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Studies of Shock/Shock Interaction on Smooth and Transpiration-Cooled Hemispherical Nosetips in Hypersonic Flow

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Abstract

A program of experimental research and analysis has been conducted to examine the heat transfer and pressure distributions in regions of shock/shock interaction over smooth and transpiration-cooled hemispherical noseshapes. The objective of this investigation was to determine whether the large heat transfer generated in regions of shock/shock interaction can be reduced by transpiration cooling. The experimental program was conducted at Mach numbers of 12 to 16 in the Calspan 48-Inch Shock Tunnel. Type III and type IV interaction regions were generated for a range of freestream unit Reynolds numbers to provide shear layer Reynolds numbers from 10^4 to 10^6 to enable both laminar and turbulent interaction regions to be studied. Shock/shock interactions were investigated on a smooth hemispherical nosetip and a similar transpiration-cooled nosetip, with the latter configuration being examined for a range of surface blowing rates up to one-third of the freestream mass flux. While the heat transfer measurements on the smooth hemisphere without shock/shock interaction were in good agreement with Fay-Riddell predictions, those on the transpiration-cooled nosetip indicated that its intrinsic roughness caused heating-enhancement factors of over 1.5. In the shock/shock interaction studies on the smooth nosetip, detailed heat transfer and pressure measurements were obtained to map the variation of the distributions with shock-impingement position for a range of type III and type IV interactions. Such sets of measurements were obtained for a range of unit Reynolds numbers and Mach numbers to obtain both laminar and turbulent interactions. The measurements indicated that shear layer transition had a significant influence on the heating rates for the type IV interaction as well as the anticipated large effects on type III interaction heating. In the absence of blowing, the peak heating in the type III and type IV interaction regions, over the transpiration-cooled model, did not appear to be influenced by the model's rough surface characteristics. The studies of the effects of transpiration cooling on type III and type IV shock/shock interaction regions demonstrated that large surface blowing rates had significant effect on the structure of the flowfield, enlarging the shock layer and moving the region of peak-heating interaction around the body. However, despite a reduction in the total heating rate, the peak heating was reduced by less than 10 percent for coolant flow rates as large as 30 percent of the freestream mass flux.

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Nomenclature

A, B	Model Configuration Parameters, Tables 1 and 3 and Figure 9
a	Speed of Sound
C_h	$\dot{q}/(\varrho_\infty U_\infty (H_0 - H_w))$, Stanton Number
C_p	Pressure Coefficient, Equation 10
c_p	Specific Heat at Constant Pressure
D	Diameter of Cylinder
H	Total Enthalpy
ℓ	Characteristic Dimension
ℓ_{SL}	Length of Shear Layer, Figure 3
M	Mach Number
M_i	Incident Mach Number
M_{SL}	Shear Layer Mach Number, Figure 3 (Reference 3)
p	Static Pressure
p_0'	Pitot Pressure
P, Q	Triple Shock Point, Figure 2
$\dot{q}$	Heat Transfer Rate
q_∞	Dynamic Pressure
$\dot{q}_{FR}$	Fay-Riddell Heat Transfer Rate, Reference 17
R	Reattachment Point, Figure 2
$\overline{R}$	Gas Constant (=1717.91 ft-lb/slug/°R)
r	Radial Position on Hemisphere Model
Re	$U\ell/\nu$, Reynolds Number
Re_{SL}	Shear Layer Reynolds Number, Figure 3 (Reference 3)
$S.G.$	Shock Generator
T	Temperature
T_w	Initial Model Surface Temperature, Table 2
TC	Test Condition
U	Velocity
v_c	Coolant Velocity

GREEK SYMBOLS

α	Reattachment Angle
γ	Specific Heat Ratio ($\sim$1.4)
$\Delta\ell$	Width of Shear Layer, Figure 1
δ_{SL}	Width of Shear Layer
θ	Angular (Azimuthal) Position on Hemisphere Model Relative to Stagnation Point
λ	$(\varrho_w v_w)/(\varrho_\infty U_\infty)$, Blowing Parameter
μ	Viscosity
ν	Kinematic Viscosity
ϱ	Density
ϕ	Circumferential Position on Hemisphere Model

SUBSCRIPTS

0	Undisturbed Stagnation Value
1	Initial Value
1, 2, 3, 4, 5, 6, 7, 8	Regions in Type III and Type IV Interactions as Illustrated by Figures 1 and 2
aw	Adiabatic Wall Value
c	Coolant
D	Diameter
FR	Fay-Riddell Value, Reference 17
i	Incident
IDEAL	Ideal Value
p	Perfect
peak	Peak Value
REAL	Real Value
SL	Shear Layer Value
stag	At Stagnation Region
trans	Transition Value
w	Wall Value
∞	Freestream Value

Section 1
INTRODUCTION

The large aerothermal loads generated in regions of shock/shock interaction remain one of the key problems associated with the design of airbreathing hypersonic vehicles. At hypersonic speeds, the heat transfer to the lip of an engine cowl, with the compression ramp shocks focused upon it, can exceed the normal stagnation values by factors of between 20 and 50 under continuum conditions. Such heating loads make it mandatory that some form of cooling technique be employed. Generally, an active cooling system is preferred to an ablative system; however, the large heating levels may preclude the use of backface-cooling techniques. Therefore, transpiration cooling was anticipated to represent the most effective technique to alleviate cowl heating in the presence of shock/shock interaction heating.

The two types of shock/shock interaction that generate the largest heating loads were defined by Edney (Reference 1) as type III and type IV interactions. Shown schematically in Figure 1, the type IV interaction is one in which a jet comprising a series of compression and expansion waves efficiently compresses the freestream gas. This jet, preceded and bounded by shear layers, is terminated by a normal shock just ahead of the surface to produce what is, effectively, a very narrow stagnation region. To predict the heating loads in this region, Edney modeled this region as a stagnation region on a body with an effectively smaller nose radius, obtaining the expression shown in Figure 1. For flows in which the shear layer upstream of the jet is transitional, the heating levels for the type IV interaction can be increased by radiated noise, as discussed in Reference 2. In the type III interaction (Figure 2), where the shear layer is directly incident on the model surface, the heating levels in the attachment region are significantly increased when transition occurs in the shear layer. Consequently, in predicting the heating loads in these flows, it is essential to establish a transition criterion of the type shown in Figure 3 (Reference 3), where the Reynolds number based on the shear layer length and adjacent flow properties is plotted versus effective shear layer Mach number. Generally, for shear layer Reynolds numbers below 5×10^4, the shear layer should remain laminar; for shear layer Reynolds numbers above 5×10^5, a turbulent flow may be expected. The exact Reynolds number at which shear layer transition will occur will, of course, also depend upon the disturbances that are radiated from upstream surfaces of the vehicle and those present in the freestream.

During the past two decades, a significant number of studies have been conducted to investigate the aerothermal loads generated in regions of shock/shock interaction. A recent review of these studies, as well as an extensive set of heat transfer and pressure measurements in regions of shock/shock interaction at Mach numbers from 6 to 18, is presented by Holden *et al.* in Reference 2. Comparisons between the peak heat transfer and pressure measurements on cylindrical leading edges made in these studies with the simple prediction techniques devised by Edney (Reference 1) and Keyes and Hains (Reference 4) showed general agreement. However, these studies suggest that it is necessary to understand the role of the disturbances generated by shear layer turbulence, and the influence of viscous effects on jet structure, to better predict these flows. The heating levels predicted by these semiempirical techniques are capable of bounding the levels of heating generated by laminar and turbulent type III interactions. However, for flows where the viscous region occupies an extensive part of the shock layer, the compression and heating mechanisms may be significantly modified. Within the past several years, both the finite-difference and the finite-element techniques have been employed to obtain solutions to the Navier-Stokes equations for regions of shock/shock interaction. An adequate solution for these types of flows requires a careful and detailed gridding of the flowfield in the jet or shear layer region between the shock intersection point and

the body. Once again, an accurate solution for flows with shear layer transition depends on correctly describing the transitional and turbulent flow structures of the shear layer and the radiated noise effects on type IV heating or reattachment characteristics for type III flows.

Controlling the heating loads generated by shock/shock interaction on the small-radius cowl lip of a hypersonic scramjet engine represents a formidable and, as yet, unresolved problem. The use of ablative materials has been one of the most effective proven ways of controlling the stagnation point heating loads associated with sustained hypersonic flight. However, the ablation products can be inconsistent with an airbreathing propulsion system and clearly involve the refurbishment of the cowl lip. While backface cooling represents an ideal technique, it is not known if it could be applied to such large heating loads and has yet to be proven in hypersonic flight. Transpiration cooling has been used successfully on hypersonic re-entry vehicles and, in principle, represents the most practical way of handling the large heating loads. However, here, the large unknown is whether the region of high momentum generated by the jet will essentially cut through the low-momentum coolant layer or the shear layer scouring the cooling layer from the surface. A transpiration-cooled nosetip, designed by Aerojet employing its platelet technology in a slot cooling configuration, was used successfully in flight tests of ballistic re-entry vehicles. This model (Reference 5) was used with a gaseous injectant in shock tunnel studies of cooling effectiveness. In the absence of a coolant, the discontinuous nature of the surface produced an effective roughness that resulted in heating rates up to 60 percent more than those of a smooth model of the same geometry (Reference 5). For the lower blowing rates, the boundary layer in the stagnation region was apparently tripped by the injectant, and this also resulted in increased heating. Thus, the introduction of shock/shock interaction causes a significant complication to an already complex situation. Clearly, the effectiveness of transpiration cooling in reducing the heating loads developed by a transitional shock/shock interaction can be addressed only by an experimental program. Although a cylindrical transpiration-cooled leading edge would more closely simulate the cowl heating configuration, we believe that experiments with an existing hemispherical configuration should provide a clear indication of the phenomenology of importance in shock/shock interaction on transpiration-cooled leading edges.

In this report, we present the results of two studies to investigate the aerothermal loads generated in shock/shock interaction regions over hemispherical nosetips. First, in the following section, we describe the objective and design of the experimental program. The test facility is then described, and the conditions selected for the experimental studies are discussed and tabulated. The two models used for these studies, and the instrumentation installed in them, are described. We then discuss the results of the experimental studies. First, measurements on the two models in the absence of shock/shock interaction are presented to define the effects on the basic heating levels of the surface roughness of the transpiration-cooled model. We next present measurements on the smooth hemispherical nosetip for laminar and turbulent interaction regions at Mach numbers from 12 to 16. These are compared with measurements first presented in Reference 6, where the effects of transpiration cooling on the interaction-induced heating were investigated. The set of measurements to investigate Mach number and Reynolds number effects for type III and type IV interactions over the smooth configuration is then presented and discussed. Measurements of shock/shock interaction heating on the transpiration-cooled nosetip are next presented—first, for interactions in the absence of blowing; then, for a series of blowing levels—each for a range of Mach number and Reynolds number conditions. The measurements for each set of studies are compared with each other and with the predictions from the simple Edney/Keyes and Hains models. The conclusions from all of these studies are then presented.

Section 2
EXPERIMENTAL PROGRAM

2.1 PROGRAM OBJECTIVES AND DESIGN

The objective of the present studies was to provide detailed pressure and heat transfer measurements as well as schlieren photographs to define the structure and properties of regions of shock/shock interaction on smooth and transpiration-cooled nosetips at Mach numbers from 12 to 16. The emphasis in these studies was placed on type III and type IV interactions, for these provide the largest aerothermal loads. Studies were performed over a range of Reynolds numbers to explore the effects of transition on the heating rates. Measurements were also performed for fully laminar conditions to provide a data set that could be compared with theory without transition or turbulence modeling problems.

The first set of studies explored the aerothermal characteristics of the interaction between a planar shock and the shock layer of a smooth hemispherical nosetip. The primary objective of these studies was to investigate the effects of Mach number and Reynolds number on the magnitude and distribution of heating caused by type III and type IV shock/shock interaction for laminar and turbulent flows. The Mach number and Reynolds number in the shock layer adjacent to the shear layer are believed to be the most important parameters controlling transition of the shear layer, which, in turn, is controlled by the Mach number and Reynolds number of the freestream and interaction geometry. Measurements at Mach 12 were made for Reynolds numbers large enough to ensure generation of turbulent shear layers by the shock/shock interactions. The majority of the studies at Mach numbers from 12 to 16 were conducted for Reynolds numbers where the shear layers were determined to be fully laminar, based on observations of the measured heat transfer rates to the model surface.

The second series of studies investigated the aerothermal loads associated with the impingement of a weak, planar shock in the vicinity of the stagnation region of a transpiration-cooled hemispherical nosetip. The objective was to determine whether the heating levels generated by the interactions could be reduced by transpiration cooling. This investigation arose from questions as to whether transpiration cooling would be capable of diverting the strong momentum field generated by a type III and type IV interaction such that the aerothermal loads could be significantly reduced. Because of the large pressures anticipated in the peak interaction region, the experiment was designed so that the plenum pressure, which fed the slots in the model surface, was at least 20 times the freestream pitot pressure. This assured that fluid was being issued from the slots in the model unaltered by the presence of the interaction.

A number of key problems must be solved before a meaningful experimental study of shock/shock interaction at hypersonic speeds can be conducted. First, a blockage-free flow between the shock generator and the cylinder must be obtained while, at the same time, preventing expansion at the trailing edge of the shock generator from influencing the shock/shock interaction. These constraints required the use of a shock generator 60 inches in length and 18 inches in width, with various nosetip geometries, to obtain two-dimensional flow over the centerline of the model. Large experimental facilities are required for such experimental studies. We designed models with shock-generator angles of 10° based on Edney's prediction (Reference 1), to provide large interference-heating enhancement over the range of test conditions.

2.2 EXPERIMENTAL FACILITIES AND TEST CONDITIONS

2.2.1 Experimental Facilities

The experimental studies were conducted in Calspan's 48-Inch Shock Tunnel at Mach numbers of 12 to 16. The facility and its performance characteristics are described in Reference 7. The freestream conditions at which the current experimental program was conducted are plotted on the map of Mach number versus unit Reynolds number shown in Figure 4a. At Mach 12, the maximum Reynolds numbers were sufficiently large that the interactions generated transitional to turbulent shear layers. Completely laminar interactions were obtained under low Reynolds numbers at Mach numbers of 12 and 16.

The shock tunnel is basically a "blowdown tunnel" with a shock compression heater. The operation of the shock tunnel in the reflected-shock mode is shown with the aid of the wave diagram in Figure 4b. The tunnel is started by rupturing a double diaphragm, permitting high-pressure helium in the driver section to expand into the driven section. This generates a normal shock, which propagates through the low-pressure air. A region of high-temperature, high-pressure air is produced between this normal-shock front and the gas interface (often referred to as the contact surface) between the driver and driven gases. When the primary or incident shock strikes the end of the driven section, it is reflected, leaving a region of almost stationary, high-pressure, heated air. This air is then expanded through a nozzle to the desired freestream conditions in the test section.

The duration of the flow in the test section is controlled by the interactions between the reflected shock, the gas interface, and the leading expansion wave generated by the non-stationary expansion process occurring in the driver section. We normally control the initial conditions of the gases in the driver and driven sections so that the gas interface becomes transparent to the reflected shock interaction. This is known as operating under "tailored-interface" conditions. Under these conditions, the test time is controlled by the time taken for the driver/driven interface to reach the throat, or for the leading expansion wave to deplete the reservoir of pressure behind the reflected shock. The flow duration is, therefore, either driver-gas-limited or expansion-limited. Figure 4c shows the flow duration in the test section as a function of the Mach number of the incident shock. In the current program, we obtained flow durations of 6 to 10 milliseconds.

2.2.2 Evaluation Of Test Conditions

The stagnation and freestream test conditions were determined based on measurements of the incident-shock-wave speed, U_i, the initial temperature of the test gas (in the driven tube), T_1, the initial pressure of the test gas, p_1, and the pressure behind the reflected shock wave, p_0. We calculated the incident-shock-wave Mach number, $M_i = U_i/a_1$, where the speed of sound, a_1, is a function of p_1 and T_1. The freestream Mach number, M_∞, was determined from correlations of M_∞ with M_i and p_0. These correlations were based on previous airflow calibrations of the "D" nozzle used.

Freestream test conditions of pressure, temperature, Reynolds number, etc., were computed based on isentropic expansion of the test gas from the conditions behind the reflected shock wave to the freestream Mach number. Real gas effects were taken into account for this expansion under the justified assumption that the gas was in thermochemical equilibrium. In the freestream, the static temperature, T_∞, was sufficiently low that the ideal gas equation of state, $p_\infty = \varrho \overline{R} T_\infty$ was applicable, where $\overline{R}$ is the gas constant for the test gas.

The stagnation enthalpy, H_0, and temperature, T_0, of the gas behind the reflected shock wave (shown as region 4 in Figure 4b) were calculated from:

$$H_0 = (H_4/H_1)H_1 \text{ and } T_0 = (T_4/T_1)\ T_1 \tag{1}$$

where (H_4/H_1) and (T_4/T_1) are functions of U_i (or M_i) and p_1 and are given in Reference 8 for air. H_1 was obtained from Reference 9 for air, knowing p_1 and T_1.

The freestream static temperature was found from the energy equation, knowing H_0 and M_∞,

$$T_\infty = \frac{H_o}{c_p}\left(\frac{1}{1+\frac{(\gamma-1)}{2}M_\infty^2}\right) \tag{2}$$

where c_p = 6006 ft-lb/slug/R° and γ = 1.40.

The freestream static pressure was calculated from

$$p_\infty = \frac{p}{p_p}p_0\left(1+\frac{(\gamma-1)}{2}M_\infty^2\right)^{\left(\frac{-\gamma}{\gamma-1}\right)} \tag{3}$$

where

$$\frac{p}{p_p} = \frac{(p_\infty/p_0)_{REAL}}{(p_\infty/p_0)_{IDEAL}} \tag{4}$$

is the real gas correction to the ideal gas static-to-total pressure ratio as described in Reference 10. The sources for the real gas data used in this technique are References 11 and 12.

The freestream velocity was determined from

$$U_\infty = M_\infty a_\infty \tag{5}$$

where

$$a_\infty = \sqrt{\gamma \overline{R} T_\infty}\ , \tag{6}$$

the speed of sound.

The freestream dynamic pressure was found from

$$q_\infty = 1/2\gamma p_\infty M_\infty^2 \tag{7}$$

and the freestream density then was calculated from the ideal gas equation of state

$$\varrho_\infty = p_\infty/\overline{R}T_\infty \tag{8}$$

where $\overline{R}$ = 1717.91 ft-lb/slug/R° for air. Values of the absolute viscosity, μ, used to compute the freestream Reynolds number per foot were obtained using the technique described in Reference 8.

The test–section pitot pressure, p_0', was determined from q_∞ and the ratio (p_0'/q_∞). This ratio has been correlated as a function of M_∞ and H_0 for normal–shock waves in air in thermodynamic equilibrium.

For the test conditions at which our studies were conducted, the uncertainty in pitot–pressure measurements from errors in calibration and recording is ±2.5%. The reservoir pressure can be measured with an uncertainty of ±2.0%, and the total enthalpy (H_0) can be determined from the driven–tube pressure and the incident–shock Mach number with an uncertainty of ±1.5%. These measurements combine to yield an uncertainty in the Mach number and dynamic pressure measurements of ±0.8% and ±3.5%, respectively.

2.2.3 Smooth and Transpiration–Cooled Hemispherical Nosetips

The smooth hemispherical model shown in Figure 5 was used in an earlier study (Reference 13) and was recently modified for this program. A unique model coordinate system (Figure 6) was used in this program. The gages were all positioned on the surface of the hemisphere, on a plane containing a vertical diameter parallel to the freestream flow. Those above a horizontal radius were given the designation of $+\theta$; those below, $-\theta$. The smooth hemispherical model was instrumented with heat transfer gages in the stagnation region and along the ϕ = 0°, 180° plane (Figure 7), with the interaction region (azimuthal position, θ, between 22° and 40°) highly instrumented. Midway through the study, a 10° wedge was mounted behind the nosetip to pivot the highly instrumented region to an azimuthal position of 12° to 30° (Figure 8). Refer to Table 5 for tabular listings of gage positions for the smooth hemisphere. Figure 9 shows the experimental configuration used for both the smooth and transpiration–cooled nosetips.

The hemispherical transpiration–cooled model was developed previously and is described in Reference 14. The transpiration model (Figures 10 and 11) contains discrete circumferential slots. (The slots are also called pods in Reference 15.) The slots were machined in the model in the direction parallel to the axis of symmetry of the model. Thus, coolant flow exits the end of a slot in the direction parallel to the axis of the model and not normal to the model's surface. (All slots were machined to a nominal depth of 0.125 inch.) The slots are arranged in a spiral pattern to promote uniform coolant distribution as the transpired coolant spreads over the model surface. The length, width, and spacing of the slots vary with angular position, θ, on the surface. At all θ positions, all slots are 0.040 inch apart in the circumferential direction. (See Figure 12a.) The dimensions shown in Figure 12b are those at about θ = −21°. Coolant was fed to each slot through two or three sonic orifices (depending on slot length) at the base of the slot. The transpiration surface extends to θ = ±50.2° and is formed by discrete slots separated by distinct land (solid) areas. This type of surface is more complex to manufacture than sintered surfaces, such as used in the experiments reported by Kaattari (Reference 5). However, a slotted surface has the advantage of more precise coolant flow control through internal sonic orifices, and the availability of the land areas for placement of heat–flux instrumentation. Refer to Figure 13 for the instrumentation schematic diagram and to Table 6 for the tabular listings of gage positions for the transpiration–cooled hemisphere.

The model has eight independent concentric transpiration zones, and the helium coolant was applied from eight separately manifolded supply bottles mounted outside the tunnel. For the present experiments, the coolant mass flux was the same for each zone. Eight fast–acting valves were mounted directly behind the model, and the coolant flow was fully established before freestream tunnel flow reached the model; this required about 22 milliseconds. The pressures in the supply bottles were measured before the valves were open, and after the valves were closed when the bottles became equilibrated back to room temperature. This pressure drop in each bottle, of known volume, for a known time was used to calculate the

coolant flow rate. Helium–coolant mass flux (flow rate per unit area), $\varrho_c v_c$, was obtained by dividing the total coolant flow rate from all eight bottles by the total transpiration surface area (slot plus land areas). The transpiration surface area used was the area projected on a plane normal to the model centerline. Freestream mass flux is noted as $\varrho_\infty U_\infty$. The surface has an average porosity of 0.28 (ratio of total slot exit area to total projected surface area up to $\theta = \pm 50.2°$). Additional details of the model can be found in Reference 15.

2.2.4 Model–Support and Shock–Generator System

The model was sting mounted above the centerline to accommodate the 60–inch–long flat–plate shock generator. The model–support and shock–generator assembly was positioned to assure that the shock/shock–interference flowfield could be viewed through the schlieren windows of the shock tunnel's test section. For a majority of the studies, the shock generator had a 0.3125–inch–radius leading edge to raise the incident shock with respect to the shock generator and, thus, prevent trailing–edge expansion–fan interference in the region of interest on the hemisphere. Flat and 0.3750–inch–radius leading edges were also used. For all experiments with an incident shock, the shock generator was inclined at an angle of 10° to the freestream. The shock/shock–intersection point was adjusted by vertically moving either the model or the shock generator, or both.

2.2.5 Heat Transfer Instrumentation

The large heat transfer gradients generated in the interaction regions on the hemisphere can be significantly distorted by lateral heat conduction unless the heat transfer instrumentation is mounted on a surface of low thermal conductivity. Because our platinum thin–film gages are mounted on a Pyrex substrate, they are well suited for this application. However, with heating rates up to 500 Btu/ft²/sec, the rise in surface temperature during the shock tunnel's short run times can also lead to problems with data analysis and interpretation.

For the transpiration–cooled nosetip, the platinum films were deposited on a rectangular substrate. These gages were mounted at the midpoint of the land areas, centered between the slots and as close as possible to the plane $\phi = 0°, 180°$. These gages have a frequency response of 1 MHz and, therefore, can easily follow the instabilities occurring in shock/shock–interaction regions. Refer to Figure 13 and Table 6 for a diagram and a tabulation of gage positions.

The smooth hemispherical nosetip utilized both 0.125–inch–diameter button heat transfer gages and a Pyrex insert or "ladderstrip" that contained 44 gages with spacings of 0.040 and 0.020 inch. The use of a continuous, nonconducting surface in the region of peak heat transfer levels and gradients minimized lateral conduction effects. Refer to Figure 7 and Table 5 for a schematic diagram and a tabulation of gage positions.

Thin–film gages have been used extensively at Calspan and elsewhere to detect transition. The transient response of these gages is such that they can detect turbulent bursts that occur in transitional boundary layers and the unsteady nature of the heat transfer beneath turbulent boundary layers. Thus, this measurement technique provides an excellent method of determining the nature of the boundary layer at the attachment point of the jet on the hemispherical model.

The thin–film heat transfer gage is a resistance thermometer that reacts to the local surface temperature of the model. The first step of the data reduction was to convert the measured voltage time history for each gage to a temperature time history, taking into account the gage resistance, the current through the

gage, the gage calibration factor, and the amplifier gain. The theory of heat conduction was used to relate the surface temperature to the rate of heat transfer. The platinum resistance element has negligible heat capacity and, hence, negligible effect on the Pyrex–substrate surface temperature. The substrate can be characterized as being homogeneous and isotropic. Furthermore, because of the short duration of a shock tunnel test, the substrate can be treated as a semi–infinite body. The final data reduction was done using the Cook–Felderman (Reference 16) algorithm.

The Stanton number, C_h, based on the freestream conditions, was calculated from the following

$$C_h = \frac{\dot{q}}{\varrho_\infty U_\infty (H_0 - H_w)} \tag{9}$$

where H_w is the enthalpy at the measured wall temperature.

For the thin–film heat transfer instrumentation, the uncertainties associated with the gage calibration and the recording equipment are estimated to be ±5% for the levels of heating obtained in the current studies. The basic unsteady nature of some of the type III and type IV shock/shock interactions observed in earlier studies produced cyclic variations of typically up to ±15%. (See Reference 2.)

2.2.6 Pressure Instrumentation

We used flush–mounted pressure gages in the smooth–hemisphere studies to obtain measurements of the mean and fluctuating pressure levels through the interaction regions. High–frequency Kulite transducers (0.062 inch in diameter) were flush–mounted to the surface of the model in key areas of the flow. Their positions and gage numbers are shown in Figure 7 and Table 5. Pressure measurements were not made for the transpiration–cooled model.

The pressures were converted to absolute pressures (psia) by adding the measured initial vacuum pressure in the test section. The latter was the reference pressure for the transducers. The pressures were then averaged over an interval of time in which steady flow was established over the model, to obtain an average value for each case. The values of the pressure coefficients, C_p, were calculated from

$$C_p = p/(1/2\varrho_\infty U_\infty^2) \tag{10}$$

where p was the measured model pressure (psia).

The uncertainties in the pressure measurements associated with the calibration and recording apparatus are ±3%. Again, the variations associated with the unsteady nature of the fluid dynamics can be as large as ±15%.

2.2.7 Measurement Recording System

All data were recorded on the 128–channel Calspan Digital Data Acquisition System (DDAS II). The DDAS II system consists of 128 Marel Co. Model 117–22 amplifiers, an Analogic ANDS 5400 data acquisition and distribution system, and a Digital Equipment Corp. (DEC) PDP–11/73 computer. For the smooth hemispherical nosetip studies, a Sun SparcStation 2 computer was utilized. The Analogic system functions as a transient–event recorder in that it acquires, digitizes, and stores the data in real time. Immediately after each test run, the data were transferred to the DEC or Sun computer for processing and storage.

The Marel amplifiers provide gains up to 1000 for low-level signals, can be AC or DC coupled to the transducers, and have selectable low-pass filters with cutoff frequencies of 300, 1000, or 3000 Hz. The Analogic system contains a sample-and-hold amplifier, a 12-bit analog-to-digital converter, and a 4096-sample memory for each channel.

2.2.8 Flow Visualization

Flow visualization in these studies was accomplished via a standard off-axis, Z-type schlieren system, which uses 16-inch-diameter, f/7.5 schlieren-grade spherical mirrors as schileren heads. A horizontal source-slit/knife-edge combination provides sensitivity in the vertical plane of 5 arc seconds, with test-section resolution better than 0.005 inch. A 1.5-microsecond FWHM (full-width, half-maximum) light pulse was generated from a high-voltage spark in air, triggered close to the end of the steady run time. The image was recorded on Kodak Tri-X panchromatic film.

Section 3
RESULTS AND DISCUSSION

3.1 INTRODUCTION

The basic objective of this program was to investigate the application of transpiration cooling to alleviate the large heating loads generated by shock/shock interaction on a leading edge. The experimental program was conducted in two basic research efforts, each of which constitutes a definitive set of studies. In the first investigation, we studied the aerothermal loads generated in regions of shock interaction over a highly instrumented smooth 12-inch-diameter hemispherical nosetip. In these studies, we placed the emphasis on measurements in type III and type IV interaction regions for a range of freestream Reynolds numbers and Mach numbers to investigate both laminar and turbulent interaction regions.

In the studies of transpiration-cooling effects on the flow structure and heating in shock/shock interaction over a 12-inch-diameter transpiration-cooled hemisphere, we first measured the effects of the intrinsic surface roughness caused by the cooling slots in the model surface on the heating to the basic hemispherical configuration. Measurements of the heat transfer distribution in type III and type IV interactions were made for a range of blowing rates up to those where large instabilities were observed in the major flowfield in earlier studies (Reference 14). Again, the measurements were made for a range of freestream Reynolds numbers and Mach numbers for which the interaction regions, in the absence of mass addition, were laminar and turbulent.

In the following text, we discuss first the measurements that were made on both the smooth and transpiration-cooled models in the absence of shock/shock interaction, performed to establish baseline results. Then, we describe the shock/shock interaction studies on the smooth configuration, emphasizing transition effects on the heating in type III and type IV interactions. The results of the transpiration-cooled studies are then presented, and we discuss how blowing influences the structure of the flowfield and the magnitude and distribution of the heating.

3.2 MEASUREMENTS ON THE SMOOTH AND TRANSPIRATION-COOLED HEMISPHERES WITHOUT SHOCK/SHOCK INTERACTION

3.2.1 Smooth-Wall Measurements

Measurements of the distribution of pressure and heat transfer were obtained on the smooth hemisphere at each of the test conditions at which the transpiration-cooled studies were conducted. The measured distributions of heat transfer are compared with the theories of Fay and Riddell (Reference 17) and Kemp, Rose, and Detra (Reference 18) in Figures 14a and 14b for each of the Mach numbers and Reynolds numbers at which the transpiration-cooled studies were conducted. Tabulations of the model configurations and the test conditions at which the studies were conducted are presented in Table 1 and Table 2, respectively. In general, the measurements are in good agreement with the theories, with the measured stagnation value being slightly higher than the Fay-Riddell value at the higher Reynolds numbers, as has been observed in earlier studies (Reference 13). The correlations of the pressure measurements shown in Figure 15 are well represented by a Newtonian distribution.

3.2.2 Measurements on the Transpiration-Cooled Model

The measurements on the non-blowing transpiration-cooled nosetip demonstrated, as we had observed in earlier studies (Reference 14) under different freestream conditions, that the intrinsic roughness of the surface causes a heating enhancement that is greatest at the largest Reynolds numbers. Figure 16 shows the heat transfer rate distributions around the smooth and rough hemispheres for a range of freestream Reynolds numbers. We observe that the heating levels on the transpiration-cooled model are greater than those on the smooth configuration, and that the difference increases with increased Reynolds number as the thickness of the boundary layer decreases, and as the ratio of slot width to boundary layer thickness increases.

The effects of the blowing on the distribution of heat transfer over the transpiration-cooled hemisphere are shown in Figures 17 and 18. As we have observed earlier on these configurations for the lower blowing rates, the heat transfer rate for the stagnation region is increased when the blowing trips the boundary layer. Downstream on the main body of the hemisphere, the heating is significantly reduced by blowing, and the heating, both in and downstream of the stagnation regions, is reduced rapidly with increased blowing, as shown in Figure 17. Tabulations of the model configurations and test conditions are presented in Table 3 and Table 4, respectively.

3.3 STUDIES OF SHOCK/SHOCK INTERACTION ON A SMOOTH HEMISPHERICAL NOSETIP

3.3.1 Introduction

This series of studies was designed to provide not only a reference against which to compare measurements on the transpiration-cooled nosetip but also a set of high-quality, high-resolution measurements for code validation. In this investigation, we obtained sets of measurements for a range of positions of the incident-shock impingement point to define the distribution of heating and the locus of the maximum heating points for each of the test conditions that were selected for the transpiration-cooling study. Here, we obtained a series of shear layer conditions that provided a detailed set of surface measurements for fully laminar and turbulent interaction regions. These data, along with schlieren photographs, provide information necessary for code evaluation. The model configurations and test conditions for these series of studies are listed in Tables 1 and 2.

3.3.2 Reynolds Number and Mach Number Effects on Shock/Shock Interaction on a Smooth Hemisphere

The measurements to examine shock/shock interaction on a smooth 12-inch-diameter hemisphere were conducted for freestream conditions similar to those selected for studies with the transpiration-cooled model. At each of these conditions, measurements of the distributions of heat transfer and pressure were made for a range of positions of the incident shock to generate a series of distributions from which to construct the magnitude and location of the point of peak heating. Here, we concentrated principally on generating type III and type IV interactions, because they create the largest heating loads. In Figures 19 through 23, we have presented distributions representative of the measurements obtained. The measurements at Mach 12 for a range of Reynolds numbers are presented in Figures 19 through 21 in order of increasing Reynolds number. At the lowest Reynolds number (TC 3), the shear layers for both type III and type IV interactions remained laminar, as verified by heat transfer measurements in the

interaction region. The type IV interaction, shown in Figure 19a, has a peak heating ratio of 20 and occurs close to 26° below the model axis. As the interaction is moved downward, the heating decreases until, for angles of 35° and below, the interaction changes to a type III, as shown in Figure 19b. The locus for peak-heating points for test condition 3, shown in Figure 19c, illustrates that the maximum peak heating occurs between 20° and 25°. A similar set of measurements at a larger Reynolds number (TC 1) is shown in Figure 20 (a through c). For the type IV interaction (shown in Figure 20a), it is clear that the peak-heating ratio is increasing with Reynolds number, and we observe a rapid decrease in heating when the interaction is moved in either direction away from the 20° to 23° region. As the interaction moves downward, it changes to a type III interaction with peak heating ratios of 14 (Figure 20b). The locus of peak-heating points for test condition 1 is shown in Figure 20c. At the largest Reynolds number (TC 2), where we believe the shear layers were turbulent, based on heat transfer data, the measurements presented in Figure 21 (a through c) show an interesting change. In addition to a significantly increased peak-heating ratio (>30), the angle at which the peak heating occurs is now slightly below 30°. When the interaction changes from type IV (Figure 21a) to type III (Figure 21b), as the interaction is moved below 37°, the peak-heating ratio (20) is 60% greater than the measurements at the lower Reynolds numbers, as can be seen by comparing Figure 20b with Figure 21b. This is also true at lower angles, as illustrated in Figure 22, where the measurements from the three sets of test conditions are plotted together. Plotting the peak-heating measurements for type III and type IV interactions in terms of the shear layer Reynolds number (defined in Reference 3), as shown in Figure 23, it can be seen that there is a Reynolds number variation that suggests transition in the shear layer influences both type III and type IV interactions. While it is clear that turbulent reattachment heating ratios should be greater than the laminar ratios for type III flows, it is not clear whether transitional type IV interactions have large ratios because of turbulence enhancement in the jet stagnation region or because a more efficient compression process takes place in the jet at the larger Reynolds numbers.

Examples of measurements made at Mach 14 and 16 in the studies for the smooth configuration are shown in Figure 24 (a through d) and Figure 25 (a through c). Both sets of measurements are believed to reflect fully laminar conditions, and they exhibit trends similar to those found in the "laminar" Mach 12 measurements. However, there appears to be a trend that the heating-ratio increases with Mach number, as suggested by the predictions of Edney (Reference 1). As we found earlier for fully laminar and turbulent type III interactions, the Morris and Keyes (Reference 19) empirical analysis tend to underpredict the measurements of peak heating, while the peak-heating predictions are in reasonable agreement with the measurements for a type IV interaction if a region 8 compression is assumed. Tabulations of the predictions of peak heating using the Morris and Keyes computational model (Reference 19) are presented in Tables 7 and 8 for the "smooth" and the "transpiration-cooled" studies, respectively.

3.4 STUDIES OF THE EFFECTS OF TRANSPIRATION COOLING ON THE HEAT TRANSFER IN SHOCK/SHOCK-INTERACTION REGIONS

3.4.1 Introduction

This segment of the experimental program was embarked upon to assess the effectiveness of transpiration cooling in reducing the large heat transfer loads generated in regions of shock/shock interaction. While a cylindrical configuration is more representative of the practical problems on the cowl lip, it proved more expedient to employ the existing transpiration-cooled hemisphere (Reference 14) in this initial investigation. When the results of some of this research were first presented (Reference 6), we did not

have a comparable set of measurements on a smooth non-blowing spherical configuration. We were, therefore, unable to assess the effects of the intrinsic roughness of the transpiration-cooled model. Thus, we first compare the measurements on the smooth and rough hemispherical models used in this study. The effects of blowing on the distribution of heat transfer on the transpiration-cooled model in the presence of shock/shock interaction are presented first by showing the effects of blowing with fixed incident shock geometry, and then by presenting measurements for a fixed blowing rate with a variation in position of the incident shock. Both sets of measurements are combined to demonstrate that (i) surface roughness has little effect on the peak heating, and (ii) surface blowing has little effect on reducing the peak heating levels in type III and type IV interaction regions.

3.4.2 Studies on the Transpiration-Cooled Model Without Blowing

This set of measurements was made to provide the base against which to evaluate the effectiveness of transpiration cooling. Also, by comparing these measurements with the equivalent set on the smooth model (Figures 20a through 20c), the effects of the intrinsic roughness of the model on interaction heating can be determined. Examples of the distribution of heating on the transpiration model with blowing are shown in Figures 26a through 26f. When the interaction is placed close to the axis of the hemisphere (Figure 26a), there is relatively little enhancement. However, as observed on the smooth hemisphere (Figure 20a), heating-enhancement factors of close to 20 are generated (Figure 26b) when the type IV jet is incident close to 20° from the axis of the model. In slight contrast, the rough-wall heating-enhancement ratio remains relatively high until the impingement point drops below 40°. Possibly, the surface roughness has induced transition on the model's surface. The broad locus of the peak-heating values between 20° and 30° from the model axis is similar in shape to the measurements at test condition 3, shown in Figure 22, where we believe the shear layers to have been turbulent. Comparing the sets of measurements shown in Figure 20c with those in Figure 26f in Figure 27, it is clear that the peak heating for type IV interaction is relatively uninfluenced by surface roughness, while heating-enhancement factors for the type III interaction are increased by roughness, possibly as a result of transition.

3.4.3 Studies of Surface Blowing Effects on Shock/Shock-Interaction Heating

The effects of surface blowing on interaction heating are demonstrated first by presenting sets of measurements for a range of blowing rates with a fixed shock-generator geometry. We then present the measurements obtained at a fixed blowing rate for a range of model geometries.

Positioning the interaction at 20° below the axis of the model without blowing, we see in Figures 28a through 28f that the effect of blowing is basically to move the interaction downward from the model axis—an effect that results from the displacement of the bow shock away from the hemisphere in response to an increased volume of gas in the shock layer. As was observed in the zero-blowing studies, the impingement heating does not decrease appreciably until the interaction drops 40° below the axis, as illustrated in Figures 28e and 28f. If the interaction is positioned on the axis of the model without blowing, the effect of blowing is still to move the interaction downward, as illustrated in Figures 29a through 29e. Comparing the measurements in Figures 26, 28, and 29, it can be seen that the peak heating for the type IV interaction is not significantly reduced by surface blowing; however, there is a small reduction for the type III interaction, which is well below the centerline. It is noted here that, for values of the blowing-rate parameter (λ) close to or greater than 0.3, the shock layer is unsteady, and it is difficult to select a representative distribution of heating.

In Figures 30 (a through d) and 31 (a through e), we illustrate the effects of a variation in the position of the incident shock for a constant value of blowing. In Figures 30a through 30c, the blowing parameter is $\lambda = 0.2$ and the interaction is moved downward, placing it at 10°, 20°, and 30° below the model axis, respectively. As the interaction is moved downward to 20°, the enhancement ratio rises from 10 to 20, a value close to that for the no-blowing case. The enhancement ratio falls as the interaction is lowered to 30°, again a value little different than the no-blowing value on the transpiration-cooled nosetip. These measurements are plotted together in Figure 30d. Finally, we show the measurements for the blowing parameter $\lambda = 0.3$ and note again that, at this level of blowing, the shear layer is unstable, even in absence of the interaction, as observed in Reference 14. As the interaction is moved from close to the axis to the 20° point, the enhancement ratio increases to approximately 18, a 10% decrease from the no-blowing ratio. Similarly, when the interaction is moved down to just above 40°, an enhancement factor of 12 is approximately 85% of the value in the absence of blowing. These measurements are plotted together with those for the other blowing rates in Figure 32, which again emphasizes that neither the magnitude nor the shape of the locus of the heating-enhancement factor is significantly influenced by transpiration cooling.

Section 4
CONCLUSIONS

Experimental studies have been conducted to investigate the use of transpiration cooling to reduce the peak-heating loads in regions of shock/shock interaction. The experimental studies were conducted in the Calspan 48-Inch Shock Tunnel at Mach numbers of 12 to 16 for a range of unit Reynolds numbers from 10^4 to 10^6. Smooth and transpiration-cooled hemispherical nosetip models, 12 inches in diameter, were used in the experimental studies, which focused on defining the heat transfer and pressure distributions in type III and type IV interaction regions. The studies of shock/shock interaction on the smooth configuration demonstrated that transition in the shear layers of both the type III and the type IV interactions caused an increase in the peak-heating levels. While the rough surface of the transpiration-cooled nosetip caused enhanced heating in the absence of shock/shock interaction, the peak-heating rates in the interaction region on the uncooled nosetip were not increased by the slotted nature of the surface. Transpiration cooling was found to significantly increase the size of the shock layer and to move the peak-heating point around the body. A transpiration-cooling rate of over 30 percent of the freestream maximum flux did not reduce the peak-heating level more than 10 percent, however the integrated heating loads were reduced.

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Table 1
SUMMARY OF SMOOTH HEMISPHERE STUDY

RUN	TC†	Mach	Re/ft	S.G. CONFIGURATION Lip Rad. (inches)	A* (inches)	B* (inches)
3	1	12.1	3.8E+05	-	-	-
4	3	11.9	1.9E+05	-	-	-
5	5	14.8	5.4E+04	-	-	-
8	1	12.2	3.7E+05	5/16	9.953	3.359
9	1	12.1	3.8E+05	5/16	10.688	3.375
10	1	12.1	3.8E+05	5/16	10.343	3.375
13	3	11.9	2.0E+05	5/16	10.484	3.390
14	3	12.0	2.2E+05	5/16	10.765	3.399
15	3	11.9	2.0E+05	5/16	9.921	3.389
16	5	14.6	4.7E+04	5/16	8.718	3.637
17	5	14.6	4.7E+04	5/16	8.312	3.590
18	5	14.6	4.6E+04	5/16	7.765	3.417
26	5	14.6	4.0E+04	5/16	6.437	3.264
28	3	11.9	2.0E+05	5/16	8.368	3.193
29	1	12.1	3.9E+05	5/16	8.368	3.193
30	2	12.5	1.6E+06	5/16	8.368	3.193
31	2	12.6	1.5E+06	5/16	8.220	3.133
33	2	12.6	1.6E+06	5/16	8.947	3.187
34	2	12.6	1.6E+06	5/16	8.593	3.184
35	4	16.3	4.9E+05	5/16	7.906	3.411
36	4	16.2	4.9E+05	5/16	7.368	3.409
37	4	16.3	4.9E+05	5/16	6.922	3.266
38	1	12.1	3.7E+05	5/16	7.389	3.374
39	1	12.1	3.6E+05	5/16	8.168	3.418
43	2	12.5	1.4E+06	5/16	8.761	3.402
44	2	12.5	1.5E+06	5/16	8.480	3.431
45	2	12.5	1.5E+06	5/16	8.052	3.404
49	2	12.5	1.4E+06	-	-	-
50	4	16.2	4.3E+05	-	-	-
53	2	12.5	1.4E+06	-	-	-

†Test Conditions (Tcs) (Re/M_∞ Pairings) Are Shown In Figure 4a.
*Refer to Figure 9.

Table 2
SUMMARY OF TEST CONDITIONS FOR SMOOTH HEMISPHERE STUDY

RUN	M_I	p_o	H_o	T_o	M_∞	U_∞	T_∞	p_∞	q_∞	ϱ_∞	μ_∞	Re/ft	p_o'	$\dot{q}_{o_{FR}}$	T_w
3	2.962	715.8	1.488E+07	2287.4	12.127	5372.2	78.85	4.302E-03	4.433E-01	4.423E-06	6.3E-08	3.794E+05	0.8289	5.810	527.8
4	2.978	350.0	1.514E+07	2312.8	11.929	5414.9	82.79	2.325E-03	2.318E-01	2.277E-06	6.6E-08	1.877E+05	0.4336	4.294	529.3
5	3.596	312.6	2.042E+07	3083.3	14.746	6325.9	73.94	4.536E-04	6.912E-02	4.974E-07	5.9E-08	5.351E+04	0.1293	3.478	525.2
8	2.847	641.4	1.411E+07	2164.7	12.150	5231.6	74.49	3.840E-03	3.972E-01	4.179E-06	5.9E-08	3.692E+05	0.7428	5.105	530.1
9	2.939	701.4	1.471E+07	2261.7	12.132	5340.3	77.85	4.212E-03	4.344E-01	4.387E-06	6.2E-08	3.788E+05	0.8124	5.658	527.9
10	2.917	699.1	1.454E+07	2236.9	12.142	5310.7	76.85	4.183E-03	4.322E-01	4.413E-06	6.1E-08	3.838E+05	0.8082	5.557	528.2
13	3.039	380.1	1.556E+07	2380.5	11.912	5489.4	85.32	2.534E-03	2.520E-01	2.408E-06	6.8E-08	1.953E+05	0.4712	4.650	528.0
14	2.947	381.1	1.460E+07	2261.9	11.963	5318.0	79.40	2.502E-03	2.509E-01	2.555E-06	6.3E-08	2.155E+05	0.4693	4.263	525.7
15	3.031	377.3	1.536E+07	2363.7	11.915	5453.7	84.17	2.518E-03	2.505E-01	2.426E-06	6.7E-08	1.981E+05	0.4685	4.561	526.4
16	3.810	330.8	2.278E+07	3395.4	14.637	6680.9	83.71	4.867E-04	7.305E-02	4.714E-07	6.6E-08	4.742E+04	0.1366	4.097	526.8
17	3.843	333.0	2.314E+07	3444.3	14.616	6733.5	85.27	4.919E-04	7.363E-02	4.677E-07	6.8E-08	4.656E+04	0.1377	4.194	526.9
18	3.808	331.0	2.318E+07	3413.7	14.639	6738.3	85.12	4.833E-04	7.258E-02	4.604E-07	6.8E-08	4.594E+04	0.1357	4.165	530.1
26	3.903	332.1	2.509E+07	3599.4	14.555	7010.6	93.20	4.891E-04	7.262E-02	4.255E-07	7.4E-08	4.040E+04	0.1358	4.581	536.7
28	3.025	379.8	1.519E+07	2349.8	11.920	5424.5	83.20	2.534E-03	2.523E-01	2.469E-06	6.6E-08	2.029E+05	0.4717	4.514	525.1
29	2.954	708.5	1.452E+07	2262.0	12.127	5306.6	76.92	4.277E-03	4.408E-01	4.508E-06	6.1E-08	3.914E+05	0.8244	5.618	524.0
30	3.300	4401.0	1.835E+07	2720.1	12.543	5971.5	91.06	2.123E-02	2.340E+00	1.890E-05	7.2E-08	1.564E+06	4.3770	17.560	531.0
31	3.251	4139.0	1.788E+07	2656.5	12.557	5894.5	88.53	1.993E-02	2.202E+00	1.825E-05	7.0E-08	1.533E+06	4.1180	16.470	531.0
33	3.204	4292.0	1.792E+07	2622.0	12.599	5901.6	88.14	2.022E-02	2.249E+00	1.860E-05	7.0E-08	1.570E+06	4.2060	16.640	536.0
34	3.226	4237.0	1.744E+07	2614.3	12.581	5821.5	86.03	2.032E-02	2.254E+00	1.915E-05	6.8E-08	1.634E+06	4.2150	16.150	528.8
35	3.616	3950.0	2.151E+07	3151.6	16.269	6506.2	64.25	3.034E-03	5.627E-01	3.828E-06	5.1E-08	4.861E+05	1.0520	10.550	532.0
36	3.748	4192.0	2.244E+07	3315.0	16.174	6643.8	67.79	3.305E-03	6.059E-01	3.953E-06	5.4E-08	4.863E+05	1.1330	11.560	528.2
37	3.606	3928.0	2.144E+07	3137.7	16.275	6494.8	63.98	3.012E-03	5.591E-01	3.817E-06	5.1E-08	4.859E+05	1.0460	10.470	532.0
38	2.949	708.2	1.497E+07	2282.7	12.130	5387.8	79.26	4.242E-03	4.374E-01	4.339E-06	6.3E-08	3.714E+05	0.8179	5.807	530.2
39	2.969	712.5	1.531E+07	2315.7	12.121	5448.1	81.17	4.269E-03	4.395E-01	4.264E-06	6.4E-08	3.605E+05	0.8219	5.992	532.2
43	3.245	3944.0	1.801E+07	2658.6	12.545	5915.5	89.33	1.903E-02	2.099E+00	1.727E-05	7.1E-08	1.443E+06	3.9240	16.210	532.9
44	3.288	4223.0	1.814E+07	2699.6	12.538	5936.7	90.08	2.047E-02	2.255E+00	1.843E-05	7.1E-08	1.532E+06	4.2170	16.990	530.0
45	3.312	4200.0	1.857E+07	2740.7	12.519	6006.1	92.47	2.040E-02	2.241E+00	1.789E-05	7.3E-08	1.467E+06	4.1900	17.440	532.0
49	3.284	4248.0	1.889E+07	2734.1	12.543	6058.6	93.74	2.026E-02	2.234E+00	1.753E-05	7.4E-08	1.430E+06	4.1780	17.750	538.0
50	3.743	3985.0	2.335E+07	3357.0	16.157	6778.2	70.71	3.108E-03	5.685E-01	3.563E-06	5.6E-08	4.292E+05	1.0630	11.730	536.0
53	3.293	4305.0	1.950E+07	2772.5	12.540	6155.7	96.81	2.035E-02	2.243E+00	1.705E-05	7.7E-08	1.369E+06	4.1940	18.480	543.0

Test Condition Parameter Descriptions

M_I	=	Shock Tube Incident Shock Mach Number	-
p_o	=	Reservoir Total Pressure	psia
H_o	=	Reservoir Total Enthalpy	$(ft/sec)^2$
T_o	=	Reservoir Total Temperature	°R
M_∞	=	Freestream Mach Number	-
U_∞	=	Freestream Velocity	ft/sec
T_∞	=	Freestream Temperature	°R
p_∞	=	Freestream Static Pressure	psia
q_∞	=	Dynamic Pressure ($\varrho U^2/288$)	psia
ϱ_∞	=	Freestream Density	slugs/ft³
μ_∞	=	Freestream Viscosity	slugs/ft/sec
Re/ft	=	Freestream Reynolds Number	1/ft
p_o'	=	Pitot Pressure	psia
$\dot{q}_{o_{FR}}$	=	Fay-Riddell Heat Transfer	Btu/ft²/sec
T_w	=	Initial Model Surface Temperature	°R

Table 3
SUMMARY OF TRANSPIRATION-COOLED HEMISPHERE STUDY

RUN	TC†	Mach	Re/ft	λ	S.G. CONFIGURATION		
					Lip Rad. (inches)	A* (inches)	B* (inches)
4	1	12.1	3.3E+05	0.07	-	-	-
5	1	12.1	3.2E+05	0	-	-	-
6	1	12.1	3.3E+05	0.08	-	-	-
7	1	12.1	3.3E+05	0.12	-	-	-
9	1	12.1	3.3E+05	0.16	-	-	-
10	1	12.1	3.1E+05	0.15	-	-	-
13	2	12.6	1.5E+06	0	-	-	-
14	2	12.6	1.5E+06	0.06	-	-	-
15	2	12.6	1.3E+06	0.06	-	-	-
16	1	12.1	3.2E+05	0	flat	11.860	3.121
17	1	12.1	3.1E+05	0	flat	10.360	3.121
18	1	12.1	3.3E+05	0	flat	9.375	3.295
19	1	12.1	3.1E+05	0	3/8	9.375	3.295
20	1	12.1	3.2E+05	0.12	flat	9.375	3.295
21	1	12.1	3.0E+05	0.17	flat	9.375	3.295
22	1	12.1	3.1E+05	0	5/16	9.375	3.295
23	1	12.1	3.1E+05	0	5/16	9.875	3.295
24	1	12.1	3.0E+05	0	5/16	10.375	3.295
25	1	12.1	3.1E+05	0	5/16	10.875	3.295
27	1	12.1	3.4E+05	0.15	5/16	9.375	3.295
28	1	12.1	3.4E+05	0.20	5/16	9.375	3.295
29	1	12.1	3.4E+05	0.26	5/16	9.375	3.295
30	1	12.1	3.5E+05	0.31	5/16	9.375	3.295
31	1	12.2	3.6E+05	0	5/16	9.575	3.295
33	1	12.2	3.6E+05	0.19	5/16	9.128	3.338
34	1	12.1	3.5E+05	0.31	5/16	9.128	3.338
35	1	12.2	3.5E+05	0.36	5/16	9.128	3.338
36	1	12.2	3.6E+05	0	5/16	9.128	3.338
37	1	12.2	3.5E+05	0	5/16	9.728	3.338
38	1	12.2	3.6E+05	0	5/16	11.428	3.338
39	1	12.2	3.5E+05	0	5/16	8.636	3.425
40	1	12.2	3.4E+05	0	5/16	8.636	3.425
41	1	12.2	3.3E+05	0.20	5/16	8.636	3.425
42	1	12.2	3.5E+05	0.31	5/16	8.636	3.425
43	1	12.2	3.5E+05	0.36	5/16	8.636	3.425
44	1	12.2	3.3E+05	0	5/16	8.143	3.512
45	1	12.2	3.2E+05	0.20	5/16	8.143	3.512
46	1	12.2	3.4E+05	0.32	5/16	8.143	3.512
47	2	12.6	1.3E+06	0	5/16	9.728	3.338
48	2	12.6	1.3E+06	0.06	5/16	9.728	3.338
49	3	12.2	2.0E+05	0	5/16	10.428	3.338
50	3	12.1	2.1E+05	0	5/16	9.128	3.338
51	3	12.1	2.0E+05	0.20	5/16	9.128	3.338
52	3	12.2	2.1E+05	0.24	5/16	9.128	3.338
53	3	12.2	2.2E+05	0	5/16	10.028	3.338
54	1	12.1	3.2E+05	0	5/16	9.128	3.338
55	1	12.1	3.3E+05	0.39	5/16	9.128	3.338
56	1	12.1	3.4E+05	0.30	5/16	8.636	3.425
57	1	12.1	3.4E+05	0.34	5/16	8.636	3.425
58	1	12.2	3.5E+05	0.28	5/16	8.143	3.512
60	4	16.1	3.2E+05	0	5/16	8.743	3.512
61	5	15.3	6.3E+04	0	5/16	8.743	3.512
62	1	12.1	3.1E+05	0	-	-	-

†Test Conditions (Tcs) (Re/M_∞ Pairings) Are Shown In Figure 4a.
*Refer to Figure 9.

Table 4
SUMMARY OF TEST CONDITIONS FOR TRANSPIRATION-COOLED HEMISPHERE STUDY

RUN	M_i	p_o	H_o	T_o	M_∞	U_∞	T_∞	p_∞	q_∞	ϱ_∞	μ_∞	Re/ft	p_o'	$\dot{q}_{o_{FR}}$	T_w
4	2.941	730.5	1.565E+07	2313	12.14	5509	82.67	4.300E-03	4.444E-01	4.2E-06	7.0E-08	3.341E+05	0.8311	6.178	539.5
5	2.961	727.2	1.609E+07	2351	12.13	5587	85.19	4.282E-03	4.417E-01	4.1E-06	7.2E-08	3.177E+05	0.8259	6.381	542.6
6	2.962	740.4	1.577E+07	2335	12.14	5530	83.41	4.368E-03	4.509E-01	4.2E-06	7.0E-08	3.347E+05	0.8433	6.291	538.7
7	2.975	740.1	1.598E+07	2356	12.13	5567	84.63	4.370E-03	4.506E-01	4.2E-06	7.1E-08	3.275E+05	0.8427	6.397	539.8
9	2.929	707.8	1.544E+07	2294	12.14	5472	81.63	4.187E-03	4.324E-01	4.2E-06	6.9E-08	3.315E+05	0.8087	5.989	538.2
10	2.956	693.1	1.583E+07	2334	12.12	5540	83.97	4.123E-03	4.244E-01	4.0E-06	7.1E-08	3.123E+05	0.7936	6.129	540.0
13	3.037	3689.0	1.611E+07	2401	12.65	5597	78.68	1.735E-02	1.945E+00	1.8E-05	6.6E-08	1.513E+06	3.6380	13.470	533.3
14	3.099	4029.0	1.711E+07	2500	12.64	5768	83.60	1.873E-02	2.099E+00	1.8E-05	7.0E-08	1.490E+06	3.9250	15.120	538.1
15	3.234	4020.0	1.849E+07	2674	12.56	5994	91.52	1.910E-02	2.111E+00	1.7E-05	7.7E-08	1.317E+06	3.9480	16.770	538.9
16	3.012	747.7	1.633E+07	2401	12.11	5627	86.68	4.435E-03	4.561E-01	4.1E-06	7.3E-08	3.201E+05	0.8529	6.625	539.9
17	2.998	740.5	1.638E+07	2393	12.12	5635	86.89	4.377E-03	4.504E-01	4.1E-06	7.3E-08	3.149E+05	0.8423	6.602	542.0
18	2.947	686.1	1.530E+07	2299	12.12	5446	81.12	4.109E-03	4.230E-01	4.1E-06	6.8E-08	3.278E+05	0.7911	5.865	534.5
19	2.998	686.5	1.594E+07	2370	12.09	5559	84.89	4.135E-03	4.238E-01	3.9E-06	7.1E-08	3.074E+05	0.7925	6.194	536.9
20	2.961	715.8	1.592E+07	2342	12.13	5555	84.31	4.237E-03	4.366E-01	4.1E-06	7.1E-08	3.192E+05	0.8165	6.262	540.5
21	2.998	718.6	1.651E+07	2400	12.11	5658	87.71	4.261E-03	4.377E-01	3.9E-06	7.4E-08	3.020E+05	0.8186	6.571	543.5
22	3.016	727.5	1.625E+07	2400	12.10	5613	86.42	4.345E-03	4.460E-01	4.1E-06	7.3E-08	3.148E+05	0.8340	6.514	538.6
23	3.004	727.1	1.631E+07	2394	12.11	5623	86.64	4.324E-03	4.443E-01	4.0E-06	7.3E-08	3.122E+05	0.8308	6.525	540.5
24	3.047	751.4	1.689E+07	2456	12.09	5722	89.91	4.466E-03	4.578E-01	4.0E-06	7.6E-08	3.046E+05	0.8561	6.930	542.6
25	3.020	753.1	1.681E+07	2432	12.11	5709	89.28	4.441E-03	4.565E-01	4.0E-06	7.5E-08	3.066E+05	0.8537	6.869	544.6
27	3.023	770.8	1.609E+07	2397	12.12	5586	85.38	4.580E-03	4.713E-01	4.4E-06	7.2E-08	3.383E+05	0.8813	6.619	536.0
28	2.953	738.5	1.548E+07	2313	12.14	5479	81.81	4.366E-03	4.510E-01	4.3E-06	6.9E-08	3.445E+05	0.8434	6.147	536.1
29	2.964	750.1	1.561E+07	2328	12.14	5503	82.53	4.428E-03	4.574E-01	4.4E-06	6.9E-08	3.448E+05	0.8554	6.258	536.6
30	2.966	759.0	1.569E+07	2333	12.14	5515	82.87	4.471E-03	4.620E-01	4.4E-06	7.0E-08	3.461E+05	0.8639	6.330	537.2
31	2.931	754.1	1.517E+07	2281	12.16	5424	79.93	4.435E-03	4.595E-01	4.5E-06	6.7E-08	3.630E+05	0.8593	6.043	534.6
33	2.956	783.8	1.560E+07	2321	12.16	5500	82.19	4.584E-03	4.749E-01	4.5E-06	6.9E-08	3.598E+05	0.8882	6.369	537.2
34	2.990	790.2	1.604E+07	2370	12.14	5577	84.72	4.632E-03	4.787E-01	4.4E-06	7.1E-08	3.469E+05	0.8953	6.631	538.8
35	2.987	806.3	1.610E+07	2371	12.15	5588	84.95	4.702E-03	4.866E-01	4.5E-06	7.1E-08	3.509E+05	0.9099	6.708	539.9
36	2.951	782.6	1.564E+07	2320	12.16	5508	82.40	4.568E-03	4.735E-01	4.5E-06	6.9E-08	3.572E+05	0.8855	6.377	538.3
37	2.975	797.5	1.600E+07	2356	12.16	5570	84.35	4.649E-03	4.813E-01	4.5E-06	7.1E-08	3.507E+05	0.9001	6.622	540.0
38	2.951	798.7	1.583E+07	2330	12.17	5541	83.30	4.633E-03	4.807E-01	4.5E-06	7.0E-08	3.566E+05	0.8990	6.521	540.6
39	2.908	756.0	1.548E+07	2280	12.17	5480	81.42	4.395E-03	4.563E-01	4.4E-06	6.8E-08	3.502E+05	0.8533	6.163	541.0
40	2.920	751.8	1.582E+07	2307	12.16	5539	83.30	4.368E-03	4.529E-01	4.3E-06	7.0E-08	3.361E+05	0.8470	6.311	543.8
41	2.922	764.3	1.608E+07	2322	12.17	5585	84.62	4.414E-03	4.580E-01	4.2E-06	7.1E-08	3.318E+05	0.8565	6.475	546.7
42	2.943	781.4	1.592E+07	2329	12.16	5557	83.84	4.534E-03	4.702E-01	4.4E-06	7.1E-08	3.455E+05	0.8793	6.491	542.5
43	2.931	778.0	1.589E+07	2318	12.17	5551	83.58	4.504E-03	4.674E-01	4.4E-06	7.0E-08	3.450E+05	0.8741	6.451	543.4
44	2.909	739.8	1.595E+07	2305	12.16	5561	83.97	4.288E-03	4.446E-01	4.1E-06	7.1E-08	3.260E+05	0.8315	6.311	546.6
45	2.945	774.7	1.647E+07	2358	12.16	5651	86.74	4.467E-03	4.630E-01	4.2E-06	7.3E-08	3.233E+05	0.8658	6.714	548.8
46	2.890	777.6	1.598E+07	2293	12.19	5567	83.79	4.445E-03	4.628E-01	4.3E-06	7.0E-08	3.397E+05	0.8656	6.445	549.0
47	3.208	4157.0	1.861E+07	2660	12.59	6014	91.72	1.945E-02	2.159E+00	1.7E-05	7.7E-08	1.340E+06	4.0370	17.070	542.7
48	3.260	4222.0	1.953E+07	2747	12.56	6161	96.73	1.975E-02	2.182E+00	1.7E-05	8.1E-08	1.254E+06	4.0810	18.220	546.7
49	2.664	357.0	1.390E+07	2029	12.08	5191	74.15	2.212E-03	2.263E-01	2.4E-06	6.2E-08	2.014E+05	0.4232	3.723	548.0
50	2.812	406.1	1.461E+07	2167	12.04	5321	78.43	2.548E-03	2.589E-01	2.6E-06	6.6E-08	2.125E+05	0.4843	4.290	540.5
51	2.766	373.4	1.424E+07	2116	12.05	5254	76.44	2.351E-03	2.390E-01	2.5E-06	6.4E-08	2.038E+05	0.4470	3.978	540.9
52	2.744	396.2	1.409E+07	2093	12.07	5227	75.34	2.467E-03	2.518E-01	2.7E-06	6.3E-08	2.190E+05	0.4709	4.022	541.4
53	2.674	389.2	1.354E+07	2017	12.10	5124	72.10	2.404E-03	2.465E-01	2.7E-06	6.1E-08	2.286E+05	0.4610	3.762	541.8
54	2.938	676.6	1.544E+07	2300	12.12	5471	81.85	4.042E-03	4.161E-01	4.0E-06	6.9E-08	3.182E+05	0.7782	5.879	537.2
55	2.931	708.9	1.540E+07	2293	12.14	5465	81.43	4.197E-03	4.334E-01	4.2E-06	6.8E-08	3.335E+05	0.8106	5.978	537.5
56	2.924	720.9	1.530E+07	2283	12.15	5448	80.79	4.255E-03	4.400E-01	4.3E-06	6.8E-08	3.423E+05	0.8229	5.972	537.0
57	2.923	713.8	1.533E+07	2284	12.15	5453	80.98	4.216E-03	4.358E-01	4.2E-06	6.8E-08	3.380E+05	0.8151	5.958	537.5
58	2.922	740.2	1.541E+07	2287	12.16	5466	81.21	4.340E-03	4.496E-01	4.3E-06	6.8E-08	3.468E+05	0.8408	6.090	536.5
60	3.721	3182.0	2.380E+07	3359	16.07	6842	72.85	2.537E-03	4.590E-01	2.8E-06	6.1E-08	3.154E+05	0.8583	10.760	541.5
61	3.438	445.6	2.087E+07	2971	15.26	6400	70.65	5.070E-04	8.277E-02	5.8E-07	5.9E-08	6.271E+04	0.1548	3.879	543.8
62	2.918	690.5	1.574E+07	2301	12.14	5525	83.25	4.070E-03	4.202E-01	4.0E-06	7.0E-08	3.128E+05	0.7858	6.040	543.1

NOTE: SEE TABLE 2 FOR DESCRIPTION OF TEST CONDITION PARAMETERS

Table 5
SUMMARY OF GAGE POSITIONS ON SMOOTH HEMISPHERE

GAGE	θ (degrees) *	**	GAGE	θ (degrees) *	**
HT1	0.000	9.850	HT36	-32.68	-22.83
HT2	-2.390	7.460	HT37	-33.12	-23.27
HT3	-5.300	4.550	HT38	-33.57	-23.72
HT4	-8.800	1.050	HT39	-34.02	-24.17
HT5	-13.35	-3.500	HT40	-34.54	-24.69
HT6	-15.37	-5.520	HT41	-34.91	-25.06
HT7	-17.23	-7.380	HT42	-35.44	-25.59
HT8	-21.49	-11.64	HT43	-35.88	-26.03
HT9	-22.01	-12.16	HT44	-36.41	-26.56
HT10	-22.38	-12.53	HT45	-36.85	-27.00
HT11	-22.90	-13.05	HT46	-37.30	-27.45
HT12	-23.28	-13.43	HT47	-37.75	-27.90
HT13	-23.72	-13.87	HT48	-38.20	-28.35
HT14	-24.25	-14.40	HT49	-38.64	-28.79
HT15	-24.62	-14.77	HT50	-39.09	-29.24
HT16	-25.14	-15.29	HT51	-39.54	-29.69
HT17	-25.59	-15.74	HT52	-44.54	-34.69
HT18	-26.11	-16.26	HT53	-48.19	-38.34
HT19	-26.56	-16.71	HT54	-52.45	-42.60
HT20	-27.01	-17.16	HT55	-57.74	-47.89
HT21	-27.45	-17.60	HT56	-64.23	-54.38
HT22	-27.90	-18.05	HT57	2.24	12.09
HT23	-28.35	-18.50	HT58	4.48	14.33
HT24	-28.80	-18.95	HT59	7.01	16.86
HT25	-29.24	-19.39	HT60	9.85	19.70
HT26	-29.54	-19.69	HT61	2.24	12.09
HT27	-29.84	-19.99	HT62	-2.39	7.46
HT28	-30.14	-20.29	P1	-23.43	-13.58
HT29	-30.36	-20.51	P2	-25.89	-16.04
HT30	-30.66	-20.81	P3	-28.13	-18.28
HT31	-30.89	-21.04	P4	-30.59	-20.74
HT32	-31.18	-21.33	P5	-32.97	-23.12
HT33	-31.48	-21.63	P6	-35.21	-25.36
HT34	-31.78	-21.93	P7	-37.60	-27.75
HT35	-32.23	-22.38	P8	-39.99	-30.14

* ANGULAR POSITION FOR RUNS : 3-5, 8-10, 13-18, 43-45, 49, 50, 53
** ANGULAR POSITION FOR RUNS : 26, 28-31, 33-39

Table 6
SUMMARY OF GAGE POSITIONS ON TRANSPIRATION-COOLED HEMISPHERE

GAGE	θ (degrees)	GAGE	θ (degrees)
HT1	-0.622	HT27	-29.18
HT2	-1.553	HT28	-30.08
HT3	-4.348	HT29	-30.99
HT4	-8.095	HT30	-31.90
HT5	-9.042	HT31	-32.83
HT6	-9.981	HT32	-33.76
HT7	-10.93	HT33	-34.71
HT8	-11.88	HT34	-35.67
HT9	-12.84	HT35	-36.58
HT10	-13.69	HT36	-37.42
HT11	-14.75	HT37	-38.28
HT12	-15.71	HT38	-39.14
HT13	-16.69	HT39	-40.00
HT14	-17.66	HT40	-40.88
HT15	-18.64	HT41	-41.78
HT16	-19.62	HT42	-42.69
HT17	-20.56	HT43	-43.60
HT18	-21.40	HT44	-44.55
HT19	-22.25	HT45	4.348
HT20	-23.08	HT46	8.095
HT21	-23.94	HT47	16.69
HT22	-24.80	HT48	26.53
HT23	-25.66	HT49	35.67
HT24	-26.53	HT50	-54.62
HT25	-27.40	HT51	-61.83
HT26	-28.29	HT52	-69.00

Table 7
PREDICTION OF PEAK HEATING RATES AND PRESSURES USING MORRIS AND KEYES COMPUTATIONAL MODEL FOR THE SMOOTH HEMISPHERE

RUN	S.L. MACH	$^{**}TS_{actual}$ (in.)	$^{\dagger\dagger}\ell_{SL}$ (in.)	TYPE III					TYPE IV					q_∞	$\dot{q}_o$ FR (Btu/ft²/sec)	Mach	OBSERVED PEAKS			
				Re_{SL}*	θ_s (deg)†	p_s/q_∞	$\dot{q}_{peak}/\dot{q}_o$ FR Lam.	$\dot{q}_{peak}/\dot{q}_o$ FR Turb.	Re_{SL}	p/q_∞ Reg. 7	p/q_∞ Reg. 8	$\dot{q}_{peak}/\dot{q}_o$ FR Reg. 7	$\dot{q}_{peak}/\dot{q}_o$ FR Reg. 8				Re_D	$\dot{q}/\dot{q}_o$	p/q_∞	θ (deg)
8	3.18	1.42	1.39	4.809E+04	35.21	16.73	7.17	10.45	5.194E+04	21.92	42.88	11.79	28.20	0.3972	5.105	12.1	3.69E+05	23.43	8.47	-24.25
9	3.18	2.01	1.93	7.055E+04	33.75 X	14.75	6.66	10.39	7.798E+04	22.05	43.10	9.88	23.62	0.4344	5.658	12.1	3.79E+05	13.58	10.10	-34.91
10	3.18	1.75	2.00	6.251E+04	35.21	16.92	6.95	10.41	6.743E+04	22.01	43.05	10.66	25.49	0.4322	5.557	12.1	3.84E+05	18.19	14.42	-30.66
13	3.15	2.03	2.07	4.062E+04	34.75 X	16.11	5.73	8.80	4.428E+04	22.13	42.86	9.62	22.77	0.2520	4.650	11.9	1.95E+05	17.92	10.65	-31.48
14	3.16	2.46	2.18	5.209E+04	34.75 X	15.90	5.52	8.37	5.681E+04	21.91	42.53	8.79	20.85	0.2509	4.263	12.0	2.16E+05	16.71	10.73	-34.54
15	3.15	1.57	1.77	3.138E+04	35.00	16.65	6.13	9.18	3.398E+04	22.08	42.76	11.04	26.14	0.2505	4.561	11.9	1.98E+05	20.31	17.60	-25.59
17	3.44	1.57	1.81	8.966E+03	36.52	22.45	5.31	8.82	9.620E+03	28.85	61.23	11.96	31.05	0.0736	4.194	14.6	4.66E+04	13.27	14.94	-32.68
18	3.44	1.47	1.76	7.987E+03	36.56	22.63	5.39	8.85	8.560E+03	28.90	61.37	12.53	32.57	0.0726	4.165	14.6	4.59E+04	18.27	15.32	-25.59
26	3.42	1.45	1.68	7.829E+03	36.48	23.07	5.26	8.87	8.395E+03	29.61	62.44	12.21	31.46	0.0726	4.581	14.6	4.04E+04	14.98	15.27	-23.72
28	3.14	1.46	1.78	2.936E+04	34.98	16.62	6.24	9.28	3.176E+04	21.94	42.30	11.50	27.05	0.2523	4.514	11.9	2.03E+05	16.74	15.27	-22.83
30	3.22	0.851	1.12	1.443E+05	35.43	17.21	11.93	20.53	1.555E+05	22.40	44.28	14.31	34.55	2.3400	17.560	12.5	1.56E+06	27.28	11.10	-15.74
33	3.23	1.50	1.75	2.588E+05	35.44	17.01	10.11	17.62	2.794E+05	22.33	44.23	10.52	25.45	2.2490	16.840	12.6	1.57E+06	31.06	13.83	-27.90
34	3.22	1.03	1.24	1.620E+05	35.44	16.91	11.58	19.68	1.747E+05	22.12	43.79	13.58	32.81	2.2540	16.150	12.6	1.63E+06	28.17	-	-19.39
35	3.57	1.48	1.72	7.367E+04	37.17	22.66	9.01	15.69	7.863E+04	28.44	62.98	12.08	32.77	0.5627	10.550	16.3	4.86E+05	22.12	9.64	-26.56
36	3.56	1.20	1.36	6.060E+04	37.13	22.82	9.80	17.37	6.472E+04	28.74	63.51	13.67	37.00	0.6059	11.560	16.2	4.86E+05	22.15	10.75	-21.93
37	3.57	0.789	0.938	3.939E+04	37.18	22.77	10.49	17.64	4.201E+04	28.42	62.95	16.48	44.74	0.5591	10.470	16.3	4.86E+05	23.26	10.89	-17.60
39	3.17	0.779	0.949	2.577E+04	35.12	16.77	8.47	12.42	2.786E+04	22.12	43.00	16.14	38.29	0.4395	5.992	12.1	3.61E+05	15.34	8.11	-13.43
44	3.22	2.02	1.97	3.384E+05	31.75 X	13.27	8.97	16.79	3.806E+05	22.36	44.26	9.05	21.87	2.2550	16.990	12.5	1.53E+06	20.36	11.04	-37.30
45	3.22	1.56	1.87	2.522E+05	35.40	17.11	10.14	18.08	2.724E+05	22.52	44.53	10.54	25.45	2.2410	17.440	12.5	1.47E+06	29.59	12.60	-28.35

* As defined in Figure 3 (Reference 3).
** Measured transmitted shock length
† "X" appended to θ_5 value indicates a specified shear layer angle was used rather than the calculated maximum
†† Measured shear layer length

Table 8
PREDICTION OF PEAK HEATING RATES AND PRESSURES USING MORRIS AND KEYES COMPUTATIONAL MODEL FOR THE TRANSPIRATION-COOLED HEMISPHERE

RUN	S.L. MACH	$^{**}TS_{actual}$ (in.)	$^{\dagger\dagger}\ell_{SL}$ (in.)	TYPE III					TYPE IV					q_∞	$\dot{q}_o$ FR (Btu/ft²/sec)	Mach	Re_D	OBSERVED PEAKS		
				Re_{SL}*	θ_s (deg)†	p_s/q_∞	$\dot{q}_{peak}/\dot{q}_o$ FR Lam.	$\dot{q}_{peak}/\dot{q}_o$ FR Turb.	Re_{SL}	p/q_∞ Reg. 7	p/q_∞ Reg. 8	$\dot{q}_{peak}/\dot{q}_o$ FR Reg. 7	$\dot{q}_{peak}/\dot{q}_o$ FR Reg. 8					$\dot{q}/\dot{q}_o$	p/q_∞	θ (deg)
16	3.18	2.98	3.45	1.208E+05	23.75	8.95	4.15	7.17	1.451E+05	22.57	44.15	6.96	16.66	0.4561	6.625	12.1	3.20E+05	6.79	-	-44.54
17	3.18	2.73	2.83	7.093E+04	35.18	17.11	6.47	10.14	7.672E+04	22.56	44.15	9.46	22.64	0.4504	6.602	12.1	3.15E+05	14.36	-	-27.40
18	3.18	1.72	1.93	4.169E+04	35.19	16.93	7.42	11.08	4.507E+04	22.26	43.55	12.49	29.88	0.4230	5.865	12.1	3.28E+05	20.44	-	-22.25
19	3.18	1.50	1.75	3.781E+04	35.19	17.19	7.47	11.26	4.082E+04	22.45	43.87	12.84	30.69	0.4238	6.194	12.1	3.07E+05	18.58	-	-17.66
20	3.18	3.18	3.72	7.754E+04	35.20	17.08	6.30	9.79	8.379E+04	22.42	43.90	9.05	21.66	0.4366	6.262	12.1	3.19E+05	18.36	-	-29.18
21	3.18	4.75	4.54	1.134E+05	35.19	17.26	5.64	9.04	1.225E+05	22.60	44.21	7.34	17.56	0.4377	6.571	12.1	3.02E+05	15.08	-	-32.83
22	3.18	1.68	1.89	4.223E+04	35.18	17.16	7.39	11.29	4.564E+04	22.53	44.05	12.32	29.45	0.4460	6.514	12.1	3.15E+05	19.33	-	-18.64
23	3.18	2.77	2.25	5.674E+04	35.18	17.12	6.82	10.56	6.135E+04	22.53	44.07	10.55	25.23	0.4443	6.525	12.1	3.12E+05	19.49	-	-29.18
24	3.18	2.94	3.18	7.038E+04	35.16	17.26	6.48	10.28	7.611E+04	22.74	44.45	9.45	22.59	0.4578	6.930	12.1	3.05E+05	17.84	-	-34.71
25	3.18	3.60	3.42	8.683E+04	32.00	13.77	5.82	9.65	9.753E+04	22.71	44.42	8.33	19.93	0.4565	6.869	12.1	3.07E+05	15.32	-	-39.14
27	3.18	3.14	3.88	8.803E+04	35.20	17.17	6.36	10.07	9.506E+04	22.44	43.91	8.84	21.15	0.4713	6.619	12.1	3.28E+05	17.50	-	-25.66
28	3.18	3.84	4.37	9.633E+04	35.22	17.07	6.17	9.63	1.040E+05	22.32	43.72	8.43	20.18	0.4510	6.147	12.1	3.45E+05	17.33	-	-31.90
29	3.18	6.62	6.33	1.681E+05	35.22	17.18	5.39	8.66	1.814E+05	22.36	43.78	6.40	15.33	0.4574	6.258	12.1	3.45E+05	11.48	-	-36.58
30	3.18	6.98	6.59	1.746E+05	27.50	10.79	4.46	7.65	2.032E+05	22.40	43.86	6.06	14.51	0.4620	6.330	12.1	3.46E+05	13.62	-	-36.58
31	3.19	1.60	1.88	4.573E+04	35.21	16.89	7.58	11.34	4.944E+04	22.23	43.56	12.49	29.92	0.4595	6.043	12.2	3.63E+05	18.93	-	-17.66
34	3.18	7.78	6.88	1.925E+05	35.21	17.15	5.27	8.63	2.080E+05	22.50	44.07	6.02	14.43	0.4787	6.631	12.1	3.47E+05	11.58	-	-36.58
35	3.18	4.67	3.17	1.280E+05	35.22	17.19	5.87	9.41	1.383E+05	22.51	44.11	7.43	17.81	0.4866	6.708	12.1	3.51E+05	15.30	-	-32.83
36	3.19	1.16	1.31	3.213E+04	35.24	17.17	8.27	12.22	3.467E+04	22.38	43.87	14.86	35.61	0.4735	6.377	12.2	3.57E+05	13.11	-	-12.84
37	3.19	1.48	1.74	4.177E+04	35.23	17.20	7.71	11.64	4.508E+04	22.44	43.98	12.94	31.01	0.4813	6.522	12.2	3.51E+05	19.13	-	-19.62
38	3.19	4.07	3.38	9.593E+04	27.75	10.93	5.28	8.78	1.114E+05	22.43	43.98	8.27	19.84	0.4807	6.521	12.2	3.57E+05	8.63	-	-42.68
39	3.19	0.667	0.972	2.094E+04	35.24	17.16	9.02	12.93	2.259E+04	22.37	43.85	18.10	43.39	0.4563	6.163	12.2	3.50E+05	5.15	-	-1.55
40	3.19	0.724	0.753	1.204E+04	35.24	17.27	10.20	14.30	1.299E+04	22.48	44.06	23.46	56.22	0.4529	6.311	12.2	3.36E+05	5.06	-	-4.35
41	3.19	1.70	1.89	4.373E+04	35.24	17.23	7.35	11.04	4.722E+04	22.53	44.17	12.22	29.29	0.4580	6.475	12.2	3.32E+05	10.05	-	-9.98
42	3.19	5.13	4.91	1.382E+05	35.24	17.32	5.65	8.99	1.490E+05	22.51	44.11	7.05	16.90	0.4702	6.491	12.2	3.46E+05	17.56	-	-21.40
43	3.19	8.20	8.26	2.139E+05	35.21	17.02	5.05	8.22	2.314E+05	22.47	44.06	5.63	13.50	0.4674	6.451	12.2	3.45E+05	12.61	-	-26.54
44	3.19	0.614	0.622	1.451E+04	35.21	17.10	9.59	13.61	1.569E+04	22.54	44.17	20.99	50.31	0.4446	6.311	12.2	3.26E+05	3.69	-	-1.55
45	3.19	1.19	1.19	3.155E+04	35.23	17.30	7.94	11.83	3.408E+04	22.66	44.42	14.27	34.20	0.4630	6.714	12.2	3.23E+05	3.43	-	-23.94
47	3.24	1.18	1.41	1.415E+05	35.53	17.60	11.35	19.24	1.523E+05	22.70	45.24	13.70	33.39	2.1590	17.070	12.6	1.34E+06	25.42	-	-16.70
48	3.23	1.85	2.52	2.009E+05	35.49	17.63	10.30	18.13	2.168E+05	23.03	45.85	11.29	27.49	2.1820	18.220	12.6	1.25E+06	25.03	-	-16.70
49	3.18	3.36	3.32	5.203E+04	35.18	16.78	5.14	7.28	5.618E+04	21.93	42.85	8.40	20.06	0.2263	3.723	12.1	2.01E+05	18.26	-	-36.58
50	3.17	1.19	1.21	2.149E+04	35.12	16.72	6.85	9.62	2.325E+04	22.10	43.10	13.76	32.81	0.2589	4.290	12.0	2.13E+05	16.91	-	-16.70
51	3.17	4.34	4.69	6.535E+04	35.15	16.74	5.00	7.33	7.061E+04	21.94	42.80	7.66	18.27	0.2390	3.978	12.1	2.04E+05	21.73	-	-29.18
52	3.17	4.75	4.90	7.564E+04	35.18	16.86	4.97	7.28	8.162E+04	21.95	42.86	7.36	17.58	0.2518	4.022	12.1	2.19E+05	15.10	-	-32.82
53	3.18	2.77	3.17	4.518E+04	35.16	16.53	5.69	7.99	4.887E+04	21.81	42.64	9.61	22.97	0.2465	3.762	12.1	2.29E+05	20.79	-	-32.82

* As defined in Figure 3 (Reference 3).
** Measured transmitted shock length
† "X" appended to θ_s value indicates a specified shear layer angle was used rather than the calculated maximum
†† Measured shear layer length

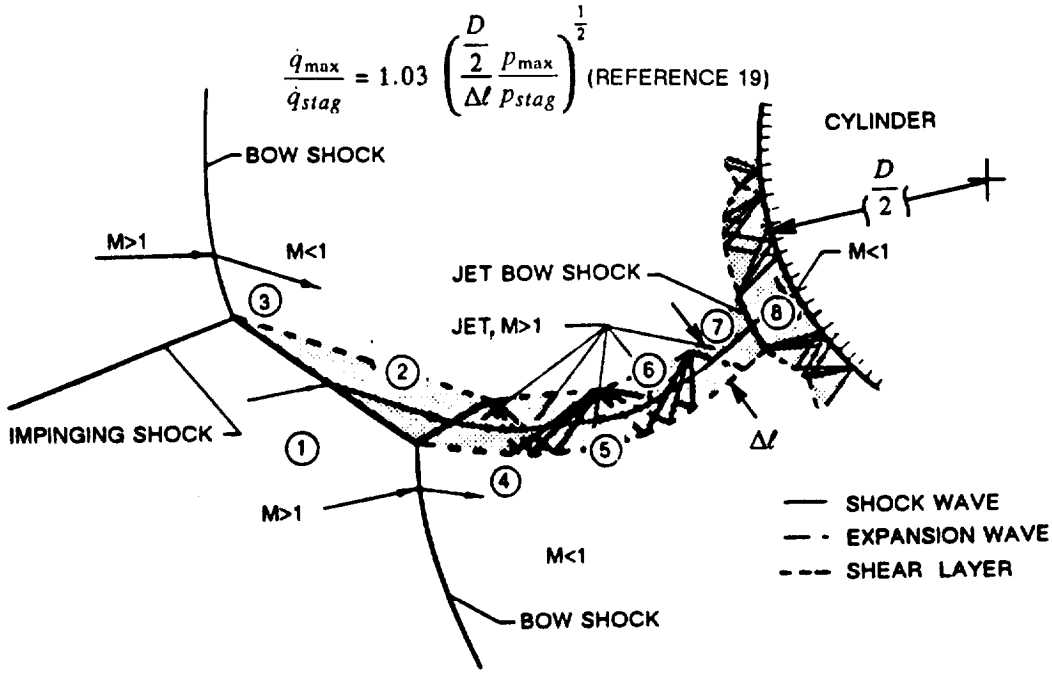


Figure 1 SCHEMATIC DIAGRAM OF A TYPE IV INTERFERENCE PATTERN IMPINGING ON A CYLINDER (REFERENCE 19)

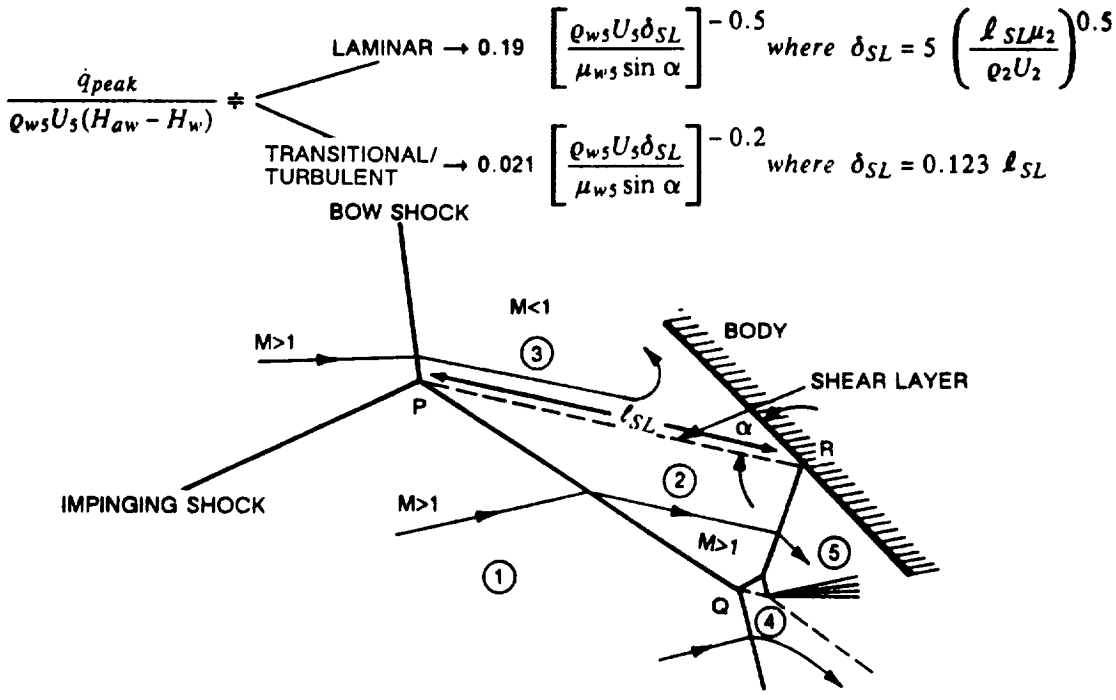


Figure 2 SCHEMATIC DIAGRAM OF TYPE III INTERFERENCE (REFERENCE 19)

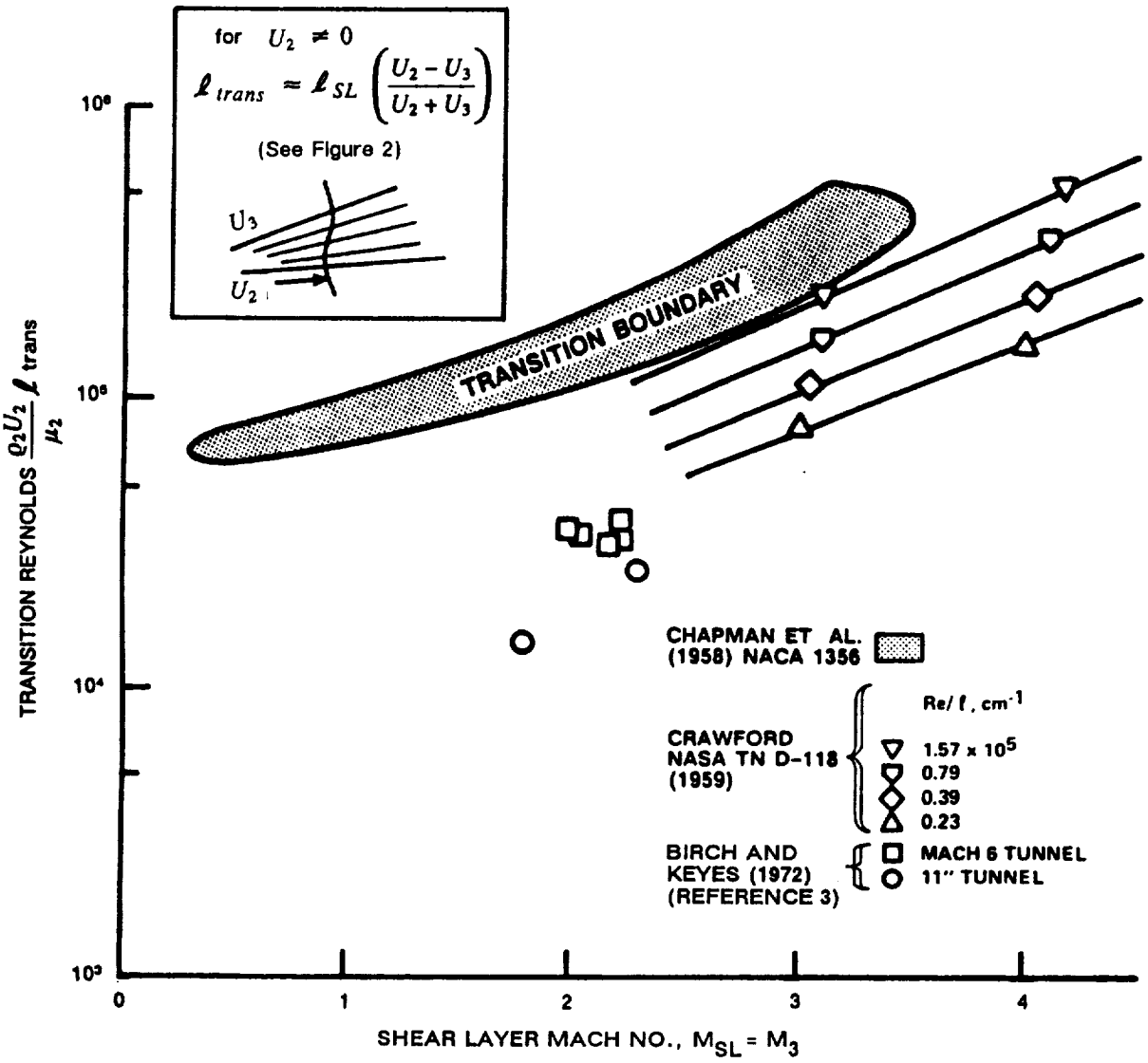


Figure 3 VARIATION OF TRANSITION REYNOLDS NUMBER WITH SHEAR LAYER MACH NUMBER

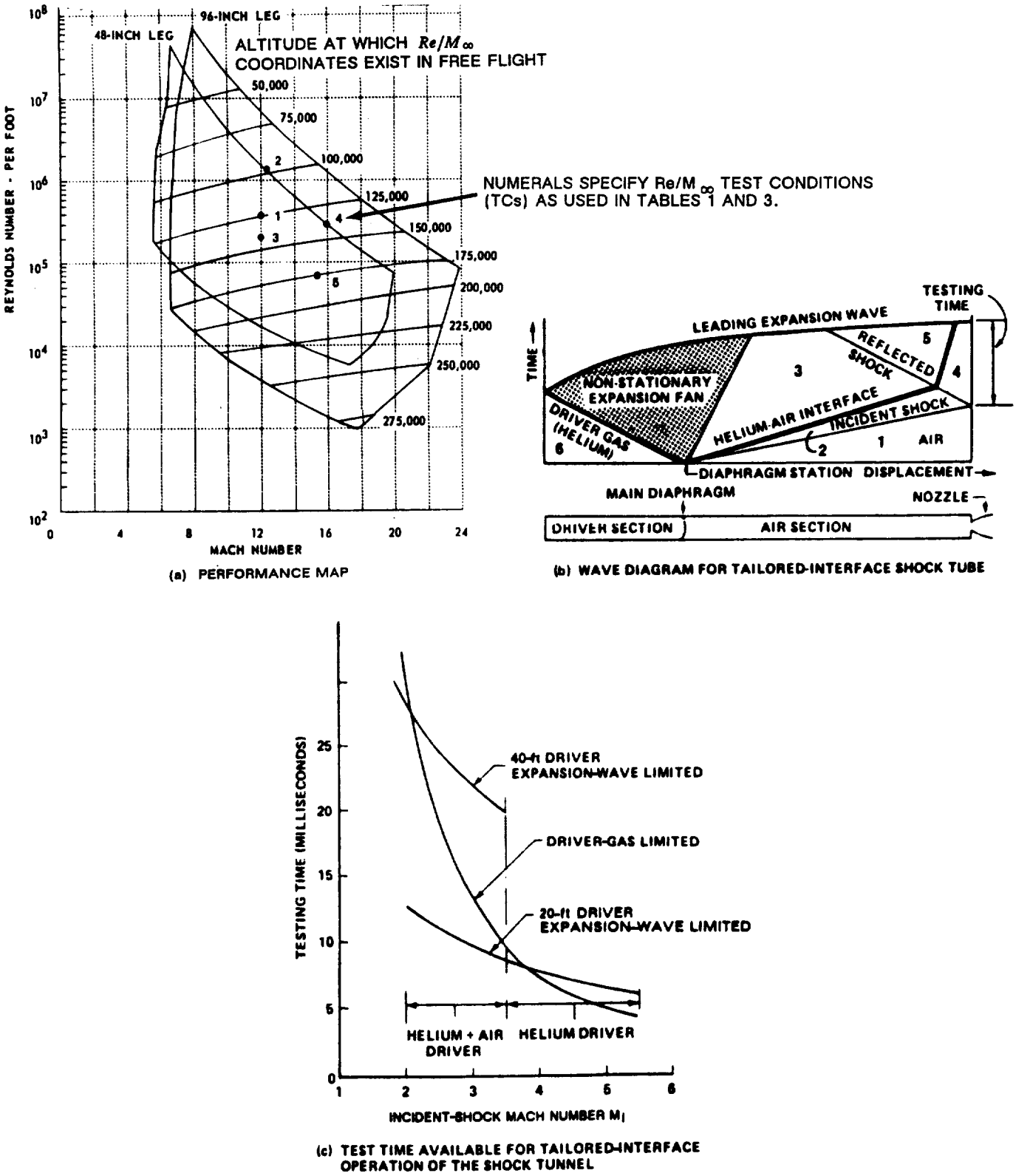


Figure 4 PERFORMANCE CHARACTERISTICS OF CALSPAN'S SHOCK TUNNEL

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

Figure 5 PHOTOGRAPH OF SMOOTH HEMISPHERE IN TUNNEL

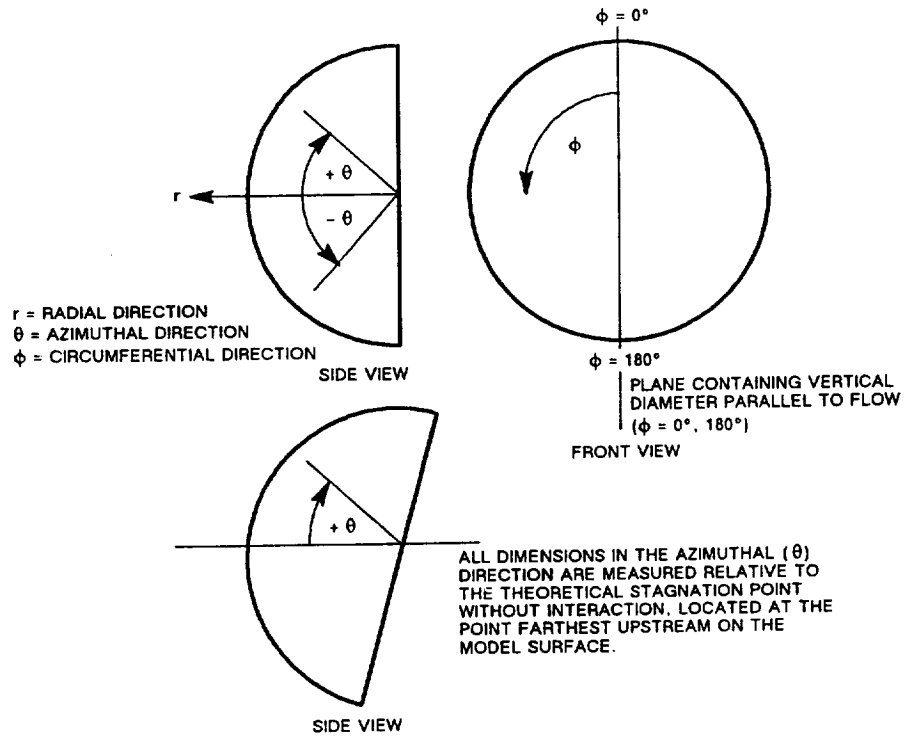


Figure 6 MODEL COORDINATE SYSTEM

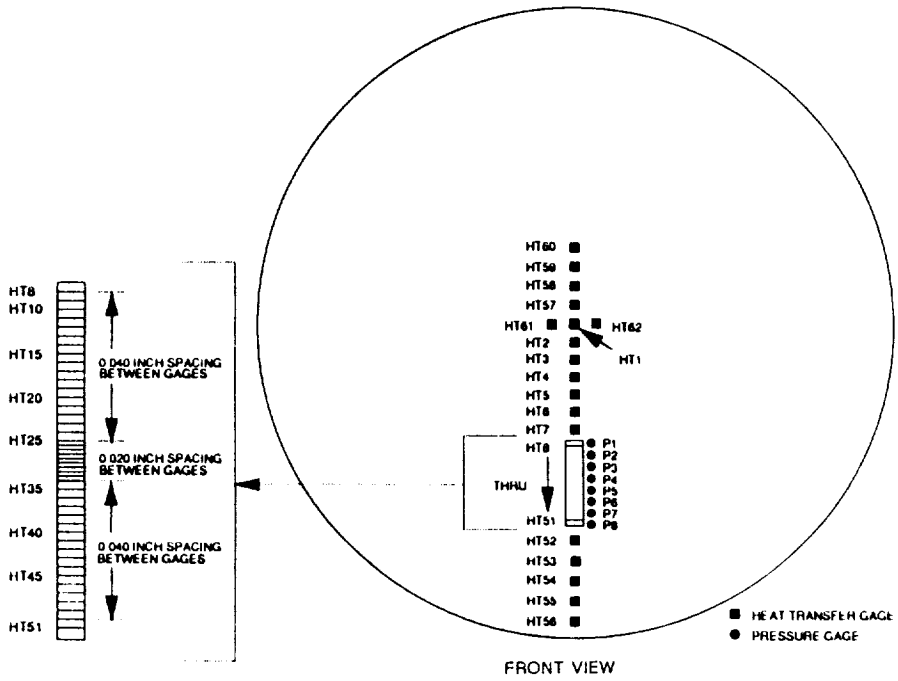


Figure 7 INSTRUMENTATION SCHEMATIC DIAGRAM FOR SMOOTH HEMISPHERE

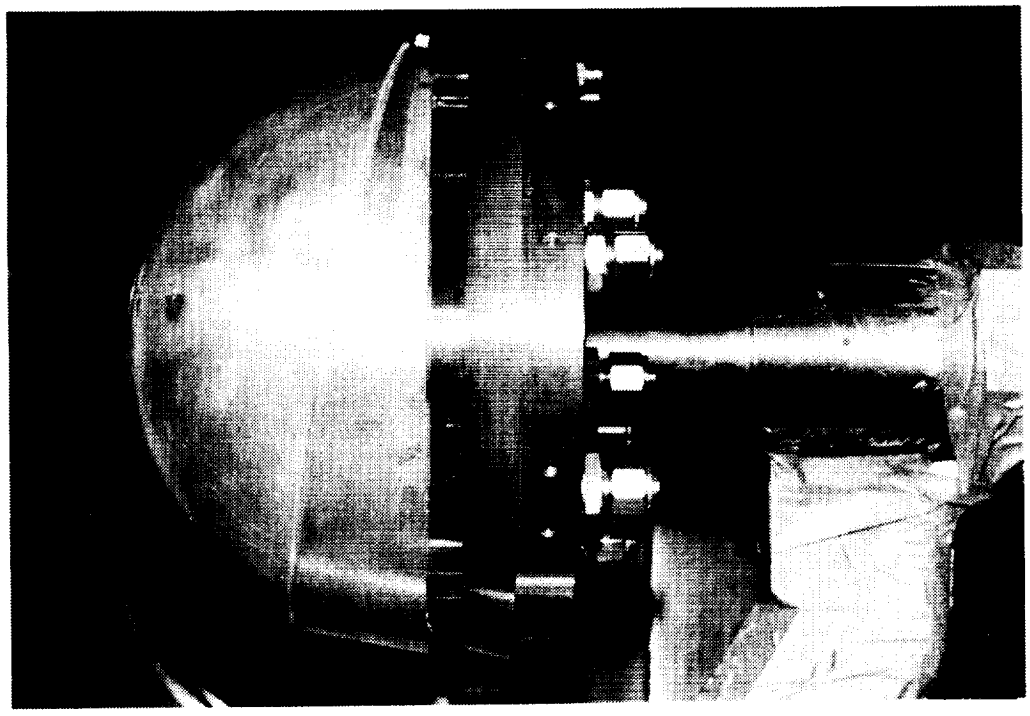
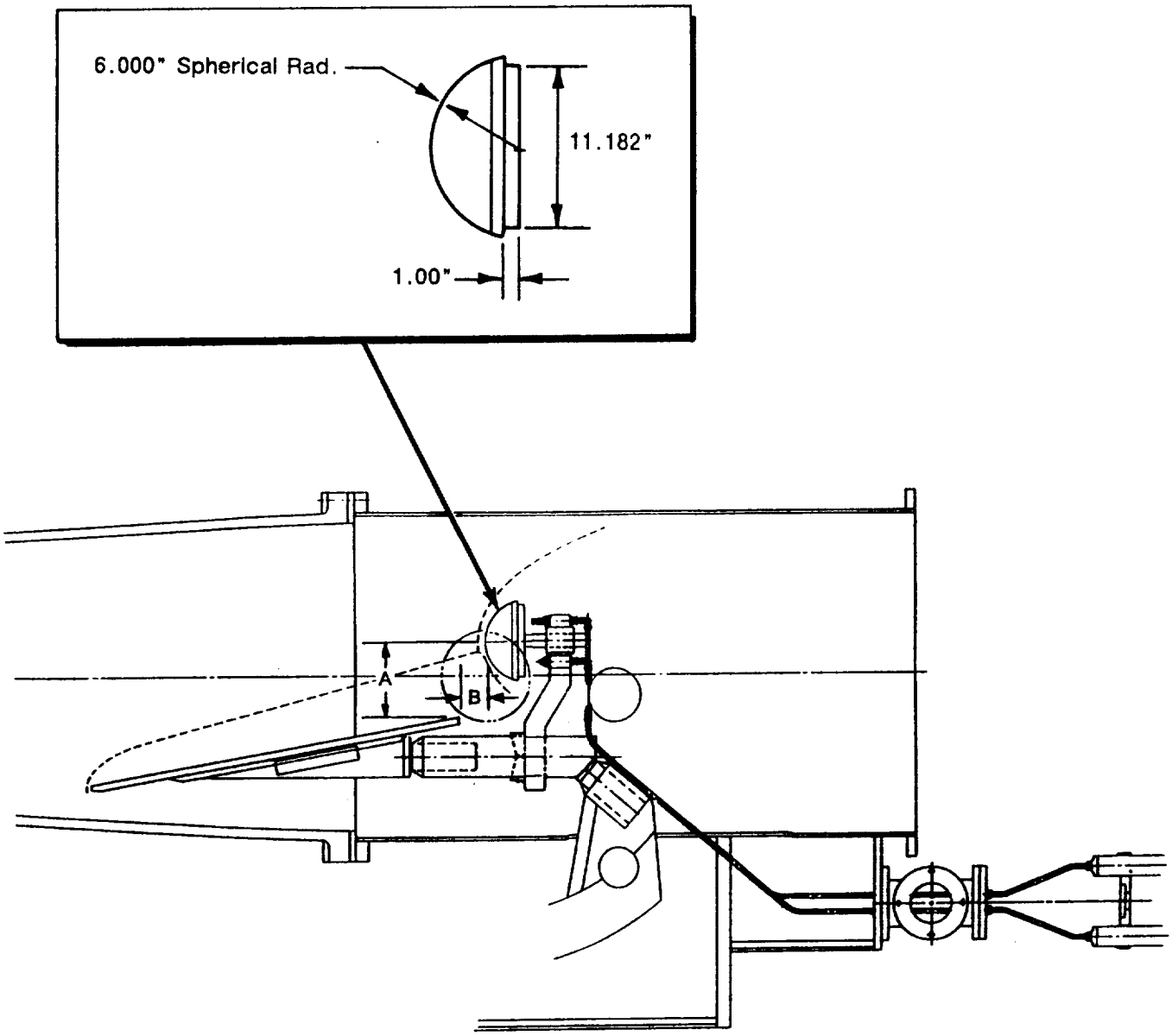


Figure 8 PHOTOGRAPH OF SMOOTH HEMISPHERE WITH 10° WEDGE



NOTE: PLUMBING DISCONNECTED FOR SMOOTH-HEMISPHERE STUDY

Figure 9 SCHEMATIC DIAGRAM OF EXPERIMENTAL CONFIGURATION IN CALSPAN'S 48-INCH HYPERSONIC SHOCK TUNNEL

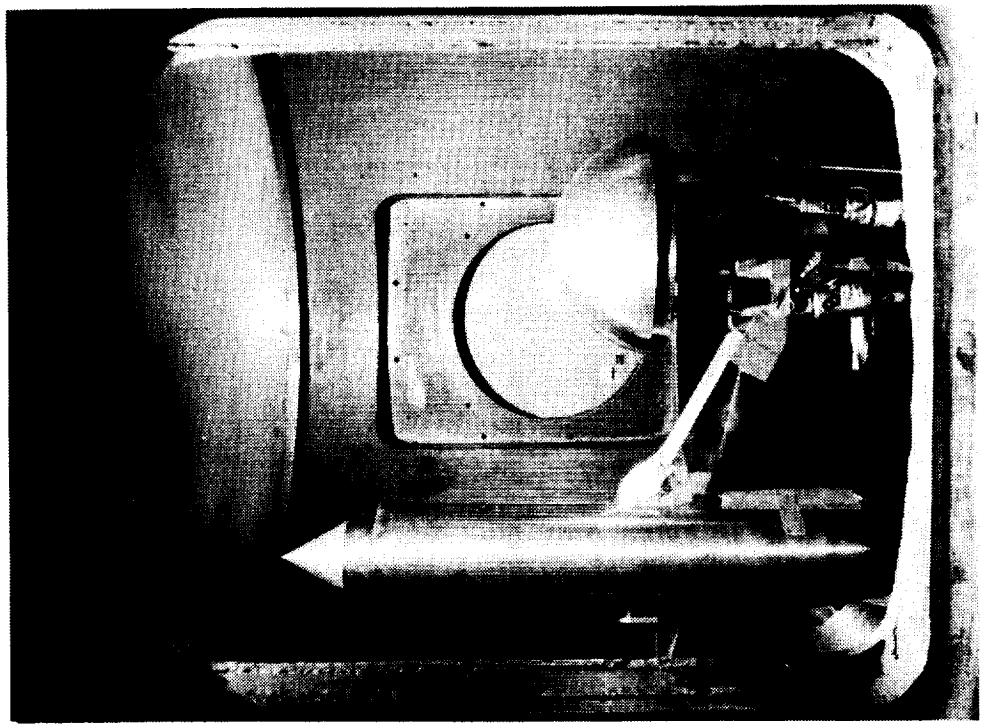


Figure 10a PHOTOGRAPH OF TRANSPIRATION-COOLED HEMISPHERE IN TUNNEL

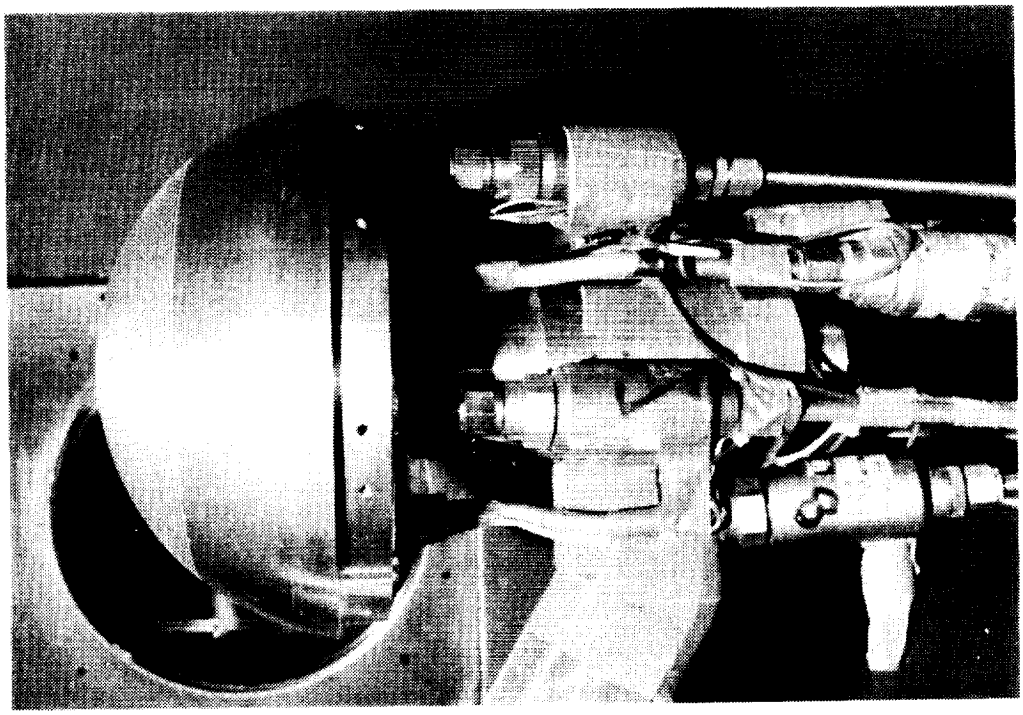


Figure 10b FAST-ACTING VALVES MOUNTED BEHIND TRANSPIRATION-COOLED HEMISPHERE

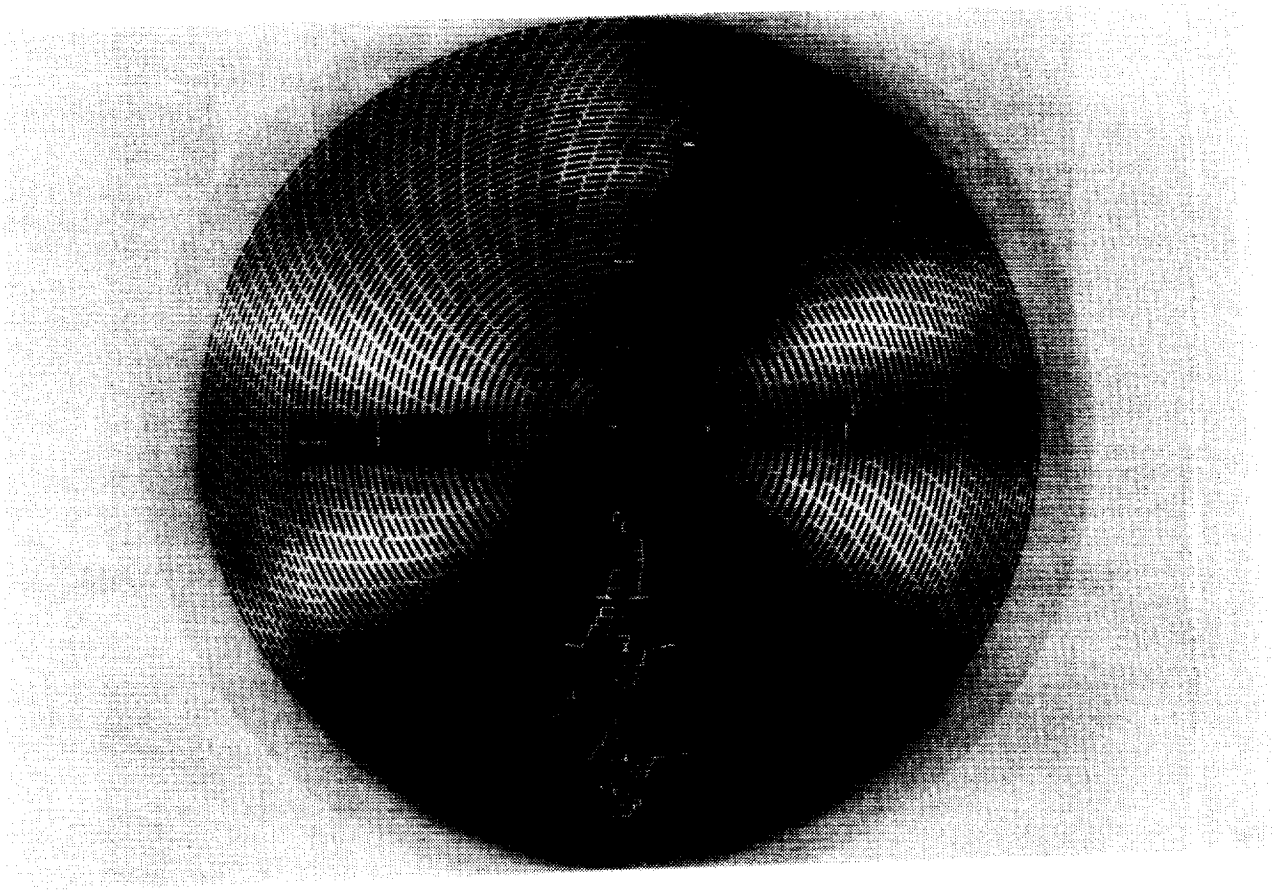


Figure 11 FRONT VIEW OF TRANSPIRATION-COOLED HEMISPHERE

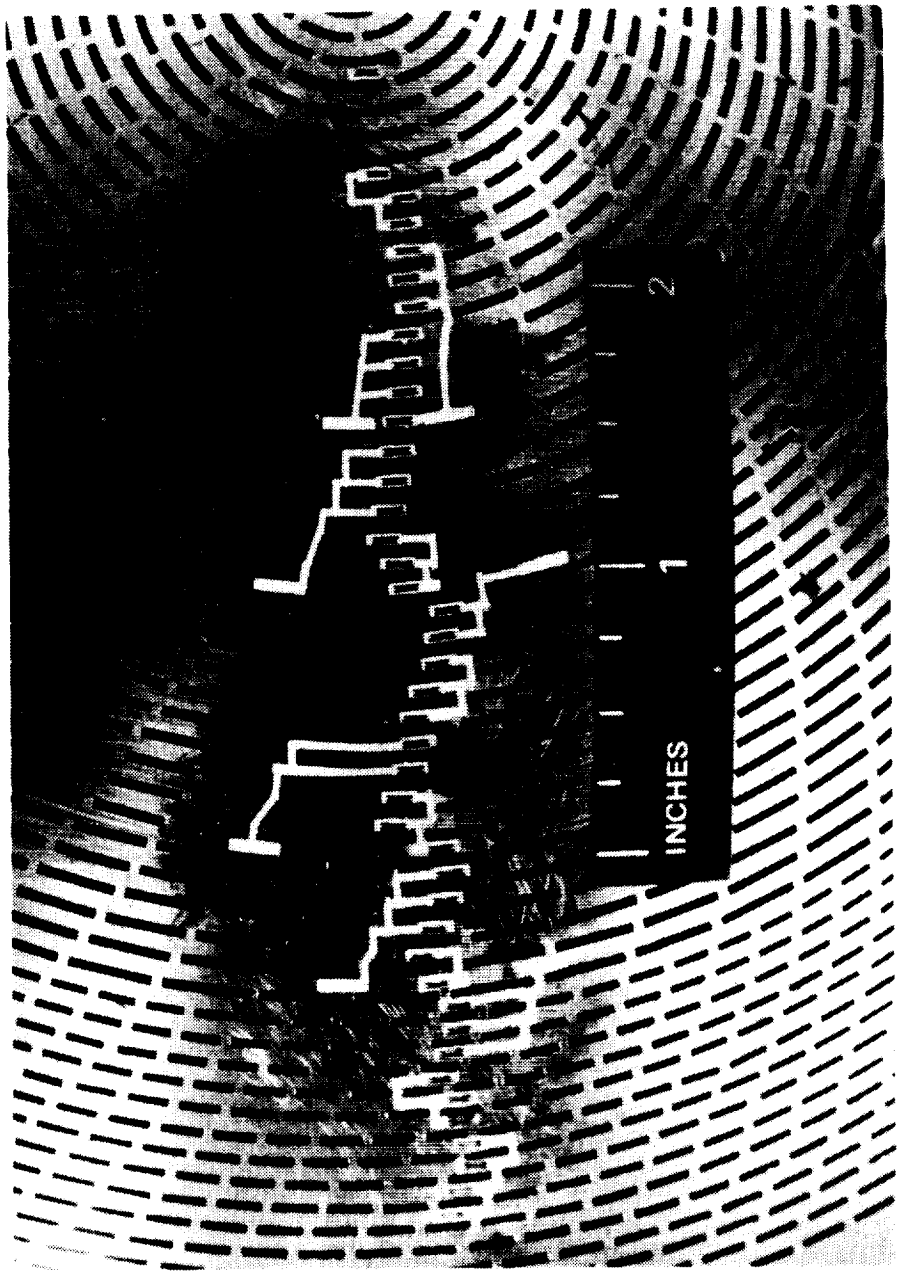


Figure 12a PHOTOGRAPH OF TRANSPIRATION-COOLED SURFACE

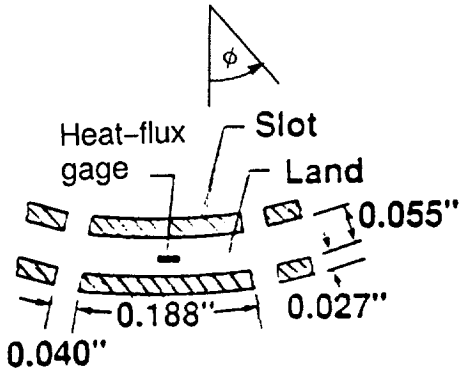


Figure 12b DETAILS OF TRANSPIRATION-COOLED SURFACE

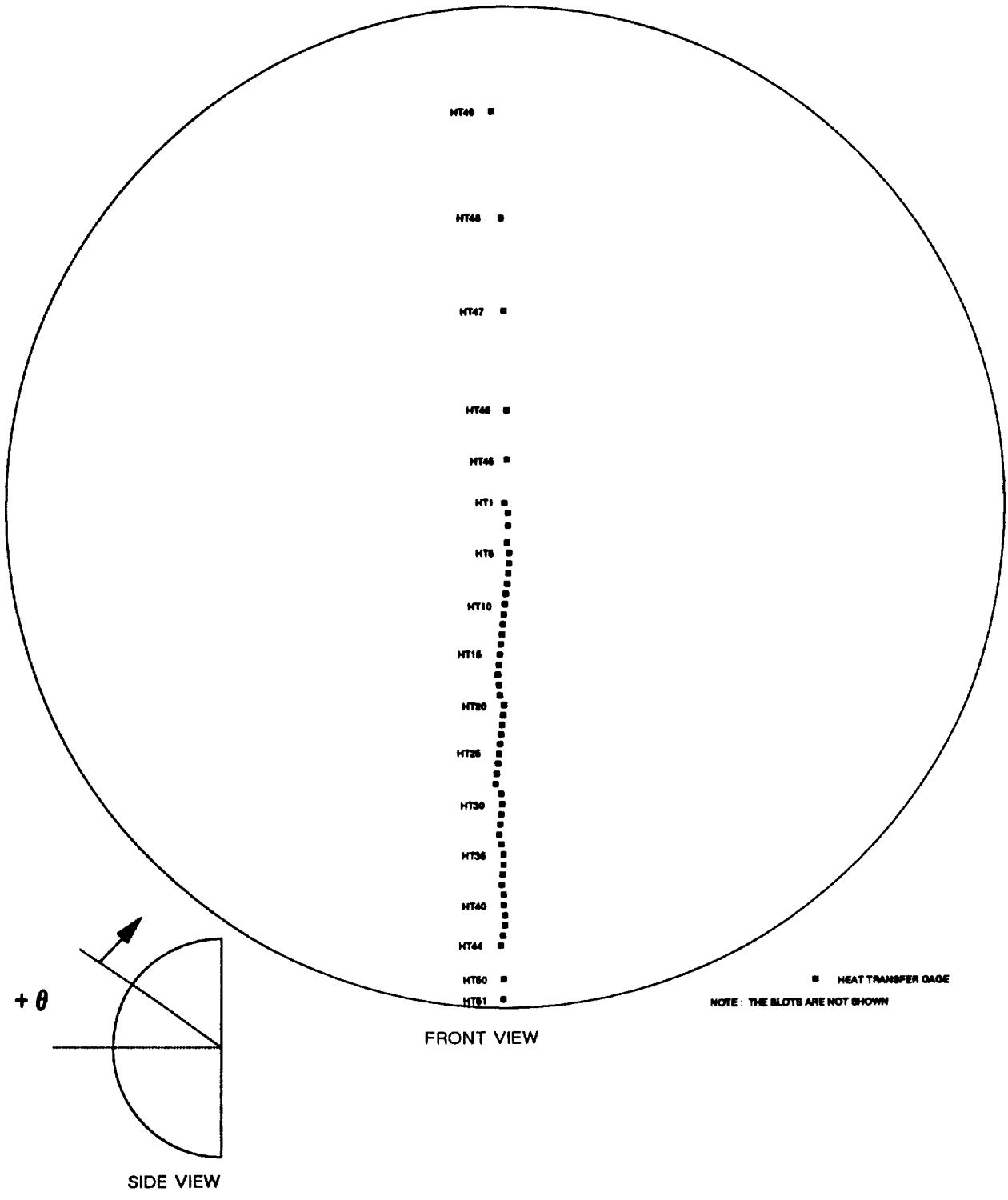


Figure 13 **INSTRUMENTATION SCHEMATIC DIAGRAM FOR TRANSPIRATION-COOLED HEMISPHERE**

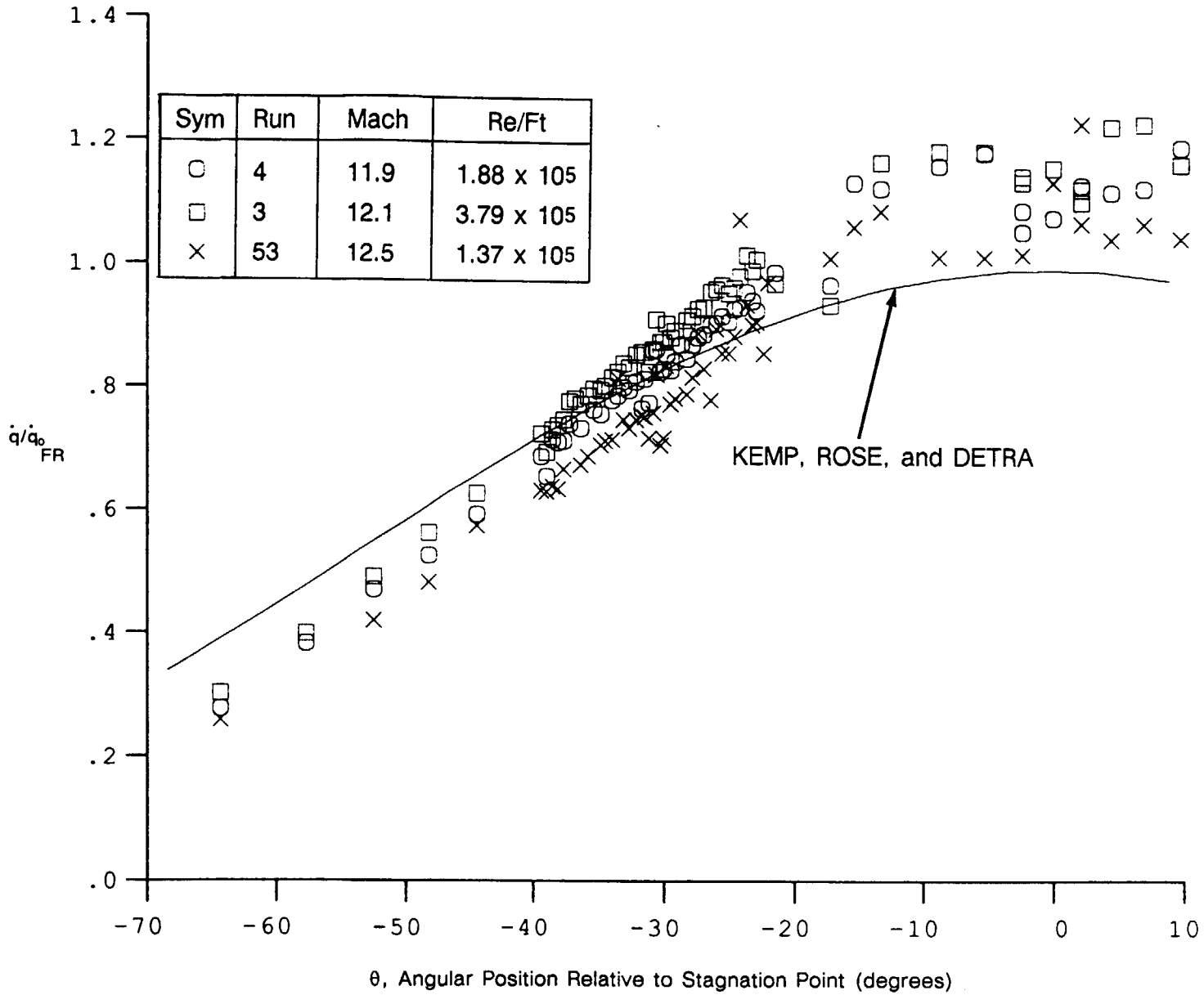


Figure 14a COMPARISONS BETWEEN MEASURED AND PREDICTED HEAT TRANSFER DISTRIBUTIONS OVER A SMOOTH HEMISPHERE AT MACH - 12

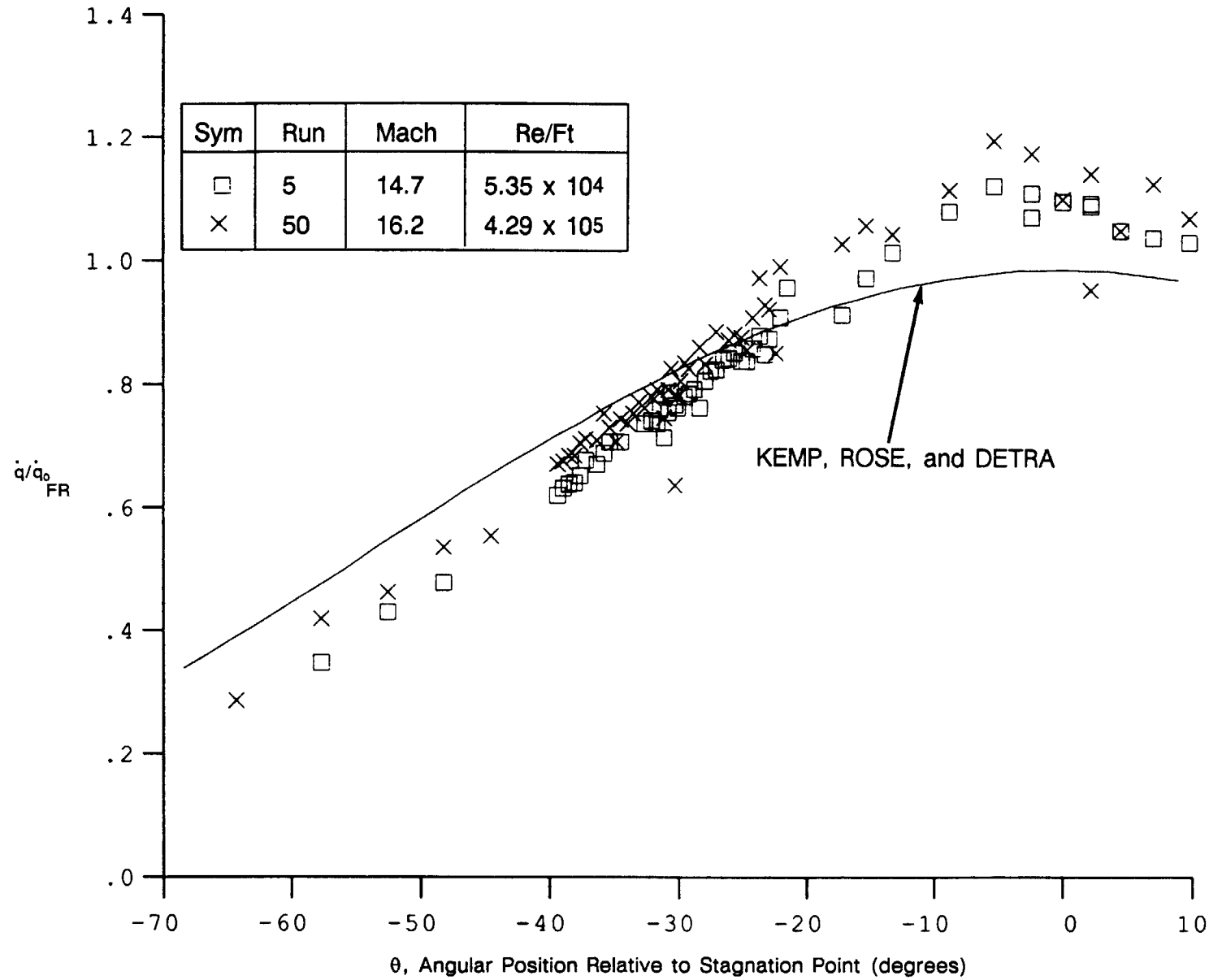


Figure 14b COMPARISONS BETWEEN MEASURED AND PREDICTED HEAT TRANSFER DISTRIBUTIONS OVER A SMOOTH HEMISPHERE AT MACH - 15 TO 16

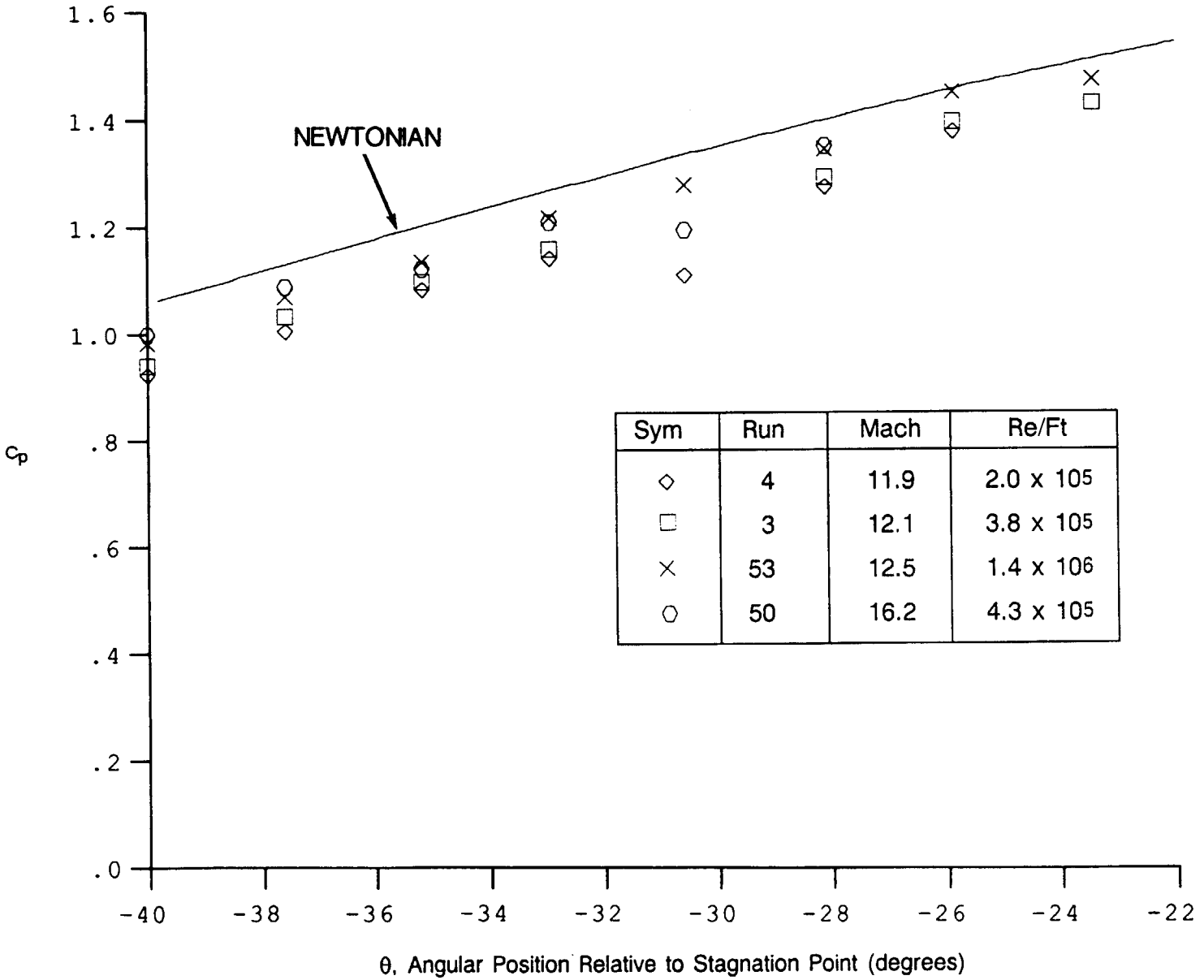


Figure 15 COMPARISONS BETWEEN MEASURED AND PREDICTED PRESSURE DISTRIBUTIONS OVER A SMOOTH HEMISPHERE AT VARIOUS MACH AND REYNOLDS NUMBERS

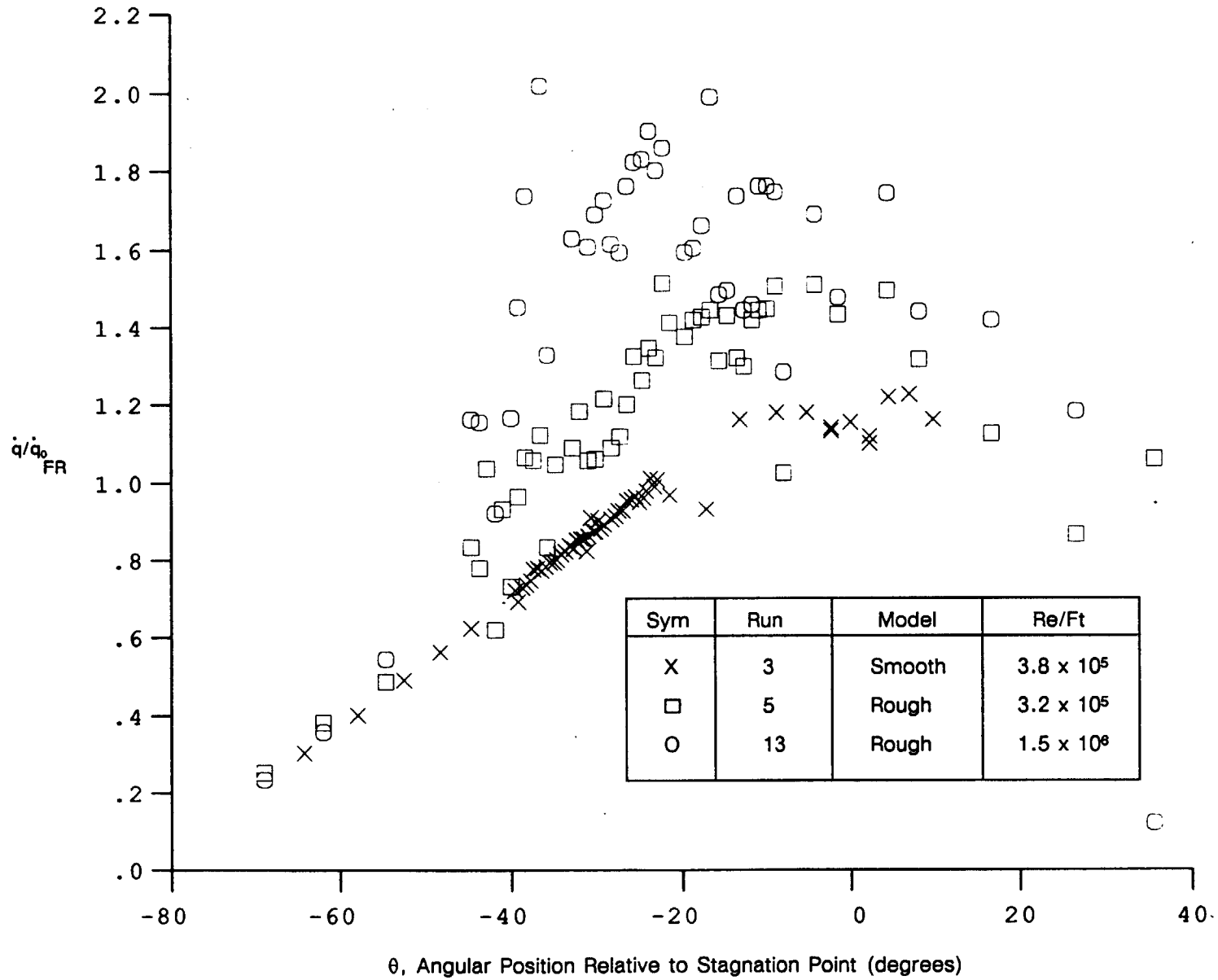


Figure 16 HEAT TRANSFER DISTRIBUTIONS OVER A SMOOTH AND A ROUGH HEMISPHERE FOR A RANGE OF REYNOLDS NUMBERS AT MACH 12

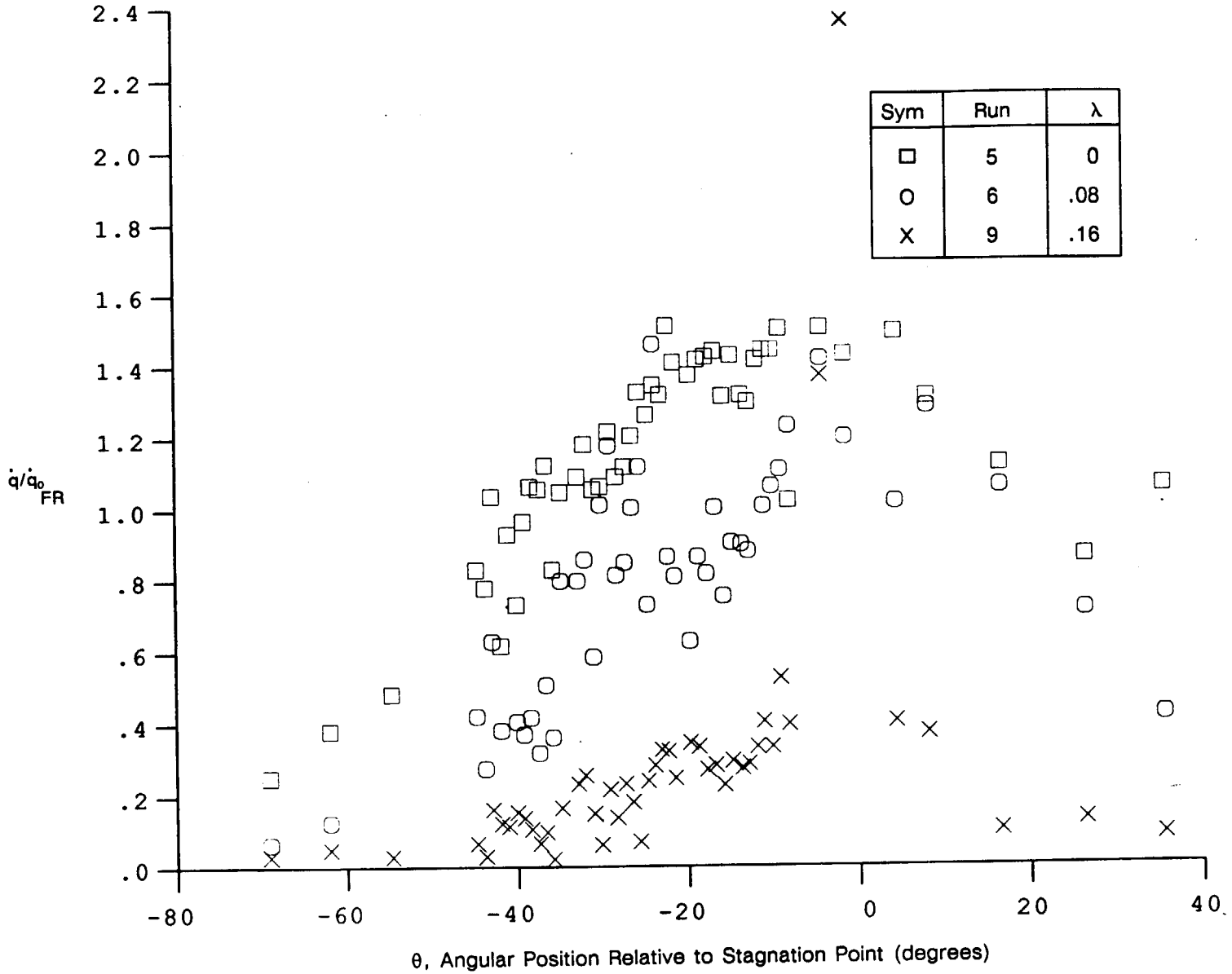


Figure 17 HEAT TRANSFER DISTRIBUTIONS OVER A TRANSPIRATION-COOLED HEMISPHERE WITH VARIOUS BLOWING RATES AT MACH 12.1 AND Re/Ft = 3.3 x 10^5

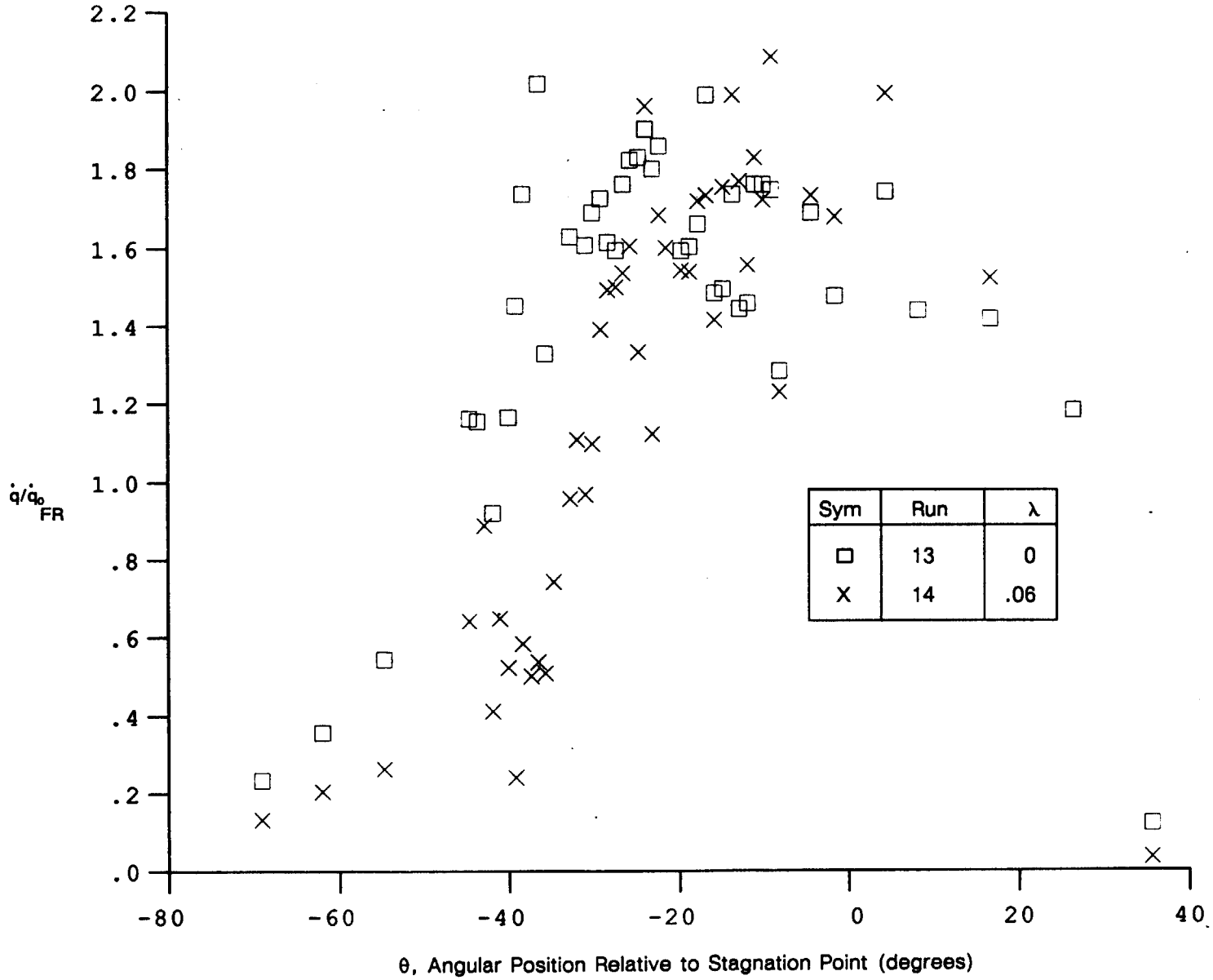


Figure 18 **HEAT TRANSFER DISTRIBUTIONS OVER A TRANSPIRATION-COOLED HEMISPHERE WITH VARIOUS BLOWING RATES AT MACH 12.6 AND Re/Ft = 1.5 x 10^6**

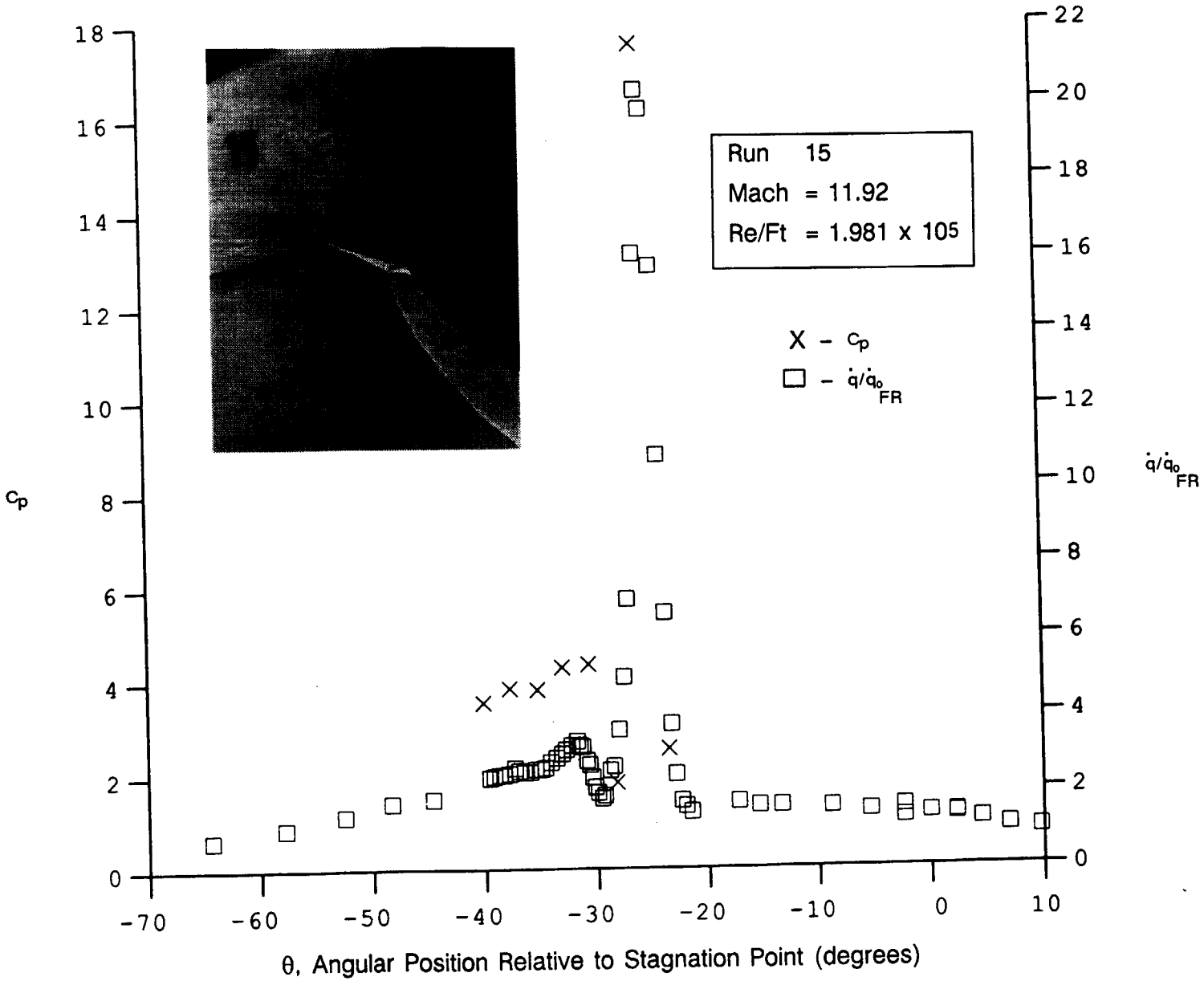


Figure 19a HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 11.92 FOR RUN 15

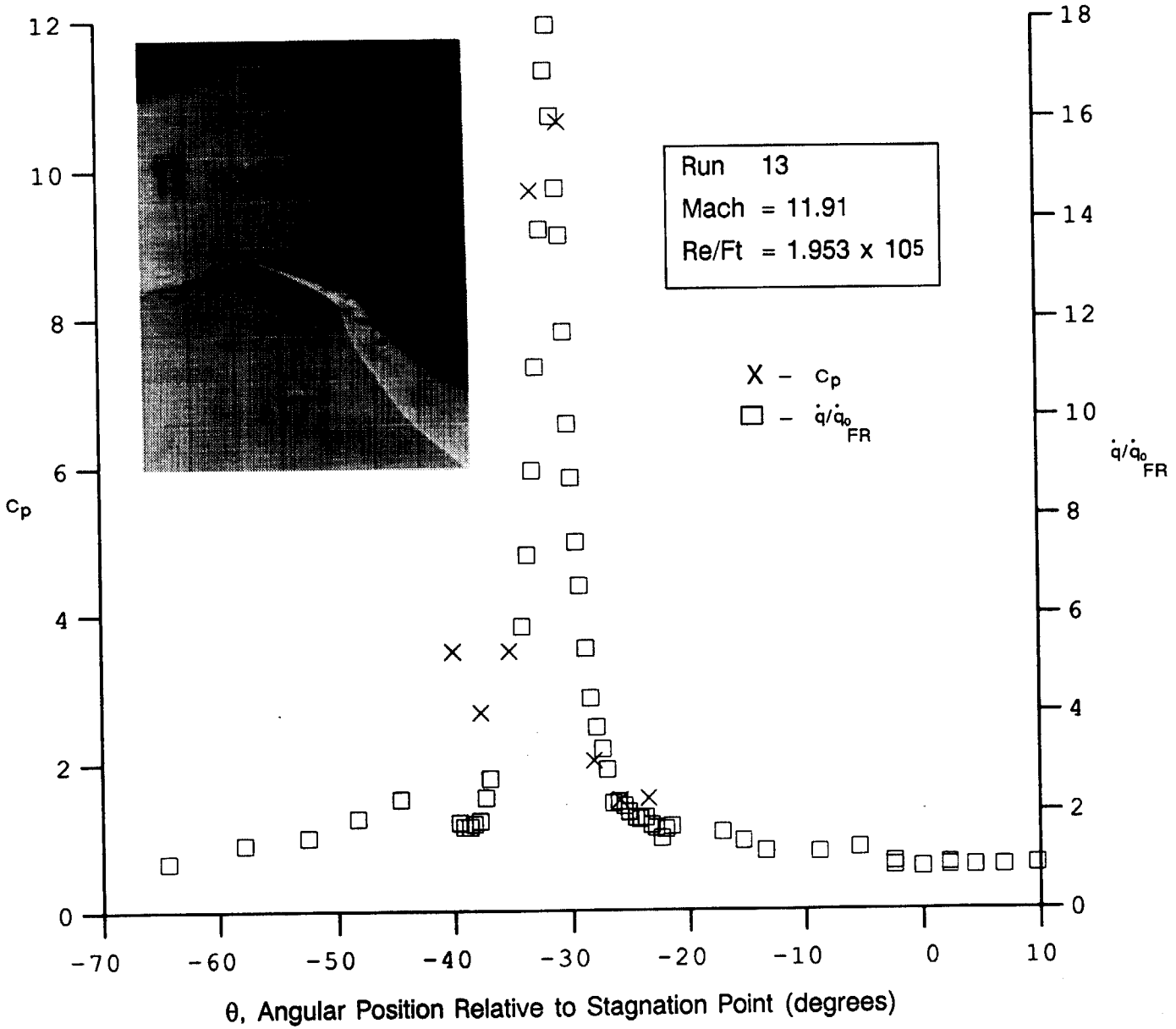


Figure 19b HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 11.91 FOR RUN 13

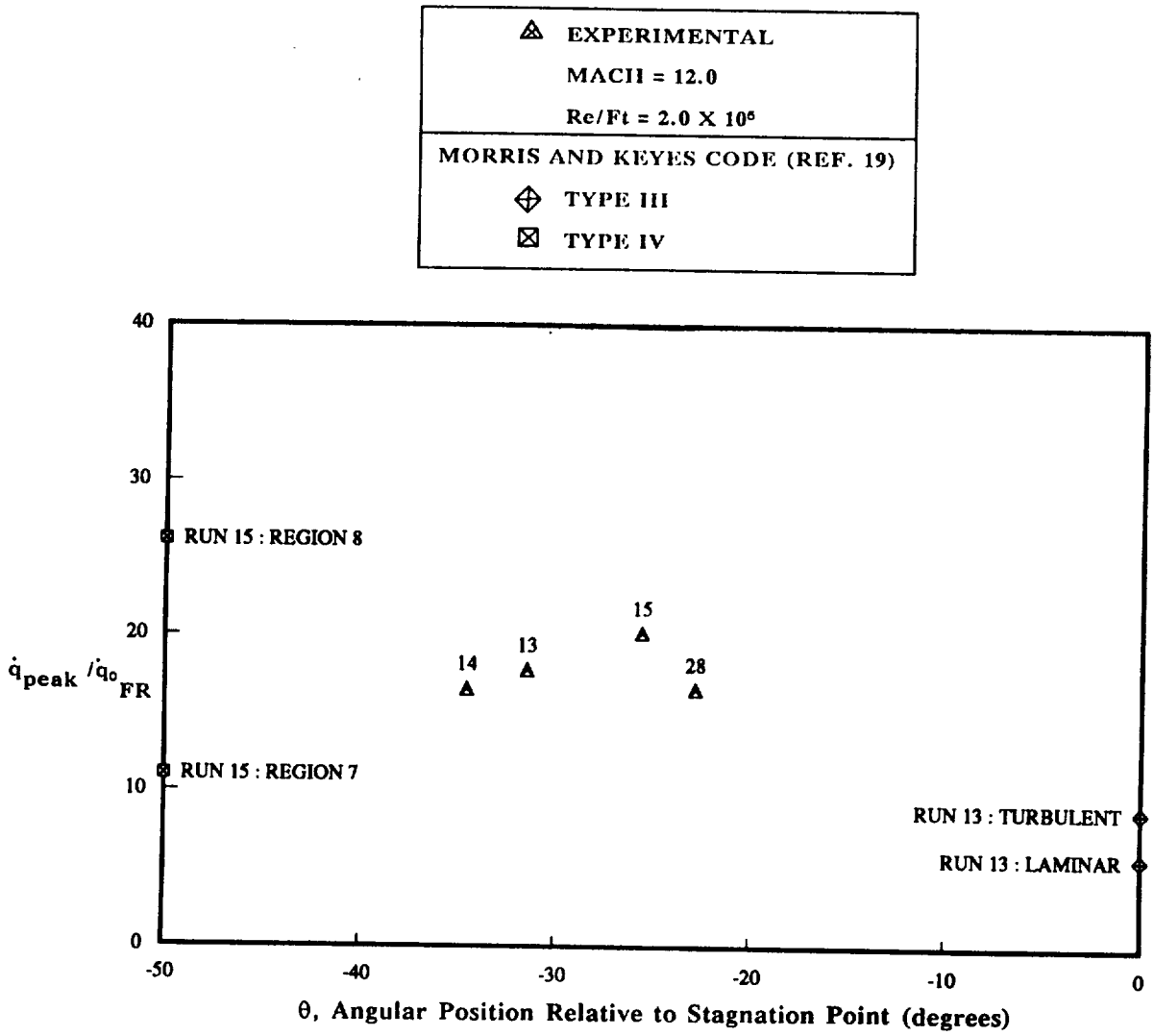


Figure 19c VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OVER A SMOOTH HEMISPHERE OF A LAMINAR INTERACTION FOR MACH 12.0 AND Re/Ft = 2.0 x 10^5

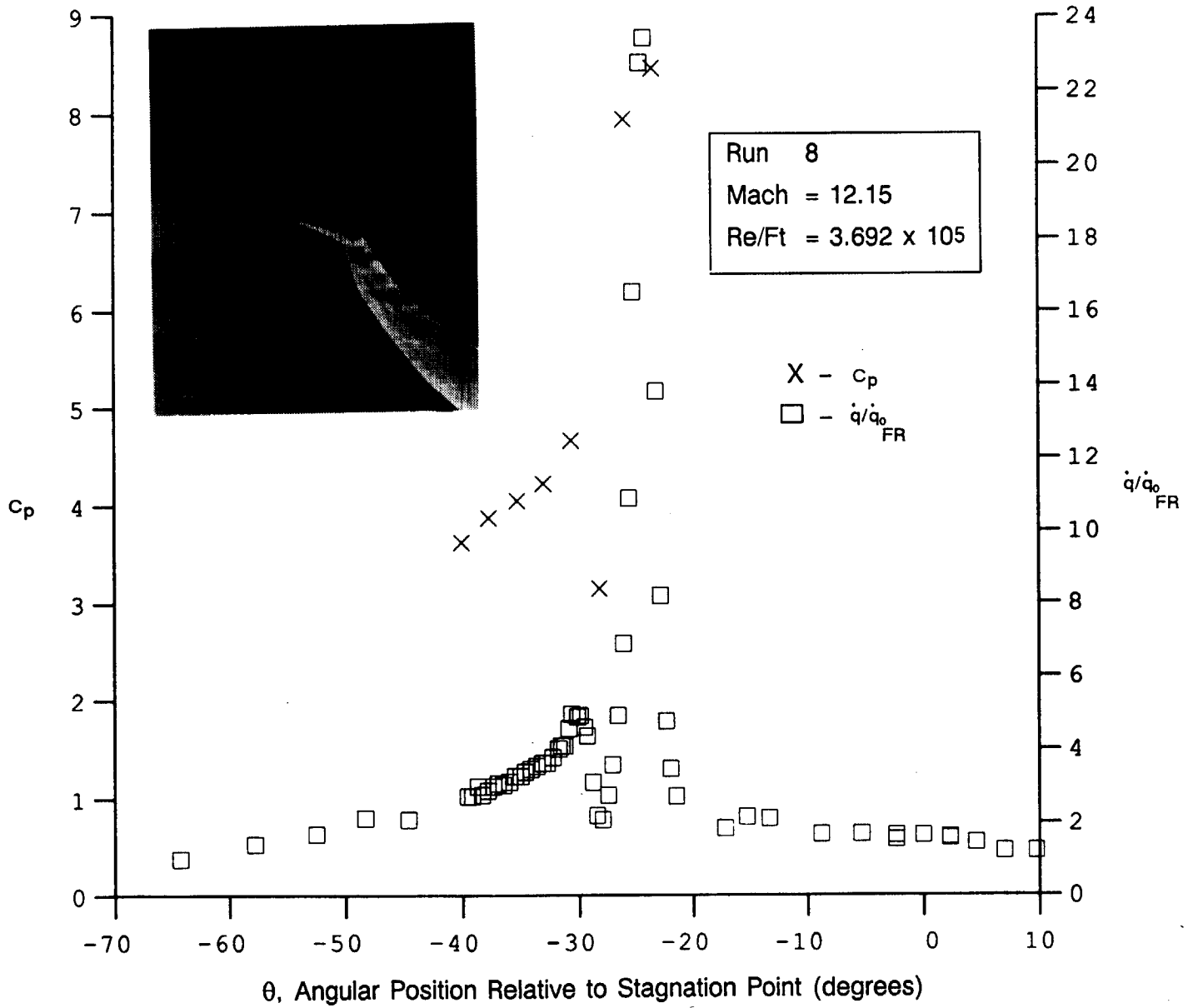


Figure 20a HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 12.15 FOR RUN 8

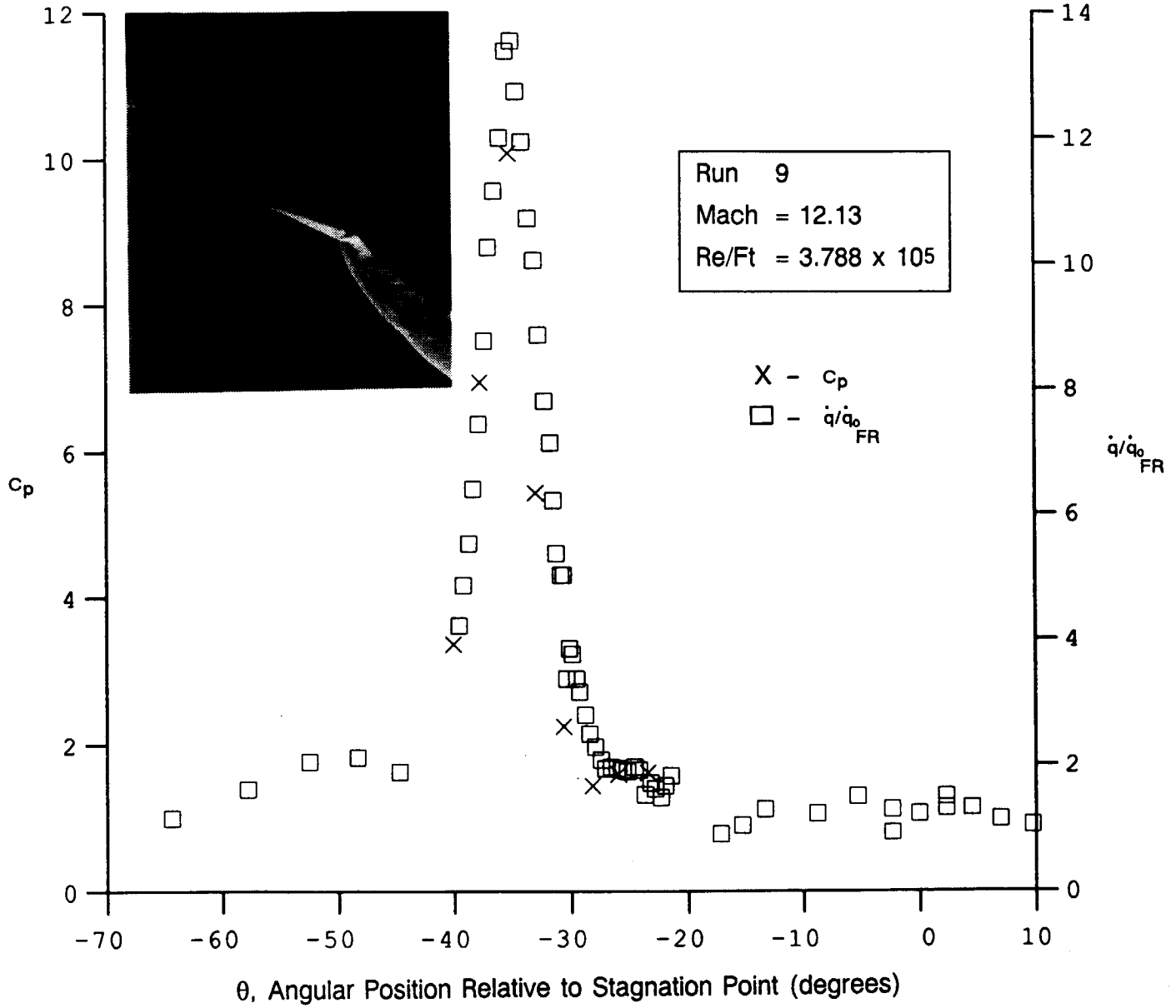


Figure 20b HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 12.13 FOR RUN 9

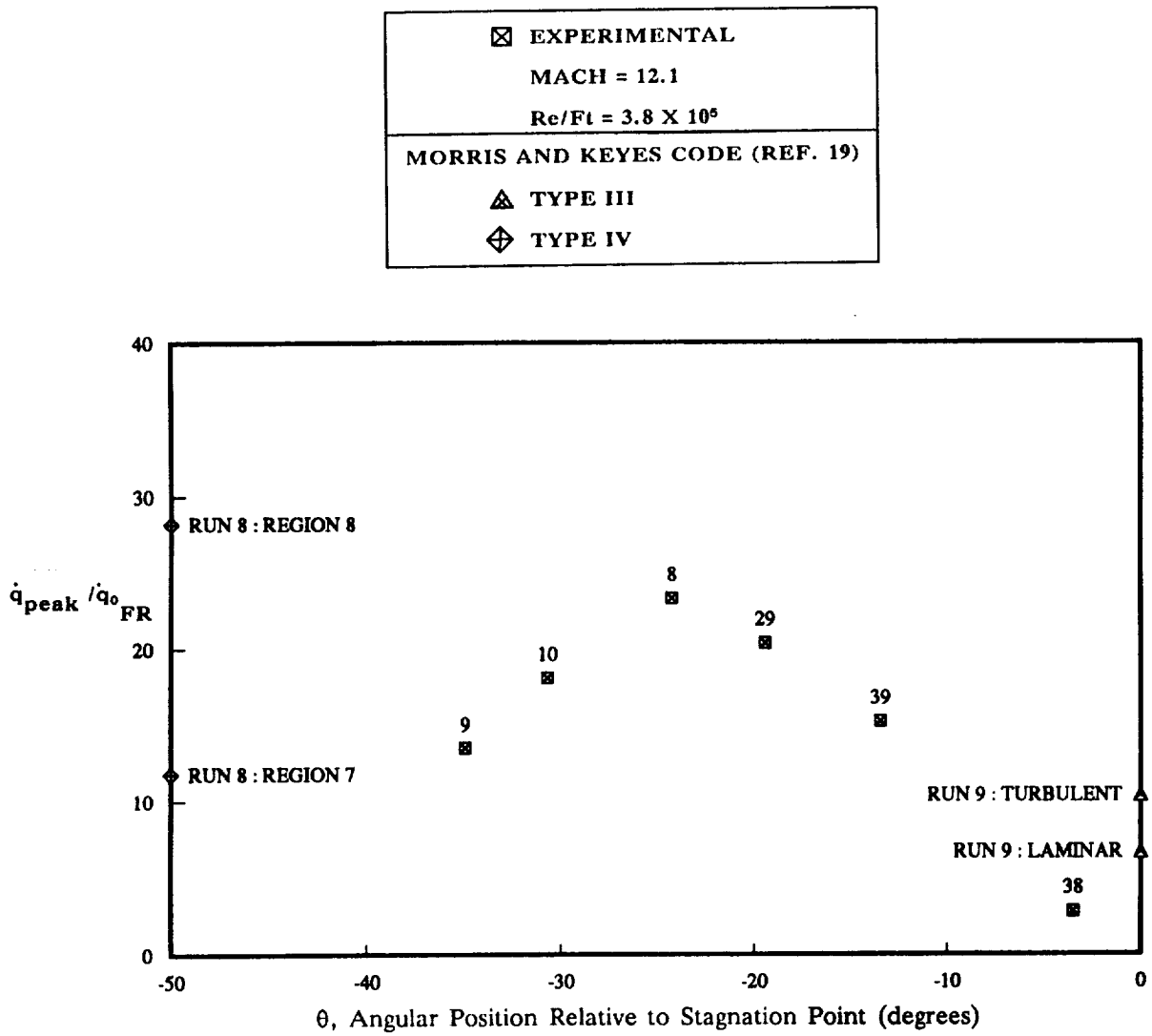


Figure 20c VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A SMOOTH HEMISPHERE FOR MACH 12.1 AND Re/Ft = 3.8 x 10^5

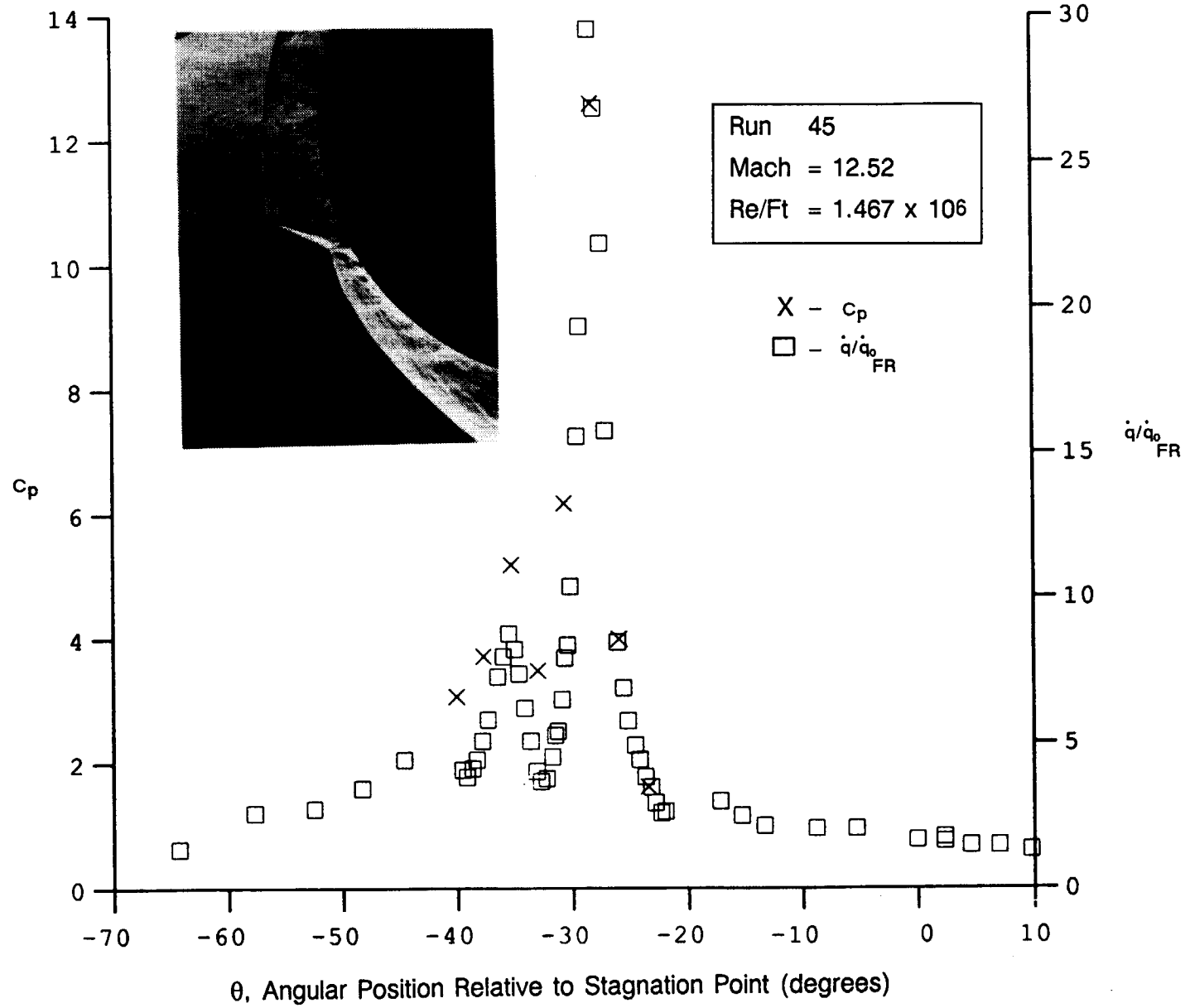


Figure 21a HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 12.52 FOR RUN 45

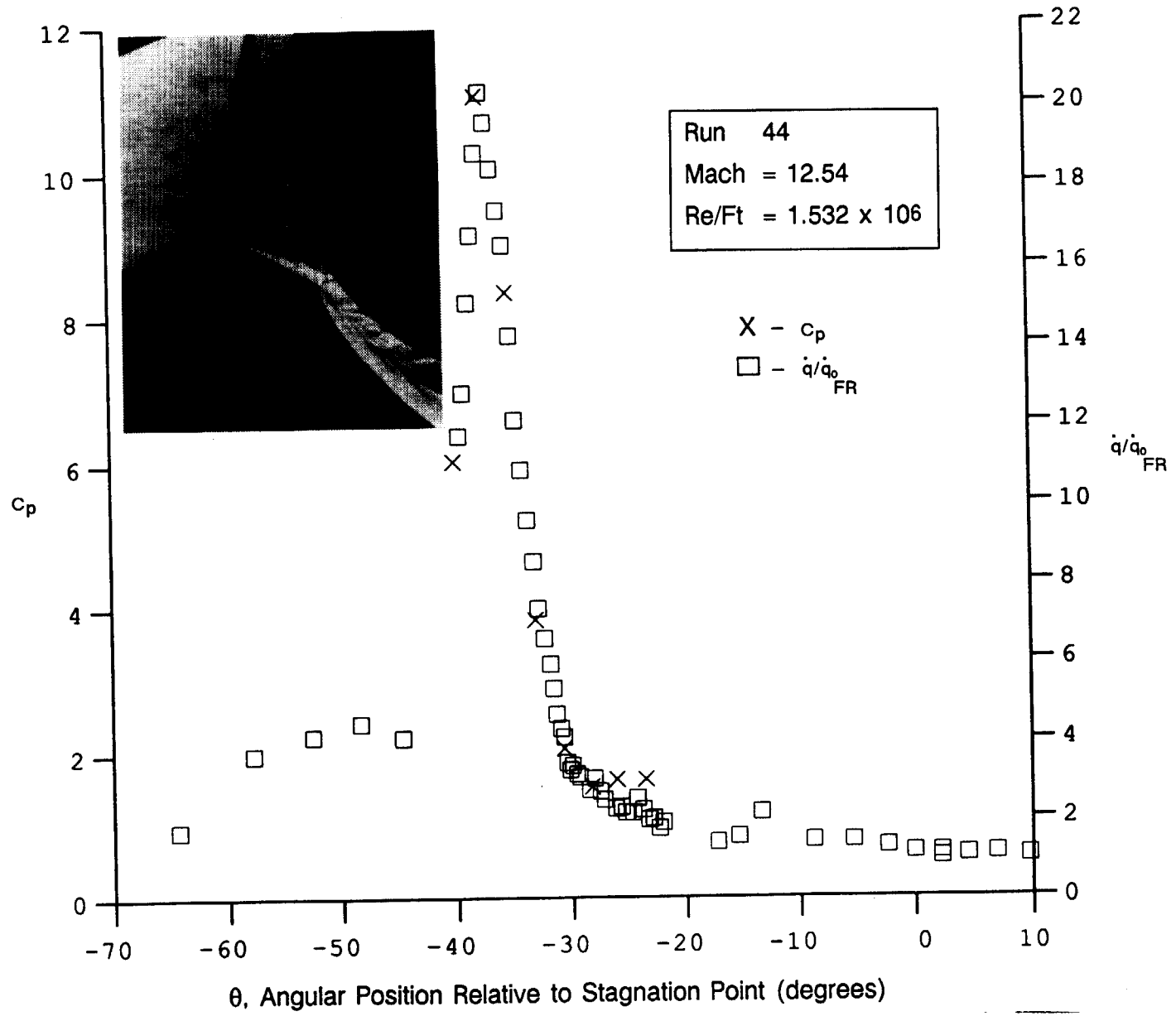


Figure 21b HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 12.54 FOR RUN 44

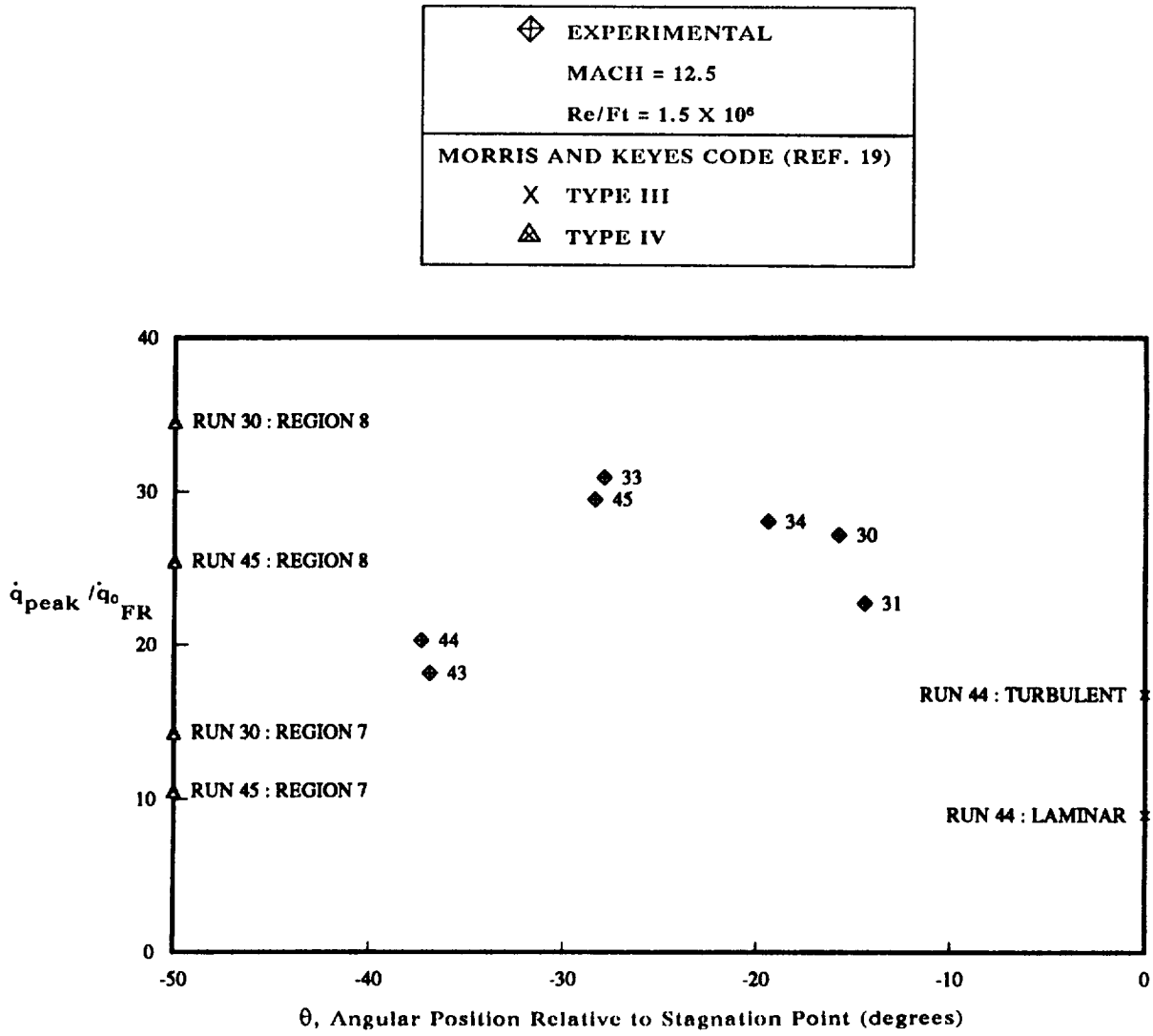


Figure 21c VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF A TURBULENT INTERACTION OVER A SMOOTH HEMISPHERE FOR MACH 12.5 AND Re/Ft = 1.5 x 10^6

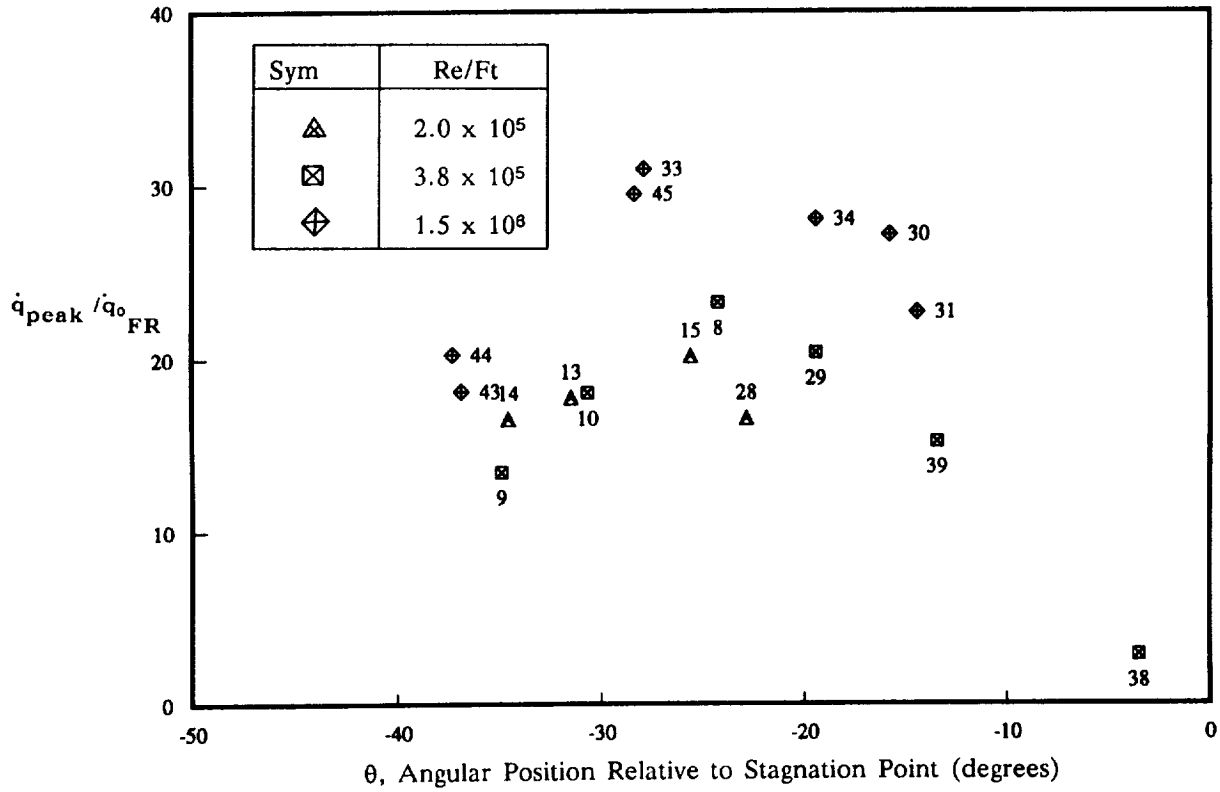


Figure 22 VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A SMOOTH HEMISPHERE FOR MACH 12 AT VARIOUS REYNOLDS NUMBERS

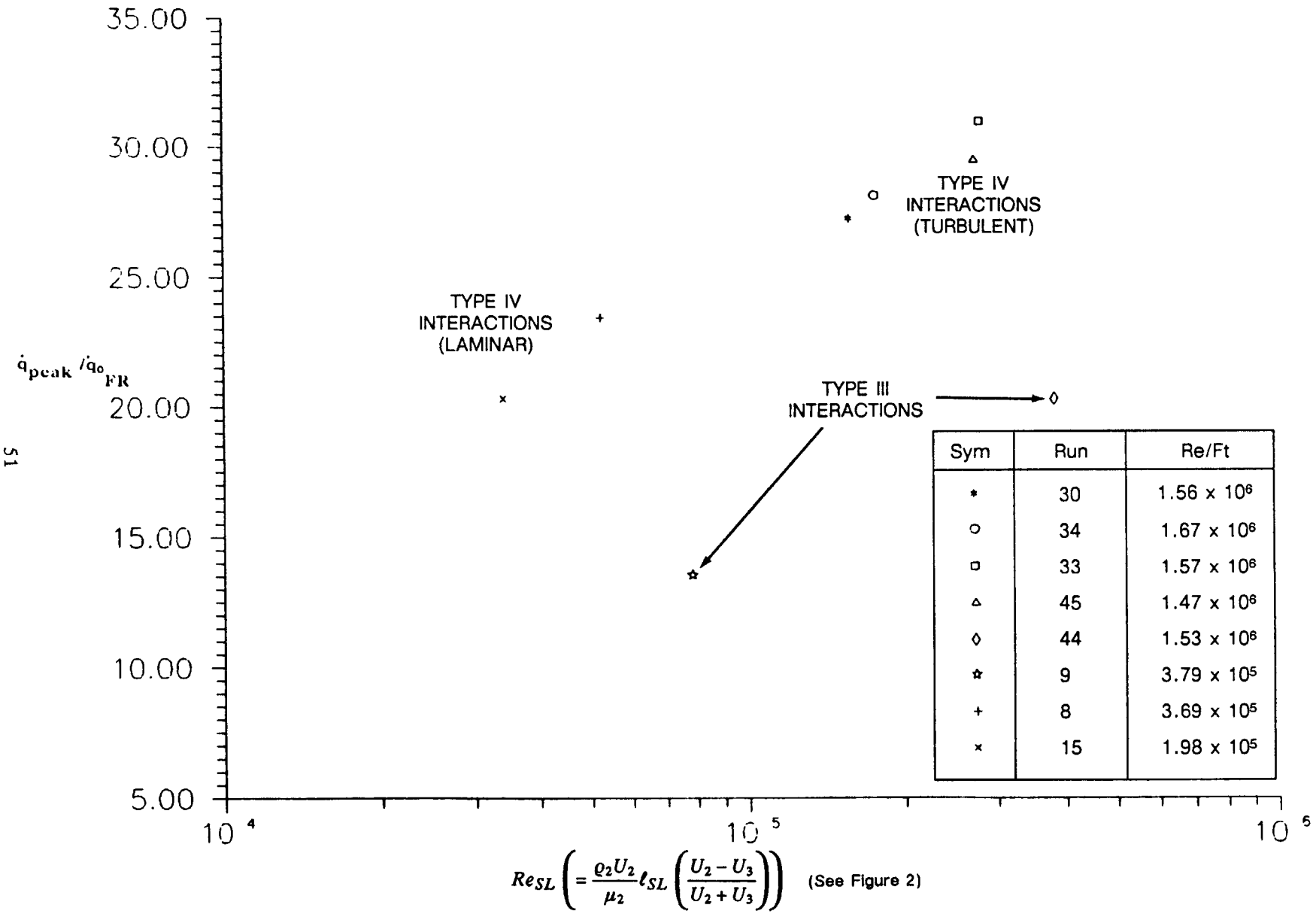


Figure 23 VARIATIONS OF PEAK HEATING WITH SHEAR LAYER REYNOLDS NUMBER FOR TYPE III AND TYPE IV INTERACTIONS OVER A SMOOTH HEMISPHERE AT MACH 12

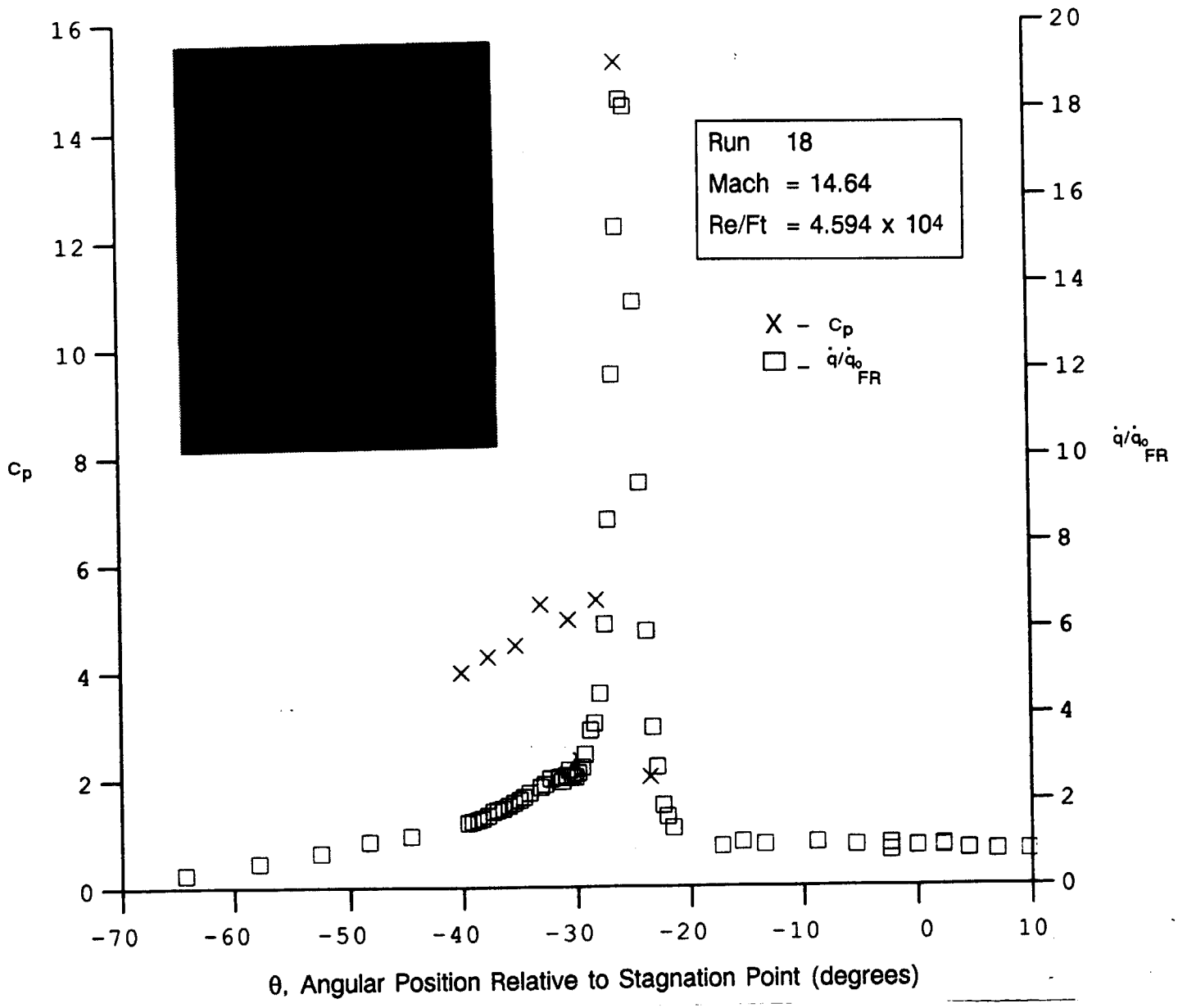


Figure 24a HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 14.64 FOR RUN 18

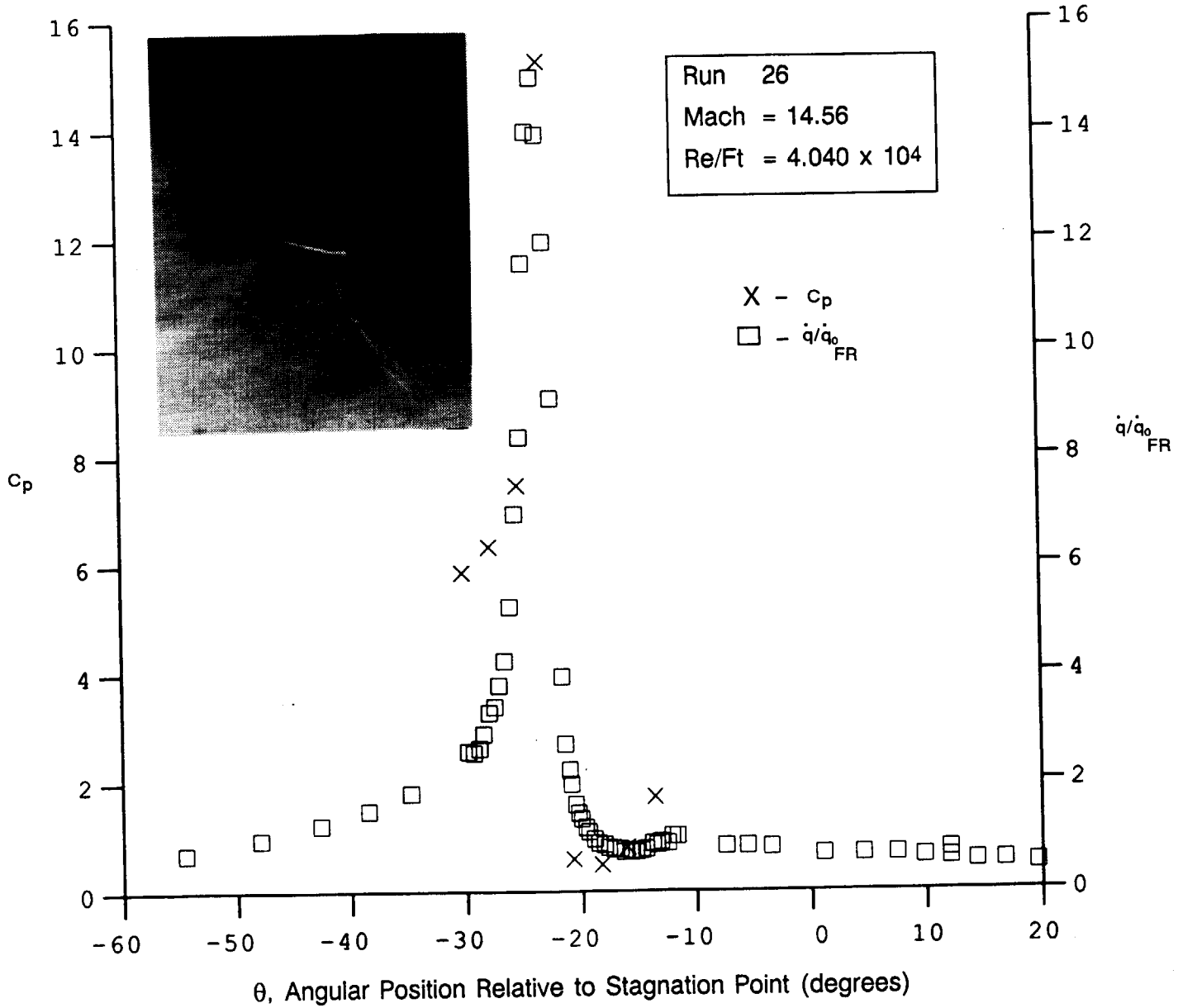


Figure 24b HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 14.56 FOR RUN 26

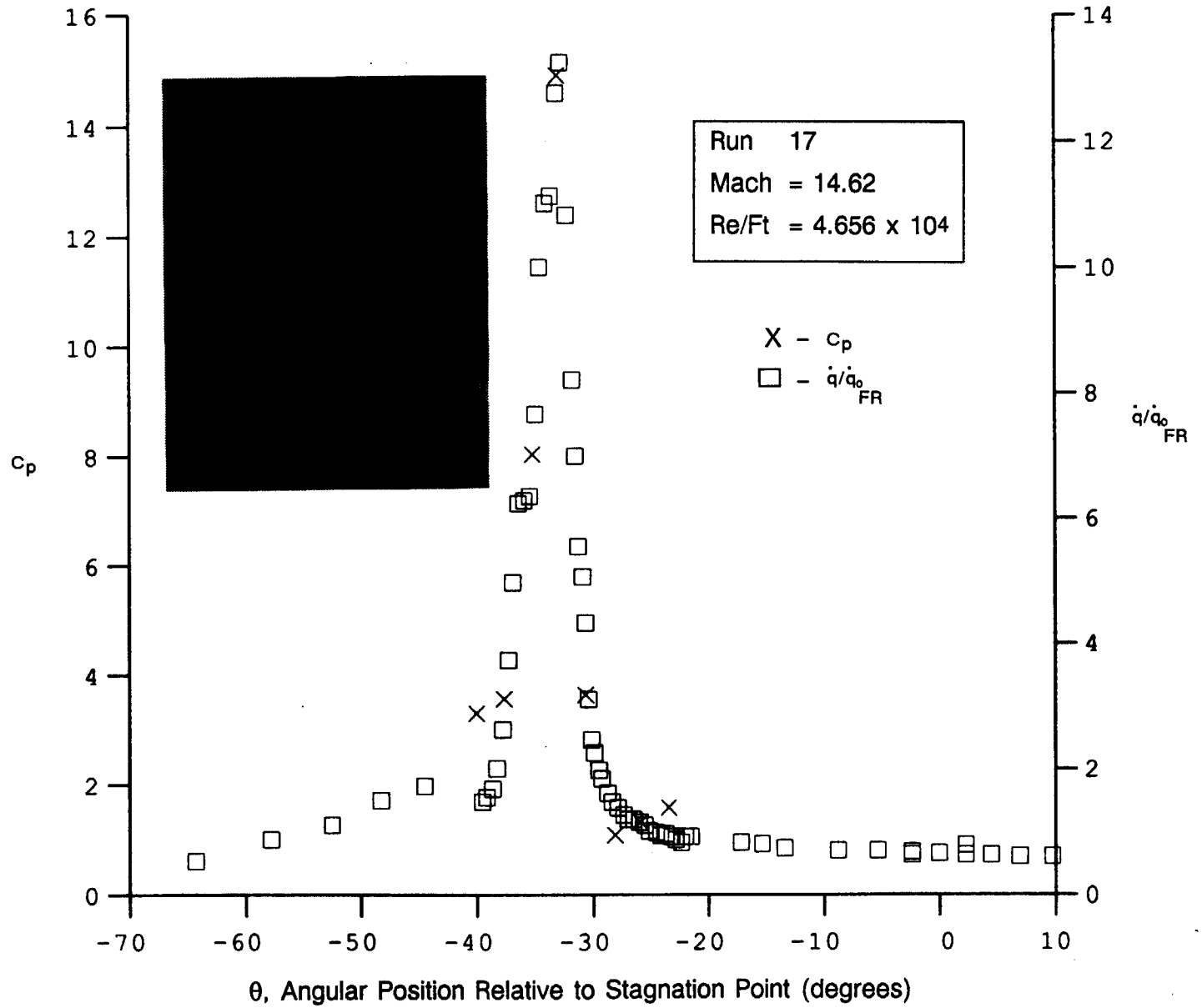


Figure 24c HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 14.62 FOR RUN 17

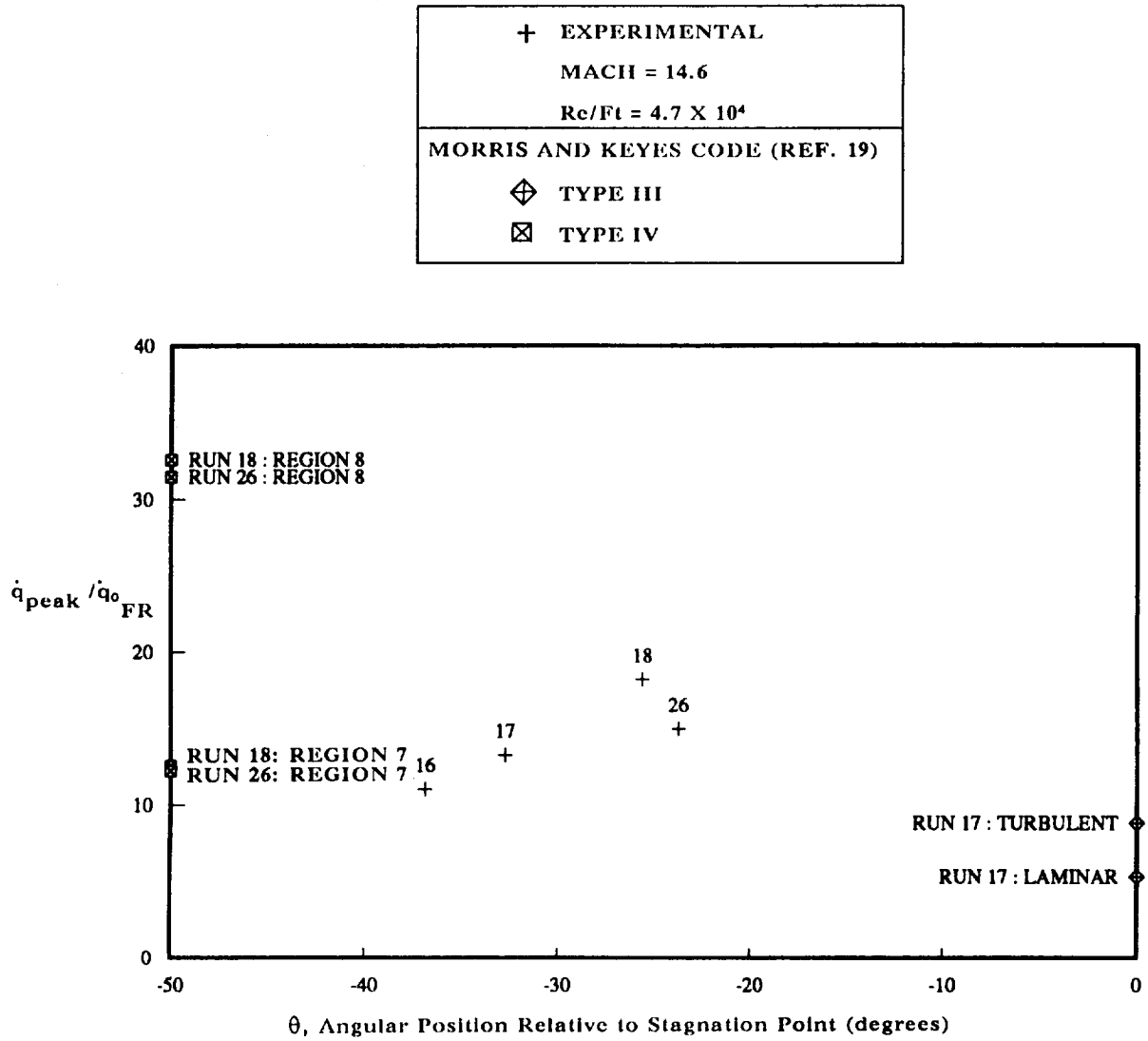


Figure 24d VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF A LAMINAR INTERACTION OVER A SMOOTH HEMISPHERE FOR MACH 14.6 AND Re/Ft = 4.7 x 10^4

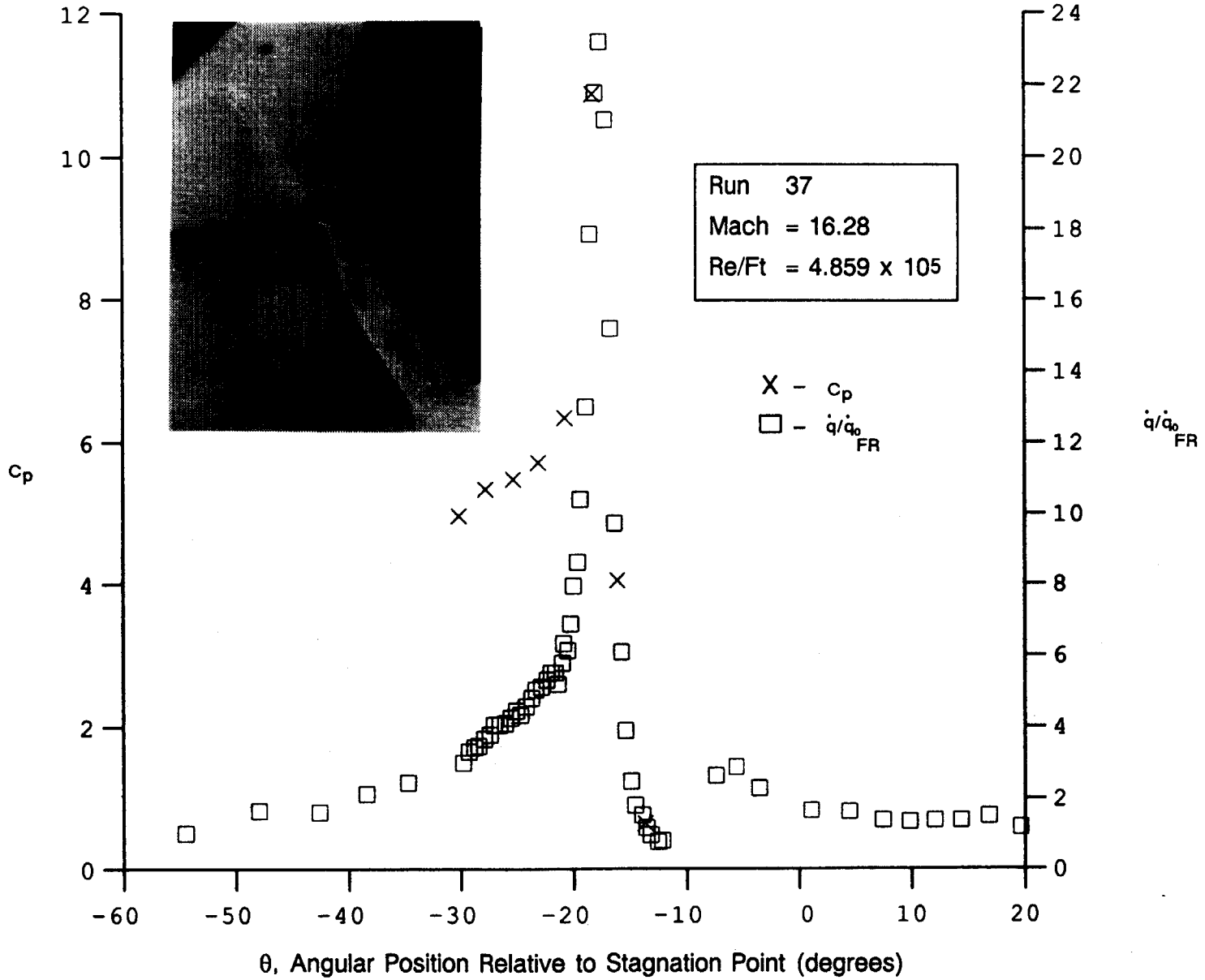


Figure 25a HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 16.28 FOR RUN 37

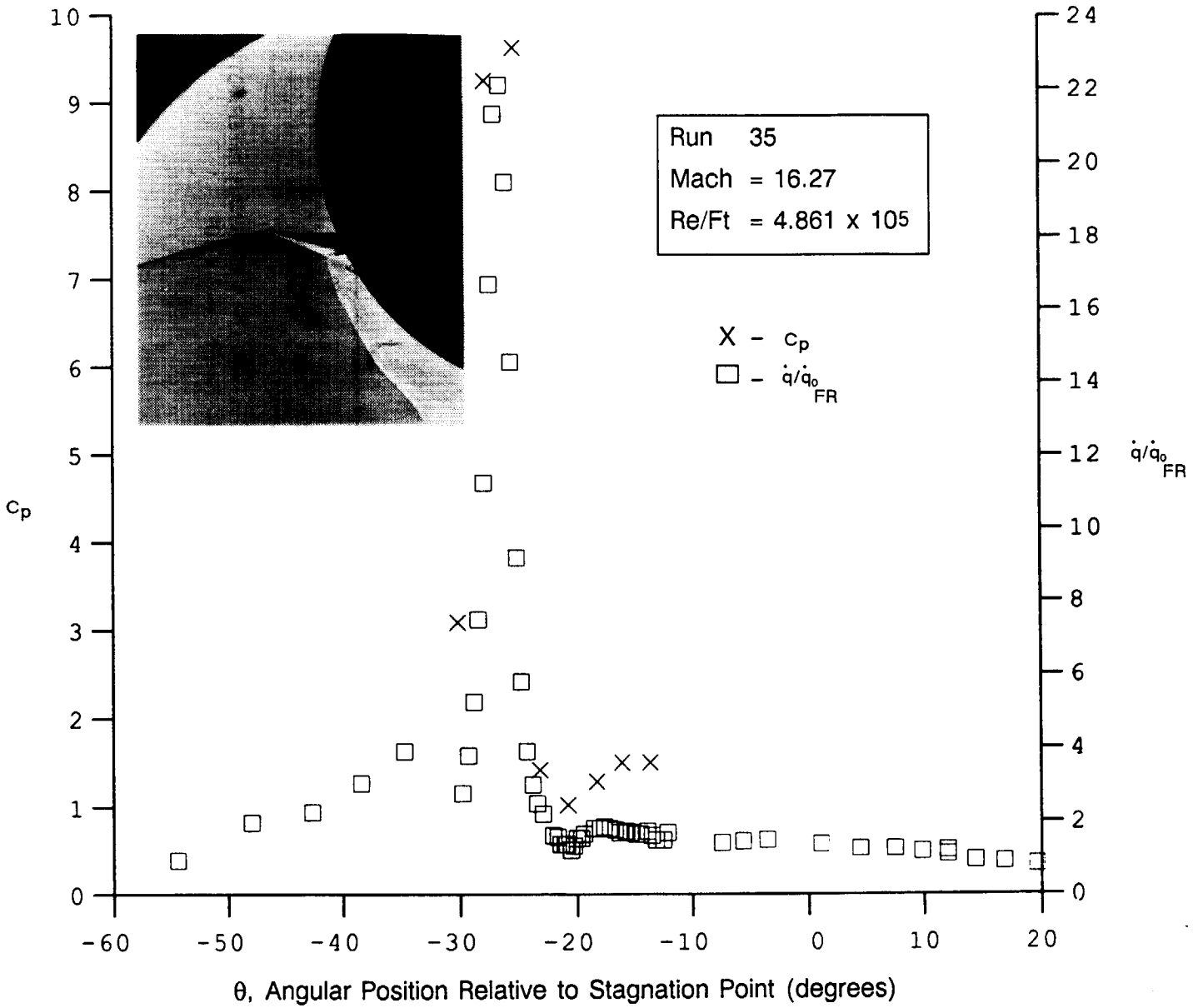


Figure 25b HEAT AND PRESSURE DISTRIBUTIONS IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A SMOOTH HEMISPHERE AT MACH 16.27 FOR RUN 35

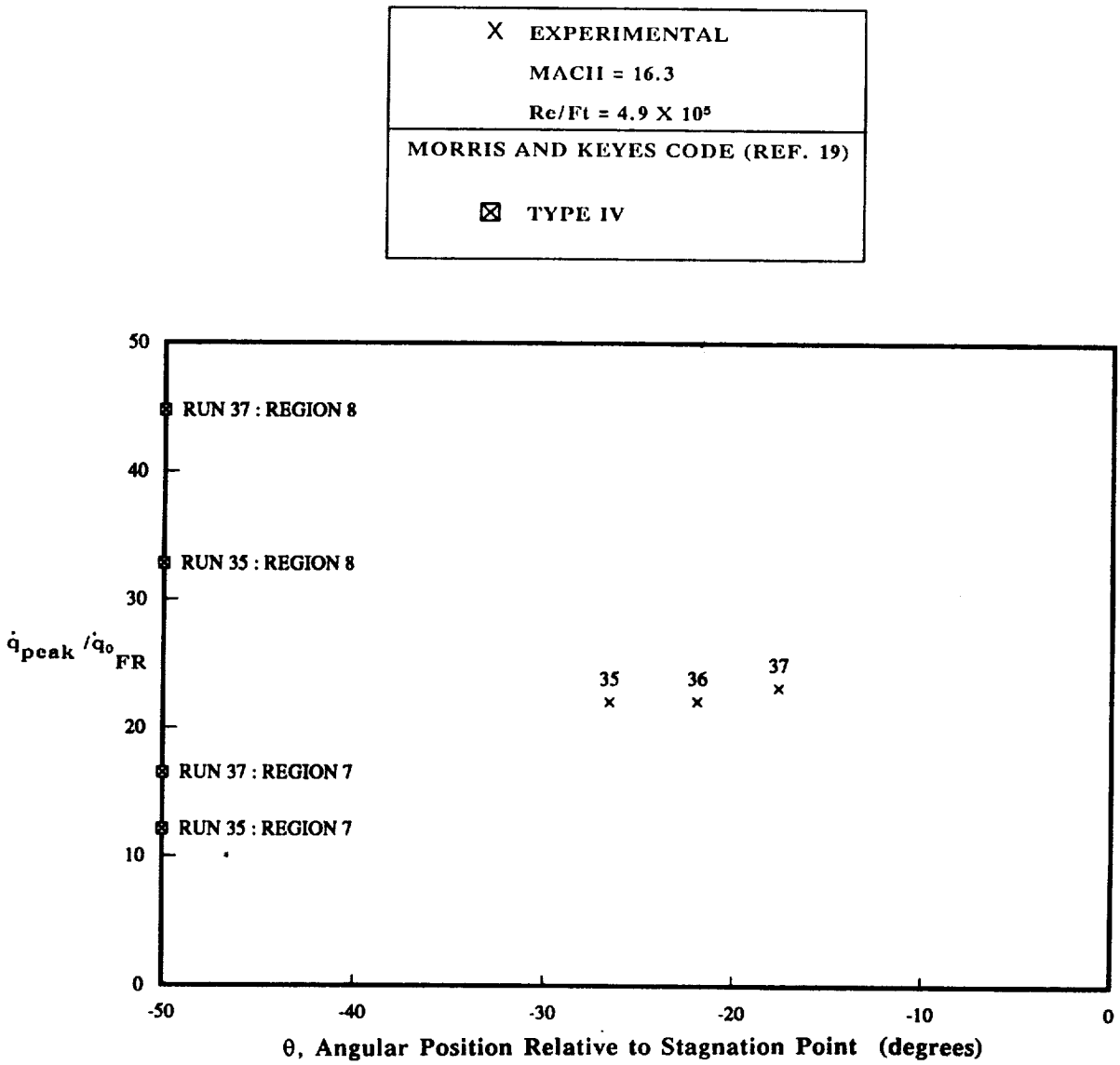


Figure 25c VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF A LAMINAR INTERACTION OVER A SMOOTH HEMISPHERE FOR MACH 16.3 AND Re/Ft = 4.9 x 10^5

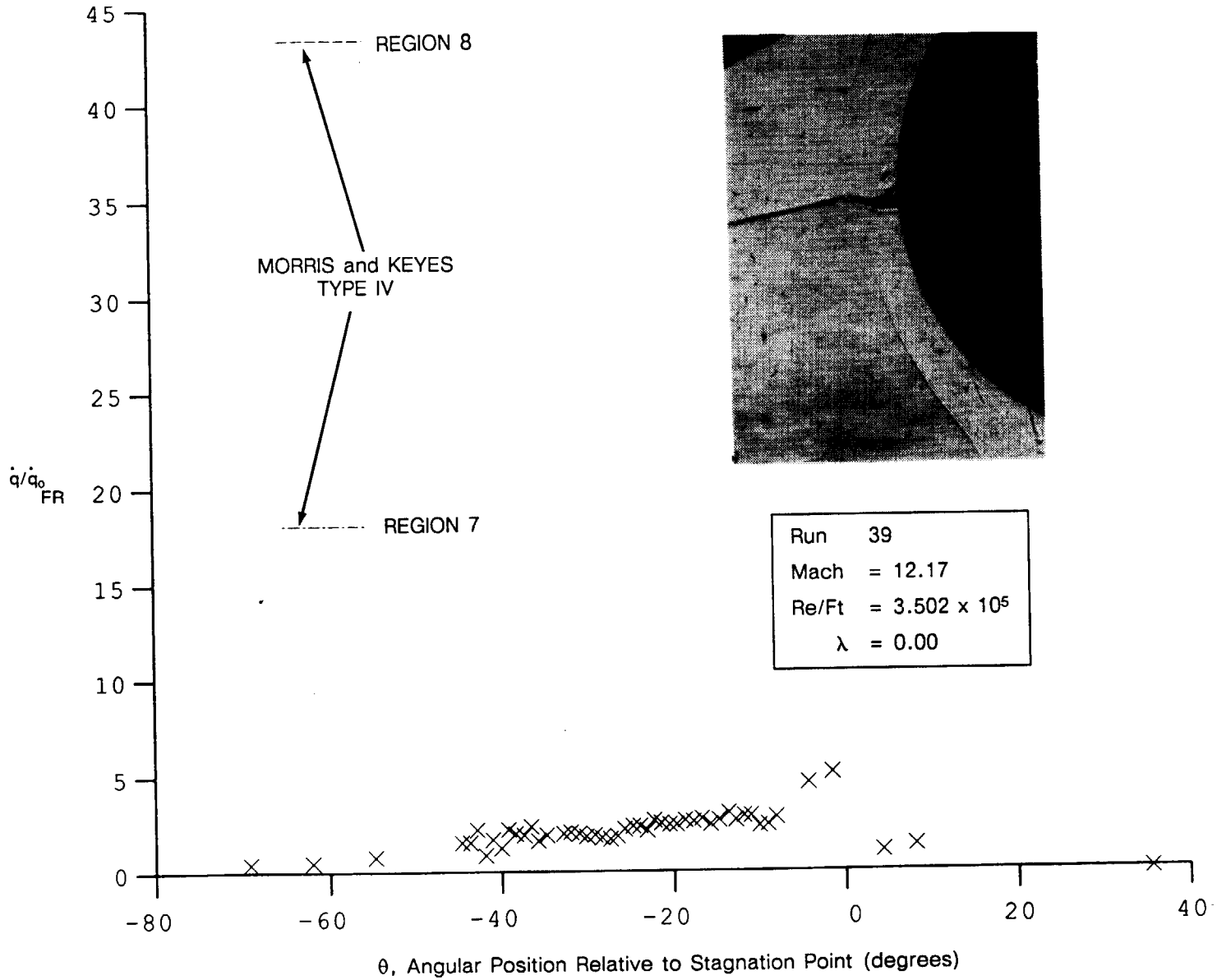


Figure 26a HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITHOUT BLOWING AT MACH 12 FOR RUN 39

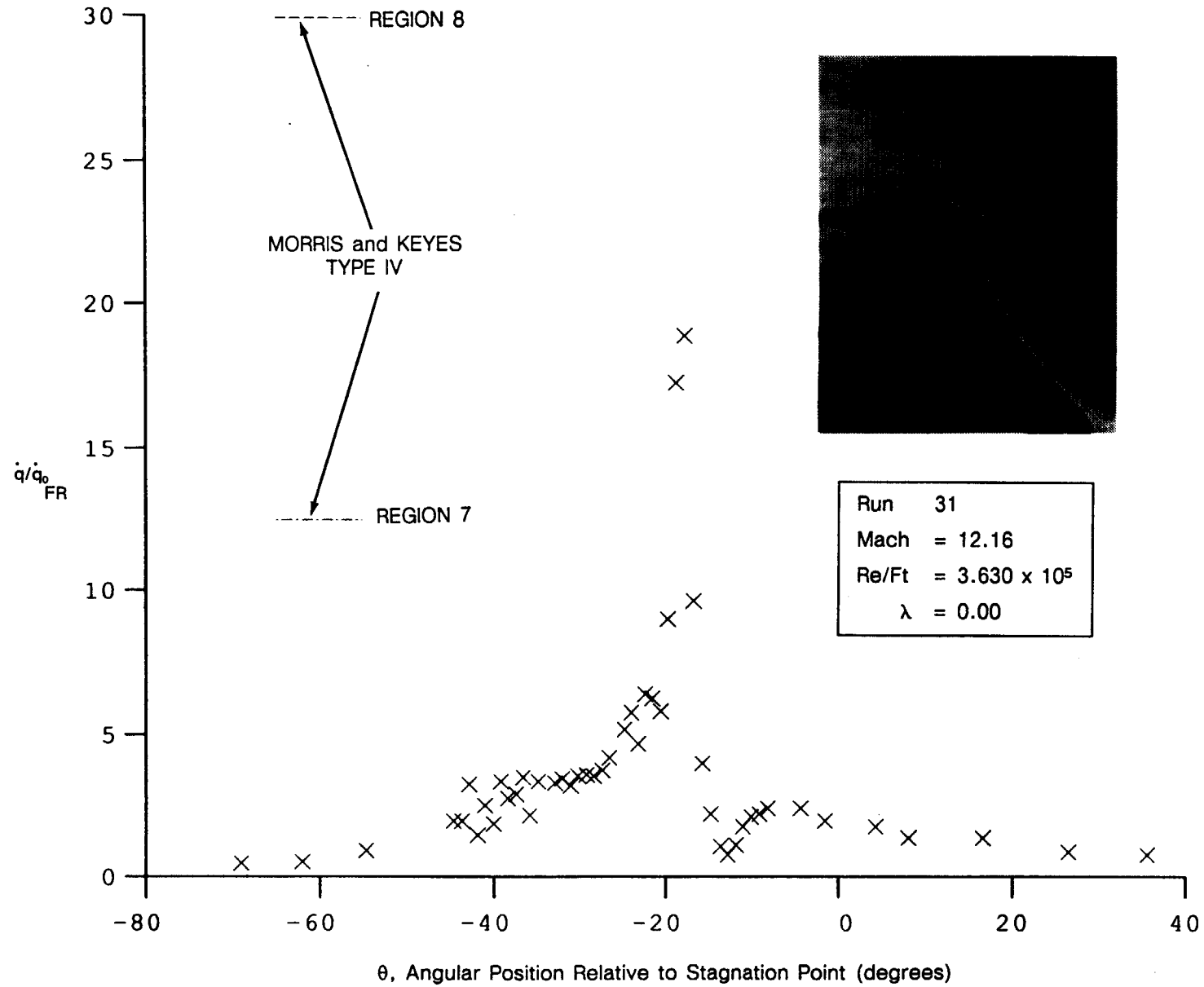


Figure 26b HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITHOUT BLOWING AT MACH 12 FOR RUN 31

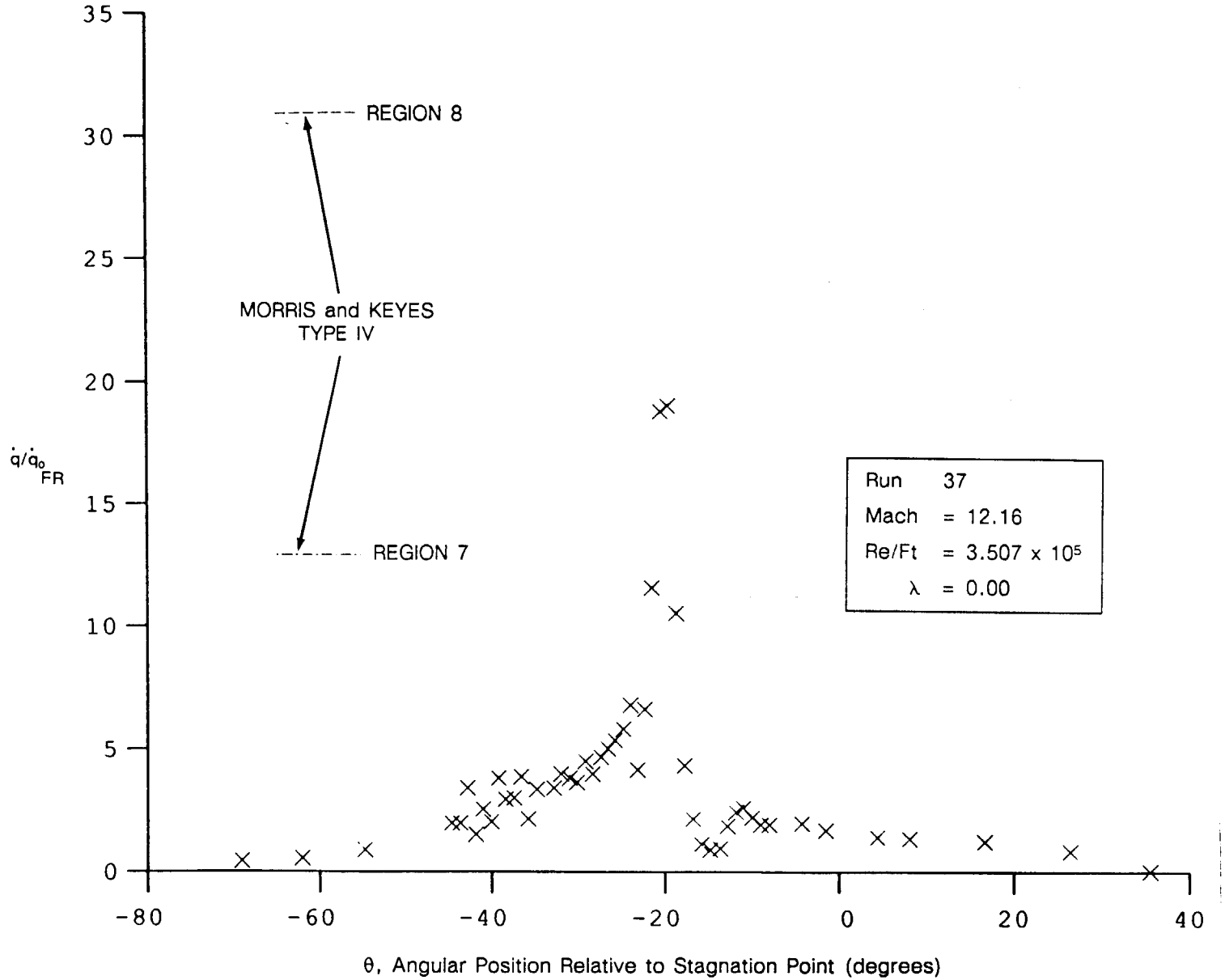


Figure 26c HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITHOUT BLOWING AT MACH 12 FOR RUN 37

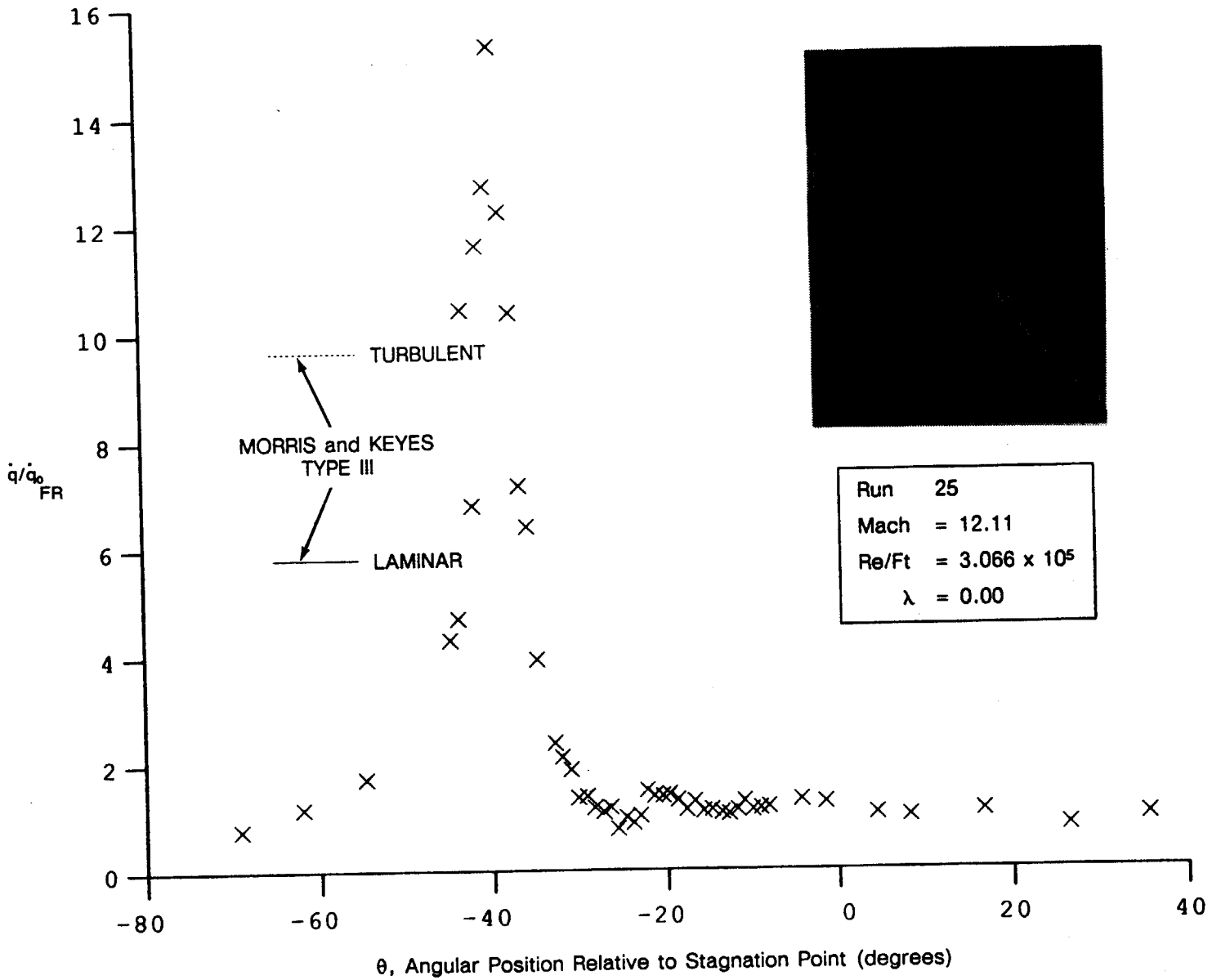


Figure 26d HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITHOUT BLOWING AT MACH 12 FOR RUN 25

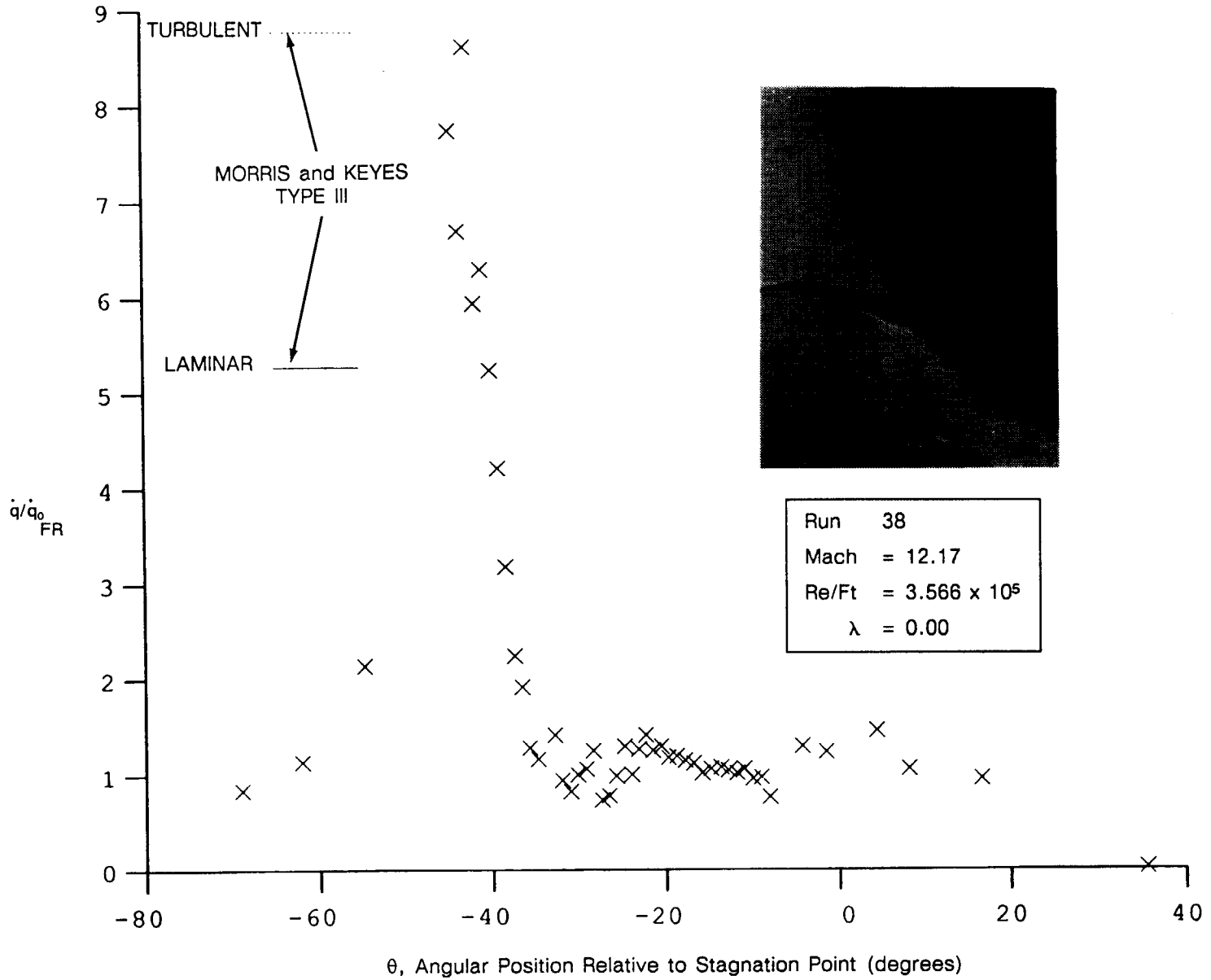


Figure 26e HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITHOUT BLOWING AT MACH 12 FOR RUN 38

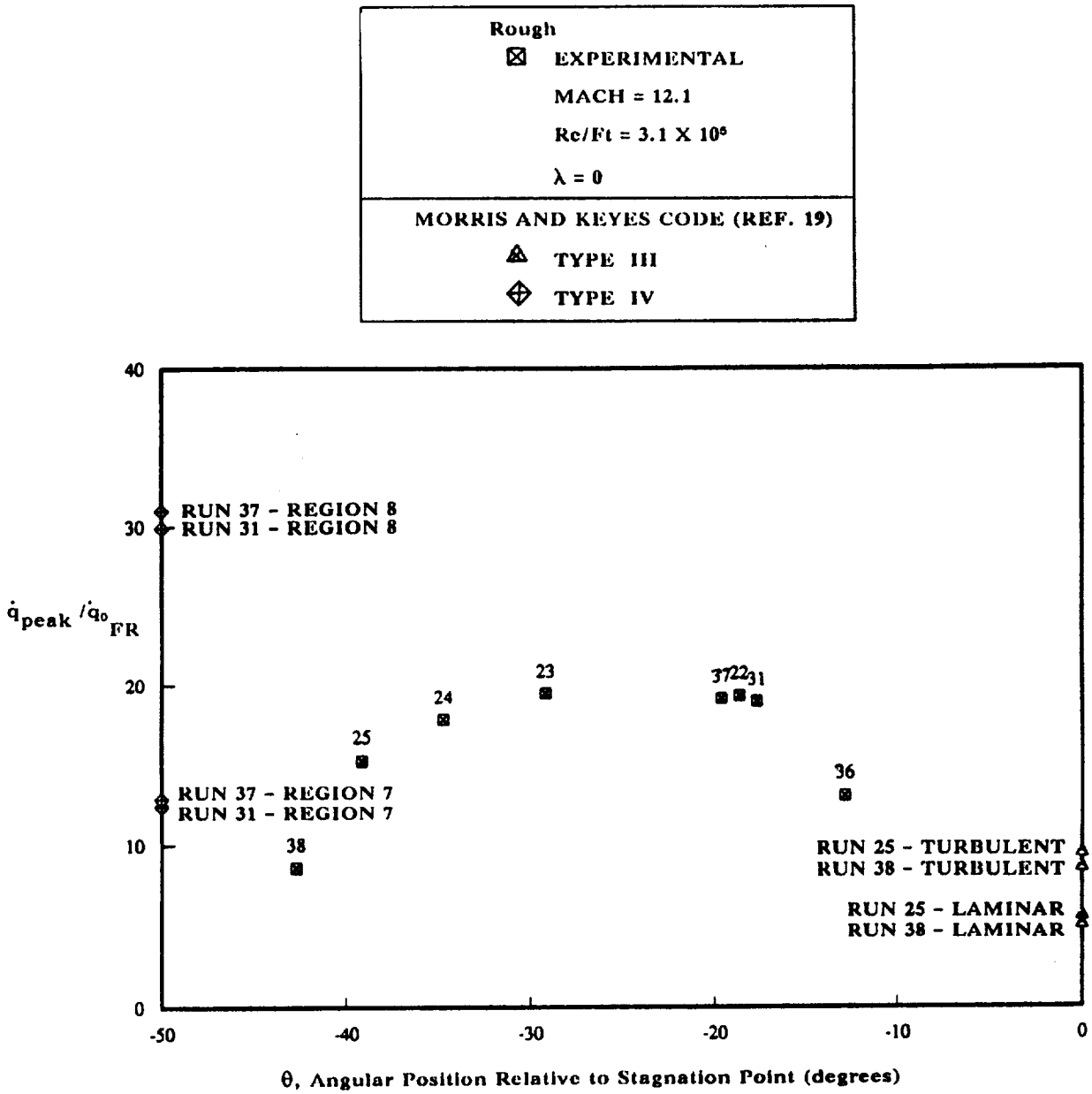


Figure 26f VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A TRANSPIRATION-COOLED HEMISPHERE FOR BLOWING PARAMETER, $\lambda = 0$, AT MACH 12

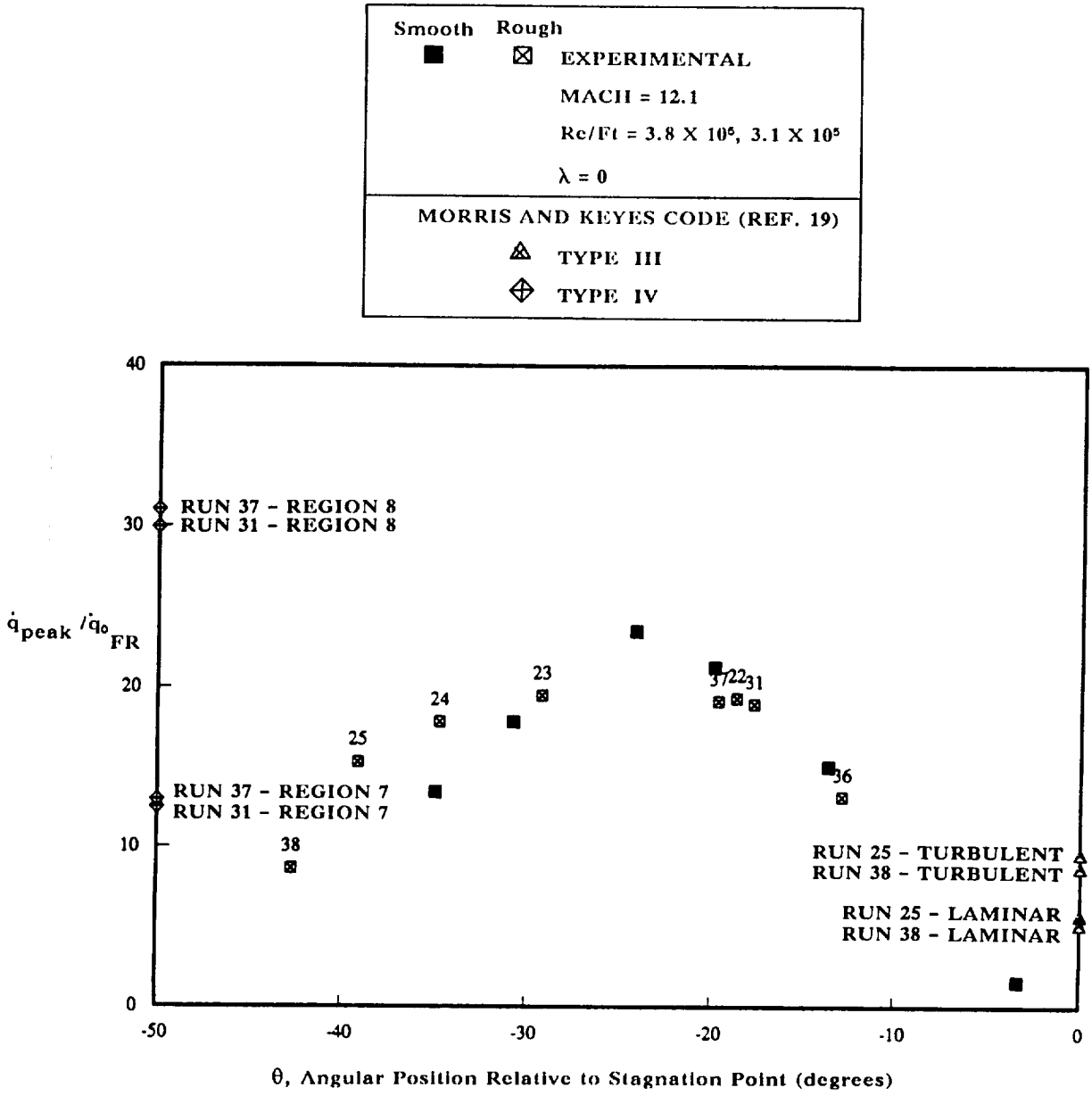


Figure 27 COMPARISON OF THE VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A SMOOTH AND A TRANSPIRATION-COOLED (ROUGH) HEMISPHERE FOR BLOWING PARAMETER, $\lambda = 0$, AT MACH 12

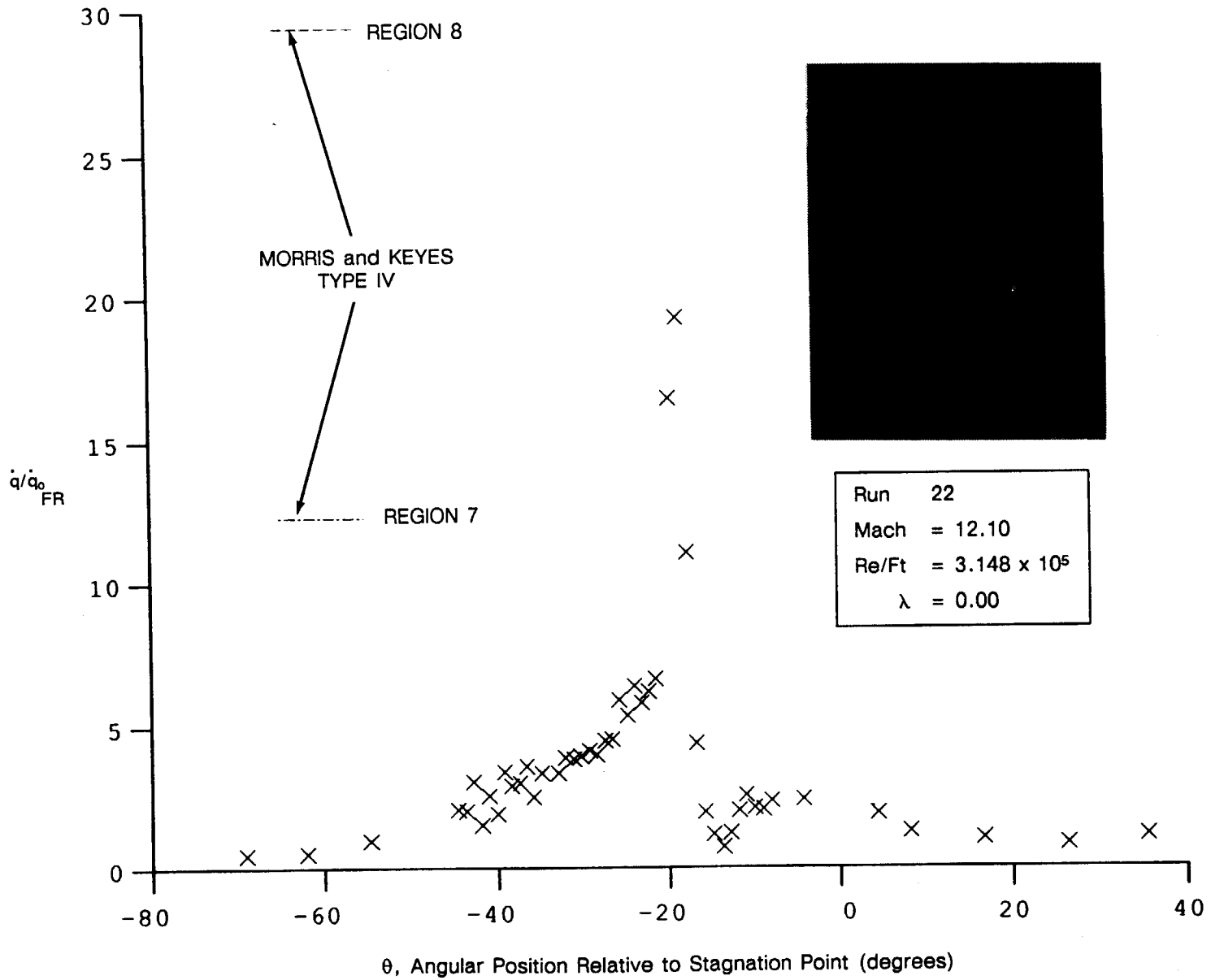


Figure 28a HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0 AT MACH 12 FOR RUN 22

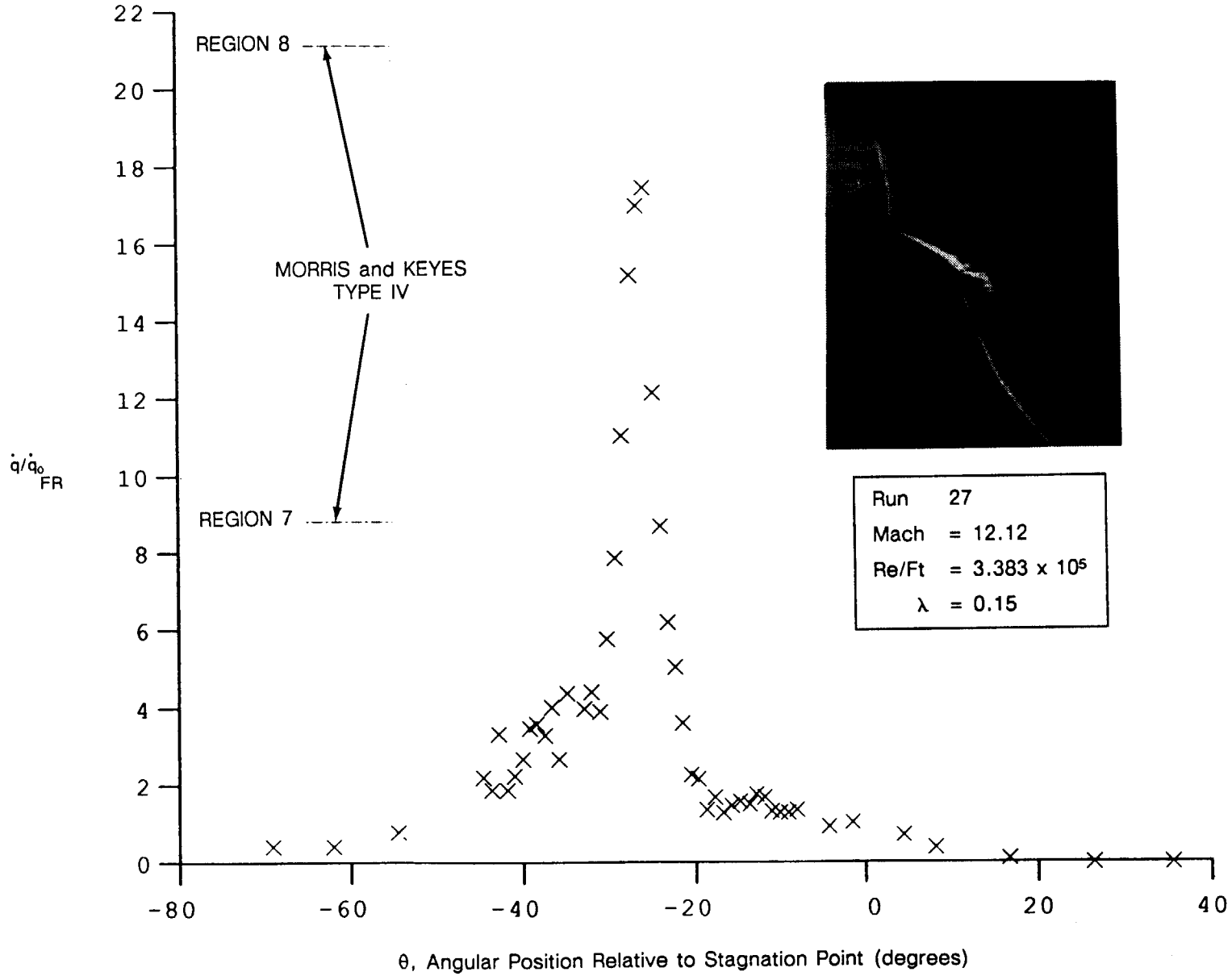


Figure 28b HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.15 AT MACH 12 FOR RUN 27

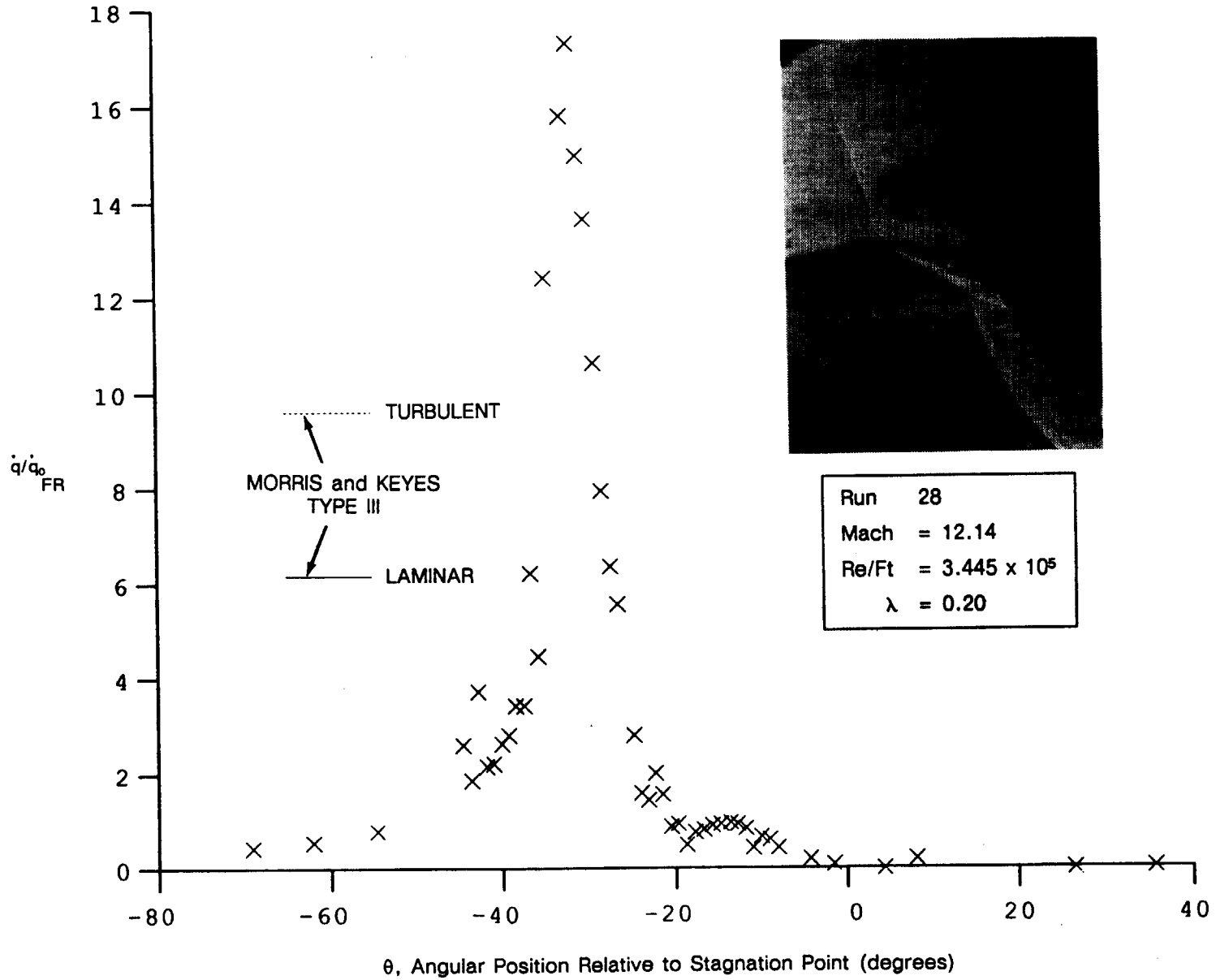


Figure 28c HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.20 AT MACH 12 FOR RUN 28

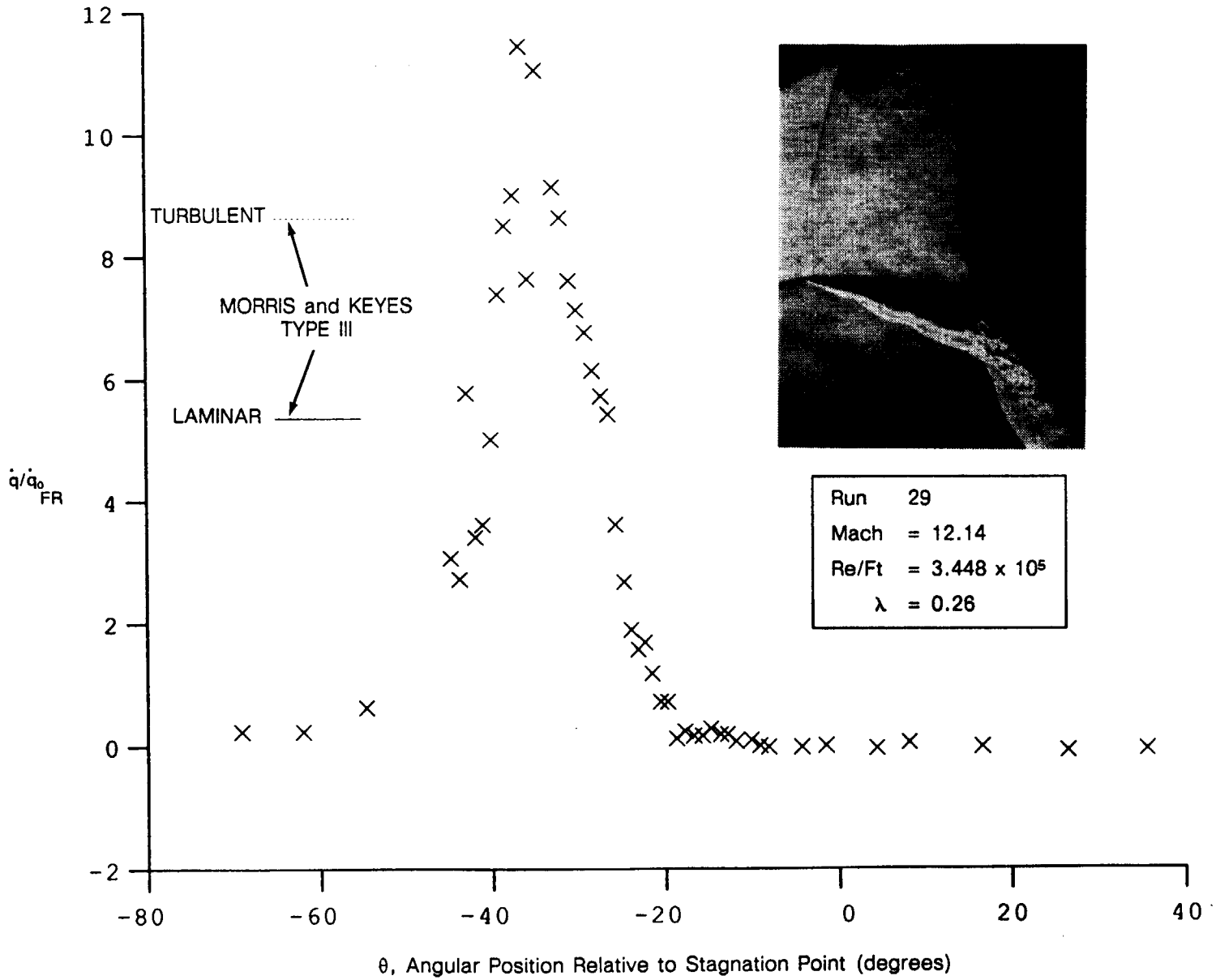


Figure 28d HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.26 AT MACH 12 FOR RUN 29

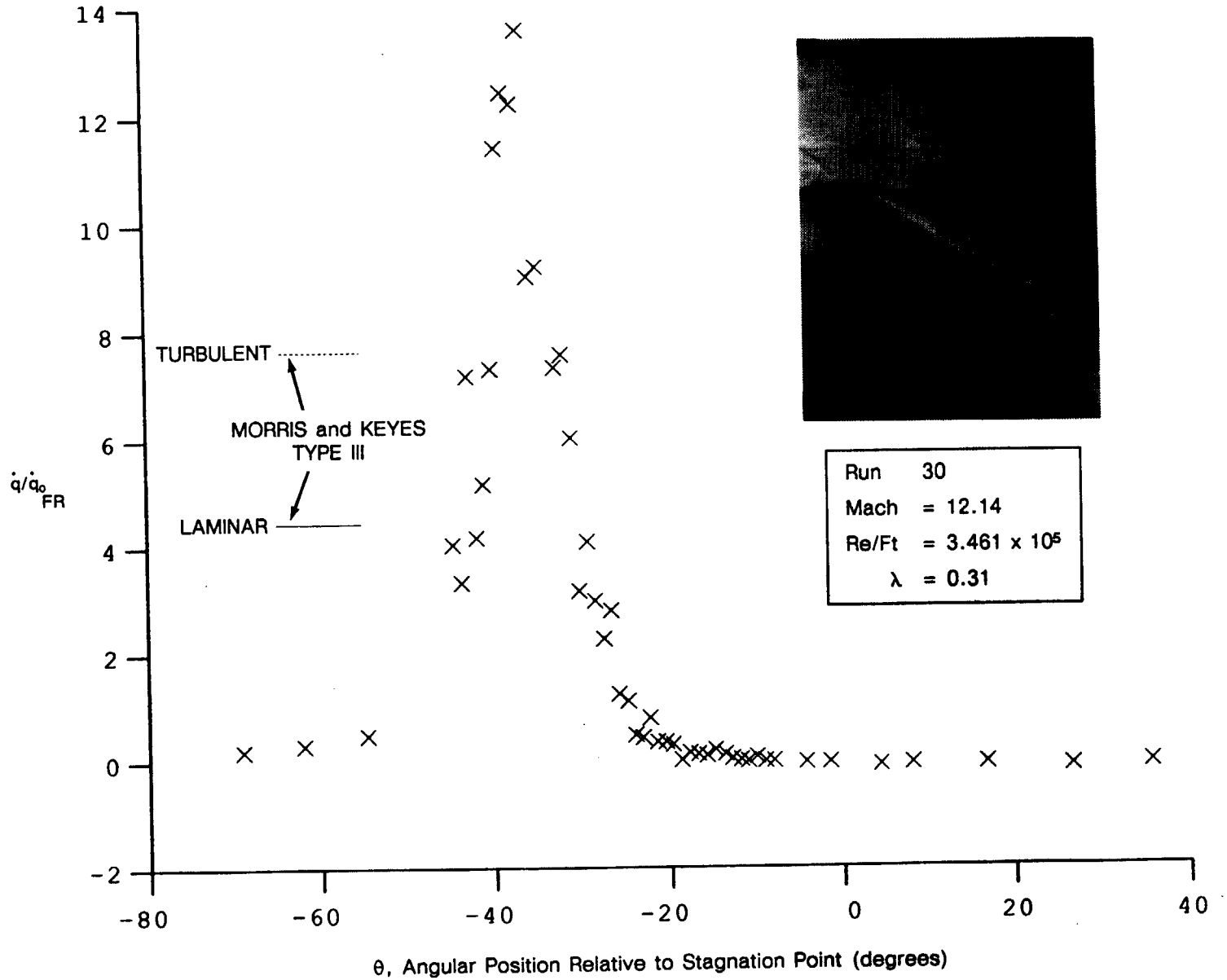


Figure 28e HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.31 AT MACH 12 FOR RUN 30

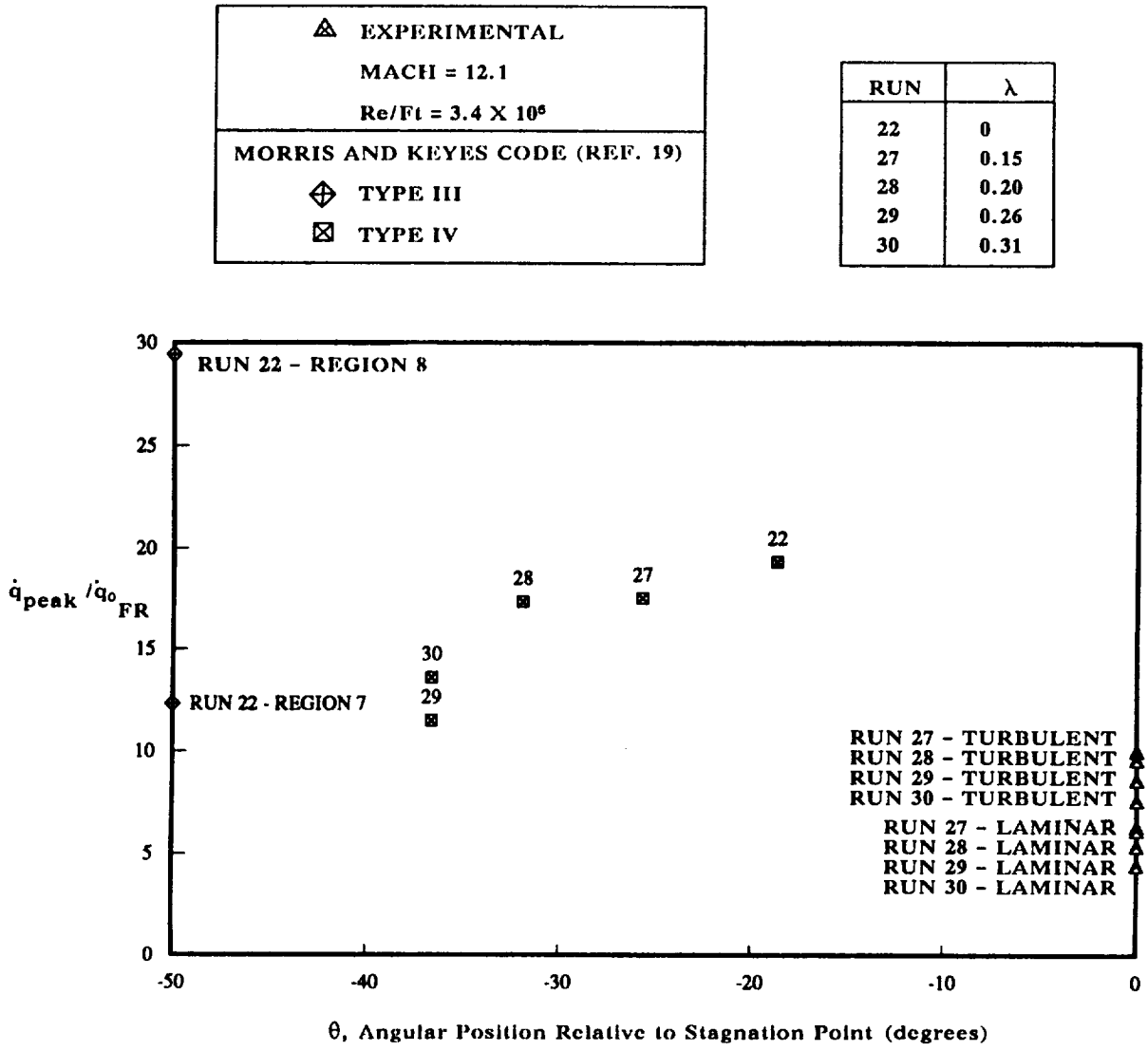


Figure 28f VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A TRANSPIRATION-COOLED HEMISPHERE FOR VARIOUS BLOWING PARAMETERS, λ, AT A FIXED MODEL CONFIGURATION AT MACH 12

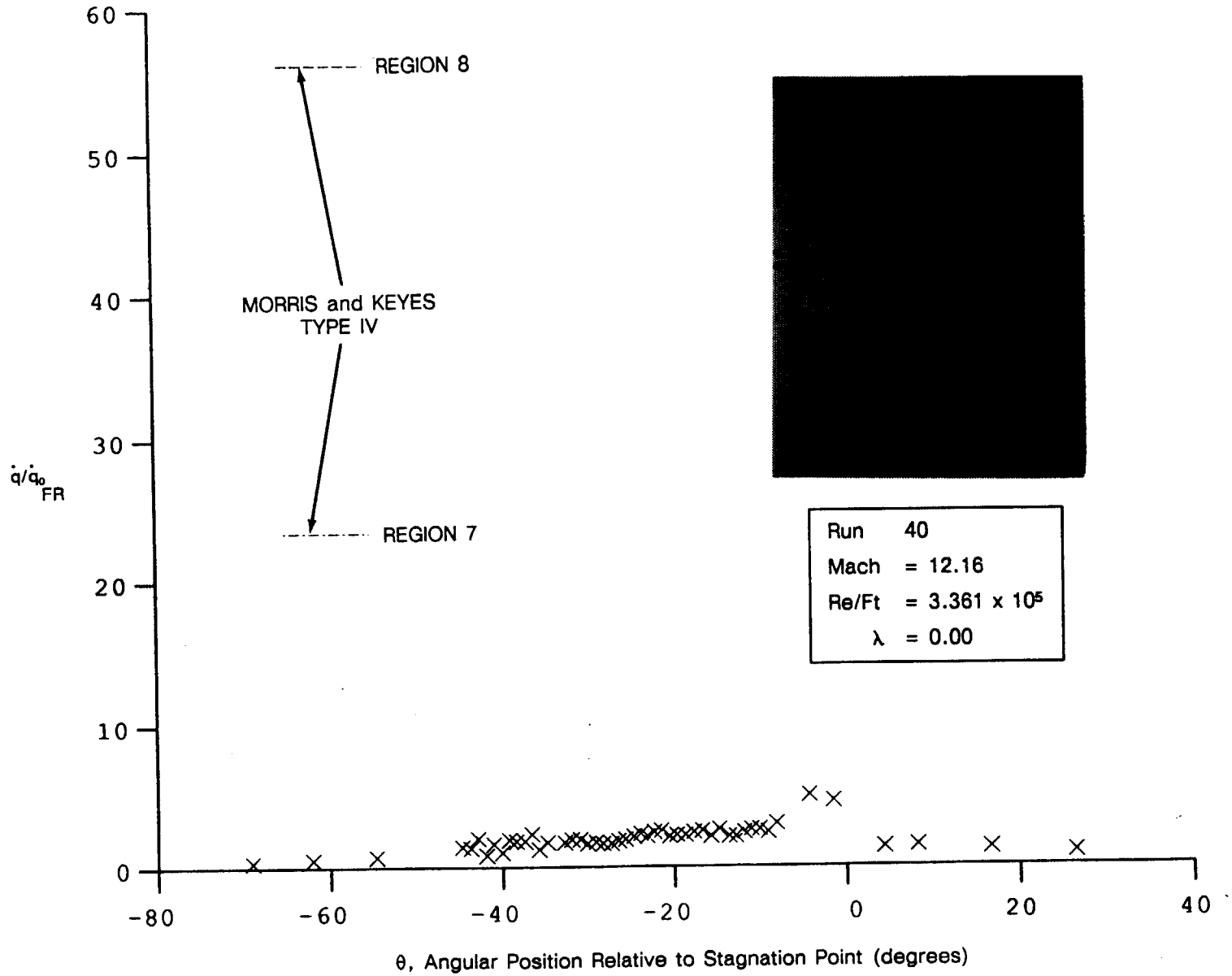


Figure 29a HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0 AT MACH 12 FOR RUN 40

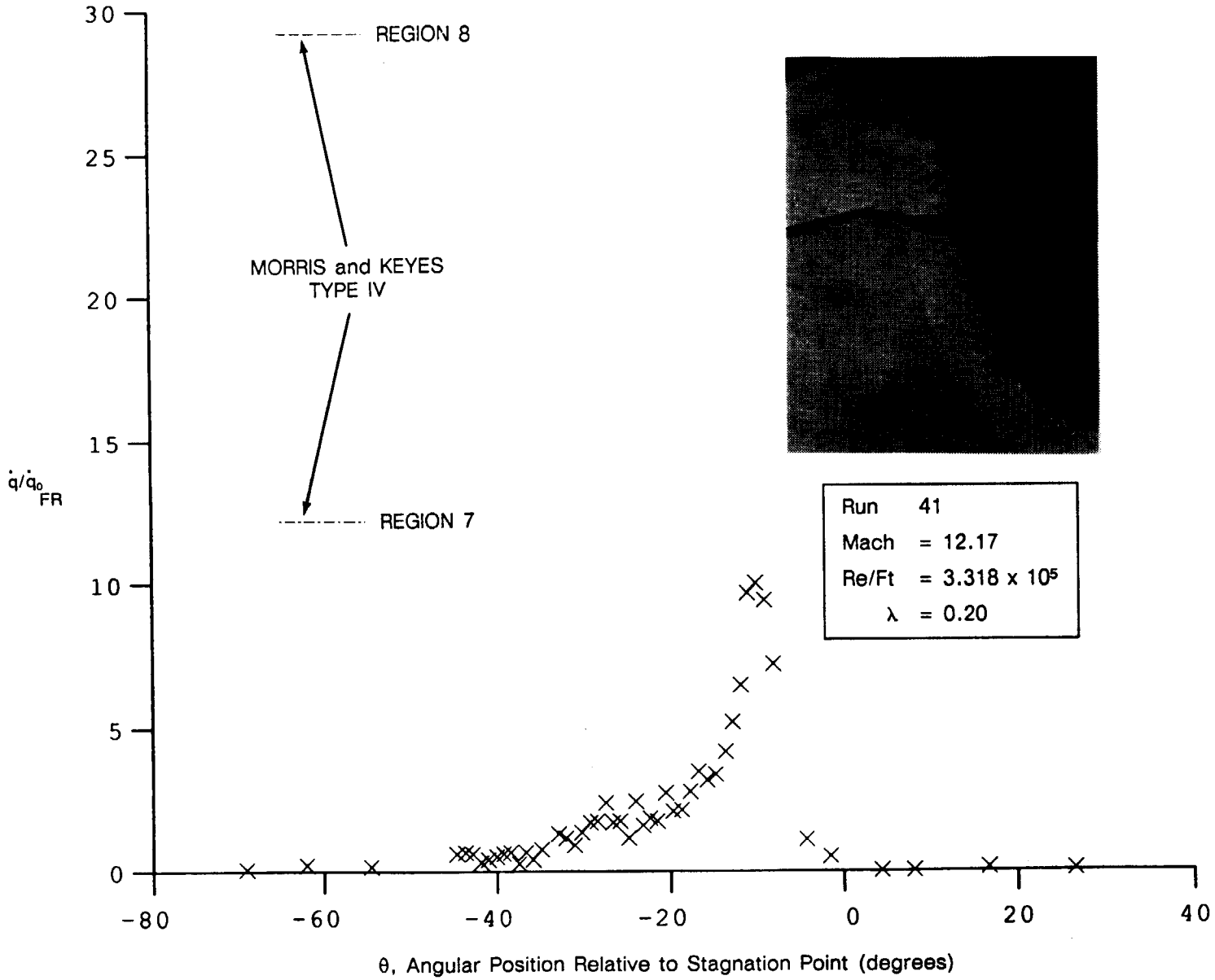


Figure 29b HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.20 AT MACH 12 FOR RUN 41

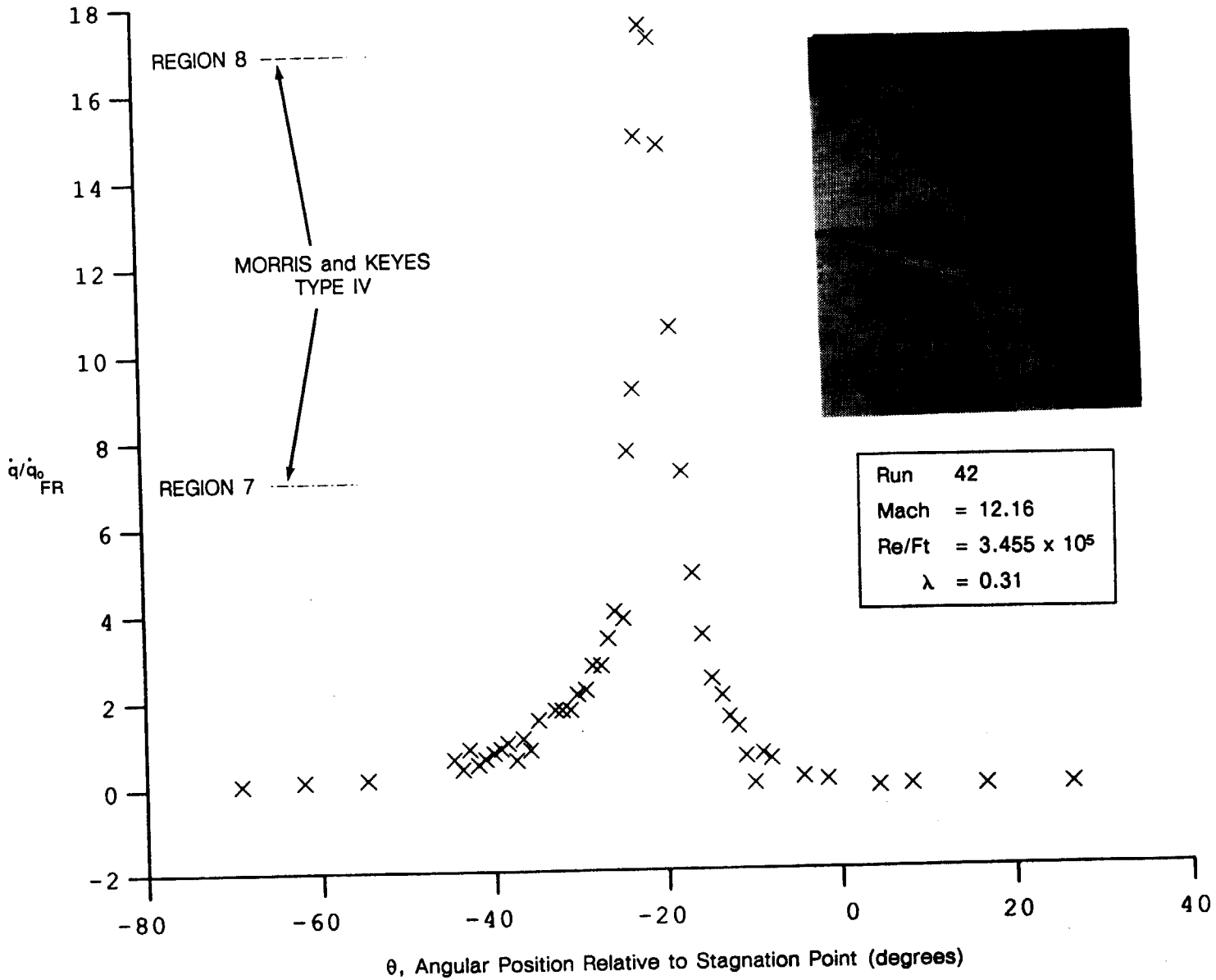


Figure 29c HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.31 AT MACH 12 FOR RUN 42

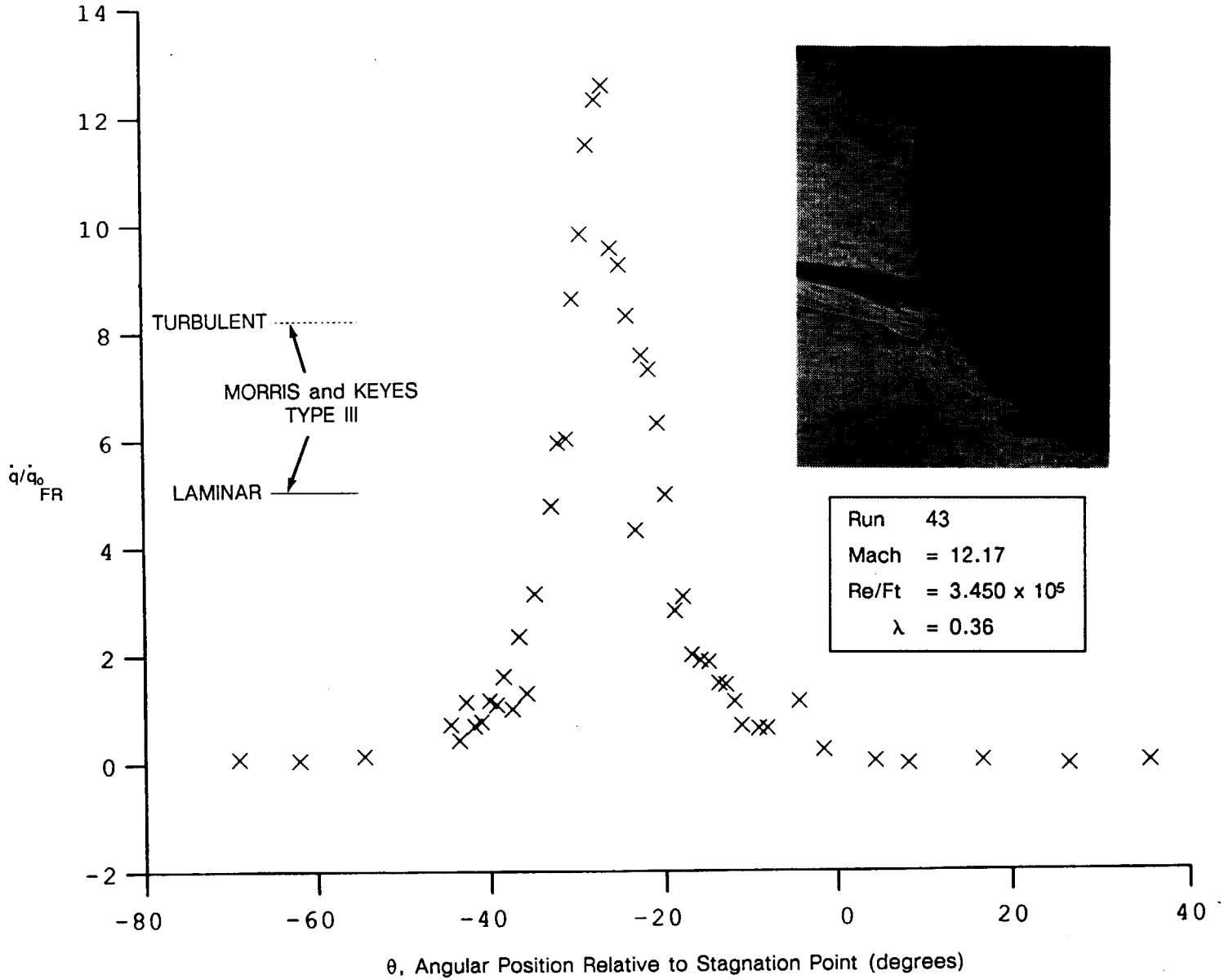


Figure 29d HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.36 AT MACH 12 FOR RUN 43

EXPERIMENTAL
MACH = 12.1
Re/Ft = 3.4 X 10^6
MORRIS AND KEYES CODE (REF. 19)
TYPE III
TYPE IV

RUN	λ
39	0
40	0
41	0.20
56	0.30
42	0.31
57	0.34
43	0.36

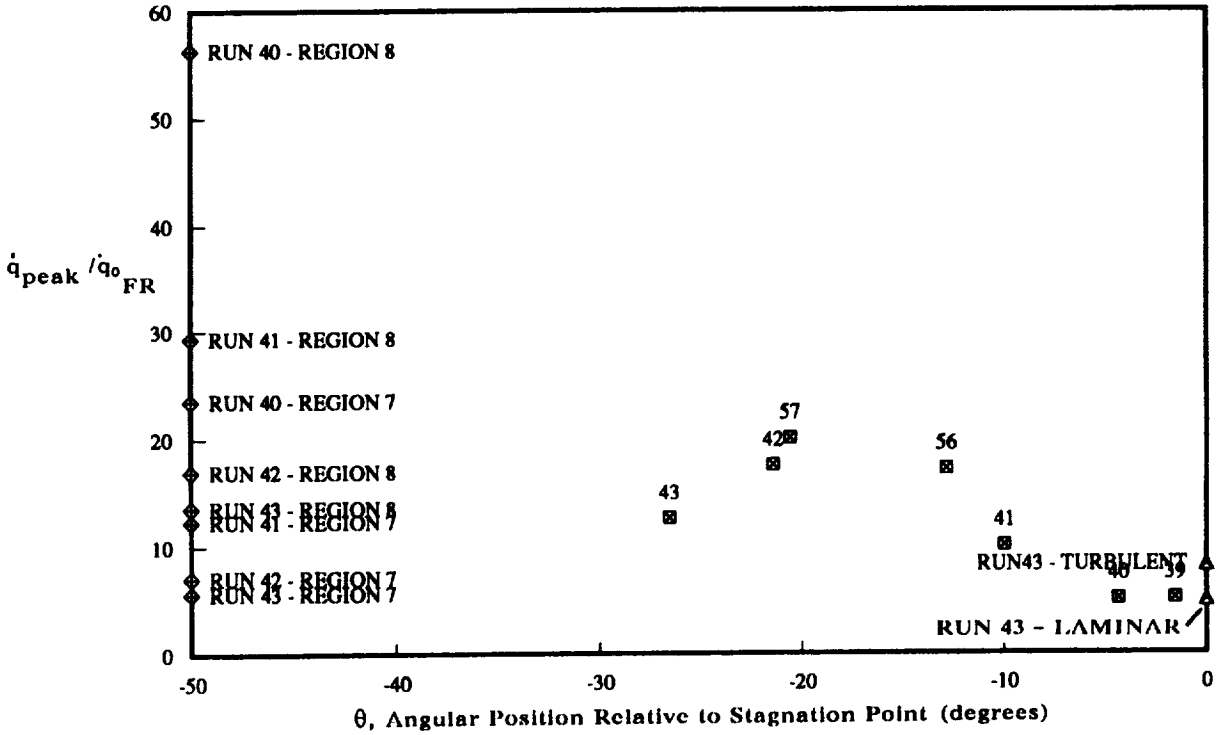


Figure 29e VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A TRANSPIRATION-COOLED HEMISPHERE FOR VARIOUS BLOWING PARAMETERS, λ, AT A FIXED MODEL CONFIGURATION AT MACH 12

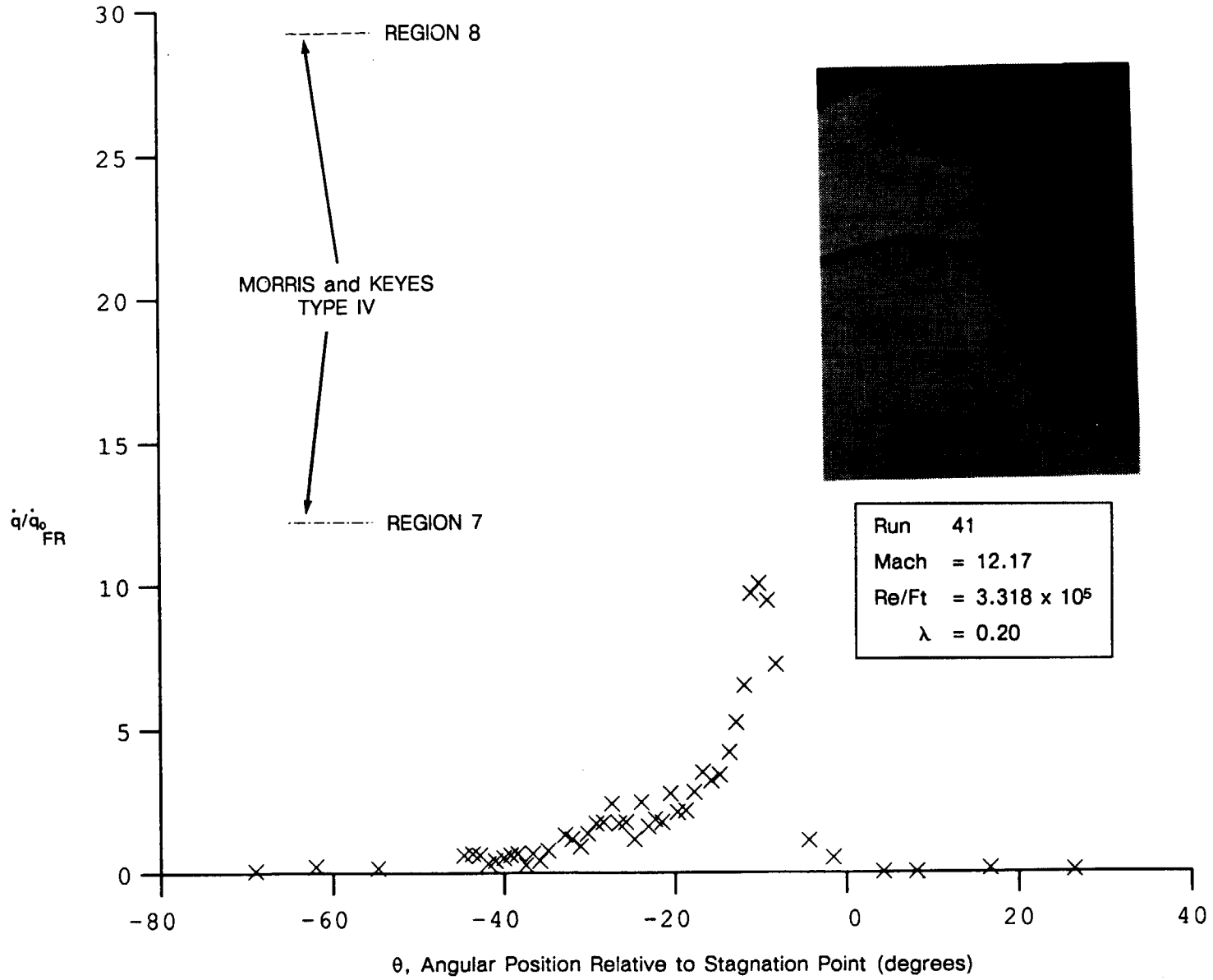


Figure 30a HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.20 AT MACH 12 FOR RUN 41

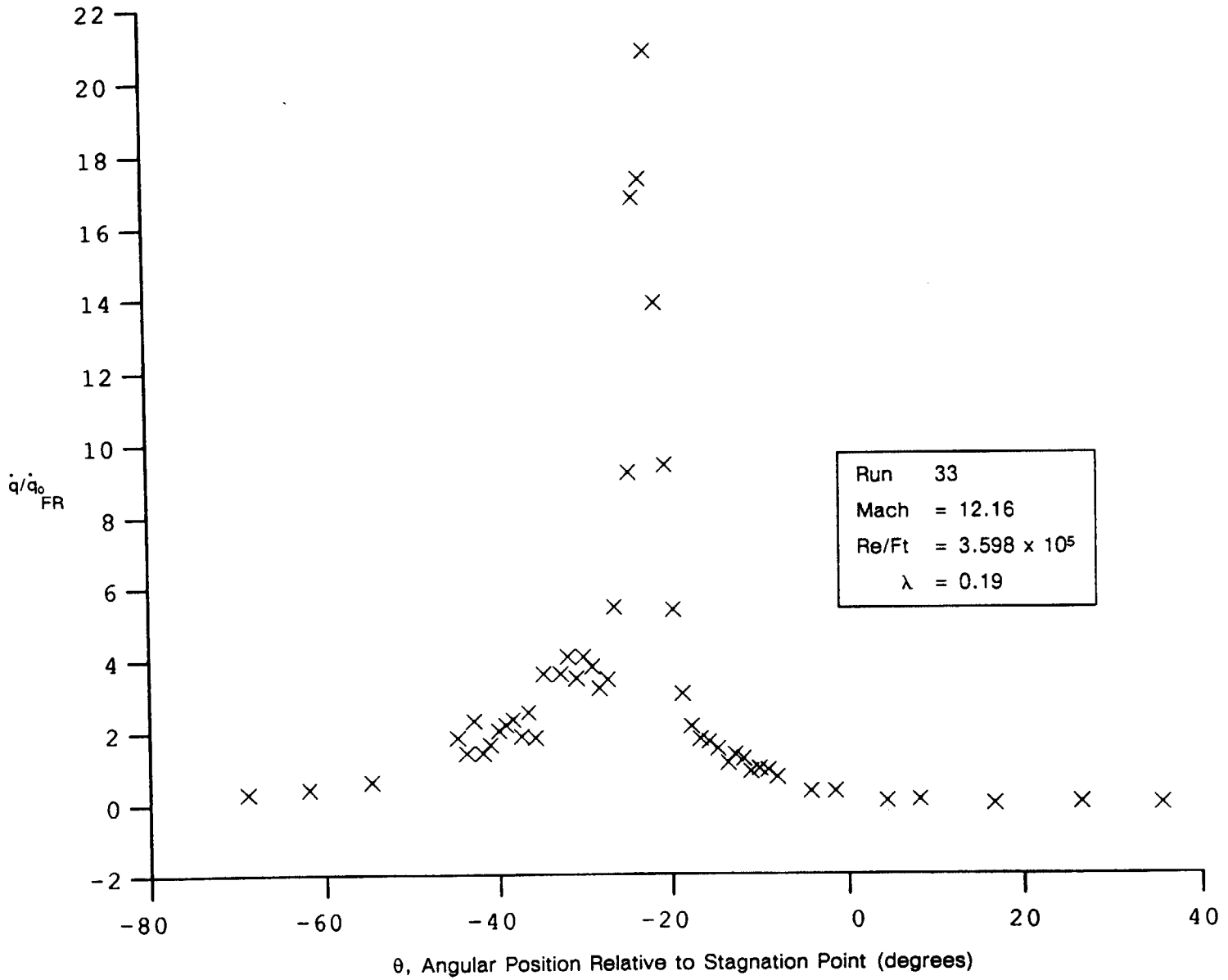


Figure 30b HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.20 AT MACH 12 FOR RUN 33

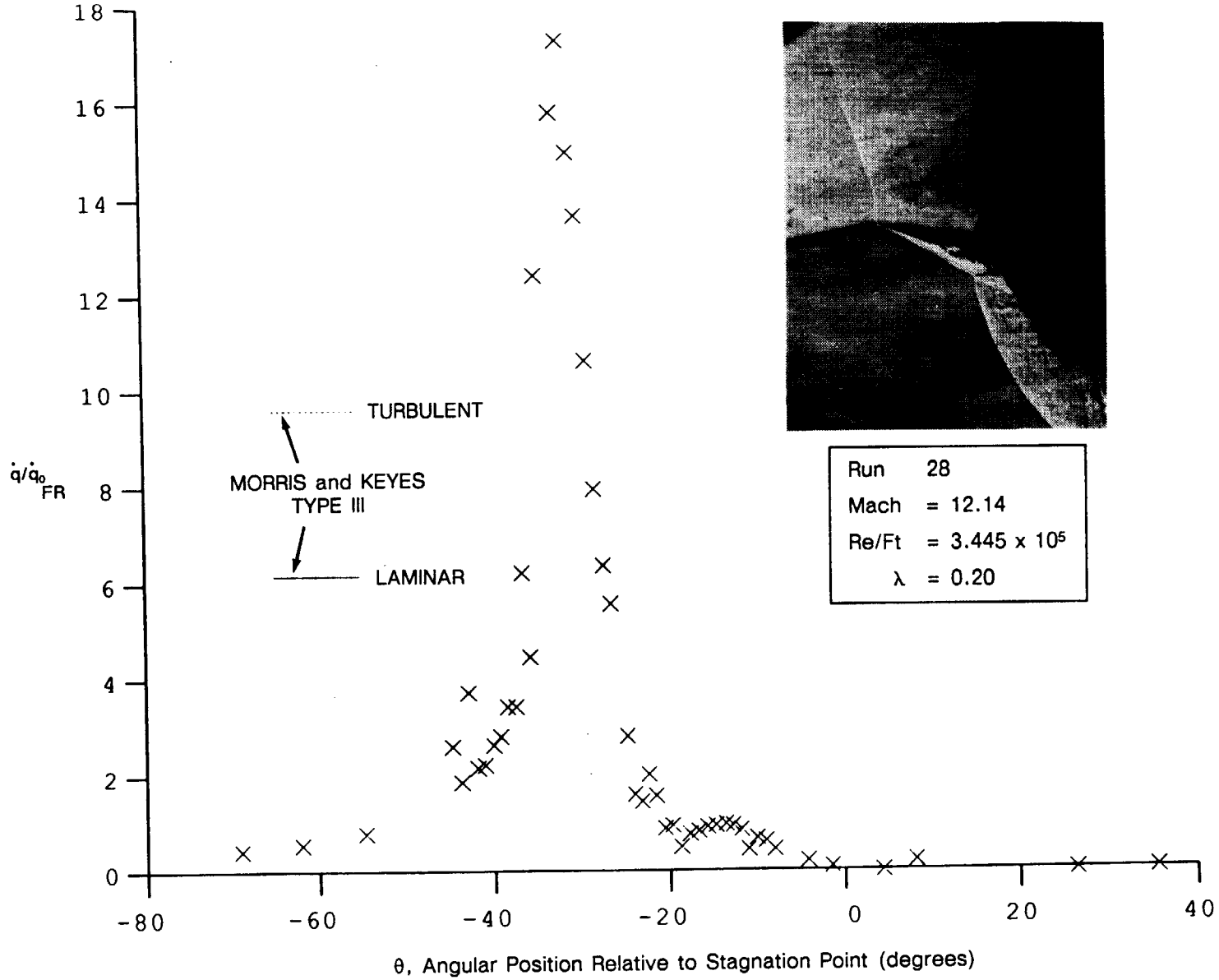


Figure 30c HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.20 AT MACH 12 FOR RUN 28

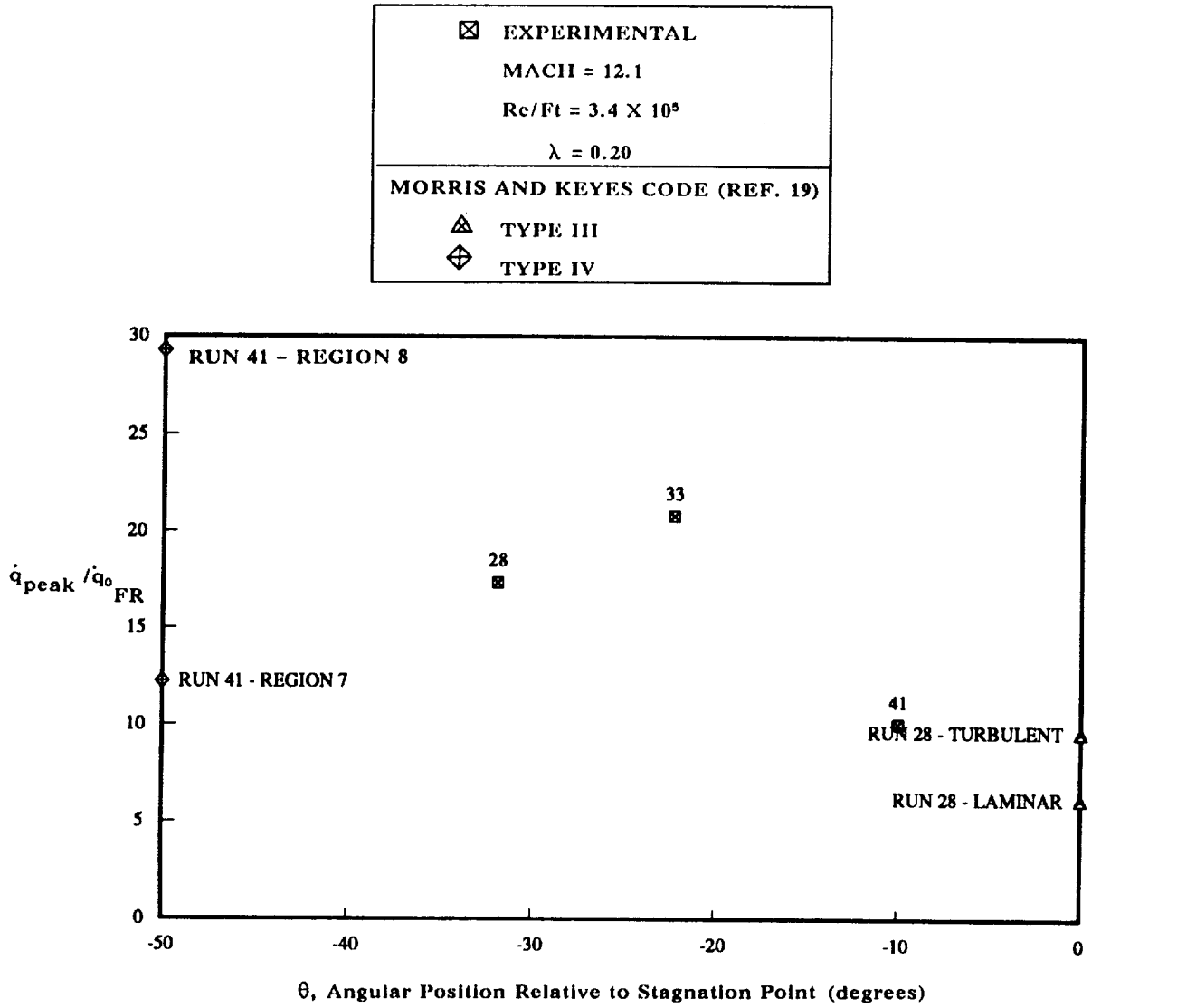


Figure 30d VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A TRANSPIRATION-COOLED HEMISPHERE FOR BLOWING PARAMETER, λ = 0.20, AT MACH 12

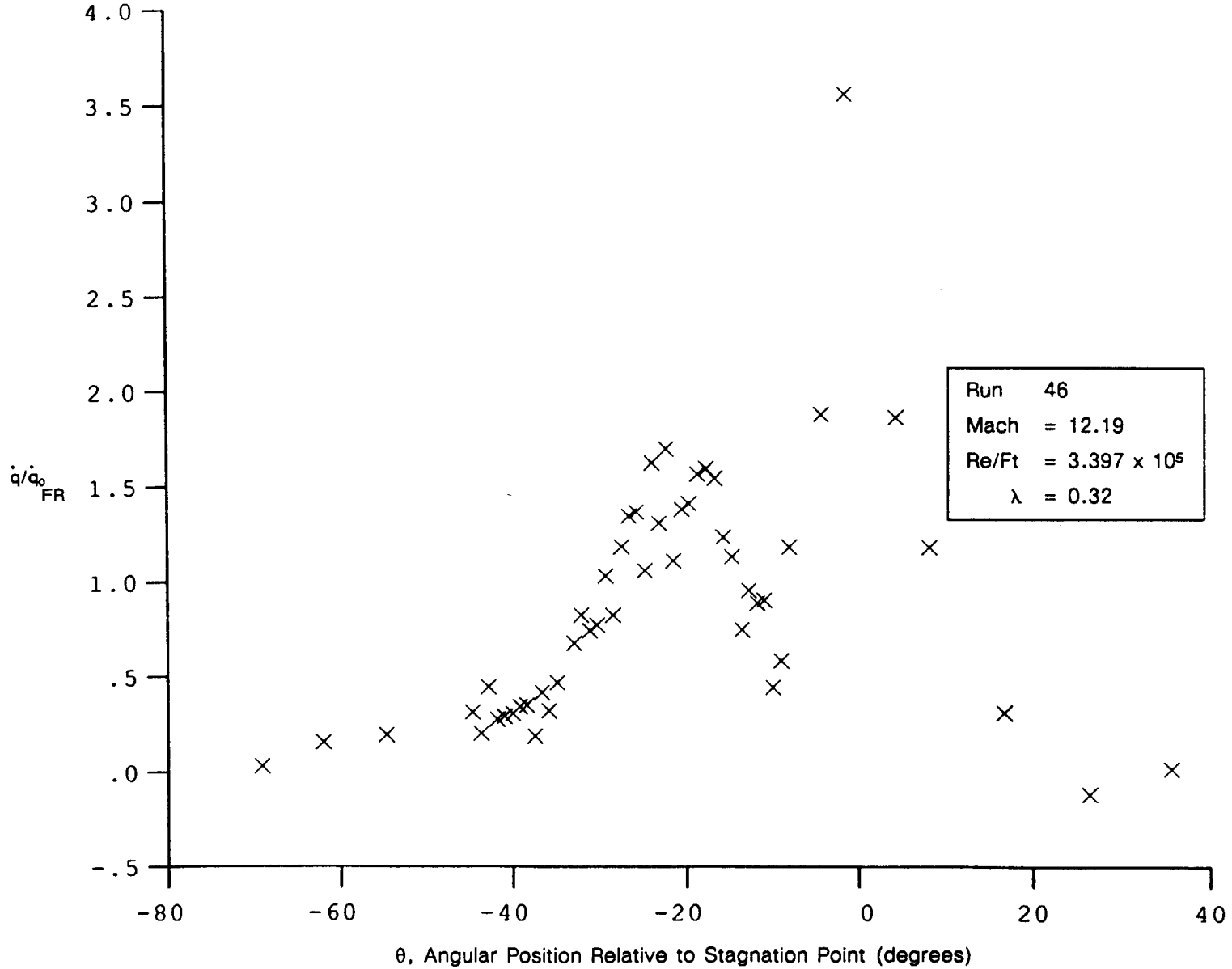


Figure 31a HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.31 AT MACH 12 FOR RUN 46

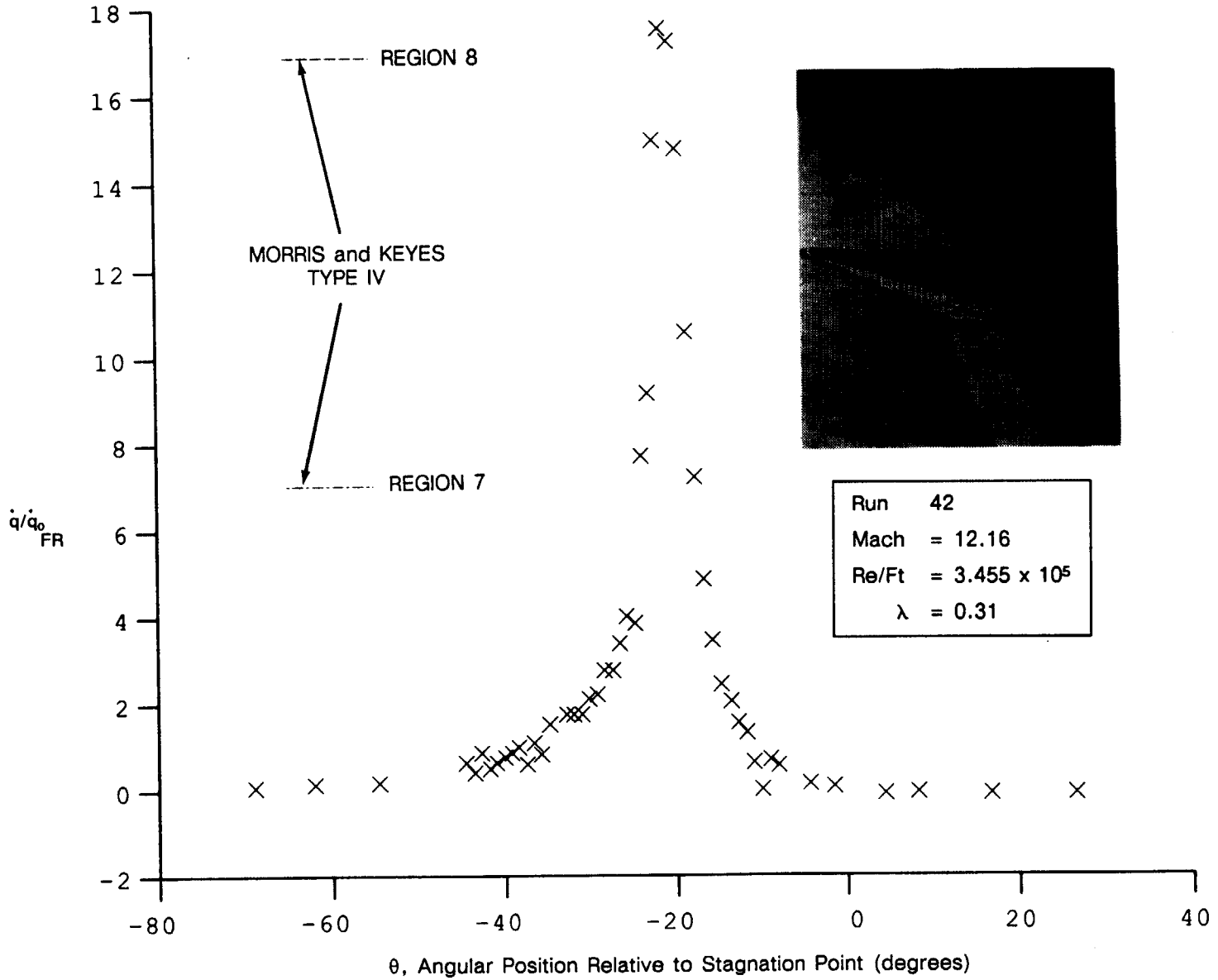


Figure 31b HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.31 AT MACH 12 FOR RUN 42

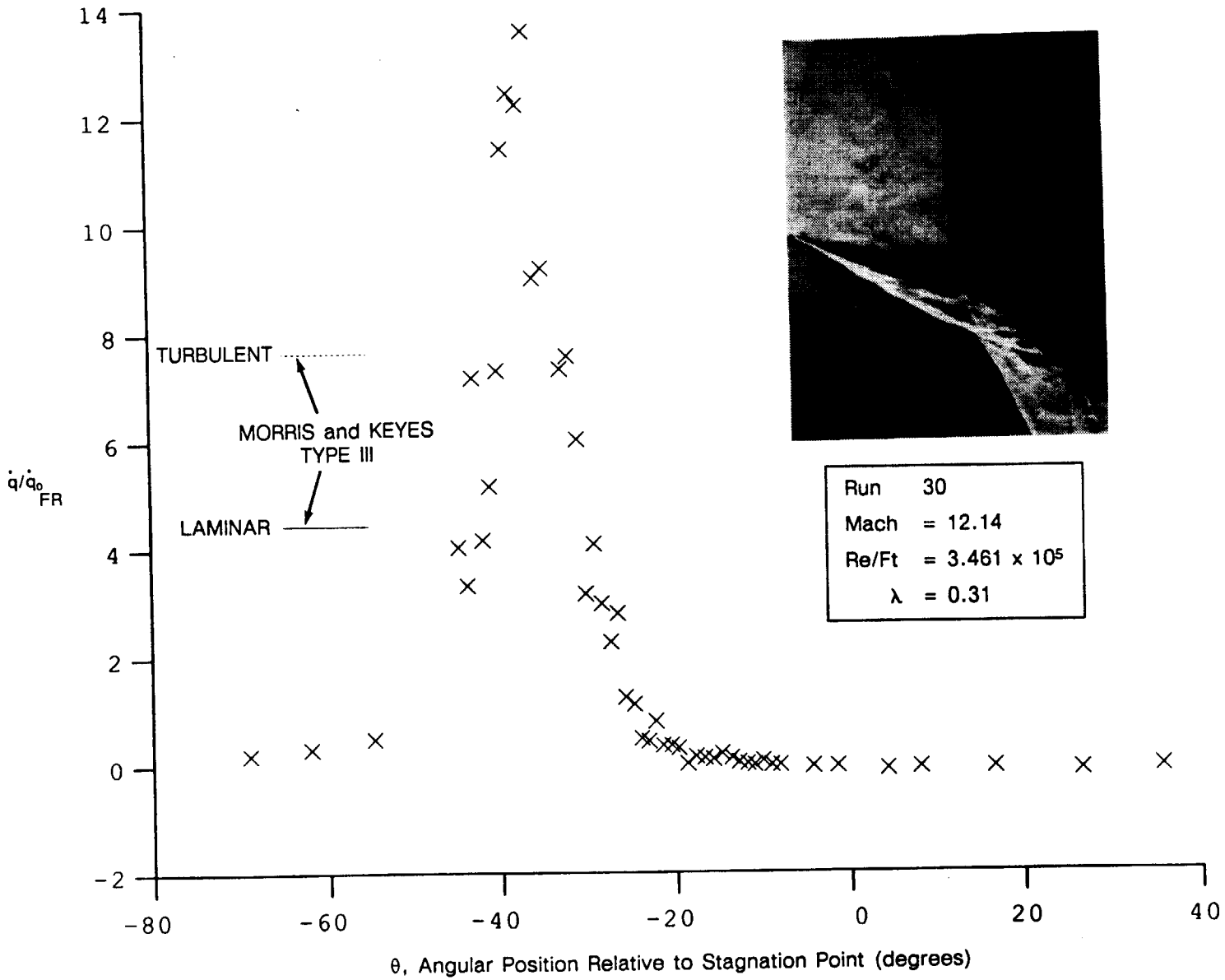


Figure 31c HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.31 AT MACH 12 FOR RUN 30

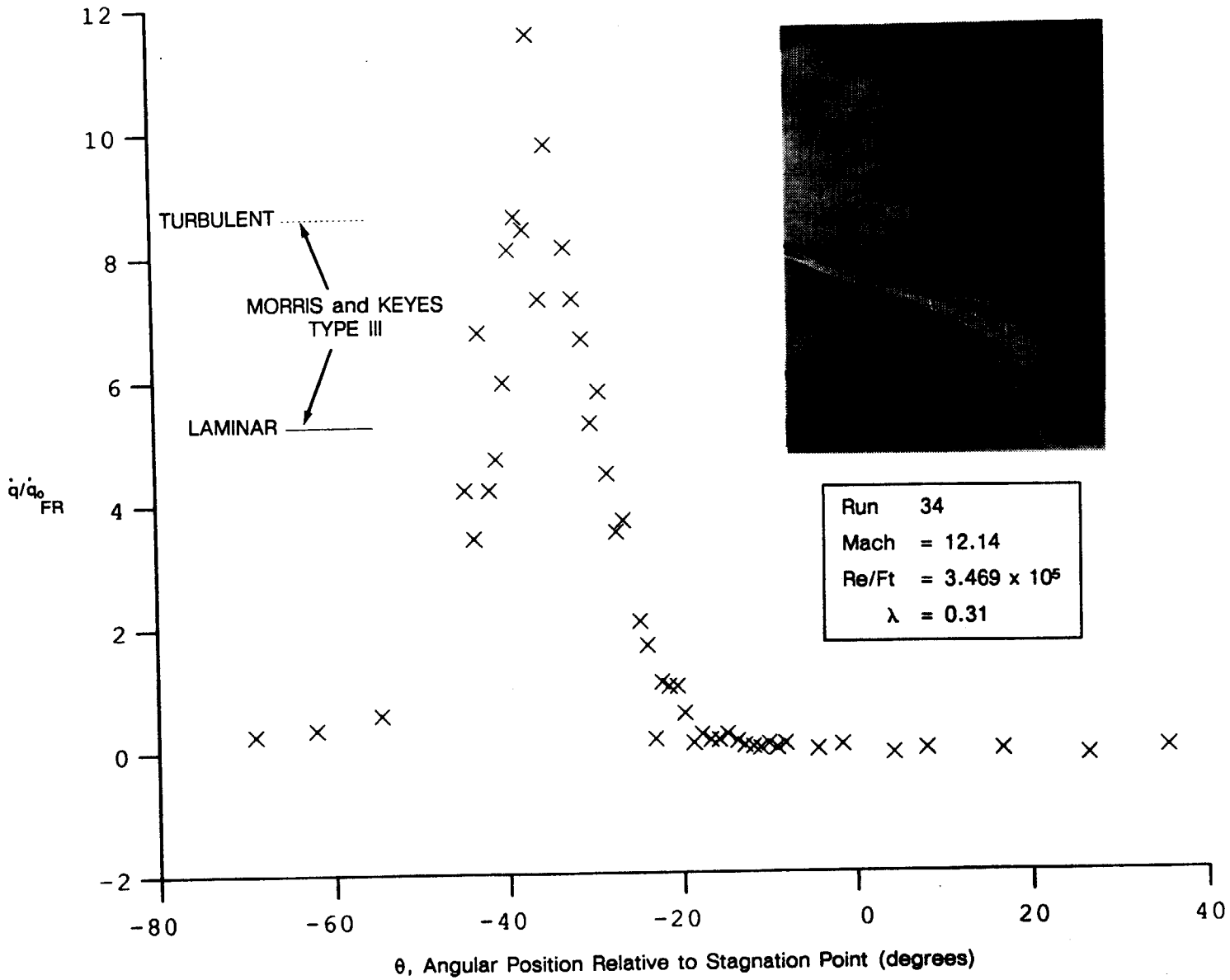


Figure 31d HEAT TRANSFER DISTRIBUTION IN SHOCK/SHOCK-INTERACTION REGIONS INDUCED BY A 10° SHOCK GENERATOR OVER A TRANSPIRATION-COOLED HEMISPHERE WITH λ = 0.31 AT MACH 12 FOR RUN 34

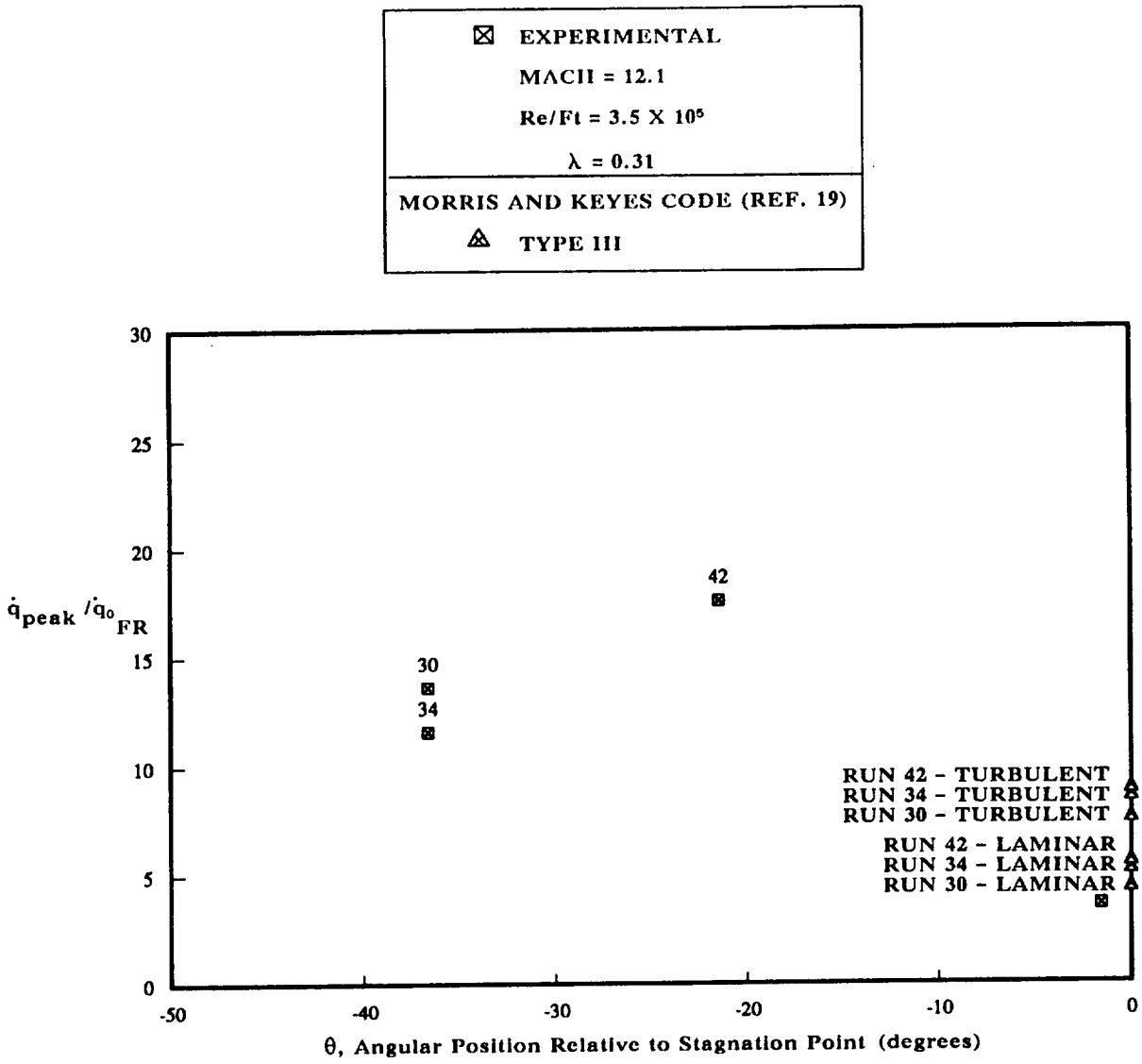


Figure 31e VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A TRANSPIRATION-COOLED HEMISPHERE FOR BLOWING PARAMETER, λ = 0.31, AT MACH 12

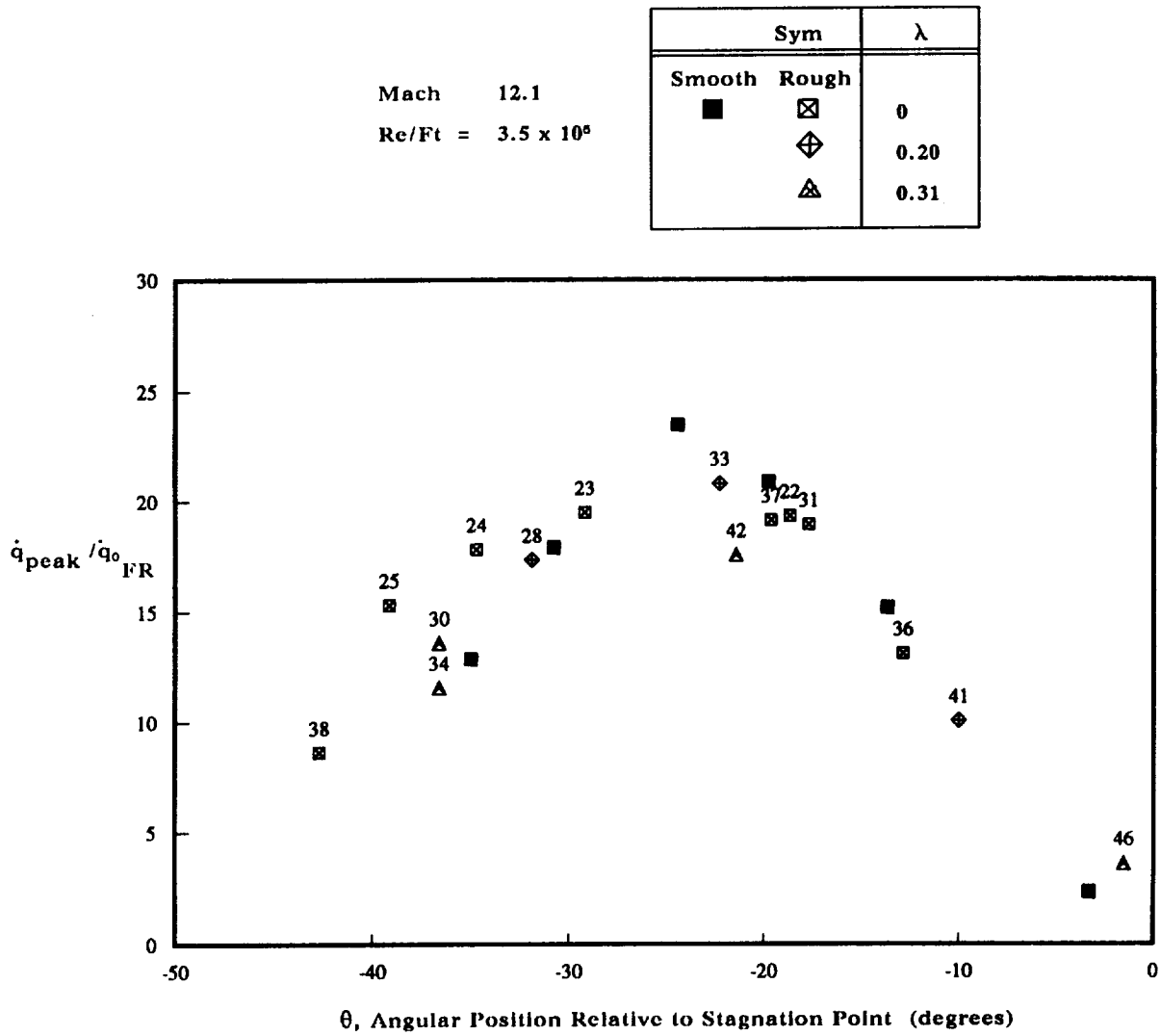
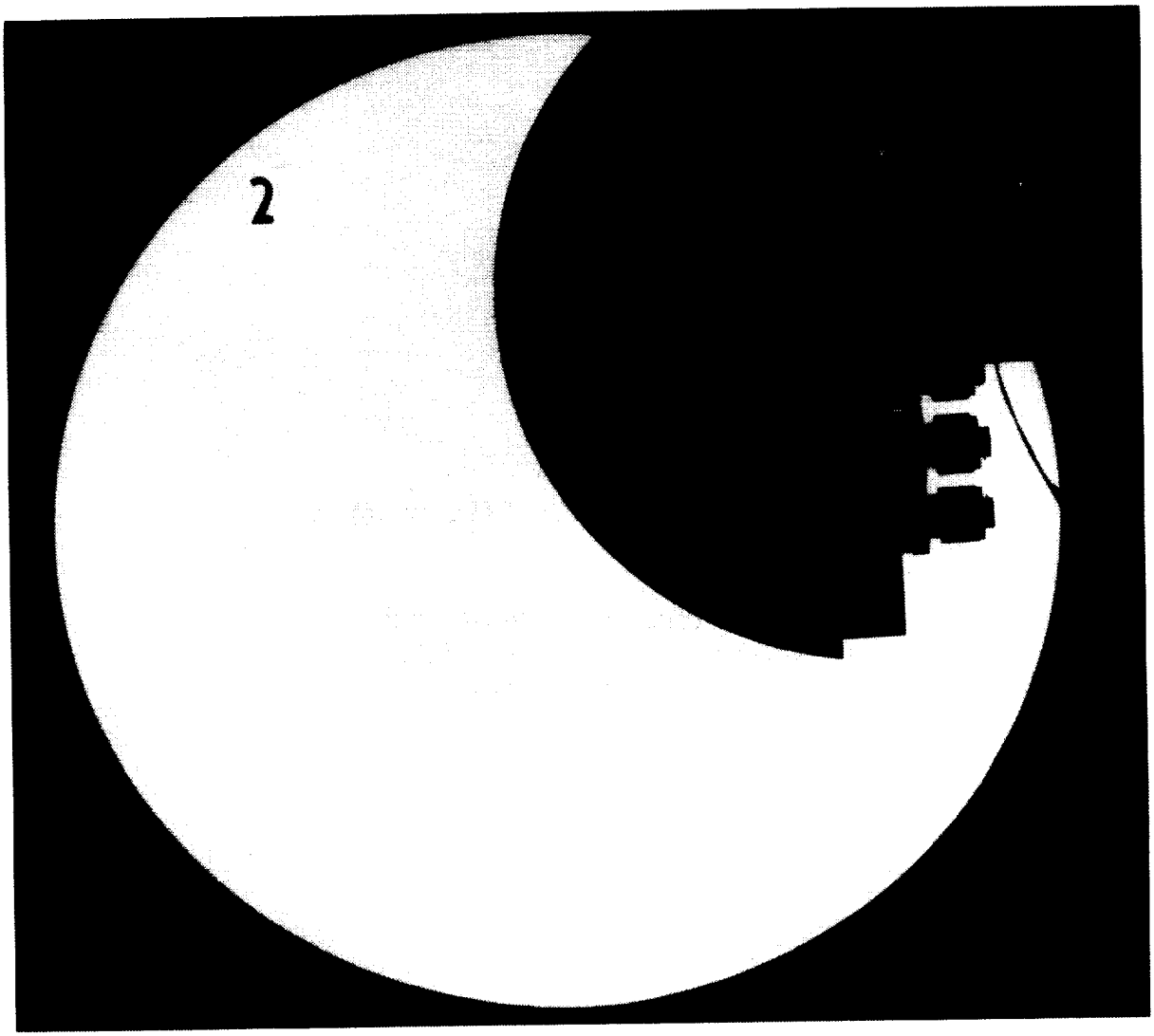


Figure 32 VARIATIONS OF PEAK HEATING WITH ANGULAR POSITION OF THE INTERACTION REGION OVER A SMOOTH AND A TRANSPIRATION-COOLED (ROUGH) HEMISPHERE FOR VARIOUS BLOWING PARAMETERS, λ, AT MACH 12

Appendix A
SMOOTH HEMISPHERICAL STUDY DATA

Test Conditions, Heat Transfer and Pressure Measurements, Schlieren Photographs, and Reduced Data Tabulations

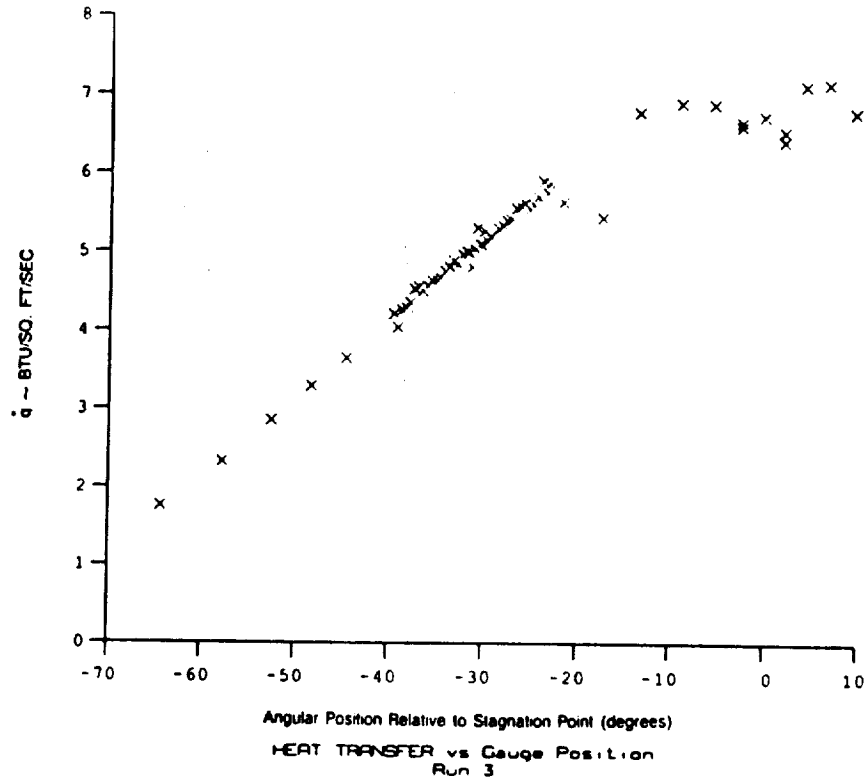
C-2



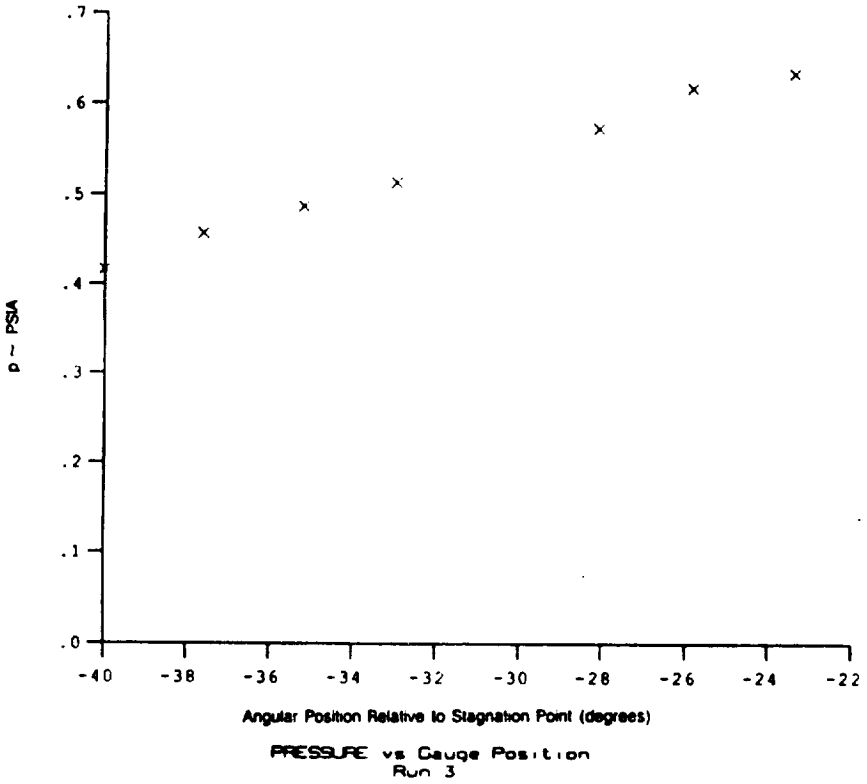
Test Conditions

Po	= 7.1580X10+2	PSIA	Reservoir Tctal Pressure
Ho	= 1.4884X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2874X10+3	degR	Reservoir Total Temperature
M	= 12.1270		Freestream Mach Number
U	= 5.3722X10+3	Ft/sec	Freestream Velocity
T	= 7.8847X10+1	degR	Freestream Temperature
P	= 4.3015X10-3	PSIA	Freestream Static Pressure
Rho	= 4.4233X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.2628X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.7943X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.2895X10-1	PSIA	Pitot Pressure
Q	= 4.4327X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9616		Shock Tube Incident Shock Mach Number
Hw	= 3.2756X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2560	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.8204X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 5.8102	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

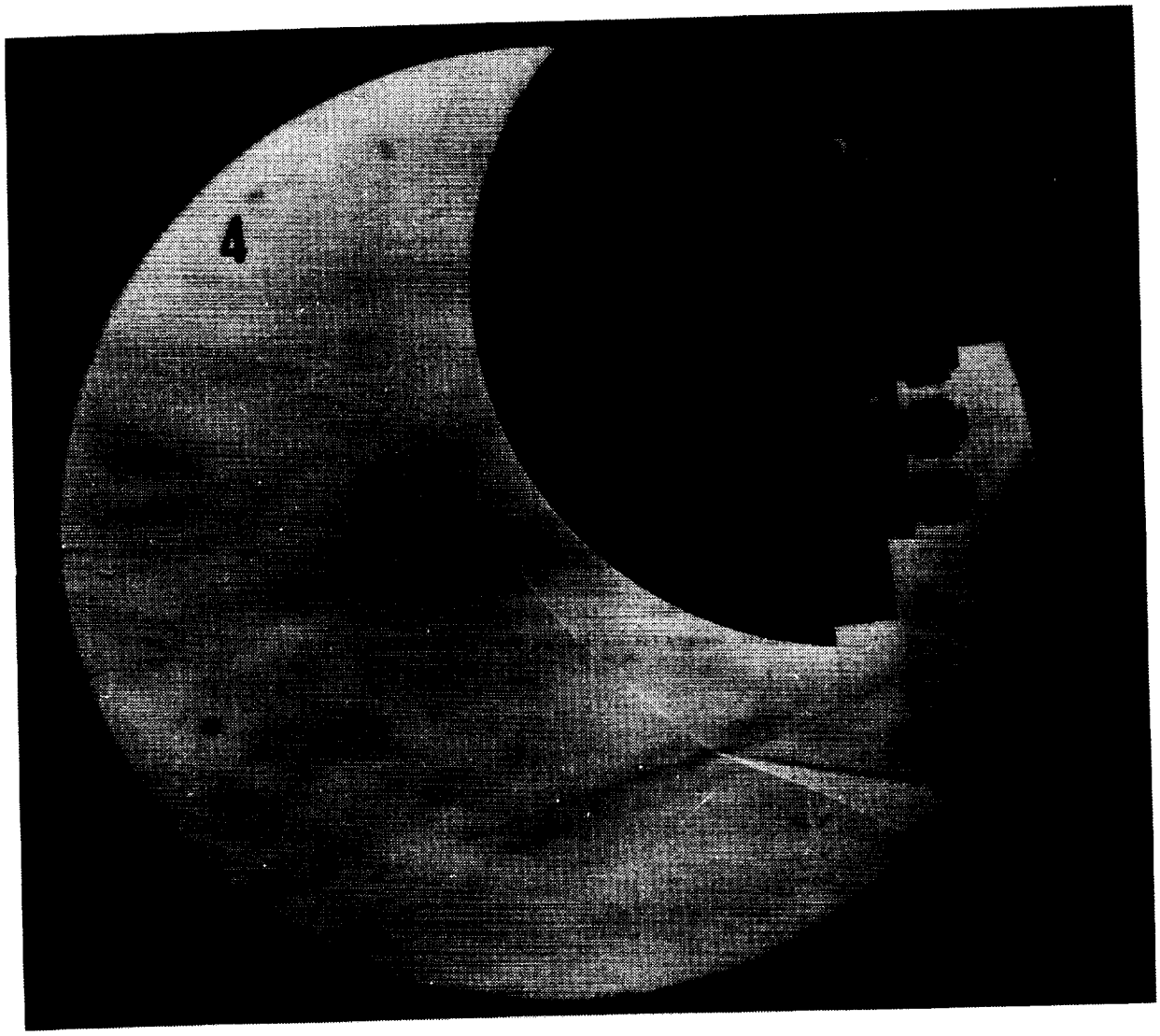
Run 3



HEAT TRANSFER vs Gauge Position
Run 3



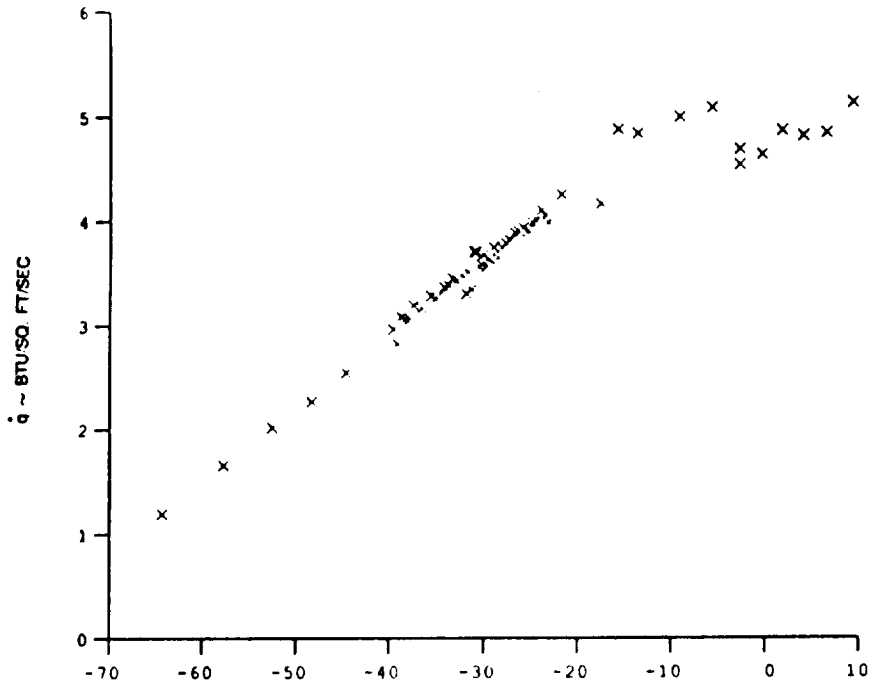
PRESSURE vs Gauge Position
Run 3



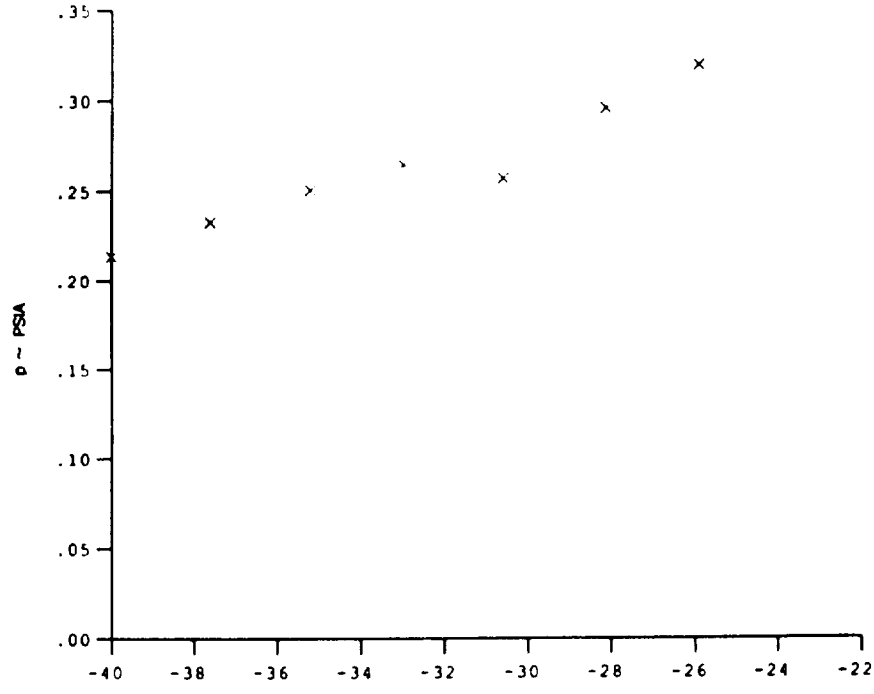
Test Conditions

Po	= 3.5000X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5138X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3128X10+3	degR	Reservoir Total Temperature
M	= 11.9290		Freestream Mach Number
U	= 5.4149X10+3	Ft/sec	Freestream Velocity
T	= 8.2786X10+1	degR	Freestream Temperature
P	= 2.3252X10-3	PSIA	Freestream Static Pressure
Rho	= 2.2773X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.5699X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.8769X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.3357X10-1	PSIA	Pitot Pressure
Q	= 2.3184X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 2.9776		Shock Tube Incident Shock Mach Number
Hw	= 3.2849X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.3131	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.3228X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 4.2945	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

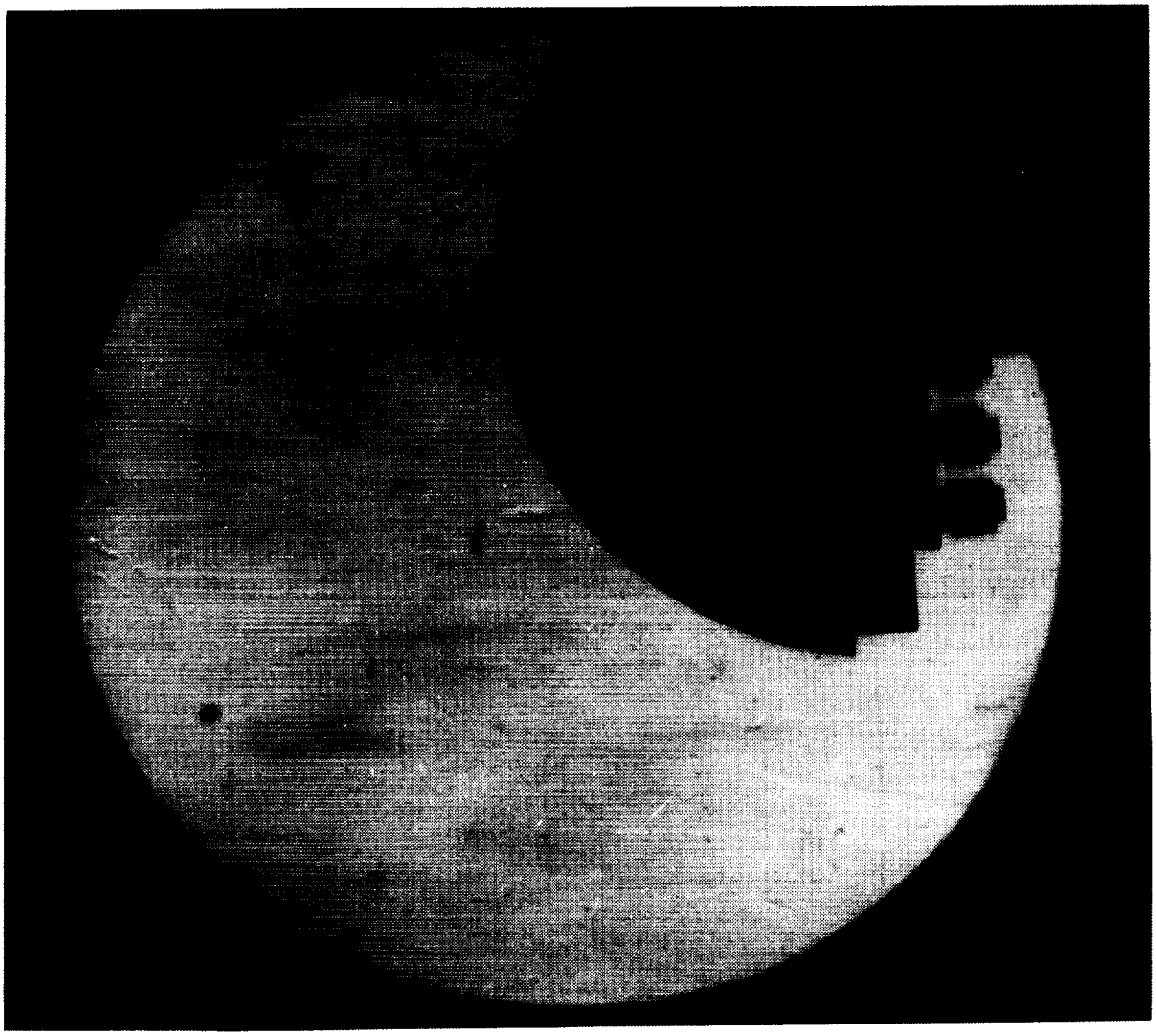
Run 4



HEAT TRANSFER vs Gauge Position
Run 4



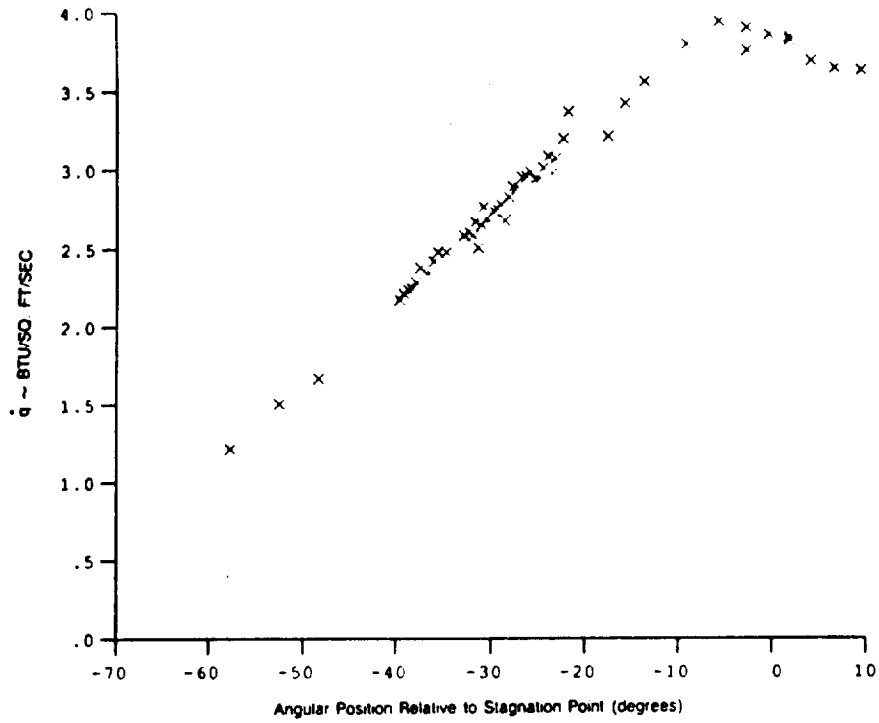
PRESSURE vs Gauge Position
Run 4



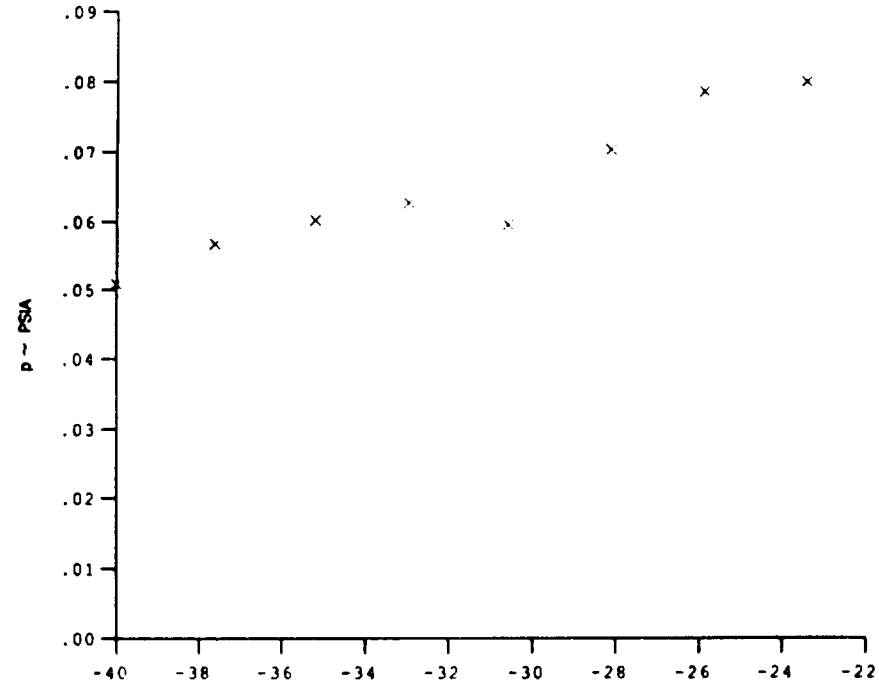
Test Conditions

Po	= 3.1260X10+2	PSIA	Reservoir Total Pressure
Ho	= 2.0418X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.0833X10+3	degR	Reservoir Total Temperature
M	= 14.7460		Freestream Mach Number
U	= 6.3259X10+3	Ft/sec	Freestream Velocity
T	= 7.3940X10+1	degR	Freestream Temperature
P	= 4.5363X10-4	PSIA	Freestream Static Pressure
Rho	= 4.9744X10-7	Slugs/Ft3	Freestream Density
Mu	= 5.8802X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 5.3514X10+4	1/Ft	Freestream Reynolds Number
Po'	= 1.2926X10-1	PSIA	Pitot Pressure
Q	= 6.9117X10-2	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.5960		Shock Tube Incident Shock Mach Number
Hw	= 3.2595X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.4468X10+1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.4409X10-2	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 3.4783	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

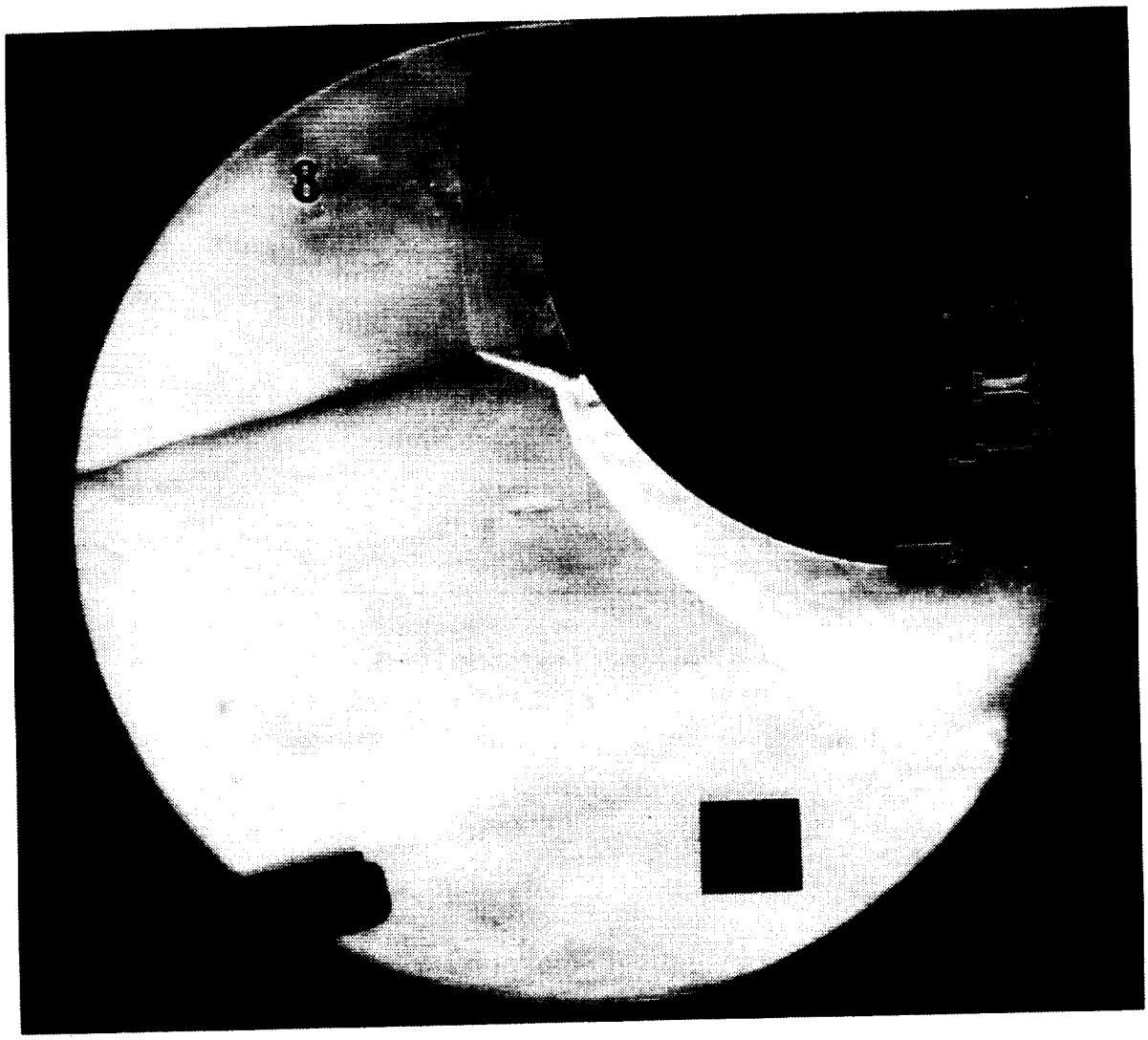
Run 5



HEAT TRANSFER vs Gauge Position
Run 5



PRESSURE vs Gauge Position
Run 5

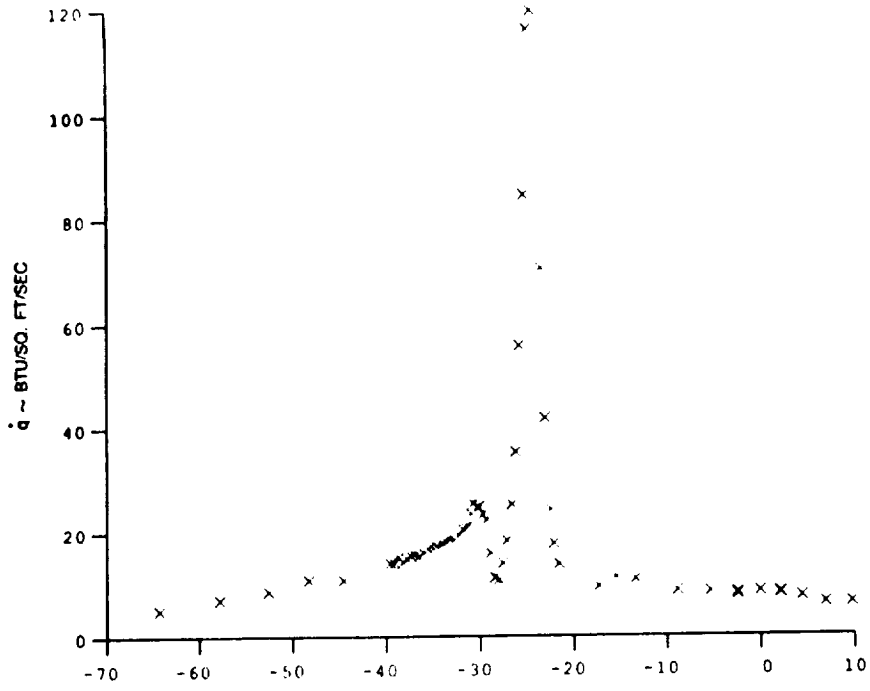


Test Conditions

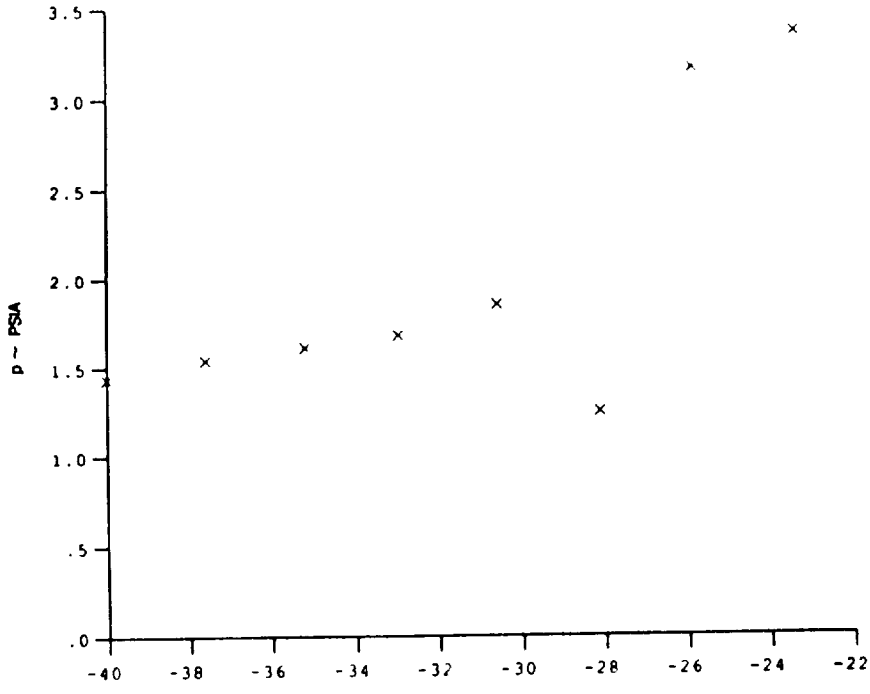
Po	= 6.414CX10+2	PSIA	Reservoir Total Pressure
Ho	= 1.4113X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.1647X10+3	degR	Reservoir Total Temperature
M	= 12.1500		Freestream Mach Number
U	= 5.2316X10+3	Ft/sec	Freestream Velocity
T	= 7.4490X10+1	degR	Freestream Temperature
P	= 3.8397X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1794X10-6	Slugs/Ft3	Freestream Density
Mu	= 5.9231X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.6915X10+5	1/Ft	Freestream Reynolds Number
Po'	= 7.4277X10-1	PSIA	Pitot Pressure
Q	= 3.9718X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.8469		Shock Tube Incident Shock Mach Number
Hw	= 3.2899X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.5177	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 3.2876X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR	= 5.1048	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	9.953
B - see shock generator diagram	(inches)	3.359

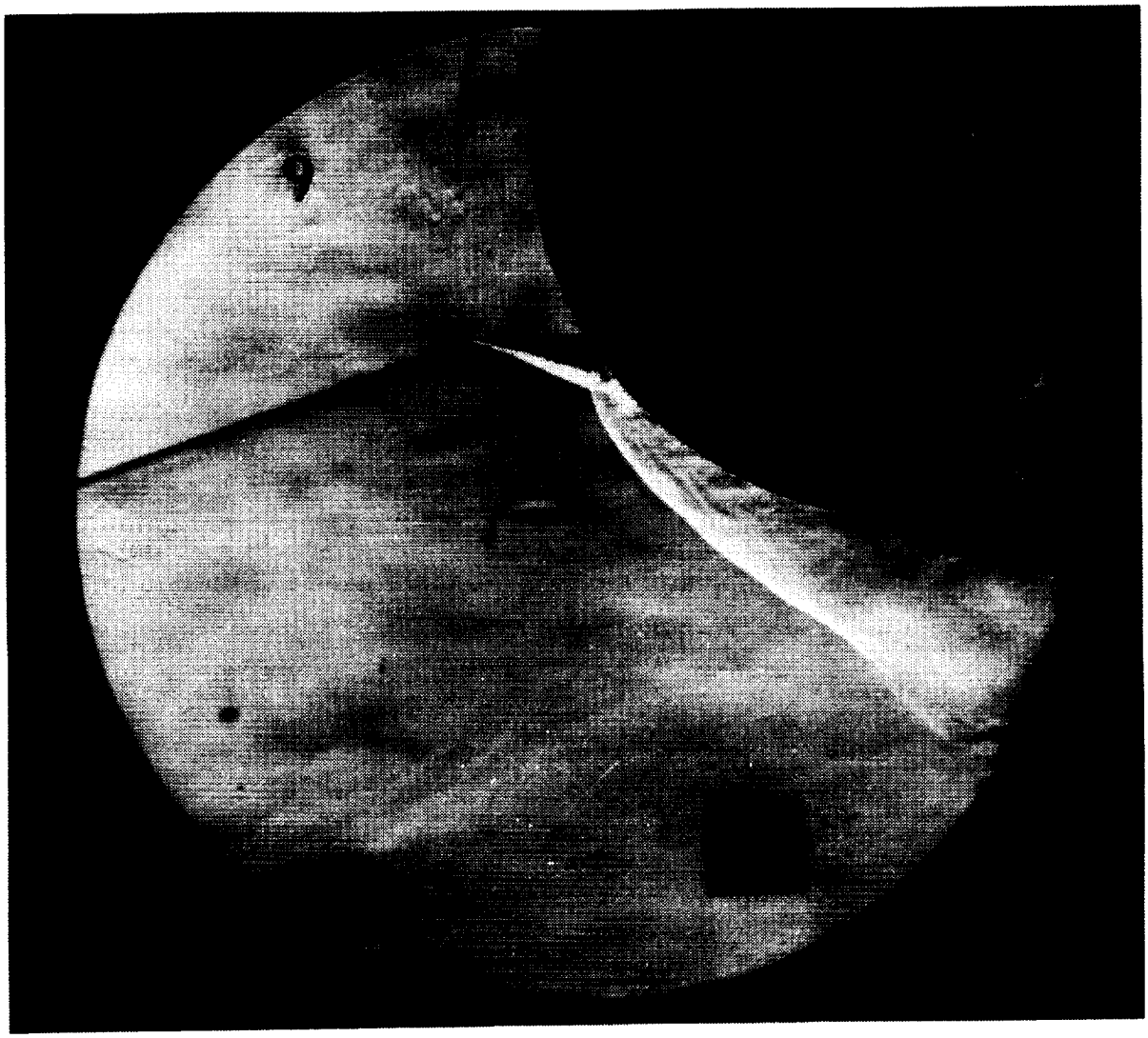
Run 8



HEAT TRANSFER vs Gauge Position
Run 8



PRESSURE vs Gauge Position
Run 8

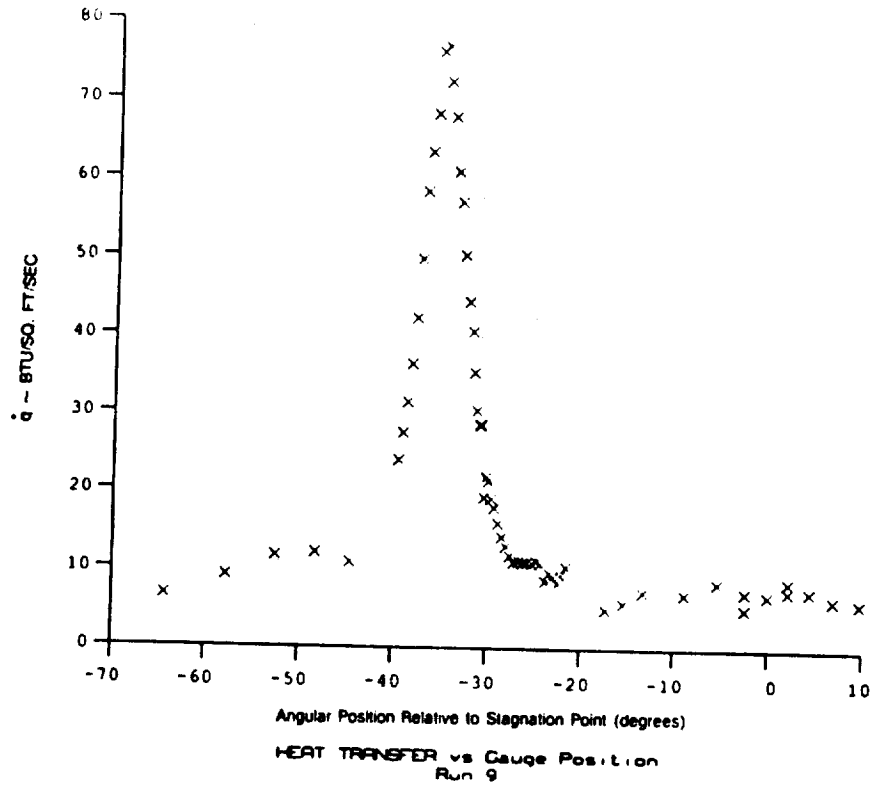


Test Conditions

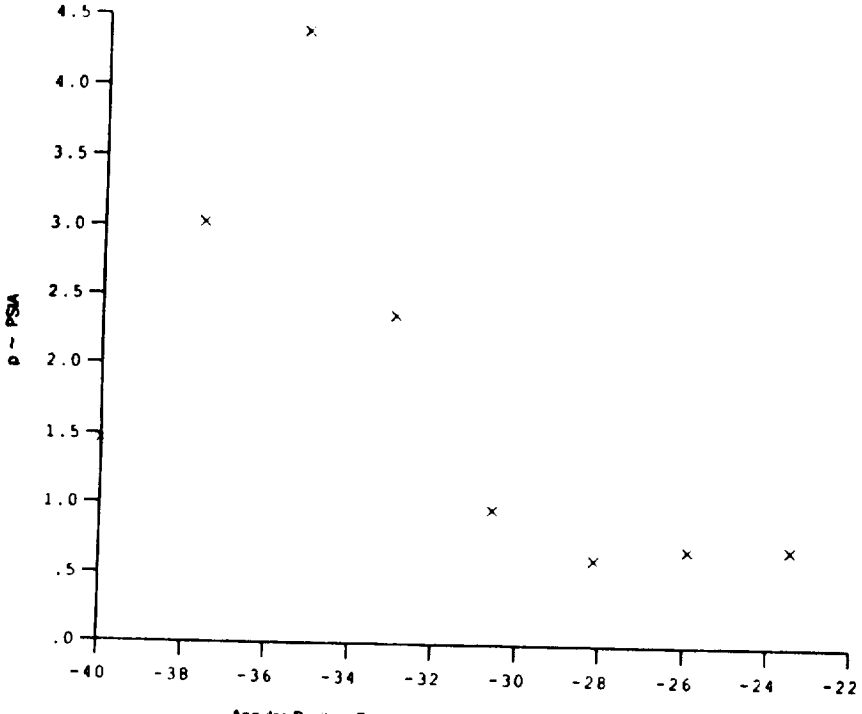
Po	= 7.0140X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.4707X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2617X10+3	degR	Reservoir Total Temperature
M	= 12.1320		Freestream Mach Number
U	= 5.3403X10+3	Ft/sec	Freestream Velocity
T	= 7.7845X10+1	degR	Freestream Temperature
P	= 4.2119X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3869X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.1846X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.788CX10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.1238X10-1	PSIA	Pitot Pressure
Q	= 4.3440X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9392		Shock Tube Incident Shock Mach Number
Hw	= 3.2763X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3020	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.9052X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	5.6583	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	10.688
B - see shock generator diagram	(inches)	3.375

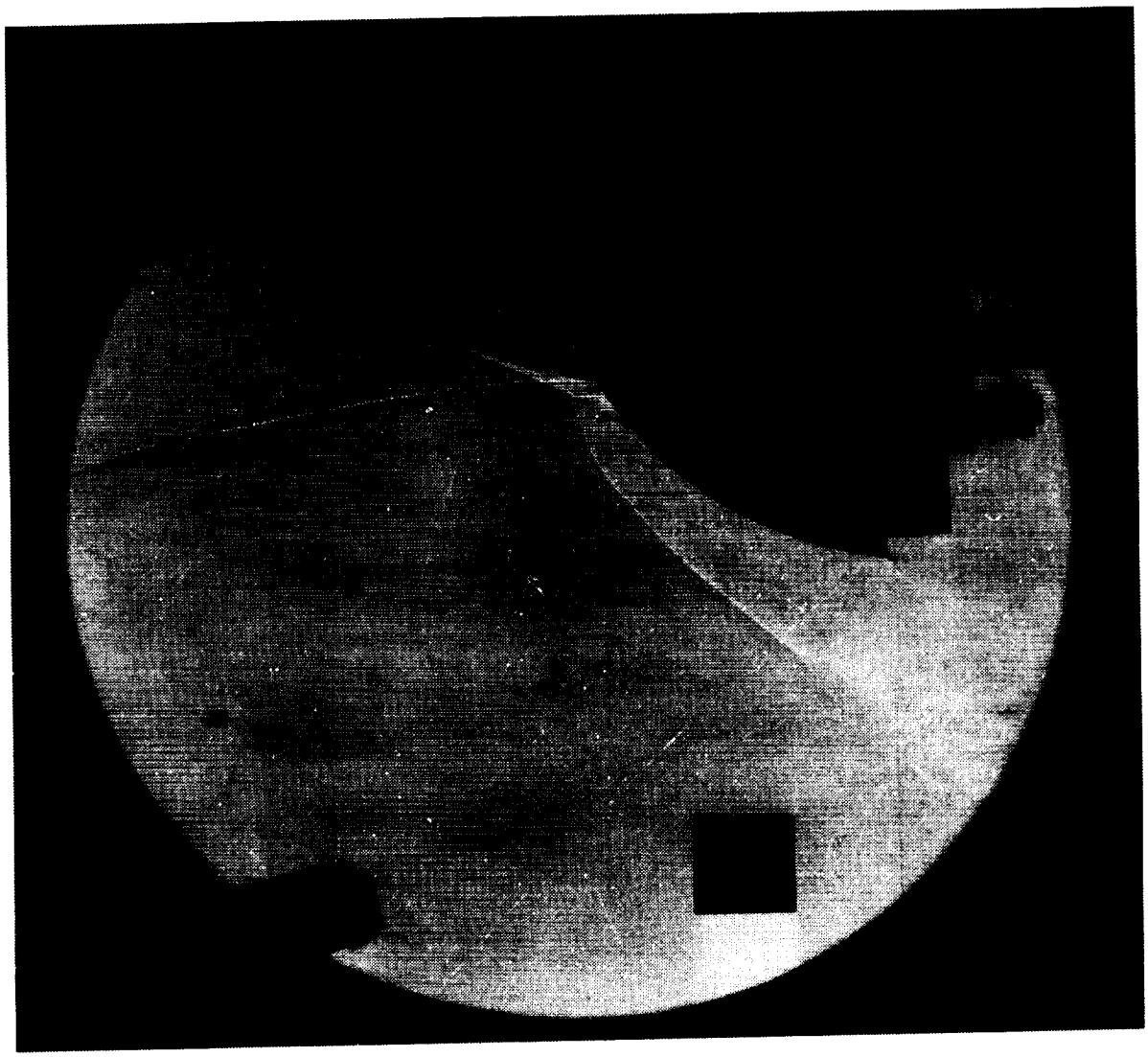
Run 9



HEAT TRANSFER vs Gauge Position
Run 9



PRESSURE vs Gauge Position
Run 9

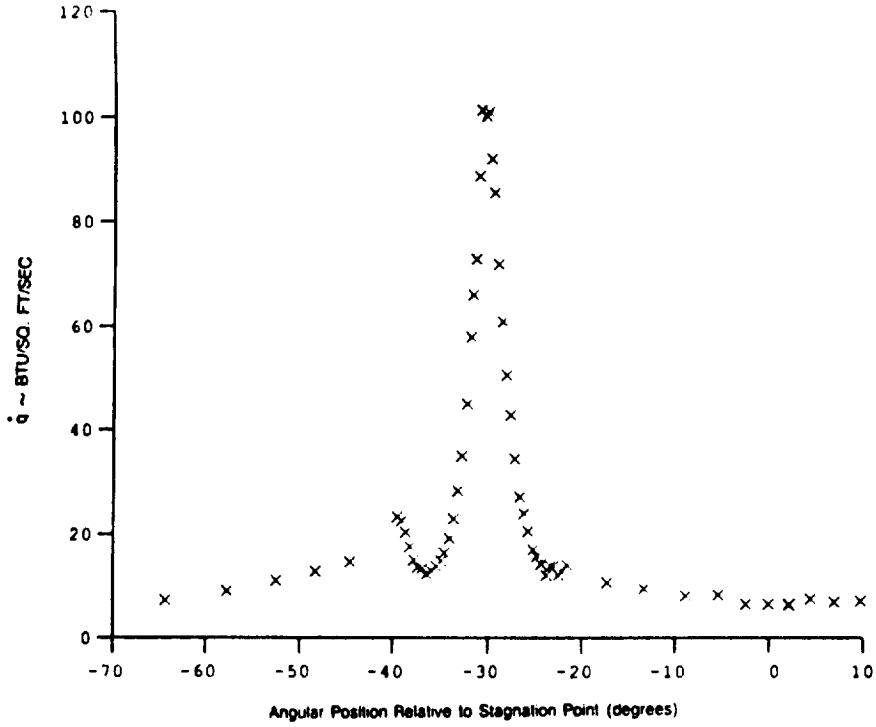


Test Conditions

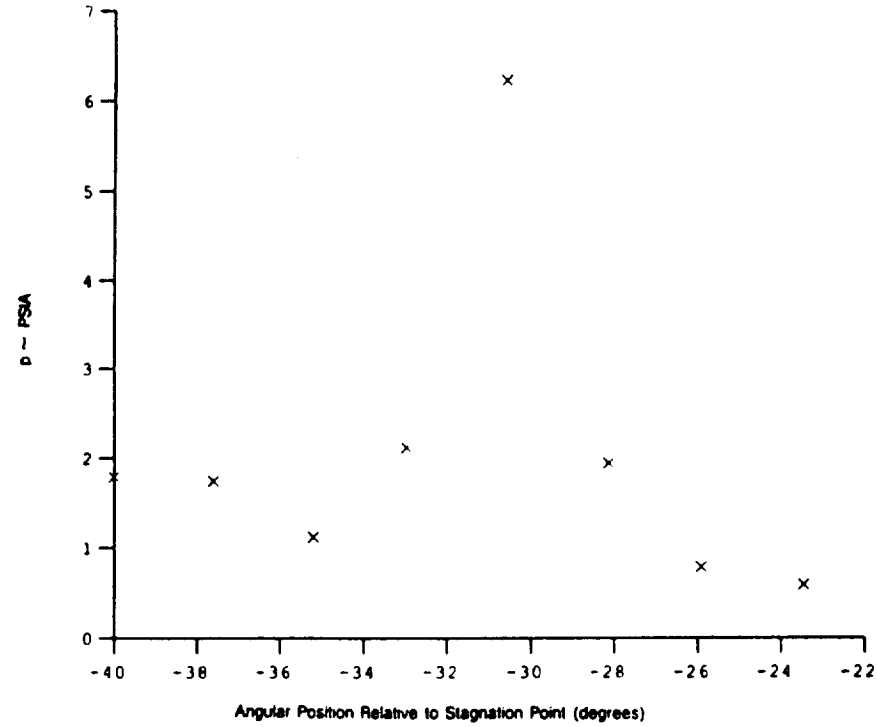
Po	= 6.9910X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.4544X10+7	(Ft/sec)2	Reservoir Tota. Enthalpy
To	= 2.2369X10+3	degR	Reservoir Tota. Temperature
M	= 12.1420		Freestream Mach Number
U	= 5.3107X10+3	Ft/sec	Freestream Velocity
T	= 7.6854X10+1	degR	Freestream Temperature
P	= 4.1831X10-3	PSIA	Freestream Static Pressure
Rho	= 4.4131X10-6	Slugs/Ft3	Freestream Density
MU	= 6.1073X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.8375X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.0822X10-1	PSIA	Pitot Pressure
Q	= 4.3218X10+1	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 2.9168		Shock Tube Incident Shock Mach Number
Hw	= 3.2781X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3139	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.9466X10-3	Ft2-s/BTU	Heat Rate to Ch factor (778/(Rho U (Ho-Hw))
QofR=	5.5574	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter	Value	
A - see shock generator diagram	(inches)	10.343
B - see shock generator diagram	(inches)	3.375

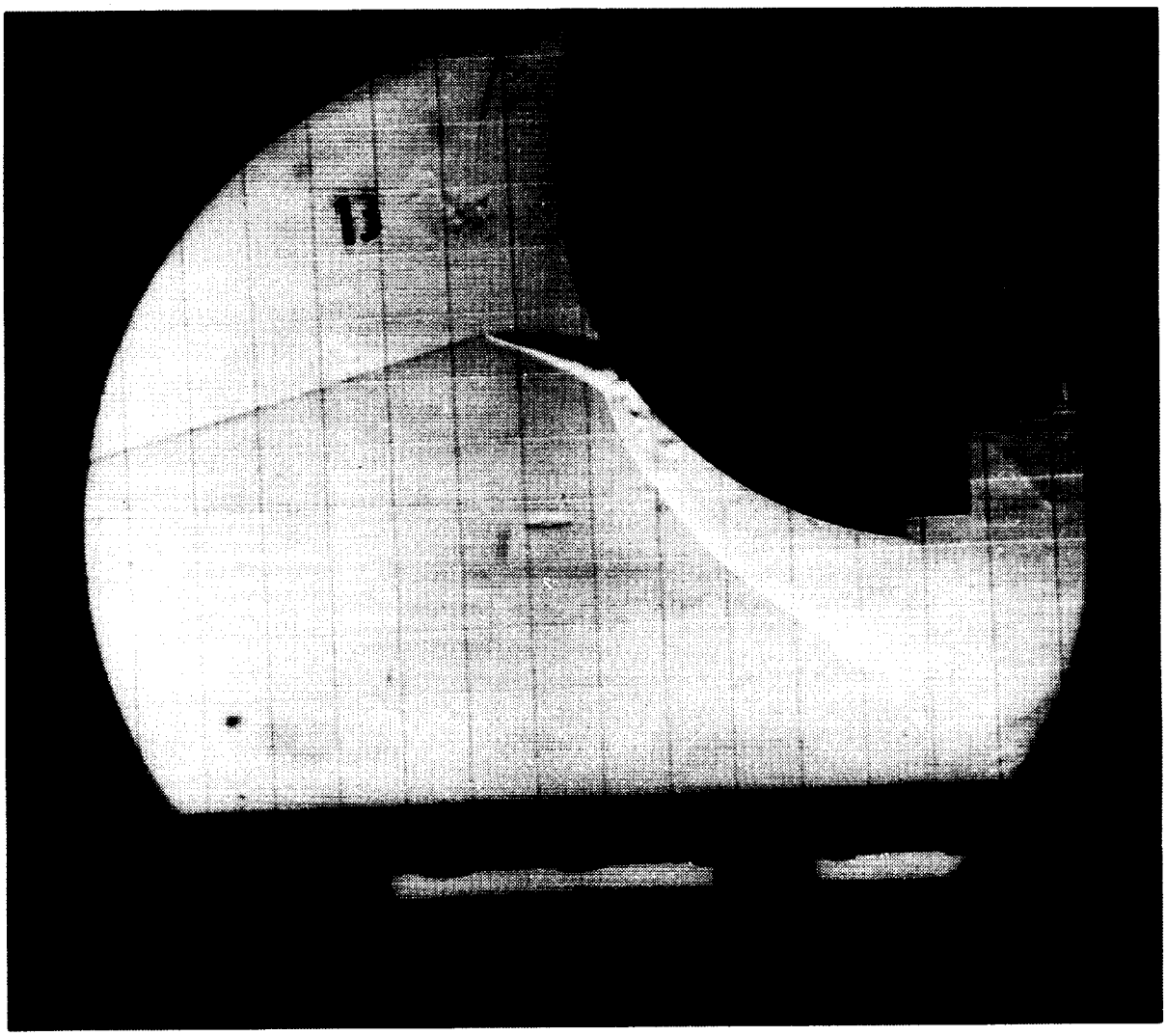
Run 10



HEAT TRANSFER vs Gauge Position
Run 10



PRESSURE vs Gauge Position
Run 10

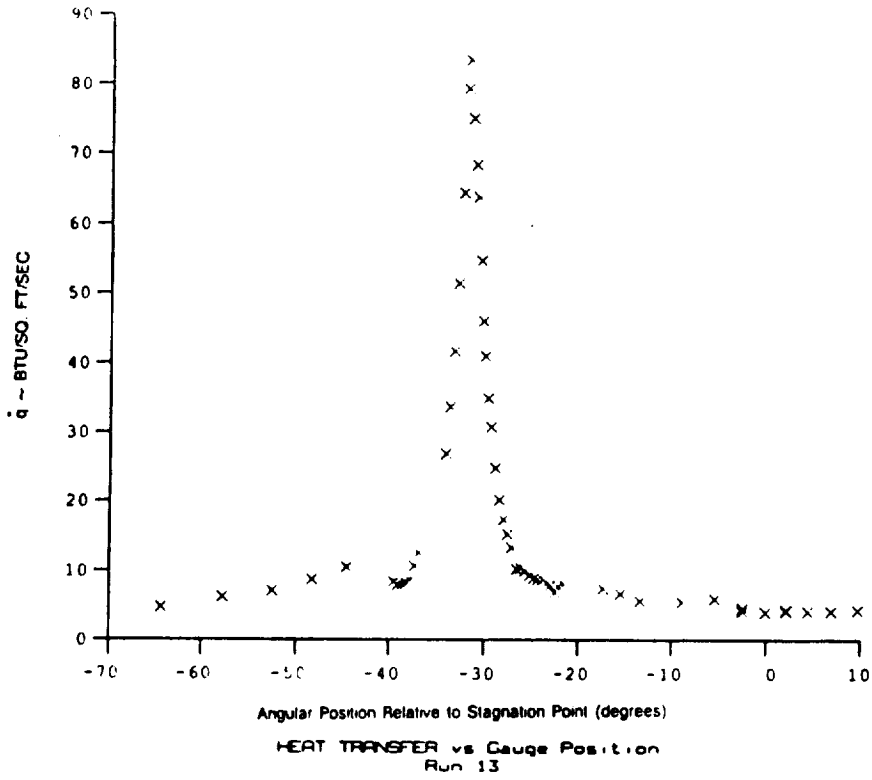


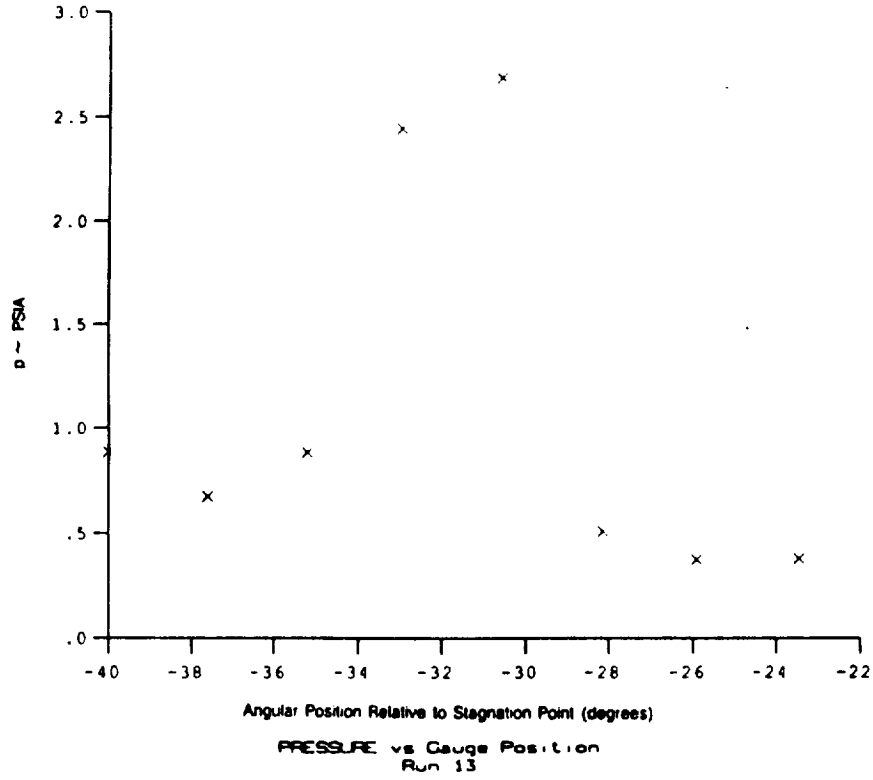
Test Conditions

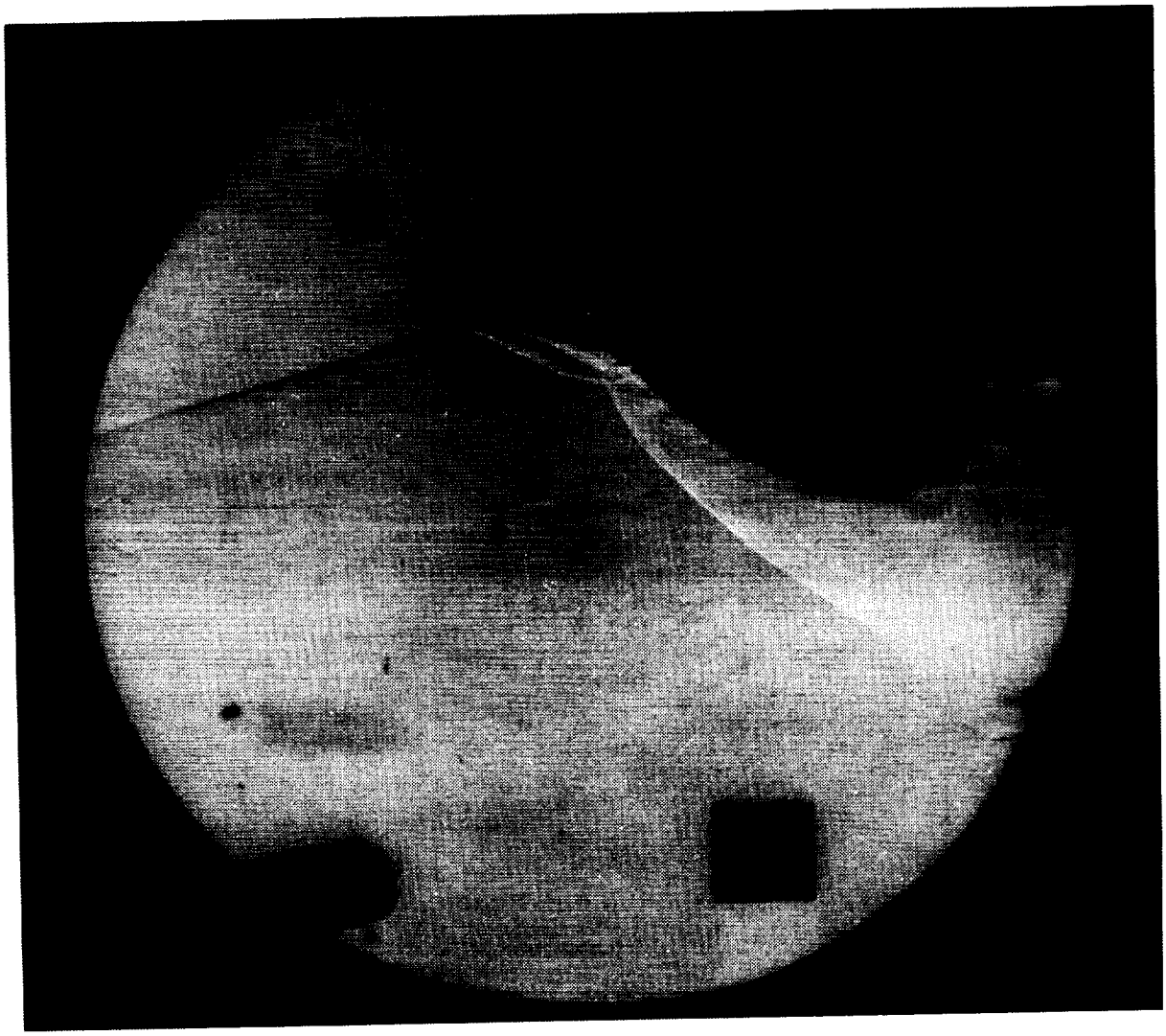
Po	= 3.8010X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5559X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3805X10+3	degR	Reservoir Total Temperature
M	= 11.912C		Freestream Mach Number
U	= 5.4894X10+3	Ft/sec	Freestream Velocity
T	= 8.5321X10+1	degR	Freestream Temperature
P	= 2.5342X10-3	PSIA	Freestream Static Pressure
Rho	= 2.4082X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.7676X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.9534X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.7122X10-1	PSIA	Pitot Pressure
Q	= 2.5197X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0394		Shock Tube Incident Shock Mach Number
Hw	= 3.2769X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 3.9687	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.7917X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR=	4.6498	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value	
A - see shock generator diagram	(inches)	10.484
B - see shock generator diagram	(inches)	3.390

Run 13


q ~ BTU/SQ FT/SEC
90
80
70
60
50
40
30
20
10
0
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 13


p ~ PSIA
3.0
2.5
2.0
1.5
1.0
.5
.0
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 13

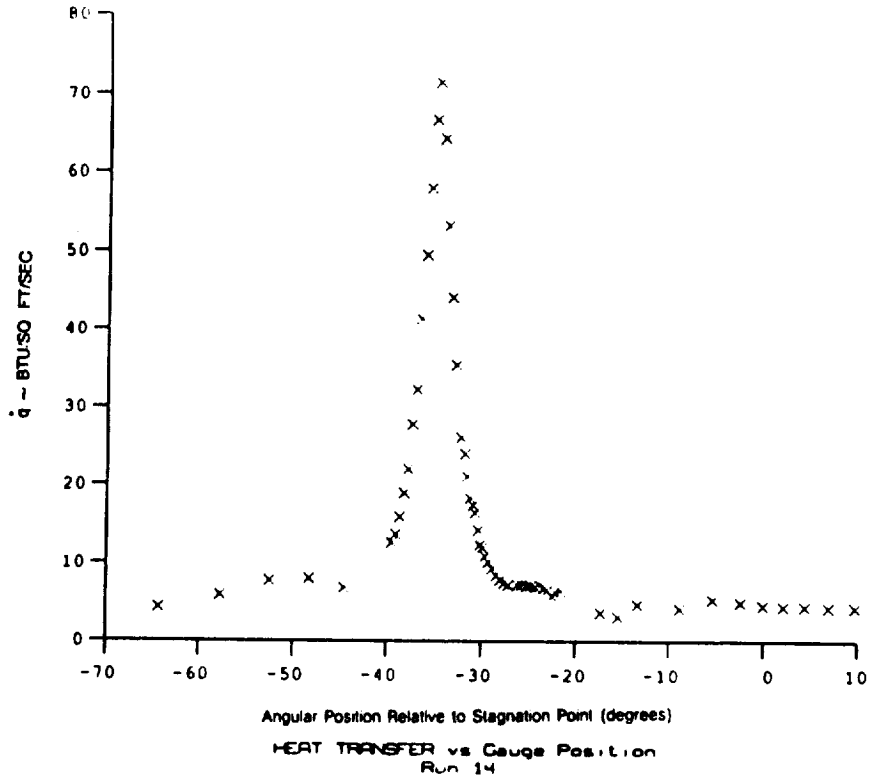


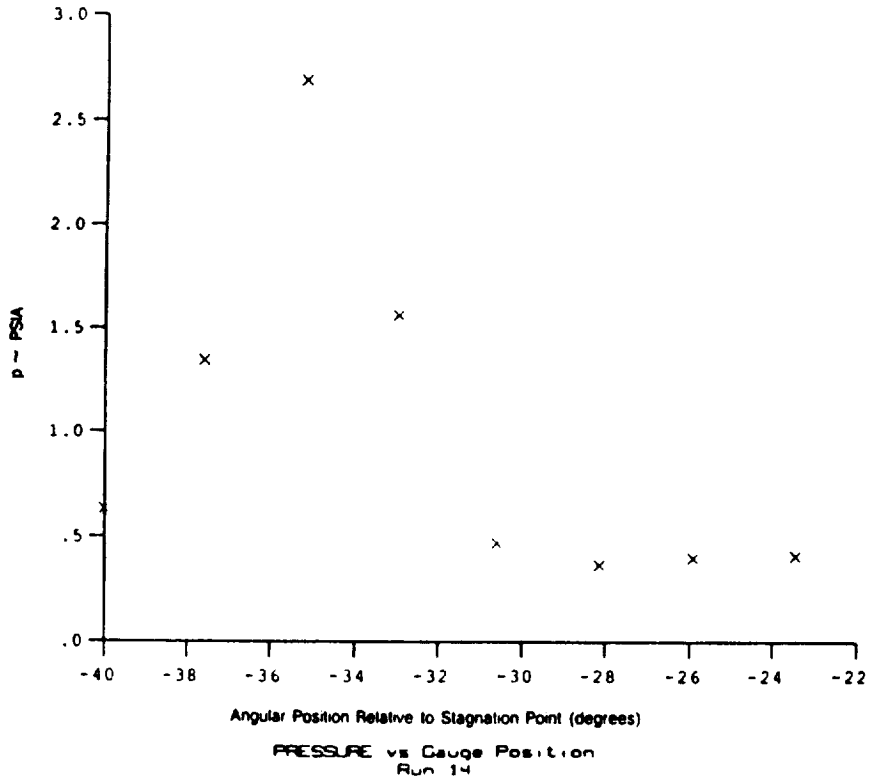
Test Conditions

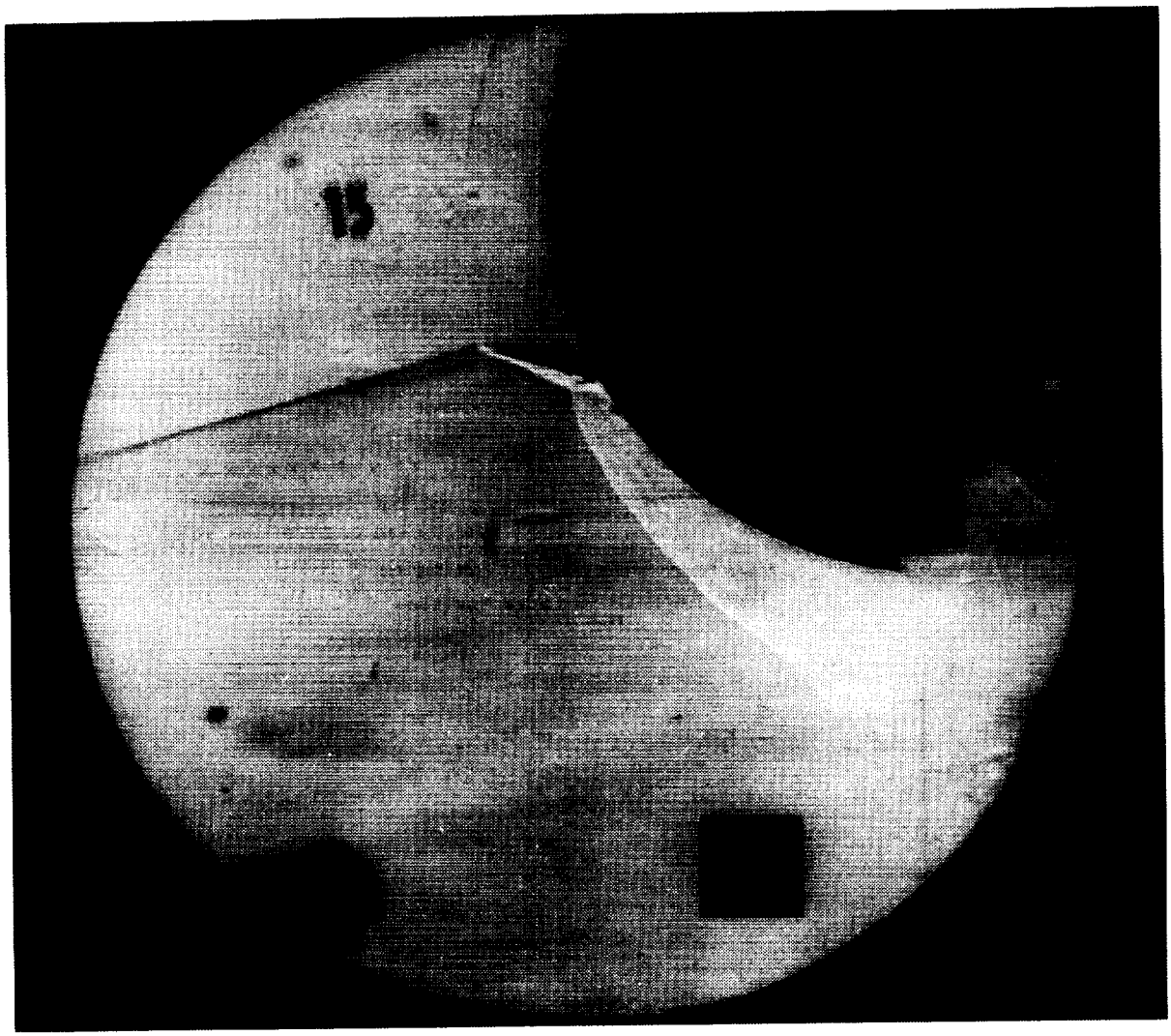
Po	= 3.8110X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.4599X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2619X10+3	degR	Reservoir Total Temperature
M	= 11.9630		Freestream Mach Number
U	= 5.3180X10+3	Ft/sec	Freestream Velocity
T	= 7.9398X10+1	degR	Freestream Temperature
P	= 2.5024X10-3	PSIA	Freestream Static Pressure
Rho	= 2.5554X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.3057X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 2.1551X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.6927X10-1	PSIA	Pitot Pressure
Q	= 2.5093X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9475		Shock Tube Incident Shock Mach Number
Hw	= 3.2626X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 3.9851	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.0501X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR=	4.2634	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value	
A - see shock generator diagram	(inches)	10.765
B - see shock generator diagram	(inches)	3.399

Run 14


80
70
60
50
40
30
20
10
0
q ~ BTU/SQ FT/SEC
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 14


3.0
2.5
2.0
1.5
1.0
.5
.0
p ~ PSIA
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 14

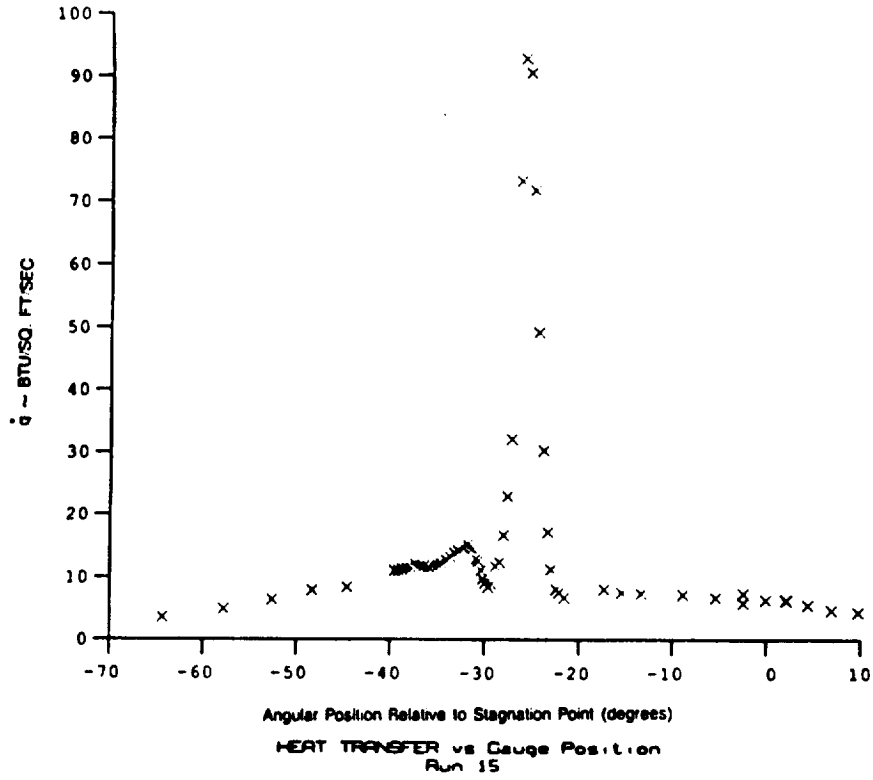


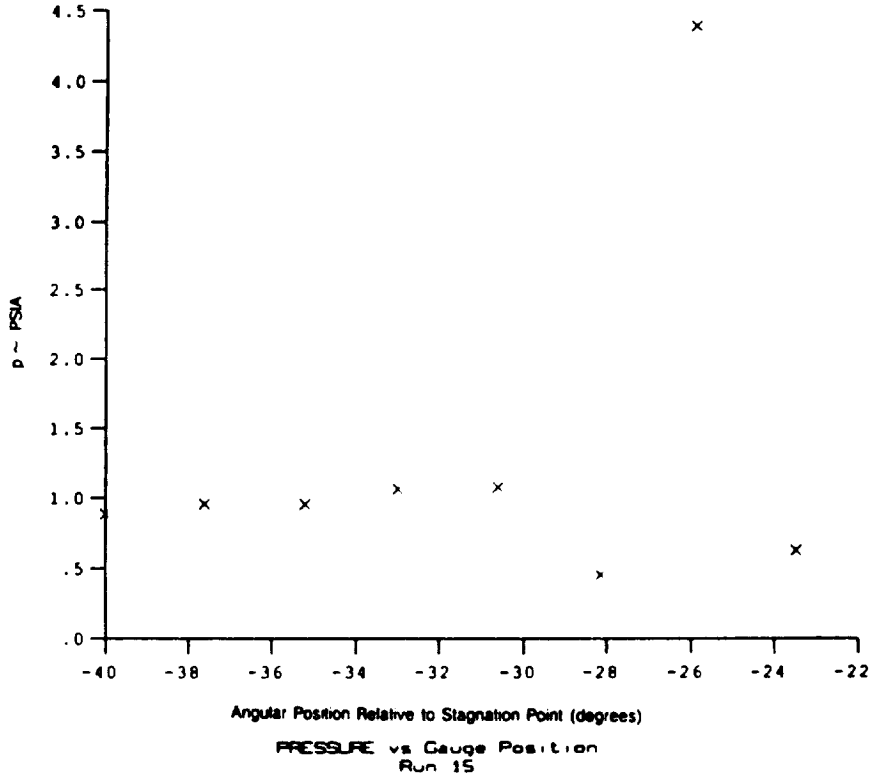
Test Conditions

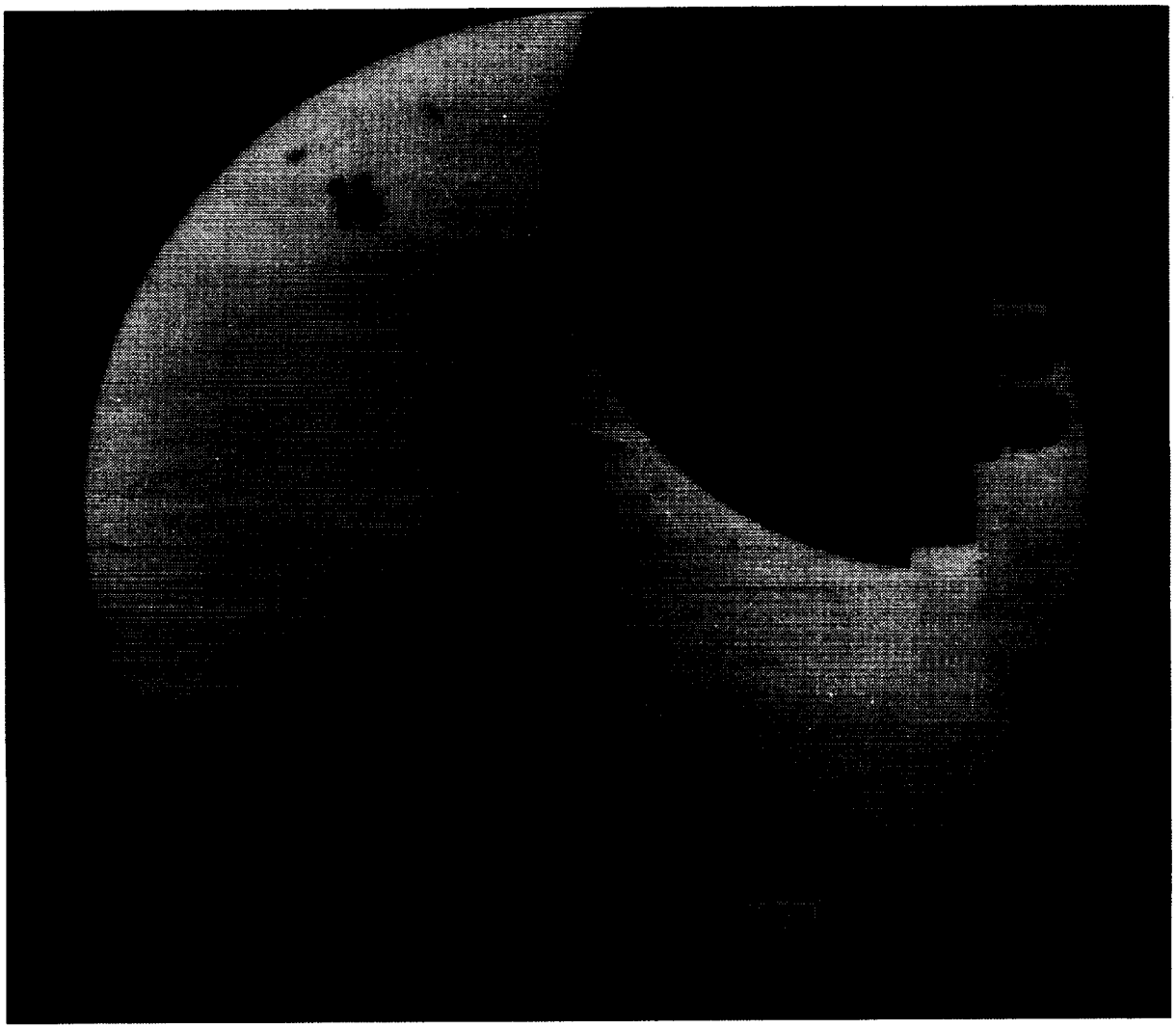
Po	= 3.7730X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5357X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3637X10+3	degR	Reservoir Total Temperature
M	= 11.9150		Freestream Mach Number
U	= 5.4537X10+3	Ft/sec	Freestream Velocity
T	= 8.4172X10+1	degR	Freestream Temperature
P	= 2.5185X10-3	PSIA	Freestream Static Pressure
Rho	= 2.4260X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.6780X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.9812X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.6853X10-1	PSIA	Pitot Pressure
Q	= 2.5054X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0314		Shock Tube Incident Shock Mach Number
Hw	= 3.2669X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPI	= 3.9913	1/PSIA	Pressure to CP factor (1/Q)
CHI	= 4.8637X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR=	4.5606	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	9.921
B - see shock generator diagram	(inches)	3.389

Run 15


100
90
80
70
60
50
40
30
20
10
0
q̇ ~ BTU/SQ. FT/SEC
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 15

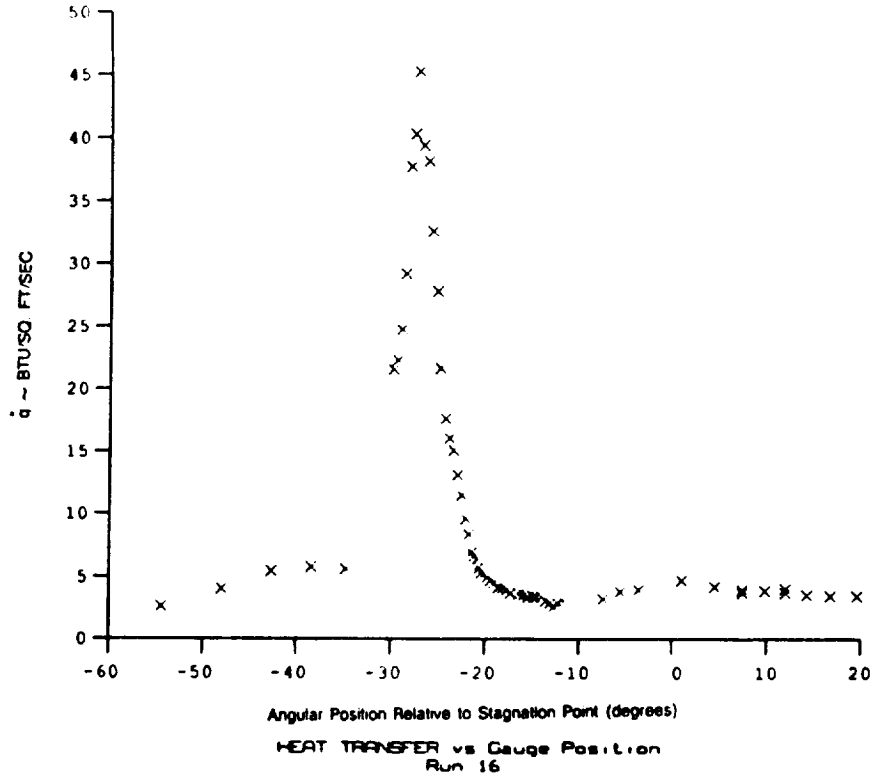

4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
.5
.0
p ~ PSIA
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 15

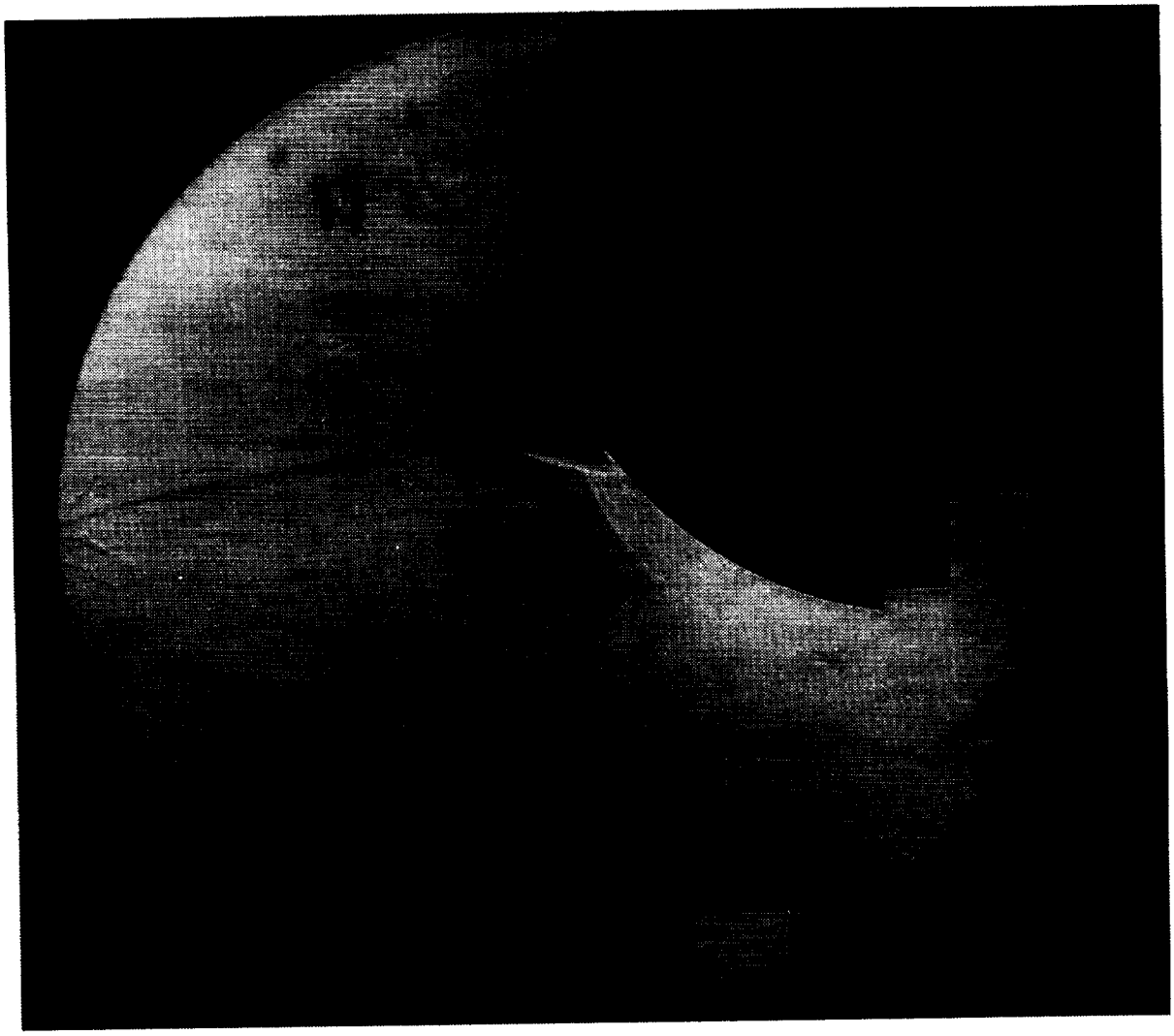


Test Conditions

Po	= 3.3080X10+2	PSIA	Reservoir Total Pressure	A - see shock generator diagram	(inches)	8.718
Ho	= 2.2782X10+7	(Ft/sec)2	Reservoir Total Enthalpy	B - see shock generator diagram	(inches)	3.637
To	= 3.3954X10+3	degR	Reservoir Total Temperature			
M	= 14.6370		Freestream Mach Number			
U	= 6.6809X10+3	Ft/sec	Freestream Velocity			
T	= 8.3705X10+1	degR	Freestream Temperature			
P	= 4.8665X10-4	PSIA	Freestream Static Pressure			
Rho	= 4.7139X10-7	Slugs/Ft3	Freestream Density			
Mu	= 6.6416X10-8	Slugs/Ft-sec	Freestream Viscosity			
Re	= 4.7418X10+4	1/Ft	Freestream Reynolds Number			
Po'	= 1.3662X10-1	PSIA	Pitot Pressure			
Q	= 7.3055X10-2	PSIA	Dynamic Pressure (Rho U^2/288)			
Mi	= 3.8096		Shock Tube Incident Shock Mach Number			
Hw	= 3.2694X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)			
CPf	= 1.3688X10+1	1/PSIA	Pressure to CP factor (1/Q)			
CHf	= 1.2660X10-2	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))			
QoFR	= 4.0970	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)			

Run 16


50
45
40
35
30
25
20
15
10
5
0
q ~ BTU/SQ FT/SEC
-60
-50
-40
-30
-20
-10
0
10
20
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 16

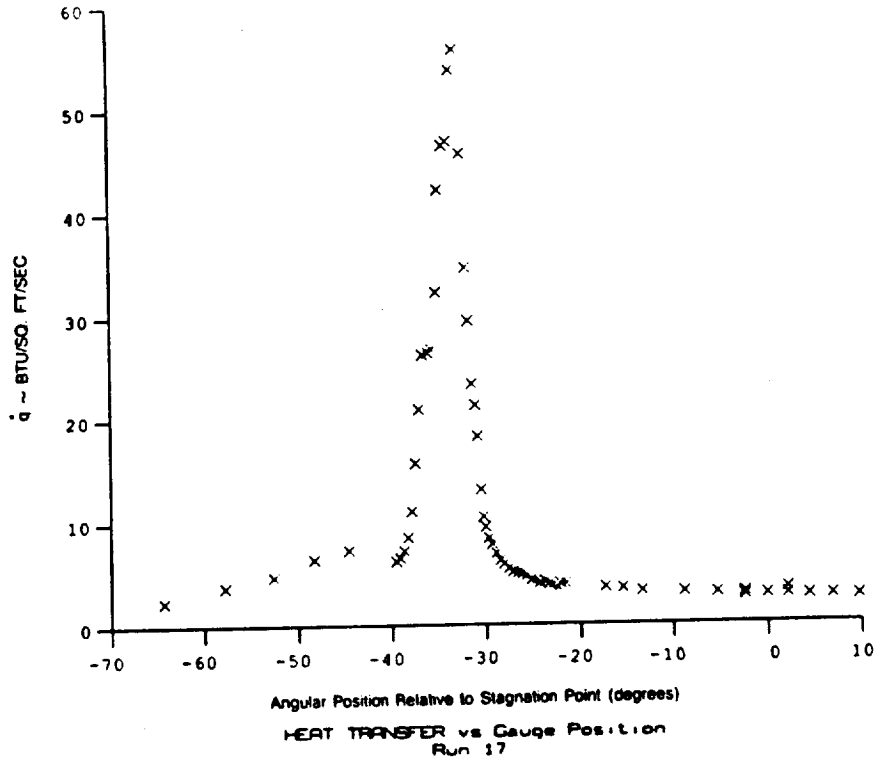


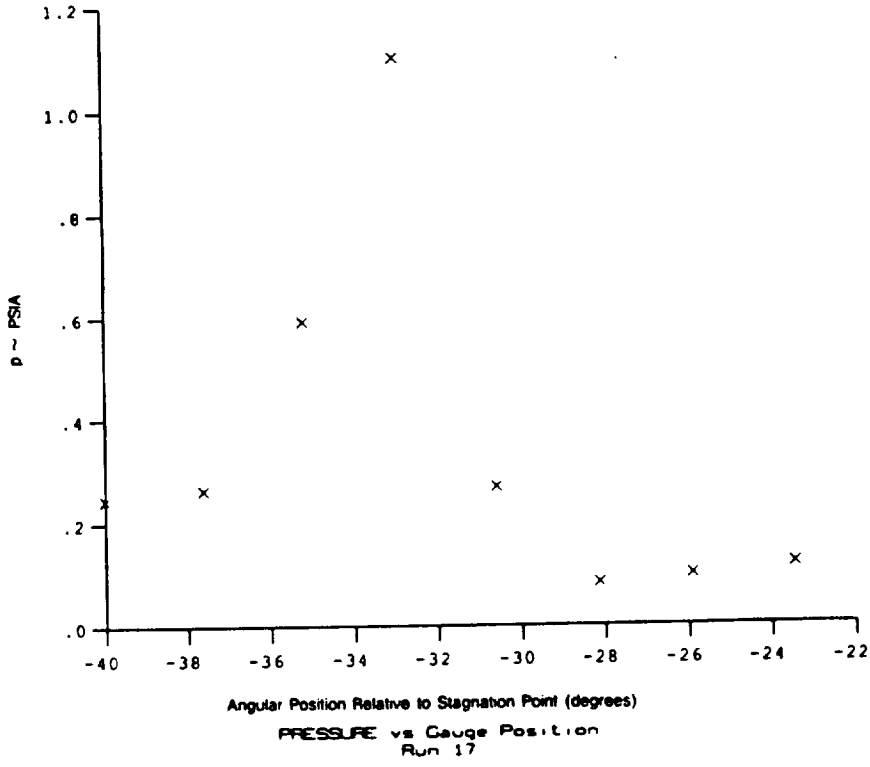
Test Conditions

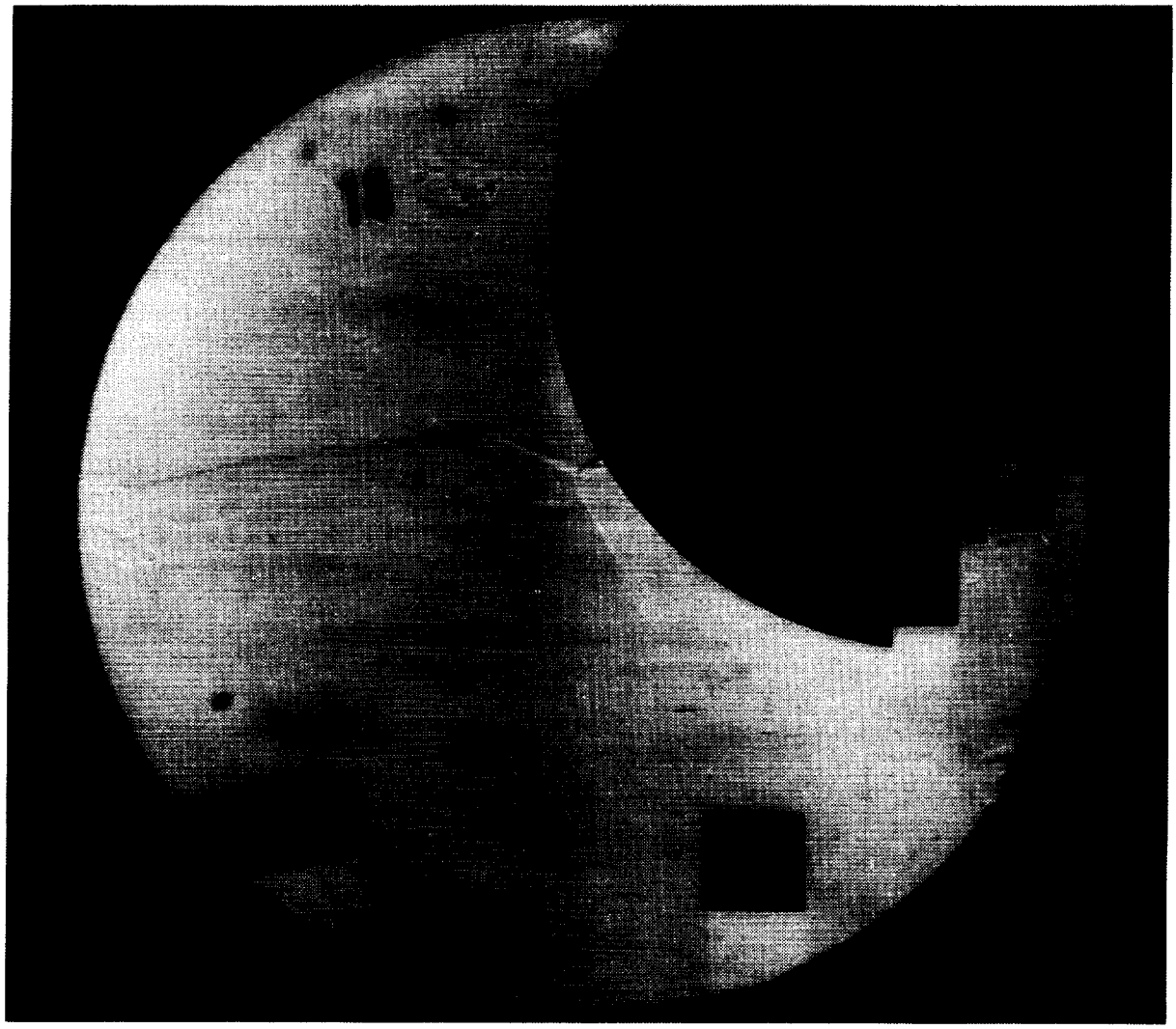
Po	= 3.3300X10+2	PSIA	Reservoir Total Pressure
Ho	= 2.3144X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.4443X10+3	degR	Reservoir Total Temperature
M	= 14.6160		Freestream Mach Number
U	= 6.7335X10+3	Ft/sec	Freestream Velocity
T	= 8.5273X10+1	degR	Freestream Temperature
P	= 4.9185X10-4	PSIA	Freestream Static Pressure
Rho	= 6.6767X10-7	Slugs/Ft3	Freestream Density
Mu	= 6.7638X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 4.6557X10+4	1/Ft	Freestream Reynolds Number
Po'	= 1.3769X10-1	PSIA	Pitot Pressure
Q	= 7.3626X10-2	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.8427		Shock Tube Incident Shock Mach Number
Hw	= 3.2700X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.3582X10+1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.2431X10-2	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 4.1936	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	8.312
B - see shock generator diagram	(inches)	3.590

Run 17

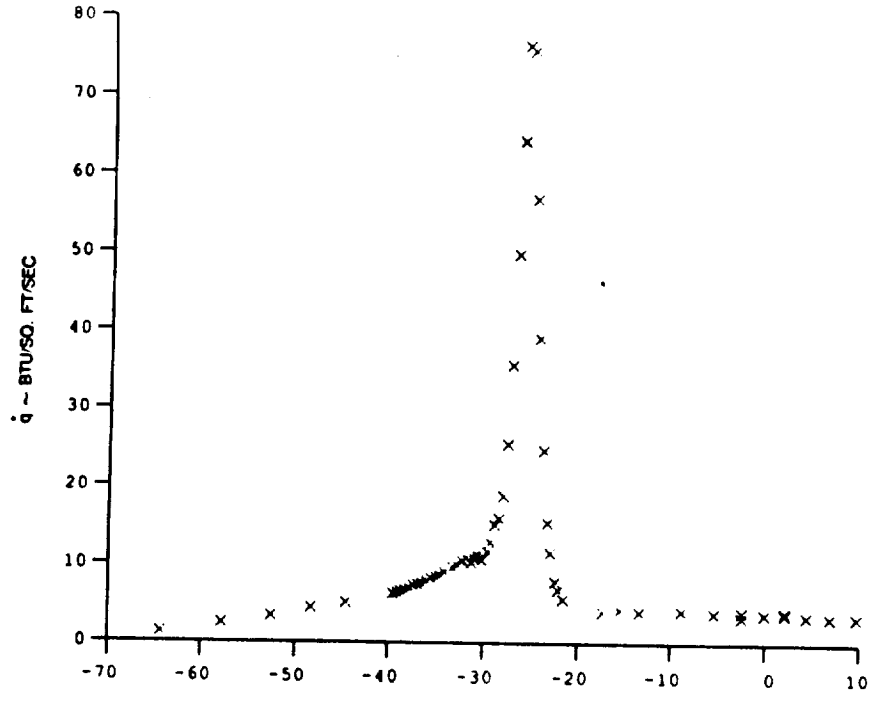

60
50
40
30
20
10
0
q ~ BTU/SQ. FT/SEC
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 17

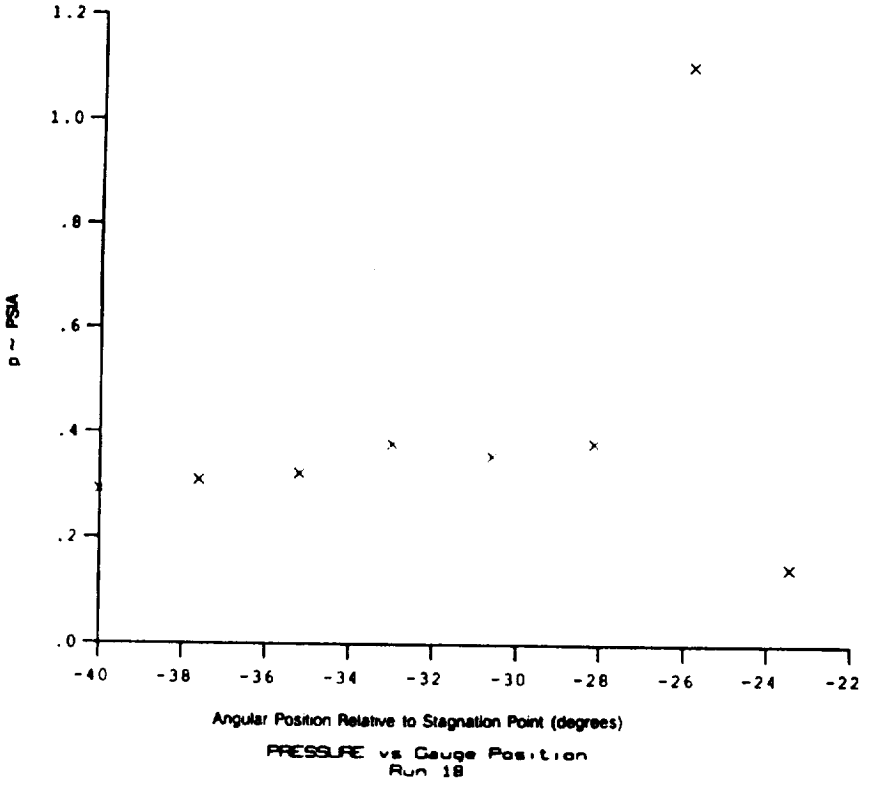

1.2
1.0
.8
.6
.4
.2
.0
p ~ PSIA
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 17

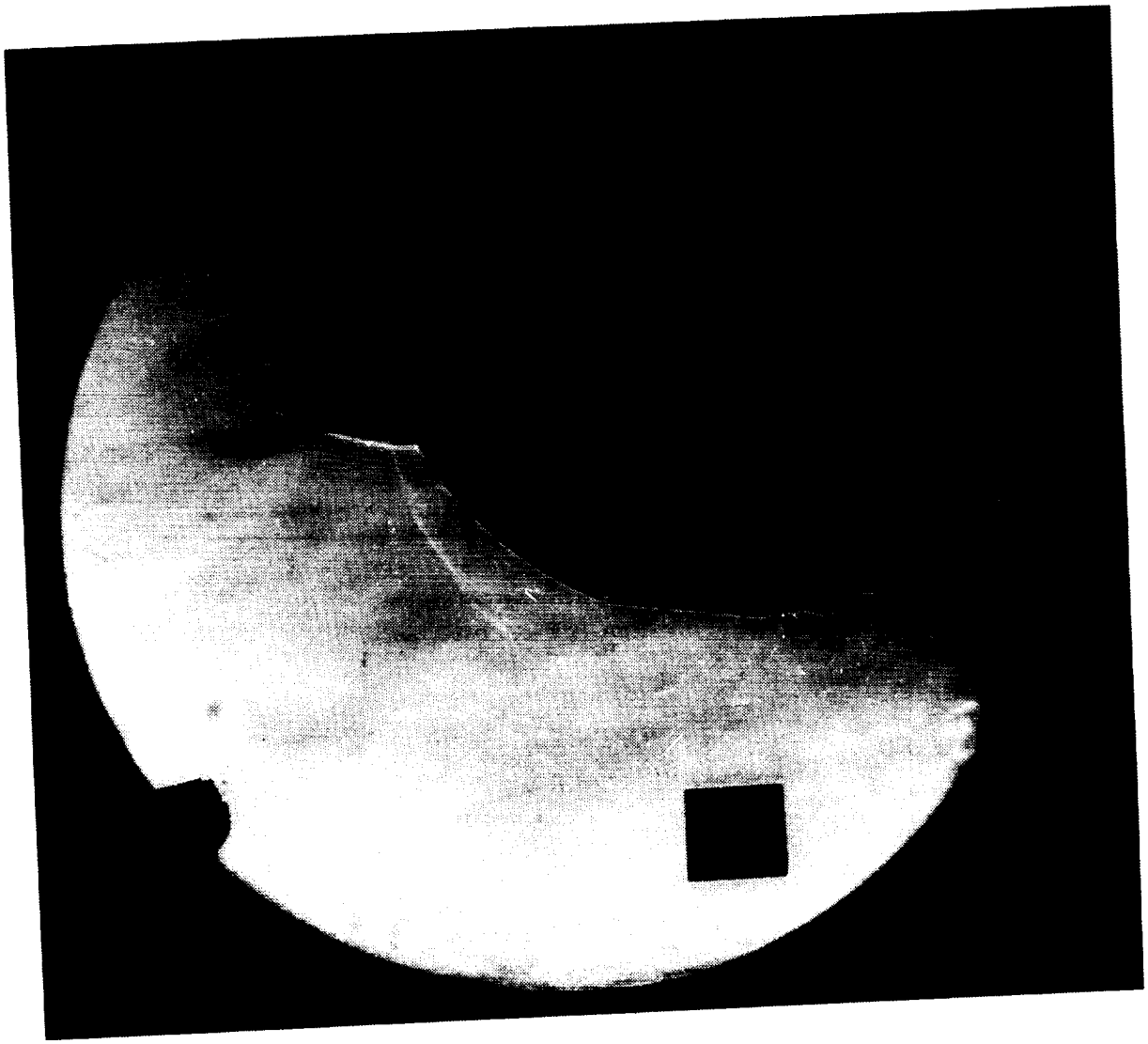


Test Conditions				Model Parameter	Value
Po	= 3.3100X10-2	PSIA	Reservoir Total Pressure	A - see shock generator diagram (inches)	7.765
Ho	= 2.3175X10-7	(Ft/sec)2	Reservoir Total Enthalpy	B - see shock generator diagram (inches)	3.417
To	= 3.4137X10-3	degR	Reservoir Total Temperature		
M	= 14.6390		Freestream Mach Number		
U	= 6.7303X10-3	Ft/sec	Freestream Velocity		
T	= 8.5110X10-1	degR	Freestream Temperature		
P	= 4.8329X10-4	PSIA	Freestream Static Pressure		
Rho	= 4.6036X10-7	Slugs/Ft3	Freestream Density		
Mu	= 6.7510X10-8	Slugs/Ft-sec	Freestream Viscosity		
Re	= 4.5944X10-4	1/Ft	Freestream Reynolds Number		
Po'	= 1.3573X10-1	PSIA	Pitot Pressure		
Q	= 7.2578X10-2	PSIA	Dynamic Pressure (Rho U^2/288)		
Mi	= 3.8076		Shock Tube Incident Shock Mach Number		
Hw	= 3.2899X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)		
CPf	= 1.3778X10-1	1/PSIA	Pressure to CP factor (1/Q)		
CHf	= 1.2613X10-2	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))		
QoFR	= 4.1649	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)		

Run 18


80
70
60
50
40
30
20
10
0
q ~ BTU/SQ. FT/SEC
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 18


1.2
1.0
.8
.6
.4
.2
.0
p ~ PSIA
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 18

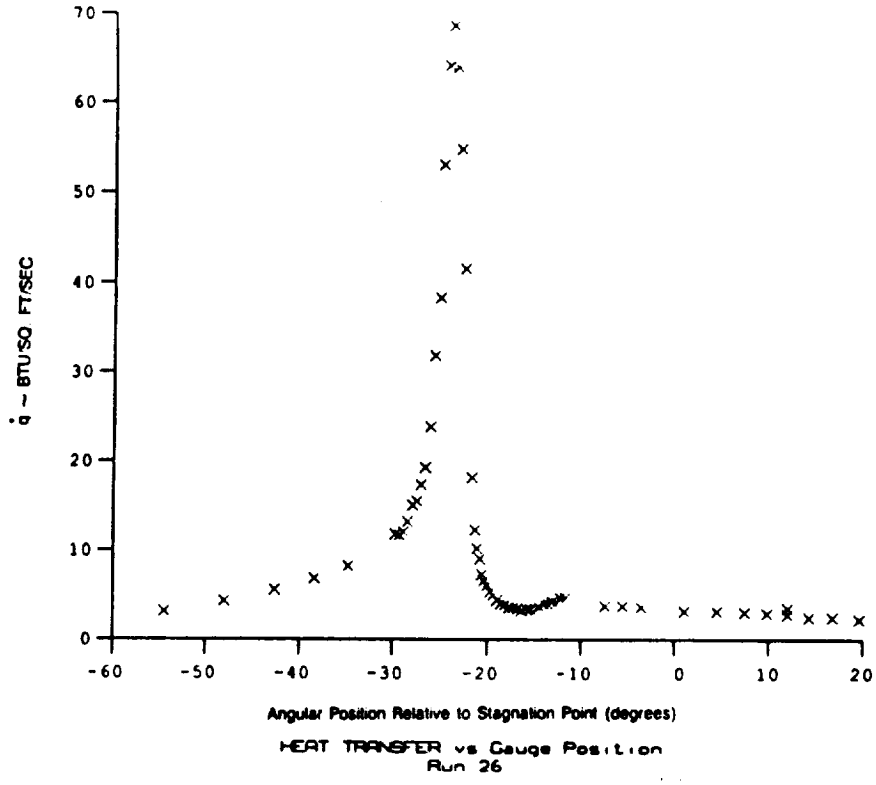


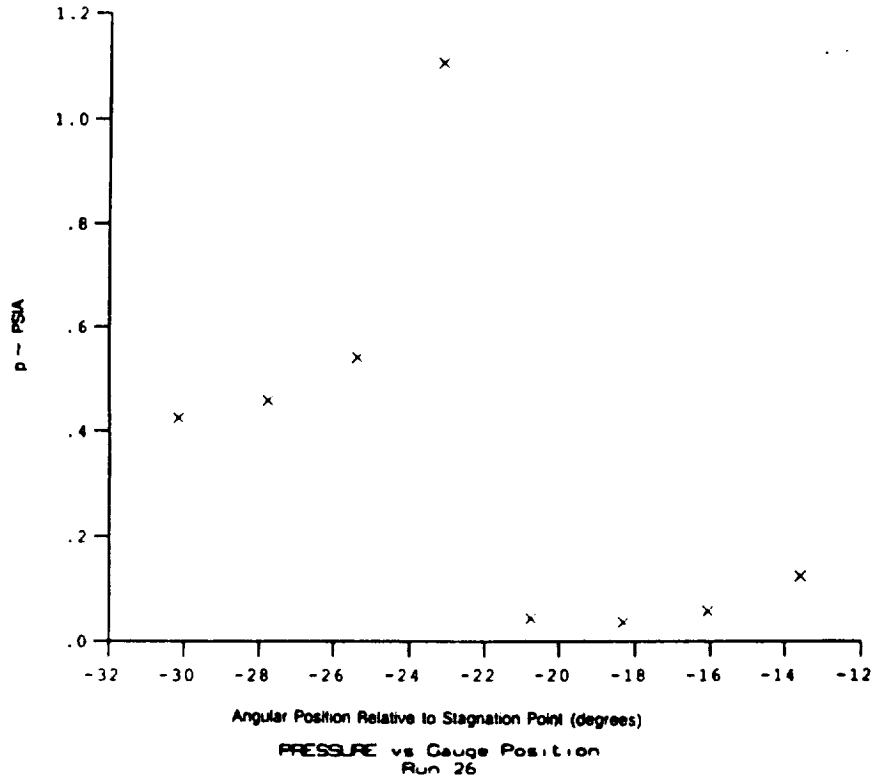
Test Conditions

Po	= 3.3210X10+2	PSIA	Reservoir Total Pressure
Ho	= 2.5092X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.5994X10+3	degR	Reservoir Total Temperature
M	= 14.555C		Freestream Mach Number
U	= 7.0106X10+3	Ft/sec	Freestream Velocity
T	= 9.3203X10+1	degR	Freestream Temperature
P	= 4.8915X10-4	PSIA	Freestream Static Pressure
Rho	= 4.2552X10-7	Slugs/Ft3	Freestream Density
Mu	= 7.3835X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 4.0403X10+4	1/Ft	Freestream Reynolds Number
Po'	= 1.3580X10-1	PSIA	Pitot Pressure
Q	= 7.2617X10-2	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.9034		Shock Tube Incident Shock Mach Number
Hw	= 3.3309X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.3771X10+1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.1985X10-2	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	4.5805	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

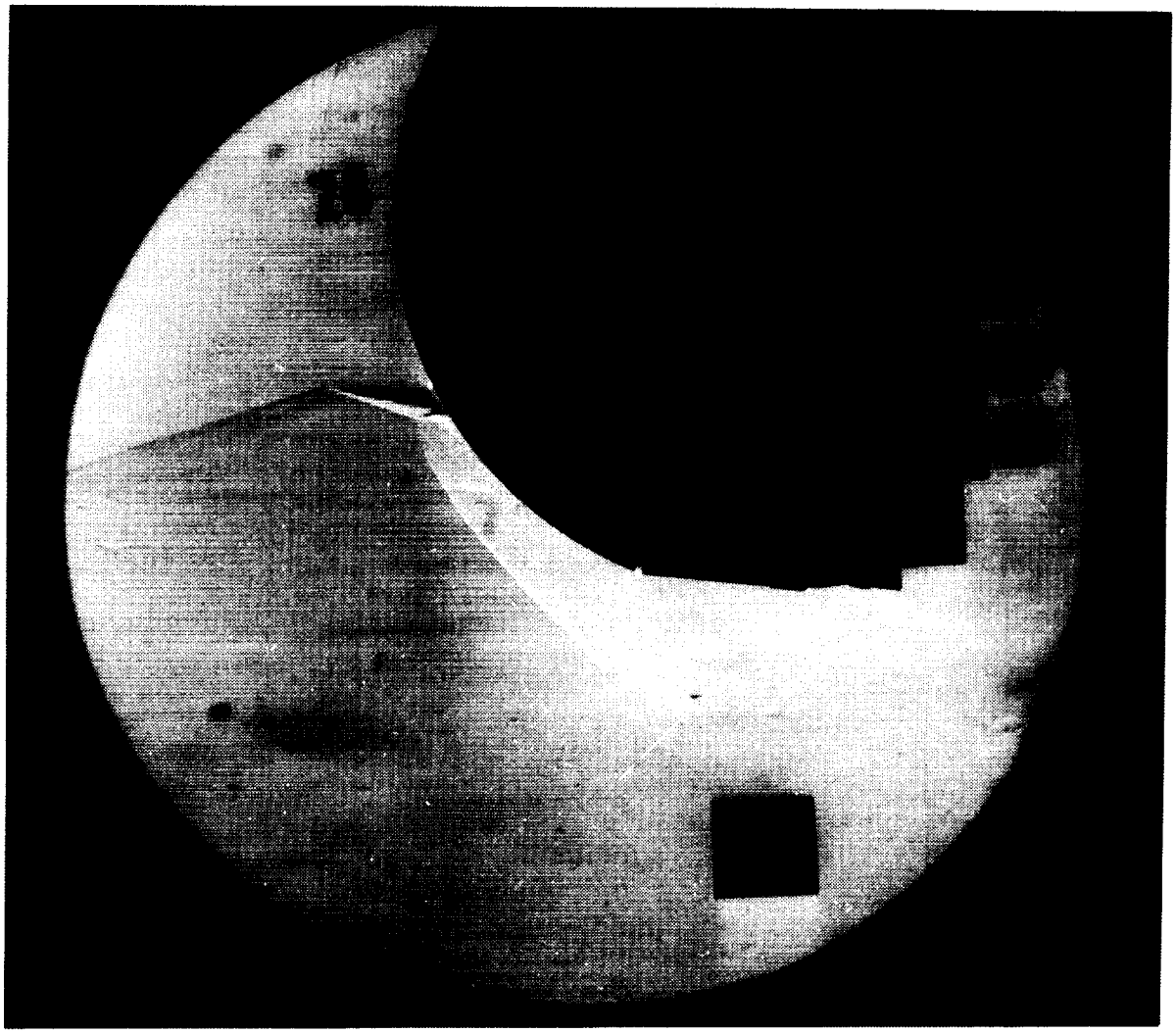
Model Parameter		Value
A - see shock generator diagram	(inches)	6.437
B - see shock generator diagram	(inches)	3.264

Run 26


70
60
50
40
30
20
10
0
q ~ BTU/SQ FT/SEC
-60
-50
-40
-30
-20
-10
0
10
20
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 26


1.2
1.0
.8
.6
.4
.2
.0
p ~ PSIA
-32
-30
-28
-26
-24
-22
-20
-18
-16
-14
-12
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 26

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

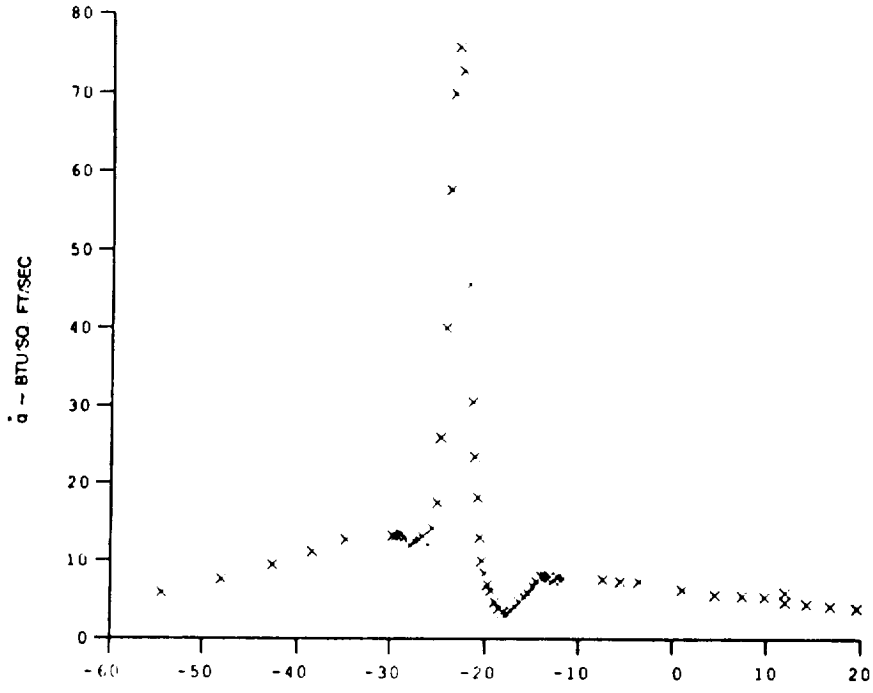


Test Conditions

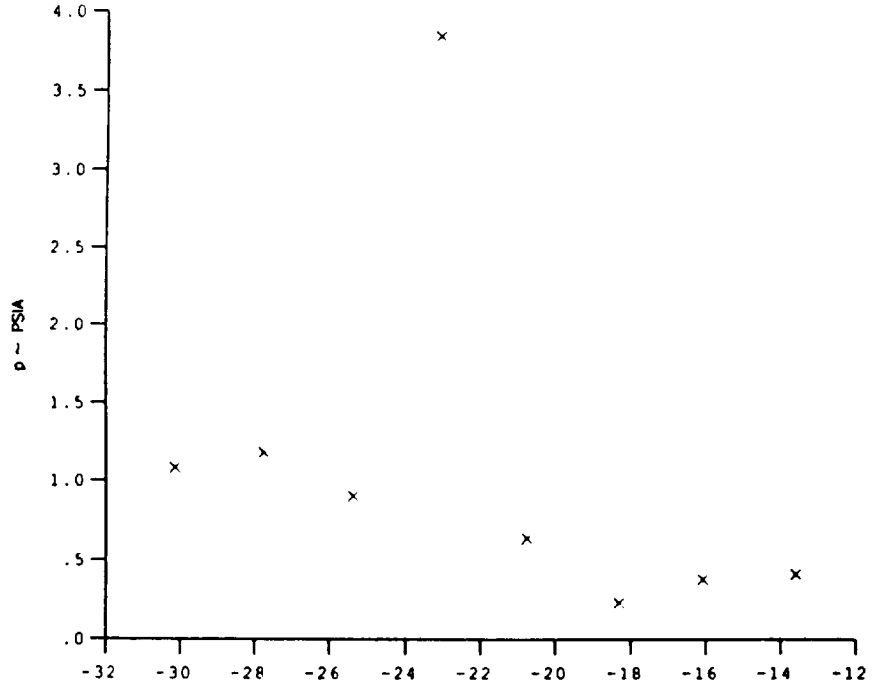
Po	= 3.7980X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5193X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3498X10+3	degR	Reservoir Total Temperature
M	= 11.9200		Freestream Mach Number
U	= 5.4245X10+3	Ft/sec	Freestream Velocity
T	= 8.3201X10+1	degR	Freestream Temperature
P	= 2.5336X10-3	PSIA	Freestream Static Pressure
Rho	= 2.4690X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.6022X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 2.0285X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.7174X10-1	PSIA	Pitot Pressure
Q	= 2.5226X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0246		Shock Tube Incident Shock Mach Number
Hw	= 3.2589X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 3.9642	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.8675X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR	= 4.5143	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	8.368
B - see shock generator diagram	(inches)	3.193

Run 28



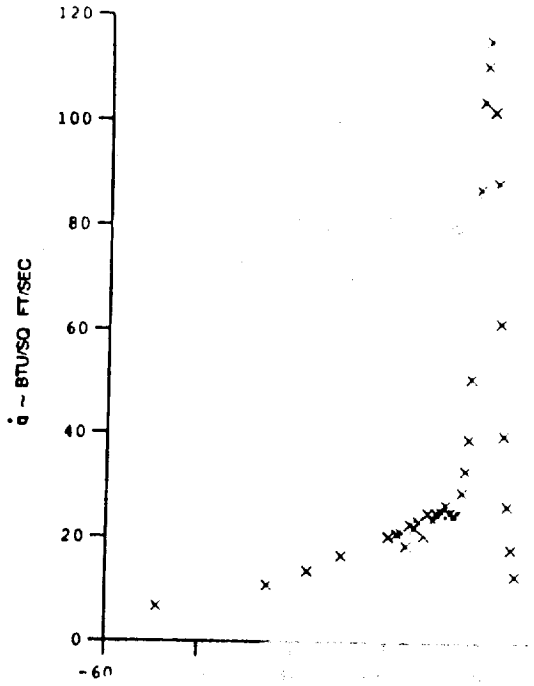
HEAT TRANSFER vs Gauge Position
Run 28



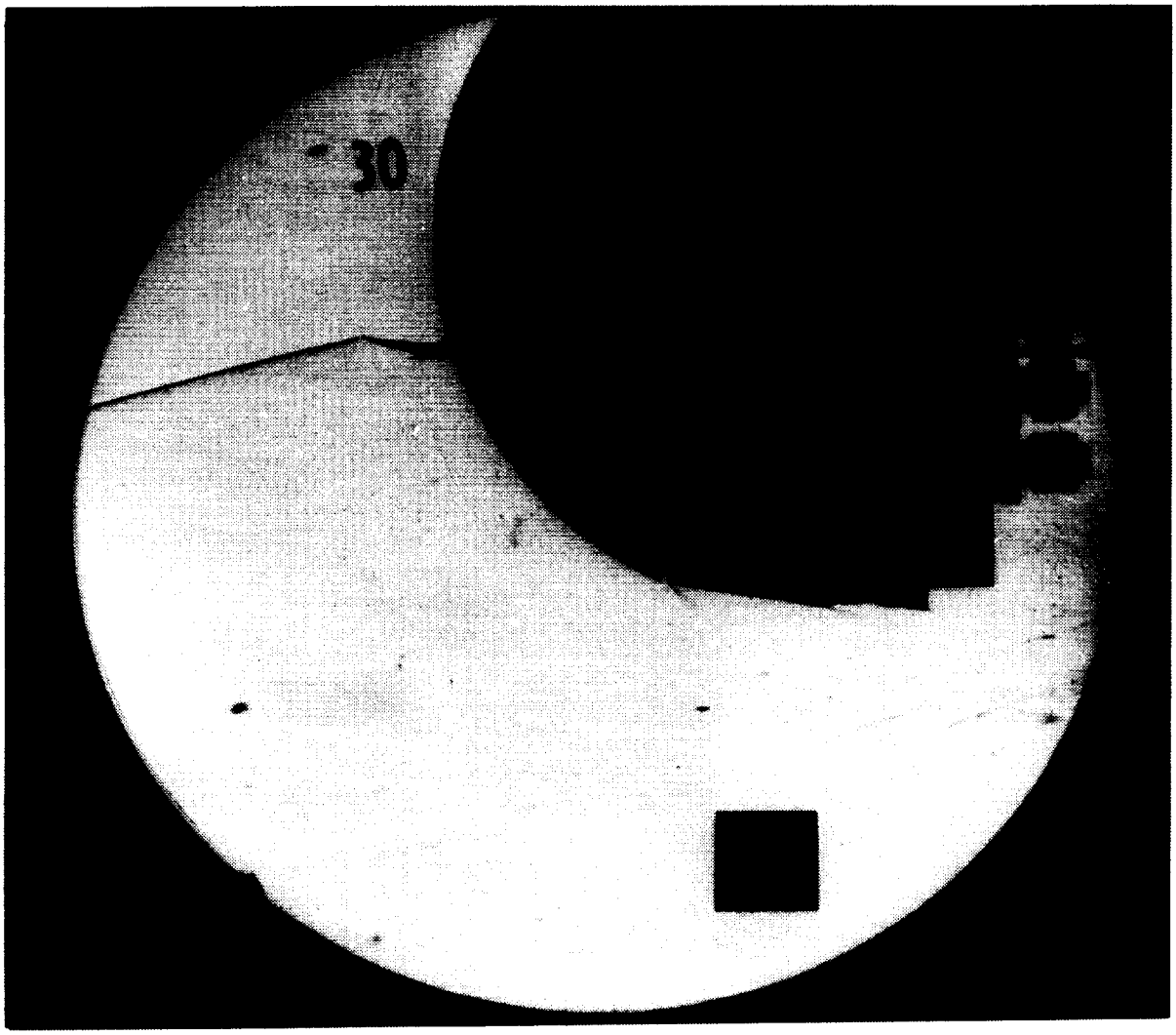
PRESSURE vs Gauge Position
Run 28

Test Conditions					Model Parameter		Value
Po	= 7.0850X10+2	PSIA	Reservoir Total Pressure		A - see shock generator diagram	(inches)	0.360
Ho	= 1.4523X10+7	(Ft/sec)2	Reservoir Total Enthalpy		B - see shock generator diagram	(inches)	3.193
To	= 2.2620X10+3	degR	Reservoir Total Temperature				
M	= 12.1270		Freestream Mach Number				
U	= 5.3066X10+3	Ft/sec	Freestream Velocity				
T	= 7.6924X10+1	degR	Freestream Temperature				
P	= 4.2771X10-3	PSIA	Freestream Static Pressure				
Rho	= 4.5082X10-6	Slugs/Ft3	Freestream Density				
Mu	= 6.1128X10-8	Slugs/Ft-sec	Freestream Viscosity				
Re	= 3.9137X10+5	1/Ft	Freestream Reynolds Number				
Po'	= 8.2436X10-1	PSIA	Pitot Pressure				
Q	= 4.4081X10-1	PSIA	Dynamic Pressure (Rho U^2/288)				
Mi	= 2.9539		Shock Tube Incident Shock Mach Number				
Hw	= 3.2520X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)				
CPf	= 2.2686	1/PSIA	Pressure to CP factor (1/Q)				
CHf	= 2.8854X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))				
QofR	= 5.6180	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)				

Run 29


120
100
80
60
40
20
0
-60
$\dot{q}$ ~ BTU/SQ FT/SEC

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH



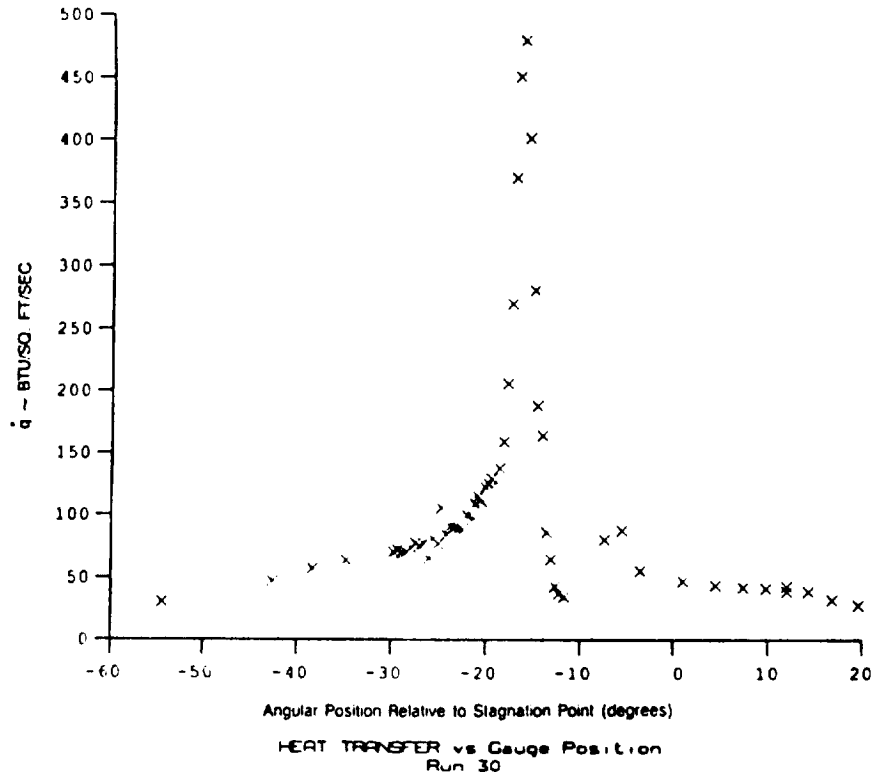
Test Conditions

Po	= 4.4010X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.8350X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.7201X10+3	degR	Reservoir Total Temperature
M	= 12.5430		Freestream Mach Number
U	= 5.9715X10+3	Ft/sec	Freestream Velocity
T	= 9.1056X10+1	degR	Freestream Temperature
P	= 2.1227X10-2	PSIA	Freestream Static Pressure
Rho	= 1.8902X10-5	Slugs/Ft3	Freestream Density
Mu	= 7.2155X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.5643X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.3766	PSIA	Pitot Pressure
Q	= 2.3403	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.3003		Shock Tube Incident Shock Mach Number
Hw	= 3.2955X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.2729X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.5785X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	1.7564X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

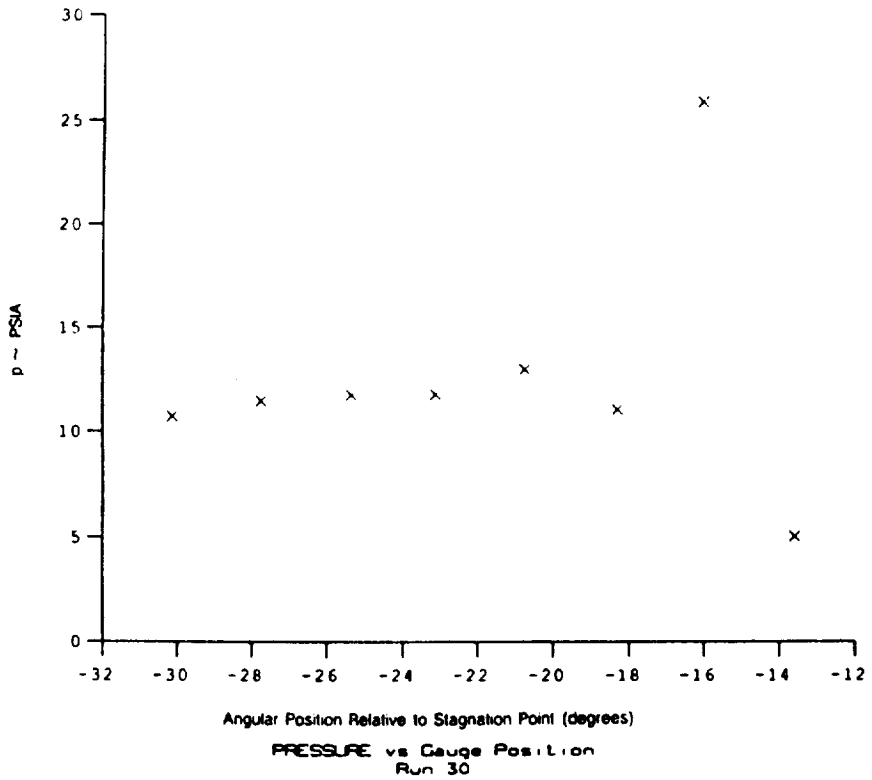
Model Parameter Value

A - see shock generator diagram	(inches)	8.368
B - see shock generator diagram	(inches)	3.193

Run 30



HEAT TRANSFER vs Gauge Position
Run 30



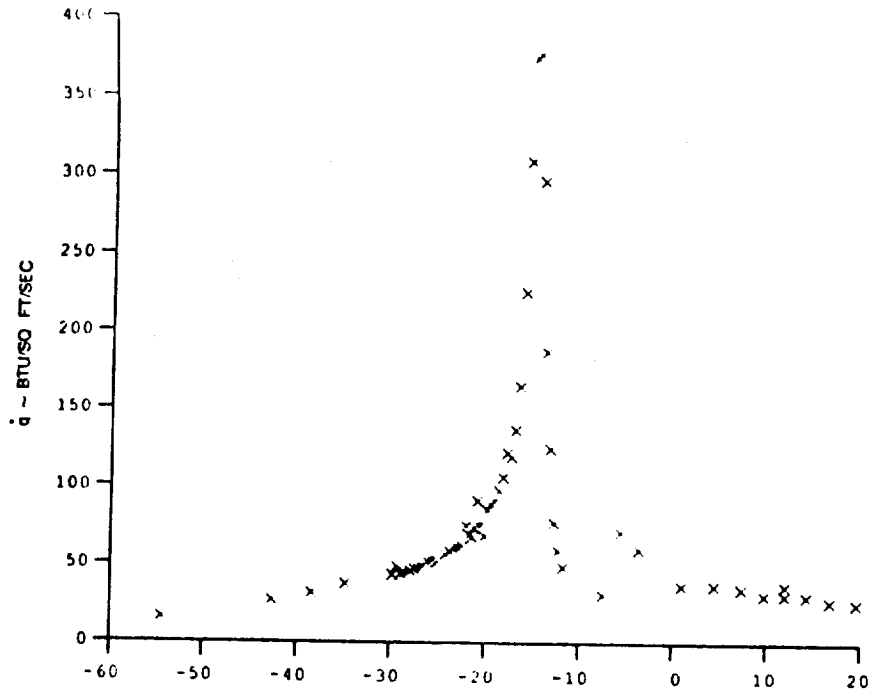
PRESSURE vs Gauge Position
Run 30

Test Conditions

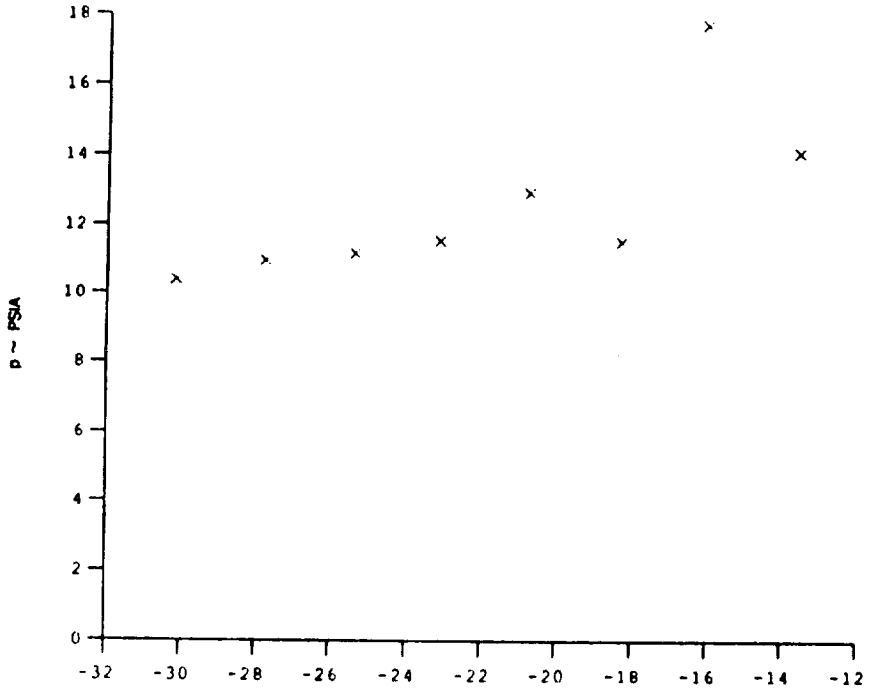
Po	4.1390X10+3	PSIA	Reservoir Total Pressure
Ho	1.7879X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	2.6565X10+3	degR	Reservoir Total Temperature
M	12.5570		Freestream Mach Number
U	5.8945X10+3	Ft/sec	Freestream Velocity
T	8.8531X10+1	degR	Freestream Temperature
P	1.9930X10-2	PSIA	Freestream Static Pressure
Rho	1.8253X10-5	Sluge/Ft3	Freestream Density
Mu	7.0182X10-8	Sluge/Ft-sec	Freestream Viscosity
Re	1.5330X10+6	1/Ft	Freestream Reynolds Number
Po'	4.1180	PSIA	Pitot Pressure
Q	2.2020	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	3.2509		Shock Tube Incident Shock Mach Number
Hw	3.2955X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	4.5411X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	4.9583X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	1.6471X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	8.220
B - see shock generator diagram	(inches)	3.133

Run 31



HEAT TRANSFER vs Gauge Position
Run 31



PRESSURE vs Gauge Position
Run 31

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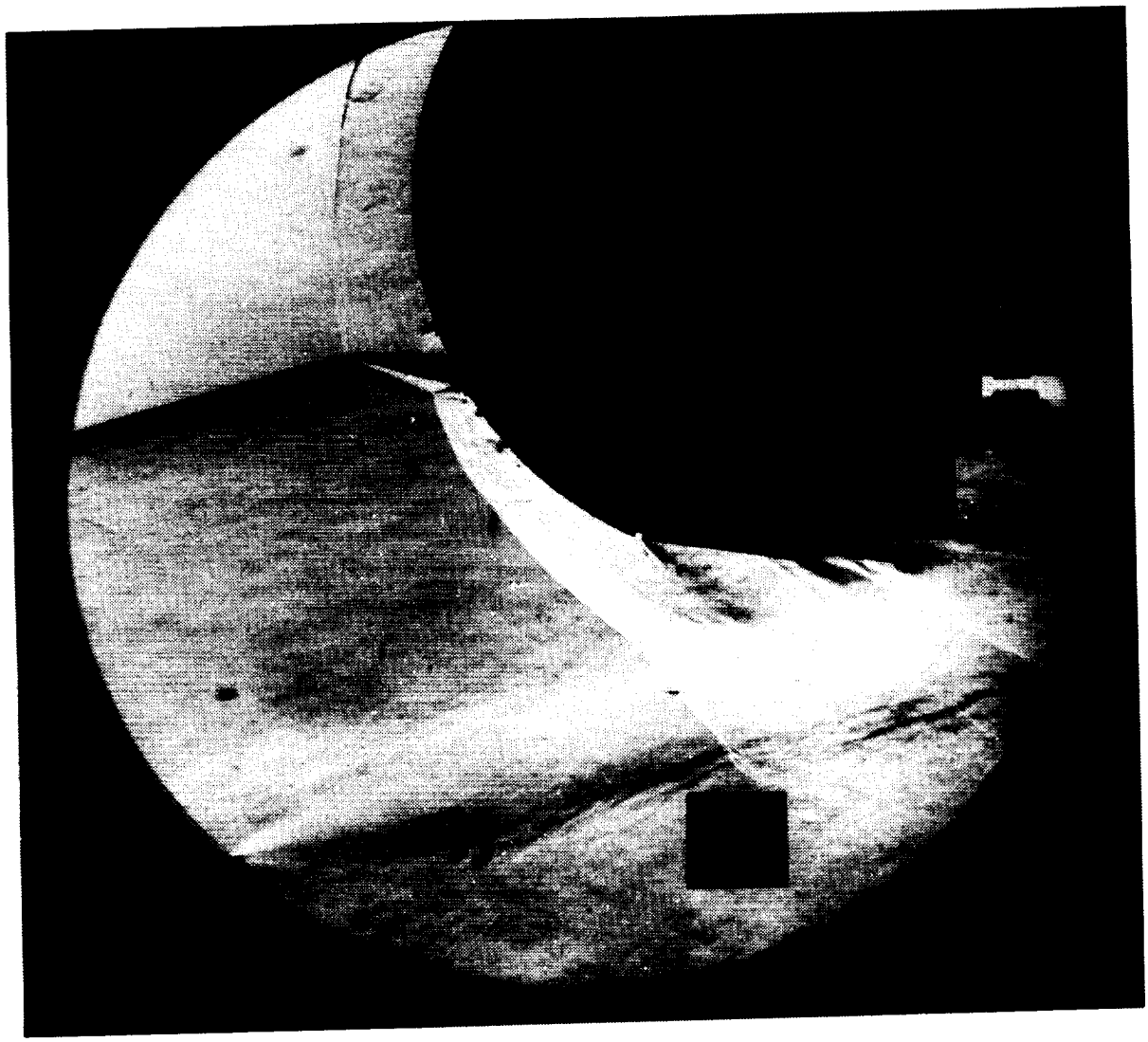
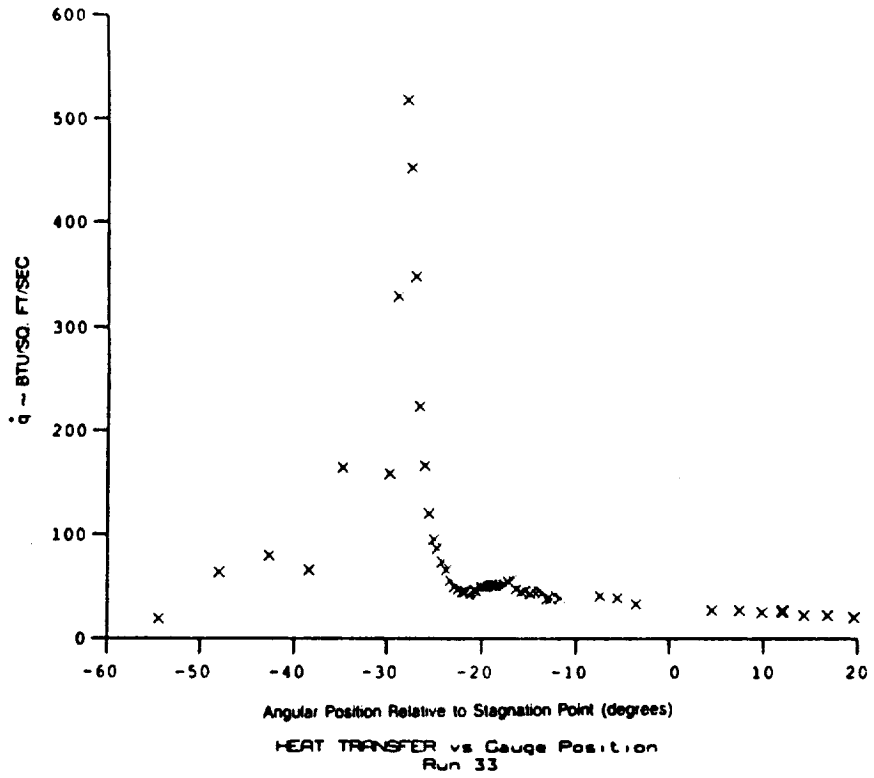


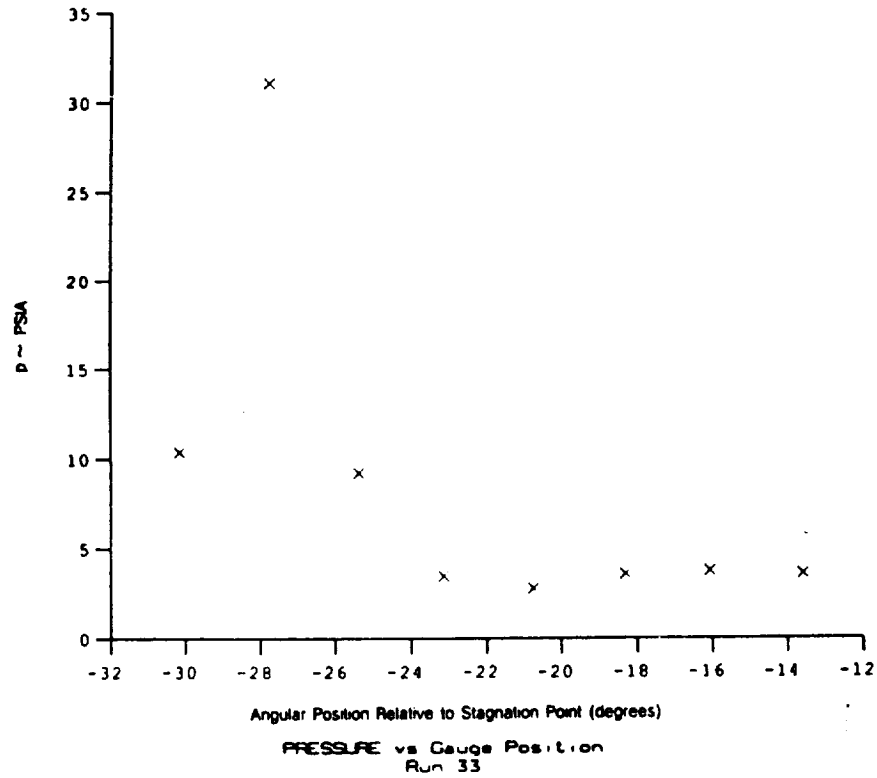
Test Conditions

Po	= 4.2920X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.7918X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.6220X10+3	degR	Reservoir Total Temperature
M	= 12.5990		Freestream Mach Number
U	= 5.9016X10+3	Ft/sec	Freestream Velocity
T	= 8.8144X10+1	degR	Freestream Temperature
P	= 2.0216X10-2	PSIA	Freestream Static Pressure
Rho	= 1.8596X10-5	Slugs/Ft3	Freestream Density
Mu	= 6.9882X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.5704X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.2055	PSIA	Pitot Pressure
Q	= 2.2468	PSIA	Dynamic Pressure (Rho U^2/288)
Ml	= 3.2044		Shock Tube Incident Shock Mach Number
Hw	= 3.3265X10-6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.4467X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.8584X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFP	= 1.6644X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Mode. Parameter	Value	
A - see shock generator diagram	(inches)	8.947
B - see shock generator diagram	(inches)	3.187

Run 33


600
500
400
300
200
100
0
q̇ ~ BTU/SQ. FT/SEC
-60
-50
-40
-30
-20
-10
0
10
20
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 33


35
30
25
20
15
10
5
0
p ~ PSIA
-32
-30
-28
-26
-24
-22
-20
-18
-16
-14
-12
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 33

ORIGINAL PAGE
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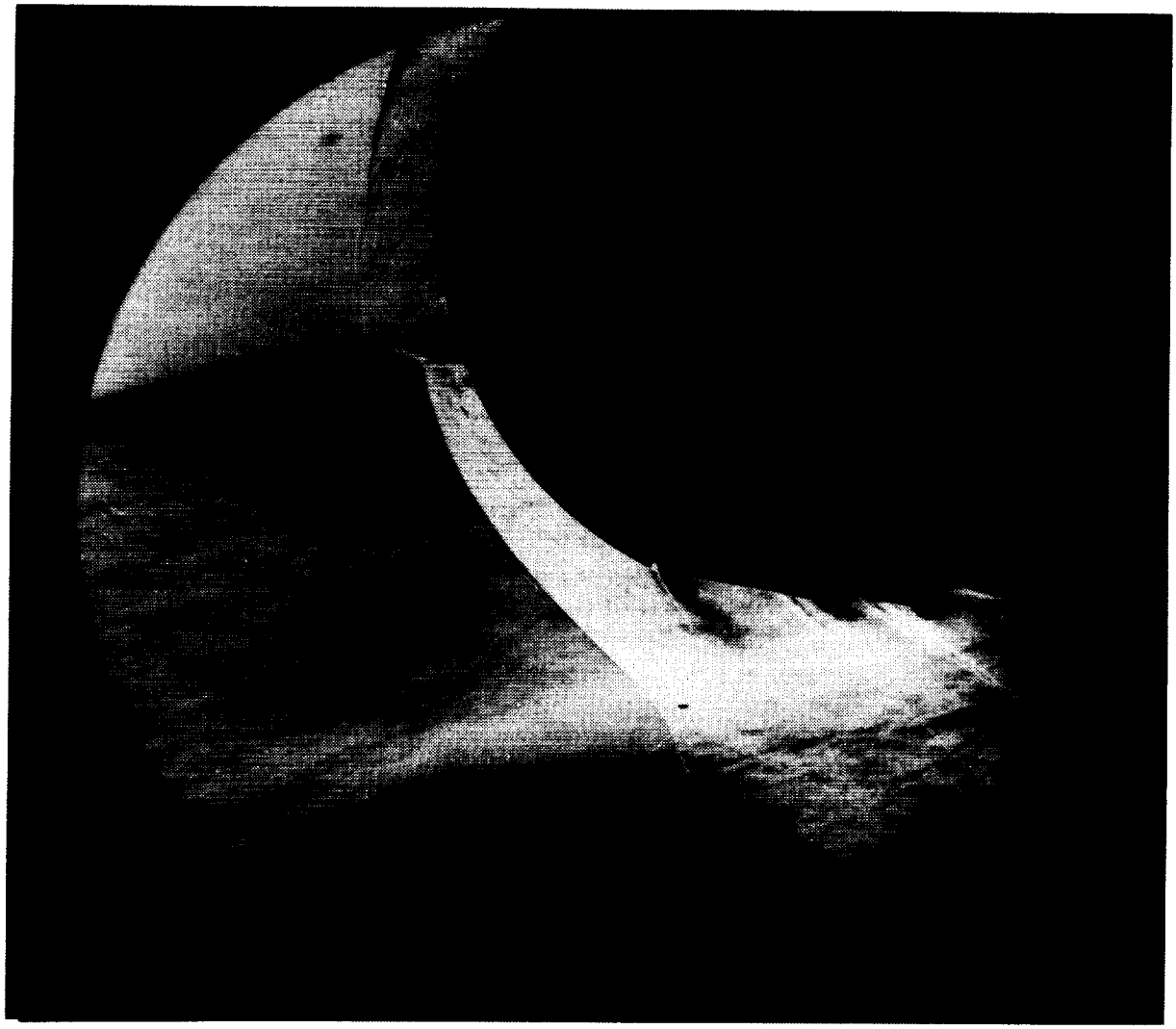
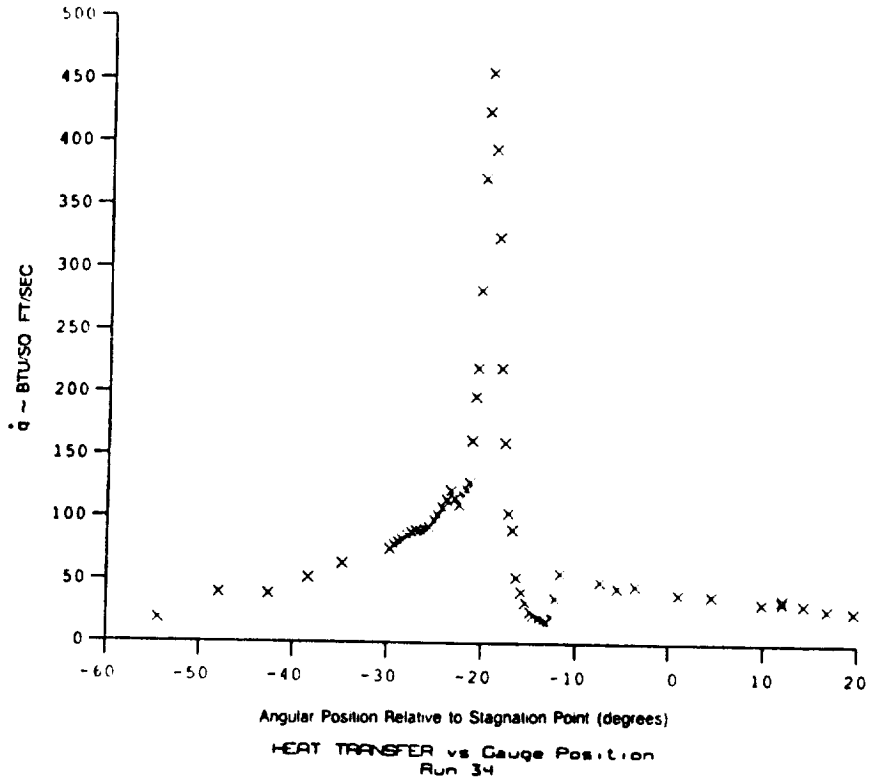
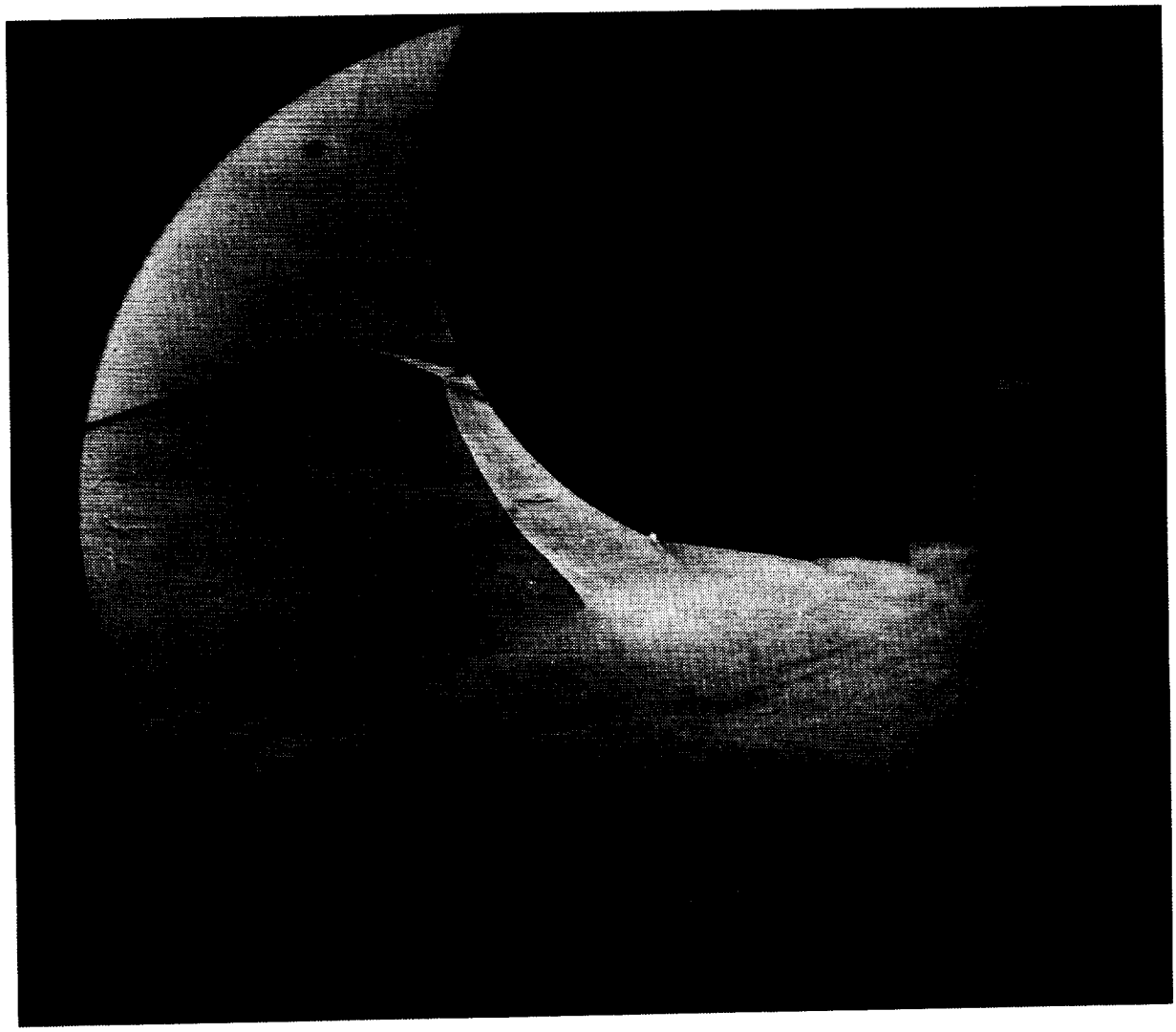


Test Conditions				Model Parameter	Value
Po	= 4.2370X10+3	PSIA	Reservoir Total Pressure	A - see shock generator diagram (inches)	8.593
Ho	= 1.7437X10+7	(Ft/sec)2	Reservoir Total Enthalpy	B - see shock generator diagram (inches)	3.184
To	= 2.6143X10+3	degR	Reservoir Total Temperature		
M	= 12.5810		Freestream Mach Number		
U	= 5.8215X10+3	Ft/sec	Freestream Velocity		
T	= 8.6025X10+1	degR	Freestream Temperature		
P	= 2.0321X10-2	PSIA	Freestream Static Pressure		
Rho	= 1.9153X10-5	Slugs/Ft3	Freestream Density		
Mu	= 6.8226X10-8	Slugs/Ft-sec	Freestream Viscosity		
Re	= 1.6343X10+6	1/Ft	Freestream Reynolds Number		
Po'	= 4.2148	PSIA	Pitot Pressure		
Q	= 2.2538	PSIA	Dynamic Pressure (Rho U^2/288)		
M1	= 3.2263		Shock Tube Incident Shock Mach Number		
Hw	= 3.2810X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)		
CPf	= 4.4370X10-1	1/PSIA	Pressure to CP factor (1/Q)		
CHf	= 4.9294X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))		
QofR=	1.6149X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)		

Run 34


500
450
400
350
300
250
200
150
100
50
0
q̇ ~ BTU/SQ FT/SEC
-60
-50
-40
-30
-20
-10
0
10
20
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 34

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

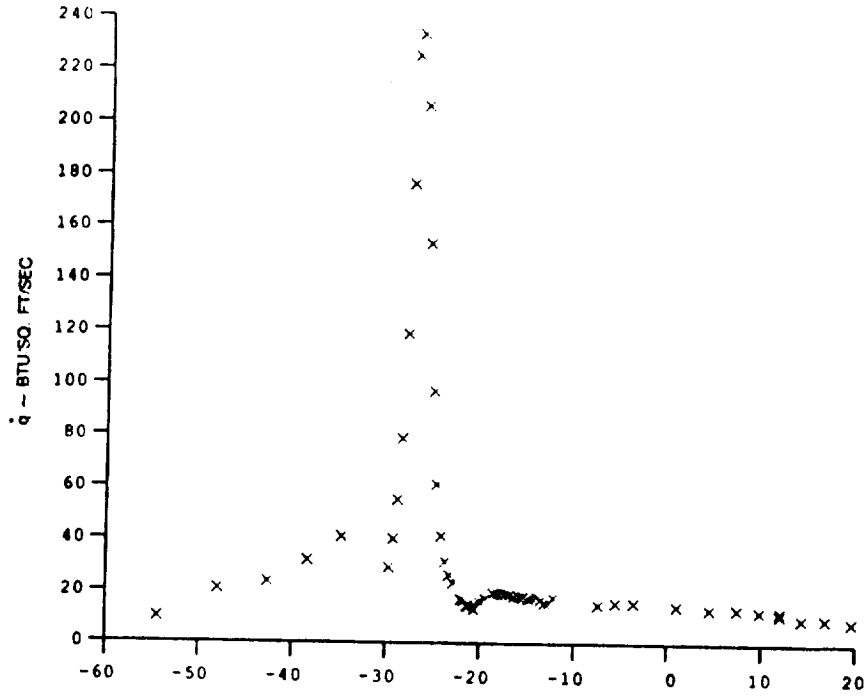


Test Conditions

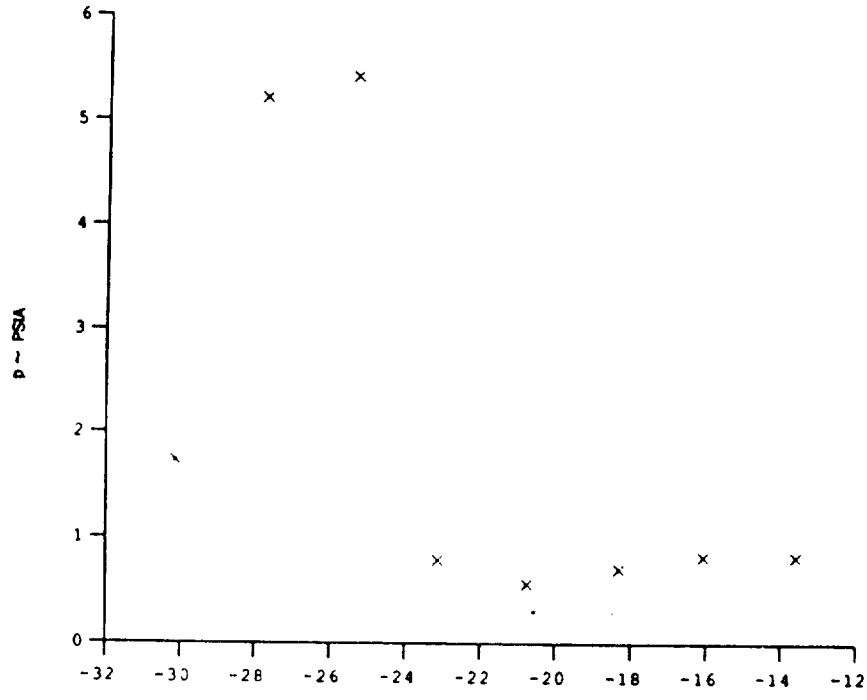
Po	= 3.9500X10-3	PSIA	Reservoir Total Pressure
Ho	= 2.1512X10-7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.1516X10+3	degR	Reservoir Total Temperature
M	= 16.2690		Freestream Mach Number
U	= 6.5062X10+3	Ft/sec	Freestream Velocity
T	= 6.4254X10+1	degR	Freestream Temperature
P	= 3.0339X10-3	PSIA	Freestream Static Pressure
Rho	= 3.8283X10-6	Slugs/Ft3	Freestream Density
Mu	= 5.1241X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 4.8609X10+5	1/Ft	Freestream Reynolds Number
Po'	= 1.0523	PSIA	Pitot Pressure
Q	= 5.6269X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Ml	= 3.6162		Shock Tube Incident Shock Mach Number
Hw	= 3.3017X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.7772	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.7153X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR=	1.0554X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	7.906
B - see shock generator diagram	(inches)	3.411

Run 35



HEAT TRANSFER vs Gauge Position
Run 35



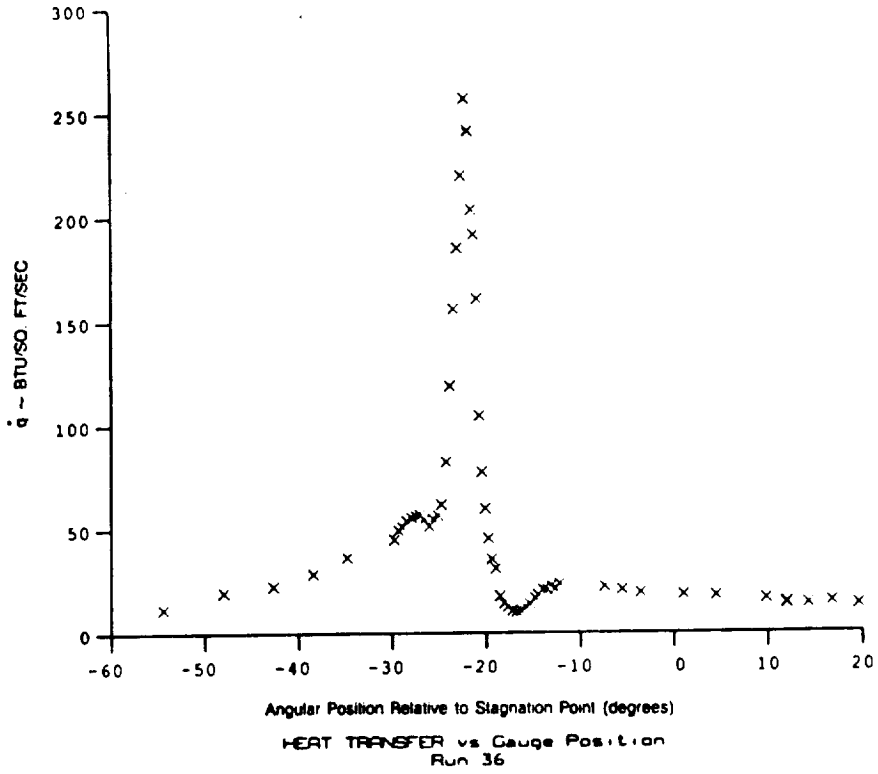
PRESSURE vs Gauge Position
Run 35

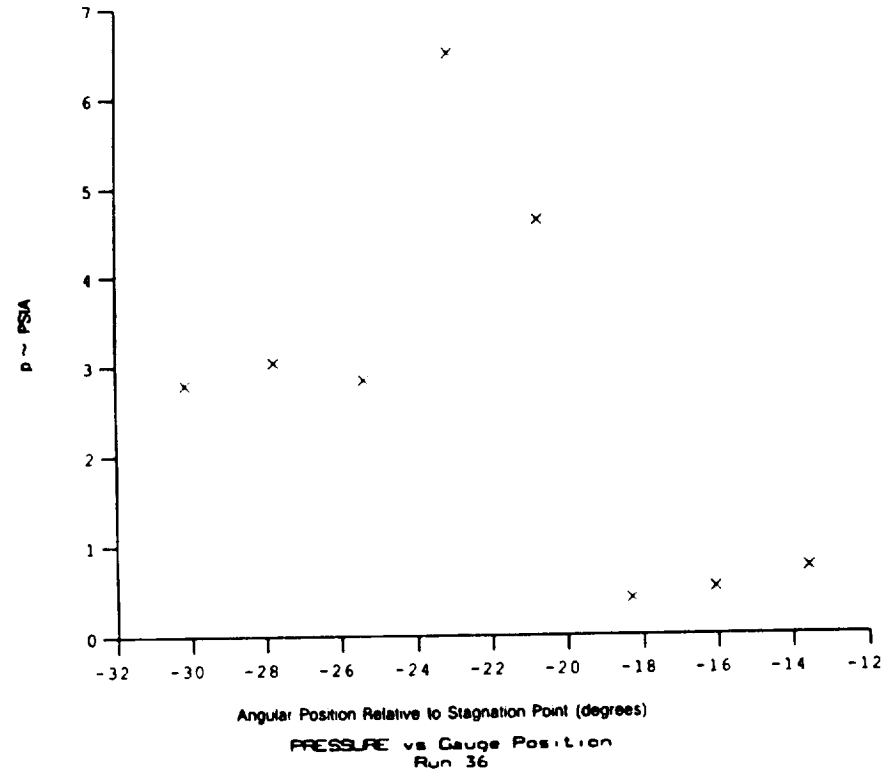
Test Conditions

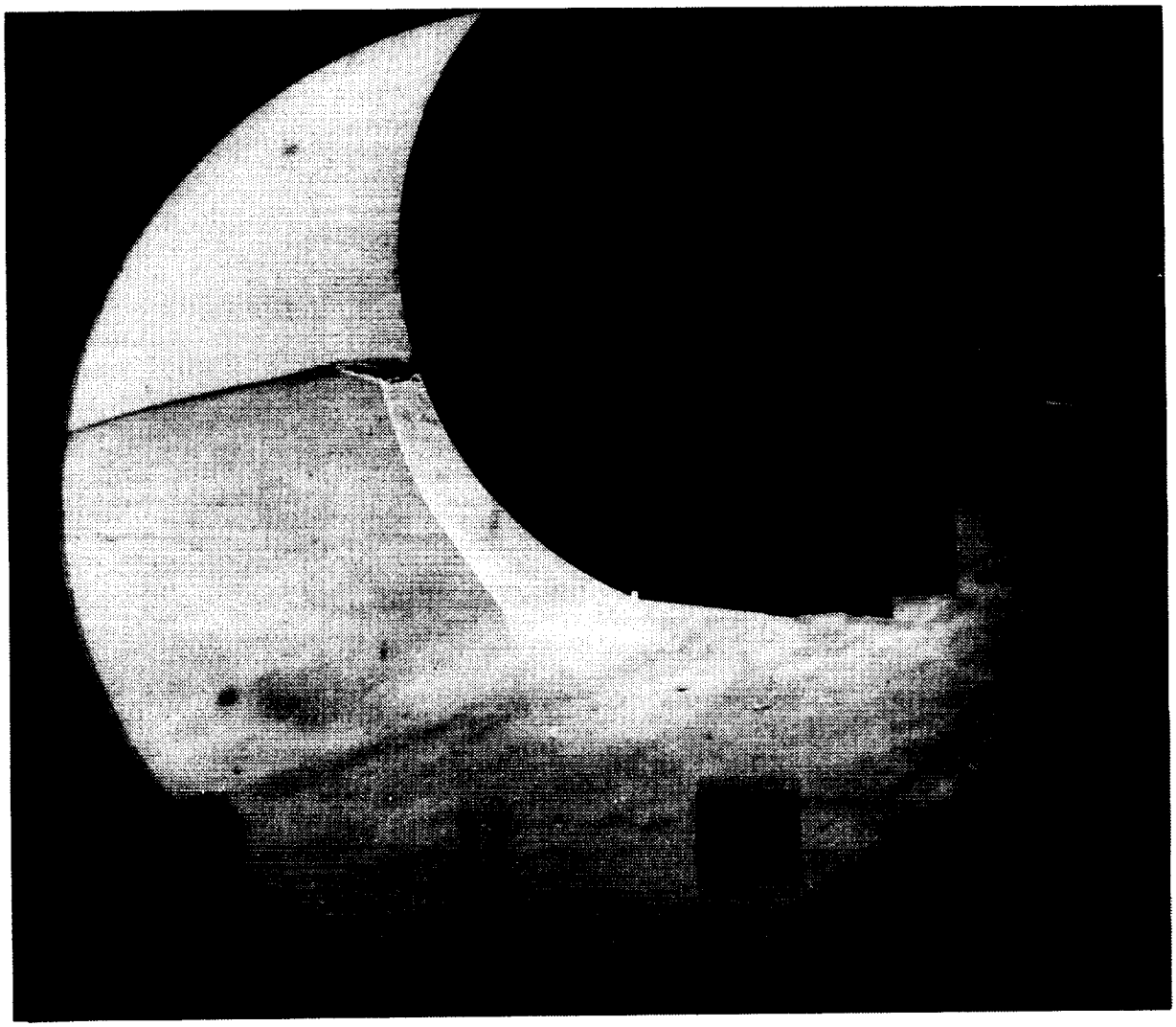
Po	= 4.192CX10+3	PSIA	Reservoir Total Pressure
Ho	= 2.2437X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.3150X10+3	degR	Reservoir Total Temperature
M	= 16.1740		Freestream Mach Number
U	= 6.6438X10+3	Ft/sec	Freestream Velocity
T	= 6.7793X10+1	degR	Freestream Temperature
P	= 3.3052X10-3	PSIA	Freestream Static Pressure
Rho	= 3.9530X10-6	Slugs/Ft3	Freestream Density
Mu	= 5.4006X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 4.8631X10+5	1/Ft	Freestream Reynolds Number
Po'	= 1.1330	PSIA	Pitot Pressure
Q	= 6.0586X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 3.7478		Shock Tube Incident Shock Mach Number
Hw	= 3.2781X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.6506	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.5462X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 1.1564X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	7.368
B - see shock generator diagram	(inches)	3.409

Run 36


300
250
200
150
100
50
0
q̇ ~ BTU/SQ. FT/SEC
-60
-50
-40
-30
-20
-10
0
10
20
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 36


7
6
5
4
3
2
1
0
p ~ PSIA
-32
-30
-28
-26
-24
-22
-20
-18
-16
-14
-12
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 36

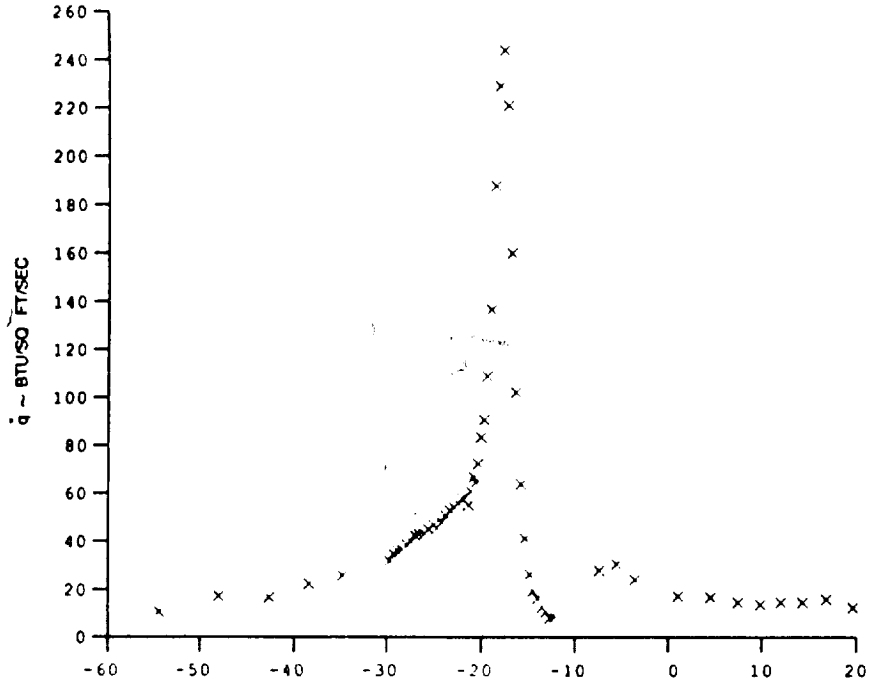


Test Conditions

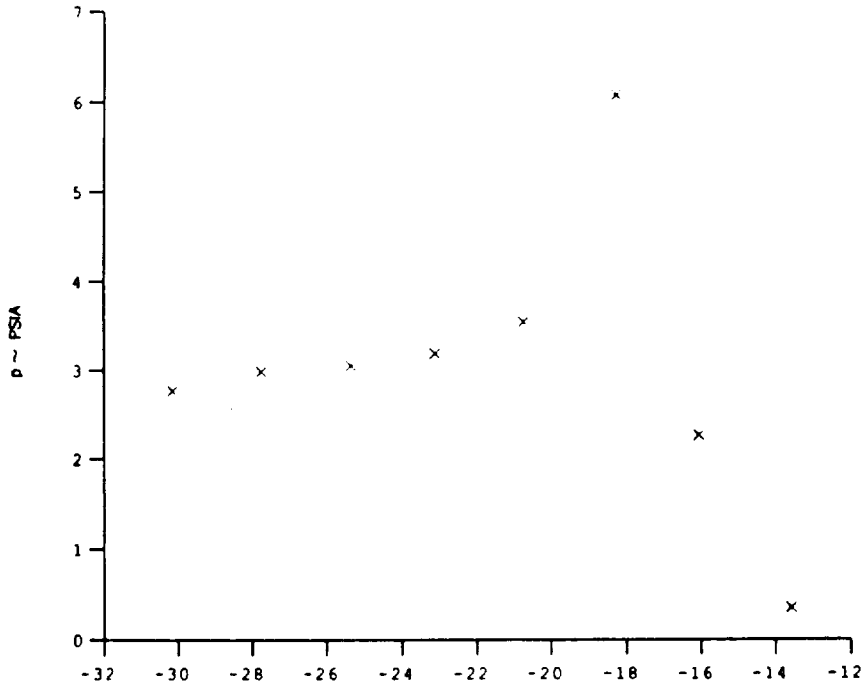
Po	= 3.9280X10+3	PSIA	Reservoir Total Pressure
Ho	= 2.1436X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.1377X10+3	degR	Reservoir Total Temperature
M	= 16.2750		Freestream Mach Number
U	= 6.4948X10+3	Ft/sec	Freestream Velocity
T	= 6.3980X10+1	degR	Freestream Temperature
P	= 3.0123X10-3	PSIA	Freestream Static Pressure
Rho	= 3.8174X10-6	Slugs/Ft3	Freestream Density
Mu	= 5.1027X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 4.8589X10+5	1/Ft	Freestream Reynolds Number
Po'	= 1.0456	PSIA	Pitot Pressure
Q	= 5.5912X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 3.6063		Shock Tube Incident Shock Mach Number
Hw	= 3.3017X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.7885	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.7304X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	1.0473X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	6.922
B - see shock generator diagram	(inches)	3.266

Run 37



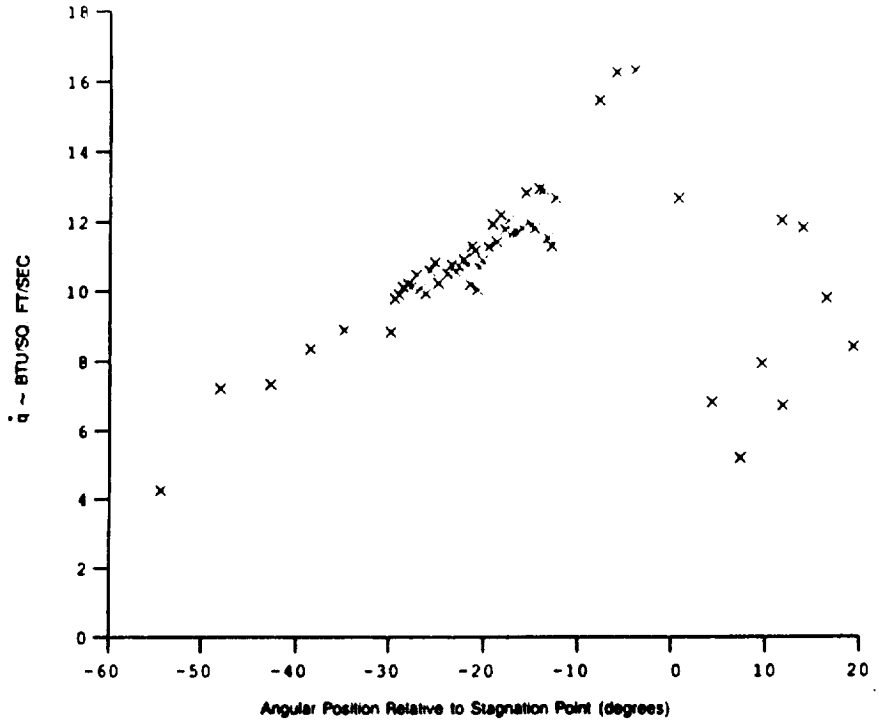
HEAT TRANSFER vs Gauge Position
Run 37



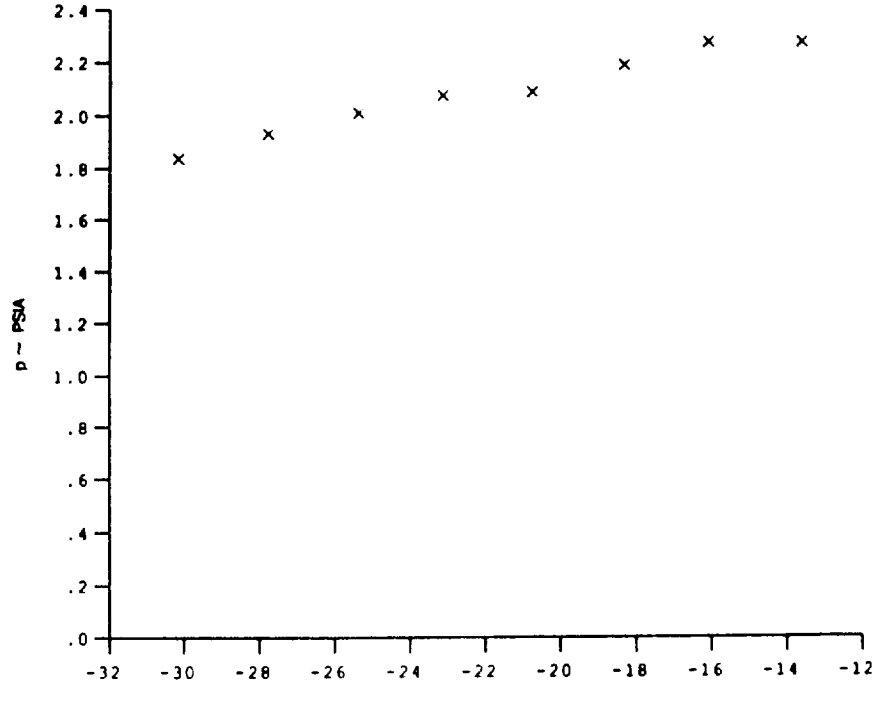
PRESSURE vs Gauge Position
Run 37

Test Conditions				Model Parameter		
Po =	7.0820X10+2	PSIA	Reservoir Total Pressure	A - see shock generator diagram	(inches)	7.389
Ho =	1.4970X10+7	(Ft/sec)2	Reservoir Total Enthalpy	B - see shock generator diagram	(inches)	3.374
To =	2.2827X10+3	degR	Reservoir Total Temperature			
M =	12.1300		Freestream Mach Number			
U =	5.3878X10+3	Ft/sec	Freestream Velocity			
T =	7.9261X10+1	degR	Freestream Temperature			
P =	4.2419X10-3	PSIA	Freestream Static Pressure			
Rho =	4.3393X10-6	Slugs/Ft3	Freestream Density			
Mu =	6.2950X10-8	Slugs/Ft-sec	Freestream Viscosity			
Re =	3.7139X10+5	1/Ft	Freestream Reynolds Number			
Po' =	8.1791X10-1	PSIA	Pitot Pressure			
Q =	4.3736X10-1	PSIA	Dynamic Pressure (Rho U^2/288)			
Mi =	2.9488		Shock Tube Incident Shock Mach Number			
Hw =	3.2905X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)			
CPf =	2.2864	1/PSIA	Pressure to CP factor (1/Q)			
CHf =	2.8492X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))			
QoFR=	5.8071	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)			

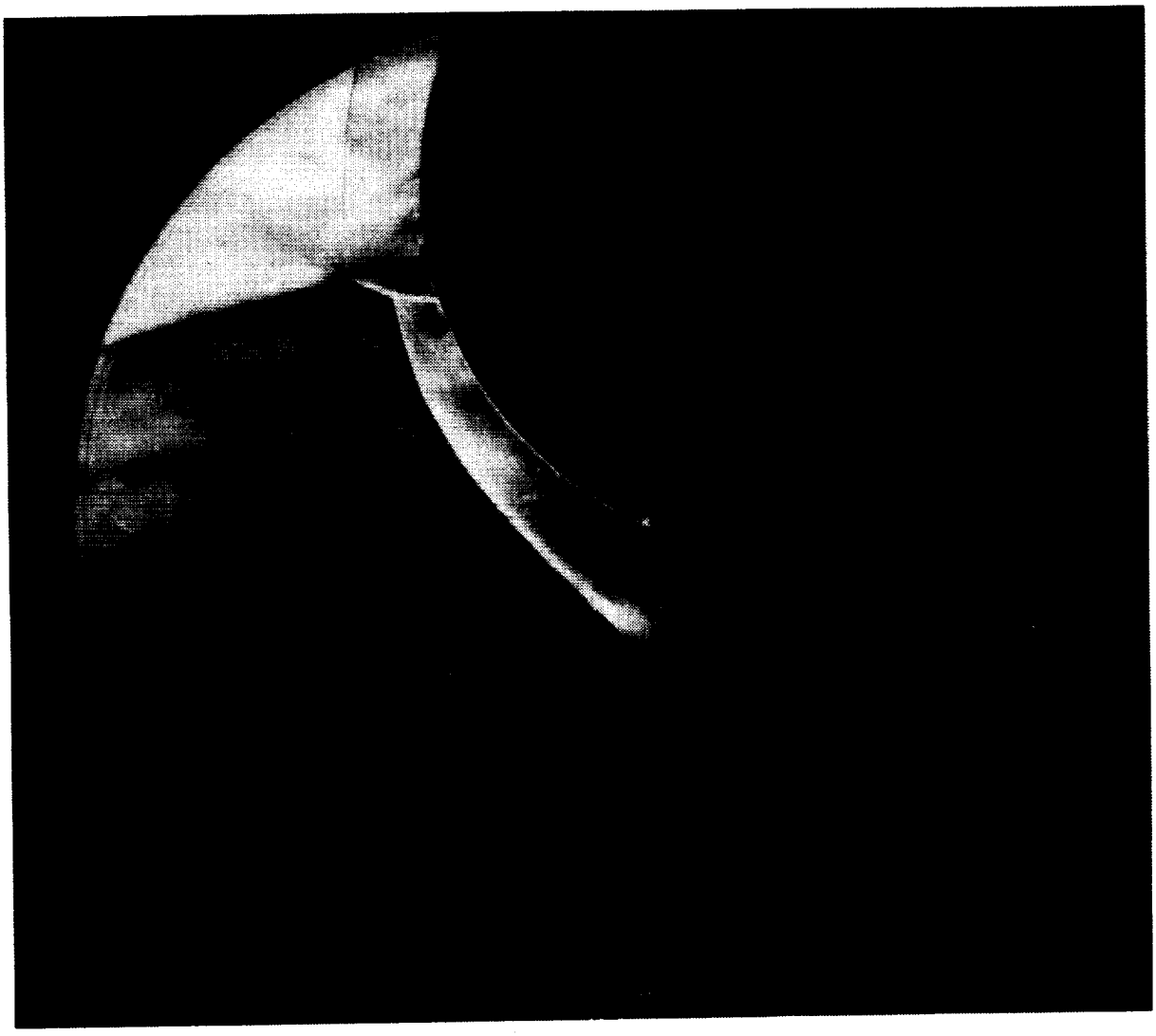
Run 38



HEAT TRANSFER vs Gauge Position
Run 38



PRESSURE vs Gauge Position
Run 38

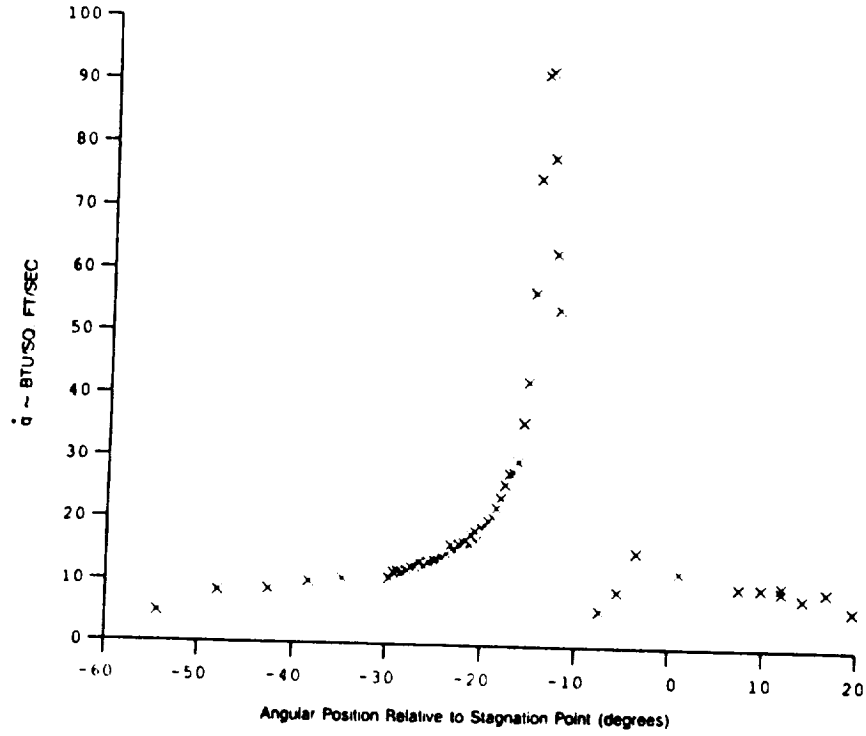


Test Conditions

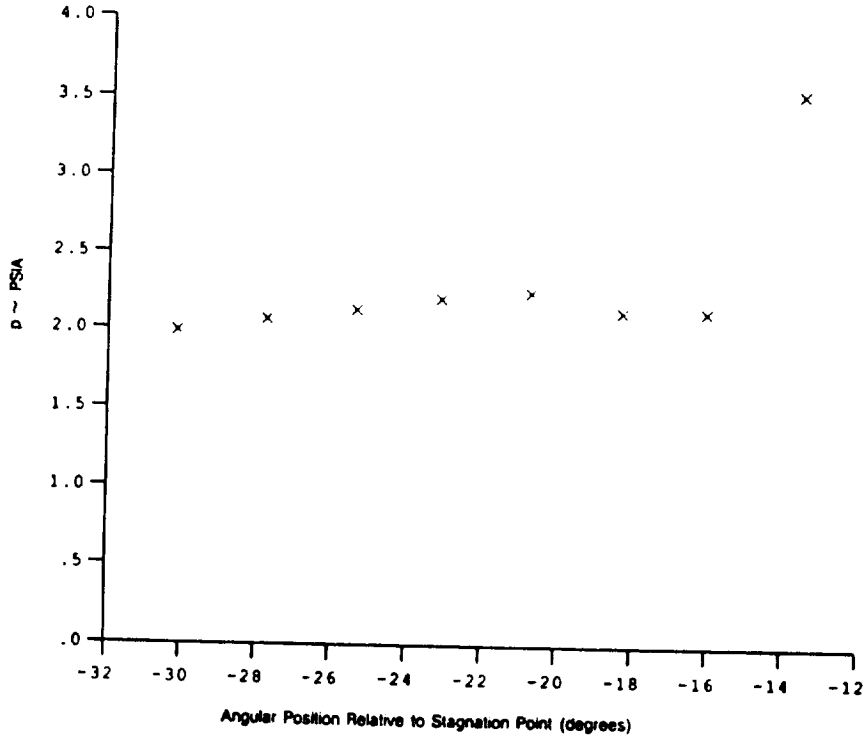
Po	= 7.1250X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5308X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3157X10+3	degR	Reservoir Total Temperature
M	= 12.1210		Freestream Mach Number
U	= 5.4481X10+3	Ft/sec	Freestream Velocity
T	= 8.1165X10+1	degR	Freestream Temperature
P	= 4.2606X10-3	PSIA	Freestream Static Pressure
Rho	= 4.2641X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.4435X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.6054X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.2165X10-1	PSIA	Pitot Pressure
Q	= 4.3947X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 2.9694		Shock Tube Incident Shock Mach Number
Hw	= 3.3029X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2755	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.7896X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 5.9919	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	8.168
B - see shock generator diagram	(inches)	3.418

Run 39



HEAT TRANSFER vs Gauge Position
Run 39



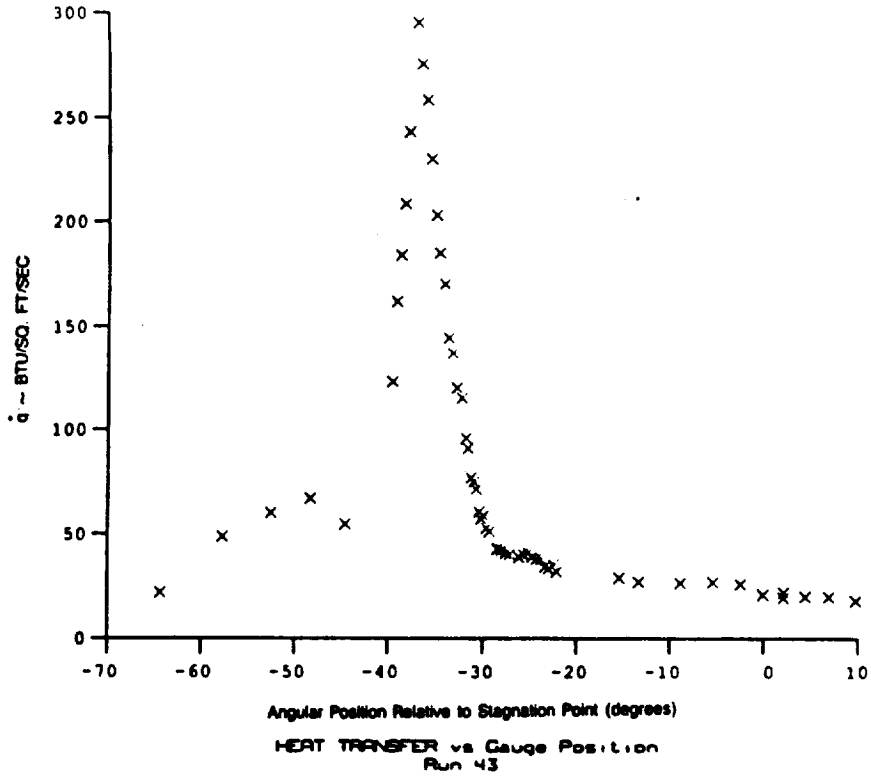
PRESSURE vs Gauge Position
Run 39

Test Conditions

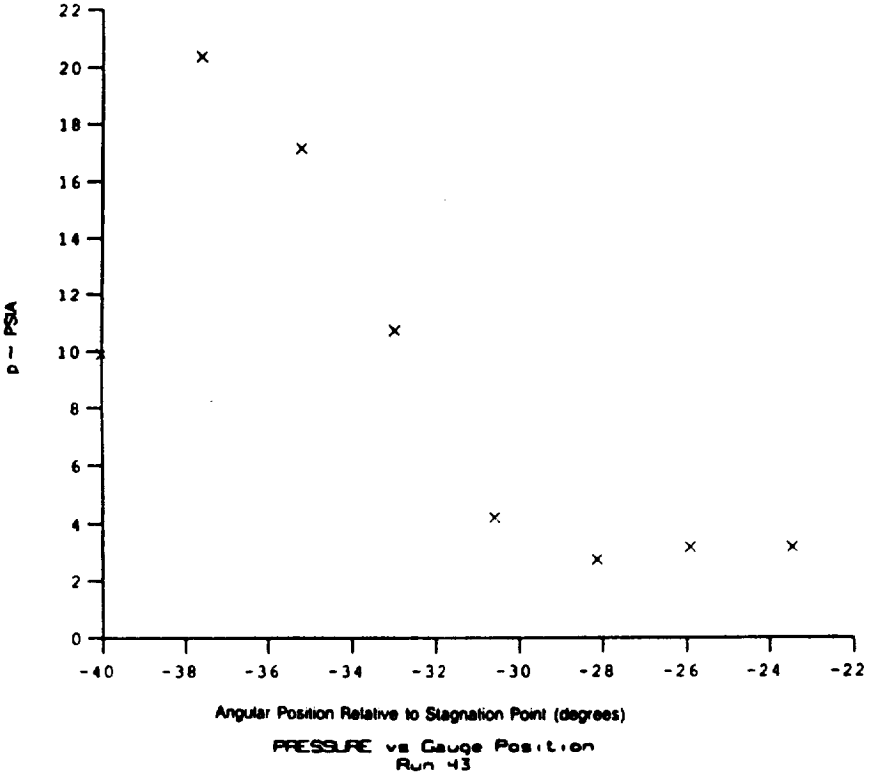
Po	= 3.9440X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.8008X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.6586X10+3	degR	Reservoir Total Temperature
M	= 12.5450		Freestream Mach Number
U	= 5.9155X10+3	Ft/sec	Freestream Velocity
T	= 8.9334X10+1	degR	Freestream Temperature
P	= 1.9029X10-2	PSIA	Freestream Static Pressure
Rho	= 1.7271X10-5	slugs/Ft3	Freestream Density
Mu	= 7.0810X10-8	slugs/Ft-sec	Freestream Viscosity
Re	= 1.4428X10+6	1/Ft	Freestream Reynolds Number
Po'	= 3.9243	PSIA	Pitot Pressure
Q	= 2.0985	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.2450		Shock Tube Incident Shock Mach Number
Hw	= 3.3073X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.7653X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.1800X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 1.6213X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	8.761
B - see shock generator diagram	(inches)	3.402

Run 43



HEAT TRANSFER vs Gauge Position
Run 43



PRESSURE vs Gauge Position
Run 43

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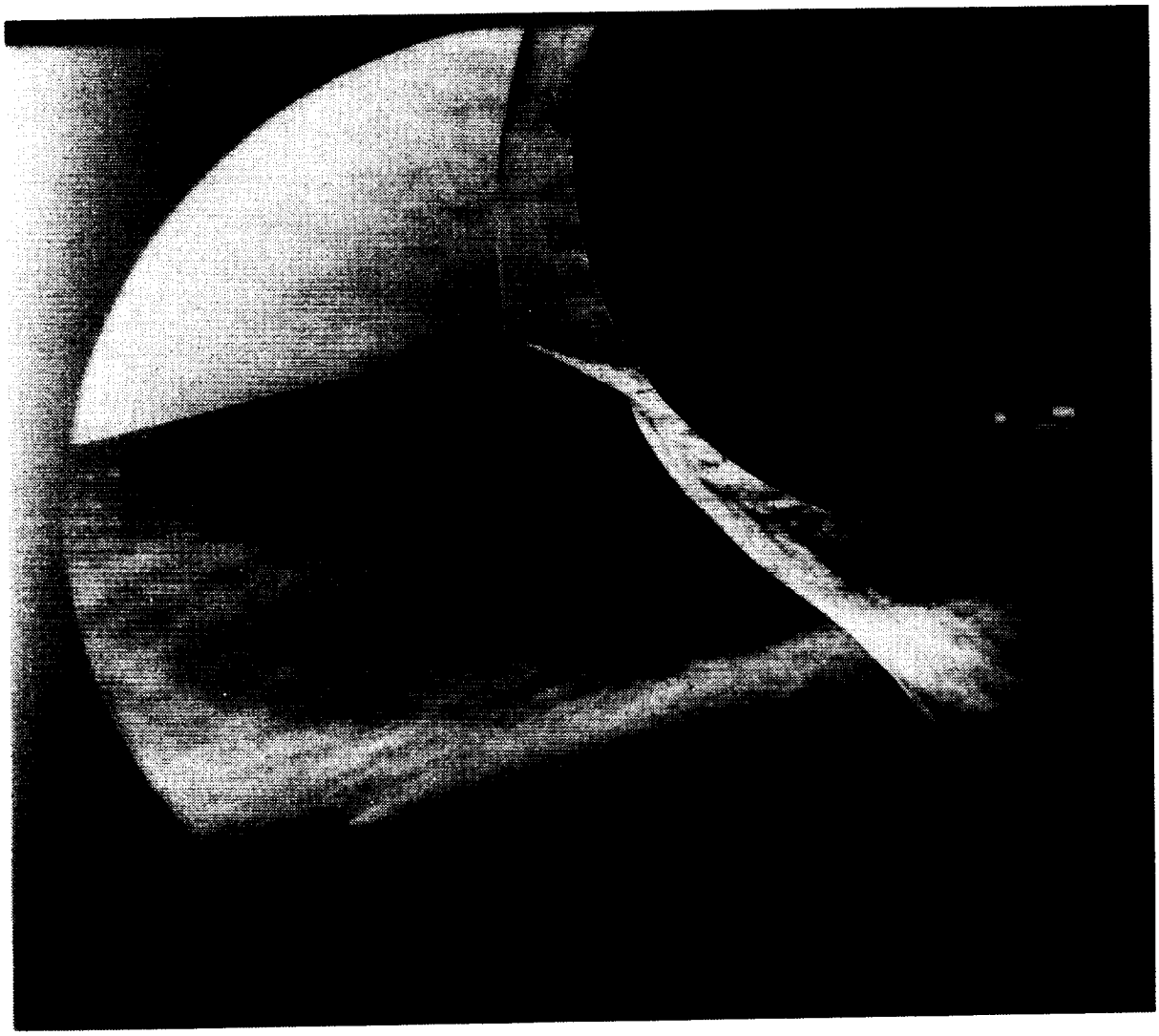
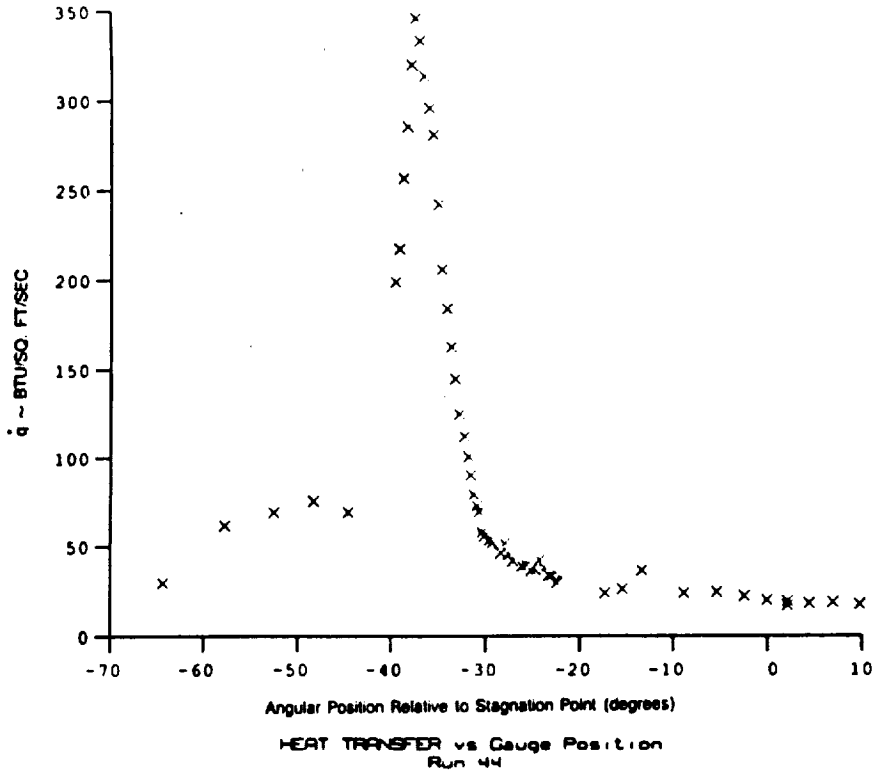


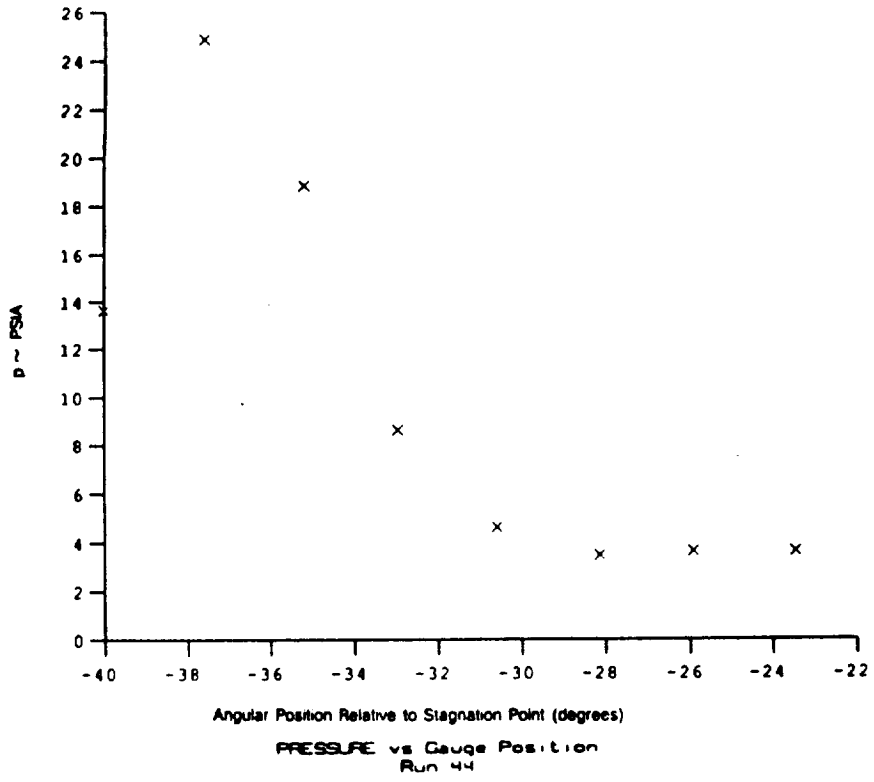
Test Conditions

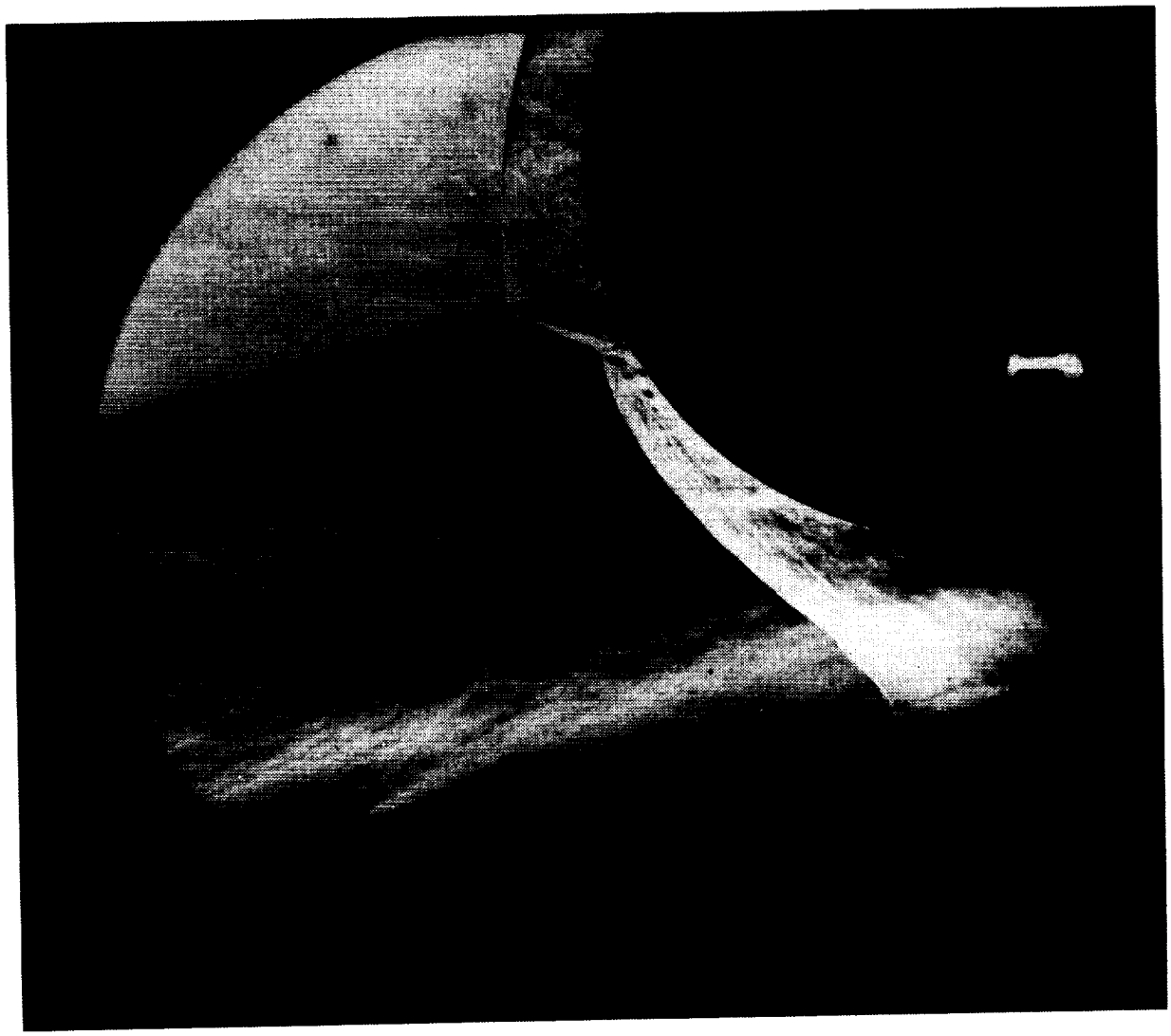
Po	= 4.2230X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.8138X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.6996X10+3	degR	Reservoir Total Temperature
M	= 12.538C		Freestream Mach Number
U	= 5.9367X10+3	Ft/sec	Freestream Velocity
T	= 9.0C80X10+1	degR	Freestream Temperature
P	= 2.0471X10-2	PSIA	Freestream Static Pressure
Rho	= 1.8626X10-5	Slugs/Ft3	Freestream Density
Mu	= 7.1392X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.5322X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.2169	PSIA	Pitot Pressure
Q	= 2.2549	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 3.2884		Shock Tube Incident Shock Mach Number
Hw	= 3.2893X10-6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPI	= 4.4340X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.7898X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	1.6992X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter	Value
A - see shock generator diagram (inches)	8.480
B - see shock generator diagram (inches)	3.431

Run 44


350
300
250
200
150
100
50
0
q ~ BTU/SQ. FT/SEC
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 44


26
24
22
20
18
16
14
12
10
8
6
4
2
0
p ~ PSIA
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 44

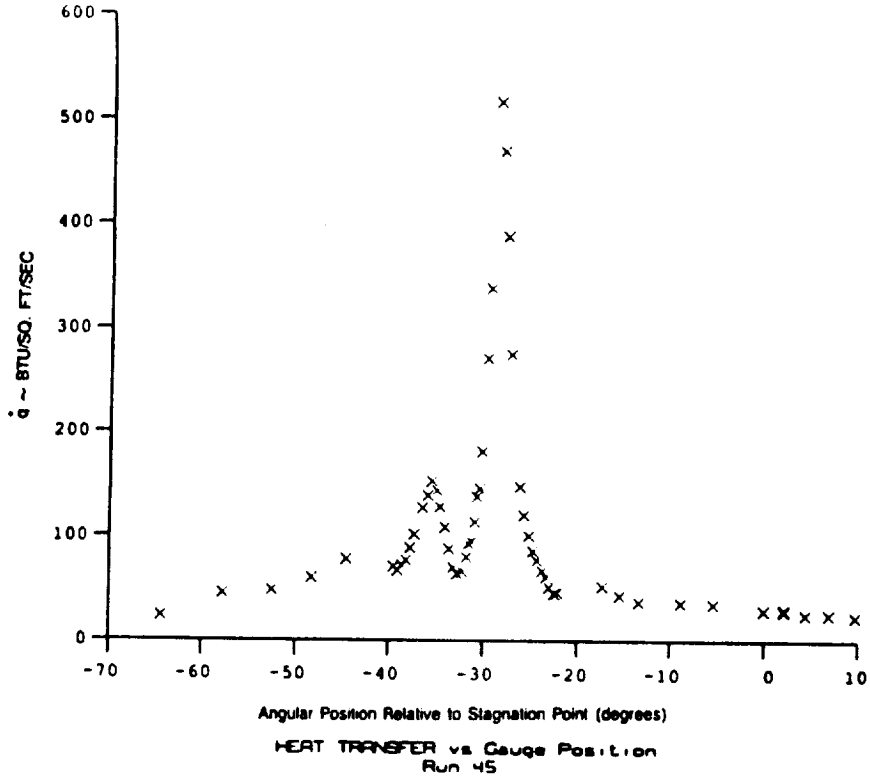


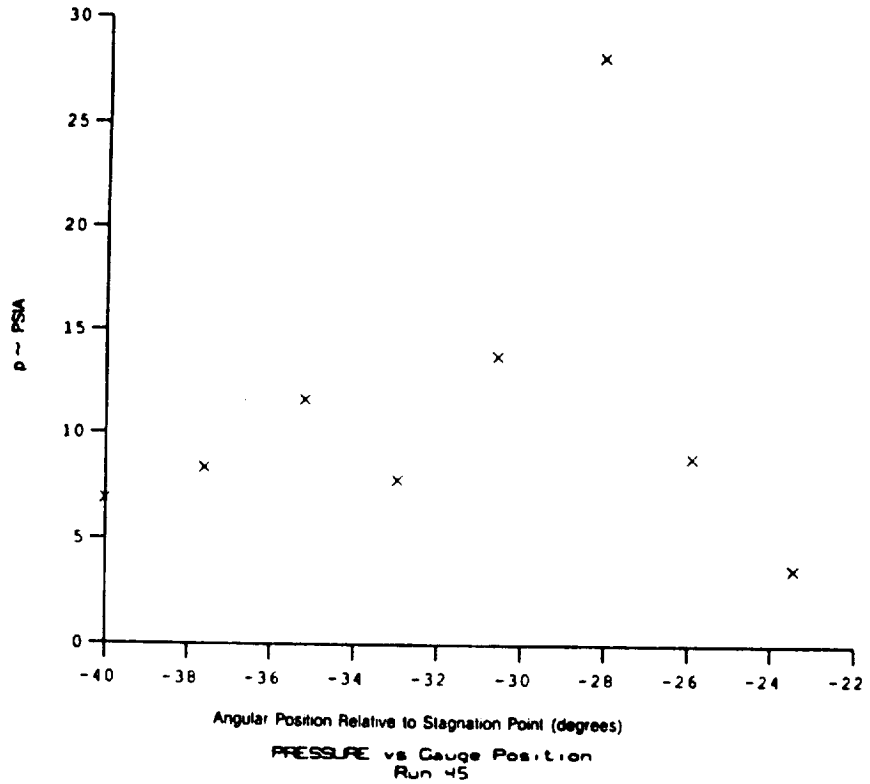
Test Conditions

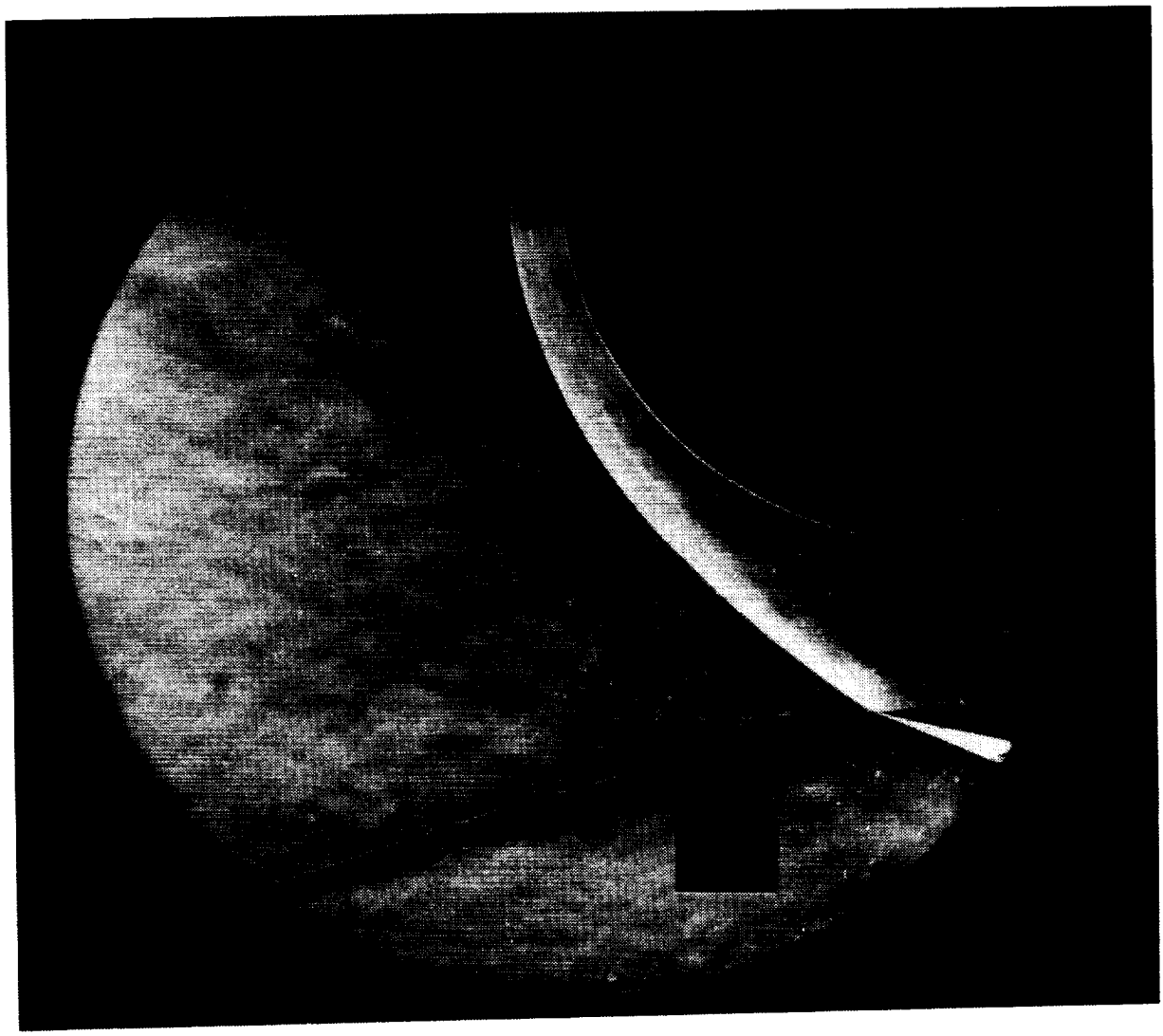
Po	= 4.2000X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.8566X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.7407X10+3	degR	Reservoir Total Temperature
M	= 12.5190		Freestream Mach Number
U	= 6.0061X10+3	Ft/sec	Freestream Velocity
T	= 9.2471X10+1	degR	Freestream Temperature
P	= 2.0403X10-2	PSIA	Freestream Static Pressure
Rho	= 1.7889X10-5	Sluga/Ft3	Freestream Density
Mu	= 7.3261X10-8	Sluga/Ft-sec	Freestream Viscosity
Re	= 1.4666X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.1904	PSIA	Pitot Pressure
Q	= 2.2407	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.3123		Shock Tube Incident Shock Mach Number
Hw	= 3.3017X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.4629X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.7438X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 1.7438X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - see shock generator diagram	(inches)	8.052
B - see shock generator diagram	(inches)	3.404

Run 45


600
500
400
300
200
100
0
q̇ ~ BTU/SQ. FT/SEC
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 45

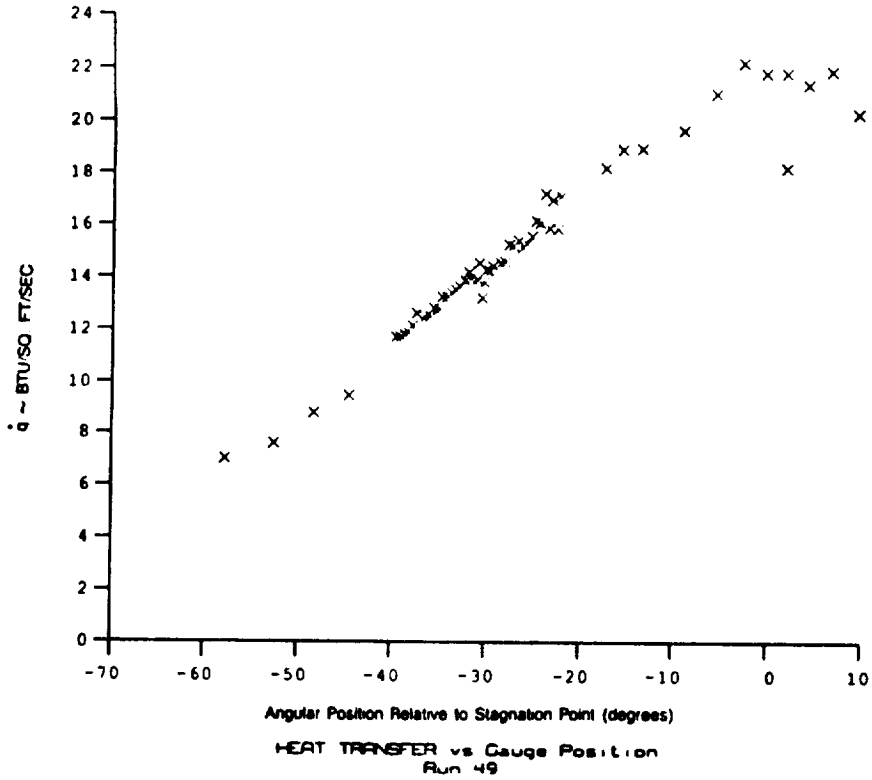

30
25
20
15
10
5
0
p ~ PSIA
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 45



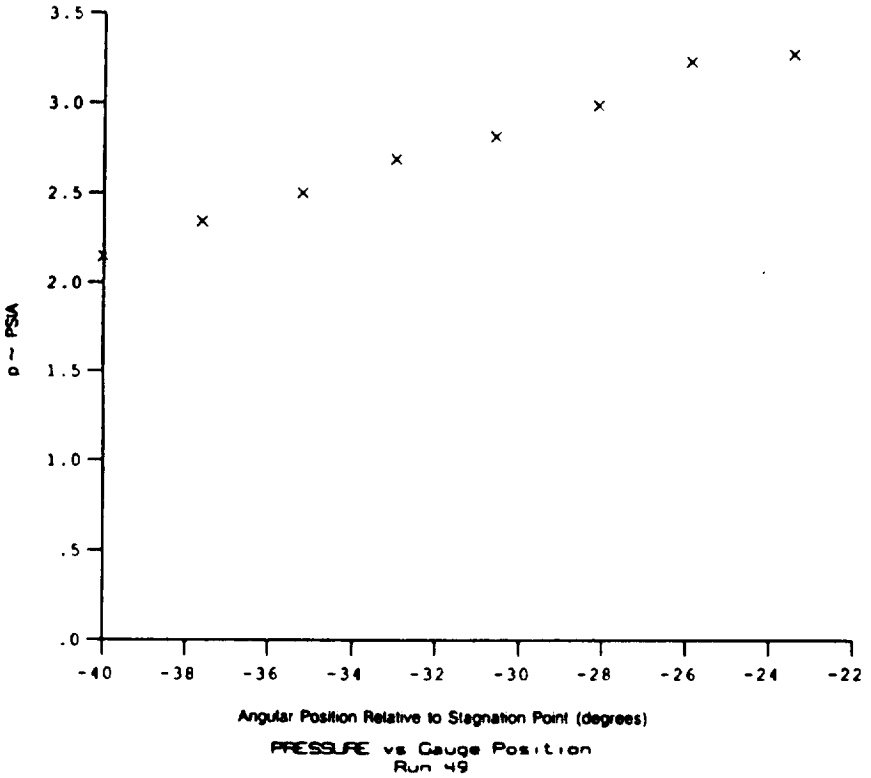
Test Conditions

Po	= 4.2480X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.8890X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.7341X10+3	degR	Reservoir Total Temperature
M	= 12.5430		Freestream Mach Number
U	= 6.0586X10+3	Ft/sec	Freestream Velocity
T	= 9.3739X10+1	degR	Freestream Temperature
P	= 2.0265X10-2	PSIA	Freestream Static Pressure
Rho	= 1.7528X10-5	Slugs/Ft3	Freestream Density
Mu	= 7.4254X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.4302X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.1779	PSIA	Pitot Pressure
Q	= 2.2340	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 3.2836		Shock Tube Incident Shock Mach Number
Hw	= 3.3389X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.4763X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.7110X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR	= 1.7747X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Run 49



HEAT TRANSFER vs Gauge Position
Run 49

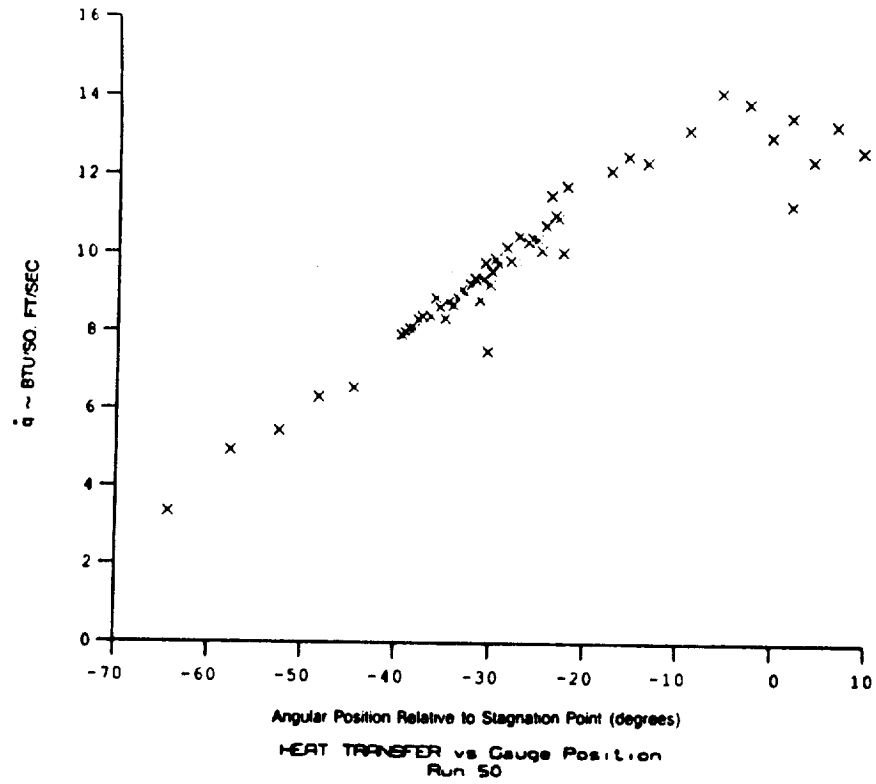


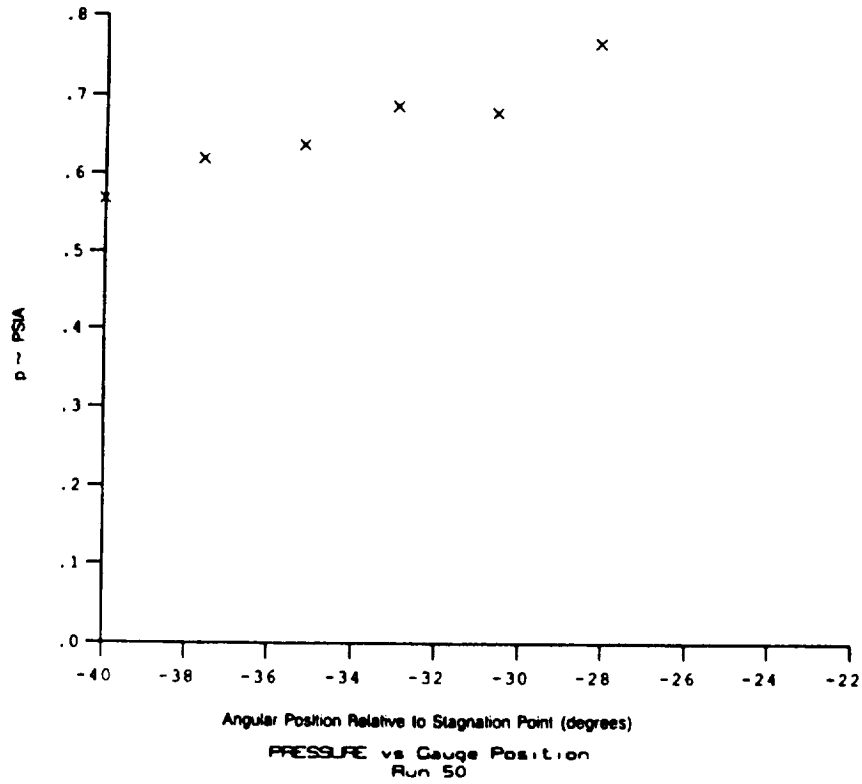
PRESSURE vs Gauge Position
Run 49

Test Conditions

Po	= 3.9850X10+3	PSIA	Reservoir Total Pressure
Ho	= 2.3354X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.3570X10+3	degR	Reservoir Total Temperature
M	= 16.1570		Freestream Mach Number
U	= 6.7782X10+3	Ft/sec	Freestream Velocity
T	= 7.0707X10+1	degR	Freestream Temperature
P	= 3.1075X10-3	PSIA	Freestream Static Pressure
Rho	= 3.5634X10-6	Slugs/Ft3	Freestream Density
Mu	= 5.6280X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 4.2916X10+5	1/Ft	Freestream Reynolds Number
Po'	= 1.0631	PSIA	Pitot Pressure
Q	= 5.6846X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.7430		Shock Tube Incident Shock Mach Number
Hw	= 3.3265X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.7591	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.6083X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw)))
QofR=	1.1730X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Run 50


16
14
12
10
8
6
4
2
0
-70
-60
-50
-40
-30
-20
-10
0
10
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 50


.8
.7
.6
.5
.4
.3
.2
.1
.0
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
p ~ PSIA
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 50

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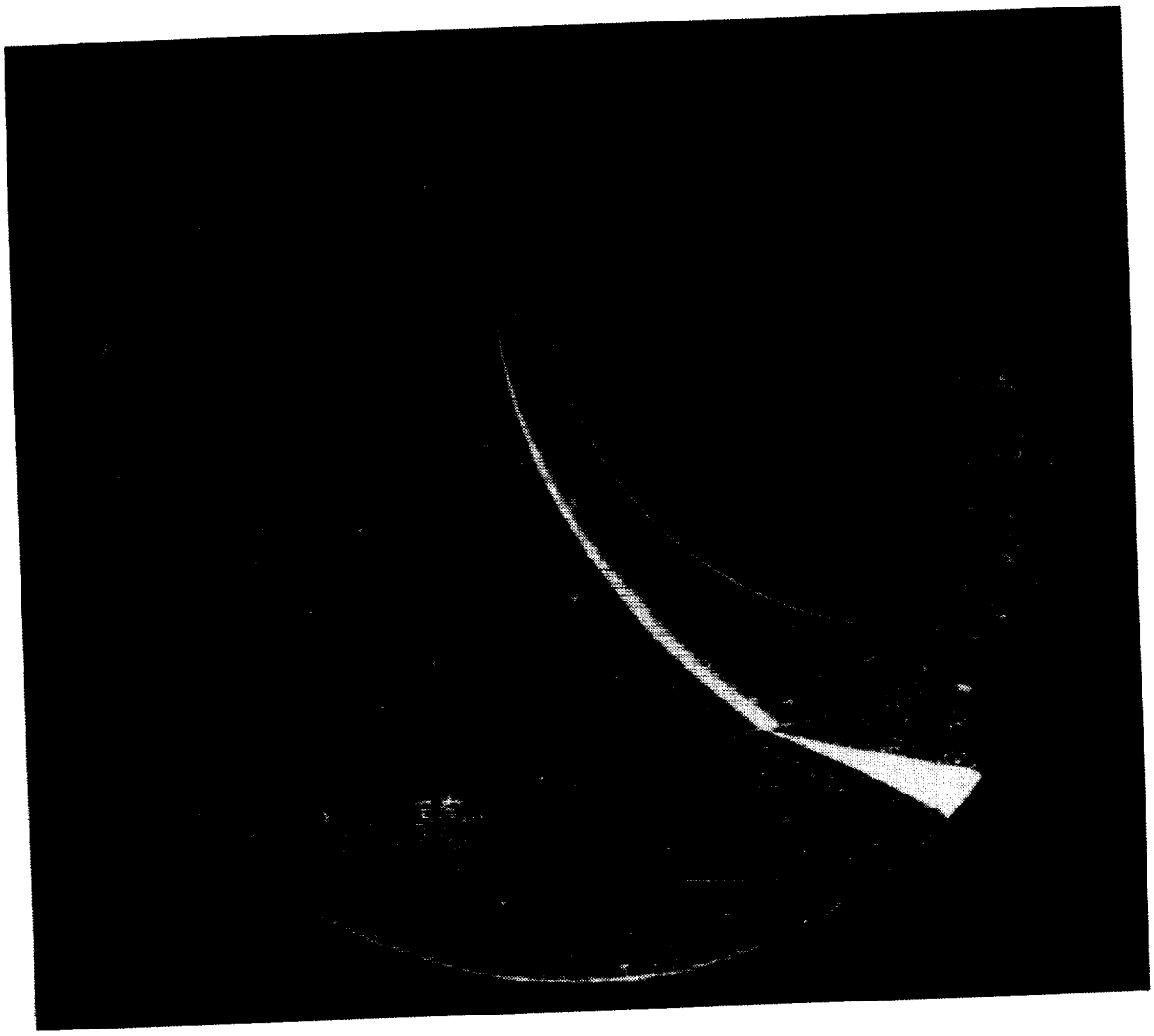
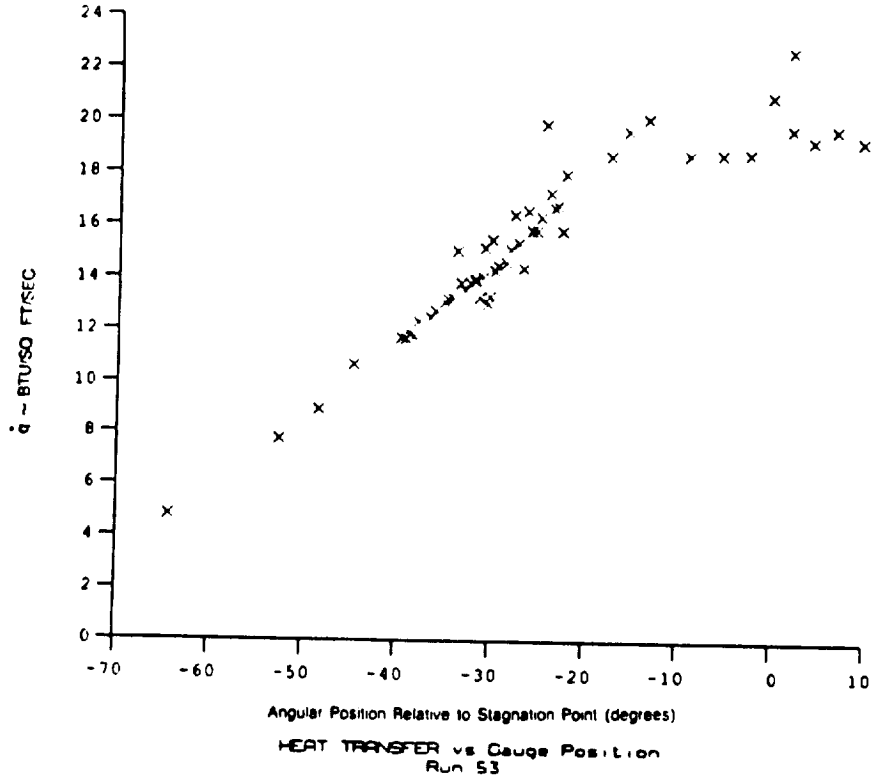
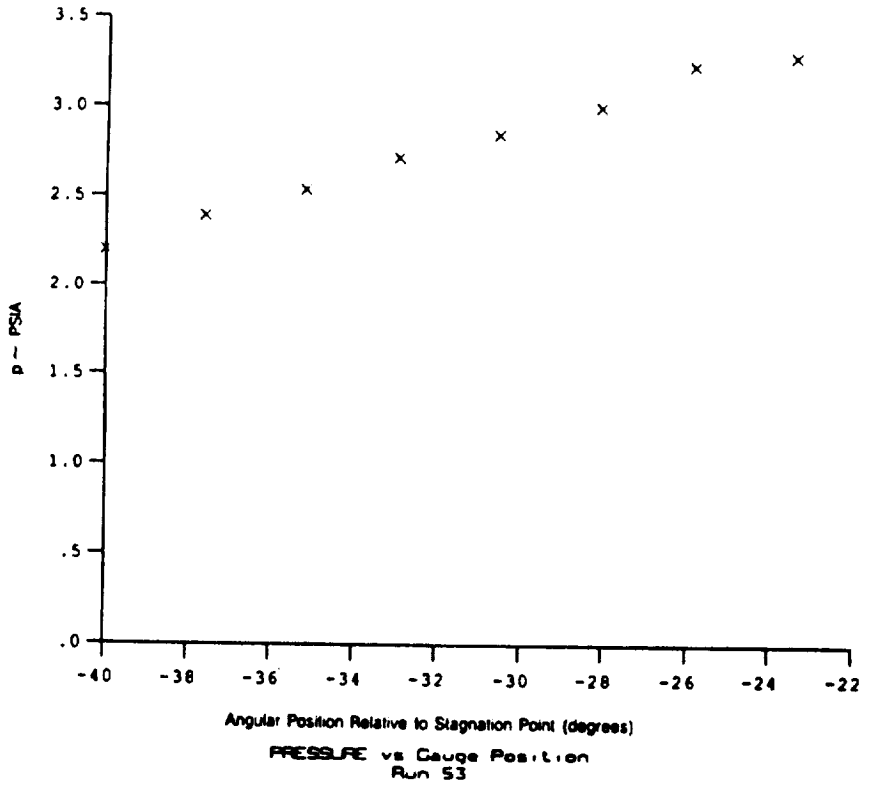


Test Conditions

Po	= 4.3050X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.9501X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.7725X10+3	degR	Reservoir Total Temperature
M	= 12.5400		Freestream Mach Number
U	= 6.1557X10+3	Ft/sec	Freestream Velocity
T	= 9.6806X10+1	degR	Freestream Temperature
P	= 2.0352X10-2	PSIA	Freestream Static Pressure
Rho	= 1.7046X10-5	Slugs/Ft3	Freestream Density
Mu	= 7.6657X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.3688X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.1942	PSIA	Pitot Pressure
Q	= 2.2428	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 1.2935		Shock Tube Incident Shock Mach Number
Hw	= 3.3700X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.4588X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.5964X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	1.8475X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Run 53


24
22
20
18
16
14
12
10
8
6
4
2
0
q ~ BTU/SQ FT/SEC
-70
-60
-50
-40
-30
-20
-10
0
10
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 53


3.5
3.0
2.5
2.0
1.5
1.0
.5
.0
p ~ PSIA
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
Angular Position Relative to Stagnation Point (degrees)
PRESSURE vs Gauge Position
Run 53

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	1.764(0)	$29.50	MT35	-32.23	4.965(0)	$32.46	MT14	-24.25	5.698(0)	$33.12
MT55	-57.74	2.332(0)	$30.04	MT34	-31.78	4.895(0)	$32.51	MT13	-23.72	5.895(0)	$33.34
MT54	-52.45	2.860(0)	$30.52	MT33	-31.48	4.990(0)	$32.50	MT12	-23.28	5.753(0)	$33.16
MT53	-48.19	3.285(0)	$30.89	MT32	-31.18	4.787(0)	$32.35	MT11	-22.90	5.865(0)	$33.21
MT52	-44.54	3.651(0)	$31.25	MT31	-30.89	5.019(0)	$32.56	MT10	-22.38	Null	Null
MT51	-39.54	4.211(0)	$31.75	MT30	-30.66	5.298(0)	$32.78	MT9	-22.01	Null	Null
MT50	-39.09	4.035(0)	$31.58	MT29	-30.36	5.087(0)	$32.60	MT8	-21.49	5.627(0)	$33.27
MT49	-38.64	4.260(0)	$31.80	MT28	-30.14	5.080(0)	$32.57	MT7	-17.23	5.426(0)	$32.81
MT48	-38.20	4.293(0)	$31.85	MT27	-29.84	5.257(0)	$32.76	MT6	-15.37	Null	Null
MT47	-37.75	4.350(0)	$31.90	MT26	-29.54	5.126(0)	$32.63	MT5	-13.35	6.762(0)	$34.09
MT46	-37.30	4.526(0)	$32.03	MT25	-29.24	5.192(0)	$32.69	MT4	-8.80	6.872(0)	$34.41
MT45	-36.85	4.550(0)	$32.08	MT24	-28.80	Null	Null	MT3	-5.30	6.868(0)	$34.58
MT44	-36.41	4.500(0)	$32.04	MT23	-28.35	5.283(0)	$32.75	MT2	-2.39	6.583(0)	$34.47
MT43	-35.88	4.569(0)	$32.11	MT22	-27.90	5.324(0)	$32.82	MT62	-2.38	6.644(0)	$34.41
MT42	-35.44	4.635(0)	$32.16	MT21	-27.45	5.394(0)	$32.87	MT1	.00	6.723(0)	$34.56
MT41	-34.91	4.633(0)	$32.17	MT20	-27.01	5.400(0)	$32.86	MT61	2.24	6.403(0)	$34.36
MT40	-34.54	4.664(0)	$32.19	MT19	-26.56	5.547(0)	$33.01	MT57	2.24	6.526(0)	$34.33
MT39	-34.02	4.750(0)	$32.27	MT18	-26.11	5.577(0)	$33.01	MT58	4.48	7.112(0)	$34.24
MT38	-33.57	4.802(0)	$32.32	MT17	-25.59	5.615(0)	$33.05	MT59	7.01	7.139(0)	$34.10
MT37	-33.12	4.881(0)	$32.40	MT16	-25.14	5.537(0)	$32.99	MT60	9.85	6.769(0)	$33.94
MT36	-32.68	4.839(0)	$32.35	MT15	-24.62	5.592(0)	$33.05				

Run 3 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	1.199(0)	$30.56	MT35	-32.23	3.478(0)	$32.79	MT14	-24.25	3.897(0)	$33.29
MT55	-57.74	1.657(0)	$30.95	MT34	-31.78	3.297(0)	$32.60	MT13	-23.72	4.098(0)	$33.42
MT54	-52.45	2.029(0)	$31.38	MT33	-31.48	3.501(0)	$32.81	MT12	-23.28	4.046(0)	$33.33
MT53	-48.19	2.270(0)	$31.59	MT32	-31.18	3.335(0)	$32.64	MT11	-22.90	3.974(0)	$33.25
MT52	-44.54	2.950(0)	$31.90	MT31	-30.89	3.697(0)	$32.88	MT10	-22.38	Null	Null
MT51	-39.54	2.961(0)	$32.25	MT30	-30.66	3.704(0)	$33.01	MT9	-22.01	Null	Null
MT50	-39.09	2.819(0)	$32.13	MT29	-30.36	3.548(0)	$32.86	MT8	-21.49	4.240(0)	$33.48
MT49	-38.64	3.079(0)	$32.33	MT28	-30.14	3.568(0)	$32.86	MT7	-17.23	4.155(0)	$33.40
MT48	-38.20	3.056(0)	$32.38	MT27	-29.84	3.671(0)	$32.95	MT6	-15.37	4.059(0)	$34.36
MT47	-37.75	3.063(0)	$32.38	MT26	-29.54	3.559(0)	$32.89	MT5	-13.35	4.827(0)	$34.05
MT46	-37.30	3.189(0)	$32.48	MT25	-29.24	3.622(0)	$32.96	MT4	-8.80	4.982(0)	$34.26
MT45	-36.85	Null	Null	MT24	-28.80	3.734(0)	$33.02	MT3	-5.30	5.067(0)	$34.43
MT44	-36.41	3.155(0)	$32.47	MT23	-28.35	3.642(0)	$32.93	MT2	-2.39	4.673(0)	$34.21
MT43	-35.88	Null	Null	MT22	-27.90	3.741(0)	$33.03	MT62	-2.39	4.528(0)	$34.12
MT42	-35.44	3.278(0)	$32.58	MT21	-27.45	3.783(0)	$33.06	MT1	.00	4.630(0)	$34.16
MT41	-34.91	3.259(0)	$32.57	MT20	-27.01	3.803(0)	$33.10	MT61	2.24	4.855(0)	$34.22
MT40	-34.54	Null	Null	MT19	-26.56	3.875(0)	$33.15	MT57	2.24	4.851(0)	$34.32
MT39	-34.02	3.353(0)	$32.66	MT18	-26.11	3.884(0)	$33.17	MT58	4.48	4.835(0)	$34.14
MT38	-33.57	3.378(0)	$32.70	MT17	-25.59	3.930(0)	$33.21	MT59	7.01	4.830(0)	$34.14
MT37	-33.12	3.440(0)	$32.76	MT16	-25.14	3.895(0)	$33.18	MT60	9.85	5.117(0)	$34.26
MT36	-32.68	3.420(0)	$32.70	MT15	-24.62	3.979(0)	$33.26				

Run 4 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	Null	Null	MT35	-32.23	2.596(0)	$27.55	MT14	-24.25	3.001(0)	$27.92
MT55	-57.74	1.217(0)	$26.32	MT34	-31.78	2.579(0)	$27.47	MT13	-23.72	3.073(0)	$28.01
MT54	-52.45	1.506(0)	$26.61	MT33	-31.48	2.661(0)	$27.48	MT12	-23.28	2.960(0)	$27.89
MT53	-48.19	1.673(0)	$26.74	MT32	-31.18	2.501(0)	$27.49	MT11	-22.90	3.056(0)	$27.97
MT52	-44.54	Null	Null	MT31	-30.89	2.641(0)	$27.60	MT10	-22.38	Null	Null
MT51	-39.54	2.172(0)	$27.17	MT30	-30.66	2.755(0)	$27.72	MT9	-22.01	3.180(0)	$28.06
MT50	-39.09	2.212(0)	$27.21	MT29	-30.36	2.684(0)	$27.64	MT8	-21.49	3.350(0)	$28.17
MT49	-38.64	2.234(0)	$27.23	MT28	-30.14	2.670(0)	$27.62	MT7	-17.23	3.197(0)	$28.10
MT48	-38.20	2.266(0)	$27.24	MT27	-29.84	Null	Null	MT6	-15.37	3.405(0)	$28.28
MT47	-37.75	2.285(0)	$27.29	MT26	-29.54	2.728(0)	$27.67	MT5	-13.35	3.946(0)	$28.38
MT46	-37.30	2.371(0)	$27.35	MT25	-29.24	2.745(0)	$27.63	MT4	-8.80	3.777(0)	$28.60
MT45	-36.85	Null	Null	MT24	-28.80	2.769(0)	$27.73	MT3	-5.30	3.822(0)	$28.67
MT44	-36.41	2.344(0)	$27.34	MT23	-28.35	2.670(0)	$27.62	MT2	-2.38	3.686(0)	$28.63
MT43	-35.88	2.413(0)	$27.39	MT22	-27.90	2.816(0)	$27.75	MT62	-2.39	3.742(0)	$28.50
MT42	-35.44	2.472(0)	$27.32	MT21	-27.45	2.877(0)	$27.83	MT1	.00	3.836(0)	$28.62
MT41	-34.91	Null	Null	MT20	-27.01	2.881(0)	$27.82	MT61	2.24	3.809(0)	$28.61
MT40	-34.54	2.473(0)	$27.38	MT19	-26.56	2.941(0)	$27.86	MT57	2.24	3.828(0)	$28.62
MT39	-34.02	Null	Null	MT18	-26.11	2.965(0)	$27.87	MT58	4.48	3.674(0)	$28.48
MT38	-33.57	Null	Null	MT17	-25.59	2.975(0)	$27.90	MT59	7.01	3.631(0)	$28.48
MT37	-33.12	Null	Null	MT16	-25.14	2.928(0)	$27.86	MT60	9.85	3.816(0)	$28.47
MT36	-32.68	2.877(0)	$27.47	MT15	-24.62	2.932(0)	$27.86				

Run 5 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	5.233(0)	$35.17	MT35	-32.23	1.950(1)	$48.89	MT14	-24.25	1.196(2)	603.98
MT55	-57.74	7.267(0)	$37.03	MT34	-31.78	2.063(1)	$49.71	MT13	-23.72	Null	Null
MT54	-52.45	8.703(0)	$38.62	MT33	-31.48	2.102(1)	$49.99	MT12	-23.28	7.052(1)	$44.52
MT53	-48.19	1.101(1)	$40.67	MT32	-31.18	2.109(1)	$49.78	MT11	-22.90	4.194(1)	$46.82
MT52	-44.54	1.885(1)	$42.45	MT31	-30.89	2.347(1)	$52.03	MT10	-22.38	2.437(1)	$53.98
MT51	-39.54	1.403(1)	$44.61	MT30	-30.66	2.543(1)	$53.90	MT9	-22.01	1.784(1)	$40.11
MT50	-39.09	1.408(1)	$45.02	MT29	-30.36	Null	Null	MT8	-21.49	1.392(1)	$45.96
MT49	-38.64	1.537(1)	$46.16	MT28	-30.14	2.499(1)	$53.82	MT7	-17.23	9.481(0)	$39.69
MT48	-38.20	1.426(1)	$45.66	MT27	-29.84	2.520(1)	$55.65	MT6	-15.37	1.125(1)	$40.90
MT47	-37.75	1.478(1)	$46.30	MT26	-29.54	2.363(1)	$55.95	MT5	-13.35	1.163(1)	$40.40
MT46	-37.30	1.541(1)	$47.12	MT25	-29.24	2.239(1)	$56.71	MT4	-8.80	8.711(0)	$38.94
MT45	-36.85	1.572(1)	$47.48	MT24	-28.80	1.606(1)	$56.55	MT3	-5.30	8.664(0)	$38.79
MT44	-36.41	1.552(1)	$47.20	MT23	-28.35	1.140(1)	$55.31	MT2	-2.39	8.468(0)	$38.48
MT43	-35.88	1.587(1)	$47.21	MT22	-27.90	1.005(1)	$55.23	MT62	-2.39	7.898(0)	$37.97
MT42	-35.44	1.687(1)	$47.18	MT21	-27.45	1.412(1)	$55.71	MT1	.00	8.576(0)	$38.41
MT41	-34.91	1.687(1)	$47.28	MT20	-27.01	1.849(1)	$56.98	MT61	2.24	8.326(0)	$38.02
MT40	-34.54	1.735(1)	$47.77	MT19	-26.56	2.525(1)	$60.43	MT57	2.24	8.191(0)	$38.15
MT39	-34.02	1.786(1)	$48.46	MT18	-26.11	3.539(1)	$64.32	MT58	4.48	7.535(0)	$37.36
MT38	-33.57	1.825(1)	$48.72	MT17	-25.59	5.571(1)	$73.17	MT59	7.01	6.417(0)	$36.37
MT37	-33.12	1.871(1)	$49.27	MT16	-25.14	8.437(1)	$84.62	MT60	9.85	6.422(0)	$36.33
MT36	-32.68	1.864(1)	$48.86	MT15	-24.62	1.161(2)	$98.68				

Run 6 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	6.728(0)	$34.37	MT35	-32.23	4.431(1)	$60.30	MT14	-24.25	1.088(1)	$35.86
MT55	-57.74	8.278(0)	$36.89	MT34	-31.78	4.051(1)	$56.97	MT13	-23.72	8.746(0)	$34.39
MT54	-52.45	1.181(1)	$39.18	MT33	-31.48	3.527(1)	$53.80	MT12	-23.28	9.842(0)	$35.64
MT53	-48.19	1.212(1)	$40.91	MT32	-31.18	3.044(1)	$50.29	MT11	-22.90	9.322(0)	$35.42
MT52	-44.54	1.093(1)	$42.68	MT31	-30.89	2.858(1)	$49.64	MT10	-22.38	8.499(0)	$34.91
MT51	-39.54	2.403(1)	$50.32	MT30	-30.66	2.859(1)	$49.20	MT9	-22.01	8.511(0)	$35.73
MT50	-39.09	2.758(1)	$61.13	MT29	-30.36	1.920(1)	$43.20	MT8	-21.49	1.053(1)	$37.36
MT49	-38.64	3.145(1)	$63.52	MT28	-30.14	2.194(1)	$44.09	MT7	-17.23	5.221(0)	$35.26
MT48	-38.20	3.632(1)	$65.25	MT27	-29.84	2.134(1)	$44.30	MT6	-15.37	6.016(0)	$34.79
MT47	-37.75	4.223(1)	$67.92	MT26	-29.54	1.918(1)	$43.24	MT5	-13.35	7.471(0)	$35.75
MT46	-37.30	4.977(1)	$71.61	MT25	-29.24	1.796(1)	$42.40	MT4	-8.80	7.099(0)	$35.17
MT45	-36.85	5.827(1)	$73.91	MT24	-28.80	1.595(1)	$40.92	MT3	-5.30	8.603(0)	$36.05
MT44	-36.41	6.327(1)	$74.61	MT23	-28.35	1.422(1)	$39.58	MT2	-2.39	7.420(0)	$35.67
MT43	-35.88	6.809(1)	$76.56	MT22	-27.90	1.313(1)	$38.69	MT62	-2.39	5.383(0)	$34.90
MT42	-35.44	7.595(1)	$79.70	MT21	-27.45	1.194(1)	$38.18	MT1	.00	7.026(0)	$36.38
MT41	-34.91	7.604(1)	$79.39	MT20	-27.01	1.107(1)	$37.85	MT61	2.24	8.691(0)	$35.79
MT40	-34.54	7.219(1)	$77.39	MT19	-26.56	1.121(1)	$37.62	MT57	2.24	7.569(0)	$36.12
MT39	-34.02	6.775(1)	$74.86	MT18	-26.11	1.115(1)	$37.11	MT58	4.48	7.585(0)	$36.32
MT38	-33.57	6.081(1)	$72.35	MT17	-25.59	1.104(1)	$36.84	MT59	7.01	6.515(0)	$35.56
MT37	-33.12	5.701(1)	$68.82	MT16	-25.14	1.091(1)	$36.21	MT60	9.85	6.090(0)	$35.08
MT36	-32.68	5.026(1)	$64.87	MT15	-24.62	1.120(1)	$36.07				

Run 9 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	7.428(0)	$36.80	MT35	-32.23	4.507(1)	$79.11	MT14	-24.25	1.426(1)	$41.78
MT55	-57.74	9.161(0)	$37.08	MT34	-31.78	5.790(1)	$87.55	MT13	-23.72	1.212(1)	$39.46
MT54	-52.45	1.114(1)	$39.23	MT33	-31.48	6.600(1)	$90.65	MT12	-23.28	1.383(1)	$40.89
MT53	-48.19	1.283(1)	$41.28	MT32	-31.18	7.285(1)	$91.46	MT11	-22.90	1.383(1)	$40.70
MT52	-44.54	1.461(1)	$43.75	MT31	-30.89	8.854(1)	$98.42	MT10	-22.38	1.207(1)	$39.25
MT51	-39.54	2.341(1)	$47.80	MT30	-30.66	1.012(2)	$03.80	MT9	-22.01	1.287(1)	$40.18
MT50	-39.09	2.257(1)	$47.16	MT29	-30.36	Null	Null	MT8	-21.49	1.404(1)	$41.51
MT49	-38.64	2.033(1)	$46.19	MT28	-30.14	1.000(2)	$99.63	MT7	-17.23	1.073(1)	$38.70
MT48	-38.20	1.755(1)	$45.19	MT27	-29.84	1.008(2)	$99.47	MT6	-15.37	Null	Null
MT47	-37.75	1.900(1)	$44.57	MT26	-29.54	9.191(1)	$94.73	MT5	-13.35	9.488(0)	$37.46
MT46	-37.30	1.375(1)	$45.00	MT25	-29.24	8.542(1)	$90.59	MT4	-8.80	8.239(0)	$36.52
MT45	-36.85	1.356(1)	$46.53	MT24	-28.80	7.176(1)	$82.00	MT3	-5.30	8.434(0)	$36.45
MT44	-36.41	1.240(1)	$48.69	MT23	-28.35	6.001(1)	$72.86	MT2	-2.39	8.649(0)	$35.20
MT43	-35.88	1.295(1)	$48.11	MT22	-27.90	5.064(1)	$66.00	MT62	-2.39	Null	Null
MT42	-35.44	1.396(1)	$48.97	MT21	-27.45	4.287(1)	$60.17	MT1	.00	8.615(0)	$35.35
MT41	-34.91	1.486(1)	$50.10	MT20	-27.01	3.448(1)	$54.52	MT61	2.24	8.373(0)	$35.53
MT40	-34.54	1.637(1)	$52.74	MT19	-26.56	2.717(1)	$50.77	MT57	2.24	8.631(0)	$36.19
MT39	-34.02	1.812(1)	$56.30	MT18	-26.11	2.389(1)	$48.42	MT58	4.48	7.643(0)	$35.77
MT38	-33.57	2.286(1)	$60.41	MT17	-25.59	2.058(1)	$46.36	MT59	7.01	6.953(0)	$34.96
MT37	-33.12	2.832(1)	$64.99	MT16	-25.14	1.706(1)	$44.05	MT60	9.85	7.216(0)	$34.96
MT36	-32.68	3.505(1)	$70.71	MT15	-24.62	1.586(1)	$43.00				

Run 10 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	4.762(0)	$32.88	MT35	-32.23	6.421(1)	$80.62	MT14	-24.25	8.733(0)	$35.84
MT55	-57.74	6.348(0)	$34.43	MT34	-31.78	7.909(1)	$80.78	MT13	-23.72	8.852(0)	$35.98
MT54	-52.45	7.124(0)	$35.79	MT33	-31.48	8.331(1)	$78.48	MT12	-23.28	8.142(0)	$35.45
MT53	-48.19	8.850(0)	$36.94	MT32	-31.18	7.484(1)	$71.67	MT11	-22.90	7.891(0)	$35.24
MT52	-44.54	1.060(1)	$37.90	MT31	-30.89	6.816(1)	$67.44	MT10	-22.38	6.913(0)	$34.44
MT51	-39.54	8.493(0)	$41.06	MT30	-30.66	6.365(1)	$66.76	MT9	-22.01	7.029(0)	$35.19
MT50	-39.09	8.008(0)	$42.10	MT29	-30.36	5.464(1)	$60.43	MT8	-21.49	8.073(0)	$35.36
MT49	-38.64	8.043(0)	$42.82	MT28	-30.14	4.593(1)	$56.07	MT7	-17.23	7.530(0)	$35.20
MT48	-38.20	8.378(0)	$43.03	MT27	-29.84	4.083(1)	$53.85	MT6	-15.37	6.665(0)	$34.96
MT47	-37.75	8.622(0)	$44.41	MT26	-29.54	3.483(1)	$51.15	MT5	-13.35	5.676(0)	$34.74
MT46	-37.30	1.079(1)	$46.41	MT25	-29.24	3.072(1)	$48.47	MT4	-8.80	5.614(0)	$34.25
MT45	-36.85	1.259(1)	$47.89	MT24	-28.80	2.480(1)	$44.66	MT3	-5.30	5.912(0)	$34.05
MT44	-36.41	Null	Null	MT23	-28.35	2.016(1)	$41.75	MT2	-2.39	4.627(0)	$33.60
MT43	-35.88	Null	Null	MT22	-27.90	1.736(1)	$40.12	MT62	-2.39	4.237(0)	$33.76
MT42	-35.44	Null	Null	MT21	-27.45	1.531(1)	$39.08	MT1	.00	3.992(0)	$33.19
MT41	-34.91	Null	Null	MT20	-27.01	1.342(1)	$38.10	MT61	2.24	4.418(0)	$33.03
MT40	-34.54	Null	Null	MT19	-26.56	1.031(1)	$36.18	MT57	2.24	4.175(0)	$33.36
MT39	-34.02	2.685(1)	$46.46	MT18	-26.11	1.036(1)	$36.82	MT58	4.48	4.171(0)	$33.24
MT38	-33.57	3.359(1)	$70.09	MT17	-25.59	1.001(1)	$36.69	MT59	7.01	4.143(0)	$33.11
MT37	-33.12	4.162(1)	$73.24	MT16	-25.14	9.444(0)	$36.30	MT60	9.85	4.358(0)	$33.10
MT36	-32.68	5.134(1)	$77.77	MT15	-24.62	8.885(0)	$36.07				

Run 13 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	4.347(0)	$29.31	MT35	-32.23	2.604(1)	$37.13	MT14	-24.25	6.979(0)	$30.33
MT55	-57.74	5.834(0)	$30.50	MT34	-31.78	2.398(1)	$38.69	MT13	-23.72	7.329(0)	$30.56
MT54	-52.45	7.843(0)	$31.94	MT33	-31.48	2.116(1)	$38.49	MT12	-23.28	6.856(0)	$30.17
MT53	-48.19	8.100(0)	$32.15	MT32	-31.18	1.831(1)	$36.74	MT11	-22.90	6.689(0)	$29.95
MT52	-44.54	6.853(0)	$33.37	MT31	-30.89	1.742(1)	$36.13	MT10	-22.38	5.811(0)	$29.44
MT51	-39.54	1.262(1)	$43.76	MT30	-30.66	1.644(1)	$35.83	MT9	-22.01	6.359(0)	$29.91
MT50	-39.09	1.378(1)	$46.16	MT29	-30.36	1.419(1)	$34.87	MT8	-21.49	6.480(0)	$30.03
MT49	-38.64	1.582(1)	$48.43	MT28	-30.14	1.247(1)	$34.16	MT7	-17.23	3.724(0)	$30.04
MT48	-38.20	1.693(1)	$50.19	MT27	-29.84	1.199(1)	$34.06	MT6	-15.37	3.263(0)	$29.92
MT47	-37.75	2.201(1)	$50.53	MT26	-29.54	1.092(1)	$33.52	MT5	-13.35	4.791(0)	$30.17
MT46	-37.30	2.784(1)	$51.24	MT25	-29.24	1.016(1)	$33.10	MT4	-8.80	4.225(0)	$29.63
MT45	-36.85	3.228(1)	$51.20	MT24	-28.80	9.361(0)	$32.61	MT3	-5.30	5.387(0)	$30.13
MT44	-36.41	4.136(1)	$52.77	MT23	-28.35	8.505(0)	$32.12	MT2	-2.39	5.002(0)	$29.98
MT43	-35.88	4.845(1)	$54.94	MT22	-27.90	7.913(0)	$31.88	MT62	-2.39	Null	Null
MT42	-35.44	5.787(1)	$58.04	MT21	-27.45	7.588(0)	$31.60	MT1	.00	4.645(0)	$29.91
MT41	-34.91	6.653(1)	$58.85	MT20	-27.01	7.291(0)	$31.16	MT61	2.24	4.565(0)	$29.86
MT40	-34.54	7.124(1)	$58.54	MT19	-26.56	Null	Null	MT57	2.24	4.536(0)	$29.90
MT39	-34.02	6.421(1)	$55.88	MT18	-26.11	7.273(0)	$30.78	MT58	4.48	4.476(0)	$29.74
MT38	-33.57	5.318(1)	$52.02	MT17	-25.59	7.281(0)	$30.75	MT59	7.01	4.451(0)	$29.69
MT37	-33.12	4.411(1)	$48.68	MT16	-25.14	7.162(0)	$30.56	MT60	9.85	4.448(0)	$29.66
MT36	-32.68	3.535(1)	$45.21	MT15	-24.62	7.146(0)	$30.45				

Run 14 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
NT56	-64.23	3.670(0)	529.49	NT35	-32.23	1.477(1)	535.04	NT14	-24.25	6.915(1)	549.28
NT55	-57.74	5.034(0)	530.54	NT34	-31.78	1.517(1)	536.02	NT13	-23.72	3.032(1)	544.03
NT54	-52.45	6.529(0)	531.86	NT33	-31.48	1.475(1)	536.41	NT12	-23.28	1.715(1)	538.66
NT53	-48.19	7.994(0)	532.96	NT32	-31.18	1.451(1)	537.57	NT11	-22.90	1.128(1)	535.13
NT52	-44.54	8.685(0)	533.29	NT31	-30.89	1.290(1)	537.86	NT10	-22.38	8.144(0)	532.81
NT51	-39.54	1.102(1)	534.44	NT30	-30.66	1.250(1)	538.26	NT9	-22.01	7.960(0)	532.48
NT50	-39.09	1.116(1)	534.52	NT29	-30.36	1.101(1)	539.73	NT8	-21.49	6.795(0)	532.10
NT49	-38.64	1.129(1)	534.62	NT28	-30.14	9.762(0)	540.64	NT7	-17.23	8.047(0)	532.15
NT48	-38.20	1.134(1)	534.68	NT27	-29.84	9.127(0)	542.88	NT6	-15.37	7.960(0)	532.12
NT47	-37.75	1.146(1)	534.84	NT26	-29.54	8.513(0)	545.08	NT5	-13.35	7.430(0)	532.14
NT46	-37.30	1.203(1)	535.24	NT25	-29.24	8.096(0)	548.26	NT4	-8.80	7.386(0)	531.58
NT45	-36.85	1.185(1)	535.16	NT24	-28.80	1.181(1)	553.64	NT3	-5.30	6.866(0)	531.26
NT44	-36.41	1.167(1)	535.16	NT23	-28.35	1.232(1)	552.83	NT2	-2.39	7.391(0)	531.82
NT43	-35.88	1.162(1)	535.12	NT22	-27.90	1.663(1)	552.93	NT62	-2.39	6.058(0)	531.33
NT42	-35.44	1.191(1)	535.14	NT21	-27.45	2.283(1)	553.11	NT1	.00	6.440(0)	531.56
NT41	-34.91	1.194(1)	534.91	NT20	-27.01	3.208(1)	552.19	NT61	2.24	6.333(0)	531.28
NT40	-34.54	1.218(1)	534.66	NT19	-26.56	Null	Null	NT57	2.24	6.503(0)	531.78
NT39	-34.02	1.271(1)	534.67	NT18	-26.11	7.322(1)	559.89	NT58	4.48	5.623(0)	531.22
NT38	-33.57	1.329(1)	534.36	NT17	-25.59	9.263(1)	564.60	NT59	7.01	4.869(0)	530.78
NT37	-33.12	1.380(1)	534.42	NT16	-25.14	9.034(1)	562.58	NT60	9.85	4.451(0)	530.67
NT36	-32.68	1.425(1)	534.49	NT15	-24.62	7.167(1)	556.25				

Run 15 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
NT56	-64.38	2.656(0)	530.24	NT35	-32.38	1.149(1)	537.94	NT14	-14.40	3.382(0)	531.32
NT55	-47.89	4.065(0)	531.92	NT34	-31.93	9.580(0)	536.74	NT13	-13.67	3.376(0)	531.61
NT54	-42.60	5.425(0)	533.38	NT33	-31.63	8.296(0)	535.89	NT12	-13.43	3.086(0)	531.56
NT53	-38.34	5.782(0)	535.08	NT32	-31.33	6.915(0)	536.98	NT11	-13.05	2.925(0)	531.68
NT52	-34.69	5.600(0)	540.47	NT31	-31.04	6.580(0)	535.12	NT10	-12.53	2.682(0)	531.24
NT51	-29.69	2.157(1)	554.09	NT30	-30.81	6.364(0)	535.27	NT9	-12.16	2.954(0)	531.75
NT50	-29.24	2.229(1)	554.77	NT29	-30.51	5.735(0)	534.79	NT8	-11.64	3.062(0)	531.60
NT49	-28.79	2.479(1)	555.03	NT28	-30.29	5.275(0)	534.10	NT7	-7.38	3.231(0)	531.77
NT48	-28.35	2.920(1)	555.53	NT27	-29.99	5.210(0)	534.14	NT6	-5.52	3.022(0)	531.73
NT47	-27.90	3.776(1)	557.66	NT26	-29.69	4.997(0)	533.83	NT5	-3.50	4.003(0)	531.66
NT46	-27.45	4.025(1)	558.53	NT25	-29.39	4.742(0)	533.69	NT4	1.05	4.733(0)	531.86
NT45	-27.00	4.523(1)	558.03	NT24	-28.95	4.535(0)	533.38	NT3	4.55	4.217(0)	531.53
NT44	-26.56	3.939(1)	555.85	NT23	-28.50	4.168(0)	532.72	NT2	7.46	3.998(0)	531.35
NT43	-26.03	3.815(1)	554.97	NT22	-28.05	4.156(0)	532.54	NT62	7.46	3.761(0)	531.40
NT42	-25.59	3.259(1)	553.00	NT21	-27.60	4.001(0)	532.01	NT1	9.85	3.882(0)	531.41
NT41	-25.06	2.778(1)	551.55	NT20	-27.16	3.772(0)	531.61	NT61	12.09	4.079(0)	531.58
NT40	-24.69	2.166(1)	547.17	NT19	-26.71	Null	Null	NT57	12.09	3.769(0)	531.42
NT39	-24.17	1.765(1)	543.68	NT18	-26.26	3.614(0)	531.42	NT58	14.33	3.562(0)	531.24
NT38	-23.72	1.603(1)	542.05	NT17	-25.74	3.548(0)	531.53	NT59	16.86	3.487(0)	531.24
NT37	-23.27	1.508(1)	540.90	NT16	-25.29	3.415(0)	531.42	NT60	19.70	3.472(0)	531.23
NT36	-22.83	1.308(1)	539.04	NT15	-24.77	3.398(0)	531.42				

Run 16 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
NT56	-64.23	2.376(0)	529.96	NT35	-32.23	4.558(1)	571.73	NT14	-24.25	4.135(0)	533.79
NT55	-57.74	3.784(0)	531.56	NT34	-31.78	3.458(1)	569.68	NT13	-23.72	4.231(0)	533.85
NT54	-52.45	4.778(0)	532.99	NT33	-31.48	2.947(1)	567.64	NT12	-23.28	3.966(0)	533.43
NT53	-48.19	6.410(0)	534.69	NT32	-31.18	2.339(1)	562.69	NT11	-22.90	3.820(0)	533.16
NT52	-44.54	7.336(0)	535.82	NT31	-30.89	2.134(1)	560.55	NT10	-22.38	3.595(0)	532.67
NT51	-39.54	6.303(0)	537.82	NT30	-30.66	1.826(1)	557.58	NT9	-22.01	4.033(0)	532.80
NT50	-39.09	6.557(0)	538.47	NT29	-30.36	1.317(1)	553.31	NT8	-21.49	4.034(0)	532.69
NT49	-38.64	7.212(0)	539.56	NT28	-30.14	1.068(1)	551.64	NT7	-17.23	3.587(0)	532.24
NT48	-38.20	8.548(0)	540.97	NT27	-29.84	9.567(0)	551.01	NT6	-15.37	3.506(0)	532.27
NT47	-37.75	1.110(1)	543.21	NT26	-29.54	8.426(0)	548.14	NT5	-13.35	3.215(0)	532.17
NT46	-37.30	1.576(1)	546.71	NT25	-29.24	7.816(0)	548.12	NT4	-8.80	3.084(0)	532.06
NT45	-36.85	2.093(1)	550.30	NT24	-28.80	6.941(0)	545.93	NT3	-5.30	3.018(0)	531.60
NT44	-36.41	2.623(1)	552.89	NT23	-28.35	6.269(0)	543.34	NT2	-2.39	2.984(0)	531.41
NT43	-35.88	2.645(1)	553.93	NT22	-27.90	5.944(0)	541.87	NT62	-2.39	2.740(0)	531.09
NT42	-35.44	2.671(1)	556.00	NT21	-27.45	5.454(0)	540.31	NT1	.00	2.830(0)	531.39
NT41	-34.91	3.228(1)	559.31	NT20	-27.01	5.194(0)	539.14	NT61	2.24	3.405(0)	531.48
NT40	-34.54	4.210(1)	563.00	NT19	-26.56	5.113(0)	539.13	NT57	2.24	2.762(0)	531.35
NT39	-34.02	4.635(1)	566.80	NT18	-26.11	4.962(0)	538.19	NT58	4.48	2.749(0)	531.26
NT38	-33.57	4.670(1)	566.36	NT17	-25.59	4.786(0)	536.96	NT59	7.01	2.691(0)	531.19
NT37	-33.12	5.363(1)	574.45	NT16	-25.14	4.402(0)	535.22	NT60	9.85	2.644(0)	531.06
NT36	-32.68	5.565(1)	573.68	NT15	-24.62	4.312(0)	534.32				

Run 17 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
NT56	-64.23	1.413(0)	532.01	NT35	-32.23	1.059(1)	540.84	NT14	-24.25	3.913(1)	565.52
NT55	-57.74	2.536(0)	532.95	NT34	-31.78	Null	Null	NT13	-23.72	2.482(1)	561.28
NT54	-52.45	3.476(0)	533.93	NT33	-31.48	1.072(1)	541.38	NT12	-23.28	1.546(1)	557.35
NT53	-48.19	4.936(0)	535.02	NT32	-31.18	1.036(1)	541.15	NT11	-22.90	1.167(1)	557.02
NT52	-44.54	5.170(0)	535.83	NT31	-30.89	1.087(1)	541.86	NT10	-22.38	7.950(0)	553.59
NT51	-39.54	6.409(0)	537.31	NT30	-30.66	1.137(1)	542.73	NT9	-22.01	6.888(0)	552.26
NT50	-39.09	6.481(0)	537.41	NT29	-30.36	1.089(1)	542.29	NT8	-21.49	5.768(0)	550.45
NT49	-38.64	6.607(0)	537.54	NT28	-30.14	1.074(1)	542.14	NT7	-17.23	4.103(0)	540.43
NT48	-38.20	6.774(0)	537.64	NT27	-29.84	1.118(1)	542.70	NT6	-15.37	4.439(0)	536.72
NT47	-37.75	7.070(0)	537.84	NT26	-29.54	1.171(1)	542.97	NT5	-13.35	4.118(0)	535.99
NT46	-37.30	7.387(0)	538.20	NT25	-29.24	1.294(1)	543.72	NT4	-8.80	4.301(0)	535.86
NT45	-36.85	7.608(0)	538.31	NT24	-28.80	1.522(1)	544.93	NT3	-5.30	4.009(0)	535.08
NT44	-36.41	7.715(0)	538.42	NT23	-28.35	1.597(1)	545.63	NT2	-2.39	4.139(0)	535.24
NT43	-35.88	8.009(0)	538.71	NT22	-27.90	1.881(1)	547.58	NT62	-2.39	3.454(0)	534.59
NT42	-35.44	8.286(0)	538.90	NT21	-27.45	2.549(1)	551.02	NT1	.00	3.910(0)	535.06
NT41	-34.91	8.518(0)	539.06	NT20	-27.01	3.563(1)	555.67	NT61	2.24	4.101(0)	535.08
NT40	-34.54	8.765(0)	539.26	NT19	-26.56	4.869(1)	561.46	NT57	2.24	3.855(0)	534.81
NT39	-34.02	9.173(0)	539.58	NT18	-26.11	6.398(1)	567.68	NT58	4.48	3.648(0)	534.50
NT38	-33.57	Null	Null	NT17	-25.59	7.610(1)	573.49	NT59	7.01	3.516(0)	534.44
NT37	-33.12	9.774(0)	540.15	NT16	-25.14	7.547(1)	576.16	NT60	9.85	3.479(0)	534.47
NT36	-32.68	1.008(1)	540.34	NT15	-24.62	5.669(1)	571.93				

Run 18 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	3.307(0)	$39.08	MT35	-22.38	4.161(1)	$61.77	MT14	-14.40	3.689(0)	$41.80
MT55	-47.89	6.474(0)	$40.09	MT34	-21.93	Null	Null	MT13	-13.87	4.134(0)	$41.61
MT54	-42.60	5.702(0)	$40.98	MT33	-21.63	1.817(1)	$53.64	MT12	-13.43	4.044(0)	$40.95
MT53	-38.34	6.937(0)	$41.76	MT32	-21.33	1.240(1)	$51.01	MT11	-13.05	4.301(0)	$40.96
MT52	-34.69	8.317(0)	$42.51	MT31	-21.04	1.024(1)	$51.70	MT10	-12.53	4.152(0)	$40.60
MT51	-29.69	1.188(1)	$44.21	MT30	-20.81	9.099(0)	$52.54	MT9	-12.16	4.776(0)	$41.10
MT50	-29.24	1.178(1)	$44.34	MT29	-20.51	7.450(0)	$51.47	MT8	-11.64	4.767(0)	$41.23
MT49	-28.79	1.213(1)	$44.50	MT28	-20.29	6.720(0)	$50.82	MT7	-7.38	3.851(0)	$40.66
MT48	-28.35	1.332(1)	$44.85	MT27	-19.99	6.164(0)	$49.71	MT6	-5.52	3.896(0)	$40.63
MT47	-27.90	1.509(1)	$45.47	MT26	-19.69	5.469(0)	$47.85	MT5	-3.50	3.745(0)	$40.47
MT46	-27.45	1.560(1)	$46.26	MT25	-19.39	5.117(0)	$46.19	MT4	1.05	3.247(0)	$39.89
MT45	-27.00	1.738(1)	$47.08	MT24	-18.95	4.500(0)	$44.79	MT3	4.55	3.231(0)	$39.65
MT44	-26.56	1.940(1)	$48.59	MT23	-18.50	4.204(0)	$45.12	MT2	7.46	3.150(0)	$39.47
MT43	-26.03	2.397(1)	$49.78	MT22	-18.05	4.026(0)	$44.42	MT62	7.46	Null	Null
MT42	-25.59	3.186(1)	$51.89	MT21	-17.60	3.783(0)	$43.41	MT1	9.85	3.003(0)	$39.34
MT41	-25.06	3.830(1)	$53.34	MT20	-17.16	3.728(0)	$42.99	MT61	12.09	3.602(0)	$39.61
MT40	-24.69	5.304(1)	$58.31	MT19	-16.71	3.618(0)	$42.86	MT57	12.09	2.876(0)	$39.23
MT39	-24.17	6.411(1)	$62.49	MT18	-16.26	3.431(0)	$43.32	MT58	14.33	2.641(0)	$38.96
MT38	-23.72	6.861(1)	$63.90	MT17	-15.74	3.497(0)	$44.10	MT59	16.86	2.537(0)	$38.89
MT37	-23.27	6.388(1)	$66.10	MT16	-15.29	3.453(0)	$43.65	MT60	19.70	2.339(0)	$38.76
MT36	-22.83	5.480(1)	$65.58	MT15	-14.77	3.532(0)	$42.49				

Run 26 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	5.923(0)	$30.58	MT35	-22.38	7.253(1)	$69.48	MT14	-14.40	7.409(0)	$31.80
MT55	-47.89	7.665(0)	$32.01	MT34	-21.93	Null	Null	MT13	-13.87	8.072(0)	$32.12
MT54	-42.60	8.575(0)	$33.57	MT33	-21.63	4.558(1)	$60.08	MT12	-13.43	8.057(0)	$32.00
MT53	-38.34	1.119(1)	$35.06	MT32	-21.33	3.053(1)	$53.04	MT11	-13.05	8.062(0)	$31.96
MT52	-34.69	1.282(1)	$35.94	MT31	-21.04	2.342(1)	$49.84	MT10	-12.53	7.498(0)	$31.52
MT51	-29.69	1.335(1)	$37.16	MT30	-20.81	1.820(1)	$46.19	MT9	-12.16	8.009(0)	$32.15
MT50	-29.24	1.338(1)	$37.43	MT29	-20.51	1.308(1)	$41.35	MT8	-11.64	7.779(0)	$32.27
MT49	-28.79	1.351(1)	$37.84	MT28	-20.29	1.000(1)	$38.64	MT7	-7.38	7.677(0)	$31.94
MT48	-28.35	1.320(1)	$38.87	MT27	-19.99	8.421(0)	$37.00	MT6	-5.52	7.391(0)	$31.70
MT47	-27.90	1.202(1)	$38.26	MT26	-19.69	7.075(0)	$35.41	MT5	-3.50	7.466(0)	$31.59
MT46	-27.45	1.265(1)	$39.38	MT25	-19.39	6.207(0)	$33.98	MT4	1.05	6.311(0)	$30.89
MT45	-27.00	1.285(1)	$39.82	MT24	-18.95	4.752(0)	$31.81	MT3	4.55	5.708(0)	$30.42
MT44	-26.56	1.316(1)	$42.94	MT23	-18.50	4.016(0)	$30.77	MT2	7.46	5.641(0)	$30.37
MT43	-26.03	1.220(1)	$44.43	MT22	-18.05	3.419(0)	$30.13	MT62	7.46	Null	Null
MT42	-25.59	1.430(1)	$46.40	MT21	-17.60	3.313(0)	$29.97	MT1	9.85	5.418(0)	$30.21
MT41	-25.06	1.752(1)	$47.95	MT20	-17.16	3.633(0)	$30.10	MT61	12.09	5.984(0)	$30.62
MT40	-24.69	2.589(1)	$52.84	MT19	-16.71	4.176(0)	$30.28	MT57	12.09	4.857(0)	$29.78
MT39	-24.17	3.896(1)	$58.58	MT18	-16.26	4.817(0)	$30.42	MT58	14.33	4.585(0)	$29.43
MT38	-23.72	5.753(1)	$64.30	MT17	-15.74	5.499(0)	$30.79	MT59	16.86	4.323(0)	$29.23
MT37	-23.27	6.969(1)	$68.32	MT16	-15.29	5.841(0)	$31.06	MT60	19.70	3.999(0)	$28.99
MT36	-22.83	7.557(1)	$69.29	MT15	-14.77	6.703(0)	$31.49				

Run 28 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	6.716(0)	$30.65	MT35	-22.38	2.490(1)	$60.11	MT14	-14.40	5.197(0)	$31.56
MT55	-47.89	Null	Null	MT34	-21.93	2.883(1)	$61.45	MT13	-13.87	5.252(0)	$32.02
MT54	-42.60	1.102(1)	$34.50	MT33	-21.63	3.307(1)	$68.02	MT12	-13.43	5.465(0)	$31.91
MT53	-38.34	1.368(1)	$36.24	MT32	-21.33	3.912(1)	$67.48	MT11	-13.05	5.947(0)	$32.11
MT52	-34.69	1.658(1)	$41.15	MT31	-21.04	5.086(1)	$71.40	MT10	-12.53	6.349(0)	$31.73
MT51	-29.69	2.037(1)	$41.93	MT30	-20.81	Null	Null	MT9	-12.16	6.998(0)	$33.22
MT50	-29.24	Null	Null	MT29	-20.51	Null	Null	MT8	-11.64	1.065(1)	$34.00
MT49	-28.79	2.089(1)	$43.02	MT28	-20.29	8.691(1)	$73.77	MT7	-7.38	1.334(1)	$34.90
MT48	-28.35	2.127(1)	$43.73	MT27	-19.99	1.037(2)	$76.72	MT6	-5.52	1.172(1)	$34.20
MT47	-27.90	1.861(1)	$41.60	MT26	-19.69	1.105(2)	$77.05	MT5	-3.50	Null	Null
MT46	-27.45	2.267(1)	$45.96	MT25	-19.39	1.152(2)	$79.56	MT4	1.05	8.959(0)	$32.90
MT45	-27.00	2.213(1)	$45.45	MT24	-18.95	1.017(2)	$71.40	MT3	4.55	8.206(0)	$32.06
MT44	-26.56	2.341(1)	$46.75	MT23	-18.50	8.812(1)	$65.46	MT2	7.46	7.874(0)	$32.16
MT43	-26.03	2.050(1)	$42.98	MT22	-18.05	6.167(1)	$56.56	MT62	7.46	Null	Null
MT42	-25.59	2.497(1)	$44.84	MT21	-17.60	3.989(1)	$48.43	MT1	9.85	7.232(0)	$31.53
MT41	-25.06	2.377(1)	$43.52	MT20	-17.16	2.638(1)	$42.36	MT61	12.09	8.184(0)	$31.64
MT40	-24.69	2.498(1)	$45.36	MT19	-16.71	1.798(1)	$37.95	MT57	12.09	7.449(0)	$31.38
MT39	-24.17	2.511(1)	$47.42	MT18	-16.26	1.289(1)	$34.82	MT58	14.33	6.402(0)	$30.72
MT38	-23.72	2.650(1)	$49.98	MT17	-15.74	9.755(0)	$33.18	MT59	16.86	5.781(0)	$30.39
MT37	-23.27	2.490(1)	$52.62	MT16	-15.29	7.527(0)	$32.15	MT60	19.70	4.934(0)	$29.83
MT36	-22.83	2.444(1)	$55.67	MT15	-14.77	5.868(0)	$31.58				

Run 29 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	3.049(1)	$60.43	MT35	-22.38	8.851(1)	613.74	MT14	-14.40	1.076(2)	644.08
MT55	-47.89	Null	Null	MT34	-21.93	9.960(1)	627.48	MT13	-13.87	1.640(2)	640.78
MT54	-42.60	4.731(1)	$74.52	MT33	-21.63	1.002(2)	632.10	MT12	-13.43	8.607(1)	$97.21
MT53	-38.34	5.736(1)	$83.52	MT32	-21.33	9.728(1)	634.89	MT11	-13.05	6.419(1)	$84.85
MT52	-34.69	6.388(1)	$93.74	MT31	-21.04	1.088(2)	650.58	MT10	-12.53	4.340(1)	$72.26
MT51	-29.69	7.045(1)	804.93	MT30	-20.81	1.148(2)	658.96	MT9	-12.16	3.776(1)	$71.03
MT50	-29.24	7.184(1)	807.02	MT29	-20.51	1.113(2)	657.69	MT8	-11.64	3.476(1)	$70.92
MT49	-28.79	7.055(1)	806.41	MT28	-20.29	1.100(2)	655.69	MT7	-7.38	7.966(1)	$89.85
MT48	-28.35	7.046(1)	804.85	MT27	-19.99	1.322(2)	665.35	MT6	-5.52	8.712(1)	$92.87
MT47	-27.90	7.321(1)	805.02	MT26	-19.69	1.252(2)	663.14	MT5	-3.50	5.581(1)	$76.41
MT46	-27.45	7.726(1)	807.58	MT25	-19.39	1.295(2)	660.40	MT4	1.05	4.734(1)	$70.96
MT45	-27.00	7.534(1)	805.94	MT24	-18.95	1.259(2)	648.14	MT3	4.55	4.384(1)	$67.98
MT44	-26.56	7.717(1)	807.81	MT23	-18.50	1.379(2)	652.20	MT2	7.46	4.219(1)	$66.28
MT43	-26.03	6.517(1)	$95.10	MT22	-18.05	1.591(2)	660.30	MT62	7.46	Null	Null
MT42	-25.59	8.091(1)	616.59	MT21	-17.60	2.054(2)	680.59	MT1	9.85	4.171(1)	$64.24
MT41	-25.06	7.711(1)	614.20	MT20	-17.16	2.695(2)	701.82	MT61	12.09	4.287(1)	$66.69
MT40	-24.69	1.057(2)	633.98	MT19	-16.71	3.702(2)	728.61	MT57	12.09	3.886(1)	$62.58
MT39	-24.17	8.385(1)	615.85	MT18	-16.26	4.505(2)	743.26	MT58	14.33	3.889(1)	$62.41
MT38	-23.72	9.099(1)	618.46	MT17	-15.74	4.790(2)	740.78	MT59	16.86	3.250(1)	$58.39
MT37	-23.27	9.024(1)	615.09	MT16	-15.29	4.008(2)	717.45	MT60	19.70	2.836(1)	$56.25
MT36	-22.83	8.948(1)	613.36	MT15	-14.77	2.805(2)	678.20				

Run 30 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	1.610(1)	550.10	MT35	-22.38	6.220(1)	588.35	MT14	-14.40	3.759(2)	727.21
MT55	-47.89	Null	Null	MT34	-21.93	7.535(1)	600.93	MT13	-13.87	2.949(2)	701.44
MT54	-42.60	2.718(1)	564.29	MT33	-21.63	6.946(1)	595.45	MT12	-13.43	1.872(2)	660.67
MT53	-38.34	3.216(1)	570.79	MT32	-21.33	6.785(1)	594.73	MT11	-13.05	1.246(2)	631.51
MT52	-34.69	3.753(1)	578.22	MT31	-21.04	7.357(1)	600.00	MT10	-12.53	7.720(1)	602.61
MT51	-29.69	4.358(1)	575.81	MT30	-20.81	8.076(1)	613.23	MT9	-12.16	5.917(1)	591.01
MT50	-29.24	4.865(1)	581.52	MT29	-20.51	7.524(1)	601.65	MT8	-11.64	4.925(1)	585.75
MT49	-28.79	4.417(1)	575.87	MT28	-20.29	7.665(1)	602.40	MT7	-7.38	3.135(1)	562.50
MT48	-28.35	4.512(1)	576.52	MT27	-19.99	6.868(1)	595.13	MT6	-5.52	7.138(1)	581.76
MT47	-27.90	4.432(1)	577.02	MT26	-19.69	8.506(1)	608.63	MT5	-3.50	6.004(1)	578.58
MT46	-27.45	4.794(1)	579.58	MT25	-19.39	8.918(1)	611.81	MT4	1.05	3.681(1)	564.65
MT45	-27.00	4.777(1)	578.63	MT24	-18.95	9.066(1)	615.12	MT3	4.55	3.685(1)	564.08
MT44	-26.56	4.888(1)	580.01	MT23	-18.50	9.774(1)	621.68	MT2	7.46	3.527(1)	562.09
MT43	-26.03	5.193(1)	582.45	MT22	-18.05	1.060(2)	629.55	MT62	7.46	Null	Null
MT42	-25.59	5.260(1)	582.99	MT21	-17.60	1.219(2)	643.75	MT1	9.85	3.151(1)	561.23
MT41	-25.06	5.245(1)	581.93	MT20	-17.16	1.190(2)	643.84	MT61	12.09	3.708(1)	563.51
MT40	-24.69	Null	Null	MT19	-16.71	1.365(2)	656.38	MT57	12.09	3.115(1)	559.89
MT39	-24.17	5.701(1)	585.64	MT18	-16.26	1.648(2)	665.68	MT58	14.33	3.040(1)	559.00
MT38	-23.72	5.882(1)	587.27	MT17	-15.74	2.291(2)	682.60	MT59	16.86	2.708(1)	555.70
MT37	-23.27	6.087(1)	589.23	MT16	-15.29	3.075(2)	706.33	MT60	19.70	2.621(1)	553.78
MT36	-22.83	6.145(1)	589.05	MT15	-14.77	3.736(2)	725.13				

Run 31 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	2.007(1)	561.09	MT35	-22.38	4.922(1)	601.39	MT14	-14.40	4.656(1)	590.78
MT55	-47.89	6.418(1)	610.69	MT34	-21.93	4.598(1)	595.85	MT13	-13.87	4.654(1)	591.27
MT54	-42.60	7.883(1)	621.31	MT33	-21.63	4.567(1)	595.90	MT12	-13.43	4.461(1)	589.70
MT53	-38.34	6.690(1)	625.27	MT32	-21.33	4.258(1)	589.84	MT11	-13.05	3.917(1)	583.37
MT52	-34.69	1.650(2)	678.71	MT31	-21.04	4.470(1)	595.00	MT10	-12.53	3.915(1)	584.25
MT51	-29.69	1.594(2)	741.77	MT30	-20.81	4.776(1)	598.04	MT9	-12.16	4.270(1)	589.08
MT50	-29.24	Null	Null	MT29	-20.51	4.642(1)	595.09	MT8	-11.64	3.967(1)	581.88
MT49	-28.79	3.297(2)	827.11	MT28	-20.29	4.444(1)	591.82	MT7	-7.38	4.210(1)	587.79
MT48	-28.35	Null	Null	MT27	-19.99	5.026(1)	598.52	MT6	-5.52	3.983(1)	582.73
MT47	-27.90	5.169(2)	896.92	MT26	-19.69	5.038(1)	598.42	MT5	-3.50	3.367(1)	577.29
MT46	-27.45	4.520(2)	868.26	MT25	-19.39	5.193(1)	599.69	MT4	1.05	Null	Null
MT45	-27.00	3.483(2)	814.70	MT24	-18.95	5.316(1)	602.73	MT3	4.55	2.807(1)	572.83
MT44	-26.56	2.246(2)	740.74	MT23	-18.50	5.193(1)	598.32	MT2	7.46	2.857(1)	570.95
MT43	-26.03	1.670(2)	698.77	MT22	-18.05	5.210(1)	597.94	MT62	7.46	Null	Null
MT42	-25.59	1.206(2)	668.35	MT21	-17.60	5.262(1)	598.21	MT1	9.85	2.638(1)	569.00
MT41	-25.06	9.613(1)	644.97	MT20	-17.16	5.517(1)	602.61	MT61	12.09	2.810(1)	573.68
MT40	-24.69	8.681(1)	638.83	MT19	-16.71	5.765(1)	601.95	MT57	12.09	2.594(1)	568.31
MT39	-24.17	7.416(1)	629.31	MT18	-16.26	6.912(1)	593.70	MT58	14.33	2.298(1)	567.00
MT38	-23.72	6.616(1)	620.63	MT17	-15.74	4.606(1)	590.49	MT59	16.86	2.293(1)	565.02
MT37	-23.27	5.638(1)	616.86	MT16	-15.29	4.700(1)	593.16	MT60	19.70	2.111(1)	563.07
MT36	-22.83	5.104(1)	603.17	MT15	-14.77	4.346(1)	589.27				

Run 33 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	1.091(1)	549.84	MT35	-22.38	1.104(2)	649.93	MT14	-14.40	2.365(1)	577.97
MT55	-47.89	3.878(1)	571.13	MT34	-21.93	1.176(2)	658.74	MT13	-13.87	2.087(1)	572.94
MT54	-42.60	3.800(1)	571.53	MT33	-21.63	1.227(2)	663.26	MT12	-13.43	1.945(1)	572.04
MT53	-38.34	5.209(1)	582.85	MT32	-21.33	1.286(2)	666.00	MT11	-13.05	1.775(1)	567.40
MT52	-34.68	6.399(1)	592.72	MT31	-21.04	1.618(2)	687.92	MT10	-12.53	2.260(1)	569.91
MT51	-29.69	7.518(1)	601.67	MT30	-20.81	1.977(2)	706.89	MT9	-12.16	3.618(1)	579.88
MT50	-29.24	7.861(1)	605.37	MT29	-20.51	2.205(2)	718.60	MT8	-11.64	5.631(1)	590.19
MT49	-28.78	8.090(1)	606.92	MT28	-20.29	2.828(2)	727.97	MT7	-7.38	4.029(1)	587.47
MT48	-28.35	8.226(1)	609.28	MT27	-19.99	3.719(2)	761.20	MT6	-5.52	4.445(1)	579.22
MT47	-27.90	8.560(1)	612.67	MT26	-19.69	4.240(2)	778.03	MT5	-3.50	4.647(1)	577.56
MT46	-27.45	8.786(1)	614.62	MT25	-19.39	4.550(2)	790.73	MT4	1.05	4.021(1)	573.39
MT45	-27.00	9.025(1)	616.56	MT24	-18.95	3.944(2)	775.07	MT3	4.55	3.867(1)	569.74
MT44	-26.56	8.966(1)	615.86	MT23	-18.50	3.247(2)	762.13	MT2	7.46	Null	Null
MT43	-26.03	9.083(1)	617.05	MT22	-18.05	2.203(2)	732.09	MT62	7.46	Null	Null
MT42	-25.59	9.260(1)	622.83	MT21	-17.60	1.607(2)	715.09	MT1	9.85	3.329(1)	565.30
MT41	-25.06	9.816(1)	625.37	MT20	-17.16	1.037(2)	682.09	MT61	12.09	3.626(1)	568.66
MT40	-24.69	1.020(2)	629.51	MT19	-16.71	9.106(1)	678.75	MT57	12.09	3.400(1)	565.57
MT39	-24.17	1.082(2)	633.07	MT18	-16.26	5.296(1)	624.28	MT58	14.33	3.223(1)	564.22
MT38	-23.72	1.148(2)	640.12	MT17	-15.74	4.121(1)	607.71	MT59	16.86	2.824(1)	559.94
MT37	-23.27	1.220(2)	650.97	MT16	-15.29	3.265(1)	592.51	MT60	19.70	2.673(1)	559.45
MT36	-22.83	1.152(2)	648.40	MT15	-14.77	2.546(1)	579.15				

Run J4 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	1.002(1)	543.31	MT35	-22.38	Null	Null	MT14	-14.40	1.784(1)	552.19
MT55	-47.89	2.120(1)	554.50	MT34	-21.93	1.723(1)	555.16	MT13	-13.87	1.849(1)	552.76
MT54	-42.60	2.397(1)	557.66	MT33	-21.63	1.677(1)	554.78	MT12	-13.43	1.725(1)	551.52
MT53	-38.34	3.230(1)	564.50	MT32	-21.33	1.676(1)	552.59	MT11	-13.05	1.603(1)	550.33
MT52	-34.68	4.137(1)	574.95	MT31	-21.04	1.668(1)	552.77	MT10	-12.53	1.588(1)	549.93
MT51	-29.69	2.941(1)	586.61	MT30	-20.81	1.657(1)	552.91	MT9	-12.16	1.791(1)	551.96
MT50	-29.24	4.034(1)	604.65	MT29	-20.51	1.325(1)	551.05	MT8	-11.64	Null	Null
MT49	-28.78	5.935(1)	624.32	MT28	-20.29	1.429(1)	552.20	MT7	-7.38	1.520(1)	549.94
MT48	-28.35	7.914(1)	645.31	MT27	-19.99	1.625(1)	553.83	MT6	-5.52	1.578(1)	548.17
MT47	-27.90	1.189(2)	664.21	MT26	-19.69	1.650(1)	553.38	MT5	-3.50	1.582(1)	547.93
MT46	-27.45	1.763(2)	680.43	MT25	-19.39	1.748(1)	553.01	MT4	1.05	1.476(1)	546.13
MT45	-27.00	2.251(2)	686.99	MT24	-18.95	Null	Null	MT3	4.55	1.354(1)	545.51
MT44	-26.56	2.335(2)	675.94	MT23	-18.50	1.954(1)	555.08	MT2	7.46	1.361(1)	544.92
MT43	-26.03	2.059(2)	661.05	MT22	-18.05	1.949(1)	554.00	MT62	7.46	Null	Null
MT42	-25.58	1.537(2)	635.32	MT21	-17.60	1.976(1)	554.80	MT1	9.85	1.283(1)	544.71
MT41	-25.06	9.686(1)	611.13	MT20	-17.16	1.933(1)	554.68	MT61	12.09	1.290(1)	544.38
MT40	-24.68	6.144(1)	592.06	MT19	-16.71	1.899(1)	554.52	MT57	12.09	1.181(1)	544.46
MT39	-24.17	4.146(1)	576.33	MT18	-16.26	1.817(1)	553.84	MT58	14.33	9.999(0)	542.86
MT38	-23.72	3.183(1)	567.25	MT17	-15.74	1.846(1)	553.89	MT59	16.86	9.934(0)	542.83
MT37	-23.27	2.650(1)	562.04	MT16	-15.29	1.814(1)	552.85	MT60	19.70	8.742(0)	541.68
MT36	-22.83	2.363(1)	559.29	MT15	-14.77	1.755(1)	551.86				

Run 35 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	1.204(1)	$41.81	MT35	-22.38	3.196(2)	662.47	MT14	-14.40	1.025(1)	$49.71
MT55	-47.89	2.018(1)	$51.36	MT34	-21.93	3.561(2)	669.16	MT13	-13.87	2.114(1)	$51.65
MT54	-42.60	2.275(1)	$54.82	MT33	-21.63	3.408(2)	663.01	MT12	-13.43	2.112(1)	$51.34
MT53	-38.34	2.871(1)	$61.27	MT32	-21.33	3.034(2)	646.70	MT11	-13.05	2.285(1)	$51.54
MT52	-34.69	3.688(1)	$68.58	MT31	-21.04	1.915(2)	651.85	MT10	-12.53	2.143(1)	$50.78
MT51	-29.69	4.488(1)	$74.00	MT30	-20.81	1.609(2)	640.68	MT9	-12.16	2.412(1)	$53.37
MT50	-29.24	4.931(1)	$77.51	MT29	-20.51	1.048(2)	616.58	MT8	-11.64	Null	Null
MT49	-28.79	5.107(1)	$78.29	MT28	-20.29	7.755(1)	603.83	MT7	-7.38	2.234(1)	$52.06
MT48	-28.35	5.393(1)	$83.60	MT27	-19.99	5.992(1)	596.44	MT6	-5.52	2.069(1)	$50.65
MT47	-27.90	5.549(1)	$90.65	MT26	-19.69	4.578(1)	586.76	MT5	-3.50	1.957(1)	$48.23
MT46	-27.45	5.651(1)	600.71	MT25	-19.39	3.595(1)	578.35	MT4	1.05	1.862(1)	$47.86
MT45	-27.00	5.680(1)	610.66	MT24	-18.95	3.148(1)	572.72	MT3	4.55	1.808(1)	$47.12
MT44	-26.56	5.452(1)	615.12	MT23	-18.50	1.810(1)	555.06	MT2	7.46	Null	Null
MT43	-26.03	5.139(1)	618.01	MT22	-18.05	1.443(1)	549.98	MT62	7.46	Null	Null
MT42	-25.59	5.500(1)	623.17	MT21	-17.60	1.330(1)	547.97	MT1	9.85	1.646(1)	$45.48
MT41	-25.06	5.652(1)	632.11	MT20	-17.16	1.120(1)	545.90	MT61	12.09	1.408(1)	$44.14
MT40	-24.69	6.178(1)	630.63	MT19	-16.71	1.063(1)	545.09	MT57	12.09	1.466(1)	$43.74
MT39	-24.17	8.255(1)	634.81	MT18	-16.26	1.100(1)	545.93	MT58	14.33	1.386(1)	$42.74
MT38	-23.72	1.190(2)	643.12	MT17	-15.74	1.233(1)	547.55	MT59	16.86	1.520(1)	$42.82
MT37	-23.27	1.558(2)	652.75	MT16	-15.29	1.378(1)	547.96	MT60	19.70	1.367(1)	$41.79
MT36	-22.83	1.852(2)	655.24	MT15	-14.77	1.708(1)	549.11				

Run 36 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	1.102(1)	$43.77	MT35	-22.38	5.592(1)	$96.02	MT14	-14.40	1.936(1)	$50.72
MT55	-47.89	1.747(1)	$51.61	MT34	-21.93	5.801(1)	601.23	MT13	-13.87	1.642(1)	$48.99
MT54	-42.60	1.703(1)	$52.60	MT33	-21.63	5.812(1)	605.06	MT12	-13.43	1.260(1)	$46.38
MT53	-38.34	2.256(1)	$58.49	MT32	-21.33	5.485(1)	607.09	MT11	-13.05	1.069(1)	$45.98
MT52	-34.69	2.589(1)	$63.41	MT31	-21.04	6.068(1)	619.97	MT10	-12.53	8.293(0)	$44.47
MT51	-29.69	3.173(1)	$69.69	MT30	-20.81	6.872(1)	631.85	MT9	-12.16	8.712(0)	$46.35
MT50	-29.24	3.472(1)	$73.01	MT29	-20.51	6.446(1)	630.04	MT8	-11.64	Null	Null
MT49	-28.79	3.600(1)	$73.66	MT28	-20.29	7.256(1)	640.72	MT7	-7.38	2.788(1)	$60.85
MT48	-28.35	3.662(1)	$74.66	MT27	-19.99	8.355(1)	654.15	MT6	-5.52	3.040(1)	$63.04
MT47	-27.90	3.862(1)	$76.65	MT26	-19.69	9.064(1)	661.69	MT5	-3.50	2.409(1)	$56.60
MT46	-27.45	3.972(1)	$77.80	MT25	-19.39	1.092(2)	675.55	MT4	1.05	1.738(1)	$51.89
MT45	-27.00	4.255(1)	$80.87	MT24	-18.95	1.366(2)	688.29	MT3	4.55	1.707(1)	$51.21
MT44	-26.56	4.275(1)	$81.27	MT23	-18.50	1.871(2)	696.51	MT2	7.46	1.482(1)	$49.77
MT43	-26.03	4.310(1)	$82.05	MT22	-18.05	2.286(2)	694.72	MT62	7.46	Null	Null
MT42	-25.59	4.498(1)	$85.30	MT21	-17.60	2.435(2)	686.20	MT1	9.85	1.405(1)	$48.58
MT41	-25.06	4.679(1)	$88.17	MT20	-17.16	2.204(2)	659.21	MT61	12.09	1.479(1)	$48.87
MT40	-24.69	4.553(1)	$87.15	MT19	-16.71	1.596(2)	626.25	MT57	12.09	1.459(1)	$48.46
MT39	-24.17	4.819(1)	$89.17	MT18	-16.26	1.023(2)	598.88	MT58	14.33	1.467(1)	$47.73
MT38	-23.72	5.058(1)	$92.00	MT17	-15.74	6.402(1)	580.40	MT59	16.86	1.602(1)	$48.25
MT37	-23.27	5.296(1)	$94.53	MT16	-15.29	4.100(1)	$66.18	MT60	19.70	1.240(1)	$45.71
MT36	-22.83	5.398(1)	$94.55	MT15	-14.77	2.607(1)	$56.07				

Run 37 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	6.358(0)	534.92	MT35	-22.38	1.067(1)	$43.05	MT14	-14.40	1.179(1)	$43.84
MT55	-47.89	7.237(0)	538.00	MT34	-21.93	1.088(1)	$43.05	MT13	-13.87	1.291(1)	$45.44
MT54	-42.60	7.353(0)	538.19	MT33	-21.63	1.073(1)	$43.04	MT12	-13.43	1.289(1)	$46.19
MT53	-38.34	8.358(0)	539.30	MT32	-21.33	1.019(1)	$42.18	MT11	-13.05	1.152(1)	$44.61
MT52	-34.69	8.887(0)	539.98	MT31	-21.04	1.128(1)	$43.46	MT10	-12.53	1.127(1)	$44.37
MT51	-29.69	8.837(0)	539.74	MT30	-20.81	1.117(1)	$43.58	MT9	-12.16	1.265(1)	$45.52
MT50	-29.24	9.767(0)	541.04	MT29	-20.51	1.005(1)	$42.24	MT8	-11.64	Null	Null
MT49	-28.79	9.879(0)	541.17	MT28	-20.29	1.065(1)	$43.07	MT7	-7.38	1.945(1)	$45.78
MT48	-28.35	1.009(1)	541.24	MT27	-19.99	1.085(1)	$43.46	MT6	-5.52	1.625(1)	$46.82
MT47	-27.90	1.018(1)	541.62	MT26	-19.68	Null	Null	MT5	-3.50	1.631(1)	$47.00
MT46	-27.45	1.016(1)	541.63	MT25	-19.39	1.126(1)	$43.91	MT4	1.05	1.264(1)	$42.48
MT45	-27.00	1.045(1)	542.03	MT24	-18.95	1.190(1)	$44.85	MT3	4.55	6.819(0)	538.32
MT44	-26.56	1.007(1)	541.61	MT23	-18.50	1.138(1)	$44.38	MT2	7.46	5.185(0)	537.80
MT43	-26.03	9.818(0)	541.50	MT22	-18.05	1.217(1)	$44.83	MT62	7.46	Null	Null
MT42	-25.59	1.057(1)	542.11	MT21	-17.60	1.176(1)	$45.67	MT1	9.85	7.923(0)	538.67
MT41	-25.06	1.081(1)	542.59	MT20	-17.16	1.200(1)	$45.15	MT61	12.09	6.712(0)	537.54
MT40	-24.69	1.023(1)	541.82	MT19	-16.71	1.165(1)	$43.81	MT57	12.09	1.201(1)	$40.04
MT39	-24.17	Null	Null	MT18	-16.26	1.165(1)	$43.74	MT58	14.33	1.103(1)	$39.91
MT38	-23.72	1.049(1)	542.10	MT17	-15.74	1.179(1)	$44.34	MT59	16.86	9.804(0)	539.43
MT37	-23.27	1.075(1)	542.43	MT16	-15.29	1.277(1)	$45.11	MT60	19.70	8.403(0)	538.17
MT36	-22.83	1.053(1)	542.51	MT15	-14.77	1.191(1)	$43.96				

Run 38 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-54.38	5.082(0)	537.25	MT35	-22.38	1.634(1)	$51.76	MT14	-14.40	7.503(1)	$76.09
MT55	-47.89	8.443(0)	540.38	MT34	-21.93	1.665(1)	$52.11	MT13	-13.87	9.139(1)	$82.50
MT54	-42.60	8.858(0)	540.87	MT33	-21.63	1.694(1)	$52.25	MT12	-13.43	9.192(1)	$81.78
MT53	-38.34	1.008(1)	542.71	MT32	-21.33	1.626(1)	$50.82	MT11	-13.05	7.018(1)	$75.47
MT52	-34.69	1.058(1)	543.18	MT31	-21.04	1.700(1)	$51.87	MT10	-12.53	6.319(1)	$69.54
MT51	-29.69	1.076(1)	547.22	MT30	-20.81	1.843(1)	$52.34	MT9	-12.16	5.434(1)	$66.10
MT50	-29.24	1.166(1)	548.84	MT29	-20.51	1.687(1)	$50.18	MT8	-11.64	Null	Null
MT49	-28.79	1.185(1)	547.77	MT28	-20.29	Null	Null	MT7	-7.38	5.965(0)	$61.48
MT48	-28.35	1.175(1)	546.70	MT27	-19.99	1.880(1)	$52.31	MT6	-5.52	9.154(0)	$61.89
MT47	-27.90	1.210(1)	547.11	MT26	-19.69	1.962(1)	$53.26	MT5	-3.50	1.533(1)	$44.57
MT46	-27.45	1.252(1)	547.08	MT25	-19.39	2.006(1)	$54.47	MT4	1.05	1.216(1)	$42.93
MT45	-27.00	1.261(1)	547.02	MT24	-18.95	2.071(1)	$56.30	MT3	4.55	Null	Null
MT44	-26.56	1.333(1)	547.64	MT23	-18.50	2.228(1)	$60.25	MT2	7.46	9.966(0)	$61.46
MT43	-26.03	1.288(1)	547.74	MT22	-18.05	2.397(1)	$65.03	MT62	7.46	Null	Null
MT42	-25.59	1.332(1)	548.43	MT21	-17.60	2.606(1)	$68.89	MT1	9.85	9.986(0)	$61.15
MT41	-25.06	1.370(1)	548.87	MT20	-17.16	2.780(1)	$68.57	MT61	12.09	1.033(1)	$41.36
MT40	-24.69	1.385(1)	549.66	MT19	-16.71	2.803(1)	$66.56	MT57	12.09	9.688(0)	$40.69
MT39	-24.17	1.419(1)	550.23	MT18	-16.26	2.982(1)	$61.71	MT58	14.33	8.241(0)	$39.74
MT38	-23.72	1.464(1)	550.66	MT17	-15.74	3.610(1)	$62.36	MT59	16.86	9.671(0)	$41.10
MT37	-23.27	1.612(1)	551.57	MT16	-15.29	4.262(1)	$63.81	MT60	19.70	6.463(0)	$38.63
MT36	-22.83	1.525(1)	550.60	MT15	-14.77	5.686(1)	$69.44				

Run 39 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT56	-64.23	2.223(1)	552.49	HT35	-32.23	1.157(2)	622.52	HT14	-24.25	3.830(1)	567.07
HT55	-57.74	4.880(1)	576.65	HT34	-31.78	9.610(1)	609.27	HT13	-23.72	3.833(1)	567.51
HT54	-52.45	6.042(1)	582.31	HT33	-31.48	9.161(1)	606.58	HT12	-23.28	3.461(1)	565.19
HT53	-48.19	6.743(1)	587.70	HT32	-31.18	7.714(1)	596.62	HT11	-22.90	3.385(1)	564.92
HT52	-44.54	5.492(1)	589.72	HT31	-30.89	7.493(1)	594.31	HT10	-22.38	3.576(1)	568.10
HT51	-39.54	1.236(2)	643.46	HT30	-30.66	7.176(1)	592.83	HT9	-22.01	3.310(1)	564.28
HT50	-39.09	1.618(2)	668.20	HT29	-30.36	6.092(1)	585.77	HT8	-21.49	Null	Null
HT49	-38.64	1.842(2)	679.75	HT28	-30.14	5.726(1)	582.54	HT7	-17.23	Null	Null
HT48	-38.20	2.085(2)	689.54	HT27	-29.84	5.865(1)	584.12	HT6	-15.37	2.955(1)	562.50
HT47	-37.75	2.432(2)	703.02	HT26	-29.54	5.317(1)	580.27	HT5	-13.35	2.737(1)	562.46
HT46	-37.30	Null	Null	HT25	-29.24	5.144(1)	579.00	HT4	-8.80	2.706(1)	565.65
HT45	-36.85	2.955(2)	719.25	HT24	-28.80	Null	Null	HT3	-5.30	2.741(1)	559.50
HT44	-36.41	2.756(2)	708.62	HT23	-28.35	4.295(1)	575.15	HT2	-2.39	2.619(1)	558.02
HT43	-35.88	2.585(2)	701.47	HT22	-27.90	4.239(1)	575.13	HT62	-2.39	Null	Null
HT42	-35.44	2.304(2)	693.38	HT21	-27.45	4.114(1)	573.67	HT1	.00	2.136(1)	557.00
HT41	-34.91	2.033(2)	678.56	HT20	-27.01	4.085(1)	573.23	HT61	2.24	2.243(1)	556.56
HT40	-34.54	1.849(2)	667.34	HT19	-26.56	Null	Null	HT57	2.24	1.996(1)	554.99
HT39	-34.02	1.703(2)	658.90	HT18	-26.11	3.919(1)	569.31	HT58	4.48	2.063(1)	555.34
HT38	-33.57	1.448(2)	642.47	HT17	-25.59	4.072(1)	569.40	HT59	7.01	2.063(1)	555.53
HT37	-33.12	1.371(2)	635.18	HT16	-25.14	4.135(1)	569.24	HT60	9.85	1.871(1)	555.55
HT36	-32.68	1.203(2)	623.45	HT15	-24.62	3.937(1)	567.05				

Run 43 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT56	-64.23	3.002(1)	554.04	HT35	-32.23	1.121(2)	580.20	HT14	-24.25	4.307(1)	557.69
HT55	-57.74	6.236(1)	580.68	HT34	-31.78	1.008(2)	587.93	HT13	-23.72	3.842(1)	556.73
HT54	-52.45	7.003(1)	583.73	HT33	-31.48	9.061(1)	583.45	HT12	-23.28	3.398(1)	554.49
HT53	-48.19	7.588(1)	587.68	HT32	-31.18	7.944(1)	577.08	HT11	-22.90	3.438(1)	554.85
HT52	-44.54	6.969(1)	617.34	HT31	-30.89	7.318(1)	576.92	HT10	-22.38	3.013(1)	551.99
HT51	-39.54	1.991(2)	668.07	HT30	-30.66	6.988(1)	576.63	HT9	-22.01	3.308(1)	553.15
HT50	-39.09	2.175(2)	667.78	HT29	-30.36	5.860(1)	569.88	HT8	-21.49	Null	Null
HT49	-38.64	2.565(2)	676.44	HT28	-30.14	5.575(1)	568.53	HT7	-17.23	2.434(1)	552.52
HT48	-38.20	2.853(2)	678.14	HT27	-29.84	5.727(1)	568.79	HT6	-15.37	2.695(1)	551.72
HT47	-37.75	3.201(2)	680.38	HT26	-29.54	5.345(1)	568.45	HT5	-13.35	3.705(1)	556.21
HT46	-37.30	3.460(2)	685.91	HT25	-29.24	5.261(1)	566.68	HT4	-8.80	2.470(1)	551.65
HT45	-36.85	3.331(2)	675.56	HT24	-28.80	Null	Null	HT3	-5.30	2.515(1)	551.60
HT44	-36.41	3.133(2)	663.57	HT23	-28.35	4.679(1)	562.68	HT2	-2.39	2.249(1)	549.65
HT43	-35.88	2.954(2)	658.58	HT22	-27.90	5.180(1)	569.21	HT62	-2.39	Null	Null
HT42	-35.44	2.809(2)	650.25	HT21	-27.45	4.610(1)	561.02	HT1	.00	2.015(1)	549.13
HT41	-34.91	2.422(2)	636.76	HT20	-27.01	4.240(1)	559.20	HT61	2.24	1.731(1)	547.22
HT40	-34.54	2.062(2)	624.10	HT19	-26.56	Null	Null	HT57	2.24	1.972(1)	548.62
HT39	-34.02	1.843(2)	617.11	HT18	-26.11	3.923(1)	557.54	HT58	4.48	1.862(1)	547.57
HT38	-33.57	1.630(2)	608.75	HT17	-25.59	3.981(1)	557.12	HT59	7.01	1.933(1)	548.50
HT37	-33.12	1.449(2)	601.58	HT16	-25.14	3.710(1)	555.48	HT60	9.85	1.808(1)	546.63
HT36	-32.68	1.251(2)	593.43	HT15	-24.62	3.729(1)	555.65				

Run 44 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT56	-64.23	2.462(1)	558.86	HT35	-32.23	6.652(1)	665.43	HT14	-24.25	7.768(1)	594.56
HT55	-57.74	4.986(1)	581.47	HT34	-31.78	7.988(1)	685.51	HT13	-23.72	6.748(1)	589.08
HT54	-52.45	4.876(1)	586.65	HT33	-31.48	9.268(1)	694.86	HT12	-23.28	6.122(1)	587.87
HT53	-48.19	6.016(1)	601.81	HT32	-31.18	9.470(1)	698.44	HT11	-22.90	5.161(1)	579.78
HT52	-44.54	7.812(1)	608.83	HT31	-30.89	1.141(2)	720.17	HT10	-22.38	4.581(1)	576.27
HT51	-39.54	7.183(1)	625.65	HT30	-30.66	1.387(2)	737.50	HT9	-22.01	4.679(1)	577.47
HT50	-39.09	6.701(1)	624.23	HT29	-30.36	1.466(2)	727.13	HT8	-21.49	Null	Null
HT49	-38.64	7.235(1)	630.39	HT28	-30.14	1.813(2)	735.15	HT7	-17.23	5.254(1)	579.00
HT48	-38.20	7.760(1)	632.16	HT27	-29.84	Null	Null	HT6	-15.37	4.389(1)	573.78
HT47	-37.75	8.891(1)	636.84	HT26	-29.54	2.717(2)	755.91	HT5	-13.35	3.817(1)	570.51
HT46	-37.30	1.019(2)	641.33	HT25	-29.24	3.381(2)	766.37	HT4	-8.80	3.647(1)	571.05
HT45	-36.85	Null	Null	HT24	-28.80	Null	Null	HT3	-5.30	3.609(1)	568.02
HT44	-36.41	1.278(2)	642.59	HT23	-28.35	5.161(2)	778.65	HT2	-2.39	Null	Null
HT43	-35.88	1.395(2)	646.38	HT22	-27.90	4.686(2)	746.45	HT62	-2.39	Null	Null
HT42	-35.44	1.536(2)	651.74	HT21	-27.45	3.875(2)	720.42	HT1	.00	2.987(1)	566.48
HT41	-34.91	1.439(2)	652.40	HT20	-27.01	2.752(2)	684.44	HT61	2.24	3.093(1)	563.97
HT40	-34.54	1.290(2)	651.83	HT19	-26.56	Null	Null	HT57	2.24	2.857(1)	563.60
HT39	-34.02	1.081(2)	647.44	HT18	-26.11	1.681(2)	634.00	HT58	4.48	2.610(1)	562.28
HT38	-33.57	8.853(1)	643.24	HT17	-25.59	1.206(2)	621.29	HT59	7.01	2.578(1)	561.15
HT37	-33.12	7.065(1)	643.92	HT16	-25.14	1.011(2)	609.39	HT60	9.85	2.370(1)	561.28
HT36	-32.68	6.490(1)	652.30	HT15	-24.62	8.666(1)	599.80				

Run 45 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT56	-64.23	Null	Null	HT35	-32.23	1.390(1)	552.97	HT14	-24.25	1.610(1)	559.72
HT55	-57.74	7.034(0)	545.52	HT34	-31.78	1.423(1)	553.35	HT13	-23.72	1.721(1)	556.90
HT54	-52.45	7.639(0)	546.17	HT33	-31.48	1.398(1)	553.14	HT12	-23.28	1.589(1)	555.62
HT53	-48.19	8.808(0)	547.46	HT32	-31.18	Null	Null	HT11	-22.90	1.697(1)	556.42
HT52	-44.54	9.467(0)	548.17	HT31	-30.89	1.391(1)	553.23	HT10	-22.38	1.586(1)	555.60
HT51	-39.54	1.173(1)	550.90	HT30	-30.66	1.456(1)	553.74	HT9	-22.01	1.712(1)	556.88
HT50	-39.09	1.174(1)	550.60	HT29	-30.36	1.323(1)	552.23	HT8	-21.49	Null	Null
HT49	-38.64	1.105(1)	550.67	HT28	-30.14	1.382(1)	552.97	HT7	-17.23	1.820(1)	557.65
HT48	-38.20	1.187(1)	550.72	HT27	-29.84	1.431(1)	553.59	HT6	-15.37	1.688(1)	558.66
HT47	-37.75	1.215(1)	551.05	HT26	-29.54	1.425(1)	553.59	HT5	-13.35	1.692(1)	558.88
HT46	-37.30	1.266(1)	551.57	HT25	-29.24	1.444(1)	553.78	HT4	-8.80	1.965(1)	558.85
HT45	-36.85	Null	Null	HT24	-28.80	Null	Null	HT3	-5.30	2.105(1)	560.17
HT44	-36.41	1.249(1)	551.38	HT23	-28.35	1.455(1)	553.93	HT2	-2.39	2.224(1)	560.51
HT43	-35.88	1.252(1)	551.74	HT22	-27.90	1.462(1)	554.06	HT62	-2.39	Null	Null
HT42	-35.44	1.284(1)	551.72	HT21	-27.45	1.529(1)	554.81	HT1	.00	2.185(1)	560.23
HT41	-34.91	1.277(1)	551.77	HT20	-27.01	1.522(1)	554.72	HT61	2.24	1.821(1)	558.26
HT40	-34.54	1.326(1)	552.13	HT19	-26.56	1.544(1)	554.89	HT57	2.24	2.184(1;	561.51
HT39	-34.02	1.324(1)	552.21	HT18	-26.11	1.515(1)	554.62	HT58	4.48	2.141(1)	560.35
HT38	-33.57	1.342(1)	552.34	HT17	-25.59	1.530(1)	555.07	HT59	7.01	2.192(1)	560.50
HT37	-33.12	1.353(1)	552.57	HT16	-25.14	1.557(1)	555.16	HT60	9.85	2.032(1)	559.57
HT36	-32.68	1.365(1)	552.80	HT15	-24.62	1.618(1)	555.65				

Run 46 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	3.378(0)	$39.62	MT35	-32.23	9.199(0)	$46.26	MT14	-24.25	1.071(1)	$47.63
MT55	-57.74	4.953(0)	$41.49	MT34	-31.78	9.356(0)	$46.49	MT13	-23.72	1.147(1)	$48.36
MT54	-52.45	5.463(0)	$42.01	MT33	-31.48	9.302(0)	$46.44	MT12	-23.28	1.096(1)	$47.82
MT53	-48.19	6.333(0)	$42.92	MT32	-31.18	8.806(0)	$45.79	MT11	-22.90	1.088(1)	$47.86
MT52	-44.54	6.556(0)	$43.23	MT31	-30.89	9.340(0)	$46.38	MT10	-22.38	1.063(1)	$46.97
MT51	-39.54	7.911(0)	$44.76	MT30	-30.66	9.754(0)	$46.80	MT9	-22.01	1.170(1)	$49.06
MT50	-39.09	7.974(0)	$44.83	MT29	-30.36	9.514(0)	$46.64	MT8	-21.49	Null	Null
MT49	-38.64	8.070(0)	$44.88	MT28	-30.14	9.211(0)	$46.29	MT7	-17.23	1.211(1)	$48.91
MT48	-38.20	8.066(0)	$44.90	MT27	-29.84	9.513(0)	$46.66	MT6	-15.37	1.246(1)	$49.39
MT47	-37.75	8.324(0)	$45.17	MT26	-29.54	9.858(0)	$46.75	MT5	-13.35	1.230(1)	$49.22
MT46	-37.30	8.407(0)	$45.36	MT25	-29.24	9.736(0)	$46.82	MT4	-8.80	1.316(1)	$49.87
MT45	-36.85	Null	Null	MT24	-28.80	Null	Null	MT3	-5.30	1.410(1)	$50.81
MT44	-36.41	8.383(0)	$45.25	MT23	-28.35	1.016(1)	$47.10	MT2	-2.39	1.384(1)	$50.96
MT43	-35.88	8.876(0)	$45.82	MT22	-27.90	9.824(0)	$46.89	MT62	-2.39	Null	Null
MT42	-35.44	8.622(0)	$45.68	MT21	-27.45	Null	Null	MT1	.00	1.298(1)	$50.83
MT41	-34.91	8.356(0)	$45.38	MT20	-27.01	1.044(1)	$47.78	MT61	2.24	1.126(1)	$49.05
MT40	-34.54	8.773(0)	$45.73	MT19	-26.56	Null	Null	MT57	2.24	1.348(1)	$50.53
MT39	-34.02	8.691(0)	$45.84	MT18	-26.11	1.028(1)	$47.35	MT58	4.48	1.239(1)	$49.53
MT38	-33.57	8.875(0)	$45.89	MT17	-25.59	1.039(1)	$47.70	MT59	7.01	1.328(1)	$49.97
MT37	-33.12	9.090(0)	$46.08	MT16	-25.14	1.035(1)	$47.41	MT60	9.85	1.262(1)	$49.69
MT36	-32.68	9.006(0)	$46.05	MT15	-24.62	1.009(1)	$47.13				

Run 50 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT56	-64.23	6.842(0)	$48.05	MT35	-32.23	1.383(1)	$57.44	MT14	-24.25	1.083(1)	$63.24
MT55	-57.74	Null	Null	MT34	-31.78	1.395(1)	$57.58	MT13	-23.72	1.725(1)	$60.50
MT54	-52.45	7.781(0)	$51.27	MT33	-31.48	1.391(1)	$57.49	MT12	-23.28	1.668(1)	$59.87
MT53	-48.19	8.921(0)	$52.45	MT32	-31.18	1.325(1)	$56.78	MT11	-22.90	1.670(1)	$59.87
MT52	-44.54	1.065(1)	$54.40	MT31	-30.89	1.404(1)	$57.67	MT10	-22.38	1.583(1)	$58.97
MT51	-39.54	1.170(1)	$55.18	MT30	-30.66	1.517(1)	$58.85	MT9	-22.01	1.794(1)	$60.85
MT50	-39.09	1.164(1)	$55.22	MT29	-30.36	1.304(1)	$56.53	MT8	-21.49	Null	Null
MT49	-38.64	1.184(1)	$55.40	MT28	-30.14	1.328(1)	$56.80	MT7	-17.23	1.865(1)	$61.65
MT48	-38.20	1.175(1)	$55.38	MT27	-29.84	1.545(1)	$58.65	MT6	-15.37	1.958(1)	$62.29
MT47	-37.75	1.233(1)	$55.94	MT26	-29.54	1.428(1)	$57.87	MT5	-13.35	2.008(1)	$63.36
MT46	-37.30	Null	Null	MT25	-29.24	1.448(1)	$57.97	MT4	-8.80	1.869(1)	$62.01
MT45	-36.85	Null	Null	MT24	-28.80	Null	Null	MT3	-5.30	1.872(1)	$62.36
MT44	-36.41	1.246(1)	$56.00	MT23	-28.35	1.459(1)	$58.20	MT2	-2.39	1.879(1)	$61.96
MT43	-35.88	1.272(1)	$56.27	MT22	-27.90	1.510(1)	$58.58	MT62	-2.39	Null	Null
MT42	-35.44	Null	Null	MT21	-27.45	1.442(1)	$59.73	MT1	.00	2.098(1)	$63.60
MT41	-34.91	1.305(1)	$56.51	MT20	-27.01	1.533(1)	$58.82	MT61	2.24	2.272(1)	$64.72
MT40	-34.54	1.317(1)	$56.61	MT19	-26.56	1.442(1)	$57.86	MT57	2.24	1.974(1)	$64.29
MT39	-34.02	1.322(1)	$56.72	MT18	-26.11	1.656(1)	$60.14	MT58	4.48	1.928(1)	$64.04
MT38	-33.57	1.505(1)	$58.69	MT17	-25.59	1.583(1)	$59.29	MT59	7.01	1.971(1)	$63.55
MT37	-33.12	1.382(1)	$57.40	MT16	-25.14	1.582(1)	$59.06	MT60	9.85	1.929(1)	$63.02
MT36	-32.68	1.355(1)	$57.11	MT15	-24.62	1.632(1)	$59.53				

Run 53 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	6.175(-1)
P7	-37.60	6.580(-1)
P6	-35.21	6.874(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	5.147(-1)
P4	-30.59	Null
P3	-28.13	5.738(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	6.191(-1)
P1	-23.43	6.358(-1)

Run 3 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	2.143(-1)
P7	-37.60	2.333(-1)
P6	-35.21	2.510(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	2.646(-1)
P4	-30.59	2.572(-1)
P3	-28.13	2.957(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	3.193(-1)
P1	-23.43	Null

Run 4 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	5.086(-2)
P7	-37.60	5.608(-2)
P6	-35.21	6.021(-2)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	6.274(-2)
P4	-30.59	5.960(-2)
P3	-28.13	7.041(-2)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	7.868(-2)
P1	-23.43	8.019(-2)

Run 5 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	1.441(0)
P7	-37.60	1.541(0)
P6	-35.21	1.610(0)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	1.682(0)
P4	-30.59	1.856(0)
P3	-28.13	1.256(0)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	3.164(0)
P1	-23.43	3.364(0)

Run 8 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	1.464(0)
P7	-37.60	3.028(0)
P6	-35.21	4.390(0)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	2.366(0)
P4	-30.59	9.800(-3)
P3	-28.13	6.265(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	6.971(-1)
P1	-23.43	7.081(-1)

Run 9 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	1.797(0)
P7	-37.60	1.750(0)
P6	-35.21	1.129(0)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	2.133(0)
P4	-30.59	6.231(0)
P3	-28.13	1.961(0)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	7.963(-1)
P1	-23.43	6.029(-1)

Run 10 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	8.869(-1)
P7	-37.60	6.783(-1)
P6	-35.21	8.874(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	2.448(0)
P4	-30.59	2.685(0)
P3	-28.13	5.128(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	3.819(-1)
P1	-23.43	3.868(-1)

Run 13 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	6.354(-1)
P7	-37.60	1.346(0)
P6	-35.21	2.693(0)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	1.570(0)
P4	-30.59	4.765(-1)
P3	-28.13	3.711(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	4.054(-1)
P1	-23.43	4.147(-1)

Run 14 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	8.889(-1)
P7	-37.60	9.664(-1)
P6	-35.21	9.615(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	1.077(0)
P4	-30.59	1.090(0)
P3	-28.13	4.608(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	4.408(0)
P1	-23.43	6.418(-1)

Run 15 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	2.455(-1)
P7	-37.60	3.634(-1)
P6	-35.21	5.830(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	1.100(0)
P4	-30.59	3.689(-1)
P3	-28.13	8.293(-2)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	8.934(-2)
P1	-23.43	1.197(-1)

Run 17 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	3.817(-1)
P7	-37.60	3.116(-1)
P6	-35.21	3.263(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-32.97	3.830(-1)
P4	-30.59	3.623(-1)
P3	-28.13	3.881(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-25.89	1.113(0)
P1	-23.43	1.409(-1)

Run 18 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	6.263(-1)
P7	-27.75	6.609(-1)
P6	-25.36	5.435(-1)

Gauge Label	Loc. (deg)	Value (PSIA)
P5	-23.12	1.189(0)
P4	-20.74	6.542(-2)
P3	-18.28	3.797(-2)

Gauge Label	Loc. (deg)	Value (PSIA)
P2	-16.04	9.951(-2)
P1	-13.58	1.277(-1)

Run 26 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.060(0)	P5	-23.12	3.853(0)	P2	-16.04	3.929(-1)
P7	-27.75	1.186(0)	P4	-20.74	6.481(-1)	P1	-13.58	4.209(-1)
P6	-25.36	9.078(-1)	P3	-18.28	2.419(-1)			

Run 28 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.993(0)	P5	-23.12	2.045(0)	P2	-16.04	4.756(-1)
P7	-27.75	2.108(0)	P4	-20.74	3.881(0)	P1	-13.58	4.276(-1)
P6	-25.36	2.088(0)	P3	-18.28	3.354(0)			

Run 29 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.077(1)	P5	-23.12	1.185(1)	P2	-16.04	2.597(1)
P7	-27.75	1.149(1)	P4	-20.74	1.308(1)	P1	-13.58	5.120(0)
P6	-25.36	1.179(1)	P3	-18.28	1.114(1)			

Run 30 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.043(1)	P5	-23.12	1.157(1)	P2	-16.04	1.782(1)
P7	-27.75	1.087(1)	P4	-20.74	1.296(1)	P1	-13.58	1.418(1)
P6	-25.36	1.120(1)	P3	-18.28	1.158(1)			

Run 31 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.041(1)	P5	-23.12	3.508(0)	P2	-16.04	3.848(0)
P7	-27.75	1.110(1)	P4	-20.74	2.833(0)	P1	-13.58	3.673(0)
P6	-25.36	9.302(0)	P3	-18.28	3.650(0)			

Run 33 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.739(0)	P5	-23.12	8.025(-1)	P2	-16.04	8.441(-1)
P7	-27.75	5.215(0)	P4	-20.74	5.749(-1)	P1	-13.58	8.466(-1)
P6	-25.36	5.427(0)	P3	-18.28	7.244(-1)			

Run 35 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	2.798(0)	P5	-23.12	6.511(0)	P2	-16.04	5.304(-1)
P7	-27.75	3.050(0)	P4	-20.74	4.659(0)	P1	-13.58	7.566(-1)
P6	-25.36	2.858(0)	P3	-18.28	4.178(-1)			

Run 36 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	2.781(0)	P5	-23.12	3.203(0)	P2	-16.04	2.277(0)
P7	-27.75	2.890(0)	P4	-20.74	3.957(0)	P1	-13.58	3.676(-1)
P6	-25.36	3.064(0)	P3	-18.28	6.090(0)			

Run 37 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.839(0)	P5	-23.12	2.078(0)	P2	-16.04	2.279(0)
P7	-27.75	1.933(0)	P4	-20.74	2.088(0)	P1	-13.58	2.278(0)
P6	-25.36	2.011(0)	P3	-18.28	2.182(0)			

Run 38 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-30.14	1.996(0)	P5	-23.12	2.217(0)	P2	-16.04	2.148(0)
P7	-27.75	2.072(0)	P4	-20.74	3.260(0)	P1	-13.58	3.565(0)
P6	-25.36	2.140(0)	P3	-18.28	2.141(0)			

Run 39 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-38.98	9.930(0)	P5	-32.97	1.080(1)	P2	-25.89	3.184(0)
P7	-37.60	2.040(1)	P4	-30.59	4.235(0)	P1	-23.43	3.200(0)
P6	-35.21	1.718(1)	P3	-28.13	2.762(0)			

Run 43 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-38.99	1.362(1)	P5	-32.97	8.700(0)	P2	-25.89	3.689(0)
P7	-37.60	2.489(1)	P4	-30.59	4.677(0)	P1	-23.43	3.699(0)
P6	-35.21	1.867(1)	P3	-28.13	3.502(0)			

Run 44 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	6.926(0)	P5	-32.97	7.844(0)	P2	-25.89	8.967(0)
P7	-37.60	8.386(0)	P4	-30.59	1.387(1)	P1	-23.43	3.668(0)
P6	-35.21	1.169(1)	P3	-28.13	2.823(1)			

Run 45 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	2.154(0)	P5	-32.97	2.701(0)	P2	-25.89	3.244(0)
P7	-37.60	2.349(0)	P4	-30.59	2.825(0)	P1	-23.43	3.289(0)
P6	-35.21	2.510(0)	P3	-28.13	2.997(0)			

Run 49 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	5.686(-1)	P5	-32.97	6.880(-1)	P2	-25.89	Null
P7	-37.60	6.196(-1)	P4	-30.59	6.794(-1)	P1	-23.43	Null
P6	-35.21	6.377(-1)	P3	-28.13	7.692(-1)			

Run 50 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)	Gauge Label	Loc. (deg)	Value (PSIA)
P8	-39.99	2.205(0)	P5	-32.97	2.731(0)	P2	-25.89	3.254(0)
P7	-37.60	2.401(0)	P4	-30.59	2.864(0)	P1	-23.43	3.313(0)
P6	-35.21	2.551(0)	P3	-28.13	3.010(0)			

Run 53 Reduced Data Tabulation

Appendix B
TRANSPIRATION-COOLED HEMISPHERICAL STUDY DATA

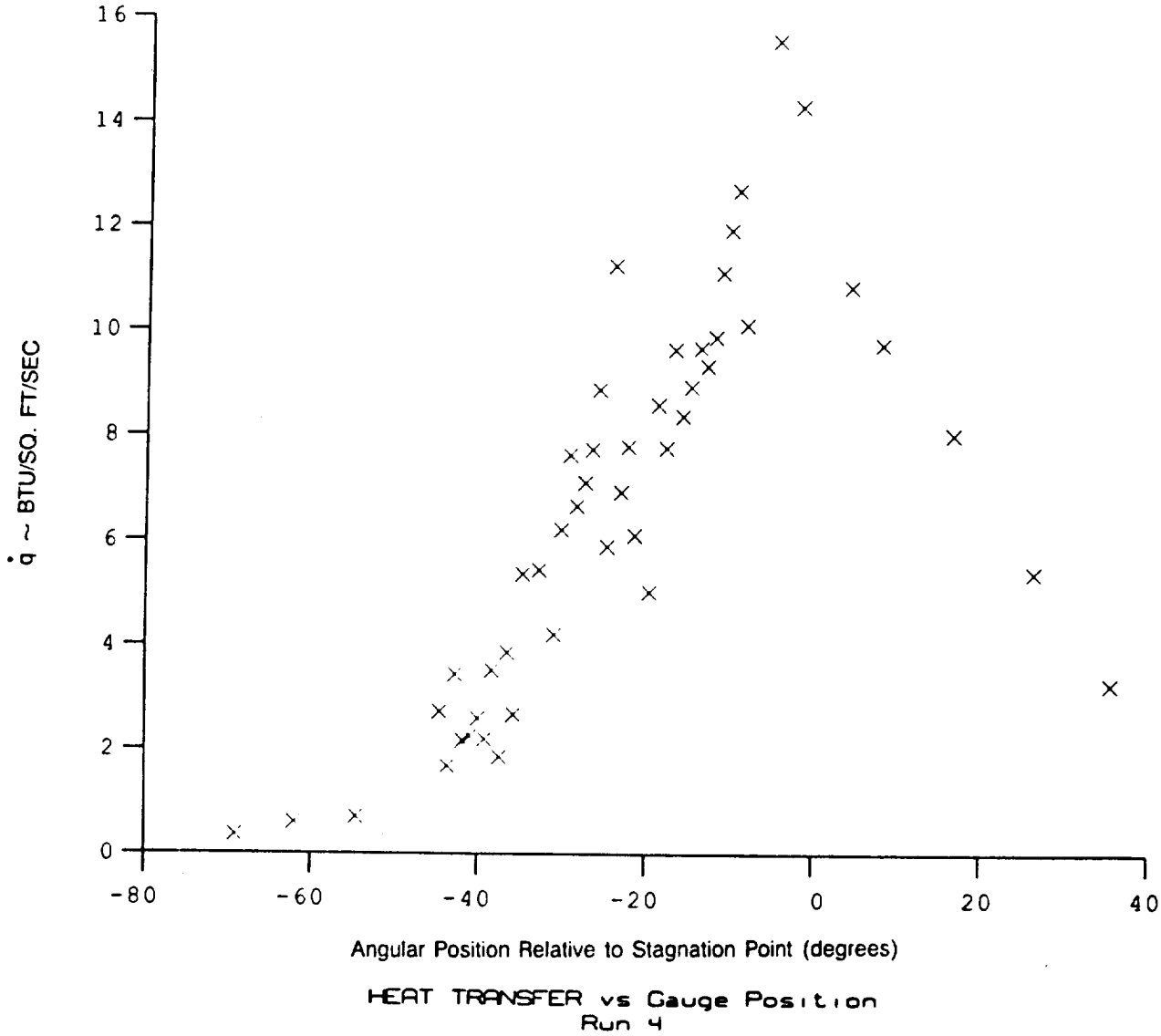
Test Conditions, Heat Transfer Measurements, Schlieren Photographs, and Reduced Data Tabulations

Test Conditions

Po	= 7.3050X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5650X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3130X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.5090X10+3	Ft/sec	Freestream Velocity
T	= 8.2670X10+1	degR	Freestream Temperature
P	= 4.3000X10-3	PSIA	Freestream Static Pressure
Rho	= 4.2180X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.9530X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3410X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.3110X10-1	PSIA	Pitot Pressure
Q	= 6.4440X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9410		Shock Tube Incident Shock Mach Number
Hw	= 3.3482X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2498	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.7217X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.1783	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.07

Run 4


16
14
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0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 4

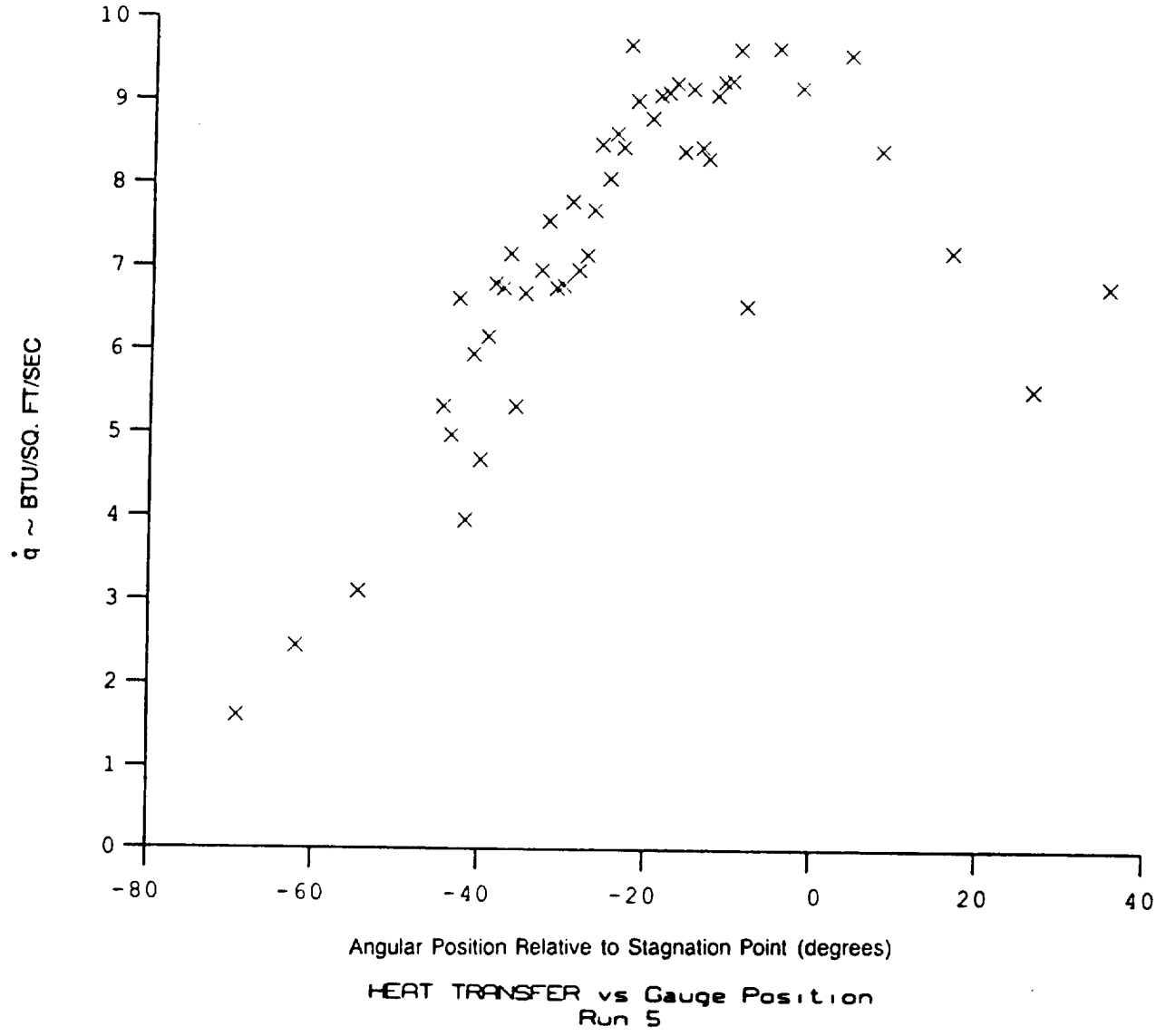
Test Conditions

Po	= 7.2720X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6090X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3510X10+3	degR	Reservoir Total Temperature
M	= 12.1300		Freestream Mach Number
U	= 5.5870X10+3	Ft/sec	Freestream Velocity
T	= 8.5190X10+1	degR	Freestream Temperature
P	= 4.2820X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0760X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.1660X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1770X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.2590X10-1	PSIA	Pitot Pressure
Q	= 4.4170X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9610		Shock Tube Incident Shock Mach Number
Hw	= 3.3675X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2636	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6853X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.3809	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter Value

Lambda 0.0

Run 5


10
9
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5
4
3
2
1
0
-80
-60
-40
-20
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20
40
$\dot{q}$ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 5

ORIGINAL PAGE
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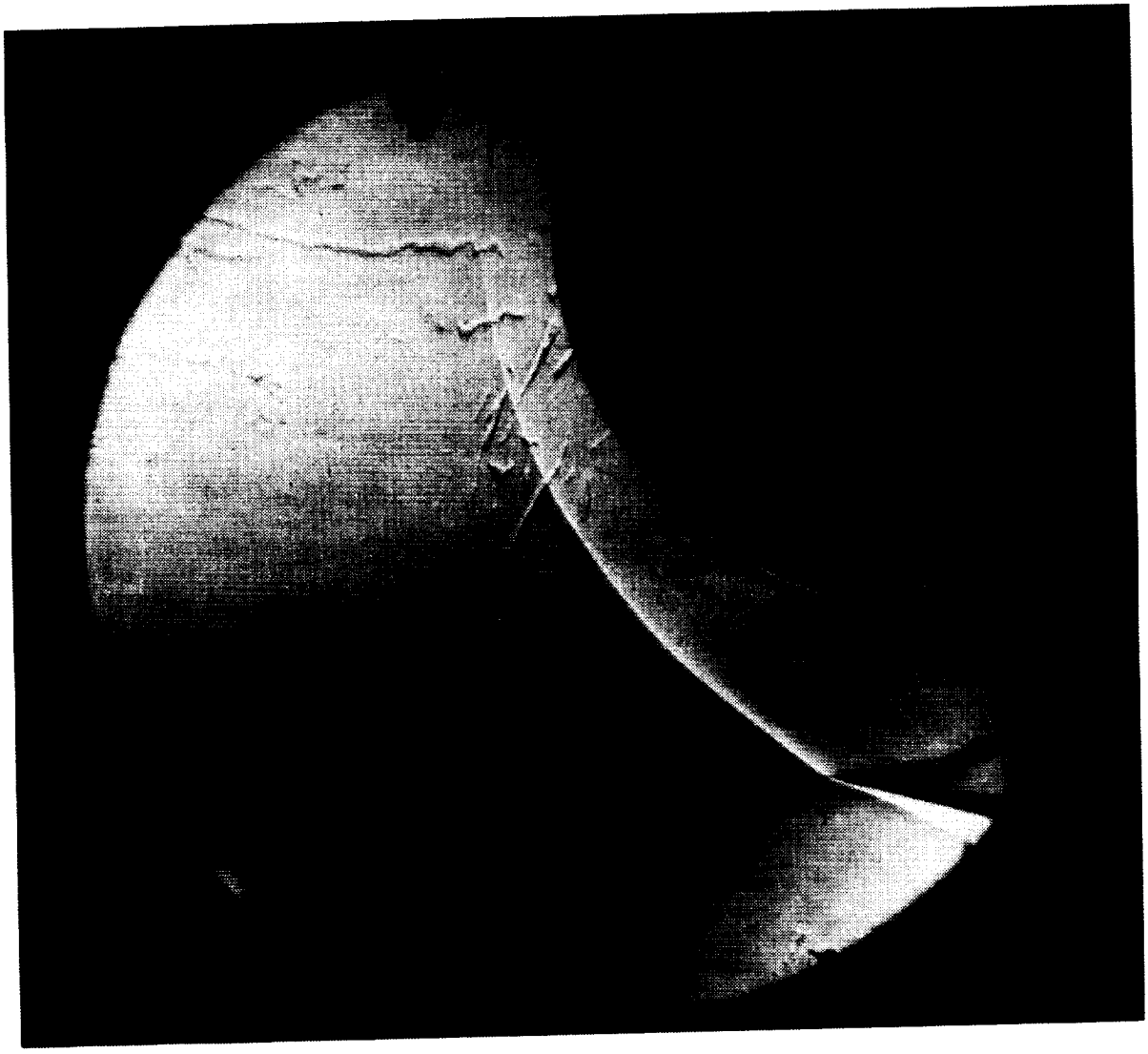
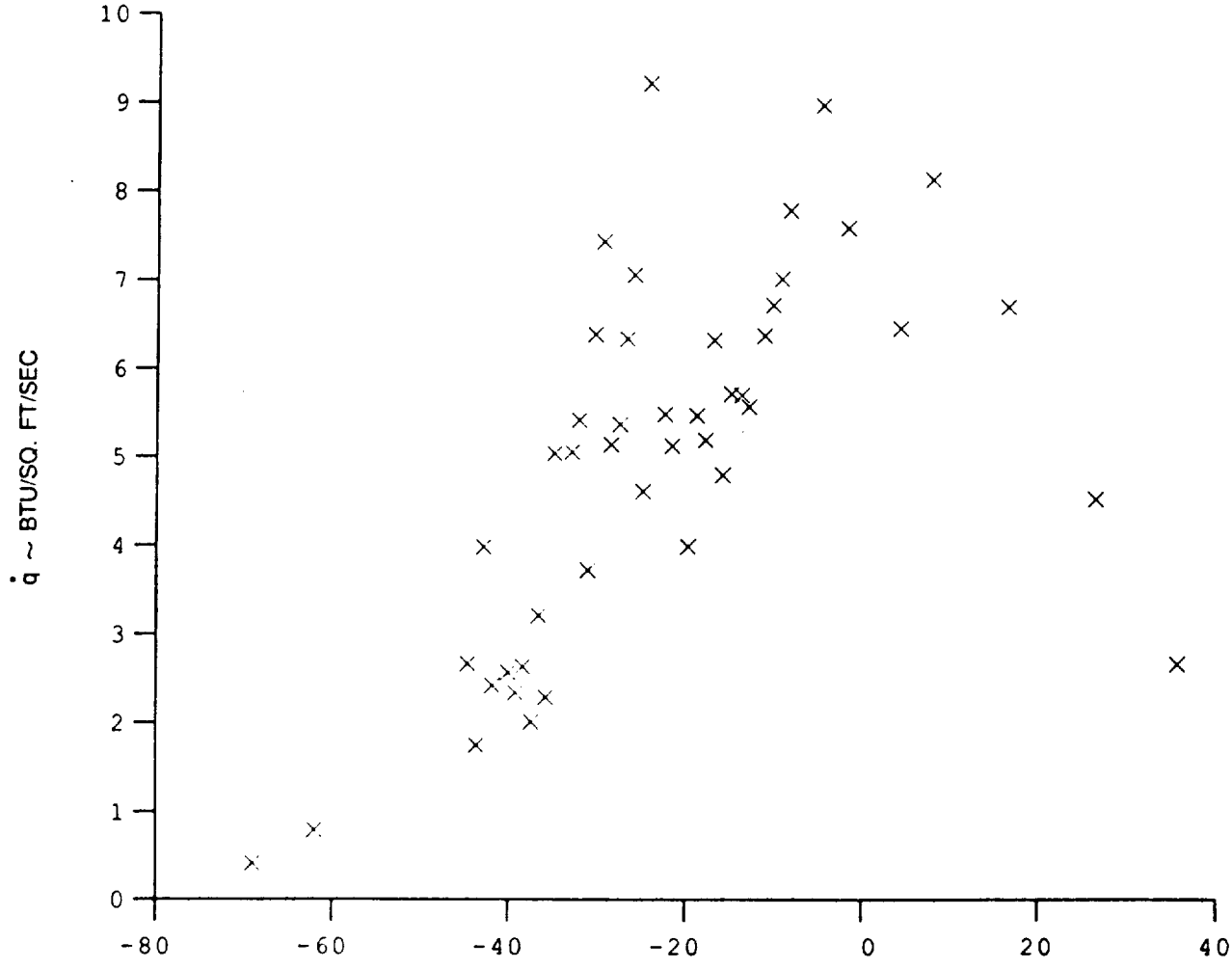


Test Conditions

Po	= 7.4040X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5770X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3350X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.5300X10+3	Ft/sec	Freestream Velocity
T	= 8.3410X10+1	degR	Freestream Temperature
P	= 4.3680X10-3	PSIA	Freestream Static Pressure
Rho	= 4.2460X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0160X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3470X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.4330X10-1	PSIA	Pitot Pressure
Q	= 4.5090X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9620		Shock Tube Incident Shock Mach Number
Hw	= 3.3433X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2180	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6664X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.2911	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.08

Run 6


10
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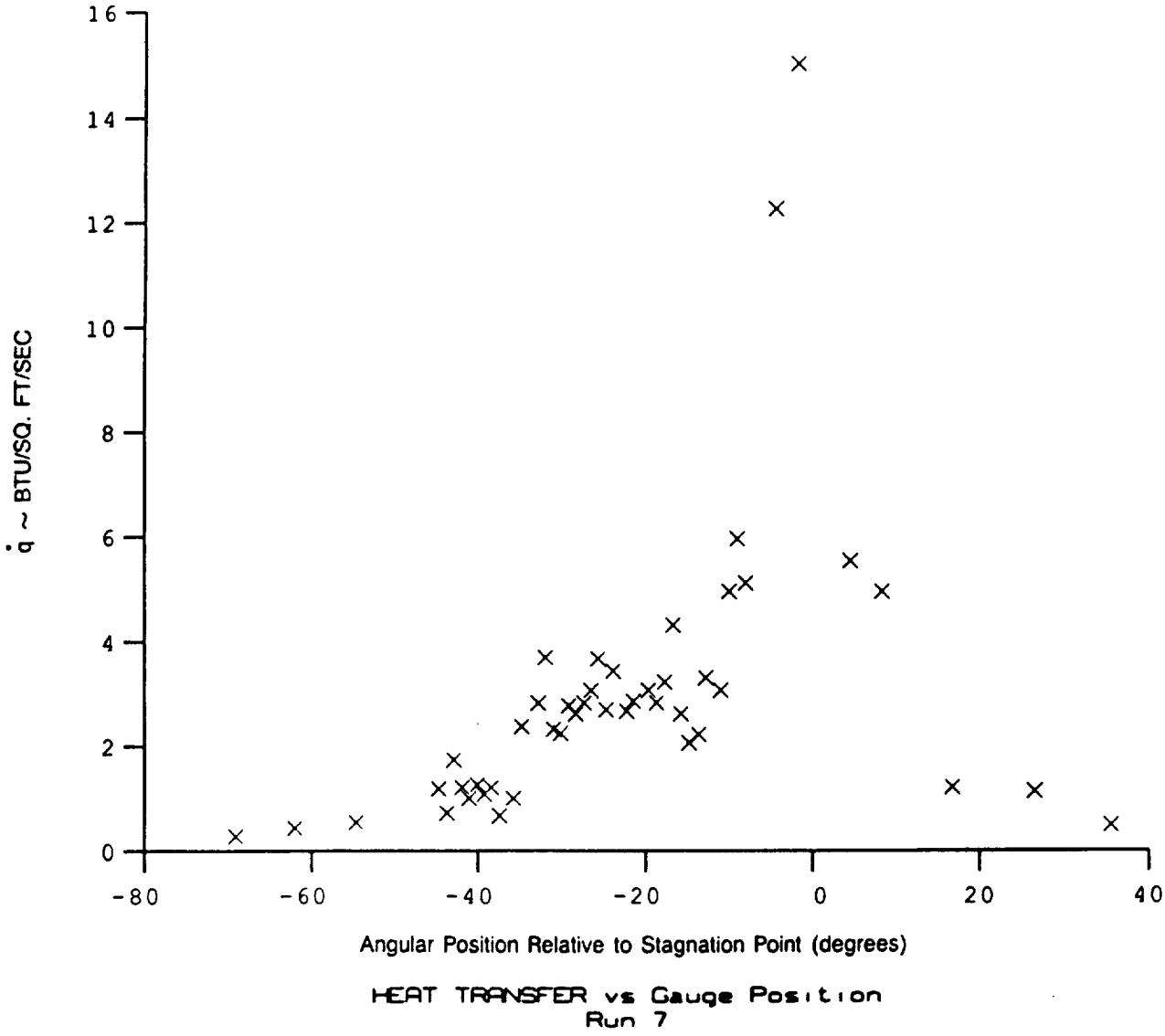
1
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 6

Test Conditions

Po	= 7.4010X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5980X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3560X10+3	degR	Reservoir Total Temperature
M	= 12.1300		Freestream Mach Number
U	= 9.5670X10+3	Ft/sec	Freestream Velocity
T	= 8.4630X10+1	degR	Freestream Temperature
P	= 4.3700X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1870X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.1190X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.2750X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.4270X10-1	PSIA	Pitot Pressure
Q	= 4.5060X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9750		Shock Tube Incident Shock Mach Number
Hw	= 3.3501X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2185	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6627X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.3973	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.12

Run 7


16
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6
4
2
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 7

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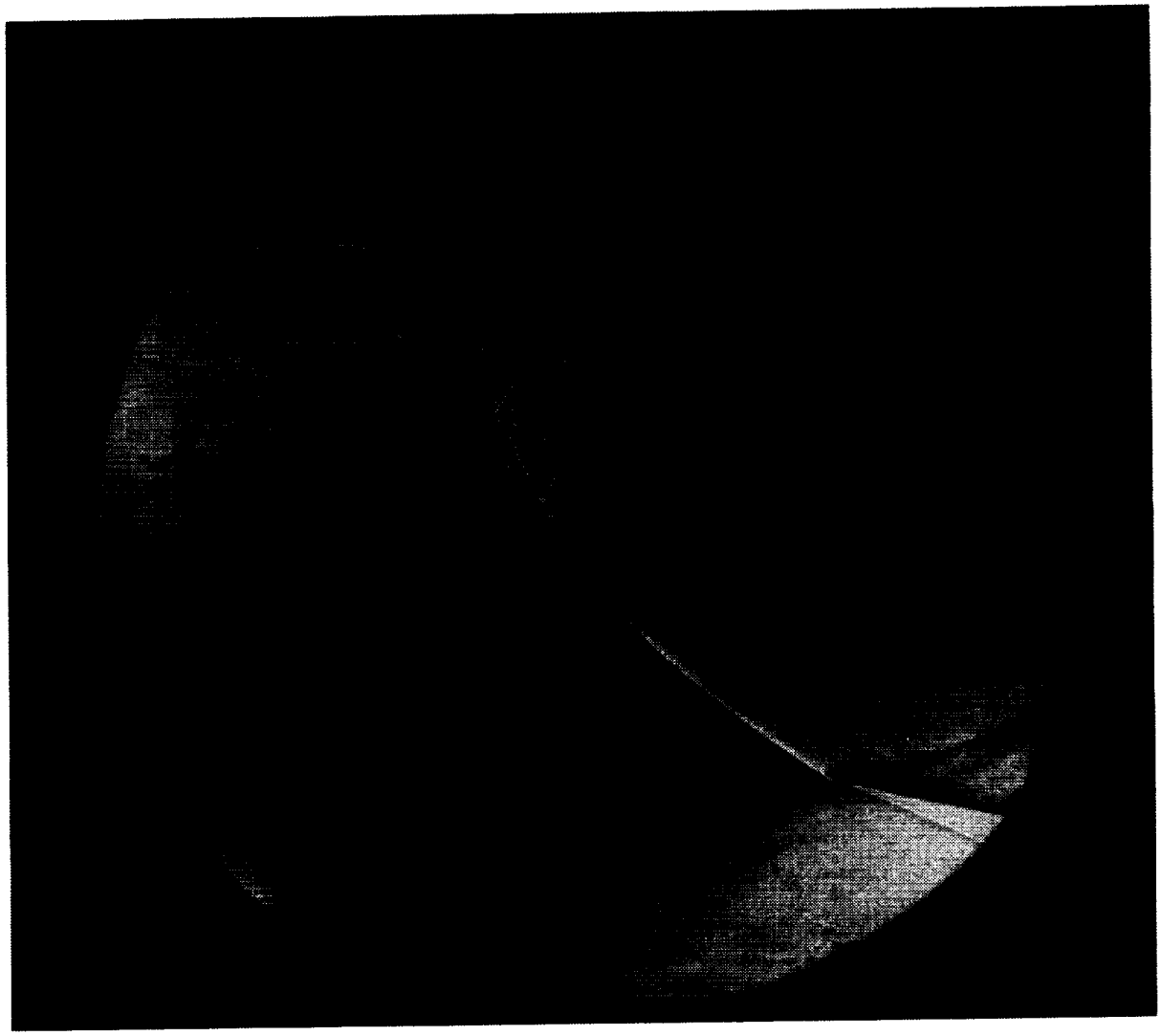
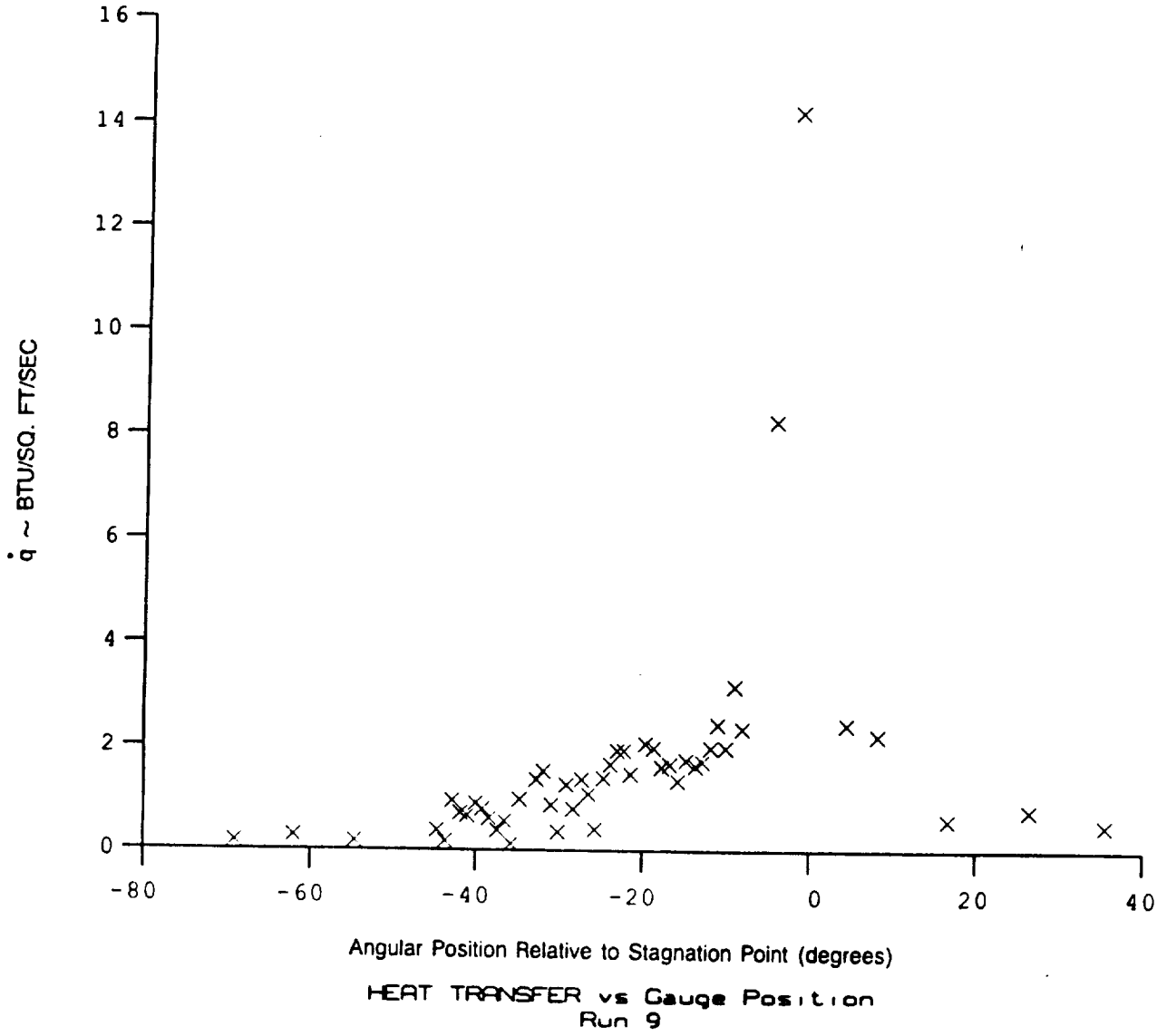


Test Conditions

Po	= 7.0780X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5440X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2940X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.4720X10+3	Ft/sec	Freestream Velocity
T	= 8.1630X10+1	degR	Freestream Temperature
P	= 8.1870X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1590X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8660X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3150X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.0870X10-1	PSIA	Pitot Pressure
Q	= 4.3240X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9290		Shock Tube Incident Shock Mach Number
Hw	= 3.3402X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3127	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.8253X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 5.9892	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.16

Run 9


16
14
12
10
8
6
4
2
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 9

ORIGINAL PAGE
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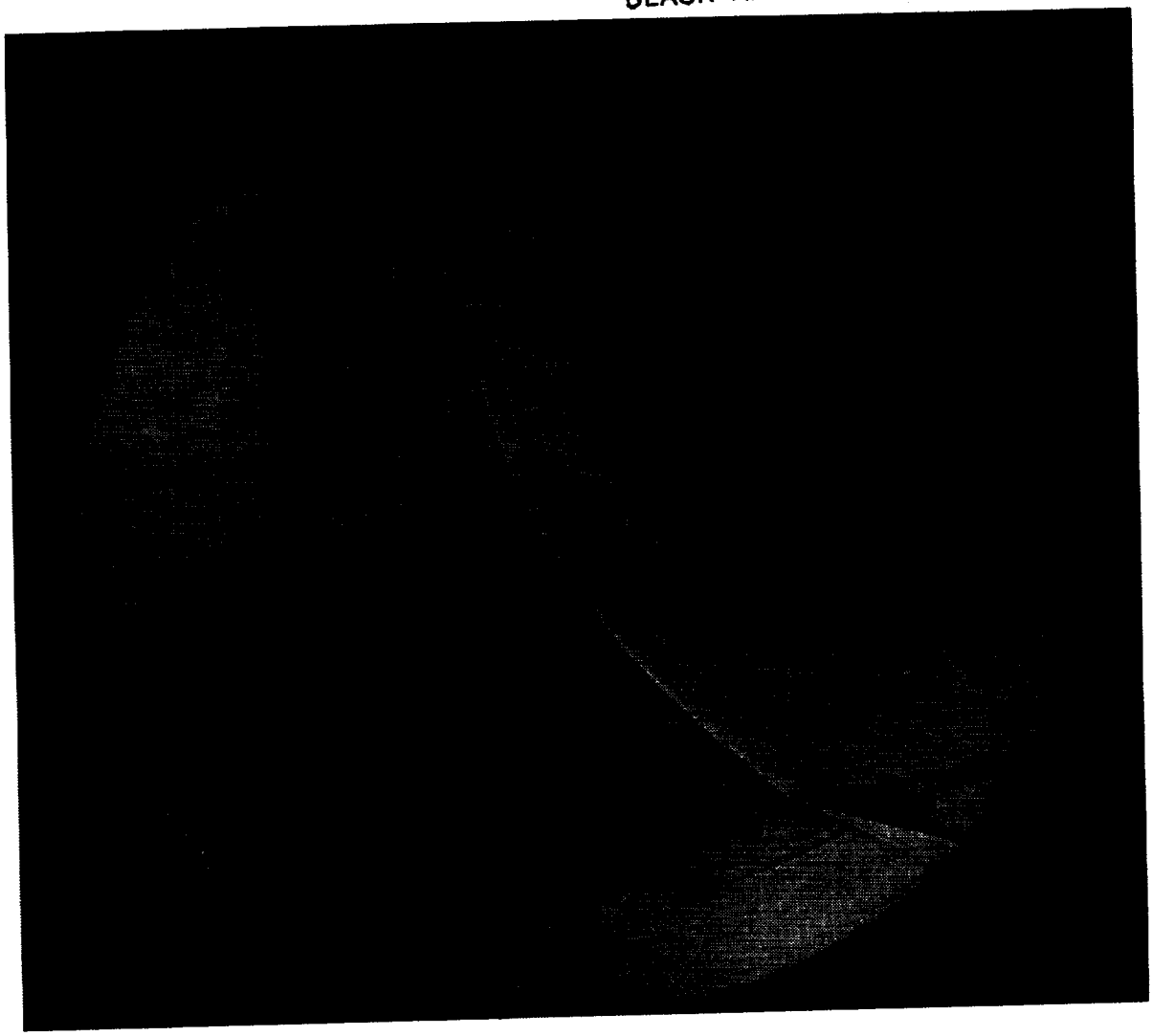
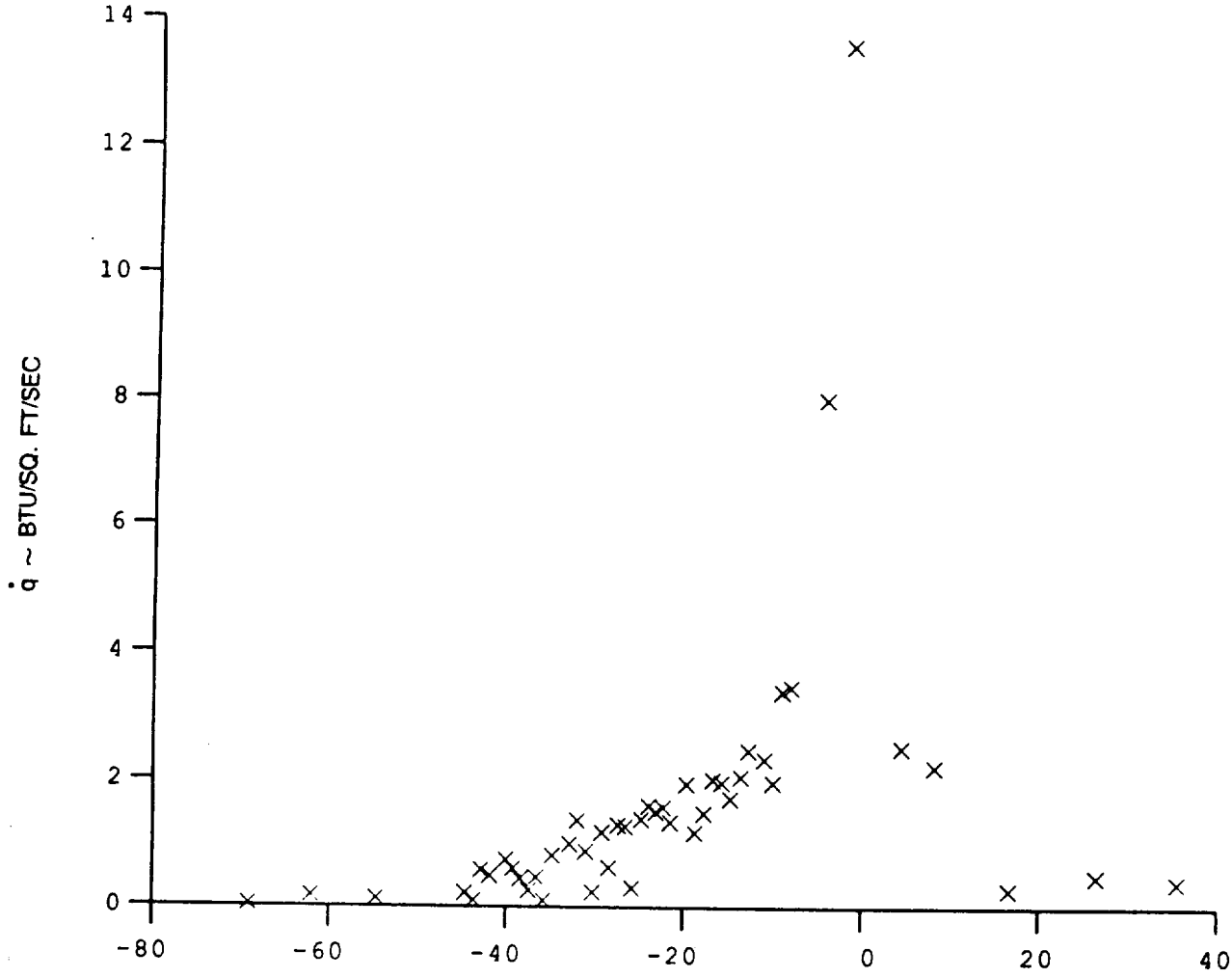


Test Conditions

Po	= 6.9310X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5830X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3340X10+3	degR	Reservoir Total Temperature
M	= 12.1200		Freestream Mach Number
U	= 5.5400X10+3	Ft/sec	Freestream Velocity
T	= 8.3970X10+1	degR	Freestream Temperature
P	= 4.1230X10-3	PSIA	Freestream Static Pressure
Rho	= 3.9820X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0630X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1230X10+5	1/Ft	Freestream Reynolds Number
Po'	= 7.9360X10-1	PSIA	Pitot Pressure
Q	= 6.2440X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9560		Shock Tube Incident Shock Mach Number
Hw	= 3.3513X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3565	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.8262X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.1294	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.15

Run 10


14
12
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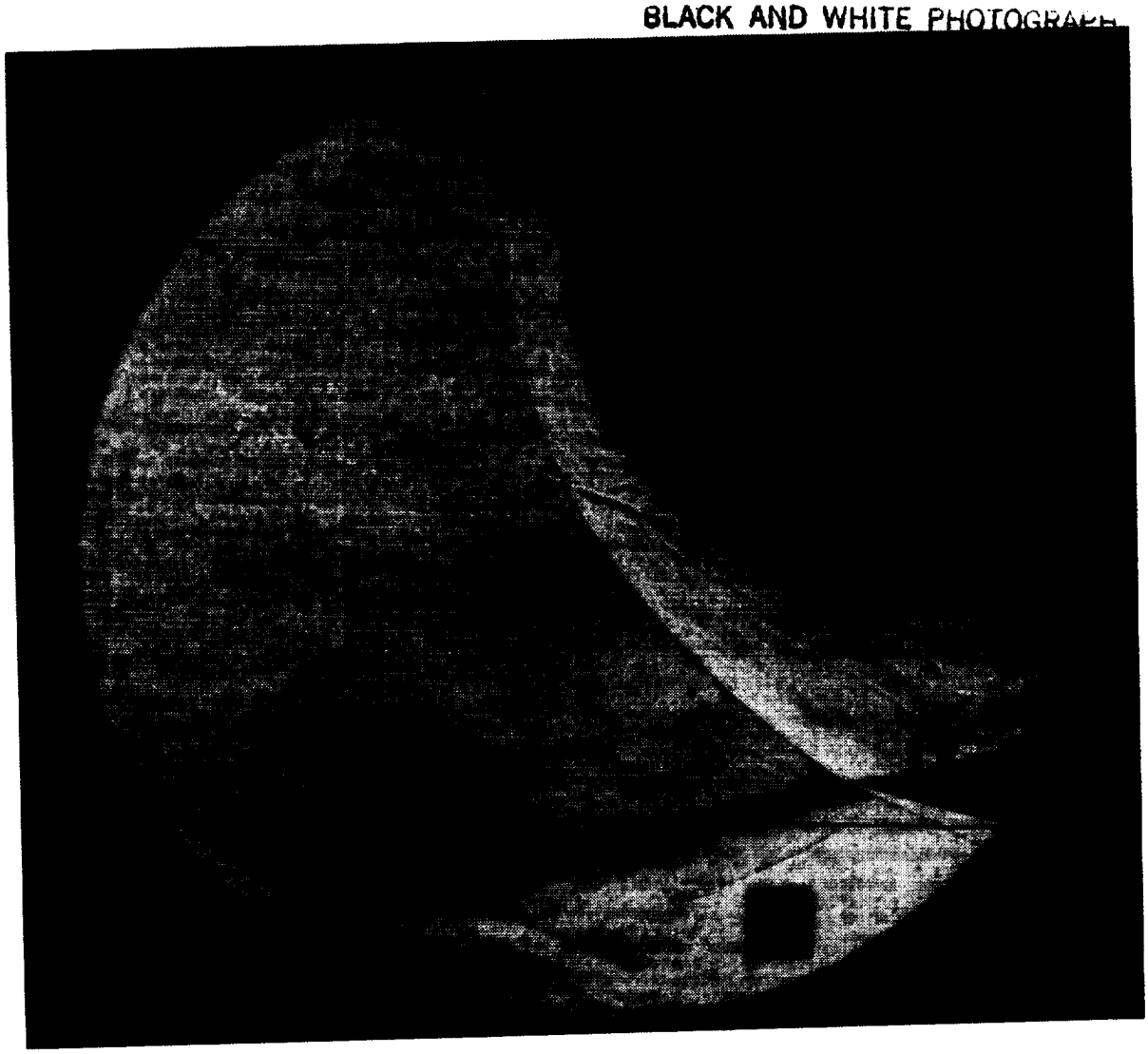
8
6
4
2
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 10

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

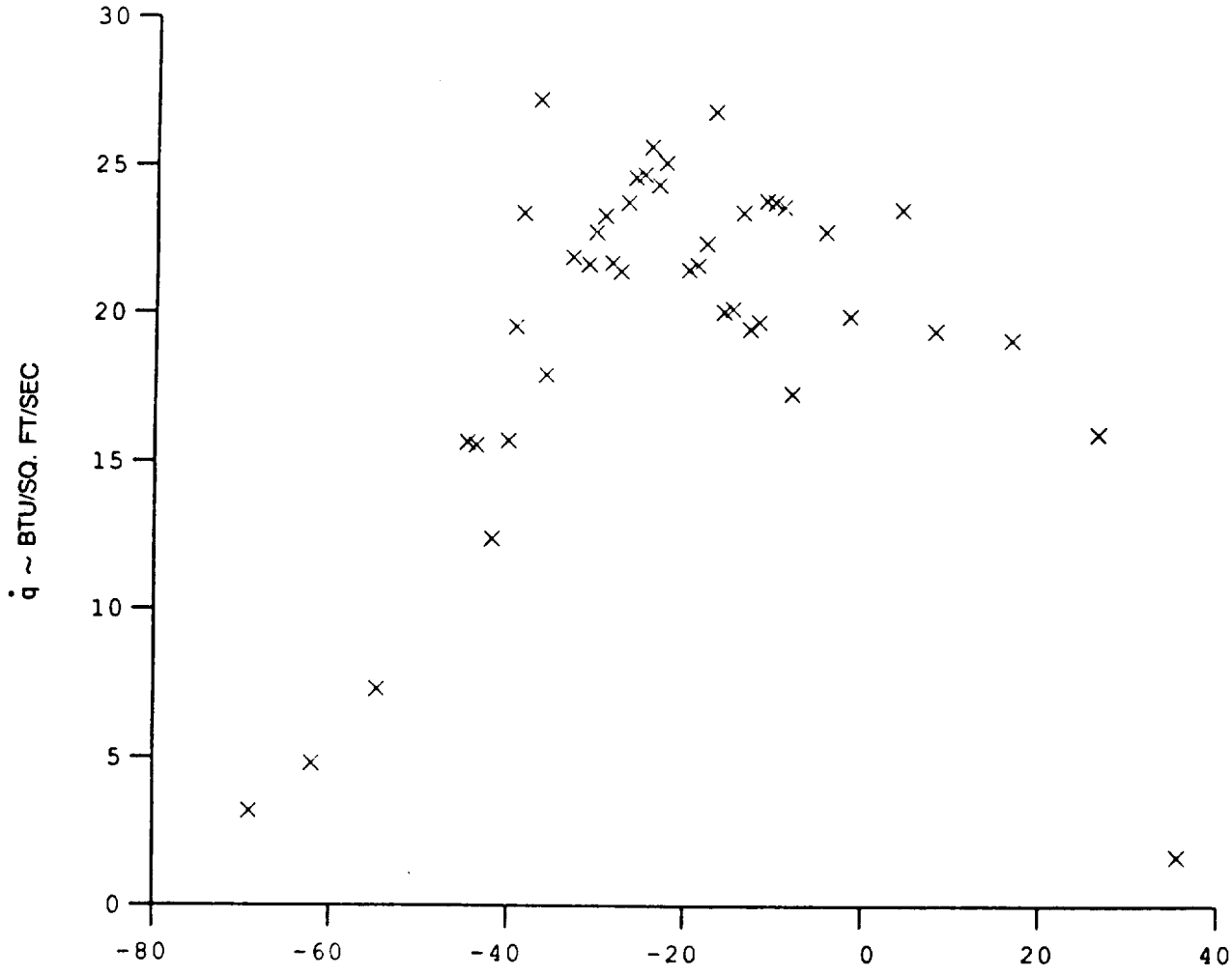


Test Conditions

Po	= 3.6890X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.6110X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.4010X10+3	degR	Reservoir Total Temperature
M	= 12.6500		Freestream Mach Number
U	= 5.5970X10+3	Ft/sec	Freestream Velocity
T	= 7.8680X10+1	degR	Freestream Temperature
P	= 1.7350X10-2	PSIA	Freestream Static Pressure
Rho	= 1.7880X10-5	Slugs/Ft3	Freestream Density
Mu	= 6.6170X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.5130X10+6	1/Ft	Freestream Reynolds Number
Po'	= 3.6380	PSIA	Pitot Pressure
Q	= 1.9450	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0370		Shock Tube Incident Shock Mach Number
Hw	= 3.3098X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 5.1418X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 6.0735X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 1.3474X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.0

Run 13



HEAT TRANSFER vs Gauge Position
Run 13

ORIGINAL PAGE
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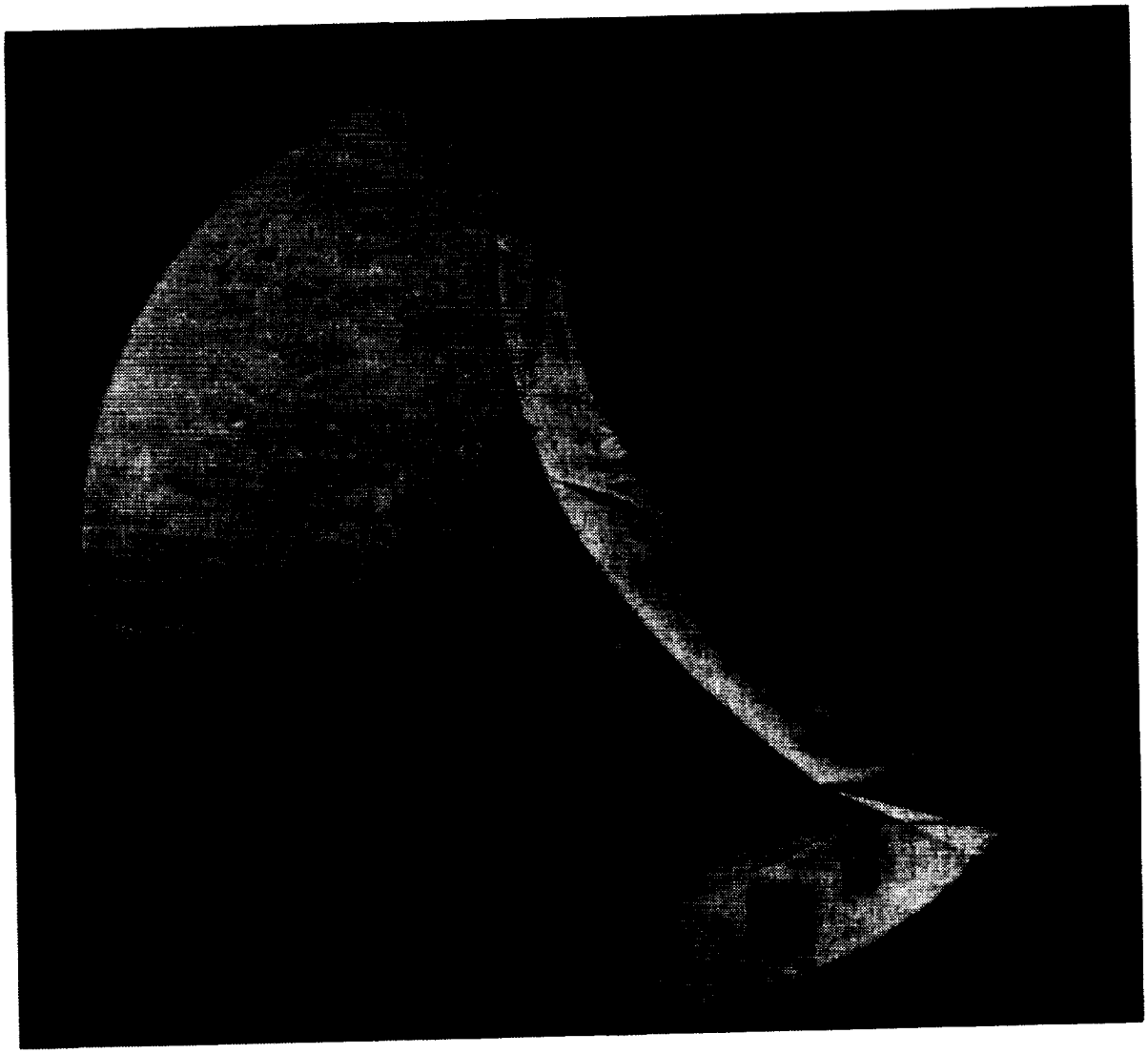
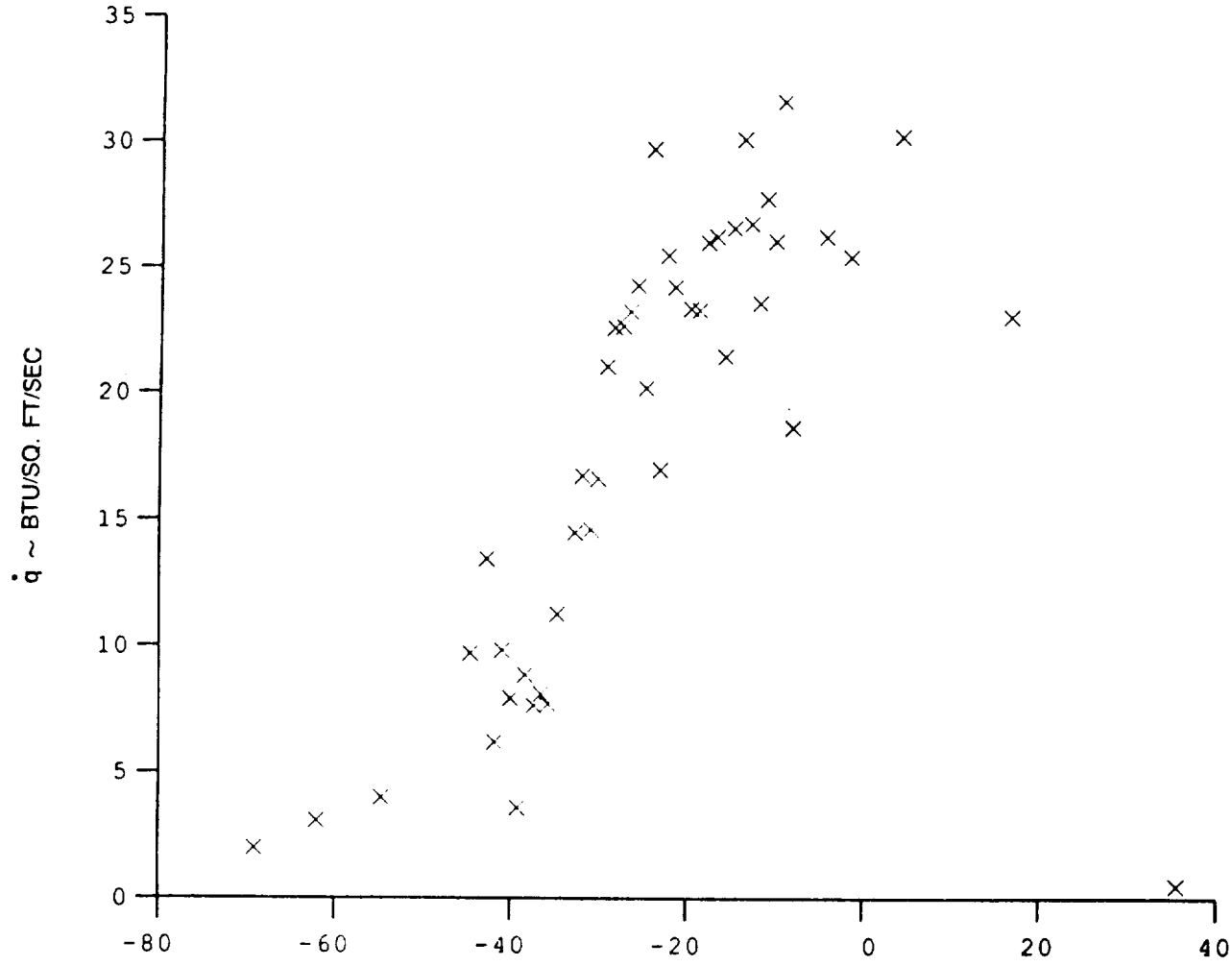


Test Conditions

Po	= 4.0290X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.7110X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.5000X10+3	degR	Reservoir Total Temperature
M	= 12.6400		Freestream Mach Number
U	= 5.7680X10+3	Ft/sec	Freestream Velocity
T	= 8.3600X10+1	degR	Freestream Temperature
P	= 1.8730X10-2	PSIA	Freestream Static Pressure
Rho	= 1.8170X10-5	Slugs/Ft3	Freestream Density
Mu	= 7.0320X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.4900X10+6	1/Ft	Freestream Reynolds Number
Po'	= 3.9250	PSIA	Pitot Pressure
Q	= 2.0990	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0990		Shock Tube Incident Shock Mach Number
Hw	= 3.3396X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.7642X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.3908X10-6	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	1.5117X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.06

Run 14



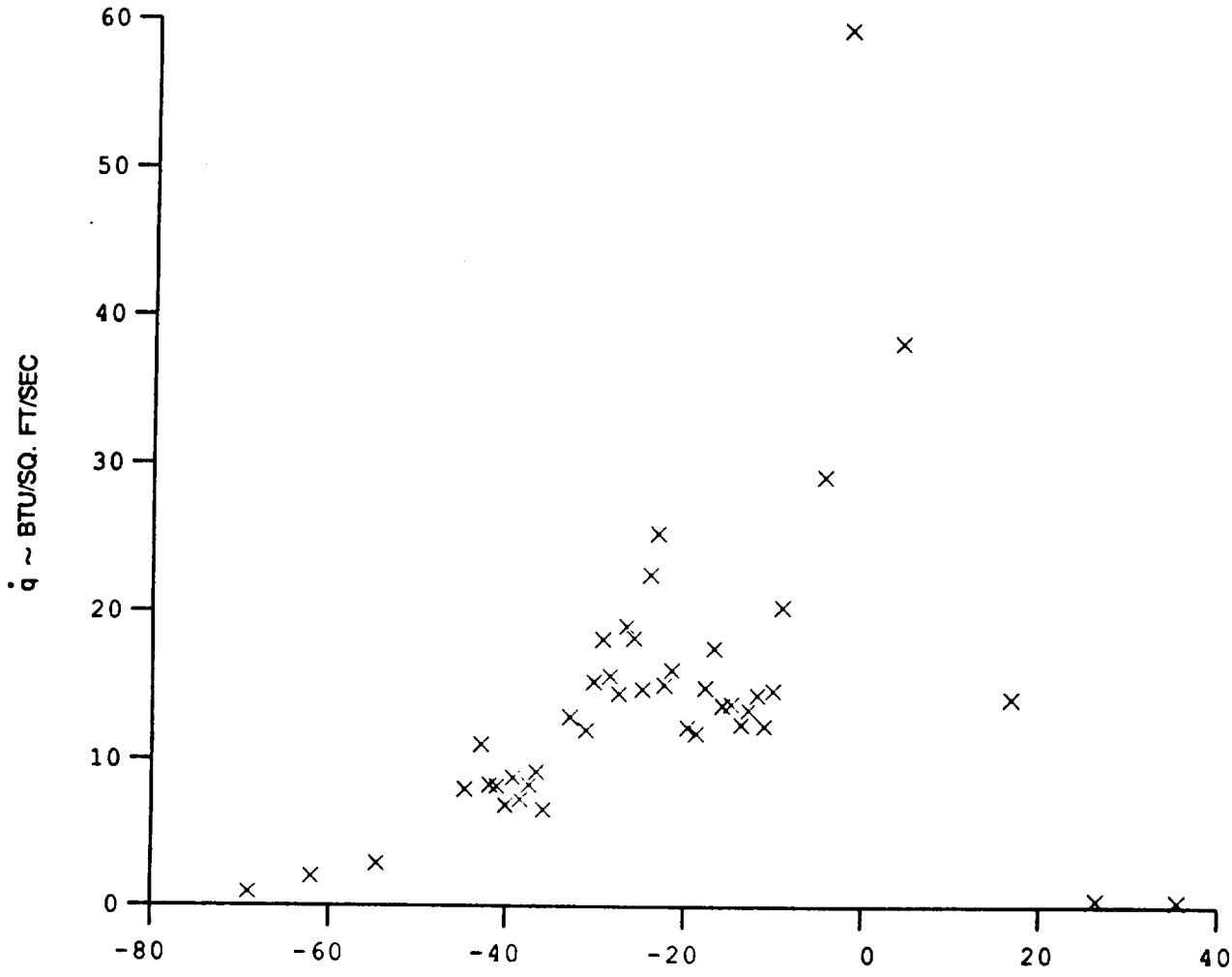
HEAT TRANSFER vs Gauge Position
Run 14

Test Conditions

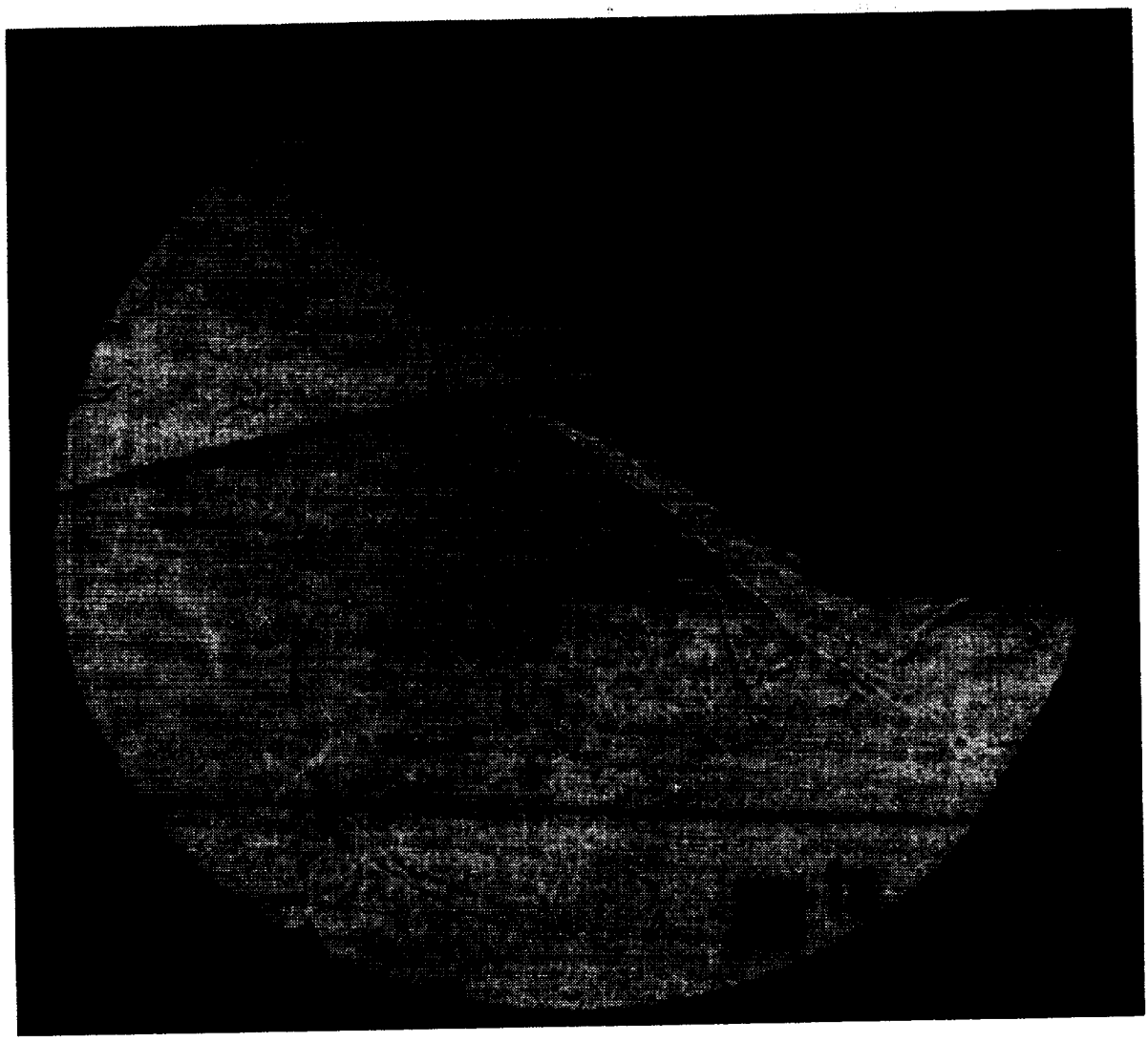
Po	= 4.0200X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.8490X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.6740X10+3	degR	Reservoir Total Temperature
M	= 12.5600		Freestream Mach Number
U	= 9.9940X10+3	Ft/sec	Freestream Velocity
T	= 9.1520X10+1	degR	Freestream Temperature
P	= 1.9100X10-2	PSIA	Freestream Static Pressure
Rho	= 1.6920X10-5	Slugs/Ft3	Freestream Density
Mu	= 7.7000X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.3170X10+6	1/Ft	Freestream Reynolds Number
Po'	= 3.8480	PSIA	Pitot Pressure
Q	= 2.1110	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.2340		Shock Tube Incident Shock Mach Number
Hw	= 3.3465X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.7376X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.0650X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 1.6771X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.06

Run 15


60
50
40
30
20
10
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 15

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

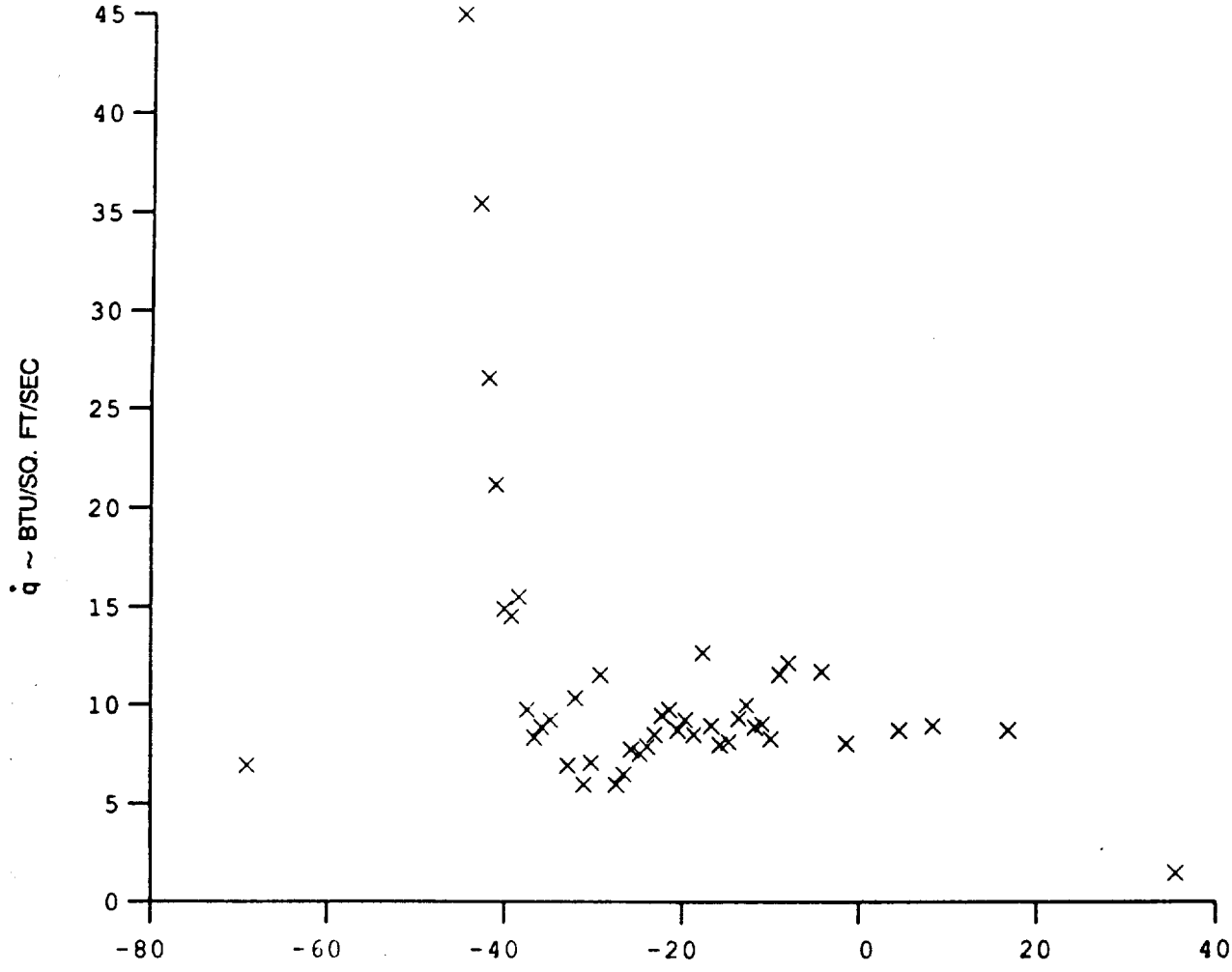


Test Conditions

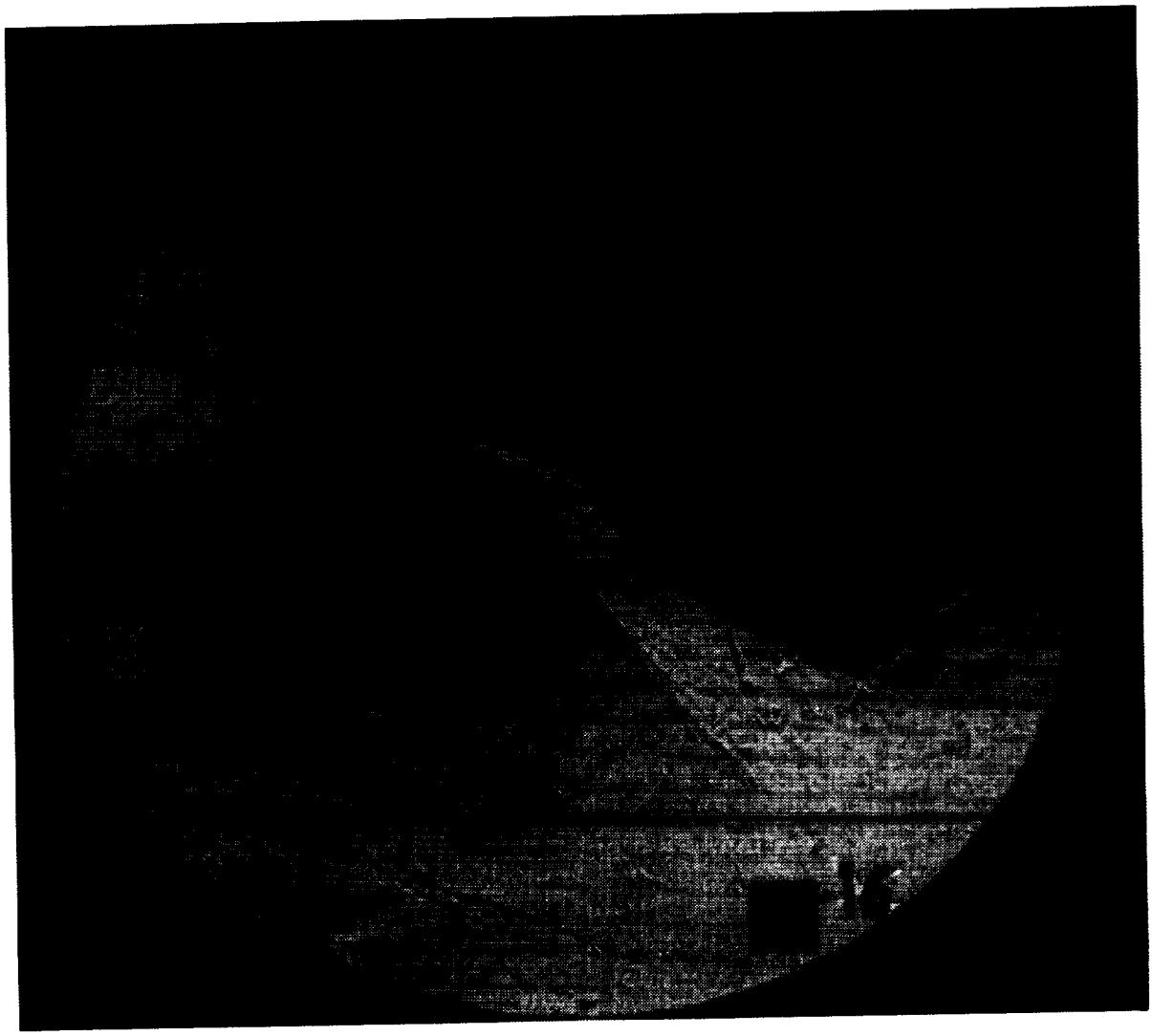
Po	= 7.4770X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6330X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.4010X10+3	degR	Reservoir Total Temperature
M	= 12.1100		Freestream Mach Number
U	= 5.6270X10+3	Ft/sec	Freestream Velocity
T	= 8.6680X10+1	degR	Freestream Temperature
P	= 4.4350X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1490X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.2920X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.2010X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5290X10-1	PSIA	Pitot Pressure
Q	= 4.5610X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0120		Shock Tube Incident Shock Mach Number
Hw	= 3.3507X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1923	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5675X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.6249	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
A - See Shock Generator Diagram (inches)	11.860
B - See Shock Generator Diagram (inches)	3.121
Shock Generator Lip	Flat
Lambda	0.0

Run 16



HEAT TRANSFER vs Gauge Position
Run 16

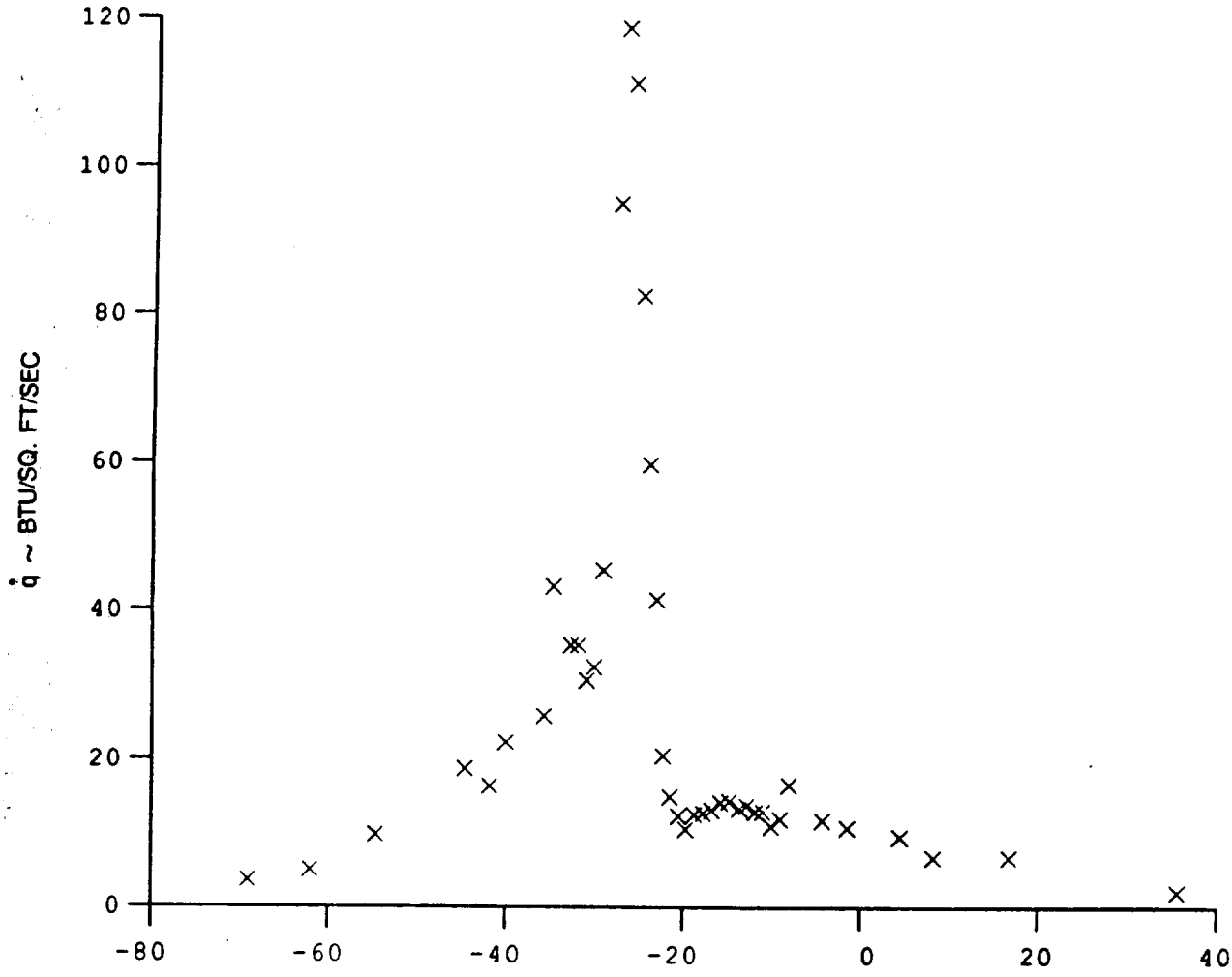


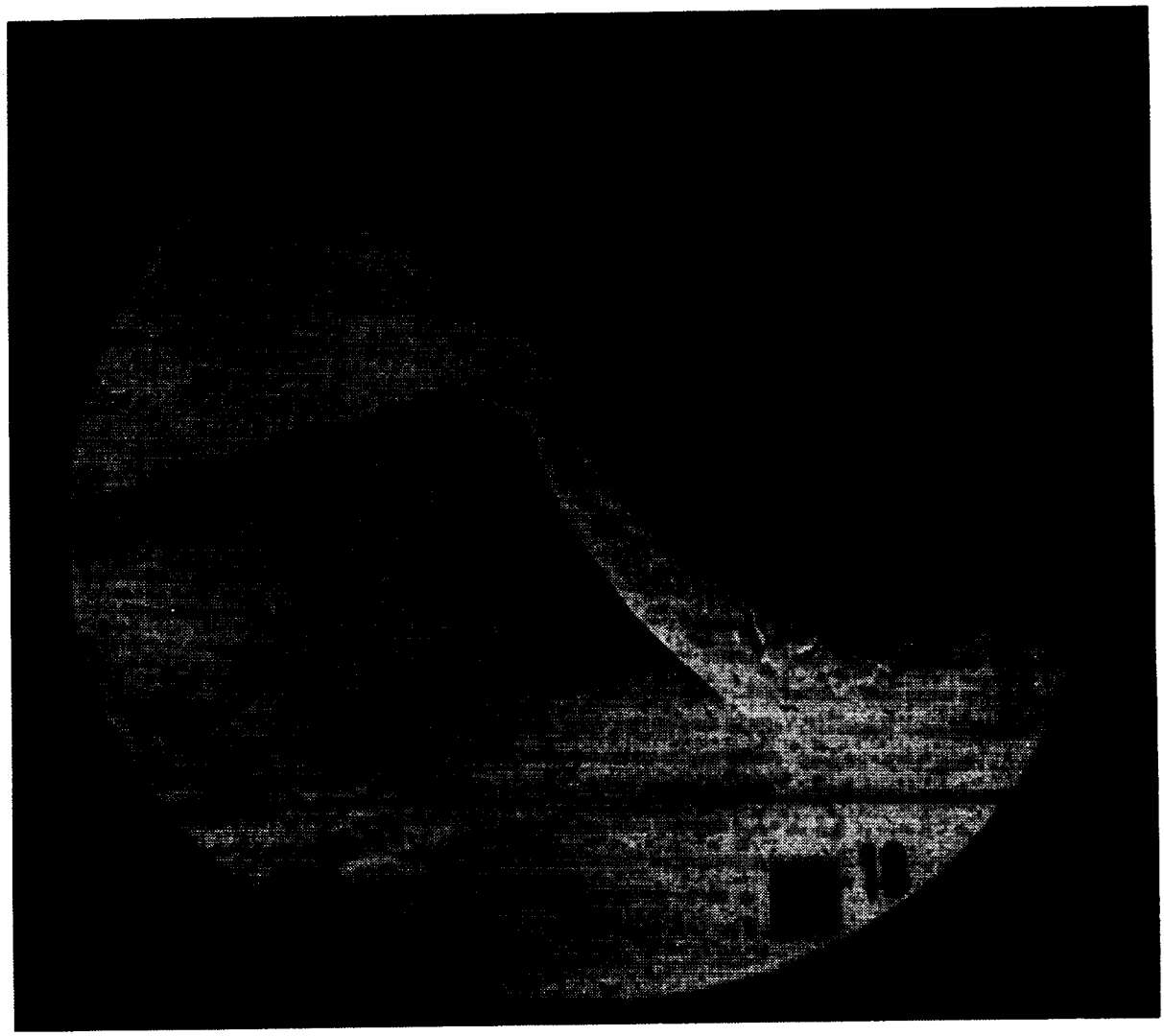
Test Conditions

Po	= 7.4050X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6380X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3930X10+3	degR	Reservoir Total Temperature
M	= 12.1200		Freestream Mach Number
U	= 5.6350X10+3	Ft/sec	Freestream Velocity
T	= 8.6890X10+1	degR	Freestream Temperature
P	= 4.3770X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0850X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.3090X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1490X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.4230X10-1	PSIA	Pitot Pressure
Q	= 4.5040X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9980		Shock Tube Incident Shock Mach Number
Hw	= 3.3638X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2203	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5966X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.6016	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	10.360
B - See Shock Generator Diagram	(inches)	3.121
Shock Generator Lip		Flat
Lambda		0.0

Run 17


120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 17

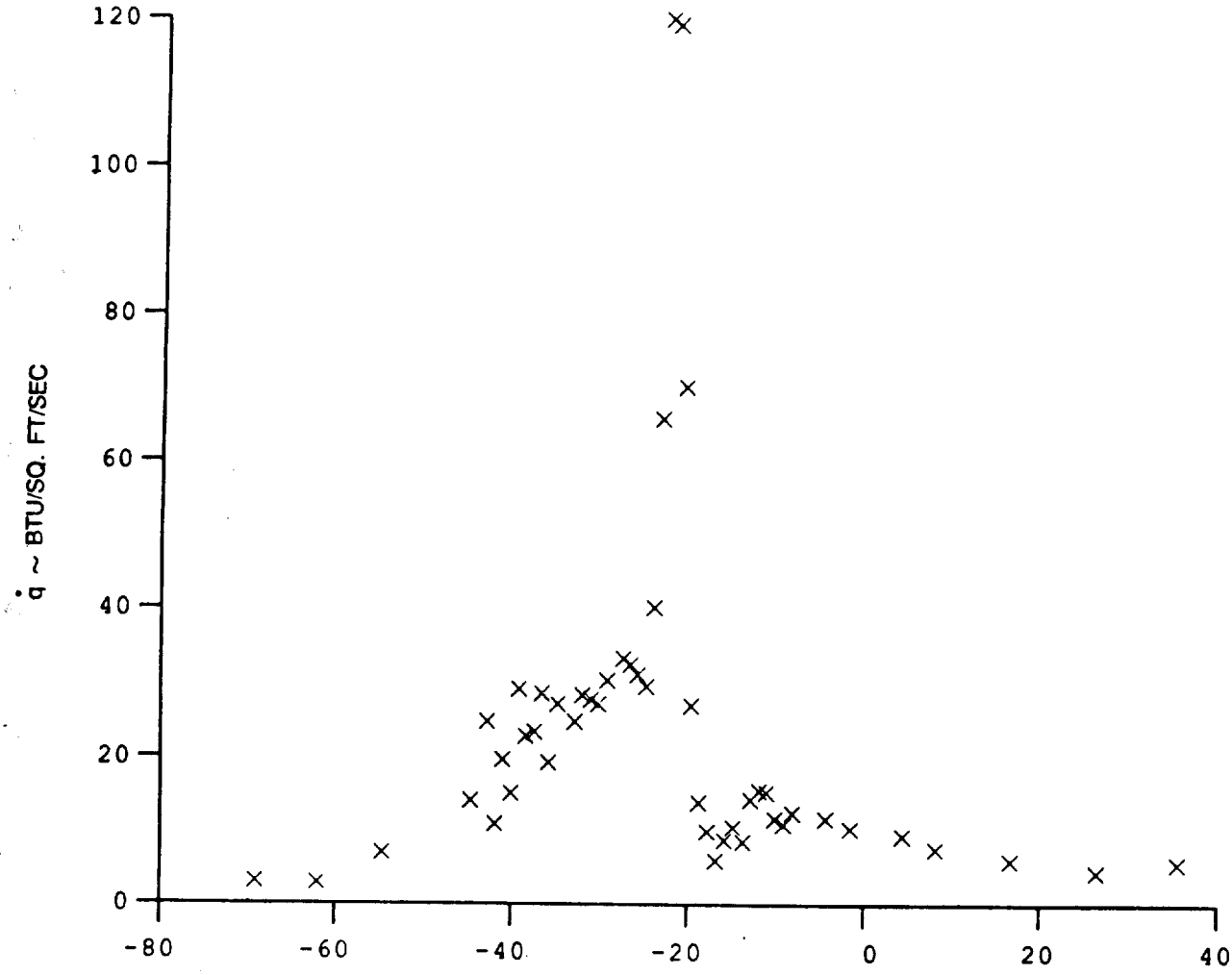


Test Conditions

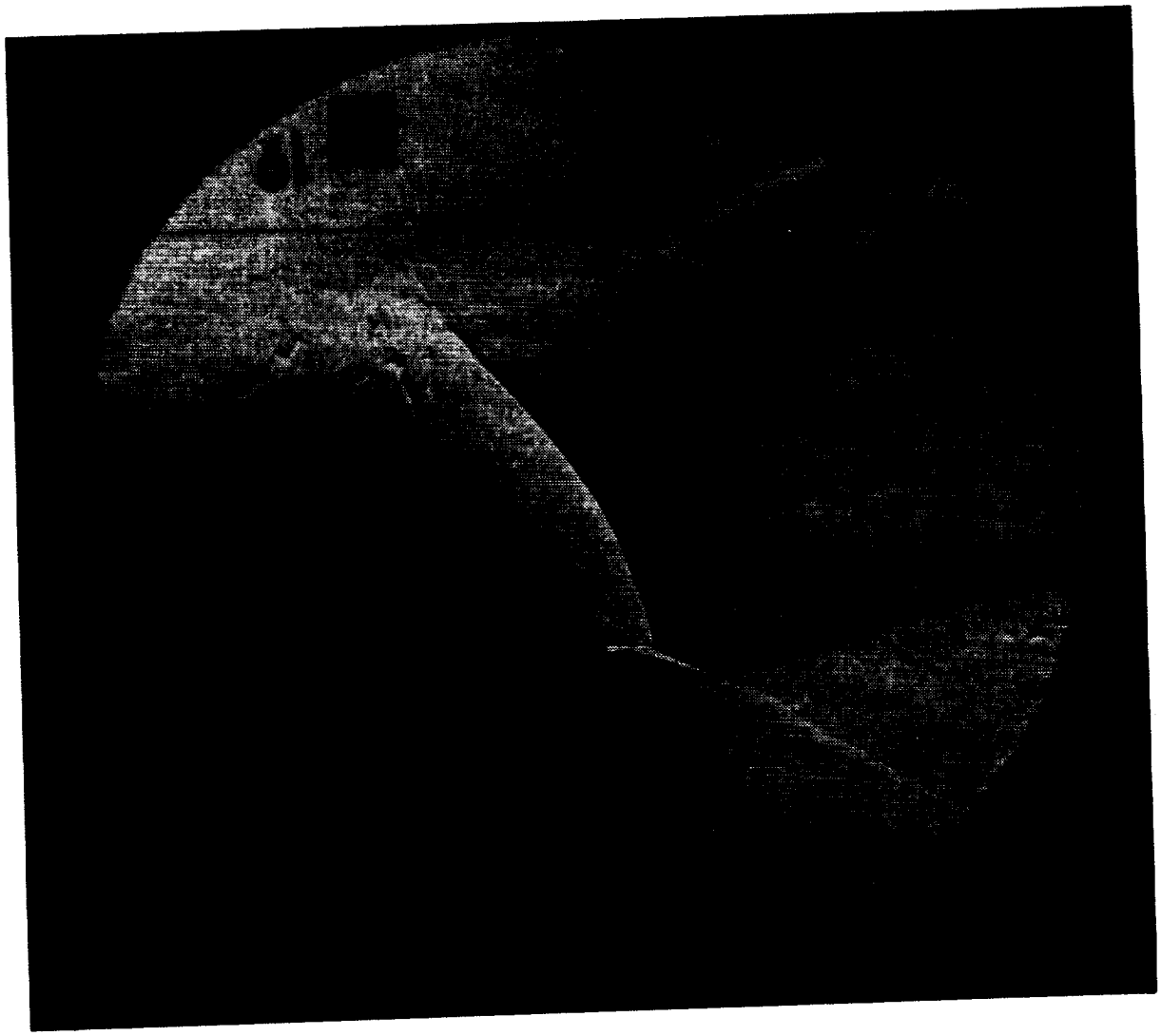
Po	= 6.8610X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5300X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2990X10+3	degR	Reservoir Total Temperature
M	= 12.1200		Freestream Mach Number
U	= 5.4660X10+3	Ft/sec	Freestream Velocity
T	= 8.1120X10+1	degR	Freestream Temperature
P	= 4.1090X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1070X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8230X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.2780X10+5	1/Ft	Freestream Reynolds Number
Po'	= 7.9110X10-1	PSIA	Pitot Pressure
Q	= 4.2300X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9470		Shock Tube Incident Shock Mach Number
Hw	= 3.3172X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3644	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.9028X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR	= 5.8653	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip		Flat
Lambda		0.0

Run 18


120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 18

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH



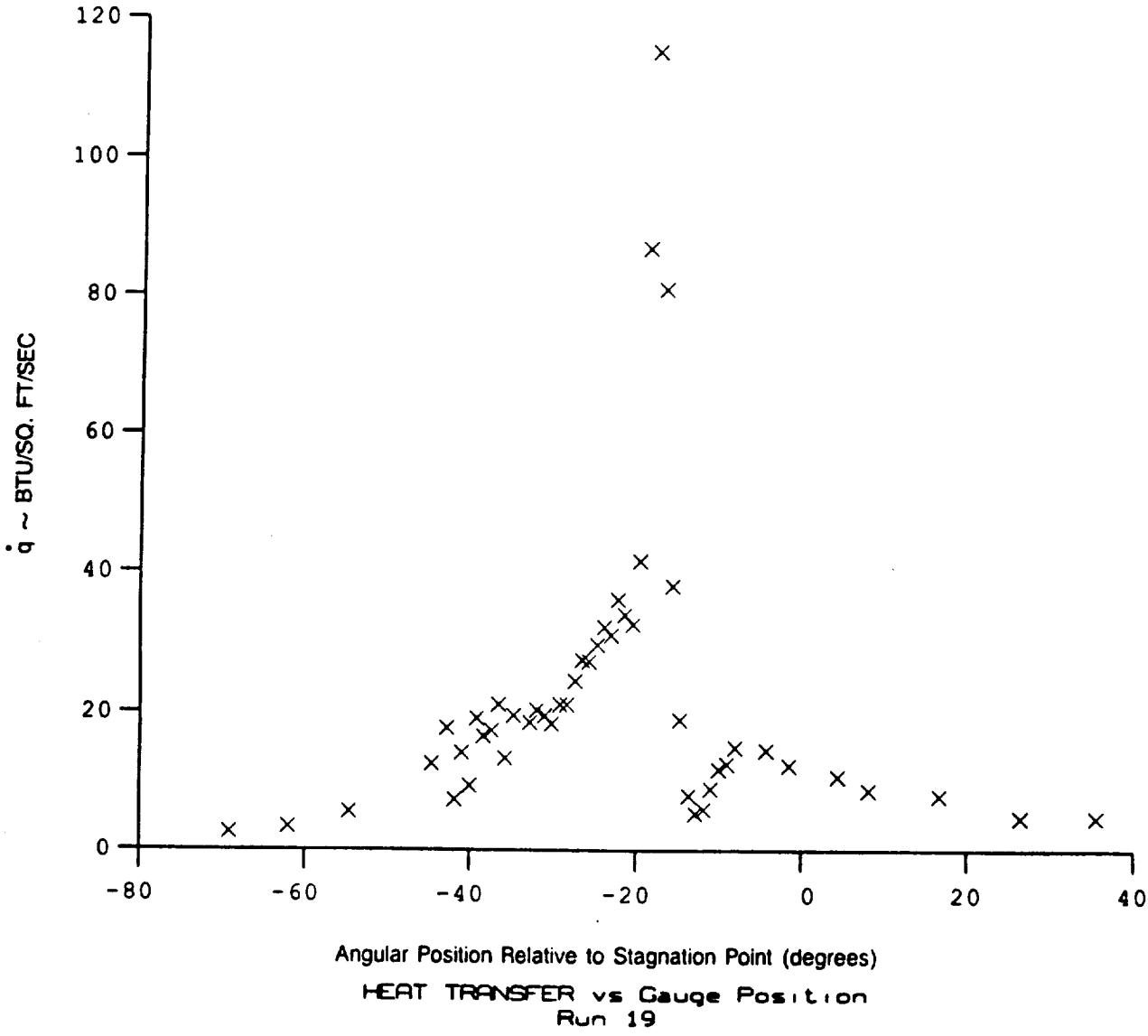
Test Conditions

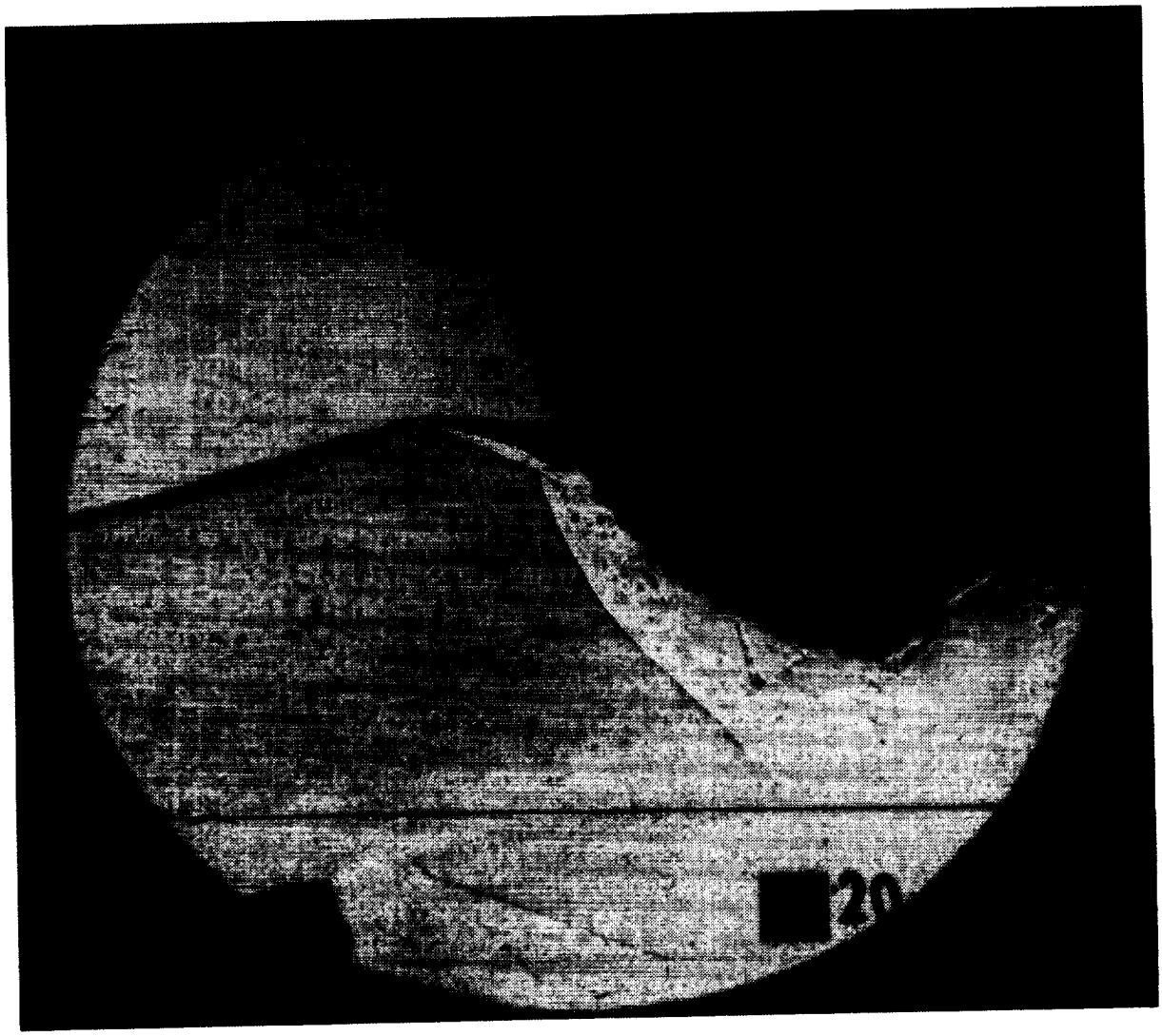
Po	= 6.8630X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5940X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3700X10+3	degR	Reservoir Total Temperature
M	= 12.0900		Freestream Mach Number
U	= 5.5590X10+3	Ft/sec	Freestream Velocity
T	= 8.4890X10+1	degR	Freestream Temperature
P	= 4.1350X10-3	PSIA	Freestream Static Pressure
Rho	= 3.9490X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.1410X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.0740X10+5	1/Ft	Freestream Reynolds Number
Po'	= 7.9250X10-1	PSIA	Pitot Pressure
Q	= 4.2380X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9980		Shock Tube Incident Shock Mach Number
Hw	= 3.3321X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3600	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.8110X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.1945	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.750
	Lambda	0.0

Run 19

C-3


120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 19

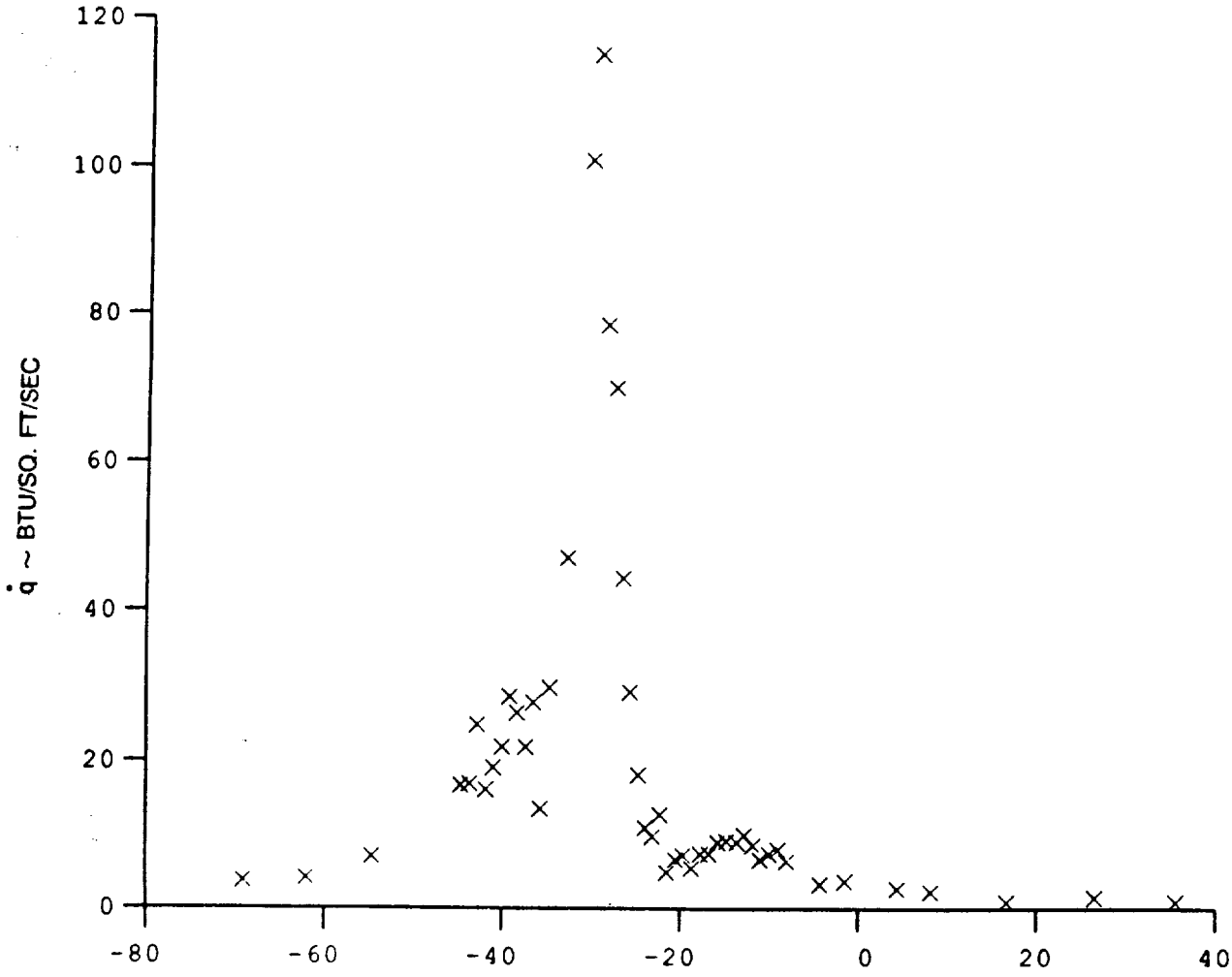


Test Conditions

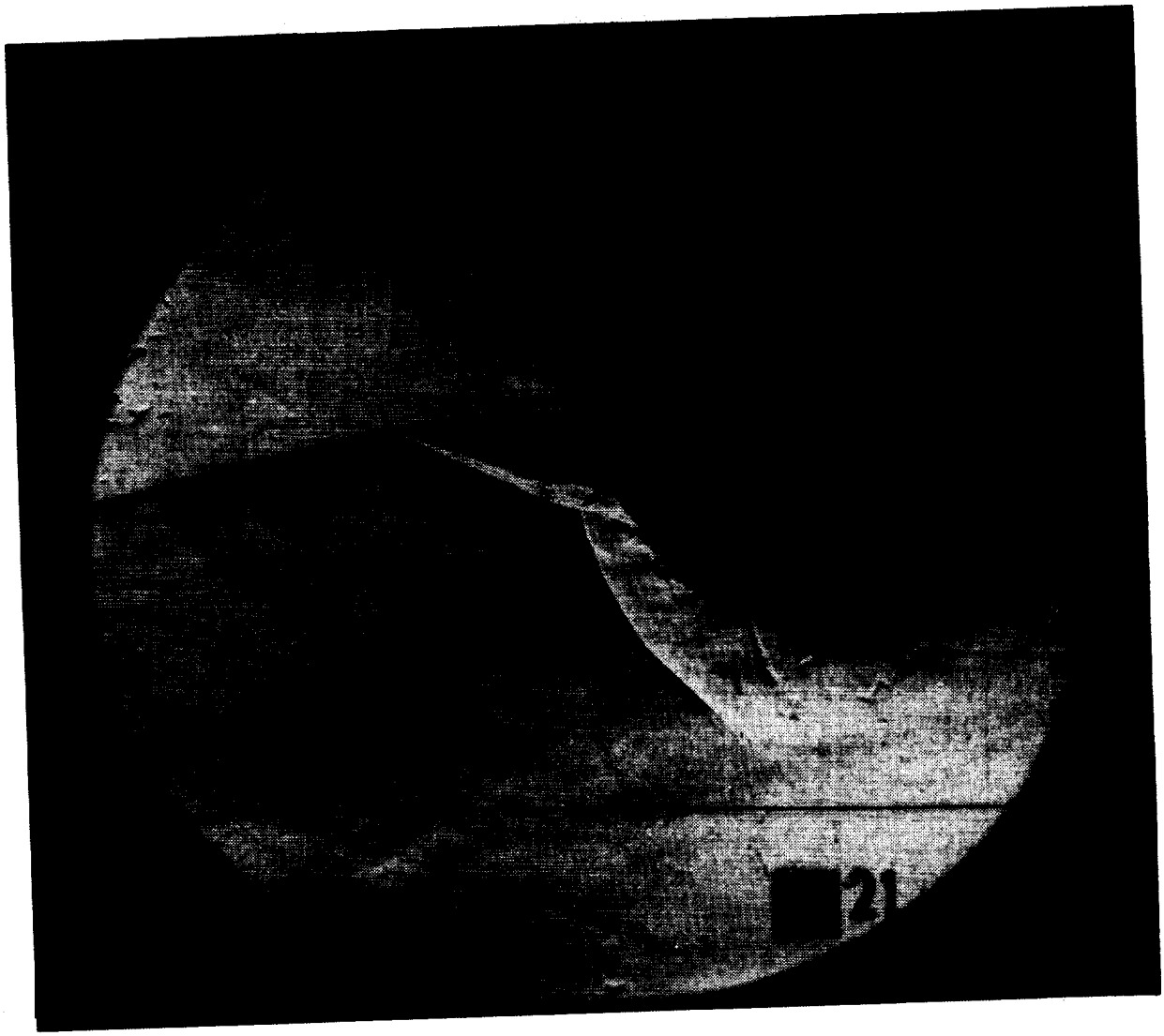
Po	= 7.1580X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5920X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3420X10+3	degR	Reservoir Total Temperature
M	= 12.1300		Freestream Mach Number
U	= 5.5550X10+3	Ft/sec	Freestream Velocity
T	= 8.4310X10+1	degR	Freestream Temperature
P	= 4.2370X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0750X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0920X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1920X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.1650X10-1	PSIA	Pitot Pressure
Q	= 4.3660X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9610		Shock Tube Incident Shock Mach Number
Hw	= 3.3545X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2903	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.7352X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.2623	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
A - See Shock Generator Diagram (inches)	9.375
B - See Shock Generator Diagram (inches)	3.295
Shock Generator Lip	Flat
Lambda	0.12

Run 20



HEAT TRANSFER vs Gauge Position
Run 20

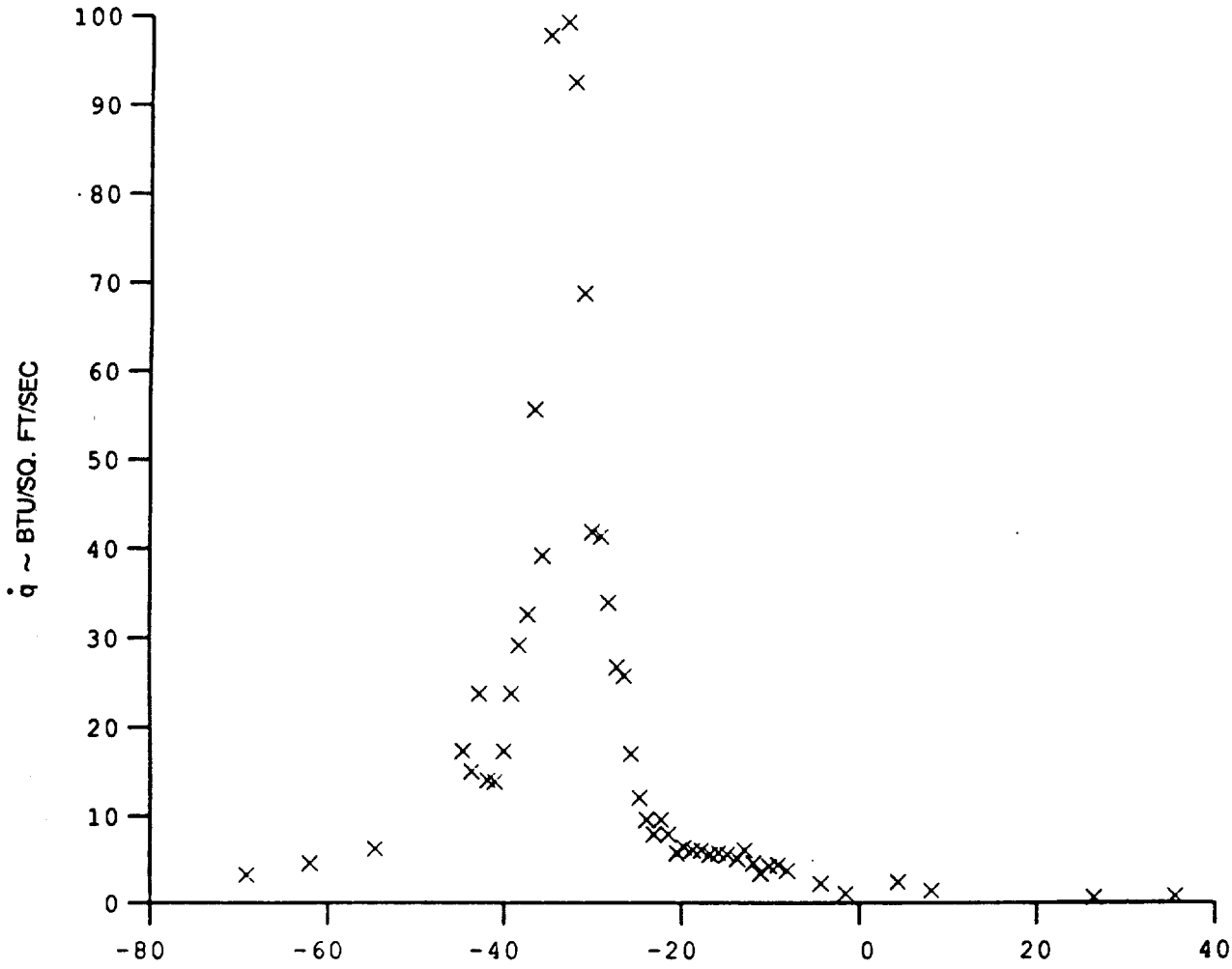


Test Conditions

Po	= 7.1860X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6510X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.4000X10+3	degR	Reservoir Total Temperature
M	= 12.1100		Freestream Mach Number
U	= 5.6580X10+3	Ft/sec	Freestream Velocity
T	= 8.7710X10+1	degR	Freestream Temperature
P	= 4.2610X10-3	PSIA	Freestream Static Pressure
Rho	= 3.9390X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.3790X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.0200X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.1860X10-1	PSIA	Pitot Pressure
Q	= 4.3770X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9980		Shock Tube Incident Shock Mach Number
Hw	= 3.3731X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2839	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6573X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.5708	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
A - See Shock Generator Diagram (inches)	9.375
B - See Shock Generator Diagram (inches)	3.295
Shock Generator Lip	Flat
Lambda	0.17

Run 21

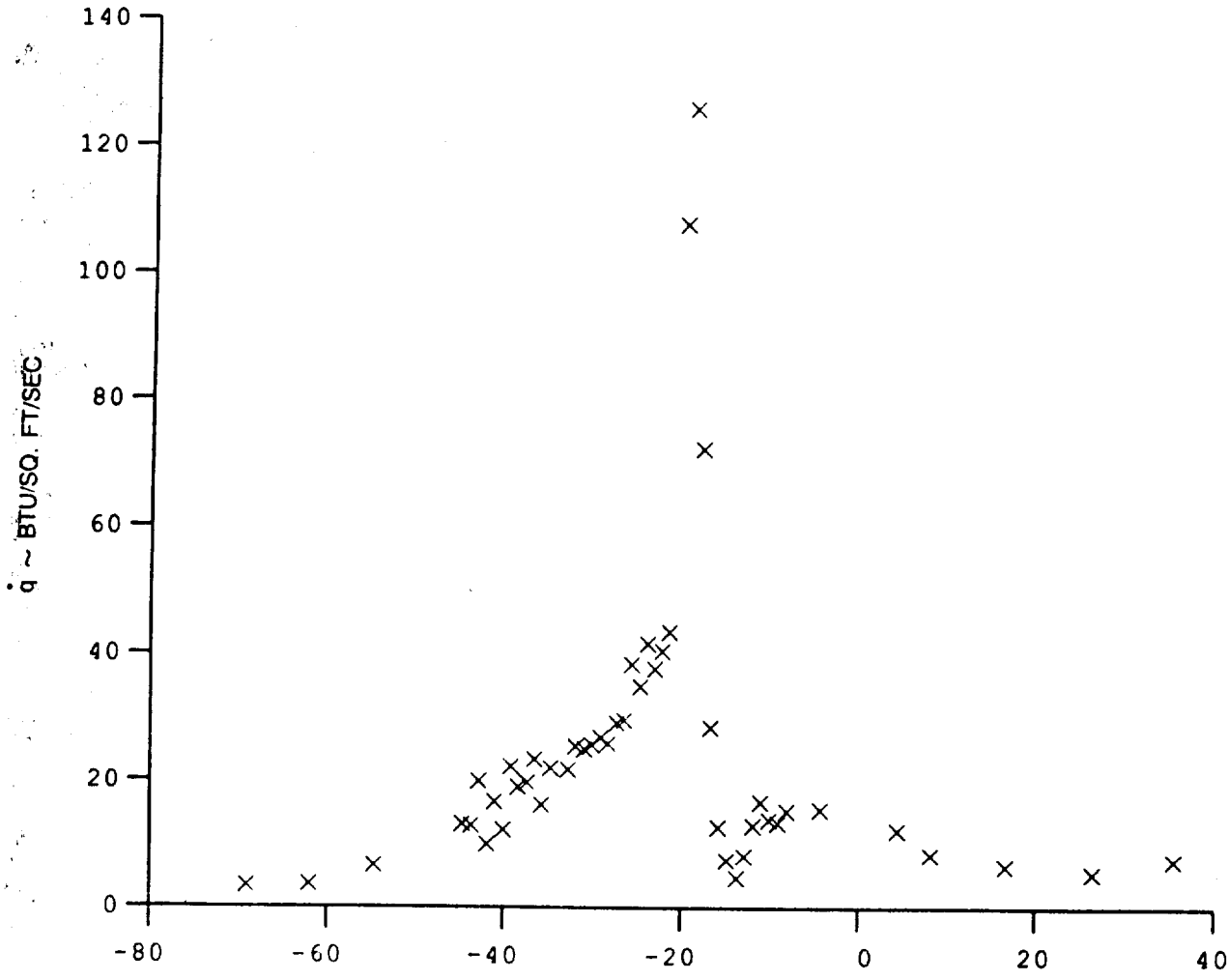

100
90
80
70
60
50
40
30
20
10
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 21

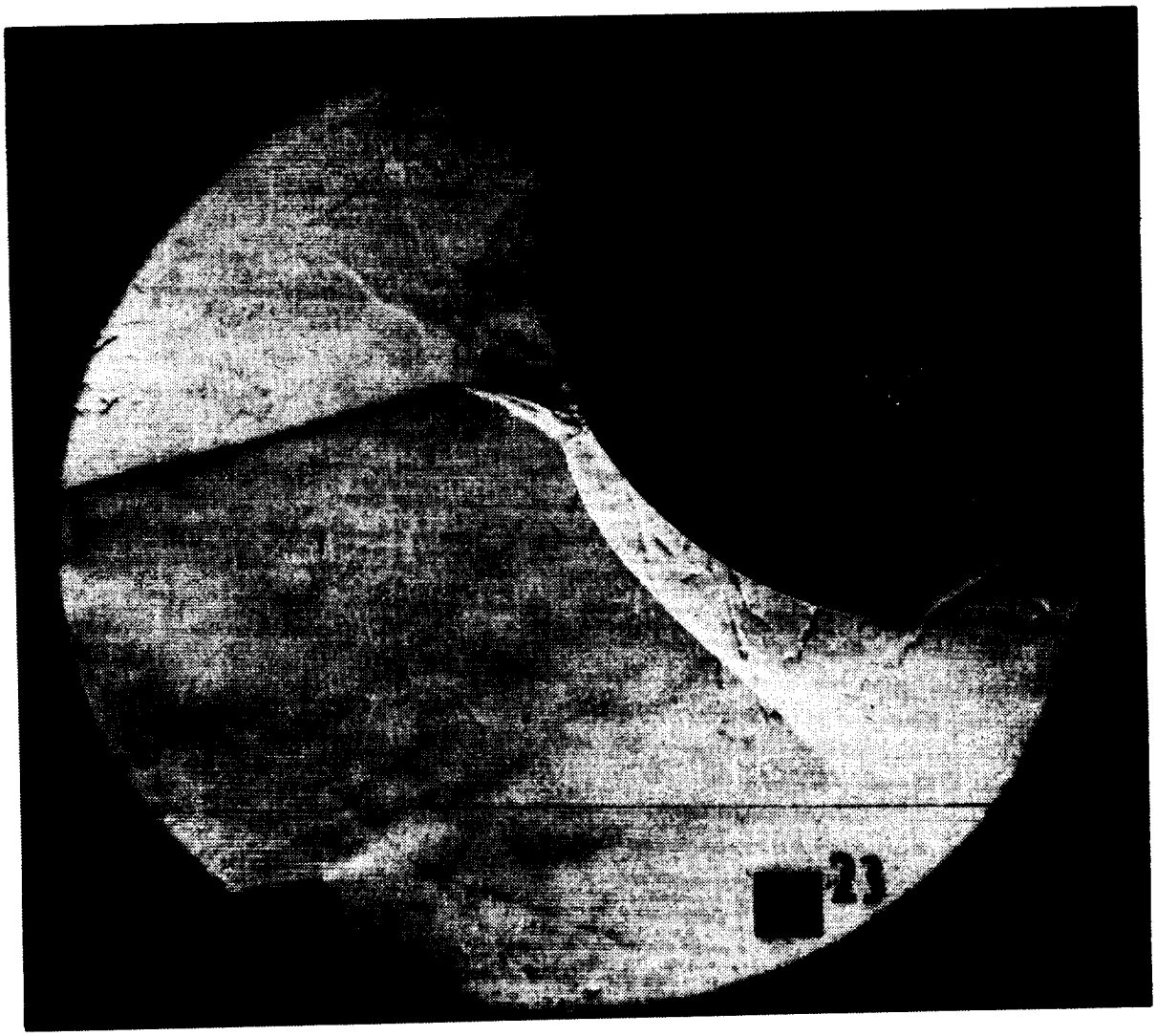
Test Conditions

Po	= 7.2750X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6250X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.4000X10+3	degR	Reservoir Total Temperature
M	= 12.1000		Freestream Mach Number
U	= 5.6130X10+3	Ft/sec	Freestream Velocity
T	= 8.6420X10+1	degR	Freestream Temperature
P	= 4.3450X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0770X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.2700X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1480X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.3600X10-1	PSIA	Pitot Pressure
Q	= 4.4600X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0160		Shock Tube Incident Shock Mach Number
Hw	= 3.3427X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2421	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6339X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.5137	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 22


140
120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 22

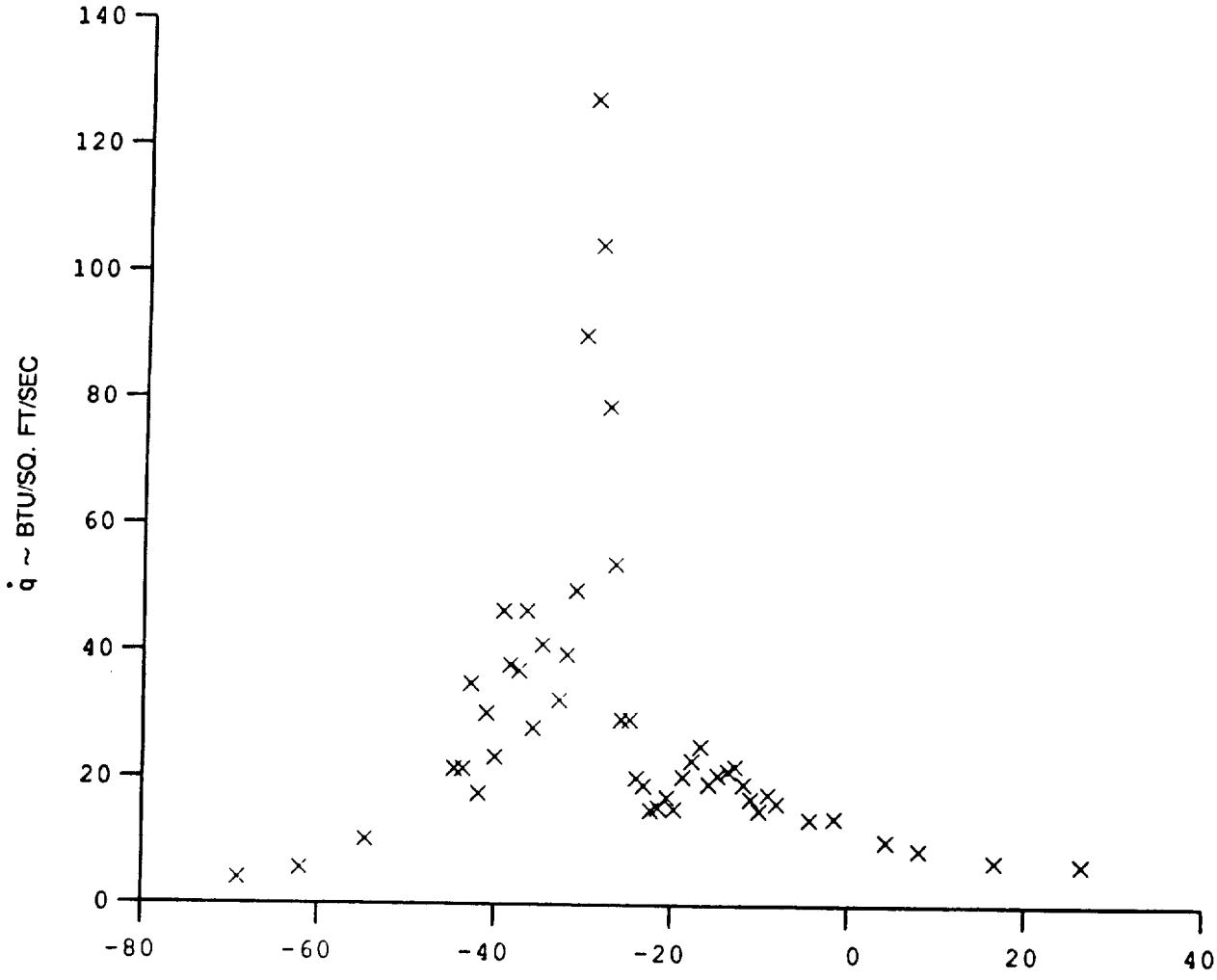


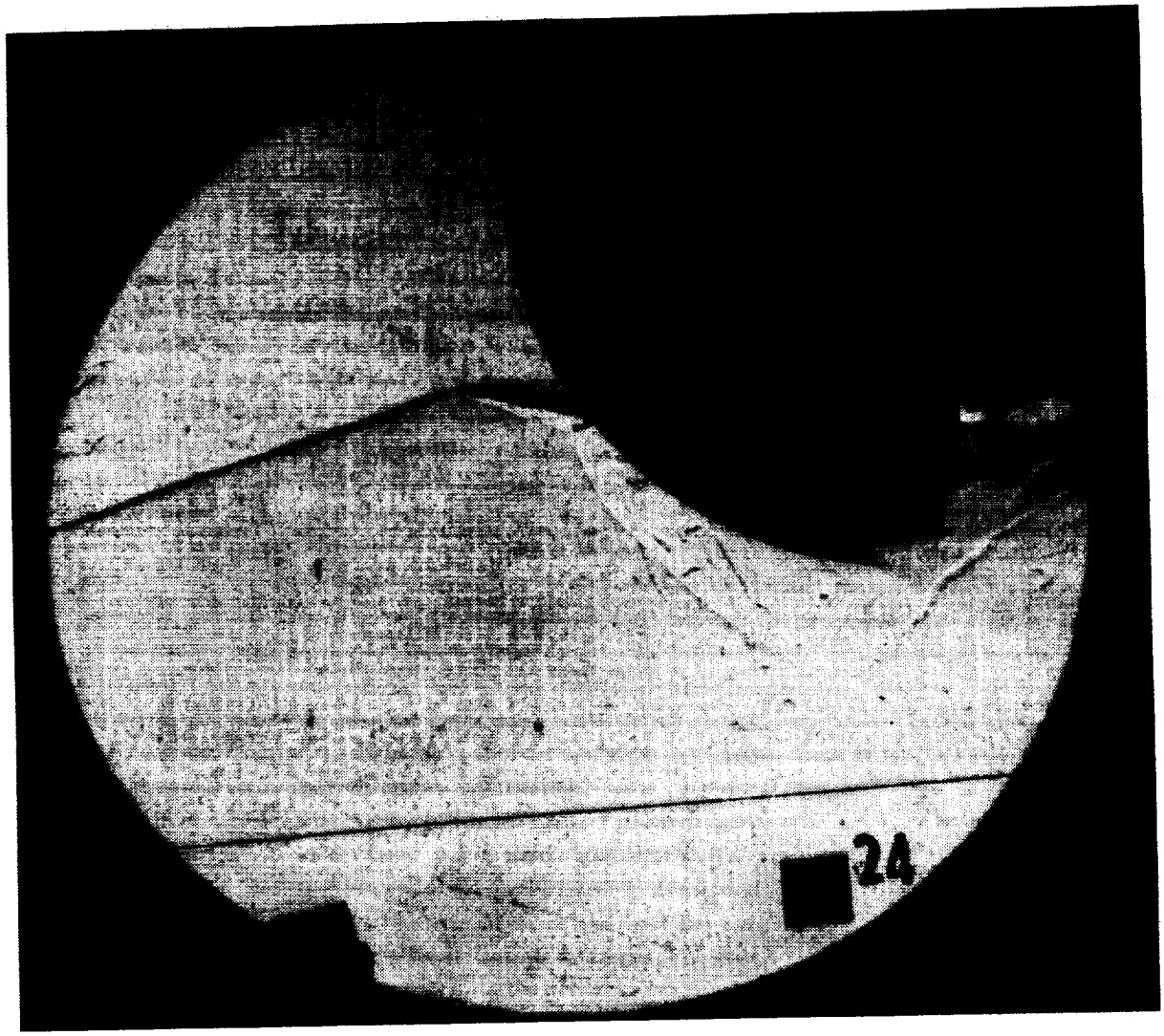
Test Conditions

Po	= 7.2710X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6310X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3940X10+3	degR	Reservoir Total Temperature
M	= 12.1100		Freestream Mach Number
U	= 5.6230X10+3	Ft/sec	Freestream Velocity
T	= 8.6640X10+1	degR	Freestream Temperature
P	= 4.3260X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0460X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.2880X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1220X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.3060X10-1	PSIA	Pitot Pressure
Q	= 4.4430X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0040		Shock Tube Incident Shock Mach Number
Hw	= 3.3545X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2513	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6395X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.5254	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00" Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.875
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 23


140
120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
$\dot{q}$ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 23

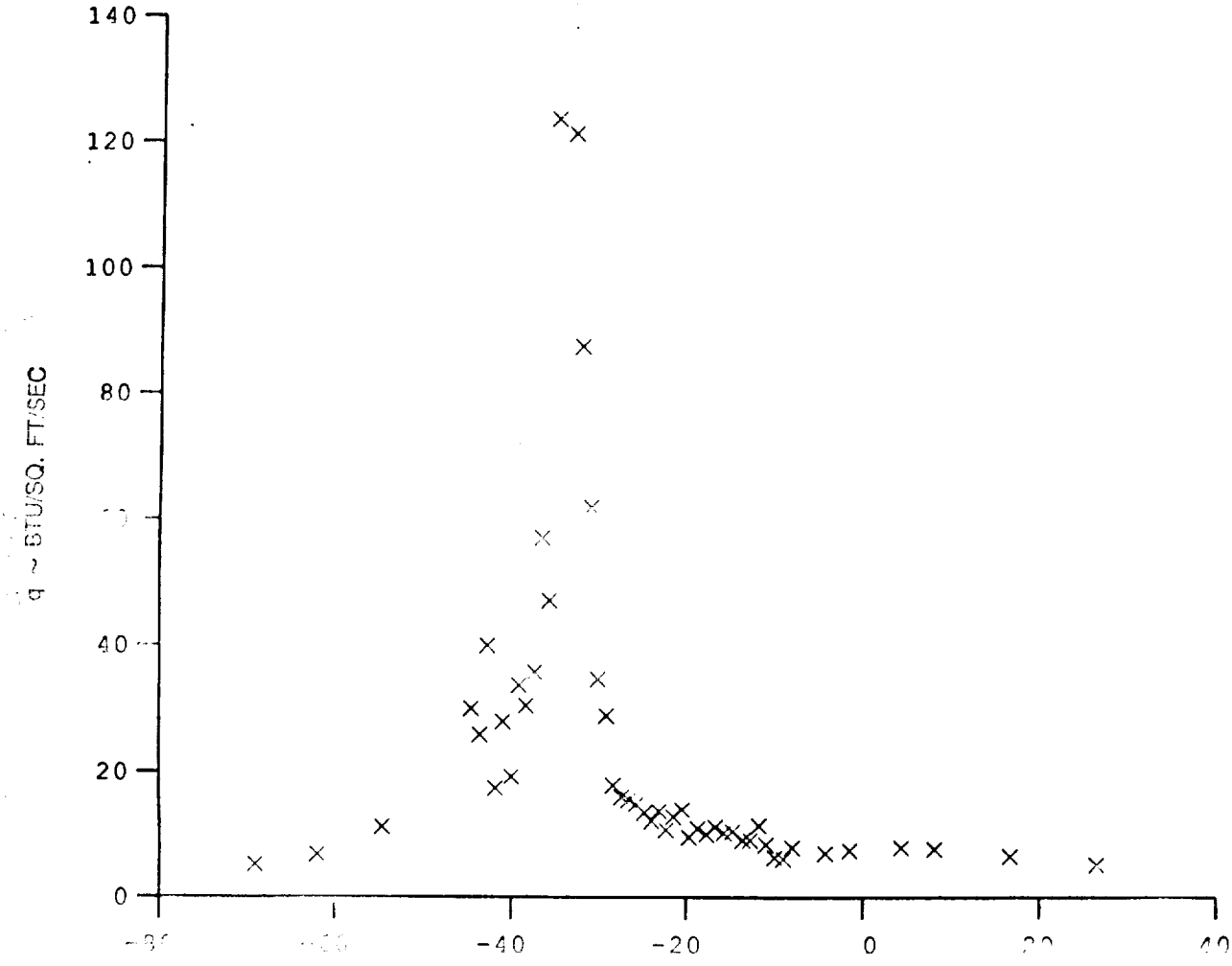


Test Conditions

Po	= 7.5140X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6890X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.4560X10+3	degR	Reservoir Total Temperature
M	= 12.0900		Freestream Mach Number
U	= 5.7220X10+3	Ft/sec	Freestream Velocity
T	= 8.9910X10+1	degR	Freestream Temperature
P	= 4.4660X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0270X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.5640X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.0460X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5610X10-1	PSIA	Pitot Pressure
Q	= 4.5780X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0470		Shock Tube Incident Shock Mach Number
Hw	= 3.3675X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1843	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.4969X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.9300	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	10.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 24

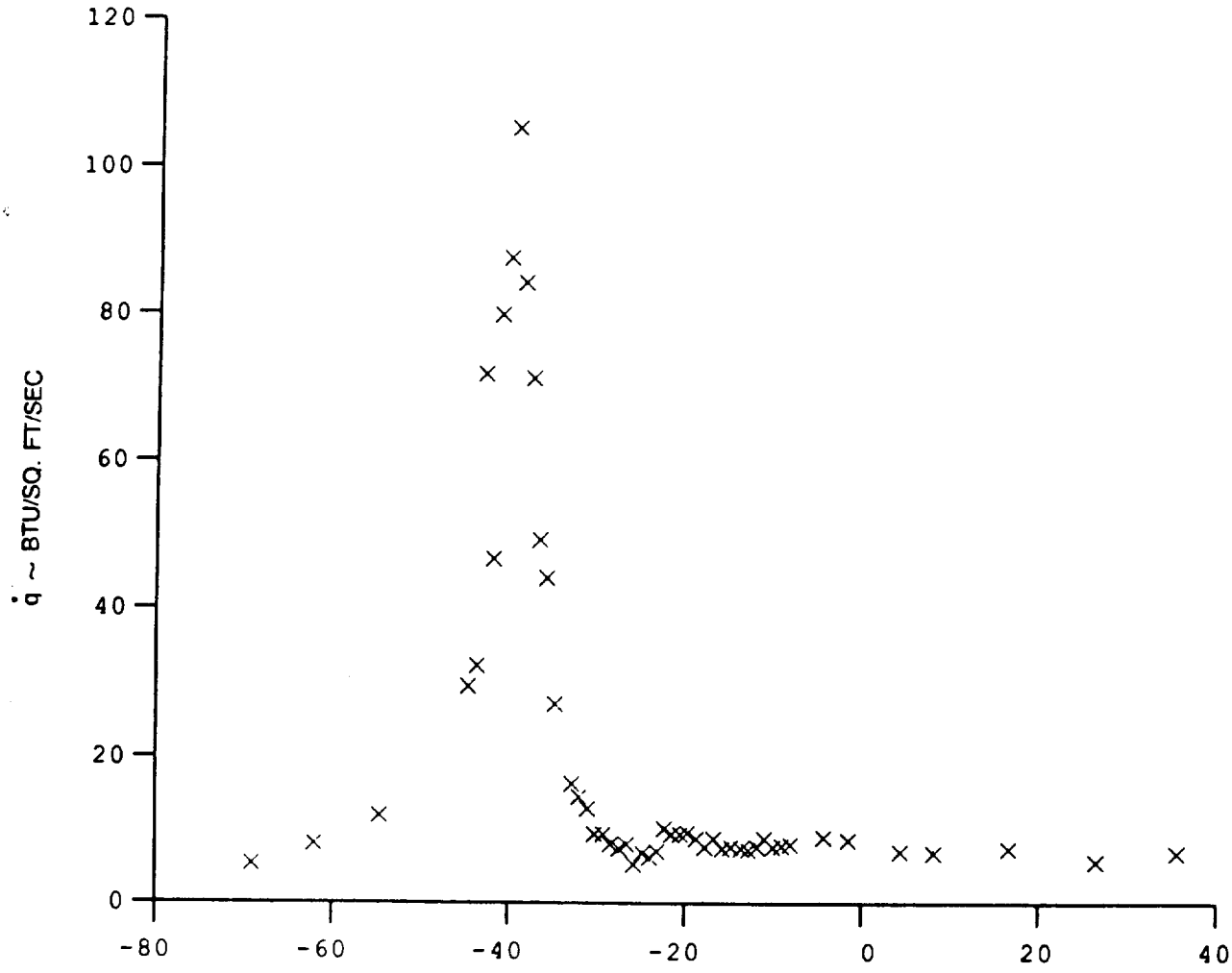

140
120
100
80
40
20
0
-40
-20
0
q ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 24

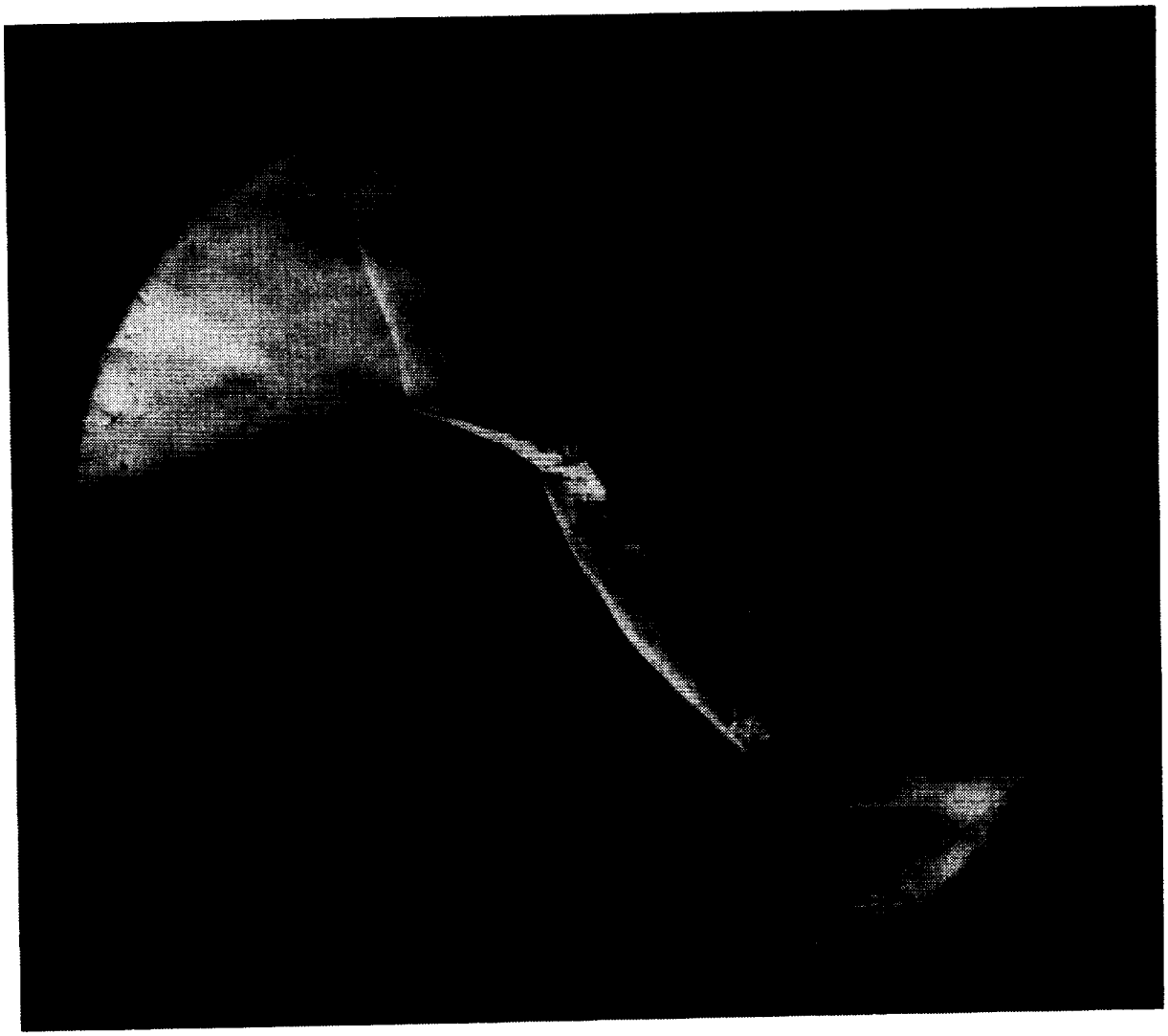
Test Conditions

Po	= 7.5310X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6810X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.4320X10+3	degR	Reservoir Total Temperature
M	= 12.1100		Freestream Mach Number
U	= 5.7090X10+3	Ft/sec	Freestream Velocity
T	= 8.9280X10+1	degR	Freestream Temperature
P	= 4.4410X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0330X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.5110X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.0660X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5370X10-1	PSIA	Pitot Pressure
Q	= 4.5650X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0200		Shock Tube Incident Shock Mach Number
Hw	= 3.3799X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1910	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5160X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.8686	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	10.875
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 25


120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 25

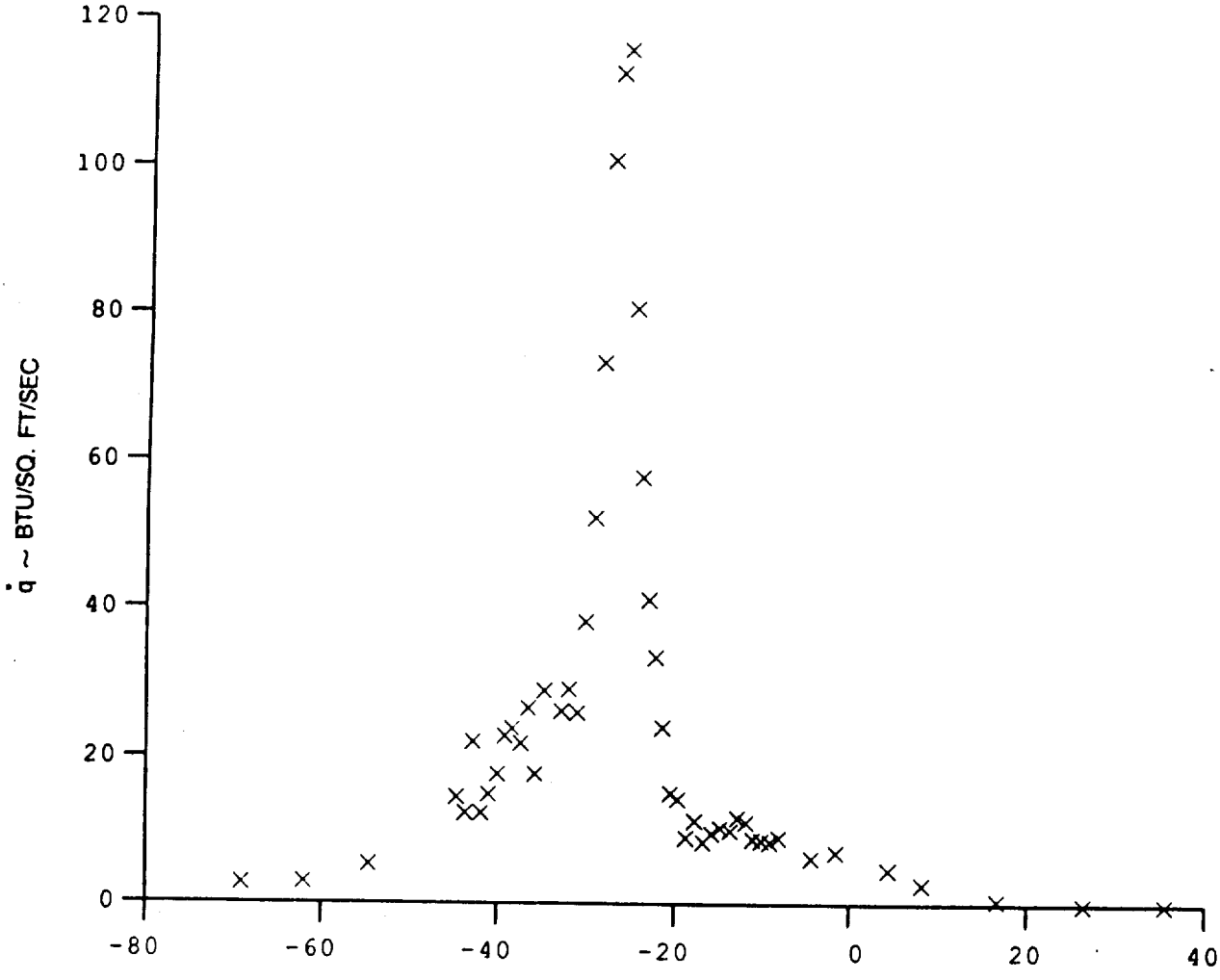


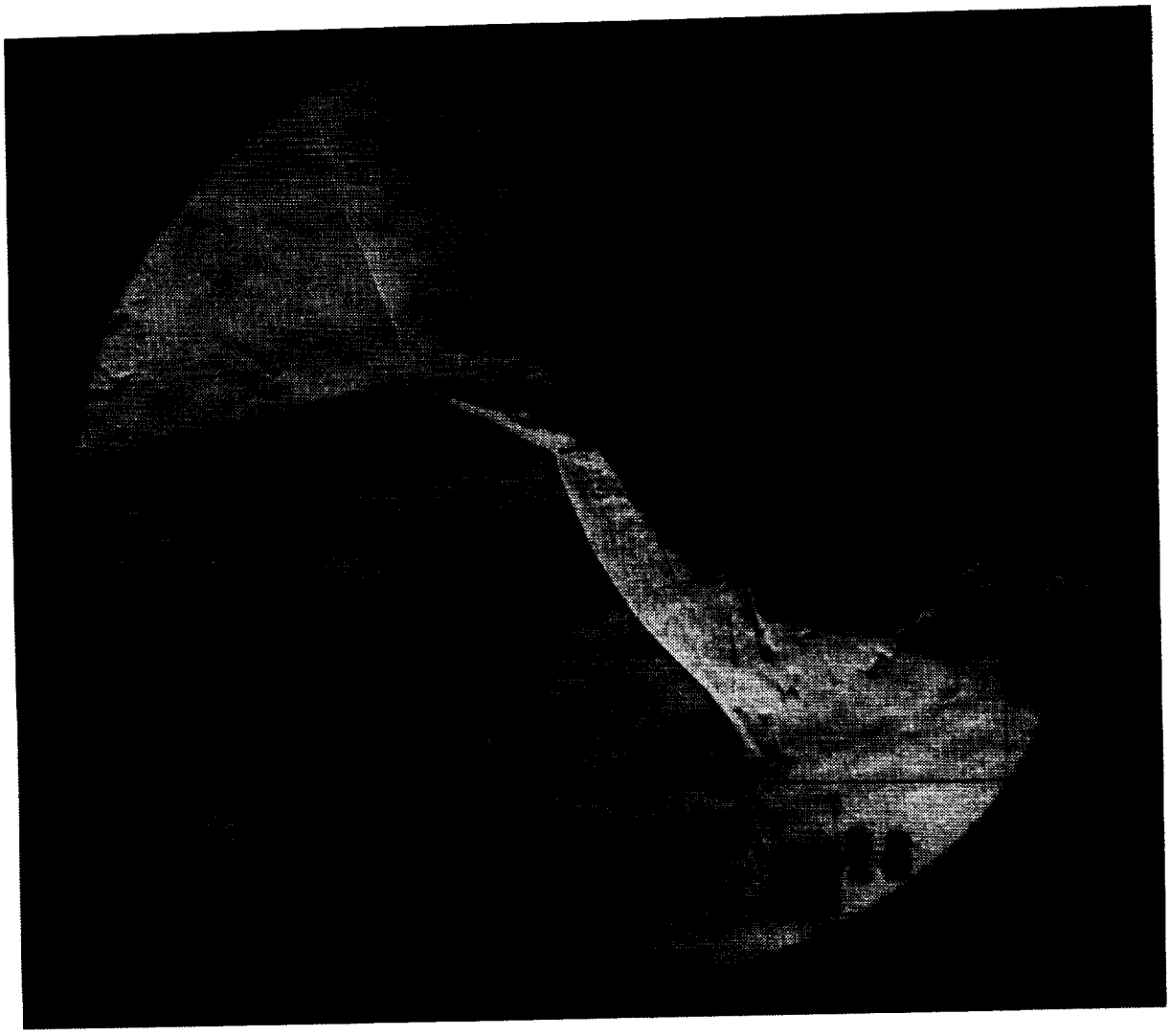
Test Conditions

Po	= 7.7080X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6090X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3970X10+3	degR	Reservoir Total Temperature
M	= 12.1200		Freestream Mach Number
U	= 5.5860X10+3	Ft/sec	Freestream Velocity
T	= 8.5380X10+1	degR	Freestream Temperature
P	= 4.5800X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3500X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.1820X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3830X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.8130X10-1	PSIA	Pitot Pressure
Q	= 4.7130X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.0230		Shock Tube Incident Shock Mach Number
Hw	= 3.3265X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1218	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5085X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.6189	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.15

Run 27


120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 27

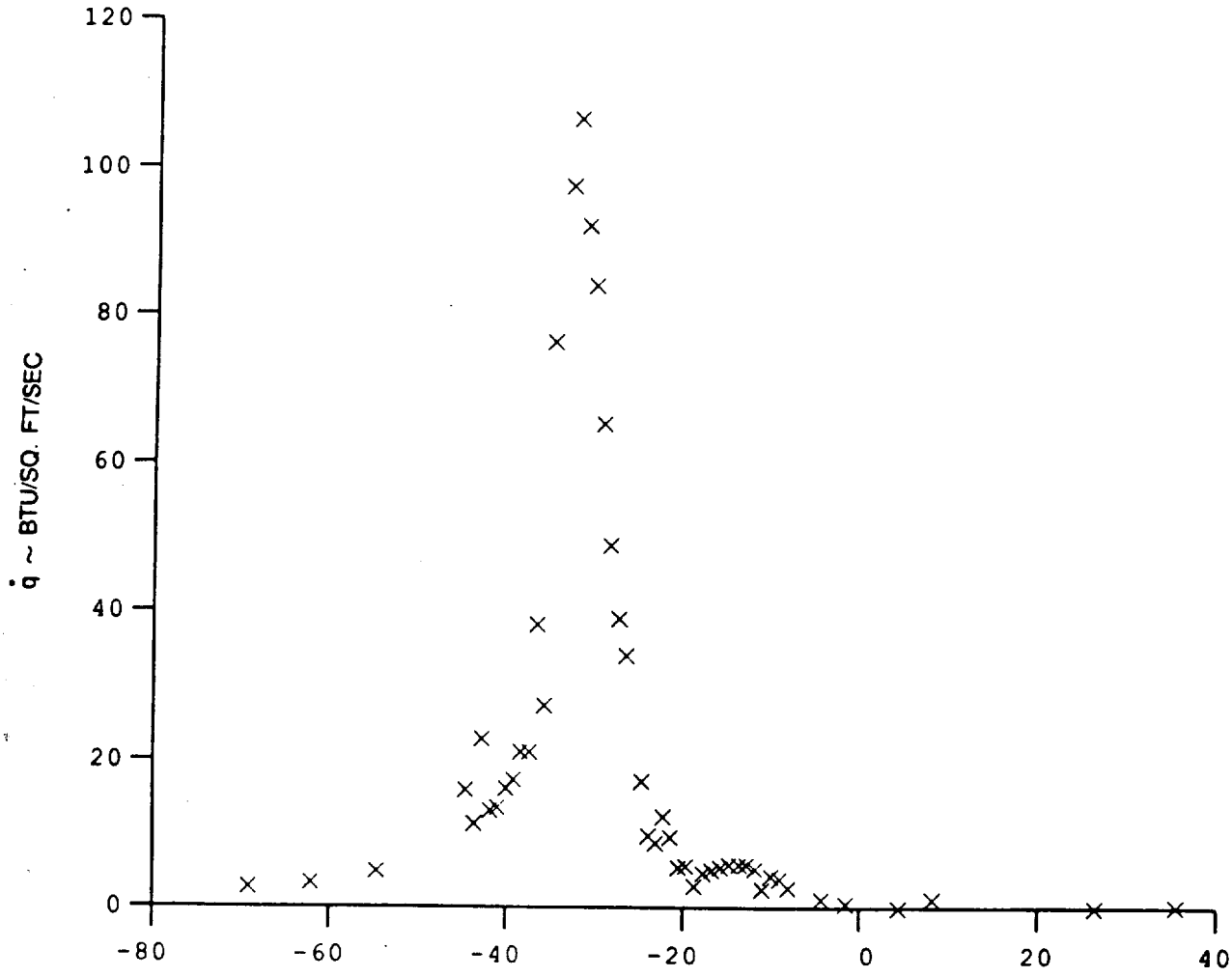


Test Conditions

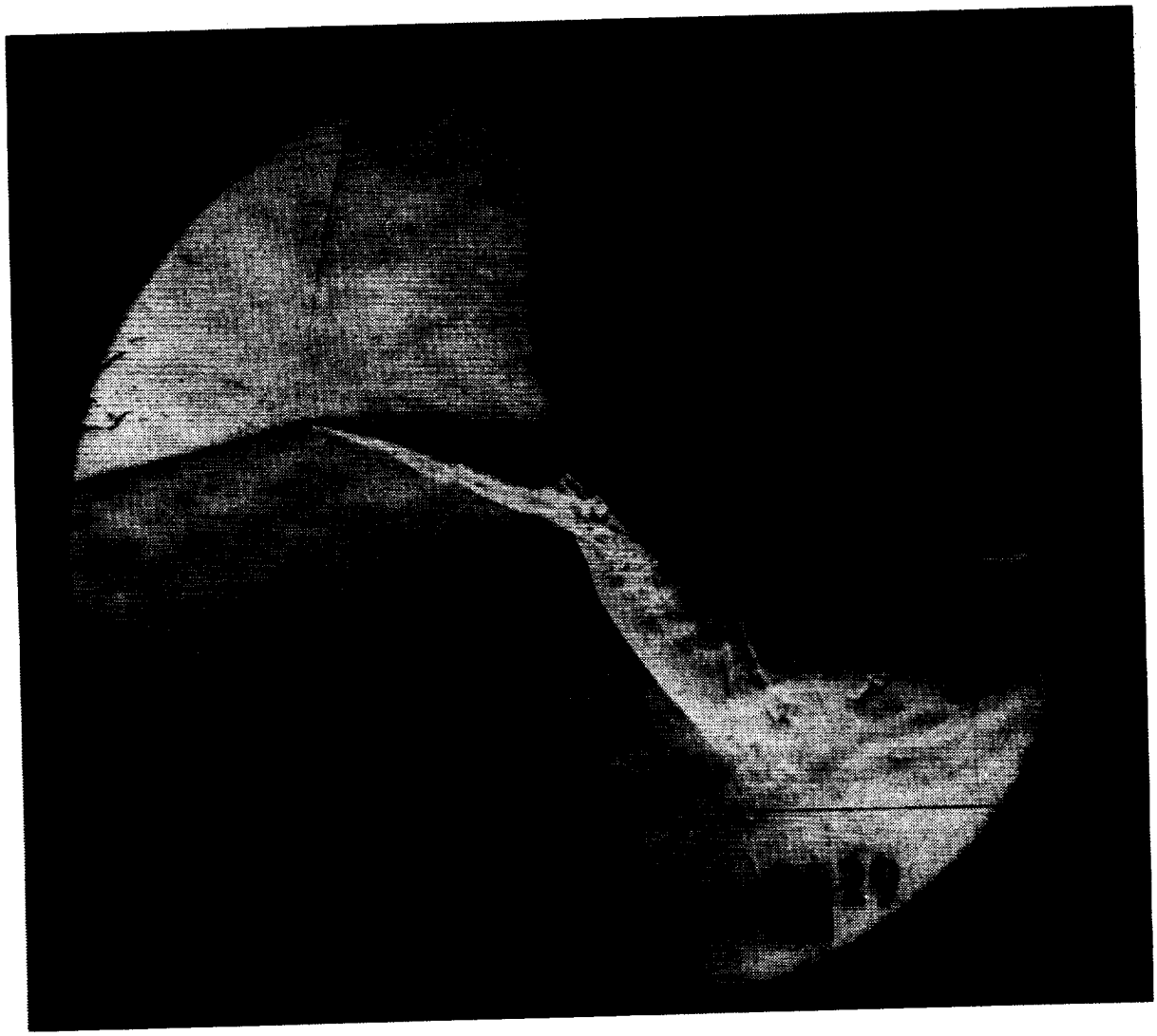
Po	= 7.3850X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5480X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3130X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.6790X10+3	Ft/sec	Freestream Velocity
T	= 8.1810X10+1	degR	Freestream Temperature
P	= 4.3660X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3270X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8810X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4450X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.4340X10-1	PSIA	Pitot Pressure
Q	= 4.5100X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9530		Shock Tube Incident Shock Mach Number
Hw	= 3.3271X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2172	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.7003X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.1466	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.20

Run 28



HEAT TRANSFER vs Gauge Position
Run 28

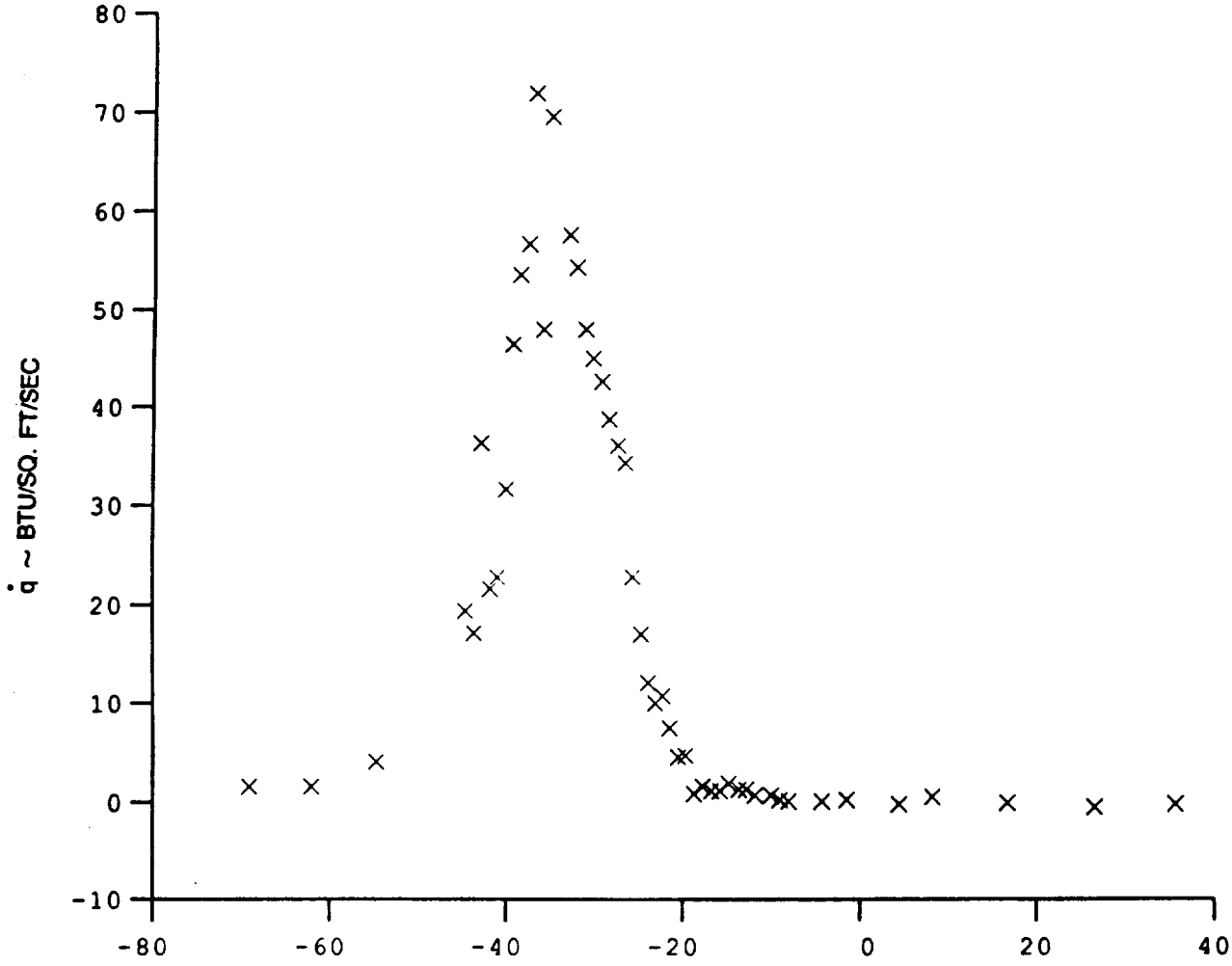


Test Conditions

Po	= 7.5010X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5610X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3280X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.5030X10+3	Ft/sec	Freestream Velocity
T	= 8.2530X10+1	degR	Freestream Temperature
P	= 4.4280X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3500X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.9420X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4480X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5540X10-1	PSIA	Pitot Pressure
Q	= 4.5740X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9640		Shock Tube Incident Shock Mach Number
Hw	= 3.3302X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1863	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6467X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.2584	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

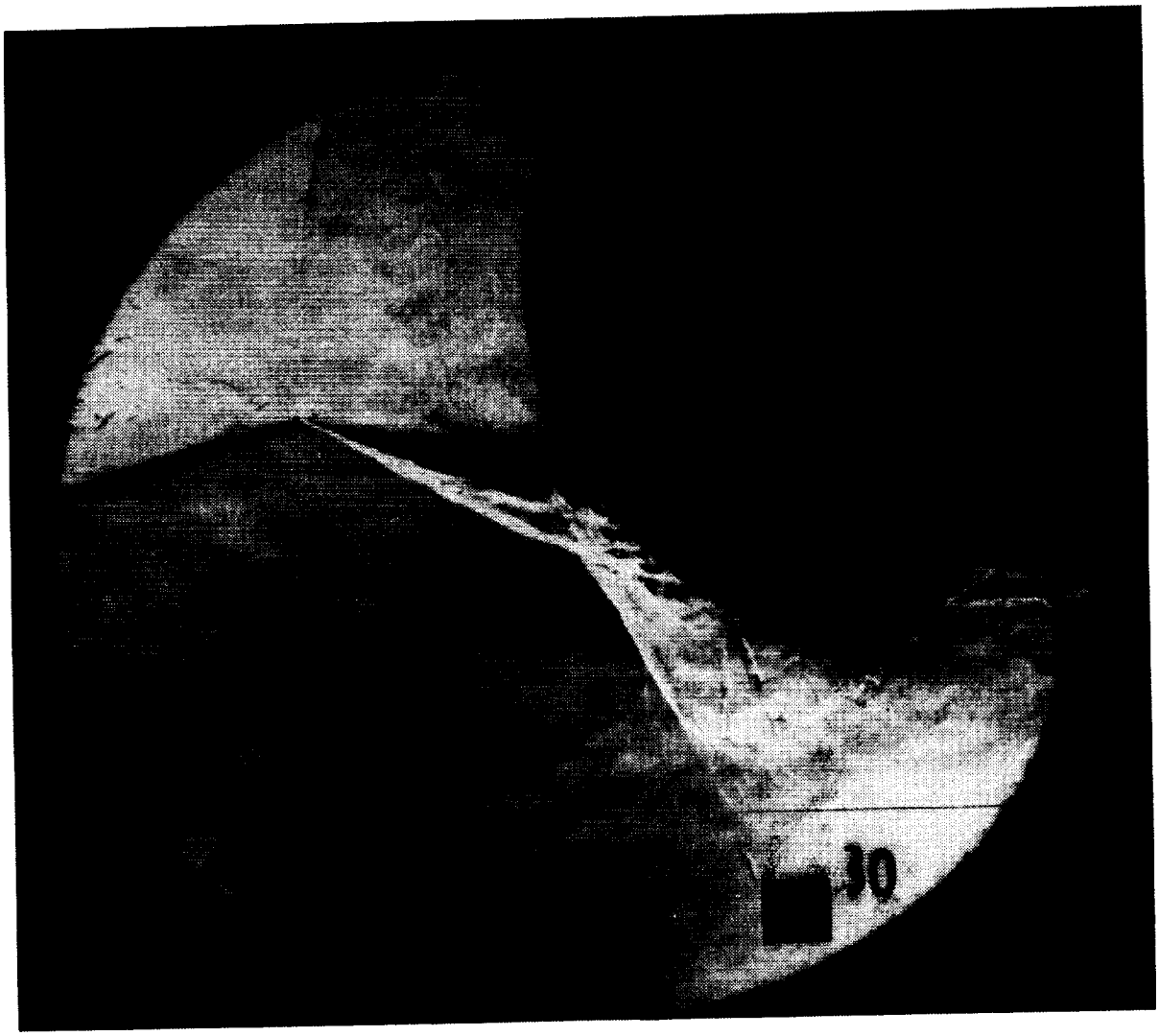
Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.26

Run 29



HEAT TRANSFER vs Gauge Position
Run 29

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

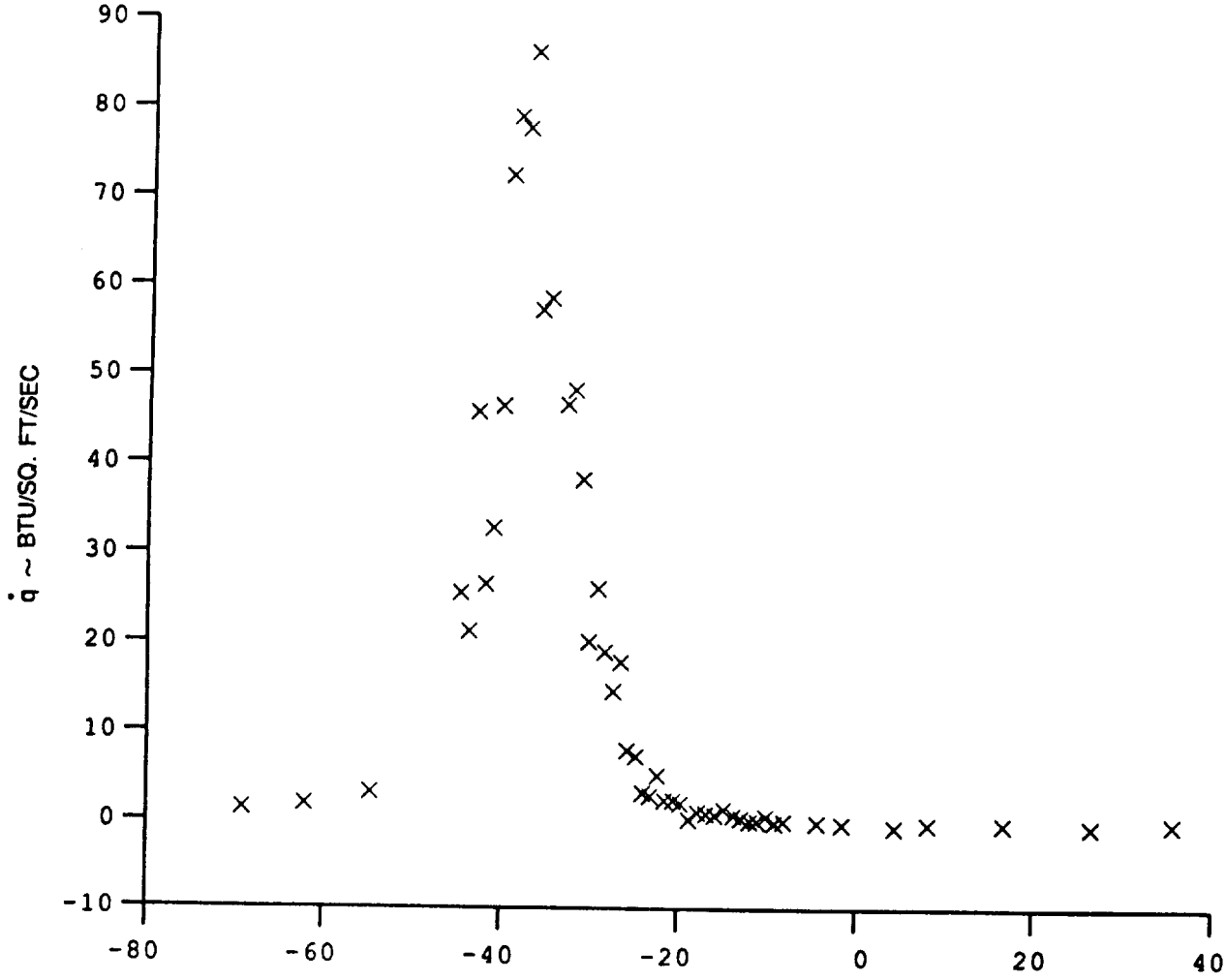


Test Conditions

Po	= 7.5900X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5690X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3330X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.5150X10+3	Ft/sec	Freestream Velocity
T	= 8.2870X10+1	degR	Freestream Temperature
P	= 4.4710X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3740X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.9710X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4610X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.6390X10-1	PSIA	Pitot Pressure
Q	= 4.6200X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9660		Shock Tube Incident Shock Mach Number
Hw	= 3.3340X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1640	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6102X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.3305	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.375
B - See Shock Generator Diagram	(inches)	3.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.31

Run 30

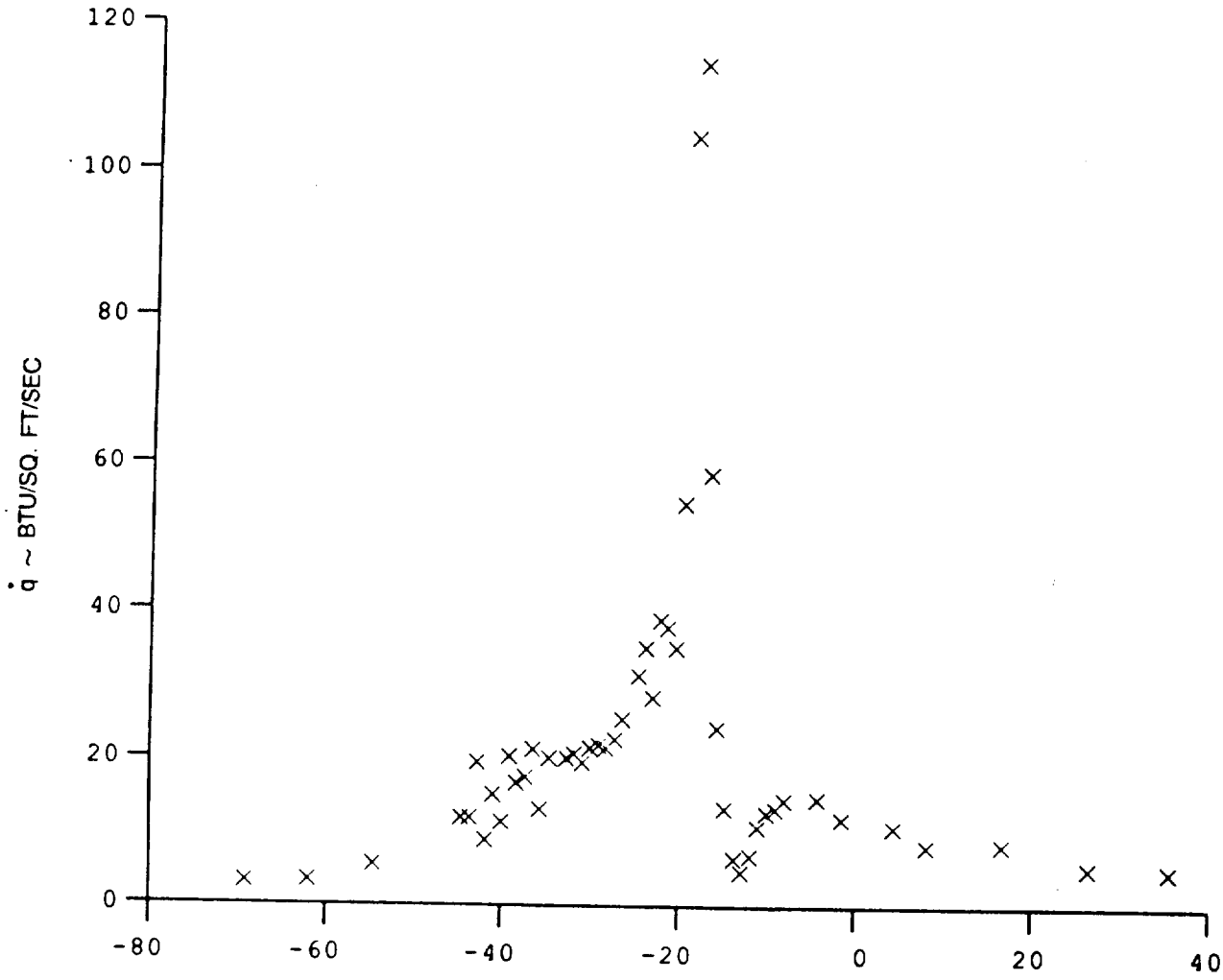

90
80
70
60
50
40
30
20
10
0
-10
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 30

Test Conditions

Po	= 7.5410X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5170X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2810X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 5.4240X10+3	Ft/sec	Freestream Velocity
T	= 7.9930X10+1	degR	Freestream Temperature
P	= 4.4350X10-3	PSIA	Freestream Static Pressure
Rho	= 4.4990X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.7220X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.6300X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5930X10-1	PSIA	Pitot Pressure
Q	= 4.5950X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9310		Shock Tube Incident Shock Mach Number
Hw	= 3.3178X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1759	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6900X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.0427	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

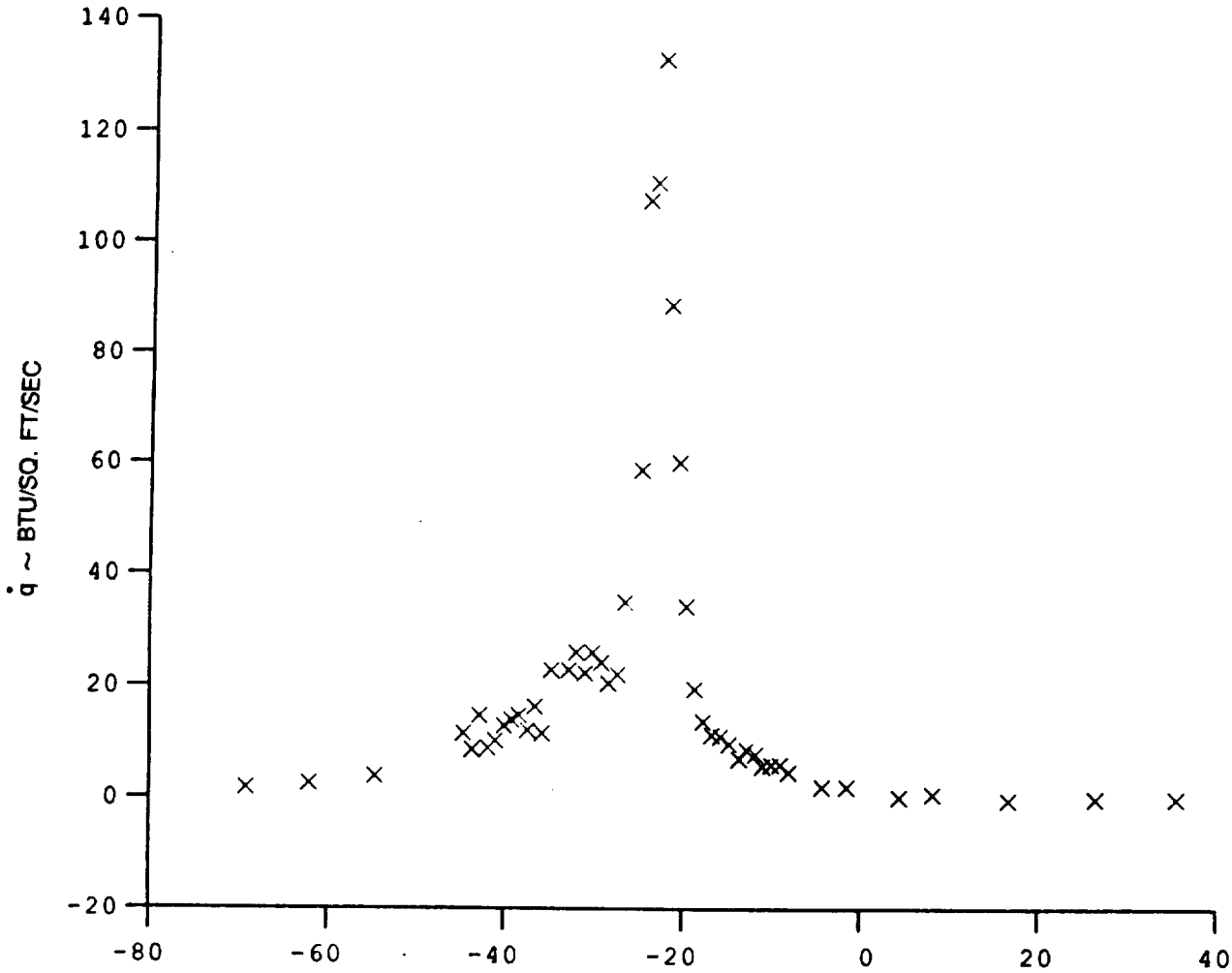
Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.575
B - See Shock Generator Diagram	(inches)	9.295
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

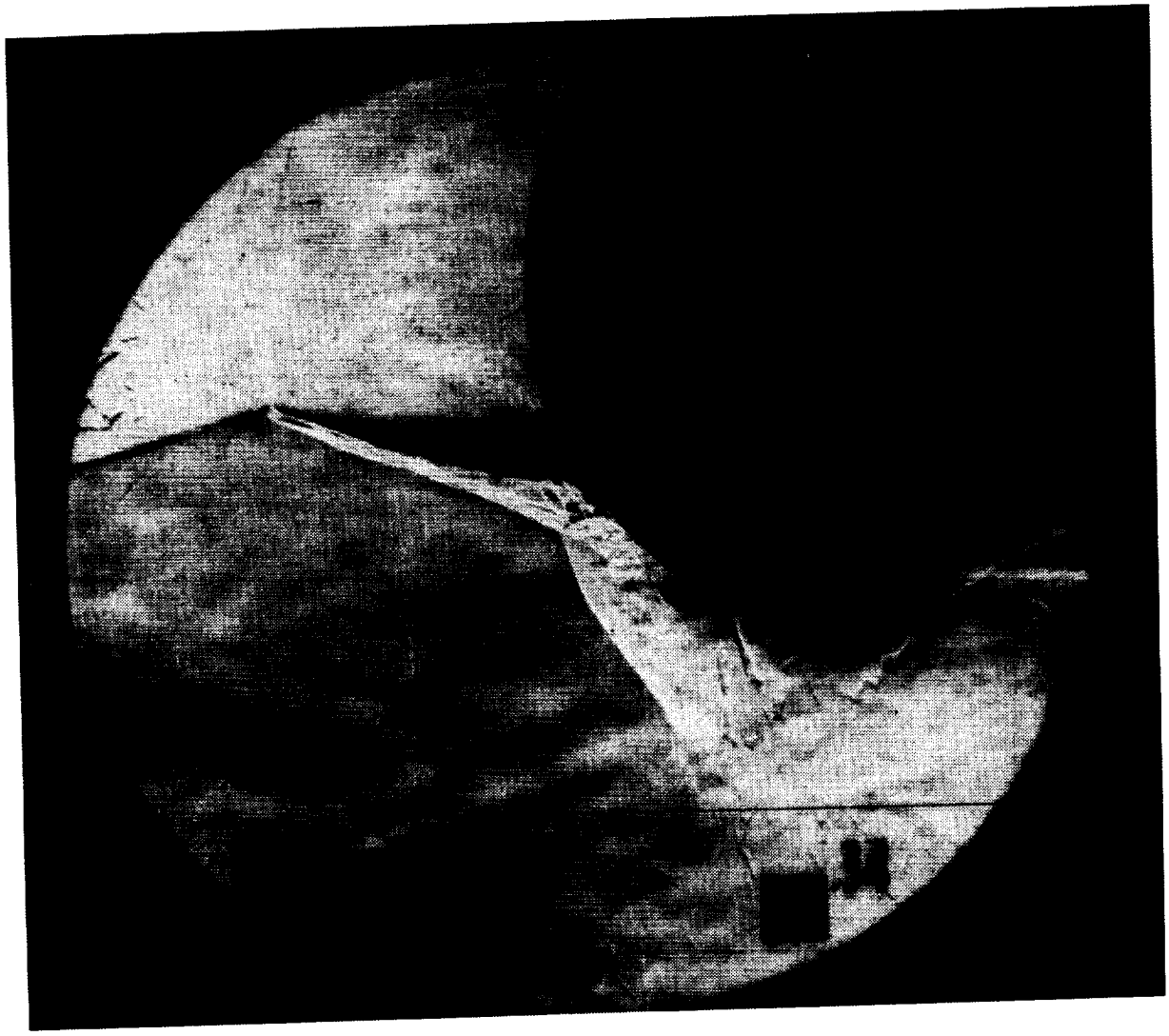
Run 31


120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
$\dot{q}$ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 31

Test Conditions				Model Parameter		
Po =	3.9440X10+3	PSIA	Reservoir Total Pressure	A - see shock generator diagram	(inches)	8.761
Ho =	1.8008X10+7	(Ft/sec)2	Reservoir Total Enthalpy	B - see shock generator diagram	(inches)	3.402
To =	2.6586X10+3	degR	Reservoir Total Temperature			
M =	12.5450		Freestream Mach Number			
U =	5.9155X10+3	Ft/sec	Freestream Velocity			
T =	8.9334X10+1	degR	Freestream Temperature			
P =	1.9029X10-2	PSIA	Freestream Static Pressure			
Rho =	1.7271X10-5	Slugs/Ft3	Freestream Density			
Mu =	7.0810X10-8	Slugs/Ft-sec	Freestream Viscosity			
Re =	1.4428X10+6	1/Ft	Freestream Reynolds Number			
Po' =	3.9243	PSIA	Pitot Pressure			
Q =	2.0985	PSIA	Dynamic Pressure (Rho U^2/288)			
Mi =	3.2450		Shock Tube Incident Shock Mach Number			
Hw =	3.3073X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)			
CPf =	4.7653X10-1	1/PSIA	Pressure to CP factor (1/Q)			
CHf =	5.1800X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))			
QoFR=	1.6213X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)			

Run 43


140
120
100
80
60
40
20
0
-20
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 33

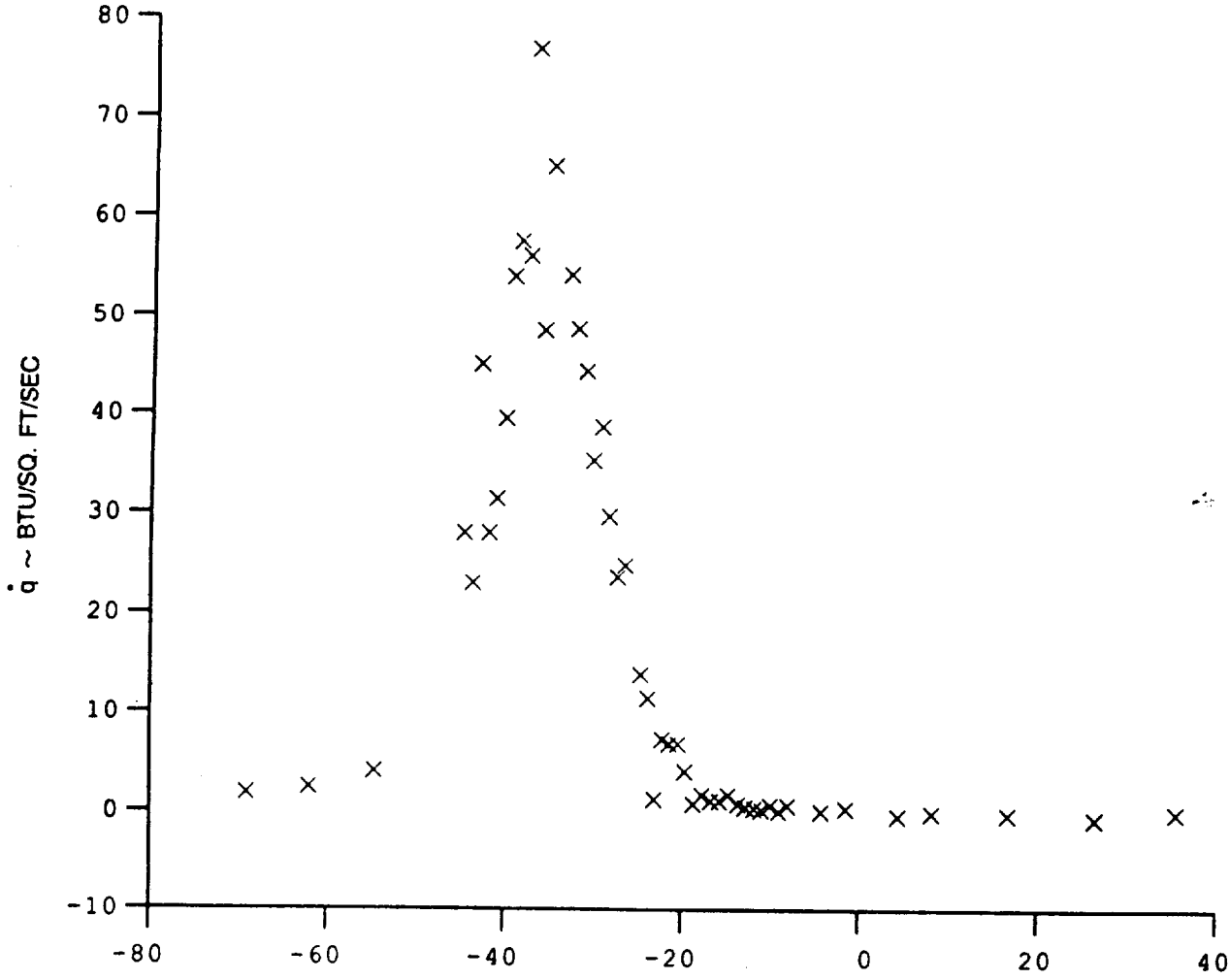


Test Conditions

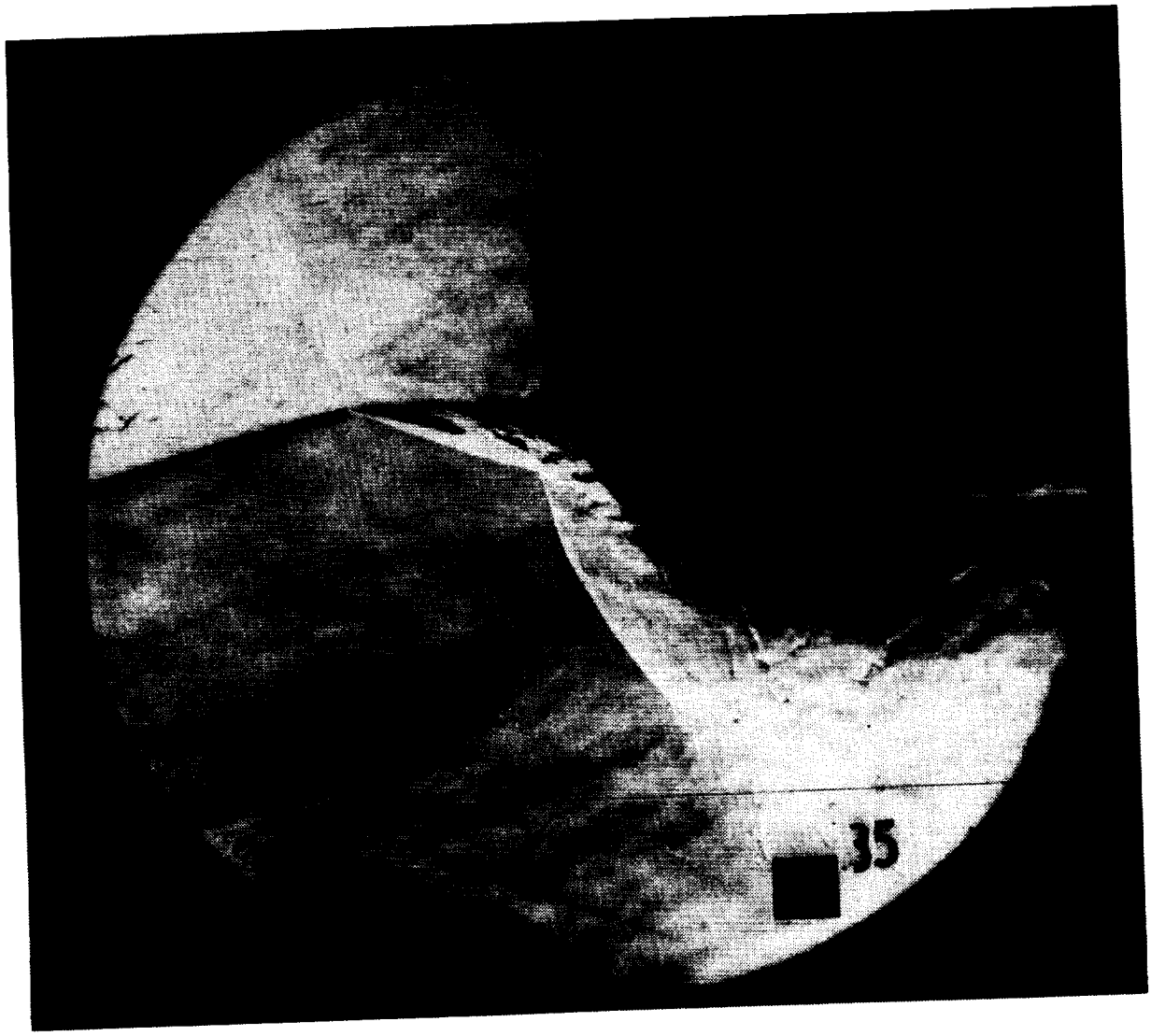
Po	= 7.9020X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6040X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3700X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.5770X10+3	Ft/sec	Freestream Velocity
T	= 8.4720X10+1	degR	Freestream Temperature
P	= 4.6320X10-3	PSIA	Freestream Static Pressure
Rho	= 4.4330X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.1260X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4690X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.9530X10-1	PSIA	Pitot Pressure
Q	= 4.7870X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9900		Shock Tube Incident Shock Mach Number
Hw	= 3.3439X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.0888	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.4786X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.6311	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.128
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.31

Run 34



HEAT TRANSFER vs Gauge Position
Run 34

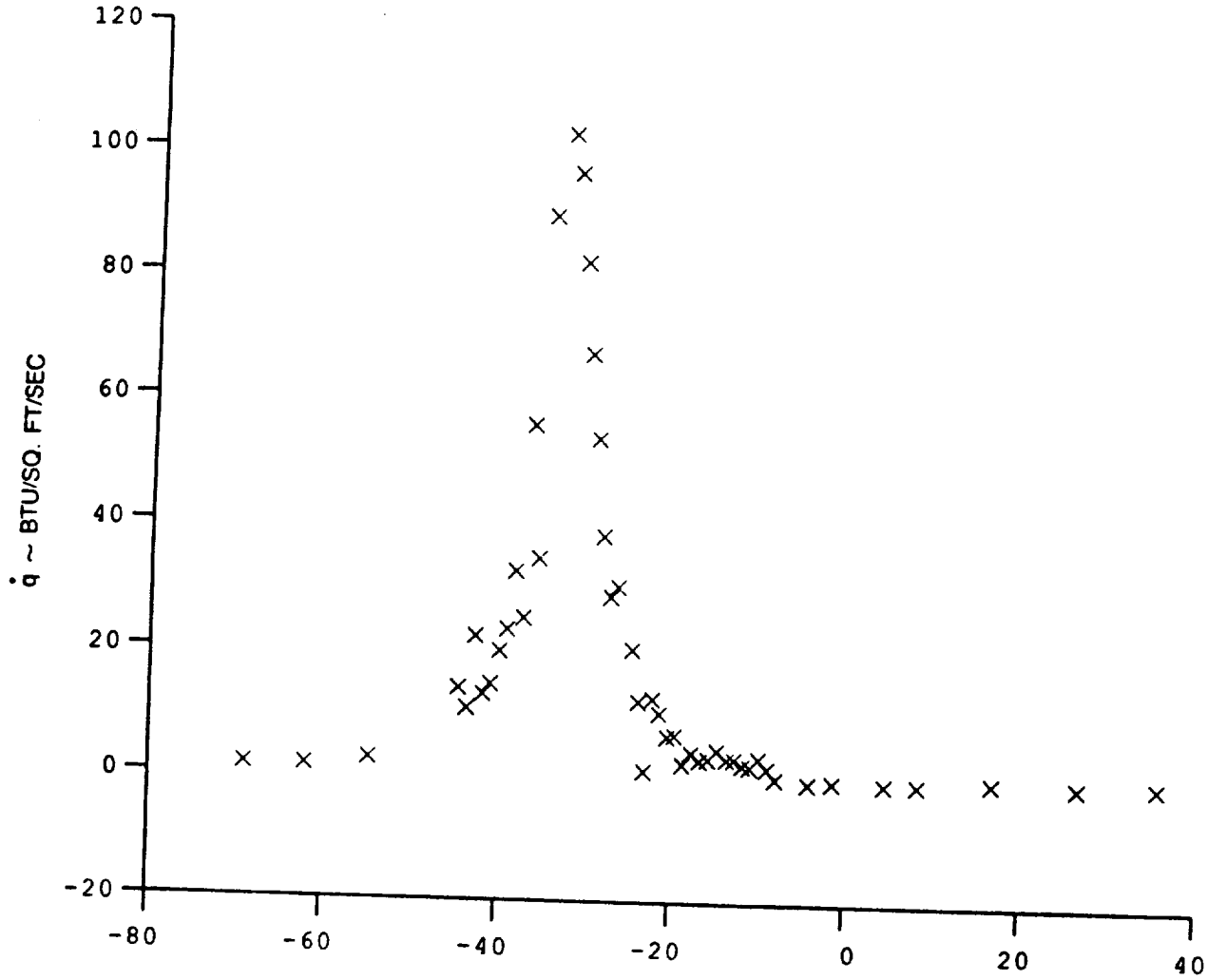


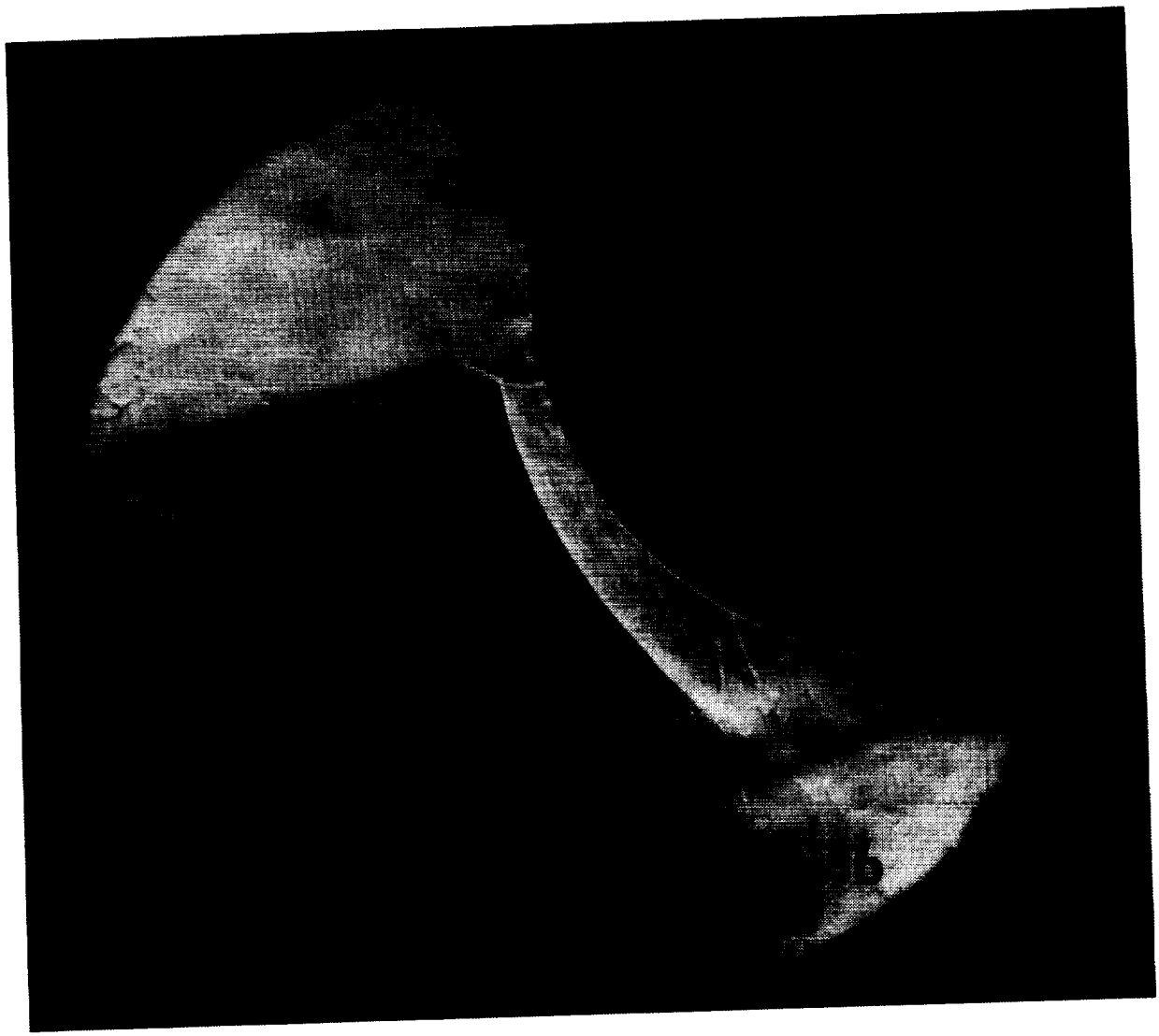
Test Conditions

Po	= 8.0630X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6100X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3710X10+3	degR	Reservoir Total Temperature
M	= 12.1500		Freestream Mach Number
U	= 5.5880X10+3	Ft/sec	Freestream Velocity
T	= 6.4950X10+1	degR	Freestream Temperature
P	= 4.7020X10-3	PSIA	Freestream Static Pressure
Rho	= 4.6870X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.1460X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.5090X10+5	1/Ft	Freestream Reynolds Number
Po'	= 9.0990X10-1	PSIA	Pitot Pressure
Q	= 4.8660X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9870		Shock Tube Incident Shock Mach Number
Hw	= 3.3507X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.0555	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.4338X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.7077	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.120
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.36

Run 35


120
100
80
60
40
20
0
-20
q̇ ~ BTU/SQ. FT/SEC
-80
-60
-40
-20
0
20
40
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 35

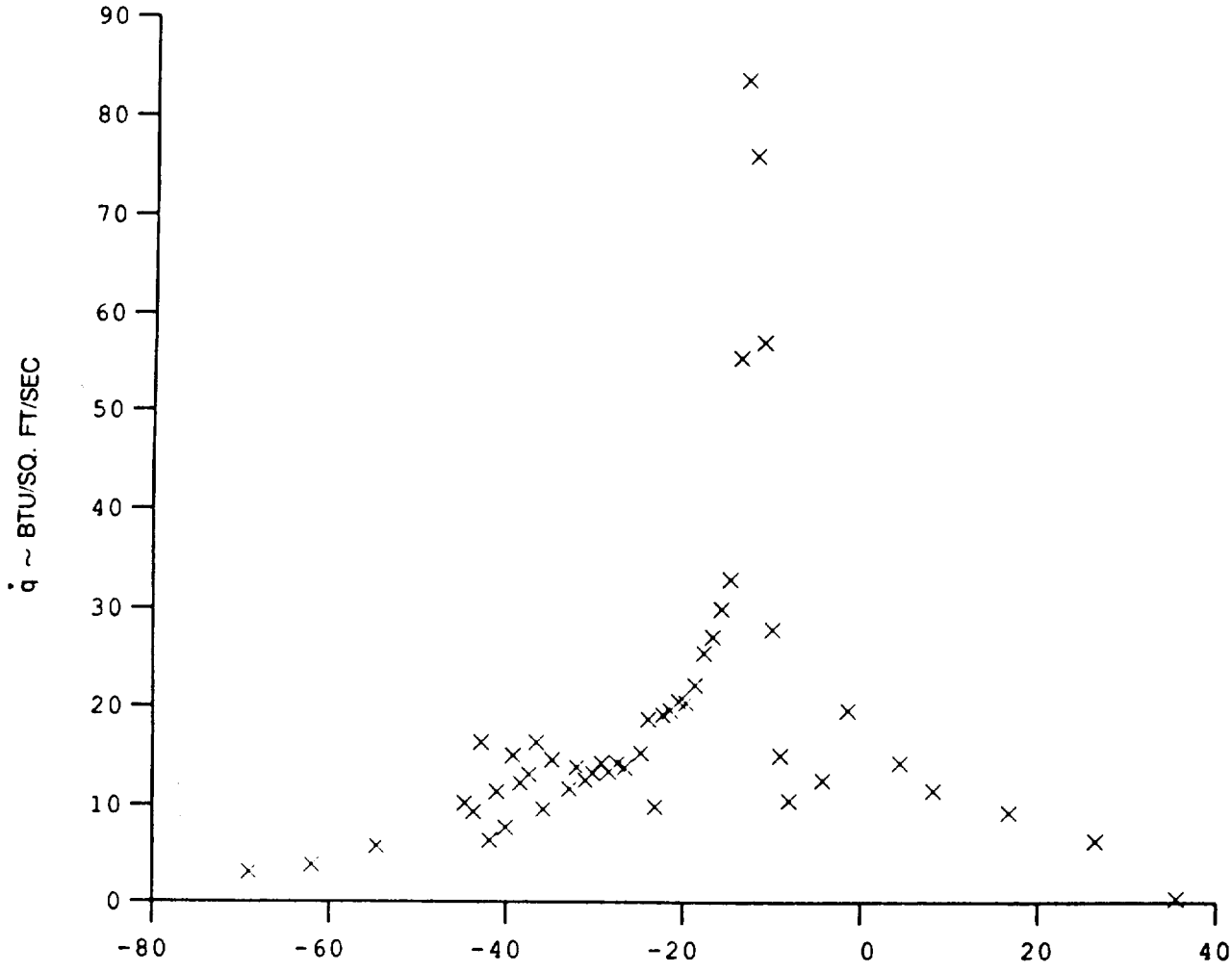


Test Conditions

Po	= 7.8260X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5640X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3200X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 5.5080X10+3	Ft/sec	Freestream Velocity
T	= 8.2400X10+1	degR	Freestream Temperature
P	= 4.5680X10-3	PSIA	Freestream Static Pressure
Rho	= 4.4950X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.9310X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.5720X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.8550X10-1	PSIA	Pitot Pressure
Q	= 4.7350X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9510		Shock Tube Incident Shock Mach Number
Hw	= 3.3408X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1119	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5549X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.3770	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.120
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 36

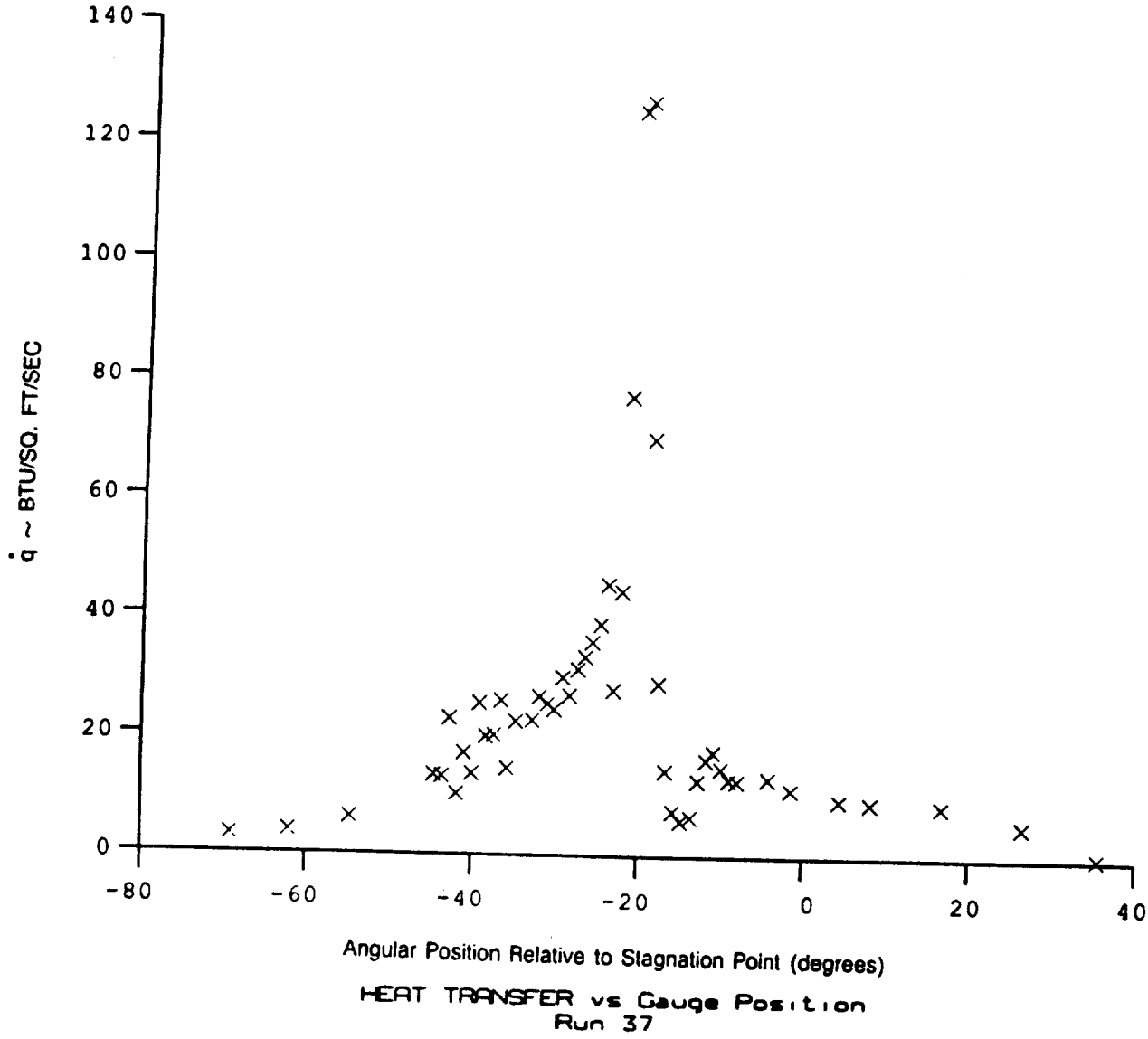

90
80
70
60
50
40
30
20
10
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 36

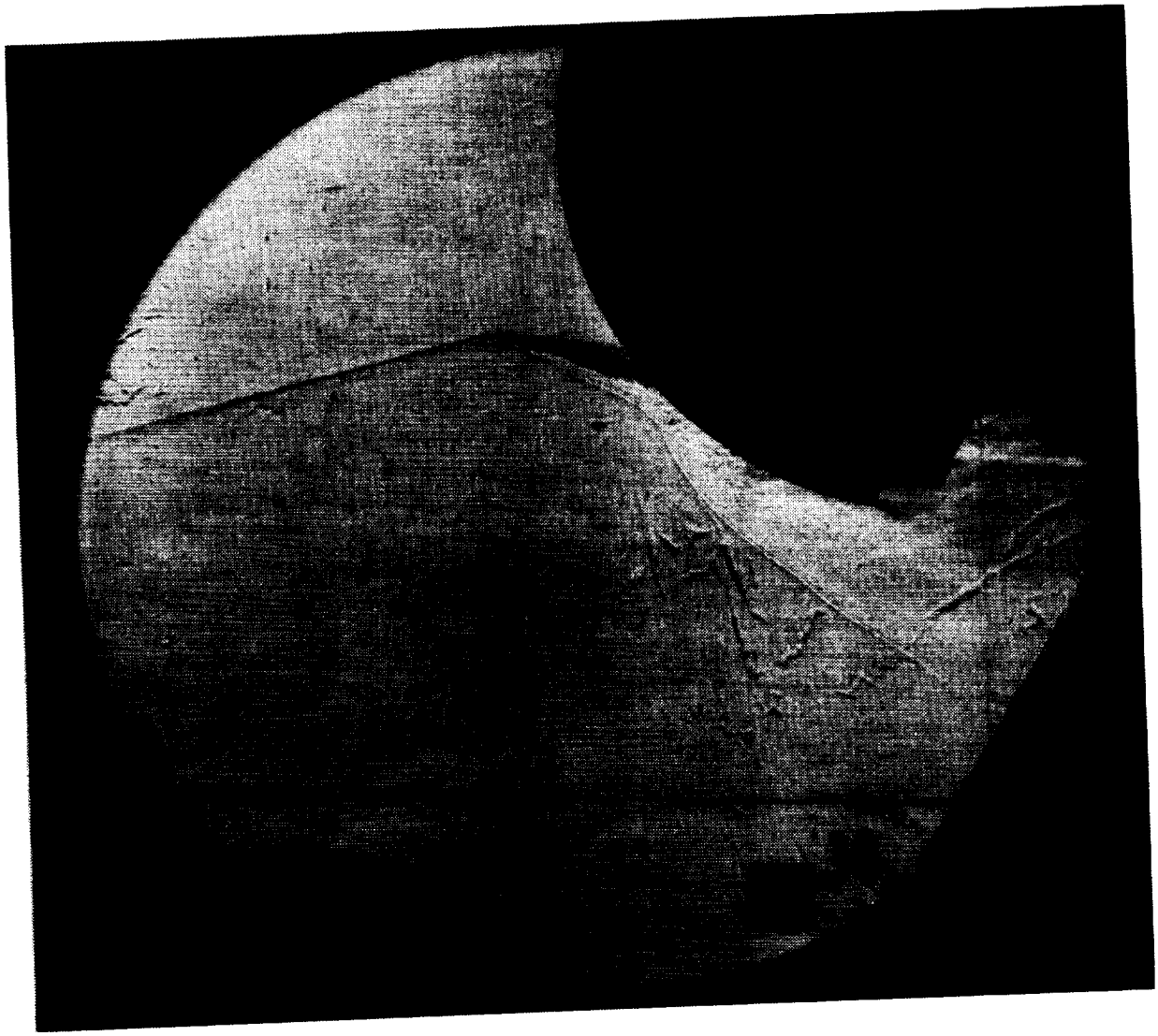
Test Conditions

Po	= 7.9750X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6000X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3560X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 5.5700X10+3	Ft/sec	Freestream Velocity
T	= 8.4350X10+1	degR	Freestream Temperature
P	= 6.6490X10-3	PSIA	Freestream Static Pressure
Rho	= 4.4680X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0960X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.5070X10+5	1/Ft	Freestream Reynolds Number
Po'	= 9.0010X10-1	PSIA	Pitot Pressure
Q	= 4.8130X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9750		Shock Tube Incident Shock Mach Number
Hw	= 3.3513X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.0776	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.4715X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.6218	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.728
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
Lambda		0.0

Run 37


140
120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 37

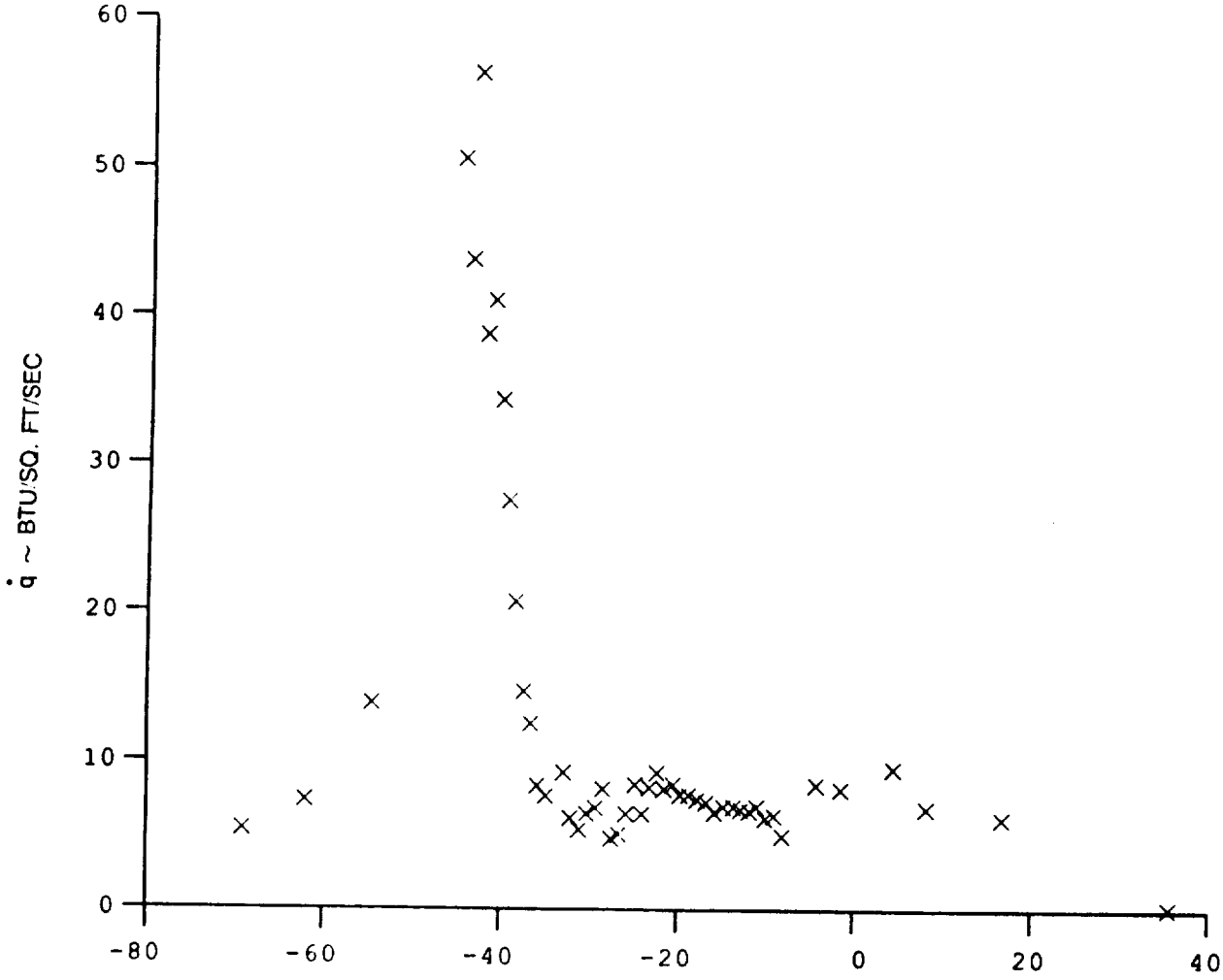


Test Conditions

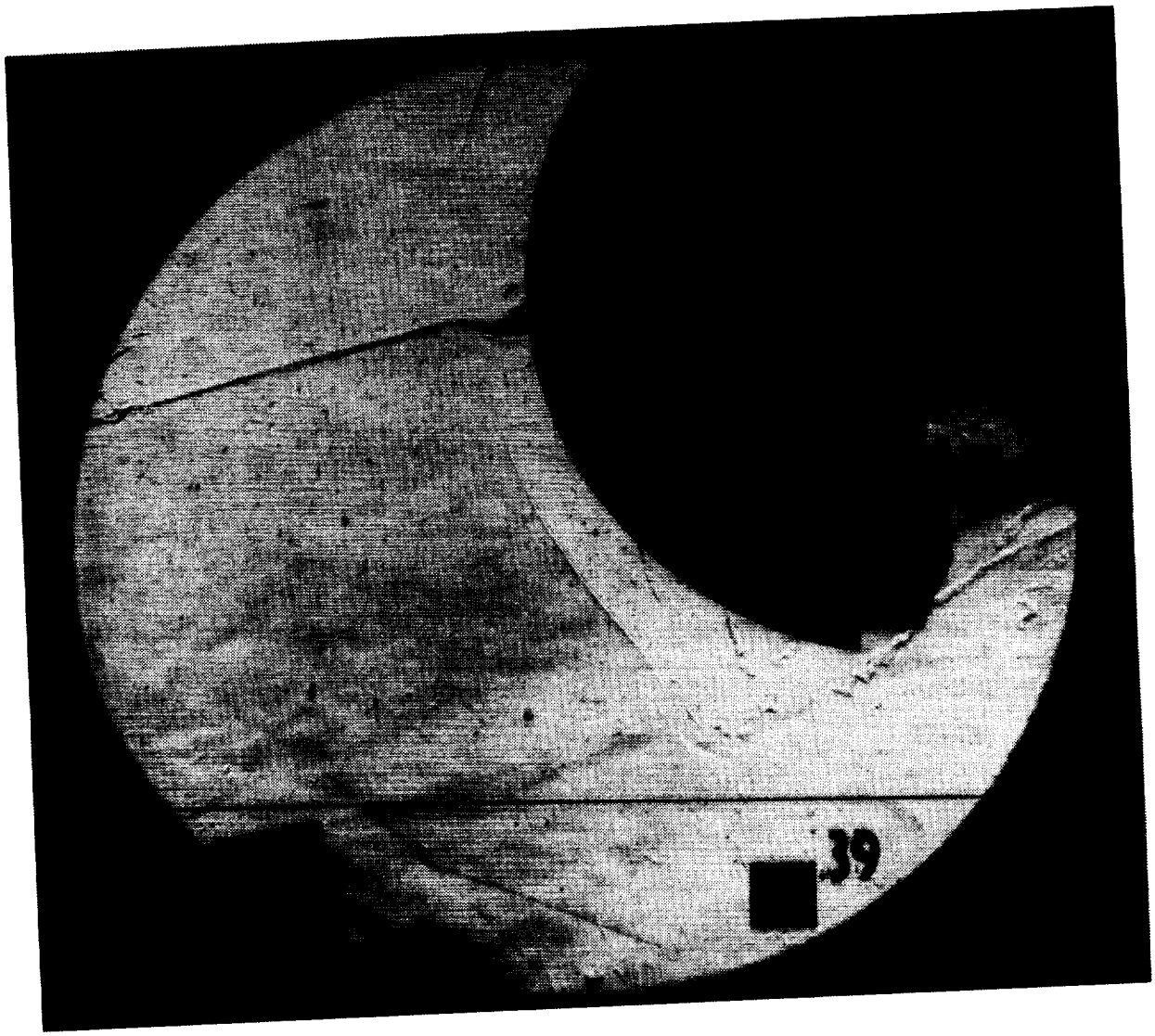
Po	= 7.9870X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5830X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3300X10+3	degR	Reservoir Total Temperature
M	= 12.1700		Freestream Mach Number
U	= 5.5410X10+3	Ft/sec	Freestream Velocity
T	= 8.3300X10+1	degR	Freestream Temperature
P	= 4.6330X10-3	PSIA	Freestream Static Pressure
Rho	= 4.5090X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0070X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.5660X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.9900X10-1	PSIA	Pitot Pressure
Q	= 4.8070X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9510		Shock Tube Incident Shock Mach Number
Hw	= 3.3551X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.0803	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.4962X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.5210	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	11.428
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 38


60
50
40
30
20
10
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 38

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

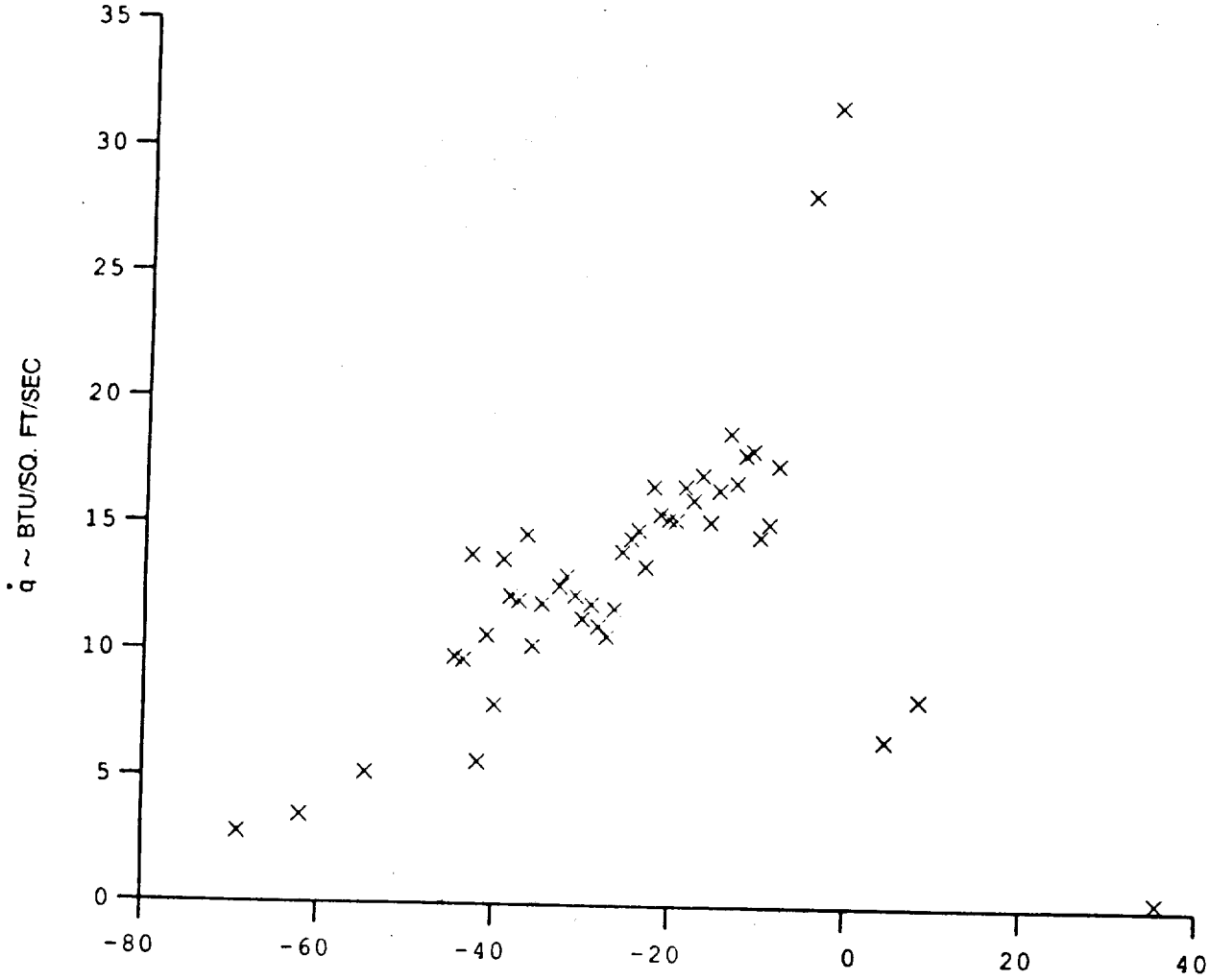


Test Conditions

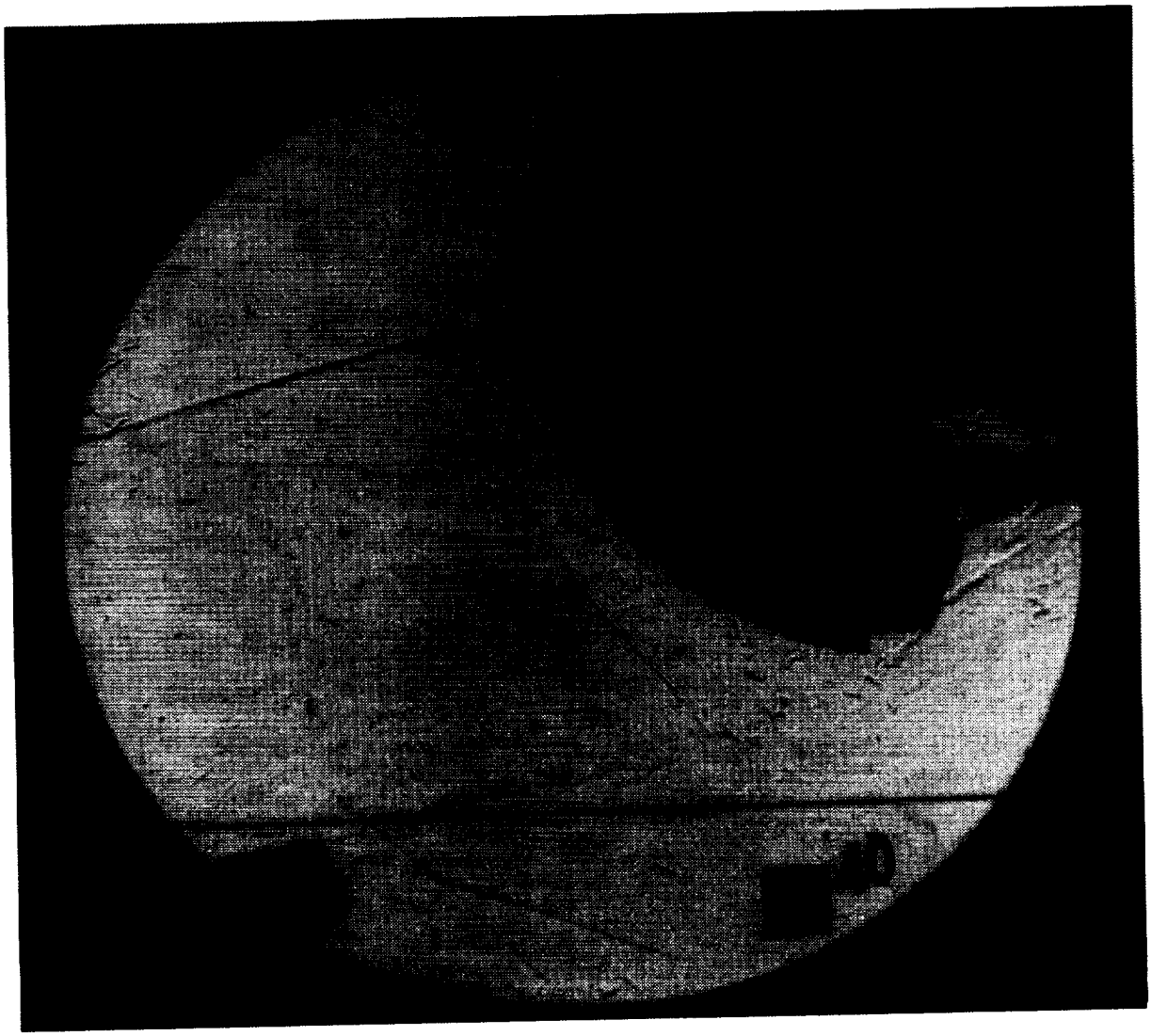
Po	= 7.5600X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5480X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2800X10+3	degR	Reservoir Total Temperature
M	= 12.1700		Freestream Mach Number
U	= 5.4800X10+3	Ft/sec	Freestream Velocity
T	= 8.1420X10+1	degR	Freestream Temperature
P	= 4.3950X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3770X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8480X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.5020X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5330X10-1	PSIA	Pitot Pressure
Q	= 4.5630X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9080		Shock Tube Incident Shock Mach Number
Hw	= 3.3576X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1911	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6757X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.1627	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.636
B - See Shock Generator Diagram	(inches)	3.425
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 39


35
30
25
20
15
10
5
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 39

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

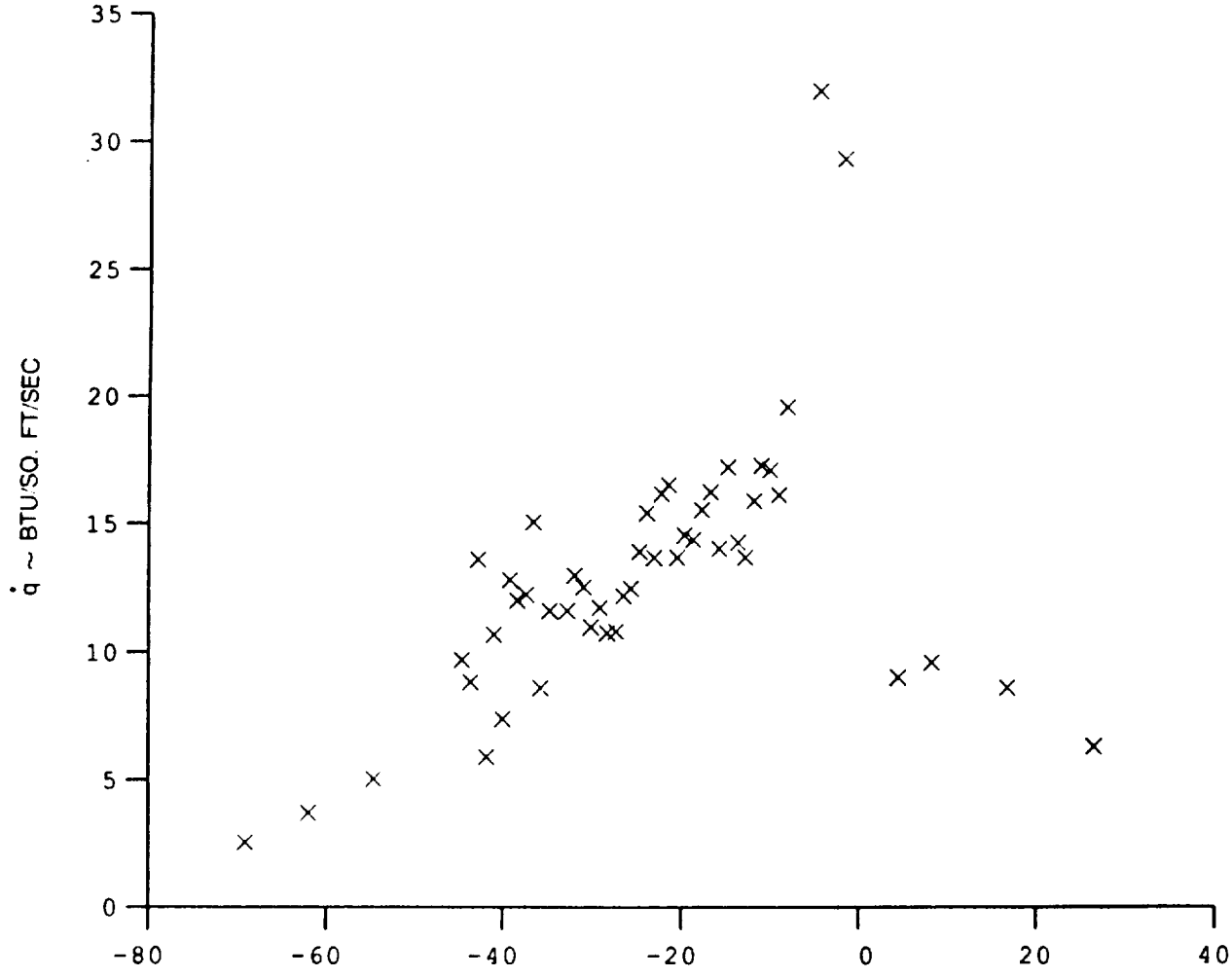


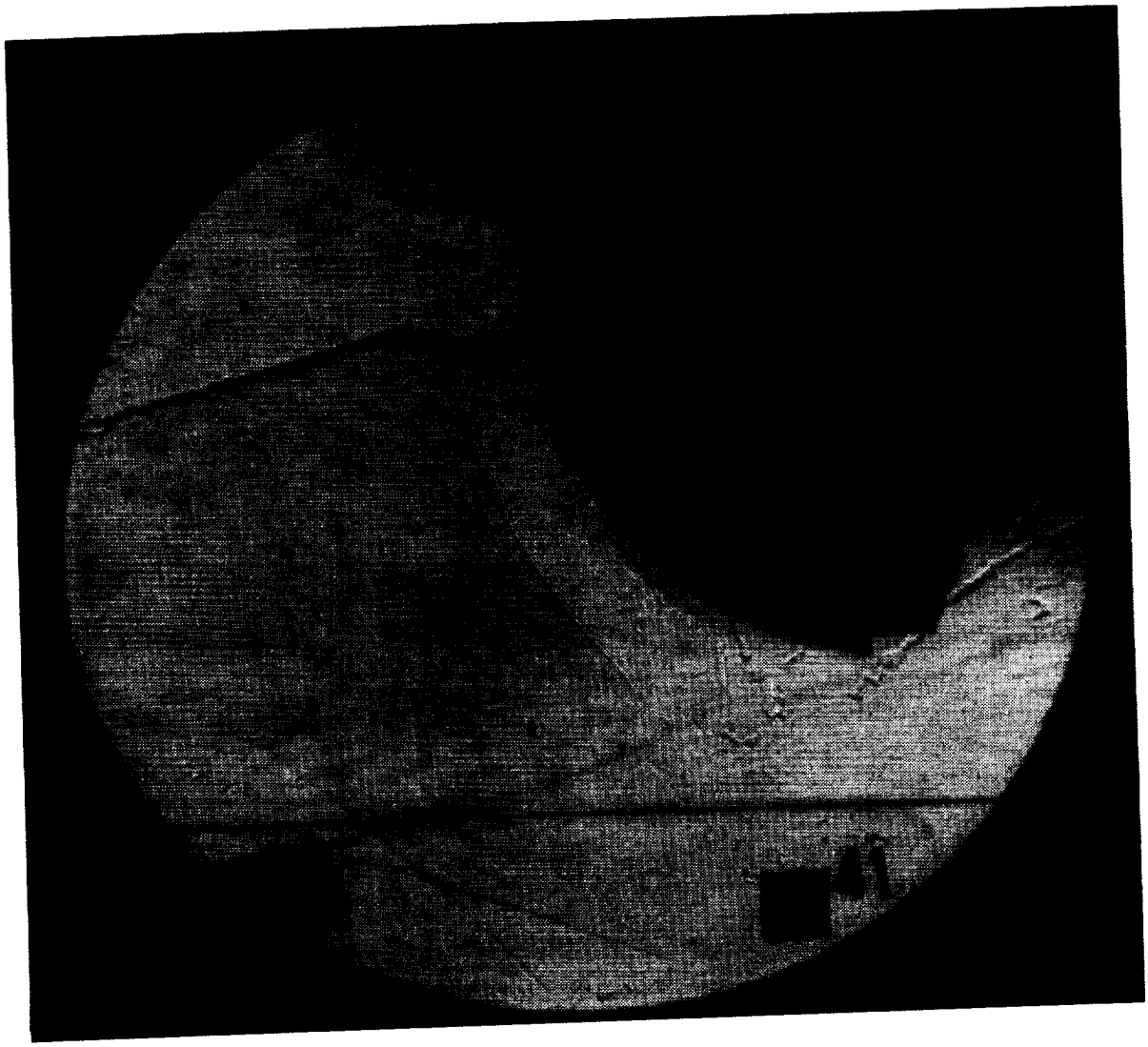
Test Conditions

Po	= 7.5180X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5820X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3070X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 5.5390X10+3	Ft/sec	Freestream Velocity
T	= 8.3300X10+1	degR	Freestream Temperature
P	= 4.3680X10-3	PSIA	Freestream Static Pressure
Rho	= 4.2510X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0070X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3610X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.4700X10-1	PSIA	Pitot Pressure
Q	= 6.5290X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9200		Shock Tube Incident Shock Mach Number
Hw	= 3.3749X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2082	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6550X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.3111	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.636
B - See Shock Generator Diagram	(inches)	3.425
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 40


35
30
25
20
15
10
5
0
-80
-60
-40
-20
0
20
40
$\dot{q}$ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 40

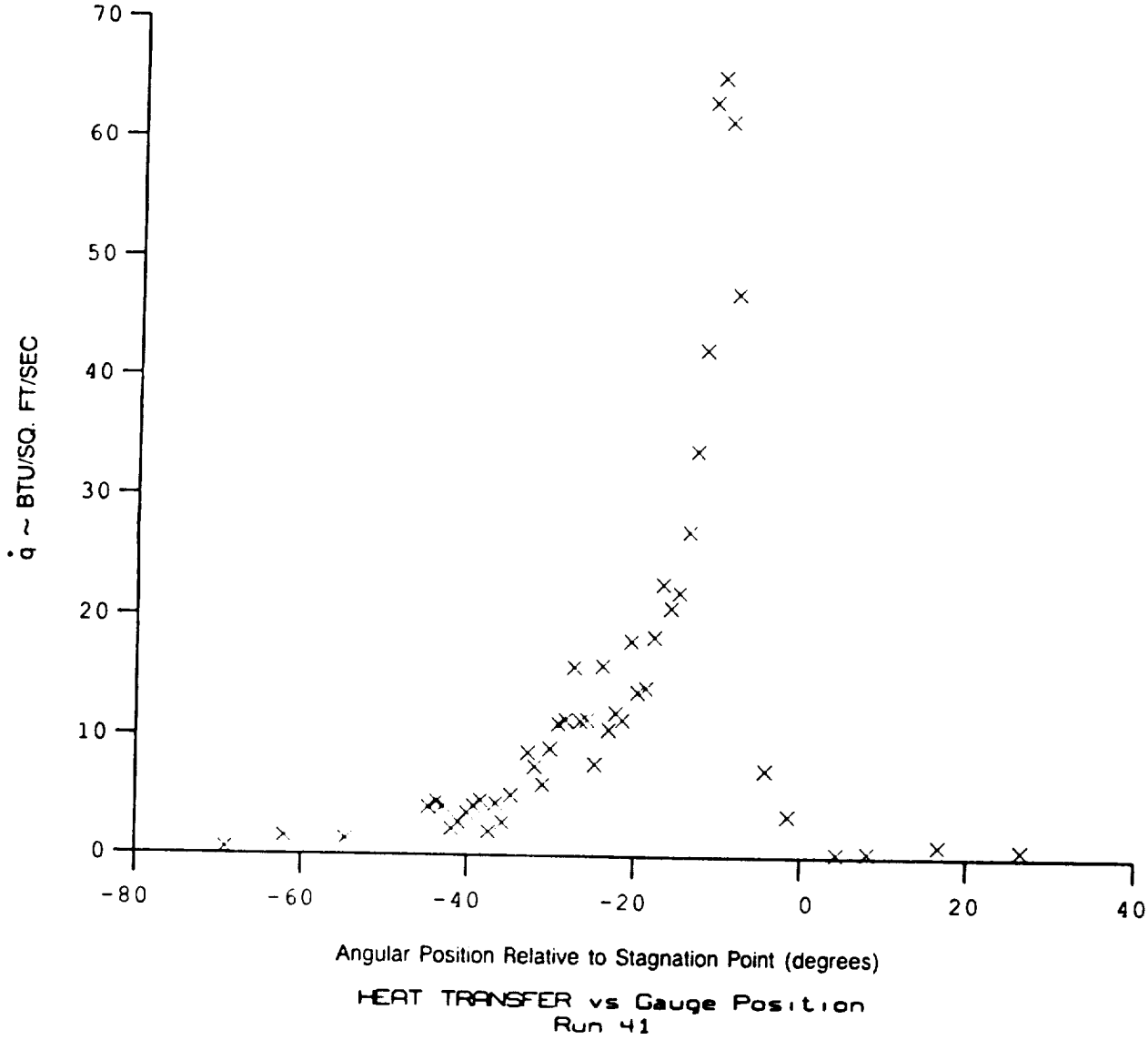


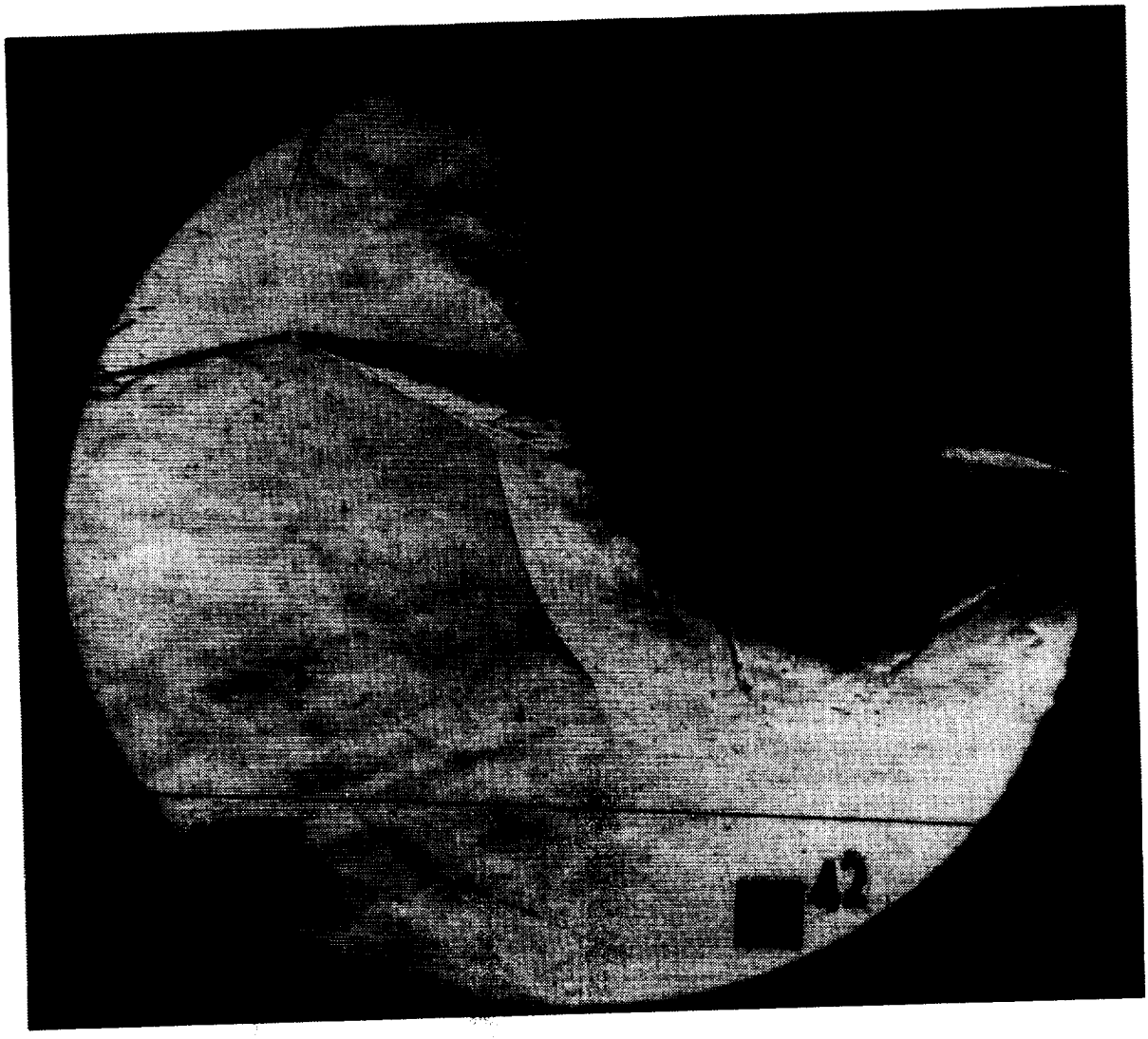
Test Conditions

Po	= 7.6430X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6080X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3220X10+3	degR	Reservoir Total Temperature
M	= 12.1700		Freestream Mach Number
U	= 5.5850X10+3	Ft/sec	Freestream Velocity
T	= 8.4620X10+1	degR	Freestream Temperature
P	= 4.4140X10-3	PSIA	Freestream Static Pressure
Rho	= 4.2290X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.1180X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3180X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5650X10-1	PSIA	Pitot Pressure
Q	= 4.5800X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9220		Shock Tube Incident Shock Mach Number
Hw	= 3.3929X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1833	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5963X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.4753	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.636
B - See Shock Generator Diagram	(inches)	3.425
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.20

Run 41


70
60
50
40
30
20
10
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 41

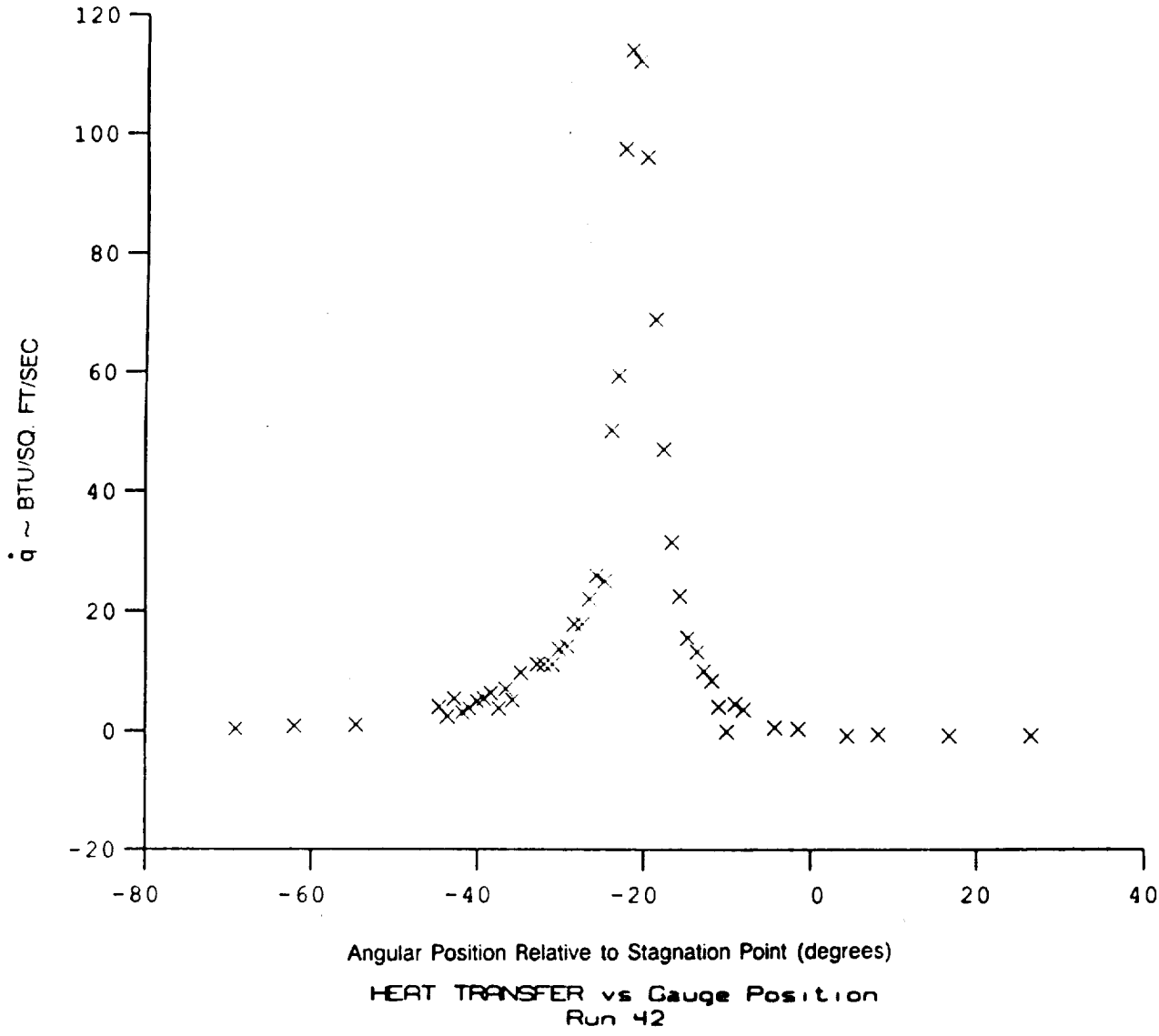


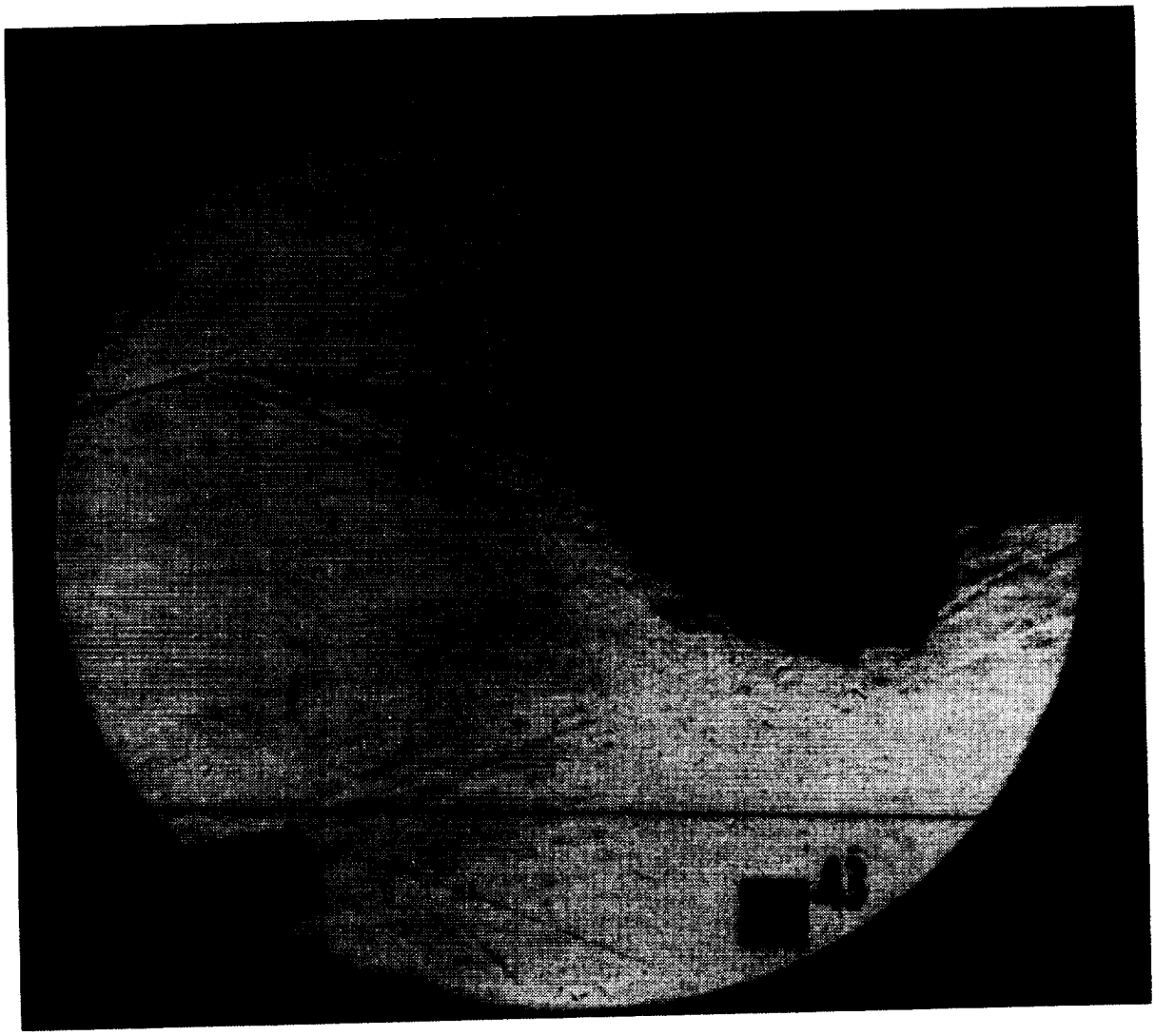
Test Conditions

Po	= 7.8140X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5920X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3290X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 5.5570X10+3	Ft/sec	Freestream Velocity
T	= 8.3940X10+1	degR	Freestream Temperature
P	= 6.5340X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3840X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0530X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4550X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.7930X10-1	PSIA	Pitot Pressure
Q	= 4.7020X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9430		Shock Tube Incident Shock Mach Number
Hw	= 3.3669X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1274	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5440X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR=	6.4908	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.636
B - See Shock Generator Diagram	(inches)	3.425
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.31

Run 42


120
100
80
60
40
20
0
-20
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 42

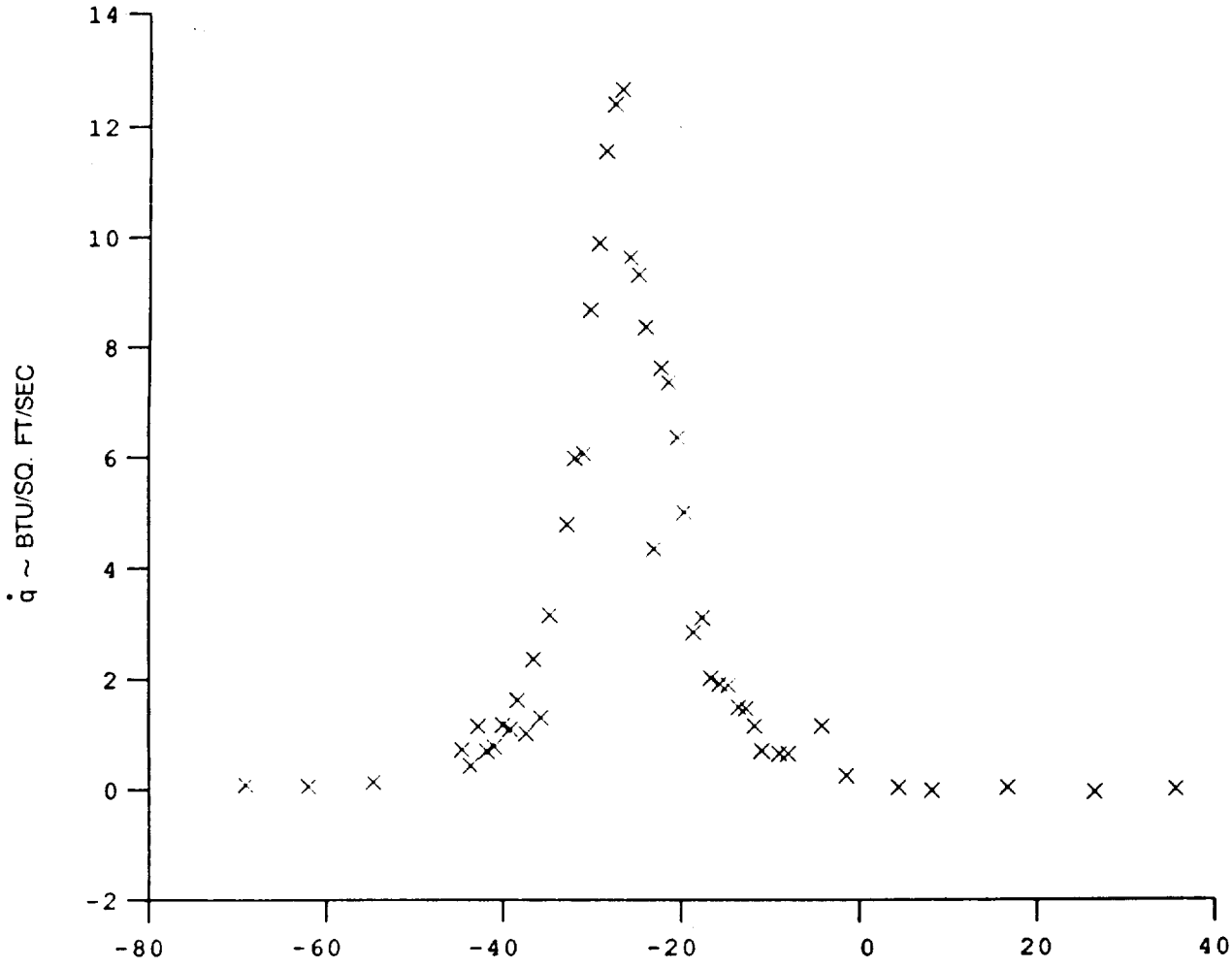


Test Conditions

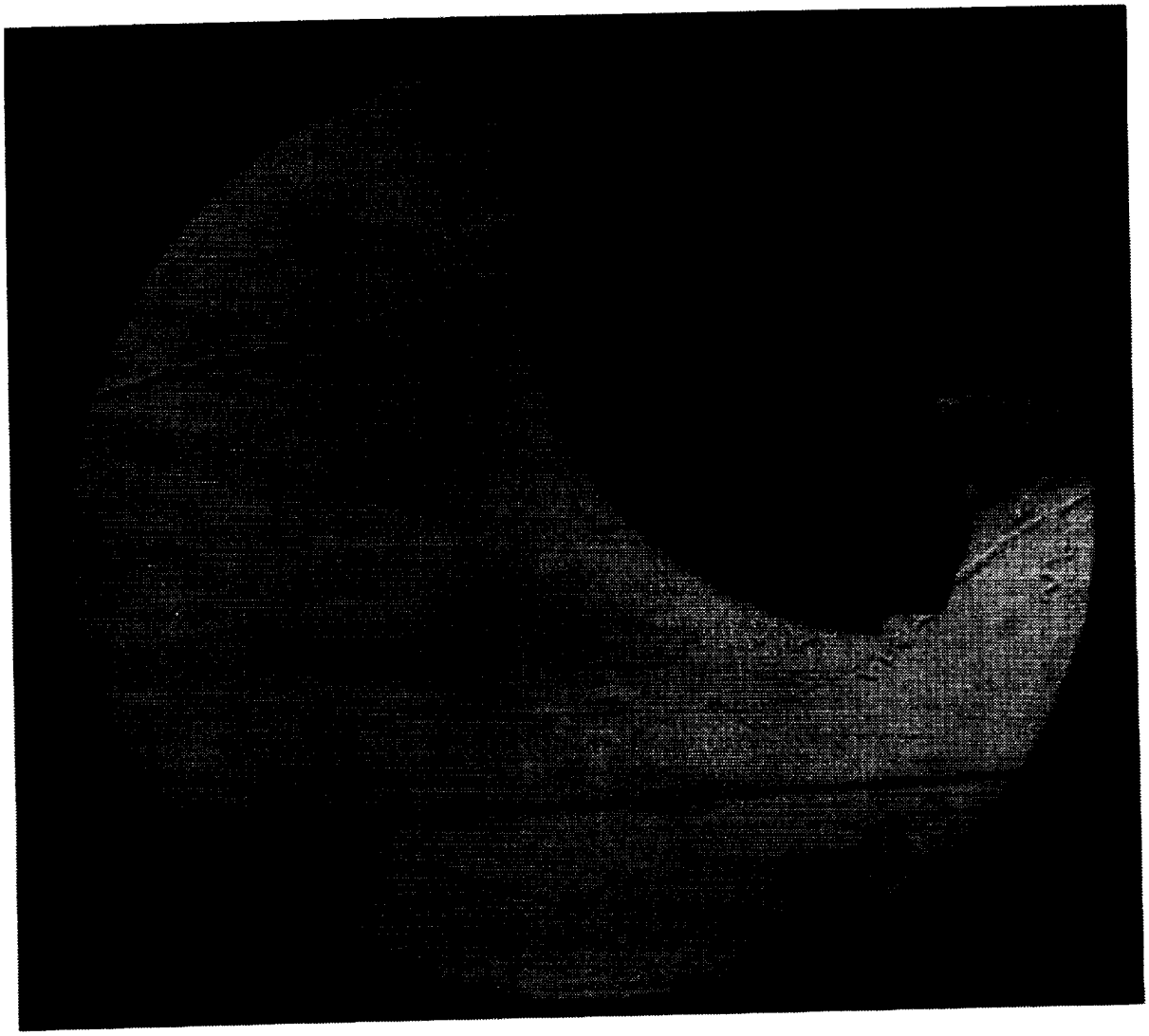
Po	= 7.7800X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5890X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3180X10+3	degR	Reservoir Total Temperature
M	= 12.1700		Freestream Mach Number
U	= 5.5510X10+3	Ft/sec	Freestream Velocity
T	= 8.3580X10+1	degR	Freestream Temperature
P	= 4.5040X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3690X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0300X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4500X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.7410X10-1	PSIA	Pitot Pressure
Q	= 6.6740X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9310		Shock Tube Incident Shock Mach Number
Hw	= 3.3724X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1393	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5628X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.4511	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.636
B - See Shock Generator Diagram	(inches)	3.425
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.36

Run 43



Q/Qo(F-R) vs Gauge Position
Run 43

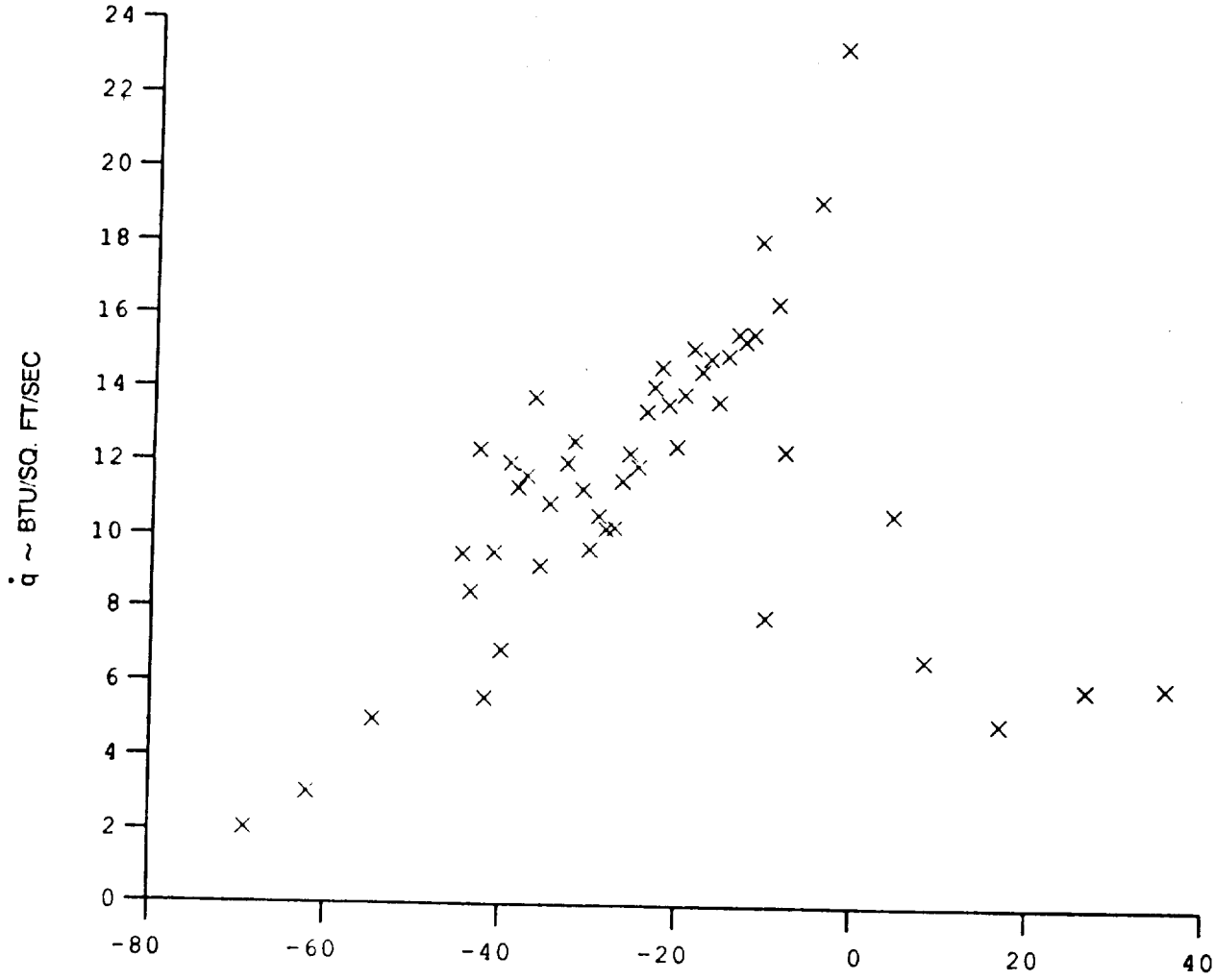


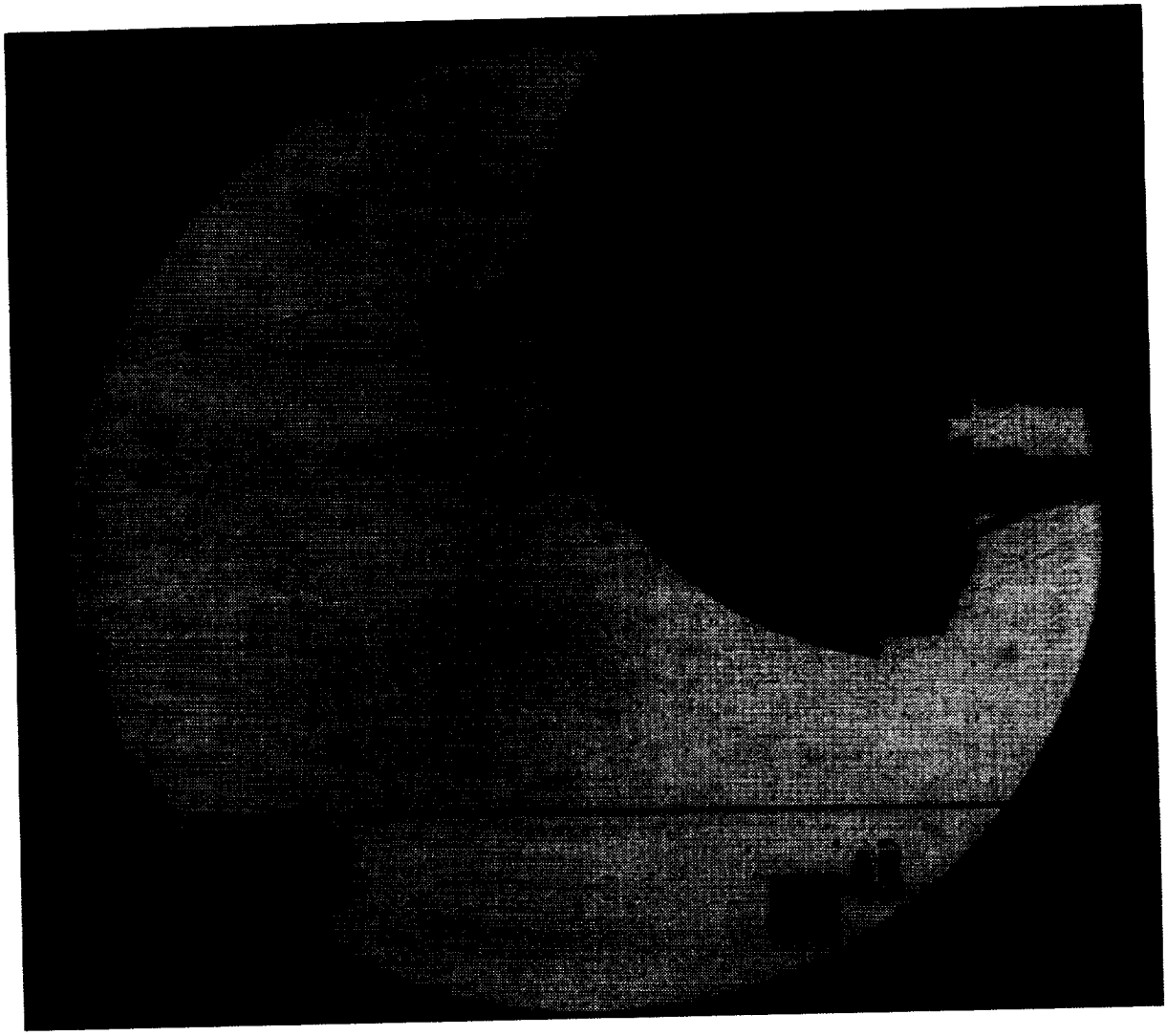
Test Conditions

Po	= 7.3980X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5950X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3050X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 5.5610X10+3	Ft/sec	Freestream Velocity
T	= 8.3970X10+1	degR	Freestream Temperature
P	= 4.2680X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1400X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0630X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.2600X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.3150X10-1	PSIA	Pitot Pressure
Q	= 4.4460X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9090		Shock Tube Incident Shock Mach Number
Hw	= 3.3923X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2495	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.6910X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR=	6.3108	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.143
B - See Shock Generator Diagram	(inches)	3.512
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 44


24
22
20
18
16
14
12
10
8
6
4
2
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 44

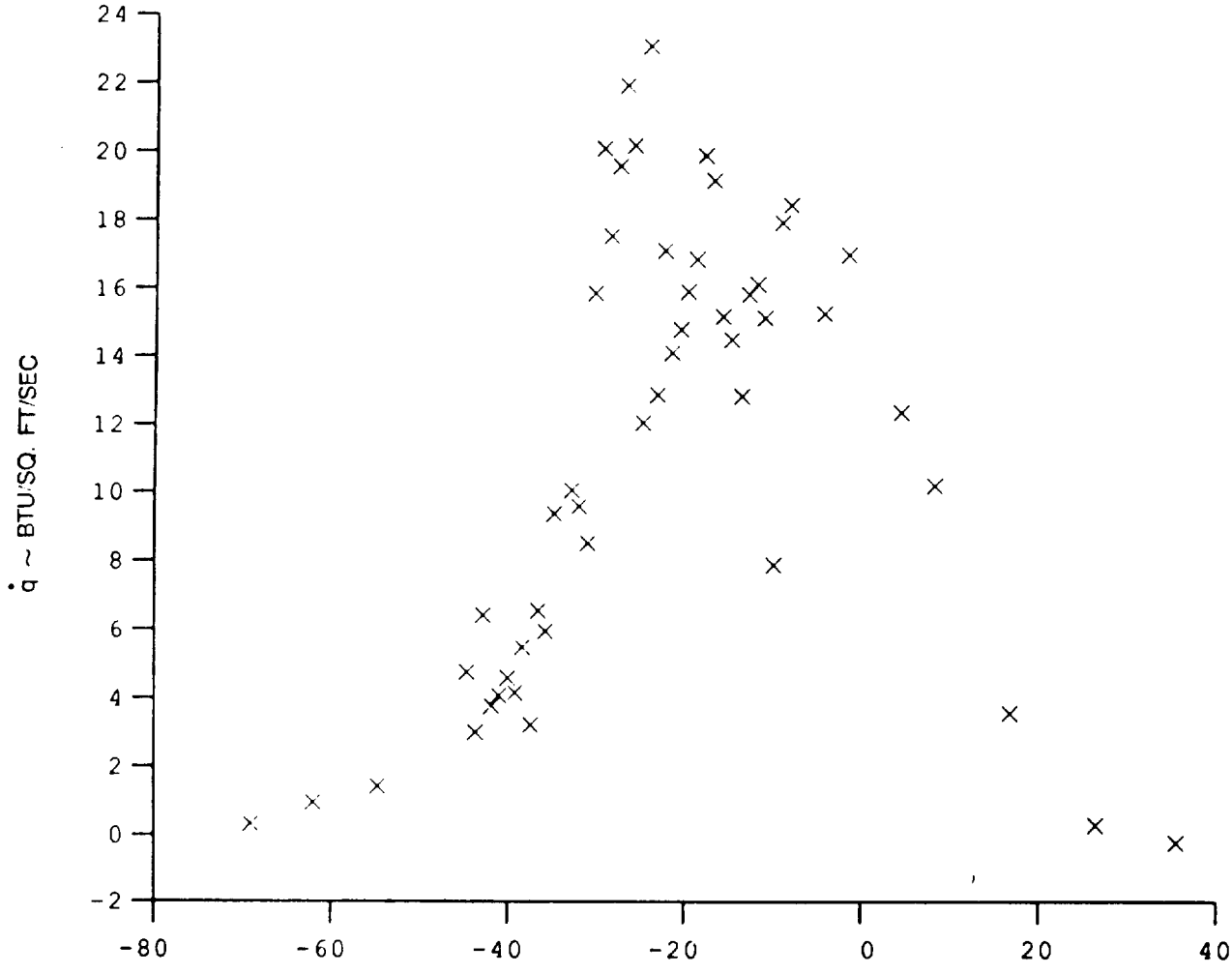


Test Conditions

Po	= 7.7470X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.6470X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3580X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 9.6510X10+3	Ft/sec	Freestream Velocity
T	= 8.6740X10+1	degR	Freestream Temperature
P	= 4.4670X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1750X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.2970X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.2330X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.6580X10-1	PSIA	Pitot Pressure
Q	= 4.6300X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
M1	= 2.9450		Shock Tube Incident Shock Mach Number
Hw	= 3.4060X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1602	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5242X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.7141	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.143
B - See Shock Generator Diagram	(inches)	3.512
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.20

Run 45



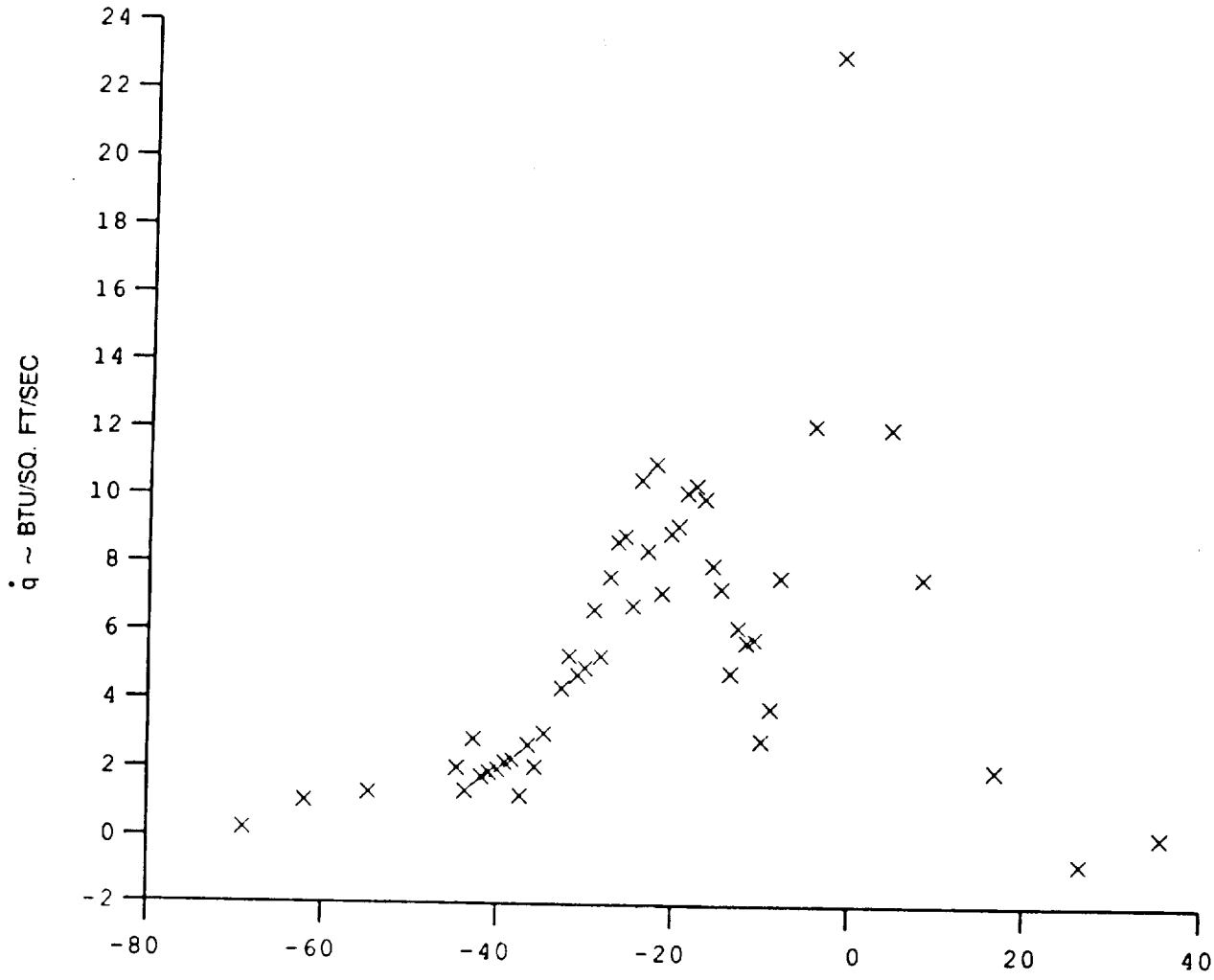
HEAT TRANSFER vs Gauge Position
Run 45

Test Conditions

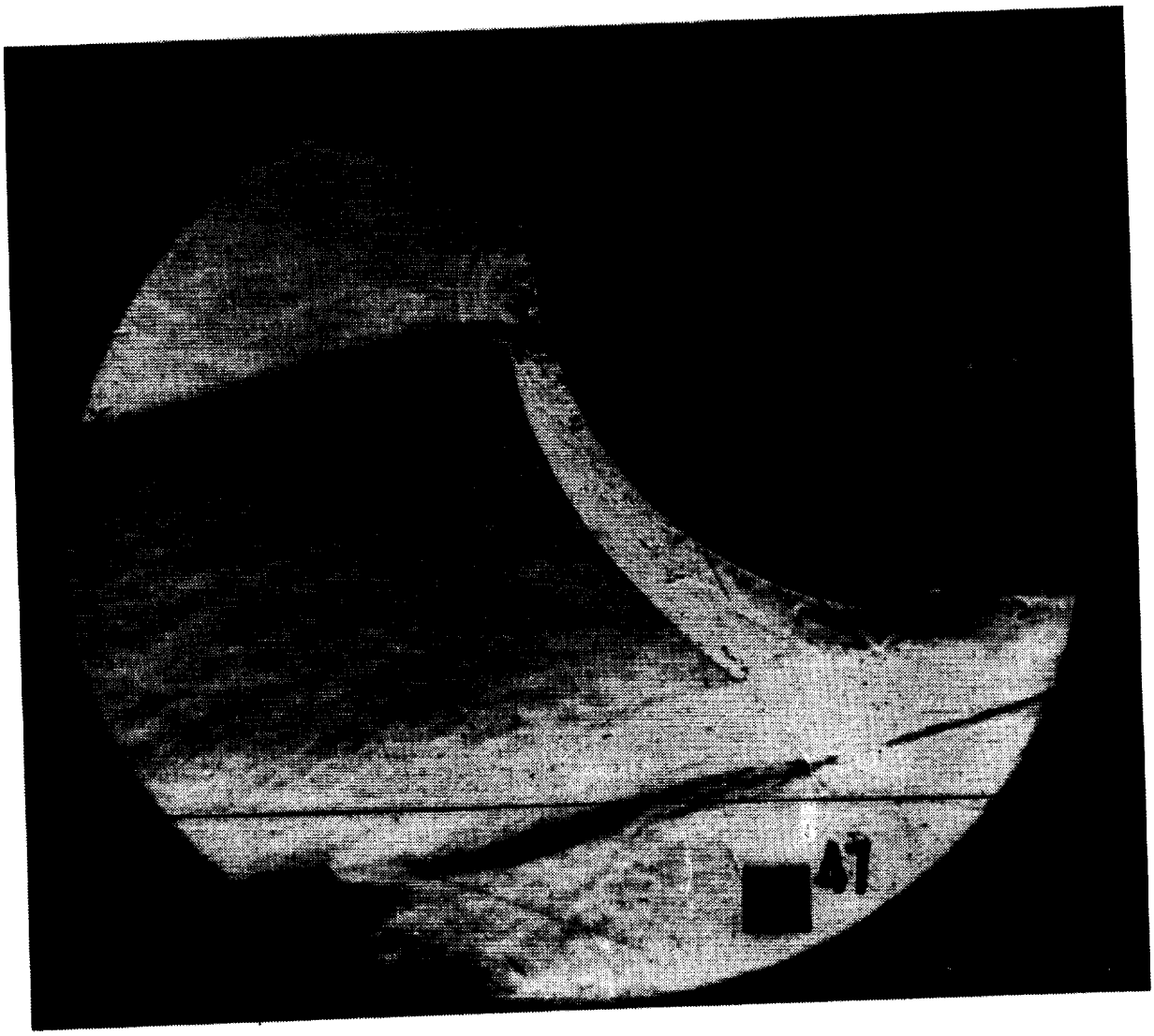
Po	= 7.7760X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5980X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2930X10+3	degR	Reservoir Total Temperature
M	= 12.1900		Freestream Mach Number
U	= 5.5670X10+3	Ft/sec	Freestream Velocity
T	= 8.3790X10+1	degR	Freestream Temperature
P	= 4.4450X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3010X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0480X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3970X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.6560X10-1	PSIA	Pitot Pressure
Q	= 4.6280X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.8900		Shock Tube Incident Shock Mach Number
Hw	= 3.4072X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1606	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.5844X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.4451	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.143
B - See Shock Generator Diagram	(inches)	3.512
Shock Generator Lip Diameter	(inches)	0.625
Lambda		0.32

Run 46


24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 46

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

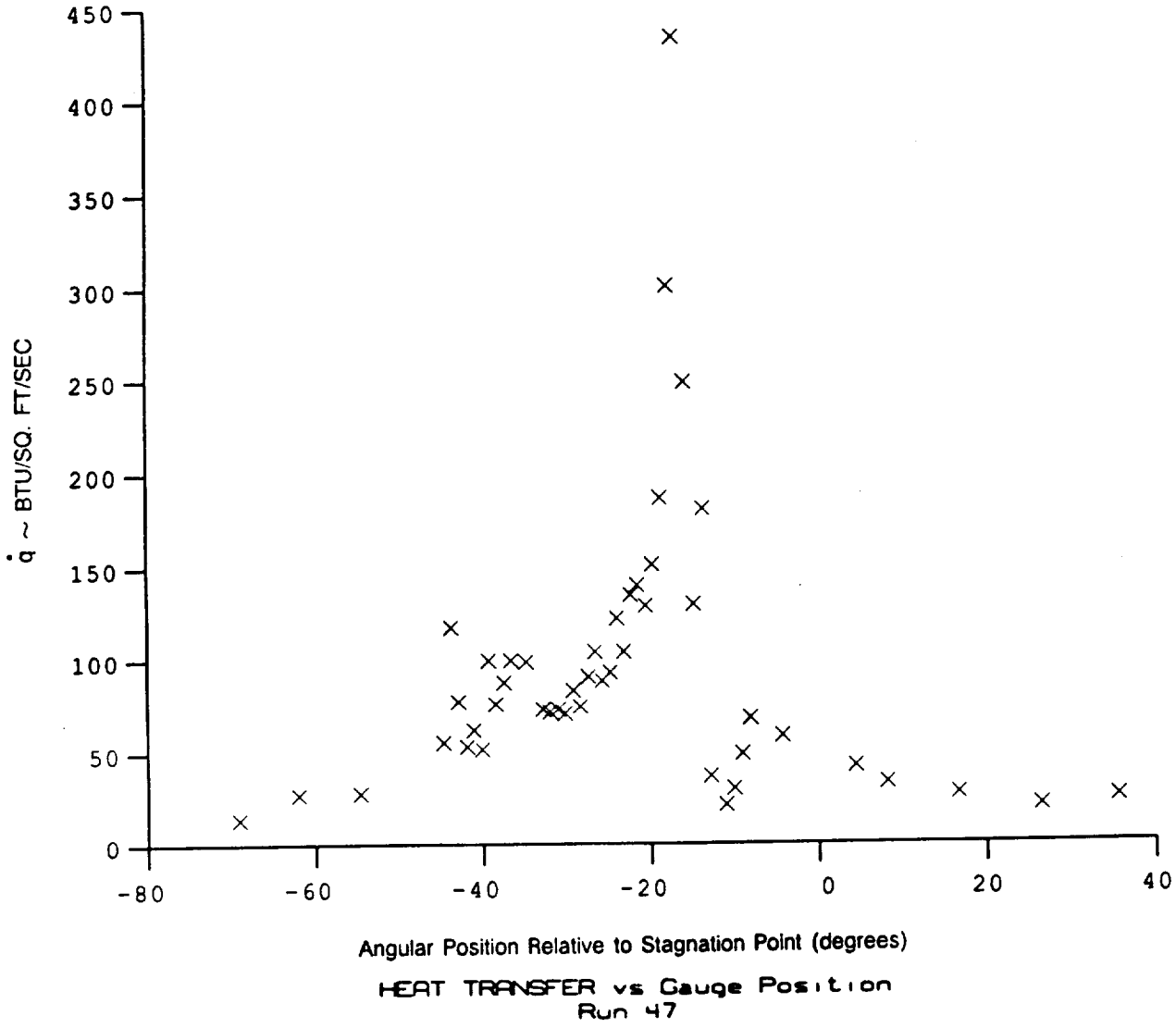


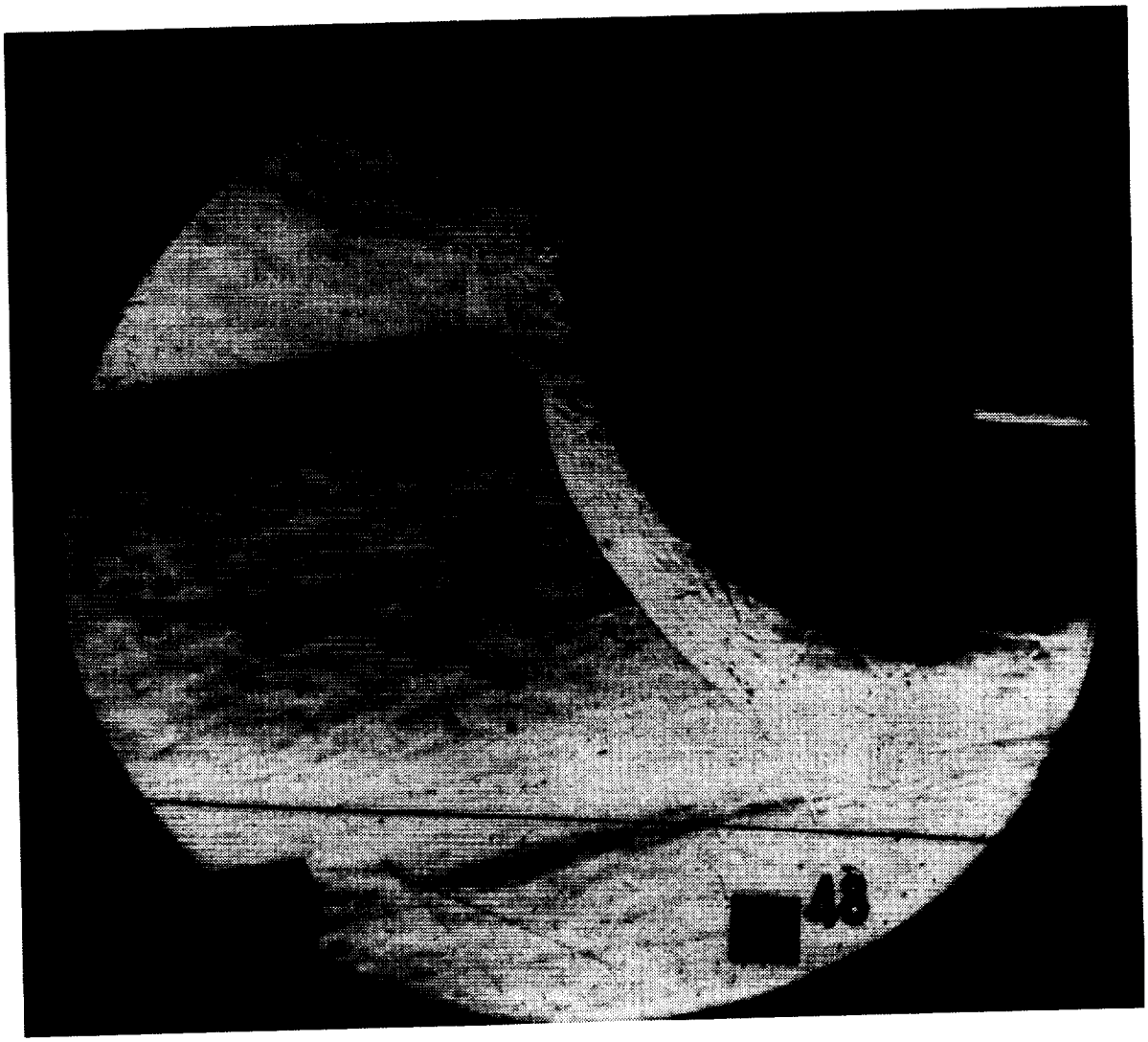
Test Conditions

Po	= 4.1570X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.8610X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.6600X10+3	degR	Reservoir Total Temperature
M	= 12.5900		Freestream Mach Number
U	= 6.0160X10+3	Ft/sec	Freestream Velocity
T	= 9.1720X10+1	degR	Freestream Temperature
P	= 1.9450X10-2	PSIA	Freestream Static Pressure
Rho	= 1.7190X10-5	Slugs/Ft3	Freestream Density
Ms	= 7.7160X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.3400X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.0370	PSIA	Pitot Pressure
Q	= 2.1590	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.2080		Shock Tube Incident Shock Mach Number
Hw	= 3.3681X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.6322X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.9374X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 1.7068X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.720
B - See Shock Generator Diagram	(inches)	3.330
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 47


450
400
350
300
250
200
150
100
50
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 47

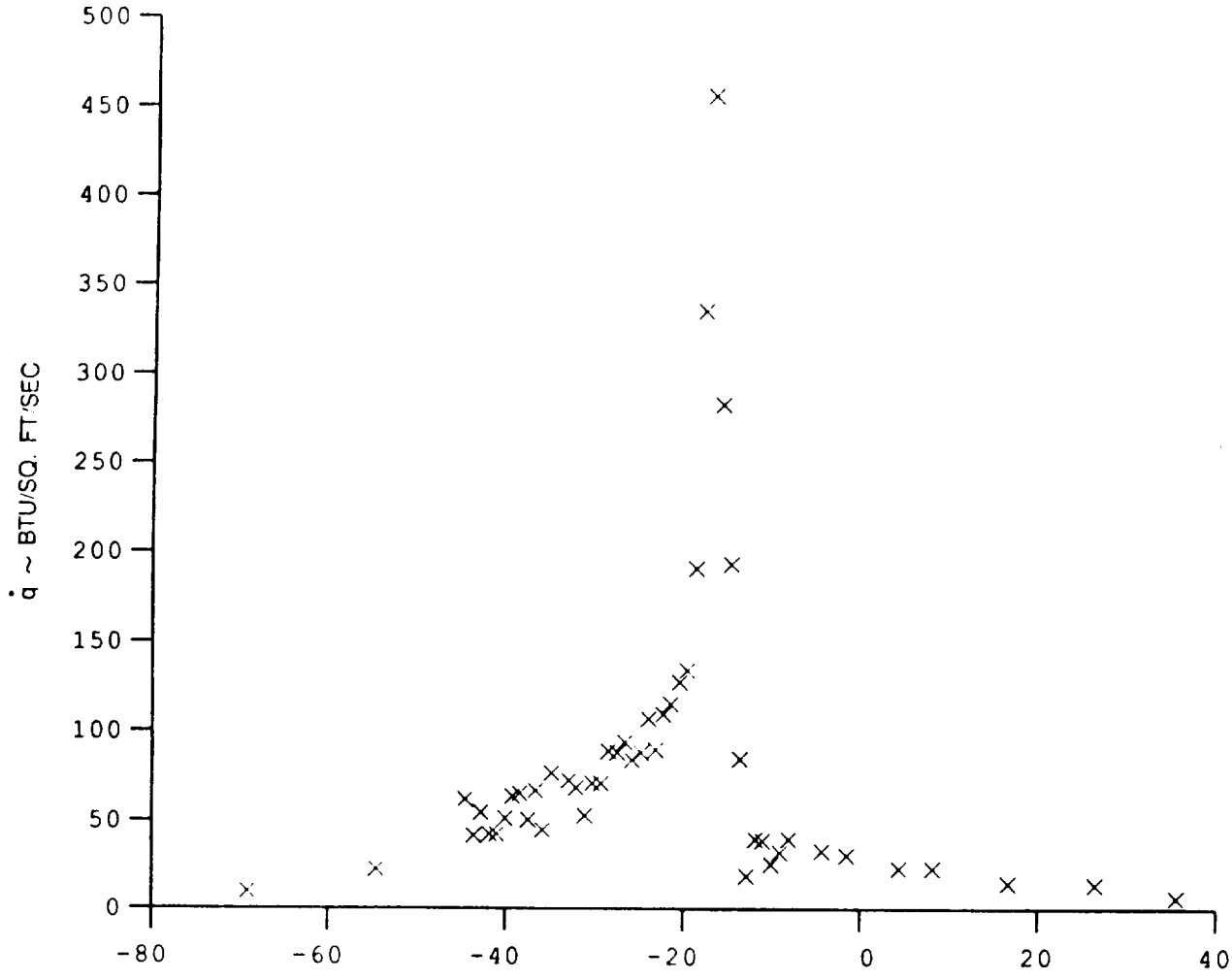


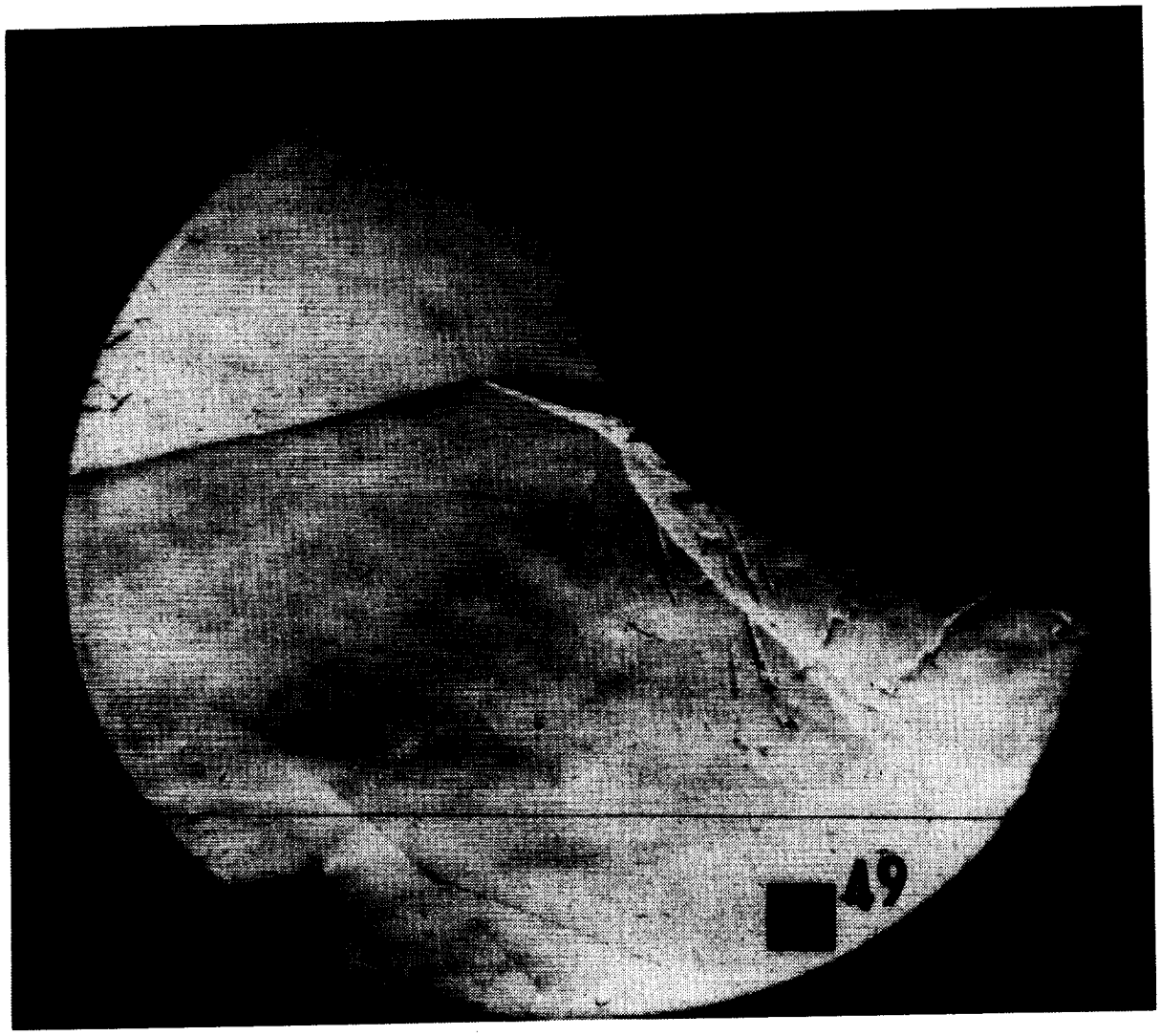
Test Conditions

Po	= 4.2220X10+3	PSIA	Reservoir Total Pressure
Ho	= 1.9530X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.7470X10+3	degR	Reservoir Total Temperature
M	= 12.5600		Freestream Mach Number
U	= 6.1610X10+3	Ft/sec	Freestream Velocity
T	= 9.6730X10+1	degR	Freestream Temperature
P	= 1.9750X10-2	PSIA	Freestream Static Pressure
Rho	= 1.6560X10-5	Slugs/Ft3	Freestream Density
Mu	= 8.1380X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 1.2540X10+6	1/Ft	Freestream Reynolds Number
Po'	= 4.0810	PSIA	Pitot Pressure
Q	= 2.1820	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.2600		Shock Tube Incident Shock Mach Number
Hw	= 3.3929X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.5817X10-1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.7255X10-4	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 1.8222X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.728
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.06

Run 48


500
450
400
350
300
250
200
150
100
50
0
-80
-60
-40
-20
0
20
40
$\dot{q}$ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 48

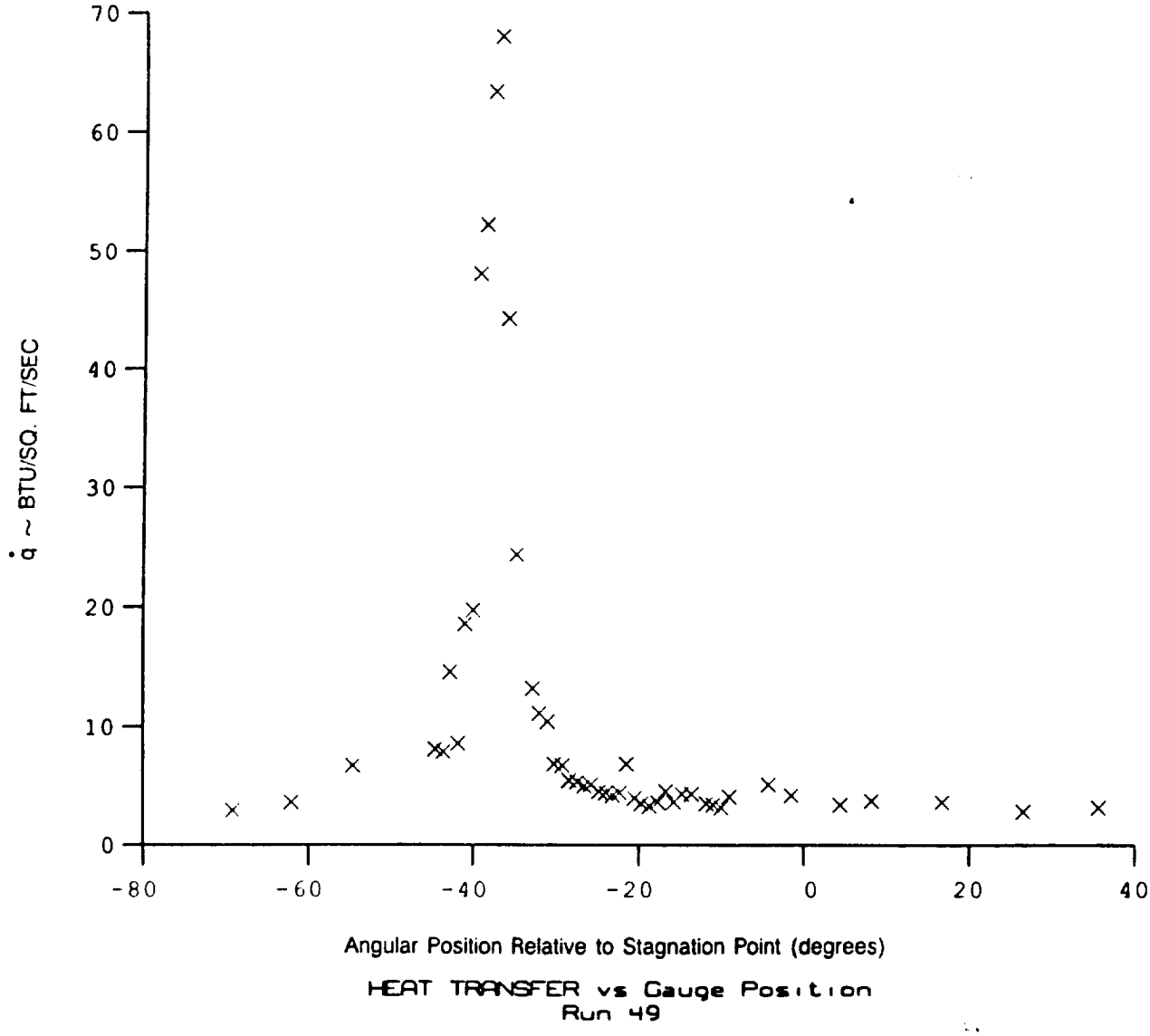


Test Conditions

Po	= 3.5700X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.3900X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.0290X10+3	degR	Reservoir Total Temperature
M	= 12.0800		Freestream Mach Number
U	= 9.1910X10+3	Ft/sec	Freestream Velocity
T	= 7.4150X10+1	degR	Freestream Temperature
P	= 2.2120X10-3	PSIA	Freestream Static Pressure
Rho	= 2.4190X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.2350X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 2.0140X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.2320X10-1	PSIA	Pitot Pressure
Q	= 2.2630X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.6640		Shock Tube Incident Shock Mach Number
Hw	= 3.4010X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.4183	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.9013X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR	= 3.7228	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	10.428
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 49

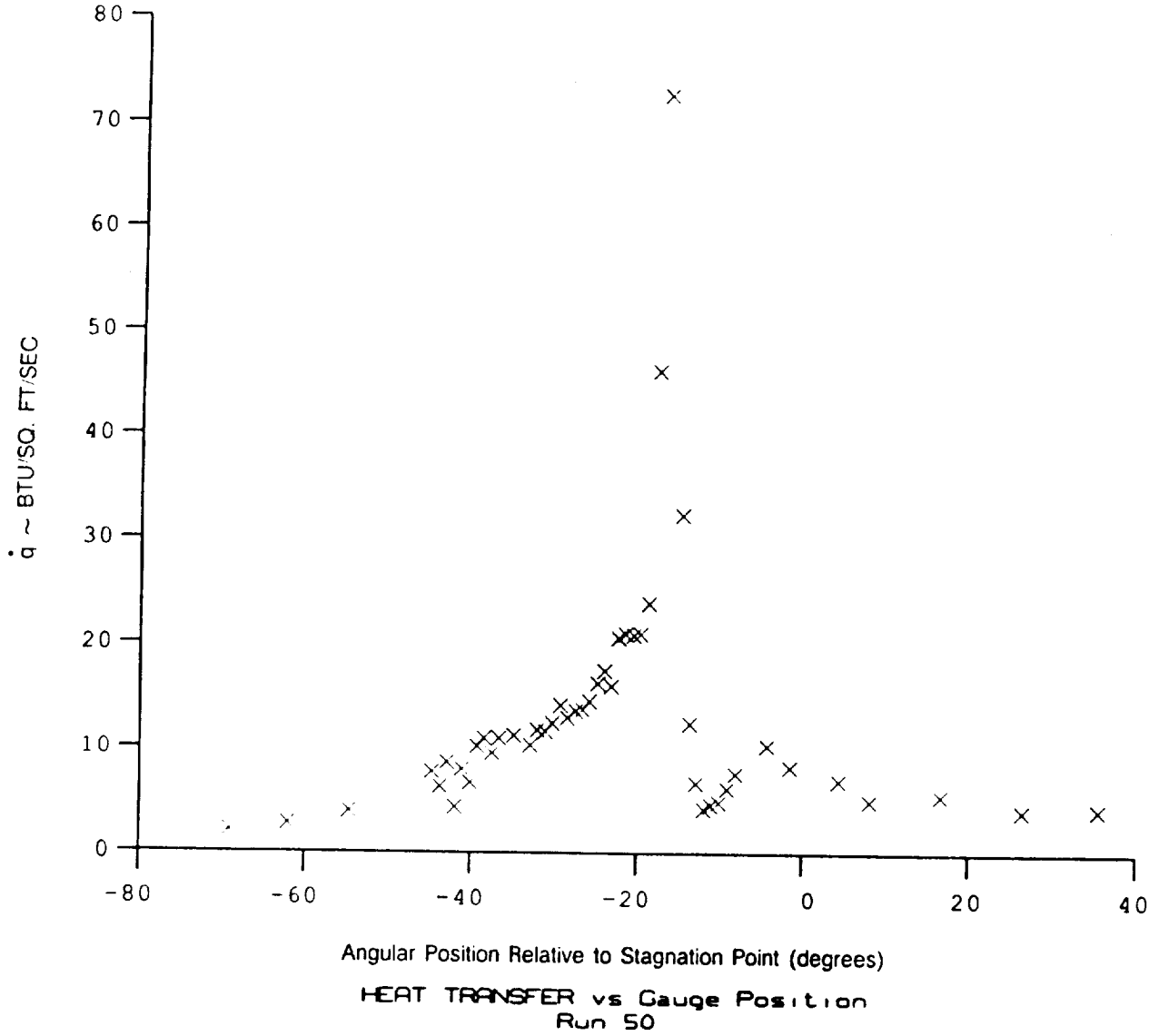

70
60
50
40
30
20
10
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 49

Test Conditions

Po	= 4.0610X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.4610X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.1670X10+3	degR	Reservoir Total Temperature
M	= 12.0400		Freestream Mach Number
U	= 5.3210X10+3	Ft/sec	Freestream Velocity
T	= 7.8430X10+1	degR	Freestream Temperature
P	= 2.5480X10-3	PSIA	Freestream Static Pressure
Rho	= 2.6340X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.5960X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 2.1250X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.8430X10-1	PSIA	Pitot Pressure
Q	= 2.5890X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.8120		Shock Tube Incident Shock Mach Number
Hw	= 3.3545X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 3.8618	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 4.9318X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	4.2905	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.128
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 50

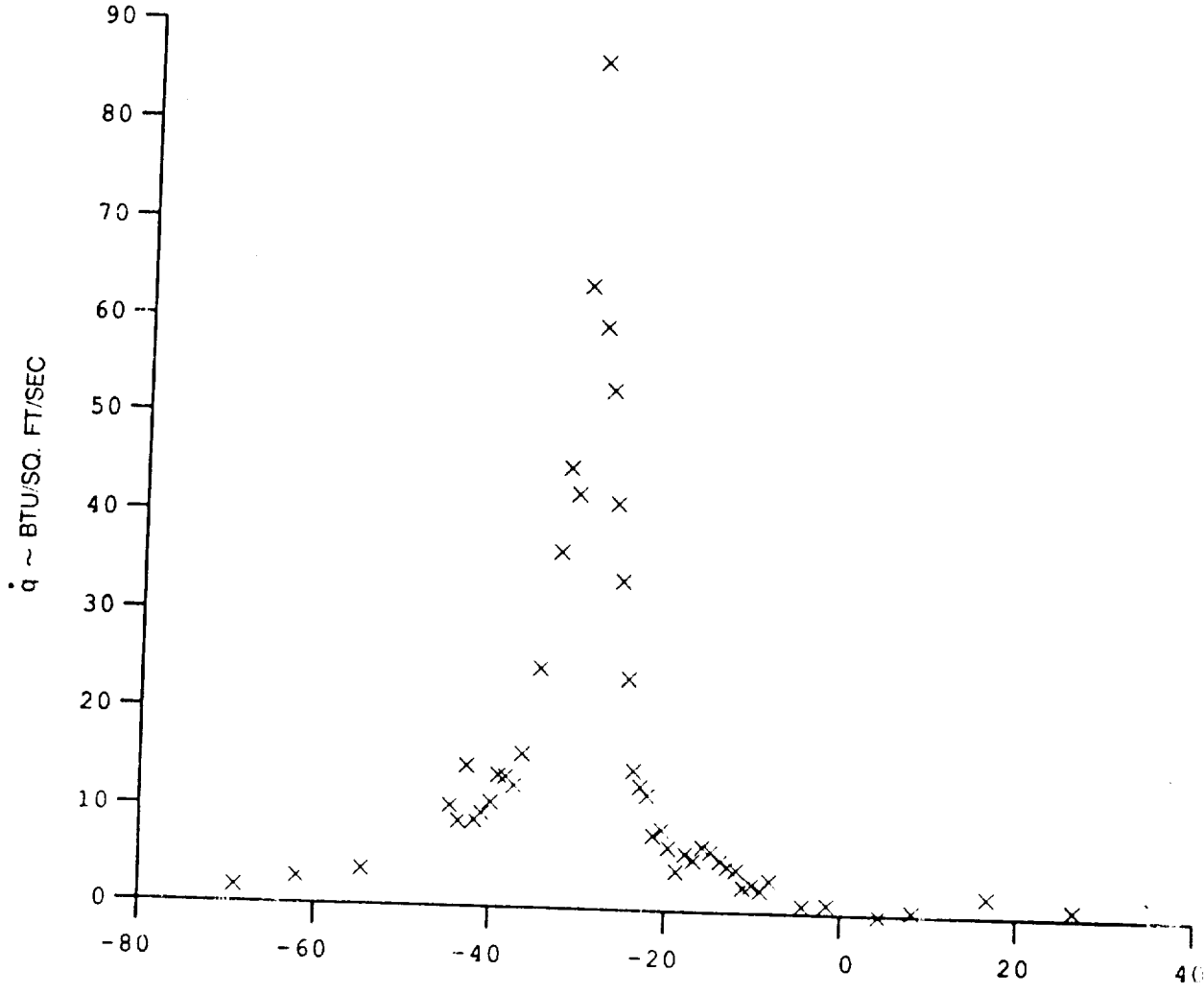

80
70
60
50
40
30
20
10
0
$\dot{q}$ ~ BTU/SQ. FT/SEC
-80
-60
-40
-20
0
20
40
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 50

Test Conditions

Po	= 3.7340X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.4240X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.1160X10+3	degR	Reservoir Total Temperature
M	= 12.0500		Freestream Mach Number
U	= 9.2540X10+3	Ft/sec	Freestream Velocity
T	= 7.6440X10+1	degR	Freestream Temperature
P	= 2.3510X10-3	PSIA	Freestream Static Pressure
Rho	= 2.4930X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.4280X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 2.0380X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.4700X10-1	PSIA	Pitot Pressure
Q	= 2.3900X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.7660		Shock Tube Incident Shock Mach Number
Hw	= 3.3569X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.1849	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.4578X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	3.9777	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.128
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.20

Run 51



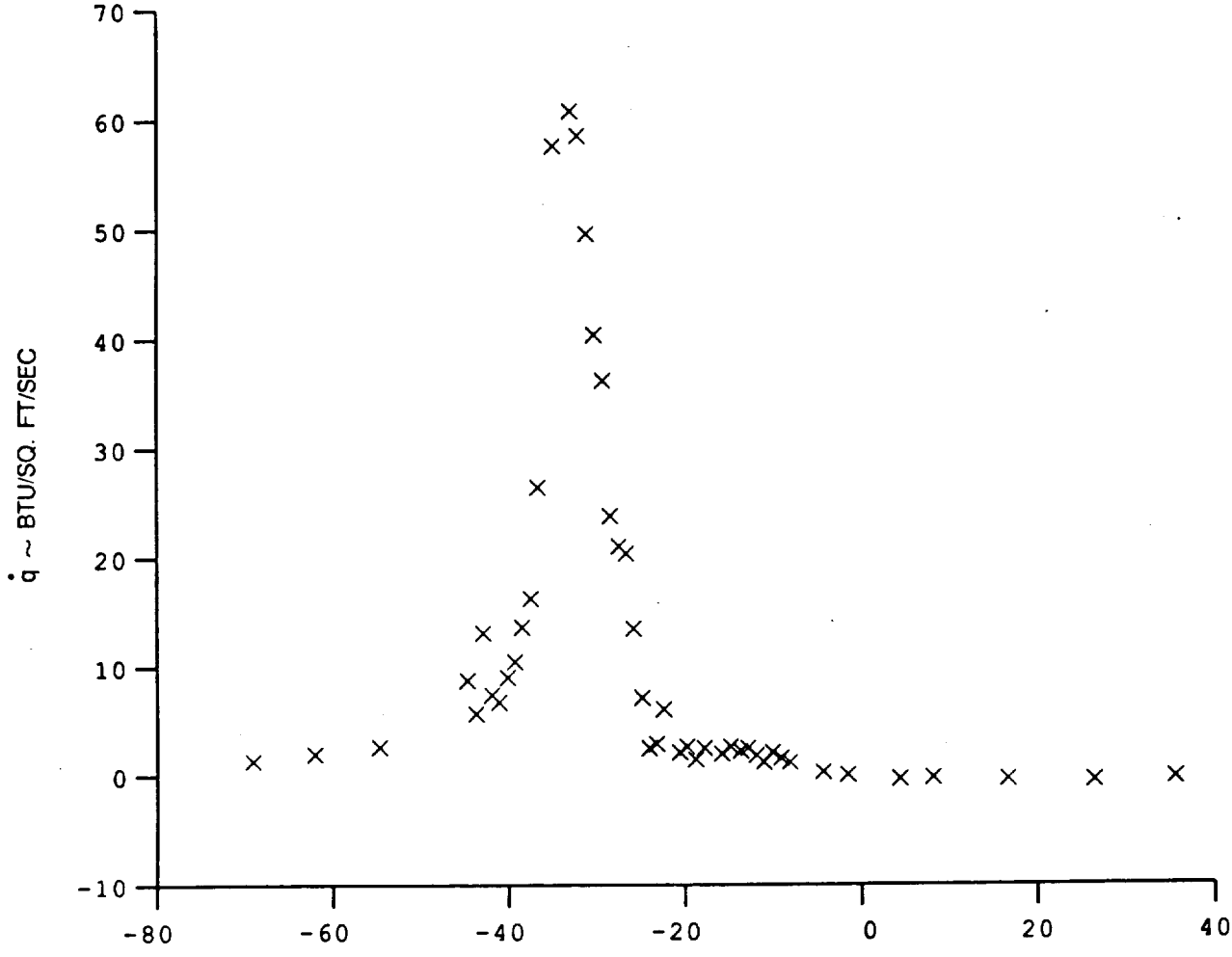
HEAT TRANSFER vs Gauge Position
Run 51

Test Conditions

Po	= 3.9620X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.4090X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.0930X10+3	degR	Reservoir Total Temperature
M	= 12.0700		Freestream Mach Number
U	= 5.2270X10+3	Ft/sec	Freestream Velocity
T	= 7.5340X10+1	degR	Freestream Temperature
P	= 2.4670X10-3	PSIA	Freestream Static Pressure
Rho	= 2.6550X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.3350X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 2.1900X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.7090X10-1	PSIA	Pitot Pressure
Q	= 2.5180X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.7440		Shock Tube Incident Shock Mach Number
Hw	= 3.3600X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 3.9703	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.2247X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	4.0218	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.128
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.24

Run 52


70
60
50
40
30
20
10
0
-10
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 52

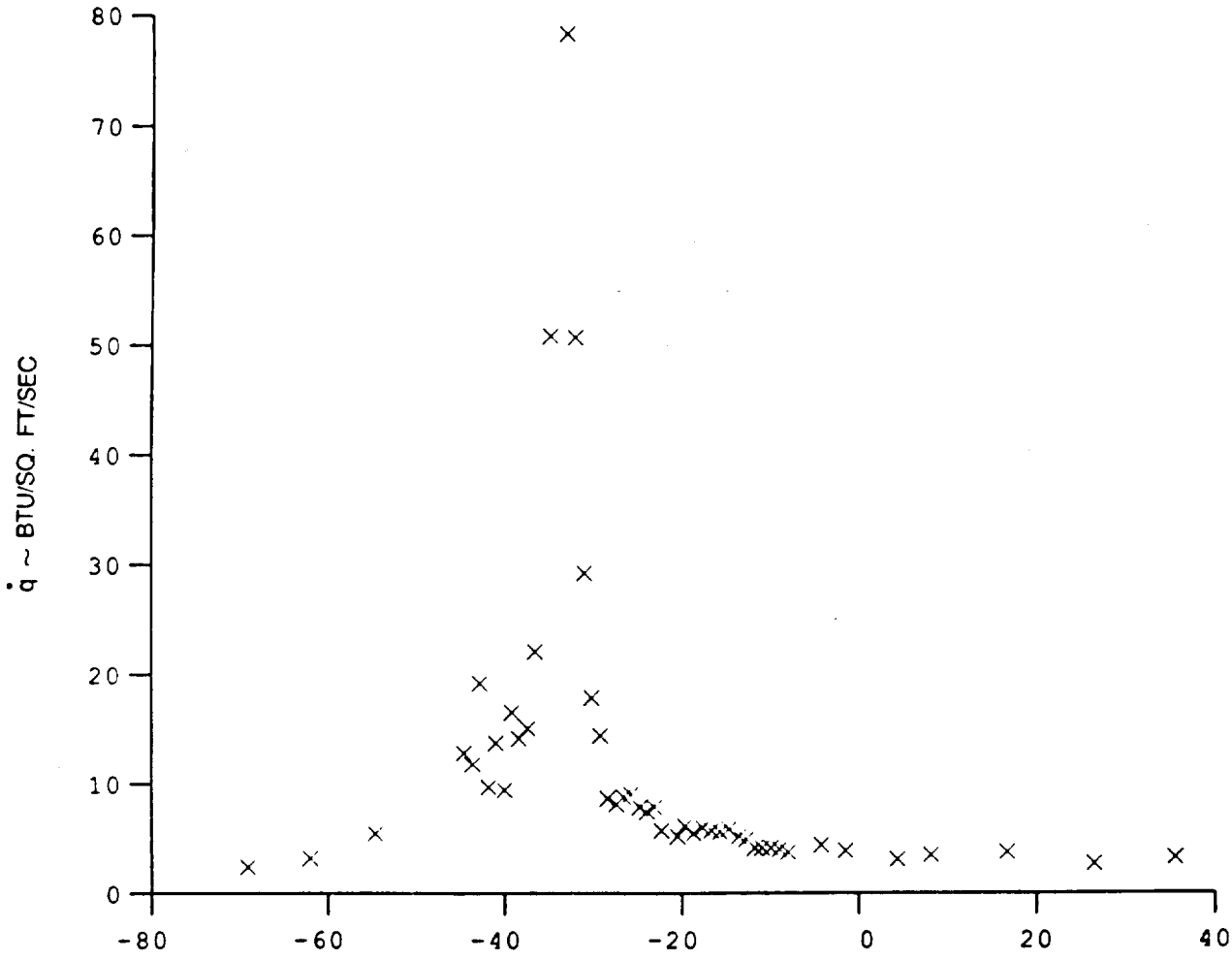
ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

Test Conditions

Po	= 3.8920X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.3540X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.0170X10+3	degR	Reservoir Total Temperature
M	= 12.1000		Freestream Mach Number
U	= 5.1240X10+3	Ft/sec	Freestream Velocity
T	= 7.2100X10+1	degR	Freestream Temperature
P	= 2.4040X10-3	PSIA	Freestream Static Pressure
Rho	= 2.7040X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.0620X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 2.2860X10+5	1/Ft	Freestream Reynolds Number
Po'	= 4.6100X10-1	PSIA	Pitot Pressure
Q	= 2.4650X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.6740		Shock Tube Incident Shock Mach Number
Hw	= 3.3625X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 4.0567	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 5.5173X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	3.7623	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	10.028
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 53

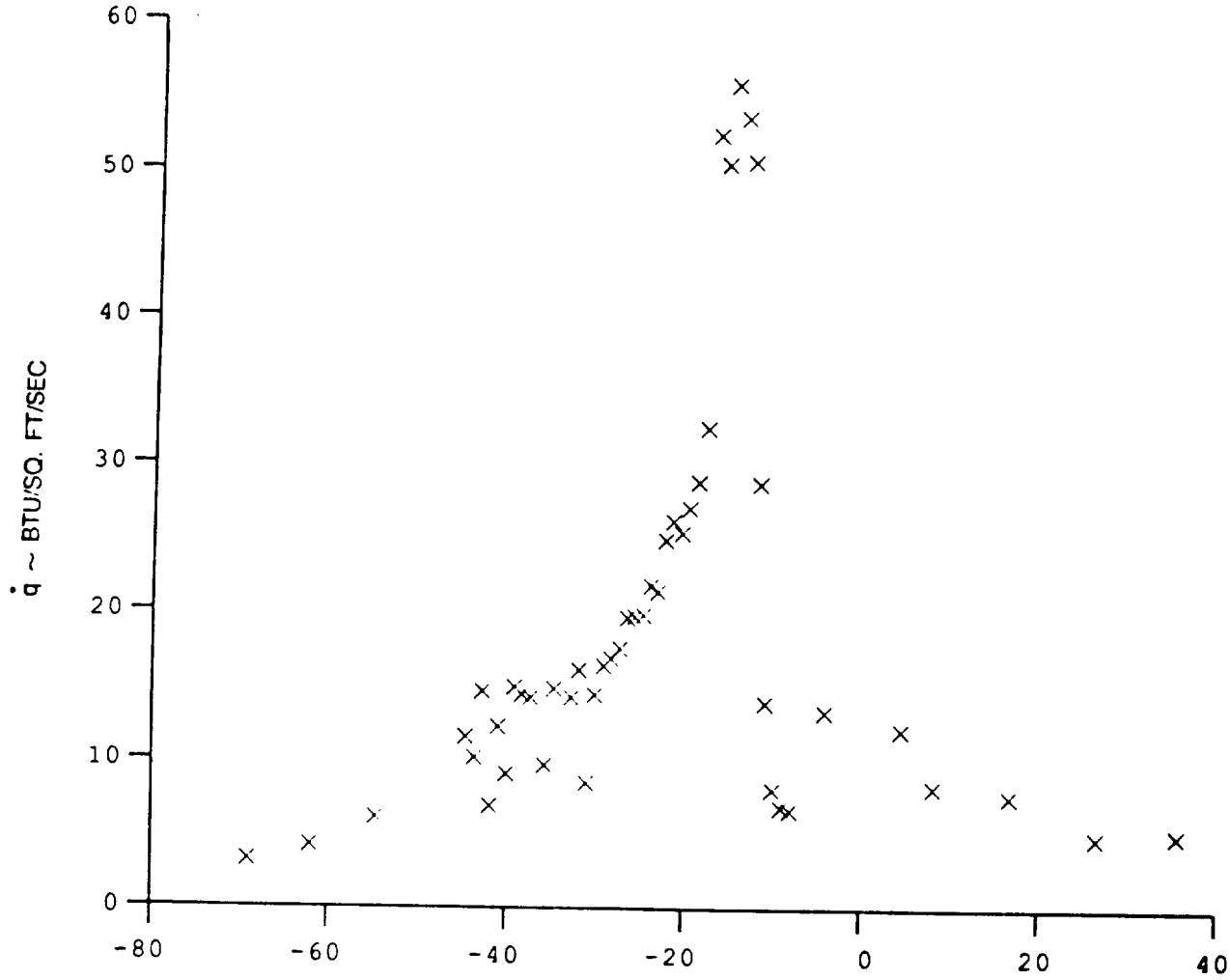

80
70
60
50
40
30
20
10
0
-80
-60
-40
-20
0
20
40
$\dot{q}$ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 53

Test Conditions

Po	= 6.7660X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5440X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3000X10+3	degR	Reservoir Total Temperature
M	= 12.1200		Freestream Mach Number
U	= 5.4710X10+3	Ft/sec	Freestream Velocity
T	= 8.1850X10+1	degR	Freestream Temperature
P	= 4.0420X10-3	PSIA	Freestream Static Pressure
Rho	= 4.0040X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8850X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1820X10+5	1/Ft	Freestream Reynolds Number
Po'	= 7.7820X10-1	PSIA	Pitot Pressure
Q	= 4.1610X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9380		Shock Tube Incident Shock Mach Number
Hw	= 3.3360X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.4031	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.9337X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	5.8789	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.128
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
Lambda		0.0

Run 54



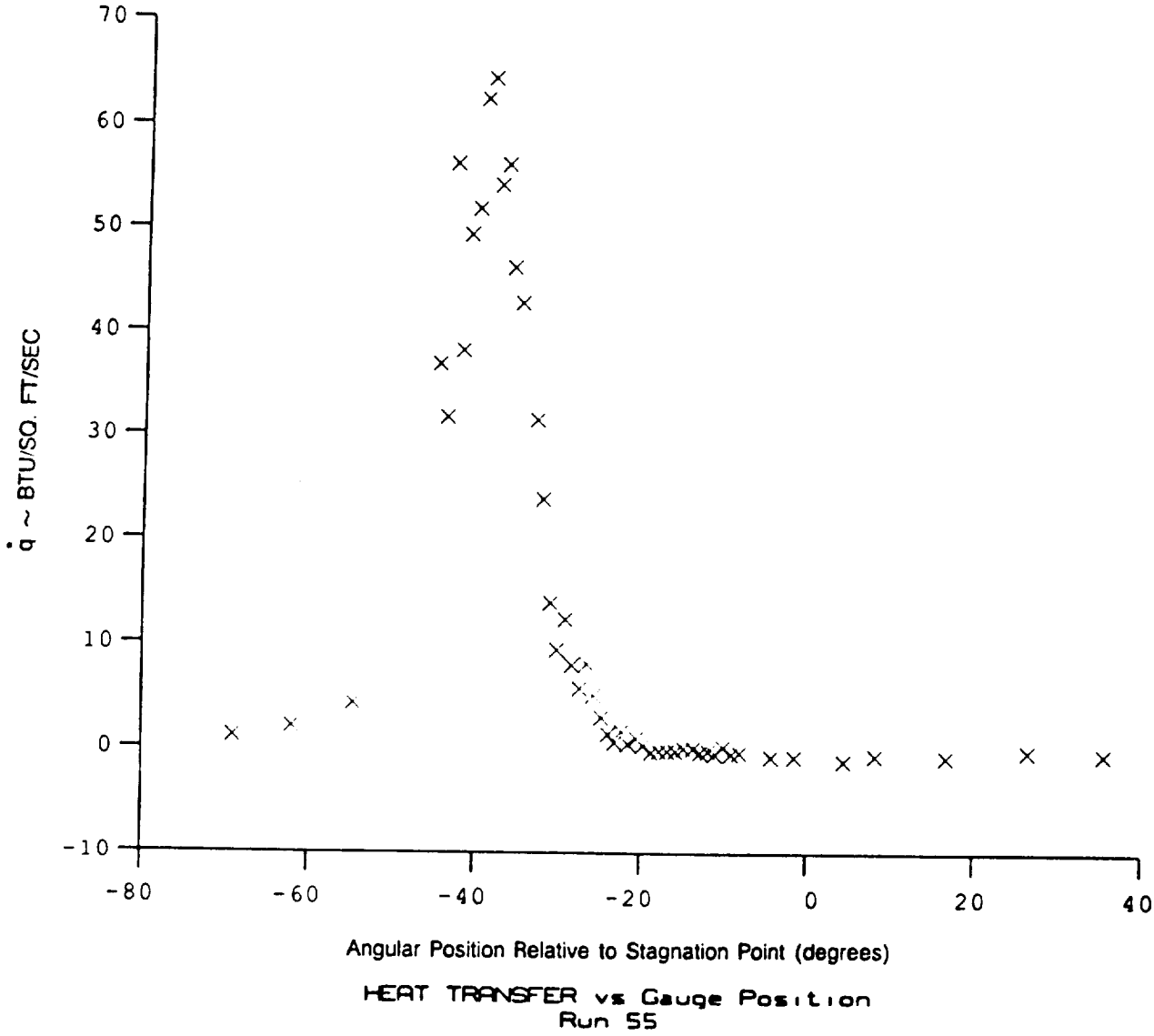
HEAT TRANSFER vs Gauge Position
Run 54

Test Conditions

Po	= 7.0890X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5400X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2930X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.4650X10+3	Ft/sec	Freestream Velocity
T	= 8.1430X10+1	degR	Freestream Temperature
P	= 4.1970X10-3	PSIA	Freestream Static Pressure
Rho	= 4.1790X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8490X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3350X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.1060X10-1	PSIA	Pitot Pressure
Q	= 4.3340X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9310		Shock Tube Incident Shock Mach Number
Hw	= 3.3358X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3075	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.8237X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 5.9779	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	9.128
B - See Shock Generator Diagram	(inches)	3.338
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.39

Run 55

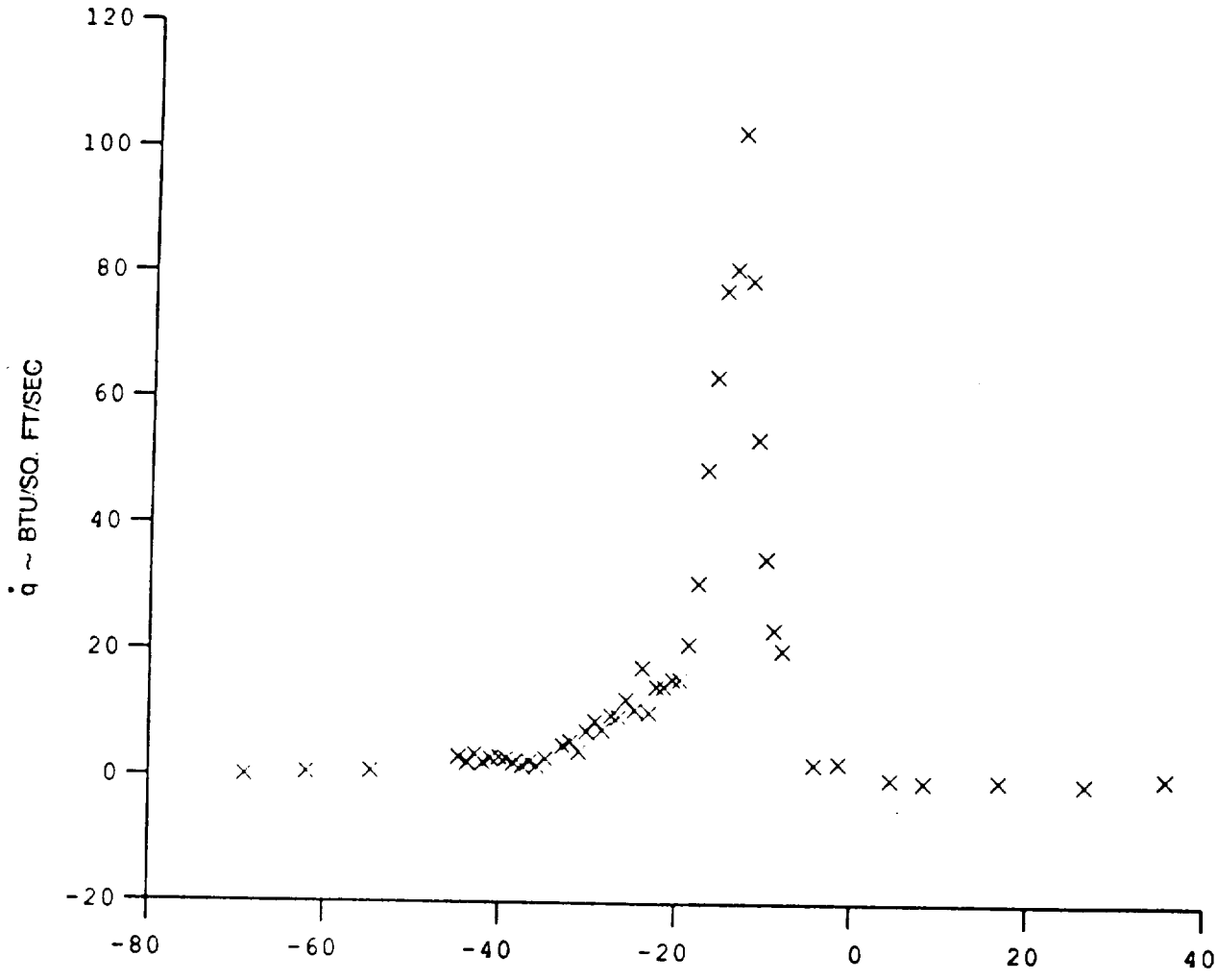

70
60
50
40
30
20
10
0
-10
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 55

Test Conditions

Po	= 7.2090X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5300X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2830X10+3	degR	Reservoir Total Temperature
M	= 12.1500		Freestream Mach Number
U	= 5.4480X10+3	Ft/sec	Freestream Velocity
T	= 8.0790X10+1	degR	Freestream Temperature
P	= 4.2550X10-3	PSIA	Freestream Static Pressure
Rho	= 4.2700X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.7950X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4230X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.2290X10-1	PSIA	Pitot Pressure
Q	= 4.4000X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9240		Shock Tube Incident Shock Mach Number
Hw	= 3.3327X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2724	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.7946X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 5.9724	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.636
B - See Shock Generator Diagram	(inches)	3.425
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.30

Run 56

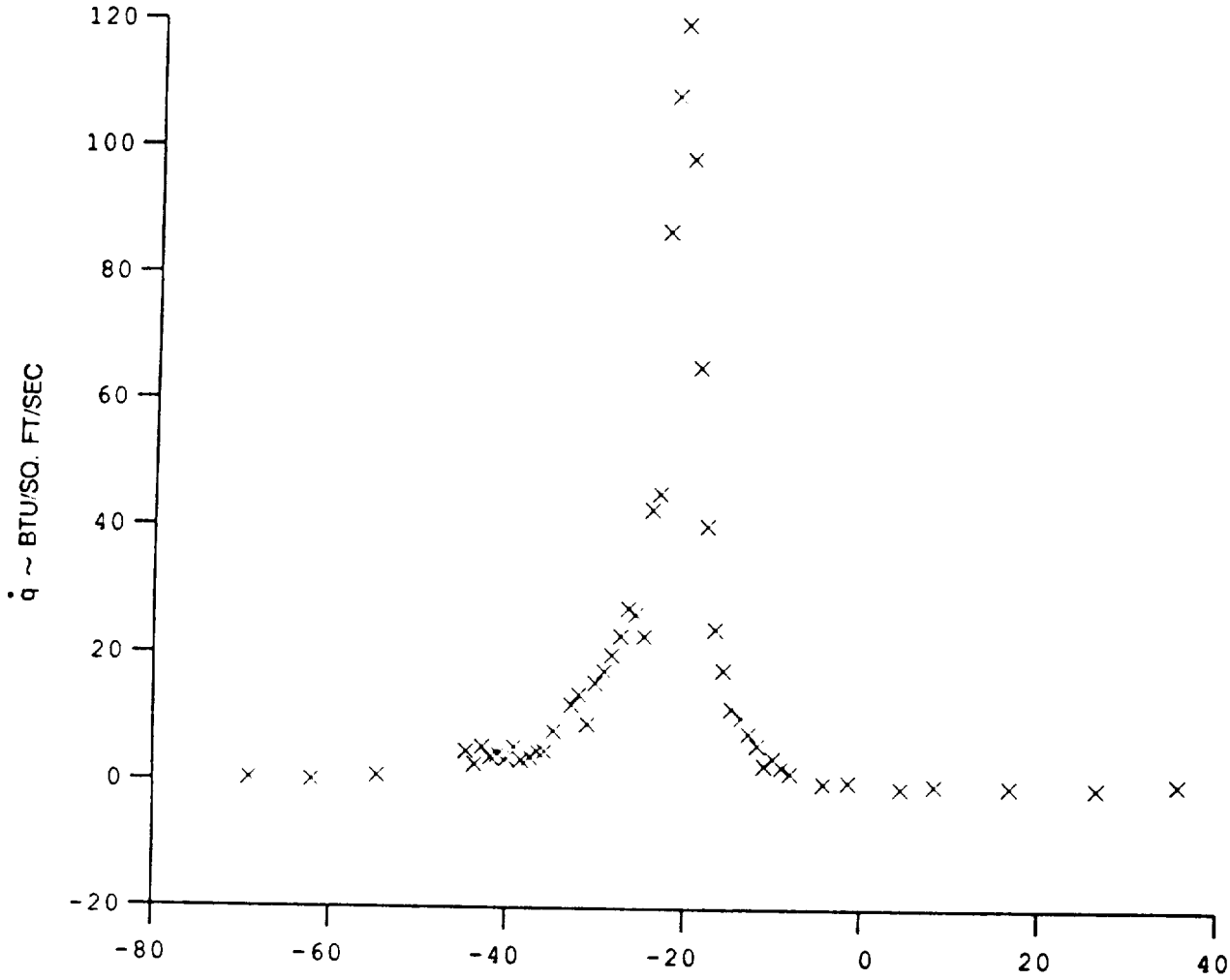

120
100
80
60
40
20
0
-20
-80
-60
-40
-20
0
20
40
$\dot{q}$ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 56

Test Conditions

Po	= 7.1380X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5330X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2840X10+3	degR	Reservoir Total Temperature
M	= 12.1500		Freestream Mach Number
U	= 5.4530X10+3	Ft/sec	Freestream Velocity
T	= 8.0980X10+1	degR	Freestream Temperature
P	= 4.2160X10-3	PSIA	Freestream Static Pressure
Rho	= 4.2220X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8110X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.3800X10+3	1/Ft	Freestream Reynolds Number
Po'	= 8.1510X10-1	PSIA	Pitot Pressure
Q	= 4.3580X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9230		Shock Tube Incident Shock Mach Number
Hw	= 3.3358X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2941	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.8174X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 5.9577	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.636
B - See Shock Generator Diagram	(inches)	3.625
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.34

Run 57



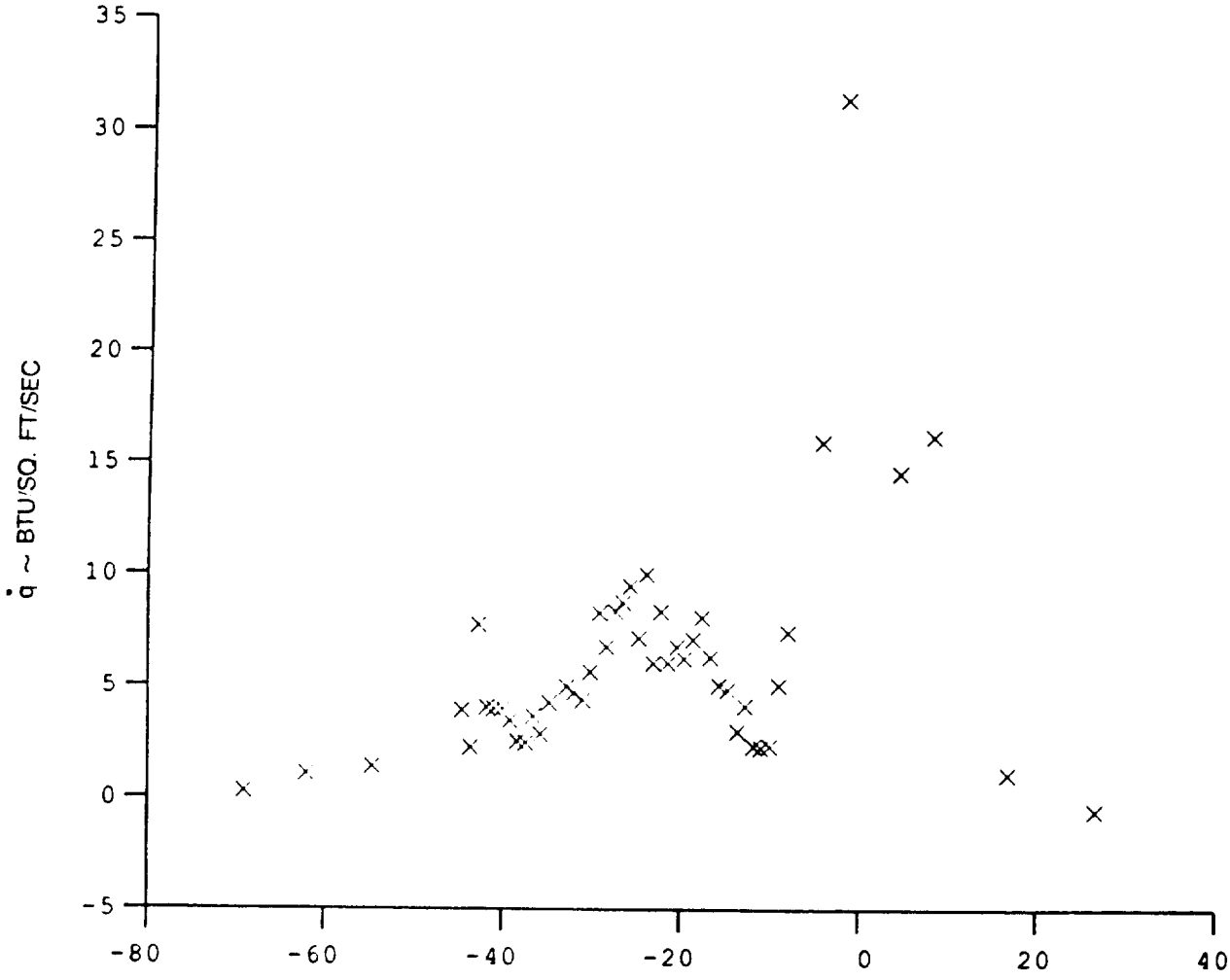
HEAT TRANSFER vs Gauge Position
Run 57

Test Conditions

Po	= 7.4020X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5410X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.2870X10+3	degR	Reservoir Total Temperature
M	= 12.1600		Freestream Mach Number
U	= 5.4660X10+3	Ft/sec	Freestream Velocity
T	= 8.1210X10+1	degR	Freestream Temperature
P	= 4.3400X10-3	PSIA	Freestream Static Pressure
Rho	= 4.3330X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.8310X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.4680X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.4080X10-1	PSIA	Pitot Pressure
Q	= 4.4960X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9220		Shock Tube Incident Shock Mach Number
Hw	= 3.3420X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.2247	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.7220X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR	= 6.0898	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.143
B - See Shock Generator Diagram	(inches)	3.512
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.28

Run 58



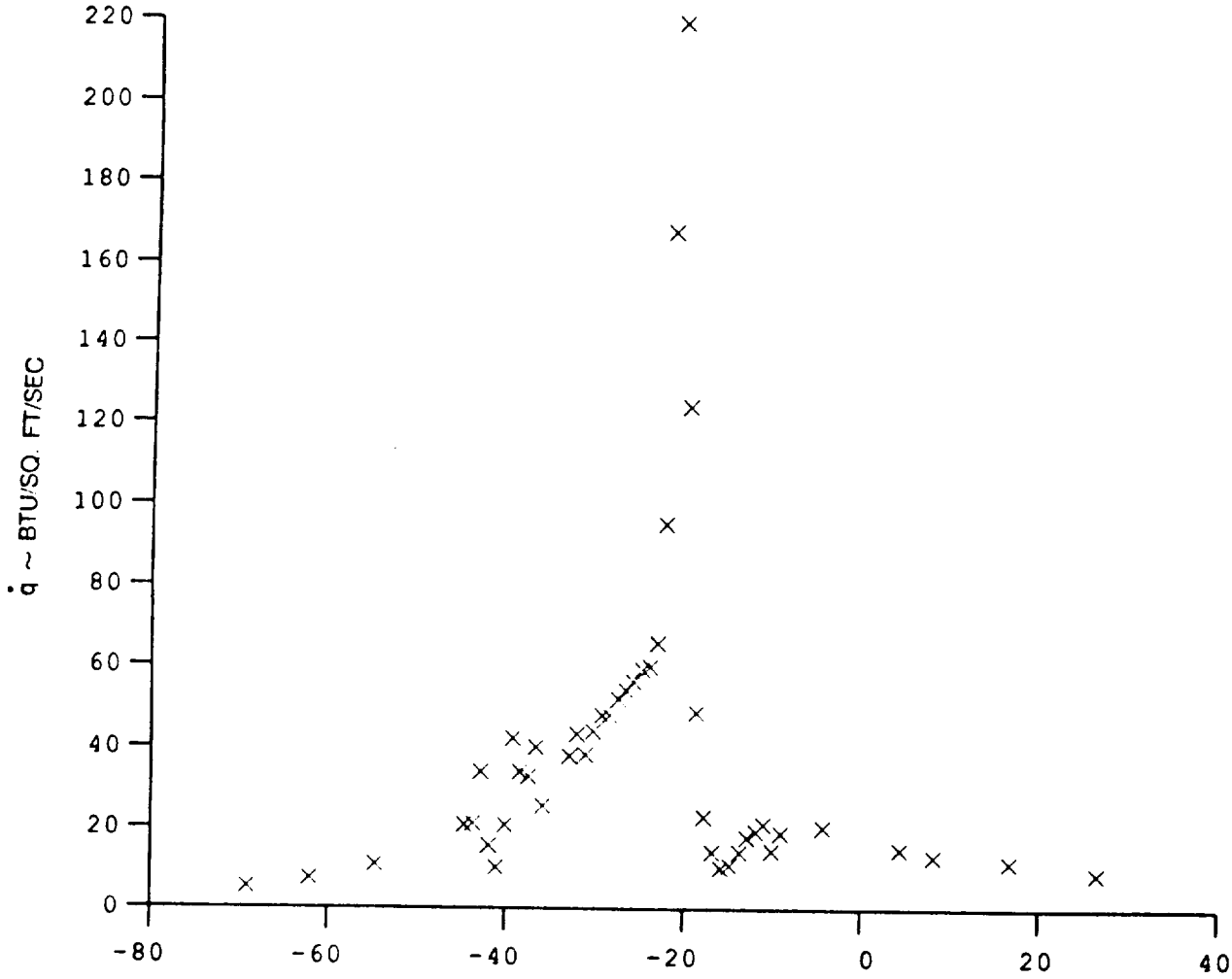
HEAT TRANSFER vs Gauge Position
Run 58

Test Conditions

Po	= 3.1820X10+3	PSIA	Reservoir Total Pressure
Ho	= 2.3800X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 3.3590X10+3	degR	Reservoir Total Temperature
M	= 16.0700		Freestream Mach Number
U	= 6.8420X10+3	Ft/sec	Freestream Velocity
T	= 7.2850X10+1	degR	Freestream Temperature
P	= 2.5370X10-3	PSIA	Freestream Static Pressure
Rho	= 2.8240X10-6	Slugs/Ft3	Freestream Density
Mu	= 6.1250X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1540X10+5	1/Ft	Freestream Reynolds Number
Po'	= 8.5830X10-1	PSIA	Pitot Pressure
Q	= 4.5900X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.7210		Shock Tube Incident Shock Mach Number
Hw	= 3.3607X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.1785	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.9700X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR	= 1.0764X10+1	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.743
B - See Shock Generator Diagram	(inches)	3.512
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 60

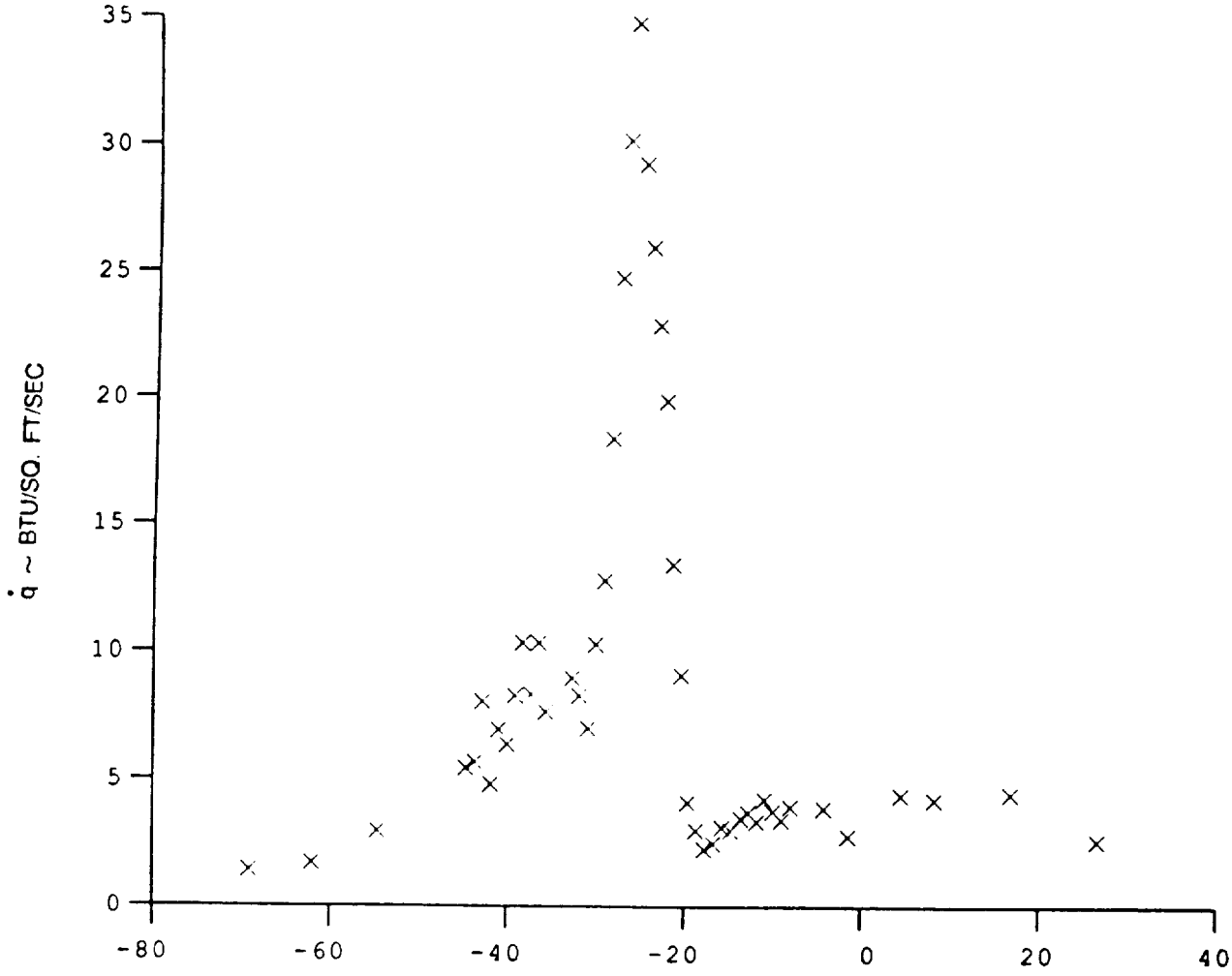

220
200
180
160
140
120
100
80
60
40
20
0
-80
-60
-40
-20
0
20
40
q̇ ~ BTU/SQ. FT/SEC
Angular Position Relative to Stagnation Point (degrees)
HEAT TRANSFER vs Gauge Position
Run 60

Test Conditions

Po	= 4.4560X10+2	PSIA	Reservoir Total Pressure
Ho	= 2.0870X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.9710X10+3	degR	Reservoir Total Temperature
M	= 15.2600		Freestream Mach Number
U	= 6.4000X10+3	Ft/sec	Freestream Velocity
T	= 7.0650X10+1	degR	Freestream Temperature
P	= 5.0700X10-4	PSIA	Freestream Static Pressure
Rho	= 5.8190X10-7	Slugs/Ft3	Freestream Density
Mu	= 5.9390X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 6.2710X10+4	1/Ft	Freestream Reynolds Number
Po'	= 1.5480X10-1	PSIA	Pitot Pressure
Q	= 9.2770X10-2	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 3.4380		Shock Tube Incident Shock Mach Number
Hw	= 3.3749X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 1.2083X10+1	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 1.1941X10-2	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QofR=	3.8789	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter		Value
A - See Shock Generator Diagram	(inches)	8.743
B - See Shock Generator Diagram	(inches)	3.512
Shock Generator Lip Diameter	(inches)	0.625
	Lambda	0.0

Run 61



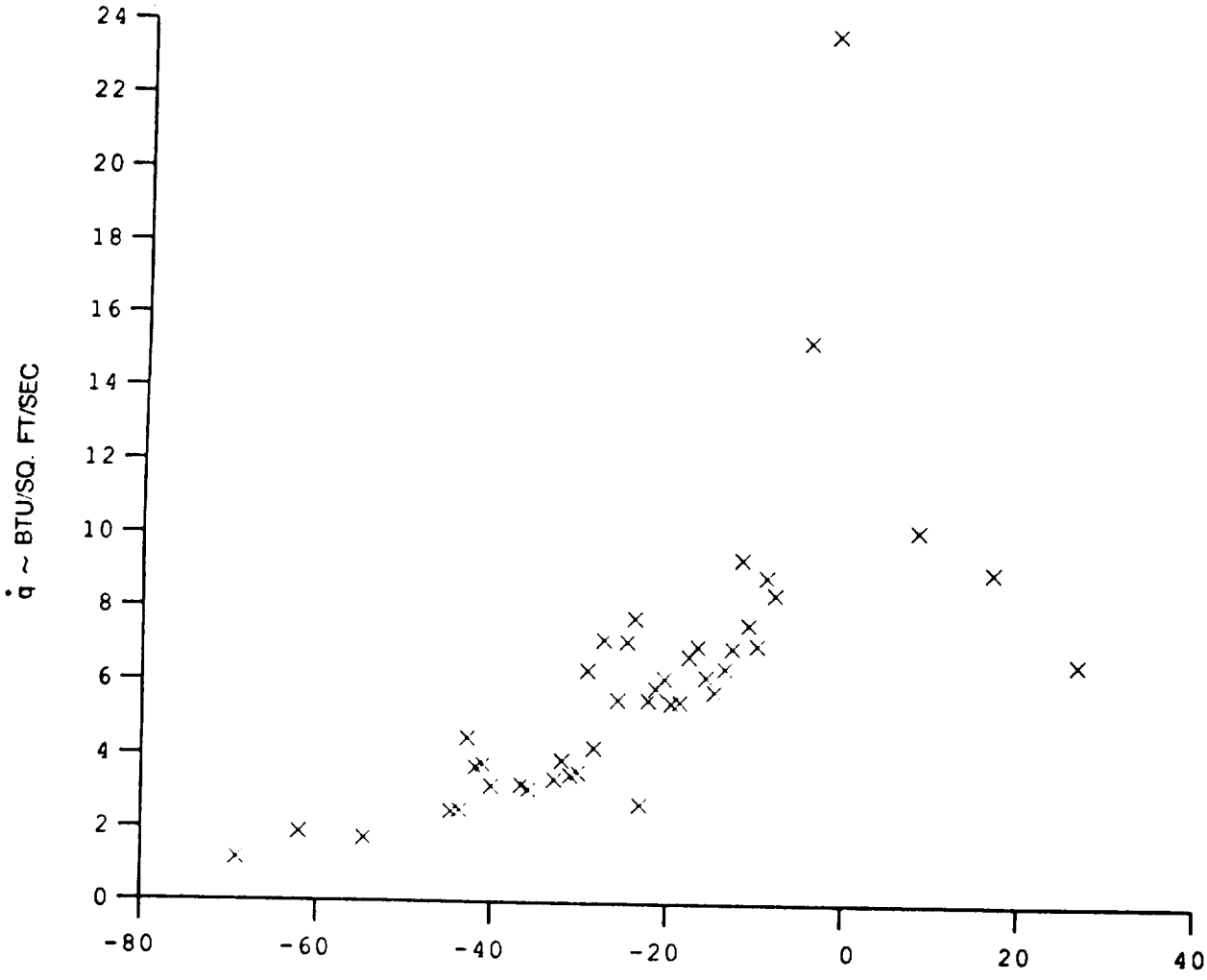
HEAT TRANSFER vs Gauge Position
Run 61

Test Conditions

Po	= 6.9050X10+2	PSIA	Reservoir Total Pressure
Ho	= 1.5740X10+7	(Ft/sec)2	Reservoir Total Enthalpy
To	= 2.3010X10+3	degR	Reservoir Total Temperature
M	= 12.1400		Freestream Mach Number
U	= 5.5250X10+3	Ft/sec	Freestream Velocity
T	= 8.3250X10+1	degR	Freestream Temperature
P	= 4.0700X10-3	PSIA	Freestream Static Pressure
Rho	= 3.9640X10-6	Slugs/Ft3	Freestream Density
Mu	= 7.0030X10-8	Slugs/Ft-sec	Freestream Viscosity
Re	= 3.1280X10+5	1/Ft	Freestream Reynolds Number
Po'	= 7.8580X10-1	PSIA	Pitot Pressure
Q	= 6.2020X10-1	PSIA	Dynamic Pressure (Rho U^2/288)
Mi	= 2.9180		Shock Tube Incident Shock Mach Number
Hw	= 3.3706X10+6	(Ft/sec)2	Wall Enthalpy (Cp Tw)
CPf	= 2.3801	1/PSIA	Pressure to CP factor (1/Q)
CHf	= 2.8719X10-3	Ft2-s/BTU	Heat Rate to CH factor (778/(Rho U (Ho-Hw))
QoFR=	6.0401	BTU/Ft2-s	Fay-Riddell Heat Transfer (1.00' Diam Sphere)

Model Parameter	Value
Lambda	0.0

Run 62



HEAT TRANSFER vs Gauge Position
Run 62

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.817(-1)	539.97	MT29	-30.99	4.218(0)	542.66	MT11	-14.75	8.928(0)	545.91
MT51	-61.83	6.096(-1)	540.20	MT28	-30.08	6.206(0)	545.42	MT10	-13.68	9.651(0)	546.61
MT50	-54.61	7.227(-1)	540.28	MT27	-29.18	7.641(0)	546.51	MT9	-12.83	9.313(0)	545.79
MT44	-44.55	2.739(0)	541.68	MT26	-28.28	6.648(0)	544.80	MT8	-11.88	9.870(0)	546.24
MT43	-43.60	1.703(0)	540.79	MT25	-27.41	7.108(0)	545.57	MT7	-10.93	1.110(1)	547.33
MT42	-42.68	3.458(0)	542.63	MT24	-26.54	7.734(0)	546.57	MT6	-9.98	1.192(1)	548.31
MT41	-41.79	2.186(0)	541.41	MT23	-25.66	8.064(0)	547.38	MT5	-9.04	1.268(1)	548.49
MT40	-40.88	2.266(0)	541.29	MT22	-24.80	5.895(0)	543.86	MT4	-8.10	1.010(1)	545.95
MT39	-40.00	2.616(0)	541.47	MT21	-23.94	1.122(1)	548.99	MT3	-4.34	1.553(1)	550.50
MT38	-39.13	2.225(0)	541.31	MT20	-23.08	6.914(0)	544.07	MT2	-1.56	1.427(1)	549.98
MT37	-38.28	3.537(0)	542.11	MT19	-22.25	7.782(0)	546.22	MT1	-.62	Null	Null
MT36	-37.42	1.875(0)	541.13	MT18	-21.40	6.115(0)	543.88	MT45	4.34	1.085(1)	548.67
MT35	-36.58	3.881(0)	542.66	MT17	-20.56	Null	Null	MT46	8.10	9.731(0)	548.61
MT34	-35.67	2.692(0)	541.83	MT16	-19.62	5.044(0)	543.49	MT47	16.69	8.024(0)	545.41
MT33	-34.71	5.373(0)	543.86	MT15	-18.64	8.587(0)	546.61	MT48	26.54	5.411(0)	543.47
MT32	-33.77	Null	Null	MT14	-17.66	7.774(0)	545.40	MT49	35.67	3.262(0)	542.07
MT31	-32.82	5.461(0)	544.01	MT13	-16.69	9.629(0)	546.98				
MT30	-31.89	Null	Null	MT12	-15.71	8.370(0)	545.59				

Run 4 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	1.618(0)	544.32	MT29	-30.99	6.760(0)	549.55	MT11	-14.75	9.149(0)	552.50
MT51	-61.83	2.457(0)	545.26	MT28	-30.08	6.793(0)	549.74	MT10	-13.68	8.441(0)	551.49
MT50	-54.61	3.116(0)	545.80	MT27	-29.18	7.788(0)	550.69	MT9	-12.83	8.323(0)	551.36
MT44	-44.55	5.326(0)	548.11	MT26	-28.28	6.967(0)	549.97	MT8	-11.88	9.072(0)	551.54
MT43	-43.60	4.986(0)	547.77	MT25	-27.41	7.151(0)	550.08	MT7	-10.93	9.240(0)	552.45
MT42	-42.68	6.630(0)	549.38	MT24	-26.54	7.697(0)	550.48	MT6	-9.98	9.252(0)	552.67
MT41	-41.79	3.968(0)	546.89	MT23	-25.66	8.483(0)	551.21	MT5	-9.04	9.626(0)	552.78
MT40	-40.88	5.950(0)	548.82	MT22	-24.80	8.076(0)	550.90	MT4	-8.10	6.547(0)	550.40
MT39	-40.00	4.683(0)	547.53	MT21	-23.94	8.610(0)	551.22	MT3	-4.34	9.653(0)	552.95
MT38	-39.13	6.171(0)	548.99	MT20	-23.08	8.440(0)	551.14	MT2	-1.56	9.171(0)	553.44
MT37	-38.28	6.801(0)	549.48	MT19	-22.25	9.681(0)	552.23	MT1	-.62	Null	Null
MT36	-37.42	6.760(0)	549.39	MT18	-21.40	9.013(0)	551.64	MT45	4.34	9.566(0)	552.61
MT35	-36.58	7.172(0)	549.74	MT17	-20.56	Null	Null	MT46	8.10	8.414(0)	551.85
MT34	-35.67	5.330(0)	548.18	MT16	-19.62	8.799(0)	551.55	MT47	16.69	7.198(0)	551.17
MT33	-34.71	6.694(0)	549.66	MT15	-18.64	9.066(0)	551.92	MT48	26.54	5.549(0)	549.09
MT32	-33.77	Null	Null	MT14	-17.66	9.109(0)	552.03	MT49	35.67	6.797(0)	549.97
MT31	-32.82	6.976(0)	549.83	MT13	-16.69	9.217(0)	552.16				
MT30	-31.89	7.569(0)	550.14	MT12	-15.71	8.403(0)	551.39				

Run 5 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	4.264(-1)	539.12	MT29	-30.99	3.716(0)	541.68	MT11	-14.75	5.705(0)	543.46
MT51	-61.83	8.014(-1)	539.38	MT28	-30.08	6.375(0)	543.97	MT10	-13.68	5.696(0)	543.79
MT50	-54.61	Null	Null	MT27	-29.18	7.422(0)	544.91	MT9	-12.83	5.559(0)	543.38
MT44	-44.55	2.661(0)	540.88	MT26	-28.28	5.133(0)	542.90	MT8	-11.88	Null	Null
MT43	-43.60	1.751(0)	540.11	MT25	-27.41	5.366(0)	543.74	MT7	-10.93	6.364(0)	543.87
MT42	-42.68	3.978(0)	541.77	MT24	-26.54	6.331(0)	544.43	MT6	-9.98	6.709(0)	544.12
MT41	-41.79	2.423(0)	540.59	MT23	-25.66	7.060(0)	544.88	MT5	-9.04	6.997(0)	544.32
MT40	-40.88	Null	Null	MT22	-24.80	4.613(0)	542.32	MT4	-8.10	7.780(0)	544.18
MT39	-40.00	2.573(0)	540.65	MT21	-23.94	9.210(0)	545.74	MT3	-4.34	8.961(0)	546.35
MT38	-39.13	2.346(0)	540.53	MT20	-23.08	Null	Null	MT2	-1.56	7.575(0)	545.32
MT37	-38.28	2.638(0)	540.94	MT19	-22.25	5.469(0)	543.16	MT1	-.62	Null	Null
MT36	-37.42	2.016(0)	540.19	MT18	-21.40	5.112(0)	542.50	MT45	4.34	6.437(0)	544.56
MT35	-36.58	3.206(0)	541.34	MT17	-20.56	Null	Null	MT46	8.10	8.125(0)	545.98
MT34	-35.67	2.285(0)	540.74	MT16	-19.62	3.974(0)	542.15	MT47	16.69	6.699(0)	543.78
MT33	-34.71	5.035(0)	542.49	MT15	-18.64	5.465(0)	543.00	MT48	26.54	4.518(0)	542.27
MT32	-33.77	Null	Null	MT14	-17.66	5.180(0)	543.38	MT49	35.67	2.666(0)	540.79
MT31	-32.82	5.055(0)	542.67	MT13	-16.69	6.322(0)	544.24				
MT30	-31.89	5.416(0)	543.15	MT12	-15.71	4.780(0)	542.94				

Run 6 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	2.962(-1)	540.29	MT29	-30.99	2.364(0)	542.10	MT11	-14.75	2.093(0)	542.28
MT51	-61.83	4.587(-1)	540.41	MT28	-30.08	2.284(0)	541.89	MT10	-13.68	2.235(0)	542.15
MT50	-54.61	5.564(-1)	540.49	MT27	-29.18	2.800(0)	542.05	MT9	-12.83	3.314(0)	542.92
MT44	-44.55	1.209(0)	541.14	MT26	-28.28	2.653(0)	542.20	MT8	-11.88	Null	Null
MT43	-43.60	7.541(-1)	540.48	MT25	-27.41	2.859(0)	542.34	MT7	-10.93	3.099(0)	543.39
MT42	-42.68	1.779(0)	541.68	MT24	-26.54	3.091(0)	542.60	MT6	-9.98	4.953(0)	543.86
MT41	-41.79	1.252(0)	541.17	MT23	-25.66	3.696(0)	543.25	MT5	-9.04	5.951(0)	544.44
MT40	-40.88	1.044(0)	540.71	MT22	-24.80	2.730(0)	542.57	MT4	-8.10	5.104(0)	545.36
MT39	-40.00	1.291(0)	541.23	MT21	-23.94	3.442(0)	544.11	MT3	-4.34	1.222(1)	549.08
MT38	-39.13	1.130(0)	540.96	MT20	-23.08	Null	Null	MT2	-1.56	1.498(1)	551.80
MT37	-38.28	1.248(0)	541.16	MT19	-22.25	2.699(0)	542.75	MT1	-.62	Null	Null
MT36	-37.42	6.846(-1)	540.55	MT18	-21.40	2.868(0)	542.26	MT45	4.34	5.534(0)	543.83
MT35	-36.58	Null	Null	MT17	-20.56	Null	Null	MT46	8.10	4.953(0)	544.33
MT34	-35.67	1.041(0)	540.85	MT16	-19.62	3.099(0)	542.86	MT47	16.69	1.239(0)	540.91
MT33	-34.71	2.414(0)	541.94	MT15	-18.64	2.847(0)	542.86	MT48	26.54	1.166(0)	540.76
MT32	-33.77	Null	Null	MT14	-17.66	3.239(0)	542.73	MT49	35.67	9.071(-1)	540.49
MT31	-32.82	2.854(0)	542.50	MT13	-16.69	4.331(0)	544.08				
MT30	-31.89	3.713(0)	543.44	MT12	-15.71	2.649(0)	542.89				

Run 7 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.897(-1)	538.65	HT29	-30.99	9.167(-1)	538.68	HT11	-14.75	1.775(0)	539.28
HT51	-61.83	3.101(-1)	538.78	HT28	-30.08	3.799(-1)	538.32	HT10	-13.68	1.670(0)	539.06
HT50	-54.61	2.016(-1)	538.74	HT27	-29.18	1.307(0)	538.59	HT9	-12.83	1.746(0)	539.17
HT44	-44.55	4.044(-1)	538.49	HT26	-28.28	8.310(-1)	538.33	HT8	-11.88	2.018(0)	539.37
HT43	-43.60	1.931(-1)	538.36	HT25	-27.41	1.399(0)	539.07	HT7	-10.93	2.450(0)	539.54
HT42	-42.68	9.750(-1)	538.76	HT24	-26.54	1.109(0)	538.95	HT6	-9.98	2.009(0)	539.33
HT41	-41.79	7.435(-1)	538.58	HT23	-25.66	4.369(-1)	538.44	HT5	-9.04	3.182(0)	540.09
HT40	-40.88	6.892(-1)	538.44	HT22	-24.80	1.444(0)	539.02	HT4	-8.10	2.385(0)	539.71
HT39	-40.00	9.222(-1)	538.77	HT21	-23.94	1.707(0)	539.20	HT3	-4.34	8.255(0)	542.71
HT38	-39.13	8.355(-1)	538.77	HT20	-23.08	1.967(0)	539.32	HT2	-1.56	1.421(1)	547.07
HT37	-38.28	6.526(-1)	538.67	HT19	-22.25	1.955(0)	539.44	HT1	-.62	Null	Null
HT36	-37.42	4.019(-1)	538.61	HT18	-21.40	1.508(0)	539.28	HT45	4.34	2.447(0)	539.88
HT35	-36.58	5.908(-1)	538.54	HT17	-20.56	Null	Null	HT46	8.10	2.248(0)	539.77
HT34	-35.67	1.462(-1)	538.41	HT16	-19.62	2.083(0)	539.54	HT47	16.69	6.168(-1)	539.32
HT33	-34.71	1.002(0)	538.62	HT15	-18.64	2.009(0)	539.44	HT48	26.54	7.914(-1)	538.85
HT32	-33.77	Null	Null	HT14	-17.66	1.648(0)	539.46	HT49	35.67	5.243(-1)	538.60
HT31	-32.82	1.410(0)	538.89	HT13	-16.69	1.707(0)	539.26				
HT30	-31.89	1.557(0)	539.03	HT12	-15.71	1.380(0)	539.18				

Run 9 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (Degk)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	5.041(-2)	540.36	HT29	-30.99	9.143(-1)	540.55	HT11	-14.75	1.735(0)	541.76
HT51	-61.83	1.924(-1)	540.50	HT28	-30.08	2.687(-1)	540.06	HT10	-13.68	2.092(0)	541.72
HT50	-54.61	1.443(-1)	540.48	HT27	-29.18	1.204(0)	540.60	HT9	-12.83	2.485(0)	542.04
HT44	-44.55	2.325(-1)	540.13	HT26	-28.28	6.545(-1)	540.16	HT8	-11.88	Null	Null
HT43	-43.60	1.246(-1)	540.13	HT25	-27.41	1.313(0)	541.05	HT7	-10.93	2.357(0)	542.33
HT42	-42.68	6.011(-1)	540.41	HT24	-26.54	1.305(0)	541.20	HT6	-9.98	1.978(0)	542.05
HT41	-41.79	5.286(-1)	540.35	HT23	-25.66	3.417(-1)	540.29	HT5	-9.04	3.410(0)	543.10
HT40	-40.88	Null	Null	HT22	-24.80	1.421(0)	541.12	HT4	-8.10	3.490(0)	543.10
HT39	-40.00	7.808(-1)	540.53	HT21	-23.94	1.612(0)	541.50	HT3	-4.34	8.020(0)	546.58
HT38	-39.13	6.334(-1)	540.56	HT20	-23.08	1.521(0)	541.48	HT2	-1.56	1.358(1)	550.81
HT37	-38.28	4.659(-1)	540.52	HT19	-22.25	1.608(0)	541.83	HT1	-.62	Null	Null
HT36	-37.42	2.847(-1)	540.41	HT18	-21.40	1.357(0)	541.65	HT45	4.34	2.538(0)	542.61
HT35	-36.58	4.483(-1)	540.49	HT17	-20.56	Null	Null	HT46	8.10	2.230(0)	542.18
HT34	-35.67	1.333(-1)	540.28	HT16	-19.62	1.870(0)	542.31	HT47	16.69	3.066(-1)	540.97
HT33	-34.71	8.374(-1)	540.43	HT15	-18.64	1.212(0)	541.27	HT48	26.54	5.208(-1)	540.99
HT32	-33.77	Null	Null	HT14	-17.66	1.503(0)	541.65	HT49	35.67	4.219(-1)	540.54
HT31	-32.82	1.014(0)	540.59	HT13	-16.69	2.029(0)	541.94				
HT30	-31.89	1.383(0)	540.91	HT12	-15.71	1.985(0)	542.23				

Run 10 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	3.206(0)	537.05	HT29	-30.99	2.171(1)	556.09	HT11	-14.75	2.017(1)	555.21
HT51	-61.83	4.830(0)	538.70	HT28	-30.08	2.278(1)	556.09	HT10	-13.68	2.342(1)	556.34
HT50	-54.61	7.385(0)	541.18	HT27	-29.18	2.331(1)	557.04	HT9	-12.83	1.949(1)	554.29
HT44	-44.55	1.571(1)	549.55	HT26	-28.28	2.175(1)	555.98	HT8	-11.88	1.971(1)	554.63
HT43	-43.60	1.558(1)	548.85	HT25	-27.41	2.147(1)	555.71	HT7	-10.93	2.380(1)	558.26
HT42	-42.68	Null	Null	HT24	-26.54	2.377(1)	557.36	HT6	-9.98	2.375(1)	558.04
HT41	-41.79	1.243(1)	545.56	HT23	-25.66	2.459(1)	558.19	HT5	-9.04	2.361(1)	558.49
HT40	-40.88	Null	Null	HT22	-24.80	2.470(1)	559.45	HT4	-8.10	1.734(1)	550.92
HT39	-40.00	1.576(1)	548.80	HT21	-23.94	2.566(1)	560.98	HT3	-4.34	2.279(1)	556.84
HT38	-39.13	1.960(1)	550.14	HT20	-23.08	2.434(1)	559.34	HT2	-1.56	1.995(1)	554.87
HT37	-38.28	2.342(1)	557.21	HT19	-22.25	2.512(1)	561.02	HT1	-.62	Null	Null
HT36	-37.42	Null	Null	HT18	-21.40	Null	Null	HT45	4.34	2.353(1)	557.28
HT35	-36.58	2.722(1)	560.94	HT17	-20.56	Null	Null	HT46	8.10	1.943(1)	554.82
HT34	-35.67	1.794(1)	551.21	HT16	-19.62	2.149(1)	557.73	HT47	16.69	1.913(1)	553.95
HT33	-34.71	Null	Null	HT15	-18.64	2.163(1)	557.78	HT48	26.54	1.596(1)	550.50
HT32	-33.77	Null	Null	HT14	-17.66	2.239(1)	558.32	HT49	35.67	1.684(0)	535.39
HT31	-32.82	2.197(1)	556.02	HT13	-16.69	2.682(1)	562.03				
HT30	-31.89	Null	Null	HT12	-15.71	2.005(1)	554.93				

Run 13 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	2.054(0)	540.32	HT29	-30.99	1.464(1)	556.37	HT11	-14.75	2.656(1)	564.47
HT51	-61.83	3.146(0)	541.83	HT28	-30.08	1.662(1)	559.36	HT10	-13.68	3.010(1)	569.97
HT50	-54.61	4.031(0)	542.71	HT27	-29.18	2.106(1)	561.98	HT9	-12.83	2.676(1)	562.25
HT44	-44.55	9.747(0)	551.06	HT26	-28.28	2.260(1)	563.51	HT8	-11.88	2.357(1)	559.97
HT43	-43.60	Null	Null	HT25	-27.41	2.269(1)	565.21	HT7	-10.93	2.771(1)	563.82
HT42	-42.68	1.349(1)	554.70	HT24	-26.54	2.322(1)	565.81	HT6	-9.98	2.606(1)	564.92
HT41	-41.79	6.228(0)	545.31	HT23	-25.66	2.429(1)	565.36	HT5	-9.04	3.157(1)	566.43
HT40	-40.88	9.840(0)	550.47	HT22	-24.80	2.019(1)	559.40	HT4	-8.10	1.867(1)	557.91
HT39	-40.00	7.965(0)	548.85	HT21	-23.94	2.970(1)	569.59	HT3	-4.34	2.626(1)	565.13
HT38	-39.13	3.675(0)	543.42	HT20	-23.08	1.699(1)	558.68	HT2	-1.56	2.543(1)	563.05
HT37	-38.28	8.899(0)	550.88	HT19	-22.25	2.547(1)	568.73	HT1	-.62	Null	Null
HT36	-37.42	7.644(0)	548.56	HT18	-21.40	2.423(1)	566.69	HT45	4.34	3.018(1)	566.22
HT35	-36.58	8.154(0)	550.03	HT17	-20.56	Null	Null	HT46	8.10	Null	Null
HT34	-35.67	7.701(0)	548.64	HT16	-19.62	2.334(1)	564.09	HT47	16.69	2.309(1)	565.31
HT33	-34.71	1.129(1)	554.18	HT15	-18.64	2.331(1)	564.60	HT48	26.54	Null	Null
HT32	-33.77	Null	Null	HT14	-17.66	2.600(1)	567.29	HT49	35.67	5.641(-1)	539.12
HT31	-32.82	1.448(1)	557.27	HT13	-16.69	2.624(1)	565.97				
HT30	-31.89	1.677(1)	557.32	HT12	-15.71	2.145(1)	561.18				

Run 14 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.061(0)	540.58	HT29	-30.99	1.206(1)	547.26	HT11	-14.75	1.385(1)	551.01
HT51	-61.83	2.126(0)	541.33	HT28	-30.08	1.530(1)	551.40	HT10	-13.68	1.247(1)	549.75
HT50	-54.61	3.042(0)	542.04	HT27	-29.18	1.822(1)	552.64	HT9	-12.83	1.344(1)	550.50
HT44	-44.55	8.010(0)	545.19	HT26	-28.28	1.567(1)	550.61	HT8	-11.88	1.447(1)	551.28
HT43	-43.60	Null	Null	HT25	-27.41	1.457(1)	551.41	HT7	-10.93	1.235(1)	550.08
HT42	-42.68	1.104(1)	546.42	HT24	-26.54	1.903(1)	554.49	HT6	-9.98	1.468(1)	549.68
HT41	-41.79	0.310(0)	544.52	HT23	-25.66	1.826(1)	553.17	HT5	-9.04	2.031(1)	553.39
HT40	-40.88	0.178(0)	544.24	HT22	-24.80	1.487(1)	550.01	HT4	-8.10	Null	Null
HT39	-40.00	6.976(0)	543.51	HT21	-23.94	2.255(1)	557.77	HT3	-4.34	2.913(1)	559.86
HT38	-39.13	8.864(0)	544.77	HT20	-23.08	2.523(1)	554.86	HT2	-1.56	5.926(1)	574.59
HT37	-38.28	7.328(0)	544.21	HT19	-22.25	1.515(1)	552.42	HT1	-.62	Null	Null
HT36	-37.42	8.368(0)	544.06	HT18	-21.40	1.608(1)	553.23	HT45	4.34	3.816(1)	563.63
HT35	-36.58	9.229(0)	544.98	HT17	-20.56	Null	Null	HT46	8.10	Null	Null
HT34	-35.67	6.687(0)	544.48	HT16	-19.62	1.229(1)	549.82	HT47	16.69	1.426(1)	550.24
HT33	-34.71	Null	Null	HT15	-18.64	1.187(1)	550.26	HT48	26.54	5.392(-1)	539.15
HT32	-33.77	Null	Null	HT14	-17.66	1.497(1)	552.79	HT49	35.67	4.818(-1)	539.20
HT31	-32.82	1.296(1)	548.48	HT13	-16.69	1.755(1)	554.09				
HT30	-31.89	Null	Null	HT12	-15.71	1.376(1)	551.57				

Run 15 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	6.979(0)	551.67	HT29	-30.99	6.955(0)	549.46	HT11	-14.75	8.201(0)	551.34
HT51	-61.83	Null	Null	HT28	-30.08	7.114(0)	550.19	HT10	-13.68	9.342(0)	552.58
HT50	-54.61	Null	Null	HT27	-29.18	1.153(1)	554.44	HT9	-12.83	1.001(1)	553.47
HT44	-44.55	4.498(1)	572.94	HT26	-28.28	Null	Null	HT8	-11.88	8.924(0)	553.25
HT43	-43.60	Null	Null	HT25	-27.41	5.998(0)	549.39	HT7	-10.93	9.086(0)	552.39
HT42	-42.68	3.546(1)	566.52	HT24	-26.54	6.557(0)	550.08	HT6	-9.98	8.349(0)	551.13
HT41	-41.79	2.660(1)	560.09	HT23	-25.66	7.032(0)	550.60	HT5	-9.04	1.155(1)	552.96
HT40	-40.88	2.119(1)	557.54	HT22	-24.80	7.573(0)	551.16	HT4	-8.10	1.214(1)	556.30
HT39	-40.00	1.486(1)	552.37	HT21	-23.94	7.968(0)	552.13	HT3	-4.34	1.175(1)	555.08
HT38	-39.13	1.452(1)	553.07	HT20	-23.08	8.560(0)	551.49	HT2	-1.56	8.103(0)	551.95
HT37	-38.28	1.545(1)	555.17	HT19	-22.25	9.520(0)	553.70	HT1	-.62	Null	Null
HT36	-37.42	9.808(0)	551.26	HT18	-21.40	9.780(0)	554.07	HT45	4.34	8.782(0)	551.50
HT35	-36.58	8.390(0)	550.41	HT17	-20.56	8.772(0)	552.05	HT46	8.10	9.007(0)	551.63
HT34	-35.67	8.917(0)	550.76	HT16	-19.62	9.259(0)	551.73	HT47	16.69	8.786(0)	551.25
HT33	-34.71	9.304(0)	552.30	HT15	-18.64	8.553(0)	552.56	HT48	26.54	Null	Null
HT32	-33.77	Null	Null	HT14	-17.66	1.266(1)	556.20	HT49	35.67	1.491(0)	542.12
HT31	-32.82	6.972(0)	550.32	HT13	-16.69	8.950(0)	552.22				
HT30	-31.89	1.038(1)	555.68	HT12	-15.71	7.981(0)	551.16				

Run 16 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	3.901(0)	548.85	HT29	-30.99	3.059(1)	590.31	HT11	-14.75	1.447(1)	557.03
HT51	-61.83	5.192(0)	550.75	HT28	-30.08	3.240(1)	597.16	HT10	-13.68	1.348(1)	556.83
HT50	-54.61	9.874(0)	557.68	HT27	-29.18	4.538(1)	604.03	HT9	-12.83	1.398(1)	556.46
HT44	-44.55	1.872(1)	576.03	HT26	-28.28	Null	Null	HT8	-11.88	1.305(1)	556.29
HT43	-43.60	Null	Null	HT25	-27.41	9.481(1)	611.08	HT7	-10.93	1.312(1)	555.96
HT42	-42.68	Null	Null	HT24	-26.54	1.185(2)	610.83	HT6	-9.98	1.115(1)	554.74
HT41	-41.79	1.652(1)	573.10	HT23	-25.66	1.110(2)	596.32	HT5	-9.04	1.208(1)	557.07
HT40	-40.88	Null	Null	HT22	-24.80	8.250(1)	581.00	HT4	-8.10	1.657(1)	565.33
HT39	-40.00	2.239(1)	583.26	HT21	-23.94	5.960(1)	570.54	HT3	-4.34	1.185(1)	556.37
HT38	-39.13	Null	Null	HT20	-23.08	4.143(1)	565.66	HT2	-1.56	1.093(1)	555.68
HT37	-38.28	Null	Null	HT19	-22.25	2.053(1)	559.13	HT1	-.62	Null	Null
HT36	-37.42	Null	Null	HT18	-21.40	1.509(1)	557.58	HT45	4.34	9.709(0)	556.04
HT35	-36.58	Null	Null	HT17	-20.56	1.257(1)	557.01	HT46	8.10	7.080(0)	552.54
HT34	-35.67	2.583(1)	580.97	HT16	-19.62	1.071(1)	555.99	HT47	16.69	7.043(0)	552.29
HT33	-34.71	4.325(1)	598.63	HT15	-18.64	1.266(1)	557.11	HT48	26.54	Null	Null
HT32	-33.77	Null	Null	HT14	-17.66	1.289(1)	557.07	HT49	35.67	2.247(0)	544.71
HT31	-32.82	3.536(1)	592.21	HT13	-16.69	1.338(1)	557.06				
HT30	-31.89	3.533(1)	593.15	HT12	-15.71	1.437(1)	556.80				

Run 17 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	3.315(0)	538.77	HT29	-30.99	2.790(1)	568.34	HT11	-14.75	1.080(1)	547.17
HT51	-61.83	3.063(0)	539.55	HT28	-30.08	2.730(1)	567.15	HT10	-13.68	8.863(0)	546.72
HT50	-54.61	7.239(0)	543.14	HT27	-29.18	3.039(1)	570.41	HT9	-12.83	1.453(1)	549.48
HT44	-44.55	1.432(1)	551.25	HT26	-28.28	Null	Null	HT8	-11.88	1.563(1)	550.11
HT43	-43.60	Null	Null	HT25	-27.41	3.344(1)	571.99	HT7	-10.93	1.552(1)	550.36
HT42	-42.68	2.488(1)	562.25	HT24	-26.54	3.259(1)	572.33	HT6	-9.98	1.197(1)	548.01
HT41	-41.79	1.119(1)	548.47	HT23	-25.66	3.131(1)	574.70	HT5	-9.04	1.115(1)	547.47
HT40	-40.88	1.985(1)	557.08	HT22	-24.80	2.975(1)	582.71	HT4	-8.10	1.268(1)	549.00
HT39	-40.00	1.535(1)	552.03	HT21	-23.94	4.038(1)	600.23	HT3	-4.34	1.192(1)	549.88
HT38	-39.13	2.921(1)	566.54	HT20	-23.08	6.570(1)	613.33	HT2	-1.56	1.052(1)	546.76
HT37	-38.28	2.292(1)	560.82	HT19	-22.25	1.199(2)	627.03	HT1	-.62	Null	Null
HT36	-37.42	2.345(1)	560.89	HT18	-21.40	1.191(2)	607.95	HT45	4.34	9.618(0)	544.96
HT35	-36.58	2.872(1)	565.78	HT17	-20.56	6.999(1)	584.66	HT46	8.10	7.771(0)	543.63
HT34	-35.67	1.938(1)	555.61	HT16	-19.62	2.711(1)	558.89	HT47	16.69	6.238(0)	542.60
HT33	-34.71	2.735(1)	566.84	HT15	-18.64	1.400(1)	549.22	HT48	26.54	4.621(0)	540.29
HT32	-33.77	Null	Null	HT14	-17.66	1.017(1)	547.02	HT49	35.67	5.909(0)	541.75
HT31	-32.82	2.487(1)	564.57	HT13	-16.69	6.128(0)	544.95				
HT30	-31.89	2.854(1)	568.53	HT12	-15.71	9.012(0)	547.78				

Run 18 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	2.878(0)	539.72	MT29	-30.99	1.968(1)	552.48	MT11	-14.75	1.901(1)	565.46
MT51	-61.83	3.673(0)	540.34	MT28	-30.08	1.836(1)	552.75	MT10	-13.68	8.229(0)	553.31
MT50	-54.61	5.736(0)	542.52	MT27	-29.18	2.120(1)	554.44	MT9	-12.83	5.560(0)	548.20
MT44	-44.55	1.263(1)	547.64	MT26	-28.28	2.113(1)	553.86	MT8	-11.88	6.265(0)	544.61
MT43	-43.60	Null	Null	MT25	-27.41	2.454(1)	555.14	MT7	-10.93	9.066(0)	544.85
MT42	-42.68	1.783(1)	551.40	MT24	-26.54	2.741(1)	556.95	MT6	-9.98	1.185(1)	545.20
MT41	-41.79	7.594(0)	543.88	MT23	-25.66	2.737(1)	557.60	MT5	-9.04	1.269(1)	545.84
MT40	-40.88	1.438(1)	549.11	MT22	-24.80	2.975(1)	560.45	MT4	-8.10	1.498(1)	547.23
MT39	-40.00	9.460(0)	545.78	MT21	-23.94	3.224(1)	563.19	MT3	-4.34	1.464(1)	549.14
MT38	-39.13	1.929(1)	552.29	MT20	-23.08	3.095(1)	562.72	MT2	-1.56	1.246(1)	547.33
MT37	-38.28	1.664(1)	550.92	MT19	-22.25	3.620(1)	566.37	MT1	-.62	Null	Null
MT36	-37.42	1.753(1)	550.80	MT18	-21.40	3.391(1)	566.54	MT45	4.34	1.084(1)	546.34
MT35	-36.58	2.122(1)	552.98	MT17	-20.56	3.256(1)	567.00	MT46	8.10	8.994(0)	544.55
MT34	-35.67	1.349(1)	547.99	MT16	-19.62	4.177(1)	572.28	MT47	16.69	8.209(0)	543.76
MT33	-34.71	1.954(1)	552.27	MT15	-18.64	8.681(1)	584.79	MT48	26.54	4.939(0)	541.52
MT32	-33.77	Null	Null	MT14	-17.66	1.151(2)	594.39	MT49	35.67	4.936(0)	542.19
MT31	-32.82	1.861(1)	552.51	MT13	-16.69	8.094(1)	589.00				
MT30	-31.89	2.032(1)	553.35	MT12	-15.71	3.815(1)	574.36				

Run 19 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.882(0)	545.02	MT29	-30.99	Null	Null	MT11	-14.75	9.340(0)	549.13
MT51	-61.83	4.226(0)	546.01	MT28	-30.08	1.007(2)	623.20	MT10	-13.68	9.239(0)	549.03
MT50	-54.61	7.167(0)	548.80	MT27	-29.18	1.150(2)	629.19	MT9	-12.83	1.010(1)	549.75
MT44	-44.55	1.676(1)	559.38	MT26	-28.28	7.855(1)	607.51	MT8	-11.88	8.719(0)	548.93
MT43	-43.60	1.702(1)	558.67	MT25	-27.41	6.998(1)	595.12	MT7	-10.93	6.891(0)	548.98
MT42	-42.68	2.484(1)	568.39	MT24	-26.54	4.451(1)	584.04	MT6	-9.98	7.538(0)	547.95
MT41	-41.79	1.621(1)	558.12	MT23	-25.66	2.919(1)	572.05	MT5	-9.04	8.094(0)	548.08
MT40	-40.88	1.923(1)	559.59	MT22	-24.80	1.820(1)	562.69	MT4	-8.10	6.579(0)	547.51
MT39	-40.00	2.196(1)	562.05	MT21	-23.94	1.110(1)	556.11	MT3	-4.34	3.528(0)	544.20
MT38	-39.13	2.872(1)	569.12	MT20	-23.08	9.901(0)	553.65	MT2	-1.56	3.821(0)	544.83
MT37	-38.28	2.646(1)	567.57	MT19	-22.25	1.287(1)	557.14	MT1	-.62	Null	Null
MT36	-37.42	2.203(1)	565.67	MT18	-21.40	5.013(0)	547.87	MT45	4.34	2.796(0)	543.39
MT35	-36.58	2.784(1)	572.93	MT17	-20.56	6.837(0)	550.12	MT46	8.10	2.469(0)	543.71
MT34	-35.67	1.366(1)	554.10	MT16	-19.62	7.344(0)	549.48	MT47	16.69	1.057(0)	542.43
MT33	-34.71	2.983(1)	584.10	MT15	-18.64	5.605(0)	547.05	MT48	26.54	1.622(0)	542.53
MT32	-33.77	Null	Null	MT14	-17.66	7.650(0)	548.53	MT49	35.67	1.016(0)	541.37
MT31	-32.82	4.722(1)	594.40	MT13	-16.69	7.512(0)	548.42				
MT30	-31.89	Null	Null	MT12	-15.71	9.248(0)	548.97				

Run 20 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.357(0)	547.32	MT29	-30.99	6.866(1)	600.73	MT11	-14.75	5.678(0)	552.02
MT51	-61.83	4.644(0)	548.41	MT28	-30.08	4.187(1)	589.07	MT10	-13.68	5.239(0)	551.21
MT50	-54.61	6.382(0)	550.41	MT27	-29.18	4.135(1)	586.21	MT9	-12.83	6.237(0)	551.47
MT44	-44.55	1.736(1)	559.11	MT26	-28.28	3.388(1)	576.93	MT8	-11.88	4.722(0)	550.61
MT43	-43.60	1.500(1)	557.32	MT25	-27.41	2.673(1)	571.83	MT7	-10.93	3.472(0)	549.03
MT42	-42.68	2.377(1)	565.48	MT24	-26.54	2.569(1)	569.83	MT6	-9.98	4.349(0)	549.11
MT41	-41.79	1.399(1)	556.80	MT23	-25.66	1.708(1)	563.29	MT5	-9.04	4.505(0)	549.00
MT40	-40.88	1.384(1)	557.79	MT22	-24.80	1.212(1)	559.50	MT4	-8.10	3.783(0)	548.42
MT39	-40.00	1.737(1)	559.82	MT21	-23.94	9.552(0)	556.59	MT3	-4.34	2.312(0)	547.86
MT38	-39.13	2.378(1)	566.47	MT20	-23.08	7.931(0)	555.69	MT2	-1.56	1.311(0)	547.19
MT37	-38.28	2.913(1)	569.78	MT19	-22.25	9.634(0)	559.47	MT1	-.62	Null	Null
MT36	-37.42	3.254(1)	571.69	MT18	-21.40	7.918(0)	557.70	MT45	4.34	2.612(0)	548.00
MT35	-36.58	5.556(1)	586.51	MT17	-20.56	5.890(0)	555.99	MT46	8.10	1.628(0)	547.21
MT34	-35.67	3.921(1)	574.85	MT16	-19.62	6.460(0)	556.46	MT47	16.69	Null	Null
MT33	-34.71	9.765(1)	604.99	MT15	-18.64	6.171(0)	554.65	MT48	26.54	7.624(-1)	545.70
MT32	-33.77	Null	Null	MT14	-17.66	6.173(0)	553.97	MT49	35.67	8.662(-1)	545.24
MT31	-32.82	9.908(1)	611.43	MT13	-16.69	5.644(0)	552.72				
MT30	-31.89	9.244(1)	609.52	MT12	-15.71	5.878(0)	552.84				

Run 21 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.510(0)	542.97	MT29	-30.99	2.513(1)	568.97	MT11	-14.75	7.713(0)	548.03
MT51	-61.83	3.709(0)	543.93	MT28	-30.08	2.587(1)	570.53	MT10	-13.68	4.871(0)	548.85
MT50	-54.61	6.697(0)	546.86	MT27	-29.18	2.702(1)	572.52	MT9	-12.83	8.328(0)	553.09
MT44	-44.55	1.354(1)	554.02	MT26	-28.28	2.602(1)	571.64	MT8	-11.88	1.325(1)	554.82
MT43	-43.60	1.319(1)	554.51	MT25	-27.41	2.929(1)	575.30	MT7	-10.93	1.699(1)	556.49
MT42	-42.68	2.004(1)	563.80	MT24	-26.54	2.968(1)	578.19	MT6	-9.98	1.407(1)	554.48
MT41	-41.79	1.013(1)	551.07	MT23	-25.66	3.862(1)	569.07	MT5	-9.04	1.378(1)	554.18
MT40	-40.88	1.681(1)	559.28	MT22	-24.80	3.515(1)	581.96	MT4	-8.10	1.549(1)	555.86
MT39	-40.00	1.262(1)	554.54	MT21	-23.94	4.173(1)	587.74	MT3	-4.34	1.578(1)	556.81
MT38	-39.13	2.235(1)	567.46	MT20	-23.08	3.792(1)	585.00	MT2	-1.56	Null	Null
MT37	-38.28	1.917(1)	563.09	MT19	-22.25	4.063(1)	597.39	MT1	-.62	Null	Null
MT36	-37.42	1.987(1)	563.35	MT18	-21.40	4.353(1)	614.08	MT45	4.34	1.260(1)	551.88
MT35	-36.58	2.345(1)	568.15	MT17	-20.56	Null	Null	MT46	8.10	8.659(0)	549.91
MT34	-35.67	1.649(1)	560.03	MT16	-19.62	1.077(2)	641.67	MT47	16.69	6.868(0)	548.56
MT33	-34.71	2.213(1)	567.36	MT15	-18.64	1.259(2)	619.05	MT48	26.54	5.740(0)	545.62
MT32	-33.77	Null	Null	MT14	-17.66	7.232(1)	581.87	MT49	35.67	7.613(0)	546.96
MT31	-32.82	2.197(1)	566.10	MT13	-16.69	2.860(1)	558.54				
MT30	-31.89	2.562(1)	569.61	MT12	-15.71	1.304(1)	549.67				

Run 22 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	4.254(0)	545.70	HT29	-30.99	4.988(1)	593.10	HT11	-14.75	2.082(1)	556.79
HT51	-61.83	5.866(0)	547.55	HT28	-30.08	9.002(1)	615.93	HT10	-13.68	2.141(1)	555.97
HT50	-54.61	1.041(1)	551.77	HT27	-29.18	1.272(2)	634.73	HT9	-12.83	2.207(1)	556.09
HT44	-44.55	2.170(1)	563.43	HT26	-28.28	1.042(2)	629.33	HT8	-11.88	1.951(1)	555.77
HT43	-43.60	2.175(1)	563.15	HT25	-27.41	7.885(1)	622.10	HT7	-10.93	1.704(1)	554.89
HT42	-42.68	3.507(1)	577.31	HT24	-26.54	5.397(1)	606.50	HT6	-9.98	1.528(1)	553.49
HT41	-41.79	1.773(1)	560.09	HT23	-25.66	2.952(1)	568.30	HT5	-9.04	1.777(1)	553.49
HT40	-40.88	3.045(1)	572.41	HT22	-24.80	2.961(1)	574.37	HT4	-8.10	1.643(1)	553.63
HT39	-40.00	2.363(1)	566.98	HT21	-23.94	2.032(1)	560.92	HT3	-4.34	1.398(1)	553.64
HT38	-39.13	4.662(1)	588.64	HT20	-23.08	1.922(1)	559.00	HT2	-1.56	1.415(1)	552.54
HT37	-38.28	3.805(1)	581.13	HT19	-22.25	1.530(1)	555.55	HT1	-.62	Null	Null
HT36	-37.42	3.717(1)	579.82	HT18	-21.40	1.568(1)	556.73	HT45	4.34	1.047(1)	550.59
HT35	-36.58	4.648(1)	588.43	HT17	-20.56	1.735(1)	556.27	HT46	8.10	9.010(0)	549.22
HT34	-35.67	2.811(1)	571.01	HT16	-19.62	1.551(1)	555.45	HT47	16.69	7.260(0)	549.03
HT33	-34.71	4.131(1)	584.21	HT15	-18.64	2.062(1)	558.10	HT48	26.54	6.772(0)	547.37
HT32	-33.77	Null	Null	HT14	-17.66	2.315(1)	557.99	HT49	35.67	Null	Null
HT31	-32.82	3.250(1)	581.28	HT13	-16.69	2.544(1)	558.70				
HT30	-31.89	3.961(1)	587.09	HT12	-15.71	1.936(1)	556.20				

Run 23 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	5.484(0)	548.84	HT29	-30.99	6.191(1)	612.69	HT11	-14.75	1.077(1)	555.42
HT51	-61.83	6.994(0)	550.92	HT28	-30.08	3.485(1)	586.49	HT10	-13.68	9.308(0)	554.67
HT50	-54.61	1.133(1)	555.62	HT27	-29.18	2.900(1)	575.85	HT9	-12.83	9.262(0)	554.97
HT44	-44.55	3.022(1)	573.44	HT26	-28.28	1.802(1)	563.64	HT8	-11.88	1.158(1)	556.29
HT43	-43.60	2.600(1)	571.24	HT25	-27.41	1.612(1)	560.45	HT7	-10.93	8.637(0)	554.28
HT42	-42.68	4.002(1)	589.12	HT24	-26.54	1.582(1)	560.46	HT6	-9.98	6.483(0)	551.94
HT41	-41.79	1.770(1)	566.78	HT23	-25.66	1.500(1)	560.00	HT5	-9.04	6.273(0)	551.83
HT40	-40.88	2.825(1)	578.86	HT22	-24.80	1.361(1)	559.11	HT4	-8.10	8.212(0)	552.58
HT39	-40.00	1.943(1)	570.39	HT21	-23.94	1.238(1)	557.50	HT3	-4.34	7.327(0)	552.87
HT38	-39.13	3.386(1)	585.21	HT20	-23.08	1.394(1)	558.65	HT2	-1.56	7.675(0)	552.85
HT37	-38.28	3.063(1)	580.12	HT19	-22.25	1.091(1)	556.51	HT1	-.62	Null	Null
HT36	-37.42	3.597(1)	581.99	HT18	-21.40	1.295(1)	557.56	HT45	4.34	8.177(0)	551.90
HT35	-36.58	5.722(1)	599.26	HT17	-20.56	1.416(1)	556.48	HT46	8.10	7.913(0)	551.47
HT34	-35.67	4.730(1)	590.21	HT16	-19.62	9.773(0)	554.99	HT47	16.69	6.766(0)	551.22
HT33	-34.71	1.235(2)	650.15	HT15	-18.64	1.105(1)	556.13	HT48	26.54	5.496(0)	549.30
HT32	-33.77	Null	Null	HT14	-17.66	1.018(1)	555.76	HT49	35.67	Null	Null
HT31	-32.82	1.213(2)	655.75	HT13	-16.69	1.148(1)	556.33				
HT30	-31.89	8.748(1)	635.43	HT12	-15.71	1.049(1)	555.65				

Run 24 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	5.484(0)	550.75	HT29	-30.99	1.311(1)	556.63	HT11	-14.75	7.851(0)	553.46
HT51	-61.83	8.133(0)	553.13	HT28	-30.08	9.508(0)	554.24	HT10	-13.68	7.503(0)	553.26
HT50	-54.61	1.203(1)	557.86	HT27	-29.18	9.636(0)	554.50	HT9	-12.83	7.312(0)	553.23
HT44	-44.55	2.974(1)	587.56	HT26	-28.28	8.186(0)	553.39	HT8	-11.88	7.865(0)	553.46
HT43	-43.60	3.242(1)	590.41	HT25	-27.41	7.598(0)	553.47	HT7	-10.93	8.908(0)	554.66
HT42	-42.68	7.177(1)	621.62	HT24	-26.54	8.215(0)	554.93	HT6	-9.98	7.772(0)	553.68
HT41	-41.79	4.677(1)	599.82	HT23	-25.66	5.494(0)	554.56	HT5	-9.04	7.966(0)	553.80
HT40	-40.88	7.990(1)	617.39	HT22	-24.80	6.911(0)	554.82	HT4	-8.10	8.213(0)	552.92
HT39	-40.00	8.750(1)	616.36	HT21	-23.94	6.313(0)	554.61	HT3	-4.34	9.129(0)	555.18
HT38	-39.13	1.052(2)	625.88	HT20	-23.08	7.125(0)	554.41	HT2	-1.56	8.823(0)	555.11
HT37	-38.28	8.425(1)	607.14	HT19	-22.25	1.030(1)	554.67	HT1	-.62	Null	Null
HT36	-37.42	7.132(1)	593.09	HT18	-21.40	9.630(0)	554.70	HT45	4.34	7.288(0)	553.69
HT35	-36.58	4.941(1)	579.72	HT17	-20.56	9.591(0)	553.93	HT46	8.10	6.962(0)	553.10
HT34	-35.67	4.420(1)	575.00	HT16	-19.62	8.782(0)	554.06	HT47	16.69	7.583(0)	553.45
HT33	-34.71	2.724(1)	564.89	HT15	-18.64	9.031(0)	554.08	HT48	26.54	5.765(0)	551.31
HT32	-33.77	Null	Null	HT14	-17.66	7.802(0)	554.13	HT49	35.67	6.960(0)	552.68
HT31	-32.82	1.644(1)	559.66	HT13	-16.69	9.017(0)	554.59				
HT30	-31.89	1.464(1)	557.27	HT12	-15.71	7.618(0)	553.67				

Run 25 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	2.912(0)	539.43	HT29	-30.99	2.604(1)	576.41	HT11	-14.75	1.062(1)	547.26
HT51	-61.83	3.082(0)	540.40	HT28	-30.08	3.839(1)	593.39	HT10	-13.68	1.015(1)	546.97
HT50	-54.61	5.425(0)	542.62	HT27	-29.18	5.227(1)	605.12	HT9	-12.83	1.186(1)	547.96
HT44	-44.55	1.474(1)	552.17	HT26	-28.28	7.337(1)	612.37	HT8	-11.88	1.130(1)	547.30
HT43	-43.60	1.255(1)	549.66	HT25	-27.41	1.009(2)	620.30	HT7	-10.93	9.012(0)	544.41
HT42	-42.68	2.211(1)	559.68	HT24	-26.54	1.126(2)	623.59	HT6	-9.98	8.788(0)	544.36
HT41	-41.79	1.248(1)	550.41	HT23	-25.66	1.158(2)	603.57	HT5	-9.04	8.657(0)	543.67
HT40	-40.88	1.499(1)	552.06	HT22	-24.80	8.060(1)	602.70	HT4	-8.10	9.208(0)	542.97
HT39	-40.00	1.784(1)	554.07	HT21	-23.94	5.777(1)	586.35	HT3	-4.34	6.336(0)	539.60
HT38	-39.13	2.303(1)	558.41	HT20	-23.08	4.134(1)	576.28	HT2	-1.56	7.097(0)	538.43
HT37	-38.28	2.385(1)	559.46	HT19	-22.25	3.363(1)	567.36	HT1	-.62	Null	Null
HT36	-37.42	2.188(1)	557.82	HT18	-21.40	2.413(1)	559.20	HT45	4.34	4.892(0)	538.95
HT35	-36.58	2.672(1)	562.90	HT17	-20.56	1.518(1)	553.65	HT46	8.10	2.809(0)	537.81
HT34	-35.67	1.788(1)	554.31	HT16	-19.62	1.447(1)	550.42	HT47	16.69	7.706(-1)	536.59
HT33	-34.71	2.914(1)	568.99	HT15	-18.64	9.172(0)	546.18	HT48	26.54	2.087(-3)	536.15
HT32	-33.77	Null	Null	HT14	-17.66	1.146(1)	547.17	HT49	35.67	1.676(-1)	536.19
HT31	-32.82	2.638(1)	569.58	HT13	-16.69	8.631(0)	546.29				
HT30	-31.89	2.918(1)	577.13	HT12	-15.71	9.822(0)	547.07				

Run 27 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	2.802(0)	539.49	MT29	-30.99	9.212(1)	590.66	MT11	-14.75	5.983(0)	543.47
MT51	-61.83	3.532(0)	540.29	MT28	-30.08	8.404(1)	590.82	MT10	-13.68	6.010(0)	542.70
MT50	-54.61	5.004(0)	542.14	MT27	-29.18	6.541(1)	586.38	MT9	-12.83	5.928(0)	543.17
MT44	-44.55	1.612(1)	552.89	MT26	-28.28	4.896(1)	580.33	MT8	-11.88	5.380(0)	542.50
MT43	-43.60	1.162(1)	550.39	MT25	-27.41	3.910(1)	573.07	MT7	-10.93	2.757(0)	540.71
MT42	-42.68	2.296(1)	562.75	MT24	-26.54	3.422(1)	571.63	MT6	-9.98	4.341(0)	541.21
MT41	-41.79	1.334(1)	553.04	MT23	-25.66	Null	Null	MT5	-9.04	3.975(0)	540.88
MT40	-40.88	1.367(1)	555.79	MT22	-24.80	1.726(1)	556.97	MT4	-8.10	2.902(0)	540.10
MT39	-40.00	1.622(1)	557.75	MT21	-23.94	9.924(0)	551.48	MT3	-4.34	1.293(0)	538.39
MT38	-39.13	1.734(1)	569.55	MT20	-23.08	9.019(0)	548.65	MT2	-1.56	6.423(-1)	538.33
MT37	-38.28	2.118(1)	569.62	MT19	-22.25	1.246(1)	551.75	MT1	-.62	Null	Null
MT36	-37.42	2.113(1)	569.48	MT18	-21.40	9.734(0)	548.62	MT45	4.34	2.707(-2)	537.13
MT35	-36.58	3.824(1)	579.03	MT17	-20.56	5.536(0)	545.61	MT46	8.10	1.351(0)	537.49
MT34	-35.67	2.756(1)	567.92	MT16	-19.62	5.840(0)	545.24	MT47	16.69	Null	Null
MT33	-34.71	7.636(1)	596.06	MT15	-18.64	3.113(0)	542.15	MT48	26.54	2.078(-2)	536.66
MT32	-33.77	Null	Null	MT14	-17.66	4.833(0)	543.31	MT49	35.67	2.557(-1)	537.06
MT31	-32.82	9.736(1)	595.43	MT13	-16.69	5.150(0)	542.92				
MT30	-31.89	1.065(2)	596.61	MT12	-15.71	5.672(0)	543.11				

Run 28 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	1.613(0)	539.55	MT29	-30.99	4.780(1)	572.68	MT11	-14.75	1.939(0)	541.81
MT51	-61.83	1.660(0)	540.31	MT28	-30.08	4.487(1)	569.06	MT10	-13.68	1.296(0)	541.15
MT50	-54.61	4.040(0)	542.98	MT27	-29.18	4.247(1)	570.14	MT9	-12.83	1.347(0)	541.13
MT44	-44.55	1.935(1)	563.40	MT26	-28.28	3.863(1)	567.03	MT8	-11.88	6.723(-1)	541.12
MT43	-43.60	1.717(1)	560.88	MT25	-27.41	3.608(1)	566.14	MT7	-10.93	Null	Null
MT42	-42.68	3.638(1)	579.06	MT24	-26.54	3.421(1)	566.91	MT6	-9.98	7.214(-1)	540.74
MT41	-41.79	2.152(1)	564.53	MT23	-25.66	2.274(1)	558.67	MT5	-9.04	2.042(-1)	539.76
MT40	-40.88	2.276(1)	569.76	MT22	-24.80	1.694(1)	555.79	MT4	-8.10	5.410(-2)	539.47
MT39	-40.00	3.158(1)	573.61	MT21	-23.94	1.206(1)	550.23	MT3	-4.34	1.096(-1)	537.95
MT38	-39.13	4.640(1)	588.35	MT20	-23.08	1.006(1)	548.46	MT2	-1.56	2.837(-1)	538.19
MT37	-38.28	5.340(1)	588.58	MT19	-22.25	1.078(1)	549.40	MT1	-.62	Null	Null
MT36	-37.42	5.656(1)	586.36	MT18	-21.40	7.569(0)	546.46	MT45	4.34	-1.103(-1)	537.10
MT35	-36.58	7.184(1)	592.33	MT17	-20.56	4.609(0)	544.22	MT46	8.10	5.599(-1)	537.56
MT34	-35.67	4.792(1)	576.36	MT16	-19.62	4.636(0)	543.86	MT47	16.69	3.802(-2)	537.13
MT33	-34.71	6.940(1)	587.28	MT15	-18.64	9.026(-1)	540.73	MT48	26.54	-3.954(-1)	536.93
MT32	-33.77	Null	Null	MT14	-17.66	1.613(0)	541.62	MT49	35.67	-1.627(-1)	536.88
MT31	-32.82	5.748(1)	580.73	MT13	-16.69	1.166(0)	541.19				
MT30	-31.89	5.427(1)	578.15	MT12	-15.71	1.214(0)	541.27				

Run 29 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	1.425(0)	539.65	MT29	-30.99	3.825(1)	568.56	MT11	-14.75	1.429(0)	543.63
MT51	-61.83	1.975(0)	540.47	MT28	-30.08	2.012(1)	559.67	MT10	-13.68	8.129(-1)	543.32
MT50	-54.61	3.251(0)	541.77	MT27	-29.18	2.598(1)	559.86	MT9	-12.83	4.272(-1)	543.41
MT44	-44.55	2.562(1)	556.39	MT26	-28.28	1.906(1)	554.49	MT8	-11.88	1.742(-1)	542.96
MT43	-43.60	2.122(1)	553.32	MT25	-27.41	1.447(1)	552.13	MT7	-10.93	9.396(-2)	542.95
MT42	-42.68	4.571(1)	568.90	MT24	-26.54	1.780(1)	554.20	MT6	-9.98	5.857(-1)	543.29
MT41	-41.79	2.658(1)	556.62	MT23	-25.66	7.992(0)	548.71	MT5	-9.04	-1.172(-2)	542.76
MT40	-40.88	3.278(1)	560.32	MT22	-24.80	7.289(0)	548.42	MT4	-8.10	4.628(-2)	541.80
MT39	-40.00	4.639(1)	565.86	MT21	-23.94	3.293(0)	546.77	MT3	-4.34	-1.033(-1)	542.10
MT38	-39.13	7.238(1)	578.05	MT20	-23.08	2.841(0)	546.12	MT2	-1.56	-1.625(-1)	543.05
MT37	-38.28	7.895(1)	583.02	MT19	-22.25	5.179(0)	548.83	MT1	-.62	Null	Null
MT36	-37.42	7.763(1)	580.66	MT18	-21.40	2.368(0)	546.40	MT45	4.34	-4.828(-1)	540.93
MT35	-36.58	8.619(1)	588.73	MT17	-20.56	2.352(0)	544.68	MT46	8.10	-2.335(-1)	540.09
MT34	-35.67	5.724(1)	575.50	MT16	-19.62	2.061(0)	544.64	MT47	16.69	-2.904(-1)	538.46
MT33	-34.71	5.848(1)	584.63	MT15	-18.64	2.145(-1)	542.56	MT48	26.54	-6.036(-1)	538.10
MT32	-33.77	Null	Null	MT14	-17.66	1.072(0)	543.73	MT49	35.67	-2.848(-1)	537.56
MT31	-32.82	4.658(1)	575.24	MT13	-16.69	9.011(-1)	543.12				
MT30	-31.89	4.818(1)	574.39	MT12	-15.71	7.749(-1)	543.27				

Run 30 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.178(0)	538.26	MT29	-30.99	1.953(1)	558.60	MT11	-14.75	1.353(1)	550.04
MT51	-61.83	3.489(0)	539.28	MT28	-30.08	2.154(1)	558.45	MT10	-13.68	6.586(0)	543.31
MT50	-54.61	5.686(0)	541.38	MT27	-29.18	2.198(1)	560.40	MT9	-12.83	4.834(0)	543.01
MT44	-44.55	1.203(1)	547.91	MT26	-28.28	2.154(1)	559.59	MT8	-11.88	6.932(0)	544.03
MT43	-43.60	1.210(1)	547.83	MT25	-27.41	2.275(1)	561.53	MT7	-10.93	1.084(1)	546.77
MT42	-42.68	1.966(1)	555.24	MT24	-26.54	2.546(1)	562.58	MT6	-9.98	1.294(1)	547.59
MT41	-41.79	8.973(0)	544.59	MT23	-25.66	Null	Null	MT5	-9.04	1.349(1)	548.12
MT40	-40.88	1.530(1)	551.27	MT22	-24.80	3.147(1)	566.89	MT4	-8.10	1.463(1)	550.06
MT39	-40.00	1.148(1)	547.31	MT21	-23.94	3.510(1)	571.44	MT3	-4.34	1.483(1)	550.03
MT38	-39.13	2.037(1)	557.31	MT20	-23.08	2.849(1)	554.11	MT2	-1.56	1.204(1)	547.29
MT37	-38.28	1.679(1)	553.56	MT19	-22.25	3.892(1)	577.27	MT1	-.62	Null	Null
MT36	-37.42	1.764(1)	553.58	MT18	-21.40	3.797(1)	582.30	MT45	4.34	1.100(1)	546.08
MT35	-36.58	2.131(1)	557.45	MT17	-20.56	3.517(1)	583.17	MT46	8.10	8.391(0)	544.17
MT34	-35.67	1.327(1)	549.07	MT16	-19.62	5.474(1)	594.64	MT47	16.69	8.625(0)	543.21
MT33	-34.71	2.029(1)	556.69	MT15	-18.64	1.045(2)	614.41	MT48	26.54	5.400(0)	540.35
MT32	-33.77	Null	Null	MT14	-17.66	1.145(2)	609.41	MT49	35.67	4.960(0)	540.68
MT31	-32.82	2.024(1)	557.08	MT13	-16.69	5.863(1)	583.11				
MT30	-31.89	2.088(1)	559.15	MT12	-15.71	2.425(1)	559.99				

Run 31 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.885(0)	539.99
HT51	-61.83	2.757(0)	540.93
HT50	-54.61	4.051(0)	541.95
HT44	-44.55	1.176(1)	548.95
HT43	-43.60	8.861(0)	546.01
HT42	-42.68	1.485(1)	552.33
HT41	-41.79	8.954(0)	546.35
HT40	-40.88	1.044(1)	548.23
HT39	-40.00	1.293(1)	548.96
HT38	-39.13	1.411(1)	550.48
HT37	-38.28	1.492(1)	551.67
HT36	-37.42	1.210(1)	548.73
HT35	-36.58	1.626(1)	553.45
HT34	-35.67	1.164(1)	549.32
HT33	-34.71	2.298(1)	558.30
HT32	-33.77	Null	Null
HT31	-32.82	2.305(1)	560.77
HT30	-31.89	2.604(1)	563.03
HT29	-30.99	2.232(1)	561.59
HT28	-30.08	2.616(1)	567.26
HT27	-29.18	2.422(1)	569.28
HT26	-28.28	2.050(1)	571.45
HT25	-27.41	2.213(1)	577.70
HT24	-26.54	3.495(1)	584.29
HT23	-25.66	Null	Null
HT22	-24.80	5.859(1)	589.52
HT21	-23.94	1.072(2)	607.87
HT20	-23.08	1.105(2)	598.66
HT19	-22.25	1.326(2)	621.73
HT18	-21.40	8.843(1)	610.13
HT17	-20.56	6.003(1)	597.66
HT16	-19.62	3.432(1)	579.88
HT15	-18.64	1.957(1)	566.95
HT14	-17.66	1.373(1)	559.00
HT13	-16.69	1.146(1)	553.91
HT12	-15.71	1.101(1)	550.97
HT11	-14.75	9.704(0)	549.99
HT10	-13.68	7.300(0)	548.34
HT9	-12.83	8.785(0)	549.53
HT8	-11.88	8.012(0)	549.16
HT7	-10.93	5.806(0)	548.17
HT6	-9.98	6.118(0)	549.09
HT5	-9.04	6.027(0)	549.00
HT4	-8.10	4.825(0)	547.44
HT3	-4.34	2.114(0)	541.29
HT2	-1.56	2.273(0)	540.62
HT1	-.62	Null	Null
HT45	4.34	4.622(-1)	538.90
HT46	8.10	7.767(-1)	538.79
HT47	16.69	-3.403(-2)	538.39
HT48	26.54	1.913(-1)	537.99
HT49	35.67	-1.507(-2)	537.93

Run 33 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.923(0)	541.49
HT51	-61.83	2.510(0)	542.43
HT50	-54.61	4.102(0)	544.19
HT44	-44.55	2.806(1)	560.16
HT43	-43.60	2.300(1)	557.61
HT42	-42.68	4.498(1)	570.67
HT41	-41.79	2.805(1)	559.58
HT40	-40.88	3.147(1)	564.00
HT39	-40.00	3.965(1)	566.82
HT38	-39.13	5.385(1)	577.79
HT37	-38.28	5.745(1)	577.94
HT36	-37.42	5.605(1)	574.40
HT35	-36.58	7.678(1)	583.37
HT34	-35.67	4.848(1)	571.24
HT33	-34.71	6.507(1)	580.89
HT32	-33.77	Null	Null
HT31	-32.82	5.404(1)	577.93
HT30	-31.89	4.854(1)	576.17
HT29	-30.99	4.432(1)	573.51
HT28	-30.08	3.529(1)	573.76
HT27	-29.18	3.870(1)	572.80
HT26	-28.28	2.973(1)	568.03
HT25	-27.41	2.362(1)	564.99
HT24	-26.54	2.481(1)	566.94
HT23	-25.66	Null	Null
HT22	-24.80	1.387(1)	558.84
HT21	-23.94	1.143(1)	557.95
HT20	-23.08	1.334(0)	542.67
HT19	-22.25	7.394(0)	558.49
HT18	-21.40	6.877(0)	557.15
HT17	-20.56	6.961(0)	556.31
HT16	-19.62	4.065(0)	555.07
HT15	-18.64	8.401(-1)	551.33
HT14	-17.66	1.740(0)	551.62
HT13	-16.69	1.105(0)	549.97
HT12	-15.71	1.156(0)	549.24
HT11	-14.75	1.802(0)	548.78
HT10	-13.68	9.171(-1)	546.88
HT9	-12.83	5.092(-1)	546.44
HT8	-11.88	3.627(-1)	545.28
HT7	-10.93	2.569(-1)	543.76
HT6	-9.98	7.209(-1)	544.03
HT5	-9.04	1.568(-1)	543.19
HT4	-8.10	7.059(-1)	542.94
HT3	-4.34	1.091(-1)	540.79
HT2	-1.56	4.683(-1)	541.00
HT1	-.62	Null	Null
HT45	4.34	-3.341(-1)	540.14
HT46	8.10	4.734(-2)	540.34
HT47	16.69	-1.502(-1)	540.33
HT48	26.54	-6.202(-1)	540.36
HT49	35.67	1.383(-2)	538.88

Run 34 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.757(0)	542.74
HT51	-61.83	1.811(0)	543.43
HT50	-54.61	2.953(0)	544.84
HT44	-44.55	1.425(1)	559.01
HT43	-43.60	1.089(1)	555.76
HT42	-42.68	2.250(1)	569.26
HT41	-41.79	1.313(1)	558.68
HT40	-40.88	1.472(1)	561.47
HT39	-40.00	2.008(1)	566.19
HT38	-39.13	2.355(1)	570.76
HT37	-38.28	3.265(1)	584.20
HT36	-37.42	2.536(1)	578.12
HT35	-36.58	5.603(1)	596.12
HT34	-35.67	3.484(1)	583.03
HT33	-34.71	8.960(1)	611.69
HT32	-33.77	Null	Null
HT31	-32.82	1.026(2)	604.32
HT30	-31.89	9.646(1)	602.88
HT29	-30.99	8.220(1)	594.78
HT28	-30.08	6.750(1)	584.31
HT27	-29.18	5.381(1)	577.66
HT26	-28.28	3.840(1)	569.27
HT25	-27.41	2.893(1)	563.20
HT24	-26.54	3.041(1)	565.97
HT23	-25.66	Null	Null
HT22	-24.80	2.065(1)	558.75
HT21	-23.94	1.240(1)	554.58
HT20	-23.08	1.292(0)	544.29
HT19	-22.25	1.272(1)	556.43
HT18	-21.40	1.045(1)	554.61
HT17	-20.56	6.801(0)	549.28
HT16	-19.62	7.035(0)	550.38
HT15	-18.64	2.308(0)	545.95
HT14	-17.66	4.264(0)	547.56
HT13	-16.69	3.189(0)	546.72
HT12	-15.71	3.290(0)	546.78
HT11	-14.75	4.661(0)	547.51
HT10	-13.68	3.269(0)	546.23
HT9	-12.83	3.418(0)	545.51
HT8	-11.88	2.459(0)	545.60
HT7	-10.93	2.260(0)	546.51
HT6	-9.98	3.496(0)	547.78
HT5	-9.04	1.872(0)	545.84
HT4	-8.10	3.625(-1)	545.17
HT3	-4.34	-2.889(-1)	543.03
HT2	-1.56	-2.951(-2)	543.45
HT1	-.62	Null	Null
HT45	4.34	-3.778(-1)	542.01
HT46	8.10	-2.988(-1)	541.67
HT47	16.69	1.543(-2)	541.71
HT48	26.54	-4.146(-1)	540.69
HT49	35.67	-9.707(-3)	539.91

Run 35 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	3.106(0)	541.84
HT51	-61.83	3.909(0)	542.86
HT50	-54.61	5.783(0)	544.85
HT44	-44.55	1.034(1)	550.50
HT43	-43.60	9.419(0)	549.91
HT42	-42.68	1.649(1)	556.41
HT41	-41.79	6.498(0)	546.90
HT40	-40.88	1.140(1)	552.46
HT39	-40.00	7.758(0)	548.60
HT38	-39.13	1.514(1)	556.02
HT37	-38.28	1.232(1)	553.96
HT36	-37.42	1.324(1)	554.35
HT35	-36.58	1.644(1)	557.77
HT34	-35.67	9.608(0)	550.54
HT33	-34.71	1.467(1)	554.54
HT32	-33.77	Null	Null
HT31	-32.82	1.176(1)	554.38
HT30	-31.89	1.398(1)	556.06
HT29	-30.99	1.259(1)	554.47
HT28	-30.08	1.332(1)	554.65
HT27	-29.18	1.441(1)	555.41
HT26	-28.28	1.359(1)	554.14
HT25	-27.41	1.436(1)	555.51
HT24	-26.54	1.401(1)	557.77
HT23	-25.66	Null	Null
HT22	-24.80	1.549(1)	559.65
HT21	-23.94	1.084(1)	561.57
HT20	-23.08	1.005(1)	546.64
HT19	-22.25	1.927(1)	562.82
HT18	-21.40	1.966(1)	562.78
HT17	-20.56	2.059(1)	562.79
HT16	-19.62	2.049(1)	563.27
HT15	-18.64	2.221(1)	564.97
HT14	-17.66	2.542(1)	570.26
HT13	-16.69	2.712(1)	573.84
HT12	-15.71	2.987(1)	574.83
HT11	-14.75	3.282(1)	578.76
HT10	-13.68	5.530(1)	598.19
HT9	-12.83	8.361(1)	611.63
HT8	-11.88	7.592(1)	601.82
HT7	-10.93	5.693(1)	584.73
HT6	-9.98	2.787(1)	562.73
HT5	-9.04	1.510(1)	553.01
HT4	-8.10	1.056(1)	550.12
HT3	-4.34	1.266(1)	552.74
HT2	-1.56	1.976(1)	556.01
HT1	-.62	Null	Null
HT45	4.34	1.436(1)	552.73
HT46	8.10	1.157(1)	549.98
HT47	16.69	9.388(0)	548.01
HT48	26.54	6.404(0)	544.01
HT49	35.67	5.458(-1)	538.83

Run 36 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	3.300(0)	544.26	HT29	-30.99	2.557(1)	570.50	HT11	-14.75	6.090(0)	551.54
HT51	-61.83	4.326(0)	545.62	HT28	-30.08	2.464(1)	570.17	HT10	-13.68	6.816(0)	550.16
HT50	-54.61	6.256(0)	548.07	HT27	-29.18	3.008(1)	572.17	HT9	-12.83	1.290(1)	553.72
HT44	-44.55	1.356(1)	556.38	HT26	-28.28	2.695(1)	570.62	HT8	-11.88	1.649(1)	555.88
HT43	-43.60	1.344(1)	556.27	HT25	-27.41	3.136(1)	573.50	HT7	-10.93	1.775(1)	557.23
HT42	-42.68	2.312(1)	566.12	HT24	-26.54	3.356(1)	577.13	HT6	-9.98	1.511(1)	555.58
HT41	-41.79	1.046(1)	552.47	HT23	-25.66	3.602(1)	581.61	HT5	-9.04	1.313(1)	554.88
HT40	-40.88	1.734(1)	560.69	HT22	-24.80	3.897(1)	586.96	HT4	-8.10	1.299(1)	556.00
HT39	-40.00	1.387(1)	556.17	HT21	-23.94	4.553(1)	589.11	HT3	-4.34	1.338(1)	555.83
HT38	-39.13	2.555(1)	569.22	HT20	-23.08	2.781(1)	577.32	HT2	-1.56	1.169(1)	554.08
HT37	-38.28	2.013(1)	564.18	HT19	-22.25	4.447(1)	598.33	HT1	-.62	Null	Null
HT36	-37.42	2.024(1)	564.47	HT18	-21.40	7.709(1)	610.91	HT45	4.34	9.825(0)	552.27
HT35	-36.58	2.619(1)	570.26	HT17	-20.56	1.251(2)	620.66	HT46	8.10	9.240(0)	550.57
HT34	-35.67	1.475(1)	559.45	HT16	-19.62	1.267(2)	626.03	HT47	16.69	8.740(0)	549.52
HT33	-34.71	2.272(1)	569.73	HT15	-18.64	7.005(1)	615.41	HT48	26.54	5.740(0)	546.70
HT32	-33.77	Null	Null	HT14	-17.66	2.900(1)	585.21	HT49	35.67	5.680(-1)	540.70
HT31	-32.82	2.285(1)	568.63	HT13	-16.69	1.462(1)	565.13				
HT30	-31.89	2.684(1)	570.69	HT12	-15.71	7.676(0)	554.52				

Run 37 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Ga ge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	5.501(0)	547.59	HT29	-30.99	5.435(0)	549.43	HT11	-14.75	7.010(0)	550.88
HT51	-61.83	7.446(0)	550.91	HT28	-30.08	6.590(0)	549.54	HT10	-13.68	7.064(0)	550.62
HT50	-54.61	1.398(1)	560.38	HT27	-29.18	6.980(0)	549.55	HT9	-12.83	6.885(0)	550.26
HT44	-44.55	5.056(1)	594.32	HT26	-28.28	8.201(0)	549.07	HT8	-11.88	6.707(0)	549.94
HT43	-43.60	4.374(1)	586.79	HT25	-27.41	4.877(0)	548.05	HT7	-10.93	7.004(0)	550.74
HT42	-42.68	5.627(1)	593.87	HT24	-26.54	5.199(0)	548.59	HT6	-9.98	6.294(0)	550.19
HT41	-41.79	3.881(1)	579.17	HT23	-25.66	6.530(0)	549.62	HT5	-9.04	6.410(0)	550.33
HT40	-40.88	4.106(1)	577.72	HT22	-24.80	8.545(0)	550.78	HT4	-8.10	5.034(0)	548.55
HT39	-40.00	3.429(1)	571.56	HT21	-23.94	6.599(0)	550.72	HT3	-4.34	8.523(0)	551.79
HT38	-39.13	2.751(1)	562.74	HT20	-23.08	8.348(0)	550.92	HT2	-1.56	8.183(0)	551.85
HT37	-38.28	2.075(1)	560.55	HT19	-22.25	9.283(0)	552.09	HT1	-.62	Null	Null
HT36	-37.42	1.472(1)	555.33	HT18	-21.40	8.245(0)	551.41	HT45	4.34	9.572(0)	551.87
HT35	-36.58	1.256(1)	553.54	HT17	-20.56	8.485(0)	551.30	HT46	8.10	6.965(0)	549.86
HT34	-35.67	8.435(0)	551.62	HT16	-19.62	7.803(0)	551.14	HT47	16.69	6.300(0)	549.49
HT33	-34.71	7.699(0)	550.83	HT15	-18.64	7.832(0)	551.32	HT48	26.54	Null	Null
HT32	-33.77	Null	Null	HT14	-17.66	7.519(0)	551.27	HT49	35.67	2.524(-1)	540.92
HT31	-32.82	9.338(0)	550.11	HT13	-16.69	7.360(0)	551.31				
HT30	-31.89	6.222(0)	549.59	HT12	-15.71	6.694(0)	550.49				

Run 38 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	2.818(0)	544.47	HT29	-30.99	1.231(1)	556.71	HT11	-14.75	1.651(1)	560.76
HT51	-61.83	3.535(0)	545.53	HT28	-30.08	1.139(1)	555.79	HT10	-13.68	1.877(1)	561.32
HT50	-54.61	5.247(0)	547.39	HT27	-29.18	1.197(1)	556.65	HT9	-12.83	1.681(1)	561.02
HT44	-44.55	9.871(0)	552.97	HT26	-28.28	1.110(1)	555.65	HT8	-11.88	1.791(1)	561.31
HT43	-43.60	9.753(0)	552.51	HT25	-27.41	1.072(1)	555.71	HT7	-10.93	1.807(1)	561.78
HT42	-42.68	1.390(1)	557.32	HT24	-26.54	1.180(1)	557.23	HT6	-9.98	1.469(1)	558.51
HT41	-41.79	5.730(0)	548.70	HT23	-25.66	1.408(1)	558.48	HT5	-9.04	1.518(1)	560.32
HT40	-40.88	1.073(1)	554.60	HT22	-24.80	1.459(1)	558.77	HT4	-8.10	1.751(1)	562.71
HT39	-40.00	7.934(0)	551.16	HT21	-23.94	1.493(1)	559.89	HT3	-4.34	2.827(1)	572.15
HT38	-39.13	1.372(1)	557.11	HT20	-23.08	1.347(1)	558.77	HT2	-1.56	3.175(1)	572.17
HT37	-38.28	1.230(1)	556.31	HT19	-22.25	1.663(1)	560.56	HT1	-.62	Null	Null
HT36	-37.42	1.212(1)	556.46	HT18	-21.40	1.553(1)	559.87	HT45	4.34	6.706(0)	549.90
HT35	-36.58	1.468(1)	559.04	HT17	-20.56	1.540(1)	558.62	HT46	8.10	8.316(0)	552.29
HT34	-35.67	1.030(1)	553.67	HT16	-19.62	1.530(1)	560.16	HT47	16.69	Null	Null
HT33	-34.71	1.197(1)	556.51	HT15	-18.64	1.664(1)	560.75	HT48	26.54	Null	Null
HT32	-33.77	Null	Null	HT14	-17.66	1.612(1)	561.59	HT49	35.67	3.803(-1)	541.43
HT31	-32.82	1.268(1)	556.91	HT13	-16.69	1.709(1)	562.48				
HT30	-31.89	1.305(1)	557.70	HT12	-15.71	1.525(1)	560.54				

Run 39 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	2.632(0)	546.82	HT29	-30.99	1.255(1)	558.08	HT11	-14.75	1.721(1)	562.74
HT51	-61.83	3.774(0)	548.00	HT28	-30.08	1.101(1)	557.01	HT10	-13.68	1.428(1)	562.11
HT50	-54.61	5.080(0)	549.64	HT27	-29.18	1.178(1)	557.83	HT9	-12.83	1.370(1)	560.84
HT44	-44.55	9.748(0)	554.80	HT26	-28.28	1.075(1)	557.31	HT8	-11.88	1.589(1)	561.03
HT43	-43.60	8.893(0)	553.82	HT25	-27.41	1.085(1)	556.72	HT7	-10.93	1.729(1)	562.25
HT42	-42.68	1.364(1)	558.12	HT24	-26.54	1.219(1)	558.22	HT6	-9.98	1.710(1)	560.73
HT41	-41.79	5.971(0)	550.81	HT23	-25.66	1.251(1)	558.84	HT5	-9.04	1.613(1)	561.02
HT40	-40.88	1.070(1)	555.99	HT22	-24.80	1.395(1)	559.79	HT4	-8.10	1.954(1)	563.97
HT39	-40.00	7.419(0)	552.88	HT21	-23.94	1.542(1)	561.16	HT3	-4.34	3.193(1)	572.63
HT38	-39.13	1.285(1)	557.94	HT20	-23.08	1.368(1)	561.34	HT2	-1.56	2.931(1)	569.30
HT37	-38.28	1.202(1)	557.50	HT19	-22.25	1.616(1)	561.97	HT1	-.62	Null	Null
HT36	-37.42	1.226(1)	557.98	HT18	-21.40	1.654(1)	561.86	HT45	4.34	9.054(0)	552.92
HT35	-36.58	1.507(1)	560.47	HT17	-20.56	1.371(1)	560.25	HT46	8.10	9.598(0)	553.89
HT34	-35.67	8.650(0)	554.72	HT16	-19.62	1.458(1)	562.42	HT47	16.69	8.643(0)	553.39
HT33	-34.71	1.163(1)	557.70	HT15	-18.64	1.441(1)	562.47	HT48	26.54	6.368(0)	550.34
HT32	-33.77	Null	Null	HT14	-17.66	1.555(1)	562.46	HT49	35.67	Null	Null
HT31	-32.82	1.164(1)	557.79	HT13	-16.69	1.624(1)	563.51				
HT30	-31.89	1.302(1)	558.83	HT12	-15.71	1.406(1)	561.65				

Run 40 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	6.412(-1)	548.23	MT29	-30.99	6.160(0)	557.57	MT11	-14.75	2.209(1)	574.18
MT51	-61.83	1.627(0)	549.02	MT28	-30.08	9.130(0)	561.52	MT10	-13.68	2.723(1)	578.23
MT50	-54.61	1.400(0)	549.73	MT27	-29.18	1.125(1)	563.79	MT9	-12.83	3.386(1)	582.77
MT44	-44.55	4.172(0)	553.68	MT26	-28.28	1.151(1)	562.01	MT8	-11.88	4.237(1)	588.81
MT43	-43.60	4.647(0)	551.86	MT25	-27.41	1.587(1)	564.64	MT7	-10.93	6.305(1)	599.92
MT42	-42.68	4.274(0)	555.13	MT24	-26.54	1.140(1)	564.77	MT6	-9.98	6.509(1)	605.54
MT41	-41.79	2.314(0)	551.60	MT23	-25.66	1.154(1)	565.28	MT5	-9.04	6.144(1)	609.02
MT40	-40.88	2.920(0)	552.57	MT22	-24.80	7.895(0)	560.47	MT4	-8.10	4.702(1)	607.07
MT39	-40.00	3.692(0)	552.60	MT21	-23.94	1.606(1)	568.86	MT3	-4.34	7.419(0)	574.42
MT38	-39.13	4.302(0)	553.42	MT20	-23.08	1.070(1)	561.77	MT2	-1.56	3.565(0)	555.45
MT37	-38.28	4.779(0)	554.39	MT19	-22.25	1.216(1)	564.49	MT1	-.62	Null	Null
MT36	-37.42	2.148(0)	551.64	MT18	-21.40	1.160(1)	562.95	MT45	4.34	4.549(-1)	550.90
MT35	-36.58	4.523(0)	554.66	MT17	-20.56	1.805(1)	565.91	MT46	8.10	5.193(-1)	550.84
MT34	-35.67	2.983(0)	553.61	MT16	-19.62	1.382(1)	564.22	MT47	16.69	1.118(0)	548.08
MT33	-34.71	5.281(0)	557.13	MT15	-18.64	1.421(1)	564.94	MT48	26.54	7.274(-1)	546.80
MT32	-33.77	Null	Null	MT14	-17.66	1.842(1)	569.91	MT49	35.67	Null	Null
MT31	-32.82	8.800(0)	559.36	MT13	-16.69	2.277(1)	574.04				
MT30	-31.89	7.696(0)	559.35	MT12	-15.71	2.084(1)	571.20				

Run 41 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	6.090(-1)	544.09	MT29	-30.99	1.133(1)	554.79	MT11	-14.75	1.584(1)	586.94
MT51	-61.83	9.238(-1)	544.83	MT28	-30.08	1.382(1)	557.11	MT10	-13.68	1.339(1)	577.34
MT50	-54.61	1.284(0)	545.65	MT27	-29.18	1.447(1)	557.70	MT9	-12.83	1.025(1)	573.58
MT44	-44.55	4.146(0)	549.40	MT26	-28.28	1.809(1)	559.04	MT8	-11.88	8.699(0)	565.82
MT43	-43.60	2.758(0)	547.65	MT25	-27.41	1.809(1)	561.25	MT7	-10.93	4.282(0)	556.93
MT42	-42.68	5.726(0)	550.53	MT24	-26.54	2.210(1)	564.87	MT6	-9.98	1.680(-1)	543.24
MT41	-41.79	3.414(0)	548.01	MT23	-25.66	2.613(1)	567.40	MT5	-9.04	4.641(0)	553.13
MT40	-40.88	4.112(0)	548.47	MT22	-24.80	2.513(1)	567.34	MT4	-8.10	3.746(0)	551.56
MT39	-40.00	5.100(0)	549.30	MT21	-23.94	5.025(1)	581.80	MT3	-4.34	9.026(-1)	547.38
MT38	-39.13	5.714(0)	550.83	MT20	-23.08	5.950(1)	579.59	MT2	-1.56	4.708(-1)	548.57
MT37	-38.28	6.610(0)	551.18	MT19	-22.25	9.740(1)	591.18	MT1	-.62	Null	Null
MT36	-37.42	3.953(0)	548.61	MT18	-21.40	1.140(2)	594.59	MT45	4.34	-5.543(-1)	547.02
MT35	-36.58	7.267(0)	551.25	MT17	-20.56	1.121(2)	594.89	MT46	8.10	-2.767(-1)	546.40
MT34	-35.67	5.410(0)	549.81	MT16	-19.62	9.606(1)	596.83	MT47	16.69	-5.720(-1)	544.38
MT33	-34.71	9.979(0)	553.00	MT15	-18.64	6.875(1)	593.21	MT48	26.54	-5.485(-1)	543.04
MT32	-33.77	Null	Null	MT14	-17.66	4.707(1)	593.65	MT49	35.67	Null	Null
MT31	-32.82	1.143(1)	555.12	MT13	-16.69	3.170(1)	595.01				
MT30	-31.89	1.139(1)	556.11	MT12	-15.71	2.257(1)	590.17				

Run 42 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	8.027(-1)	545.48	MT29	-30.99	3.913(1)	574.56	MT11	-14.75	1.223(1)	558.94
MT51	-61.83	6.234(-1)	546.28	MT28	-30.08	5.575(1)	582.48	MT10	-13.68	9.806(0)	556.42
MT50	-54.61	1.085(0)	547.16	MT27	-29.18	6.360(1)	586.04	MT9	-12.83	9.627(0)	554.29
MT44	-44.55	4.745(0)	553.69	MT26	-28.28	7.428(1)	588.68	MT8	-11.88	7.542(0)	552.48
MT43	-43.60	2.936(0)	551.54	MT25	-27.41	7.977(1)	588.93	MT7	-10.93	4.678(0)	549.67
MT42	-42.68	7.536(0)	557.74	MT24	-26.54	8.135(1)	589.83	MT6	-9.98	Null	Null
MT41	-41.79	4.695(0)	553.26	MT23	-25.66	6.199(1)	579.10	MT5	-9.04	4.374(0)	549.56
MT40	-40.88	5.212(0)	554.04	MT22	-24.80	5.984(1)	575.87	MT4	-8.10	4.230(0)	548.90
MT39	-40.00	7.710(0)	555.98	MT21	-23.94	5.383(1)	574.19	MT3	-4.34	7.448(0)	550.23
MT38	-39.13	7.206(0)	558.93	MT20	-23.08	2.808(1)	558.54	MT2	-1.56	1.753(0)	548.24
MT37	-38.28	1.060(1)	561.94	MT19	-22.25	4.904(1)	572.86	MT1	-.62	Null	Null
MT36	-37.42	6.665(0)	558.72	MT18	-21.40	4.743(1)	570.96	MT45	4.34	3.880(-1)	548.86
MT35	-36.58	1.532(1)	565.77	MT17	-20.56	4.098(1)	567.42	MT46	8.10	4.340(-3)	547.98
MT34	-35.67	8.578(0)	559.29	MT16	-19.62	3.228(1)	566.83	MT47	16.69	3.509(-1)	547.01
MT33	-34.71	2.039(1)	571.43	MT15	-18.64	1.844(1)	562.99	MT48	26.54	-1.592(-1)	545.36
MT32	-33.77	Null	Null	MT14	-17.66	2.007(1)	564.01	MT49	35.67	1.563(-1)	544.89
MT31	-32.82	3.086(1)	573.46	MT13	-16.69	1.318(1)	561.18				
MT30	-31.89	3.858(1)	576.40	MT12	-15.71	1.249(1)	559.28				

Run 43 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	2.068(0)	548.79	MT29	-30.99	1.129(1)	559.15	MT11	-14.75	1.497(1)	561.86
MT51	-61.83	3.050(0)	550.02	MT28	-30.08	9.660(0)	558.26	MT10	-13.68	1.556(1)	562.66
MT50	-54.61	5.020(0)	551.83	MT27	-29.18	1.056(1)	559.23	MT9	-12.83	1.536(1)	562.50
MT44	-44.55	9.526(0)	556.67	MT26	-28.28	1.025(1)	558.68	MT8	-11.88	1.554(1)	562.60
MT43	-43.60	8.490(0)	555.50	MT25	-27.41	1.027(1)	558.54	MT7	-10.93	1.807(1)	564.24
MT42	-42.68	1.234(1)	558.85	MT24	-26.54	1.153(1)	560.21	MT6	-9.98	7.881(0)	554.62
MT41	-41.79	5.622(0)	552.91	MT23	-25.66	1.226(1)	560.78	MT5	-9.04	1.635(1)	562.14
MT40	-40.88	9.558(0)	557.01	MT22	-24.80	1.191(1)	560.53	MT4	-8.10	1.237(1)	559.93
MT39	-40.00	6.926(0)	554.88	MT21	-23.94	1.341(1)	561.52	MT3	-4.34	1.912(1)	565.33
MT38	-39.13	1.200(1)	559.18	MT20	-23.08	1.409(1)	561.57	MT2	-1.56	2.330(1)	568.33
MT37	-38.28	1.132(1)	558.77	MT19	-22.25	1.466(1)	562.46	MT1	-.62	Null	Null
MT36	-37.42	1.164(1)	559.32	MT18	-21.40	1.362(1)	561.37	MT45	4.34	1.065(1)	556.28
MT35	-36.58	1.378(1)	561.18	MT17	-20.56	1.248(1)	560.51	MT46	8.10	6.715(0)	553.01
MT34	-35.67	9.200(0)	556.52	MT16	-19.62	1.387(1)	560.94	MT47	16.69	5.028(0)	552.83
MT33	-34.71	1.091(1)	558.71	MT15	-18.64	1.513(1)	561.53	MT48	26.54	5.972(0)	552.07
MT32	-33.77	Null	Null	MT14	-17.66	1.450(1)	561.57	MT49	35.67	6.046(0)	552.65
MT31	-32.82	1.201(1)	559.58	MT13	-16.69	1.489(1)	562.00				
MT30	-31.89	1.258(1)	560.31	MT12	-15.71	1.371(1)	561.17				

Run 44 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.479(-1)	550.34	MT29	-30.99	8.519(0)	558.38	MT11	-14.75	1.444(1)	562.50
MT51	-61.83	9.763(-1)	551.24	MT28	-30.08	1.582(1)	563.90	MT10	-13.68	1.278(1)	561.39
MT50	-54.61	1.445(0)	552.13	MT27	-29.18	2.004(1)	566.92	MT9	-12.83	1.579(1)	565.53
MT44	-44.55	4.750(0)	555.24	MT26	-28.28	1.747(1)	565.26	MT8	-11.88	1.607(1)	564.84
MT43	-43.60	3.010(0)	553.35	MT25	-27.41	1.953(1)	567.32	MT7	-10.93	1.510(1)	563.59
MT42	-42.68	6.414(0)	556.84	MT24	-26.54	2.187(1)	569.83	MT6	-9.98	7.878(0)	553.79
MT41	-41.79	3.766(0)	553.63	MT23	-25.66	2.012(1)	568.22	MT5	-9.04	1.787(1)	561.71
MT40	-40.88	4.098(0)	554.03	MT22	-24.80	1.201(1)	561.47	MT4	-8.10	1.838(1)	566.08
MT39	-40.00	4.609(0)	554.27	MT21	-23.94	2.303(1)	571.30	MT3	-4.34	1.524(1)	560.12
MT38	-39.13	4.174(0)	554.80	MT20	-23.08	1.282(1)	563.12	MT2	-1.56	1.692(1)	565.00
MT37	-38.28	5.476(0)	555.86	MT19	-22.25	1.705(1)	566.19	MT1	-.62	Null	Null
MT36	-37.42	3.224(0)	553.76	MT18	-21.40	1.409(1)	563.18	MT45	4.34	1.234(1)	561.22
MT35	-36.58	6.543(0)	557.31	MT17	-20.56	1.477(1)	564.04	MT46	8.10	1.018(1)	558.38
MT34	-35.67	5.977(0)	556.12	MT16	-19.62	1.587(1)	565.11	MT47	16.69	3.550(0)	552.66
MT33	-34.71	9.390(0)	559.72	MT15	-18.64	1.681(1)	565.05	MT48	26.54	2.821(-1)	550.63
MT32	-33.77	Null	Null	MT14	-17.66	1.985(1)	567.38	MT49	35.67	-2.299(-1)	550.03
MT31	-32.82	1.007(1)	559.73	MT13	-16.69	1.910(1)	566.57				
MT30	-31.89	8.592(0)	559.50	MT12	-15.71	1.514(1)	563.37				

Run 45 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	2.240(-1)	550.31	MT29	-30.99	4.780(0)	558.09	MT11	-14.75	7.312(0)	561.69
MT51	-61.83	1.053(0)	551.38	MT28	-30.08	4.998(0)	559.40	MT10	-13.68	4.854(0)	559.46
MT50	-54.61	1.296(0)	552.50	MT27	-29.18	6.682(0)	562.24	MT9	-12.83	6.169(0)	562.27
MT44	-44.55	2.025(0)	554.97	MT26	-28.28	5.325(0)	560.46	MT8	-11.88	5.736(0)	562.02
MT43	-43.60	1.348(0)	553.50	MT25	-27.41	7.680(0)	562.86	MT7	-10.93	5.831(0)	559.68
MT42	-42.68	2.884(0)	556.37	MT24	-26.54	8.684(0)	563.39	MT6	-9.98	2.896(0)	552.38
MT41	-41.79	1.762(0)	553.76	MT23	-25.66	8.860(0)	563.77	MT5	-9.04	3.819(0)	563.35
MT40	-40.88	1.891(0)	554.14	MT22	-24.80	6.833(0)	561.72	MT4	-8.10	7.654(0)	564.45
MT39	-40.00	1.981(0)	554.86	MT21	-23.94	1.053(1)	566.13	MT3	-4.34	1.217(1)	563.29
MT38	-39.13	2.208(0)	555.89	MT20	-23.08	8.449(0)	561.83	MT2	-1.56	2.305(1)	572.94
MT37	-38.28	2.284(0)	556.00	MT19	-22.25	1.101(1)	565.26	MT1	-.62	Null	Null
MT36	-37.42	1.224(0)	554.44	MT18	-21.40	7.199(0)	561.25	MT45	4.34	1.206(1)	566.90
MT35	-36.58	2.719(0)	556.28	MT17	-20.56	8.965(0)	562.84	MT46	8.10	7.678(0)	562.66
MT34	-35.67	2.068(0)	554.22	MT16	-19.62	9.148(0)	562.87	MT47	16.69	2.049(0)	553.45
MT33	-34.71	3.061(0)	556.07	MT15	-18.64	1.016(1)	563.71	MT48	26.54	-7.091(-1)	549.91
MT32	-33.77	Null	Null	MT14	-17.66	1.034(1)	564.06	MT49	35.67	1.269(-1)	549.52
MT31	-32.82	4.363(0)	557.63	MT13	-16.69	9.990(0)	563.51				
MT30	-31.89	5.342(0)	559.00	MT12	-15.71	8.010(0)	562.26				

Run 46 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	1.415(1)	557.97	MT29	-30.99	7.351(1)	624.16	MT11	-14.75	1.294(2)	673.58
MT51	-61.83	2.803(1)	566.03	MT28	-30.08	7.136(1)	623.82	MT10	-13.68	1.809(2)	706.87
MT50	-54.61	2.830(1)	572.06	MT27	-29.18	8.358(1)	622.87	MT9	-12.83	3.714(1)	589.35
MT44	-44.55	5.589(1)	600.19	MT26	-28.28	7.508(1)	622.69	MT8	-11.88	Null	Null
MT43	-43.60	1.176(2)	667.45	MT25	-27.41	9.134(1)	631.84	MT7	-10.93	2.202(1)	575.46
MT42	-42.68	7.761(1)	618.14	MT24	-26.54	1.047(2)	637.14	MT6	-9.98	3.085(1)	572.34
MT41	-41.79	5.349(1)	590.91	MT23	-25.66	8.888(1)	633.01	MT5	-9.04	4.913(1)	583.72
MT40	-40.88	6.261(1)	607.29	MT22	-24.80	9.316(1)	644.35	MT4	-8.10	6.837(1)	601.28
MT39	-40.00	5.214(1)	603.94	MT21	-23.94	1.225(2)	656.65	MT3	-4.34	5.873(1)	599.47
MT38	-39.13	9.977(1)	650.19	MT20	-23.08	1.048(2)	644.19	MT2	-1.56	Null	Null
MT37	-38.28	7.631(1)	634.14	MT19	-22.25	1.345(2)	661.71	MT1	-.62	Null	Null
MT36	-37.42	8.810(1)	641.49	MT18	-21.40	1.401(2)	676.89	MT45	4.34	4.279(1)	585.04
MT35	-36.58	1.002(2)	652.87	MT17	-20.56	1.288(2)	666.08	MT46	8.10	3.342(1)	577.06
MT34	-35.67	Null	Null	MT16	-19.62	1.515(2)	670.98	MT47	16.69	2.804(1)	572.75
MT33	-34.71	9.970(1)	645.55	MT15	-18.64	1.864(2)	677.61	MT48	26.54	2.099(1)	565.00
MT32	-33.77	Null	Null	MT14	-17.66	3.005(2)	721.34	MT49	35.67	2.566(1)	569.04
MT31	-32.82	7.352(1)	623.70	MT13	-16.69	4.339(2)	803.06				
MT30	-31.89	7.187(1)	621.57	MT12	-15.71	2.483(2)	748.48				

Run 47 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	1.048(1)	559.40	MT29	-30.99	5.296(1)	606.55	MT11	-14.75	1.933(2)	652.54
MT51	-61.83	Null	Null	MT28	-30.08	7.097(1)	622.80	MT10	-13.68	8.464(1)	603.03
MT50	-54.61	2.223(1)	570.03	MT27	-29.18	7.068(1)	623.72	MT9	-12.83	1.954(1)	582.66
MT44	-44.55	6.189(1)	610.38	MT26	-28.28	8.907(1)	639.83	MT8	-11.88	3.996(1)	586.62
MT43	-43.60	4.117(1)	589.86	MT25	-27.41	8.811(1)	642.27	MT7	-10.93	3.902(1)	580.58
MT42	-42.68	5.494(1)	604.39	MT24	-26.54	9.406(1)	646.59	MT6	-9.98	2.606(1)	577.24
MT41	-41.79	4.196(1)	586.28	MT23	-25.66	8.443(1)	642.54	MT5	-9.04	3.270(1)	578.56
MT40	-40.88	4.241(1)	590.63	MT22	-24.80	8.849(1)	653.46	MT4	-8.10	3.990(1)	583.49
MT39	-40.00	5.129(1)	599.03	MT21	-23.94	1.075(2)	681.13	MT3	-4.34	3.328(1)	579.43
MT38	-39.13	6.383(1)	612.58	MT20	-23.08	9.002(1)	667.00	MT2	-1.56	3.109(1)	576.89
MT37	-38.28	6.559(1)	614.77	MT19	-22.25	1.094(2)	681.72	MT1	-.62	Null	Null
MT36	-37.42	5.060(1)	603.80	MT18	-21.40	1.155(2)	698.06	MT45	4.34	2.350(1)	570.74
MT35	-36.58	6.686(1)	622.58	MT17	-20.56	1.280(2)	697.87	MT46	8.10	2.364(1)	570.29
MT34	-35.67	4.464(1)	595.76	MT16	-19.62	1.339(2)	701.37	MT47	16.69	1.560(1)	564.41
MT33	-34.71	7.639(1)	628.24	MT15	-18.64	1.907(2)	718.34	MT48	26.54	1.419(1)	562.71
MT32	-33.77	Null	Null	MT14	-17.66	3.351(2)	769.99	MT49	35.67	7.213(0)	557.44
MT31	-32.82	7.249(1)	623.16	MT13	-16.69	4.560(2)	772.95				
MT30	-31.89	6.859(1)	620.56	MT12	-15.71	2.832(2)	689.28				

Run 48 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	3.078(0)	551.40	HT29	-30.99	1.050(1)	558.66	HT11	-14.75	4.394(0)	554.00
HT51	-61.83	3.711(0)	552.46	HT28	-30.08	6.970(0)	556.43	HT10	-13.68	4.407(0)	554.26
HT50	-54.61	6.826(0)	555.71	HT27	-29.18	6.823(0)	556.59	HT9	-12.83	Null	Null
HT44	-44.55	8.235(0)	559.13	HT26	-28.28	5.574(0)	555.06	HT8	-11.88	3.625(0)	552.98
HT43	-43.60	7.956(0)	559.04	HT25	-27.41	5.450(0)	554.01	HT7	-10.93	3.562(0)	553.36
HT42	-42.68	1.470(1)	568.56	HT24	-26.54	5.143(0)	554.52	HT6	-9.98	3.313(0)	552.90
HT41	-41.79	8.689(0)	561.18	HT23	-25.66	5.186(0)	554.10	HT5	-9.04	4.150(0)	553.22
HT40	-40.88	1.873(1)	574.75	HT22	-24.80	4.706(0)	554.00	HT4	-8.10	Null	Null
HT39	-40.00	1.984(1)	577.13	HT21	-23.94	4.527(0)	553.92	HT3	-4.34	5.196(0)	554.51
HT38	-39.13	4.814(1)	605.65	HT20	-23.08	4.364(0)	553.62	HT2	-1.56	4.263(0)	553.72
HT37	-38.28	5.224(1)	603.98	HT19	-22.25	4.500(0)	553.62	HT1	-.62	Null	Null
HT36	-37.42	6.339(1)	605.50	HT18	-21.40	6.929(0)	555.02	HT45	4.34	3.498(0)	552.95
HT35	-36.58	6.798(1)	601.79	HT17	-20.56	4.101(0)	553.80	HT46	8.10	3.856(0)	553.23
HT34	-35.67	4.428(1)	587.62	HT16	-19.62	3.632(0)	552.57	HT47	16.69	3.726(0)	552.65
HT33	-34.71	2.447(1)	575.53	HT15	-18.64	3.405(0)	552.79	HT48	26.54	2.887(0)	551.56
HT32	-33.77	Null	Null	HT14	-17.66	3.740(0)	553.09	HT49	35.67	3.316(0)	552.18
HT31	-32.82	1.323(1)	561.36	HT13	-16.69	4.691(0)	554.01				
HT30	-31.89	1.116(1)	559.65	HT12	-15.71	3.727(0)	553.40				

Run 49 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	2.173(0)	542.44	HT29	-30.99	1.176(1)	549.86	HT11	-14.75	3.240(1)	561.34
HT51	-61.83	2.853(0)	543.07	HT28	-30.08	1.250(1)	550.80	HT10	-13.68	1.258(1)	552.25
HT50	-54.61	4.064(0)	544.19	HT27	-29.18	1.431(1)	551.70	HT9	-12.83	6.768(0)	549.15
HT44	-44.55	7.842(0)	547.02	HT26	-28.28	1.312(1)	550.80	HT8	-11.88	4.222(0)	547.01
HT43	-43.60	6.414(0)	546.36	HT25	-27.41	1.377(1)	551.43	HT7	-10.93	4.685(0)	546.35
HT42	-42.68	8.729(0)	548.73	HT24	-26.54	1.385(1)	552.13	HT6	-9.98	4.975(0)	545.85
HT41	-41.79	4.367(0)	545.07	HT23	-25.66	1.463(1)	552.78	HT5	-9.04	6.219(0)	546.38
HT40	-40.88	8.124(0)	547.77	HT22	-24.80	1.630(1)	553.92	HT4	-8.10	7.700(0)	546.66
HT39	-40.00	6.754(0)	546.56	HT21	-23.94	1.756(1)	555.41	HT3	-4.34	1.051(1)	548.38
HT38	-39.13	1.030(1)	549.16	HT20	-23.08	1.605(1)	554.60	HT2	-1.56	8.288(0)	547.47
HT37	-38.28	1.108(1)	549.51	HT19	-22.25	2.070(1)	556.89	HT1	-.62	Null	Null
HT36	-37.42	9.617(0)	548.89	HT18	-21.40	2.108(1)	558.25	HT45	4.34	7.066(0)	546.92
HT35	-36.58	1.116(1)	550.00	HT17	-20.56	2.096(1)	558.35	HT46	8.10	5.004(0)	545.64
HT34	-35.67	Null	Null	HT16	-19.62	2.105(1)	562.15	HT47	16.69	5.534(0)	545.17
HT33	-34.71	1.136(1)	550.84	HT15	-18.64	2.393(1)	563.59	HT48	26.54	4.193(0)	543.88
HT32	-33.77	Null	Null	HT14	-17.66	4.624(1)	571.82	HT49	35.67	4.231(0)	544.32
HT31	-32.82	1.046(1)	549.78	HT13	-16.69	7.253(1)	578.90				
HT30	-31.89	1.194(1)	550.66	HT12	-15.71	Null	Null				

Run 50 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.829(0)	542.90	HT29	-30.99	4.239(1)	575.94	HT11	-14.75	6.244(0)	546.41
HT51	-61.83	2.915(0)	543.70	HT28	-30.08	6.361(1)	584.95	HT10	-13.68	5.375(0)	546.19
HT50	-54.61	3.770(0)	544.98	HT27	-29.18	8.644(1)	592.38	HT9	-12.83	4.865(0)	546.11
HT44	-44.55	1.044(1)	550.42	HT26	-28.28	5.953(1)	585.15	HT8	-11.88	4.448(0)	546.10
HT43	-43.60	8.842(0)	548.63	HT25	-27.41	5.297(1)	581.18	HT7	-10.93	2.804(0)	545.30
HT42	-42.68	1.461(1)	553.94	HT24	-26.54	4.142(1)	575.35	HT6	-9.98	3.064(0)	545.77
HT41	-41.79	8.969(0)	548.95	HT23	-25.66	3.360(1)	568.28	HT5	-9.04	2.454(0)	545.37
HT40	-40.88	9.753(0)	549.85	HT22	-24.80	2.369(1)	561.86	HT4	-8.10	3.442(0)	545.89
HT39	-40.00	1.090(1)	550.84	HT21	-23.94	1.436(1)	555.89	HT3	-4.34	9.037(-1)	544.88
HT38	-39.13	1.360(1)	552.94	HT20	-23.08	1.285(1)	553.43	HT2	-1.56	1.152(0)	546.07
HT37	-38.28	1.354(1)	553.38	HT19	-22.25	1.184(1)	553.68	HT1	-.62	Null	Null
HT36	-37.42	1.267(1)	552.01	HT18	-21.40	7.733(0)	550.53	HT45	4.34	1.454(-1)	544.02
HT35	-36.58	1.596(1)	556.95	HT17	-20.56	8.338(0)	549.79	HT46	8.10	5.480(-1)	543.40
HT34	-35.67	Null	Null	HT16	-19.62	6.613(0)	548.35	HT47	16.69	2.144(0)	543.48
HT33	-34.71	2.456(1)	563.78	HT15	-18.64	4.150(0)	545.93	HT48	26.54	9.687(-1)	541.88
HT32	-33.77	Null	Null	HT14	-17.66	6.042(0)	546.88	HT49	35.67	1.363(0)	541.96
HT31	-32.82	3.648(1)	569.13	HT13	-16.69	5.397(0)	546.38				
HT30	-31.89	4.495(1)	576.11	HT12	-15.71	6.739(0)	546.29				

Run 51 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.466(0)	543.12	HT29	-30.99	4.953(1)	578.84	HT11	-14.75	2.782(0)	546.02
HT51	-61.83	2.178(0)	543.77	HT28	-30.08	4.040(1)	571.64	HT10	-13.68	2.443(0)	545.69
HT50	-54.61	2.853(0)	544.79	HT27	-29.18	3.619(1)	569.36	HT9	-12.83	2.660(0)	545.53
HT44	-44.55	8.888(0)	551.73	HT26	-28.28	2.381(1)	562.56	HT8	-11.88	2.050(0)	545.07
HT43	-43.60	5.870(0)	549.17	HT25	-27.41	2.111(1)	559.61	HT7	-10.93	1.400(0)	544.47
HT42	-42.68	1.322(1)	557.20	HT24	-26.54	2.040(1)	558.75	HT6	-9.98	2.263(0)	544.98
HT41	-41.79	7.567(0)	550.72	HT23	-25.66	1.359(1)	554.93	HT5	-9.04	1.793(0)	544.35
HT40	-40.88	6.869(0)	551.45	HT22	-24.80	7.293(0)	551.58	HT4	-8.10	1.380(0)	543.92
HT39	-40.00	9.120(0)	553.42	HT21	-23.94	2.652(0)	548.55	HT3	-4.34	4.072(-1)	543.09
HT38	-39.13	1.059(1)	560.52	HT20	-23.08	3.063(0)	547.51	HT2	-1.56	1.995(-1)	543.18
HT37	-38.28	1.366(1)	563.20	HT19	-22.25	6.187(0)	549.98	HT1	-.62	Null	Null
HT36	-37.42	1.635(1)	564.57	HT18	-21.40	Null	Null	HT45	4.34	-2.690(-1)	543.46
HT35	-36.58	2.639(1)	573.16	HT17	-20.56	2.220(0)	547.03	HT46	8.10	-1.291(-1)	543.28
HT34	-35.67	Null	Null	HT16	-19.62	2.857(0)	546.53	HT47	16.69	-2.548(-1)	542.77
HT33	-34.71	5.763(1)	590.58	HT15	-18.64	1.603(0)	545.13	HT48	26.54	-2.835(-1)	542.36
HT32	-33.77	Null	Null	HT14	-17.66	2.622(0)	546.16	HT49	35.67	-6.297(-2)	542.03
HT31	-32.82	6.074(1)	587.10	HT13	-16.69	Null	Null				
HT30	-31.89	5.850(1)	582.96	HT12	-15.71	2.183(0)	545.80				

Run 52 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	2.497(0)	545.10	MT29	-30.99	2.922(1)	586.93	MT11	-14.75	6.007(0)	549.08
MT51	-61.83	3.409(0)	546.32	MT28	-30.08	1.790(1)	568.12	MT10	-13.68	5.311(0)	548.68
MT50	-54.61	5.602(0)	548.80	MT27	-29.18	1.455(1)	560.26	MT9	-12.83	4.995(0)	548.56
MT44	-44.55	1.295(1)	557.26	MT26	-28.28	8.761(0)	553.31	MT8	-11.88	4.294(0)	548.16
MT43	-43.60	1.184(1)	556.21	MT25	-27.41	8.173(0)	551.75	MT7	-10.93	4.231(0)	548.07
MT42	-42.68	1.925(1)	564.41	MT24	-26.54	8.809(0)	551.99	MT6	-9.98	4.210(0)	547.45
MT41	-41.79	9.787(0)	554.07	MT23	-25.66	9.185(0)	551.81	MT5	-9.04	4.192(0)	547.45
MT40	-40.88	1.387(1)	559.54	MT22	-24.80	7.912(0)	551.01	MT4	-8.10	3.898(0)	547.29
MT39	-40.00	9.524(0)	555.42	MT21	-23.94	7.575(0)	550.73	MT3	-4.34	4.597(0)	548.32
MT38	-39.13	1.655(1)	562.85	MT20	-23.08	7.902(0)	551.15	MT2	-1.56	4.051(0)	547.62
MT37	-38.28	1.422(1)	560.64	MT19	-22.25	5.860(0)	549.68	MT1	-.62	Null	Null
MT36	-37.42	1.520(1)	561.70	MT18	-21.40	Null	Null	MT45	4.34	3.278(0)	547.01
MT35	-36.58	2.212(1)	569.76	MT17	-20.56	5.262(0)	549.50	MT46	8.10	3.650(0)	546.74
MT34	-35.67	Null	Null	MT16	-19.62	6.293(0)	549.38	MT47	16.69	3.856(0)	546.69
MT33	-34.71	5.071(1)	595.37	MT15	-18.64	5.595(0)	549.29	MT48	26.54	2.876(0)	545.55
MT32	-33.77	Null	Null	MT14	-17.66	6.082(0)	549.30	MT49	35.67	3.368(0)	546.31
MT31	-32.82	7.821(1)	606.97	MT13	-16.69	5.795(0)	549.36				
MT30	-31.89	5.062(1)	599.99	MT12	-15.71	5.761(0)	548.89				

Run 53 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.306(0)	539.31	MT29	-30.99	8.565(0)	543.76	MT11	-14.75	5.583(1)	556.07
MT51	-61.83	4.297(0)	540.09	MT28	-30.08	1.442(1)	568.11	MT10	-13.68	5.352(1)	553.41
MT50	-54.61	6.138(0)	541.14	MT27	-29.18	1.645(1)	569.66	MT9	-12.83	5.054(1)	551.91
MT44	-44.55	1.160(1)	544.63	MT26	-28.28	1.693(1)	550.07	MT8	-11.88	2.869(1)	546.43
MT43	-43.60	1.021(1)	544.15	MT25	-27.41	1.761(1)	551.55	MT7	-10.93	1.393(1)	543.85
MT42	-42.68	1.461(1)	547.43	MT24	-26.54	1.962(1)	553.75	MT6	-9.98	8.087(0)	542.71
MT41	-41.79	6.931(0)	542.61	MT23	-25.66	1.975(1)	552.18	MT5	-9.04	6.981(0)	542.91
MT40	-40.88	1.229(1)	545.99	MT22	-24.80	1.983(1)	554.05	MT4	-8.10	6.774(0)	542.95
MT39	-40.00	8.082(0)	544.16	MT21	-23.94	2.186(1)	555.26	MT3	-4.34	1.332(1)	544.63
MT38	-39.13	1.492(1)	547.39	MT20	-23.08	2.139(1)	553.48	MT2	-1.56	Null	Null
MT37	-38.28	1.444(1)	547.61	MT19	-22.25	2.491(1)	553.54	MT1	-.62	Null	Null
MT36	-37.42	1.426(1)	547.28	MT18	-21.40	2.611(1)	553.98	MT45	4.34	1.214(1)	544.71
MT35	-36.58	Null	Null	MT17	-20.56	2.536(1)	552.85	MT46	8.10	8.330(0)	542.74
MT34	-35.67	9.752(0)	545.04	MT16	-19.62	2.700(1)	554.12	MT47	16.69	7.736(0)	542.03
MT33	-34.71	1.402(1)	547.34	MT15	-18.64	2.882(1)	557.53	MT48	26.54	5.002(0)	540.42
MT32	-33.77	Null	Null	MT14	-17.66	3.242(1)	556.01	MT49	35.67	5.183(0)	540.59
MT31	-32.82	1.428(1)	548.10	MT13	-16.69	5.236(1)	561.84				
MT30	-31.89	1.607(1)	549.01	MT12	-15.71	5.041(1)	560.72				

Run 54 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	1.284(0)	539.55	MT29	-30.99	1.393(1)	551.18	MT11	-14.75	1.901(-1)	543.99
MT51	-61.83	2.152(0)	540.28	MT28	-30.08	9.490(0)	552.34	MT10	-13.68	1.956(-1)	543.62
MT50	-54.61	4.440(0)	541.80	MT27	-29.18	1.237(1)	553.96	MT9	-12.83	-2.774(-1)	543.15
MT44	-44.55	3.677(1)	554.30	MT26	-28.28	8.083(0)	551.54	MT8	-11.88	-8.163(-2)	542.67
MT43	-43.60	3.172(1)	551.22	MT25	-27.41	5.836(0)	551.25	MT7	-10.93	-3.758(-1)	541.92
MT42	-42.68	5.608(1)	561.80	MT24	-26.54	8.225(0)	553.08	MT6	-9.98	3.110(-1)	542.93
MT41	-41.79	3.820(1)	553.40	MT23	-25.66	5.230(0)	550.29	MT5	-9.04	-3.547(-1)	542.62
MT40	-40.88	4.929(1)	557.42	MT22	-24.80	3.065(0)	549.11	MT4	-8.10	-2.180(-1)	541.53
MT39	-40.00	5.107(1)	559.81	MT21	-23.94	1.458(0)	546.82	MT3	-4.34	-5.427(-1)	542.70
MT38	-39.13	6.228(1)	566.27	MT20	-23.08	7.425(-1)	546.19	MT2	-1.56	-6.187(-1)	543.88
MT37	-38.28	6.422(1)	568.50	MT19	-22.25	1.803(0)	547.52	MT1	-.62	Null	Null
MT36	-37.42	5.401(1)	564.30	MT18	-21.40	5.263(-1)	546.04	MT45	4.34	-1.012(0)	542.07
MT35	-36.58	5.595(1)	566.68	MT17	-20.56	1.087(0)	545.21	MT46	8.10	-5.410(-1)	540.38
MT34	-35.67	4.622(1)	561.99	MT16	-19.62	4.448(-1)	544.78	MT47	16.69	-6.677(-1)	540.11
MT33	-34.71	4.278(1)	564.80	MT15	-18.64	-2.447(-1)	543.99	MT48	26.54	-4.463(-2)	540.19
MT32	-33.77	Null	Null	MT14	-17.66	-6.160(-2)	544.71	MT49	35.67	-3.638(-1)	538.35
MT31	-32.82	3.140(1)	562.31	MT13	-16.69	-4.500(-2)	544.47				
MT30	-31.89	2.377(1)	559.08	MT12	-15.71	-8.797(-2)	543.74				

Run 55 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	3.966(-1)	538.26	MT29	-30.99	4.281(0)	544.07	MT11	-14.75	7.726(1)	595.18
MT51	-61.83	8.296(-1)	538.81	MT28	-30.08	7.534(0)	547.92	MT10	-13.68	8.073(1)	592.17
MT50	-54.61	1.120(0)	539.47	MT27	-29.18	9.152(0)	549.62	MT9	-12.83	1.025(2)	586.89
MT44	-44.55	3.378(0)	544.05	MT26	-28.28	7.705(0)	549.36	MT8	-11.88	7.903(1)	580.89
MT43	-43.60	2.364(0)	542.14	MT25	-27.41	9.974(0)	551.79	MT7	-10.93	5.378(1)	566.52
MT42	-42.68	3.701(0)	545.72	MT24	-26.54	9.837(0)	552.54	MT6	-9.98	3.485(1)	558.41
MT41	-41.79	2.493(0)	542.80	MT23	-25.66	1.352(1)	553.96	MT5	-9.04	2.357(1)	553.06
MT40	-40.88	3.056(0)	543.71	MT22	-24.80	1.086(1)	551.97	MT4	-8.10	2.026(1)	551.32
MT39	-40.00	3.430(0)	544.10	MT21	-23.94	1.766(1)	550.64	MT3	-4.34	2.322(0)	542.33
MT38	-39.13	3.076(0)	544.86	MT20	-23.08	1.046(1)	552.53	MT2	-1.56	2.579(0)	543.77
MT37	-38.28	2.446(0)	544.18	MT19	-22.25	1.461(1)	550.11	MT1	-.62	Null	Null
MT36	-37.42	1.865(0)	543.17	MT18	-21.40	1.465(1)	562.22	MT45	4.34	7.709(-2)	541.42
MT35	-36.58	2.664(0)	544.23	MT17	-20.56	1.584(1)	564.68	MT46	8.10	-2.766(-1)	542.21
MT34	-35.67	2.050(0)	542.51	MT16	-19.62	1.578(1)	569.99	MT47	16.69	-2.137(-1)	540.48
MT33	-34.71	3.203(0)	544.92	MT15	-18.64	2.131(1)	578.65	MT48	26.54	-6.176(-1)	538.98
MT32	-33.77	Null	Null	MT14	-17.66	3.085(1)	584.75	MT49	35.67	3.324(-1)	537.95
MT31	-32.82	5.117(0)	546.64	MT13	-16.69	4.880(1)	590.86				
MT30	-31.89	5.953(0)	547.54	MT12	-15.71	6.349(1)	590.98				

Run 56 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	5.001(-1)	538.90	HT29	-30.99	9.255(0)	550.21	HT11	-14.75	1.190(1)	571.14
HT51	-61.83	4.404(-1)	539.53	HT28	-30.08	1.564(1)	557.52	HT10	-13.68	1.053(1)	563.20
HT50	-54.61	1.145(0)	540.05	HT27	-29.18	1.749(1)	560.49	HT9	-12.83	7.817(0)	558.21
HT44	-44.55	5.048(0)	544.88	HT26	-28.28	2.000(1)	561.99	HT8	-11.88	6.023(0)	553.77
HT43	-43.60	2.792(0)	542.71	HT25	-27.41	2.313(1)	565.39	HT7	-10.93	2.982(0)	548.16
HT42	-42.68	5.682(0)	546.71	HT24	-26.54	2.752(1)	567.74	HT6	-9.98	3.935(0)	548.37
HT41	-41.79	4.028(0)	543.99	HT23	-25.66	2.657(1)	567.38	HT5	-9.04	2.690(0)	547.10
HT40	-40.88	4.452(0)	544.92	HT22	-24.80	2.310(1)	565.76	HT4	-8.10	1.615(0)	545.40
HT39	-40.00	3.792(0)	545.01	HT21	-23.94	4.285(1)	573.60	HT3	-4.34	1.906(-1)	543.97
HT38	-39.13	5.698(0)	548.86	HT20	-23.08	4.534(1)	570.31	HT2	-1.56	2.875(-1)	544.11
HT37	-38.28	3.480(0)	544.64	HT19	-22.25	8.687(1)	582.26	HT1	-.62	Null	Null
HT36	-37.42	3.949(0)	544.45	HT18	-21.40	1.081(2)	586.77	HT45	4.34	-4.671(-1)	543.77
HT35	-36.58	4.841(0)	545.10	HT17	-20.56	1.194(2)	591.50	HT46	8.10	-2.261(-1)	542.57
HT34	-35.67	4.871(0)	543.54	HT16	-19.62	9.833(1)	591.35	HT47	16.69	-2.970(-1)	539.64
HT33	-34.71	8.273(0)	548.40	HT15	-18.64	6.535(1)	589.24	HT48	26.54	-6.816(-1)	538.25
HT32	-33.77	Null	Null	HT14	-17.66	4.028(1)	587.06	HT49	35.67	1.614(-1)	538.08
HT31	-32.82	1.225(1)	552.41	HT13	-16.69	2.427(1)	584.24				
HT30	-31.89	1.379(1)	555.23	HT12	-15.71	1.777(1)	577.88				

Run 57 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	3.367(-1)	540.09	HT29	-30.99	4.426(0)	545.70	HT11	-14.75	4.878(0)	547.73
HT51	-61.83	1.117(0)	541.17	HT28	-30.08	5.642(0)	547.75	HT10	-13.68	3.040(0)	545.90
HT50	-54.61	1.461(0)	541.77	HT27	-29.18	8.307(0)	549.46	HT9	-12.83	4.176(0)	546.67
HT44	-44.55	3.951(0)	546.34	HT26	-28.28	6.801(0)	548.00	HT8	-11.88	2.385(0)	546.40
HT43	-43.60	2.312(0)	544.68	HT25	-27.41	8.385(0)	549.94	HT7	-10.93	2.319(0)	545.39
HT42	-42.68	7.773(0)	549.88	HT24	-26.54	8.745(0)	549.67	HT6	-9.98	2.410(0)	544.77
HT41	-41.79	4.094(0)	545.61	HT23	-25.66	9.462(0)	550.23	HT5	-9.04	5.060(0)	546.41
HT40	-40.88	4.048(0)	546.09	HT22	-24.80	7.212(0)	549.26	HT4	-8.10	7.447(0)	547.21
HT39	-40.00	4.063(0)	545.89	HT21	-23.94	1.004(1)	551.95	HT3	-4.34	1.592(1)	552.55
HT38	-39.13	3.474(0)	546.57	HT20	-23.08	6.063(0)	548.08	HT2	-1.56	3.132(1)	563.44
HT37	-38.28	2.579(0)	545.08	HT19	-22.25	8.344(0)	550.96	HT1	-.62	Null	Null
HT36	-37.42	2.518(0)	544.61	HT18	-21.40	6.065(0)	548.50	HT45	4.34	1.456(1)	553.09
HT35	-36.58	3.703(0)	545.29	HT17	-20.56	6.812(0)	549.63	HT46	8.10	1.618(1)	552.03
HT34	-35.67	2.944(0)	543.96	HT16	-19.62	6.273(0)	548.55	HT47	16.69	1.135(0)	542.94
HT33	-34.71	4.290(0)	546.57	HT15	-18.64	7.134(0)	548.38	HT48	26.54	-4.970(-1)	539.57
HT32	-33.77	Null	Null	HT14	-17.66	8.076(0)	549.69	HT49	35.67	Null	Null
HT31	-32.82	5.005(0)	546.41	HT13	-16.69	6.356(0)	548.81				
HT30	-31.89	4.729(0)	546.00	HT12	-15.71	5.052(0)	548.02				

Run 58 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	5.660(0)	545.90	HT29	-30.99	3.860(1)	576.42	HT11	-14.75	1.145(1)	553.03
HT51	-61.83	7.781(0)	547.60	HT28	-30.08	4.432(1)	579.44	HT10	-13.68	1.464(1)	553.51
HT50	-54.61	1.124(1)	550.27	HT27	-29.18	4.827(1)	580.79	HT9	-12.83	1.828(1)	554.37
HT44	-44.55	2.119(1)	560.11	HT26	-28.28	4.806(1)	579.45	HT8	-11.88	1.954(1)	554.14
HT43	-43.60	2.137(1)	559.17	HT25	-27.41	5.203(1)	578.53	HT7	-10.93	2.143(1)	555.09
HT42	-42.68	3.413(1)	569.38	HT24	-26.54	5.440(1)	580.85	HT6	-9.98	1.484(1)	550.33
HT41	-41.79	1.617(1)	555.52	HT23	-25.66	5.669(1)	583.53	HT5	-9.04	1.924(1)	553.37
HT40	-40.88	1.050(1)	550.27	HT22	-24.80	5.953(1)	580.61	HT4	-8.10	Null	Null
HT39	-40.00	2.123(1)	560.25	HT21	-23.94	6.015(1)	585.56	HT3	-4.34	2.063(1)	555.10
HT38	-39.13	4.240(1)	575.30	HT20	-23.08	6.604(1)	594.30	HT2	-1.56	Null	Null
HT37	-38.28	3.429(1)	571.53	HT19	-22.25	9.521(1)	595.31	HT1	-.62	Null	Null
HT36	-37.42	3.299(1)	570.97	HT18	-21.40	1.673(2)	604.88	HT45	4.34	1.546(1)	551.99
HT35	-36.58	4.018(1)	579.56	HT17	-20.56	2.192(2)	612.03	HT46	8.10	1.362(1)	551.55
HT34	-35.67	2.583(1)	568.44	HT16	-19.62	1.239(2)	584.91	HT47	16.69	1.227(1)	550.52
HT33	-34.71	Null	Null	HT15	-18.64	4.882(1)	565.21	HT48	26.54	9.259(0)	548.29
HT32	-33.77	Null	Null	HT14	-17.66	2.341(1)	558.57	HT49	35.67	Null	Null
HT31	-32.82	3.822(1)	580.45	HT13	-16.69	1.461(1)	556.60				
HT30	-31.89	4.364(1)	580.58	HT12	-15.71	1.048(1)	553.19				

Run 60 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)	Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
HT52	-69.00	1.439(0)	545.04	HT29	-30.99	7.068(0)	549.98	HT11	-14.75	3.059(0)	547.60
HT51	-61.83	1.780(0)	545.59	HT28	-30.08	1.029(1)	551.70	HT10	-13.68	3.519(0)	547.38
HT50	-54.61	3.027(0)	546.22	HT27	-29.18	1.278(1)	553.47	HT9	-12.83	3.740(0)	547.54
HT44	-44.55	5.495(0)	548.33	HT26	-28.28	1.834(1)	555.41	HT8	-11.88	3.433(0)	547.14
HT43	-43.60	5.696(0)	548.29	HT25	-27.41	2.473(1)	559.53	HT7	-10.93	4.275(0)	547.42
HT42	-42.68	8.089(0)	550.11	HT24	-26.54	3.016(1)	563.46	HT6	-9.98	3.825(0)	547.00
HT41	-41.79	4.842(0)	547.96	HT23	-25.66	3.475(1)	563.07	HT5	-9.04	3.476(0)	546.90
HT40	-40.88	7.011(0)	549.54	HT22	-24.80	2.923(1)	560.11	HT4	-8.10	4.011(0)	546.89
HT39	-40.00	6.424(0)	548.91	HT21	-23.94	2.595(1)	557.12	HT3	-4.34	3.942(0)	547.29
HT38	-39.13	8.294(0)	550.64	HT20	-23.08	2.284(1)	555.25	HT2	-1.56	2.861(0)	546.51
HT37	-38.28	1.038(1)	551.27	HT19	-22.25	1.983(1)	555.02	HT1	-.62	Null	Null
HT36	-37.42	8.362(0)	550.11	HT18	-21.40	1.341(1)	552.14	HT45	4.34	4.431(0)	547.67
HT35	-36.58	1.039(1)	551.23	HT17	-20.56	9.128(0)	550.51	HT46	8.10	4.304(0)	546.99
HT34	-35.67	7.667(0)	549.58	HT16	-19.62	4.195(0)	548.62	HT47	16.69	4.489(0)	546.75
HT33	-34.71	Null	Null	HT15	-18.64	3.046(0)	548.35	HT48	26.54	2.683(0)	545.67
HT32	-33.77	Null	Null	HT14	-17.66	2.332(0)	547.86	HT49	35.67	Null	Null
HT31	-32.82	9.021(0)	550.57	HT13	-16.69	2.558(0)	548.11				
HT30	-31.89	8.292(0)	550.41	HT12	-15.71	3.165(0)	548.28				

Run 61 Reduced Data Tabulation

Gauge Label	Loc. (deg)	Value (BTU/Ft2-Sec)	T Surf (DegR)
MT52	-69.00	1.221(0)	544.01
MT51	-61.83	1.916(0)	544.43
MT50	-54.61	1.757(0)	544.45
MT44	-44.55	2.519(0)	544.56
MT43	-43.60	2.537(0)	544.56
MT42	-42.68	4.501(0)	545.34
MT41	-41.79	3.737(0)	544.82
MT40	-40.88	3.784(0)	544.82
MT39	-40.00	3.205(0)	544.76
MT38	-39.13	Null	Null
MT37	-38.28	Null	Null
MT36	-37.42	Null	Null
MT35	-36.58	3.251(0)	545.00
MT34	-35.67	3.121(0)	544.89
MT33	-34.71	Null	Null
MT32	-33.77	Null	Null
MT31	-32.82	3.408(0)	545.50
MT30	-31.89	3.913(0)	545.70
MT29	-30.99	3.526(0)	545.71
MT28	-30.08	3.607(0)	547.44
MT27	-29.18	6.368(0)	547.69
MT26	-28.28	4.295(0)	546.96
MT25	-27.41	7.205(0)	547.61
MT24	-26.54	Null	Null
MT23	-25.66	5.587(0)	547.58
MT22	-24.80	7.160(0)	547.92
MT21	-23.94	7.794(0)	548.48
MT20	-23.08	2.736(0)	545.45
MT19	-22.25	5.575(0)	547.31
MT18	-21.40	5.905(0)	547.02
MT17	-20.56	6.165(0)	547.24
MT16	-19.62	5.491(0)	547.14
MT15	-18.64	5.545(0)	547.22
MT14	-17.66	6.758(0)	547.46
MT13	-16.69	7.017(0)	547.71
MT12	-15.71	6.209(0)	548.01
MT11	-14.75	5.812(0)	547.97
MT10	-13.68	6.434(0)	547.73
MT9	-12.83	6.992(0)	548.27
MT8	-11.88	9.414(0)	548.95
MT7	-10.93	7.632(0)	549.39
MT6	-9.98	7.083(0)	548.58
MT5	-9.04	8.920(0)	548.07
MT4	-8.10	8.446(0)	547.30
MT3	-4.34	1.530(1)	550.11
MT2	-1.56	2.371(1)	553.17
MT1	-.62	Null	Null
MT45	4.34	Null	Null
MT46	8.10	1.019(1)	548.58
MT47	16.69	9.068(0)	547.18
MT48	26.54	6.616(0)	545.50
MT49	35.67	Null	Null

Run 62 Reduced Data Tabulation

REPORT DOCUMENTATION PAGE

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13. ABSTRACT (Maximum 200 words)

A program of experimental research and analysis has been conducted to examine the heat transfer and pressure distributions in regions of shock/shock interaction over smooth and transpiration-cooled hemispherical noseshapes. The objective of this investigation was to determine whether the large heat transfer generated in regions of shock/shock interaction can be reduced by transpiration cooling. The experimental program was conducted at Mach numbers of 12 to 16 in the Calspan 48-Inch Shock Tunnel. Type III and type IV interaction regions were generated for a range of freestream unit Reynolds numbers to provide shear layer Reynolds numbers from 10^4 to 10^6 to enable both laminar and turbulent interaction regions to be studied. Shock/shock interactions were investigated on a smooth hemispherical nosetip and a similar transpiration-cooled nosetip, with the latter configuration being examined for a range of surface blowing rates up to one-third of the freestream mass flux. While the heat transfer measurements on the smooth hemisphere without shock/shock interaction were in good agreement with Fay-Riddell predictions, those on the transpiration-cooled nosetip indicated that its intrinsic roughness caused heating-enhancement factors of over 1.5. In the shock/shock interaction studies on the smooth nosetip, detailed heat transfer and pressure measurements were obtained to map the variation of the distributions with shock-impingement position for a range of type III and type IV interactions. Such sets of measurements were obtained for a range of unit Reynolds numbers and Mach numbers to obtain both laminar and turbulent interactions. The measurements indicated that shear layer transition had a significant influence on the heating rates for the type IV interaction as well as the anticipated large effects on type III interaction heating. In the absence of blowing, the peak heating in the type III and type IV interaction regions, over the transpiration-cooled model, did not appear to be influenced by the model's rough surface characteristics. The studies of the effects of transpiration cooling on type III and type IV shock/shock interaction regions demonstrated that large surface blowing rates had significant effect on the structure of the flowfield, enlarging the shock layer and moving the region of peak-heating interaction around the body. However, despite a reduction in the total heating rate, the peak heating was reduced by less than 10 percent for coolant flow rates as large as 30 percent of the freestream mass flux.

14. SUBJECT TERMS			15. NUMBER OF PAGES
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