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Efficient, Low-Cost Fan System Research for General Aviation and Commuter Aircraft

G.L. Merrill
Advanced Propulsion, Inc., Phoenix, Arizona

August 2003

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Efficient, Low-Cost Fan System Research for General Aviation and Commuter Aircraft

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Prepared under Contract NAS3–27644

National Aeronautics and
Space Administration

Glenn Research Center

August 2003

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EFFICIENT, LOW-COST FAN SYSTEM RESEARCH

FOR GENERAL AVIATION & COMMUTER AIRCRAFT

PREFACE

This investigation was conducted by Advanced Propulsion Inc. of Phoenix, Arizona under Contract NAS3-27644, administered by the National Aeronautics and Space Administration, Lewis Research Center. The Advanced Propulsion Inc. principal investigator was G. L. Merrill. Aerodynamics design and analysis support was provided by B. Cassem. Mechanical/structural design and analysis support was provided by G. Pittard. The NASA Contracting Officers were K. R. Brocone and H. Shaw. The NASA Contracting Officer's Technical Representative, J. D. Eisenberg, provided technical direction for the program.

EFFICIENT, LOW-COST FAN SYSTEM RESEARCH

FOR GENERAL AVIATION & COMMUTER AIRCRAFT

ABSTRACT

Research investigations conducted by Advanced Propulsion Inc., which were intended to validate efficient, low-cost fan system concepts, are described in this report. The report briefly describes the broad range of applicability of the fan system investigated. It defines the expected benefits the fan system would have on new, advanced turbofan engines for specific, lower-speed aircraft applications. The overall concept is shown to apply specifically to future general aviation and commuter aircraft optimized for relatively short-range missions and to typical cruising flight speeds in the range of 200 to 400 knots.

Basic fan design premises are defined that are intended to yield high efficiency level in terms of both stage adiabatic efficiency and turbofan engine propulsive efficiency at lower flight speeds than are now addressed with turbofan propulsion systems designed specifically for executive and commercial jet aircraft.

The premises include system and mission optimized fan pressure ratio ranges for the range of relevant flight speeds of future general aviation private aircraft and low-density, shorthaul airliners that are commonally referred to as commuters. The premises also include the use of current state-of-the-art aerodynamic loading parameters yielding velocity triangles that are very similar to those of current, high pressure ratio, transonic stages in larger turbofans. Such premises are shown to yield very low fan rotational speed versus current practice. In turn, this is shown to yield high potential for use of substantially different materials and mechanical design criteria that can result in dramatically lower manufacturing cost.

Materials, manufacturing, stress, vibration, bird-strike and erosion investigations are reported that sought low-cost solutions for the fan rotor design, given the unique, low-speed characteristics of the predicated fan design. The materials investigations included fiber reinforced plastics and commercially available aluminum alloys. The manufacturing investigations included injection molded blading, precision forged blading with blade-root machining and forged/numerical controlled machined integral wheel (blisk) processing. The aluminum alloy blisk rotor configuration is reported to have the best combination of overall performance, including one and four-pound bird strike capability and lower manufacturing cost. The fan stator system, mechanically integrated with the engine front frame, is described to be most suitable as an assembly of aluminum precision investment cast components having minimal machining.

The report describes parametric aerodynamic design analyses that yielded 91+ percent adiabatic efficiency for a 1.10 pressure ratio, 38.5 pound-per-second fan for a 200-knot-class small turbofan. These results obtained with the USAF UDO300 code suggests that, with follow-on use of an advanced computational aerodynamics code and with a comprehensive component development program, adiabatic efficiencies in the range of 92 to 93 percent may be obtained over the ranges of predicated pressure ratios from 1.08 to 1.35 and flows from 38 to 150 pounds per second.

The report ends with the Advanced Propulsion Inc. conclusions that the investigations carried out in this program substantially validated optimistic preliminary design premises used in prior systems/mission analyses on the applicability of turbofan propulsion to lower-speed general aviation and commuter aircraft.

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EFFICIENT, LOW-COST FAN SYSTEM RESEARCH

FOR GENERAL AVIATION & COMMUTER AIRCRAFT

1.0 INTRODUCTION

The National Aeronautics and Space Administration and the Federal Aviation Administration have missions to facilitate advances in technologies applicable to General Aviation (GA) and Commuter (low-density, shorthaul) aircraft. It is widely perceived that propulsion for these aviation segments is barrier technology. Exactly how significant improvements can be achieved constitutes a pivotal issue.

Definite needs exist for major improvements in propulsion/aircraft performance, fuel efficiency, reduced community noise, lowered chemical emissions, increased reliability and integrity, reduced cabin noise and vibration and dramatically reduced operating and ownership cost. These are, in fact, the essential improvements that mission-optimized, high bypass ratio turbofans have provided over the past few decades for commercial and executive aviation segments. Turbofan propulsion is now the definitive means of propulsion for all aircraft except those that are the subject of this investigative research effort. It is a reasonable assumption that similarly mission-optimized turbofans could yield similar benefits for general aviation and low-density shorthaul aviation.

During the period 1984 to the present, Advanced Propulsion Inc. has performed broad ranging, internally-funded studies based upon this assumption. The studies include turbofan engine and airplane conceptual and preliminary design, comprehensive mission and tradeoff analyses and in-depth cost/business analyses. More than twenty different engine/airplane/mission combinations have been evaluated in these studies, including single and twin-engine private light airplanes, work airplanes such as crop application airplanes and package freighters, as well as low-density shorthaul airliners ranging from twelve to forty four seats. The results of these studies have been very positive in terms of the potential of mission-optimized turbofans yielding major improvements versus all the needs cited above.

In order to proceed with further technical and business developments it is prudent to further validate the assumptions and premises of the studies. Fan system design is a key element of Advanced Propulsion Inc. validation efforts for reasons made clear in the body of this report. In turbofan engines, the fan system design involves nearly all of the aircraft system-level tradeoff and optimization analyses. It is key in all the propulsion system weight, drag and fuel efficiency tradeoffs, in all the aircraft performance trades and in the final economic analyses of new aircraft products. The predications and premises of the investigations conducted in the present research were derived from the systems studies previously conducted by Advanced Propulsion Inc. This report and its conclusions show that the work has yielded a higher level of confidence in the fan system design fundamentals that were addressed.

2.0 TECHNICAL PREMISES OF THE RESEARCH

The overreaching, implied premise of the investigation is that internal momentum exchange propulsion--turbofan jet propulsion can be superior, in the several ways described above, to open propeller propulsion in applications having as little as 200 to 400 knots design flight speeds. (There is a general technical concensus that open-propeller propulsion is more fuel-efficient at these speeds and is an essential imperative for aircraft of this class.) There are no engine/aircraft examples flying that tend to substantiate this turbofan premise. There are no known turbofans mission-optimized for 200 knots cruise speed.

The first technical premise of the present study is that the fan design effort is addressed to aircraft having cruise speeds/altitudes in the shaded box of Figure 1.

The second technical premise is concerned with the selection of fan pressure ratio, a principle determinant of turbofan engine propulsive efficiency.

The ongoing systems and mission analysis work of Advanced Propulsion Inc. deals with the separate elements of overall propulsion system efficiency:

- **CYCLE THERMAL EFFICIENCY**
- **PROPULSIVE EFFICIENCY**
- **SYSTEM WEIGHT EFFICIENCY**
- **SYSTEM DRAG EFFICIENCY**

There are numerous interrelationships between these efficiency elements and between the component and engine design variables that affect them. Furthermore, there are numerous interrelationships between the engine elements and design variables and the aircraft design for which the new propulsion system is intended. A rigorous, systematic approach is required in order to define all the design variables that quantify a best set that meets the overall propulsion system efficiency goals and the aircraft size, performance and cost goals.

Fan pressure ratio is one of the engine design variables that affect the propulsive efficiency element. Selection of the best fan pressure ratio for an aircraft design cruise flight speed involves numerous tradeoffs relating to engine size, weight, nacelle drag and cost. Advanced Propulsion Inc. has made those trades for numerous aircraft point designs having design cruise speeds between 200 and 400 knots. The best solutions fall approximately on a line of pressure ratio versus cruise speed that represents a constant fan-jet ideal propulsive efficiency of 80 percent.

This fan pressure ratio versus aircraft design cruise speed relationship is illustrated in Figure 2. The term, ideal propulsive efficiency, is defined on this figure.

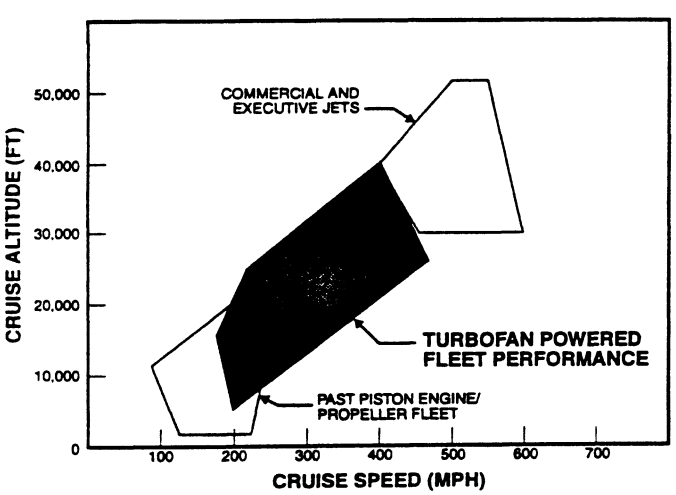

FIGURE 1. Aircraft performance envelope.

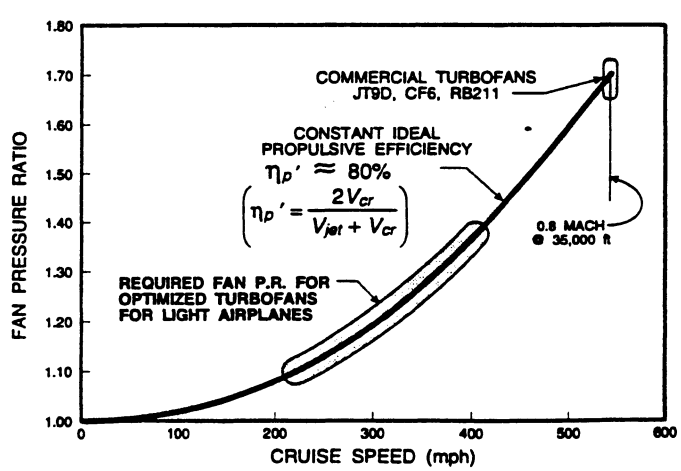

FIGURE 2. Fan pressure ratio vs speed.

2.1 FAN DESIGN BASELINES

Initial proposal baselines for the fan design were further refined as definitive baselines for the investigation. A representative fan stage was selected that would yield the broadest applicability of the study results. The stage was adapted from prior general aviation and commuter system study results. The design parameters were selected to yield very high bypass ratio turbofans suitable for airplanes having design cruise speeds from 200 to 300 knots. The stage is intended to be uprated in increments of flow and pressure ratio as a function of fan speed (rpm) and to be scaleable over a broad range. Because the smallest of the potential applications represents the toughest case for meeting efficiency and production cost goals, it was elected to study a fan sized at 19 inches diameter and corrected flow less than 40 lb/sec. The following table lists data on the selected fan and one representative uprated derivative, and Figure 3 illustrates the basic configuration and additional data.

FAN CONFIGURATION	BASELINE	UPRATE
AIRPLANE SPEED CLASS	200-KNOT	300-KNOT
ENGINE THRUST CLASS	500-LB	800-LB
FAN FLOW	38.45 LB/SEC	47.18 LB/SEC
FAN PRESSURE RATIO	1.10	1.19
TIP SPEED	734 FPS	983 FPS
SPEED	8844 RPM	11,847 RPM
TIP DIAMETER	19.00 IN	19.00 IN
INLET HUB/TIP RATIO	0.316	0.316
BLADE ASPECT RATIO	1.88	1.88
BLADE/STATOR VANE NUMBERS	17/27	17/27

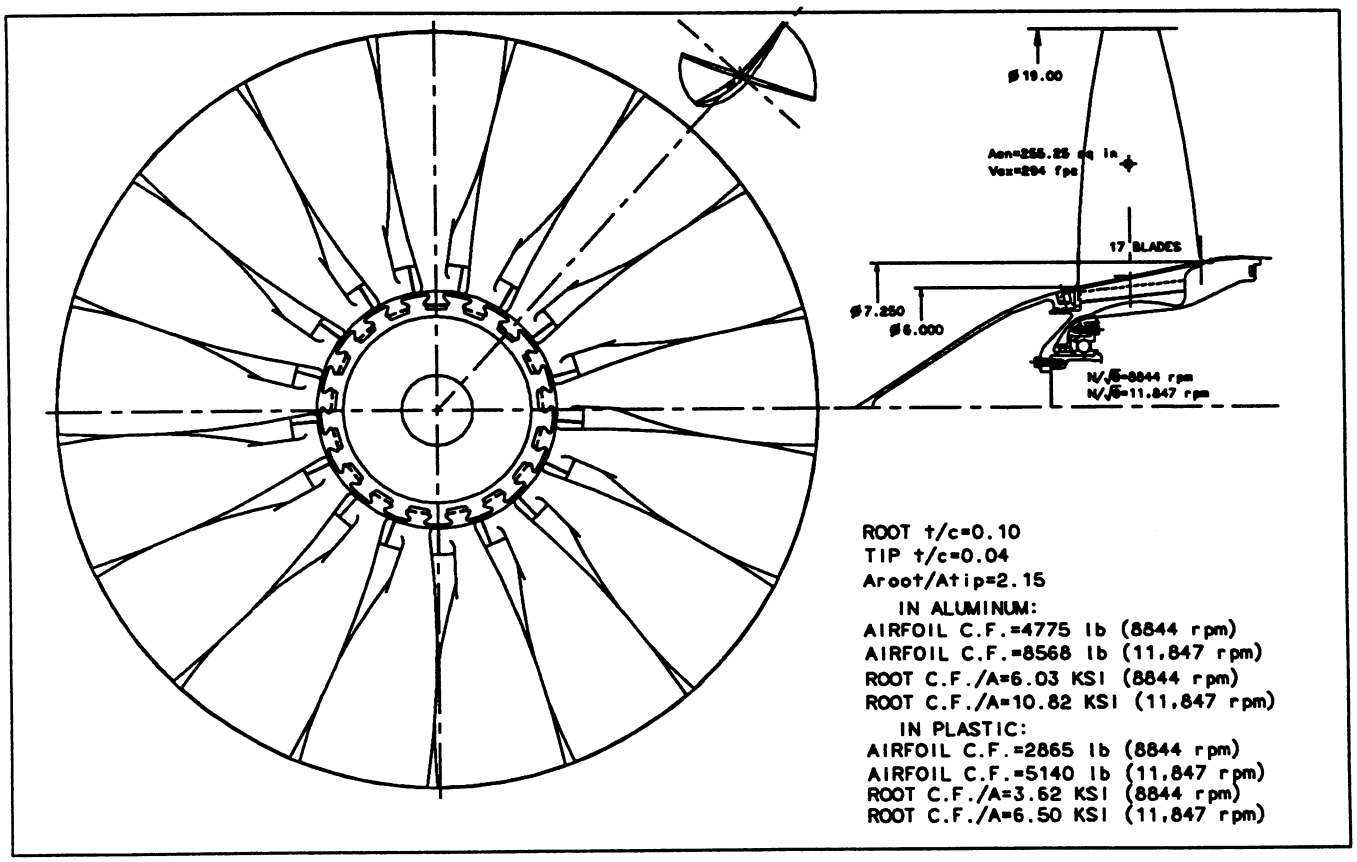

FIGURE 3. Baseline fan configuration for aerodynamic design analyses and manufacturing process/cost studies.

The initial, design-point velocity triangles for the baseline and uprated stages are shown in Figure 4. The close similarity in the triangles confirm that only flowpath adjustments will be required to accomplish both the baseline and the uprated version with the same set of rotor and stator blading. The rotor tip relative Mach number is subsonic on both stages, and the rotor is shown to have about 50 degrees of hub turning in both stages. The aerodynamic loadings, in terms of diffusion factor and other such empirical factors, are similar to the larger transonic fans in executive jets and commercial airliners. Considering these factors, the rational adiabatic efficiency goal for these stages is 92 percent.

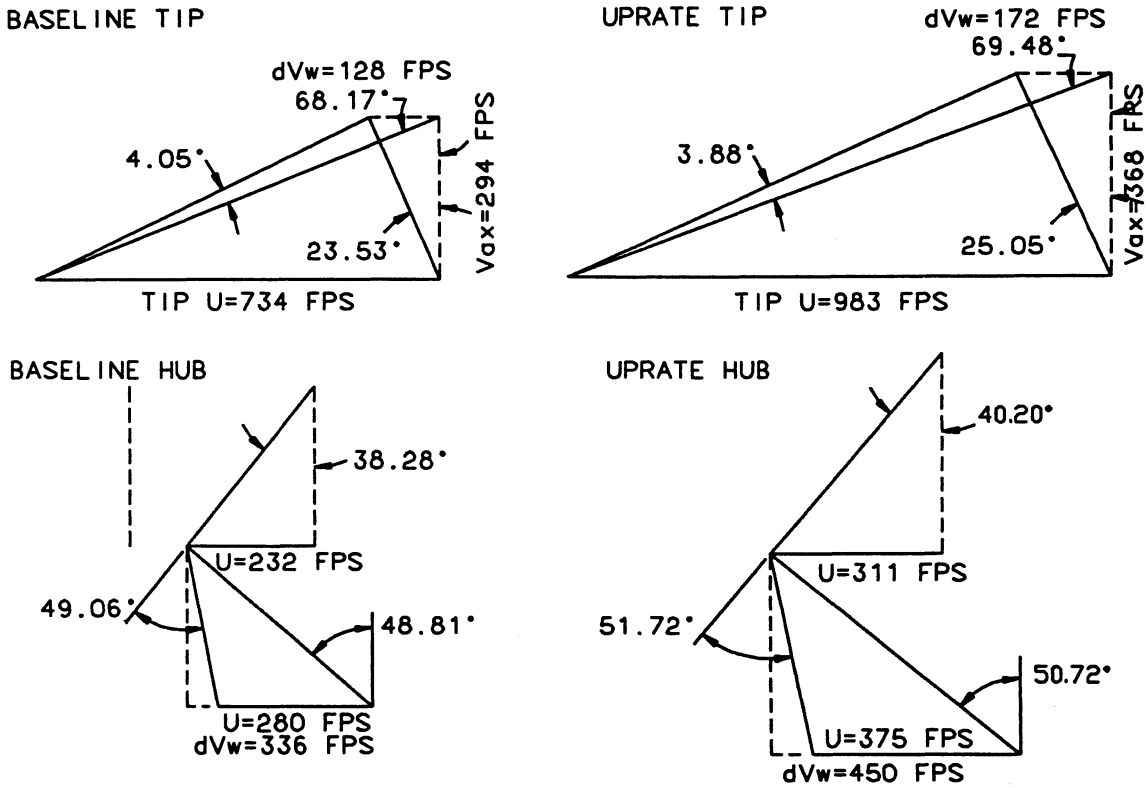

FIGURE 4. Velocity triangles for study baseline and uprated fan stages.

It should be noted that although the sea level static thrust of the uprated engine is about 1.8 times the baseline engine, the thermodynamic power is about 2.25 times as great. The increased flow and pressure ratio of the fan correlates directly with this ratio.

For purposes of this investigation, complete nacelle and bypass-duct system flowpaths were modeled for both the baseline and uprated fan stages. The initial layout of the geometry used in the aerodynamic analyses is depicted in Figure 5. The study baseline is shown above the centerline and the uprated version is shown below the centerline. The gas generator section length differs between the baseline and the uprated version by 1.75 inches. The baseline engine bypass ratio is 18.6, and the higher performance uprated engine is about 13.5. This difference is reflected in the core/bypass splitter and the core inlet flowpath geometries.

Both flowpath layouts depict variable-geometry, two-position fan jet nozzles. Thus far, it has not been determined by engine and aircraft takeoff, climb and cruise performance analyses that the two-position nozzle system is an essential feature for good performance matching. A full set of engine component off-design maps will be required to obtain adequate performance data to make the determination.

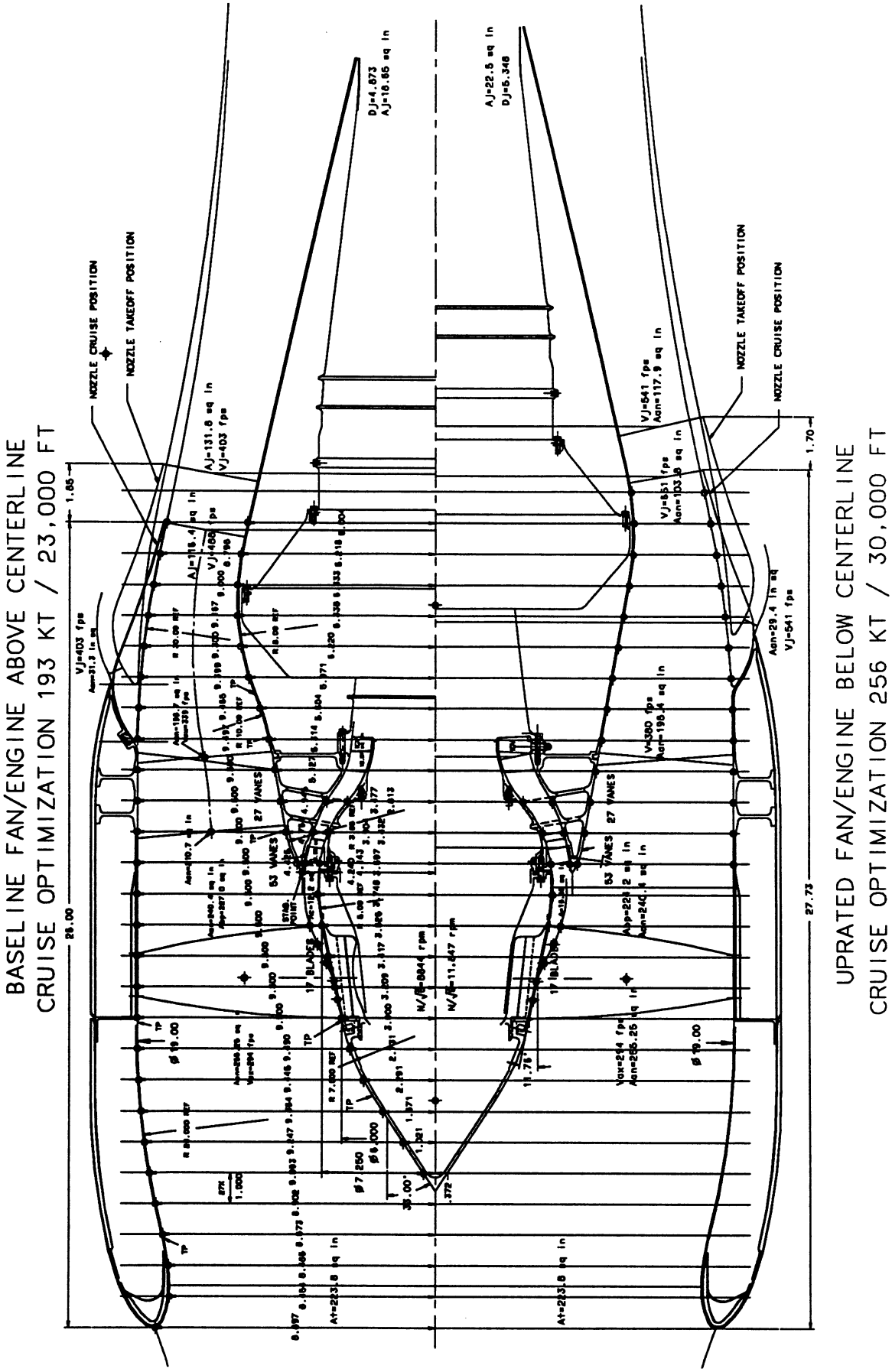

FIGURE 5. Fan system flowpath layouts of baseline and typical uprated turbofans.

3.0 LOW-COST MANUFACTURING INVESTIGATIONS

System studies on general aviation and commuter aircraft are conclusive--substantial cost reductions are required in gas turbine propulsion systems if general aviation and commuter customers are to have the enormous benefits of turbine propulsion. Advanced Propulsion Inc. has determined that there are numerous cost reduction opportunities in predicating new propulsion product lines for these markets. The use of new, lower-cost materials and manufacturing methods applicable to the new classes of is, of course, a fundamental imperative. The fan systems of these potential, new product lines present significant opportunities for advantageous changes in design and manufacture. Larger, more robust fan systems, both rotor and stator elements, and much lower rotor tip speeds are the enabling factors for the future 200 to 400 knot class aircraft propulsion systems that are the subject of this investigation. The change from titanium fan rotors to aluminum or reinforced plastic (composites) has a potential for cost reduction up to a factor of ten. A further substantial cost reduction potential exists for use of these materials in an integrated assembly of fan stator and front frame.

The investigative approach for the present study was to design a 17-bladed fan rotor and a 27-vaned bypass stator/front frame assembly. Such designs could alternatively use aluminum alloys or fiber reinforced plastic, and be produced by relevant high volume rate means.

In the case of aluminum, the rotor could have loose blades and a separate rotor hub. The blades would be precision forged to finished dimensions on all surfaces except the dovetail attachment which would be NC machined. Alternatively, the rotor could be an integrally-bladed (blisk) configuration. Preliminary manufacturing drawings were prepared for these two configurations. These drawings, Figure 6 and Figure 7, were evaluated by several engine parts suppliers. Two clearly best quotations were obtained.

In the case of plastic, an extensive review of candidate materials and production methods was made. The continuous fiber layup method was rejected on the basis much higher cost than the precision injection molding alternative. For the injection molding, a proprietary, graphite fiber/fluorocarbon reinforced polyamide-imide resin was selected on the basis of its having adequate mechanical and heat resistant properties for this application. The drawing prepared for vendor review and quotations is show in Figure 8.

The lowest quotation on the precision forged blade candidate was $86.00 each at volume rates of 2000 per month, with one-time $93,700 tooling charge. The cost was estimated for the forged aluminum, NC-machined hub, assembly and balancing for a total rotor cost of approximately $2500.00. A further estimate was made of the stator elements of a precision investment cast front frame, and the total fan system cost was totaled at about $4000.00 in quantities greater than 1000 units per year. Advanced Propulsion Inc. estimates that this is about 20 percent of the cost a similar-size titanium fan system on a typical low-volume turbofan engine produced for executive jets.

The lowest quotation on the blisk configuration was a ROM estimate of less than $2200.00. Advanced Propulsion Inc. performed cost analyses on its own propritary NC machining and tooling concept. With these methods, total rotor cost is estimated at $1740.00 at production rates between 1000 and 4000 units per year and total fan system cost was estimated at $3800.00 per unit.

The supplier of the proprietary injection molded plastic spent substantial effort in preparing a molded fan blade proposal. Engineering discussions suggested a potential unit price in the area of $25.00. In a separate business decision, the supplier finally declined to submit their quotation. The limited scope of this project prevents further development of injection molded plastic alternatives, despite the low-cost promise.

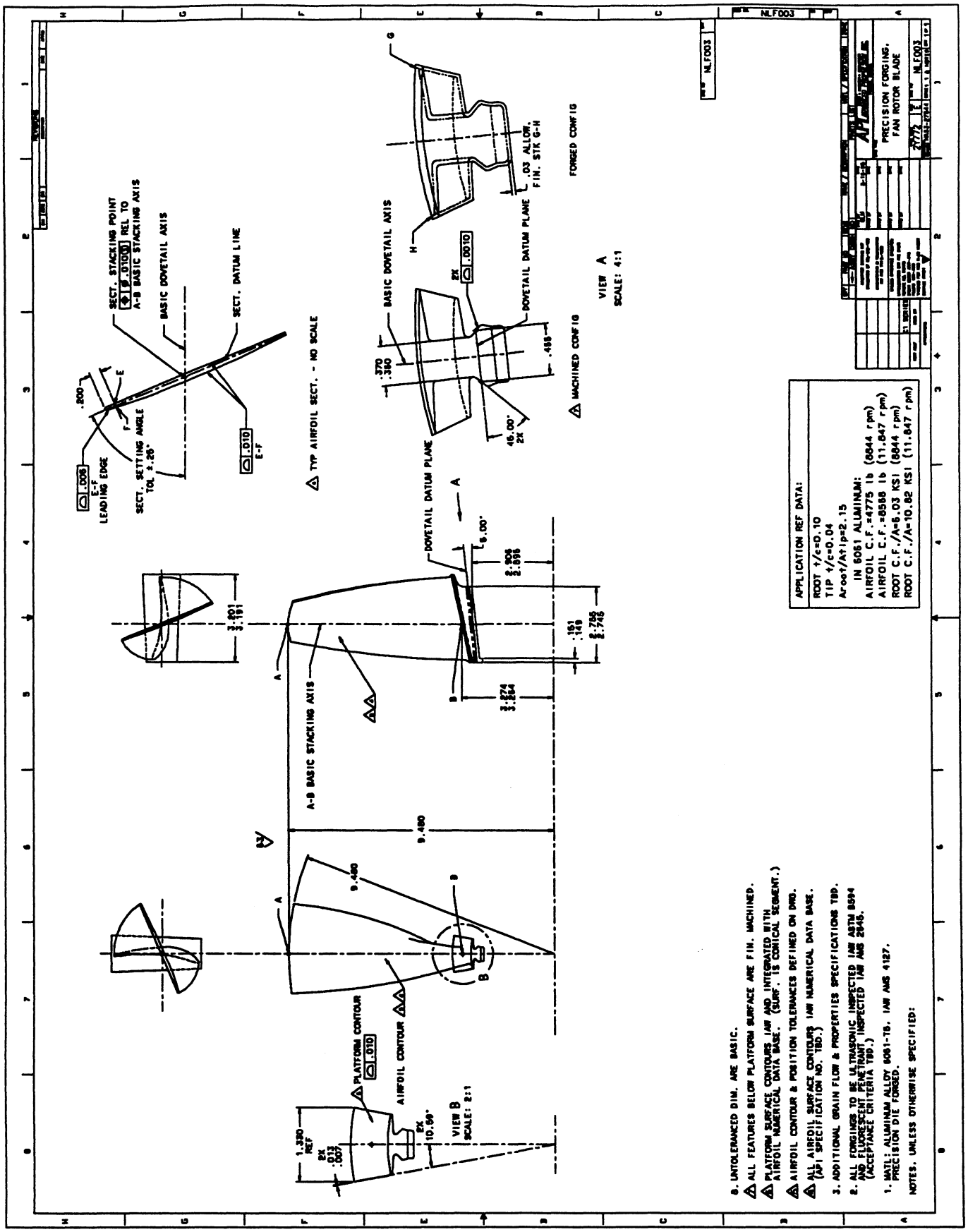

FIGURE 6. Precision forged fan blade preliminary manufacturing drawing.

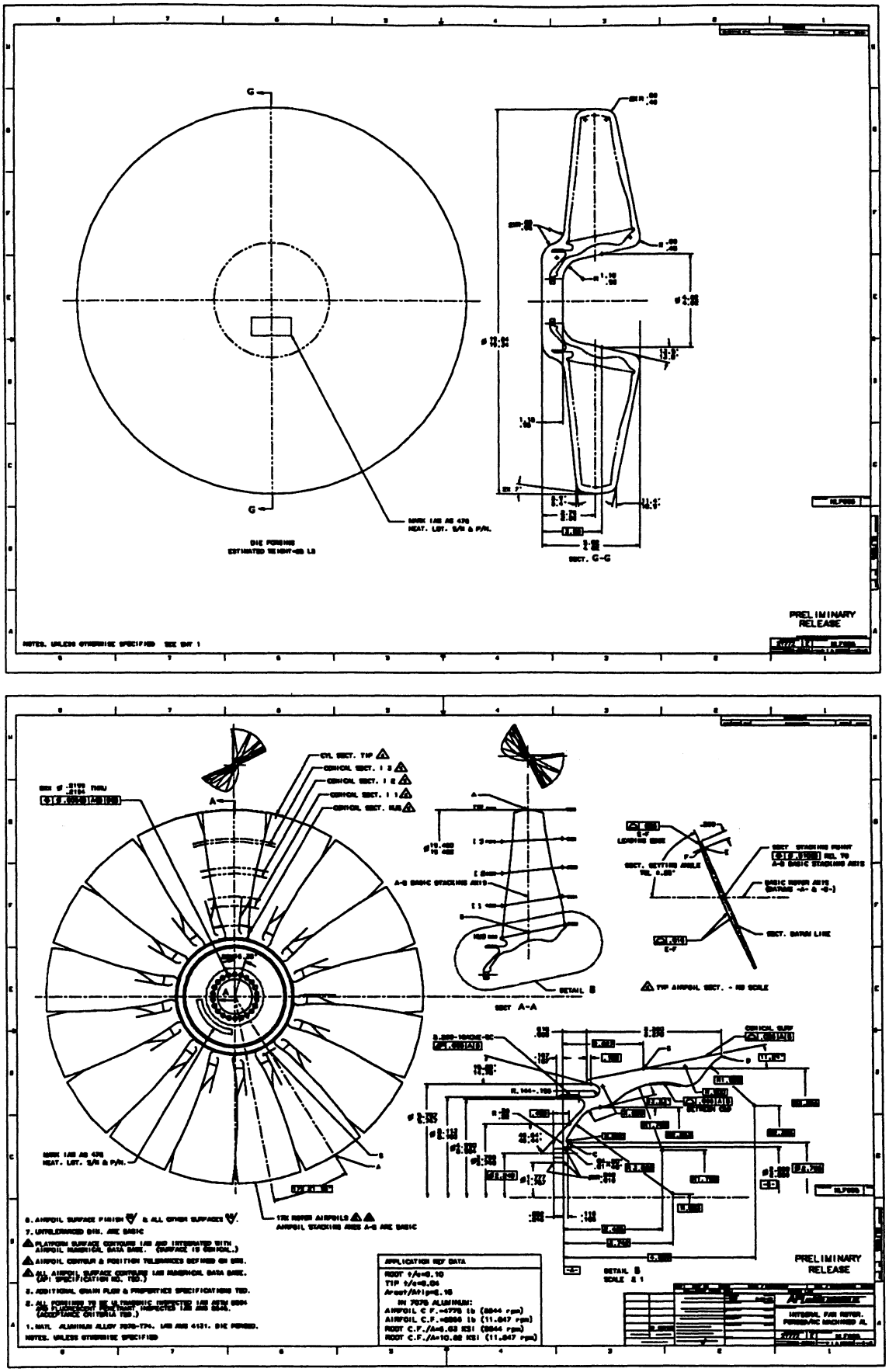

FIGURE 7. Forged aluminum, NC-machined blisk preliminary manufacturing drawing.

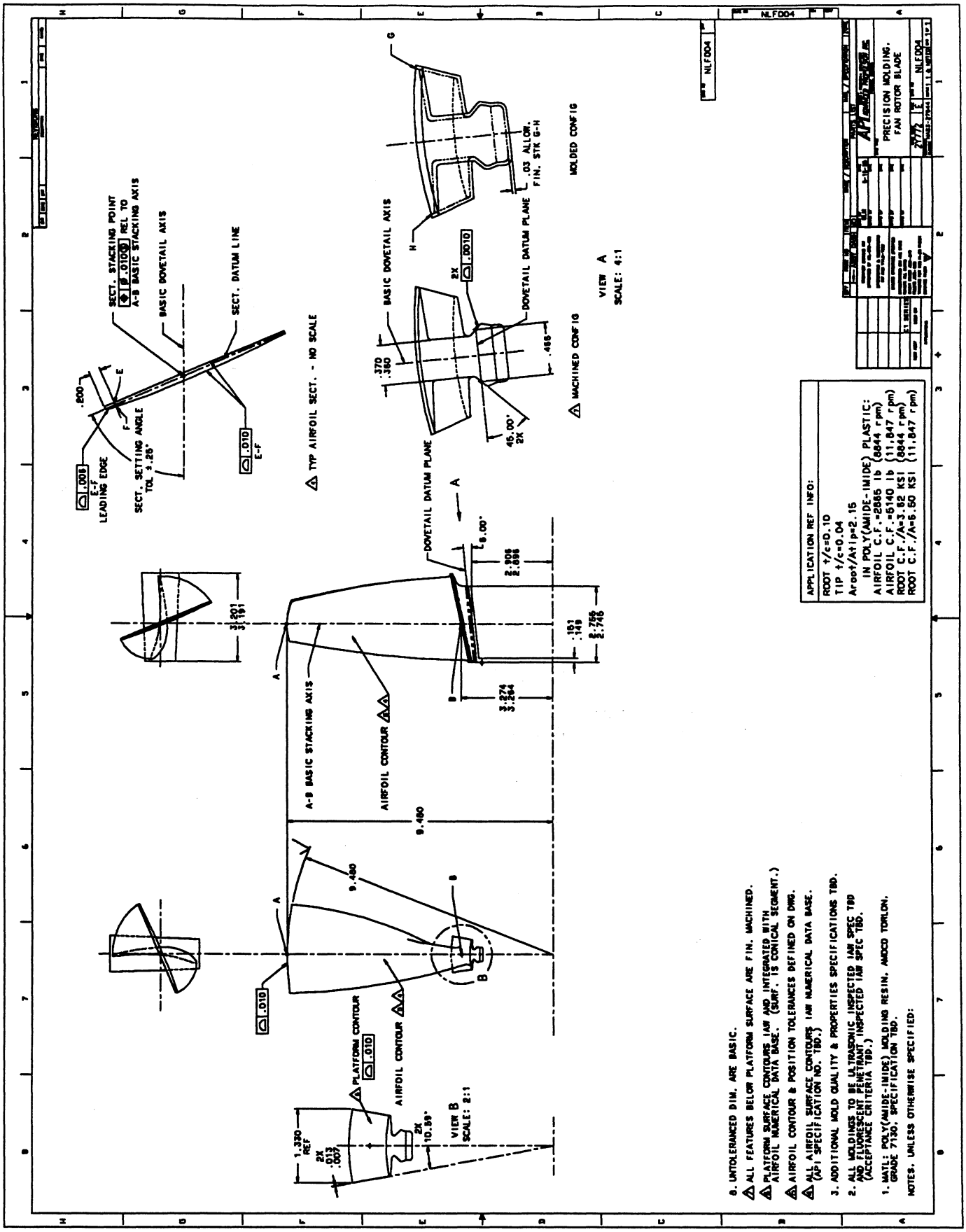

FIGURE 8. Precision molded Torlon fan blade preliminary manufacturing drawing.

4.0 AERODYNAMIC DESIGN AND ANALYSIS

The aerodynamic design and analysis effort was structured to carefully follow the design premises of the baseline stage preliminary design described in Paragraph 2.0 and 2.1. The following is a partial list of the many parameters incorporated in the design/analysis model:

- o Design Corrected Flow, 38.45 lb/sec
- o Design Point Pressure Ratio, 1.10
- o Inlet Axial Velocity, 294 ft/sec
- o Inlet Hub/Tip Ratio, 0.316
- o Inlet Tip Diameter, 19.00 in
- o Rotor Corrected Tip Speed, 734 ft/sec
- o Rotor Corrected Speed, 8844 rpm
- o Rotor Blade Aspect Ratio, 1.88
- o Blade Root Thickness/Chord, 10 percent
- o Blade Tip Thickness/Chord, 4 percent
- o Number of Rotor Blades, 17
- o Stator Vane Aspect Ratio, 1.8
- o Number of Stator Vanes, 27

The commonly-used U.S. Air Force compressor design program, UD0300M, was used to model and perform parametric analyses on the baseline fan stage. (The version of the code obtained from the Air Force lacked an output data plotting routine and did not include provision for splitting core/bypass flow ahead of the fan stator. Writing new code, Advanced Propulsion Inc. was able to correct the latter deficiency but not the former.)

Initial runs of the baseline stage configuration clearly demonstrated that the preliminary design was valid. Appendix A of this report is a complete output of one of these runs showing over 90 percent isentropic efficiency.

It was originally planned to perform a broad range of parametric analyses, including variable parameters such as diffusion factor, aspect ratio, rotational speed, finish and tip clearance. The continuing difficulties in using UD0300M made this impractical, and high efficiency predictions in the early results obviated the need.

The parametrics that were performed were encouraging however. For example, modelled with substantially higher axial velocity and lower diffusion factors, the stage was shown to drop about 1.5 percent in efficiency. This demonstrated that the initial baseline is essentially correct. In a later effort, rotor hub contouring was explored, resulting in a stage efficiency increase of about one percent. This put adiabatic efficiency near the 92 percent efficiency goal.

The final blisk rotor configuration with the beneficial hub modification is shown in full scale in Figure 9.

It is essential that low pressure ratio fans for lower flight-speed airplanes have good operating characteristics, including high surge margins at the design point, broad efficiency islands and broad flow range between surge and choke. In an initial evaluation, the baseline stage was shown to have these desireable characteristics.

The limited scope of this program prevented full development of a definitive fan stage aerodynamic design. The program did achieve a well developed go-foward baseline and the analytical results yielded high confidence in the potential to achieve 92-to-93 percent efficiency with implementation of a computational fluid dyanamics design effort.

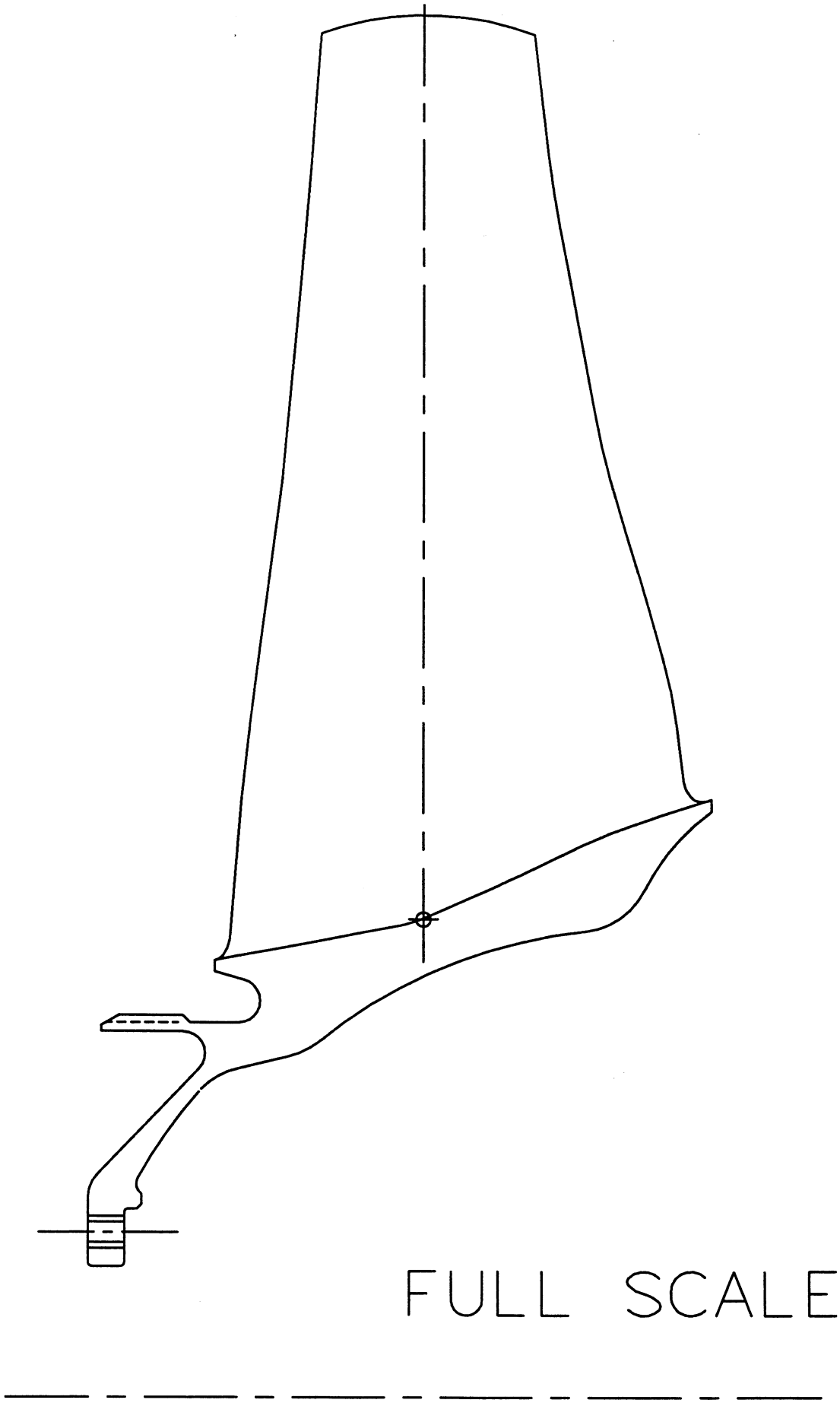

FIGURE 9. Final blisk rotor configuration from aerodynamics design/analysis effort.

5.0 MECHANICAL DESIGN AND STRUCTURAL ANALYSIS

The mechanical design and structural analysis task element of the program was structured as an extensive preliminary design review. It covered essentially all design suitability elements applicable to the fan system of a FAR Part 33 certified turbofan engine. To assure that the low-cost, efficient fan system designed in this program is valid in terms of stringent engine mechanical design criteria, the effort was comprehensive. The list of criteria examined in this program is provided in Figure 10.

The ability of the fan system design to meet one-pound and four-pound bird strike criteria for FAA certification is of utmost significance. It is the usual concensus that only carefully designed and tested, larger titanium fans on engines for executive and commercial aircraft can meet this test. Advanced Propulsion Inc. has determined by extensive analyses that the aluminum, blisk-configuration fan defined in this program will also meet the criteria and pass the one-pound and four-pound bird strike test.

The Figure 11 through Figure 16 show the detailed bird strike evaluation methods and results. The material presented in these figures is comprehensive and self explanatory. It should be noted, however, that the blisk material of choice was changed from aluminum alloy 6061-T6 to alloy 7075-T73 in order to provide substantially greater stress margins for bird strike events and increased fatigue life.

The low blade rotational and relative velocities of the low-cost, efficient fan system design are important factors in the ability to meet bird strike criteria. This same feature of the design contributes to its remarkable resistance to rain and sand erosion. A similar amount of work was done on the erosion problem, but this work is not presented in detail in this report. The basic result is that the low-speed aluminum fan calculated erosion rate is almost exactly equal to the rate on conventional high-speed titanium fans. Also, it was concluded that the performance degradation effects will be less on the aluminum fan because the airfoils have more robust thickness/chord ratios and leading/trailing edge thicknesses, plus, the fact they operate in the low-to-medium subsonic range--not the transonic/supersonic range of typical titanium fans.

The blade airfoils were modelled for extensive computer stress, deflection and vibration analysis under dynamic and aerodynamic loads. The results provided in representative plots included in Appendix B show that the current design is a conservative, successful design. A further indication of this is illustrated in the classic Campbell Diagram depicted in Figures 17 and 18. The various vibratory modes are exactly where they are desired to be versus the rotational speed scale. Figure 17 through Figure 22 show the methods and results of the analyses of vibration margins, low cycle fatigue and high cycle fatigue. The predicated Installation Manual (IM) limits distortion limits are well above typical field distortion. The overall structural analysis results indicate the low-cost, efficient fan design is conservative and successful.

The precision-forged, loose-bladed configuration and the reinforced plastic configuration, as well as the aluminum blisk, were carried through the entire structural analysis task. A complete dovetail design/analysis effort was conducted for both the aluminum and plastic blades, enabling the loose-bladed option to be exercised if it were determined to be the low-cost option. (The blisk configuration was finally selected.)

One of the principal goals of the mechanical design and structural analysis tasking was to assure that the design met a fan system weight goal of less than 15 pounds. The goal was achieved. The solution fan rotor blisk weighs an estimated 9 pounds and the stator elements of the front frame assembly weigh 5 pounds. The total estimated weight of 14 pounds is about one-third the weight of a conventional, constant-speed propeller system capable of absorbing the same 200+ horsepower load.

19 INCH FAN, 17 BLADES

MECHANICAL DESIGN SPEED

9000 RPM, 747 FT/SEC TIP SPEED

FOD

NPRM PROPOSED RULES FOR BIRD

ONE,1.0 LB BIRD @ T/0 CONDITION, V=NORMAL FLIGHT UP TO 1500FT.

75% THRUST POST EVENT

ONE,4.0 LB BIRD @ 200 KNOTS

CONTAINED,MOUNTED,SHUTDOWN,NO FIRE

HAIL

ICE

WATER

BLADE OUT

1.5 BLADE IMBALANCE FOR BLADED DISK

1.0 AIRFOIL IMBALANCE FOR BLISK

NO ATTACHMENT UNZIPPERING

CONTAINMENT

OUTERMOST RETENTION FEATURE FOR BLADED DISK

80% AIRFOIL FOR BLISK

BURST SPEED

135% DISK

135% SHEDDING FOR BLADES

VIBRATION

1/REV OR 2/REV BLADE

FLUTTER PARAMETER GOALS

1.6 TORSION

.33 BENDING

125% MARGIN ON DISK DIAMETRAL VIBES

LCF

100,000 CYCLES BLADE & DISK ATTACHMENT (BLADED DISK)

100,000 CYCLES DISK

GYRO

3.5 RAD/SEC, 10E07 CYCLES

PRELIMINARY DESIGN CRITERIA (PDR)

MATERIALS.

METALLIC

SELECTION REQUIRES MIN ELONGATION = OR >7%

MAX OPERATING TEMP 200 DEG F

ATTACHMENT CONTACT FACE COAT ASSESSMENT REQ'D FOR FRET

AIRFOIL HARDNESS ASSESSMENT REQ'D FOR FOD

BIRD

1.0 LB LOADING TO BE MAXIMIZED BETWEEN 50 AND 150 KNOTS

MAX L.E. SHEAR STRESS < Fsu .

FOLD-OVER DAMAGE ASSESSMENT TO BE MADE FROM BENDING STRESS;

< 1% BLOCKAGE PERMITTED.

4.0 LB LOADING TO BE BASED ON 200 KNOTS.

MAX L.E. SHEAR STRESS < Fsu.

BIRD VELOCITY THAT SETS L.E. SHEAR AT Fsu TO BE DETERMINED.

DISK BURST SPEED

135% OF MECH DESIGN SPEED.

BURST FACTOR = .9

SIG AVG TANG = .9 X Ftu @ 200 DEG F AND N= 1.35 X 9000 RPM.

DISK BORE STRESS

MAX STRESS WITH RING BENDING INCLUDED < Ff @ 100,000 CYCLES.

ATTACHMENT DESIGN (BLADED DISK)

10% STRONGER THAN AIRFOIL ROOT FOR BENDING AND SHEAR LOADS.

135% SHEDDING SPEED REQ'D; LOBE SHEAR < Fsu, LOBE BENDING < 1.5Fty,

NECK TENSILE < Ftu.

OPERATING BEARING STRESS < .67Fty

MAX STRESS WITH Kt < Ff @ 100,000 CYCLES.

HOOP STRESS FIELD TO BE ISOLATED FROM HOOK STRESS FIELD BY ELLIPTICAL FILLET.

INFLECTION POINT FROM RING BENDING TO BE ASSESSED IN DISK SLOT.

CANTED DOVETAIL BEAVER TOOTH OR EQUIV..AXIAL LOAD CAPACITY

135% SHEDDING SPEED

MAX STRESS WITH Kt, < Ff @ 100,000 CYCLES

DOVETAIL FRICTION FACTOR = .05

BLISK RIM DESIGN

20% STRONGER THAN AIRFOIL ROOT FOR BENDING LOADS.

LCF TO BE CONTROLLED IN AIRFOIL SECTION OF TRANSITION FILLET

1ST BENDING MODE WEAK SECTION >20% SPAN

VIBRATION

1/REV BLADE TO HAVE 10% FREQ MARGIN ON 1E @ 105% SPEED

GOAL TO PASS THROUGH 2E @ < 50% SPEED.

INLET DISTORTION(CDI) ALLOWED (2E) OF 3% FOR BLADED DISK, 2% FOR BLISK AT RESONANT 2E SPEED.

2/REV BLADE TO HAVE 10% MARGIN ON 2E @ 105% SPEED.

GOAL TO PASS THROUGH 3E @ LOWEST SPEED POSSIBLE.

CDI ALLOWED (3E) OF 3% FOR BLADED, 2% FOR BLISK @ RESONANT SPEED.

FIGURE 10. Structural design criteria and requirements list for low-cost fan system.

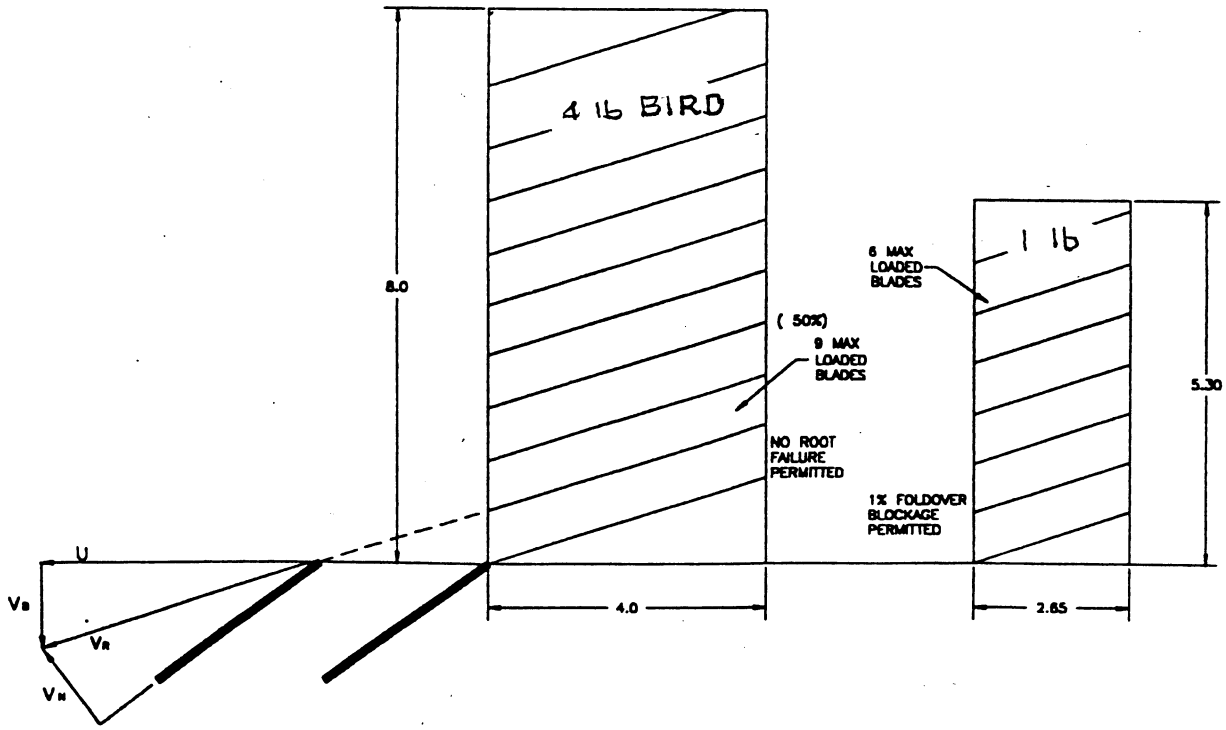

FIGURE 11. Bird slicing at 100 knots -- (maximum MVn at 100 knots).

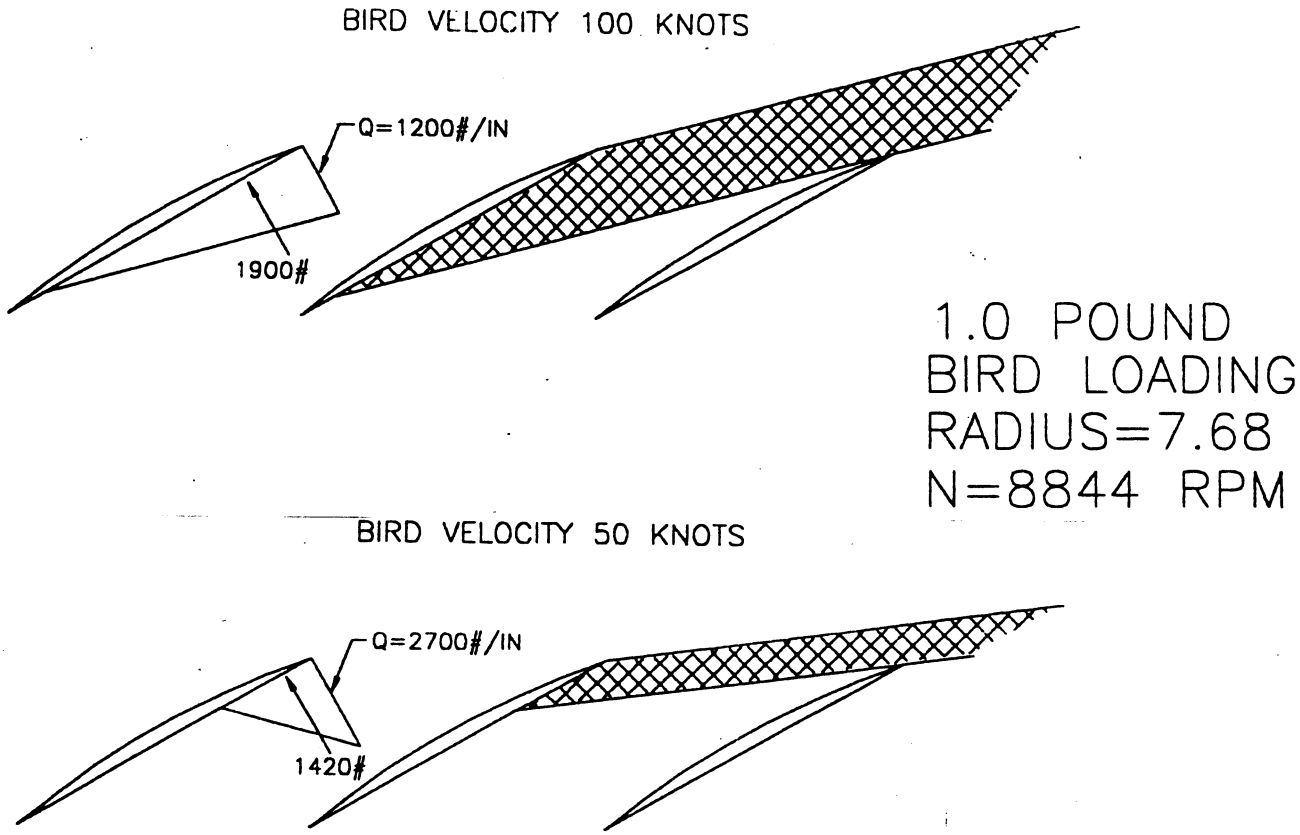

FIGURE 12. Lower bird velocity maximizes unit loading at leading edge.

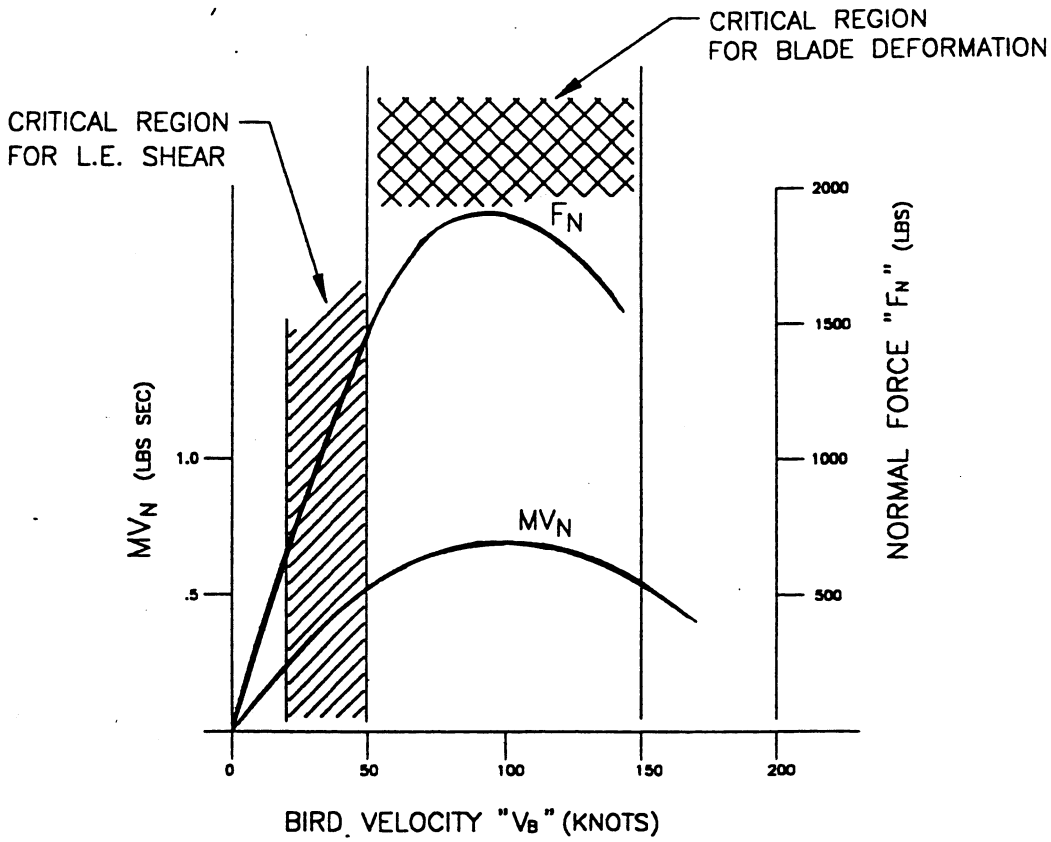

FIGURE 13. One-pound bird strike, 7.68-in radius, 8844 rpm -- two critical regions.

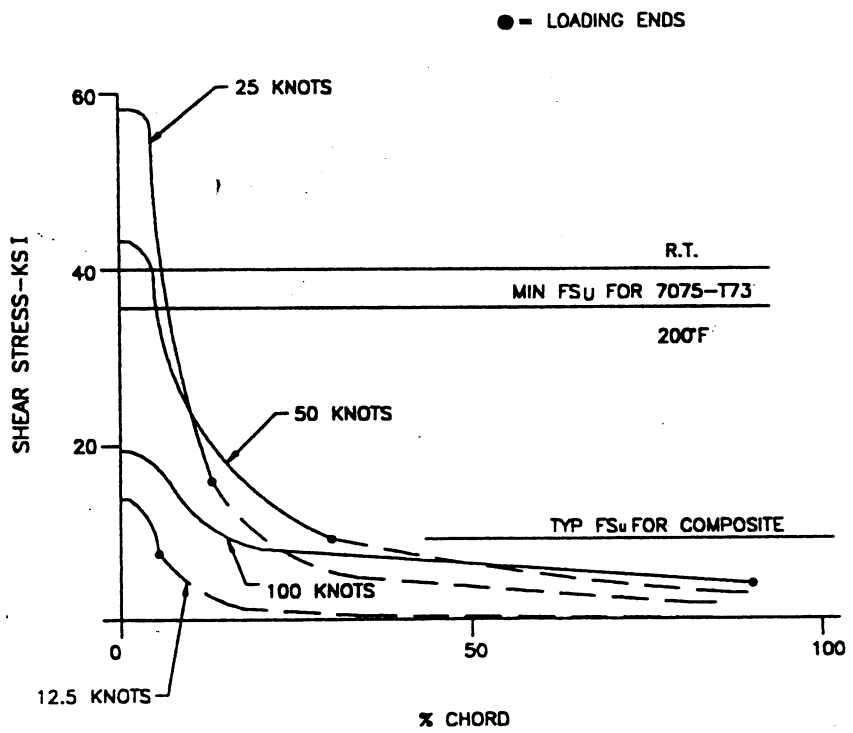

FIGURE 14. One-pound bird strike, 7.68-in radius, 8844 rpm -- shear stress vs chord.

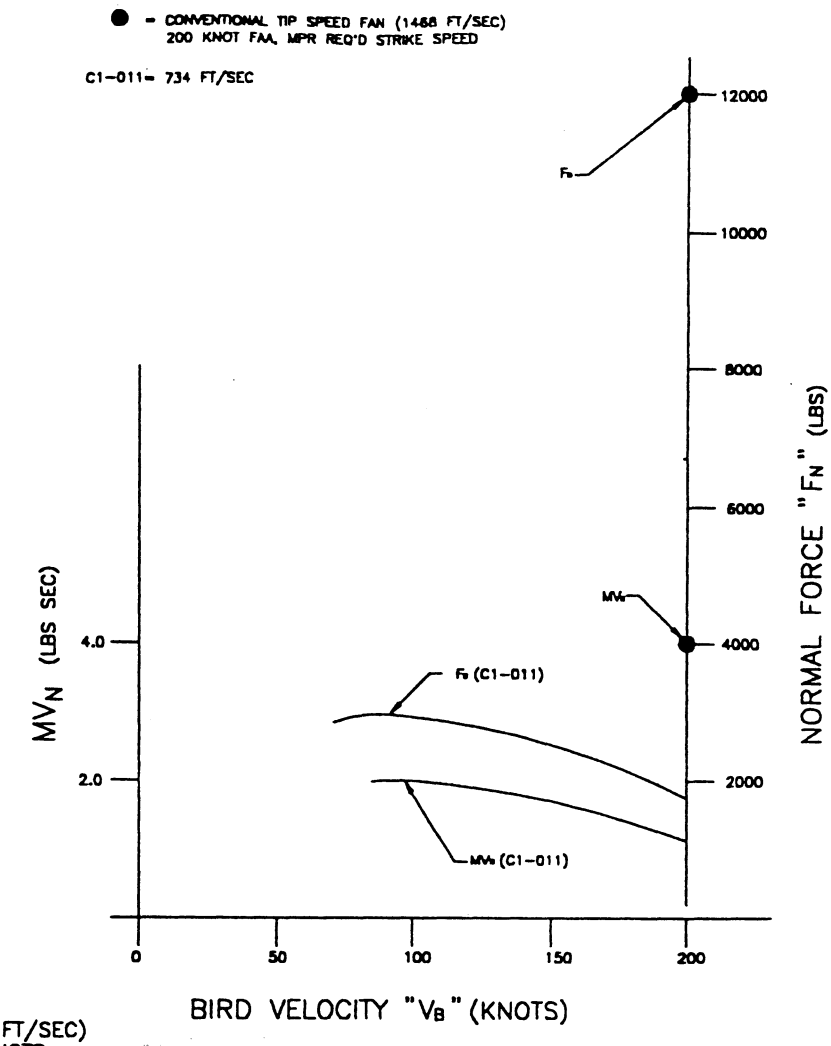

FIGURE 15. Bird loading would be much higher at typical titanium fan tip speed of 1468 fps than on the low-cost aluminum fan for lower-speed aircraft.

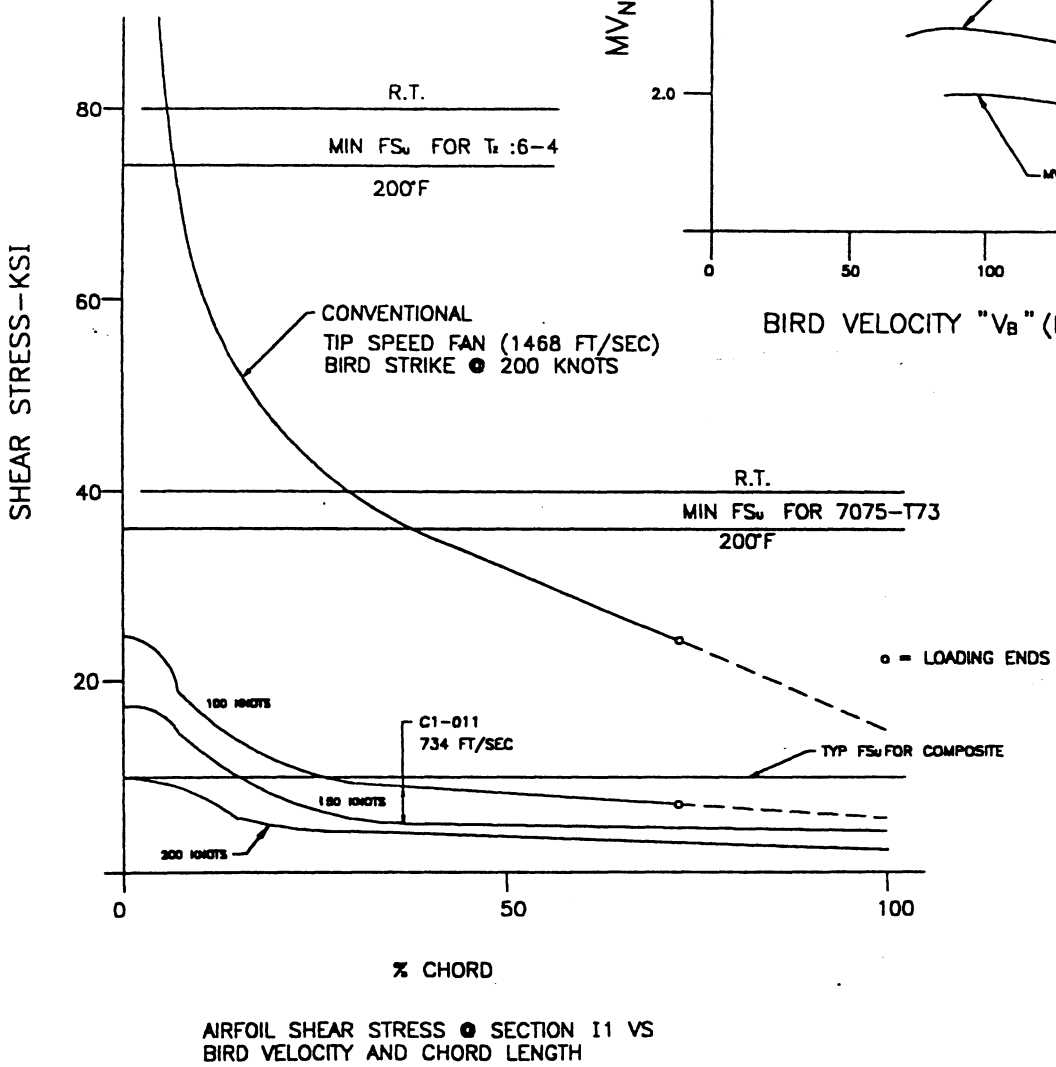

FIGURE 16. Shear stress margin is higher on low-cost aluminum fan than on a conventional, high tip speed titanium fan for 0.8 Mach aircraft.

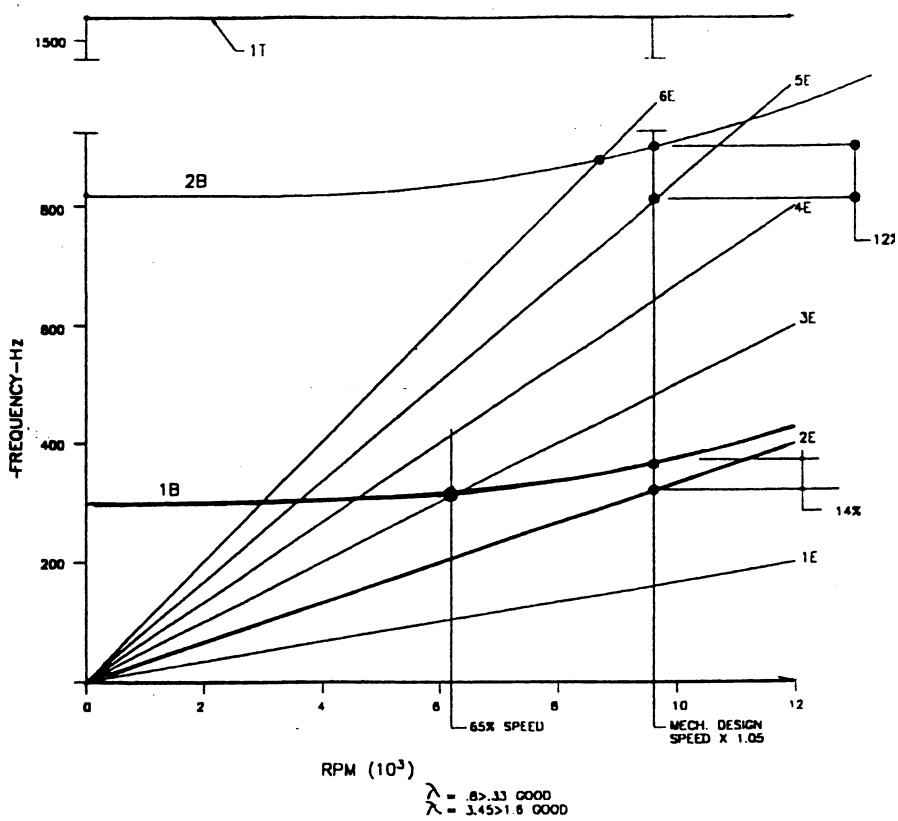

FIGURE 17. The Campbell diagram for baseline aluminum fan rotor blade.

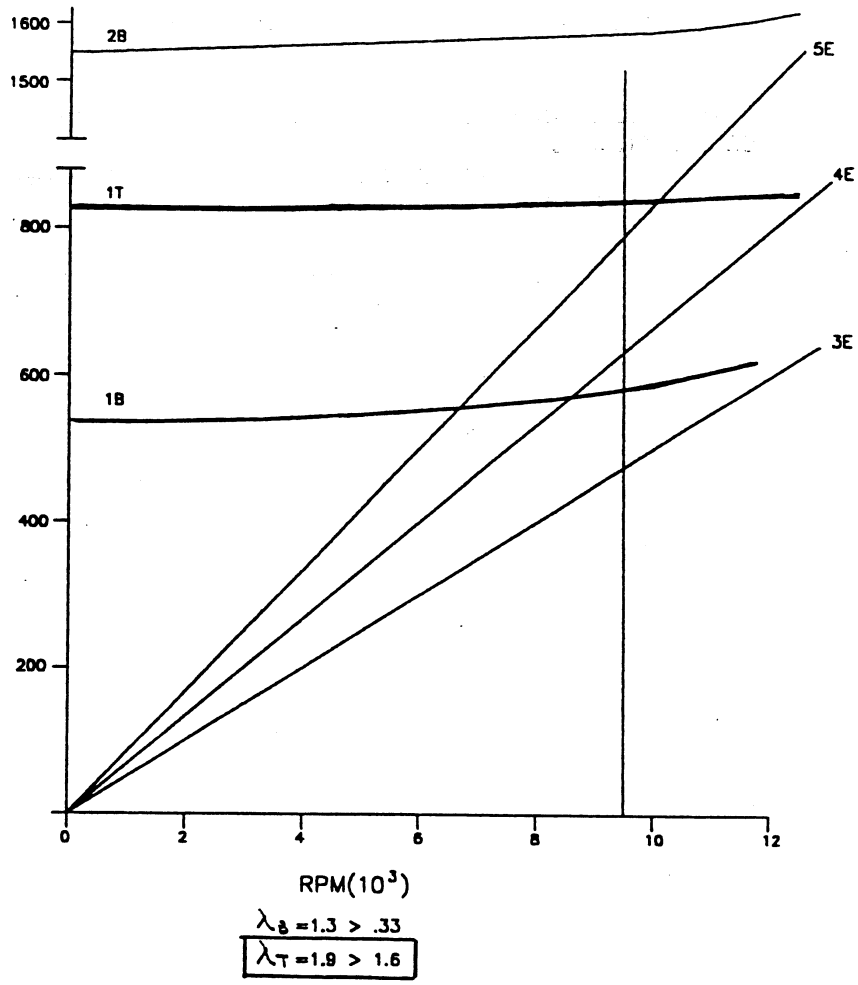

FIGURE 18. Campbell diagram for composite fan rotor blade.

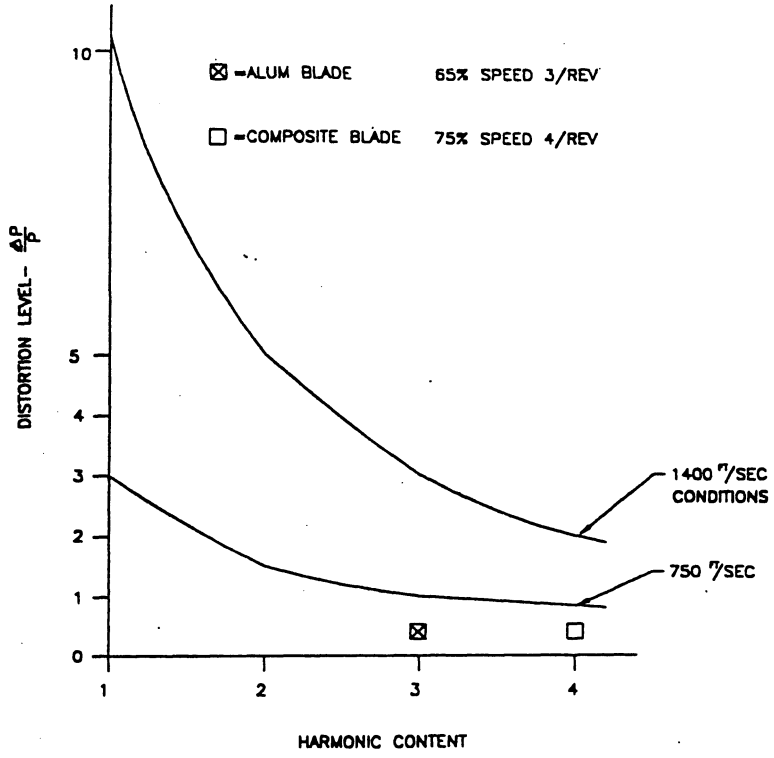

FIGURE 19. Typical inlet distortion decrease with tip speed and harmonic order.

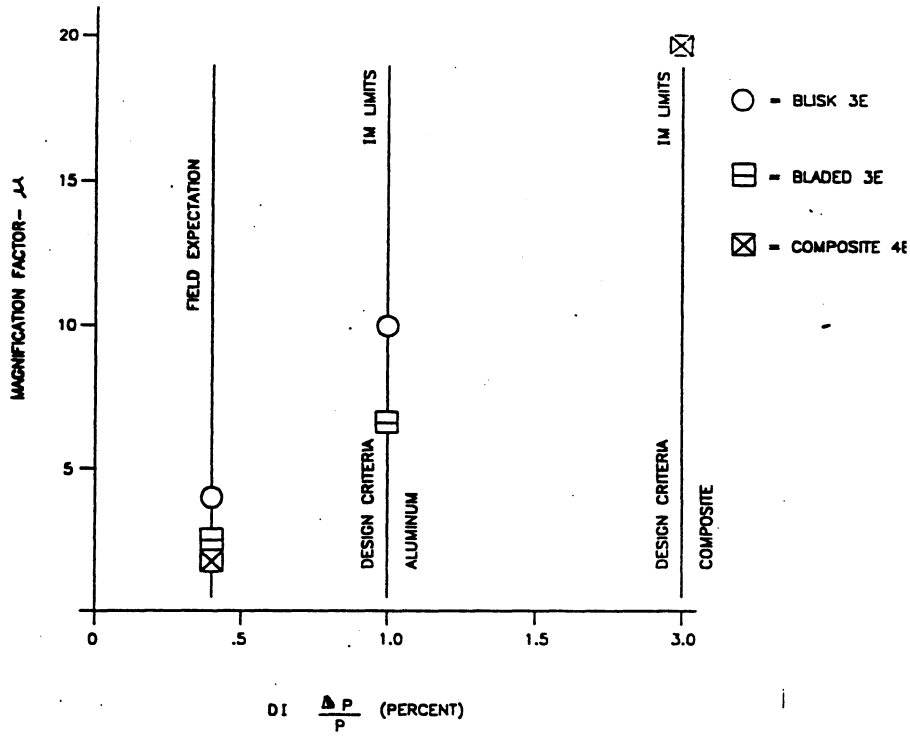

FIGURE 20. IM limits well above field distortion. Composite has high margin.

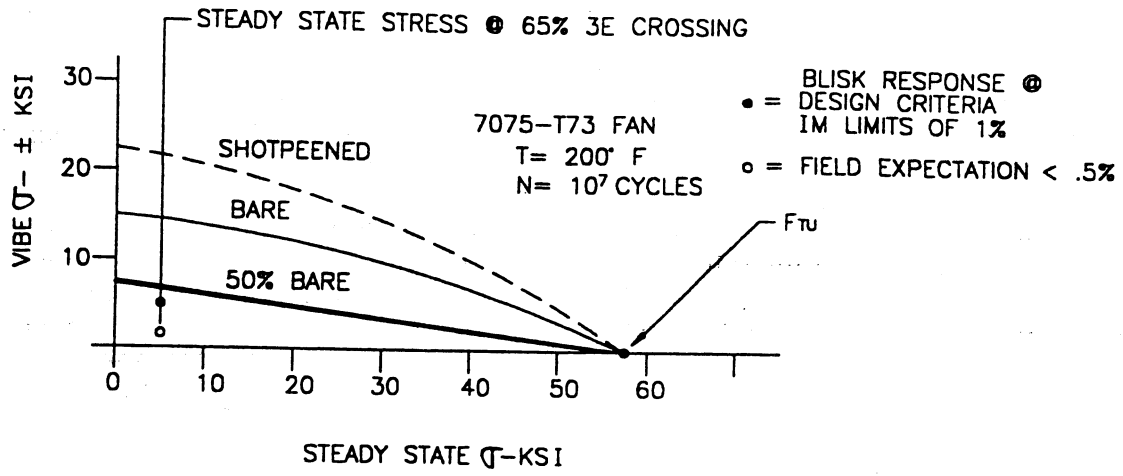

FIGURE 21. Aluminum blade meets 50% criteria for high cycle fatigue at IM limits. Add shot peen processing for increased robustness.

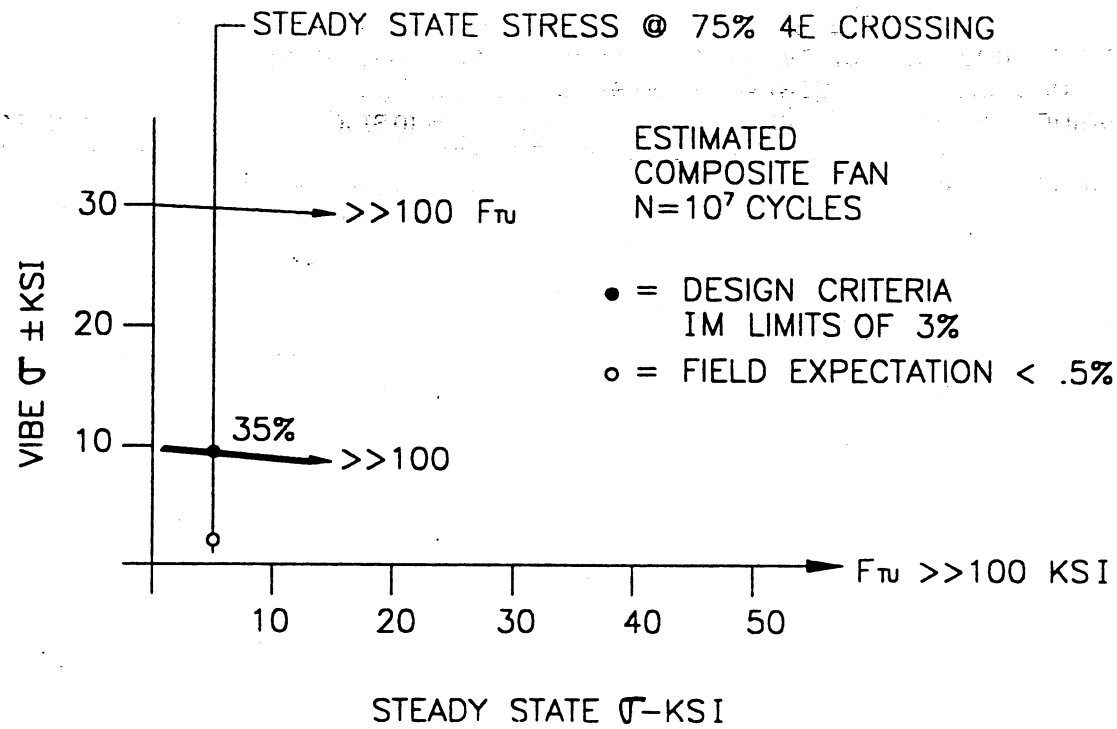

FIGURE 22. Composite blade has high vibration margin. IM limits have factor of three.

6.0 FAN-TECHNOLOGY APPLICATIONS AND BENEFITS

The efficient, low-cost fan system as defined in this investigation is applicable to turbofan engines in the 500-to-5000 pound thrust range, mission-optimized for shorter-range, lower-speed aircraft. General aviation and low-density, shorthaul aircraft represent about eighty five percent of all aircraft in the world. Their missions specifics are such that 200 to 400 knots is the pertinent cruise speed range. Turbofans of much lower fan pressure ratio, and higher consequent bypass ratio, are required for optimal aircraft mission performance in this cruise speed range.

The prior general aviation private aircraft system studies conducted by Advanced Propulsion Inc. provide substantive evidence that fans of this kind are essential to meet future requirements for private aircraft takeoff, climb rate and cruise performance, fuel efficiency, 90% reduction in community noise and 95% reduction in cabin noise and vibration.

6.1 LOW-DENSITY, SHORTHAUL AIRLINERS

Typical missions for low-density, shorthaul airliners dictate performance optimizations for stage lengths ranging from 75 to 250 miles and payload/range capability to give three stages between fuelings. About 10,000 such airplanes in worldwide service have cabin capacities in destinct groupings; e.g., 8-12, 19, 30 and about 45 passengers. Airliners having greater capabilities than this so-called commuter class are properly termed regional airliners.

Past low-density, shorthaul airliners are all powered by piston/propeller and turboprop propulsion systems made available by engine and propeller manufacturers. All these airplanes have cruising speeds in the range of 200 to 300 knots--essentially optimal for the shorter stage lengths on which they are used.

Advanced Propulsion Inc. has conducted extensive system studies of optimized-turbofan propulsion for airliners having exactly the same capacity and performance capabilities as the past, existent world fleet. Figure 23 is a three-view drawing of a 19 passenger study aircraft. It is annotated with a large amount of technical data.

Figure 24 is a table comparing pertinent data on this preliminary design with data on two existent airliners having comparable capacity and performance in every aspect. The salient attributes of the turbofan-powered study airplane are that it is about three-quarters the weight of the turboprops and has about three-quarters the mission fuel consumption. Not shown on the chart are the estimates of 12 EPNdB lower takeoff and sideline noise and about 15 dB(A) reduction in cabin noise and vibration levels.

The engine in this preliminary design would use a fan of the kind that is subject of this investigation. The 29-inch diameter fan would pass 118 lb/sec of corrected airflow and have a pressure ratio of 1.145. The turbofan predicated has 1800 pounds thrust and a bypass ratio of about 15. This turbofan is merely typical of a variety of engines studied that are applicable to 200-to-300 knot class low-density, shorthaul airliners ranging from 12 to 66 passenger capacities.

After two decades of growth in the regional-airline turboprop fleets, a sudden and unexpected change of course is underway. During the past four years, two new turbofan-powered, 50-passenger regional jets have come to dominate this market, garnering orders for about 650 airplanes. Development of additional, smaller and larger turbofan-powered aircraft for the regional market have been announced. All of the new airplanes will be produced by overseas manufacturers. The U.S. producers that once dominated the small turboprop airliner markets are no longer major competitors.

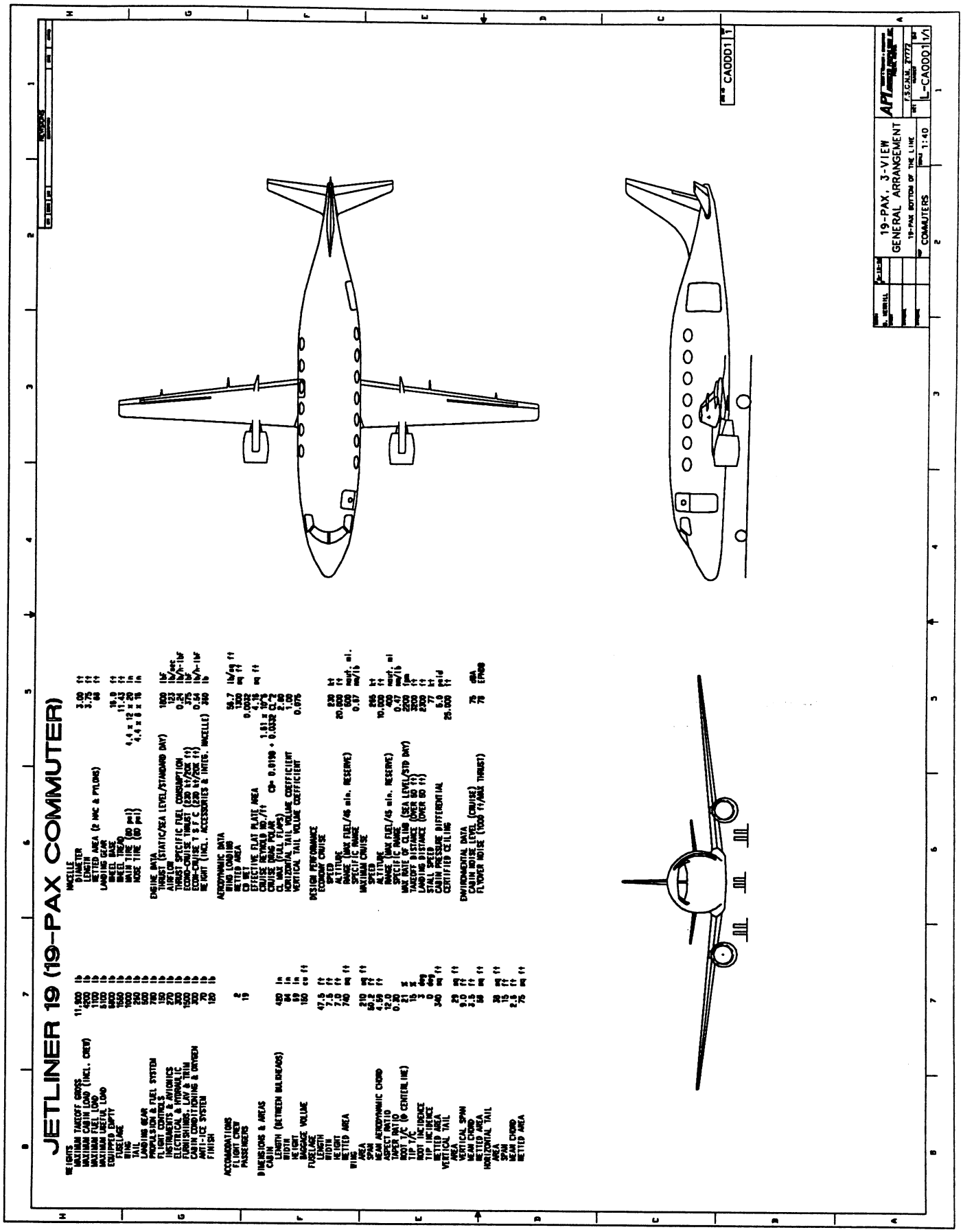

FIGURE 23. 19-Passenger low-density, shorthaul airliner preliminary design study.

	API JETLINER 19	BEECH RAYTHEON 1900C	BAe JETSTREAM 31
PROPULSION SIZE/TYPE	TWO 1800 LBf TURBOFANS	TWO 1100 SHP TURBOPROPS	TWO 940 SHP TURBOPROPS
ACCOMODATIONS	TWO CREW/19 PASSENGERS	TWO CREW/19 PASSENGERS	TWO CREW/19 PASSENGERS
MAX TAKEOFF WEIGHT (lb)	11,900	16,600	15,212
EMPTY WEIGHT (lb)	6800	8700	9570
INST'D. PROPULSION WEIGHT (lb)	720	1890	1690
MAX USEFUL LOAD (lb)	5100	7900	5642
MAX PAYLOAD (lb)	4200	5300	3980
MAX FUEL (lb)	1100	2848	3024
MAX CRUISE SPEED/ALT (kt/ft)	265/12,000	256/8000	263/15,000
ECON CRUISE SPEED/ALT (kt/ft)	230/20,000	235/25,000	230/25,000
MAX RANGE (nm)	500 (PLUS RES.)	794 (PLUS RES.)	675 (PLUS RES.)
MAX SPECIFIC RANGE (nm/lb)	0.67	0.47	0.45
MAX RATE OF CLIMB (ft/min)	2200	2330	2080
TAKEOFF DISTANCE (ft)	3200	3260	3200
STALL SPEED (kt)	77	87	86
WING AREA (sq ft)	210	303	271.3
WING SPAN (ft)	50.2	54.5	52.0
FUSELAGE LENGTH (ft)	47.5	53.1	44
FUSELAGE DIAMETER (ft)	7.50	5.8	6.5
CABIN WIDTH (in)	84	54	73
CABIN HEIGHT (in)	66	57	71
SEAT PITCH(in)	31	30	29
BAGGAGE VOLUME (cu ft)	150	182	90
CABIN NOISE LEVEL (dbA)	75	90	93
ESTIMATED PRICE	$2,700,000	$3,500,000	$3,800,000

FIGURE 24. Favorable comparisons of 19-passenger turbofan study airplane with existent 19-passenger turboprop low-density, shorthaul airliners.

The explosive growth in the new, smaller regional jet market is accounted for by two principal factors. First, passenger acceptance is phenomenal. The airplanes are being used on some routes where passengers have come to expect turboprop service--service that has become increasingly unacceptable to travelers. Second, the airplanes are adequately low in total operating cost on stage lengths averaging 300 miles or greater. Although the turbofan engines on the small regional jets are all optimized for 0.80 Mach in the stratosphere, they provide reasonable seat-mile fuel burns on route stage lengths of 300 miles or more.

An upshot of the new regional jet market is that airlines are withdrawing from short-stage-length commuter markets while expanding into increased-stage-length regional markets. They are, thereby, depriving an increasing number of small communities of scheduled passenger service. Twenty years ago, average low-density, shorthaul stage lengths were about 100 miles. Today, average stage lengths are approaching 200 miles, and they are increasing rapidly.

As new turbofans were the enablers of the new regional jet aircraft and the expanding regional airline markets, it is reasonable to believe that additional, new mission-optimized turbofans could yield new aircraft for a revitalized, true, low-density, shorthaul market. It has been shown that it would be advantageous for the new turbofans to use the fan system designs investigated in this study.

6.2 REDUCED NOISE WITH EFFICIENT, LOW-COST FANS

The low tip speed, low pressure ratio fans that are subject of this investigation are expected to yield engines and aircraft having much lower community noise levels than any previously available examples.

On average, properly matched engines using these fans will have both core and fan jet velocities less than half those of typical executive jet and commercial airliner turbofans. Combining the eighth-power-of-velocity law (applying to jets) and the fact that the engines will be substantially lower in thrust level, the average engine exhaust signature will be about 30 dB quieter than the average executive jet turbofan engine. It will be far quieter in takeoff, sideline and 1000 foot flyover noise than any governmental regulations currently in effect or even visualized.

All but the highest pressure ratio versions of the efficient, low-cost fans premised in this study will have subsonic tip relative Mach numbers. Therefore, the characteristic buzzsaw signature contribution of transonic fans will be subliminal or non-existent. With fan blade passing frequencies of 1000 hertz or less at approach thrust settings, it is expected that approach noise profiles will be about equal to the aircraft on which the engines are installed.

Furthermore, on the smaller turbofans to which this fan technology is applicable, the core compressor, core turbine and fan turbine blade passing frequencies are all well above the audible range of the human ear at normal thrust settings, from flight idle to maximum. Their contributions to aircraft noise will be nil.

A specific evaluation was made of the 500-pound thrust class turbofan using the 19-inch diameter fan subject of this study. In a comparative analysis, it was determined that the 1000-foot maximum-power flyover noise signature of a bare, unattenuated engine would be less than 65 EPNdB. This is less than the background noise level of a typical suburban general aviation airport.

7.0 CONCLUSIONS

The conclusions that Advanced Propulsion Inc. has drawn from the results of i investigation are as follows:

1. Conventional fan design practices and normal blade and vane aerodynam loading parameters can be used to design low-tip-speed fans for turbofan engines th are, in all respects, mission optimized for 200-to-400 knot aircraft.

2. Low-tip-speed fan rotors and their accompanying stators can be produced fro aluminum alloys and some reinforced plastics at substantially lower cost than th titanium alloy fans that are current practice on executive jet and commercial airlin turbofans. Based in the investigation results, the preferred, low-risk configurations a aluminum alloy, integrally-bladed, NC-machined (from near-net-shape forging), blis rotors. For stators, the preferred solution is aluminum alloy, precision-investment-cas integrated stator and front frame assemblies. Total fan system manufacturing cost expected to be less than one-fifth that of similar-size titanium fan systems.

3. When produced in quantities associated with general aviation and low-densit shorthaul aircraft, the efficient, low-cost fan systems will have equal manufacturing co and will weigh about one-quarter as much as constant-speed propellers capable absorbing the same power.

4. The first-cut preliminary design of an example fan system yielded a predicte efficiency of more than 91 percent adiabatic efficiency at 1.10 pressure ratio. It reasonable to expect that design refinement with advanced CFD methods, combine with test rig development, will yield efficiencies in the range of 92 to 93 percent. It expected this level of efficiency can be attained over the range of pressure ratios of 1.(to 1.35 and corrected flows between 35 and 150 pounds per second.

5. Thicker, tailored blade sections and much lower rotational speeds yie substantial structural design margins for meeting FAA certification requirements f 1-pound and 4-pound bird strikes.

6. Similarly, robust, subsonic blade sections and lower rotational speeds yield du sand and rain erosion resistance equal to or superior to conventional, high-spee titanium fans.

7. Further structural design evaluations confirm the adequacy of low and high-cyc fatigue lives, adequacy of lightweight blade containment and potential for lightweig blade-off design solutions.

8. Future turbofan engines using the efficient, low-cost fan system design metho and parameters used in this investigation will have lower community noise levels, by usual measuring methods, than any previous aircraft propulsion systems, by as mu as 24 to 30 EPNdB.

9. The overall propulsive coefficient, including adiabatic efficiency, ideal propulsi efficiency and nacelle drag, of the efficient, low-cost fan system is greater than t typical, installed efficiency (including additive aircraft drag) of open propellers.

10. Future general aviation private light aircraft and low-density shorthaul airline can benefit from this fan system technology in terms of greater aircraft performanc lower aircraft weights, improved fuel efficiency and much lower levels of commun noise and cabin noise/vibration.

APPENDIX A

FAN STAGE AERODYNAMIC DESIGN

UD0300 PROGRAM OUTPUT FILE

```
1
        PROGRAM UD0300 - COMPRESSOR DESIGN - CONTROL SECTION
        ****************************************************

        TITLE =  EFFICIENT LOW COST FAN RUN 17  BNC 6/25/95

 =>     THERE WILL BE AN ENTRY TO THE AERODYNAMIC SECTION
        NUMBER OF ARBITRARY MEANLINE BLADEROWS =  1
        NUMBER OF BLADE DESIGN PASSES =  1
        NO ENTRY TO RECALCULATE WORK DISTRIBUTIONS WILL BE MADE
        THIS OUTPUT FOR BLADE PASS NUMBER  1
1       PROGRAM UD0300 -    VERSION 2.0    - AERODYNAMIC SECTION
        ****************************************************
        INPUT DATA
        **********

        TITLE                                  =   ROTOR INTERNAL STATIONS
 =>

        IDEAL GAS PROPERTIES SPECIFICATION

          GAS CONSTANT                  =  53.345
          GRAVITATIONAL ACCELERATION    =  32.174
          JOULES EQUIVALENT             =  778.161

          CP=CP(1)+CP(2)*T+CP(3)*T**2+CP(4)*T**3+CP(5)*T**4+CP(6)*T**5

          N            CP(N)

          1          .240000E+00
          2          .000000E+00
          3          .000000E+00
          4          .000000E+00
          5          .000000E+00
          6          .000000E+00

        NUMBER OF STATIONS                     = 24
        NUMBER OF STREAMLINES                  = 11
        MAX NUMBER OF PASSES                   = 80
        MAX NUMBER OF ARBITRARY PASSES         = 20
        BOUNDARY LAYER CALC INDICATOR          =  0
        NUMBER OF RUNNING POINTS               =  1
        STREAMLINE DISTRIBUTION INDICATOR      =  1
        NUMBER OF LOSS/D-FACTOR CURVE SETS     =  2
        NUMBER OF LOSS/T.E.LOSS CURVE SETS     =  1
        STREAMLINE INPUT INDICATOR             =  1
        STREAMLINE OUTPUT INDICATOR            =  1
        PRECISION PLOT INDICATOR               =  0
        MAX NUMBER OF LINES/PAGE               = 60
        WAKE TRANSPORT CALC INDICATOR          =  0
        MAINSTREAM MIXING CALC INDICATOR       =  0
        NO OF STATIONS FROM ANALYTIC SECN      =  0
        LINE-PRINTER PLOT INDICATOR            =  1
        MOMENTUM EQUATION FORM INDICATOR       =  2

        GRAVITATIONAL CONSTANT                 = 32.1740
        JOULES EQUIVALENT                      = 778.160
        LINEAR DIMENSION SCALE FACTOR          = 12.0000
        BASIC TOLERANCE                        =  .00100
        KINEMATIC VISCOSITY                    =  .00018
        B.L. SHAPE FACTOR                      =  .70000

        PLOTTING SCALE FOR DIMENSIONS          =  2.000
        PLOTTING SCALE FOR PRESSURES           =  1.000
        MINIMUM RADIUS ON PLOT                 =   .000
        MINIMUM PRESSURE ON PLOT               = 12.000
        MAXIMUM M-SQUARED IN RELAXATION FACTOR =   .6000
        CONSTANT IN RELAXATION FACTOR          =  4.0000

        WAKE TRANSFER CONSTANT                 =  .00000
        TURBULENT MIXING CONSTANT              =  .00000
1

        POINTS TO BE COMPUTED

        NO      FLOWRATE    SPEED FACTOR

         1       38.450      8844.000

        ANNULUS / COMPUTING STATION GEOMETRY

        STATION  1  SPECIFIED BY  2 POINTS

              XSTN        RSTN

           -10.0000       .0000
           -10.0000      8.8970

        STATION  2  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -9.0000       .0000
            -9.0000      8.4540

        STATION  3  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -8.0000       .0000
            -8.0000      8.4860

        STATION  4  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -7.0000       .0000
            -7.0000      8.6730

        STATION  5  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -5.0000       .3720
            -6.0000      8.9020

        STATION  6  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -4.0000      1.0210
            -5.0000      9.0930

        STATION  7  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -3.0000      1.6710
            -4.0000      9.2470
1

        STATION  8  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -2.0000      2.2910
            -3.0000      9.3640

        STATION  9  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            -1.0000      2.7310
            -2.0000      9.4450

        STATION 10  SPECIFIED BY  5 POINTS

              XSTN        RSTN

             -.5000      2.7500
             -.6000      4.5000
             -.6650      5.7000
             -.6650      7.7000
             -.5000      9.5000

        STATION 11  SPECIFIED BY 11 POINTS

              XSTN        RSTN

             .0000      3.0000
             .0198      3.6435
             .0492      4.2874
             .0990      4.9351
             .1388      5.5856
             .2085      6.2371
             .2789      6.8907
             .3592      7.5438
             .4497      8.1982
             .5701      8.8507
             .7000      9.5000

        STATION 12  SPECIFIED BY 11 POINTS

              XSTN        RSTN

             .6000      3.1250
             .6127      3.7450
             .6255      4.3698
             .6540      5.0014
             .6692      5.6376
             .7067      6.2769
             .7432      6.9198
             .7851      7.5636
             .8326      8.2098
             .9036      8.8558
             .9800      9.5000
1

        STATION 13  SPECIFIED BY 11 POINTS

              XSTN        RSTN

            1.2000      3.2500
            1.2055      3.8464
            1.2018      4.4522
            1.2090      5.0677
            1.1996      5.6896
            1.2049      6.3168
            1.2075      6.9488
            1.2109      7.5835
            1.2154      8.2215
            1.2371      8.8610
            1.2600      9.5000

        STATION 14  SPECIFIED BY 11 POINTS

              XSTN        RSTN

            1.8000      3.3750
            1.7984      3.9479
            1.7782      4.5345
            1.7641      5.1339
            1.7301      5.7417
            1.7032      6.3566
            1.6717      6.9779
            1.6368      7.6033
            1.5983      8.2331
            1.5706      8.8661
            1.5400      9.5000

        STATION 15  SPECIFIED BY 11 POINTS

              XSTN        RSTN

            2.4000      3.5000
            2.3912      4.0493
            2.3545      4.6169
            2.3191      5.2002
            2.2605      5.7937
            2.2014      6.3965
            2.1360      7.0069
            2.0626      7.6232
            1.9811      8.2448
            1.9041      8.8713
            1.8200      9.5000
1

        STATION 16  SPECIFIED BY 11 POINTS

              XSTN        RSTN

            3.0000      3.6250
            2.9841      4.1508
            2.9308      4.6993
            2.8741      5.2665
            2.7909      5.8457
            2.6996      6.4363
            2.6003      7.0360
            2.4885      7.6430
            2.3640      8.2564
            2.2376      8.8764
            2.1000      9.5000

        STATION 17  SPECIFIED BY  2 POINTS

              XSTN        RSTN

            4.0000      3.7480
            4.0000      9.5000

        STATION 18  SPECIFIED BY  2 POINTS

              XSTN        RSTN
```

```
        5.0000      4.0110
        5.0000      9.5000

STATION 19  SPECIFIED BY  2 POINTS

       XSTN        RSTN

       6.0000      4.3820
       6.0000      9.5000

STATION 20  SPECIFIED BY  2 POINTS

       XSTN        RSTN

       8.0000      4.7970
       8.5600      9.5000

STATION 21  SPECIFIED BY  2 POINTS

       XSTN        RSTN

       9.0000      5.0080
       9.0000      9.5000

STATION 22  SPECIFIED BY  2 POINTS

       XSTN        RSTN

      10.0000      5.0080
      10.0000      9.5000
1

STATION 23  SPECIFIED BY  2 POINTS

       XSTN        RSTN

      11.0000      5.0080
      11.0000      9.5000

STATION 24  SPECIFIED BY  2 POINTS

       XSTN        RSTN

      12.0000      5.0080
      12.0000      9.5000

STATION CALCULATION DATA

STATION 1 NDATA=  1 NTERP= 0 NDIMEN= 0 NMACH= 0 NPLOT1= 0 NPLOT2= 0

 DATAC      TOTAL PRESSURE     TOTAL TEMPERATURE     WHIRL ANGLE

  .0000        14.6960             518.690              .000

STATION  2
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION  3
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION  4
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION  5
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION  6
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0
1

STATION  7
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION  8
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION  9
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION 10
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0
1

STATION 11
**********
NDATA = 11 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  1 NOUT3 = 0 NBLADE= 17 NDATA2= 11 NSKIP =  1
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

SPEED =      .00

DATAC      DATA1      DATA2      DATA6

 .0000     14.696     .000000     .0000
 .0990     14.696     .000000     .0000
 .1981     14.696     .000000     .0000
 .2977     14.696     .000000     .0000
 .3978     14.696     .000000     .0000
 .4980     14.696     .000000     .0000
 .5986     14.696     .000000     .0000
 .6990     14.696     .000000     .0000
 .7997     14.696     .000000     .0000
 .9001     14.696     .000000     .0000
1.0000     14.696     .000000     .0000

DAT2C      DAT23      DAT24      DAT25    NWORK=0,5,OR 6 ONLY- DAT21
                                          ******************
3.0000   -14.8614     .02878    2.52234                     -36.3014
3.6639    -9.3584     .02609    2.20658                     -43.2565
4.3322    -4.8159     .02449    1.99146                     -46.9630
4.9903    -2.7693     .02401    1.83861                     -50.3522
5.6442     1.0307     .02379    1.71073                     -53.4250
6.2957     4.2819     .02319    1.57809                     -56.1367
6.9459     6.8642     .02264    1.45354                     -58.3872
7.5909     9.8375     .02210    1.32646                     -60.1894
8.2309    13.9180     .02220    1.19631                     -61.6417
8.8651    18.0490     .02176    1.04895                     -63.0545
9.5000    20.2311     .01963     .88297                     -64.7645
1

STATION 12
**********
NDATA = 11 NTERP =  0 NDIMEN= 3 NMACH =  0 NWORK =  1 NLOSS =  4
NL1   = -1 NL2   = -1 NEVAL = 0 NCURVE=  1 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  1 NOUT3 = 0 NBLADE= 17 NDATA2= 11 NSKIP =  1
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

SPEED =     1.00

DATAC      DATA1      DATA2      DATA6

 .0000     15.011     .000000     .0000
 .0973     15.005     .000000     .0000
 .1953     15.001     .000000     .0000
 .2943     14.998     .000000     .0000
 .3941     14.996     .000000     .0000
 .4944     14.995     .000000     .0000
 .5953     14.994     .000000     .0000
 .6963     14.994     .000000     .0000
 .7976     14.994     .000000     .0000
 .8989     14.995     .000000     .0000
1.0000     14.995     .000000     .0000

DAT2C      DAT23      DAT24      DAT25    NWORK=0,5,OR 6 ONLY- DAT21
                                          ******************
3.1250   -11.6559     .17163    2.52234                     -27.2676
3.7875    -8.7074     .16137    2.20658                     -33.9728
4.4305    -6.1274     .15185    1.99146                     -39.8407
5.0686    -4.1964     .14601    1.83861                     -44.7915
5.7065    -1.5627     .13768    1.71073                     -49.0489
6.3464     .6820      .13446    1.57809                     -52.6586
6.9889    2.3500      .12674    1.45354                     -55.7752
7.6286    4.1450      .11012    1.32646                     -58.5548
8.2593    7.1885      .07449    1.19631                     -61.0716
8.8792   11.3813      .04461    1.04895                     -63.3105
9.5000   12.8858      .03864     .88297                     -65.5371
1

STATION 13
**********
NDATA = 11 NTERP =  0 NDIMEN= 3 NMACH =  0 NWORK =  1 NLOSS =  4
NL1   = -2 NL2   = -2 NEVAL = 0 NCURVE=  1 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  1 NOUT3 = 0 NBLADE= 17 NDATA2= 11 NSKIP =  1
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

SPEED =     1.00

DATAC      DATA1      DATA2      DATA6

 .0000     15.327     .000000     .0000
 .0954     15.314     .000000     .0000
 .1924     15.306     .000000     .0000
 .2908     15.300     .000000     .0000
 .3903     15.296     .000000     .0000
 .4907     15.294     .000000     .0000
 .5918     15.292     .000000     .0000
 .6934     15.292     .000000     .0000
 .7954     15.292     .000000     .0000
 .8978     15.293     .000000     .0000
1.0000     15.294     .000000     .0000

DAT2C      DAT23      DAT24      DAT25    NWORK=0,5,OR 6 ONLY- DAT21
                                          ******************
3.2500    -6.7534     .23693    2.52234                     -13.7706
3.8843    -5.0127     .21720    2.20658                     -23.4008
4.5056    -3.6739     .20372    1.99146                     -31.5483
5.1285    -3.0031     .19668    1.83861                     -38.3335
5.7551    -2.0455     .18665    1.71073                     -43.8702
6.3873    -1.0898     .18391    1.57809                     -48.4174
7.0247     -.2905     .17473    1.45354                     -52.3062
7.6609      .5496     .15302    1.32646                     -55.8341
8.2849    2.3145      .10197    1.19631                     -59.0636
8.8939    4.5391      .05692    1.04895                     -61.8077
9.5000    5.2692      .04833     .88297                     -64.0207
1

STATION 14
**********
NDATA = 11 NTERP =  0 NDIMEN= 3 NMACH =  0 NWORK =  1 NLOSS =  4
NL1   = -3 NL2   = -3 NEVAL = 0 NCURVE=  1 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  1 NOUT3 = 0 NBLADE= 17 NDATA2= 11 NSKIP =  1
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

SPEED =     1.00

DATAC      DATA1      DATA2      DATA6

 .0000     15.642     .000000     .0000
 .0935     15.623     .000000     .0000
 .1893     15.610     .000000     .0000
 .2872     15.601     .000000     .0000
 .3864     15.596     .000000     .0000
 .4868     15.592     .000000     .0000
 .5882     15.591     .000000     .0000
 .6903     15.590     .000000     .0000
 .7932     15.591     .000000     .0000
 .8965     15.592     .000000     .0000
1.0000     15.592     .000000     .0000

DAT2C      DAT23      DAT24      DAT25    NWORK=0,5,OR 6 ONLY- DAT21
                                          ******************
3.3750     4.1709     .23712    2.52234                       .1150
3.9707     3.1637     .20837    2.20658                     -13.3311
```

FRACTION OF COMPUTING STATION LENGTH AT BLADE EXIT = 6.2500

FRACTION OF MERIDIONAL CHORD	LOSS/LOSS AT TRAILING EDGE
.0000	.0000
.2000	.2000
.4000	.4000
.6000	.5000
.8000	.8000
1.0000	1.0000

1

PROPORTIONS OF TOTAL FLOW BETWEEN HUB AND EACH STREAMLINE ARE TO BE AS
=> FOLLOWS

STREAMLINE	1	2	3	4	5	6	7
FLOW	.0000	.0532	.1168	.1908	.2752	.3700	.4752

STREAMLINE	8	9	10	11
FLOW	.5908	.7168	.8532	1.0000

ESTIMATED STREAMLINE COORDINATES

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
1	1	.0000	-10.0000	.0000	1	1
1	2	2.0400	-10.0000	2.0400	1	2
1	3	3.0237	-10.0000	3.0237	1	3
1	4	3.8647	-10.0000	3.8647	1	4
1	5	4.6407	-10.0000	4.6407	1	5
1	6	5.3801	-10.0000	5.3801	1	6
1	7	6.0963	-10.0000	6.0963	1	7
1	8	6.7977	-10.0000	6.7977	1	8
1	9	7.4907	-10.0000	7.4907	1	9
1	10	8.1842	-10.0000	8.1842	1	10
1	11	8.8970	-10.0000	8.8970	1	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
2	1	.0000	-9.0000	.0000	2	1
2	2	2.1102	-9.0000	2.1102	2	2
2	3	3.0941	-9.0000	3.0941	2	3
2	4	3.9187	-9.0000	3.9187	2	4
2	5	4.6737	-9.0000	4.6737	2	5
2	6	5.3886	-9.0000	5.3886	2	6
2	7	6.0736	-9.0000	6.0736	2	7
2	8	6.7300	-9.0000	6.7300	2	8
2	9	7.3532	-9.0000	7.3532	2	9
2	10	7.9326	-9.0000	7.9326	2	10
2	11	8.4540	-9.0000	8.4540	2	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
3	1	.0000	-8.0000	.0000	3	1
3	2	2.2345	-8.0000	2.2345	3	2
3	3	3.1982	-8.0000	3.1982	3	3
3	4	3.9878	-8.0000	3.9878	3	4
3	5	4.7214	-8.0000	4.7214	3	5
3	6	5.4200	-8.0000	5.4200	3	6
3	7	6.0904	-8.0000	6.0904	3	7
3	8	6.7338	-8.0000	6.7338	3	8
3	9	7.3488	-8.0000	7.3488	3	9
3	10	7.9329	-8.0000	7.9329	3	10
3	11	8.4860	-8.0000	8.4860	3	11

1

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
4	1	.0000	-7.0000	.0000	4	1
4	2	2.5773	-7.0000	2.5773	4	2
4	3	3.3216	-7.0000	3.3216	4	3
4	4	4.0662	-7.0000	4.0662	4	4
4	5	4.7856	-7.0000	4.7856	4	5
4	6	5.4797	-7.0000	5.4797	4	6
4	7	6.1514	-7.0000	6.1514	4	7
4	8	6.8034	-7.0000	6.8034	4	8
4	9	7.4381	-7.0000	7.4381	4	9
4	10	8.0591	-7.0000	8.0591	4	10
4	11	8.6730	-7.0000	8.6730	4	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
5	1	.3720	-5.0000	.0000	5	1
5	2	2.4290	-5.2411	2.0711	5	2
5	3	3.3706	-5.3515	3.0191	5	3
5	4	4.1637	-5.4445	3.8177	5	4
5	5	4.8977	-5.5306	4.5567	5	5
5	6	5.5988	-5.6128	5.2626	5	6
5	7	6.2783	-5.6924	5.9468	5	7
5	8	6.9430	-5.7703	6.6160	5	8
5	9	7.5976	-5.8471	7.2751	5	9
5	10	8.2478	-5.9233	7.9297	5	10
5	11	8.9020	-6.0000	8.5884	5	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
6	1	1.0210	-4.0000	.0000	6	1
6	2	2.5429	-4.1885	1.5335	6	2
6	3	3.4735	-4.3038	2.4713	6	3
6	4	4.2677	-4.4022	3.2715	6	4
6	5	5.0038	-4.4934	4.0133	6	5
6	6	5.7089	-4.5808	4.7238	6	6
6	7	6.3958	-4.6659	5.4159	6	7
6	8	7.0721	-4.7496	6.0973	6	8
6	9	7.7434	-4.8328	6.7737	6	9
6	10	8.4151	-4.9160	7.4506	6	10
6	11	9.0930	-5.0000	8.1337	6	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
7	1	1.6710	-3.0000	.0000	7	1
7	2	2.7937	-3.1482	1.1324	7	2
7	3	3.6449	-3.2606	1.9910	7	3
7	4	4.4094	-3.3615	2.7621	7	4
7	5	5.1321	-3.4569	3.4912	7	5
7	6	5.8319	-3.5492	4.1969	7	6
7	7	6.5185	-3.6398	4.8896	7	7
7	8	7.1986	-3.7296	5.5755	7	8
7	9	7.8770	-3.8192	6.2599	7	9
7	10	8.5584	-3.9091	6.9471	7	10
7	11	9.2470	-4.0000	7.6417	7	11

1

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
8	1	2.2910	-2.0000	.0000	8	1
8	2	3.1067	-2.1153	.8239	8	2
8	3	3.8584	-2.2216	1.5830	8	3
8	4	4.5774	-2.3233	2.3092	8	4
8	5	5.2755	-2.4220	3.0142	8	5
8	6	5.9609	-2.5189	3.7064	8	6
8	7	6.6392	-2.6148	4.3915	8	7
8	8	7.3150	-2.7103	5.0740	8	8
8	9	7.9920	-2.8060	5.7577	8	9
8	10	8.6738	-2.9024	6.4463	8	10
8	11	9.3640	-3.0000	7.1433	8	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
9	1	2.7310	-1.0000	.0000	9	1
9	2	3.3826	-1.0970	.6587	9	2
9	3	4.0740	-1.2000	1.3578	9	3
9	4	4.7522	-1.3010	2.0435	9	4
9	5	5.4227	-1.4009	2.7214	9	5
9	6	6.0887	-1.5001	3.3947	9	6
9	7	6.7528	-1.5990	4.0661	9	7
9	8	7.4175	-1.6980	4.7382	9	8
9	9	8.0857	-1.7975	5.4138	9	9
9	10	8.7604	-1.8980	6.0959	9	10
9	11	9.4450	-2.0000	6.7881	9	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
10	1	2.7500	-.5000	.0000	10	1
10	2	3.5304	-.5440	.7817	10	2
10	3	4.2022	-.5825	1.4545	10	3
10	4	4.8686	-.6218	2.1221	10	4
10	5	5.5298	-.6574	2.7843	10	5
10	6	6.1893	-.6816	3.4438	10	6
10	7	6.8486	-.6886	4.1028	10	7
10	8	7.5085	-.6740	4.7629	10	8
10	9	8.1697	-.6336	5.4255	10	9
10	10	8.8330	-.5723	6.0917	10	10
10	11	9.5000	-.5000	6.7622	10	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
11	1	3.0000	.0000	.0000	11	1
11	2	3.6639	.0205	.6642	11	2
11	3	4.3322	.0523	1.3333	11	3
11	4	4.9903	.1025	1.9933	11	4
11	5	5.6442	.1438	2.6485	11	5
11	6	6.2957	.2150	3.3038	11	6
11	7	6.9459	.2852	3.9578	11	7
11	8	7.5909	.3652	4.6078	11	8
11	9	8.2309	.4550	5.2541	11	9
11	10	8.8651	.5730	5.8992	11	10
11	11	9.5000	.7000	6.5466	11	11

1

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
12	1	3.1250	.6000	.0000	12	1
12	2	3.7875	.6134	.6626	12	2
12	3	4.4305	.6279	1.3058	12	3
12	4	5.0686	.6560	1.9446	12	4
12	5	5.7065	.6721	2.5826	12	5
12	6	6.3464	.7109	3.2237	12	6
12	7	6.9889	.7474	3.8673	12	7
12	8	7.6286	.7894	4.5083	12	8
12	9	8.2593	.8372	5.1409	12	9
12	10	8.8792	.9064	5.7646	12	10
12	11	9.5000	.9800	6.3900	12	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
13	1	3.2500	1.2000	.0000	13	1
13	2	3.8843	1.2054	.6343	13	2
13	3	4.5056	1.2022	1.2556	13	3
13	4	5.1285	1.2087	1.8786	13	4
13	5	5.7551	1.1993	2.5053	13	5
13	6	6.3873	1.2055	3.1375	13	6
13	7	7.0247	1.2078	3.7749	13	7
13	8	7.6609	1.2111	4.4110	13	8
13	9	8.2849	1.2168	5.0351	13	9
13	10	8.8939	1.2384	5.6445	13	10
13	11	9.5000	1.2600	6.2510	13	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
14	1	3.3750	1.8000	.0000	14	1
14	2	3.9707	1.7979	.5957	14	2
14	3	4.5690	1.7773	1.1944	14	3
14	4	5.1788	1.7622	1.8044	14	4
14	5	5.7965	1.7272	2.4230	14	5
14	6	6.4219	1.7003	3.0490	14	6
14	7	7.0537	1.6676	3.6817	14	7
14	8	7.6852	1.6317	4.3142	14	8
14	9	8.3037	1.5947	4.9338	14	9
14	10	8.9057	1.5689	5.5364	14	10
14	11	9.5000	1.5400	6.1314	14	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
15	1	3.5000	2.4000	.0000	15	1
15	2	4.0520	2.3911	.5521	15	2
15	3	4.6285	2.3538	1.1298	15	3
15	4	5.2266	2.3170	1.7291	15	4
15	5	5.8359	2.2562	2.3413	15	5
15	6	6.4536	2.1957	2.9620	15	6
15	7	7.0772	2.1280	3.5893	15	7
15	8	7.7008	2.0526	4.2174	15	8
15	9	8.3139	1.9724	4.8357	15	9
15	10	8.9132	1.8988	5.4396	15	10
15	11	9.5000	1.8200	6.0316	15	11

1

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
16	1	3.6250	3.0000	.0000	16	1
16	2	4.1365	2.9850	.5117	16	2
16	3	4.6953	2.9312	1.0731	16	3
16	4	5.2804	2.8724	1.6612	16	4
16	5	5.8778	2.7859	2.2648	16	5
16	6	6.4842	2.6920	2.8784	16	6
16	7	7.0959	2.5898	3.4986	16	7
16	8	7.7081	2.4756	4.1214	16	8
16	9	8.3154	2.3520	4.7410	16	9
16	10	8.9145	2.2295	5.3526	16	10
16	11	9.5000	2.1000	5.9523	16	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
17	1	3.7480	4.0000	.0000	17	1
17	2	4.2979	4.0000	.5499	17	2
17	3	4.8532	4.0000	1.1052	17	3
17	4	5.4175	4.0000	1.6695	17	4
17	5	5.9897	4.0000	2.2417	17	5
17	6	6.5680	4.0000	2.8200	17	6
17	7	7.1508	4.0000	3.4028	17	7
17	8	7.7364	4.0000	3.9884	17	8
17	9	8.3234	4.0000	4.5754	17	9
17	10	8.9112	4.0000	5.1632	17	10
17	11	9.5000	4.0000	5.7520	17	11

```
4.5690    1.8777    .19347   1.99146                    -24.4417
5.1788     .5299    .18798   1.83861                    -33.3693
5.7965    -.8134    .18064   1.71073                    -40.3329
6.4219   -1.5593    .18022   1.57809                    -45.8060
7.0537   -1.8159    .17290   1.45354                    -50.2746
7.6852   -1.9514    .15250   1.32646                    -54.1917
8.3037   -1.6264    .10207   1.19631                    -57.7206
8.9057   -2.2331    .05651   1.04895                    -60.5740
9.5000   -3.0052    .04698    .88297                    -62.4810
1

STATION 15
**********
NDATA = 11 NTERP =  0 NDIMEN= 3 NMACH =  0 NWORK =  1 NLOSS =  4
NL1   = -4 NL2   = -4 NEVAL = 0 NCURVE=  1 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  1 NOUT3 = 0 NBLADE= 17 NDATA2= 11 NSKIP =  1
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

SPEED =     1.00

DATAC     DATA1     DATA2     DATA6

 .0000    15.958    .000000    .0000
 .0916    15.932    .000000    .0000
 .1864    15.915    .000000    .0000
 .2834    15.903    .000000    .0000
 .3823    15.896    .000000    .0000
 .4828    15.891    .000000    .0000
 .5845    15.889    .000000    .0000
 .6872    15.888    .000000    .0000
 .7908    15.889    .000000    .0000
 .8952    15.890    .000000    .0000
1.0000    15.891    .000000    .0000

DAT2C     DAT23     DAT24     DAT25   NWORK=0,5,OR 6 ONLY- DAT21
                                      ******************
3.5000   20.9195    .16918   2.52234                      14.8815
4.0520   16.0619    .14096   2.20658                      -2.6276
4.6285   10.6494    .12832   1.99146                     -17.3561
5.2266    6.3990    .12516   1.83861                     -28.8282
5.8359    2.2058    .12252   1.71073                     -37.5611
6.4536    -.8026    .12446   1.57809                     -44.1768
7.0772   -2.6944    .12136   1.45354                     -49.2442
7.7008   -4.2307    .10810   1.32646                     -53.3135
8.3139   -5.4790    .07380   1.19631                     -56.7688
8.9132   -9.3492    .04304   1.04895                     -59.4456
9.5000  -11.9606    .03519    .88297                     -60.7739
1

STATION 16
**********
NDATA = 11 NTERP =  0 NDIMEN= 3 NMACH =  0 NWORK =  1 NLOSS =  1
NL1   = -5 NL2   = -5 NEVAL = 1 NCURVE=  1 NLITER=  0 NDEL  =  2
NOUT1 =  0 NOUT2 =  1 NOUT3 = 0 NBLADE= 17 NDATA2= 11 NSKIP =  1
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

SPEED =     1.00

DATAC     DATA1     DATA2     DATA6

 .0000    16.273    .066000    .0000
 .0895    16.241    .056000    .0000
 .1829    16.219    .056000    .0000
 .2794    16.205    .039000    .0000
 .3780    16.196    .039000    .0000
 .4785    16.190    .025000    .0000
 .5806    16.187    .025000    .0000
 .6839    16.186    .019000    .0000
 .7883    16.187    .019000    .0000
 .8939    16.188    .029000    .0000
1.0000    16.190    .056000    .0000

DAT2C     DAT23     DAT24     DAT25   NWORK=0,5,OR 6 ONLY- DAT21
                                      ******************
3.6250   41.1943    .02267   2.52234                      30.5876
4.1365   32.2080    .02067   2.20658                       9.6098
4.6953   22.1990    .01913   1.99146                      -9.4174
5.2804   14.4257    .01849   1.83861                     -23.9870
5.8778    6.8627    .01864   1.71073                     -34.5188
6.4842    1.0875    .01860   1.57809                     -42.0930
7.0959   -2.9501    .01858   1.45354                     -47.7344
7.7081   -6.3959    .01855   1.32646                     -52.0029
8.3154   -9.4879    .01891   1.19631                     -55.4606
8.9145  -16.5031    .01854   1.04895                     -57.8722
9.5000  -20.6508    .01610    .88297                     -58.8382

   DELC      DELTA

  .0000    10.0000
 1.0000     5.0000

STATION 17
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION 18
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0
1

STATION 19
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION 20
**********
NDATA = 11 NTERP =  0 NDIMEN= 3 NMACH =  0 NWORK =  4 NLOSS =  1
NL1   = -1 NL2   = -1 NEVAL = 2 NCURVE=  0 NLITER=  0 NDEL  =  2
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE= 27 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

SPEED =      .00  RESTAGGER ANGLE (NWORK=7) =     .000

DATAC     DATA1     DATA2     DATA3     DATA4     DATA5     DATA6

 .0000      .000    .08706     .0000    .00000   2.02700    .00000
 .0773      .000    .08500     .0000    .00000   1.90000    .00000
 .1617      .000    .08100     .0000    .00000   1.76400    .00000
 .2525      .000    .06300     .0000    .00000   1.65200    .00000
 .3491      .000    .05500     .0000    .00000   1.55500    .00000
 .4502      .000    .04900     .0000    .00000   1.47000    .00000
 .5552      .000    .04200     .0000    .00000   1.39600    .00000
 .6632      .000    .04500     .0000    .00000   1.33100    .00000
 .7737      .000    .04700     .0000    .00000   1.27500    .00000
 .8862      .000    .05500     .0000    .00000   1.22500    .00000
1.0000      .000    .06000     .0000    .00000   1.18100    .00000

DATAC     DATA7     DATA8     DATA9    DATA10    DATA11

 .0000    .00000    .00000    .00000    .00000    .00000
 .0773    .00000    .00000    .00000    .00000    .00000
 .1617    .00000    .00000    .00000    .00000    .00000
 .2525    .00000    .00000    .00000    .00000    .00000
 .3491    .00000    .00000    .00000    .00000    .00000
 .4502    .00000    .00000    .00000    .00000    .00000
 .5552    .00000    .00000    .00000    .00000    .00000
 .6632    .00000    .00000    .00000    .00000    .00000
 .7737    .00000    .00000    .00000    .00000    .00000
 .8862    .00000    .00000    .00000    .00000    .00000
1.0000    .00000    .00000    .00000    .00000    .00000

   DELC      DELTA

  .0000     5.0000
 1.0000     5.0000

STATION 21
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0
1

STATION 22
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION 23
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

STATION 24
**********
NDATA =  0 NTERP =  0 NDIMEN= 0 NMACH =  0 NWORK =  0 NLOSS =  0
NL1   =  0 NL2   =  0 NEVAL = 0 NCURVE=  0 NLITER=  0 NDEL  =  0
NOUT1 =  0 NOUT2 =  0 NOUT3 = 0 NBLADE=  0 NDATA2=  0 NSKIP =  0
NPLOT1=  0 NPLOT2=  0 NPLOT3= 0 NPLOT4=  0 NPLOT5=  0 NBLEED=  0

BLOCKAGE FACTOR SPECIFICATIONS

STATION   WALL BLOCKAGE   WAKE BLOCKAGE   WAKE DISTRIBUTION FACTOR

   1        .00000         .00000              1.000
   2        .00150         .00000              1.000
   3        .00300         .00000              1.000
   4        .00450         .00000              1.000
   5        .00600         .00000              1.000
   6        .00750         .00000              1.000
   7        .00900         .00000              1.000
   8        .01050         .00000              1.000
   9        .01200         .00000              1.000
  10        .01350         .00000              1.000
  11        .01500         .00000              1.000
  12        .01750         .00000              1.000
  13        .02000         .00000              1.000
  14        .02250         .00000              1.000
  15        .02250         .00000              1.000
  16        .02250         .00000              1.000
  17        .02250         .00000              1.000
  18        .02250         .00000              1.000
  19        .02250         .00000              1.000
  20        .02750         .00000              1.000
  21        .02750         .00000              1.000
  22        .02750         .00000              1.000
  23        .02750         .00000              1.000
  24        .02750         .00000              1.000
1

LOSS PARAMETER / DIFFUSION FACTOR CURVES FOR BLADE TYPE 1
( 15 D-FACTORS GIVEN)

   DIFFUSION     L O S S   P A R A M E T E R S
    FACTORS        HUB          MID         TIP

      .000       .00900       .00900      .00900
      .050       .00900       .00900      .00900
      .100       .00900       .00900      .00900
      .150       .00900       .00900      .00900
      .200       .00900       .00900      .00900
      .250       .00900       .00900      .00900
      .300       .00900       .00900      .00900
      .350       .00920       .00920      .00920
      .400       .00960       .00960      .00980
      .450       .01010       .01010      .01100
      .500       .01110       .01110      .01290
      .550       .01270       .01270      .01590
      .600       .01520       .01520      .02040
      .650       .01890       .01890      .02700
      .700       .02450       .02450      .03770

LOSS PARAMETER / DIFFUSION FACTOR CURVES FOR BLADE TYPE 2
( 15 D-FACTORS GIVEN)

   DIFFUSION     L O S S   P A R A M E T E R S
    FACTORS        HUB          MID         TIP

      .000       .00640       .00340      .00640
      .050       .00690       .00390      .00690
      .100       .00750       .00450      .00750
      .150       .00810       .00510      .00810
      .200       .00900       .00600      .00900
      .250       .01020       .00720      .01020
      .300       .01150       .00850      .01150
      .350       .01320       .01020      .01320
      .400       .01500       .01200      .01500
      .450       .01750       .01450      .01750
      .500       .02020       .01720      .02020
      .550       .02470       .02170      .02470
      .600       .02940       .02640      .02940
      .650       .03480       .03180      .03480
      .700       .04170       .03870      .04170

FRACTIONAL LOSS DISTRIBUTION CURVES FOR BLADE CLASS 1

 6 POINTS GIVEN AT  1 RADIAL LOCATIONS
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STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
18	1	4.0110	5.0000	.0000	18	1
18	2	4.5178	5.0000	.5068	18	2
18	3	5.0324	5.0000	1.0214	18	3
18	4	5.5594	5.0000	1.5484	18	4
18	5	6.0988	5.0000	2.0878	18	5
18	6	6.6490	5.0000	2.6380	18	6
18	7	7.2081	5.0000	3.1971	18	7
18	8	7.7742	5.0000	3.7632	18	8
18	9	8.3457	5.0000	4.3347	18	9
18	10	8.9213	5.0000	4.9103	18	10
18	11	9.5000	5.0000	5.4890	18	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
19	1	4.3820	6.0000	.0000	19	1
19	2	4.7889	6.0000	.4069	19	2
19	3	5.2355	6.0000	.8535	19	3
19	4	5.7136	6.0000	1.3316	19	4
19	5	6.2159	6.0000	1.8339	19	5
19	6	6.7366	6.0000	2.3546	19	6
19	7	7.2716	6.0000	2.8896	19	7
19	8	7.8178	6.0000	3.4358	19	8
19	9	8.3726	6.0000	3.9906	19	9
19	10	8.9339	6.0000	4.5519	19	10
19	11	9.5000	6.0000	5.1180	19	11

1

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
20	1	4.7970	8.0000	.0000	20	1
20	2	5.1604	8.0433	.3660	20	2
20	3	5.5587	8.0907	.7671	20	3
20	4	5.9870	8.1417	1.1984	20	4
20	5	6.4409	8.1957	1.6556	20	5
20	6	6.9164	8.2524	2.1344	20	6
20	7	7.4097	8.3111	2.6312	20	7
20	8	7.9174	8.3716	3.1425	20	8
20	9	8.4367	8.4334	3.6654	20	9
20	10	8.9650	8.4963	4.1974	20	10
20	11	9.5000	8.5600	4.7362	20	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
21	1	5.0080	9.0000	.0000	21	1
21	2	5.3115	9.0000	.3035	21	2
21	3	5.6658	9.0000	.6578	21	3
21	4	6.0631	9.0000	1.0551	21	4
21	5	6.4952	9.0000	1.4872	21	5
21	6	6.9548	9.0000	1.9468	21	6
21	7	7.4360	9.0000	2.4280	21	7
21	8	7.9344	9.0000	2.9264	21	8
21	9	8.4463	9.0000	3.4383	21	9
21	10	8.9690	9.0000	3.9610	21	10
21	11	9.5000	9.0000	4.4920	21	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
22	1	5.0080	10.0000	.0000	22	1
22	2	5.3331	10.0000	.3251	22	2
22	3	5.6989	10.0000	.6909	22	3
22	4	6.0999	10.0000	1.0919	22	4
22	5	6.5306	10.0000	1.5226	22	5
22	6	6.9859	10.0000	1.9779	22	6
22	7	7.4614	10.0000	2.4534	22	7
22	8	7.9535	10.0000	2.9455	22	8
22	9	8.4590	10.0000	3.4510	22	9
22	10	8.9752	10.0000	3.9672	22	10
22	11	9.5000	10.0000	4.4920	22	11

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
23	1	5.0080	11.0000	.0000	23	1
23	2	5.3394	11.0000	.3314	23	2
23	3	5.7108	11.0000	.7028	23	3
23	4	6.1154	11.0000	1.1074	23	4
23	5	6.5476	11.0000	1.5396	23	5
23	6	7.0025	11.0000	1.9945	23	6
23	7	7.4761	11.0000	2.4681	23	7
23	8	7.9652	11.0000	2.9572	23	8
23	9	8.4670	11.0000	3.4590	23	9
23	10	8.9792	11.0000	3.9712	23	10
23	11	9.5000	11.0000	4.4920	23	11

1

STATION	STREAMLINE	RADIUS	AXIAL COORDINATE	L-COORDINATE	I	J
24	1	5.0080	12.0000	.0000	24	1
24	2	5.3427	12.0000	.3347	24	2
24	3	5.7171	12.0000	.7091	24	3
24	4	6.1242	12.0000	1.1162	24	4
24	5	6.5578	12.0000	1.5498	24	5
24	6	7.0131	12.0000	2.0051	24	6
24	7	7.4859	12.0000	2.4779	24	7
24	8	7.9733	12.0000	2.9653	24	8
24	9	8.4727	12.0000	3.4647	24	9
24	10	8.9822	12.0000	3.9742	24	10
24	11	9.5000	12.0000	4.4920	24	11

1 OUTPUT FOR POINT NO. 1

1

STATION 1 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	.0000	306.35	.00	306.35	.00	306.35
2	2.0400	306.35	.00	305.60	21.45	306.35
3	3.0237	306.35	.00	305.59	21.50	306.35
4	3.8647	306.35	.00	305.90	16.52	306.35
5	4.6407	306.35	.00	306.18	10.09	306.35
6	5.3801	306.35	.00	306.34	2.63	306.35
7	6.0963	306.35	.00	306.27	-6.97	306.35
8	6.7977	306.35	.00	305.65	-20.68	306.35
9	7.4907	306.35	.00	303.50	-41.71	306.35
10	8.1842	306.35	.00	297.09	-74.75	306.35
11	8.8970	306.35	.00	280.10	-124.08	306.35

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	.0000	-10.0000	.0000	.00	.000	.000
2	2.0400	-10.0000	2.0400	.00	4.016	.000
3	3.0237	-10.0000	3.0237	.00	4.025	.000
4	3.8647	-10.0000	3.8647	.00	3.091	.000
5	4.6407	-10.0000	4.6407	.00	1.888	.000
6	5.3801	-10.0000	5.3801	.00	.492	.000
7	6.0963	-10.0000	6.0963	.00	-1.303	.000
8	6.7977	-10.0000	6.7977	.00	-3.870	.000
9	7.4907	-10.0000	7.4907	.00	-7.824	.000
10	8.1842	-10.0000	8.1842	.00	-14.123	.000
11	8.8970	-10.0000	8.8970	.00	-23.893	.000

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	.0000	.2765	14.6960	13.9358	518.690	510.881	.073635
2	2.0400	.2765	14.6960	13.9358	518.690	510.881	.073635
3	3.0237	.2765	14.6960	13.9358	518.690	510.881	.073635
4	3.8647	.2765	14.6960	13.9358	518.690	510.881	.073635
5	4.6407	.2765	14.6960	13.9358	518.690	510.881	.073635
6	5.3801	.2765	14.6960	13.9358	518.690	510.881	.073635
7	6.0963	.2765	14.6960	13.9358	518.690	510.881	.073635
8	6.7977	.2765	14.6960	13.9358	518.690	510.881	.073635
9	7.4907	.2765	14.6960	13.9358	518.690	510.881	.073635
10	8.1842	.2765	14.6960	13.9358	518.690	510.881	.073635
11	8.8970	.2765	14.6960	13.9358	518.690	510.881	.073635

STREAM LINE	RADIUS	ENTHALPIES TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	.0000	124.486	122.611	.975379	.000	.000
2	2.0400	124.486	122.611	.975379	.000	4.016
3	3.0237	124.486	122.611	.975379	.000	4.025
4	3.8647	124.486	122.611	.975379	.000	3.091
5	4.6407	124.486	122.611	.975379	.000	1.888
6	5.3801	124.486	122.611	.975379	.000	.492
7	6.0963	124.486	122.611	.975379	.000	-1.303
8	6.7977	124.486	122.611	.975379	.000	-3.870
9	7.4907	124.486	122.611	.975379	.000	-7.824
10	8.1842	124.486	122.611	.975379	.000	-14.123
11	8.8970	124.486	122.611	.975379	.000	-23.893

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STATION 2 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	.0000	278.88	.00	278.88	.00	278.88
2	2.1102	292.33	.00	290.96	28.27	292.33
3	3.0941	304.51	.00	303.36	26.46	304.51
4	3.9187	310.91	.00	310.32	19.11	310.91
5	4.6737	314.66	.00	314.40	12.68	314.66
6	5.3886	319.09	.00	319.02	6.38	319.09
7	6.0736	326.05	.00	326.05	-.96	326.05
8	6.7300	337.94	.00	337.76	-10.77	337.94
9	7.3532	359.16	.00	358.27	-25.31	359.16
10	7.9326	398.13	.00	395.12	-48.89	398.13
11	8.4540	469.44	.00	460.77	-89.82	469.44

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	.0000	-9.0000	.0000	.00	.000	.000
2	2.1102	-9.0000	2.1102	18.77	5.550	.000
3	3.0941	-9.0000	3.0941	29.97	4.984	.000
4	3.9187	-9.0000	3.9187	66.31	3.524	.000
5	4.6737	-9.0000	4.6737	68.02	2.309	.000
6	5.3886	-9.0000	5.3886	43.84	1.146	.000
7	6.0736	-9.0000	6.0736	25.26	-.168	.000
8	6.7300	-9.0000	6.7300	14.03	-1.826	.000
9	7.3532	-9.0000	7.3532	7.61	-4.041	.000
10	7.9326	-9.0000	7.9326	4.12	-7.053	.000
11	8.4540	-9.0000	8.4540	2.33	-11.030	.000

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	.0000	.2514	14.6960	14.0640	518.690	512.218	.074118
2	2.1102	.2637	14.6960	14.0026	518.690	511.579	.073887
3	3.0941	.2748	14.6960	13.9448	518.690	510.974	.073668
4	3.9187	.2807	14.6960	13.9135	518.690	510.646	.073550
5	4.6737	.2841	14.6960	13.8949	518.690	510.451	.073480
6	5.3886	.2882	14.6960	13.8726	518.690	510.218	.073396
7	6.0736	.2946	14.6960	13.8371	518.690	509.844	.073262
8	6.7300	.3055	14.6960	13.7748	518.690	509.187	.073026
9	7.3532	.3251	14.6960	13.6585	518.690	507.956	.072585
10	7.9326	.3613	14.6960	13.4287	518.690	505.500	.071710
11	8.4540	.4282	14.6960	12.9560	518.690	500.352	.069898

STREAM LINE	RADIUS	ENTHALPIES TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	.0000	124.486	122.932	.975379	.000	.000
2	2.1102	124.486	122.779	.975379	.000	5.550
3	3.0941	124.486	122.634	.975379	.000	4.984
4	3.9187	124.486	122.555	.975379	.000	3.524
5	4.6737	124.486	122.508	.975379	.000	2.309
6	5.3886	124.486	122.452	.975379	.000	1.146
7	6.0736	124.486	122.363	.975379	.000	-.168
8	6.7300	124.486	122.205	.975379	.000	-1.826
9	7.3532	124.486	121.909	.975379	.000	-4.041
10	7.9326	124.486	121.320	.975379	.000	-7.053
11	8.4540	124.486	120.084	.975379	.000	-11.030

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STATION 3 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	.0000	234.10	.00	234.10	.00	234.10
2	2.2345	278.08	.00	270.95	62.58	278.08
3	3.1982	313.12	.00	311.12	35.40	313.12
4	3.9878	317.27	.00	316.42	23.34	317.27
5	4.7214	320.44	.00	319.94	17.90	320.44
6	5.4201	325.55	.00	325.21	14.80	325.55
7	6.0905	333.56	.00	333.31	12.97	333.56
8	6.7339	345.53	.00	345.30	12.66	345.53
9	7.3488	362.72	.00	362.39	15.35	362.72
10	7.9329	386.06	.00	385.29	24.26	386.06
11	8.4860	414.63	.00	412.20	44.87	414.63

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	.0000	-8.0000	.0000	.00	.000	.000
2	2.2345	-8.0000	2.2345	5.00	13.005	.000
3	3.1982	-8.0000	3.1982	52.60	6.492	.000
4	3.9878	-8.0000	3.9878	110.01	4.218	.000
5	4.7214	-8.0000	4.7214	60.91	3.202	.000
6	5.4201	-8.0000	5.4201	35.55	2.606	.000
7	6.0905	-8.0000	6.0905	22.72	2.228	.000
8	6.7339	-8.0000	6.7339	15.25	2.100	.000
9	7.3488	-8.0000	7.3488	10.70	2.425	.000
10	7.9329	-8.0000	7.9329	8.02	3.603	.000
11	8.4860	-8.0000	8.4860	6.60	6.212	.000

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	.0000	.2106	14.6960	14.2486	518.690	514.130	.074812
2	2.2345	.2507	14.6960	14.0476	518.690	512.255	.074131
3	3.1982	.2827	14.6960	13.9025	518.690	510.531	.073509
4	3.9878	.2865	14.6960	13.8818	518.690	510.314	.073430
5	4.7214	.2894	14.6960	13.8658	518.690	510.146	.073370
6	5.4201	.2941	14.6960	13.8397	518.690	509.871	.073271
7	6.0905	.3015	14.6960	13.7979	518.690	509.432	.073113
8	6.7339	.3125	14.6960	13.7339	518.690	508.755	.072871

9	7.3488	.3284	14.6960	13.6384	518.690	507.742	.072509
10	7.9329	.3500	14.6960	13.5022	518.690	506.288	.071990
11	8.4860	.3767	14.6960	13.3253	518.690	504.384	.071315

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	.0000	124.486	123.391	.975379	.000	.000
2	2.2345	124.486	122.941	.975379	.000	13.005
3	3.1982	124.486	122.528	.975379	.000	6.492
4	3.9878	124.486	122.475	.975379	.000	4.218
5	4.7214	124.486	122.435	.975379	.000	3.202
6	5.4201	124.486	122.369	.975379	.000	2.606
7	6.0905	124.486	122.264	.975379	.000	2.228
8	6.7339	124.486	122.101	.975379	.000	2.100
9	7.3488	124.486	121.858	.975379	.000	2.425
10	7.9329	124.486	121.509	.975379	.000	3.603
11	8.4860	124.486	121.052	.975379	.000	6.212

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STATION 4 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	.0000	.00	.00	.00	.00	.00
2	2.5773	378.31	.00	375.45	46.45	378.31
3	3.3217	331.05	.00	330.08	25.23	331.05
4	4.0662	320.87	.00	320.07	22.57	320.87
5	4.7856	320.36	.00	319.57	22.46	320.36
6	5.4797	323.61	.00	322.76	23.48	323.61
7	6.1514	329.03	.00	328.01	25.91	329.03
8	6.8034	336.00	.00	334.60	30.61	336.00
9	7.4381	343.89	.00	341.69	38.88	343.89
10	8.0591	351.40	.00	347.48	52.35	351.40
11	8.6730	355.99	.00	348.53	72.46	355.99

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	.0000	-7.0000	.0000	8.25	5.268	.000
2	2.5773	-7.0000	2.5773	-3.40	7.053	.000
3	3.3217	-7.0000	3.3217	-14.25	4.370	.000
4	4.0662	-7.0000	4.0662	-82.40	4.034	.000
5	4.7856	-7.0000	4.7856	102.34	4.020	.000
6	5.4797	-7.0000	5.4797	45.88	4.160	.000
7	6.1514	-7.0000	6.1514	32.31	4.517	.000
8	6.8034	-7.0000	6.8034	25.74	5.227	.000
9	7.4381	-7.0000	7.4381	22.42	6.491	.000
10	8.0591	-7.0000	8.0591	21.87	8.567	.000
11	8.6730	-7.0000	8.6730	25.38	11.745	.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	.0000	.0000	14.6960	14.6960	518.690	518.690	.076482
2	2.5773	.3428	14.6960	13.5482	518.690	506.781	.072166
3	3.3217	.2992	14.6960	13.8111	518.690	509.571	.073163
4	4.0662	.2898	14.6960	13.8636	518.690	510.123	.073362
5	4.7856	.2894	14.6960	13.8662	518.690	510.150	.073372
6	5.4797	.2924	14.6960	13.8496	518.690	509.976	.073309
7	6.1514	.2973	14.6960	13.8216	518.690	509.681	.073203
8	6.8034	.3038	14.6960	13.7851	518.690	509.296	.073065
9	7.4381	.3110	14.6960	13.7428	518.690	508.849	.072905
10	8.0591	.3179	14.6960	13.7018	518.690	508.415	.072749
11	8.6730	.3222	14.6960	13.6763	518.690	508.145	.072653

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	.0000	124.486	124.486	.975379	.000	5.268
2	2.5773	124.486	121.627	.975379	.000	7.053
3	3.3217	124.486	122.297	.975379	.000	4.370
4	4.0662	124.486	122.429	.975379	.000	4.034
5	4.7856	124.486	122.436	.975379	.000	4.020
6	5.4797	124.486	122.394	.975379	.000	4.160
7	6.1514	124.486	122.324	.975379	.000	4.517
8	6.8034	124.486	122.231	.975379	.000	5.227
9	7.4381	124.486	122.124	.975379	.000	6.491
10	8.0591	124.486	122.020	.975379	.000	8.567
11	8.6730	124.486	121.955	.975379	.000	11.745

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STATION 5 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	.3720	178.05	.00	165.36	66.01	178.05
2	2.4290	264.40	.00	264.38	3.13	264.40
3	3.3706	290.77	.00	290.18	18.54	290.77
4	4.1637	300.55	.00	299.56	24.34	300.55
5	4.8978	306.23	.00	305.02	27.24	306.23
6	5.5988	310.47	.00	309.04	29.76	310.47
7	6.2784	313.96	.00	312.22	33.02	313.96
8	6.9430	316.74	.00	314.48	37.73	316.74
9	7.5976	318.29	.00	315.17	44.45	318.29
10	8.2478	317.36	.00	312.84	53.40	317.36
11	8.9020	311.50	.00	304.85	64.00	311.50

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	.3720	-5.0000	.0000	4.12	21.760	-6.686
2	2.4290	-5.2412	2.0711	7.36	.678	-6.686
3	3.3706	-5.3515	3.0191	19.78	3.657	-6.686
4	4.1637	-5.4445	3.8177	35.37	4.644	-6.686
5	4.8978	-5.5306	4.5568	48.87	5.104	-6.686
6	5.5988	-5.6128	5.2626	58.67	5.501	-6.686
7	6.2784	-5.6924	5.9468	68.17	6.037	-6.686
8	6.9430	-5.7703	6.6160	88.22	6.842	-6.686
9	7.5976	-5.8471	7.2751	208.32	8.027	-6.686
10	8.2478	-5.9233	7.9297	-117.73	9.686	-6.686
11	8.9020	-6.0000	8.5884	-28.08	11.856	-6.686

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	.3720	.1599	14.6960	14.4360	518.690	516.052	.075513
2	2.4290	.2382	14.6960	14.1270	518.690	512.873	.074355
3	3.3706	.2623	14.6960	14.0099	518.690	511.655	.073914
4	4.1637	.2712	14.6960	13.9638	518.690	511.173	.073740
5	4.8978	.2764	14.6960	13.9364	518.690	510.886	.073637
6	5.5988	.2803	14.6960	13.9157	518.690	510.669	.073559
7	6.2784	.2835	14.6960	13.8984	518.690	510.488	.073493
8	6.9430	.2860	14.6960	13.8845	518.690	510.342	.073441
9	7.5976	.2875	14.6960	13.8767	518.690	510.260	.073411
10	8.2478	.2866	14.6960	13.8813	518.690	510.309	.073429
11	8.9020	.2812	14.6960	13.9106	518.690	510.616	.073539

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	.3720	124.486	123.853	.975379	.000	15.074
2	2.4290	124.486	123.089	.975379	.000	-6.008
3	3.3706	124.486	122.797	.975379	.000	-3.030
4	4.1637	124.486	122.682	.975379	.000	-2.042
5	4.8978	124.486	122.613	.975379	.000	-1.583
6	5.5988	124.486	122.561	.975379	.000	-1.186
7	6.2784	124.486	122.517	.975379	.000	-.650
8	6.9430	124.486	122.482	.975379	.000	.155
9	7.5976	124.486	122.462	.975379	.000	1.341
10	8.2478	124.486	122.474	.975379	.000	3.000
11	8.9020	124.486	122.548	.975379	.000	5.169

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STATION 6 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	1.0210	229.68	.00	192.61	125.10	229.68
2	2.5429	258.15	.00	254.34	44.23	258.15
3	3.4736	281.19	.00	278.80	36.57	281.19
4	4.2678	292.16	.00	290.15	34.22	292.16
5	5.0039	298.15	.00	296.27	33.49	298.15
6	5.7090	301.63	.00	299.72	33.86	301.63
7	6.3959	303.42	.00	301.37	35.27	303.42
8	7.0721	303.70	.00	301.35	37.75	303.70
9	7.7434	302.24	.00	299.41	41.26	302.24
10	8.4151	298.58	.00	295.10	45.50	298.58
11	9.0930	292.34	.00	288.09	49.68	292.34

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	1.0210	-4.0000	.0000	1695.52	33.004	-7.062
2	2.5429	-4.1885	1.5336	8.27	9.865	-7.062
3	3.4736	-4.3038	2.4713	16.26	7.472	-7.062
4	4.2678	-4.4022	3.2716	29.29	6.726	-7.062
5	5.0039	-4.4934	4.0133	49.13	6.450	-7.062
6	5.7090	-4.5808	4.7238	84.64	6.445	-7.062
7	6.3959	-4.6659	5.4159	203.86	6.675	-7.062
8	7.0721	-4.7496	6.0974	-423.47	7.140	-7.062
9	7.7434	-4.8328	6.7738	-88.24	7.845	-7.062
10	8.4151	-4.9160	7.4506	-43.94	8.764	-7.062
11	9.0930	-5.0000	8.1337	-28.25	9.784	-7.062

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	1.0210	.2066	14.6960	14.2652	518.690	514.300	.074874
2	2.5429	.2325	14.6960	14.1532	518.690	513.145	.074453
3	3.4736	.2535	14.6960	14.0537	518.690	512.111	.074079
4	4.2678	.2635	14.6960	14.0035	518.690	511.587	.073890
5	5.0039	.2690	14.6960	13.9752	518.690	511.293	.073783
6	5.7090	.2722	14.6960	13.9587	518.690	511.119	.073721
7	6.3959	.2738	14.6960	13.9500	518.690	511.029	.073688
8	7.0721	.2741	14.6960	13.9487	518.690	511.015	.073683
9	7.7434	.2728	14.6960	13.9557	518.690	511.089	.073710
10	8.4151	.2694	14.6960	13.9732	518.690	511.272	.073776
11	9.0930	.2637	14.6960	14.0026	518.690	511.578	.073887

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	1.0210	124.486	123.432	.975379	.000	25.942
2	2.5429	124.486	123.155	.975379	.000	2.803
3	3.4736	124.486	122.907	.975379	.000	.410
4	4.2678	124.486	122.781	.975379	.000	-.336
5	5.0039	124.486	122.710	.975379	.000	-.612
6	5.7090	124.486	122.669	.975379	.000	-.617
7	6.3959	124.486	122.647	.975379	.000	-.387
8	7.0721	124.486	122.644	.975379	.000	.078
9	7.7434	124.486	122.661	.975379	.000	.783
10	8.4151	124.486	122.705	.975379	.000	1.702
11	9.0930	124.486	122.779	.975379	.000	2.722

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STATION 7 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	1.6710	258.90	.00	218.57	138.77	258.90
2	2.7937	271.52	.00	262.01	71.23	271.52
3	3.6450	283.15	.00	278.44	51.46	283.15
4	4.4094	290.01	.00	286.85	42.74	290.01
5	5.1322	294.04	.00	291.54	38.25	294.04
6	5.8319	296.09	.00	293.91	35.92	296.09
7	6.5186	296.54	.00	294.48	34.95	296.54
8	7.1986	295.46	.00	293.39	34.95	295.46
9	7.8771	292.78	.00	290.60	35.65	292.78
10	8.5584	288.36	.00	286.01	36.74	288.36
11	9.2470	282.14	.00	279.58	37.87	282.14

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	1.6710	-3.0000	.0000	-55.41	32.411	-7.519
2	2.7937	-3.1482	1.1325	18.61	15.208	-7.519
3	3.6450	-3.2606	1.9911	26.60	10.471	-7.519
4	4.4094	-3.3615	2.7622	41.70	8.474	-7.519
5	5.1322	-3.4569	3.4912	72.03	7.474	-7.519
6	5.8319	-3.5492	4.1970	173.85	6.968	-7.519
7	6.5186	-3.6399	4.8896	-582.68	6.769	-7.519
8	7.1986	-3.7296	5.5756	-106.44	6.794	-7.519
9	7.8771	-3.8192	6.2599	-56.29	6.993	-7.519
10	8.5584	-3.9091	6.9471	-37.30	7.320	-7.519
11	9.2470	-4.0000	7.6417	-27.78	7.714	-7.519

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	1.6710	.2332	14.6960	14.1501	518.690	513.112	.074442
2	2.7937	.2447	14.6960	14.0964	518.690	512.555	.074240
3	3.6450	.2553	14.6960	14.0448	518.690	512.018	.074046
4	4.4094	.2616	14.6960	14.0134	518.690	511.691	.073927
5	5.1322	.2652	14.6960	13.9947	518.690	511.496	.073857
6	5.8319	.2671	14.6960	13.9850	518.690	511.395	.073820
7	6.5186	.2675	14.6960	13.9829	518.690	511.373	.073812
8	7.1986	.2665	14.6960	13.9880	518.690	511.426	.073831
9	7.8771	.2641	14.6960	14.0006	518.690	511.557	.073879
10	8.5584	.2600	14.6960	14.0210	518.690	511.771	.073956
11	9.2470	.2544	14.6960	14.0494	518.690	512.066	.074063

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	1.6710	124.486	123.147	.975379	.000	24.892
2	2.7937	124.486	123.013	.975379	.000	7.689
3	3.6450	124.486	122.884	.975379	.000	2.952
4	4.4094	124.486	122.806	.975379	.000	.954
5	5.1322	124.486	122.759	.975379	.000	-.046
6	5.8319	124.486	122.735	.975379	.000	-.551
7	6.5186	124.486	122.729	.975379	.000	-.750
8	7.1986	124.486	122.742	.975379	.000	-.725
9	7.8771	124.486	122.774	.975379	.000	-.526
10	8.5584	124.486	122.825	.975379	.000	-.199
11	9.2470	124.486	122.896	.975379	.000	.195

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STATION 8 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL

1	2.2910	305.51	.00	270.31	142.36	305.51
2	3.1068	292.51	.00	281.17	80.67	292.51
3	3.8585	290.68	.00	284.58	59.27	290.68
4	4.5775	292.25	.00	288.29	47.97	292.25
5	5.2756	293.68	.00	290.79	41.10	293.68
6	5.9610	294.23	.00	291.95	36.59	294.23
7	6.6393	293.68	.00	291.76	33.49	293.68
8	7.3151	291.87	.00	290.19	31.27	291.87
9	7.9920	288.68	.00	287.16	29.63	288.68
10	8.6738	284.02	.00	282.60	28.38	284.02
11	9.3640	277.88	.00	276.53	27.37	277.88

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	2.2910	-2.0000	.0000	-8.08	27.774	-8.047
2	3.1068	-2.1153	.8239	-35.82	16.009	-8.047
3	3.8585	-2.2216	1.5831	197.65	11.764	-8.047
4	4.5775	-2.3233	2.3093	118.98	9.447	-8.047
5	5.2756	-2.4220	3.0143	190.93	8.045	-8.047
6	5.9610	-2.5189	3.7065	6652.40	7.144	-8.047
7	6.6393	-2.6148	4.3916	-172.07	6.548	-8.047
8	7.3151	-2.7103	5.0740	-79.74	6.151	-8.047
9	7.9920	-2.8060	5.7577	-50.04	5.892	-8.047
10	8.6738	-2.9024	6.4463	-35.89	5.734	-8.047
11	9.3640	-3.0000	7.1433	-28.19	5.652	-8.047

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	2.2910	.2757	14.6960	13.9399	518.690	510.923	.073650
2	3.1068	.2638	14.6960	14.0018	518.690	511.570	.073883
3	3.8585	.2622	14.6960	14.0103	518.690	511.659	.073916
4	4.5775	.2636	14.6960	14.0030	518.690	511.583	.073888
5	5.2756	.2649	14.6960	13.9963	518.690	511.513	.073863
6	5.9610	.2654	14.6960	13.9937	518.690	511.486	.073853
7	6.6393	.2649	14.6960	13.9964	518.690	511.513	.073863
8	7.3151	.2633	14.6960	14.0048	518.690	511.601	.073895
9	7.9920	.2603	14.6960	14.0195	518.690	511.755	.073950
10	8.6738	.2561	14.6960	14.0409	518.690	511.978	.074031
11	9.3640	.2505	14.6960	14.0685	518.690	512.265	.074135

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	2.2910	124.486	122.622	.975379	.000	19.727
2	3.1068	124.486	122.777	.975379	.000	7.962
3	3.8585	124.486	122.798	.975379	.000	3.717
4	4.5775	124.486	122.780	.975379	.000	1.400
5	5.2756	124.486	122.763	.975379	.000	-.002
6	5.9610	124.486	122.757	.975379	.000	-.904
7	6.6393	124.486	122.763	.975379	.000	-1.500
8	7.3151	124.486	122.784	.975379	.000	-1.897
9	7.9920	124.486	122.821	.975379	.000	-2.155
10	8.6738	124.486	122.875	.975379	.000	-2.313
11	9.3640	124.486	122.944	.975379	.000	-2.395

STATION 9 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	2.7310	349.67	.00	340.76	78.44	349.67
2	3.3826	296.36	.00	286.17	77.02	296.36
3	4.0741	295.92	.00	289.65	60.61	295.92
4	4.7522	295.67	.00	291.44	49.85	295.67
5	5.4228	295.70	.00	292.68	42.15	295.70
6	6.0887	295.37	.00	293.12	36.37	295.37
7	6.7528	294.37	.00	292.66	31.74	294.37
8	7.4176	292.44	.00	291.13	27.67	292.44
9	8.0858	289.28	.00	288.30	23.79	289.28
10	8.7604	284.65	.00	283.94	20.01	284.65
11	9.4450	278.40	.00	277.92	16.34	278.40

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	2.7310	-1.0000	.0000	-2.12	12.963	-8.471
2	3.3826	-1.0971	.6588	-252.85	15.064	-8.472
3	4.0741	-1.2000	1.3579	-246.73	11.819	-8.472
4	4.7522	-1.3010	2.0435	3002.05	9.707	-8.472
5	5.4228	-1.4009	2.7215	-3891.28	8.194	-8.471
6	6.0887	-1.5001	3.3948	-355.92	7.074	-8.471
7	6.7528	-1.5990	4.0662	-148.43	6.190	-8.472
8	7.4176	-1.6980	4.7383	-82.54	5.429	-8.471
9	8.0858	-1.7976	5.4138	-52.62	4.717	-8.472
10	8.7604	-1.8980	6.0959	-37.35	4.032	-8.472
11	9.4450	-2.0000	6.7881	-28.35	3.365	-8.471

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	2.7310	.3164	14.6960	13.7113	518.690	508.516	.072785
2	3.3826	.2674	14.6960	13.9838	518.690	511.382	.073815
3	4.0741	.2670	14.6960	13.9858	518.690	511.403	.073823
4	4.7522	.2667	14.6960	13.9870	518.690	511.416	.073828
5	5.4228	.2668	14.6960	13.9869	518.690	511.414	.073827
6	6.0887	.2665	14.6960	13.9884	518.690	511.430	.073833
7	6.7528	.2656	14.6960	13.9931	518.690	511.479	.073851
8	7.4176	.2638	14.6960	14.0021	518.690	511.574	.073885
9	8.0858	.2609	14.6960	14.0168	518.690	511.727	.073940
10	8.7604	.2567	14.6960	14.0380	518.690	511.948	.074020
11	9.4450	.2510	14.6960	14.0661	518.690	512.241	.074126

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	2.7310	124.486	122.044	.975379	.000	4.491
2	3.3826	124.486	122.732	.975379	.000	6.592
3	4.0741	124.486	122.737	.975379	.000	3.348
4	4.7522	124.486	122.740	.975379	.000	1.236
5	5.4228	124.486	122.739	.975379	.000	-.277
6	6.0887	124.486	122.743	.975379	.000	-1.398
7	6.7528	124.486	122.755	.975379	.000	-2.282
8	7.4176	124.486	122.778	.975379	.000	-3.043
9	8.0858	124.486	122.814	.975379	.000	-3.755
10	8.7604	124.486	122.868	.975379	.000	-4.440
11	9.4450	124.486	122.938	.975379	.000	-5.106

STATION 10 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	2.7500	228.35	.00	221.20	56.67	228.35
2	3.5305	303.00	.00	293.84	73.97	303.00
3	4.2022	298.47	.00	292.33	60.21	298.47
4	4.8685	298.32	.00	294.13	49.83	298.32
5	5.5297	298.24	.00	295.23	42.26	298.24
6	6.1892	298.06	.00	295.92	35.69	298.06
7	6.8486	297.54	.00	295.99	30.33	297.54
8	7.5085	296.77	.00	295.72	24.86	296.77
9	8.1697	295.50	.00	294.89	18.95	295.50
10	8.8330	293.31	.00	293.05	12.16	293.31
11	9.5000	289.85	.00	289.80	5.31	289.85

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	2.7500	-.5000	.0000	1.24	14.371	-3.216
2	3.5305	-.5440	.7817	-19.61	14.130	-3.242
3	4.2022	-.5825	1.4545	-217.79	11.638	-3.350
4	4.8685	-.6218	2.1221	-202.66	9.615	-3.328
5	5.5297	-.6574	2.7842	-541.92	8.146	-2.697
6	6.1892	-.6816	3.4438	-201.51	6.876	-1.425
7	6.8486	-.6886	4.1028	-179.08	5.851	.252
8	7.5085	-.6740	4.7629	-110.43	4.805	2.381
9	8.1697	-.6336	5.4255	-72.50	3.678	4.514
10	8.8330	-.5723	6.0917	-46.59	2.375	5.889
11	9.5000	-.5000	6.7622	-36.85	1.050	6.335

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	2.7500	.2054	14.6960	14.2701	518.690	514.351	.074892
2	3.5305	.2735	14.6960	13.9520	518.690	511.050	.073696
3	4.2022	.2693	14.6960	13.9737	518.690	511.277	.073778
4	4.8685	.2692	14.6960	13.9744	518.690	511.284	.073780
5	5.5297	.2691	14.6960	13.9748	518.690	511.288	.073782
6	6.1892	.2689	14.6960	13.9757	518.690	511.297	.073785
7	6.8486	.2684	14.6960	13.9782	518.690	511.323	.073794
8	7.5085	.2677	14.6960	13.9818	518.690	511.361	.073808
9	8.1697	.2666	14.6960	13.9878	518.690	511.424	.073831
10	8.8330	.2646	14.6960	13.9981	518.690	511.531	.073870
11	9.5000	.2614	14.6960	14.0142	518.690	511.699	.073930

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	2.7500	124.486	123.444	.975379	.000	11.154
2	3.5305	124.486	122.652	.975379	.000	10.888
3	4.2022	124.486	122.707	.975379	.000	8.288
4	4.8685	124.486	122.708	.975379	.000	6.287
5	5.5297	124.486	122.709	.975379	.000	5.449
6	6.1892	124.486	122.711	.975379	.000	5.451
7	6.8486	124.486	122.718	.975379	.000	6.103
8	7.5085	124.486	122.727	.975379	.000	7.187
9	8.1697	124.486	122.742	.975379	.000	8.191
10	8.8330	124.486	122.768	.975379	.000	8.264
11	9.5000	124.486	122.808	.975379	.000	7.385

STATION 11 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	3.0000	331.17	.00	312.81	108.73	331.17
2	3.6638	306.09	.00	298.81	66.37	306.09
3	4.3320	308.55	.00	303.27	56.81	308.55
4	4.9899	308.96	.00	305.34	47.15	308.96
5	5.6438	308.67	.00	306.10	39.79	308.67
6	6.2954	308.33	.00	306.48	33.77	308.33
7	6.9458	309.17	.00	307.75	29.61	309.17
8	7.5910	311.87	.00	310.78	26.06	311.87
9	8.2311	315.85	.00	315.18	20.56	315.85
10	8.8653	317.39	.00	317.19	11.14	317.39
11	9.5000	313.11	.00	313.11	.00	313.11

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	3.0000	.0000	.0000	-2.27	19.167	1.659
2	3.6638	.0205	.6641	-22.20	12.523	1.983
3	4.3320	.0523	1.3330	-18.70	10.611	3.878
4	4.9899	.1025	1.9929	-25.16	8.778	3.805
5	5.6438	.1438	2.6482	-27.52	7.407	4.820
6	6.2954	.2150	3.3036	-43.17	6.289	6.477
7	6.9458	.2852	3.9577	-101.81	5.497	6.466
8	7.5910	.3652	4.6079	81.89	4.793	7.363
9	8.2311	.4550	5.2543	42.10	3.733	9.249
10	8.8653	.5730	5.8994	53.55	2.011	11.236
11	9.5000	.7000	6.5466	.00	.000	11.356

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	3.0000	.2993	14.6960	13.8105	518.690	509.564	.073161
2	3.6638	.2763	14.6960	13.9371	518.690	510.894	.073639
3	4.3320	.2785	14.6960	13.9251	518.690	510.768	.073594
4	4.9899	.2789	14.6960	13.9231	518.690	510.747	.073587
5	5.6438	.2786	14.6960	13.9245	518.690	510.762	.073592
6	6.2954	.2783	14.6960	13.9262	518.690	510.779	.073598
7	6.9458	.2791	14.6960	13.9220	518.690	510.736	.073583
8	7.5910	.2816	14.6960	13.9087	518.690	510.597	.073532
9	8.2311	.2852	14.6960	13.8889	518.690	510.389	.073458
10	8.8653	.2866	14.6960	13.8812	518.690	510.308	.073428
11	9.5000	.2827	14.6960	13.9026	518.690	510.532	.073509

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	3.0000	124.486	122.295	.975379	.000	20.825
2	3.6638	124.486	122.614	.975379	.000	14.506
3	4.3320	124.486	122.584	.975379	.000	14.488
4	4.9899	124.486	122.579	.975379	.000	12.583
5	5.6438	124.486	122.583	.975379	.000	12.227
6	6.2954	124.486	122.587	.975379	.000	12.765
7	6.9458	124.486	122.577	.975379	.000	11.962
8	7.5910	124.486	122.543	.975379	.000	12.157
9	8.2311	124.486	122.493	.975379	.000	12.982
10	8.8653	124.486	122.474	.975379	.000	13.246
11	9.5000	124.486	122.528	.975379	.000	11.356

STATION 11 IS AT THE LEADING EDGE OF A BLADE
ROTATING AT 8844.0 RPM. NUMBER OF BLADES IN ROW = 17.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	INCIDENCE ANGLE
1	3.0000	231.54	404.08	.3652	-34.959	4.006
2	3.6638	282.77	416.71	.3761	-42.732	1.523
3	4.3320	334.33	454.95	.4107	-47.297	1.626
4	4.9899	385.11	493.73	.4457	-51.262	1.713
5	5.6438	435.58	533.86	.4819	-54.677	1.739
6	6.2954	485.87	575.44	.5195	-57.601	1.811
7	6.9458	536.06	618.83	.5586	-60.026	1.853
8	7.5910	585.86	663.70	.5992	-61.973	1.930
9	8.2311	635.27	709.45	.6407	-63.564	2.016
10	8.8653	684.21	754.24	.6812	-65.115	2.092
11	9.5000	733.20	797.25	.7199	-66.875	2.111

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE
1	3.0000	-30.953	-14.861	.7949
2	3.6638	-41.208	-9.359	.7291
3	4.3320	-45.671	-4.817	.7511
4	4.9899	-49.549	-2.771	.7786
5	5.6438	-52.938	1.028	.8130
6	6.2954	-55.790	4.281	.8634
7	6.9458	-58.173	6.864	.9281
8	7.5910	-60.043	9.838	1.0195

9	8.2311	-61.548	13.920	1.1462
10	8.8653	-63.023	18.850	1.3217
11	9.5000	-64.765	20.231	1.5525

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STATION 12 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	3.1250	343.12	81.62	335.91	69.98	352.70
2	3.7872	356.01	65.92	350.00	65.10	362.06
3	4.4300	356.66	55.91	352.67	53.20	361.02
4	5.0681	354.76	48.79	352.01	44.06	358.09
5	5.7060	351.72	43.47	349.79	36.82	354.40
6	6.3460	348.62	39.28	347.14	32.09	350.83
7	6.9886	345.41	35.94	344.16	29.27	347.27
8	7.6285	341.33	33.21	340.19	27.91	342.94
9	8.2594	336.07	30.91	335.25	23.52	337.49
10	8.8793	330.05	28.86	329.75	14.08	331.31
11	9.5000	321.62	26.89	321.62	.00	322.74

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	3.1250	.6000	.0000	.00	11.768	1.239
2	3.7872	.6133	.6623	-14.13	10.536	.986
3	4.4300	.6279	1.3053	-15.31	8.579	2.156
4	5.0681	.6560	1.9440	-17.62	7.135	1.856
5	5.7060	.6721	2.5821	-21.72	6.009	2.318
6	6.3460	.7109	3.2233	-26.31	5.282	3.616
7	6.9886	.7473	3.8669	-30.68	4.861	3.379
8	7.6285	.7894	4.5082	-33.69	4.689	3.886
9	8.2594	.8372	5.1410	-49.35	4.013	5.357
10	8.8793	.9064	5.7647	245.68	2.445	6.824
11	9.5000	.9800	6.3900	.00	.000	6.732

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	3.1250	.3181	15.0114	13.9948	521.966	511.615	.073840
2	3.7872	.3268	15.0047	13.9352	521.897	510.989	.073616
3	4.4300	.3258	15.0004	13.9371	521.871	511.026	.073620
4	5.0681	.3231	14.9976	13.9512	521.866	511.196	.073670
5	5.7060	.3197	14.9958	13.9705	521.876	511.425	.073740
6	6.3460	.3164	14.9947	13.9895	521.892	511.650	.073807
7	6.9886	.3131	14.9942	14.0089	521.916	511.881	.073876
8	7.6285	.3092	14.9941	14.0327	521.944	512.158	.073962
9	8.2594	.3041	14.9942	14.0625	521.969	512.491	.074070
10	8.8793	.2985	14.9945	14.0959	521.981	512.848	.074195
11	9.5000	.2906	14.9948	14.1410	521.972	513.304	.074366

STREAM LINE	RADIUS	ENTHALPIES TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	3.1250	125.272	122.788	.975435	13.381	13.007
2	3.7872	125.255	122.637	.975433	10.490	11.522
3	4.4300	125.249	122.646	.975441	8.909	10.735
4	5.0681	125.248	122.687	.975452	7.831	8.991
5	5.7060	125.250	122.742	.975464	7.045	8.327
6	6.3460	125.254	122.796	.975477	6.428	8.898
7	6.9886	125.260	122.851	.975490	5.940	8.240
8	7.6285	125.267	122.918	.975504	5.558	8.576
9	8.2594	125.273	122.998	.975515	5.255	9.370
10	8.8793	125.276	123.083	.975519	4.997	9.269
11	9.5000	125.273	123.193	.975513	4.780	6.732

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STATION 12 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 8844.0 RPM. NUMBER OF BLADES IN ROW = 17.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	3.1250	241.18	378.41	.3413	-24.939	.000
2	3.7872	292.29	421.88	.3808	-32.452	.000
3	4.4300	341.90	457.16	.4126	-38.725	.000
4	5.0681	391.15	493.01	.4449	-43.982	.000
5	5.7060	440.38	530.33	.4784	-48.455	.000
6	6.3460	489.77	569.63	.5138	-52.265	.000
7	6.9886	539.37	610.53	.5505	-55.546	.000
8	7.6285	588.75	652.02	.5878	-58.433	.000
9	8.2594	637.45	693.42	.6249	-61.010	.000
10	8.8793	685.29	734.74	.6619	-63.307	.000
11	9.5000	733.20	776.08	.6988	-65.517	.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	3.1250	.000	-11.656	.8271	.00922	.0989	.1383
2	3.7872	.000	-8.709	.8482	.00846	.0183	-.0013
3	4.4300	.000	-6.129	.8688	.00830	.0218	.0070
4	5.0681	.000	-4.198	.8940	.00832	.0250	.0138
5	5.7060	.000	-1.565	.9264	.00844	.0278	.0192
6	6.3460	.000	.681	.9768	.00847	.0296	.0225
7	6.9886	.000	2.349	1.0383	.00850	.0316	.0264
8	7.6285	.000	4.145	1.1194	.00843	.0348	.0324
9	8.2594	.000	7.189	1.2257	.00820	.0395	.0393
10	8.8793	.000	11.382	1.3809	.00763	.0434	.0425
11	9.5000	.000	12.886	1.6002	.00668	.0457	.0416

STREAM LINE	RADIUS	INLET THROUGH STATION 12 PRESS RATIO	ISENT EFF	DELTA H ON H1	STATION 11 THRU STATION 12 PRESS RATIO	ISENT EFF	DELTA H ON H1
MEAN	VALUES-	1.0204	.9284	.0062	1.0204	.9284	.0062
1	3.1250	1.0215	.9631	.0063	1.0215	.9631	.0063
2	3.7872	1.0210	.9635	.0062	1.0210	.9635	.0062
3	4.4300	1.0207	.9575	.0061	1.0207	.9575	.0061
4	5.0681	1.0205	.9503	.0061	1.0205	.9503	.0061
5	5.7060	1.0204	.9421	.0061	1.0204	.9421	.0061
6	6.3460	1.0203	.9338	.0062	1.0203	.9338	.0062
7	6.9886	1.0203	.9251	.0062	1.0203	.9251	.0062
8	7.6285	1.0203	.9168	.0063	1.0203	.9168	.0063
9	8.2594	1.0203	.9101	.0063	1.0203	.9101	.0063
10	8.8793	1.0203	.9078	.0063	1.0203	.9078	.0063
11	9.5000	1.0203	.9113	.0063	1.0203	.9113	.0063

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STATION 13 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	3.2500	376.32	155.87	368.41	76.75	407.32
2	3.8843	383.33	127.61	378.80	58.75	404.01
3	4.5055	381.32	109.21	378.55	45.90	396.65
4	5.1284	377.14	95.79	375.25	37.67	389.11
5	5.7550	372.98	85.61	371.61	31.98	382.68
6	6.3870	368.91	77.55	367.82	28.26	376.97
7	7.0242	363.76	71.05	362.86	25.57	370.63
8	7.6604	355.95	65.71	355.17	23.64	361.97
9	8.2846	345.81	61.24	345.24	19.90	351.19
10	8.8937	336.36	57.26	336.10	13.21	341.20
11	9.5000	330.18	53.48	330.18	.00	334.48

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	3.2500	1.2000	.0000	xxxxxxxxxx	11.768	.794
2	3.8843	1.2054	.6343	-34.48	8.816	-.136
3	4.5055	1.2022	1.2556	-28.69	6.913	.309
4	5.1284	1.2087	1.8785	-32.09	5.732	-.186
5	5.7550	1.1993	2.5051	-38.88	4.919	-.333
6	6.3870	1.2055	3.1372	-40.94	4.393	.622
7	7.0242	1.2078	3.7744	-33.17	4.031	.159
8	7.6604	1.2111	4.4106	-23.25	3.808	.250
9	8.2846	1.2168	5.0348	-22.11	3.299	1.297
10	8.8937	1.2384	5.6443	-40.81	2.251	2.242
11	9.5000	1.2600	6.2510	.00	.000	1.946

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	3.2500	.3675	15.3268	13.9620	525.196	511.391	.073700
2	3.8843	.3645	15.3134	13.9708	525.057	511.474	.073734
3	4.5055	.3577	15.3049	14.0099	525.010	511.918	.073876
4	5.1284	.3507	15.2992	14.0520	525.000	512.401	.074028
5	5.7550	.3448	15.2956	14.0884	525.018	512.833	.074157
6	6.3870	.3395	15.2934	14.1212	525.052	513.227	.074273
7	7.0242	.3336	15.2923	14.1583	525.100	513.670	.074404
8	7.6604	.3256	15.2921	14.2092	525.155	514.253	.074587
9	8.2846	.3157	15.2924	14.2716	525.206	514.943	.074814
10	8.8937	.3066	15.2930	14.3281	525.231	515.544	.075023
11	9.5000	.3004	15.2936	14.3654	525.215	515.906	.075165

STREAM LINE	RADIUS	ENTHALPIES TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	3.2500	126.047	122.734	.975490	22.498	12.562
2	3.8843	126.014	122.754	.975486	18.412	8.680
3	4.5055	126.002	122.860	.975503	15.982	7.222
4	5.1284	126.000	122.976	.975524	14.252	5.547
5	5.7550	126.004	123.080	.975548	12.927	4.586
6	6.3870	126.012	123.174	.975573	11.871	5.015
7	7.0242	126.024	123.281	.975600	11.052	4.190
8	7.6604	126.037	123.421	.975627	10.459	4.058
9	8.2846	126.049	123.586	.975648	10.042	4.596
10	8.8937	126.056	123.731	.975657	9.662	4.493
11	9.5000	126.052	123.817	.975647	9.200	1.946

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STATION 13 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 8844.0 RPM. NUMBER OF BLADES IN ROW = 17.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	3.2500	250.83	388.12	.3501	-14.163	.000
2	3.8843	299.79	420.22	.3791	-24.188	.000
3	4.5055	347.73	449.77	.4056	-32.027	.000
4	5.1284	395.80	481.91	.4343	-38.502	.000
5	5.7550	444.16	517.37	.4661	-43.870	.000
6	6.3870	492.94	555.56	.5003	-48.392	.000
7	7.0242	542.12	595.17	.5357	-52.325	.000
8	7.6604	591.22	634.71	.5710	-55.888	.000
9	8.2846	639.39	673.69	.6057	-59.115	.000
10	8.8937	686.40	713.41	.6410	-61.870	.000
11	9.5000	733.20	755.67	.6787	-64.092	.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	3.2500	.000	-6.753	.8893	.01844	.1065	.1137
2	3.8843	.000	-5.013	.9043	.01681	.0517	.0236
3	4.5055	.000	-3.674	.9204	.01650	.0643	.0495
4	5.1284	.000	-3.003	.9408	.01658	.0708	.0634
5	5.7550	.000	-2.046	.9725	.01683	.0731	.0683
6	6.3870	.000	-1.090	1.0238	.01688	.0734	.0693
7	7.0242	.000	-.291	1.0849	.01693	.0744	.0719
8	7.6604	.000	.549	1.1612	.01677	.0779	.0786
9	8.2846	.000	2.313	1.2577	.01628	.0841	.0866
10	8.8937	.000	4.539	1.4023	.01518	.0889	.0884
11	9.5000	.000	5.269	1.6305	.01337	.0901	.0808

STREAM LINE	RADIUS	INLET THROUGH STATION 13 PRESS RATIO	ISENT EFF	DELTA H ON H1	STATION 11 THRU STATION 13 PRESS RATIO	ISENT EFF	DELTA H ON H1
MEAN	VALUES-	1.0409	.9278	.0124	1.0409	.9278	.0124
1	3.2500	1.0429	.9628	.0125	1.0429	.9628	.0125
2	3.8843	1.0420	.9633	.0123	1.0420	.9633	.0123
3	4.5055	1.0414	.9573	.0122	1.0414	.9573	.0122
4	5.1284	1.0410	.9500	.0122	1.0410	.9500	.0122
5	5.7550	1.0408	.9416	.0122	1.0408	.9416	.0122
6	6.3870	1.0407	.9333	.0123	1.0407	.9333	.0123
7	7.0242	1.0406	.9245	.0124	1.0406	.9245	.0124
8	7.6604	1.0406	.9163	.0125	1.0406	.9163	.0125
9	8.2846	1.0406	.9097	.0126	1.0406	.9097	.0126
10	8.8937	1.0406	.9071	.0126	1.0406	.9071	.0126
11	9.5000	1.0407	.9101	.0126	1.0407	.9101	.0126

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STATION 14 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	3.3750	391.71	222.20	383.48	79.89	450.34
2	3.9709	384.52	184.90	380.73	53.91	426.67
3	4.5694	376.14	159.35	374.00	40.07	408.50
4	5.1792	370.15	140.19	368.70	32.81	395.81
5	5.7968	366.67	125.46	365.59	28.14	387.54
6	6.4220	364.15	113.68	363.32	24.55	381.48
7	7.0534	360.44	104.15	359.85	20.71	375.19
8	7.6846	353.55	96.29	353.16	16.77	366.43
9	8.3031	343.68	89.72	343.43	13.08	355.19
10	8.9054	335.60	83.95	335.46	9.73	345.94
11	9.5000	334.30	78.54	334.30	.00	343.40

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	3.3750	1.8000	.0000	xxxxxxxxxx	11.768	.345
2	3.9709	1.7979	.5959	-66.16	8.059	-1.307
3	4.5694	1.7773	1.1947	-75.45	6.115	-1.641
4	5.1792	1.7622	1.8047	-105.92	5.086	-2.305
5	5.7968	1.7272	2.4233	-119.48	4.402	-3.086
6	6.4220	1.7003	3.0491	-78.88	3.866	-2.506
7	7.0534	1.6677	3.6814	-38.96	3.293	-3.159
8	7.6846	1.6318	4.3135	-21.21	2.719	-3.493
9	8.3031	1.5947	4.9332	-17.31	2.182	-2.916
10	8.9054	1.5689	5.5360	-26.46	1.661	-2.468
11	9.5000	1.5400	6.1314	.00	.000	-2.938

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	3.3750	.4063	15.4423	13.9618	528.322	511.446	.073690
2	3.9709	.3843	15.6226	14.1092	528.121	512.972	.074247
3	4.5694	.3675	15.6097	14.2192	528.042	514.157	.074653
4	5.1792	.3558	15.6010	14.2936	528.016	514.979	.074924

5	5.7968	.3482	15.5956	14.3411	528.031	515.534	.075092
6	6.4220	.3426	15.5921	14.3758	528.067	515.957	.075212
7	7.0534	.3368	15.5905	14.4131	528.125	516.412	.075341
8	7.6846	.3288	15.5902	14.4659	528.195	517.021	.075527
9	8.3031	.3185	15.5907	14.5326	528.259	517.761	.075768
10	8.9054	.3100	15.5915	14.5866	528.293	518.334	.075965
11	9.5000	.3077	15.5923	14.6016	528.273	518.460	.076025

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	3.3750	126.797	122.747	.975517	29.564	12.113
2	3.9709	126.749	123.113	.975512	25.681	6.752
3	4.5694	126.730	123.398	.975533	22.961	4.474
4	5.1792	126.724	123.595	.975559	20.744	2.781
5	5.7968	126.728	123.728	.975590	18.889	1.316
6	6.4220	126.736	123.830	.975621	17.337	1.360
7	7.0534	126.750	123.939	.975655	16.116	.134
8	7.6846	126.767	124.085	.975688	15.235	-.774
9	8.3031	126.782	124.263	.975715	14.632	-.734
10	8.9054	126.790	124.400	.975727	14.044	-.807
11	9.5000	126.785	124.430	.975714	13.220	-2.938

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STATION 14 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 8844.0 RPM. NUMBER OF BLADES IN ROW = 17.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	3.3750	260.48	393.57	.3550	-5.581	.000
2	3.9709	306.47	403.28	.3633	-17.544	.000
3	4.5694	352.66	422.90	.3805	-27.199	.000
4	5.1792	399.72	452.07	.4064	-35.035	.000
5	5.7968	447.39	487.94	.4384	-41.281	.000
6	6.4220	495.64	527.73	.4740	-46.368	.000
7	7.0534	544.37	568.96	.5108	-50.691	.000
8	7.6846	593.08	609.75	.5471	-54.562	.000
9	8.3031	640.82	649.48	.5823	-58.052	.000
10	8.9054	687.30	690.41	.6187	-60.916	.000
11	9.5000	733.20	735.08	.6586	-62.949	.000

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STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	3.3750	.000	4.171	.9235	.02305	.1208	.1135
2	3.9709	.000	3.163	.9115	.02099	.1199	.1204
3	4.5694	.000	1.877	.9131	.02061	.1483	.1716
4	5.1792	.000	.529	.9284	.02071	.1535	.1822
5	5.7968	.000	-.814	.9608	.02103	.1483	.1737
6	6.4220	.000	-1.559	1.0154	.02110	.1401	.1599
7	7.0534	.000	-1.816	1.0807	.02116	.1339	.1495
8	7.6846	.000	-1.952	1.1599	.02095	.1319	.1458
9	8.3031	.000	-1.626	1.2576	.02033	.1341	.1457
10	8.9054	.000	-2.233	1.4067	.01898	.1357	.1395
11	9.5000	.000	-3.005	1.6519	.01671	.1338	.1220

STREAM LINE	RADIUS	INLET THROUGH STATION 14 PRESS RATIO	ISENT EFF	DELTA H ON H1	STATION 11 THRU STATION 14 PRESS RATIO	ISENT EFF	DELTA H ON H1
MEAN VALUES-		1.0613	.9385	.0183	1.0613	.9385	.0183
1	3.3750	1.0644	.9684	.0186	1.0644	.9684	.0186
2	3.9709	1.0630	.9690	.0182	1.0630	.9690	.0182
3	4.5694	1.0622	.9638	.0180	1.0622	.9638	.0180
4	5.1792	1.0616	.9575	.0180	1.0616	.9575	.0180
5	5.7968	1.0612	.9503	.0180	1.0612	.9503	.0180
6	6.4220	1.0610	.9432	.0181	1.0610	.9432	.0181
7	7.0534	1.0609	.9356	.0182	1.0609	.9356	.0182
8	7.6846	1.0608	.9285	.0183	1.0608	.9285	.0183
9	8.3031	1.0609	.9228	.0184	1.0609	.9228	.0184
10	8.9054	1.0609	.9204	.0185	1.0609	.9204	.0185
11	9.5000	1.0610	.9231	.0185	1.0610	.9231	.0185

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STATION 15 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	3.5000	381.08	285.52	373.07	77.72	476.18
2	4.0522	358.35	241.59	354.91	49.53	432.18
3	4.6289	344.39	209.96	342.36	37.42	403.35
4	5.2271	337.98	185.64	336.58	30.77	385.61
5	5.8363	335.82	166.78	334.84	25.72	374.95
6	6.4539	335.63	151.61	334.97	21.12	368.28
7	7.0772	335.37	139.35	335.01	15.52	363.17
8	7.7004	333.70	129.19	333.57	9.36	357.84
9	8.3134	330.04	120.62	329.99	5.34	351.39
10	8.9129	327.41	112.97	327.38	4.53	346.35
11	9.5000	333.24	105.74	333.24	.00	349.61

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	3.5000	2.4000	.00008225971.00	11.768	-.142	
2	4.0522	2.3911	.5523	118.34	7.945	-2.493
3	4.6289	2.3537	1.1302	48.48	6.238	-3.677
4	5.2271	2.3170	1.7295	55.52	5.223	-4.507
5	5.8363	2.2561	2.3418	128.31	4.393	-5.919
6	6.4539	2.1956	2.9623	-184.50	3.608	-5.719
7	7.0772	2.1280	3.5892	-43.73	2.652	-6.553
8	7.7004	2.0527	4.2170	-22.26	1.607	-7.326
9	8.3134	1.9725	4.8352	-17.24	.926	-7.201
10	8.9129	1.8988	5.4392	-18.53	.793	-7.227
11	9.5000	1.8200	6.0316	.00	.000	-7.855

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	3.5000	.4291	15.9577	14.0610	531.526	512.658	.074039
2	4.0522	.3883	15.9321	14.3591	531.264	515.721	.075159
3	4.6289	.3617	15.9147	14.5394	531.173	517.635	.075821
4	5.2271	.3454	15.9030	14.6434	531.154	518.781	.076195
5	5.8363	.3356	15.8955	14.7033	531.192	519.493	.076402
6	6.4539	.3295	15.8908	14.7400	531.257	519.971	.076522
7	7.0772	.3248	15.8887	14.7691	531.357	520.382	.076613
8	7.7004	.3199	15.8882	14.8007	531.468	520.813	.076713
9	8.3134	.3140	15.8889	14.8395	531.570	521.296	.076843
10	8.9129	.3094	15.8901	14.8698	531.623	521.641	.076949
11	9.5000	.3124	15.8911	14.8519	531.592	521.421	.076889

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	3.5000	127.566	123.038	.975600	36.842	11.626
2	4.0522	127.503	123.773	.975591	33.986	5.452
3	4.6289	127.482	124.232	.975625	31.369	2.561
4	5.2271	127.477	124.507	.975667	28.779	.715
5	5.8363	127.486	124.678	.975716	26.410	-1.526
6	6.4539	127.502	124.793	.975766	24.309	-2.111
7	7.0772	127.526	124.892	.975821	22.563	-3.901
8	7.7004	127.552	124.995	.975873	21.164	-5.718
9	8.3134	127.577	125.111	.975916	20.077	-6.274
10	8.9129	127.589	125.194	.975935	19.036	-6.435
11	9.5000	127.582	125.141	.975916	17.604	-7.855

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STATION 15 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 8844.0 RPM. NUMBER OF BLADES IN ROW = 17.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	3.5000	270.12	381.39	.3436	2.314	.000
2	4.0522	312.74	365.35	.3282	-11.230	.000
3	4.6289	357.25	374.57	.3359	-23.154	.000
4	5.2271	403.42	402.06	.3601	-32.794	.000
5	5.8363	450.44	439.59	.3935	-40.186	.000
6	6.4539	498.10	482.40	.4316	-45.912	.000
7	7.0772	546.21	527.26	.4715	-50.501	.000
8	7.7004	594.30	572.44	.5117	-54.342	.000
9	8.3134	641.61	616.73	.5511	-57.647	.000
10	8.9129	687.88	661.61	.5910	-60.339	.000
11	9.5000	733.20	710.46	.6348	-62.028	.000

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STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	3.5000	.000	20.919	.9025	.03688	.1773	.1880
2	4.0522	.000	16.060	.8570	.03355	.2383	.2952
3	4.6289	.000	10.646	.8426	.03295	.2799	.3583
4	5.2271	.000	6.396	.8532	.03313	.2778	.3541
5	5.8363	.000	2.203	.8840	.03364	.2598	.3248
6	6.4539	.000	-.804	.9394	.03374	.2384	.2894
7	7.0772	.000	-2.694	1.0078	.03382	.2198	.2578
8	7.7004	.000	-4.230	1.0949	.03346	.2061	.2335
9	8.3134	.000	-5.477	1.2065	.03246	.1980	.2152
10	8.9129	.000	-9.347	1.3717	.03030	.1919	.1956
11	9.5000	.000	-11.961	1.6450	.02674	.1840	.1657

STREAM LINE	RADIUS	INLET THROUGH STATION 15 PRESS RATIO	ISENT EFF	DELTA H ON H1	STATION 11 THRU STATION 15 PRESS RATIO	ISENT EFF	DELTA H ON H1
MEAN VALUES-		1.0817	.9262	.0245	1.0817	.9262	.0245
1	3.5000	1.0859	.9620	.0247	1.0859	.9620	.0247
2	4.0522	1.0841	.9627	.0242	1.0841	.9627	.0242
3	4.6289	1.0829	.9564	.0241	1.0829	.9564	.0241
4	5.2271	1.0821	.9489	.0240	1.0821	.9489	.0240
5	5.8363	1.0816	.9403	.0241	1.0816	.9403	.0241
6	6.4539	1.0813	.9319	.0242	1.0813	.9319	.0242
7	7.0772	1.0812	.9229	.0244	1.0812	.9229	.0244
8	7.7004	1.0811	.9146	.0246	1.0811	.9146	.0246
9	8.3134	1.0812	.9078	.0248	1.0812	.9078	.0248
10	8.9129	1.0813	.9050	.0249	1.0813	.9050	.0249
11	9.5000	1.0813	.9079	.0249	1.0813	.9079	.0249

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STATION 16 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	3.6250	342.88	342.28	338.28	55.94	484.48
2	4.1366	313.94	293.96	310.44	46.75	430.08
3	4.6955	302.34	257.13	299.76	39.44	396.90
4	5.2806	297.65	228.28	295.90	32.27	375.11
5	5.8781	295.83	205.73	294.75	25.22	360.33
6	6.4845	295.80	187.50	295.21	18.58	350.22
7	7.0961	297.38	172.72	297.14	11.89	343.90
8	7.7082	301.50	160.42	301.45	5.61	341.52
9	8.3154	307.66	149.91	307.66	1.57	342.24
10	8.9145	315.17	140.40	315.17	.49	345.03
11	9.5000	325.40	131.44	325.40	.00	350.94

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	3.6250	3.0000	.0000	-9.76	9.390	-.665
2	4.1366	2.9850	.5118	49.17	8.564	-3.698
3	4.6955	2.9312	1.0733	26.02	7.496	-5.812
4	5.2806	2.8724	1.6614	33.97	6.225	-6.812
5	5.8781	2.7859	2.2651	66.29	4.890	-8.827
6	6.4845	2.6920	2.8787	370.74	3.601	-9.012
7	7.0961	2.5898	3.4988	-468.65	2.292	-9.988
8	7.7082	2.4756	4.1215	10864.64	1.067	-11.181
9	8.3154	2.3520	4.7410	-5844.83	.292	-11.508
10	8.9145	2.2295	5.3526	-156.17	.089	-11.970
11	9.5000	2.1000	5.9523	.00	.000	-12.725

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	3.6250	.4355	16.2731	14.2851	534.627	515.095	.074863
2	4.1366	.3852	16.2417	14.6618	534.309	518.917	.076271
3	4.6955	.3547	16.2198	14.8686	534.197	521.089	.077024
4	5.2806	.3348	16.2048	14.9950	534.173	522.465	.077474
5	5.8781	.3213	16.1954	15.0774	534.222	523.418	.077758
6	6.4845	.3121	16.1896	15.1325	534.307	524.101	.077941
7	7.0961	.3063	16.1869	15.1672	534.433	524.591	.078046
8	7.7082	.3041	16.1863	15.1806	534.573	524.867	.078074
9	8.3154	.3047	16.1871	15.1774	534.701	524.954	.078045
10	8.9145	.3073	16.1886	15.1628	534.766	524.860	.077984
11	9.5000	.3126	16.1899	15.1294	534.729	524.480	.077868

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	3.6250	128.310	123.623	.975654	44.950	8.725
2	4.1366	128.234	124.540	.975644	43.118	4.866
3	4.6955	128.207	125.061	.975686	40.379	1.683
4	5.2806	128.202	125.392	.975739	37.487	-.588
5	5.8781	128.213	125.620	.975800	34.816	-3.937
6	6.4845	128.234	125.784	.975863	32.370	-5.411
7	7.0961	128.264	125.902	.975931	30.149	-7.695
8	7.7082	128.297	125.968	.975996	28.017	-10.114
9	8.3154	128.328	125.989	.976050	25.977	-11.216
10	8.9145	128.344	125.966	.976074	24.012	-11.881
11	9.5000	128.335	125.875	.976051	21.996	-12.725

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STATION 16 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 8844.0 RPM. NUMBER OF BLADES IN ROW = 17.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	3.6250	279.77	348.53	.3133	10.331	.000
2	4.1366	319.26	314.96	.2821	-4.606	.000
3	4.6955	362.39	320.15	.2861	-19.196	.000
4	5.2806	407.55	347.47	.3101	-31.059	.000
5	5.8781	453.66	385.99	.3442	-39.966	.000
6	6.4845	500.46	430.63	.3838	-46.615	.000
7	7.0961	547.67	478.56	.4263	-51.581	.000
8	7.7082	594.91	528.85	.4709	-55.242	.000
9	8.3154	641.77	580.16	.5166	-57.974	.000
10	8.9145	688.01	631.83	.5627	-60.078	.000
11	9.5000	733.20	684.10	.6094	-61.598	.000

STREAM	RADIUS	BLADE	LEAN	DELTA P	LOSS	DIFF	DELTA P

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LINE		ANGLE	ANGLE	A-BLADE	COEFF	FACTOR	ON Q
1	3.6250	.000	41.194	.4055	.04609	.2817	.3561
2	4.1366	.000	32.206	.3763	.04192	.3842	.5070
3	4.6955	.000	22.196	.3701	.04121	.4227	.5504
4	5.2806	.000	14.423	.3754	.04144	.4096	.5270
5	5.8781	.000	6.859	.3888	.04207	.3797	.4808
6	6.4845	.000	1.085	.4134	.04218	.3469	.4290
7	7.0961	.000	-2.952	.4459	.04228	.3162	.3789
8	7.7082	.000	-6.396	.4933	.04183	.2892	.3329
9	8.3154	.000	-9.488	.5607	.04057	.2667	.2917
10	8.9145	.000	-16.503	.6592	.03785	.2486	.2535
11	9.5000	.000	-20.651	.8033	.03342	.2353	.2141

STREAM LINE	RADIUS	INLET THROUGH STATION 16 PRESS RATIO	ISENT EFF	DELTA H ON H1	STATION 11 THRU STATION 16 PRESS RATIO	ISENT EFF	DELTA H ON H1
MEAN VALUES-		1.1022	.9254	.0304	1.1022	.9254	.0304
1	3.6250	1.1073	.9616	.0307	1.1073	.9616	.0307
2	4.1366	1.1052	.9623	.0301	1.1052	.9623	.0301
3	4.6955	1.1037	.9560	.0299	1.1037	.9560	.0299
4	5.2806	1.1027	.9484	.0299	1.1027	.9484	.0299
5	5.8781	1.1020	.9397	.0299	1.1020	.9397	.0299
6	6.4845	1.1016	.9311	.0301	1.1016	.9311	.0301
7	7.0961	1.1014	.9220	.0304	1.1014	.9220	.0304
8	7.7082	1.1014	.9135	.0306	1.1014	.9135	.0306
9	8.3154	1.1015	.9067	.0309	1.1015	.9067	.0309
10	8.9145	1.1016	.9039	.0310	1.1016	.9039	.0310
11	9.5000	1.1017	.9068	.0309	1.1017	.9068	.0309

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STATION 17 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	3.7480	281.32	331.04	276.27	53.07	434.43
2	4.2981	295.02	282.92	289.87	54.88	408.75
3	4.8535	299.73	248.75	295.80	48.35	389.51
4	5.4179	301.81	222.50	299.22	39.43	374.96
5	5.9901	303.10	201.88	301.57	30.35	364.17
6	6.5684	304.43	185.11	303.63	22.03	356.29
7	7.1512	306.08	171.39	305.72	14.71	350.80
8	7.7367	308.11	159.83	307.99	8.69	347.10
9	8.3236	310.30	149.76	310.27	4.22	344.55
10	8.9113	312.30	140.45	312.30	1.28	342.43
11	9.5000	313.45	131.44	313.45	.00	339.89

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	3.7480	4.0000	.0000	7.57	10.874	.000
2	4.2981	4.0000	.5501	17.46	10.721	.000
3	4.8535	4.0000	1.1055	34.40	9.283	.000
4	5.4179	4.0000	1.6699	54.07	7.507	.000
5	5.9901	4.0000	2.2421	66.48	5.748	.000
6	6.5684	4.0000	2.8204	69.28	4.149	.000
7	7.1512	4.0000	3.4032	66.44	2.755	.000
8	7.7367	4.0000	3.9887	66.17	1.616	.000
9	8.3236	4.0000	4.5756	76.98	.780	.000
10	8.9113	4.0000	5.1633	117.36	.235	.000
11	9.5000	4.0000	5.7520	.00	.000	.000

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	3.7480	.3891	16.2731	14.6601	534.627	518.922	.076261
2	4.2981	.3656	16.2417	14.8096	534.309	520.406	.076819
3	4.8535	.3480	16.2198	14.9170	534.197	521.573	.077203
4	5.4179	.3347	16.2048	14.9960	534.173	522.474	.077478
5	5.9901	.3248	16.1954	15.0541	534.222	523.186	.077672
6	6.5684	.3176	16.1896	15.0965	534.307	523.743	.077808
7	7.1512	.3126	16.1869	15.1268	534.433	524.193	.077898
8	7.7367	.3092	16.1863	15.1483	534.573	524.548	.077956
9	8.3236	.3068	16.1871	15.1641	534.701	524.822	.077996
10	8.9113	.3049	16.1886	15.1779	534.766	525.009	.078039
11	9.5000	.3026	16.1899	15.1936	534.729	525.116	.078104

STREAM LINE	RADIUS	ENTHALPIES TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	3.7480	128.310	124.541	.975654	49.642	10.874
2	4.2981	128.234	124.897	.975644	43.801	10.721
3	4.8535	128.207	125.177	.975686	39.690	9.283
4	5.4179	128.202	125.394	.975739	36.399	7.507
5	5.9901	128.213	125.565	.975800	33.666	5.748
6	6.5684	128.234	125.698	.975863	31.301	4.149
7	7.1512	128.264	125.806	.975931	29.248	2.755
8	7.7367	128.297	125.891	.975996	27.418	1.616
9	8.3236	128.328	125.957	.976050	25.763	.780
10	8.9113	128.344	126.002	.976074	24.215	.235
11	9.5000	128.335	126.028	.976051	22.750	.000

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STATION 18 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	4.0110	293.75	309.34	280.08	88.55	426.59
2	4.5180	307.67	269.15	298.81	73.30	408.78
3	5.0327	312.99	239.90	307.42	58.75	394.35
4	5.5598	314.94	216.82	311.55	46.12	382.36
5	6.0992	315.55	198.27	313.56	35.45	372.67
6	6.6494	315.86	182.85	314.75	26.51	364.97
7	7.2084	316.22	170.03	315.65	19.06	359.04
8	7.7744	316.77	159.06	316.51	12.88	354.46
9	8.3458	317.47	149.36	317.37	7.80	350.85
10	8.9213	318.23	140.29	318.21	3.60	347.78
11	9.5000	318.85	131.44	318.85	.00	344.88

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	4.0110	5.0000	.0000	10.71	17.545	.000
2	4.5180	5.0000	.5070	21.39	13.783	.000
3	5.0327	5.0000	1.0217	44.01	10.819	.000
4	5.5598	5.0000	1.5488	83.99	8.421	.000
5	6.0992	5.0000	2.0882	129.08	6.450	.000
6	6.6494	5.0000	2.6384	153.28	4.815	.000
7	7.2084	5.0000	3.1974	159.93	3.455	.000
8	7.7744	5.0000	3.7634	171.43	2.330	.000
9	8.3458	5.0000	4.3348	213.06	1.407	.000
10	8.9213	5.0000	4.9103	377.26	.649	.000
11	9.5000	5.0000	5.4890	.00	.000	.000

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	4.0110	.3818	16.2731	14.7158	534.627	519.484	.076468
2	4.5180	.3656	16.2417	14.8095	534.309	520.404	.076819
3	5.0327	.3524	16.2198	14.8854	534.197	521.257	.077086
4	5.5598	.3414	16.2048	14.9491	534.173	522.008	.077305
5	6.0992	.3326	16.1954	15.0016	534.222	522.665	.077479
6	6.6494	.3255	16.1896	15.0440	534.307	523.222	.077615
7	7.2084	.3201	16.1869	15.0777	534.433	523.706	.077717
8	7.7744	.3159	16.1863	15.1048	534.573	524.118	.077796
9	8.3458	.3126	16.1871	15.1273	534.701	524.458	.077861
10	8.9213	.3097	16.1886	15.1468	534.766	524.701	.077925
11	9.5000	.3071	16.1899	15.1649	534.729	524.831	.077999

STREAM LINE	RADIUS	ENTHALPIES TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	4.0110	128.310	124.676	.975654	46.481	17.545
2	4.5180	128.234	124.897	.975644	41.179	13.783
3	5.0327	128.207	125.102	.975686	37.469	10.819
4	5.5598	128.202	125.282	.975739	34.546	8.421
5	6.0992	128.213	125.440	.975800	32.142	6.450
6	6.6494	128.234	125.573	.975863	30.066	4.815
7	7.2084	128.264	125.689	.975931	28.267	3.455
8	7.7744	128.297	125.788	.975996	26.662	2.330
9	8.3458	128.328	125.870	.976050	25.196	1.407
10	8.9213	128.344	125.928	.976074	23.791	.649
11	9.5000	128.335	125.960	.976051	22.403	.000

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STATION 19 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	4.3820	353.28	283.15	339.53	97.61	452.75
2	4.7890	344.79	253.92	336.32	75.99	428.20
3	5.2358	338.03	230.59	332.76	59.46	409.19
4	5.7140	333.41	210.97	330.15	46.49	394.55
5	6.2162	330.28	194.54	328.31	36.01	383.32
6	6.7369	328.23	180.47	327.09	27.36	374.57
7	7.2719	326.90	168.55	326.28	20.09	367.79
8	7.8180	326.12	158.17	325.82	13.93	362.45
9	8.3727	325.78	148.88	325.67	8.66	358.19
10	8.9340	325.85	140.09	325.82	4.08	354.69
11	9.5000	326.21	131.44	326.21	.00	351.70

STREAM LINE	RADIUS	MESH-POINT COORDS X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	4.3820	6.0000	.0000	-10.32	16.039	.000
2	4.7890	6.0000	.4070	-18.35	12.733	.000
3	5.2358	6.0000	.8538	-33.26	10.131	.000
4	5.7140	6.0000	1.3320	-60.61	8.016	.000
5	6.2162	6.0000	1.8342	-111.22	6.260	.000
6	6.7369	6.0000	2.3549	-210.47	4.781	.000
7	7.2719	6.0000	2.8899	-429.57	3.524	.000
8	7.8180	6.0000	3.4360	-1002.89	2.449	.000
9	8.3727	6.0000	3.9907	-2743.54	1.524	.000
10	8.9340	6.0000	4.5520	-7617.90	.718	.000
11	9.5000	6.0000	5.1180	.00	.000	.000

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES TOTAL	STATIC	TEMPERATURES TOTAL	STATIC	SPECIFIC WEIGHT
1	4.3820	.4060	16.2731	14.5268	534.627	517.570	.075765
2	4.7890	.3834	16.2417	14.6751	534.309	519.051	.076320
3	5.2358	.3660	16.2198	14.7864	534.197	520.264	.076720
4	5.7140	.3526	16.2048	14.8703	534.173	521.220	.077013
5	6.2162	.3423	16.1954	14.9345	534.222	521.996	.077231
6	6.7369	.3343	16.1896	14.9846	534.307	522.632	.077396
7	7.2719	.3280	16.1869	15.0244	534.433	523.177	.077521
8	7.8180	.3231	16.1863	15.0568	534.573	523.641	.077619
9	8.3727	.3192	16.1871	15.0836	534.701	524.025	.077700
10	8.9340	.3160	16.1886	15.1060	534.766	524.297	.077775
11	9.5000	.3133	16.1899	15.1249	534.729	524.436	.077852

STREAM LINE	RADIUS	ENTHALPIES TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	4.3820	128.310	124.217	.975654	38.711	16.039
2	4.7890	128.234	124.572	.975644	36.369	12.733
3	5.2358	128.207	124.863	.975686	34.300	10.131
4	5.7140	128.202	125.093	.975739	32.324	8.016
5	6.2162	128.213	125.279	.975800	30.498	6.260
6	6.7369	128.234	125.432	.975863	28.804	4.781
7	7.2719	128.264	125.562	.975931	27.276	3.524
8	7.8180	128.297	125.674	.975996	25.873	2.449
9	8.3727	128.328	125.766	.976050	24.560	1.524
10	8.9340	128.344	125.831	.976074	23.265	.718
11	9.5000	128.335	125.865	.976051	21.946	.000

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STATION 19 IS AT THE LEADING EDGE OF A BLADE
ROTATING AT .0 RPM. NUMBER OF BLADES IN ROW = 27.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	INCIDENCE ANGLE
1	4.3820	.00	452.75	.4060	38.711	.000
2	4.7890	.00	428.20	.3834	36.369	.000
3	5.2358	.00	409.19	.3660	34.300	.000
4	5.7140	.00	394.55	.3526	32.324	.000
5	6.2162	.00	383.32	.3423	30.498	.000
6	6.7369	.00	374.57	.3343	28.804	.000
7	7.2719	.00	367.79	.3280	27.276	.000
8	7.8180	.00	362.45	.3231	25.873	.000
9	8.3727	.00	358.19	.3192	24.560	.000
10	8.9340	.00	354.69	.3160	23.265	.000
11	9.5000	.00	351.70	.3133	21.946	.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE
1	4.3820	.000	.000	-.7936
2	4.7890	.000	.000	-.7568
3	5.2358	.000	.000	-.7305
4	5.7140	.000	.000	-.7102
5	6.2162	.000	.000	-.6941
6	6.7369	.000	.000	-.6801
7	7.2719	.000	.000	-.6680
8	7.8180	.000	.000	-.6567
9	8.3727	.000	.000	-.6451
10	8.9340	.000	.000	-.6318
11	9.5000	.000	.000	-.6154

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STATION 20 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	VELOCITIES MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	4.7970	356.25	.00	348.70	72.96	356.25
2	5.1604	358.56	.00	353.50	60.03	358.56
3	5.5587	357.94	.00	354.67	48.27	357.94
4	5.9870	355.66	.00	353.60	38.21	355.66
5	6.4410	353.00	.00	351.73	29.86	353.00
6	6.9165	350.50	.00	349.75	22.90	350.50
7	7.4098	348.52	.00	348.10	17.02	348.52
8	7.9175	347.11	.00	346.91	11.95	347.11
9	8.4367	346.30	.00	346.22	7.49	346.30
10	8.9650	346.04	.00	346.02	3.53	346.04
11	9.5000	346.22	.00	346.22	.00	346.22

STREAM -----MESH-POINT COORDS------ RADIUS OF STREAMLINE STATION

LINE	RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE ANGLE	LEAN ANGLE
1	4.7970	8.0000	.0000	456.97	11.819	6.790
2	5.1604	8.0433	.3660	-65.54	9.637	6.790
3	5.5587	8.0907	.7671	-42.11	7.750	6.790
4	5.9870	8.1417	1.1985	-39.38	6.168	6.790
5	6.4410	8.1958	1.6556	-43.44	4.852	6.790
6	6.9165	8.2524	2.1345	-53.05	3.746	6.790
7	7.4098	8.3111	2.6312	-70.11	2.799	6.790
8	7.9175	8.3716	3.1425	-100.47	1.973	6.790
9	8.4367	8.4334	3.6654	-161.71	1.240	6.790
10	8.9650	8.4963	4.1974	-336.91	.584	6.790
11	9.5000	8.5600	4.7362	.00	.000	6.790

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	4.7970	.3175	16.1675	15.0768	534.627	524.066	.077659
2	5.1604	.3197	16.1680	15.0628	534.309	523.611	.077654
3	5.5587	.3192	16.1672	15.0655	534.197	523.536	.077680
4	5.9870	.3171	16.1659	15.0779	534.173	523.648	.077727
5	6.4410	.3146	16.1657	15.0937	534.222	523.854	.077777
6	6.9165	.3124	16.1657	15.1086	534.307	524.084	.077820
7	7.4098	.3105	16.1659	15.1206	534.433	524.325	.077846
8	7.9175	.3092	16.1659	15.1291	534.573	524.547	.077857
9	8.4367	.3084	16.1658	15.1340	534.701	524.722	.077856
10	8.9650	.3082	16.1659	15.1357	534.766	524.802	.077853
11	9.5000	.3083	16.1657	15.1344	534.729	524.754	.077854

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	4.7970	128.310	125.776	.976100	.000	18.609
2	5.1604	128.234	125.667	.975955	.000	16.428
3	5.5587	128.207	125.649	.975908	.000	14.540
4	5.9870	128.202	125.675	.975903	.000	12.958
5	6.4410	128.213	125.725	.975926	.000	11.643
6	6.9165	128.234	125.780	.975964	.000	10.537
7	7.4098	128.264	125.838	.976020	.000	9.590
8	7.9175	128.297	125.891	.976083	.000	8.763
9	8.4367	128.328	125.933	.976141	.000	8.030
10	8.9650	128.344	125.952	.976170	.000	7.374
11	9.5000	128.335	125.941	.976154	.000	6.790

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STATION 20 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT .0 RPM. NUMBER OF BLADES IN ROW = 27.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	4.7970	.00	356.25	.3175	.000	.000
2	5.1604	.00	358.56	.3197	.000	.000
3	5.5587	.00	357.94	.3192	.000	.000
4	5.9870	.00	355.66	.3171	.000	.000
5	6.4410	.00	353.00	.3146	.000	.000
6	6.9165	.00	350.50	.3124	.000	.000
7	7.4098	.00	348.52	.3105	.000	.000
8	7.9175	.00	347.11	.3092	.000	.000
9	8.4367	.00	346.30	.3084	.000	.000
10	8.9650	.00	346.04	.3082	.000	.000
11	9.5000	.00	346.22	.3083	.000	.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	4.7970	.000	.000	-.4221	.06044	.3674	.3150
2	5.1604	.000	.000	-.4094	.04699	.3187	.2475
3	5.5587	.000	.000	-.3985	.03663	.2850	.1948
4	5.9870	.000	.000	-.3876	.02913	.2605	.1556
5	6.4410	.000	.000	-.3778	.02354	.2423	.1262
6	6.9165	.000	.000	-.3686	.01979	.2282	.1029
7	7.4098	.000	.000	-.3607	.01805	.2166	.0827
8	7.9175	.000	.000	-.3536	.01808	.2063	.0640
9	8.4367	.000	.000	-.3467	.01926	.1962	.0457
10	8.9650	.000	.000	-.3392	.02095	.1856	.0274
11	9.5000	.000	.000	-.3302	.02270	.1738	.0089

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STREAM LINE	RADIUS	INLET THROUGH STATION 20 PRESS RATIO	ISENT EFF	DELTA H ON H1	STATION 19 THRU STATION 20 PRESS RATIO	ISENT EFF	DELTA H ON H1
MEAN VALUES-		1.1000	.9067	.0304	.9981	.0000	.0000
1	4.7970	1.1001	.8994	.0307	.9935	.0000	.0000
2	5.1604	1.1002	.9180	.0301	.9955	.0000	.0000
3	5.5587	1.1001	.9241	.0299	.9968	.0000	.0000
4	5.9870	1.1000	.9247	.0299	.9976	.0000	.0000
5	6.4410	1.1000	.9217	.0299	.9982	.0000	.0000
6	6.9165	1.1000	.9167	.0301	.9985	.0000	.0000
7	7.4098	1.1000	.9095	.0304	.9987	.0000	.0000
8	7.9175	1.1000	.9014	.0306	.9987	.0000	.0000
9	8.4367	1.1000	.8942	.0309	.9987	.0000	.0000
10	8.9650	1.1000	.8906	.0310	.9986	.0000	.0000
11	9.5000	1.1000	.8926	.0309	.9985	.0000	.0000

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STATION 21 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	5.0080	414.38	.00	412.14	43.01	414.38
2	5.3115	393.61	.00	392.05	35.02	393.61
3	5.6659	378.30	.00	377.23	28.41	378.30
4	6.0632	367.65	.00	366.93	23.00	367.65
5	6.4953	360.61	.00	360.13	18.50	360.61
6	6.9548	355.94	.00	355.64	14.64	355.94
7	7.4360	352.84	.00	352.66	11.21	352.84
8	7.9344	350.78	.00	350.69	8.08	350.78
9	8.4463	349.50	.00	349.46	5.18	349.50
10	8.9690	348.83	.00	348.82	2.47	348.83
11	9.5000	348.59	.00	348.59	.00	348.59

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	5.0080	9.0000	.0000	-4.86	5.957	.000
2	5.3115	9.0000	.3035	-7.29	5.105	.000
3	5.6659	9.0000	.6579	-11.38	4.307	.000
4	6.0632	9.0000	1.0552	-17.99	3.586	.000
5	6.4953	9.0000	1.4873	-28.20	2.941	.000
6	6.9548	9.0000	1.9468	-43.44	2.357	.000
7	7.4360	9.0000	2.4280	-66.33	1.820	.000
8	7.9344	9.0000	2.9264	-103.73	1.320	.000
9	8.4463	9.0000	3.4383	-178.85	.849	.000
10	8.9690	9.0000	3.9610	-427.09	.406	.000
11	9.5000	9.0000	4.4920	.00	.000	.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	5.0080	.3706	16.1675	14.7047	534.627	520.338	.076285
2	5.3115	.3517	16.1680	14.8430	534.309	521.417	.076843
3	5.6659	.3377	16.1672	14.9403	534.197	522.289	.077218
4	6.0632	.3280	16.1659	15.0053	534.173	522.926	.077459
5	6.4953	.3216	16.1657	15.0481	534.222	523.402	.077610
6	6.9548	.3173	16.1657	15.0764	534.307	523.764	.077701
7	7.4360	.3144	16.1659	15.0952	534.433	524.073	.077753
8	7.9344	.3125	16.1659	15.1076	534.573	524.334	.077778
9	8.4463	.3113	16.1658	15.1153	534.701	524.536	.077788
10	8.9690	.3107	16.1659	15.1194	534.766	524.640	.077793
11	9.5000	.3105	16.1657	15.1206	534.729	524.617	.077803

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	5.0080	128.310	124.881	.976100	.000	5.957
2	5.3115	128.234	125.140	.975955	.000	5.105
3	5.6659	128.207	125.349	.975908	.000	4.307
4	6.0632	128.202	125.502	.975903	.000	3.586
5	6.4953	128.213	125.616	.975926	.000	2.941
6	6.9548	128.234	125.703	.975964	.000	2.357
7	7.4360	128.264	125.778	.976020	.000	1.820
8	7.9344	128.297	125.840	.976083	.000	1.320
9	8.4463	128.328	125.889	.976141	.000	.849
10	8.9690	128.344	125.914	.976170	.000	.406
11	9.5000	128.335	125.908	.976154	.000	.000

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STATION 22 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	5.0080	371.26	.00	371.26	.00	371.26
2	5.3331	370.26	.00	370.22	5.17	370.26
3	5.6989	367.56	.00	367.46	8.25	367.56
4	6.0999	364.18	.00	364.05	9.50	364.18
5	6.5306	361.05	.00	360.93	9.45	361.05
6	6.9859	358.40	.00	358.30	8.54	358.40
7	7.4615	356.35	.00	356.28	7.14	356.35
8	7.9535	354.83	.00	354.79	5.47	354.83
9	8.4590	353.82	.00	353.80	3.66	353.82
10	8.9752	353.25	.00	353.24	1.81	353.25
11	9.5000	353.01	.00	353.01	.00	353.01

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	5.0080	10.0000	.0000	.00	.000	.000
2	5.3331	10.0000	.3251	-45.47	.801	.000
3	5.6989	10.0000	.6909	-47.09	1.286	.000
4	6.0999	10.0000	1.0919	-47.11	1.495	.000
5	6.5306	10.0000	1.5226	-54.64	1.499	.000
6	6.9859	10.0000	1.9779	-69.12	1.366	.000
7	7.4615	10.0000	2.4535	-93.31	1.148	.000
8	7.9535	10.0000	2.9455	-135.07	.883	.000
9	8.4590	10.0000	3.4510	-218.63	.592	.000
10	8.9752	10.0000	3.9672	-465.64	.294	.000
11	9.5000	10.0000	4.4920	.00	.000	.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	5.0080	.3311	16.1675	14.9855	534.627	523.157	.077323
2	5.3331	.3303	16.1680	14.9915	534.309	522.901	.077392
3	5.6989	.3279	16.1672	15.0072	534.197	522.956	.077464
4	6.0999	.3248	16.1659	15.0266	534.173	523.137	.077538
5	6.5306	.3220	16.1657	15.0454	534.222	523.375	.077600
6	6.9859	.3195	16.1657	15.0616	534.307	523.618	.077647
7	7.4615	.3176	16.1659	15.0743	534.433	523.866	.077676
8	7.9535	.3162	16.1659	15.0836	534.573	524.096	.077690
9	8.4590	.3152	16.1658	15.0898	534.701	524.284	.077694
10	8.9752	.3147	16.1659	15.0934	534.766	524.382	.077698
11	9.5000	.3145	16.1657	15.0945	534.729	524.359	.077707

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	5.0080	128.310	125.558	.976100	.000	.000
2	5.3331	128.234	125.496	.975955	.000	.801
3	5.6989	128.207	125.509	.975908	.000	1.286
4	6.0999	128.202	125.553	.975903	.000	1.495
5	6.5306	128.213	125.610	.975926	.000	1.499
6	6.9859	128.234	125.668	.975964	.000	1.366
7	7.4615	128.264	125.728	.976020	.000	1.148
8	7.9535	128.297	125.783	.976083	.000	.883
9	8.4590	128.328	125.828	.976141	.000	.592
10	8.9752	128.344	125.852	.976170	.000	.294
11	9.5000	128.335	125.846	.976154	.000	.000

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STATION 23 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	----------V E L O C I T I E S---------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	5.0080	362.67	.00	362.67	.00	362.67
2	5.3394	362.45	.00	362.45	1.74	362.45
3	5.7108	361.70	.00	361.69	3.29	361.70
4	6.1154	360.59	.00	360.56	4.38	360.59
5	6.5476	359.51	.00	359.48	4.90	359.51
6	7.0025	358.49	.00	358.46	4.87	358.49
7	7.4761	357.63	.00	357.61	4.37	357.63
8	7.9652	356.94	.00	356.92	3.53	356.94
9	8.4670	356.45	.00	356.44	2.45	356.45
10	8.9792	356.17	.00	356.17	1.24	356.17
11	9.5000	356.03	.00	356.03	.00	356.03

STREAM LINE	RADIUS	-----MESH-POINT COORDS------ X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	5.0080	11.0000	.0000	.00	.000	.000
2	5.3394	11.0000	.3314	-325.50	.275	.000
3	5.7108	11.0000	.7028	-182.58	.521	.000
4	6.1154	11.0000	1.1074	-149.51	.696	.000
5	6.5476	11.0000	1.5396	-147.86	.781	.000
6	7.0025	11.0000	1.9945	-165.49	.778	.000
7	7.4761	11.0000	2.4681	-203.95	.701	.000
8	7.9652	11.0000	2.9572	-276.35	.567	.000
9	8.4670	11.0000	3.4590	-427.50	.394	.000
10	8.9792	11.0000	3.9712	-882.66	.200	.000
11	9.5000	11.0000	4.4920	.00	.000	.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	5.0080	.3233	16.1675	15.0381	534.627	523.682	.077517
2	5.3394	.3232	16.1680	15.0393	534.309	523.377	.077568
3	5.7108	.3226	16.1672	15.0429	534.197	523.311	.077596
4	6.1154	.3216	16.1659	15.0483	534.173	523.354	.077618
5	6.5476	.3206	16.1657	15.0547	534.222	523.467	.077634
6	7.0025	.3196	16.1657	15.0611	534.307	523.612	.077645
7	7.4761	.3188	16.1659	15.0666	534.433	523.790	.077647
8	7.9652	.3181	16.1659	15.0710	534.573	523.971	.077643
9	8.4670	.3176	16.1658	15.0742	534.701	524.128	.077636
10	8.9792	.3174	16.1659	15.0760	534.766	524.210	.077634
11	9.5000	.3173	16.1657	15.0766	534.729	524.181	.077641

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	5.0080	128.310	125.684	.976100	.000	.000
2	5.3394	128.234	125.611	.975955	.000	.275
3	5.7108	128.207	125.595	.975908	.000	.521
4	6.1154	128.202	125.605	.975903	.000	.696

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5	6.5476	128.213	125.632	.975926	.000	.781
6	7.0025	128.234	125.667	.975964	.000	.778
7	7.4761	128.264	125.710	.976020	.000	.701
8	7.9652	128.297	125.753	.976083	.000	.567
9	8.4670	128.328	125.791	.976141	.000	.394
10	8.9792	128.344	125.810	.976170	.000	.200
11	9.5000	128.335	125.803	.976154	.000	.000

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STATION 24 FLOW-FIELD DESCRIPTION
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STREAM LINE	RADIUS	---------------V E L O C I T I E S--------------- MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	5.0080	358.50	.00	358.50	.00	358.50
2	5.3427	358.47	.00	358.47	1.17	358.47
3	5.7171	358.31	.00	358.31	2.28	358.31
4	6.1242	358.10	.00	358.09	3.15	358.10
5	6.5578	358.08	.00	358.07	3.67	358.08
6	7.0131	358.12	.00	358.10	3.78	358.12
7	7.4859	358.18	.00	358.17	3.50	358.18
8	7.9733	358.23	.00	358.22	2.90	358.23
9	8.4727	358.26	.00	358.26	2.04	358.26
10	8.9822	358.29	.00	358.29	1.05	358.29
11	9.5000	358.25	.00	358.25	.00	358.25

STREAM LINE	-----MESH-POINT COORDS------ RADIUS	X-COORD	L-COORD	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
1	5.0080	12.0000	.0000	.00	.000	.000
2	5.3427	12.0000	.3347	.00	.187	.000
3	5.7171	12.0000	.7091	.00	.364	.000
4	6.1242	12.0000	1.1162	.00	.504	.000
5	6.5578	12.0000	1.5498	.00	.587	.000
6	7.0131	12.0000	2.0051	.00	.605	.000
7	7.4859	12.0000	2.4779	.00	.560	.000
8	7.9733	12.0000	2.9653	.00	.463	.000
9	8.4727	12.0000	3.4647	.00	.327	.000
10	8.9822	12.0000	3.9742	.00	.168	.000
11	9.5000	12.0000	4.4920	.00	.000	.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES--- TOTAL	STATIC	--TEMPERATURES- TOTAL	STATIC	SPECIFIC WEIGHT
1	5.0080	.3195	16.1675	15.0633	534.627	523.932	.077609
2	5.3427	.3196	16.1680	15.0633	534.309	523.616	.077656
3	5.7171	.3195	16.1672	15.0633	534.197	523.514	.077671
4	6.1242	.3193	16.1659	15.0633	534.173	523.503	.077673
5	6.5578	.3193	16.1657	15.0633	534.222	523.553	.077666
6	7.0131	.3193	16.1657	15.0633	534.307	523.635	.077653
7	7.4859	.3193	16.1659	15.0633	534.433	523.757	.077635
8	7.9733	.3193	16.1659	15.0633	534.573	523.895	.077615
9	8.4727	.3193	16.1658	15.0633	534.701	524.020	.077596
10	8.9822	.3193	16.1659	15.0633	534.766	524.084	.077587
11	9.5000	.3193	16.1657	15.0633	534.729	524.049	.077592

STREAM LINE	RADIUS	---ENTHALPIES-- TOTAL	STATIC	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
1	5.0080	128.310	125.744	.976100	.000	.000
2	5.3427	128.234	125.668	.975955	.000	.187
3	5.7171	128.207	125.643	.975908	.000	.364
4	6.1242	128.202	125.641	.975903	.000	.504
5	6.5578	128.213	125.653	.975926	.000	.587
6	7.0131	128.234	125.672	.975964	.000	.605
7	7.4859	128.264	125.702	.976020	.000	.560
8	7.9733	128.297	125.735	.976083	.000	.463
9	8.4727	128.328	125.765	.976141	.000	.327
10	8.9822	128.344	125.780	.976170	.000	.168
11	9.5000	128.335	125.772	.976154	.000	.000

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POINT NO 1 PASS 6 THE CALCULATION IS CONVERGED
****

SPEED FACTOR = 8844.000 FLOW = 38.450 TOTAL PRESSURE RATIO = 1.10

=> 0

ISENTROPIC EFFICIENCY = .9067 POWER = .2062E+03

LOSS COEFFICIENT DETERMINATION FOR BLADE BETWEEN STATIONS 11 AND 16
AS INCORPORATED IN ABOVE RESULTS, BLADE TYPE 1
****

STREAM LINE	INLET RADIUS	OUTLET RADIUS	CASCADE SOLIDITY	DIFF FACTOR	LOSS PARAM	DIFF LOSS	BLADE ANGLE
1	3.000	3.625	2.5223	.2817	.00899	.04609	30.953
2	3.664	4.137	2.2065	.3842	.00947	.04191	41.208
3	4.332	4.696	1.9914	.4227	.00977	.04120	45.671
4	4.990	5.281	1.8386	.4096	.00965	.04143	49.549
5	5.644	5.878	1.7107	.3797	.00942	.04206	52.938
6	6.295	6.485	1.5780	.3469	.00918	.04218	55.790
7	6.946	7.096	1.4535	.3162	.00904	.04227	58.173
8	7.591	7.708	1.3264	.2892	.00899	.04183	60.043
9	8.231	8.315	1.1963	.2667	.00899	.04057	61.548
10	8.865	8.915	1.0490	.2486	.00900	.03785	63.023
11	9.500	9.500	.8830	.2353	.00900	.03342	64.765

STREAM LINE	INCID ANGLE	EXPAN ANGLE	INLET M.NO.	EXPAND M. NO.	SHOCK LOSS	TOTAL LOSS
1	4.006	14.006	.3652	1.5711	.00000	.04609
2	1.523	11.016	.3761	1.4697	.00000	.04191
3	1.626	10.608	.4107	1.4558	.00000	.04120
4	1.713	10.191	.4457	1.4415	.00000	.04143
5	1.739	9.716	.4819	1.4252	.00000	.04206
6	1.811	9.288	.5195	1.4104	.00000	.04218
7	1.853	8.830	.5586	1.3945	.00000	.04227
8	1.930	8.411	.5992	1.3799	.00000	.04183
9	2.016	8.003	.6407	1.3656	.00000	.04057
10	2.092	7.586	.6812	1.3509	.00000	.03785
11	2.111	7.111	.7199	1.3340	.00000	.03342

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LOSS COEFFICIENT DETERMINATION FOR BLADE BETWEEN STATIONS 19 AND 20
AS INCORPORATED IN ABOVE RESULTS, BLADE TYPE 2
****

STREAM LINE	INLET RADIUS	OUTLET RADIUS	CASCADE SOLIDITY	DIFF FACTOR	LOSS PARAM	DIFF LOSS	BLADE ANGLE
1	4.382	4.797	2.0270	.3674	.01491	.06043	.000
2	4.789	5.160	1.9000	.3187	.01236	.04699	.000
3	5.236	5.559	1.7636	.2850	.01038	.03662	.000
4	5.714	5.987	1.6514	.2605	.00882	.02912	.000
5	6.216	6.441	1.5546	.2423	.00757	.02353	.000
6	6.737	6.916	1.4696	.2282	.00673	.01977	.000
7	7.272	7.410	1.3958	.2166	.00646	.01804	.000
8	7.818	7.917	1.3308	.2063	.00679	.01807	.000
9	8.373	8.437	1.2749	.1962	.00755	.01924	.000
10	8.934	8.965	1.2250	.1856	.00855	.02094	.000
11	9.500	9.500	1.1810	.1738	.00961	.02269	.000

STREAM LINE	INCID ANGLE	EXPAN ANGLE	INLET M.NO.	EXPAND M. NO.	SHOCK LOSS	TOTAL LOSS
1	.000	5.000	.4060	1.2565	.00000	.06043
2	.000	5.000	.3834	1.2565	.00000	.04699
3	.000	5.000	.3660	1.2565	.00000	.03662
4	.000	5.000	.3526	1.2565	.00000	.02912
5	.000	5.000	.3423	1.2565	.00000	.02353
6	.000	5.000	.3343	1.2565	.00000	.01977
7	.000	5.000	.3280	1.2565	.00000	.01804
8	.000	5.000	.3231	1.2565	.00000	.01807
9	.000	5.000	.3192	1.2565	.00000	.01924
10	.000	5.000	.3160	1.2565	.00000	.02094
11	.000	5.000	.3133	1.2565	.00000	.02269

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PROGRAM UD0300 - VERSION 2.0 - ARBITRARY MEANLINE BLADE SECTION
****

=>

TITLE = LOW COST FAN ROTOR RUN 17 BNC 6/25/95

NUMBER OF STREAMSURFACES = 11
NUMBER OF STATIONS = 6
NUMBER OF CONSTANT-Z PLANES = 13
NUMBER OF BLADE DATA POINTS = 11
NUMBER OF POINTS PER SEGMENT = 10
NUMBER OF BLADES IN BLADE ROW = 17
ISTAK = 2
IPUNCH = 0
IFPLOT = 0
IPRINT = 1
ISPLIT = 0
INAST = 0
JSPUN = 0
JZPUN = 0
ZINNER = 2.5000
ZOUTER = 10.0000
SCALE = 2.0000
STACKX = 1.5000
PLTSZE = 11.0000
TOLLE = .0020
LEADING EDGE STATION NUMBER = 1
TRAILING EDGE STATION NUMBER = 6
RADII SPECIFYING DEVIATION = 5
RADII SPECIFYING INCIDENCE = 11
SENSE OF ROTATION INDICATOR = -1
DEVIATION CALCULATION INDEX = 2
IDELET = 0
IFLDEG = 1

SHAPE FACTOR = .7000
SOLIDITY TOLERANCE = .0100

DEVIATION CURVE 1 NUMBER OF POINTS = 6 RADIUS = 3.6250

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	.0000	.0000
2	.2000	.0600
3	.4000	.2000
4	.6000	.4300
5	.8000	.7000
6	1.0000	1.0000

DEVIATION CURVE 2 NUMBER OF POINTS = 6 RADIUS = 4.2125

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	.0000	.0000
2	.2000	.0600
3	.4000	.2000
4	.6000	.4300
5	.8000	.7000
6	1.0000	1.0000

DEVIATION CURVE 3 NUMBER OF POINTS = 6 RADIUS = 5.3875

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	.0000	.0000
2	.2000	.0000
3	.4000	.0700
4	.6000	.2500
5	.8000	.5800
6	1.0000	1.0000

DEVIATION CURVE 4 NUMBER OF POINTS = 6 RADIUS = 6.5625

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	.0000	.0000
2	.2000	.0000
3	.4000	.0000
4	.6000	.0850
5	.8000	.3600
6	1.0000	1.0000

DEVIATION CURVE 5 NUMBER OF POINTS = 6 RADIUS = 9.5000

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	.0000	.0000
2	.2000	.0000
3	.4000	.0000
4	.6000	.0850
5	.8000	.3600
6	1.0000	1.0000

INCIDENCE AND EXTRA DEVIATION DISTRIBUTION

INLET RADIUS	INCIDENCE	EXTRA DEVIATION
3.0000	2.000	4.000
3.6435	2.000	1.600
4.2874	2.000	.450
4.9351	2.000	.050
5.5856	2.000	.000
6.2371	2.000	.000
6.8907	2.000	.000
7.5438	2.000	.000
8.1982	2.000	.000
8.8507	2.000	.000
9.5000	2.000	.000

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STREAMSURFACE GEOMETRY SPECIFICATION

COMPUTING STATION 1 NUMBER OF DESCRIBING POINTS= 11 IFANGS(1)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
.0000	3.0000	1	3.0000	-34.9589
.0198	3.6435	2	3.6638	-42.7315
.0492	4.2874	3	4.3320	-47.2969
.0990	4.9351	4	4.9899	-51.2616
.1388	5.5856	5	5.6438	-54.6769
.2085	6.2371	6	6.2954	-57.6009
.2789	6.8907	7	6.9458	-60.0258
.3592	7.5438	8	7.5910	-61.9726

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.4497	8.1982	9	8.2311	-63.5641
.5701	8.8507	10	8.8653	-65.1148
.7000	9.5000	11	9.5000	-66.8754

COMPUTING STATION 2 NUMBER OF DESCRIBING POINTS= 11 IFANGS(2)= 1

DESCRIPTION X	DESCRIPTION R	STREAMLINE NUMBER	RADII	AIR ANGLE
.6000	3.1250	1	3.1250	-24.9395
.6127	3.7450	2	3.7872	-32.4511
.6255	4.3698	3	4.4300	-38.7246
.6540	5.0014	4	5.0681	-43.9814
.6692	5.6376	5	5.7060	-48.4545
.7067	6.2769	6	6.3460	-52.2649
.7432	6.9198	7	6.9886	-55.5457
.7851	7.5636	8	7.6285	-58.4330
.8326	8.2098	9	8.2594	-61.0099
.9036	8.8558	10	8.8793	-63.3073
.9800	9.5000	11	9.5000	-65.5174

COMPUTING STATION 3 NUMBER OF DESCRIBING POINTS= 11 IFANGS(3)= 1

DESCRIPTION X	DESCRIPTION R	STREAMLINE NUMBER	RADII	AIR ANGLE
1.2000	3.2500	1	3.2500	-14.1629
1.2055	3.8464	2	3.8843	-24.1876
1.2018	4.4522	3	4.5055	-32.0266
1.2090	5.0677	4	5.1284	-38.5020
1.1996	5.6896	5	5.7550	-43.8699
1.2049	6.3168	6	6.3870	-48.3918
1.2075	6.9488	7	7.0242	-52.3249
1.2109	7.5835	8	7.6604	-55.8880
1.2154	8.2215	9	8.2846	-59.1150
1.2371	8.8610	10	8.8937	-61.8697
1.2600	9.5000	11	9.5000	-64.0915

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COMPUTING STATION 4 NUMBER OF DESCRIBING POINTS= 11 IFANGS(4)= 1

DESCRIPTION X	DESCRIPTION R	STREAMLINE NUMBER	RADII	AIR ANGLE
1.8000	3.3750	1	3.3750	-5.5814
1.7984	3.9479	2	3.9709	-17.5447
1.7782	4.5345	3	4.5694	-27.1993
1.7641	5.1339	4	5.1792	-35.0358
1.7301	5.7417	5	5.7968	-41.2816
1.7032	6.3566	6	6.4220	-46.3680
1.6717	6.9779	7	7.0534	-50.6905
1.6368	7.6033	8	7.6846	-54.5613
1.5983	8.2331	9	8.3031	-58.0516
1.5706	8.8661	10	8.9054	-60.9160
1.5400	9.5000	11	9.5000	-62.9489

COMPUTING STATION 5 NUMBER OF DESCRIBING POINTS= 11 IFANGS(5)= 1

DESCRIPTION X	DESCRIPTION R	STREAMLINE NUMBER	RADII	AIR ANGLE
2.4000	3.5000	1	3.5000	2.3138
2.3912	4.0493	2	4.0522	-11.2310
2.3545	4.6169	3	4.6289	-23.1549
2.3191	5.2002	4	5.2271	-32.7952
2.2605	5.7937	5	5.8363	-40.1871
2.2014	6.3965	6	6.4539	-45.9124
2.1360	7.0069	7	7.0772	-50.5012
2.0626	7.6232	8	7.7004	-54.3418
1.9811	8.2448	9	8.3134	-57.6466
1.9041	8.8713	10	8.9129	-60.3388
1.8200	9.5000	11	9.5000	-62.0278

COMPUTING STATION 6 NUMBER OF DESCRIBING POINTS= 11 IFANGS(6)= 1

DESCRIPTION X	DESCRIPTION R	STREAMLINE NUMBER	RADII	AIR ANGLE
3.0000	3.6250	1	3.6250	10.3315
2.9841	4.1508	2	4.1366	-4.6063
2.9308	4.6993	3	4.6955	-19.1965
2.8741	5.2665	4	5.2806	-31.0597
2.7909	5.8457	5	5.8781	-39.9671
2.6996	6.4363	6	6.4845	-46.6154
2.6003	7.0360	7	7.0961	-51.5813
2.4885	7.6430	8	7.7082	-55.2424
2.3640	8.2564	9	8.3154	-57.9736
2.2376	8.8764	10	8.9145	-60.0779
2.1000	9.5000	11	9.5000	-61.5979

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SECTION GEOMETRY SPECIFICATIONS

STREAM LINE	SOLID MOD	LE RAD /CHORD	MAX TK /CHORD	TE THK /CHORD	PT OF MAX TK	X STAK OFFSET	Y STAK OFFSET
1.0	.000	.00500	.09750	.00500	.55000	.00000	.00000
2.0	.000	.00500	.09620	.00500	.55000	.00000	.00000
3.0	.000	.00500	.09270	.00500	.55000	.00000	.00000
4.0	.000	.00500	.08950	.00500	.55000	.00000	.00000
5.0	.000	.00500	.08430	.00500	.55000	.00000	.00000
6.0	.000	.00500	.08340	.00500	.55000	.00000	.00000
7.0	.000	.00500	.07970	.00500	.55000	.00000	.00000
8.0	.000	.00500	.07050	.00500	.55000	.00000	.00000
9.0	.000	.00500	.04750	.00500	.55000	.00000	.00000
10.0	.000	.00500	.02740	.00500	.55000	.00000	.00000
11.0	.000	.00500	.02550	.00500	.55000	.00000	.00000

STREAMSURFACE 1 ITERATION 1 DEVIATION = 11.273 SOLIDITY = 2.5619
ITERATION 2 DEVIATION = 11.369 SOLIDITY = 2.5224
ITERATION 2 DEVIATION = 11.369 SOLIDITY = 2.5224

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-32.95886	.91824	1.8436
2	.02222	-.01418	-32.12728	.92085	1.7880
3	.04444	-.02791	-31.27540	.92870	1.7247
4	.06667	-.04118	-30.39795	.94177	1.6547
5	.08889	-.05398	-29.48932	.96007	1.5793
6	.11111	-.06631	-28.54354	.98360	1.4998
7	.13333	-.07815	-27.55431	1.01236	1.4175
8	.15556	-.08949	-26.51495	1.04635	1.3339
9	.17778	-.10032	-25.41844	1.08557	1.2502
10	.20000	-.11061	-24.25735	1.13001	1.1677
11	.22222	-.12034	-23.02675	1.17184	1.0947
12	.24444	-.12949	-21.73308	1.20319	1.0369
13	.26667	-.13805	-20.38649	1.22408	.9919
14	.28889	-.14601	-18.99814	1.23449	.9583
15	.31111	-.15335	-17.58025	1.23444	.9351
16	.33333	-.16009	-16.14600	1.22391	.9219
17	.35556	-.16622	-14.70943	1.20291	.9187
18	.37778	-.17176	-13.28534	1.17145	.9260
19	.40000	-.17672	-11.88909	1.12951	.9449
20	.42222	-.18112	-10.53315	1.08511	.9698
21	.44444	-.18499	-9.21681	1.04627	.9938
22	.46667	-.18834	-7.93564	1.01299	1.0161
23	.48889	-.19119	-6.68475	.98526	1.0360
24	.51111	-.19355	-5.45890	.96308	1.0526
25	.53333	-.19544	-4.25259	.94646	1.0653
26	.55556	-.19686	-3.06007	.93539	1.0737
27	.57778	-.19782	-1.87543	.92988	1.0771
28	.60000	-.19832	-.69267	.92993	1.0756
29	.62222	-.19836	.49348	.93364	1.0712
30	.64444	-.19793	1.68505	.93912	1.0662
31	.66667	-.19705	2.88326	.94638	1.0607
32	.68889	-.19569	4.08928	.95542	1.0547
33	.71111	-.19387	5.30421	.96623	1.0484

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
34	.73333	-.19157	6.52908	.97882	1.0418
35	.75556	-.18878	7.76483	.99319	1.0351
36	.77778	-.18550	9.01230	1.00933	1.0284
37	.80000	-.18173	10.27220	1.02724	1.0218
38	.82222	-.17745	11.54435	1.04500	1.0174
39	.84444	-.17265	12.82529	1.06067	1.0170
40	.86667	-.16733	14.11084	1.07425	1.0205
41	.88889	-.16147	15.39690	1.08574	1.0278
42	.91111	-.15508	16.67945	1.09514	1.0388
43	.93333	-.14815	17.95467	1.10246	1.0536
44	.95556	-.14068	19.21887	1.10768	1.0723
45	.97778	-.13266	20.46859	1.11081	1.0948
46	1.00000	-.12409	21.70058	1.11186	1.1213

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-32.95886
2	.20000	-24.25734
3	.40000	-11.88907
4	.60000	-.69265
5	.80000	10.27224
6	1.00000	21.70058

1 STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 1

BETA1 =-32.959 (BLADE INLET ANGLE)
BETA2 = 21.701 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .09750 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 3.0644 (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY

BLADE CHORD = 1.0058

STAGGER ANGLE = -7.074

CAMBER ANGLE =-54.659

SECTION AREA = .06961
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .50914
YBAR = -.16320

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .00015
IY = .00386
IXY = -.00044

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS = -6.710

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .00010 (AT -6.710 WITH (X) AXIS)
IPY = .00391 (AT -6.710 WITH (Y) AXIS)

	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
	1	.00503	.00000	-32.959	.01006	.00776	.00422	.00229	-.004
=> 22									
	2	.02710	-.01408	-32.127	.01607	.03137	-.00728	.02282	-.020
=> 89									
	3	.04917	-.02772	-31.275	.02201	.05488	-.01831	.04345	-.037
=> 12									
	4	.07124	-.04089	-30.398	.02784	.07828	-.02889	.06419	-.052
=> 90									
	5	.09331	-.05361	-29.489	.03355	.10156	-.03900	.08505	-.068
=> 21									
	6	.11537	-.06585	-28.544	.03913	.12472	-.04867	.10603	-.083
=> 04									
	7	.13744	-.07761	-27.554	.04453	.14774	-.05787	.12715	-.097
=> 35									
	8	.15951	-.08888	-26.515	.04975	.17062	-.06662	.14841	-.111
=> 13									
	9	.18158	-.09963	-25.418	.05477	.19334	-.07489	.16983	-.124
=> 36									
	10	.20365	-.10984	-24.257	.05958	.21589	-.08269	.19141	-.137
=> 00									
	11	.22572	-.11951	-23.027	.06416	.23827	-.08999	.21317	-.149
=> 03									
	12	.24779	-.12860	-21.733	.06849	.26047	-.09679	.23511	-.160
=> 41									
	13	.26986	-.13710	-20.386	.07257	.28250	-.10309	.25722	-.171
=> 11									

1

POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
14	.29193	-.14500	-18.998	.07638	.30436	-.10889	.27950	-.181
=> 11								
15	.31400	-.15229	-17.580	.07992	.32607	-.11420	.30193	-.190
=> 39								
16	.33607	-.15898	-16.146	.08317	.34763	-.11904	.32450	-.198
=> 93								
17	.35814	-.16508	-14.709	.08613	.36907	-.12342	.34720	-.206
=> 73								
18	.38020	-.17058	-13.285	.08878	.39041	-.12737	.37000	-.213
=> 78								
19	.40227	-.17550	-11.889	.09112	.41166	-.13092	.39289	-.220
=> 09								
20	.42434	-.17988	-10.533	.09314	.43286	-.13409	.41583	-.225
=> 66								
21	.44641	-.18372	-9.217	.09483	.45401	-.13691	.43882	-.230
=> 52								
22	.46848	-.18704	-7.936	.09618	.47512	-.13941	.46184	-.234
=> 67								

	23	.49055	-.18987	-6.685	.09718	.49621	-.14162	.48489	-.238
=> 13									
	24	.51262	-.19222	-5.459	.09780	.51727	-.14354	.50797	-.240
=> 90									
	25	.53469	-.19410	-4.253	.09806	.53832	-.14520	.53105	-.242
=> 99									
	26	.55676	-.19551	-3.060	.09792	.55937	-.14662	.55414	-.244
=> 40									
	27	.57883	-.19646	-1.875	.09739	.58042	-.14779	.57723	-.245
=> 13									
	28	.60090	-.19695	-.693	.09647	.60148	-.14872	.60031	-.245
=> 19									
	29	.62297	-.19699	.493	.09517	.62256	-.14941	.62337	-.244
=> 57									
	30	.64503	-.19657	1.685	.09347	.64366	-.14986	.64641	-.243
=> 29									
	31	.66710	-.19569	2.883	.09138	.66480	-.15006	.66940	-.241
=> 32									
	32	.68917	-.19435	4.089	.08890	.68600	-.15001	.69234	-.238
=> 68									
	33	.71124	-.19253	5.304	.08603	.70727	-.14970	.71522	-.235
=> 36									
	34	.73331	-.19025	6.529	.08275	.72861	-.14914	.73802	-.231
=> 36									
	35	.75538	-.18748	7.765	.07908	.75004	-.14830	.76072	-.226
=> 66									
	36	.77745	-.18423	9.012	.07500	.77158	-.14719	.78332	-.221
=> 26									
	37	.79952	-.18048	10.272	.07050	.79323	-.14579	.80580	-.215
=> 16									
	38	.82159	-.17622	11.544	.06559	.81502	-.14409	.82815	-.208
=> 35									
	39	.84366	-.17146	12.825	.06025	.83697	-.14209	.85034	-.200
=> 83									
	40	.86573	-.16617	14.111	.05447	.85909	-.13976	.87237	-.192
=> 59									
	41	.88779	-.16036	15.397	.04825	.88139	-.13710	.89420	-.183
=> 62									
	42	.90986	-.15402	16.679	.04157	.90390	-.13411	.91583	-.173
=> 93									
	43	.93193	-.14713	17.955	.03442	.92663	-.13076	.93724	-.163
=> 51									
	44	.95400	-.13971	19.219	.02680	.94959	-.12706	.95841	-.152
=> 36									
	45	.97607	-.13175	20.469	.01868	.97281	-.12300	.97934	-.140
=> 50									
	46	.99814	-.12324	21.701	.01006	.99628	-.11856	1.00000	-.127
=> 91									

1 NORMALISED PLOT OF SECTION NUMBER

=> 1

1 DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
****

BLADE CHORD = 3.08206E+00

L.E.RADIUS = 1.54103E-02 CENTERED AT X= -1.5448E+00 Y= 5.0010E-01

SECTION AREA= 6.53703E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.34447E-02
IY = 3.40031E-01
IXY =-3.89643E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 8.86027E-03 (AT -6.710 WITH (X) AXIS)
IPY = 3.44616E-01 (AT -6.710 WITH (Y) AXIS)

PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
1	-1.53642E+00	5.13028E-01	-1.55318E+00	4.87168E-01
2	-1.46408E+00	4.77792E-01	-1.49027E+00	4.36085E-01
3	-1.39204E+00	4.43982E-01	-1.42705E+00	3.86345E-01
4	-1.32033E+00	4.11580E-01	-1.36350E+00	3.37990E-01
5	-1.24898E+00	3.80575E-01	-1.29959E+00	2.91070E-01
6	-1.17801E+00	3.50965E-01	-1.23530E+00	2.45641E-01
7	-1.10747E+00	3.22747E-01	-1.17059E+00	2.01779E-01
8	-1.03737E+00	2.95949E-01	-1.10543E+00	1.59542E-01
9	-9.67750E-01	2.70593E-01	-1.03979E+00	1.19008E-01
10	-8.98637E-01	2.46713E-01	-9.73644E-01	8.02622E-02
11	-8.30059E-01	2.24344E-01	-9.06964E-01	4.34015E-02
12	-7.62025E-01	2.03499E-01	-8.39740E-01	8.53652E-03
13	-6.94521E-01	1.84194E-01	-7.71986E-01	-2.42543E-02
14	-6.27527E-01	1.66416E-01	-7.03722E-01	-5.48958E-02
15	-5.61010E-01	1.50137E-01	-6.34981E-01	-8.33277E-02
16	-4.94929E-01	1.35311E-01	-5.65805E-01	-1.09507E-01
17	-4.29230E-01	1.21878E-01	-4.96246E-01	-1.33400E-01
18	-3.63849E-01	1.09771E-01	-4.26369E-01	-1.55008E-01
19	-2.98716E-01	9.89066E-02	-3.56244E-01	-1.74340E-01
20	-2.33762E-01	8.91928E-02	-2.85940E-01	-1.91428E-01
21	-1.68948E-01	8.05415E-02	-2.15495E-01	-2.06316E-01
22	-1.04247E-01	7.28740E-02	-1.44939E-01	-2.19041E-01
23	-3.96320E-02	6.61234E-02	-7.42960E-02	-2.29637E-01
24	2.49212E-02	6.02286E-02	-3.59114E-03	-2.38126E-01
25	8.94350E-02	5.51372E-02	6.71530E-02	-2.44522E-01
26	1.53932E-01	5.08067E-02	1.37914E-01	-2.48833E-01
27	2.18435E-01	4.72180E-02	2.08668E-01	-2.51073E-01
28	2.82968E-01	4.43652E-02	2.79394E-01	-2.51252E-01
29	3.47554E-01	4.22497E-02	3.50066E-01	-2.49373E-01
30	4.12227E-01	4.08784E-02	4.20650E-01	-2.45431E-01
31	4.77025E-01	4.02613E-02	4.91111E-01	-2.39420E-01
32	5.41983E-01	4.04105E-02	5.61410E-01	-2.31330E-01
33	6.07141E-01	4.13426E-02	6.31511E-01	-2.21151E-01
34	6.72537E-01	4.30771E-02	7.01372E-01	-2.08870E-01
35	7.38213E-01	4.56368E-02	7.70954E-01	-1.94471E-01

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PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
36	8.04212E-01	4.90478E-02	8.40213E-01	-1.77939E-01
37	8.70578E-01	5.33353E-02	9.09105E-01	-1.59248E-01
38	9.37359E-01	5.85358E-02	9.77582E-01	-1.38383E-01
39	1.00461E+00	6.46849E-02	1.04559E+00	-1.15326E-01
40	1.07238E+00	7.18167E-02	1.11308E+00	-9.00636E-02
41	1.14073E+00	7.99631E-02	1.17999E+00	-6.25880E-02
42	1.20971E+00	8.91421E-02	1.24627E+00	-3.28819E-02
43	1.27936E+00	9.93899E-02	1.31187E+00	-9.53495E-04
44	1.34973E+00	1.10731E-01	1.37676E+00	3.31952E-02
45	1.42087E+00	1.23184E-01	1.44088E+00	6.95597E-02
46	1.49280E+00	1.36768E-01	1.50420E+00	1.08132E-01

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-1.55318E+00	4.87168E-01
2	-1.55449E+00	4.88115E-01
3	-1.55569E+00	4.89193E-01
4	-1.55677E+00	4.90391E-01
5	-1.55772E+00	4.91695E-01
6	-1.55853E+00	4.93092E-01
7	-1.55918E+00	4.94565E-01
8	-1.55968E+00	4.96099E-01
9	-1.56002E+00	4.97676E-01
10	-1.56019E+00	4.99280E-01
11	-1.56019E+00	5.00893E-01
12	-1.56002E+00	5.02497E-01
13	-1.55969E+00	5.04076E-01
14	-1.55919E+00	5.05610E-01
15	-1.55854E+00	5.07084E-01
16	-1.55773E+00	5.08482E-01
17	-1.55678E+00	5.09787E-01
18	-1.55571E+00	5.10987E-01
19	-1.55451E+00	5.12067E-01
20	-1.55320E+00	5.13016E-01
21	-1.55181E+00	5.13823E-01
22	-1.55033E+00	5.14481E-01
23	-1.54880E+00	5.14980E-01
24	-1.54722E+00	5.15317E-01
25	-1.54562E+00	5.15486E-01
26	-1.54401E+00	5.15487E-01
27	-1.54240E+00	5.15320E-01
28	-1.54082E+00	5.14986E-01
29	-1.53929E+00	5.14488E-01
30	-1.53781E+00	5.13833E-01
31	-1.53642E+00	5.13028E-01

LEADING EDGE AXIAL DIFFERENCE = .0272 NEW DELX = -.0272

1

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-32.95886	.91824	1.8436
2	.02222	-.01418	-32.12728	.92085	1.7880
3	.04444	-.02791	-31.27540	.92870	1.7247
4	.06667	-.04118	-30.39795	.94177	1.6547
5	.08889	-.05398	-29.48932	.96007	1.5793
6	.11111	-.06631	-28.54354	.98360	1.4998
7	.13333	-.07815	-27.55431	1.01236	1.4175
8	.15556	-.08949	-26.51495	1.04635	1.3339
9	.17778	-.10032	-25.41844	1.08557	1.2502
10	.20000	-.11061	-24.25738	1.13001	1.1677
11	.22222	-.12034	-23.02675	1.17184	1.0947
12	.24444	-.12949	-21.73308	1.20319	1.0369
13	.26667	-.13805	-20.38649	1.22408	.9919
14	.28889	-.14601	-18.99814	1.23449	.9583
15	.31111	-.15335	-17.58025	1.23444	.9351
16	.33333	-.16009	-16.14600	1.22391	.9219
17	.35556	-.16622	-14.70943	1.20291	.9187
18	.37778	-.17176	-13.28534	1.17145	.9260
19	.40000	-.17672	-11.88909	1.12951	.9449
20	.42222	-.18112	-10.53315	1.08511	.9698
21	.44444	-.18499	-9.21681	1.04627	.9938
22	.46667	-.18834	-7.93564	1.01299	1.0161
23	.48889	-.19119	-6.68475	.98526	1.0360
24	.51111	-.19355	-5.45890	.96308	1.0526
25	.53333	-.19544	-4.25259	.94646	1.0653
26	.55556	-.19686	-3.06007	.93539	1.0737
27	.57778	-.19782	-1.87543	.92988	1.0771
28	.60000	-.19832	-.69267	.92993	1.0756
29	.62222	-.19836	.49348	.93364	1.0712
30	.64444	-.19793	1.68505	.93912	1.0662
31	.66667	-.19705	2.88326	.94638	1.0607
32	.68889	-.19569	4.08928	.95542	1.0547
33	.71111	-.19387	5.30421	.96623	1.0484
34	.73333	-.19157	6.52908	.97882	1.0418
35	.75556	-.18878	7.76483	.99319	1.0351
36	.77778	-.18550	9.01230	1.00933	1.0284
37	.80000	-.18173	10.27220	1.02724	1.0218
38	.82222	-.17745	11.54435	1.04500	1.0174
39	.84444	-.17265	12.82529	1.06067	1.0170
40	.86667	-.16733	14.11084	1.07425	1.0205
41	.88889	-.16147	15.39690	1.08574	1.0278
42	.91111	-.15508	16.67945	1.09514	1.0388
43	.93333	-.14815	17.95467	1.10246	1.0536
44	.95556	-.14068	19.21887	1.10768	1.0723
45	.97778	-.13266	20.46859	1.11081	1.0948
46	1.00000	-.12409	21.70058	1.11186	1.1213

1

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-32.95886
2	.20000	-24.25734
3	.40000	-11.88907
4	.60000	-.69265
5	.80000	10.27224
6	1.00000	21.70058

CARTESIAN COORDINATES ON STREAMSURFACE 1

POINT	Z1	X1	Y1	Z2	X2	Y2
1	2.96238	-1.47747	.50248	2.96318	-1.49388	.47665
2	2.98272	-1.40665	.46954	2.98362	-1.43229	.42763
3	3.00239	-1.33612	.43783	3.00307	-1.37040	.37991
4	3.02144	-1.26592	.40725	3.02163	-1.30818	.33332
5	3.03993	-1.19607	.37782	3.03939	-1.24562	.28795
6	3.05788	-1.12659	.34957	3.05640	-1.18268	.24386
7	3.07532	-1.05753	.32244	3.07273	-1.11933	.20110
8	3.09229	-.98891	.29653	3.08847	-1.05553	.15977
9	3.10881	-.92075	.27189	3.10367	-.99128	.11999
10	3.12490	-.85309	.24859	3.11840	-.92652	.08184
11	3.14059	-.78596	.22661	3.13274	-.86125	.04546
12	3.15592	-.71935	.20599	3.14677	-.79543	.01095
13	3.17091	-.65327	.18679	3.16053	-.72910	-.02164
14	3.18558	-.58768	.16904	3.17410	-.66228	-.05219
15	3.19999	-.52256	.15273	3.18753	-.59498	-.08062
16	3.21416	-.45787	.13777	3.20087	-.52726	-.10685
17	3.22812	-.39355	.12411	3.21418	-.45916	-.13086
18	3.24192	-.32955	.11173	3.22748	-.39075	-.15270
19	3.25558	-.26578	.10056	3.24082	-.32210	-.17231
20	3.26912	-.20219	.09051	3.25421	-.25327	-.18972
21	3.28258	-.13874	.08149	3.26768	-.18431	-.20491
22	3.29597	-.07540	.07341	3.28126	-.11524	-.21803
23	3.30931	-.01214	.06624	3.29495	-.04608	-.22908
24	3.32260	.05105	.05992	3.30877	.02314	-.23804
25	3.33585	.11421	.05440	3.32274	.09240	-.24489
26	3.34908	.17735	.04963	3.33686	.16167	-.24962
27	3.36230	.24050	.04554	3.35112	.23094	-.25241
28	3.37550	.30367	.04221	3.36553	.30018	-.25314
29	3.38871	.36690	.03964	3.38009	.36936	-.25177
30	3.40192	.43022	.03785	3.39478	.43846	-.24827
31	3.41515	.49365	.03685	3.40959	.50744	-.24274
32	3.42840	.55725	.03655	3.42449	.57626	-.23517
33	3.44168	.62103	.03705	3.43947	.64489	-.22545
34	3.45501	.68505	.03840	3.45451	.71328	-.21354
35	3.46838	.74935	.04063	3.46956	.78140	-.19948
36	3.48180	.81396	.04378	3.48460	.84921	-.18325

37	3.49528	.87893	.04782	3.49959	.91665	-.16484
38	3.50883	.94431	.05283	3.51448	.98369	-.14415
39	3.52246	1.01015	.05884	3.52923	1.05027	-.12117
40	3.53616	1.07649	.06590	3.54377	1.11633	-.09591
41	3.54994	1.14341	.07410	3.55806	1.18184	-.06836
42	3.56380	1.21093	.08339	3.57203	1.24672	-.03854
43	3.57775	1.27912	.09384	3.58561	1.31095	-.00638
44	3.59179	1.34801	.10547	3.59874	1.37447	.02812
45	3.60590	1.41765	.11835	3.61134	1.43725	.06494
46	3.62009	1.48808	.13263	3.62334	1.49924	.10421

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POINT	ZSEMI	XSEMI	YSEMI
1	2.96318	-1.49388	.47665
2	2.96277	-1.49516	.47756
3	2.96235	-1.49633	.47860
4	2.96194	-1.49739	.47976
5	2.96154	-1.49832	.48103
6	2.96115	-1.49911	.48239
7	2.96078	-1.49976	.48384
8	2.96043	-1.50024	.48534
9	2.96011	-1.50057	.48689
10	2.95981	-1.50074	.48847
11	2.95955	-1.50074	.49006
12	2.95932	-1.50058	.49165
13	2.95913	-1.50025	.49321
14	2.95898	-1.49976	.49473
15	2.95887	-1.49912	.49620
16	2.95880	-1.49833	.49759
17	2.95877	-1.49741	.49890
18	2.95879	-1.49635	.50010
19	2.95886	-1.49518	.50119
20	2.95896	-1.49390	.50215
21	2.95911	-1.49253	.50298
22	2.95930	-1.49109	.50365
23	2.95953	-1.48959	.50417
24	2.95980	-1.48805	.50453
25	2.96009	-1.48648	.50473
26	2.96042	-1.48490	.50476
27	2.96078	-1.48333	.50463
28	2.96116	-1.48178	.50433
29	2.96155	-1.48028	.50386
30	2.96196	-1.47884	.50325
31	2.96238	-1.47747	.50248

STREAMSURFACE 2 ITERATION 1 DEVIATION = 8.881 SOLIDITY = 2.2746
ITERATION 2 DEVIATION = 9.053 SOLIDITY = 2.2080
ITERATION 2 DEVIATION = 9.053 SOLIDITY = 2.2080

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-40.73150	1.20531	1.9067
2	.02222	-.01884	-39.83870	1.20456	1.8337
3	.04444	-.03708	-38.92322	1.20233	1.7663
4	.06667	-.05473	-37.98584	1.19860	1.7040
5	.08889	-.07179	-37.02752	1.19339	1.6468
6	.11111	-.08826	-36.04935	1.18668	1.5944
7	.13333	-.10414	-35.05261	1.17849	1.5467
8	.15556	-.11944	-34.03875	1.16881	1.5036
9	.17778	-.13416	-33.00940	1.15763	1.4649
10	.20000	-.14831	-31.96638	1.14497	1.4304
11	.22222	-.16190	-30.91173	1.13063	1.4005
12	.24444	-.17493	-29.84798	1.11436	1.3753
13	.26667	-.18741	-28.77792	1.09616	1.3548
14	.28889	-.19934	-27.70458	1.07604	1.3391
15	.31111	-.21075	-26.63116	1.05399	1.3283
16	.33333	-.22163	-25.56104	1.03001	1.3224

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
17	.35556	-.23201	-24.49776	1.00411	1.3217
18	.37778	-.24189	-23.44499	.97628	1.3265
19	.40000	-.25129	-22.40652	.94651	1.3371
20	.42222	-.26022	-21.38547	.91699	1.3508
21	.44444	-.26870	-20.38135	.89046	1.3634
22	.46667	-.27674	-19.39231	.86695	1.3744
23	.48889	-.28435	-18.41634	.84646	1.3832
24	.51111	-.29154	-17.45117	.82898	1.3895
25	.53333	-.29832	-16.49437	.81452	1.3927
26	.55556	-.30470	-15.54333	.80307	1.3925
27	.57778	-.31068	-14.59528	.79463	1.3886
28	.60000	-.31627	-13.64732	.78921	1.3808
29	.62222	-.32147	-12.69677	.78591	1.3705
30	.64444	-.32629	-11.74242	.78370	1.3596
31	.66667	-.33071	-10.78348	.78257	1.3480
32	.68889	-.33475	-9.81912	.78252	1.3358
33	.71111	-.33841	-8.84849	.78355	1.3229
34	.73333	-.34167	-7.87075	.78567	1.3095
35	.75556	-.34455	-6.88504	.78887	1.2955
36	.77778	-.34704	-5.89050	.79315	1.2810
37	.80000	-.34913	-4.88630	.79851	1.2661
38	.82222	-.35084	-3.87194	.80411	1.2522
39	.84444	-.35214	-2.84846	.80904	1.2406
40	.86667	-.35305	-1.81730	.81332	1.2314
41	.88889	-.35355	-.77993	.81694	1.2244
42	.91111	-.35365	.26214	.81991	1.2197
43	.93333	-.35335	1.30739	.82221	1.2172
44	.95556	-.35264	2.35427	.82386	1.2169
45	.97778	-.35152	3.40126	.82484	1.2188
46	1.00000	-.34999	4.44682	.82517	1.2229

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-40.73150
2	.20166	-31.88780
3	.40145	-22.33957
4	.60084	-13.61126
5	.80023	-4.87591
6	1.00000	4.44682

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STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 2
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BETA1 =-40.731 (BLADE INLET ANGLE)
BETA2 = 4.447 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .09620 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 3.0030 (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
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BLADE CHORD = 1.0587

STAGGER ANGLE =-19.290

CAMBER ANGLE =-45.178

SECTION AREA = .07501
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .49457
YBAR = -.25935

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .00057
IY = .00412
IXY = -.00139

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS =-19.071

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .00009 (AT-19.071 WITH (X) AXIS)
IPY = .00460 (AT-19.071 WITH (Y) AXIS)

	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
	1	.00529	.00000	-40.732	.01059	.00875	.00401	.00184	-.004
=> 01	2	.02739	-.01873	-39.839	.01724	.03291	-.01211	.02187	-.025
=> 35	3	.04948	-.03687	-38.923	.02378	.05695	-.02762	.04201	-.046
=> 12	4	.07158	-.05442	-37.986	.03017	.08087	-.04253	.06229	-.066
=> 31	5	.09368	-.07138	-37.028	.03641	.10464	-.05685	.08271	-.085
=> 91	6	.11577	-.08775	-36.049	.04245	.12826	-.07059	.10328	-.104
=> 91	7	.13787	-.10354	-35.053	.04827	.15173	-.08379	.12401	-.123
=> 30	8	.15996	-.11876	-34.039	.05386	.17504	-.09644	.14489	-.141
=> 07	9	.18206	-.13340	-33.009	.05921	.19819	-.10857	.16593	-.158
=> 22	10	.20415	-.14747	-31.966	.06430	.22117	-.12019	.18713	-.174
=> 74	11	.22625	-.16098	-30.912	.06912	.24400	-.13133	.20849	-.190

=> 63	12	.24834	-.17393	-29.848	.07364	.26667	-.14199	.23002	-.205
=> 87	13	.27044	-.18634	-28.778	.07786	.28918	-.15221	.25170	-.220

=> 46

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	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
	14	.29253	-.19821	-27.705	.08178	.31155	-.16200	.27352	-.234
=> 41	15	.31463	-.20955	-26.631	.08538	.33377	-.17138	.29549	-.247
=> 71	16	.33673	-.22037	-25.561	.08865	.35585	-.18038	.31760	-.260
=> 35	17	.35882	-.23069	-24.498	.09157	.37781	-.18902	.33983	-.272
=> 35	18	.38092	-.24051	-23.445	.09415	.39965	-.19732	.36219	-.283
=> 70	19	.40301	-.24985	-22.407	.09638	.42138	-.20530	.38464	-.294
=> 41	20	.42511	-.25873	-21.385	.09824	.44302	-.21300	.40720	-.304
=> 47	21	.44720	-.26716	-20.381	.09972	.46457	-.22042	.42984	-.313
=> 90	22	.46930	-.27516	-19.392	.10082	.48604	-.22761	.45256	-.322
=> 71	23	.49139	-.28272	-18.416	.10153	.50743	-.23456	.47536	-.330
=> 89	24	.51349	-.28987	-17.451	.10184	.52876	-.24130	.49822	-.338
=> 45	25	.53558	-.29662	-16.494	.10173	.55003	-.24784	.52114	-.345
=> 39	26	.55768	-.30296	-15.543	.10122	.57124	-.25420	.54412	-.351
=> 72	27	.57978	-.30891	-14.595	.10030	.59241	-.26038	.56714	-.357
=> 44	28	.60187	-.31447	-13.647	.09899	.61355	-.26637	.59019	-.362
=> 57	29	.62397	-.31964	-12.697	.09728	.63466	-.27219	.61328	-.367
=> 09	30	.64606	-.32443	-11.742	.09519	.65575	-.27783	.63638	-.371
=> 02	31	.66816	-.32883	-10.783	.09271	.67683	-.28329	.65948	-.374
=> 36	32	.69025	-.33284	-9.819	.08985	.69791	-.28858	.68259	-.377
=> 11	33	.71235	-.33648	-8.848	.08661	.71901	-.29369	.70569	-.379
=> 26	34	.73444	-.33972	-7.871	.08299	.74013	-.29862	.72876	-.380
=> 83	35	.75654	-.34258	-6.885	.07901	.76127	-.30337	.75180	-.381
=> 80	36	.77863	-.34506	-5.891	.07464	.78247	-.30793	.77480	-.382
=> 18	37	.80073	-.34714	-4.886	.06991	.80371	-.31231	.79775	-.381
=> 97	38	.82283	-.34883	-3.872	.06481	.82501	-.31650	.82064	-.381
=> 17	39	.84492	-.35013	-2.848	.05934	.84640	-.32050	.84345	-.379
=> 77	40	.86702	-.35103	-1.817	.05350	.86787	-.32430	.86617	-.377
=> 77	41	.88911	-.35153	-.780	.04728	.88943	-.32789	.88879	-.375
=> 17	42	.91121	-.35163	.262	.04070	.91111	-.33128	.91130	-.371
=> 98	43	.93330	-.35133	1.307	.03374	.93292	-.33447	.93369	-.368
=> 20	44	.95540	-.35062	2.354	.02640	.95486	-.33743	.95594	-.363
=> 81	45	.97749	-.34951	3.401	.01869	.97694	-.34019	.97805	-.358
=> 84	46	.99959	-.34800	4.447	.01059	.99918	-.34272	1.00000	-.353

=> 28

1 NORMALISED PLOT OF SECTION NUMBER

=> 2

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DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
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BLADE CHORD = 3.17940E+00

L.E.RADIUS = 1.58970E-02 CENTERED AT X= -1.4693E+00 Y= 7.7883E-01

SECTION AREA= 6.76473E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 4.64142E-02
IY = 3.35137E-01
IXY =-1.13364E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 7.22290E-03 (AT-19.071 WITH (X) AXIS)
IPY = 3.74329E-01 (AT-19.071 WITH (Y) AXIS)

PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
1	-1.45893E+00	7.90875E-01	-1.47967E+00	7.66783E-01
2	-1.38636E+00	7.42458E-01	-1.41953E+00	7.02704E-01
3	-1.31416E+00	6.95886E-01	-1.35902E+00	6.40332E-01
4	-1.24235E+00	6.51120E-01	-1.29813E+00	5.79700E-01
5	-1.17097E+00	6.08118E-01	-1.23680E+00	5.20838E-01
6	-1.10003E+00	5.66836E-01	-1.17504E+00	4.63775E-01
7	-1.02956E+00	5.27211E-01	-1.11280E+00	4.08554E-01
8	-9.59558E-01	4.89213E-01	-1.05009E+00	3.55182E-01
9	-8.90040E-01	4.52789E-01	-9.86906E-01	3.03681E-01
10	-8.21005E-01	4.17887E-01	-9.23234E-01	2.54072E-01
11	-7.52452E-01	3.84452E-01	-8.59080E-01	2.06372E-01
12	-6.84381E-01	3.52416E-01	-7.94444E-01	1.60608E-01
13	-6.16774E-01	3.21730E-01	-7.29344E-01	1.16779E-01
14	-5.49616E-01	2.92331E-01	-6.63796E-01	7.48940E-02
15	-4.82888E-01	2.64156E-01	-5.97817E-01	3.49593E-02
16	-4.16567E-01	2.37136E-01	-5.31431E-01	-3.02313E-03
17	-3.50630E-01	2.11197E-01	-4.64662E-01	-3.90489E-02
18	-2.85044E-01	1.86275E-01	-3.97541E-01	-7.31312E-02
19	-2.19778E-01	1.62297E-01	-3.30101E-01	-1.05279E-01
20	-1.54800E-01	1.39190E-01	-2.62372E-01	-1.35507E-01
21	-9.00851E-02	1.16887E-01	-1.94380E-01	-1.63834E-01
22	-2.56138E-02	9.53229E-02	-1.26145E-01	-1.90273E-01
23	3.86360E-02	7.44445E-02	-5.76878E-02	-2.14840E-01
24	1.02684E-01	5.42000E-02	1.09709E-02	-2.37544E-01
25	1.66551E-01	3.45443E-02	7.98108E-02	-2.58391E-01
26	2.30261E-01	1.54516E-02	1.48808E-01	-2.77399E-01
27	2.93839E-01	-3.09070E-03	2.17936E-01	-2.94588E-01
28	3.57311E-01	-2.10928E-02	2.87171E-01	-3.09973E-01
29	4.20700E-01	-3.85603E-02	3.56488E-01	-3.23565E-01
30	4.84035E-01	-5.54964E-02	4.25860E-01	-3.35370E-01
31	5.47346E-01	-7.19026E-02	4.95256E-01	-3.45393E-01
32	6.10661E-01	-8.77767E-02	5.64647E-01	-3.53641E-01
33	6.74012E-01	-1.03118E-01	6.34004E-01	-3.60113E-01
34	7.37426E-01	-1.17924E-01	7.03296E-01	-3.64810E-01
35	8.00935E-01	-1.32188E-01	7.72493E-01	-3.67732E-01

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PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
36	8.64570E-01	-1.45902E-01	8.41565E-01	-3.68877E-01
37	9.28363E-01	-1.59055E-01	9.10479E-01	-3.68243E-01
38	9.92346E-01	-1.71638E-01	9.79203E-01	-3.65825E-01
39	1.05656E+00	-1.83639E-01	1.04770E+00	-3.61618E-01
40	1.12103E+00	-1.95045E-01	1.11593E+00	-3.55620E-01
41	1.18580E+00	-2.05845E-01	1.18387E+00	-3.47829E-01
42	1.25091E+00	-2.16028E-01	1.25147E+00	-3.38247E-01
43	1.31639E+00	-2.25582E-01	1.31870E+00	-3.26875E-01
44	1.38227E+00	-2.34498E-01	1.38552E+00	-3.13717E-01
45	1.44858E+00	-2.42764E-01	1.45191E+00	-2.98780E-01
46	1.51537E+00	-2.50371E-01	1.51783E+00	-2.82069E-01

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-1.47967E+00	7.66783E-01
2	-1.48087E+00	7.67933E-01
3	-1.48195E+00	7.69202E-01
4	-1.48289E+00	7.70578E-01
5	-1.48368E+00	7.72043E-01
6	-1.48431E+00	7.73583E-01
7	-1.48477E+00	7.75180E-01
8	-1.48507E+00	7.76818E-01
9	-1.48519E+00	7.78477E-01
10	-1.48514E+00	7.80140E-01
11	-1.48492E+00	7.81789E-01
12	-1.48452E+00	7.83405E-01
13	-1.48396E+00	7.84972E-01
14	-1.48324E+00	7.86471E-01
15	-1.48236E+00	7.87886E-01
16	-1.48135E+00	7.89202E-01
17	-1.48020E+00	7.90404E-01
18	-1.47893E+00	7.91480E-01
19	-1.47755E+00	7.92417E-01
20	-1.47609E+00	7.93205E-01
21	-1.47455E+00	7.93835E-01
22	-1.47295E+00	7.94302E-01
23	-1.47131E+00	7.94598E-01
24	-1.46965E+00	7.94722E-01
25	-1.46799E+00	7.94672E-01
26	-1.46634E+00	7.94448E-01
27	-1.46472E+00	7.94053E-01
28	-1.46316E+00	7.93491E-01
29	-1.46166E+00	7.92769E-01
30	-1.46024E+00	7.91894E-01
31	-1.45893E+00	7.90875E-01

LEADING EDGE AXIAL DIFFERENCE = -.0177 NEW DELX = .0177

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POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-40.73150	1.20531	1.9067
2	.02222	-.01884	-39.83870	1.20456	1.8337
3	.04444	-.03708	-38.92322	1.20233	1.7663
4	.06667	-.05473	-37.98584	1.19860	1.7040
5	.08889	-.07179	-37.02752	1.19339	1.6468
6	.11111	-.08826	-36.04935	1.18668	1.5944
7	.13333	-.10414	-35.05261	1.17849	1.5467
8	.15556	-.11944	-34.03875	1.16881	1.5036
9	.17778	-.13416	-33.00940	1.15763	1.4649
10	.20000	-.14831	-31.96638	1.14497	1.4304
11	.22222	-.16190	-30.91173	1.13063	1.4005
12	.24444	-.17493	-29.84798	1.11436	1.3753
13	.26667	-.18741	-28.77792	1.09616	1.3548
14	.28889	-.19934	-27.70458	1.07604	1.3391
15	.31111	-.21075	-26.63116	1.05399	1.3283
16	.33333	-.22163	-25.56104	1.03001	1.3224
17	.35556	-.23201	-24.49776	1.00411	1.3217
18	.37778	-.24189	-23.44499	.97628	1.3265
19	.40000	-.25129	-22.40652	.94651	1.3371
20	.42222	-.26022	-21.38547	.91699	1.3508
21	.44444	-.26870	-20.38135	.89046	1.3634
22	.46667	-.27674	-19.39231	.86695	1.3744
23	.48889	-.28435	-18.41634	.84646	1.3832
24	.51111	-.29154	-17.45117	.82898	1.3895
25	.53333	-.29832	-16.49437	.81452	1.3927
26	.55556	-.30470	-15.54333	.80307	1.3925
27	.57778	-.31068	-14.59528	.79463	1.3886
28	.60000	-.31627	-13.64732	.78921	1.3808
29	.62222	-.32147	-12.69677	.78591	1.3705
30	.64444	-.32629	-11.74242	.78370	1.3596
31	.66667	-.33071	-10.78348	.78257	1.3480
32	.68889	-.33475	-9.81912	.78252	1.3358
33	.71111	-.33841	-8.84849	.78355	1.3229
34	.73333	-.34167	-7.87075	.78567	1.3095
35	.75556	-.34455	-6.88504	.78887	1.2955
36	.77778	-.34704	-5.89050	.79315	1.2810
37	.80000	-.34913	-4.88630	.79851	1.2661
38	.82222	-.35084	-3.87194	.80411	1.2522
39	.84444	-.35214	-2.84846	.80904	1.2406
40	.86667	-.35305	-1.81730	.81332	1.2314
41	.88889	-.35355	-.77993	.81694	1.2244
42	.91111	-.35365	.26214	.81991	1.2197
43	.93333	-.35335	1.30739	.82221	1.2172
44	.95556	-.35264	2.35427	.82386	1.2169
45	.97778	-.35152	3.40126	.82484	1.2188
46	1.00000	-.34999	4.44682	.82517	1.2229

1

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-40.73150
2	.20166	-31.88780
3	.40145	-22.33957
4	.60084	-13.61126
5	.80023	-4.87591
6	1.00000	4.44682

CARTESIAN COORDINATES ON STREAMSURFACE 2

POINT	Z1	X1	Y1	Z2	X2	Y2
1	3.58785	-1.45332	.77003	3.58840	-1.47359	.74595
2	3.61299	-1.38243	.72512	3.61362	-1.41484	.68495
3	3.63703	-1.31188	.68171	3.63745	-1.35572	.62561
4	3.65998	-1.24168	.63972	3.65999	-1.29620	.56767
5	3.68184	-1.17184	.59917	3.68131	-1.23625	.51117
6	3.70262	-1.10239	.55997	3.70143	-1.17583	.45619
7	3.72233	-1.03333	.52207	3.72041	-1.11490	.40275
8	3.74096	-.96466	.48554	3.73828	-1.05346	.35086
9	3.75851	-.89638	.45035	3.75507	-.99150	.30063
10	3.77499	-.82848	.41647	3.77080	-.92899	.25208
11	3.79048	-.76099	.38378	3.78550	-.86594	.20526
12	3.80509	-.69389	.35232	3.79920	-.80234	.16021
13	3.81889	-.62720	.32208	3.81202	-.73822	.11689
14	3.83199	-.56091	.29303	3.82403	-.67359	.07540
15	3.84448	-.49500	.26511	3.83534	-.60849	.03577
16	3.85644	-.42946	.23815	3.84604	-.54295	-.00201
17	3.86794	-.36428	.21222	3.85623	-.47699	-.03790
18	3.87907	-.29944	.18726	3.86600	-.41066	-.07198
19	3.88989	-.23490	.16320	3.87544	-.34399	-.10415
20	3.90043	-.17064	.13997	3.88464	-.27702	-.13446
21	3.91071	-.10663	.11742	3.89367	-.20979	-.16291
22	3.92073	-.04285	.09557	3.90257	-.14230	-.18953
23	3.93053	.02071	.07437	3.91135	-.07458	-.21435
24	3.94009	.08409	.05379	3.92004	-.00666	-.23733
25	3.94943	.14731	.03377	3.92868	.06146	-.25850
26	3.95856	.21038	.01426	3.93726	.12974	-.27787
27	3.96749	.27333	-.00474	3.94581	.19817	-.29544
28	3.97622	.33619	-.02322	3.95433	.26672	-.31126
29	3.98477	.39898	-.04118	3.96285	.33537	-.32532
30	3.99318	.46172	-.05862	3.97136	.40409	-.33763
31	4.00146	.52445	-.07555	3.97993	.47284	-.34814
32	4.00965	.58719	-.09196	3.98857	.54159	-.35693
33	4.01779	.64996	-.10785	3.99731	.61032	-.36398
34	4.02589	.71280	-.12321	4.00619	.67898	-.36929
35	4.03399	.77573	-.13804	4.01523	.74754	-.37282
36	4.04212	.83877	-.15233	4.02447	.81598	-.37456
37	4.05030	.90197	-.16611	4.03390	.88425	-.37460
38	4.05856	.96534	-.17932	4.04354	.95232	-.37290
39	4.06690	1.02893	-.19193	4.05340	1.02016	-.36940
40	4.07534	1.09277	-.20393	4.06345	1.08772	-.36407
41	4.08387	1.15690	-.21532	4.07366	1.15498	-.35692
42	4.09249	1.22135	-.22620	4.08400	1.22191	-.34812
43	4.10120	1.28617	-.23642	4.09446	1.28846	-.33749
44	4.11002	1.35138	-.24597	4.10499	1.35460	-.32503
45	4.11895	1.41702	-.25484	4.11558	1.42032	-.31074
46	4.12797	1.48313	-.26298	4.12619	1.48557	-.29461

1

POINT	ZSEMI	XSEMI	YSEMI
1	3.58840	-1.47359	.74595
2	3.58791	-1.47477	.74704
3	3.58742	-1.47582	.74826
4	3.58694	-1.47673	.74958
5	3.58647	-1.47750	.75100
6	3.58602	-1.47812	.75249
7	3.58559	-1.47857	.75404
8	3.58519	-1.47886	.75563
9	3.58482	-1.47898	.75725
10	3.58449	-1.47893	.75888
11	3.58420	-1.47872	.76050
12	3.58395	-1.47833	.76209
13	3.58374	-1.47778	.76364
14	3.58358	-1.47707	.76512
15	3.58347	-1.47622	.76653
16	3.58341	-1.47523	.76784
17	3.58341	-1.47410	.76905
18	3.58345	-1.47286	.77013
19	3.58355	-1.47152	.77108
20	3.58369	-1.47009	.77189
21	3.58389	-1.46858	.77254
22	3.58413	-1.46702	.77304
23	3.58442	-1.46542	.77337
24	3.58475	-1.46380	.77353
25	3.58511	-1.46218	.77352
26	3.58551	-1.46057	.77334
27	3.58594	-1.45899	.77300
28	3.58639	-1.45746	.77248
29	3.58687	-1.45599	.77181
30	3.58735	-1.45461	.77099
31	3.58785	-1.45332	.77003

STREAMSURFACE 3 ITERATION 1 DEVIATION = 6.728 SOLIDITY = 2.0804
ITERATION 2 DEVIATION = 6.920 SOLIDITY = 1.9942
ITERATION 2 DEVIATION = 6.920 SOLIDITY = 1.9942

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-45.29691	1.08335	2.6519
2	.02222	-.02219	-44.60616	1.08304	2.5586
3	.04444	-.04384	-43.89900	1.08208	2.4701
4	.06667	-.06495	-43.17550	1.08050	2.3863
5	.08889	-.08554	-42.43576	1.07828	2.3070
6	.11111	-.10559	-41.67993	1.07542	2.2319
7	.13333	-.12511	-40.90823	1.07193	2.1611
8	.15556	-.14410	-40.12092	1.06781	2.0944
9	.17778	-.16256	-39.31834	1.06305	2.0316
10	.20000	-.18050	-38.50086	1.05766	1.9726

```
  11   .22222   -.19792 -37.66934   1.05010     1.9201
  12   .24444   -.21482 -36.82659   1.03848     1.8776
  13   .26667   -.23120 -35.97623   1.02280     1.8448
  14   .28889   -.24708 -35.12225   1.00306     1.8219
  15   .31111   -.26247 -34.26891    .97926     1.8094
  16   .33333   -.27737 -33.42080    .95140     1.8077

POINT  FRAC. M     Y     Y-D(DEG)    Y-DD    R OF CURV

  17   .35556   -.29180 -32.58283    .91948     1.8179
  18   .37778   -.30578 -31.76016    .88350     1.8414
  19   .40000   -.31932 -30.95820    .84346     1.8801
  20   .42222   -.33245 -30.18140    .80324     1.9273
  21   .44444   -.34518 -29.42896    .76726     1.9727
  22   .46667   -.35752 -28.69838    .73553     2.0145
  23   .48889   -.36951 -27.98687    .70805     2.0510
  24   .51111   -.38115 -27.29134    .68481     2.0806
  25   .53333   -.39245 -26.60848    .66583     2.1014
  26   .55556   -.40341 -25.93473    .65109     2.1118
  27   .57778   -.41406 -25.26634    .64059     2.1107
  28   .60000   -.42439 -24.59931    .63435     2.0972
  29   .62222   -.43441 -23.93022    .63024     2.0778
  30   .64444   -.44412 -23.25854    .62613     2.0595
  31   .66667   -.45351 -22.58448    .62203     2.0424
  32   .68889   -.46260 -21.90825    .61793     2.0264
  33   .71111   -.47139 -21.23009    .61382     2.0115
  34   .73333   -.47987 -20.55020    .60973     1.9977
  35   .75556   -.48805 -19.86883    .60563     1.9850
  36   .77778   -.49593 -19.18620    .60153     1.9733
  37   .80000   -.50352 -18.50256    .59743     1.9627
  38   .82222   -.51081 -17.81805    .59357     1.9524
  39   .84444   -.51780 -17.13247    .59016     1.9416
  40   .86667   -.52451 -16.44552    .58721     1.9303
  41   .88889   -.53092 -15.75689    .58471     1.9185
  42   .91111   -.53705 -15.06626    .58267     1.9061
  43   .93333   -.54289 -14.37328    .58108     1.8932
  44   .95556   -.54844 -13.67762    .57994     1.8797
  45   .97778   -.55370 -12.97892    .57926     1.8657
  46  1.00000   -.55868 -12.27683    .57903     1.8511

DATA POINTS

POINT  FRAC. M  Y-D(DEG)

  1    .00000 -45.29691
  2    .20117 -38.45756
  3    .40074 -30.93186
  4    .60008 -24.59692
  5    .79974 -18.51053
  6   1.00000 -12.27683
1 STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER  3
  ****************************************************

   BETA1 =-45.297   (BLADE INLET ANGLE)
   BETA2 =-12.277   (BLADE OUTLET ANGLE)
   YZERO =  .00500  (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
   T     =  .09270  (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
   YONE  =  .00500  (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
   Z     =  .5500   (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
   CORD  = 2.9026   (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
****************************************************

   BLADE CHORD      = 1.1433

   STAGGER ANGLE    =-29.191

   CAMBER ANGLE     =-33.020

   SECTION AREA     =  .08343
   LOCATION OF CENTROID RELATIVE TO LEADING EDGE

            XBAR =  .48921
            YBAR = -.34515

   SECOND MOMENTS OF AREA ABOUT CENTROID

            IX   =   .00144
            IY   =   .00455
            IXY  =  -.00246

   ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS =-28.885

   PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

            IPX  =  .00008      (AT-28.885 WITH (X) AXIS)
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                       IPY  = .00591        (AT-28.885 WITH (Y) AXIS)

            POINT       M E A N L I N E   D A T A          SURFACE COORDINATE DATA
            NUMBER     X        Y     ANGLE THICKNESS     X1      Y1      X2     Y2

              1      .00572  .00000-45.297  .01143     .00978  .00402  .00165 -.004
=> 02
              2      .02778 -.02203-44.606  .01839     .03424 -.01549  .02133 -.028
=> 58
              3      .04985 -.04353-43.899  .02523     .05860 -.03444  .04110 -.052
=> 62
              4      .07192 -.06450-43.176  .03193     .08285 -.05286  .06100 -.076
=> 15
              5      .09399 -.08495-42.436  .03846     .10697 -.07075  .08101 -.099
=> 14
              6      .11606 -.10486-41.680  .04480     .13095 -.08813  .10116 -.121
=> 59
              7      .13813 -.12424-40.908  .05090     .15479 -.10501  .12146 -.143
=> 48
              8      .16019 -.14310-40.121  .05677     .17848 -.12140  .14190 -.164
=> 81
              9      .18226 -.16144-39.318  .06237     .20202 -.13731  .16250 -.185
=> 56
             10      .20433 -.17925-38.501  .06770     .22540 -.15276  .18326 -.205
=> 74
             11      .22640 -.19655-37.669  .07273     .24862 -.16776  .20417 -.225
=> 33
             12      .24847 -.21333-36.827  .07745     .27168 -.18233  .22525 -.244
=> 33
             13      .27053 -.22960-35.976  .08185     .29457 -.19648  .24649 -.262
=> 72
1
            POINT       M E A N L I N E   D A T A          SURFACE COORDINATE DATA
            NUMBER     X        Y     ANGLE THICKNESS     X1      Y1      X2     Y2

             14      .29260 -.24537-35.122  .08591     .31732 -.21024  .26789 -.280
=> 50
             15      .31467 -.26065-34.269  .08963     .33990 -.22361  .28944 -.297
=> 68
             16      .33674 -.27545-33.421  .09299     .36235 -.23664  .31113 -.314
=> 25
             17      .35881 -.28978-32.583  .09598     .38465 -.24934  .33296 -.330
=> 22
             18      .38088 -.30366-31.760  .09860     .40682 -.26174  .35493 -.345
=> 58
             19      .40294 -.31711-30.958  .10084     .42888 -.27387  .37701 -.360
=> 34
             20      .42501 -.33014-30.181  .10268     .45082 -.28576  .39920 -.374
=> 52
             21      .44708 -.34278-29.429  .10413     .47266 -.29744  .42150 -.388
=> 13
             22      .46915 -.35505-28.698  .10517     .49440 -.30892  .44390 -.401
=> 17
             23      .49122 -.36695-27.987  .10579     .51604 -.32024  .46640 -.413
=> 66
             24      .51328 -.37851-27.291  .10598     .53758 -.33141  .48899 -.425
=> 60
             25      .53535 -.38973-26.608  .10574     .55903 -.34245  .51167 -.437
=> 00
             26      .55742 -.40062-25.935  .10508     .58040 -.35337  .53444 -.447
=> 87
             27      .57949 -.41119-25.266  .10400     .60168 -.36417  .55730 -.458
=> 22
             28      .60156 -.42145-24.599  .10250     .62289 -.37485  .58022 -.468
=> 05
             29      .62363 -.43140-23.930  .10060     .64403 -.38542  .60322 -.477
=> 38
             30      .64569 -.44104-23.259  .09831     .66510 -.39588  .62628 -.486
=> 20
             31      .66776 -.45037-22.584  .09561     .68612 -.40623  .64940 -.494
=> 51
             32      .68983 -.45940-21.908  .09254     .70709 -.41647  .67257 -.502
=> 33
             33      .71190 -.46812-21.230  .08908     .72803 -.42660  .69577 -.509
=> 64
             34      .73397 -.47654-20.550  .08525     .74893 -.43663  .71900 -.516
=> 46
             35      .75603 -.48467-19.869  .08105     .76981 -.44656  .74226 -.522
=> 78
             36      .77810 -.49249-19.186  .07647     .79067 -.45638  .76554 -.528
=> 61
             37      .80017 -.50003-18.503  .07154     .81152 -.46610  .78882 -.533
=> 95
             38      .82224 -.50727-17.818  .06625     .83238 -.47573  .81210 -.538
=> 80
             39      .84431 -.51421-17.132  .06061     .85323 -.48525  .83538 -.543
=> 17
             40      .86638 -.52087-16.446  .05461     .87411 -.49468  .85865 -.547
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=> 06
             41      .88844 -.52724-15.757  .04827     .89500 -.50402  .88189 -.550
=> 47
             42      .91051 -.53333-15.066  .04158     .91592 -.51325  .90511 -.553
=> 40
             43      .93258 -.53912-14.373  .03455     .93687 -.52239  .92829 -.555
=> 86
             44      .95465 -.54464-13.678  .02718     .95786 -.53143  .95143 -.557
=> 84
             45      .97672 -.54986-12.979  .01947     .97890 -.54038  .97453 -.559
=> 35
             46      .99878 -.55481-12.277  .01143    1.00000 -.54922  .99757 -.560
=> 39
1                                                   NORMALISED PLOT OF SECTION NUMBER
=> 3

1      DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
       ****************************************************************

        BLADE CHORD = 3.31845E+00

        L.E.RADIUS  = 1.65923E-02  CENTERED AT X= -1.4034E+00 Y=  1.0018E+00

        SECTION AREA= 7.02919E-01

        SECOND MOMENTS OF AREA ABOUT CENTROID

           IX   = 1.02477E-01
           IY   = 3.23082E-01
           IXY  =-1.74954E-01

        PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

           IPX  = 5.95666E-03  (AT-28.885 WITH (X) AXIS)
           IPY  = 4.19602E-01  (AT-28.885 WITH (Y) AXIS)

       PT     SURFACE----------ONE         SURFACE----------TWO
       NO        X            Y               X            Y

        1  -1.39161E+00  1.01352E+00  -1.41519E+00  9.90175E-01
        2  -1.32060E+00  9.56896E-01  -1.35808E+00  9.18894E-01
        3  -1.24989E+00  9.01872E-01  -1.30068E+00  8.49096E-01
        4  -1.17952E+00  8.48412E-01  -1.24294E+00  7.80815E-01
        5  -1.10951E+00  7.96482E-01  -1.18484E+00  7.14081E-01
        6  -1.03988E+00  7.46045E-01  -1.12635E+00  6.48923E-01
        7  -9.70685E-01  6.97050E-01  -1.06744E+00  5.85384E-01
        8  -9.01917E-01  6.49476E-01  -1.00810E+00  5.23476E-01
        9  -8.33595E-01  6.03286E-01  -9.48309E-01  4.63224E-01
       10  -7.65730E-01  5.58441E-01  -8.88062E-01  4.04653E-01
       11  -6.98332E-01  5.14901E-01  -8.27349E-01  3.47788E-01
       12  -6.31409E-01  4.72611E-01  -7.66159E-01  2.92661E-01
       13  -5.64949E-01  4.31533E-01  -7.04508E-01  2.39278E-01
       14  -4.98942E-01  3.91609E-01  -6.42404E-01  1.87651E-01
       15  -4.33375E-01  3.52777E-01  -5.79859E-01  1.37788E-01
       16  -3.68230E-01  3.14967E-01  -5.16892E-01  8.96886E-02
       17  -3.03491E-01  2.78101E-01  -4.53519E-01  4.33538E-02
       18  -2.39128E-01  2.42105E-01  -3.89771E-01 -1.23547E-03
       19  -1.75112E-01  2.06897E-01  -3.25675E-01 -4.40972E-02
       20  -1.11417E-01  1.72388E-01  -2.61258E-01 -8.52570E-02
       21  -4.80282E-02  1.38498E-01  -1.96536E-01 -1.24749E-01
       22   1.50657E-02  1.05154E-01  -1.31518E-01 -1.62603E-01
       23   7.78756E-02  7.22997E-02  -6.62161E-02 -1.98847E-01
       24   1.40410E-01  3.98726E-02  -6.38322E-04 -2.33504E-01
       25   2.02677E-01  7.82803E-03   6.52061E-02 -2.66593E-01
       26   2.64693E-01 -2.38586E-02   1.31302E-01 -2.98144E-01
       27   3.26474E-01 -5.52012E-02   1.97632E-01 -3.28183E-01
       28   3.88034E-01 -8.62105E-02   2.64184E-01 -3.56732E-01
       29   4.49388E-01 -1.16891E-01   3.30941E-01 -3.83803E-01
       30   5.10559E-01 -1.47248E-01   3.97882E-01 -4.09403E-01
       31   5.71569E-01 -1.77287E-01   4.64984E-01 -4.33538E-01
       32   6.32444E-01 -2.07009E-01   5.32220E-01 -4.56219E-01
       33   6.93205E-01 -2.36423E-01   5.99571E-01 -4.77450E-01
       34   7.53875E-01 -2.65533E-01   6.67013E-01 -4.97234E-01
       35   8.14476E-01 -2.94344E-01   7.34524E-01 -5.15586E-01
1
       PT     SURFACE----------ONE         SURFACE----------TWO
       NO        X            Y               X            Y

       36   8.75030E-01 -3.22861E-01   8.02081E-01 -5.32506E-01
       37   9.35562E-01 -3.51082E-01   8.69661E-01 -5.48010E-01
       38   9.96090E-01 -3.79016E-01   9.37245E-01 -5.62099E-01
       39   1.05663E+00 -4.06667E-01   1.00481E+00 -5.74782E-01
       40   1.11722E+00 -4.34036E-01   1.07234E+00 -5.86066E-01
       41   1.17786E+00 -4.61125E-01   1.13981E+00 -5.95958E-01
       42   1.23858E+00 -4.87929E-01   1.20720E+00 -6.04470E-01
       43   1.29939E+00 -5.14454E-01   1.27450E+00 -6.11603E-01
       44   1.36033E+00 -5.40700E-01   1.34167E+00 -6.17360E-01
       45   1.42141E+00 -5.66664E-01   1.40871E+00 -6.21748E-01
```

46 1.48264E+00 -5.92345E-01 1.47559E+00 -6.24771E-01

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-1.41519E+00	9.90175E-01
2	-1.41635E+00	9.91472E-01
3	-1.41736E+00	9.92882E-01
4	-1.41822E+00	9.94391E-01
5	-1.41892E+00	9.95981E-01
6	-1.41945E+00	9.97636E-01
7	-1.41980E+00	9.99336E-01
8	-1.41997E+00	1.00106E+00
9	-1.41996E+00	1.00280E+00
10	-1.41977E+00	1.00453E+00
11	-1.41940E+00	1.00622E+00
12	-1.41886E+00	1.00787E+00
13	-1.41814E+00	1.00946E+00
14	-1.41727E+00	1.01096E+00
15	-1.41624E+00	1.01236E+00
16	-1.41507E+00	1.01364E+00
17	-1.41377E+00	1.01480E+00
18	-1.41236E+00	1.01581E+00
19	-1.41085E+00	1.01667E+00
20	-1.40926E+00	1.01737E+00
21	-1.40761E+00	1.01790E+00
22	-1.40591E+00	1.01825E+00
23	-1.40418E+00	1.01842E+00
24	-1.40244E+00	1.01841E+00
25	-1.40072E+00	1.01822E+00
26	-1.39902E+00	1.01785E+00
27	-1.39737E+00	1.01731E+00
28	-1.39579E+00	1.01659E+00
29	-1.39429E+00	1.01572E+00
30	-1.39289E+00	1.01469E+00
31	-1.39161E+00	1.01352E+00

LEADING EDGE AXIAL DIFFERENCE = -.0418 NEW DELX = .0418

1

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-45.29691	1.08335	2.6519
2	.02222	-.02219	-44.60616	1.08304	2.5586
3	.04444	-.04384	-43.89900	1.08208	2.4701
4	.06667	-.06495	-43.17550	1.08050	2.3863
5	.08889	-.08554	-42.43576	1.07828	2.3070
6	.11111	-.10559	-41.67993	1.07542	2.2319
7	.13333	-.12511	-40.90823	1.07193	2.1611
8	.15556	-.14410	-40.12092	1.06781	2.0944
9	.17778	-.16256	-39.31834	1.06305	2.0316
10	.20000	-.18050	-38.50086	1.05766	1.9726
11	.22222	-.19792	-37.66934	1.05010	1.9201
12	.24444	-.21482	-36.82659	1.03848	1.8776
13	.26667	-.23120	-35.97623	1.02280	1.8448
14	.28889	-.24708	-35.12225	1.00306	1.8219
15	.31111	-.26247	-34.26891	.97926	1.8094
16	.33333	-.27737	-33.42080	.95140	1.8077
17	.35556	-.29180	-32.58283	.91948	1.8179
18	.37778	-.30578	-31.76016	.88350	1.8414
19	.40000	-.31932	-30.95820	.84346	1.8801
20	.42222	-.33245	-30.18140	.80324	1.9273
21	.44444	-.34518	-29.42896	.76726	1.9727
22	.46667	-.35752	-28.69838	.73553	2.0145
23	.48889	-.36951	-27.98687	.70805	2.0510
24	.51111	-.38115	-27.29134	.68481	2.0806
25	.53333	-.39245	-26.60848	.66583	2.1014
26	.55556	-.40341	-25.93473	.65109	2.1118
27	.57778	-.41406	-25.26634	.64059	2.1107
28	.60000	-.42439	-24.59931	.63435	2.0972
29	.62222	-.43441	-23.93022	.63024	2.0778
30	.64444	-.44412	-23.25854	.62613	2.0595
31	.66667	-.45351	-22.58448	.62203	2.0424
32	.68889	-.46260	-21.90825	.61793	2.0264
33	.71111	-.47139	-21.23009	.61382	2.0115
34	.73333	-.47987	-20.55020	.60973	1.9977
35	.75556	-.48805	-19.86883	.60563	1.9850
36	.77778	-.49593	-19.18620	.60153	1.9733
37	.80000	-.50352	-18.50256	.59743	1.9627
38	.82222	-.51081	-17.81805	.59357	1.9524
39	.84444	-.51780	-17.13247	.59016	1.9416
40	.86667	-.52451	-16.44552	.58721	1.9303
41	.88889	-.53092	-15.75689	.58471	1.9185
42	.91111	-.53705	-15.06626	.58267	1.9061
43	.93333	-.54289	-14.37328	.58108	1.8932
44	.95556	-.54844	-13.67762	.57994	1.8797
45	.97778	-.55370	-12.97892	.57926	1.8657
46	1.00000	-.55868	-12.27683	.57903	1.8511

1

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-45.29691
2	.20117	-38.45756
3	.40074	-30.93186
4	.60008	-24.59692
5	.79974	-18.51053
6	1.00000	-12.27683

CARTESIAN COORDINATES ON STREAMSURFACE 3

POINT	Z1	X1	Y1	Z2	X2	Y2
1	4.22265	-1.41861	.99014	4.22376	-1.44183	.96690
2	4.24755	-1.34872	.93715	4.24907	-1.38562	.89882
3	4.27129	-1.27911	.88539	4.27292	-1.32911	.83218
4	4.29389	-1.20980	.83484	4.29541	-1.27226	.76671
5	4.31534	-1.14081	.78548	4.31659	-1.21504	.70246
6	4.33567	-1.07217	.73724	4.33649	-1.15742	.63949
7	4.35486	-1.00390	.69013	4.35515	-1.09935	.57787
8	4.37292	-.93600	.64417	4.37261	-1.04082	.51756
9	4.38983	-.86849	.59935	4.38889	-.98182	.45869
10	4.40563	-.80136	.55564	4.40401	-.92232	.40129
11	4.42040	-.73464	.51297	4.41801	-.86231	.34541
12	4.43420	-.66834	.47138	4.43092	-.80178	.29111
13	4.44712	-.60246	.43088	4.44282	-.74075	.23833
14	4.45924	-.53699	.39139	4.45377	-.67923	.18718
15	4.47063	-.47194	.35289	4.46388	-.61724	.13771
16	4.48138	-.40727	.31527	4.47321	-.55480	.08991
17	4.49155	-.34300	.27853	4.48184	-.49193	.04382
18	4.50119	-.27908	.24259	4.48986	-.42866	-.00068
19	4.51038	-.21549	.20738	4.49733	-.36503	-.04350
20	4.51912	-.15222	.17281	4.50435	-.30106	-.08464
21	4.52746	-.08923	.13878	4.51096	-.23677	-.12414
22	4.53539	-.02653	.10526	4.51723	-.17219	-.16203
23	4.54295	.03590	.07219	4.52319	-.10731	-.19841
24	4.55014	.09806	.03952	4.52887	-.04214	-.23323
25	4.55697	.15997	.00720	4.53431	.02330	-.26650
26	4.56347	.22164	-.02484	4.53954	.08901	-.29823
27	4.56962	.28308	-.05655	4.54459	.15495	-.32849
28	4.57546	.34432	-.08794	4.54947	.22113	-.35735
29	4.58101	.40535	-.11900	4.55421	.28753	-.38473
30	4.58631	.46621	-.14975	4.55886	.35411	-.41064
31	4.59138	.52690	-.18026	4.56344	.42087	-.43512
32	4.59626	.58747	-.21047	4.56802	.48776	-.45819
33	4.60099	.64791	-.24038	4.57264	.55476	-.47986
34	4.60559	.70826	-.27000	4.57735	.62186	-.50009
35	4.61009	.76853	-.29933	4.58221	.68901	-.51892
36	4.61453	.82875	-.32839	4.58725	.75621	-.53637
37	4.61893	.88893	-.35719	4.59251	.82341	-.55245
38	4.62330	.94909	-.38571	4.59805	.89060	-.56715
39	4.62764	1.00925	-.41397	4.60388	.95776	-.58050
40	4.63194	1.06945	-.44197	4.60997	1.02486	-.59251
41	4.63620	1.12969	-.46970	4.61633	1.09189	-.60315
42	4.64041	1.19000	-.49719	4.62293	1.15884	-.61246
43	4.64455	1.25040	-.52439	4.62976	1.22568	-.62045
44	4.64864	1.31092	-.55132	4.63681	1.29239	-.62711
45	4.65266	1.37157	-.57796	4.64406	1.35896	-.63241
46	4.65661	1.43238	-.60426	4.65149	1.42537	-.63633

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POINT	ZSEMI	XSEMI	YSEMI
1	4.22376	-1.44183	.96690
2	4.22326	-1.44296	.96814
3	4.22277	-1.44396	.96949
4	4.22228	-1.44481	.97094
5	4.22180	-1.44550	.97248
6	4.22134	-1.44602	.97408
7	4.22089	-1.44636	.97573
8	4.22047	-1.44653	.97741
9	4.22008	-1.44652	.97910
10	4.21972	-1.44634	.98078
11	4.21940	-1.44597	.98245
12	4.21913	-1.44544	.98406
13	4.21889	-1.44473	.98562
14	4.21871	-1.44387	.98710
15	4.21857	-1.44286	.98849
16	4.21848	-1.44171	.98976
17	4.21844	-1.44043	.99092
18	4.21846	-1.43904	.99193
19	4.21853	-1.43756	.99281
20	4.21865	-1.43599	.99352
21	4.21882	-1.43436	.99407
22	4.21904	-1.43269	.99445
23	4.21931	-1.43099	.99465
24	4.21962	-1.42928	.99468
25	4.21996	-1.42758	.99453
26	4.22035	-1.42591	.99421
27	4.22076	-1.42429	.99371
28	4.22121	-1.42273	.99305
29	4.22167	-1.42125	.99223
30	4.22216	-1.41988	.99125
31	4.22265	-1.41861	.99014

STREAMSURFACE 4 ITERATION 1 DEVIATION = 5.372 SOLIDITY = 1.9495
ITERATION 2 DEVIATION = 5.558 SOLIDITY = 1.8419
ITERATION 2 DEVIATION = 5.558 SOLIDITY = 1.8419

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-49.26162	.97922	3.6742
2	.02222	-.02556	-48.72485	.97928	3.5572
3	.04444	-.05063	-48.17631	.97945	3.4431
4	.06667	-.07523	-47.61565	.97973	3.3321
5	.08889	-.09933	-47.04249	.98013	3.2240
6	.11111	-.12296	-46.45647	.98065	3.1189
7	.13333	-.14610	-45.85721	.98128	3.0168
8	.15556	-.16875	-45.24432	.98202	2.9174
9	.17778	-.19092	-44.61739	.98288	2.8210
10	.20000	-.21261	-43.97602	.98386	2.7273
11	.22222	-.23381	-43.32041	.98216	2.6440
12	.24444	-.25452	-42.65350	.97466	2.5791
13	.26667	-.27475	-41.97930	.96135	2.5321
14	.28889	-.29451	-41.30217	.94223	2.5033
15	.31111	-.31380	-40.62682	.91731	2.4935
16	.33333	-.33265	-39.95837	.88658	2.5045

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
17	.35556	-.35105	-39.30223	.85005	2.5389
18	.37778	-.36903	-38.66418	.80771	2.6007
19	.40000	-.38662	-38.05030	.75956	2.6961
20	.42222	-.40383	-37.46548	.71100	2.8127
21	.44444	-.42069	-36.90880	.66768	2.9297
22	.46667	-.43721	-36.37748	.62959	3.0433
23	.48889	-.45343	-35.86846	.59674	3.1490
24	.51111	-.46935	-35.37843	.56912	3.2417
25	.53333	-.48500	-34.90378	.54674	3.3158
26	.55556	-.50037	-34.44069	.52960	3.3663
27	.57778	-.51548	-33.98514	.51769	3.3883
28	.60000	-.53033	-33.53287	.51102	3.3786
29	.62222	-.54493	-33.08029	.50675	3.3544
30	.64444	-.55928	-32.62701	.50217	3.3336
31	.66667	-.57338	-32.17341	.49726	3.3161
32	.68889	-.58724	-31.71991	.49204	3.3020
33	.71111	-.60086	-31.26694	.48650	3.2914
34	.73333	-.61423	-30.81492	.48065	3.2844
35	.75556	-.62737	-30.36432	.47447	3.2811
36	.77778	-.64027	-29.91558	.46798	3.2816
37	.80000	-.65294	-29.46919	.46116	3.2859
38	.82222	-.66538	-29.02544	.45459	3.2904
39	.84444	-.67760	-28.58391	.44879	3.2908
40	.86667	-.68960	-28.14400	.44377	3.2869
41	.88889	-.70138	-27.70507	.43952	3.2785
42	.91111	-.71294	-27.26647	.43604	3.2654
43	.93333	-.72429	-26.82752	.43333	3.2475
44	.95556	-.73542	-26.38751	.43140	3.2246
45	.97778	-.74634	-25.94571	.43024	3.1967
46	1.00000	-.75704	-25.50138	.42985	3.1639

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-49.26162
2	.20067	-43.95657
3	.40026	-38.04339
4	.59980	-33.53698
5	.79968	-29.47556
6	1.00000	-25.50138

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STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 4
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

BETA1 =-49.262 (BLADE INLET ANGLE)
BETA2 =-25.501 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .08950 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.7857 (MERIDIONAL CHORD OF SECTION)

K/14PRINT

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
****

BLADE CHORD = 1.2493

STAGGER ANGLE =-37.127

CAMBER ANGLE =-23.760

SECTION AREA = .09573
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .48909
YBAR = -.43032

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .00294
IY = .00521
IXY = -.00382

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS =-36.731

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .00009 (AT-36.731 WITH (X) AXIS)
IPY = .00807 (AT-36.731 WITH (Y) AXIS)

	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
=> 08	1	.00625	.00000	-49.262	.01249	.01098	.00408	.00151	-.004
=> 84	2	.02827	-.02533	-48.725	.01974	.03569	-.01882	.02085	-.031
=> 14	3	.05029	-.05018	-48.176	.02688	.06031	-.04122	.04028	-.059
=> 97	4	.07232	-.07455	-47.616	.03388	.08483	-.06313	.05980	-.085
=> 32	5	.09434	-.09845	-47.042	.04071	.10924	-.08458	.07944	-.112
=> 17	6	.11636	-.12186	-46.456	.04734	.13352	-.10555	.09921	-.138
=> 51	7	.13839	-.14479	-45.857	.05374	.15767	-.12608	.11910	-.163
=> 33	8	.16041	-.16724	-45.244	.05990	.18168	-.14616	.13914	-.188
=> 63	9	.18244	-.18922	-44.617	.06579	.20554	-.16580	.15933	-.212
=> 40	10	.20446	-.21071	-43.976	.07139	.22925	-.18502	.17967	-.236
=> 61	11	.22648	-.23172	-43.320	.07669	.25279	-.20382	.20017	-.259
=> 27	12	.24851	-.25225	-42.654	.08166	.27617	-.22222	.22084	-.282
=> 37	13	.27053	-.27230	-41.979	.08629	.29939	-.24022	.24167	-.304

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	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
=> 90	14	.29255	-.29188	-41.302	.09058	.32245	-.25786	.26266	-.325
=> 86	15	.31458	-.31100	-40.627	.09450	.34534	-.27514	.28381	-.346
=> 25	16	.33660	-.32967	-39.958	.09804	.36808	-.29210	.30512	-.367
=> 07	17	.35862	-.34791	-39.302	.10120	.39068	-.30876	.32657	-.387
=> 33	18	.38065	-.36573	-38.664	.10397	.41313	-.32514	.34817	-.406
=> 03	19	.40267	-.38316	-38.050	.10634	.43544	-.34129	.36990	-.425
=> 20	20	.42470	-.40022	-37.465	.10829	.45763	-.35724	.39176	-.443
=> 83	21	.44672	-.41693	-36.909	.10983	.47970	-.37302	.41374	-.460
=> 96	22	.46874	-.43331	-36.377	.11093	.50164	-.38865	.43585	-.477
=> 60	23	.49077	-.44938	-35.868	.11159	.52346	-.40416	.45807	-.494
=> 74	24	.51279	-.46516	-35.378	.11181	.54516	-.41958	.48042	-.510
=> 41	25	.53481	-.48066	-34.904	.11157	.56673	-.43491	.50289	-.526
=> 62	26	.55684	-.49590	-34.441	.11088	.58819	-.45017	.52548	-.541
=> 37	27	.57886	-.51087	-33.985	.10975	.60954	-.46537	.54819	-.556
=> 68	28	.60088	-.52559	-33.533	.10818	.63077	-.48050	.57100	-.570
=> 55	29	.62291	-.54006	-33.080	.10619	.65189	-.49557	.59393	-.584
=> 98	30	.64493	-.55428	-32.627	.10377	.67291	-.51059	.61696	-.597
=> 98	31	.66696	-.56826	-32.173	.10094	.69383	-.52554	.64008	-.610
=> 55	32	.68898	-.58199	-31.720	.09770	.71466	-.54044	.66330	-.623
=> 69	33	.71100	-.59549	-31.267	.09406	.73541	-.55529	.68659	-.635
=> 40	34	.73303	-.60874	-30.815	.09002	.75609	-.57008	.70997	-.647
=> 69	35	.75505	-.62176	-30.364	.08560	.77668	-.58483	.73342	-.658
=> 56	36	.77707	-.63455	-29.916	.08078	.79722	-.59954	.75693	-.669
=> 01	37	.79910	-.64711	-29.469	.07559	.81769	-.61420	.78050	-.680
=> 05	38	.82112	-.65944	-29.025	.07002	.83811	-.62883	.80413	-.690
=> 68	39	.84315	-.67155	-28.584	.06408	.85847	-.64341	.82782	-.699
=> 91	40	.86517	-.68344	-28.144	.05777	.87879	-.65797	.85154	-.708
=> 74	41	.88719	-.69511	-27.705	.05111	.89907	-.67249	.87531	-.717
=> 16	42	.90922	-.70657	-27.266	.04408	.91931	-.68698	.89912	-.726
=> 19	43	.93124	-.71781	-26.828	.03671	.93952	-.70144	.92296	-.734
=> 83	44	.95326	-.72885	-26.388	.02898	.95970	-.71587	.94682	-.741
=> 07	45	.97529	-.73967	-25.946	.02091	.97986	-.73027	.97071	-.749
=> 92	46	.99731	-.75028	-25.501	.01249	1.00000	-.74464	.99462	-.755

1 => 4 NORMALISED PLOT OF SECTION NUMBER

1

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
****

BLADE CHORD = 3.48008E+00

L.E.RADIUS = 1.74004E-02 CENTERED AT X= -1.3450E+00 Y= 1.1987E+00

SECTION AREA= 7.42849E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.77235E-01
IY = 3.13991E-01
IXY =-2.30274E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 5.40113E-03 (AT-36.731 WITH (X) AXIS)
IPY = 4.85824E-01 (AT-36.731 WITH (Y) AXIS)

PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
1	-1.33185E+00	1.21008E+00	-1.35822E+00	1.18737E+00
2	-1.26302E+00	1.14630E+00	-1.30435E+00	1.11002E+00
3	-1.19443E+00	1.08390E+00	-1.25023E+00	1.03397E+00
4	-1.12613E+00	1.02285E+00	-1.19584E+00	9.59230E-01
5	-1.05813E+00	9.63124E-01	-1.14113E+00	8.85843E-01
6	-9.90482E-01	9.04692E-01	-1.08608E+00	8.13835E-01
7	-9.23212E-01	8.47514E-01	-1.03065E+00	7.43246E-01
8	-8.56334E-01	7.91577E-01	-9.74825E-01	6.74092E-01
9	-7.89868E-01	7.36854E-01	-9.18589E-01	6.06402E-01
10	-7.23832E-01	6.83320E-01	-8.61924E-01	5.40202E-01
11	-6.58241E-01	6.30950E-01	-8.04813E-01	4.75522E-01
12	-5.93111E-01	5.79699E-01	-7.47241E-01	4.12398E-01
13	-5.28434E-01	5.29538E-01	-6.89216E-01	3.50841E-01
14	-4.64208E-01	4.80414E-01	-6.30742E-01	2.90867E-01
15	-4.00423E-01	4.32269E-01	-5.71824E-01	2.32481E-01
16	-3.37070E-01	3.85035E-01	-5.12477E-01	1.75685E-01
17	-2.74136E-01	3.38631E-01	-4.52709E-01	1.20475E-01
18	-2.11597E-01	2.92980E-01	-3.92546E-01	6.68291E-02
19	-1.49432E-01	2.47989E-01	-3.32009E-01	1.47230E-02
20	-8.76205E-02	2.03563E-01	-2.71120E-01	-3.58764E-02
21	-2.61538E-02	1.59615E-01	-2.09885E-01	-8.50139E-02
22	3.49700E-02	1.16064E-01	-1.48307E-01	-1.32730E-01
23	9.57543E-02	7.28524E-02	-8.63900E-02	-1.79062E-01
24	1.56199E-01	2.99130E-02	-2.41326E-02	-2.24040E-01
25	2.16304E-01	-1.28005E-02	3.84640E-02	-2.67692E-01
26	2.76078E-01	-5.53147E-02	1.01391E-01	-3.10050E-01
27	3.35532E-01	-9.76449E-02	1.64638E-01	-3.51148E-01
28	3.94675E-01	-1.39800E-01	2.28198E-01	-3.91007E-01
29	4.53514E-01	-1.81785E-01	2.92059E-01	-4.29643E-01
30	5.12067E-01	-2.23605E-01	3.56208E-01	-4.67062E-01
31	5.70352E-01	-2.65265E-01	4.20625E-01	-5.03272E-01
32	6.28387E-01	-3.06770E-01	4.85291E-01	-5.38282E-01
33	6.86189E-01	-3.48128E-01	5.50191E-01	-5.72096E-01
34	7.43773E-01	-3.89348E-01	6.15308E-01	-6.04722E-01
35	8.01157E-01	-4.30436E-01	6.80626E-01	-6.36169E-01

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PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
36	8.58355E-01	-4.71401E-01	7.46129E-01	-6.66446E-01
37	9.15387E-01	-5.12246E-01	8.11799E-01	-6.95567E-01
38	9.72263E-01	-5.52983E-01	8.77624E-01	-7.23539E-01
39	1.02900E+00	-5.93620E-01	9.43591E-01	-7.50371E-01
40	1.08560E+00	-6.34162E-01	1.00969E+00	-7.76074E-01
41	1.14209E+00	-6.74614E-01	1.07590E+00	-8.00656E-01
42	1.19848E+00	-7.14975E-01	1.14222E+00	-8.24131E-01
43	1.25477E+00	-7.55253E-01	1.20862E+00	-8.46501E-01
44	1.31099E+00	-7.95450E-01	1.27511E+00	-8.67769E-01
45	1.36714E+00	-8.35567E-01	1.34166E+00	-8.87940E-01
46	1.42324E+00	-8.75606E-01	1.40826E+00	-9.07016E-01

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-1.35822E+00	1.18737E+00
2	-1.35933E+00	1.18881E+00
3	-1.36029E+00	1.19036E+00
4	-1.36108E+00	1.19200E+00
5	-1.36170E+00	1.19371E+00
6	-1.36213E+00	1.19548E+00
7	-1.36238E+00	1.19729E+00
8	-1.36243E+00	1.19911E+00
9	-1.36230E+00	1.20092E+00
10	-1.36197E+00	1.20271E+00
11	-1.36146E+00	1.20446E+00
12	-1.36077E+00	1.20615E+00
13	-1.35991E+00	1.20775E+00
14	-1.35888E+00	1.20926E+00
15	-1.35771E+00	1.21065E+00
16	-1.35639E+00	1.21191E+00
17	-1.35495E+00	1.21302E+00
18	-1.35340E+00	1.21398E+00
19	-1.35176E+00	1.21477E+00
20	-1.35005E+00	1.21539E+00
21	-1.34828E+00	1.21582E+00
22	-1.34647E+00	1.21606E+00
23	-1.34465E+00	1.21612E+00
24	-1.34284E+00	1.21598E+00
25	-1.34104E+00	1.21566E+00
26	-1.33929E+00	1.21515E+00
27	-1.33761E+00	1.21446E+00
28	-1.33600E+00	1.21360E+00
29	-1.33450E+00	1.21257E+00
30	-1.33311E+00	1.21139E+00
31	-1.33185E+00	1.21008E+00

LEADING EDGE AXIAL DIFFERENCE = -.0443 NEW DELX = .0443

1

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-49.26162	.97922	3.6742
2	.02222	-.02556	-48.72485	.97928	3.5572
3	.04444	-.05063	-48.17631	.97945	3.4431
4	.06667	-.07523	-47.61565	.97973	3.3321
5	.08889	-.09933	-47.04249	.98013	3.2240
6	.11111	-.12296	-46.45647	.98065	3.1189
7	.13333	-.14610	-45.85721	.98128	3.0168
8	.15556	-.16875	-45.24432	.98202	2.9174
9	.17778	-.19092	-44.61739	.98288	2.8210
10	.20000	-.21261	-43.97602	.98386	2.7273
11	.22222	-.23381	-43.32041	.98216	2.6440
12	.24444	-.25452	-42.65350	.97466	2.5791
13	.26667	-.27475	-41.97930	.96135	2.5321
14	.28889	-.29451	-41.30217	.94223	2.5033
15	.31111	-.31380	-40.62682	.91731	2.4935
16	.33333	-.33265	-39.95837	.88658	2.5045
17	.35556	-.35105	-39.30223	.85005	2.5389
18	.37778	-.36903	-38.66418	.80771	2.6007
19	.40000	-.38662	-38.05030	.75956	2.6961

20	.42222	-.40383	-37.46548	.71100	2.8127
21	.44444	-.42069	-36.90880	.66768	2.9297
22	.46667	-.43721	-36.37748	.62959	3.0433
23	.48889	-.45343	-35.86846	.59674	3.1490
24	.51111	-.46935	-35.37843	.56912	3.2417
25	.53333	-.48500	-34.90378	.54674	3.3158
26	.55556	-.50037	-34.44069	.52960	3.3663
27	.57778	-.51548	-33.98514	.51769	3.3883
28	.60000	-.53033	-33.53287	.51102	3.3786
29	.62222	-.54493	-33.08029	.50675	3.3544
30	.64444	-.55928	-32.62701	.50217	3.3336
31	.66667	-.57338	-32.17341	.49726	3.3161
32	.68889	-.58724	-31.71991	.49204	3.3020
33	.71111	-.60086	-31.26694	.48650	3.2914
34	.73333	-.61423	-30.81492	.48065	3.2844
35	.75556	-.62737	-30.36432	.47447	3.2811
36	.77778	-.64027	-29.91558	.46798	3.2816
37	.80000	-.65294	-29.46919	.46116	3.2859
38	.82222	-.66538	-29.02544	.45459	3.2904
39	.84444	-.67760	-28.58391	.44879	3.2908
40	.86667	-.68960	-28.14400	.44377	3.2869
41	.88889	-.70138	-27.70507	.43952	3.2785
42	.91111	-.71294	-27.26647	.43604	3.2654
43	.93333	-.72429	-26.82752	.43333	3.2475
44	.95556	-.73542	-26.38751	.43140	3.2246
45	.97778	-.74634	-25.94571	.43024	3.1967
46	1.00000	-.75704	-25.50138	.42985	3.1639

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DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-49.26162
2	.20067	-43.95657
3	.40026	-38.04339
4	.59980	-33.53698
5	.79968	-29.47556
6	1.00000	-25.50138

CARTESIAN COORDINATES ON STREAMSURFACE 4

POINT	Z1	X1	Y1	Z2	X2	Y2
1	4.85170	-1.36635	1.18598	4.85316	-1.39243	1.16344
2	4.87640	-1.29826	1.12576	4.87846	-1.33915	1.08927
3	4.89993	-1.23041	1.06656	4.90228	-1.28561	1.01634
4	4.92229	-1.16282	1.00839	4.92472	-1.23180	.94439
5	4.94349	-1.09551	.95122	4.94582	-1.17767	.87348
6	4.96354	-1.02852	.89497	4.96561	-1.12318	.80365
7	4.98244	-.96187	.83970	4.98412	-1.06830	.73498
8	5.00019	-.89557	.78540	5.00139	-1.01301	.66744
9	5.01678	-.82964	.73207	5.01744	-.95729	.60114
10	5.03225	-.76410	.67971	5.03229	-.90112	.53613
11	5.04667	-.69896	.62826	5.04598	-.84447	.47246
12	5.06009	-.63424	.57778	5.05854	-.78734	.41019
13	5.07259	-.56995	.52823	5.07002	-.72972	.34927
14	5.08424	-.50609	.47960	5.08050	-.67164	.28981
15	5.09510	-.44264	.43184	5.09004	-.61309	.23183
16	5.10524	-.37961	.38487	5.09871	-.55409	.17536
17	5.11473	-.31698	.33865	5.10658	-.49465	.12041
18	5.12360	-.25473	.29311	5.11373	-.43480	.06694
19	5.13192	-.19285	.24818	5.12021	-.37457	.01493
20	5.13969	-.13131	.20376	5.12610	-.31398	-.03561
21	5.14696	-.07011	.15974	5.13145	-.25303	-.08472
22	5.15373	-.00925	.11608	5.13631	-.19173	-.13242
23	5.16002	.05129	.07271	5.14074	-.13009	-.17878
24	5.16585	.11149	.02957	5.14476	-.06810	-.22382
25	5.17122	.17136	-.01336	5.14841	-.00577	-.26755
26	5.17614	.23091	-.05613	5.15172	.05690	-.31002
27	5.18063	.29014	-.09874	5.15473	.11990	-.35123
28	5.18470	.34907	-.14119	5.15746	.18321	-.39122
29	5.18837	.40770	-.18349	5.15994	.24683	-.43002
30	5.19167	.46604	-.22564	5.16220	.31074	-.46763
31	5.19461	.52411	-.26766	5.16429	.37492	-.50403
32	5.19723	.58194	-.30953	5.16624	.43936	-.53922
33	5.19954	.63953	-.35125	5.16810	.50403	-.57327
34	5.20157	.69689	-.39284	5.16991	.56891	-.60618
35	5.20333	.75406	-.43429	5.17172	.63398	-.63791
36	5.20483	.81103	-.47568	5.17358	.69924	-.66848
37	5.20611	.86782	-.51695	5.17551	.76466	-.69794
38	5.20715	.92445	-.55811	5.17757	.83022	-.72634
39	5.20795	.98094	-.59916	5.17978	.89591	-.75361
40	5.20851	1.03728	-.64012	5.18214	.96171	-.77978
41	5.20881	1.09351	-.68098	5.18466	1.02763	-.80488
42	5.20885	1.14963	-.72174	5.18733	1.09363	-.82894
43	5.20862	1.20565	-.76240	5.19015	1.15973	-.85192
44	5.20811	1.26160	-.80297	5.19311	1.22589	-.87384
45	5.20733	1.31747	-.84342	5.19621	1.29212	-.89471
46	5.20627	1.37330	-.88371	5.19945	1.35839	-.91448

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POINT	ZSEMI	XSEMI	YSEMI
1	4.85316	-1.39243	1.16344
2	4.85266	-1.39353	1.16482
3	4.85216	-1.39448	1.16631
4	4.85166	-1.39526	1.16789
5	4.85116	-1.39587	1.16955
6	4.85069	-1.39630	1.17126
7	4.85023	-1.39654	1.17301
8	4.84979	-1.39660	1.17478
9	4.84938	-1.39646	1.17655
10	4.84901	-1.39614	1.17830
11	4.84867	-1.39564	1.18000
12	4.84837	-1.39495	1.18165
13	4.84812	-1.39410	1.18323
14	4.84791	-1.39309	1.18471
15	4.84775	-1.39192	1.18608
16	4.84765	-1.39062	1.18732
17	4.84760	-1.38920	1.18843
18	4.84760	-1.38766	1.18939
19	4.84765	-1.38604	1.19019
20	4.84775	-1.38435	1.19081
21	4.84791	-1.38260	1.19126
22	4.84812	-1.38081	1.19153
23	4.84838	-1.37901	1.19162
24	4.84868	-1.37721	1.19151
25	4.84902	-1.37544	1.19123
26	4.84940	-1.37371	1.19076
27	4.84981	-1.37204	1.19012
28	4.85025	-1.37046	1.18931
29	4.85072	-1.36897	1.18834
30	4.85120	-1.36759	1.18723
31	4.85170	-1.36635	1.18598

STREAMSURFACE 5 ITERATION 1 DEVIATION = 4.549 SOLIDITY = 1.8379
ITERATION 2 DEVIATION = 4.711 SOLIDITY = 1.7142
ITERATION 2 DEVIATION = 4.711 SOLIDITY = 1.7142

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-52.67686	.89381	5.0196
2	.02222	-.02893	-52.25440	.89426	4.8747
3	.04444	-.05741	-51.82330	.89561	4.7285
4	.06667	-.08545	-51.38288	.89787	4.5814
5	.08889	-.11305	-50.93246	.90102	4.4336
6	.11111	-.14020	-50.47128	.90508	4.2854
7	.13333	-.16691	-49.99856	.91004	4.1371
8	.15556	-.19317	-49.51345	.91590	3.9891
9	.17778	-.21897	-49.01506	.92266	3.8417
10	.20000	-.24432	-48.50247	.93032	3.6952
11	.22222	-.26921	-47.97540	.93491	3.5651
12	.24444	-.29364	-47.43683	.93208	3.4668
13	.26667	-.31761	-46.89090	.92182	3.3990
14	.28889	-.34112	-46.34211	.90413	3.3617
15	.31111	-.36419	-45.79532	.87901	3.3565
16	.33333	-.38682	-45.25579	.84646	3.3867

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
17	.35556	-.40904	-44.72912	.80649	3.4579
18	.37778	-.43085	-44.22127	.75909	3.5792
19	.40000	-.45230	-43.73849	.70426	3.7649
20	.42222	-.47339	-43.28588	.64843	3.9980
21	.44444	-.49417	-42.86274	.59820	4.2449
22	.46667	-.51465	-42.46659	.55357	4.5003
23	.48889	-.53485	-42.09471	.51453	4.7568
24	.51111	-.55480	-41.74412	.48109	5.0043
25	.53333	-.57452	-41.41161	.45324	5.2303
26	.55556	-.59401	-41.09378	.43098	5.4207
27	.57778	-.61328	-40.78705	.41433	5.5606
28	.60000	-.63235	-40.48767	.40326	5.6368
29	.62222	-.65123	-40.19234	.39535	5.6747
30	.64444	-.66990	-39.90006	.38823	5.7049
31	.66667	-.68839	-39.61034	.38191	5.7265
32	.68889	-.70669	-39.32268	.37640	5.7388
33	.71111	-.72480	-39.03656	.37169	5.7410
34	.73333	-.74272	-38.75145	.36778	5.7326
35	.75556	-.76047	-38.46677	.36467	5.7131
36	.77778	-.77804	-38.18197	.36236	5.6821
37	.80000	-.79542	-37.89643	.36085	5.6395
38	.82222	-.81263	-37.60965	.35980	5.5906
39	.84444	-.82966	-37.32142	.35887	5.5406
40	.86667	-.84651	-37.03168	.35806	5.4896
41	.88889	-.86319	-36.74031	.35738	5.4374
42	.91111	-.87969	-36.44723	.35682	5.3842
43	.93333	-.89601	-36.15232	.35639	5.3300
44	.95556	-.91216	-35.85550	.35608	5.2747
45	.97778	-.92813	-35.55664	.35589	5.2184
46	1.00000	-.94393	-35.25564	.35583	5.1612

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-52.67686
2	.20052	-48.49032
3	.40013	-43.73568
4	.59975	-40.49102
5	.79948	-37.90050
6	1.00000	-35.25564

1 STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 5
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

BETA1 =-52.677 (BLADE INLET ANGLE)
BETA2 =-35.256 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .08430 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.6528 (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

BLADE CHORD = 1.3671

STAGGER ANGLE =-43.348

CAMBER ANGLE =-17.421

SECTION AREA = .10801
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .49120
YBAR = -.51408

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .00512
IY = .00591
IXY = -.00540

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS =-42.900

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .00010 (AT-42.900 WITH (X) AXIS)
IPY = .01093 (AT-42.900 WITH (Y) AXIS)

	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
	1	.00684	.00000	-52.677	.01367	.01227	.00414	.00140	-.004
=> 14									
	2	.02882	-.02861	-52.254	.02098	.03711	-.02219	.02052	-.035
=> 04									
	3	.05080	-.05679	-51.823	.02819	.06188	-.04808	.03972	-.065
=> 50									
	4	.07278	-.08453	-51.383	.03526	.08656	-.07353	.05901	-.095
=> 53									
	5	.09477	-.11183	-50.932	.04218	.11114	-.09854	.07839	-.125
=> 12									
	6	.11675	-.13869	-50.471	.04890	.13561	-.12313	.09789	-.154
=> 25									
	7	.13873	-.16511	-49.999	.05540	.15995	-.14730	.11751	-.182
=> 92									
	8	.16071	-.19108	-49.513	.06166	.18416	-.17107	.13727	-.211
=> 10									
	9	.18270	-.21661	-49.015	.06766	.20823	-.19442	.15716	-.238
=> 80									
	10	.20468	-.24169	-48.502	.07338	.23216	-.21738	.17720	-.266
=> 00									
	11	.22666	-.26631	-47.975	.07879	.25593	-.23993	.19740	-.292
=> 68									
	12	.24864	-.29047	-47.437	.08388	.27953	-.26210	.21776	-.318
=> 84									
	13	.27063	-.31418	-46.891	.08863	.30298	-.28390	.23828	-.344
=> 46									

1

POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2

1C71.4PRINT

=> 55	14	.29261	-.33744	-46.342	.09302	.32626	-.30533	.25896 -.369
=> 10	15	.31459	-.36026	-45.795	.09706	.34938	-.32642	.27980 -.394
=> 10	16	.33658	-.38265	-45.256	.10072	.37234	-.34720	.30081 -.418
=> 57	17	.35856	-.40463	-44.729	.10399	.39515	-.36769	.32197 -.441
=> 50	18	.38054	-.42621	-44.221	.10686	.41781	-.38792	.34328 -.464
=> 92	19	.40252	-.44742	-43.738	.10933	.44032	-.40792	.36473 -.486
=> 83	20	.42451	-.46829	-43.286	.11139	.46269	-.42775	.38632 -.508
=> 26	21	.44649	-.48884	-42.863	.11302	.48493	-.44742	.40805 -.530
=> 22	22	.46847	-.50910	-42.467	.11421	.50703	-.46697	.42992 -.551
=> 74	23	.49045	-.52909	-42.095	.11495	.52898	-.48643	.45192 -.571
=> 82	24	.51244	-.54882	-41.744	.11525	.55080	-.50583	.47407 -.591
=> 47	25	.53442	-.56832	-41.412	.11507	.57248	-.52517	.49636 -.611
=> 72	26	.55640	-.58760	-41.094	.11444	.59401	-.54448	.51879 -.630
=> 58	27	.57838	-.60667	-40.787	.11335	.61541	-.56376	.54136 -.649
=> 06	28	.60037	-.62554	-40.488	.11181	.63667	-.58302	.56407 -.668
=> 15	29	.62235	-.64421	-40.192	.10983	.65779	-.60226	.58691 -.686
=> 88	30	.64433	-.66268	-39.900	.10741	.67878	-.62148	.60988 -.703
=> 25	31	.66631	-.68097	-39.610	.10457	.69965	-.64069	.63298 -.721
=> 25	32	.68830	-.69907	-39.323	.10129	.72039	-.65989	.65620 -.738
=> 89	33	.71028	-.71698	-39.037	.09760	.74102	-.67908	.67954 -.754
=> 17	34	.73226	-.73472	-38.751	.09350	.76152	-.69826	.70300 -.771
=> 10	35	.75425	-.75227	-38.467	.08898	.78192	-.71744	.72657 -.787
=> 68	36	.77623	-.76965	-38.182	.08406	.80221	-.73661	.75025 -.802
=> 91	37	.79821	-.78685	-37.896	.07874	.82239	-.75578	.77403 -.817
=> 79	38	.82019	-.80387	-37.610	.07303	.84248	-.77494	.79791 -.832
=> 33	39	.84218	-.82072	-37.321	.06692	.86246	-.79411	.82189 -.847
=> 51	40	.86416	-.83739	-37.032	.06043	.88236	-.81327	.84596 -.861
=> 34	41	.88614	-.85388	-36.740	.05356	.90216	-.83242	.87012 -.875
=> 84	42	.90812	-.87021	-36.447	.04632	.92188	-.85158	.89437 -.888
=> 98	43	.93011	-.88635	-36.152	.03870	.94152	-.87073	.91869 -.901
=> 78	44	.95209	-.90233	-35.855	.03072	.96109	-.88988	.94309 -.914
=> 23	45	.97407	-.91813	-35.557	.02238	.98058	-.90903	.96757 -.927
=> 34	46	.99605	-.93375	-35.256	.01367	1.00000	-.92817	.99211 -.939

NORMALISED PLOT OF SECTION NUMBER

1 => 5

1 DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
==========

BLADE CHORD = 3.62682E+00

L.E.RADIUS = 1.81341E-02 CENTERED AT X= -1.2849E+00 Y= 1.3638E+00

SECTION AREA= 7.60090E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.53374E-01
IY = 2.92666E-01
IXY =-2.67492E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 4.80775E-03 (AT-42.900 WITH (X) AXIS)
IPY = 5.41233E-01 (AT-42.900 WITH (Y) AXIS)

PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
1	-1.27051E+00	1.37477E+00	-1.29935E+00	1.35278E+00
2	-1.20461E+00	1.30490E+00	-1.24862E+00	1.27083E+00
3	-1.13891E+00	1.23622E+00	-1.19769E+00	1.19001E+00
4	-1.07344E+00	1.16872E+00	-1.14653E+00	1.11034E+00
5	-1.00823E+00	1.10236E+00	-1.09510E+00	1.03185E+00
6	-9.43322E-01	1.03713E+00	-1.04338E+00	9.54563E-01
7	-8.78744E-01	9.73000E-01	-9.91327E-01	8.78526E-01
8	-8.14514E-01	9.09962E-01	-9.38925E-01	8.03755E-01
9	-7.50655E-01	8.48002E-01	-8.86151E-01	7.30280E-01
10	-6.87189E-01	7.87109E-01	-8.32985E-01	6.58131E-01
11	-6.24134E-01	7.27268E-01	-7.79407E-01	5.87339E-01
12	-5.61511E-01	6.68452E-01	-7.25397E-01	5.17945E-01
13	-4.99316E-01	6.10636E-01	-6.70959E-01	4.49964E-01
14	-4.37551E-01	5.53778E-01	-6.16091E-01	3.83413E-01
15	-3.76214E-01	4.97825E-01	-5.60795E-01	3.18299E-01
16	-3.15299E-01	4.42713E-01	-5.05078E-01	2.54621E-01
17	-2.54799E-01	3.88362E-01	-4.48945E-01	1.92372E-01
18	-1.94697E-01	3.34696E-01	-3.92415E-01	1.31529E-01
19	-1.34976E-01	2.81620E-01	-3.35503E-01	7.20623E-02
20	-7.56229E-02	2.29032E-01	-2.78223E-01	1.39313E-02
21	-1.66342E-02	1.76842E-01	-2.20579E-01	-4.29156E-02
22	4.19876E-02	1.24968E-01	-1.62568E-01	-9.85270E-02
23	1.00241E-01	7.33407E-02	-1.04189E-01	-1.52949E-01
24	1.58121E-01	2.18954E-02	-4.54362E-02	-2.06218E-01
25	2.15622E-01	-2.94212E-02	1.36956E-02	-2.58368E-01
26	2.72748E-01	-8.06429E-02	7.32021E-02	-3.09437E-01
27	3.29507E-01	-1.31790E-01	1.33076E-01	-3.59461E-01
28	3.85902E-01	-1.82879E-01	1.93313E-01	-4.08470E-01
29	4.41941E-01	-2.33916E-01	2.53907E-01	-4.56484E-01
30	4.97632E-01	-2.84910E-01	3.14849E-01	-5.03516E-01
31	5.52986E-01	-3.35870E-01	3.76128E-01	-5.49576E-01
32	6.08015E-01	-3.86800E-01	4.37732E-01	-5.94677E-01
33	6.62727E-01	-4.37706E-01	4.99652E-01	-6.38824E-01
34	7.17132E-01	-4.88595E-01	5.61879E-01	-6.82026E-01
35	7.71240E-01	-5.39470E-01	6.24404E-01	-7.24288E-01

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PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
36	8.25060E-01	-5.90334E-01	6.87217E-01	-7.65616E-01
37	8.78606E-01	-6.41185E-01	7.50304E-01	-8.06018E-01
38	9.31884E-01	-6.92027E-01	8.13658E-01	-8.45493E-01
39	9.84905E-01	-7.42862E-01	8.77270E-01	-8.84043E-01
40	1.03768E+00	-7.93690E-01	9.41128E-01	-9.21670E-01
41	1.09022E+00	-8.44512E-01	1.00522E+00	-9.58374E-01
42	1.14253E+00	-8.95323E-01	1.06954E+00	-9.94163E-01
43	1.19464E+00	-9.46129E-01	1.13407E+00	-1.02903E+00
44	1.24654E+00	-9.96929E-01	1.19880E+00	-1.06298E+00
45	1.29824E+00	-1.04773E+00	1.26373E+00	-1.09602E+00
46	1.34977E+00	-1.09852E+00	1.32883E+00	-1.12813E+00

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-1.29935E+00	1.35278E+00
2	-1.30042E+00	1.35435E+00
3	-1.30133E+00	1.35602E+00
4	-1.30205E+00	1.35777E+00
5	-1.30258E+00	1.35959E+00
6	-1.30292E+00	1.36146E+00
7	-1.30306E+00	1.36335E+00
8	-1.30301E+00	1.36525E+00
9	-1.30275E+00	1.36713E+00
10	-1.30230E+00	1.36898E+00
11	-1.30167E+00	1.37076E+00
12	-1.30084E+00	1.37247E+00
13	-1.29985E+00	1.37409E+00
14	-1.29869E+00	1.37559E+00
15	-1.29738E+00	1.37697E+00
16	-1.29593E+00	1.37819E+00
17	-1.29436E+00	1.37926E+00
18	-1.29269E+00	1.38016E+00
19	-1.29093E+00	1.38089E+00
20	-1.28911E+00	1.38142E+00
21	-1.28725E+00	1.38176E+00
22	-1.28535E+00	1.38190E+00
23	-1.28346E+00	1.38185E+00
24	-1.28157E+00	1.38159E+00
25	-1.27973E+00	1.38114E+00
26	-1.27794E+00	1.38050E+00
27	-1.27623E+00	1.37968E+00
28	-1.27462E+00	1.37869E+00
29	-1.27311E+00	1.37753E+00
30	-1.27174E+00	1.37621E+00
31	-1.27051E+00	1.37477E+00

LEADING EDGE AXIAL DIFFERENCE = -.0590 NEW DELX = .0590

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POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-52.67686	.89381	5.0196
2	.02222	-.02893	-52.25440	.89426	4.8747
3	.04444	-.05741	-51.82330	.89561	4.7285
4	.06667	-.08545	-51.38288	.89787	4.5814
5	.08889	-.11305	-50.93246	.90102	4.4336
6	.11111	-.14020	-50.47128	.90508	4.2854
7	.13333	-.16691	-49.99856	.91004	4.1371
8	.15556	-.19317	-49.51345	.91590	3.9891
9	.17778	-.21897	-49.01506	.92266	3.8417
10	.20000	-.24432	-48.50247	.93032	3.6952
11	.22222	-.26921	-47.97540	.93491	3.5651
12	.24444	-.29364	-47.43683	.93208	3.4668
13	.26667	-.31761	-46.89090	.92182	3.3990
14	.28889	-.34112	-46.34211	.90413	3.3617
15	.31111	-.36419	-45.79532	.87901	3.3565
16	.33333	-.38682	-45.25579	.84646	3.3867
17	.35556	-.40904	-44.72912	.80649	3.4579
18	.37778	-.43085	-44.22127	.75909	3.5792
19	.40000	-.45230	-43.73849	.70426	3.7649
20	.42222	-.47339	-43.28588	.64843	3.9980
21	.44444	-.49417	-42.86274	.59820	4.2449
22	.46667	-.51465	-42.46659	.55357	4.5003
23	.48889	-.53485	-42.09471	.51453	4.7568
24	.51111	-.55480	-41.74412	.48109	5.0043
25	.53333	-.57452	-41.41161	.45324	5.2303
26	.55556	-.59401	-41.09378	.43098	5.4207
27	.57778	-.61328	-40.78705	.41433	5.5606
28	.60000	-.63235	-40.48767	.40326	5.6368
29	.62222	-.65123	-40.19234	.39535	5.6747
30	.64444	-.66990	-39.90006	.38823	5.7049
31	.66667	-.68839	-39.61034	.38191	5.7265
32	.68889	-.70669	-39.32268	.37640	5.7388
33	.71111	-.72480	-39.03656	.37169	5.7410
34	.73333	-.74272	-38.75145	.36778	5.7326
35	.75556	-.76047	-38.46677	.36467	5.7131
36	.77778	-.77804	-38.18197	.36236	5.6821
37	.80000	-.79542	-37.89643	.36085	5.6395
38	.82222	-.81263	-37.60965	.35980	5.5906
39	.84444	-.82966	-37.32142	.35887	5.5406
40	.86667	-.84651	-37.03168	.35806	5.4896
41	.88889	-.86319	-36.74031	.35738	5.4374
42	.91111	-.87969	-36.44723	.35682	5.3842
43	.93333	-.89601	-36.15232	.35639	5.3300
44	.95556	-.91216	-35.85550	.35608	5.2747
45	.97778	-.92813	-35.55664	.35589	5.2184
46	1.00000	-.94393	-35.25564	.35583	5.1612

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DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-52.67686
2	.20052	-48.49032
3	.40013	-43.73568
4	.59975	-40.49102
5	.79968	-37.90050
6	1.00000	-35.25564

CARTESIAN COORDINATES ON STREAMSURFACE 5

POINT	Z1	X1	Y1	Z2	X2	Y2
1	5.48387	-1.32283	1.35149	5.48555	-1.35145	1.32974
2	5.50811	-1.25742	1.28495	5.51046	-1.30110	1.25079
3	5.53118	-1.19220	1.21929	5.53390	-1.25055	1.17294
4	5.55310	-1.12721	1.15450	5.55600	-1.19977	1.09592
5	5.57387	-1.06246	1.09055	5.57678	-1.14871	1.01978
6	5.59351	-.99798	1.02741	5.59626	-1.09736	.94457
7	5.61202	-.93382	.96509	5.61447	-1.04567	.87036
8	5.62939	-.86998	.90363	5.63145	-.99362	.79713
9	5.64565	-.80648	.84301	5.64722	-.94118	.72499
10	5.66080	-.74335	.78325	5.66180	-.88834	.65398
11	5.67491	-.68060	.72433	5.67523	-.83508	.58416
12	5.68804	-.61827	.66627	5.68753	-.78136	.51557
13	5.70024	-.55634	.60907	5.69875	-.72720	.44823
14	5.71156	-.49482	.55274	5.70895	-.67260	.38218
15	5.72207	-.43372	.49718	5.71819	-.61755	.31747
16	5.73181	-.37303	.44235	5.72652	-.56208	.25411
17	5.74085	-.31275	.38821	5.73401	-.50617	.19210
18	5.74922	-.25285	.33470	5.74071	-.44986	.13145
19	5.75696	-.19334	.28173	5.74668	-.39316	.07210

20	5.76409	-.13418	.22917	5.75198	-.33609	.01405
21	5.77064	-.07538	.17694	5.75665	-.27865	-.04274
22	5.77663	-.01694	.12499	5.76075	-.22084	-.09832
23	5.78207	.04114	.07326	5.76432	-.16265	-.15273
24	5.78696	.09885	.02168	5.76739	-.10409	-.20603
25	5.79132	.15618	-.02981	5.76998	-.04514	-.25820
26	5.79515	.21314	-.08124	5.77214	.01418	-.30931
27	5.79847	.26974	-.13262	5.77390	.07387	-.35939
28	5.80127	.32598	-.18396	5.77527	.13393	-.40847
29	5.80358	.38186	-.23524	5.77628	.19435	-.45656
30	5.80541	.43740	-.28649	5.77697	.25512	-.50366
31	5.80675	.49260	-.33772	5.77736	.31623	-.54981
32	5.80763	.54748	-.38890	5.77748	.37766	-.59500
33	5.80805	.60204	-.44006	5.77736	.43941	-.63924
34	5.80803	.65629	-.49119	5.77704	.50147	-.68254
35	5.80757	.71025	-.54230	5.77655	.56382	-.72491
36	5.80667	.76391	-.59340	5.77591	.62646	-.76635
37	5.80535	.81730	-.64446	5.77516	.68937	-.80686
38	5.80361	.87042	-.69549	5.77433	.75254	-.84648
39	5.80143	.92328	-.74648	5.77344	.81597	-.88519
40	5.79882	.97589	-.79742	5.77252	.87964	-.92299
41	5.79578	1.02827	-.84835	5.77157	.94353	-.95988
42	5.79230	1.08042	-.89921	5.77060	1.00765	-.99588
43	5.78838	1.13236	-.95002	5.76962	1.07198	-1.03099
44	5.78402	1.18409	-1.00078	5.76863	1.13651	-1.06519
45	5.77922	1.23563	-1.05147	5.76766	1.20122	-1.09849
46	5.77398	1.28700	-1.10201	5.76670	1.26613	-1.13087

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POINT	ZSEMI	XSEMI	YSEMI
1	5.48555	-1.35145	1.32974
2	5.48505	-1.35251	1.33125
3	5.48454	-1.35341	1.33286
4	5.48404	-1.35412	1.33456
5	5.48354	-1.35465	1.33632
6	5.48306	-1.35499	1.33813
7	5.48259	-1.35513	1.33997
8	5.48215	-1.35508	1.34181
9	5.48173	-1.35482	1.34365
10	5.48135	-1.35438	1.34544
11	5.48100	-1.35374	1.34719
12	5.48069	-1.35293	1.34886
13	5.48043	-1.35194	1.35044
14	5.48021	-1.35079	1.35191
15	5.48004	-1.34949	1.35326
16	5.47993	-1.34805	1.35447
17	5.47986	-1.34650	1.35553
18	5.47985	-1.34484	1.35642
19	5.47990	-1.34309	1.35714
20	5.47999	-1.34129	1.35768
21	5.48014	-1.33943	1.35804
22	5.48034	-1.33755	1.35820
23	5.48059	-1.33567	1.35816
24	5.48088	-1.33380	1.35794
25	5.48122	-1.33197	1.35753
26	5.48159	-1.33020	1.35693
27	5.48200	-1.32850	1.35615
28	5.48243	-1.32690	1.35521
29	5.48289	-1.32541	1.35412
30	5.48337	-1.32405	1.35287
31	5.48387	-1.32283	1.35149

STREAMSURFACE 6 ITERATION 1 DEVIATION = 4.076 SOLIDITY = 1.7128
ITERATION 2 DEVIATION = 4.201 SOLIDITY = 1.5817
ITERATION 2 DEVIATION = 4.201 SOLIDITY = 1.5817

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-55.60087	.81446	6.8091
2	.02222	-.03225	-55.26696	.81531	6.6316
3	.04444	-.06411	-54.92662	.81787	6.4441
4	.06667	-.09555	-54.57895	.82214	6.2476
5	.08889	-.12660	-54.22303	.82812	6.0431
6	.11111	-.15723	-53.85784	.83580	5.8318
7	.13333	-.18745	-53.48231	.84520	5.6148
8	.15556	-.21725	-53.09531	.85630	5.3935
9	.17778	-.24663	-52.69563	.86910	5.1690
10	.20000	-.27558	-52.28199	.88362	4.9426
11	.22222	-.30410	-51.85379	.89489	4.7420
12	.24444	-.33217	-51.41387	.89738	4.5932
13	.26667	-.35980	-50.96629	.89107	4.4929
14	.28889	-.38699	-50.51542	.87598	4.4402
15	.31111	-.41375	-50.06600	.85209	4.4372
16	.33333	-.44009	-49.62312	.81940	4.4890
17	.35556	-.46602	-49.19220	.77793	4.6055
18	.37778	-.49157	-48.77903	.72766	4.8027
19	.40000	-.51676	-48.38964	.66860	5.1075
20	.42222	-.54162	-48.02909	.60761	5.5027
21	.44444	-.56618	-47.69704	.55207	5.9410
22	.46667	-.59047	-47.39155	.50200	6.4204
23	.48889	-.61451	-47.11041	.45738	6.9353
24	.51111	-.63832	-46.85122	.41823	7.4751
25	.53333	-.66192	-46.61140	.38454	8.0223
26	.55556	-.68534	-46.38820	.35630	8.5521
27	.57778	-.70858	-46.17873	.33353	9.0318
28	.60000	-.73166	-45.97997	.31622	9.4239
29	.62222	-.75457	-45.78911	.30296	9.7353
30	.64444	-.77734	-45.60435	.29235	9.9890
31	.66667	-.79997	-45.42421	.28439	10.1706
32	.68889	-.82245	-45.24709	.27908	10.2676
33	.71111	-.84480	-45.07140	.27640	10.2713
34	.73333	-.86701	-44.89548	.27638	10.1782
35	.75556	-.88908	-44.71765	.27900	9.9898
36	.77778	-.91102	-44.53617	.28426	9.7132
37	.80000	-.93281	-44.34925	.29217	9.3600
38	.82222	-.95446	-44.15551	.30087	9.0000
39	.84444	-.97596	-43.95507	.30854	8.6875
40	.86667	-.99731	-43.74852	.31519	8.4163
41	.88889	-1.01851	-43.53642	.32082	8.1816
42	.91111	-1.03954	-43.31938	.32542	7.9795
43	.93333	-1.06042	-43.09799	.32901	7.8072
44	.95556	-1.08113	-42.87290	.33156	7.6624
45	.97778	-1.10168	-42.64474	.33310	7.5433
46	1.00000	-1.12206	-42.41418	.33361	7.4488

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-55.60087
2	.20065	-52.26970
3	.40042	-48.38251
4	.60005	-45.97955
5	.79985	-44.35057
6	1.00000	-42.41418

1 STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 6
==========

BETA1 =-55.601 (BLADE INLET ANGLE)
BETA2 =-42.414 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .08340 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.4845 (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
==========

BLADE CHORD = 1.4917

STAGGER ANGLE =-48.292

CAMBER ANGLE =-13.187

SECTION AREA = .12707
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .49397
YBAR = -.59688

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .00846
IY = .00696
IXY = -.00755

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS = 42.156

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .01530 (AT 42.156 WITH (X) AXIS)
IPY = .00012 (AT 42.156 WITH (Y) AXIS)

POINT NUMBER	M E A N L I N E D A T A X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
1	.00746	.00000	-55.601	.01492	.01361	.00421	.00130	-.004
=> 21								
2	.02940	-.03185	-55.267	.02267	.03872	-.02539	.02009	-.038
=> 31								
3	.05135	-.06331	-54.927	.03033	.06376	-.05459	.03894	-.072
=> 02								
4	.07329	-.09436	-54.579	.03785	.08872	-.08339	.05787	-.105
=> 33								
5	.09524	-.12502	-54.223	.04522	.11358	-.11180	.07690	-.138
=> 23								
6	.11718	-.15527	-53.858	.05239	.13834	-.13982	.09603	-.170
=> 72								
7	.13913	-.18511	-53.482	.05934	.16297	-.16745	.11528	-.202
=> 76								
8	.16107	-.21454	-53.095	.06604	.18748	-.19471	.13467	-.234
=> 37								
9	.18302	-.24355	-52.696	.07247	.21184	-.22159	.15419	-.265
=> 51								
10	.20496	-.27214	-52.282	.07861	.23605	-.24809	.17387	-.296
=> 19								
11	.22691	-.30030	-51.854	.08444	.26011	-.27422	.19370	-.326
=> 38								
12	.24885	-.32802	-51.414	.08992	.28399	-.29998	.21371	-.356
=> 06								
13	.27079	-.35531	-50.966	.09505	.30771	-.32538	.23388	-.385
=> 24								

1

POINT NUMBER	M E A N L I N E D A T A X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
14	.29274	-.38216	-50.515	.09981	.33126	-.35042	.25422	-.413
=> 89								
15	.31468	-.40858	-50.066	.10419	.35463	-.37514	.27474	-.442
=> 02								
16	.33663	-.43459	-49.623	.10818	.37783	-.39955	.29542	-.469
=> 63								
17	.35857	-.46020	-49.192	.11175	.40086	-.42368	.31628	-.496
=> 71								
18	.38052	-.48543	-48.779	.11490	.42373	-.44757	.33731	-.523
=> 29								
19	.40246	-.51030	-48.390	.11762	.44643	-.47125	.35849	-.549
=> 36								
20	.42441	-.53485	-48.029	.11990	.46898	-.49476	.37984	-.574
=> 95								
21	.44635	-.55911	-47.697	.12173	.49137	-.51814	.40134	-.600
=> 07								
22	.46830	-.58309	-47.392	.12309	.51359	-.54143	.42300	-.624
=> 76								
23	.49024	-.60683	-47.110	.12398	.53566	-.56464	.44482	-.649
=> 02								
24	.51219	-.63035	-46.851	.12438	.55756	-.58781	.46681	-.672
=> 88								
25	.53413	-.65366	-46.611	.12429	.57929	-.61097	.48897	-.696
=> 35								
26	.55608	-.67678	-46.388	.12369	.60085	-.63412	.51130	-.719
=> 44								
27	.57802	-.69973	-46.179	.12260	.62225	-.65729	.53379	-.742
=> 18								
28	.59997	-.72252	-45.980	.12103	.64348	-.68047	.55645	-.764
=> 57								
29	.62191	-.74515	-45.789	.11897	.66455	-.70367	.57927	-.786
=> 63								
30	.64385	-.76764	-45.604	.11644	.68545	-.72691	.60226	-.808
=> 37								
31	.66580	-.78998	-45.424	.11343	.70620	-.75017	.62540	-.829
=> 78								
32	.68774	-.81218	-45.247	.10996	.72679	-.77347	.64870	-.850
=> 89								
33	.70969	-.83425	-45.071	.10602	.74722	-.79681	.67216	-.871
=> 68								
34	.73163	-.85618	-44.895	.10162	.76750	-.82018	.69577	-.892
=> 18								
35	.75358	-.87798	-44.718	.09677	.78762	-.84359	.71953	-.912
=> 36								
36	.77552	-.89964	-44.536	.09147	.80760	-.86704	.74344	-.932
=> 24								
37	.79747	-.92116	-44.349	.08573	.82743	-.89051	.76750	-.951
=> 81								
38	.81941	-.94254	-44.156	.07955	.84712	-.91400	.79170	-.971
=> 08								
39	.84136	-.96377	-43.955	.07294	.86667	-.93752	.81604	-.990
=> 03								
40	.86330	-.98486	-43.749	.06589	.88608	-.96106	.84052	-1.008
=> 66								
41	.88525	-1.00579	-43.536	.05842	.90537	-.98461	.86513	-1.026
=> 96								
42	.90719	-1.02656	-43.319	.05054	.92453	-1.00817	.88985	-1.044
=> 94								
43	.92914	-1.04717	-43.098	.04224	.94357	-1.03175	.91471	-1.062
=> 59								
44	.95108	-1.06763	-42.873	.03353	.96249	-1.05534	.93967	-1.079
=> 91								

=> 90

45 .97302-1.08792-42.645 .02442 .98130-1.07893 .96475-1.096

=> 55

46 .99497-1.10805-42.414 .01492 1.00000-1.10254 .98994-1.113

1

=> 6

NORMALISED PLOT OF SECTION NUMBER

1

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

BLADE CHORD = 3.70605E+00

L.E.RADIUS = 1.85302E-02 CENTERED AT X= -1.2087E+00 Y= 1.4829E+00

SECTION AREA= 7.84350E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 3.22379E-01
IY = 2.65090E-01
IXY =-2.87610E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 5.82767E-01 (AT 42.156 WITH (X) AXIS)
IPY = 4.70160E-03 (AT 42.156 WITH (Y) AXIS)

PT	SURFACE----------ONE		SURFACE----------TWO	
NO	X	Y	X	Y
1	-1.19342E+00	1.49340E+00	-1.22400E+00	1.47246E+00
2	-1.13105E+00	1.41984E+00	-1.17733E+00	1.38775E+00
3	-1.06884E+00	1.34729E+00	-1.13050E+00	1.30400E+00
4	-1.00683E+00	1.27574E+00	-1.08347E+00	1.22124E+00
5	-9.45057E-01	1.20517E+00	-1.03620E+00	1.13949E+00
6	-8.83548E-01	1.13556E+00	-9.88665E-01	1.05879E+00
7	-8.22346E-01	1.06690E+00	-9.40825E-01	9.79171E-01
8	-7.61466E-01	9.99177E-01	-8.92664E-01	9.00653E-01
9	-7.00934E-01	9.32395E-01	-8.44154E-01	8.23273E-01
10	-6.40775E-01	8.66549E-01	-7.95272E-01	7.47063E-01
11	-5.81011E-01	8.01637E-01	-7.45994E-01	6.72059E-01
12	-5.21667E-01	7.37641E-01	-6.96297E-01	5.98306E-01
13	-4.62743E-01	6.74547E-01	-6.46180E-01	5.25824E-01
14	-4.04244E-01	6.12319E-01	-5.95637E-01	4.54633E-01
15	-3.46172E-01	5.50911E-01	-5.44667E-01	3.84743E-01
16	-2.88527E-01	4.90264E-01	-4.93271E-01	3.16155E-01
17	-2.31307E-01	4.30304E-01	-4.41449E-01	2.48864E-01
18	-1.74499E-01	3.70955E-01	-3.89216E-01	1.82846E-01
19	-1.18093E-01	3.12124E-01	-3.36581E-01	1.18070E-01
20	-6.20790E-02	2.53710E-01	-2.83553E-01	5.44972E-02
21	-6.45764E-03	1.95622E-01	-2.30133E-01	-7.92820E-03
22	4.87656E-02	1.37776E-01	-1.76315E-01	-6.92571E-02
23	1.03586E-01	8.01005E-02	-1.22094E-01	-1.29538E-01
24	1.57996E-01	2.25278E-02	-6.74625E-02	-1.88813E-01
25	2.11987E-01	-3.50001E-02	-1.24113E-02	-2.47118E-01
26	2.65557E-01	-9.25245E-02	4.30593E-02	-3.04494E-01
27	3.18715E-01	-1.50072E-01	9.89436E-02	-3.60982E-01
28	3.71462E-01	-2.07665E-01	1.55238E-01	-4.16616E-01
29	4.23802E-01	-2.65317E-01	2.11939E-01	-4.71423E-01
30	4.75740E-01	-3.23041E-01	2.69042E-01	-5.25424E-01
31	5.27282E-01	-3.80846E-01	3.26543E-01	-5.78634E-01
32	5.78432E-01	-4.38737E-01	3.84433E-01	-6.31070E-01
33	6.29196E-01	-4.96718E-01	4.42711E-01	-6.82738E-01
34	6.79577E-01	-5.54789E-01	5.01371E-01	-7.33646E-01
35	7.29581E-01	-6.12948E-01	5.60409E-01	-7.83795E-01

1

PT	SURFACE----------ONE		SURFACE----------TWO	
NO	X	Y	X	Y
36	7.79213E-01	-6.71189E-01	6.19818E-01	-8.33186E-01
37	8.28484E-01	-7.29501E-01	6.79589E-01	-8.81817E-01
38	8.77397E-01	-7.87876E-01	7.39717E-01	-9.29677E-01
39	9.25965E-01	-8.46305E-01	8.00191E-01	-9.76753E-01
40	9.74198E-01	-9.04781E-01	8.60999E-01	-1.02304E+00
41	1.02211E+00	-9.63296E-01	9.22131E-01	-1.06852E+00
42	1.06971E+00	-1.02184E+00	9.83570E-01	-1.11319E+00
43	1.11701E+00	-1.08042E+00	1.04531E+00	-1.15704E+00
44	1.16402E+00	-1.13902E+00	1.10734E+00	-1.20007E+00
45	1.21076E+00	-1.19764E+00	1.16965E+00	-1.24228E+00
46	1.25722E+00	-1.25629E+00	1.23222E+00	-1.28365E+00

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-1.22400E+00	1.47246E+00
2	-1.22501E+00	1.47412E+00
3	-1.22584E+00	1.47587E+00
4	-1.22649E+00	1.47770E+00
5	-1.22694E+00	1.47958E+00
6	-1.22719E+00	1.48151E+00
7	-1.22723E+00	1.48345E+00
8	-1.22708E+00	1.48538E+00
9	-1.22672E+00	1.48729E+00
10	-1.22617E+00	1.48915E+00
11	-1.22542E+00	1.49094E+00
12	-1.22449E+00	1.49264E+00
13	-1.22339E+00	1.49424E+00
14	-1.22213E+00	1.49571E+00
15	-1.22072E+00	1.49704E+00
16	-1.21918E+00	1.49822E+00
17	-1.21752E+00	1.49923E+00
18	-1.21577E+00	1.50006E+00
19	-1.21394E+00	1.50071E+00
20	-1.21205E+00	1.50115E+00
21	-1.21013E+00	1.50140E+00
22	-1.20819E+00	1.50145E+00
23	-1.20626E+00	1.50130E+00
24	-1.20435E+00	1.50094E+00
25	-1.20249E+00	1.50039E+00
26	-1.20070E+00	1.49964E+00
27	-1.19900E+00	1.49871E+00
28	-1.19740E+00	1.49761E+00
29	-1.19593E+00	1.49635E+00
30	-1.19460E+00	1.49494E+00
31	-1.19342E+00	1.49340E+00

LEADING EDGE AXIAL DIFFERENCE = -.0618 NEW DELX = .0618

1

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-55.60087	.81446	6.8091
2	.02222	-.03225	-55.26696	.81531	6.6316
3	.04444	-.06411	-54.92662	.81787	6.4441
4	.06667	-.09555	-54.57895	.82214	6.2476
5	.08889	-.12660	-54.22303	.82812	6.0431
6	.11111	-.15723	-53.85784	.83580	5.8318
7	.13333	-.18745	-53.48231	.84520	5.6148
8	.15556	-.21725	-53.09531	.85630	5.3935
9	.17778	-.24663	-52.69563	.86910	5.1690
10	.20000	-.27558	-52.28199	.88362	4.9426
11	.22222	-.30410	-51.85379	.89489	4.7420
12	.24444	-.33217	-51.41387	.89738	4.5932
13	.26667	-.35980	-50.96629	.89107	4.4929
14	.28889	-.38699	-50.51542	.87598	4.4402
15	.31111	-.41375	-50.06600	.85209	4.4372
16	.33333	-.44009	-49.62312	.81940	4.4890
17	.35556	-.46602	-49.19220	.77793	4.6055
18	.37778	-.49157	-48.77903	.72766	4.8027
19	.40000	-.51676	-48.38964	.66860	5.1075
20	.42222	-.54162	-48.02909	.60761	5.5027
21	.44444	-.56618	-47.69704	.55207	5.9410
22	.46667	-.59047	-47.39155	.50200	6.4204
23	.48889	-.61451	-47.11041	.45738	6.9353
24	.51111	-.63832	-46.85122	.41823	7.4751
25	.53333	-.66192	-46.61140	.38454	8.0223
26	.55556	-.68534	-46.38820	.35630	8.5521
27	.57778	-.70858	-46.17873	.33353	9.0318
28	.60000	-.73166	-45.97997	.31622	9.4239
29	.62222	-.75457	-45.78911	.30296	9.7353
30	.64444	-.77734	-45.60435	.29235	9.9890
31	.66667	-.79997	-45.42421	.28439	10.1706
32	.68889	-.82245	-45.24709	.27908	10.2676
33	.71111	-.84480	-45.07140	.27640	10.2713
34	.73333	-.86701	-44.89548	.27638	10.1782
35	.75556	-.88908	-44.71765	.27900	9.9898
36	.77778	-.91102	-44.53617	.28426	9.7132
37	.80000	-.93281	-44.34925	.29217	9.3600
38	.82222	-.95446	-44.15551	.30087	9.0000
39	.84444	-.97596	-43.95507	.30854	8.6875
40	.86667	-.99731	-43.74852	.31519	8.4163
41	.88889	-1.01851	-43.53642	.32082	8.1816
42	.91111	-1.03954	-43.31938	.32542	7.9795
43	.93333	-1.06042	-43.09799	.32901	7.8072
44	.95556	-1.08113	-42.87290	.33156	7.6624
45	.97778	-1.10168	-42.64474	.33310	7.5433
46	1.00000	-1.12206	-42.41418	.33361	7.4488

1

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-55.60087
2	.20065	-52.26970
3	.40042	-48.38251
4	.60005	-45.97955
5	.79985	-44.35057
6	1.00000	-42.41418

CARTESIAN COORDINATES ON STREAMSURFACE 6

POINT	Z1	X1	Y1	Z2	X2	Y2
1	6.12468	-1.25032	1.47197	6.12629	-1.28073	1.45129
2	6.14796	-1.18829	1.40140	6.15019	-1.23432	1.36929
3	6.17013	-1.12643	1.33159	6.17272	-1.18775	1.28824
4	6.19121	-1.06476	1.26249	6.19398	-1.14098	1.20789
5	6.21121	-1.00331	1.19411	6.21398	-1.09397	1.12828
6	6.23013	-.94211	1.12640	6.23276	-1.04669	1.04947
7	6.24799	-.88121	1.05939	6.25033	-.99910	.97151
8	6.26478	-.82061	.99311	6.26673	-.95118	.89441
9	6.28050	-.76034	.92757	6.28197	-.90291	.81825
10	6.29520	-.70042	.86278	6.29608	-.85426	.74309
11	6.30890	-.64089	.79872	6.30909	-.80520	.66898
12	6.32164	-.58175	.73543	6.32102	-.75572	.59597
13	6.33348	-.52303	.67294	6.33191	-.70580	.52410
14	6.34446	-.46472	.61123	6.34181	-.65546	.45338
15	6.35462	-.40683	.55018	6.35076	-.60467	.38386
16	6.36400	-.34935	.48981	6.35881	-.55346	.31558
17	6.37265	-.29230	.43007	6.36601	-.50181	.24853
18	6.38060	-.23565	.37090	6.37240	-.44974	.18270
19	6.38788	-.17939	.31218	6.37804	-.39727	.11803
20	6.39451	-.12352	.25378	6.38297	-.34439	.05453
21	6.40052	-.06804	.19569	6.38723	-.29113	-.00783
22	6.40591	-.01296	.13780	6.39086	-.23746	-.06911
23	6.41070	.04173	.08006	6.39390	-.18338	-.12934
24	6.41489	.09601	.02238	6.39638	-.12889	-.18864
25	6.41849	.14988	-.03530	6.39832	-.07398	-.24696
26	6.42151	.20333	-.09299	6.39976	-.01865	-.30434
27	6.42395	.25637	-.15071	6.40071	.03710	-.36082
28	6.42580	.30900	-.20848	6.40121	.09326	-.41645
29	6.42708	.36123	-.26631	6.40126	.14983	-.47130
30	6.42778	.41306	-.32423	6.40090	.20681	-.52532
31	6.42791	.46449	-.38223	6.40014	.26418	-.57853
32	6.42746	.51554	-.44029	6.39900	.32194	-.63096
33	6.42645	.56620	-.49842	6.39751	.38010	-.68262
34	6.42485	.61648	-.55662	6.39568	.43864	-.73353
35	6.42269	.66639	-.61488	6.39354	.49755	-.78365
36	6.41996	.71592	-.67318	6.39110	.55684	-.83299
37	6.41666	.76510	-.73151	6.38838	.61649	-.88157
38	6.41279	.81392	-.78985	6.38541	.67650	-.92936
39	6.40836	.86239	-.84819	6.38221	.73686	-.97636
40	6.40338	.91053	-.90652	6.37880	.79755	-1.02254
41	6.39783	.95835	-.96485	6.37519	.85857	-1.06791
42	6.39173	1.00587	-1.02313	6.37142	.91989	-1.11244
43	6.38507	1.05308	-1.08137	6.36748	.98151	-1.15618
44	6.37787	1.10000	-1.13955	6.36342	1.04342	-1.19906
45	6.37012	1.14665	-1.19767	6.35924	1.10561	-1.24111
46	6.36185	1.19303	-1.25564	6.35497	1.16807	-1.28230

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POINT	ZSEMI	XSEMI	YSEMI
1	6.12629	-1.28073	1.45129
2	6.12580	-1.28173	1.45290
3	6.12531	-1.28256	1.45459
4	6.12481	-1.28320	1.45637
5	6.12433	-1.28365	1.45820
6	6.12386	-1.28390	1.46007
7	6.12340	-1.28394	1.46195
8	6.12297	-1.28379	1.46384
9	6.12256	-1.28343	1.46569
10	6.12219	-1.28288	1.46751
11	6.12185	-1.28214	1.46925
12	6.12155	-1.28122	1.47092
13	6.12130	-1.28012	1.47248
14	6.12109	-1.27887	1.47392
15	6.12093	-1.27747	1.47523
16	6.12082	-1.27593	1.47638
17	6.12075	-1.27429	1.47738
18	6.12075	-1.27255	1.47820
19	6.12079	-1.27073	1.47884
20	6.12089	-1.26885	1.47930
21	6.12103	-1.26694	1.47955
22	6.12123	-1.26501	1.47961
23	6.12147	-1.26309	1.47948
24	6.12176	-1.26119	1.47914
25	6.12209	-1.25934	1.47862
26	6.12245	-1.25756	1.47792
27	6.12285	-1.25587	1.47704
28	6.12328	-1.25428	1.47600
29	6.12373	-1.25282	1.47480
30	6.12420	-1.25149	1.47345

31	6.12468	-1.25032	1.47197

STREAMSURFACE 7 ITERATION 1 DEVIATION = 3.647 SOLIDITY = 1.5838
ITERATION 2 DEVIATION = 3.715 SOLIDITY = 1.4577
ITERATION 2 DEVIATION = 3.715 SOLIDITY = 1.4577

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-58.02584	.68089	9.8908
2	.02222	-.03543	-57.78089	.68249	9.6680
3	.04444	-.07052	-57.53139	.68727	9.4047
4	.06667	-.10528	-57.27607	.69523	9.1046
5	.08889	-.13969	-57.01355	.70638	8.7722
6	.11111	-.17375	-56.74239	.72072	8.4126
7	.13333	-.20745	-56.46107	.73824	8.0315
8	.15556	-.24080	-56.16797	.75895	7.6345
9	.17778	-.27376	-55.86139	.78285	7.2273
10	.20000	-.30634	-55.53951	.80993	6.8151
11	.22222	-.33852	-55.20121	.83389	6.4518
12	.24444	-.37029	-54.84919	.84728	6.1846
13	.26667	-.40164	-54.48743	.85010	6.0016
14	.28889	-.43257	-54.12023	.84235	5.8969
15	.31111	-.46308	-53.75221	.82402	5.8706
16	.33333	-.49319	-53.38833	.79512	5.9290

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
17	.35556	-.52291	-53.03386	.75565	6.0858
18	.37778	-.55225	-52.69442	.70560	6.3662
19	.40000	-.58125	-52.37588	.64498	6.8146
20	.42222	-.60992	-52.08326	.58117	7.4147
21	.44444	-.63831	-51.81649	.52281	8.0967
22	.46667	-.66644	-51.57390	.46989	8.8648
23	.48889	-.69434	-51.35364	.42242	9.7193
24	.51111	-.72203	-51.15366	.38040	10.6529
25	.53333	-.74954	-50.97179	.34383	11.6478
26	.55556	-.77687	-50.80569	.31271	12.6707
27	.57778	-.80405	-50.65294	.28704	13.6694
28	.60000	-.83108	-50.51101	.26682	14.5730
29	.62222	-.85799	-50.37742	.25118	15.3500
30	.64444	-.88477	-50.25028	.23918	15.9910
31	.66667	-.91143	-50.12778	.23084	16.4423
32	.68889	-.93797	-50.00808	.22614	16.6588
33	.71111	-.96441	-49.88929	.22509	16.6133
34	.73333	-.99073	-49.76952	.22768	16.3023
35	.75556	-1.01695	-49.64678	.23393	15.7473
36	.77778	-1.04304	-49.51910	.24382	14.9903
37	.80000	-1.06902	-49.38443	.25736	14.0851
38	.82222	-1.09486	-49.24116	.27185	13.2184
39	.84444	-1.12058	-49.08961	.28464	12.5091
40	.86667	-1.14615	-48.93058	.29572	11.9255
41	.88889	-1.17158	-48.76486	.30510	11.4447
42	.91111	-1.19686	-48.59330	.31277	11.0505
43	.93333	-1.22198	-48.41673	.31874	10.7308
44	.95556	-1.24694	-48.23605	.32300	10.4772
45	.97778	-1.27175	-48.05214	.32556	10.2838
46	1.00000	-1.29639	-47.86592	.32641	10.1466

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-58.02584
2	.20093	-55.52562
3	.40088	-52.36377
4	.60035	-50.50882
5	.79993	-49.38488
6	1.00000	-47.86592

1 STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 7
****

BETA1 =-58.026 (BLADE INLET ANGLE)
BETA2 =-47.866 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .07970 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.3099 (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
****

BLADE CHORD = 1.6222

STAGGER ANGLE =-52.354

CAMBER ANGLE =-10.160

SECTION AREA = .14390
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .49644
YBAR = -.67963

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .01282
IY = .00789
IXY = -.00991

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS = 38.026

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .02057 (AT 38.026 WITH (X) AXIS)
IPY = .00015 (AT 38.026 WITH (Y) AXIS)

POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2	
1	.00811	.00000	-58.026	.01622	.01499	.00430	.00123	-.004	=> 30
2	.03002	-.03493	-57.781	.02408	.04021	-.02851	.01983	-.041	=> 35
3	.05193	-.06953	-57.531	.03185	.06536	-.06098	.03849	-.078	=> 08
4	.07384	-.10379	-57.276	.03950	.09045	-.09311	.05722	-.114	=> 47
5	.09574	-.13771	-57.014	.04701	.11546	-.12492	.07603	-.150	=> 51
6	.11765	-.17130	-56.742	.05434	.14037	-.15640	.09493	-.186	=> 19
7	.13956	-.20452	-56.461	.06145	.16517	-.18755	.11395	-.221	=> 50
8	.16147	-.23739	-56.168	.06832	.18985	-.21838	.13309	-.256	=> 41
9	.18338	-.26989	-55.861	.07493	.21439	-.24887	.15237	-.290	=> 92
10	.20529	-.30201	-55.540	.08126	.23878	-.27902	.17179	-.325	=> 00
11	.22719	-.33374	-55.201	.08727	.26303	-.30883	.19136	-.358	=> 64
12	.24910	-.36506	-54.849	.09294	.28710	-.33830	.21111	-.391	=> 81
13	.27101	-.39596	-54.487	.09826	.31100	-.36742	.23102	-.424	=> 50

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POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2	
14	.29292	-.42646	-54.120	.10321	.33473	-.39621	.25111	-.456	=> 70
15	.31483	-.45654	-53.752	.10778	.35829	-.42468	.27137	-.488	=> 40
16	.33674	-.48622	-53.388	.11194	.38166	-.45285	.29181	-.519	=> 60
17	.35864	-.51552	-53.034	.11568	.40486	-.48074	.31243	-.550	=> 30
18	.38055	-.54445	-52.694	.11899	.42788	-.50839	.33323	-.580	=> 51
19	.40246	-.57304	-52.376	.12187	.45072	-.53584	.35420	-.610	=> 23
20	.42437	-.60131	-52.083	.12429	.47340	-.56312	.37534	-.639	=> 50
21	.44628	-.62930	-51.816	.12625	.49590	-.59027	.39666	-.668	=> 32
22	.46819	-.65703	-51.574	.12774	.51822	-.61733	.41815	-.696	=> 73
23	.49009	-.68454	-51.354	.12874	.54037	-.64434	.43982	-.724	=> 73
24	.51200	-.71183	-51.154	.12924	.56233	-.67130	.46168	-.752	=> 37
25	.53391	-.73895	-50.972	.12922	.58410	-.69826	.48372	-.779	=> 63
26	.55582	-.76589	-50.806	.12868	.60568	-.72523	.50595	-.806	=> 56
27	.57773	-.79269	-50.653	.12764	.62708	-.75223	.52838	-.833	=> 15
28	.59964	-.81934	-50.511	.12608	.64829	-.77925	.55098	-.859	=> 43
29	.62154	-.84587	-50.377	.12402	.66931	-.80632	.57378	-.885	=> 41
30	.64345	-.87227	-50.250	.12146	.69015	-.83343	.59676	-.911	=> 10
31	.66536	-.89855	-50.128	.11841	.71080	-.86060	.61992	-.936	=> 51
32	.68727	-.92472	-50.008	.11487	.73127	-.88781	.64327	-.961	=> 64
33	.70918	-.95079	-49.889	.11084	.75156	-.91508	.66679	-.986	=> 49
34	.73109	-.97674	-49.770	.10633	.77167	-.94240	.69050	-1.011	=> 07
35	.75299	-1.00258	-49.647	.10133	.79160	-.96977	.71438	-1.035	=> 39
36	.77490	-1.02831	-49.519	.09586	.81136	-.99719	.73844	-1.059	=> 42
37	.79681	-1.05391	-49.384	.08993	.83094	-1.02464	.76268	-1.083	=> 19
38	.81872	-1.07940	-49.241	.08352	.85035	-1.05213	.78708	-1.106	=> 66
39	.84063	-1.10475	-49.090	.07666	.86959	-1.07965	.81166	-1.129	=> 85
40	.86254	-1.12996	-48.931	.06934	.88868	-1.10718	.83640	-1.152	=> 74
41	.88444	-1.15503	-48.765	.06158	.90760	-1.13473	.86129	-1.175	=> 32
42	.90635	-1.17995	-48.593	.05337	.92637	-1.16230	.88634	-1.197	=> 60
43	.92826	-1.20472	-48.417	.04473	.94499	-1.18987	.91153	-1.219	=> 56
44	.95017	-1.22933	-48.236	.03565	.96346	-1.21746	.93687	-1.241	=> 20
45	.97208	-1.25378	-48.052	.02615	.98180	-1.24504	.96235	-1.262	=> 52
46	.99398	-1.27808	-47.866	.01622	1.00000	-1.27264	.98797	-1.283	=> 52

1 NORMALISED PLOT OF SECTION NUMBER
=> 7

1 DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
****

BLADE CHORD = 3.74724E+00

L.E.RADIUS = 1.87362E-02 CENTERED AT X= -1.1280E+00 Y= 1.5699E+00

SECTION AREA= 7.67823E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 3.64882E-01
IY = 2.24757E-01
IXY =-2.82108E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 5.85498E-01 (AT 38.026 WITH (X) AXIS)
IPY = 4.14136E-03 (AT 38.026 WITH (Y) AXIS)

PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
1	-1.11209E+00	1.57979E+00	-1.14388E+00	1.55995E+00
2	-1.05385E+00	1.50401E+00	-1.10091E+00	1.47436E+00
3	-9.95740E-01	1.42902E+00	-1.05781E+00	1.38952E+00
4	-9.37785E-01	1.35479E+00	-1.01455E+00	1.30546E+00
5	-8.80022E-01	1.28132E+00	-9.71106E-01	1.22220E+00
6	-8.22480E-01	1.20861E+00	-9.27435E-01	1.13978E+00
7	-7.65200E-01	1.13665E+00	-8.83503E-01	1.05823E+00
8	-7.08200E-01	1.06545E+00	-8.39291E-01	9.77584E-01
9	-6.51509E-01	9.95011E-01	-7.94769E-01	8.97876E-01
10	-5.95154E-01	9.25355E-01	-7.49912E-01	8.19149E-01
11	-5.39159E-01	8.56494E-01	-7.04695E-01	7.41449E-01
12	-4.83552E-01	7.88429E-01	-6.59091E-01	6.64826E-01
13	-4.28336E-01	7.21159E-01	-6.13094E-01	5.89311E-01
14	-3.73523E-01	6.54663E-01	-5.66695E-01	5.14933E-01
15	-3.19118E-01	5.88907E-01	-5.19889E-01	4.41708E-01
16	-2.65123E-01	5.23844E-01	-4.72671E-01	3.69640E-01
17	-2.11544E-01	4.59411E-01	-4.25038E-01	2.98730E-01
18	-1.58371E-01	3.95538E-01	-3.76998E-01	2.28956E-01
19	-1.05600E-01	3.32142E-01	-3.28558E-01	1.60291E-01
20	-5.32244E-02	2.69125E-01	-2.79721E-01	9.26962E-02
21	-1.24890E-03	2.06401E-01	-2.30485E-01	2.61172E-02
22	5.03187E-02	1.43889E-01	-1.80840E-01	-3.94968E-02
23	1.01472E-01	8.15187E-02	-1.30782E-01	-1.04195E-01
24	1.52201E-01	1.92252E-02	-8.02982E-02	-1.68019E-01
25	2.02494E-01	-4.30490E-02	-2.93791E-02	-2.31005E-01
26	2.52348E-01	-1.05347E-01	2.19790E-02	-2.93193E-01
27	3.01768E-01	-1.67698E-01	7.37716E-02	-3.54624E-01
28	3.50756E-01	-2.30126E-01	1.25996E-01	-4.15331E-01
29	3.99314E-01	-2.92648E-01	1.78649E-01	-4.75344E-01
30	4.47446E-01	-3.55277E-01	2.31729E-01	-5.34684E-01
31	4.95154E-01	-4.18022E-01	2.85234E-01	-5.93369E-01
32	5.42442E-01	-4.80887E-01	3.39158E-01	-6.51414E-01

IC/14PRINT

33	5.89311E-01	-5.43876E-01	3.93501E-01	-7.08826E-01
34	6.35765E-01	-6.06985E-01	4.48259E-01	-7.65611E-01
35	6.81806E-01	-6.70209E-01	5.03430E-01	-8.21768E-01

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PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
36	7.27439E-01	-7.33538E-01	5.59009E-01	-8.77293E-01
37	7.72671E-01	-7.96956E-01	6.14990E-01	-9.32180E-01
38	8.17507E-01	-8.60450E-01	6.71366E-01	-9.86412E-01
39	8.61956E-01	-9.24005E-01	7.28128E-01	-1.03997E+00
40	9.06029E-01	-9.87610E-01	7.85267E-01	-1.09284E+00
41	9.49737E-01	-1.05125E+00	8.42772E-01	-1.14501E+00
42	9.93094E-01	-1.11492E+00	9.00627E-01	-1.19646E+00
43	1.03611E+00	-1.17862E+00	9.58826E-01	-1.24719E+00
44	1.07879E+00	-1.24233E+00	1.01736E+00	-1.29718E+00
45	1.12114E+00	-1.30606E+00	1.07622E+00	-1.34643E+00
46	1.16318E+00	-1.36980E+00	1.13539E+00	-1.39494E+00

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-1.14388E+00	1.55995E+00
2	-1.14483E+00	1.56167E+00
3	-1.14560E+00	1.56347E+00
4	-1.14617E+00	1.56535E+00
5	-1.14654E+00	1.56727E+00
6	-1.14671E+00	1.56923E+00
7	-1.14668E+00	1.57119E+00
8	-1.14644E+00	1.57313E+00
9	-1.14600E+00	1.57504E+00
10	-1.14536E+00	1.57690E+00
11	-1.14453E+00	1.57868E+00
12	-1.14352E+00	1.58036E+00
13	-1.14234E+00	1.58192E+00
14	-1.14100E+00	1.58336E+00
15	-1.13952E+00	1.58464E+00
16	-1.13791E+00	1.58577E+00
17	-1.13619E+00	1.58672E+00
18	-1.13439E+00	1.58748E+00
19	-1.13251E+00	1.58805E+00
20	-1.13059E+00	1.58843E+00
21	-1.12863E+00	1.58860E+00
22	-1.12667E+00	1.58856E+00
23	-1.12473E+00	1.58832E+00
24	-1.12282E+00	1.58788E+00
25	-1.12096E+00	1.58724E+00
26	-1.11918E+00	1.58641E+00
27	-1.11750E+00	1.58540E+00
28	-1.11594E+00	1.58422E+00
29	-1.11450E+00	1.58288E+00
30	-1.11322E+00	1.58140E+00
31	-1.11209E+00	1.57979E+00

LEADING EDGE AXIAL DIFFERENCE = -.0710 NEW DELX = .0710

1

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-58.02584	.68089	9.8908
2	.02222	-.03543	-57.78089	.68249	9.6680
3	.04444	-.07052	-57.53139	.68727	9.4047
4	.06667	-.10528	-57.27607	.69523	9.1046
5	.08889	-.13969	-57.01355	.70638	8.7722
6	.11111	-.17375	-56.74239	.72072	8.4126
7	.13333	-.20745	-56.46107	.73824	8.0315
8	.15556	-.24080	-56.16797	.75895	7.6345
9	.17778	-.27376	-55.86139	.78285	7.2273
10	.20000	-.30634	-55.53951	.80993	6.8151
11	.22222	-.33852	-55.20121	.83389	6.4518
12	.24444	-.37029	-54.84919	.84728	6.1846
13	.26667	-.40164	-54.48743	.85010	6.0016
14	.28889	-.43257	-54.12023	.84235	5.8969
15	.31111	-.46308	-53.75221	.82402	5.8706
16	.33333	-.49319	-53.38833	.79512	5.9290
17	.35556	-.52291	-53.03386	.75565	6.0858
18	.37778	-.55225	-52.69442	.70560	6.3662
19	.40000	-.58125	-52.37588	.64498	6.8146
20	.42222	-.60992	-52.08326	.58117	7.4147
21	.44444	-.63831	-51.81649	.52281	8.0967
22	.46667	-.66644	-51.57390	.46989	8.8648
23	.48889	-.69434	-51.35364	.42242	9.7193
24	.51111	-.72203	-51.15366	.38040	10.6529
25	.53333	-.74954	-50.97179	.34383	11.6478
26	.55556	-.77687	-50.80569	.31271	12.6707
27	.57778	-.80405	-50.65294	.28704	13.6694
28	.60000	-.83108	-50.51101	.26682	14.5730
29	.62222	-.85799	-50.37742	.25118	15.3500
30	.64444	-.88477	-50.25028	.23918	15.9910
31	.66667	-.91143	-50.12778	.23084	16.4423
32	.68889	-.93797	-50.00808	.22614	16.6588
33	.71111	-.96441	-49.88929	.22509	16.6133
34	.73333	-.99073	-49.76952	.22768	16.3023
35	.75556	-1.01695	-49.64678	.23393	15.7473
36	.77778	-1.04304	-49.51910	.24382	14.9903
37	.80000	-1.06902	-49.38443	.25736	14.0851
38	.82222	-1.09486	-49.24116	.27185	13.2184
39	.84444	-1.12058	-49.08961	.28464	12.5091
40	.86667	-1.14615	-48.93058	.29572	11.9255
41	.88889	-1.17158	-48.76486	.30510	11.4447
42	.91111	-1.19686	-48.59330	.31277	11.0505
43	.93333	-1.22198	-48.41673	.31874	10.7308
44	.95556	-1.24694	-48.23605	.32300	10.4772
45	.97778	-1.27175	-48.05214	.32556	10.2838
46	1.00000	-1.29639	-47.86592	.32641	10.1466

1

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-58.02584
2	.20093	-55.52562
3	.40088	-52.36377
4	.60035	-50.50882
5	.79993	-49.38488
6	1.00000	-47.86592

CARTESIAN COORDINATES ON STREAMSURFACE 7

POINT	Z1	X1	Y1	Z2	X2	Y2
1	6.77175	-1.17923	1.56022	6.77313	-1.21087	1.54060
2	6.79386	-1.12125	1.48712	6.79570	-1.16810	1.45744
3	6.81496	-1.06340	1.41459	6.81705	-1.12519	1.37503
4	6.83506	-1.00570	1.34257	6.83723	-1.08213	1.29315
5	6.85417	-.94819	1.27109	6.85628	-1.03888	1.21182
6	6.87230	-.89089	1.20011	6.87420	-.99540	1.13112
7	6.88945	-.83384	1.12966	6.89102	-.95166	1.05108
8	6.90562	-.77706	1.05977	6.90675	-.90763	.97173
9	6.92080	-.72058	.99048	6.92142	-.86329	.89315
10	6.93502	-.66442	.92179	6.93504	-.81861	.81540
11	6.94831	-.60861	.85372	6.94762	-.77357	.73852
12	6.96069	-.55318	.78632	6.95920	-.72813	.66260
13	6.97218	-.49813	.71962	6.96981	-.68230	.58766
14	6.98282	-.44347	.65359	6.97946	-.63606	.51372
15	6.99264	-.38921	.58817	6.98821	-.58940	.44085
16	7.00167	-.33535	.52337	6.99608	-.54233	.36906
17	7.00994	-.28191	.45916	7.00311	-.49484	.29838
18	7.01747	-.22886	.39544	7.00935	-.44693	.22879
19	7.02430	-.17621	.33215	7.01482	-.39862	.16022
20	7.03043	-.12394	.26917	7.01955	-.34991	.09269
21	7.03589	-.07208	.20645	7.02359	-.30080	.02617
22	7.04069	-.02061	.14392	7.02696	-.25127	-.03940
23	7.04484	.03045	.08149	7.02969	-.20133	-.10406
24	7.04833	.08108	.01911	7.03181	-.15096	-.16788
25	7.05119	.13129	-.04327	7.03333	-.10015	-.23086
26	7.05341	.18106	-.10569	7.03429	-.04889	-.29305
27	7.05499	.23040	-.16816	7.03469	.00280	-.35447
28	7.05593	.27931	-.23071	7.03455	.05493	-.41515
29	7.05623	.32780	-.29336	7.03390	.10749	-.47514
30	7.05589	.37587	-.35611	7.03274	.16048	-.53446
31	7.05490	.42351	-.41895	7.03110	.21389	-.59310
32	7.05327	.47074	-.48189	7.02898	.26773	-.65108
33	7.05098	.51755	-.54491	7.02640	.32200	-.70840
34	7.04805	.56395	-.60802	7.02336	.37668	-.76509
35	7.04446	.60994	-.67121	7.01989	.43178	-.82112
36	7.04023	.65553	-.73444	7.01599	.48729	-.87648
37	7.03534	.70072	-.79770	7.01168	.54320	-.93116
38	7.02982	.74551	-.86098	7.00697	.59951	-.98516
39	7.02366	.78992	-.92424	7.00187	.65622	-1.03844
40	7.01689	.83396	-.98747	6.99642	.71330	-1.09098
41	7.00949	.87763	-1.05068	6.99062	.77075	-1.14278
42	7.00149	.92095	-1.11383	6.98452	.82856	-1.19380
43	6.99288	.96393	-1.17691	6.97813	.88671	-1.24407
44	6.98368	1.00658	-1.23992	6.97150	.94520	-1.29357
45	6.97390	1.04890	-1.30284	6.96463	1.00401	-1.34227
46	6.96355	1.09091	-1.36557	6.95758	1.06314	-1.39017

1

POINT	ZSEMI	XSEMI	YSEMI
1	6.77313	-1.21087	1.54060
2	6.77266	-1.21182	1.54226
3	6.77218	-1.21258	1.54402
4	6.77171	-1.21315	1.54584
5	6.77125	-1.21352	1.54772
6	6.77080	-1.21369	1.54962
7	6.77036	-1.21365	1.55153
8	6.76995	-1.21342	1.55343
9	6.76956	-1.21298	1.55530
10	6.76921	-1.21234	1.55711
11	6.76889	-1.21151	1.55885
12	6.76861	-1.21051	1.56049
13	6.76837	-1.20933	1.56202
14	6.76818	-1.20800	1.56343
15	6.76803	-1.20653	1.56469
16	6.76794	-1.20493	1.56580
17	6.76789	-1.20322	1.56674
18	6.76789	-1.20142	1.56749
19	6.76794	-1.19955	1.56806
20	6.76804	-1.19764	1.56844
21	6.76819	-1.19569	1.56862
22	6.76839	-1.19374	1.56859
23	6.76863	-1.19180	1.56837
24	6.76891	-1.18990	1.56796
25	6.76923	-1.18806	1.56736
26	6.76959	-1.18629	1.56657
27	6.76998	-1.18461	1.56561
28	6.77039	-1.18306	1.56448
29	6.77083	-1.18163	1.56320
30	6.77129	-1.18035	1.56177
31	6.77175	-1.17923	1.56022

STREAMSURFACE 8 ITERATION 1 DEVIATION = 3.127 SOLIDITY = 1.4357
ITERATION 2 DEVIATION = 3.174 SOLIDITY = 1.3312
ITERATION 2 DEVIATION = 3.174 SOLIDITY = 1.3312

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-59.97257	.43719	18.2532
2	.02222	-.03834	-59.83228	.44010	17.9041
3	.04444	-.07646	-59.68890	.44884	17.3310
4	.06667	-.11436	-59.54048	.46340	16.5654
5	.08889	-.15203	-59.38496	.48379	15.6498
6	.11111	-.18946	-59.22025	.51000	14.6315
7	.13333	-.22664	-59.04412	.54203	13.5560
8	.15556	-.26356	-58.85426	.57989	12.4635
9	.17778	-.30018	-58.64825	.62357	11.3861
10	.20000	-.33650	-58.42353	.67308	10.3477
11	.22222	-.37248	-58.17828	.72004	9.4738
12	.24444	-.40811	-57.91509	.75381	8.8516
13	.26667	-.44337	-57.63809	.77435	8.4209
14	.28889	-.47825	-57.35163	.78165	8.1481
15	.31111	-.51274	-57.06038	.77572	8.0183
16	.33333	-.54684	-56.76928	.75656	8.0313

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
17	.35556	-.58058	-56.48361	.72417	8.2022
18	.37778	-.61396	-56.20893	.67854	8.5666
19	.40000	-.64700	-55.95113	.61968	9.1939
20	.42222	-.67974	-55.71526	.55601	10.0620
21	.44444	-.71220	-55.50132	.49830	11.0452
22	.46667	-.74442	-55.30762	.44658	12.1444
23	.48889	-.77641	-55.13228	.40086	13.3518
24	.51111	-.80821	-54.97331	.36114	14.6448
25	.53333	-.83983	-54.82860	.32742	15.9800
26	.55556	-.87129	-54.69591	.29969	17.2874
27	.57778	-.90260	-54.57293	.27797	18.4703
28	.60000	-.93377	-54.45726	.26224	19.4126
29	.62222	-.96481	-54.34661	.25124	20.0988
30	.64444	-.99573	-54.23944	.24355	20.5721
31	.66667	-1.02652	-54.13433	.23916	20.7904
32	.68889	-1.05720	-54.02990	.23808	20.7281
33	.71111	-1.08776	-53.92469	.24030	20.3819
34	.73333	-1.11820	-53.81723	.24582	19.7712
35	.75556	-1.14852	-53.70602	.25464	18.9352
36	.77778	-1.17872	-53.58952	.26676	17.9254
37	.80000	-1.20878	-53.46616	.28219	16.7980
38	.82222	-1.23871	-53.33472	.29830	15.7441
39	.84444	-1.26848	-53.19554	.31252	14.8819
40	.86667	-1.29810	-53.04934	.32484	14.1722
41	.88889	-1.32757	-52.89688	.33526	13.5869
42	.91111	-1.35686	-52.73891	.34379	13.1061
43	.93333	-1.38599	-52.57623	.35043	12.7153
44	.95556	-1.41494	-52.40964	.35516	12.4038
45	.97778	-1.44372	-52.23997	.35801	12.1646
46	1.00000	-1.47232	-52.06808	.35895	11.9927

DATA POINTS

POINT FRAC. M Y-D(DEG)

```
 1     .00000 -59.97257
 2     .20140 -58.40871
 3     .40143 -55.93528
 4     .60071 -54.45367
 5     .79992 -53.46664
 6    1.00000 -52.06808
1 STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER  8
  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

  BETA1 =-59.973  (BLADE INLET ANGLE)
  BETA2 =-52.068  (BLADE OUTLET ANGLE)
  YZERO = .00500  (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
  T     = .07050  (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
  YONE  = .00500  (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
  Z     =  .5500  (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
  CORD  = 2.1144  (MERIDIONAL CHORD OF SECTION)

  NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
  BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

  BLADE CHORD    = 1.7606

  STAGGER ANGLE  =-55.816

  CAMBER ANGLE   = -7.904

  SECTION AREA   = .15113
  LOCATION OF CENTROID RELATIVE TO LEADING EDGE

        XBAR =  .49827
        YBAR = -.76380

  SECOND MOMENTS OF AREA ABOUT CENTROID

        IX   =  .01759
        IY   =  .00833
        IXY  = -.01196

  ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS = 34.420

  PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

        IPX  = .02578      (AT 34.420 WITH (X) AXIS)
        IPY  = .00014      (AT 34.420 WITH (Y) AXIS)

 POINT       M E A N L I N E   D A T A          SURFACE COORDINATE DATA
 NUMBER    X       Y     ANGLE THICKNESS     X1      Y1      X2      Y2

   1     .00880  .00000-59.973  .01761    .01642  .00441  .00118 -.004
=> 41
   2     .03068 -.03774-59.832  .02483    .04141 -.03150  .01994 -.043
=> 97
   3     .05255 -.07526-59.689  .03199    .06635 -.06719  .03874 -.083
=> 33
   4     .07442 -.11256-59.540  .03906    .09125 -.10266  .05759 -.122
=> 46
   5     .09629 -.14964-59.385  .04601    .11609 -.13792  .07649 -.161
=> 35
   6     .11816 -.18648-59.220  .05282    .14086 -.17296  .09547 -.200
=> 00
   7     .14004 -.22307-59.044  .05946    .16553 -.20778  .11454 -.238
=> 37
   8     .16191 -.25941-58.854  .06589    .19010 -.24237  .13371 -.276
=> 44
   9     .18378 -.29545-58.648  .07209    .21456 -.27670  .15300 -.314
=> 21
  10     .20565 -.33120-58.424  .07804    .23890 -.31077  .17241 -.351
=> 63
  11     .22753 -.36662-58.178  .08372    .26309 -.34455  .19196 -.388
=> 69
  12     .24940 -.40169-57.915  .08909    .28714 -.37802  .21166 -.425
=> 35
  13     .27127 -.43639-57.638  .09414    .31103 -.41119  .23151 -.461
=> 58
1
 POINT       M E A N L I N E   D A T A          SURFACE COORDINATE DATA
 NUMBER    X       Y     ANGLE THICKNESS     X1      Y1      X2      Y2

  14     .29314 -.47072-57.352  .09884    .33476 -.44405  .25153 -.497
=> 38
  15     .31502 -.50466-57.060  .10320    .35832 -.47661  .27171 -.532
=> 72
  16     .33689 -.53823-56.769  .10718    .38171 -.50887  .29206 -.567
=> 60
  17     .35876 -.57144-56.484  .11077    .40493 -.54086  .31259 -.602
=> 02
  18     .38063 -.60429-56.209  .11396    .42799 -.57260  .33328 -.635
=> 98
  19     .40250 -.63681-55.951  .11674    .45087 -.60413  .35414 -.669
=> 49
  20     .42438 -.66904-55.715  .11909    .47358 -.63549  .37518 -.702
=> 58
  21     .44625 -.70099-55.501  .12101    .49612 -.66672  .39638 -.735
=> 26
  22     .46812 -.73270-55.308  .12249    .51848 -.69784  .41777 -.767
=> 55
  23     .48999 -.76419-55.132  .12350    .54066 -.72889  .43933 -.799
=> 49
  24     .51187 -.79548-54.973  .12403    .56265 -.75989  .46108 -.831
=> 08
  25     .53374 -.82661-54.829  .12408    .58445 -.79087  .48302 -.862
=> 34
  26     .55561 -.85757-54.696  .12364    .60606 -.82184  .50516 -.893
=> 29
  27     .57748 -.88838-54.573  .12270    .62747 -.85282  .52749 -.923
=> 95
  28     .59936 -.91906-54.457  .12128    .64870 -.88381  .55001 -.954
=> 31
  29     .62123 -.94962-54.347  .11938    .66973 -.91482  .57273 -.984
=> 41
  30     .64310 -.98005-54.239  .11700    .69057 -.94586  .59563-1.014
=> 23
  31     .66497-1.01036-54.134  .11415    .71122 -.97692  .61872-1.043
=> 80
  32     .68684-1.04055-54.030  .11083    .73169-1.00801  .64200-1.073
=> 10
  33     .70872-1.07063-53.925  .10704    .75197-1.03912  .66546-1.102
=> 15
  34     .73059-1.10060-53.817  .10279    .77207-1.07025  .68910-1.130
=> 94
  35     .75246-1.13044-53.706  .09809    .79199-1.10141  .71293-1.159
=> 47
  36     .77433-1.16016-53.590  .09293    .81173-1.13258  .73694-1.187
=> 74
  37     .79621-1.18975-53.466  .08732    .83129-1.16376  .76112-1.215
=> 74
  38     .81808-1.21920-53.335  .08128    .85068-1.19493  .78548-1.243
=> 47
  39     .83995-1.24851-53.196  .07479    .86989-1.22611  .81001-1.270
=> 91
  40     .86182-1.27766-53.049  .06787    .88894-1.25727  .83470-1.298
=> 06
  41     .88370-1.30666-52.897  .06052    .90783-1.28841  .85956-1.324
=> 92
  42     .90557-1.33550-52.739  .05276    .92656-1.31953  .88457-1.351
=> 47
  43     .92744-1.36416-52.576  .04458    .94514-1.35062  .90974-1.377
=> 71
  44     .94931-1.39266-52.410  .03599    .96357-1.38168  .93505-1.403
=> 64
  45     .97118-1.42099-52.240  .02700    .98186-1.41272  .96051-1.429
=> 25
  46     .99306-1.44914-52.068  .01761   1.00000-1.44373  .98611-1.454
=> 55
1                                   NORMALISED PLOT OF SECTION NUMBER
=> 8

1 DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

   BLADE CHORD = 3.72251E+00

   L.E.RADIUS  = 1.86126E-02  CENTERED AT X= -1.0349E+00 Y=  1.6150E+00

   SECTION AREA= 6.75637E-01

   SECOND MOMENTS OF AREA ABOUT CENTROID

      IX   = 3.51541E-01
      IY   = 1.66541E-01
      IXY  =-2.38984E-01

   PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

      IPX  = 5.15302E-01  (AT 34.420 WITH (X) AXIS)
      IPY  = 2.77945E-03  (AT 34.420 WITH (Y) AXIS)

 PT     SURFACE----------ONE        SURFACE----------TWO
 NO        X             Y             X             Y

  1  -1.01880E+00   1.62427E+00  -1.05103E+00   1.60564E+00
  2  -9.65981E-01   1.54836E+00  -1.01136E+00   1.52198E+00
  3  -9.13233E-01   1.47290E+00  -9.71618E-01   1.43877E+00
  4  -8.60587E-01   1.39789E+00  -9.31772E-01   1.35603E+00
  5  -8.08070E-01   1.32334E+00  -8.91798E-01   1.27379E+00
  6  -7.55709E-01   1.24925E+00  -8.51667E-01   1.19209E+00
  7  -7.03540E-01   1.17563E+00  -8.11345E-01   1.11096E+00
  8  -6.51582E-01   1.10250E+00  -7.70810E-01   1.03045E+00
  9  -5.99865E-01   1.02991E+00  -7.30036E-01   9.50606E-01
 10  -5.48414E-01   9.57884E-01  -6.88995E-01   8.71478E-01
 11  -4.97256E-01   8.86462E-01  -6.47662E-01   7.93128E-01
 12  -4.46416E-01   8.15675E-01  -6.06009E-01   7.15621E-01
 13  -3.95905E-01   7.45542E-01  -5.64029E-01   6.39005E-01
 14  -3.45735E-01   6.76068E-01  -5.21707E-01   5.63320E-01
 15  -2.95915E-01   6.07240E-01  -4.79035E-01   4.88595E-01
 16  -2.46452E-01   5.39029E-01  -4.36006E-01   4.14843E-01
 17  -1.97354E-01   4.71391E-01  -3.92613E-01   3.42072E-01
 18  -1.48616E-01   4.04273E-01  -3.48859E-01   2.70267E-01
 19  -1.00238E-01   3.37603E-01  -3.04746E-01   1.99406E-01
 20  -5.22190E-02   2.71297E-01  -2.60273E-01   1.29453E-01
 21  -4.56508E-03   2.05278E-01  -2.15435E-01   6.03584E-02
 22   4.27142E-02   1.39475E-01  -1.70223E-01  -7.92763E-03
 23   8.96109E-02   7.38264E-02  -1.24628E-01  -7.54492E-02
 24   1.36114E-01   8.27622E-03  -7.86389E-02  -1.42244E-01
 25   1.82211E-01  -5.72243E-02  -3.22444E-02  -2.08346E-01
 26   2.27897E-01  -1.22713E-01   1.45614E-02  -2.73786E-01
 27   2.73175E-01  -1.88212E-01   6.17752E-02  -3.38597E-01
 28   3.18047E-01  -2.53741E-01   1.09395E-01  -4.02806E-01
 29   3.62515E-01  -3.19311E-01   1.57418E-01  -4.66435E-01
 30   4.06583E-01  -3.84930E-01   2.05842E-01  -5.29498E-01
 31   4.50252E-01  -4.50603E-01   2.54664E-01  -5.92006E-01
 32   4.93528E-01  -5.16330E-01   3.03880E-01  -6.53967E-01
 33   5.36413E-01  -5.82112E-01   3.53487E-01  -7.15383E-01
 34   5.78909E-01  -6.47944E-01   4.03483E-01  -7.76256E-01
 35   6.21021E-01  -7.13818E-01   4.53863E-01  -8.36580E-01
1
 PT     SURFACE----------ONE        SURFACE----------TWO
 NO        X             Y             X             Y

 36   6.62752E-01  -7.79723E-01   5.04623E-01  -8.96350E-01
 37   7.04111E-01  -8.45643E-01   5.55756E-01  -9.55555E-01
 38   7.45101E-01  -9.11564E-01   6.07258E-01  -1.01418E+00
 39   7.85731E-01  -9.77471E-01   6.59119E-01  -1.07220E+00
 40   8.26010E-01  -1.04335E+00   7.11332E-01  -1.12961E+00
 41   8.65946E-01  -1.10920E+00   7.63888E-01  -1.18639E+00
 42   9.05554E-01  -1.17499E+00   8.16772E-01  -1.24253E+00
 43   9.44837E-01  -1.24074E+00   8.69980E-01  -1.29802E+00
 44   9.83805E-01  -1.30642E+00   9.23504E-01  -1.35284E+00
 45   1.02247E+00  -1.37204E+00   9.77335E-01  -1.40700E+00
 46   1.06083E+00  -1.43760E+00   1.03147E+00  -1.46048E+00

 POINTS DESCRIBING LEADING EDGE RADIUS

 POINT NO.      X             Y

    1     -1.05103E+00   1.60564E+00
    2     -1.05192E+00   1.60738E+00
    3     -1.05262E+00   1.60919E+00
    4     -1.05312E+00   1.61108E+00
    5     -1.05343E+00   1.61300E+00
    6     -1.05353E+00   1.61494E+00
    7     -1.05343E+00   1.61689E+00
    8     -1.05312E+00   1.61881E+00
    9     -1.05262E+00   1.62070E+00
   10     -1.05192E+00   1.62252E+00
   11     -1.05104E+00   1.62425E+00
   12     -1.04998E+00   1.62589E+00
   13     -1.04876E+00   1.62740E+00
   14     -1.04738E+00   1.62878E+00
   15     -1.04586E+00   1.63001E+00
   16     -1.04423E+00   1.63107E+00
   17     -1.04250E+00   1.63195E+00
   18     -1.04068E+00   1.63265E+00
   19     -1.03880E+00   1.63316E+00
   20     -1.03687E+00   1.63346E+00
   21     -1.03493E+00   1.63357E+00
   22     -1.03298E+00   1.63347E+00
   23     -1.03106E+00   1.63316E+00
   24     -1.02917E+00   1.63266E+00
   25     -1.02735E+00   1.63196E+00
   26     -1.02562E+00   1.63108E+00
   27     -1.02398E+00   1.63002E+00
   28     -1.02247E+00   1.62879E+00
   29     -1.02109E+00   1.62741E+00
   30     -1.01986E+00   1.62590E+00
   31     -1.01880E+00   1.62427E+00
 LEADING EDGE AXIAL DIFFERENCE =      -.0833   NEW DELX =      .0833
1

 POINT  FRAC. M      Y     Y-D(DEG)    Y-DD   R OF CURV

   1     .00000   .00000 -59.97257   .43719   18.2532
   2     .02222  -.03834 -59.83228   .44010   17.9041
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  3    .04444   -.07646 -59.68890    .44884   17.3310
  4    .06667   -.11436 -59.54048    .46340   16.5654
  5    .08889   -.15203 -59.38496    .48379   15.6498
  6    .11111   -.18946 -59.22025    .51000   14.6315
  7    .13333   -.22664 -59.04412    .54203   13.5560
  8    .15556   -.26356 -58.85426    .57989   12.4635
  9    .17778   -.30018 -58.64825    .62357   11.3861
 10    .20000   -.33650 -58.42353    .67308   10.3477
 11    .22222   -.37248 -58.17828    .72004    9.4738
 12    .24444   -.40811 -57.91509    .75381    8.8516
 13    .26667   -.44337 -57.63809    .77435    8.4209
 14    .28889   -.47825 -57.35163    .78165    8.1481
 15    .31111   -.51274 -57.06038    .77572    8.0183
 16    .33333   -.54684 -56.76928    .75656    8.0313
 17    .35556   -.58058 -56.48361    .72417    8.2022
 18    .37778   -.61396 -56.20893    .67854    8.5666
 19    .40000   -.64700 -55.95113    .61968    9.1939
 20    .42222   -.67974 -55.71526    .55601   10.0620
 21    .44444   -.71220 -55.50132    .49830   11.0452
 22    .46667   -.74442 -55.30762    .44658   12.1444
 23    .48889   -.77641 -55.13228    .40086   13.3518
 24    .51111   -.80821 -54.97331    .36114   14.6448
 25    .53333   -.83983 -54.82860    .32742   15.9800
 26    .55556   -.87129 -54.69591    .29969   17.2874
 27    .57778   -.90260 -54.57293    .27797   18.4703
 28    .60000   -.93377 -54.45726    .26224   19.4126
 29    .62222   -.96481 -54.34661    .25124   20.0988
 30    .64444   -.99573 -54.23944    .24355   20.5721
 31    .66667  -1.02652 -54.13433    .23916   20.7904
 32    .68889  -1.05720 -54.02990    .23808   20.7281
 33    .71111  -1.08776 -53.92469    .24030   20.3819
 34    .73333  -1.11820 -53.81723    .24582   19.7712
 35    .75556  -1.14852 -53.70602    .25464   18.9352
 36    .77778  -1.17872 -53.58952    .26676   17.9254
 37    .80000  -1.20878 -53.46616    .28219   16.7980
 38    .82222  -1.23871 -53.33472    .29830   15.7441
 39    .84444  -1.26848 -53.19554    .31252   14.8819
 40    .86667  -1.29810 -53.04934    .32484   14.1722
 41    .88889  -1.32757 -52.89688    .33526   13.5869
 42    .91111  -1.35686 -52.73891    .34379   13.1061
 43    .93333  -1.38599 -52.57623    .35043   12.7153
 44    .95556  -1.41494 -52.40964    .35516   12.4038
 45    .97778  -1.44372 -52.23997    .35801   12.1646
 46   1.00000  -1.47232 -52.06808    .35895   11.9927
1

 DATA POINTS

 POINT  FRAC. M  Y-D(DEG)

   1    .00000 -59.97257
   2    .20140 -58.40871
   3    .40143 -55.93528
   4    .60071 -54.45367
   5    .79992 -53.46664
   6   1.00000 -52.06808

 CARTESIAN COORDINATES ON STREAMSURFACE  8

 POINT     Z1        X1        Y1        Z2        X2        Y2

   1    7.42235  -1.09888   1.60661   7.42336  -1.13098   1.58806
   2    7.44275  -1.04628   1.53309   7.44398  -1.09147   1.50659
   3    7.46230   -.99374   1.45982   7.46358  -1.05189   1.42552
   4    7.48099   -.94131   1.38678   7.48220  -1.01221   1.34471
   5    7.49884   -.88900   1.31401   7.49986   -.97239   1.26421
   6    7.51582   -.83684   1.24149   7.51655   -.93242   1.18406
   7    7.53196   -.78486   1.16924   7.53228   -.89226   1.10430
   8    7.54722   -.73309   1.09732   7.54707   -.85188   1.02498
   9    7.56162   -.68155   1.02577   7.56092   -.81126    .94618
  10    7.57516   -.63027    .95462   7.57384   -.77037    .86795
  11    7.58783   -.57928    .88392   7.58584   -.72918    .79037
  12    7.59966   -.52859    .81374   7.59694   -.68768    .71351
  13    7.61064   -.47823    .74413   7.60715   -.64584    .63744
  14    7.62079   -.42819    .67508   7.61649   -.60365    .56217
  15    7.63014   -.37850    .60655   7.62499   -.56111    .48777
  16    7.63869   -.32916    .53859   7.63266   -.51821    .41429
  17    7.64647   -.28017    .47114   7.63953   -.47494    .34173
  18    7.65349   -.23154    .40417   7.64563   -.43131    .27010
  19    7.65977   -.18326    .33759   7.65098   -.38731    .19933
  20    7.66534   -.13533    .27132   7.65561   -.34295    .12944
  21    7.67020   -.08776    .20532   7.65952   -.29821    .06039
  22    7.67436   -.04055    .13951   7.66275   -.25310   -.00786
  23    7.67783    .00627    .07382   7.66531   -.20760   -.07535
  24    7.68062    .05271    .00821   7.66722   -.16170   -.14214
  25    7.68274    .09875   -.05737   7.66850   -.11539   -.20824
  26    7.68417    .14438   -.12294   7.66916   -.06866   -.27367
  27    7.68494    .18961   -.18851   7.66921   -.02152   -.33847
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  28    7.68503    .23444   -.25411   7.66867    .02603   -.40265
  29    7.68444    .27887   -.31974   7.66755    .07399   -.46624
  30    7.68319    .32290   -.38540   7.66585    .12235   -.52926
  31    7.68125    .36654   -.45109   7.66360    .17112   -.59170
  32    7.67865    .40979   -.51680   7.66078    .22029   -.65356
  33    7.67536    .45265   -.58251   7.65743    .26985   -.71484
  34    7.67141    .49513   -.64823   7.65353    .31980   -.77556
  35    7.66677    .53722   -.71394   7.64910    .37015   -.83568
  36    7.66147    .57894   -.77962   7.64415    .42088   -.89520
  37    7.65551    .62028   -.84525   7.63869    .47198   -.95410
  38    7.64890    .66126   -.91080   7.63272    .52346  -1.01236
  39    7.64165    .70189   -.97626   7.62625    .57531  -1.06996
  40    7.63379    .74216  -1.04161   7.61931    .62750  -1.12687
  41    7.62531    .78209  -1.10685   7.61193    .68005  -1.18308
  42    7.61625    .82169  -1.17195   7.60414    .73292  -1.23858
  43    7.60660    .86097  -1.23690   7.59597    .78612  -1.29336
  44    7.59638    .89993  -1.30170   7.58746    .83964  -1.34741
  45    7.58560    .93859  -1.36634   7.57865    .89346  -1.40072
  46    7.57430    .97695  -1.43071   7.56956    .94759  -1.45329
1

 POINT   ZSEMI     XSEMI     YSEMI

   1    7.42336  -1.13098   1.58806
   2    7.42292  -1.13186   1.58975
   3    7.42247  -1.13256   1.59152
   4    7.42203  -1.13306   1.59336
   5    7.42160  -1.13337   1.59523
   6    7.42118  -1.13347   1.59714
   7    7.42078  -1.13337   1.59904
   8    7.42040  -1.13307   1.60092
   9    7.42005  -1.13257   1.60277
  10    7.41973  -1.13187   1.60455
  11    7.41944  -1.13099   1.60626
  12    7.41919  -1.12993   1.60786
  13    7.41898  -1.12871   1.60936
  14    7.41882  -1.12734   1.61071
  15    7.41869  -1.12584   1.61193
  16    7.41862  -1.12421   1.61298
  17    7.41858  -1.12248   1.61386
  18    7.41860  -1.12067   1.61456
  19    7.41866  -1.11880   1.61507
  20    7.41877  -1.11688   1.61538
  21    7.41893  -1.11494   1.61550
  22    7.41913  -1.11300   1.61542
  23    7.41936  -1.11109   1.61514
  24    7.41964  -1.10921   1.61468
  25    7.41995  -1.10740   1.61402
  26    7.42029  -1.10567   1.61318
  27    7.42067  -1.10404   1.61217
  28    7.42106  -1.10254   1.61099
  29    7.42148  -1.10116   1.60966
  30    7.42191  -1.09994   1.60820
  31    7.42235  -1.09888   1.60661

 STREAMSURFACE  9   ITERATION  1  DEVIATION =  2.356  SOLIDITY = 1.2721
                    ITERATION  2  DEVIATION =  2.398  SOLIDITY = 1.2012
                    ITERATION  2  DEVIATION =  2.398  SOLIDITY = 1.2012

 POINT  FRAC. M     Y      Y-D(DEG)    Y-DD   R OF CURV

   1    .00000    .00000 -61.56413   .08004  115.7138
   2    .02222   -.04102 -61.54053   .08491  108.8365
   3    .04444   -.08199 -61.51409   .09950   92.6383
   4    .06667   -.12292 -61.48195   .12382   74.2124
   5    .08889   -.16378 -61.44126   .15786   57.9790
   6    .11111   -.20457 -61.38910   .20164   45.1650
   7    .13333   -.24526 -61.32251   .25514   35.4669
   8    .15556   -.28582 -61.23845   .31837   28.1955
   9    .17778   -.32622 -61.13374   .39133   22.7113
  10    .20000   -.36643 -61.00506   .47402   18.5225
  11    .22222   -.40640 -60.84996   .55505   15.5891
  12    .24444   -.44610 -60.67119   .61905   13.7456
  13    .26667   -.48550 -60.47328   .66594   12.5451
  14    .28889   -.52456 -60.26091   .69572   11.7757
  15    .31111   -.56329 -60.03902   .70839   11.3333
  16    .33333   -.60166 -59.81277   .70395   11.1738

 POINT  FRAC. M     Y      Y-D(DEG)    Y-DD   R OF CURV

  17    .35556   -.63969 -59.58766   .68240   11.2965
  18    .37778   -.67739 -59.36944   .64374   11.7451
  19    .40000   -.71476 -59.16419   .58797   12.6288
  20    .42222   -.75185 -58.97717   .52514   13.9106
  21    .44444   -.78867 -58.80838   .46944   15.3348
  22    .46667   -.82527 -58.65587   .42097   16.8770
  23    .48889   -.86165 -58.51761   .37973   18.4894
  24    .51111   -.89785 -58.39141   .34572   20.0907
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  25    .53333   -.93388 -58.27500   .31894   21.5634
  26    .55556   -.96974 -58.16603   .29940   22.7608
  27    .57778  -1.00546 -58.06207   .28708   23.5306
  28    .60000  -1.04104 -57.96061   .28199   23.7523
  29    .62222  -1.07648 -57.85939   .28173   23.5743
  30    .64444  -1.11178 -57.75734   .28332   23.2441
  31    .66667  -1.14694 -57.65381   .28674   22.7700
  32    .68889  -1.18196 -57.54808   .29201   22.1648
  33    .71111  -1.21683 -57.43946   .29913   21.4456
  34    .73333  -1.25156 -57.32721   .30808   20.6320
  35    .75556  -1.28613 -57.21058   .31887   19.7451
  36    .77778  -1.32055 -57.08881   .33151   18.8059
  37    .80000  -1.35480 -56.96109   .34599   17.8342
  38    .82222  -1.38889 -56.82685   .36055   16.9302
  39    .84444  -1.42279 -56.68638   .37341   16.1650
  40    .86667  -1.45651 -56.54021   .38455   15.5155
  41    .88889  -1.49004 -56.38889   .39397   14.9643
  42    .91111  -1.52337 -56.23299   .40169   14.4983
  43    .93333  -1.55651 -56.07309   .40768   14.1078
  44    .95556  -1.58945 -55.90979   .41197   13.7853
  45    .97778  -1.62218 -55.74372   .41454   13.5254
  46   1.00000  -1.65471 -55.57554   .41540   13.3247

 DATA POINTS

 POINT  FRAC. M  Y-D(DEG)

   1    .00000 -61.56413
   2    .20175 -60.99379
   3    .40202 -59.14635
   4    .60123 -57.95502
   5    .80016 -56.96012
   6   1.00000 -55.57554
1        STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER  9
         ****************************************************

   BETA1 =-61.564  (BLADE INLET ANGLE)
   BETA2 =-55.576  (BLADE OUTLET ANGLE)
   YZERO = .00500  (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
   T     = .04750  (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
   YONE  = .00500  (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
   Z     =  .5500  (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
   CORD  = 1.8995  (MERIDIONAL CHORD OF SECTION)

 NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
 BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
 ****************************************************

   BLADE CHORD    = 1.9093

   STAGGER ANGLE  =-58.854

   CAMBER ANGLE   = -5.989

   SECTION AREA   = .12398
   LOCATION OF CENTROID RELATIVE TO LEADING EDGE

            XBAR =  .49871
            YBAR = -.84868

   SECOND MOMENTS OF AREA ABOUT CENTROID

            IX   =  .01922
            IY   =  .00710
            IXY  = -.01161

   ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS = 31.210

   PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

            IPX  = .02625      (AT 31.210 WITH (X) AXIS)
            IPY  = .00006      (AT 31.210 WITH (Y) AXIS)

 POINT        M E A N L I N E   D A T A        SURFACE COORDINATE DATA
 NUMBER     X        Y     ANGLE THICKNESS    X1      Y1      X2     Y2

   1      .00955  .00000-61.564  .01909    .01794  .00455  .00115 -.004
=> 55
   2      .03138 -.04030-61.541  .02380    .04184 -.03463  .02092 -.045
=> 97
   3      .05322 -.08056-61.514  .02848    .06573 -.07377  .04070 -.087
=> 36
   4      .07505 -.12078-61.482  .03313    .08961 -.11287  .06050 -.128
=> 69
   5      .09689 -.16093-61.441  .03771    .11345 -.15192  .08033 -.169
=> 94
   6      .11872 -.20101-61.389  .04222    .13725 -.19090  .10019 -.211
=> 11
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RESULTS.OUT 6-25-95 10:23a

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         7      .14056 -.24098-61.323  .04662   .16101 -.22980  .12010 -.252
  => 17
         8      .16239 -.28084-61.238  .05091   .18471 -.26859  .14008 -.293
  => 09
         9      .18423 -.32053-61.134  .05507   .20834 -.30724  .16011 -.333
  => 83
        10      .20606 -.36004-61.005  .05907   .23189 -.34573  .18023 -.374
  => 36
        11      .22790 -.39932-60.850  .06289   .25536 -.38400  .20043 -.414
  => 64
        12      .24973 -.43833-60.671  .06653   .27873 -.42204  .22073 -.454
  => 62
        13      .27157 -.47704-60.473  .06995   .30200 -.45980  .24113 -.494
  => 28
1
      POINT        M E A N L I N E   D A T A       SURFACE COORDINATE DATA
      NUMBER    X         Y      ANGLE THICKNESS    X1       Y1       X2      Y2

        14      .29340 -.51543-60.261  .07316   .32516 -.49728  .26164 -.533
  => 57
        15      .31524 -.55348-60.039  .07613   .34822 -.53447  .28226 -.572
  => 49
        16      .33707 -.59118-59.813  .07885   .37115 -.57136  .30299 -.611
  => 01
        17      .35891 -.62855-59.588  .08132   .39397 -.60797  .32384 -.649
  => 13
        18      .38074 -.66559-59.369  .08352   .41667 -.64431  .34481 -.686
  => 86
        19      .40258 -.70231-59.164  .08544   .43926 -.68041  .36590 -.724
  => 21
        20      .42441 -.73875-58.977  .08708   .46172 -.71631  .38710 -.761
  => 19
        21      .44625 -.77493-58.808  .08842   .48407 -.75204  .40843 -.797
  => 83
        22      .46808 -.81089-58.656  .08947   .50629 -.78762  .42988 -.834
  => 16
        23      .48992 -.84664-58.518  .09019   .52838 -.82309  .45146 -.870
  => 19
        24      .51175 -.88221-58.391  .09060   .55033 -.85846  .47317 -.905
  => 95
        25      .53359 -.91761-58.275  .09068   .57215 -.89377  .49502 -.941
  => 45
        26      .55542 -.95285-58.166  .09041   .59383 -.92901  .51702 -.976
  => 70
        27      .57726 -.98795-58.062  .08982   .61537 -.96419  .53915-1.011
  => 71
        28      .59909-1.02291-57.961  .08889   .63677 -.99933  .56142-1.046
  => 48
        29      .62093-1.05773-57.859  .08763   .65803-1.03442  .58383-1.081
  => 04
        30      .64276-1.09241-57.757  .08604   .67915-1.06946  .60638-1.115
  => 37
        31      .66460-1.12696-57.654  .08413   .70014-1.10445  .62906-1.149
  => 47
        32      .68643-1.16137-57.548  .08190   .72099-1.13940  .65188-1.183
  => 34
        33      .70827-1.19564-57.439  .07936   .74171-1.17428  .67483-1.216
  => 99
        34      .73010-1.22976-57.327  .07650   .76230-1.20911  .69791-1.250
  => 41
        35      .75194-1.26373-57.211  .07333   .78276-1.24387  .72112-1.283
  => 58
        36      .77377-1.29755-57.089  .06985   .80310-1.27857  .74445-1.316
  => 52
        37      .79561-1.33120-56.961  .06607   .82330-1.31319  .76792-1.349
  => 21
        38      .81744-1.36469-56.827  .06199   .84339-1.34773  .79150-1.381
  => 65
        39      .83928-1.39800-56.686  .05762   .86336-1.38218  .81520-1.413
  => 83
        40      .86111-1.43113-56.540  .05295   .88320-1.41654  .83903-1.445
  => 73
        41      .88295-1.46408-56.389  .04800   .90294-1.45079  .86296-1.477
  => 37
        42      .90479-1.49683-56.233  .04277   .92256-1.48495  .88701-1.508
  => 72
        43      .92662-1.52939-56.073  .03726   .94208-1.51900  .91116-1.539
  => 79
        44      .94846-1.56176-55.910  .03147   .96149-1.55294  .93542-1.570
  => 58
        45      .97029-1.59392-55.744  .02542   .98079-1.58676  .95979-1.601
  => 07
        46      .99213-1.62588-55.576  .01909  1.00000-1.62048  .98425-1.631
  => 28
1                                           NORMALISED PLOT OF SECTION NUMBER
  =>  9

1     DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
```

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

 BLADE CHORD = 3.62664E+00

 L.E.RADIUS  = 1.81332E-02  CENTERED AT X= -9.2916E-01 Y=  1.6121E+00

 SECTION AREA= 4.47325E-01

 SECOND MOMENTS OF AREA ABOUT CENTROID

    IX   = 2.50224E-01
    IY   = 9.23697E-02
    IXY  =-1.51100E-01

 PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

    IPX  = 3.41769E-01  (AT 31.210 WITH (X) AXIS)
    IPY  = 8.24801E-04  (AT 31.210 WITH (Y) AXIS)

PT     SURFACE----------ONE        SURFACE----------TWO
NO        X              Y             X              Y

 1  -9.13212E-01   1.62069E+00  -9.45103E-01   1.60342E+00
 2  -8.67810E-01   1.54627E+00  -9.07553E-01   1.52473E+00
 3  -8.22430E-01   1.47192E+00  -8.69982E-01   1.44612E+00
 4  -7.77086E-01   1.39766E+00  -8.32374E-01   1.36762E+00
 5  -7.31797E-01   1.32349E+00  -7.94712E-01   1.28925E+00
 6  -6.86580E-01   1.24945E+00  -7.56979E-01   1.21105E+00
 7  -6.41454E-01   1.17556E+00  -7.19153E-01   1.13306E+00
 8  -5.96438E-01   1.10188E+00  -6.81218E-01   1.05534E+00
 9  -5.51550E-01   1.02845E+00  -6.43155E-01   9.77953E-01
10  -5.06809E-01   9.55351E-01  -6.04945E-01   9.00964E-01
11  -4.62233E-01   8.82646E-01  -5.66570E-01   8.24453E-01
12  -4.17841E-01   8.10400E-01  -5.28011E-01   7.48503E-01
13  -3.73642E-01   7.38665E-01  -4.89259E-01   6.73181E-01
14  -3.29645E-01   6.67473E-01  -4.50305E-01   5.98541E-01
15  -2.85859E-01   5.96840E-01  -4.11139E-01   5.24623E-01
16  -2.42290E-01   5.26763E-01  -3.71758E-01   4.51450E-01
17  -1.98944E-01   4.57226E-01  -3.32153E-01   3.79034E-01
18  -1.55820E-01   3.88194E-01  -2.92325E-01   3.07367E-01
19  -1.12922E-01   3.19617E-01  -2.52272E-01   2.36429E-01
20  -7.02484E-02   2.51430E-01  -2.11995E-01   1.66184E-01
21  -2.78059E-02   1.83569E-01  -1.71486E-01   9.65820E-02
22   1.43983E-02   1.15976E-01  -1.30739E-01   2.75782E-02
23   5.63578E-02   4.86033E-02  -8.97474E-02  -4.08684E-02
24   9.80642E-02  -1.85924E-02  -4.85026E-02  -1.08791E-01
25   1.39509E-01  -8.56460E-02  -6.99600E-03  -1.76218E-01
26   1.80686E-01  -1.52584E-01   3.47777E-02  -2.43171E-01
27   2.21598E-01  -2.19421E-01   7.68173E-02  -3.09672E-01
28   2.62245E-01  -2.86165E-01   1.19122E-01  -3.75735E-01
29   3.02628E-01  -3.52818E-01   1.61689E-01  -4.41369E-01
30   3.42751E-01  -4.19380E-01   2.04517E-01  -5.06574E-01
31   3.82616E-01  -4.85848E-01   2.47603E-01  -5.71351E-01
32   4.22227E-01  -5.52217E-01   2.90944E-01  -6.35698E-01
33   4.61585E-01  -6.18482E-01   3.34536E-01  -6.99610E-01
34   5.00695E-01  -6.84637E-01   3.78378E-01  -7.63081E-01
35   5.39559E-01  -7.50672E-01   4.22464E-01  -8.26104E-01
1
PT     SURFACE----------ONE        SURFACE----------TWO
NO        X              Y             X              Y

36   5.78182E-01  -8.16577E-01   4.66793E-01  -8.88669E-01
37   6.16568E-01  -8.82339E-01   5.11358E-01  -9.50765E-01
38   6.54721E-01  -9.47945E-01   5.56156E-01  -1.01238E+00
39   6.92646E-01  -1.01338E+00   6.01182E-01  -1.07350E+00
40   7.30348E-01  -1.07864E+00   6.46431E-01  -1.13410E+00
41   7.67833E-01  -1.14372E+00   6.91898E-01  -1.19419E+00
42   8.05108E-01  -1.20859E+00   7.37573E-01  -1.25375E+00
43   8.42178E-01  -1.27327E+00   7.83455E-01  -1.31277E+00
44   8.79046E-01  -1.33773E+00   8.29538E-01  -1.37124E+00
45   9.15719E-01  -1.40199E+00   8.75816E-01  -1.42917E+00
46   9.52201E-01  -1.46604E+00   9.22285E-01  -1.48654E+00

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.      X             Y

    1      -9.45103E-01   1.60342E+00
    2      -9.45918E-01   1.60513E+00
    3      -9.46549E-01   1.60692E+00
    4      -9.46990E-01   1.60877E+00
    5      -9.47236E-01   1.61065E+00
    6      -9.47284E-01   1.61255E+00
    7      -9.47132E-01   1.61444E+00
    8      -9.46784E-01   1.61631E+00
    9      -9.46243E-01   1.61813E+00
   10      -9.45515E-01   1.61988E+00
   11      -9.44608E-01   1.62155E+00
   12      -9.43531E-01   1.62311E+00
   13      -9.42296E-01   1.62455E+00
   14      -9.40918E-01   1.62586E+00
   15      -9.39411E-01   1.62701E+00
   16      -9.37792E-01   1.62800E+00
   17      -9.36078E-01   1.62881E+00
   18      -9.34288E-01   1.62945E+00
   19      -9.32442E-01   1.62989E+00
   20      -9.30560E-01   1.63013E+00
   21      -9.28662E-01   1.63018E+00
   22      -9.26770E-01   1.63003E+00
   23      -9.24904E-01   1.62968E+00
   24      -9.23085E-01   1.62914E+00
   25      -9.21332E-01   1.62841E+00
   26      -9.19665E-01   1.62750E+00
   27      -9.18102E-01   1.62643E+00
   28      -9.16660E-01   1.62519E+00
   29      -9.15355E-01   1.62381E+00
   30      -9.14202E-01   1.62231E+00
   31      -9.13212E-01   1.62069E+00
LEADING EDGE AXIAL DIFFERENCE =      -.0984   NEW DELX =        .0984
1

POINT  FRAC. M      Y     Y-D(DEG)     Y-DD   R OF CURV

   1    .00000    .00000 -61.56413    .08004  115.7138
   2    .02222   -.04102 -61.54053    .08491  108.8365
   3    .04444   -.08199 -61.51409    .09950   92.6383
   4    .06667   -.12292 -61.48195    .12382   74.2124
   5    .08889   -.16378 -61.44126    .15786   57.9790
   6    .11111   -.20457 -61.38910    .20164   45.1650
   7    .13333   -.24526 -61.32251    .25514   35.4669
   8    .15556   -.28582 -61.23845    .31837   28.1955
   9    .17778   -.32622 -61.13374    .39133   22.7113
  10    .20000   -.36643 -61.00506    .47402   18.5225
  11    .22222   -.40640 -60.84996    .55505   15.5891
  12    .24444   -.44610 -60.67119    .61905   13.7456
  13    .26667   -.48550 -60.47328    .66594   12.5451
  14    .28889   -.52456 -60.26091    .69572   11.7757
  15    .31111   -.56329 -60.03902    .70839   11.3333
  16    .33333   -.60166 -59.81277    .70395   11.1738
  17    .35556   -.63969 -59.58766    .68240   11.2965
  18    .37778   -.67739 -59.36944    .64374   11.7451
  19    .40000   -.71476 -59.16419    .58797   12.6288
  20    .42222   -.75185 -58.97717    .52514   13.9106
  21    .44444   -.78867 -58.80838    .46944   15.3348
  22    .46667   -.82527 -58.65587    .42097   16.8770
  23    .48889   -.86165 -58.51761    .37973   18.4894
  24    .51111   -.89785 -58.39141    .34572   20.0907
  25    .53333   -.93388 -58.27500    .31894   21.5634
  26    .55556   -.96974 -58.16603    .29940   22.7608
  27    .57778  -1.00546 -58.06207    .28708   23.5306
  28    .60000  -1.04104 -57.96061    .28199   23.7523
  29    .62222  -1.07648 -57.85939    .28173   23.5743
  30    .64444  -1.11178 -57.75734    .28332   23.2441
  31    .66667  -1.14694 -57.65381    .28674   22.7700
  32    .68889  -1.18196 -57.54808    .29201   22.1648
  33    .71111  -1.21683 -57.43946    .29913   21.4456
  34    .73333  -1.25156 -57.32721    .30808   20.6320
  35    .75556  -1.28613 -57.21058    .31887   19.7451
  36    .77778  -1.32055 -57.08881    .33151   18.8059
  37    .80000  -1.35480 -56.96109    .34599   17.8342
  38    .82222  -1.38889 -56.82685    .36055   16.9302
  39    .84444  -1.42279 -56.68638    .37341   16.1650
  40    .86667  -1.45651 -56.54021    .38455   15.5155
  41    .88889  -1.49004 -56.38889    .39397   14.9643
  42    .91111  -1.52337 -56.23299    .40169   14.4983
  43    .93333  -1.55651 -56.07309    .40768   14.1078
  44    .95556  -1.58945 -55.90979    .41197   13.7853
  45    .97778  -1.62218 -55.74372    .41454   13.5254
  46   1.00000  -1.65471 -55.57554    .41540   13.3247
1

DATA POINTS

POINT  FRAC. M  Y-D(DEG)

   1    .00000 -61.56413
   2    .20175 -60.99379
   3    .40202 -59.14635
   4    .60123 -57.95502
   5    .80016 -56.96012
   6   1.00000 -55.57554

CARTESIAN COORDINATES ON STREAMSURFACE  9

POINT     Z1        X1        Y1        Z2        X2        Y2
```

IC/14PRINT

1	8.07564	-1.00946	1.60615	8.07663	-1.04127	1.58880
2	8.09317	-.96419	1.53369	8.09423	-1.00382	1.51200
3	8.11003	-.91894	1.46114	8.11106	-.96636	1.43516
4	8.12621	-.87372	1.38851	8.12714	-.92885	1.35826
5	8.14170	-.82855	1.31581	8.14247	-.89130	1.28134
6	8.15648	-.78346	1.24308	8.15703	-.85367	1.20444
7	8.17057	-.73846	1.17034	8.17083	-.81594	1.12761
8	8.18394	-.69356	1.09767	8.18386	-.77811	1.05091
9	8.19659	-.64878	1.02511	8.19612	-.74015	.97441
10	8.20850	-.60416	.95275	8.20761	-.70204	.89818
11	8.21968	-.55969	.88064	8.21833	-.66377	.82231
12	8.23011	-.51540	.80889	8.22828	-.62530	.74691
13	8.23980	-.47130	.73756	8.23747	-.58665	.67202
14	8.24874	-.42740	.66670	8.24591	-.54779	.59772
15	8.25694	-.38370	.59633	8.25360	-.50871	.52406
16	8.26441	-.34022	.52644	8.26056	-.46942	.45110
17	8.27116	-.29695	.45704	8.26680	-.42990	.37884
18	8.27720	-.25390	.38813	8.27233	-.39016	.30729
19	8.28254	-.21107	.31963	8.27717	-.35018	.23642
20	8.28720	-.16846	.25149	8.28133	-.30998	.16622
21	8.29118	-.12608	.18364	8.28483	-.26954	.09665
22	8.29450	-.08392	.11603	8.28767	-.22886	.02766
23	8.29716	-.04201	.04864	8.28987	-.18793	-.04077
24	8.29916	-.00035	-.01858	8.29144	-.14674	-.10871
25	8.30052	.04106	-.08568	8.29239	-.10529	-.17613
26	8.30123	.08220	-.15267	8.29272	-.06357	-.24308
27	8.30130	.12308	-.21954	8.29246	-.02157	-.30957
28	8.30073	.16371	-.28632	8.29159	.02069	-.37562
29	8.29953	.20407	-.35297	8.29014	.06322	-.44123
30	8.29768	.24417	-.41952	8.28811	.10602	-.50639
31	8.29520	.28402	-.48594	8.28549	.14907	-.57108
32	8.29209	.32362	-.55223	8.28231	.19239	-.63532
33	8.28834	.36296	-.61837	8.27857	.23596	-.69909
34	8.28397	.40206	-.68435	8.27426	.27978	-.76238
35	8.27898	.44092	-.75015	8.26939	.32385	-.82516
36	8.27337	.47954	-.81578	8.26398	.36817	-.88744
37	8.26714	.51792	-.88119	8.25803	.41273	-.94918
38	8.26032	.55607	-.94637	8.25153	.45752	-1.01039
39	8.25293	.59400	-1.01131	8.24451	.50254	-1.07102
40	8.24497	.63170	-1.07599	8.23699	.54779	-1.13107
41	8.23648	.66918	-1.14042	8.22898	.59325	-1.19052
42	8.22746	.70646	-1.20457	8.22053	.63892	-1.24936
43	8.21794	.74353	-1.26844	8.21165	.68481	-1.30760
44	8.20792	.78040	-1.33201	8.20239	.73089	-1.36521
45	8.19744	.81707	-1.39529	8.19278	.77717	-1.42219
46	8.18651	.85355	-1.45813	8.18283	.82364	-1.47853

1

POINT	ZSEMI	XSEMI	YSEMI
1	8.07663	-1.04127	1.58880
2	8.07624	-1.04208	1.59047
3	8.07585	-1.04271	1.59222
4	8.07546	-1.04315	1.59402
5	8.07508	-1.04339	1.59587
6	8.07471	-1.04344	1.59773
7	8.07435	-1.04329	1.59959
8	8.07401	-1.04294	1.60142
9	8.07370	-1.04240	1.60321
10	8.07341	-1.04168	1.60494
11	8.07315	-1.04077	1.60659
12	8.07293	-1.03970	1.60813
13	8.07273	-1.03847	1.60956
14	8.07258	-1.03709	1.61086
15	8.07247	-1.03559	1.61201
16	8.07239	-1.03397	1.61300
17	8.07236	-1.03227	1.61382
18	8.07237	-1.03048	1.61447
19	8.07242	-1.02864	1.61492
20	8.07251	-1.02676	1.61519
21	8.07264	-1.02487	1.61526
22	8.07281	-1.02298	1.61513
23	8.07302	-1.02112	1.61482
24	8.07326	-1.01931	1.61431
25	8.07353	-1.01756	1.61362
26	8.07383	-1.01590	1.61275
27	8.07416	-1.01434	1.61172
28	8.07450	-1.01290	1.61053
29	8.07487	-1.01160	1.60919
30	8.07525	-1.01045	1.60773
31	8.07564	-1.00946	1.60615

STREAMSURFACE 10 ITERATION 1 DEVIATION = 1.887 SOLIDITY = 1.0960
ITERATION 2 DEVIATION = 1.922 SOLIDITY = 1.0538
ITERATION 2 DEVIATION = 1.922 SOLIDITY = 1.0538

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-63.11479	-.26768	-40.3995
2	.02222	-.04390	-63.18372	-.26079	-41.7642
3	.04444	-.08792	-63.24877	-.24010	-45.6691
4	.06667	-.13206	-63.30645	-.20563	-53.6462
5	.08889	-.17631	-63.35330	-.15737	-70.4416
6	.11111	-.22063	-63.38591	-.09532	-116.6955
7	.13333	-.26499	-63.40086	-.01948	-571.9807
8	.15556	-.30937	-63.39469	.07015	158.7020
9	.17778	-.35371	-63.36383	.17357	63.9363
10	.20000	-.39797	-63.30458	.29078	37.9297
11	.22222	-.44208	-63.21427	.40658	26.8732
12	.24444	-.48599	-63.09589	.50184	21.5071
13	.26667	-.52965	-62.95420	.57649	18.4511
14	.28889	-.57303	-62.79399	.63054	16.5956
15	.31111	-.61610	-62.62026	.66398	15.4844
16	.33333	-.65885	-62.43816	.67682	14.9147

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
17	.35556	-.70125	-62.25312	.66905	14.8115
18	.37778	-.74333	-62.07082	.64067	15.1905
19	.40000	-.78510	-61.89724	.59169	16.1695
20	.42222	-.82657	-61.73758	.53390	17.6421
21	.44444	-.86778	-61.59186	.48339	19.2119
22	.46667	-.90875	-61.45838	.44024	20.8248
23	.48889	-.94950	-61.33531	.40446	22.4008
24	.51111	-.99005	-61.22074	.37604	23.8313
25	.53333	-1.03042	-61.11268	.35499	24.9864
26	.55556	-1.07061	-61.00908	.34130	25.7346
27	.57778	-1.11063	-60.90781	.33498	25.9710
28	.60000	-1.15049	-60.80668	.33603	25.6456
29	.62222	-1.19018	-60.70371	.34197	24.9587
30	.64444	-1.22970	-60.59798	.34968	24.1693
31	.66667	-1.26904	-60.48890	.35915	23.2952
32	.68889	-1.30821	-60.37586	.37038	22.3543
33	.71111	-1.34720	-60.25824	.38337	21.3646
34	.73333	-1.38600	-60.13538	.39812	20.3432
35	.75556	-1.42460	-60.00663	.41464	19.3056
36	.77778	-1.46300	-59.87129	.43291	18.2656
37	.80000	-1.50118	-59.72864	.45295	17.2351
38	.82222	-1.53914	-59.57814	.47278	16.2913
39	.84444	-1.57686	-59.42014	.49028	15.4906
40	.86667	-1.61435	-59.25521	.50545	14.8085
41	.88889	-1.65158	-59.08397	.51829	14.2264
42	.91111	-1.68856	-58.90704	.52879	13.7306
43	.93333	-1.72528	-58.72507	.53695	13.3106
44	.95556	-1.76173	-58.53875	.54279	12.9585
45	.97778	-1.79791	-58.34880	.54629	12.6686
46	1.00000	-1.83383	-58.15595	.54745	12.4370

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-63.11479
2	.20133	-63.30004
3	.40181	-61.88369
4	.60135	-60.80048
5	.80047	-59.72555
6	1.00000	-58.15595

1

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 10
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

BETA1 =-63.115 (BLADE INLET ANGLE)
BETA2 =-58.156 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .02740 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 1.6574 (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

BLADE CHORD = 2.0593

STAGGER ANGLE =-61.396

CAMBER ANGLE = -4.959

SECTION AREA = .08963
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .49577
YBAR = -.92812

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .01885
IY = .00558
IXY = -.01024

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS = 28.526

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .02442 (AT 28.526 WITH (X) AXIS)
IPY = .00002 (AT 28.526 WITH (Y) AXIS)

	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
=> 66	1	.01030	.00000	-63.115	.02059	.01948	.00466	.00111	-.004
=> 22	2	.03210	-.04306	-63.184	.02289	.04231	-.03790	.02188	-.048
=> 92	3	.05389	-.08625	-63.249	.02519	.06514	-.08058	.04265	-.091
=> 72	4	.07569	-.12955	-63.306	.02747	.08797	-.12338	.06342	-.135
=> 62	5	.09749	-.17295	-63.353	.02974	.11078	-.16628	.08420	-.179
=> 59	6	.11929	-.21643	-63.386	.03197	.13358	-.20927	.10500	-.223
=> 60	7	.14109	-.25995	-63.401	.03416	.15636	-.25230	.12582	-.267
=> 61	8	.16289	-.30348	-63.395	.03630	.17912	-.29535	.14666	-.311
=> 58	9	.18469	-.34698	-63.364	.03837	.20184	-.33837	.16754	-.355
=> 46	10	.20649	-.39039	-63.305	.04038	.22453	-.38132	.18845	-.399
=> 19	11	.22829	-.43366	-63.214	.04230	.24717	-.42413	.20941	-.443
=> 72	12	.25009	-.47673	-63.096	.04413	.26976	-.46675	.23041	-.486
=> 99	13	.27188	-.51957	-62.954	.04586	.29231	-.50914	.25146	-.529

1

	POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
=> 98	14	.29368	-.56212	-62.794	.04748	.31480	-.55127	.27257	-.572
=> 63	15	.31548	-.60437	-62.620	.04899	.33723	-.59311	.29373	-.615
=> 95	16	.33728	-.64630	-62.438	.05037	.35961	-.63464	.31495	-.657
=> 92	17	.35908	-.68790	-62.253	.05163	.38193	-.67588	.33624	-.699
=> 53	18	.38088	-.72918	-62.071	.05275	.40418	-.71683	.35758	-.741
=> 80	19	.40268	-.77015	-61.897	.05373	.42638	-.75749	.37898	-.782
=> 75	20	.42448	-.81083	-61.738	.05456	.44851	-.79791	.40045	-.823
=> 40	21	.44628	-.85125	-61.592	.05525	.47058	-.83811	.42198	-.864
=> 77	22	.46808	-.89144	-61.458	.05579	.49258	-.87812	.44357	-.904
=> 89	23	.48988	-.93142	-61.335	.05616	.51451	-.91795	.46524	-.944
=> 77	24	.51167	-.97120	-61.221	.05637	.53638	-.95763	.48697	-.984
=> 42	25	.53347	-1.01080	-61.113	.05642	.55817	-.99717	.50877	-1.024
=> 86	26	.55527	-1.05022	-61.009	.05629	.57989	-1.03658	.53065	-1.063
=> 09	27	.57707	-1.08948	-60.908	.05599	.60154	-1.07587	.55261	-1.103
=> 12	28	.59887	-1.12858	-60.807	.05553	.62311	-1.11503	.57463	-1.142
=> 94	29	.62067	-1.16751	-60.704	.05490	.64461	-1.15408	.59673	-1.180
=> 56	30	.64247	-1.20628	-60.598	.05410	.66603	-1.19300	.61890	-1.219
=> 96	31	.66427	-1.24488	-60.489	.05314	.68739	-1.23179	.64115	-1.257
=> 16	32	.68607	-1.28330	-60.376	.05201	.70867	-1.27045	.66346	-1.296
=> 13	33	.70787	-1.32155	-60.258	.05073	.72989	-1.30896	.68584	-1.334
=> 88	34	.72966	-1.35961	-60.135	.04929	.75104	-1.34733	.70829	-1.371
=> 39	35	.75146	-1.39747	-60.007	.04770	.77212	-1.38555	.73081	-1.409

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      36     .77326-1.43514-59.871  .04595   .79313-1.42361  .75339-1.446
=> 67
      37     .79506-1.47259-59.729  .04405   .81408-1.46149  .77604-1.483
=> 69
      38     .81686-1.50983-59.578  .04200   .83497-1.49919  .79875-1.520
=> 46
      39     .83866-1.54684-59.420  .03981   .85580-1.53671  .82152-1.556
=> 96
      40     .86046-1.58361-59.255  .03747   .87656-1.57403  .84436-1.593
=> 18
      41     .88226-1.62013-59.084  .03499   .89727-1.61114  .86725-1.629
=> 12
      42     .90406-1.65640-58.907  .03238   .91792-1.64804  .89019-1.664
=> 77
      43     .92586-1.69242-58.725  .02963   .93852-1.68473  .91319-1.700
=> 11
      44     .94766-1.72818-58.539  .02675   .95906-1.72120  .93625-1.735
=> 16
      45     .96945-1.76368-58.349  .02373   .97956-1.75745  .95935-1.769
=> 90
      46     .99125-1.79891-58.156  .02059  1.00000-1.79347  .98251-1.804
=> 34
1                                    NORMALISED PLOT OF SECTION NUMBER
=> 10

1     DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
      MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM

       BLADE CHORD = 3.41312E+00

       L.E.RADIUS  = 1.70656E-02  CENTERED AT X= -8.0464E-01 Y=  1.5383E+00

       SECTION AREA= 2.46211E-01

       SECOND MOMENTS OF AREA ABOUT CENTROID

          IX   = 1.42278E-01
          IY   = 4.21450E-02
          IXY  =-7.72482E-02

       PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

          IPX  = 1.84266E-01   (AT 28.526 WITH (X) AXIS)
          IPY  = 1.57438E-04   (AT 28.526 WITH (Y) AXIS)

      PT     SURFACE----------ONE        SURFACE----------TWO
      NO        X             Y             X             Y

       1 -7.89421E-01  1.54601E+00 -8.19863E-01  1.53058E+00
       2 -7.51580E-01  1.47548E+00 -7.85443E-01  1.45836E+00
       3 -7.13741E-01  1.40474E+00 -7.51022E-01  1.38595E+00
       4 -6.75910E-01  1.33380E+00 -7.16592E-01  1.31335E+00
       5 -6.38095E-01  1.26269E+00 -6.82146E-01  1.24059E+00
       6 -6.00305E-01  1.19145E+00 -6.47675E-01  1.16771E+00
       7 -5.62548E-01  1.12012E+00 -6.13171E-01  1.09477E+00
       8 -5.24835E-01  1.04877E+00 -5.78624E-01  1.02183E+00
       9 -4.87173E-01  9.77462E-01 -5.44025E-01  9.48947E-01
      10 -4.49572E-01  9.06285E-01 -5.09364E-01  8.76219E-01
      11 -4.12043E-01  8.35332E-01 -4.74633E-01  8.03735E-01
      12 -3.74592E-01  7.64689E-01 -4.39823E-01  7.31590E-01
      13 -3.37226E-01  6.94430E-01 -4.04928E-01  6.59865E-01
      14 -2.99949E-01  6.24608E-01 -3.69944E-01  5.88626E-01
      15 -2.62766E-01  5.55262E-01 -3.34867E-01  5.17920E-01
      16 -2.25679E-01  4.86413E-01 -2.99693E-01  4.47781E-01
      17 -1.88692E-01  4.18063E-01 -2.64419E-01  3.78227E-01
      18 -1.51805E-01  3.50202E-01 -2.29045E-01  3.09255E-01
      19 -1.15020E-01  2.82799E-01 -1.93569E-01  2.40852E-01
      20 -7.83375E-02  2.15807E-01 -1.57991E-01  1.72986E-01
      21 -4.17600E-02  1.49180E-01 -1.22308E-01  1.05614E-01
      22 -5.29127E-03  8.28748E-02 -8.65156E-02  3.86971E-02
      23  3.10652E-02  1.68544E-02 -5.06113E-02 -2.77968E-02
      24  6.73056E-02 -4.89110E-02 -1.45907E-02 -9.38953E-02
      25  1.03426E-01 -1.14446E-01  2.15500E-02 -1.59620E-01
      26  1.39423E-01 -1.79767E-01  5.78136E-02 -2.24987E-01
      27  1.75298E-01 -2.44884E-01  9.41995E-02 -2.90008E-01
      28  2.11051E-01 -3.09801E-01  1.30707E-01 -3.54691E-01
      29  2.46684E-01 -3.74515E-01  1.67335E-01 -4.19037E-01
      30  2.82197E-01 -4.39022E-01  2.04083E-01 -4.83041E-01
      31  3.17592E-01 -5.03315E-01  2.40949E-01 -5.46697E-01
      32  3.52871E-01 -5.67384E-01  2.77931E-01 -6.09998E-01
      33  3.88035E-01 -6.31223E-01  3.15028E-01 -6.72936E-01
      34  4.23086E-01 -6.94819E-01  3.52237E-01 -7.35501E-01
      35  4.58025E-01 -7.58161E-01  3.89559E-01 -7.97680E-01
1
      PT     SURFACE----------ONE        SURFACE----------TWO
      NO        X             Y             X             Y

      36  4.92855E-01 -8.21236E-01  4.26989E-01 -8.59461E-01
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  37  5.27579E-01 -8.84027E-01  4.64526E-01 -9.20830E-01
  38  5.62198E-01 -9.46519E-01  5.02168E-01 -9.81770E-01
  39  5.96715E-01 -1.00870E+00  5.39912E-01 -1.04226E+00
  40  6.31133E-01 -1.07055E+00  5.77755E-01 -1.10230E+00
  41  6.65454E-01 -1.13206E+00  6.15695E-01 -1.16186E+00
  42  6.99683E-01 -1.19323E+00  6.53726E-01 -1.22094E+00
  43  7.33822E-01 -1.25403E+00  6.91848E-01 -1.27953E+00
  44  7.67873E-01 -1.31448E+00  7.30058E-01 -1.33762E+00
  45  8.01840E-01 -1.37456E+00  7.68353E-01 -1.39520E+00
  46  8.35724E-01 -1.43427E+00  8.06730E-01 -1.45227E+00

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.      X              Y

    1      -8.19863E-01   1.53058E+00
    2      -8.20587E-01   1.53221E+00
    3      -8.21135E-01   1.53391E+00
    4      -8.21503E-01   1.53566E+00
    5      -8.21686E-01   1.53743E+00
    6      -8.21683E-01   1.53922E+00
    7      -8.21492E-01   1.54100E+00
    8      -8.21117E-01   1.54274E+00
    9      -8.20562E-01   1.54444E+00
   10      -8.19832E-01   1.54607E+00
   11      -8.18936E-01   1.54762E+00
   12      -8.17883E-01   1.54906E+00
   13      -8.16685E-01   1.55038E+00
   14      -8.15355E-01   1.55158E+00
   15      -8.13908E-01   1.55262E+00
   16      -8.12359E-01   1.55351E+00
   17      -8.10726E-01   1.55424E+00
   18      -8.09026E-01   1.55479E+00
   19      -8.07278E-01   1.55515E+00
   20      -8.05501E-01   1.55534E+00
   21      -8.03715E-01   1.55533E+00
   22      -8.01939E-01   1.55514E+00
   23      -8.00192E-01   1.55477E+00
   24      -7.98495E-01   1.55421E+00
   25      -7.96864E-01   1.55348E+00
   26      -7.95319E-01   1.55259E+00
   27      -7.93876E-01   1.55153E+00
   28      -7.92551E-01   1.55034E+00
   29      -7.91358E-01   1.54901E+00
   30      -7.90311E-01   1.54756E+00
   31      -7.89421E-01   1.54601E+00
LEADING EDGE AXIAL DIFFERENCE =     -.1051    NEW DELX =     .1051
1

POINT  FRAC. M     Y     Y-D(DEG)    Y-DD    R OF CURV

  1     .00000   .00000 -63.11479  -.26768   -40.3995
  2     .02222  -.04390 -63.18372  -.26079   -41.7642
  3     .04444  -.08792 -63.24877  -.24010   -45.6691
  4     .06667  -.13206 -63.30645  -.20563   -53.6462
  5     .08889  -.17631 -63.35330  -.15737   -70.4416
  6     .11111  -.22063 -63.38591  -.09532 -116.6955
  7     .13333  -.26499 -63.40086  -.01948 -571.9807
  8     .15556  -.30937 -63.39469   .07015  158.7020
  9     .17778  -.35371 -63.36383   .17357   63.9363
 10     .20000  -.39797 -63.30458   .29078   37.9297
 11     .22222  -.44208 -63.21427   .40658   26.8732
 12     .24444  -.48599 -63.09589   .50184   21.5071
 13     .26667  -.52965 -62.95420   .57649   18.4511
 14     .28889  -.57303 -62.79399   .63054   16.5956
 15     .31111  -.61610 -62.62026   .66398   15.4844
 16     .33333  -.65885 -62.43816   .67682   14.9147
 17     .35556  -.70125 -62.25312   .66905   14.8115
 18     .37778  -.74333 -62.07082   .64067   15.1905
 19     .40000  -.78510 -61.89724   .59169   16.1695
 20     .42222  -.82657 -61.73758   .53390   17.6421
 21     .44444  -.86778 -61.59186   .48339   19.2119
 22     .46667  -.90875 -61.45838   .44024   20.8248
 23     .48889  -.94950 -61.33531   .40446   22.4008
 24     .51111  -.99005 -61.22074   .37604   23.8313
 25     .53333 -1.03042 -61.11268   .35499   24.9864
 26     .55556 -1.07061 -61.00908   .34130   25.7346
 27     .57778 -1.11063 -60.90781   .33498   25.9710
 28     .60000 -1.15049 -60.80668   .33603   25.6456
 29     .62222 -1.19018 -60.70371   .34197   24.9587
 30     .64444 -1.22970 -60.59798   .34968   24.1693
 31     .66667 -1.26904 -60.48890   .35915   23.2952
 32     .68889 -1.30821 -60.37586   .37038   22.3543
 33     .71111 -1.34720 -60.25824   .38337   21.3646
 34     .73333 -1.38600 -60.13538   .39812   20.3432
 35     .75556 -1.42460 -60.00663   .41464   19.3056
 36     .77778 -1.46300 -59.87129   .43291   18.2656
 37     .80000 -1.50118 -59.72864   .45295   17.2351
```

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  38    .82222  -1.53914 -59.57814   .47278   16.2913
  39    .84444  -1.57686 -59.42014   .49028   15.4906
  40    .86667  -1.61435 -59.25521   .50545   14.8085
  41    .88889  -1.65158 -59.08397   .51829   14.2264
  42    .91111  -1.68856 -58.90704   .52879   13.7306
  43    .93333  -1.72528 -58.72507   .53695   13.3106
  44    .95556  -1.76173 -58.53875   .54279   12.9585
  45    .97778  -1.79791 -58.34880   .54629   12.6686
  46   1.00000  -1.83383 -58.15595   .54745   12.4370
1

DATA POINTS

POINT  FRAC. M  Y-D(DEG)

  1     .00000 -63.11479
  2     .20133 -63.30004
  3     .40181 -61.88369
  4     .60135 -60.80048
  5     .80047 -59.72555
  6    1.00000 -58.15595

CARTESIAN COORDINATES ON STREAMSURFACE 10

POINT     Z1        X1        Y1        Z2        X2        Y2

  1    8.73260   -.89381   1.53621   8.73405   -.92423   1.52061
  2    8.74606   -.85600   1.46705   8.74751   -.88984   1.44985
  3    8.75902   -.81819   1.39757   8.76045   -.85544   1.37868
  4    8.77146   -.78040   1.32778   8.77284   -.82104   1.30722
  5    8.78338   -.74261   1.25771   8.78467   -.78663   1.23550
  6    8.79477   -.70486   1.18738   8.79594   -.75219   1.16355
  7    8.80561   -.66713   1.11686   8.80664   -.71771   1.09142
  8    8.81592   -.62946   1.04620   8.81676   -.68320   1.01920
  9    8.82566   -.59183    .97549   8.82630   -.64863    .94693
 10    8.83485   -.55426    .90480   8.83525   -.61400    .87472
 11    8.84345   -.51677    .83424   8.84361   -.57930    .80267
 12    8.85147   -.47936    .76391   8.85136   -.54452    .73087
 13    8.85889   -.44203    .69390   8.85852   -.50966    .65941
 14    8.86571   -.40479    .62427   8.86508   -.47471    .58836
 15    8.87193   -.36764    .55507   8.87103   -.43967    .51780
 16    8.87756   -.33059    .48631   8.87639   -.40453    .44777
 17    8.88259   -.29363    .41803   8.88116   -.36929    .37829
 18    8.88703   -.25678    .35022   8.88534   -.33395    .30934
 19    8.89089   -.22002    .28285   8.88895   -.29850    .24095
 20    8.89419   -.18336    .21588   8.89200   -.26296    .17308
 21    8.89692   -.14681    .14924   8.89448   -.22730    .10571
 22    8.89911   -.11037    .08293   8.89641   -.19154    .03880
 23    8.90075   -.07403    .01690   8.89780   -.15566   -.02771
 24    8.90186   -.03781   -.04888   8.89867   -.11966   -.09383
 25    8.90245   -.00171   -.11443   8.89901   -.08354   -.15957
 26    8.90251    .03427   -.17978   8.89884   -.04730   -.22494
 27    8.90205    .07012   -.24491   8.89816   -.01093   -.28994
 28    8.90108    .10586   -.30982   8.89699    .02555   -.35461
 29    8.89960    .14148   -.37451   8.89532    .06217   -.41893
 30    8.89761    .17698   -.43896   8.89317    .09890   -.48288
 31    8.89511    .21237   -.50320   8.89054    .13575   -.54646
 32    8.89209    .24763   -.56717   8.88744    .17272   -.60964
 33    8.88856    .28279   -.63088   8.88385    .20980   -.67244
 34    8.88452    .31783   -.69430   8.87979    .24700   -.73484
 35    8.87997    .35277   -.75741   8.87525    .28431   -.79680
 36    8.87492    .38760   -.82022   8.87025    .32174   -.85831
 37    8.86936    .42232   -.88269   8.86477    .35927   -.91935
 38    8.86331    .45693   -.94480   8.85883    .39691   -.97992
 39    8.85680    .49145  -1.00653   8.85243    .43465  -1.03998
 40    8.84983    .52587  -1.06786   8.84559    .47249  -1.09952
 41    8.84243    .56019  -1.12881   8.83833    .51043  -1.15851
 42    8.83461    .59442  -1.18935   8.83068    .54846  -1.21696
 43    8.82639    .62855  -1.24946   8.82265    .58658  -1.27485
 44    8.81780    .66261  -1.30914   8.81428    .62479  -1.33217
 45    8.80884    .69657  -1.36839   8.80558    .66308  -1.38893
 46    8.79956    .73045  -1.42702   8.79658    .70146  -1.44510
1

POINT   ZSEMI     XSEMI     YSEMI

  1    8.73405   -.92423   1.52061
  2    8.73374   -.92495   1.52221
  3    8.73343   -.92550   1.52388
  4    8.73311   -.92586   1.52560
  5    8.73280   -.92605   1.52734
  6    8.73249   -.92604   1.52910
  7    8.73219   -.92585   1.53086
  8    8.73191   -.92548   1.53258
  9    8.73164   -.92492   1.53426
 10    8.73138   -.92420   1.53588
 11    8.73115   -.92330   1.53741
 12    8.73094   -.92225   1.53885
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13	8.73076	-.92105	1.54017
14	8.73060	-.91972	1.54136
15	8.73048	-.91828	1.54242
16	8.73038	-.91673	1.54331
17	8.73032	-.91510	1.54405
18	8.73029	-.91340	1.54461
19	8.73030	-.91165	1.54500
20	8.73034	-.90988	1.54521
21	8.73041	-.90809	1.54523
22	8.73051	-.90632	1.54506
23	8.73065	-.90457	1.54471
24	8.73081	-.90288	1.54418
25	8.73100	-.90125	1.54348
26	8.73122	-.89970	1.54262
27	8.73146	-.89826	1.54160
28	8.73172	-.89694	1.54043
29	8.73200	-.89575	1.53914
30	8.73229	-.89470	1.53772
31	8.73260	-.89381	1.53621

STREAMSURFACE 11 ITERATION 1 DEVIATION = 2.231 SOLIDITY = .9173
ITERATION 2 DEVIATION = 2.275 SOLIDITY = .8880
ITERATION 2 DEVIATION = 2.275 SOLIDITY = .8880

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-64.87535	-.59562	-21.9342
2	.02222	-.04753	-65.01060	-.58536	-22.6595
3	.04444	-.09535	-65.13987	-.55456	-24.2690
4	.06667	-.14345	-65.25874	-.50322	-27.1073
5	.08889	-.19179	-65.36292	-.43136	-32.0011
6	.11111	-.24034	-65.44824	-.33896	-41.1242
7	.13333	-.28906	-65.51057	-.22602	-62.1153
8	.15556	-.33790	-65.54574	-.09255	-152.3053
9	.17778	-.38677	-65.54951	.06145	229.4982
10	.20000	-.43562	-65.51740	.23598	59.5396
11	.22222	-.48435	-65.44643	.40669	34.2675
12	.24444	-.53287	-65.34040	.54922	25.0691
13	.26667	-.58113	-65.20478	.66357	20.4317
14	.28889	-.62907	-65.04506	.74973	17.7603
15	.31111	-.67663	-64.86685	.80771	16.1594
16	.33333	-.72379	-64.67603	.83751	15.2575

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
17	.35556	-.77055	-64.47878	.83913	14.9007
18	.37778	-.81689	-64.28162	.81256	15.0601
19	.40000	-.86283	-64.09150	.75782	15.8192
20	.42222	-.90839	-63.91413	.69397	16.9486
21	.44444	-.95362	-63.74915	.64011	18.0546
22	.46667	-.99852	-63.59454	.59623	19.0688
23	.48889	-1.04313	-63.44813	.56233	19.9096
24	.51111	-1.08747	-63.30764	.53842	20.4910
25	.53333	-1.13153	-63.17066	.52448	20.7384
26	.55556	-1.17534	-63.03473	.52053	20.6048
27	.57778	-1.21889	-62.89724	.52656	20.0835
28	.60000	-1.26218	-62.75550	.54257	19.2111
29	.62222	-1.30520	-62.60727	.56264	18.2494
30	.64444	-1.34795	-62.45232	.58086	17.4032
31	.66667	-1.39040	-62.29100	.59724	16.6551
32	.68889	-1.43257	-62.12362	.61176	15.9917
33	.71111	-1.47443	-61.95055	.62442	15.4021
34	.73333	-1.51598	-61.77215	.63524	14.8777
35	.75556	-1.55722	-61.58880	.64421	14.4116
36	.77778	-1.59814	-61.40092	.65132	13.9983
37	.80000	-1.63874	-61.20891	.65658	13.6334
38	.82222	-1.67901	-61.01318	.66068	13.2995
39	.84444	-1.71896	-60.81383	.66429	12.9813
40	.86667	-1.75858	-60.61093	.66742	12.6780
41	.88889	-1.79787	-60.40456	.67007	12.3889
42	.91111	-1.83683	-60.19477	.67224	12.1134
43	.93333	-1.87546	-59.98165	.67393	11.8509
44	.95556	-1.91375	-59.76528	.67513	11.6011
45	.97778	-1.95171	-59.54576	.67586	11.3634
46	1.00000	-1.98934	-59.32318	.67610	11.1374

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-64.87535
2	.20000	-65.51740
3	.40000	-64.09151
4	.60000	-62.75551
5	.80000	-61.20893
6	1.00000	-59.32318

1 STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 11
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

BETA1 =-64.875 (BLADE INLET ANGLE)
BETA2 =-59.323 (BLADE OUTLET ANGLE)
YZERO = .00500 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .02550 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00500 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 1.4000 (MERIDIONAL CHORD OF SECTION)

NORMALIZED RESULTS - ALL THE FOLLOWING REFER TO A
BLADE HAVING A MERIDIONAL CHORD PROJECTION OF UNITY
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

BLADE CHORD = 2.1921

STAGGER ANGLE =-63.312

CAMBER ANGLE = -5.552

SECTION AREA = .09573
LOCATION OF CENTROID RELATIVE TO LEADING EDGE

XBAR = .49105
YBAR =-1.00475

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = .02404
IY = .00599
IXY = -.01197

ANGLE OF INCLINATION OF (ONE) PRINCIPAL AXIS TO (X) AXIS = 26.498

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = .03001 (AT 26.498 WITH (X) AXIS)
IPY = .00002 (AT 26.498 WITH (Y) AXIS)

POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
1	.01096	.00000	-64.875	.02192	.02088	.00465	.00104	-.004
2	.03273	-.04656	-65.011	.02410	.04365	-.04147	.02181	-.051
3	.05450	-.09341	-65.140	.02629	.06642	-.08788	.04257	-.098
4	.07627	-.14052	-65.259	.02847	.08919	-.13457	.06334	-.146
5	.09804	-.18788	-65.363	.03063	.11196	-.18150	.08412	-.194
6	.11981	-.23544	-65.448	.03276	.13471	-.22864	.10491	-.242
7	.14158	-.28317	-65.511	.03487	.15744	-.27595	.12571	-.290
8	.16334	-.33101	-65.546	.03692	.18015	-.32337	.14654	-.338
9	.18511	-.37889	-65.550	.03892	.20283	-.37083	.16740	-.386
10	.20688	-.42674	-65.517	.04084	.22547	-.41827	.18830	-.435
11	.22865	-.47447	-65.446	.04269	.24807	-.46560	.20924	-.483
12	.25042	-.52201	-65.340	.04445	.27062	-.51274	.23023	-.531
13	.27219	-.56929	-65.205	.04610	.29312	-.55962	.25126	-.578

POINT NUMBER	MEANLINE DATA X	Y	ANGLE	THICKNESS	SURFACE COORDINATE DATA X1	Y1	X2	Y2
14	.29396	-.61624	-65.045	.04765	.31556	-.60619	.27236	-.626
15	.31573	-.66283	-64.867	.04908	.33795	-.65241	.29351	-.673
16	.33750	-.70904	-64.676	.05039	.36027	-.69826	.31472	-.719
17	.35927	-.75484	-64.479	.05158	.38254	-.74373	.33600	-.765
18	.38104	-.80023	-64.282	.05262	.40474	-.78882	.35733	-.811
19	.40281	-.84524	-64.091	.05354	.42688	-.83354	.37873	-.856
20	.42457	-.88987	-63.914	.05431	.44896	-.87793	.40019	-.901
21	.44634	-.93417	-63.749	.05493	.47098	-.92203	.42171	-.946
22	.46811	-.97817	-63.595	.05540	.49292	-.96585	.44330	-.990

=> 65
=> 66
=> 94
=> 48
=> 26
=> 25
=> 40
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=> 94
=> 20
=> 34
=> 28
=> 95
1
=> 29
=> 26
=> 82
=> 95
=> 65
=> 93
=> 81
=> 32
=> 48
=> 32
=> 85
=> 08
=> 01
=> 66
=> 01
=> 07
=> 83
=> 26
=> 38
=> 16
=> 60
=> 70
=> 46
=> 86
=> 91
=> 61
=> 94
=> 92
=> 54
=> 79
=> 68
=> 21
=> 38
1
=> 11
1

23	.48988	-1.02187	-63.448	.05572	.51480	-1.00941	.46496	-1.034
24	.51165	-1.06530	-63.308	.05588	.53661	-1.05275	.48669	-1.077
25	.53342	-1.10847	-63.171	.05588	.55835	-1.09586	.50849	-1.121
26	.55519	-1.15138	-63.035	.05571	.58002	-1.13875	.53036	-1.164
27	.57696	-1.19404	-62.897	.05538	.60161	-1.18143	.55231	-1.206
28	.59873	-1.23645	-62.756	.05489	.62313	-1.22389	.57433	-1.249
29	.62050	-1.27859	-62.607	.05424	.64458	-1.26612	.59642	-1.291
30	.64227	-1.32047	-62.452	.05344	.66596	-1.30811	.61857	-1.332
31	.66404	-1.36206	-62.291	.05249	.68727	-1.34985	.64080	-1.374
32	.68580	-1.40336	-62.124	.05139	.70852	-1.39135	.66309	-1.415
33	.70757	-1.44437	-61.951	.05015	.72970	-1.43258	.68545	-1.456
34	.72934	-1.48507	-61.772	.04876	.75082	-1.47354	.70786	-1.496
35	.75111	-1.52547	-61.589	.04723	.77188	-1.51423	.73034	-1.536
36	.77288	-1.56556	-61.401	.04556	.79288	-1.55465	.75288	-1.576
37	.79465	-1.60533	-61.209	.04376	.81382	-1.59479	.77548	-1.615
38	.81642	-1.64478	-61.013	.04182	.83471	-1.63465	.79813	-1.654
39	.83819	-1.68391	-60.814	.03976	.85554	-1.67422	.82083	-1.693
40	.85996	-1.72273	-60.611	.03757	.87632	-1.71351	.84359	-1.731
41	.88173	-1.76122	-60.405	.03525	.89705	-1.75251	.86640	-1.769
42	.90350	-1.79938	-60.195	.03282	.91774	-1.79123	.88926	-1.807
43	.92527	-1.83722	-59.982	.03027	.93837	-1.82965	.91216	-1.844
44	.94703	-1.87474	-59.765	.02760	.95896	-1.86779	.93511	-1.881
45	.96880	-1.91192	-59.546	.02481	.97950	-1.90564	.95811	-1.918
46	.99057	-1.94879	-59.323	.02192	1.00000	-1.94319	.98115	-1.954

NORMALISED PLOT OF SECTION NUMBER

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

BLADE CHORD = 3.06895E+00

L.E.RADIUS = 1.53448E-02 CENTERED AT X= -6.7213E-01 Y= 1.4066E+00

SECTION AREA= 1.87630E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 9.23661E-02
IY = 2.30287E-02
IXY =-4.60008E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.15299E-01 (AT 26.498 WITH (X) AXIS)
IPY = 9.53513E-05 (AT 26.498 WITH (Y) AXIS)

PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
1	-6.58232E-01	1.41316E+00	-6.86018E-01	1.40013E+00
2	-6.26356E-01	1.34858E+00	-6.56941E-01	1.33433E+00
3	-5.94475E-01	1.28361E+00	-6.27868E-01	1.26813E+00
4	-5.62598E-01	1.21825E+00	-5.98791E-01	1.20157E+00
5	-5.30730E-01	1.15255E+00	-5.69705E-01	1.13467E+00
6	-4.98880E-01	1.08655E+00	-5.40602E-01	1.06749E+00
7	-4.67054E-01	1.02032E+00	-5.11474E-01	1.00009E+00
8	-4.35262E-01	9.53932E-01	-4.82312E-01	9.32536E-01
9	-4.03512E-01	8.87477E-01	-4.53108E-01	8.64927E-01
10	-3.71814E-01	8.21061E-01	-4.23852E-01	7.97365E-01
11	-3.40176E-01	7.54802E-01	-3.94537E-01	7.29966E-01
12	-3.08605E-01	6.88810E-01	-3.65155E-01	6.62848E-01
13	-2.77106E-01	6.23178E-01	-3.35699E-01	5.96110E-01
14	-2.45684E-01	5.57979E-01	-3.06167E-01	5.29833E-01

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15	-2.14343E-01	4.93268E-01	-2.76555E-01	4.64082E-01
16	-1.83086E-01	4.29079E-01	-2.46858E-01	3.98901E-01
17	-1.51915E-01	3.65425E-01	-2.17076E-01	3.34315E-01
18	-1.20830E-01	3.02302E-01	-1.87206E-01	2.70331E-01
19	-8.98326E-02	2.39686E-01	-1.57250E-01	2.06938E-01
20	-5.89228E-02	1.77535E-01	-1.27206E-01	1.44105E-01
21	-2.81027E-02	1.15805E-01	-9.70726E-02	8.17919E-02
22	2.62460E-03	5.44585E-02	-6.68462E-02	1.99646E-02
23	3.32567E-02	-6.53604E-03	-3.65245E-02	-4.14065E-02
24	6.37905E-02	-6.72017E-02	-6.10445E-03	-1.02344E-01
25	9.42230E-02	-1.27556E-01	2.44168E-02	-1.62862E-01
26	1.24553E-01	-1.87607E-01	5.50404E-02	-2.22972E-01
27	1.54782E-01	-2.47356E-01	8.57651E-02	-2.82678E-01
28	1.84911E-01	-3.06797E-01	1.16590E-01	-3.41976E-01
29	2.14941E-01	-3.65919E-01	1.47514E-01	-4.00859E-01
30	2.44874E-01	-4.24708E-01	1.78535E-01	-4.59313E-01
31	2.74712E-01	-4.83153E-01	2.09650E-01	-5.17325E-01
32	3.04458E-01	-5.41242E-01	2.40858E-01	-5.74883E-01
33	3.34114E-01	-5.98966E-01	2.72156E-01	-6.31978E-01
34	3.63682E-01	-6.56316E-01	3.03541E-01	-6.88602E-01
35	3.93165E-01	-7.13287E-01	3.35012E-01	-7.44745E-01

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PT NO	SURFACE----------ONE X	Y	SURFACE----------TWO X	Y
36	4.22565E-01	-7.69871E-01	3.66566E-01	-8.00401E-01
37	4.51885E-01	-8.26064E-01	3.98200E-01	-8.55567E-01
38	4.81127E-01	-8.81864E-01	4.29912E-01	-9.10237E-01
39	5.10293E-01	-9.37266E-01	4.61699E-01	-9.64409E-01
40	5.39386E-01	-9.92271E-01	4.93560E-01	-1.01808E+00
41	5.68407E-01	-1.04687E+00	5.25493E-01	-1.07125E+00
42	5.97361E-01	-1.10107E+00	5.57493E-01	-1.12391E+00
43	6.26248E-01	-1.15487E+00	5.89559E-01	-1.17607E+00
44	6.55071E-01	-1.20826E+00	6.21690E-01	-1.22772E+00
45	6.83831E-01	-1.26125E+00	6.53884E-01	-1.27886E+00
46	7.12532E-01	-1.31383E+00	6.86137E-01	-1.32949E+00

POINTS DESCRIBING LEADING EDGE RADIUS

POINT NO.	X	Y
1	-6.86018E-01	1.40013E+00
2	-6.86623E-01	1.40162E+00
3	-6.87069E-01	1.40316E+00
4	-6.87351E-01	1.40474E+00
5	-6.87467E-01	1.40634E+00
6	-6.87414E-01	1.40795E+00
7	-6.87194E-01	1.40954E+00
8	-6.86809E-01	1.41110E+00
9	-6.86263E-01	1.41261E+00
10	-6.85562E-01	1.41405E+00
11	-6.84714E-01	1.41542E+00
12	-6.83728E-01	1.41669E+00
13	-6.82615E-01	1.41784E+00
14	-6.81387E-01	1.41888E+00
15	-6.80057E-01	1.41978E+00
16	-6.78640E-01	1.42054E+00
17	-6.77152E-01	1.42114E+00
18	-6.75610E-01	1.42159E+00
19	-6.74028E-01	1.42187E+00
20	-6.72426E-01	1.42199E+00
21	-6.70821E-01	1.42193E+00
22	-6.69230E-01	1.42171E+00
23	-6.67671E-01	1.42133E+00
24	-6.66160E-01	1.42078E+00
25	-6.64715E-01	1.42008E+00
26	-6.63351E-01	1.41923E+00
27	-6.62083E-01	1.41825E+00
28	-6.60926E-01	1.41713E+00
29	-6.59890E-01	1.41591E+00
30	-6.58989E-01	1.41458E+00
31	-6.58232E-01	1.41316E+00

LEADING EDGE AXIAL DIFFERENCE = -.1125 NEW DELX = .1125

1

POINT	FRAC. M	Y	Y-D(DEG)	Y-DD	R OF CURV
1	.00000	.00000	-64.87535	-.59562	-21.9342
2	.02222	-.04753	-65.01060	-.58534	-22.6595
3	.04444	-.09535	-65.13987	-.55456	-24.2690
4	.06667	-.14345	-65.25874	-.50322	-27.1073
5	.08889	-.19179	-65.36292	-.43136	-32.0011
6	.11111	-.24034	-65.44824	-.33896	-41.1242
7	.13333	-.28906	-65.51057	-.22602	-62.1153
8	.15556	-.33790	-65.54574	-.09255	-152.3053
9	.17778	-.38677	-65.54951	.06145	229.4982
10	.20000	-.43562	-65.51740	.23598	59.5396
11	.22222	-.48435	-65.44643	.40669	34.2675
12	.24444	-.53287	-65.34040	.54922	25.0691
13	.26667	-.58113	-65.20478	.66357	20.4317
14	.28889	-.62907	-65.04506	.74973	17.7603
15	.31111	-.67663	-64.86685	.80771	16.1594
16	.33333	-.72379	-64.67603	.83751	15.2575
17	.35556	-.77055	-64.47878	.83913	14.9007
18	.37778	-.81689	-64.28162	.81256	15.0601
19	.40000	-.86283	-64.09150	.75782	15.8192
20	.42222	-.90839	-63.91413	.69397	16.9486
21	.44444	-.95362	-63.74915	.64011	18.0546
22	.46667	-.99852	-63.59454	.59623	19.0688
23	.48889	-1.04313	-63.44813	.56233	19.9096
24	.51111	-1.08747	-63.30764	.53842	20.4910
25	.53333	-1.13153	-63.17066	.52448	20.7384
26	.55556	-1.17534	-63.03473	.52053	20.6048
27	.57778	-1.21889	-62.89724	.52656	20.0835
28	.60000	-1.26218	-62.75550	.54257	19.2111
29	.62222	-1.30520	-62.60727	.56264	18.2494
30	.64444	-1.34795	-62.45232	.58086	17.4032
31	.66667	-1.39040	-62.29100	.59724	16.6551
32	.68889	-1.43257	-62.12362	.61176	15.9917
33	.71111	-1.47443	-61.95055	.62442	15.4021
34	.73333	-1.51598	-61.77215	.63524	14.8777
35	.75556	-1.55722	-61.58880	.64421	14.4116
36	.77778	-1.59814	-61.40092	.65132	13.9983
37	.80000	-1.63874	-61.20891	.65658	13.6334
38	.82222	-1.67901	-61.01318	.66068	13.2995
39	.84444	-1.71896	-60.81383	.66429	12.9813
40	.86667	-1.75858	-60.61093	.66742	12.6780
41	.88889	-1.79787	-60.40456	.67007	12.3889
42	.91111	-1.83683	-60.19477	.67224	12.1134
43	.93333	-1.87546	-59.98165	.67393	11.8509
44	.95556	-1.91375	-59.76528	.67513	11.6011
45	.97778	-1.95171	-59.54576	.67586	11.3634
46	1.00000	-1.98934	-59.32318	.67610	11.1374

1

DATA POINTS

POINT	FRAC. M	Y-D(DEG)
1	.00000	-64.87535
2	.20000	-65.51740
3	.40000	-64.09151
4	.60000	-62.75551
5	.80000	-61.20893
6	1.00000	-59.32318

CARTESIAN COORDINATES ON STREAMSURFACE 11

POINT	Z1	X1	Y1	Z2	X2	Y2
1	9.39506	-.77077	1.40815	9.39703	-.79855	1.39490
2	9.40439	-.73889	1.34445	9.40642	-.76947	1.33015
3	9.41334	-.70701	1.28027	9.41543	-.74040	1.26475
4	9.42190	-.67513	1.21565	9.42404	-.71132	1.19892
5	9.43007	-.64326	1.15059	9.43223	-.68224	1.13267
6	9.43782	-.61141	1.08514	9.43999	-.65313	1.06606
7	9.44515	-.57959	1.01937	9.44731	-.62401	.99916
8	9.45204	-.54779	.95337	9.45417	-.59484	.93203
9	9.45848	-.51605	.88721	9.46056	-.56564	.86476
10	9.46446	-.48435	.82101	9.46647	-.53639	.79746
11	9.46996	-.45271	.75489	9.47189	-.50707	.73026
12	9.47498	-.42114	.68898	9.47682	-.47769	.66327
13	9.47952	-.38964	.62339	9.48125	-.44823	.59659
14	9.48359	-.35822	.55820	9.48519	-.41870	.53033
15	9.48717	-.32688	.49349	9.48864	-.38909	.46455
16	9.49030	-.29562	.42926	9.49160	-.35939	.39933
17	9.49296	-.26445	.36557	9.49410	-.32961	.33470
18	9.49519	-.23336	.30241	9.49614	-.29974	.27064
19	9.49697	-.20236	.23977	9.49774	-.26978	.20717
20	9.49834	-.17146	.17760	9.49890	-.23974	.14427
21	9.49929	-.14063	.11583	9.49965	-.20960	.08191
22	9.49984	-.10991	.05447	9.49998	-.17938	.02006
23	9.50000	-.07928	-.00653	9.49991	-.14906	-.04136
24	9.49976	-.04874	-.06719	9.49945	-.11864	-.10232
25	9.49914	-.01831	-.12753	9.49860	-.08812	-.16285
26	9.49815	.01202	-.18758	9.49738	-.05749	-.22295
27	9.49678	.04225	-.24730	9.49580	-.02677	-.28262
28	9.49505	.07238	-.30669	9.49385	.00406	-.34188
29	9.49296	.10241	-.36573	9.49154	.03498	-.40071
30	9.49051	.13234	-.42441	9.48890	.06600	-.45909
31	9.48773	.16218	-.48275	9.48592	.09712	-.51698
32	9.48460	.19193	-.54070	9.48262	.12833	-.57439
33	9.48114	.22158	-.59825	9.47900	.15962	-.63132
34	9.47737	.25115	-.65539	9.47507	.19101	-.68775
35	9.47327	.28063	-.71211	9.47085	.22248	-.74366
36	9.46887	.31003	-.76843	9.46634	.25403	-.79904
37	9.46417	.33935	-.82432	9.46155	.28567	-.85389
38	9.45918	.36859	-.87978	9.45649	.31738	-.90822
39	9.45390	.39776	-.93480	9.45117	.34917	-.96202
40	9.44834	.42685	-.98937	9.44559	.38103	-1.01526
41	9.44251	.45587	-1.04352	9.43978	.41296	-1.06797
42	9.43642	.48483	-1.09723	9.43373	.44496	-1.12012
43	9.43008	.51372	-1.15049	9.42746	.47703	-1.17173
44	9.42348	.54254	-1.20331	9.42098	.50916	-1.22279
45	9.41665	.57130	-1.25567	9.41428	.54135	-1.27330
46	9.40961	.60000	-1.30739	9.40739	.57360	-1.32326

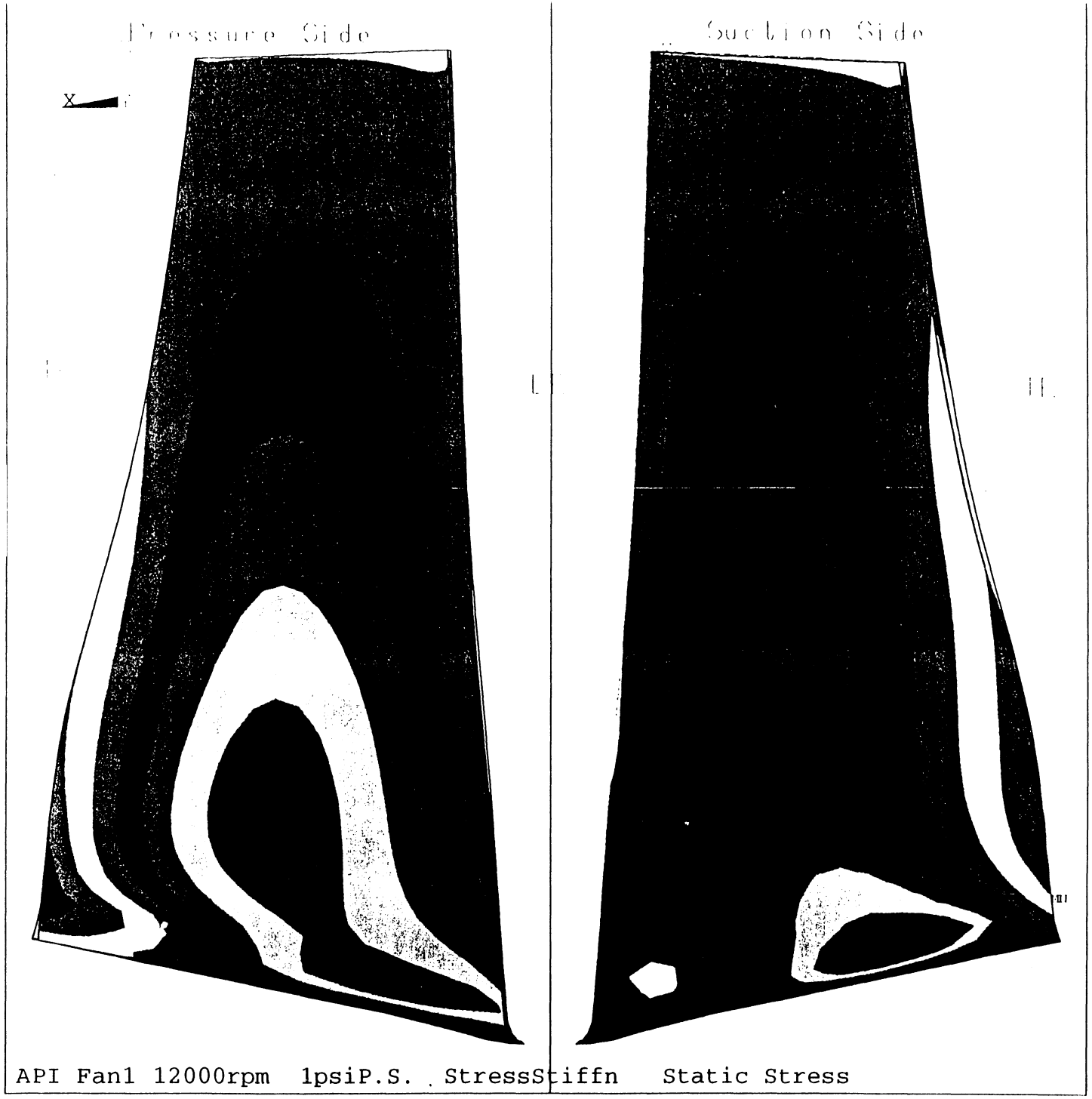
1

POINT	ZSEMI	XSEMI	YSEMI
1	9.39703	-.79855	1.39490
2	9.39682	-.79916	1.39636
3	9.39659	-.79960	1.39788
4	9.39636	-.79988	1.39944
5	9.39612	-.80000	1.40102
6	9.39589	-.79995	1.40261
7	9.39565	-.79973	1.40419
8	9.39542	-.79934	1.40573
9	9.39520	-.79880	1.40724
10	9.39498	-.79810	1.40868
11	9.39477	-.79725	1.41004
12	9.39458	-.79626	1.41131
13	9.39441	-.79515	1.41248
14	9.39425	-.79392	1.41352
15	9.39411	-.79259	1.41443
16	9.39400	-.79117	1.41520
17	9.39390	-.78969	1.41583
18	9.39383	-.78814	1.41629
19	9.39379	-.78656	1.41660
20	9.39377	-.78496	1.41673
21	9.39377	-.78335	1.41670
22	9.39380	-.78176	1.41650
23	9.39386	-.78020	1.41613
24	9.39394	-.77869	1.41561
25	9.39404	-.77725	1.41493
26	9.39416	-.77588	1.41411
27	9.39431	-.77462	1.41315
28	9.39447	-.77346	1.41206
29	9.39465	-.77242	1.41085
30	9.39485	-.77152	1.40955
31	9.39506	-.77077	1.40815

APPENDIX B

FAN ROTOR BLADE STRESS/VIBRATION SOLID MODEL

ANSYS OUTPUT GRAPHICS

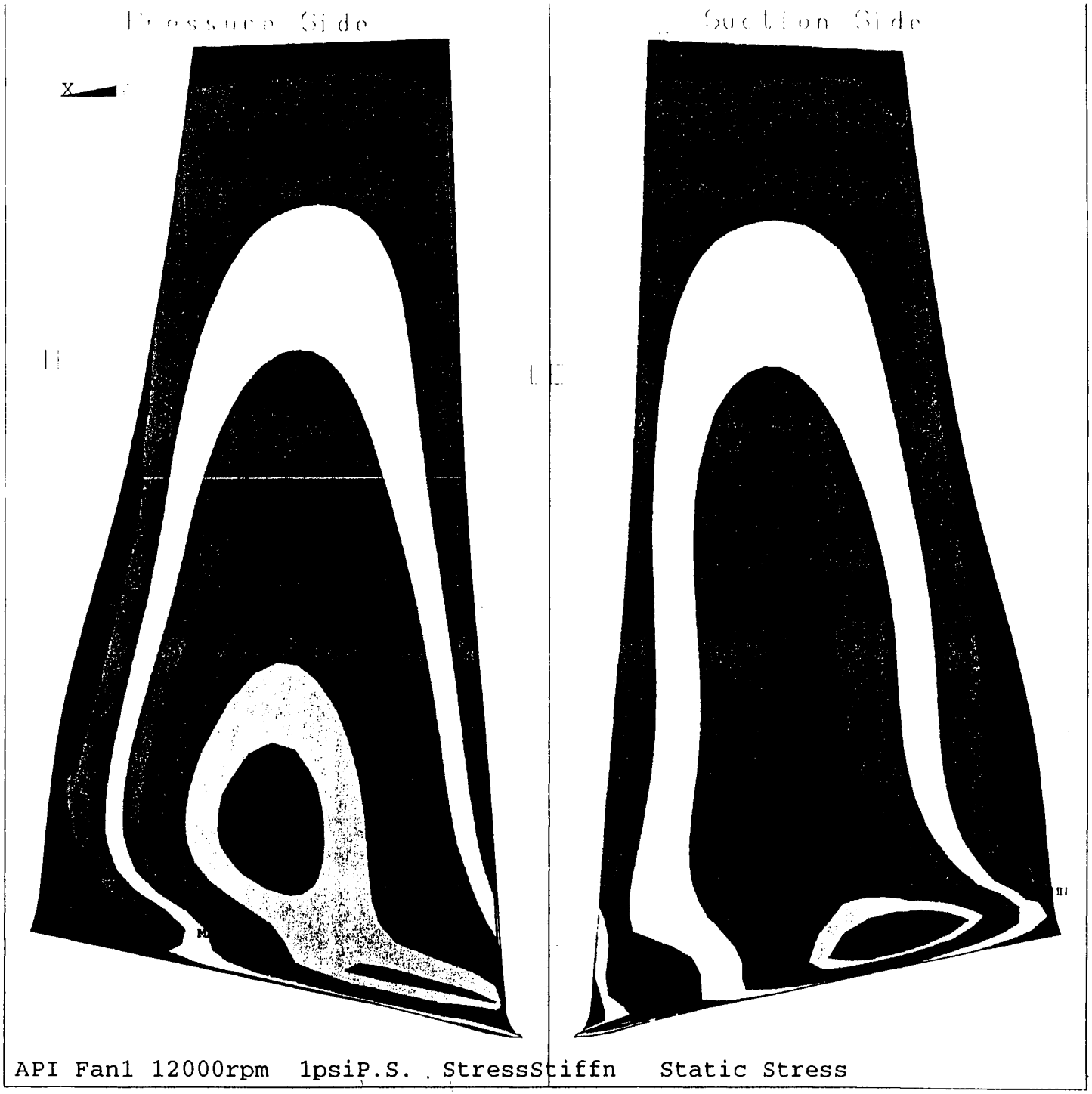


STEADY STATE
RADIAL STRESS DISTIBUTION
(a) 12, 000 RPM

SIGMAX = 16, 600 PSI
(a) 9, 000 RPM MECHANICAL
DESIGN SPEED FOR
CI-011

SMN =-14275
SMX =29548

-14275
-9406
-4537
332.468
5202
10071
14940
19810
24679
29548

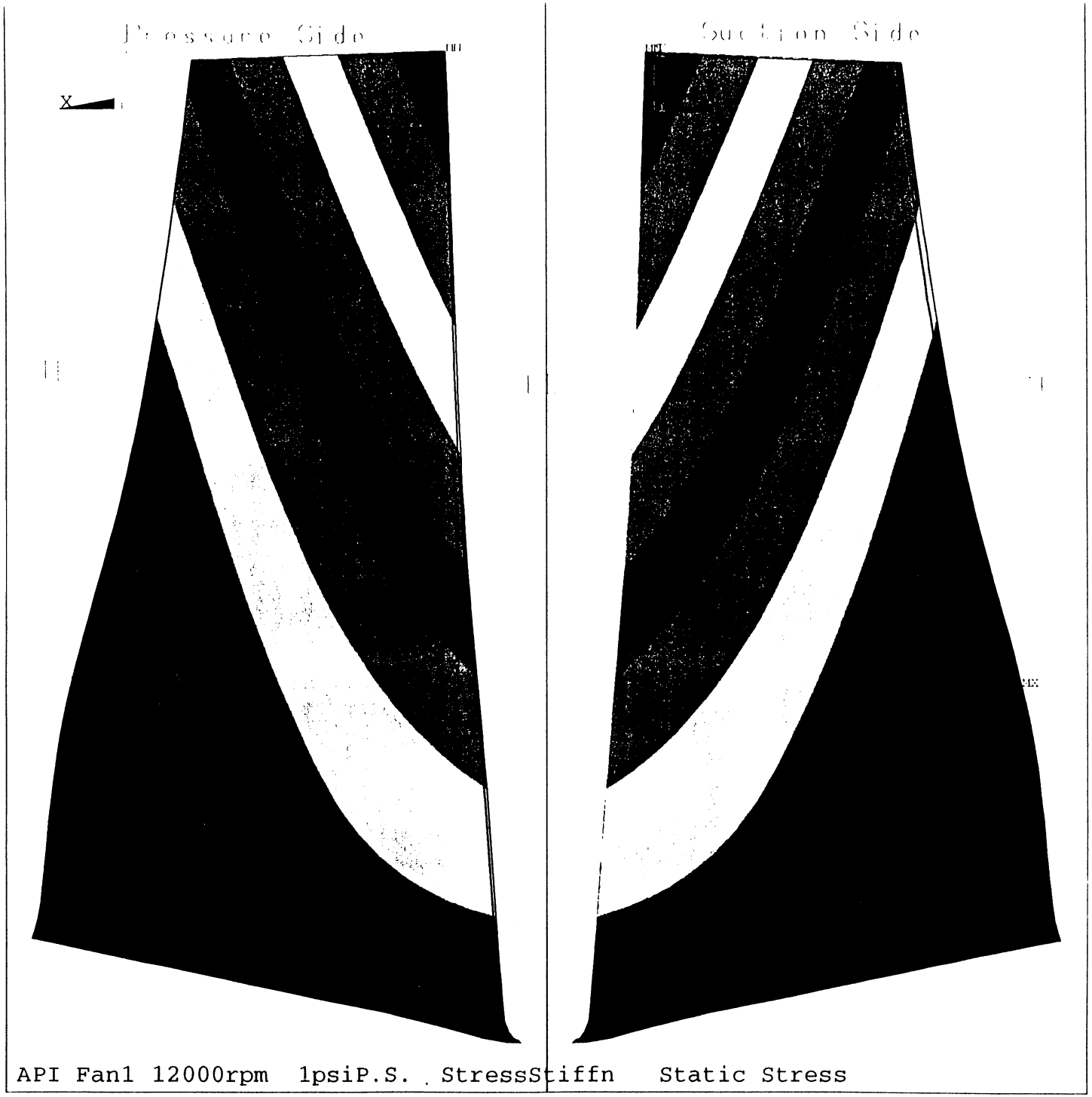


STEADY STATE PRINCIPAL STRESS DISTRIBUTION (@ 12, 000 RPM SIMILAR TO RADIAL

SMN =-2655
SMX =30264

-2655
1003
4660
8318
11975
15633
19291
22948
26606
30264

PADT

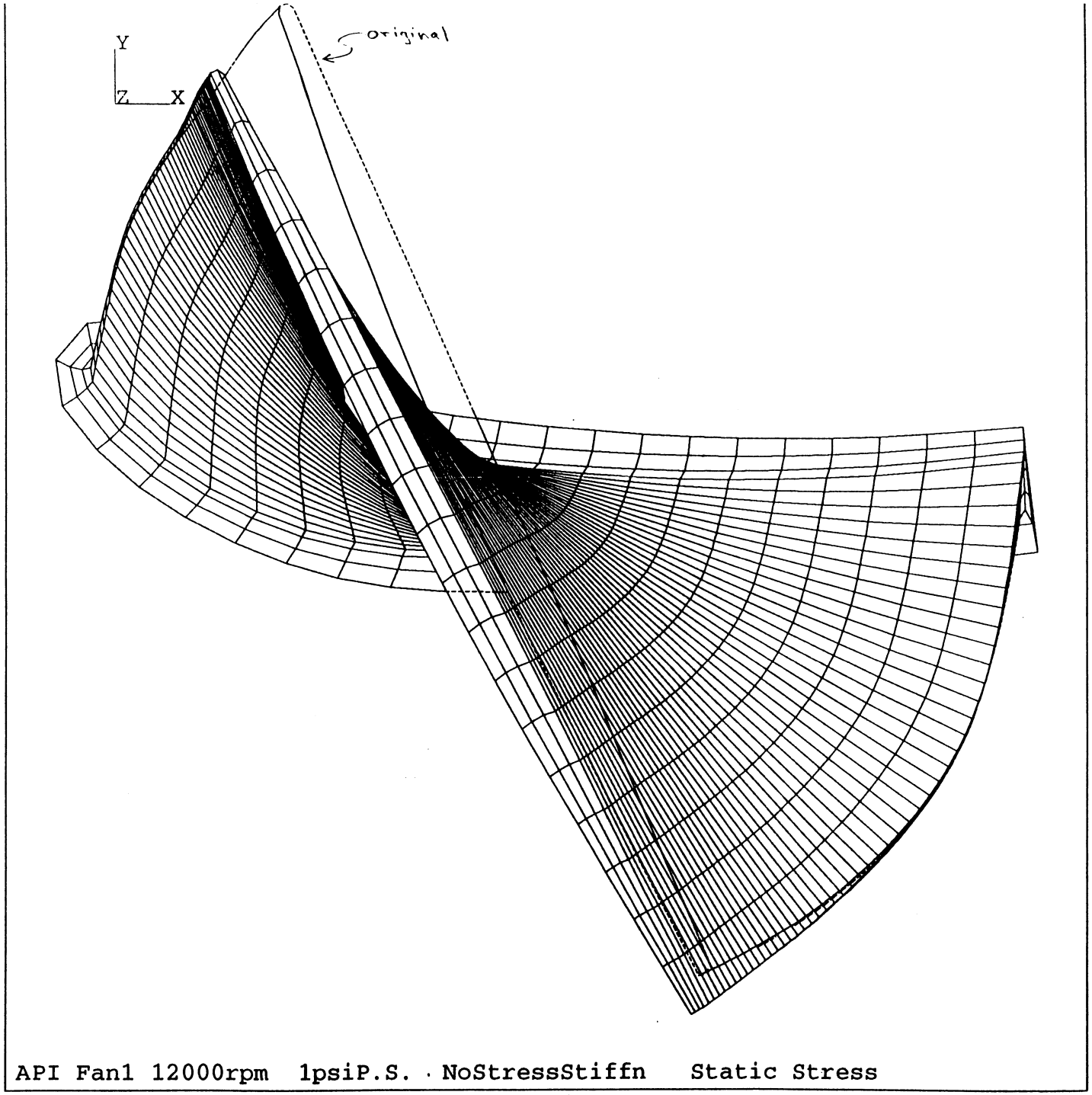


TANGENTIAL DISPLACEMENT DISTRIBUTION @ 12,000 RPM

SMN =-0.03545
SMX =0.007805

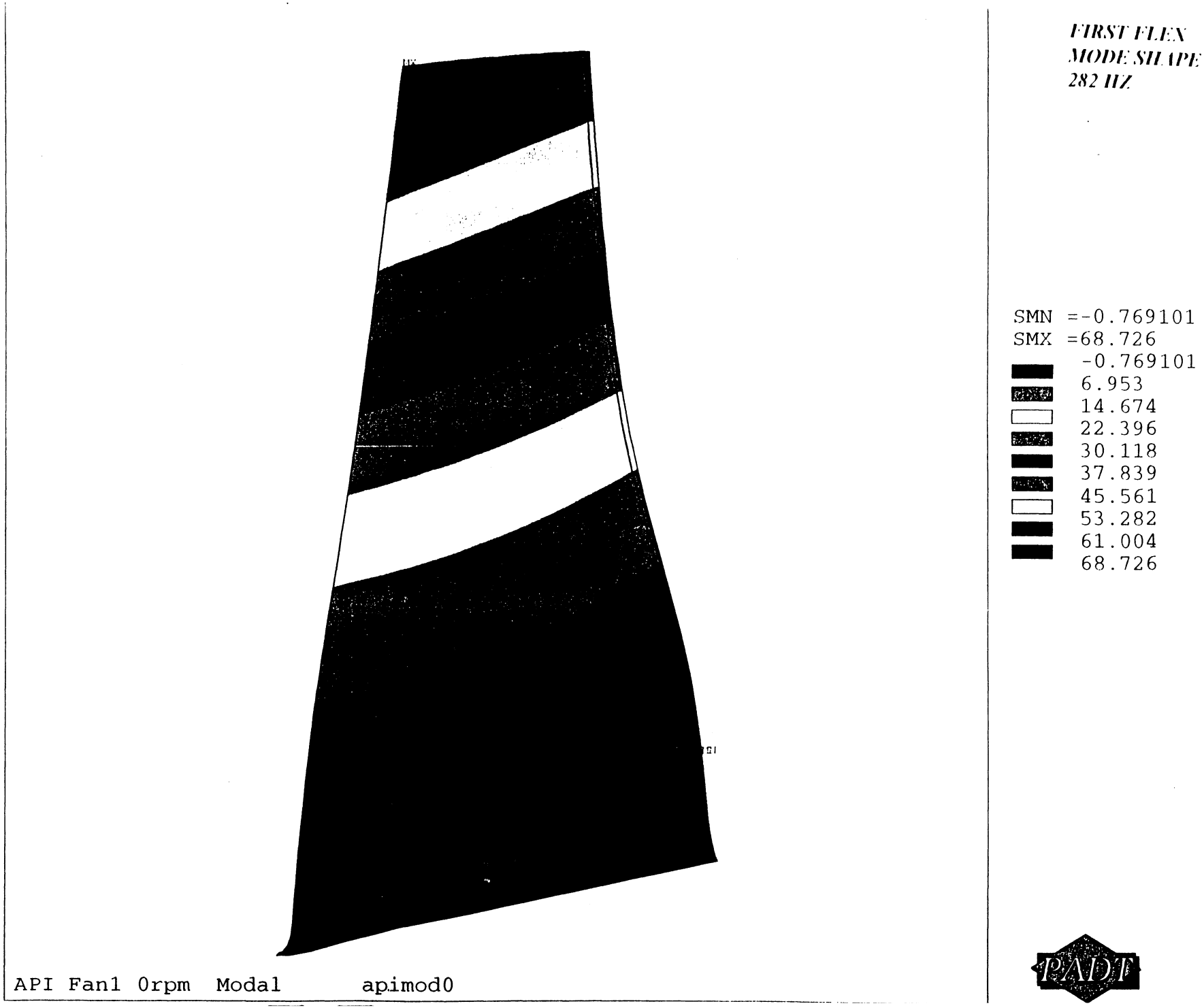
-0.03545
-0.030644
-0.025838
-0.021032
-0.016226
-0.01142
-0.006614
-0.001808
0.002998
0.007805

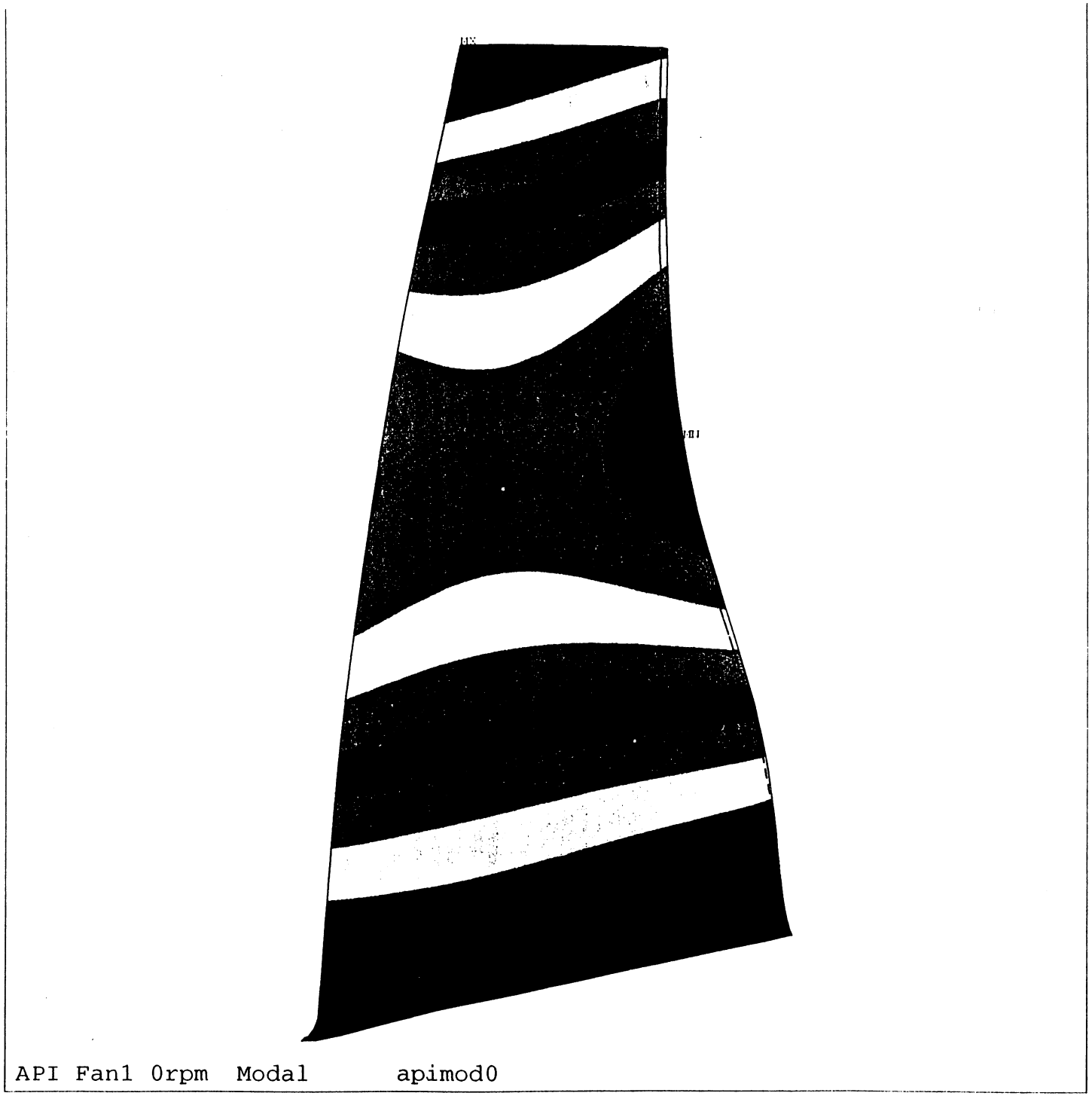
PADT



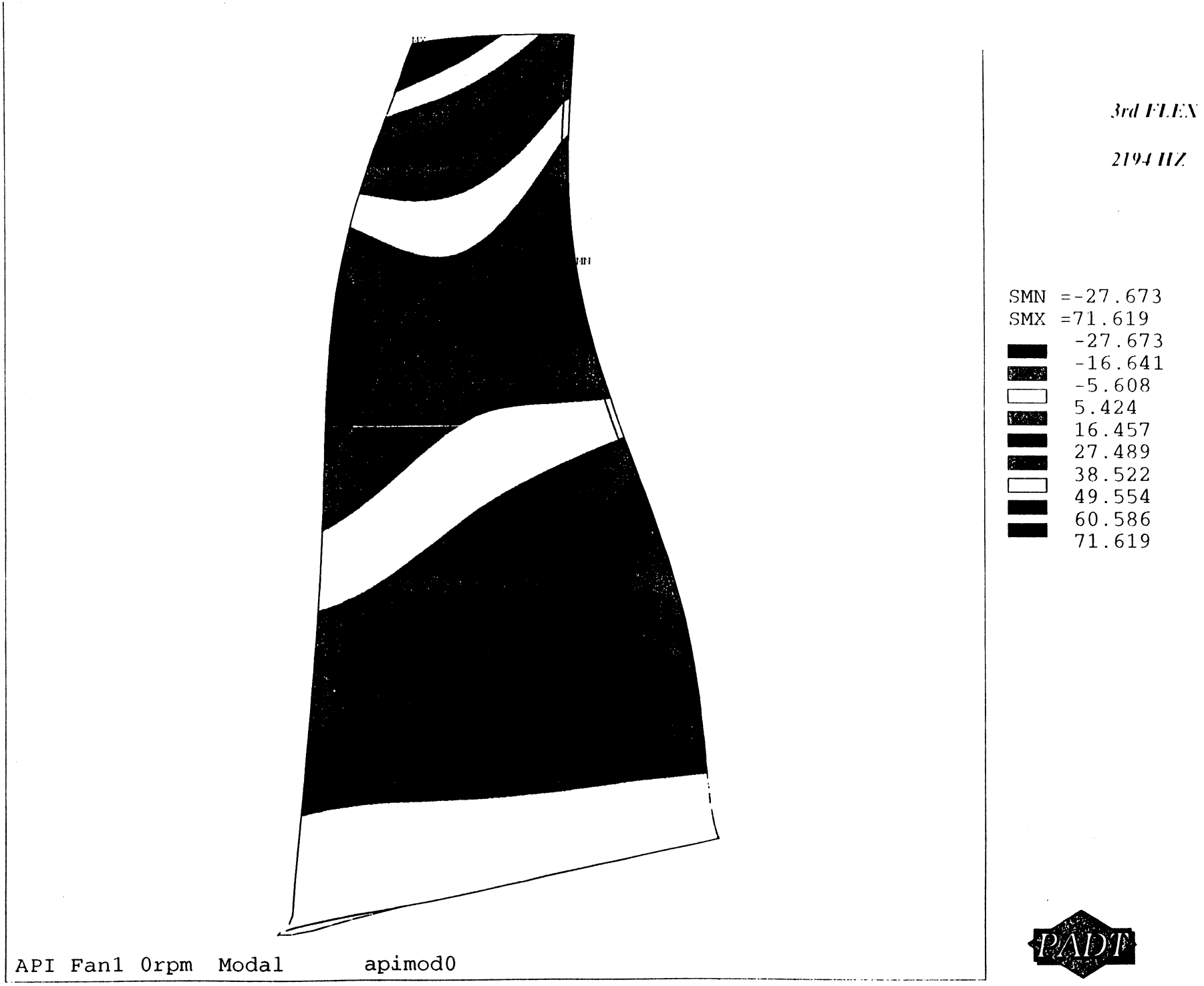
AMPLIFIED DISPLACEMENT DISTRIBUTION AT 12, 000 RPM

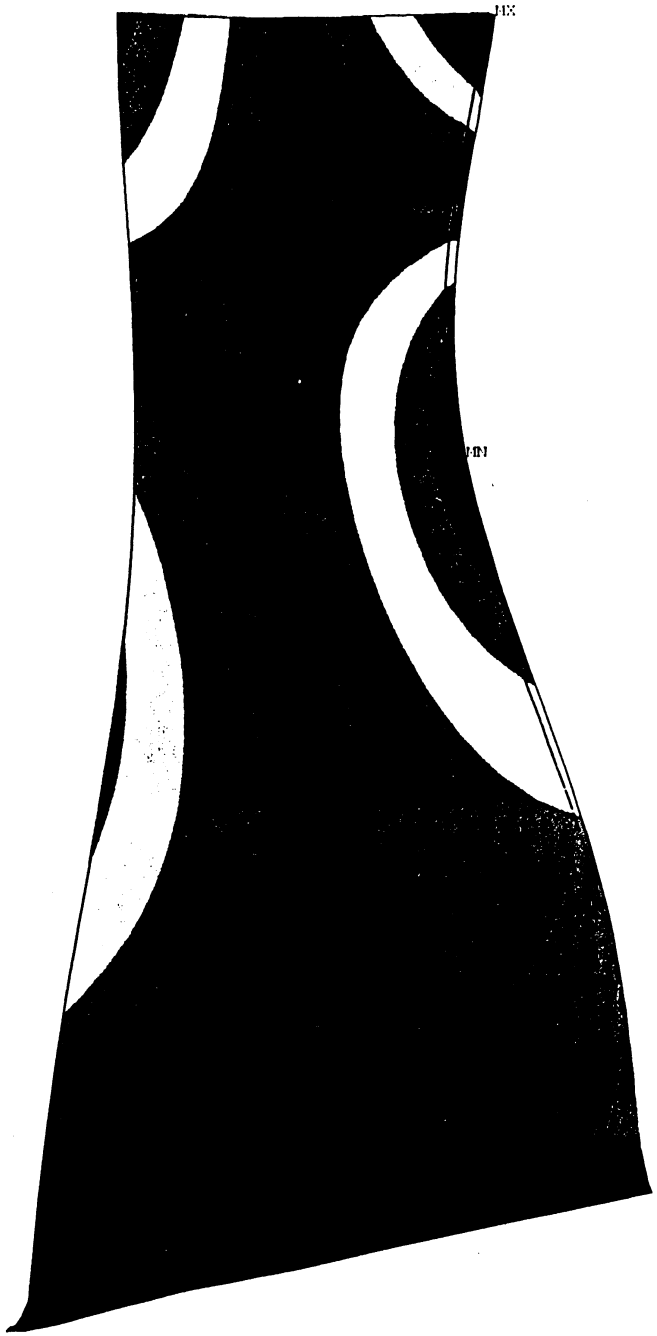
TIP UNTWIST IS SMALL
.85 DEG @ 12, 000 RPM
.45 DEG @ 9, 000 RPM
MECHANICAL DESIGN SPEED FOR C1-04


FIRST FLEX
MODE SHAPE
282 HZ
SMN =-0.769101
SMX =68.726
-0.769101
6.953
14.674
22.396
30.118
37.839
45.561
53.282
61.004
68.726
API Fan1 0rpm Modal apimod0


2nd FLEX
MODE SHAPE
821 HZ
SMN =-36.354
SMX =4.263
-36.354
-31.841
-27.328
-22.815
-18.302
-13.789
-9.276
-4.763
-0.249663
4.263
API Fan1 0rpm Modal apimod0

1st TORSION
MODE SHAPE
1515 HZ
SMN =-48.297
SMX =87.524
-48.297
-33.206
-18.115
-3.024
12.068
27.159
42.25
57.341
72.433
87.524
API Fan1 0rpm Modal apimod0


3rd FLEX
2194 HZ
SMN =-27.673
SMX =71.619
-27.673
-16.641
-5.608
5.424
16.457
27.489
38.522
49.554
60.586
71.619
API Fan1 0rpm Modal apimod0
PADT



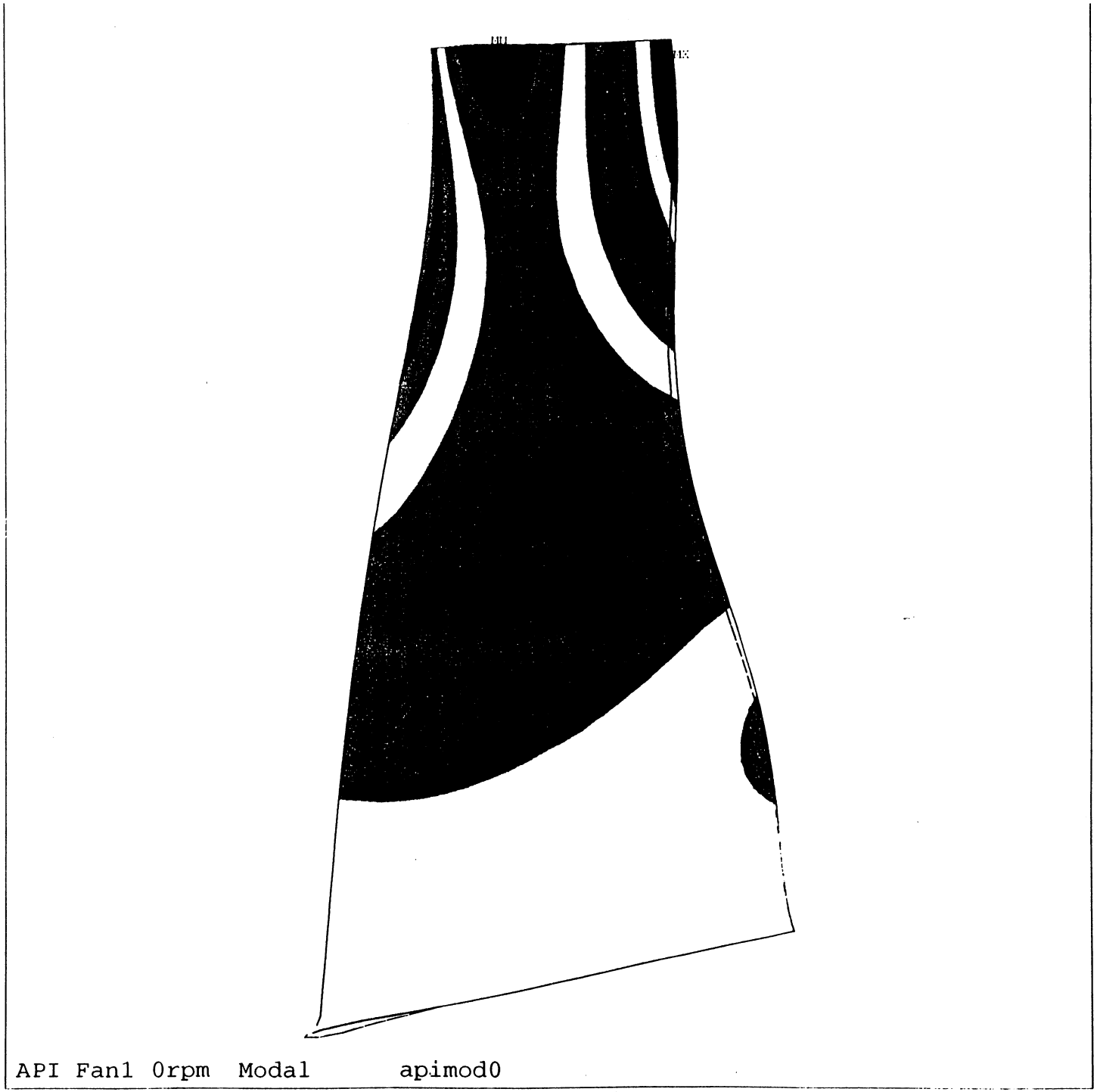
2nd TORSION

3212 HZ

SMN =-73.922
SMX =88.75

-73.922
-55.847
-37.773
-19.698
-1.624
16.451
34.526
52.6
70.675
88.75

API Fan1 0rpm Modal apimod0



2 STRIPE MODE

3890 HZ

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13. ABSTRACT ***(Maximum 200 words)***
This document reports research investigations into efficient, low-cost fan system concepts for high bypass turbofans for future general aviation and commuter aircraft. The research specifically addressed lower pressure ratio fans for good propulsive efficiencies in the 200 to 400 knot flight speed regime. Aerodynamic design analyses yielded predicted efficiency in area of 91 to 92 percent (adiabatic). Low-cost manufacturing studies yielded an aluminum blisk rotor and investment cast stator having lowest cost. Structural design analyses yielded a design having excellent vibratory characteristics and the ability to pass One- and Four-pound bird strikes satisfactorily. The low speed and low pressure fans of the study are estimated to have 24 to 30 EPNdB lower community noise levels than larger, high pressure ratio transonic fans.

14. SUBJECT TERMS
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