NASA CR 137747

SMALL SCALE NOISE AND WIND TUNNEL TESTS OF UPPER SURFACE BLOWING NOZZLE FLAP CONCEPTS

VOLUME I. AERODYNAMIC TEST RESULTS

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DECEMBER 1975

(NASA-CR-137747) SMALL SCALE NOISE AND WIND TUNNEL TESTS OF UPPER SURFACE BLOWING NOZZLE FLAP CONCEPTS. VOLUME 1. AERODYNAMIC TEST RESULTS (Rockwell International Corp., Los Angeles) 143 p HC $6.00 CSCL 01A G3/02 N76-21159 Unclas 25121

Prepared Under Contract NAS2-8607
By Los Angeles Aircraft Division
ROCKWELL INTERNATIONAL CORPORATION
Los Angeles, California
For
AMES RESEARCH CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

SUMMARY

The results and analyses of aerodynamic and acoustic studies conducted on the Small Scale Noise and Wind Tunnel Tests of Upper Surface Blowing Nozzle Flap Concepts are presented. The aerodynamic test was conducted during a period from June 6 to 16, 1975 by the Contractor at its NAAL low speed atmospheric wind tunnel (test number NAAL 742). The acoustic test was performed by Bolt, Beranek and Newman (BBN), as sub-contractors, at BBN's Cambridge, Massachusetts facility.

A summary of results of the Contractor's previous aerodynamic tests (NAAL's 714 and 720) performed by the Contractor's IR&D funds are also included.

Various types of nozzle flap concepts have been tested under the current contract. These are an upper surface blowing concept with a multiple slot arrangement with seven slots ("seven slotted nozzle"), an upper surface blowing type with a large nozzle exit at approximately mid-chord location in conjunction with a powered trailing edge flap with multiple slots ("split flow or partially slotted nozzle"). In addition, aerodynamic tests have been continued on a similar multi-slotted nozzle flap, but with 14 slots, using the Contractor's IR&D funds.

All three types of nozzle flap concepts tested appear to be about equal in overall aerodynamic performance but with the split flow nozzle somewhat better than the other two nozzle flaps in the landing approach mode. All nozzle flaps can be deflected to a large angle to increase drag without significant loss in lift. The nozzle flap concepts appear to be viable aerodynamic drag modulation devices for landing.

Prior tests (NAAL 720) indicated that the nozzle flap concept is superior to the regular Coanda flap in the capability to generate a steep descent flight path for landing approach. Prior to NAAL 720 tests, tests were conducted on an external blown type flap, a regular Coanda flap and the slotted nozzle concept with 2 slots (NAAL 714). These tests indicated that for the best geometries selected the Coanda flaps and the nozzle flaps are compatible in terms of maximum lift. The externally blown flap produced greater lift and drag and was regarded to be the best of all flap types from an aerodynamic landing performance viewpoint but slightly detrimental for STOL climb performance because of the higher drag. However, the externally blown flap was eliminated from the present studies because of unfavorable noise aspects.

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NOMENCLATURE

ALPHA, α	=	Angle of attack in degrees
δ_N	=	Nozzle (powered) flap deflection angle in degrees
δ_F	=	Wing flap deflection angle in degrees
RPM, rpm	=	Revolutions per minute
c	=	Reference chord length in meters (feet)
S	=	Reference area in square meters (square feet)
Q, q	=	Dynamic pressure in Newtons per square meter (pounds per square foot)
A	=	Axial force in Newtons (pounds)
D	=	Drag force in Newtons (pounds)
L	=	Lift force in Newtons (pounds)
M	=	Pitching moment in meter - Newtons (foot-pounds)
N	=	Normal force in Newtons (pounds)
T	=	Static reference thrust in Newtons (pounds) (δ_N, δ_F = 0°)
C_D	=	Drag coefficient = D/q.S
C_L	=	Lift coefficient = L/q.S
CM, Cm	=	Pitching moment coefficient = M/q.S.c
C_T	=	Thrust coefficient = T/q.S
A/T	=	Axial force to static reference thrust ratio (positive forward)
D/T	=	Drag force to static reference thrust ratio
L/T	=	Lift force to static reference thrust ratio
M/T.C	=	Pitching moment to static reference thrust moment ratio
N/SQRT	=	$N/\sqrt{\Theta} = N/\sqrt{T/To} = N/\sqrt{T/518.7° R}$ where N = actual fan RPM

NOMENCLATURE (CONTINUED)

N_2: Fourteen multi-slotted nozzle

N_3: Seven slotted nozzle

N_4: Split flow partially slotted nozzle

P_{T1}, P_{T2} = P_T/P_{ATM} = Total pressures at nacelle exit/atmospheric pressure (figures 3 and 14)

P_{S1}, P_{S2}, P_{S3}, P_{S4}, P_{S5} & P_{S6} = P_S/P_{ATM} = Static pressure/atmospheric pressure (figures 3 and 14)

T_{TEX} = Rake temperature at nacelle exit (the thermocouple is located on the total head tube as shown on figure 3)

kPa = Kilo Pascal = 1000 Newtons/m2

DIMENSIONAL DATA

Dimensional data used to non-dimensionalize the test data are:

c = Reference chord = .373 meter = 14.7 inches = 1.225 feet

b = Wing semi-span = 1.067 meters = 42 inches = 3.5 feet

S = Reference area = c•b = .398 square meter = 4.29 square feet

INTRODUCTION

There has been a considerable interest focused on the Coanda flap as a means to enhance wing lift for short takeoff and landing (STOL) aircraft. However, as is discussed in reference (4), past NASA investigations of Coanda type flap have shown that relatively large flap radii are needed to prevent flow separation over the Coanda surface for large flap angles. To circumvent the use of Coanda flaps with such large radii, the Aerodynamics group of Rockwell International has in early 1973 conceived and devised a split Coanda flap with two nozzles in series, each nozzle having its own Coanda flap portion (called the "slotted nozzle flap with 2 slots" herein). This flap has since formed a basis for further development on an experimental basis.

In order to establish some design ground rules for the slotted nozzle flap and to obtain a direct comparison with the unslotted Coanda flap and with more extensively analyzed externally blown flap, a wind tunnel test was conducted by RI/LAAD in September, 1973. At about the same time a noise test was performed with the same model by Bolt, Beranek and Newman, Inc. as sub-contractors. A regular Coanda flap and the RI devised slotted nozzle flap were tested along with an externally blown flap. Nozzle and flap geometries were varied to obtain aerodynamically optimum configuration for each of the three flap types tested. The results of the aerodynamic test are documented in reference (1) and result of the noise test in reference (2).

For the geometries selected the Coanda flap and the slotted nozzle flap were about compatible at same angles. The externally blown flap produced greater lift and drag and was regarded to be the best of these flap types from a STOL landing approach viewpoint (where high drag is beneficial) but slightly detrimental for STOL climb performance because of the higher drag. However, acoustic tests indicated the externally blown flap to produce higher noise. The slotted nozzle flap was, therefore, found to be a attractive alternate flap system, aerodynamically and acoustically.

Meanwhile, discussions with noise abatement specialists from Bolt, Beranek and Newman resulted in an expansion of this concept into a multiple exhaust with many exhaust openings in series. The purpose of the multiple slot configuration is to alter the noise spectrum of upper surface blown flaps by breaking up the exhaust into filaments where predominantly high frequency noise is generated rather than low frequency. The higher frequency noise is then attenuated more easily, leading to lower cabin noise levels. This concept led to design of a multi-slotted nozzle flap, where many exhaust slots are located at the upper surface, again each followed by a small portion of a Coanda surface. The entire exhaust flow was lead through slots in the forward portion followed by a slotted rear flap. Specifically of aerodynamic interest was whether the exhaust nozzles' rear flap, which can be set to various angles for thrust vectoring, could be rotated to high deflection angles without causing flow separation. High deflection angles are needed to provide adequate aircraft drag in the landing descent.

The nozzle flap concepts need a high deflection because the rotatable nozzle flap portions have a small chord and in itself produces little power-off drag. Furthermore, of interest was whether the lift induced by the multi-slotted arrangement was still comparable to the Coanda flap. An aerodynamic multi-slotted nozzle flap test was conducted with 14 slots. An underslung nacelle was used leading exhaust through the wing to the upper surface, as well as a nacelle located above the wing (overwing nacelle). The test was conducted in the Rockwell NAAL lwo speed wind tunnel (NAAL 720) in March, 1974 with Contractor's IR&D funds. The test results are reported in reference (4). In reference (5) the multi-slotted nozzle flap is compared to the regular Coanda nozzle flap. The test results indicated that the nozzle flap concept with the multi-slotted exhaust nozzle is superior to the regular Coanda flap in the capability to generate a steep descent flight path for landing approach.

The present tests were initiated under NASA/Ames sponsorship to continue with the experimental aeodynamic and acoustic investigation of a multi-slotted nozzle-flap arrangement. Nozzle-flaps tested were an upper surface blowing concept with a mutliple slot arrangement with fewer slots (7 instead of 14) and an upper surface blowing type with a large nozzle exit at approximately semi-chord location in conjunction with a powered trailing edge flap with multiple slots (split flow or partically slotted nozzle). The objective of the present program was to obtain aerodynamic and acoustic data on the above two new nozzles, compare to them the 14 slotted nozzle and other previous tests and to evaluate the noise test results in terms of an extrapolation to a 48000 pounds gross weight. Information will be used to provide a data base for future design and tests of improved noise suppression nozzles for upper surface blown flaps systems.

This volume of the final report presents experimental aerodynamic data obtained from the Contractor's low speed atmospheric wind tunnel (NAAL 742) in June, 1975, and analyzes and correlates these data and compares them to earlier test results obtained on the multi-slotted nozzle flap.

MODEL DESCRIPTION

The model is a semi-span wing with a powered nacelle, representative of a STOL aircraft. The half span is 1.067m (3.5 ft.), semi-span wing reference area, 0.398m^2 (4.288 ft.^{2}),and the reference chord length, .373m (1.225 ft.). A single nitrogen driven fan is installed at the center of the half span capable of supplying exhaust forces in the order of 440 Newtons (100 lb.). Photographs of the model and its installations on the outside static test stand and in the wind tunnel are shown in figures 1 and 2, respectively.

Three different types of nozzle-flap arrangements located behind the fan exhaust were tested. These are a seven slotted type (N_3) and a split flow partially slotted type (N_4) and a 14 slot type (N_2). The N2 has previously been tested by the Contractor in its low speed wind tunnel (test No. NAAL 720, reference 4 except that the flap is now moved aft) and; therefore, the scope of the present aerodynamic testing of the N_2 is limited.

Schematics pertaining to the seven slotted and split flow nozzles are shown in figures 3 through 5. The 14 slot nozzle configuration is presented in figure 6. These figures show that the flaps have different numbers and locations of slots depending on the nozzle geometry, i.e. split flow flaps and the 14 slot configuration have 4 slots and the 7 slot configuration has 2 slots on the flap. All three nozzles have the same total exhaust area. Figure 7 shows a plan view of the semi-span wing-nacelle assembly.

Wing flap details are given in figure 8 for the 60-degree double slotted flap and in figure 9 for the 40-degree single slotted flap. The wing flaps were moved aft 0.068m (2.7 inches) from the previous wing flap position by inserting a fill-block into the powered portion of the wing. This flap relocation was used to approximately align the trailing edges of the flaps adjacent to the powered wing portion with these inside the powered portion. A 40 degree flap deflection is simulated by deleting the second segment of a double slotted flap and relocating the first segment on a different strut. Flow from the lower surface to the upper surface at the sides of the blown flaps is prevented by installing small local fences between the flaps of the blown and the unblown portion of the wing, and by extending the unblown flaps laterally towards the blown flap so as to leave no lateral gaps.

The same leading edge Krueger flaps that were used previously are installed along the entire wing leading edge. A drawing of the leading edge cross section is presented in figure 10. The leading edge flaps were mounted during the entire test and no flaps-up runs were made.

The power unit in the model is a fan from Tech Development Inc., Ohio, model TD-457, serial number 283. The fan is powered by a tip turbine and is driven by nitrogen with a maximum pressure of 2070 kPa (300 psi). The fan diameter is 0.14m (5.5 inches). Mounting of the fan is shown in figure 11. It is to be noted that all fan exhaust flows over the upper surface of the wing.

The model was installed outside the wind tunnel on a test stand for the static tests as shown in a photograph of figure 1. The photograph of figure 2 shows the model installation in the tunnel with the half wing positioned vertically on the turntable with a splitter plate installed. The schematic of the nitrogen plumbing is presented in figure 12, and is devised to minimize interference of power supply on the wind tunnel balance readings by using flexible tubes. Photographs of figures 13 through 15 present the three nacelle-nozzle-wing arrangements and their installations inside and outside the wind tunnel.

Figure 16 schematic shows layout of the pressure taps inside the nacelle. Taps are located downstream of the fan but ahead of the exhaust nozzle.

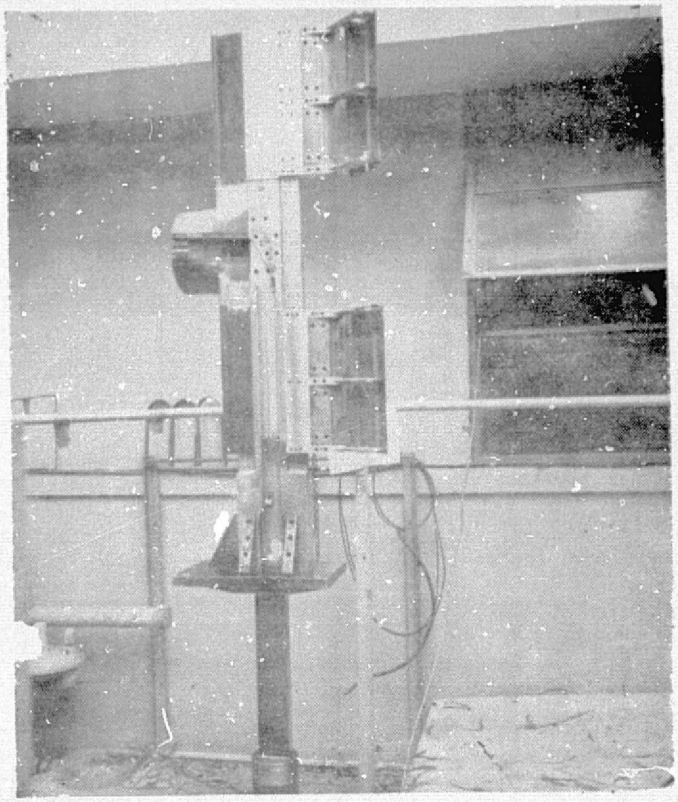


Figure 1. Static Test Model Installation

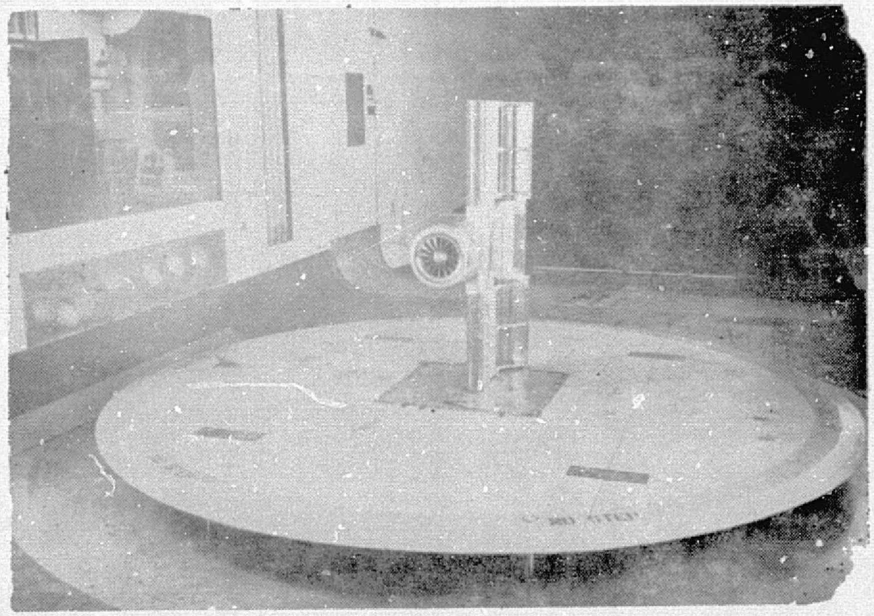
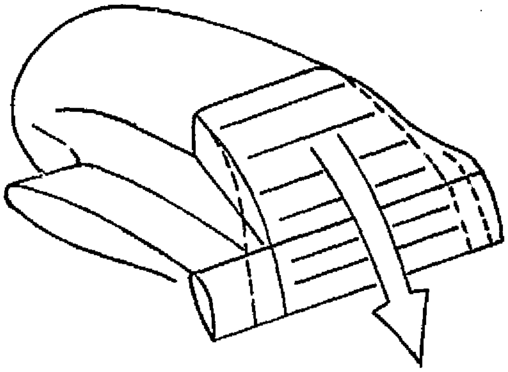
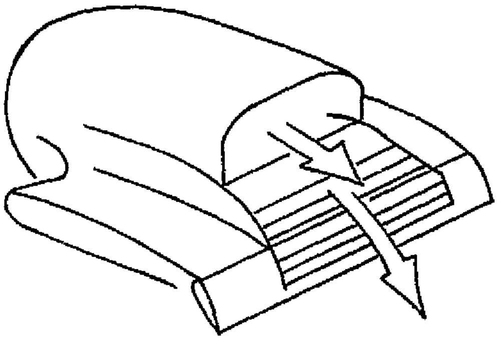


Figure 2. Model Installation in the Wind Tunnel



7- SLOT NOZZLE HINGED FLAP



SPLIT FLOW PARTIALLY SLOTTED NOZZLE HINGED FLAP

FIGURE 3. ADDITIONAL NOZZLE/FLAP ARRANGEMENTS

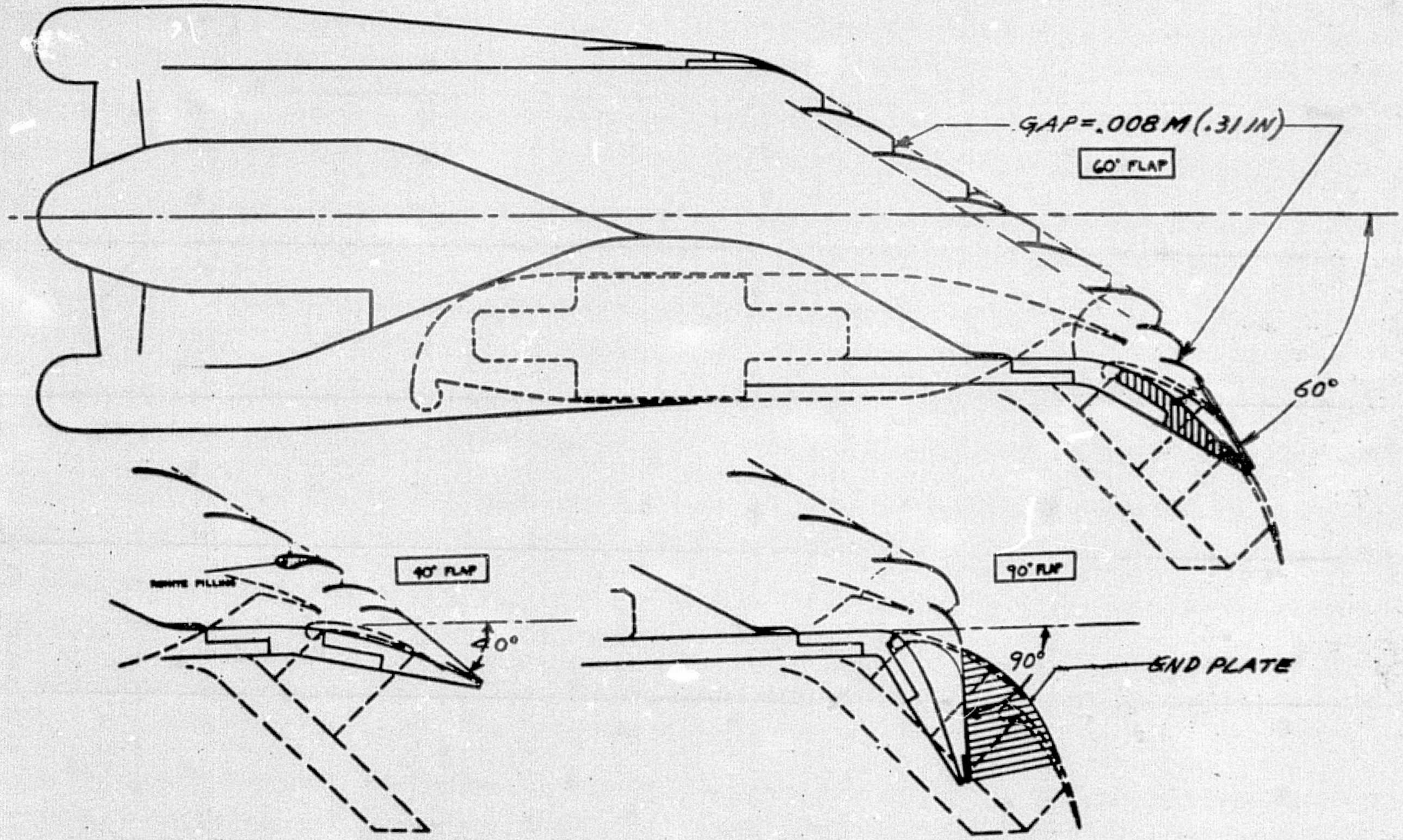


FIGURE 4. SEVEN - SLOT NOZZLE FLAP

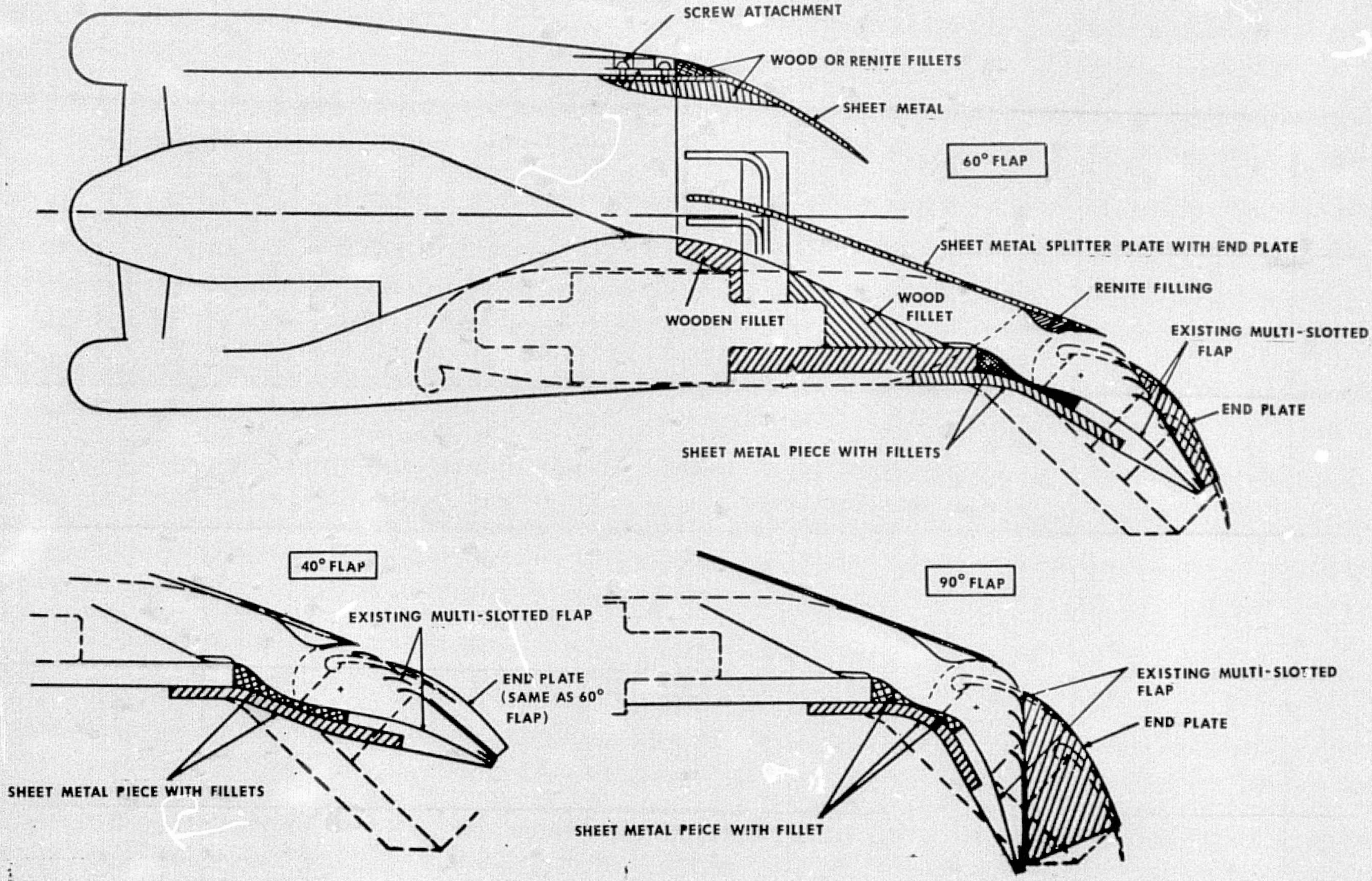


FIGURE 5. SPLIT FLOW PARTIALLY SLOTTED NOZZLE FLAP

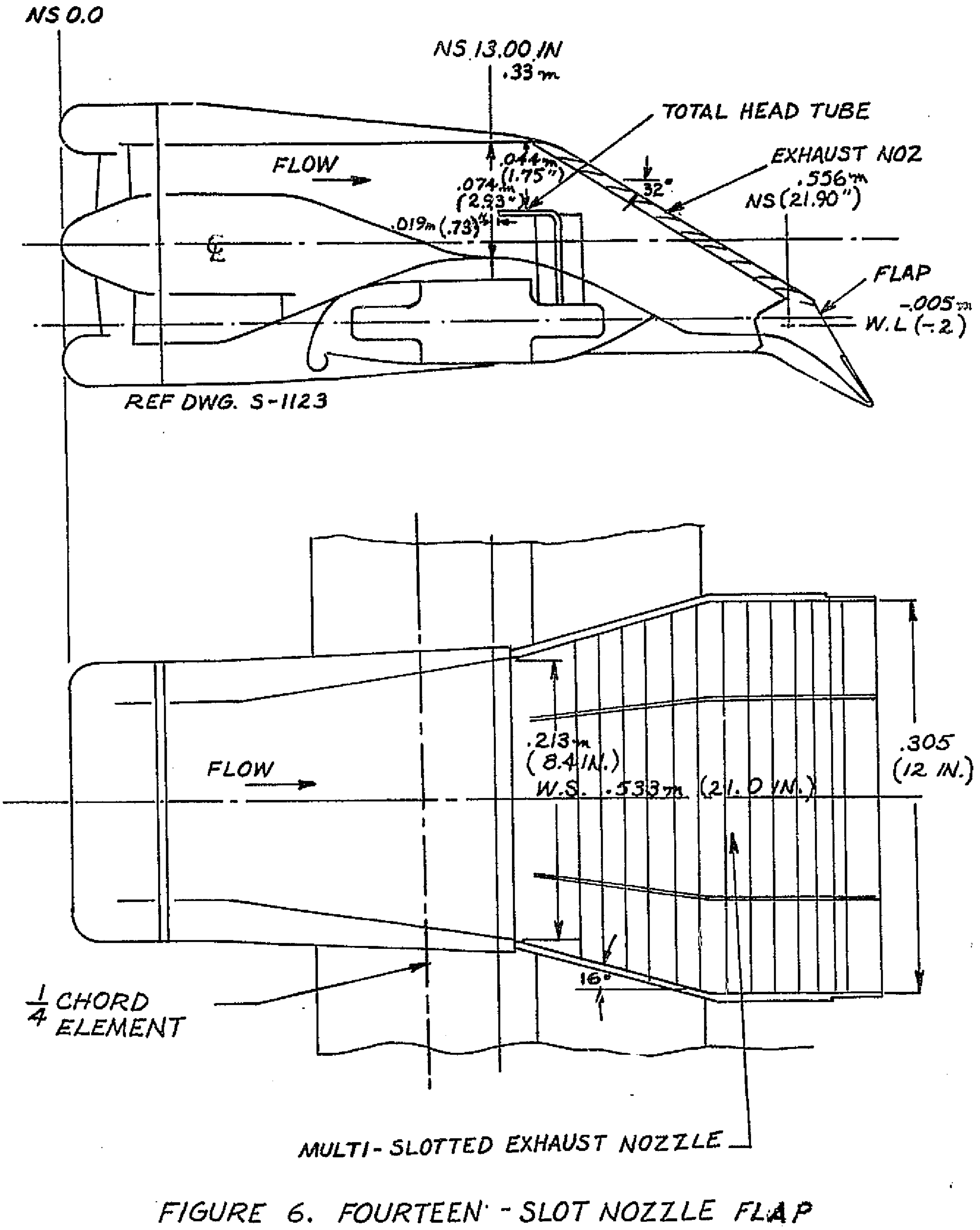


FIGURE 6. FOURTEEN - SLOT NOZZLE FLAP

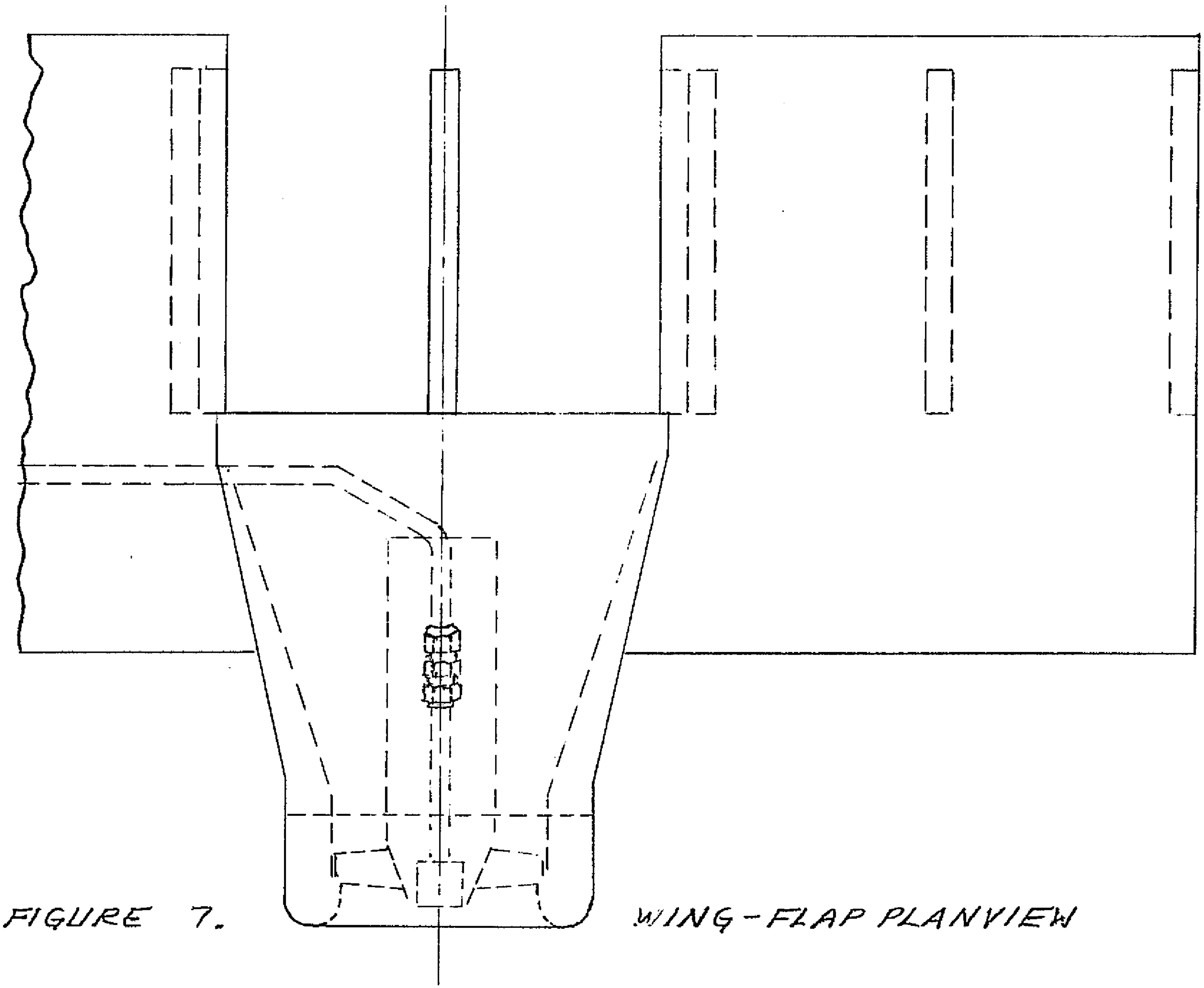


FIGURE 7. WING-FLAP PLANVIEW

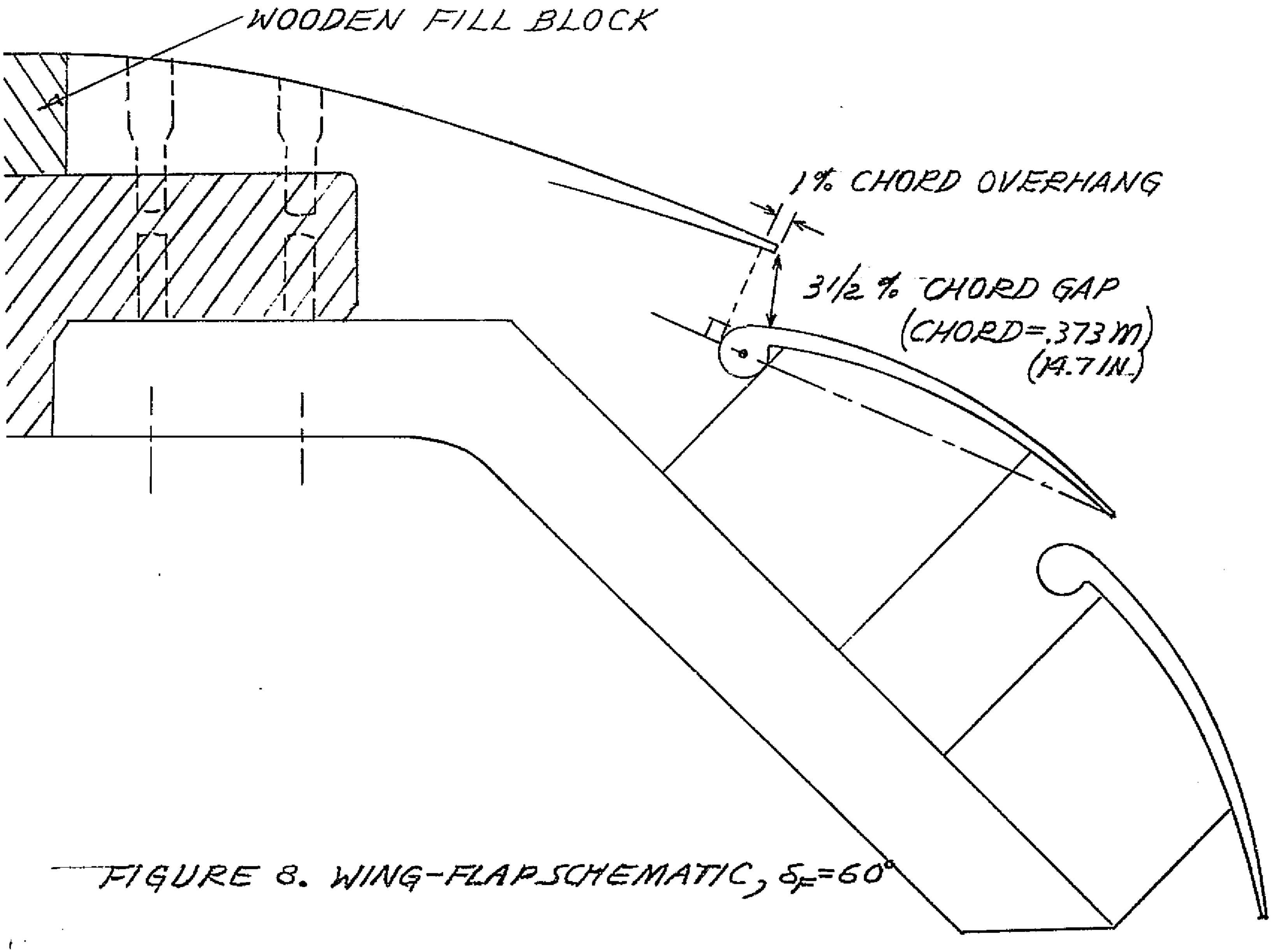


FIGURE 8. WING-FLAP SCHEMATIC, $\delta_F=60^\circ$

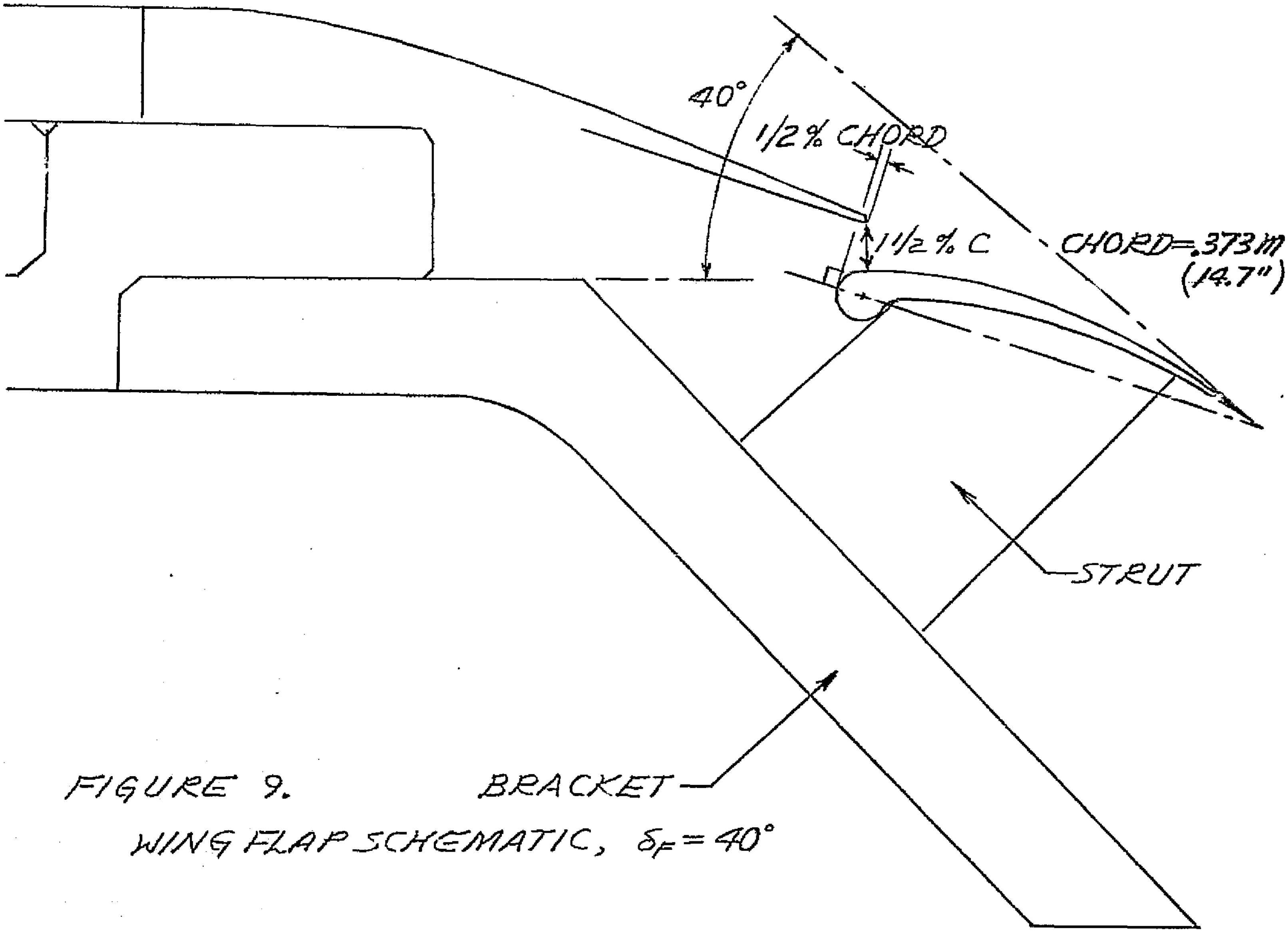


FIGURE 9.
WING FLAP SCHEMATIC, $\delta_F = 40°$

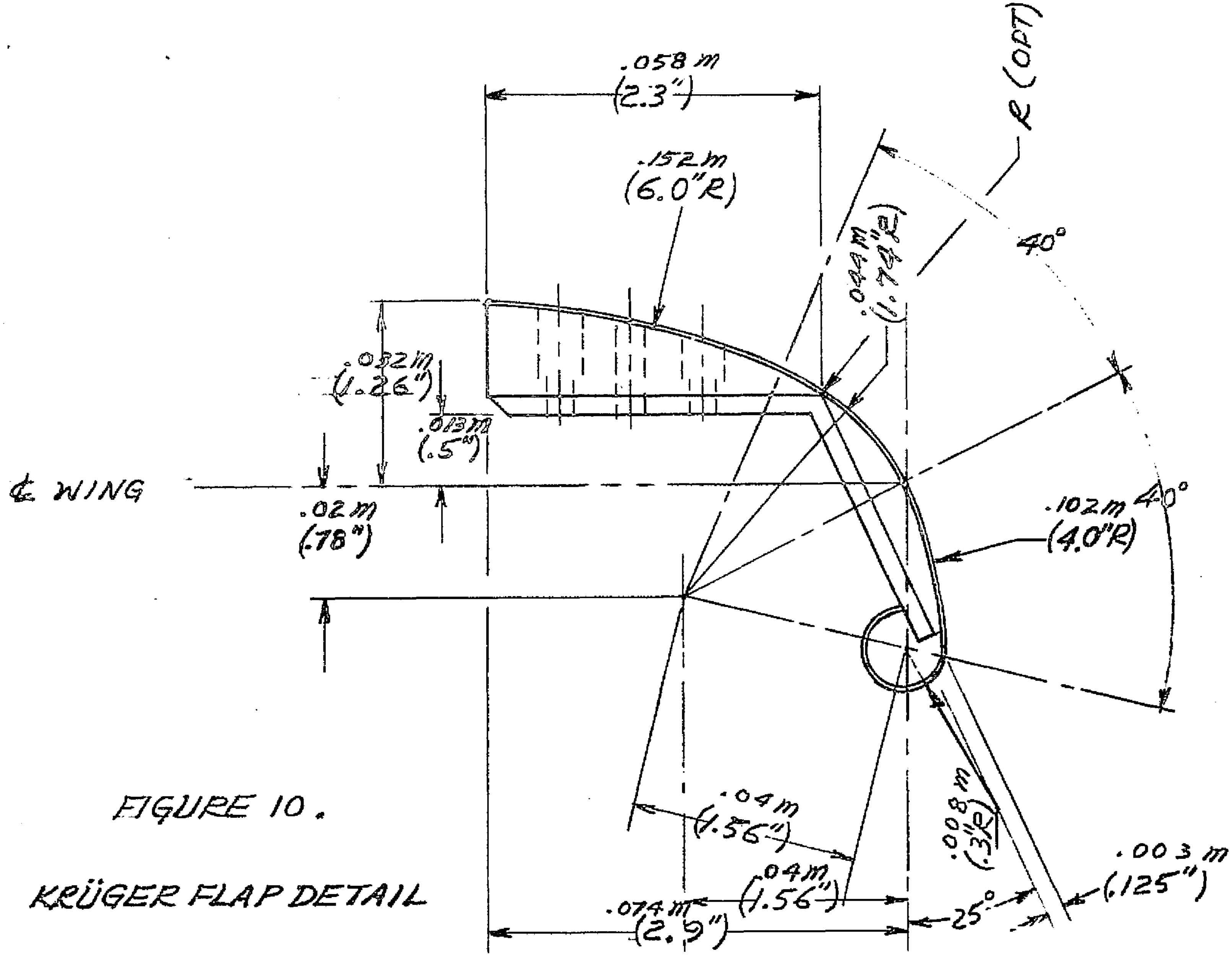


FIGURE 10.

KRÜGER FLAP DETAIL

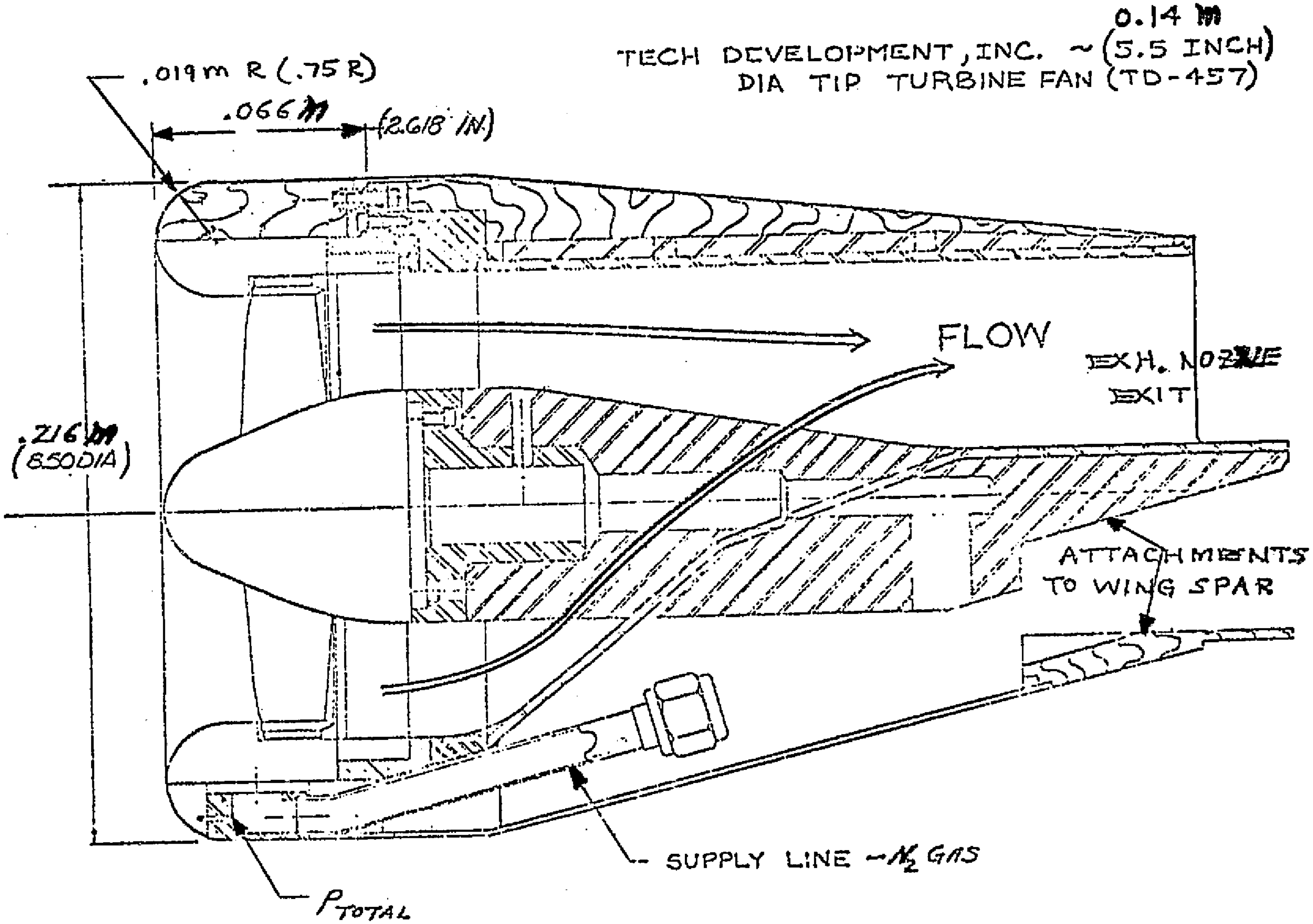


FIGURE 11. FAN DETAIL

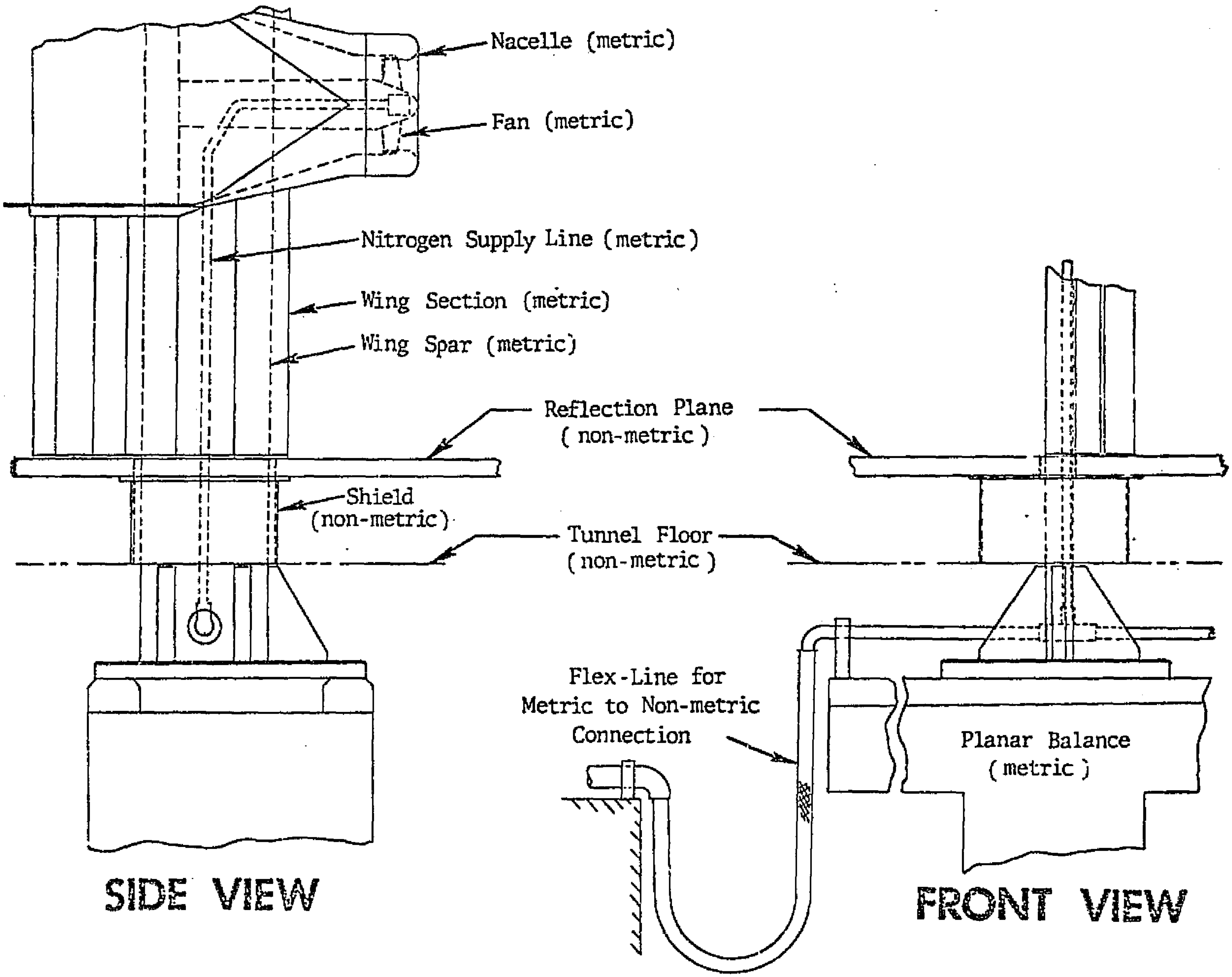


Figure 12. Wind Tunnel Test Stand Schematic

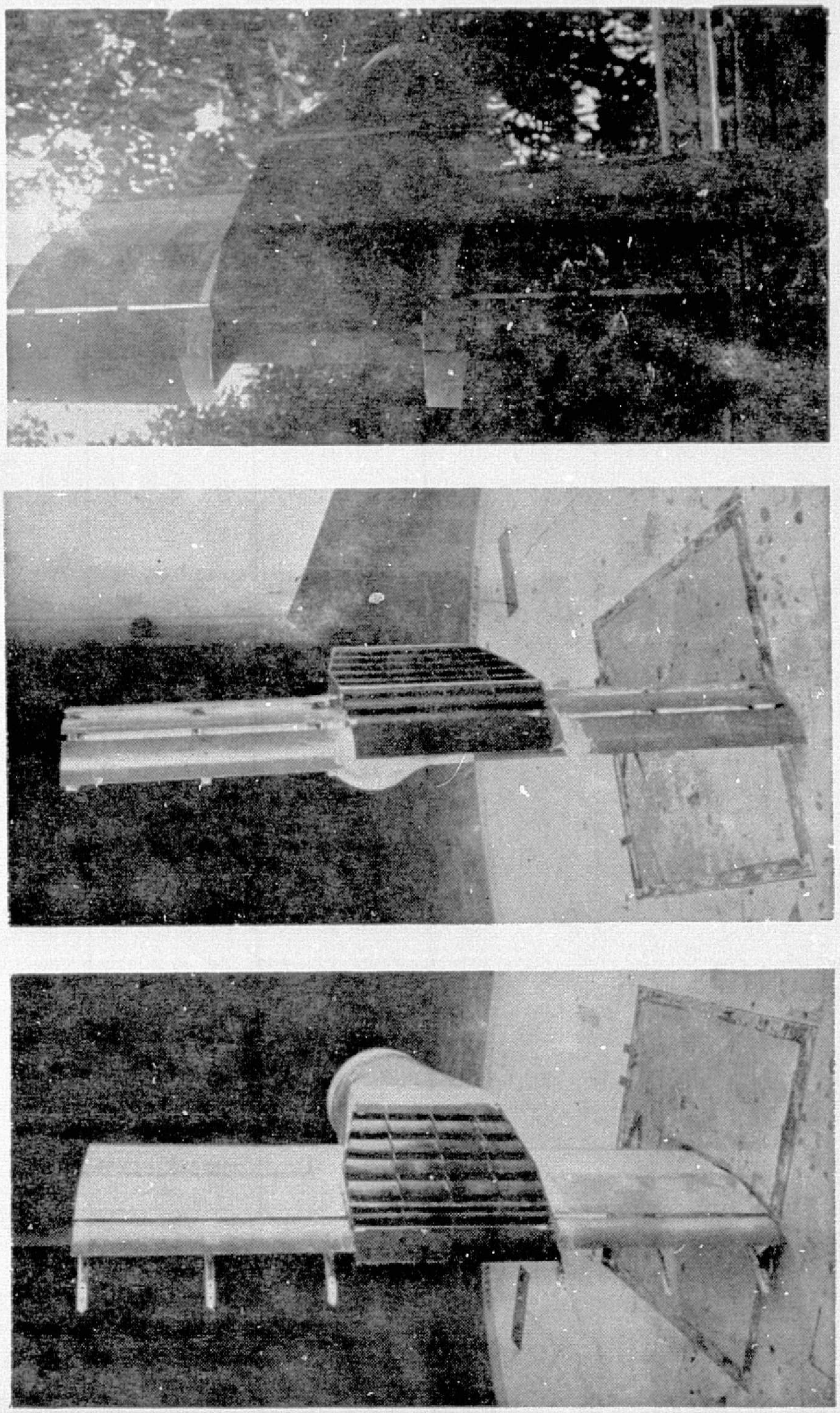


Figure 13. Seven-Slot Nozzle Flap (N_3) tests Outside and Inside Wind Tunnel

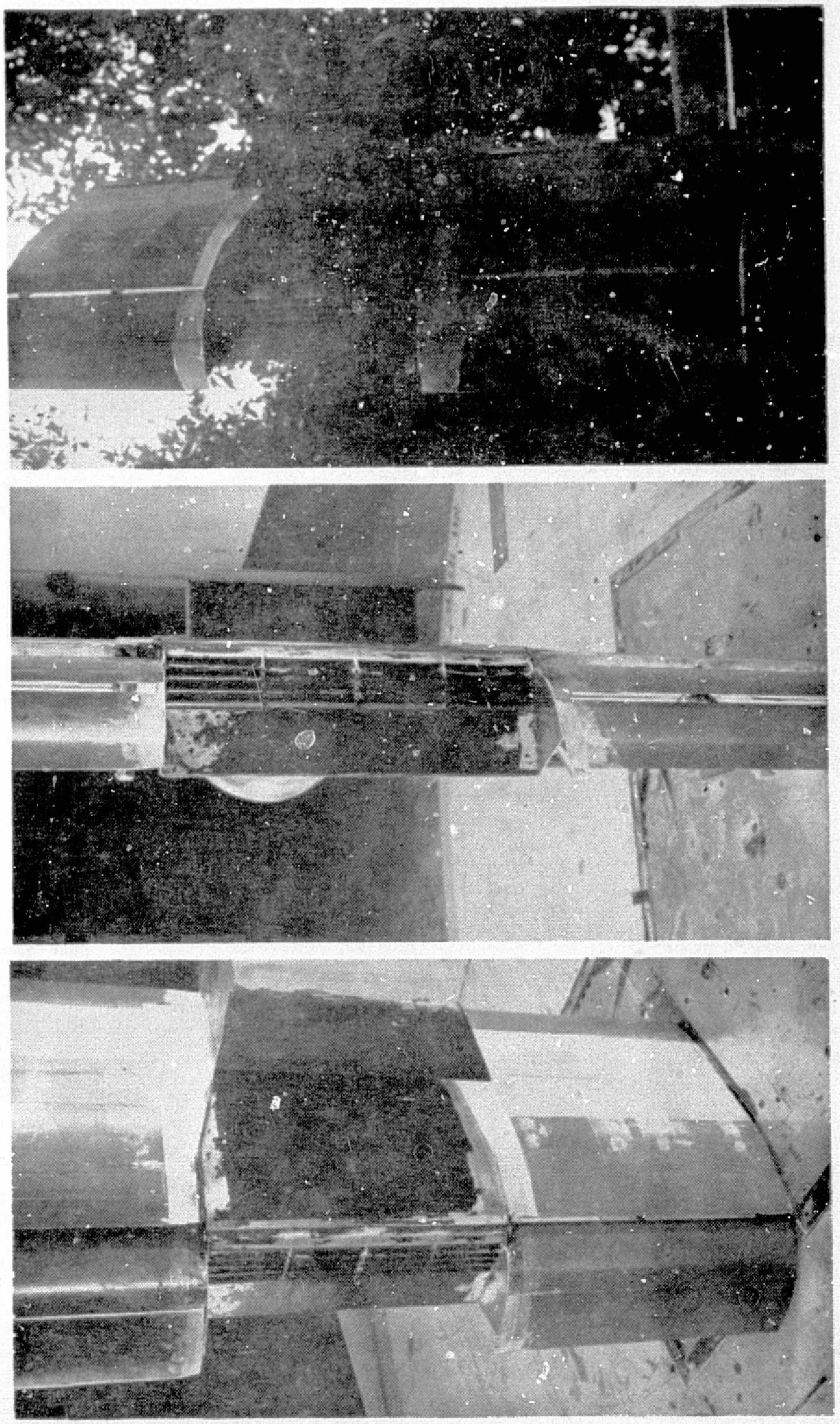


Figure 14. Split Flow Partially Slotted Nozzle Flap (N_4) Test Outside and Inside Wind Tunnel

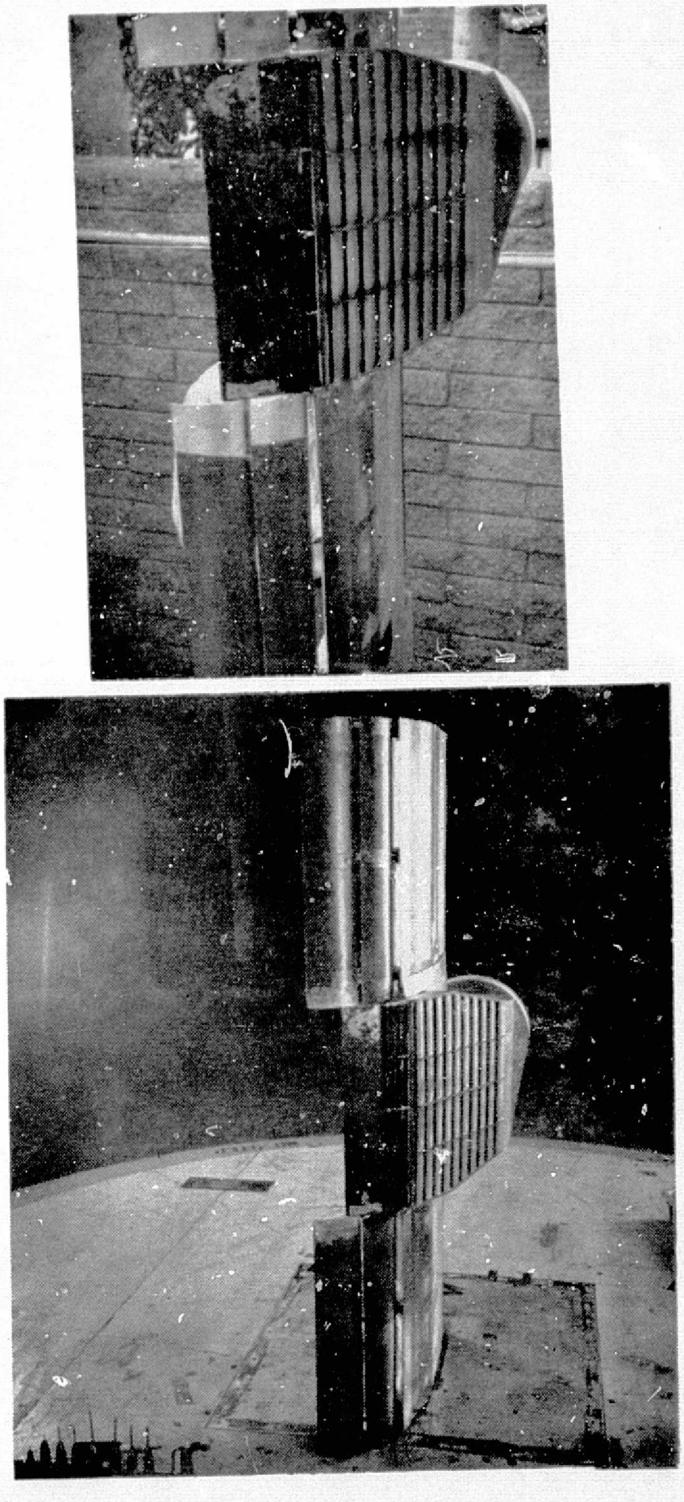
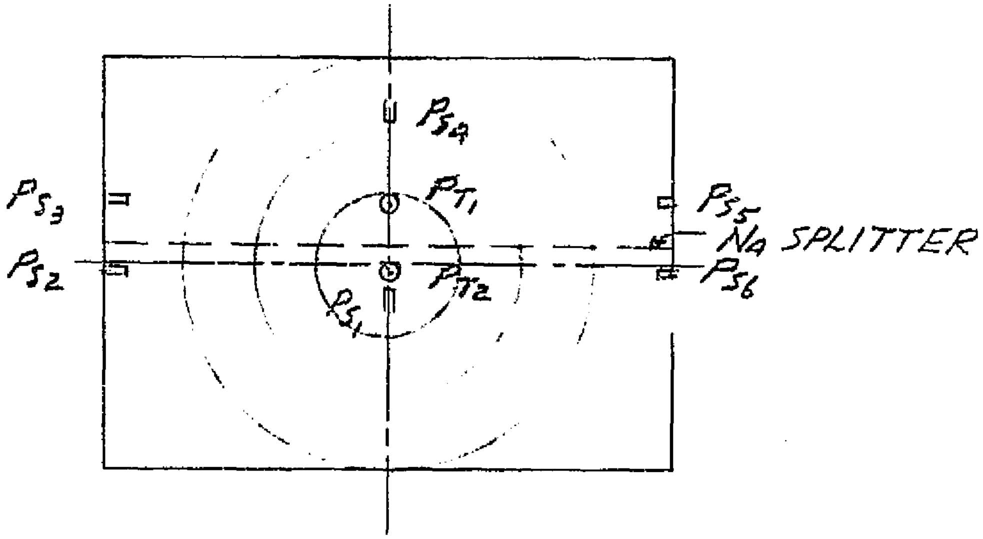


Figure 15. Fourteen Slot Nozzle Flap (N_2) Test
Outside and Inside Wind Tunnel



FAN & NACELLE FRONT VIEW

FIGURE 16. PRESSURE TUBES LAYOUT

AERODYNAMIC TEST PROCEDURES AND DATA ACQUISITION

The bulk of the present tests were made with the seven slot and split flow partially slotted nozzle flaps. The 14 slot nozzle (N_2) was previously tested aerodynamically, (reference 4) and very limited additional testing was carried out with the nozzle flaps during the present aerodynamic experiment with a further aft location of the flap.

The static test was conducted outside the tunnel in accordance with Aerodynamics recommendations made from two previous tests, i.e., NAAL's 714 and 720, references (1) and (4). The outside location for the static test was used to avoid possible induced flow in the wind tunnel that could be generated by the model exhaust even while the wind tunnel power is off. Table I describes the static tests performed. Deflection angles of the powered nozzle flap are 40°, 60° and 90°. The wing flaps adjacent to the nozzle were deflected 40° (single slotted) and 60° (double slotted). The fan RPM was varied from maximum (34600 RPM) to 70% (24200 RPM), to 50% (17300 RPM), and to 30% (10400 RPM) during all static test runs. The model lift, drag and pitching moment were measured. Also recorded were fan rpm, exhaust flow parameters inside the nacelle (one temperature, two total pressures and six static pressures). The purpose of the static test was to measure lift and drag forces acting on the model and to determine static reference thrusts as discussed later.

Table II lists tests conducted inside the wind tunnel. Powered tests were conducted by varying fan rpm while fixing the tunnel dynamic pressure q to a specified value to achieve thrust coefficients of 4, 2, 1 and 0.1. The low value of $C_T = 0.1$ was included in an attempt to obtain aerodynamic characteristics where the flow on the upper surface of the flap is not separated but no significant lift increase due to supercirculation has occured; i.e. to have essentially a power off condition where the boundary layer separation has been eliminated. The fan rpm was varied as indicated on Table II. A lower q was used to achieve $C_T = 4$. The thrust coefficient (C_T) is defined herein as follows:

$$C_T = \frac{T}{qS}$$

where T = Static reference thrust Newtons (pounds) (δ_N, $\delta_F = 0°$)

q = Dynamic pressure in kPa (psf)

$\hat{S}$ = Reference area

$= 0.398 m^2$ ($4.288\ ft.^2$)

For $C_T = 4$, the maximum q for the seven slotted nozzle (N_3) using the static reference thrust at maximum rpm of 34600 is

$$q_{max} = \frac{T}{C_T \cdot S} = \frac{98}{4 \times 4.29} = 5.7 \text{ psf}$$

or 0.273 kPa and for $C_T = 2$, using the same maximum static reference thrust

$$q_{max} = \frac{T}{C_T\, S} = \frac{98}{2 \times 4.29} = 11.4 \text{ psf} = 0.546 \text{ kPa}$$

At lower C_T values and during power off conditions this q value is used. However for power off (fan wind milling) free air runs the low and high q's were used to obtain the effect of airspeed on the aerodynamic characteristics. q and rpm values for other nacelles are also noted on Table II.

Measured during the tunnel tests were:

1. Model lift, drag and pitching moment
2. Fan rpm
3. Exhaust flow parameters inside nacelle (one temperature, two total and six static pressures)
4. Mass flow supply to fan (weight flow per second)
5. Tunnel flow conditions (temperature, dynamic and atmospheric pressures)

Figure 17 presents the average measured fan weight flow per second into the nozzle as a variable of thrust coefficient.

Tabulated computer printout data and machine plots are presented in appendices of this report.

TABLE I

Static Test Schedule (NAAL 742)

RUN	NOZZLE	δ_N Deg.	δ_F Deg.	REMARKS
1	N_3	40	40	
3	N_3	60	60	
4	N_3	90	60	
6	N_4	90	60	Rerun of run 5
7	N_4	60	60	
8	N_4	40	40	
9	N_2	40	40	Funded by RI/LAAD
10	N_2	60	60	Funded by RI/LAAD
11	N_2	60	60	Funded by RI/LAAD Wing flaps moved aft

TABLE II Aerodynamic Test Schedule (NAAL 742)

RUN	NOZZLE	δ_N - deg	δ_F - deg	FAN RPM	C_T	TUNNEL q ~kPa (psf)	REMARKS
12	N_2	60	60	34600	4	0.264 (5.5)	Funded by RI/LAAD Wing flaps moved aft
13	N_2	60	60	0	0	0.264 (5.5)	Funded by RI/LAAD Wing flaps moved aft
17	N_3	90	60	34600	4	0.273 (5.7)	Rerun of run 14
18	N_3	90	60	0	0	0.273 (5.7)	Rerun of run 15
19	N_3	90	60	34600	2	0.546 (11.4)	Rerun of run 16
20	N_3	90	60	23500	1	0.546 (11.4)	
21	N_3	90	60	5500	.1	0.546 (11.4)	
22	N_3	90	60	0	0	0.546 (11.4)	
23	N_3	60	60	34600	4	0.273 (5.7)	
24	N_3	60	60	0	0	0.273 (5.7)	
25	N_3	60	60	34600	2	0.546 (11.4)	
26	N_3	60	60	23500	1	0.546 (11.4)	
27	N_3	60	60	5500	.1	0.546 (11.4)	
28	N_3	60	60	0	0	0.546 (11.4)	

TABLE II Aerodynamic Test Schedule (NAAL 742) (Continued)

RUN	NOZZLE	δ_N - deg	δ_F - deg	FAN RPM	C_T	TUNNEL q kPa (psf)	REMARKS
29	N_3	40	40	34600	4	0.273 (5.7)	
30	N_3	40	40	0	0	0.273 (5.7)	
31	N_3	40	40	34600	2	0.546 (11.4)	
32	N_3	40	40	23500	1	0.546 (11.4)	
33	N_3	40	40	5500	.1	0.546 (11.4)	
34	N_3	40	40	0	0	0.546 (11.4)	
35	N_4	40	40	34600	4	0.244 (5.1)	
36	N_4	40	40	0	0	0.244 (5.1)	
37	N_4	40	40	34600	2	0.494 (10.3)	
38	N_4	40	40	22600	1	0.494 (10.3)	
39	N_4	40	40	5200	.1	0.494 (10.3)	
40	N_4	40	40	0	0	0.494 (10.3)	
47	N_4	60	60	0	0	0.244 (5.1)	Rerun of run 42
48	N_4	60	60	0	0	0.494 (10.3)	Rerun of run 46
49	N_4	60	60	34600	4	0.244 (5.1)	Rerun of run 41
50	N_4	60	60	34600	2	0.494 (10.3)	Rerun of run 43

TABLE II Aerodynamic Test Schedule (NAAL 742) (Continued)

RUN	NOZZLE	δ_N - deg	δ_F - deg	FAN RPM	C_T	TUNNEL q ~ kPa (psf)	REMARKS
51	N_4	60	60	22600	1	0.494 (10.3)	Rerun of run 44
52	N_4	60	60	5200	.1	0.494 (10.3)	Rerun of run 45
53	N_4	90	60	0	0	0.244 (5.1)	
54	N_4	90	60	0	0	0.494 (10.3)	
55	N_4	90	60	34600	4	0.244 (5.1)	
56	N_4	90	60	34600	2	0.494 (10.3)	
57	N_4	90	60	34600	4	0.244 (5.1)	
58	N_4	90	60	22600	1	0.494 (10.3)	
59	N_4	90	60	5200	.1	0.494 (10.3)	

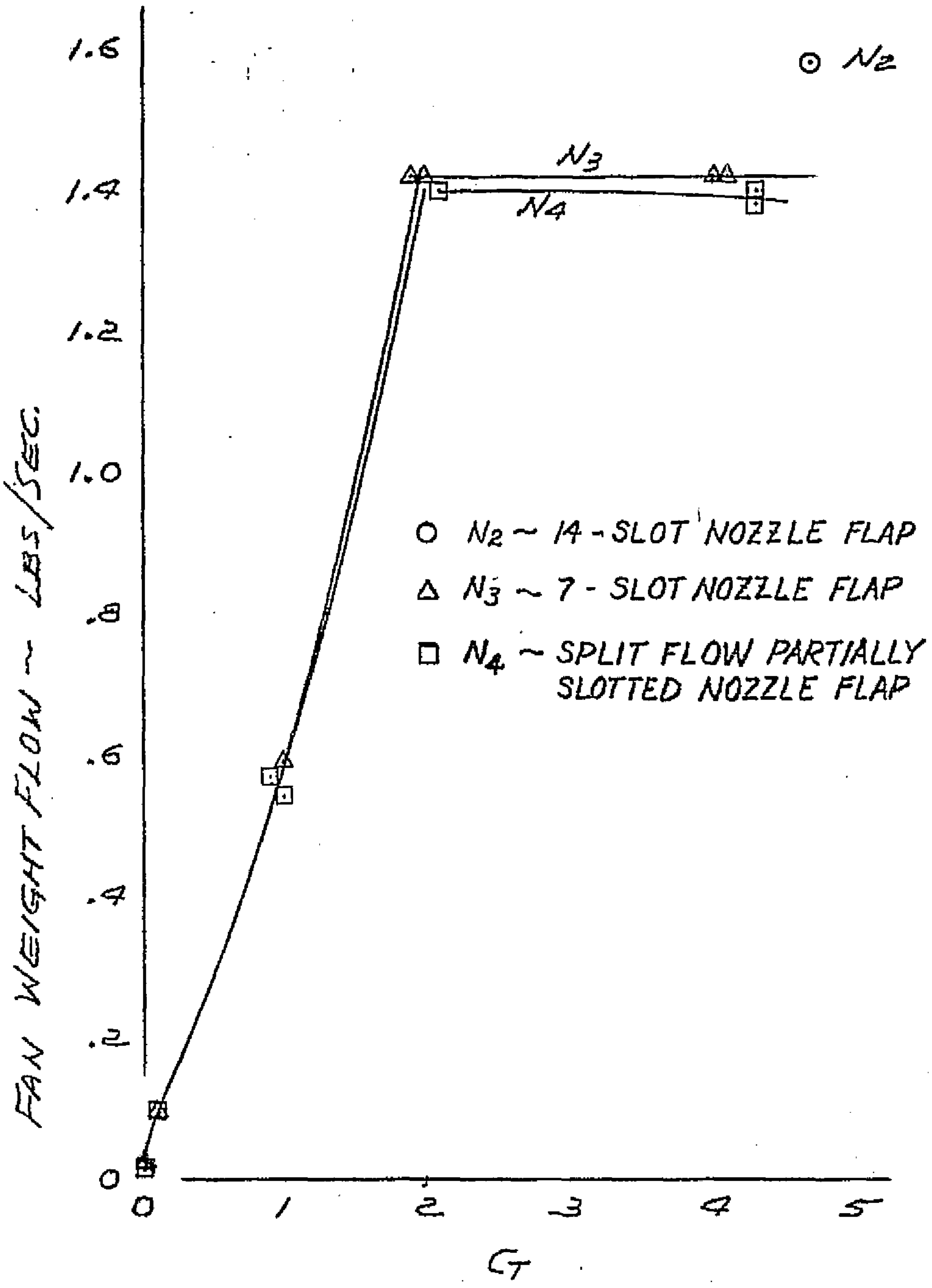


FIGURE 17. AVERAGE MEASURED FAN WEIGHT FLOW INTO NOZZLE VS. THRUST COEFFICIENT

STATIC FORCE TESTS AND REFERENCE THRUST DETERMINATION

Static test results of the three nozzle flap/wing flap arrangements are presented in figures 18 through 20 in the form of static thrust $T = L^2 + D^2$ versus fan rpm. These thrust curves were used to obtain static reference thrusts by extrapolation to zero flap angle as illustrated by figure 21. As is discussed in reference (5) (p.9) the slotted exhaust nozzle is part of the flap, thus the reference thrust can not be determined for a zero flap setting by removing the flap. This is the reason the extrapolation method was used to determine the reference thrusts. The reference thrust, thus obtained are used to non-dimensionalize normal (N) and axial (A) forces (N/T) are plotted against axial forces (A/T) in figure 22 to determine thrust turning angles (θ) and thrust turning efficiency (η).

Figure 22 indicates that the turning angles are about the same for three nozzle configurations; however, the turning efficiency is better for the split flow partially slotted nozzle than for the seven slotted nozzle, showing as much as 10 percent difference for the nozzle flap/wing flap setting 90°/60°. The seven slot and 14 slot nozzles are about the same in turning efficiency.

Static thrust of split flow nozzle is low compared to the other two at low nozzle and flap deflection angles. At nozzle flap/wing flap deflections of 90°/60° the static thrust of split flow has the same level as that of the seven slotted nozzle (figure 21). Therefore, the split flow nozzle results in lower static reference thrust (at $\delta_N/\delta_F = 0°/0°$) by the extrapolation method as can be noted on figure 21.

T-SLOT NOZZLE FLAP

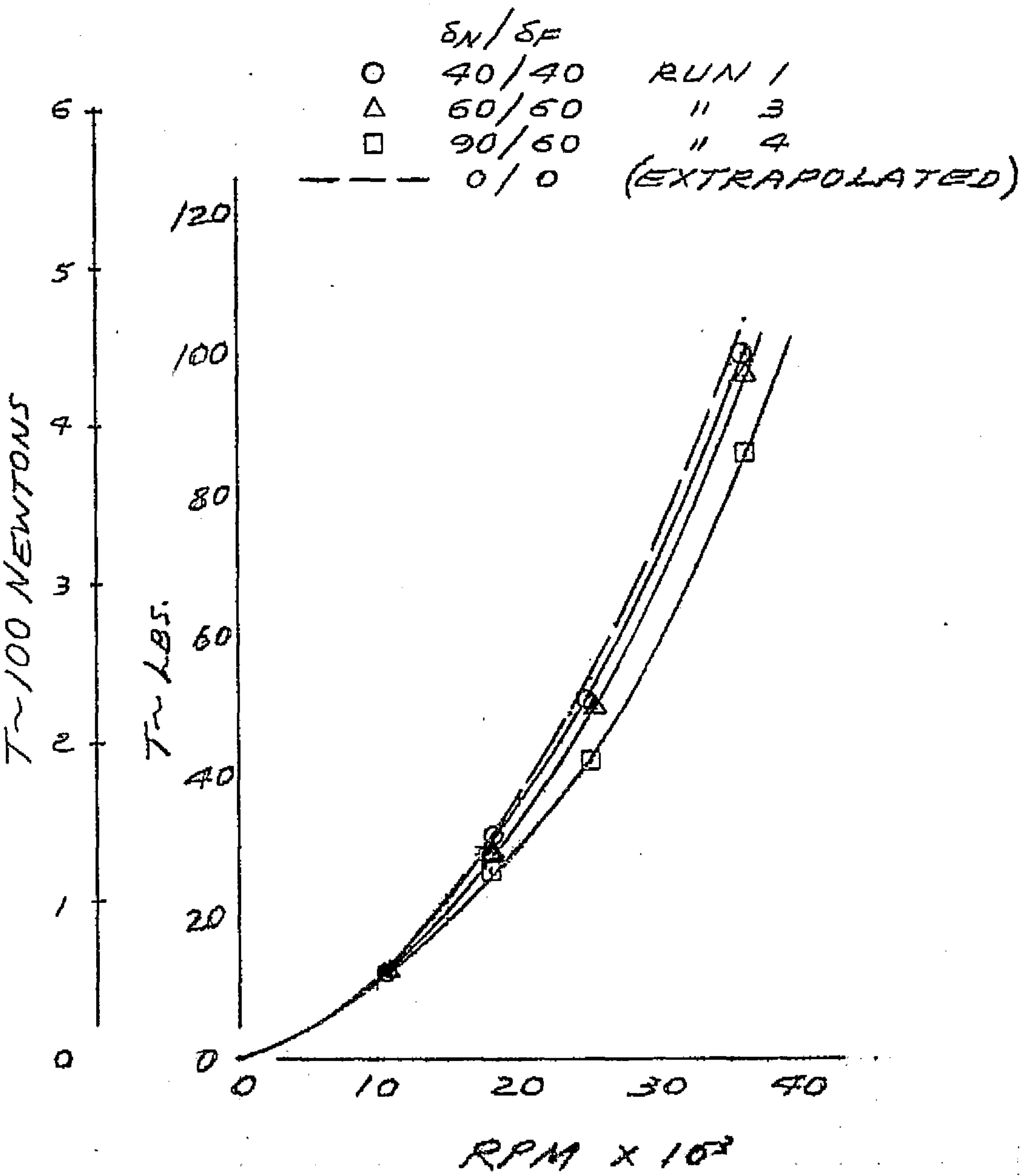


FIGURE 18. STATIC THRUST VS RPM

SPLIT FLOW PARTIALLY SLOTTED NOZZLE FLAP

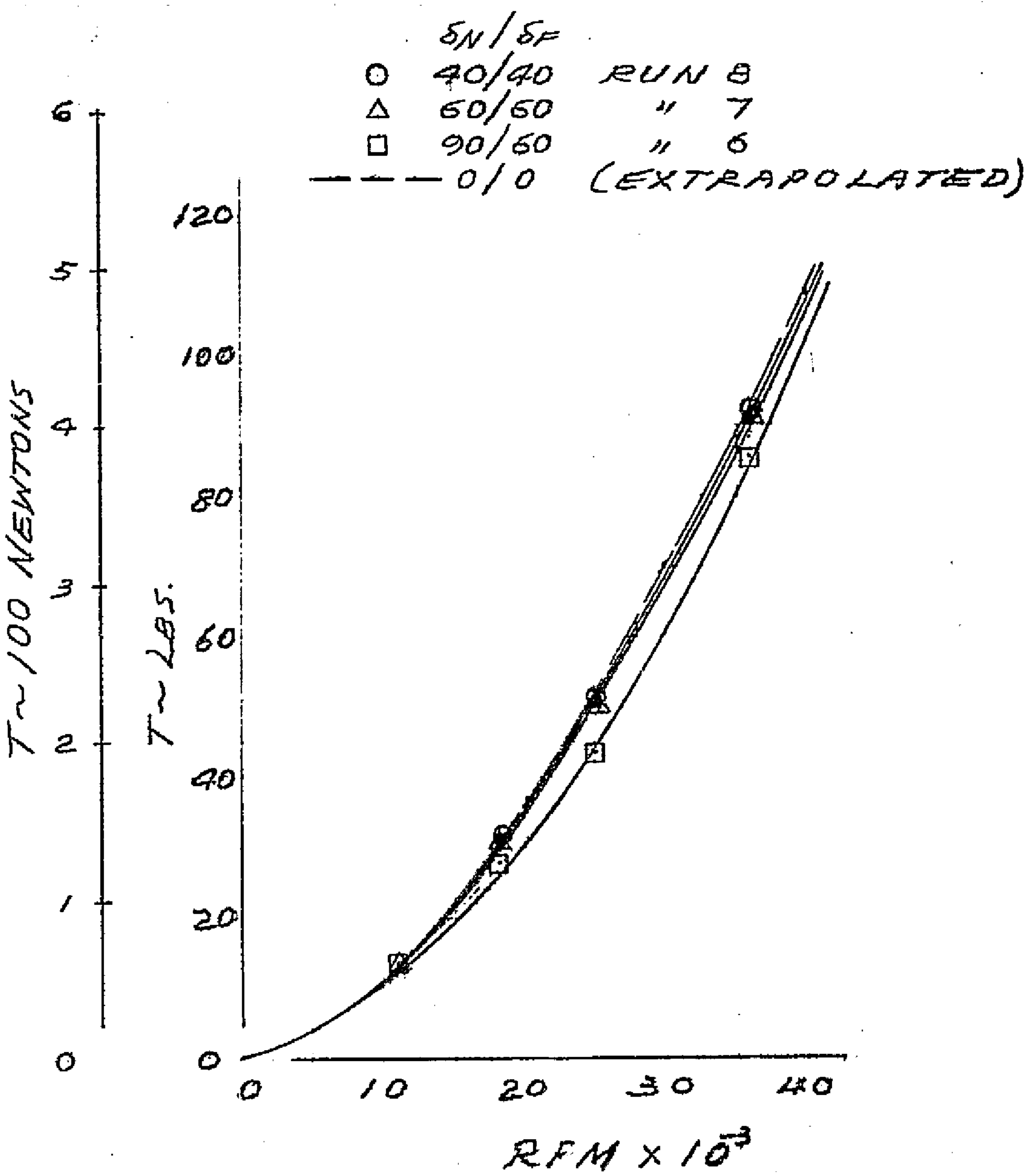


FIGURE 13. STATIC THRUST VS RPM

14 – SLOT NOZZLE FLAP

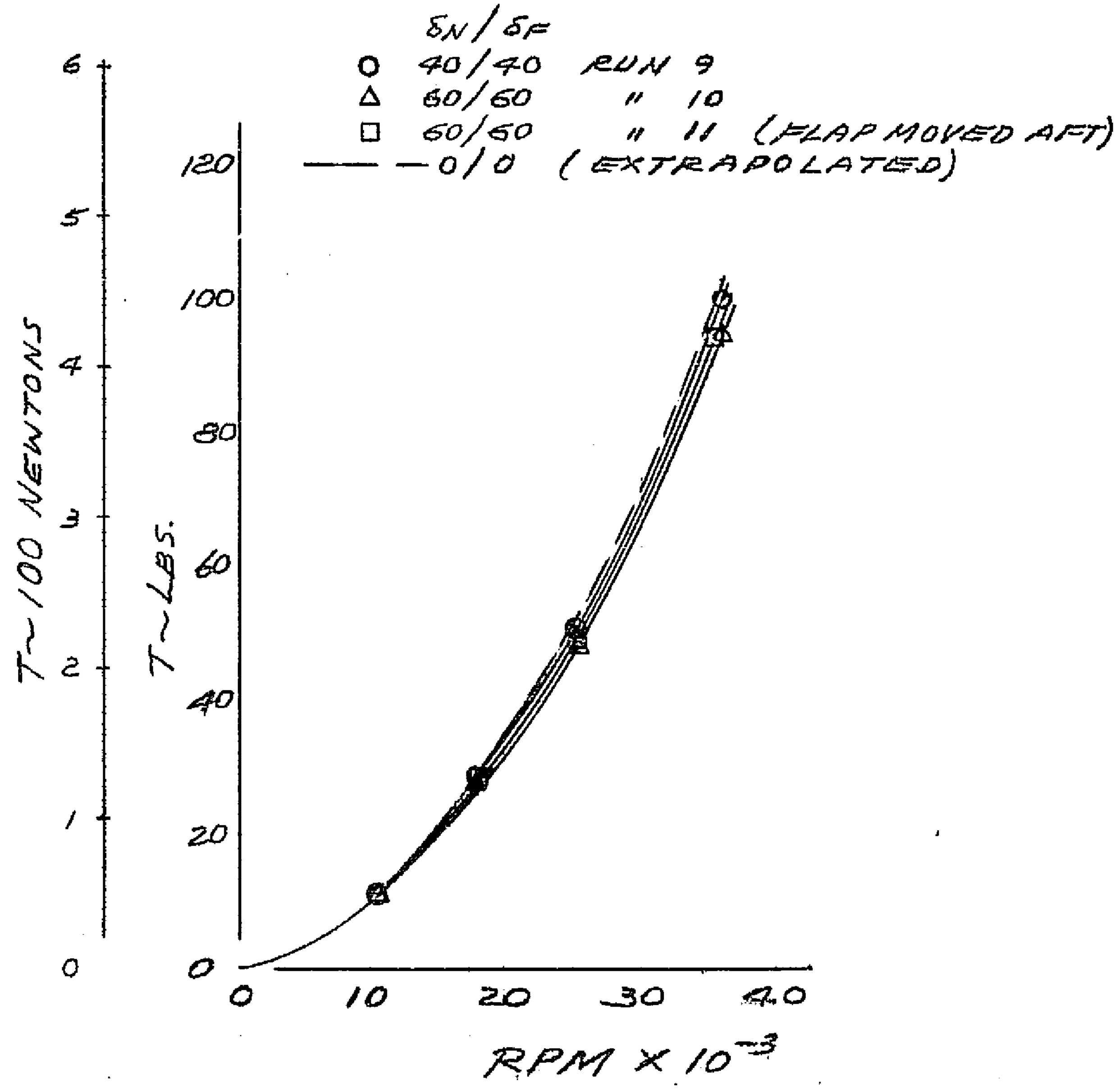


FIGURE 20. STATIC THRUST VS RPM

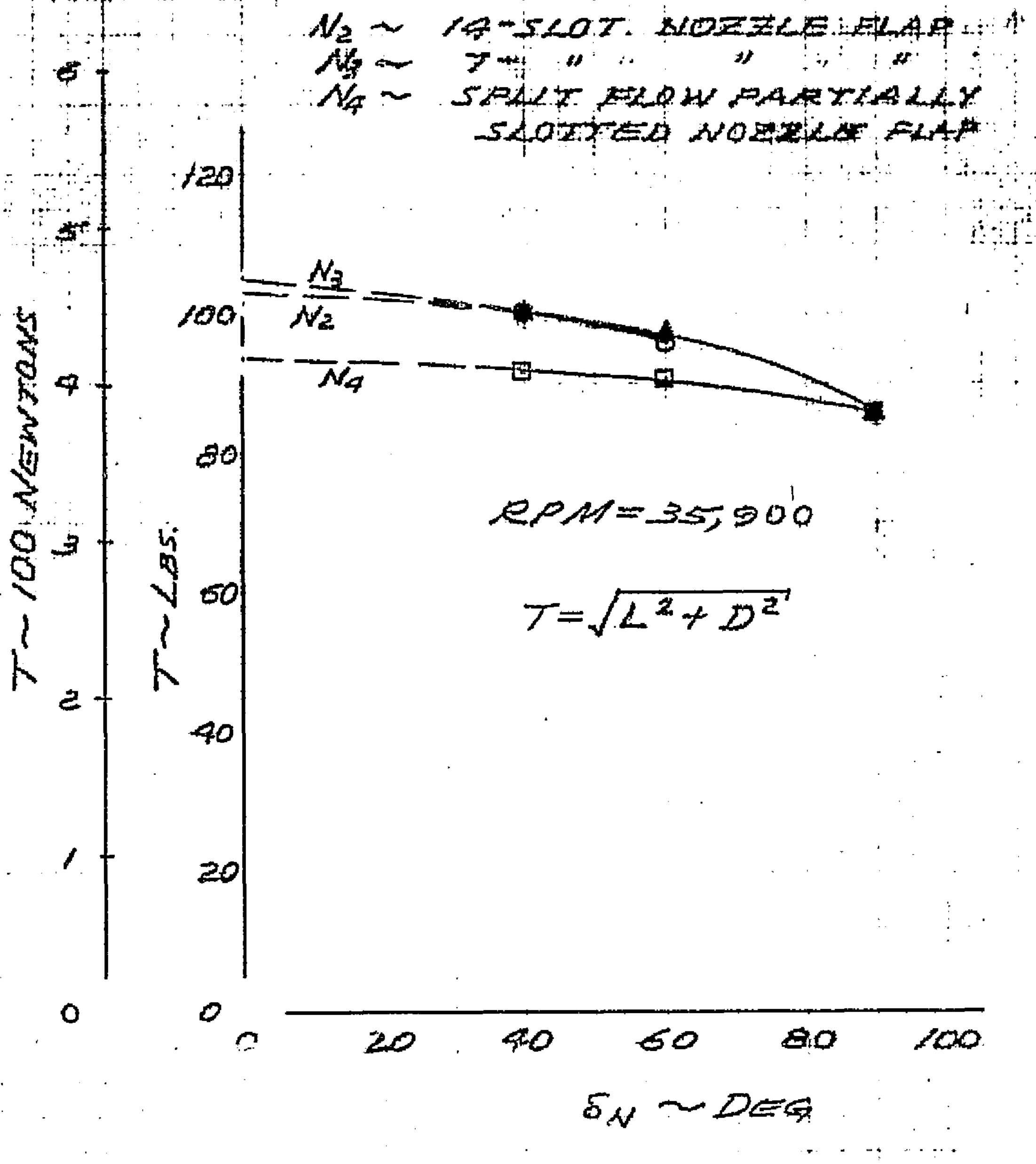


FIGURE 21. STATIC REFERENCE THRUST DETERMINATION

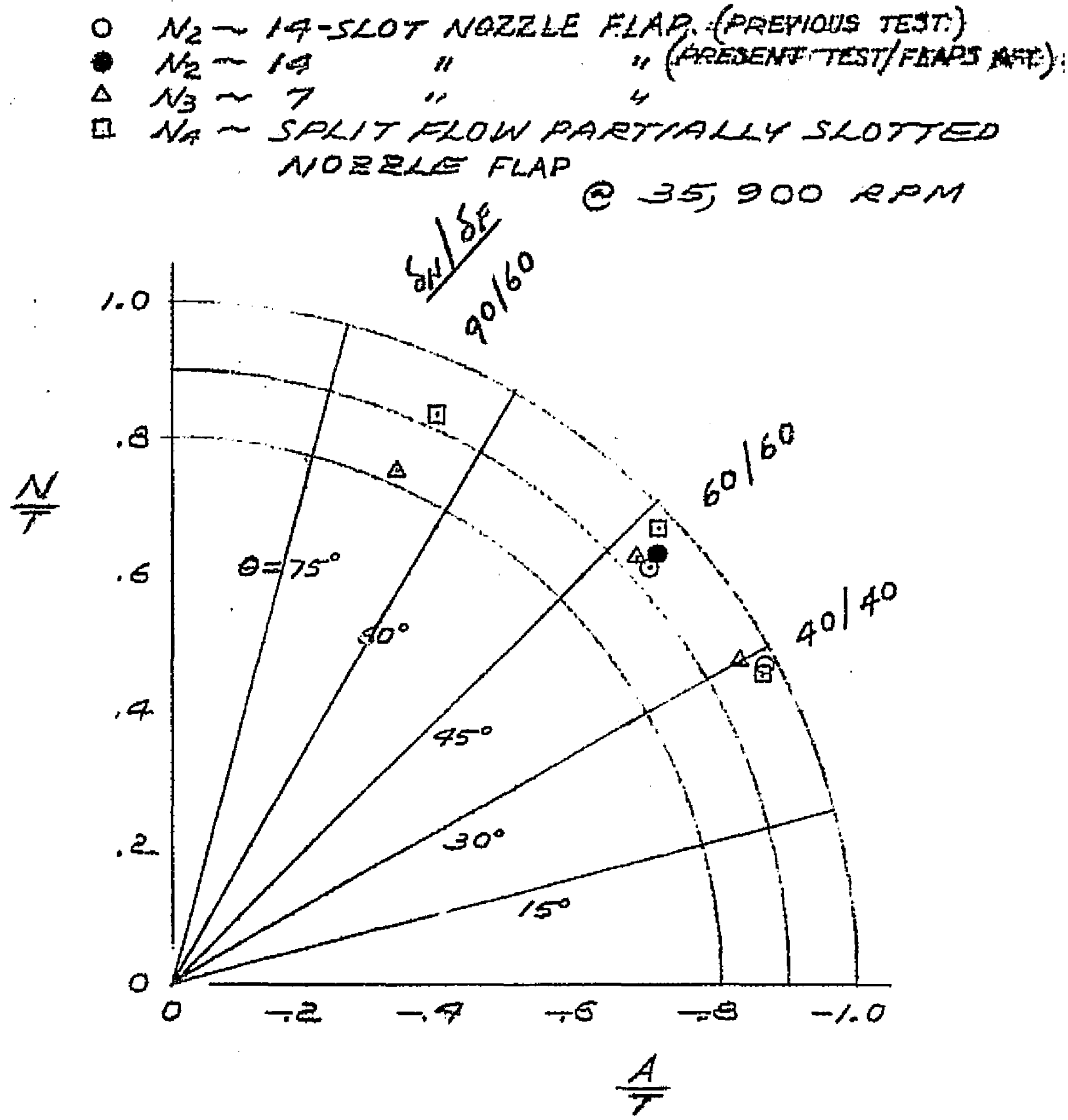


FIGURE 22. STATIC TEST SUMMARY

AERODYNAMIC TEST RESULTS

Figures 23 through 25 show correlation of lift coefficients at zero alpha (C_{L_O}) and maximum lift coefficients ($C_{L_{max}}$) as a function of thrust coefficient (C_T) for three nozzle flaps (N_2, N_3 and N_4) and three nozzle flap/wing flap settings of 90°/60°, 60°/60° and 40°/40°. Figure 23 shows the advantage of the split flow partially slotted nozzle (N_4) over the seven slotted nozzle (N_3) at 90°/60° flap setting in generating a somewhat greater lift. At other flap settings the split flow (N_4) and the seven slotted (N_3) nozzle flaps show about equal lifting characteristics. The 14 slotted nozzle flap (N_2) was tested at 60°/60° flap setting only and is equivalent to other two nozzle flaps in lifting capability.

Figures 26 through 28 present the same lifting capabilities of the three nozzle configurations as functions of angle of attack. For fan power off conditions (C_T = 0) the lift data are shown in conventional coefficient form as there is negligible power or power-induced effect of lift due to the wind-milling fan. The power on lift data are expressed as lift to reference thrust ratios versus angle of attack and as a function of thrust coefficient. No abrupt stalling characteristics are noted for any of the three nozzle arrangements. These data again indicate that the split flow (N_4) nozzle has better lifting capability (C_L) than the seven slotted one (N_3) at 90°/60° flap setting. The ratio of lift to static reference thrust is indicative of lifting efficiency rather than just a lifting force.

Drag polars of the split flow partially slotted nozzle and the seven slotted nozzle are given in figures 29 and 30 for various flap angles and thrust settings. It is seen that the nozzle flap can be deflected to a large angle without significant loss in lift. This is important for glide path control during landing since such control is obtained by varying the airplane drag. The data give the appearance that even larger nozzle flap angles are aerodynamically feasible for producing drag without much loss in lift. The data also indicate that the split flow nozzle (figure 30) at C_T = 2 and 60°/60° flap setting produces a slightly lesser drag than the seven slotted at same lift coefficients resulting in a steeper climb angle.

A comparison of figures 29 and 30 for the highest thrust coefficient shows that the 60°/60° flap setting for the split flow partially slotted nozzle has less drag than the 40°/40° flap setting with the relationship reversed for the 7-slot nozzle. Lift and drag coefficients, as replotted in figures 30a and 30b respectively, show that the relationships are reasonable and consistent. Figure 21 suggests that the reversal is due to the ability of the split flow partially slotted nozzle to maintain higher efficiencies at the larger flap deflections than the 7-slot nozzle.

Detailed aerodynamic data pertaining to lift, drag and pitching moment are presented in appendices A and B in plotted as well as tabular form.

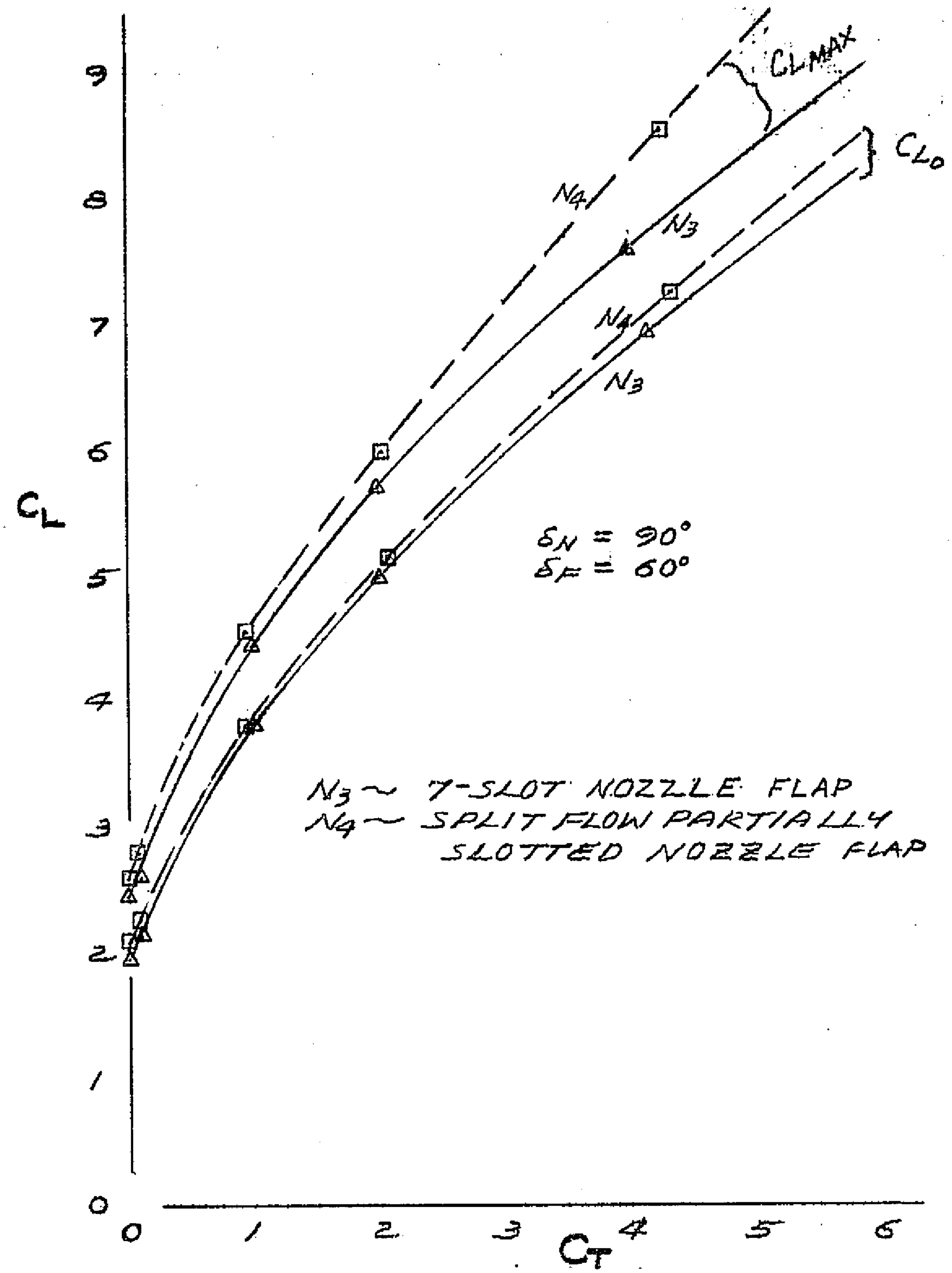


FIGURE 23. LIFT AT ZERO ALPHA & MAX. LIFT CORRELATION WITH C_T, δ_N/δ_F = 90°/60°

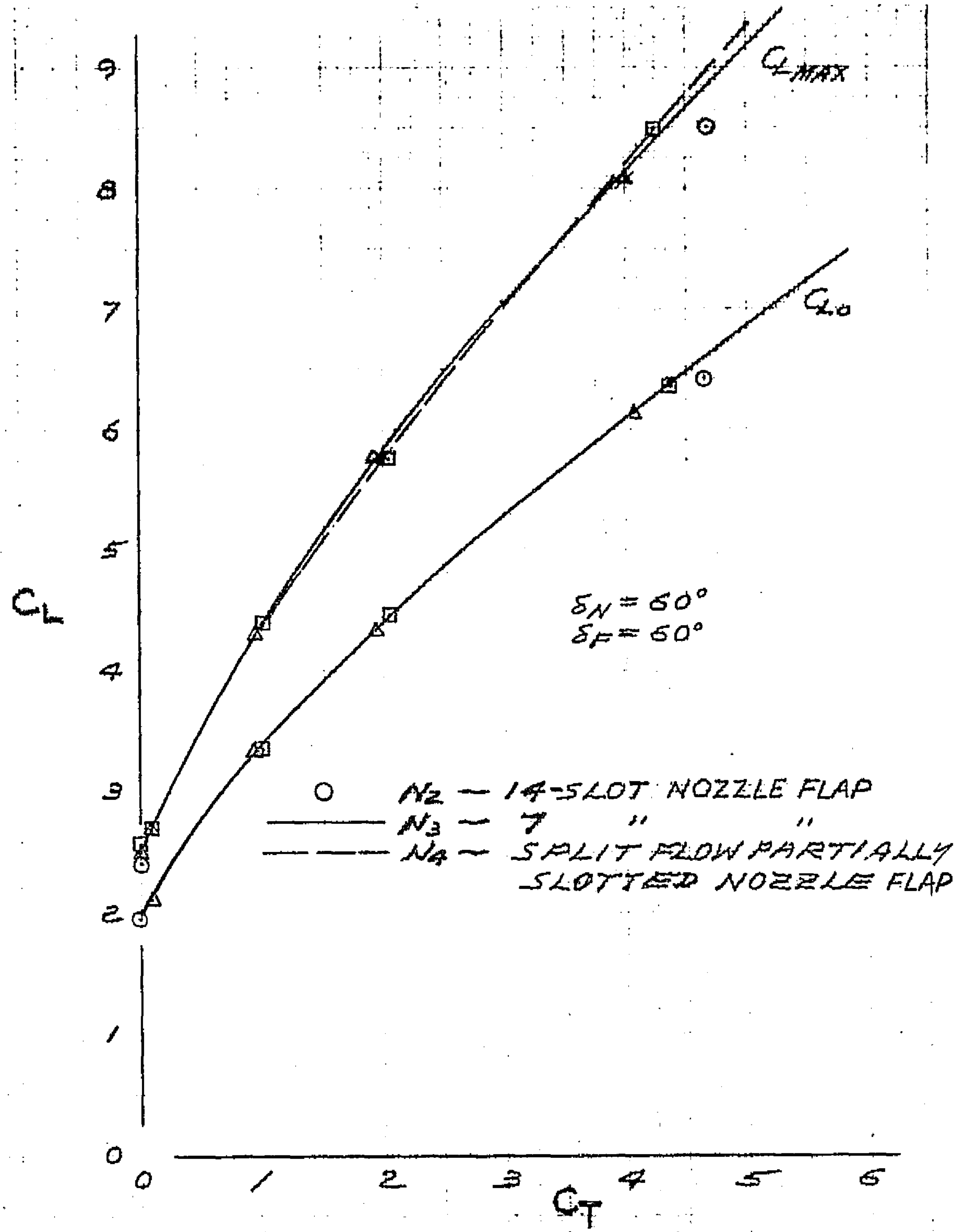


FIGURE 24. LIFT AT ZERO ALPHA & MAX. LIFT CORRELATION WITH C_T, δ_N/δ_F = 60°/60°

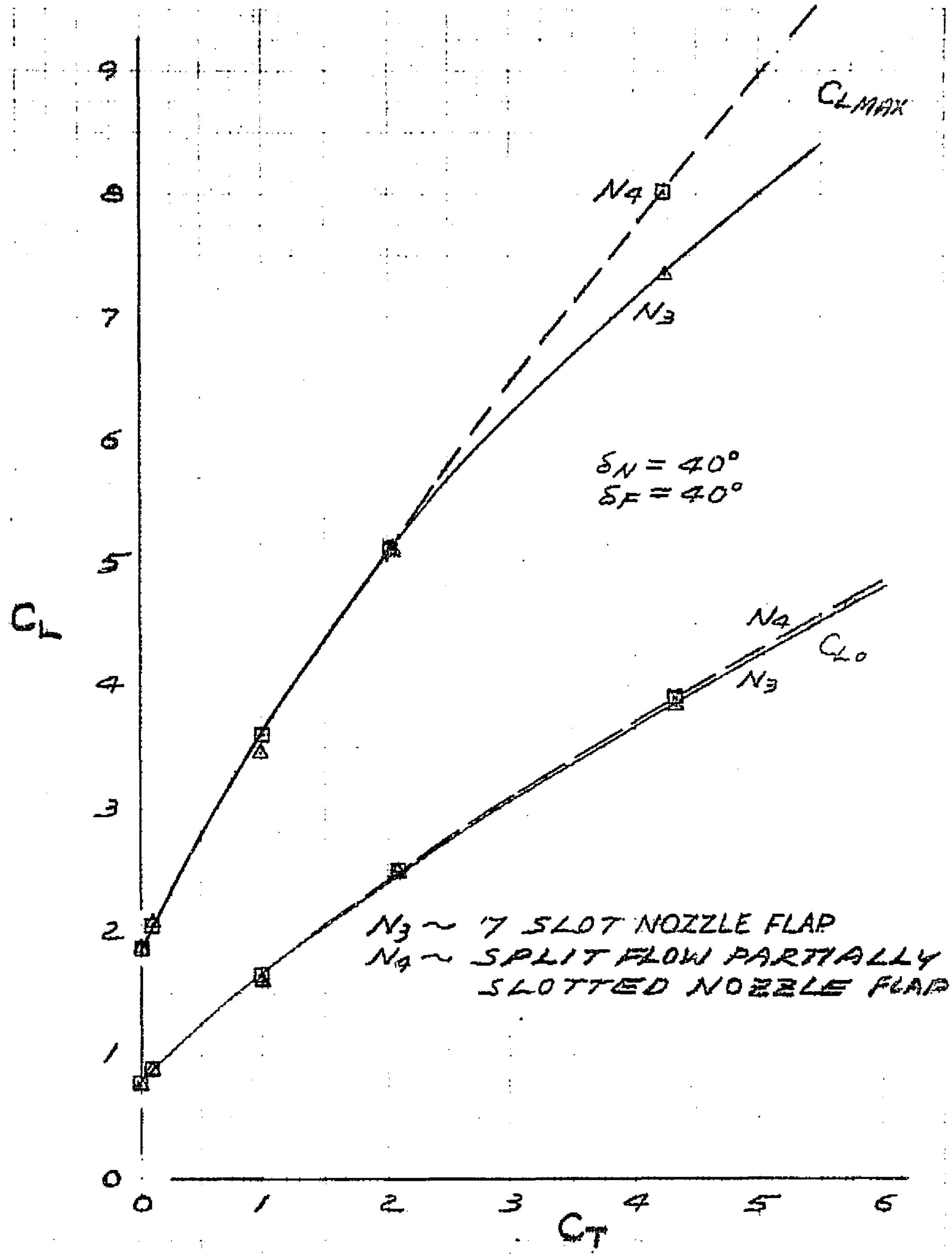


FIGURE 25. LIFT AT ZERO ALPHA & MAX. LIFT CORRELATION WITH C_T, δ_N/δ_F = 40°/40°

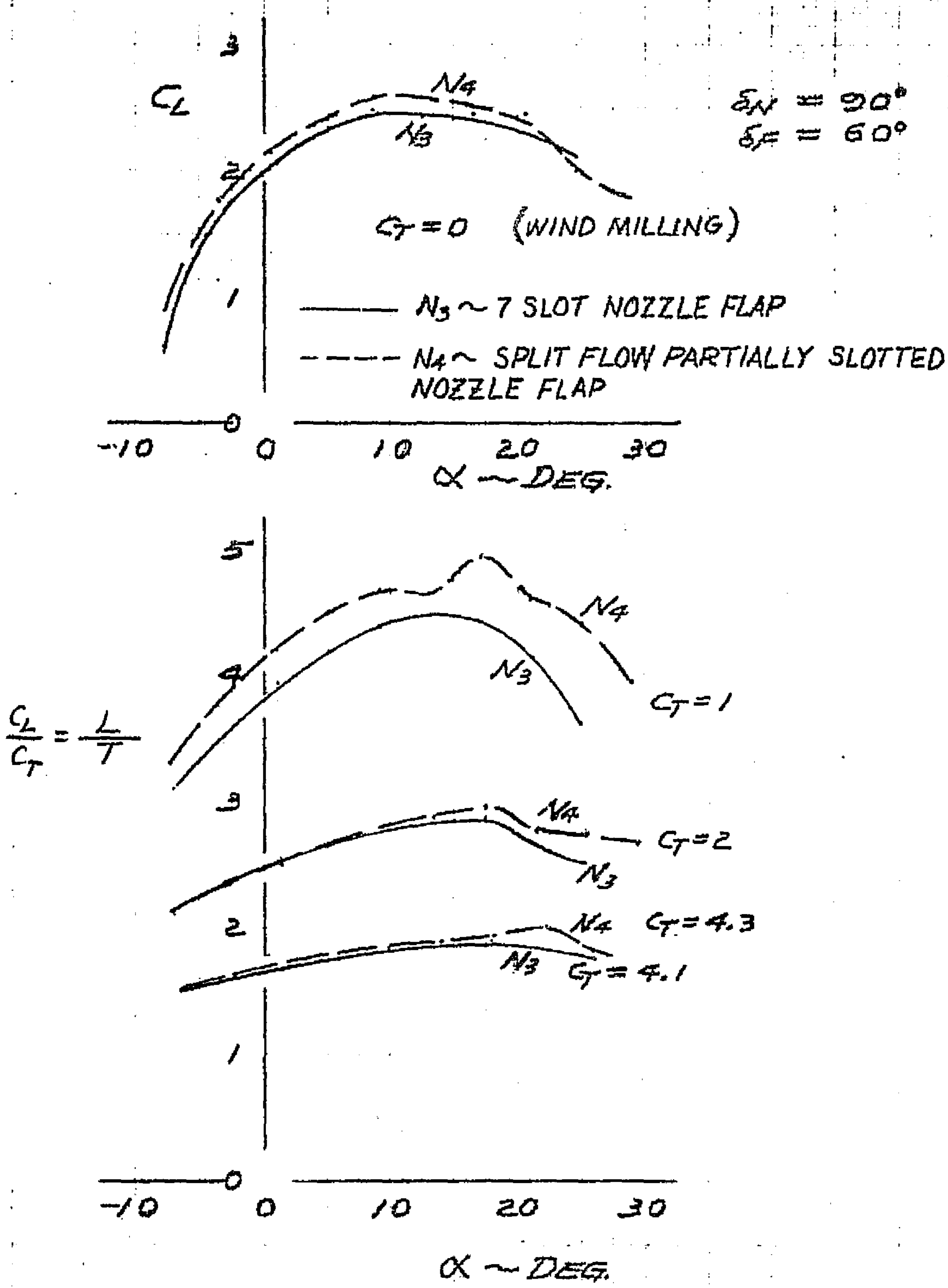


FIGURE 26. LIFTING EFFICIENCY
$\delta_N / \delta_F = 90°/60°$

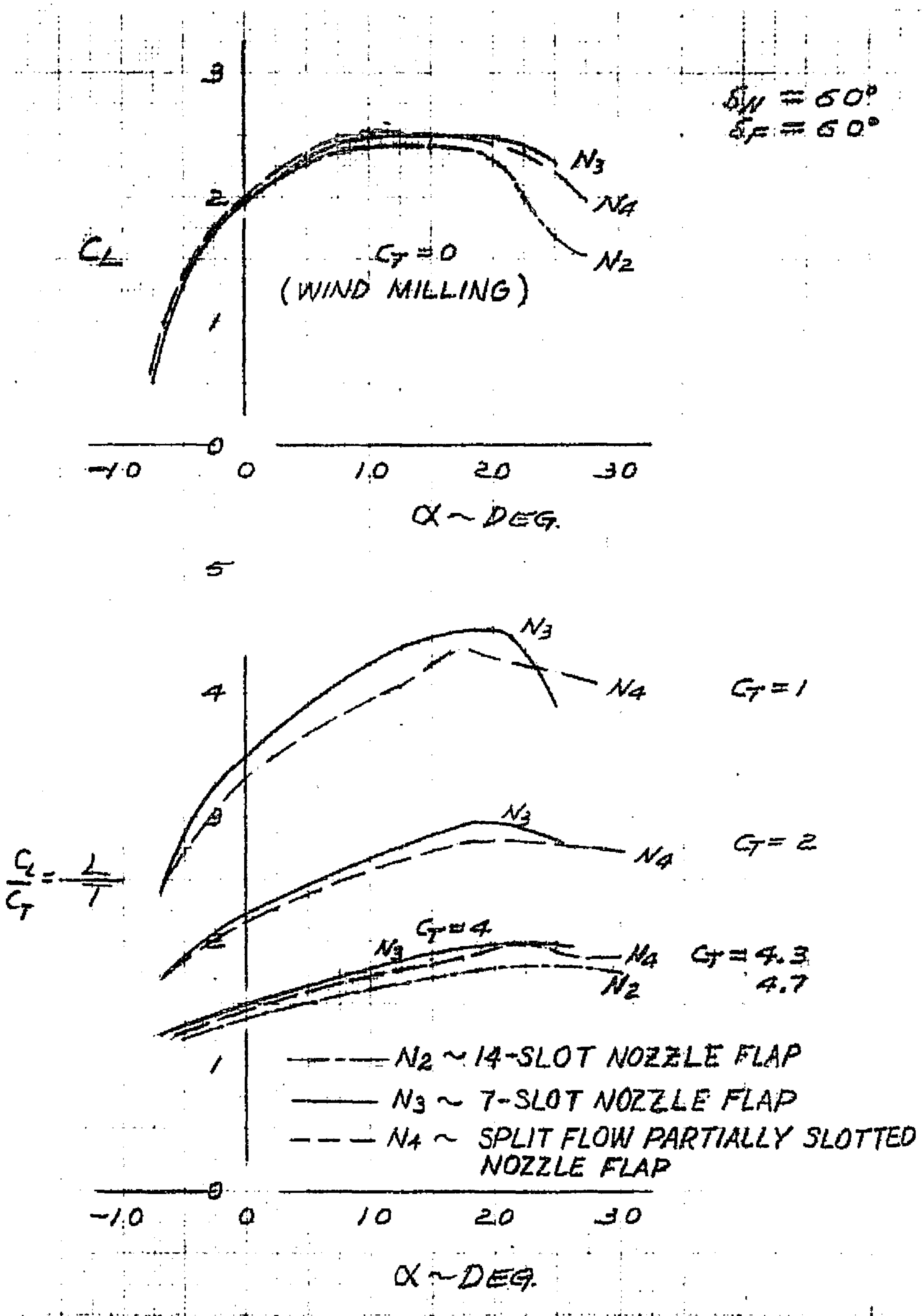


FIGURE 27. LIFTING EFFICIENCY

$\delta_N / \delta_F = 60°/60°$

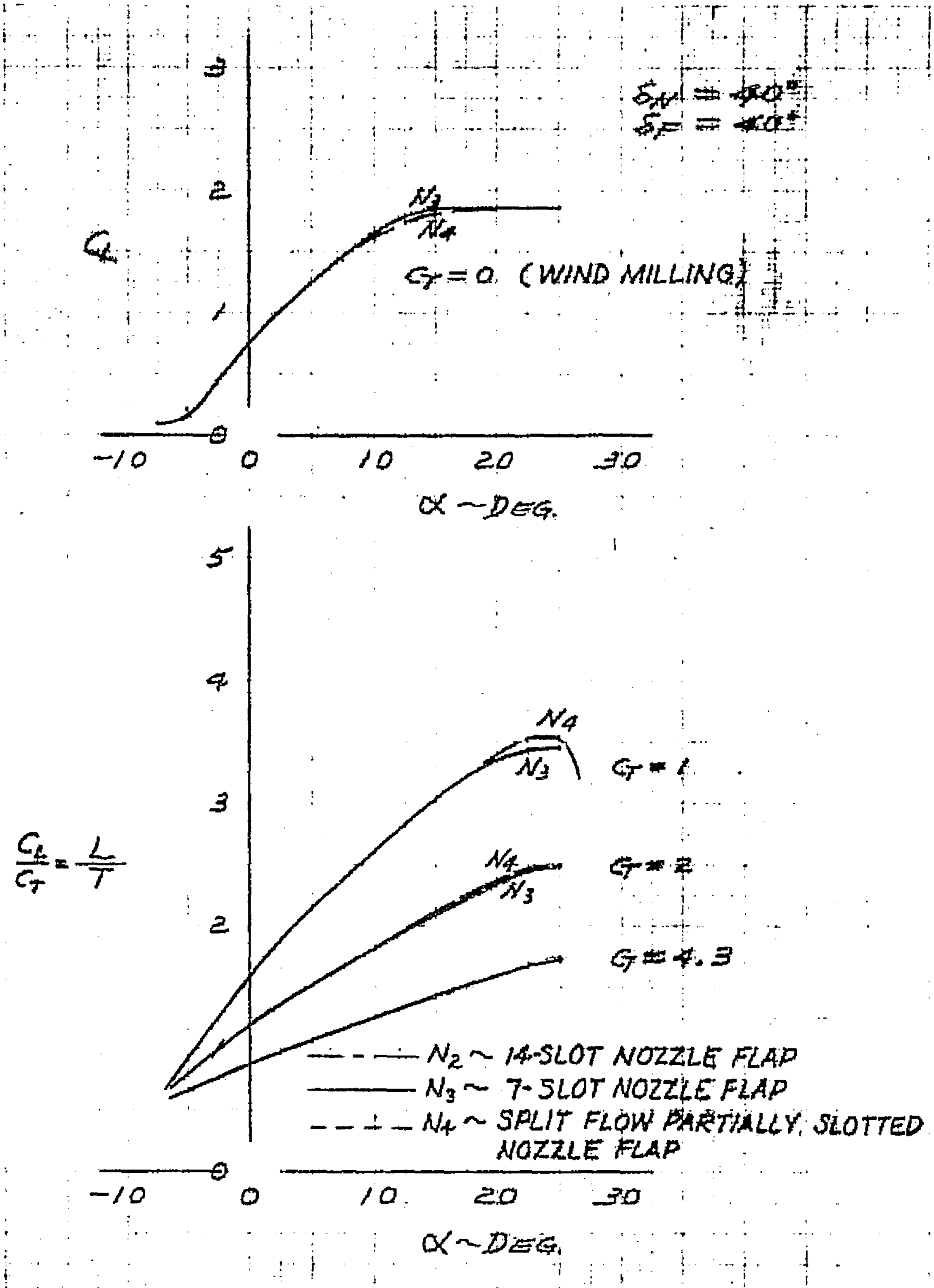


FIGURE 28. LIFTING EFFICIENCY

$\delta_N / \delta_F = 40° / 40°$

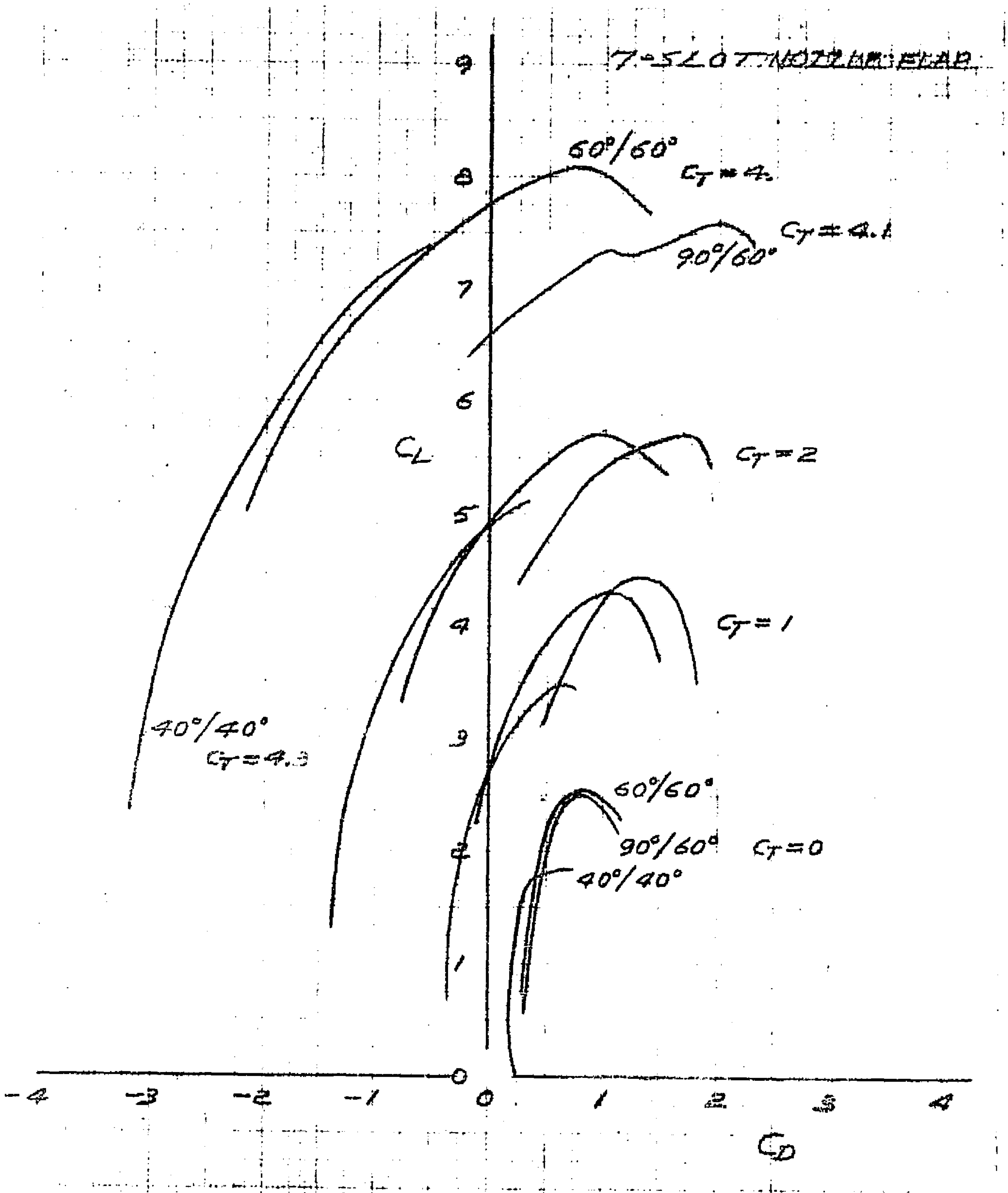


FIGURE 29. DRAG POLARS — 7-SLOT NOZZLE FLAP

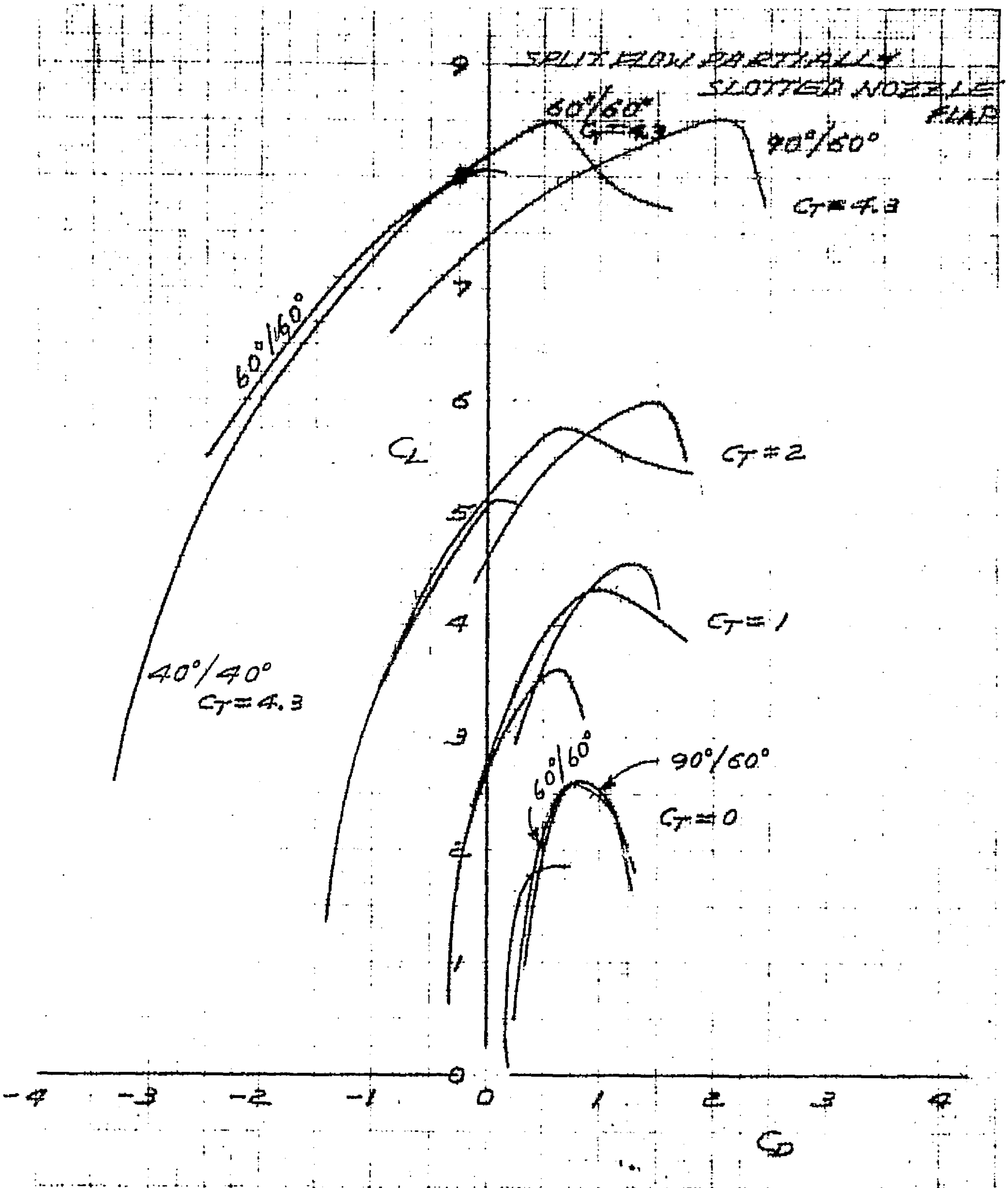


FIGURE 30. DRAG POLARS – SPLIT FLOW PARTIALLY SLOTTED NOZZLE

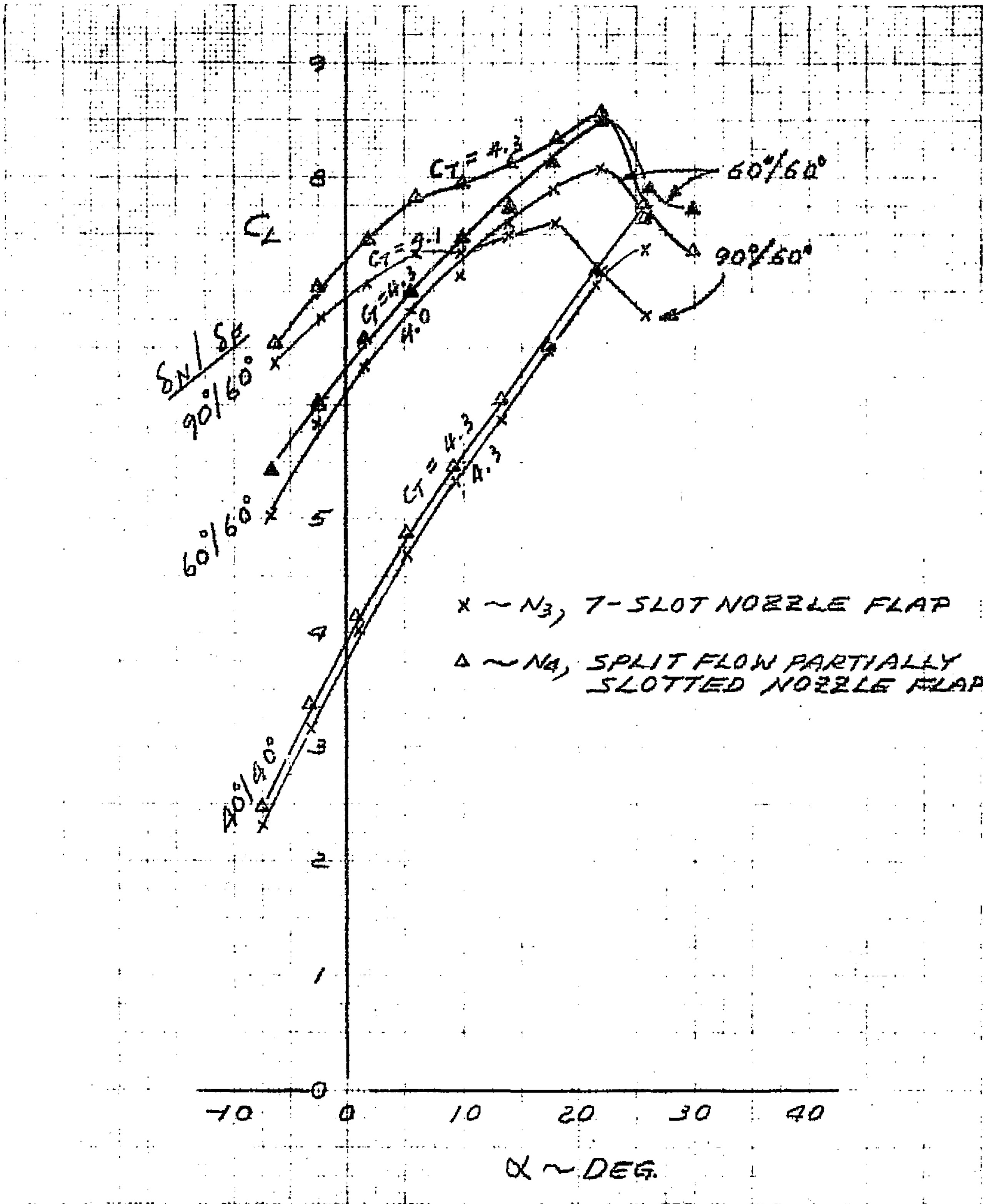


FIGURE 30a. NOZZLE FLAP COMPARISONS ~ LIFT

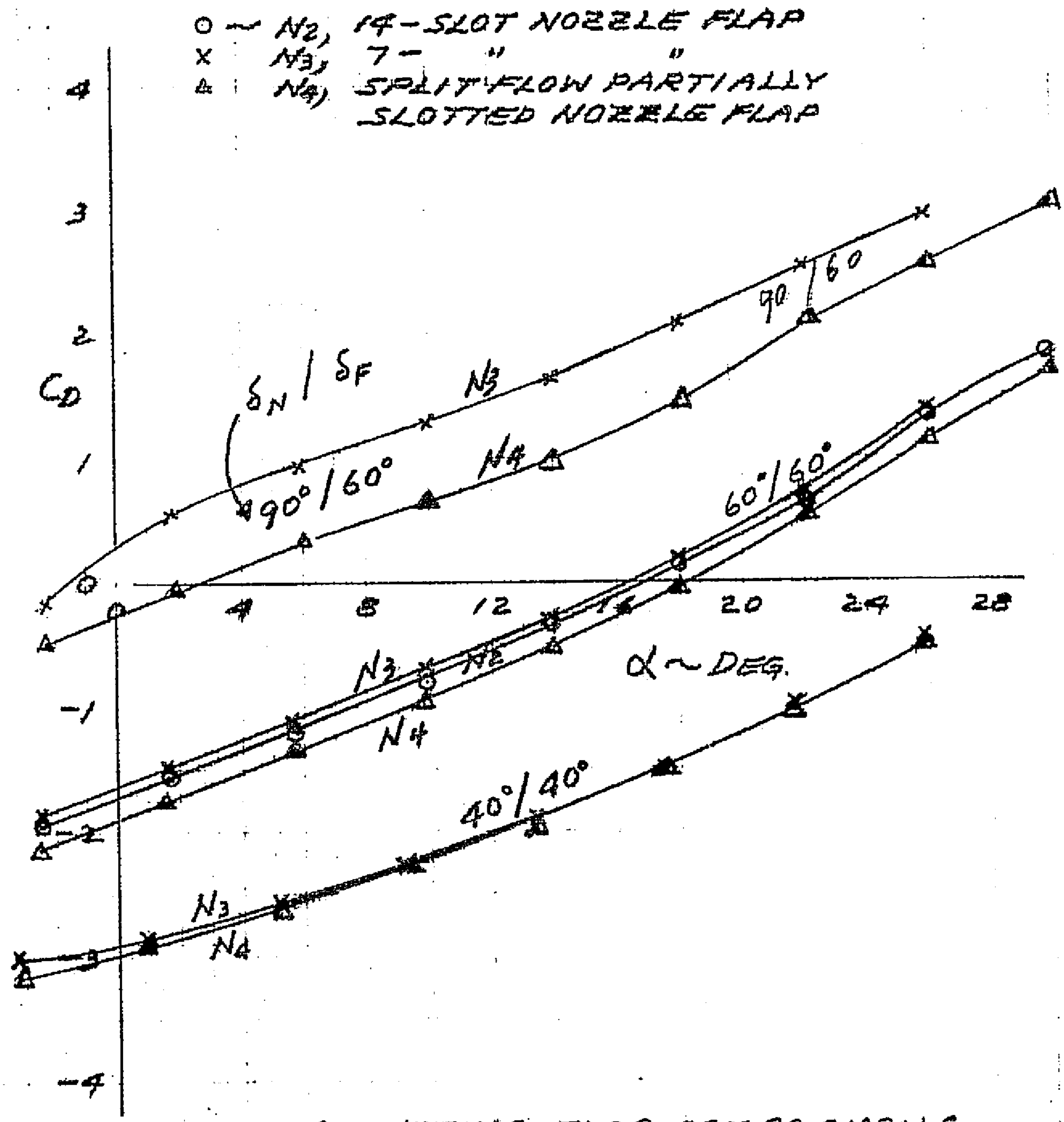


FIGURE 30 b. NOZZLE FLAP COMPARISONS ~ DRAG

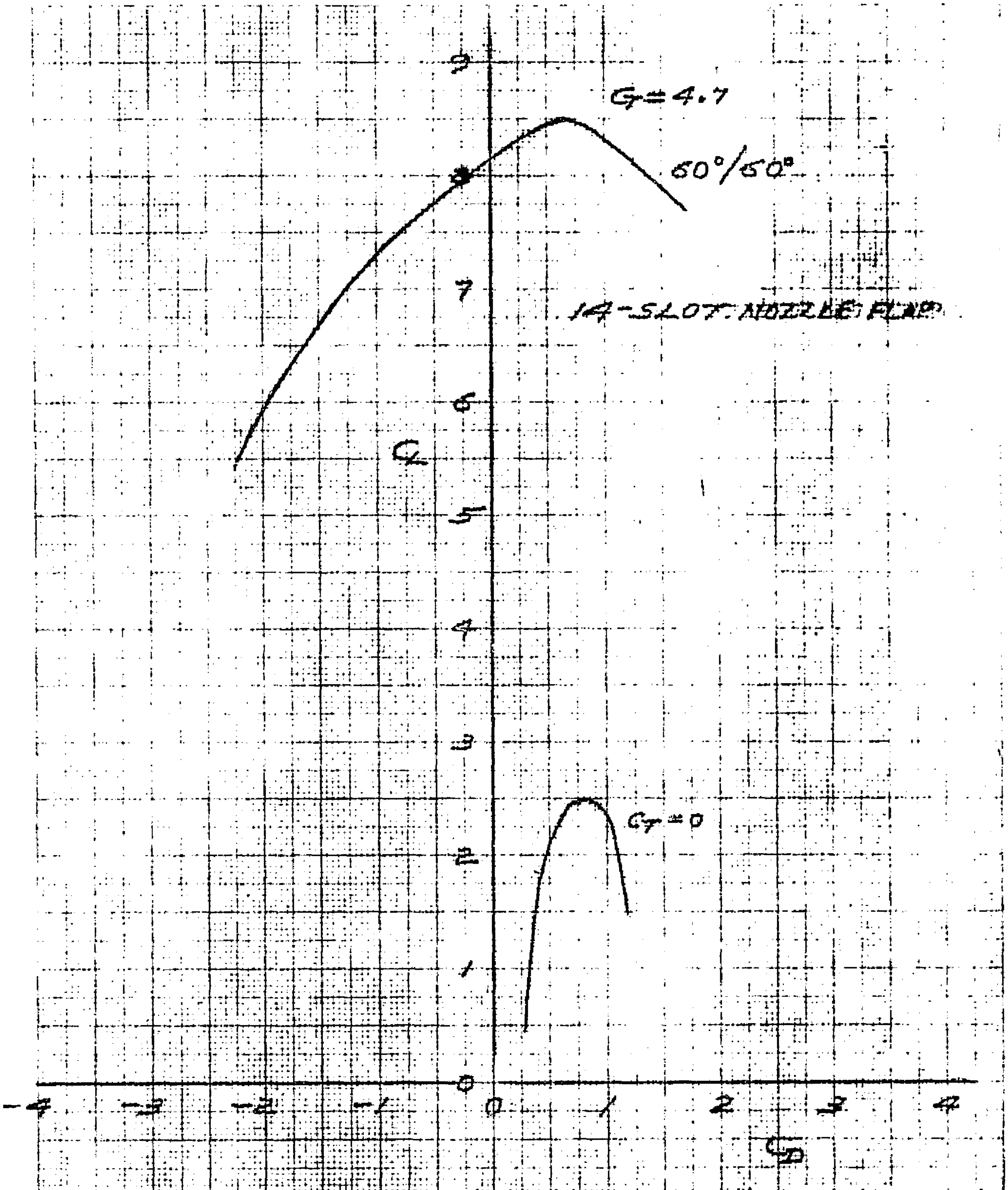


FIGURE 31 - DRAG POLARS - 14-SLOT NOZZLE FLAP

AERODYNAMIC DATA OF PREVIOUS TESTS

In this section, selected data of two previous wind tunnel tests are presented that use basically the same model but different flaps. The data of NAAL test 714 are discussed first, whereafter NAAL test 720 is discussed.

NAAL Test 714

The first test was conducted from September 26 to October 1, 1973 in the Rockwell International low speed wind tunnel, and is described in detail in reference 1.

The purpose of the test is to determine the effectiveness of these several different flaps on a comparative basis in the presence of an equal powerplant nozzle airflow. These showed that the externally blown flap generates the highest maximum lift and best landing drag at equal flap angle, and that the nozzle flap with two slots is a viable flap system.

The model is of a semispan type mounted vertically on the tunnel floor. The half span is 1.07m (3.5 ft), the semispan wing reference area 0.325m^2 (3.5 ft^2) and the reference chord 0.305m (1.0 ft). A single nitrogen driven fan is installed at the center of the half span, capable of supplying exhaust forces in the order of 445N (100 lb). A top view of the model is given in figure 32.

Three different types of flaps were tested in a portion of the wing located behind the fan exhaust. They are the Coanda flap, the externally blown flap, and a new flap introduced in reference (1). This new flap is the nozzle flap with two fan exhausts. Sketches of the externally blown flap are presented in figures 33 and 34, and a sketch of the regular Coanda flap in figure 35. The radius of the Coanda flap upper surface is 0.153m (6 inches), the height of the exhaust nozzle opening is .0457m (1.80 inches), figure 36.

A sketch pertaining to the nozzle flap with the two slots is given in figure 37. This flap uses fan exhaust located underneath the wing, and the exhaust is then led through flap gaps to the upper surface of the flap segments. Each flap segment is then acting as a Coanda flap by itself. The entire fan exhaust is captured by a duct consisting of a lower wall and sidewalls; all of the exhaust is led through the flap gaps. In a flap retracted condition, the duct is retracted. Flap details are given in figure 38. The flap segments of this nozzle flap are identical to those of the externally blown flap, except they are positioned differently.

Wing sections adjacent to the section where the fan exhaust acts carry only one type of flap. This is essentially an unblown region. The double slotted flap was chosen for this region in almost all cases to prevent flow separation. In these adjacent wing sections, this flap is used regardless of the type of flap tested in the wing section directly behind the fan exhaust. Constant flap angles, flap chord and flap gaps were used in these wing sections, identical with the double slotted externally blown flap within the blown region.

Leading edge Krueger flaps are installed along the entire wing leading edge. A drawing of the leading edge cross section is presented in figure 8. The leading edge and trailing edge flaps are always installed during the aerodynamic runs (no flaps-up aerodynamic runs were made).

The power unit in the model is the fan from Tech Development Incs., Ohio and is designated TD-457. The fan is powered by a tip turbine and is driven by nitrogen with a maximum pressure of 2930 KPa (300 psi). The fan diameter is 0.140m (5.5 inches). Note that all fan exhaust is lead to one side of the wing.

There are a number of different exhaust ducts. The "regular" exhaust duct (0.046m (1.8") height) has sidewalls that are parallel near the exit. Another duct has a "reduced height" of the exhaust exit. The two nozzles are compared with each other in top view as shown in figure 32. The exhaust areas of both nozzles is equal to the fan exhaust area. The nozzle with parallel sidewalls could be tested with wing fences.

For static test a "Scavenger" or scoop was installed behind the model to collect the fan flow into a pipe of approximately 0.25m (10") diameter and to lead it out of the tunnel through a tunnel sidewall. The collection of the fan flow is needed to avoid any induced wind tunnel flow that would otherwise be generated by the model exhaust (even while the wind tunnel power is off). Some "quasi-static" tests were run with model power on, but with wind tunnel power off and no Scavenger installed. The exhaust of the model fan generated a small but usually significant tunnel velocity in these conditions (q ranging from approximately zero to approximately 50 Pa (approximately 1 lb/ft^2)).

Static thrust calibrations were performed with the "Scavenger" installed and all flaps removed from the model.

Test results pertaining to static turning angles and thrust efficiencies are presented in figure 39 for various flap configurations, nondimensionalized by the above described calibrated static thrust.

The figure shows that the thrust efficiencies obtained with the nozzle flap and the Coanda flap is about 90%. The data for the externally blown flap are not included because the results appeared doubtful.

The turning angles of the Slotted Coanda Flap appeared greatest and about the same as the Coanda flap with fences. The Coanda with reduced nozzle height and no fences, conducive of spreading, shows a substantially lesser turning angle.

In case of the nozzle flap it becomes difficult to designate a reference thrust because no calibration can be made without the flap in place. In this report the reference thrust was used belonging to the straight sided nozzle with the regular height.

Test results at forward speeds are as follows:

(a) Regular Coanda Flap

The (regular) Coanda flap shows an effect of a flat chord extension as presented in figure 40. For the regular nozzle height, the extension produces a loss in maximum lift, but for the reduced nozzle height the extension produces an increase in maximum lift. A correlation is performed in this figure using a parameter ℓ/h, where ℓ is the length of the arc of the Coanda surface, and h is the vertical dimension on the nozzle exhaust. The figure shows that an increased arc length of the flap (i.e. increased flap angle) beyond an optimum value results in a lift loss. The optimum value depends on the vertical dimension of the nozzle.

A reduction in the nozzle height improves the maximum lift capability for all flap chord lengths tested. The maximum turning angle is increased when the nozzle height is reduced.

(b) Nozzle Flap With Two Slots

The nozzle flap characteristics are obtained with and without flap chord extension. At $C_T = 4.4$ a C_{LMAX} of 8.5 is obtained which is high enough to give this flap serious future considerations (not shown here).

In the above case the sidewalls of the exhaust duct were installed so that all exhaust had to flow through the flap gaps. However, tests were also conducted without sidewalls, and only the bottom of the duct was installed. Removal of the duct increases the maximum normal force in the power-on condition. This is probably due to a spreading of the exhaust flow similar to the externally blown flap principle. Results are shown in figure 41.

(c) Externally Blown Flap

Externally blown flap characteristics were obtained showing that the maximum lift values are quite high, being in the order of 10.5 for a C_T value of 4.35. (not shown here) and exceeds 8.0 at G = 2.07 (figure 41).

(d) Flap Comparison

A flap comparison of the Coanda flap, slotted Coanda flap, and externally blown flap is presented in figures 41a and b. For each of these powered flaps the best geometries were selected; for the Coanda flap the extended nozzle exhaust and fences were taken, and with regard to the dual slotted nozzle flaps, the data shown pertain to the test without duct sidewalls. However, each case represents a condition without flap extension for consistency i.e. all flaps have a constant flap angle.

The data show that the lifting capability is compatible for the regular Coanda flap and the nozzle flap, but that the externally blown flap produces a greater lift and drag. Drag is beneficial from a STOL landing approach viewpoint, but is detrimental for STOL climb performance.

NAAL Test 720

The test is described in detail in reference 4. This reference describes the aerodynamic test results of a flap as part of a quiet STOL vehicle research program. This effort was performed by the Aerodynamics Group of the Los Angeles Aircraft Division of Rockwell International. Additional testing was carried out to establish noise characteristics. These are reported separately (reference 6). The testing was conducted March 11 through 14 of 1974 in the Rockwell low speed facility. The present document presents selected data.

Test results are presented for a short chord, multiple slotted nozzle flap configuration. Aerodynamic data at static and forward speed conditions are compared with a conventional large chord Coanda flap with a single exhaust nozzle. Results show that the multiple slotted nozzle flap is superior in the capability to generate a steep descent angle during landing while providing a potentially low noise STOL design approach. Two vertical positions of nacelles were tested: a high location with an over wing location of the nacelle, and a low location with an underslung nacelle. The high location was detrimental for lift at low thrust values, but was beneficial at high thrust values.

The multiple slotted nozzle flap consisted of a twelve inch constant chord 1.07m (3.5 foot) semi-span wing with a multi-slotted exhaust mounted at the mid-span. A top view of the model is given in figure 42. The leading edge consisted of a Krueger flap deflected 115°. The nacelle with the nitrogen gas-powered Tech Development, Inc. tip turbine fan, model TD-457, could be so configured as to be an overwing or underslung nacelle arrangement, figure 43. The trailing edge flap of the center section had a 30.5 cm (12 in) span and consisted of a multiple slotted 36.5° ramp with curved vanes leading to a 0.30c flap (also with curved slots) with which the nozzle exhaust angle could be varied. This "flap" could be deflected 40°, 60° and 90°. The trailing edge inboard and outboard of the center section were double slotted flaps with a constant deflection of 60° during all runs except the thrust calibrations. Slots and vane details of the powered nozzle flap are shown in figure 44.

The model was installed in the North American Aeronautical Laboratory (NAAL) closed throat low speed tunnel. The model was mounted on the planar balance system and tested at q≈0 (near static conditions) and low forward speeds. The near static conditions were run by setting the angle of attack to direct the fan exhaust flow parallel to the tunnel centerline and collecting this flow through a funnel arrangement ("Scavenger") and then out of the tunnel to the atmosphere. The purpose of the Scavenger is to avoid an induced velocity to build up in the tunnel due to the model power unit while the wind tunnel motor is shut off. Setting the angle of attack of the model such that the exhaust is immediately directed into the Scavenger is to ensure that a maximum of exhaust is collected by the Scavenger at each flap angle. Previous tests, reference 1, have shown that the Scavenger effectiveness decreases when the exhaust is not directed into it. Model reference area is 0.325m^2 (3.5 ft^2).

Static wind tunnel balance forces with the powered fan operating are presented in figure 45. The data are expressed in terms of a ratio to the fan reference thrusts for each model geometry considered.

Results in this figure show that the upper surface blowing with the ..-slotted exhaust is capable of turning the exhaust flow through a very e angle. Turning angles of 75 degrees were achieved for an upper surface deflection of 90 degrees, being the highest deflection tested. This is accomplished using a flap with only a relatively short chord and a flap hinge similar to a plain flap. That the flap was capable of turning the flow through a large angle was confirmed from visual inspection of traces of oil vapor from the fan, emenating from the slots. These results answered affirmatively one of the major goals of the test, i.e., could the multi-slotted arrangement with small chord flap prevent large scale flow separation?

A comparison of static data of the underslung nacelle versus the over-wing nacelle showed no important differences in turning angle and thrust variation for the various nozzle angles tested, figure 45.

Figure 45 shows a static data comparison between the multi-slotted arrangement and the regular Coanda flap. In this figure, both flaps are set to an upper surface angle of approximately 60 degrees. Results show that the static turning angle of the multi-slotted arrangement is nearly 10 degrees greater than that of the regular Conada flap. This indicates that the exhaust flow of the regular Coanda flap does not follow the flap contour as well as the multiple slotted exhaust does. However, this may have been caused by some air leakage from underneath the wing to the upper surface through rather large spanwise gaps that existed at the sides of the Coanda surface. It appears possible that the flow turning capability of both flaps is about equivalent when such gaps can be avoided. Figure 45 also presents a comparison of efficiencies, showing approximately equal values ($\eta = 0.9$) for the two flaps.

Lift comparisons between the multi-slotted and Coanda flaps at forward speed are given in figures 46 and 47. These figures show curves of C_L versus α for 60° flap deflection and thrust settings of $C_T = 2.40$ and 4.95. The comparison shows that the total lift coefficient of the multi-slotted nozzle flap is from 5 to 15 percent less than that of the regular Coanda flap at equal angles of attack.

It should be noted that the trailing edge of the multiple slotted powered portion of the wing was located a considerable distance behind the trailing edge of the flap of the unblown portion of the wing. This probably reduces some entrainment flow from the unblown portion into the nozzle exhaust flow, and probably results in a reduction of lift.

A comparison between the overwing and the underslung multi-slotted arrangement (figures 48 and 49), show negligible difference in lift characteristics at $C_T \approx 2.0$. At higher C_T values, the overwing location shows about 10% more maximum lift. It is concluded that the overwing location of the nacelle is not detrimental to lift in the takeoff and landing condition. At the very low C_T values (0 and 0.15) the overwing arrangement has somewhat lower lift, presumably because of the larger flow obstructions above the wing.

Lift-drag polars of the multiple slotted geometries are given in figure 50 for various nozzle angles and for thrust settings at $C_T \cong 5.0$. It is seen that the flap can be deflected to a large angle without significant loss in lift. This is important for glide path control during landing since such control is obtained by varying the aircraft drag. The data give the appearance that even larger flap angles are aerodynamically feasible for producing drag. In comparison, a Coanda flap has a much lesser drag capability because the Coanda flap used is limited to about 60° (unless a larger flap radius exists).

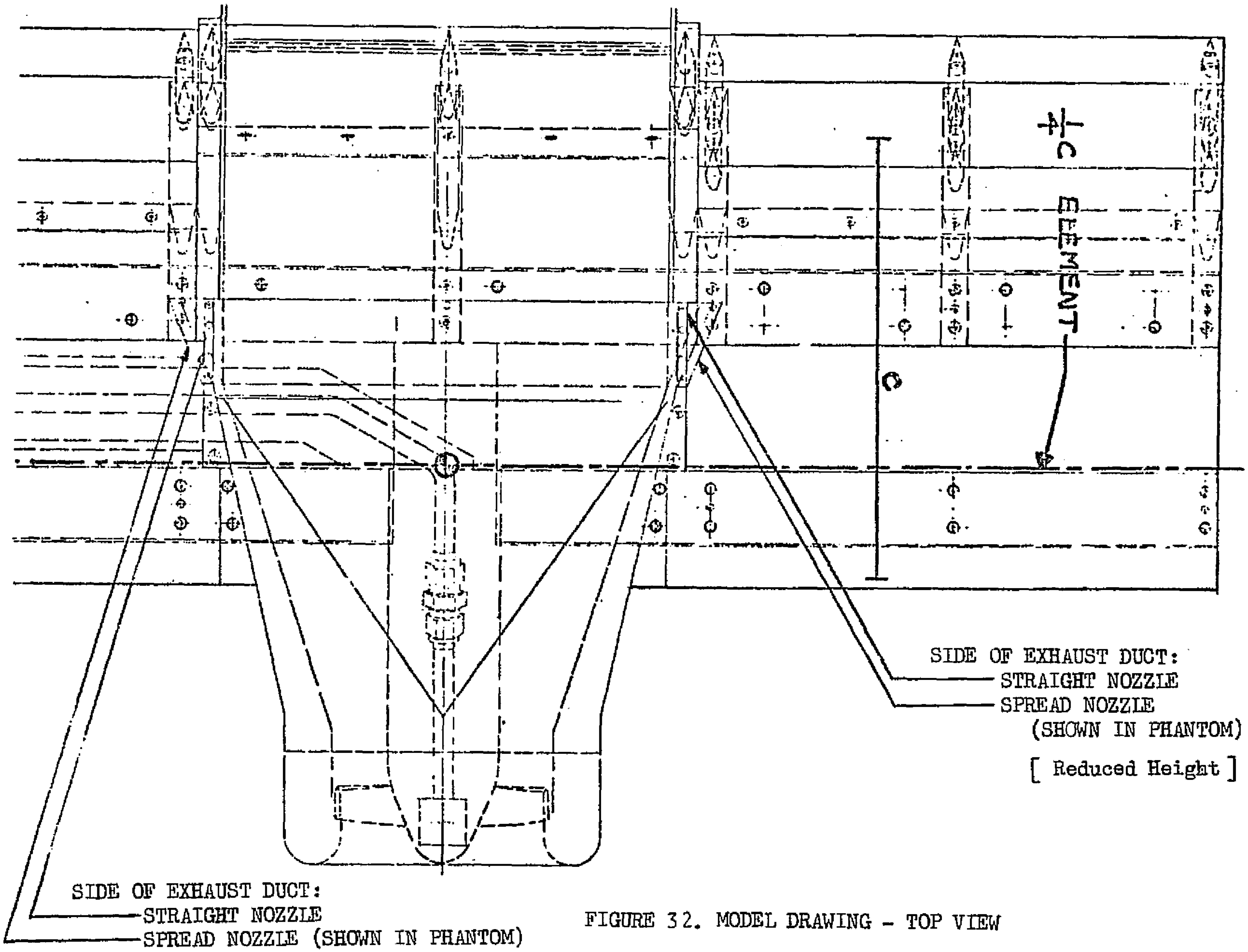


FIGURE 32. MODEL DRAWING - TOP VIEW

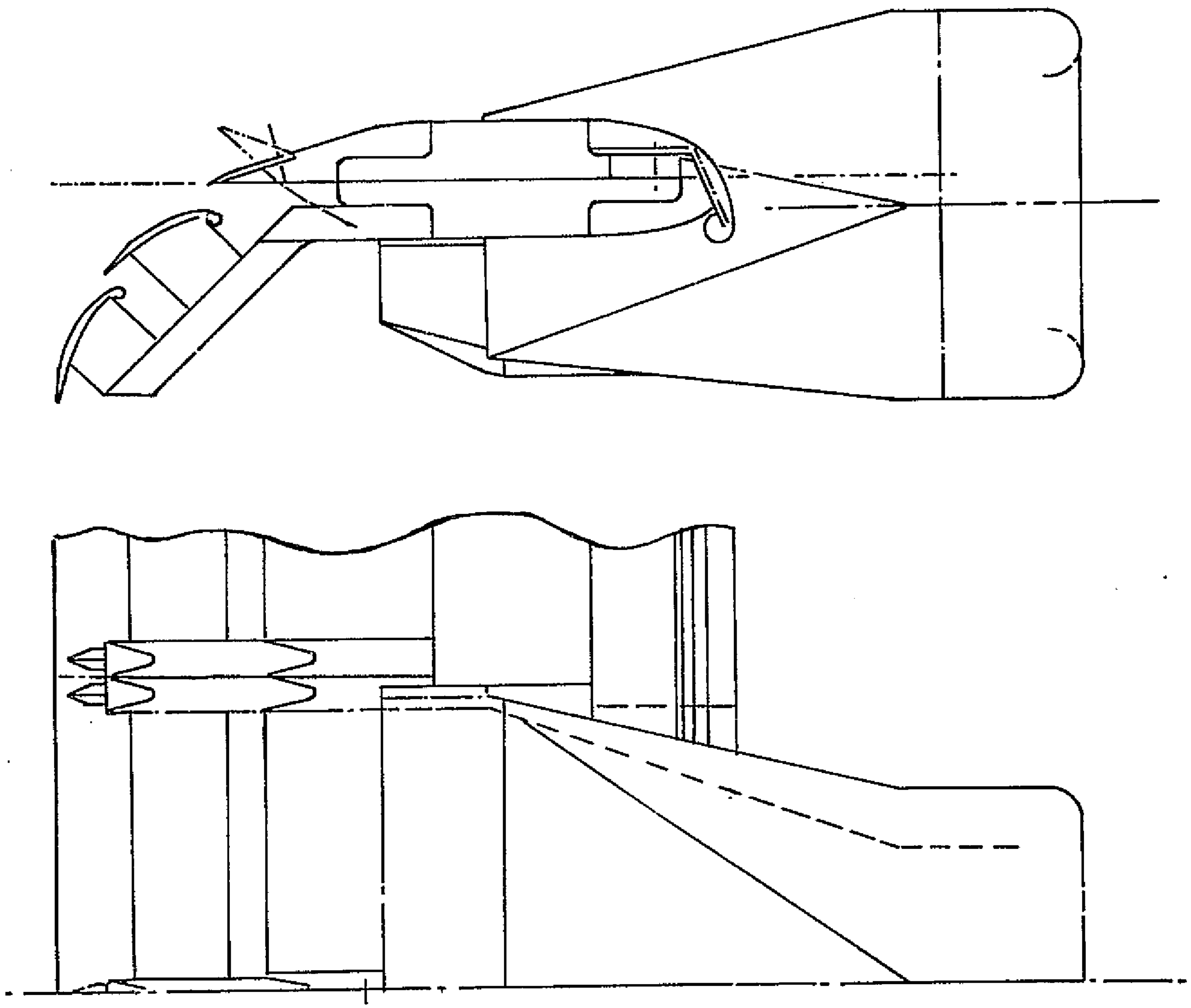
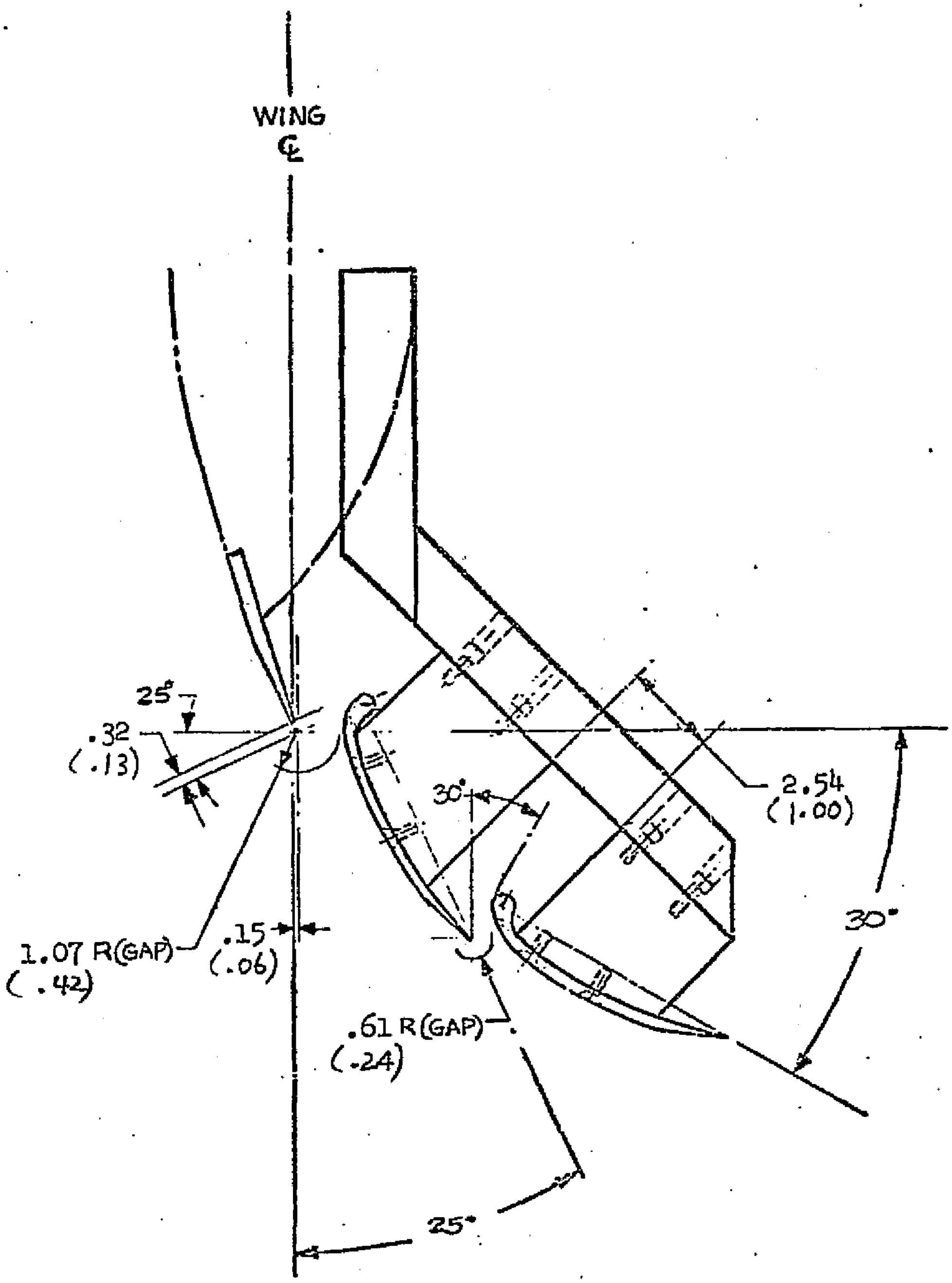


FIGURE 33. EXTERNALLY BLOWN FLAP ASSEMBLY



NOTE: DIMENSIONS ARE IN CENTIMETERS (INCHES)

FIGURE 34. EXTERNALLY BLOWN FLAP -DETAIL-

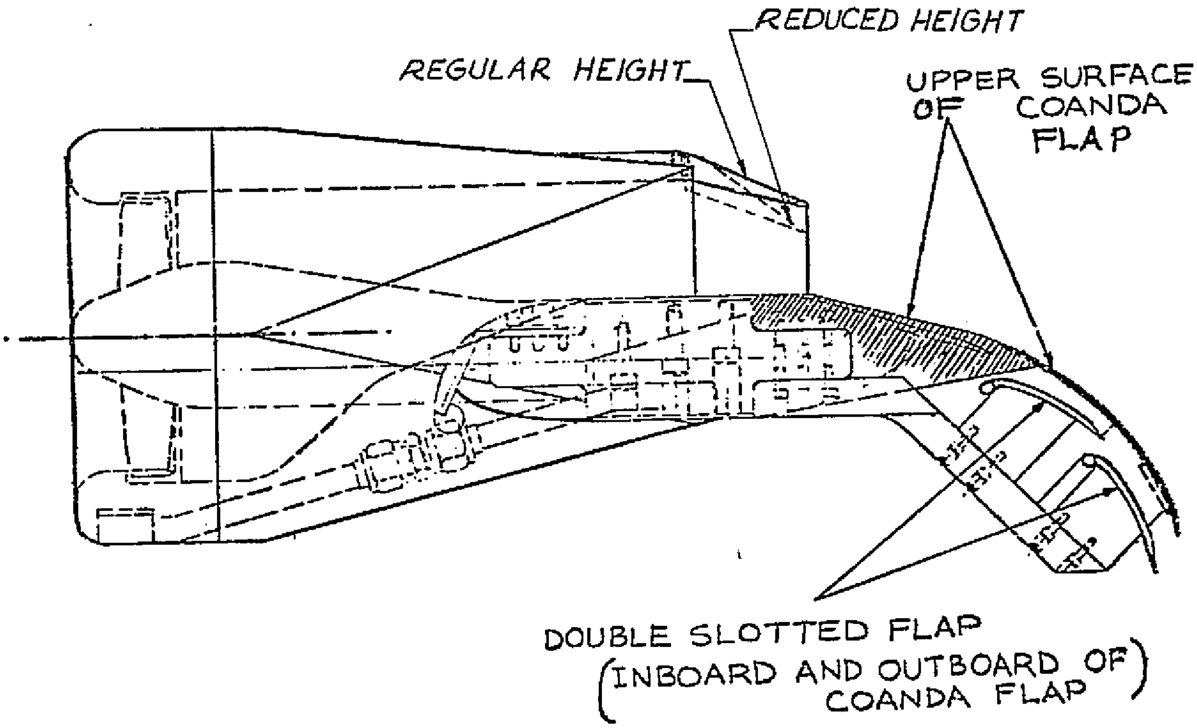


FIGURE 35. COANDA FLAP -ASSEMBLY

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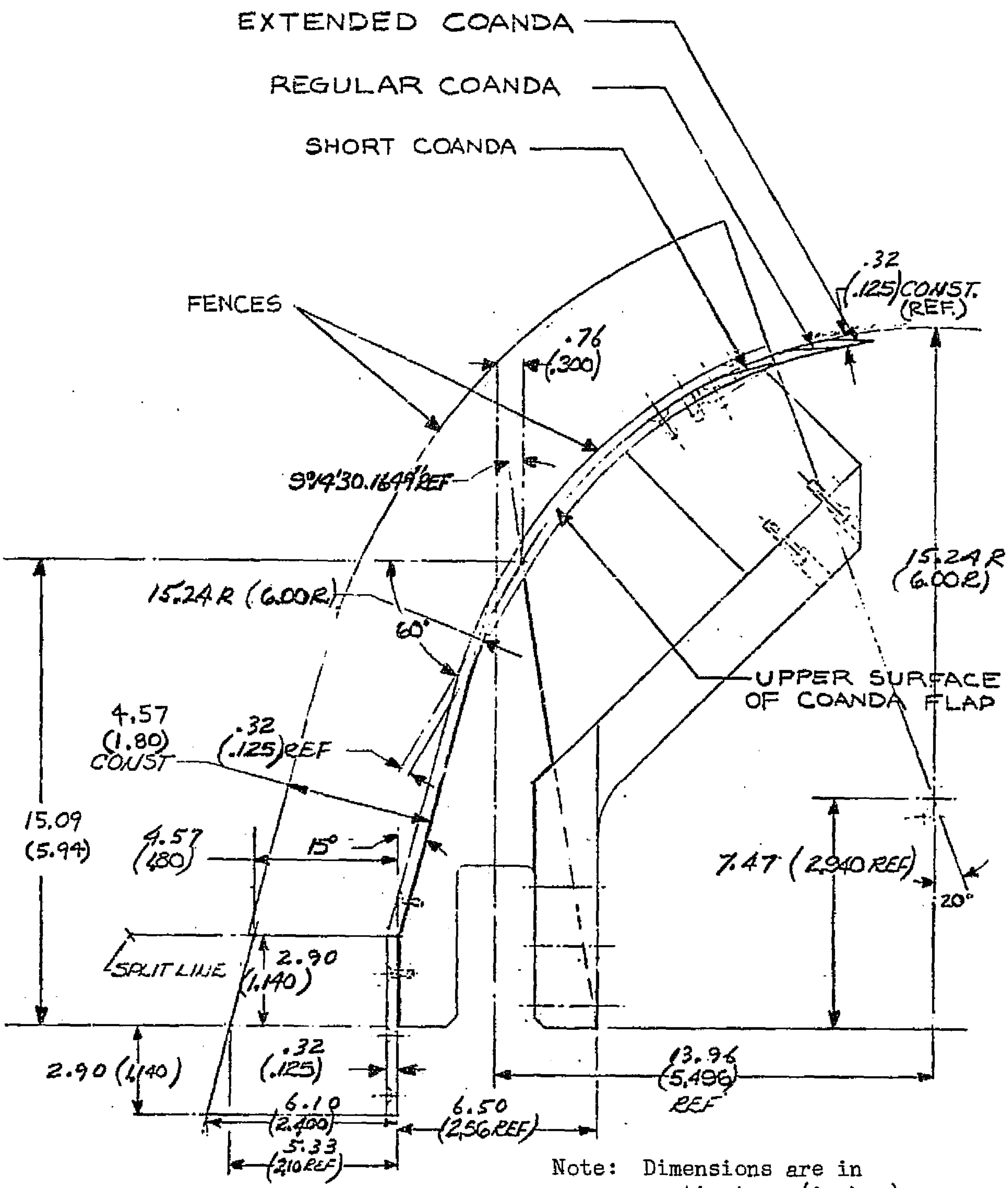

Note: Dimensions are in centimeters (inches)

FIGURE 36. COANDA FLAP-DETAIL

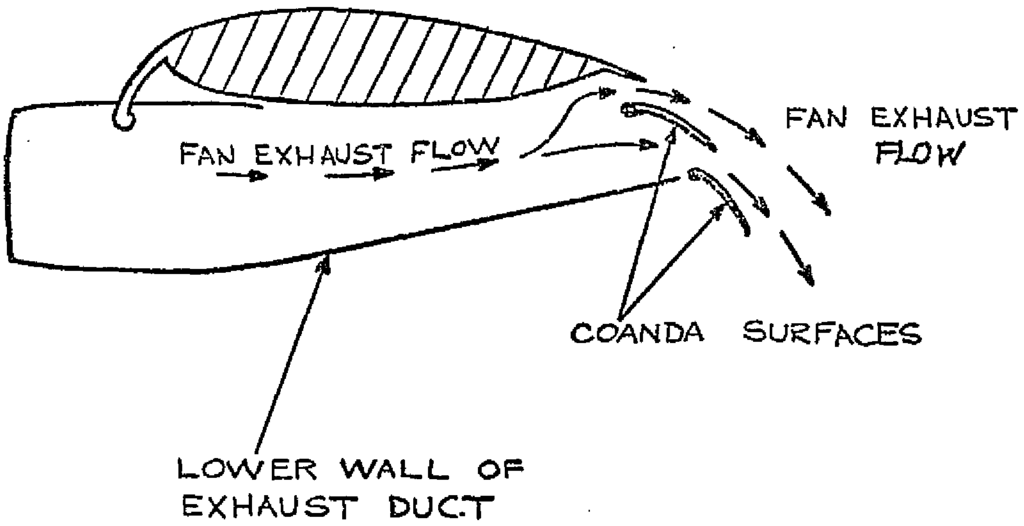

FIGURE 37. SCHEMATIC OF THE SLOTTED COANDA FLAP

(Flaps in Extended Condition)

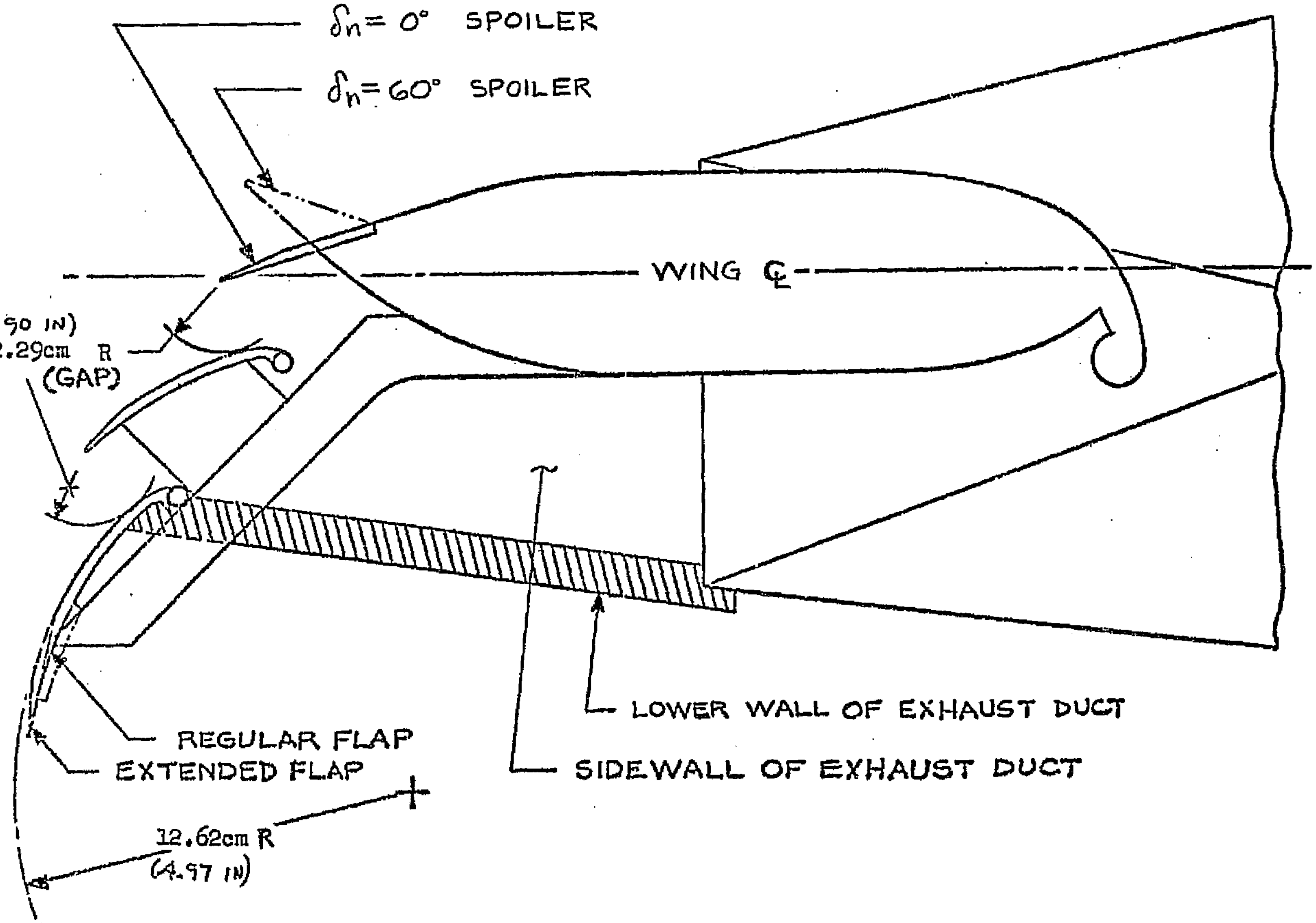

FIGURE 38 . SLOTTED COANDA FLAP-DETAIL

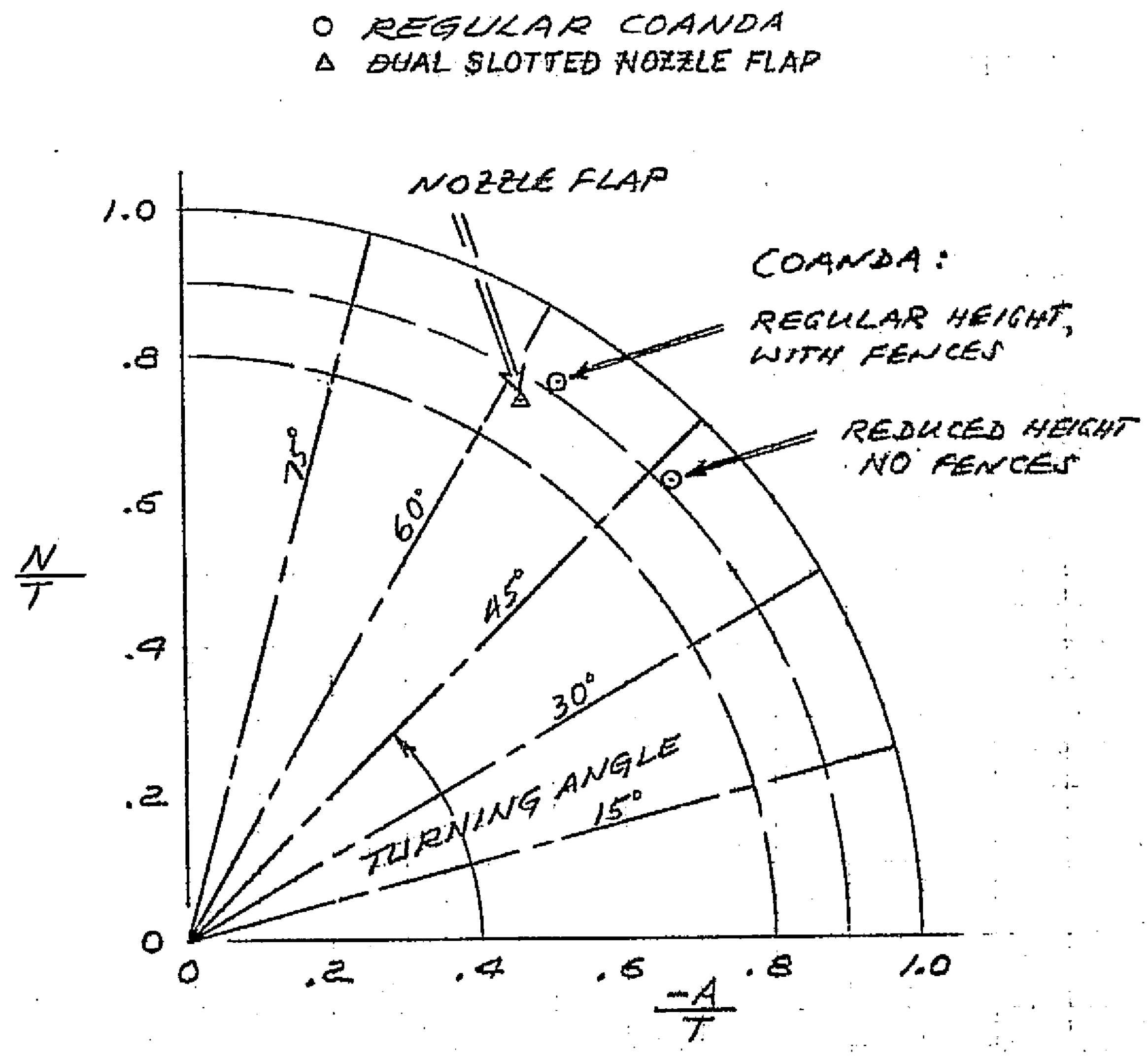

FIGURE 39. STATIC TEST DATA SUMMARY

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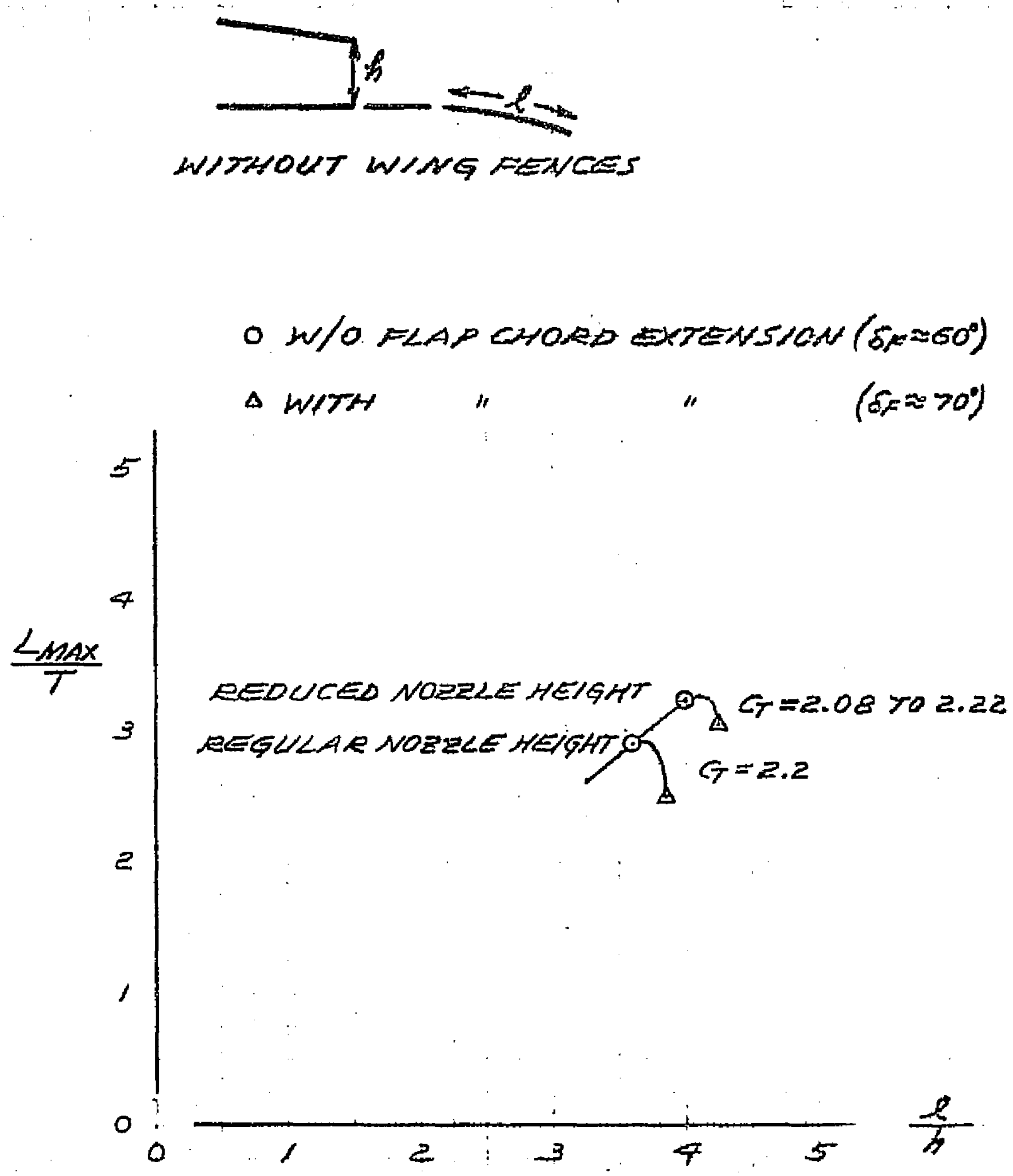


FIGURE 40. EFFECT OF CHORD EXTENSION

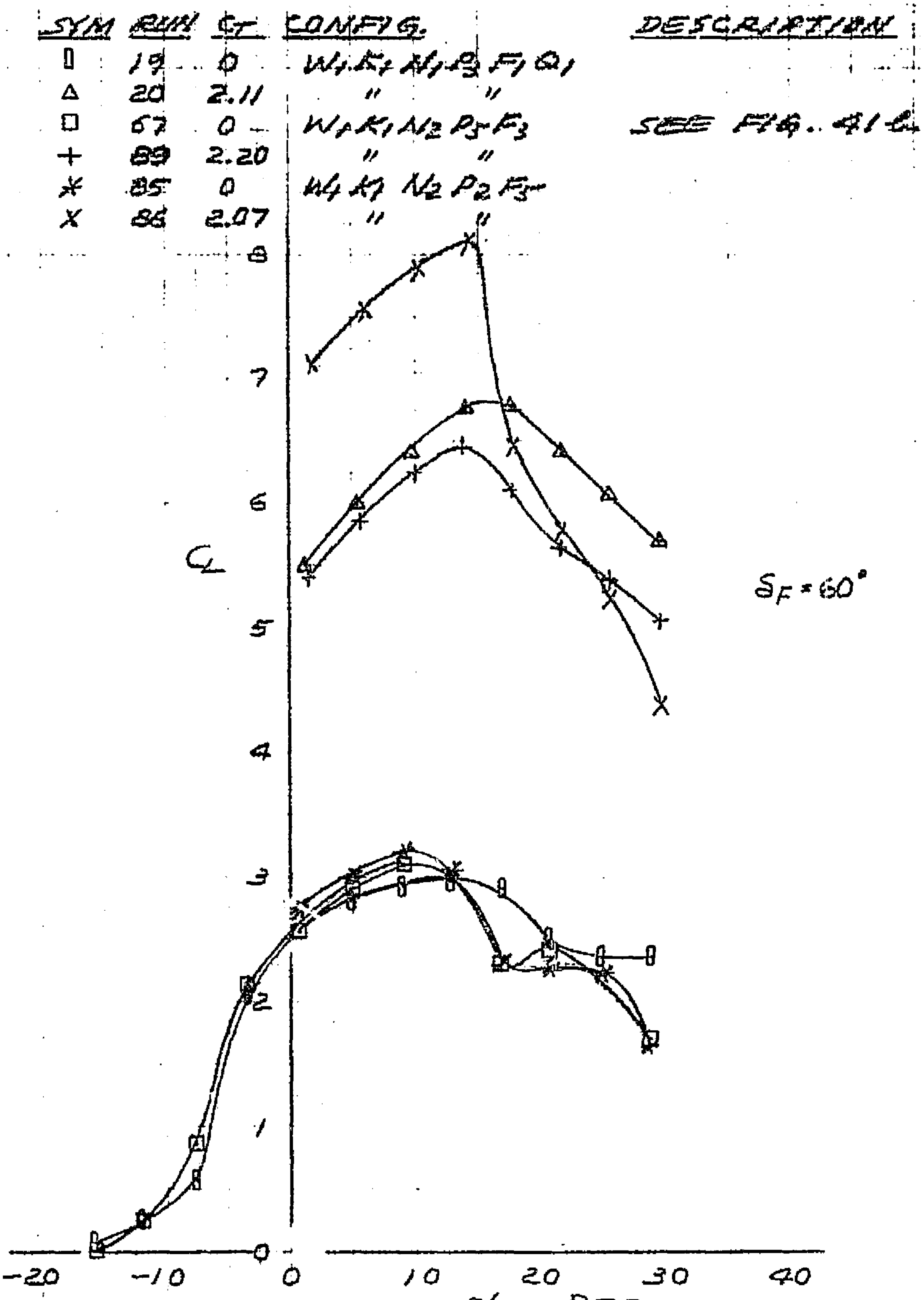


FIGURE 41 a. FLAP COMPARISON IN LIFT
FLAP WITHOUT CHORD EXTENSION

SYM	RUN	C_T	
0	19	0	COANDA FLAP, EXT'D NOZ, WING FENCES
△	20	2.11	" " "
□	67	0	DUAL SLOTTED NOZZLE FLAP W/O SIDEWALLS
+	89	2.20	" "
✳	85	0	EXTERNALLY BLOWN FLAP, REDUCED HEIGHT NOZZLE
×	86	2.07	

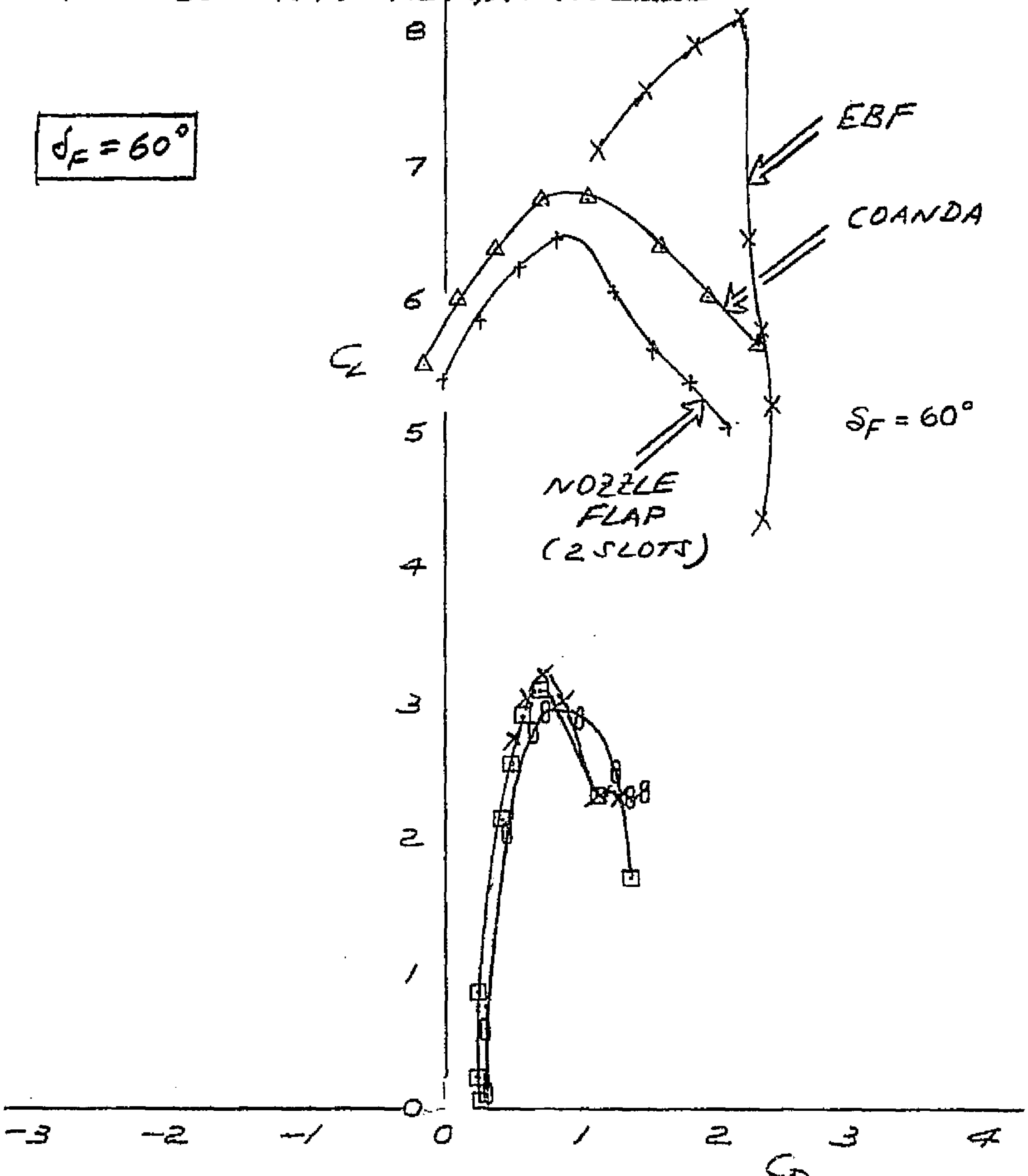


FIGURE 41b. FLAP COMPARISON IN DRAG
FLAP WITHOUT CHORD EXTENSION

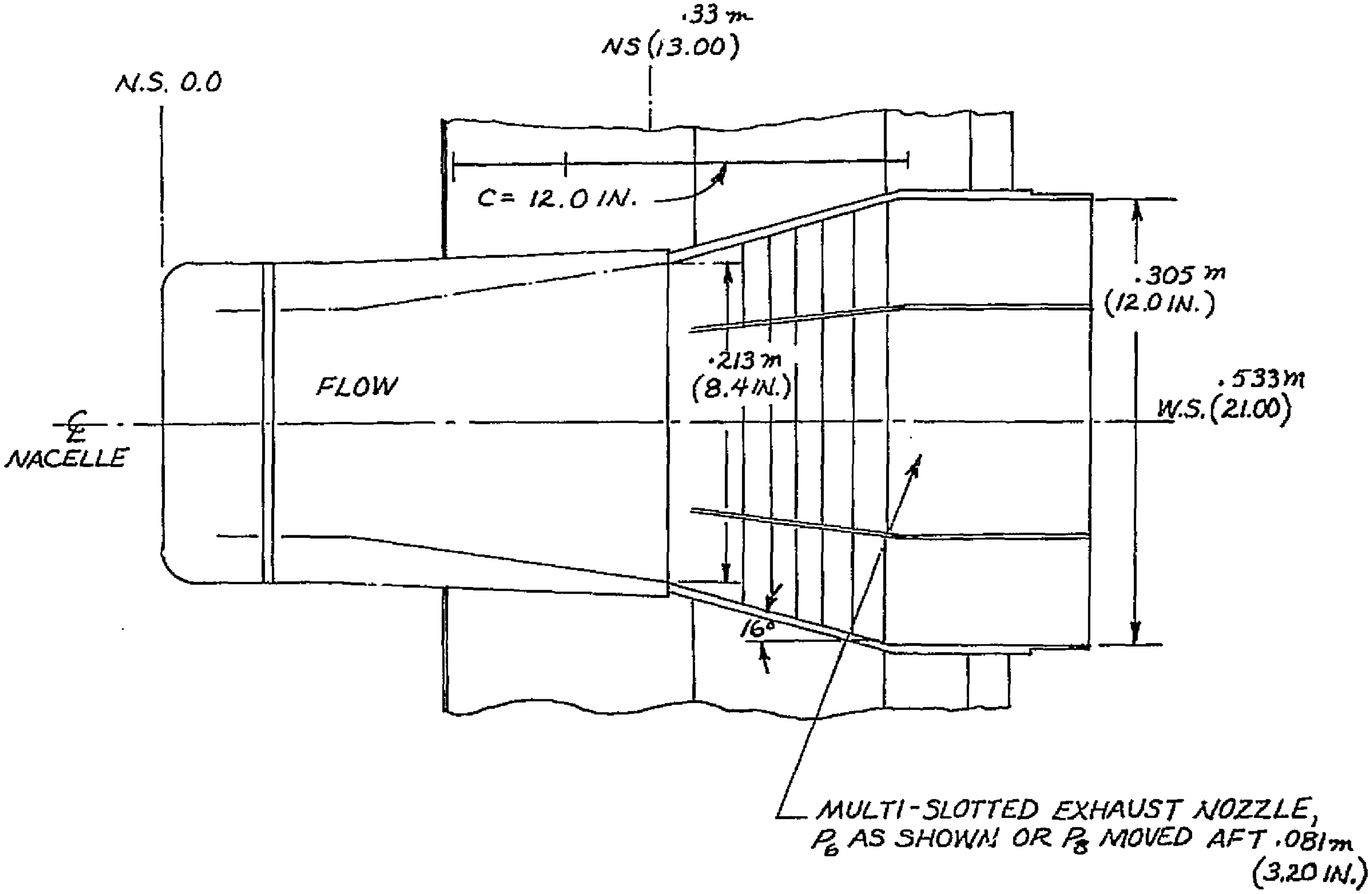


FIGURE 42. SKETCH SHOWING EXHAUST NOZZLE CONFIGURATION

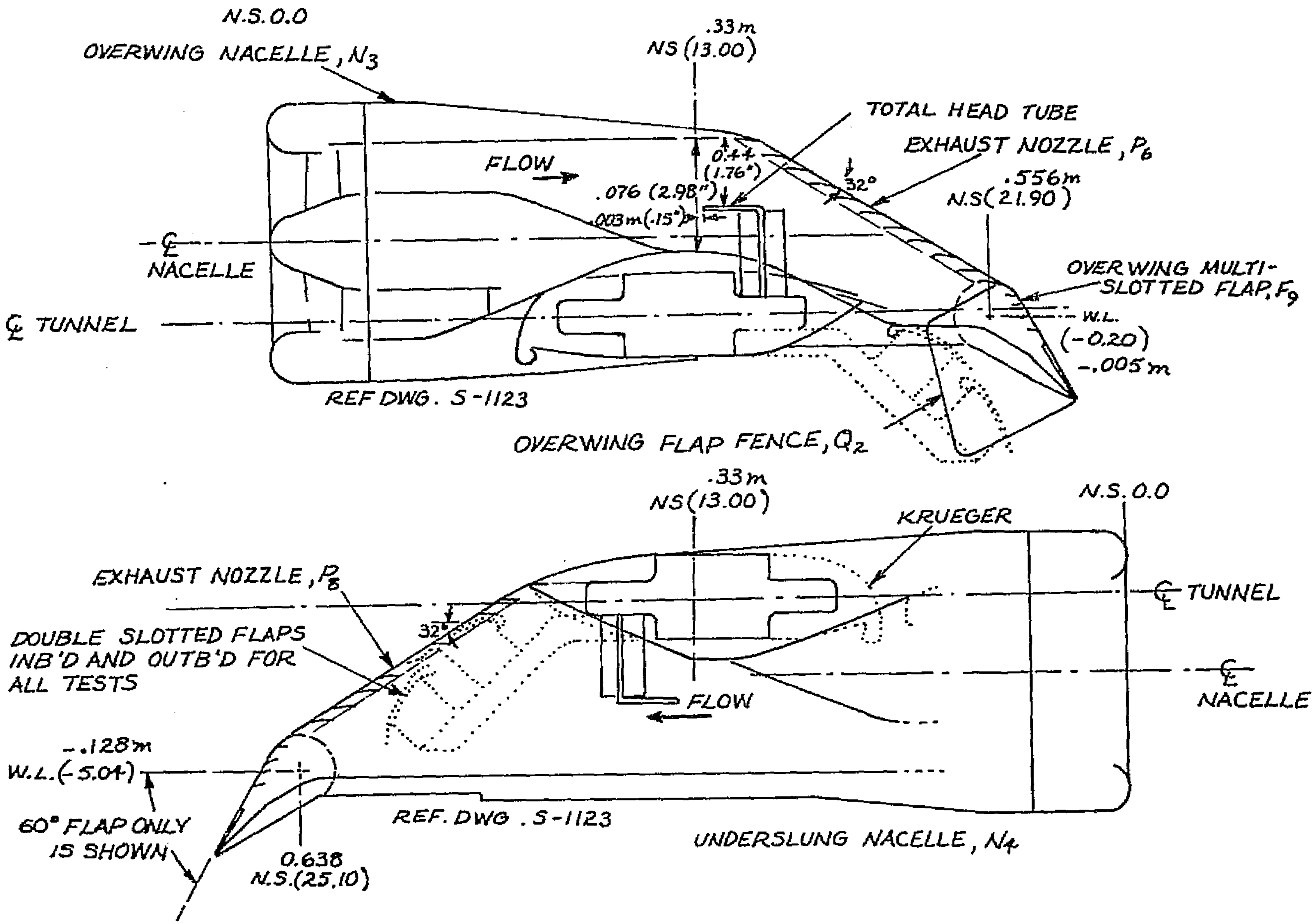
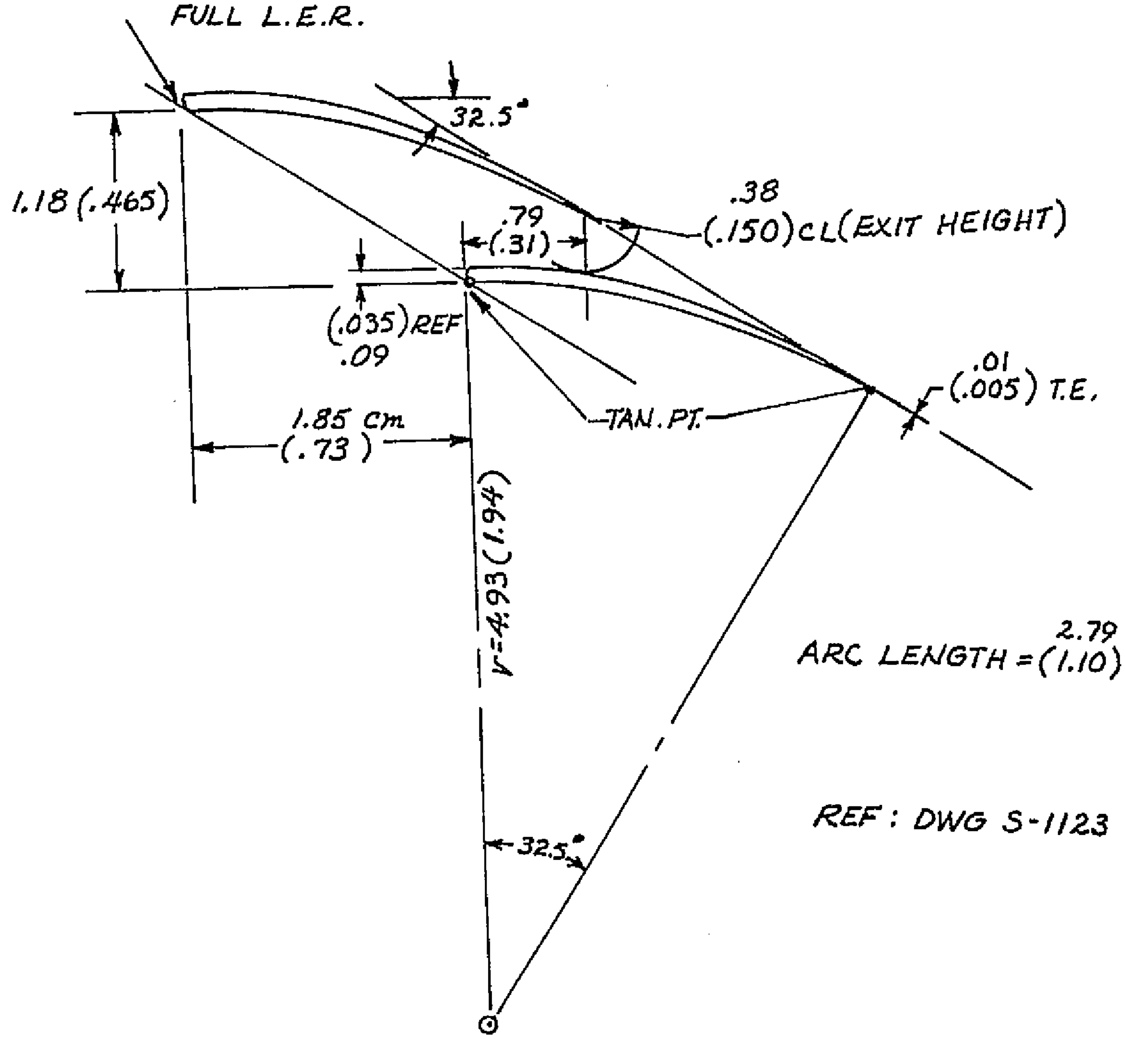


FIGURE 43. SKETCH SHOWING FLAP CONFIGURATIONS SIDE VIEW



NOTE: DIMENSIONS ARE IN CENTIMETERS (INCHES)

FIGURE 44. SKETCH SHOWING SLOT DETAIL FORWARD OF FLAP

T = STATIC REF THRUST ; $\delta_F = 0°$

RPM ≈ 35,900

○ OVERWING NACELLE ~ SLOTTED NOZZLE FLAP
□ UNDERSLUNG " " "

CURVED VANES

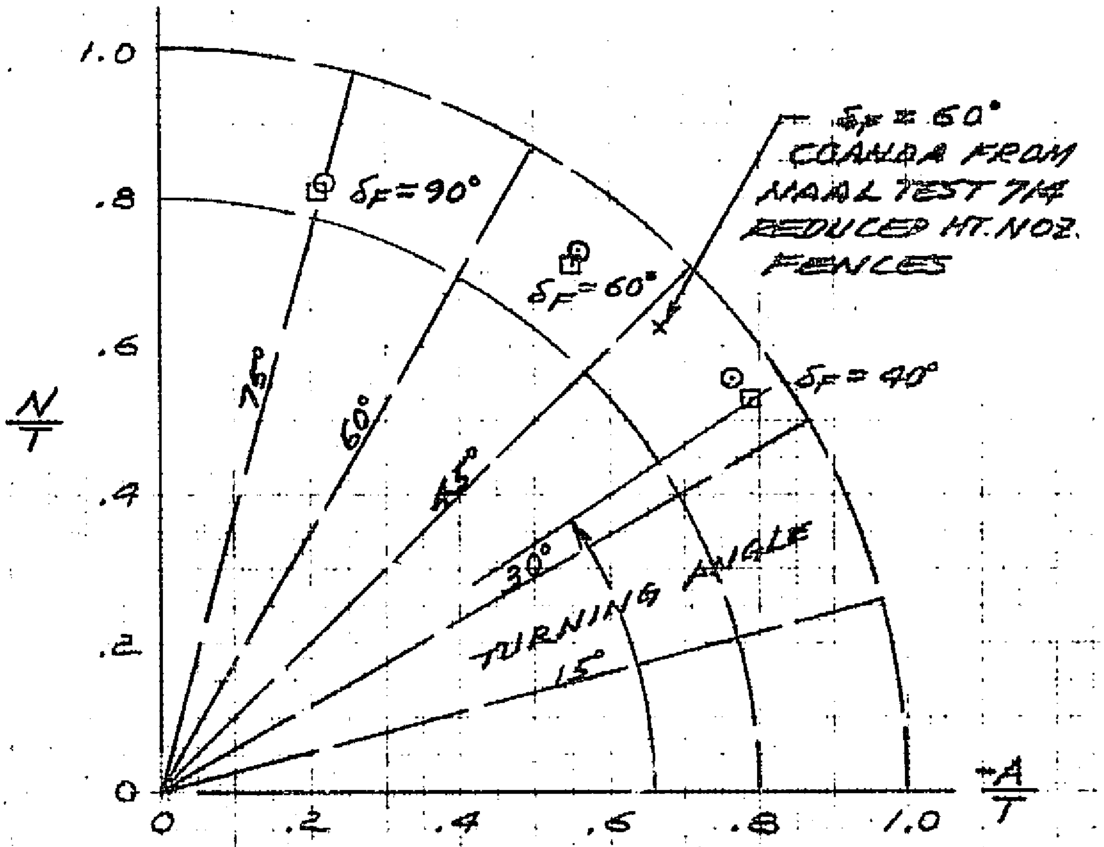


FIGURE 45. STATIC TEST SUMMARY ~ SCAVENGER INSTALLED

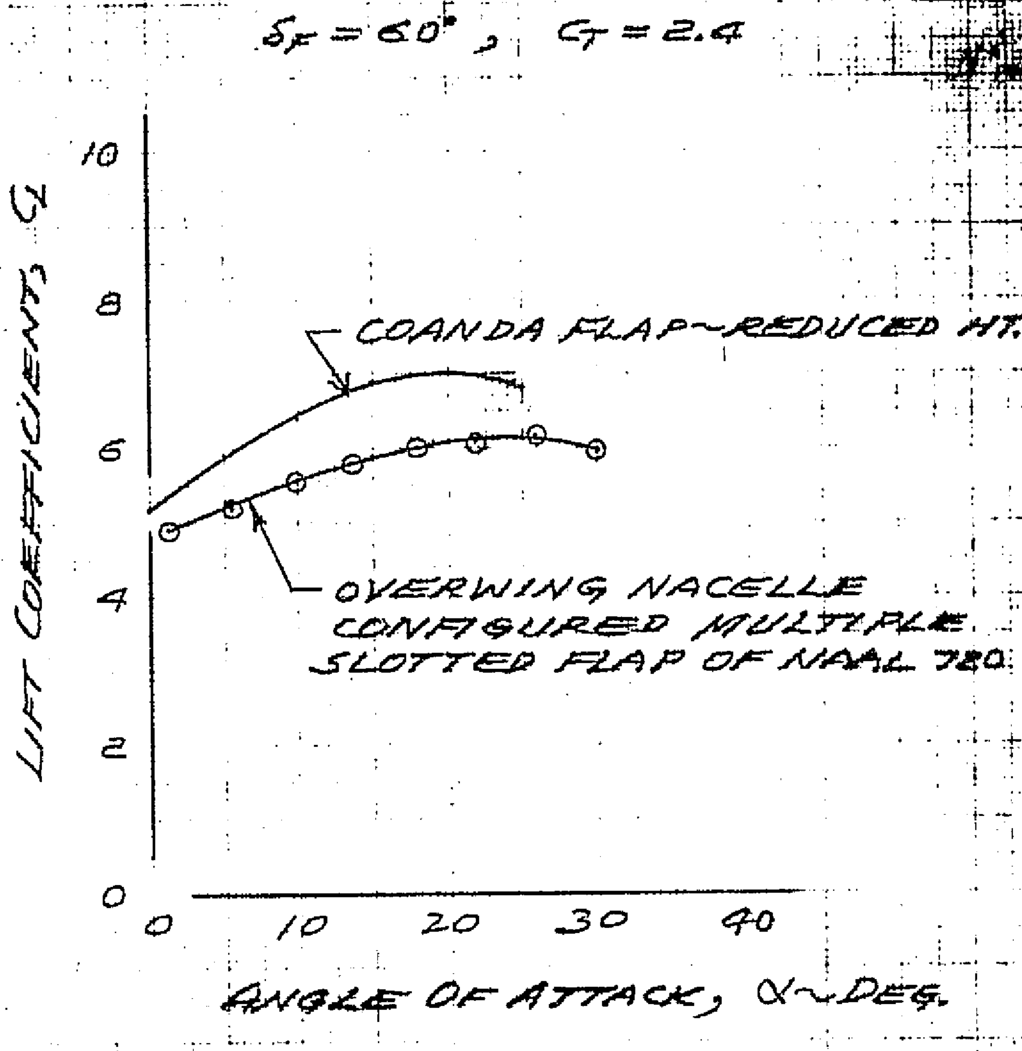


FIGURE 46. LIFT COMPARISON
AT FORWARD SPEED

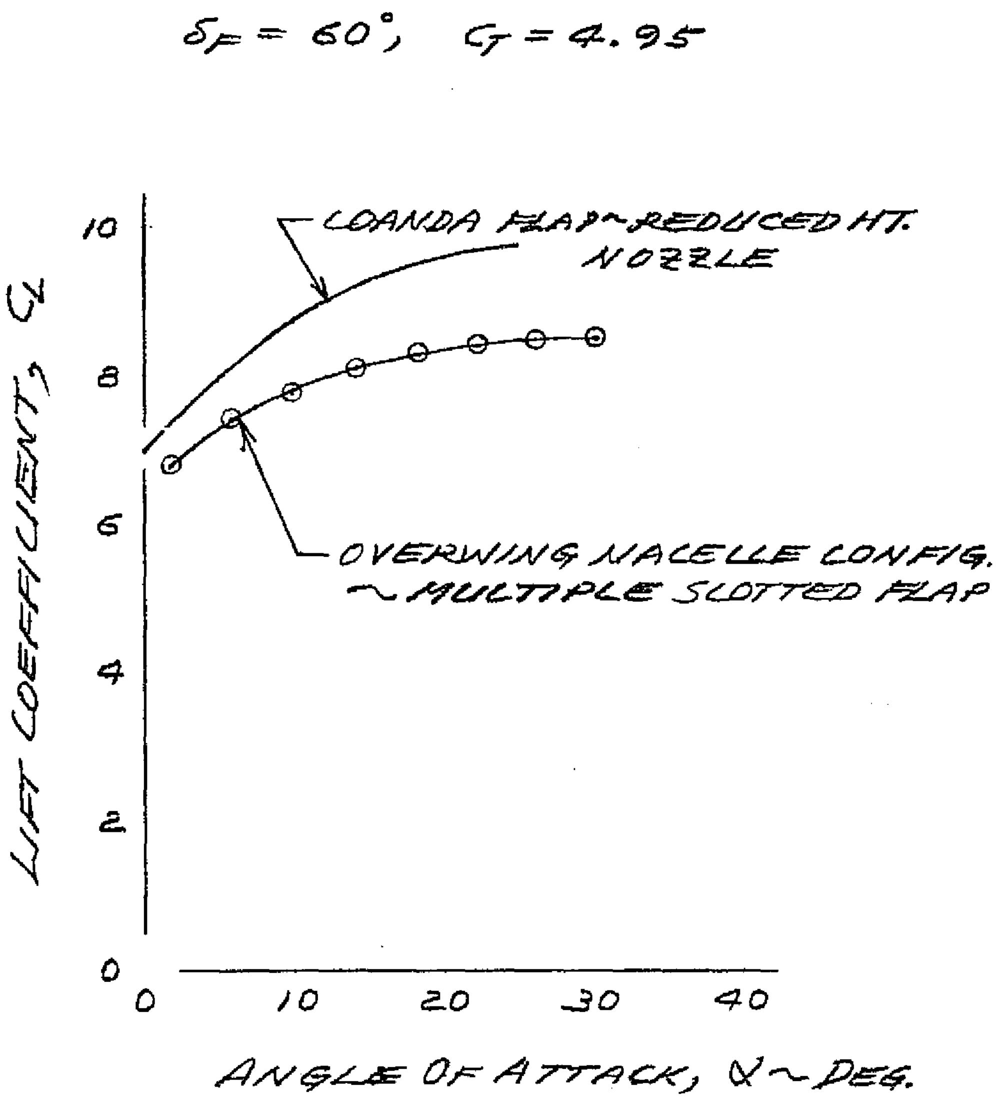


FIGURE 47. LIFT CURVE COMPARISON OF COANDA FLAP & MULTIPLE SLOTTED FLAP

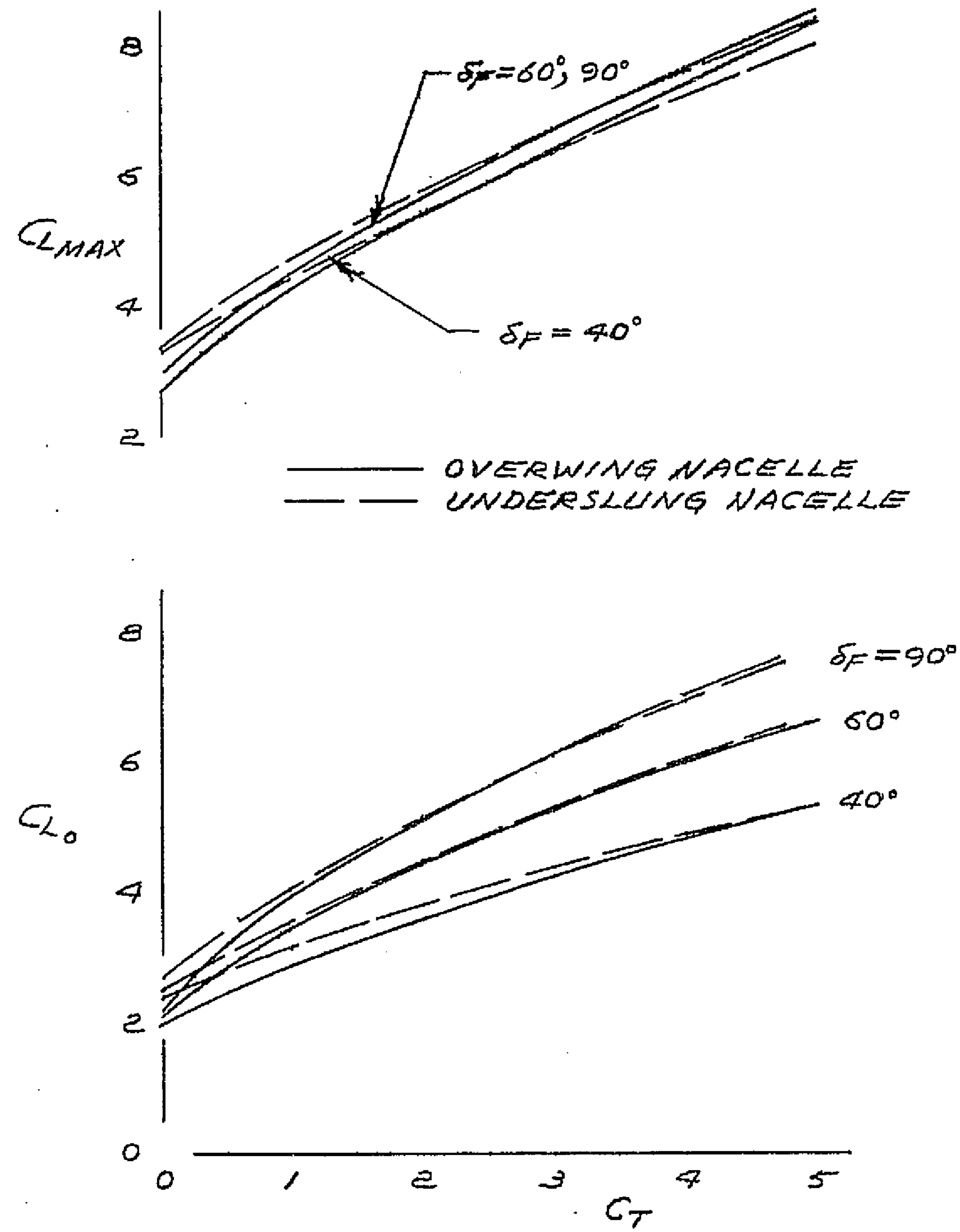


FIGURE 48. LIFT VARIATION WITH THRUST - OVERWING & UNDERSLUNG NACELLES

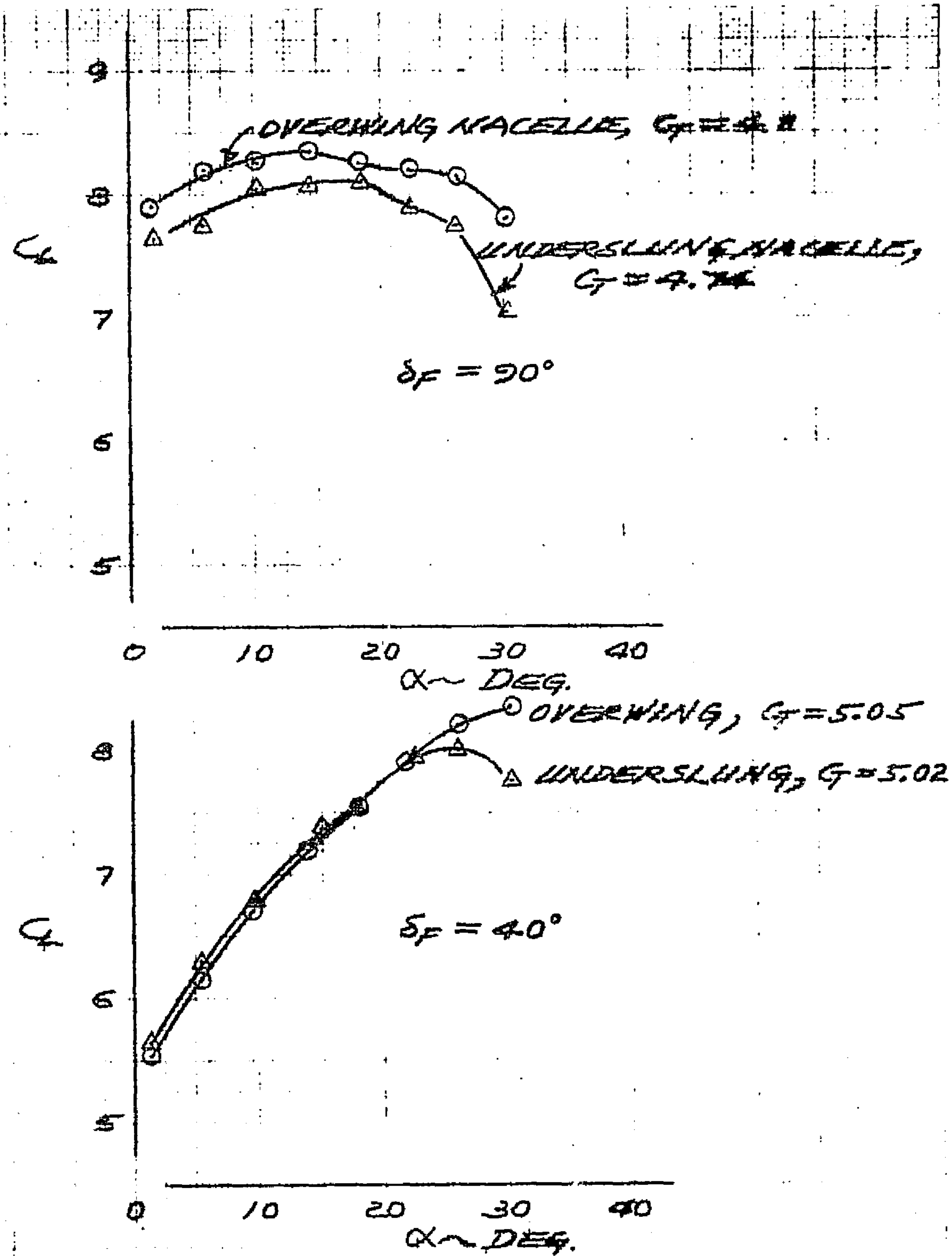


FIGURE 49. LIFT COMPARISON OF MULTIPLE SLOTTED FLAP CONFIGURATIONS

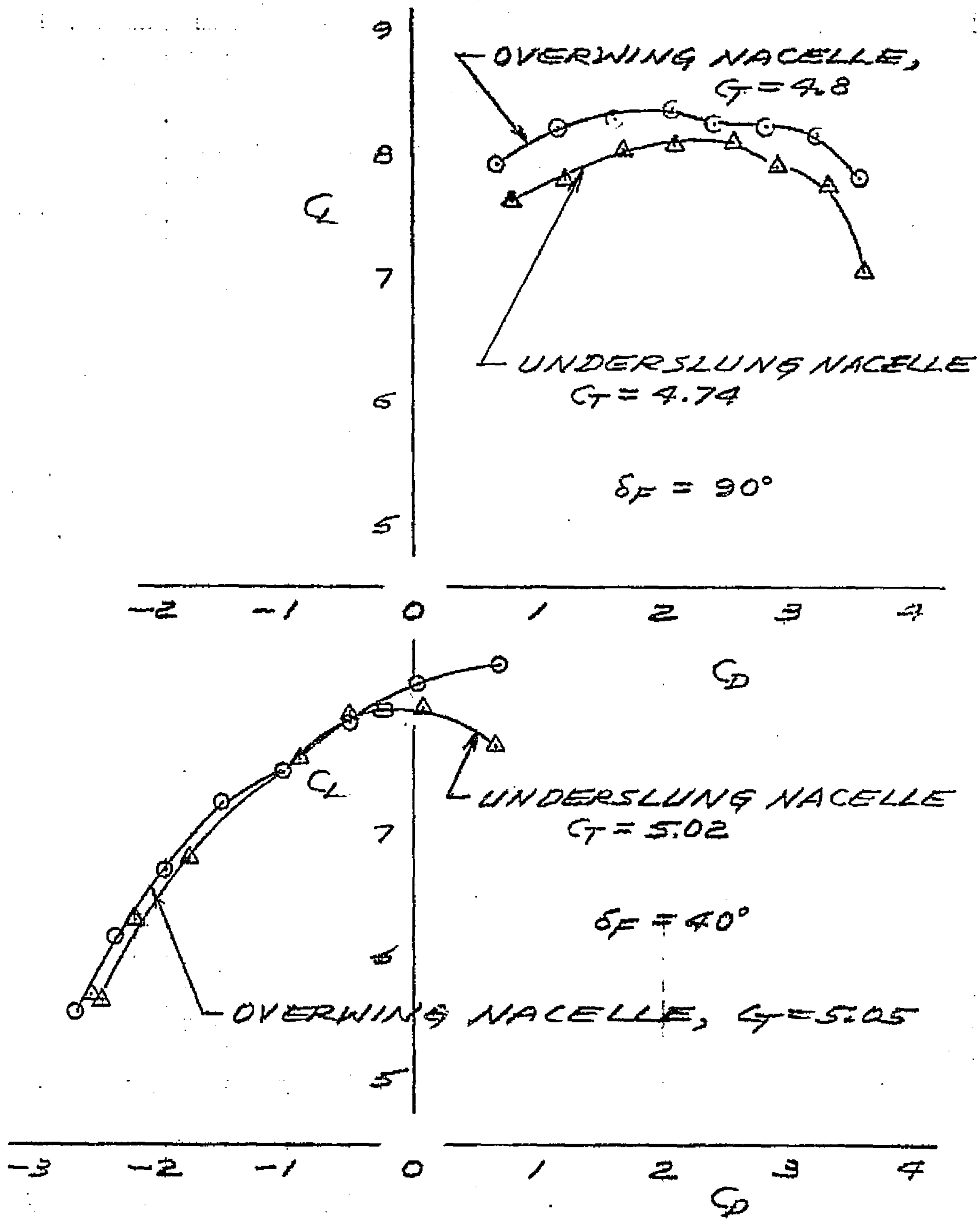


FIGURE 50. COMPARISON OF DRAG POLARS OF MULTIPLE SLOTTED FLAP CONFIGURATIONS

REQUIRED THRUST LEVEL FOR A STOL AIRCRAFT WEIGHING 48000 LBS

The required thrust level strongly depends on the aircraft weight, takeoff distance, number of engines, wing loading and safety ground rules. A four engine design with engine failure at the critical moment, and having a maneuver margin of n = 1.2 after engine failure, results in field lengths characteristics presented in figure 51. This figure shows balanced field lengths as a function of thrust/weight ratio, T/W, and wing loading, W/S. Herein, T denotes the installed thrust before engine failure. The data include a two seconds time delay for decision and a one second additional time delay for the brakes to be fully deployed in case of the aborted takeoff. A deceleration of 1/2 g was used for the braking. For the continued takeoff and one engine failed, a rotation time of 1 second was used before maximum tolerated normal acceleration was achieved during the initial pull up and after the liftoff speed was obtained. The maximum normal acceleration was limited by the requirement that no speed decrease is allowed during the climb. Target height at the end of the runway is 10.67m (35 ft). The figure is based on the partially slotted nozzle flap concept described above and based on optimized flap angles varying from 42° to 52°. Using W/S = 5434 N/m^2, (113.5 lbs/ft^2), a field length of 610m (2000 ft) and an aircraft weight of 213500N (48000 lbs), the figure yields.

Four Engine Aircraft:

T/W = .534

T = 114000N (25632 lbs) total

The flight path for the four engine design is presented in figure 52 for a normal full power operation and for an engine failed operation. With full power, the climbout is 8.8° after the target height is reached at a takeoff distance of 529m (1735 ft). Reducing the total thrust to 88900N (19993 lbs) in normal operation after the target height is reached yields a 3.7° climb angle.

It should be noted that with a slightly higher T/W ratio a large reduction in field length can be obtained.

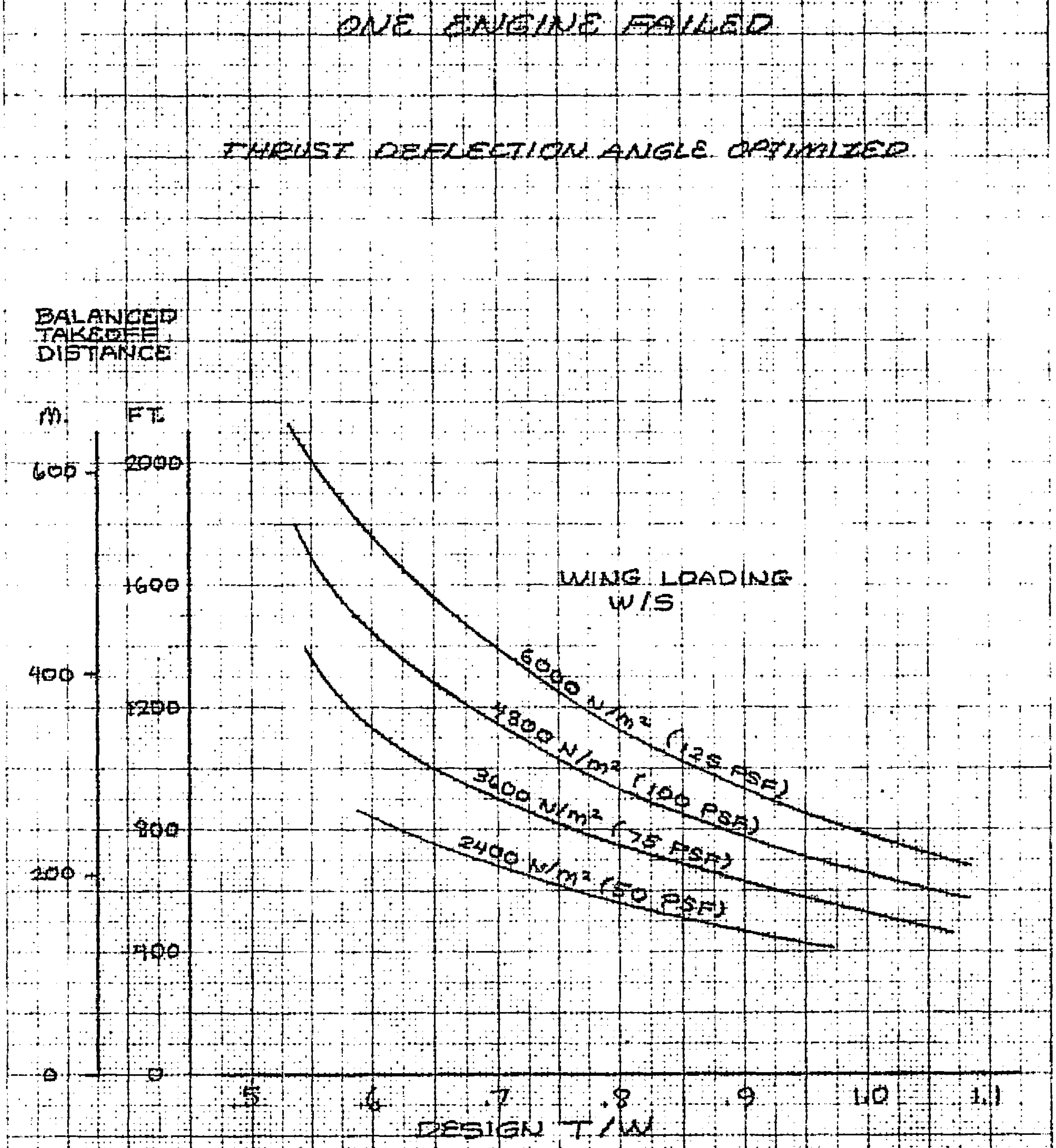


FIGURE 51. BALANCED FIELD LENGTH OF A FOUR ENGINE AIRCRAFT USING PARTIALLY SLOTTED NOZZLE FLAPS

FOUR ENGINE AIRCRAFT

PARTIALLY SLOTTED EXHAUST

$W/S = 5462 N/m^2$ (113.5 PSF)
$T/W = .534$
$\delta_F = 53°$

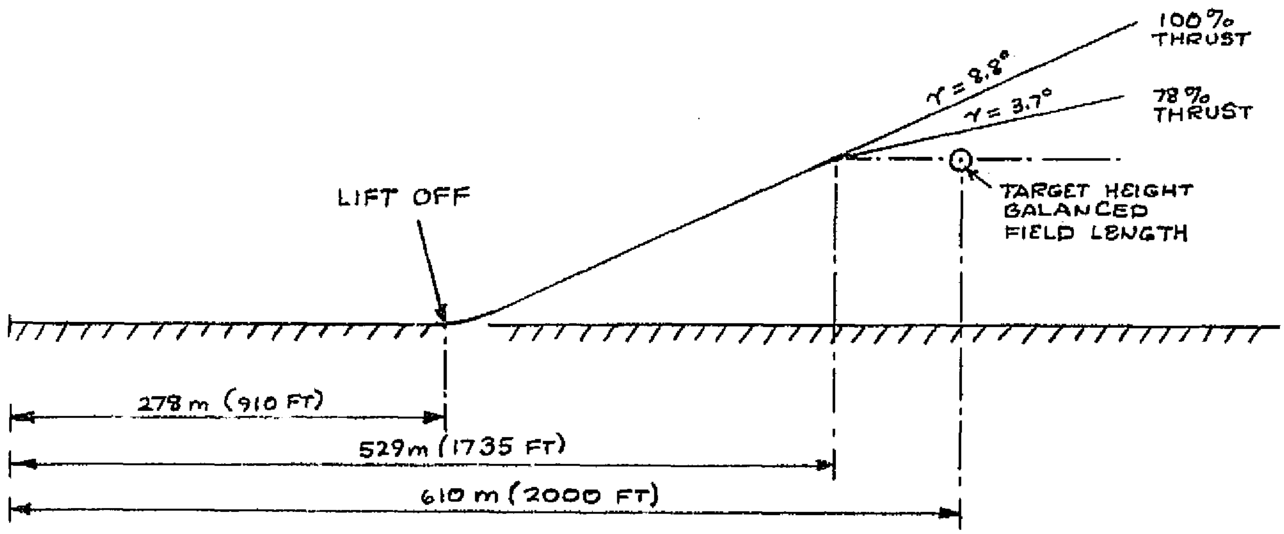


FIGURE 52. NORMAL TAKEOFF FLIGHT PROFILE WITH AND WITHOUT THRUST CUTBACK AT 35 FT. ALTITUDE.

CONCLUSIONS

Static turning angles are about the same for the three multislotted nozzle configurations tested.

The experimental determination of the thrust at zero flap angle (or flaps removed) for reference purposes is impossible for the multislotted flaps because they are an integral part of the nozzle. A reliable turning efficiency is difficult to determine for this reason.

The split flow nozzle is advantageous over the seven slotted nozzle at all flap settings tested (90°/60°, 60°/60°, 40°/40°) in generating greater lift at forward speed ($C_T > 0$).

The data also indicate that the split flow nozzle at $C_T = 2$ and 60°/60° flap setting produces slightly less drag then the seven slotted nozzle at the same lift coefficients, resulting in a somewhat steeper climb angle.

The nozzle flaps can be deflected to a large angle without significant loss in lift because the multiplicity of slots delays boundary layer separation. Large flap deflections can be used for thrust vector location which is required to provide sufficient overall drag to prevent the aircraft from increasing speed when the glid path is steep and the dynamic pressure low. Therefore, nozzle flaps appear to be viable aerodynamic drag modulation devices for landing.

No abrupt stalling characteristics are noted for any of the three nozzle arrangements.

The two Coanda types ("regular" and "slotted Coanda") were found to be similar aerodynamically with the slotted Coanda having a smaller overall flap chord.

REFERENCES

1. D.J. Renselaer: Aerodynamic Comparison of Three Different STOL Powered Lift Flaps Based on R.I. Wind Tunnel Data, NA-73-893, Rockwell International (LAAD), 1975.

2. W.H. Decker: Draft Report on NASA Measurements on Quiet Propulsion Lift Scale Models, TFD-73-1565, Rockwell International (LAAD), revised February 12, 1974.

3. D.J. Renselaer: Model Specification for Aerodynamic Testing of Multi-Slotted Flap Wing Upper Surface Blowing, TFD-74-279, Rockwell International (LAAD), 1974.

4. D.J. Renselaer: Analysis of a Powered Multiple Slotted Upper Surface Blown Flap in the Rockwell International Low Speed Wind Tunnel, NA-74-211, Rockwell International (LAAD), 1975.

5. D.J. Renselaer: A Comparison of Aerodynamic Test Data of Upper Surface Blown Flaps With Single and Multiple Thrust Exhausts, NA-74-324, Rockwell International (LAAD), 1974.

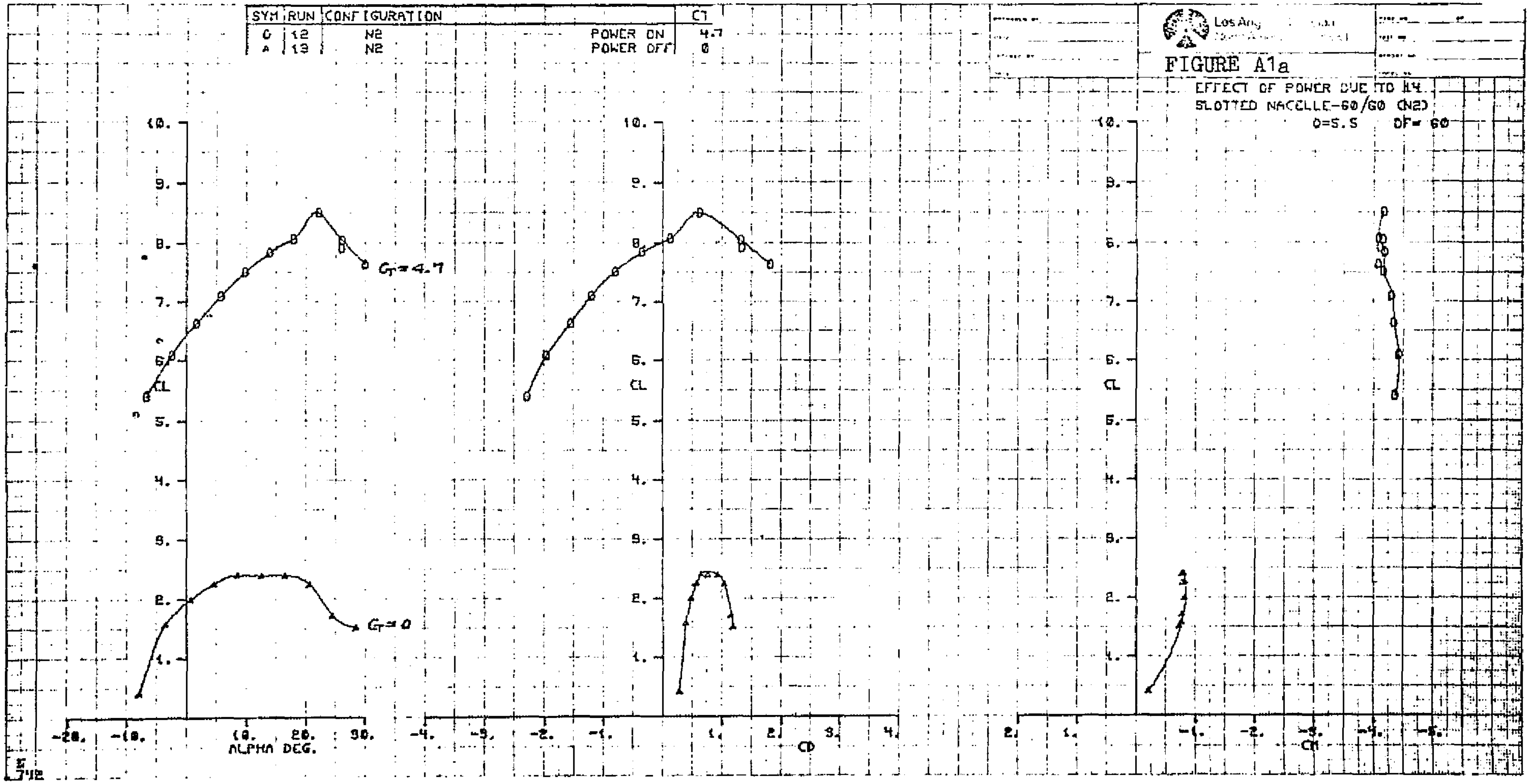
6. B.L. Kern: Preliminary Summary for NAAL Propulsive Lift Model Acoustic Test #2, TFD-74-307, Rockwell International, March 1974.

APPENDIX A

MACHINE PLOTS OF EXPERIMENTAL DATA

This appendix presents machine plots of the wind tunnel test results from NAAL 742. The plotted data are presented in the following forms: (a) lift coefficient (C_L) versus angle of attack (α), lift coefficient (C_L) versus drag coefficient (C_D) and lift coefficient (C_L) versus pitching moment coefficient (C_m) and (b) lift to thrust ratio (L/T) versus drag to thrust ratio (D/T), L/T versus α , D/T versus α and M/T.C versus α . Thrusts used here are static reference thrusts ($\delta_N/\delta_F = 0°/0°$) presented in figures 18, 19 and 20 of the main text. Figures A1 through A7 present machine plots.

Figure No.	Title
A1 a,b	Effect of power due to 14 slotted nacelle - 60°/60°
A2 a,b	Effect of power due to 7 slotted nacelle - 90°/60°
A3 a,b	Effect of power due to 7 slotted nacelle - 60°/60°
A4 a,b	Effect of power due to 7 slotted nacelle - 40°/40°
A5 a,b	Effect of power due to split flow nacelle - 90°/60°
A6 a,b	Effect of power due to split flow nacelle - 60°/60°
A7 a,b	Effect of power due to split flow nacelle - 40°/40°


SYM RUN CONFIGURATION CT
O 12 N2 POWER ON 4.7
Δ 13 N2 POWER OFF 0
FIGURE A1a
EFFECT OF POWER DUE TO 14
SLOTTED NACELLE-60/60 (N2)
D=5.5 DF= 60
CL
ALPHA DEG.
CD
CM
$C_T = 4.7$
$C_T = 0$

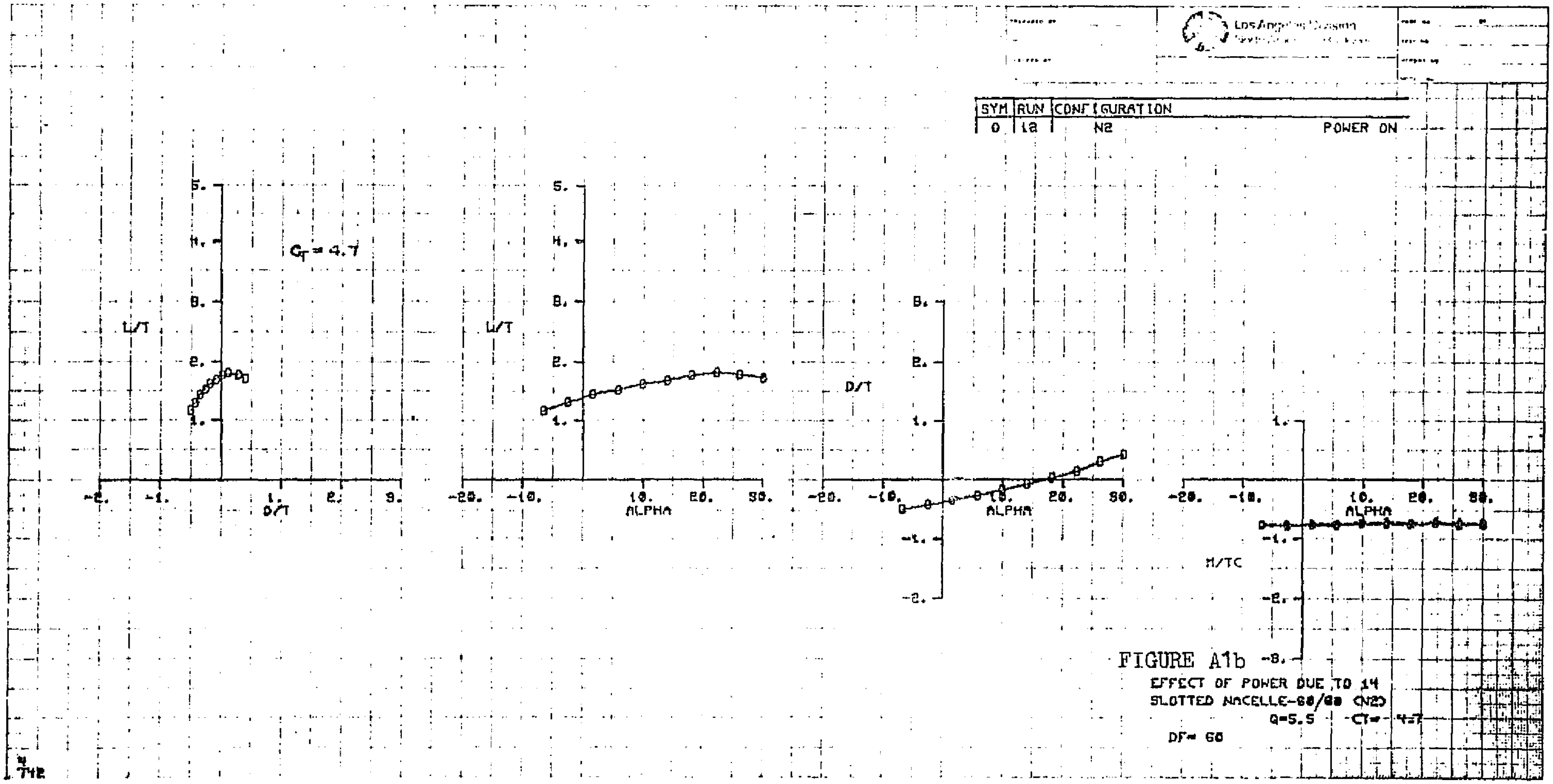
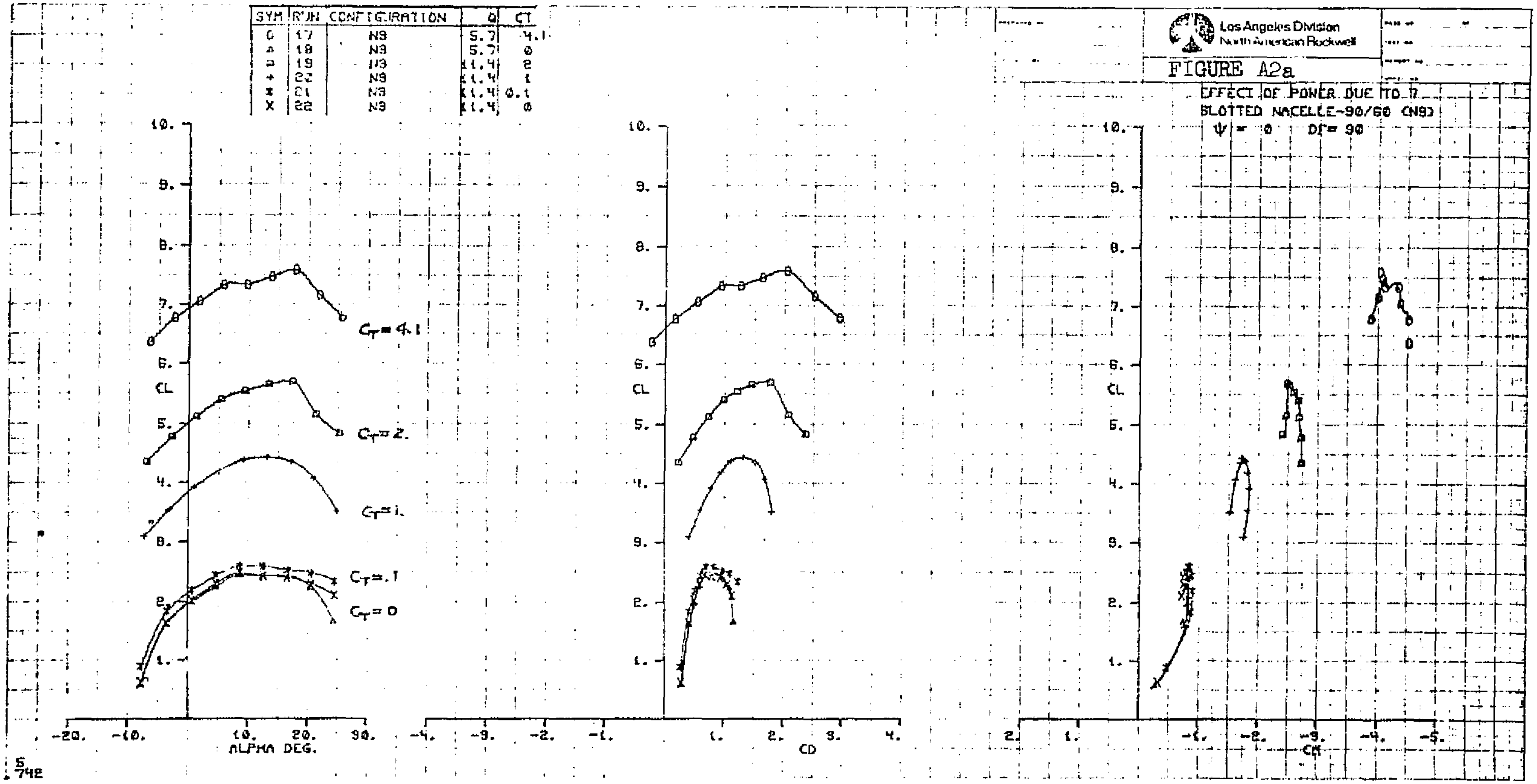


FIGURE A1b
EFFECT OF POWER DUE TO 14
SLOTTED NACELLE-60/60 (N2)
Q=5.5 CT= 4.7
DF= 60


SYM RUN CONFIGURATION Q CT
17 N9 5.7 4.1
18 N9 5.7 0
19 N9 11.4 2
22 N9 11.4 1
21 N9 11.4 0.1
22 N9 11.4 0
Los Angeles Division
North American Rockwell
FIGURE A2a
EFFECT OF POWER DUE TO
SLOTTED NACELLE-90/60 (N9)
ψ = 0 DF = 90
CL
ALPHA DEG.
CD
CM
C_T= 4.1
C_T= 2.
C_T= 1.
C_T= .1
C_T= 0

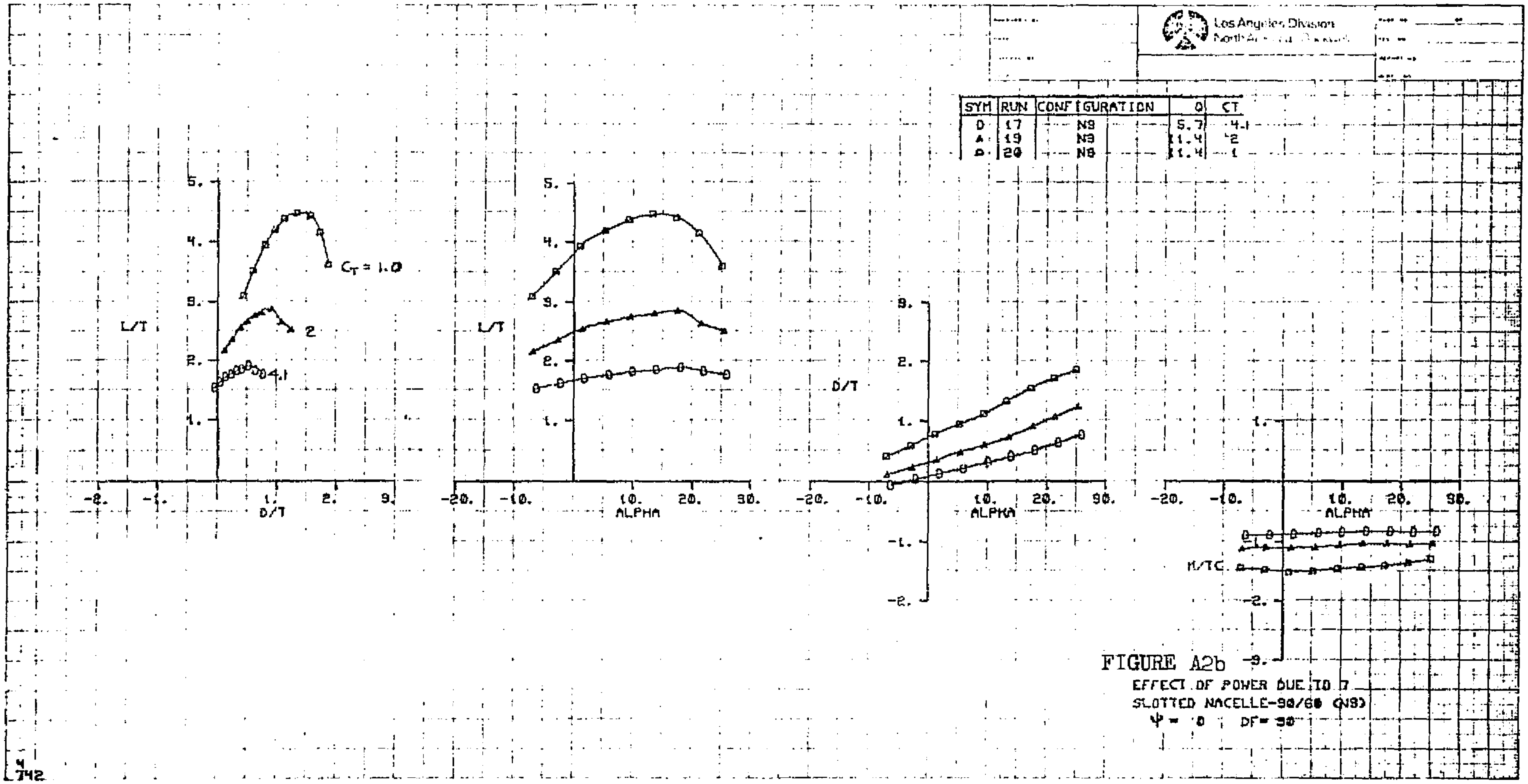
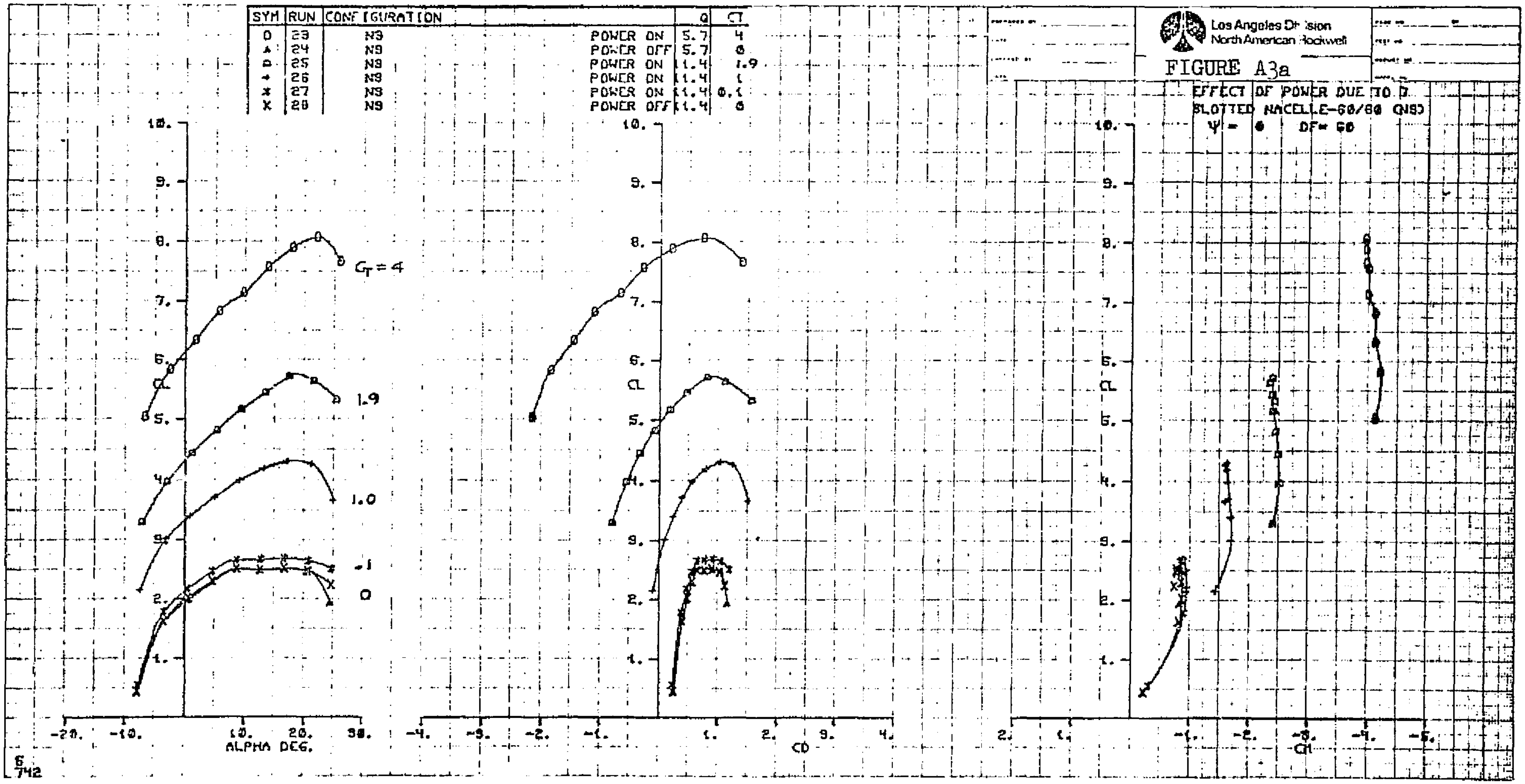


FIGURE A2b
EFFECT OF POWER DUE TO 7
SLOTTED NACELLE-90/60 (N9)
ψ = 0 ; DF = 30


SYM RUN CONFIGURATION Q CT
O 23 N9 POWER ON 5.7 4
▲ 24 N9 POWER OFF 5.7 0
◻ 25 N9 POWER ON 1.4 1.9
+ 26 N9 POWER ON 1.4 1
* 27 N9 POWER ON 1.4 0.1
X 28 N9 POWER OFF 1.4 0
Los Angeles Division
North American Rockwell
FIGURE A3a
EFFECT OF POWER DUE TO Q
SLOTTED NACELLE-60/60 (N9)
Ψ = 0 DF= 60
$C_T = 4$
1.9
1.0
.1
O
CL
ALPHA DEG.
CD
CM

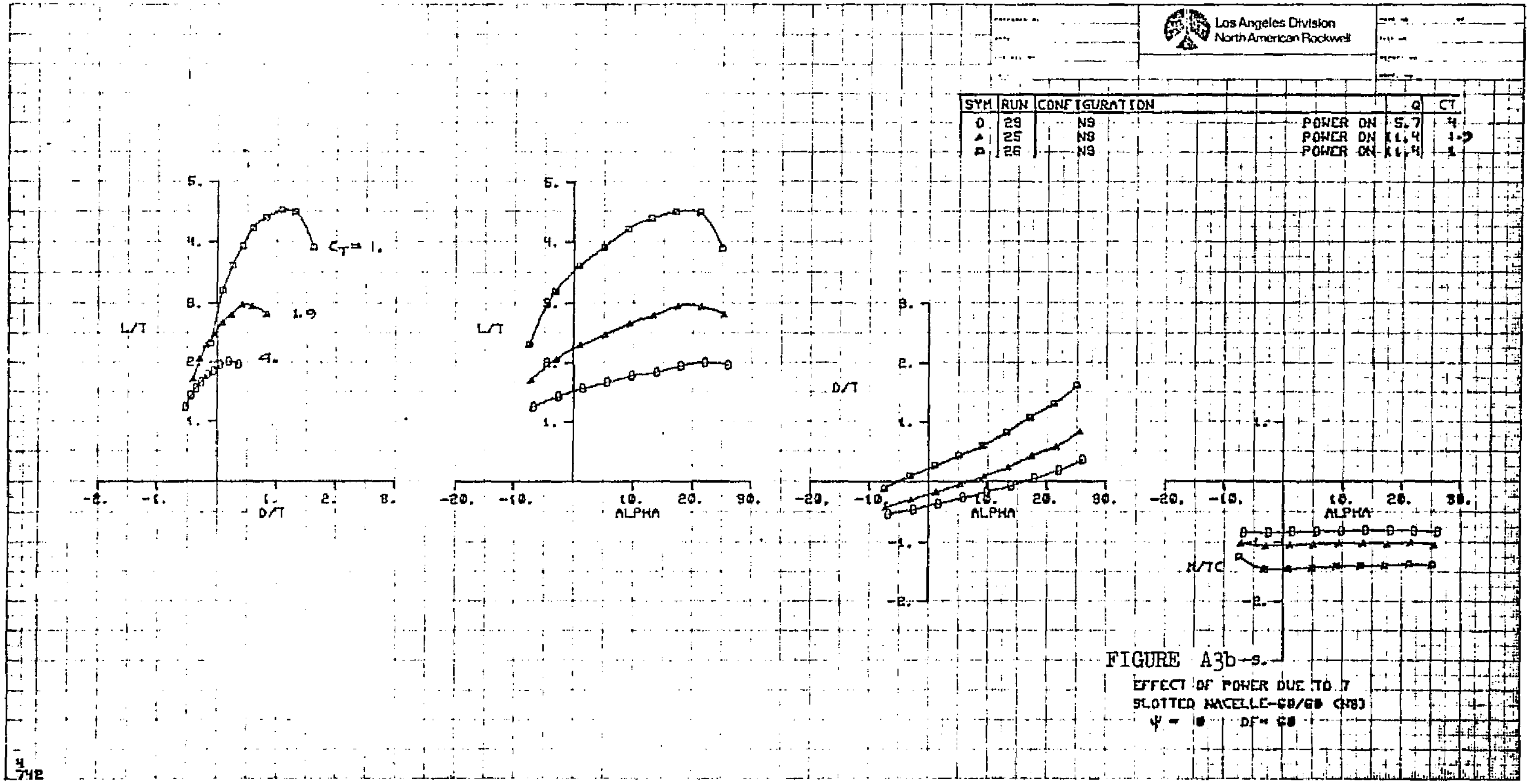
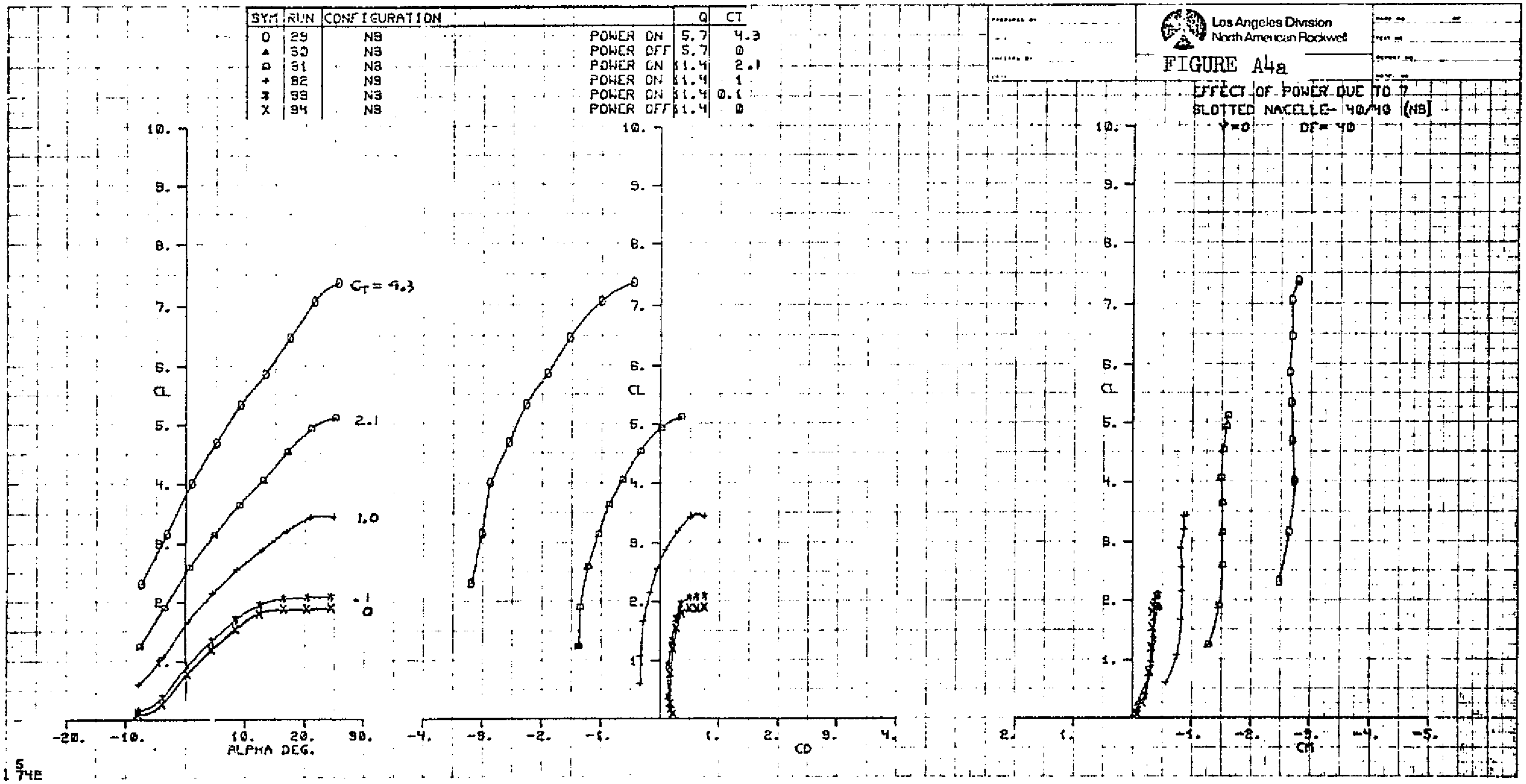


FIGURE A3b-9.
EFFECT OF POWER DUE TO 7
SLOTTED NACELLE-60/60 (N9)
ψ = 0 DF= 60


SYM RUN CONFIGURATION Q CT
O 29 N3 POWER ON 5.7 4.3
▲ 30 N3 POWER OFF 5.7 0
□ 31 N3 POWER ON 1.4 2.1
+ 32 N9 POWER ON 1.4 1
33 N3 POWER ON 1.4 0.1
X 34 N3 POWER OFF 1.4 0
Los Angeles Division
North American Rockwell
FIGURE A4a
EFFECT OF POWER DUE TO 17
SLOTTED NACELLE- 40/40 (N3)
Y=0 DF= 40
CL
ALPHA DEG.
CD
CM
C_T = 4.3
2.1
1.0
.1
0

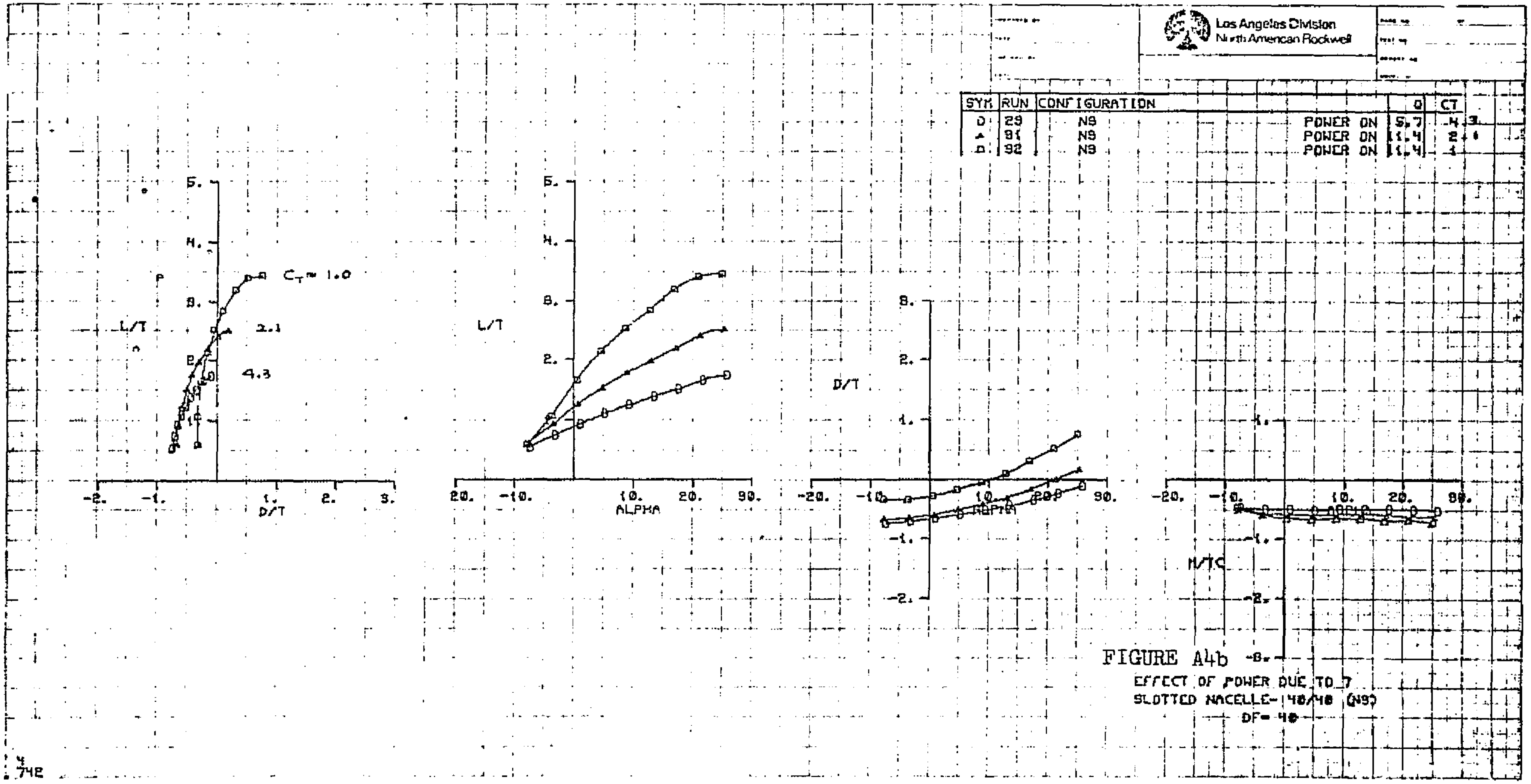


FIGURE A4b
EFFECT OF POWER DUE TO 7
SLOTTED NACELLE- 140/140 (N9)
DF= 40

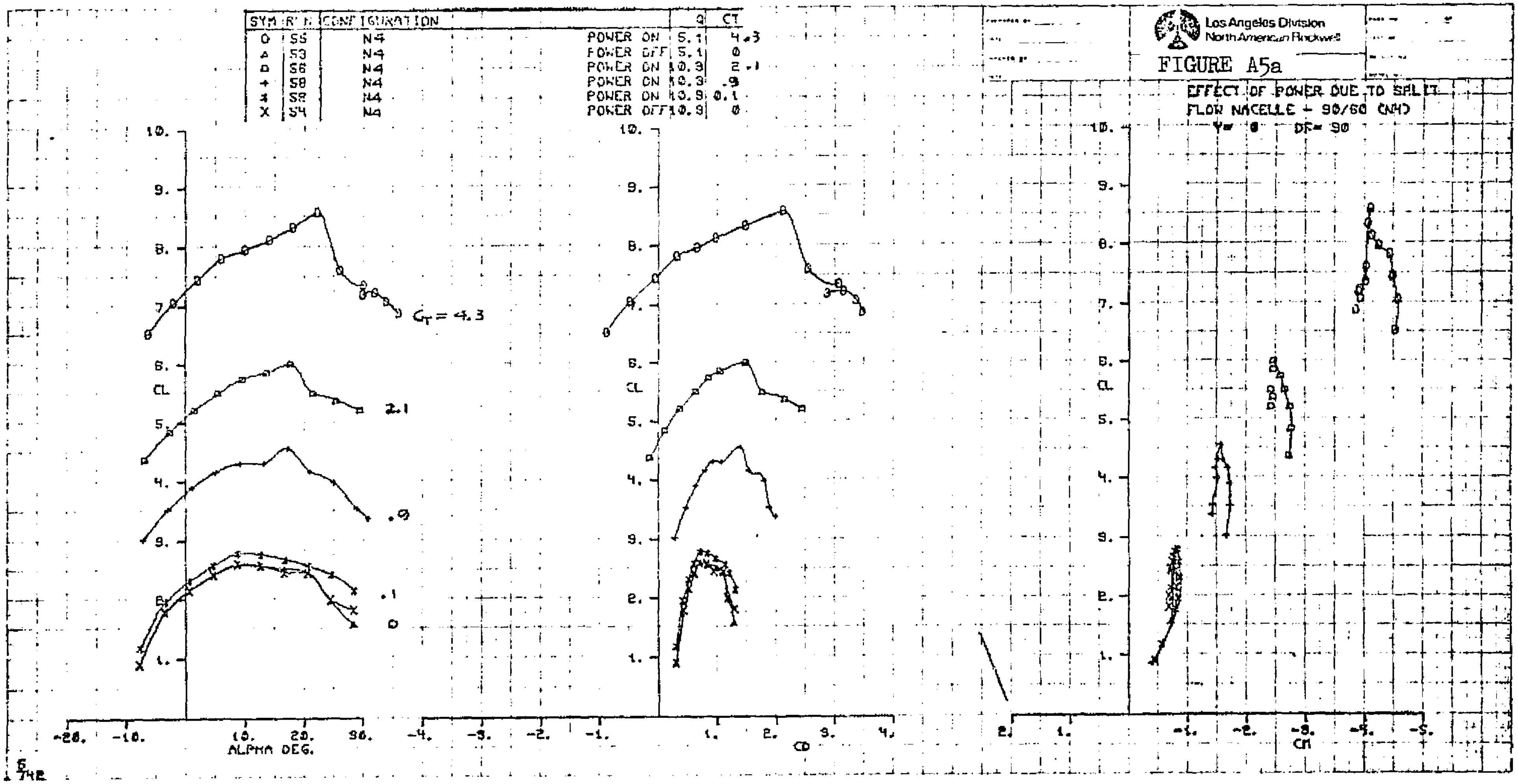
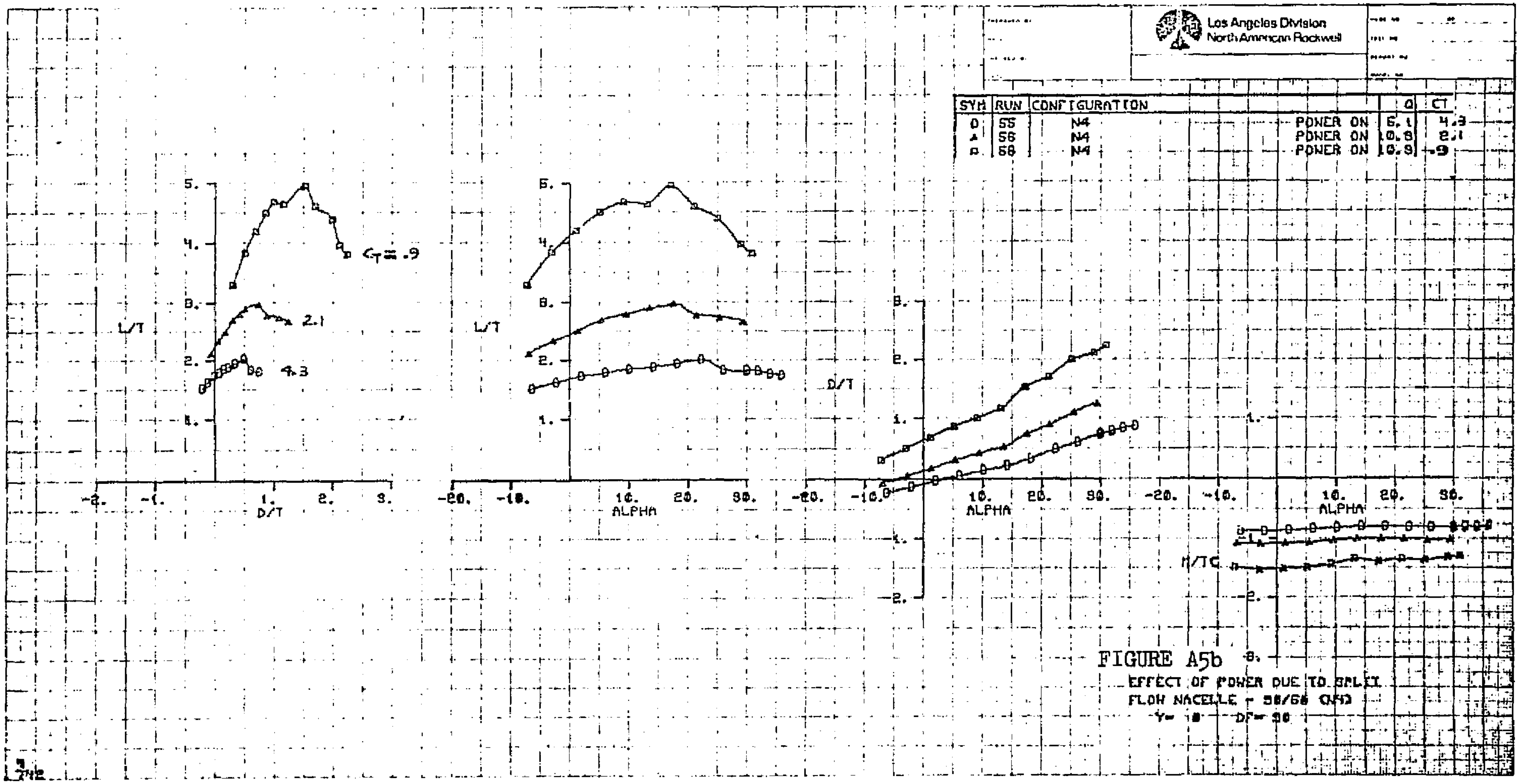


FIGURE A5a

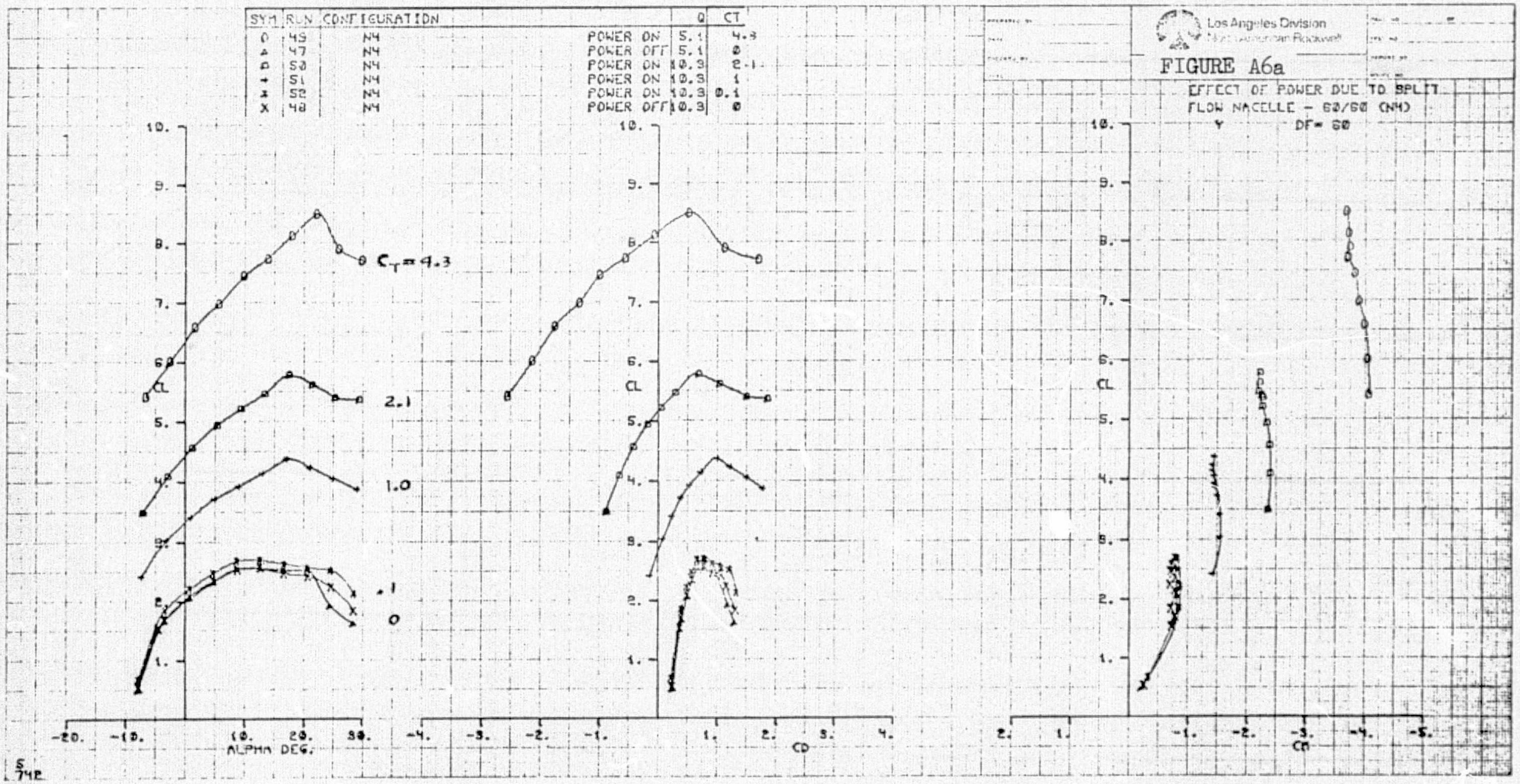
EFFECT OF POWER DUE TO SPLIT FLOW NACELLE + 90/60 (N4)

Y= 0 DF= 90



SYM	RUN	CONFIGURATION		Q	CT
o	55	N4	POWER ON	6.1	4.3
△	56	N4	POWER ON	10.8	2.1
□	58	N4	POWER ON	10.9	.9

FIGURE A5b
EFFECT OF POWER DUE TO SPLIT
FLOW NACELLE - 58/66 GFD
Y= 0 DF= 50


SYM RUN CONFIGURATION Q CT
49 N4 POWER ON 5.1 4.3
47 N4 POWER OFF 5.1 0
50 N4 POWER ON 10.3 2.1
51 N4 POWER ON 10.3 1
52 N4 POWER ON 10.3 0.1
48 N4 POWER OFF 10.3 0
Los Angeles Division
North American Rockwell
FIGURE A6a
EFFECT OF POWER DUE TO SPLIT
FLOW NACELLE - 60/60 (N4)
DF= 60
C_T = 4.3
2.1
1.0
.1
0
CL
ALPHA DEG.
CD
CM

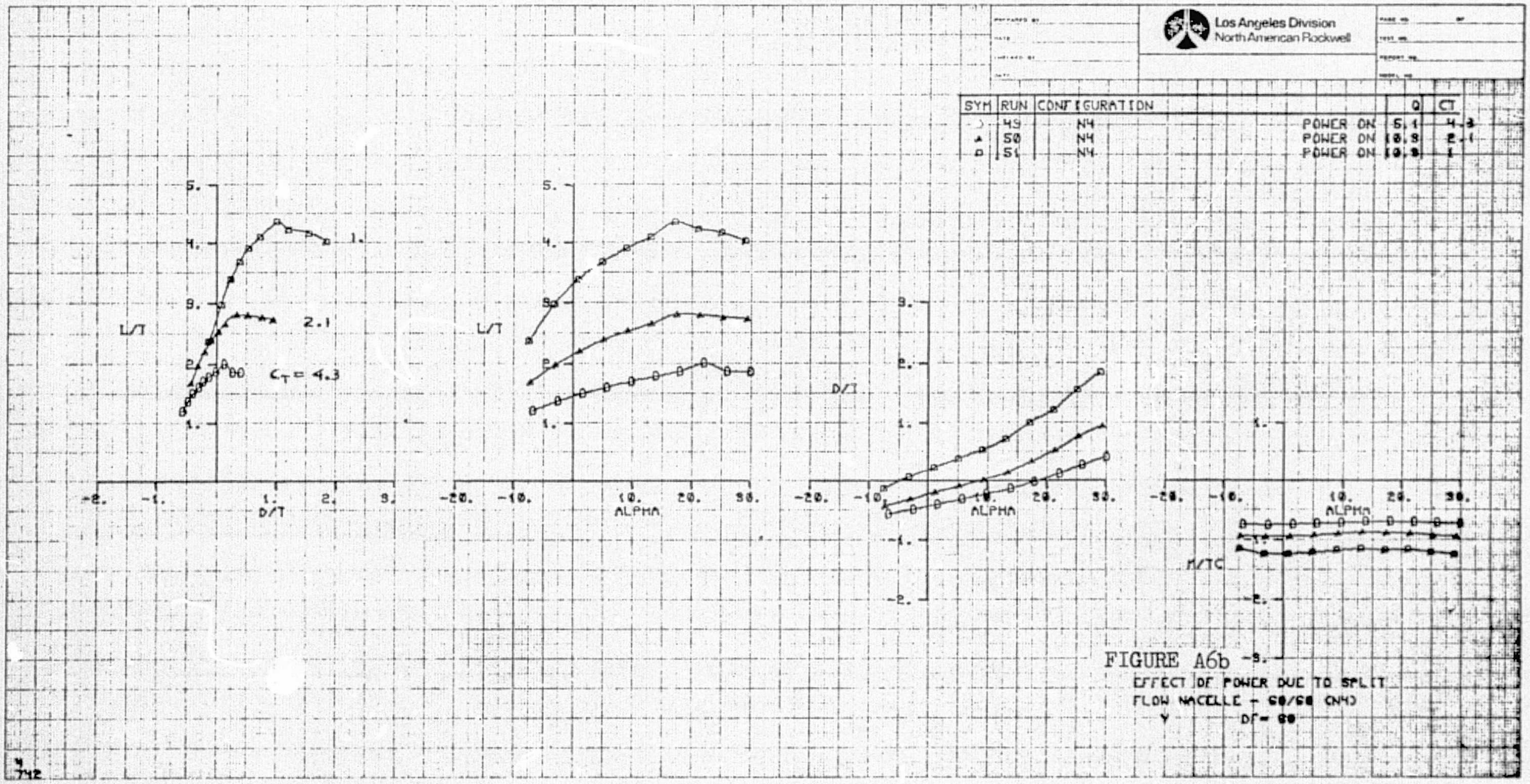


FIGURE A6b
EFFECT OF POWER DUE TO SPLIT
FLOW NACELLE - 60/60 (N4)
Y DF= 60

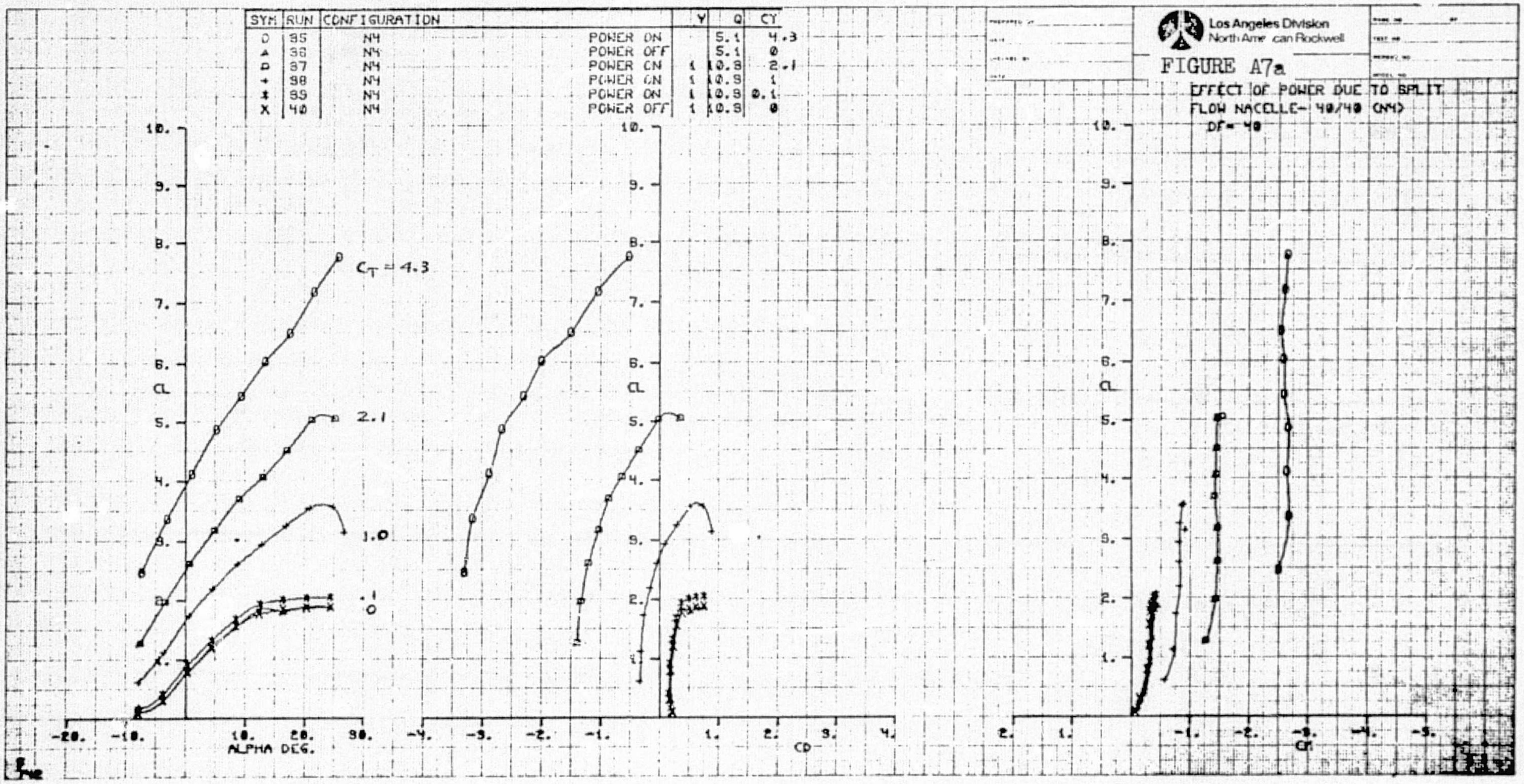


FIGURE A7a
EFFECT OF POWER DUE TO SPLIT FLOW NACELLE- 40/40 (N4)
DF= 40

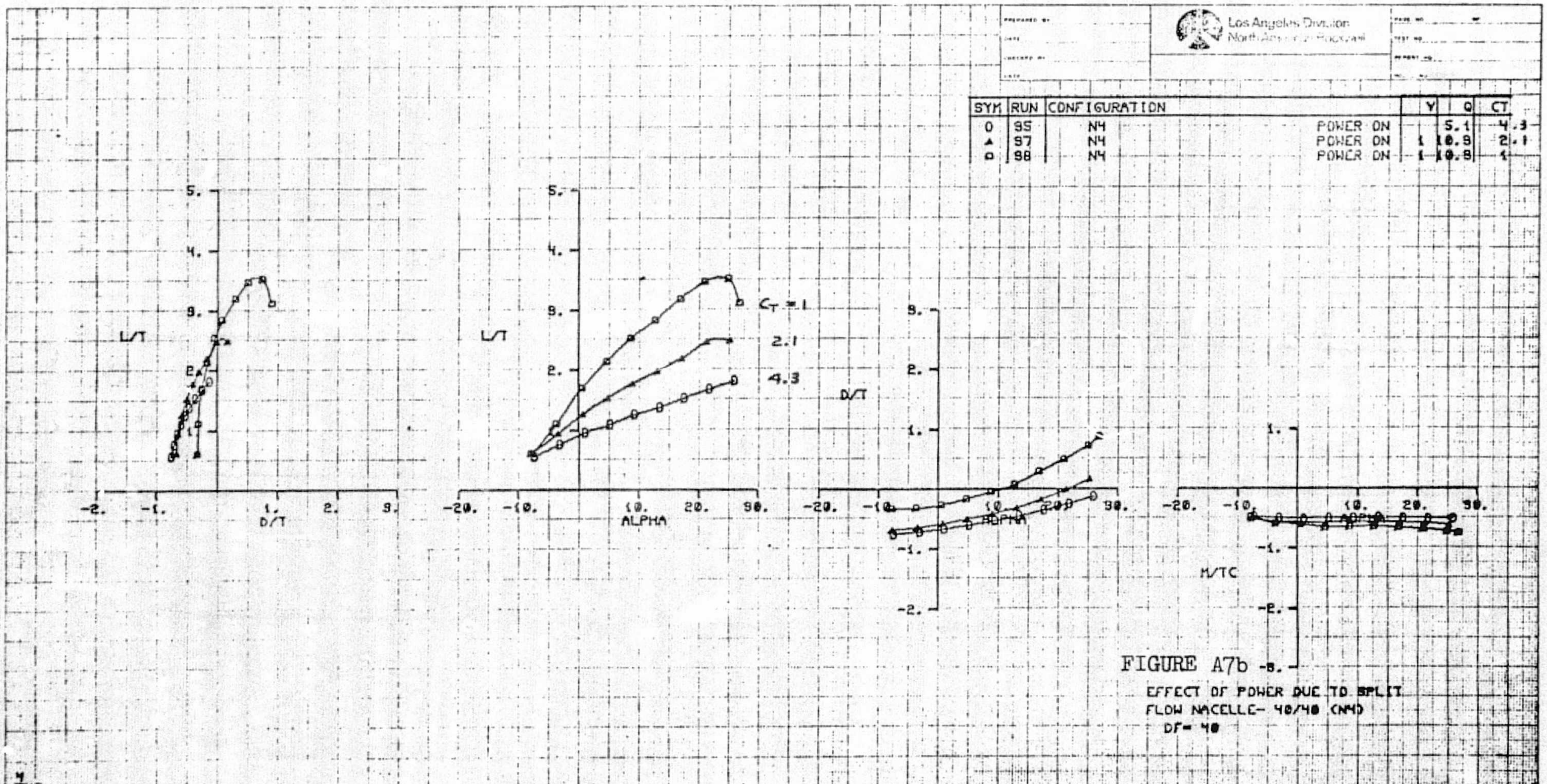


FIGURE A7b

EFFECT OF POWER DUE TO SPLIT FLOW NACELLE- 40/40 (N4)
DF= 40

APPENDIX B

MACHINE TABULATION OF EXPERIMENTAL DATA

This appendix contains selected machine tabulation of the experimental data from NAAL 742. Presented for the static test conducted outside the wind tunnel are lift and drag in pounds, pitching moment in inch-pounds, rake total temperature at nacelle exit in °R and two total and six static pressure ratios at the nacelle exit (run 1 through 11 except 2 and 5). The static test parameters are followed by aerodynamic data in stability axes and thrust parameters.

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NAAL	RUN	CONFIGURATION	YAW	RD
742	1	N3 (OUTSIDE)		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	10820.	8.38	-9.42	-63.85	64.5	1.0123	1.0158	1.0064	1.0243	1.0045	1.0092	1.0050	1.0012
2	18330.	18.35	-26.06	-180.57	64.5	1.0352	1.0488	1.0188	1.0621	1.0127	1.0255	1.0139	1.0024
3	24759.	27.46	-43.69	-312.98	59.4	1.0588	1.0833	1.0325	1.0778	1.0170	1.0433	1.0240	1.0066
4	36044.	49.89	-86.97	-697.16	53.6	1.1323	1.1766	1.0759	1.2069	1.0431	1.0941	1.0486	1.0170
5	102.	0.51	-0.22	0.95	53.3	1.0005	1.0009	1.0000	1.0003	1.0000	1.0000	1.0000	1.0000

NAAL	RUN	CONFIGURATION	YAW	RD
742	3	N3 FLAP = 60		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	10665.	10.71	-6.69	-79.06	68.9	1.0117	1.0161	1.0057	1.0097	1.0034	1.0071	1.0037	0.9998
2	10785.	10.87	-6.69	-79.48	67.9	1.0116	1.0156	1.0057	1.0112	1.0035	1.0071	1.0037	0.9998
3	17822.	22.04	-20.16	-222.81	70.3	1.0324	1.0459	1.0172	1.0321	1.0094	1.0220	1.0108	0.9995
4	17841.	21.39	-20.05	-223.22	69.6	1.0324	1.0455	1.0175	1.0303	1.0096	1.0219	1.0108	0.9996
5	25360.	34.21	-36.13	-416.91	64.2	1.0618	1.0880	1.0310	1.0176	1.0136	1.0400	1.0206	0.9999
6	25326.	34.05	-36.10	-417.31	62.6	1.0632	1.0898	1.0300	1.0170	1.0134	1.0400	1.0203	1.0000
7	36158.	65.37	-71.71	-873.85	56.0	1.1279	1.1789	1.0698	1.0440	1.0321	1.0873	1.0400	1.0113
8	36099.	66.20	-71.54	-875.17	57.7	1.1306	1.1791	1.0684	1.0376	1.0321	1.0858	1.0400	1.0103

NAAL	RUN	CONFIGURATION	YAW	RD
742	4	N3 FLAP = 90		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	10681.	12.03	-2.50	-93.15	67.3	1.0112	1.0161	1.0050	1.0063	1.0028	1.0091	1.0015	0.9994
2	10898.	12.10	-2.84	-92.53	66.4	1.0111	1.0158	1.0051	1.0074	1.0028	1.0091	1.0015	0.9994
3	17947.	25.31	-8.77	-265.87	69.4	1.0322	1.0464	1.0157	1.0189	1.0079	1.0221	1.0087	0.9993
4	17950.	24.97	-9.06	-263.14	69.2	1.0317	1.0469	1.0156	1.0160	1.0080	1.0220	1.0088	0.9992
5	25033.	38.95	-15.95	-478.30	65.1	1.0610	1.0876	1.0270	0.9981	1.0114	1.0394	1.0159	0.9985
6	25063.	38.85	-16.56	-478.29	63.8	1.0613	1.0881	1.0271	0.9975	1.0106	1.0395	1.0161	0.9987
7	36235.	79.21	-34.94	-1016.84	55.7	1.1260	1.1739	1.0638	0.9993	1.0289	1.0847	1.0313	1.0102
8	35945.	78.40	-34.57	-1015.32	57.2	1.1246	1.1732	1.0643	0.9974	1.0254	1.0839	1.0318	1.0104

NAAL	RUN	CONFIGURATION	YAW	RD
742	6	N4 FLAP = 90		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	10935.	12.99	-3.18	-103.90	62.8	1.0110	1.0173	0.9885	0.9969	0.9988	1.0043	1.0002	1.0000
2	11135.	13.40	-3.09	-105.59	62.9	1.0106	1.0175	0.9889	0.9968	0.9987	1.0049	1.0002	1.0000
3	18134.	26.24	-9.51	-282.94	64.5	1.0291	1.0477	0.9716	0.9900	0.9881	1.0133	0.9999	0.9976
4	18122.	26.51	-9.15	-284.84	64.8	1.0291	1.0474	0.9718	0.9301	0.9881	1.0134	0.9999	0.9975
5	25096.	40.56	-16.10	-492.29	62.4	1.0558	1.0823	0.9473	0.9828	0.9819	1.0227	0.9957	0.9973
6	25011.	40.49	-16.22	-492.70	61.7	1.0558	1.0816	0.9478	0.9826	0.9820	1.0233	0.9956	0.9975
7	35801.	77.51	-36.44	-999.32	57.8	1.1172	1.1673	0.9049	0.9639	0.9612	1.0514	0.9844	1.0052
8	35856.	77.80	-36.18	-1001.44	56.2	1.1184	1.1643	0.9049	0.9640	0.9616	1.0509	0.9849	1.0045

FOLDOUT FRAME

NAAL	RUN	CONFIGURATION	YAW	RD
742	7	N4 FLAP = 60		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	11243.	11.39	-7.76	-92.31	63.8	1.0105	1.0176	0.9904	0.9993	0.9961	1.0051	0.9995	0.9998
2	11112.	11.79	-7.62	-92.31	65.1	1.0109	1.0178	0.9900	0.9993	0.9962	1.0050	0.9995	0.9998
3	18059.	22.86	-20.59	-241.37	64.0	1.0307	1.0469	0.9733	0.9916	0.9901	1.0140	0.9983	0.9994
4	18218.	23.00	-20.76	-242.43	63.4	1.0308	1.0469	0.9733	0.9917	0.9903	1.0142	0.9982	0.9993
5	25222.	34.84	-35.47	-422.51	61.5	1.0584	1.0867	0.9486	0.9840	0.9825	1.0237	0.9980	0.9991
6	25266.	34.87	-35.90	-422.30	64.3	1.0585	1.0871	0.9493	0.9843	0.9836	1.0241	0.9980	0.9991
7	35787.	61.84	-66.10	-823.55	55.0	1.1258	1.1498	0.9205	0.9652	0.9662	1.0474	0.9865	1.0065
8	35917.	62.40	-66.28	-818.60	57.3	1.1240	1.1588	0.9143	0.9655	0.9655	1.0472	0.9857	1.0062

NAAL	RUN	CONFIGURATION	YAW	RD
742	8	N4 FLAP = 40		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	10944.	8.81	-9.51	-62.59	66.9	1.0114	1.0166	0.9942	0.9991	0.9973	1.0052	0.9999	1.0000
2	10900.	8.63	-9.08	-62.80	66.2	1.0113	1.0167	0.9941	0.9993	0.9974	1.0051	0.9998	0.9999
3	18246.	17.63	-26.87	-179.09	69.3	1.0307	1.0471	0.9859	0.9971	0.9923	1.0161	0.9996	1.0017
4	18143.	17.96	-26.75	-180.14	69.7	1.0301	1.0475	0.9861	0.9969	0.9924	1.0163	0.9996	1.0017
5	25260.	25.53	-44.35	-297.06	64.3	1.0529	1.0807	0.9760	0.9916	0.9879	1.0268	0.9993	1.0071
6	25173.	24.91	-44.01	-297.88	64.9	1.0563	1.0798	0.9723	0.9920	0.9883	1.0266	0.9993	1.0068
7	35724.	44.17	-81.11	-596.53	53.8	1.1122	1.1476	0.9463	0.9775	0.9728	1.0562	0.9902	1.0146
8	36344.	42.83	-81.17	-604.44	53.1	1.1173	1.1465	0.9403	0.9788	0.9728	1.0554	0.9903	1.0143

NAAL	RUN	CONFIGURATION	YAW	RD
742	9	N2 FLAP = 40		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	10641.	7.80	-7.58	-57.88	61.7	1.0140	1.0171	1.0084	1.0705	1.0092	1.0106	1.0087	1.0066
2	10734.	7.81	-7.99	-58.30	62.1	1.0146	1.0173	1.0085	1.0703	1.0091	1.0107	1.0098	1.0067
3	18061.	16.59	-24.17	-171.62	62.7	1.0425	1.0501	1.0242	1.2035	1.0264	1.0306	1.0243	1.0158
4	18184.	16.48	-24.30	-170.58	61.7	1.0406	1.0488	1.0245	1.2054	1.0265	1.0306	1.0245	1.0159
5	25194.	26.41	-43.51	-310.15	58.4	1.0747	1.0926	1.0432	1.3488	1.0446	1.0541	1.0437	1.0288
6	25192.	26.14	-43.09	-305.95	58.5	1.0759	1.0935	1.0432	1.3518	1.0446	1.0543	1.0458	1.0301
7	36105.	47.71	-88.32	-691.22	51.9	1.1623	1.1992	1.0943	1.7097	1.0915	1.0944	1.0972	1.0772
8	36216.	47.67	-88.05	-688.91	49.0	1.1639	1.2005	1.0943	1.7062	1.0911	1.0944	1.0972	1.0773

NAAL	RUN	CONFIGURATION	YAW	RD
742	10	N2 FLAP = 60		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	11143.	9.80	-6.57	-78.89	62.2	1.0143	1.0175	1.0086	1.0617	1.0076	1.0098	1.0117	1.0045
2	11141.	9.65	-6.44	-79.52	62.4	1.0149	1.0179	1.0086	1.0624	1.0077	1.0099	1.0118	1.0046
3	17961.	19.98	-18.73	-212.74	62.5	1.0395	1.0483	1.0231	1.1785	1.0218	1.0292	1.0253	1.0123
4	18017.	19.89	-18.89	-215.26	63.1	1.0402	1.0482	1.0226	1.1769	1.0218	1.0293	1.0254	1.0123
5	25253.	32.33	-34.65	-407.03	60.3	1.0771	1.0963	1.0417	1.3199	1.0434	1.0531	1.0407	1.0228
6	25237.	32.95	-34.67	-404.32	60.9	1.0761	1.0954	1.0415	1.3196	1.0433	1.0532	1.0408	1.0230
7	36181.	62.84	-71.52	-873.65	52.7	1.1593	1.1997	1.0942	1.6576	1.0887	1.0944	1.0899	1.0655
8	36133.	62.29	-71.75	-871.75	51.1	1.1540	1.1990	1.0942	1.6513	1.0886	1.0944	1.0901	1.0662

NAAL	RUN	CONFIGURATION	YAW	RD
742	11	N2 FLAP = 60		2

STATIC TEST PARAMETERS

PT	RPM	LIFT	DRAG	MOMENT	TTEX	PT1	PT2	PS1	PS2	PS3	PS4	PS5	PS6
1	11210.	10.62	-6.80	-84.01	66.8	1.0162	1.0195	1.0086	1.0532	1.0074	1.0114	1.0076	1.0054
2	11299.	10.34	-6.93	-82.75	67.0	1.0154	1.0177	1.0088	1.0540	1.0075	1.0116	1.0079	1.0054
3	18085.	20.74	-19.11	-218.50	67.4	1.0396	1.0485	1.0231	1.1645	1.0236	1.0296	1.0228	1.0119
4	18048.	20.53	-19.23	-218.49	67.6	1.0391	1.0492	1.0235	1.1608	1.0236	1.0294	1.0228	1.0119
5	25475.	33.06	-35.22	-417.01	64.0	1.0772	1.0979	1.0414	1.2924	1.0417	1.0540	1.0428	1.0226
6	25559.	32.90	-35.22	-418.26	64.5	1.0774	1.0988	1.0413	1.2859	1.0413	1.0541	1.0429	1.0224
7	35683.	63.41	-70.81	-881.39	64.1	1.1555	1.1940	1.0926	1.5803	1.0840	1.0944	1.0892	1.0634
8	35565.	62.33	-71.02	-873.32	64.7	1.1498	1.1896	1.0932	1.5637	1.0828	1.0944	1.0892	1.0632

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	12	N2	POWER ON		5.5	4	60	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-6.664	4.652	35960.	5.092	5.394	-2.278	-4.357	-0.121	3.810	2.335
2	-2.486	4.695	35964.	5.047	6.092	-1.952	-4.418	-0.150	3.667	2.871
3	1.631	4.609	35966.	5.141	6.630	-1.557	-4.336	-0.170	3.498	3.335
4	5.783	4.670	36086.	5.108	7.104	-1.200	-4.306	-0.206	3.531	3.794
5	9.889	4.641	36086.	5.140	7.518	-0.802	-4.155	-0.238	3.530	4.266
6	13.979	4.655	36184.	5.151	7.649	-0.353	-4.172	-0.237	3.497	4.693
7	18.051	4.569	36184.	5.248	8.086	0.131	-4.084	-0.221	3.389	5.106
8	22.158	4.690	36184.	5.112	8.515	0.620	-4.163	-0.227	3.424	5.694
9	26.081	4.526	36186.	5.298	8.052	1.321	-4.154	-0.387	2.617	5.636
10	26.053	4.458	36186.	5.379	7.932	1.326	-4.097	-0.390	2.535	5.555
11	30.003	4.450	36186.	5.389	7.645	1.811	-4.076	-0.428	2.149	5.695

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	12	N2	POWER ON		5.5	4	60	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-6.664	4.652	35960.	5.092	1.1595	-0.4897	-0.7644	1.2085	0.3510	101.64	519.66
2	-2.486	4.695	35964.	5.047	1.2976	-0.4158	-0.7682	1.3145	0.3591	101.66	519.53
3	1.631	4.609	35966.	5.141	1.4365	-0.3378	-0.7679	1.4283	0.3786	101.67	519.48
4	5.783	4.670	36086.	5.108	1.5213	-0.2570	-0.7527	1.4877	0.4090	102.34	519.40
5	9.889	4.641	36086.	5.140	1.6200	-0.1729	-0.7308	1.5662	0.4486	102.34	519.40
6	13.979	4.655	36184.	5.151	1.6860	-0.0758	-0.7315	1.6177	0.4809	102.88	519.40
7	18.051	4.569	36184.	5.248	1.7698	0.0287	-0.7297	1.6916	0.5211	102.88	519.40
8	22.158	4.690	36184.	5.112	1.8155	0.1323	-0.7246	1.7314	0.5622	102.88	519.40
9	26.081	4.526	36186.	5.298	1.7789	0.2920	-0.7492	1.7262	0.5198	102.89	519.35
10	26.053	4.458	36186.	5.379	1.7793	0.2975	-0.7502	1.7291	0.5142	102.89	519.35
11	30.003	4.450	36186.	5.389	1.7179	0.4071	-0.7476	1.6913	0.5065	102.89	519.35

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	13	N2	POWER OFF	5.5	0	60		2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.867	0.049	1796.	5.551	0.404	0.274	-0.220	-0.006	-0.702	0.282
2	-3.558	0.053	1913.	5.583	1.578	0.393	-0.768	-0.026	-1.091	0.805
3	0.548	0.053	1913.	5.515	1.995	0.482	-0.826	-0.051	-1.110	0.943
4	4.635	0.053	1913.	5.570	2.259	0.567	-0.823	-0.061	-1.022	1.023
5	8.667	0.053	1913.	5.537	2.413	0.652	-0.796	-0.068	-0.893	1.066
6	12.667	0.053	1913.	5.561	2.405	0.761	-0.767	-0.106	-0.831	1.069
7	16.661	0.049	1802.	5.602	2.907	0.918	-0.794	-0.117	-0.849	1.084
8	20.612	0.049	1795.	5.587	2.255	1.040	-0.776	-0.064	-0.875	0.946
9	24.454	0.045	1698.	5.629	1.716	1.155	-0.767	-0.137	-1.154	0.620
10	28.393	0.045	1698.	5.642	1.508	1.188	-0.740	-0.095	-1.122	0.466

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	13	N2	POWER OFF	5.5	0	60		2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.867	0.049	1796.	5.551	8.1447	5.5390	-3.6326	7.3099	-6.6017	1.18	519.62
2	-3.558	0.053	1913.	5.583	29.6663	7.4025	-11.7880	29.1496	-9.2295	1.27	519.62
3	0.548	0.053	1913.	5.515	37.0442	8.9510	-12.5295	37.1282	-8.5960	1.27	519.66
4	4.635	0.053	1913.	5.570	42.3698	10.6340	-12.6026	43.0905	-7.1753	1.27	519.66
5	8.667	0.053	1913.	5.537	44.9946	12.1540	-12.1238	46.3124	-5.2345	1.27	519.70
6	12.667	0.053	1913.	5.561	45.0273	14.2515	-11.7326	47.0566	-4.0305	1.27	519.70
7	16.661	0.049	1802.	5.602	48.7278	18.6023	-13.1213	52.0155	-3.8506	1.18	519.70
8	20.612	0.049	1795.	5.587	45.7378	21.0939	-12.8597	50.2359	-3.6414	1.18	519.70
9	24.454	0.045	1698.	5.629	37.4649	25.2338	-13.6834	44.5499	-7.4609	1.10	519.75
10	28.393	0.045	1698.	5.642	33.0097	26.0144	-13.2306	41.4092	-7.1883	1.10	519.79

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	17	N3	0	5.7	4	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-6.370	4.164	34705.	5.447	6.372	-0.229	-4.523	-0.153	-1.128	3.271
2	-2.255	4.182	34804.	5.451	6.768	0.164	-4.519	-0.180	-1.302	3.378
3	1.795	4.127	34908.	5.553	7.058	0.546	-4.385	-0.192	-1.358	3.436
4	5.921	4.166	34910.	5.501	7.344	0.933	-4.340	-0.226	-1.325	3.529
5	9.934	4.025	34708.	5.637	7.347	1.273	-4.120	-0.206	-1.169	3.501
6	13.972	4.037	34708.	5.619	7.488	1.634	-4.076	-0.207	-0.993	3.601
7	18.036	3.994	34607.	5.651	7.598	2.060	-4.036	-0.205	-0.920	3.718
8	21.949	3.923	34500.	5.722	7.168	2.508	-3.997	-0.372	-1.139	3.620
9	25.863	3.848	34500.	5.833	6.798	2.944	-3.887	-0.394	-1.355	3.501

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	17	N3	0	5.7	4	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-6.370	4.164	34705.	5.447	1.5299	-0.0551	-0.8866	1.5266	-0.1149	97.32	520.76
2	-2.255	4.182	34804.	5.451	1.6182	0.0392	-0.8820	1.6154	-0.1028	97.81	520.71
3	1.795	4.127	34908.	5.553	1.7099	0.1322	-0.8673	1.7132	-0.0786	98.33	520.71
4	5.921	4.166	34910.	5.501	1.7627	0.2240	-0.8503	1.7764	-0.0410	98.34	520.67
5	9.934	4.025	34708.	5.637	1.8254	0.3164	-0.8356	1.8526	0.0031	97.34	520.67
6	13.972	4.037	34708.	5.619	1.8545	0.4047	-0.8242	1.8974	0.0550	97.34	520.67
7	18.036	3.994	34607.	5.651	1.9023	0.5158	-0.8249	1.9686	0.0985	96.84	520.58
8	21.949	3.923	34500.	5.722	1.8272	0.6392	-0.8317	1.9337	0.0900	96.31	520.67
9	25.863	3.848	34500.	5.833	1.7664	0.7649	-0.8246	1.9231	0.0822	96.31	520.67

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	18	N3	0	5.7	0	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.827	0.044	1911.	5.742	0.573	0.289	-0.281	-0.026	-0.774	0.365
2	-3.547	0.051	2112.	5.714	1.617	0.427	-0.773	-0.038	-1.171	0.830
3	0.537	0.050	2112.	5.796	1.990	0.512	-0.814	-0.055	-1.179	0.938
4	4.627	0.051	2112.	5.717	2.249	0.591	-0.812	-0.073	-1.081	1.009
5	8.688	0.050	2112.	5.803	2.453	0.674	-0.781	-0.091	-0.932	1.079
6	12.682	0.047	2008.	5.768	2.441	0.792	-0.767	-0.105	-0.884	1.077
7	16.673	0.047	2008.	5.818	2.434	0.952	-0.797	-0.139	-0.907	1.087
8	20.629	0.047	2008.	5.822	2.255	1.098	-0.784	-0.087	-0.991	0.933
9	24.447	0.044	1910.	5.812	1.671	1.170	-0.752	-0.140	-1.211	0.577

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	18	N3	0	5.7	0	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.827	0.044	1911.	5.742	12.7792	6.4613	-5.1226	11.7803	-8.1414	1.10	520.76
2	-3.547	0.051	2112.	5.714	31.5403	8.3457	-12.3059	30.9634	-10.2814	1.25	520.76
3	0.537	0.050	2112.	5.796	39.3713	10.1445	-13.1536	39.4647	-9.7746	1.25	520.80
4	4.627	0.051	2112.	5.717	43.8926	11.5511	-12.9440	44.6815	-7.9721	1.25	520.80
5	8.688	0.050	2112.	5.803	48.5912	13.3642	-12.6433	50.0524	-5.8707	1.25	520.84
6	12.682	0.047	2008.	5.768	51.2989	16.6596	-13.1689	53.7048	-4.9905	1.17	520.84
7	16.673	0.047	2008.	5.818	51.5971	20.1841	-13.7992	55.2139	-4.5309	1.17	520.84
8	20.629	0.047	2008.	5.822	47.8514	23.2958	-13.5898	52.9907	-4.9432	1.17	520.80
9	24.447	0.044	1910.	5.812	37.7375	26.4202	-13.8615	45.2851	-8.4336	1.10	520.89

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	19	N3	0	11.4	2	90	2

*** * * * * STABILITY AXIS * * * * ***

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-6.870	2.011	34695.	11.274	4.357	0.227	-2.734	-0.096	-1.636	2.304
2	-2.727	2.020	34755.	11.257	4.772	0.481	-2.724	-0.119	-1.746	2.397
3	1.352	1.999	34794.	11.397	5.116	0.731	-2.686	-0.130	-1.743	2.464
4	5.463	2.022	34898.	11.327	5.396	0.993	-2.683	-0.152	-1.665	2.526
5	9.499	2.008	34888.	11.402	5.544	1.214	-2.591	-0.157	-1.448	2.560
6	13.536	2.001	34791.	11.382	5.650	1.462	-2.520	-0.163	-1.252	2.622
7	17.552	1.979	34791.	11.511	5.694	1.779	-2.492	-0.227	-1.206	2.693
8	21.429	1.946	34690.	11.648	5.159	2.079	-2.474	-0.354	-1.385	2.482
9	25.332	1.916	34692.	11.831	4.835	2.368	-2.412	-0.383	-1.517	2.366

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	19	N3	0	11.4	2	90	2

*** * * * * THRUST PARAMETERS * * * * ***

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-6.870	2.011	34695.	11.274	2.1663	0.1130	-1.1100	2.1372	-0.3713	97.27	521.06
2	-2.727	2.020	34755.	11.257	2.3621	0.2382	-1.1009	2.3480	-0.3504	97.57	521.02
3	1.352	1.999	34794.	11.397	2.5566	0.3657	-1.0969	2.5665	-0.3052	97.76	521.02
4	5.463	2.022	34898.	11.327	2.6665	0.4910	-1.0830	2.7031	-0.2347	98.28	521.02
5	9.499	2.008	34888.	11.402	2.7608	0.6045	-1.0533	2.8227	-0.1406	98.23	521.11
6	13.536	2.001	34791.	11.302	2.8224	0.7304	-1.0279	2.9150	-0.0494	97.75	521.11
7	17.552	1.979	34791.	11.511	2.8768	0.8991	-1.0279	3.0141	0.0102	97.75	521.11
8	21.429	1.946	34690.	11.648	2.650[illegible]	1.0686	-1.0380	2.8580	-0.0262	97.25	521.20
9	25.332	1.916	34692.	11.831	2.5[illegible]6	1.2361	-1.0277	2.8098	-0.0374	97.26	521.15

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	20	N3	0	11.4	1	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.159	0.998	23408.	11.401	3.092	0.414	-1.763	-0.070	-1.722	1.684
2	-3.037	1.008	23512.	11.379	3.544	0.592	-1.828	-0.086	-1.825	1.794
3	1.047	0.997	23512.	11.495	3.929	0.781	-1.853	-0.099	-1.837	1.876
4	5.146	1.001	23511.	11.454	4.195	0.949	-1.830	-0.120	-1.697	1.926
5	9.192	1.002	23511.	11.443	4.389	1.111	-1.784	-0.142	-1.488	1.996
6	13.206	0.990	23510.	11.584	4.437	1.313	-1.730	-0.168	-1.358	2.021
7	17.200	0.986	23510.	11.624	4.364	1.525	-1.694	-0.256	-1.281	2.035
8	21.131	0.982	23510.	11.676	4.079	1.685	-1.625	-0.310	-1.207	1.945
9	24.961	0.972	23509.	11.790	3.517	1.805	-1.538	-0.332	-1.282	1.678

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	20	N3	0	11.4	1	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.159	0.998	23408.	11.401	3.0973	0.4148	-1.4419	3.0215	-0.7976	48.83	521.28
2	-3.037	1.008	23512.	11.379	3.5158	0.5076	-1.4808	3.4797	-0.7731	49.21	521.28
3	1.047	0.997	23512.	11.495	3.9370	0.7826	-1.5161	3.9507	-0.7105	49.21	521.28
4	5.146	1.001	23511.	11.454	4.1894	0.9479	-1.4922	4.2575	-0.5682	49.21	521.33
5	9.192	1.002	23511.	11.443	4.3791	1.1083	-1.4531	4.4399	-0.3945	49.21	521.33
6	13.206	0.990	23510.	11.584	4.4620	1.3267	-1.4269	4.6666	-0.2676	49.20	521.37
7	17.200	0.986	23510.	11.624	4.4233	1.5459	-1.4020	4.6826	-0.1686	49.20	521.37
8	21.131	0.982	23510.	11.676	4.1525	1.7155	-1.3506	4.4918	-0.1031	49.20	521.37
9	24.961	0.972	23509.	11.790	3.6160	1.8564	-1.2909	4.0617	-0.1570	49.20	521.41

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	21	N3	0	11.4	0.1	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.770	0.095	5525.	11.514	0.878	0.282	-0.470	-0.030	-0.846	0.521
2	-3.495	0.102	5733.	11.313	1.634	0.417	-0.878	-0.044	-1.182	0.937
3	0.579	0.089	5317.	11.564	2.165	0.513	-0.898	-0.058	-1.186	1.036
4	4.679	0.090	5317.	11.505	2.444	0.603	-0.886	-0.076	-1.088	1.109
5	8.716	0.090	5317.	11.499	2.597	0.694	-0.845	-0.095	-0.947	1.168
6	12.708	0.100	5733.	11.548	2.592	0.828	-0.819	-0.130	-0.912	1.177
7	16.692	0.087	5219.	11.594	2.521	0.958	-0.801	-0.189	-0.892	1.159
8	20.678	0.089	5317.	11.611	2.479	1.090	-0.800	-0.208	-0.864	1.153
9	24.639	0.091	5421.	11.667	2.341	1.226	-0.797	-0.196	-0.901	1.089

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	21	N3	0	11.4	0.1	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.770	0.095	5525.	11.514	9.1911	2.9544	-4.0141	8.7073	-4.1700	4.72	521.55
2	-3.495	0.102	5733.	11.313	17.8509	4.0618	-6.9747	17.5701	-5.1425	4.98	521.55
3	0.579	0.089	5317.	11.564	24.2896	5.[illegible]054	-8.1536	24.3461	-5.4594	4.46	521.55
4	4.679	0.090	5317.	11.505	27.0259	6.6742	-8.0033	27.4803	-4.4471	4.46	521.59
5	8.716	0.090	5317.	11.499	28.7037	7.6770	-7.6283	29.5356	-3.2381	4.46	521.55
6	12.708	0.100	5733.	11.548	25.7495	8.2246	-6.6446	26.9280	-2.3584	4.98	521.59
7	16.692	0.087	5219.	11.594	28.8671	10.9718	-7.4875	30.8022	-2.2178	4.34	521.59
8	20.678	0.089	5317.	11.611	27.6696	12.1672	-7.2882	30.1836	-1.6123	4.46	521.59
9	24.639	0.091	5421.	11.667	25.5169	13.3686	-7.0951	28.7689	-[illegible].5122	4.59	521.63

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	22	N3	0	11.4	0	90	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.816	0.039	2937.	11.534	0.613	0.286	-0.327	-0.020	-0.786	0.380
2	-3.532	0.041	3034.	11.527	1.637	0.418	-0.789	-0.039	-1.157	0.836
3	0.551	0.041	3040.	11.487	2.023	0.506	-0.831	-0.050	-1.167	0.952
4	4.663	0.041	3040.	11.522	2.307	0.593	-0.828	-0.068	-1.076	1.033
5	8.706	0.040	3040.	11.582	2.484	0.678	-0.794	-0.088	-0.933	1.102
6	12.680	0.039	2943.	11.550	2.431	0.801	-0.754	-0.123	-0.908	1.089
7	16.658	0.038	2937.	11.614	2.397	0.932	-0.753	-0.180	-0.892	1.085
8	20.635	0.038	2936.	11.683	2.302	1.050	-0.742	-0.208	-0.880	1.053
9	24.570	0.036	2826.	11.653	2.111	1.147	-0.718	-0.180	-0.888	0.941

NAAL	RUN	CONFIGURATION	YAW	Q	CT	DF	RD
742	22	N3	0	11.4	0	90	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.816	0.039	2937.	11.534	15.6420	7.2964	-6.8096	14.5044	-9.3559	1.94	521.63
2	-3.532	0.041	3034.	11.527	39.9268	10.1964	-15.7195	39.2247	-12.6371	2.02	521.72
3	0.551	0.041	3040.	11.487	49.0105	12.2675	-16.4376	49.1262	-11.7954	2.03	521.68
4	4.663	0.041	3040.	11.522	56.0655	14.4109	-16.4340	57.0515	-9.8052	2.03	521.68
5	8.706	0.040	3040.	11.582	60.6793	16.5693	-15.8394	62.4883	-7.1929	2.03	521.68
6	12.680	0.039	2943.	11.550	61.8927	20.4092	-15.6775	64.8632	-6.3253	1.94	521.68
7	16.658	0.038	2937.	11.614	61.5421	23.9371	-15.7766	65.8212	-5.2900	1.94	521.63
8	20.635	0.038	2936.	11.683	59.4414	27.1241	-15.6595	65.1869	-4.4353	1.94	521.68
9	24.570	0.036	2826.	11.653	57.2466	31.1102	-15.9165	65.0008	-4.4880	1.84	521.77

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	23	N3	POWER ON	0	5.7	4	60	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-6.748	4.049	33655.	5.307	5.041	-2.155	-4.115	-0.127	3.599	2.192
2	-2.542	4.088	33658.	5.257	5.835	-1.843	-4.207	-0.144	3.423	2.763
3	1.568	4.058	33754.	5.323	6.340	-1.460	-4.108	-0.158	3.251	3.198
4	5.722	4.112	33855.	5.281	6.842	-1.101	-4.108	-0.196	3.247	3.654
5	9.805	4.008	33863.	5.419	7.149	-0.677	-3.983	-0.216	3.149	4.031
6	13.917	4.107	33973.	5.319	7.581	-0.281	-3.997	-0.239	3.215	4.514
7	17.993	4.047	33864.	5.368	7.903	0.202	-3.965	-0.247	3.133	4.945
8	22.071	4.010	33858.	5.415	8.080	0.738	-3.943	-0.307	2.942	5.323
9	25.987	3.912	33866.	5.553	7.671	1.393	-3.966	-0.426	2.215	5.304

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	23	N3	POWER ON	0	5.7	4	60	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-6.748	4.049	33655.	5.307	1.2449	-0.5323	-0.8296	1.2988	0.3823	92.20	521.41
2	-2.542	4.088	33658.	5.257	1.4272	-0.4508	-0.8400	1.4458	0.3870	92.21	521.33
3	1.568	4.058	33754.	5.323	1.5624	-0.3598	-0.8263	1.5519	0.4024	92.68	521.37
4	5.722	4.112	33855.	5.281	1.6639	-0.2678	-0.8156	1.6289	0.4324	93.16	521.28
5	9.805	4.008	33863.	5.419	1.7834	-0.1690	-0.8112	1.7286	0.4703	93.20	521.24
6	13.917	4.107	33973.	5.319	1.8456	-0.0684	-0.7945	1.7749	0.5103	93.74	521.24
7	17.993	4.047	33864.	5.368	1.9526	0.0500	-0.7998	1.8726	0.5555	93.21	521.20
8	22.071	4.010	33858.	5.415	2.0147	0.1841	-0.8027	1.9363	0.5864	93.18	521.20
9	25.987	3.912	33866.	5.553	1.9607	0.3560	-0.8274	1.9185	0.5390	93.21	521.15

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	24	N3	POWER OFF	0	5.7	0	60	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.882	0.016	875.	5.709	0.423	0.255	-0.219	-0.013	-0.662	0.296
2	-3.544	0.021	1077.	5.781	1.611	0.393	-0.816	-0.038	-1.088	0.829
3	0.538	0.021	1077.	5.700	1.977	0.479	-0.861	-0.048	-1.100	0.948
4	4.645	0.021	1077.	5.788	2.280	0.562	-0.869	-0.069	-1.005	1.043
5	8.707	0.021	1077.	5.747	2.508	0.646	-0.837	-0.088	-0.854	1.137
6	12.681	0.021	1077.	5.807	2.478	0.769	-0.831	-0.130	-0.818	1.154
7	16.681	0.019	973.	5.783	2.501	0.922	-0.848	-0.156	-0.809	1.180
8	20.677	0.018	973.	5.846	2.476	1.058	-0.848	-0.191	-0.785	1.190
9	24.517	0.016	875.	5.801	1.929	1.164	-0.819	-0.224	-1.023	0.847

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	24	N3	POWER OFF	0	5.7	0	60	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.882	0.016	875.	5.709	25.0205	15.0622	-10.5625	22.7185	-18.3511	0.41	521.28
2	-3.544	0.021	1077.	5.781	74.4447	18.1722	-30.8061	73.1787	-22.7401	0.53	521.33
3	0.538	0.021	1077.	5.700	90.0723	21.8349	-32.0233	90.2737	-20.9869	0.53	521.33
4	4.645	0.021	1077.	5.788	105.4740	26.0008	-32.8073	107.2330	-17.3729	0.53	521.37
5	8.707	0.021	1077.	5.747	115.1630	29.6771	-31.4064	118.3490	-11.8977	0.53	521.37
6	12.681	0.021	1077.	5.807	115.0010	35.6824	-31.4987	120.0290	-9.5645	0.53	521.37
7	16.681	0.019	973.	5.783	131.1430	48.3954	-36.3231	139.5150	-8.7146	0.47	521.37
8	20.677	0.018	973.	5.846	131.2630	56.0886	-36.7268	142.6120	-6.1258	0.47	521.37
9	24.517	0.016	875.	5.801	115.7560	69.8400	-40.1520	134.3000	-15.5084	0.41	521.37

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	25	N3	POWER ON	0	11.4	2	60	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	C_{LS}
1	-7.124	1.931	33547.	11.063	3.301	-0.790	-2.398	-0.082	0.956	1.558
2	-2.953	1.929	33612.	11.116	3.981	-0.557	-2.504	-0.096	0.750	1.928
3	1.152	1.930	33646.	11.124	4.442	-0.331	-2.486	-0.113	0.713	2.189
4	5.272	1.941	33750.	11.125	4.814	-0.095	-2.454	-0.140	0.758	2.438
5	9.371	1.933	33848.	11.228	5.155	0.165	-2.396	-0.171	0.820	2.700
6	13.416	1.935	33848.	11.216	5.435	0.455	-2.385	-0.186	0.882	2.951
7	17.509	1.925	33848.	11.273	5.713	0.808	-2.402	-0.224	0.876	3.223
8	21.509	1.916	33843.	11.325	5.644	1.112	-2.354	-0.306	0.850	3.373
9	25.424	1.889	33845.	11.485	5.323	1.568	-2.420	-0.393	0.369	3.299

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	25	N3	POWER ON	0	11.4	2	60	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.124	1.931	33547.	11.063	1.7091	-0.4093	-1.0136	1.7467	0.1942	91.68	521.55
2	-2.953	1.929	33612.	11.116	2.0641	-0.2890	-1.0598	2.0763	0.1823	91.99	521.55
3	1.152	1.930	33646.	11.124	2.3005	-0.1719	-1.0509	2.2966	0.2181	92.15	521.50
4	5.272	1.941	33750.	11.125	2.4798	-0.0492	-1.0320	2.4648	0.2768	92.65	521.50
5	9.371	1.933	33848.	11.228	2.6665	0.0856	-1.0116	2.6449	0.3496	93.13	521.50
6	13.416	1.935	33848.	11.216	2.8084	0.2352	-1.0061	2.7863	0.4227	93.13	521.50
7	17.509	1.925	33848.	11.273	2.9673	0.4200	-1.0185	2.9562	0.4921	93.13	521.50
8	21.509	1.916	33843.	11.325	2.9451	0.5806	-1.0027	2.9529	0.5396	93.11	521.63
9	25.424	1.889	33845.	11.485	2.8171	0.8302	-1.0455	2.9007	0.4596	93.11	521.59

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	26	N3	POWER ON	0	11.4	1	60	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.439	0.928	22371.	11.328	2.152	-0.100	-1.418	-0.049	-0.312	1.109
2	-3.176	0.944	22585.	11.325	3.019	0.085	-1.690	-0.067	-0.587	1.497
3	0.912	0.945	22585.	11.314	3.408	0.238	-1.691	-0.086	-0.574	1.651
4	5.013	0.950	22682.	11.334	3.725	0.396	-1.665	-0.108	-0.481	1.803
5	9.082	0.947	22681.	11.379	3.994	0.561	-1.632	-0.134	-0.333	1.964
6	13.124	0.953	22785.	11.397	4.189	0.780	-1.623	-0.159	-0.261	2.112
7	17.158	0.954	22888.	11.467	4.308	1.027	-1.622	-0.222	-0.229	2.247
8	21.160	0.950	22887.	11.522	4.269	1.239	-1.593	-0.293	-0.185	2.346
9	24.998	0.940	22887.	11.637	3.671	1.516	-1.594	-0.361	-0.592	2.048

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	26	N3	POWER ON	0	11.4	1	60	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.439	0.928	22371.	11.328	2.3171	-0.1083	-1.2464	2.3117	-0.1925	45.14	521.72
2	-3.176	0.944	22585.	11.325	3.1963	0.0908	-1.4611	3.1863	-0.2678	45.90	521.72
3	0.912	0.945	22585.	11.314	3.6043	0.2517	-1.4599	3.6079	-0.1942	45.89	521.77
4	5.013	0.950	22682.	11.334	3.9178	0.4170	-1.4297	3.9393	-0.0730	46.24	521.77
5	9.082	0.947	22681.	11.379	4.2176	0.5928	-1.4066	4.2583	0.0803	46.23	521.81
6	13.124	0.953	22785.	11.397	4.3956	0.8186	-1.3903	4.4666	0.2008	46.60	521.81
7	17.158	0.954	22888.	11.467	4.5130	1.0758	-1.3869	4.6295	0.3034	46.97	521.85
8	21.160	0.950	22887.	11.522	4.4935	1.3041	-1.3692	4.6613	0.4058	46.96	521.90
9	24.998	0.940	22887.	11.637	3.9028	1.6115	-1.3839	4.2182	0.1886	46.96	521.90

NAAL	RUN	CONFIGURATION		YAW 28. 0	RD
742	27	N3	POWER ON	0 11.4 0.1 60	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	U	CL	CD	CM	CY	CNS	CLS
1	-7.838	0.070	4489.	11.516	0.551	0.229	-0.306	-0.019	-0.637	0.340
2	-3.493	0.075	4697.	11.442	1.765	0.380	-0.897	-0.041	-1.089	0.918
3	0.590	0.077	4794.	11.490	2.174	0.472	-0.935	-0.059	-1.090	1.046
4	4.699	0.083	5009.	11.454	2.467	0.565	-0.930	-0.077	-0.996	1.144
5	8.737	0.085	5106.	11.505	2.658	0.660	-0.899	-0.101	-0.856	1.231
6	12.737	0.082	5009.	11.509	2.667	0.789	-0.869	-0.143	-0.800	1.264
7	16.740	0.082	5009.	11.560	2.686	0.927	-0.858	-0.191	-0.749	1.296
8	20.737	0.082	5009.	11.605	2.646	1.060	-0.851	-0.230	-0.708	1.314
9	24.682	0.081	5009.	11.664	2.502	1.202	-0.843	-0.231	-0.747	1.261

NAAL	RUN	CONFIGURATION		YAW 28. 0	RD
742	27	N3	POWER ON	0 11.4 0.1 60	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Ū	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.838	0.070	4489.	11.516	7.7969	3.2381	-3.5332	7.2824	-4.2712	3.49	521.98
2	-3.493	0.075	4697.	11.442	23.5022	5.0122	-9.6398	23.1531	-6.4351	3.72	522.03
3	0.590	0.077	4794.	11.490	27.6975	6.0673	-9.7946	27.9586	-5.7794	3.84	522.03
4	4.699	0.083	5009.	11.454	29.6228	6.7923	-9.1174	30.0797	-4.3423	4.09	522.03
5	8.737	0.085	5106.	11.505	31.1828	7.7445	-8.6103	31.9974	-2.9178	4.20	522.03
6	12.737	0.082	5009.	11.509	32.1858	9.5214	-8.5619	33.4931	-2.1905	4.09	522.03
7	16.740	0.082	5009.	11.560	32.5595	11.2445	-8.4970	34.4184	-1.3895	4.09	522.03
8	20.737	0.082	5009.	11.605	32.1949	12.9057	-8.4533	34.6788	-0.6694	4.09	522.07
9	24.682	0.081	5009.	11.664	30.6077	14.7002	-8.4243	33.9500	-0.5756	4.09	522.12

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	28	N3	POWER OFF	0	11.4	0	60	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.878	0.037	2825.	11.396	0.435	0.249	-0.233	-0.020	-0.658	0.294
2	-3.545	0.041	3039.	11.517	1.627	0.389	-0.815	-0.044	-1.088	0.837
3	0.546	0.041	3039.	11.515	2.026	0.475	-0.857	-0.054	-1.095	0.969
4	4.626	0.041	3039.	11.514	2.302	0.560	-0.850	-0.073	-1.005	1.057
5	8.686	0.041	3039.	11.484	2.504	0.646	-0.820	-0.096	-0.861	1.145
6	12.676	0.039	2941.	11.537	2.494	0.767	-0.785	-0.141	-0.812	1.166
7	16.684	0.039	2941.	11.551	2.514	0.896	-0.768	-0.188	-0.762	1.199
8	20.678	0.037	2824.	11.576	2.466	1.025	-0.774	-0.218	-0.735	1.197
9	24.599	0.036	2824.	11.665	2.239	1.113	-0.739	-0.199	-0.739	1.[illegible]71

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	28	N3	POWER OFF	0	11.4	0	60	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.878	0.037	2825.	11.396	11.5562	6.6222	-5.0493	10.5394	-8.1438	1.84	522.16
2	-3.545	0.041	3039.	11.517	39.5422	9.4596	-16.1736	38.8815	-11.8869	2.03	522.16
3	0.546	0.041	3039.	11.515	49.2333	11.5561	-17.0060	49.3413	-11.0859	2.03	522.16
4	4.626	0.041	3039.	11.514	55.9520	13.6152	-16.8686	56.8679	-9.0579	2.03	522.20
5	8.686	0.041	3039.	11.484	60.6890	15.6667	-16.2243	62.3590	-6.3214	2.03	522.20
6	12.676	0.039	2941.	11.537	63.4539	19.5254	-16.3018	66.1919	-5.1251	1.94	522.20
7	16.684	0.039	2941.	11.551	64.0505	22.8227	-15.9744	67.9064	-3.4731	1.94	522.20
8	20.678	0.037	2824.	11.576	66.4711	27.6471	-17.0507	71.9517	-2.3928	1.84	522.20
9	24.599	0.036	2824.	11.665	60.8200	30.2489	-16.4046	67.8918	-2.1854	1.84	522.25

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	29	N3	POWER ON		5.7	4	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.409	4.280	34640.	5.282	2.316	-3.191	-2.472	-0.108	6.811	1.725
2	-3.214	4.234	34642.	5.341	3.161	-3.010	-2.645	-0.109	6.575	2.813
3	0.977	4.372	34741.	5.198	4.019	-2.865	-2.732	-0.111	6.518	3.910
4	5.147	4.290	34741.	5.296	4.689	-2.551	-2.693	-0.129	6.180	4.829
5	9.288	4.334	34846.	5.271	5.341	-2.260	-2.681	-0.148	5.963	5.749
6	13.413	4.264	34749.	5.332	5.870	-1.903	-2.650	-0.172	5.662	6.564
7	17.557	4.325	34750.	5.257	6.476	-1.527	-2.686	-0.213	5.401	7.495
8	21.690	4.293	34752.	5.296	7.074	-0.998	-2.689	-0.279	4.868	8.404
9	25.769	4.251	34745.	5.347	7.379	-0.443	-2.787	-0.352	4.259	9.017

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	29	N3	POWER ON		5.7	4	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.409	4.280	34640.	5.282	0.5412	-0.7457	-0.4716	0.6328	0.6696	97.00	519.97
2	-3.214	4.234	34642.	5.341	0.7465	-0.7108	-0.5099	0.7852	0.6679	97.01	519.92
3	0.977	4.372	34741.	5.198	0.9194	-0.6554	-0.5102	0.9080	0.6710	97.50	519.88
4	5.147	4.290	34741.	5.296	1.0928	-0.5946	-0.5124	1.0351	0.6903	97.50	519.88
5	9.288	4.334	34846.	5.271	1.2324	-0.5215	-0.5049	1.1320	0.7136	98.02	519.83
6	13.413	4.264	34749.	5.332	1.3767	-0.4463	-0.5074	1.2355	0.7535	97.54	519.83
7	17.557	4.325	34750.	5.257	1.4973	-0.3531	-0.5069	1.3210	0.7884	97.55	519.79
8	21.690	4.293	34752.	5.296	1.6478	-0.2326	-0.5113	1.4452	0.8251	97.55	519.75
9	25.769	4.251	34745.	5.347	1.7359	-0.1043	-0.5353	1.5179	0.8486	97.52	519.75

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	30	N3	POWER OFF		5.7	0	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.979	0.042	1808.	5.699	0.077	0.213	-0.040	-0.011	-0.479	0.112
2	-3.905	0.041	1808.	5.777	0.261	0.167	-0.099	-0.007	-0.397	0.265
3	0.209	0.041	1801.	5.725	0.768	0.173	-0.287	-0.013	-0.383	0.733
4	4.318	0.044	1912.	5.765	1.179	0.213	-0.323	-0.014	-0.371	1.114
5	8.403	0.041	1801.	5.716	1.533	0.275	-0.346	-0.030	-0.346	1.454
6	12.460	0.041	1808.	5.763	1.820	0.352	-0.361	-0.061	-0.309	1.749
7	16.465	0.041	1808.	5.738	1.870	0.498	-0.400	-0.082	-0.433	1.804
8	20.456	0.044	1918.	5.786	1.867	0.632	-0.429	-0.059	-0.559	1.806
9	24.436	0.042	1847.	5.773	1.898	0.751	-0.458	-0.064	-0.629	1.861

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	30	N3	POWER OFF		5.7	0	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.979	0.042	1808.	5.699	1.8417	5.0662	-0.7906	1.1205	-5.2728	1.02	520.10
2	-3.905	0.041	1808.	5.777	6.2890	4.0271	-1.9524	6.0001	-4.4462	1.02	520.10
3	0.209	0.041	1801.	5.725	18.4220	4.1679	-5.6212	18.4371	-4.1006	1.02	520.10
4	4.318	0.044	1912.	5.765	26.3880	4.7773	-5.9089	26.6728	-2.7766	1.10	520.10
5	8.403	0.041	1801.	5.716	36.7176	6.5958	-6.7662	37.2873	-1.1592	1.02	520.14
6	12.460	0.041	1808.	5.763	43.7503	8.4750	-7.0991	44.5483	1.1642	1.02	520.19
7	16.465	0.041	1808.	5.738	44.7543	11.9165	-7.8260	46.2965	1.2572	1.02	520.19
8	20.456	0.044	1918.	5.786	41.7525	14.1359	-7.8475	44.0599	1.3480	1.11	520.19
9	24.436	0.042	1847.	5.773	44.4699	17.6048	-8.7668	47.7691	2.3691	1.05	520.23

NAAL	RUN	CONFIGURATION		YAW	ϕ/Q	CT	DF	RD
742	31	N3	POWER ON		11.4	2	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.678	2.042	34631.	11.063	1.245	-1.375	-1.286	-0.064	2.893	0.978
2	-3.489	2.068	34730.	10.980	1.912	-1.341	-1.463	-0.056	2.894	1.730
3	0.662	2.067	34730.	10.966	2.589	-1.218	-1.524	-0.059	2.777	2.495
4	4.811	2.071	34835.	11.021	3.147	-1.048	-1.524	-0.073	2.652	3.151
5	8.936	2.068	34836.	11.041	3.652	-0.859	-1.521	-0.097	2.556	3.773
6	13.009	2.058	34838.	11.097	4.063	-0.632	-1.497	-0.118	2.425	4.321
7	17.130	2.071	34942.	11.084	4.536	-0.337	-1.538	-0.145	2.222	4.950
8	21.233	2.044	34838.	11.171	4.925	0.015	-1.586	-0.220	1.934	5.507
9	25.255	2.037	34838.	11.208	5.124	0.353	-1.610	-0.296	1.652	5.892

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	31	N3	POWER ON		11.4	2	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.678	2.042	34631.	11.063	0.6098	-0.6733	-0.5139	0.6343	0.5858	96.96	520.23
2	-3.489	2.068	34730.	10.980	0.9246	-0.6485	-0.5775	0.9624	0.5910	97.45	520.19
3	0.662	2.067	34730.	10.986	1.2525	-0.5891	-0.6019	1.2456	0.6036	97.45	520.19
4	4.811	2.071	34835.	11.021	1.5191	-0.5061	-0.6004	1.4713	0.6317	97.96	520.23
5	8.936	2.068	34836.	11.041	1.7658	-0.4155	-0.6003	1.6798	0.6848	97.97	520.14
6	13.009	2.058	34836.	11.097	1.9742	-0.3073	-0.5940	1.8544	0.7439	97.98	520.10
7	17.130	2.071	34942.	11.084	2.1902	-0.1628	-0.6062	2.0451	0.8008	98.50	520.10
8	21.233	2.044	34838.	11.171	2.4092	0.0075	-0.6334	2.2484	0.8655	97.98	520.10
9	25.255	2.037	34838.	11.208	2.5149	0.1734	-0.6452	2.3486	0.9161	97.98	520.10

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	32	N3	POWER ON		11.4	1	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.853	1.013	23540.	11.340	0.597	-0.338	-0.571	-0.025	0.673	0.522
2	-3.698	1.009	23443.	11.306	1.074	-0.337	-0.750	-0.031	0.690	1.002
3	0.442	1.014	23443.	11.255	1.670	-0.275	-0.824	-0.031	0.637	1.599
4	4.567	1.005	23337.	11.257	2.144	-0.171	-0.837	-0.040	0.582	2.084
5	8.670	1.013	23538.	11.338	2.552	-0.050	-0.833	-0.053	0.555	2.521
6	12.743	1.014	23537.	11.322	2.864	0.090	-0.827	-0.074	0.536	2.905
7	16.817	1.003	23439.	11.370	3.205	0.307	-0.871	-0.124	0.400	3.287
8	20.877	1.009	23537.	11.380	3.436	0.516	-0.865	-0.188	0.300	3.607
9	24.852	0.998	23536.	11.513	3.451	0.745	-0.915	-0.229	0.106	3.703

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	32	N3	POWER ON		11.4	1	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.853	1.013	23540.	11.340	0.5890	-0.3336	-0.4600	0.6291	0.2500	49.31	520.32
2	-3.698	1.009	23443.	11.306	1.0642	-0.3345	-0.6070	1.0835	0.2652	48.96	520.32
3	0.442	1.014	23443.	11.255	1.6470	-0.2713	-0.6634	1.6449	0.2840	48.96	520.32
4	4.567	1.005	23337.	11.257	2.1320	-0.1704	-0.6796	2.1117	0.3397	48.57	520.41
5	8.670	1.013	23538.	11.338	2.5182	-0.0500	-0.6714	2.4819	0.4291	49.30	520.45
6	12.743	1.014	23537.	11.322	2.8417	0.0887	-0.6652	2.7913	0.5403	49.30	520.49
7	16.817	1.003	23439.	11.370	3.1941	0.3065	-0.7090	3.1461	0.6306	48.94	520.49
8	20.877	1.009	23537.	11.380	3.4030	0.5116	-0.6994	3.3619	0.7346	49.30	520.49
9	24.852	0.998	23536.	11.513	3.4578	0.7471	-0.7489	3.4516	0.7752	49.29	520.54

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	33	N3	POWER ON		11.4	0.1	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.951	0.096	5529.	11.451	0.143	0.178	-0.101	-0.016	-0.417	0.171
2	-3.881	0.101	5737.	11.495	0.369	0.139	-0.217	-0.011	-0.336	0.366
3	0.240	0.104	5835.	11.403	0.923	0.142	-0.315	-0.009	-0.318	0.881
4	4.361	0.107	5939.	11.404	1.340	0.196	-0.369	-0.017	-0.322	1.271
5	8.462	0.107	5939.	11.398	1.702	0.262	-0.368	-0.031	-0.291	1.622
6	12.494	0.107	5939.	11.436	1.951	0.349	-0.382	-0.052	-0.272	1.882
7	16.510	0.106	5939.	11.469	2.060	0.488	-0.411	-0.099	-0.361	2.005
8	20.497	0.106	5939.	11.526	2.078	0.625	-0.428	-0.107	-0.465	2.042
9	24.497	0.106	5939.	11.553	2.088	0.757	-0.448	-0.1[illegible]3	-0.545	2.086

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RF
742	33	N3	POWER ON		11.4	0.1	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.951	0.096	5529.	11.451	1.4890	1.8508	-0.8634	1.2186	-2.0390	4.72	520.80
2	-3.881	0.101	5737.	11.495	3.6443	1.3745	-1.7500	3.5428	-1.6181	4.99	520.76
3	0.240	0.104	5835.	11.403	8.8212	1.3633	-2.4642	8.8268	-1.3263	5.12	520.76
4	4.361	0.107	5939.	11.404	12.4782	1.8266	-2.8039	12.5809	-0.8724	5.25	520.76
5	8.462	0.107	5939.	11.398	15.8330	2.4381	-2.7953	16.0194	-0.0815	5.25	520.76
6	12.494	0.107	5939.	11.436	18.2163	3.2655	-2.9129	18.4913	0.7528	5.25	520.80
7	16.510	0.106	5939.	11.469	19.2833	4.5715	-3.1434	19.7874	1.0971	5.25	520.76
8	20.497	0.106	5939.	11.526	19.5507	5.8812	-3.2888	20.3723	1.3372	5.25	520.80
9	24.497	0.106	5939.	11.553	19.6981	7.1458	-3.4562	20.8878	1.6655	5.25	520.84

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	34	N3	POWER OFF		11.4	0	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	C_{LS}
1	-7.942	0.035	2724.	11.517	0.083	0.209	-0.073	-0.009	-0.475	0.118
2	-3.910	0.033	2626.	11.540	0.259	0.170	-0.167	-0.008	-0.397	0.264
3	0.217	0.035	2724.	11.438	0.779	0.169	-0.282	-0.007	-0.376	0.744
4	4.336	0.035	2730.	11.463	1.191	0.213	-0.314	-0.016	-0.372	1.126
5	8.405	0.001	251.	11.442	1.541	0.276	-0.326	-0.030	-0.350	1.462
6	12.464	0.001	251.	11.482	1.799	0.354	-0.328	-0.051	-0.318	1.727
7	16.469	0.033	2626.	11.489	1.885	0.491	-0.356	-0.105	-0.424	1.820
8	20.471	0.035	2730.	11.566	1.887	0.607	-0.367	-0.086	-0.504	1.838
9	24.451	0.035	2730.	11.597	1.895	0.745	-0.400	-0.088	-0.610	1.865

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	34	N3	POWER OFF		11.4	0	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.942	0.035	2724.	11.517	2.3610	5.8962	-1.6862	1.5236	-6.1659	1.75	520.84
2	-3.910	0.033	2626.	11.540	7.6861	5.0469	-4.0364	7.3260	-5.5595	1.67	520.93
3	0.217	0.035	2724.	11.438	21.7974	4.7404	-6.4461	21.8152	-4.6577	1.75	520.93
4	4.336	0.035	2730.	11.463	33.2833	5.9634	-7.1806	33.6389	-3.4294	1.76	520.93
5	8.405	0.001	251.	11.442	1016.7800	182.5320	-175.0270	1032.5400	-31.9437	0.07	520.93
6	12.464	0.001	251.	11.482	1190.9000	234.4340	-177.2140	1213.4300	28.1327	0.07	520.93
7	16.469	0.033	2626.	11.489	55.5778	14.4960	-8.5821	57.4072	1.8553	1.67	520.89
8	20.471	0.035	2730.	11.566	53.1932	17.1319	-8.4574	55.8256	2.5541	1.76	520.98
9	24.451	0.035	2730.	11.597	53.5661	21.0764	-9.2274	57.4859	2.9858	1.76	520.98

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	35	N4	POWER ON		5.1	4	40	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	W	CL	CD	CM	CY	CNS	CLS
1	-7.395	4.379	34615.	4.687	2.464	-3.308	-2.502	0.025	7.039	1.851
2	-3.162	4.409	34712.	4.675	3.369	-3.161	-2.682	0.027	6.892	3.007
3	0.991	4.324	34712.	4.768	4.122	-2.873	-2.652	0.032	6.523	4.009
4	5.195	4.427	34813.	4.677	4.862	-2.655	-2.678	0.001	6.411	5.010
5	9.320	4.322	34714.	4.769	5.437	-2.292	-2.600	-0.006	6.038	5.851
6	13.443	4.387	34714.	4.700	6.035	-1.985	-2.596	-0.029	5.863	6.755
7	17.568	4.245	34505.	4.812	6.500	-1.500	-2.553	-0.082	5.328	7.504
8	21.737	4.291	34507.	4.760	7.184	-1.049	-2.617	-0.109	5.008	8.551
9	25.871	4.271	34505.	4.782	7.757	-0.517	-2.654	-0.151	4.536	9.498

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	35	N4	POWER ON		5.1	4	40	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	W	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.395	4.379	34615.	4.687	0.5627	-0.7555	-0.4663	0.6553	0.6768	88.06	520.54
2	-3.162	4.409	34712.	4.675	0.7641	-0.7168	-0.4964	0.8025	0.6735	88.45	520.54
3	0.991	4.324	34712.	4.768	0.9533	-0.6645	-0.5007	0.9417	0.6809	88.45	520.54
4	5.195	4.427	34813.	4.677	1.0981	-0.5997	-0.4938	1.0393	0.6967	88.84	520.45
5	9.320	4.322	34714.	4.769	1.2578	-0.5303	-0.4911	1.1553	0.7270	88.45	520.49
6	13.443	4.387	34714.	4.700	1.3757	-0.4526	-0.4830	1.2328	0.7601	88.45	520.49
7	17.568	4.245	34505.	4.812	1.5313	-0.3534	-0.4910	1.3532	0.7991	87.63	520.49
8	21.737	4.291	34507.	4.760	1.6740	-0.2445	-0.4979	1.4644	0.8471	87.64	520.45
9	25.871	4.271	34505.	4.782	1.8162	-0.1210	-0.5072	1.5813	0.9014	87.63	520.49

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	36	N4	POWER OFF		5.1	0	40	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	W	CL	CD	CM	CY	CNS	CLS
1	-7.968	0.036	1800.	5.110	0.098	0.218	-0.044	-0.004	-0.490	0.133
2	-3.891	0.035	1800.	5.183	0.295	0.188	-0.169	-0.004	-0.431	0.299
3	0.213	0.036	1800.	5.091	0.762	0.189	-0.272	0.002	-0.413	0.746
4	4.327	0.039	1911.	5.174	1.191	0.232	-0.314	-0.012	-0.407	1.125
5	8.415	0.036	1800.	5.101	1.539	0.292	-0.344	-0.028	-0.379	1.458
6	12.477	0.036	1794.	5.144	1.846	0.370	-0.355	-0.052	-0.336	1.771
7	16.452	0.039	1911.	5.149	1.799	0.527	-0.390	-0.074	-0.515	1.720
8	20.472	0.041	2008.	5.215	1.869	0.643	-0.420	-0.077	-0.565	1.829
9	24.455	0.039	1911.	5.164	1.874	0.759	-0.441	-0.089	-0.648	1.834

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	36	N4	POWER OFF		5.1	0	40	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	W	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.968	0.036	1800.	5.110	2.6947	6.0030	-0.9987	1.8365	-6.3186	0.79	520.62
2	-3.891	0.035	1800.	5.183	8.2400	5.2373	-3.8464	7.8655	-5.7844	0.79	520.67
3	0.213	0.036	1800.	5.091	21.4001	5.1868	-6.0839	21.4192	-5.1072	0.79	520.67
4	4.327	0.039	1911.	5.174	30.5058	5.9465	-6.5705	30.8675	-3.6279	0.86	520.67
5	8.415	0.036	1800.	5.101	42.1959	8.0203	-7.7127	42.9153	-1.7589	0.79	520.67
6	12.477	0.036	1794.	5.144	51.2819	10.2779	-8.0526	52.2912	1.0443	0.79	520.67
7	16.452	0.039	1911.	5.149	45.8460	13.4507	-8.1210	47.7783	[illegible]	0.86	520.71
8	20.472	0.041	2008.	5.215	45.4864	15.4906	-8.2552	48.0314	1.3972	0.9[illegible]	520.76
9	24.455	0.039	1911.	5.164	47.8981	19.4169	-9.2150	51.6392	2.1545	0.86	520.76

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	37	N4	POWER ON	1	10.3	2	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.681	2.053	34601.	9.990	1.275	-1.395	-1.273	0.008	2.933	1.003
2	-3.475	2.075	34705.	9.928	1.965	-1.333	-1.422	0.009	2.866	1.782
3	0.670	2.075	34706.	9.931	2.617	-1.202	-1.461	0.00[illegible]	2.736	2.521
4	4.620	2.076	34809.	9.971	3.183	-1.035	-1.463	-0.002	2.616	3.184
5	8.927	2.088	34803.	9.911	3.697	-0.859	-1.415	-0.0[illegible]0	2.546	3.815
6	13.019	2.057	34607.	9.971	4.064	-0.638	-1.429	-0.0[illegible]4	2.431	4.323
7	17.138	2.055	34601.	9.980	4.507	-0.358	-1.440	-0.101	2.253	4.925
8	21.278	2.035	34497.	10.033	5.028	-0.021	-1.457	-0.[illegible]42	2.037	5.635
9	25.267	2.030	34606.	10.104	5.054	0.340	-1.535	-0.235	1.656	5.820

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	37	N4	POWER ON	1	10.3	2	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.681	2.053	34601.	9.990	0.6212	-0.6793	-0.5062	0.7064	0.5902	88.01	520.76
2	-3.475	2.075	34705.	9.928	0.9469	-0.6421	-0.5595	0.9841	0.5835	88.42	520.76
3	0.670	2.075	34706.	9.931	1.2610	-0.5794	-0.5748	1.2542	0.5941	88.42	520.71
4	4.820	2.076	34809.	9.971	1.5332	-0.4988	-0.5752	1.4858	0.6258	88.83	520.76
5	8.927	2.088	34803.	9.911	1.7703	-0.4114	-0.5530	1.6850	0.6811	88.80	520.76
6	13.019	2.057	34607.	9.971	1.9749	-0.3102	-0.5672	1.8543	0.7472	88.03	520.76
7	17.138	2.055	34601.	9.980	2.1930	-0.1744	-0.5721	2.0442	0.8128	88.01	520.76
8	21.278	2.035	34497.	10.033	2.4709	-0.0104	-0.5846	2.2987	0.9064	87.60	520.76
9	25.267	2.030	34606.	10.104	2.4891	0.1677	-0.6173	2.3225	0.9107	88.03	520.80

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	38	N4	POWER ON	1	10.3	1	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.848	1.015	22604.	10.159	0.616	-0.336	-0.573	0.000	0.665	0.541
2	-3.686	1.009	22605.	10.219	1.121	-0.322	-0.729	0.000	0.649	1.049
3	0.461	1.017	22700.	10.204	1.725	-0.269	-0.756	0.001	0.616	1.652
4	4.583	1.025	22803.	10.201	2.187	-0.164	-0.819	-0.009	0.568	2.125
5	8.682	1.027	22802.	10.185	2.602	-0.048	-0.816	-0.026	0.558	2.569
6	12.756	1.033	22907.	10.201	2.933	0.083	-0.807	-0.048	0.560	2.957
7	16.835	1.020	22802.	10.257	3.258	0.296	-0.826	-0.091	0.439	3.347
8	20.905	1.019	22801.	10.258	3.546	0.509	-0.857	-0.132	0.355	3.733
9	24.903	1.011	22801.	10.346	3.569	0.740	-0.886	-0.193	0.170	3.846
10	26.799	1.004	22801.	10.412	3.139	0.889	-0.915	-0.251	-0.156	3.374

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	38	N4	POWER ON	1	10.3	1	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.848	1.015	22604.	10.159	0.6071	-0.3315	-0.4610	0.6467	0.2455	44.24	520.89
2	-3.686	1.009	22605.	10.219	1.1109	-0.3192	-0.5897	1.1291	0.2471	44.24	520.84
3	0.461	1.017	22700.	10.204	1.6957	-0.2648	-0.6065	1.6935	0.2785	44.55	520.93
4	4.583	1.025	22803.	10.201	2.1322	-0.1605	-0.6520	2.1126	0.3303	44.89	520.98
5	8.682	1.027	22802.	10.185	2.5330	-0.0476	-0.6487	2.4967	0.4295	44.88	521.02
6	12.756	1.033	22907.	10.201	2.8383	0.0809	-0.6375	2.7861	0.5477	45.23	520.98
7	16.835	1.020	22802.	10.257	3.1940	0.2905	-0.6611	3.1413	0.6469	44.88	521.02
8	20.905	1.019	22801.	10.258	3.4772	0.4995	-0.6860	3.4266	0.7741	44.88	521.06
9	24.903	1.011	22801.	10.346	3.5294	0.7326	-0.7158	3.5097	0.8216	44.88	521.06
10	26.799	1.004	22801.	10.412	3.1248	0.8850	-0.7435	3.1882	0.6189	44.88	521.06

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	MD
742	39	N4	POWER ON	1	10.3	0.1	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.959	0.097	5631.	10.388	0.150	0.184	-0.110	-0.007	-0.427	0.178
2	-3.871	0.097	5631.	10.397	0.410	0.150	-0.231	-0.008	-0.362	0.406
3	0.242	0.101	5735.	10.327	0.913	0.161	-0.321	-0.007	-0.355	0.871
4	4.361	0.101	5735.	10.318	1.322	0.211	-0.349	-0.014	-0.354	1.252
5	8.455	0.101	5729.	10.308	1.676	0.276	-0.364	-0.026	-0.324	1.594
6	12.490	0.100	5735.	10.394	1.935	0.362	-0.365	-0.046	-0.302	1.862
7	16.516	0.100	5728.	10.357	2.007	0.489	-0.373	-0.076	-0.377	1.950
8	20.517	0.097	5630.	10.437	2.040	0.617	-0.387	-0.109	-0.456	2.006
9	24.496	0.096	5630.	10.489	2.045	0.763	-0.418	-0.111	-0.571	2.035

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	MD
742	39	N4	POWER ON	1	10.3	0.1	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.959	0.097	5631.	10.388	1.5376	1.8823	-0.9211	1.2621	-2.0771	4.35	521.11
2	-3.871	0.097	5631.	10.397	4.1981	1.5446	-1.9321	4.0342	-1.8245	4.35	521.20
3	0.242	0.101	5735.	10.327	9.0170	1.5945	-2.5946	9.0237	-1.5563	4.48	521.20
4	4.361	0.101	5735.	10.318	13.0451	2.0874	-2.8179	13.1660	-1.0893	4.48	521.20
5	8.455	0.101	5729.	10.308	16.5505	2.7329	-2.9357	16.7724	-0.2695	4.47	521.20
6	12.490	0.100	5735.	10.394	19.2331	3.6034	-2.9673	19.5573	0.6416	4.48	521.24
7	16.516	0.100	5728.	10.357	19.9190	4.8542	-3.0269	20.4771	1.0089	4.47	521.24
8	20.517	0.097	5630.	10.437	20.9691	6.3448	-3.2520	21.8628	1.4072	4.35	521.28
9	24.496	0.096	5630.	10.489	21.1300	7.8844	-3.5282	22.4972	1.5865	4.35	521.28

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	40	N4	POWER OFF	1	10.3	0	40	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.986	0.032	2729.	10.404	0.090	0.211	-0.065	-0.007	-0.483	0.125
2	-3.928	0.032	2736.	10.390	0.306	0.167	-0.136	-0.009	-0.402	0.309
3	0.215	0.032	2736.	10.334	0.793	0.178	-0.266	-0.010	-0.399	0.757
4	4.324	0.032	2736.	10.350	1.200	0.224	-0.299	-0.022	-0.397	1.133
5	8.423	0.032	2736.	10.335	1.552	0.287	-0.309	-0.033	-0.374	1.470
6	12.457	0.032	2729.	10.413	1.771	0.374	-0.311	-0.042	-0.371	1.692
7	16.467	0.034	2833.	10.386	1.840	0.498	-0.323	-0.079	-0.455	1.769
8	20.477	0.034	2833.	10.374	1.872	0.612	-0.340	-0.110	-0.517	1.820
9	24.456	0.033	2833.	10.475	1.876	0.753	-0.374	-0.091	-0.636	1.838

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	40	N4	POWER OFF	1	10.3	0	40	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.986	0.032	2729.	10.404	2.7946	6.5510	-1.6583	1.8573	-6.8757	1.43	521.33
2	-3.928	0.032	2736.	10.390	9.4718	5.1664	-3.4496	9.0956	-5.8031	1.44	521.37
3	0.215	0.032	2736.	10.334	24.3591	5.4954	-6.6731	24.3796	-5.4035	1.44	521.41
4	4.324	0.032	2736.	10.350	36.9096	6.9002	-7.5184	37.3248	-4.0975	1.44	521.37
5	8.423	0.032	2736.	10.335	47.6622	8.8424	-7.7634	48.4433	-1.7652	1.44	521.41
6	12.457	0.032	2729.	10.413	54.9803	11.6152	-7.8947	56.1914	0.5182	1.43	521.37
7	16.467	0.034	2833.	10.386	53.9609	14.6037	-7.7472	55.8872	1.2918	1.51	521.41
8	20.477	0.034	2833.	10.374	54.8368	17.9292	-8.1374	57.6459	2.3889	1.51	521.46
9	24.456	0.033	2833.	10.475	55.4925	22.2898	-9.0410	59.7415	2.6838	1.51	521.41

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	47	N4	POWER OFF		5.1	0	60	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.864	0.039	1919.	5.101	0.468	0.250	-0.218	-0.015	-0.637	0.521
2	-3.533	0.042	2016.	5.116	1.652	0.402	-0.780	-0.031	-1.064	1.619
3	0.566	0.042	2010.	5.104	2.045	0.490	-0.811	-0.045	-1.131	1.947
4	4.630	0.045	2114.	5.162	2.318	0.578	-0.800	-0.069	-1.125	2.171
5	8.683	0.042	2010.	5.103	2.550	0.661	-0.781	-0.092	-1.063	2.376
6	12.671	0.044	2114.	5.185	2.552	0.782	-0.749	-0.137	-1.083	2.370
7	16.653	0.044	2114.	5.181	2.524	0.966	-0.772	-0.143	-1.235	2.327
8	20.642	0.044	2114.	5.204	2.513	1.081	-0.776	-0.164	-1.244	2.333
9	24.474	0.041	2010.	5.196	1.919	1.175	-0.757	-0.207	-1.447	1.694
10	28.395	0.038	1918.	5.214	1.620	1.292	-0.762	-0.088	-1.679	1.314

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	47	N4	POWER OFF		5.1	0	60	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTD
1	-7.864	0.039	1919.	5.101	12.2622	6.2890	-4.4838	11.2863	-7.9077	0.87	520.01
2	-3.533	0.042	2016.	5.116	38.6098	9.4509	-14.9720	38.1535	-11.8250	0.93	520.01
3	0.566	0.042	2010.	5.104	46.1464	11.5552	-15.5963	48.2523	-11.0784	0.93	520.01
4	4.630	0.045	2114.	5.162	51.4316	12.8210	-14.4861	52.2988	-8.6268	0.99	520.05
5	8.683	0.042	2010.	5.103	60.0294	15.5756	-15.0216	61.6929	-6.3336	0.93	520.01
6	12.671	0.044	2114.	5.185	56.8708	17.4419	-13.6293	59.3117	-4.5414	0.99	520.01
7	16.653	0.044	2114.	5.181	56.1969	21.5095	-14.0371	60.0040	-4.5023	0.99	520.01
8	20.642	0.044	2114.	5.204	56.1990	24.1725	-14.1758	61.1127	-2.8080	0.99	520.01
9	24.474	0.041	2010.	5.196	46.0054	28.1589	-14.8171	53.5375	-6.5690	0.93	520.01
10	28.395	0.038	1918.	5.214	41.5871	33.1539	-15.9657	52.3500	-9.3883	0.87	520.10

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	48	N4	POWER OFF	10.3	0	60		2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	W	CL	CD	CM	CY	CNS	CLS
1	-7.649	0.033	2830.	10.410	0.527	0.245	-0.255	-0.020	-0.636	0.559
2	-4.556	0.036	2947.	10.350	1.531	0.365	-0.722	-0.034	-1.006	1.514
3	-3.524	0.037	3044.	10.408	1.666	0.397	-0.774	-0.036	-1.063	1.653
4	0.576	0.037	3044.	10.395	2.079	0.489	-0.815	-0.050	-1.132	1.980
5	4.649	0.037	3044.	10.377	2.351	0.577	-0.794	-0.070	-1.122	2.202
6	8.694	0.037	3044.	10.388	2.534	0.668	-0.760	-0.088	-1.078	2.358
7	12.675	0.037	3044.	10.412	2.565	0.790	-0.731	-0.133	-1.099	2.380
8	16.651	0.037	3044.	10.477	2.463	0.923	-0.713	-0.166	-1.171	2.275
9	20.642	0.037	3044.	10.497	2.420	1.079	-0.729	-0.184	-1.272	2.232
10	24.565	0.036	3024.	10.623	2.239	1.154	-0.697	-0.181	-1.279	2.069
11	28.453	0.031	2731.	10.620	1.832	1.304	-0.715	-0.159	-1.578	1.579

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	48	N4	POWER OFF	10.3	0	60		2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	W	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.649	0.033	2830.	10.410	15.5212	7.2212	-6.1479	14.3895	-9.2733	1.51	520.23
2	-4.556	0.036	2947.	10.350	42.2311	10.0749	-16.2584	41.2973	-13.3978	1.61	520.32
3	-3.524	0.037	3044.	10.408	44.5761	10.5077	-16.7064	43.8458	-13.2283	1.68	520.32
4	0.576	0.037	3044.	10.395	54.8958	12.9307	-17.5795	55.0229	-12.3782	1.68	520.32
5	4.649	0.037	3044.	10.377	61.9577	15.2150	-17.0852	62.9871	-10.1427	1.68	520.32
6	8.694	0.037	3044.	10.388	66.8475	17.6214	-16.3854	68.7431	-7.3136	1.68	520.36
7	12.675	0.037	3044.	10.412	67.8188	20.9029	-15.7823	70.7527	-5.5121	1.68	520.32
8	16.651	0.037	3044.	10.477	65.5271	24.5750	-15.5013	69.8211	-4.7682	1.68	520.36
9	20.642	0.037	3044.	10.497	64.5165	28.7872	-15.8734	70.5230	-4.1941	1.68	520.36
10	24.565	0.036	3024.	10.623	60.9969	31.4409	-15.5058	68.5469	-3.2365	1.67	520.49
11	28.453	0.031	2731.	10.620	57.9407	41.2579	-18.4694	70.5388	-8.6691	1.44	520.49

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	49	N4	POWER ON		5.1	4	60	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	W	CL	CD	CM	CY	CNS	CLS
1	-6.688	4.479	34718.	4.603	5.415	-2.560	-4.065	0.026	4.708	4.897
2	-2.512	4.385	34720.	4.702	6.008	-2.129	-4.043	0.002	4.182	5.643
3	1.623	4.381	34721.	4.707	6.568	-1.759	-3.992	-0.018	3.851	6.364
4	5.737	4.347	34830.	4.767	6.991	-1.339	-3.880	-0.034	3.482	6.924
5	9.851	4.369	34745.	4.725	7.452	-0.993	-3.828	-0.073	3.345	7.579
6	13.905	4.328	34830.	4.788	7.741	-0.562	-3.712	-0.077	3.039	8.081
7	18.016	4.339	34830.	4.776	8.131	-0.067	-3.717	-0.098	2.666	8.708
8	22.134	4.241	34831.	4.886	8.501	0.518	-3.682	-0.111	2.142	9.323
9	26.005	4.221	34831.	4.909	7.856	1.132	-3.745	-0.294	1.308	8.845
10	29.983	4.128	34830.	5.019	7.713	1.694	-3.705	-0.368	0.652	8.834

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	49	N4	POWER ON		5.1	4	60	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	W	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-6.688	4.479	34718.	4.603	1.2088	-0.5715	-0.7409	1.2672	0.4268	88.47	520.36
2	-2.512	4.385	34720.	4.702	1.3701	-0.4856	-0.7527	1.3901	0.4251	88.47	520.32
3	1.623	4.381	34721.	4.707	1.5038	-0.4016	-0.7437	1.4918	0.4440	88.48	520.27
4	5.737	4.347	34830.	4.767	1.6061	-0.3080	-0.7286	1.5693	0.4672	88.91	520.14
5	9.851	4.369	34745.	4.725	1.7056	-0.2272	-0.7152	1.6416	0.5157	88.57	520.14
6	13.905	4.328	34830.	4.788	1.7867	-0.1299	-0.7003	1.7051	0.5560	88.91	520.14
7	18.016	4.339	34830.	4.776	1.8740	-0.0155	-0.6994	1.7772	0.5944	88.91	520.14
8	22.134	4.241	34831.	4.886	2.0041	0.1223	-0.7087	1.9025	0.6418	88.91	520.10
9	26.005	4.221	34831.	4.909	1.8703	0.2683	-0.7242	1.7986	0.5789	88.91	520.10
10	29.983	4.128	34830.	5.019	1.8682	0.4104	-0.7327	1.8232	0.5781	88.91	520.14

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	50	N4	POWER ON		10.3	2	60	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.123	2.066	34728.	9.985	3.496	-0.883	-2.358	0.001	1.317	3.275
2	-2.954	2.064	34729.	9.994	4.088	-0.650	-2.404	-0.016	1.042	3.882
3	1.163	2.064	34730.	9.996	4.557	-0.419	-2.384	-0.039	0.868	4.366
4	5.263	2.055	34732.	10.038	4.930	-0.184	-2.335	-0.058	0.756	4.775
5	9.324	2.052	34835.	10.101	5.208	0.042	-2.259	-0.071	0.710	5.120
6	13.381	2.053	34836.	10.093	5.462	0.291	-2.197	-0.086	0.656	5.473
7	17.468	2.050	34882.	10.129	5.776	0.680	-2.219	-0.123	0.361	5.884
8	21.454	2.005	34827.	10.334	5.613	1.042	-2.215	-0.227	0.027	5.822
9	25.390	1.957	34729.	10.539	5.402	1.493	-2.251	-0.315	-0.511	5.660
10	29.396	1.966	34729.	10.494	5.364	1.852	-2.276	-0.359	-0.812	5.740

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	50	N4	POWER ON		10.3	2	60	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.123	2.066	34728.	9.985	1.6921	-0.4278	-0.9317	1.7321	0.2146	88.51	520.27
2	-2.954	2.064	34729.	9.994	1.9805	-0.3152	-0.9506	1.9941	0.2127	88.51	520.23
3	1.163	2.064	34730.	9.996	2.2079	-0.2033	-0.9431	2.2033	0.2481	88.52	520.19
4	5.263	2.055	34732.	10.038	2.3964	-0.0897	-0.9275	2.3800	0.3093	88.52	520.14
5	9.324	2.052	34835.	10.101	2.5361	0.0209	-0.8990	2.5079	0.3906	88.93	520.19
6	13.381	2.053	34836.	10.093	2.6593	0.1419	-0.8731	2.6199	0.4773	88.93	520.14
7	17.468	2.050	34882.	10.129	2.8165	0.3315	-0.8833	2.7861	0.5292	89.11	520.14
8	21.454	2.005	34827.	10.334	2.7997	0.5198	-0.9019	2.7959	0.5401	88.90	520.23
9	25.390	1.957	34729.	10.539	2.7595	0.7629	-0.9387	2.8201	0.4940	88.51	520.23
10	29.396	1.966	34729.	10.494	2.7285	0.9423	-0.9450	2.8397	0.5182	88.51	520.23

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	51	N4	POWER ON		10.3	1	60	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	W	CL	CD	CM	CY	CNS	CLS
1	-7.383	1.013	22622.	10.188	2.410	-0.135	-1.426	-0.019	-0.162	2.337
2	-3.183	1.020	22718.	10.191	3.033	0.071	-1.552	-0.039	-0.482	2.919
3	0.905	1.010	22718.	10.287	3.418	0.227	-1.539	-0.054	-0.579	3.262
4	4.977	1.012	22717.	10.269	3.722	0.381	-1.508	-0.072	-0.604	3.541
5	9.040	1.006	22717.	10.331	3.932	0.532	-1.456	-0.097	-0.577	3.757
6	13.076	1.012	22717.	10.272	4.145	0.728	-1.427	-0.132	-0.609	3.999
7	17.138	1.001	22717.	10.378	4.368	1.001	-1.446	-0.173	-0.764	4.260
8	21.104	1.000	22716.	10.391	4.231	1.211	-1.427	-0.244	-0.867	4.187
9	25.052	0.972	22619.	10.618	4.048	1.509	-1.451	-0.297	-1.169	4.031
10	29.015	0.962	22502.	10.639	3.874	1.775	-1.475	-0.346	-1.416	3.896

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	51	N4	POWER ON		10.3	1	60	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	W	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.383	1.013	22622.	10.188	2.3762	-0.1339	-1.1490	2.3757	-0.1727	44.29	520.36
2	-3.183	1.020	22718.	10.191	2.9725	0.0702	-1.2422	2.9640	-0.2351	44.61	520.41
3	0.905	1.010	22718.	10.287	3.3819	0.2254	-1.2435	3.3851	-0.1720	44.61	520.41
4	4.977	1.012	22717.	10.269	3.6759	0.3771	-1.2162	3.6947	-0.0568	44.61	520.45
5	9.040	1.006	22717.	10.331	3.9066	0.5289	-1.1810	3.9412	0.0914	44.61	520.45
6	13.076	1.012	22717.	10.272	4.0950	0.7195	-1.1509	4.1516	0.2255	44.61	520.45
7	17.138	1.001	22717.	10.378	4.3601	0.9999	-1.1783	4.4612	0.3292	44.61	520.45
8	21.104	1.000	22716.	10.391	4.2291	1.2107	-1.1643	4.3814	0.3933	44.60	520.49
9	25.052	0.972	22619.	10.618	4.1638	1.5525	-1.2183	4.4295	0.3567	44.28	520.49
10	29.015	0.962	22502.	10.639	4.0270	1.8454	-1.2522	4.4167	0.3394	43.91	520.45

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	52	N4	POWER ON		10.3	0.1	60	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.839	0.095	5531.	10.373	0.660	0.227	-0.327	-0.014	-0.619	0.686
2	-3.504	0.101	5739.	10.361	1.838	0.386	-0.847	-0.037	-1.054	1.797
3	0.594	0.094	5530.	10.440	2.207	0.482	-0.869	-0.050	-1.120	2.102
4	4.663	0.095	5530.	10.371	2.479	0.572	-0.854	-0.067	-1.104	2.325
5	8.703	0.094	5530.	10.416	2.661	0.667	-0.825	-0.091	-1.056	2.503
6	12.694	0.094	5530.	10.430	2.694	0.788	-0.786	-0.134	-1.065	2.511
7	16.684	0.093	5530.	10.525	2.624	0.930	-0.759	-0.164	-1.137	2.443
8	20.665	0.094	5530.	10.497	2.562	1.054	-0.753	-0.196	-1.173	2.397
9	24.630	0.093	5530.	10.574	2.511	1.212	-0.764	-0.183	-1.269	2.362
10	28.522	0.092	5529.	10.609	2.123	1.328	-0.769	-0.208	-1.455	1.939

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	52	N4	POWER ON		10.3	0.1	60	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.839	0.095	5531.	10.373	6.9454	2.3913	-2.8129	6.5543	-3.3163	4.23	520.49
2	-3.504	0.101	5739.	10.361	18.1960	3.8242	-6.8447	17.9282	-4.9293	4.49	520.54
3	0.594	0.094	5530.	10.440	23.3543	5.1057	-7.5106	23.4060	-4.8631	4.23	520.58
4	4.663	0.095	5530.	10.371	26.0563	6.0127	-7.3329	26.4589	-3.8745	4.23	520.58
5	8.703	0.094	5530.	10.416	28.3062	7.0413	-7.1094	29.0458	-2.6768	4.23	520.54
6	12.694	0.094	5530.	10.430	28.4822	8.3315	-6.7856	29.6169	-1.8687	4.23	520.62
7	16.684	0.093	5530.	10.525	27.9979	9.9251	-6.6142	29.6687	-1.4691	4.23	520.58
8	20.665	0.094	5530.	10.497	27.2620	11.2168	-6.5420	29.4664	-0.8740	4.23	520.58
9	24.630	0.093	5530.	10.574	26.9178	12.9937	-6.6913	29.8840	-0.5932	4.23	520.62
10	28.522	0.092	5529.	10.609	22.8326	14.2913	-6.7549	26.8855	-1.6540	4.23	520.71

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	53	N4	POWER OFF	0	5.1	0	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.781	0.050	1912.	5.141	0.894	0.307	-0.404	-0.013	-0.847	0.930
2	-3.512	0.053	2009.	5.158	1.768	0.435	-0.789	-0.035	-1.152	1.734
3	0.578	0.053	2016.	5.121	2.142	0.525	-0.810	-0.056	-1.209	2.040
4	4.646	0.056	2113.	5.175	2.413	0.618	-0.803	-0.065	-1.210	2.257
5	8.690	0.053	2016.	5.144	2.589	0.704	-0.770	-0.097	-1.151	2.406
6	12.670	0.053	2016.	5.203	2.560	0.867	-0.772	-0.137	-1.256	2.357
7	16.643	0.056	2113.	5.175	2.522	1.000	-0.753	-0.148	-1.309	2.313
8	20.631	0.055	2113.	5.255	2.450	1.102	-0.733	-0.170	-1.308	2.255
9	24.484	0.052	2016.	5.239	1.953	1.223	-0.740	-0.215	-1.528	1.711
10	28.368	0.049	1918.	5.251	1.559	1.298	-0.724	-0.102	-1.719	1.237

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	53	N4	POWER OFF	0	5.1	0	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.781	0.050	1912.	5.141	17.8612	6.1337	-6.5839	16.8663	-8.4954	1.10	520.32
2	-3.512	0.053	2009.	5.158	33.2200	8.1777	-12.1101	32.6566	-10.1975	1.17	520.32
3	0.578	0.053	2016.	5.121	39.7834	9.7496	-12.2821	39.8798	-9.3476	1.18	520.32
4	4.646	0.056	2113.	5.175	42.5987	10.9156	-11.5858	43.3429	-7.4288	1.25	520.36
5	8.690	0.053	2016.	5.144	48.3063	13.1349	-11.7283	49.7363	-5.6855	1.18	520.32
6	12.670	0.053	2016.	5.203	48.3009	16.3686	-11.9030	50.7150	-5.3751	1.18	520.32
7	16.643	0.056	2113.	5.175	44.5287	17.6536	-10.8626	47.7194	-4.1602	1.25	520.36
8	20.631	0.055	2113.	5.255	43.9177	19.7593	-10.7292	48.0634	-3.0175	1.25	520.32
9	24.484	0.052	2016.	5.239	37.1160	23.2456	-11.4830	43.4124	-5.7723	1.18	520.36
10	28.368	0.049	1918.	5.251	31.6592	26.3556	-12.0087	40.3798	-8.1478	1.10	520.41

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	54	N4	POWER OFF	0	10.3	0	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.600	0.041	2829.	10.381	0.858	0.303	-0.437	-0.017	-0.843	0.933
2	-3.544	0.043	2946.	10.396	1.778	0.428	-0.786	-0.039	-1.146	1.744
3	0.565	0.045	3044.	10.387	2.152	0.521	-0.814	-0.050	-1.207	2.050
4	4.626	0.045	3044.	10.399	2.412	0.610	-0.799	-0.072	-1.195	2.258
5	8.673	0.044	2992.	10.443	2.602	0.697	-0.770	-0.095	-1.136	2.420
6	12.650	0.045	3044.	10.454	2.582	0.825	-0.735	-0.140	-1.175	2.387
7	16.614	0.045	3044.	10.520	2.453	0.954	-0.706	-0.167	-1.243	2.253
8	20.615	0.044	3043.	10.560	2.445	1.112	-0.721	-0.183	-1.330	2.246
9	24.476	0.042	2946.	10.600	2.000	1.178	-0.684	-0.199	-1.430	1.781
10	28.417	0.040	2828.	10.658	1.810	1.302	-0.688	-0.135	-1.601	1.544

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	54	N4	POWER OFF	0	10.3	0	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.800	0.041	2829.	10.381	21.6680	7.3141	-8.6220	20.4748	-10.1872	1.84	520.49
2	-3.544	0.043	2946.	10.396	40.6909	9.8055	-14.6816	40.0068	-12.3026	1.94	520.54
3	0.565	0.045	3044.	10.387	47.0838	11.4111	-14.5417	47.1942	-10.9455	2.03	520.58
4	4.626	0.045	3044.	10.399	52.6418	13.3776	-14.2980	53.7487	-9.0718	2.03	520.62
5	8.673	0.044	2992.	10.443	58.5863	15.6992	-14.1593	60.2858	-6.6844	1.99	520.58
6	12.650	0.045	3044.	10.454	56.8423	18.1829	-13.2235	59.4445	-5.2927	2.03	520.62
7	16.614	0.045	3044.	10.520	54.3558	21.1445	-12.7728	58.1322	-4.7201	2.03	520.62
8	20.615	0.044	3043.	10.560	54.3771	24.7502	-13.0931	59.6095	-4.0197	2.03	520.67
9	24.476	0.042	2946.	10.600	46.6666	27.4973	-13.0426	53.8654	-5.6911	1.94	520.71
10	28.417	0.040	2828.	10.658	44.8517	32.2551	-13.9218	54.7972	-7.0243	1.84	520.76

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	55	M4	POWER ON	0	5.1	4	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-6.391	4.292	32974.	4.829	6.523	-0.884	-4.515	0.010	0.650	6.235
2	-2.248	4.345	33078.	4.797	7.047	-0.480	-4.567	-0.012	0.260	6.734
3	1.677	4.308	33079.	4.838	7.448	-0.056	-4.483	-0.036	-0.091	7.120
4	5.968	4.366	33184.	4.801	7.813	0.311	-4.426	-0.052	-0.248	7.498
5	10.012	4.278	33184.	4.899	7.949	0.654	-4.236	-0.048	-0.311	7.699
6	14.048	4.296	33178.	4.877	8.119	0.982	-4.125	-0.056	-0.305	7.988
7	18.123	4.264	33185.	4.916	8.325	1.485	-4.066	-0.079	-0.657	8.303
8	22.208	4.238	33281.	4.972	8.578	2.121	-4.103	-0.084	-1.210	8.662
9	25.991	4.137	33281.	5.093	7.607	2.544	-4.025	-0.300	-1.704	7.749
10	29.956	4.056	33280.	5.194	7.351	3.054	-4.017	-0.354	-2.204	7.579

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	55	M4	POWER ON	0	5.1	4	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-6.391	4.292	32974.	4.829	1.5197	-0.2059	-0.8587	1.5332	0.0355	88.93	520.14
2	-2.248	4.345	33078.	4.797	1.6217	-0.1105	-0.8579	1.6248	0.0468	89.43	520.14
3	1.677	4.308	33079.	4.838	1.7286	-0.0130	-0.8494	1.7273	0.0696	89.44	520.10
4	5.968	4.366	33184.	4.801	1.7894	0.0712	-0.8275	1.7871	0.1152	89.93	520.10
5	10.012	4.278	33184.	4.899	1.8577	0.1530	-0.8082	1.8560	0.1723	89.93	520.10
6	14.048	4.296	33178.	4.877	1.8897	0.2286	-0.7837	1.8886	0.2369	89.91	520.05
7	18.123	4.264	33185.	4.916	1.9524	0.3484	-0.7785	1.9639	0.2761	89.94	520.05
8	22.208	4.238	33281.	4.972	2.0241	0.5005	-0.7903	2.0631	0.3016	90.46	520.10
9	25.991	4.137	33281.	5.093	1.8385	0.6149	-0.7941	1.9220	0.2529	90.46	520.10
10	29.956	4.056	33280.	5.194	1.8125	0.7530	-0.8084	1.9464	0.2525	90.39	520.14

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	56	M4	POWER ON	0	10.3	2	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-6.883	2.065	33077.	10.090	4.373	-0.137	-2.726	-0.006	-0.560	4.252
2	-2.742	2.081	33181.	10.072	4.847	0.113	-2.769	-0.020	-0.794	4.659
3	1.366	2.082	33278.	10.118	5.215	0.370	-2.736	-0.035	-0.959	4.972
4	5.443	2.034	32971.	10.187	5.497	0.629	-2.647	-0.065	-1.062	5.222
5	9.494	2.050	33074.	10.166	5.748	0.855	-2.572	-0.086	-1.046	5.478
6	13.520	2.024	32971.	10.240	5.858	1.054	-2.467	-0.093	-0.999	5.648
7	17.568	2.021	33074.	10.309	6.014	1.485	-2.461	-0.122	-1.512	5.832
8	21.448	1.978	32975.	10.480	5.504	1.757	-2.417	-0.266	-1.510	5.360
9	25.422	1.961	32972.	10.568	5.375	2.145	-2.449	-0.315	-1.854	5.292
10	29.382	1.946	33071.	10.704	5.207	2.431	-2.407	-0.349	-2.036	5.208

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	56	M4	POWER ON	0	10.3	2	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-6.883	2.065	33077.	10.090	2.1170	-0.0663	-1.0773	2.1096	-0.1878	89.42	520.19
2	-2.742	2.081	33181.	10.072	2.3293	0.0543	-1.0865	2.3240	-0.1656	89.92	520.19
3	1.368	2.082	33278.	10.118	2.5047	0.1778	-1.0729	2.5083	-0.1179	90.39	520.19
4	5.443	2.034	32971.	10.187	2.7020	0.3094	-1.0623	2.7192	-0.0516	88.92	520.23
5	9.494	2.050	33074.	10.166	2.8038	0.4172	-1.0243	2.8342	0.0510	89.41	520.27
6	13.520	2.024	32971.	10.240	2.8941	0.5211	-0.9950	2.9357	0.1698	88.92	520.23
7	17.568	2.021	33074.	10.309	2.9748	0.7848	-0.9937	3.0579	0.1973	89.41	520.27
8	21.448	1.978	32975.	10.480	2.7827	0.8882	-0.9974	2.9148	0.1907	88.94	520.32
9	25.422	1.961	32972.	10.568	2.7402	1.0936	-1.0193	2.9444	0.1886	88.92	520.41
10	29.382	1.946	33071.	10.704	2.6748	1.2490	-1.0095	2.9436	0.2240	89.40	520.36

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	57	N4	POWER ON	0	5.1	4	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	29.914	3.964	33070.	5.256	7.203	2.868	-3.899	-0.343	-1.907	7.499
2	31.935	4.008	33274.	5.255	7.243	3.144	-3.929	-0.343	-2.130	7.616
3	33.882	4.039	33275.	5.214	7.094	3.367	-3.932	-0.337	-2.352	7.516
4	35.867	3.985	33383.	5.316	6.887	3.466	-3.842	-0.375	-2.372	7.420

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	57	N4	POWER ON	0	5.1	4	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	29.914	3.964	33070.	5.256	1.8172	0.7235	-0.8030	1.9359	0.2790	89.39	520.41
2	31.935	4.008	33274.	5.255	1.8071	0.7844	-0.8003	1.9485	0.2902	90.37	520.32
3	33.882	4.039	33275.	5.214	1.7563	0.8337	-0.7947	1.9228	0.2870	90.36	520.36
4	35.867	3.985	33383.	5.316	1.7281	0.8697	-0.7870	1.9100	0.3077	90.89	520.36

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	58	N4	POWER ON	0	10.3	1	90	2

***** STABILITY AXIS *****

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.199	0.917	20966.	10.250	3.027	0.279	-1.660	-0.020	-1.210	3.006
2	-3.069	0.920	21057.	10.300	3.532	0.462	-1.727	-0.034	-1.427	3.424
3	1.029	0.929	21167.	10.292	3.896	0.634	-1.723	-0.056	-1.519	3.707
4	5.110	0.925	21166.	10.330	4.173	0.796	-1.691	-0.077	-1.518	3.926
5	9.126	0.921	21167.	10.379	4.313	0.921	-1.616	-0.102	-1.402	4.051
6	13.124	0.927	21264.	10.397	4.306	1.077	-1.528	-0.139	-1.350	4.059
7	17.201	0.920	21262.	10.471	4.559	1.400	-1.577	-0.190	-1.572	4.313
8	21.098	0.904	21164.	10.572	4.163	1.534	-1.487	-0.259	-1.576	3.966
9	25.037	0.907	21263.	10.619	3.991	1.809	-1.526	-0.309	-1.806	3.812
10	28.920	0.894	21163.	10.694	3.542	1.890	-1.437	-0.337	-1.823	3.408
11	30.879	0.886	21105.	10.734	3.378	1.989	-1.423	-0.277	-1.948	3.232

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	58	N4	POWER ON	0	10.3	1	90	2

***** THRUST PARAMETERS *****

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.199	0.917	20966.	10.250	3.2984	0.3047	-1.4765	3.2342	-0.7157	40.36	520.45
2	-3.069	0.920	21057.	10.300	3.8381	0.5021	-1.5321	3.8057	-0.7069	40.66	520.45
3	1.029	0.929	21167.	10.292	4.1925	0.6825	-1.5140	4.2041	-0.6071	41.03	520.49
4	5.110	0.925	21166.	10.330	4.5075	0.8603	-1.4914	4.5662	-0.4553	41.03	520.54
5	9.126	0.921	21167.	10.379	4.6610	1.0000	-1.4315	4.7803	-0.2449	41.03	520.49
6	13.124	0.927	21264.	10.397	4.6443	1.1621	-1.3454	4.7869	-0.0772	41.35	520.54
7	17.201	0.920	21262.	10.471	4.9527	1.5209	-1.3987	5.1810	0.0118	41.35	520.62
8	21.098	0.904	21164.	10.572	4.6029	1.6970	-1.3427	4.9052	0.0736	41.02	520.62
9	25.037	0.907	21263.	10.619	4.3972	1.9936	-1.3727	4.8277	0.0547	41.35	520.58
10	28.920	0.894	21163.	10.694	3.9615	2.1147	-1.3120	4.4901	0.0647	41.02	520.67
11	30.879	0.886	21105.	10.734	3.8113	2.2440	-1.3105	4.4228	0.0301	40.82	520.67

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	59	N4	POWER ON	0	10.3	0.1	90	2

* * * * * STABILITY AXIS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	CL	CD	CM	CY	CNS	CLS
1	-7.698	0.063	3876.	10.384	1.167	0.297	-0.567	-0.020	-0.883	1.195
2	-3.489	0.066	3987.	10.334	1.950	0.423	-0.854	-0.039	-1.153	1.908
3	0.623	0.066	3987.	10.348	2.313	0.520	-0.876	-0.055	-1.209	2.203
4	4.682	0.066	3987.	10.347	2.587	0.612	-0.856	-0.072	-1.190	2.425
5	8.727	0.066	3987.	10.341	2.769	0.708	-0.831	-0.093	-1.133	2.600
6	12.719	0.066	3987.	10.419	2.764	0.839	-0.783	-0.138	-1.164	2.567
7	16.684	0.065	3987.	10.444	2.676	0.977	-0.755	-0.180	-1.225	2.480
8	20.662	0.065	3986.	10.497	2.563	1.135	-0.762	-0.207	-1.330	2.368
9	24.600	0.065	3986.	10.545	2.417	1.222	-0.730	-0.208	-1.332	2.247
10	28.526	0.062	3876.	10.596	2.140	1.315	-0.722	-0.188	-1.424	1.966

NAAL	RUN	CONFIGURATION		YAW	Q	CT	DF	RD
742	59	N4	POWER ON	0	10.3	0.1	90	2

* * * * * THRUST PARAMETERS * * * * *

POINT	ALPHA	CT	N/SQRT	Q	L/T	D/T	M/TC	N/T	-A/T	THRUST	TTO
1	-7.698	0.063	3876.	10.384	18.3036	4.6622	-7.2678	17.5141	-7.0722	2.84	520.71
2	-3.489	0.066	3987.	10.334	29.2690	6.3486	-10.4606	28.8283	-8.1182	2.95	520.76
3	0.623	0.066	3987.	10.348	34.7596	7.8273	-10.7532	34.8427	-7.4487	2.95	520.76
4	4.682	0.066	3987.	10.347	38.8774	9.2087	-10.5000	39.4394	-6.0042	2.95	520.80
5	8.727	0.066	3987.	10.341	41.8827	10.6321	-10.1913	43.0111	-4.1535	2.95	520.80
6	12.719	0.066	3987.	10.419	41.8224	12.7045	-9.6740	43.5934	-3.1844	2.95	520.80
7	16.684	0.065	3987.	10.444	40.5925	14.8296	-9.3589	43.1411	-2.5513	2.95	520.80
8	20.662	0.065	3986.	10.497	39.0710	17.3056	-9.4840	42.6643	-2.4058	2.95	520.84
9	24.600	0.065	3986.	10.545	37.0192	18.7167	-9.1321	41.4506	-1.6074	2.95	520.84
10	28.526	0.062	3876.	10.596	34.2591	21.0586	-9.4437	40.1568	-2.1407	2.83	520.93