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EXPERIMENTS ON RUDDERS WITH SMALL
FLAPS IN FREE-STREAM AND BEHIND A
PROPELLER

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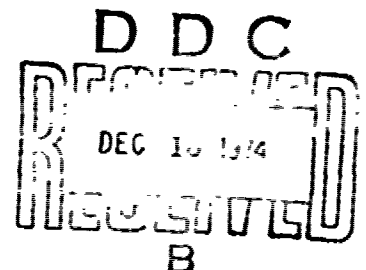
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ABSTRACT

Water tunnel experiments were performed to determine the characteristics of rudders with small flaps both in the free stream and behind a propeller. The results include plots of lift, drag, rudder moment, and flap moment coefficient for a complete range of angles of attack and flap deflection.

List of Symbols

- A = total rudder area (flap plus skeg)
- a = half width of tip chord @ 20% of tip chord forward of trailing edge
(see Fig. 2, sketch 9)
- b = half width of root chord @ same longitudinal position
- $\bar{c}$ = length of mean aerodynamic chord = $\frac{2}{3}[c_t + c_r \frac{c_t c_r}{c_t c_r}]$
- C_D = drag coefficient = $D/\frac{\rho}{2} AU_\infty^2$
- C_L = lift coefficient = $L/\frac{\rho}{2} AU_\infty^2$
- C_M = rudder moment coefficient = $M/\frac{\rho}{2} A \bar{c} U_\infty^2$
- C_{MF} = flap moment coefficient = $MF/\frac{\rho}{2} A \bar{c} U_\infty^2$
- c_t = tip chord
- c_r = root chord
- D = propeller diameter, rudder drag
- E = propeller efficiency, $JK_T/2\pi K_Q$
- flap = movable after portion of rudder
- flap area = rudder area between flap hinge location and trailing edge of rudder
- flap gap = distance between trailing edge of skeg and leading edge of flap measured in the rudder plane of symmetry with zero flap deflection
- J = U_∞/ND
- K_T = $T/\rho N^2 D^4$
- K_Q = $Q/\rho N^2 D^5$
- L = total lift of rudder
- M = total moment acting on rudder about stock axis

MAC = mean aerodynamic chord = $\bar{c}$
 MF = moment acting on flap about flap hinge line
 N = propeller speed
 Q = torque on propeller
rudder = flap plus skeg
skeg = forward portion of rudder
 T = thrust on propeller
taper ratio = c_t/c_r
 U = local velocity near wall or near splitter plate in water tunnel
 U_∞ = uniform flow velocity well away from wall
 U_w = average velocity of flow over rudder in wake of a propeller
 x_c = axial clearance between end of propeller hub and the leading edge of the MAC
 x' = axial distance along chord of rudder, nondimensionalized by a rudder local chord
 y_c = transverse clearance between propeller axis and rudder plane of symmetry $\alpha = 0$
 y' = transverse distance along thickness of rudder, nondimensionalized by a local rudder chord
 z = spanwise distance from splitter plate
 α = angle of attack on skeg = rudder angle
 δ = angle of deflection of flap relative to skeg = flap angle
 ρ = fluid mass density

I. INTRODUCTION

In 1968-72, a project was carried out at MIT, to provide the beginning of a systematic series of experiments on flapped rudders [1]. Free stream characteristics of a series of twelve rudders with systematic variations in the amount of flap area and flap balance were measured. In this series, the flap size varied from 20% to 60% of the total projected rudder area, and the flap balance varied from 0 to 40% of the flap chord.

One of the conclusions of this study was that flap balance, while beneficial in reducing flap moment, greatly reduced rudder effectiveness. It was also observed that the rudder with the smallest flap had quite good performance characteristics. If the flap is sufficiently small there is obviously less need for reducing flap moment through balance. It therefore would appear that a rudder with a small, unbalanced flap might offer substantial improvement over an all-movable rudder and still be practical from a structural point of view. The present experimental program was therefore planned to explore this possibility.

In addition, it is well known that the characteristics of an all-movable rudder are influenced by the presence of a propeller. However, there is very little information available on the influence of a propeller on the effectiveness of a rudder with a small flap, or on the influence of propeller-rudder clearance on rudder performance. Rudder tests both in free-stream and behind a propeller were therefore included in the current experimental program.

II. TEST CONFIGURATION

Rudder and Flap Configurations

Table 1 compares the overall rudder and flap configurations of the current program to the configurations tested under the previous series tested in 1968-72 [1]. The current series has only two model rudders, one with a 20% flap, and a second with a 10% flap. These flap sizes are either equal to or smaller than any of the flaps used in the previous series. Characteristics of an all-movable rudder with the current planform can be estimated with sufficient accuracy from the results for zero flap deflection from either model.

The geometric aspect ratio of the current rudder series and the previous series was selected to be identical, with a value of 1.4. Other geometric features of the current series such as taper ratio and sweep angle were intended to be chosen as optimum values from the program developed and described in [2]. Following exercise of this program other changes became desirable. Each of these changes will be discussed.

Flap Size

The reason for the flap sizes selected for the current series is that the 20% flap, zero balance rudder was the best of the rudders tested in the previous program and the results of that program aroused speculation that a rudder with a flap smaller than 20% might exhibit even more favorable characteristics than the 20% flap. A 10% flap rudder was therefore added to the current series.

Sweep Angle and Taper Ratio

The sweep angle and taper ratio of the current series was determined on the basis of the lifting surface program calculations given in [2]. The

optimum taper ratio from these calculations came out to be, coincidentally, identical with that of the previous series, namely 0.60. The optimum sweep angle came out to be 15° aft compared to 11° aft used with the previous rudders. Furthermore the combination of a taper ratio of 0.60 and a sweep angle of 15° of the quarter chord resulted in the trailing edge of the rudder being perpendicular to the root and tip chords. Since the flap hinge is also normal to the root chord, significant simplification in the geometry of the flap was made possible.

Sectional Shape and Thickness Ratio

An NACA 66 profile was selected for the previous tests because its maximum thickness is well aft of the leading edge, which was desirable for the large-flap rudders included in that series. Since no large-flap rudders are included in the current program this constraint no longer applies. An NACA 63a profile was therefore selected for the current series because it should have a larger stall angle and higher maximum lift than the 66 profile.

The previous series tapered from a root thickness ratio of 0.20 to a tip thickness ratio of 0.10 following typical destroyer rudder practice. However, one of the reasons given in [1] for the poor maximum lift coefficient of the previous series compared, for example, to the Whicker-Fehlner data [3] is that the latter had a uniform thickness ratio of 0.15. For this reason it was decided to adopt an NACA 63₂A015 profile, [4].

The 63₂A015 sections have however been slightly altered in order to develop a two-dimensional prismatic flap and flap gap. This permits the flap section to consist only of a circular arc leading edge and straight lines emanating from the tangency points of the leading edge to the sharp trailing edge with a selected trailing edge thickness of 0.20 inches. The details of how this alteration was accomplished are described in Appendix 1

and depicted in Fig. 2.

As a result of this alteration, the final thickness ratio is not a constant 0.15 but in fact varies from 0.1507 at the root to 0.1562 at the tip. A comparison of the original and modified airfoil coordinates appears in Table 2.

Scale

Testing of rudder and propeller combinations imposes the constraint that the models simulate current ship practice in their relation to each other and to the boundary which models the ship's hull. We assume in terms of propeller diameter, D , that rudder span is $1.05D$, propeller tip clearance from hull is $0.3D$, and the propeller tip extends $0.25D$ beyond the rudder tip. Since our propeller drive is mounted in the center of the tunnel, then one possible combination would be a 12.5" dia. propeller, and a rudder with a 13.12" span. This would have resulted in very large hydrodynamic loads for our dynamometer and would have been much too large for blockage of the flow. In fact, for some transverse locations of the rudder and at large flap deflections the flap would touch the tunnel wall.

The rudder model tested as shown in Fig. 1, is 21% smaller than the previous series. Its span was determined by the above restrictions and by the availability of a suitable propeller.

Propeller

The propeller used in the current tests is a typical modern five-bladed propeller designated as No. 4427 by NSRDC, with a diameter of 7.48" and a pitch of 8.03". The design value of J is 0.6. The characteristics of this propeller in uniform flow as measured in the MIT tunnel, corrected for wall effects, are shown in Fig. 3. Tabulated values of the faired data in the region of the design J appear in Table 3.

Overall Test Set-up

The final form of the test set-up of the rudder and propeller for the experiments of this report in the MIT Water Tunnel is shown in Fig. 4. Aside from the introduction of the propeller, this set-up differs from the one described in [1] in two important respects:

- a) A splitter plate is introduced;
- b) The rudder is mounted on a turntable fitted into the splitter plate so that there is no longer a gap between the root of the rudder and the plate against which it is mounted. Also, the rudder may be moved laterally on the turntable.

This first change came about because of the reduction in rudder size. To achieve the desired propeller tip clearance of $0.3D$ with the selected 7.48° propeller, a splitter plate was essential. Furthermore the splitter plate was expected to reduce the thickness of the boundary layer at the rudder which was desirable.

The turntable was a necessary complication since the main dynamometer could not be displaced laterally to provide transverse clearance between the rudder and propeller. Provision was therefore made to displace the rudder model laterally on the turntable. This arrangement had the undesirable result of coupling rudder angle of attack with propeller-rudder longitudinal clearance. Thus, if the rudder is a distance, y_c , off of the propeller axis, the axial location of the propeller is changed by a distance $y_c \sin \alpha$ where α is the rudder angle. This change could be compensated for by a corresponding change in propeller longitudinal position or by cross fairing of the data.

In the current tests, the rudder stock location must be fixed relative to the chord of the rudder because it affects both the axial clearance and

the transverse positions of the rudder relative to the propeller. These dimensions are two of the most important variables whose effects we are eager to determine in our tests. It would be desirable to locate the stock at the position in which it is likely to be installed in practice. This position is roughly that corresponding to zero torque on the rudder stock at an angle of attack between 10° and 15° . According to [1], this corresponds to roughly 30% of the MAC aft of the leading edge at the MAC for the 20% flap rudder at a rudder deflection angle of 12.5° and a flap deflection relative to the rudder of 12.5° . Unfortunately, because of structural reasons, it was not possible to locate the stock at this point. In the current series, the stock is 38.28% of the MAC aft of the leading edge at the MAC.

An additional complication of mounting the rudder lower in the tunnel on the turntable was that this imposed larger bending moments on the mounting shaft which supports the turntable. To reduce deflections to a minimum under hydrodynamic and vibratory loads it was necessary to increase shaft diameter to 1.5 inches. This required extensive changes to the dynamometer, including a new shaft clamp, a larger hole bored through the measuring element and new shaft seals.

The test set-up allows for the following changes in propeller-rudder relative positions:

- a) Axial clearance between the propeller and the leading edge of the rudder can be varied continuously between $0.5D$ and $1.0D$ where D is the propeller diameter;
- b) The transverse position of the rudder can be adjusted so that it can be tested at values of y_c of 0, 0.5" ($0.067D$), 1.0" ($0.134D$), 1.5" ($0.201D$) and 2" ($0.268D$) off of the propeller axis. (These positions correspond only to zero rudder deflection angle for all cases where the rudder is off of the propeller axis.)

As noted earlier, propeller tip clearance to the splitter plate simulating the ship's hull is $0.3D$. The rudder extends to within $0.25D$ of the bottom of the propeller. The arrangement of the rudder on the turntable is shown in Fig. 5. The range of axial clearances and transverse positions in which the rudder can be tested is more than adequate to cover current design practice.

The previous method for measuring angle of attack on the rudder was by a mechanical counter which was geared to the base plate of the dynamometer. An optical check of this system revealed errors of up to ± 0.2 degrees, presumably due to gear imperfections, wear, and backlash. A new optical system was therefore designed and installed. A curved scale made to order was mounted rigidly on the wall such that it was at constant radius from the dynamometer center of rotation. A telescope with cross hairs mounted on top of the dynamometer was used to read angle of attack. The scale divisions were selected so that angle of attack could be read directly in degrees. The accuracy of this system was approximately ± 0.01 degrees, which was more than adequate to improve the quality of the data.

The basic rudder dynamometer used in these tests was described in [1] by text and photographs, and is unchanged except as previously mentioned. Briefly, the measuring system is supported in space by six load cells, whose reactions are measured by six Lebow digital strain indicators. These outputs provide all the information necessary to determine forces and moments on the rudder about any three convenient axes. Hinge moment of the flap about the flap axis was measured by a special sensor which also serves to clamp the flap at any desired deflection. Four strain gages were mounted on the sensor forming a full four-arm bridge to achieve a temperature compensated output.

This output was read on a seventh Lebow digital strain indicator. A special jig was built to measure flap deflection.

Fig. 6 is a photograph of the MIT Water Tunnel with the complete set-up used for this test program, and showing the instrumentation. Fig. 7 is a synchronized strobe photograph of the flow interaction between propeller and rudder under test conditions.

Tunnel Flow Calibration

The velocity distribution in the plane of the rudder was measured using a Pitot-static tube mounted on the propeller drive system. From these data, the mean value of velocity was determined to be 9.47% higher than for the standard calibration for the test section without the splitter plate. The variation of velocity relative to this mean value is shown in Fig. 8 to be quite uniform away from the boundary layer on the walls and splitter plate. During testing, flow mean velocity was determined in the usual manner from manometer measurements of pressure taps in the converging nozzle, and the result increased by the factor 1.0947.

The boundary layer thickness on the splitter plate has been measured both at the propeller and at the rudder positions, and the results are plotted in Fig. 9. This thickness was expected to be smaller than at the tunnel wall due to the shorter length of the splitter plate, the plate itself being away from the tunnel wall boundary layer. This was unfortunately not the case. The boundary layer thickness was approximately 1.4 inches, and the measured profiles, as shown in Fig. 9, were somewhat unusual in shape. Subsequent to the completion of this test series, a detailed examination of the flow near the leading edge of the splitter plate was made. It was found that a substantial region of separated flow existed, thus explaining the

lack of improvement in boundary layer thickness. Subsequent modifications to the leading edge of the splitter plate have resulted in a boundary layer which is substantially thinner [5], with a value of boundary layer thickness of 0.35 inches. The influence of this change in boundary layer thickness on rudder characteristics is described in Section 4.

III. DATA REDUCTION

Sample test data recording sheets which appear in Appendix 2, were used to supply data cards to the program listed in Appendix 3. Appendix 4 contains a brief explanation of the data reduction program. Appendices 5 and 6 contain copies of all the data reduction runs for the 20% and 10% flap rudders respectively. Appendix 7 contains the data reduction for a run with the modified splitter plate having an improved leading edge contour.

IV. RESULTS

Table 4 summarizes the overall testing program. Results of the performance tests of the 20% flap rudder located on the propeller axis are shown in Figs. 10-17. In all tests the tunnel static pressure was at ambient atmospheric pressure and on those runs where the propeller was operational it was at the design J value of 0.8. Figs. 10-13 show rudder performance in uniform flow for all combinations of angle of attack and flap deflection, whereas Figs. 14-17 show the comparison between rudder performance in uniform flow and behind an operational propeller at three longitudinal locations. These latter runs are at zero flap angle.

Data shown on Figs. 6-13 include lift coefficient, C_L , drag coefficient, C_D , rudder moment coefficient, C_{Mf} , and flap moment, C_{Mf} . The moment data in Figs. 12 and 16 are referred to a phantom stock axis located 51.57% of MAC aft of the leading edge. At this point rudder moment becomes essentially independent of flap deflection in the non-stalled range of angle of attacks, and all the data collapses to a single curve. The same data reduced to an axis 24.88% of the MAC from the leading edge would result in a family of curves with shape similar to those of Fig. 16 of [1] and Fig. 20 in this report.

Comparison of Fig. 10 with similar data from Fig. 16 of [1] shows that the current 20% flap rudder does achieve somewhat better maximum lift and lift curve slope than the comparable rudder of [1]. Another expected result of these experiments is the large increase in lift achieved in the behind the propeller condition shown in Fig. 14. One conclusion from these data is that rudder selection based solely on uniform flow conditions may lead to far from the optimum solution for the realistic behind the propeller condition.

Figs. 18-20 show performance data from measurements on the 10% flap rudder at all positive flap angles in the free stream and at 0 and 35 degrees flap deflection behind the propeller. Rudder moment coefficients in Fig. 20 are about a stock axis at 24.88% of the MAC which is the balance point at zero flap deflection. Clearly this smaller flap is less effective than the 20% flap as can be seen in the comparative data in Figs. 21 and 22. Also, the C_{LMAX} increment for 35° flap deflection for the 20° flap is about 0.43 compared to 0.41 for the 10% flap. Fig. 18 indicates a C_{LMAX} of 1.65 for the flap deflected 35 degrees behind the propeller. Unfortunately, no comparative data was taken for the 20% flap.

Figs. 21 and 22 compare lifting surface characteristics for the two rudders. Fig. 21 has $dC_L/d\alpha$ and also C_L at $\alpha=0$, both plotted against flap deflection. Fig. 22 has C_D at $\alpha=0$, $dC_D/d\alpha$ and $dC_D/d\alpha^2$ plotted against flap deflection. The plotted test values were obtained directly from the data reduction program for the tests on the 10% flap rudder by means of DYCOR, which is explained in Appendix 4. For the earlier 20% flap rudder, a special program was written to obtain these values from the reduced data. In both cases, the data are obtained for data below the stall angle.

Fig. 21 also has a comparison of these results with theory [2] for this rudder geometry (aspect ratio, taper ratio, sweep angle, and flap geometry). For these rudders, the lift curve slope versus flap deflection data are nearly identical and they tend to be low at small flap deflections but approach the theoretical value [2] of .0547 per degree at larger flap deflections. The lower graph on Fig. 21 shows C_L at $\alpha=0$ versus flap deflection, whose slope is $dC_L/d\delta_F$. The measured test data are somewhat lower than the theoretical values [2] of .0319 δ_F for the 20% flap rudder and

.02366_F for the 10% flap rudder. The 20% flap rudder data is in better agreement with theory.

Another interesting result of the behind the propeller experiments is that steady state rudder performance is independent of axial clearance downstream of the propeller for the range of locations 0.5D to 1.0D tested (Figs. 14-16). This is in contrast to the unsteady test results of F. M. Lewis, who found that very small changes in axial clearance between the propeller and rudder could result in a very large reduction in the blade frequency vibration force on the rudder [7].

One of the most dramatic yet potentially useful results of these new experiments is the opportunity they present for observing the flow around the rudder downstream of the propeller at a cavitation number corresponding to the full scale ship. The impingement on the rudder of the tip vortices shed by the propeller can be observed as well as the vortices shed by the rudder itself. These opportunities for visual observation may in the future help explain Professor Lewis' finding that large changes in blade frequency vibration force on the rudder take place as the rudder is moved longitudinally relative to the propeller. A pair of photographs showing the influence of rudder angle of attack on the location of impingement of the propeller hub vortex on the rudder appear in Fig. 23. Propeller tip vortices are also greatly distorted by rudder deflections but not at the small rudder deflections in Fig. 23.

Splitter Plate Modification

After all the present test data were obtained the splitter plate leading edge was modified to improve the boundary layer. A new leading edge contour was built with a larger radius of curvature and extending near the top wall of the tunnel. The result was to reduce the boundary layer thickness from

1.4" to 0.35" at the rudder location. A final run was made using the 20% flap rudder model at $\delta_F=0$ for which the data reduction appears in Appendix 7. These results are added to Figs. 21 and 22. Fig. 21 indicates that $dC_L/d\alpha$ for 20% flap at zero flap deflection has increased from .0492 with the original splitter plate to .051 with the modified splitter plate. This is in better agreement with the theoretical value of .0546. Fig. 22 indicates a lower C_D at $\alpha=0$ of .0127, $dC_D/d\alpha$ is zero, and $dC_D/d\alpha^2$ has increased to .00043 for the test with the modified splitter plate.

V. CONCLUSIONS

1. The new test apparatus performed well. Improvements such as the optical angle of attack device resulted in more accurate data. The new data reduction program provided more accurate data from the dynamometer and gave additional hydrodynamic coefficients directly.
2. The rudder worked in a thicker boundary layer on the splitter plate than desired. A later test with a thinner boundary layer over an improved splitter plate indicates that lift and drag forces would have been larger with a thinner boundary layer and that lift curve slope would have agreed better with theory.
3. Comparing the new test with the previous test for 20% flap rudders, C_{LMAX} and C_D at C_{LMAX} are in excellent agreement at 35° flap deflection, but at zero flap deflection the C_{LMAX} is higher and $C_{D_{LMAX}}$ is lower for the new test. In general, at points other than near stall, the new data shows higher lift and lower drag at comparable conditions. Also, $dC_L/d\alpha$ for the previous series at zero flap deflection was .047; for the present series it is .049 and with the improved splitter plate it is .051 compared to the theoretical value of .0546 for this rudder.
4. Placing the propeller upstream of the 20% flap rudder compared to the rudder in uniform flow leads to three conclusions:
 - a. The rudder lift curve slope is increased from .049 to .062 which would indicate an effective velocity increment of 12.5%;
 - b. This increase is constant over the range of longitudinal propeller locations tested;

c. Maximum lift coefficient has been increased an additional amount by increasing the stall angle of attack by 9.5°

5. The 10% flap rudder is roughly half as effective in terms of $dC_L/d\delta_F$ as is the 20% flap rudder. Maximum lift coefficient for the 10% flap rudder is only 1.2 compared to 1.4 for the 20% flap rudder, both at $\delta_F = 35^\circ$.

6. Placing the propeller upstream of the 20% flap rudder compared to the rudder in uniform flow leads to the following conclusions:

- a. Rudder lift curve slope is increased from .486 to .0606 at $\delta_F = 0$ which would indicate an effective velocity increment of 11.66% which is approximately the same as for the 10% flap;
- b. Rudder lift curve slope is increased from .0535 to .0647 at $\delta_F = 35^\circ$ which would indicate an effective velocity increment of 9.97%.

7. In general, for an all movable rudder design, a 20% flap would be recommended with the flap angle geared so that flap deflection reaches 35° relative to the rudder when rudder deflection reaches 20° relative to the ship.

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Table 1.

Comparison of Current Rudder with
Rudder Tested in the Previous Series

Section Shape	Current Rudders	Previous Series (See [1])
	Modified 63 ₂ A015	66 ₂ 020 66 ₂ 010
Taper Ratio	0.60	0.60
Geom. Aspect Ratio	1.40	1.40
Root Thickness Ratio	0.1507	0.20
Tip Thickness Ratio	0.1562	0.10
Root Chord, inches	7.031	8.925
Tip Chord, inches	4.219	5.355
Span, inches	7.875	10
25% Flap Chord, inches	1.125	---
10% Flap Chord, inches	0.562	---
Sweep Angle, degrees	15	11
M.A.C., inches	5.7421	7.289
Area, sq. in.	44.3	71.4
Tip Shape	squared off	squared off
Location of stock axis in M.A.C. aft of leading edge	38.28	variable
Flap Size and Flap balance, % Of M.A.C.	flap - bal. 10% " - 0 " 20% " - 0 "	flap - bal. 20% " - 0 " 30% " - 0 " 30% " - 39 " 40% " - 0 " 40% " - 19 " 40% " - 38 " 50% " - 0 " 50% " - 18 " 50% " - 36 " 60% " - 18 " 60% " - 36 "

Table 2.

Comparison of Airfoil Coordinates

NACA 63 ₂ A015 Basic Thickness Form (From [4])		Modified Section Shape	
x (per cent c)	y (per cent c)	y Tip	y Root
0 -	0	0	0
0.5	1.203	1.139	1.122
0.75	1.448	1.330	1.298
1.25	1.844	1.707	1.663
2.5	2.579	2.586	2.514
5.0	3.618	3.833	3.715
7.5	4.382	4.511	4.359
10	4.997	5.171	4.993
15	5.942	6.174	5.956
20	6.619	6.910	6.652
25	7.091	7.397	7.117
30	7.384	7.704	7.420
35	7.496	7.812	7.533
40	7.435	7.733	7.483
45	7.215	7.487	7.271
50	6.858	7.104	6.915
55	6.387	6.602	6.450
60	5.820	6.004	5.883
65	5.173	5.339	5.224
70	4.468	4.616	4.550
75	3.731	3.884	3.813
80	2.991	3.154	3.080
85	2.252	2.424	2.346
90	1.512	1.694	1.612
95	0.772	0.964	0.878
100	0.032	0.234	0.144

Table 3.

Characteristics of NSRDC Propeller 4427
as Measured in MIT Water Tunnel

MODEL 4427		5-BLADED		
J-COR	KT	KQ	E	KT/J**2
0.550	0.283	0.0471	0.526	0.737795
0.560	0.278	0.0465	0.534	0.898984
0.570	0.273	0.0458	0.542	0.843023
0.580	0.269	0.0451	0.550	0.799716
0.590	0.264	0.0444	0.557	0.759886
0.600	0.259	0.0438	0.565	0.720368
0.610	0.254	0.0431	0.572	0.684012
0.620	0.249	0.0425	0.579	0.649679
0.630	0.245	0.0418	0.586	0.617242
0.640	0.240	0.0412	0.593	0.586582
0.650	0.235	0.0405	0.600	0.557591
0.660	0.231	0.0399	0.607	0.530162
0.670	0.226	0.0393	0.613	0.504189
0.680	0.221	0.0387	0.620	0.479574
0.690	0.217	0.0380	0.626	0.456224
0.700	0.212	0.0374	0.632	0.434057
0.710	0.208	0.0368	0.637	0.412794
0.720	0.203	0.0362	0.643	0.392965
0.730	0.199	0.0356	0.649	0.373901
0.740	0.194	0.0350	0.654	0.355742
0.750	0.190	0.0344	0.659	0.338432
0.760	0.185	0.0338	0.664	0.321915
0.770	0.181	0.0332	0.668	0.306145
0.780	0.177	0.0326	0.673	0.291073
0.790	0.172	0.0320	0.677	0.276659
0.800	0.168	0.0314	0.681	0.262862
0.810	0.163	0.0308	0.684	0.249646
0.820	0.159	0.0301	0.688	0.236975
0.830	0.154	0.0295	0.691	0.224818
0.840	0.150	0.0289	0.694	0.213144
0.850	0.145	0.0283	0.696	0.201925
0.860	0.141	0.0276	0.699	0.191136
0.870	0.136	0.0270	0.700	0.180750
0.880	0.132	0.0263	0.702	0.170746
0.890	0.127	0.0256	0.703	0.161102
0.900	0.122	0.0249	0.703	0.151796
0.910	0.118	0.0242	0.704	0.142812
0.920	0.113	0.0235	0.703	0.134130
0.930	0.108	0.0228	0.702	0.125738
0.940	0.103	0.0221	0.700	0.117626
0.950	0.099	0.0214	0.699	0.109784
0.960	0.094	0.0206	0.694	0.102201
0.970	0.089	0.0199	0.690	0.094870
0.980	0.084	0.0191	0.684	0.087780
0.990	0.079	0.0183	0.678	0.080924
1.000	0.074	0.0175	0.669	0.074293

Table 4.

Summary of Test Program

20% Flap

Free Stream, C_L, C_D, C_M, C_{MF} $\begin{cases} \alpha = -30 \text{ to } +30^\circ \\ \delta = 0, 5, 10, 15, 20, 30, 35^\circ \end{cases}$

With Propeller, $J = 0.8$ C_L, C_D, C_M, C_{MF} $\begin{cases} \alpha = -30 \text{ to } +30^\circ \\ \delta = 0 \end{cases}$
 $x_c = 0.5D, 0.75D, 1.00D$

10% Flap

Free Stream, C_L, C_D, C_M $\begin{cases} \alpha = -30 \text{ to } +30^\circ \\ \delta = 0, 5, 10, 15, 20, 25, 30, 35^\circ \end{cases}$

With Propeller C_L, C_D, C_M $\begin{cases} \alpha = -30 \text{ to } +30^\circ \\ \delta = 0, 35^\circ \end{cases}$

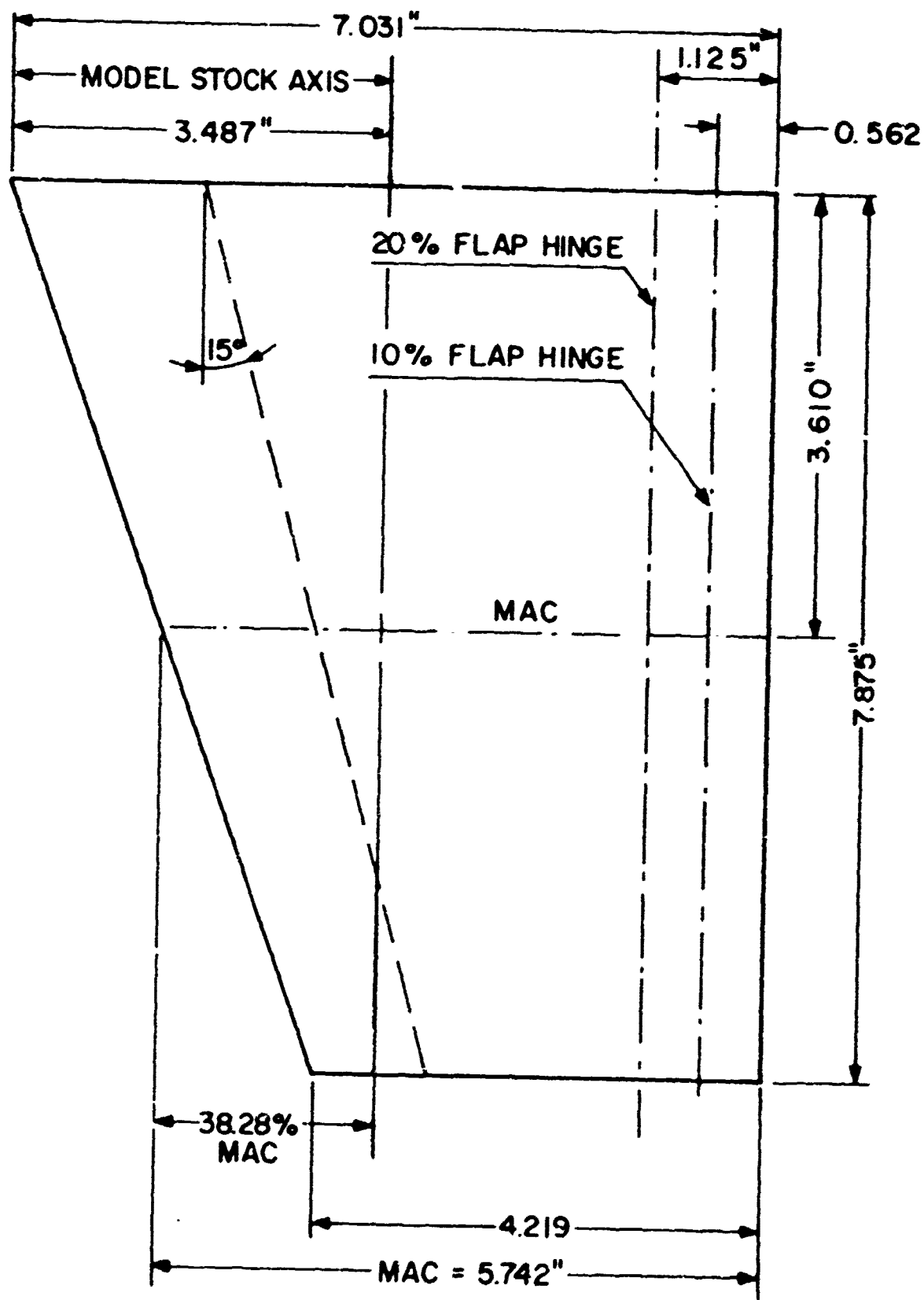


Figure 1 Planform of the 10% and 20% Flap Rudders.

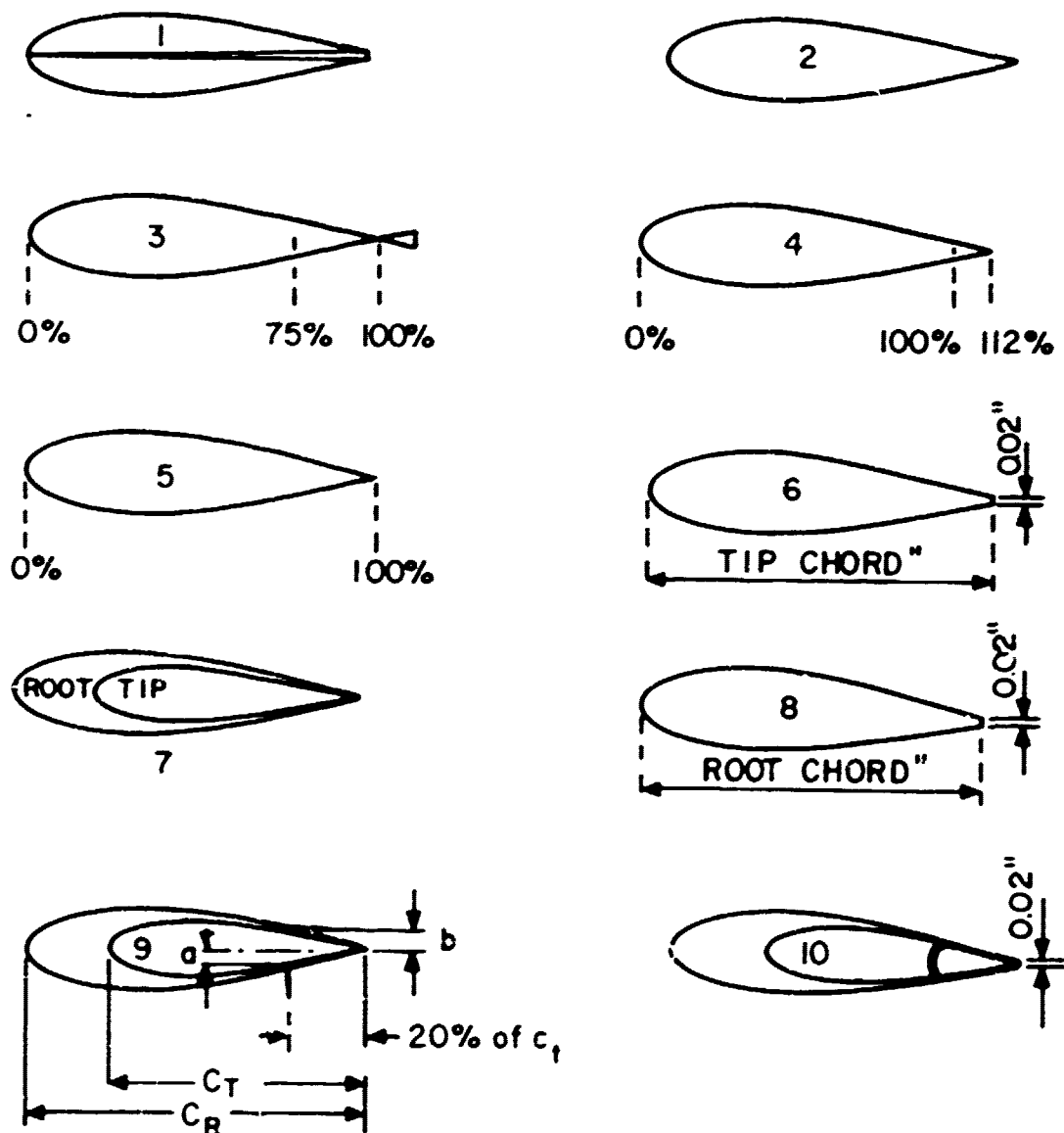


Figure 2 Sketches Depicting Modifications to NACA 63 A015 Section.

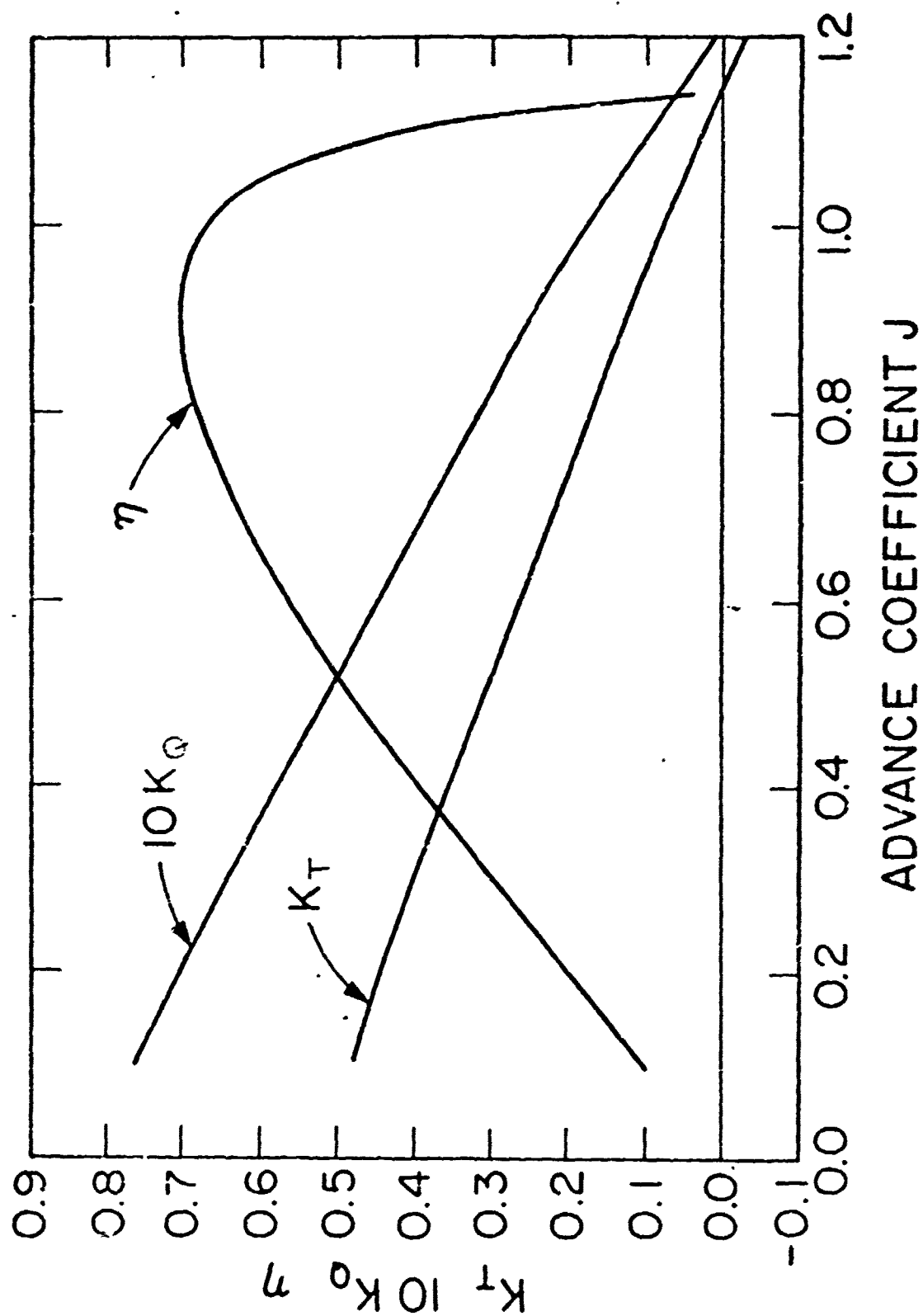


Figure 3 Open-water Characteristics of NSRDC Propeller 4427 as measured in the MIT Tunnel.

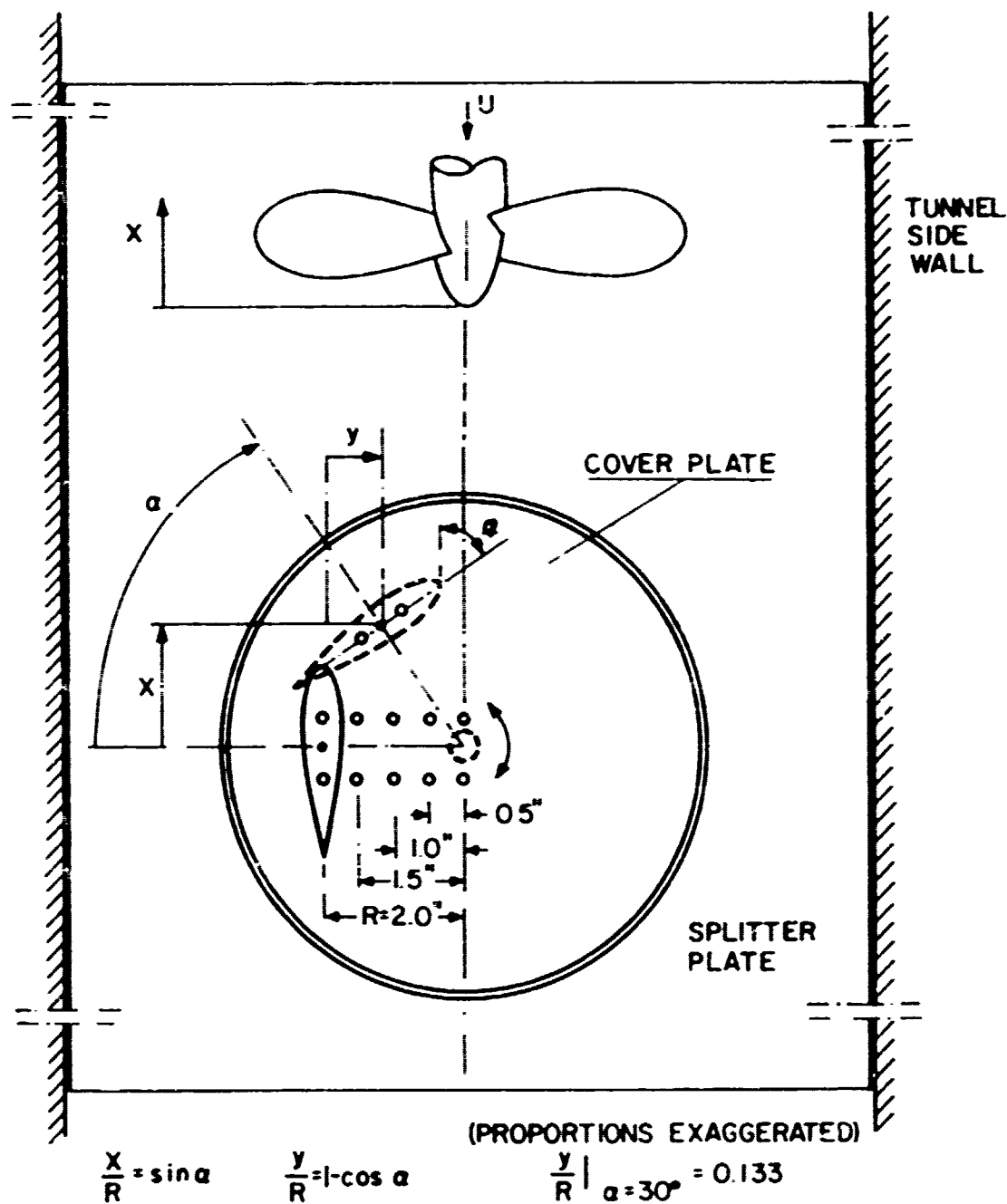


Figure 5 Scheme of the Mechanism for Testing Rudders at Several Transverse Locations.

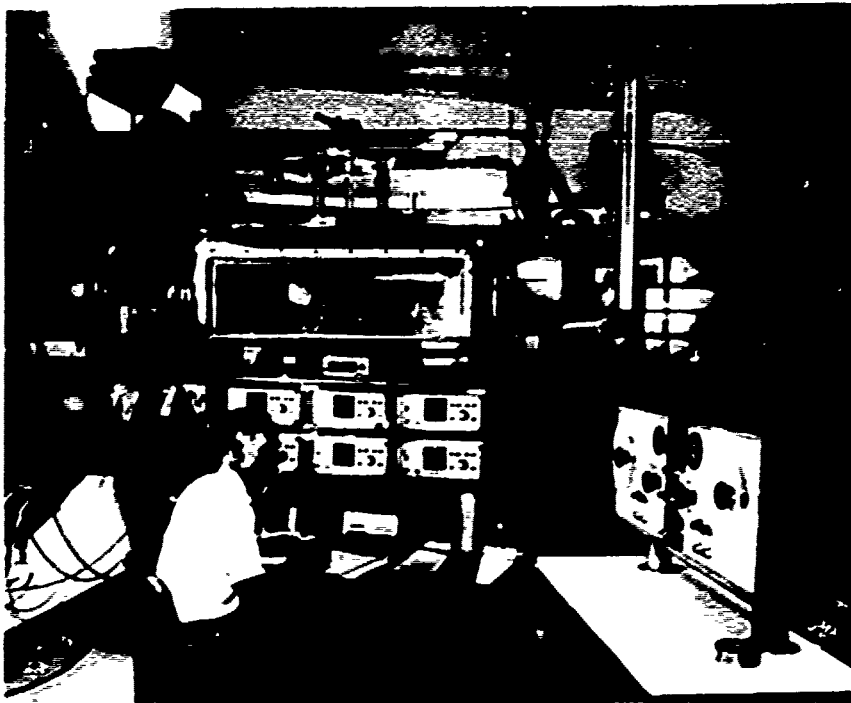
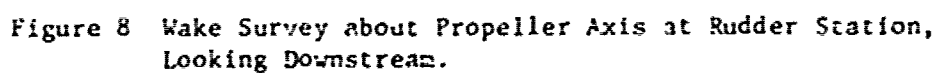
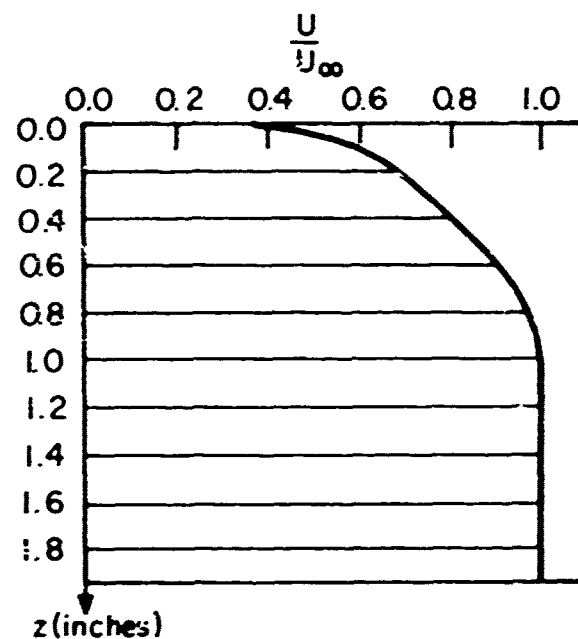


Figure 6 Rudder Model in the Tunnel Test Section.

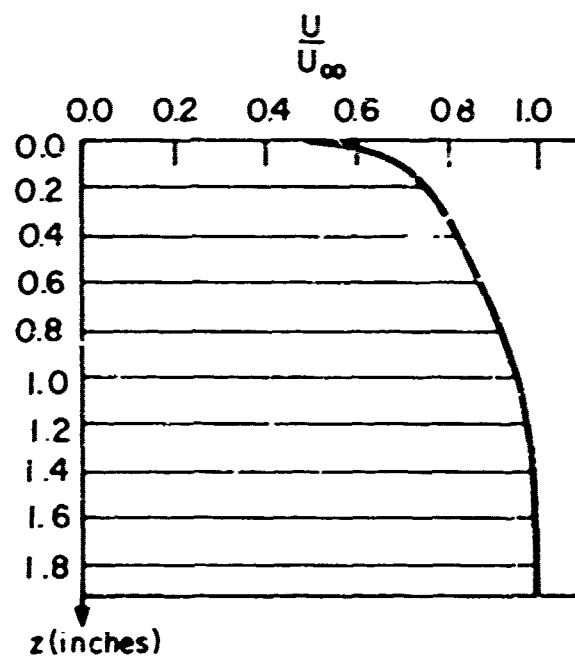


Figure 7 Propeller-Rudder Flow Interaction.
(Photograph taken with a strobe-light)





BOUNDARY LAYER
PROPELLER POSITION (UPSTREAM)



BOUNDARY LAYER AT
RUDDER POSITION (DOWNSTREAM)

Figure 9 Boundary Layers at Two Locations under Splitter Plate.

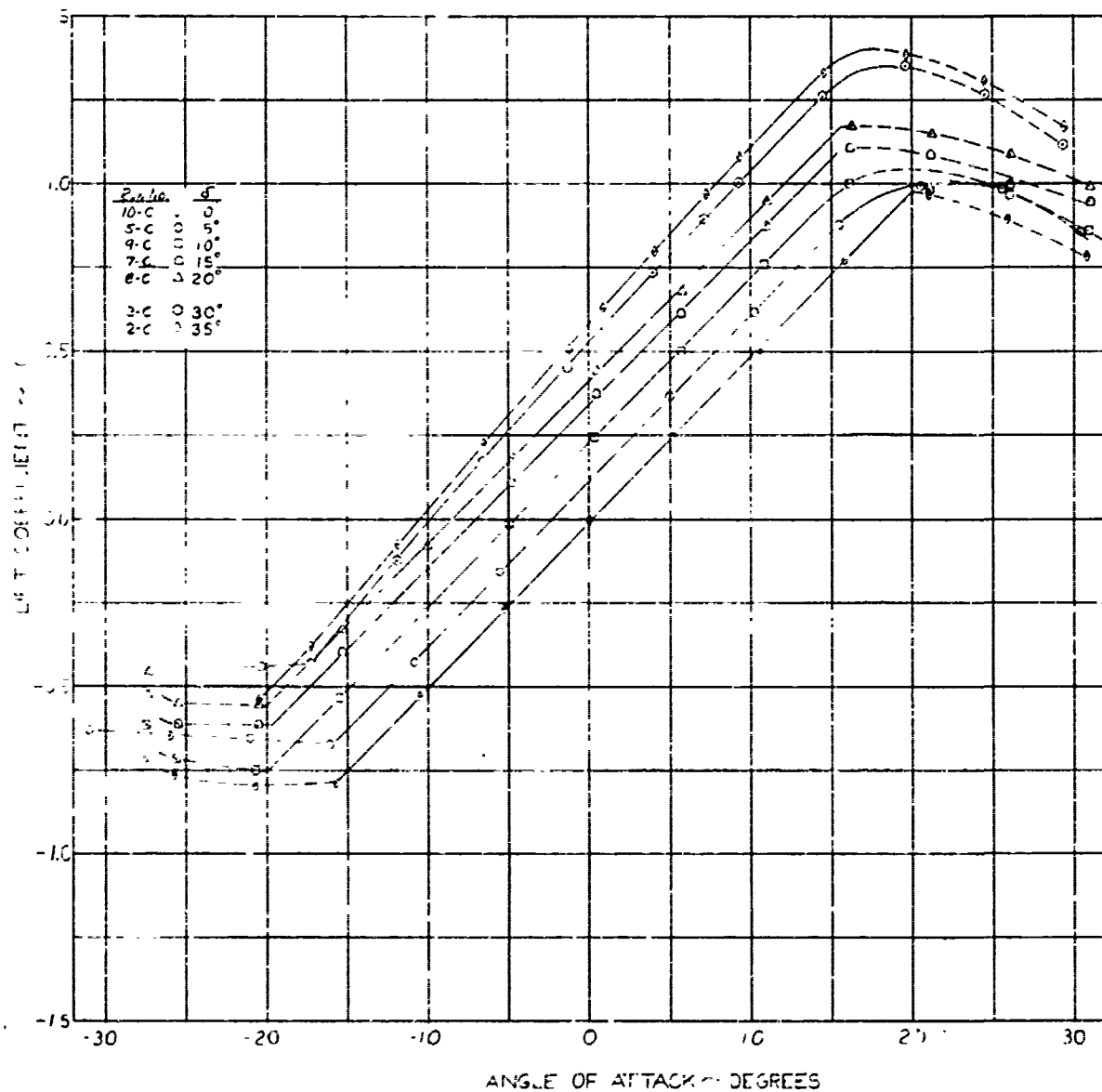


Figure 10 Lift Coefficient Versus Angle of Attack for 10% Flapped Rudder in Uniform Flow.

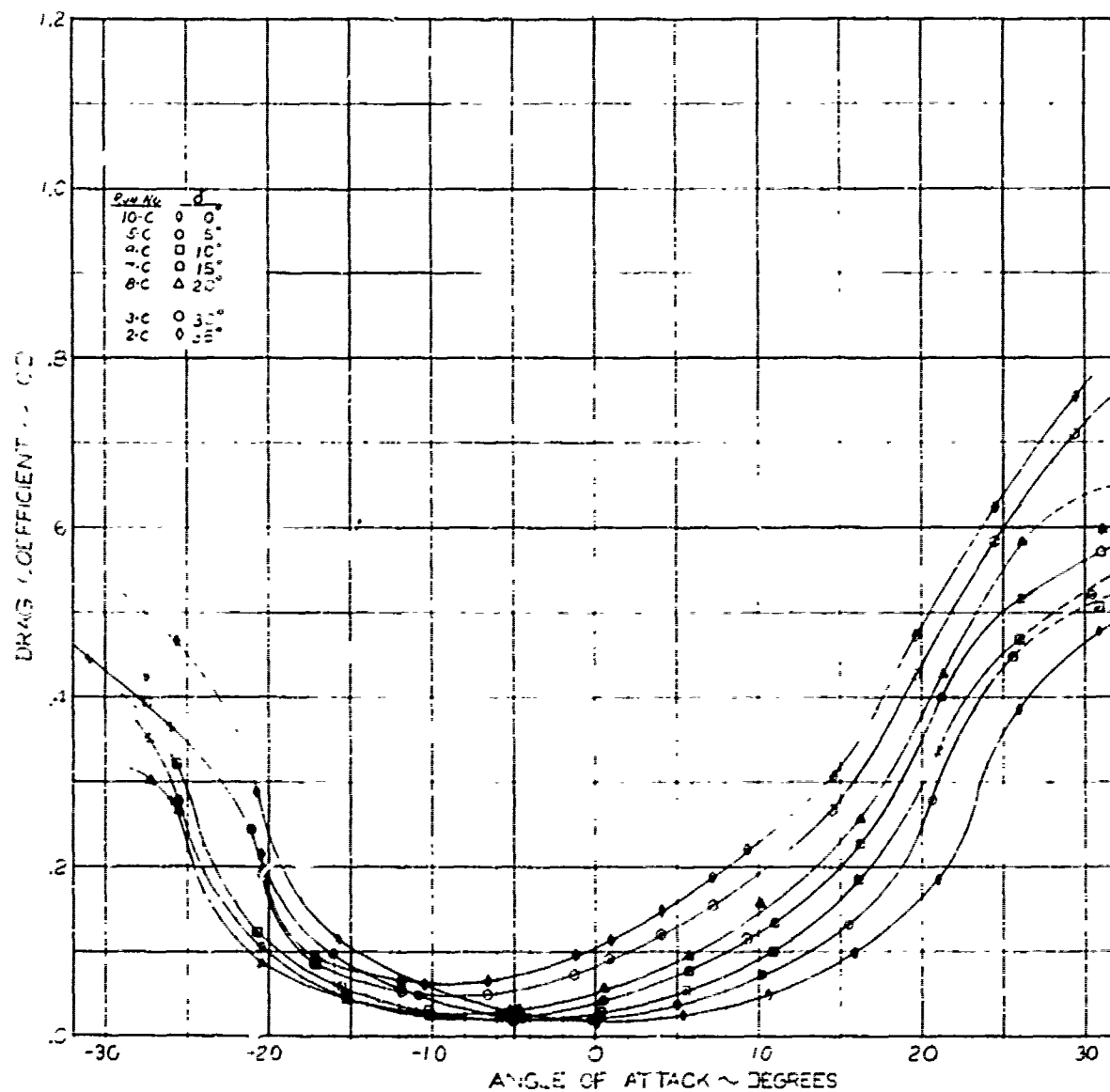


Figure 11 Drag Coefficient Versus Angle of Attack for 20 % Flapped Rudder in Uniform Flow.

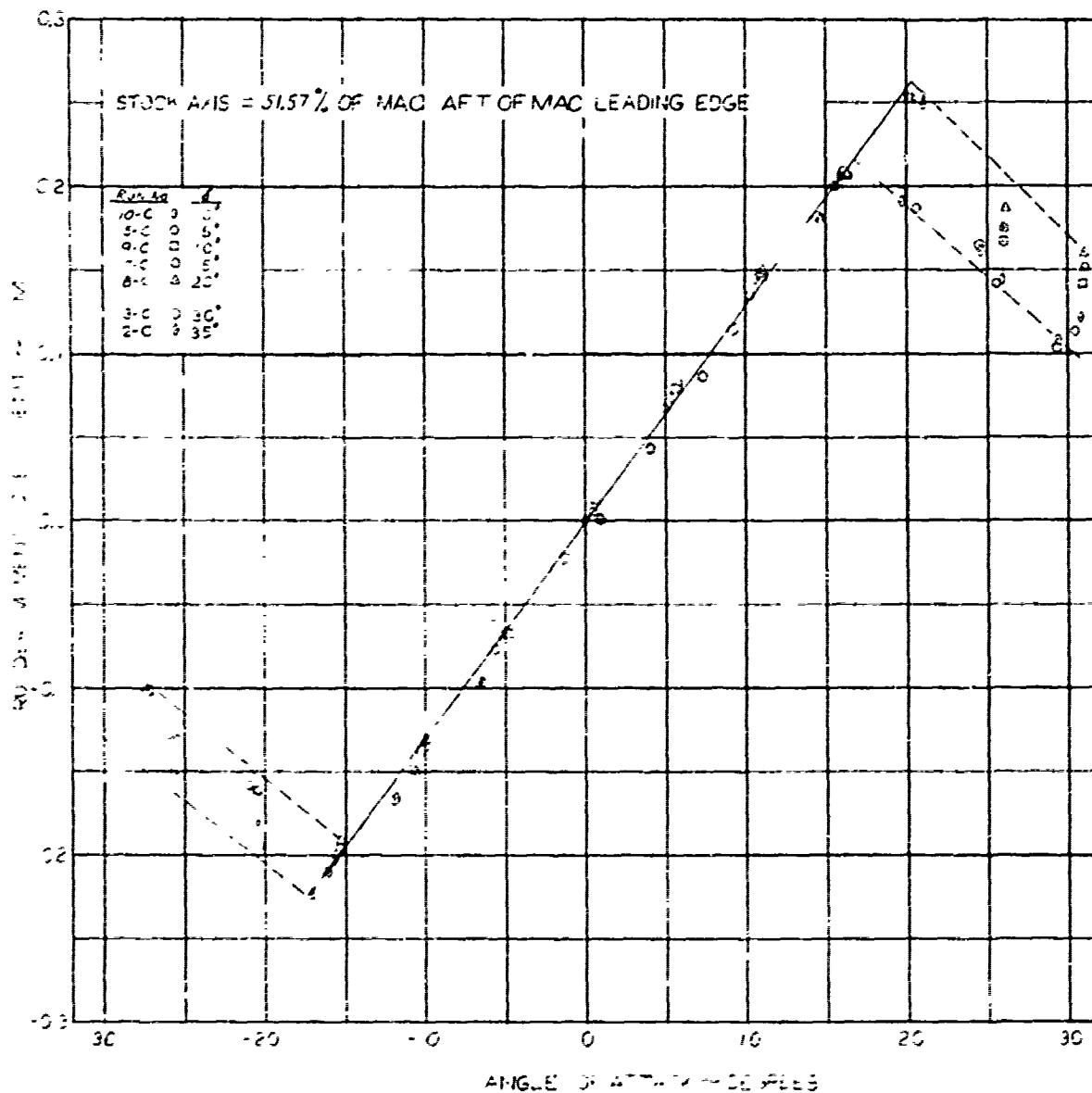


Figure 12 Rudder Moment Coefficient Versus Angle of Attack for 20% Flapped Rudder in Uniform Flow.

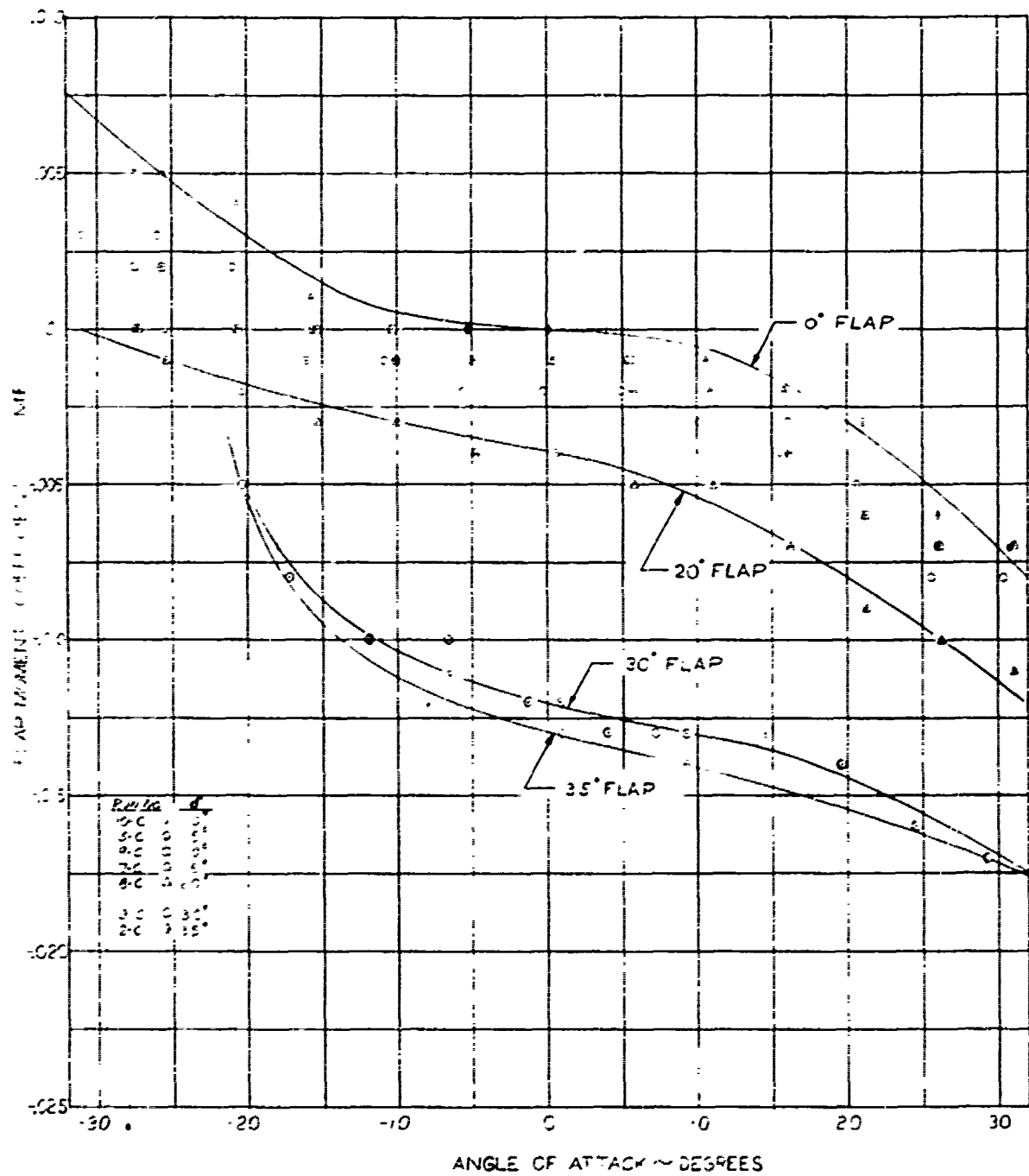


Figure 13 Flap Moment Coefficient Versus Angle of Attack for 20% Flapped Rudder in Uniform Flow.

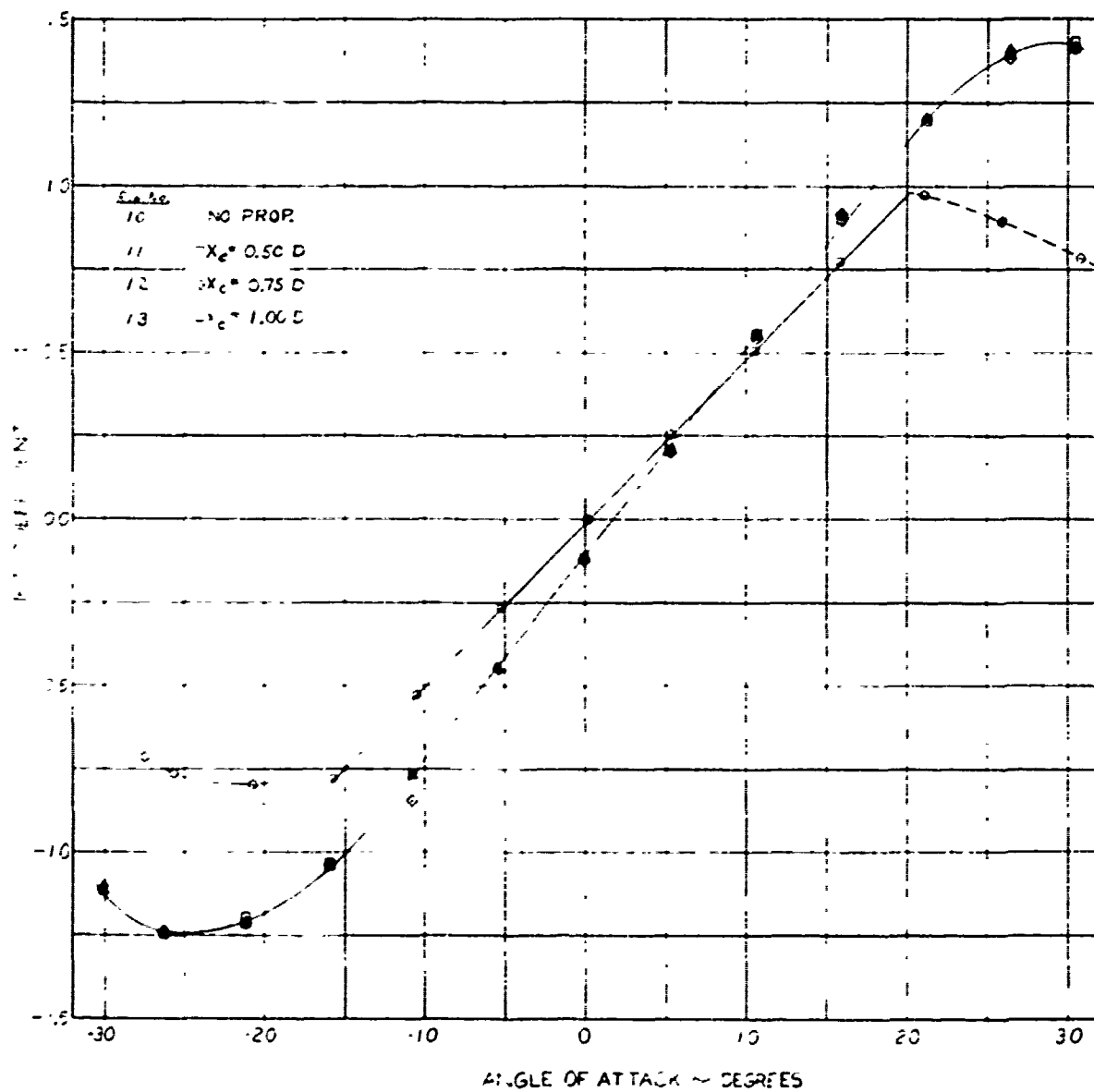


Figure 14 Lift Coefficient Versus Angle of Attack for 20% Flapped Rudder Downstream of Propeller, $y_c = 0$.

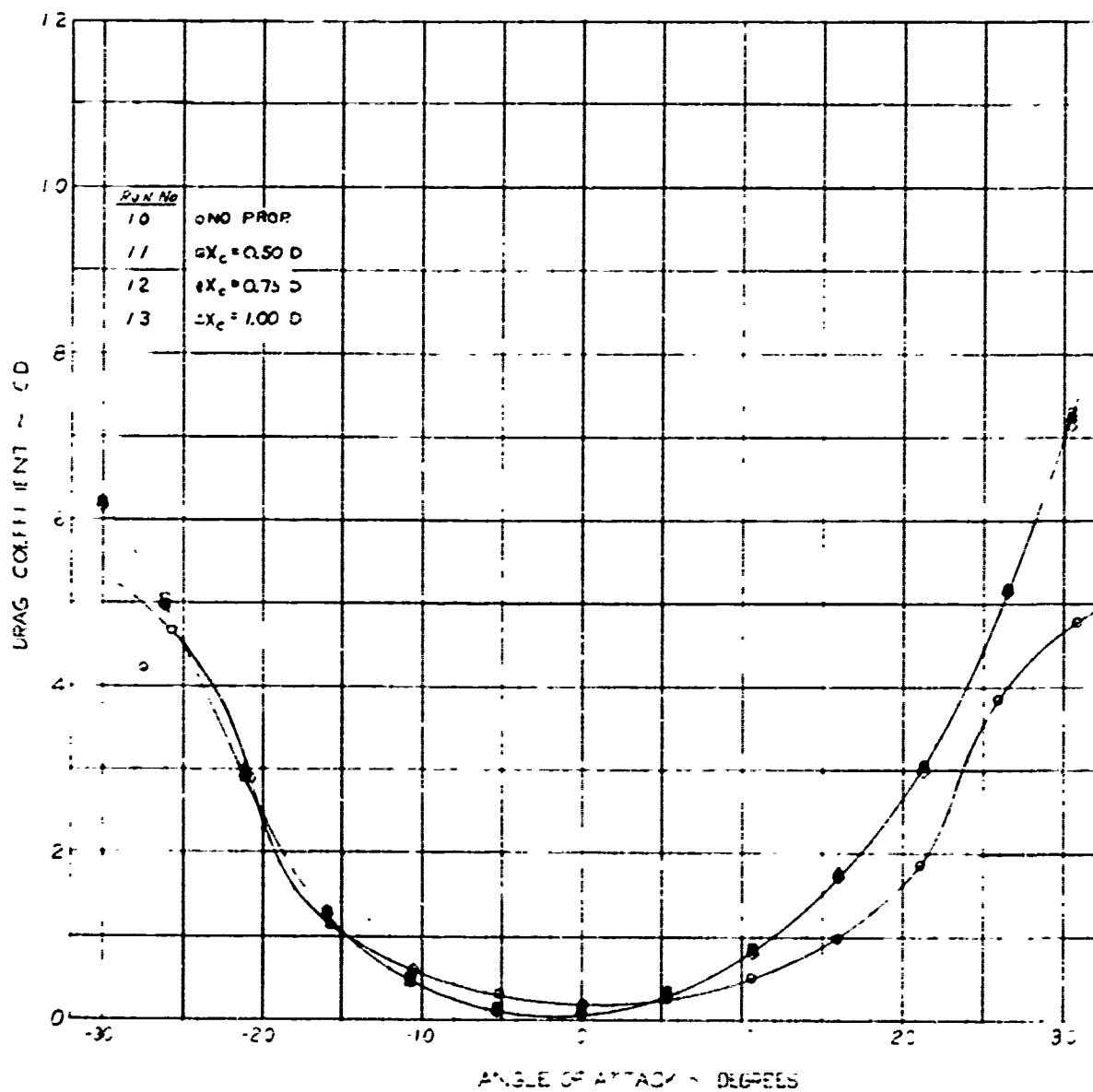


Figure 15 Drag Coefficient Versus Angle of Attack for 20% Flapped Rudder Downstream of Propeller, $y_c = 0$.

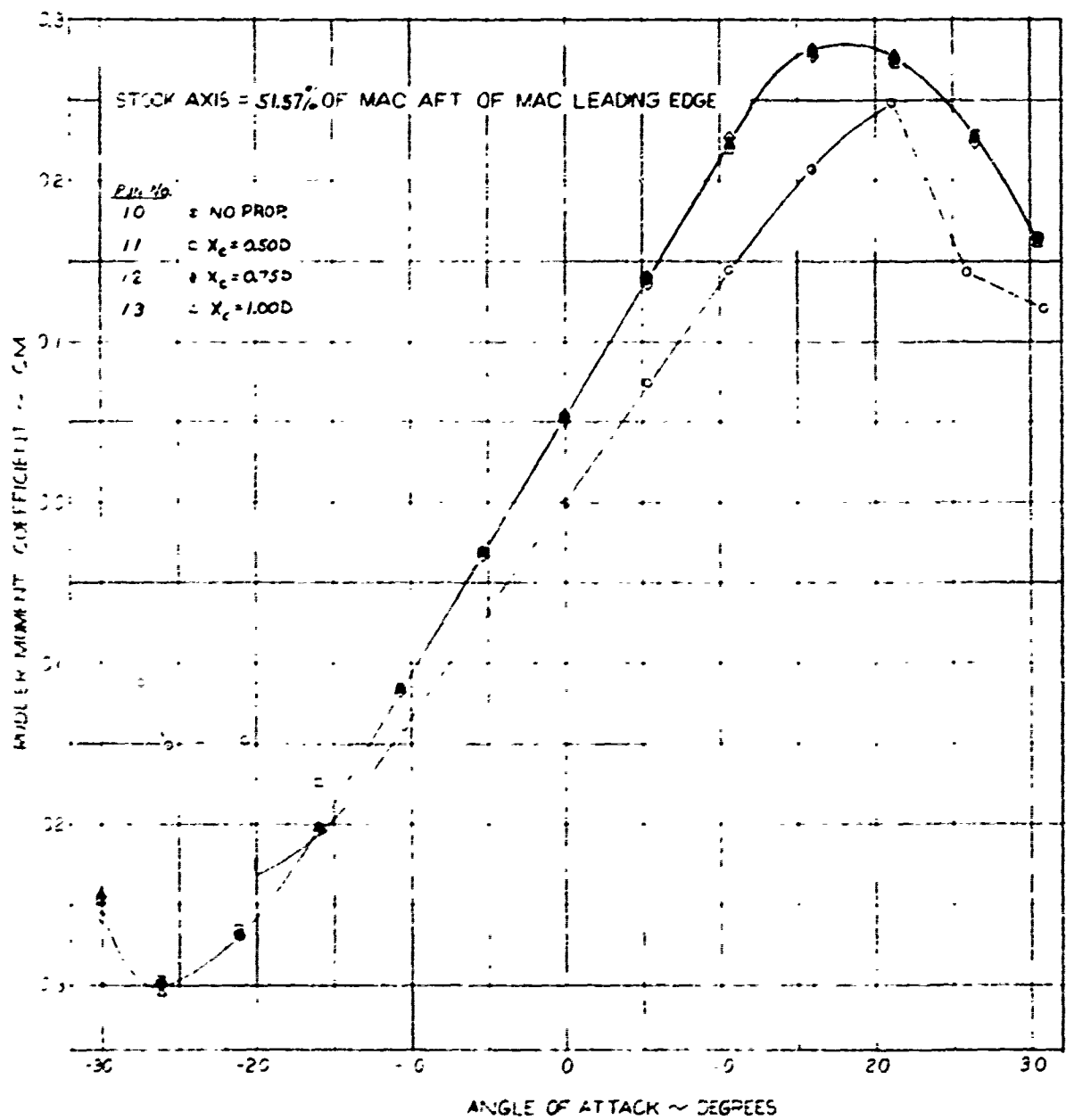


Figure 16 Rudder Moment Coefficient Versus Angle of Attack for 20% Flapped Rudder Downstream of Propeller, $y_c = 0$.

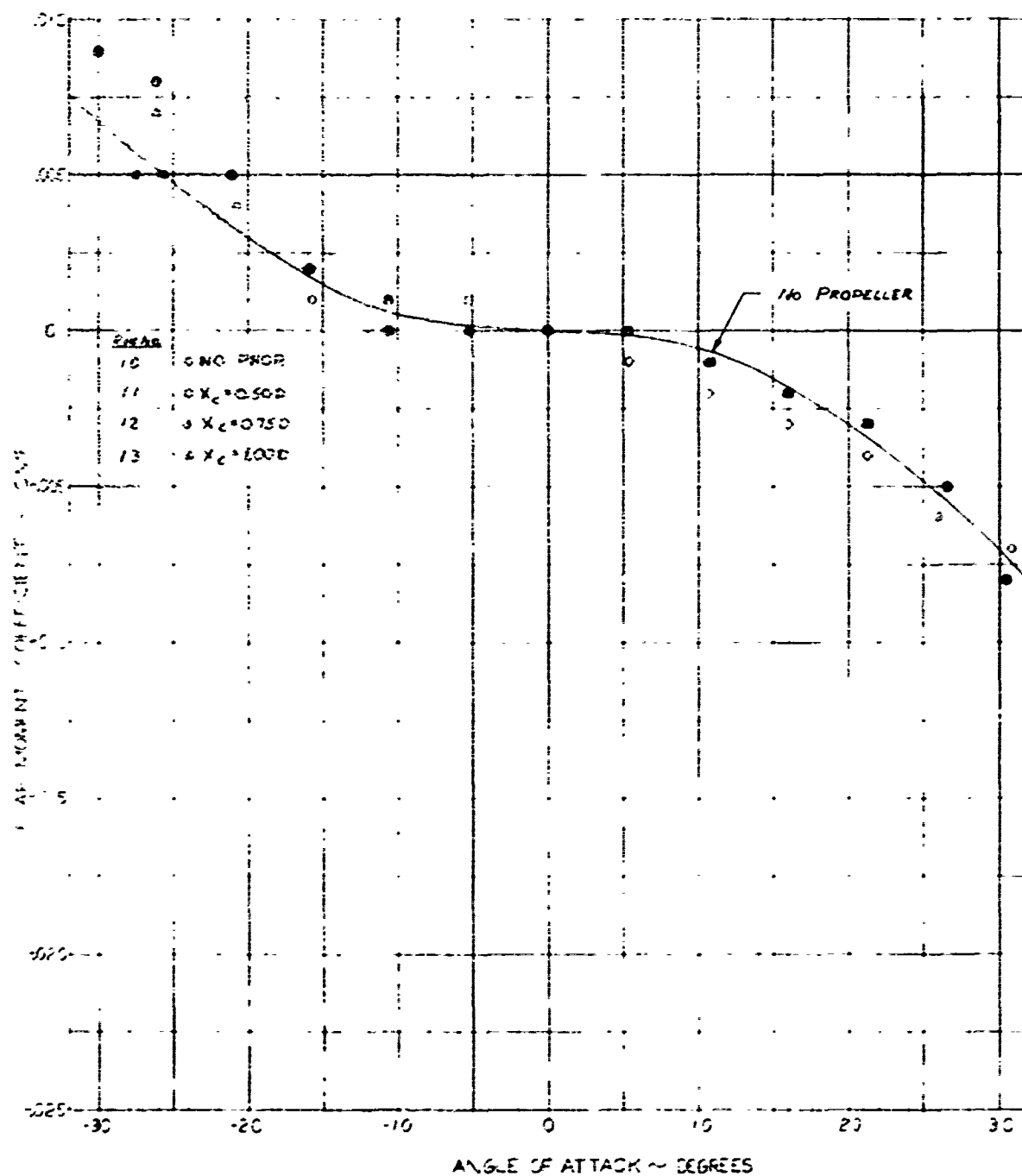


Figure 17 Flap Moment Coefficient Versus Angle of Attack for 20% Flapped Rudder Downstream of Propeller, $y_c = 0$.

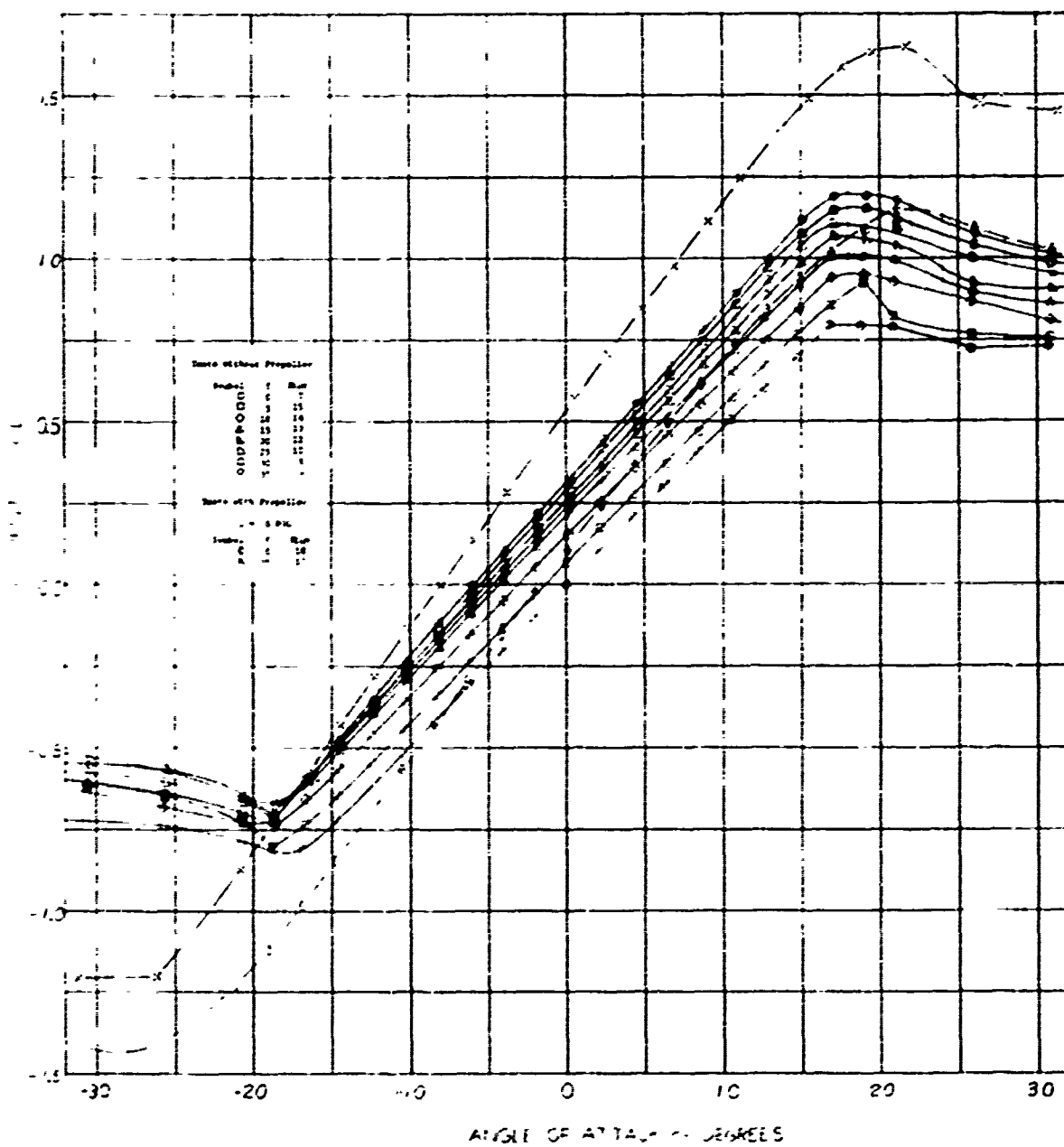


Figure 18 Lift Coefficient Versus Angle of Attack for 10% Flapped Rudder in Uniform Flow and Also Behind a Propeller.

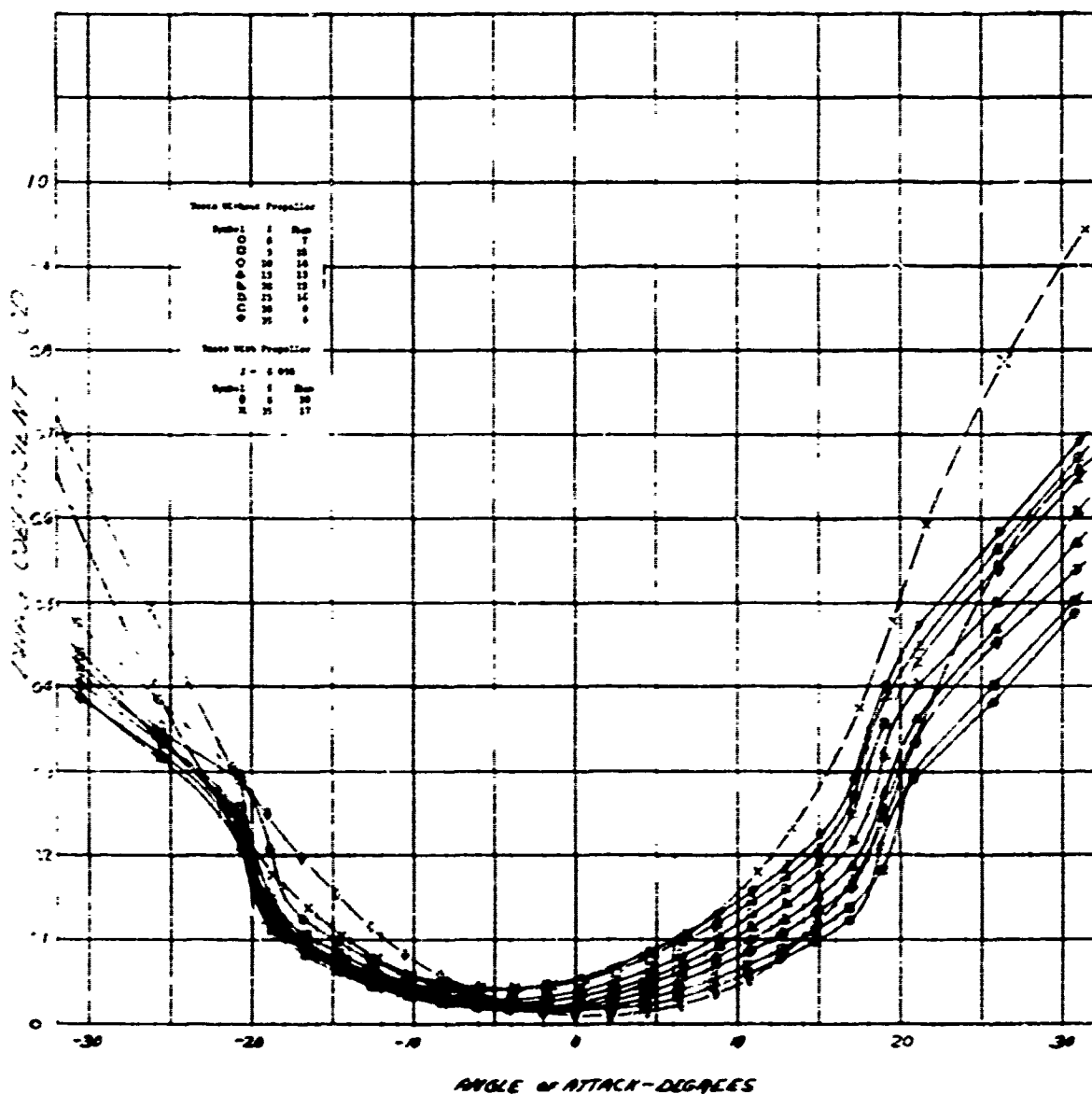


Figure 19 Drag Coefficient Versus Angle of Attack for 10% Flapped Rudder in Uniform Flow and Also Behind a Propeller.

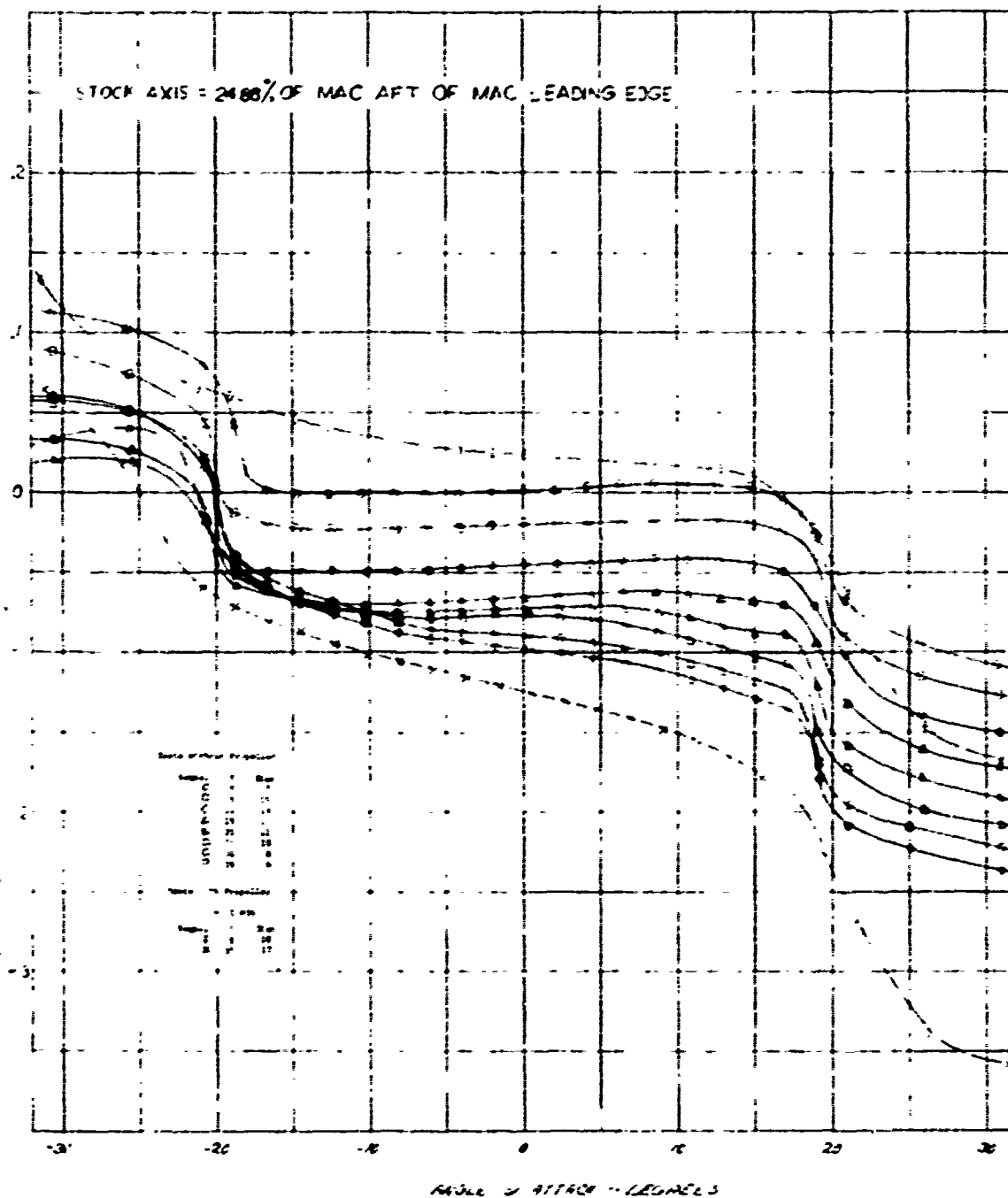


Figure 20 Rudder Moment Coefficient Versus Angle of Attack for a 10% Flapped Rudder in Uniform Flow and Also Behind a Propeller.

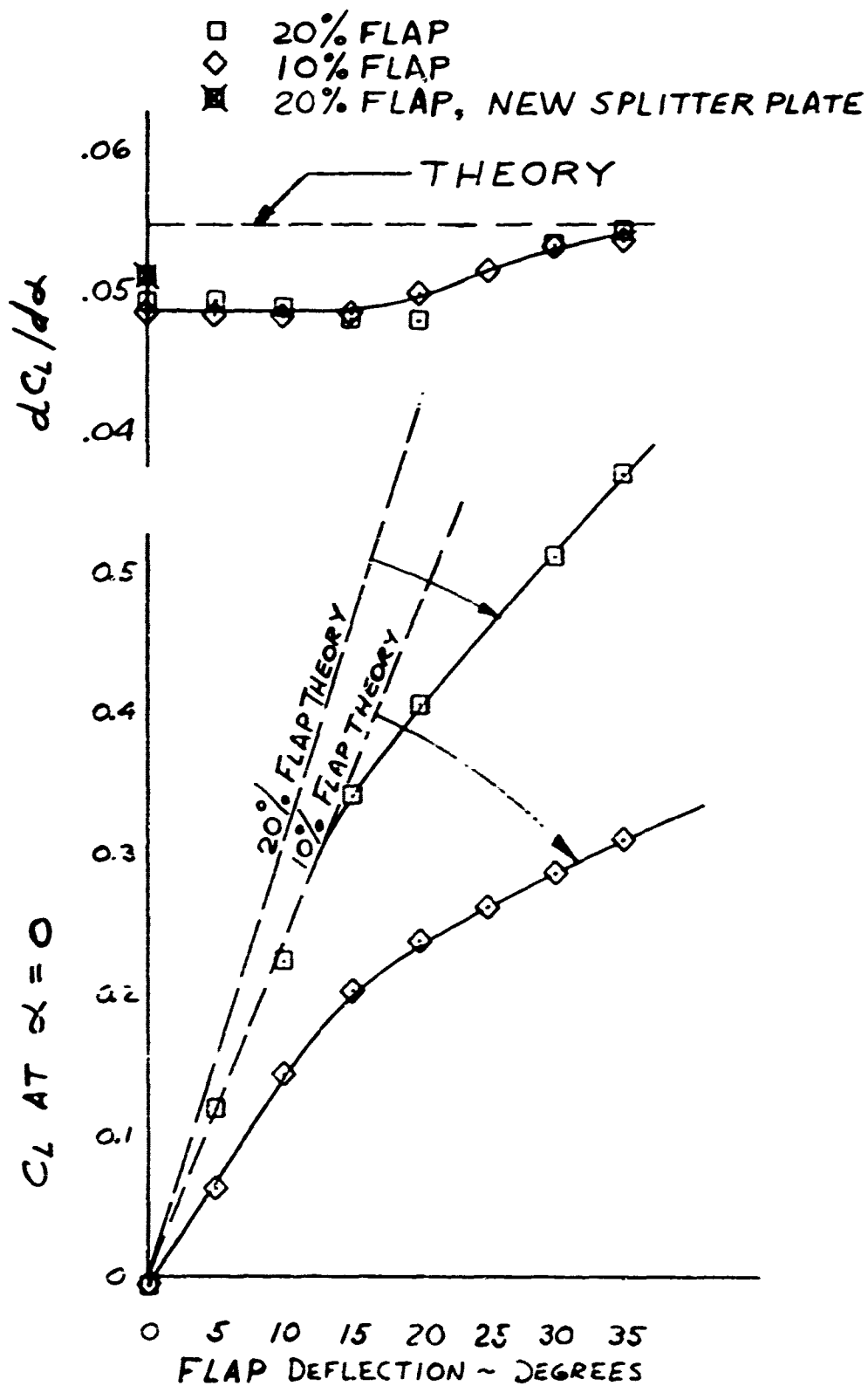


Figure 21 Comparison of Flapped Rudder Airfoil Data with Theory;
 C_L @ $\alpha = 0$, $dC_L/d\alpha$.

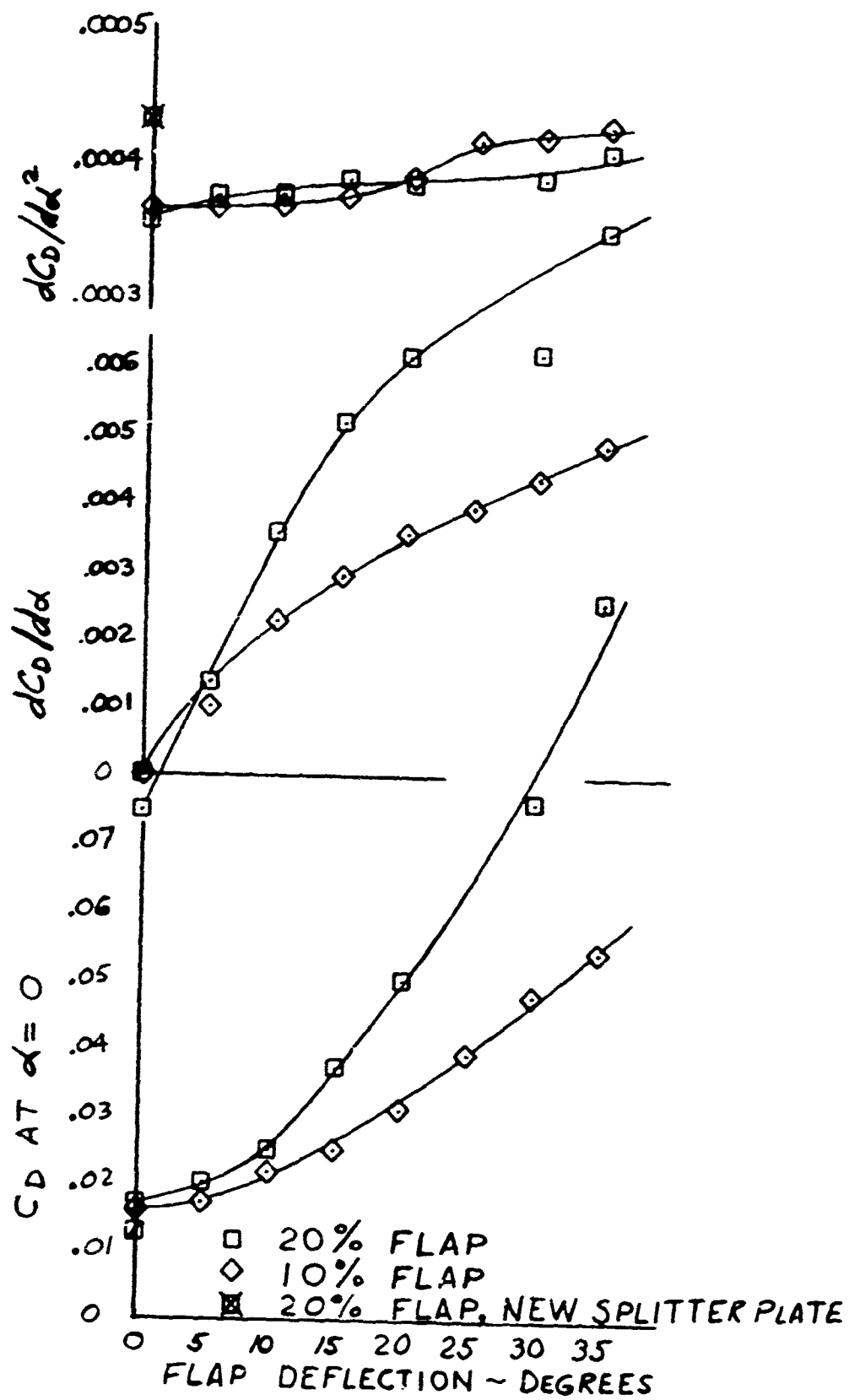


Figure 22 Comparison of Flapped Rudder Airfoil Data with Theory;
 C_D @ $\alpha = 0$, $dC_D/d\alpha$, and $dC_D/d\alpha^2$.



Figure 23 Photographs Showing Effect of Rudder Deflection on Propeller Hub Vortex Impingement on Rudder.

Appendix 1

Modification of the Rudder to Simplify Construction

The rudder geometry which has been chosen has a constant chord flap. To simplify construction, it was decided to make the flap and adjacent skeg surface exactly two-dimensional. Due to the taper of the rudder, this required a modification to the airfoil section for both the tip and the root. The NACA 63,A015 section which is the basic airfoil chosen has a straight line section from 70% to 100% of chord which made modification easier.

A program outlined in the following paragraphs is written to modify the 63,A015 section to produce the tip section and the root section needed to meet the above requirement. The output of this program is tabulated data in a form convenient to the machinist-model maker who machined the model from 6061-T6 aluminum alloy. In particular, 230 spanwise cuts are specified along straight lines connecting points of constant percent chord at root and tip. The final machine marks are small and are removed by polishing the surfaces by hand. The resultant accuracy of the rudder surfaces is very satisfactory. Roughness does not exceed 0.002" and the tolerance of the offsets is smaller than 0.005".

Modification of the tip foil section by numerical methods is accomplished in the following steps: (the sketches referred to are shown in Fig. 2)

- a) Begin with the original 63 A015 profile which has a finite trailing edge thickness (see sketch 1);
- b) From this section a wedge is removed centered around the plane of symmetry of the section leaving a sharp trailing edge: (see sketch 2)

$$y'_1 = y'_0 - 0.032 \cdot x' \quad 0 \leq x' \leq 1 \quad (1)$$

where y'_0 = non-dimensional offsets of 63₂A015 section

- c) Straight lines that form the trailing edge of the last 25% chord are extended beyond the trailing edge so that the last 30% of the new chord is linear (see sketch 3);
- d) A new wedge is added to remove the negative thickness from the previous step and the abscissa is rescaled to go from 0 to 100%. This foil now has a sharp trailing edge (see sketches 4 and 5);
- e) A wedge is then added to bring the trailing edge thickness on model scale to 0.020" (± 0.010): (see sketch 6)

$$y'_2 = y'_1 + \frac{0.010}{c_t} \cdot x' \quad (2)$$

As shown in sketch 7, root and tip sections differ in the flap region. The root section is therefore next modified to be identical to the tip section between 70% of tip chord and the trailing edge for this model with a 0.60 taper ratio. (Other taper ratios than 0.6 would require a similar procedure and would result in other profiles.) These steps are as follows:

- 1) The 63₂A015 foil trailing edge thickness is removed by subtracting a wedge and then brought to 0.020" thickness by adding a wedge: (see sketch 8)

$$y'_3 = y'_0 - 0.032 \cdot x' + \frac{0.010}{c_r} \cdot x' \quad , \quad 0 \leq x' \leq 1 \quad (3)$$

- 2) Compare the root trailing edge wedge with that of the tip to evaluate a ratio, $N=a/b$ (see sketch 9), by which all coordinates on the root section could be multiplied to make the trailing edge angles of root and tip identical.
- 3) Reevaluate the root foil with a sharp trailing edge, then multiply all ordinates by the ratio N :

$$y'_4 = y'_3 - \frac{0.010}{c_r} \cdot x' \quad , \quad 0 \leq x' \leq 1 \quad ; \quad (4)$$

$$y'_5 = y'_4 \cdot N \quad , \quad 0 \leq x' \leq 1 \quad (5)$$

- 4) The last step is to bring the trailing edge thickness at the root to 0.020":

$$y'_6 = y'_5 + \frac{0.010}{c_r} \cdot x' , \quad 0 \leq x' \leq 1 . \quad (6)$$

Table 2 shows the comparison between the original NACA 63₂A015 coordinates and the corresponding coordinates for the tip and root sections on the current flapped rudder models, modified in accordance with the preceding steps.

FORTRAN STATEMENT										IDENTIFICATION NUMBER
1	2	3	4	5	6	7	8	9	10	

[illegible]

TAP CODE 7/4 = 1 6/5 = 2 7/6 = 3 5/4 = 4 PITOT STATIC = 5 FLUID CODE. 1 = BLUE 2 = MERCURY
SIGN CODE N = NORMAL K: REVERSE MENBOX + OR - BEFORE FIRST DIGIT

CONTINUED

[illegible][illegible]

TAP CODE 7/4 = 1 6/5 = 2 7/6 = 3 5/4 = 4 PITOT STATIC = 5 FLUID CODE 1 = BLUE 2 = MERCURY
SIGN CODE N = NORMAL K = PENULT MENBOX + OR - BEFORE FIRST DIGIT

Appendix 2
Concluded

Appendix 3

Program Listing

```
// *DEAN LEWIS*,CLASS=3,REGION=123K
// *MITID USEN=(M11314.4J32.0,SEKAWDEM)
// *SRT LON

/*MAIN TIME=1
// *HDDYN FAC( FUDG)
// *C.SYSIN DU *JCH=MLKSIZE=2000
C MKS MUDDEN DYNAMOMETER DATA REDUCTION PROGRAM KERWIN/LEWIS/OPPENHEIM JU73
  INTEGER NS,S,SLANK
  REAL M,M1,M2,M3,MZ,MFLAP,MAC
  DIMENSION IDENT(24),ZM(2),ZI(7,2),ZF(2),NTAP(40),NFLD(40),ANOM(4
10),ANGL(40),S(40,7),M(40,7),DZ1(7,2),CL(40),CD(40),CM(40),CPL(40),
2CY(40),CMF(40),VC(5),VF(5),FM(2),C(7),CLU(40),CLSD(40),RM(40),SI(4
30),CU(40)
  IZ1=0 CMF=0 IDENT(23)=0 CPL=0 IDENT(24)=0 CY=0
  DATA VC/4.11447,2.60044,0.9016,0.6214,4./381/,VE/.49353,.5,.4724,0
1.50638,.5/45/,M1/.MLAK/0/
  READ (K1,104)(C(N),N=1,7),TWIST,SHAFT
104 FORMAT(7F8.4,2F12.5)
1  READ (K1,104)(IDENT(N),N=1,18)
103 FORMAT(14A4)
  READ (K1,104) JF,NT,NTT,AREA,SPAN,MAC,XMAC,ZMAC,AZL,DYCOR,VELINC
100 F0RMAT(F6.1,I4,I4,F9.2,F8.3,F8.4,F8.4,F8.2,F9.4,F8.4)
  IF (AREA.LT.0) GO TO 49
  RM=1.55/4-0.00028*IT
  SCALE=1.000472-13.3E-6*IT
  F(1)=1.4575-.00071*NTT
  F(2)=24.5074-.00236*NTT
  WRITE (K0,200) (IDENT(N),N=1,19)
200 F0RMAT ('1.1A.14A4//1/1.1FLAPPED MUDDEN INPUT DATA//3X.0F.3X.0
1TP.2X.1TT.4X.1AREA.4X.1SPAN.5X.1MAC.4X.1XMAC.4X.1ZMAC.4X.1A
2ZL.4X.1DYCOR.2X.1VELINC')
  WRITE (K0,104) JF,NT,NTT,AREA,SPAN,MAC,XMAC,ZMAC,AZL,DYCOR,VELINC
150 F0RMAT(F6.1,I4,I4,F9.2,F8.3,F8.4,F8.4,F8.2,F9.4,F8.4)
  DYCOR=0
  DYCOR=DYCOR/
  IF (DYCOR.LT.10.0) GO TO 30
  DYCOR=49.
  DYCOR=0.0
  DYCOR=0
30 READ (K1,101)(Z(M,L,K),L=1,2),M=1,7),K=1,2)
101 F0RMAT(F5.0,I2X,F5.0,F4.0,F5.0,F4.0,5.0,F4.0,F5.0,F4.0,
1F5.0,F4.0,F5.0,F4.0)
  WRITE (K0,201)
201 F0RMAT(/.0/ ZERO READINGS BEFORE AND AFTER// ANOM 1-N 1-R 2-N
1 2-R 3-N 3-R 4-N 4-R 5-N 5-R 6-N 6-R 7-N 7-R)
  WRITE (K0,204) (ZM(K),((Z(M,L,K),L=1,2),M=1,7),K=1,2)
204 F0RMAT(2(F4.0,4(2X,F4.0),2(1X,F4.0),8(2X,F4.0)/))
  WRITE (K0,212)(C(N),N=1,7),TWIST,SHAFT
  212 F0RMAT(' C L L L L S / C U N T 1=0.F7.5, 2=0.F7.5, 3=0.F7.5, 4=0.F
17.5, 5=0.F7.5, 6=0.F7.5, 7=0.F7.5// TWIST=0.F7.1, SHAFT
201A=0.F7.2, 1=0.1)
  WRITE (K0,202)
202 F0RMAT(/.0/ INPUT DATA AS RECORDED// IF ANOM ANGLE S 1
1 S 2 S 3 S 4 S 5 S 6 S 7)
  DO 2 J=1,40
  JT=J-1
```

19SEP73

19SEP73

Appendix 3
(cont.)

```

      READ(K1,102)NTAP(J),NFLD(J),ANOM(J),ANGL(J),(S(J,M),R(J,M),M=1,7)
102  FORMAT(14,F5.0,F7.2,2X,A1,F8.2,A1,F8.2,A1,F8.2,A1,F8.2,
      1A1,F8.2,A1,F8.0)
      IF (ANOM(J).EQ.0.0) GO TO 3
      WRITE(K0,203)NTAP(J),NFLD(J),ANOM(J),ANGL(J),(S(J,M),R(J,M),M=1,7)
203  FORMAT(1X,12,F6.0,F7.2,2X,7(A1,F6.0,2X))
      GO TO 34
      MUG=1.0/(JT-1)
      DZM=(ZM(2)-ZM(1))*MUG
      DO 4 M=1,7
      DO 4 L=1,2
4      DZI(M,L)=(ZI(M,L,2)-ZI(M,L,1))*RUG
      DO 7 J=1,JT
      IF (J.EQ.1) GO TO 5
      IF (NTAP(J).EQ.0) NTAP(J)=NTAP(J-1)
      IF (NFLD(J).EQ.0) NFLD(J)=NFLD(J-1)
      MUG=J-1
      ANOM(J)=ANOM(J)-ZM(1)-MUG*DZM
      ANGL(J)=ANGL(J)-AZL
      DO 7 M=1,7
      IF (S(1,M).EQ.BLANK) GO TO 21
      IF (S(J,M).EQ.BLANK) S(J,M)=S(J-1,M)
      IF (S(J,M).EQ.RS) GO TO 5
      R(J,M)=R(J,M)-ZI(M,1,1)-MUG*DZI(M,1)
      GO TO 7
      R(J,M)=-R(J,M)+ZI(M,2,1)+MUG*DZI(M,2)
      GO TO 7
21  R(J,M)=-R(J,M)+DZI(M,1)*RUG
7      CONTINUE
      WRITE(K0,204)(IDENT(N),N=1,18)
204  FORMAT(11,1X,14A4//)
      WRITE(K0,705)(NTAP(J),NFLD(J),ANOM(J),ANGL(J),(R(J,M),M=1,7),J=1,J
      1T)
705  FORMAT('  INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS'/(13,
      11,F6.0,F7.2,2X,7F6.2))
73  WRITE(K0,707)(IDENT(N),N=1,18)
707  FORMAT(11,1X,14A4//)
      IF (DYCUM.EQ.99) GO TO 407
      WRITE(K0,707) DYCUM
307  FORMAT(17,F6.0DYCUM=99,FA.0//)
      GO TO 407
407  WRITE(K0,507)
507  FORMAT(1X,'DYCUM IS BEING COMPUTED'//)
507  WRITE(K0,707)
707  FORMAT('  OVERLAPPED MUDFLOW DATA REDUCTION'//)
      ALPHA FX-LB 19SEP73
      1 FZ-LB MX-INLB MZ-INLB FXO-LB FYO-LB F70-LB MXO-INLB MY 19SEP73
      20-INLB MZU-INLB MYOFLAP-INLB VEL-FPS) 19SEP73
      HEAD=MAC/(12*3.4739*EXP(67.6832/NTT))
      DO 4 J=1,JT
      I=NTAP(J)
      IF (I.LT.1.0-1.0T,5) GO TO 99
      K=NFLD(J)
      IF (K.LT.1.0-K,0T,2) GO TO 99
      MUG=VE(I)
      V=(ANOM(J)*M(K)*SCALE/(VC(I)*MUG))*MUG*(1.0+VELINC)
      FYHAFT=0.00327*5-MAFT**2*V**2
      FMOX1=C(1)*M(J,1)
      FMOX2=C(2)*M(J,2)
      FMOX3=C(3)*M(J,3)
      FMOX4=C(4)*M(J,4)+FYHAFT*0.41477

```

Appendix 3
(cont.)

[illegible]

Appendix 3
Concluded

```

511 FORMAT(17X,'DYCOR IS BEING COMPUTED'//)
611 WRITE(K0,711)
711 FORMAT(' PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE'//)
1PHA CL CD CM CPL CY L/D CMF RN=10**-6
2 CLSQ)
WRITE(K0,2009) (ANG0(J),CL(J),CD(J),CM(J),CPL(J),CY(J),CLD(J),CMF(J)
1,RN(J),CLS(J),J=1,JT)
IF(DYCOR.E).0.0) GO TO 1
DO 31 J=1,15
M=J
IF(J.GT.5) M=J+5
A(J,1)=1.0
A(J,2)=ANG0(M)
71 A(J,3)=CL(M)
CALL PTLSQ(A,MMS,15,2,KERR0R)
SL=SMS(2)
WRITE(5,214) MMS(1),MMS(2)
214 FORMAT(////////) CL COEFFS',2F12.6)
DO 32 J=1,15
M=J
IF(J.GT.5) M=J+5
A(J,1)=1.0
A(J,2)=ANG0(M)
A(J,3)=ANG0(M)**2
32 A(J,4)=CU(M)
CALL PTLSQ(A,MMS,15,3,KERR0R)
IF(MYCOR.E).0) DYCOR=57.296*MMS(2)/SL
DYCOR=DYCOR
WRITE(5,213) (MMS(M),M=1,3),DYCOR
IF(MYCOR.E).0) GO TO 1
213 FORMAT(' CO COEFFS',3F12.6,' DYCOR',F12.5)
MYCOR=MYCOR-1
IF(MYCOR.E).0) GO TO 1
GO TO 33
99 STOP
END
SUBROUTINE PTLSQ (A,M,NED,NJN,KERROR)
C A IS THE MATRIX OF COEFFICIENTS WITH NED EQUATIONS(ROWS) AND NJN COLUMNS.
C NJN=NUN+1 I.E. NUMBER OF UNKNOWN PLUS ONE. RIGHT HAND SIDE IS IN THE LAST
C COLUMN OF A. M ARE THE RETURNED SOLUTIONS. IF KERROR .NE.0 THE GAUSS
C REDUCTION WAS NOT SUCCESSFUL. MSQ=NUN**2. DIMENSIONS: A(NED,NUN),R(NED).
C H(MSQ)
DIMENSION A(15,4),H(4),H(16)
NUN=NUN+1
MSQ=NUN**2
DO 1 N=1,NJN
DO 1 M=1,NJN
DO 1 R=1,NJN
L=N+(M-1)*NJN
H(L)=0.0
DO 1 J=1,NED
1 H(L)=H(L)+A(J,M)*A(J,N)
DO 2 M=1,NJN
H(M)=0.0
DO 2 N=1,NED
2 H(M)=H(M)+A(N,MUN)*A(N,M)
CALL SIMQ (H,R,NUN,KERROR)
RETURN
END
//G.SYSIN DD *.JCH=MLKSIZE=2000

```

Appendix 4

Rudder Dynamometer Data Reduction Program

Appendix 2 shows sample data sheets used as input to the data reduction program. The first line (card) contains whatever identification is useful. The second card has inputs for room and tunnel temperature necessary for tunnel water speed and density determination; also rudder dimensional data needed to determine airfoil characteristics in coefficient form and Reynolds number. XMAC and ZMAC are used if it is required to transfer the axis of moment coefficient data along the rudder chord or normal to the chord respectively, relative to the dynamometer axis. AZL is used to relate the dynamometer measuring axis to the rudder chord.

DYCOR relates to a modification to the data reduction program to correct data taken on a symmetrical airfoil to make the drag curve symmetrical. It corrects for an assumed fault in the dynamometer geometry which results in cross-talk between lift and drag measurements. When applied to flapped rudders, a zero flap deflection run will be used to compute DYCOR. If 99. is entered under DYCOR as in Test 7 under Appendix 6, the program will compute DYCOR and the result appears on the fifth page of data reduction. On subsequent runs for flap deflections other than zero and including propeller runs this value of DYCOR will be entered and the appropriate correction will be made. For example see any other data reduction runs in Appendix 6.

The following entries on the data sheet are zero readings before and after the run. The program uses these values to correct the load cell raw data for zero drift by linearly interpolating between the before and after zero values.

A calibration card precedes all the data runs. The values contained on it are printed out by the data reduction program, following Cell lbs/count. The first seven values are in fact the values used to convert digital indicator readings to pounds. Twist is related to shaft stiffness and used to correct the angle of attack of the rudder for shaft twist due to moment MY.

The main body of the data sheet has columns for the following: indication of static pressure taps and fluid being used; manometer reading due to velocity; rudder angle of attack; and then seven columns of data for load cell output on the digital indicators. The first six are for the rudder dynamometer load cells which read the total reaction from the rudder. The seventh is the output of a flap hinge moment sensor when used.

The tabulated output of the computer program requires five pages if DYCOR is not being computed. The first page repeats all the input data. The second page contains input data corrected for zero readings and signs. The third page contains forces and moments about the three axes in pounds and inch pounds and water velocity in feet-per-second. The fourth page gives all the rudder data in coefficient form tabulated against rudder angle of attack α . Lift-to-drag ratios and also Reynolds numbers have been computed for this table. On the fifth page are the final data corrected for DYCOR and for tunnel wall effect. At the bottom of the fifth page are lifting surface characteristics calculated by DYCOR: next to CL coefficients are C_L at $\alpha=0$, and $dC_L/d\alpha$; next to CD coefficients are C_D at $\alpha=0$, $dC_D/d\alpha$, and $dC_D/d\alpha^2$. The final value is the numerical value of DYCOR in degrees.

Tunnel wall corrections for the resulting test section dimensions and model size, found in accordance with [6] are:

$$\Delta\alpha = 0.9618 \cdot C_L \text{ [deg]}$$

$$\Delta C_D = 0.01674 C_L^2$$

Typical value of $\Delta\alpha$ at the highest lift is 1.3° and this amount is added algebraically to the measured value. Typical corresponding value of ΔC_D is 0.032 and again this amount is added to the measured drag coefficient.

FLAPPED RUDDER INPUT DATA

TEST LOC. Y=0 IN.FL=0 DEG.,NO PROP,208 FLAP 7/29/73

DF TR TT ARFA SPAN C-MAC K-MAC ZAC Y
0.0 85 87 44.30 7.875 5.7421 0.763 -3.15 0.0

ZERO READINGS BEFORE AND AFTER

ANOM 1-N 1-R 2-N 2-R 3-N 3-R 4-N 4-R 5-N 5-R 6-N 6-R 7-N 7-R
0. 100. 100. 20. 20. 0. 0. 100. 100. 100. 100. 10. 10. 20. 20.
0. 100. 100. 10. 11. 2. 2. 100. 100. 98. 101. 9. 11. 30. 12.

CELL LMS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=0.10000 5=0.48970 6=0.20000 7=0.02273
TWIST= 1500.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

YF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
00	1284.	26.9	R	1280.	N	21.	826.	288.	R	288.	N	50.	R	54.	R	234.
00	1283.	21.9	R	1350.	R	84.	162.	1455.		1455.		309.		42.		216.
00	1314.	16.9	R	1350.		522.	-1596.	1550.		1550.		308.	N	15.		110.
00	1325.	11.9		1093.		467.	-968.	260.		260.		268.	R	11.		75.
00	1334.	6.9		755.		347.	-220.	860.		860.		213.		23.		45.
00	1338.	1.9		430.		191.	204.	503.		503.		155.		28.		35.
00	1339.	-3.1	N	102.	N	22.	232.	140.	R	140.		109.		25.		22.
00	1337.	-8.1		450.		173.	-127.	390.		390.		183.		15.		21.
00	1332.	-13.1		703.		329.	-886.	680.		680.		261.	N	19.	N	31.
00	1322.	-18.1		1040.		458.	-1920.	935.		935.		339.		41.		61.
00	1287.	-23.1		1110.		181.	-726.	1005.		1005.		332.		12.		166.
00	1263.	-28.1		1220.		168.	560.	1040.		1040.		335.		10.		199.
00	1249.	-30.0		1140.		45.	40.	975.		975.		314.	R	18.		205.

INPUT DATA CORRECTED FOR ZERO READINGS AND SIFTS

21	1284.	30.05	-1180.00	1.30	-826.00	-188.00	-50.00	-44.00	-214.00
21	1283.	25.05	-1250.00	-64.75	-161.83	-1355.00	209.17	-31.92	-196.67
21	1314.	20.05	-1750.00	-503.50	1596.33	-1450.00	208.33	5.17	-91.33
21	1325.	15.05	-990.00	-449.25	968.50	-160.00	168.50	-0.75	-57.00
21	1334.	10.05	-655.00	-330.00	220.67	-760.00	113.67	-12.67	-27.67
21	1338.	5.05	-330.00	-174.75	-203.17	-600.00	55.83	-17.58	-18.33
21	1339.	0.05	2.00	-3.00	-231.00	40.00	-8.50	-14.50	-6.00
21	1337.	-4.95	350.00	147.17	123.17	290.00	-82.42	-4.42	-5.67
21	1332.	-9.95	680.00	302.33	887.33	580.00	-160.33	9.67	4.33
21	1322.	-14.95	990.00	430.50	1921.50	835.00	-238.25	31.75	33.50
21	1287.	-19.95	1080.00	152.67	727.67	905.00	-231.17	2.83	137.67
21	1263.	-24.95	1120.00	138.83	-558.17	940.00	-234.08	0.92	169.83
21	1249.	-26.85	1040.00	15.00	-38.00	875.00	-213.00	-7.00	175.00

••FLAPPED RUNNER DATA REDUCTION••

TEST LOC. Y=0 IM,NFL= 0 DEG.,N7 PROP,20R FLAP 7/29/73 WITH OVCOR

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXO-LR	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYFLAP-INLR	VFL-FPS
30.05	8.26	117.99	591.97	40.63	60.75	48.87	101.49	-509.53	0.0	304.35	-4.86	20.90
25.05	1.62	125.05	848.64	14.66	40.37	36.24	115.98	792.87	11.00	-302.93	-4.47	20.89
20.06	-15.96	130.04	881.02	92.60	22.53	38.66	129.06	871.81	90.00	-160.39	-2.79	21.14
15.06	-9.68	173.49	178.19	-281.12	11.86	-69.68	103.27	47.90	80.00	-297.39	-1.30	21.23
10.06	-2.21	68.80	473.06	17.60	6.07	19.53	68.57	471.75	59.00	-39.36	-0.63	21.30
5.05	2.03	34.75	244.74	-6.00	3.18	12.83	34.66	243.71	31.00	-14.79	-7.42	21.33
0.05	2.31	-0.17	-48.68	-37.92	2.32	-0.29	-0.04	-46.56	0.0	-40.49	-0.14	21.34
-4.95	-1.23	-36.47	-248.13	18.89	3.92	8.90	-36.28	-248.31	-26.00	-16.26	-2.13	21.32
-9.95	-8.87	-71.02	-491.97	62.81	7.46	15.25	-71.19	-493.60	-54.00	-50.33	0.10	21.28
-14.96	-19.21	-103.31	-725.32	133.47	13.83	23.51	-104.16	-730.90	-77.00	-98.47	0.76	21.20
-19.95	-7.28	-109.53	-717.33	54.73	16.28	18.92	-103.60	-681.29	-27.00	-231.79	3.13	20.92
-24.95	5.58	-113.39	-728.96	101.70	58.33	17.29	-97.39	-690.94	-24.00	-253.63	3.86	20.72
-26.85	0.38	-104.15	-670.62	36.77	52.40	15.08	-90.01	-598.14	-2.00	-303.46	3.98	20.61

Appendix 5
(cont.)

UNFLAPPED RUNOFF DATA IN NON-DIMENSIONAL FORM

TEST 13C, Y= IN. DEL= .006, NC PRCP. 2.18 FLAP 7/29/73

ALPHA	CL	CD	CM	CPL	CV	L/C	CMF	CLSQ	RN#10#-6
30.5	1.782	0.4679	0.1208	-0.638	0.376	1.671	-0.007	0.6111	1.156
25.06	0.894	0.3728	0.1435	-0.868	0.279	2.359	-0.006	0.7993	1.155
20.11	1.971	0.1696	0.2481	0.858	0.291	5.729	-0.003	0.9436	1.169
15.10	0.771	0.0886	0.2066	0.059	-0.520	8.704	-0.002	0.5941	1.174
10.09	0.508	0.0453	0.1440	0.874	0.145	11.287	-0.001	0.2584	1.178
5.17	1.256	0.0235	0.0740	0.893	0.095	10.891	-0.001	0.0656	1.190
0.05	-0.000	0.0171	-0.0021	1.873	-0.002	-0.019	-0.000	0.0000	1.180
-4.97	-1.268	0.0291	-0.1693	0.869	0.166	-9.257	-0.001	0.0720	1.179
-9.99	-0.529	0.0554	-0.1399	0.880	0.113	-9.545	0.000	0.2794	1.177
-15.00	-0.779	0.1035	-0.2030	0.891	0.176	-7.532	0.001	0.6073	1.173
-19.97	-0.796	0.2788	-0.1490	0.835	0.145	-2.856	0.004	0.6338	1.157
-24.97	-0.763	0.4568	-0.1507	0.901	0.135	-1.670	0.005	0.5817	1.146
-26.85	-0.713	0.415	-0.1123	0.845	0.119	-1.718	0.005	0.5080	1.140

AROUND DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CV	L/C	CMF	CLSQ	RN#10#-6
30.80	0.782	0.4782	0.1208	-0.638	0.376	1.635	0.007	0.6111	1.156
25.92	0.894	0.3862	0.1435	0.868	0.279	2.315	0.006	0.7993	1.155
21.74	1.971	0.1854	0.2481	0.858	0.291	5.241	0.003	0.9436	1.169
15.84	0.771	0.0985	0.2066	0.059	-0.520	7.825	0.002	0.5941	1.174
10.58	0.508	0.0494	0.1440	0.874	0.145	11.298	0.001	0.2584	1.178
5.32	0.256	0.0246	0.0740	0.853	0.095	10.405	0.001	0.0656	1.180
0.05	-0.000	0.0171	-0.0021	1.873	-0.002	-0.019	0.000	0.0000	1.180
-5.23	-1.268	0.0342	-0.1693	0.869	0.166	-8.887	0.000	0.0720	1.179
-10.49	-0.529	0.0600	-0.1399	0.880	0.113	-8.805	-0.000	0.2794	1.177
-15.75	-0.779	0.1136	-0.2030	0.891	0.176	-6.858	-0.001	0.6073	1.173
-20.73	-0.796	0.2894	-0.1440	0.835	0.145	-2.751	-0.004	0.6338	1.157
-25.70	-0.763	0.4665	-0.1507	0.901	0.135	-1.635	-0.005	0.5817	1.146
-27.54	-0.713	0.4235	-0.1123	0.845	0.119	-1.683	-0.005	0.5080	1.140

FLAPPED RUNNER INPUT DATA

TEST 50, Y=1 IN, DEL=5 DEG, N7 PRO, 207 FLAP 7/27/73

DF	TR	TT	APFA	SPAN	C-MAC	X-MAC	ZAC	Y
5.0	82	85	44.30	7.875	5.7421	0.763	96.90	0.0

ZERO READINGS BEFORE AND AFTER

ANOM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	20.	20.	0.	0.	100.	100.	100.	100.	10.	10.	20.	20.
0.	100.	100.	32.	32.	10.	20.	95.	105.	98.	101.	10.	11.	18.	18.

CELL LBS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=0.10000 5=0.49977 6=1.20000 7=3.22273
 TWIST= 15.000 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1275.	126.5	q	1390.	N	102.	950.	q	1345.	N	315.	362.	48.	45.	48.	278.
00	1399.	121.5	q	1621.	q	28.	541.	q	1671.	q	350.	350.	26.	26.	26.	218.
00	1418.	116.5	q	1550.	q	260.	-450.	q	1690.	q	319.	319.	14.	14.	14.	164.
00	1447.	111.5	q	1360.	q	402.	-882.	q	1540.	q	257.	257.	28.	28.	28.	132.
00	1459.	106.5	q	995.	q	265.	-52.	q	1110.	q	191.	191.	35.	35.	35.	112.
00	1469.	101.5	q	635.	q	97.	380.	q	705.	q	120.	120.	32.	32.	32.	97.
00	1472.	96.5	q	265.	q	127.	358.	q	315.	q	160.	160.	21.	21.	21.	86.
00	1473.	91.5	q	311.	q	798.	0.	q	570.	q	251.	251.	13.	13.	13.	74.
00	1472.	86.5	q	690.	q	470.	-838.	q	840.	q	338.	338.	32.	32.	32.	45.
00	1468.	81.5	q	1033.	q	609.	-1520.	q	880.	q	328.	328.	26.	26.	26.	95.
00	1424.	76.5	q	1075.	q	330.	-630.	q	870.	q	326.	326.	38.	38.	38.	121.
00	1400.	71.5	q	1135.	q	168.	69.	q	880.	q	338.	338.	41.	41.	41.	125.
00	1382.	66.5	q	1170.	q	120.	222.	q		q						

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

21	1275.	29.6	-1291.0	32.0	-951.0	-1245.0	215.0	-38.0	-258.0
21	1399.	24.60	-1520.0	7.00	-535.83	-1565.58	262.17	-34.92	-281.17
21	1418.	19.60	-1450.00	-241.67	450.33	-1589.17	250.33	-15.83	-198.33
21	1447.	14.6	-1260.00	-384.50	882.50	-1438.75	219.50	-3.75	-144.50
21	1459.	9.60	-895.00	-248.33	52.67	-1009.33	157.67	-17.67	-112.67
21	1469.	4.6	-535.0	-81.17	-379.17	-632.92	91.83	-24.58	-92.83
21	1472.	-0.40	-165.00	-112.00	-397.00	-212.50	21.00	-21.50	-78.00
21	1473.	-5.40	210.00	271.00	1.17	152.92	-59.42	-10.42	-67.17
21	1472.	-10.40	550.00	442.00	839.33	473.33	-150.33	3.00	-55.33
21	1468.	-15.40	933.00	580.00	1921.50	743.75	-237.25	22.00	-26.50
21	1424.	-20.40	975.00	311.00	631.67	784.17	-227.17	-15.17	76.67
21	1400.	-25.40	1035.00	137.00	-66.17	774.58	-225.08	-27.08	102.83
21	1382.	-30.40	1070.00	84.00	-270.00	785.00	-237.00	-30.00	107.00

Appendix 5
(cont.)

***FLAPPED RUDDER DATA REDUCTION**

TEST 5C , Y=0 IN,NFL=5 DFG,NQ PRND,PCF FLAP :/27/73

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXC-LR	FYC-LR	FZC-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FOS
29.59	9.50	128.18	797.31	-17.32	65.70	23.62	110.47	696.86	-14.00	-366.79	-5.86	20.84
24.60	5.40	151.93	1011.97	6.57	60.70	32.05	139.38	943.87	-1.00	-364.74	-6.39	21.82
19.63	-4.51	147.42	1179.54	51.92	37.55	35.94	142.63	983.10	43.00	-237.04	-4.51	21.97
14.65	-8.82	129.85	910.25	72.88	17.24	33.51	129.00	906.51	69.00	-110.06	-3.28	22.20
9.63	-1.53	91.98	644.67	21.61	9.89	23.51	91.45	642.79	44.00	-53.10	-2.56	22.29
4.61	3.79	54.31	381.48	-12.21	5.21	16.56	54.19	381.03	14.00	-22.19	-2.11	22.36
-0.39	3.97	17.62	107.90	-16.11	2.89	11.58	17.83	108.68	20.00	-9.49	-1.77	22.39
-5.43	-0.11	-23.71	-157.05	12.77	3.49	12.20	-23.45	-157.21	-48.00	-10.58	-1.53	22.39
-10.45	-8.39	-63.42	-433.55	62.56	6.64	22.00	-63.63	-436.17	-79.00	-40.38	-1.26	22.39
-15.47	-19.21	-99.11	-696.91	13.48	13.22	31.73	-100.08	-692.81	-104.00	-94.22	-0.60	22.36
-20.44	-6.32	-100.50	-674.86	33.38	34.28	32.29	-54.68	-632.19	-54.00	-238.49	1.74	22.02
-25.42	0.66	-104.87	-642.22	25.54	50.62	34.67	-91.85	-576.58	-24.00	-284.00	2.34	21.83
-30.41	2.20	-117.88	-669.68	39.65	61.48	40.10	-88.75	-580.32	-15.00	-336.56	2.43	21.69

Appendix 5
(cont.)

REFLAPED HUNTER DATA IN NON-DIMENSIONAL FORM

TEST 5C + Y=11 IN, DELTAS REL, INC POS, P, 238 FLAP 7/27/73

ALPHA	CL	CD	CM	COL	CY	L/D	CMF	CLSQ	PN*10 ⁻⁶
29.59	1.856	0.5211	0.1130	0.801	0.187	1.682	-0.008	0.7321	1.131
24.60	0.984	0.4447	0.1413	0.860	0.226	2.256	-0.008	0.9679	1.185
19.63	0.993	0.2781	0.1886	0.875	0.251	3.798	-0.008	0.9866	1.193
14.65	0.883	0.1306	0.1994	0.892	0.229	7.482	-0.004	0.7750	1.205
9.63	0.619	0.0734	0.1346	0.893	0.159	9.247	-0.003	0.3831	1.210
4.61	0.364	0.0196	0.0391	0.874	0.111	10.398	-0.002	0.1327	1.215
-0.39	0.120	0.0234	0.0772	0.851	0.078	6.176	-0.002	0.0143	1.216
-5.43	-0.157	0.0446	0.1483	0.870	0.148	-6.714	-0.001	0.1247	1.216
-10.45	-0.427	0.0889	0.2104	0.879	0.227	-7.565	-0.001	0.4532	1.214
-15.47	-0.673	0.2377	0.1578	0.848	0.224	-7.767	-0.002	0.4311	1.196
-20.44	-0.657	0.3571	0.1279	0.757	0.245	-1.814	0.003	0.4157	1.186
-25.42	-0.648	0.4386	0.1211	0.831	0.287	-1.446	0.003	0.4021	1.178

AROE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	COL	CY	L/C	CMF	CLSQ	PN*10 ⁻⁶
30.41	1.856	0.5211	0.1130	0.801	0.187	1.642	0.008	0.7321	1.131
25.55	0.984	0.4447	0.1413	0.860	0.226	2.212	0.008	0.9679	1.185
20.58	0.993	0.2781	0.1886	0.875	0.251	3.573	0.005	0.9866	1.193
15.49	0.883	0.1306	0.1994	0.892	0.229	6.735	0.004	0.7750	1.205
10.22	0.619	0.0734	0.1346	0.893	0.159	8.439	0.003	0.3831	1.210
4.96	0.364	0.0196	0.0391	0.874	0.111	9.778	0.002	0.1327	1.215
-0.27	0.120	0.0234	0.0772	0.851	0.078	6.100	0.002	0.0143	1.216
-5.58	-0.157	0.0446	0.1483	0.870	0.148	-6.597	0.001	0.1247	1.216
-10.86	-0.427	0.0889	0.2104	0.879	0.227	-8.964	0.001	0.1822	1.216
-16.12	-0.673	0.2377	0.1578	0.848	0.224	-6.974	0.001	0.4532	1.214
-21.07	-0.657	0.3571	0.1279	0.757	0.245	-7.681	-0.002	0.4311	1.196
-26.04	-0.648	0.4386	0.1211	0.831	0.287	-1.779	-0.003	0.4157	1.186
-31.02	-0.634	0.4453	0.1211	0.831	0.287	-1.424	-0.003	0.4021	1.178

Appendix 5
(cont.)

FLAPPED DIMMER INPUT DATA

TEST 9/C, Y=0 IN, DEL=-10DFG, AN PRTP, 20R FLAP 7/29/73

OF	TP	TT	AREA	SPAN	C-MAC	X-MAC	ZAC	Y
10.0	86	87	44.30	7.875	5.7421	0.763	-3.15	0.0

ZERO READINGS BEFORE AND AFTER

ANIM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	105.	103.	22.	10.	36.	16.	105.	100.	100.	101.	9.	10.	42.	20.

CELL 135/COUNTY 1=1.1111 2=1.1111 3=1.1111 4=1.1111 5=0.10000 6=0.48970 7=0.02273
 TWIST= 1500.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TP	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1333.	26.9	1067.	213.	89.	118.	1200.	254.	50.	1.4.						
00	1338.	21.9	1130.	290.	118.	1200.	265.	39.	21.	77.						
00	1372.	16.9	1075.	695.	-1522.	1290.	262.	N	21.	N						
00	1385.	11.9	787.	615.	-804.	950.	216.	q	11.	27.						
00	1391.	6.9	445.	519.	-60.	553.	158.		24.	43.						
00	1393.	1.9	11.	159.	27.	171.	176.		26.	48.						
00	1396.	-3.1	465.	193.	-264.	395.	179.		24.	61.						
00	1393.	-8.1	810.	20.	-264.	715.	257.		15.	71.						
00	1383.	-13.1	115.	188.	-1146.	1000.	341.	N	21.	88.						
00	1367.	-18.1	1467.	318.	-2076.	1255.	417.	K	38.	137.						
00	1335.	-23.1	1500.	132.	-128.	415.	410.		10.	233.						
00	1308.	-28.1	1510.	49.	-690.	1265.	392.		13.	258.						
00	1296.	-30.0	1415.	R	2.	1185.	366.		21.	267.						

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

21	1333.	31.5	-967.17	-193.31	-893.71	-991.11	154.71	-41.00	-84.00
21	1338.	25.05	-1029.75	-270.17	-315.00	-1100.00	165.17	-29.00	-58.50
21	1372.	20.05	-974.50	-675.33	1528.00	-1190.11	162.33	11.17	-1.67
21	1385.	15.05	-686.25	-615.50	813.00	-850.00	116.50	-1.00	1.50
21	1391.	10.05	-344.00	-499.67	72.00	-455.00	58.67	-14.00	15.67
21	1393.	5.05	7.92	-339.83	-255.31	-75.00	-5.58	-16.00	18.83
21	1396.	0.05	362.50	-174.00	-196.00	292.50	-78.50	-14.00	30.00
21	1393.	-4.95	707.08	7.93	285.00	612.78	-156.42	-5.00	38.17
21	1383.	-9.95	1046.67	166.67	1170.00	896.67	-240.33	11.67	53.33
21	1367.	-14.95	1356.25	296.50	2103.00	1151.25	-316.25	-28.00	100.50
21	1335.	-19.95	1395.83	111.33	1311.00	300.83	-299.17	0.0	194.67
21	1308.	-24.05	1405.42	27.17	723.00	1160.42	-291.08	-3.00	217.83
21	1296.	-26.85	1310.00	-120.00	34.00	1080.00	-265.00	-11.00	225.00

♦♦FLAPPED PUDDER DATA REDUCTION♦♦

TEST 9/C, Y=0 IN,DFL=-10DEG.,N7 PROP,208 FLAP 7/29/73

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FYC-LR	FZO-LB	MXO-INLR	MYO-INLR	MZO-INLR	MYJELAP-INLR	VEL-FPS
30.07	9.99	97.93	594.59	-11.67	24.25	83.31	524.96	34.00	-279.41	-1.91	21.29
25.08	3.15	105.68	665.68	11.14	29.61	56.88	625.51	48.10	-239.44	-1.33	21.32
20.13	-15.28	104.20	710.51	104.11	33.84	104.15	710.48	121.00	-107.05	-0.04	21.59
15.12	-9.13	74.73	507.77	56.00	24.69	74.85	508.41	110.00	-49.90	0.03	21.70
10.11	-1.72	39.43	263.83	7.65	16.39	39.20	262.83	89.00	-24.15	0.36	21.74
5.09	2.55	2.61	13.54	-8.39	4.45	2.52	13.26	61.00	-8.83	0.43	21.76
0.07	1.96	-34.51	-247.29	-6.26	8.51	-34.25	-246.58	31.00	-19.63	0.68	21.78
-4.95	-2.85	-70.79	-500.91	23.36	12.91	-70.48	-499.20	-1.00	-47.45	0.87	21.76
-9.97	-11.70	-106.33	-754.58	82.55	27.23	-106.22	-753.65	-29.00	-90.62	1.21	21.68
-14.99	-21.13	-138.59	-981.86	-55.66	41.92	-138.27	-915.98	-53.00	-357.94	2.28	21.55
-19.96	-13.10	-140.69	-405.71	145.57	113.08	-134.55	-508.76	-19.00	158.68	4.42	21.30
-24.95	-7.23	-140.81	-902.20	48.37	23.83	-127.62	-818.64	-4.00	-382.27	4.95	21.08
-26.84	-0.34	-129.80	-828.06	37.12	20.73	-112.58	-735.68	21.00	-381.88	5.11	20.99

Appendix 5
(cont.)

REFLECTED WAVE DATA IN MIN-DIMENSIONAL FORM

TEST 9/C, Y= IN, CCL=1000, NC PRCP, 208 FLAP 7/29/77

ALPHA	CL	CN	CM	CPL	CY	L/C	CMF	CLSQ	RN1100-6
30.07	0.860	0.4933	-0.1406	0.900	0.210	1.743	0.007	0.3824	1.177
25.08	0.965	0.4535	-0.1657	0.920	0.219	2.129	0.007	0.5133	1.179
20.13	1.097	0.3198	-0.2519	0.966	0.244	3.118	0.006	0.5642	1.194
15.12	1.001	0.1670	-0.2079	0.863	0.176	5.994	0.003	0.2860	1.200
10.11	0.760	0.0903	-0.1475	0.851	0.114	8.360	0.002	0.0778	1.203
5.09	0.501	0.0508	-0.0779	0.668	0.067	9.854	0.001	0.0003	1.205
0.07	0.244	0.0271	-0.0058	0.911	0.060	8.985	0.001	0.0553	1.205
-4.95	-0.018	0.1187	0.1691	0.959	0.52	-1.957	0.001	0.2537	1.203
-9.97	-0.279	0.0286	0.1372	0.901	0.159	-9.755	0.000	0.5776	1.199
-14.99	-0.535	0.0533	0.2001	0.841	0.303	-10.077	0.000	1.0017	1.192
-19.96	-0.751	0.1130	0.1631	0.480	0.838	-6.645	-0.000	0.9946	1.178
-24.95	-0.716	0.3131	0.1468	0.815	0.180	-2.288	-0.002	0.9321	1.166
-26.84	-1.618	0.1878	0.1138	0.83	0.158	-1.565	-0.002	0.7389	1.161

ARCWAVE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CN	CM	CPL	CY	L/C	CMF	CLSQ	RN1100-6
30.90	0.860	0.5056	0.1406	0.800	0.210	1.700	-0.007	0.3824	1.177
26.01	0.965	0.4691	0.1657	0.820	0.219	2.059	-0.007	0.5133	1.179
21.09	1.097	0.3365	0.2518	0.866	0.244	2.964	-0.006	0.5642	1.194
16.09	1.001	0.1837	0.2079	0.813	0.176	5.447	-0.003	0.2860	1.200
10.84	0.760	0.1006	0.1475	0.851	0.114	7.556	-0.002	0.0778	1.203
5.57	0.501	0.0550	0.0779	0.668	0.067	9.102	-0.001	0.0003	1.203
0.30	0.244	0.0281	0.0058	0.911	0.060	8.668	-0.001	0.0553	1.205
-4.97	-0.018	0.1187	0.1691	0.959	0.192	-1.956	-0.001	0.2507	1.203
-9.97	-0.279	0.0299	0.1372	0.901	0.159	-9.330	-0.000	0.5776	1.199
-15.50	-0.535	0.0591	0.2001	0.841	0.313	-9.271	-0.000	1.0017	1.192
-20.69	-0.751	0.1225	0.1631	0.480	0.838	-6.133	0.000	0.9946	1.178
-25.64	-0.716	0.3217	0.1468	0.815	0.180	-2.227	0.000	0.9321	1.166
-27.43	-1.618	0.3942	0.1138	0.83	0.158	-1.565	0.000	0.7389	1.161

FLAPPED RUDDER INPUT DATA

TEST 7/C, Y=0 IN, DEL=-15 DEG, NC PROP, 20R FLAP 7/29/73

CF	TR	TT	AREA	SPAN	C-MAC	X-MAC	ZAC	Y
15.0	R4	45	44.30	7.875	5.7421	0.763	-3.15	0.0

ZERO READINGS BEFORE AND AFTER

ANCM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	20.	20.	0.	0.	100.	100.	100.	100.	10.	10.	20.	20.
0.	100.	100.	26.	11.	-42.	-42.	100.	100.	98.	102.	9.	11.	43.	-2.

CELL LRS/COUNT 1=0.10070 2=0.01000 3=C.01000 4=0.10000 5=0.48970 6=0.20000 7=0.02273
TWIST= 1500.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1363.	26.9	R	940.	R	326.	S	1020.	R	940.	N	243.	R	47.	R	37.
00	1385.	21.9	R	1000.		408.		340.		1080.		256.		34.	N	20.
00	1411.	16.9		905.		792.		-1216.		1100.		237.	N	21.	N	27.
00	1421.	11.9		600.		723.		-558.		750.		186.	R	13.	N	28.
00	1422.	6.9		265.		600.		70.		385.		125.		27.	N	48.
00	1423.	1.9	N	300.		448.		362.	N	205.	R	143.		30.		60.
00	1422.	-3.1		665.		278.		264.		570.		219.		28.		75.
00	1414.	-8.1		555.		93.		-254.		875.		295.		18.		89.
00	1407.	-13.1		1345.	N	104.		-1172.		1175.	N	383.		18.		121.
00	1390.	-18.1		1650.		241.		-2110.		1420.		460.	R	33.		170.
00	1356.	-23.1		1670.		72.		-1070.		1410.		440.		12.		250.
00	1324.	-28.1		1605.	R	105.		-440.		1332.		415.		27.		284.
00	1307.	-30.0		1570.		201.		48.		1285.		395.		28.		291.

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

21	1363.	30.05	-840.00	-306.00	-1020.00	-840.00	143.00	-37.00	-17.00
21	1385.	25.05	-900.00	-388.58	-343.50	-980.00	156.17	-23.92	-1.83
21	1411.	20.05	-805.00	-771.17	1209.00	-1000.00	137.33	11.17	3.17
21	1421.	15.05	-500.00	-704.75	547.50	-650.00	86.50	-2.75	-13.50
21	1422.	10.05	-165.00	-582.33	-84.00	-285.00	25.67	-16.67	20.33
21	1423.	5.05	200.00	-430.92	-379.50	105.00	-42.17	-19.58	30.42
21	1422.	0.05	565.00	-261.50	-285.00	470.00	-118.00	-17.50	43.50
21	1414.	-4.95	895.00	-77.08	229.50	775.00	-193.83	-7.42	55.58
21	1407.	-9.95	1245.00	80.00	1144.00	1075.00	-281.67	8.67	85.67
21	1390.	-14.95	1550.00	216.50	2078.50	1320.00	-358.50	23.75	132.75
21	1356.	-19.95	1570.00	47.00	1035.00	1310.00	-338.33	-1.17	210.83
21	1324.	-24.95	1505.00	-91.42	401.50	1232.00	-313.17	-16.08	242.92
21	1307.	-26.85	1470.00	-188.00	-90.00	1185.00	-293.00	-17.00	248.00

Appendix 5
(cont.)

••FLAPPED RUDDER DATA REDUCTION••

TEST 7/C, Y=0 IN,DEL=-15DEG.,NO PRNP,208 FLAP 7/29/73

ALPHA	FX-LH	FZ-LR	MX-INLR	MZ-INLR	FXO-LB	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
30.09	10.20	87.06	522.35	-28.95	48.49	17.91	73.03	452.74	55.00	-262.15	-0.39	21.69
25.10	3.43	93.89	614.06	10.09	38.21	22.84	85.83	573.51	69.00	-219.67	-0.04	21.70
20.14	-12.09	88.23	596.99	95.54	14.08	26.98	87.94	598.98	139.00	-82.14	0.07	21.91
15.13	-5.48	57.05	381.26	44.01	6.41	19.64	56.95	382.14	126.00	-35.56	-0.31	21.98
10.12	0.84	22.32	143.48	2.95	7.52	15.71	22.06	142.80	104.00	-14.31	0.46	21.99
5.10	3.79	-15.69	-114.69	-13.26	3.27	10.50	-15.81	-115.06	77.00	-9.45	0.69	22.00
0.08	2.85	-53.88	-380.60	-8.41	5.76	10.73	-53.65	-379.59	47.00	-28.98	0.99	21.99
-4.94	-2.30	-88.73	-625.97	24.86	10.23	15.17	-88.17	-623.22	13.00	-63.59	1.26	21.93
-9.96	-11.44	-125.30	-895.77	81.98	17.26	25.18	-124.63	-991.04	-14.00	-123.18	1.95	21.88
-14.98	-20.78	-157.17	-1121.81	135.15	29.07	35.33	-155.85	-1108.29	-38.00	-220.05	3.02	21.74
-19.96	-10.35	-157.47	-1054.44	68.51	52.26	31.52	-148.91	-996.77	-8.00	-350.68	4.79	21.48
-24.94	-4.02	-149.59	-569.70	31.79	66.91	30.06	-133.84	-870.37	16.00	-428.70	5.52	21.22
-26.83	0.90	-145.12	-502.44	33.77	73.34	25.11	-125.23	-798.43	33.00	-421.97	5.64	21.08

Appendix 5
(cont.)

••FLAPPED RUDDER DATA IN NCA-DIMENSIONAL FORM••

TEST 7/C, Y=0 IN, DEL=-150 DEG., N) PROP, 2C8 FLAP 7/29/73

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN#1000-6
30.09	0.947	0.5547	-0.1511	0.787	0.128	1.708	0.007	0.2724	1.178
25.10	0.999	0.4996	-0.1749	0.848	0.163	2.000	0.007	0.3753	1.179
20.14	1.086	0.3810	-0.2517	0.865	0.199	2.949	0.006	0.3795	1.190
15.13	1.108	0.2067	-0.2054	0.852	0.137	5.361	0.004	0.1570	1.194
10.12	0.876	0.1212	-0.1465	0.822	0.109	7.222	0.002	0.0235	1.194
5.10	0.616	0.0715	-0.0787	0.924	0.073	8.619	0.002	0.0121	1.195
0.08	0.373	0.0400	-0.0071	0.898	0.075	9.315	0.001	0.1391	1.194
-4.94	0.110	0.0227	0.7666	0.898	0.107	4.830	0.001	0.3799	1.191
-9.96	-0.153	0.0244	0.1341	0.908	0.177	6.275	0.001	0.7667	1.188
-14.98	-0.396	0.0446	0.1956	0.903	0.251	8.890	-0.000	1.2284	1.181
-19.96	-0.616	0.0986	0.1627	0.850	0.230	6.245	0.000	1.1783	1.166
-24.94	-0.613	0.2727	0.1276	0.826	0.224	-2.247	-0.000	0.9986	1.152
-26.83	-0.522	0.3466	0.1024	0.810	0.190	-1.506	-0.000	0.8971	1.145

ARDF DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN#1000-6
31.00	0.947	0.5657	0.1511	0.747	0.128	1.662	-0.007	0.2724	1.178
26.06	0.999	0.5163	0.1748	0.848	0.163	1.935	-0.007	0.3753	1.179
21.19	1.086	0.4007	0.2517	0.865	0.189	2.709	-0.006	0.3795	1.190
16.20	1.108	0.2273	0.2054	0.852	0.137	4.876	-0.004	0.1570	1.194
10.96	0.876	0.1341	0.1465	0.822	0.109	6.531	-0.002	0.0235	1.194
5.64	0.616	0.0779	0.0787	0.924	0.073	7.915	-0.002	0.0121	1.195
0.44	0.373	0.0424	0.0071	0.898	0.075	8.803	-0.001	0.1391	1.194
-4.84	0.110	0.0229	-0.0666	0.898	0.107	4.788	-0.001	0.3799	1.191
-10.11	-0.153	0.0248	-0.1341	0.908	0.177	-6.175	-0.001	0.7667	1.188
-15.36	-0.396	0.0472	-0.1956	0.903	0.251	-8.395	-0.000	1.2284	1.181
-20.55	-0.616	0.1050	-0.1627	0.850	0.230	-5.867	-0.000	1.1783	1.166
-25.53	-0.613	0.2790	-0.1276	0.826	0.224	-2.196	-0.000	0.9986	1.152
-27.33	-0.522	0.3511	-0.1024	0.810	0.190	-1.487	-0.000	0.8971	1.145

Appendix 5
(cont.)

TEST E/C, Y= 14,0111-2.0100,N= 0010,2 FLAP 7/29/73

Y	X-MAC	C-MAC	SPAY	Y
0.0	7.163	5.1421	7.075	0.0
1.0				1.0
2.0				2.0
3.0				3.0
4.0				4.0
5.0				5.0
6.0				6.0
7.0				7.0
8.0				8.0
9.0				9.0
10.0				10.0

AN	1-N	1-H	2-N	2-H	1-N	1-H	4-N	4-H	5-N	5-H	6-N	6-H	7-N	7-H
0.	100.	100.	100.	100.	0.	0.	100.	100.	100.	100.	10.	10.	20.	20.
0.	105.	105.	105.	105.	14.	14.	110.	110.	98.	111.	9.	12.	31.	23.

CELL LOS/COUNT 100.1 200.11 300.11 400.11 500.11 600.11 700.11 800.11 900.11 1000.11 1100.11 1200.11 1300.11 1400.11 1500.11 1600.11 1700.11 1800.11 1900.11 2000.11 2100.11 2200.11 2300.11 2400.11 2500.11 2600.11 2700.11 2800.11 2900.11 3000.11 3100.11 3200.11 3300.11 3400.11 3500.11 3600.11 3700.11 3800.11 3900.11 4000.11 4100.11 4200.11 4300.11 4400.11 4500.11 4600.11 4700.11 4800.11 4900.11 5000.11 5100.11 5200.11 5300.11 5400.11 5500.11 5600.11 5700.11 5800.11 5900.11 6000.11 6100.11 6200.11 6300.11 6400.11 6500.11 6600.11 6700.11 6800.11 6900.11 7000.11 7100.11 7200.11 7300.11 7400.11 7500.11 7600.11 7700.11 7800.11 7900.11 8000.11 8100.11 8200.11 8300.11 8400.11 8500.11 8600.11 8700.11 8800.11 8900.11 9000.11 9100.11 9200.11 9300.11 9400.11 9500.11 9600.11 9700.11 9800.11 9900.11 10000.11 10100.11 10200.11 10300.11 10400.11 10500.11 10600.11 10700.11 10800.11 10900.11 11000.11 11100.11 11200.11 11300.11 11400.11 11500.11 11600.11 11700.11 11800.11 11900.11 12000.11 12100.11 12200.11 12300.11 12400.11 12500.11 12600.11 12700.11 12800.11 12900.11 13000.11 13100.11 13200.11 13300.11 13400.11 13500.11 13600.11 13700.11 13800.11 13900.11 14000.11 14100.11 14200.11 14300.11 14400.11 14500.11 14600.11 14700.11 14800.11 14900.11 15000.11 15100.11 15200.11 15300.11 15400.11 15500.11 15600.11 15700.11 15800.11 15900.11 16000.11 16100.11 16200.11 16300.11 16400.11 16500.11 16600.11 16700.11 16800.11 16900.11 17000.11 17100.11 17200.11 17300.11 17400.11 17500.11 17600.11 17700.11 17800.11 17900.11 18000.11 18100.11 18200.11 18300.11 18400.11 18500.11 18600.11 18700.11 18800.11 18900.11 19000.11 19100.11 19200.11 19300.11 19400.11 19500.11 19600.11 19700.11 19800.11 19900.11 20000.11 20100.11 20200.11 20300.11 20400.11 20500.11 20600.11 20700.11 20800.11 20900.11 21000.11 21100.11 21200.11 21300.11 21400.11 21500.11 21600.11 21700.11 21800.11 21900.11 22000.11 22100.11 22200.11 22300.11 22400.11 22500.11 22600.11 22700.11 22800.11 22900.11 23000.11 23100.11 23200.11 23300.11 23400.11 23500.11 23600.11 23700.11 23800.11 23900.11 24000.11 24100.11 24200.11 24300.11 24400.11 24500.11 24600.11 24700.11 24800.11 24900.11 25000.11 25100.11 25200.11 25300.11 25400.11 25500.11 25600.11 25700.11 25800.11 25900.11 26000.11 26100.11 26200.11 26300.11 26400.11 26500.11 26600.11 26700.11 26800.11 26900.11 27000.11 27100.11 27200.11 27300.11 27400.11 27500.11 27600.11 27700.11 27800.11 27900.11 28000.11 28100.11 28200.11 28300.11 28400.11 28500.11 28600.11 28700.11 28800.11 28900.11 29000.11 29100.11 29200.11 29300.11 29400.11 29500.11 29600.11 29700.11 29800.11 29900.11 30000.11 30100.11 30200.11 30300.11 30400.11 30500.11 30600.11 30700.11 30800.11 30900.11 31000.11 31100.11 31200.11 31300.11 31400.11 31500.11 31600.11 31700.11 31800.11 31900.11 32000.11 32100.11 32200.11 32300.11 32400.11 32500.11 32600.11 32700.11 32800.11 32900.11 33000.11 33100.11 33200.11 33300.11 33400.11 33500.11 33600.11 33700.11 33800.11 33900.11 34000.11 34100.11 34200.11 34300.11 34400.11 34500.11 34600.11 34700.11 34800.11 34900.11 35000.11 35100.11 35200.11 35300.11 35400.11 35500.11 35600.11 35700.11 35800.11 35900.11 36000.11 36100.11 36200.11 36300.11 36400.11 36500.11 36600.11 36700.11 36800.11 36900.11 37000.11 37100.11 37200.11 37300.11 37400.11 37500.11 37600.11 37700.11 37800.11 37900.11 38000.11 38100.11 38200.11 38300.11 38400.11 38500.11 38600.11 38700.11 38800.11 38900.11 39000.11 39100.11 39200.11 39300.11 39400.11 39500.11 39600.11 39700.11 39800.11 39900.11 40000.11 40100.11 40200.11 40300.11 40400.11 40500.11 40600.11 40700.11 40800.11 40900.11 41000.11 41100.11 41200.11 41300.11 41400.11 41500.11 41600.11 41700.11 41800.11 41900.11 42000.11 42100.11 42200.11 42300.11 42400.11 42500.11 42600.11 42700.11 42800.11 42900.11 43000.11 43100.11 43200.11 43300.11 43400.11 43500.11 43600.11 43700.11 43800.11 43900.11 44000.11 44100.11 44200.11 44300.11 44400.11 44500.11 44600.11 44700.11 44800.11 44900.11 45000.11 45100.11 45200.11 45300.11 45400.11 45500.11 45600.11 45700.11 45800.11 45900.11 46000.11 46100.11 46200.11 46300.11 46400.11 46500.11 46600.11 4670

TE	ANGLE	S	1	S	2	3	S	4	S	5	S	6	S	7
21	1317.	q	805.		184.	1160.		850.		216.		57.		24.
22	1319.		865.		470.	500.		950.		227.		41.		42.
23	1340.		805.		805.	-1146.		975.	N	211.		15.		51.
24	1354.		845.		734.	-376.		643.	q	164.		19.		112.
25	1356.		155.		625.	230.		260.		107.		30.		132.
26	1355.	N	195.		487.	526.	N	115.		158.		32.		152.
27	1348.		735.		324.	400.		635.		230.		32.		171.
28	1342.		1045.		153.	-110.		925.		303.		23.		184.
29	1331.	N	1385.		42.	-116.		1215.	N	347.		14.		208.
30	1315.		169.		169.	-1872.		1435.		457.		28.		248.
31	1284.		20.		20.	-1000.		1425.	R	427.		14.		332.
32	1245.	q	151.		151.	-176.		1345.		404.		29.		357.
33	1245.		1670.		238.	126.		1295.		401.		31.		364.

21	1317.	30.05	-715.7	-369.1	-1163.12	-753.77	116.77	-47.01	4.010
21	1310.	25.05	-764.58	-450.17	-494.33	-850.00	127.17	-30.83	21.17
21	1349.	20.05	-679.17	-785.33	1147.33	-874.00	111.33	5.17	69.33
21	1354.	15.5	-303.75	-714.50	372.00	-540.00	64.50	-8.50	69.50
21	1356.	10.05	-53.33	-605.67	-231.33	-160.00	7.67	-19.33	108.67
21	1355.	5.05	202.02	-467.83	-522.67	215.00	-57.58	-21.17	127.83
21	1348.	0.05	612.90	-107.00	-396.00	545.00	-129.50	-21.00	146.00
21	1342.	-4.95	942.08	-134.17	114.67	825.00	-202.42	-11.83	158.17
21	1331.	-9.95	1201.67	19.13	1.21.33	1105.00	-286.33	4.67	181.33
21	1315.	-14.95	1561.25	146.00	1878.00	1335.00	-356.25	13.75	220.50
21	1284.	-19.05	1575.83	4.67	1.6.67	1325.00	-326.17	-2.33	333.67
21	1255.	-24.95	1565.42	-132.83	183.33	1245.00	-303.08	-17.17	327.83
21	1245.	-26.05	1465.00	-226.00	-118.00	1195.00	-300.00	-15.00	334.00

FLAPPED WING DATA REDUCTIONS

TEST R/C, Y=0 IN, DEL=-20 DEG, N) PROP, 208 FLAP 7/29/73

ALPHA	FX-LP	FZ-LP	MX-INLR	MZ-INLR	FYC-LP	FYD-LM	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
30.09	11.60	74.18	448.50	-41.63	43.91	24.30	60.91	381.14	66.00	-240.04	0.09	21.16
25.10	4.99	80.96	510.24	-1.91	34.83	25.59	73.26	472.70	81.00	-192.38	3.48	21.17
20.14	-11.47	75.77	472.91	78.82	11.05	28.57	75.83	504.11	141.00	-70.78	1.58	21.41
15.14	-3.78	45.52	303.74	31.63	5.69	20.73	45.32	303.73	128.00	-31.68	2.03	21.45
10.12	2.33	11.39	65.93	-11.98	3.68	12.72	11.73	64.02	109.00	-19.81	2.47	21.47
5.11	5.23	-24.61	-184.97	-23.97	4.41	7.54	-24.77	-185.67	84.00	-17.82	2.91	21.46
0.09	3.96	-60.18	-474.40	-18.13	7.21	10.75	-59.88	-422.79	55.00	-41.05	3.32	21.40
-4.93	-1.15	-92.87	-662.21	12.45	11.95	15.63	-92.10	-657.35	24.00	-80.98	3.60	21.36
-9.95	-10.21	-128.36	-913.35	71.65	19.15	25.46	-127.33	-905.82	-3.00	-137.22	4.12	21.27
-14.97	-18.78	-157.59	-1122.24	118.49	31.11	33.92	-155.62	-1103.52	-26.00	-236.03	5.01	21.14
-19.95	-10.07	-157.63	-1026.66	39.77	52.58	24.48	-148.94	-959.95	0.0	-366.21	6.90	20.89
-24.93	-1.83	-155.21	-921.06	16.57	71.49	24.21	-137.78	-820.30	23.00	-419.21	7.45	20.65
-26.82	1.18	-144.30	-933.16	16.78	73.17	28.10	-124.38	-826.53	39.00	-434.72	7.59	20.57

Appendix 5
(cont.)

REFLECTED RUMPLE DATA IN NON-DIMENSIONAL FORM

TEST R/C, Y IN, DEFLECTION, PREP, 2, 18 FLAP 7/29/73

ALPHA	CL	CD	CM	CPL	CY	L/C	CMF	CLSQ	RN10 ⁻⁶
16.19	0.989	0.5816	-0.1614	0.793	0.183	1.7111	0.711	0.2094	1.170
25.10	1.086	0.5617	-0.1865	0.819	0.192	1.927	0.810	0.3020	1.171
20.14	1.148	0.4052	-0.2560	0.844	0.210	2.832	0.739	0.3094	1.194
15.14	1.171	0.2341	-0.2071	0.851	0.151	5.003	0.007	0.1097	1.187
10.12	0.947	0.1423	-0.1496	0.737	0.093	6.651	0.005	0.0065	1.187
5.11	0.679	0.1801	-0.1829	0.952	0.155	7.707	0.005	0.0327	1.187
0.09	0.440	0.0529	-0.0116	0.957	0.079	8.306	0.004	0.1932	1.184
-4.93	0.181	0.0322	0.0612	0.916	0.115	5.621	0.134	0.4612	1.191
-9.95	-0.080	0.0269	0.1307	0.903	0.189	-2.553	0.003	0.8962	1.176
-14.97	-0.331	0.0416	0.1916	0.900	0.255	-7.564	0.003	1.3713	1.169
-19.95	-0.556	0.1810	0.1613	0.818	0.189	-6.864	0.002	1.3175	1.155
-24.93	-0.550	0.2613	0.1310	0.756	0.191	-2.103	0.001	1.1802	1.142
-26.82	-0.458	0.3299	0.1094	0.944	0.223	-1.387	0.000	0.9772	1.138

ARRE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/C	CMF	CLSQ	RN10 ⁻⁶
31.14	1.989	0.5570	0.1634	0.755	0.183	1.653	-0.011	0.2094	1.170
26.15	1.086	0.5914	0.1865	0.819	0.192	1.862	-0.010	0.3020	1.171
21.25	1.148	0.4273	0.2540	0.844	0.210	2.686	-0.009	0.3094	1.184
16.26	1.171	0.2570	0.2071	0.851	0.151	4.556	-0.007	0.1097	1.187
11.03	0.947	0.1573	0.1496	0.737	0.093	6.017	-0.005	0.0065	1.187
5.76	0.679	0.1958	0.1829	0.952	0.055	7.086	-0.005	0.0327	1.187
0.51	0.440	0.0562	0.0116	0.957	0.079	7.828	-0.004	0.1932	1.184
-4.76	0.181	0.0327	0.1612	0.916	0.115	5.526	-0.014	0.4612	1.181
-10.03	-0.080	0.0270	0.1307	0.903	0.189	-2.581	-0.003	0.8962	1.176
-15.29	-0.331	0.0414	0.1916	0.900	0.255	-7.631	-0.003	1.3713	1.169
-20.48	-0.556	0.1862	0.1614	0.818	0.189	-6.451	-0.002	1.3175	1.155
-25.46	-0.550	0.2664	0.1310	0.756	0.191	-2.063	-0.001	1.1802	1.142
-27.26	-0.458	0.3334	0.1094	0.944	0.223	-1.371	-0.000	0.9772	1.138

FLAPPED RUNNER INPUT DATA

TEST 3/C,Y=0 "FL=30 DEG X=0.202 FLAP AC PROP, 7/33/73

OF	TR	TY	AREA	SPAN	C-MAC	X-MAC	ZAC	Y
30.0	97	85	44.31	7.875	5.7421	0.763	96.90	0.0

ZERO READINGS BEFORE AND AFTER

ANOM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	20.	20.	0.	0.	100.	100.	100.	100.	10.	10.	20.	20.
0.	97.	104.	8.	14.	15.	15.	93.	105.	98.	101.	8.	11.	11.	28.

CELL LMS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=0.10000 5=0.48970 6=0.20000 7=0.02273
TWIST= 1500.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1311.	129.2	1850.	N	318.	1580.	K	1780.	N	413.	S	81.	S	R	579.	
00	1348.	120.2	1985.	R	98.	1150.	1945.	435.	73.	455.	60.	517.	561.			
00	1377.	115.2	2045.	R	65.	400.	2175.	431.	506.	431.	54.	502.	498.			
00	1412.	110.2	1925.	N	70.	198.	2050.	373.	73.	346.	74.	487.	467.			
00	1437.	105.2	1575.	N	115.	100.	1637.	305.	259.	74.	417.	386.	310.			
00	1445.	103.2	1430.	N	174.	1345.	1445.	257.	248.	36.	201.					
00	1458.	100.2	1210.	N	270.	1600.	1215.	570.	600.							
00	1467.	97.2	973.	N	366.	1665.	950.									
00	1471.	95.2	805.	N	419.	1594.	775.									
00	1476.	90.2	403.	N	576.	1173.	373.									
00	1476.	85.2	225.	N	723.	304.	220.									
00	1468.	80.2	660.	N	807.	-1000.	570.									
00	1446.	77.0	735.	N	615.	50.	600.									

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

21	1311.	28.30	-1750.00	298.00	-1980.00	-1680.00	313.00	-71.00	-559.00
21	1348.	23.30	-1884.67	79.00	-1141.75	-1844.58	335.17	-62.92	-540.33
21	1377.	18.30	-1954.33	-42.67	-347.50	-2074.17	355.33	-49.83	-495.67
21	1412.	13.30	-1824.00	-46.50	-194.25	-1948.75	331.50	-43.75	-484.00
21	1437.	8.30	-1473.67	99.00	-95.00	-1535.33	273.67	-59.67	-479.33
21	1445.	6.30	-1328.33	159.00	-1338.75	-1362.92	246.83	-62.58	-474.67
21	1458.	3.30	-1108.00	256.00	-1592.50	-1112.50	206.00	-65.50	-470.00
21	1467.	0.30	-867.67	353.00	-1656.25	-847.08	160.17	-63.42	-462.33
21	1471.	-1.70	-702.33	407.00	-1584.00	-671.67	126.33	-59.33	-441.67
21	1476.	-6.70	-297.70	545.00	-1161.75	-266.25	44.50	-44.25	-391.00
21	1476.	-11.70	127.50	713.00	-291.50	125.83	50.67	-21.17	-359.33
21	1468.	-16.70	562.75	798.00	1013.75	476.42	-156.08	5.83	-282.67
21	1446.	-19.90	638.00	607.00	-35.00	507.00	-147.00	28.00	-173.00

Appendix 5
(cont.)

UNSLAPPED SUPPER DATA REDUCTION**

TEST 3/C.Y=3 , CFL=10 DEG , X=0.204 FLAP AC PROP, 7/30/73

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXJ-INR	FYJ-LR	FZJ-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYJFLAP-INLR	VEL-FPS
28.26	10.40	172.02	1134.78	-96.79	91.16	25.65	147.22	985.57	-53.00	-570.74	-12.71	21.10
23.29	11.49	187.68	1226.38	-88.92	75.55	29.54	172.17	1120.24	-14.00	-506.91	-12.28	21.40
18.30	3.98	195.86	1386.75	-34.06	55.19	35.94	187.97	1329.31	7.00	-396.45	-11.27	21.62
13.31	1.94	182.97	1311.37	-25.98	34.29	37.76	179.63	1276.20	8.00	-256.02	-11.00	21.90
8.74	0.95	146.39	1051.49	-130.47	14.21	27.86	145.69	1035.33	-17.00	-225.23	-10.90	22.09
6.28	13.39	131.24	938.81	-95.99	23.69	24.32	130.29	931.99	-28.00	-148.25	-10.79	22.15
3.27	15.93	178.24	774.49	-111.60	16.30	19.83	108.18	774.09	-46.00	-114.30	-10.68	22.25
0.26	16.56	83.24	595.67	-115.83	12.48	15.29	83.95	600.62	-63.00	-86.59	-10.51	22.32
-1.75	15.84	66.16	465.57	-118.74	19.25	13.49	67.26	477.02	-73.00	-69.05	-10.04	22.35
-4.77	11.62	24.05	179.87	-78.94	7.35	10.00	25.68	150.68	-101.00	-47.17	-8.89	22.39
-11.79	2.91	-19.98	168.06	-189.22	7.93	-36.84	-18.48	213.32	-128.00	-140.31	-8.17	22.37
-16.80	-10.14	-64.25	-448.54	72.75	12.23	23.96	-63.89	-446.67	-143.00	-83.49	-6.43	22.33
-19.97	0.35	-65.67	-413.59	171.54	27.62	12.07	-64.18	-447.74	-109.00	-3.69	-3.93	22.16

Appendix 5
(cont.)

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM**

TEST 3/C,Y=0 ,DEL=30 DEG ,X=0.207 FLAP NO PROP, 7/30/73

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN*10**6
28.26	1.112	0.6884	-0.1029	0.850	0.194	1.615	-0.017	1.2360	1.146
23.29	1.264	0.5551	-0.1653	0.826	0.217	2.278	-0.016	1.5989	1.162
18.30	1.351	0.3968	-0.1959	0.898	0.287	3.406	-0.014	1.8264	1.174
13.31	1.259	0.2405	-0.1801	0.902	0.265	5.238	-0.013	1.5863	1.189
8.29	1.004	0.0979	-0.1136	0.902	0.192	10.251	-0.013	1.0075	1.200
6.28	0.893	0.1418	-0.0861	0.908	0.167	6.296	-0.013	0.7469	1.203
3.27	0.735	0.1107	-0.0433	0.909	0.135	6.636	-0.013	0.5396	1.208
0.26	0.567	0.0842	-0.0006	0.909	0.103	6.728	-0.012	0.3210	1.212
-1.75	0.453	0.0690	0.0264	0.901	0.091	6.563	-0.012	0.2049	1.214
-6.77	0.172	0.0493	0.0965	0.943	0.067	3.491	-0.010	0.0297	1.216
-11.79	-0.124	0.0530	0.1675	-1.449	-0.247	-2.340	-0.010	0.0154	1.215
-16.80	-0.431	0.0825	0.2255	0.888	0.162	-5.225	-0.008	0.1857	1.213
-19.97	-0.439	0.1891	0.1935	0.886	0.083	-2.323	-0.005	0.1931	1.203

ABOVE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN*10**6
29.33	1.112	0.7091	-0.1029	0.850	0.194	1.568	+0.017	1.2360	1.146
24.51	1.264	0.5819	-0.1653	0.826	0.217	2.173	+0.016	1.5989	1.162
19.60	1.351	0.4274	-0.1959	0.898	0.287	3.162	+0.014	1.8264	1.174
14.52	1.259	0.2670	-0.1801	0.902	0.265	4.717	+0.013	1.5863	1.189
9.25	1.004	0.1148	-0.1136	0.902	0.192	8.744	+0.013	1.0075	1.200
7.14	0.893	0.1551	-0.0861	0.909	0.167	5.755	+0.013	0.7969	1.203
3.98	0.735	0.1107	-0.0433	0.909	0.135	6.135	+0.013	0.5396	1.208
0.80	0.567	0.0896	-0.0006	0.909	0.103	6.325	+0.012	0.3210	1.212
-1.31	0.453	0.0724	-0.0264	0.901	0.091	6.252	+0.012	0.2049	1.214
-6.60	0.172	0.0498	-0.0965	0.943	0.067	3.456	+0.010	0.0297	1.216
-11.90	-0.124	0.0533	-0.1675	-1.449	-0.247	-2.328	+0.010	0.0154	1.215
-17.21	-0.431	0.0856	0.2255	0.888	0.162	-5.035	+0.008	0.1857	1.213
-20.40	-0.439	0.1974	0.1935	0.886	0.083	-2.284	+0.005	0.1931	1.203

Appendix 5
(cont.)

FLAPPED RUDDER INPUT DATA

TEST 2/C,Y=0 DEL=35 DEG 4/1 PROP, 208 FLAP 7/30/73

DE	TR	TT	APFA	SPAN	C-MAC	X-MAC	ZAC	Y
35.0	36	93	44.30	7.975	5.7421	0.763	96.90	0.0

ZERO READINGS BEFORE AND AFTER

ANOM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	20.	20.	0.	0.	100.	100.	100.	100.	10.	10.	20.	20.
0.	100.	100.	17.	21.	6.	6.	95.	100.	97.	101.	8.	9.	14.	23.

CELL 195/COUNT 1=0.10000 2=0.01000 3=0.01000 4=C.10000 5=0.48970 6=0.20000 7=0.02273
TWIST= 1500.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1278.	125.2	P	1911.	N	328.	2110.	1420.	2000.	2097.	422.	444.	461.	460.	84.	559.
00	1303.	120.2		2000.		33.	831.	2065.	1660.	1495.	357.	315.	271.	79.	469.	549.
00	1321.	115.2		2040.		20.	500.	1408.	1630.	1235.	985.	810.	415.	61.	430.	509.
00	1355.	110.2		1960.		156.	1456.	1898.	1255.	1025.	855.	460.	167.	38.	398.	514.
00	1371.	105.2		1630.		216.	1894.	724.	811.	494.	715.	282.	34.	150.		511.
00	1383.	103.2		1485.		306.	1958.	632.	N	167.	495.	235.				502.
00	1395.	100.2		1255.		392.	1894.	632.	N	167.	495.	235.				502.
00	1409.	97.2		1025.		449.	1894.	632.	N	167.	495.	235.				489.
00	1413.	95.2		855.		595.	1480.	632.	N	167.	495.	235.				430.
00	1422.	90.2		460.		724.	632.	N	167.	495.	235.	282.				398.
00	1426.	85.2		580.		811.	-666.	-247.								332.
00	1425.	80.2		870.		494.										150.
00	1396.	77.0														

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

21	1278.	28.30	-1800.00	308.00	-7110.00	-1690.00	322.00	-74.00	-539.00
21	1303.	23.30	-1400.00	125.25	-1419.50	-1900.00	344.25	-68.08	-528.75
21	1321.	18.30	-1947.00	13.50	-829.00	-1990.00	361.50	-56.17	-488.50
21	1355.	13.30	-1860.00	0.75	-498.50	-1965.00	340.75	-50.25	-493.25
21	1371.	8.30	-1570.00	137.00	-1406.00	-1560.00	284.00	-66.33	-490.00
21	1383.	6.30	-1385.00	197.25	-1653.50	-1395.00	258.25	-70.42	-487.75
21	1395.	3.30	-1155.00	287.50	-1895.00	-1135.00	216.50	-72.50	-480.50
21	1409.	0.30	-925.00	373.75	-1954.50	-885.00	172.75	-69.58	-467.25
21	1413.	-1.70	-755.00	431.00	-1890.00	-710.00	139.00	-65.67	-447.00
21	1422.	-6.70	-360.00	577.25	-1475.50	-315.00	59.25	-51.75	-375.50
21	1426.	-11.70	60.00	706.50	-627.00	64.17	-33.17	-28.83	-309.25
21	1425.	-16.70	480.00	793.75	671.50	399.58	-134.08	-2.92	-309.25
21	1396.	-19.90	777.00	477.00	246.00	620.00	-181.00	-25.00	-127.00

Appendix 5
(cont.)

◆◆FLAPPED RUDDER DATA REDUCTION◆◆

TEST 2/C-V=0 DEL=35 DEG AN PROP, 208 FLAP 7/30/73

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXO-LR	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYDELAP-INLR	VEL-FPS
28.26	21.10	176.92	1144.41	-112.80	94.42	22.92	151.10	987.47	-55.00	-589.32	-12.25	20.84
23.29	14.21	188.75	1281.87	-89.90	78.59	31.78	172.24	1171.99	-22.00	-527.00	-12.02	21.04
18.30	8.29	191.87	1363.46	-75.27	58.83	29.91	184.91	1296.03	-2.00	-430.12	-11.10	21.18
13.30	4.99	185.99	1323.90	-43.92	37.84	36.30	182.17	1295.20	0.0	-277.66	-11.21	21.45
8.28	14.06	151.63	1072.29	-100.31	27.74	26.77	149.73	1058.79	-24.00	-197.08	-11.14	21.58
6.28	16.53	136.53	967.19	-116.14	24.13	23.66	135.39	959.19	-35.00	-169.95	-11.09	21.67
3.27	18.95	112.63	798.58	-131.27	19.34	18.49	112.56	798.11	-51.00	-134.06	-10.92	21.77
0.26	19.54	88.76	629.90	-131.04	15.19	14.30	89.61	635.55	-67.00	-100.11	-10.62	21.88
-1.75	18.90	71.19	506.66	-124.15	12.88	12.53	72.52	515.27	-77.00	-81.32	-10.16	21.91
-6.77	14.76	30.23	224.02	-97.89	9.39	9.28	32.30	237.41	-103.00	-58.33	-9.27	21.98
-11.78	6.27	-13.06	-75.62	-34.22	9.40	12.03	-11.03	-64.37	-127.00	-52.40	-8.54	22.01
-16.79	-6.71	-55.94	-375.96	48.29	12.63	22.72	-54.91	-370.09	-142.00	-81.91	-7.03	22.00
-19.96	-7.46	-81.77	-526.79	-3.57	29.69	28.15	-76.23	-483.52	-85.00	-209.12	-2.89	21.78

Appendix 5
(cont.)

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

TEST 2/C,Y=0 DEL=35 DEG NO PROP, 20% FLAP 7/30/73

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN#1000-6
28.26	1.170	0.7311	-0.1079	0.830	0.177	1.600	-0.017	1.3687	1.110
23.29	1.308	0.5961	-0.1614	0.864	0.241	2.194	-0.016	1.7109	1.121
18.30	1.385	0.4407	-0.1904	0.890	0.224	3.143	-0.014	1.9185	1.129
13.30	1.330	0.2764	-0.1805	0.903	0.265	4.814	-0.014	1.7698	1.143
8.28	1.081	0.2002	-0.1153	0.858	0.193	5.397	-0.014	1.1679	1.150
6.28	0.969	0.1727	-0.0862	0.900	0.169	5.611	-0.014	0.9384	1.155
3.27	0.798	0.1372	-0.0432	0.900	0.131	5.819	-0.013	0.6375	1.160
0.26	0.629	0.1066	-0.0209	0.901	0.100	5.901	-0.013	0.3961	1.166
-1.75	0.508	0.0902	0.0277	0.902	0.088	5.632	-0.012	0.2579	1.167
-6.77	0.225	0.0654	0.0969	0.933	0.065	3.438	-0.011	0.0505	1.171
-11.78	-0.077	0.0652	0.1655	0.741	0.083	-1.173	-0.010	0.0059	1.173
-16.79	-0.381	0.0877	0.2233	0.856	0.158	-4.347	-0.009	0.1454	1.172
-19.96	-0.540	0.2104	0.1819	0.805	0.200	-2.568	-0.004	0.2920	1.160

ABOVE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN#1000-6
29.39	1.170	0.7540	-0.1079	0.830	0.177	1.552	-0.017	1.3687	1.110
24.54	1.308	0.6248	-0.1614	0.864	0.241	2.094	-0.016	1.7109	1.121
19.63	1.385	0.4728	-0.1904	0.890	0.224	2.930	-0.014	1.9185	1.129
14.58	1.330	0.3060	-0.1805	0.903	0.265	4.348	-0.014	1.7698	1.143
9.32	1.081	0.2198	-0.1153	0.898	0.193	4.917	-0.014	1.1679	1.150
7.21	0.969	0.1884	-0.0862	0.900	0.169	5.143	-0.014	0.9384	1.155
4.03	0.798	0.1479	-0.0432	0.900	0.131	5.399	-0.013	0.6375	1.160
0.86	0.629	0.1133	-0.0009	0.901	0.100	5.556	-0.013	0.3961	1.166
-1.26	0.508	0.0945	-0.0277	0.902	0.088	5.375	-0.012	0.2579	1.167
-6.55	0.225	0.0662	-0.0969	0.933	0.065	3.394	-0.011	0.0505	1.171
-11.86	-0.077	0.0653	-0.1655	0.741	0.083	-1.172	-0.010	0.0059	1.173
-17.16	-0.381	0.0901	-0.2233	0.856	0.158	-4.230	-0.009	0.1454	1.172
-20.48	-0.540	0.2153	-0.1819	0.805	0.200	-2.510	-0.004	0.2920	1.160

Appendix 5
(cont.)

FLAPPER RUNNER INPUT DATA

TEST 110, Y=0 IN, INEL = 0.05, X=0.5 C, 208 FLAP 7/29/73 RPM 2468

OF	TR	TT	AREA	SPAN	C-MAC	X-MAC	ZAC	Y
0.0	87	87	44.30	7.875	5.7421	0.763	-3.15	0.0

ZERO READINGS BEFORE AND AFTER

ANIM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-P	5-N	5-P	6-N	6-R	7-N	7-R
0.	100.	100.	20.	20.	0.	0.	100.	100.	100.	100.	10.	10.	20.	20.
0.	100.	100.	19.	21.	-2.	-2.	105.	105.	100.	101.	9.	11.	31.	10.

CELL LHS/CJUNT 1=0.10000 2=C.01000 3=0.01000 4=C.10000 5=0.48970 6=3.20000 7=0.02273
TWIST= 1500.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1244.	25.5	2	1695.	N	36.	674.	1800.	R	1800.	N	355.	R	64.	R	313.
00	1245.	21.9		1760.	0	226.	-230.	1900.		1900.		381.		46.		261.
00	1269.	16.5		1618.		481.	-1166.	1805.		1805.		361.		18.		173.
00	1246.	11.4		1345.		601.	-1306.	1550.		1550.		315.	N	16.		81.
00	1238.	6.9		1005.		494.	-672.	1157.		1157.		261.	R	12.		48.
00	1231.	1.9		625.		144.	-51.	722.		722.		154.		23.		33.
00	1254.	-3.1		235.	N	33.	46.	315.	R	315.		167.		19.	N	28.
00	1241.	-8.1		785.		191.	-550.	705.		705.		264.	R	13.		53.
00	1241.	-13.1		1270.		239.	-1608.	1095.		1095.		375.	N	32.		86.
00	1244.	-18.1		1575.		441.	-2634.	1405.		1405.		467.		51.		122.
00	1237.	-23.1		1890.		432.	-2886.	1660.		1660.		532.		51.		184.
00	1240.	-28.1		2070.		165.	-2150.	1775.		1775.		555.		36.		281.

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

21	1244.	29.05	-1595.00	16.00	-674.00	-1700.00	259.00	-54.00	-293.00
21	1245.	25.05	-1660.00	-205.92	229.83	-1799.58	291.00	-35.92	-241.83
21	1269.	21.15	-1518.00	-459.83	1165.67	-1774.17	261.00	-7.83	-154.67
21	1246.	15.05	-1245.00	-580.75	1305.50	-1448.75	219.00	6.25	-63.50
21	1238.	10.05	-905.00	-471.67	671.33	-1055.33	161.00	-1.67	-31.33
21	1243.	5.05	-525.00	-323.58	49.17	-619.92	94.00	-12.58	-17.17
21	1254.	0.05	-135.00	-152.50	-223.00	-192.50	18.00	-13.50	-8.00
21	1241.	-4.95	265.00	13.58	-47.17	212.08	-66.42	-8.42	1.58
21	1241.	-9.95	685.00	171.67	588.67	601.67	-163.33	-2.33	25.67
21	1244.	-14.95	1120.00	219.75	1606.50	991.25	-274.25	22.75	57.75
21	1237.	-19.95	1475.00	420.83	2632.33	1300.83	-366.17	41.83	92.83
21	1240.	-24.95	1790.00	412.92	2884.17	1555.42	-431.08	41.92	153.92
21	1237.	-28.95	1970.00	146.00	2148.00	1670.00	-454.00	27.00	250.00

Appendix 5
(cont.)

ELAPSED RUDDER DATA DEFINITION

TEST 11C, Y=0 INDEFINITE 0050.5 C.208 FLAP 1/20/73 RPM 246P

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXO-LR	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
29.05	6.74	159.34	1046.52	-1.03	75.64	50.85	140.39	940.95	-2.00	-458.05	-6.66	20.58
25.37	-2.3	168.16	1136.99	15.31	60.55	46.42	156.79	1054.98	37.00	-407.91	-5.50	20.59
20.10	-11.66	156.40	1068.98	67.35	34.71	40.49	153.03	1042.30	82.00	-246.28	-3.52	20.79
15.12	-13.06	130.31	912.64	91.32	14.1	33.26	130.21	911.86	104.00	-98.84	-1.44	20.60
10.11	-6.71	95.24	667.69	56.02	4.78	23.52	95.35	669.58	85.00	-24.60	-0.71	20.53
5.09	-0.40	55.74	391.49	10.67	1.36	15.36	55.72	391.62	58.00	-2.32	-0.39	20.57
1.07	2.23	15.13	99.13	1.07	1.41	9.99	15.12	98.93	27.00	6.43	-0.18	20.67
-4.95	0.47	-26.64	-199.87	13.16	4.22	9.89	-26.30	-199.73	-2.00	-15.13	0.04	20.56
-9.97	-5.89	-70.22	-517.82	33.60	10.18	17.17	-69.72	-511.96	-30.00	-84.64	0.58	20.56
-14.98	-16.07	-114.20	-875.44	124.71	20.21	27.51	-113.54	-870.86	-39.00	-153.44	1.31	20.58
-20.00	-26.32	-151.71	-1158.73	190.44	35.31	37.76	-145.87	-1140.54	-75.00	-279.44	2.11	20.53
-25.00	-28.84	-183.13	-1357.13	200.98	60.81	44.17	-175.13	-1291.98	-74.00	-462.01	3.50	20.55
-28.97	-21.48	-198.46	-1422.16	184.12	87.26	46.82	-179.53	-1302.75	-26.00	-599.86	5.68	20.53

Appendix 5
(cont.)

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

TEST 11C, Y=0 IN, DEL= 0.000, X=0.5 F, 2.03 FLAP 7/29/73 RPM 2468

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN#1000-6
29.05	1.433	0.6966	-0.1653	0.851	0.404	2.057	0.008	1.2420	1.138
25.07	1.395	0.4843	-0.2282	0.854	0.368	2.880	0.005	1.5466	1.139
20.10	1.196	0.2819	-0.2728	0.865	0.319	4.245	0.003	1.4182	1.150
15.12	0.901	0.1604	-0.2878	0.889	0.264	5.618	0.002	1.0648	1.139
10.11	0.555	0.0817	-0.2190	0.852	0.191	6.848	0.001	0.5785	1.136
5.09	0.209	0.0336	-0.1391	0.852	0.122	6.233	0.000	0.1960	1.138
0.07	-0.119	0.0111	-0.0528	0.831	0.079	10.654	-0.000	0.0142	1.143
-4.95	-0.443	0.0108	0.0309	0.964	0.079	4.077	-0.001	0.0438	1.137
-9.97	-0.761	0.0381	0.1158	0.932	0.137	19.962	-0.001	0.3078	1.137
-14.98	-1.032	0.1117	0.1744	0.974	0.218	-9.237	-0.002	0.8123	1.138
-20.00	-1.191	0.2670	0.2652	0.966	0.301	-4.460	-0.005	1.4315	1.135
-25.00	-1.244	0.4803	0.2964	0.937	0.351	-2.585	-0.008	1.9451	1.137
-28.97	-1.114	0.6006	0.2467	0.921	0.374	-1.855	-0.009	2.0542	1.135

ABOVE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	RN#1000-6
30.43	1.433	0.7310	0.1653	0.851	0.404	1.961	-0.008	1.2420	1.138
26.42	1.395	0.5169	0.2282	0.854	0.368	2.698	-0.005	1.5466	1.139
21.26	1.196	0.3058	0.2728	0.865	0.319	3.912	-0.003	1.4182	1.150
15.99	0.901	0.1740	0.2808	0.889	0.264	5.179	-0.002	1.0648	1.139
10.64	0.555	0.0862	0.2190	0.852	0.191	6.439	-0.001	0.5785	1.136
5.29	0.209	0.0343	0.1391	0.892	0.122	6.100	-0.000	0.1960	1.138
-0.05	-0.119	0.0114	0.0528	0.831	0.079	10.471	+0.000	0.0142	1.143
-5.38	-0.443	0.0141	-0.0309	0.964	0.079	31.485	+0.001	0.0438	1.137
-10.70	-0.761	0.0478	-0.1158	0.932	0.137	15.916	+0.001	0.3078	1.137
-15.97	-1.032	0.1295	-0.1744	0.974	0.218	-7.966	+0.002	0.8123	1.138
-21.15	-1.191	0.2908	-0.2652	0.966	0.301	-4.096	+0.005	1.4315	1.135
-26.20	-1.244	0.5062	-0.2964	0.937	0.351	-2.457	+0.008	1.9451	1.137
-30.04	-1.114	0.6214	-0.2467	0.921	0.374	-1.793	+0.009	2.0542	1.135

Appendix 5
(cont.)

FLAPPED RUNNER INPUT DATA

TEST 12C, Y= IN,DEF= DEF.G.X=J.75C.23E FLAP 7/29/73 RPM 246R

DE TR TT AREA SPAN C-MAC X-MAC ZAC Y
 7. 82 87 64.30 7.875 5.7421 0.763 -3.15 30.0

ZERO READINGS BEFORE AND AFTER

ANOM 1-N 1-P 2-N 2-R 3-N 3-R 4-N 4-P 5-N 5-R 6-N 6-R 7-N 7-R
 0. 100. 100. 20. 20. 0. 0. 100. 100. 100. 100. 10. 10. 20. 20.
 0. 100. 100. 19. 21. -2. -2. 105. 105. 100. 101. 9. 11. 31. 10.

CELL LRS/COUNT 1=C.10000 2=C.0100C 3=0.0100C 4=C.1000C 5=C.4997C 6=0.20300 7=0.02273
 TWIST= 150.33 SHAFT DIA.= 1.53 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLF	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1234.	25.9	P	1480.	N	34.	640.	-278.	1760.	N	363.	378.	44.	63.	R	306.
00	1250.	21.9	P	1750.	R	218.	-278.	-1210.	1775.		355.	355.	15.	44.	R	260.
00	1225.	16.9	P	1595.	R	463.	-1346.	-1210.	1775.		355.	355.	15.	44.	R	167.
00	1219.	11.9	P	1345.	R	580.	-1346.	-1210.	1775.		355.	355.	15.	44.	R	68.
00	1245.	6.9	P	1115.	R	482.	-744.	-1112.	1540.		321.	263.	10.	18.	R	24.
00	1244.	1.9	P	635.	R	330.	-112.	-112.	1540.		321.	263.	10.	18.	R	25.
00	1246.	-3.1	P	245.	R	164.	150.	290.	119.		119.	119.	24.	19.	R	38.
00	1237.	-8.1	P	355.	R	44.	-28.	-28.	305.	R	169.	169.	19.	12.	R	56.
00	1248.	-13.1	P	780.	R	205.	-660.	-660.	700.		270.	270.	31.	115.	R	78.
00	1252.	-18.1	P	1235.	R	349.	-1696.	-1696.	1100.		381.	381.	52.	144.	R	115.
00	1251.	-23.1	P	1580.	R	462.	-2700.	-2700.	1405.		470.	470.	50.	203.	R	144.
00	1258.	-28.1	P	1900.	R	557.	-2858.	-2858.	1665.		537.	537.	34.	284.	R	203.
00	1233.	-32.1	P	2030.	R	221.	-2188.	-2188.	1735.		543.	543.			R	284.

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

TF	ANOM	ANGLF	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1234.	29.05	P	-1580.00	N	14.00	-640.00	-1680.00	1760.00	N	263.00	278.00	44.00	63.00	R	-286.00
21	1250.	25.05	P	-1651.00	R	197.92	277.83	-1769.58	1769.58		278.00	278.00	15.00	44.00	R	-240.83
21	1225.	20.05	P	-1495.00	R	442.83	1209.67	-1674.17	1674.17		259.00	259.00	8.25	18.00	R	-148.67
21	1239.	15.05	P	-1245.00	R	559.75	1345.50	-1438.75	1438.75		221.00	221.00	0.33	10.00	R	-50.50
21	1245.	1.05	P	-1015.00	R	461.67	743.33	-1048.33	1048.33		163.00	163.00	0.33	10.00	R	-7.33
21	1244.	5.05	P	-535.00	R	309.58	111.17	-613.92	613.92		95.00	95.00	0.42	10.58	R	0.42
21	1246.	0.05	P	-145.00	R	143.50	-151.00	-187.50	187.50		19.00	19.00	0.42	10.58	R	0.42
21	1237.	-4.95	P	255.00	R	24.58	26.83	202.08	202.08		-68.42	-68.42	2.67	10.42	R	29.58
21	1248.	-9.95	P	680.00	R	185.67	658.67	596.67	596.67		-169.33	-169.33	21.75	10.42	R	50.67
21	1252.	-14.95	P	1135.00	R	329.75	1694.50	996.25	996.25		-280.25	-280.25	42.83	10.42	R	86.75
21	1251.	-19.95	P	1480.00	R	442.83	2698.33	1300.83	1300.83		-365.17	-365.17	40.92	10.42	R	114.83
21	1258.	-24.95	P	1810.00	R	437.92	2896.17	1563.42	1563.42		-436.08	-436.08	25.00	10.42	R	172.92
21	1233.	-28.95	P	1930.00	R	202.00	2186.00	1630.00	1630.00		-442.00	-442.00			R	253.00

Appendix 5
 (cont.)

••FLAPPED RUDDER DATA REDUCTION••

TEST 12C- Y=0 IN,DEL= ODEG,X=0.75C,20R FLAP 7/29/73 RPM 2468

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXO-LR	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
29.05	6.40	157.85	1041.13	-20.09	74.71	44.72	139.21	927.79	-2.00	-472.84	-6.50	20.50
25.07	-2.78	166.48	1109.00	14.20	59.70	44.47	155.97	1034.27	35.00	-400.47	-5.47	20.63
20.10	-12.10	153.93	1056.42	68.42	33.17	38.48	150.80	1030.69	79.00	-241.64	-3.38	20.43
15.12	-13.46	130.15	915.51	89.31	13.66	30.90	130.08	912.30	100.00	-100.98	-1.15	20.54
10.11	-7.43	106.12	617.97	53.56	5.37	21.83	106.24	619.93	83.00	-21.07	-0.17	20.59
5.09	-1.11	56.60	386.75	10.74	0.77	13.87	56.60	386.90	55.00	-2.09	0.01	20.58
0.07	1.51	15.94	94.77	-5.80	0.65	9.02	15.99	94.95	25.00	-0.66	0.28	20.60
-4.95	-0.27	-25.75	-203.95	16.59	3.36	11.88	-25.53	-204.26	-4.00	-12.31	0.67	20.53
-9.97	-6.59	-69.86	-534.30	59.36	9.42	19.60	-69.53	-533.85	-33.00	-63.29	1.15	20.62
-14.99	-16.94	-116.80	-824.00	125.68	20.18	30.13	-116.28	-879.30	-59.00	-155.18	1.97	20.65
-20.00	-26.98	-152.43	-1164.23	195.87	34.98	39.00	-150.79	-1147.73	-79.00	-276.60	2.61	20.64
-25.00	-28.96	-184.38	-1369.27	203.83	61.30	46.17	-176.29	-1303.88	-78.00	-465.14	3.93	20.70
-28.97	-21.86	-195.02	-1378.74	168.25	85.11	45.36	-176.82	-1257.74	-36.00	-589.54	5.75	20.49

Appendix 5
(cont.)

REFLAPED PROFILE DATA IN MIN-DIMENSIONAL FORM

TEST 12C, Y=0 IP,DFL= DREG,X=0.75C,20R FLAP 7/29/73 RPM 240R									
ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	PN=10 ⁻⁶
29.05	1.416	0.6817	-0.1651	0.446	0.358	2.077	0.008	1.2410	1.134
25.17	1.384	0.6812	-0.2214	0.342	0.351	2.876	0.005	1.5182	1.141
20.10	1.190	0.2761	-0.2758	0.868	0.310	4.310	0.004	1.4777	1.130
15.12	0.917	.1592	-0.2766	1.051	0.246	5.294	0.003	1.0748	1.136
10.11	0.550	0.0745	-0.2265	0.741	0.173	7.383	0.002	0.7101	1.139
5.09	0.204	0.0268	-0.1357	0.864	0.110	7.553	0.001	0.2019	1.138
0.7	-0.127	0.0051	-0.0513	0.754	0.072	24.756	0.000	0.0161	1.139
-4.05	-0.449	0.0061	0.0320	1.016	0.095	73.952	0.000	0.0415	1.135
-9.97	-0.843	0.026	0.1180	0.975	0.155	19.788	-0.000	0.3327	1.140
-14.90	-1.037	0.1089	0.2035	0.960	0.239	5.522	-0.002	0.8412	1.142
-20.00	-1.216	0.2674	0.2695	0.967	0.308	4.546	-0.005	1.4169	1.142
-25.1	-1.232	0.4717	0.2991	0.939	0.362	2.512	-0.008	1.9150	1.145
-28.97	-1.114	0.5979	0.2578	0.903	0.363	-1.863	-0.005	2.0055	1.133

ARC DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	CLSQ	PN=10 ⁻⁶
30.41	1.416	0.7153	0.1641	0.446	0.358	1.980	-0.008	1.2410	1.134
26.40	1.384	0.5132	0.2214	0.842	0.351	2.656	-0.005	1.5182	1.141
21.25	1.190	0.2999	0.2758	0.868	0.310	3.969	-0.004	1.4777	1.130
16.00	0.917	0.1733	0.2766	1.851	0.246	5.294	-0.003	1.0748	1.136
10.61	0.550	0.0796	0.2265	0.741	0.173	6.913	-0.002	0.7101	1.139
5.28	0.204	0.0275	0.1357	0.864	0.110	7.401	-0.001	0.2019	1.138
-0.06	-0.127	0.1054	0.0513	0.754	0.072	23.520	-0.000	0.0161	1.139
-5.34	-0.449	0.0105	-0.0329	1.016	0.095	47.515	-0.000	0.0415	1.135
-10.78	-0.843	0.0545	-0.1149	0.975	0.155	15.469	+0.000	0.3327	1.140
-15.90	-1.037	0.1269	0.2035	0.960	0.239	8.171	+0.002	0.8412	1.142
-21.17	-1.216	0.2922	0.2685	0.967	0.308	4.161	+0.005	1.4169	1.142
-26.19	-1.232	0.4571	0.2990	0.939	0.362	2.475	+0.008	1.9150	1.145
-30.05	-1.114	0.6187	0.2578	0.903	0.363	-1.801	+0.009	2.0055	1.133

Appendix 5
(cont.)

FLAPPED RUONER INPUT DATA

TEST 13C, Y=0 IN, DEL= ODEG., X=1.0 D, 208 FLAP 7/29/73 RPM 2468

DF	TR	TT	ARFA	SPAN	C-MAC	X-MAC	ZAC	Y
0.0	82	87	44.30	7.875	5.7421	0.763	-3.15	0.0

ZERO READINGS BEFORE AND AFTER

ANOM 1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	20.	20.	0.	0.	100.	100.	100.	10.	10.	20.	20.
0.	100.	100.	19.	21.	0.	0.	105.	105.	101.	9.	11.	31.	10.

CELL LRS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=0.10000 5=0.48970 6=0.20000 7=0.02273
TWIST= 1500.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1242.	25.9	R	1680.	N	43.	752.	R	1760.	N	360.	R	63.	R	308.	
00	1258.	21.9		1765.	R	229.	-294.		1890.		383.		46.		260.	
00	1243.	16.9		1620.		478.	-1100.		1810.		364.		18.		176.	
00	1265.	11.9		1375.		610.	-1340.		1585.		325.	N	16.		85.	
00	1244.	6.9		1020.		505.	-730.		1170.		264.	R	11.		44.	
00	1249.	1.9		635.		353.	-88.		730.		195.		22.		27.	
00	1249.	-3.1		243.		178.	192.		300.		119.		26.		21.	
00	1253.	-8.1	Y	167.	N	34.	22.	N	327.	R	165.		19.	N	32.	
00	1256.	-13.1		790.		194.	-628.		1120.		269.		15.		54.	
00	1252.	-18.1		1243.		336.	-1656.		1420.		381.		34.		89.	
00	1249.	-23.1		1595.		453.	-2668.		1690.		468.		53.		128.	
00	1249.	-28.1		1923.		463.	-2982.		1750.		537.		53.		191.	
00	1239.	-32.1		2045.		168.	-2066.				541.		34.		274.	

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS

21	1242.	29.05		-1580.00		23.00	-752.00		-1660.00		260.00		-53.00		-288.00	
21	1258.	25.05		-1665.00		-208.92	294.00		-1789.58		283.00		-35.92		-240.83	
21	1243.	20.05		-1520.00		-457.83	1100.00		-1709.17		264.00		-7.83		-157.67	
21	1265.	15.05		-1275.00		-589.75	1343.00		-1483.75		225.00		6.25		-67.50	
21	1244.	10.05		-923.00		-484.67	730.00		-1068.33		164.00		-0.67		-27.33	
21	1249.	5.05		-535.00		-332.58	88.00		-627.92		95.00		-11.50		-11.17	
21	1249.	0.05		-140.00		-157.50	-192.00		-197.50		19.00		-15.50		-6.00	
21	1253.	-4.95		267.00		14.58	-22.00		224.08		-68.42		-8.42		5.58	
21	1256.	-9.95		690.00		174.67	628.00		616.67		-168.33		5.67		26.67	
21	1252.	-14.95		1140.00		316.75	1656.00		1016.25		-280.25		24.75		60.75	
21	1249.	-19.95		1495.00		433.83	2668.00		1315.83		-367.17		43.83		98.83	
21	1249.	-24.95		1823.00		443.92	2982.00		1585.42		-436.08		43.92		160.92	
21	1239.	-28.95		1945.00		149.00	2066.00		1645.00		-440.00		25.00		243.00	

Appendix 5
(cont.)

●●●(ADDED) SUBP DATA PRODUCTION●●●

TEST 13C, Y=1 IN, DELA 1000.0X=1.0, 0.279 FLAP 7/29/73 RPM 2468

ALPHA	IX-LR	FZ-LR	MX-LR	MZ-LR	FX-LR	FY-LR	FZ-LR	MX-LR	MY-LR	MZ-LR	MYOFLAP-INLR	MYOFLAP-INLR	VEL-FPS
29.05	7.52	157.77	132.65	-9.66	75.68	46.17	138.64	924.71	-4.00	-459.75	-6.55	20.57	
25.07	-2.94	168.59	1128.16	5.05	50.15	44.40	157.52	1048.82	37.00	-416.17	-5.47	20.70	
20.10	-11.00	156.59	1179.96	67.06	34.95	41.39	153.01	1052.92	82.00	-249.78	-3.58	20.57	
15.17	-13.40	173.40	937.07	61.65	14.35	33.77	133.29	935.83	106.00	-103.55	-1.53	20.76	
10.14	-7.30	96.85	676.87	56.37	4.39	23.54	57.02	678.70	87.00	-25.66	-0.62	20.58	
5.09	-1.88	56.83	394.15	13.33	1.00	15.46	56.82	394.38	59.00	0.25	-0.25	20.62	
0.07	1.92	15.58	102.54	-7.17	1.07	10.42	15.66	102.77	28.00	-1.62	-0.14	20.62	
-4.95	7.22	-26.85	-212.19	11.21	0.07	9.64	-26.55	-211.55	-2.00	-18.80	0.13	20.66	
-9.97	-6.28	-70.75	-539.25	62.31	4.92	16.49	-70.33	-539.34	-31.00	-61.53	0.61	20.68	
-14.99	-16.50	-117.17	-894.37	130.72	20.66	27.53	-116.51	-890.73	-57.00	-153.61	1.38	20.65	
-20.00	-26.68	-157.84	-1165.73	192.33	35.82	36.32	-151.97	-1143.00	-78.00	-278.76	2.25	20.62	
-25.00	-29.82	-196.44	-1374.69	201.24	61.51	43.10	-178.51	-1307.44	-79.00	-469.97	3.66	20.62	
-29.97	-20.66	-195.09	-1377.31	165.94	86.65	42.86	-177.31	-1255.93	-26.00	-591.33	5.52	20.54	

Appendix 5
(cont.)

UNCLASSIFIED BUREAU DATA IN HYPER-DIMENSIONAL FORM

TEST 110, Y=0 IN 0.010 = 0.010 X 1.0 J 0.200 FLAP 7/29/73 RDM 246R

ALPHA	CL	CC	CM	CP	CV	L/C	CMF	CLSQ	PN01000-6
29.05	1.411	0.6006	-0.1611	0.847	0.367	2.143	0.005	1.2151	1.138
29.07	1.411	0.6006	-0.2264	0.846	0.349	2.502	0.005	1.5289	1.145
20.10	1.202	0.2817	-0.2787	0.874	0.318	4.243	0.003	1.4777	1.138
15.12	1.919	-0.1637	-0.2825	0.892	0.264	5.189	0.002	1.0827	1.148
10.11	0.553	0.0780	-0.2224	0.898	0.187	7.091	0.001	0.5932	1.138
5.09	0.209	0.3315	-0.1409	0.881	0.122	6.636	0.000	0.2116	1.141
0.07	-0.124	0.3085	-0.0549	0.874	0.082	14.565	-0.000	0.0153	1.141
-4.95	-0.449	0.3079	0.0139	1.012	0.071	26.567	-0.000	0.0438	1.143
-9.97	-0.774	0.2348	0.1164	0.971	0.217	22.113	-0.001	0.3058	1.144
-14.99	-1.041	0.1124	0.2011	0.971	0.217	9.260	-0.002	0.8446	1.142
-20.00	-1.216	0.2750	0.2690	0.955	0.287	4.373	-0.003	1.4437	1.141
-25.00	-1.217	0.6727	0.3046	0.930	0.341	2.615	-0.007	1.9914	1.141
-28.97	-1.107	0.6017	0.2437	0.900	0.347	1.832	-0.009	1.9973	1.136

ABOVE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CC	CM	CP	CV	L/C	CMF	CLSQ	PN01000-6
30.40	1.411	0.7239	0.1611	0.947	0.347	1.949	-0.008	1.2151	1.138
26.41	1.411	0.5197	0.2264	0.846	0.349	2.716	-0.005	1.5289	1.145
21.26	1.202	0.3073	0.2787	0.874	0.318	3.509	-0.003	1.4777	1.138
16.11	1.919	0.1771	0.2825	0.892	0.264	5.189	-0.002	1.0827	1.148
10.64	0.553	0.0831	0.2224	0.888	0.187	6.654	-0.001	0.5932	1.138
5.29	0.209	0.3323	0.1419	0.981	0.122	6.485	-0.000	0.2116	1.141
-0.05	-0.124	0.3088	0.0549	0.834	0.082	14.138	-0.000	0.0153	1.141
-5.78	-0.449	0.3013	-0.0739	0.912	0.076	35.680	-0.000	0.0438	1.143
-10.71	-0.774	0.1464	0.1164	0.974	0.170	17.206	-0.001	0.3058	1.144
-15.09	-1.041	0.1305	0.2011	0.971	0.217	7.973	-0.002	0.8446	1.142
-21.17	-1.216	0.3127	0.2690	0.955	0.287	4.115	-0.003	1.4437	1.141
-26.19	-1.217	0.6978	0.3046	0.930	0.341	2.484	-0.007	1.9919	1.141
-30.03	-1.107	0.6221	0.2437	0.900	0.347	1.772	-0.009	1.9903	1.136

Appendix 5
Concluded

TEST 7 2AC=0 IN,DEL=3. DEG,X=24.7 D, 10 3FLAP,RPM=NCPROP 26SEPT73

FLAPPED RUDDER INPUT DATA

DF	TR	TY	AREA	SPAN	MAC	XMAC	ZMAC	AZL	DYCOR
0.0	78	78	44.30	7.875	5.7421	-0.7659	0.0	-2.00	99.0000

ZERO READINGS BEFORE AND AFTER

ANOM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	100.	100.	0.	0.	100.	100.	100.	100.	100.	100.	0.	0.
0.	101.	101.	100.	101.	-12.	-12.	100.	105.	99.	101.	100.	100.	0.	0.

CELL LBS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=C.10000 5=0.4897C 6=0.20000 7=0.02273
TWIST=11570.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1239.	-2.0	R	100.	R	106.	S	208.	R	144.	N	92.	A	86.	S	0.
00	1232.	0.0	R	225.	R	166.	S	188.	R	275.	N	117.	A	85.	S	0.
00	1223.	2.0	R	345.	R	225.	S	154.	R	401.	N	141.	A	86.	S	0.
00	1244.	4.0	R	449.	R	286.	S	77.	R	536.	N	163.	A	86.	S	0.
00	1242.	6.0	R	589.	R	343.	S	-60.	R	665.	N	186.	A	89.	S	0.
00	1237.	8.0	R	710.	R	394.	S	-255.	R	806.	N	208.	A	93.	S	0.
00	1238.	10.0	R	824.	R	440.	S	-505.	R	941.	N	225.	A	98.	S	0.
00	1236.	12.0	R	935.	R	484.	S	-796.	R	1075.	N	248.	A	104.	S	0.
00	1232.	14.0	R	1051.	R	512.	S	-1111.	R	1214.	N	268.	A	110.	S	0.
00	1221.	16.0	R	1076.	R	443.	S	-400.	R	1188.	N	272.	A	95.	S	0.
00	1208.	18.0	R	1106.	R	270.	S	200.	R	1165.	N	278.	A	76.	S	0.
00	1189.	23.0	R	1070.	R	153.	S	650.	R	1086.	N	270.	A	70.	S	0.
00	1171.	28.0	R	1125.	R	130.	S	880.	R	1126.	N	272.	A	67.	S	0.
00	1258.	-4.0	N	230.	N	159.	S	142.	N	189.	R	136.	R	112.	S	0.
00	1260.	-6.0	N	356.	N	218.	S	20.	N	310.	R	163.	R	109.	S	0.
00	1260.	-8.0	N	484.	N	278.	S	-155.	N	434.	R	191.	R	104.	S	0.
00	1262.	-10.0	N	610.	N	338.	S	-383.	N	548.	R	220.	R	99.	S	0.
00	1259.	-12.0	N	736.	N	393.	S	-672.	N	664.	R	250.	R	92.	S	0.
00	1255.	-14.0	N	861.	N	446.	S	-1015.	N	770.	R	280.	R	84.	S	0.
00	1253.	-16.0	N	977.	N	495.	S	-1389.	N	871.	R	308.	R	74.	S	0.
00	1251.	-18.1	N	1085.	N	537.	S	-1754.	N	962.	R	335.	R	68.	S	0.
00	1232.	-20.0	N	1115.	N	378.	S	-1100.	N	1004.	R	326.	R	90.	S	0.
00	1217.	-22.0	N	1124.	N	235.	S	-300.	N	1005.	R	313.	R	102.	S	0.
00	1199.	-27.0	N	1109.	N	135.	S	50.	N	975.	R	303.	R	109.	S	0.
00	1182.	-32.0	N	1135.	N	114.	S	200.	N	986.	R	306.	R	107.	S	0.

[illegible]

Appendix 6
(cont.)

TEST 7 ,ZAC= 0 IN,DEL= 0. DEG,X-24.7 D, 10 FLAP,PPM=NCPRCP 26SFPI73

NYCOR IS BEING COMPLETED

***FLAPPED RUDDER DATA REDUCTION**

ALPHA	FX-1.B	FZ-LR	MX-INLR	MZ-INLR	FYC-LB	FZ-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
0.00	2.08	0.06	2.64	-8.76	8.01	0.13	2.94	1.00	-8.66	0.0	20.55
2.00	1.88	13.16	54.39	-10.23	9.04	13.16	94.39	11.00	-10.23	0.0	20.49
4.00	1.55	25.74	182.55	-5.58	9.67	25.67	182.24	22.00	-11.98	0.0	20.42
6.00	0.78	38.75	268.24	0.20	12.21	38.60	267.60	33.00	-18.51	J-J	20.59
8.00	-0.58	51.31	357.77	10.56	13.71	51.09	356.94	43.00	-26.69	0.0	20.57
10.01	-2.52	63.92	446.56	25.45	15.80	63.65	445.76	52.00	-36.98	0.0	20.53
12.01	-5.02	75.77	534.72	41.85	17.98	75.49	533.86	61.00	-51.64	J-C	20.54
14.05	-7.93	87.31	617.84	62.76	20.84	87.04	617.34	69.00	-67.50	0.0	20.52
16.04	-11.07	99.18	705.36	82.56	23.71	98.51	704.34	74.00	-90.93	0.0	20.43
18.00	-3.95	100.99	692.94	48.58	22.14	98.17	675.63	61.00	-143.80	0.0	20.40
20.03	2.05	102.25	650.83	-5.85	20.65	96.60	655.09	30.00	-319.39	0.0	20.29
25.00	6.55	97.48	641.75	-19.09	17.92	87.17	583.27	9.00	-268.32	J-A	20.13
30.00	8.86	102.75	647.05	-7.55	21.54	86.56	567.56	5.00	-310.63	0.0	19.58
-2.04	1.48	-13.54	-95.26	-4.24	7.71	-13.40	-94.72	-10.00	-10.54	0.0	20.71
-4.00	0.27	-26.72	-186.33	4.05	8.21	-26.55	-185.74	-21.00	-15.41	0.0	20.72
-6.00	-1.47	-40.12	-281.20	17.40	8.50	-35.93	-280.88	-32.00	-21.90	0.0	20.72
-8.00	-3.75	-53.31	-373.92	33.42	17.27	-53.15	-374.04	-42.00	-32.02	0.0	20.74
-10.00	-6.64	-66.46	-471.06	54.38	11.95	-66.39	-472.07	-52.00	-44.74	0.0	20.71
-12.01	-10.06	-79.49	-562.70	79.70	14.43	-79.56	-565.27	-62.00	-58.80	0.0	20.68
-14.01	-13.80	-91.57	-645.82	101.88	16.43	-91.83	-652.73	-71.00	-81.18	0.0	20.67
-16.06	-17.44	-102.79	-732.02	126.26	18.53	-103.13	-735.11	-78.00	-106.76	0.0	20.65
-18.00	-10.90	-104.19	-723.99	52.04	14.75	-101.64	-698.13	-50.00	-198.71	0.0	20.49
-20.00	-2.89	-103.66	-701.25	34.85	13.15	-97.19	-605.10	-24.00	-231.13	0.0	20.37
-25.00	0.61	-101.15	-652.24	12.28	10.23	-85.05	-586.73	-6.00	-285.17	0.0	20.21
-30.00	2.12	-103.54	-656.42	27.43	10.22	-86.68	-571.21	-2.00	-324.59	0.0	20.07

Appendix 6
(cont.)

TEST 7 ,ZAC= 0 IN,DEL= '1. DEG,X=24.7 0, 10 RELAP,KPM=NCPROP 26SEPT73

DYCOR IS BEING COMPUTED

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CC	C'	CPL	CY	L/C	CMF	RN1000-6	CLSC
0.00	0.001	0.0165	0.0012	0.021	0.064	0.064	0.0	1.039	0.0000
2.00	0.105	0.0151	0.0012	0.911	0.072	6.575	C.C	1.036	0.0111
4.01	0.207	0.0198	0.0030	0.901	0.078	10.470	U.U	1.032	0.0428
6.00	0.306	0.0276	0.0044	0.880	0.097	11.072	C.C	1.041	0.0935
8.03	0.405	0.0382	0.0049	0.887	0.109	10.614	C.C	1.040	0.1643
10.01	0.507	0.0510	0.0040	0.889	0.126	9.535	0.0	1.038	0.2571
12.01	0.601	0.0654	0.0039	0.858	0.143	5.151	0.0	1.039	0.3611
14.05	0.694	0.0834	0.0028	0.904	0.166	8.320	U.U	1.038	0.4816
16.04	0.791	0.1064	-0.0028	0.904	0.190	7.434	0.0	1.036	0.6260
18.00	0.792	0.1938	-0.0213	0.879	0.179	4.088	0.0	1.031	0.6278
20.03	0.788	0.2741	-0.0362	0.861	0.169	2.875	U.C	1.026	0.6210
25.00	0.722	0.3657	-0.0955	0.850	0.148	1.516	C.C	1.018	0.5220
30.00	0.728	0.4718	-0.1089	0.833	0.181	1.544	U.U	1.010	0.5307
-2.04	-0.105	0.0191	0.0004	0.858	0.060	-5.502	U.C	1.047	0.0110
-4.00	-0.208	0.0239	-0.0006	0.888	0.064	-8.671	C.C	1.048	0.0431
-6.00	-0.312	0.0322	-0.0015	0.853	0.066	-9.686	C.C	1.049	0.0575
-8.00	-0.415	0.0435	-0.0012	0.854	0.080	-9.552	C.C	1.048	0.1723
-10.00	-0.520	0.0574	-0.0009	0.903	0.094	-9.160	U.U	1.047	0.2700
-12.01	-0.625	0.0743	-0.0008	0.902	0.113	-8.403	0.0	1.046	0.3903
-14.01	-0.722	0.0942	-0.0002	0.903	0.129	-7.665	0.0	1.045	0.5216
-16.06	-0.812	0.1203	0.0021	0.905	0.149	-6.756	U.C	1.044	0.6601
-18.00	-0.913	0.2032	0.0424	0.872	0.118	-4.002	C.C	1.036	0.6610
-20.00	-0.787	0.2927	0.0787	0.869	0.107	-2.689	U.U	1.030	0.6194
-25.00	-0.739	0.3820	0.1028	0.825	0.084	-1.933	C.C	1.022	0.5454
-30.00	-0.723	0.4725	0.1127	0.837	0.085	-1.530	C.C	1.015	0.5223

Appendix 6
(cont.)

TEST 7 ,ZAC= 0 IN,DEL= 0. DEG,X=24.7 G. 10 3FLAP,RPM=NCPROP 26SEPT73

NYCOR IS BEING COMPUTED

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN#10#-6	CLSQ
0.00	0.001	0.0165	0.0012	2.821	0.064	0.064	0.0	1.035	0.0000
2.10	0.105	0.0153	0.0012	0.911	0.072	6.894	0.0	1.036	0.0111
4.21	0.207	0.0205	0.0030	0.901	0.078	10.103	0.0	1.032	0.0428
6.30	0.306	0.0292	0.0044	0.880	0.097	10.476	0.0	1.041	0.0935
8.42	0.405	0.0409	0.0049	0.887	0.105	5.900	0.0	1.040	0.1643
10.50	0.507	0.0553	0.0040	0.889	0.126	5.162	0.0	1.038	0.2571
12.58	0.601	0.0714	0.0039	0.898	0.143	8.413	0.0	1.039	0.3611
14.71	0.694	0.0915	0.0028	0.901	0.166	7.587	0.0	1.038	0.4816
16.80	0.791	0.1169	-0.0028	0.904	0.190	6.767	0.0	1.036	0.6260
18.76	0.792	0.2044	-0.0233	0.879	0.179	3.877	0.0	1.031	0.6278
20.79	0.788	0.2845	-0.0692	0.861	0.169	2.770	0.0	1.026	0.6210
25.70	0.722	0.3744	-0.0955	0.853	0.148	1.930	0.0	1.018	0.5220
30.70	0.728	0.4807	-0.1089	0.833	0.181	1.516	0.0	1.010	0.5307
-2.14	-0.105	0.0193	0.0005	0.858	0.060	-5.450	0.0	1.047	0.0110
-4.20	-0.208	0.0247	0.0006	0.888	0.064	-8.417	0.0	1.043	0.0431
-6.30	-0.312	0.0339	-0.0015	0.893	0.066	-5.215	0.0	1.048	0.0575
-8.40	-0.415	0.0463	-0.0012	0.894	0.080	-8.957	0.0	1.049	0.1723
-10.50	-0.520	0.0619	0.0009	0.903	0.094	-8.398	0.0	1.047	0.2700
-12.61	-0.625	0.0809	0.0008	0.902	0.113	-7.724	0.0	1.046	0.3903
-14.70	-0.722	0.1030	-0.0002	0.903	0.129	-7.015	0.0	1.045	0.5216
-16.84	-0.812	0.1313	0.0021	0.905	0.149	-6.187	0.0	1.044	0.6601
-18.79	-0.813	0.2142	0.0424	0.872	0.118	-3.795	0.0	1.036	0.6610
-20.76	-0.787	0.3031	0.0787	0.869	0.107	-2.557	0.0	1.030	0.6154
-25.71	-0.739	0.3911	0.1028	0.829	0.024	-1.828	0.0	1.022	0.5454
-30.70	-0.723	0.4812	0.1127	0.837	0.085	-1.502	0.0	1.015	0.5223

CL COEFFS -0.005266 0.048575
 CD COEFFS 0.016314 -0.000370
 NYCCR 0.000377 -0.002675

Appendix 6
(cont.)

TEST 7 ZAC= 0 INTEL= 0. DFC, X=24.7 D, 1C FLAP, RDM=NCRNDP 26SEP73

NYCOR= -0.4168

MYFLAPED KUDDEP DASA REDUCTIONS

ALPHA	FX-LN	FZ-LN	MX-INLR	MZ-INLR	FXD-LN	FYC-LN	FZC-LN	MXD-INLR	MYD-INLR	MZD-INLR	MYNFLAP-INLR	VEL-FPS
0.00	2.08	0.06	2.64	-4.76	2.68	8.01	0.12	2.98	1.00	-8.68	0.0	20.55
2.00	1.88	13.16	54.19	-10.23	1.99	9.04	13.14	94.31	11.00	-10.95	0.0	20.49
4.01	1.55	25.74	182.55	-5.58	2.65	9.67	25.65	182.14	22.00	-13.37	0.0	20.42
6.00	0.78	38.75	268.24	0.29	3.78	12.31	38.57	267.45	33.00	-20.55	0.0	20.59
8.03	0.58	51.31	357.77	10.56	5.20	13.71	51.05	356.72	43.00	-29.41	0.0	20.57
10.01	-2.52	63.92	446.56	25.49	6.85	15.80	63.59	445.46	52.00	-40.38	0.0	20.53
12.01	-5.02	75.77	534.72	41.85	8.79	17.96	75.43	533.45	61.00	-55.70	0.0	20.54
14.05	-7.93	87.31	617.84	62.76	11.12	20.84	86.96	616.81	69.00	-72.21	0.0	20.52
16.04	-11.07	95.18	705.16	82.56	14.76	23.71	98.87	703.62	74.00	-96.27	0.0	20.49
18.00	-3.95	100.99	692.94	48.98	24.76	22.14	98.49	678.51	61.00	-148.97	0.0	20.40
20.03	2.05	102.25	650.83	-5.85	34.33	20.65	96.34	651.40	30.00	-224.17	0.0	20.29
25.00	4.55	97.48	641.75	-15.05	44.79	17.92	86.83	581.21	0.00	-272.76	0.0	20.13
30.00	8.86	102.75	647.05	-7.95	56.72	21.54	66.13	565.18	5.00	-315.14	0.0	19.58
-2.04	1.48	-13.54	-95.26	-4.24	2.33	7.71	-13.42	-94.81	-10.00	-13.22	0.0	20.71
-4.00	0.27	-26.72	-186.33	4.05	2.86	8.21	-26.57	-185.85	-21.00	-13.79	0.0	20.72
-6.00	-1.47	-40.12	-281.20	17.40	3.82	8.50	-35.96	-281.04	-32.00	-19.76	0.0	20.72
-8.00	-3.75	-53.31	-373.92	33.42	5.16	10.27	-53.20	-374.28	-42.00	-29.17	0.0	20.74
-10.00	-6.64	-66.46	-471.06	54.38	6.82	11.95	-66.44	-472.40	-52.00	-41.14	0.0	20.71
-12.01	-10.06	-79.49	-562.77	75.73	8.86	14.43	-79.63	-565.70	-62.00	-54.49	0.0	20.68
-14.01	-13.80	-91.57	-645.82	101.88	11.28	16.43	-91.91	-653.33	-71.00	-76.21	0.0	20.67
-16.06	-17.44	-102.79	-732.02	126.26	14.48	18.53	-103.25	-735.91	-78.00	-131.15	0.0	20.65
-18.00	-19.90	-104.19	-723.99	52.04	24.62	14.75	-101.83	-655.62	-50.00	-193.39	0.0	20.49
-20.00	-2.89	-103.66	-703.25	34.85	35.41	13.15	-97.47	-666.84	-24.00	-226.05	0.0	20.37
-25.00	0.61	-101.15	-652.24	12.28	45.78	17.23	-95.21	-598.89	-6.10	-287.69	0.0	20.21
-30.00	2.12	-103.54	-656.42	27.43	56.00	10.22	-87.11	-573.67	-2.00	-320.22	0.0	20.07

Appendix 6
(cont.)

TEST 7 ,ZAC= 0 IN,DEL= 0. DEG,X=24.7 D, IC 3FLAP,RPM=NCPROP 26SEPT73

OYCOR= -0.4368

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN*10**6	CLSC
0.00	0.001	0.0165	0.0013	3.132	0.064	0.056	0.0	1.039	0.0000
2.00	0.105	0.0159	0.0012	0.911	0.072	6.615	0.0	1.036	0.0110
4.01	0.207	0.0213	0.0030	0.502	0.078	9.689	0.0	1.032	0.0427
6.00	0.306	0.0299	0.0044	0.881	0.097	10.204	0.0	1.041	0.0934
8.03	0.405	0.0413	0.0049	0.887	0.109	9.812	0.0	1.040	0.1641
10.01	0.507	0.0549	0.0040	0.889	0.126	9.228	0.0	1.038	0.2567
12.01	0.600	0.0700	0.0039	0.858	0.143	8.582	0.0	1.039	0.3605
14.05	0.693	0.0887	0.0027	0.901	0.166	7.817	0.0	1.038	0.4807
16.04	0.790	0.1125	-0.0029	0.904	0.190	7.028	0.0	1.036	0.6247
18.00	0.791	0.1999	-0.0234	0.879	0.179	3.957	0.0	1.031	0.6255
20.03	0.786	0.2801	-0.0692	0.861	0.165	2.806	0.0	1.026	0.6177
25.00	0.720	0.3712	-0.0955	0.850	0.148	1.935	0.0	1.018	0.5180
30.00	0.725	0.4773	-0.1088	0.833	0.181	1.515	0.0	1.010	0.5254
-2.04	-0.105	0.0183	0.0005	0.857	0.060	-5.751	0.0	1.047	0.0110
-4.00	-0.208	0.0224	-0.0006	0.888	0.064	-5.293	0.0	1.048	0.0432
-6.00	-0.313	0.0299	-0.0015	0.853	0.066	-10.467	0.0	1.048	0.0977
-8.00	-0.415	0.0403	-0.0012	0.853	0.080	-10.311	0.0	1.045	0.1726
-10.00	-0.520	0.0534	-0.0013	0.903	0.094	-9.740	0.0	1.047	0.2705
-12.01	-0.625	0.0696	-0.0008	0.902	0.113	-8.586	0.0	1.046	0.3910
-14.01	-0.723	0.0887	-0.0003	0.903	0.125	-8.145	0.0	1.045	0.5226
-16.06	-0.813	0.1141	0.0020	0.905	0.149	-7.130	0.0	1.044	0.6615
-18.00	-0.815	0.1970	0.0424	0.872	0.118	-4.136	0.0	1.036	0.6634
-20.00	-0.789	0.2867	0.0787	0.869	0.107	-2.753	0.0	1.030	0.6229
-25.00	-0.741	0.3763	0.1028	0.829	0.084	-1.570	0.0	1.022	0.5457
-30.00	-0.726	0.4669	0.1127	0.836	0.085	-1.556	0.0	1.015	0.5275

Appendix 6
(cont.)

TEST 7 ,ZAC= 0 IN,DEL= J. 073,X=24.7 D, LC 3FLAP,RPM=NCPRP 26SEPT73

DYCCR= -0.436R

PRIOR DATA CORRECTIFC FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN*10**6	CLSC
0.00	0.001	0.0165	0.0013	3.132	0.064	0.056	0.0	1.039	0.0000
2.10	0.105	0.0161	0.0012	0.911	0.072	0.543	0.0	1.036	0.0110
4.21	0.207	0.0220	0.0030	0.902	0.078	5.375	0.0	1.032	0.0427
6.30	0.306	0.0315	0.0044	0.881	0.097	5.657	0.0	1.041	0.0934
8.42	0.405	0.0440	0.0049	0.887	0.109	5.200	0.0	1.040	0.1641
10.50	0.507	0.0592	0.0040	0.889	0.126	5.558	0.0	1.038	0.2567
12.58	0.600	0.0760	0.0039	0.858	0.143	7.900	0.0	1.039	0.3605
14.71	0.693	0.0967	0.0027	0.851	0.166	7.167	0.0	1.038	0.4807
16.87	0.790	0.1229	0.0029	0.874	0.190	6.432	0.0	1.036	0.6247
18.76	0.791	0.2104	0.0034	0.874	0.179	3.760	0.0	1.031	0.6255
20.79	0.736	0.2904	0.0062	0.861	0.169	2.706	0.0	1.026	0.6177
25.69	0.720	0.3799	0.0075	0.850	0.148	1.855	0.0	1.018	0.5180
30.70	0.725	0.4861	0.0108	0.833	0.181	1.451	0.0	1.010	0.5254
-2.14	-0.105	0.0185	0.0005	0.857	0.060	-5.693	0.0	1.047	0.0110
-4.20	-0.208	0.0231	0.0006	0.888	0.064	-5.001	0.0	1.048	0.0432
-6.30	-0.313	0.0315	0.0015	0.853	0.066	-5.523	0.0	1.048	0.0977
-8.40	-0.415	0.0432	0.0012	0.853	0.080	-9.621	0.0	1.049	0.1726
-10.50	-0.520	0.0579	0.0010	0.903	0.094	-8.575	0.0	1.047	0.2705
-12.61	-0.625	0.0761	0.0038	0.902	0.113	-8.213	0.0	1.046	0.3910
-14.70	-0.723	0.0975	0.0003	0.903	0.129	-7.417	0.0	1.045	0.5226
-16.84	-0.813	0.1251	0.0020	0.905	0.149	-6.455	0.0	1.044	0.6615
-18.79	-0.815	0.2081	0.0424	0.872	0.118	-3.515	0.0	1.036	0.6634
-20.76	-0.789	0.2972	0.0787	0.869	0.107	-2.656	0.0	1.030	0.6229
-25.71	-0.741	0.3855	0.1028	0.829	0.084	-1.923	0.0	1.022	0.5457
-30.70	-0.726	0.4758	0.1127	0.836	0.085	-1.527	0.0	1.015	0.5275

CL COEFFS -0.005587 0.048581
 CC COEFFS 0.016318 -0.000000
 DYCCR -C.00052

Appendix 6
 (cont.)

TEST 15 2MAC=0 INCEL 5 DEC 27 24.7 D.109FIAP, 51M=00 PRIMP.1 OCT 73

FLATFIR NUMBER INPUT DATA

CF	TR	Y	AP	MAC	XMAC	7MAC	AZL	DYCON
5.0	74	77	44.	0.00	0.7735	0.0	-2.00	-0.4368

ZERO HEADINGS REFERENCE AND -111P

ANGLE	1-N	2-N	3-N	4-N	5-N	6-N	7-N
C. 100.	100.	100.	0.	100.	100.	100.	0.
C. 105.	98.	101.	12.	104.	98.	94.	0.

CELL US/SCOUNT 100.10300 200.01000 300.01000 400.10000 500.01000 600.20000 700.02273
TWIST=11570.0 START DIA. 1.50 IN.

INPUT DATA AS RECEIVED

TR	ANGLE	1	2	3	4	5	6	7
CC 1260.	-2.0	190.	149.	246.	225.	N	110.	114.
CC 1260.	0.0	270.	97.	238.	355.	R	115.	113.
CC 1267.	2.0	445.	171.	198.	492.	P	160.	113.
CC 1256.	4.0	584.	233.	100.	619.		182.	113.
CC 1267.	6.0	650.	290.	-50.	762.		206.	110.
CC 1264.	8.0	815.	343.	-20.	903.		228.	105.
CC 1262.	10.0	936.	392.	-536.	1049.		250.	100.
CC 1261.	12.0	1053.	435.	-849.	1187.		270.	94.
CC 1260.	14.0	1184.	472.	-1174.	1319.	N	283.	112.
CC 1259.	16.0	1245.	491.	-1266.	1400.		302.	113.
CC 1254.	18.0	1300.	509.	126.	1270.		288.	79.
CC 1253.	20.0	1361.	506.	730.	1165.	P	286.	127.
CC 1252.	22.0	1422.	495.	842.	1177.		286.	130.
CC 1251.	24.0	1483.	475.	948.	1177.		286.	130.
CC 1250.	26.0	1544.	450.	1048.	1177.		286.	130.
CC 1249.	28.0	1605.	425.	1143.	1177.		286.	130.
CC 1248.	30.0	1666.	400.	1238.	1177.		286.	130.
CC 1247.	32.0	1727.	375.	1333.	1177.		286.	130.
CC 1246.	34.0	1788.	350.	1428.	1177.		286.	130.
CC 1245.	36.0	1849.	325.	1523.	1177.		286.	130.
CC 1244.	38.0	1910.	300.	1618.	1177.		286.	130.
CC 1243.	40.0	1971.	275.	1713.	1177.		286.	130.
CC 1242.	42.0	2032.	250.	1808.	1177.		286.	130.
CC 1241.	44.0	2093.	225.	1903.	1177.		286.	130.
CC 1240.	46.0	2154.	200.	1998.	1177.		286.	130.
CC 1239.	48.0	2215.	175.	2093.	1177.		286.	130.
CC 1238.	50.0	2276.	150.	2188.	1177.		286.	130.
CC 1237.	52.0	2337.	125.	2283.	1177.		286.	130.
CC 1236.	54.0	2398.	100.	2378.	1177.		286.	130.
CC 1235.	56.0	2459.	75.	2473.	1177.		286.	130.
CC 1234.	58.0	2520.	50.	2568.	1177.		286.	130.
CC 1233.	60.0	2581.	25.	2663.	1177.		286.	130.
CC 1232.	62.0	2642.	0.	2758.	1177.		286.	130.
CC 1231.	64.0	2703.	-25.	2853.	1177.		286.	130.
CC 1230.	66.0	2764.	-50.	2948.	1177.		286.	130.
CC 1229.	68.0	2825.	-75.	3043.	1177.		286.	130.
CC 1228.	70.0	2886.	-100.	3138.	1177.		286.	130.
CC 1227.	72.0	2947.	-125.	3233.	1177.		286.	130.
CC 1226.	74.0	3008.	-150.	3328.	1177.		286.	130.
CC 1225.	76.0	3069.	-175.	3423.	1177.		286.	130.
CC 1224.	78.0	3130.	-200.	3518.	1177.		286.	130.
CC 1223.	80.0	3191.	-225.	3613.	1177.		286.	130.
CC 1222.	82.0	3252.	-250.	3708.	1177.		286.	130.
CC 1221.	84.0	3313.	-275.	3803.	1177.		286.	130.
CC 1220.	86.0	3374.	-300.	3898.	1177.		286.	130.
CC 1219.	88.0	3435.	-325.	3993.	1177.		286.	130.
CC 1218.	90.0	3496.	-350.	4088.	1177.		286.	130.
CC 1217.	92.0	3557.	-375.	4183.	1177.		286.	130.
CC 1216.	94.0	3618.	-400.	4278.	1177.		286.	130.
CC 1215.	96.0	3679.	-425.	4373.	1177.		286.	130.
CC 1214.	98.0	3740.	-450.	4468.	1177.		286.	130.
CC 1213.	100.0	3801.	-475.	4563.	1177.		286.	130.
CC 1212.	102.0	3862.	-500.	4658.	1177.		286.	130.
CC 1211.	104.0	3923.	-525.	4753.	1177.		286.	130.
CC 1210.	106.0	3984.	-550.	4848.	1177.		286.	130.
CC 1209.	108.0	4045.	-575.	4943.	1177.		286.	130.
CC 1208.	110.0	4106.	-600.	5038.	1177.		286.	130.
CC 1207.	112.0	4167.	-625.	5133.	1177.		286.	130.
CC 1206.	114.0	4228.	-650.	5228.	1177.		286.	130.
CC 1205.	116.0	4289.	-675.	5323.	1177.		286.	130.
CC 1204.	118.0	4350.	-700.	5418.	1177.		286.	130.
CC 1203.	120.0	4411.	-725.	5513.	1177.		286.	130.
CC 1202.	122.0	4472.	-750.	5608.	1177.		286.	130.
CC 1201.	124.0	4533.	-775.	5703.	1177.		286.	130.
CC 1200.	126.0	4594.	-800.	5798.	1177.		286.	130.
CC 1199.	128.0	4655.	-825.	5893.	1177.		286.	130.
CC 1198.	130.0	4716.	-850.	5988.	1177.		286.	130.
CC 1197.	132.0	4777.	-875.	6083.	1177.		286.	130.
CC 1196.	134.0	4838.	-900.	6178.	1177.		286.	130.
CC 1195.	136.0	4899.	-925.	6273.	1177.		286.	130.
CC 1194.	138.0	4960.	-950.	6368.	1177.		286.	130.
CC 1193.	140.0	5021.	-975.	6463.	1177.		286.	130.
CC 1192.	142.0	5082.	-1000.	6558.	1177.		286.	130.
CC 1191.	144.0	5143.	-1025.	6653.	1177.		286.	130.
CC 1190.	146.0	5204.	-1050.	6748.	1177.		286.	130.
CC 1189.	148.0	5265.	-1075.	6843.	1177.		286.	130.
CC 1188.	150.0	5326.	-1100.	6938.	1177.		286.	130.
CC 1187.	152.0	5387.	-1125.	7033.	1177.		286.	130.
CC 1186.	154.0	5448.	-1150.	7128.	1177.		286.	130.
CC 1185.	156.0	5509.	-1175.	7223.	1177.		286.	130.
CC 1184.	158.0	5570.	-1200.	7318.	1177.		286.	130.
CC 1183.	160.0	5631.	-1225.	7413.	1177.		286.	130.
CC 1182.	162.0	5692.	-1250.	7508.	1177.		286.	130.
CC 1181.	164.0	5753.	-1275.	7603.	1177.		286.	130.
CC 1180.	166.0	5814.	-1300.	7698.	1177.		286.	130.
CC 1179.	168.0	5875.	-1325.	7793.	1177.		286.	130.
CC 1178.	170.0	5936.	-1350.	7888.	1177.		286.	130.
CC 1177.	172.0	5997.	-1375.	7983.	1177.		286.	130.
CC 1176.	174.0	6058.	-1400.	8078.	1177.		286.	130.
CC 1175.	176.0	6119.	-1425.	8173.	1177.		286.	130.
CC 1174.	178.0	6180.	-1450.	8268.	1177.		286.	130.
CC 1173.	180.0	6241.	-1475.	8363.	1177.		286.	130.
CC 1172.	182.0	6302.	-1500.	8458.	1177.		286.	130.
CC 1171.	184.0	6363.	-1525.	8553.	1177.		286.	130.
CC 1170.	186.0	6424.	-1550.	8648.	1177.		286.	130.
CC 1169.	188.0	6485.	-1575.	8743.	1177.		286.	130.
CC 1168.	190.0	6546.	-1600.	8838.	1177.		286.	130.
CC 1167.	192.0	6607.	-1625.	8933.	1177.		286.	130.
CC 1166.	194.0	6668.	-1650.	9028.	1177.		286.	130.
CC 1165.	196.0	6729.	-1675.	9123.	1177.		286.	130.
CC 1164.	198.0	6790.	-1700.	9218.	1177.		286.	130.
CC 1163.	200.0	6851.	-1725.	9313.	1177.		286.	130.
CC 1162.	202.0	6912.	-1750.	9408.	1177.		286.	130.
CC 1161.	204.0	6973.	-1775.	9503.	1177.		286.	130.
CC 1160.	206.0	7034.	-1800.	9598.	1177.		286.	130.
CC 1159.	208.0	7095.	-1825.	9693.	1177.		286.	130.
CC 1158.	210.0	7156.	-1850.	9788.	1177.		286.	130.
CC 1157.	212.0	7217.	-1875.	9883.	1177.		286.	130.
CC 1156.	214.0	7278.	-1900.	9978.	1177.		286.	130.
CC 1155.	216.0	7339.	-1925.	10073.	1177.		286.	130.
CC 1154.	218.0	7400.	-1950.	10168.	1177.		286.	130.
CC 1153.	220.0	7461.	-1975.	10263.	1177.		286.	130.
CC 1152.	222.0	7522.	-2000.	10358.	1177.		286.	130.
CC 1151.	224.0	7583.	-2025.	10453.	1177.		286.	130.
CC 1150.	226.0	7644.	-2050.	10548.	1177.		286.	130.
CC 1149.	228.0	7705.	-2075.	10643.	1177.		286.	130.
CC 1148.	230.0	7766.	-2100.	10738.	1177.		286.	130.
CC 1147.	232.0	7827.	-2125.	10833.	1177.		286.	130.
CC 1146.	234.0	7888.	-2150.	10928.	1177.		286.	130.
CC 1145.	236.0	7949.	-2175.	11023.	1177.		286.	130.
CC 1144.	238.0	8010.	-2200.	11118.	1177.		286.	130.
CC 1143.	240.0	8071.	-2225.	11213.	1177.		286.	130.
CC 1142.	242.0	8132.	-2250.	11308.	1177.		286.	130.
CC 1141.	244.0	8193.	-2275.	11403.	1177.		286.	130.
CC 1140.	246.0	8254.</						

TEST 15 7MAC=0 1A,011= 5 DFC,X=24.7 D,10RT(AR,4PM=N) PROP,1 OCT 73

INPUT DATA	CORRECTED FOR	ZERO READINGS AND	SIGNS				
21 1264.	0.0	-90.30	49.00	-246.00	-125.00	10.00	-14.00
21 1256.	2.00	-220.00	-13.04	-237.50	-254.83	35.08	-13.00
21 1267.	4.00	-345.17	-72.92	-197.00	-391.67	60.17	-13.00
21 1256.	6.00	-464.24	-132.87	-98.50	-519.50	82.25	-13.00
21 1267.	8.00	-550.33	-146.81	52.00	-661.33	106.33	-13.00
21 1264.	10.00	-715.42	-242.79	268.50	-802.17	129.42	-5.00
21 1262.	12.00	-836.50	-291.74	535.00	-948.00	150.50	0.00
21 1241.	14.00	-943.64	-334.71	951.50	-1085.83	173.58	6.00
21 1252.	16.00	-1065.07	-371.67	1178.00	-1217.67	183.67	12.33
21 1252.	18.00	-1146.74	-390.62	1270.50	-1298.50	202.75	13.32
21 1234.	20.00	-1200.00	-108.54	-121.00	-1118.33	188.81	-20.58
21 1212.	25.00	-1061.92	-6.54	-694.50	-1063.17	186.92	-27.00
21 1149.	30.00	-1043.30	31.53	-896.00	-1075.00	157.00	-30.00
21 1277.	-2.00	73.92	109.46	-101.50	3.17	-15.92	-12.00
21 1277.	-4.00	147.08	172.42	-67.00	112.00	-42.83	-8.00
21 1202.	-6.00	290.47	233.77	133.50	260.00	-70.75	-6.00
21 1281.	-8.00	412.67	292.33	120.00	382.00	-100.00	2.00
21 1274.	-10.00	541.46	348.20	604.50	497.00	-130.00	9.00
21 1275.	-12.00	666.24	401.25	943.00	608.00	-160.00	17.00
21 1271.	-14.00	784.04	451.21	1307.50	710.00	-185.00	25.00
21 1266.	-16.00	890.01	488.17	1664.00	500.00	-215.00	33.00
21 1256.	-18.00	982.52	503.12	1830.50	380.00	-235.00	34.00
21 1241.	-20.00	960.43	253.04	15.00	970.00	-208.00	2.00
21 1221.	-25.00	904.21	100.04	-200.00	915.00	-195.00	-6.00
21 1204.	-30.00	931.33	74.00	-232.00	963.00	-194.00	-3.00

Appendix 6
(cont.)

TEST 15, JMACOJ 1A.CEL 5, EFFC.X.24.2 D.10.9FLA",000000) 0000,1 CT 71

MYCFLAP -0.1168

FLAPPED P:INFO DATA REFLECTION

ALPHA	FX-LB	FZ-LB	MX-INLR	MZ-INLR	FX-LB	FY-LB	FZ-LB	MX-INLR	MY-INLR	MZ-INLR	MYCFLAP-INLR	VEL-FPS
-0.00	2.46	8.51	65.25	-9.46	2.23	7.22	8.57	65.48	-9.00	-7.68	0.0	20.80
2.00	2.38	22.14	156.52	-4.01	2.44	7.75	22.12	153.99	2.00	-5.19	0.0	20.71
4.00	1.97	35.25	249.50	-1.02	3.47	9.12	35.13	240.23	13.00	-11.63	0.0	20.91
6.00	0.99	47.75	332.84	0.97	4.68	11.02	47.53	331.91	23.00	-24.08	0.0	20.71
8.00	-0.52	60.93	428.66	12.69	6.31	12.98	63.61	427.38	34.00	-35.44	0.0	20.91
10.00	-2.68	73.97	517.58	30.94	8.20	15.15	73.56	516.91	44.00	-45.39	0.0	20.78
12.00	-5.35	86.57	612.41	48.19	10.38	17.03	86.11	611.05	52.00	-63.76	0.0	20.76
14.01	-8.51	98.71	698.24	67.88	12.96	20.69	98.22	696.47	63.00	-84.09	0.0	20.76
16.01	-11.78	110.28	782.29	97.74	16.00	24.76	109.74	782.50	66.00	-95.39	0.0	20.75
18.01	-15.73	118.48	829.73	97.11	21.34	26.19	117.23	821.49	70.00	-145.90	0.0	20.69
20.00	1.21	105.17	722.67	3.16	19.67	20.38	103.18	686.64	19.00	-225.36	0.0	20.51
25.00	6.95	106.25	657.15	-7.43	46.61	17.13	94.72	636.86	0.0	-284.17	0.0	20.36
30.00	9.86	108.58	651.83	-4.60	59.69	18.94	91.62	606.17	-5.00	-331.49	0.0	20.15
-2.00	1.81	-4.49	-27.37	-5.78	2.05	6.77	-4.36	-26.95	-19.00	-7.47	0.0	20.89
-4.00	0.61	-17.43	-124.80	1.13	2.36	6.17	-17.29	-124.52	-31.00	-8.99	0.0	20.89
-6.00	-1.21	-31.72	-219.63	11.76	1.10	6.22	-31.19	-219.28	-42.00	-17.27	0.0	20.93
-8.00	-3.20	-44.19	-319.63	29.19	4.19	7.15	-44.11	-320.07	-52.00	-24.12	0.0	20.92
-10.01	-6.04	-57.61	-414.50	50.46	5.63	8.05	-57.67	-416.69	-62.00	-33.24	0.0	20.90
-12.01	-9.41	-70.64	-509.78	74.75	7.40	10.95	-70.88	-513.10	-72.00	-46.85	0.0	20.87
-14.01	-13.07	-82.97	-597.81	91.97	9.65	11.40	-83.18	-590.93	-81.00	-69.11	0.0	20.84
-16.01	-16.64	-93.96	-679.22	122.10	12.40	15.50	-94.61	-684.46	-97.00	-88.36	0.0	20.80
-18.02	-18.10	-103.29	-743.00	124.12	17.36	17.12	-103.46	-741.65	-90.00	-131.97	0.0	20.73
-20.00	-20.76	-98.57	-679.10	55.24	15.52	11.34	-91.65	-651.88	-45.00	-198.21	0.0	20.59
-25.00	2.01	-51.52	-610.80	70.66	42.72	7.23	-90.96	-555.65	-19.00	-254.48	0.0	20.42
-30.00	2.17	-57.84	-634.64	12.25	53.19	6.58	-92.15	-557.89	-13.00	-304.87	0.0	20.28

Appendix 6
(cont.)

TEST 15 ,ZMAC=0 1A,DEL= 5 DEG,X=24.7 D,108FLAP,RPM=NO PROP,1 OCT 73

OVCC= -0.436R

♦♦FLAPPED RUDDER DATA IN NCM-DIMENSIONAL FORM♦♦

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN10**6	CLSO
-0.00	0.067	0.0175	-0.0157	0.970	0.056	3.850	0.0	1.040	0.0044
2.00	0.173	0.0155	-0.0206	0.804	0.061	8.696	0.0	1.036	0.0700
4.00	0.273	0.0265	-0.0151	0.901	0.071	10.133	0.0	1.040	0.0743
6.00	0.372	0.0366	-0.0108	0.857	0.086	10.165	0.0	1.036	0.1384
8.00	0.470	0.0490	-0.0174	0.895	0.100	9.598	0.0	1.040	0.2211
10.00	0.572	0.0637	-0.0188	0.892	0.118	8.975	0.0	1.039	0.3273
12.00	0.671	0.0809	-0.0197	0.901	0.140	8.295	0.0	1.038	0.4499
14.01	0.766	0.1005	-0.0214	0.920	0.161	7.589	0.0	1.037	0.5863
16.01	0.856	0.1255	-0.0253	0.882	0.204	6.822	0.0	1.034	0.7329
18.01	0.920	0.1674	-0.0286	0.800	0.194	5.494	0.0	1.027	0.8450
20.00	0.822	0.2842	-0.0302	0.845	0.142	7.892	0.0	1.018	0.6756
25.00	0.768	0.3941	-0.1156	0.854	0.139	1.948	0.0	1.008	0.5892
30.00	0.757	0.4935	-0.1262	0.840	0.157	1.535	0.0	1.044	0.5737
-2.00	-0.034	0.0161	-0.0205	0.784	0.052	-2.088	0.0	1.044	0.0011
-4.00	-0.133	0.0181	-0.0236	0.915	0.047	-7.314	0.0	1.044	0.0177
-6.00	-0.239	0.0237	-0.0239	0.893	0.048	-10.071	0.0	1.046	0.0572
-8.00	-0.338	0.0321	-0.0240	0.921	0.055	-10.537	0.0	1.046	0.1146
-10.01	-0.443	0.0413	-0.0235	0.918	0.069	-10.245	0.0	1.045	0.1965
-12.01	-0.546	0.0570	-0.0234	0.919	0.084	-9.580	0.0	1.043	0.2986
-14.01	-0.645	0.0746	-0.0228	0.900	0.088	-8.640	0.0	1.042	0.4159
-16.01	-0.735	0.0970	-0.0194	0.910	0.120	-7.574	0.0	1.040	0.5396
-18.02	-0.808	0.1356	-0.0138	0.910	0.134	-5.961	0.0	1.036	0.6535
-20.00	-0.728	0.2814	0.0426	0.900	0.090	-2.588	0.0	1.029	0.5305
-25.00	-0.652	0.3439	0.0735	0.871	0.058	-1.895	0.0	1.021	0.4249
-30.00	-0.671	0.4343	0.0885	0.862	0.054	-1.545	0.0	1.014	0.4499

Appendix 6
(cont.)

TEST 15 ,ZMAC=0 IN,DEL= 5 DEG,X=24.7 D,108FLAP,RPM=NO PRUP,1 OCT 73

DYCCR= -0.4368

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CE	CM	CPL	CY	L/D	CMF	RN*10**-6	CLSQ
0.06	0.067	0.0174	-0.0197	0.970	0.056	3.934	0.0	1.040	0.0044
2.17	0.173	0.0204	-0.0204	0.884	0.051	8.482	0.0	1.036	0.0300
4.26	0.273	0.0281	-0.0191	0.901	0.071	9.685	0.0	1.040	0.0743
6.36	0.372	0.0385	-0.0188	0.897	0.066	9.560	0.0	1.036	0.1384
8.46	0.470	0.0527	-0.0174	0.895	0.100	8.924	0.0	1.040	0.2211
10.55	0.572	0.0652	-0.0188	0.892	0.118	8.264	0.0	1.039	0.3273
12.65	0.671	0.0984	-0.0197	0.901	0.140	7.588	0.0	1.039	0.4499
14.74	0.766	0.1107	-0.0214	0.900	0.161	6.916	0.0	1.038	0.5863
16.83	0.856	0.1373	-0.0253	0.892	0.204	6.214	0.0	1.037	0.7329
18.89	0.920	0.1816	-0.0286	0.870	0.194	5.065	0.0	1.034	0.8459
20.75	0.822	0.2955	-0.0902	0.845	0.162	2.782	0.0	1.027	0.6756
25.74	0.769	0.4040	-0.1156	0.854	0.139	1.900	0.0	1.018	0.5892
30.73	0.757	0.5031	-0.1282	0.840	0.157	1.506	0.0	1.008	0.5737
-2.03	-0.034	0.0161	-0.0205	0.794	0.052	-2.086	0.0	1.044	0.0011
-4.13	-0.133	0.0184	-0.0236	0.915	0.047	-7.216	0.0	1.044	0.0177
-6.23	-0.239	0.0247	-0.0239	0.893	0.048	-9.681	0.0	1.046	0.0572
-8.33	-0.338	0.0340	-0.0240	0.921	0.055	-9.943	0.0	1.046	0.1146
-10.43	-0.443	0.0466	-0.0235	0.918	0.069	-9.521	0.0	1.045	0.1965
-12.53	-0.546	0.0620	-0.0234	0.919	0.084	-8.808	0.0	1.043	0.2986
-14.63	-0.645	0.0816	-0.0228	0.900	0.088	-7.903	0.0	1.042	0.4159
-16.71	-0.735	0.1060	-0.0194	0.919	0.120	-6.929	0.0	1.040	0.5396
-18.80	-0.808	0.1466	-0.0138	0.910	0.134	-5.515	0.0	1.036	0.6535
-20.70	-0.728	0.2903	0.0426	0.900	0.090	-2.509	0.0	1.029	0.5305
-25.63	-0.652	0.3510	0.0735	0.871	0.058	-1.857	0.0	1.021	0.4249
-30.65	-0.671	0.4418	0.0885	0.862	0.054	-1.518	0.0	1.014	0.4499

CL CCEFFS	0.062605	0.048238	DYCOR	-0.43680
CD CCEFFS	0.017007	0.001005		

Appendix 6
(cont.)

TEST 14, ZMAC 0.1N, DEL=10.0DEG, X=24.7, 108 FLAP, RPM=NC PRCP28SEPT73

FLAPPEC RUDDER INPUT DATA

DF	TR	TT	AREA	SPAN	MAC	XMAC	ZMAC	AZL	DYCOR
10.0	78	83	44.30	7.875	5.7421	-0.7659	0.0	-2.00	-0.4368

ZERO READINGS BEFORE AND AFTER

ANOM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	100.	100.	0.	0.	100.	100.	100.	100.	100.	100.	0.	0.
0.	103.	102.	100.	101.	0.	0.	97.	101.	100.	100.	99.	102.	0.	0.

CELL LBS/COUNT 1=0.10000 2=0.01000 3=C.01000 4=C.10000 5=0.48970 6=0.20300 7=0.02273
 TWIST=11570.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1246.	-2.00	R	305.	N	203.	S	314.	R	325.	N	133.	A	84.		0.
00	1236.	0.0		427.		145.		310.		454.		155.	R	117.		0.
00	1228.	2.00		548.		85.		258.		581.		181.		117.		0.
00	1218.	4.00	R	657.	R	175.		156.		704.		202.		116.		0.
00	1214.	6.00		774.		228.		-10.		835.		224.		112.		0.
00	1208.	8.00		891.		278.		-224.		972.		246.		107.		0.
00	1200.	10.00		1000.		323.		-486.		1100.		262.		102.		0.
00	1196.	12.01		1107.		365.		-790.		1230.		283.		97.		0.
00	1189.	14.01		1211.		398.		-1108.		1356.		300.	N	113.		0.
00	1172.	16.02		1240.		326.		-472.		1328.		302.	R	94.		0.
00	1157.	18.00		1248.		181.		70.		1290.		307.		122.		0.
00	1134.	23.00		1222.		57.		682.		1213.		295.		131.		0.
00	1113.	28.00	N	1194.	N	181.		890.		1164.		270.		132.		0.
00	1261.	-4.00	R	184.	N	266.		264.		200.		108.		115.		0.
00	1261.	-6.00		58.		326.		156.	R	75.	N	81.	R	111.		0.
00	1257.	-8.00	N	271.		386.		0.	N	244.	R	147.		107.		0.
00	1258.	-10.00		396.		444.		-202.		366.		175.		102.		0.
00	1255.	-12.00		521.		500.		-470.		481.		203.		96.		0.
00	1255.	-14.00		645.		554.		-786.		591.		232.	N	114.		0.
00	1250.	-16.00		760.		601.		-1136.		691.		260.		122.		0.
00	1246.	-18.00		871.		637.		-1502.		785.		287.		130.		0.
00	1241.	-20.00		970.		658.		-1762.		870.		310.		135.		0.
00	1219.	-22.00		982.		438.		-518.		895.		287.		107.		0.
00	1196.	-27.00		963.		281.		166.		857.		273.		94.		0.
00	1182.	-32.00		970.		245.		348.		857.		270.	R	108.		0.

TEST 14, ZMAC 0.IN, DEL=10.0DEG, X=24.7, 10X FLAP, RPM=NG PRCP28SEPT73

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS									
21 1246.	0.0	-205.00	103.00	-314.00	-225.00	33.00	-16.00	0.0	
21 1236.	2.00	-326.92	45.00	-310.00	-353.96	55.00	-16.92	0.0	
21 1228.	4.00	-447.83	-15.00	-258.00	-480.52	81.00	-16.83	0.0	
21 1218.	6.00	-556.75	-74.88	-156.00	-603.87	124.00	-15.75	0.0	
21 1214.	8.00	-673.67	-127.83	10.00	-734.83	124.00	-11.67	0.0	
21 1208.	10.00	-790.58	-177.79	224.00	-871.79	146.00	-6.58	0.0	
21 1200.	12.00	-899.50	-222.75	486.00	-999.75	162.00	-1.50	0.0	
21 1196.	14.01	-1006.42	-264.71	790.00	-1129.71	183.00	3.58	0.0	
21 1189.	16.01	-1110.33	-297.67	1108.00	-1255.67	200.00	15.33	0.0	
21 1172.	18.02	-1139.25	-225.62	472.00	-1227.62	302.00	-5.63	0.0	
21 1157.	20.00	-1147.17	-80.58	-70.00	-1189.58	207.00	-21.17	0.0	
21 1134.	25.00	-1121.08	43.46	-682.00	-1112.54	199.00	-30.08	0.0	
21 1113.	30.00	-1093.00	81.00	-890.00	-1063.50	196.00	-31.00	0.0	
21 1261.	-2.00	-82.92	166.00	-264.00	-99.46	8.00	-13.92	0.0	
21 1261.	-4.00	43.17	226.00	-156.00	25.58	-19.00	-9.85	0.0	
21 1257.	-6.00	169.12	286.00	0.0	145.87	-47.00	-5.75	0.0	
21 1258.	-8.00	294.00	344.00	202.00	268.00	-75.00	-0.67	0.0	
21 1255.	-10.00	418.87	400.00	470.00	383.12	-103.00	5.42	0.0	
21 1255.	-12.00	542.75	454.00	786.00	493.25	-132.00	14.75	0.0	
21 1250.	-14.00	657.62	501.00	1136.00	593.37	-160.00	22.79	0.0	
21 1246.	-16.00	768.50	537.00	1502.00	687.50	-187.00	30.83	0.0	
21 1241.	-18.00	867.37	558.00	1762.00	772.62	-216.00	35.87	0.0	
21 1219.	-20.00	879.25	338.00	518.00	797.75	-187.00	7.92	0.0	
21 1196.	-25.00	860.12	181.00	-166.00	759.87	-173.00	-5.04	0.0	
21 1182.	-30.00	867.00	145.00	-348.00	760.00	-170.00	-6.00	0.0	

Appendix 6
(cont.)

TEST 14, ZMAC DE=10.0DEG, X=24.7, 10R FLAP, RPM=NO PROP28SEPT73

DY OR= -0.436P

♦♦FLAPPED RUDDER DATA REDUCTION♦♦

ALPHA	FX-LB	FZ-LB	MX-INLB	MZ-INLB	FXC-LB	FYC-LB	FZO-LB	MXO-INLR	MYO-INLB	MZO-INLB	HYOFLAP-INLB	VEL-FPS
-0.00	3.14	19.47	142.36	-17.46	2.61	6.41	19.55	142.79	-18.00	-13.59	0.0	20.61
2.00	3.10	32.24	225.50	-13.37	3.35	8.74	32.22	225.39	-8.00	-15.08	0.0	20.53
4.00	2.58	44.93	319.67	-15.67	4.49	8.71	44.78	318.72	2.00	-29.24	0.0	20.47
6.00	1.56	56.42	402.26	-9.75	5.92	10.53	56.13	400.30	13.00	-40.84	0.0	20.38
8.00	-0.10	68.64	489.21	4.44	7.60	12.05	68.22	486.62	23.00	-50.43	0.0	20.35
10.00	-2.24	80.84	579.94	21.88	9.64	13.47	80.29	576.87	32.00	-63.45	0.0	20.30
12.00	-4.86	92.18	651.42	44.18	11.92	17.93	91.53	648.64	40.00	-74.56	0.0	20.23
14.01	-7.90	103.29	740.04	56.63	14.55	19.64	102.56	734.85	47.00	-104.21	0.0	20.20
16.01	-11.08	114.01	816.20	89.76	17.71	21.98	113.17	812.79	53.00	-116.70	0.0	20.14
18.02	-4.72	116.18	794.88	41.98	28.35	22.03	112.76	774.21	40.00	-184.92	0.0	19.99
20.00	0.70	115.52	789.77	-7.24	37.20	18.52	109.37	746.95	14.00	-256.64	0.0	19.86
25.00	6.82	111.67	737.51	-21.95	50.67	16.97	99.75	667.93	-7.00	-313.47	0.0	19.67
30.00	8.90	108.49	696.10	-16.98	59.49	16.71	91.16	604.03	-14.00	-346.41	0.0	19.48
-2.00	2.64	6.63	52.71	-13.84	2.22	5.65	6.78	53.46	-29.00	-10.54	0.0	20.74
-4.00	1.56	-6.58	-40.84	-2.52	2.19	5.55	-6.39	-40.40	-40.00	-6.47	0.0	20.74
-6.00	0.0	-19.77	-134.53	9.91	2.60	6.42	-19.60	-134.66	-51.00	-7.88	0.0	20.71
-8.01	-2.02	-32.84	-229.93	22.93	3.46	6.90	-32.72	-230.55	-61.00	-15.59	0.0	20.69
-10.01	-4.70	-45.89	-321.19	38.69	4.59	7.89	-45.90	-322.43	-72.00	-36.48	0.0	20.69
-12.01	-7.86	-58.82	-412.96	66.72	6.15	9.22	-59.02	-417.09	-81.00	-31.99	0.0	20.69
-14.01	-11.36	-70.77	-500.27	90.52	8.04	11.32	-71.23	-506.22	-90.00	-47.02	0.0	20.65
-16.01	-15.02	-82.22	-583.39	113.96	10.49	13.53	-82.92	-590.59	-96.00	-67.40	0.0	20.61
-18.01	-17.62	-92.32	-655.56	128.48	14.31	15.29	-92.89	-660.74	-100.00	-88.45	0.0	20.57
-20.01	-5.18	-91.31	-607.30	43.79	28.74	7.16	-86.82	-580.89	-60.00	-182.47	0.0	20.39
-25.00	1.66	-87.82	-559.24	21.22	40.74	6.74	-77.81	-509.70	-32.00	-231.10	0.0	20.20
-30.00	3.48	-88.15	-548.86	21.37	49.11	5.48	-73.29	-478.85	-26.00	-269.08	0.0	20.03

Appendix 6
(cont.)

TEST 14, ZMAC 0.1N, DEL=10.0DEG, X=24.7, FLAP, RPP=AC PRCP28SEPT73

DYCOR = -0.4368

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN*10 ⁻⁶	CLSQ
-0.00	0.155	0.0206	-0.0455	0.528	0.051	7.456	0.0	1.098	0.0239
2.00	0.257	0.0267	-0.0457	0.888	0.070	5.625	0.0	1.054	0.0660
4.00	0.359	0.0360	-0.0456	0.904	0.070	5.978	0.0	1.090	0.1292
6.00	0.454	0.0479	-0.0429	0.906	0.085	5.482	0.0	1.086	0.2063
8.00	0.554	0.0617	-0.0422	0.906	0.098	8.981	0.0	1.084	0.3067
10.00	0.655	0.0787	-0.0429	0.912	0.114	8.325	0.0	1.081	0.4290
12.00	0.752	0.0979	-0.0441	0.900	0.147	7.680	0.0	1.078	0.5651
14.01	0.845	0.1199	-0.0464	0.910	0.162	7.050	0.0	1.076	0.7142
16.01	0.938	0.1468	-0.0498	0.912	0.182	6.385	0.0	1.073	0.8798
18.02	0.948	0.2387	-0.0722	0.872	0.185	3.972	0.0	1.065	0.8990
20.00	0.932	0.3168	-0.1111	0.867	0.161	2.940	0.0	1.058	0.8679
25.00	0.867	0.4404	-0.1409	0.850	0.148	1.968	0.0	1.048	0.7514
30.00	0.807	0.5267	-0.1506	0.841	0.148	1.532	0.0	1.038	0.6516
-2.00	0.053	0.0174	-0.0465	1.001	0.044	3.052	0.0	1.105	0.0028
-4.00	-0.050	0.0171	-0.0476	0.802	0.043	-2.920	0.0	1.105	0.0025
-6.00	-0.154	0.0204	-0.0489	0.872	0.050	-7.532	0.0	1.103	0.0236
-8.01	-0.256	0.0271	-0.0497	0.895	0.054	-5.446	0.0	1.104	0.0657
-10.01	-0.360	0.0361	-0.0500	0.892	0.062	-9.992	0.0	1.102	0.1239
-12.01	-0.463	0.0483	-0.0486	0.857	0.072	-5.593	0.0	1.102	0.2148
-14.01	-0.562	0.0634	-0.0425	0.903	0.089	-8.854	0.0	1.100	0.3153
-16.01	-0.656	0.0830	-0.0446	0.904	0.107	-7.904	0.0	1.098	0.4301
-18.01	-0.738	0.1136	-0.0395	0.903	0.121	-6.492	0.0	1.094	0.5441
-20.01	-0.702	0.2323	0.0146	0.850	0.058	-3.021	0.0	1.086	0.4926
-25.00	-0.641	0.3358	0.0510	0.822	0.056	-1.909	0.0	1.076	0.4111
-30.00	-0.611	0.4094	0.0606	0.830	0.044	-1.492	0.0	1.070	0.3734

Appendix 6
(cont.)

TEST 14, ZMAC 0.1N, DEL=10.0DEG, X=24.7, 103 FLAP, RPM=NO PROP28SEPT73

DYCOR= -0.4368

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CV	L/D	CMF	RH=1000-6	CLSQ
0.15	0.155	0.0210	-0.0455	0.928	0.051	7.354	0.0	1.098	0.0239
2.25	0.257	0.0278	-0.0457	0.888	0.070	9.246	0.0	1.094	0.0660
4.35	0.359	0.0382	-0.0456	0.904	0.070	9.413	0.0	1.090	0.1292
6.44	0.454	0.0514	-0.0429	0.904	0.085	8.844	0.0	1.086	0.2063
8.53	0.554	0.0668	-0.0422	0.906	0.098	8.291	0.0	1.084	0.3067
10.63	0.655	0.0859	-0.0429	0.912	0.114	7.629	0.0	1.081	0.4290
12.73	0.752	0.1073	-0.0441	0.900	0.147	7.003	0.0	1.078	0.5651
14.83	0.845	0.1318	-0.0464	0.910	0.162	6.411	0.0	1.076	0.7142
16.92	0.938	0.1616	-0.0498	0.912	0.182	5.806	0.0	1.073	0.8798
18.94	0.948	0.2537	-0.0772	0.872	0.185	3.737	0.0	1.065	0.8990
20.90	0.932	0.3314	-0.1111	0.867	0.161	2.811	0.0	1.058	0.8679
25.83	0.867	0.4530	-0.1409	0.850	0.148	1.914	0.0	1.048	0.7514
30.78	0.807	0.5376	-0.1506	0.841	0.148	1.501	0.0	1.038	0.6516
-1.95	0.053	0.0174	-0.0465	1.001	0.044	3.043	0.0	1.105	0.0028
-4.05	-0.050	0.0172	-0.0476	0.802	0.043	-2.912	0.0	1.105	0.0025
-6.15	-0.154	0.0208	-0.0489	0.872	0.050	-7.388	0.0	1.103	0.0236
-8.25	-0.256	0.0282	-0.0487	0.895	0.054	-9.078	0.0	1.104	0.0657
-10.35	-0.360	0.0382	-0.0500	0.892	0.042	-9.424	0.0	1.102	0.1299
-12.45	-0.463	0.0519	-0.0486	0.897	0.072	-8.928	0.0	1.102	0.2148
-14.55	-0.562	0.0687	-0.0485	0.903	0.089	-8.173	0.0	1.100	0.3153
-16.64	-0.656	0.0902	-0.0446	0.904	0.107	-7.273	0.0	1.098	0.4301
-18.72	-0.738	0.1227	-0.0395	0.903	0.121	-6.010	0.0	1.096	0.5441
-20.68	-0.702	0.2406	0.0146	0.850	0.058	-2.917	0.0	1.086	0.4926
-25.62	-0.641	0.3427	0.0510	0.832	0.056	-1.871	0.0	1.076	0.4111
-30.59	-0.611	0.4157	0.0606	0.830	0.046	-1.470	0.0	1.070	0.3734

CL CCEFFS	0.142361	0.048170	DYCOR	-0.4368
CD CDEFFS	0.020980	0.002129		

Appendix 6
(cont.)

TEST 13, ZMAC C.IN.OEL=15.0 DEG,X=24.7, 1C, FLAP,RPM=ND PRNP 28SEPT73

FLAPREC RUOCFR INPUT DATA

CF	TR	IT	AREA	SPAN	MAC	XMAC	ZMAC	AZL	DYCOR
15.0	75	87	44.30	7.875	5.7421	-0.7699	0.0	-2.00	-0.4368

ZERO READINGS BEFORE AND AFTER

ANCM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
C.	ICC.	100.	100.	100.	C.	0.	100.	100.	100.	100.	100.	100.	0.	0.
C.	58.	102.	99.	101.	-4.	-4.	101.	100.	100.	101.	101.	99.	0.	0.

CELL LRS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=C.10000 5=0.49970 6=0.20090 7=0.02273
TWIST=11570.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANCM	ANGLF	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1262.	-2.0	R	355.	N	256.	398.	R	406.	N	151.	R	81.	0.	0.	0.
OC	1260.	2.0	C	524.	194.	384.	324.	677.	199.	175.	119.	0.	0.	0.	0.	0.
CC	1256.	2.0	C	643.	134.	324.	208.	801.	221.	221.	118.	0.	0.	0.	0.	0.
OO	1255.	4.0	C	757.	72.	30.	940.	1085.	242.	113.	108.	0.	0.	0.	0.	0.
OO	1253.	6.0	R	880.	181.	-200.	1732.	283.	263.	103.	95.	0.	0.	0.	0.	0.
CC	1249.	R.C	C	1004.	232.	-482.	1376.	308.	326.	91.	108.	0.	0.	0.	0.	0.
OC	1247.	10.0	C	1127.	278.	-812.	1498.	326.	326.	108.	122.	0.	0.	0.	0.	0.
OC	1243.	12.0	C	1247.	320.	-1078.	1460.	330.	330.	122.	130.	0.	0.	0.	0.	0.
CC	1239.	14.0	C	1351.	758.	152.	1425.	315.	315.	133.	133.	0.	0.	0.	0.	0.
OO	1221.	16.0	C	1369.	278.	-496.	1286.	125.	125.	115.	115.	0.	0.	0.	0.	0.
CC	1205.	18.0	C	1388.	135.	728.	284.	98.	98.	111.	111.	0.	0.	0.	0.	0.
OC	1181.	23.0	C	1315.	206.	942.	250.	72.	72.	108.	108.	0.	0.	0.	0.	0.
OO	1162.	28.0	C	1320.	234.	354.	100.	158.	158.	102.	102.	0.	0.	0.	0.	0.
CC	1263.	-4.0	R	273.	314.	374.	30.	186.	186.	94.	94.	0.	0.	0.	0.	0.
OC	1263.	-6.0	C	145.	374.	434.	410.	215.	215.	116.	116.	0.	0.	0.	0.	0.
CC	1266.	-8.0	C	20.	434.	493.	522.	248.	248.	132.	132.	0.	0.	0.	0.	0.
CC	1266.	-10.0	C	306.	493.	550.	-352.	272.	272.	106.	106.	0.	0.	0.	0.	0.
OO	1265.	-12.0	C	430.	550.	602.	-660.	291.	291.	88.	88.	0.	0.	0.	0.	0.
CC	1263.	-14.0	C	556.	602.	641.	-1024.	259.	259.	108.	108.	0.	0.	0.	0.	0.
CC	1260.	-16.0	C	653.	641.	704.	-1394.	803.	803.	0.	0.	0.	0.	0.	0.	0.
OO	1256.	-18.0	C	802.	704.	729.	-1620.	804.	804.	0.	0.	0.	0.	0.	0.	0.
CC	1249.	-20.0	C	880.	729.	338.	276.	476.	476.	0.	0.	0.	0.	0.	0.	0.
OO	1230.	-22.0	C	500.	338.	318.	476.	476.	476.	0.	0.	0.	0.	0.	0.	0.
OC	1212.	-27.0	C	873.	318.	318.	476.	476.	476.	0.	0.	0.	0.	0.	0.	0.
CC	1156.	-32.0	C	885.	318.	318.	476.	476.	476.	0.	0.	0.	0.	0.	0.	0.

TEST 13, ZMAC 0.1A,CFL=15.0 DEG,X=24.7, IC, FLAP,RP4=NO PROP 28SEPT73

INPUT DATA	CORRECTED	FOR	ZERC	READINGS	AND	SIGNS			
21 1262.	0.0	-295.00	156.00	-398.00	-306.00	51.00	-19.00	0.0	
21 1260.	2.00	-423.92	94.04	-384.17	-444.00	75.00	-19.04	0.0	
21 1256.	4.00	-542.83	34.08	-324.33	-577.00	97.00	-18.08	0.0	
21 1255.	6.00	-656.75	-27.88	-208.50	-701.00	121.00	-18.12	0.0	
21 1253.	8.00	-779.67	-80.83	-30.67	-840.00	142.00	-13.17	0.0	
21 1249.	10.00	-903.58	-131.79	199.17	-985.00	163.00	-8.21	0.0	
21 1247.	12.00	-1026.50	-177.75	487.00	-1132.00	183.00	-3.25	0.0	
21 1245.	14.00	-1146.42	-219.71	810.83	-1276.00	208.00	4.71	0.0	
21 1239.	16.00	-1250.33	-257.67	1076.67	-1398.00	226.00	8.67	0.0	
21 1221.	18.00	-1268.25	-177.62	494.50	-1360.00	228.00	-8.37	0.0	
21 1205.	20.00	-1287.17	-34.58	-153.67	-1325.00	230.00	-22.42	0.0	
21 1181.	25.00	-1214.08	106.44	-725.83	-1211.00	215.00	-30.46	0.0	
21 1162.	30.00	-1219.00	134.50	-944.00	-1186.00	212.00	-37.50	0.0	
21 1263.	-3.00	-171.92	214.54	-356.17	-184.00	25.00	-15.54	0.0	
21 1263.	-4.00	-43.83	274.58	-252.33	-55.00	-2.00	-11.58	0.0	
21 1266.	-6.00	81.25	334.62	-102.50	70.00	-28.00	-8.62	0.0	
21 1266.	-8.00	207.31	393.67	95.33	190.33	-57.33	-2.67	0.0	
21 1263.	-10.00	331.42	450.71	349.17	309.29	-85.29	5.29	0.0	
21 1263.	-12.00	457.50	502.75	657.00	421.25	-114.25	12.25	0.0	
21 1260.	-14.00	594.58	541.75	1020.83	541.21	-147.21	15.21	0.0	
21 1256.	-16.00	703.67	577.83	1390.67	631.17	-171.17	25.17	0.0	
21 1245.	-18.00	781.75	604.87	1616.50	699.12	-190.12	31.13	0.0	
21 1230.	-20.00	801.83	429.92	610.33	738.08	-178.08	5.08	0.0	
21 1212.	-25.00	774.92	238.96	-279.83	702.04	-158.04	-12.96	0.0	
21 1196.	-30.00	787.00	219.00	-480.00	703.00	-156.00	-9.00	0.0	

Appendix 6
(cont.)

TEST 13, ZMAC 0.1N,DEL=1N,C NEG,X=24.7, 1C, FLAP,RPM=NC, PRCP 29SEPT73

DYCCR= -0.4368

••FLAPPED RUNNER DATA REDUCTION••

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXO-LR	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
-0.00	3.98	27.94	204.88	-76.23	3.22	6.26	28.04	205.52	-28.00	-20.64	0.0	20.74
2.00	3.94	41.45	255.94	-19.87	4.16	6.32	41.42	295.78	-16.00	-22.12	0.0	20.72
4.00	3.24	52.94	384.70	-14.01	5.53	9.69	53.76	387.84	-6.00	-30.53	0.0	20.69
6.00	2.39	65.95	472.51	-13.93	7.18	11.32	65.59	470.02	5.00	-50.45	0.0	20.68
8.00	0.31	78.77	558.53	7.21	9.14	13.95	78.24	555.82	14.00	-55.45	0.0	20.67
10.00	-1.99	91.68	647.81	28.00	11.48	17.19	90.98	644.91	23.00	-67.35	0.0	20.63
12.00	-4.87	104.43	736.05	48.46	14.13	21.11	103.98	732.65	31.00	-85.67	0.0	20.62
14.00	-8.11	116.84	838.91	67.83	17.24	21.68	115.84	833.83	39.00	-114.43	0.0	20.58
16.00	-10.77	127.61	915.41	80.60	21.39	24.29	126.26	906.59	46.00	-150.16	0.0	20.55
18.00	-4.95	128.60	993.62	13.32	31.65	22.96	124.74	866.53	31.00	-220.90	0.0	20.40
20.00	1.54	129.06	876.16	0.43	42.27	21.33	121.95	831.33	6.00	-276.68	0.0	20.27
25.00	7.30	120.34	803.72	-13.93	54.56	18.94	107.51	731.88	-19.00	-332.45	0.0	20.06
30.00	9.44	120.56	778.67	-17.78	65.71	18.57	101.51	676.25	-24.00	-386.43	0.0	19.90
-2.00	3.56	15.05	114.66	-14.57	2.62	6.10	15.24	115.34	-38.00	-7.41	0.0	20.75
-4.00	2.52	1.64	19.67	-4.84	2.35	5.63	1.87	20.05	-49.00	-2.93	0.0	20.75
-6.00	1.02	-11.47	-71.35	-1.05	2.53	5.26	-11.24	-70.59	-60.00	-10.43	0.0	20.77
-8.00	-0.95	-24.67	-169.01	18.06	3.16	6.40	-24.49	-169.66	-70.00	-10.27	0.0	20.77
-10.00	-3.49	-37.65	-262.80	19.46	4.13	6.61	-37.58	-265.37	-81.00	-14.01	0.0	20.76
-12.00	-6.57	-50.78	-354.60	59.07	5.52	8.21	-50.90	-354.56	-90.00	-25.73	0.0	20.75
-14.00	-10.21	-64.88	-458.54	66.46	7.57	11.77	-65.24	-459.56	-97.00	-59.00	0.0	20.72
-16.00	13.91	-76.14	-530.95	92.49	9.72	12.52	-76.74	-534.11	-104.00	-72.04	0.0	20.69
-18.00	-16.16	-84.22	-590.25	110.83	12.97	13.63	-84.77	-593.29	-108.00	-93.21	0.0	20.63
-20.00	-6.10	-84.48	-576.90	15.38	25.37	9.30	-80.81	-549.52	-77.00	-179.12	0.0	20.48
-25.00	2.40	-79.88	-517.30	-5.76	38.22	6.74	-70.20	-460.11	-43.00	-236.48	0.0	20.32
-30.00	4.90	-80.89	-507.05	13.35	46.43	4.89	-66.41	-439.02	-39.00	-254.04	0.0	20.19

Appendix 6
(cont.)

TEST 13, ZMAC C.IA,DEL=15.0 DEG,X=24.7, 1C, FLAP,APM=NO PROP 28SEP173

DYCCP= -0.4368

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CC	CM	CPL	CY	L/D	CMF	RA=1000-6	CLSQ
-0.00	0.219	0.0251	-0.0675	0.931	0.049	8.717	0.0	1.094	0.0480
2.00	0.324	0.0325	-0.0654	0.907	0.045	9.963	0.0	1.093	0.1051
4.00	0.422	0.0434	-0.0651	0.916	0.076	9.714	0.0	1.091	0.1781
6.00	0.515	0.0564	-0.0627	0.910	0.089	9.135	0.0	1.091	0.2656
8.00	0.616	0.0719	-0.0635	0.902	0.110	8.564	0.0	1.090	0.3791
10.00	0.718	0.0906	-0.0653	0.900	0.136	7.924	0.0	1.088	0.5158
12.00	0.819	0.1117	-0.0678	0.898	0.167	7.332	0.0	1.087	0.6708
14.00	0.919	0.1368	-0.0701	0.914	0.172	6.718	0.0	1.086	0.8444
16.00	1.005	0.1702	-0.0720	0.912	0.193	5.904	0.0	1.034	1.0097
18.00	1.007	0.2355	-0.0704	0.882	0.185	5.942	0.0	1.076	1.0148
20.00	0.996	0.3459	-0.1330	0.866	0.175	5.885	0.0	1.069	0.9958
25.00	0.858	0.4555	-0.1625	0.864	0.158	5.970	0.0	1.052	0.8057
30.00	0.861	0.5576	-0.1729	0.846	0.159	5.545	0.0	1.050	0.7420
-2.00	0.119	0.0205	-0.0675	0.961	0.048	5.817	0.0	1.094	0.0142
-4.00	0.015	0.0184	-0.0654	1.358	0.044	0.797	0.0	1.094	0.0002
-6.00	-0.098	0.0197	-0.0654	0.798	0.041	-4.449	0.0	1.096	0.0077
-8.00	-0.191	0.0246	-0.0652	0.880	0.050	-7.752	0.0	1.096	0.0364
-10.00	-0.291	0.0322	-0.0705	0.897	0.052	-9.110	0.0	1.095	0.0858
-12.00	-0.397	0.0431	-0.0690	0.894	0.064	-9.219	0.0	1.094	0.1579
-14.00	-0.511	0.0553	-0.0639	0.895	0.092	-8.615	0.0	1.093	0.2606
-16.00	-0.603	0.0743	-0.0617	0.893	0.058	-7.901	0.0	1.091	0.3634
-18.00	-0.669	0.1024	-0.0589	0.889	0.109	-6.536	0.0	1.086	0.4479
-20.00	-0.648	0.2034	-0.0165	0.963	0.075	-3.185	0.0	1.080	0.4197
-25.00	-0.571	0.3110	0.0261	0.932	0.055	-1.836	0.0	1.072	0.3261
-30.00	-0.548	0.3828	0.0332	0.839	0.040	-1.430	0.0	1.065	0.2998

Appendix 6
(cont.)

TEST 13, ZMAC 0.1A,OFL=15.0 DEG,X=24.7, IC, FLAP,RPM=NO PROP 28SEPT73

DYCCFV -0.4368

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CC	CM	CPL	CY	L/D	CMF	RNOL000-6	CLSQ
0.21	C.219	0.0259	-0.3675	0.931	0.049	8.447	0.0	1.034	0.0480
2.31	C.324	0.0345	-0.3654	0.907	0.065	9.452	0.0	1.093	0.1051
4.41	0.422	0.0464	-0.0451	0.916	0.076	9.090	0.0	1.091	0.1781
6.50	C.515	0.0609	-0.0627	0.910	0.085	8.447	0.0	1.091	0.2656
8.59	C.616	0.0782	-0.0635	0.902	0.110	7.470	0.0	1.090	0.3791
10.69	C.718	0.0993	-0.0633	0.900	0.136	7.115	0.0	1.088	0.5122
12.76	C.819	0.1225	-0.0678	0.898	0.167	6.662	0.0	1.087	0.6708
14.85	C.919	0.1505	-0.0701	0.914	0.172	6.081	0.0	1.086	0.8444
16.97	1.005	0.1871	-0.0720	0.912	0.193	5.370	0.0	1.084	1.0097
18.97	1.007	0.2725	-0.0954	0.882	0.185	3.894	0.0	1.076	1.7928
20.96	C.554	0.3626	-0.1330	0.866	0.175	2.752	0.0	1.065	0.9438
22.96	C.858	0.4690	-0.1625	0.864	0.158	1.914	0.0	1.050	0.9952
30.87	C.861	0.5700	-0.1729	0.846	0.158	1.511	0.0	1.050	0.7475
-1.85	0.115	0.0207	-0.0675	0.961	0.048	5.750	0.0	1.094	0.0547
-3.95	0.015	0.0184	-0.0634	1.358	0.044	0.797	0.0	1.094	0.0575
-6.05	-0.090	0.0159	-0.0654	0.798	0.041	-4.420	0.0	1.096	0.0077
-8.19	-0.191	0.0252	-0.0692	0.880	0.050	-7.565	0.0	1.096	0.0364
-10.25	-0.291	0.0336	-0.0725	0.897	0.052	-8.720	0.0	1.095	0.0858
-12.39	-0.397	0.0457	-0.0690	0.894	0.064	-8.886	0.0	1.094	0.1579
-14.50	-0.511	0.0636	-0.0634	0.895	0.092	-8.024	0.0	1.093	0.2606
-16.59	-0.607	0.0824	-0.0617	0.883	0.098	-7.318	0.0	1.091	0.3634
-18.65	-0.669	0.1059	-0.0589	0.889	0.109	-6.690	0.0	1.088	0.4479
-20.63	-0.648	0.2104	-0.0165	0.863	0.075	-3.079	0.0	1.080	0.9197
-25.55	-0.571	0.3163	0.0261	0.832	0.053	-1.805	0.0	1.072	0.3261
-30.53	-0.548	0.3878	0.0372	0.819	0.041	-1.412	0.0	1.065	0.2598

CL COEFFS 0.203970 0.048359 0.000375 DYCCFV -0.43680
 CD COEFFS 0.024955 0.002927

Appendix 6
 (cont.)

FSI 12, ZMAC 0.1A, DEL=20.0 DEG, X=24.7, 102 FLAP, RPM=NO PROPOSEPT73

FLAPPED RUDDER INPUT DATA

CC TR TS TT AREA SPAN MAC XMAC ZMAC AZL DYCOR
26.0 15 61 44.30 7.875 5.7421 -0.7699 0.0 -2.00 -0.4368

ZERO READINGS BEFORE AND AFTER

1-N 1-N 2-A 2-R 3-R 4-N 4-R 5-M 5-R 6-N 6-R 7-M 7-R
0. 100. 100. 100. 0. 100. 100. 100. 100. 100. 100. 0. 0.
0. 101. 101. 100. -6. -6. 100. 105. 99. 101. 100. 0. 0.

CELL LMS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=C.10000 5=0.49970 6=0.20000 7=0.02273
TWIST=11570.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TR	ANGLE	S	1	2	3	4	5	6	7
21	1268.	-2.0	R	434.	496.	445.	156.	78.	0.
00	1269.	0.0	R	568.	478.	585.	184.	120.	0.
00	1271.	2.0	R	698.	414.	722.	208.	122.	0.
CC	1270.	4.0	R	824.	292.	865.	230.	120.	0.
00	1268.	6.1	R	954.	88.	1025.	254.	115.	0.
CC	1262.	8.0	R	1094.	-142.	1173.	279.	113.	0.
00	1261.	10.0	R	1228.	-440.	1330.	303.	107.	0.
CC	1243.	12.0	R	1345.	-780.	1475.	326.	101.	0.
CC	1250.	14.1	R	1455.	-970.	1600.	341.	98.	0.
00	1228.	16.0	R	1460.	-178.	1528.	343.	82.	0.
CC	1209.	18.1	R	1468.	-400.	1470.	342.	68.	0.
00	1185.	23.0	R	1370.	930.	1343.	322.	137.	0.
00	1163.	28.0	R	1395.	1050.	1355.	324.	138.	0.
CC	1277.	-4.0	R	310.	454.	320.	132.	121.	0.
CC	1283.	-6.0	R	180.	352.	190.	105.	116.	0.
CC	1286.	-8.0	R	50.	194.	60.	77.	113.	0.
00	1286.	-10.0	R	276.	-74.	265.	49.	100.	0.
00	1285.	-12.0	R	400.	-290.	382.	21.	101.	0.
CC	1282.	-14.0	R	528.	-584.	500.	208.	94.	0.
00	1277.	-16.0	R	673.	-962.	625.	241.	82.	0.
00	1265.	-18.0	R	810.	-1364.	743.	272.	126.	0.
CC	1266.	-20.0	R	930.	-1696.	845.	302.	132.	0.
00	1246.	-22.0	R	933.	-672.	860.	284.	102.	0.
00	1225.	-27.0	R	873.	338.	860.	261.	86.	0.
CC	1210.	-32.0	R	864.	588.	860.	256.	86.	0.

Appendix 6
(cont.)

TEST 12, ZMAC 0.1N, DEL=20.0 DEG, X=24.7, 108 FLAP, RPM=ND PROP8SEPT73

IMPLY DATA	CORRECTED	FOR	ZERO READINGS AND	SIGNS			
21 1268.	0.0	-334.00	167.00	-496.00	-345.00	56.00	-22.00
21 1269.	2.00	-467.96	107.96	-478.25	-484.79	84.04	-19.96
21 1271.	4.00	-597.92	48.92	-414.50	-621.58	108.08	-21.92
21 1270.	6.00	-723.87	-9.12	-292.75	-764.37	130.12	-19.88
21 1268.	8.10	-865.83	-63.00	-89.00	-924.17	154.17	-14.83
21 1262.	10.01	-993.79	-106.00	140.75	-1071.96	179.21	-12.79
21 1261.	12.03	-1127.75	-148.00	438.50	-1228.75	203.25	-6.75
21 1265.	14.03	-1244.71	-183.00	778.25	-1373.54	226.29	-0.71
21 1250.	16.03	-1354.67	-225.00	968.00	-1498.33	241.33	2.33
21 1228.	18.00	-1359.62	-104.00	175.71	-1426.12	243.37	-18.00
21 1209.	20.03	-1367.58	43.00	-402.50	-1367.02	242.42	-32.00
21 1185.	25.03	-1269.54	159.54	-932.75	-1240.71	222.46	-36.54
21 1163.	30.02	-1294.50	179.50	-1053.00	-1252.50	224.50	-37.10
21 1277.	-2.00	-209.46	227.46	-459.25	-217.29	32.54	-20.46
21 1283.	-4.00	-79.42	289.42	-355.50	-87.08	5.58	-17.42
21 1286.	-6.00	50.62	350.37	-147.75	43.12	-22.38	-12.38
21 1285.	-8.00	179.33	409.33	22.00	165.00	-50.33	-7.33
21 1282.	-10.00	303.51	465.29	275.75	282.00	-78.29	-0.29
21 1277.	-12.00	431.75	519.25	579.50	400.00	-107.25	6.75
21 1277.	-14.00	576.96	554.21	937.25	525.00	-140.21	18.79
21 1265.	-16.00	714.17	579.17	1359.00	643.00	-171.17	26.00
21 1266.	-18.02	834.37	601.12	1690.75	745.00	-201.12	32.00
21 1246.	-20.00	837.58	457.08	666.50	760.00	-183.08	2.00
21 1225.	-25.00	777.79	275.04	-343.75	760.00	-160.04	-14.00
21 1210.	-30.00	764.00	265.00	-594.00	760.00	-155.00	-14.00

Appendix 6
(cont.)

TEST 12, 2MAC C-1A,DEL=20.0 OFG, X=24.7, 108 FLAP,RPM=NO PROPBSEPT73

NYCCRW -0.4368

••FLAPPED RUDDER DATA REDUCTION••

ALPHA	FX-LB	FZ-LB	MX-INLB	MZ-INLB	FXD-LB	FYO-LB	FZO-LB	MXO-INLB	MYO-INLB	MZO-INLB	MYOFLAP-INLB	VEL-FPS
-0.00	4.96	31.73	225.45	-26.74	4.09	8.29	31.85	226.10	-30.00	-20.58	0.0	20.80
2.00	4.78	45.72	327.35	-19.76	5.13	8.13	45.68	327.19	-19.00	-22.26	0.0	20.81
4.00	4.14	59.30	417.45	-22.78	6.66	10.42	59.07	416.11	-8.00	-40.50	0.0	20.83
6.00	2.93	72.48	507.19	-9.37	8.53	13.50	72.04	504.94	1.00	-48.58	0.0	20.82
8.10	0.89	87.21	605.80	12.90	10.81	16.70	86.55	603.33	11.00	-56.15	0.0	20.80
10.01	-1.41	100.44	707.24	17.60	13.36	18.83	99.56	702.18	19.00	-86.28	0.0	20.75
12.03	-4.39	114.26	808.37	37.99	16.44	21.53	113.15	801.82	26.00	-109.50	0.0	20.73
14.03	-7.78	126.30	907.63	53.70	19.67	23.55	125.00	897.82	32.00	-143.50	0.0	20.61
16.03	-9.68	137.73	973.94	72.90	25.08	28.05	135.77	961.74	40.00	-172.96	0.0	20.66
18.00	-1.76	137.00	939.65	12.38	37.08	23.95	131.90	904.76	18.00	-254.00	0.0	20.47
20.03	4.02	135.33	904.71	-26.72	47.04	21.44	128.02	849.55	-7.00	-312.21	0.0	20.31
25.03	9.33	125.36	820.18	-27.45	58.48	19.47	111.28	741.41	-28.00	-351.79	0.0	20.11
30.02	10.51	127.66	822.54	-24.41	70.08	19.89	107.21	711.53	-32.00	-413.39	0.0	19.92
-2.00	4.59	18.67	140.10	-27.72	3.42	6.68	18.92	141.55	-40.00	-18.96	0.0	20.88
-4.00	3.55	5.05	45.51	-21.63	3.05	6.24	5.37	47.40	-52.00	-17.11	0.0	20.93
-6.01	1.98	-8.57	-52.09	-9.56	3.09	5.89	-8.23	-50.38	-63.00	-16.33	0.0	20.95
-8.01	-0.22	-22.03	-145.36	2.50	3.44	6.39	-21.76	-143.76	-73.00	-21.49	0.0	20.95
-10.01	-2.76	-35.01	-237.95	21.47	4.32	6.97	-34.85	-237.43	-83.00	-26.67	0.0	20.94
-12.01	-5.80	-48.37	-332.32	19.44	5.71	7.95	-48.38	-332.30	-93.00	-39.60	0.0	20.92
-14.01	-9.57	-63.24	-435.67	75.35	7.75	9.19	-63.49	-439.92	-99.00	-44.30	0.0	20.88
-16.01	-13.59	-77.21	-533.10	92.69	10.34	11.14	-77.71	-536.21	-104.00	-72.50	0.0	20.78
-18.03	-16.91	-89.45	-626.03	113.10	14.05	14.41	-89.94	-627.72	-108.00	-103.27	0.0	20.79
-20.01	-6.47	-88.33	-586.85	23.12	26.26	10.13	-84.60	-554.28	-82.00	-194.18	0.0	20.62
-25.00	3.44	-80.53	-555.30	-23.15	39.09	2.10	-70.49	-486.33	-49.00	-269.03	0.0	20.45
-30.00	5.94	-79.55	-544.77	-19.97	46.70	-0.34	-64.67	-453.89	-47.00	-302.27	0.0	20.32

Appendix 6
(cont.)

TEST 12, ZMAC C.IA,DEL=20.0 DEG, X=24.7 , 10% FLAP,RPM=NO PROP8SEPT73

DYCCR= -0.4368

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CC	CM	CPL	CY	L/D	CMF	RN*10**-6	CLSQ
-0.00	C.247	0.0318	-0.0737	0.901	0.064	7.783	0.0	1.086	0.0612
2.00	C.354	0.0358	-0.0733	0.910	0.063	8.903	0.0	1.087	0.1256
4.00	C.458	0.0516	-0.0725	0.894	0.081	8.866	0.0	1.088	0.2094
6.00	C.558	0.0661	-0.0740	0.890	0.105	8.449	0.0	1.087	0.3118
8.10	0.672	0.0840	-0.0759	0.885	0.130	8.004	0.0	1.086	0.4515
10.01	C.777	0.1042	-0.0792	0.896	0.147	7.451	0.0	1.084	0.6032
12.03	0.983	0.1284	-0.0841	0.900	0.168	6.881	0.0	1.083	0.7804
14.03	C.999	0.1555	-0.0856	0.912	0.186	6.356	0.0	1.076	0.9771
16.05	1.069	0.1975	-0.0902	0.899	0.221	5.413	0.0	1.078	1.1434
18.00	1.057	0.2573	-0.1220	0.871	0.192	3.557	0.0	1.069	1.1182
20.05	1.042	0.3831	-0.1588	0.843	0.175	2.721	0.0	1.061	1.0867
25.03	C.924	0.4858	-0.1804	0.846	0.162	1.903	0.0	1.050	0.8547
30.02	0.908	0.5933	-0.1923	0.843	0.168	1.530	0.0	1.040	0.8237
-2.00	0.146	0.0264	-0.0731	0.950	0.051	5.527	0.0	1.090	0.0213
-4.00	C.041	0.0234	-0.0748	1.121	0.048	1.761	0.0	1.093	0.0017
-6.01	-0.063	0.0236	-0.0753	0.777	0.045	-2.666	0.0	1.094	0.0040
-8.01	-C.167	0.0264	-0.0747	0.839	0.049	-6.320	0.0	1.094	0.0277
-10.01	-0.267	0.0321	-0.0747	0.865	0.053	-8.075	0.0	1.093	0.0713
-12.01	-0.372	0.0438	-0.0744	0.872	0.061	-8.473	0.0	1.092	0.1380
-14.01	-C.489	0.0557	-0.0673	0.880	0.071	-8.197	0.0	1.090	0.2396
-16.01	-0.605	0.0805	-0.0600	0.876	0.087	-7.514	0.0	1.085	0.3658
-18.03	-0.655	0.1093	-0.0526	0.886	0.112	-6.401	0.0	1.085	0.4892
-20.01	-C.668	0.2075	-0.0191	0.832	0.080	-3.221	0.0	1.077	0.4468
-25.00	-0.567	0.3141	0.0181	0.876	0.017	-1.804	0.0	1.068	0.3209
-30.00	-C.526	0.3800	0.0200	0.891	-0.003	-1.385	0.0	1.061	0.2769

Appendix 6
(cont.)

TEST 12, ZMAC 0.1N,DEL=20.0 DEG, X=24.7 , 108 FLAP,RPM=ND PROP8SEPT73

DYCOR= -0.4368

PRICE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN*10**-6	CLSQ
G-24	0.247	0.0328	-0.0737	0.901	0.064	7.540	0.0	1.086	0.0612
2-34	0.354	0.0419	-0.0733	0.910	0.063	8.456	0.0	1.087	0.1256
4-44	0.458	0.0551	-0.0725	0.894	0.081	8.302	0.0	1.088	0.2094
6-54	0.558	0.0713	-0.0740	0.890	0.105	7.831	0.0	1.087	0.3118
8-75	0.672	0.0915	-0.0755	0.885	0.130	7.343	0.0	1.086	0.4515
10-76	0.777	0.1143	-0.0792	0.896	0.147	6.793	0.0	1.084	0.6032
12-88	0.883	0.1415	-0.0841	0.900	0.168	6.245	0.0	1.083	0.7804
14-99	0.988	0.1719	-0.0856	0.912	0.186	5.751	0.0	1.076	0.9771
17-08	1.069	0.2167	-0.0902	0.899	0.221	4.935	0.0	1.078	1.1434
19-02	1.057	0.3160	-0.1220	0.871	0.192	3.346	0.0	1.069	1.1182
21-05	1.042	0.4013	-0.1588	0.843	0.175	2.598	0.0	1.061	1.0867
25-92	0.924	0.5001	-0.1804	0.846	0.162	1.848	0.0	1.050	0.8547
30-89	0.908	0.6071	-0.1923	0.843	0.168	1.495	0.0	1.040	0.8237
-1-86	0.146	0.0267	-0.0731	0.950	0.051	5.453	0.0	1.090	0.0213
-3-96	0.041	0.0234	-0.0748	0.777	0.048	1.759	0.0	1.093	0.0017
-6-07	-0.063	0.0237	-0.0753	0.777	0.045	-2.658	0.0	1.094	0.0040
-8-17	-0.167	0.0268	-0.0747	0.839	0.049	-6.211	0.0	1.094	0.0277
-10-26	-0.267	0.0342	-0.0747	0.865	0.053	-7.794	0.0	1.093	0.0713
-12-37	-0.372	0.0462	-0.0744	0.872	0.061	-8.049	0.0	1.092	0.1380
-14-48	-0.485	0.0637	-0.0673	0.880	0.071	-7.681	0.0	1.090	0.2396
-16-59	-0.605	0.0866	-0.0600	0.876	0.087	-6.983	0.0	1.085	0.3658
-18-70	-0.699	0.1175	-0.0526	0.886	0.112	-5.955	0.0	1.085	0.4892
-20-65	-0.668	0.2150	-0.0151	0.832	0.080	-3.109	0.0	1.077	0.4468
-25-55	-0.567	0.3195	0.0181	0.876	0.017	-1.773	0.0	1.068	0.3209
-30-51	-0.526	0.3846	0.0200	0.891	-0.003	-1.368	0.0	1.061	0.2769

CL CCEFFS 0.238715 C.049809
CD CCEFFS 0.031188 C.003550
DYCOR -0.43680

Appendix 6
(cont.)

TEST 10, ZMAC 0 IN, DEL= 25. DEG,X=24.7, 103FLAP,NUPROP 27SEPT73

FLAPPED RUNNER INPUT DATA

CF	TR	TT	AREA	SPAN	MAC	XMAC	ZMAC	AZL	DYCOR
25.0	78	8C	44.30	7.875	5.7421	-0.7699	0.0	-2.00	-0.4368

ZERC REACINGS BEFORE AND AFTER

ANCM	1-N	1-R	2-N	2-R	3-N	3-P	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	100.	100.	C.	0.	100.	100.	100.	100.	100.	100.	0.	0.
C.	100.	100.	106.	95.	20.	20.	100.	105.	98.	100.	99.	100.	0.	0.

CELL LBS/COUNT 1=C.10000 2=0.C1000 3=C.C1000 4=C.10000 5=C.48970 6=0.20000 7=0.02273
TWIST=1157C.0 S/AFT CIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANCM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1244.	-2.0	R	452.	N	268.		574.	R	467.	N	159.	R	124.		0.
OC	1225.	0.0		580.		212.		556.		600.		186.		125.		0.
OC	1204.	2.0		705.		160.		486.		735.		210.		124.		0.
CC	1201.	4.C		830.		113.		37C.		875.		234.		122.		0.
CC	1156.	6.0		962.		70.		198.		1025.		256.		118.		0.
CC	1180.	8.C		1085.	R	168.		-30.		1166.		281.		113.		0.
OO	1183.	10.0		1220.		206.		-308.		1325.		303.		108.		0.
CC	1173.	12.0		1335.		238.		-632.		1467.		324.		102.		0.
OC	1165.	14.0		1420.		264.		-618.		1550.		337.		105.		0.
OO	1155.	16.0		1432.		95.		180.		1490.		338.		129.		0.
CC	1144.	18.0		1458.	N	168.		500.		1490.		341.		135.		0.
CC	1126.	23.0		1406.		275.		95C.		1395.		330.		141.		0.
OC	1104.	28.0		1398.		306.		1106.		1370.		324.		139.		0.
CC	121C.	-4.C		322.		325.		548.		335.		134.		121.		0.
OO	1217.	-6.0	R	200.	N	383.		462.	R	213.	N	109.	R	121.		0.
OC	1219.	-8.0		75.		444.		324.	N	85.		81.		117.		0.
OO	1220.	-10.C	N	255.		495.		130.		245.	R	146.		112.		0.
OC	1209.	-12.0		385.		543.		-126.		365.		175.		105.		0.
CC	1218.	-14.0		515.		591.		-456.		483.		204.		97.		0.
CC	1216.	-16.0		642.		632.		-808.		590.	N	235.	N	111.		0.
CO	1213.	-18.0		785.		656.		-1222.		710.		268.		121.		0.
CC	1205.	-20.C		521.		663.		-1588.		827.		301.		128.		0.
OO	1186.	-22.0		920.		396.		-272.		848.		281.		94.		0.
CC	117C.	-27.0		900.		310.		296.		800.	R	265.	R	115.		0.
OO	1153.	-32.C		856.		336.		482.		800.		264.		116.		0.

TEST 10, ZMAC 6 IN, DEL= 25. DEG,X=24.7, 103FLAP,HOPROP 27SEPT73

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS									
21 1244.	0.0	-352.00	168.00	-574.00	-367.00	59.00	-24.00	0.0	
21 1225.	2.00	-480.00	111.75	-555.17	-499.79	86.08	-25.00	0.0	
21 1204.	4.00	-605.00	59.50	-484.33	-634.58	110.17	-24.00	0.0	
21 1201.	6.00	-730.00	12.25	-367.50	-774.37	134.25	-22.00	0.0	
21 1196.	8.00	-862.00	-31.00	-194.67	-924.17	156.33	-18.00	0.0	
21 1180.	10.00	-985.00	-69.04	34.17	-1054.96	181.42	-13.00	0.0	
21 1183.	12.00	-1120.00	-107.25	313.00	-1223.75	203.50	-8.00	0.0	
21 1173.	14.02	-1235.00	-139.46	637.83	-1365.54	224.58	-2.00	0.0	
21 1169.	16.00	-1320.00	-165.67	624.67	-1448.33	237.67	-5.00	0.0	
21 1155.	18.00	-1332.00	3.13	-172.50	-1388.12	238.75	-29.00	0.0	
21 1144.	20.01	-1358.00	65.50	-491.67	-1387.92	241.83	-41.00	0.0	
21 1126.	25.00	-1306.00	172.25	-940.83	-1292.71	230.92	-35.00	0.0	
21 1104.	30.03	-1298.00	203.00	-1096.00	-1267.50	225.00	-39.00	0.0	
21 1210.	-2.00	-222.00	221.75	-537.17	-232.29	35.08	-21.00	0.0	
21 1217.	-4.00	-100.00	279.50	-450.33	-110.08	10.17	-17.00	0.0	
21 1219.	-6.00	25.00	340.25	-311.50	18.12	-17.75	-17.00	0.0	
21 1220.	-8.00	155.00	391.00	-116.67	145.00	-46.00	-12.00	0.0	
21 1209.	-10.01	285.00	438.75	140.17	265.00	-75.00	-5.00	0.0	
21 1218.	-12.02	415.00	486.50	471.00	383.00	-104.00	3.00	0.0	
21 1216.	-14.00	542.00	527.25	823.83	490.00	-135.00	11.79	0.0	
21 1213.	-16.01	685.00	551.00	1238.67	610.00	-168.00	21.83	0.0	
21 1205.	-18.00	821.00	557.75	1605.50	727.00	-201.00	28.87	0.0	
21 1186.	-20.00	820.00	290.50	290.33	748.00	-181.00	-5.08	0.0	
21 1170.	-25.00	800.00	204.25	-276.83	700.00	-165.00	-15.00	0.0	
21 1153.	-30.00	796.00	230.00	-462.00	700.00	-164.00	-16.00	0.0	

Appendix 6
(cont.)

TEST 10, ZMA= 6 IN, DEL= 25. DEG, X=24.7, 10XFLAP, NOPROP 27SEPT73

OYCOR= -0.4328

FLAPPED RUDDER DATA REDUCTION

ALPHA	FX-LR	FZ-LR	PX-INLR	MZ-INLR	FXO-LR	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
-0.00	5.74	33.52	239.24	-27.31	4.82	9.49	33.66	239.89	-30.00	-20.78	0.0	20.59
2.00	5.55	46.88	337.00	-31.55	5.91	9.75	46.84	336.75	-20.00	-34.12	0.0	20.44
4.00	4.84	59.90	428.67	-25.59	7.39	11.29	59.64	427.19	-10.00	-43.80	0.0	20.26
6.00	3.68	72.88	523.61	-16.65	9.30	13.08	72.37	520.75	-2.00	-57.11	0.0	20.23
8.00	1.95	86.51	615.55	3.39	11.63	16.46	85.75	612.05	5.00	-65.64	0.0	20.19
10.00	-0.14	99.19	715.45	15.89	14.22	17.30	98.17	710.04	12.00	-89.25	0.0	20.06
12.00	-3.13	113.07	811.67	37.48	17.40	21.35	111.77	805.03	19.00	-110.17	0.0	20.08
14.00	-6.38	124.89	904.35	56.06	20.71	24.03	123.33	895.16	25.00	-140.33	0.0	20.00
16.00	-6.25	133.66	951.98	53.02	27.27	26.52	130.99	935.14	29.00	-185.99	0.0	19.96
18.00	1.72	133.17	921.00	-14.01	39.34	24.80	127.24	879.40	0.0	-274.04	0.0	19.84
20.01	4.92	135.15	920.69	-24.73	47.43	24.50	126.65	865.56	-11.00	-314.78	0.0	19.75
25.00	9.41	128.88	860.18	-38.56	59.89	21.57	114.50	773.88	-31.00	-377.50	0.0	19.59
30.03	10.96	127.77	832.57	-23.09	70.54	21.60	107.10	720.90	-36.00	-417.14	0.0	19.40
-2.00	5.37	19.98	150.54	-24.59	4.12	7.21	20.28	151.81	-39.00	-15.59	0.0	20.31
-4.00	4.50	7.21	62.87	-29.16	3.78	7.18	7.61	65.40	-50.00	-22.93	0.0	20.37
-6.01	3.11	-5.90	-35.79	-19.12	3.86	7.22	-5.44	-32.96	-61.00	-23.66	0.0	20.39
-8.01	1.17	-19.41	-132.74	-7.28	4.38	7.37	-18.95	-129.69	-70.00	-29.23	0.0	20.39
-10.02	-1.40	-32.89	-227.89	12.14	5.22	8.19	-32.50	-225.69	-78.00	-33.83	0.0	20.30
-12.03	-4.71	-46.36	-321.83	32.17	6.31	8.97	-46.17	-320.38	-87.00	-44.32	0.0	20.38
-14.01	-8.24	-55.47	-416.79	61.13	8.02	11.70	-59.50	-417.91	-94.00	-52.94	0.0	20.36
-16.02	-12.39	-74.01	-518.80	90.30	10.54	13.86	-74.30	-521.85	-99.00	-70.55	0.0	20.34
-18.01	-16.05	-87.68	-623.11	112.57	14.23	16.93	-87.99	-624.83	-100.00	-102.58	0.0	20.27
-20.00	-2.90	-84.91	-589.57	17.39	28.50	11.88	-80.03	-554.70	-52.00	-200.51	0.0	20.11
-25.00	2.77	-82.04	-526.50	-0.22	39.16	10.87	-72.14	-470.83	-36.00	-235.64	0.0	19.97
-30.00	4.62	-81.90	-524.21	3.41	46.81	10.62	-67.37	-448.44	-41.00	-271.48	0.0	19.83

Appendix 6
(cont.)

TEST 10, ZMAC C IN, DEL= 25. DEG, X=24.7, 108FLAP,NOPROP 27SEPT73

NYCOR= -C.4368

FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CC	CM	CPL	CY	L/D	CMF	RN#1000-6	CLSQ
-0.00	C.267	0.0382	-0.0771	0.905	0.075	6.979	0.0	1.064	0.0711
2.00	0.377	0.0475	-0.0787	0.913	0.078	7.927	0.0	1.056	0.1420
4.00	C.488	C.0605	-0.0801	0.909	0.092	8.075	0.0	1.047	0.2383
6.00	C.594	C.0763	-0.0831	0.914	0.107	7.781	0.0	1.046	0.3527
8.00	0.707	0.0959	-0.0884	0.906	0.136	7.371	0.0	1.043	0.4992
10.00	C.820	0.1187	-0.0936	0.918	0.144	6.906	0.0	1.036	0.6722
12.00	0.931	0.1450	-0.0986	0.915	0.178	6.422	0.0	1.038	0.8669
14.02	1.036	0.1740	-0.1039	0.922	0.202	5.955	0.0	1.033	1.0736
16.00	1.104	C.2259	-0.1083	C.907	0.224	4.803	0.0	1.032	1.2195
18.00	1.086	0.3356	-0.1523	0.878	0.212	3.235	0.0	1.025	1.1786
20.01	1.091	0.4086	-0.1727	0.868	0.211	2.670	0.0	1.020	1.1902
25.00	1.002	0.5242	-0.1587	0.858	0.189	1.912	0.0	1.012	1.0043
30.03	C.956	0.6256	-0.2092	0.855	0.193	1.518	0.0	1.002	0.9140
-2.00	C.165	0.0336	-0.0773	0.951	0.059	4.922	0.0	1.049	0.0273
-4.00	0.062	0.0306	-0.0785	1.092	0.058	2.011	0.0	1.032	0.0038
-6.01	-0.044	0.0312	-0.0756	0.769	0.058	-1.408	0.0	1.053	0.0019
-8.01	-0.153	0.0353	-0.0775	0.869	0.060	-4.330	0.0	1.054	0.0234
-10.02	-0.265	0.0426	-0.0748	0.882	0.067	-6.220	0.0	1.049	0.0702
-12.03	-0.374	0.0511	-0.0722	0.881	0.073	-7.317	0.0	1.053	0.1396
-14.01	-0.482	0.0650	-0.0678	0.892	0.055	-7.419	0.0	1.052	0.2325
-16.02	-0.604	0.0856	-0.0591	0.892	0.113	-7.051	0.0	1.051	0.3644
-18.01	-0.720	0.1164	-0.0458	0.902	0.138	-6.184	0.0	1.047	0.5179
-20.00	-0.665	0.2269	0.0194	0.880	0.099	-2.808	0.0	1.035	0.4422
-25.00	-0.608	0.3299	0.0397	0.829	0.092	-1.842	0.0	1.032	0.3693
-30.00	-0.576	0.4001	0.0327	0.845	0.091	-1.439	0.0	1.024	0.3315

Appendix 6
(cont.)

TEST 10, ZMAC 0 IN, DEL= 25. DEG, X=24.7, 108ELAP,NOPROP 27SEPT73

DYCCP= -0.4368

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN1000-6	CLSO
0.25	C.267	0.0394	-0.0771	0.905	0.075	6.768	0.0	1.064	0.0711
2.36	C.377	0.0459	-0.0787	0.913	0.078	7.549	0.0	1.056	0.1420
4.47	0.488	0.0644	-0.0801	0.909	0.092	7.575	0.0	1.047	0.2383
6.57	C.554	0.0822	-0.0831	0.914	0.107	7.222	0.0	1.046	0.3527
8.68	0.707	0.1042	-0.0884	0.906	0.136	6.780	0.0	1.043	0.4992
10.75	C.820	0.1300	-0.0936	0.918	0.144	6.308	0.0	1.036	0.6722
12.90	C.531	0.1555	-0.0986	0.915	0.178	5.837	0.0	1.038	0.8669
15.02	1.036	0.1920	-0.1035	0.922	0.202	5.397	0.0	1.033	1.0736
17.06	1.104	0.2553	-0.1083	0.907	0.224	4.411	0.0	1.032	1.2195
19.04	1.086	0.3554	-0.1523	0.878	0.212	3.055	0.0	1.025	1.1786
21.06	1.091	0.4285	-0.1727	0.868	0.211	2.546	0.0	1.020	1.1902
25.96	1.002	0.5410	-0.1987	0.858	0.189	1.852	0.0	1.012	1.0043
30.95	C.954	0.6450	-0.2092	0.855	0.193	1.482	0.0	1.002	0.9140
-1.84	C.165	0.0340	-0.0773	0.951	0.059	4.856	0.0	1.049	0.0273
-3.95	C.062	0.0307	-0.0785	1.092	0.058	2.007	0.0	1.052	0.0038
-6.05	-C.044	0.0313	-0.0756	0.769	0.058	-1.406	0.0	1.053	0.0019
-8.15	-C.153	0.0357	-0.0775	0.869	0.060	-4.283	0.0	1.054	0.0234
-10.27	-0.265	0.0438	-0.0748	0.882	0.067	-6.053	0.0	1.049	0.0702
-12.39	-0.374	0.0534	-0.0722	0.881	0.073	-6.996	0.0	1.053	0.1396
-14.47	-0.482	0.0685	-0.0678	0.892	0.095	-7.000	0.0	1.052	0.2325
-16.60	-0.604	0.0917	-0.0591	0.892	0.113	-6.582	0.0	1.051	0.3644
-18.70	-0.720	0.1251	-0.0458	0.902	0.138	-5.755	0.0	1.047	0.5179
-20.64	-0.665	0.2443	0.0154	0.880	0.094	-2.722	0.0	1.039	0.4422
-25.59	-0.608	0.3361	0.0397	0.829	0.092	-1.608	0.0	1.032	0.3693
-30.56	-0.576	0.4056	0.0327	0.845	0.091	-1.420	0.0	1.024	0.3115

CL CCEFFS	0.261791	C.051381	DYCOR	-0.43680
CD CCEFFS	0.039144	0.003918		

Appendix 6
(cont.)

TEST R ,ZMAC 0 IN,DEL=30. NFG,X=24.7 0. 10 RELAP,RPM=NCRP 26SEP73

FLAPPEC RUNNER INPUT DATA

DE TR TT ARFA SPAN MAC XMAC ZMAC #ZL OYCJR
30.0 79 79 44.30 7.875 5.7421 -0.7699 0.0 -2.00 -0.4368

ZERO READINGS BEFORE AND AFTER

ANOM 1-N 1-P 2-N 2-R 3-N 3-R 4-N 4-P 5-N 5-R 6-N 6-R 7-N 7-R
0. 100. 102. 103. 99. 0. 0. 100. 104. 100. 101. 100. 100. 0. 0.
0. 100. 102. 103. 99. 0. 0. 100. 104. 100. 101. 100. 100. 0. 0.

CELL LRS/COUNT 107.1 IN. 2=0.1 IN. 3=0.1 IN. 4=0.1 IN. 5=0.48970 6=0.20000 7=0.02273
TWIST=11570.0 SHAFT DIA. 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1252.	-7.0	R	505.	N	301.	S	718.	R	511.	N	172.	R	129.	S	0.
00	1243.	0.0	R	640.	N	248.	N	680.	R	651.	N	198.	R	130.	R	0.
00	1230.	7.0	R	773.	N	199.	N	617.	R	794.	N	224.	R	130.	R	0.
00	1231.	4.1	R	916.	N	15.	N	489.	R	942.	N	248.	R	128.	R	0.
00	1237.	6.0	R	1046.	N	105.	N	307.	R	1098.	N	272.	R	125.	R	0.
00	1229.	8.0	R	1179.	N	63.	N	61.	R	1251.	N	296.	R	121.	R	0.
00	1216.	10.0	R	1304.	N	26.	N	-235.	R	1405.	N	320.	R	115.	R	0.
00	1211.	12.0	R	1430.	N	208.	N	-580.	R	1555.	N	342.	R	108.	R	0.
00	1199.	14.1	R	1512.	N	236.	N	-56.	R	1639.	N	353.	R	111.	R	0.
00	1175.	16.0	R	1546.	N	68.	N	300.	R	1672.	N	358.	R	134.	R	0.
00	1180.	18.0	R	1550.	N	238.	N	600.	R	1568.	N	359.	R	141.	R	0.
00	1156.	23.0	R	1495.	N	301.	N	1000.	R	1475.	N	347.	R	144.	R	0.
00	1139.	28.0	R	1488.	N	344.	N	1200.	R	1450.	N	340.	R	146.	R	0.
00	1249.	-4.1	R	369.	N	355.	N	667.	R	373.	N	145.	R	127.	R	0.
00	1249.	-6.0	R	236.	N	413.	N	570.	R	236.	N	117.	R	124.	R	0.
00	1252.	-8.0	R	105.	N	470.	N	478.	R	106.	N	89.	R	121.	R	0.
00	1253.	-10.0	R	240.	N	516.	N	204.	R	230.	N	59.	R	114.	R	0.
00	1252.	-12.0	R	392.	N	554.	N	-102.	R	370.	N	25.	R	106.	R	0.
00	1251.	-14.1	R	537.	N	595.	N	-456.	R	498.	N	217.	R	97.	R	0.
00	1255.	-16.0	R	680.	N	635.	N	-845.	R	620.	N	243.	R	88.	R	0.
00	1252.	-18.0	R	824.	N	663.	N	-1278.	R	739.	N	278.	R	78.	R	0.
00	1242.	-20.0	R	952.	N	654.	N	-1500.	R	859.	N	304.	R	74.	R	0.
00	1224.	-22.0	R	992.	N	417.	N	-300.	R	900.	N	295.	R	101.	R	0.
00	1204.	-27.1	R	981.	N	293.	N	25.	R	875.	N	284.	R	112.	R	0.
00	1190.	-32.0	R	980.	N	277.	N	450.	R	866.	N	279.	R	114.	R	0.

TEST A ,IMAC 0 IN,DEL=30. DEG,X=24.7 D, 10 3FLAP,RPM=NCRPP 24SEPT73

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS									
21 1252.	0.0	-405.00	201.00	-718.00	-410.00	72.00	-29.00	0.0	
21 1243.	2.0	-539.92	147.67	-681.00	-550.83	98.00	-30.00	0.0	
21 1230.	4.00	-672.83	98.75	-617.00	-693.67	124.00	-30.00	0.0	
21 1231.	6.00	-805.75	49.63	-489.00	-841.50	148.00	-28.00	0.0	
21 1237.	8.00	-945.67	4.50	-307.00	-997.33	172.00	-25.00	0.0	
21 1229.	10.00	-1078.58	-37.62	-61.00	-1149.17	196.00	-21.00	0.0	
21 1216.	12.00	-1213.50	-74.75	235.00	-1304.00	220.00	-15.00	0.0	
21 1211.	14.00	-1329.42	-108.29	580.00	-1453.83	242.00	-8.00	0.0	
21 1199.	16.00	-1411.33	-136.33	560.00	-1537.67	253.00	-11.00	0.0	
21 1175.	18.03	-1445.25	31.63	-300.00	-1500.50	258.00	-34.00	0.0	
21 1180.	20.01	-1449.17	136.75	-600.00	-1466.33	259.00	-41.00	0.0	
21 1156.	25.00	-1394.08	149.62	-1000.00	-1373.17	247.00	-44.00	0.0	
21 1139.	30.00	-1387.00	242.50	-1200.00	-1348.00	240.00	-46.00	0.0	
21 1249.	-2.00	-267.92	253.37	-667.00	-267.83	45.00	-27.00	0.0	
21 1249.	-4.00	-174.83	311.25	-570.00	-133.67	17.00	-24.00	0.0	
21 1252.	-6.00	-3.75	368.12	-428.00	-3.50	-11.00	-20.00	0.0	
21 1253.	-8.00	140.00	414.00	-204.00	130.00	-41.00	-14.00	0.0	
21 1252.	-10.00	292.00	451.87	102.00	270.00	-75.00	-6.00	0.0	
21 1251.	-12.00	437.00	492.75	456.00	398.00	-119.25	3.00	0.0	
21 1255.	-14.00	500.00	532.62	845.00	520.00	-142.21	12.00	0.0	
21 1252.	-16.00	724.00	560.50	1278.00	639.00	-177.17	22.00	0.0	
21 1242.	-18.00	852.00	556.37	1500.00	759.00	-223.12	26.00	0.0	
21 1224.	-20.00	892.00	314.25	300.00	800.00	-194.08	-1.00	0.0	
21 1204.	-25.00	880.00	190.12	-250.00	775.00	-183.04	-12.00	0.0	
21 1190.	-30.00	880.00	174.00	-450.00	766.00	-178.00	-14.00	0.0	

Appendix 6
(cont.)

TEST R 2MAC 0 IN,DEL=30. DEG.X=24.7 0. 10 XFLAP,RPM=NORROP 26SEPT73

NYCR= -0.436R

FLAPPED RUDDER DATA REDUCTION

ALPHA	FX-LR	FZ-LR	MX-INLR	MZ-INLR	FXO-LR	FYO-LR	FZO-LR	MXO-INLR	MYO-INLR	MZO-INLR	MYOFIAP-INLR	VEI-FPS
-0.00	7.18	38.49	280.41	-44.78	6.13	8.40	38.67	281.53	-36.00	-37.11	0.0	20.65
2.00	6.80	52.51	376.71	-45.25	7.20	9.58	52.46	376.35	-17.00	-48.12	0.0	20.58
4.00	6.17	66.31	475.35	-42.81	8.98	11.56	65.97	473.10	-26.00	-62.97	0.0	20.47
6.00	4.89	80.08	571.09	-31.42	11.07	14.19	79.46	566.95	-8.00	-75.51	0.0	20.48
8.00	3.07	94.52	668.56	-16.60	13.65	17.41	93.58	662.51	0.0	-91.24	0.0	20.53
10.00	0.61	108.23	767.05	-2.35	16.48	20.05	106.97	758.40	6.00	-114.90	0.0	20.46
12.00	-2.35	121.10	871.38	17.13	19.63	22.62	119.57	860.07	13.00	-141.01	0.0	20.35
14.00	-5.8	134.12	966.44	39.41	23.21	25.44	132.13	952.25	19.00	-169.65	0.0	20.31
16.00	-5.60	142.50	1009.88	40.62	30.10	29.07	139.39	988.12	24.00	-212.44	0.0	20.21
18.00	3.00	144.21	994.11	-18.68	43.75	27.56	137.44	948.14	-5.00	-299.71	0.0	20.11
20.00	6.00	143.55	979.48	-47.02	51.11	25.04	134.27	915.85	-24.00	-349.79	0.0	20.05
25.00	10.00	137.41	916.38	-45.35	63.85	22.26	122.06	822.51	-35.00	-406.55	0.0	19.85
30.00	12.00	136.28	885.71	-39.56	75.44	23.62	114.12	760.01	-43.00	-456.55	0.0	19.70
-2.00	6.67	24.26	181.33	-43.85	5.15	7.02	24.63	183.70	-45.00	-37.50	0.0	20.63
-4.00	5.70	10.37	82.49	-37.18	4.67	6.71	10.87	85.71	-56.00	-29.11	0.0	20.63
-6.00	4.28	-3.31	-14.91	-27.83	4.68	6.60	-2.71	-11.12	-66.00	-29.55	0.0	20.65
-8.00	2.04	-18.14	-114.81	-13.28	5.03	6.74	-17.55	-111.00	-74.00	-32.17	0.0	20.66
-10.00	-1.12	-33.72	-226.99	8.79	5.76	7.79	-33.24	-224.15	-81.00	-36.89	0.0	20.64
-12.00	-4.56	-41.63	-335.82	36.62	6.97	9.06	-48.34	-335.04	-88.00	-43.15	0.0	20.64
-14.00	-8.45	-63.33	-438.16	62.69	8.85	12.19	-63.27	-438.92	-95.00	-57.16	0.0	20.68
-16.00	-12.78	-78.01	-544.72	98.57	11.35	15.32	-78.23	-547.86	-100.00	-74.21	0.0	20.65
-18.00	-15.00	-90.76	-634.24	100.20	16.26	15.26	-90.55	-631.17	-100.00	-117.96	0.0	20.57
-20.00	-3.00	-92.34	-624.79	35.17	31.15	12.17	-86.98	-593.95	-56.00	-197.01	0.0	20.42
-25.00	2.50	-89.00	-588.39	13.41	42.44	11.52	-79.29	-532.28	-34.00	-251.13	0.0	20.25
-30.00	4.50	-89.74	-568.73	10.55	50.81	1.38	-74.11	-49.12	-31.00	-288.71	0.0	20.14

Appendix 6
(cont.)

TEST R 12MAC 0 IN,DFL=30. NEG,X=24.7 D. 1' 8FLAP,RPDM=NOPROP 26SEPT73

DYCOR= -0.436R

8-FLAPPED RUNNER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CD	CM	CPL	CV	L/D	CMF	RN=10 ⁴ -4	CLSO
-0.00	0.305	0.0481	-0.0902	0.924	0.066	6.311	0.1	1.156	1.1928
2.00	0.416	0.0471	-0.0919	0.911	0.079	7.286	0.0	1.052	0.1732
4.00	0.529	0.0720	-0.0951	0.911	0.093	7.344	0.0	1.046	0.2797
6.00	0.636	0.087	-0.0973	0.916	0.114	7.178	0.1	1.047	0.4451
8.00	0.746	0.1088	-0.1011	0.899	0.139	6.857	0.0	1.049	0.5564
10.00	0.858	0.1322	-0.1080	0.900	0.161	6.490	0.0	1.046	0.7366
12.00	0.969	0.1591	-0.1132	0.914	0.183	6.090	0.0	1.040	0.9392
14.00	1.076	0.1889	-0.1171	0.915	0.207	5.695	0.0	1.038	1.1573
16.00	1.146	0.2476	-0.1224	0.911	0.239	4.631	0.1	1.033	1.3140
18.00	1.153	0.3672	-0.1696	0.876	0.231	3.141	0.0	1.023	1.4302
20.00	1.172	0.4271	-0.1959	0.866	0.209	2.627	0.0	1.025	1.2589
25.00	1.041	0.5450	-0.2094	0.855	0.190	1.910	0.0	1.015	1.0840
30.00	0.988	0.6531	-0.2233	0.846	0.204	1.513	0.0	1.007	0.9759
-2.00	0.194	0.147	-0.0877	0.947	0.155	4.782	0.1	1.055	0.3378
-4.00	0.086	0.0368	-0.0891	1.001	0.053	2.330	0.0	1.055	0.1074
-6.00	0.021	0.0368	-0.0872	0.520	0.052	-0.580	0.0	1.056	0.1115
-8.00	0.0138	0.0395	-0.0823	0.803	0.053	-3.492	0.0	1.056	0.0191
-10.00	0.0262	0.0454	-0.0755	0.856	0.061	-5.771	0.0	1.056	0.0685
-12.00	0.0381	0.0549	-0.0693	0.881	0.079	-6.934	0.1	1.055	0.1452
-14.00	0.0497	0.0695	-0.0631	0.881	0.095	-7.149	0.0	1.057	0.2471
-16.00	0.0616	0.0894	-0.0544	0.880	0.121	-6.890	0.0	1.056	0.3795
-18.00	0.0719	0.1291	-0.0412	0.885	0.121	-5.570	0.0	1.052	0.5147
-20.00	0.0701	0.2509	0.0212	0.867	0.098	-2.793	0.0	1.044	0.4910
-25.00	0.0649	0.3475	0.0511	0.852	0.094	-1.868	0.1	1.035	0.4217
-30.00	0.0614	0.4210	0.0548	0.840	0.086	-1.459	0.0	1.029	0.3771

Appendix 6
(cont.)

TEST 8 JZMAC 0 IN,DEL=30. DEG,X=24.7 C, 10 SLAP,RPM=NOPROP 26SEPT73

NYCOR=-0.436R

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	1/D	CMF	RM,1000-6	CLSQ
0.29	0.305	0.049R	-0.0902	0.924	0.066	6.114	0.0	1.056	0.0928
2.40	0.416	0.0600	-0.0919	0.911	0.079	6.934	0.0	1.052	0.1732
4.51	0.529	0.0767	-0.0951	0.911	0.097	6.896	0.0	1.046	0.2797
6.61	0.636	0.0955	-0.0973	0.906	0.114	6.668	0.0	1.047	0.4051
8.72	0.746	0.1181	-0.1111	0.899	0.139	6.316	0.0	1.049	0.5564
10.83	0.858	0.1446	-0.1080	0.900	0.161	5.936	0.0	1.046	0.7366
12.93	0.969	0.1749	-0.1132	0.914	0.183	5.542	0.0	1.040	0.9392
15.04	1.076	0.2183	-0.1191	0.915	0.207	5.165	0.0	1.038	1.1573
17.10	1.146	0.2696	-0.1225	0.900	0.239	4.753	0.0	1.033	1.3140
19.14	1.153	0.3894	-0.1696	0.876	0.231	2.962	0.0	1.023	1.3312
21.09	1.122	0.4482	-0.1959	0.866	0.209	2.503	0.0	1.025	1.2589
26.03	1.041	0.5631	-0.2094	0.856	0.190	1.849	0.0	1.015	1.0840
31.95	0.988	0.6694	-0.2233	0.846	0.2	1.476	0.0	1.007	0.9759
-1.82	0.194	0.0413	-0.0877	0.947	0.055	4.709	0.0	1.053	0.0378
-3.92	0.086	0.0370	-0.0881	1.001	0.053	2.322	0.0	1.055	0.1074
-6.03	-0.021	0.0368	-0.0872	0.920	0.052	-0.580	0.0	1.056	0.3005
-8.14	-0.138	0.0399	-0.0823	0.903	0.053	-3.464	0.0	1.056	0.0191
-10.26	-0.262	0.0465	-0.0755	0.856	0.061	-5.629	0.0	1.056	0.0685
-12.37	-0.381	0.0574	-0.0693	0.880	0.079	-6.641	0.0	1.055	0.1452
-14.49	-0.497	0.0737	-0.0631	0.881	0.195	-6.748	0.0	1.157	0.2471
-16.60	-0.616	0.0958	-0.0544	0.889	0.121	-6.432	0.0	1.056	0.3795
-19.70	-0.719	0.1377	-0.0412	0.985	0.121	-5.220	0.0	1.052	0.5167
-20.68	-0.711	0.2591	-0.0212	0.867	0.198	-2.704	0.0	1.044	0.4910
-25.63	-0.649	0.3546	0.0501	0.852	0.094	-1.831	0.0	1.035	0.4217
-30.59	-0.614	0.4273	0.0548	0.840	0.086	-1.437	0.0	1.029	0.3771

CL COEFFS	0.285869	0.053069	NYCOR	-0.43680
CD COEFFS	0.047873	0.004379	0.000420	

Appendix 6
(cont.)

TEST 9 ,ZMAC 0 IN,DEL=35. DEG,X=24.7 D,108FLAP,SPW=NO PRNP,275FPT73

FLAPFC RUNNER INPUT DATA

DE 1R 76 79 AREA 44.30 SPAN 7.875 5.7421 MAC -0.7699 ZMAC 7.0 AZI -2.00 NYCOR -0.4368

ZERO READINGS BEFORE AND AFTER

ANCM 1-N 1-R 2-N 2-R 3-N 3-R 4-N 4-R 5-N 5-R 6-N 6-R 7-N 7-R
 0. 100. 100. 100. 100. 0. 0. 100. 100. 100. 100. 100. 0. 0.
 0. 100. 103. 101. 100. 0. 0. 95. 105. 100. 101. 99. 100. 0. 0.

CELL LRS/COUNT 1=0.10000 2=0.01000 3=C.01000 4=C.10000 5=0.48070 6=2.20000 7=0.02273
 TWIST=11570.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANCM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1234.	-2.00	R	532.	N	310.	790.	766.	766.	535.	N	177.	R	131.	0.	0.
00	1232.	0.01		674.		267.	766.	766.	766.	680.		204.		132.	0.	0.
00	1222.	2.02		806.		217.	702.	702.	702.	828.		230.		171.	0.	0.
00	1219.	4.00		541.		172.	574.	574.	574.	975.		256.		130.	0.	0.
00	1216.	6.00		1077.		128.	192.	192.	1132.	280.		280.		123.	0.	0.
00	1215.	8.01		1215.		87.	150.	150.	1290.	303.		303.		123.	0.	0.
00	1214.	10.01		1350.		50.	-152.	-152.	1452.	329.		329.		118.	0.	0.
00	1208.	12.03		1481.		186.	-508.	-508.	1610.	349.		349.		111.	0.	0.
00	1199.	14.02		1572.		209.	-488.	-488.	1705.	369.		369.		115.	0.	0.
00	1184.	16.01		1607.		254.	116.	116.	1667.	371.		371.		133.	0.	0.
00	1169.	18.01		1613.		254.	646.	646.	1624.	371.		371.		143.	0.	0.
00	1146.	23.10		1530.		333.	1056.	1056.	1510.	353.		353.		147.	0.	0.
00	1123.	29.00		1510.		373.	1244.	1244.	1470.	344.		344.		147.	0.	0.
00	1236.	-4.00		400.		373.	750.	750.	400.	150.		150.		129.	0.	0.
00	1237.	-6.00		263.		425.	650.	650.	265.	122.		122.		126.	0.	0.
00	1238.	-8.00		130.		401.	492.	492.	174.	93.		93.		122.	0.	0.
00	1242.	-10.00		215.		528.	768.	768.	200.	138.		138.		116.	0.	0.
00	1238.	-12.00		358.		566.	-14.	-14.	335.	171.		171.		108.	0.	0.
00	1237.	-14.00		500.		606.	-758.	-758.	462.	203.		203.		109.	0.	0.
00	1229.	-16.02		644.		641.	-754.	-754.	585.	237.		237.		109.	0.	0.
00	1231.	-18.00		789.		663.	-1182.	-1182.	710.	271.		271.		118.	0.	0.
00	1221.	-20.02		927.		667.	-1522.	-1522.	829.	303.		303.		126.	0.	0.
00	1204.	-22.01		1005.		417.	-544.	-544.	915.	300.		300.		100.	0.	0.
00	1178.	-27.00		995.		252.	-130.	-130.	880.	298.		298.		112.	0.	0.
00	1160.	-32.00		990.		223.	346.	346.	885.	292.		292.		111.	0.	0.

TEST 9 17MAC 0 1A,DEL=35. DEG,X=24.7 D,108FLAP,RPM=NC PRDP,27SEPT73

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS								
21 1234.	0.0	-432.00	219.00	-790.00	-435.00	77.00	-31.00	0.0
21 1232.	2.01	-573.87	166.96	-765.92	-579.79	104.00	-32.00	0.0
21 1222.	4.02	-705.75	116.92	-701.83	-727.58	130.00	-31.00	0.0
21 1219.	6.00	-840.62	71.84	-873.75	-874.37	156.00	-30.00	0.0
21 1216.	8.00	-976.50	27.81	-991.67	-1031.17	180.00	-23.00	0.0
21 1215.	10.01	-1114.37	-13.21	-149.58	-1188.96	203.00	-23.00	0.0
21 1215.	12.01	-1249.25	-50.25	152.50	-1350.75	220.00	-18.00	0.0
21 1208.	14.01	-1380.12	-86.00	508.58	-1508.54	249.00	-11.00	0.0
21 1199.	16.02	-1471.00	-109.00	488.67	-1603.33	268.00	-15.00	0.0
21 1184.	18.01	-1505.87	55.00	-315.24	-1565.12	273.00	-33.00	0.0
21 1169.	20.01	-1511.75	153.34	-645.17	-1521.92	271.00	-43.00	0.0
21 1146.	25.10	-1428.62	232.54	-1055.08	-1407.71	253.00	-47.00	0.0
21 1123.	30.00	-1408.50	272.50	-1243.00	-1367.50	244.00	-47.00	0.0
21 1236.	-2.00	-298.37	272.44	-748.92	-297.29	50.00	-29.00	0.0
21 1237.	-4.00	-161.25	324.42	-648.83	-162.08	22.00	-26.00	0.0
21 1238.	-6.00	-28.13	380.17	-490.75	-30.88	7.62	-22.00	0.0
21 1242.	-8.00	115.00	427.33	-266.67	103.33	-37.33	-16.00	0.0
21 1238.	-10.00	258.00	465.29	15.42	238.54	-70.29	-8.00	0.0
21 1237.	-12.00	400.00	505.24	359.50	365.75	-102.25	0.0	0.0
21 1229.	-14.02	544.00	540.21	755.58	488.96	-136.21	9.79	0.0
21 1231.	-16.00	689.00	562.17	1183.67	614.17	-170.17	18.83	0.0
21 1221.	-18.02	827.00	566.12	1523.75	733.37	-202.12	26.87	0.0
21 1204.	-20.01	905.00	318.04	545.82	819.58	-199.08	0.92	0.0
21 1178.	-25.00	895.00	158.04	131.92	784.79	-187.04	-12.00	0.0
21 1160.	-30.00	890.00	128.00	-144.00	770.00	-181.00	-11.00	0.0

Appendix 6
(cont.)

TEST 9 ,ZMAC 0 14,DFL=35. DFG,X=24.7 D,10%FLAP,PPM=NC PRCD,27SEPT73

DYCOR= -0.4368

FLAPPED RUDDER DATA REDUCTION

ALPHA	FY-LR	FZ-LR	MX-INLR	MZ-INLR	FXQ-LR	FYO-LR	FZO-LR	MXQ-INLR	MYQ-INLR	MZO-INLR	MYOFLAP-INLR	VEL-FPS
-0.00	7.90	41.01	299.50	-48.01	6.79	8.90	41.21	299.70	-39.00	-39.85	0.0	20.52
2.01	7.66	55.72	396.03	-48.15	8.09	10.36	55.66	396.54	-30.00	-51.25	0.0	20.50
4.02	7.07	65.41	499.03	-40.61	9.99	12.23	69.04	496.83	-21.00	-61.96	0.0	20.42
6.00	5.74	83.34	599.34	-36.44	12.17	13.98	82.65	594.73	-12.00	-82.69	0.0	20.39
8.00	3.92	97.37	699.35	-7.45	14.81	16.52	96.72	694.11	-5.00	-85.81	0.0	20.37
10.01	1.50	111.57	796.20	-3.39	17.87	21.03	110.14	787.11	2.00	-120.01	0.0	20.37
12.01	-1.52	125.43	905.98	11.74	21.24	23.48	123.62	893.09	9.00	-152.73	0.0	20.36
14.03	-5.09	138.87	997.48	19.71	25.01	28.09	136.70	982.53	15.00	-176.55	0.0	20.30
16.02	-4.89	148.19	1067.32	27.64	32.26	29.08	144.72	1040.42	19.00	-239.69	0.0	20.23
18.01	3.15	150.04	1050.27	-17.64	45.50	26.45	143.01	1002.30	-9.00	-314.28	0.0	20.10
20.01	6.45	149.64	1020.02	-47.82	53.47	25.15	139.91	952.48	-27.00	-368.12	0.0	19.97
25.10	10.55	140.54	940.36	-51.20	65.79	23.40	124.63	841.68	-41.00	-422.46	0.0	19.77
30.00	12.43	138.13	900.67	-40.97	76.70	23.84	115.54	772.49	-49.00	-464.91	0.0	19.58
-2.00	7.49	27.11	200.54	-45.05	5.79	7.94	27.53	202.95	-49.00	-32.51	0.0	20.54
-4.01	6.49	12.88	102.70	-38.90	5.21	7.53	13.45	105.99	-58.00	-28.76	0.0	20.54
-6.01	4.91	-0.99	46.04	-54.02	5.00	0.65	-0.34	52.75	-68.00	-47.49	0.0	20.55
-8.01	2.67	-15.77	-58.94	-14.09	5.25	9.03	-15.11	-95.22	-76.00	-30.33	0.0	20.59
-10.01	-0.15	-30.45	-209.38	9.00	5.95	9.06	-29.87	-206.93	-83.00	-33.15	0.0	20.55
-12.01	-3.59	-45.05	-312.38	30.25	7.07	10.39	-44.64	-310.76	-90.00	-43.85	0.0	20.54
-14.03	-7.56	-59.80	-418.18	59.98	8.79	12.76	-59.63	-418.92	-97.00	-54.57	0.0	20.48
-16.01	-11.84	-74.52	-525.34	84.93	11.20	15.06	-74.62	-526.48	-101.00	-77.55	0.0	20.49
-18.03	-15.24	-88.36	-627.09	109.31	15.26	17.20	-88.36	-627.45	-101.00	-107.19	0.0	20.41
-20.01	-5.46	-93.68	-645.18	31.70	29.37	12.33	-89.13	-611.64	-57.00	-207.75	0.0	20.27
-25.00	-1.32	-91.08	-600.63	-1.71	39.55	12.56	-82.06	-536.69	-28.00	-269.67	0.0	20.05
-30.00	3.44	-90.28	-577.51	19.50	50.19	10.92	-75.12	-502.29	-23.00	-285.67	0.0	19.90

Appendix 6
(cont.)

TEST 9 ,ZMAC 0 IN,DFL=35. DFG,X=24.7 D,10XFLAP,RPM=ND PROP,27SEPT73

NYCOR= -0.4368

FLAPPED RUDDER DATA IN NFN-DIMENSIONAL FORM

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN*10**6	CLSQ
-0.00	0.329	0.0541	-0.0983	0.923	0.071	6.080	0.0	1.049	0.1081
2.01	0.445	0.0647	-0.1016	0.905	0.083	6.877	0.0	1.048	0.1978
4.02	0.556	0.0805	-0.1046	0.914	0.099	6.913	0.0	1.044	0.3094
6.00	0.668	0.0983	-0.1073	0.914	0.113	6.793	0.0	1.043	0.4456
8.00	0.780	0.1199	-0.1128	0.915	0.134	6.505	0.0	1.041	0.6081
10.01	0.892	0.1447	-0.1183	0.907	0.170	6.164	0.0	1.041	0.7951
12.01	1.002	0.1721	-0.1235	0.917	0.190	5.820	0.0	1.041	1.0034
14.03	1.114	0.2038	-0.1303	0.913	0.229	5.465	0.0	1.038	1.2411
16.02	1.188	0.2649	-0.1358	0.913	0.239	4.485	0.0	1.034	1.4120
18.01	1.189	0.3784	-0.1803	0.890	0.270	3.143	0.0	1.028	1.4139
20.01	1.178	0.4503	-0.2087	0.864	0.212	2.617	0.0	1.021	1.3883
25.10	1.071	0.5652	-0.2235	0.858	0.201	1.894	0.0	1.011	1.1463
30.00	1.013	0.6724	-0.2375	0.849	0.209	1.506	0.0	1.001	1.0260
-2.00	0.219	0.0461	-0.0571	0.936	0.063	4.754	0.0	1.050	0.0481
-4.01	0.107	0.0415	-0.0943	1.001	0.060	2.582	0.0	1.050	0.0115
-6.01	-0.003	0.0357	-0.0933-19.892	0.005	-0.067	0.0	0.0	1.051	0.0000
-8.01	-0.120	0.0416	-0.0982	0.800	0.064	-2.878	0.0	1.052	0.0143
-10.01	-0.238	0.0473	-0.0825	0.880	0.072	-5.017	0.0	1.051	0.0564
-12.01	-0.355	0.0563	-0.0766	0.884	0.083	-6.313	0.0	1.050	0.1262
-14.03	-0.478	0.0704	-0.0705	0.892	0.102	-6.787	0.0	1.047	0.2282
-16.01	-0.597	0.0896	-0.0604	0.896	0.120	-6.661	0.0	1.048	0.3561
-18.03	-0.712	0.1230	-0.0459	0.902	0.139	-5.790	0.0	1.043	0.5076
-20.01	-0.729	0.2401	0.0217	0.871	0.101	-3.035	0.0	1.036	0.5311
-25.00	-0.686	0.3305	0.0613	0.831	0.105	-2.075	0.0	1.025	0.4703
-30.00	-0.638	0.4259	0.0686	0.849	0.093	-1.497	0.0	1.017	0.4065

Appendix 6
(cont.)

TEST 9 ,ZMAC 0 IN,DFL=35. NEG,X=24.7 D,108FLAP,RPM=NO PROP,27SEPT73

DYCOR = -0.4368

ORIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CC	CM	CPL	CY	L/D	CMF	RN*10**-6	CLSO
0.31	0.329	0.0559	-0.0983	0.923	0.071	5.883	0.0	1.049	0.1081
2.44	0.445	0.0680	-0.1016	0.905	0.083	6.542	0.0	1.048	0.1978
4.55	0.556	0.0856	-0.1046	0.914	0.099	6.495	0.0	1.044	0.3094
6.64	0.668	0.1057	-0.1073	0.914	0.113	6.313	0.0	1.043	0.4456
8.75	0.780	0.1301	-0.1128	0.915	0.134	5.995	0.0	1.041	0.6081
10.87	0.892	0.1580	-0.1183	0.907	0.170	5.645	0.0	1.041	0.7951
12.97	1.002	0.1889	-0.1235	0.917	0.190	5.302	0.0	1.041	1.0034
15.10	1.114	0.2246	-0.1303	0.913	0.229	4.959	0.0	1.038	1.2411
17.16	1.188	0.2866	-0.1358	0.913	0.239	4.118	0.0	1.034	1.4120
19.15	1.189	0.4020	-0.1803	0.890	0.220	2.953	0.0	1.028	1.4139
21.14	1.178	0.4735	-0.2087	0.864	0.212	2.488	0.0	1.021	1.3883
26.13	1.071	0.5844	-0.2235	0.858	0.201	1.832	0.0	1.011	1.1463
30.97	1.013	0.6896	-0.2375	0.849	0.209	1.469	0.0	1.001	1.0260
-1.79	0.219	0.0469	-0.0971	0.936	0.063	4.673	0.0	1.050	0.0481
-3.90	0.107	0.0416	-0.0943	1.001	0.060	2.570	0.0	1.050	0.0115
-6.01	-0.003	0.0397	-0.0933	1.892	0.005	-0.067	0.0	1.051	0.0000
-8.12	-0.120	0.0419	-0.0882	0.800	0.064	-2.862	0.0	1.052	0.0143
-10.24	-0.238	0.0483	-0.0825	0.880	0.072	-4.919	0.0	1.051	0.0564
-12.35	-0.355	0.0584	-0.0766	0.804	0.083	-6.085	0.0	1.050	0.1262
-14.49	-0.478	0.0742	-0.0729	0.892	0.102	-6.437	0.0	1.047	0.2282
-16.58	-0.597	0.0956	-0.0604	0.896	0.120	-6.245	0.0	1.048	0.3561
-18.71	-0.712	0.1315	-0.0459	0.902	0.139	-5.416	0.0	1.043	0.5076
-20.72	-0.729	0.2490	0.0217	0.871	0.101	-2.926	0.0	1.036	0.5311
-25.66	-0.686	0.3384	0.0613	0.831	0.105	-2.026	0.0	1.025	0.4703
-30.62	-0.638	0.4327	0.0686	0.849	0.093	-1.473	0.0	1.017	0.4065

CL COEFFS 0.310943 C.053561
CD COEFFS 0.054093 0.004884 DYCOR -0.43680

Appendix 6
(cont.)

TEST 16 ,ZMAC=0 1A,DEL=0.0 DEG,X=0.75 C,1C8 FLAP,RPM=2477 1 OCT 73

FLAPPED RUDDER INPUT DATA

CF	TR	TY	AREA	SPAN	MAC	XMAC	ZMAC	AZL	OYCOR
C.O	74	78	44.30	7.875	5.7421	-0.7699	0.0	-2.00	-0.4368

ZERO READINGS BEFORE AND AFTER

ANCM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
C.	100.	100.	100.	100.	0.	0.	100.	100.	100.	100.	100.	100.	0.	0.
C.	100.	100.	100.	100.	-10.	-10.	101.	104.	99.	99.	100.	100.	0.	0.

CELL LBS/COUNT 1=0.10000 2=0.01000 3=0.01000 4=C.10000 5=0.48970 6=0.20000 7=0.02273
TWIST=11570.0 SHAFT DIA.= 1.50 IN.

INPLT DATA AS RECORDED

TF	ANCM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1245.	-2.0	R	218.	R	250.	S	156.	R	264.	N	115.	N	88.	S	0.
CC	1244.	C.O		378.		315.		72.		434.		147.		90.		0.
00	1243.	2.0		535.		382.		-62.		606.		179.		93.		0.
00	1245.	4.0		687.		444.		-264.		775.		208.		98.		0.
CC	1245.	6.0		835.		504.		-512.		942.		236.		103.		0.
CC	1245.	8.0		978.		560.		-794.		1110.		262.		109.		0.
CC	1245.	10.0		1115.		612.		-1064.		1268.		285.		115.		0.
CC	1246.	12.0		1234.		645.		-1262.		1400.		308.		116.		0.
00	1245.	14.0		1340.		633.		-1318.		1507.		327.		115.		0.
CC	1247.	16.0		1454.		588.		-1208.		1615.		343.		110.		0.
00	1246.	18.0		1570.		485.		-834.		1700.		366.		96.		0.
00	1243.	20.0		1620.		167.		506.		1690.		371.		64.		0.
CC	1246.	28.0		1630.		74.		936.		1652.		362.		56.		0.
CC	1244.	-4.0		60.		185.		164.		100.		82.		88.		0.
00	1244.	-6.0	N	305.	R	120.	N	102.	N	275.	N	46.	N	90.		0.
CC	1243.	-8.0		467.		56.		-22.		436.		10.		92.		0.
00	1243.	-10.0		635.	N	205.		-220.	R	600.	R	228.		97.		0.
CC	1245.	-12.0		805.		268.		-482.		762.		270.		103.		0.
00	1245.	-14.0		575.		325.		-782.		975.		310.		109.		0.
CC	1244.	-16.0		1150.		380.		-1142.		1088.		348.		117.		0.
CC	1246.	-18.0		1325.		430.		-1572.		1245.		396.		125.		0.
CC	1246.	-20.0		1500.		477.		-2044.		1402.		440.		134.		0.
CC	1246.	-22.0		1635.		519.		-2430.		1525.		475.		142.		0.
CC	1243.	-27.0		1918.		554.		-2810.		1774.		534.		146.		0.
00	1247.	-32.0		2020.		404.		-2116.		1815.		531.		126.		0.

Appendix 6
(cont.)

TEST 16 ,ZMAC=0 1A,DEL=0.0 DEG,X=0.75 D,IC8 FLAP,RPM=2477 1 OCT 73

INPLT DATA CORRECTED FOR ZERO READINGS AND SIGNS					
21 1245.	0.0	-118.00	-150.00	-156.00	15.00
21 1244.	2.00	-278.00	-214.96	-72.42	-12.00
21 1243.	4.01	-435.00	-281.92	61.17	-10.00
21 1245.	6.00	-587.00	-343.87	262.75	-7.00
21 1245.	8.00	-735.00	-403.83	510.33	-2.00
21 1245.	10.00	-878.00	-459.79	791.92	3.00
21 1245.	12.00	-1015.00	-511.75	1061.50	9.00
21 1246.	14.00	-1134.00	-544.71	1259.08	15.00
21 1245.	16.00	-1240.00	-532.67	1314.61	16.00
21 1247.	18.00	-1354.00	-487.62	1204.25	15.00
21 1246.	19.98	-1470.00	-384.58	825.83	227.33
21 1243.	25.00	-1520.00	-66.54	-510.58	243.37
21 1246.	30.00	-1530.00	26.50	-941.00	266.42
21 1244.	-2.00	40.00	-84.46	-165.42	271.46
21 1244.	-4.02	205.00	-19.42	-107.83	-36.00
21 1243.	-6.00	367.00	44.62	15.75	-44.00
21 1243.	-8.00	535.00	105.00	213.33	-12.00
21 1245.	-10.00	705.00	168.00	480.92	-10.00
21 1245.	-12.00	875.00	225.00	774.50	-8.00
21 1246.	-14.00	1050.00	280.00	1134.08	-3.00
21 1246.	-16.00	1225.00	330.00	1563.67	3.00
21 1246.	-18.00	1400.00	377.00	2035.25	9.00
21 1246.	-20.00	1535.00	419.00	2420.83	17.00
21 1243.	-25.00	1818.00	454.00	2800.42	25.00
21 1247.	-30.00	1920.00	304.00	2106.00	34.00
					42.00
					46.00
					26.00

Appendix 6
(cont.)

TEST 16 ,ZMAC=0 IA,DF -0.0 DEG,X=0.75 C,108 FLAP,RPM=2477 1 OCT 73

OYCCA= -0.4368

♦♦FLAPPED RUDDER DATA REDUCTION♦♦

ALPHA	FX-LB	FZ-LB	PX-INLB	MZ-INLB	FXO-LB	FYO-LB	FZO-LB	MXO-INLB	MYO-INLB	MZO-INLB	MYOFLAP-INLB	VEL-FPS
0.00	1.56	13.30	81.10	-1.82	1.20	8.33	13.34	81.12	27.00	0.39	0.0	20.62
2.00	0.72	29.95	200.50	5.57	0.95	9.22	29.94	200.54	38.00	4.04	0.0	20.61
4.00	-0.61	46.32	322.44	14.70	1.37	10.12	46.30	322.77	50.00	0.92	0.0	20.60
6.00	-2.63	62.14	436.25	31.53	2.19	11.77	62.16	437.38	61.00	-2.32	0.0	20.62
8.00	-5.10	77.54	547.87	47.19	3.62	13.72	77.62	549.70	72.00	-14.53	0.0	20.62
10.00	-7.92	92.40	656.70	68.43	5.72	16.55	92.56	659.64	82.00	-28.66	0.0	20.62
12.00	-10.62	106.62	753.59	91.89	8.87	19.85	106.78	757.77	92.00	-46.15	0.0	20.62
14.00	-12.59	118.85	844.13	92.61	13.30	21.55	118.77	844.26	98.00	-91.36	0.0	20.63
16.00	-13.15	129.33	915.90	91.73	19.51	23.11	128.52	909.75	95.00	-139.90	0.0	20.62
18.00	-12.04	140.28	977.15	89.76	28.14	27.04	137.95	962.62	87.00	-190.40	0.0	20.64
19.50	-8.30	150.85	1047.04	49.96	39.78	27.04	145.74	1009.19	69.00	-283.39	0.0	20.63
25.00	5.11	152.67	1047.24	-7.93	65.41	29.96	138.04	957.69	11.00	-423.80	0.0	20.60
30.00	9.41	152.74	557.18	-12.65	81.01	32.12	129.83	870.75	-4.00	-486.14	0.0	20.63
2.00	1.69	-3.16	-38.23	-3.71	1.89	7.61	-3.04	-37.93	15.00	-6.08	0.0	20.61
4.00	1.08	-20.31	-168.36	1.53	3.05	7.59	-20.10	-167.71	3.00	-14.85	0.0	20.61
6.00	-0.16	-37.15	-293.10	7.80	4.73	8.71	-36.84	-291.58	-8.00	-30.84	0.0	20.60
8.00	-2.13	-54.55	-426.50	25.46	6.96	10.55	-54.15	-425.20	-18.00	-45.82	0.0	20.60
10.00	-4.81	-72.18	-566.58	48.63	9.76	13.74	-71.68	-564.83	-30.00	-65.93	0.0	20.62
12.00	-7.75	-85.75	-701.22	66.79	13.52	15.85	-89.06	-697.32	-40.00	-99.52	0.0	20.62
14.00	-11.34	-107.80	-827.64	85.22	18.00	16.59	-106.89	-820.16	-50.00	-139.96	0.0	20.61
16.00	-15.64	-125.80	-980.36	119.59	23.05	22.81	-124.65	-970.74	-59.00	-181.82	0.0	20.63
18.00	-20.35	-143.77	-1121.34	148.51	28.96	26.08	-142.29	-1106.33	-67.00	-235.53	0.0	20.63
20.00	-24.21	-157.69	-1234.13	174.57	35.44	30.15	-155.55	-1211.91	-75.00	-291.22	0.0	20.63
25.00	-28.00	-186.34	-1424.94	184.33	58.28	33.37	-179.19	-1356.96	-81.00	-472.34	0.0	20.60
30.00	-21.06	-195.04	-1399.88	129.59	84.15	31.82	-177.21	-1260.62	-54.00	-622.32	0.0	20.64

Appendix 6
(cont.)

TEST 16 ZMAC=C IN,DEL=0.C DEG,X=0.75 D,1CR FLAP,RPM=2477 1 OCT 73

NYCCR= -0.4368

••FLAPPED RUDDER DATA IN NON-DIMENSIONAL FORM••

ALPHA	CI	CC	CM	CPL	CY	L/D	CMF	RM10--6	CLSQ
0.00	0.105	C.CC95	C.0230	0.772	0.066	11.146	0.0	1.043	0.0111
2.00	0.237	C.CC75	0.3206	0.850	0.073	31.438	0.0	1.042	0.0560
4.01	C.366	C.C108	0.0198	0.885	0.080	33.889	0.0	1.042	0.1342
6.01	0.491	C.0173	0.0182	0.894	0.093	28.416	0.0	1.043	0.2411
8.01	0.613	C.C286	0.0171	0.899	0.108	21.434	0.0	1.043	0.3760
10.01	C.731	0.0452	0.0152	C.905	0.131	16.174	0.0	1.043	0.5346
12.01	C.843	0.0701	0.0140	0.901	0.157	12.032	0.0	1.043	0.7115
14.01	C.937	C.1050	0.0093	0.903	0.170	8.930	0.0	1.043	0.8789
16.01	1.015	0.1541	-0.0055	0.899	0.183	6.587	0.0	1.043	1.0307
18.01	1.088	0.2219	-0.0284	0.886	0.213	4.952	0.0	1.043	1.1837
19.99	1.150	C.3140	-0.0645	0.879	0.213	3.663	0.0	1.043	1.3234
25.00	1.092	0.5175	-0.1465	0.881	0.237	2.111	0.0	1.042	1.1929
30.00	1.025	0.6354	-0.1674	0.852	0.254	1.603	0.0	1.043	1.0501
-2.00	-0.024	0.0149	0.0239	1.582	0.060	-1.613	0.0	1.042	0.0006
-4.02	-0.159	0.0241	0.0256	1.059	0.060	-6.594	0.0	1.042	0.0253
-6.00	-0.292	C.0374	0.0284	1.005	0.069	-7.784	0.0	1.042	0.0850
-8.00	-0.428	0.0551	0.0331	0.997	0.083	-7.781	0.0	1.042	0.1835
-10.00	-0.566	0.0771	0.0353	1.001	0.109	-7.347	0.0	1.043	0.3206
-12.00	-0.704	0.1068	0.0402	0.994	0.125	-6.588	0.0	1.043	0.4950
-14.00	-0.845	0.1423	0.0457	0.974	0.131	-5.939	0.0	1.042	0.7141
-16.01	-0.984	C.1820	0.0524	0.989	0.180	-5.407	0.0	1.043	0.9681
-18.01	-1.123	C.2286	C.0606	0.987	0.212	-4.913	0.0	1.043	1.2613
-20.01	-1.228	0.2757	0.0644	0.989	0.238	-4.389	0.0	1.043	1.5075
-25.01	-1.418	0.4611	0.0868	0.962	0.264	-3.075	0.0	1.042	2.0102
-30.00	-1.358	0.6637	0.1326	0.903	0.251	-2.106	0.0	1.043	1.9534

Appendix 6
(cont.)

TEST 16 ,ZMAC=0 IN,DEL=0.0 DEG,X=0.75 D,10% FLAP,KPM=2477 I OCT 73

DYCCR= -0.4368

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CC	CM	CPL	CY	L/D	CMF	RN*10**6	CLSQ
0.10	C.105	C.CC56	0.0230	C.772	0.066	10.931	0.0	1.043	0.0111
2.23	0.237	0.CC85	0.0206	C.850	0.073	27.954	0.0	1.042	0.0560
4.37	C.366	0.0131	0.0198	0.885	0.080	28.056	0.0	1.042	0.1342
6.48	0.491	C.C213	C.0182	0.894	0.093	23.034	0.0	1.043	0.2411
8.60	0.613	C.0349	0.0171	0.899	0.108	17.568	0.0	1.043	0.3760
10.71	C.731	C.C542	0.0152	C.905	0.131	13.500	0.0	1.043	0.5346
12.82	0.843	0.CA20	0.0140	0.901	0.151	10.284	0.0	1.043	0.7115
14.91	C.937	C.1157	0.0053	0.903	0.170	7.032	0.0	1.043	0.8789
16.98	1.015	0.1714	-0.0055	0.899	0.183	5.924	0.0	1.043	1.0307
19.05	1.088	C.2418	-0.0284	0.886	0.213	4.500	0.0	1.043	1.1837
21.05	1.150	0.3367	-0.0645	0.879	0.213	3.422	0.0	1.043	1.3234
26.05	1.052	C.5375	-0.1429	0.881	0.237	2.032	0.0	1.042	1.5729
30.99	1.025	0.6570	-0.1674	0.852	0.254	1.560	0.0	1.043	1.0501
-2.02	-0.024	0.C145	0.0239	1.582	0.060	-1.612	0.0	1.042	0.0006
-4.17	-0.159	C.C245	0.0254	1.059	0.060	-6.481	0.0	1.042	0.0253
-6.28	-0.292	0.C385	0.0284	1.005	0.069	-7.499	0.0	1.042	0.0850
-8.41	-0.428	C.C581	0.0331	0.997	0.083	-7.349	0.0	1.042	0.1635
-10.55	-0.566	0.CA24	0.0353	1.001	0.109	-6.868	0.0	1.043	0.3206
-12.68	-0.704	0.1151	0.0402	0.994	0.125	-6.114	0.0	1.043	0.4950
-14.82	-0.845	0.1542	0.0457	0.974	0.131	-5.479	0.0	1.042	0.7141
-16.95	-0.984	0.1982	0.0524	0.989	0.180	-4.965	0.0	1.043	0.9681
-19.09	-1.121	C.2457	0.0606	0.987	0.212	-4.497	0.0	1.043	1.2613
-21.19	-1.228	0.3050	0.0644	0.999	0.238	-4.026	0.0	1.043	1.5075
-26.37	-1.418	0.4948	0.0868	0.962	0.264	-2.866	0.0	1.042	2.0102
-31.35	-1.358	C.6564	0.1326	0.903	0.251	-2.007	0.0	1.043	1.9534

CL COEFFS 0.081954 C.060629
CD COEFFS 0.007467 -0.001350
DYCOR 0.000570 DYCOR -0.43680

Appendix 6
(cont.)

TEST 17, ZMAC 0.1N, DEL=35 DEG, X=C.150, 108 FLAP,RPM=2477 200173

FLAPPED ALCCER INPUT DATA

CC	TS	TT	AREA	SPAN	MAC	XMAC	ZMAC	AZL	CYCCR
15.0	74	78	44.30	7.875	5.7421	-C.7659	C.C	-2.00	-C.436P

ZERO READINGS BEFORE AND AFTER

ANCM	1-N	2-N	3-N	4-N	5-N	6-N	7-N
0.	100.	100.	100.	100.	100.	100.	100.
C.	98.	101.	103.	100.	102.	101.	101.

CELL LES/CCOUNT 1=0.1000 2=0.0100 3=C.0100 4=C.1000 5=C.40570 6=C.20000 7=C.02273
 TAIST=11570.C SHAFT CIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANCM	ANGLE	S	1	2	3	4	5	6	7
21	1246.	-2.00	R	842.	305.	812.	831.	239.	131.	C.
00	1245.	0.01	A	1014.	250.	668.	1017.	271.	128.	0.
CC	1245.	2.00	1185.	193.	452.	1203.	308.	308.	124.	C.
CC	1246.	4.00	1349.	142.	192.	1390.	330.	330.	110.	C.
CC	1245.	5.98	1516.	93.	-100.	1582.	370.	370.	113.	0.
CC	1245.	8.00	1685.	R	-354.	1777.	401.	401.	109.	0.
CC	1243.	10.01	1849.	185.	-662.	1970.	430.	430.	106.	C.
CC	1244.	12.02	2001.	196.	-844.	2134.	457.	457.	105.	0.
00	1246.	14.01	2125.	165.	-856.	2264.	473.	473.	108.	0.
CC	1245.	16.00	2236.	89.	-574.	2355.	455.	455.	121.	C.
CC	1247.	18.00	2317.	A	-28.	2401.	507.	507.	138.	0.
00	1246.	20.00	2247.	579.	1272.	2256.	489.	489.	161.	0.
CC	1246.	28.01	2315.	627.	1350.	2301.	452.	452.	145.	C.
CC	1245.	-4.00	661.	364.	892.	642.	204.	204.	135.	C.
00	1245.	-6.00	487.	423.	872.	466.	167.	167.	132.	0.
CC	1245.	-8.00	305.	482.	774.	280.	129.	129.	130.	C.
CC	1247.	-10.01	131.	539.	608.	108.	91.	91.	126.	C.
CC	1243.	-12.00	230.	594.	378.	250.	150.	150.	121.	0.
CC	1246.	-14.00	415.	652.	114.	427.	152.	152.	116.	0.
CC	1246.	-16.00	600.	700.	-218.	600.	235.	235.	107.	C.
CC	1245.	-18.00	780.	753.	-598.	773.	279.	279.	98.	0.
00	1245.	-20.00	961.	796.	-1012.	535.	323.	323.	111.	0.
CC	1245.	-22.00	1157.	831.	-1480.	1092.	362.	362.	120.	C.
CC	1246.	-24.00	1623.	719.	-2262.	1524.	468.	468.	136.	0.
00	1243.	-32.00	1742.	572.	-1602.	1604.	476.	476.	118.	0.

TEST 17, ZMAC 5.1A, DFL=35 DEG, X=0.75C, 108 FLAP, RPM=2477 2CC172

INPLT DATA CORRECTED FOR ZERO READINGS AND SIGNS									
21 1246.	C.C	-742.00	205.00	-812.00	-731.00	139.00	-31.00	C.C	0.0
21 1245.	2.01	-913.56	149.07	-667.90	-917.00	170.92	-27.96	0.0	0.0
21 1245.	4.00	-1084.92	92.75	-451.00	-1103.00	207.83	-23.92	0.0	0.0
21 1246.	6.00	-1248.87	41.63	-190.50	-1290.00	237.75	-17.88	0.0	0.0
21 1245.	7.98	-1415.83	-7.50	102.00	-1482.00	269.67	-12.83	0.0	0.0
21 1245.	10.00	-1584.79	-51.42	396.50	-1677.00	300.58	-8.75	0.0	0.0
21 1243.	12.01	-1748.75	-85.50	665.00	-1870.00	329.50	-5.75	0.0	0.0
21 1244.	14.02	-1900.71	-96.58	847.50	-2034.00	356.42	-4.71	0.0	0.0
21 1246.	16.01	-2024.67	-65.67	860.00	-2164.00	377.33	-7.67	0.0	0.0
21 1245.	18.00	-2135.62	10.25	578.50	-2255.00	354.25	-20.63	0.0	0.0
21 1247.	20.00	-2216.58	149.75	33.00	-2301.00	406.17	-37.58	0.0	0.0
21 1246.	25.00	-2146.54	477.62	-1260.50	-2156.00	388.08	-60.54	0.0	0.0
21 1246.	30.01	-2214.50	525.50	-1352.00	-2201.00	351.00	-64.50	0.0	0.0
21 1245.	-2.00	-560.46	262.37	-885.50	-542.00	102.92	-34.46	0.0	0.0
21 1245.	-4.00	-386.42	321.25	-865.00	-366.00	65.83	-31.42	0.0	0.0
21 1245.	-6.00	-204.37	380.12	-766.50	-180.00	27.75	-29.38	0.0	0.0
21 1247.	-8.01	-30.33	437.00	-600.00	-8.00	-10.33	-25.33	0.0	0.0
21 1243.	-10.00	131.42	491.07	-369.50	148.58	-49.29	-20.29	0.0	0.0
21 1246.	-12.00	316.50	549.75	-103.00	325.50	-51.25	-15.25	0.0	0.0
21 1246.	-14.00	501.58	597.62	227.50	498.42	-134.21	-6.21	0.0	0.0
21 1245.	-16.00	681.67	650.50	608.00	671.33	-178.17	2.83	0.0	0.0
21 1245.	-18.00	862.75	693.37	1022.50	833.25	-222.12	11.00	0.0	0.0
21 1245.	-20.00	1058.33	728.25	1451.00	590.17	-261.08	20.00	0.0	0.0
21 1246.	-25.00	1524.52	616.12	2273.50	1422.08	-367.04	36.00	0.0	0.0
21 1243.	-30.00	1644.00	469.00	1614.00	1502.00	-375.00	18.00	0.0	0.0

Appendix 6
(cont.)

TEST 17, ZMAC 0.1A, DEL=35 DEG, X=C.75C, 108 FLAP, RPM=2477 200773

CYCORN= -C.436A

♦♦FLAPPED RUDDER DATA REDUCTION♦♦

ALPHA	FX-LB	FZ-LB	PX-INLB	PZ-INLB	FX-LB	FYC-LB	FZC-LB	PXC-INLB	PYC-INLB	MZC-INLB	MYCFLAP-INLB	VEL-FPS
-C.CC	8.12	72.15	514.85	-49.63	6.15	8.1C	72.34	516.C2	-36.CC	-35.57	0.0	20.63
2.01	6.68	89.90	438.5C	-35.7C	7.36	1C.47	85.84	638.20	-26.00	-40.68	0.0	20.62
4.CC	4.51	107.56	777.36	-3C.34	9.08	1C.18	1C7.28	775.37	-16.CC	-63.36	0.0	20.62
6.CC	1.5C	124.47	859.65	-7.89	11.53	13.C2	123.55	856.34	-7.0C	-77.46	0.0	20.63
7.98	-1.C2	141.26	1C29.57	7.97	14.82	15.58	14C.68	1024.01	1.00	-107.15	0.0	2C.62
1C.0C	-3.96	158.99	1157.65	23.08	19.40	15.12	157.45	1148.51	5.CC	-147.02	0.0	20.62
12.01	-6.65	175.73	1281.41	38.74	25.32	23.67	174.C2	1267.15	15.CC	-194.25	0.0	2C.60
14.02	-8.47	191.C4	1788.41	44.94	32.93	26.68	188.37	1365.41	17.00	-255.60	0.0	20.61
16.01	-8.60	203.12	1472.19	43.92	42.35	3C.C2	195.85	1426.4C	11.CC	-324.75	0.0	20.63
18.CC	-5.78	213.46	1528.74	15.93	54.85	32.43	206.37	147C.77	-1.CC	-417.25	0.0	20.62
20.0C	-0.33	220.16	1560.34	-2C.4C	69.31	35.58	208.97	1473.80	-26.0C	-512.82	0.0	2C.64
24.99	12.67	209.88	1467.34	-56.97	55.1C	34.52	187.53	1223.63	-65.CC	-635.88	0.0	20.63
3C.CC	13.52	216.2C	1473.43	-55.66	114.87	38.40	183.65	1265.C2	-54.CC	-75C.75	0.0	20.63
-2.CC	8.86	53.42	381.66	-62.25	5.52	7.57	53.87	384.79	-47.CC	-38.41	0.0	20.62
-4.00	8.65	35.43	249.90	-5C.85	5.17	7.57	36.1C	253.65	-57.00	-26.43	0.0	20.62
-6.C1	7.67	16.64	112.89	-48.42	5.41	7.15	17.5C	118.28	-68.CC	-33.14	0.0	20.62
-8.02	6.CC	-1.34	-19.51	-37.44	6.14	7.79	-0.32	-13.01	-78.0C	-40.17	0.0	20.60
-10.01	3.65	-18.C5	-151.06	-19.15	7.24	1C.21	-16.55	-144.15	-88.00	-49.08	0.0	20.63
-12.C1	1.C5	-37.15	-292.68	-4.52	9.73	12.C5	-35.67	-283.45	-58.CC	-73.C3	0.0	20.63
-14.C1	-2.27	-56.13	-435.31	23.68	12.87	13.99	-54.69	-425.70	-1C7.0C	-93.58	0.0	20.63
-16.01	-6.C8	-74.67	-583.04	51.33	16.74	16.42	-73.C3	-571.35	-117.00	-127.00	0.0	20.62
-18.01	-10.22	-93.21	-724.10	78.24	21.58	2C.17	-91.25	-7C8.45	-124.CC	-168.74	0.0	20.62
-2C.01	-14.91	-113.17	-840.57	98.61	27.72	21.71	-11C.73	-617.55	-131.CC	-217.22	0.0	20.62
-25.01	-22.74	-158.65	-12C2.02	146.58	50.61	27.2C	-152.C7	-114C.68	-110.00	-406.41	0.0	20.63
-30.01	-16.14	-169.09	-1224.77	1C2.C5	74.76	26.71	-152.52	-1C57.C2	-84.CC	-554.1C	0.0	20.60

Appendix 6
(cont.)

TEST 17, 2MAC C.IN, DFL=35 DEG, X=C.75D, ICE FLAP, RPP=2477 2CC173

OYCOP= -0.436R

••FLAPPED RUCCER DATA IN NCM-DIMENSIONAL FORM••

ALPHA	CL	CD	CM	CPL	CV	L/E	CMF	PA01C00-6	CLSQ
-0.00	0.571	C.485	-C.1260	0.904	C.064	11.746	C.C	1.043	C.3261
2.01	C.71C	C.583	-C.1311	0.902	0.083	12.181	C.C	1.043	C.5037
4.00	C.647	C.6717	-C.1360	0.918	0.080	11.815	0.0	1.043	0.7181
6.00	0.978	C.6410	-C.1414	C.918	C.103	10.752	C.C	1.043	C.9572
7.98	1.113	0.1171	-C.1486	0.923	0.123	9.508	C.C	1.043	1.2384
10.00	1.247	C.1533	-C.1558	C.924	0.151	8.135	0.0	1.043	1.5550
12.01	1.377	C.2004	-C.1655	C.925	C.187	6.872	C.C	1.042	1.8959
14.02	1.489	0.2604	-C.1788	0.920	C.211	5.720	C.C	1.042	2.2178
16.01	1.570	C.3343	-C.1995	0.917	0.237	4.696	0.0	1.043	2.4634
18.00	1.630	C.4333	-C.2212	C.905	C.264	3.762	C.C	1.043	2.6577
20.00	1.648	0.5467	-C.2684	0.896	C.281	3.015	C.C	1.043	2.7162
24.99	1.480	C.7506	-C.3392	0.896	0.273	1.972	C.C	1.043	2.1509
30.00	1.450	C.9047	-C.3583	0.877	C.303	1.599	C.C	1.043	2.1013
-2.00	0.426	C.6436	-C.1715	0.907	C.060	9.761	C.C	1.043	C.1811
-4.00	C.285	C.6409	-C.1162	0.892	0.059	6.576	0.0	1.043	C.0813
-6.01	C.138	C.6427	-C.1114	0.858	C.057	3.236	0.0	1.043	0.0191
-8.02	-0.003	C.6484	-C.1059	0.160	C.061	-C.052	C.C	1.043	C.0000
-10.01	-0.134	0.0573	-C.1022	1.080	0.081	-2.342	0.0	1.042	C.0180
-12.01	-C.283	C.6748	-C.0954	1.004	0.095	-3.685	0.0	1.043	C.0801
-14.01	-0.432	C.1016	-C.0876	0.988	C.110	-4.249	0.0	1.043	0.1863
-16.01	-0.577	0.1322	-C.0817	0.954	C.130	-4.363	0.0	1.043	C.2328
-18.01	-C.721	C.1704	-C.0716	0.986	C.159	-4.229	0.0	1.043	C.5196
-20.01	-0.875	C.2190	-C.0600	C.938	C.171	-3.594	C.C	1.043	0.7651
-25.01	-1.200	0.3995	0.0173	0.952	C.215	-3.005	C.C	1.043	1.4408
-30.01	-1.207	C.5915	0.0640	0.913	0.211	-2.040	0.0	1.042	1.4564

Appendix 6
(cont.)

TEST 17, 2MAC C.IN, DEL=35 DEG, X=C.75D, 108 FLAP.RPM=2477 2CC173

DYCOR= -C.4368

PRICE DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RA=1000-A	CLSC
0.55	0.571	0.0540	-0.1260	0.904	C.064	10.576	0.0	1.043	C.2261
2.69	C.71C	C.0667	-C.1311	C.902	C.083	10.640	0.0	1.043	C.5C37
4.01	0.847	C.0837	-C.136C	C.918	C.08C	10.119	0.0	1.043	0.7181
6.94	0.978	0.1070	-0.1414	0.918	C.103	9.142	0.0	1.043	C.5572
9.05	1.113	C.1378	-C.1486	0.923	C.123	8.077	0.0	1.043	1.2384
11.20	1.247	C.1793	-C.1558	C.924	C.151	6.954	0.0	1.043	1.355C
13.34	1.377	0.2321	-0.1655	C.925	C.187	5.932	0.0	1.042	1.8950
15.45	1.485	C.2975	-C.1788	0.920	0.211	5.006	0.0	1.042	2.2178
17.52	1.57C	C.3755	-C.1955	0.917	0.237	4.180	0.0	1.043	2.4634
19.57	1.630	0.4778	-C.2212	C.905	C.264	3.412	0.0	1.043	2.6577
21.58	1.648	C.5922	-0.2684	0.898	0.281	2.783	0.0	1.043	2.7162
26.42	1.48C	C.7873	-C.3392	0.896	0.273	1.880	0.0	1.043	2.1509
31.40	1.450	C.9419	-C.3583	0.877	C.303	1.539	0.0	1.043	2.1013
-1.59	0.426	0.0466	-0.1215	0.907	C.060	9.128	0.0	1.043	C.1811
-3.73	C.285	C.0422	-C.1162	0.892	C.059	6.752	0.0	1.043	C.0817
-5.87	0.138	C.0430	-C.1114	C.898	C.057	3.212	0.0	1.043	0.0191
-8.02	-0.001	0.0484	-0.1059	5.160	C.061	-C.052	0.0	1.043	C.0000
-10.14	-C.134	C.0576	-0.1022	1.080	C.081	-2.379	0.0	1.042	C.018C
-12.28	-C.283	C.0782	-C.0554	1.004	C.095	-3.622	0.0	1.043	C.0801
-14.42	-0.432	0.1047	-0.0876	0.988	C.11C	-4.123	0.0	1.043	C.1863
-16.56	-C.577	C.1378	-0.0817	0.994	0.130	-4.187	0.0	1.043	C.7328
-18.70	-C.721	C.1791	-C.0716	0.986	C.159	-4.024	0.0	1.043	0.5196
-20.85	-0.875	C.2318	-C.0600	0.938	C.171	-3.773	0.0	1.043	C.7651
-26.16	-1.20C	C.4236	0.0173	0.957	0.215	-2.834	0.0	1.043	1.4408
-31.17	-1.207	C.6159	C.064C	0.913	0.211	-1.960	0.0	1.042	1.4564

CL CCEFFS C.520928 0.064763
 CD CCEFFS C.046696 C.00523C
 DYCCM -0.4368C

Appendix 6
 Concluded

NEW L.E. ON SPL. PLATE, DEL=0.208FLAP, X =0 9 MAR 74

FLAPPED RUDDER INPUT DATA

DF	TR	TT	AREA	SPAN	MAC	XMAC	ZMAC	AZL	DYCOP
0.0	75	80	44.30	7.875	5.7421	-0.7699	0.0	0.0	99.0003

ZERO READINGS BEFORE AND AFTER

ANOM	1-N	1-R	2-N	2-R	3-N	3-R	4-N	4-R	5-N	5-R	6-N	6-R	7-N	7-R
0.	100.	100.	10.	10.	0.	0.	100.	100.	100.	100.	10.	10.	0.	0.
0.	100.	100.	10.	10.	2.	2.	100.	100.	99.	100.	8.	11.	0.	0.

CELL LRS/COUNT 1=0.10000 2=0.05000 3=0.01000 4=0.10000 5=0.48970 6=0.20300 7=0.0
TWIST=11570.0 SHAFT DIA.= 1.50 IN.

INPUT DATA AS RECORDED

TF	ANOM	ANGLE	S	1	S	2	S	3	S	4	S	5	S	6	S	7
21	1185.	0.0	R	100.	N	12.	164.	R	137.	R	108.	R	22.	22.	0.	0.
00	1197.	2.00	R	240.	R	23.	164.		290.	N	119.		25.	25.	0.	0.
00	1187.	4.00		185.		38.	116.		477.		148.		23.	23.	0.	0.
00	1170.	6.00		515.		53.	16.		575.		175.		19.	19.	0.	0.
00	1172.	8.00		645.		67.	-134.		720.		200.		16.	16.	0.	0.
00	1165.	10.00		775.		81.	-342.		870.		223.		11.	11.	0.	0.
00	1158.	12.00		905.		94.	-610.		1030.		247.	N	13.	13.	0.	0.
00	1160.	14.00		1032.		107.	-928.		1180.		239.		21.	21.	0.	0.
00	1154.	16.00		1153.		117.	-1286.		1325.		287.		28.	28.	0.	0.
00	1153.	18.00		1260.		126.	-1618.		1465.		306.		33.	33.	0.	0.
00	1143.	20.00	R	1130.	R	31.	220.	R	1220.	N	291.	R	21.	21.	0.	0.
00	1126.	23.00		1070.		21.	480.		1190.		275.	R	22.	22.	0.	0.
00	1115.	28.00		1020.		21.	860.		940.		268.		29.	29.	0.	0.
00	1185.	-2.00	N	240.	N	27.	98.	N	200.	R	139.	R	21.	21.	0.	0.
00	1186.	-4.00		180.		42.	-6.		375.		170.		19.	19.	0.	0.
00	1185.	-6.00		515.		58.	-165.		455.		202.		17.	17.	0.	0.
00	1185.	-8.00		650.		73.	-386.		575.		236.		13.	13.	0.	0.
00	1185.	-10.00		790.		88.	-678.		690.		271.	N	10.	10.	0.	0.
00	1184.	-12.00		920.		101.	-1012.		800.		305.		16.	16.	0.	0.
00	1178.	-14.00		1045.		113.	-1378.		895.		336.		23.	23.	0.	0.
00	1175.	-16.00		1135.		118.	-1496.		970.		357.		21.	21.	0.	0.
00	1155.	-18.00		1025.		127.	-178.		945.		328.	R	32.	32.	0.	0.
00	1143.	-20.00		1070.		50.	184.		910.		316.		37.	37.	0.	0.
00	1133.	-22.00		1000.		28.	560.		850.		298.		42.	42.	0.	0.
00	1117.	-27.00		1015.		23.	708.		860.		297.		40.	40.	0.	0.

Appendix 7 Comparative Data With Modified Splitter Plate

NEW L.E. ON SPL. PLATE, DEL=0, 20% FLAP, X = 0, 9 MAR 74

INPUT DATA CORRECTED FOR ZERO READINGS AND SIGNS											
21 1185.	0.0	0.0	2.00	-164.00	-37.00	-8.00	-12.00	0.0			
21 1197.	2.00	-140.00	-13.00	-163.92	-190.00	19.04	-14.96	0.0			
21 1187.	4.00	-285.00	-28.00	-115.83	-337.00	48.08	-12.92	0.0			
21 1170.	6.00	-415.00	-43.00	-15.75	-475.00	75.12	-8.88	0.0			
21 1172.	8.00	-545.00	-57.00	134.33	-620.00	100.17	-5.83	0.0			
21 1165.	10.00	-675.00	-71.00	342.42	-770.00	123.21	-0.79	0.0			
21 1158.	12.00	-805.00	-84.00	610.50	-930.00	147.25	3.50	0.0			
21 1160.	14.00	-932.00	-97.00	928.58	-1080.00	139.29	11.58	0.0			
21 1154.	16.00	-1050.00	-107.00	1286.67	-1225.00	187.33	18.67	0.0			
21 1153.	18.00	-1160.00	-116.00	1618.75	-1365.00	206.37	25.75	0.0			
21 1143.	20.00	-1030.00	-23.00	-219.17	-1120.00	191.42	-10.58	0.0			
21 1126.	23.00	-970.00	-11.00	-479.58	-1090.00	175.46	-11.54	0.0			
21 1115.	28.00	-920.00	-11.00	-859.00	-890.00	168.50	-18.50	0.0			
21 1105.	-2.00	140.00	17.00	-96.92	100.00	-39.00	-10.46	0.0			
21 1106.	-4.00	280.00	32.00	7.17	235.00	-70.00	-8.42	0.0			
21 1105.	-6.00	415.00	48.00	165.25	355.00	-102.00	-6.38	0.0			
21 1185.	-8.00	550.00	63.00	387.33	475.00	-136.00	-2.33	0.0			
21 1185.	-10.00	690.00	78.00	679.42	590.00	-171.00	1.42	0.0			
21 1104.	-12.00	820.00	91.00	1013.50	700.00	-205.00	7.50	0.0			
21 1178.	-14.00	945.00	103.00	1379.58	795.00	-236.00	14.58	0.0			
21 1175.	-16.00	1035.00	108.00	1497.67	870.00	-257.00	12.67	0.0			
21 1155.	-18.00	995.00	47.00	179.75	845.00	-228.00	-21.13	0.0			
21 1143.	-20.00	970.00	40.00	-182.17	810.00	-216.00	-26.08	0.0			
21 1133.	-22.00	900.00	18.00	-558.08	750.00	-198.00	-31.04	0.0			
21 1117.	-27.00	915.00	13.00	-706.00	760.00	-197.00	-29.00	0.0			

Appendix 7
(cont.)

NEW L.E. ON SPL. PLATE, DEL=0.208FLAP, X = 0 9 MAR 74

DYCOR IS BEING COMPUTED

FLAPPED RUDDER DATA REDUCTION

ALPHA	FX-LB	FZ-LB	MX-INLR	MZ-INLR	FXO-LB	FYO-LB	FZO-LB	MXO-INLB	MYO-INLR	MZO-INLB	MYOELAP-INLB	VEL-EPS
-0.00	1.64	-0.10	-0.85	-6.47	1.64	6.70	-0.10	-0.85	-1.00	-6.47	0.0	21.24
2.00	1.64	14.65	102.48	-9.35	2.15	9.31	14.58	102.09	11.00	-12.92	0.0	21.35
4.00	1.16	29.90	205.75	-2.99	3.24	9.41	29.75	205.04	25.00	-17.34	0.0	21.26
6.00	0.16	43.65	304.71	8.00	4.72	9.21	43.39	303.88	38.00	-23.90	0.0	21.10
8.00	-1.34	57.35	402.22	19.10	6.65	10.83	56.98	400.96	51.00	-37.06	0.0	21.12
10.01	-3.42	71.05	498.81	39.45	8.97	13.56	70.57	496.12	63.00	-47.42	0.0	21.06
12.01	-6.10	84.70	600.68	56.20	11.64	16.95	84.12	599.24	75.00	-69.92	0.0	20.99
14.01	-9.29	98.05	694.91	134.85	14.71	34.22	97.38	619.56	87.00	-15.50	0.0	21.01
16.01	-12.87	110.35	777.30	110.47	18.05	23.80	109.62	777.64	96.00	-108.06	0.0	20.96
18.01	-16.19	121.80	864.59	135.27	22.24	27.06	120.84	864.08	104.00	-138.52	0.0	20.95
20.00	2.19	104.15	755.07	38.22	37.68	17.18	97.12	722.60	20.00	-222.33	0.0	20.86
22.00	4.79	97.55	720.69	64.09	42.53	22.23	87.92	688.44	9.00	-222.60	0.0	20.70
24.00	8.59	92.55	602.42	0.26	51.03	7.06	77.68	532.03	9.00	-282.59	0.0	20.60
-2.00	0.97	-14.85	-106.23	0.79	1.49	7.87	-14.81	-106.19	-15.00	-2.91	0.0	21.24
-4.00	-0.07	-29.60	-210.40	8.71	1.99	9.14	-29.53	-210.49	-28.00	-5.98	0.0	21.25
-6.00	-1.65	-43.90	-310.57	21.05	2.95	12.41	-43.83	-311.07	-43.00	-11.53	0.0	21.24
-8.00	-3.87	-58.15	-416.91	40.60	4.26	16.25	-58.12	-418.50	-56.00	-17.82	0.0	21.24
-10.01	-6.79	-72.90	-520.83	59.31	5.97	21.14	-72.97	-523.22	-70.00	-32.03	0.0	21.24
-12.01	-10.13	-86.55	-623.95	84.02	8.08	25.57	-86.77	-627.78	-81.00	-47.54	0.0	21.23
-14.01	-13.80	-99.65	-711.66	110.74	10.72	29.85	-100.03	-717.31	-92.00	-64.72	0.0	21.17
-16.01	-14.98	-108.90	-775.76	108.37	15.62	33.03	-108.81	-775.58	-97.00	-109.65	0.0	21.15
-18.00	-1.80	-101.85	-707.83	14.57	29.76	28.14	-97.42	-677.69	-42.00	-204.87	0.0	20.97
-20.00	1.82	-99.00	-664.46	6.46	35.57	26.79	-92.41	-626.59	-36.00	-221.19	0.0	20.86
-22.00	5.28	-90.90	-612.92	-2.52	39.23	25.00	-82.19	-567.35	-16.00	-231.94	0.0	20.77
-27.00	7.06	-92.15	-610.11	6.21	48.13	23.14	-78.90	-546.43	-11.00	-271.45	0.0	20.62

NEW L.E. ON SPL. PLATE, DEL=0.2, KFLAP, X = 0 9 MAR 74

NYCOR IS BEING COMPUTED

FLAPPED RUNDER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CD	CN	CPL	CY	L/D	CMF	RN*10**6	CLS2
-0.00	-0.001	0.3122	-0.0012	1.075	0.350	-0.061	0.0	1.097	0.3800
2.00	0.108	0.0159	-0.0004	0.889	0.369	6.785	0.0	1.103	0.0116
4.00	0.221	0.0241	0.0026	0.875	0.070	9.178	0.0	1.098	0.0429
6.00	0.327	0.0356	0.0058	0.889	0.069	9.195	0.0	1.090	0.1072
8.00	0.429	0.0501	0.0090	0.854	0.082	8.567	0.0	1.091	0.1842
10.01	0.535	0.0679	0.0110	0.893	0.133	7.671	0.0	1.088	0.2859
12.01	0.641	0.0987	0.0130	0.905	0.129	7.228	0.0	1.095	0.4111
14.01	0.741	0.1119	0.0153	0.808	0.260	6.620	0.0	1.086	0.5491
16.01	0.838	0.1381	0.0147	0.901	0.182	6.074	0.0	1.083	0.7031
18.01	0.925	0.1703	0.0136	0.909	0.207	5.433	0.0	1.082	0.8559
20.00	0.750	0.2910	-0.0809	0.945	0.123	2.577	0.0	1.078	0.5625
23.00	0.689	0.3334	-0.0902	0.994	0.174	2.368	0.0	1.070	0.4751
28.00	0.615	0.4040	-0.0858	0.970	0.056	1.522	0.0	1.064	0.3782
-2.00	-0.110	0.0111	-0.0046	0.911	0.359	-9.959	0.0	1.098	0.0122
-4.00	-0.220	0.0148	-0.0068	0.905	0.068	-14.816	0.0	1.097	0.0433
-6.00	-0.327	0.0219	-0.0119	0.901	0.392	-14.882	0.0	1.097	0.1066
-8.00	-0.433	0.0317	-0.0146	0.914	0.121	-13.653	0.0	1.097	0.1874
-10.01	-0.544	0.0445	-0.0190	0.910	0.157	-12.227	0.0	1.097	0.2955
-12.01	-0.647	0.0602	-0.0187	0.919	0.191	-10.737	0.0	1.097	0.4134
-14.01	-0.750	0.0803	-0.0199	0.911	0.224	-9.330	0.0	1.094	0.5618
-16.01	-0.817	0.1173	-0.0172	0.905	0.248	-6.966	0.0	1.093	0.6682
-18.00	-0.745	0.2275	0.0485	0.983	0.215	-3.273	0.0	1.083	0.5543
-20.00	-0.714	0.2747	0.0541	0.861	0.207	-2.598	0.0	1.078	0.5093
-22.00	-0.640	0.3056	0.0732	0.877	0.195	-2.095	0.0	1.073	0.4100
-27.00	-0.624	0.3803	0.0825	0.879	0.183	-1.639	0.0	1.065	0.3899

Appendix 7
(cont.)

NEW L.E. ON SFL PLATE, DEL=0.20XFLAP, X = 0 9 MAR 74

NYCTR IS BEING COMPUTED

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CFL	CV	L/D	CWF	NYCTR--6	CLSQ
-0.00	-0.001	0.0122	-0.0012	1.375	0.050	-0.061	0.0	1.007	0.0030
2.10	0.108	0.0163	-0.0034	0.889	0.069	6.703	0.0	1.103	0.0116
4.21	0.221	0.0249	0.0026	0.875	0.070	8.876	0.0	1.098	0.0489
6.32	0.327	0.0374	0.0058	0.789	0.069	8.754	0.0	1.090	0.1072
8.42	0.429	0.0532	0.0090	0.894	0.082	8.071	0.0	1.091	0.1842
10.52	0.535	0.0727	0.0110	0.893	0.103	7.353	0.0	1.088	0.2959
12.62	0.641	0.0954	0.0130	0.905	0.129	6.707	0.0	1.085	0.4111
14.72	0.741	0.1211	0.0153	0.803	0.260	6.118	0.0	1.084	0.5491
16.81	0.838	0.1498	0.0147	0.901	0.182	5.597	0.0	1.083	0.7031
18.90	0.925	0.1846	0.0136	0.914	0.277	5.011	0.0	1.082	0.8559
20.72	0.750	0.3004	-0.0809	0.945	0.133	2.497	0.0	1.078	0.5625
23.66	0.689	0.3413	-0.0902	0.994	0.174	2.019	0.0	1.070	0.4751
28.59	0.615	0.4103	-0.0859	0.970	0.056	1.499	0.0	1.064	0.3782
-2.11	-0.110	0.0113	-0.0046	0.911	0.059	-9.779	0.0	1.097	0.0127
-4.21	-0.220	0.0156	-0.0068	0.905	0.068	-14.350	0.0	1.098	0.0463
-6.32	-0.327	0.0237	-0.0119	0.911	0.092	-13.762	0.0	1.097	0.1066
-8.42	-0.433	0.0349	-0.0146	0.914	0.121	-12.423	0.0	1.097	0.1874
-10.53	-0.544	0.0494	-0.0180	0.913	0.157	-11.003	0.0	1.097	0.2955
-12.63	-0.647	0.0673	-0.0187	0.919	0.191	-9.618	0.0	1.097	0.4134
-14.73	-0.750	0.0897	-0.0199	0.911	0.224	-8.352	0.0	1.194	0.5618
-16.79	-0.817	0.1285	-0.0172	0.905	0.248	-6.363	0.0	1.093	0.6682
-18.72	-0.765	0.2367	0.0485	0.983	0.215	-3.145	0.0	1.083	0.5543
-20.69	-0.714	0.2832	0.0541	0.861	0.207	-2.520	0.0	1.078	0.5093
-22.62	-0.640	0.3125	0.0732	0.877	0.195	-2.049	0.0	1.073	0.4100
-27.60	-0.624	0.3868	0.0925	0.879	0.183	-1.612	0.0	1.065	0.3889

CL COEFFS	-0.001770	0.051021	NYCTR	1.23061
CD COEFFS	0.012742	0.001094		

Appendix 7
(cont.)

NEW L.E. ON SPL. PLATE, DEL=0.207FLAP, X = 0 9 MAR 74

DYCDR= 1.2306

OVERLAPPED RUNNER DATA REMICTION**

ALPHA	FX-L4	FZ-L5	MX-INLR	MY-INLR	FYQ-LR	FYC-LR	FZ-LR	MXJ-INLR	MYJ-INLR	MYDELAP-INLR	VEL-FPS
-0.00	1.64	-0.10	-0.95	-6.47	1.64	6.70	-0.04	-0.71	-1.02	0.0	21.24
2.00	1.64	14.65	102.48	-9.35	1.84	9.31	14.63	1.32.35	11.73	1.73	21.35
4.00	1.16	29.90	205.75	-2.99	2.60	9.41	29.81	2.05.37	25.00	0.0	21.26
6.00	0.16	43.65	304.71	8.00	3.79	0.21	43.49	3.04.32	34.00	1.1	21.10
8.00	-1.34	57.35	402.22	19.10	5.43	13.83	57.11	4.01.66	51.00	0.0	21.12
10.01	-3.42	71.05	496.81	30.45	7.45	13.56	70.74	4.97.02	63.00	0.0	21.06
12.01	-6.10	84.70	600.68	56.20	9.83	16.95	84.35	6.01.67	75.00	1.1	20.99
14.01	-9.29	98.05	694.91	134.85	12.62	34.22	97.63	6.19.75	87.00	0.0	21.01
16.01	-12.87	110.35	777.30	110.47	15.60	23.90	109.93	7.19.74	96.00	0.0	20.94
18.01	-16.19	121.80	864.54	135.27	19.64	27.16	121.29	8.66.96	104.00	0.0	20.95
20.00	2.19	104.15	755.07	38.22	35.59	17.18	97.91	7.27.21	20.00	0.0	20.96
23.00	4.79	97.55	720.69	94.09	40.53	22.24	88.92	6.93.07	9.00	1.1	20.71
26.00	8.59	92.55	602.42	0.26	49.35	7.36	78.75	5.37.94	9.00	0.0	20.60
-2.00	0.97	-14.85	-106.23	0.79	1.81	7.87	-14.77	-1.06.10	-14.00	0.0	21.24
-4.00	-0.07	-29.60	-210.40	3.71	2.63	9.14	-29.49	-2.10.31	-20.00	1.1	21.25
-6.00	-1.65	-43.90	-310.57	21.05	3.84	12.41	-43.76	-3.10.75	-43.00	0.0	21.24
-8.00	-3.87	-58.15	-416.91	40.60	5.50	16.25	-58.12	-4.13.02	-56.00	0.0	21.24
-10.01	-6.79	-72.40	-520.93	59.31	7.53	21.14	-72.83	-5.22.61	-70.00	0.0	21.24
-12.01	-10.13	-86.55	-623.95	84.02	9.94	25.57	-86.57	-6.26.61	-81.00	0.0	21.23
-14.01	-13.80	-99.45	-711.66	111.74	12.87	29.85	-99.77	-7.15.76	-92.00	0.0	21.17
-16.01	-14.98	-108.90	-775.76	108.37	17.05	33.03	-108.45	-7.73.05	-97.00	0.0	21.15
-18.00	-1.80	-101.85	-707.93	14.57	31.85	28.14	-96.76	-6.73.13	-92.00	0.0	20.97
-20.00	1.87	-99.00	-664.46	6.46	37.55	26.70	-91.62	-6.21.70	-96.00	0.0	20.96
-22.00	5.58	-90.40	-612.92	-2.52	40.98	25.00	-91.33	-5.62.24	-16.00	0.0	20.77
-27.00	7.06	-92.15	-610.11	6.21	49.81	23.14	-77.85	-5.40.48	-11.00	0.0	20.62

Appendix 7
(cont.)

NEW L.E. ON SPL. PLATE, DEL=0.218 FLAP, X = 0 9 MAR 74

NYCNR= 1.2336

FLAPPED RUMBER DATA IN NON-DIMENSIONAL FORM

ALPHA	CL	CD	CM	CPI	CY	L/D	CMF	HNLOWE-6	CISQ
-0.00	-0.000	0.0122	-0.0012	1.387	0.053	-0.039	0.0	1.097	0.0000
2.00	0.108	0.0135	-0.0004	0.882	0.069	7.968	0.0	1.103	0.0116
4.00	0.222	0.0193	0.0075	0.874	0.070	11.458	0.0	1.093	0.0491
6.00	0.328	0.0286	0.0059	0.889	0.069	11.485	0.0	1.040	0.1076
8.00	0.430	0.0409	0.0090	0.893	0.082	10.525	0.0	1.091	0.1850
10.01	0.536	0.0564	0.0110	0.892	0.133	9.498	0.0	1.084	0.2873
12.01	0.643	0.0749	0.0132	0.904	0.129	8.591	0.0	1.085	0.4136
14.01	0.743	0.0960	0.0155	0.906	0.260	7.743	0.0	1.086	0.5524
16.01	0.841	0.1200	0.0150	0.900	0.182	7.010	0.0	1.083	0.7077
18.01	0.929	0.1504	0.0140	0.908	0.207	6.175	0.0	1.082	0.8622
20.00	0.756	0.2748	-0.0010	0.943	0.133	2.751	0.0	1.078	0.5717
23.00	0.696	0.3185	-0.0023	0.991	0.174	2.196	0.0	1.070	0.4844
28.00	0.624	0.1907	-0.0060	0.867	0.056	1.506	0.0	1.064	0.3083
-2.00	-0.110	0.0134	-0.0047	0.912	0.059	-8.196	0.0	1.097	0.0121
-4.00	-0.219	0.0196	-0.0068	0.906	0.068	-11.223	0.0	1.098	0.0482
-6.00	-0.326	0.0289	-0.0119	0.902	0.092	-11.261	0.0	1.097	0.1062
-8.00	-0.432	0.0410	-0.0145	0.915	0.121	-10.540	0.0	1.097	0.1809
-10.01	-0.542	0.0561	-0.0179	0.911	0.157	-9.667	0.0	1.097	0.2943
-12.01	-0.645	0.0741	-0.0195	0.919	0.191	-8.707	0.0	1.097	0.4166
-14.01	-0.748	0.0964	-0.0197	0.911	0.224	-7.754	0.0	1.094	0.5589
-16.01	-0.815	0.1349	-0.0149	0.905	0.248	-6.041	0.0	1.093	0.6637
-18.00	-0.710	0.2434	0.0485	0.843	0.215	-3.039	0.0	1.083	0.5468
-20.00	-0.700	0.2900	0.0540	0.862	0.207	-2.440	0.0	1.078	0.5006
-22.00	-0.634	0.3193	0.0331	0.878	0.195	-1.985	0.0	1.073	0.4315
-27.00	-0.615	0.3936	0.0823	0.982	0.193	-1.563	0.0	1.055	0.3785

Appendix 7
(cont.)

NEW L.F. ON SPL. PLATE, DFL=0.208FLAP, X = 0 9 MAR 74

NYCOR= 1.2306

PRIOR DATA CORRECTED FOR TUNNEL INTERFERENCE

ALPHA	CL	CD	CM	CPL	CY	L/D	CMF	RN*LOS=-6	CLSQ
-0.00	-0.000	0.0122	-0.0012	1.387	0.050	-0.039	0.0	1.097	0.0000
2.10	0.108	0.0137	-0.0004	0.889	0.069	7.855	0.0	1.103	0.0116
4.22	0.222	0.0202	0.0025	0.875	0.070	10.990	0.0	1.098	0.0491
6.32	0.328	0.0304	0.0058	0.889	0.069	10.804	0.0	1.090	0.1076
8.42	0.430	0.0440	0.0090	0.893	0.082	9.783	0.0	1.091	0.1850
10.52	0.536	0.0612	0.0110	0.892	0.103	8.752	0.0	1.088	0.2873
12.62	0.643	0.0818	0.0132	0.904	0.129	7.856	0.0	1.085	0.4134
14.72	0.743	0.1052	0.0155	0.806	0.260	7.362	0.0	1.086	0.5524
16.82	0.841	0.1319	0.0150	0.900	0.182	6.380	0.0	1.083	0.7077
18.90	0.929	0.1648	0.0140	0.908	0.207	5.634	0.0	1.082	0.8622
20.73	0.756	0.2444	-0.0010	0.943	0.133	2.659	0.0	1.078	0.5717
23.67	0.696	0.3266	-0.0003	0.991	0.174	2.132	0.0	1.070	0.4849
28.60	0.624	0.3972	-0.0060	0.867	0.056	1.570	0.0	1.064	0.3283
-2.11	-0.110	0.0134	-0.0047	0.912	0.059	-8.064	0.0	1.097	0.0121
-4.21	-0.219	0.0204	-0.0068	0.936	0.068	-10.778	0.0	1.098	0.0492
-6.32	-0.326	0.0307	-0.0119	0.902	0.092	-10.609	0.0	1.097	0.1062
-8.42	-0.432	0.0441	-0.0145	0.915	0.121	-9.793	0.0	1.097	0.1868
-10.53	-0.542	0.0610	-0.0179	0.911	0.157	-8.886	0.0	1.097	0.2973
-12.63	-0.645	0.0811	-0.0185	0.919	0.191	-7.958	0.0	1.097	0.4166
-14.73	-0.748	0.1058	-0.0197	0.911	0.224	-7.068	0.0	1.094	0.5589
-16.79	-0.815	0.1460	-0.0269	0.904	0.248	-5.581	0.0	1.093	0.6637
-18.71	-0.739	0.2526	0.0455	0.883	0.215	-2.928	0.0	1.083	0.5468
-20.68	-0.708	0.2984	0.0540	0.867	0.207	-2.377	0.0	1.078	0.5036
-22.61	-0.634	0.3260	0.0731	0.878	0.195	-1.944	0.0	1.073	0.4015
-27.59	-0.615	0.3999	0.0823	0.982	0.183	-1.538	0.0	1.065	0.3785

CL COEFFS	-0.002856	0.051331	NYCOR	0.20170
CD COEFFS	0.012741	0.000001		

Appendix 7
Concluded