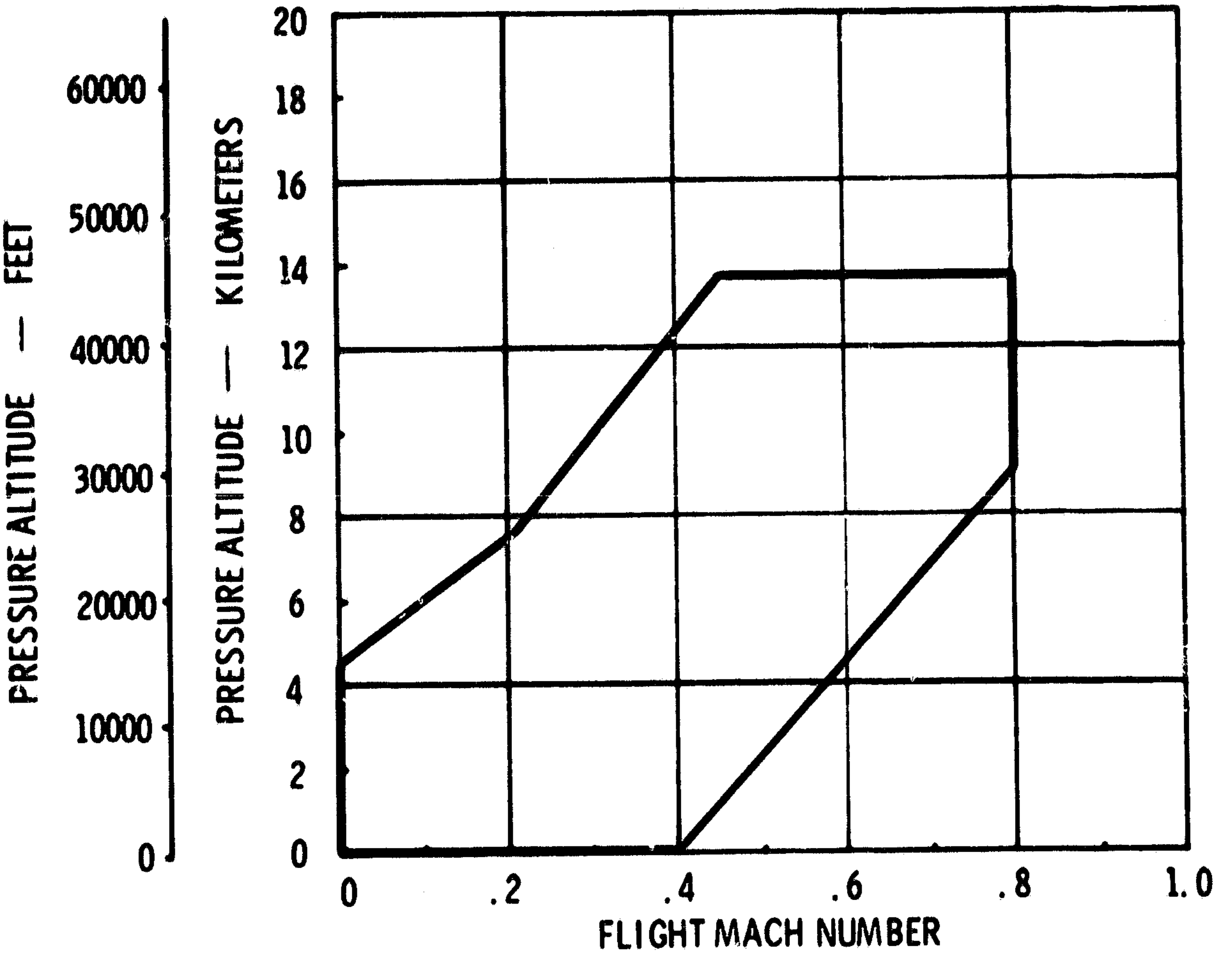


Figure 11. T700 QCGAT Flight Envelope.

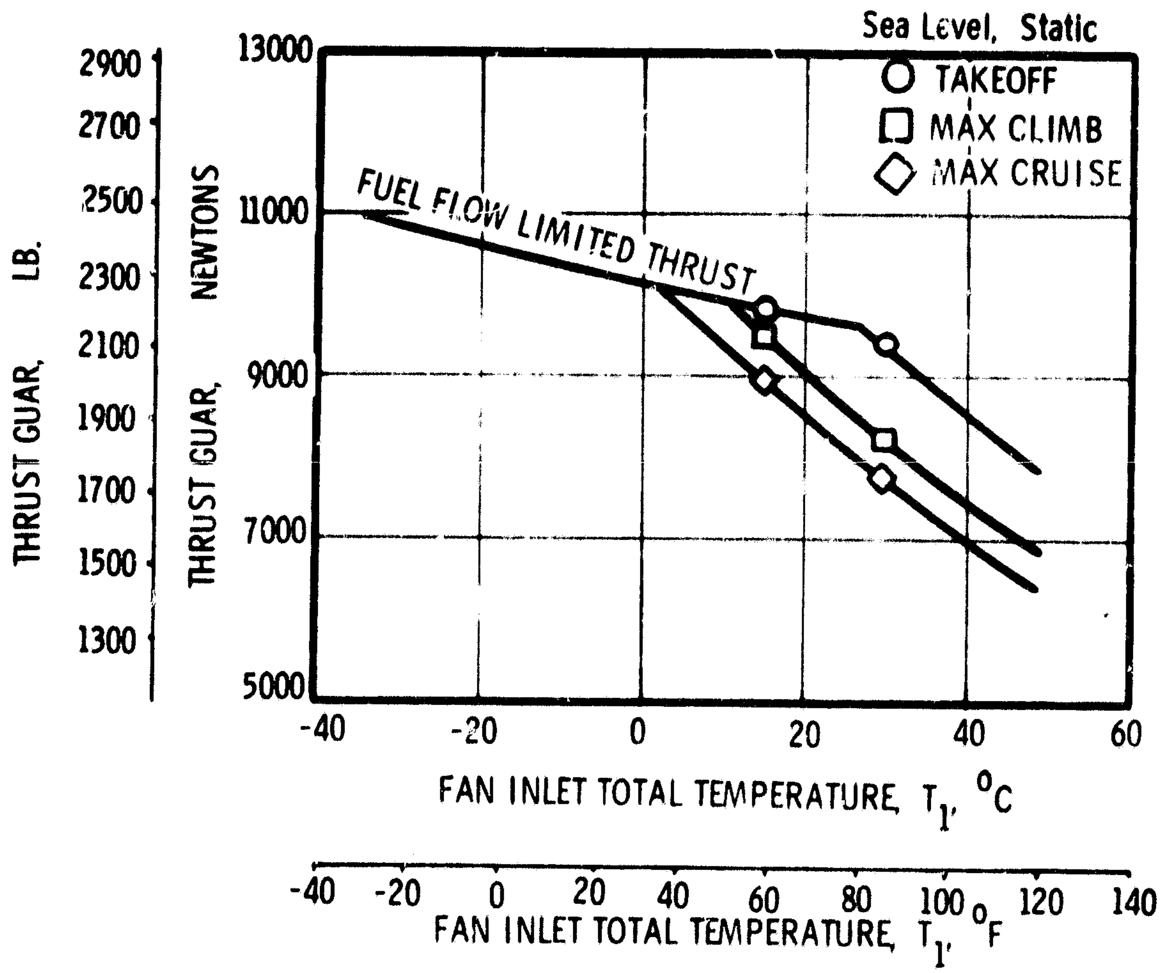


Figure 12. T700 Turbofan, Thrust vs Inlet Temperature.

TABLE 5. QCGAT GEARED T700 TURBOFAN DERIVATIVE

(SEA LEVEL STATIC)

	SI Units	English Units
Fan Nozzle Area,	1974/1677 cm^2	306/260 $in.^2$
Takeoff Thrust Fn	9892 N	2224 lb
Max Climb Thrust at 10.7 km, 0.8 M (35,000 ft., 0.8M)	2157 N	485 lb
Max Climb Thrust/Takeoff Thrust	0.218	0.218
Max Cruise SFC at 9.14 km, 0.8 M (30,000 ft, 0.8M)	0.0206 kg/kN/s	0.727 lb/hp/hr
By-pass Ratio	9.8	9.8
Fan Tip Diameter	67.06 cm	26.4 in.
Fan Tip Speed	294 m/s	963 ft/sec
Core Jet Velocity	308 m/s	1012 ft/sec
Fan Jet Velocity	196 m/s	643 ft/sec
Low Pressure Turbine (LPT)		
Gear Ratio	2.14	2.14
LPT Max Speed	20,600 rpm	20,600 rpm
No. Stages	2	2

TABLE 6. T700 QCGAT ESTIMATED PERFORMANCE RATINGS AT SEA LEVEL, STATIC, STANDARD DAY

Rating	Net Thrust (Min.) N	(lb)	Specific Fuel Consumption (Max) kg/kNs,	(lb/lb hr)	Measured Gas Generator Discharge Temperature °C	(°F)
Takeoff	9892	(2224)	.00943	(.333)	796	(1465)
Max Climb	9537	(2144)	.00940	(.332)	782	(1440)
Max Cruise	8945	(2011)	.00935	(.330)	760	(1400)
90% Max Cruise	8051	(1810)	.00932	(.329)	-	-
75% Max Cruise	6708	(1508)	.00937	(.329)	-	-

TABLE 7. T700 QCGAT ESTIMATED PERFORMANCE RATINGS

AT SEA LEVEL, STATIC, 30°C (86°F) DAY

Rating	Net Thrust (Min.) N	(lb)	Specific Fuel Consumption (Max) kg/kNs,	(lb/lb hr)	Measured Gas Generator Discharge Temperature °C	(°F)
Takeoff	9421	(2118)	.00969	(.342)	830	(1525)
Max Climb	8229	(1850)	.00963	(.340)	782	(1440)
Max Cruise	7713	(1734)	.00960	(.339)	760	(1400)
90% Max Cruise	6939	(1560)	.00957	(.338)	-	-
75% Max Cruise	5782	(1300)	.00969	(.342)	-	-

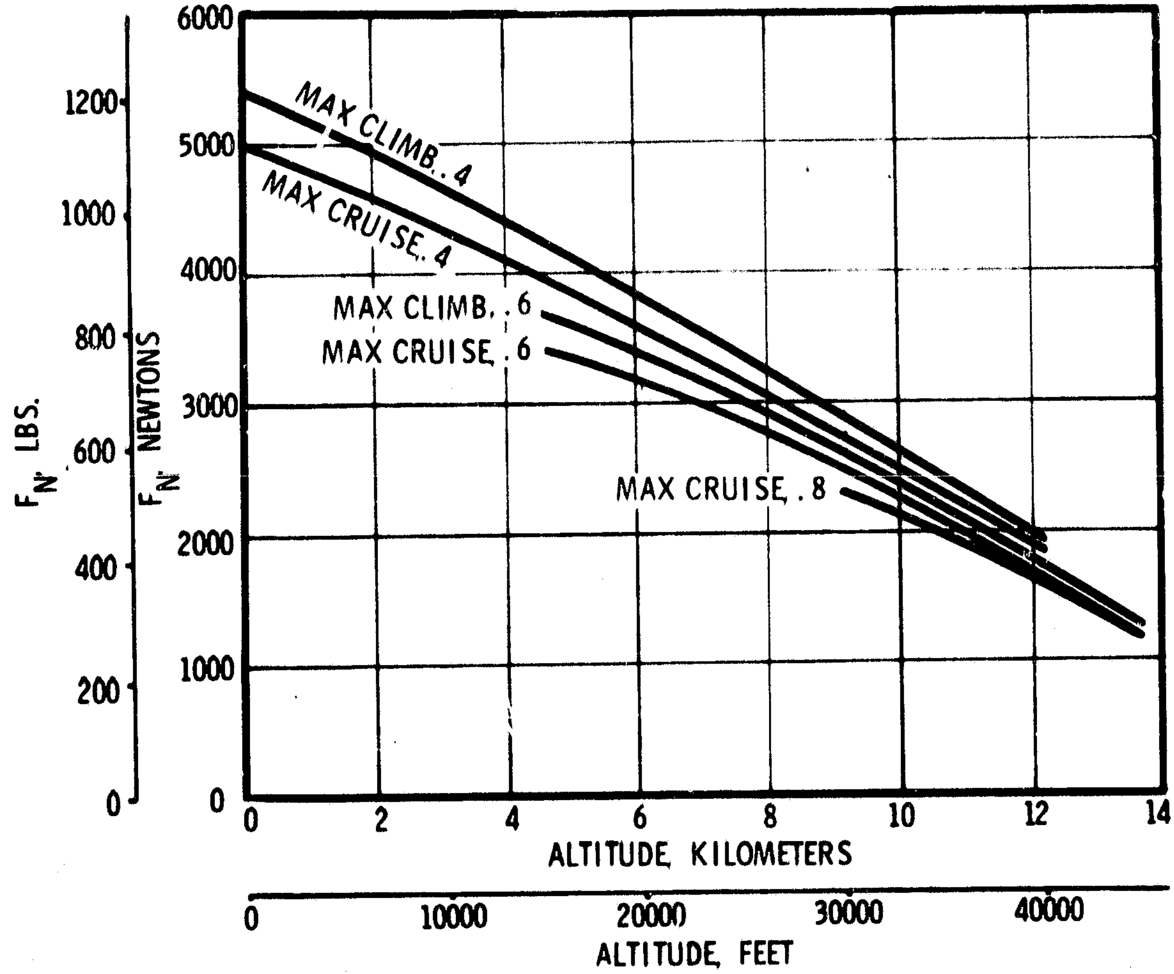


Figure 13. T700 QCGAT Net Thrust vs Altitude.

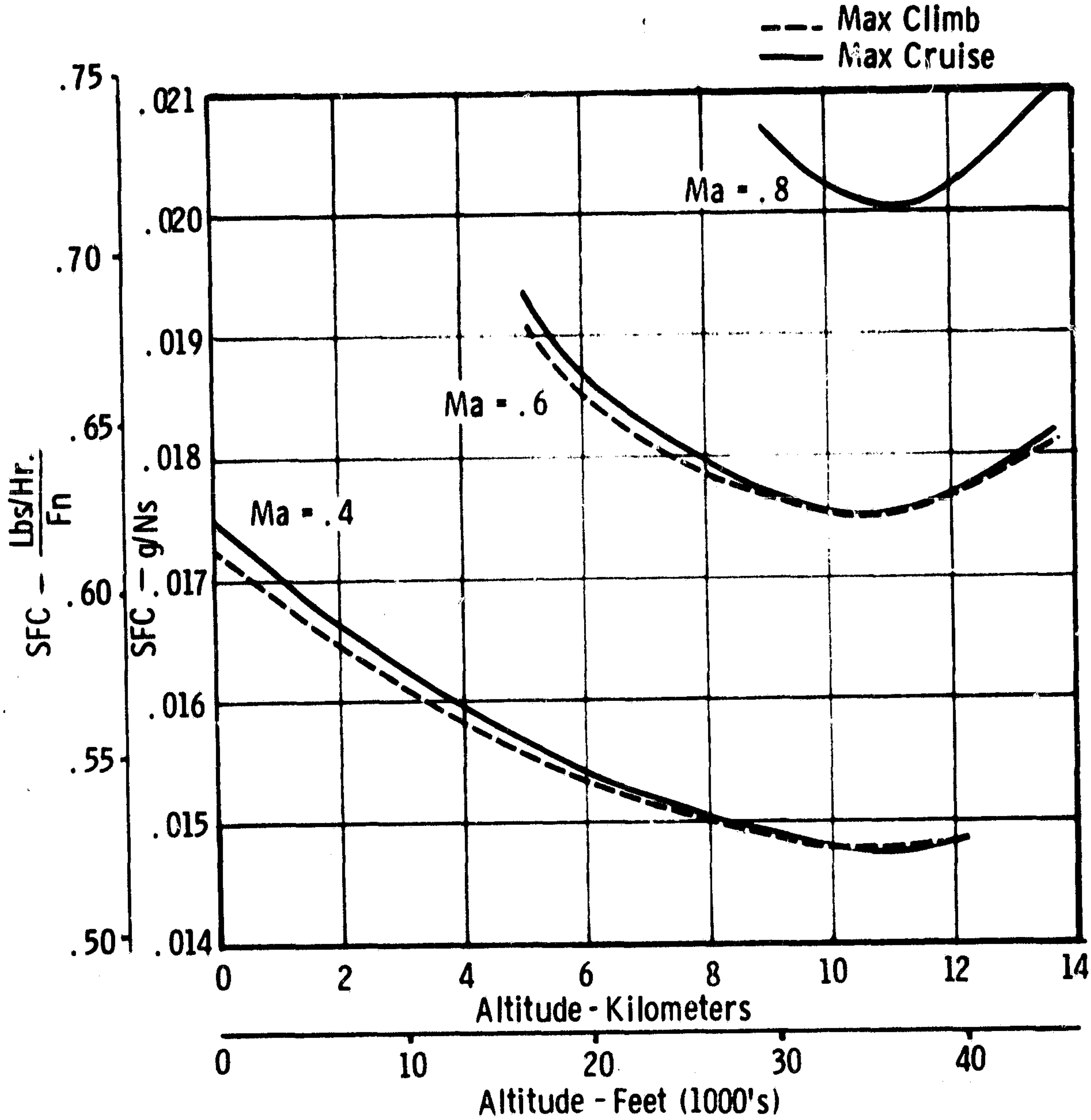


Figure 14. T700 QCGAT SFC vs Altitude.

ACOUSTIC CHARACTERISTICS

APPROACH

The General Electric QCGAT engine nacelle configuration is shown in Figure 15 The acoustic analysis of the engine was conducted for the aircraft described in the Engine Selection and Application Section for the takeoff and approach flight characteristics given in Table 4 and Figure 6. Engine cycle parameters used to predict fan core and jet noise at takeoff, sideline, and approach powers are listed in Table 9. The acoustic features on which the QCGAT engine design is based are:

1. Fan Vane to Blade Ratio
2. Fan Vane to Blade Spacing
3. Inlet and Fan Exhaust Acoustic Treatment

Turbine noise is not considered to be a significant contributor to the overall noise signature of the engine because the LP turbine rotational speed of 13,000 rpm at approach is relatively high and the number of blades (60) is relatively large. Also, an empirically derived prediction procedure indicates that core combustor noise is not a significant contributor. General Electric experience with gear noise also indicates that the fan reduction gear noise will not be significant at the distances specified in the noise level requirements. Jet noise is probably the dominant source at takeoff and sideline conditions, for a treated engine. Fan noise is expected to be dominant at approach conditions.

VANE AND BLADE GEOMETRY EVALUATION

The acoustic-mechanical design trade-off analyses which lead to an acoustic design for a single stage fan are affected by the ratio of the number of rotor blades to outlet guide vanes (OGV). Theoretical analysis and test results indicate that rotor blade wakes, passing through the stator, create radiated noise in the aft quadrant. That noise, which is probably the dominant source of aft quadrant noise radiation for the QCGAT engine fan nozzle, can be reduced by maintaining a large ratio of outlet guide vanes to rotor blades and by large rotor to OGV spacing. Figure 16 includes the correlated results of various test programs. The data shows the general effect of numbers of blades and vanes and the effect of rotor to OGV spacing on PNdB. Other trade-off parameters are the amount of acoustic treatment in the fan and fan nozzle duct, and noise shielding by the aircraft. The trade-off analysis for the QCSEE - Over The Wing (OTW) design resulted in a configuration with 28 rotor blades, 33 OGV which serve as struts and a 2-chord rotor-to-OGV spacing. This Configuration 1 on Figure 16.

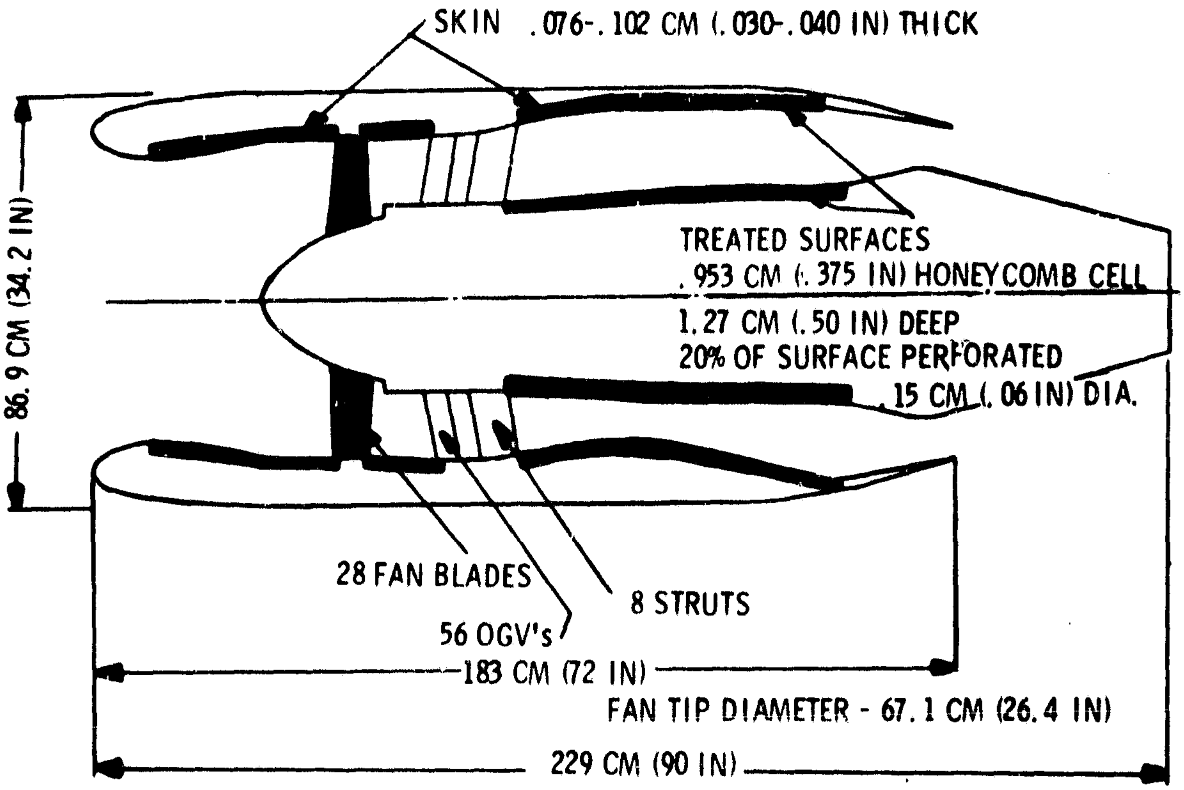


Figure 15. T700 QCGAT Acoustic Treatment.

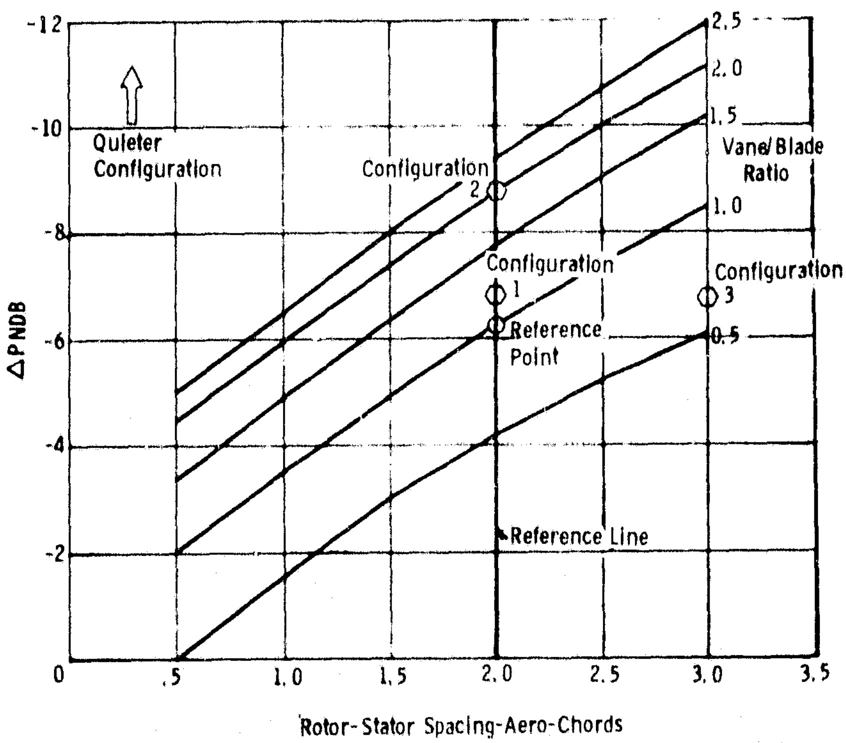


Figure 16. Relative Noise Characteristics Based on Accumulated Test Data - Untreated Engine.

TABLE 9

T700 - QCGAT

REFERENCE CYCLE CONDITIONS

Parameter	Takeoff (SLS) (77° F)		Takeoff (3600 ft) (59°) (M.25)		Approach (M.166) (59°)	
FN-N(lb)	9697	(2180)	6761	(1520)	2691	(605)
NF-RPM	8279		8594		5214	
NG-RPM	44564		44178		36829	
NPT-RPM	17718		18392		11159	
A8-m^2(ft^2)	0.0348	(0.375)	0.0348	(0.375)	0.0348	(0.375)
A28-in^2(ft^2)	0.197	(2.125)	0.197	(2.125)	0.197	(2.125)
W8-kg/s(lb/sec)	4.503	(9.928)	4.481	(9.88)	2.623	(5.7833)
W28-kg/s(lb/sec)	43.32	(95.59)	44.35	(97.78)	29.26	(64.5)
V8-m/s(ft/sec)	300.1	(984.5)	326.1	(1070)	158.5	(520)
V28-m/s(ft/sec)	193.5	(634.9)	212.9	(698.4)	126.5	(415)
T8-°K(°R)	864	(1555)	838	(1509)	752	(1353)
T28-°K(°R)	320	(576.1)	307	(553.3)	297	(535)
$P28/P_o$	1.2439		1.3058		1.1057	
$P8/P_o$	1.2044		1.2197		1.0669	
β-Bypass Ratio	9.815		10.092		11.657	
$\%Nf/\sqrt{\theta}$	84.9		90.2		54.348	
$\%Ng/\sqrt{\theta}$	99.7		98.8		82.3	
100% Nf	9584					
100% Ng	44699					

Initially, the QCSEE - OTW design was scaled for the T700 QCGAT design. However, during the preliminary design phase of the QCGAT program, Task II, it was determined that the linear scale factor of 0.37 led to higher frequency tones in the T700 QCGAT design because of the increased fan speed. These frequencies lie in a higher NOY weighting regime of the noise spectrum and, therefore, lead to higher relative PNdB levels. Because it appears to be undesirable or impractical from the mechanical design standpoint to install large enough amounts of acoustic treatment in the smaller QCGAT engine to reduce radiated noise adequately and because the QCGAT aircraft installation will probably not benefit from aircraft shielding, as over-the-wing QCSEE installation does, it was decided to investigate two additional fan blading configurations. These are different from the QCSEE design only in the design of outlet guide vanes and struts. The three configurations analyzed are:

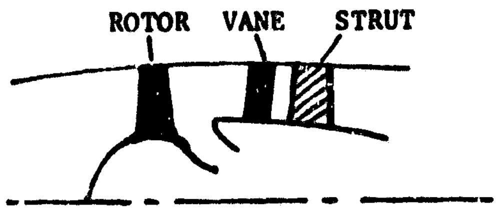
Configuration		Blades	OGV	Spacing
1	QCSEE OTW scale	28	33 vane struts	2 chord
2	T700 QCGAT Mod 1	28	56 vanes	2 chord
3	T700 QCGAT Mod 2	28	18 vane struts	3 chord

Configuration 2 has eight struts behind the OGV to carry the structural loads and services which are required. Configurations 1 and 3 both use the OGVs as struts. Figure 16 indicates that higher noise generation due to the small number of vanes in Configuration 3 is partially compensated for by the larger blade-to-vane spacing which is possible. However, Configuration 2, whose parameters are given in Table 10, provides about 2 PNdB improvement over the other configurations because of the larger number of OGVs. It is also the basis for a sound low cost mechanical design in the small size QCGAT engine, which, with acoustic treatment, will meet desired aircraft noise objectives.

ACOUSTIC TREATMENT EVALUATION

The nacelle shown in Figure 15 and Configuration 2 described in Table 10 were used to determine the noise reduction available from the installation of acoustic treatment on the fan frame outer wall between rotor and vanes, and in the fan nozzle duct aft of the struts on both outer and inner walls. In general, fan noise

TABLE 10. CONFIGURATION 2 DESIGN



	SI Units	English Units
28 Blades, 56 Vanes > Ratio =	2	2
Approach Fan Speed	5214 rpm	5214 rpm
Takeoff Fan Speed	8279 rpm	8279 rpm
Fan Diameter	67.1 cm	26.4 in.
Tip Speed - Takeoff	290.7 m/s	953.7 ft/sec
Tip Speed - Approach	183.1 m/s	600.6 ft/sec
Hub/Tip Speed Ratio	.4143	.4143
No. Spin Lobes	28	28
Cutoff Mach No.	1.09	1.09
Cutoff Tip Speed	370.6 m/s	1216 ft/sec
Vane to Blade Spacing	2 chord	2 chord
Fan Always Operating Below Cutoff		
Δ PNdB	-2.0	-2.0

reduction, as a result of acoustic treatment, is determined by evaluating the flight 1/3 octave spectrums. Based on the treatment parameters given in Table 11, a preliminary assessment of the 1/3 octave broadband and tone noise

TABLE 11. ACOUSTIC TREATMENT PARAMETERS

Inlet Length/Diameter = .53

28 Fan Blades and 56 outlet guide vanes

Fan Speed Approach = 5214 rpm

Fan Speed Takeoff = 8279 rpm

Frequency Fundamental Tone - Approach = 2433 Hz, λ = 14.7 cm (5.8 in.)

Frequency Fundamental Tone - Takeoff = 3863 Hz, λ = 9.4 cm (3.7 in.)

Treatment Tuned to Provide Maximum Noise Reduction at Approach Power

Fan Duct Mach Number - Takeoff = 0.35, Approach = .22

Nominal Fan Duct Height = 17.3 cm (6.8 in.) (H)

Nominal Fan Duct Length = 16 in. (L), L/H = 2.35

H/λ Approach = 1.46

reduction was made. It is presented in Figure 17 for the approach power point and at takeoff and sideline conditions. Predictions of T700 QCGAT flight spectrums, front and aft max noise angles, were based on QCSEE-OTW spectrum predictions scaled down to QCGAT engine size. The reliability of these prediction methods has been confirmed by tests on the QCSEE-UTW (under-the-wing) configuration. The QCGAT spectrums were obtained for approach, sideline, and takeoff flight conditions. They include the 1/3 octave spectrum predictions of jet, core, and fan noise. The objective of this type of spectrum analysis is the determination of noise constituent PNdB values at the front and aft quadrant maximum angle noise locations. These PNdB values are summed, corrected for aircraft flight effects and used to determine EPNdB values for the aircraft. Front quadrant (inlet) noise reduction due to addition of inlet treatment was determined from empirical data presented in Figure 18.

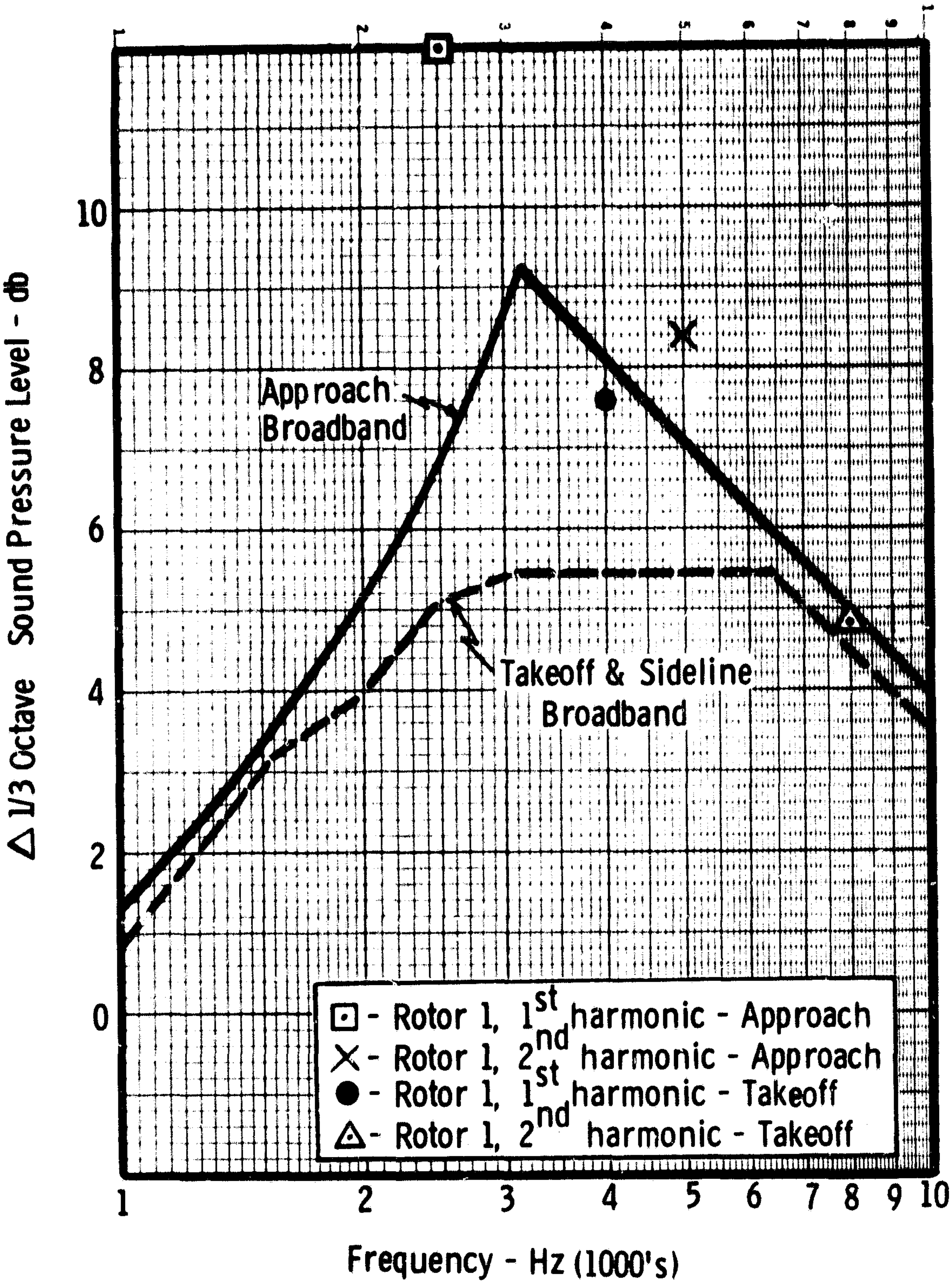


Figure 17. T700 Turbofan Estimated Noise Suppression for SDOF Acoustic Treatment Fan Nozzle Duct.

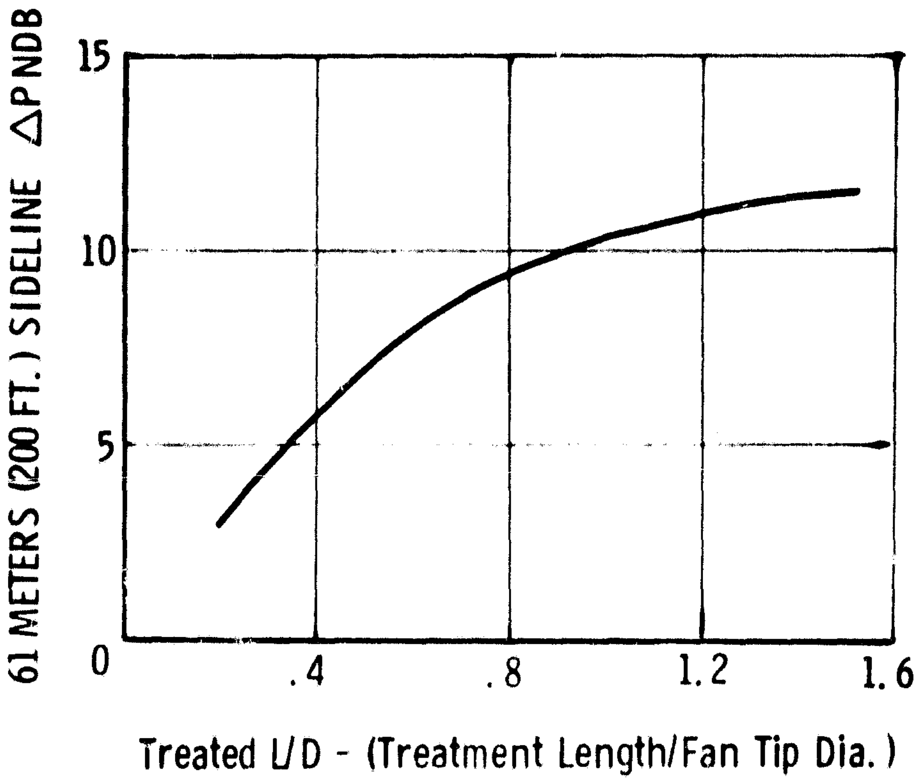


Figure 18. Inlet Fan Noise Reduction Due to Acoustic Treatment Installation.

Table 12 summarizes the EPNdB estimates at the FAA measuring stations for the takeoff flight path of Figure 6. Bar charts showing the constituent noise levels at takeoff, sideline, and approach are presented in Figures 19 through 21.

TABLE 12. QCGAT FAA FAR 36 NOISE ESTIMATES
T700 TURBOFAN POWERED GENERAL AVIATION AIRCRAFT

Total Gross Weight = 4445 kg (9800 lb)

Condition	Altitude m	Altitude (ft)	Mach No.	Thrust kN	Thrust (lb)	Estimated T700 QCGAT Engine EPNdB	FAR 36 FAA Rule EPNdB
2 ENGINES - WITHOUT ACOUSTIC TREATMENT							
Takeoff at 6.5 km (3.5 nmi)	1122	(3680)	.21	9.70	(2180) (SLS)	73.1	93
Sideline at .5 km (.25 nmi)	213	(700)	.21	9.70	(2180) (SLS)	83.9	102
Approach at 1.85 km (1 nmi)	113	(370)	.166	2.69	(605)	87	102
2 ENGINES - WITH ACOUSTIC TREATMENT							
Takeoff at 6.5 km (3.5 nmi)	1122	(3680)	.21	9.70	(2180) (SLS)	69.7	93
Sideline at .5 km (.25 nmi)	213	(700)	.21	9.70	(2180) (SLS)	79.3	102
Approach at 1.85 km (1 nmi)	113	(370)	.166	2.69	(605)	80.4	102

AIRCRAFT ALONE NOISE (NO ENGINE NOISE)

Table 12 shows that the treated QCGAT engine is very quiet in comparison to current FAA rules. Since engine noise levels are forecasted to be low, it is desirable to determine whether aircraft alone noise could become the dominant flight noise contributor.

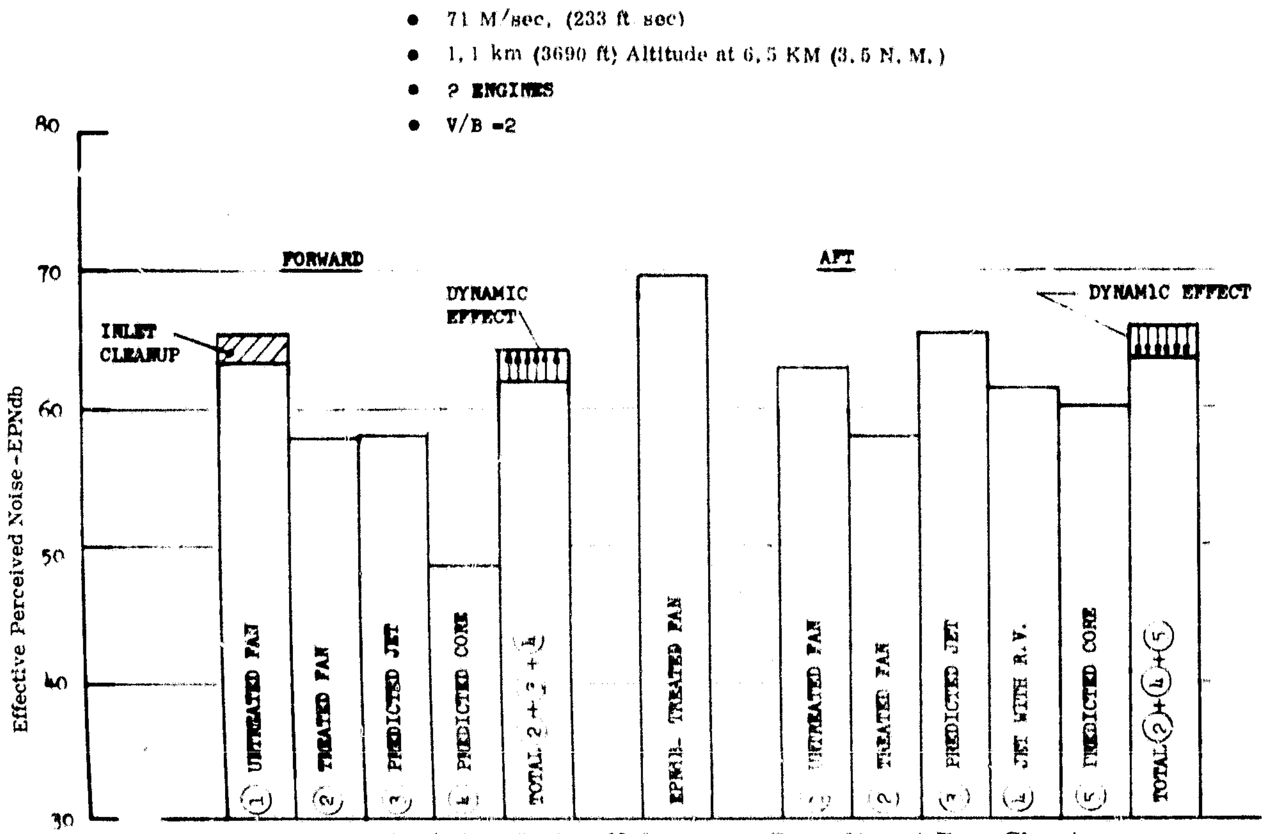


Figure 19. QCGAT at Takeoff Power - Constituent Bar Chart.

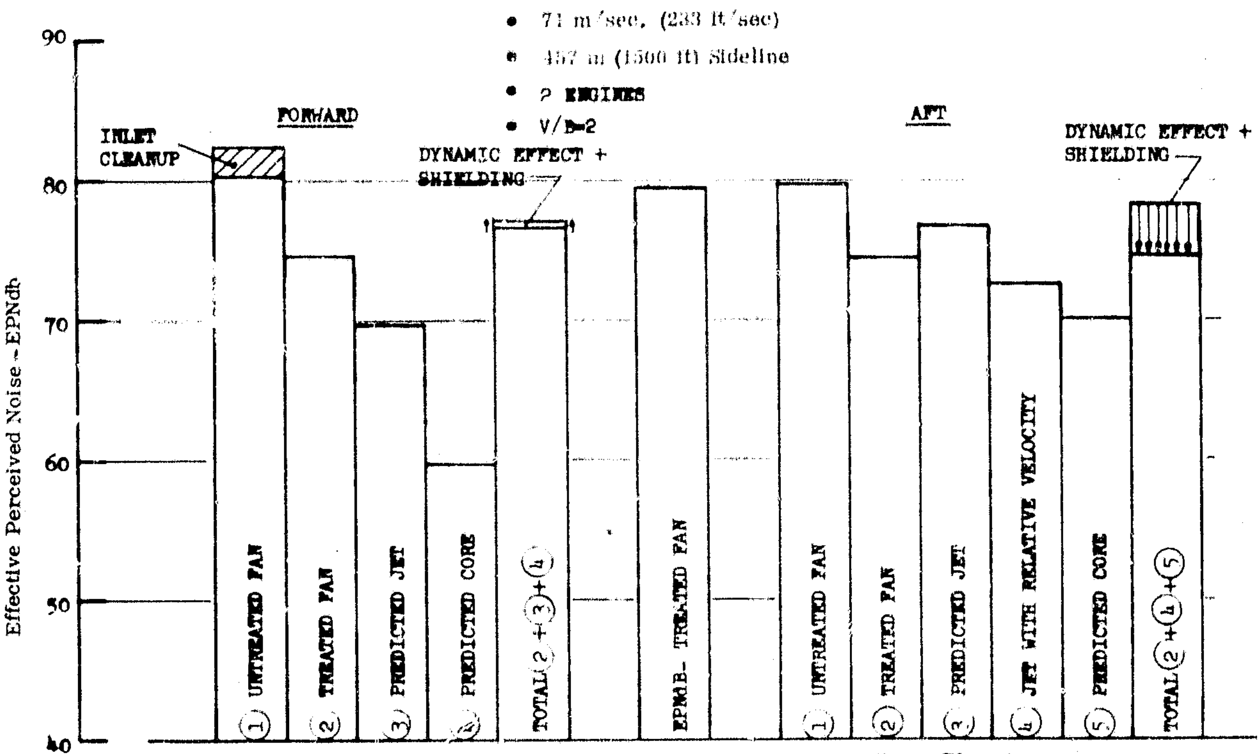


Figure 20. QCGAT at Sideline - Constituent Bar Chart.

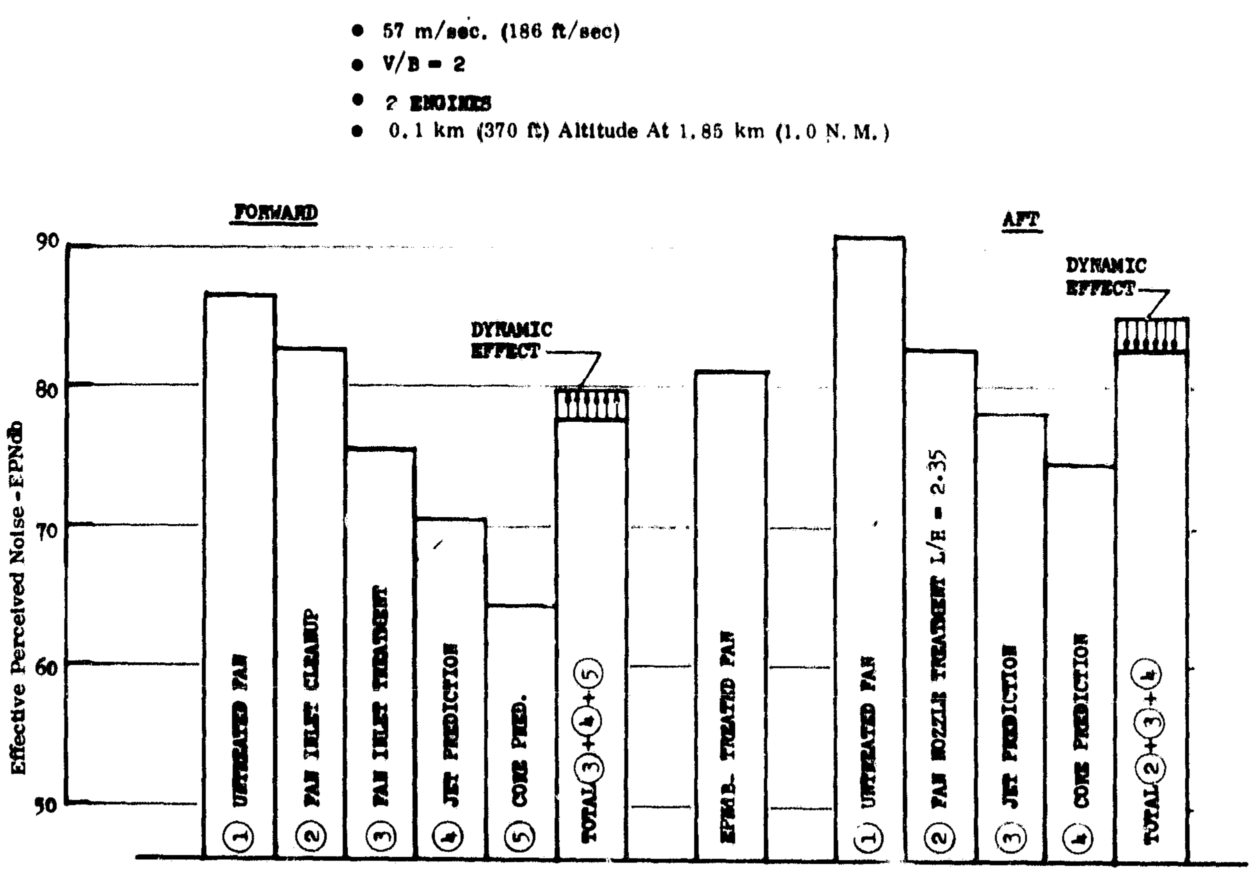


Figure 21. QCGAT at Approach Power - Constituent Bar Chart.

To calculate aircraft noise, a clean wing noise prediction model (ref. 1) was used to predict 1/3 octave spectra at various acoustic angles for the pass of a particular aircraft over the microphone. By assigning a typical flyover time history for the aircraft, EPNdB numbers were determined for a range of aircraft weights for the various FAA conditions.

The results are plotted in Figures 3 through 5, along with flight noise estimates of QCGAT and noise status of other aircraft. The figures also show the FAA current and proposed rules. It appears from these results that the T700 QCGAT engine may be sufficiently quiet that the aircraft alone noise will dominate the flight signature and prevent the achievement of lower radiated noise levels.

EXHAUST EMISSION CHARACTERISTICS

Combustion system emissions levels predicted for the QCGAT engine cycle are based on GE12 demonstrator and TF34 engine test data. The QCGAT combustion system is identical to the T700-GE-700 combustion system which is a developed and refined version of the GE12 combustion system.

The test data was used to derive emissions correlation equations for each of the four EPA cycle conditions: Idle, approach, climb, and takeoff, and for each of the three major emission pollutants: carbon monoxide, unburned hydrocarbons, and nitrogen oxides. These correlation equations are similar to those developed for the NASA Experimental Clean Combustor Program.

One NO_x correlation was developed to predict the NO_x emissions at the low power conditions (Idle and approach) and a separate correlation was used to predict the NO_x emissions at the high power conditions (takeoff and climb). In the same way, different correlations were developed to predict the CO emissions at these two extremes of power settings. However, the C_xH_y emissions were satisfactorily correlated with a single equation.

The T700-GE-700 combustor dome design includes a central fuel injector with concentric reverse swirlers around each injector. Since that design is very similar to the design of the current TF34 combustor dome, recent TF34 engine emission test data were used to develop new correlation equations for the emission indices. These equations were corrected for residence time differences and solved to predict the emission indices for the QCGAT engine. In general, the agreement with the GE12 data is very close. At the Idle condition for the QCGAT engine, the correlations developed from the GE12 test data predict a CO emission index of 42.9 g/kg (lb/1,000 lb) of fuel, and the correlations developed from the TF34 test data predict a CO level of 43.2 g/kg (lb/1,000 lb) of fuel.

The results of emissions calculations for the T700 QCGAT engine are given in Table 13. The thrust and time spent at Idle, approach, climb and takeoff are the EPA, Class Tl Standard landing and takeoff cycle. Table 13 shows that, currently, the CO emission is above the EPA Standard. However, unburned hydrocarbons and carbon monoxide emissions will be reduced by using the sector burning techniques which have been applied in the CF6 and F101 emissions reduction program. In sector burning tests on those engines, a 47% reduction in CO emissions and 87% reduction in C_xH_y emissions were achieved by sector burning. As Table 13 indicates, this technique can be expected to bring QCGAT emissions within the EPA Standards.

TABLE 13. ESTIMATED EFFECTS OF SECTOR BURNING

	EPA Parameters g/kNs (lb/1,000 lb. Thrust hr cycle)					
	CO		C_xH_y		NO_x	
Requirements	.266	(9.4)	.045	(1.6)	.105	(3.7)
Estimated Status	.340	(12.0)	.011	(.4)	.098	(3.5)
50% Sector Burning at Ground Idle	.187	(6.6)	.001	(.1)	.098	(3.5)

FAN DESIGN

AERODYNAMIC DESIGN

The QCGAT flowpath and single stage rotor, shown in Figure 22, are a 0.37 linear scale of the QCSEE - OTW design (ref. 2, 3, and 4). There are 28 rotor blades, 56 outlet guide vanes (OGVs) in the by-pass flowpath and the fan rotor to OGV spacing is 2 chords in order to reduce noise radiated by the fan to the aft quadrant as much as possible. To provide for structural loads and services, which are required, eight struts are located aft of the OGV. The aerodynamic design intent for the T700 QCGAT inlet, fan, by-pass duct, and fan-to-core passage is to make them a 0.37 linear scale of the General Electric QCSEE-OTW Design. The only major deviation is the by-pass OGV design which was changed by increasing the number of vanes for noise reduction and by providing separate structural struts aft of the vanes. See the Acoustical Characteristics section for a more complete discussion of the acoustic design.

A comparison between the important performance parameters at the QCSEE design point and at the QCGAT takeoff condition is:

Parameter	QCSEE Design Point	QCGAT Takeoff
Total fan flow	408 kg/sec (900 lb/sec)	50.0 kg/sec (110.3 lb/sec)
Pressure ratio - bypass flow	1.36	1.26
Pressure ratio - core flow	1.43	1.32
Bypass ratio	9.9	9.76
Corrected tip speed	358 m/sec (1175 ft/sec)	294 m/sec (964 ft/sec)

The fuel flow limit, discussed in the Performance section of this report causes the takeoff fan flow at sea level on a standard day to be lower than the scaled QCSEE flow which is $0.37^2 \times 408 = 55.8$ kg/s = 123 lb/sec.

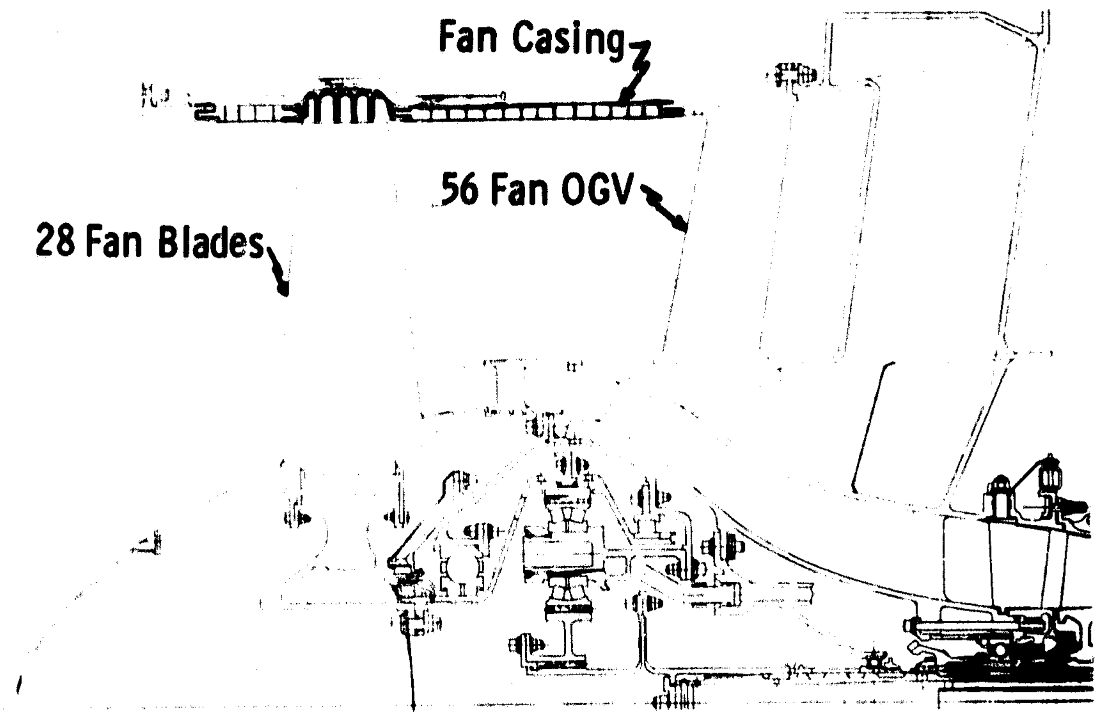


Figure 22. T700 QCGAT Composite Parts.

ROTOR MECHANICAL DESIGN

In the 28-blade composite fan design, the integral fan blade platforms made from 80% AS/20% Kevlar material weigh .204 kg (0.45 lb). If they were made of Ti-6Al-4V material, they would weigh .549 kg (1.21 lb). Full rotor weight for the composite design is 8.16 kg (18.66 lb), while a metal design would be 19.8 kg (43.74 lb) for the same number of blades, mainly because the disk is also heavier for titanium blades.

The primary advantages of organic matrix composites when compared with Ti-6Al-4V fan blades are lower cost and weight. Additional advantages of organic matrix blades are reduced weight of the supporting structures, reduced blade containment penalties, reduced secondary impact damage, low notch sensitivity, and high fatigue resistance.

Table 14 is a tabulation of the rotor mechanical design data. Figures 23 and 24 give the chord and tm/c distribution versus percent span. Figure 25 is the QCGAT Campbell Diagram.

The composite fan rotor blade design is based on successful designs and manufacturing techniques developed for larger engines. General Electric has fabricated and tested over 200 TF39, F103 and QCSEE composite blades. These blades are the result of a broad base material selection program which has been conducted by General Electric to keep abreast of new material developments in

TABLE 14. FAN BLADE SCALED FROM THE QCSEE OTW SCALE FACTOR 0.3718

Materials

Disk	Titanium (Ti 6-4)
Blades	Composite(80% AS/20% Kevlar)

Number of Blades		28				
Per Blade Centrifugal Load - kN (lb)	16.6	(3738)				
Design Point RPM		9630				
Fan Tip Diameter - cm (in.)	67.1	(26.4)				
Airfoil Length - cm (in.)	17.9	(7.06)				
Aspect Ratio		2.15				
Average Root Centrifugal Stress - N/cm^2 (psi)	4482	(6500)				
Chord - cm (in.) — Tip	9.80	(3.86)	Root	7.57	(2.98)	
tm/c — Tip		0.0265	Root		0.0850	
Solidity — Tip		1.3	Root		2.34	
Airfoil Weight - kg (lb)	0.0836	(0.1843)				
Blade Weight - kg (lb) with Platform	0.205	(0.4511)				
Disk Weight - kg (lb)	2.73	(6.03)				
Rotor Weight - kg (lb)	8.46	(18.66)				
Disk Diameter - cm (in.)	23.3	(9.16)	ID	26.9	(10.58)	OD
Disk Width - cm (in.)	6.35	(2.5)				

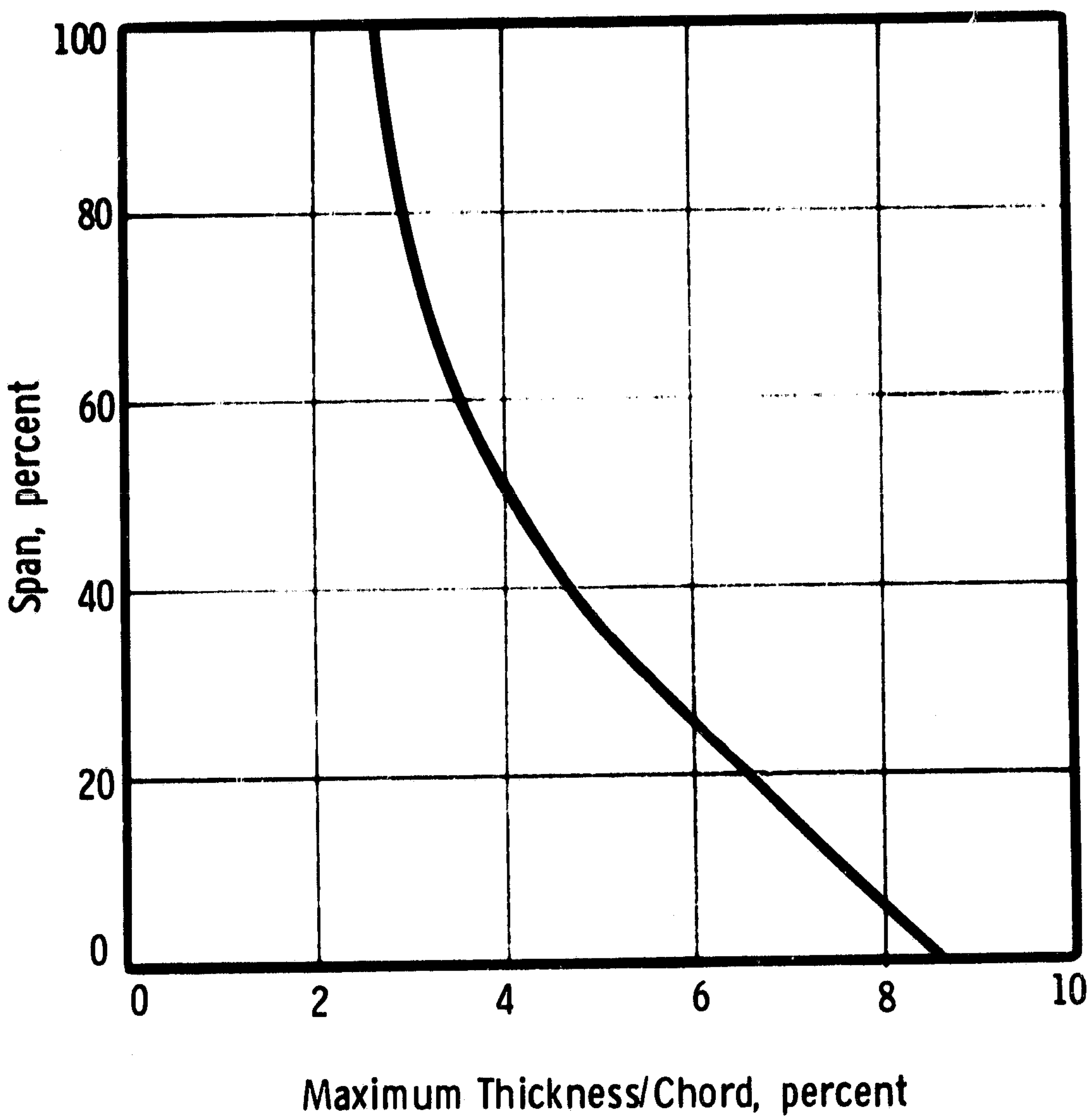


Figure 23. QCGAT Fan Blade Chord vs Span.

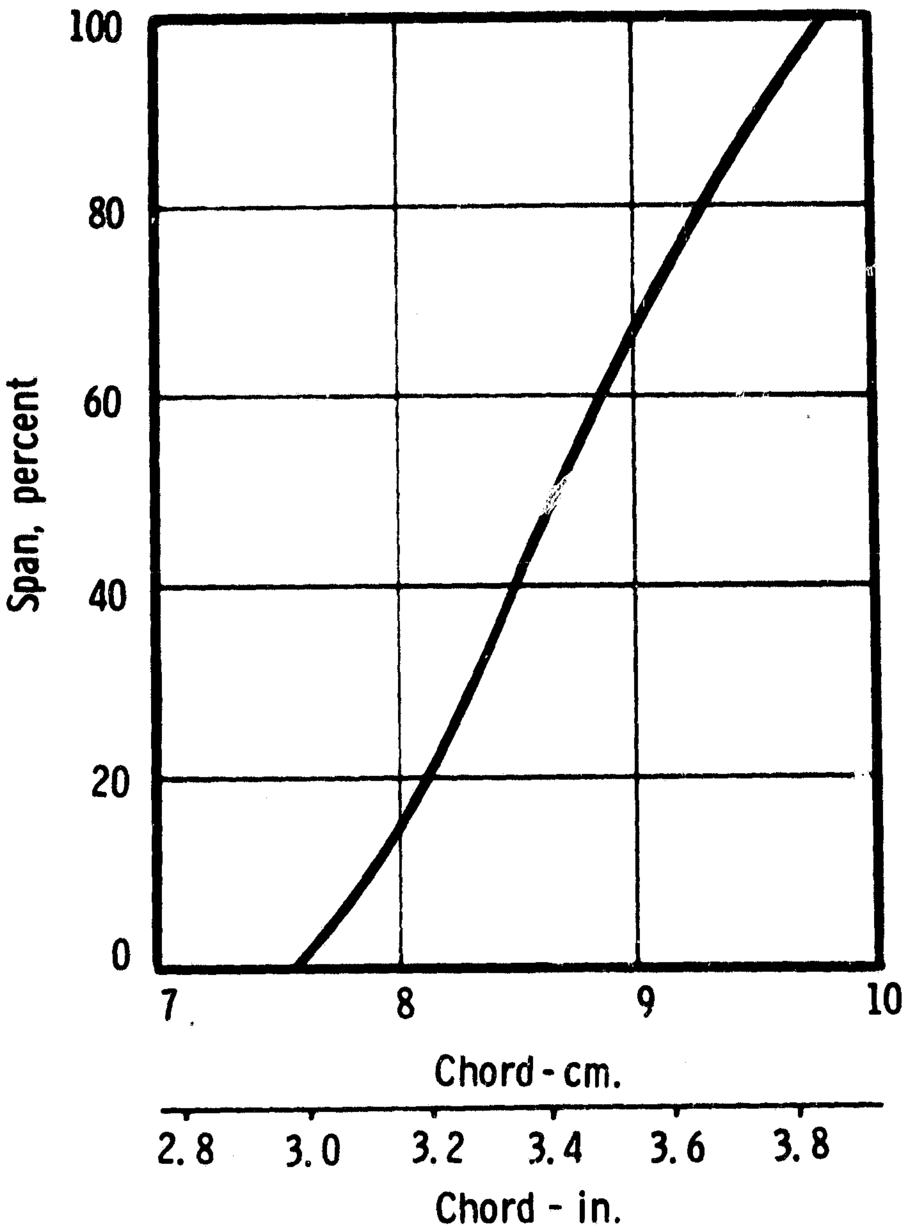


Figure 24. QCGAT Fan Blade Maximum Thickness/Chord vs Span.

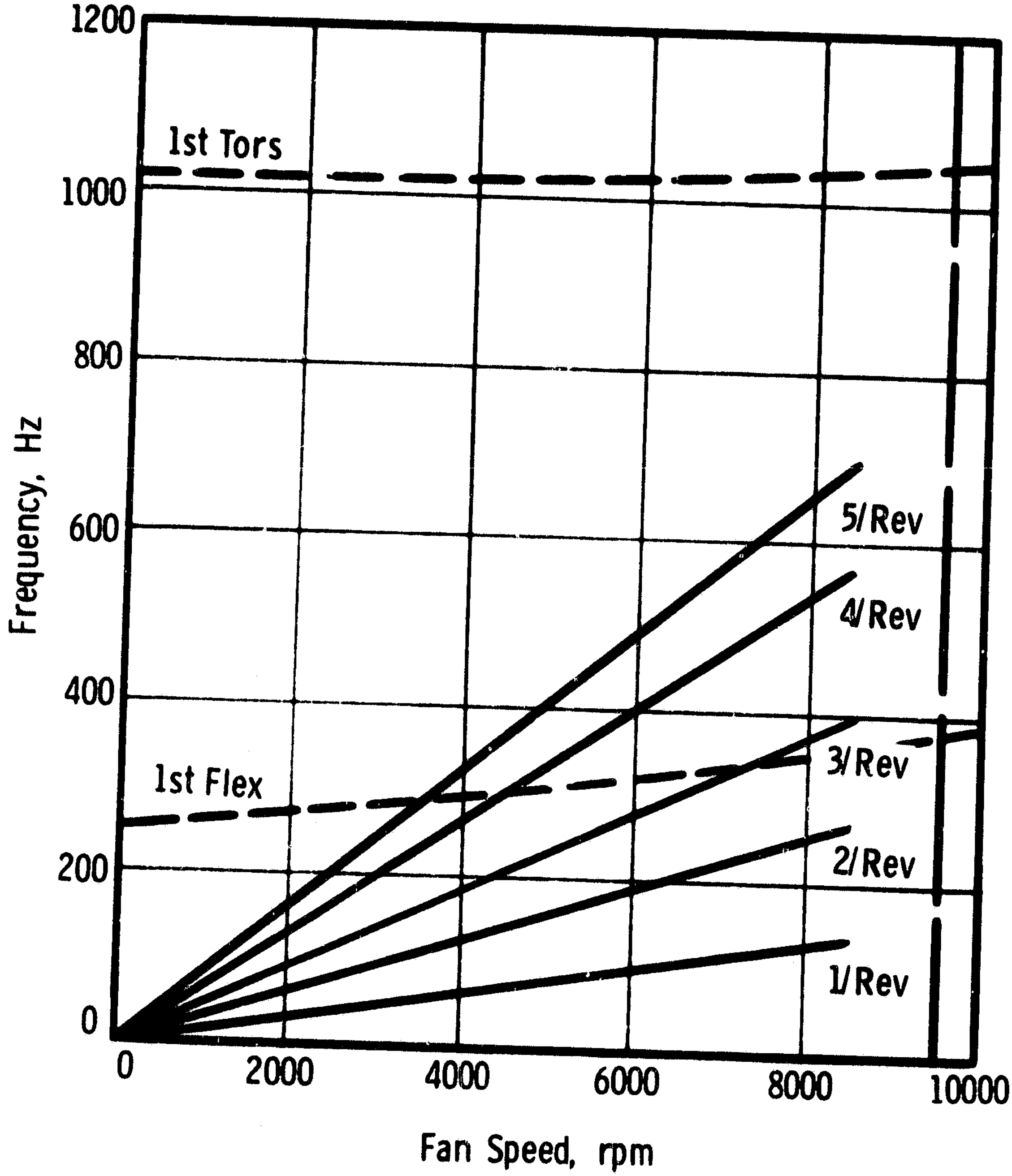


Figure 25. QCGAT Fan Blade Campbell Diagram.

the composites field. Also, extensive programs to develop design methods, analytical techniques, and testing procedures for composite materials have been conducted at General Electric.

STATIC STRUCTURE DESIGN

Figure 22 shows a cross section of the fan preliminary design, and Figure 26 shows components which are made of composite materials. The outer and inner bands and the vanes of the by-pass OGV are of graphite epoxy material. The OGV is made of eight sectors for ease of maintenance and to prevent local heavy damage to the OGV from causing replacement of the entire OGV section.

The blade containment structure consists of a laminate boron-graphite and epoxy shell encapsulating a continuous belt of Kevlar material. The design shown is for the composite blades, although an acceptable Kevlar containment structure for Titanium blades could be provided by increasing the Kevlar belt thickness. Table 15 gives the important design parameters of vane sectors, fan casing, and fan blades.

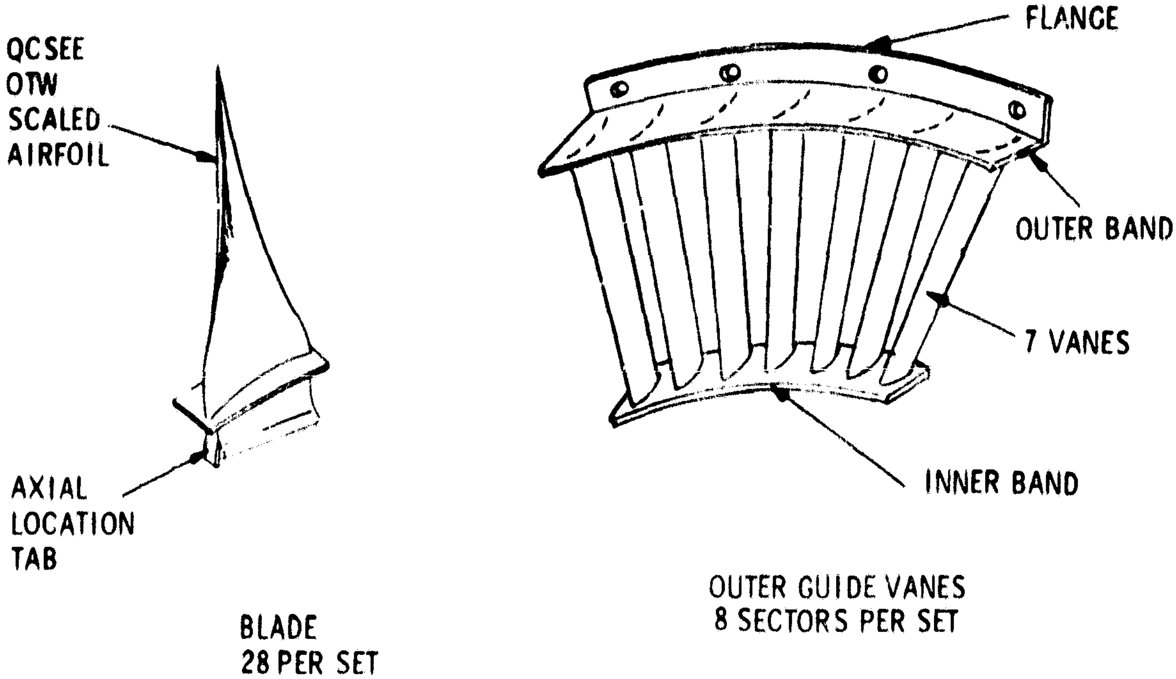


Figure 26. T700 QCGAT Composite Fan Parts.

TABLE 15. T700 QCGAT COMPOSITE PART CHARACTERISTICS

VANE SECTORS	SI Units	English Units
No. of Sectors	8	8
Vane Radial Height	13.7 cm	5.4 in.
No. of Vanes	56	
Material	Graphite/Epoxy	
Density	1.58 g/cm^3	.057 $lb/in.^3$
Weight	3.2 kg	7.0 lb
FAN CASING		
Inner Casing Dia. at Fan Blade	67.3 cm	26.5 in.
Overall Axial Length	36.8 cm	14.5 in.
Material	Graphite/Epoxy	
Weight	5.8 kg	12.7 lb
FAN BLADES		
No. of Blades	28	28
Material	80% AS/20% Kevlar	
Method of Attachment	Dovetail	
Weight (Total)	5.7 kg	12.6 lb

ENGINE LIFE ANALYSIS

Allowable operating life for an aircraft engine is dependent on the cumulative damage to the most critical component because of operation over long periods of time at high engine speeds and temperatures. The most critical component in the T700-GE-700 is the Stage 1 blade of the high-pressure turbine which is rupture limited.

An engine life analysis based on the takeoff ambient temperature distribution shown in Figure 27, was conducted on the T700 QCGAT engine. The figure includes an estimated annual average distribution curve, derived from airline information and other sources such as MIL-STD-210B, and the proposed QCGAT distribution, which is more conservative. Increasing ambient temperature (T_2) tends to increase turbine inlet temperature $T_{4.1}$ for a given thrust rating. It also increases the temperature of compressor discharge air, which provides cooling for the hot section components, and therefore, reduces the cooling effectiveness of the system. If not considered in the life analysis, the effects of high T_2 can cause premature failure of critical components. Table 16 shows the time spent in the important segments of four one-hour and two two-hour missions which were used in the engine life analysis. The most important segments are takeoff, climb, and cruise. Other segments do not contribute significantly to the damage sustained per flight.

Figure 28 shows the beneficial effect of flat rating on engine life. The calculations were based on the one-minute takeoff duration, one- and two-hour missions of Table 16. Figure 28 shows that engine life increases rapidly with decreasing T_2 at temperatures lower than approximately 30°C (86°F). In that region, $T_{4.1}$ is lowered by a fuel flow limit which has the effect of flat rating the engine below the turbine inlet temperature corresponding to a 30°C (86°F) day. Figures 29 and 30 show the effect of climb and cruise $T_{4.1}$ on life. For these figures, the engine is flat rated at takeoff and the climb and cruise turbine inlet temperatures were held constant for the mission. The effect of $T_{4.1}$ on life for missions with a 15-minute duration climb, with takeoff and cruise duration varied, indicates the strong effect of turbine inlet temperature on time-between-overhaul (TBO).

The results of the engine life analysis shown in Figures 28 through 30 indicate that 2700 to 3200 hours between overhauls are feasible for one-to-two hour missions if the engine is flat rated up to T_2 = 30°C (86°F) and takeoff durations are one minute or less. If the QCGAT aircraft is in use for 600 hours per year, the TBO is about five years. This engine life is less than the T700-GE-700 goal of 5,000 hours with 15% and 20% of the time at rated $T_{4.1}$ for the UTTAS and AAH aircraft, respectively. The shorter QCGAT engine life results from higher climb and cruise $T_{4.1}$ for the T700 QCGAT than for the T700-GE-700. In the tradeoff between engine performance and life, the improved performance due to higher $T_{4.1}$ results in a shorter but adequate five-year TBO.

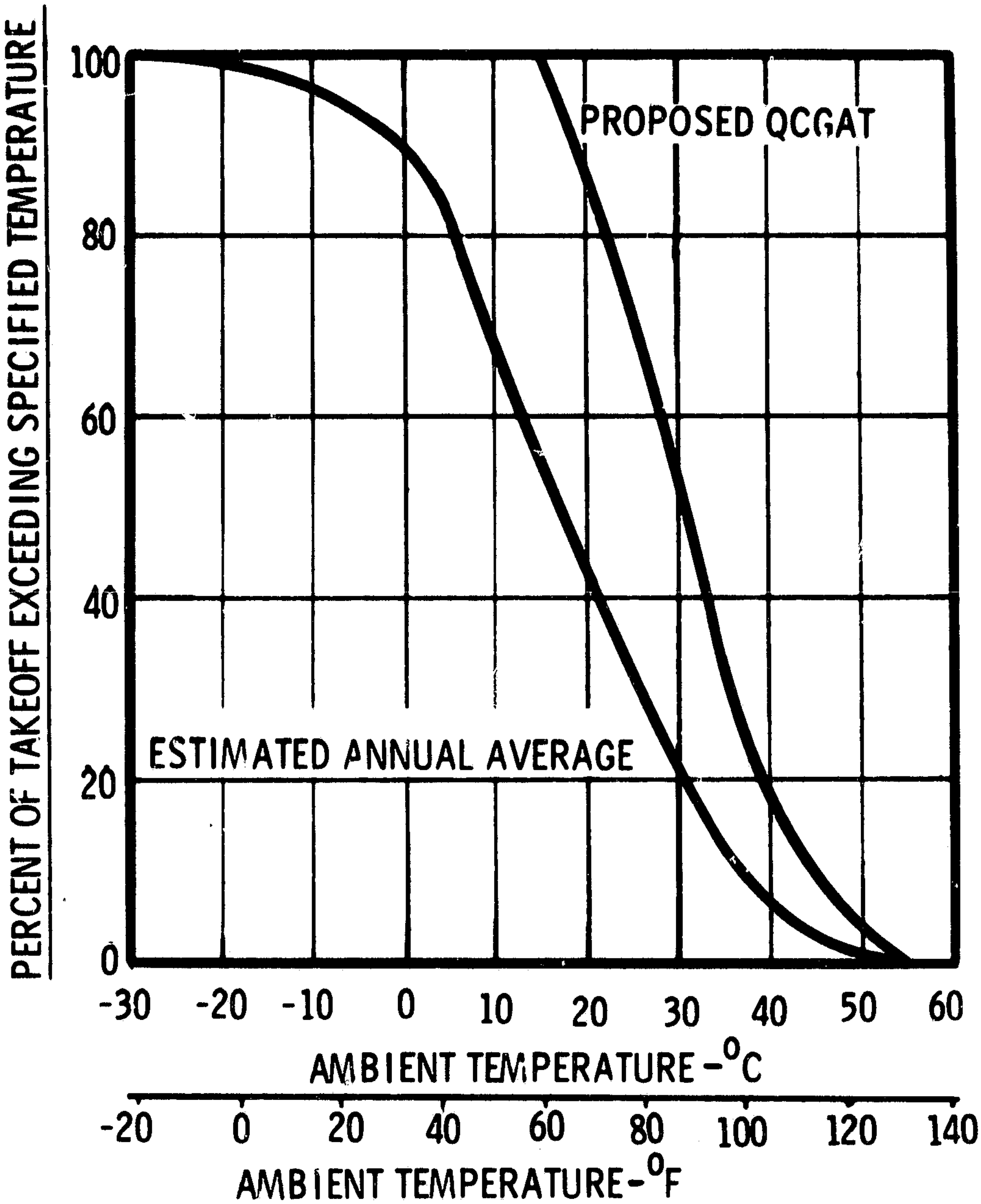


Figure 27. T700 QCGAT Takeoff Temperature Distribution.

TABLE 16. QCGAT MISSION

	Mission Duration - Minutes						Expected % Segment Time at Temperature		
							15°C	30°C	40°C
	60	60	60	60	120	120	(59° F)	(86° F)	(103° F)
Start and Idle	5	5	5	5	5	5	-	-	-
Accel - Takeoff	2	1.5	1	.5	1.0	.5	50	30	20
Max Climb	15	15	15	15	15	15	50	30	20
Max Cruise	20	20	20	20	80	80	-	-	-
Descent	15	15	15	15	15	15	-	-	-
Taxiing	3	3.5	4	4.5	4	4.5	-	-	-

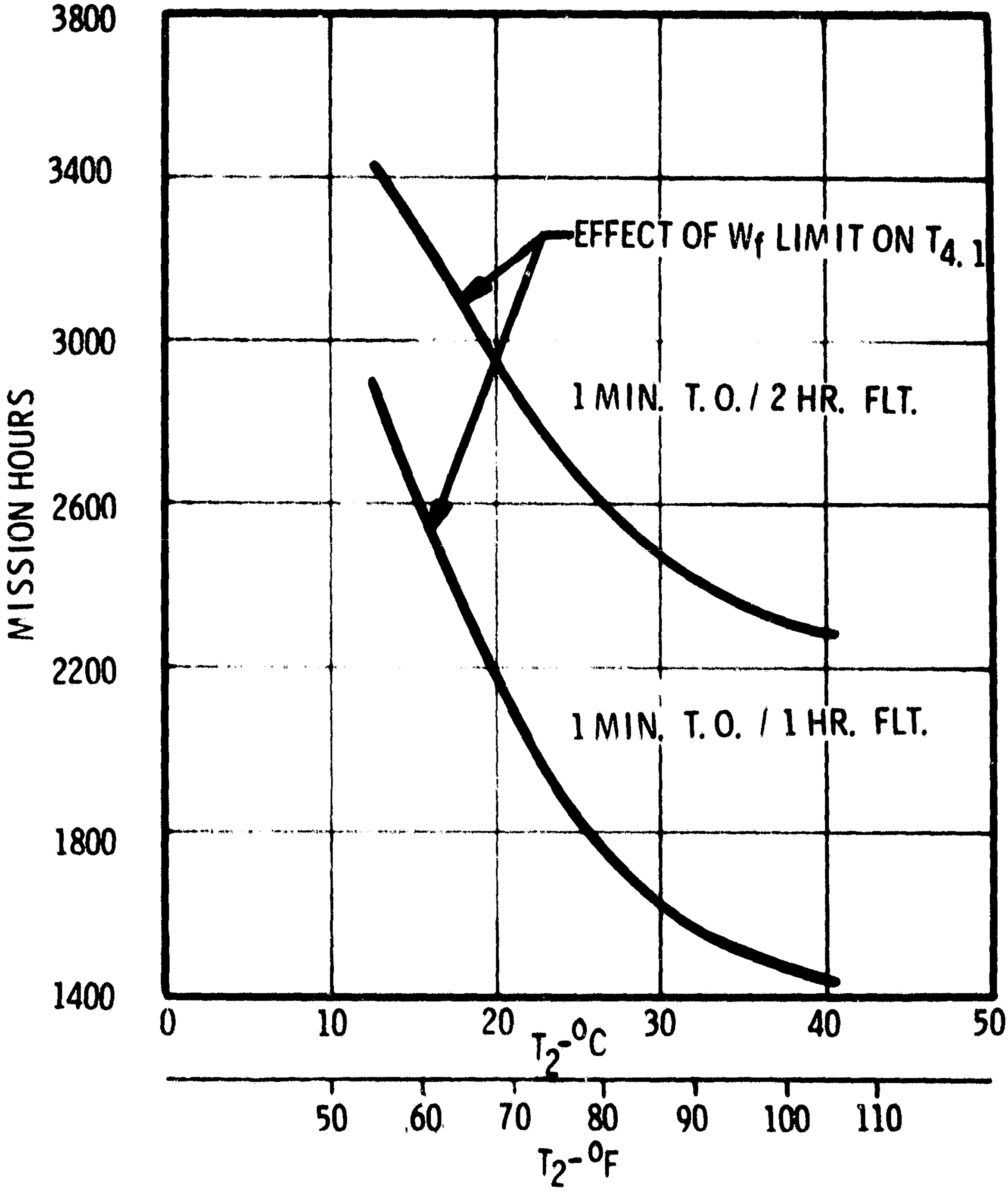


Figure 28. Flat Rating Effect on Mission Life.

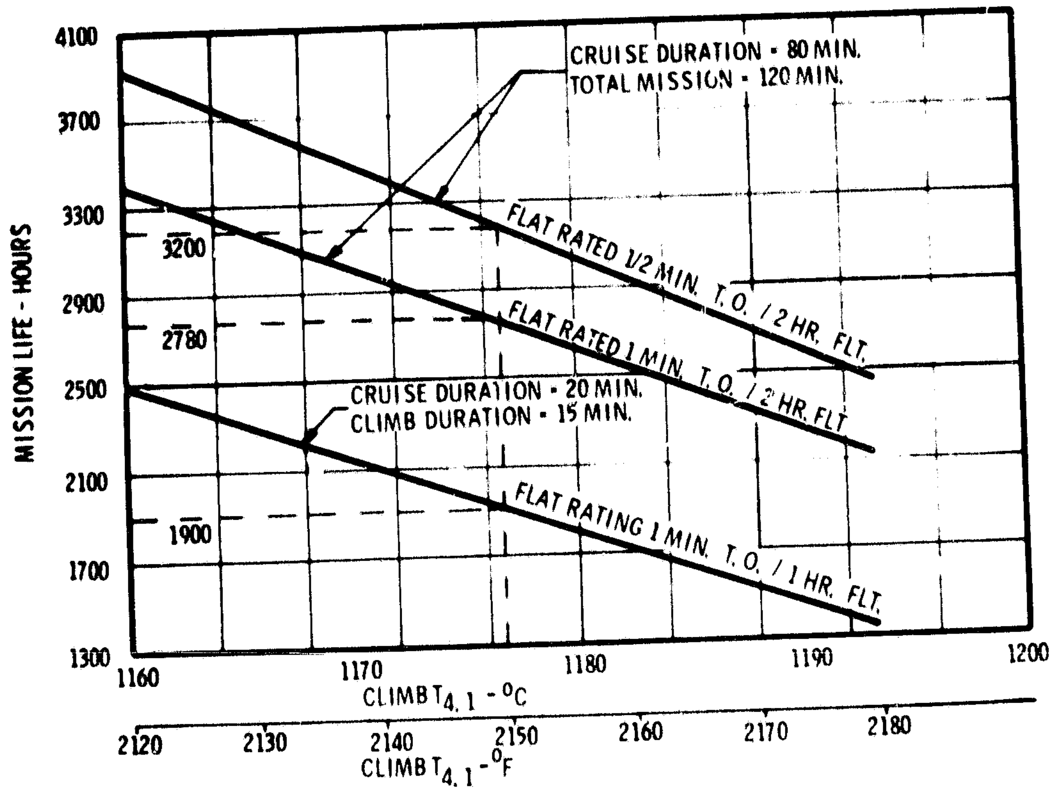


Figure 29. Mission Life as a Function of Climb $T_{4.1}$

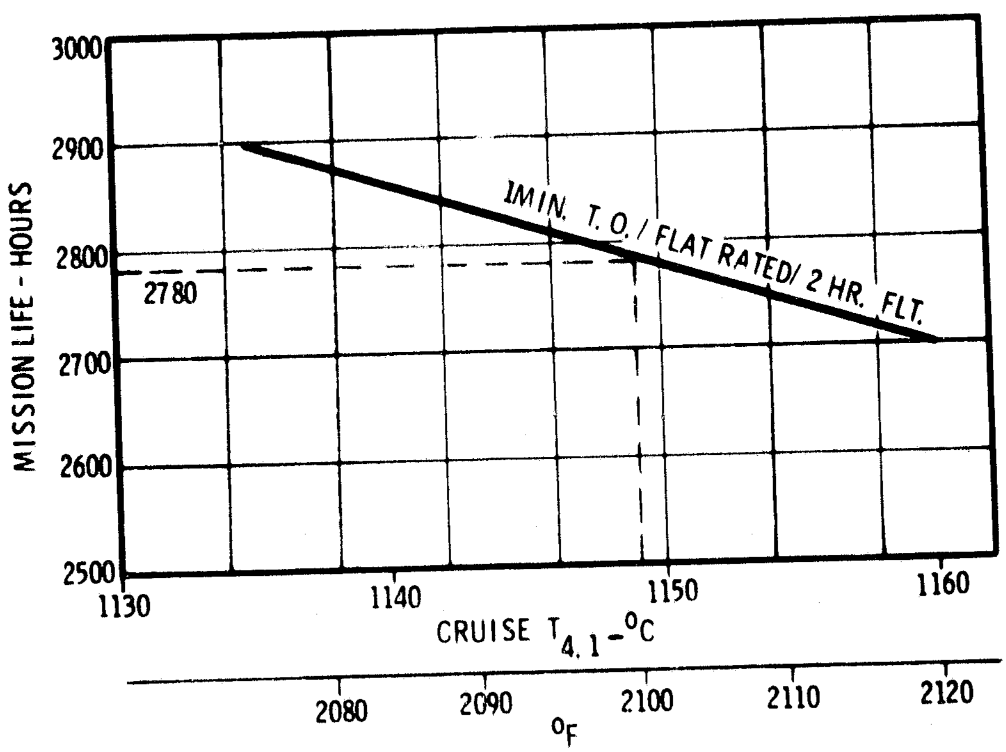


Figure 30. Mission Life vs Turbine Cruise Temperature.

FAN LOW-PRESSURE TURBINE DESIGN

A review of T700 cycle data and a preliminary aero design analysis were made to determine the degree of compatibility of the present T700-GE-700 LP turbine configuration with QCGAT LP turbine requirements. The conditions for the analysis were:

1. Preservation of the present T700 flow path dimensions.

2. Design point at 10.7 km (35,000 ft) altitude and 0.7 Mach number.

3. LP turbine speed of 22,000 RPM.

On this basis design and off design velocity diagram calculations were made to determine the changes required in LP turbine vane and blade geometry. The results were:

1. The present T700 flow path is satisfactory for the T700 QCGAT engine. However, discharge absolute Mach numbers are in the range of 0.4 to 0.5 which is somewhat higher than the T700 Mach numbers.

2. At 10.7 km (35,000 ft) altitude and 0.7 Mach number exit, swirl angle is about 10°. At takeoff, it is close to zero.

3. Turbine blading should be modified.

The new LP turbine blading will have increased solidity in the second stage and increased gas turning angles. The following is a pitch line turning angle comparison:

	T700-GE-700 Engine (deg.)	QCGAT Engine (deg.)
First Nozzle	60.1	62.2
First Rotor	90.1	103.5
Second Nozzle	82.7	90.3
Second Rotor	80.6	81.4

This design increases blade loading by 25% and energy output by 36%. The increased output costs about one point in efficiency.

The gas exit angles, turning angles, loadings (Zweifel Numbers), and solidities at the more highly loaded rotor-blade root and nozzle-vane tip locations are given in Table 17. The comparison with the T700-GE-700 design indicates that changes in blade geometry and in second stage solidities leads to T700-QCGAT loadings which are similar to those of the T700-GE-700 LP turbine.

TABLE 17. COMPARISON OF QCGAT AND T700 LP TURBINE DESIGNS

		Nozzle N1	Rotor R1	Nozzle N2	Rotor R2
Radial Location for Max Load		Tip	Root	Tip	Root
Radius	cm	13.06	10.54	16.45	10.92
	(in)	(1.14)	(4.15)	(6.475)	(4.3)
Axial Chord	cm	1.90	2.03	2.54	1.90
	(in)	(.75)	(.80)	(1.0)	(.75)
		T700 QCGAT			
Gas Exit Angle		59	59	53.6	52.0
Turning Angle		59	113.9	82.6	99.8
Number of blades		48	50	62	56
Design Loading (Zweifel Number)		.80	1.07	.902	1.16
Solidity*		1.114	1.534	1.474	1.554
		T700-GE-700			
Gas Exit Angle		60.1	55.27	62.4	53.28
Turning Angle		60.1	95.63	84.6	94.48
Number of blades		48	50	50	50
Design Loading (Zweifel Number)		.828	1.098	.895	1.310
Solidity*		1.114	1.534	1.229	1.388

*Solidity = Axial chord/pitch

GEARING

FAN REDUCTION GEAR

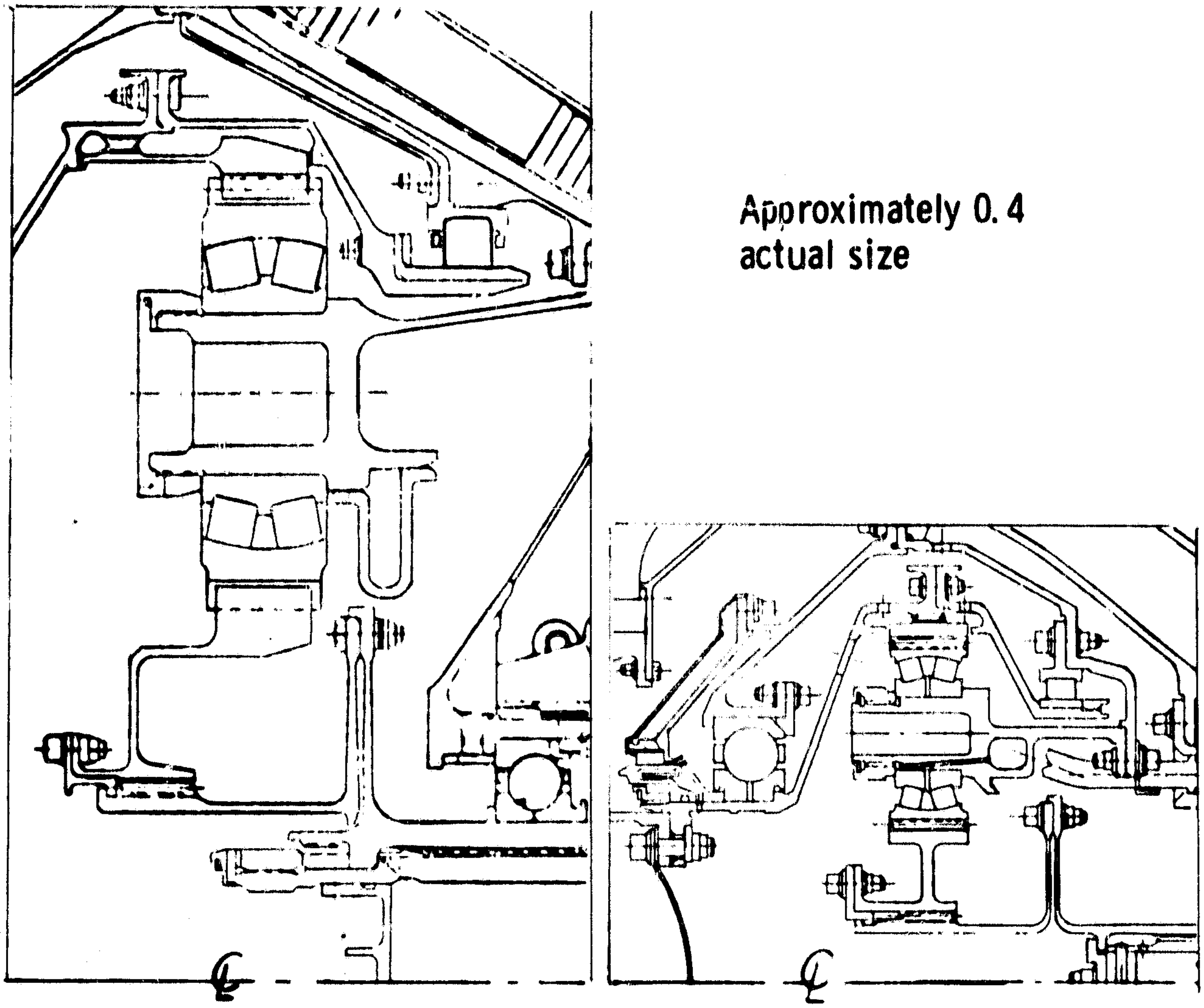
The epicyclic speed reduction gearset which drives the fan is of the star configuration. It is similar in layout and arrangement to the QCSEE reduction gear with which it is shown in Figure 31. In the QCGAT application, a unit which has five branches has been chosen. The physical size of the gearset is governed by the size of the spherical double row roller bearings. Calculations indicate that a smaller bearing of this type would suffice. However, the bearing shown is the smallest size available in this country due to the limitations imposed by existing tooling. The gearset is envisioned as a bench assembly which is positioned into the engine forward frame during the final stages of engine assembly. The machinery concept and material selection provide a reliable flightworthy unit capable of being put into immediate production. Table 18 gives the important design parameters of the reduction gear whose design oil temperature is 116°C(245°F).

The gearset is driven by the LP turbine shaft by means of an adaptor shaft which contains a flexible coupling. The flexible coupling provides for radial flexibility to assure free-floating of the sun gear for proper load-sharing during operation. A simple locking means positions the sun gear axially for tracking, but does not otherwise offer restraint. The sun gear is driven by a spline coupling at the forward end of the adaptor shaft. The externally splined half of this coupling has a slight helix angle to account for shaft twisting and is lightly crowned for alignment under load and flexibility.

The free-floating sun gear meshes with and drives five star gears which rotate about fixed axes, serving as idlers between the sun gear and the ring gear. The star gear teeth are machined into and are integral with the outer races of the spherical double row roller bearings. This design concept has been applied successfully in the GE T64 turboprop planetary speed reduction gearset.

The ring or annulus gear is driven by the star gears and is free to float radially and axially within mechanical limits. An external spline at the center of its face and along its outer diameter engages a mating spline in the ring gear carrier. This spline coupling is designed with sufficient radial tooth proportions and clearance to allow for flexing of the ring gear during operation.

The star gear carrier is a machined casting which incorporates a cored lube oil manifold. It has five bearing posts to which the spherical double row roller bearings are fitted. The bearing support posts will be misaligned so that the sun star and star ring gear meshes are in alignment at operational load levels.



QCSEE REDUCTION GEAR

T700 QCGAT REDUCTION GEAR

Figure 31. Fan Reduction Gear Comparison.

TABLE 18. FAN REDUCTION GEAR DATA

	SUN		STAR		RING	
Pitch Diameter - cm (in.)	10.9	(4.30)	6.2	(2.45)	23.4	(9.2)
Number of Teeth	86		49		184	
Face Width - cm (in.)	2.54	(1.0)	2.54	(1.0)	2.54	(1.0)
Speed - rpm	20,600		36,100		9,600	
Material	AMS 6265		AMS 6265		AMS 6512	
Helix Angle	0		0		0	
Face Diameter Ratio	.233		.408		.109	
Pitch Line Velocity - m/s (ft/min)			117.6	(23159.2)		
Overall Gear Reduction	2.14					

	SUN/STAR		PLANET/RING	
K-Factor	347		162	
Unit Load of Face Width - N/cm (lb/in.)	19,300	(11,000)	19,300	(11,000)
Hertz Stress - N/cm^2 ($lb/in.^2$)	74,466	(108,000)	51,713	(75,000)
Root Stress - N/cm^2 ($lb/in.^2$)	16,548/24,822 (24,000/36,000)		22,754/>15,859 (33,000/>23,000)	
Contact Ratio	1.79		1.91	
Temperature Rise - °C (°F)	6.5	(20.2)	9.2	(15.4)
Tangential Driving Load - N (lb)	2,410	(541)	2,410	(541)

*Design conditions were:

Gear loading - 141 kW (1900 hp)
Speed - 20,600 rpm
Heat rejection - 1.55 kW (53,200 BTU/hr)

Thus misalignment stresses and edge or corner load conditions exist only at low nonoperational torque levels and do not exist during operational modes when stresses are mainly due to drive loads. Also, the bearings come into alignment as load and speed increase. Thus, axial slipping is held to minimum during operation and allowed to go to a maximum at startup and coast down. This increases efficiency and bearing life.

The ring gear carrier also serves as the fan shaft. The carrier spans the epicyclic gear assembly and is driven by the ring gear through a spline coupling which is forward of its midflange. The carrier transmits the drive torque while supporting the fan induced thrust, gyro, LP, and radial loads. Bearings at each end support the carrier in the static casing structure which is attached to the engine forward frame.

Finite element computer programs are available to analyze the star gear carrier, star gear-bearing outer races, the ring gear carrier, and the housing or casing from a stress deflection viewpoint so as to allow the design to proceed with choices based upon engineering prediction.

Lubrication will be furnished by either MIL-L-7808 or MIL-L-23699 synthetic oil. The present concept is to lubricate the bearings through their inner races, taking advantage of the centrifugal fields to disperse the lubricant, and to oil spray both the sun-star and star-ring meshes. Oil scavenging and the use of and the positioning of appropriate shrouds to reduce windage will be studied.

POWER TAKEOFF (PTO)

The power takeoff which drives the accessory gearbox (AGB) will be a modification of that presently employed in the T700-GE-700 engines. A new design will be required because of a change in shaft angle. It is anticipated that the radial bevel gearshaft bearing and shimming of the present T700 can be utilized. Therefore, design and hardware changes will be restricted to the bevel gears and support structure. The overall location and mounting means of the T700-GE-100 will be retained.

ACCESSORY GEARBOX (AGB)

The accessory gearbox which is shown in Figure 32 located below the engine has been configured to drive five accessory pads shown in Figure 33. On the forward side are the starter-generator, alternator, and hydraulic pump. On the rear side are the main fuel control (MFC) and the lube and scavenge pump. The hydraulic pump and the lube and scavenge pump are driven by the same gearshaft. Pad speeds for the various accessories are the same as those now in use on the T700-GE-700 AGB.

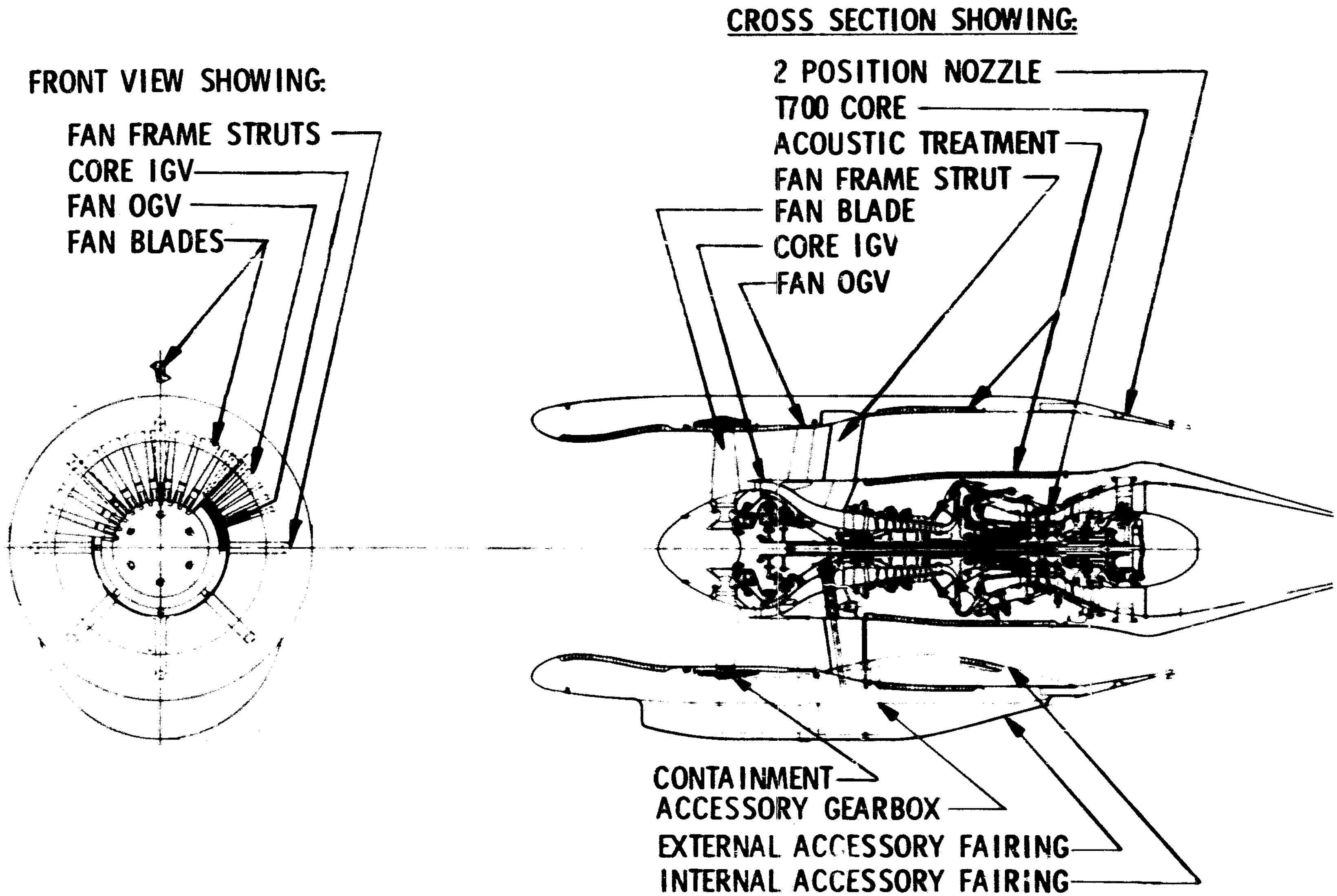


Figure 32. T700 QCGAT Nacelle Section Showing Accessory Gearbox.

Input to and output from the accessory gearbox is afforded by a bevel pinion gearshaft which engages the PTO through the radial drive shaft. The bevel pinion mates with a bevel gear whose gearshaft also mounts a spur gear idler and is parallel to all of the other gearshafts in the gearbox. The bevel gearshaft forward end terminates in the starter-generator pad. The starter drive train components which are subjected to the heavy start torque levels are therefore at a minimum.

The remainder of the gearing consists of parallel axis spur gears and shafts common to AGB design practices with idlers where required for spacing and/or proper direction of rotation.

The gearbox is of "watch case" construction. The MFC and starter-generator are attached by Marmon clamps. The other accessories are mounted to their respective pads by means of bolts or studs and locknuts.

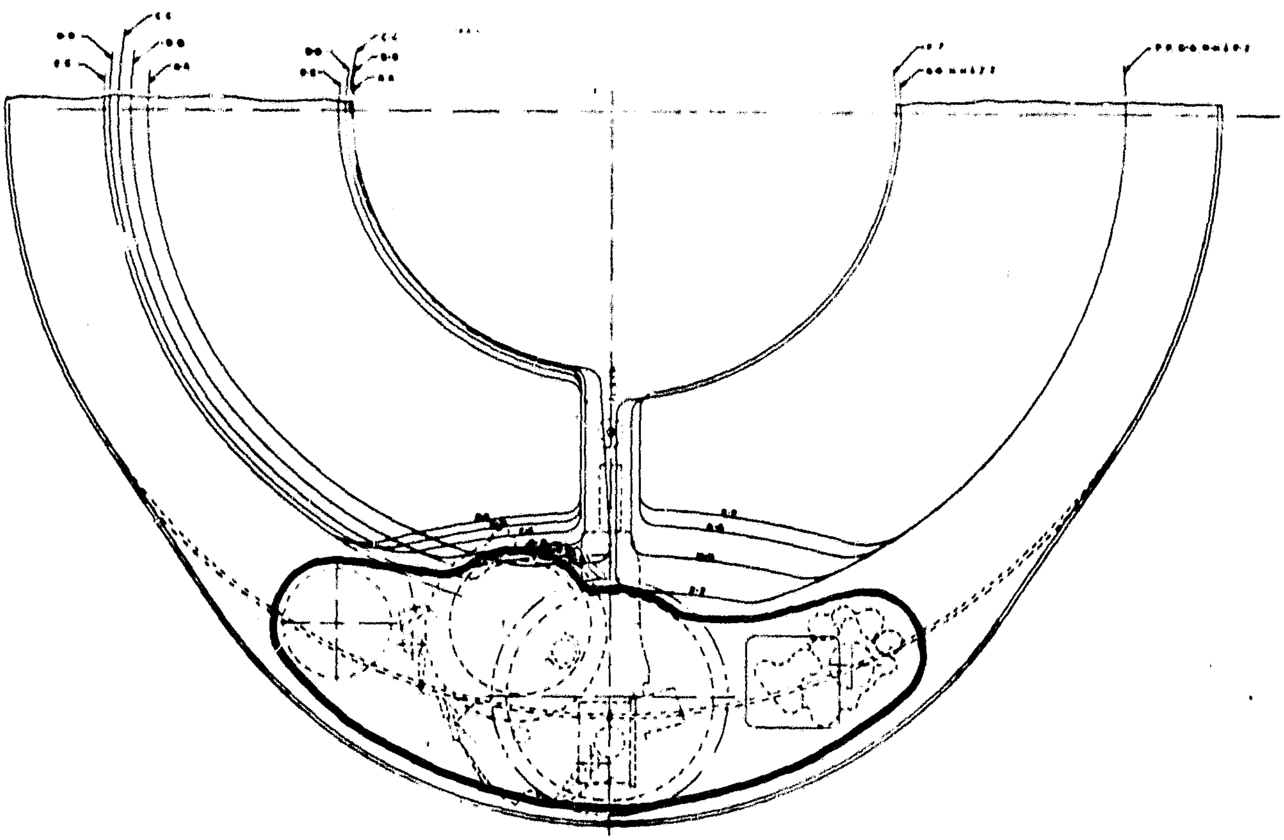


Figure 33. T700 QCGAT Nacelle Cross Section.

QCGAT LUBE SYSTEM

The lube system for the QCGAT engine is essentially the same as that of the T700-GE-700 engine, except that additional oil flow and scavenging are provided for the fan reduction gear. Figure 34 shows the oil tank cross section and Figure 35 is a schematic of the lube system.

The T700 inlet particle separator, which acts as an air-oil cooler, has been removed for the turbofan and is replaced by a fan, reduction gear and front oil sump. Therefore, the lube system of the T700-GE-700 engine must be modified for the QCGAT engine.

The T700-GE-700 concept of a front frame structure with integral oil tank and air-oil cooling capability has been retained for the QCGAT engine. The oil tank is integral with the fan frame and consists of two annular cavities connected by 7 of the 8 frame struts. In this way, the entire frame structure operates at relatively uniform temperature and thermal induced stresses are low.

The surfaces of the tank are exposed to fan discharge and core engine inlet air streams and act as an air-oil cooler. Figure 36 shows a schematic of the fan frame and oil tank.

Analysis of the heat rejection requirements of the lube system were made by assuming several values of power loss in the reduction gear (.8%, 1.1% and 1.5% of transmitted power) and combining with the known heat rejection of the T700-GE-700. Takeoff and various flight conditions were considered to determine sensitivities of reduction gear loss and of the rejection capabilities of the fan frame surfaces. Fins on the surfaces in the fan discharge stream were also considered in order to increase heat rejection to the fan discharge stream and to reduce the temperature increase of the core engine inlet air stream.

Fins have not been included in the design described here in order to reduce complexity and cost of the frame, but do provide a means to improve engine performance in the future.

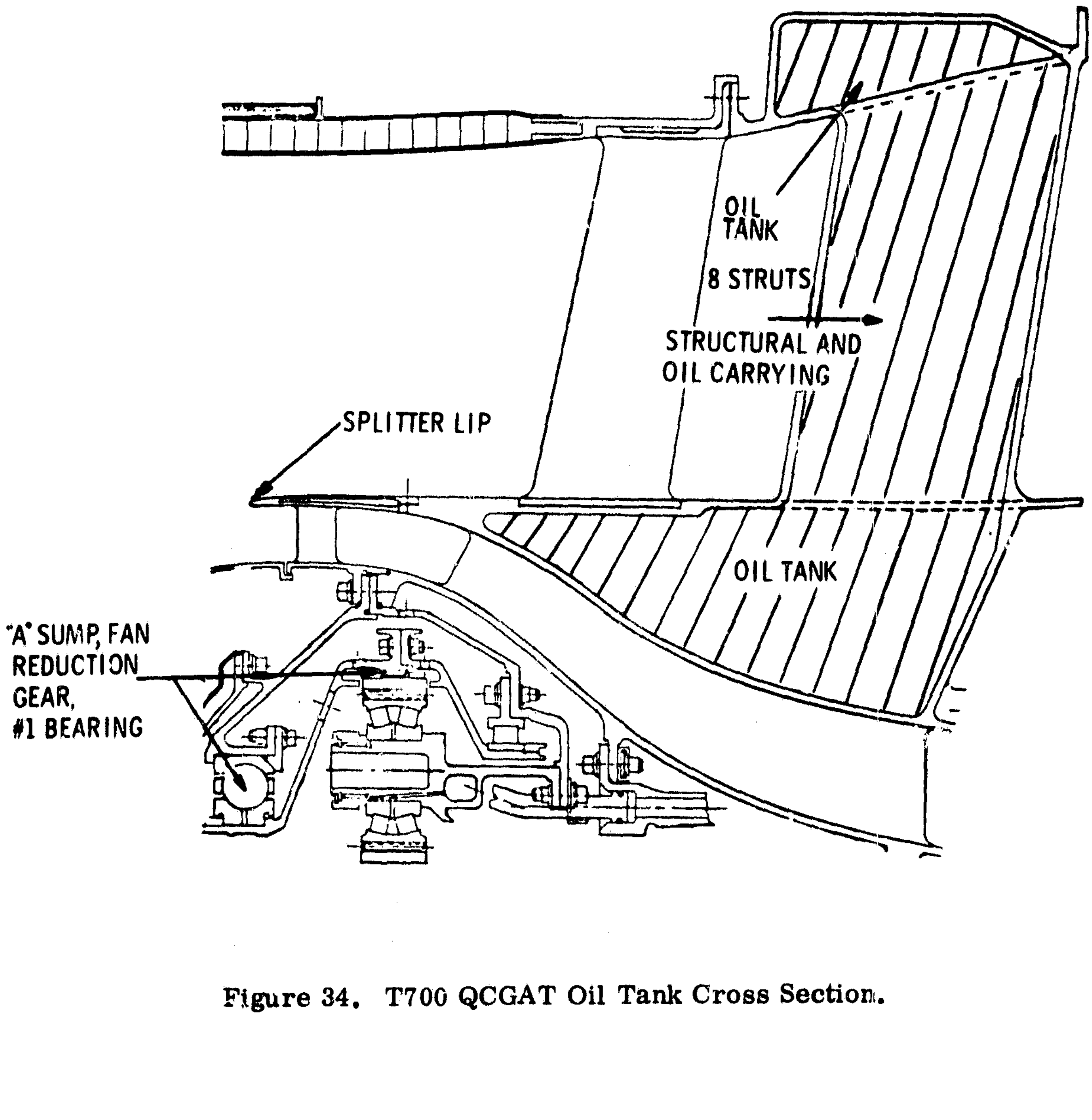


Figure 34. T700 QCGAT Oil Tank Cross Section.

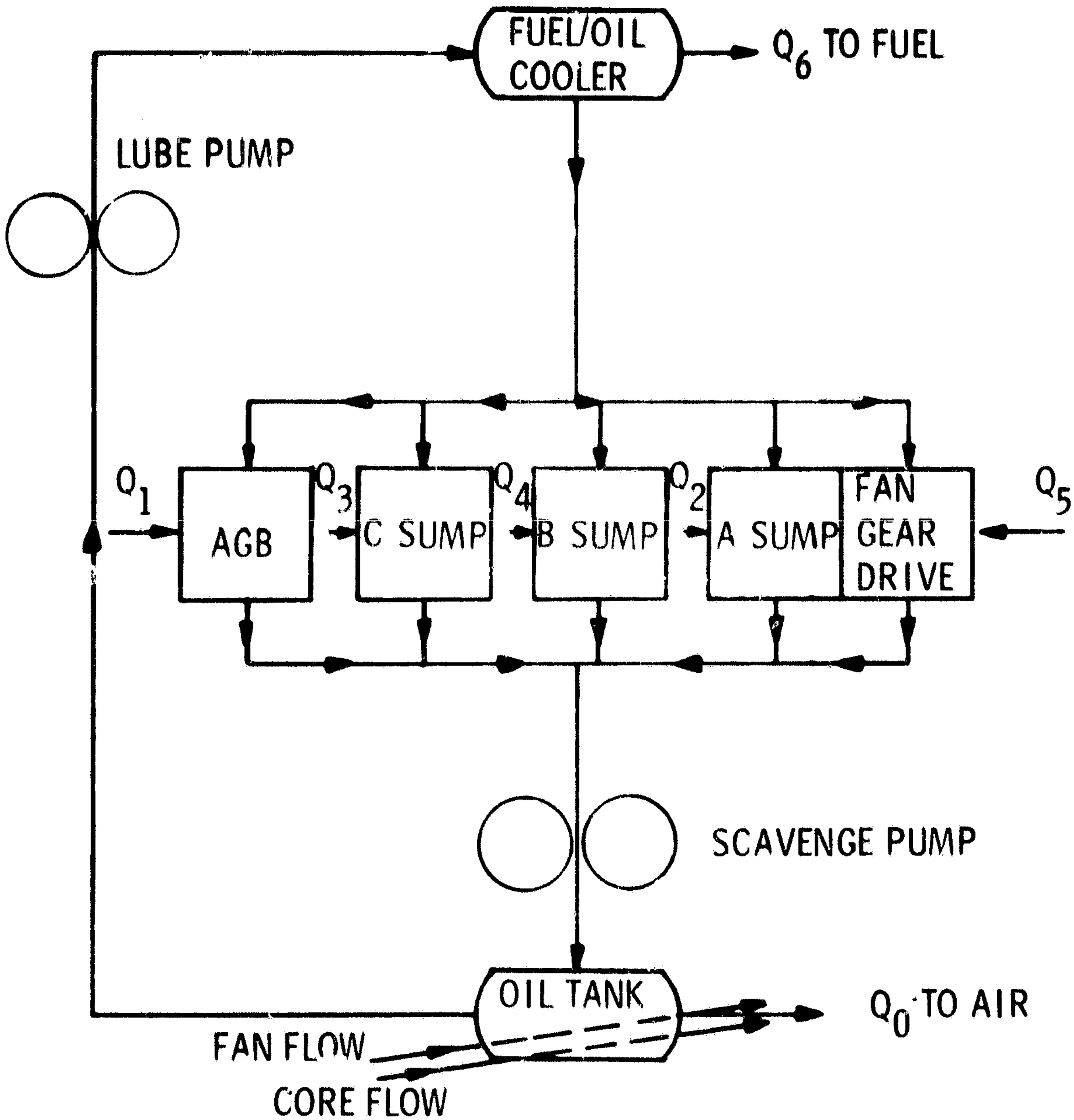


Figure 35. T700 QCGAT Engine Lube System Schematic.

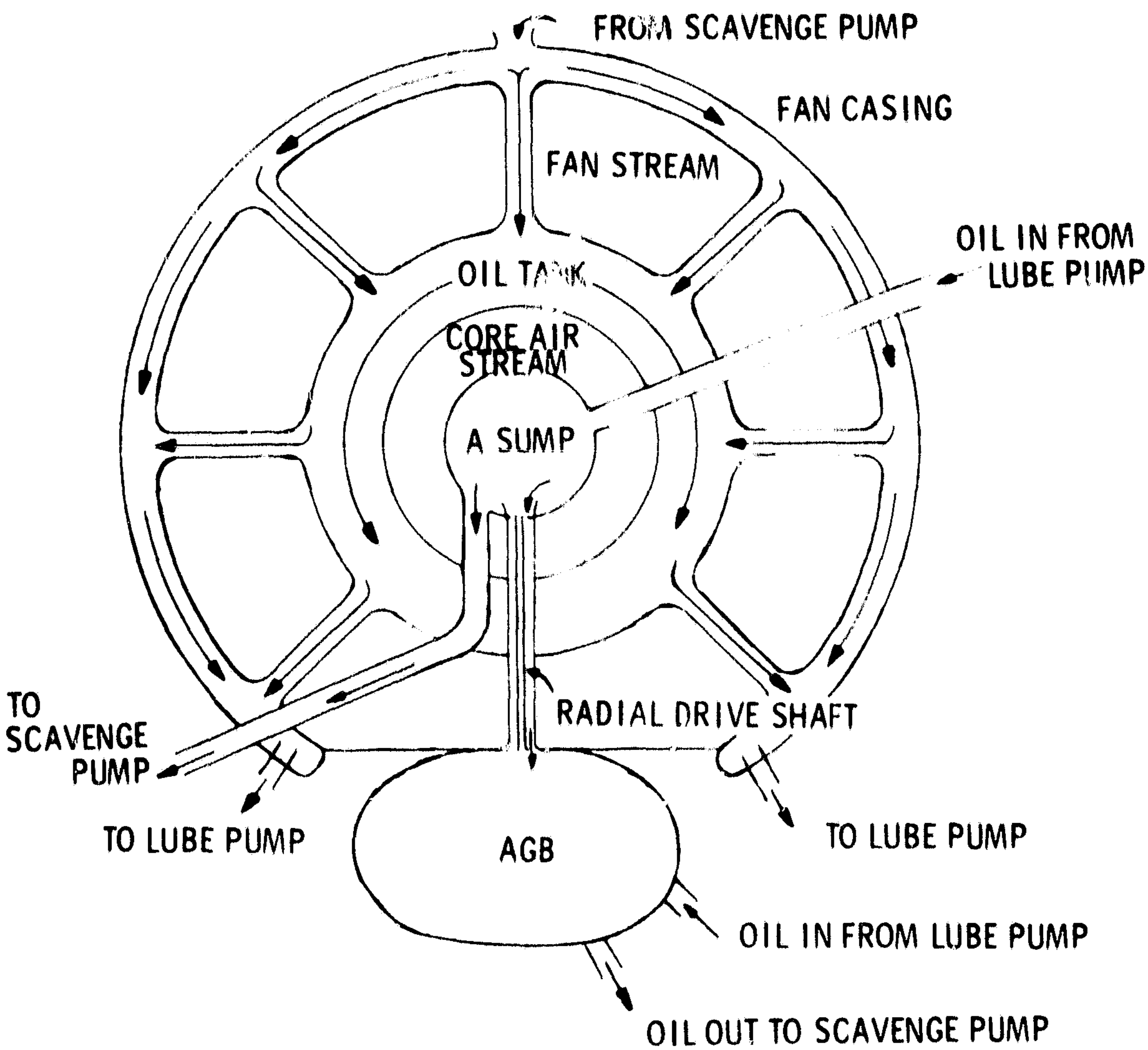


Figure 36. T700 QCGAT Fan Frame Lube System Schematic.

The results of these analyses are shown in Figures 37 through 41.

Figure 37 shows that oil temperature increases with rising air and fuel temperatures. Figure 38 shows that the reduction gearbox provides an increasing percentage of the total heat rejected to the oil as power increases. Gearbox efficiency is most crucial at higher engine speeds - and is practically insignificant at Idle. Figure 39 shows the effect of air density and ambient temperature, both of which fall off with altitude and affect engine power. For the fuel, temperature is the dominant effect, as the lowered initial temperature more than offsets the increasing flow of heat from the oil. Figure 40 shows that fins improve the efficiency of the air-oil heat exchanger. By increasing the heat transferred at a given temperature, fins lower oil temperatures effectively. Without fins the maximum cooled oil temperature is about 240°F. All of the gearing is designed for that temperature.

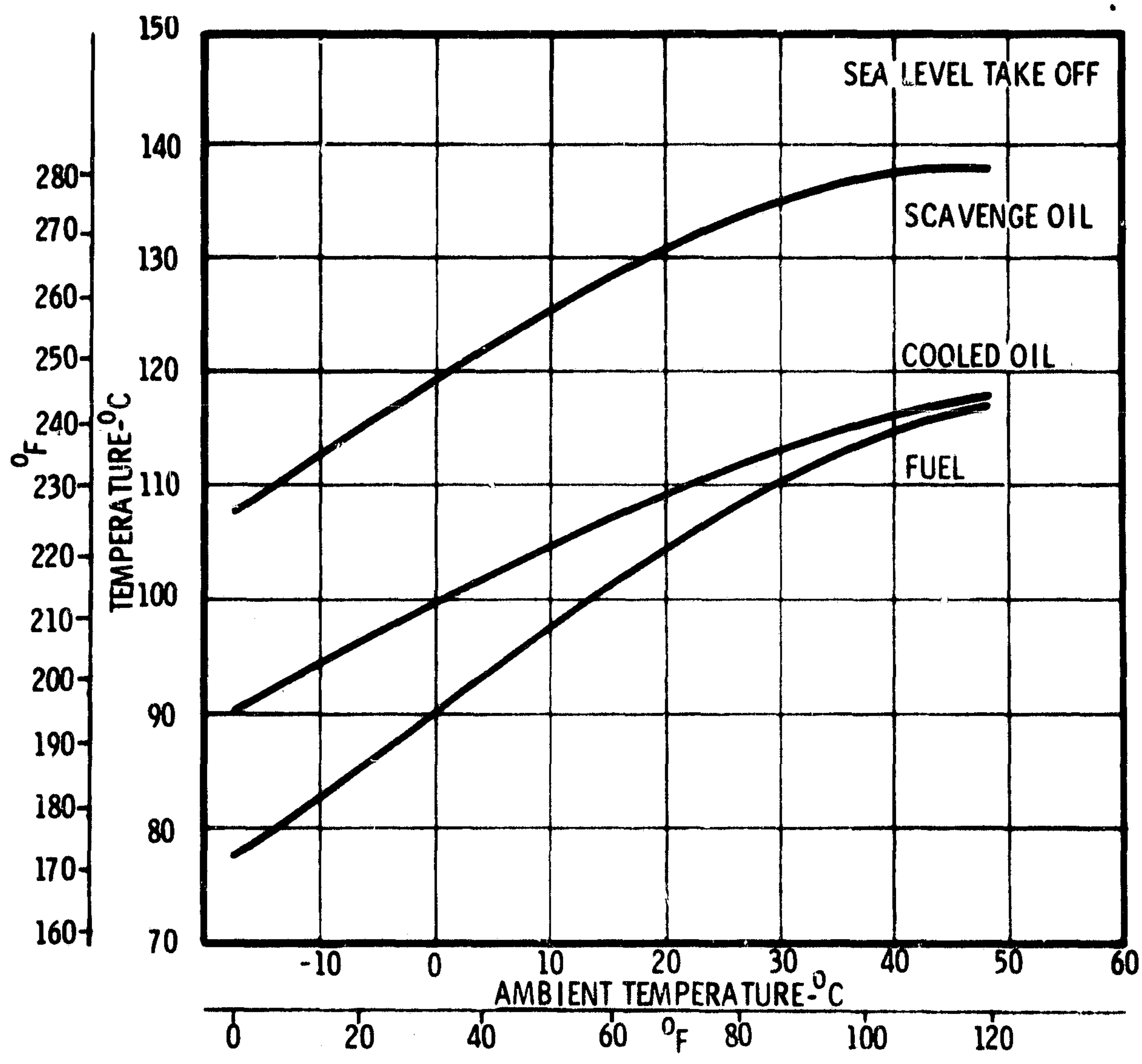


Figure 37. Oil Temperature vs Ambient Temperature.

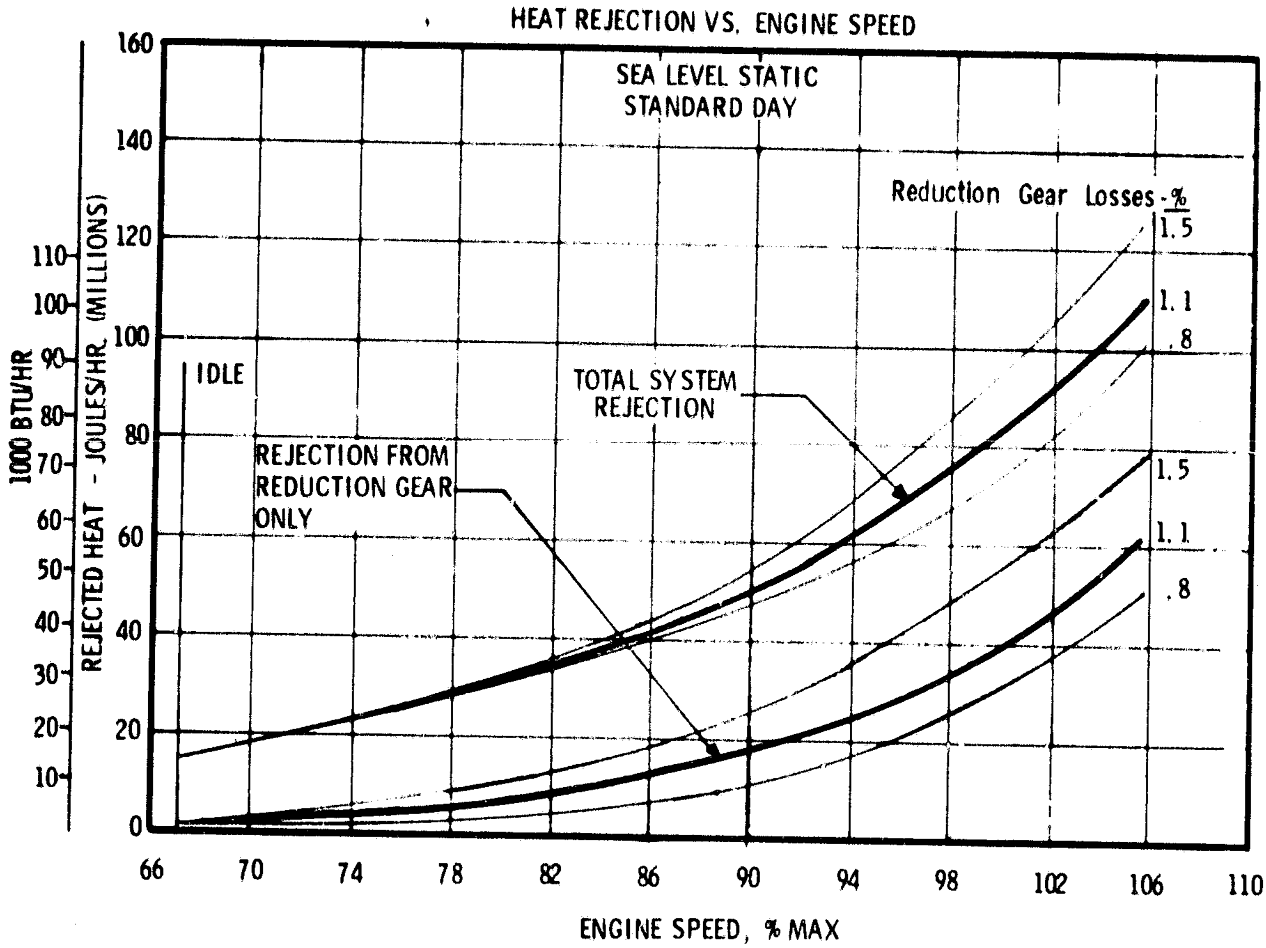


Figure 38. Heat Rejection vs Speed.

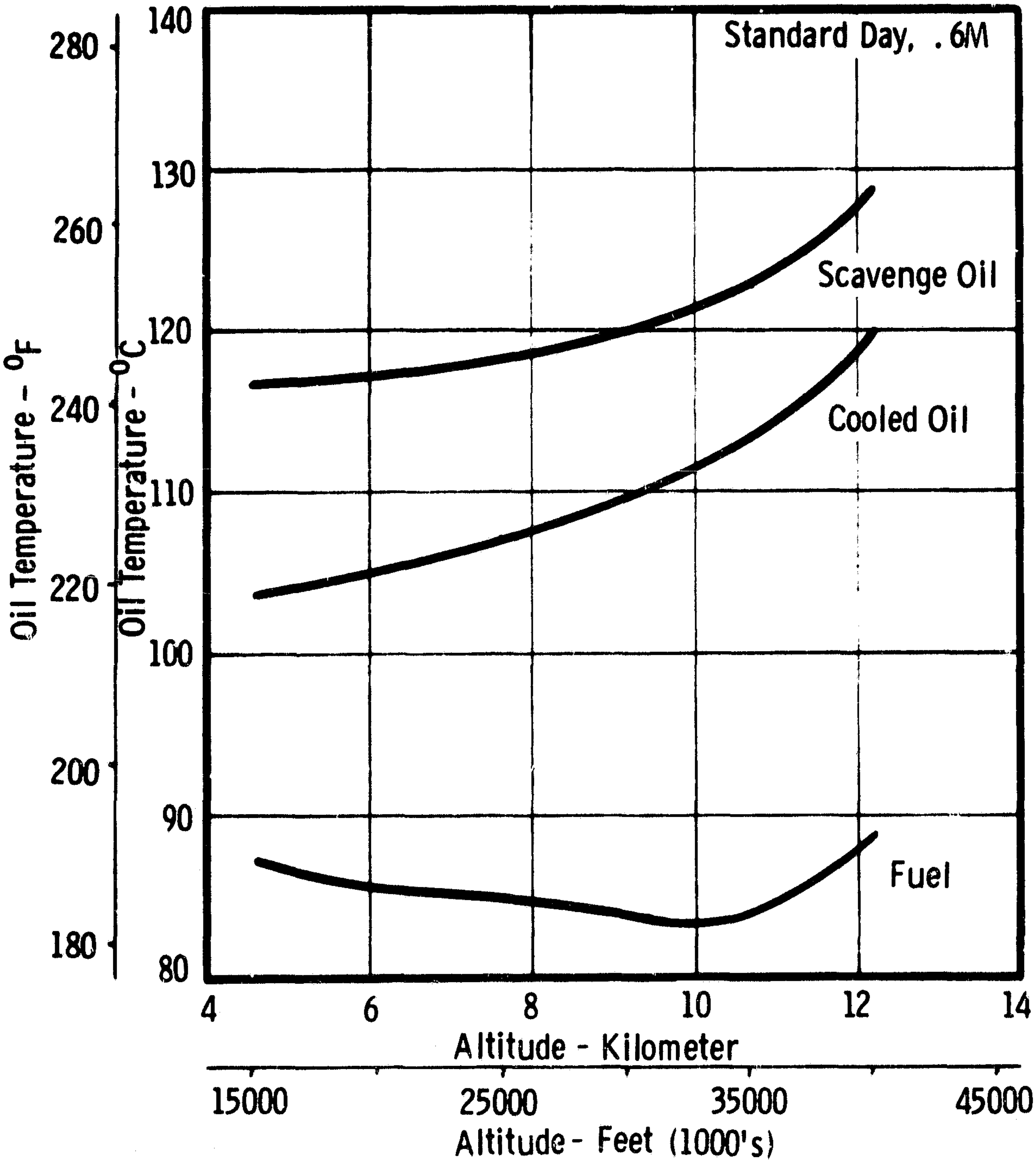


Figure 39. Oil Temperature vs Altitude.

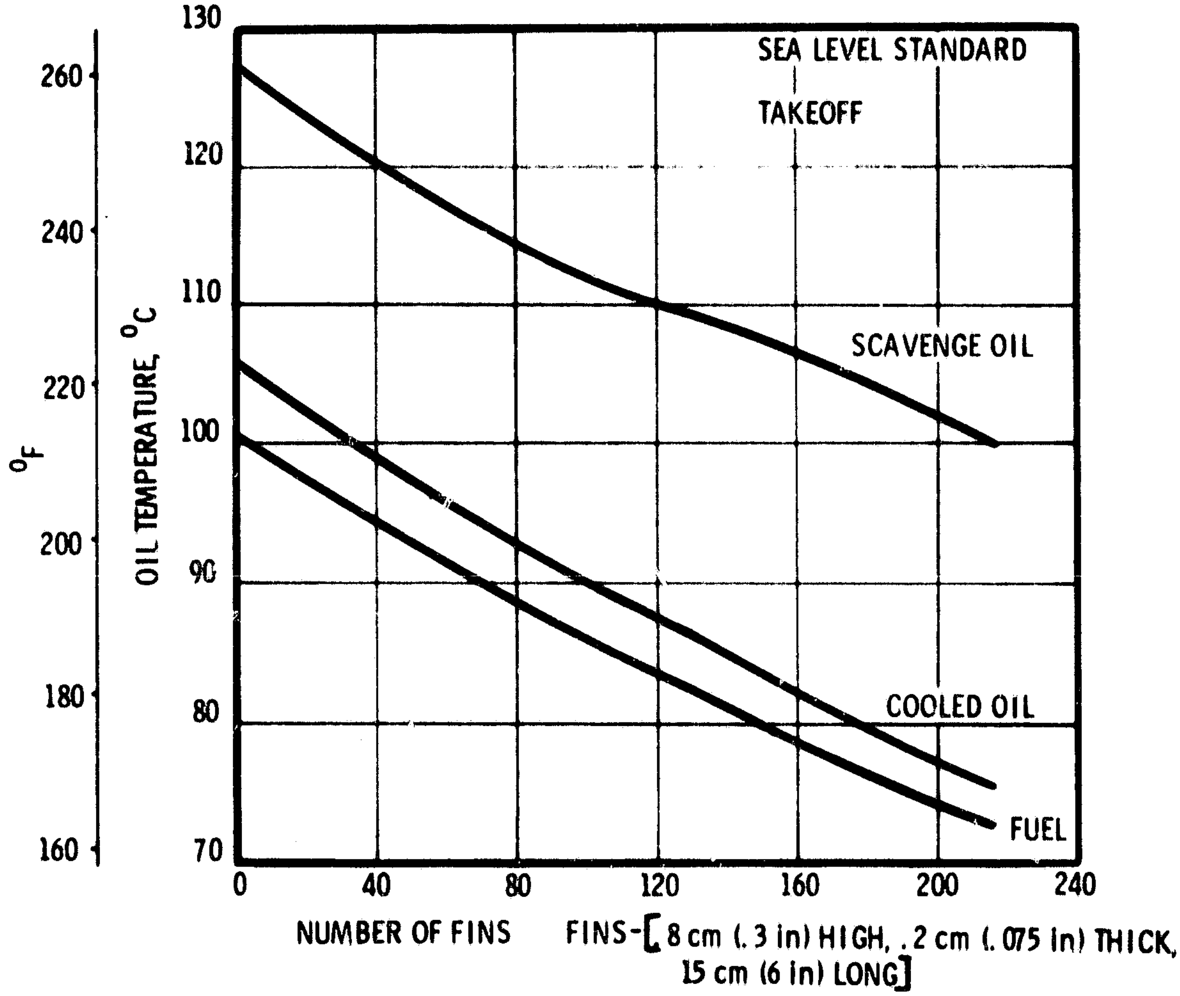


Figure 40. Oil Temperature vs Number of Fins.

CONTROLS AND ACCESSORIES

The T700-GE-700 control system is primarily hydromechanical with its turbine temperature control functions electrical. This control was investigated to determine its applicability to the T700 QCGAT turbofan engine. Also, a full authority digital electrical control was considered.

These controls must limit gas generator and fan rotor speeds. They limit turbine inlet temperature $T_{4.1}$ by sensing and limiting the gas generator turbine discharge temperature $T_{4.5}$. In order to provide a flat takeoff rating, fuel flow is also limited. These functions are all available in the present T700-GE-700 fuel control. Also, Idle and minimum fuel flow settings are provided.

Acceleration and deceleration are the usual scheduled functions of gas generator speed inlet temperature T_{22} and compressor discharge pressure P_3. These are provided for in the present T700 control. However, changes to the 3-D cam, which schedules fuel flow as a function of T_{22}, will be required, since a different compressor inlet sensing device is necessary. The T700-GE-700 helicopter engine does not need a rapid response inlet temperature sensor, but the T700 turbofan engine will have rapid T_{22} transients during accels and decels because of the rapidly changing temperature rise across the fan. The engine will, therefore, have a correspondingly rapid response inlet temperature sensor, and that will lead to a different T_{22} schedule on the 3-D cam. There will be no fan inlet temperature sensor.

The present T700-GE-700 control provides adequate starting bleed, customer bleed for aircraft pressurization, and fuel flow for the T700 QCGAT engine. The engine will not require provisions for anti-icing, and torque sensing. For emission reduction, provision for shutting off fuel flow to the fuel nozzles at ground idle will be provided.

In order to keep the fuel control and its functions as simple as possible, the gas generator discharge temperature will be monitored by the pilot, who will use it to set climb and cruise conditions. Provision may also be made for the pilot to monitor fan speed. The present T700 control contains no provision for changing nozzle area. This function in the T700 QCGAT engine will be performed by the pilot, who will manually set the two-position fan nozzle in the open or closed position.

As engine size decreases, its control system cannot be decreased equivalently in weight or size. Therefore, a small engine tends to be overwhelmed by controls and accessories. An electric control would reduce the size of the control system.

A full authority digital control would be desirable for the T700 QCGAT engine. However, the development of such a system would be time-consuming and expensive, especially when compared to the present T700-GE-700 control, which is in production and which fulfills most of the needs of a general aviation aircraft. From this control, the anti-icing system, the load demand spindle, and torque sensor and circuitry will be removed. Provision for shutting off half of the fuel nozzles at Idle and a new fuel manifold will be added for emission reduction at Idle.

Most of the T700-GE-700 engine accessories can be used in the QCGAT engine. The fuel pump, ignition exciter, ignition alternator, igniters, gas generator turbine discharge temperature sensors and harness, and the fuel-oil cooler will not change. The required rotor speed pickups will not change.

Most of the accessory changes result from integrating the fan reduction gear and fan into the T700-GE-700 engine. Because of the fan, the accessory gearbox must be relocated and repackaged. The lube system must be enlarged because of the added load of the fan reduction gear. The size of the lube and scavenge pump and of the lube tank must be increased. Also, an 8 to 10 KVA starter-generator will be required. Other relatively small changes will be a new starting bleed valve and some changed linkages in the variable geometry system to connect the repositioned actuator, which is integral with the hydromechanical control, to the stator vane linkage.

MOUNTING

The T700 QCGAT engine will probably be installed in nacelles mounted on horizontal pylons from the fuselage, on vertical pylons above the wing, or on vertical pylons below the wing. Engine mounts permit all of these installations. Figure 41 shows an isometric of the engine from the left side. Main mounts are provided in four locations on the outer surface of the fan frame, at 45 degrees above and below horizontal centerline. These are designed to take vertical, side, and thrust reactions.

The T700 core mainframe is provided with four rear integral mounting legs at horizontal and vertical centerlines.

The QCGAT engine can be mounted from any two main thrust mounts, and one rear mount. Figure 41 shows a typical mount arrangement, where left side main mounts and the left horizontal rear mount are used. Reactions at each mount are shown by arrows. For an installation of nacelle below the wing, the two upper main mounts and the top rear mount would be used.

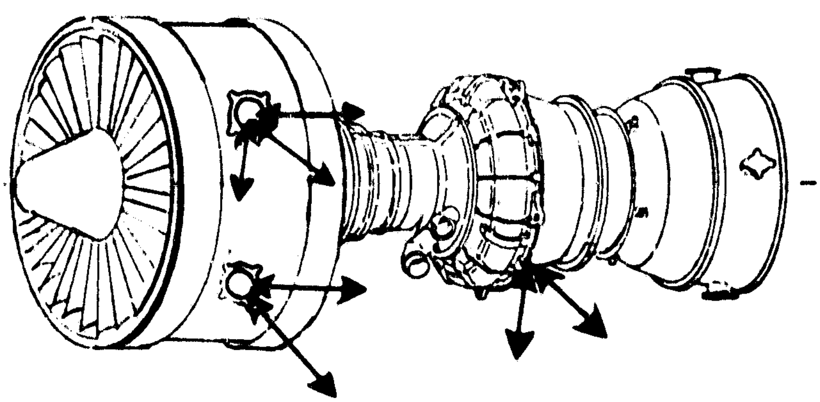


Figure 41. Two Plane Mounting System.

WEIGHT

The T700-GE-700 turboshaft engine base for the QCGAT engine has an established weight. The QCGAT engine uses the T700-GE-700 core and LPT parts (except airfoils). Weight estimates for the unique parts for the QCGAT engine have been made. Table 19 shows the results. A 7% margin for the unique parts has been included to account for tolerances and variations which might be included in detail designs as well as allowances for changes made to parts during a future engine qualification program. No margin is made for T700 common parts, since the qualification engine design has essentially been established. Total predicted QCGAT engine weight is 227 kg (500 lb).

In addition to the base engine with composite materials, adders are included for metal fan blades and OGV, which will continue to be considered as alternates while other General Electric technology programs evaluate composites. Table 19 also lists the separate weight of unique QCGAT parts and system adders.

TABLE 19. T700 QCGAT WEIGHT SUMMARY

	kg	lb
T700 BASE	188	415
DELETIONS (PARTS NOT REQUIRED FOR QCGAT)	-72	-158
T700 COMMON PARTS TOTAL	116	257

QCGAT NEW PARTS

	kg	lb
Fan Frame	14.7	32.1
Fan Blades	5.7	12.6
Fan Disks	3.5	7.7
Fan Casing	8.2	18.0
Fan OGV	2.3	5.0
Core OGV	2.3	5.1
Spinner	0.8	1.8
Containment Ring	2.9	6.6
Fan Reduction Gear	31.2	68.7
Lube System	10.7	23.7
AGB and Drive	12.3	27.1
External Configuration	6.2	13.6
Fire Safety Shields	1.8	4.0
Starting Bleed Valve	0.4	1.0

	kg	lb
TOTAL (QCGAT NEW PARTS)	103	227
TOTAL (T700 COMMON AND QCGAT PARTS)	219	484
7% MARGIN	+7	+16
TOTAL PLUS 7% MARGIN	226	500

ADDER FOR Ti AND AL PARTS

	kg	lb
Fan OGV - AL	2	5
Fan Blades - Ti	13	29
Fan Disk	2	4
Margin	1	2

	kg	lb
TOTAL ADDER (Ti AND AL PARTS)	18	40
TOTAL	244	540

INLET AND NACELLE

The inlet has been designed for a throat Mach number of 0.6 to provide high levels of recovery and substantial flow margin before severe recovery loss is encountered. A throat Mach number of 0.6 also provides the maximum flow approach angle (angle of attack or crosswind) prior to the onset of separation inside the inlet. The recovery of this inlet is 0.997. Inlet contraction ratio expressed as highlight to throat diameter (D_{HL}/D_{THT}) is 1.17, which provides angle of attack and crosswind capability of better than 50 degrees.

The T700 QCGAT mass flow ratio at 10.7 km (35,000 feet) and 0.7 Mn is 0.613. Figure 42 provides additive drag at that mass flow ratio. The figure shows that minimum drag occurs at forebody length/diameter ratio of about 0.55 and a highlight to maximum diameter ratio of approximately 0.8. Insufficient data is available to accurately determine minimum drag, but the trends indicate that the design chosen is virtually at the minimum drag point. Table 20 presents inlet-nacelle dimensions and compares design parameters with those of the QCSEE inlet.

Nacelle friction drag was calculated from flat plate, incompressible coefficients where wetted area is considered to be a cylinder of $D = D_{max}$, whose length extends from inlet lip highlight to fan nozzle trailing edge. The General Electric method of predicting boattail drag based on nacelle effective fineness ratio has been used to establish a boattail drag. The coefficient of 0.025 is based on free stream dynamic pressure and nacelle maximum cross section area (A_{max}). Normalizing the total nacelle drag by Q and A_{max} results in the nacelle drag coefficient (C_{D_π}) = 0.066, which is assumed constant throughout the operating envelope of the engine.

The nacelle is perturbed locally at 6 o'clock in order to house engine accessories such as alternator-generator and main fuel control. This can be seen on the nacelle outline, Figure 43. A small, auxiliary inlet is located in the front "shark mouth" to provide accessory cooling air.

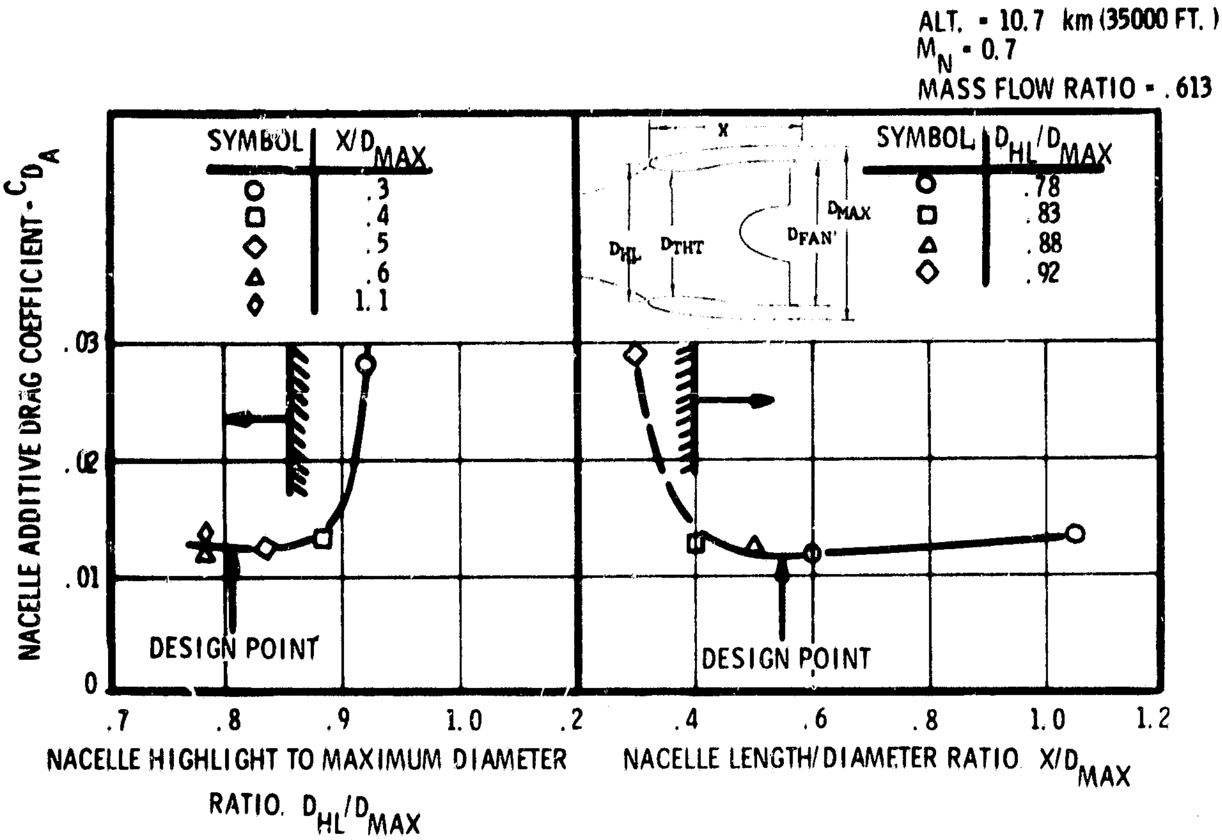
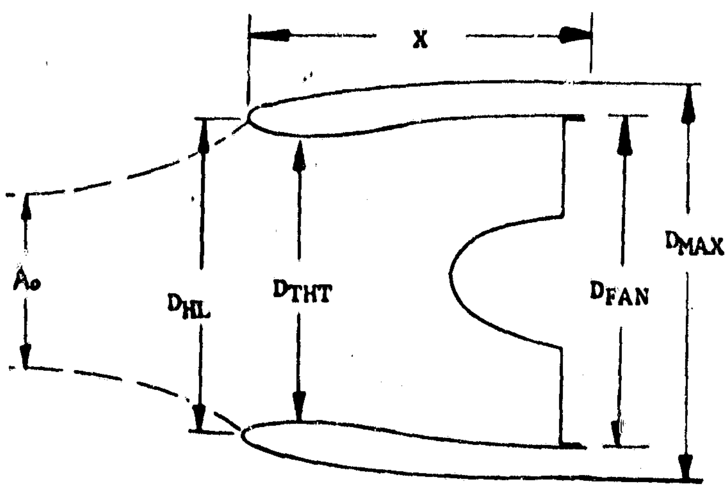


Figure 42. Nacelle Forebody Design Selection.

TABLE 20. INLET DESIGN

Parameter	QCGAT	QCSEE
D_{HL}/D_{THT}	1.17	1.21
$D_{HL}/D_{MAX.}$	.806	.90
$X/D_{MAX.}$	.55	.219
M_{CRUISE}	.70	.70
M_{THT}	.60	.79
A_o/A_{HL}	.62	.717
A_{FAN}/A_{THT}	1.25	1.466



QCGAT

Design Parameters

D_{FAN} = 66.8 cm (26.3 in)

D_{TH} = 60.0 cm (23.6 in)

D_{HL} = 70.2 cm (27.7 in)

D_{MAX} = 87.1 cm (34.3 in)

X = 47.9 cm (18.9 in)

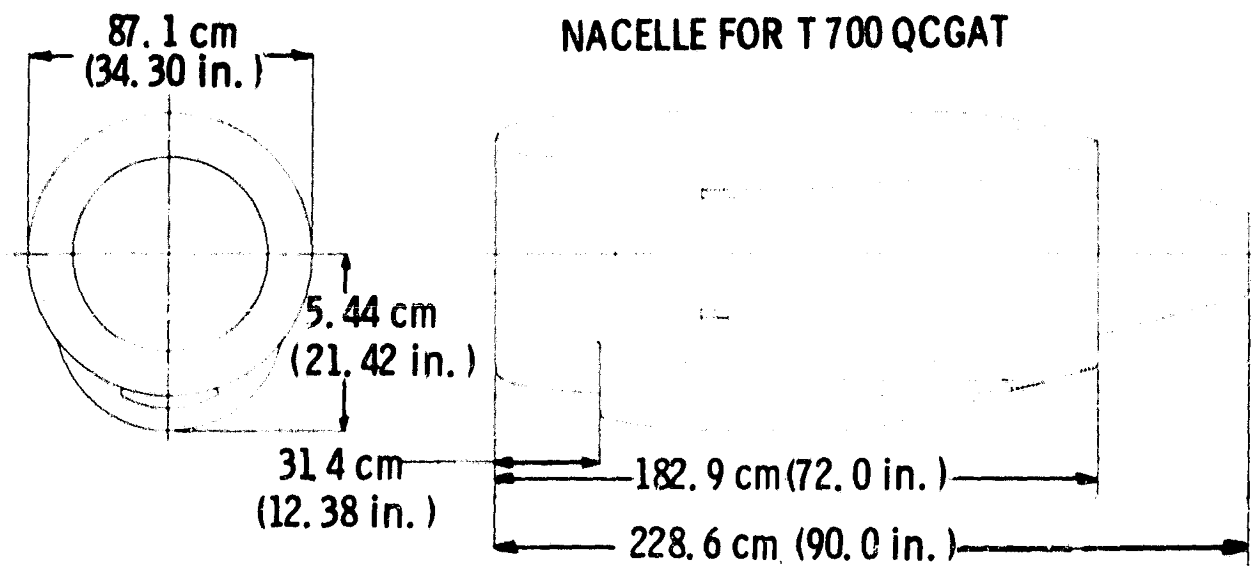


Figure 43. Nacelle for T700 QCGAT.

EXHAUST DUCTS AND NOZZLES

CORE TAILPIPE AND NOZZLE

The core tailpipe and nozzle are designed to efficiently diffuse the core exit gas from the existing T700-GE-700 turbine frame and provide smooth, rapid acceleration to the controlling area, A_8. The length of the tailpipe was determined by the fan duct and nozzle design, which maintains core cowl angles at no greater than 15 degrees.

Pressure losses in the tailpipe are the result of diffusion and friction on the tailpipe walls. Diffusion loss was taken from SAE Design Data for 1.71 area ratio diffuser with a 16.5 degree mean angle. Skin friction loss was calculated using the incompressible, flat plate relationship.

$$C_f = 0.455/(\log R_{e_1})^{2.58}$$

A conic convergent nozzle was chosen for the core nozzle. This results in a configuration very similar to the TF34-GE-100 exhaust system, which provides high levels of performance.

BY-PASS DUCT AND NOZZLE

The by-pass duct aft of the fan consists of a low area ratio diffuser to lower the average duct Mach number, constant area duct, and a two-position converging annular plug nozzle. The by-pass duct must be designed with doors to provide access to the core engine. Traditionally, the incorporation of doors results in steps and gaps in the flowpath, which cause pressure losses. These losses, along with losses caused by five fan frame struts ($t_m/c = .203$), a pylon, and fins for the engine oil cooler drag, were included in the overall duct loss. In order to avoid large disturbances in the external flow field, the duct is designed with an accessory fairing in the 6 o'clock position. This allows the starter-generator, main fuel control, and several smaller accessories to be placed close to the engine centerline. Also at 6 o'clock there is a pylon through which the power take-off shaft (PTO), compressor geometry actuator, and all fuel, oil and electrical lines pass. The engine cross section, Figure 32, provides the qualitative detail of the duct. Figure 44 provides a more detailed description of the accessory fairing shape.

The length of the by-pass duct has been determined by trade-off studies considering both duct internal and nacelle external factors. Specifically, as the duct is shortened, both duct friction loss and nacelle friction losses decrease. If the fan

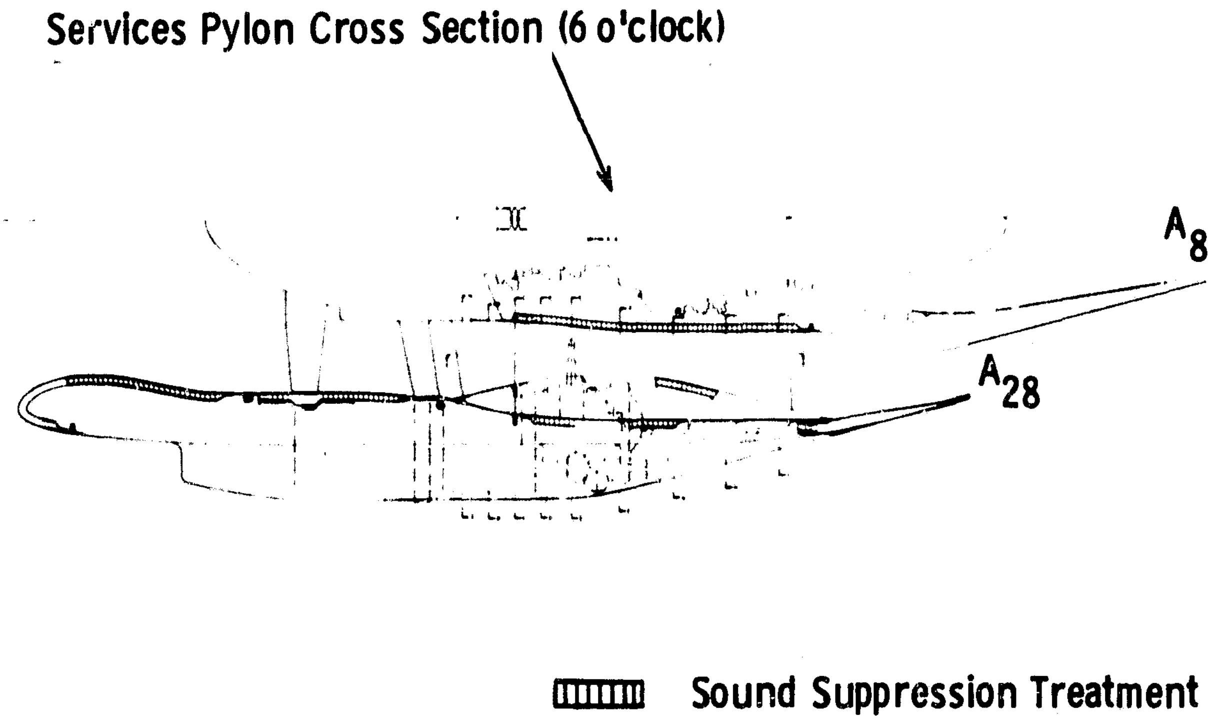


Figure 44. QCGAT Nacelle - Lower Half.

cowl boattail closure and radius of curvature are independent of duct length, the boattail should have no influence on optimum duct length. As the design must provide a smooth flowpath from the by-pass nozzle to the end of the primary nozzle, the shorter the fan duct, the longer will be the scrubbed length of the core waist cowl.

Figure 45 presents the relative net thrust available at 10.7 km (35,000 feet) and 0.7 Mach number as a function of duct length. The figure indicates that overall engine performance improves as the duct is shortened. However, as the duct is shortened below a length of 101.6 cm (40 in), measured from fan case forward flange, the throat area interferes with the accessory fairing and nonsymmetric bluff base forms at 6 o'clock. Available base pressure data indicates that a base pressure coefficient (C_p) of approximately 0.15 is appropriate at 0.7 Mach number. As can be seen in Figure 45, this causes a severe reduction in available net thrust. The aerodynamic optimum length shown on the figure is the shortest length with no bluff base. However, smooth closure of the nacelle and packaging of nozzle actuators require the nozzle throat to move slightly aft of the aerodynamic optimum. This is shown as the system optimum length at which 0.6% of available thrust is lost to create a viable, aerodynamically acceptable system design.

Because the duct loss is composed of diffusion, friction, and irregularities (step-gaps) the total loss is a function of the duct length and diffuser area ratio. Length by the tradeoff shown on Figure 45 was established at 134.6 cm (53.0 in). As area ratio increases, diffusion loss increases. However, increased diffusion results in lower duct Mach number, which leads to lower friction losses and step-gap losses.

Figure 46 illustrates this tradeoff in pressure loss as a function of duct diffuser area ratio. The diffuser design point area ratio of 1.35 is slightly greater than the minimum to provide for any flight conditions that may result in high corrected flows. The increment of pressure loss is insignificant.

The resulting axial area distribution shown on Figure 47 is generally smooth for both cruise and takeoff nozzle positions. Figure 48 presents average flow Mach number and wall static pressure distributions corresponding to the area distribution of Figure 47.

Favorable experience with the TF34-GE-100 fan nozzle has led to the use of a 15 degree core waist-cowl angle on the T700 QCGAT engine. This design provides the shortest possible cowl length consistent with low risk of premature separation of the fan discharge flow from the cowl. The TF34-GE-100 originally utilized a 10 degree cowl angle, but this was increased to provide additional core nozzle suppression which had favorable cycle performance characteristics.

A two-position, translating conic, annular plug nozzle is used. The outer wall is formed by a translating cone with a trailing edge angle of 15 degrees. The inner wall forms the plug portion and creates rapid convergence with the raised portion of the plug (see Figure 44). The nozzle actuation system is shown in Figure 49.

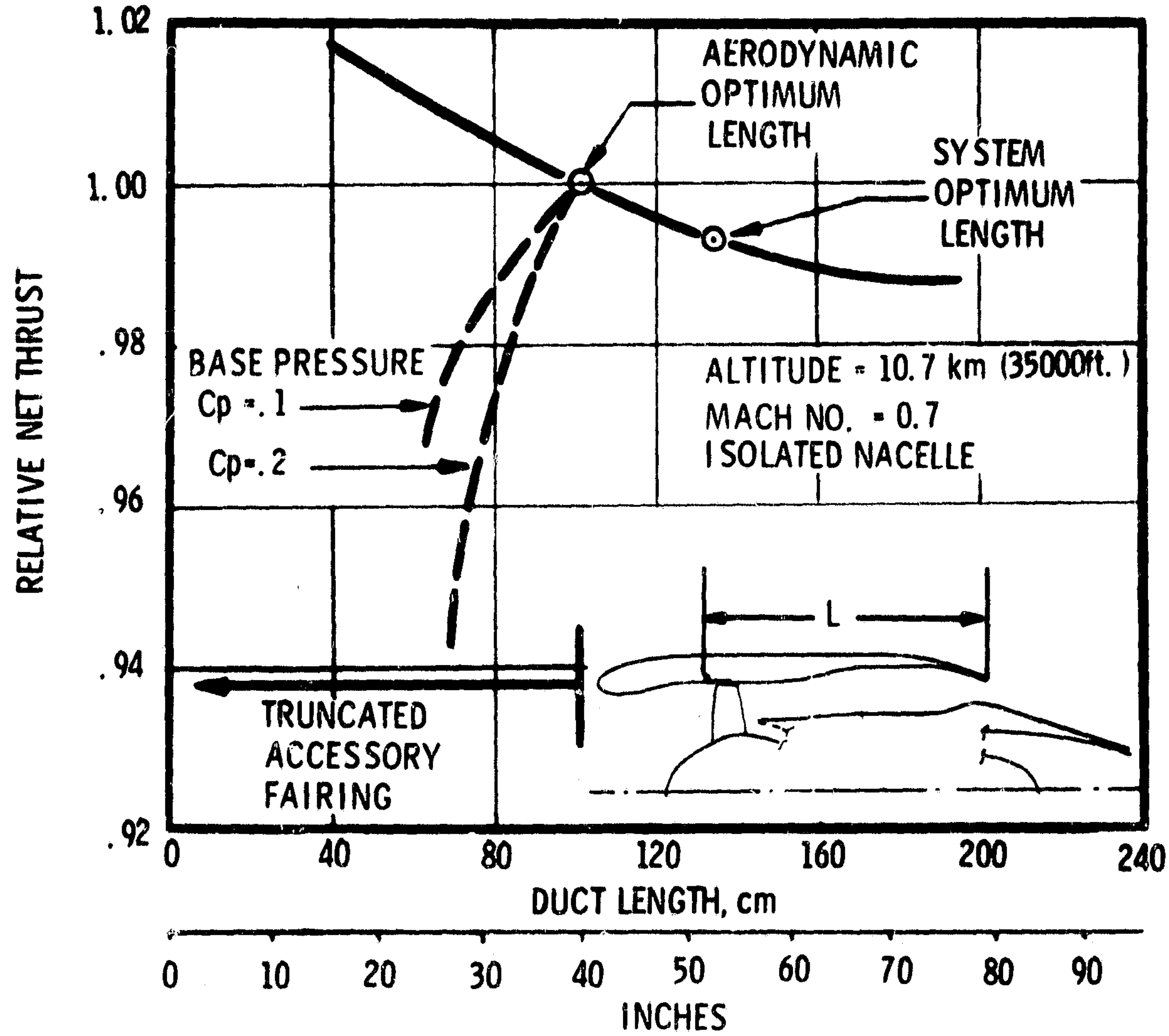


Figure 45. Nacelle Duct Length.

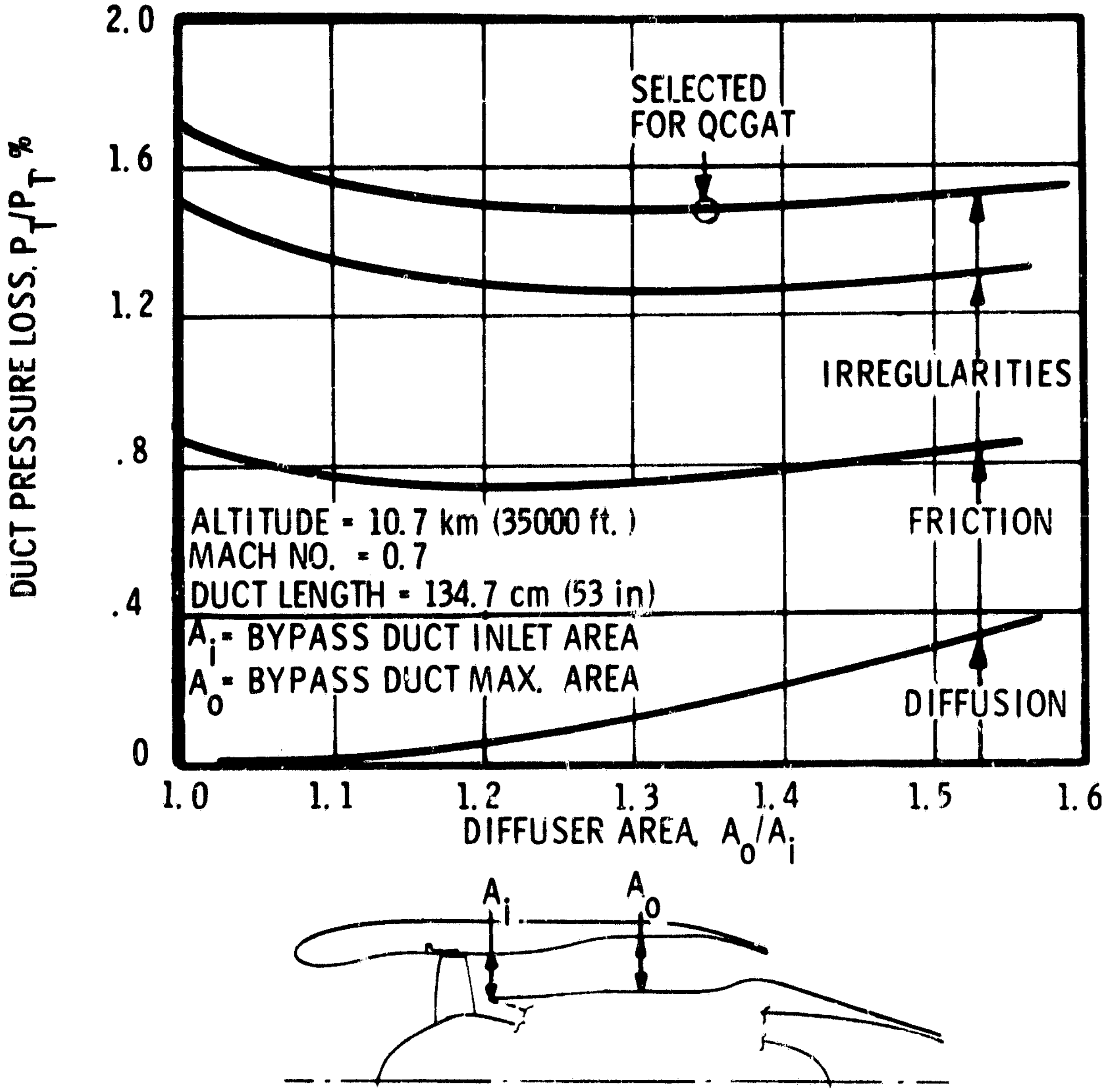


Figure 46. By-Pass Duct Diffuser Optimization.

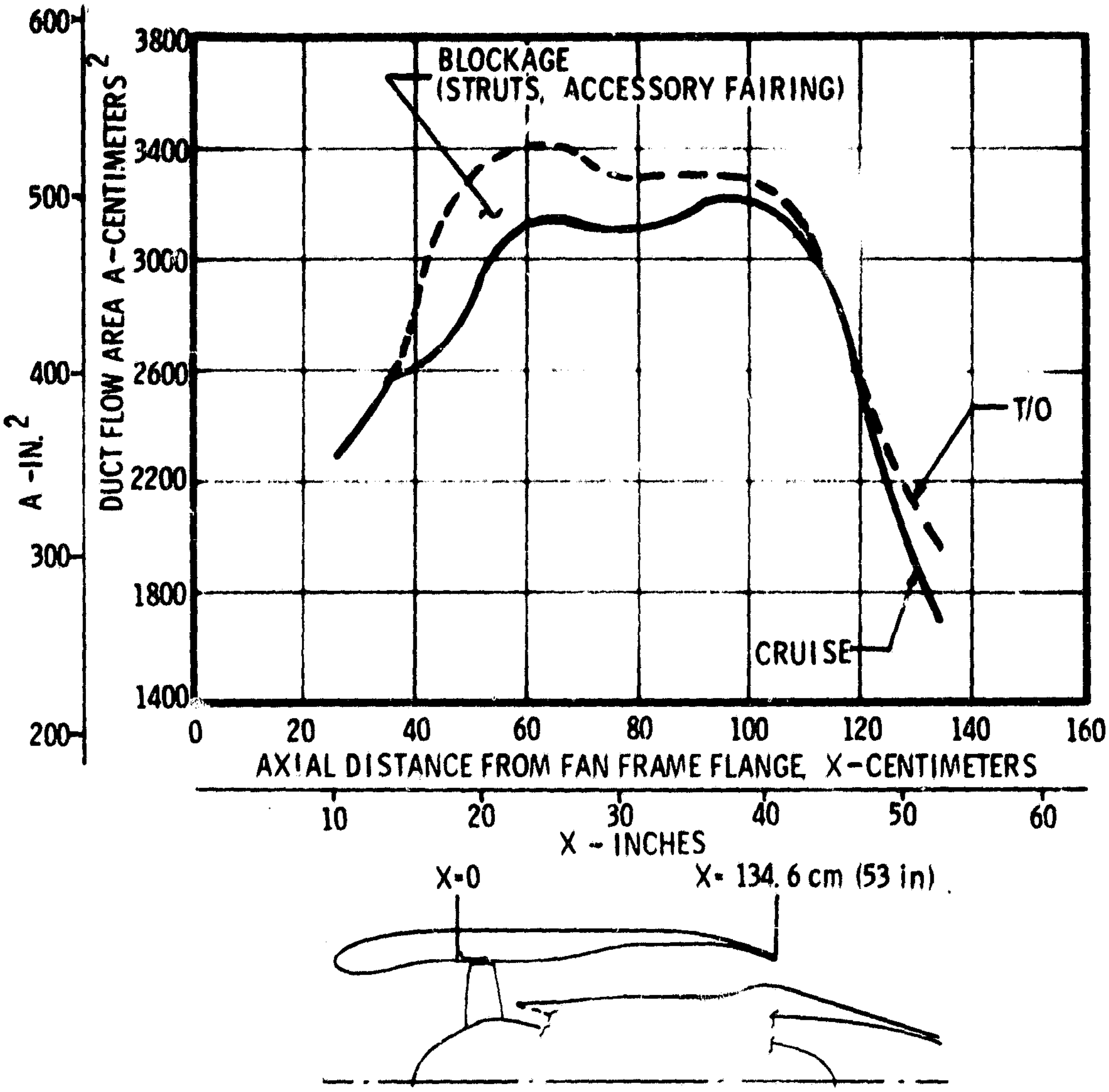


Figure 47. By-Pass Duct Characteristics - Axial Area Distribution.

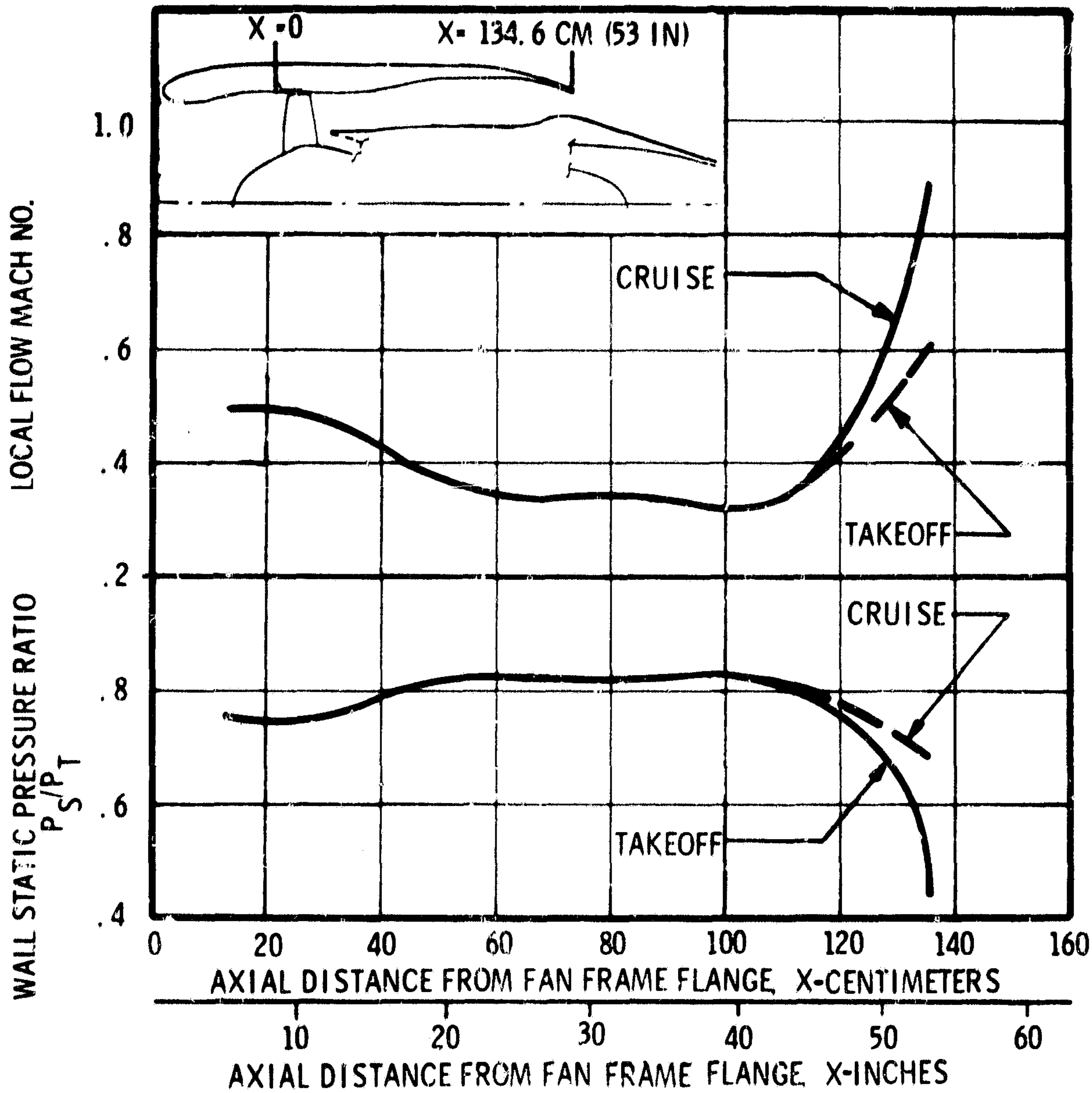


Figure 48. By-Pass Duct Characteristics - One Dimensional Flow Properties.

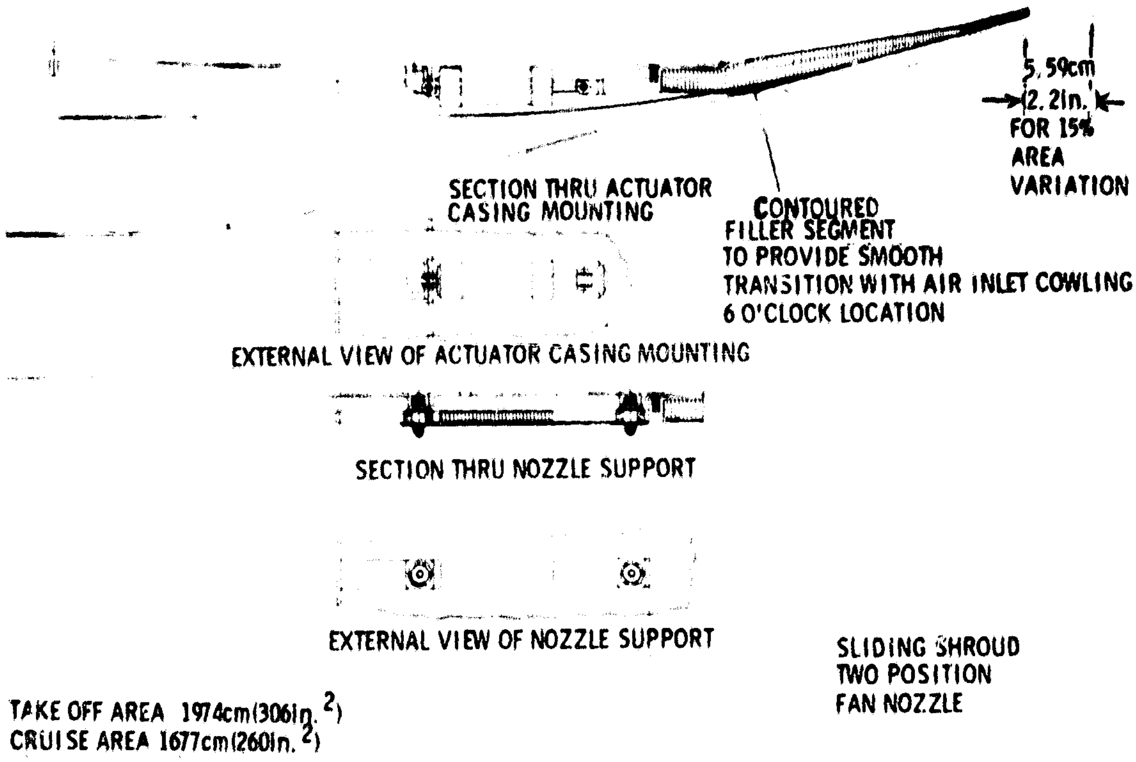


Figure 49. Sliding Shroud Two Position Nozzle.

EXPERIMENTAL PROGRAM

INTRODUCTION

The experimental program plan describes the content, scope, schedules, cost estimate and risk assessment of a test engine specifically produced to demonstrate the performance, acoustical level, and emission level of the flight type production engine, previously described under the Engine Preliminary Design phase.

The test engine configuration, which differs in detail from the production engine, is also described. These differences will not compromise the objectives of the experimental program.

ENGINE CONFIGURATION

The experimental engine cross section is shown in Figure 50. The principal objective of this engine design is to demonstrate the acoustical and emission levels as well as the performance characteristics of the production (flight type) engine. Accordingly, the design of the inner nacelle flow path includes flight type acoustical panels, front fan production design aerodynamics and the fan reduction gear box (also representing flight type production design).

Referring to Figure 50, the accessory gearbox (AGB) can be seen located at top rather than at the bottom as it would be on the flight type production engine, (see Figure 32 in the previous section). This accessory gearbox top location was chosen to enable the conventional T700-GE-700 engine AGB to be used. However, the flow passage obstruction for the production AGB is maintained, as is its location relative to the power takeoff shaft. This may be seen by referring to top view of Figure 51 and comparing it to bottom view of power takeoff and AGB location.

The fan nozzle (top view of Figure 51) is shown with an identical profile and aero flow path as the production design. Moreover, the axial motion from closed to open duplicates the production design. The actuators are externally mounted, see bottom view of Figure 50 to enable ready access during installation, rigging, and testing.

The standard T700-GE-700 core engine is used with the same low pressure turbine flowpath. The LP turbine blade and vane airfoils are modified the same as the flight design to match the aerodynamic requirements of the fan.

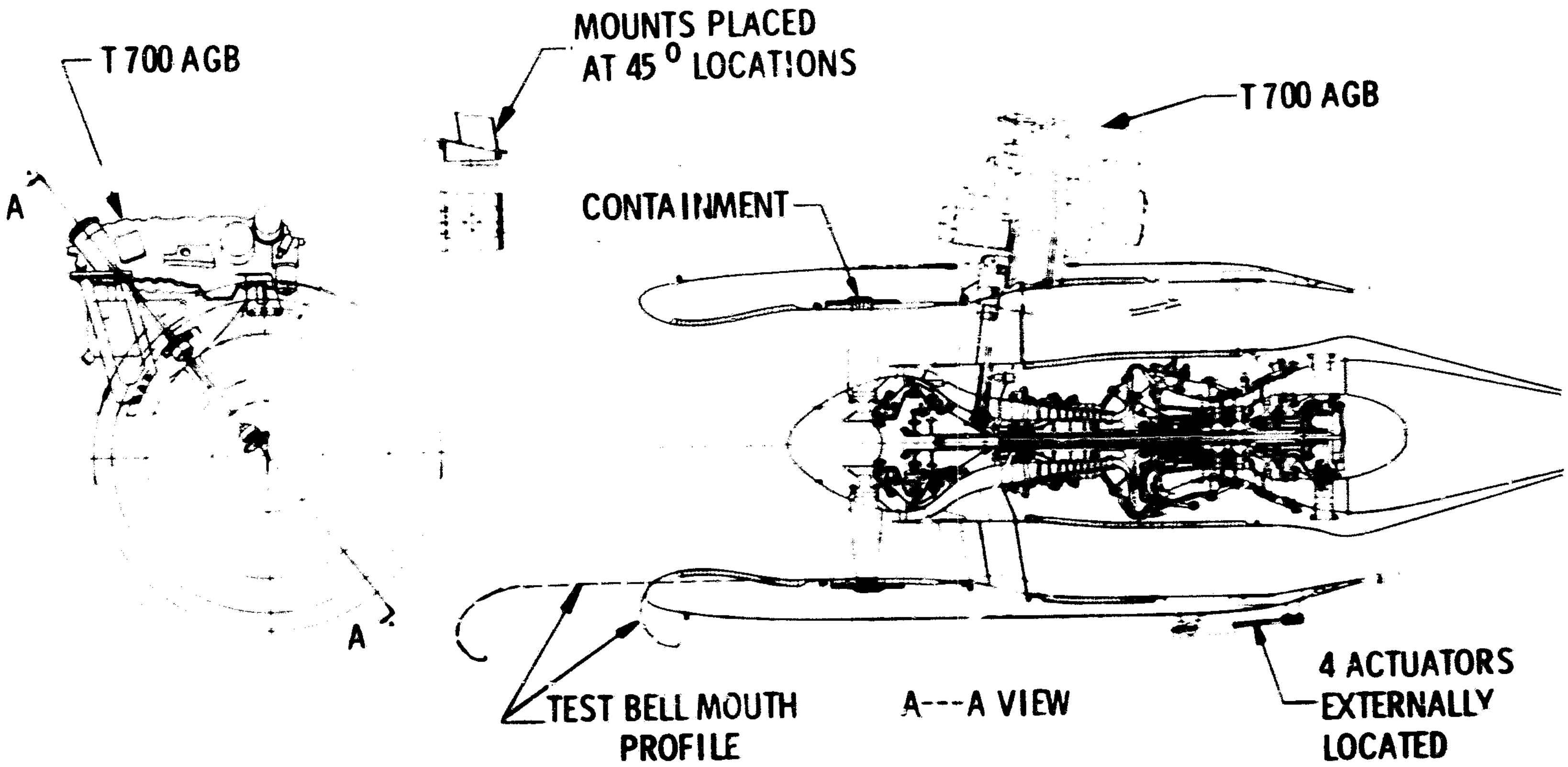


Figure 50. QCGAT Experimental Engine.

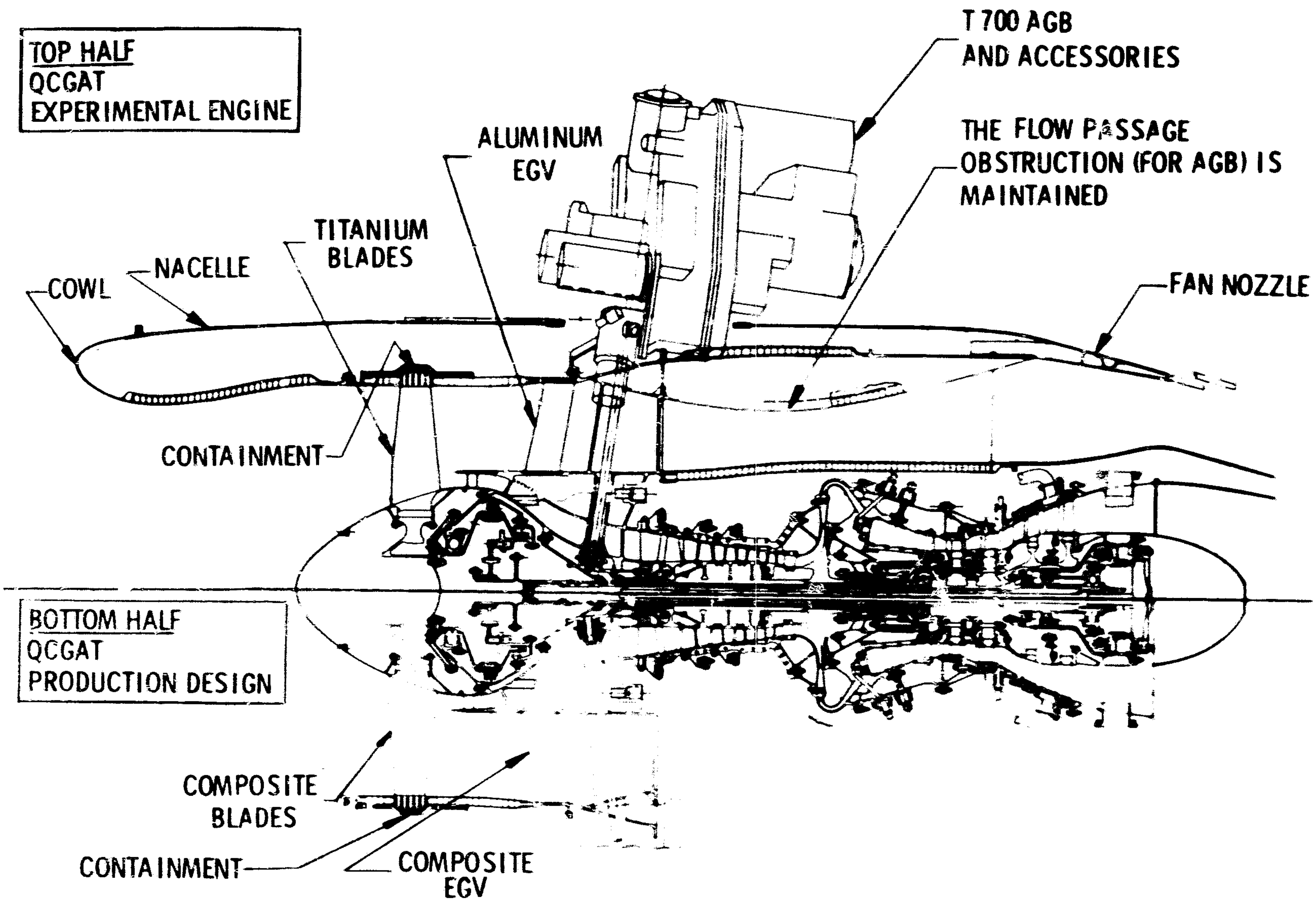


Figure 51. Comparison of QCGAT Experimental Engine Design vs QCGAT Production Design.

It can be seen in Figure 50 that the cowl may be replaced by two test bellmouths. The longer design represents the test cell bellmouth which is to be instrumented for engine performance testing. The shorter test bellmouth profile represents the actual cowl profile and contains acoustical panels permitting factory testing (without instrumentation) as well as the test in the outdoor acoustical facility.

The following list of components represent flight type hardware. Some of the parts represent the identical foil section as the flight design, but have different materials, e.g. the fan rotor blades are titanium. These materials, however, are flight type hardware and could be used in a final flight engine design. The fan exit guide vanes also are a different material, aluminum, which could be a final flight engine design.

Fan Rotor	Production engine aero design, except titanium blades.
Fan Exit Guide Vanes	Production engine aero design, except aluminum vanes.
Fan Frame	Production engine flowpath, except frame fabricated.
Fan Casing	Production engine flowpath design, except material will be aluminum.
Reduction Gear	Production engine design.
Power Takeoff	Production engine design, except drive shaft longer to mate with AGB.
LP Turbine	Production engine design.
Core Engine	T700-GE-700 core engine (CT7 will have been certified).
Fuel Control	T700-GE-700 engine control and fuel pump.
VG Actuation	Core engine linkage and actuator are flight type, connecting linkage for experimental testing only.
Acoustical Treatment	Production engine design.
Lube Pump	Production engine design.

C - 2

The following components will be designed specifically for the experimental test program and to minimize program costs.

AGB	T700-GE-700 turboshaft unit will be used mounted on top of fan frame.
Lube Tank	Sheet metal tank, not configured to fit into flight nacelle, will be provided.
Oil Cooler	Cell water coolers will be provided instead of air-oil cooler integral with fan frame.
Nacelle	Same internal aero flowpath design as production engine, but without external surfaces and made of aluminum.
Fan Nozzle	Same aero design as production engine, with area change actuation, heavier construction than flight design.

Piping and valves for combustor sector burning will demonstrate required emissions, but will not be final design hardware (combustor is flight type).

PROGRAM DESCRIPTION

The program scope includes design, fabrication (hardware procurement), component and engine testing to demonstrate performance, emissions acoustics, and mechanical integrity.

Design

The design effort involves all design aspects required to add a geared fan to the T700-GE-700 core engine and to attach a nacelle and (adjustable) nozzle to the front fan frame for both factory and outdoor facility testing. Adapting the T700 AGB, controls and accessories to the redesigned PTO shaft will be acomplished for test purposes.

Hardware Procurement

Hardware procurement of the unique components described above will begin with the early release of parts having long lead times especially the rough forgings, castings, and fan reduction gear bearings. A list of the unique hardware and the number of sets required follows:

Part	Sets
Fan Blades	2
Fan OGV	1-1/2
Front Frame	1
Fan Casing	1
Core IGV	1-1/2
Nacelle, Cowl, Exhaust Nozzle	1
Exhaust Tailpipe	1
LP Turbine, Stage 1 and 2 Blades	1-1/2
LP Turbine, Stage 2 Nozzle	1-1/2
Unique Miscellaneous Hardware	1
Lube and Scavenge Pump	1 (unit)
Bellmouth	2 (units)

PROGRAM SCHEDULE

Figure 52 shows the program schedule. The schedule assumes go-ahead to occur July 1, 1976 - with shipment of engine to NASA on December 31, 1978. The program is planned to provide Design Release of critical hardware within the first three months on a priority basis. The long lead items such as blade and gear forgings will be released within the first month; then castings and fan gear reduction bearings a week or two later, and so on, to assure that all hardware will be received no later than the 16th month after go-ahead.

Since the same fan reduction gear which is to be used in component testing is to be later used in engine tests, the schedule is planned to complete component tests in the last quarter of 1977 with engine factory tests completed in the second quarter of 1978. This allows for a four month cycle to ship engine to Outdoor Facility in Peebles, Ohio, for acoustic testing (running the tests) and returning engine to factory. This permits a two month time period for the partial teardown and inspection of engine and minor reconditioning for prep-to-ship to NASA.

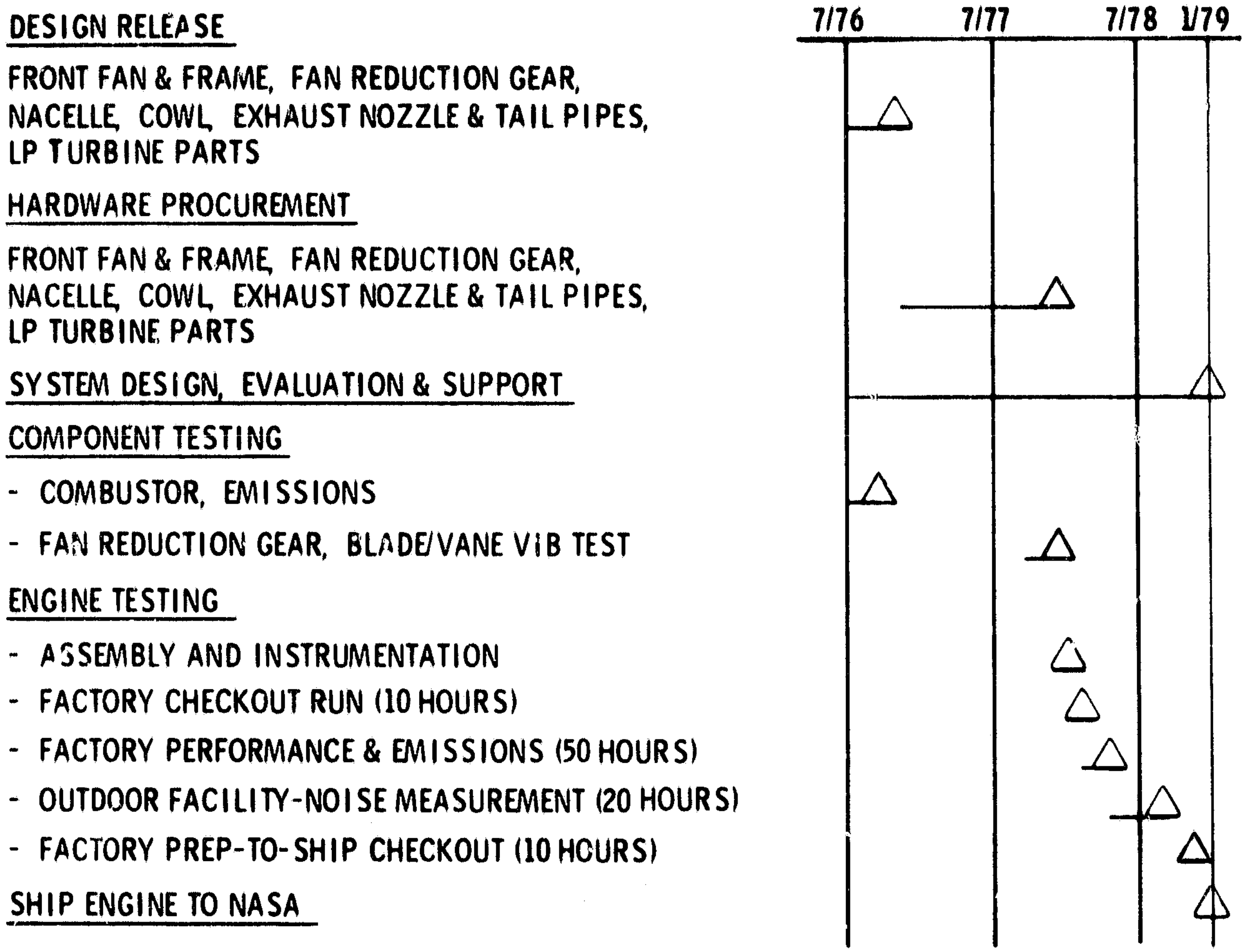


Figure 52. QCGAT Experimental Engine Program Schedule.

COMPONENT TESTS

Three component tests are scheduled:

1. Fan Reduction Gear Test.

2. Combustor Emission Test.

3. Fan Blade Vibration Testing.

Fan Gear Reduction Test

Test will be run at General Electric (Evendale, Ohio) facility. A drive stand will be modified to accept the gear reduction unit, (see Figure 53). Loading will be accomplished by having the gear set drive a water brake. After installing the instrumentation, the gear reduction unit will be tested both at light load and with full load.

Instrumentation of Gearset

The following instrumentation will be installed:

1. Temperature:

   Bearing inner races (Star Gears).
   Lube oil in and out.
   Bearing outer races (Fan Drive Shaft).
   Gearbox casing at selected locations.

2. Flow:

   Lube Oil-in.

3. Vibration:

   Horizontal and vertical accelerometers.

4. Speed:

   Tachometer.

5. Noise:

   Suitable noise measuring instrument.

6. Monitor:

   Magnetic drain plugs with electrical signal capability. SOAP analysis from oil samples.

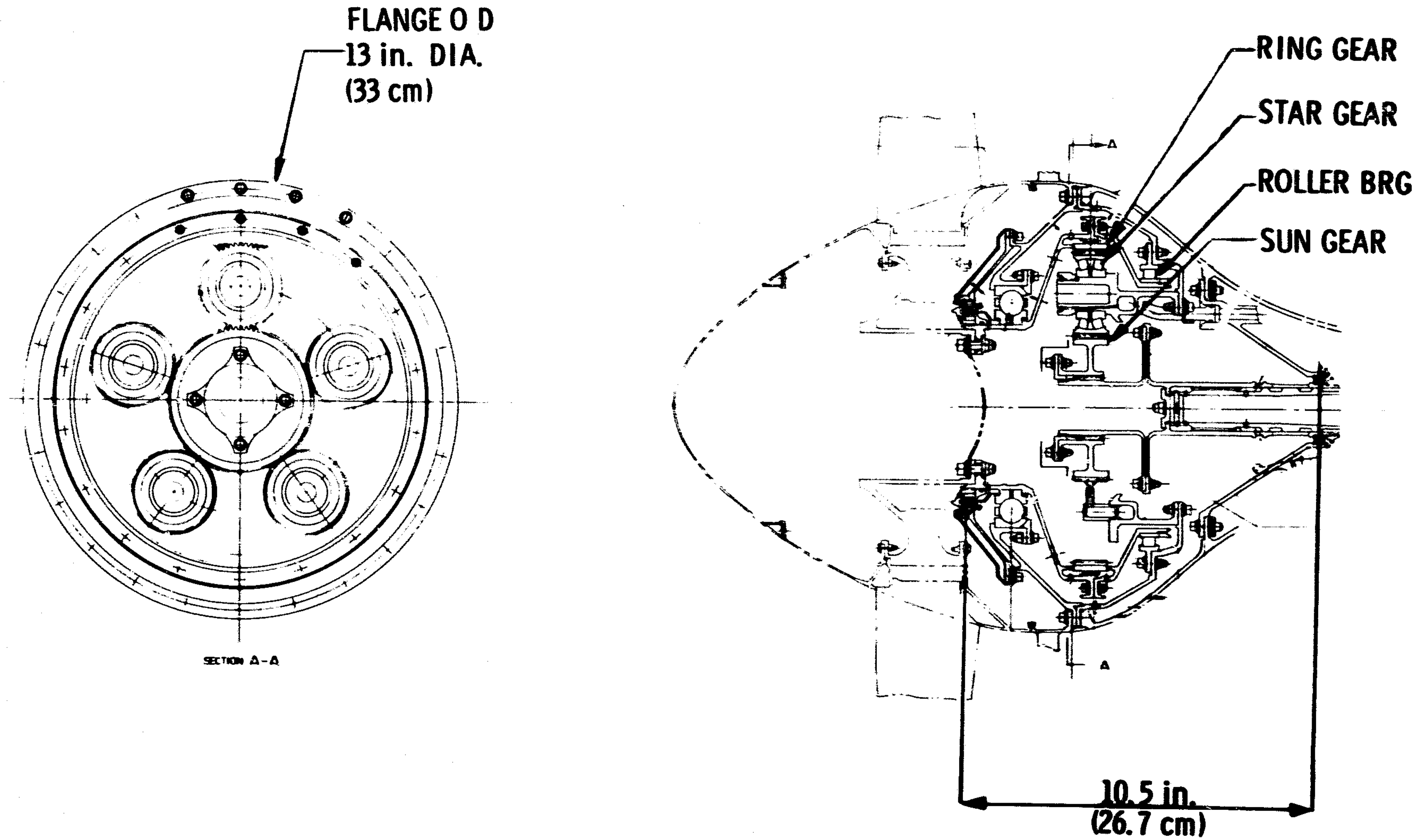


Figure 53. Fan Reduction Gear.

Light Load Test

Initiate test with lube oil flow check. Initially start unit and rotate slowly while listening for abnormal sounds. Gradually bring unit up to 10% speed. Gradually apply light load (approximately 10% of full load). Note temperature readouts and stay at light load point for 15 minutes or until temperatures stabilize. Increase speed gradually to 20% speed, etc., up to and including 110% speed. Remove from test and partially disassemble for visual inspection.

Full Load Test

Initiate test as in Light Load Test except that speed and then torque load are step increased in 10% increments from 10% to 110% of rated speed.

Data recorded will include:

1. Percent Speed
2. Percent Torque
3. Bearing Temperatures
4. Oil-In Temperatures
5. Oil-Out Temperatures
6. Oil Flow Rate
7. Horizontal Vibration
8. Vertical Vibration

Gear tooth contact pattern checks will be taken after 30%, 60%, and 110% speed data runs.

Assurance Test (20 Hours)

This short test is to be conducted to verify the flight type integrity of the gear set without affecting its remaining life. The testing cycle selected represents a simplified general aviation flight schedule.

Condition	Time (min)
Full Power and Takeoff Speed	2
85% Power and Climb Speed	10
70% Power and Cruise Speed	90
30% Power and Descent Speed	18
TOTAL	120

Repeat cycle 10 times, totalling 20 hours.

Combustor Sector Burning Emissions Test

Both visible emissions (smoke) and non visible emissions (gases, CO, CO_2, NO, NO_2) will be measured on a combustor component stand in accordance with ARP 1179 and ARP1256, smoke and gaseous emission procedures and EPA Federal Register Vol. 38 No. 136 Part II (July 17, 1973) Control of Air Pollution From Aircraft and Aircraft Engines, Emission Standards and Test Procedures.

Using system analysis cycle data, set combustor inlet conditions representing the 4 power settings:

1. Idle, from cycle data
2. Takeoff, 100% rated power
3. Climb Out, 90% rated power
4. Approach, 30% rated power

With conventional T700 combustor and fuel system, take smoke emissions and gaseous emission samples, analyze and compare with EPA standards.

With modified fuel supply system, explore sector burning and emissions together with exhaust temperature gradients. Analyze samples as before and compare with EPA standards.

If results are not as expected (better than standards) explore sector burning with other combinations of fuel nozzles.

Fan Blade and Vibration Testing

Component Bench Tests will be run on:

1. Fan Blades
2. Fan exit guide vanes
3. Core inlet deswirl vanes

Vibration frequency checks (nondestructive) will be run on all fan blades and a large sample of vanes, approximately 30 of each, to establish design and manufacturing consistency over the full range of operating speeds.

Stress Distributions (nondestructive) will be run on one sample of fan blade and of fan outlet guide vane by strain gaging various sections including base and root portion to determine end effects during both steady state and vibratory conditions.

Fatigue tests (destructive tests) will be run on four fan blades, six exit guide vanes, and six core inlet deswirl vanes to assure predicted margin over operating range of fan and engine.

ENGINE TESTS

The experimental engine will be tested at the Lynn, Massachusetts, facility for aeromechanical data and performance, mechanical integrity, smoke and gas emissions.

Facility Modification

These will consist of preparing a factory cell to accept and test the QCGAT Experimental Engine including its nacelle. The following list covers the cell modification and required test facilities:

1. Engine mounting dolly.
2. Bellmouth, screen, brackets.
3. Throttle actuation system.
4. Under cowl fire protection.
5. Exhaust adaptor.
6. Cell inlet modification blower added.
7. Air start system.
8. Electrical jumpers and harnesses.
9. Hoses, tubing and fittings.
10. Electrical actuators (4) and motor drive.

Instrumentation

The instrumentation will include front fan blade rotating strain gages and slip ring assembly to measure vibratory stress levels in fan blades. Strain gages in fan outlet guide vanes and in core deswirl blades will be installed to measure their vibratory stress levels. Fan inlet and exhaust rakes and core engine inlet rakes will be installed to measure fan performance and fan plus engine performance. The pressure, temperature, and vibratory instrumentation required for component and engine performance will be installed. The list of instrumentation is as follows:

Front Fan Instrumentation

Rotating Strain Gages (12)
Static Strain Gages (20)
Inlet Rakes (4)
Discharge Rakes (4)
Inlet Rakes to Core (4)
Vibration Pickups (8)
Pressure Measurements, Kulites (12)
Slip Ring Assembly and Adaptor
Clearancsometers, Fan Blade Tip (2 at 90°)
Traverse Actuators and Probes (3)
Flow Path Static Pressures (50)
Skin Thermocouples (8)

Engine Operational Instrumentation

Operational Temperatures (15)
Operational Pressures (15)
Inlet Screen Thermocouples (40)
Exhaust Smoke and Gas Emission Probes
Position potentiometers
Vibration Pickups (6)
Exhaust Nozzle Position Indicator
Skin Thermocouples (20)

Fan Reduction Gear Instrumentation

Operational Temperatures (15)
Operational Pressures (5)
Chip Metal Detector
Vibration Pickups and Installation (6)

Factory Check Out Run

After engine has been installed in its test cell and instrumentation completed, it will be run to check out facility, instrumentation, and engine's mechanical operation. Approximately 10 engine test hours are expected to be run for this test.

Front Fan Aeromechanical and Engine Performance Tests

The most sensitive instrumentation is the rotating strain gage and the slip ring assembly and readout. Consequently, this part of the test will be conducted first. Although the emphasis is on the front fan and its instrumentation, other data including fan reduction gear operation and engine performance will also be recorded concurrently.

Speed Lines: Operate engine at 60, 70, 80, 85, 90, 95, and 100% speed. Gather data (5 points) at each speed representing five different fan exhaust area settings.

Traversing: Operate engine at 85, 90, 95, and 100% speed (including design point). Take aerodynamic profile at fan discharge, fan inlet, and at core inlet.

This data will provide information on the aeromechanical performance of the fan as well as the engine's performance.

Analysis of the data will determine the following parameters:

1. Fan stall line (actual or indicated).
2. Fan efficiency.
3. Fan pressure ratio.
4. Fan and engine airflow.
5. Fan blade stress measurements.
6. Fan, reduction gear, and engine vibrations.
7. Fan reduction gear mechanical assurance; e.g., temperatures, vibrations, oil pressure within operational limits as determined on component stand.
8. Engine thrust, SFC, operating line.

Estimated Performance Ratings

Referring to Figure 54, note that the thrust versus fan inlet temperature curve is not fuel flow limited as in flight engine curve. This demonstrates the engine's full potential which is advantageous in an engine development program. Table 21 shows the experimental engine rating data with takeoff at the same $T_{4.1}$ as hot day. Compare this data with previous data shown in Tables 6 and 7.

Engine Smoke and Gas Emission Test

Refer to Combustor Sector Burning Emission Test for required test procedure specifications. Utilizing the exhaust smoke and gas probes, the engine will be operated at four power settings.

1. Idle, from engine operation.
2. Takeoff, 100% rated power.
3. Climb out, 90% rated power.
4. Approach, 30% rated power.

With fuel supply (sector burning) system selected during combustor testing, take smoke and gaseous emission samples, analyze and compare with EPA standards.

This testing is expected to consist of 50 engine test hours and completes the performance and emissions testing for the experimental engine at the Lynn facility.

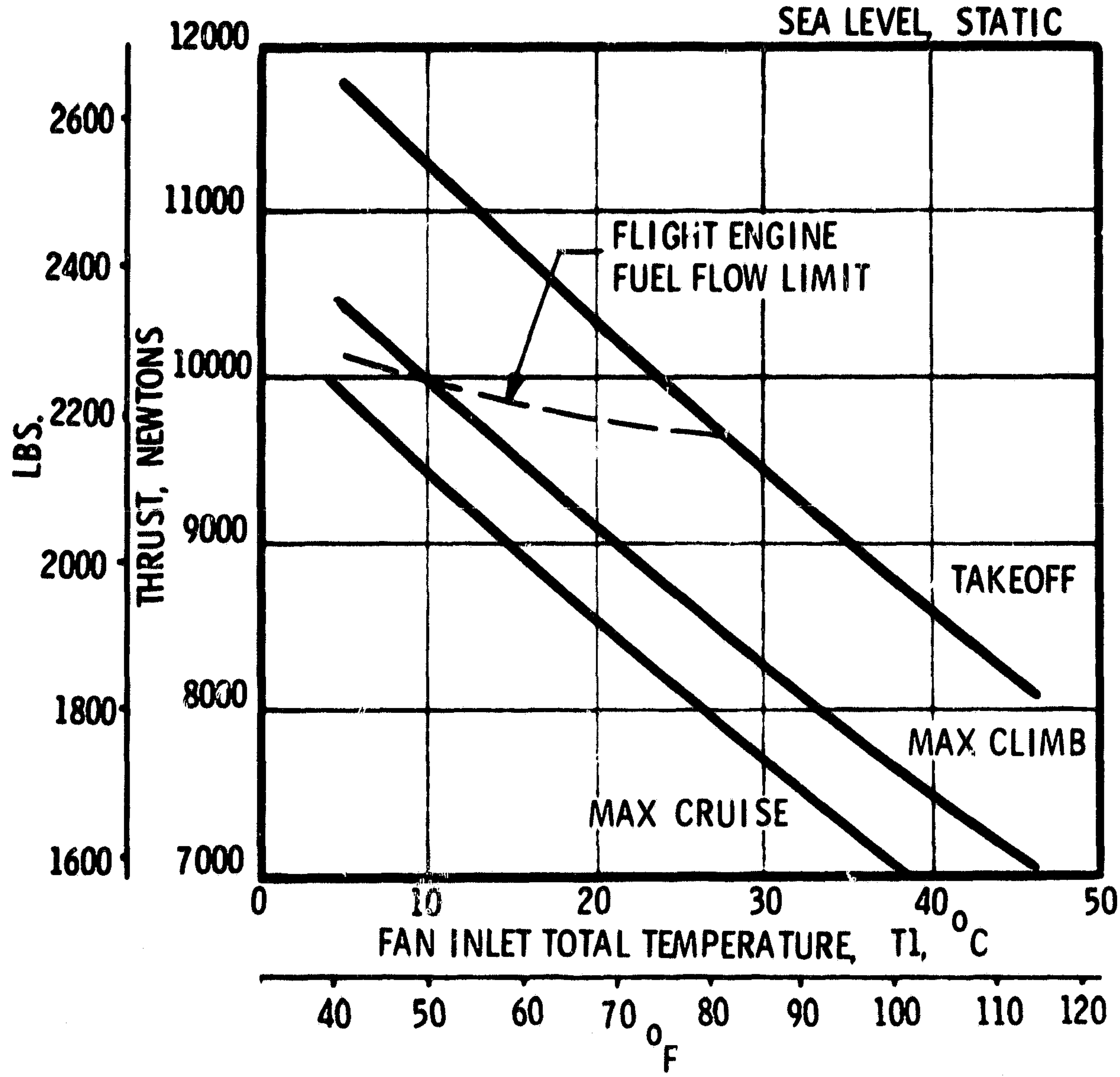


Figure 54. QCGAT Experimental Program Engine Estimated Thrust vs Fan Inlet Temperature.

TABLE 21. T700 QCGAT ESTIMATED PERFORMANCE RATINGS AT SEA LEVEL, STATIC, STANDARD DAY

Rating	Net Thrust (Min.) N	(lb)	Specific Fuel Consumption (Max) kg/kNs,	(lb/lb hr)	Measured Gas Generator Discharge Temperature °C	(°F)
Takeoff	10765	(2420)	.00951	(.336)	830	(1525)
Max Climb	9537	(2144)	.00940	(.332)	782	(1440)
Max Cruise	8945	(2011)	.00935	(.330)	760	(1400)
90% Max Cruise	8051	(1810)	.00932	(.329)	-	-
75% Max Cruise	6708	(1508)	.00937	(.329)	-	-

Outdoor Facility, Acoustics

Install the engine at Site IVD, Acoustic Arena, (see Figure 55) at the Peebles, Ohio facility. Perform checkout run on engine to correlate performance with factory. Take measurements at the following operating conditions.

Test No. 1: With acoustical panels installed and with microphones on towers, operate fan engine from Idle to Maximum power in eight equal increments. Measure fan speed and stabilize for approximately one minute. Take reading. Repeat reading from maximum power to Idle in the same eight equal increments.

Test No. 2: With acoustical panels installed and with microphones located for near field testing, repeat Test No. 1.

Test No. 3: With solid panels installed, repeat Test No. 2.

Test No. 4: With solid panels installed, repeat Test No. 1.

This testing is expected to consist of 20 engine test hours and completes the outdoor testing.

Factory Prep-to-Ship Checkout

After engine is returned to the factory, it will be subjected to partial teardown and inspection. It is expected that minor replacements of parts will restore the engine to its original condition, after which a performance verification run will be made (approximately ten engine test hours) and the engine will them be shipped to NASA.

RISK ASSESSMENT

Referring to the risk assessment summary in Table 22, it can be seen that all potential problem categories are classified as low risk (indicated by "L" in the table). This, of course, was an objective in planning the experimental engine program.

These low risk assessments are based upon the aeromechanical performance predictability of the combination of having a developed core engine (T700-GE-700) together with scaled and proven unique parts (e.g. fan and reduction gear scaled from QCSEE). The required emission and acoustics levels of acceptability, moreover, will have been achieved prior to engine testing. For example, the combustor component test will optimize emissions - the QCSEE noise data will be available to optimize acoustics. The notes and comments referenced in the Recovery Action column of Table 22 briefly explain the straightforward corrective action to be taken in the event that an unexpected problem should arise.

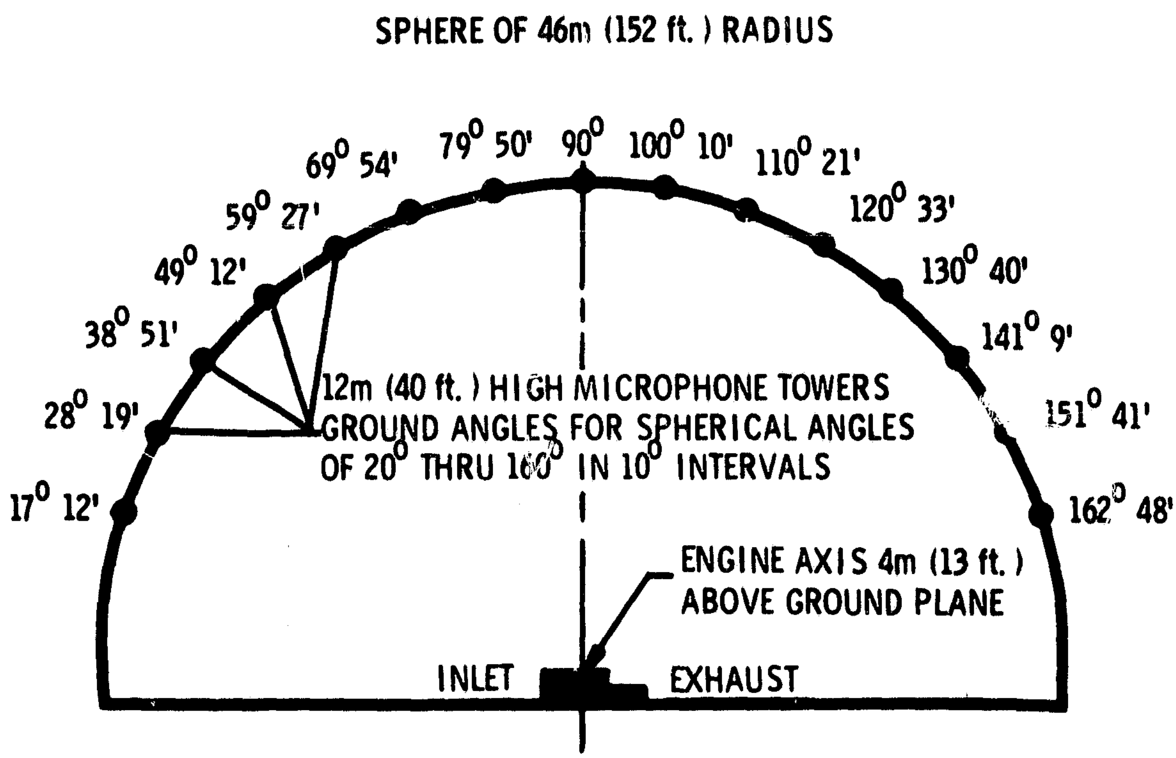


Figure 55. Plan View of Peebles Site IV D Acoustic Arena.

TABLE 22. QCGAT EXPERIMENTAL ENGINE RISK ASSESSMENT

	POTENTIAL PROBLEM	SOURCE OF DISCOVERY	CONSEQUENCES	TECH. RISK	SCHEDULE IMPACT	COST IMPACT	PROB. OF OCCUR.	RECOVERY ACTION
1.	PERFORMANCE DEFICIENT							
	a. SFC	Engine Test	Miss SFC Goal	L	L	L	L	(1)
	b. Thrust, Test	Engine Test	Miss Thrust Goal	L	L		L	(1)
2.	EMISSIONS TOO HIGH							
	Combustor Sector Test	Comb. Stand	Miss Emission Goal	L	L	L	L	(2)
3.	NOISE LEVEL TOO HIGH	Outdoor Engine Test	Miss Noise Goal	L	L	L	L	(3)
4.	FAN BLADE AERO-ELASTIC INSTABILITY	Lab Blade Frequency Check	Temp. Restriction on Engine Operation	L	L	L	L	Select blades for frequency
5.	FAN GEAR REDUCTION OPERATING DEFICIENCY							
	a. Temperature Rise	Component Test	Modification Required	L	L	L	L	Apply windage baffles
	b. Vibration	Component Test	Modification Required	L	L	L	L	Refine balance, or control bearing clearance.
6.	BLADE TIP AND/OR SEAL RUBS	Engine Test with Sector Burning	Clearance Increase	L	L	L	L	(4)
7.	NON-FLIGHT DESIGN COMPONENTS	Engine Test	Redesign	L	L	L	L	
	Long PTO Shaft, T700 AGB Oil Cooler, Oil Tank, Actuators							
8.	LOW PRESSURE TURBINE AIRFOILS	Engine Test	Miss Performance	L	L	[illegible]	L	(5)
9.	SINGLE ENGINE PROGRAM	Engine Test	Delay in Schedule, Increased Cost	L	L	L	L	(6)

Note (1) Performance deficiency could be due to low component performance or due to high losses in nacelle and nozzle. Operate core at higher turbine temperature. Predicted performance for experimental engine includes margin for component performance variations.

Note (2) Emissions exceeding goals could be due to fuel sector schedule. Fix by changing number of operating fuel nozzles.

Note (3) Because of noise data availability for QCSEE, probability of occurrence is very low. Acoustic treatment surface area could be increased.

Note (4) Increase clearance in area where rub occurs by either reduced blade or seal diameter or "elliptical" machining of stator parts.

Note (5) Modifications to LPT airfoils will consist of small changes to airfoil stagger angles and camber to adopt to turbofan flow and RPM differences from turboshaft engine. Experience with T700, TF34, CF6, TF39 LP Turbines makes this very low risk.

Note (6) T700-700 Development program has adequate high time test experience on 12 engines to insure that a single engine QCGAT program is very low risk.

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2. Advanced Engineering and Technology Programs Department, General Electric Co., QCSEE PRELIMINARY ANALYSES AND DESIGN REPORT, Volume I, NASA CR134838 NASA Lewis Research Center, General Electric Company Report No. R74AEG478, October 1974.

3. Advanced Engineering and Technology Programs Department, General Electric Co. QCSEE PRELIMINARY ANALYSES AND DESIGN REPORT, Volume II, NASA CR134839 NASA Lewis Research Center, General Electric Company Report No. R74AEG479, October 1974.

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APPENDIX

ENGINE PERFORMANCE DATA

Net thrust, fuel flow and airflow are shown as functions of Mach number, and specific fuel consumption (SFC in lb/hp hr) as a function of net thrust on Figures 56 through 76. The performance curves are given at altitudes from sea level to 40,000 ft in increments of 10,000 ft. Each figure includes six part power settings. Sea level and 10,000 ft also have takeoff power.

Table 23 gives the engine performance parameters at altitudes from sea level to 45,000 ft in 5,000 ft increments. At each altitude, the engine performance is given at Mach numbers, within the flight envelope, in increments of 0.1. The nomenclature used in the performance tables is defined as follows:

Computer Readout	Nomenclature	Units
26 ALT	Altitude	ft
27 ZXM	Aircraft Mach Number	---
351 TAMB	Ambient Temperature	°R
279 PAMB	Ambient Pressure	psia
42 T1	Inlet Total Temperature	°R
41 P1	Inlet Total Pressure	psia
31 FN	Net Thrust	lbs
35 SFC	Specific Fuel Consumption	(lb/hr)/lb
183 FG8	Core Gross Thrust	lb
182 FG28	Bypass Gross Thrust	lb
37 FRAM	Ram Drag	lb
793 WFT	Fuel Flow	lb/hr
420 W1	Inlet Airflow	lb/sec
56 BPR	Bypass Ratio	---
316 XNF	Fan RPM	rpm
298 XNH	Gas Generator RPM	rpm
23 A28	Bypass Exhaust Nozzle Area	in^2
1166 XV8	Core Exhaust Velocity	ft/sec
1167 XV28	Bypass Exhaust Velocity	ft/sec
272 P8	Core Exhaust Total Pressure	psia
275 P28	Bypass Exhaust Total Pressure	psia
44 T8	Core Exhaust Total Temperature	°R
45 T28	Bypass Exhaust Total Temperature	°R
352 T45	Power Turbine Inlet Total Temperature	°R
416 W8	Core Exhaust Airflow	lb/sec
415 W28	Bypass Exhaust Airflow	lb/sec
6 P C	Power Setting	---

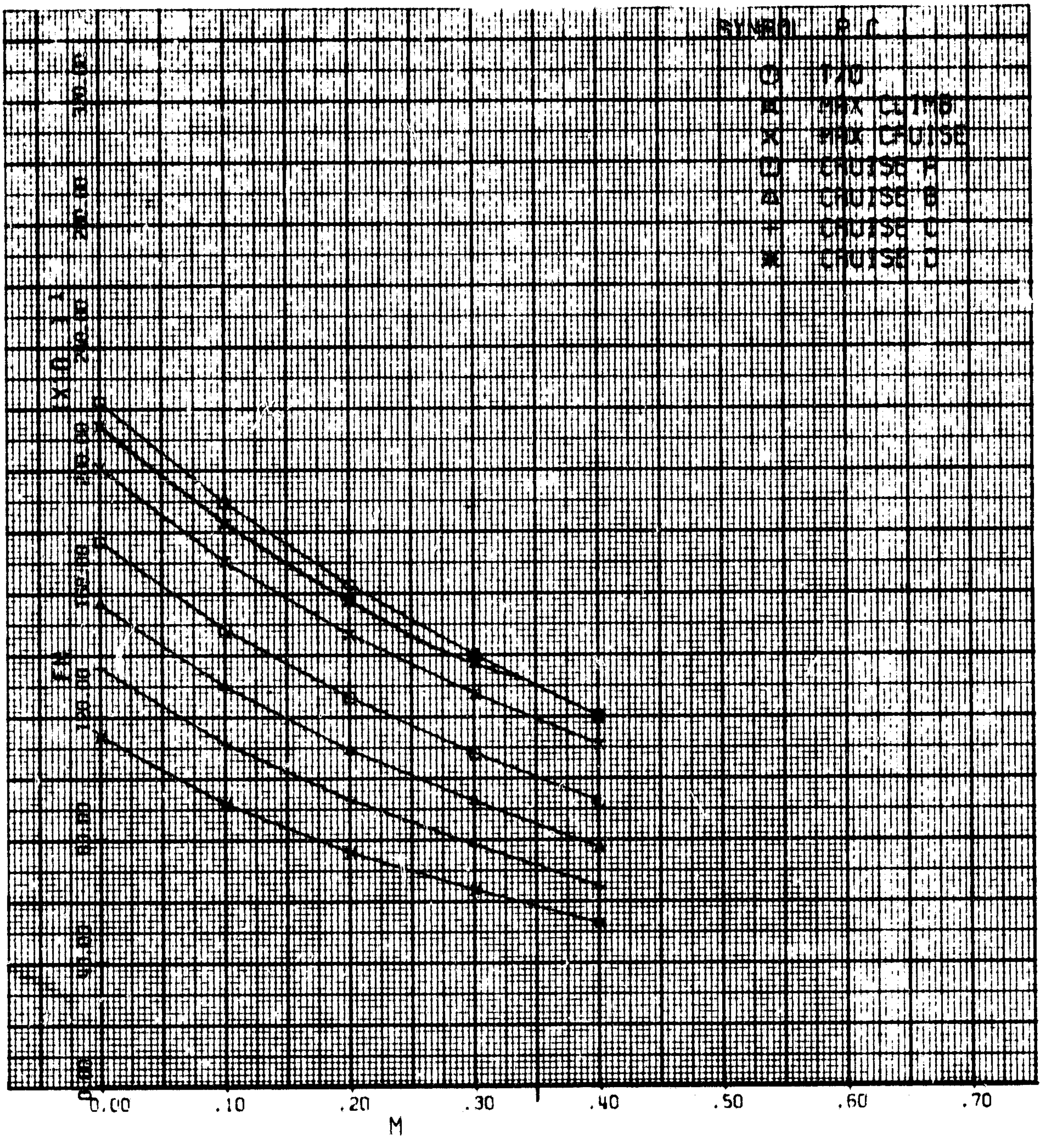

Figure 56. GE T700 QCGAT-Net Thrust vs. Mach Number at Sea Level.

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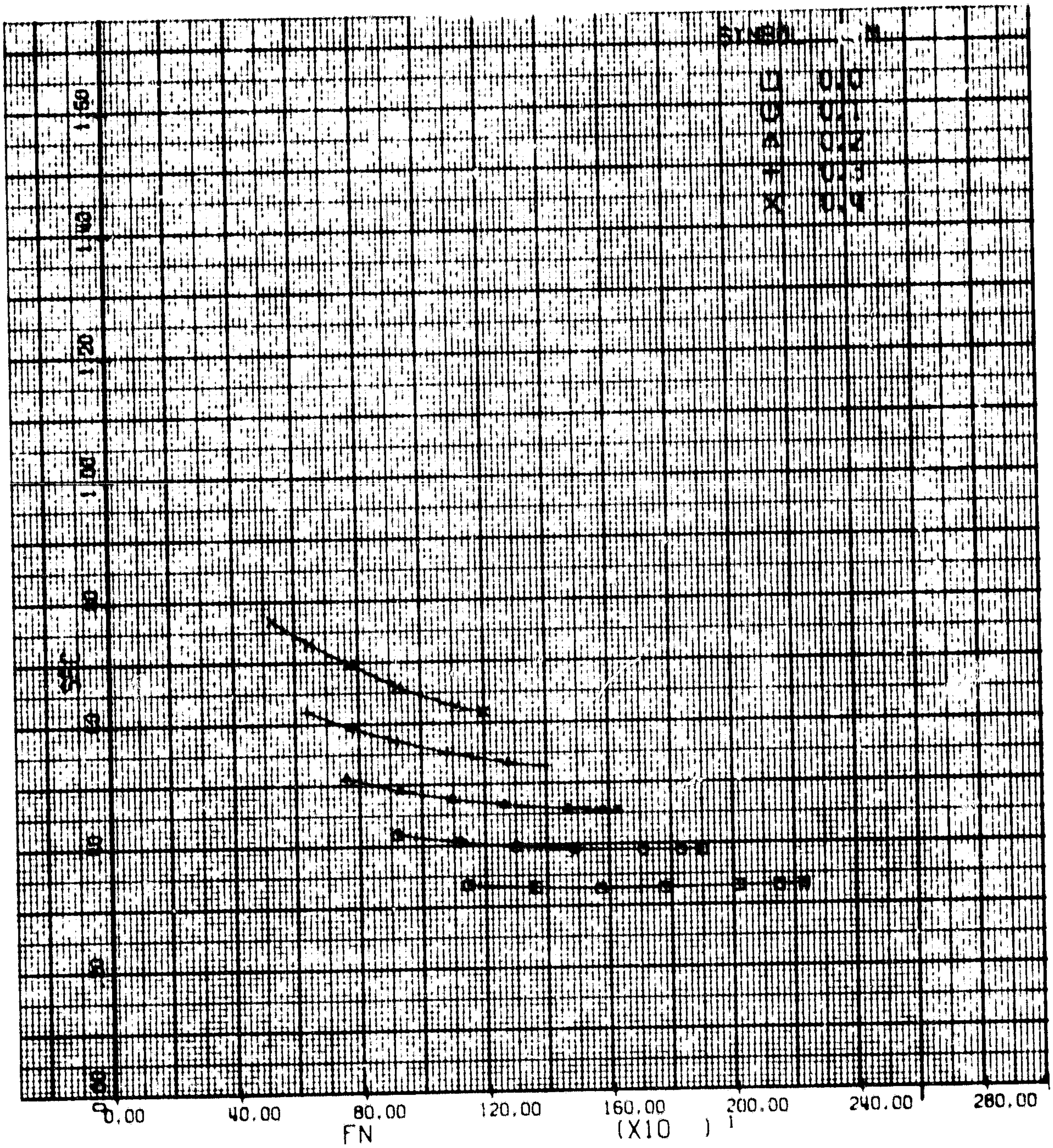

Figure 57. GE T700 QCGAT - SFC vs. Net Thrust at Sea Level.

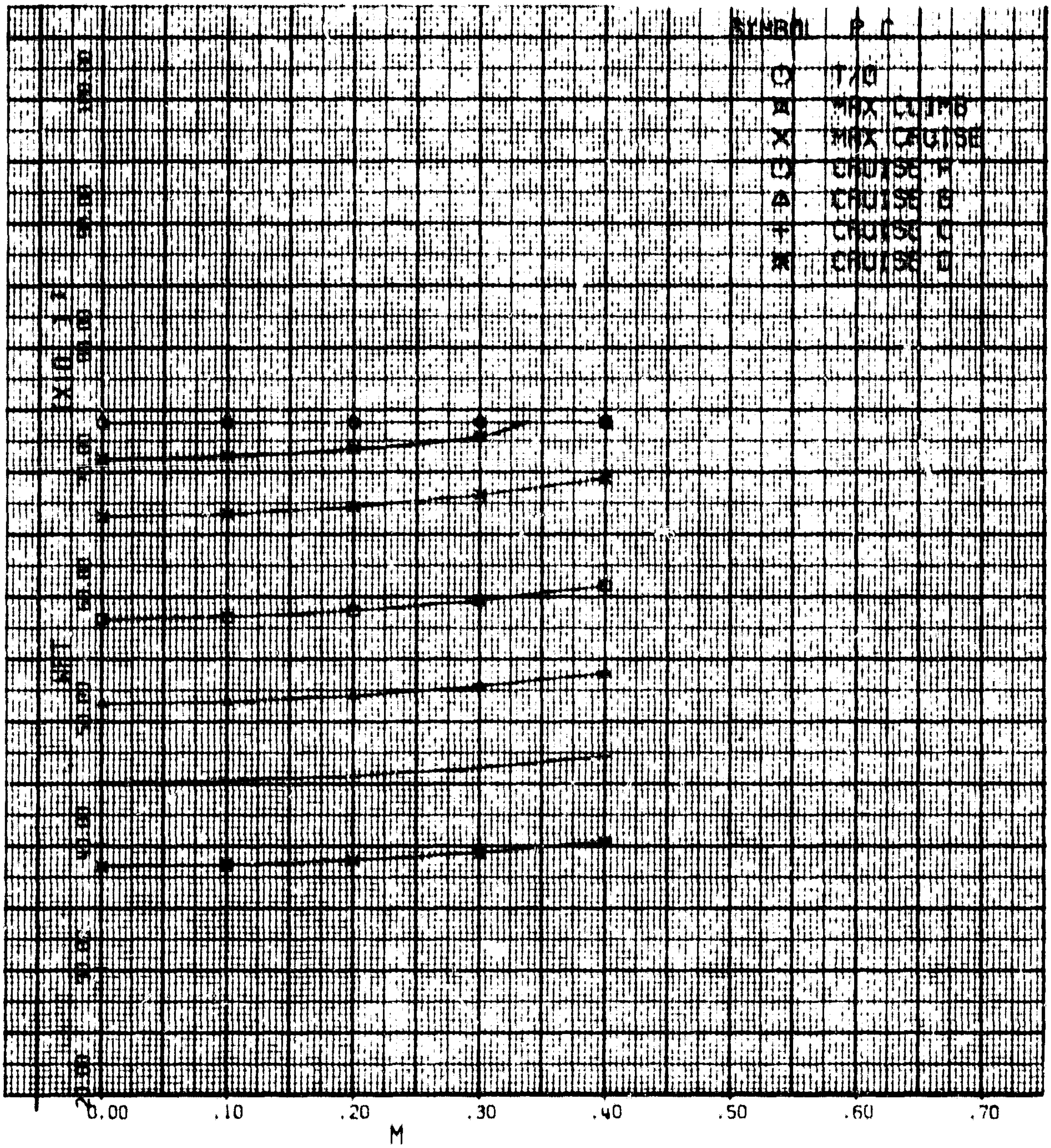

Figure 58. GE T700 QCGAT - Fuel Flow vs. Mach Number at Sea Level.

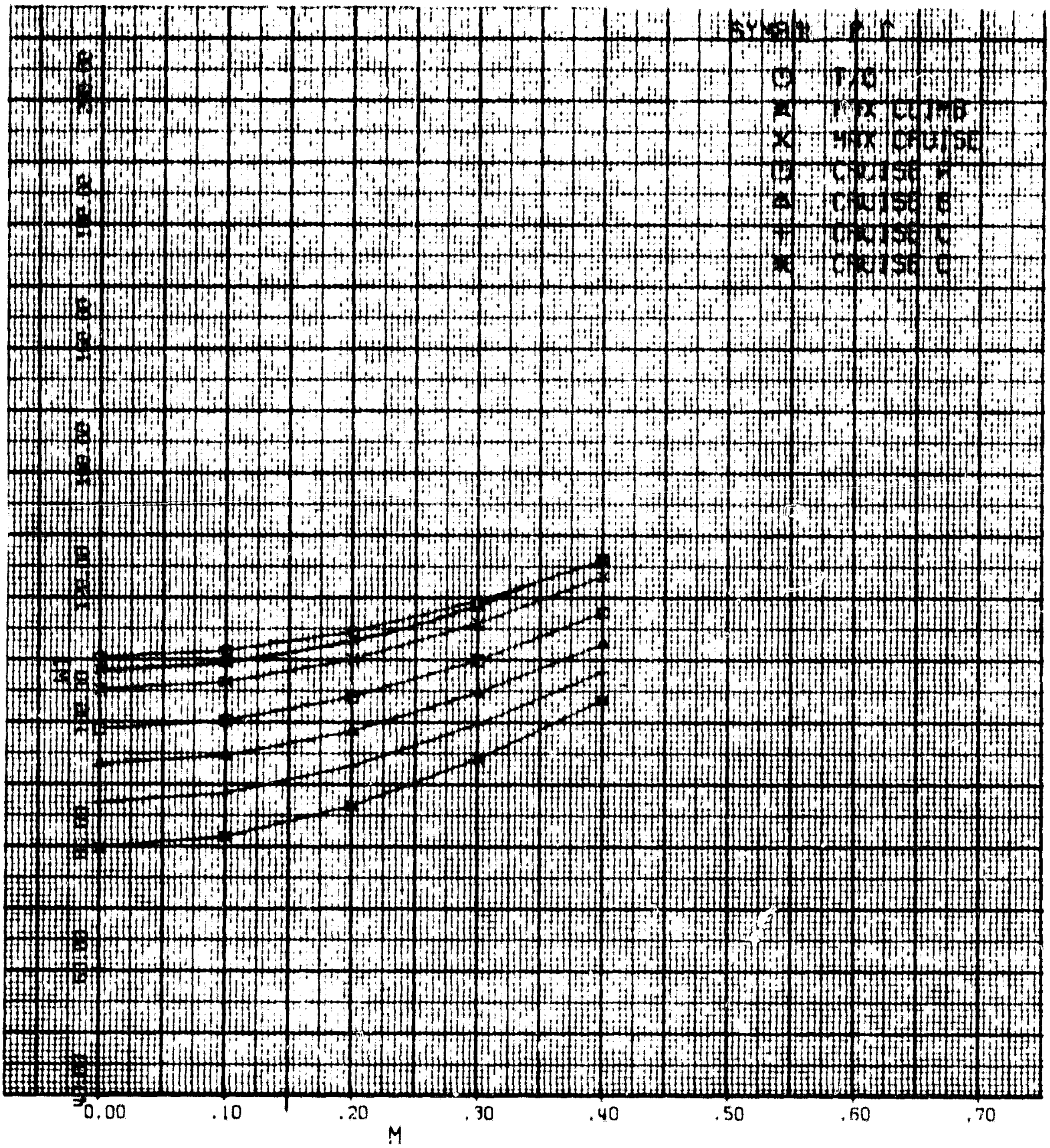

Figure 59. GE T700 QCGAT - Airflow vs. Mach Number at Sea Level.

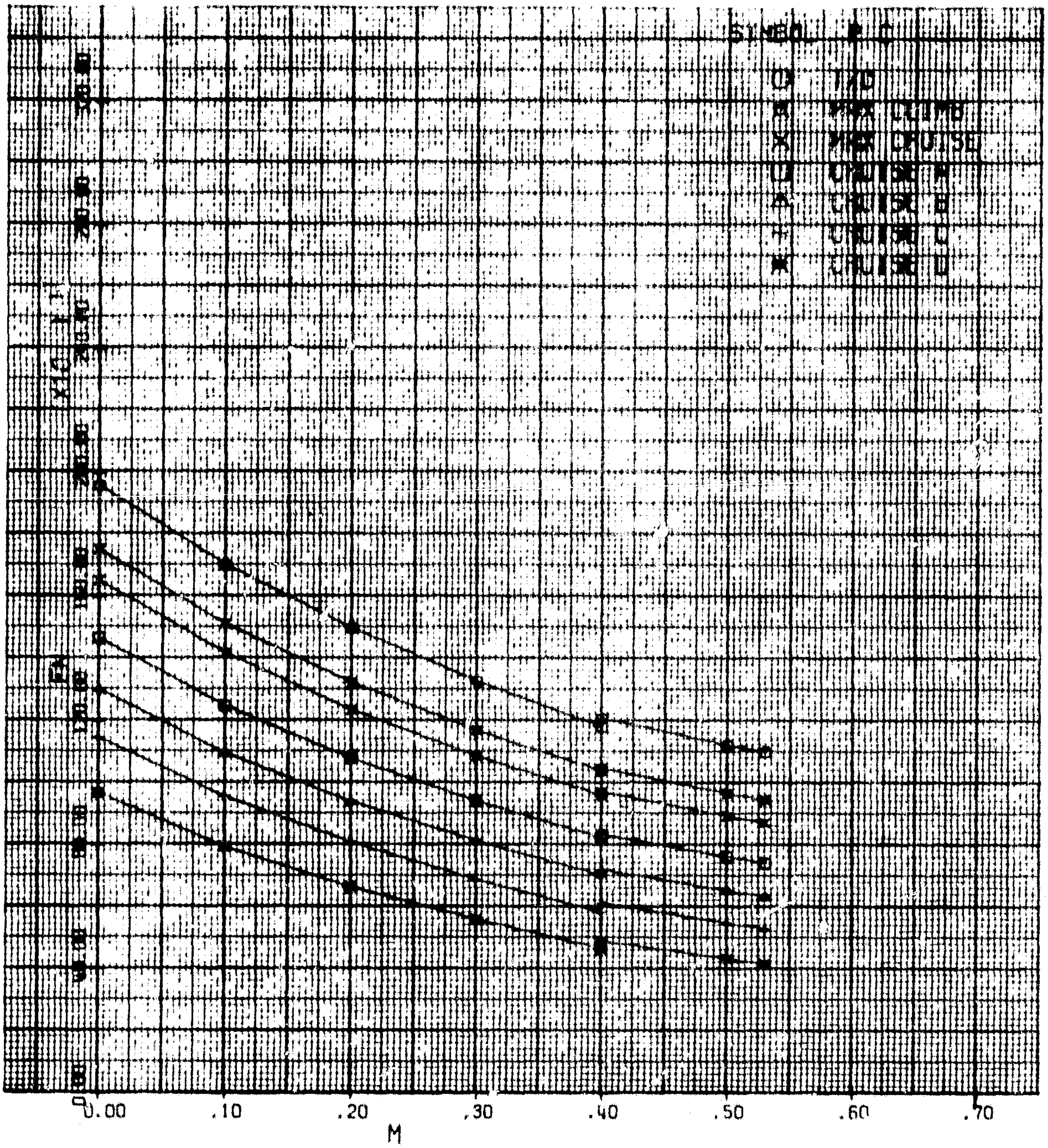

Figure 60. GE T700 QCGAT - Net Thrust vs. Mach Number at 10,000 Ft.

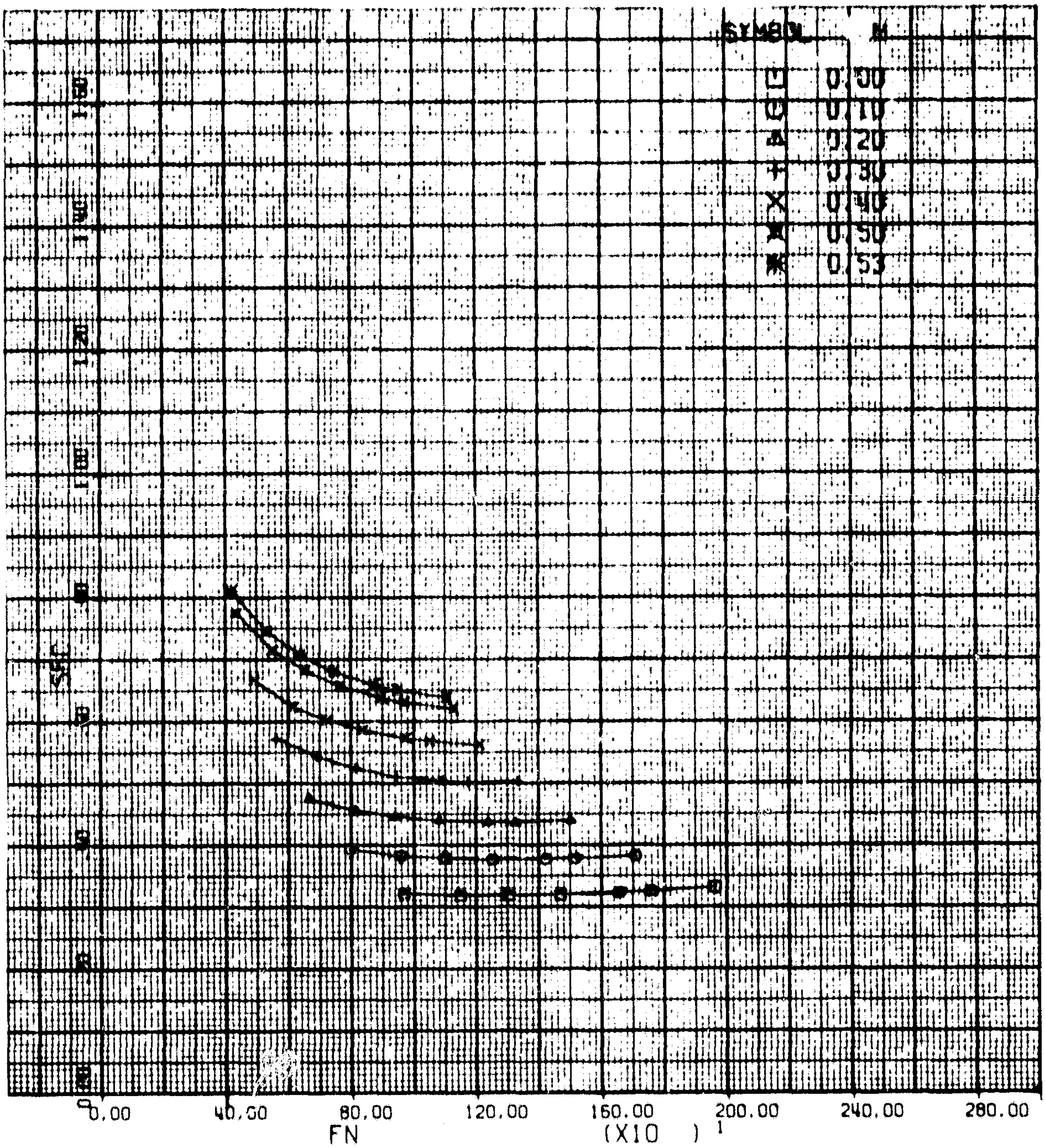

Figure 61. GE T700 QCGAT - SFC vs. Net Thrust at 10,000 Ft.

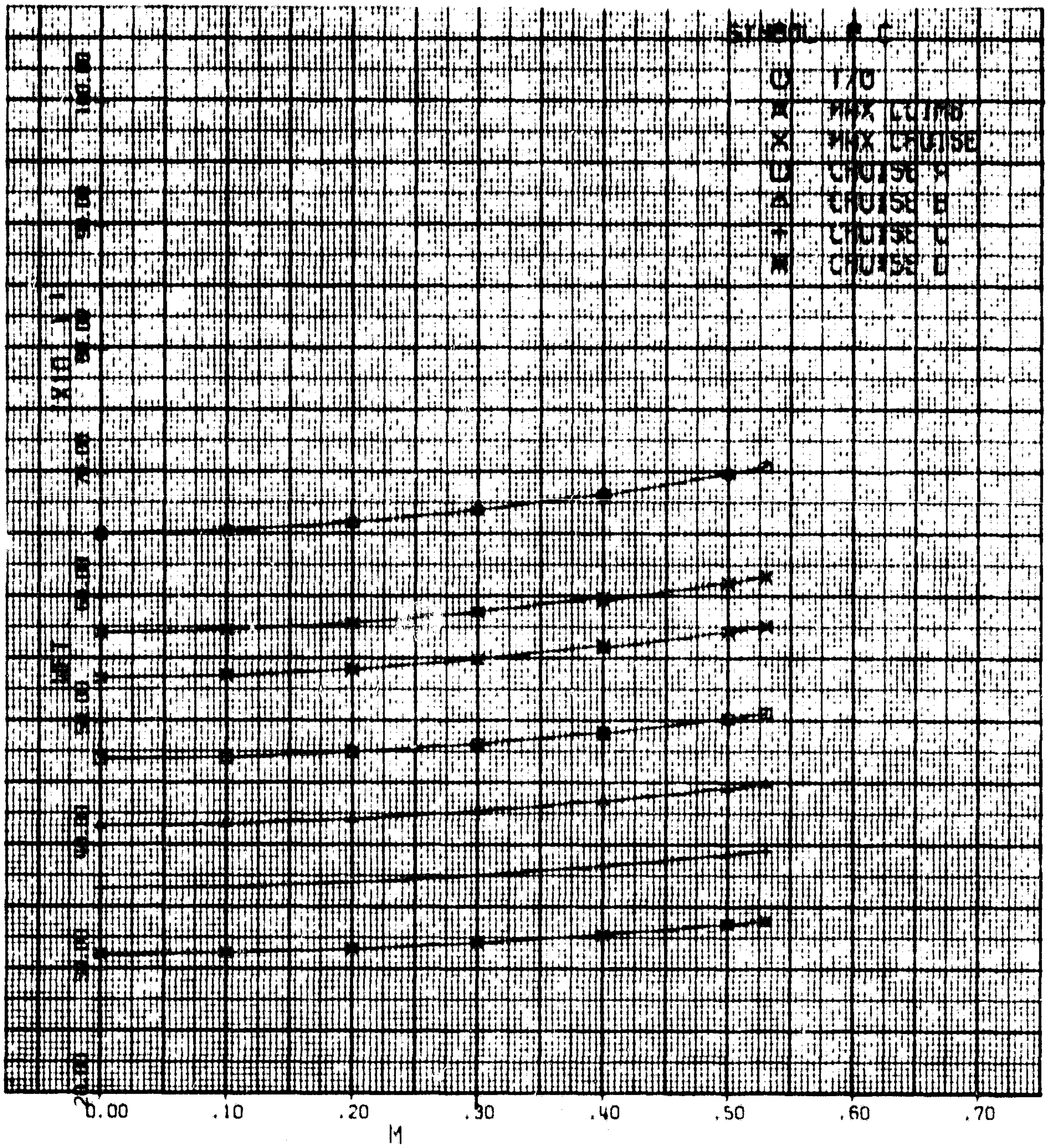

Figure 62. GE T700 QCGAT - Fuel Flow vs. Mach Number at 10,000 Ft.

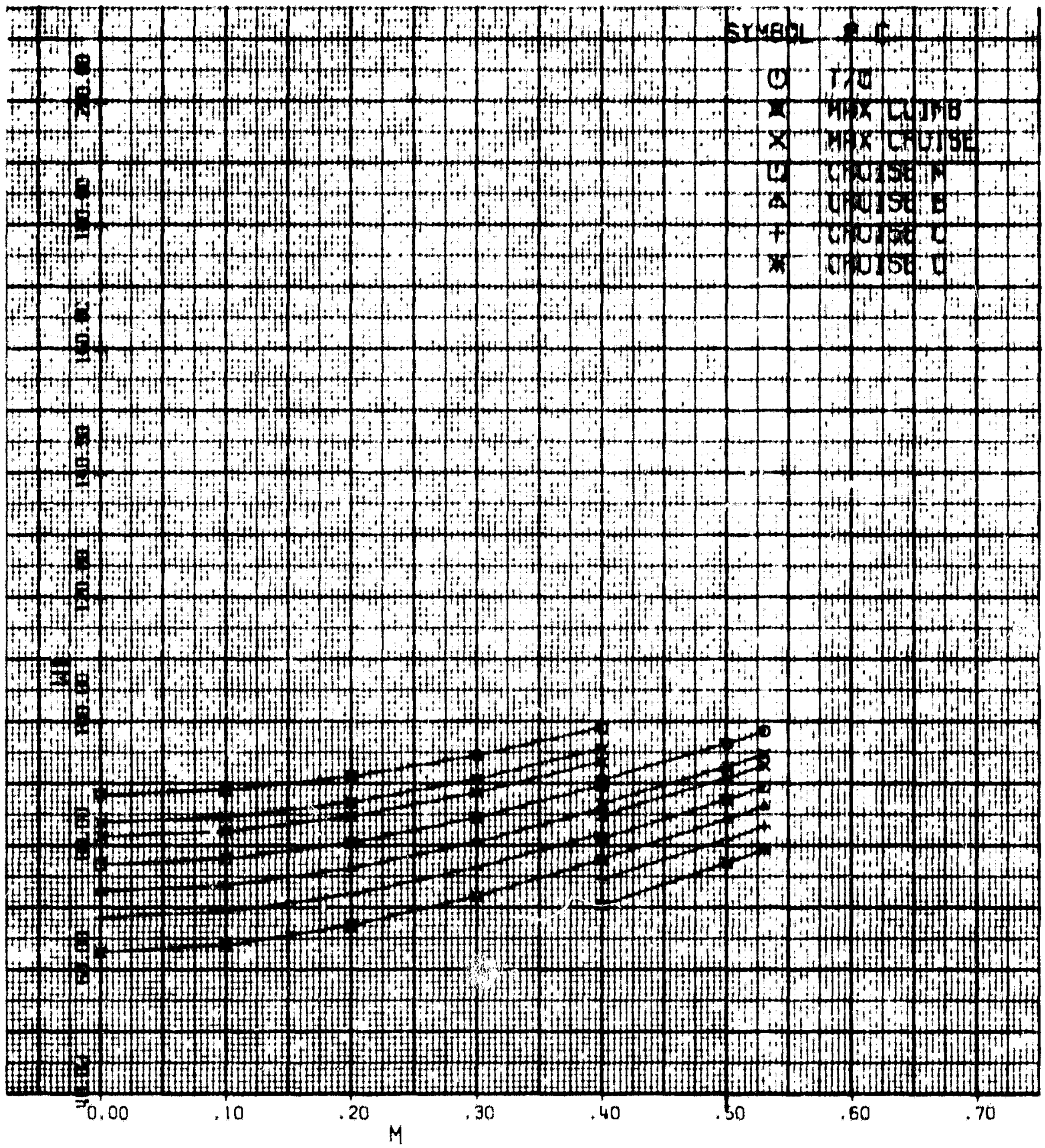

Figure 63. GE T700 QCGAT - Airflow vs. Mach Number at 10,000 Ft.

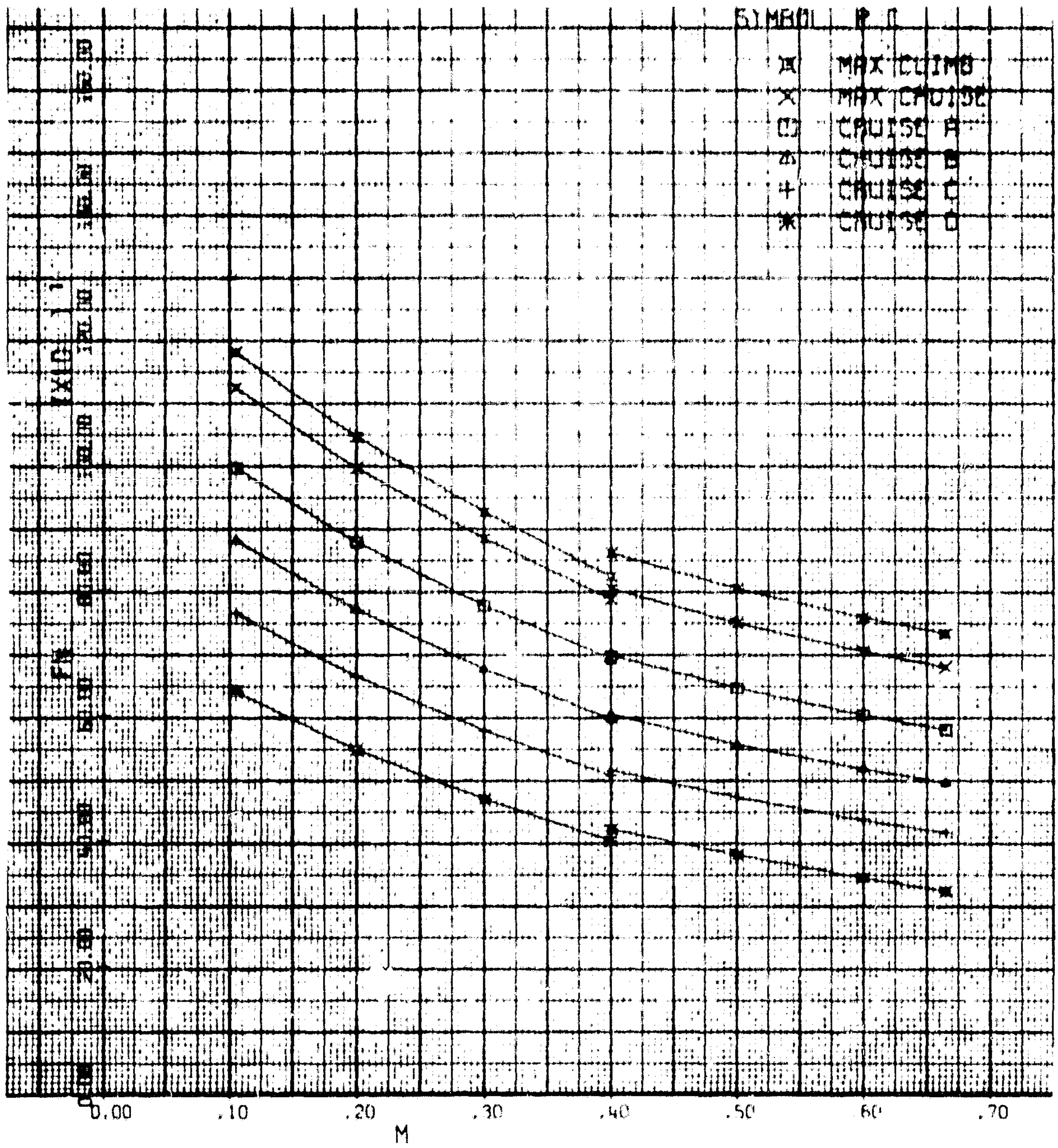

Figure 64. GE T700 QCGAT - Net Thrust vs. Mach Number at 20,000 Ft.

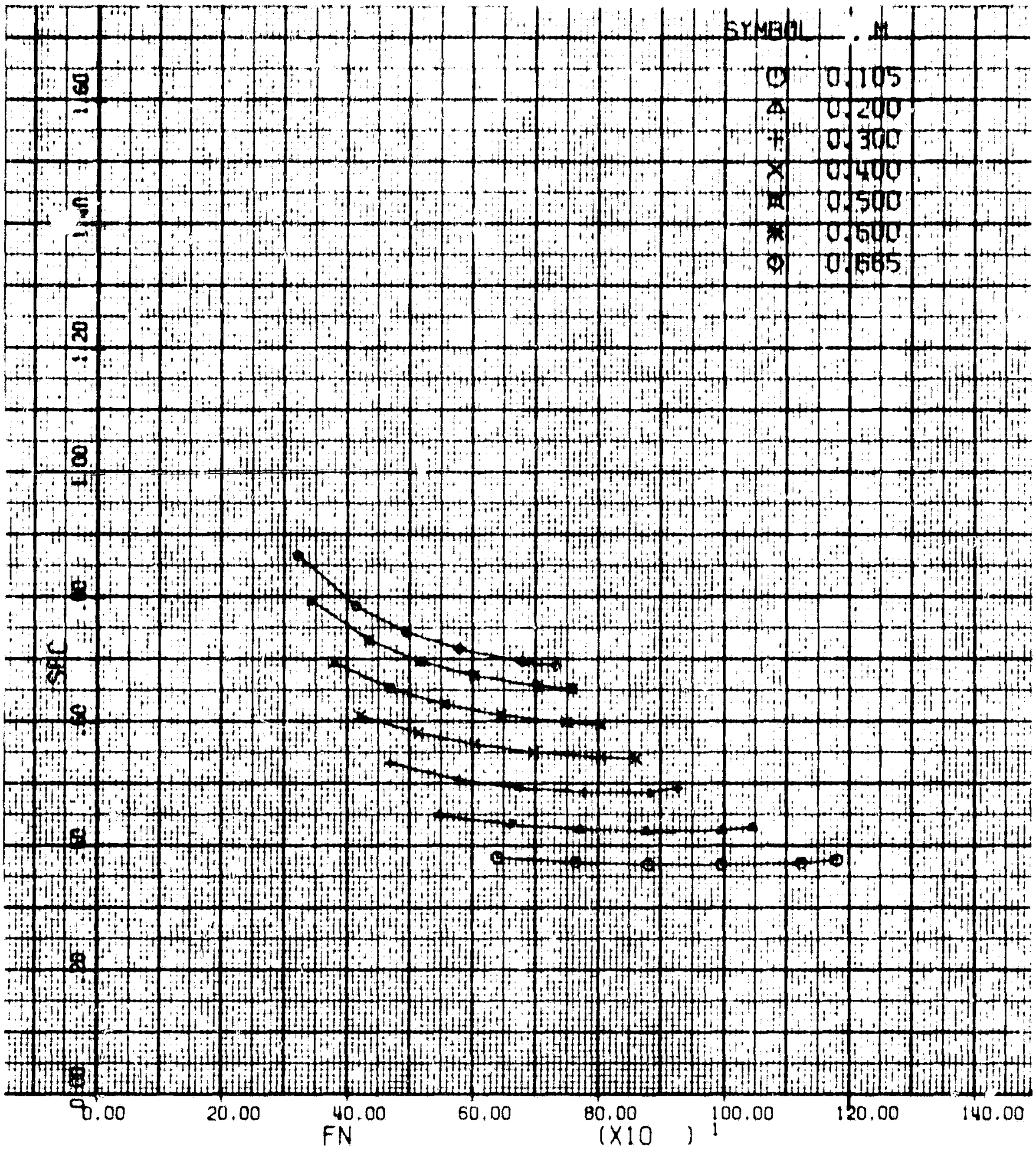

Figure 65. GE T700 QCGAT - SFC vs. Net Thrust at 20,000 Ft.

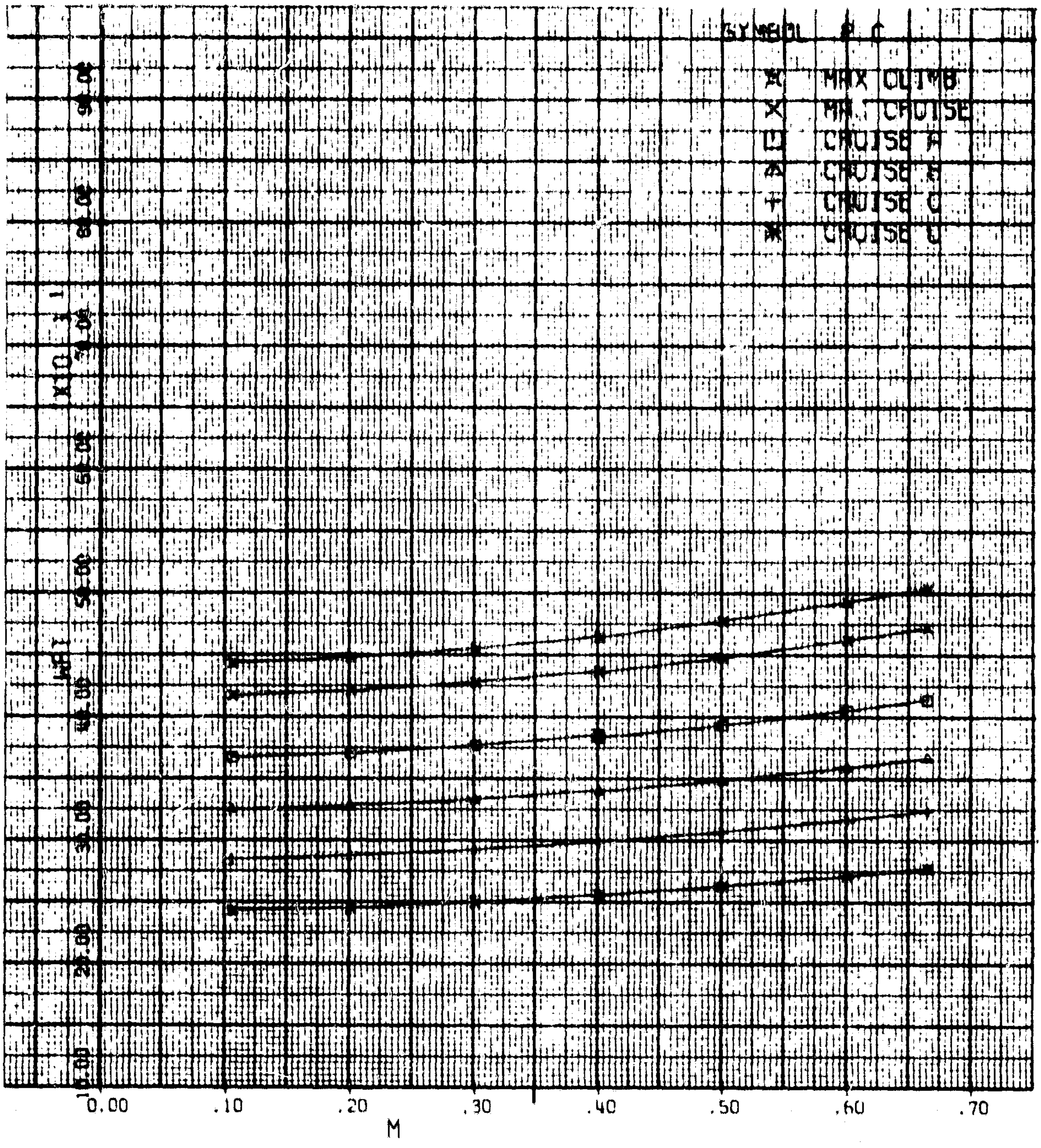

Figure 66. GE T700 QCGAT - Fuel Flow vs. Mach Number at 20,000 Ft.

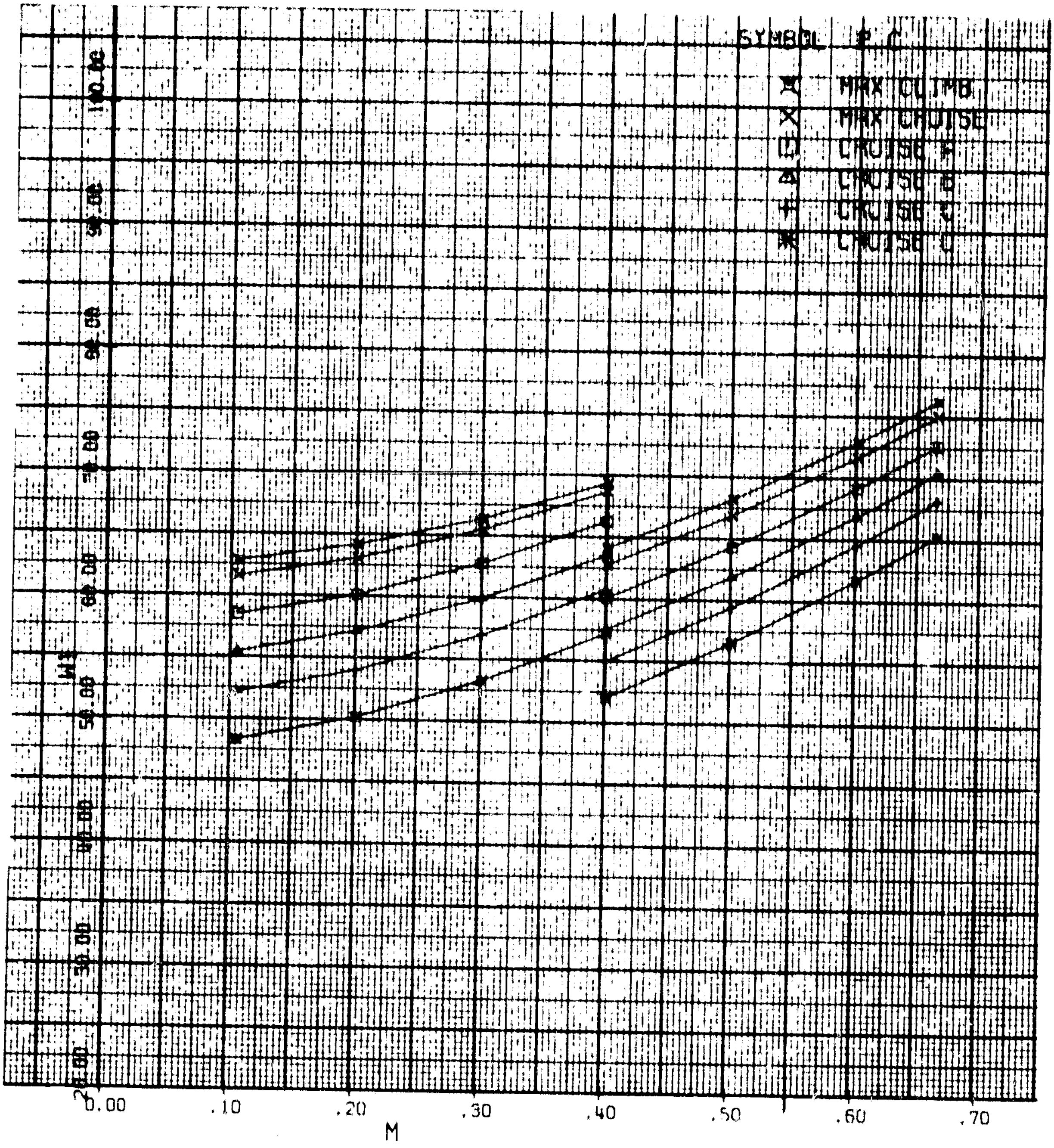

Figure 67. GE T700 QCGAT - Airflow vs. Mach Number at 20,000 Ft.

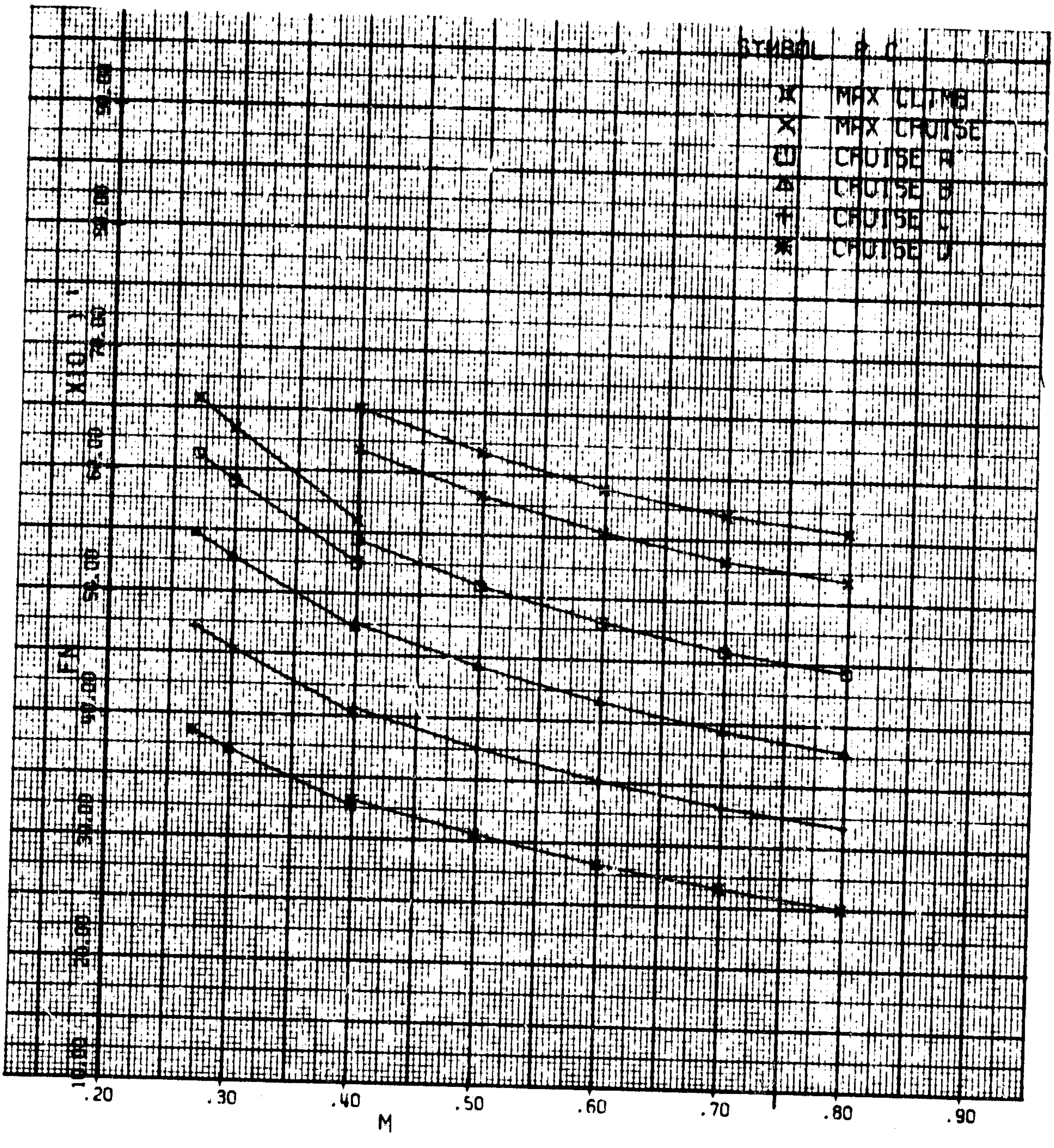

Figure 68. GE T700 QCGAT - Net Thrust vs. Mach Number at 30,000 Ft.

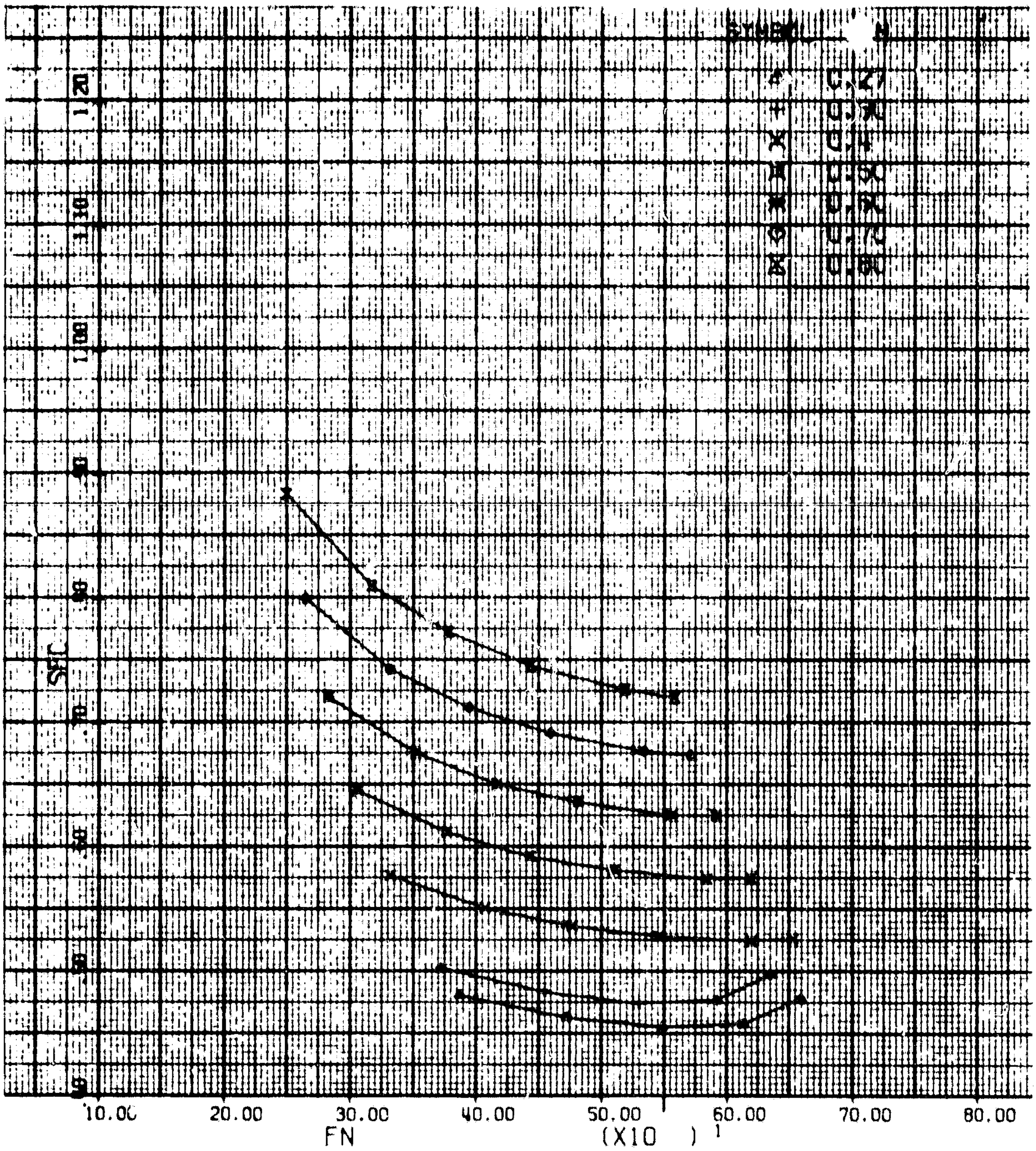

Figure 69. GE T700 QCGAT - SFC vs. Net Thrust at 30,000 Ft.

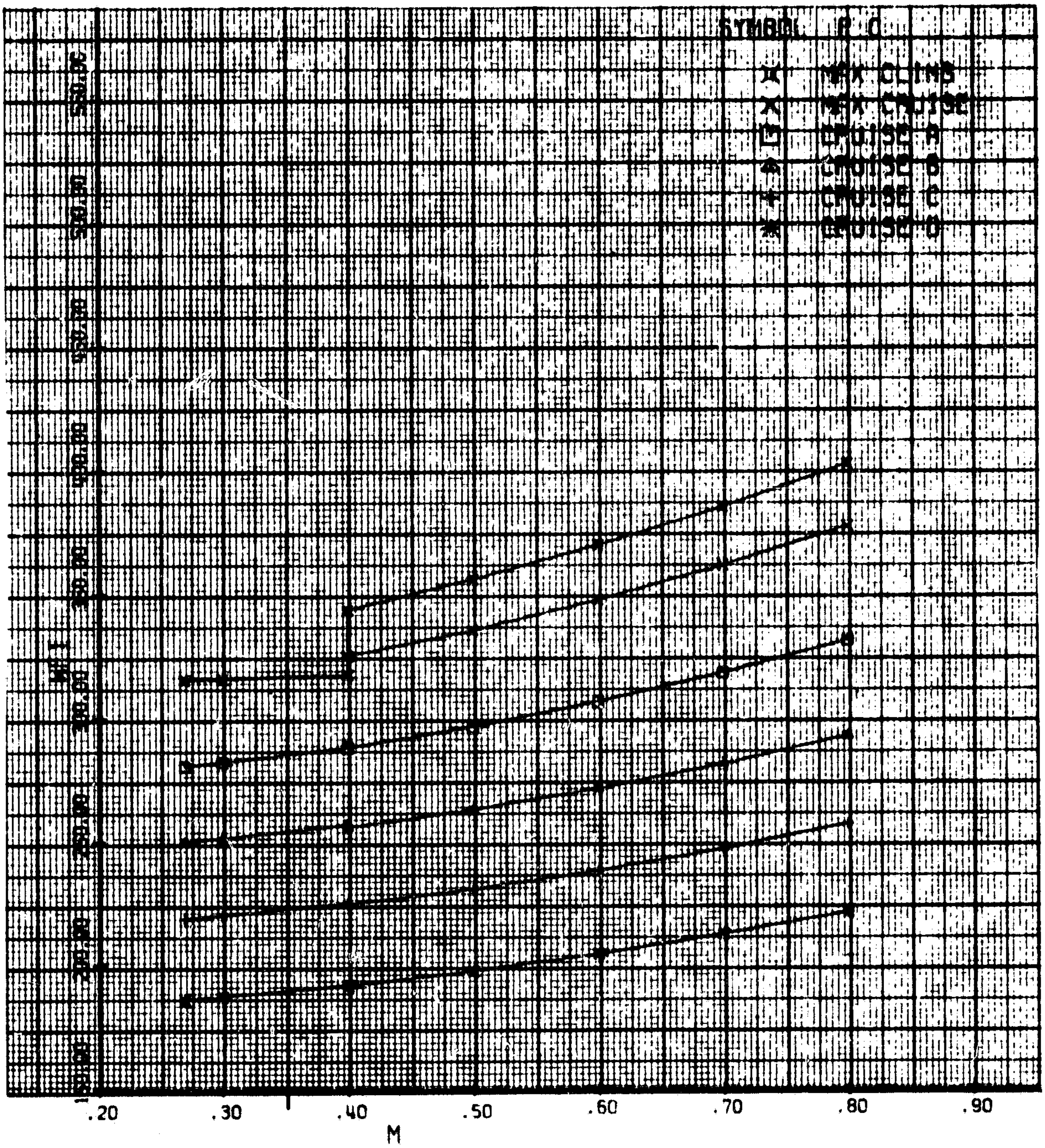

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Figure 70. GE T700 QCGAT - Fuel Flow vs. Mach Number at 30,000 Ft.

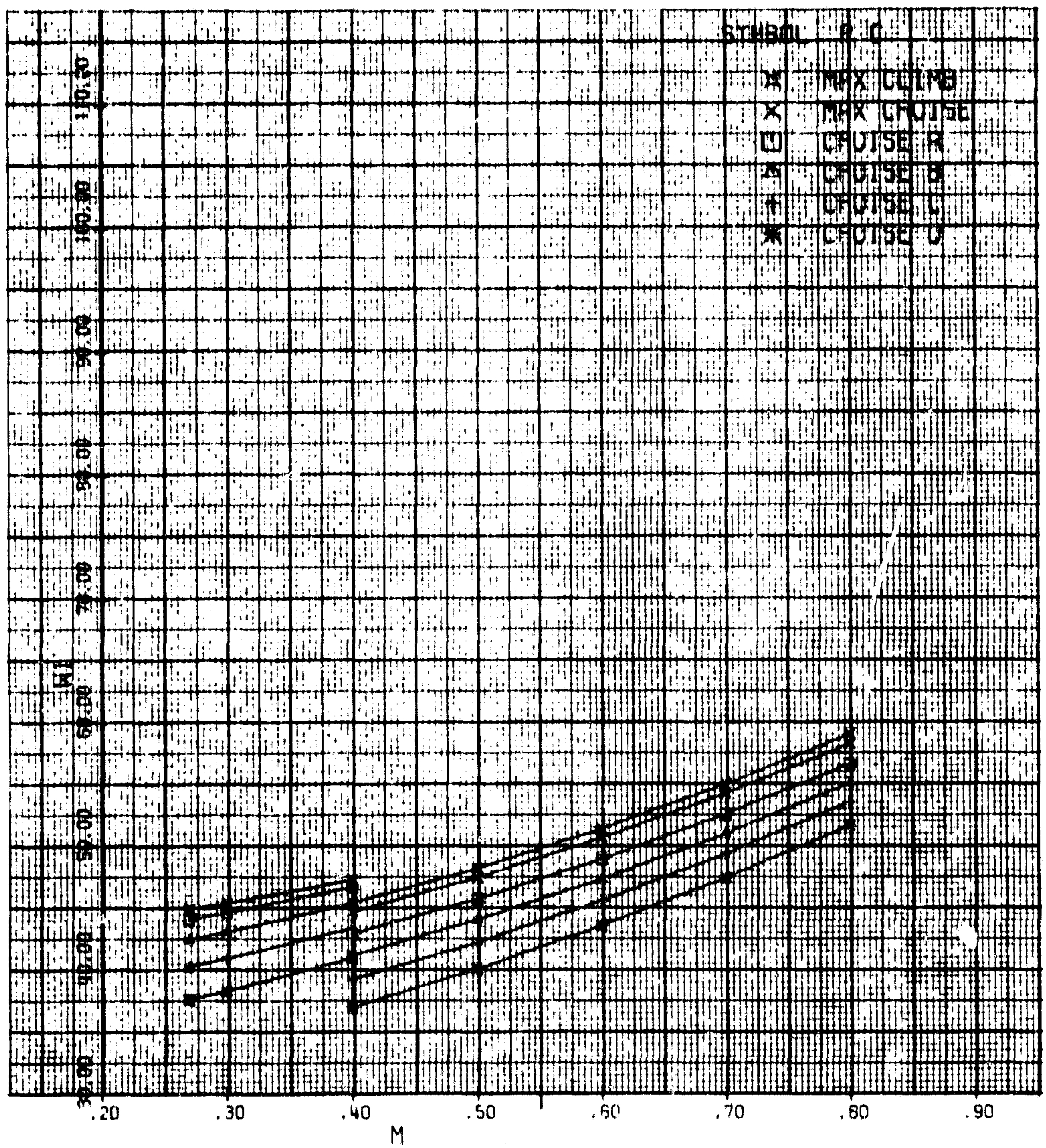

Figure 71. GE T700 QCGAT - Airflow vs. Mach Number at 30,000 Ft.

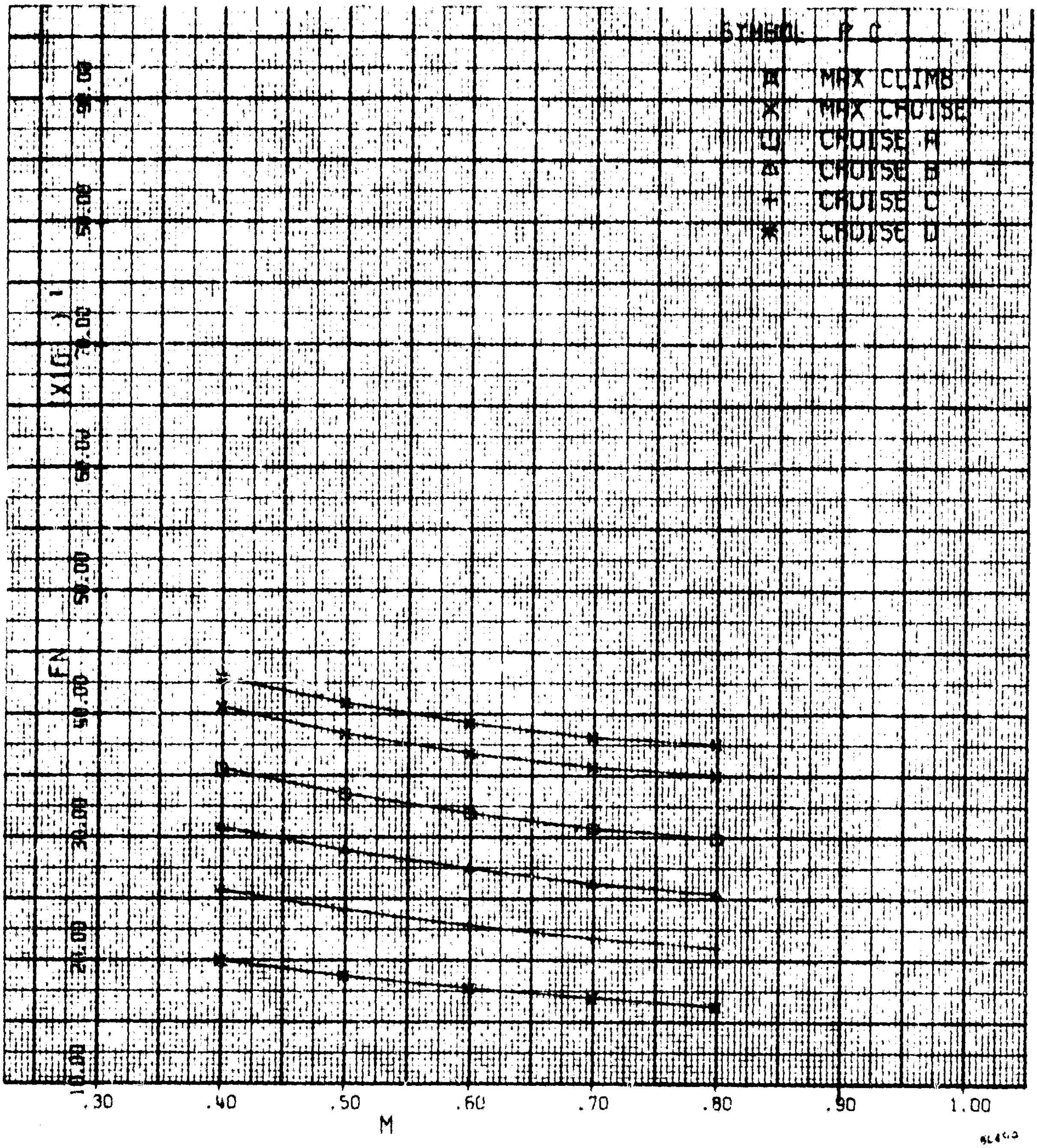

Figure 72. GE T700 QCGAT - Net Thrust vs. Mach Number at 40,000 Ft.

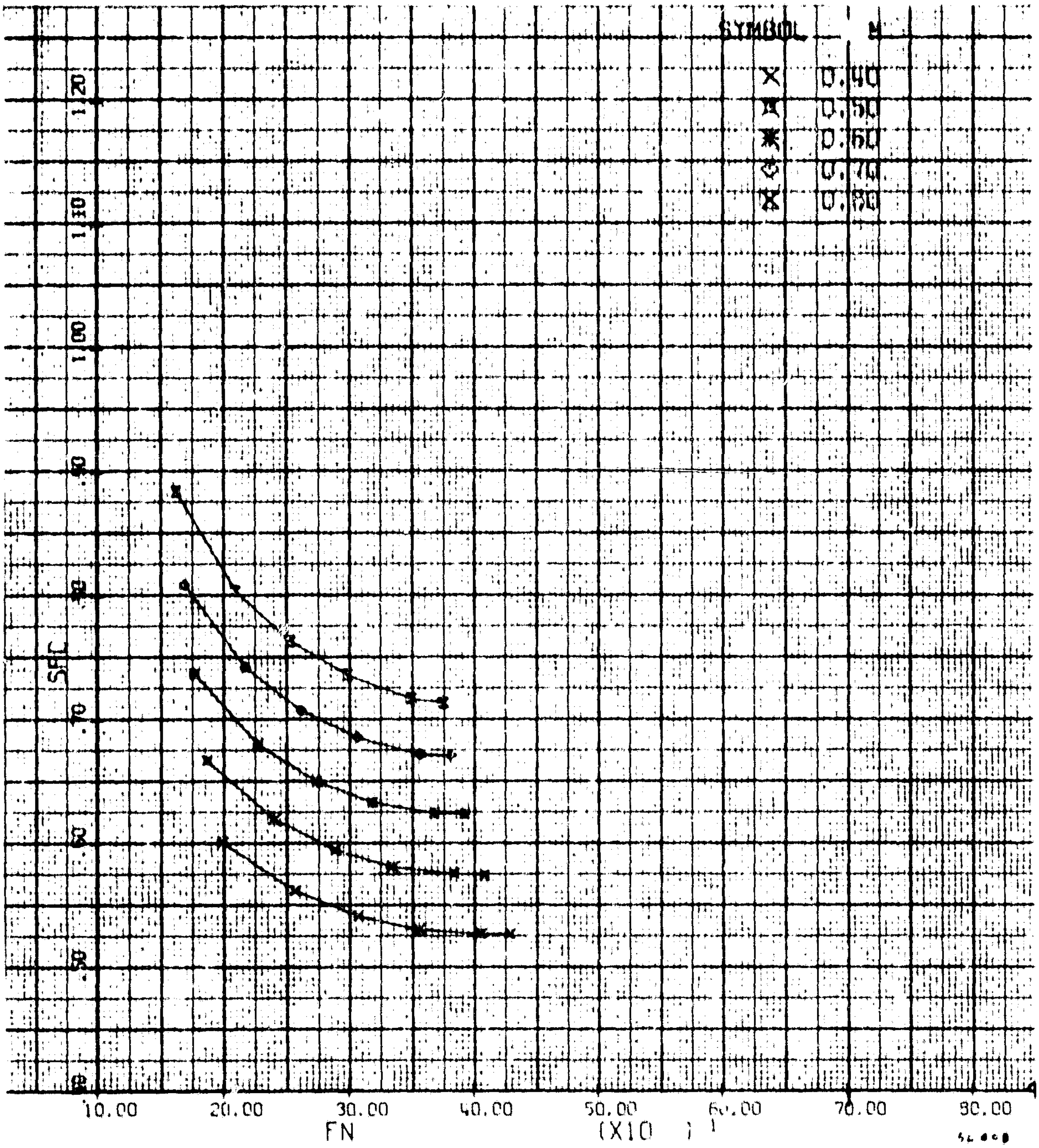

Figure 73. GE T700 QCGAT - SFC vs. Net Thrust at 40,000 Ft.

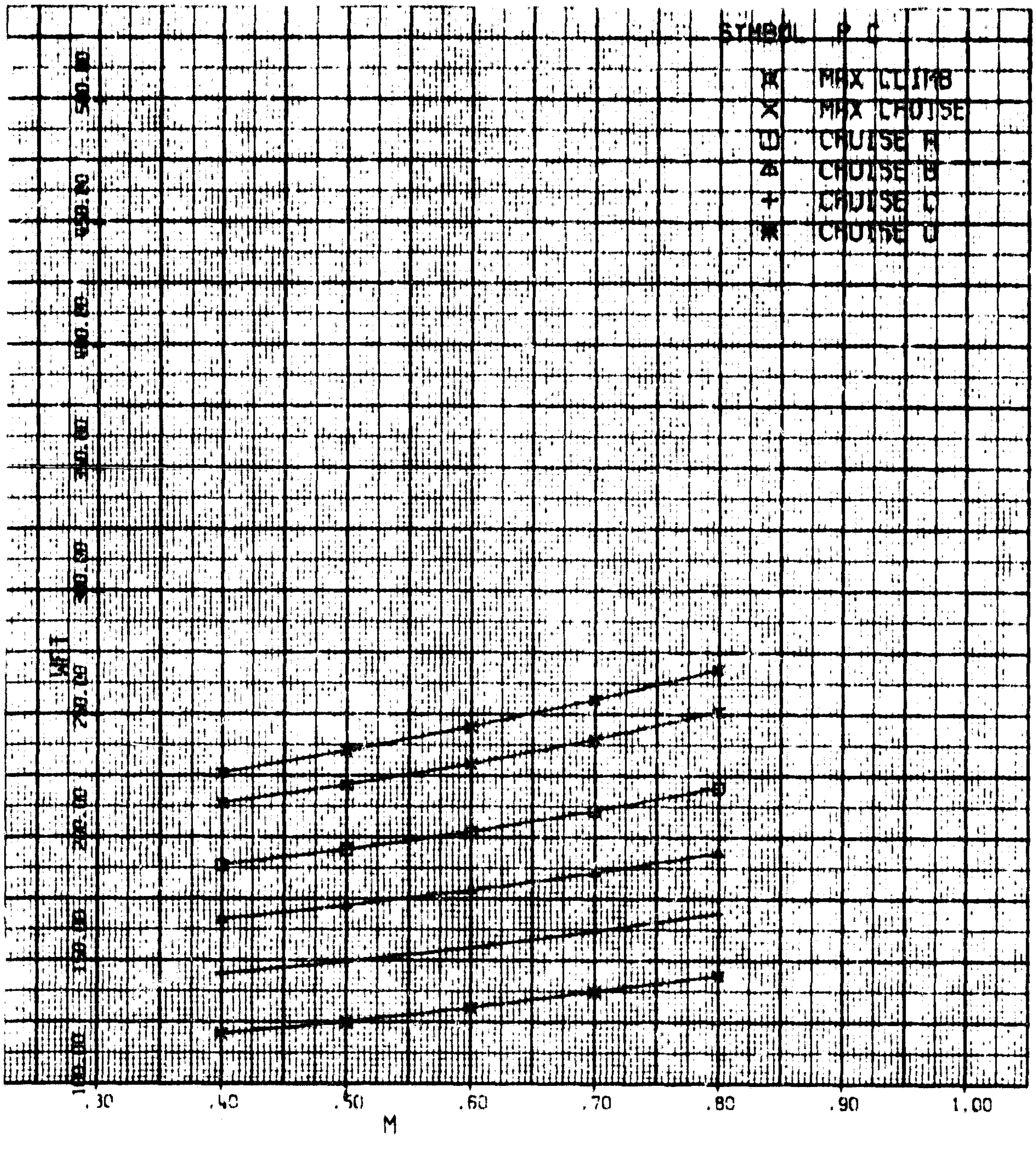

Figure 74. GE T700 QCGAT - Fuel Flow vs. Mach Number at 40,000 Ft.

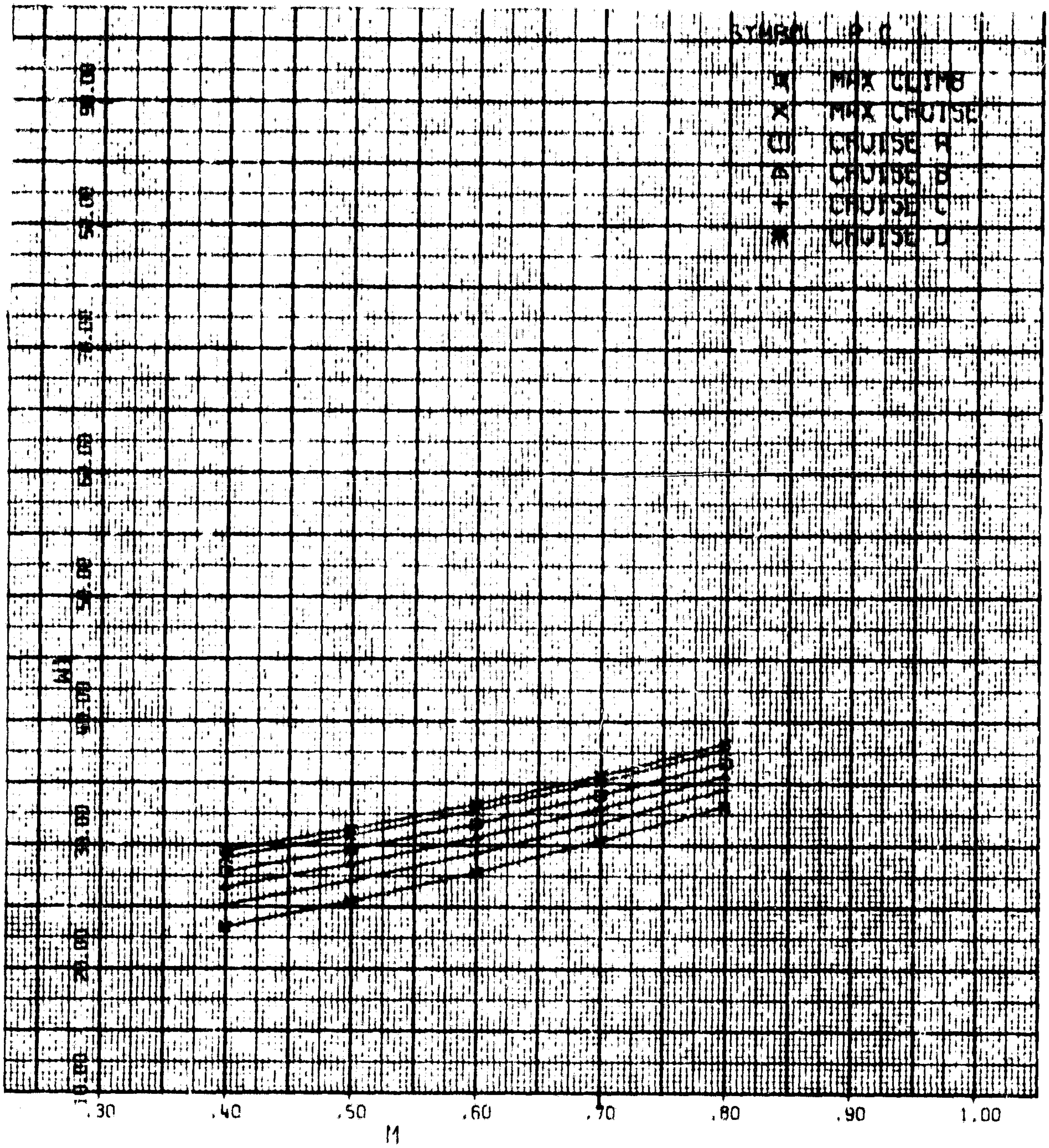

Figure 75. GE T700 QCGAT - Airflow vs. Mach Number at 40,000 Ft.

TABLE 23. T700 QCGAT PERFORMANCE.

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 1

2 CASE	1.0000	2.0000	3.0000	4.0000	5.0000	6.0000	7.0000	8.0000
26 ALT	0.	0.	0.	0.	0.	0.	0.	0.
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.	0.1000	0.2000
351 TAMB	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880
279 PAMB	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960
42 T1	518.6880	519.7292	522.8526	528.0579	535.3441	518.6880	519.7292	522.8526
41 P1	14.6960	14.7992	15.1120	15.6438	16.4105	14.6960	14.7992	15.1120
31 FN	2224.3742	1894.3150	1625.4386	1397.2273	1194.3603	2144.0351	1625.7966	1576.8885
35 SFC	0.3326	0.3906	0.4553	0.5297	0.6196	0.3315	0.3904	0.4558
183 FG8	327.8175	328.7612	332.0940	336.9993	344.0329	312.0522	314.0922	320.0395
182 FG28	1989.2389	2031.0719	2155.9030	2362.3581	2649.0609	1921.3177	1968.2370	2108.3943
37 FRAM	0.	386.6082	794.6318	1243.9123	1748.9685	0.	380.4577	785.8416
793 WFT	739.8477	739.8328	740.0423	740.0456	739.9981	710.7481	712.7750	718.8168
420 W1	110.2776	111.3493	114.4621	119.4222	125.9327	108.3464	109.5779	113.1674
56 BPR	9.7603	9.8398	10.0697	10.4221	10.8596	9.7992	9.8815	10.1132
316 XNF	8366.2994	8366.8651	8371.6362	8388.9598	8427.8894	8228.8151	8238.4573	8272.2244
298 XNH	44214.7500	44217.1636	44217.1831	44195.5483	44177.2739	43987.4058	43999.9810	44038.1641
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000
1166 XV8	1012.0612	1012.7834	1016.0568	1019.9246	1025.5585	984.2422	987.0169	994.6479
1167 XV28	642.9670	649.6820	669.4449	700.9379	742.7415	631.8499	639.5116	661.9251
272 P8	17.9593	17.9692	18.0068	18.0583	18.1328	17.7916	17.8133	17.8746
275 P28	18.3552	18.4385	18.6896	19.1087	19.7017	18.2214	18.3144	18.5941
44 T8	1524.7508	1522.8009	1517.3660	1508.4016	1496.1135	1511.1994	1510.3174	1507.5436
45 T28	559.0650	559.7749	561.9804	565.8369	571.5586	557.6925	558.4941	560.9830
352 T45	1924.4646	1922.6140	1917.4326	1909.0532	1897.6935	1900.0034	1900.0005	1899.9957
416 W8	10.4514	10.4748	10.5463	10.6615	10.8242	10.2301	10.2681	10.3822
415 W28	100.0291	101.0770	104.1220	108.9668	115.3146	98.3135	99.5078	102.9843
6 P C	55.0000	55.0000	55.0000	55.0000	55.0000	50.0000	50.0000	50.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 2

2 CASE	9.0000	10.0000	11.0000	12.0000	13.0000	14.0000	15.0000	16.0000
26 ALT	0.	0.	0.	0.	0.	0.	0.	0.
27 ZXM	0.3000	0.4000	0.	0.1000	0.2000	0.3000	0.4000	0.
351 TAMB	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880
279 PAMB	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960
42 T1	528.0579	535.3441	518.6880	519.7292	522.8526	528.0579	535.3441	518.6880
41 P1	15.6438	16.4105	14.6960	14.7992	15.1125	15.6438	16.4105	14.6960
31 FN	1374.1244	1194.3816	2010.7595	1702.6808	1463.8909	1270.4155	1104.7922	1769.8763
35 SFC	0.5305	0.6196	0.3304	0.3912	0.4590	0.5364	0.6287	0.3286
183 FG8	330.6686	344.0543	287.0595	288.8811	294.5921	304.5520	318.3428	243.5925
182 FG28	2338.1502	2649.0610	1807.4820	1653.8749	1994.2250	2225.2547	2545.5055	1600.0225
37 FRAM	1237.4392	1748.9678	0.	369.1302	763.9307	1206.4572	1713.0231	0.
793 WFT	728.9310	740.0114	664.3368	666.0566	671.8852	681.4485	694.5787	581.5557
420 W1	118.8007	125.9326	105.0766	106.3154	110.0121	115.8263	123.3445	98.8143
56 BPR	10.4507	10.8597	9.8514	9.9421	10.1946	10.5649	11.0046	9.9549
316 XNF	8337.2020	8427.8855	7998.5840	8005.6368	8035.6508	8098.2585	8205.5240	7553.7330
298 XNH	44103.9629	44177.3877	43578.5049	43589.1675	43531.8657	43702.4229	43804.1768	42768.7290
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000
1166 XV8	1008.9068	1025.6207	938.7378	941.4455	949.2463	963.2075	981.3418	856.0314
1167 XV28	697.2170	742.7413	612.6097	620.4901	643.5765	679.9503	727.8734	576.1105
272 P8	17.9892	18.1333	17.5258	17.5459	17.6056	17.7121	17.8572	17.0741
275 P28	19.0584	19.7017	17.9964	18.0884	18.3660	18.8284	19.4858	17.5939
44 T8	1503.2836	1496.1347	1489.5918	1488.7323	1486.0330	1481.4778	1474.9325	1449.7904
45 T28	565.3108	571.5585	555.4248	556.2172	558.6960	563.0346	569.4556	551.1805
352 T45	1899.9875	1897.7127	1860.0238	1859.9983	1859.9978	1859.9849	1859.9665	1785.0008
416 W8	10.5754	10.8242	9.8670	9.9010	10.0138	10.2023	10.4672	9.1618
415 W28	108.4257	115.3141	95.3934	96.5992	100.1848	105.8109	113.0697	89.7942
6 P C	50.0000	50.0000	45.0000	45.0000	45.0000	45.0000	45.0000	40.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 3

2 CASE	17.0000	18.0000	19.0000	20.0000	21.0000	22.0000	23.0000	24.0000
26 ALT	0.	0.	0.	0.	0.	0.	0.	0.
27 ZXM	0.1000	0.2000	0.3000	0.4000	0.	0.1000	0.2000	0.3000
351 TAMB	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880
279 PAMB	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960
42 T1	519.7292	522.8526	528.0579	535.3441	518.6880	519.7292	522.8526	528.0579
41 P1	14.7992	15.1120	15.6438	16.4105	14.6960	14.7992	15.1120	15.6438
31 FN	1482.0639	1259.1001	1077.1220	919.1618	1565.7700	1295.6663	1088.8267	919.5736
35 SFC	0.3935	0.4672	0.5539	0.6620	0.3282	0.3977	0.4774	0.5738
183 FG8	245.1817	250.0168	258.4453	270.6405	208.4520	209.8141	214.1823	221.8101
182 FG28	1646.3206	1783.3662	2007.9725	2318.9391	1422.5584	1467.9962	1604.0336	1826.1720
37 FRAM	347.6859	721.8223	1144.4157	1632.1193	0.	328.1579	684.0214	1090.0930
793 WFT	583.2210	588.2111	596.6204	608.4846	513.8262	515.2249	519.8356	527.6086
420 W1	100.1391	103.9482	109.8700	117.5191	93.1411	94.5147	98.5045	104.6547
56 BPR	10.0602	10.3529	10.7763	11.2671	10.0505	10.1731	10.5094	10.9900
316 XNF	7558.4355	7577.6863	7625.6395	7720.5203	7135.5206	7136.9299	7151.3428	7194.1821
298 XNH	42802.8823	42845.1377	42917.2852	43022.4272	42051.1904	42065.3745	42116.2441	42203.1226
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000
1166 XV8	858.4161	865.6395	878.2163	895.7523	784.6971	786.9999	794.0948	806.4302
1167 XV28	564.3801	608.2707	645.7225	694.6062	542.9391	551.5362	576.5604	615.5059
272 P8	17.0902	17.1396	17.2271	17.3536	16.7139	16.7279	16.7718	16.8496
275 P28	17.6833	17.9501	18.3934	19.0200	17.2539	17.3405	17.6016	18.0340
44 T8	1448.9423	1446.3631	1441.9074	1435.3694	1416.3292	1415.6003	1413.1373	1408.9052
45 T28	551.9701	554.4394	558.8158	565.3106	547.5393	548.3126	550.7694	555.1412
352 T45	1785.0000	1784.9999	1785.0002	1784.9990	1719.9980	1720.0018	1719.9960	1719.9983
416 W8	9.2161	9.3194	9.4956	9.7490	8.5716	8.6023	8.7030	8.8750
415 W28	91.0850	94.7921	100.5402	107.9391	84.7124	86.0556	89.9459	95.9252
6 P C	40.0000	40.0000	40.0000	40.0000	35.0000	35.0000	35.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75-23 AUGUST 1975 PAGE 4

2 CASE	25.0000	26.0000	27.0000	28.0000	29.0000	30.0000	31.0000	32.0000
26 ALT	0.	0.	0.	0.	0.	0.	0.	0.
27 ZXM	0.4000	0.	0.1000	0.2000	0.3000	0.4000	0.	0.1000
351 TAMB	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880	518.6880
279 PAMB	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960	14.6960
42 TI	535.3441	518.6880	519.7292	522.8526	528.0579	535.3441	518.6880	519.7292
41 PI	16.4105	14.6960	14.7992	15.1120	15.6438	16.4105	14.6960	14.7992
31 FN	769.1474	1358.4223	1110.5495	925.8960	777.4464	642.5667	1137.3087	914.1642
35 SFC	0.6997	0.3315	0.4067	0.4920	0.5945	0.7339	0.3366	0.4200
183 FG8	232.6045	176.1315	177.3041	180.9134	187.4076	196.7827	142.2426	143.0341
182 FG28	2130.4563	1238.8916	1286.5716	1428.3885	1660.1414	1972.4019	1042.4540	1091.6745
37 FRAM	1561.8656	0.	307.0533	644.8269	1037.7090	1499.8443	0.	282.6541
793 WFT	538.1874	450.3210	451.6087	455.5120	462.1739	471.5563	382.7866	383.9250
420 W1	112.4605	86.8932	88.4362	92.8602	99.6256	107.9948	79.6721	81.4089
56 BPR	11.5417	10.1003	10.2545	10.6814	11.2887	11.9559	10.2126	10.4124
316 XNF	7285.7479	6693.1168	6694.6786	6709.9307	6763.1758	6874.1412	6142.3771	6145.5670
298 XNH	42309.3179	41246.2319	41259.6396	41300.0010	41369.3862	41468.8330	40185.3164	40200.8550
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000	306.0000
1166 XV8	823.2611	714.5677	716.6094	722.8359	734.2579	749.9819	636.4647	637.4677
1167 XV28	665.5598	506.6124	516.2303	543.8903	586.4949	639.8909	464.4603	475.2862
272 P8	16.9603	16.3887	16.4001	16.4353	16.5009	16.5946	16.0535	16.0590
275 P28	18.6384	16.[illegible]71	16.9967	17.2650	17.7101	18.3227	16.5417	16.6331
44 T8	1402.3739	1382.[illegible]83	1381.7769	1379.3167	1375.0230	1368.6571	1349.3924	1348.4738
45 T28	561.6699	544.2190	544.9602	547.3168	551.5838	558.0487	540.2296	540.9553
352 T45	1719.9971	1655.0055	1655.0051	1654.9908	1654.9951	1654.9986	1585.0054	1584.9978
416 W8	9.1167	7.9533	7.9835	8.0758	8.2356	8.4663	7.2113	7.2400
415 W28	103.4936	79.0652	80.5784	84.9108	91.5185	99.6592	72.5665	74.2755
6 P C	35.0000	30.0000	30.0000	30.0000	30.0000	30.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 5

2 CASE	33,0000	34,0000	35,0000	36,0000	37,0000	38,0000	39,0000	40,0000
26 ALT	0.	0.	0.	5000,0000	5000,0000	5000,0000	5000,0000	5000,0000
27 ZXM	0,2000	0,3000	0,4000	0.	0,1000	0,2000	0,3000	0,4000
351 TAMB	518,6880	518,6880	518,6880	500,8570	500,8570	500,8570	500,8570	500,8570
274 PAMB	14,6960	14,6960	14,6960	12,2277	12,2277	12,2277	12,2277	12,2277
42 T1	522,8526	528,0579	535,3441	500,8570	501,8629	504,8803	509,9091	516,9486
41 P1	15,1120	15,6438	16,4105	12,2277	12,3137	12,5739	13,0164	13,6545
31 FN	754,6141	632,0082	522,0406	2193,4516	1898,7648	1661,5667	1447,4209	1257,9245
35 SFC	0,5136	0,6231	0,7713	0,3337	0,3867	0,4454	0,5113	0,5883
183 FG8	146,3514	152,1075	160,6971	344,5373	347,0671	353,7841	359,4053	367,0903
182 FG28	1239,5260	1485,8281	1820,0928	1940,3082	1979,2761	2092,3897	2260,6754	2496,1659
37 FRAM	599,8211	979,5938	1436,9976	0.	348,4632	715,3751	1112,3507	1552,9182
793 WFT	387,5695	393,8111	402,6392	731,8717	734,3082	739,9946	740,0049	740,0044
420 W1	86,3790	94,0462	103,4695	101,1747	102,1273	104,8307	108,6689	113,7820
56 BPR	10,9573	11,7379	12,5878	9,5710	9,6256	9,7826	10,0448	10,3812
316 XNF	6168,9112	6255,0605	6438,5132	8899,6033	8917,7334	8965,6866	8995,5646	9040,3534
298 XNH	40250,8228	40336,7627	40457,4648	44509,8960	44528,2788	44572,2715	44577,1660	44596,0029
23 A28	306,0000	306,0000	306,0000	306,0000	306,0000	306,0000	306,0000	306,0000
1166 XV8	644,0898	655,0503	671,0515	1137,3984	1140,9471	1149,8636	1154,5547	1160,9301
1167 XV28	506,2964	554,3229	613,9149	684,8341	691,7007	711,2958	739,5669	777,6221
272 P8	16,0920	16,1485	16,2347	15,7261	15,7542	15,8292	15,8924	15,9785
275 P28	16,9083	17,3746	18,022?	15,8476	15,9272	16,1652	16,5111	17,0114
44 T8	1345,8212	1340,7892	1333,34[illegible]	1544,2712	1543,3232	1539,7313	1529,5730	1516,4637
45 T28	543,2754	547,5285	554,0157	546,6818	547,5066	549,9489	553,6746	559,1338
352 T45	1585,0005	1584,9986	1584,9973	1984,9990	1985,0005	1963,6401	1973,7190	1960,9930
416 W8	7,3317	7,4926	7,7270	9,7742	9,8153	9,9275	10,0444	10,2029
415 W28	79,1551	86,6639	95,6547	91,6038	92,5159	95,1087	98,8309	103,7846
6 P C	25,0000	25,0000	25,0000	55,0000	55,0000	55,0000	55,0000	55,0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 6

2 CASE	41.0000	42.0000	43.0000	44.0000	45.0000	46.0000	47.0000	48.0000
26 ALT	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000
27 ZXM	0.4000	0.4700	0.	0.1000	0.2000	0.3000	0.4000	0.4510
351 TAMB	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570
279 PAMB	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277
42 T1	516.9486	523.0722	500.8570	501.8629	504.8803	509.9091	516.9486	516.9486
41 P1	13.6545	14.2274	12.2277	12.3137	12.5739	13.0164	13.6545	13.6545
31 FN	1275.4394	1182.0196	1985.5677	1668.1541	1449.3647	1271.1316	1118.2610	1134.3418
35 SFC	0.5802	0.6260	0.3284	0.3842	0.4462	0.5165	0.5988	0.5684
183 FG8	364.2936	370.3980	291.4104	293.4256	299.4693	309.8336	324.2827	321.2923
182 FG28	2375.3977	2587.9960	1735.2226	1773.6391	1889.2729	2079.7634	2342.8167	2222.8432
37 FRAM	1411.1086	1727.1236	0.	329.5952	678.9874	1065.4966	1502.2441	1362.5295
793 WFT	739.9983	739.9810	638.9284	640.8787	646.7753	656.5607	669.6554	667.4992
420 W1	103.3916	107.6987	95.6054	96.5975	99.4985	104.0916	110.0691	99.6322
56 BPR	9.4073	9.7050	9.7238	9.7930	9.9875	10.2721	10.6135	9.5954
316 XNF	8711.1316	8680.2567	8409.5986	8420.9841	8459.0118	8530.5044	8637.6252	8393.6321
298 XNH	44562.4385	44571.0005	43743.7388	43762.2983	43819.0601	43915.6538	44016.5024	43992.2539
23 A28	259.7740	259.7740	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740
1166 XV8	1159.2207	1164.2441	1034.1744	1037.2822	1046.3096	1061.7082	1082.7451	1079.0482
1167 XV28	821.7735	856.9836	647.1625	654.3360	675.3804	708.8777	753.0181	794.9144
272 P8	15.9468	16.0149	15.1434	15.1654	15.2302	15.3431	15.5011	15.4688
275 P28	17.6614	18.2112	15.4328	15.5103	15.7437	16.1338	16.6844	17.2734
44 T8	1522.8697	1512.7645	1495.6152	1494.7674	1492.1636	1487.8519	1482.0266	1485.2932
45 T28	563.7056	568.3041	541.7698	542.5660	545.0265	549.3011	555.5299	559.6266
352 T45	1964.4120	1954.0149	1899.9961	1899.9944	1899.9997	1899.9923	1899.9985	1900.0003
416 W8	10.1401	10.2655	9.0922	9.1276	9.2352	9.4162	9.6639	9.6076
415 W28	93.4571	97.6380	86.6902	87.6474	90.4428	94.8571	100.5914	90.4100
6 P C	55.0000	55.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 7

2 CASE	49.0000	50.0000	51.0000	52.0000	53.0000	54.0000	55.0000	56.0000
26 ALT	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000
27 ZXM	0.4700	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.4700
351 TAMB	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570
279 PAMB	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277
42 T1	523.0722	500.8570	501.8629	504.8803	509.9091	516.9486	516.9486	523.0722
41 P1	14.2274	12.2277	12.3137	12.5739	13.0164	13.6545	13.6545	14.2274
31 FN	1066.7211	1832.4347	1563.9491	1352.9912	1161.1711	1033.9531	1049.1042	984.8051
35 SFC	0.6355	0.3262	0.3834	0.4470	0.5193	0.6049	0.5949	0.6439
183 FG8	332.8954	268.3745	270.2217	275.4642	284.6387	297.8064	295.8290	306.7930
182 FG28	2458.6451	1640.4117	1679.4646	1795.4409	1986.2599	2250.0119	2128.8417	2364.8125
37 FRAM	1680.3725	0.	320.5726	661.5393	1040.5120	1470.7838	1331.8538	1645.7668
793 WFT	677.9427	577.8164	599.6013	604.7990	613.4279	625.3920	624.0658	634.0960
420 W1	104.7834	92.9220	93.9531	96.9417	101.6506	107.7640	97.5646	102.6255
56 BPR	9.8985	9.7950	9.8729	10.0925	10.4145	10.7952	9.7293	10.0509
316 XNF	8408.5785	8185.3362	8195.6699	8229.4214	8294.7473	8398.3173	8164.5394	8201.5707
298 XNH	44059.6675	43379.4136	43398.2778	43441.3999	43507.1390	43603.7866	43583.3066	43660.8394
23 A28	259.7740	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740
1166 XV8	1095.7545	986.9736	989.9642	997.8989	1012.1188	1032.0978	1029.8369	1046.1231
1167 XV28	835.2735	629.0433	636.4853	658.1416	692.4238	737.5877	777.8206	819.1479
272 P8	15.5963	14.8960	14.9161	14.9706	15.0694	15.2125	15.1912	15.3095
275 P28	17.8754	15.2438	15.3215	15.5539	15.9411	16.4888	17.0361	17.6343
44 T8	1481.3227	1473.0542	1472.1884	1469.6232	1465.4662	1459.7179	1462.4548	1458.4142
45 T28	564.8601	539.5233	540.3067	542.7187	546.9212	553.1092	557.0832	562.3379
352 T45	1899.9996	1859.9997	1860.0014	1859.9973	1859.9869	1859.9806	1860.0033	1859.9989
416 W8	9.8028	8.7739	8.8076	8.9071	9.0744	9.3104	9.2689	9.4626
415 W28	95.1689	84.3141	85.3121	88.2023	92.7455	98.6276	88.4895	93.3386
6 P C	50.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 8

2 CASE	57,0000	58,0000	59,0000	60,0000	61,0000	62,0000	63,0000	64,0000
26 ALT	5000,0000	5000,0000	5000,0000	5000,0000	5000,0000	5000,0000	5000,0000	5000,0000
27 ZXM	0,	0,1000	0,2000	0,3000	0,4000	0,4000	0,4700	0,
351 TAMB	500,8570	500,8570	500,8570	500,8570	500,8570	500,8570	500,8570	500,8570
279 PAMB	12,2277	12,2277	12,2277	12,2277	12,2277	12,2277	12,2277	12,2277
42 T1	500,8570	501,8629	504,8803	509,9091	516,9486	516,9486	523,0722	500,8570
41 P1	12,2277	12,3137	12,5739	13,0164	13,6545	13,6545	14,2274	12,2277
31 FN	1614,9136	1363,8533	1169,4895	1012,3528	877,4620	896,5786	836,3819	1434,9001
35 SFC	0,3244	0,3852	0,4532	0,5313	0,6251	0,6110	0,6655	0,3231
183 FG8	227,5638	229,1186	233,8676	241,9441	253,2083	252,3311	261,7788	195,4362
182 FG28	1454,6379	1493,6925	1610,2540	1802,5934	2068,5684	1955,9261	2168,7395	1299,2515
37 FRAM	0,	302,1305	625,9034	990,0034	1407,7739	1274,3212	1579,2871	0,
793 WFT	523,8011	525,3499	530,0372	537,8701	548,5158	547,8305	556,6427	463,6188
420 W1	87,4654	88,5481	91,7196	96,7164	103,1473	93,3692	98,4600	82,6235
56 BPR	9,9067	10,0008	10,2640	10,6466	11,1916	9,9877	10,3469	10,0138
316 XNF	7739,7349	7747,0256	7774,3020	7834,5616	7938,6019	7778,3306	7796,1315	7353,7021
298 XNH	42588,3569	42603,1689	42648,1851	42725,2729	42829,0581	42817,7314	42896,7002	41863,6445
23 A28	306,0000	306,0000	306,0000	306,0000	306,0000	259,7740	259,7740	306,0000
1166 XV8	899,4219	902,1210	910,2828	923,7562	941,8109	941,2496	956,2337	826,4048
1167 XV28	591,9851	599,9283	622,9259	659,1948	706,8084	745,1062	788,0268	559,1852
272 P8	14,4629	14,4794	14,5296	14,6149	14,7333	14,7247	14,8239	14,1313
275 P28	14,8776	14,9545	15,1841	15,5671	16,1107	16,6023	17,1874	14,5772
44 T8	1433,1723	1432,3073	1429,6745	1425,0954	1418,6629	1421,3096	1416,9968	1399,8341
45 T28	535,2150	535,9883	538,3845	542,6021	548,8356	552,3075	557,6422	531,4443
352 T45	1785,0134	1785,0009	1784,9982	1784,9556	1784,9910	1785,0021	1784,9980	1720,0016
416 W8	8,1639	8,1950	8,2899	8,4511	8,6750	8,6501	8,8334	7,6308
415 W28	79,4460	80,4989	83,5768	88,4122	94,6238	84,8716	89,8010	75,1217
6 P C	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000	35,0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 9

2 CASE	65.0000	66.0000	67.0000	68.0000	69.0000	70.0000	71.0000	72.0000
26 ALT	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000
27 ZXM	0.1000	0.2000	0.3000	0.4000	0.4000	0.4700	0.	0.1000
351 TAMB	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570
279 PAMB	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277
42 T1	501.8629	504.8803	509.9091	516.9486	516.9486	523.0722	500.8570	501.8629
41 P1	12.3137	12.5739	13.0164	13.6545	13.6545	14.2274	12.2277	12.3137
31 FN	1198.7793	1016.2779	867.1295	737.0765	771.0028	713.7121	1257.3906	1037.7266
35 SFC	0.3879	0.4615	0.5488	0.6587	0.6289	0.6907	0.3239	0.3936
183 FG8	196.6401	200.7364	207.5970	217.5634	216.8901	225.4588	165.6117	166.8040
182 FG28	1337.8868	1451.6956	1638.0780	1895.4693	1809.8847	2039.1066	1144.1701	1162.7251
37 FRAM	285.7985	593.8091	942.4152	1345.2446	1223.6469	1521.1154	0.	268.5640
793 WFT	464.9715	469.0592	475.9059	485.4986	484.8669	492.9494	407.2254	408.4504
420 W1	83.7616	87.0165	92.0674	98.5658	89.6563	94.8526	77.5030	78.7105
56 BPR	10.1228	10.4234	10.8570	11.3585	10.2661	10.6627	10.1054	10.2344
316 XNF	7338.3719	7356.4226	7402.8884	7495.1954	7387.1581	7405.5187	6902.8383	6905.1515
298 XNH	41878.9878	41924.5073	42002.3296	42112.4990	42102.5884	42195.2778	41102.4136	41119.6636
23 A28	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	306.0000	306.0000
1166 XV8	828.3453	836.0081	848.2409	865.5617	864.9013	879.6695	753.5004	755.9717
1167 XV28	567.4351	591.1367	628.2345	676.4931	716.2397	760.2399	524.5425	533.2940
272 P8	14.1424	14.1853	14.2559	14.3593	14.3524	14.4414	13.8263	13.8387
275 P28	14.6516	14.8724	15.2392	15.7562	16.2422	16.8100	14.2811	14.3543
44 T8	1398.9378	1396.4083	1391.9662	1385.4940	1387.4231	1382.9639	1366.3956	1365.6194
45 T28	532.2129	534.6072	538.8574	545.1607	548.0684	553.4847	527.9068	528.6549
352 T45	1719.9920	1719.9936	1719.9987	1719.9993	1720.0030	1719.9964	1655.0059	1655.0033
416 W8	7.6598	7.7477	7.8969	8.1104	8.0915	8.2700	7.0919	7.1196
415 W28	76.2309	79.3991	84.3026	90.5902	81.6997	86.7196	70.5242	71.7043
6 P C	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 10

2 CASE	73.0000	74.0000	75.0000	76.0000	77.0000	78.0000	79.0000	80.0000
26 ALT	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000	5000.0000
27 ZXM	0.2000	0.3000	0.4000	0.4000	0.4700	0.	0.1000	0.2000
351 TAMB	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570	500.8570
279 PAMB	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277	12.2277
42 T1	504.8803	509.9091	516.9486	516.9486	523.0722	500.8570	501.8629	504.8803
41 P1	12.5739	13.0164	13.6545	13.6545	14.2274	12.2277	12.3137	12.5739
31 FN	870.5151	733.4012	610.0805	645.9923	592.2380	1054.6177	857.0289	712.9987
35 SFC	0.4735	0.5701	0.6987	0.6595	0.7309	0.3291	0.4061	0.4928
183 FG8	170.4037	176.3140	184.8145	184.4164	191.5925	133.9212	134.8607	137.9564
182 FG28	1297.1828	1483.1588	1735.6283	1655.8784	1883.8287	964.6358	1005.2426	1126.5581
37 FRAM	560.7999	895.5132	1284.9423	1168.3862	1458.5067	0.	247.3649	521.8095
793 WFT	412.1699	418.1249	426.2445	426.0374	432.8775	347.0516	348.0762	351.5733
420 W1	82.1794	87.4854	94.1474	85.6074	90.9485	71.1148	72.4975	76.4657
56 BPR	10.5911	11.1085	11.6872	10.5538	11.0119	10.2148	10.3884	10.8628
316 XNF	6919.7584	6961.2224	7047.9156	6957.6819	6978.7307	6358.2715	6360.8407	6362.5824
298 XNH	41172.4644	41245.2075	41330.3179	41327.8154	41398.3999	40067.4141	40082.7524	40135.4150
23 A28	306.0000	306.0000	306.0000	259.7740	259.7740	306.0000	306.0000	306.0000
1166 XV8	763.1974	774.6863	790.9618	790.4395	803.7244	671.2862	673.3455	680.2942
1167 XV28	558.5345	597.4863	647.0409	685.0518	730.5053	481.4980	491.4626	520.1880
272 P8	13.8753	13.9350	14.0221	14.0180	14.0909	13.5088	13.5180	13.5492
275 P28	14.5732	14.9339	15.4337	15.8709	16.4238	13.9439	14.0196	14.2478
44 T8	1363.1877	1359.1327	1353.4022	1354.4891	1350.0525	1332.9386	1332.1154	1329.5806
45 T28	531.0129	535.1992	541.4382	544.0639	549.4881	523.9760	524.6807	526.9440
352 T45	1654.9953	1654.9882	1654.9975	1655.0053	1654.9983	1585.0218	1584.9981	1584.9974
416 W8	7.2044	7.3437	7.5394	7.5281	7.6918	6.4372	6.4625	6.5435
415 W28	75.0805	80.2579	86.7267	78.1979	83.3770	64.7736	66.1316	70.0199
6 P C	30.0000	30.0000	30.0000	30.0000	30.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN　　DK NO. 75023　　AUGUST 1975　　PAGE 11

2	CASE	81.0000	82.0000	83.0000	84.0000
26	ALT	5000.0000	5000.0000	5000.0000	5000.0000
27	ZXM	0.3000	0.4000	0.4000	0.4700
351	TAMB	500.8570	500.8570	500.8570	500.8570
279	PAMB	12.2277	12.2277	12.2277	12.2277
42	T1	509.9091	516.9486	516.9486	523.0722
41	P1	13.0164	13.6545	13.6545	14.2274
31	FN	599.1121	494.3410	517.0650	472.4242
35	SFC	0.5959	0.7374	0.7042	0.7839
183	FG8	143.2565	150.7731	150.2854	156.6291
182	FG28	1325.5966	1591.3376	1494.8596	1727.7382
37	FRAM	844.7780	1227.1722	1106.5357	1392.2587
793	WFT	357.0070	364.5167	364.1169	370.3474
420	W1	82.5289	89.9146	81.0756	86.8174
56	BPR	11.5325	12.2666	10.9931	11.5470
316	XNF	6452.9659	6585.7356	6439.5707	6485.0613
298	XNH	40220.1763	40321.4990	40318.3501	40401.6470
23	A28	306.0000	306.0000	259.7740	259.7740
1166	XV8	691.5588	707.2650	706.7272	719.6961
1167	XV28	564.3487	618.8643	650.3535	699.1492
272	P8	13.6014	13.6766	13.6724	13.7358
275	P28	14.6279	15.1466	15.4843	16.0421
44	T8	1324.9954	1318.5609	1320.0976	1315.3658
45	T28	531.0747	537.3231	539.6652	545.1165
352	T45	1584.9948	1584.9985	1584.9962	1584.9993
416	W8	6.6841	6.8786	6.8615	7.0223
415	W28	75.9437	83.1371	74.3154	79.8980
6	P C	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   PR NO. 75023   AUGUST 1975   PAGE 12

2 CASE	85.0000	86.0000	87.0000	88.0000	89.0000	90.0000	91.0000	92.0000
26 ALT	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.5300
351 TAMB	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260
279 PAMB	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065
42 T1	483.0260	483.9963	486.9073	491.7587	498.5501	498.5501	507.2811	510.2784
41 P1	10.1065	10.1775	10.3926	10.7584	11.2858	11.2856	11.9906	12.2397
31 FN	1959.8591	1765.5345	1560.8189	1329.5301	1181.4010	1209.8120	1124.0303	1101.3767
35 SFC	0.3323	0.3832	0.4396	0.5041	0.5785	0.5636	0.6224	0.6406
183 FG8	318.1670	320.4556	327.6726	339.3318	354.9960	350.4344	370.8906	377.9294
182 FG28	1723.3530	1754.5523	1847.1287	1997.0371	2204.8310	2126.0099	2418.4141	2519.3934
37 FRAM	0.	298.4095	611.4483	951.4417	1329.2009	1216.2234	1618.4400	1750.0554
793 WFT	651.3054	653.5100	660.0932	670.1996	683.4581	681.8870	699.6257	705.5776
420 W1	88.3015	89.0534	91.2363	94.6453	99.1673	90.7385	96.5972	98.5403
56 BPR	9.4764	9.5179	9.6436	9.8214	10.0493	9.1956	9.5055	9.5033
316 XNF	9136.5009	9158.5284	9223.5994	9321.6902	9452.5303	8945.6940	8972.7408	8960.5782
298 XNH	44292.9619	44306.0923	44350.1069	44427.6519	44549.2759	44464.4375	44604.9761	44652.6943
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	1192.4351	1195.8761	1207.2559	1225.7784	1249.8496	1243.7262	1274.7665	1265.2108
1167 XV28	697.5945	703.9333	722.4479	751.6666	790.3757	839.9137	894.6140	912.7054
272 P8	13.3732	13.3980	13.4800	13.6150	13.7965	13.7414	13.9606	14.0635
275 P28	13.3441	13.4088	13.6016	13.9188	14.3639	15.0176	15.7925	16.0656
44 T8	1530.4083	1529.5077	1526.9232	1523.4280	1519.0472	1522.9767	1518.1650	1516.6925
45 T28	530.6913	531.5081	533.9920	538.1715	544.1581	548.8796	556.4205	559.0656
352 TAS	1984.9992	1985.0623	1985.0701	1984.9999	1985.0049	1965.0343	1985.0062	1985.0021
416 W8	8.6095	8.6464	8.7578	8.9324	9.1648	9.0915	9.3880	9.4884
415 W28	79.8729	80.5866	82.6644	85.8991	90.1923	81.8387	87.4023	89.2469
6 P C	55.0000	55.0000	55.0000	55.0000	55.0000	55.0000	55.0000	55.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 13

2 CASE	93.0000	94.0000	95.0000	96.0000	97.0000	98.0000	99.0000	100.0000
26 ALT	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.5300
351 TAMB	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260
279 PAMB	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065
42 T1	483.0260	483.9963	486.9073	491.7587	498.5501	498.5501	507.2811	510.2784
41 P1	10.1065	10.1775	10.3926	10.7584	11.2858	11.2858	11.9906	12.2397
31 FN	1753.6984	1514.2267	1324.6932	1170.5285	1039.8462	1047.8640	966.6737	945.0766
35 SFC	0.3259	0.3786	0.4370	0.5023	0.5771	0.5696	0.6325	0.6523
183 FG8	270.9874	272.8876	278.7823	288.8291	302.4544	298.2045	314.6425	320.4618
182 FG28	1555.7817	1588.0737	1684.3225	1843.3476	2064.3893	1957.5885	2248.0016	2348.3597
37 FRAM	0.	283.6420	583.2162	912.8762	1283.6705	1164.2679	1555.6923	1684.3867
793 WFT	571.4730	573.3321	578.8865	587.9688	600.0770	596.8662	611.4610	616.4409
420 W1	83.8345	83.6464	87.0237	90.8089	95.7705	86.8622	92.8521	94.8427
56 BPR	9.6395	9.6984	9.8642	10.1087	10.4070	9.4395	9.8189	9.9335
316 XNF	8594.6617	8610.3775	8659.9806	8749.4722	8879.4614	8540.5880	8568.3665	8577.4583
298 XNH	43478.1577	43496.8594	43553.3276	43649.5947	437[illegible].1763	43722.0210	43867.4531	43917.4111
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	1087.8115	1090.9355	1100.9138	1117.9153	1139.7402	1133.8446	1160.0887	1169.9039
1167 XV28	662.2483	669.1274	689.2097	721.2311	763.6956	805.8406	862.4884	881.1431
272 P8	12.8453	12.8657	12.9306	13.0449	13.1950	13.1470	13.3305	13.3471
275 P28	13.0006	13.0664	13.2636	13.5935	14.0629	14.5826	15.3388	15.6048
44 T8	1480.6511	1479.6884	1476.9494	1472.5674	1466.7421	1471.0968	1465.4064	1463.6317
45 T28	525.8764	526.6717	529.0960	533.2558	539.2790	543.4846	551.0541	553.7151
352 T45	1900.0122	1900.0002	1900.0003	1899.9662	1899.9983	1900.0001	1900.0059	1900.0042
416 W8	8.0381	8.0715	8.1709	8.3366	8.5627	8.4863	8.7515	8.6429
415 W28	75.9549	76.7344	79.0136	82.6344	87.3747	78.5417	84.2697	86.1686
6 PC	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 14

2 CASE	101.0000	102.0000	103.0000	104.0000	105.0000	106.0000	107.0000	108.0000
26 ALT	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.5300
351 TAMB	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260
279 PAMB	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065
42 T1	483.0260	485.9963	486.9073	491.7587	498.5501	498.5501	507.2811	510.2784
41 P1	10.1065	10.1775	10.3926	10.7584	11.2858	11.2858	11.9906	12.2397
31 FN	1652.7834	1420.2070	1236.4464	1087.2749	960.3699	971.9693	893.1161	872.0877
35 SFC	0.3235	0.3777	0.4379	0.5057	0.5841	0.5749	0.6403	0.6609
183 FG8	249.4029	251.1883	256.4699	265.5224	278.0243	275.0694	289.9581	295.2485
182 FG28	1472.2465	1504.1069	1599.5656	1757.7228	1977.4210	1875.6766	2164.8269	2264.7399
37 FRAM	0.	275.9129	568.0105	890.6672	1255.0500	1138.2774	1524.4557	1651.5637
793 WFT	534.7014	536.3784	541.4126	549.8199	560.9952	558.7581	571.9036	576.3733
420 W1	81.5157	82.3398	84.7548	88.5997	93.6359	84.9232	90.9877	92.9945
56 BPR	9.7170	9.7823	9.9659	10.2370	10.5663	9.5623	9.9607	10.1086
316 XNF	8363.7327	8375.6134	8414.9995	8469.6484	8602.7262	8340.0197	8363.8861	8372.7094
298 XNH	43109.6162	43128.4209	43185.6064	43263.3789	43403.0684	43367.4600	43475.8115	43511.0034
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	1037.7203	1041.0045	1050.2998	1066.0465	1087.1692	1082.9975	1107.8858	1116.7480
1167 XV28	644.0330	650.9794	671.3932	704.0831	747.4055	788.7600	846.3256	865.2812
272 P8	12.6078	12.6277	12.6850	12.7842	12.9222	12.8893	13.0544	13.1145
275 P28	12.8320	12.8962	13.0897	13.4152	13.8771	14.3741	15.1193	15.3821
44 T8	1457.9007	1457.0785	1454.5087	1450.2045	1444.3501	1447.8392	1442.1754	1440.3591
45 T28	523.5561	524.3316	526.7241	530.8764	536.9033	540.9282	548.4692	551.1253
352 T45	1860.0144	1860.0128	1859.9979	1859.9812	1859.9845	1859.9987	1860.0007	1860.0031
416 W8	7.7549	7.7858	7.8791	8.0368	8.2517	8.1954	8.4449	8.5308
415 W28	73.9095	74.7032	77.0259	80.7150	85.5403	76.8829	82.7016	84.6231
6 P C	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 15

2	CASE	109,0000	110,0000	111,0000	112,0000	113,0000	114,0000	115,0000	116,0000
26	ALT	10000,0000	10000,0000	10000,0000	10000,0000	10000,0000	10000,0000	10000,0000	10000,0000
27	ZXM	0.	0,1000	0,2000	0,3000	0,4000	0,4000	0,5000	0,5300
351	TAMB	483,0260	483,0260	483,0260	483,0260	483,0260	483,0260	483,0260	483,0260
279	PAMB	10,1065	10,1065	10,1065	10,1065	10,1065	10,1065	10,1065	10,1065
42	T1	483,0260	483,9963	486,9073	491,7587	498,5501	498,5501	507,2811	510,2784
41	P1	10,1065	10,1775	10,3926	10,7584	11,2858	11,2858	11,9906	12,2397
31	FN	1467,5509	1249,4387	1079,3407	940,9058	821,9317	833,4663	761,4098	742,1536
35	SFC	0,3200	0,3769	0,4401	0,5120	0,5975	0,5883	0,6595	0,6821
183	FG8	212,1069	213,3902	217,7642	224,8682	235,3158	233,9975	247,2252	251,8779
182	FG28	1316,5920	1349,2148	1446,0121	1604,9988	1823,9059	1722,6212	2011,1772	2111,1147
37	FRAM	0.	261,1063	539,4630	849,7568	1203,0428	1088,4246	1465,2672	1589,9159
793	WFT	469,5443	470,9165	475,0708	481,7319	491,1309	490,3686	502,1722	506,2417
420	W1	77,0316	77,9212	80,4951	84,5301	89,7551	81,2038	87,4550	89,5233
56	BPR	9,8590	9,9417	10,1747	10,5194	10,9190	9,8234	10,3003	10,4455
316	XNF	7925,7199	7935,8100	7968,9665	8033,2622	8135,5928	7936,9802	7965,1726	7977,0070
298	XNH	42383,1558	42397,0640	42438,8770	42505,5833	42605,5337	42588,2227	42707,9961	42750,0708
23	A28	306,0000	306,0000	306,0000	306,0000	306,0000	259,7740	259,7740	259,7740
1166	XV8	947,3316	949,4603	957,9165	971,1043	990,3345	988,4722	1012,5105	1020,7143
1167	XV28	608,6491	616,1377	637,8882	672,2490	717,1800	755,6893	815,7056	835,4278
272	P8	12,2080	12,2202	12,2673	12,3429	12,4555	12,4402	12,5858	12,6344
275	P28	12,5216	12,5862	12,7793	13,1069	13,5533	13,9674	14,7204	14,9791
44	T8	1416,6961	1415,7685	1413,1553	1408,8117	1403,1291	1405,9100	1399,9468	1397,9001
45	T28	519,2493	520,0043	522,3305	526,3894	532,3531	536,0930	543,0670	546,3777
352	T45	1785,0024	1785,0049	1784,9975	1784,9939	1784,9811	1785,0058	1784,9990	1784,9648
416	W8	7,2245	7,2519	7,3352	7,4717	7,6670	7,6384	7,8786	7,9624
415	W28	69,9378	70,7997	73,2918	77,1920	82,2247	73,7012	79,7159	81,7017
6	P C	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DR NO. 75023 AUGUST 1975 PAGE 16

2 CASE	117.0000	118.0000	119.0000	120.0000	121.0000	122.0000	123.0000	124.0000
26 ALT	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.5500
351 TAMB	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260
279 PAMB	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065
42 T1	483.0260	483.9963	486.9073	491.7587	498.5501	498.5501	507.2811	510.2764
41 P1	10.1065	10.1775	10.3926	10.7584	11.2656	11.2656	11.9906	12.2597
31 FN	1302.3153	1097.7017	939.0651	811.9524	762.1936	719.7539	651.7124	653.1394
35 SFC	0.3191	0.3798	0.4477	0.5260	0.6215	0.6046	0.6839	0.7097
183 FGR	181.7301	183.0034	166.8731	193.5289	202.6125	201.9587	213.4996	217.5844
182 FG2R	1174.8483	1207.2679	1303.7041	1462.5457	1682.2771	1592.4743	1877.5281	1970.0561
37 FRAM	0.	246.8321	511.7594	810.2906	1153.4376	1044.6893	1412.1600	1554.1202
793 WFT	415.5890	416.8614	420.6795	427.0693	435.7061	435.1551	445.7064	449.3139
420 W1	72.7284	73.6613	76.3614	80.6042	86.0542	77.9409	84.2653	86.3617
56 BPR	9.9673	10.0643	10.3352	10.7279	11.1934	10.0751	10.6036	10.7657
316 XNF	7519.4836	7526.4598	7552.4547	7610.3527	7712.0609	7566.3235	7595.4558	7607.4637
298 XNH	41644.7671	41660.8765	41709.2090	41790.2759	41896.9238	41884.6136	42006.4009	42051.4663
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	869.1347	871.7995	879.8170	893.4125	910.7615	910.3159	932.5092	940.2684
1167 XV28	574.6829	582.5487	605.4014	641.3355	688.5193	726.1622	768.1376	808.3164
272 P8	11.8875	11.9008	11.9415	12.0120	12.1060	12.0998	12.2214	12.2651
275 P28	12.2436	12.3068	12.4961	12.8114	13.2594	13.6622	14.3788	14.6501
44 T8	1383.2379	1382.3881	1379.7620	1375.2820	1368.8358	1371.3106	1364.9954	1362.8829
45 T28	515.4350	516.1790	518.4992	522.5841	528.6304	531.8774	539.5732	542.2690
352 T45	1720.0016	1720.0016	1719.9892	1719.9805	1719.9962	1719.9988	1719.9956	1720.0001
416 W8	6.7468	6.7733	6.8535	6.9896	7.1782	7.1586	7.3875	7.4668
415 W28	66.0970	67.0038	69.6247	73.7313	78.9968	70.9034	77.0216	79.0398
6 P C	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 17

2 CASE	125.0000	126.0000	127.0000	128.0000	129.0000	130.0000	131.0000	132.0000
26 ALT	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.5300
351 TAMB	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260
279 PAMB	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065
42 T1	483.0260	483.9963	486.9073	491.7587	498.5501	498.5501	507.2811	510.2784
41 P1	10.1065	10.1775	10.3926	10.7584	11.2858	11.2858	11.9906	12.2397
31 FN	1147.0694	955.5808	808.3125	687.6841	582.4498	612.4199	546.9463	528.3399
35 SFC	0.3184	0.3834	0.4575	0.5456	0.6580	0.6249	0.7171	0.7401
183 FG8	154.3087	155.4166	158.7328	164.2505	172.4867	171.9521	182.1198	185.6415
182 FG28	1040.5553	1072.4966	1167.0159	1320.9746	1533.4689	1466.5809	1745.7001	1841.3420
37 FRAM	0.	232.5165	483.7565	768.8875	1099.2371	1000.5956	1358.0842	1476.6295
793 WFT	365.2017	366.3615	369.7699	375.3295	383.2379	382.7102	392.1887	395.2696
420 W1	68.4155	69.3892	72.1830	76.4856	82.0105	74.6512	81.0576	83.1445
56 BPR	10.0926	10.2046	10.5155	10.9643	11.4773	10.3849	10.9656	11.1438
310 XNF	7090.2286	7094.5735	7113.4611	7159.5197	7252.6682	7154.8356	7185.4047	7176.6594
298 XNH	40882.1152	40899.9507	40952.3242	41036.1509	41157.1846	41144.9155	41278.1016	41311.1050
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	794.1883	796.6516	803.9178	815.7600	833.2600	832.6323	853.7229	861.0857
1167 XV28	540.4662	548.6966	572.4306	609.3254	657.2255	696.3448	759.8105	780.2796
272 P8	11.6055	11.6167	11.6502	11.7063	11.7916	11.7865	11.8916	11.9296
275 P28	11.9844	12.0457	12.2284	12.5302	12.9555	13.3528	14.0457	14.2876
44 T8	1351.1004	1350.2625	1347.6146	1343.0883	1336.5006	1338.2583	1331.7032	1329.6462
45 T28	511.5743	512.3181	514.6523	518.7798	524.9116	527.6054	535.4290	538.1690
352 T45	1655.0021	1655.0014	1654.9983	1654.9966	1654.9993	1655.0029	1654.9972	1655.0052
416 W8	6.2694	6.2948	6.3710	6.4968	6.6793	6.6036	6.8833	6.9564
415 W28	62.2479	63.1963	65.9146	70.0926	75.4377	68.0941	74.2835	76.2979
6 P C	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0010	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

7 CASE	133.0000	134.0000	135.0000	136.0000	137.0000	138.0000	139.0000	140.0000
26 ALT	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000	10000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.5300
351 TAMB	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260	483.0260
279 PAMB	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065	10.1065
42 T1	483.0260	483.9963	486.9973	491.7587	498.5501	498.5501	507.2811	510.2784
41 P1	10.1065	10.1775	10.3926	10.7584	11.2856	11.2856	11.9906	12.2397
31 FN	966.6350	793.1123	663.5536	559.2600	464.5200	489.4330	432.5676	416.6367
35 SFC	0.3228	0.3946	0.4762	0.5740	0.7055	0.6591	0.7767	0.8131
183 FG8	125.1399	126.0466	128.8858	133.6564	140.5579	140.1015	148.9804	152.0739
182 FG28	881.7716	914.6092	1012.1278	1171.4523	1385.4654	1314.1254	1595.5969	1692.3740
37 FRAM	0.	214.4972	449.8120	722.5462	1042.1483	944.4008	1293.9861	1410.4513
793 WFT	311.9845	312.9747	315.9762	320.9986	327.7240	327.4992	335.9701	338.7766
420 W1	62.9276	64.0117	67.1180	71.8757	77.7513	70.4587	77.2321	79.4182
56 BPR	10.2162	10.3625	10.7666	11.3398	11.9775	10.7803	11.4778	11.6865
316 XNF	6564.0402	6566.9387	6584.1340	6636.3618	6737.8539	6638.0656	6686.3903	6706.7136
298 XNH	39900.6084	39916.5010	39964.5640	40045.6343	40151.1377	40146.6440	40277.3232	40319.5225
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	708.7299	710.9480	717.9957	729.2380	745.6226	744.5252	765.1092	772.1915
1167 XV28	497.3921	506.5393	532.8399	573.4202	624.2248	658.9552	726.1610	747.9310
272 P8	11.3101	11.3190	11.3476	11.3957	11.4660	11.4604	11.5509	11.5830
275 P28	11.6829	11.7448	11.9300	12.2370	12.6582	12.9849	13.6706	13.9114
44 T8	1317.6983	1316.8752	1314.3513	1309.9552	1303.8390	1304.9822	1298.3158	1296.0511
45 T28	507.5831	508.2930	510.5388	514.5817	520.6319	523.0759	530.9213	533.6944
352 T45	1585.0032	1585.0020	1584.9978	1584.9960	1584.9976	1584.9980	1584.9991	1584.9961
416 W8	5.6973	5.7207	5.7921	5.9139	6.0826	6.0718	6.2629	6.3546
415 W28	57.3172	58.3782	61.4139	66.0510	71.7600	64.4776	71.0425	73.1582
6 P C	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 19

	141.0000	142.0000	143.0000	144.0000	145.0000	146.0000	147.0000	148.0000
2 CASE	141.0000	142.0000	143.0000	144.0000	145.0000	146.0000	147.0000	148.0000
26 ALT	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000
351 TAMB	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950
279 PAMB	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935
42 T1	465.1950	466.1297	468.9336	473.6067	480.1489	480.1489	488.5598	498.8387
41 P1	8.2935	8.3518	8.5284	8.8285	9.2613	9.2613	9.8398	10.5812
31 FN	1562.4372	1357.3426	1193.2283	1057.8120	940.4962	956.5189	888.3461	830.7600
35 SFC	0.3241	0.3744	0.4301	0.4929	0.5656	0.5541	0.6124	0.6741
183 FG8	249.1256	251.0465	256.6241	265.9827	278.3252	274.7176	290.7398	310.4042
182 FG28	1378.4132	1404.5784	1482.2005	1609.0397	1783.7064	1708.3804	1949.6230	2245.4520
37 FRAM	0.	241.7264	495.8785	773.3348	1082.3481	966.7243	1315.0023	1690.4813
793 WFT	506.3943	508.1506	513.2489	521.3914	531.9624	530.0330	543.9871	560.0499
420 W1	72.8563	73.5057	75.3950	78.3666	82.2816	75.0124	79.9749	85.6754
56 BPR	9.5557	9.6034	9.7366	9.9365	10.1814	9.2849	9.6170	9.9567
316 XNF	8815.6073	8835.9639	8897.1573	8995.6956	9126.8929	8670.7937	8701.6768	8726.8564
298 XNH	43206.4438	43222.2759	43274.5947	43371.3379	43502.3608	43418.3730	43566.4448	43739.7769
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	1141.4758	1145.2308	1155.8362	1173.9351	1196.5303	1191.3427	1220.5722	1255.8887
1167 XV28	675.7171	682.1389	705.8937	730.6489	769.7256	815.6471	870.1363	932.4838
272 P8	10.6381	10.8597	10.9220	11.0296	11.1686	11.1287	11.3121	11.5432
275 P28	10.8765	10.9305	11.0917	11.3587	11.7309	12.2296	12.6654	13.6733
44 T8	1466.2581	1465.3401	1462.6946	1458.8086	1453.9636	1456.3437	1453.1662	1448.1349
45 T28	509.8782	510.6590	513.0376	517.0878	522.8811	527.2759	534.5973	543.7864
352 T45	1900.0186	1900.0027	1900.0063	1900.0024	1899.9775	1900.0005	1900.0171	1899.9997
416 W8	7.0422	7.0732	7.1640	7.3106	7.5056	7.4406	7.6659	7.9757
415 W28	65.9542	66.5735	68.3727	71.2010	74.9230	67.7190	72.4422	77.6560
6 P C	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 T PROFAN   DR [illegible] 75023   AUGUST 1975   PAGE 20

2	CASE	149.0000	150.0000	151.0000	152.0000	153.0000	154.0000	155.0000	156.0000
26	ALT	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000
27	ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000
351	TAMB	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950
279	PAMB	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935
42	T1	465.1950	466.1297	468.9336	473.6667	480.1489	480.1489	488.5596	498.8587
41	P1	8.2935	8.3518	8.5284	8.8285	9.2613	9.2613	9.8398	10.5812
31	FN	1477.8612	1278.8488	1121.4415	993.4694	884.3695	891.1015	824.6459	768.5498
35	SFC	0.3212	0.3725	0.4291	0.4922	0.5647	0.5572	0.6176	0.6819
183	FG8	229.9037	231.6304	236.8919	245.5594	257.3950	253.5003	256.1266	266.0212
182	FG28	1309.5350	1336.1537	1415.5943	1546.8989	1727.2505	1640.4479	1860.4273	2175.6996
37	FRAM	0.	235.6500	484.3176	757.6317	1063.7489	965.7175	1289.5446	1651.1481
793	WFT	474.7230	476.3418	481.1746	489.0056	499.2126	496.5613	509.2716	524.0379
420	W1	70.9812	71.6590	73.6372	76.7923	80.8679	73.4154	78.4266	84.1085
56	BPR	9.6421	9.6975	9.8532	10.0818	10.3007	9.4154	9.7755	10.1454
316	XNF	8549.1036	8566.6594	8621.8835	8720.6489	8850.5410	8476.0142	8506.3605	8537.0834
298	XNH	42815.0483	42834.3032	42892.9624	42993.6514	43133.6655	43060.1714	43210.8913	43373.3194
23	A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166	XV8	1090.6593	1094.1481	1104.7899	1121.6616	1144.3585	1137.7147	1165.6154	1198.6976
1167	XV28	658.3512	665.0320	684.6207	715.8869	757.2216	799.1726	854.5149	917.9082
272	P8	10.6233	10.6425	10.7016	10.7986	10.9313	10.8858	11.0519	11.2586
275	P28	10.7354	10.7898	10.9532	11.2266	11.6124	12.0539	12.6809	13.4601
44	T8	1443.3476	1442.4208	1439.7031	1435.2354	1429.7972	1434.0965	1428.7042	1422.9479
45	T28	507.5610	508.3320	510.6889	514.7322	520.5483	524.7138	532.0342	541.2744
352	T45	1859.9996	1859.9997	1860.0028	1859.9759	1860.0062	1859.9946	1860.0114	1860.0003
416	W8	6.8016	6.8309	6.9187	7.0640	7.2576	7.1895	7.4223	7.6492
415	W28	64.3113	64.9594	66.8524	69.8627	73.7497	66.3666	71.1488	76.6351
6	P C	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 21

2 CASE	157.0000	158.0000	159.0000	160.0000	161.0000	162.0000	163.0000	164.0000
26 ALT	15000,0000	15000,0000	15000,0000	15000,0000	15000,0000	15000,0000	15000,0000	15000,0000
27 ZXM	0.	0,1000	0,2000	0,3000	0,4000	0,4000	0,5000	0,6000
351 TAMB	465,1950	465,1950	465,1950	465,1950	465,1950	465,1950	465,1950	465,1950
279 PAMB	8,2935	8,2935	8,2935	8,2935	8,2935	8,2935	8,2935	8,2935
42 T1	465,1950	466,1297	468,9336	473,6067	480,1489	480,1489	488,5598	498,8387
41 P1	8,2935	8,3518	8,5284	8,8285	9,2613	9,2613	9,8398	10,5812
31 FN	1314,1329	1126,8591	979,9382	860,3367	757,7099	768,1550	705,9171	653,6591
35 SFC	0,3171	0,3710	0,4309	0,4986	0,5778	0,5680	0,6332	0,7032
183 FG8	195,1986	196,6219	200,8811	208,1528	218,0822	216,0934	228,1889	243,2365
182 FG28	1173,6898	1200,3248	1279,8294	1410,1505	1589,7718	1507,6237	1746,1644	2041,2544
37 FRAM	0.	223,1351	459,9415	722,1193	1018,5726	923,5556	1239,0230	1603,5960
793 WFT	416,7224	418,0975	422,2186	428,9401	437,7837	436,3432	446,9768	459,6335
420 W1	67,1400	67,8524	69,9310	73,1956	77,4335	70,2102	75,3540	81,2720
56 BPR	9,8054	9,8746	10,0679	10,3519	10,6915	9,6637	10,0944	10,5360
316 XNF	8090,9641	8103,1642	8143,2500	8215,1364	8321,5880	8087,6494	8115,1287	8151,2365
298 XNH	42094,9307	42115,6533	42178,1846	42277,6143	42374,2871	42348,1060	42459,5322	42595,2285
23 A28	306,0000	306,0000	306,0000	306,0000	306,0000	259,7740	259,7740	259,7740
1166 XV8	995,0678	998,1667	1007,1786	1022,7031	1043,2853	1039,8777	1064,5928	1094,2135
1167 XV28	622,8390	629,8770	650,4845	683,0576	725,8606	766,1001	823,4360	889,1274
272 P8	10,2442	10,2595	10,3048	10,3840	10,4926	10,4705	10,6036	10,7706
275 P28	10,4609	10,5144	10,6750	10,9419	11,3178	11,7157	12,3279	13,1126
44 T8	1401,8540	1400,9600	1398,2242	1393,9780	1368,3063	1391,3528	1365,5671	1378,9763
45 T28	503,1104	503,8624	506,1831	510,1875	516,0122	519,8261	527,1350	536,4320
352 T45	1785,0096	1785,0085	1784,9947	1784,9573	1765,0010	1784,9999	1784,9991	1784,9975
416 W8	6,3297	6,3560	6,4356	6,5673	6,7449	6,7053	6,9162	7,1727
415 W28	60,9264	61,6128	63,6126	66,7477	70,8105	63,6261	68,5620	74,2269
6 P C	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000	40,0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 22

2 CASE	165.0000	166.0000	167.0000	168.0000	169.0000	170.0000	171.0000	172.0000
26 ALT	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000
351 TAMB	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950
279 PAMB	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935
42 T1	465.1950	466.1297	468.9336	473.6067	480.1489	480.1489	488.5598	498.8387
41 P1	8.2935	8.3518	8.5284	8.8285	9.2613	9.2613	9.8398	10.5812
31 FN	1170.1347	994.2854	858.1929	748.7916	655.5930	664.4234	607.5657	558.7960
35 SFC	0.3153	0.3722	0.4353	0.5066	0.5908	0.5623	0.6529	0.7306
183 FGR	167.1386	168.2263	171.8265	177.8479	186.5856	185.7647	196.7564	210.3175
182 FG28	1051.7523	1078.8547	1159.3985	1292.3950	1475.9468	1391.9569	1630.1136	1924.0588
37 FRAM	0.	211.3671	437.2740	690.2516	979.6230	885.6138	1193.9890	1552.2971
793 WFT	368.9523	370.1036	373.5854	379.3442	387.3323	386.8862	396.7098	408.3600
420 W1	63.5104	64.2739	66.4846	69.9654	74.4725	67.3256	72.6152	78.6721
56 BPR	9.9439	10.0304	10.2728	10.6281	11.0406	9.9266	10.4018	10.8905
316 XNF	7679.5344	7689.6856	7723.7462	7792.7025	7904.6035	7716.9857	7750.6218	7796.2031
298 XNH	41384.1943	41400.1968	41448.0063	41528.3994	41642.7017	41627.3433	41757.5015	41904.6533
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	913.1354	915.4148	923.8168	937.3655	956.7645	955.6260	979.8993	1008.4276
1167 XV28	589.2662	596.8011	618.7039	653.4209	698.8085	735.8359	795.5790	863.3323
272 P8	9.9445	9.9551	9.9934	10.0568	10.1504	10.1408	10.2596	10.4063
275 P28	10.2189	10.2723	10.4324	10.7005	11.0786	11.4238	12.0276	12.7973
44 T8	1368.4044	1367.4401	1364.6632	1359.9541	1353.4618	1356.4199	1350.1654	1342.9571
45 T28	499.1838	499.9160	502.1784	506.1448	511.9837	515.5052	522.9034	532.3149
352 T45	1720.0062	1720.0004	1719.9867	1719.9940	1719.9977	1720.0040	1719.9988	1719.9990
416 W8	5.9060	5.9297	6.0015	6.1220	6.2926	6.2724	6.4789	6.7296
415 W28	57.7072	58.4469	60.5868	63.9485	68.2874	61.1607	66.2464	72.0557
6 P C	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 23

2 CASE	173.0000	174.0000	175.0000	176.0000	177.0000	178.0000	179.0000	180.0000
26 ALT	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000
351 TAMB	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950
279 PAMB	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935
42 T1	465.1950	466.1297	468.9336	473.6067	480.1489	480.1489	488.5598	498.8387
41 P1	8.2935	8.3518	8.5284	8.8285	9.2613	9.2613	9.8398	10.5812
31 FN	1027.2628	863.1558	737.0153	635.5457	549.0650	566.1840	513.3232	466.9179
35 SFC	0.3153	0.3765	0.4451	0.5246	0.6210	0.6012	0.6809	0.7717
183 FG8	141.3542	142.3351	145.4705	150.8765	158.7073	158.1773	168.0126	180.2259
182 FG28	928.7112	955.5606	1034.9591	1165.7447	1347.4807	1278.7621	1514.3089	1804.8389
37 FRAM	0.	198.7751	412.7053	654.5944	934.2453	847.1644	1147.6099	1498.6919
793 WFT	323.8697	324.9502	328.0783	333.4175	340.9446	340.4085	349.5078	360.3135
420 W1	59.6430	60.4448	62.7490	66.3511	71.0228	64.4028	69.7945	75.9553
56 BPR	10.0725	10.1744	10.4575	10.8654	11.3348	10.2179	10.7473	11.2611
316 XNF	7249.1392	7256.2749	7281.7087	7340.0302	7447.0154	7318.4181	7356.9258	7411.4086
298 XNH	40598.9346	40616.6079	40668.4463	40757.2144	40885.6108	40872.3594	41019.9927	41192.3022
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	832.8022	835.1051	843.0491	856.4019	875.0117	874.5692	897.7916	925.2551
1167 XV28	553.4237	561.3616	584.2597	620.3261	667.5301	704.7948	766.7604	836.3615
272 P8	9.6749	9.6843	9.7169	9.7731	9.8545	9.8497	9.9531	10.0829
275 P28	9.9786	10.0397	10.1858	10.4456	10.8130	11.1421	11.7325	12.4615
44 T8	1336.4517	1335.5899	1332.7843	1328.0049	1321.1002	1323.3922	1316.5452	1308.5922
45 T28	495.2506	495.9777	498.2379	502.2414	508.1648	511.1253	518.6761	528.2577
352 T45	1654.9985	1655.0666	1654.9984	1654.9970	1654.9992	1654.9930	1655.0021	1654.9988
416 W8	5.4767	5.4995	5.5677	5.6846	5.8525	5.8359	6.0384	6.2851
415 W28	54.2564	55.0356	57.2724	60.7591	65.2649	58.6618	63.8532	69.7706
6 P C	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 24

2 CASE	181.0000	182.0000	183.0000	184.0000	185.0000	186.0000	187.0000	188.0000
26 ALT	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000	15000.0000
27 ZXM	0.	0.1000	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000
351 TAMB	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950	465.1950
279 PAMB	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935	8.2935
42 T1	465.1950	466.1297	468.9336	473.6067	480.1489	480.1489	488.5598	498.6387
41 P1	8.2935	8.3518	8.5284	8.8285	9.2613	9.2613	9.8398	10.5612
31 FN	873.2445	722.9952	609.0621	516.2674	432.6919	458.1221	407.9198	363.6280
35 SFC	0.3169	0.3841	0.4608	0.5527	0.6736	0.6358	0.7328	0.8478
183 FG8	114.5746	115.4983	118.2587	122.9129	129.2000	128.8928	136.9788	147.3050
182 FG28	795.0551	821.7559	900.5989	1028.5150	1201.4333	1149.1453	1379.2466	1664.3926
37 FRAM	0.	184.1343	384.4179	613.6495	879.9126	800.8276	1091.3091	1432.9184
793 WFT	276.7325	277.7201	280.6408	285.3665	291.4737	291.2946	298.9424	308.2779
420 W1	55.1533	55.9927	58.4481	62.2008	66.8924	60.8602	66.3705	72.6216
56 BPR	10.2561	10.3824	10.7243	11.2106	11.7650	10.6357	11.2579	11.8706
316 XNF	6724.0901	6728.9121	6749.0967	6797.7819	6867.0684	6804.3017	6844.7064	6912.4667
298 XNH	39643.3779	39665.0635	39728.3984	39821.6958	39923.5303	39918.6089	40043.0674	40196.1519
23 A28	306.0000	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	743.2386	745.8849	753.6440	766.6110	783.4144	782.7596	803.9431	829.7494
1167 XV28	511.6932	520.2060	544.6366	582.3050	630.0572	667.6567	731.5663	803.4209
272 P8	9.4010	9.4103	9.4382	9.4856	9.5499	9.5466	9.6298	9.7365
275 P28	9.7223	9.7731	9.9243	10.1732	10.5166	10.8256	11.3919	12.1158
44 T8	1304.3775	1303.4936	1300.8217	1296.4056	1290.3713	1291.3189	1284.4742	1276.1467
45 T28	490.8787	491.5969	493.8478	497.8327	503.7160	506.2167	513.8275	523.5173
352 T45	1584.9980	1584.9991	1584.9987	1584.9985	1584.9984	1584.9982	1584.9990	1584.9983
416 W8	4.9741	4.9964	5.0632	5.1734	5.3214	5.3132	5.4977	5.7283
415 W28	50.2361	51.0735	53.4629	57.1066	61.6521	55.6480	60.9560	65.9794
6 P C	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 25

2 CASE	189.0000	190.0000	191.0000	192.0000	193.0000	194.0000	195.0000	196.0000
26 ALT	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000
27 XM	0.1050	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000	0.6650
351 TAMB	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640
279 PAMB	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534
42 T1	448.3549	450.9592	455.4533	461.7451	461.7451	469.8365	479.7210	487.1108
41 P1	6.8057	6.9446	7.1890	7.5415	7.5415	8.0125	8.6162	9.0882
31 FB	1179.8126	1044.9971	925.5324	822.4472	859.5592	803.2956	756.6396	731.1741
35 SFC	0.3767	0.4295	0.4929	0.5662	0.5412	0.5958	0.6529	0.6910
183 FG8	227.1342	232.3305	241.1800	253.3307	249.3543	265.0331	284.0216	298.2849
182 FG28	1214.8644	1270.6381	1366.0936	1499.6665	1474.2180	1672.8331	1916.4979	2101.4121
37 FRAM	213.0271	414.4299	643.1773	896.2814	828.1982	1101.1000	1412.3532	1438.0972
793 WFT	444.4072	448.7920	456.1535	465.6744	465.1811	478.5863	494.0419	505.2490
420 W1	62.9116	64.2549	66.4806	69.4816	64.2037	68.2876	72.9924	76.3823
56 BPR	9.4963	9.5807	9.7143	9.8889	9.1626	9.4373	9.7253	9.9112
316 XNF	9074.3040	9147.1836	9270.1464	9423.3008	8790.7245	8831.5679	8860.8706	8868.6471
298 XNH	42939.0640	42984.6924	43067.1802	43226.1494	43098.2466	43238.3535	43414.5928	43541.3896
23 A28	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740
1166 XV8	1197.8521	1209.7091	1229.1202	1255.4339	1248.0864	1281.1944	1320.0161	1348.1089
1167 XV28	690.0911	706.0908	732.7669	768.4030	821.4100	875.9490	936.1932	979.2479
272 P8	9.1007	9.1614	9.2639	9.4074	9.3593	9.5445	9.7726	9.9458
275 P28	9.0483	9.1656	9.3685	9.6553	10.1756	10.7065	11.3807	11.9804
44 T8	1454.0736	1451.8812	1448.1456	1443.5937	1448.1712	1443.2034	1438.4120	1435.3906
45 T28	494.3938	496.6650	500.6582	506.2456	510.6478	517.7983	526.7359	533.5352
352 T45	1900.0666	1900.0141	1900.0035	1900.0119	1900.0080	1900.0162	1899.9998	1900.0058
416 W8	6.1184	6.1970	6.3314	6.5110	6.4466	6.6748	6.9427	7.1304
415 W28	56.9180	58.1821	60.2757	63.1306	57.8860	61.7450	66.1867	69.3820
6 P C	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 26

2 CASE	197.0000	198.0000	199.0000	200.0000	201.0000	202.0000	203.0000	204.0000
26 ALT	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000
27 ZXM	0.1050	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000	0.6690
351 TAMB	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640
279 PAMB	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534
42 T1	448.3549	450.9592	455.4533	461.7451	461.7451	469.8345	479.7210	487.1108
41 P1	6.8057	6.9446	7.1890	7.5415	7.5415	8.0125	8.6162	9.0082
31 FN	1123.3218	995.1729	883.2405	786.2266	803.0969	747.9102	702.9782	677.7197
35 SFC	0.3721	0.4242	0.4856	0.5569	0.5438	0.5999	0.6585	0.6981
183 FG8	210.5076	215.1862	223.0283	233.6948	230.8408	244.7676	262.9354	275.1487
182 FG28	1168.4463	1228.7794	1331.5576	1472.5519	1414.5545	1614.3549	1858.4661	2042.9052
37 FRAM	208.8271	407.3273	634.5437	887.2607	810.8361	1080.0495	1588.4327	1612.0998
793 WFT	418.0125	422.1055	428.9358	437.8514	434.7283	448.6794	462.9320	473.0804
420 W1	61.6713	63.1537	65.5882	68.7823	62.8577	66.9821	71.7561	75.1717
56 BPR	9.6214	9.7380	9.9236	10.1571	9.2746	9.5862	9.9060	10.1143
316 XNF	8776.4829	8837.1212	8941.1436	9074.0542	8592.0928	8626.0062	8657.6550	8669.7715
298 XNH	42517.2476	42565.5649	42668.3701	42802.0308	42710.7930	42867.6177	43054.4331	43184.9067
23 A28	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740
1166 XV8	1146.5415	1157.5002	1175.2148	1198.9622	1193.8492	1224.2028	1261.3228	1287.6465
1167 XV28	676.2345	693.6757	722.5351	760.3657	807.1841	860.5214	921.9150	965.5343
272 P8	8.9106	8.9645	9.0540	9.1749	9.1437	9.3049	9.5114	9.6690
275 P28	8.9517	9.0776	9.2947	9.5966	10.0247	10.5484	11.2178	11.7405
44 T8	1429.9892	1427.5208	1423.4937	1418.9149	1423.0114	1417.8819	1412.6253	1409.3248
45 T28	492.0863	494.3172	498.2724	503.8859	509.2201	515.3103	524.2461	531.0363
352 T45	1860.0454	1859.9993	1860.0011	1860.0050	1860.0000	1860.0028	1860.0052	1859.9993
416 W8	5.9243	5.9986	6.1235	6.2893	6.2391	6.4514	6.7084	6.8049
415 W28	55.8650	57.2724	59.5839	62.6147	56.7399	60.6548	65.1766	68.4083
6 P C	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 27

2 CASE	205.0000	206.0000	207.0000	208.0000	209.0000	210.0000	211.0000	212.0000
26 ALT	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000
27 ZXM	0.1050	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000	0.6650
351 TAMB	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640
279 PAMB	6.7534	6.7534	6.7534	6.7534	6.7534	6.75[illegible]	6.7534	6.7534
42 T1	448.3549	450.9592	455.4533	461.7451	461.7451	469.[illegible]345	479.7210	487.1108
41 P1	6.8057	6.9446	7.1890	7.5415	7.5415	8.0125	8.6162	9.0882
31 FN	995.3075	877.2434	776.2990	691.6914	696.1309	644.8191	601.6314	577.8493
35 SFC	0.3696	0.4235	0.4865	0.5582	0.5515	0.6113	0.6750	0.7181
183 FG8	179.1900	183.0579	189.9238	199.5268	196.6172	208.3150	[illegible]2.7265	233.7038
182 FG28	1055.9010	1118.9451	1226.9519	1377.3668	1304.7682	1532.6225	1744.4115	1928.7350
37 FRAM	198.3124	388.2079	608.2309	856.3847	774.2491	1038.6509	1340.4386	1560.5124
793 WFT	367.8622	371.4843	377.6959	386.1237	383.9415	394.[illegible]802	406.1003	414.9334
420 W1	58.5660	60.1894	62.8684	66.3885	62.1764	[illegible]	69.2757	72.7666
56 BPR	9.8133	9.9757	10.2230	10.5149	9.5356	9.9102	10.2954	10.5394
316 XNF	8251.7607	8299.9441	8390.7327	8525.7837	8205.968[illegible]	8[illegible]42.6161	8[illegible]79.0507	8301.5455
298 XNH	41758.3462	41818.3579	41923.6914	42076.5903	42054.7334	421[illegible]0.9927	42315.1475	42421.5010
23 A28	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740
1166 XV8	1047.7557	1057.2122	1073.9943	1096.4257	1092.4336	1117.7401	1150.5595	1174.4075
1167 XV28	642.3155	661.3112	692.7135	734.5693	774.5438	824.9837	893.2112	938.2594
272 P8	8.5617	8.6041	8.6806	8.7872	8.7540	8.8853	9.0502	9.1757
275 P28	8.7206	8.8496	9.0733	9.3927	9.7361	10.2491	10.9018	11.4151
44 T8	1388.4500	1385.6805	1381.1393	1374.8585	1379.0354	1372.9512	1366.6225	1362.3250
45 T28	487.5798	489.7820	493.6986	499.3779	503.2504	510.3975	519.3910	526.2722
352 T45	1785.0073	1785.0019	1785.0714	1784.9997	1784.9960	1785.0027	1785.0035	1784.9971
416 W8	5.5184	5.5870	5.7060	5.8719	5.8181	6.0136	6.2462	6.4918
415 W28	53.1499	54.7055	57.2667	60.6240	54.4647	58.5106	63.1426	66.4605
6 P C	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 28

2	CASE	213.0000	214.0000	215.0000	216.0000	217.0000	218.0000	219.0000	220.0000
26	ALT	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000
27	ZXM	0.1050	0.2000	0.3000	0.4000	0.4000	0.5000	0.4000	0.6650
351	TAMB	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640
279	PAMB	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534
42	T1	448.3549	450.9592	455.4533	461.7451	461.7451	469.8345	479.7210	487.1108
41	P1	6.8057	6.9446	7.1890	7.5415	7.5415	8.0125	8.6162	9.0882
31	FN	879.7208	769.5124	675.0743	595.0413	602.7543	554.8452	515.2089	493.3040
35	SFC	0.3698	0.4267	0.4942	0.5732	0.5644	0.6289	0.6979	0.7449
183	FG8	152.7877	156.0380	161.6810	169.9689	168.6926	178.5930	191.1032	200.7771
182	FG28	951.4507	1014.7361	1122.2160	1270.7469	1202.5825	1398.8444	1641.7873	1826.4537
37	FRAM	188.0627	369.1987	580.6945	820.8702	743.4061	990.4736	1296.2146	1513.3705
793	WFT	325.2936	328.3526	333.6523	341.0776	340.1956	348.9606	359.5634	367.4628
420	W1	55.5391	57.2421	60.0222	63.6363	57.6304	61.9850	66.9902	70.5682
56	BPR	10.0016	10.2041	10.5072	10.8590	9.7936	10.2366	10.4821	10.9696
316	XNF	7831.0323	7868.1052	7939.9384	8050.5319	7835.8553	7870.5687	7917.3773	7949.5752
298	XNH	41080.4572	41130.1089	41213.1528	41331.2290	41307.9468	41436.2583	41593.3311	41707.7083
23	A28	306.0000	306.0000	306.0000	305.0000	259.7740	259.7740	259.7740	259.7740
1166	XV8	959.4002	968.2043	982.8181	1004.2532	1001.7276	1026.6058	1056.8625	1079.4772
1167	XV28	609.3870	629.3144	662.0263	705.0835	743.5587	800.9211	866.5586	913.1451
272	P8	8.2740	8.3094	8.3696	8.4603	8.4461	8.5544	8.6926	8.8005
275	P28	8.5102	8.6370	8.8561	9.1658	9.4769	9.9786	10.6224	11.1286
44	T8	1354.1507	1351.4749	1346.9894	1341.0018	1343.9762	1337.7043	1330.4398	1325.4346
45	T28	483.5404	485.6869	489.5496	495.2145	498.8280	505.9[illegible]	515.0112	521.9615
352	T45	1720.0016	1719.9987	1719.9637	1720.0023	1719.9996	1720.0002	1719.9784	1720.0014
416	W8	5.1386	5.2082	5.3081	5.4611	5.4338	5.6133	5.8345	6.0015
415	W28	50.4908	52.1331	54.8061	58.2702	52.2911	56.4687	61.2558	64.6691
6	P C	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 29

2 CASE	221.0000	222.0000	223.0000	224.0000	225.0000	226.0000	227.0000	228.0000
26 ALT	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000
27 ZXM	0.1050	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000	0.6450
351 TAMB	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640
279 PAMB	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534
42 T1	448.3549	450.9592	455.4533	461.7451	461.7451	469.8345	479.7210	487.1108
41 P1	6.8057	6.9446	7.1890	7.5415	7.5415	8.0125	8.4162	9.0882
31 FN	763.8079	663.0022	577.4958	505.0329	513.3896	469.9932	433.3536	412.3784
35 SFC	0.3734	0.4345	0.5071	0.5928	0.5825	0.6539	0.7322	0.7869
183 FG8	128.7766	131.7122	136.5625	143.5322	143.0691	152.0655	163.4609	172.0991
182 FG28	843.7684	907.6454	1016.8279	1167.8835	1101.7285	1297.[illegible]974	1538.8384	1721.8018
37 FRAM	176.9118	348.7304	551.8322	785.3397	711.0168	959.6867	1250.8893	1464.3401
793 WFT	285.2339	288.1036	292.8652	299.4008	279.0565	307.3288	317.2804	324.4036
420 W1	52.2460	54.0686	57.0389	60.8812	55.0420	59.5175	64.4477	68.2819
56 BPR	10.1769	10.4207	10.7970	11.2330	10.0925	10.5827	11.0724	11.3802
316 XNF	7387.0675	7419.2310	7487.5255	7601.2943	7477.6483	74[illegible].2983	7538.5461	7578.9508
298 XNH	40276.0913	40333.1167	40425.0596	40552.3407	40535.8970	40[illegible]	40864.3867	40990.5552
23 A28	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740
1166 XV8	874.1058	882.8244	896.3014	915.3069	915.0083	930.2919	968.9837	990.6208
1167 XV28	573.4614	594.8325	629.7564	675.4322	711.2779	770.2631	839.1118	886.9175
272 P8	8.0199	8.0512	8.1015	8.1757	8.1705	8.2668	8.3894	8.4882
275 P28	8.2963	8.4226	8.6413	8.9507	9.2230	9.2167	10.3465	10.8399
44 T8	1322.6339	1319.9403	1315.0313	1308.2435	1318.9490	1304.1553	1296.1843	1290.5976
45 T28	479.4553	481.9811	485.6367	491.1087	494.3363	501.5850	510.8015	517.8400
352 T45	1654.9925	1654.9960	1654.9994	1654.9942	1655.0002	1655.0027	1654.9995	1454.9993
416 W8	4.7537	4.8140	4.9162	5.0599	5.0452	5.2238	5.4432	5.6056
415 W28	47.5715	49.3344	52.2039	55.9044	50.3799	54.3790	59.2927	62.7665
6 PC	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 30

2 CASE	229.0000	230.0000	231.0000	232.0000	233.0000	234.0000	235.0000	236.0000
26 ALT	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000	20000.0000
27 ZXM	0.1050	0.2000	0.3000	0.4000	0.4000	0.5000	0.6000	0.6650
351 TAMB	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640	447.3640
279 PAMB	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534	6.7534
42 T1	448.3549	450.9592	455.4533	461.7451	461.7451	469.8385	479.7210	487.1108
41 P1	6.8057	6.9446	7.1890	7.5415	7.5415	8.0125	8.4162	9.0882
31 FN	639.1079	546.4894	467.6134	430.5017	413.1146	378.5136	341.4357	320.0211
35 SFC	0.3809	0.4498	0.5349	0.6401	0.6107	0.6958	0.7958	0.8686
183 FG8	104.0787	106.4351	110.6486	116.9390	116.5412	124.3162	133.6395	140.9311
182 FG28	725.5075	787.0540	892.2962	1039.0811	991.8325	1183.0275	1417.1982	1595.3120
37 FRAM	163.8488	324.2293	515.8475	738.8308	671.7960	913.0587	1195.1755	1402.8878
793 WFT	243.4589	245.8081	250.1143	256.3636	255.9393	263.3575	271.7168	277.9607
420 W1	48.3882	50.2699	53.3194	57.2797	52.0790	56.6258	61.7683	65.4144
56 BPR	10.4117	10.7112	11.1493	11.6429	10.5268	11.0807	11.4447	11.9923
316 XNF	6855.8823	6875.3097	6929.1200	7037.3689	6930.7031	6986.5940	7045.2247	7091.9871
298 XNH	39306.7764	39360.9585	39464.2993	39615.9121	39600.5898	39763.8276	39913.0664	40024.8770
23 A28	306.0000	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740
1166 XV8	779.5581	787.5402	800.8282	819.9908	810.3588	842.5944	869.3108	889.5141
1167 XV28	531.3287	553.4623	589.5970	636.9314	674.2420	734.6334	805.5135	854.2213
272 P8	7.7643	7.7892	7.8322	7.8971	7.8934	7.9739	8.0711	8.1480
275 P28	8.0662	8.1854	8.3920	8.6844	8.9516	9.4275	10.0264	10.4073
44 T8	1291.7602	1289.3047	1284.5626	1277.1702	1278.9608	1271.6087	1263.5312	1257.7086
45 T28	474.8332	476.9353	480.8310	486.6521	489.2389	496.6197	505.9162	513.0309
552 T45	1584.9828	1584.9993	1584.9998	1585.0012	1585.0093	1585.0017	1584.9990	1584.9989
416 W8	4.3079	4.3608	4.4582	4.6016	4.5895	4.7606	4.9604	5.1122
415 W28	44.1480	45.6774	48.9367	52.7494	47.5609	51.9385	56.8834	60.3814
6 PC	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 31

2 CASE	237.0000	238.0000	239.0000	240.0000	241.0000	242.0000	243.0000	244.0000
26 ALT	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000
27 XM	0.2100	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.7300
351 TAMB	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330
279 PAMB	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535
42 T1	433.3381	437.2987	443.3390	443.3390	451.1053	460.5978	471.8161	475.5180
41 P1	5.6239	5.8053	6.0899	6.0899	6.4702	6.9577	7.5670	7.7741
31 FN	876.6341	786.0792	699.6750	758.1454	713.0231	676.3872	647.4956	440.1526
35 SFC	0.4438	0.5019	0.5735	0.5315	0.5828	0.6358	0.6899	0.7041
183 FG8	210.0554	217.4186	226.4258	222.6094	237.5441	255.5852	277.1520	284.2563
182 FG28	1060.5214	1126.7704	1233.4421	1254.2815	1317.2725	1616.9875	1856.7250	1936.9977
37 FRAM	357.4163	525.3565	731.0398	687.1541	912.0842	[illegible]	1459.4024	1554.4204
793 WFT	389.0177	394.5399	401.2684	402.9866	415.5278	[illegible]	446.6814	452.0336
420 W1	53.8622	55.4194	57.8316	54.3657	57.7291	[illegible]	65.9791	67.3872
56 BPR	9.3017	9.3947	9.5948	[illegible]	9.3028	[illegible]	9.7808	9.8497
316 XNF	9457.2616	9566.4351	[illegible]	8872.4987	8925.9580	[illegible]	8975.7355	8972.5490
298 XNH	[illegible]14.2749	42810.2148	42953.8530	42759.4441	42893.8760	[illegible]	43847.3076	43373.3232
23 A28	306.0000	306.0000	306.0000	259.7740	259.7740	[illegible]	259.7740	259.7740
1166 XV8	1270.0803	1289.1553	[illegible]	1303.5745	1340.3574	[illegible]	1432.5982	1447.5516
1167 XV28	705.0331	727.3281	[illegible]	828.6636	879.0827	[illegible]	1002.8730	1023.7042
272 P8	7.6536	7.7490	7.9565	[illegible]	7.9913	[illegible]	8.4868	8.5771
275 P28	7.4744	7.6160	7.8455	8.3860	8.8273	9.3871	10.0871	10.3283
44 T8	1442.5662	1439.7935	1436.4527	[illegible]	1434.5698	[illegible]	1427.7916	1426.6148
45 T28	480.4386	483.8501	488.9585	493.5385	500.4646	509.1532	519.6213	523.1161
352 T45	1900.0026	1900.0026	1900.0037	1899.9983	1900.0033	1900.0061	1900.0074	1900.0035
416 W8	5.3365	5.4419	5.5707	5.5131	3.7185	5.9626	6.2446	6.3342
415 W28	48.6338	50.0879	52.3745	48.9474	52.1258	55.7622	59.8590	61.1742
6 PC	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	[illegible]0.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 32

2 CASE	245.0000	246.0000	247.0000	248.0000	249.0000	250.0000	251.0000	252.0000
26 ALT	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000
27 ZXM	0.2100	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.7300
351 TAMB	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330
279 PAMB	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535
42 T1	433.3381	437.2987	443.3390	443.3390	451.1053	460.5978	471.8161	475.5180
41 P1	5.6239	5.8053	6.0899	6.0899	6.4702	6.9577	7.5670	7.7761
31 FN	845.8479	758.7606	673.8804	712.0791	667.0757	630.4891	601.4023	594.0598
35 SFC	0.4327	0.4898	0.5624	0.5327	0.5855	0.6404	0.6963	0.7132
183 FG8	193.2707	200.3886	210.0528	206.9158	220.2608	236.5315	255.8401	262.4682
182 FG28	1041.6913	1111.1101	1217.4528	1208.6161	1370.1010	1568.6713	1807.8902	1887.8948
37 FRAM	353.8704	521.1231	725.5468	673.7878	895.4913	1148.4433	1437.2696	1531.5580
793 WFT	365.9684	371.6416	378.9819	379.3084	390.5893	403.7474	418.7570	423.6706
420 W1	53.3279	54.9729	57.4030	53.3076	56.6788	60.5742	64.9785	66.3957
56 BPR	9.5697	9.6731	9.8472	9.1730	9.4358	9.7074	9.9793	10.0507
316 XNF	9097.1415	9214.8152	9360.0023	8686.1929	8731.3165	8766.2281	8780.3340	8779.0558
298 XNH	42237.1011	42333.3296	42499.6470	42343.8833	42483.0181	42604.3257	42878.8247	42946.9867
23 A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	25[illegible]40
1166 XV8	1211.7050	1230.6355	1255.6931	1249.0180	1282.9494	1322.8284	1367.7210	1382.9848
1167 XV28	697.5[illegible]30	721.0440	755.3535	812.9515	864.3842	923.5348	989.7037	1010.7859
272 P8	7.4630	7.5466	7.6607	7.6230	7.7817	7.9787	8.2152	8.2988
275 P28	7.4344	7.5824	7.8108	8.2649	8.6981	9.2497	9.9418	10.1805
44 T8	1417.9290	1414.4314	1410.3109	1414.9765	1410.0948	1405.1032	1400.2160	1398.9469
45 T28	478.0679	481.6050	486.8910	491.2065	498.1176	506.7870	517.2455	520.7292
352 T45	1860.0177	1860.0413	1860.0072	1859.9993	1859.9990	1860.0032	1860.0046	1860.0271
416 W8	5.1467	5.2541	5.3976	5.3454	5.5397	5.7695	6.0357	6.1237
415 W28	48.2825	49.8223	52.1111	48.0675	51.2476	54.9170	59.0602	60.3874
6 P C	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 33

2 CASE	253.0000	254.0000	255.0000	256.0000	257.0000	258.0000	259.0000	260.0000
26 ALT	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000
27 ZXM	0.2100	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.7300
351 TAMB	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330
279 PAMB	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535
42 T1	433.3381	437.2987	443.3390	443.3390	451.1053	460.5978	471.8161	475.5180
41 P1	5.6239	5.8053	6.0899	6.0899	6.4702	6.9577	7.5670	7.7761
31 FN	763.3708	686.7061	612.7722	620.8752	578.1009	543.2061	514.6623	507.1301
35 SFC	0.4238	0.4785	0.5480	0.5388	0.5947	0.6535	0.7143	0.7328
183 FG8	164.8404	170.7465	179.1936	176.8931	187.6331	201.2200	217.5338	222.8018
182 FG28	971.6540	1050.4575	1168.3997	1115.4839	1276.0661	1473.0619	1711.5277	1790.9960
37 FRAM	341.3165	505.8852	709.2889	545.6320	861.5108	1109.3422	1392.9549	1485.6273
793 WFT	323.4870	328.6074	335.8271	334.5332	343.8041	354.9627	367.6092	371.6476
420 W1	51.4360	53.3654	56.1167	51.0604	54.5281	58.5118	62.0750	64.4045
56 BPR	9.9122	10.1002	10.3483	9.4190	9.7550	10.0783	10.4106	10.5077
316 XNF	8484.1750	8579.0535	8715.8549	8295.2993	8332.6097	8371.0947	8397.8226	8402.3198
298 XNH	41423.4531	41530.6743	41681.6875	41594.0341	41750.5376	41958.1094	42147.5518	42200.4458
23 A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740
1166 XV8	1107.9235	1124.5783	1147.6110	1142.5821	1171.5723	1207.2091	1248.4869	1261.7782
1167 XV28	672.3800	699.4352	738.2250	781.0127	836.1886	895.2750	963.1113	984.6623
272 P8	7.1367	7.2047	7.3002	7.2738	7.3962	7.5538	7.7478	7.8118
275 P28	7.2873	7.4530	7.7052	8.0214	8.4440	8.9841	9.6595	9.8922
44 T8	1373.8871	1369.9726	1364.5552	1368.9525	1363.4065	1357.6391	1352.8415	1350.3844
45 T28	473.4857	476.9913	482.4562	486.4677	493.3317	501.9938	512.4486	515.9370
352 T45	1784.9932	1785.0015	1785.0023	1784.9988	1785.0119	1785.0025	1785.0025	1784.9973
416 WC	4.8025	4.8991	5.0383	4.9955	5.167[illegible]	5.3783	5.6212	5.6999
415 [illegible]	46.7224	48.5578	51.1718	46.4778	49.4580	53.2302	57.4560	58.8079
6 [illegible] C	40.0000	40.00[illegible]	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 34

2	CASE	261.0000	262.0000	263.0000	264.0000	265.0000	266.0000	267.0000	268.0000
26	ALT	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000
27	ZXM	0.2100	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.7300
351	TAMB	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330
279	PAMB	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535
42	T1	433.3381	437.2987	443.3390	443.3390	451.1053	460.5978	471.8161	475.5180
41	P1	5.6239	5.8053	6.0899	6.0899	6.4702	6.9577	7.5670	7.7761
31	FN	671.7996	601.2424	534.8283	539.5309	499.1236	466.3151	440.1442	433.3103
35	SFC	0.4262	0.4838	0.5564	0.5491	0.6094	0.6729	0.7386	0.7587
183	FG8	140.6574	145.6484	153.2008	151.4577	160.4605	171.9254	186.0760	190.8889
182	FG28	884.2747	964.6241	1086.4356	1029.0970	1188.3215	1385.6404	1624.2116	1703.9992
37	FRAM	325.1409	483.9784	682.5236	618.5434	828.8616	1071.8209	1351.8041	1443.5232
793	WFT	286.3273	290.9108	297.5631	296.2576	304.1594	313.7721	325.0741	328.7660
420	W1	48.9984	51.0545	53.9992	48.9372	57.4616	56.5328	61.1146	62.5792
56	BPR	10.1600	10.3965	10.7085	9.6903	10.0848	10.4811	10.8616	10.9705
316	XNF	8000.6499	8076.5457	8201.0511	7935.0192	7969.7443	8013.8631	8057.601	8067.5076
298	XMW	40731.3623	40836.9507	40974.3408	40934.9992	41067.9097	41227.5464	41416.19[illegible]	41477.0603
23	A28	304.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740
1166	XV8	1015.3313	1030.5146	1052.9124	1048.6807	1074.8066	1107.0356	1145.1962	1157.9299
1167	XV28	640.9206	669.6325	711.2422	756.0629	804.9727	868.0700	938.3707	960.6233
272	P8	6.8687	6.9234	7.0072	6.9878	7.0875	7.2166	7.3786	7.4344
275	P28	7.1066	7.2724	7.5295	7.7995	8.2115	8.7405	9.4078	9.6376
44	T8	1339.6747	1335.5644	1329.3856	1332.9890	1326.9911	1320.1830	1312.8127	1310.7792
45	T28	469.3340	472.8082	478.2865	481.9410	488.8037	497.5328	508.1450	511.6797
352	T45	1719.9995	1719.9789	1719.9945	1720.0072	1719.9983	1719.9987	1719.9996	1719.9804
416	W8	4.4700	4.8604	4.6949	4.6602	4.8172	5.0111	5.2428	5.3193
415	W28	44.4078	46.5746	49.3872	44.3595	47.7288	51.4088	55.9624	57.3514
6	P C	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 35

2 CASE	269.0000	270.0000	271.0000	272.0000	273.0000	274.0000	275.0000	276.0000
26 ALT	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000
27 ZXM	0.2100	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.7300
351 TAMB	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330
279 PAMB	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535
42 T1	433.3381	437.2987	443.3390	443.3390	451.1053	460.5978	471.8161	475.5180
41 P1	5.6239	5.8053	6.0899	6.0899	6.4702	6.9577	7.5670	7.7761
31 FN	580.8747	516.1873	454.5260	459.5907	423.4803	393.2492	368.6132	362.4874
35 SFC	0.4320	0.4936	0.5732	0.5660	0.6314	0.7016	0.7757	0.7982
183 FG8	118.1593	122.2271	128.4698	127.8354	135.9410	145.9163	158.1361	162.4262
182 FG28	794.6896	875.7270	997.4900	948.7411	1100.2682	1297.1660	1534.9862	1415.8414
37 FRAM	307.7711	460.2590	652.4952	589.8342	795.0840	1033.4478	1309.1503	1309.8765
793 WFT	250.9471	254.7892	260.5176	260.1133	267.3692	275.9112	285.9347	289.3577
420 W1	44.3808	48.5524	51.6234	46.6680	50.3237	54.5088	59.1862	60.6871
56 BPR	10.4266	10.7309	11.1172	9.9950	10.4505	10.9102	11.3466	11.4680
316 XNF	7548.4470	7615.5390	7728.7626	7534.1158	7575.5972	7629.2010	7687.9372	7705.4076
298 XNH	39958.0840	40042.7754	40168.7041	40149.1299	40300.4355	40471.3735	40667.8838	40734.9321
23 A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740
1166 XV8	923.4457	936.8692	956.7612	955.6138	981.4737	1011.8199	1047.0553	1059.1847
1167 XV28	607.1026	637.5020	680.9212	716.9846	774.5358	839.9303	912.4167	935.4586
272 P8	6.6260	6.6696	6.7365	6.7292	6.8174	6.9267	7.0616	7.1009
275 P28	6.9247	7.0891	7.3413	7.5740	7.9820	8.5007	9.1547	9.3815
44 T8	1307.4326	1303.0727	1296.4868	1299.7946	1293.3591	1285.8457	1277.3788	1274.7171
45 T28	465.1144	468.5416	474.0140	477.3590	484.2758	493.0676	503.7941	507.3958
352 T45	1655.0000	1655.0001	1655.0023	1655.0013	1655.0012	1654.9996	1654.9994	1655.0008
416 W8	4.1287	4.2096	4.3326	4.3164	4.4692	4.6533	4.8732	4.9481
415 W28	42.3217	44.4135	47.3630	42.4217	45.9288	49.9322	54.3925	55.8196
6 PC	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 36

2 CASE	277.0000	278.0000	279.0000	280.0000	281.0000	282.0000	283.0000	284.0000
26 ALT	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000	25000.0000
27 ZXN	0.2100	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.7300
351 TAMB	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330	429.5330
279 PAMB	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535	5.4535
42 T1	433.3381	437.2987	443.3390	443.3390	451.1053	460.5978	471.8161	475.5180
41 P1	5.6239	5.8053	6.0899	6.0899	6.4702	6.9577	7.5670	7.7261
31 FN	479.2145	420.6929	365.3631	375.6731	342.5233	314.8154	289.5440	282.8581
35 SFC	0.4473	0.5176	0.6104	0.5927	0.6690	0.7533	0.8487	0.8788
183 FG8	95.4203	98.9377	104.3585	103.9814	110.8521	119.8103	130.0575	133.5692
182 FG28	690.0858	769.8666	891.3638	844.6242	1001.5740	1196.3332	1428.3916	1506.3448
37 FRAM	286.3243	430.5825	615.1357	557.2813	755.6310	988.2107	1256.8408	1345.2702
793 WFT	214.3320	217.7405	223.0188	222.6587	229.1489	237.1580	245.7438	248.5690
420 W1	43.1487	45.4218	48.6676	44.0904	47.8265	52.1228	56.8213	58.3198
56 BPR	10.7265	11.1010	11.5716	10.4226	10.9440	11.4558	11.9554	12.0970
316 XNF	7007.9980	7063.1364	7173.2674	7049.6646	7095.1694	7162.6156	7226.8168	7245.8880
298 XNH	38982.0010	39071.9644	39216.1299	39199.0718	39366.3677	39571.3165	39744.6567	39800.0176
23 A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740
1166 XV8	823.5618	837.0002	856.1181	855.4829	879.3224	909.4925	942.1544	953.0678
1167 XV28	565.2924	597.3627	643.3392	678.7932	738.9512	806.8611	880.7454	904.1294
272 P8	6.3864	6.4240	6.4803	6.4766	6.5452	6.6437	6.7533	6.7914
275 P28	6.7163	6.8749	7.1212	7.3359	7.7297	8.2326	8.8579	9.0743
44 T8	1274.5902	1272.2687	1265.2033	1267.4319	1260.4313	1251.9301	1243.2840	1240.5941
45 T28	460.4362	463.8686	469.3972	472.1707	479.2249	488.2193	499.0178	502.6282
352 T45	1584.9904	1585.0040	1585.0010	1585.0032	1584.9986	1585.0002	1584.9983	1584.9968
416 W8	3.7385	3.8161	3.9332	3.9219	4.0677	4.2506	4.4542	4.5221
415 W28	39.4692	41.6683	44.7964	40.7305	43.8223	47.9382	52.4354	53.8669
6 P C	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 37

2 CASE	285.0000	286.0000	287.0000	288.0000	289.0000	290.0000	291.0000	292.0000
26 ALT	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000
27 ZXM	0.2700	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000
351 TAMB	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020
279 PAMB	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641
42 TI	417.7290	419.1428	424.9307	424.9307	432.3729	441.4698	452.2209	464.6265
41 P1	4.5911	4.6456	4.8733	4.8733	5.1776	5.5677	6.0552	6.6547
31 FN	659.3016	634.8326	561.0548	653.0195	618.8634	591.0509	570.9921	558.1007
35 SFC	0.4784	0.4974	0.5659	0.5261	0.5753	0.6255	0.6744	0.7208
183 FG8	175.0950	176.1459	180.3717	194.1722	209.2025	226.3741	246.8364	271.3905
182 FG28	886.9738	906.3433	989.1039	1048.1127	1180.8378	1342.7545	1538.7504	1772.2345
37 FRAM	375.2962	421.2052	585.0433	562.0561	745.3910	953.4505	1190.8033	1462.2701
793 WFT	315.4267	315.7728	317.4391	343.5451	356.0261	369.7002	385.0589	402.2808
420 W1	44.9333	45.3869	47.2810	45.4232	48.1917	51.3694	54.9921	59.0875
56 BPR	9.3698	9.4276	9.6926	9.0186	9.1846	9.3723	9.5732	9.7805
316 XNF	9422.7764	9438.7087	9503.6541	8939.3004	9019.9255	9065.7955	9058.9447	9023.8293
298 XNH	41958.6836	41966.0049	42018.0425	42319.1904	42498.9653	42665.8867	42842.0239	43061.6904
23 A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740
1166 XV8	1277.9700	1280.0567	1290.5002	1353.1076	1397.0657	1444.8094	1500.9198	1566.5042
1167 XV28	706.3343	714.1234	746.1511	828.7547	878.4752	935.2955	999.1838	1013.6630
272 P8	6.2135	6.2252	6.2761	6.4443	6.6314	6.8487	7.1218	7.4682
275 P28	6.0630	6.1046	6.2827	6.8296	7.1929	7.6520	8.2311	8.9330
44 T8	1407.4369	1404.9454	1397.4594	1436.4846	1431.8023	1427.6232	1424.7246	1423.2896
43 T28	463.1851	464.2622	468.7479	476.0458	482.8926	491.3004	501.3061	512.8711
352 T45	1858.7751	1856.3739	1849.3607	1900.0589	1900.0603	1900.0330	1900.0288	1900.0014
416 W8	4.4209	4.4402	4.5099	4.6303	4.8318	5.0554	5.3072	5.5926
415 W28	40.6002	41.0343	42.8591	40.8893	43.4599	46.4169	49.7910	53.6066
6 P C	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 38

2	CASE	293.0000	294.0000	295.0000	296.0000	297.0000	298.0000	299.0000	300.0000
26	ALT	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000
27	ZXM	0.2700	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000
351	TAMB	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020
279	PAMB	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641
42	T1	417.7290	419.1428	424.9307	424.9307	432.3729	441.4694	452.2209	464.6265
41	P1	4.5911	4.6456	4.8733	4.8733	5.1776	5.5677	6.0552	6.6547
31	FN	659.2691	634.8691	561.1423	619.3401	583.7101	555.3908	533.6285	518.6339
35	SFC	0.4784	0.4974	0.5659	0.5248	0.5745	0.6257	0.6775	0.7273
183	FG8	175.0064	176.1824	180.4455	182.1852	194.5262	209.7394	228.0793	249.9673
182	FG28	887.0286	906.3449	989.1210	1015.9408	1147.4145	1308.6150	1502.1257	1732.7379
37	FRAM	375.2964	421.2052	585.0434	552.9801	733.9095	939.8219	1174.3420	1442.4616
793	WFT	315.3979	315.7936	317.4781	325.0366	335.3171	347.4846	361.5444	377.2036
420	W1	44.9334	45.3869	47.2810	44.6897	47.4494	50.6352	54.2319	58.2871
56	BPR	9.3705	9.4277	9.6924	9.0988	9.3242	9.5523	9.7723	9.9918
316	XNF	9422.7764	9438.7087	9503.6541	8751.4424	8804.6471	8845.9233	8862.2329	8844.7163
298	XNH	41958.6074	41966.2983	42018.6738	41935.2935	42076.7632	42240.9598	42453.3701	42690.9004
23	A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740
1166	XV8	1277.4077	1280.2914	1290.9272	1301.8779	1338.7972	1382.6944	1433.2616	1492.1600
1167	XV28	706.3720	714.1239	746.1652	815.7838	885.6900	923.0530	987.1686	1011.4994
272	P8	6.2117	6.2259	6.2775	6.2984	6.4484	6.6374	6.8707	7.1633
275	P28	6.0632	6.1046	6.2827	6.7435	7.1005	7.5539	8.1210	8.8131
44	T8	1407.3466	1405.0090	1397.5359	1408.9502	1404.4182	1399.9879	1395.9126	1393.0549
45	T28	463.1885	464.2623	468.7493	475.8751	480.5292	488.8968	499.0036	510.6878
352	T45	1858.7449	1856.4248	1849.4105	1860.0179	1860.8303	1860.0128	1859.9[illegible]98	1860.0035
416	W8	4.4205	4.4403	4.5102	4.5154	4.6883	4.8945	5.1347	5.4062
415	W28	40.6006	41.0344	42.8590	40.2644	42.8535	45.8367	49.1975	52.9843
6	P C	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 39

2	CASE	301.0000	302.0000	303.0000	304.0000	385.0000	306.0000	307.0000	308.0000
26	ALT	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30800.0000
27	ZXM	0.2700	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000
351	TAMB	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020
279	PAMB	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641
42	T1	417.7290	419.1428	424.9307	424.9307	432.3729	441.4696	452.2209	464.6265
41	P1	4.5911	4.6456	4.8733	4.8733	5.1776	5.5677	6.0552	6.6547
31	FN	613.1504	591.9098	526.5055	565.3313	509.7699	481.6029	459.6193	443.7694
35	SFC	0.4577	0.4769	0.5474	0.5282	0.5815	0.6364	0.6920	0.7462
183	FG8	149.1769	151.1364	158.6147	156.8455	166.7658	179.2423	194.2462	212.0836
182	FG28	857.8968	879.5687	967.4660	942.5437	1071.2130	1230.5530	1422.9178	1651.8298
37	FRAM	368.3754	414.1324	577.6375	531.3358	786.9685	908.1254	1138.3939	1401.6537
793	WFT	280.6461	282.2541	288.2156	288.0591	296.4141	306.4958	318.0754	331.1559
420	W1	44.1047	44.6248	46.6824	42.9405	45.7076	48.927[illegible]	52.5718	56.6381
56	BPR	9.9014	9.9513	10.1415	9.3286	9.6146	9.903[illegible]	10.1874	10.4606
316	XNF	8744.6064	8784.6774	8930.7217	8377.8657	8416.6954	8452.980[illegible]	8473.3689	8473.4464
298	XNH	41068.0786	41108.0874	41263.4561	41137.7549	41302.6567	41501.7534	41729.5698	41957.9121
23	A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.774[illegible]	259.7740	259.7740
1166	XV8	1167.4628	1174.1823	1198.5934	1194.3407	1226.2137	1264.8299	1309.1848	1359.4372
1167	XV28	692.4105	701.3061	736.1249	785.7552	836.5424	895.2709	960.9946	1006.9605
272	P8	5.9076	5.9308	6.0175	5.9969	6.1132	6.262[illegible]	6.4441	6.6656
275	P28	6.0009	6.0472	6.2359	6.5491	6.8922	7.3329	7.8859	8.5699
44	T8	1361.9252	1360.7473	1356.3561	1360.6439	1355.8675	1350.731[illegible]	1345.6505	1341.0223
45	T28	458.8309	460.1110	465.3001	469.3719	475.9669	484.2969	494.3504	506.1233
352	T45	1784.9159	1785.0040	1784.9993	1785.0008	1785.0006	1785.0005	1785.0006	1784.9979
415	W8	4.1230	4.1533	4.2700	4.2374	4.3883	4.5726	4.7875	5.0339
415	W28	40.0589	40.5499	42.4925	38.7831	41.4015	44.440[illegible]	47.8726	51.6962
6	P C	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 40

	309.0000	310.0000	311.0000	312.0000	313.0000	314.0000	315.0000	316.0000
2 CASE	309.0000	310.0000	311.0000	312.0000	313.0000	314.0000	315.0000	316.0000
26 ALT	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0004	30000.0000	30000.0000
27 ZXM	0.2700	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000
351 TAMB	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020
279 PAMB	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641
42 T1	417.7290	419.1428	424.9307	424.9307	432.3729	441.4695	452.2209	464.6265
41 P1	4.5911	4.6456	4.8733	4.8733	5.1776	5.5677	6.0552	6.6547
31 FN	548.3859	529.6569	473.0530	476.6078	443.5505	416.6174	394.6543	378.4328
35 SFC	0.4555	0.4743	0.5429	0.5364	0.5925	0.6515	0.7125	0.7734
183 FG8	128.1835	129.7654	136.3143	134.5251	142.8120	153.1171	165.7554	181.1476
182 FG28	797.7919	821.6052	917.9765	871.5543	1000.2847	1159.1024	1349.6695	1576.3288
37 FRAM	354.7401	399.6446	561.5273	509.6137	681.0649	878.2435	1184.3267	1363.2756
793 WFT	249.8018	251.2051	256.8017	255.6662	282.7836	271.2784	281.2088	292.6640
420 W1	42.4722	43.0637	45.3805	41.1858	44.8328	47.3174	50.9985	55.0874
56 BPR	10.2268	10.3020	10.5753	9.5937	9.9470	10.3025	10.6399	10.9525
316 XNF	8207.5033	8240.5939	8374.6594	8011.4340	8049.9014	8092.1547	8125.8936	8145.1282
298 XNH	40357.8408	40396.2627	40551.9609	40479.2007	40639.7905	40819.5646	41094.5723	41217.2705
23 A28	306.0000	306.0000	306.0000	259.7745	259.7740	259.7740	259.7740	259.7740
1166 XV8	1073.6655	1079.1384	1101.8374	1096.6866	1125.2012	1159.2224	1199.3364	1246.1585
1167 XV28	666.6978	676.7279	715.8633	755.5174	808.3095	868.8824	936.0722	1002.7309
272 P8	5.6695	5.6872	5.7669	5.7401	5.8345	5.9533	6.1009	6.2848
275 P28	5.8737	5.9240	6.1295	6.3645	6.7017	7.1328	7.6721	8.3440
44 T8	1325.9953	1324.4964	1318.8240	1323.1674	1317.4021	1311.1090	1305.2567	1299.4585
45 T28	454.6955	455.9521	461.1920	464.9445	471.5552	479.9139	493.0052	501.8881
352 T45	1719.9990	1719.9963	1720.0064	1719.9947	1719.9995	1720.0007	1719.9999	1719.9752
416 W8	3.8523	3.8801	3.9919	3.9588	4.0953	4.2620	4.4595	4.6905
415 W28	38.6891	39.2534	41.1600	37.2973	40.0105	43.1306	46.6172	50.4785
6 P C	35.0000	35.0000	35.0000	35.0009	35.0000	35.0000	35.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 41

2	CASE	317.0000	318.0000	319.0000	320.0000	321.0000	322.0000	323.0000	324.0000
26	ALT	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000
27	ZXM	0.2700	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000
351	TAMB	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020	411.7020
279	PAMB	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641
42	T1	417.7290	419.1428	424.9307	424.9307	432.3729	441.4694	452.2209	464.6265
41	P1	4.5911	4.6456	4.8733	4.8733	5.1776	5.5677	6.0552	6.6547
31	FN	472.4900	455.1653	402.8293	407.3601	376.7099	351.9259	332.0361	317.0078
35	SFC	0.4633	0.4836	0.5588	0.5512	0.6122	0.6764	0.7432	0.8106
163	FG8	107.4336	108.7319	114.3385	113.5068	120.4051	129.1666	140.0350	153.2990
182	FG28	721.4217	745.2715	841.6001	796.6631	924.6310	1083.2944	1274.7039	1502.0053
37	FRAM	336.6782	379.8729	536.3341	485.8365	652.6299	845.8715	1068.8689	1325.0878
793	WFT	218.8839	220.1031	225.0979	224.5205	230.6131	238.0335	246.7796	256.9587
420	W1	40.3097	40.9332	43.3445	39.2634	42.1944	45.5734	49.3610	53.5443
56	BPR	10.5453	10.6407	10.9780	9.9035	10.3272	10.7508	11.1503	11.5130
316	XNF	7707.9791	7734.0095	7841.9589	7622.2827	7699.5089	7709.1359	7759.1668	7799.0532
298	XNH	39606.8882	39636.1157	39758.0552	39733.7231	39872.9482	40042.1230	40238.4746	40462.5215
23	A28	306.0000	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740
1166	XV8	975.8750	980.6897	1002.0275	999.7628	1025.3337	1056.5626	1093.8214	1136.9481
1167	XV28	633.5109	643.9857	684.9537	722.2570	777.1075	840.0239	909.8160	985.7335
272	P8	5.4413	5.4550	5.5165	5.5069	5.5827	5.6803	5.8032	5.9550
275	P28	5.7153	5.7644	5.9664	6.1734	6.5022	6.9240	7.4570	8.1206
44	T8	1293.3279	1291.7636	1286.0410	1289.4209	1283.2399	1275.9879	1268.3880	1260.8010
45	T28	450.4120	451.6628	456.9014	460.2917	466.8978	475.3203	485.5467	497.5857
352	T45	1654.9991	1655.0015	1655.0059	1654.9995	1654.9998	1654.9999	1654.9994	1655.0001
416	W8	3.5522	3.5775	3.6819	3.6634	3.7891	3.9447	4.1309	4.3507
415	W28	36.8182	37.4168	39.7259	35.6624	38.4694	41.6949	45.2985	49.2652
6	P C	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 42

2 CASE	325.0000	326.0000	327.0000	328.0000	329.0000	330.0000	331.0000	332.0000
26 ALT	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000	30000.0000
27 ZXM	0.2700	0.3000	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000
351 TAMB	411.7020	411.7020	411.7020	411.7020	411.7020	411.702[illegible]	411.7020	411.7020
279 PAMB	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641	4.3641
42 T1	417.7290	419.1428	424.9307	424.9307	432.3729	441.4696	452.2209	464.6265
41 P1	4.5911	4.6456	4.8733	4.8733	5.1776	5.5677	6.0552	6.6547
31 FN	387.1670	372.1817	327.1409	331.9737	305.7359	283.4244	265.3063	249.9647
35 SFC	0.4808	0.5033	0.5867	0.5775	0.6461	0.721[illegible]	0.8006	0.8844
183 FG8	85.9591	87.1238	92.0115	91.5936	97.8887	105.616[illegible]	115.2014	126.2211
182 FG28	631.6211	656.0924	755.4735	711.9986	840.1786	997.8759	1188.2888	1412.5145
37 FRAM	314.2812	355.5269	506.7134	457.7863	619.5924	808.2584	1027.1295	1273.3558
793 WFT	186.1618	187.3096	191.9247	191.7028	197.5335	204.3522	212.3989	221.0790
420 W1	37.6282	38.3098	40.9505	36.9965	40.0585	43.546[illegible]	47.4335	51.6559
56 BPR	10.9630	11.0846	11.5204	10.3438	10.8291	11.314[illegible]	11.7614	12.1863
316 XNF	7141.0866	7166.9418	7284.3092	7131.6472	7181.9784	7244.5224	7315.5493	7371.1412
298 XNH	38596.9976	38633.5815	38780.5905	38759.4388	38930.9688	39125.0249	39350.8955	39549.7241
23 A28	306.0000	306.0000	306.0000	259.7748	259.7740	259.774[illegible]	259.7740	259.7740
1166 XV8	867.5300	872.4809	893.1939	891.6474	917.8287	948.4122	984.4671	1023.5975
1167 XV28	592.2193	603.6637	648.2421	682.3825	740.7383	806.3624	878.8281	956.6475
272 P8	5.2117	5.2239	5.2761	5.2704	5.3379	5.421[illegible]	5.5255	5.6469
275 P28	5.5327	5.5821	5.7855	5.9601	6.2840	6.6953	7.2138	7.8853
44 T8	1263.4393	1261.7152	1254.7360	1257.2688	1250.2150	1242.2658	1233.3332	1224.4196
45 T28	445.4095	446.6633	451.9562	454.9476	461.7180	470.272[illegible]	480.6934	492.0590
352 T45	1584.9991	1584.9993	1584.9975	1584.9922	1585.0003	1585.0011	1584.9975	1584.9970
416 W8	3.1972	3.2221	3.3239	3.3148	3.4413	3.5933	3.7758	3.9789
415 W28	34.4828	35.1397	37.6799	33.7349	36.6720	40.0198	43.7166	47.7385
6 P C	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 43

2 CASE	333.0000	334.0000	335.0000	336.0000	337.0000	338.0000	339.0000	340.0000
26 ALT	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000
27 ZKM	0.3300	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000	0.3300
351 TAMB	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710
279 PAMB	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580
42 T1	402.4809	406.5206	406.5206	413.6374	422.3369	432.6194	444.4851	402.4809
41 P1	3.7291	3.8614	3.8614	4.1025	4.4115	4.7978	5.2727	3.7291
31 FN	485.5015	445.7213	550.8613	527.4589	508.4600	493.1424	485.2867	485.5016
35 SFC	0.5111	0.5592	0.5217	0.5687	0.6174	0.6640	0.7076	0.5111
183 FG8	139.8594	142.5571	164.6371	180.1822	198.0839	217.3959	239.4907	139.8594
182 FG28	737.0609	785.2719	861.9384	971.3401	1101.0090	1254.9951	1443.4233	737.0608
37 FRAM	371.1899	463.5360	453.4950	602.0060	769.4471	958.7000	1177.4071	371.1899
793 WFY	248.1491	249.2261	285.9787	299.9718	313.9283	327.8951	343.3669	248.1498
420 W1	37.1781	38.3027	37.4730	39.7957	42.3870	45.2679	48.6455	37.1781
56 BPR	9.6134	9.7981	9.8477	9.1322	9.2216	9.3606	9.5580	9.6134
316 XNF	9249.1931	9295.5017	8932.9562	9063.0955	9144.1829	9141.7416	9093.0619	9249.1931
298 XNH	41013.9148	41064.8018	41718.6958	41997.7354	42238.9111	42422.6460	42615.4058	41013.9129
23 A28	306.0000	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740	306.0000
1166 XV8	1263.3840	1271.7943	1394.1489	1448.4453	1510.8626	1574.8263	1644.2550	1263.3858
1167 XV28	707.6551	730.5071	825.7799	875.5709	930.8894	983.2716	994.4667	707.6554
272 P8	4.9364	4.9691	5.2405	5.4368	5.6772	5.9517	6.2759	4.9364
275 P28	4.8776	4.9816	5.4967	5.7994	6.1711	6.6294	7.1971	4.8778
44 T8	1366.1088	1360.3452	1434.4738	1429.1674	1425.6097	1424.1656	1423.8843	1366.1109
45 T28	445.3619	448.5039	457.7287	464.7109	473.0347	482.6370	493.6658	445.3619
352 T45	1806.0926	1800.6789	1899.9261	1900.0818	1900.0468	1900.0014	1900.0387	1806.0951
416 W8	3.5726	3.6168	3.9104	4.0121	4.2333	4.4564	4.7033	3.5726
415 W28	33.6751	34.7555	33.7435	35.8681	38.2403	40.9025	44.0380	33.6751
6 P C	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 44

2	CASE	341.0000	342.0000	343.0000	344.0000	345.0000	346.0000	347.0000	348.0000
26	ALT	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000
27	ZMM	0.4000	0.4000	0.5000	0.6000	0.7000	0.8000	0.3300	0.4800
351	TAMB	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710
279	PAMB	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580
42	T1	406.5206	406.5206	413.6374	422.3369	432.6194	444.4851	462.4802	406.5206
41	P1	3.8614	3.8614	4.1025	4.4119	4.7978	5.2727	3.7291	3.8614
31	FN	445.7390	528.4523	501.6846	479.6777	463.8800	455.1178	475.1487	838.1721
35	SFC	0.5592	0.5197	0.5679	0.6171	0.6649	0.7084	0.5053	0.5555
183	FG8	142.5756	157.4652	169.9304	184.0713	280.8126	220.8708	133.6150	138.1789
182	FG28	785.2719	840.9224	946.4557	1074.6348	1229.8134	1417.3158	730.6926	780.0914
37	FRAM	463.5360	447.9164	593.7980	759.0418	947.4177	1164.1087	369.3610	461.8011
793	WFT	249.2363	274.6528	284.9066	296.0224	308.4356	322.4076	240.0740	243.4017
420	W1	38.3027	37.0120	39.2531	41.8138	44.7352	48.0967	36.9950	35.1593
56	BPR	9.7981	9.0529	9.2046	9.3805	9.5732	9.7879	9.7654	9.8989
316	XNF	9295.5017	8807.3478	8894.6765	8945.6060	8941.0048	8893.4214	9053.5472	9152.6383
298	XNH	41064.9492	41449.3438	41644.0063	41821.9738	42092.1182	42214.2385	40751.7837	40880.6665
23	A28	306.0000	259.7740	259.7740	259.7740	259.7740	259.7740	366.0000	306.0000
1166	XV8	1271.9389	1352.0504	1396.7248	1445.0707	1581.7665	1567.6904	1230.8436	1249.0793
1167	XV28	730.5071	815.7275	864.2607	919.5199	981.0946	992.3363	763.9797	727.6898
272	P8	4.9694	5.1509	5.3067	5.4873	5.7138	5.9998	4.8611	4.9164
275	P28	4.9816	5.4399	5.7298	6.0944	6.5541	7.1179	4.8640	4.9703
44	T8	1360.3833	1404.7871	1400.1345	1396.1038	1393.5233	1392.5654	1352.5853	1350.1119
45	T28	448.5039	456.2186	462.8307	470.9158	480.5072	491.5274	444.1898	447.6857
352	T45	1800.7096	1860.0044	1860.0027	1860.0027	1860.0389	1860.0223	1785.0439	1785.0293
416	W8	3.6169	3.7579	3.9257	4.1101	4.3155	4.5489	3.5027	3.5695
415	W28	34.7555	33.3303	35.4065	37.7857	40.5042	43.6374	33.5585	34.6581
6	P C	45.0000	45.0000	45.0000	45.0000	45.0000	45.0000	40.0000	40.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 45

2	CASE	349.0000	350.0000	351.0000	352.0000	353.0000	354.0000	355.0000	356.0000
26	ALT	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000
27	ZXM	0.4000	0.5000	0.6000	0.7000	0.6000	0.3304	0.4000	0.4000
351	TAMB	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710
279	PAMB	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580
42	T1	406.5206	413.6374	422.3369	432.6194	444.4851	402.4809	406.5206	406.5206
41	P1	3.8614	4.1025	4.4115	4.7978	5.2727	3.7291	3.8614	3.8614
31	FN	471.3447	443.8105	421.5616	404.3195	392.5767	439.2427	426.7029	414.0987
35	SFC	0.5198	0.5695	0.6209	0.6731	0.7230	0.4893	0.5375	0.5266
183	FG8	137.0073	146.2981	157.5437	171.1958	187.3931	114.7194	119.1439	117.8328
182	FG28	786.2333	890.3858	1017.8655	1178.7759	1353.7901	704.9259	759.1653	728.4773
37	FRAM	432.2565	574.3813	736.2825	920.8047	1132.2492	362.4007	454.6603	414.9573
793	WFT	244.9877	252.7592	261.7663	272.1392	283.8518	214.8804	218.5993	218.0662
420	W1	35.7180	37.9696	40.5601	43.4788	46.7797	35.2678	37.5693	34.2885
56	BPR	9.2637	9.5050	9.7523	9.9968	10.2301	10.2877	10.4406	9.5164
316	XNF	8433.9629	8487.8274	8529.3833	8546.4008	8537.5795	8426.8448	8535.6429	8875.6839
298	XNH	40665.4058	40825.1641	41022.6616	41245.4736	41493.0591	39936.2119	40057.8774	39955.6826
23	A28	259.7740	259.7740	259.7740	259.7740	259.7740	306.0000	366.0000	259.7740
1166	XV8	1246.0361	1281.4418	1322.5422	1370.7677	1424.9390	1131.0467	1149.4042	1145.1893
1167	XV28	788.5180	837.9422	894.5687	957.7128	987.9891	689.5083	715.9047	759.0831
272	P8	4.9016	5.0130	5.1502	5.3218	5.5301	4.6408	4.6919	4.6761
275	P28	5.2934	5.5746	5.9312	6.3769	6.9251	4.8058	4.9252	5.1414
44	T8	1354.6462	1349.9171	1345.0986	1340.7692	1336.9847	1314.4268	1310.5969	1314.9629
45	T28	451.8972	458.3147	466.3495	476.0186	487.2691	440.1674	443.9191	447.7190
352	T45	1785.0022	1785.0296	1785.0118	1785.0093	1784.9811	1720.0005	1720.0133	1719.9925
416	W8	3.5479	3.6838	3.8437	4.0298	4.2434	3.2727	3.3447	3.3201
415	W28	32.2380	34.3552	36.7879	39.5249	42.6142	33.0548	34.2854	31.0281
6	P C	40.0000	40.0000	40.0000	40.0000	40.0000	35.0000	35.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 46

2 CASE	357.0000	358.0000	359.0000	360.0000	361.0000	362.0000	363.0000	364.0000
26 ALT	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000
27 ZKM	0.5000	0.6000	0.7000	0.8000	0.3300	0.4000	0.4000	0.5000
351 TAMB	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710
279 PAMB	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580
42 T1	413.6374	422.3369	432.6194	444.4851	402.4802	406.5206	406.5206	413.6374
41 P1	4.1025	4.4115	4.7978	5.2727	3.7291	3.8614	3.8614	4.1025
31 FN	388.0207	366.8871	349.7015	338.9893	381.3270	352.6427	355.0515	330.1123
35 SFC	0.5791	0.6338	0.6899	0.7450	0.4950	0.5444	0.5389	0.5960
183 FG8	125.6128	135.2618	146.5577	159.9398	96.3478	100.0571	99.1200	105.2245
182 FG28	832.0790	959.1007	1111.3495	1291.9829	647.1097	704.0568	686.4230	768.7356
37 FRAM	553.5035	712.1865	893.6348	1100.8916	346.2418	436.7775	395.6977	530.0932
793 WFT	224.7180	232.5196	241.2510	251.0460	188.7636	191.9799	191.3434	196.7515
420 W1	36.5895	39.2328	42.1956	45.4842	34.6794	36.0918	32.6971	35.0419
56 BPR	9.8172	10.1235	10.4256	10.7158	10.6813	10.8961	9.8500	10.2296
316 XNF	8120.6422	8160.3242	8185.3828	8191.7548	7866.5581	7960.8689	7683.7620	7723.8261
298 XNH	40142.7026	40354.7852	40572.9116	40772.8735	39182.1294	39280.8916	39241.4209	39387.6196
23 A28	259.7740	259.7740	259.7740	259.7740	306.0000	306.0000	259.7740	259.7740
1166 XV8	1176.8685	1215.1938	1257.6663	1305.7827	1029.0983	1045.8178	1042.8366	1069.3442
1167 XV28	810.1465	868.4675	933.2306	983.6889	659.7837	688.5937	725.8760	778.6153
272 P8	4.7661	4.8803	5.0160	5.1801	4.4340	4.4759	4.4651	4.5326
275 P28	5.4161	5.7651	6.2013	6.7402	4.6858	4.8069	4.9810	5.2471
44 T8	1309.4607	1304.1787	1299.0805	1294.1598	1280.8974	1276.5714	1280.4563	1274.3208
45 T28	454.1211	462.1201	471.7559	488.0458	435.7978	439.4929	442.9702	449.3447
352 T45	1719.9796	1719.9992	1719.9991	1720.0015	1655.8154	1654.9927	1654.9914	1654.9978
418 W8	3.4440	3.5916	3.7601	3.9522	3.0209	3.0871	3.0669	3.1751
415 W28	33.2070	35.7058	38.5026	41.6018	31.7106	33.0577	29.6835	31.9214
6 P C	35.0000	35.0000	35.0000	35.0000	30.0000	30.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN   DK NO. 75023   AUGUST 1975   PAGE 47

2 CASE	365.0000	366.0000	367.0000	368.0000	369.0000	370.0000	371.0000	372.0000
26 ALT	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000	35000.0000
27 ZXM	0.6000	0.7000	0.8000	0.3300	0.4000	0.4000	0.5000	0.6000
351 TAMB	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710	393.8710
279 PAMB	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580	3.4580
42 T1	422.3369	432.6194	444.4851	402.4802	406.5206	406.5206	413.6374	422.3369
41 P1	4.4115	4.7978	5.2727	3.7291	3.8614	3.8614	4.1025	4.4115
31 FN	310.3773	294.9076	282.9404	308.9864	284.2052	286.5924	265.6246	249.0147
55 SFC	0.6556	0.7167	0.7784	0.5161	0.5719	0.5669	0.6299	0.6970
183 FG8	113.3115	123.1243	134.9205	75.9804	79.2197	78.8459	84.2989	91.2912
182 FG28	895.3123	1048.1142	1228.4372	569.7622	627.9153	590.7399	593.6371	821.2416
37 FRAM	685.3141	864.0431	1068.6284	323.8818	411.0880	371.0501	561.2437	653.1424
793 WFT	203.4823	211.3612	220.2300	159.4592	162.5306	162.2644	167.3229	173.5521
420 W1	37.7524	40.7984	44.1512	32.4398	33.9688	30.6604	33.1348	35.9801
56 BPR	10.9000	10.9505	11.2730	11.2394	11.5110	10.3337	10.7894	11.2273
316 XNF	7771.7490	7818.2953	7847.0775	7254.8901	7346.9634	7168.8635	7220.0397	7289.4731
298 XNH	39569.6865	39780.5718	40005.5562	38123.1499	38242.3315	38214.6307	38391.8901	38604.2651
23 A28	259.7740	259.7740	259.7740	306.0000	306.0000	259.7740	259.7740	259.7740
1166 XV8	1104.2314	1143.9960	1190.0653	909.7372	926.8056	924.9965	951.9797	984.9096
1167 XV28	839.0943	906.4537	979.2493	618.3870	649.5725	683.2199	739.5547	803.6964
272 P8	4.6251	4.7378	4.8768	4.2132	4.2480	4.2437	4.3023	4.3781
275 P28	5.5881	6.0178	6.5499	4.5243	4.6455	4.7893	5.0510	5.3869
44 T8	1267.7112	1260.6436	1254.2418	1251.7172	1246.4346	1249.6247	1242.7563	1234.5968
45 T28	457.4282	467.2451	478.7052	430.4620	434.2511	437.2960	443.7669	452.0228
352 T45	1654.9914	1654.9856	1654.9699	1585.0013	1585.0031	1585.0187	1585.0035	1585.0140
416 W6	3.3111	3.4728	3.6582	2.6949	2.7604	2.7504	2.8573	2.9908
415 W28	34.4978	37.3844	40.5537	29.7894	31.2537	27.9555	30.3242	33.0375
6 P C	30.0000	30.0000	30.0000	25.0000	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 48

2	CASE	37[illegible],0000	37[illegible],0000
26	ALT	35000,0000	35000.0000
27	ZXM	0,7000	0.8000
351	TAMB	393,8710	393.8710
279	PAMB	3.4580	3.4580
42	T1	432,6194	444.4851
41	P1	4,7978	5.2[illegible]27
31	FN	235,9005	225.8668
35	SFC	0,7664	0.8366
183	FG8	99,8674	110.1885
182	FG28	974,7124	1156.3412
37	FRAM	829,0501	1031.2518
793	WFY	180,7870	188.9658
420	W1	39,1461	42.6069
56	BPR	11,6323	11.9946
316	XNF	7363,4447	7425.1270
298	XNH	38844,1479	39103.1323
23	A28	259,7740	259.7740
1166	XV8	1023,3152	1067.3055
1167	XV28	874,4241	950.6286
272	P8	4,4726	4.5886
275	P28	5,8095	6.3340
44	T8	1225,6094	1216.6765
45	T28	462,0481	473.7879
352	T49	1584,9968	1585.0026
416	W8	3,1490	3.3312
415	W28	36,0472	39.3281
6	P C	25,0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 49

2 CASE	375.0000	376.0000	377.0000	378.0000	379.0000	380.0000	381.0000	382.0000
26 ALT	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000
27 ZXM	0.4000	0.5000	0.6000	0.7000	0.8000	0.4000	0.5000	0.6000
351 TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279 PAMB	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200
42 T1	402.5112	409.5571	418.1699	428.3501	440.0979	402.5112	409.5571	418.1699
41 P1	3.0373	3.2269	3.4700	3.7738	4.1474	3.0373	3.2269	3.4700
31 FN	429.8297	409.8121	393.1733	381.5518	375.9506	406.1327	384.7611	368.3903
35 SFC	0.5267	0.5747	0.6240	0.6715	0.7139	0.5269	0.5755	0.6246
183 FG8	128.7430	139.6976	152.1912	166.8347	184.1114	120.2995	129.1388	139.9177
182 FG28	674.5896	758.5178	859.3727	981.3229	1129.9511	652.0059	754.6562	836.7327
37 FRAM	355.5933	471.3278	602.0084	756.7079	922.4472	349.2488	463.2023	592.9106
793 WFT	226.3820	235.5175	245.3265	256.1998	268.3990	214.0016	221.4227	230.0997
420 W1	29.5297	31.3126	33.3285	35.6237	38.3016	29.0028	30.7727	32.8249
56 BPR	9.1069	9.2259	9.3669	9.5295	9.7201	9.1979	9.3865	9.5796
316 XNF	8859.5474	8963.4889	9025.2726	9028.0225	8981.8136	8678.7814	8752.3274	8802.0637
298 XNH	41337.2161	41578.6230	41793.1240	41999.6616	42216.1123	40952.3965	41137.3057	41341.0684
23 A28	259.7740	259.7740	259.7740	259.7748	259.7740	259.7740	259.7740	259.7740
1166 XV8	1391.9005	1441.2901	1495.9320	1559.0208	1630.1207	1336.4810	1377.5890	1425.7704
1167 XV28	819.7013	868.0966	922.6685	977.7535	988.9268	805.8618	854.3375	910.1923
272 P8	4.1127	4.2515	4.4163	4.6218	4.8755	4.0074	4.1169	4.2537
275 P28	4.3146	4.5463	4.8347	5.1973	5.6449	4.2534	4.4801	4.7690
44 T8	1437.2673	1432.5767	1429.0466	1427.2579	1427.0219	1409.4763	1404.9256	1400.7247
45 T28	452.9253	459.6045	467.6883	477.2471	488.1924	450.8347	457.2919	465.3254
352 T49	1900.0013	1900.0054	1900.0062	1900.0009	1900.0042	1859.9755	1860.0304	1860.0171
416 W8	2.9845	3.1275	3.2830	3.4548	3.6471	2.9044	3.0248	3.1665
415 W28	26.0080	28.2505	30.1137	32.2404	34.7287	26.1588	27.8100	29.7222
6 P C	50.0000	50.0000	50.0000	50.0000	50.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 50

2 CASE	383.0000	384.0000	385.0000	386.0000	387.0000	388.0000	389.0000	390.0000
26 ALT	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000
27 ZXM	0.7000	0.8000	0.4000	0.5000	0.6000	0.7000	0.8000	0.4000
351 TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279 PAMB	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200
42 T1	428.3501	440.0979	402.5112	409.5572	418.1699	428.3501	440.0979	402.5112
41 P1	3.7738	4.1474	3.0373	3.2269	3.4700	3.7738	4.1474	3.0373
31 FN	357.1190	350.5083	356.1544	335.5928	319.5549	307.1521	299.2620	307.9744
35 SFC	0.6723	0.7173	0.5301	0.5810	0.6333	0.6867	0.7364	0.5411
183 FG8	152.9488	168.9319	102.3259	109.4825	118.4572	129.1490	142.0079	86.5567
182 FG28	960.1465	1106.8512	603.8327	686.2449	787.4340	908.6777	1053.7379	554.4303
37 FRAM	741.0963	910.6702	335.1645	446.1518	573.8216	717.8774	884.0146	320.1803
793 WFT	240.0999	251.4354	188.7868	194.9898	202.3788	210.7735	220.3803	166.6471
420 W1	35.1676	37.8126	27.8332	29.6400	31.7238	34.0658	36.7058	26.5889
56 BPR	9.7762	9.9690	9.4890	9.7412	9.9927	10.2341	10.4615	9.8033
316 XNF	8807.8995	9785.4745	8273.8628	8329.0444	8377.3857	8404.5067	8469.1521	7880.2684
298 XNH	41563.7344	41822.3096	40123.2705	40324.4048	40595.3486	40805.5483	41085.3540	39408.6445
23 A28	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740
1166 XV8	1482.2225	1550.3419	1220.1249	1255.7841	1299.1546	1348.2111	1404.0155	1113.8636
1167 XV28	973.0131	986.6978	775.3442	825.4098	882.8321	946.6919	982.1201	742.9486
272 P8	4.4259	4.6516	3.7914	3.8758	3.9846	4.1167	4.2793	3.6085
275 P28	5.1337	5.5747	4.1250	4.3463	4.6279	4.9796	5.4138	3.9958
44 T8	1397.5024	1395.9804	1361.4428	1356.3607	1351.2220	1346.3264	1341.9619	1324.8302
45 T28	474.9310	485.9990	446.1283	452.5368	460.5779	470.2404	481.5098	441.5363
352 T45	1859.9996	1860.0118	1785.0116	1784.9948	1784.9994	1785.0008	1784.9958	1719.9890
416 W8	3.3299	3.5175	2.7061	2.8131	2.9421	3.0910	3.2636	2.5074
415 W28	31.9041	34.3654	25.1797	26.8809	28.8379	31.0334	33.5033	24.1277
6 P C	45.0000	45.0000	40.0000	40.0000	40.0000	40.0000	40.0000	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 51

2 CASE	391.0000	392.0000	393.0000	394.0000	395.0000	396.0000	397.0000	398.0000
26 ALT	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000
27 ZXM	0.5000	0.6000	0.7000	0.8000	0.4000	0.5000	0.6000	0.7000
351 TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279 PAMB	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200
42 T1	409.5571	418.1699	428.3501	440.0977	402.5112	409.5571	418.1699	428.3501
41 P1	3.2269	3.4700	3.7739	4.1474	3.8373	3.2269	3.4700	3.7738
31 FN	289.4960	274.4457	262.1734	253.7421	257.1659	240.9919	228.0146	217.7081
35 SFC	0.5947	0.6504	0.7079	0.7638	0.5618	0.6207	0.6808	0.7431
183 FG8	92.7443	100.1983	109.0214	119.7758	71.0157	76.3345	82.7721	90.5992
182 FG28	637.2543	738.4213	859.0601	1002.4328	499.7571	582.7565	684.6595	806.4604
37 FRAM	428.4402	552.7387	694.9841	857.8939	302.8915	408.0587	539.9163	670.2803
793 WFT	172.1746	178.4981	185.5801	193.7961	144.4749	149.4185	155.2238	161.7743
420 W1	28.4633	30.6009	32.9794	35.6213	25.1532	27.1099	29.3374	31.8071
56 BPR	10.1164	10.4333	10.7407	11.0168	10.2142	10.6005	10.9752	11.3296
316 XNF	7935.4970	7988.4688	8027.3582	8053.0008	7440.6017	7501.8627	7571.9354	7836.0797
298 XNH	39619.4077	39840.2324	40052.3145	40298.5890	38561.8970	38763.2065	38991.4897	39233.0674
23 A28	259.7740	259.7740	259.7740	259.7746	259.7740	259.774[illegible]	259.7740	259.7740
1166 XV8	1147.3222	1185.9677	1229.7672	1280.4318	1003.6210	1035.5133	1071.3810	1113.8609
1167 XV28	795.4138	854.9637	920.5989	977.5998	705.2744	763.5865	823.2868	892.1163
272 P8	3.6793	3.7659	3.8703	4.0008	3.4355	3.4942	3.5655	3.6549
275 P28	4.2139	4.4901	4.8335	5.2604	3.8558	4.0698	4.3420	4.6820
44 T8	1318.5453	1312.0623	1306.0723	1300.3465	1294.3623	1287.0155	1278.7612	1270.5221
45 T28	447.9990	456.0659	465.7313	477.0974	436.3533	442.8778	451.1096	460.9952
352 T45	1719.9993	1719.9913	1720.0083	1719.9944	1655.0014	1655.0124	1655.0042	1654.9699
416 W8	2.6083	2.7261	2.8605	3.0183	2.2832	2.3788	2.4928	2.6245
415 W28	25.9029	27.9244	30.1704	32.6578	22.9102	24.7723	26.8876	29.2274
6 P C	35.0000	35.0000	35.0000	35.0000	30.0000	30.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 52

2	CASE	399.0000	400.0000	401.0000	402.0000	403.0000	404.0000
26	ALT	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000	40000.0000
27	ZXM	0.8000	0.4000	0.5000	0.6000	0.7000	0.8000
351	TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279	PAMB	2.7200	2.7200	2.7200	2.7200	2.7200	2.7200
42	T1	440.0979	402.5112	409.5571	418.1699	428.3501	440.0979
41	P1	4.1474	3.0373	3.2269	3.4708	3.7738	4.1474
31	FN	210.2282	200.0298	187.2672	177.2508	169.6510	162.5279
35	SFC	0.8048	0.6011	0.6676	0.7378	0.8096	0.8859
183	FG8	99.9168	54.2149	58.9724	64.9568	72.2246	80.0843
182	FG28	950.4574	435.6439	519.1420	621.8803	745.1537	888.0319
37	FRAM	831.3865	281.4944	383.0444	502.2017	640.6585	798.8169
793	WFT	169.1915	120.2388	125.0229	130.7793	137.3518	143.8809
420	W1	34.5206	23.3763	25.4475	27.8031	30.4014	33.1685
56	BPR	11.6495	10.8679	11.3235	11.7422	12.1117	12.4844
316	XNF	7686.8857	6856.4465	6939.8406	7040.2849	7146.0730	7220.6194
298	XNH	39489.6377	37372.1123	37620.4512	37909.5372	38221.5547	38468.2556
23	A28	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740
1166	XV8	1161.3414	873.4845	906.2907	944.8474	988.8350	1033.7238
1167	XV28	966.6032	657.9799	717.8304	784.7606	857.8941	934.9694
272	P8	3.7624	3.2545	3.3053	3.3693	3.4482	3.5354
275	P28	5.1045	3.6945	3.9051	4.1729	4.5089	4.9186
44	T8	1262.4558	1267.5703	1258.5722	1248.5752	1237.8327	1228.0537
45	T28	472.9687	430.1871	436.9393	445.4352	455.6729	467.4074
352	T45	1655.0008	1584.9792	1584.9955	1585.0002	1584.9962	1584.9964
416	W8	2.7761	2.0027	2.0996	2.2183	2.3568	2.4998
415	W28	31.7916	21.4066	23.3826	25.6211	28.0828	30.7689
6	P C	30.0000	25.0000	25.0000	25.0000	25.0000	25.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 53

	405.0000	406.0000	437.0000	408.0000	409.0000	410.0000	411.0000	412.0000
2 CASE	405.0000	406.0000	437.0000	408.0000	409.0000	410.0000	411.0000	412.0000
26 ALT	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000
27 ZXM	0.4500	0.5000	0.6000	0.7000	0.8000	0.4500	0.5000	0.6000
351 TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279 PAMB	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389
42 T1	405.8383	409.5571	418.1699	428.3501	440.0979	405.8383	409.5571	418.1699
41 P1	2.4581	2.5376	2.7287	2.9676	3.2614	2.4581	2.5376	2.7287
31 FN	305.9488	298.8594	287.7442	280.4521	276.4091	284.4413	277.5362	266.8122
35 SFC	0.5659	0.5904	0.6393	0.6868	0.7320	0.5634	0.5935	0.6439
183 FG8	95.6789	99.5196	108.4246	119.2493	132.4642	87.2710	90.7235	98.9785
182 FG28	539.0333	574.0956	655.9737	754.5223	870.7591	518.3633	553.4176	635.2720
37 FRAM	316.0156	362.3033	464.6647	581.6342	715.2971	309.3417	355.0409	456.3212
793 WFT	173.1310	176.4492	183.9538	192.6159	202.3249	161.4724	164.7226	171.7924
420 W1	23.3271	24.0695	25.7249	27.6005	29.7004	22.8348	23.5871	25.2630
56 BPR	9.5017	9.5924	9.7783	9.9541	10.1210	9.7072	9.8126	10.0200
316 XNF	8655.9266	8695.8270	8760.7247	8785.3933	8778.7966	8425.0601	8460.5845	8527.4259
298 XNH	40811.3696	40926.9653	41172.9536	41450.4956	41744.9790	40362.2284	40482.7051	40752.2212
23 A28	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740
1166 XV8	1360.2152	1383.4921	1435.1175	1495.5701	1568.1319	1292.9102	1314.6466	1364.7445
1167 XV28	825.7339	851.5524	908.7555	972.6528	986.7446	809.5674	835.8975	894.1630
272 P8	3.1648	3.2127	3.3250	3.4669	3.6527	3.0628	3.1042	3.2057
275 P28	3.4161	3.5126	3.7444	4.0355	4.3849	3.3600	3.4555	3.6849
44 T8	1444.4280	1441.9247	1436.9716	1433.0522	1431.2705	1418.9702	1416.2180	1410.6248
45 T28	453.3500	456.8386	465.0442	474.8403	486.0450	450.7064	454.1918	462.4412
352 T45	1899.7917	1899.9975	1899.9895	1899.9953	1900.6013	1860.0011	1859.9859	1859.9942
416 W8	2.2697	2.3211	2.4378	2.5738	2.7268	2.1780	2.2267	2.3402
415 W28	21.1059	21.7972	23.3382	25.0809	27.0297	20.7016	21.4056	22.9705
6 P C	50.0000	50.0000	50.0000	50.0000	50.0000	45.0000	45.0000	45.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 54

2 CASE	413.0000	414.0000	415.0000	416.0000	417.0000	418.0000	419.0000	420.0000
26 ALT	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000
27 ZXM	0.7000	0.8000	0.4500	0.5000	0.6000	0.7000	0.8000	0.4500
351 TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279 PAMB	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389
42 T1	428.3501	440.0979	405.8383	409.5572	419.1699	428.3501	440.0979	405.8383
41 P1	2.9676	3.2614	2.4581	2.5378	2.7287	2.9676	3.2614	2.4581
81 FN	259.0330	254.5655	240.0965	238.8652	224.0309	216.7420	212.0991	198.6605
35 SFC	0.6943	0.7419	0.5846	0.6113	0.6651	0.7193	0.7714	0.5108
183 FG8	108.8871	120.7894	72.0899	74.8218	81.5852	89.7977	99.4869	58.5074
182 FG28	732.8082	848.5398	472.2144	507.3228	589.2392	686.8644	802.0857	426.9609
37 FRAM	571.8693	704.1568	294.1235	338.5345	437.4588	550.8899	680.6360	278.5092
793 WFT	179.8311	188.8709	140.3725	142.9689	149.8014	155.9067	163.6088	121.3575
420 W1	27.1372	29.2378	21.7112	22.4909	24.2187	26.1414	28.2612	20.5586
56 BPR	10.2084	10.3881	10.1101	10.2579	10.5341	10.7855	11.0136	10.6174
316 XNF	8569.9768	8588.8528	7962.4295	7996.8461	8067.4403	8125.4789	8183.3365	7504.3448
298 XNH	41043.0273	41353.8535	39539.0264	39660.0503	39924.9004	40195.3633	40482.6709	38841.0532
23 A28	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740
1166 XV8	1421.7674	1487.7279	1165.7491	1184.9483	1229.5182	1281.2509	1338.7401	1046.8557
1167 XV28	958.0052	984.3310	772.7642	800.4092	861.3000	928.2708	979.1487	734.7287
272 P8	3.3307	3.4882	2.8831	2.9159	2.9945	3.0928	3.2115	2.7311
275 P28	3.9702	4.3174	3.2369	3.3303	3.5548	3.8349	4.1780	3.1189
44 T8	1405.5586	1401.3528	1376.5814	1372.8636	1365.3248	1358.4460	1352.2129	1346.7650
45 T28	472.3124	483.5753	445.3214	448.8369	457.1395	467.0675	478.6069	439.8729
352 T45	1860.0037	1860.0083	1784.9976	1785.0002	1784.9956	1785.0014	1785.0026	1719.9989
416 W8	2.4712	2.6201	1.9932	2.0374	2.1411	2.2619	2.3979	1.8034
415 W28	24.7160	26.6764	19.7570	20.4929	22.1190	23.9235	[illegible]	18.7889
6 P C	45.0000	45.0000	40.0000	40.0000	40.0000	40.0000	[illegible]	35.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

G.E. T700 TURBOFAN DK NO. 75023 AUGUST 1975 PAGE 55

	2 CASE	421.0000	422.0000	423.0000	424.0000	425.0000	426.0000	427.0000	428.0000
26	ALT	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000
27	ZXM	0.5000	0.6000	0.7000	0.8000	0.4500	0.5000	0.6000	0.7000
351	TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279	PAMB	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389
42	T1	409.5571	418.1699	428.3501	440.0979	405.8383	409.5571	418.1699	428.3501
41	P1	2.5376	2.7287	2.9676	3.2616	2.4581	2.5376	2.7287	2.9676
31	FN	193.8185	185.1118	179.2935	175.6216	156.4805	152.6882	147.1905	143.3803
35	SFC	0.6400	0.6986	0.7569	0.8138	0.6548	0.6876	0.7512	0.8157
183	FG8	60.9299	66.9113	74.1553	82.6852	45.3951	47.7001	53.3050	60.0737
182	FG28	462.1392	544.5648	643.0143	759.0437	378.4675	414.3809	498.3434	598.2294
37	FRAM	321.6957	418.6514	530.4053	658.7907	280.8620	303.0299	398.3249	508.9486
793	WFT	123.7313	129.3246	135.7130	142.8880	102.4683	104.8997	110.5722	116.9554
420	W1	21.3718	23.1775	25.1695	27.3541	19.2559	20.1317	22.0522	24.1514
56	BPR	10.7985	11.1265	11.4198	11.6708	11.3116	11.5148	11.8678	12.1631
316	XNF	7542.3079	7630.1194	7715.5500	7787.8463	6956.4457	7013.7566	7139.4427	7265.2571
298	XNH	38760.9497	39040.2065	39338.0674	39655.3818	37534.6470	37689.4788	38039.5776	38421.3662
23	A28	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740
1166	XV8	1065.0891	1108.9510	1159.1053	1218.5381	919.7971	939.7839	985.9679	1038.1674
1167	XV28	763.8769	827.9185	898.3164	974.0361	691.6449	723.2910	792.2073	866.6989
272	P8	2.7578	2.8251	2.9085	3.0072	2.5888	2.6134	2.6740	2.7483
275	P28	3.2104	3.4308	3.7071	4.0491	2.9955	3.0866	3.3063	3.5800
44	T8	1342.4812	1333.2466	1323.7660	1314.5061	1322.0365	1316.5586	1304.8006	1293.0523
45	T28	443.4311	451.8811	462.0492	473.8932	434.0557	437.7633	446.5441	457.0029
352	T45	1720.0054	1719.9904	1719.9797	1720.0008	1654.9948	1654.9978	1655.0016	1654.9731
416	W8	1.8459	1.9469	2.0643	2.1989	1.5925	1.6377	1.7445	1.8671
415	W28	19.5604	21.2662	23.1430	25.1953	17.6919	18.5231	20.3385	22.3166
6	P G	35.0000	35.0000	35.0000	35.0000	30.0000	30.0000	30.0000	30.0000

TABLE 23 (CONTINUED) T700 QCGAT PERFORMANCE

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2	CASE	429.0000	430.0000	431.0000	432.0000	433.0000	434.0000
26	ALT	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000	45000.0000
27	ZXM	0.8000	0.4500	0.5000	0.6000	0.7000	0.8000
351	TAMB	389.9880	389.9880	389.9880	389.9880	389.9880	389.9880
279	PAMB	2.1389	2.1389	2.1389	2.1389	2.1389	2.1389
42	T1	440.0979	405.8383	409.5571	418.1699	428.3501	440.0979
41	P1	3.2614	2.4581	2.5376	2.7287	2.9676	3.2614
31	FN	140.6763	100.9526	100.7070	99.4534	96.8920	96.1428
35	SFC	0.8786	0.7888	0.8173	0.8867	0.9747	1.0533
183	FG8	67.6278	29.3143	31.8440	37.3443	43.2384	50.2604
182	FG28	714.8022	309.9397	348.6441	435.3650	534.6656	652.1627
37	FRAM	635.8922	234.0951	275.5850	369.1119	476.9749	602.2743
793	WFT	123.6015	79.6290	82.3091	88.1862	94.4386	101.2676
429	W1	26.4034	17.2801	18.3084	20.4349	22.6341	25.0075
56	BPR	12.4423	12.8119	12.9707	13.2558	13.5315	13.7411
316	XNF	7370.8441	6025.4440	6150.7930	6378.4852	6566.3481	6746.8779
298	XNH	38753.1050	35552.3633	35847.2759	36393.1230	36854.7153	37313.6069
23	A28	259.7740	259.7740	259.7740	259.7740	259.7740	259.7740
1166	XV8	1091.8490	743.0403	770.6194	826.4820	880.9837	940.4943
1167	XV28	945.6440	625.1722	663.1532	740.7910	820.1847	904.5279
272	P8	2.8327	2.4217	2.4477	2.5043	2.5657	2.6407
275	P28	3.9166	2.8250	2.9204	3.1408	3.4043	3.7334
44	T8	1281.3727	1314.5288	1305.0520	1287.2388	1271.9677	1256.2143
45	T28	469.0704	425.8144	430.0197	439.5319	450.4035	462.9712
892	T49	1654.9985	1584.9642	1584.9773	1584.9929	1584.9534	1584.9860
816	W8	1.9986	1.2730	1.3333	1.4580	1.5936	1.7244
815	W28	24.4392	16.0290	16.9979	19.0018	21.9765	23.3110
6	P C	30.0000	25.0000	25.0000	25.0000	25.0000	25.0000