NASA TECHNICAL MEMORANDUM

UB
NASA TM X-2282

THERMAL ANALYSIS METHODS AND BASIC HEAT-TRANSFER DATA FOR A TURBULENT HEATING FLIGHT EXPERIMENT AT MACH 20 (REENTRY F)

by Floyd G. Howard

Langley Research Center

Hampton, Va. 23365

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • MAY 1971

THERMAL ANALYSIS METHODS AND BASIC HEAT-TRANSFER DATA FOR A TURBULENT HEATING FLIGHT EXPERIMENT AT MACH 20 (REENTRY F)*

By Floyd G. Howard
Langley Research Center

SUMMARY

A heat-transfer experiment was flight conducted on a 5° half-angle cone, 396.2 cm (13 ft) in length, as it entered the sensible atmosphere under laminar, transitional, and turbulent boundary-layer conditions at a free-stream Mach number of about 20. Accurate turbulent-heat-transfer data with natural transition were obtained for correlation with theories in regions of simultaneous high Mach number, Reynolds number, enthalpy, and total-to-wall temperature ratio. Temperatures were measured at four depths through the 15.24-mm-thick (0.600-in.) beryllium wall. Experimental heating rates at 20 stations on the cone were determined independently from the outermost temperature measurement and from the temperature measurement at the second depth by a single-thermocouple inverse method and also from the temperature histories at all four depths by an integral method. The thermal data analysis procedure, associated problems, and results are presented herein.

INTRODUCTION

In order that future high-speed entry vehicles be efficiently designed to survive the extremely high heat load to which they will be subjected, the predictions of transition and turbulent heating must be reliable. Existing methods of predicting turbulent heat transfer are based on correlation of data from ground facilities and flight experiments. However, the test conditions for which these data have been obtained fall significantly short of simultaneously duplicating the important parameters (high local Mach number, high local Reynolds number, high total enthalpy, and high total-to-wall temperature ratio) in the operating regimes of advanced vehicles. (See ref. 1.)

The flight test reported herein was conducted to extend the experimental turbulent-heat-transfer data in the regions of simultaneous high Mach number, Reynolds number, enthalpy, and temperature ratio. The test results were primarily intended to provide

*Title, Unclassified.

accurate turbulent-heat-transfer data (with natural transition) to test the reliability of existing correlations and to develop new correlations at the test conditions for advanced vehicles. A second objective was to provide experimental information on boundary-layer transition at the test conditions. Initial turbulent heating and transition results from the experiment are presented in reference 2. That paper utilized heating rates for a few selected altitudes from the results presented herein.

The basic data of this experiment were temperature histories measured at four depths within the skin at various stations along the 5° half-angle conical body as it entered the sensible atmosphere at a Mach number of approximately 20. The thermal-sensor design was predicated on the integral concept (ref. 3), used in Project Fire, to convert the experimental temperature histories to experimental heating rates. The method utilizes the time rate of change of measured temperatures at four depths in a thick skin and an integration scheme to compute the heating rate. Since the failure of any one of the four measurements could significantly affect the accuracy of the integral method, a second method, which requires a temperature measurement at only one depth reasonably close to the heated surface, was developed during the course of the project. (See ref. 4.) Therefore, experimental heating rates were determined independently from the outermost temperature measurement and from the second depth at each sensor location by a single-thermocouple method and also from the temperature histories at all four depths by an integral method. The purpose of this report is to discuss the thermal data analysis procedures and associated problems and to present the basic heating-rate results.

SYMBOLS

Values are given in both SI and U.S. Customary Units. The measurements and calculations were made in U.S. Customary Units.

A	area
c	specific heat
k	thermal conductivity
L	surface distance from virtual tip (see fig. 18)
L'	surface distance from mechanical joint
l	length along lateral conduction path

[redacted]

n	number of points in walking polynomial
q	heating rate
q_c	rate of heat accumulation due to lateral conduction
r	radius to some depth below surface, measured perpendicular from cone center line
r_s	radius to outside surface, measured perpendicular from cone center line
$\bar{r}$	radius at which mean lateral conduction occurs, assumed to be $r_s - \frac{1}{3}\tau_t$
$\Delta\overline{T}$	difference between mean temperature on primary ray and mean temperature on secondary ray
T	temperature
$\overline{T}$	mean temperature through wall
t	time
x	longitudinal distance from virtual tip
α_T	angle of attack in plane of primary and secondary rays (positive value indicates 180^o ray windward)
β_T	angle of sideslip in plane which is perpendicular to plane of primary and secondary rays (positive value indicates 270^o ray windward)
η_T	vectorial sum of α_T and β_T
θ	cone half-angle
ρ	density
σ	degree of data scatter
τ	depth measured from outside surface (see fig. 18)

[redacted]

ϕ angular location around cone (see fig. 3)

Subscripts:

c conduction

s surface

t total, trim

τ at depth τ in the wall

1,2,3 denote different conditions

Abbreviation:

TC thermocouple

SPACECRAFT, INSTRUMENTATION, AND PROPERTIES

Description of Spacecraft

Figure 1 shows the configuration and construction of the spacecraft. The spacecraft configuration was a 5° half-angle cone, 396.2 cm (13 ft) in length. The 19.3-cm-long (7.6-in.) nose tip was made of ATJ graphite with an initial tip radius of 2.54 mm (0.10 in.). The beryllium structure was fabricated from seven separate conical frustums, each with a wall thickness of 15.24 mm (0.600 in.). The frustums and the nose tip were joined together mechanically at the stations shown to form the conical spacecraft. The five most rearward joints were as shown in figure 2. To minimize the local heat-sink effect of these joints, excess beryllium was removed by scalloping the bolt flange between bolts. The joints between the graphite nose tip and the first beryllium frustum and between the first and second frustums were screw-type joints. Thermal measurement stations were located relatively far from these joints in order to minimize the heat-sink effect of the joints on the measurements. Further details of design, assembly, and so forth can be found in reference 5.

Instrumentation

The temperature measurement stations are shown in figure 3. There were 12 measurement stations on the main ray ($\phi = 0^{\circ}$), 5 on the secondary ray ($\phi = 180^{\circ}$), and 2 each on the 90° and 270° rays. However, the most forward sensor on the 270° ray became

inoperative prior to launch. (See fig. 3.) At each of the 21 (20 operative) stations, thermocouples were located at four depths through the 15.24-mm-thick (0.600-in.) beryllium wall. An exploded view of a thermal-sensor assembly is shown in figure 4, and a typical thermal-sensor installation in the outer shell is shown in figure 5. The nominal thermocouple depths were 0.254 mm (0.01 in.), 2.54 mm (0.10 in.), 7.62 mm (0.30 in.), and 15.24 mm (0.60 in.) (i.e., back surface) for thermocouples 1, 2, 3, and 4, respectively. Measured thermocouple depths determined by an X-ray technique prior to final installation are shown in table I. Also shown in the table are the wall, sleeve, and core thicknesses and the radius to the outside surface measured perpendicular from the vehicle center line. The effective wall thickness was taken as the average of the measured wall and sleeve values.

The nominal depths were chosen after an analytical investigation was conducted to determine the optimum locations which would provide the best results when considering heat-transfer data reduction by use of (1) all four thermocouple measurements in the integral method, (2) thermocouple 1 in the single-thermocouple method, and (3) thermocouple 2 in the single-thermocouple method in the event of thermocouple 1 failure. Other instrumentation consisted of cone surface and base-pressure sensors, base heat-flux sensors, accelerometers and gyros for measurement of body motions, and various diagnostic instruments.

Thermal Properties

Since the wall of the spacecraft was utilized as a calorimeter, accurate determination of local heating rates required precise knowledge of the thermal properties of the beryllium wall material. The thermal sensors were constructed from portions of the billets from which the wall frustums were machined. Samples from the same billets were used in tests to measure thermal conductivity and specific heat. Details of test procedures are discussed in reference 6, and the results are presented in table II. (Measurements were made to 1278° K (2300° R) and extrapolated to 1556° K (2800° R), the approximate melting temperature of beryllium.) Specific-heat values determined by these tests were generally in good agreement with data for beryllium of similar composition (beryllium oxide was 1.6 percent) from other sources. Conductivity values when compared with the generally wide band of data from various sources (with beryllium oxide ranging from 0.48 percent to 2.82 percent) fell within the band at temperatures ranging from 278° K (500° R) to 944° K (1700° R). However, at higher temperatures they were higher than other sources. Since surface radiation in the flight experiment was calculated to be such a low value compared with convective heating (always less than 0.2 percent), no attempt was made to obtain new values of emissivity. The emissivity values listed in table II were taken from previously existing data (ref. 3). Room-temperature density of the beryllium was 1860 kg/m^3 (116.12 lb/ft^3). Variations in the linear dimensions and

the density with temperature were disregarded. Estimates showed that the assumption of a constant density and wall thickness over the measured temperature range would result in an error of less than 1 percent in the heating rates computed from the thermal data.

TRAJECTORY AND ANGLE OF ATTACK

The spacecraft was launched to an altitude of 193.548 km (635 000 ft) from Wallops Island, Virginia, and reentered the atmosphere north of Bermuda in order to minimize distance to the tracking station, which was located on the northern end of the island. Bermuda was the primary radar-telemetry receiving station. In addition, two ships, one with radar tracking capability and each with telemetry reception capability, and two aircraft with optical tracking and telemetry receiving equipment were located in the reentry area. Figure 6 shows the variation of Mach number, velocity, and altitude with time during reentry.

The variation of angle-of-attack parameters, presented in figures 7 and 8, was determined from onboard measurements of normal and transverse acceleration as described in reference 7. Further details of the trajectory and the angle of attack are presented in reference 7.

EXPERIMENTAL HEATING DATA AND ANALYSIS

Temperature Data and Smoothing Procedure

The commutation arrangement for telemetering temperatures was such that the measurement at thermocouple 1 (outermost) was sampled 20 times per second and measurements at thermocouples 2, 3, and 4 were each sampled 10 times per second. Although the scatter in the raw measured temperature data was generally very low (see symbols in fig. 9), smoothing was required before the data could be utilized in the computational procedures to determine heating rates. An example of the raw and smoothed temperature data is shown by the symbols and the solid line, respectively, in figure 9.

The raw measured telemetered temperatures were recorded during flight on magnetic tape along with all other data, such as pressure and body-motion data. To start the heat-transfer data reduction phase, all the raw temperature data were collected and recorded on a separate tape. This tape was the input to an automatic smoothing program, which used a single-stepping, least-squares walking polynomial to smooth the raw data. To provide the best representation of the data, the order of the polynomial (always 1 or 2), the number of points considered, and the number of passes by the polynomial through the data were specified for each thermocouple. (See table III.) Since the single-stepping

walking polynomial technique changes only one data point at a time (the midpoint), special treatment was required for the $\frac{n-1}{2}$ points at the beginning and at the end of the curve being smoothed (where n is the number of data points used to establish the coefficients of the polynomial). For these first (or last) $\frac{n-1}{2}$ points, smoothed values are computed from the same polynomial formulated to smooth the first (or last) midpoint, the polynomial coefficients having been established by the first (or last) n data points. The temperature-time curves, which were observed from quick-look plots of the raw temperature data to have a sharp change in slope (thermocouple 1, thermocouple 2, and sometimes thermocouple 3), were smoothed as two individual curves with the break in the curve at the point where $\Delta^2T/\Delta t^2$ appeared to be maximum. The times of the break points are listed in table III. Since the break point was smoothed as the last point of the first part of the curve and the first point of the last part, two slightly different values resulted for the point at the break. The final value was taken as the average of the two values. An example of the smoothing program printout is shown in appendix A. The smoothed temperature data were recorded on another tape for use as input to the programs for computing heating rates, which are discussed subsequently. Although the temperature data were not recorded at even tenths of a second (see appendix A), linear interpolation of the smoothed data between the measurement times was used for the convenience of tabulation of smoothed temperature, as shown in table IV. Surface temperatures determined by a least-squares fit of a second-order polynomial to the four measured temperatures are given in table V. Hereinafter the smoothed temperature data are referred to as the measured data.

Methods of Computing Heating Rates

Three independent determinations of the experimental heating rates were made at each sensor location. The first was based on the temperature data from the first thermocouple in depth, the second was based on the data from the second thermocouple in depth, and the third evaluation utilized the data from all four thermocouples.

Single-thermocouple method.- The single-thermocouple method utilizes a backward finite-difference technique and solves the simultaneous finite-difference equations of a one-dimensional thermal model (i.e., heat flow normal to the heated surface). The heating rate required during the computing interval to produce the measured temperature increase at the known depth in the wall is determined. Capabilities of the method which were developed for the present experiment are presented in reference 4, and details of a general program incorporating the method are given in reference 8. A modified version of that program was developed for reduction of the present data.

The 30-block thermal model used is shown in appendix B. A computer subroutine, also presented in appendix B, accounted for the conical shape of the spacecraft skin. It also computed the depth, thickness, area, and volume, of each block by use of local radius, thermocouple depths, and effective wall thickness as the governing criteria. Two factors cause the thermal model to vary from station to station. First, variation of the local radius with body station affects the conductive area between blocks. Second, the actual thermocouple depths were not precisely the nominal values. The thermal model was varied from station to station so that the centers of blocks 2, 10, 22, and 30 would be located at the precise depths of thermocouples 1, 2, 3, and 4, respectively. Because the actual thermocouple depths are different at each station, the thickness of the blocks also differs. Both factors (body radius and thermocouple depths) affect the volume of each block. An example of the computer printout showing typical block dimensions and thermal details is shown in appendix B. A refinement suggested in reference 4 is incorporated in the present program; that is, the thermal properties are based on the temperature extrapolated to the center of the computing interval instead of on the temperature at the beginning of the interval.

Integral method.- The integral method, developed in reference 3 for Project Fire, is based on the concept that the heating rate to a one-dimensional thermally thick wall with no heat losses at the surface is equal to the rate of change of heat content of the incremental layers $\rho c \frac{dT}{dt} \Delta\tau$ integrated through the wall:

$$q = \rho \int_0^{\tau_t} c(T)\frac{dT}{dt}\, d\tau \tag{1}$$

Reference 9 presents a method of expressing the distribution of $c(T)\frac{dT}{dt}$ through the wall that is more accurate than that of reference 3 for the conditions of the present experiment, where the wall is very thick and the thermocouples are unequally spaced through it. The method employs a restricted third-order exponential in τ with least-squares fit of the four experimental values of $c(T)\frac{dT}{dt}$ and numerical integration by the Gaussian technique by using 100 increments through the wall. Values of dT/dt were determined from the smoothed temperature data by a five-point digital differential filter on the basis of the least-squares criteria (ref. 10). Also for the present program, the flat-plate expression of equation (1) was modified to incorporate the conical geometry of the spacecraft skin. (See appendix C.)

Accuracy of methods.- In reference 4 an accuracy of 1 percent or better is shown for the single-thermocouple method for measurement depths as great as thermocouple 2

in the present experiment. This accuracy was determined by comparison of the heating rates computed from theoretical temperature histories. In this procedure the finite-difference methods used in the "forward" computations of temperature from assumed heating rates were similar to those used in the "inverse" computations of heating rates from temperatures. To determine if this similarity was a factor in the high degree of accuracy noted and to investigate the adequacy of the 30-block finite-difference thermal model used in the Reentry F data reduction procedure, a comparison was made with an exact solution for temperatures in a thick wall. Wall curvature was set at zero in the thermal model for comparison with the flat-plate exact solution, and a computing time interval of 0.2 second was used in the finite-difference computations. Constant thermal properties and a constant heat flux (680.94 W/cm^2 (600 Btu/ft^2-sec)) were assumed. Comparisons of temperature histories were made at a depth of 0.3353 mm (0.0132 in.) and at the back surface of a 15.29-mm-thick (0.6020-in.) beryllium wall, as shown in figure 10. Except for the first few computations, the finite-difference temperatures are in excellent agreement with the exact results for both depths. The temperature history from the exact solution at the 0.3353-mm (0.0132-in.) depth was then used as input to the single-thermocouple inverse solution. Figure 11 shows that, except for a short transition period after the initial step input of heating, the computed heating rates are accurate within 1 percent.

In reference 9, heating rates computed by the integral method for a set of assumed conditions simulating the Reentry F experiment were shown to be accurate within 2 percent when precise temperature data were used. Experimental temperature data were also simulated in both references 9 and 4 by applying random scatter having a standard deviation σ of 8.3° K (15° R) to the precise calculated temperature data. In both references, the simulated experimental data were faired with sixth-order polynomial curve fits, which were then used as the temperature-history inputs for the heating-rate calculations. The previously noted accuracies decreased from 1 percent to approximately 3 percent for the single-thermocouple method, and from 2 percent to between 5 and 10 percent (depending on heating-rate magnitude) for the integral method.

As pointed out in reference 4, these results with scattered temperature data are actually a measure of the accuracy of the sixth-order polynomial curve-fitting technique rather than a test of the heat-transfer computation methods. They do, however, emphasize the rather obvious fact that final accuracy in computed heat-transfer rates depends strongly on the input temperature histories. Although some scatter is evident in the measured Reentry F temperatures, the standard deviation is less than 2.8° K (5° R) for most temperature histories and less than 3.9° K (7° R) for the "worst." Also, the data smoothing techniques discussed previously are considered to be superior to the sixth-order polynomial curve fits used in the accuracy analyses of references 4 and 9. Also, absence of significant bias inaccuracies, except in the measurements of inside surface

temperature (thermocouple 4), is indicated by the computations. When the experimental temperature history from either thermocouple 1 or 2 is used in the single-thermocouple method, computed temperature histories matched the measurements within about 11.1° K (20° R) or less (approximately 1 percent of the full-scale range of the thermocouple), except for the measurements at thermocouple 4. These temperatures on the inside surface of the thermal sensors lagged the computed temperatures increasingly to a maximum of approximately 44.4° K (80° R) as the temperature rose. This trend is shown in appendix D to be at least in part due to the local added mass of the potting compound on the inner surface of the thermal sensor, but the influence on the heating rates determined by the single-thermocouple method was negligible.

Effects of Angle of Attack, Radiation, and Conduction

Angle of attack.- Machine computations have shown that the individual cycles in angle of attack, as shown in figure 7, cause small waves of matching frequency on the rising temperature of the skin. However, the maximum amplitude of the oscillations at the depth of the first thermocouple is less than ±2.2° K (4° R). Such waves were not evident in the telemetered temperature data, and, therefore, no oscillations appear in the heating-rate history. However, as a result of the trim angle of attack (fig. 8) with the secondary ray on the upwind side of the body, the heating rates on the secondary ray were higher than on the primary ray at comparable locations; thus, some circumferential conduction effects, which are discussed subsequently, were created.

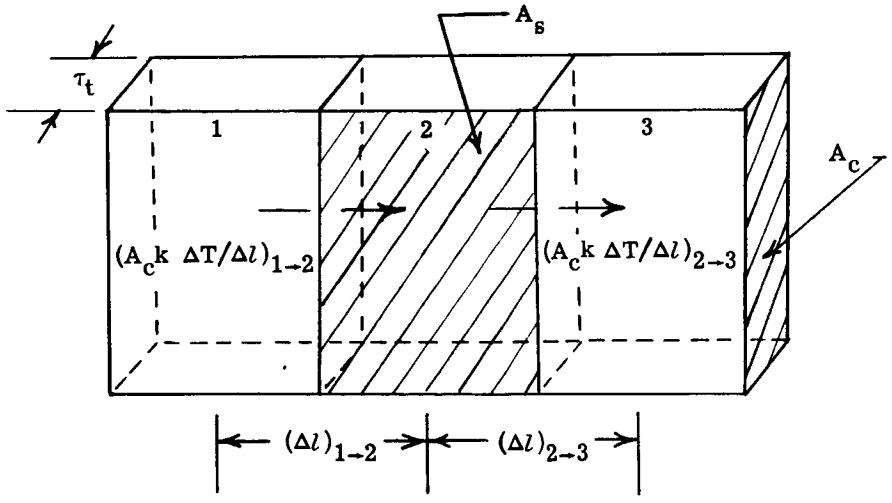
Radiation.- The radiation rates from the heated surface were computed by, and are included in the results of, both inverse methods. For the single-thermocouple method, the computed temperature of block 1 of the thermal model was used in the computations of radiation., Surface radiation temperature was obtained for the integral method by fitting a second-order polynomial through the four measured values. Computed surface radiation was always less than 0.2 percent of the measured heating. Radiation from the back surface, although not computed, was negligible, since the back surface temperatures were much lower than the heated-surface temperatures. Heat loss from the back surface due to internal convection was assumed to be negligible.

Longitudinal conduction.- As previously noted, the joints between the skin frustums were designed to reduce the additional local heat-sink mass as much as possible, and the measurement stations were located as far as practical from the joints. The influence of the joints on the heating at the measurement stations was determined by use of a thermal model, as shown in figure 12. The model has a more abrupt change in mass distribution than the actual joint (fig. 2). This change will result in a conservative computation of longitudinal conduction effects; that is, more heat-sink mass near the thermocouple installation is assumed in the model. Further conservatism results from the neglect of

the scalloping of the flange material between the bolts. Temperature histories of the thermal model were computed by use of one of the more severe experimental heating rates. (The computed histories of convective heating for each measurement station are presented subsequently.) The longitudinal temperature distributions shown in figure 12 are those of the sixth layer of blocks from the heated surface in the thermal model at 459.0 and 461.0 seconds. These distributions were assumed to exist at all depths through the wall and were used to compute longitudinal conduction. Since the computations showed that the longitudinal gradients become more severe with increased depth below the heated surface, the assumption is conservative. The effect of longitudinal conduction near the thermal-sensor locations was computed by use of the general finite-difference expression for the accumulation of heat by conduction (refs. 11 and 12):

$$q_{c,2} = \frac{A_c}{A_s}\left[\left(k\frac{\Delta T}{\Delta l}\right)_{1\to 2} - \left(k\frac{\Delta T}{\Delta l}\right)_{2\to 3}\right] \tag{2}$$

where A_c is the conductive area, A_s is the surface of convective area, Δl is distance between block centers, and $q_{c,2}$ is the conductive heating per unit surface area at point 2. (See sketch (a).)



Sketch (a)

In equation (2), the conduction area in block 2 is assumed to be equal to the conduction area out of block 2. If the growth in conductive area along the length of a cone is accounted for and the finite-difference equation is reduced to a differential form, the equation becomes

$$q_c = k\tau_t\left(\frac{d^2T}{dl^2} + \frac{1}{L}\frac{dT}{dl}\right) \tag{3}$$

where $\frac{1}{L}\frac{dT}{d\ell}$ is a result of the conical effect. In addition to estimates by use of equation (2), estimates were also made by use of equation (3). The values of $d^2T/d\ell^2$ were determined graphically from the temperature distribution of figure 12. Results from both methods are shown in table VI for two locations which are slightly closer to the joint than any of the thermal sensors on the spacecraft. The maximum effect of longitudinal conduction due to additional mass at the joint is less than 0.2 percent of convective heating in these conservative estimates.

Longitudinal conduction due to the uneven temperatures along the length of the vehicle was also investigated. Figure 13 shows the variation of outside temperature (from TC 1) along the main ray ($\phi = 0^o$) for several times. Equation (3) was used to estimate longitudinal conduction at 458.1 seconds. The first and second derivatives of temperature with respect to distance were determined graphically from the curve shown in figure 13. As shown in table VI, the estimates of conduction at 458.1 seconds were less than 0.02 percent of the measured heating except at the most forward station where the estimate was 0.13 percent.

Circumferential conduction.- Since small angles of attack and asymmetric transition occurred during the experiment (figs. 7 and 8 and refs. 2 and 7), uneven heating, and thus temperature gradients, existed around the circumference of the spacecraft. The main thermocouple ray was the coolest position circumferentially because transitional and turbulent heating occurred slightly later at locations on that ray than at corresponding circumferential locations and because the leeward location on the spacecraft stayed within about 15^o of the main thermocouple ray during the later part of the reentry when the mean total angle of attack exceeded 0.1^o. As a result, there was a tendency for heat accumulation by circumferential conduction at measurement locations along the main ray.

There were three circumferential measurement stations at station 185.42 cm (73 in.) and four at station 365.76 cm (144 in.). Figure 14 shows the mean temperatures at these locations determined from a fairing of the four temperature measurements through the skin $\left(\text{that is, } \overline{T} = \frac{1}{\tau_t}\int_0^{\tau_t} T\, d\tau\right)$. Circumferential distributions of mean temperature are shown for the two stations noted at 458.0 seconds, approximately the time when the circumferential conduction effects were most important, and also at 460.0 seconds. At station 185.42 cm (73 in.) the circumferential temperature distributions were faired by assuming $\phi = 0^o$ to be the coolest ray. This assumption is conservative (i.e., results in the greatest effect of conduction at the main-ray measurement locations). By assuming a cylindrical configuration, two different approaches were taken to estimate conduction at 458.0 seconds for station 185.42 cm (73 in.) by using the following expression:

$$q_c = \frac{\bar{r}}{r_s} k\tau_t \frac{d^2\overline{T}}{d\ell^2} \tag{4}$$

In the first case the value of $d^2\overline{T}/d\ell^2$ was determined graphically from the faired circumferential temperature distribution (fig. 14). Conduction by this approach was 0.869 W/cm^2 (0.7657 Btu/ft^2-sec), which is 0.212 percent of the measured heating. (This value of conduction was used as a base value to estimate conduction at other stations and at other times, as will be discussed subsequently.)

The second approach taken to estimate conduction at station 185.42 cm (73 in.) was based on an assumed cosine variation of temperature between the maximum and minimum temperature values, indicated by the broken curve in figure 14. Conduction based on the cosine variation was 0.221 W/cm^2 (0.195 Btu/ft^2-sec). It is apparent that the assumption of a cosine variation in temperature between $\phi = 180^o$ and $\phi = 0^o$ is less severe than the fairing of the experimental mean temperatures. Further checks at several times for both stations 185.42 cm (73 in.) and 365.76 cm (144 in.) showed that fairing of the experimental data produced conduction heat fluxes that were consistently between 2 and 4 times larger than those obtained by use of the cosine assumption. (This factor is pertinent to the estimates of conduction presented below for the most forward measurement location where a cosine distribution of heating around the body was assumed.)

Since $\phi = 0^o$ was the only circumferential measurement location at the 40.64-cm (16-in.) station, estimates of conduction at that measurement location were made differently from the previously discussed methods. The temperature variations around the body at station 40.64 cm (16 in.) were determined from computer calculations which were made primarily for an analysis of thermal distortion (ref. 13) caused by the uneven heating around the body. For that analysis, heating-rate histories on the windward (secondary) ray, including transition, were estimated from extrapolations of the measurements at the more rearward stations and from theoretical heating-rate computations. These estimated rates are presented in table VII. A cosine variation was assumed between the estimated heating rates on the windward ray and the measured heating rates on the leeward ray and used in conjunction with a thermal model which divided the skin circumferentially and in depth by using 100 blocks. The temperature differences between blocks of the thermal model were used in conjunction with equation (2) to compute conduction at the measurement location on the leeward ray. Fluxes of 4.27, 7.90, and 14.06 W/cm^2 (3.77, 6.96, and 12.39 Btu/ft^2-sec) were computed for 458.0, 458.8, and 460.0 seconds, respectively. These values are 5.2, 13.7, and 4.3 percent, respectively, of the experimental heating at these times. If the previously noted ratio of roughly 1 to 3 between the cosine assumption and experimental results is applied, these results become approximately 16, 41, and 13 percent, respectively. These large and increasing values of conduction heat flux are due to the small circumference at

station 40.64 cm (16 in.) and the large and increasing temperature difference caused by the angle-of-attack history. The conduction effect in terms of percent of measured heating on the leeward ray is a maximum, and very large, at 458.8 seconds because that measured heating was low (commensurate with laminar flow on the leeward ray). The measured heating was actually decreasing because of increasing angle of attack until 458.8 seconds, when transition occurred and the measured heating increased markedly. Therefore, the percentage effect of conduction decreased.

Conduction effects were also estimated at the forward measurement stations, including station 40.64 cm (16 in.), by assuming the following relationship between conduction heat flux at different stations on the body:

$$q_{c,2} = q_{c,1} \frac{r_{s,1}}{r_{s,2}} \frac{\bar{r}_1}{\bar{r}_2} \frac{k_2\left(\overline{T}_2\right)}{k_1\left(\overline{T}_1\right)} \frac{\left(\overline{T}_{\phi=0^o} - \overline{T}_{\phi=180^o}\right)_2}{\left(\overline{T}_{\phi=0^o} - \overline{T}_{\phi=180^o}\right)_1} \tag{5}$$

where k is evaluated as a function of mean temperature $\overline{T}$. This assumption implies that the circumferential temperature distributions at the two stations are nondimensionally similar.

The 0.869-W/cm^2 (0.7657-Btu/ft^2-sec) conduction heat flux determined from the faired curve of figure 14 for station 185.42 cm (73 in.) was used as a base value in equation (5) to estimate conduction at other locations and times. The temperature histories at uninstrumented stations on the windward ray were determined from the previously mentioned computations made for the thermal distortion analysis. Estimates made by this approach are given in table VI. The large effects computed at station 40.64 cm (16 in.) (i.e., 18.6, 43.6, and 14.4 percent of measured heating at times 458.0, 458.8, and 460.0 seconds, respectively) are very similar to the percentages obtained previously by the cosine assumption amplified by a factor of 3. At stations 78.74 cm (31 in.) and 101.60 cm (40 in.), the maximum effects of 8.3 and 2.9 percent occur at 458.6 seconds when measured heating was small. Just after that time, the heating increased abruptly as transition moved over those stations, and thereafter the percentage effects of conduction were negligible. Since temperature differences between the windward and leeward ray become smaller and the circumference becomes larger at the more rearward stations, the conduction effects decrease and are negligible at stations farther aft than those shown.

In concluding the discussion of the effects of longitudinal and circumferential conductions, it should be reemphasized that although the results have been presented in precise numbers, the accuracy of many of the assumptions, fairings, and extrapolations involved in the computations is open to question. However, the general magnitude of the results from the conservative approach taken herein provides assurance that except at stations 40.64 cm (16 in.) at altitudes below about 22.86 km (75 000 ft) and at stations

78.74 cm (31 in.) and 101.60 cm (40 in.) near an altitude of 18.59 km (61 000 ft), longitudinal and circumferential conduction effects were a negligible part of the measured heating rates. At stations 40.64, 78.74, and 101.60 cm (16, 31, and 40 in.) at the times referred to, circumferential conduction heat fluxes caused increases in the measured heating rates.

Experimental Heating Rates

Typical examples of the heating-rate histories computed by the single-thermocouple method from measurements at thermocouples 1 and 2 and by the integral method from measurements at all four thermocouples are shown in figure 15. Results from the data of thermocouple 1 and thermocouple 2 compare within about 5 percent. Results from the integral method agree with the single-thermocouple results within about 10 percent but are consistently below them at the later times when the heating rates are high. The principal reason for this trend is the tendency of the inside surface temperature measurements (TC 4) to rise at a slightly slower rate than is compatible (in the thermal model) with the other thermocouple measurements, as noted in the section "Methods of Computing Heating Rates." Computations discussed in appendix D show that the potting compound on the back surface of the thermal sensors accounts for only a small part of the "apparent" lag of the TC 4 measurement. Reasonable changes in the beryllium conductivity cannot explain the measurements.

For comparison, computations were made by the integral method with computed back surface temperatures substituted for the measurements of TC 4. With this substitution, the integral results moved considerably closer to the single-thermocouple results, as shown in figure 16.

Because of the previously mentioned reasons to suspect some inaccuracy in the measurements of TC 4, which are required in evaluation of the integral method, the best determination of the experimental heating results is taken to be a fairing of the rates determined independently from TC 1 and TC 2 by the single-thermocouple method.

The two individual sets of single-thermocouple results are shown for each station in figure 17. Although not shown in the figure, the hand-faired values are listed in table VIII. When fairing the data in regions where significant differences occurred, engineering judgment was exercised by looking at large CalComp plots of raw and smoothed temperature data. By fairing the curve through the results from thermocouple 1 and thermocouple 2, more credence was given to the data which had the best apparent fairing of temperature data during the period of disagreement.

CONCLUDING REMARKS

A 5^{o} half-angle beryllium cone, 396.2 cm (13 ft) long, with an initial nose radius of 2.54 mm (0.1 in.), was launched on a ballistic trajectory and entered the atmosphere at a free-stream Mach number of approximately 20. Accurate heating rates were determined from temperatures measured during laminar, transitional, and turbulent flow conditions. Estimates showed that circumferential conduction was significant at certain times at the three most forward stations where temperature gradients were large because of the small circumference. Circumferential conduction at other stations and longitudinal conduction at all stations were negligible.

Langley Research Center,
National Aeronautics and Space Administration,
Hampton, Va., March 31, 1971.

[redacted]

APPENDIX A

EXAMPLE OF PRINTOUT OF TEMPERATURE SMOOTHING PROGRAM

Reentry F temperature data
Sensor A 391
Thermocouple 2

TIME SEC	INITIAL T R	SMOOTHED T R	T(SMOOTH)-T(INIT)
442.1493	603.7133	602.3368	-1.3765
442.2492	601.5798	602.5692	.9894
442.3483	603.7133	602.8157	-.8976
442.4482	601.5798	603.0803	1.5005
442.5473	603.7133	603.3586	-.3546
442.6472	601.5798	603.6554	2.0756
442.7463	605.8467	603.9657	-1.8810
442.8462	603.7133	604.2947	.5814
442.9453	607.9801	604.6368	-3.3433
443.0443	603.7133	604.9946	1.2813
443.1442	601.5798	605.3717	3.7919
443.2433	607.9801	605.7616	-2.2185
443.3432	605.8467	606.1710	.3243
443.4423	605.8467	606.5928	.7461
443.5422	605.8467	607.0872	1.2405
443.6413	610.1135	607.5803	-2.5332
443.7412	605.8467	608.0774	2.2308
443.8403	610.1135	608.5947	-1.5188
443.9393	605.8467	609.1001	3.2534
444.0392	614.3804	609.6272	-4.7532
444.1383	610.1135	610.1397	.0262
444.2382	607.9801	610.6564	2.6763
444.3373	612.2470	611.1828	-1.0642
444.4372	607.9801	611.7032	3.7231
444.5363	614.3804	612.2350	-2.1454
444.6362	614.3804	612.7299	-1.6505
444.7353	614.3804	613.2036	-1.1768
444.8352	614.3804	613.6701	-.7103
444.9343	616.5138	614.1125	-2.4013
445.0342	614.3804	614.5094	.1290
445.1333	612.2470	614.9011	2.6542
445.2323	616.5138	615.2906	-1.2232
445.3322	612.2470	615.6725	3.4255
445.4313	618.6472	616.0594	-2.5878
445.5312	610.1135	616.4404	6.3269
445.6303	616.5138	616.8679	.3541
445.7302	620.7807	617.3100	-3.4707
445.8293	618.6472	617.7257	-.9215
445.9292	620.7807	618.1447	-2.6360
446.0283	618.6472	618.5445	-.1028
446.1282	622.9141	618.9592	-3.9549

[redacted]

446.2273	616.5138	619.3610	2.8472
446.3263	618.6472	619.7942	1.1470
446.4262	622.9141	620.2804	-2.6337
446.5253	616.5138	620.7838	4.2700
446.6252	620.7807	621.3609	.5802
446.7243	620.7807	621.9563	1.1756
446.8242	620.7807	622.6347	1.8540
446.9233	625.0475	623.3793	-1.6682
447.0232	622.9141	624.1434	1.2293
447.1223	629.3144	624.9471	-4.3673
447.2222	620.7807	625.7446	4.9639
447.3213	627.1810	626.6030	-.5780
447.4203	631.4478	627.4870	-3.9608
447.5202	629.3144	628.3576	-.9568
447.6193	625.0475	629.2361	4.1886
447.7192	631.4478	630.1571	-1.2907
447.8183	629.3144	631.0633	1.7489
447.9182	631.4478	631.9935	.5457
448.0173	631.4478	632.9267	1.4789
448.1172	633.5812	633.8566	.2754
448.2163	639.9815	634.7777	-5.2039
448.3162	635.7147	635.6038	-.1109
448.4153	635.7147	636.3937	.6790
448.5143	642.1149	637.1823	-4.9327
448.6142	635.7147	637.9306	2.2159
448.7133	639.9815	638.6912	-1.2903
448.8132	639.9815	639.4512	-.5303
448.9123	635.7147	640.2260	4.5113
449.0122	644.2484	641.0434	-3.2050
449.1113	642.1149	641.8573	-.2576
449.2112	639.9815	642.7245	2.7430
449.3103	639.9815	643.6362	3.6546
449.4102	646.3818	644.6023	-1.7795
449.5093	646.3818	645.5967	-.7851
449.6083	646.3818	646.6102	.2284
449.7082	646.3818	647.6670	1.2852
449.8073	646.3818	648.7405	2.3587
449.9072	650.6487	649.8768	-.7719
450.0063	654.9155	651.0096	-3.9059
450.1062	648.5152	652.1374	3.6222
450.2053	657.0489	653.3139	-3.7350
450.3052	652.7821	654.4882	1.7062
450.4043	652.7821	655.6489	2.8669
450.5042	659.1824	656.8492	-2.3332
450.6033	661.3158	658.0095	-3.3063
450.7032	661.3158	659.1622	-2.1536
450.8023	663.4492	660.2808	-3.1684
450.9013	654.9155	661.3797	6.4642
451.0012	661.3158	662.5533	1.2375
451.1003	665.5826	663.7190	-1.8636
451.2002	663.4492	664.8817	1.4325
451.2993	667.7161	666.0786	-1.6374

APPENDIX A – Continued

451.3992	667.7161	667.2894	-.4267
451.4983	667.7161	668.5045	.7884
451.5982	667.7161	669.7451	2.0290
451.6973	669.8495	670.9936	1.1441
451.7963	671.9829	672.2837	.3007
451.8962	674.1163	673.5968	-.5196
451.9953	674.1163	674.9192	.8028
452.0952	678.3832	676.2667	-2.1165
452.1943	678.3832	677.6070	-.7762
452.2942	678.3832	678.9719	.5887
452.3933	680.5166	680.3570	-.1597
452.4932	682.6501	681.7532	-.8969
452.5923	682.6501	683.1359	.4858
452.6922	684.7835	684.5363	-.2472
452.7913	691.1838	685.9468	-5.2369
452.8903	686.9169	687.3214	.4044
452.9902	686.9169	688.7504	1.8334
453.0893	691.1838	690.2168	-.9669
453.1892	686.9169	691.7264	4.8095
453.2883	693.3172	693.3012	-.0160
453.3882	693.3172	694.9535	1.6363
453.4873	697.5840	696.6649	-.9192
453.5872	701.8509	698.4729	-3.3780
453.6863	697.5840	700.3283	2.7443
453.7862	699.7175	702.2604	2.5429
453.8853	706.1178	704.2891	-1.8287
453.9852	710.3846	706.3681	-4.0165
454.0843	708.2512	708.4777	.2266
454.1833	708.2512	710.6493	2.3981
454.2832	712.5180	712.9212	.4032
454.3823	716.8390	715.2230	-1.6160
454.4822	712.5180	717.6050	5.0869
454.5813	721.2291	720.0528	-1.1763
454.6812	723.4242	722.5803	-.8439
454.7803	725.6193	725.1608	-.4585
454.8802	725.6193	727.8328	2.2135
454.9793	736.5947	730.6138	-5.9809
455.0783	734.3997	733.4261	-.9736
455.1782	738.7898	736.3557	-2.4341
455.2773	738.7898	739.4793	.6894
455.3772	743.1800	742.7320	-.4480
455.4763	743.1800	746.0590	2.8790
455.5762	745.3751	749.5169	4.1418
455.6753	754.1554	753.0474	-1.1081
455.7752	756.3505	756.7105	.3600
455.8743	758.5456	760.4444	1.8988
455.9742	758.5456	764.3127	5.7671
456.0733	767.3260	768.2500	.9241
456.1723	769.5210	772.2855	2.7644
456.2722	778.3014	776.4610	-1.8404

APPENDIX A – Concluded

456.3713	780.4965	780.7030	.2066
456.4712	791.4719	787.2017	-4.2702
456.5703	806.8375	810.6119	3.7744
456.6702	835.3736	832.0855	-3.2881
456.7693	852.9343	853.1593	.2249
456.8692	881.2700	874.2102	-7.0598
456.9683	887.7395	894.6987	6.9592
457.0673	917.9302	914.7001	-3.2300
457.1672	937.6025	934.3668	-3.2358
457.2663	954.8544	953.3526	-1.5018
457.3662	978.5756	971.8940	-6.6816
457.4653	987.2016	989.9317	2.7302
457.5652	1006.6099	1007.9387	1.3288
457.6643	1026.0182	1025.8568	-.1614
457.7642	1041.1135	1044.2363	3.1228
457.8633	1060.2536	1062.8331	2.5795
457.9623	1079.1678	1081.6992	2.5314
458.0622	1104.3868	1100.9387	-3.4481
458.1613	1121.1994	1119.9355	-1.2639
458.2612	1142.2152	1139.9260	-3.2892
458.3603	1156.9263	1157.7006	.7743
458.4602	1171.6373	1176.5315	4.8942
458.5593	1201.0594	1195.2055	-5.8540
458.6592	1211.5673	1214.4582	2.8908
458.7583	1224.1768	1233.9648	9.7879
458.8573	1257.5506	1253.7476	-3.8031
458.9572	1278.2694	1274.2726	-3.9969
459.0563	1290.7007	1295.2705	4.5698
459.1562	1309.9819	1316.8511	6.8691
459.2553	1338.9883	1338.6753	-.3130
459.3552	1361.7790	1361.1209	-.6581
459.4543	1384.5697	1383.5486	-1.0210
459.5542	1405.2885	1406.0585	.7700
459.6533	1428.9671	1428.1076	-.8595
459.7532	1455.9016	1449.9700	-5.9316
459.8523	1472.4766	1471.2347	-1.2420
459.9513	1491.1236	1492.1441	1.0205
460.0512	1511.8424	1513.0166	1.1742
460.1503	1533.4069	1533.6851	.2782
460.2502	1554.1257	1554.5728	.4471
460.3493	1576.9164	1575.4269	-1.4895
460.4492	1593.4914	1596.5318	3.0403
460.5483	1619.1997	1617.4781	-1.7216
460.6482	1637.8466	1638.5316	.6850
460.7473	1658.8264	1659.1066	.2802
460.8463	1684.0428	1678.9884	-5.0544
460.9462	1703.8128	1698.1997	-5.6131
461.0453	1718.5224	1715.2466	-2.2757
461.1452	1735.3333	1733.2413	-2.0919
461.2443	1758.4483	1749.1008	-9.3475
461.3442	1765.7387	1764.5353	-1.2034
461.4433	1774.1442	1779.8393	5.6952

[redacted]

APPENDIX B

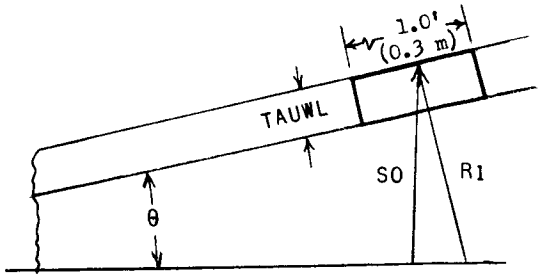
SOME DETAILS OF SINGLE-THERMOCOUPLE INVERSE METHOD

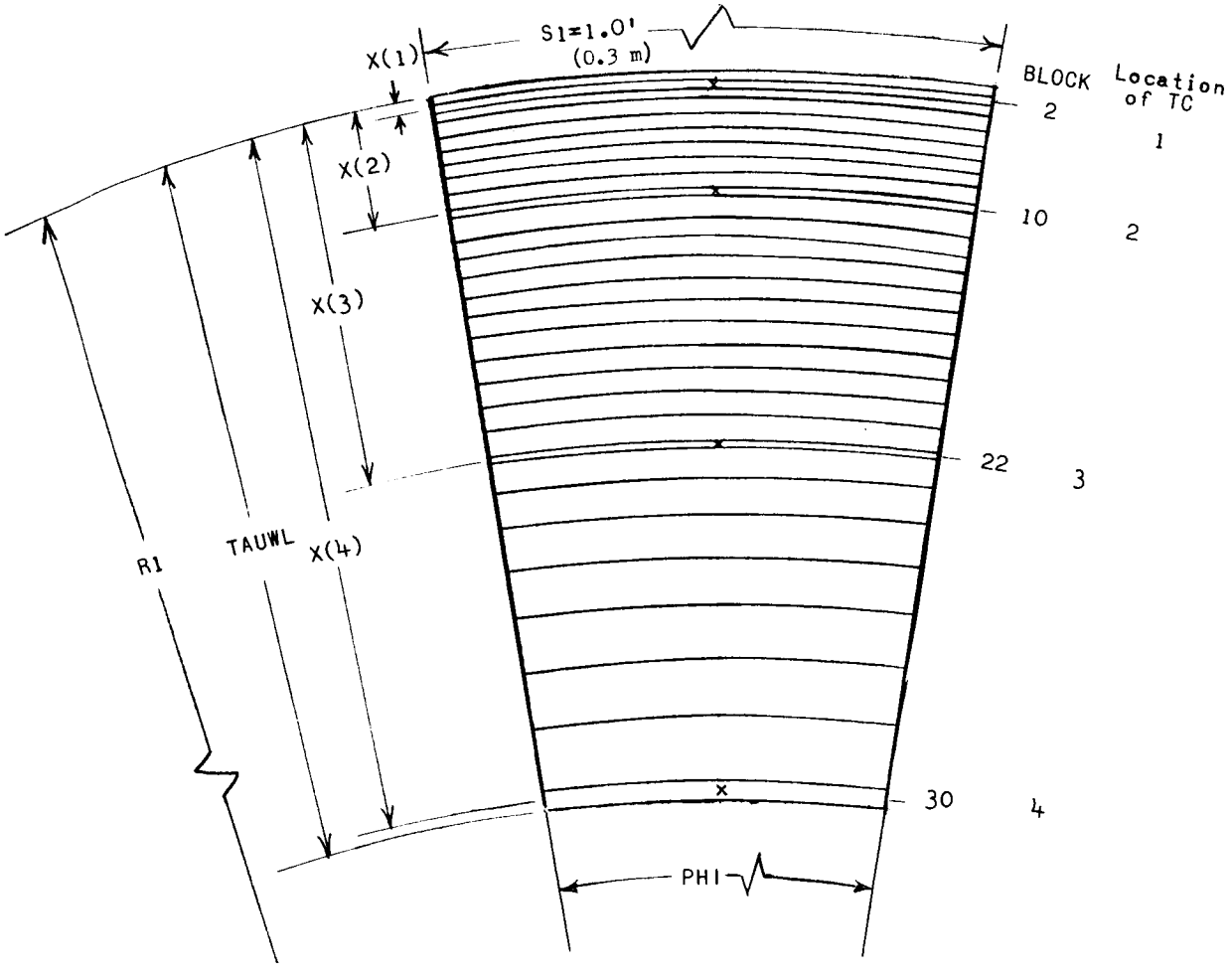
Computer Program Notation

The following notation was used in the computer program and printout. (See sketch (b) for illustration of thermal model used in the computations.)

ACOND	contact or conduction area between blocks
CP	specific heat
DPTH	depth (τ) to center of block
LEN	block thickness
PHI	local angle required for arc length of 0.3 meter (1.0 ft) at outer surface
Q-CONV	rate at which heat is stored in the wall
Q-RAD-OUT	rate of heat radiation from heated surface
R1	$\frac{SO}{12} \cos \theta$
SO	radius (r_s)
S1	initially is 0.3 meter (1.0 ft) of arc length
TAUWL	total wall thickness (τ_t)
X(1),X(2),. . .	depth of thermocouple 1, thermocouple 2, . . .

[redacted]


1.0'
(0.3 m)
TAUWL
SO
R1
θ


S1=1.0'
(0.3 m)
X(1)
X(2)
X(3)
X(4)
R1
TAUWL
PHI
BLOCK
Location of TC
2
1
10
2
22
3
30
4

Sketch (b)

[redacted]

APPENDIX B – Continued

Subroutine VARBLK

The subroutine utilized to compute the dimensions of the thermal model, accounting for conical effect, with local radius, effective wall thickness, and actual thermocouple depths as the governing criteria is listed

```
      SUBROUTINE VARBLK(X,SO,TAUWL)
      COMMON/CONT/ACOND(30),NTOUCH(5,30)
      COMMON/INVOLY/TIME,IPIVOT(30),KB,PRFREQ,DPTH(30)
      COMMON/VARB/LEN(30),VOL(30),WD(30)
      DIMENSION X(4)
      REAL LEN
      LEN(2)=.01*TAUWL
      LEN(10)=LEN(2)
      LEN(22)=LEN(2)
      LEN(30)=2.*(TAUWL-X(4))
      LEN(1)=X(1)-LEN(2)*.5
      LEN(6)=(X(2)-X(1)-LEN(2))/7.
      LEN(4)=(LEN(6)+LEN(1))*.5
      LEN(3)=(LEN(4)+LEN(1))*.5
      LEN(5)=(LEN(4)+LEN(6))*.5
      DM=LEN(5)-LEN(4)
      DO 1 I=7,9
1     LEN(I)=DM+LEN(I-1)
      DM=(((X(3)-X(2)-LEN(2))/11.+LEN(9))/2.-LEN(9))/3.
      LEN(11)=DM+LEN(9)
      DO 2 I=12,21
2     LEN(I)=DM+LEN(I-1)
      IF(X(4).NE.TAUWL)GO TO 26
      LEN(30)=LEN(2)
26    LEN(26)=(TAUWL-X(3)-LEN(30)-LEN(22)*.5)/7.
      LEN(24)=(LEN(26)+LEN(21))*.5
      LEN(23)=(LEN(24)+LEN(21))*.5
      SUM=LEN(24)-LEN(23)
      DO 3 I=25,29
3     LEN(I)=LEN(I-1)+SUM
      DPTH(1)=LEN(1)/2.
      DO 5 I=2,30
5     DPTH(I)=DPTH(I-1)+LEN(I-1)/2.+LEN(I)/2.
      R1=SO/11.95428
      ROVA=R1
      S1=1.
      PHI=S1/R1
      DO 4 J=2,31
      R2=R1-LEN(J-1)
      S2=R2*PHI
      WD(J-1)=(S1+S2)*.5
      VOL(J-1)=WD(J-1)*LEN(J-1)
      ACOND(J-1)=S2
      S1=S2
4     R1=R2
      RETURN
      END
```

[redacted]

Example of Printout From Single-Thermocouple Inverse Program

TIME = 457.0000 DELTA TIME = .20000 Q-CONV = 3.8164249E+02 Q-RAD-OUT = 3.7669585E-02

DEPTH FT	TEMP R AT 457.1000 SEC	THICKNESS FT	VOLUME CUFT	CP AT 457.1000 SEC	COND AREA SQFT 1.0000	DTEMP/DTIME
.000392	1033.504	.000783	.000783	.6204701	.99927	280.8447
.001033	1023.090	.000500	.000499	.6185617	.99807	272.7252
.001706	1012.532	.000844	.000842	.6166259	.99681	264.4396
.002580	999.450	.000905	.000901	.6142247	.99517	254.0084
.003516	986.185	.000966	.000960	.6117870	.99342	243.2727
.004513	972.833	.001027	.001019	.6091340	.99156	232.3068
.005571	959.486	.001088	.001077	.6059528	.98958	221.1756
.006690	946.229	.001149	.001135	.6027893	.98748	209.9468
.007870	933.142	.001210	.001193	.5996627	.98528	198.6978
.008725	924.271	.000500	.000492	.5975406	.98367	190.9575
.009603	915.457	.001255	.001232	.5954322	.98203	183.2561
.010880	903.490	.001300	.001273	.5925667	.97964	172.6796
.012202	891.983	.001344	.001314	.5898097	.97717	162.4268
.013568	880.956	.001389	.001354	.5869386	.97461	152.5312
.014980	870.423	.001433	.001393	.5837231	.97197	143.0228
.016435	860.396	.001478	.001433	.5806610	.96925	133.9280
.017936	850.885	.001523	.001472	.5777552	.96644	125.2692
.019480	841.894	.001567	.001510	.5750081	.96355	117.0650
.021070	833.428	.001612	.001548	.5724211	.96058	109.3303
.022704	825.490	.001656	.001586	.5699952	.95752	102.0761
.024383	818.079	.001701	.001623	.5677310	.95438	95.3132
.025483	813.679	.000500	.000476	.5663865	.95232	91.3032
.026791	808.618	.002115	.002009	.5648410	.94987	86.7086
.029113	800.711	.002529	.002391	.5624266	.94553	79.5586
.031849	792.783	.002943	.002768	.5600075	.94041	72.4422
.034999	785.329	.003357	.003137	.5567643	.93451	65.8124
.038563	778.839	.003771	.003499	.5539396	.92785	60.0976
.042542	773.801	.004185	.003852	.5517488	.92040	55.7059
.046934	770.736	.004599	.004195	.5504168	.91218	53.0552
.049625	770.463	.000783	.000711	.5502980	.90715	52.8192

APPENDIX C

MODIFICATION TO INTEGRAL METHOD FOR CURVED SURFACE

The inverse method of reference 3 was developed for solution on a flat plate. Therefore, an extension to the program was needed to account for a conical surface, as shown in the following derivation:

For flat plate only

$$q = \rho \int_0^{\tau_t} c(T)\frac{dT}{dt}\, d\tau$$

General

$$qA_S = \rho \int_0^{\tau_t} c(T)A_\tau \frac{dT}{dt}\, d\tau$$

$$q\frac{A_S}{A_S} = \rho \int_0^{\tau_t} c(T)\frac{A_\tau}{A_S}\frac{dT}{dt}\, d\tau$$

For a cone or cylinder (fig. 18)

$$\frac{A_\tau}{A_S} = \frac{2\pi}{2\pi}\frac{r\,\Delta L}{r_S\,\Delta L} = \frac{r}{r_S}$$

$$r = r_S - \tau\cos\theta$$

$$\frac{r}{r_S} = \frac{r_S - \tau\cos\theta}{r_S} = 1 - \frac{\tau\cos\theta}{r_S}$$

Therefore,

$$q = \rho \int_0^{\tau_t} c(T)\left(1 - \frac{\tau\cos\theta}{r_S}\right)\frac{dT}{dt}\, d\tau$$

APPENDIX D

INVESTIGATION OF ERROR SOURCES

In addition to the computation of heat flux by the method of reference 4, heat flux was also computed by the integral method of reference 3 in conjunction with the curve-fitting method of reference 9. During the later, higher heating period, heating rates computed by the integral method were generally below those computed by the single-thermocouple method. When temperature histories from either thermocouple 1 or thermocouple 2 were used in the single-thermocouple inverse method, the temperature computed for the back surface consistently rose slightly faster than the temperature measured at thermocouple 4. Two possible causes were investigated analytically: uncertainty in the conductivity values used in the computations, and the influence of the potting compound at the back surface of the thermocouple plug.

A reasonable, but arbitrary, decrease in thermal conductivity closed the gap between the measured and computed back surface temperatures by only about 25 percent without creating an unacceptable difference at the other measurement depths. Unreasonably low values of conductivity would be required to generate computed temperatures by the single-thermocouple method (by use of TC 1) which would match the measured temperatures at the back surface. Such low values of conductivity would also cause the computed temperatures to be lower than the measured temperatures at thermocouples 2 and 3. It is apparent that errors in conductivity can, at best, account for only a small part of the discrepancy.

A three-dimensional thermal analysis was conducted to determine the influence of the potting compound on measured temperatures. A typical Reentry F heat-flux history was applied to an appropriate thermal model, as shown in figure 19. Figure 20 shows the computed temperatures through the skin on the plug center line and at an "undisturbed" location, that is, the blocks farthest removed from the plug center line at two times during the reentry. The measured temperatures are also plotted. As shown by the difference between the solid and the dashed lines in figure 20, the effect of the potting compound lowers the center-line temperatures. At 458.5 seconds, the reduction varies from 1.44° K (2.6° R) at the front surface to 7.8° K (14.0° R) at the back surface. At 460.5 seconds, the reduction varies from 2.2° K (4.0° R) at the front surface to 12.0° K (21.6° R) at the back surface. Since temperature measurements at four depths in the wall, including those reduced the most, are utilized in the integral method, results determined by the integral method will be lower than results determined from a single temperature near the surface. Furthermore, the measured back surface temperature is lower than the center-line temperature (dashed lines) at the back surface of the beryllium and, therefore, would further lower the values determined by the integral method. As

shown in detail B of figure 5, the back surface thermocouple was installed by filling the 0.1524-mm (0.006-in.) hole with iridium paste, pressing the thermocouple bead into contact with the beryllium, and allowing the paste to dry. Then the ceramic potting compound was applied. The results shown in figure 20 suggest that thermocouple 4 may not only be influenced by the presence of the potting compound, but may possibly be sensing the temperature of the potting compound, which drops off sharply. However, this is only a supposition.

An additional comparison between the two computation programs was made. The results are shown in figure 21. Heating rates were computed by the single-thermocouple method with measured data from thermocouple 1 and by the integral method with the measured data for thermocouple 1 and temperatures computed by the single-thermocouple solution for thermocouple 2, 3, and 4 locations. Thus, both solutions incorporated identical temperature histories for all thermocouple locations. Figure 21 shows that essentially identical heating rates were obtained by both methods.

As a result of the investigation of two possible sources of error (erroneous thermal conductivity and the effect of potting compound on the measurements), it was apparent that

(1) The major difference in the computed and measured temperatures at the back surface was not a result of erroneous conductivity values for beryllium used in the computations.

(2) Temperature measurements at all four depths were affected by the presence of the potting compound, as shown in figure 20, with the back surface temperature being affected the most. The effects at thermocouples 1 and 2 were insignificant.

(3) Integral-method computations give lower heating rates because the measured value of the back surface temperature was compromised by the potting compound.

[redacted]

REFERENCES

1. Schadt, Gail H.: Aerodynamic Heating Problems and Their Influence on Earth Orbit Lifting Entry Spacecraft. AIAA Paper No. 68-1126, Oct. 1968.

2. Rumsey, Charles B.; Carter, Howard S.; Hastings, Earl C., Jr.; Raper, James L.; and Zoby, Ernest V.: Initial Results From Flight Measurements of Turbulent Heat Transfer and Boundary-Layer Transition at Local Mach Numbers Near 15 (Reentry F). NASA TM X-1856, 1969.

3. Cornette, Elden S.: Forebody Temperatures and Total Heating Rates Measured During Project Fire I Reentry at 38 000 Feet per Second. NASA TM X-1120, 1965.

4. Howard, Floyd G.: Single-Thermocouple Method for Determining Heat Flux to a Thermally Thick Wall. NASA TN D-4737, 1968.

5. Anon.: Re-Entry F Turbulent Heat Experiment Familiarization Manual. Doc. No. 67SD7243 (Contract No. NAS 1-6039), Re-Entry Syst. Dep., Gen. Elec. Co., Oct. 30, 1967.

6. Tye, R. P.: Thermophysical Properties of Hot Pressed Beryllium. Rep. No. 796, Dynatech Corp., July 1, 1968.

7. Woodbury, Gerard E.; and Morris, W. Douglas: Angle-of-Attack Analysis of a Spinning Slender Cone With Slight Aerodynamic and Mass Asymmetries (Reentry F). NASA TN D-5948, 1970.

8. Garrett, L. Bernard; and Pitts, Joan I.: A General Transient Heat-Transfer Computer Program for Thermally Thick Walls. NASA TM X-2058, 1970.

9. Dillon, James L.; Wright, Robert L.; and Smith, G. Louis: Data-Reduction Technique for Determining Rapidly Rising Heating Rates to Thermally Thick Walls. NASA TN D-5309, 1969.

10. Smith, E. S.: A Collection of Linear Numerical Filters for Missile Trajectory Data With General Principles and Design Considerations. ETR-TR-66-10, U.S. Air Force, Nov. 1966. (Available from DDC as AD 804830.)

11. Howard, Floyd G.: Heat Transfer on Unswept and 38° Swept Cylindrically Blunted Wedge Fins in Free Flight to Mach Number 4.11. NASA TN D-2386, 1964.

12. Kreith, Frank: Principles of Heat Transfer. Int. Textbook Co. (Scranton, Pa.), c.1958.

13. Alley, Vernon L., Jr.; and Guillotte, Robert J.: Postflight Analysis of Thermal Distortions of the Reentry F Spacecraft. NASA TM X-2250, 1971.

[redacted]

TABLE I.- THERMOCOUPLE LOCATIONS, DEPTHS, AND THERMAL-SENSOR IDENTIFICATION

(a) U.S. Customary Units

Location			Depth, inches, for TC –				Thickness, in.			Identification number
ϕ, deg	Station, in.	Radius, in.	1	2	3	4	Wall	Sleeve	Core	
0	16	1.4060	0.0131	0.1046	0.3047	0.5968	0.6115	0.6018	0.5968	A 380
	31	2.7169	.0176	.1028	.3045	.5968	.6010	.6005	.5964	A 382
	40	3.5088	.0139	.1100	.3066	.5960	.6050	.6005	.5960	A 383
	52	4.5531	.0134	.1047	.3066	.5960	.6050	.6021	.5960	A 387
	59.25	5.1906	.0149	.1090	.3089	.5960	.6050	.6021	.5960	A 386
	73	6.3890	.0128	.1038	.3070	.5954	.5990	.6011	.5954	A 388
	85	7.4435	.0133	.1040	.3061	.5945	.6045	.6013	.5945	A 389
	99	8.6646	.0126	.1052	.3057	.5954	.6115	.6016	.5954	A 391
	109	9.5441	.0138	.1042	.3046	.5972	.6145	.6014	.5972	A 392
	121	10.5890	.0137	.1046	.3065	.5965	.6120	.6014	.5965	A 394
	133	11.6438	.0126	.1058	.3057	.5976	.6190	.6025	.5976	A 395
	144	12.5997	.0132	.1051	.3070	.5976	.6010	.6030	.5976	A 399
90	73	6.3890	0.0124	0.1047	0.3058	0.5955	0.5990	0.6014	0.5955	A 385
	144	12.5997	.0116	.1032	.3051	.5947	.6000	.6009	.5947	A 396
180	52	4.5531	0.0139	0.1065	0.3058	0.5973	0.6040	0.6016	0.5973	A 381
	73	6.3890	.0128	.1036	.3036	.5942	.5990	.6010	.5942	A 384
	99	8.6646	.0151	.1056	.3060	.5957	.6120	.6018	.5957	A 390
	121	10.5890	.0126	.1045	.3056	.5958	.6120	.6018	.5958	A 393
	144	12.5997	.0139	.1046	.3075	.5962	.6010	.6011	.5962	A 397
270	73	6.3890	0.0119	0.1028	0.3035	0.5967	0.5990	0.6030	0.5967	A 376
	144	12.5997	.0133	.1037	.3056	.5959	.6050	.6010	.5959	A 398

TABLE I.- THERMOCOUPLE LOCATIONS, DEPTHS, AND THERMAL-SENSOR IDENTIFICATION – Concluded

(b) SI Units

Location			Depth, mm, for TC –				Thickness, mm			Identification number
ϕ, deg	Station, cm	Radius, cm	1	2	3	4	Wall	Sleeve	Core	
0	40.64	3.5712	0.333	2.657	7.739	15.159	15.532	15.286	15.159	A 380
	78.74	6.9009	.447	2.611	7.734	15.159	15.265	15.253	15.149	A 382
	101.60	8.9124	.353	2.794	7.788	15.138	15.367	15.253	15.138	A 383
	132.08	11.5649	.340	2.659	7.788	15.138	15.367	15.293	15.138	A 387
	150.50	13.1841	.378	2.769	7.846	15.138	15.367	15.293	15.138	A 386
	185.42	16.2281	.325	2.637	7.798	15.123	15.215	15.268	15.123	A 388
	215.90	18.9065	.338	2.642	7.775	15.100	15.354	15.273	15.100	A 389
	251.46	22.0081	.320	2.672	7.765	15.123	15.532	15.281	15.123	A 391
	276.86	24.2420	.351	2.647	7.737	15.169	15.608	15.276	15.169	A 392
	307.34	26.8961	.348	2.657	7.785	15.151	15.545	15.276	15.151	A 394
	337.82	29.5753	.320	2.687	7.765	15.179	15.723	15.304	15.179	A 395
	365.76	32.0032	.335	2.670	7.798	15.179	15.265	15.316	15.179	A 399
90	185.42	16.2281	.315	2.659	7.767	15.126	15.215	15.276	15.126	A 385
	365.76	32.0032	.295	2.621	7.750	15.105	15.240	15.263	15.105	A 396
180	132.08	11.5649	.353	2.705	7.767	15.171	15.342	15.281	15.171	A 381
	185.42	16.2281	.325	2.631	7.711	15.093	15.215	15.265	15.093	A 384
	251.46	22.0081	.384	2.682	7.772	15.131	15.545	15.286	15.131	A 390
	307.34	26.8961	.320	2.654	7.762	15.133	15.545	15.286	15.133	A 393
	365.76	32.0032	.353	2.657	7.811	15.143	15.265	15.268	15.143	A 397
270	185.42	16.2281	.302	2.611	7.709	15.156	15.215	15.316	15.156	A 376
	365.76	32.0032	.338	2.634	7.762	15.136	15.367	15.265	15.136	A 398

TABLE II.- BERYLLIUM PROPERTIES

[Density = 1860 kg/cm^3 (116.12 lb/ft^3)]

Temperature		Specific heat		Conductivity		Emissivity (ref. 3)
^{o}R	^{o}K	Btu/lb-^{o}R	J/g-^{o}K	Btu/ft-^{o}R-sec	W/cm-^{o}K	
400	222	0.338	1.414	0.03120	1.9425	0.046
500	278	.408	1.707	.02970	1.8491	.051
600	333	.470	1.966	.02810	1.7495	.055
700	389	.520	2.176	.02670	1.6623	.060
800	444	.560	2.343	.02525	1.5721	.066
900	500	.588	2.460	.02390	1.4880	.072
1000	556	.610	2.552	.02255	1.4040	.078
1100	611	.627	2.623	.02130	1.3261	.084
1200	667	.644	2.694	.02020	1.2577	.091
1300	722	.659	2.757	.01920	1.1954	.100
1400	778	.674	2.820	.01830	1.1394	.108
1500	833	.688	2.879	.01750	1.0896	.117
1600	889	.701	2.933	.01680	1.0460	.128
1700	944	.714	2.987	.01620	1.0086	.143
1800	1000	.727	3.042	.01570	.9775	.160
1900	1056	.740	3.096	.01520	.9464	.183
2000	1111	.752	3.146	.01480	.9214	.208
2100	1167	.764	3.197	.01435	.8934	.238
2200	1222	.777	3.251	.01400	.8716	.220
2300	1278	.790	3.305	.01365	.8498	.308
2400	1333	.803	3.360	.01335	.8312	.346
2500	1389	.815	3.410	.01305	.8125	.390
2600	1444	.828	3.464	.01275	.7938	.437
2700	1500	.840	3.515	.01245	.7751	.490
[a]2800	1556	.852	3.565	.01220	.7596	.544

[a]Approximate melting temperature.

TABLE III.- TEMPERATURE SMOOTHING DETAILS

Station	ϕ, deg	Thermocouple	Before break			Time of break point, sec	After break		
			Order of polynomial	Number of points	Number of passes		Order of polynomial	Number of points	Number of passes
16 in. (40.64 cm)	0	1	2	27	2	458.9683	1	5	5
		2	2	27	2	458.9914	1	5	4
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
31 in. (78.74 cm)	0	1	2	27	2	458.6725	1	5	4
		2	2	27	2	458.7990	1	5	4
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
40 in. (101.60 cm)	0	1	2	27	2	458.6237	1	5	4
		2	2	27	2	458.8023	1	5	3
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
52 in. (132.08 cm)	0	1	2	27	2	458.5781	1	5	5
		2	2	27	2	458.7165	2	21	2
		3	2	27	2	458.8166	1	5	4
		4	2	27	2	(a)	(a)	(a)	(a)
59.25 in. (150.50 cm)	0	1	2	27	2	458.0300	1	5	5
		2	2	27	2	458.4147	1	5	3
		3	2	27	2	458.7143	1	5	4
		4	2	27	2	(a)	(a)	(a)	(a)
73 in. (185.42 cm)	0	1	2	27	2	456.7892	1	5	5
		2	2	27	2	456.8592	1	5	4
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
85 in. (215.90 cm)	0	1	2	27	2	456.4922	2	21	2
		2	2	27	2	456.5637	1	3	5
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
99 in. (251.46 cm)	0	1	2	27	2	456.3449	1	5	5
		2	2	27	2	456.4712	1	5	3
		3	2	27	2	456.7704	2	21	2
		4	2	27	2	(a)	(a)	(a)	(a)
109 in. (276.86 cm)	0	1	2	27	2	455.9487	1	5	5
		2	2	27	2	455.9776	1	5	3
		3	2	27	2	456.2767	2	21	2
		4	2	27	2	(a)	(a)	(a)	(a)
121 in. (307.34 cm)	0	1	2	27	2	454.8059	1	5	5
		2	2	27	2	454.6177	1	5	5
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
133 in. (337.82 cm)	0	1	2	27	2	453.9630	1	5	5
		2	2	27	2	454.1337	2	21	2
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
144 in. (365.76 cm)	0	1	2	27	2	453.7684	2	21	2
		2	2	27	2	453.8850	2	21	2
		3	2	27	2	454.0851	1	5	5
		4	2	27	2	(a)	(a)	(a)	(a)

[a]Curve not broken. One continuous smoothing.

TABLE III.- TEMPERATURE SMOOTHING DETAILS – Concluded

Station	ϕ, deg	Thermocouple	Before break			Time of break point, sec	After break		
			Order of polynomial	Number of points	Number of passes		Order of polynomial	Number of points	Number of passes
52 in. (132.08 cm)	180	1	2	27	2	456.5824	1	5	5
		2	2	27	2	457.5030	1	3	5
		3	1	5	5	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
73 in. (185.42 cm)	180	1	2	27	2	456.5362	1	5	4
		2	2	27	2	456.6180	1	5	3
		3	2	27	2	457.2157	2	21	2
		4	2	27	2	(a)	(a)	(a)	(a)
99 in. (251.46 cm)	180	1	2	27	2	454.7033	2	21	2
		2	2	27	2	454.6779	1	5	5
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
121 in. (307.34 cm)	180	1	2	27	2	454.0106	1	5	5
		2	2	27	2	454.0173	1	5	4
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
144 in. (365.76 cm)	180	1	2	27	2	453.7662	2	21	2
		2	2	27	2	454.0673	2	21	2
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
73 in. (185.42 cm)	90	1	2	27	2	456.4878	2	21	2
		2	2	27	2	456.6213	1	5	3
		3	2	27	2	456.9210	2	21	2
		4	2	27	2	(a)	(a)	(a)	(a)
144 in. (365.76 cm)	90	1	2	27	2	453.8149	2	21	2
		2	2	27	2	453.9523	1	5	5
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)
144 in. (365.76 cm)	270	1	2	27	2	453.4191	2	21	2
		2	2	27	2	453.8717	2	21	2
		3	2	27	2	(a)	(a)	(a)	(a)
		4	2	27	2	(a)	(a)	(a)	(a)

[a]Curve not broken. One continuous smoothing.

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA

(a) Station 16 in. (40.64 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	678.4	(376.9)	683.4	(379.7)	673.4	(374.1)	664.7	(369.3)
444.0	692.8	(384.9)	694.3	(385.7)	682.9	(379.4)	672.6	(373.6)
445.0	706.0	(392.2)	706.3	(392.4)	694.1	(385.6)	682.0	(378.9)
446.0	717.8	(398.8)	718.8	(399.4)	706.0	(392.2)	693.1	(385.1)
447.0	737.0	(409.5)	736.1	(409.0)	717.5	(398.6)	703.4	(390.8)
448.0	759.4	(421.9)	756.7	(420.4)	734.6	(408.1)	717.2	(398.5)
448.1	762.0	(423.3)	758.9	(421.6)	736.6	(409.2)	718.9	(399.4)
448.2	764.5	(424.7)	761.1	(422.8)	738.7	(410.4)	720.7	(400.4)
448.3	767.2	(426.2)	763.3	(424.0)	740.7	(411.5)	722.5	(401.4)
448.4	769.8	(427.7)	765.5	(425.3)	742.8	(412.7)	724.3	(402.4)
448.5	772.5	(429.2)	767.8	(426.6)	744.9	(413.8)	726.2	(403.4)
448.6	775.2	(430.6)	770.1	(427.8)	747.0	(415.0)	728.0	(404.4)
448.7	777.9	(432.1)	772.4	(429.1)	749.1	(416.2)	729.8	(405.5)
448.8	780.5	(433.6)	774.8	(430.5)	751.2	(417.3)	731.7	(406.5)
448.9	783.2	(435.1)	777.2	(431.8)	753.3	(418.5)	733.5	(407.5)
449.0	785.9	(436.6)	779.7	(433.2)	755.4	(419.7)	735.3	(408.5)
449.1	788.6	(438.1)	782.3	(434.6)	757.5	(420.8)	737.2	(409.5)
449.2	791.6	(439.8)	784.9	(436.0)	759.7	(422.0)	739.0	(410.5)
449.3	794.7	(441.5)	787.5	(437.5)	761.8	(423.2)	740.8	(411.6)
449.4	797.8	(443.2)	790.2	(439.0)	764.0	(424.4)	742.6	(412.5)
449.5	801.0	(445.0)	792.9	(440.5)	766.1	(425.6)	744.4	(413.5)
449.6	804.2	(446.8)	795.7	(442.0)	768.4	(426.9)	746.1	(414.5)
449.7	807.5	(448.6)	798.4	(443.6)	770.6	(428.1)	747.9	(415.5)
449.8	810.9	(450.5)	801.2	(445.1)	772.9	(429.4)	749.7	(416.5)
449.9	814.4	(452.4)	804.1	(446.7)	775.2	(430.7)	751.5	(417.5)
450.0	817.8	(454.3)	806.9	(448.3)	777.5	(431.9)	753.3	(418.5)
450.1	821.2	(456.2)	809.7	(449.9)	779.8	(433.2)	755.2	(419.5)
450.2	824.5	(458.1)	812.6	(451.4)	782.2	(434.6)	757.0	(420.6)
450.3	827.7	(459.9)	815.4	(453.0)	784.6	(435.9)	759.0	(421.6)
450.4	830.9	(461.6)	818.3	(454.6)	787.1	(437.3)	760.9	(422.7)
450.5	834.0	(463.3)	821.1	(456.2)	789.6	(438.7)	762.9	(423.9)
450.6	836.7	(464.9)	824.1	(457.8)	792.2	(440.1)	765.0	(425.0)
450.7	839.4	(466.3)	827.0	(459.5)	794.8	(441.5)	767.1	(426.2)
450.8	841.8	(467.7)	830.0	(461.1)	797.4	(443.0)	769.3	(427.4)
450.9	844.2	(469.0)	833.0	(462.8)	800.1	(444.5)	771.6	(428.6)
451.0	846.6	(470.3)	836.0	(464.5)	802.6	(445.9)	773.9	(429.9)
451.1	849.2	(471.8)	839.1	(466.2)	805.2	(447.4)	776.2	(431.2)
451.2	852.0	(473.4)	842.2	(467.9)	807.9	(448.8)	778.5	(432.5)
451.3	855.4	(475.2)	845.3	(469.6)	810.6	(450.3)	781.0	(433.9)
451.4	858.8	(477.1)	848.5	(471.4)	813.3	(451.8)	783.4	(435.2)
451.5	862.9	(479.4)	851.7	(473.2)	816.0	(453.3)	785.8	(436.6)
451.6	867.3	(481.8)	855.0	(475.0)	818.7	(454.9)	788.2	(437.9)
451.7	871.9	(484.4)	858.4	(476.9)	821.5	(456.4)	790.7	(439.3)
451.8	876.5	(487.0)	861.9	(478.8)	824.3	(458.0)	793.1	(440.6)
451.9	881.2	(489.6)	865.4	(480.8)	827.1	(459.5)	795.6	(442.0)
452.0	885.8	(492.1)	869.0	(482.8)	829.9	(461.1)	798.1	(443.4)
452.1	890.3	(494.6)	872.6	(484.8)	832.8	(462.6)	800.5	(444.7)
452.2	894.7	(497.1)	876.2	(486.8)	835.6	(464.2)	802.9	(446.1)
452.3	899.0	(499.4)	880.0	(488.9)	838.5	(465.8)	805.3	(447.4)
452.4	903.1	(501.7)	883.7	(490.9)	841.4	(467.4)	807.7	(448.7)
452.5	907.3	(504.0)	887.5	(493.0)	844.3	(469.0)	810.1	(450.1)
452.6	911.4	(506.4)	891.3	(495.2)	847.2	(470.7)	812.5	(451.4)
452.7	915.8	(508.8)	895.2	(497.4)	850.2	(472.3)	814.9	(452.7)
452.8	920.2	(511.2)	899.2	(499.5)	853.2	(474.1)	817.3	(454.1)
452.9	924.7	(513.7)	903.2	(501.8)	856.4	(475.8)	819.8	(455.4)
453.0	929.2	(516.2)	907.3	(504.1)	859.6	(477.5)	822.3	(456.8)
453.1	933.8	(518.8)	911.5	(506.4)	862.7	(479.3)	824.8	(458.2)
453.2	938.4	(521.3)	915.8	(508.8)	866.0	(481.1)	827.4	(459.7)
453.3	943.1	(524.0)	920.1	(511.2)	869.3	(482.9)	830.1	(461.2)
453.4	948.1	(526.7)	924.5	(513.6)	872.6	(484.8)	832.9	(462.7)
453.5	953.3	(529.6)	929.0	(516.1)	875.9	(486.6)	835.8	(464.3)
453.6	958.7	(532.6)	933.6	(518.7)	879.3	(488.5)	838.6	(465.9)
453.7	964.3	(535.7)	938.3	(521.3)	882.8	(490.5)	841.6	(467.5)
453.8	969.8	(538.8)	943.1	(523.9)	886.5	(492.5)	844.6	(469.2)
453.9	975.7	(542.1)	948.0	(526.6)	890.2	(494.6)	847.7	(470.9)
454.0	981.8	(545.5)	952.9	(529.4)	894.0	(496.7)	850.8	(472.7)
454.1	988.0	(548.9)	958.0	(532.2)	897.9	(498.8)	854.0	(474.5)
454.2	994.2	(552.3)	963.2	(535.1)	901.8	(501.0)	857.3	(476.3)
454.3	1000.5	(555.9)	968.4	(538.0)	905.8	(503.2)	860.6	(478.1)
454.4	1006.8	(559.4)	973.8	(541.0)	909.9	(505.5)	864.0	(480.0)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(a) Station 16 in. (40.64 cm), rav 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	1013.2	(562.9)	979.1	(543.9)	914.0	(507.8)	867.4	(481.9)
454.6	1019.6	(566.4)	984.5	(546.9)	918.2	(510.1)	870.8	(483.8)
454.7	1025.8	(569.9)	989.9	(550.0)	922.4	(512.5)	874.3	(485.7)
454.8	1031.9	(573.3)	995.4	(553.0)	926.7	(514.8)	877.7	(487.6)
454.9	1037.9	(576.6)	1000.8	(556.0)	931.0	(517.2)	881.2	(489.6)
455.0	1043.8	(579.9)	1006.2	(559.0)	935.3	(519.6)	884.7	(491.5)
455.1	1049.4	(583.0)	1011.5	(561.9)	939.5	(522.0)	888.2	(493.5)
455.2	1055.0	(586.1)	1016.7	(564.8)	943.9	(524.4)	891.8	(495.4)
455.3	1060.4	(589.1)	1021.8	(567.7)	948.2	(526.8)	895.3	(497.4)
455.4	1065.7	(592.1)	1026.9	(570.5)	952.6	(529.2)	899.0	(499.4)
455.5	1070.8	(594.9)	1031.8	(573.2)	957.1	(531.7)	902.6	(501.5)
455.6	1075.5	(597.5)	1036.7	(576.0)	961.4	(534.1)	906.3	(503.5)
455.7	1080.2	(600.1)	1041.6	(578.7)	965.8	(536.6)	910.1	(505.6)
455.8	1084.6	(602.6)	1046.3	(581.3)	970.3	(539.0)	913.9	(507.7)
455.9	1088.7	(604.8)	1050.9	(583.8)	974.7	(541.5)	917.7	(509.9)
456.0	1092.6	(607.0)	1055.4	(586.3)	979.1	(544.0)	921.7	(512.0)
456.1	1096.3	(609.0)	1059.6	(588.7)	983.5	(546.4)	925.6	(514.2)
456.2	1099.7	(610.9)	1063.7	(591.0)	988.0	(548.9)	929.5	(516.4)
456.3	1103.0	(612.8)	1067.8	(593.2)	992.4	(551.3)	933.4	(518.6)
456.4	1106.1	(614.5)	1071.6	(595.3)	996.8	(553.8)	937.4	(520.8)
456.5	1109.2	(616.2)	1075.3	(597.4)	1001.2	(556.2)	941.3	(523.0)
456.6	1112.3	(617.9)	1078.8	(599.3)	1005.6	(558.6)	945.3	(525.2)
456.7	1115.4	(619.7)	1082.2	(601.2)	1009.8	(561.0)	949.2	(527.4)
456.8	1118.6	(621.4)	1085.4	(603.0)	1014.1	(563.4)	953.2	(529.6)
456.9	1121.4	(623.0)	1088.5	(604.7)	1018.3	(565.7)	957.2	(531.8)
457.0	1124.2	(624.6)	1091.4	(606.3)	1022.4	(568.0)	961.1	(534.0)
457.1	1126.7	(625.9)	1094.2	(607.9)	1026.4	(570.2)	965.1	(536.1)
457.2	1128.8	(627.1)	1096.8	(609.3)	1030.3	(572.4)	968.9	(538.3)
457.3	1130.7	(628.2)	1099.3	(610.7)	1034.0	(574.4)	972.6	(540.4)
457.4	1132.1	(628.9)	1101.6	(612.0)	1037.5	(576.4)	976.4	(542.4)
457.5	1133.2	(629.5)	1103.8	(613.2)	1040.8	(578.2)	980.0	(544.5)
457.6	1134.2	(630.1)	1105.9	(614.4)	1044.0	(580.0)	983.6	(546.5)
457.7	1135.1	(630.6)	1107.8	(615.4)	1047.1	(581.7)	987.2	(548.4)
457.8	1135.9	(631.1)	1109.7	(616.5)	1050.1	(583.4)	990.7	(550.4)
457.9	1136.7	(631.5)	1111.5	(617.5)	1053.0	(585.0)	994.2	(552.4)
458.0	1137.6	(632.0)	1113.1	(618.4)	1055.8	(586.6)	997.7	(554.3)
458.1	1138.4	(632.4)	1114.7	(619.3)	1058.5	(588.1)	1001.1	(556.2)
458.2	1139.2	(632.9)	1116.2	(620.1)	1061.2	(589.5)	1004.5	(558.1)
458.3	1139.9	(633.3)	1117.5	(620.9)	1063.8	(591.0)	1007.8	(559.9)
458.4	1140.5	(633.6)	1118.7	(621.5)	1066.4	(592.5)	1011.1	(561.7)
458.5	1141.1	(634.0)	1119.8	(622.1)	1069.1	(593.9)	1014.4	(563.6)
458.6	1141.7	(634.3)	1120.9	(622.7)	1071.8	(595.5)	1017.6	(565.3)
458.7	1142.2	(634.5)	1121.7	(623.2)	1074.7	(597.1)	1020.7	(567.0)
458.8	1142.6	(634.8)	1122.5	(623.6)	1077.7	(598.7)	1023.7	(568.7)
458.9	1143.0	(635.0)	1123.1	(623.9)	1080.8	(600.5)	1026.7	(570.4)
459.0	1153.1	(640.6)	1123.2	(624.0)	1084.2	(602.4)	1029.9	(572.2)
459.1	1179.3	(655.2)	1126.7	(631.5)	1087.9	(604.4)	1033.1	(574.0)
459.2	1205.0	(669.5)	1151.7	(639.8)	1092.0	(606.6)	1036.5	(575.8)
459.3	1230.7	(683.7)	1166.7	(648.2)	1096.3	(609.0)	1039.9	(577.7)
459.4	1255.9	(697.7)	1181.7	(656.5)	1101.0	(611.7)	1043.4	(579.7)
459.5	1279.7	(711.0)	1196.7	(664.8)	1106.1	(614.5)	1047.2	(581.8)
459.6	1301.1	(722.8)	1211.5	(673.0)	1111.6	(617.6)	1051.0	(583.9)
459.7	1319.8	(733.2)	1225.0	(681.1)	1117.4	(620.8)	1054.9	(586.1)
459.8	1336.9	(742.7)	1240.3	(689.0)	1123.6	(624.2)	1058.9	(588.3)
459.9	1353.3	(751.8)	1254.2	(696.8)	1130.1	(627.8)	1063.1	(590.6)
460.0	1369.5	(760.8)	1267.9	(704.4)	1137.1	(631.7)	1067.5	(593.0)
460.1	1385.0	(769.4)	1281.4	(711.9)	1144.3	(635.7)	1072.0	(595.6)
460.2	1399.4	(777.5)	1294.9	(719.4)	1152.0	(640.0)	1076.7	(598.2)
460.3	1413.6	(785.3)	1308.5	(727.0)	1160.1	(644.5)	1081.4	(600.8)
460.4	1428.8	(793.8)	1322.5	(734.7)	1168.5	(649.1)	1086.2	(603.5)
460.5	1445.9	(803.3)	1336.9	(742.7)	1177.2	(654.0)	1091.2	(606.2)
460.6	1465.4	(814.1)	1351.8	(751.0)	1186.3	(659.1)	1096.2	(609.0)
460.7	1487.2	(826.2)	1367.4	(759.6)	1195.8	(664.3)	1101.4	(611.9)
460.8	1510.7	(839.3)	1383.3	(768.5)	1205.6	(669.8)	1106.8	(614.9)
460.9	1535.0	(852.8)	1399.5	(777.5)	1215.8	(675.5)	1112.2	(617.9)
461.0	1558.1	(865.6)	1415.7	(786.5)	1226.4	(681.3)	1117.8	(621.0)
461.1	1577.9	(876.6)	1431.7	(795.4)	1237.3	(687.4)	1123.5	(624.2)
461.2	1594.8	(886.0)	1447.4	(804.1)	1248.6	(693.7)	1129.3	(627.4)
461.3	1610.6	(894.8)	1462.9	(812.7)	1260.2	(700.1)	1135.2	(630.7)
461.4	1626.7	(903.7)	1478.1	(821.2)	1272.2	(706.8)	1141.3	(634.0)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(b) Station 31 in. (78.74 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	640.5	(355.8)	641.7	(356.5)	635.7	(353.2)	629.6	(349.8)
444.0	650.4	(361.3)	649.9	(361.1)	643.1	(357.3)	635.7	(353.2)
445.0	661.0	(367.2)	658.4	(365.8)	650.5	(361.4)	642.4	(356.9)
446.0	668.1	(371.2)	667.5	(370.8)	658.0	(365.5)	648.6	(360.3)
447.0	681.6	(378.7)	678.5	(376.9)	667.6	(370.9)	655.7	(364.3)
448.0	697.8	(387.7)	693.5	(385.3)	678.0	(376.7)	665.8	(369.9)
448.1	699.4	(388.5)	695.2	(386.2)	679.1	(377.3)	667.0	(370.6)
448.2	700.9	(389.4)	696.8	(387.1)	680.3	(378.0)	668.2	(371.2)
448.3	702.4	(390.2)	698.3	(387.9)	681.6	(378.7)	669.5	(371.9)
448.4	704.1	(391.2)	699.8	(388.8)	682.9	(379.4)	670.7	(372.6)
448.5	705.9	(392.2)	701.3	(389.6)	684.3	(380.1)	672.0	(373.3)
448.6	707.7	(393.2)	702.8	(390.4)	685.7	(380.9)	673.2	(374.0)
448.7	709.6	(394.2)	704.3	(391.3)	687.2	(381.8)	674.5	(374.7)
448.8	711.5	(395.3)	705.9	(392.2)	688.7	(382.6)	675.7	(375.4)
448.9	713.4	(396.3)	707.4	(393.0)	690.3	(383.5)	676.9	(376.1)
449.0	715.3	(397.4)	709.1	(393.9)	692.0	(384.4)	678.2	(376.8)
449.1	717.1	(398.4)	710.7	(394.8)	693.6	(385.3)	679.3	(377.4)
449.2	718.9	(399.4)	712.4	(395.8)	695.3	(386.3)	680.5	(378.0)
449.3	720.8	(400.4)	714.2	(396.8)	697.1	(387.3)	681.7	(378.7)
449.4	722.7	(401.5)	716.0	(397.8)	698.8	(388.2)	682.9	(379.4)
449.5	724.5	(402.5)	717.8	(398.8)	700.6	(389.2)	684.1	(380.0)
449.6	726.5	(403.6)	719.8	(399.9)	702.3	(390.2)	685.3	(380.7)
449.7	728.5	(404.7)	721.7	(401.0)	704.1	(391.2)	686.5	(381.4)
449.8	730.7	(405.9)	723.8	(402.1)	705.9	(392.1)	687.7	(382.0)
449.9	732.8	(407.1)	725.8	(403.2)	707.6	(393.1)	688.9	(382.7)
450.0	735.0	(408.3)	728.0	(404.4)	709.3	(394.1)	690.2	(383.4)
450.1	737.2	(409.6)	730.1	(405.6)	711.1	(395.0)	691.4	(384.1)
450.2	739.4	(410.8)	732.3	(406.8)	712.8	(396.0)	692.7	(384.8)
450.3	741.7	(412.0)	734.5	(408.0)	714.5	(397.0)	694.0	(385.6)
450.4	743.9	(413.3)	736.6	(409.2)	716.2	(397.9)	695.4	(386.3)
450.5	746.1	(414.5)	738.7	(410.4)	717.9	(398.8)	696.8	(387.1)
450.6	748.3	(415.7)	740.9	(411.6)	719.6	(399.8)	698.3	(387.9)
450.7	750.5	(416.9)	743.1	(412.8)	721.3	(400.7)	699.8	(388.8)
450.8	752.7	(418.2)	745.3	(414.1)	723.1	(401.7)	701.4	(389.6)
450.9	754.9	(419.4)	747.5	(415.3)	724.9	(402.7)	703.0	(390.6)
451.0	757.2	(420.7)	749.7	(416.5)	726.7	(403.7)	704.7	(391.5)
451.1	759.5	(421.9)	752.0	(417.8)	728.5	(404.7)	706.4	(392.5)
451.2	761.8	(423.2)	754.3	(419.0)	730.4	(405.8)	708.1	(393.4)
451.3	764.2	(424.6)	756.6	(420.3)	732.3	(406.8)	709.9	(394.4)
451.4	766.8	(426.0)	758.9	(421.6)	734.2	(407.9)	711.7	(395.4)
451.5	769.5	(427.5)	761.3	(422.9)	736.2	(409.0)	713.4	(396.4)
451.6	772.3	(429.0)	763.7	(424.3)	738.1	(410.1)	715.2	(397.4)
451.7	775.2	(430.7)	766.1	(425.6)	740.1	(411.2)	717.1	(398.4)
451.8	778.2	(432.3)	768.6	(427.0)	742.2	(412.3)	718.9	(399.4)
451.9	781.3	(434.0)	771.1	(428.4)	744.3	(413.5)	720.8	(400.5)
452.0	784.4	(435.8)	773.6	(429.8)	746.3	(414.6)	722.7	(401.5)
452.1	787.3	(437.4)	776.1	(431.2)	748.4	(415.8)	724.6	(402.5)
452.2	790.2	(439.0)	778.7	(432.6)	750.6	(417.0)	726.4	(403.6)
452.3	793.0	(440.6)	781.3	(434.0)	752.8	(418.2)	728.3	(404.6)
452.4	795.7	(442.1)	783.9	(435.5)	755.0	(419.4)	730.2	(405.7)
452.5	798.5	(443.6)	786.4	(436.9)	757.2	(420.7)	732.1	(406.7)
452.6	801.4	(445.2)	789.0	(438.3)	759.4	(421.9)	733.9	(407.7)
452.7	804.3	(446.8)	791.6	(439.8)	761.6	(423.1)	735.8	(408.8)
452.8	807.3	(448.5)	794.2	(441.2)	763.8	(424.3)	737.6	(409.8)
452.9	810.4	(450.2)	796.9	(442.7)	766.0	(425.6)	739.4	(410.8)
453.0	813.6	(452.0)	799.6	(444.2)	768.3	(426.8)	741.2	(411.8)
453.1	816.9	(453.9)	802.4	(445.8)	770.5	(428.1)	743.0	(412.8)
453.2	820.3	(455.7)	805.3	(447.4)	772.8	(429.3)	744.9	(413.8)
453.3	823.7	(457.6)	808.3	(449.0)	775.2	(430.7)	746.7	(414.9)
453.4	827.3	(459.6)	811.3	(450.7)	777.7	(432.0)	748.7	(415.9)
453.5	830.8	(461.5)	814.4	(452.5)	780.1	(433.4)	750.7	(417.0)
453.6	834.4	(463.6)	817.7	(454.3)	782.6	(434.8)	752.7	(418.1)
453.7	838.2	(465.7)	821.0	(456.1)	785.2	(436.2)	754.6	(419.2)
453.8	842.2	(467.9)	824.4	(458.0)	787.8	(437.7)	756.7	(420.4)
453.9	846.4	(470.2)	827.9	(459.9)	790.4	(439.1)	758.8	(421.5)
454.0	850.6	(472.5)	831.4	(461.9)	793.1	(440.6)	761.0	(422.8)
454.1	854.8	(474.9)	835.1	(463.9)	795.8	(442.1)	763.2	(424.0)
454.2	858.9	(477.2)	838.8	(466.0)	798.5	(443.6)	765.4	(425.2)
454.3	863.2	(479.5)	842.5	(468.1)	801.3	(445.2)	767.7	(426.5)
454.4	867.4	(481.9)	846.3	(470.1)	804.2	(446.8)	770.1	(427.8)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(b) Station 31 in. (78.74 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	871.7	(484.3)	850.0	(472.2)	807.2	(448.4)	772.5	(429.2)
454.6	876.0	(486.7)	853.9	(474.4)	810.2	(450.1)	775.0	(430.6)
454.7	880.3	(489.1)	857.7	(476.5)	813.3	(451.8)	777.6	(432.0)
454.8	884.6	(491.5)	861.5	(478.6)	816.4	(453.6)	780.2	(433.4)
454.9	889.0	(493.9)	865.3	(480.7)	819.6	(455.3)	782.8	(434.9)
455.0	893.5	(496.4)	869.1	(482.8)	822.7	(457.1)	785.4	(436.3)
455.1	897.9	(498.8)	872.7	(484.8)	825.8	(458.8)	787.9	(437.7)
455.2	902.2	(501.2)	876.3	(486.9)	828.9	(460.5)	790.5	(439.1)
455.3	906.3	(503.5)	879.9	(488.8)	832.1	(462.3)	793.0	(440.6)
455.4	910.3	(505.7)	883.5	(490.8)	835.2	(464.0)	795.6	(442.0)
455.5	914.4	(508.0)	886.9	(492.7)	838.4	(465.8)	798.2	(443.5)
455.6	918.3	(510.2)	890.4	(494.7)	841.6	(467.5)	800.9	(445.0)
455.7	922.1	(512.3)	893.9	(496.6)	844.8	(469.3)	803.6	(446.4)
455.8	925.8	(514.3)	897.4	(498.5)	848.1	(471.2)	806.3	(448.0)
455.9	929.4	(516.3)	900.8	(500.4)	851.4	(473.0)	809.1	(449.5)
456.0	933.0	(518.3)	904.2	(502.3)	854.7	(474.8)	812.0	(451.1)
456.1	936.5	(520.3)	907.6	(504.2)	858.0	(476.7)	814.8	(452.7)
456.2	940.0	(522.2)	911.1	(506.2)	861.3	(478.5)	817.7	(454.3)
456.3	943.5	(524.2)	914.5	(508.1)	864.6	(480.3)	820.7	(455.9)
456.4	947.0	(526.1)	917.9	(509.9)	867.9	(482.2)	823.6	(457.6)
456.5	950.4	(528.0)	921.2	(511.8)	871.3	(484.0)	826.7	(459.2)
456.6	953.8	(529.9)	924.4	(513.6)	874.6	(485.9)	829.7	(460.9)
456.7	957.2	(531.8)	927.6	(515.4)	877.9	(487.7)	832.7	(462.6)
456.8	960.4	(533.5)	930.7	(517.1)	881.2	(489.6)	835.7	(464.3)
456.9	963.3	(535.2)	933.8	(518.8)	884.6	(491.4)	838.8	(466.0)
457.0	966.0	(536.6)	936.8	(520.4)	888.0	(493.3)	841.9	(467.7)
457.1	968.3	(537.9)	939.7	(522.0)	891.2	(495.1)	844.9	(469.4)
457.2	970.2	(539.0)	942.5	(523.6)	894.3	(496.9)	848.0	(471.1)
457.3	971.6	(539.8)	945.1	(525.1)	897.3	(498.5)	850.9	(472.7)
457.4	972.8	(540.4)	947.7	(526.5)	900.1	(500.1)	853.7	(474.3)
457.5	973.7	(540.9)	950.1	(527.8)	902.7	(501.5)	856.4	(475.8)
457.6	974.1	(541.2)	952.3	(529.1)	905.2	(502.9)	859.2	(477.3)
457.7	974.5	(541.4)	954.5	(530.3)	907.5	(504.2)	861.8	(478.8)
457.8	974.7	(541.5)	956.6	(531.4)	909.7	(505.4)	864.4	(480.2)
457.9	975.0	(541.7)	958.5	(532.5)	911.9	(506.6)	867.0	(481.7)
458.0	975.6	(542.0)	960.3	(533.5)	914.1	(507.8)	869.6	(483.1)
458.1	976.6	(542.5)	962.1	(534.5)	916.3	(509.0)	872.2	(484.5)
458.2	977.8	(543.2)	963.7	(535.4)	918.6	(510.3)	874.6	(485.9)
458.3	979.3	(544.0)	965.2	(536.2)	921.0	(511.7)	877.0	(487.2)
458.4	980.9	(545.0)	966.5	(537.0)	923.7	(513.2)	879.5	(488.6)
458.5	982.8	(546.0)	967.8	(537.7)	926.7	(514.8)	882.0	(490.0)
458.6	985.0	(547.2)	969.0	(538.3)	929.9	(516.6)	884.6	(491.5)
458.7	989.1	(549.5)	970.0	(538.9)	933.6	(518.7)	887.3	(493.0)
458.8	1025.0	(569.4)	973.6	(540.9)	937.8	(521.0)	890.1	(494.5)
458.9	1051.4	(584.1)	996.4	(553.6)	942.5	(523.6)	893.0	(496.1)
459.0	1081.6	(600.9)	1017.0	(565.0)	947.8	(526.5)	896.2	(497.9)
459.1	1115.2	(619.6)	1037.6	(576.4)	953.8	(529.9)	899.6	(499.8)
459.2	1149.9	(638.8)	1058.2	(587.9)	960.1	(533.4)	903.1	(501.7)
459.3	1182.9	(657.2)	1078.7	(599.3)	967.2	(537.3)	906.9	(503.8)
459.4	1212.1	(673.4)	1098.9	(610.5)	974.9	(541.6)	910.9	(506.1)
459.5	1237.0	(687.2)	1118.4	(621.3)	983.0	(546.1)	915.3	(508.5)
459.6	1258.2	(699.0)	1137.1	(631.7)	991.6	(550.9)	919.9	(511.1)
459.7	1276.3	(709.1)	1154.8	(641.6)	1000.5	(555.8)	924.8	(513.8)
459.8	1291.6	(717.6)	1171.5	(650.8)	1009.7	(560.9)	930.0	(516.6)
459.9	1304.9	(724.9)	1187.2	(659.6)	1019.2	(566.2)	935.3	(519.6)
460.0	1317.7	(732.1)	1202.2	(667.9)	1029.1	(571.7)	940.9	(522.7)
460.1	1331.9	(739.9)	1216.8	(676.0)	1039.1	(577.3)	946.9	(526.0)
460.2	1348.1	(749.0)	1231.2	(684.0)	1049.3	(583.0)	953.1	(529.5)
460.3	1366.4	(759.1)	1245.8	(692.1)	1059.3	(588.5)	959.4	(533.0)
460.4	1386.0	(770.0)	1260.7	(700.4)	1069.5	(594.2)	966.0	(536.7)
460.5	1406.0	(781.1)	1276.0	(708.9)	1079.9	(600.0)	972.9	(540.5)
460.6	1426.3	(792.4)	1291.7	(717.6)	1090.5	(605.8)	979.9	(544.4)
460.7	1447.5	(804.2)	1307.8	(726.5)	1101.3	(611.8)	987.2	(548.5)
460.8	1470.0	(816.6)	1324.0	(735.6)	1112.2	(617.9)	994.8	(552.6)
460.9	1492.5	(829.2)	1340.4	(744.6)	1123.4	(624.1)	1002.5	(557.0)
461.0	1513.2	(840.7)	1356.6	(753.7)	1134.7	(630.4)	1010.6	(561.4)
461.1	1530.7	(850.4)	1372.8	(762.7)	1146.3	(636.8)	1018.8	(566.0)
461.2	1544.9	(858.3)	1388.7	(771.5)	1158.0	(643.3)	1027.3	(570.7)
461.3	1557.0	(865.0)	1404.5	(780.3)	1169.9	(650.0)	1036.0	(575.6)
461.4	1568.1	(871.2)	1420.2	(789.0)	1182.0	(656.7)	1045.0	(580.6)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(c) Station 40 in. (101.60 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	632.5	(351.4)	631.9	(351.1)	626.7	(348.2)	622.1	(345.6)
444.0	641.4	(356.3)	639.6	(355.4)	632.9	(351.6)	628.5	(349.2)
445.0	648.1	(360.0)	646.8	(359.3)	639.5	(355.3)	634.4	(352.5)
446.0	655.4	(364.1)	653.3	(363.0)	646.2	(359.0)	640.5	(355.8)
447.0	667.8	(371.0)	664.2	(369.0)	654.7	(363.7)	648.2	(360.1)
448.0	682.4	(379.1)	677.4	(376.3)	664.7	(369.3)	657.4	(365.2)
448.1	684.1	(380.1)	678.6	(377.0)	665.8	(369.9)	658.3	(365.7)
448.2	685.6	(380.9)	679.8	(377.7)	667.0	(370.5)	659.3	(366.3)
448.3	687.0	(381.7)	681.1	(378.4)	668.2	(371.2)	660.3	(366.8)
448.4	688.4	(382.4)	682.3	(379.1)	669.3	(371.9)	661.2	(367.3)
448.5	689.7	(383.2)	683.6	(379.8)	670.6	(372.5)	662.2	(367.9)
448.6	691.0	(383.9)	684.8	(380.5)	671.8	(373.2)	663.1	(368.4)
448.7	692.3	(384.6)	686.1	(381.2)	673.0	(373.9)	664.1	(368.9)
448.8	693.5	(385.3)	687.4	(381.9)	674.3	(374.6)	665.0	(369.4)
448.9	694.8	(386.0)	688.7	(382.6)	675.6	(375.3)	665.9	(370.0)
449.0	696.2	(386.8)	690.0	(383.3)	677.0	(376.1)	666.9	(370.5)
449.1	697.6	(387.6)	691.3	(384.1)	678.3	(376.8)	667.9	(371.0)
449.2	699.2	(388.4)	692.6	(384.8)	679.6	(377.6)	668.9	(371.6)
449.3	700.8	(389.3)	694.0	(385.6)	680.9	(378.3)	669.8	(372.1)
449.4	702.4	(390.2)	695.5	(386.4)	682.3	(379.1)	670.8	(372.7)
449.5	704.2	(391.2)	697.0	(387.2)	683.7	(379.8)	671.9	(373.3)
449.6	706.0	(392.2)	698.6	(388.1)	685.0	(380.6)	672.9	(373.8)
449.7	707.9	(393.3)	700.2	(389.0)	686.3	(381.3)	674.0	(374.4)
449.8	709.8	(394.4)	701.9	(390.0)	687.7	(382.0)	675.1	(375.0)
449.9	711.8	(395.5)	703.6	(390.9)	689.0	(382.8)	676.2	(375.6)
450.0	713.9	(396.6)	705.4	(391.9)	690.4	(383.5)	677.3	(376.2)
450.1	715.9	(397.7)	707.1	(392.8)	691.7	(384.3)	678.6	(377.0)
450.2	717.9	(398.8)	708.9	(393.8)	693.1	(385.0)	679.8	(377.7)
450.3	719.8	(399.9)	710.6	(394.8)	694.4	(385.8)	681.1	(378.4)
450.4	721.8	(401.0)	712.5	(395.8)	695.8	(386.5)	682.4	(379.1)
450.5	723.7	(402.1)	714.4	(396.9)	697.2	(387.3)	683.7	(379.9)
450.6	725.5	(403.1)	716.4	(398.0)	698.6	(388.1)	685.2	(380.6)
450.7	727.3	(404.1)	718.3	(399.1)	700.0	(388.9)	686.6	(381.5)
450.8	729.1	(405.0)	720.3	(400.2)	701.4	(389.7)	688.1	(382.3)
450.9	730.8	(406.0)	722.4	(401.3)	702.8	(390.5)	689.6	(383.1)
451.0	732.6	(407.0)	724.4	(402.5)	704.3	(391.3)	691.1	(383.9)
451.1	734.4	(408.0)	726.4	(403.6)	705.8	(392.1)	692.6	(384.8)
451.2	736.3	(409.1)	728.4	(404.7)	707.4	(393.0)	694.2	(385.6)
451.3	738.3	(410.2)	730.4	(405.8)	708.9	(393.8)	695.7	(386.5)
451.4	740.5	(411.4)	732.4	(406.9)	710.5	(394.7)	697.2	(387.3)
451.5	742.9	(412.7)	734.5	(408.1)	712.1	(395.6)	698.7	(388.2)
451.6	745.5	(414.1)	736.5	(409.2)	713.8	(396.6)	700.2	(389.0)
451.7	748.1	(415.6)	738.6	(410.3)	715.5	(397.5)	701.8	(389.9)
451.8	750.8	(417.1)	740.6	(411.5)	717.3	(398.5)	703.3	(390.7)
451.9	753.4	(418.5)	742.7	(412.6)	719.1	(399.5)	704.7	(391.5)
452.0	756.8	(419.9)	744.9	(413.8)	720.9	(400.5)	706.2	(392.3)
452.1	758.2	(421.2)	747.0	(415.0)	722.8	(401.6)	707.7	(393.2)
452.2	760.3	(422.4)	749.2	(416.2)	724.7	(402.6)	709.2	(394.0)
452.3	762.4	(423.6)	751.3	(417.4)	726.6	(403.6)	710.6	(394.8)
452.4	764.5	(424.7)	753.5	(418.6)	728.5	(404.7)	712.0	(395.6)
452.5	766.6	(425.9)	755.8	(419.9)	730.5	(405.8)	713.5	(396.4)
452.6	768.9	(427.2)	758.0	(421.1)	732.5	(406.9)	714.9	(397.2)
452.7	771.5	(428.6)	760.3	(422.4)	734.5	(408.1)	716.4	(398.0)
452.8	774.1	(430.1)	762.7	(423.7)	736.5	(409.2)	717.9	(398.8)
452.9	776.9	(431.6)	765.1	(425.0)	738.5	(410.3)	719.4	(399.7)
453.0	779.7	(433.2)	767.6	(426.4)	740.6	(411.4)	720.9	(400.5)
453.1	782.6	(434.8)	770.1	(427.8)	742.7	(412.6)	722.5	(401.4)
453.2	785.3	(436.3)	772.7	(429.3)	744.8	(413.8)	724.1	(402.3)
453.3	788.1	(437.8)	775.3	(430.7)	747.0	(415.0)	725.7	(403.2)
453.4	791.0	(439.4)	777.9	(432.2)	749.2	(416.2)	727.4	(404.1)
453.5	794.0	(441.1)	780.6	(433.7)	751.5	(417.5)	729.0	(405.0)
453.6	797.0	(442.8)	783.4	(435.2)	753.7	(418.7)	730.7	(406.0)
453.7	800.2	(444.5)	786.2	(436.8)	756.1	(420.1)	732.5	(407.0)
453.8	803.4	(446.3)	789.0	(438.3)	758.4	(421.4)	734.3	(408.0)
453.9	806.6	(448.1)	791.9	(439.9)	760.8	(422.7)	736.1	(409.0)
454.0	810.1	(450.0)	794.8	(441.6)	763.2	(424.0)	738.0	(410.0)
454.1	813.6	(452.0)	797.9	(443.3)	765.7	(425.4)	739.9	(411.1)
454.2	817.3	(454.0)	800.9	(444.9)	768.3	(426.8)	741.9	(412.2)
454.3	820.9	(456.0)	803.9	(446.6)	770.9	(428.3)	744.0	(413.3)
454.4	824.6	(458.1)	806.9	(448.3)	773.4	(429.7)	746.0	(414.4)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(c) Station 40 in. (101.60 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	828.4	(460.2)	810.0	(450.0)	776.0	(431.1)	748.1	(415.6)
454.6	832.3	(462.4)	813.1	(451.7)	778.6	(432.5)	750.2	(416.8)
454.7	836.1	(464.5)	816.2	(453.4)	781.2	(434.0)	752.4	(418.0)
454.8	840.0	(466.6)	819.2	(455.1)	783.7	(435.4)	754.6	(419.2)
454.9	843.8	(468.8)	822.3	(456.9)	786.3	(436.9)	756.9	(420.5)
455.0	847.6	(470.9)	825.4	(458.6)	789.0	(438.3)	759.1	(421.7)
455.1	851.3	(473.0)	828.5	(460.3)	791.5	(439.7)	761.5	(423.0)
455.2	854.9	(474.9)	831.5	(461.9)	794.1	(441.1)	763.8	(424.4)
455.3	858.3	(476.9)	834.5	(463.6)	796.5	(442.5)	766.2	(425.7)
455.4	861.7	(478.7)	837.5	(465.3)	799.0	(443.9)	768.6	(427.0)
455.5	865.0	(480.6)	840.6	(467.0)	801.5	(445.3)	771.1	(428.4)
455.6	868.4	(482.4)	843.6	(468.7)	804.1	(446.7)	773.6	(429.8)
455.7	871.6	(484.2)	846.7	(470.4)	806.8	(448.2)	776.2	(431.2)
455.8	874.7	(485.9)	849.7	(472.0)	809.5	(449.7)	778.8	(432.6)
455.9	877.5	(487.5)	852.7	(473.7)	812.2	(451.2)	781.4	(434.1)
456.0	880.2	(489.0)	855.8	(475.5)	815.1	(452.8)	784.0	(435.6)
456.1	883.0	(490.6)	859.0	(477.2)	818.1	(454.5)	786.7	(437.1)
456.2	885.7	(492.1)	862.1	(479.0)	821.1	(456.2)	789.5	(438.6)
456.3	888.5	(493.6)	865.2	(480.7)	824.3	(457.9)	792.3	(440.2)
456.4	891.2	(495.1)	868.3	(482.4)	827.4	(459.7)	795.2	(441.8)
456.5	894.1	(496.7)	871.3	(484.0)	830.6	(461.5)	798.0	(443.3)
456.6	897.3	(498.5)	874.2	(485.7)	833.9	(463.3)	800.8	(444.9)
456.7	900.5	(500.3)	877.1	(487.3)	837.2	(465.1)	803.7	(446.5)
456.8	903.9	(502.1)	879.9	(488.9)	840.4	(466.9)	806.6	(448.1)
456.9	907.2	(504.0)	882.7	(490.4)	843.5	(468.6)	809.4	(449.7)
457.0	910.4	(505.8)	885.5	(491.9)	846.6	(470.3)	812.2	(451.2)
457.1	913.4	(507.4)	888.2	(493.4)	849.5	(472.0)	814.9	(452.7)
457.2	916.1	(509.0)	890.9	(494.9)	852.3	(473.5)	817.6	(454.2)
457.3	918.4	(510.2)	893.6	(496.4)	855.0	(475.0)	820.3	(455.7)
457.4	920.1	(511.1)	896.2	(497.9)	857.4	(476.3)	822.8	(457.1)
457.5	921.3	(511.8)	898.9	(499.4)	859.6	(477.6)	825.2	(458.5)
457.6	922.5	(512.5)	901.8	(501.0)	861.6	(478.7)	827.6	(459.8)
457.7	923.7	(513.2)	904.7	(502.6)	863.4	(479.7)	829.9	(461.0)
457.8	925.4	(514.1)	907.6	(504.2)	865.2	(480.6)	832.1	(462.3)
457.9	927.5	(515.3)	910.6	(505.9)	866.9	(481.6)	834.3	(463.5)
458.0	930.4	(516.9)	913.6	(507.5)	868.7	(482.6)	836.5	(464.7)
458.1	934.0	(518.9)	916.6	(509.2)	870.7	(483.7)	838.6	(465.9)
458.2	938.2	(521.2)	919.6	(510.9)	872.9	(484.9)	840.8	(467.1)
458.3	942.9	(523.8)	922.7	(512.6)	875.5	(486.4)	843.1	(468.4)
458.4	948.2	(526.8)	925.8	(514.3)	878.3	(488.0)	845.4	(469.6)
458.5	954.0	(530.0)	928.9	(516.1)	881.8	(489.9)	847.6	(470.9)
458.6	961.1	(534.0)	932.0	(517.8)	886.0	(492.2)	850.1	(472.3)
458.7	993.5	(552.0)	935.2	(519.6)	890.7	(494.9)	852.8	(473.8)
458.8	1031.9	(573.3)	942.6	(523.7)	896.3	(497.9)	855.6	(475.4)
458.9	1071.9	(595.5)	973.0	(540.6)	902.4	(501.4)	858.8	(477.1)
459.0	1113.2	(618.4)	999.6	(555.3)	909.7	(505.4)	862.1	(478.9)
459.1	1154.2	(641.2)	1026.1	(570.0)	917.8	(509.9)	865.7	(481.0)
459.2	1193.1	(662.8)	1052.3	(584.6)	926.3	(514.6)	869.7	(483.2)
459.3	1228.6	(682.6)	1077.9	(598.8)	935.9	(519.9)	874.0	(485.6)
459.4	1260.6	(700.3)	1102.6	(612.6)	946.2	(525.7)	878.7	(488.2)
459.5	1289.5	(716.4)	1126.2	(625.7)	957.2	(531.8)	883.7	(491.0)
459.6	1315.9	(731.1)	1149.4	(638.0)	968.8	(538.2)	889.1	(494.0)
459.7	1339.7	(744.3)	1169.3	(649.6)	980.9	(545.0)	895.0	(497.2)
459.8	1360.9	(756.0)	1189.1	(660.6)	993.4	(551.9)	901.2	(500.7)
459.9	1380.0	(766.7)	1208.0	(671.1)	1006.3	(559.0)	907.8	(504.4)
460.0	1398.3	(776.8)	1226.4	(681.3)	1019.3	(566.3)	914.9	(508.3)
460.1	1417.4	(787.4)	1244.6	(691.5)	1032.4	(573.5)	922.2	(512.3)
460.2	1438.0	(798.9)	1262.9	(701.6)	1045.7	(580.9)	929.9	(516.6)
460.3	1460.0	(811.1)	1281.1	(711.7)	1058.4	(588.0)	937.8	(521.0)
460.4	1483.1	(823.9)	1299.2	(721.8)	1071.3	(595.1)	946.1	(525.6)
460.5	1506.5	(836.9)	1317.2	(731.8)	1084.3	(602.4)	954.7	(530.4)
460.6	1529.2	(849.6)	1334.7	(741.5)	1097.4	(609.7)	963.6	(535.4)
460.7	1550.3	(861.3)	1351.6	(750.9)	1110.7	(617.1)	972.9	(540.5)
460.8	1568.7	(871.5)	1367.7	(759.8)	1124.2	(624.5)	982.6	(545.9)
460.9	1583.8	(879.9)	1383.1	(768.4)	1137.8	(632.1)	992.6	(551.4)
461.0	1595.7	(886.5)	1397.7	(776.5)	1151.5	(639.7)	1002.9	(557.2)
461.1	1606.4	(892.4)	1411.8	(784.4)	1165.4	(647.4)	1013.6	(563.1)
461.2	1619.0	(899.4)	1425.7	(792.1)	1179.4	(655.2)	1024.6	(569.2)
461.3	1635.5	(908.6)	1439.5	(799.7)	1193.6	(663.1)	1035.9	(575.5)
461.4	1655.2	(919.6)	1453.2	(807.4)	1207.9	(671.0)	1047.6	(582.0)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(d) Station 52 in. (132.08 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	622.7	(345.9)	624.4	(346.9)	618.6	(343.7)	615.8	(342.1)
444.0	631.7	(351.0)	631.4	(350.8)	624.1	(346.7)	620.9	(344.9)
445.0	638.1	(354.5)	637.5	(354.2)	630.5	(350.3)	626.8	(348.2)
446.0	643.6	(357.5)	643.5	(357.5)	635.0	(352.8)	631.4	(350.8)
447.0	654.1	(363.4)	651.6	(362.0)	642.5	(357.0)	637.7	(354.3)
448.0	666.3	(370.2)	661.9	(367.7)	652.7	(362.6)	646.1	(359.0)
448.1	667.8	(371.0)	663.2	(368.4)	653.7	(363.2)	646.9	(359.4)
448.2	669.3	(371.8)	664.4	(369.1)	654.7	(363.7)	647.7	(359.9)
448.3	670.8	(372.7)	665.7	(369.9)	655.7	(364.3)	648.5	(360.3)
448.4	672.2	(373.5)	667.1	(370.6)	656.7	(364.8)	649.3	(360.7)
448.5	673.5	(374.2)	668.5	(371.4)	657.7	(365.4)	650.0	(361.1)
448.6	674.6	(374.8)	669.8	(372.1)	658.7	(366.0)	650.7	(361.5)
448.7	675.8	(375.4)	671.1	(372.8)	659.8	(366.5)	651.5	(361.9)
448.8	677.0	(376.1)	672.5	(373.6)	660.8	(367.1)	652.2	(362.4)
448.9	678.2	(376.8)	673.8	(374.4)	661.9	(367.7)	653.0	(362.8)
449.0	679.5	(377.5)	675.2	(375.1)	663.0	(368.3)	653.8	(363.2)
449.1	680.8	(378.2)	676.5	(375.8)	664.1	(368.9)	654.6	(363.7)
449.2	682.1	(379.0)	677.8	(376.6)	665.2	(369.6)	655.4	(364.1)
449.3	683.6	(379.8)	679.1	(377.3)	666.3	(370.2)	656.3	(364.6)
449.4	685.2	(380.7)	680.5	(378.0)	667.4	(370.8)	657.2	(365.1)
449.5	686.7	(381.5)	681.9	(378.8)	668.6	(371.4)	658.1	(365.6)
449.6	688.2	(382.4)	683.3	(379.6)	669.7	(372.0)	659.1	(366.2)
449.7	689.7	(383.2)	684.7	(380.4)	670.8	(372.7)	660.1	(366.7)
449.8	691.2	(384.0)	686.1	(381.2)	671.9	(373.3)	661.1	(367.3)
449.9	692.8	(384.9)	687.5	(382.0)	673.0	(373.9)	662.2	(367.9)
450.0	694.5	(385.8)	689.0	(382.8)	674.1	(374.5)	663.4	(368.5)
450.1	696.1	(386.7)	690.5	(383.6)	675.1	(375.1)	664.5	(369.2)
450.2	697.7	(387.6)	691.9	(384.4)	676.2	(375.7)	665.7	(369.8)
450.3	699.1	(388.4)	693.3	(385.2)	677.3	(376.3)	667.0	(370.5)
450.4	700.6	(389.2)	694.7	(385.9)	678.4	(376.9)	668.2	(371.2)
450.5	702.1	(390.1)	696.1	(386.7)	679.5	(377.5)	669.4	(371.9)
450.6	703.6	(390.9)	697.5	(387.5)	680.7	(378.2)	670.7	(372.6)
450.7	705.1	(391.7)	698.9	(388.3)	681.9	(378.9)	672.0	(373.3)
450.8	706.6	(392.6)	700.4	(389.1)	683.2	(379.6)	673.3	(374.1)
450.9	708.3	(393.5)	701.8	(389.9)	684.5	(380.3)	674.6	(374.8)
451.0	709.9	(394.4)	703.3	(390.7)	685.9	(381.0)	675.9	(375.5)
451.1	711.6	(395.4)	704.8	(391.5)	687.3	(381.8)	677.2	(376.2)
451.2	713.4	(396.3)	706.3	(392.4)	688.8	(382.7)	678.5	(376.9)
451.3	715.3	(397.4)	707.8	(393.2)	690.3	(383.5)	679.8	(377.7)
451.4	717.2	(398.4)	709.4	(394.1)	691.8	(384.3)	681.1	(378.4)
451.5	719.1	(399.5)	711.0	(395.0)	693.4	(385.2)	682.4	(379.1)
451.6	721.0	(400.6)	712.7	(396.0)	695.0	(386.1)	683.7	(379.8)
451.7	723.1	(401.7)	714.5	(396.9)	696.6	(387.0)	685.0	(380.6)
451.8	725.2	(402.9)	716.3	(397.9)	698.3	(388.0)	686.3	(381.3)
451.9	727.4	(404.1)	718.1	(399.0)	700.0	(388.9)	687.6	(382.0)
452.0	729.7	(405.4)	720.1	(400.0)	701.7	(389.8)	688.9	(382.7)
452.1	731.9	(406.6)	722.1	(401.1)	703.4	(390.8)	690.2	(383.5)
452.2	734.1	(407.9)	724.0	(402.2)	705.0	(391.7)	691.6	(384.2)
452.3	736.3	(409.1)	726.0	(403.4)	706.7	(392.6)	693.0	(385.0)
452.4	738.5	(410.3)	728.0	(404.5)	708.3	(393.5)	694.4	(385.8)
452.5	740.6	(411.5)	730.0	(405.6)	709.9	(394.4)	695.9	(386.6)
452.6	742.7	(412.6)	732.1	(406.7)	711.6	(395.3)	697.3	(387.4)
452.7	744.8	(413.8)	734.1	(407.8)	713.2	(396.2)	698.8	(388.2)
452.8	747.0	(415.0)	736.1	(408.9)	714.8	(397.1)	700.3	(389.0)
452.9	749.4	(416.3)	738.1	(410.1)	716.4	(398.0)	701.7	(389.8)
453.0	751.9	(417.7)	740.2	(411.2)	718.1	(398.9)	703.1	(390.6)
453.1	754.6	(419.2)	742.4	(412.4)	719.7	(399.9)	704.5	(391.4)
453.2	757.3	(420.7)	744.5	(413.6)	721.5	(400.8)	706.0	(392.2)
453.3	759.9	(422.2)	746.8	(414.9)	723.2	(401.8)	707.5	(393.0)
453.4	762.5	(423.6)	749.0	(416.1)	725.0	(402.8)	708.9	(393.9)
453.5	765.1	(425.0)	751.4	(417.4)	726.8	(403.8)	710.4	(394.7)
453.6	767.7	(426.5)	753.8	(418.8)	728.6	(404.8)	711.9	(395.5)
453.7	770.2	(427.9)	756.3	(420.1)	730.6	(405.9)	713.4	(396.3)
453.8	772.7	(429.3)	758.8	(421.6)	732.6	(407.0)	714.9	(397.2)
453.9	775.4	(430.8)	761.4	(423.0)	734.6	(408.1)	716.5	(398.1)
454.0	778.2	(432.4)	764.1	(424.5)	736.7	(409.3)	718.2	(399.0)
454.1	781.3	(434.0)	766.9	(426.0)	739.0	(410.5)	719.8	(399.9)
454.2	784.4	(435.8)	769.8	(427.6)	741.2	(411.8)	721.6	(400.9)
454.3	787.7	(437.6)	772.7	(429.3)	743.6	(413.1)	723.4	(401.9)
454.4	791.0	(439.5)	775.6	(430.9)	746.0	(414.4)	725.2	(402.9)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(d) Station 52 in. (132.08 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	794.4	(441.3)	778.6	(432.5)	748.4	(415.8)	727.1	(403.9)
454.6	797.7	(443.2)	781.5	(434.2)	750.8	(417.1)	729.0	(405.0)
454.7	801.0	(445.0)	784.5	(435.8)	753.3	(418.5)	731.1	(406.1)
454.8	804.2	(446.8)	787.4	(437.5)	755.7	(419.9)	733.1	(407.3)
454.9	807.4	(448.5)	790.3	(439.1)	758.2	(421.2)	735.2	(408.5)
455.0	810.5	(450.3)	793.2	(440.7)	760.7	(422.6)	737.4	(409.7)
455.1	813.5	(452.0)	796.1	(442.3)	763.1	(424.0)	739.5	(410.8)
455.2	816.5	(453.6)	798.9	(443.8)	765.6	(425.3)	741.7	(412.0)
455.3	819.6	(455.3)	801.6	(445.3)	768.1	(426.7)	743.8	(413.2)
455.4	822.6	(457.0)	804.3	(446.8)	770.5	(428.1)	745.9	(414.4)
455.5	825.5	(458.6)	806.9	(448.3)	772.9	(429.4)	748.0	(415.6)
455.6	828.5	(460.3)	809.6	(449.8)	775.4	(430.8)	750.1	(416.7)
455.7	831.3	(461.8)	812.2	(451.2)	777.8	(432.1)	752.2	(417.9)
455.8	834.9	(463.2)	814.7	(452.6)	780.3	(433.5)	754.3	(419.1)
455.9	836.4	(464.6)	817.3	(454.0)	782.7	(434.8)	756.4	(420.2)
456.0	838.7	(466.0)	819.8	(455.4)	785.0	(436.1)	758.4	(421.4)
456.1	840.9	(467.2)	822.3	(456.8)	787.4	(437.4)	760.5	(422.5)
456.2	843.0	(468.3)	824.8	(458.2)	789.8	(438.8)	762.6	(423.7)
456.3	845.2	(469.6)	827.2	(459.6)	792.3	(440.1)	764.7	(424.8)
456.4	847.5	(470.8)	829.6	(460.9)	794.7	(441.5)	766.8	(426.0)
456.5	850.0	(472.2)	832.0	(462.2)	797.1	(442.8)	768.9	(427.2)
456.6	853.0	(473.9)	834.5	(463.6)	799.5	(444.2)	771.0	(428.4)
456.7	856.3	(475.7)	837.0	(465.0)	801.9	(445.5)	773.1	(429.5)
456.8	859.6	(477.6)	839.6	(466.5)	804.4	(446.9)	775.3	(430.7)
456.9	863.1	(479.5)	842.3	(467.9)	806.8	(448.2)	777.5	(431.9)
457.0	866.3	(481.3)	845.1	(469.5)	809.3	(449.6)	779.7	(433.1)
457.1	869.6	(483.1)	848.1	(471.2)	811.8	(451.0)	781.9	(434.4)
457.2	872.7	(484.8)	851.3	(472.9)	814.3	(452.4)	784.1	(435.6)
457.3	875.9	(486.6)	854.6	(474.8)	816.9	(453.8)	786.4	(436.9)
457.4	879.2	(488.4)	858.1	(476.7)	819.5	(455.3)	788.6	(438.1)
457.5	882.8	(490.4)	862.1	(478.9)	822.2	(456.8)	790.8	(439.3)
457.6	887.2	(492.9)	866.4	(481.3)	825.1	(458.4)	793.0	(440.6)
457.7	891.9	(495.5)	870.9	(483.8)	828.1	(460.0)	795.2	(441.8)
457.8	897.0	(498.3)	875.5	(486.4)	831.2	(461.8)	797.4	(443.0)
457.9	903.8	(502.1)	880.5	(489.1)	834.3	(463.5)	799.7	(444.3)
458.0	911.6	(506.5)	885.6	(492.0)	837.5	(465.3)	802.0	(445.6)
458.1	919.9	(511.1)	891.0	(495.0)	840.8	(467.1)	804.4	(446.9)
458.2	929.0	(516.1)	896.5	(498.1)	844.2	(469.0)	806.8	(448.2)
458.3	938.9	(521.6)	902.3	(501.3)	847.6	(470.9)	809.3	(449.6)
458.4	949.5	(527.5)	908.3	(504.6)	851.2	(472.9)	811.9	(451.1)
458.5	960.9	(533.8)	914.5	(508.1)	854.8	(474.9)	814.8	(452.7)
458.6	977.5	(543.1)	921.0	(511.6)	858.4	(476.9)	817.9	(454.4)
458.7	1020.4	(566.9)	930.3	(516.8)	862.2	(479.0)	821.2	(456.2)
458.8	1064.8	(591.5)	940.1	(533.4)	869.0	(482.8)	824.9	(458.3)
458.9	1109.5	(616.4)	950.5	(550.3)	881.8	(489.9)	828.8	(460.5)
459.0	1153.3	(640.7)	1019.6	(566.4)	892.8	(496.0)	833.1	(462.8)
459.1	1194.9	(663.8)	1048.0	(582.2)	903.3	(501.8)	837.9	(465.5)
459.2	1233.5	(685.3)	1075.6	(597.6)	914.2	(507.9)	843.1	(468.4)
459.3	1269.2	(705.1)	1102.5	(612.5)	925.6	(514.2)	848.8	(471.6)
459.4	1302.6	(723.7)	1128.7	(627.1)	937.6	(520.9)	855.0	(475.0)
459.5	1334.6	(741.5)	1154.2	(641.2)	950.4	(528.0)	861.5	(478.6)
459.6	1365.4	(758.6)	1178.9	(654.9)	964.0	(535.5)	868.6	(482.5)
459.7	1394.8	(774.9)	1202.9	(668.3)	978.1	(543.4)	876.0	(486.7)
459.8	1422.0	(790.0)	1225.9	(681.1)	992.7	(551.5)	883.9	(491.1)
459.9	1446.8	(803.8)	1248.0	(693.3)	1007.5	(559.7)	892.2	(495.7)
460.0	1469.7	(816.5)	1269.7	(705.4)	1022.3	(568.0)	900.9	(500.5)
460.1	1491.2	(828.4)	1290.5	(716.9)	1037.0	(576.1)	909.8	(505.5)
460.2	1512.0	(840.0)	1310.9	(728.3)	1051.5	(584.2)	919.0	(510.5)
460.3	1533.1	(851.7)	1330.5	(739.2)	1065.7	(592.1)	928.4	(515.8)
460.4	1555.0	(863.9)	1349.7	(749.8)	1079.7	(599.8)	938.2	(521.2)
460.5	1577.6	(876.4)	1368.4	(760.2)	1093.5	(607.5)	948.3	(526.8)
460.6	1599.1	(888.4)	1386.5	(770.3)	1107.1	(615.1)	958.7	(532.6)
460.7	1617.8	(898.8)	1404.0	(780.0)	1120.7	(622.6)	969.5	(538.6)
460.8	1632.6	(907.0)	1420.9	(789.4)	1134.4	(630.2)	980.6	(544.8)
460.9	1643.8	(913.2)	1437.2	(798.5)	1148.1	(637.8)	992.0	(551.1)
461.0	1653.1	(918.4)	1453.0	(807.2)	1161.8	(645.5)	1003.8	(557.7)
461.1	1662.8	(923.8)	1468.2	(815.7)	1175.5	(653.1)	1015.9	(564.4)
461.2	1674.8	(930.5)	1482.8	(823.8)	1189.1	(660.6)	1028.4	(571.3)
461.3	1689.4	(938.5)	1496.8	(831.5)	1202.6	(668.1)	1041.1	(578.4)
461.4	1705.4	(947.5)	1510.2	(839.0)	1216.1	(675.6)	1054.2	(585.7)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(e) Station 59.25 in. (150.50 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	618.0	(343.3)	621.3	(345.2)	616.1	(342.3)	612.4	(340.2)
444.0	627.5	(348.6)	627.2	(348.4)	621.0	(345.0)	616.8	(342.6)
445.0	632.0	(351.1)	632.7	(351.5)	626.1	(347.8)	622.2	(345.6)
446.0	638.3	(354.6)	637.7	(354.3)	631.2	(350.7)	627.2	(348.5)
447.0	647.9	(359.9)	646.4	(359.1)	637.8	(354.3)	632.7	(351.5)
448.0	658.9	(366.1)	656.9	(364.9)	646.8	(359.3)	640.5	(355.8)
448.1	660.4	(366.9)	658.0	(365.6)	647.7	(359.9)	641.4	(356.3)
448.2	661.9	(367.7)	659.2	(366.2)	648.7	(360.4)	642.3	(356.8)
448.3	663.4	(368.5)	660.3	(366.8)	649.7	(360.9)	643.2	(357.4)
448.4	664.8	(369.3)	661.5	(367.5)	650.6	(361.5)	644.2	(357.9)
448.5	666.2	(370.1)	662.7	(368.2)	651.6	(362.0)	645.1	(358.4)
448.6	667.5	(370.9)	663.9	(368.8)	652.5	(362.5)	646.0	(358.9)
448.7	668.9	(371.6)	665.1	(369.5)	653.4	(363.0)	646.9	(359.4)
448.8	670.0	(372.2)	666.4	(370.2)	654.3	(363.5)	647.8	(359.9)
448.9	670.9	(372.7)	667.6	(370.9)	655.2	(364.0)	648.8	(360.4)
449.0	671.8	(373.2)	668.9	(371.6)	656.2	(364.5)	649.7	(360.9)
449.1	672.6	(373.7)	670.2	(372.3)	657.1	(365.1)	650.5	(361.4)
449.2	673.5	(374.1)	671.5	(373.0)	658.1	(365.6)	651.4	(361.9)
449.3	674.4	(374.7)	672.8	(373.8)	659.0	(366.1)	652.2	(362.3)
449.4	675.6	(375.3)	674.0	(374.5)	660.0	(366.7)	653.0	(362.8)
449.5	677.0	(376.1)	675.3	(375.1)	661.0	(367.2)	653.8	(363.2)
449.6	678.5	(376.9)	676.5	(375.8)	662.0	(367.8)	654.6	(363.7)
449.7	680.1	(377.9)	677.8	(376.5)	663.0	(368.4)	655.4	(364.1)
449.8	682.0	(378.9)	679.0	(377.2)	664.1	(368.9)	656.2	(364.6)
449.9	684.0	(380.0)	680.1	(377.9)	665.2	(369.6)	657.0	(365.0)
450.0	686.0	(381.1)	681.3	(378.5)	666.3	(370.2)	657.8	(365.5)
450.1	687.9	(382.1)	682.5	(379.1)	667.4	(370.8)	658.6	(365.9)
450.2	689.5	(383.1)	683.6	(379.8)	668.6	(371.5)	659.4	(366.3)
450.3	691.1	(383.9)	684.8	(380.4)	669.9	(372.1)	660.2	(366.8)
450.4	692.6	(384.8)	686.0	(381.1)	671.1	(372.8)	661.2	(367.3)
450.5	693.7	(385.4)	687.2	(381.8)	672.4	(373.6)	662.2	(367.9)
450.6	694.8	(386.0)	688.4	(382.4)	673.7	(374.3)	663.1	(368.4)
450.7	696.0	(386.6)	689.6	(383.1)	675.0	(375.0)	664.1	(369.0)
450.8	697.1	(387.3)	690.9	(383.8)	676.3	(375.7)	665.2	(369.5)
450.9	698.4	(388.0)	692.2	(384.5)	677.6	(376.4)	666.3	(370.1)
451.0	699.8	(388.8)	693.5	(385.3)	678.9	(377.2)	667.4	(370.8)
451.1	701.4	(389.7)	694.9	(386.1)	680.2	(377.9)	668.6	(371.5)
451.2	703.1	(390.6)	696.4	(386.9)	681.5	(378.6)	669.9	(372.2)
451.3	704.9	(391.6)	698.0	(387.8)	682.8	(379.3)	671.3	(372.9)
451.4	706.8	(392.7)	699.6	(388.7)	684.1	(380.1)	672.7	(373.7)
451.5	708.7	(393.7)	701.2	(389.6)	685.5	(380.8)	674.2	(374.5)
451.6	710.7	(394.9)	702.9	(390.5)	686.8	(381.6)	675.6	(375.3)
451.7	712.8	(396.0)	704.6	(391.5)	688.2	(382.3)	677.0	(376.1)
451.8	714.9	(397.2)	706.4	(392.4)	689.5	(383.1)	678.4	(376.9)
451.9	716.9	(398.3)	708.2	(393.4)	690.9	(383.9)	679.8	(377.7)
452.0	719.0	(399.4)	710.0	(394.4)	692.3	(384.6)	681.3	(378.5)
452.1	721.0	(400.6)	711.8	(395.4)	693.8	(385.4)	682.7	(379.3)
452.2	723.1	(401.7)	713.6	(396.4)	695.2	(386.2)	684.1	(380.1)
452.3	725.2	(402.9)	715.4	(397.5)	696.7	(387.1)	685.5	(380.8)
452.4	727.2	(404.0)	717.2	(398.5)	698.2	(387.9)	686.9	(381.6)
452.5	729.1	(405.1)	719.1	(399.5)	699.8	(388.8)	688.3	(382.4)
452.6	731.1	(406.1)	720.9	(400.5)	701.4	(389.6)	689.7	(383.2)
452.7	732.9	(407.2)	722.8	(401.6)	703.0	(390.5)	691.0	(383.9)
452.8	734.9	(408.3)	724.8	(402.6)	704.6	(391.5)	692.4	(384.7)
452.9	737.0	(409.4)	726.7	(403.7)	706.3	(392.4)	693.8	(385.4)
453.0	739.1	(410.6)	728.6	(404.8)	707.9	(393.3)	695.1	(386.2)
453.1	741.1	(411.7)	730.5	(405.9)	709.6	(394.2)	696.5	(386.9)
453.2	743.2	(412.9)	732.5	(407.0)	711.3	(395.1)	697.8	(387.6)
453.3	745.5	(414.1)	734.6	(408.1)	713.0	(396.1)	699.0	(388.4)
453.4	747.7	(415.4)	736.7	(409.3)	714.7	(397.1)	700.4	(389.1)
453.5	750.1	(416.7)	738.9	(410.5)	716.5	(398.1)	701.7	(389.8)
453.6	752.6	(418.1)	741.2	(411.8)	718.3	(399.1)	703.1	(390.6)
453.7	755.2	(419.6)	743.5	(413.1)	720.2	(400.1)	704.4	(391.4)
453.8	758.0	(421.1)	746.0	(414.4)	722.1	(401.2)	705.9	(392.2)
453.9	760.9	(422.7)	748.5	(415.8)	724.0	(402.2)	707.4	(393.0)
454.0	763.8	(424.3)	751.0	(417.2)	726.0	(403.3)	708.9	(393.8)
454.1	766.7	(426.0)	753.6	(418.7)	728.0	(404.5)	710.4	(394.7)
454.2	769.6	(427.6)	756.2	(420.1)	730.1	(405.6)	711.9	(395.5)
454.3	772.4	(429.1)	758.9	(421.6)	732.2	(406.8)	713.5	(396.4)
454.4	775.3	(430.7)	761.6	(423.1)	734.4	(408.0)	715.2	(397.3)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(e) Station 59.25 in. (150.50 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	778.3	(432.4)	764.3	(424.6)	736.6	(409.2)	716.9	(398.3)
454.6	781.3	(434.0)	767.0	(426.1)	738.8	(410.4)	718.7	(399.3)
454.7	784.2	(435.6)	769.6	(427.6)	741.0	(411.7)	720.6	(400.3)
454.8	787.1	(437.3)	772.2	(429.0)	743.3	(412.9)	722.5	(401.4)
454.9	790.1	(438.9)	774.9	(430.5)	745.6	(414.2)	724.5	(402.5)
455.0	793.1	(440.6)	777.4	(431.9)	747.9	(415.5)	726.6	(403.7)
455.1	796.0	(442.2)	779.9	(433.3)	750.3	(416.8)	728.8	(404.9)
455.2	798.9	(443.8)	782.3	(434.6)	752.5	(418.1)	731.0	(406.1)
455.3	801.5	(445.3)	784.7	(436.0)	754.8	(419.3)	733.2	(407.3)
455.4	804.1	(446.7)	787.1	(437.3)	757.0	(420.6)	735.4	(408.5)
455.5	806.7	(448.2)	789.4	(438.5)	759.3	(421.8)	737.6	(409.8)
455.6	809.4	(449.7)	791.6	(439.8)	761.5	(423.1)	739.9	(411.0)
455.7	812.0	(451.1)	793.8	(441.0)	763.8	(424.3)	742.0	(412.2)
455.8	814.4	(452.5)	796.1	(442.3)	766.0	(425.6)	744.1	(413.4)
455.9	816.8	(453.8)	798.3	(443.5)	768.3	(426.8)	746.2	(414.6)
456.0	819.1	(455.1)	800.6	(444.8)	770.5	(428.1)	748.4	(415.8)
456.1	821.5	(456.4)	802.8	(446.0)	772.9	(429.4)	750.5	(416.9)
456.2	824.0	(457.8)	805.1	(447.3)	775.2	(430.6)	752.6	(418.1)
456.3	826.5	(459.1)	807.5	(448.6)	777.5	(431.9)	754.7	(419.3)
456.4	829.0	(460.5)	810.0	(450.0)	779.8	(433.2)	756.8	(420.4)
456.5	831.6	(462.0)	812.7	(451.5)	782.2	(434.5)	758.8	(421.6)
456.6	834.1	(463.4)	815.5	(453.1)	784.6	(435.9)	760.9	(422.7)
456.7	837.5	(465.3)	818.6	(454.8)	787.0	(437.2)	763.0	(423.9)
456.8	841.1	(467.3)	821.8	(456.6)	789.4	(438.6)	764.9	(425.0)
456.9	845.1	(469.5)	825.3	(458.5)	792.0	(440.0)	767.0	(426.1)
457.0	849.6	(472.0)	829.1	(460.6)	794.6	(441.5)	769.1	(427.3)
457.1	854.9	(475.0)	833.1	(462.8)	797.3	(443.0)	771.2	(428.4)
457.2	860.9	(478.3)	837.6	(465.3)	800.2	(444.5)	773.3	(429.6)
457.3	867.5	(481.9)	842.4	(468.0)	803.1	(446.1)	775.4	(430.8)
457.4	874.7	(485.9)	847.5	(470.9)	806.1	(447.8)	777.6	(432.0)
457.5	881.8	(489.9)	852.9	(473.8)	809.3	(449.6)	779.8	(433.2)
457.6	889.4	(494.1)	858.6	(477.0)	812.6	(451.5)	782.1	(434.5)
457.7	897.4	(498.5)	864.5	(480.3)	816.1	(453.4)	784.4	(435.8)
457.8	905.7	(503.2)	870.7	(483.7)	819.6	(455.3)	786.8	(437.1)
457.9	914.5	(508.0)	877.1	(487.3)	823.3	(457.4)	789.3	(438.5)
458.0	923.4	(513.0)	883.9	(491.0)	827.0	(459.5)	791.8	(439.9)
458.1	933.1	(521.2)	890.9	(494.9)	830.9	(461.6)	794.6	(441.4)
458.2	946.0	(531.1)	898.2	(499.0)	834.9	(463.8)	797.4	(443.0)
458.3	974.1	(541.2)	905.7	(503.2)	838.9	(466.1)	800.5	(444.7)
458.4	993.5	(552.0)	915.2	(508.5)	843.1	(468.4)	803.8	(446.6)
458.5	1016.5	(564.7)	935.9	(519.9)	847.4	(470.8)	807.4	(448.6)
458.6	1045.0	(580.5)	956.7	(531.5)	851.8	(473.2)	811.4	(450.8)
458.7	1079.6	(599.8)	978.1	(543.4)	857.5	(476.4)	815.6	(453.1)
458.8	1119.1	(621.7)	1000.8	(556.0)	870.2	(483.5)	820.2	(455.7)
458.9	1161.0	(645.0)	1025.1	(569.5)	883.0	(490.5)	825.1	(458.4)
459.0	1202.9	(668.3)	1050.7	(583.7)	895.6	(497.6)	830.6	(461.4)
459.1	1243.3	(690.7)	1077.2	(598.5)	908.4	(504.7)	836.3	(464.6)
459.2	1281.4	(711.9)	1103.9	(613.3)	921.3	(511.9)	842.6	(468.1)
459.3	1316.8	(731.5)	1130.2	(627.9)	934.5	(519.1)	849.3	(471.8)
459.4	1349.4	(749.7)	1155.7	(642.1)	947.8	(526.6)	856.4	(475.8)
459.5	1380.2	(766.8)	1180.2	(655.7)	961.4	(534.1)	864.0	(480.0)
459.6	1410.1	(783.4)	1203.7	(668.7)	975.1	(541.7)	871.9	(484.4)
459.7	1439.2	(799.6)	1226.2	(681.2)	989.1	(549.5)	880.3	(489.1)
459.8	1467.3	(815.1)	1248.0	(693.4)	1003.3	(557.4)	889.0	(493.9)
459.9	1493.7	(829.9)	1269.4	(705.2)	1017.7	(565.4)	898.1	(498.9)
460.0	1518.4	(843.6)	1290.5	(716.9)	1032.3	(573.5)	907.6	(504.2)
460.1	1541.4	(856.3)	1311.4	(728.6)	1047.3	(581.8)	917.3	(509.6)
460.2	1563.2	(868.4)	1332.3	(740.2)	1062.5	(590.3)	927.2	(515.1)
460.3	1584.7	(880.4)	1353.0	(751.7)	1077.9	(598.8)	937.5	(520.8)
460.4	1606.2	(892.3)	1373.4	(763.0)	1093.5	(607.5)	948.0	(526.7)
460.5	1627.2	(904.0)	1393.2	(774.0)	1109.0	(616.1)	958.9	(532.7)
460.6	1647.1	(915.1)	1412.3	(784.6)	1124.5	(624.7)	970.2	(539.0)
460.7	1665.4	(925.2)	1430.6	(794.8)	1139.5	(633.1)	981.7	(545.4)
460.8	1681.6	(934.2)	1447.9	(804.4)	1154.2	(641.2)	993.6	(552.0)
460.9	1695.2	(941.8)	1464.0	(813.3)	1168.4	(649.1)	1005.8	(558.8)
461.0	1706.3	(948.0)	1479.0	(821.6)	1182.0	(656.7)	1018.3	(565.7)
461.1	1716.4	(953.6)	1492.7	(829.3)	1195.2	(664.0)	1031.2	(572.9)
461.2	1727.9	(960.0)	1505.5	(836.4)	1208.0	(671.1)	1044.3	(580.2)
461.3	1742.6	(968.1)	1517.6	(843.1)	1220.5	(678.1)	1057.8	(587.7)
461.4							1071.7	(595.4)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(f) Station 73 in. (185.42 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	612.0	(340.0)	613.4	(340.8)	608.7	(338.2)	604.5	(335.8)
444.0	620.3	(344.6)	618.8	(343.8)	613.7	(341.0)	608.9	(338.3)
445.0	623.7	(346.5)	624.1	(346.7)	619.2	(344.0)	613.9	(341.0)
446.0	630.2	(350.1)	629.4	(349.6)	624.0	(346.7)	617.1	(342.8)
447.0	638.7	(354.8)	636.8	(353.8)	629.7	(349.9)	622.3	(345.7)
448.0	648.6	(360.4)	645.3	(358.5)	638.0	(354.5)	630.3	(350.1)
448.1	649.6	(360.9)	646.3	(359.1)	638.9	(355.0)	631.1	(350.6)
448.2	650.7	(361.5)	647.3	(359.6)	639.8	(355.5)	631.9	(351.0)
448.3	651.9	(362.2)	648.3	(360.2)	640.7	(356.0)	632.7	(351.5)
448.4	653.2	(362.9)	649.4	(360.8)	641.6	(356.4)	633.4	(351.9)
448.5	654.4	(363.6)	650.4	(361.4)	642.5	(356.9)	634.2	(352.3)
448.6	655.6	(364.2)	651.5	(362.0)	643.3	(357.4)	635.0	(352.8)
448.7	656.8	(364.9)	652.6	(362.6)	644.2	(357.9)	635.7	(353.2)
448.8	657.9	(365.5)	653.8	(363.2)	645.1	(358.4)	636.5	(353.6)
448.9	659.0	(366.1)	654.9	(363.8)	645.9	(358.9)	637.2	(354.0)
449.0	659.8	(366.6)	656.0	(364.5)	646.8	(359.3)	638.0	(354.5)
449.1	660.7	(367.1)	657.2	(365.1)	647.7	(359.8)	638.8	(354.9)
449.2	661.6	(367.6)	658.3	(365.7)	648.6	(360.3)	639.6	(355.4)
449.3	662.7	(368.1)	659.5	(366.4)	649.5	(360.8)	640.4	(355.8)
449.4	663.8	(368.8)	660.6	(367.0)	650.4	(361.3)	641.2	(356.2)
449.5	665.2	(369.6)	661.8	(367.6)	651.4	(361.9)	642.0	(356.7)
449.6	666.7	(370.4)	662.9	(368.3)	652.4	(362.4)	642.9	(357.2)
449.7	668.2	(371.2)	664.1	(369.0)	653.4	(363.0)	643.8	(357.7)
449.8	669.7	(372.0)	665.3	(369.6)	654.5	(363.6)	644.7	(358.2)
449.9	671.2	(372.9)	666.6	(370.3)	655.6	(364.2)	645.7	(358.7)
450.0	672.8	(373.8)	667.8	(371.0)	656.7	(364.9)	646.6	(359.2)
450.1	674.2	(374.5)	669.0	(371.7)	657.9	(365.5)	647.6	(359.8)
450.2	675.5	(375.3)	670.3	(372.4)	659.1	(366.2)	648.5	(360.3)
450.3	676.8	(376.0)	671.5	(373.1)	660.3	(366.8)	649.4	(360.8)
450.4	678.0	(376.7)	672.8	(373.8)	661.5	(367.5)	650.3	(361.3)
450.5	679.3	(377.4)	674.1	(374.5)	662.7	(368.1)	651.2	(361.8)
450.6	680.5	(378.1)	675.4	(375.2)	663.8	(368.8)	652.2	(362.3)
450.7	681.7	(378.7)	676.6	(375.9)	665.0	(369.4)	653.2	(362.9)
450.8	683.0	(379.4)	677.9	(376.6)	666.2	(370.1)	654.2	(363.4)
450.9	684.3	(380.1)	679.1	(377.3)	667.3	(370.7)	655.2	(364.0)
451.0	685.6	(380.9)	680.5	(378.0)	668.4	(371.4)	656.3	(364.6)
451.1	686.9	(381.6)	681.8	(378.8)	669.6	(372.0)	657.4	(365.2)
451.2	688.3	(382.4)	683.2	(379.5)	670.8	(372.6)	658.5	(365.8)
451.3	689.6	(383.1)	684.6	(380.3)	671.9	(373.3)	659.6	(366.5)
451.4	691.1	(383.9)	686.1	(381.1)	673.1	(374.0)	660.8	(367.1)
451.5	692.6	(384.8)	687.5	(382.0)	674.3	(374.6)	661.9	(367.7)
451.6	694.3	(385.7)	689.1	(382.8)	675.6	(375.3)	663.1	(368.4)
451.7	696.0	(386.7)	690.7	(383.7)	676.8	(376.0)	664.2	(369.0)
451.8	697.7	(387.6)	692.3	(384.6)	678.0	(376.7)	665.4	(369.7)
451.9	699.4	(388.5)	694.0	(385.6)	679.3	(377.4)	666.6	(370.3)
452.0	701.0	(389.5)	695.7	(386.5)	680.6	(378.1)	667.8	(371.0)
452.1	702.7	(390.4)	697.4	(387.4)	682.0	(378.9)	669.0	(371.7)
452.2	704.4	(391.4)	699.1	(388.4)	683.3	(379.6)	670.2	(372.3)
452.3	706.2	(392.3)	700.8	(389.3)	684.7	(380.4)	671.4	(373.0)
452.4	708.1	(393.4)	702.5	(390.3)	686.1	(381.1)	672.6	(373.7)
452.5	710.0	(394.4)	704.2	(391.2)	687.4	(381.9)	673.8	(374.3)
452.6	712.1	(395.6)	705.9	(392.2)	688.8	(382.7)	674.9	(374.9)
452.7	714.2	(396.8)	707.6	(393.1)	690.2	(383.4)	676.0	(375.6)
452.8	716.4	(398.0)	709.2	(394.0)	691.6	(384.2)	677.1	(376.2)
452.9	718.5	(399.2)	710.9	(394.9)	693.0	(385.0)	678.2	(376.8)
453.0	720.6	(400.4)	712.5	(395.8)	694.4	(385.8)	679.3	(377.4)
453.1	722.7	(401.5)	714.1	(396.7)	695.8	(386.5)	680.4	(378.0)
453.2	724.6	(402.6)	715.8	(397.6)	697.2	(387.3)	681.6	(378.7)
453.3	726.5	(403.6)	717.4	(398.6)	698.7	(388.1)	682.8	(379.4)
453.4	728.5	(404.7)	719.1	(399.5)	700.1	(389.0)	684.1	(380.0)
453.5	730.4	(405.8)	720.9	(400.5)	701.6	(389.8)	685.3	(380.7)
453.6	732.5	(406.9)	722.8	(401.5)	703.2	(390.7)	686.6	(381.4)
453.7	734.6	(408.1)	724.7	(402.6)	704.8	(391.6)	687.9	(382.2)
453.8	736.8	(409.3)	726.7	(403.7)	706.5	(392.5)	689.2	(382.9)
453.9	739.2	(410.7)	728.8	(404.9)	708.2	(393.4)	690.6	(383.6)
454.0	741.7	(412.1)	730.9	(406.1)	709.9	(394.4)	692.0	(384.4)
454.1	744.3	(413.5)	733.2	(407.3)	711.7	(395.4)	693.4	(385.2)
454.2	747.0	(415.0)	735.6	(408.7)	713.5	(396.4)	694.9	(386.1)
454.3	749.6	(416.5)	738.0	(410.0)	715.4	(397.5)	696.5	(386.9)
454.4	752.4	(418.0)	740.4	(411.3)	717.4	(398.5)	698.1	(387.8)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(f) Station 73 in. (185.42 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	755.2	(419.5)	742.9	(412.7)	719.4	(399.6)	699.7	(388.7)
454.6	758.0	(421.1)	745.3	(414.1)	721.4	(400.8)	701.3	(389.6)
454.7	760.9	(422.7)	747.7	(415.4)	723.5	(401.9)	703.0	(390.5)
454.8	763.8	(424.3)	750.1	(416.7)	725.5	(403.1)	704.7	(391.5)
454.9	766.7	(425.9)	752.6	(418.1)	727.6	(404.2)	706.4	(392.4)
455.0	769.5	(427.5)	755.0	(419.4)	729.7	(405.4)	708.1	(393.4)
455.1	772.0	(428.9)	757.4	(420.8)	731.7	(406.5)	709.7	(394.3)
455.2	774.4	(430.2)	759.7	(422.1)	733.8	(407.7)	711.4	(395.2)
455.3	776.7	(431.5)	762.0	(423.3)	735.8	(408.8)	713.0	(396.1)
455.4	779.0	(432.8)	764.3	(424.6)	737.8	(409.9)	714.7	(397.0)
455.5	781.3	(434.1)	766.6	(425.9)	739.7	(411.0)	716.4	(398.0)
455.6	783.7	(435.4)	768.9	(427.2)	741.7	(412.0)	718.0	(398.9)
455.7	786.0	(436.7)	771.3	(428.5)	743.6	(413.1)	719.7	(399.8)
455.8	788.3	(438.0)	773.6	(429.8)	745.6	(414.2)	721.4	(400.8)
455.9	790.9	(439.4)	776.0	(431.1)	747.5	(415.3)	723.0	(401.7)
456.0	793.5	(440.9)	778.4	(432.4)	749.5	(416.4)	724.6	(402.5)
456.1	796.6	(442.5)	780.8	(433.8)	751.5	(417.5)	726.2	(403.4)
456.2	799.7	(444.3)	783.2	(435.1)	753.6	(418.6)	727.7	(404.3)
456.3	803.1	(446.2)	785.5	(436.4)	755.7	(419.8)	729.3	(405.2)
456.4	806.7	(448.2)	787.9	(437.7)	758.0	(421.1)	730.9	(406.1)
456.5	810.5	(450.3)	790.3	(439.1)	760.5	(422.5)	732.6	(407.0)
456.6	814.5	(452.5)	792.7	(440.4)	763.2	(424.0)	734.4	(408.0)
456.7	818.6	(454.8)	795.1	(441.7)	766.1	(425.6)	736.3	(409.0)
456.8	822.1	(460.0)	798.0	(443.3)	769.3	(427.4)	738.2	(410.1)
456.9	842.7	(468.2)	805.7	(447.6)	772.8	(429.3)	740.2	(411.2)
457.0	856.4	(475.8)	819.1	(455.1)	776.5	(431.4)	742.4	(412.4)
457.1	873.5	(485.3)	832.0	(462.2)	780.7	(433.7)	744.7	(413.7)
457.2	893.8	(496.6)	845.0	(469.5)	785.3	(436.3)	747.2	(415.1)
457.3	915.4	(508.5)	858.3	(476.8)	790.2	(439.0)	749.8	(416.5)
457.4	936.5	(520.3)	871.7	(484.3)	795.6	(442.0)	752.6	(418.1)
457.5	956.2	(531.2)	885.1	(491.7)	801.4	(445.2)	755.6	(419.8)
457.6	974.8	(541.5)	898.7	(499.3)	807.6	(448.7)	758.7	(421.5)
457.7	992.2	(551.2)	912.5	(506.9)	814.3	(452.4)	762.2	(423.4)
457.8	1009.3	(560.7)	926.6	(514.8)	821.5	(456.4)	765.9	(425.5)
457.9	1027.7	(570.9)	941.4	(523.0)	829.3	(460.7)	769.9	(427.7)
458.0	1049.7	(583.2)	957.0	(531.7)	837.7	(465.4)	774.4	(430.2)
458.1	1075.9	(597.7)	973.8	(541.0)	846.5	(470.3)	779.1	(432.8)
458.2	1104.8	(613.8)	991.7	(550.9)	855.9	(475.5)	784.2	(435.6)
458.3	1133.6	(629.8)	1010.6	(561.4)	865.8	(481.0)	789.6	(438.6)
458.4	1161.0	(645.0)	1030.5	(572.5)	876.0	(486.7)	795.3	(441.8)
458.5	1188.0	(660.0)	1051.1	(583.9)	886.9	(492.7)	801.4	(445.2)
458.6	1216.3	(675.7)	1072.2	(595.6)	898.2	(499.0)	807.8	(448.8)
458.7	1246.1	(692.3)	1093.6	(607.6)	909.9	(505.5)	814.6	(452.6)
458.8	1276.5	(709.1)	1115.3	(619.6)	922.0	(512.2)	821.8	(456.5)
458.9	1306.6	(725.9)	1137.3	(631.8)	934.6	(519.2)	829.3	(460.7)
459.0	1337.0	(742.8)	1159.6	(644.2)	947.6	(526.4)	837.3	(465.2)
459.1	1367.8	(759.9)	1182.1	(656.7)	961.0	(533.9)	845.7	(469.8)
459.2	1399.0	(777.2)	1205.0	(669.5)	974.9	(541.6)	854.4	(474.7)
459.3	1430.3	(794.6)	1228.2	(682.3)	989.0	(549.5)	863.5	(479.7)
459.4	1461.4	(811.9)	1251.6	(695.3)	1003.4	(557.5)	873.0	(485.0)
459.5	1492.4	(829.1)	1275.0	(708.4)	1018.1	(565.6)	882.8	(490.4)
459.6	1522.8	(846.0)	1298.4	(721.3)	1033.0	(573.9)	892.9	(496.0)
459.7	1551.8	(862.1)	1321.6	(734.2)	1048.0	(582.2)	903.2	(501.8)
459.8	1578.7	(877.1)	1344.4	(746.9)	1063.2	(590.7)	913.7	(507.6)
459.9	1603.2	(890.7)	1366.7	(759.3)	1078.5	(599.1)	924.6	(513.6)
460.0	1625.8	(903.2)	1388.5	(771.4)	1093.8	(607.7)	935.6	(519.8)
460.1	1647.4	(915.2)	1409.8	(783.2)	1109.2	(616.2)	946.7	(526.0)
460.2	1668.9	(927.1)	1430.6	(794.8)	1124.4	(624.7)	958.0	(532.2)
460.3	1690.7	(939.3)	1451.1	(806.2)	1139.6	(633.1)	969.3	(538.5)
460.4	1713.1	(951.7)	1471.2	(817.3)	1154.8	(641.6)	980.9	(544.9)
460.5	1735.6	(964.2)	1490.8	(828.2)	1170.1	(650.1)	992.6	(551.4)
460.6	1757.6	(976.4)	1510.0	(838.9)	1185.4	(658.6)	1004.5	(558.1)
460.7	1778.0	(987.8)	1528.3	(849.1)	1200.8	(667.1)	1016.6	(564.8)
460.8	1795.4	(997.5)	1545.7	(858.7)	1216.2	(675.7)	1029.0	(571.6)
460.9	1808.8	(1004.9)	1562.0	(867.8)	1231.7	(684.3)	1041.5	(578.6)
461.0	1818.6	(1010.3)	1577.2	(876.2)	1247.2	(692.9)	1054.2	(585.6)
461.1	1827.6	(1015.3)	1591.4	(884.1)	1262.8	(701.6)	1067.1	(592.8)
461.2	1839.5	(1021.9)	1604.8	(891.6)	1278.5	(710.3)	1080.1	(600.1)
461.3	1856.1	(1031.2)	1617.8	(898.8)	1294.1	(719.0)	1093.4	(607.5)
461.4	1876.5	(1042.5)	1630.6	(905.9)	1309.9	(727.7)	1106.9	(614.9)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(g) Station 85 in. (215.90 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	603.8	(335.4)	605.0	(336.1)	601.2	(334.0)	598.6	(332.6)
444.0	610.1	(338.9)	610.4	(339.1)	606.4	(336.9)	603.2	(335.1)
445.0	616.4	(342.5)	614.9	(341.6)	610.8	(339.3)	607.0	(337.2)
446.0	620.4	(344.7)	619.5	(344.2)	614.2	(341.2)	609.8	(338.8)
447.0	629.0	(349.4)	626.6	(348.1)	619.6	(344.2)	614.9	(341.6)
448.0	636.9	(353.9)	635.9	(353.3)	628.2	(349.0)	620.7	(344.8)
448.1	638.0	(354.5)	636.7	(353.7)	629.1	(349.5)	621.3	(345.2)
448.2	639.3	(355.2)	637.6	(354.2)	630.0	(350.0)	622.0	(345.5)
448.3	640.6	(355.9)	638.5	(354.7)	630.9	(350.5)	622.6	(345.9)
448.4	641.9	(356.6)	639.3	(355.2)	631.8	(351.0)	623.4	(346.3)
448.5	643.2	(357.3)	640.2	(355.6)	632.6	(351.5)	624.1	(346.7)
448.6	644.5	(358.1)	641.0	(356.1)	633.5	(351.9)	624.9	(347.2)
448.7	645.7	(358.7)	641.9	(356.6)	634.3	(352.4)	625.7	(347.6)
448.8	646.8	(359.3)	642.8	(357.1)	635.1	(352.8)	626.5	(348.1)
448.9	647.7	(359.8)	643.7	(357.6)	635.8	(353.2)	627.3	(348.5)
449.0	648.6	(360.3)	644.7	(358.2)	636.6	(353.7)	628.1	(349.0)
449.1	649.4	(360.8)	645.7	(358.7)	637.3	(354.0)	628.9	(349.4)
449.2	650.3	(361.3)	646.8	(359.3)	638.0	(354.4)	629.8	(349.9)
449.3	651.2	(361.8)	647.9	(359.9)	638.7	(354.8)	630.6	(350.3)
449.4	652.3	(362.4)	649.0	(360.5)	639.4	(355.2)	631.4	(350.8)
449.5	653.4	(363.0)	650.1	(361.2)	640.2	(355.7)	632.2	(351.2)
449.6	654.6	(363.7)	651.2	(361.8)	641.0	(356.1)	633.0	(351.7)
449.7	655.9	(364.4)	652.3	(362.4)	641.8	(356.6)	633.9	(352.2)
449.8	657.2	(365.1)	653.4	(363.0)	642.7	(357.0)	634.7	(352.6)
449.9	658.6	(365.9)	654.5	(363.6)	643.6	(357.5)	635.5	(353.1)
450.0	659.8	(366.6)	655.7	(364.3)	644.6	(358.1)	636.4	(353.5)
450.1	661.1	(367.3)	656.8	(364.9)	645.6	(358.7)	637.2	(354.0)
450.2	662.3	(367.9)	657.9	(365.5)	646.7	(359.3)	638.0	(354.4)
450.3	663.4	(368.6)	659.1	(366.1)	647.8	(359.9)	638.8	(354.9)
450.4	664.5	(369.2)	660.1	(366.7)	648.9	(360.5)	639.6	(355.3)
450.5	665.7	(369.8)	661.3	(367.4)	650.0	(361.1)	640.5	(355.8)
450.6	666.8	(370.5)	662.4	(368.0)	651.2	(361.8)	641.3	(356.3)
450.7	668.0	(371.1)	663.5	(368.6)	652.3	(362.4)	642.2	(356.8)
450.8	669.1	(371.7)	664.7	(369.3)	653.4	(363.0)	643.2	(357.3)
450.9	670.2	(372.3)	665.9	(369.9)	654.6	(363.7)	644.2	(357.9)
451.0	671.3	(373.0)	667.1	(370.6)	655.7	(364.3)	645.2	(358.4)
451.1	672.5	(373.6)	668.3	(371.3)	656.9	(365.0)	646.2	(359.0)
451.2	673.8	(374.3)	669.6	(372.0)	658.1	(365.6)	647.2	(359.5)
451.3	675.2	(375.1)	670.9	(372.7)	659.3	(366.3)	648.2	(360.1)
451.4	676.5	(375.9)	672.2	(373.5)	660.5	(367.0)	649.2	(360.7)
451.5	678.2	(376.8)	673.6	(374.2)	661.8	(367.6)	650.3	(361.3)
451.6	679.9	(377.7)	675.0	(375.0)	663.0	(368.3)	651.4	(361.9)
451.7	681.8	(378.8)	676.4	(375.8)	664.3	(369.0)	652.5	(362.5)
451.8	683.8	(379.9)	677.9	(376.6)	665.5	(369.7)	653.6	(363.1)
451.9	685.6	(380.9)	679.4	(377.5)	666.8	(370.5)	654.8	(363.8)
452.0	687.4	(381.9)	681.0	(378.3)	668.1	(371.2)	656.0	(364.4)
452.1	689.1	(382.8)	682.5	(379.2)	669.4	(371.9)	657.2	(365.1)
452.2	690.7	(383.7)	684.1	(380.1)	670.7	(372.6)	658.4	(365.8)
452.3	692.2	(384.6)	685.7	(380.9)	672.0	(373.3)	659.6	(366.4)
452.4	693.7	(385.4)	687.3	(381.8)	673.3	(374.1)	660.8	(367.1)
452.5	695.1	(386.2)	688.9	(382.7)	674.7	(374.8)	662.0	(367.8)
452.6	696.6	(387.0)	690.4	(383.6)	676.0	(375.6)	663.2	(368.4)
452.7	698.1	(387.9)	692.1	(384.5)	677.4	(376.3)	664.3	(369.1)
452.8	699.7	(388.7)	693.7	(385.4)	678.6	(377.0)	665.5	(369.7)
452.9	701.5	(389.7)	695.3	(386.3)	679.9	(377.7)	666.6	(370.4)
453.0	703.3	(390.7)	696.9	(387.1)	681.1	(378.4)	667.8	(371.0)
453.1	705.2	(391.8)	698.5	(388.0)	682.4	(379.1)	668.9	(371.6)
453.2	707.0	(392.8)	700.1	(388.9)	683.7	(379.8)	670.1	(372.3)
453.3	708.9	(393.8)	701.7	(389.8)	685.0	(380.5)	671.2	(372.9)
453.4	710.8	(394.9)	703.4	(390.8)	686.3	(381.3)	672.4	(373.5)
453.5	712.8	(396.0)	705.2	(391.8)	687.6	(382.0)	673.5	(374.2)
453.6	714.7	(397.1)	706.9	(392.7)	689.0	(382.8)	674.7	(374.8)
453.7	716.7	(398.2)	708.7	(393.7)	690.5	(383.6)	675.8	(375.4)
453.8	718.6	(399.2)	710.6	(394.8)	692.0	(384.5)	676.9	(376.1)
453.9	720.7	(400.4)	712.6	(395.9)	693.6	(385.3)	678.1	(376.7)
454.0	722.9	(401.6)	714.6	(397.0)	695.3	(386.3)	679.3	(377.4)
454.1	725.4	(403.0)	716.7	(398.2)	697.1	(387.3)	680.6	(378.1)
454.2	728.0	(404.5)	718.9	(399.4)	698.9	(388.3)	681.9	(378.8)
454.3	730.9	(406.1)	721.1	(400.6)	700.7	(389.3)	683.3	(379.6)
454.4	733.9	(407.7)	723.3	(401.8)	702.6	(390.3)	684.7	(380.4)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(g) Station 85 in. (215.90 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	737.1	(409.5)	725.6	(403.1)	704.5	(391.4)	686.2	(381.2)
454.6	740.3	(411.3)	728.0	(404.4)	706.4	(392.5)	687.7	(382.1)
454.7	743.5	(413.1)	730.3	(405.7)	708.3	(393.5)	689.3	(383.0)
454.8	746.6	(414.8)	732.7	(407.1)	710.3	(394.6)	691.0	(383.9)
454.9	749.4	(416.3)	735.1	(408.4)	712.2	(395.7)	692.6	(384.8)
455.0	751.9	(417.7)	737.6	(409.8)	714.1	(396.7)	694.3	(385.7)
455.1	754.1	(418.9)	740.0	(411.1)	716.0	(397.8)	695.9	(386.6)
455.2	756.1	(420.0)	742.5	(412.5)	717.7	(398.7)	697.5	(387.5)
455.3	758.1	(421.1)	745.0	(413.9)	719.4	(399.7)	699.2	(388.4)
455.4	760.1	(422.3)	747.4	(415.2)	721.1	(400.6)	700.8	(389.3)
455.5	762.1	(423.4)	749.8	(416.6)	722.8	(401.6)	702.3	(390.2)
455.6	764.4	(424.7)	752.3	(417.9)	724.5	(402.5)	704.0	(391.1)
455.7	767.0	(426.1)	754.8	(419.3)	726.3	(403.5)	705.6	(392.0)
455.8	769.9	(427.7)	757.2	(420.7)	728.2	(404.5)	707.3	(393.0)
455.9	772.8	(429.3)	759.7	(422.1)	730.1	(405.6)	709.0	(393.9)
456.0	775.9	(431.1)	762.2	(423.4)	732.2	(406.8)	710.8	(394.9)
456.1	779.2	(432.9)	764.7	(424.8)	734.4	(408.0)	712.5	(395.8)
456.2	782.7	(434.8)	767.2	(426.2)	736.9	(409.4)	714.3	(396.8)
456.3	786.4	(436.9)	769.7	(427.6)	739.7	(411.0)	716.2	(397.9)
456.4	790.2	(439.0)	772.2	(429.0)	742.9	(412.7)	718.1	(398.9)
456.5	794.3	(441.3)	775.7	(431.0)	746.4	(414.7)	720.2	(400.1)
456.6	821.2	(456.2)	784.9	(436.0)	750.4	(416.9)	722.4	(401.3)
456.7	844.3	(469.0)	799.6	(444.2)	754.8	(419.3)	724.8	(402.7)
456.8	867.8	(482.1)	813.2	(451.8)	759.6	(422.0)	727.5	(404.2)
456.9	891.6	(495.4)	828.1	(460.1)	765.0	(425.0)	730.3	(405.7)
457.0	916.0	(508.9)	844.6	(469.2)	770.9	(428.3)	733.3	(407.4)
457.1	941.0	(522.8)	862.3	(479.1)	777.4	(431.9)	736.7	(409.3)
457.2	966.4	(536.9)	880.5	(489.2)	784.5	(435.8)	740.3	(411.3)
457.3	991.7	(550.9)	898.7	(499.3)	792.2	(440.1)	744.3	(413.5)
457.4	1016.6	(564.8)	916.6	(509.2)	800.4	(444.7)	748.5	(415.8)
457.5	1041.5	(578.6)	934.4	(519.1)	809.1	(449.5)	752.9	(418.3)
457.6	1066.2	(592.4)	952.4	(529.1)	818.3	(454.6)	757.7	(420.9)
457.7	1091.3	(606.3)	970.6	(539.2)	828.0	(460.0)	762.8	(423.8)
457.8	1116.2	(620.1)	989.1	(549.5)	838.1	(465.6)	768.3	(426.8)
457.9	1141.5	(634.2)	1008.2	(560.1)	848.7	(471.5)	774.1	(430.1)
458.0	1167.4	(648.6)	1027.7	(570.9)	859.9	(477.7)	780.3	(433.5)
458.1	1193.1	(662.8)	1047.6	(582.0)	871.4	(484.1)	787.0	(437.2)
458.2	1218.1	(676.7)	1067.8	(593.2)	883.4	(490.8)	794.0	(441.1)
458.3	1243.1	(690.6)	1088.1	(604.5)	895.8	(497.7)	801.4	(445.2)
458.4	1267.4	(704.1)	1108.8	(616.0)	908.4	(504.7)	809.1	(449.5)
458.5	1291.5	(717.5)	1129.6	(627.5)	921.3	(511.8)	817.0	(453.9)
458.6	1315.7	(730.9)	1150.3	(639.0)	934.5	(519.2)	825.2	(458.4)
458.7	1340.1	(744.5)	1170.6	(650.4)	948.0	(526.7)	833.7	(463.1)
458.8	1364.8	(758.2)	1190.7	(661.5)	961.7	(534.3)	842.4	(468.0)
458.9	1390.9	(772.7)	1210.7	(672.6)	975.7	(542.0)	851.5	(473.1)
459.0	1417.6	(787.6)	1230.9	(683.8)	989.8	(549.9)	860.9	(478.3)
459.1	1444.9	(802.7)	1251.6	(695.3)	1004.3	(557.9)	870.6	(483.7)
459.2	1472.9	(818.3)	1273.0	(707.2)	1018.9	(566.1)	880.5	(489.2)
459.3	1501.6	(834.2)	1295.3	(719.6)	1033.7	(574.3)	890.8	(494.9)
459.4			1318.4	(732.5)	1048.7	(582.6)	901.2	(500.7)
459.5			1341.9	(745.5)	1063.7	(591.0)	911.9	(506.6)
459.6			1365.3	(758.5)	1078.9	(599.4)	922.8	(512.7)
459.7			1387.8	(771.0)	1094.1	(607.8)	933.9	(518.8)
459.8			1409.6	(783.1)	1109.3	(616.3)	945.1	(525.0)
459.9			1430.8	(794.9)	1124.5	(624.7)	956.5	(531.4)
460.0			1451.5	(806.4)	1139.8	(633.2)	968.0	(537.8)
460.1			1472.0	(817.8)	1155.0	(641.6)	979.6	(544.2)
460.2			1492.3	(829.0)	1170.1	(650.0)	991.3	(550.7)
460.3			1512.6	(840.3)	1185.1	(658.4)	1003.0	(557.2)
460.4			1533.3	(851.8)	1200.1	(666.7)	1014.8	(563.8)
460.5			1554.2	(863.4)	1215.1	(675.1)	1026.7	(570.4)
460.6			1574.6	(874.8)	1230.1	(683.4)	1038.8	(577.1)
460.7			1594.0	(885.6)	1245.2	(691.8)	1051.0	(583.9)
460.8			1612.1	(895.6)	1260.2	(700.1)	1063.2	(590.7)
460.9			1629.0	(905.0)	1275.2	(708.4)	1075.7	(597.6)
461.0			1644.8	(913.8)	1290.2	(716.8)	1088.2	(604.6)
461.1			1659.6	(922.0)	1305.2	(725.1)	1100.8	(611.6)
461.2			1673.2	(929.6)	1320.2	(733.4)	1113.6	(618.7)
461.3			1685.9	(936.6)	1335.2	(741.8)	1126.5	(625.8)
461.4			1698.0	(943.4)	1350.2	(750.1)	1139.5	(633.1)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(h) Station 99 in. (251.46 cm), ray 0°.

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	602.9	(335.0)	604.8	(336.0)	600.3	(333.5)	599.3	(332.9)
444.0	609.6	(338.7)	609.4	(338.6)	605.5	(336.4)	602.9	(335.0)
445.0	614.2	(341.2)	614.4	(341.3)	610.6	(339.2)	607.1	(337.3)
446.0	618.2	(343.4)	618.4	(343.6)	613.5	(340.8)	610.4	(339.1)
447.0	624.6	(347.0)	624.0	(346.6)	618.2	(343.5)	614.8	(341.6)
448.0	634.3	(352.4)	632.8	(351.5)	625.5	(347.5)	621.8	(345.4)
448.1	635.4	(353.0)	633.7	(352.1)	626.2	(347.9)	622.5	(345.8)
448.2	636.5	(353.6)	634.6	(352.6)	627.0	(348.3)	623.1	(346.2)
448.3	637.5	(354.2)	635.5	(353.0)	627.8	(348.8)	623.8	(346.6)
448.4	638.4	(354.7)	636.3	(353.5)	628.6	(349.2)	624.4	(346.9)
448.5	639.2	(355.1)	637.1	(353.9)	629.4	(349.6)	625.1	(347.3)
448.6	639.9	(355.5)	637.8	(354.3)	630.1	(350.1)	625.7	(347.6)
448.7	640.6	(355.9)	638.6	(354.8)	630.9	(350.5)	626.3	(347.9)
448.8	641.3	(356.3)	639.4	(355.2)	631.7	(350.9)	626.9	(348.3)
448.9	642.1	(356.7)	640.1	(355.6)	632.5	(351.4)	627.5	(348.6)
449.0	642.9	(357.2)	640.9	(356.1)	633.2	(351.8)	628.0	(348.9)
449.1	643.9	(357.7)	641.8	(356.5)	634.0	(352.2)	628.6	(349.2)
449.2	645.0	(358.3)	642.6	(357.0)	634.7	(352.6)	629.2	(349.5)
449.3	646.2	(359.0)	643.5	(357.5)	635.5	(353.1)	629.8	(349.9)
449.4	647.4	(359.6)	644.5	(358.1)	636.3	(353.5)	630.4	(350.2)
449.5	648.6	(360.3)	645.5	(358.6)	637.1	(353.9)	631.1	(350.6)
449.6	649.8	(361.0)	646.5	(359.2)	637.9	(354.4)	631.7	(351.0)
449.7	651.1	(361.7)	647.6	(359.8)	638.7	(354.8)	632.4	(351.3)
449.8	652.4	(362.5)	648.7	(360.4)	639.6	(355.3)	633.0	(351.7)
449.9	653.8	(363.2)	649.8	(361.0)	640.5	(355.8)	633.7	(352.1)
450.0	655.2	(364.0)	650.9	(361.6)	641.4	(356.3)	634.4	(352.5)
450.1	656.5	(364.7)	652.1	(362.3)	642.3	(356.8)	635.2	(352.9)
450.2	657.8	(365.4)	653.3	(362.9)	643.3	(357.4)	635.9	(353.3)
450.3	659.0	(366.1)	654.4	(363.6)	644.3	(357.9)	636.7	(353.7)
450.4	660.1	(366.7)	655.6	(364.2)	645.3	(358.5)	637.5	(354.2)
450.5	661.1	(367.3)	656.8	(364.9)	646.4	(359.1)	638.4	(354.6)
450.6	662.1	(367.8)	658.0	(365.5)	647.5	(359.7)	639.2	(355.1)
450.7	663.0	(368.3)	659.1	(366.2)	648.6	(360.3)	640.1	(355.6)
450.8	663.9	(368.8)	660.3	(366.8)	649.8	(361.0)	641.0	(356.1)
450.9	664.9	(369.4)	661.4	(367.4)	651.0	(361.7)	642.0	(356.7)
451.0	666.0	(370.0)	662.5	(368.1)	652.2	(362.3)	643.0	(357.2)
451.1	667.1	(370.6)	663.7	(368.7)	653.4	(363.0)	644.0	(357.8)
451.2	668.3	(371.3)	664.9	(369.4)	654.6	(363.7)	645.0	(358.4)
451.3	669.5	(372.0)	666.1	(370.0)	655.8	(364.3)	646.1	(358.9)
451.4	670.8	(372.7)	667.3	(370.7)	657.0	(365.0)	647.1	(359.5)
451.5	672.2	(373.5)	668.5	(371.4)	658.1	(365.6)	648.1	(360.1)
451.6	673.7	(374.3)	669.8	(372.1)	659.3	(366.3)	649.2	(360.6)
451.7	675.2	(375.1)	671.0	(372.8)	660.5	(366.9)	650.2	(361.2)
451.8	676.7	(375.9)	672.3	(373.5)	661.6	(367.6)	651.3	(361.8)
451.9	678.2	(376.8)	673.6	(374.2)	662.7	(368.2)	652.4	(362.4)
452.0	679.8	(377.7)	675.0	(375.0)	663.8	(368.8)	653.4	(363.0)
452.1	681.5	(378.6)	676.3	(375.7)	664.8	(369.3)	654.4	(363.6)
452.2	683.2	(379.6)	677.7	(376.5)	665.8	(369.9)	655.5	(364.1)
452.3	685.0	(380.5)	679.1	(377.3)	666.8	(370.4)	656.5	(364.7)
452.4	686.7	(381.5)	680.5	(378.0)	667.8	(371.0)	657.5	(365.3)
452.5	688.4	(382.5)	681.8	(378.8)	668.7	(371.5)	658.5	(365.8)
452.6	690.1	(383.4)	683.2	(379.6)	669.7	(372.1)	659.6	(366.4)
452.7	691.8	(384.3)	684.6	(380.4)	670.7	(372.6)	660.6	(367.0)
452.8	693.4	(385.2)	686.1	(381.1)	671.7	(373.2)	661.6	(367.6)
452.9	694.9	(386.0)	687.5	(381.9)	672.7	(373.7)	662.6	(368.1)
453.0	696.4	(386.9)	688.9	(382.7)	673.8	(374.3)	663.6	(368.7)
453.1	697.8	(387.6)	690.4	(383.5)	674.9	(374.9)	664.7	(369.3)
453.2	699.1	(388.4)	691.9	(384.4)	676.0	(375.6)	665.7	(369.8)
453.3	700.6	(389.2)	693.5	(385.3)	677.2	(376.2)	666.8	(370.4)
453.4	702.0	(390.0)	695.2	(386.2)	678.5	(376.9)	667.9	(371.0)
453.5	703.7	(391.0)	696.9	(387.2)	679.8	(377.7)	669.0	(371.7)
453.6	705.6	(392.0)	698.7	(388.2)	681.1	(378.4)	670.2	(372.3)
453.7	707.8	(393.2)	700.6	(389.2)	682.6	(379.2)	671.3	(373.0)
453.8	709.9	(394.4)	702.5	(390.3)	684.1	(380.0)	672.5	(373.6)
453.9	712.4	(395.8)	704.6	(391.4)	685.6	(380.9)	673.7	(374.3)
454.0	715.0	(397.2)	706.7	(392.6)	687.3	(381.8)	675.0	(375.0)
454.1	717.7	(398.7)	708.8	(393.8)	689.0	(382.8)	676.3	(375.7)
454.2	720.6	(400.3)	711.0	(395.0)	690.8	(383.8)	677.6	(376.5)
454.3	723.7	(402.0)	713.3	(396.3)	692.6	(384.8)	679.0	(377.2)
454.4	726.7	(403.7)	715.6	(397.6)	694.4	(385.8)	680.4	(378.0)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(h) Station 99 in. (251.46 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	729.9	(405.5)	718.0	(398.9)	696.2	(386.8)	681.7	(378.7)
454.6	733.0	(407.2)	720.5	(400.3)	698.0	(387.8)	683.1	(379.5)
454.7	736.1	(408.9)	723.1	(401.7)	699.9	(388.8)	684.6	(380.3)
454.8	739.2	(410.7)	725.7	(403.2)	701.8	(389.9)	686.0	(381.1)
454.9	742.2	(412.3)	728.4	(404.7)	703.7	(391.0)	687.5	(382.0)
455.0	745.1	(413.9)	731.2	(406.2)	705.7	(392.1)	689.1	(382.8)
455.1	747.9	(415.5)	734.1	(407.8)	707.8	(393.2)	690.7	(383.7)
455.2	750.7	(417.1)	737.0	(409.5)	709.9	(394.4)	692.3	(384.6)
455.3	753.6	(418.7)	740.2	(411.2)	712.0	(395.6)	693.8	(385.5)
455.4	756.8	(420.4)	743.5	(413.1)	714.3	(396.8)	695.4	(386.4)
455.5	760.9	(422.7)	746.9	(414.9)	716.6	(398.1)	697.1	(387.3)
455.6	764.6	(424.8)	750.4	(416.9)	719.1	(399.5)	698.8	(388.2)
455.7	769.3	(427.4)	754.0	(418.9)	721.8	(401.0)	700.5	(389.2)
455.8	774.0	(430.0)	757.6	(420.9)	724.5	(402.5)	702.4	(390.2)
455.9	779.0	(432.8)	761.4	(423.0)	727.2	(404.0)	704.3	(391.3)
456.0	784.2	(435.7)	765.3	(425.2)	730.1	(405.6)	706.3	(392.4)
456.1	789.7	(438.7)	769.3	(427.4)	733.1	(407.3)	708.4	(393.5)
456.2	795.5	(441.9)	773.4	(429.7)	736.1	(408.9)	710.6	(394.8)
456.3	801.4	(445.2)	777.7	(432.0)	739.2	(410.7)	713.0	(396.1)
456.4	821.0	(456.1)	782.6	(434.8)	742.4	(412.5)	715.6	(397.5)
456.5	855.1	(475.0)	794.0	(441.1)	745.7	(414.3)	718.3	(399.1)
456.6	898.1	(499.0)	817.0	(453.9)	749.1	(416.2)	721.3	(400.7)
456.7	919.4	(510.8)	838.4	(465.8)	753.9	(418.8)	724.5	(402.5)
456.8	949.4	(527.4)	859.6	(477.6)	763.8	(424.4)	727.9	(404.4)
456.9	978.5	(543.6)	880.6	(489.2)	776.5	(431.4)	731.6	(406.5)
457.0	1006.9	(559.4)	901.1	(500.6)	786.2	(436.8)	735.6	(408.6)
457.1	1033.9	(574.4)	921.1	(511.7)	796.0	(442.2)	739.8	(411.0)
457.2	1056.7	(586.2)	940.6	(522.6)	806.1	(447.8)	744.5	(413.6)
457.3	1091.7	(606.5)	959.6	(533.1)	816.4	(453.6)	749.6	(416.4)
457.4	1104.0	(613.3)	978.0	(543.4)	827.0	(459.4)	755.0	(419.4)
457.5	1126.6	(625.9)	996.2	(553.4)	837.7	(465.4)	760.7	(422.6)
457.6	1149.9	(638.8)	1014.2	(563.5)	848.8	(471.5)	766.8	(426.0)
457.7	1173.6	(652.0)	1032.4	(573.6)	860.0	(477.8)	773.3	(429.6)
457.8	1197.4	(665.2)	1051.0	(583.9)	871.4	(484.1)	780.2	(433.4)
457.9	1221.0	(678.3)	1069.8	(594.3)	883.1	(490.6)	787.4	(437.4)
458.0	1244.2	(691.2)	1089.0	(605.0)	895.1	(497.3)	795.0	(441.6)
458.1	1267.5	(704.1)	1108.2	(615.7)	907.3	(504.0)	802.9	(446.1)
458.2	1291.0	(717.2)	1127.3	(626.3)	919.6	(510.9)	811.1	(450.6)
458.3	1315.1	(730.6)	1146.3	(636.8)	932.3	(517.9)	819.6	(455.3)
458.4	1339.2	(744.0)	1165.2	(647.3)	945.1	(525.1)	828.3	(460.2)
458.5	1363.0	(757.2)	1184.0	(657.8)	958.2	(532.3)	837.3	(465.2)
458.6	1386.4	(770.2)	1203.0	(668.4)	971.6	(539.8)	846.5	(470.3)
458.7	1409.8	(783.2)	1222.5	(679.2)	985.3	(547.4)	856.0	(475.5)
458.8	1433.9	(796.6)	1242.3	(690.2)	999.1	(555.1)	865.5	(480.8)
458.9	1459.0	(810.6)	1262.5	(701.4)	1013.2	(562.9)	875.2	(486.2)
459.0	1485.5	(825.3)	1283.3	(713.0)	1027.4	(570.8)	885.1	(491.7)
459.1	1513.0	(840.6)	1304.7	(724.8)	1041.8	(578.8)	895.0	(497.2)
459.2	1541.3	(856.3)	1326.5	(736.9)	1056.3	(586.9)	905.1	(502.8)
459.3	1570.0	(872.2)	1348.7	(749.3)	1071.0	(595.0)	915.2	(508.5)
459.4	1598.8	(888.2)	1371.3	(761.8)	1085.8	(603.2)	925.5	(514.2)
459.5	1627.5	(904.2)	1393.8	(774.4)	1100.7	(611.5)	935.8	(519.9)
459.6	1655.9	(920.0)	1416.2	(786.8)	1115.7	(619.8)	946.2	(525.7)
459.7	1683.5	(935.3)	1438.3	(799.1)	1130.7	(628.2)	956.7	(531.5)
459.8	1710.0	(950.0)	1460.0	(811.1)	1145.8	(636.5)	967.3	(537.4)
459.9	1735.7	(964.3)	1481.3	(822.9)	1160.9	(645.0)	978.0	(543.3)
460.0	1761.1	(978.4)	1502.3	(834.6)	1176.1	(653.4)	988.7	(549.3)
460.1	1786.2	(992.3)	1523.2	(846.2)	1191.4	(661.9)	999.5	(555.3)
460.2	1811.1	(1006.1)	1544.1	(857.8)	1206.7	(670.4)	1010.4	(561.4)
460.3	1836.4	(1020.2)	1565.1	(869.5)	1222.0	(678.9)	1021.5	(567.5)
460.4	1863.4	(1035.2)	1586.1	(881.2)	1237.4	(687.5)	1032.6	(573.6)
460.5	1892.6	(1051.5)	1607.3	(892.9)	1252.9	(696.0)	1043.8	(579.9)
460.6	1923.9	(1068.8)	1628.4	(904.7)	1268.4	(704.7)	1055.1	(586.1)
460.7	1956.2	(1086.8)	1649.3	(916.3)	1284.0	(713.3)	1066.4	(592.5)
460.8			1669.7	(927.6)	1299.7	(722.0)	1077.9	(598.8)
460.9			1689.3	(938.5)	1315.4	(730.8)	1089.5	(605.3)
461.0			1708.0	(948.9)	1331.1	(739.5)	1101.1	(611.7)
461.1			1725.5	(958.6)	1347.0	(748.3)	1112.9	(618.3)
461.2			1742.0	(967.8)	1362.9	(757.2)	1124.7	(624.8)
461.3			1757.7	(976.5)	1378.8	(766.0)	1136.6	(631.5)
461.4			1773.2	(985.1)	1394.9	(774.9)	1148.7	(638.2)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(i) Station 109 in. (276.86 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	601.7	(334.3)	603.5	(335.3)	600.8	(333.8)	598.6	(332.6)
444.0	609.7	(338.7)	608.1	(337.8)	605.1	(336.2)	603.1	(335.1)
445.0	613.0	(340.6)	612.4	(340.2)	608.6	(338.1)	606.1	(336.7)
446.0	616.4	(342.5)	616.1	(342.3)	612.0	(340.0)	608.1	(337.8)
447.0	623.7	(346.5)	622.1	(345.6)	617.6	(343.1)	613.4	(340.8)
448.0	633.0	(351.7)	630.0	(350.0)	623.5	(346.4)	619.0	(343.9)
448.1	634.0	(352.2)	630.8	(350.4)	624.1	(346.7)	619.5	(344.2)
448.2	635.0	(352.8)	631.5	(350.9)	624.7	(347.0)	620.1	(344.5)
448.3	636.0	(353.3)	632.3	(351.3)	625.3	(347.4)	620.6	(344.8)
448.4	636.8	(353.8)	633.0	(351.7)	625.9	(347.7)	621.1	(345.0)
448.5	637.7	(354.3)	633.8	(352.1)	626.6	(348.1)	621.6	(345.3)
448.6	638.4	(354.7)	634.6	(352.5)	627.2	(348.5)	622.1	(345.6)
448.7	639.2	(355.1)	635.3	(352.9)	628.0	(348.9)	622.6	(345.9)
448.8	640.0	(355.6)	636.1	(353.4)	628.7	(349.3)	623.1	(346.2)
448.9	640.8	(356.0)	636.8	(353.8)	629.4	(349.7)	623.6	(346.5)
449.0	641.6	(356.4)	637.6	(354.2)	630.1	(350.1)	624.2	(346.8)
449.1	642.5	(356.9)	638.4	(354.7)	630.9	(350.5)	624.8	(347.1)
449.2	643.4	(357.4)	639.3	(355.1)	631.7	(351.0)	625.4	(347.4)
449.3	644.4	(358.0)	640.1	(355.6)	632.6	(351.4)	626.1	(347.8)
449.4	645.5	(358.6)	641.0	(356.1)	633.4	(351.9)	626.9	(348.3)
449.5	646.6	(359.2)	641.9	(356.6)	634.3	(352.4)	627.6	(348.7)
449.6	647.6	(359.8)	642.9	(357.2)	635.1	(352.8)	628.4	(349.1)
449.7	648.7	(360.4)	643.8	(357.7)	635.9	(353.3)	629.3	(349.6)
449.8	649.7	(361.0)	644.8	(358.2)	636.8	(353.8)	630.2	(350.1)
449.9	650.8	(361.6)	645.9	(358.8)	637.6	(354.2)	631.1	(350.6)
450.0	651.9	(362.2)	646.9	(359.4)	638.4	(354.7)	632.0	(351.1)
450.1	652.9	(362.7)	648.0	(360.0)	639.2	(355.1)	632.9	(351.6)
450.2	654.0	(363.3)	649.1	(360.6)	640.0	(355.6)	633.8	(352.1)
450.3	655.0	(363.9)	650.2	(361.2)	640.8	(356.0)	634.8	(352.6)
450.4	656.0	(364.5)	651.3	(361.8)	641.6	(356.4)	635.7	(353.2)
450.5	657.0	(365.0)	652.4	(362.4)	642.4	(356.9)	636.7	(353.7)
450.6	658.0	(365.6)	653.5	(363.1)	643.2	(357.3)	637.8	(354.3)
450.7	659.0	(366.1)	654.7	(363.7)	644.0	(357.8)	638.8	(354.9)
450.8	659.9	(366.6)	655.8	(364.3)	644.9	(358.3)	639.8	(355.4)
450.9	660.9	(367.2)	657.0	(365.0)	645.8	(358.8)	640.7	(355.9)
451.0	662.0	(367.8)	658.2	(365.7)	646.8	(359.3)	641.6	(356.5)
451.1	663.1	(368.4)	659.5	(366.4)	647.8	(359.9)	642.5	(357.0)
451.2	664.3	(369.0)	660.7	(367.1)	648.9	(360.5)	643.4	(357.4)
451.3	665.6	(369.8)	662.0	(367.8)	649.9	(361.1)	644.2	(357.9)
451.4	666.9	(370.5)	663.2	(368.5)	651.0	(361.6)	645.1	(358.4)
451.5	668.3	(371.3)	664.5	(369.2)	652.1	(362.3)	645.9	(358.9)
451.6	669.8	(372.1)	665.8	(369.9)	653.3	(362.9)	646.8	(359.3)
451.7	671.3	(373.0)	667.1	(370.6)	654.5	(363.6)	647.7	(359.8)
451.8	673.0	(373.9)	668.4	(371.3)	655.7	(364.3)	648.6	(360.3)
451.9	674.6	(374.8)	669.7	(372.0)	657.0	(365.0)	649.5	(360.8)
452.0	676.1	(375.6)	671.0	(372.8)	658.2	(365.7)	650.4	(361.3)
452.1	677.7	(376.5)	672.3	(373.5)	659.4	(366.4)	651.3	(361.8)
452.2	679.2	(377.3)	673.5	(374.2)	660.7	(367.0)	652.2	(362.3)
452.3	680.7	(378.2)	674.8	(374.9)	661.9	(367.7)	653.1	(362.9)
452.4	682.2	(379.0)	676.0	(375.6)	663.1	(368.4)	654.1	(363.4)
452.5	683.6	(379.8)	677.3	(376.3)	664.3	(369.1)	655.0	(363.9)
452.6	685.0	(380.6)	678.5	(376.9)	665.5	(369.7)	655.9	(364.4)
452.7	686.4	(381.4)	679.7	(377.6)	666.7	(370.4)	656.9	(364.9)
452.8	687.9	(382.2)	681.0	(378.3)	667.9	(371.1)	657.9	(365.5)
452.9	689.3	(383.0)	682.2	(379.0)	669.1	(371.7)	658.9	(366.0)
453.0	690.7	(383.7)	683.4	(379.7)	670.2	(372.3)	659.9	(366.6)
453.1	692.1	(384.5)	684.7	(380.4)	671.3	(373.0)	660.9	(367.1)
453.2	693.4	(385.2)	686.1	(381.2)	672.5	(373.6)	661.9	(367.7)
453.3	694.8	(386.0)	687.5	(382.0)	673.6	(374.2)	662.9	(368.2)
453.4	696.3	(386.8)	689.1	(382.8)	674.9	(374.9)	663.9	(368.8)
453.5	697.9	(387.7)	690.8	(383.8)	676.1	(375.6)	664.9	(369.4)
453.6	699.6	(388.7)	692.6	(384.8)	677.4	(376.3)	666.0	(370.0)
453.7	701.7	(389.8)	694.5	(385.8)	678.8	(377.1)	667.1	(370.6)
453.8	704.0	(391.1)	696.5	(387.0)	680.1	(377.8)	668.3	(371.3)
453.9	706.7	(392.6)	698.7	(388.2)	681.6	(378.6)	669.5	(371.9)
454.0	709.7	(394.3)	701.0	(389.5)	683.1	(379.5)	670.8	(372.7)
454.1	712.9	(396.0)	703.5	(390.8)	684.7	(380.4)	672.1	(373.4)
454.2	716.2	(397.9)	706.1	(392.3)	686.3	(381.3)	673.5	(374.2)
454.3	719.9	(399.9)	709.0	(393.9)	688.0	(382.2)	674.9	(374.9)
454.4	724.0	(402.2)	711.9	(395.5)	689.8	(383.2)	676.3	(375.7)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(i) Station 109 in. (276.86 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	728.3	(404.6)	715.1	(397.3)	691.8	(384.3)	677.8	(376.5)
454.6	732.7	(407.0)	718.3	(399.1)	693.8	(385.4)	679.3	(377.4)
454.7	737.1	(409.5)	721.8	(401.0)	695.9	(386.6)	680.8	(378.2)
454.8	741.9	(412.2)	725.5	(403.0)	698.2	(387.9)	682.4	(379.1)
454.9	746.8	(414.9)	729.3	(405.2)	700.5	(389.2)	684.1	(380.0)
455.0	752.0	(417.8)	733.3	(407.4)	703.1	(390.6)	685.7	(381.0)
455.1	757.1	(420.6)	737.4	(409.7)	705.7	(392.1)	687.4	(381.9)
455.2	762.8	(423.8)	741.7	(412.1)	708.5	(393.6)	689.2	(382.9)
455.3	769.0	(427.2)	746.2	(414.5)	711.4	(395.2)	690.9	(383.9)
455.4	775.3	(430.7)	750.8	(417.1)	714.4	(396.9)	692.8	(384.9)
455.5	781.8	(434.3)	755.6	(419.8)	717.6	(398.6)	694.7	(386.0)
455.6	788.7	(438.1)	760.5	(422.5)	720.8	(400.4)	696.8	(387.1)
455.7	795.8	(442.1)	765.6	(425.4)	724.2	(402.3)	698.9	(388.3)
455.8	803.2	(446.2)	770.9	(428.3)	727.7	(404.3)	701.3	(389.6)
455.9	810.9	(450.5)	776.3	(431.3)	731.3	(406.3)	703.7	(391.0)
456.0	818.5	(460.3)	783.8	(435.4)	735.0	(408.3)	706.4	(392.4)
456.1	848.1	(471.2)	798.6	(443.7)	738.8	(410.5)	709.3	(394.1)
456.2	868.9	(482.7)	813.6	(452.0)	742.8	(412.6)	712.5	(395.9)
456.3	892.3	(495.7)	829.2	(460.6)	747.8	(415.4)	716.0	(397.8)
456.4	918.5	(510.3)	845.4	(469.7)	756.4	(420.2)	719.7	(399.9)
456.5	946.4	(525.8)	862.5	(479.2)	765.3	(425.2)	723.8	(402.1)
456.6	973.9	(541.1)	880.3	(489.1)	774.4	(430.2)	728.2	(404.5)
456.7	999.6	(555.3)	898.4	(499.1)	783.6	(435.4)	732.8	(407.1)
456.8	1023.3	(568.5)	916.6	(509.2)	793.1	(440.6)	737.8	(409.9)
456.9	1045.4	(580.8)	934.5	(519.1)	802.8	(446.0)	743.0	(412.8)
457.0	1066.2	(592.3)	952.0	(528.9)	812.6	(451.4)	748.5	(415.8)
457.1	1086.3	(603.5)	969.2	(538.4)	822.7	(457.0)	754.4	(419.1)
457.2	1106.1	(614.5)	986.3	(547.9)	832.9	(462.7)	760.5	(422.5)
457.3	1126.1	(625.6)	1003.2	(557.3)	843.4	(468.5)	766.8	(426.0)
457.4	1146.1	(636.7)	1020.2	(566.8)	854.1	(474.5)	773.5	(429.7)
457.5	1166.6	(648.1)	1037.3	(576.3)	864.9	(480.5)	780.3	(433.5)
457.6	1187.7	(659.8)	1054.4	(585.8)	876.0	(486.6)	787.4	(437.4)
457.7	1209.1	(671.7)	1071.5	(595.3)	887.2	(492.9)	794.6	(441.5)
457.8	1230.6	(683.7)	1088.5	(604.7)	898.7	(499.3)	802.1	(445.6)
457.9	1252.1	(695.6)	1105.5	(614.2)	910.3	(505.7)	809.9	(449.9)
458.0	1273.7	(707.6)	1122.5	(623.6)	922.1	(512.3)	817.9	(454.4)
458.1	1295.5	(719.7)	1139.6	(633.1)	934.1	(518.9)	826.1	(459.0)
458.2	1317.7	(732.0)	1156.8	(642.7)	946.2	(525.7)	834.6	(463.7)
458.3	1340.1	(744.5)	1174.4	(652.5)	958.5	(532.5)	843.3	(468.5)
458.4	1362.7	(757.1)	1192.4	(662.4)	970.9	(539.4)	852.3	(473.5)
458.5	1385.4	(769.6)	1210.8	(672.7)	983.4	(546.4)	861.4	(478.6)
458.6	1408.5	(782.5)	1229.9	(683.3)	996.2	(553.4)	870.7	(483.7)
458.7	1432.8	(796.0)	1249.3	(694.1)	1009.0	(560.6)	880.4	(489.1)
458.8	1458.7	(810.4)	1269.1	(705.0)	1022.1	(567.9)	890.2	(494.6)
458.9	1485.7	(825.4)	1289.1	(716.1)	1035.5	(575.3)	900.2	(500.1)
459.0	1513.1	(840.6)	1309.2	(727.4)	1049.1	(582.8)	910.5	(505.8)
459.1	1540.6	(855.9)	1329.7	(738.7)	1062.8	(590.5)	920.9	(511.6)
459.2	1568.1	(871.1)	1350.4	(750.2)	1076.8	(598.2)	931.5	(517.5)
459.3	1595.9	(886.6)	1371.5	(761.9)	1091.0	(606.1)	942.2	(523.5)
459.4	1624.2	(902.3)	1393.1	(773.9)	1105.2	(614.0)	953.1	(529.5)
459.5	1653.0	(918.3)	1415.1	(786.2)	1119.7	(622.1)	964.1	(535.6)
459.6	1681.7	(934.3)	1437.4	(798.6)	1134.5	(630.3)	975.1	(541.7)
459.7	1710.2	(950.1)	1459.9	(811.1)	1149.5	(638.6)	986.2	(547.9)
459.8	1738.1	(965.6)	1482.4	(823.5)	1164.6	(647.0)	997.4	(554.1)
459.9	1765.2	(980.7)	1504.4	(835.8)	1179.9	(655.5)	1008.7	(560.4)
460.0	1791.7	(995.4)	1526.1	(847.8)	1195.3	(664.1)	1020.0	(566.6)
460.1	1817.9	(1010.9)	1547.3	(859.6)	1210.8	(672.7)	1031.2	(572.9)
460.2	1844.0	(1024.5)	1568.3	(871.3)	1226.4	(681.3)	1042.5	(579.2)
460.3	1870.6	(1039.2)	1589.1	(882.8)	1242.0	(690.0)	1053.7	(585.4)
460.4	1898.2	(1054.5)	1610.1	(894.5)	1257.7	(698.7)	1065.0	(591.7)
460.5	1926.4	(1070.2)	1631.3	(906.3)	1273.3	(707.4)	1076.3	(598.0)
460.6	1954.2	(1085.7)	1652.7	(918.2)	1288.9	(716.1)	1087.7	(604.3)
460.7	1980.9	(1100.5)	1674.2	(930.1)	1304.6	(724.8)	1099.1	(610.6)
460.8	2006.8	(1114.9)	1695.3	(941.8)	1320.3	(733.5)	1110.5	(616.9)
460.9	2032.4	(1129.1)	1715.7	(953.2)	1336.1	(742.3)	1121.9	(623.3)
461.0			1735.3	(964.0)	1351.8	(751.0)	1133.4	(629.7)
461.1			1753.8	(974.3)	1367.7	(759.8)	1144.9	(636.1)
461.2			1771.5	(984.2)	1383.5	(768.6)	1156.5	(642.5)
461.3			1788.6	(993.6)	1399.4	(777.4)	1168.1	(648.9)
461.4			1805.4	(1003.0)	1415.3	(786.3)	1179.7	(655.4)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(j) Station 121 in. (307.34 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	599.6	(333.1)	601.8	(334.3)	600.5	(333.6)	597.0	(331.7)
444.0	607.0	(337.2)	604.4	(335.8)	603.2	(335.1)	600.0	(333.3)
445.0	611.1	(339.5)	607.1	(337.3)	605.8	(336.5)	603.8	(335.4)
446.0	613.1	(340.6)	611.8	(339.9)	608.7	(338.2)	606.5	(336.9)
447.0	621.1	(345.0)	617.1	(342.8)	613.9	(341.1)	609.6	(338.7)
448.0	630.1	(350.1)	626.9	(348.3)	621.9	(345.5)	617.2	(342.9)
448.1	631.0	(350.6)	627.9	(348.8)	622.5	(345.8)	617.9	(343.3)
448.2	631.8	(351.0)	628.7	(349.3)	623.0	(346.1)	618.5	(343.6)
448.3	632.4	(351.4)	629.5	(349.7)	623.5	(346.4)	619.1	(343.9)
448.4	633.1	(351.7)	630.2	(350.1)	624.1	(346.7)	619.6	(344.2)
448.5	633.7	(352.1)	630.9	(350.5)	624.5	(347.0)	620.2	(344.5)
448.6	634.4	(352.5)	631.5	(350.8)	625.0	(347.2)	620.7	(344.8)
448.7	635.2	(352.9)	632.1	(351.2)	625.4	(347.5)	621.1	(345.0)
448.8	636.0	(353.3)	632.7	(351.5)	625.9	(347.7)	621.5	(345.3)
448.9	636.8	(353.8)	633.3	(351.8)	626.4	(348.0)	621.9	(345.5)
449.0	637.7	(354.3)	633.8	(352.1)	626.9	(348.3)	622.2	(345.7)
449.1	638.6	(354.8)	634.3	(352.4)	627.5	(348.6)	622.6	(345.9)
449.2	639.5	(355.3)	634.8	(352.6)	628.0	(348.9)	623.0	(346.1)
449.3	640.4	(355.8)	635.2	(352.9)	628.6	(349.2)	623.3	(346.3)
449.4	641.3	(356.3)	635.7	(353.2)	629.2	(349.6)	623.7	(346.5)
449.5	642.2	(356.8)	636.3	(353.5)	629.9	(349.9)	624.0	(346.7)
449.6	643.2	(357.3)	637.0	(353.9)	630.6	(350.3)	624.5	(346.9)
449.7	644.3	(357.9)	637.7	(354.3)	631.4	(350.8)	625.0	(347.2)
449.8	645.3	(358.5)	638.6	(354.8)	632.3	(351.3)	625.5	(347.5)
449.9	646.4	(359.1)	639.6	(355.3)	633.3	(351.9)	626.1	(347.8)
450.0	647.5	(359.7)	640.6	(355.9)	634.4	(352.5)	626.8	(348.2)
450.1	648.6	(360.3)	641.8	(356.5)	635.6	(353.1)	627.6	(348.7)
450.2	649.6	(360.9)	642.9	(357.1)	636.7	(353.7)	628.5	(349.2)
450.3	650.6	(361.4)	644.0	(357.8)	637.8	(354.3)	629.4	(349.7)
450.4	651.5	(361.9)	645.1	(358.4)	638.9	(355.0)	630.3	(350.2)
450.5	652.4	(362.4)	646.3	(359.1)	640.0	(355.6)	631.2	(350.7)
450.6	653.2	(362.9)	647.5	(359.7)	641.1	(356.1)	632.1	(351.2)
450.7	654.1	(363.4)	648.6	(360.3)	642.1	(356.7)	633.0	(351.7)
450.8	655.0	(363.9)	649.7	(360.9)	643.1	(357.3)	633.9	(352.2)
450.9	655.9	(364.4)	650.8	(361.5)	644.0	(357.8)	634.9	(352.7)
451.0	656.9	(364.9)	651.9	(362.2)	644.9	(358.3)	635.8	(353.2)
451.1	657.9	(365.5)	653.1	(362.8)	645.8	(358.8)	636.7	(353.7)
451.2	659.1	(366.2)	654.3	(363.5)	646.7	(359.3)	637.6	(354.2)
451.3	660.3	(366.8)	655.5	(364.2)	647.7	(359.8)	638.5	(354.7)
451.4	661.7	(367.6)	656.5	(364.7)	648.6	(360.3)	639.4	(355.2)
451.5	663.1	(368.4)	657.5	(365.3)	649.4	(360.8)	640.2	(355.7)
451.6	664.7	(369.3)	658.4	(365.8)	650.2	(361.2)	641.0	(356.1)
451.7	666.2	(370.1)	659.4	(366.3)	651.0	(361.7)	641.7	(356.5)
451.8	667.8	(371.0)	660.5	(366.9)	651.9	(362.1)	642.4	(356.9)
451.9	669.3	(371.8)	661.5	(367.5)	652.7	(362.6)	643.2	(357.3)
452.0	670.7	(372.6)	662.6	(368.1)	653.6	(363.1)	644.0	(357.8)
452.1	672.0	(373.3)	663.7	(368.7)	654.6	(363.7)	644.8	(358.2)
452.2	673.3	(374.0)	664.8	(369.3)	655.6	(364.2)	645.6	(358.6)
452.3	674.5	(374.7)	666.0	(370.0)	656.7	(364.9)	646.4	(359.1)
452.4	675.8	(375.4)	667.2	(370.7)	658.0	(365.5)	647.4	(359.6)
452.5	677.2	(376.2)	668.4	(371.3)	659.2	(366.2)	648.4	(360.2)
452.6	678.6	(377.0)	669.6	(372.0)	660.4	(366.9)	649.5	(360.8)
452.7	680.2	(377.9)	670.9	(372.7)	661.5	(367.5)	650.5	(361.4)
452.8	681.9	(378.8)	672.2	(373.4)	662.6	(368.1)	651.5	(362.0)
452.9	683.7	(379.8)	673.6	(374.2)	663.8	(368.8)	652.5	(362.5)
453.0	685.4	(380.8)	675.1	(375.0)	665.0	(369.4)	653.6	(363.1)
453.1	687.1	(381.7)	676.6	(375.9)	666.1	(370.0)	654.7	(363.7)
453.2	688.8	(382.6)	678.1	(376.7)	667.1	(370.6)	655.7	(364.3)
453.3	690.3	(383.5)	679.7	(377.6)	668.1	(371.2)	656.7	(364.8)
453.4	692.0	(384.4)	681.5	(378.6)	669.0	(371.7)	657.7	(365.4)
453.5	693.6	(385.3)	683.4	(379.7)	670.0	(372.2)	658.7	(365.9)
453.6	695.6	(386.4)	685.4	(380.8)	671.1	(372.8)	659.8	(366.5)
453.7	698.0	(387.8)	687.4	(381.9)	672.2	(373.4)	660.9	(367.1)
453.8	700.8	(389.4)	689.6	(383.1)	673.3	(374.0)	662.0	(367.8)
453.9	704.1	(391.2)	691.8	(384.3)	674.4	(374.7)	663.0	(368.3)
454.0	708.1	(393.4)	694.1	(385.6)	675.7	(375.4)	664.1	(368.9)
454.1	712.0	(395.5)	696.5	(386.9)	677.1	(376.2)	665.2	(369.5)
454.2	717.8	(398.8)	698.9	(388.3)	678.8	(377.1)	666.3	(370.2)
454.3	724.1	(402.3)	701.5	(389.7)	680.6	(378.1)	667.5	(370.8)
454.4	731.2	(406.2)	704.1	(391.2)	682.7	(379.3)	668.8	(371.6)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(j) Station 121 in. (307.34 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	739.0	(410.5)	706.8	(392.7)	685.1	(380.6)	670.3	(372.4)
454.6	747.5	(415.3)	710.7	(394.8)	687.8	(382.1)	671.7	(373.2)
454.7	756.8	(420.5)	719.2	(399.5)	690.9	(383.8)	673.3	(374.1)
454.8	764.4	(424.7)	727.5	(404.2)	694.4	(385.8)	675.0	(375.0)
454.9	773.6	(429.8)	735.8	(408.8)	698.2	(387.9)	676.9	(376.1)
455.0	786.3	(436.8)	744.3	(413.5)	702.3	(390.2)	678.9	(377.2)
455.1	799.0	(443.9)	753.2	(418.4)	706.8	(392.7)	681.1	(378.4)
455.2	811.8	(451.0)	762.6	(423.7)	711.7	(395.4)	683.3	(379.6)
455.3	824.9	(458.3)	772.6	(429.2)	716.9	(398.3)	685.8	(381.0)
455.4	838.8	(466.0)	783.4	(435.2)	722.5	(401.4)	688.5	(382.5)
455.5	853.8	(474.3)	795.1	(441.7)	728.4	(404.7)	691.4	(384.1)
455.6	870.3	(483.5)	807.5	(448.6)	734.7	(408.1)	694.5	(385.8)
455.7	888.3	(493.5)	820.7	(455.9)	741.2	(411.8)	697.8	(387.6)
455.8	907.2	(504.0)	834.6	(463.7)	748.1	(415.6)	701.4	(389.7)
455.9	927.0	(515.0)	849.0	(471.7)	755.3	(419.6)	705.5	(391.9)
456.0	947.7	(526.5)	863.8	(479.9)	762.9	(423.8)	709.9	(394.4)
456.1	969.4	(538.5)	878.8	(488.2)	770.8	(428.2)	714.6	(397.0)
456.2	991.2	(550.7)	893.8	(496.6)	779.0	(432.8)	719.7	(399.8)
456.3	1012.0	(562.2)	908.8	(504.9)	787.5	(437.5)	725.0	(402.8)
456.4	1030.6	(572.5)	923.7	(513.1)	796.3	(442.4)	730.8	(406.0)
456.5	1047.2	(581.8)	938.4	(521.3)	805.3	(447.4)	736.9	(409.4)
456.6	1062.9	(590.5)	952.9	(529.4)	814.6	(452.6)	743.2	(412.9)
456.7	1078.5	(599.2)	967.4	(537.4)	824.1	(457.8)	749.8	(416.5)
456.8	1094.6	(608.1)	981.9	(545.5)	833.8	(463.2)	756.8	(420.4)
456.9	1111.1	(617.3)	996.6	(553.6)	843.7	(468.7)	764.0	(424.4)
457.0	1128.1	(626.7)	1011.4	(561.9)	853.9	(474.4)	771.4	(428.6)
457.1	1145.7	(636.5)	1026.5	(570.3)	864.4	(480.2)	778.9	(432.7)
457.2	1163.3	(646.3)	1041.7	(578.7)	875.0	(486.1)	786.5	(436.9)
457.3	1180.6	(655.9)	1057.0	(587.2)	885.8	(492.1)	794.3	(441.3)
457.4	1197.5	(665.3)	1072.4	(595.8)	896.9	(498.3)	802.2	(445.6)
457.5	1214.9	(675.0)	1087.7	(604.3)	908.0	(504.4)	810.1	(450.0)
457.6	1233.8	(685.4)	1102.9	(612.7)	919.3	(510.7)	818.0	(454.5)
457.7	1254.3	(696.8)	1118.0	(621.1)	930.8	(517.1)	826.2	(459.0)
457.8	1275.3	(708.5)	1133.1	(629.5)	942.3	(523.5)	834.4	(463.6)
457.9	1296.0	(720.0)	1148.3	(637.9)	954.0	(530.0)	842.7	(468.2)
458.0	1316.1	(731.1)	1163.6	(646.4)	965.7	(536.5)	851.1	(472.8)
458.1	1336.3	(742.4)	1179.1	(655.1)	977.6	(543.1)	859.4	(477.5)
458.2	1357.4	(754.1)	1195.2	(664.0)	989.5	(549.7)	868.0	(482.2)
458.3	1379.5	(766.4)	1211.8	(673.2)	1001.5	(556.4)	876.7	(487.1)
458.4	1402.0	(778.9)	1229.0	(682.8)	1013.7	(563.2)	885.6	(492.0)
458.5	1424.6	(791.4)	1247.0	(692.8)	1026.0	(570.0)	894.6	(497.0)
458.6	1447.2	(804.0)	1265.7	(703.1)	1038.4	(576.9)	903.7	(502.1)
458.7	1470.3	(816.9)	1284.9	(713.9)	1051.0	(583.9)	913.1	(507.3)
458.8	1494.2	(830.1)	1304.7	(724.8)	1063.7	(590.9)	922.6	(512.5)
458.9	1519.2	(844.0)	1324.9	(736.1)	1076.5	(598.1)	932.3	(517.9)
459.0	1545.6	(858.7)	1345.5	(747.5)	1089.6	(605.3)	942.1	(523.4)
459.1	1573.6	(874.2)	1366.3	(759.1)	1102.8	(612.7)	952.1	(528.9)
459.2	1602.9	(890.5)	1387.4	(770.8)	1116.3	(620.2)	962.3	(534.6)
459.3	1632.6	(907.0)	1408.8	(782.7)	1129.9	(627.7)	972.6	(540.3)
459.4	1661.7	(923.2)	1430.5	(794.7)	1143.8	(635.4)	983.1	(546.2)
459.5	1689.8	(938.8)	1452.3	(806.9)	1158.0	(643.3)	993.6	(552.0)
459.6	1717.1	(954.0)	1474.3	(819.1)	1172.4	(651.3)	1004.2	(557.9)
459.7	1744.1	(968.9)	1496.3	(831.3)	1187.1	(659.5)	1014.9	(563.9)
459.8	1770.7	(983.7)	1518.3	(843.5)	1202.1	(667.8)	1025.8	(569.9)
459.9	1797.1	(998.4)	1540.0	(855.6)	1217.3	(676.3)	1036.7	(575.9)
460.0	1823.3	(1013.0)	1561.6	(867.6)	1232.7	(684.8)	1047.5	(582.0)
460.1	1849.8	(1027.7)	1583.1	(879.5)	1248.3	(693.5)	1058.4	(588.0)
460.2	1876.9	(1042.7)	1604.6	(891.4)	1264.2	(702.3)	1069.4	(594.1)
460.3	1905.3	(1058.5)	1626.3	(903.5)	1280.4	(711.3)	1080.5	(600.3)
460.4	1934.7	(1074.9)	1648.3	(915.7)	1296.7	(720.4)	1091.6	(606.5)
460.5	1964.1	(1091.2)	1670.9	(928.3)	1313.3	(729.6)	1102.8	(612.7)
460.6	1992.2	(1106.8)	1693.8	(941.0)	1330.2	(739.0)	1114.1	(618.9)
460.7	2018.6	(1121.5)	1717.0	(953.9)	1347.3	(748.5)	1125.4	(625.2)
460.8					1364.6	(758.1)	1136.9	(631.6)
460.9					1382.2	(767.9)	1148.3	(638.0)
461.0					1400.0	(777.8)	1159.9	(644.4)
461.1							1171.5	(650.8)
461.2								
461.3								
461.4								

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(k) Station 133 in. (337.82 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	596.9	(331.6)	595.7	(330.9)	594.8	(330.5)	593.3	(329.6)
444.0	603.8	(335.4)	600.8	(333.8)	595.9	(331.1)	594.8	(330.5)
445.0	606.6	(337.0)	605.2	(336.2)	598.0	(332.2)	597.9	(332.2)
446.0	610.0	(338.9)	606.3	(336.8)	602.3	(334.6)	601.4	(334.1)
447.0	616.1	(342.3)	610.9	(339.4)	605.9	(336.6)	605.6	(336.4)
448.0	624.3	(346.8)	619.7	(344.3)	613.9	(341.1)	611.8	(339.9)
448.1	625.1	(347.3)	620.6	(344.8)	614.7	(341.5)	612.3	(340.2)
448.2	626.0	(347.8)	621.4	(345.2)	615.6	(342.0)	612.8	(340.4)
448.3	626.9	(348.3)	622.2	(345.7)	616.4	(342.5)	613.2	(340.7)
448.4	627.8	(348.8)	623.0	(346.1)	617.2	(342.9)	613.6	(340.9)
448.5	628.7	(349.3)	623.7	(346.5)	617.8	(343.2)	613.9	(341.1)
448.6	629.5	(349.7)	624.3	(346.9)	618.4	(343.6)	614.2	(341.2)
448.7	630.4	(350.2)	625.0	(347.2)	619.0	(343.9)	614.5	(341.4)
448.8	631.2	(350.7)	625.7	(347.6)	619.5	(344.2)	614.9	(341.6)
448.9	632.0	(351.1)	626.3	(347.9)	619.9	(344.4)	615.3	(341.8)
449.0	632.8	(351.5)	626.8	(348.2)	620.3	(344.6)	615.7	(342.0)
449.1	633.4	(351.9)	627.4	(348.6)	620.6	(344.8)	616.0	(342.2)
449.2	634.0	(352.2)	628.0	(348.9)	620.9	(344.9)	616.3	(342.4)
449.3	634.6	(352.6)	628.5	(349.2)	621.2	(345.1)	616.6	(342.6)
449.4	635.4	(353.0)	629.0	(349.5)	621.5	(345.3)	617.0	(342.8)
449.5	636.1	(353.4)	629.6	(349.8)	621.9	(345.5)	617.4	(343.0)
449.6	637.0	(353.9)	630.2	(350.1)	622.3	(345.7)	617.9	(343.3)
449.7	637.9	(354.4)	631.0	(350.5)	622.8	(346.0)	618.3	(343.5)
449.8	638.9	(355.0)	631.8	(351.0)	623.5	(346.4)	618.9	(343.8)
449.9	640.1	(355.6)	632.7	(351.5)	624.4	(346.9)	619.6	(344.2)
450.0	641.3	(356.3)	633.6	(352.0)	625.3	(347.4)	620.4	(344.7)
450.1	642.5	(357.0)	634.5	(352.5)	626.3	(347.9)	621.1	(345.1)
450.2	643.7	(357.6)	635.5	(353.1)	627.3	(348.5)	621.9	(345.5)
450.3	644.7	(358.2)	636.5	(353.6)	628.3	(349.1)	622.7	(345.9)
450.4	645.6	(358.7)	637.6	(354.2)	629.3	(349.6)	623.4	(346.3)
450.5	646.5	(359.2)	638.6	(354.8)	630.4	(350.2)	624.2	(346.8)
450.6	647.3	(359.6)	639.7	(355.4)	631.5	(350.8)	624.9	(347.2)
450.7	648.0	(360.0)	640.8	(356.0)	632.5	(351.4)	625.6	(347.6)
450.8	648.8	(360.5)	641.9	(356.6)	633.5	(352.0)	626.3	(348.0)
450.9	649.7	(361.0)	643.1	(357.3)	634.6	(352.5)	627.1	(348.4)
451.0	650.6	(361.5)	644.3	(357.9)	635.6	(353.1)	627.9	(348.8)
451.1	651.6	(362.0)	645.4	(358.6)	636.6	(353.7)	628.8	(349.3)
451.2	652.6	(362.5)	646.5	(359.2)	637.5	(354.2)	629.7	(349.8)
451.3	653.7	(363.2)	647.7	(359.8)	638.3	(354.6)	630.5	(350.3)
451.4	654.8	(363.8)	648.8	(360.4)	639.0	(355.0)	631.4	(350.8)
451.5	656.0	(364.5)	650.0	(361.1)	639.7	(355.4)	632.3	(351.3)
451.6	657.3	(365.2)	651.1	(361.7)	640.4	(355.8)	633.2	(351.8)
451.7	658.6	(365.9)	652.2	(362.3)	641.1	(356.2)	634.2	(352.3)
451.8	660.1	(366.7)	653.2	(362.9)	641.9	(356.6)	635.3	(352.9)
451.9	661.6	(367.5)	654.2	(363.4)	642.7	(357.1)	636.4	(353.5)
452.0	663.0	(368.3)	655.1	(364.0)	643.5	(357.5)	637.5	(354.2)
452.1	664.4	(369.1)	656.2	(364.6)	644.4	(358.0)	638.6	(354.8)
452.2	665.8	(369.9)	657.3	(365.2)	645.4	(358.5)	639.8	(355.5)
452.3	667.1	(370.6)	658.4	(365.8)	646.4	(359.1)	641.1	(356.2)
452.4	668.4	(371.3)	659.6	(366.4)	647.4	(359.7)	642.4	(356.9)
452.5	669.7	(372.0)	660.8	(367.1)	648.3	(360.2)	643.6	(357.6)
452.6	670.9	(372.7)	662.1	(367.8)	649.2	(360.7)	644.8	(358.2)
452.7	672.3	(373.5)	663.5	(368.6)	650.0	(361.1)	645.8	(358.8)
452.8	673.6	(374.2)	665.1	(369.5)	650.9	(361.6)	646.8	(359.3)
452.9	675.3	(375.1)	667.0	(370.5)	651.7	(362.0)	647.7	(359.8)
453.0	677.1	(376.2)	669.1	(371.7)	652.5	(362.5)	648.4	(360.2)
453.1	679.3	(377.4)	671.3	(372.9)	653.5	(363.0)	649.1	(360.6)
453.2	681.5	(378.6)	673.7	(374.3)	654.5	(363.6)	649.7	(360.9)
453.3	683.9	(379.9)	676.2	(375.7)	655.8	(364.4)	650.2	(361.2)
453.4	686.5	(381.4)	678.9	(377.2)	657.4	(365.2)	650.8	(361.6)
453.5	689.3	(382.9)	681.7	(378.7)	659.0	(366.1)	651.3	(361.9)
453.6	692.2	(384.6)	684.7	(380.4)	660.8	(367.1)	651.8	(362.1)
453.7	695.4	(386.3)	687.8	(382.1)	662.8	(368.2)	652.2	(362.4)
453.8	698.8	(388.2)	691.0	(383.9)	665.1	(369.5)	652.7	(362.6)
453.9	702.3	(390.2)	694.4	(385.8)	667.8	(371.0)	653.2	(362.9)
454.0	713.6	(396.4)	697.9	(387.7)	670.9	(372.7)	653.8	(363.2)
454.1	728.4	(404.7)	703.8	(391.0)	674.5	(374.7)	654.7	(363.7)
454.2	742.2	(412.3)	715.1	(397.3)	678.4	(376.9)	655.9	(364.4)
454.3	755.5	(419.7)	726.5	(403.6)	682.8	(379.3)	657.3	(365.2)
454.4	769.0	(427.2)	737.0	(409.4)	687.5	(382.0)	658.9	(366.1)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(k) Station 133 in. (337.82 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	782.7	(434.8)	747.6	(415.3)	692.6	(384.8)	660.9	(367.2)
454.6	796.4	(442.4)	758.2	(421.2)	697.9	(387.7)	663.2	(368.5)
454.7	810.3	(450.2)	769.0	(427.2)	703.5	(390.8)	666.0	(370.0)
454.8	825.0	(458.3)	779.9	(433.3)	709.4	(394.1)	669.0	(371.7)
454.9	840.5	(466.9)	790.9	(439.4)	715.5	(397.5)	672.4	(373.5)
455.0	856.5	(475.9)	802.0	(445.5)	721.8	(401.0)	676.1	(375.6)
455.1	872.9	(485.0)	813.2	(451.8)	728.3	(404.6)	680.3	(377.9)
455.2	889.6	(494.2)	824.5	(458.1)	735.0	(408.4)	684.7	(380.4)
455.3	906.6	(503.6)	836.0	(464.4)	742.0	(412.2)	689.6	(383.1)
455.4	923.6	(513.1)	847.5	(470.8)	749.2	(416.2)	694.7	(386.0)
455.5	940.3	(522.4)	859.2	(477.3)	756.8	(420.4)	700.2	(389.0)
455.6	956.6	(531.4)	870.9	(483.8)	764.6	(424.8)	705.9	(392.2)
455.7	972.5	(540.3)	882.8	(490.4)	772.8	(429.3)	711.8	(395.5)
455.8	988.0	(548.9)	894.9	(497.1)	781.1	(433.9)	718.0	(398.9)
455.9	1003.1	(557.3)	907.1	(503.9)	789.6	(438.7)	724.2	(402.4)
456.0	1017.7	(565.4)	919.3	(510.7)	798.3	(443.5)	730.7	(406.0)
456.1	1032.4	(573.6)	931.6	(517.6)	807.1	(448.4)	737.4	(409.7)
456.2	1047.4	(581.9)	943.9	(524.4)	816.1	(453.4)	744.3	(413.5)
456.3	1062.3	(590.2)	956.3	(531.3)	825.3	(458.5)	751.3	(417.4)
456.4	1076.5	(598.1)	968.8	(538.2)	834.7	(463.7)	758.4	(421.4)
456.5	1089.8	(605.4)	981.3	(545.2)	844.2	(469.0)	765.8	(425.4)
456.6	1102.5	(612.5)	993.6	(552.0)	853.8	(474.4)	773.3	(429.6)
456.7	1115.5	(619.7)	1006.1	(558.9)	863.5	(479.7)	780.9	(433.8)
456.8	1129.6	(627.6)	1018.7	(565.9)	873.3	(485.1)	788.5	(438.1)
456.9	1145.1	(636.2)	1031.5	(573.1)	882.9	(490.5)	796.2	(442.3)
457.0	1161.5	(645.3)	1044.5	(580.3)	892.5	(495.8)	804.0	(446.6)
457.1	1178.0	(654.4)	1057.6	(587.5)	902.1	(501.2)	811.8	(451.0)
457.2	1194.5	(663.6)	1070.8	(594.9)	911.8	(506.6)	819.7	(455.4)
457.3	1211.2	(672.9)	1084.2	(602.4)	921.5	(512.0)	827.5	(459.7)
457.4	1229.1	(682.8)	1097.8	(609.9)	931.3	(517.4)	835.5	(464.1)
457.5	1248.0	(693.3)	1111.8	(617.7)	941.2	(522.9)	843.6	(468.7)
457.6	1266.9	(703.8)	1126.1	(625.6)	951.3	(528.5)	851.8	(473.2)
457.7	1285.1	(713.9)	1140.7	(633.7)	961.4	(534.1)	860.0	(477.8)
457.8	1303.2	(724.0)	1155.8	(642.1)	971.8	(539.9)	868.2	(482.3)
457.9	1322.1	(734.5)	1171.3	(650.7)	982.4	(545.8)	876.4	(486.9)
458.0	1342.1	(745.6)	1187.3	(659.6)	993.2	(551.8)	884.8	(491.5)
458.1	1362.6	(757.0)	1203.7	(668.7)	1004.3	(558.0)	893.1	(496.2)
458.2	1383.1	(768.4)	1220.8	(678.2)	1015.6	(564.2)	901.4	(500.8)
458.3	1404.0	(780.0)	1238.3	(688.0)	1027.0	(570.6)	909.7	(505.4)
458.4	1425.8	(792.1)	1256.3	(697.9)	1038.7	(577.1)	918.2	(510.1)
458.5	1448.8	(804.9)	1274.5	(708.1)	1050.6	(583.6)	926.8	(514.9)
458.6	1472.8	(818.2)	1293.1	(718.4)	1062.7	(590.4)	935.6	(519.8)
458.7	1497.4	(831.9)	1312.5	(729.2)	1075.1	(597.3)	944.6	(524.8)
458.8	1522.3	(845.7)	1332.4	(740.2)	1087.8	(604.3)	953.8	(529.9)
458.9	1547.7	(859.8)	1352.8	(751.5)	1100.6	(611.5)	963.1	(535.1)
459.0	1573.8	(874.4)	1373.4	(763.0)	1113.7	(618.7)	972.7	(540.4)
459.1	1601.0	(889.4)	1394.2	(774.5)	1127.0	(626.1)	982.5	(545.8)
459.2	1629.1	(905.0)	1414.9	(786.1)	1140.4	(633.6)	992.4	(551.3)
459.3	1657.9	(921.1)	1435.7	(797.6)	1154.0	(641.1)	1002.5	(557.0)
459.4	1686.8	(937.1)	1456.4	(809.1)	1167.7	(648.7)	1012.8	(562.7)
459.5	1715.1	(952.8)	1477.2	(820.6)	1181.5	(656.4)	1023.3	(568.5)
459.6	1742.7	(968.2)	1497.8	(832.1)	1195.5	(664.2)	1034.0	(574.4)
459.7	1770.0	(983.3)	1518.5	(843.6)	1209.7	(672.0)	1044.9	(580.5)
459.8			1539.2	(855.1)	1223.9	(680.0)	1056.0	(586.6)
459.9			1560.0	(866.7)	1238.3	(688.0)	1067.2	(592.9)
460.0			1581.1	(878.4)	1252.9	(696.1)	1078.7	(599.3)
460.1			1602.5	(890.3)	1267.6	(704.2)	1090.3	(605.7)
460.2			1624.1	(902.3)	1282.5	(712.5)	1102.1	(612.3)
460.3			1645.9	(914.4)	1297.5	(720.8)	1114.1	(619.0)
460.4			1667.9	(926.6)	1312.7	(729.3)	1126.4	(625.8)
460.5			1690.0	(938.9)	1328.0	(737.8)	1138.8	(632.6)
460.6			1712.2	(951.2)	1343.5	(746.4)	1151.3	(639.6)
460.7			1734.7	(963.7)	1359.1	(755.0)	1164.1	(646.7)
460.8			1757.3	(976.3)	1374.9	(763.8)	1177.1	(653.9)
460.9			1780.0	(988.9)	1390.8	(772.7)	1190.2	(661.2)
461.0			1803.0	(1001.6)	1406.9	(781.6)		
461.1								
461.2								
461.3								
461.4								

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(1) Station 144 in. (365.76 cm), ray 0°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	591.1	(328.4)	591.1	(328.4)	589.2	(327.3)	587.5	(326.4)
444.0	598.1	(332.3)	595.0	(330.5)	591.7	(328.7)	590.2	(327.9)
445.0	601.8	(334.3)	598.2	(332.3)	593.2	(329.5)	592.0	(328.9)
446.0	603.7	(335.4)	600.5	(333.6)	596.4	(331.3)	594.2	(330.1)
447.0	609.6	(338.6)	604.4	(335.8)	601.0	(333.9)	596.6	(331.4)
448.0	617.5	(343.0)	614.0	(341.1)	609.2	(338.5)	605.8	(336.5)
448.1	618.3	(343.5)	615.0	(341.7)	610.0	(338.9)	606.6	(337.0)
448.2	619.3	(344.1)	616.0	(342.2)	610.8	(339.3)	607.4	(337.5)
448.3	620.2	(344.6)	616.9	(342.7)	611.5	(339.7)	608.1	(337.8)
448.4	621.1	(345.1)	617.8	(343.2)	612.1	(340.0)	608.7	(338.2)
448.5	622.0	(345.5)	618.6	(343.7)	612.6	(340.3)	609.1	(338.4)
448.6	622.7	(345.9)	619.4	(344.1)	613.1	(340.6)	609.5	(338.6)
448.7	623.4	(346.3)	620.2	(344.6)	613.7	(340.9)	609.7	(338.7)
448.8	624.0	(346.7)	620.9	(344.9)	614.2	(341.2)	610.0	(338.9)
448.9	624.6	(347.0)	621.4	(345.2)	614.6	(341.4)	610.2	(339.0)
449.0	625.3	(347.4)	621.8	(345.5)	614.9	(341.6)	610.2	(339.0)
449.1	626.0	(347.8)	622.2	(345.7)	615.2	(341.8)	610.2	(339.0)
449.2	626.7	(348.2)	622.5	(345.8)	615.5	(341.9)	610.1	(339.0)
449.3	627.5	(348.6)	622.7	(346.0)	615.7	(342.1)	610.0	(338.9)
449.4	628.5	(349.2)	623.0	(346.1)	616.0	(342.2)	610.0	(338.9)
449.5	629.6	(349.8)	623.3	(346.3)	616.2	(342.3)	610.0	(338.9)
449.6	630.6	(350.3)	623.7	(346.5)	616.5	(342.5)	610.2	(339.0)
449.7	631.7	(350.9)	624.1	(346.7)	616.9	(342.7)	610.4	(339.1)
449.8	632.7	(351.5)	624.8	(347.1)	617.4	(343.0)	610.8	(339.3)
449.9	633.8	(352.1)	625.5	(347.5)	618.1	(343.4)	611.4	(339.7)
450.0	634.8	(352.7)	626.4	(348.0)	618.9	(343.9)	612.2	(340.1)
450.1	635.8	(353.2)	627.4	(348.6)	619.7	(344.3)	613.0	(340.6)
450.2	636.7	(353.7)	628.4	(349.1)	620.6	(344.8)	613.9	(341.0)
450.3	637.6	(354.2)	629.5	(349.7)	621.6	(345.3)	614.7	(341.5)
450.4	638.4	(354.7)	630.7	(350.4)	622.6	(345.9)	615.6	(342.0)
450.5	639.2	(355.1)	631.9	(351.0)	623.7	(346.5)	616.6	(342.6)
450.6	640.1	(355.6)	633.0	(351.7)	624.7	(347.1)	617.6	(343.1)
450.7	641.0	(356.1)	634.2	(352.3)	625.9	(347.7)	618.6	(343.7)
450.8	641.8	(356.6)	635.4	(353.0)	627.0	(348.4)	619.7	(344.3)
450.9	642.8	(357.1)	636.7	(353.7)	628.2	(349.0)	620.7	(344.8)
451.0	643.8	(357.7)	638.0	(354.4)	629.4	(349.7)	621.8	(345.4)
451.1	644.9	(358.3)	639.2	(355.1)	630.7	(350.4)	622.9	(346.1)
451.2	646.1	(359.0)	640.3	(355.7)	631.9	(351.1)	624.1	(346.7)
451.3	647.4	(359.7)	641.4	(356.3)	633.0	(351.7)	625.1	(347.3)
451.4	648.8	(360.4)	642.3	(356.8)	634.1	(352.3)	626.1	(347.8)
451.5	650.1	(361.2)	643.2	(357.3)	635.0	(352.8)	627.0	(348.3)
451.6	651.4	(361.9)	644.1	(357.8)	635.9	(353.3)	627.8	(348.8)
451.7	652.7	(362.6)	644.9	(358.3)	636.8	(353.8)	628.7	(349.3)
451.8	654.0	(363.3)	645.7	(358.7)	637.6	(354.2)	629.5	(349.7)
451.9	655.2	(364.0)	646.6	(359.2)	638.4	(354.7)	630.3	(350.2)
452.0	656.4	(364.7)	647.5	(359.7)	639.1	(355.1)	631.1	(350.6)
452.1	657.6	(365.3)	648.5	(360.3)	639.9	(355.5)	631.9	(351.1)
452.2	658.7	(365.9)	649.6	(360.9)	640.8	(356.0)	632.8	(351.6)
452.3	659.8	(366.6)	650.7	(361.5)	641.6	(356.4)	633.7	(352.1)
452.4	661.0	(367.2)	652.0	(362.2)	642.5	(356.9)	634.6	(352.5)
452.5	662.4	(368.0)	653.3	(363.0)	643.3	(357.4)	635.4	(353.0)
452.6	663.7	(368.7)	654.8	(363.8)	644.2	(357.9)	636.0	(353.3)
452.7	665.2	(369.6)	656.4	(364.7)	645.0	(358.4)	636.6	(353.7)
452.8	666.8	(370.4)	658.1	(365.6)	646.0	(358.9)	637.2	(354.0)
452.9	668.7	(371.5)	659.9	(366.6)	647.0	(359.4)	637.7	(354.3)
453.0	670.7	(372.6)	661.9	(367.7)	648.0	(360.0)	638.2	(354.6)
453.1	673.4	(374.1)	663.9	(368.8)	649.1	(360.6)	638.7	(354.8)
453.2	676.6	(375.9)	666.0	(370.0)	650.2	(361.2)	639.1	(355.1)
453.3	680.3	(377.9)	668.2	(371.2)	651.4	(361.9)	639.6	(355.3)
453.4	684.4	(380.2)	670.5	(372.5)	652.5	(362.5)	640.1	(355.6)
453.5	688.9	(382.7)	672.9	(373.8)	653.8	(363.2)	640.7	(356.0)
453.6	693.8	(385.4)	675.4	(375.2)	655.0	(363.9)	641.3	(356.3)
453.7	699.1	(388.4)	678.0	(376.6)	656.3	(364.6)	642.0	(356.7)
453.8	708.7	(393.7)	681.1	(378.4)	657.6	(365.3)	642.8	(357.1)
453.9	725.5	(403.0)	688.5	(382.5)	658.9	(366.1)	643.7	(357.6)
454.0	741.7	(412.1)	704.3	(391.3)	660.2	(366.8)	644.7	(358.2)
454.1	757.6	(420.9)	717.2	(398.4)	662.1	(367.8)	646.2	(359.0)
454.2	773.1	(429.5)	729.9	(405.5)	671.2	(372.9)	648.0	(360.0)
454.3	788.5	(438.0)	742.4	(412.5)	680.8	(378.2)	650.2	(361.2)
454.4	803.0	(446.1)	754.7	(419.3)	690.3	(383.5)	652.8	(362.7)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(1) Station 144 in. (365.76 cm), ray 0°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	817.0	(453.9)	766.8	(426.0)	699.4	(388.5)	655.8	(364.3)
454.6	831.0	(461.7)	778.7	(432.6)	708.1	(393.4)	659.2	(366.2)
454.7	844.7	(469.3)	790.4	(439.1)	716.2	(397.9)	662.8	(368.2)
454.8	858.4	(476.9)	801.9	(445.5)	723.9	(402.2)	666.6	(370.3)
454.9	872.0	(484.4)	813.1	(451.7)	731.0	(406.1)	670.7	(372.6)
455.0	885.7	(492.1)	823.9	(457.7)	737.6	(409.8)	675.0	(375.0)
455.1	899.5	(499.7)	834.4	(463.6)	743.8	(413.2)	679.6	(377.5)
455.2	913.2	(507.3)	844.8	(469.3)	749.8	(416.6)	684.4	(380.2)
455.3	926.7	(514.8)	854.9	(474.9)	755.9	(419.9)	689.4	(383.0)
455.4	940.0	(522.2)	865.0	(480.6)	762.1	(423.4)	694.6	(385.9)
455.5	953.3	(529.6)	875.1	(486.2)	768.7	(427.1)	700.0	(388.9)
455.6	966.8	(537.1)	885.4	(491.9)	775.9	(431.0)	705.6	(392.0)
455.7	980.3	(544.6)	895.9	(497.7)	783.5	(435.3)	711.3	(395.2)
455.8	993.7	(552.0)	906.6	(503.7)	791.7	(439.8)	717.2	(398.4)
455.9	1007.0	(559.5)	917.5	(509.7)	800.3	(444.6)	723.1	(401.7)
456.0	1020.4	(566.9)	928.7	(515.9)	809.1	(449.5)	729.0	(405.0)
456.1	1033.8	(574.4)	939.9	(522.1)	818.1	(454.5)	735.0	(408.3)
456.2	1047.2	(581.8)	951.2	(528.4)	827.2	(459.5)	741.2	(411.8)
456.3	1060.3	(589.1)	962.7	(534.8)	836.3	(464.6)	747.5	(415.3)
456.4	1073.5	(596.4)	974.4	(541.4)	845.4	(469.7)	753.9	(418.8)
456.5	1086.6	(603.7)	986.4	(548.0)	854.4	(474.7)	760.5	(422.5)
456.6	1100.2	(611.2)	998.3	(554.6)	863.3	(479.6)	767.3	(426.3)
456.7	1114.1	(618.9)	1010.1	(561.2)	872.3	(484.6)	774.7	(430.4)
456.8	1128.3	(626.8)	1022.1	(567.8)	881.2	(489.5)	782.2	(434.6)
456.9	1142.3	(634.6)	1034.0	(574.5)	890.1	(494.5)	789.7	(438.7)
457.0	1158.0	(643.3)	1045.9	(581.1)	899.0	(499.5)	797.1	(442.8)
457.1	1173.7	(652.1)	1057.8	(587.7)	908.0	(504.4)	804.5	(446.9)
457.2	1189.7	(660.9)	1069.8	(594.3)	916.9	(509.4)	811.8	(451.0)
457.3	1205.7	(669.9)	1082.0	(601.1)	925.9	(514.4)	819.1	(455.0)
457.4	1222.3	(679.1)	1094.5	(608.0)	934.8	(519.4)	826.4	(459.1)
457.5	1239.0	(688.3)	1107.2	(615.1)	944.0	(524.4)	833.7	(463.2)
457.6	1255.8	(697.7)	1120.3	(622.4)	953.3	(529.6)	841.0	(467.2)
457.7	1274.1	(707.8)	1133.9	(629.9)	962.9	(534.9)	848.3	(471.3)
457.8	1291.7	(717.6)	1147.9	(637.7)	972.8	(540.5)	855.7	(475.4)
457.9	1310.4	(728.0)	1162.2	(645.7)	983.2	(546.2)	863.1	(479.5)
458.0	1330.0	(738.9)	1177.0	(653.9)	993.8	(552.1)	870.7	(483.7)
458.1	1350.0	(750.0)	1192.4	(662.5)	1004.7	(558.2)	878.5	(488.0)
458.2	1369.9	(761.0)	1208.3	(671.3)	1015.8	(564.3)	886.2	(492.4)
458.3	1390.3	(772.4)	1224.9	(680.5)	1027.0	(570.5)	894.1	(496.7)
458.4	1412.5	(784.7)	1242.1	(690.1)	1038.1	(576.7)	902.0	(501.1)
458.5	1434.3	(796.8)	1259.8	(699.9)	1049.4	(583.0)	910.1	(505.6)
458.6	1456.8	(809.3)	1277.7	(709.9)	1060.7	(589.3)	918.4	(510.2)
458.7	1480.9	(822.7)	1296.2	(720.1)	1072.2	(595.6)	926.9	(514.9)
458.8	1505.1	(836.2)	1315.1	(730.6)	1084.0	(602.2)	935.7	(519.8)
458.9	1529.3	(849.6)	1334.4	(741.3)	1096.2	(609.0)	944.7	(524.9)
459.0	1556.2	(864.6)	1353.8	(752.1)	1108.9	(616.1)	954.0	(530.0)
459.1	1583.6	(879.8)	1373.5	(763.0)	1122.1	(623.4)	963.6	(535.3)
459.2	1610.5	(894.7)	1393.5	(774.1)	1135.6	(630.9)	973.5	(540.8)
459.3	1638.9	(910.5)	1413.6	(785.3)	1149.4	(638.6)	983.5	(546.4)
459.4	1667.7	(926.5)	1433.8	(796.6)	1163.4	(646.4)	993.5	(552.0)
459.5	1696.1	(942.3)	1454.1	(807.8)	1177.6	(654.2)	1003.8	(557.6)
459.6	1724.9	(958.3)	1474.5	(819.2)	1191.8	(662.1)	1014.1	(563.4)
459.7	1752.9	(973.9)	1495.0	(830.5)	1206.2	(670.1)	1024.6	(569.2)
459.8	1780.6	(989.2)	1515.5	(842.0)	1220.7	(678.2)	1035.3	(575.2)
459.9	1807.9	(1004.4)	1536.2	(853.5)	1235.4	(686.3)	1046.1	(581.2)
460.0	1835.4	(1019.7)	1557.0	(865.0)	1250.3	(694.6)	1057.1	(587.3)
460.1	1863.3	(1035.2)	1577.9	(876.6)	1265.2	(702.9)	1068.3	(593.5)
460.2	1891.8	(1051.0)	1599.0	(888.3)	1280.0	(711.1)	1079.6	(599.8)
460.3	1920.3	(1066.8)	1620.1	(900.1)	1294.6	(719.2)	1091.1	(606.2)
460.4	1948.9	(1082.7)	1641.4	(911.9)	1308.7	(727.0)	1102.7	(612.6)
460.5	1977.4	(1098.6)	1662.8	(923.8)	1322.3	(734.6)	1114.5	(619.2)
460.6	2006.0	(1114.4)	1684.2	(935.7)	1335.4	(741.9)	1126.5	(625.8)
460.7	2034.5	(1130.3)	1705.9	(947.7)	1348.2	(749.0)	1138.6	(632.6)
460.8	2063.2	(1146.2)	1727.6	(959.8)	1360.9	(756.0)	1150.9	(639.4)
460.9								
461.0								
461.1								
461.2								
461.3								
461.4								

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(m) Station 73 in. (185.42 cm), ray 90°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	608.7	(338.1)	611.4	(339.7)	607.5	(337.5)	606.1	(336.7)
444.0	616.3	(342.4)	617.4	(343.0)	612.7	(340.4)	609.9	(338.8)
445.0	621.5	(345.3)	622.5	(345.8)	616.7	(342.6)	612.5	(340.3)
446.0	627.2	(348.5)	627.8	(348.8)	621.6	(345.4)	617.2	(342.9)
447.0	634.2	(352.4)	633.6	(352.0)	627.0	(348.3)	623.2	(346.2)
448.0	643.9	(357.7)	643.0	(357.2)	635.0	(352.8)	629.4	(349.7)
448.1	645.1	(358.4)	644.1	(357.8)	635.9	(353.3)	630.1	(350.0)
448.2	646.3	(359.1)	645.2	(358.4)	636.8	(353.8)	630.8	(350.4)
448.3	647.6	(359.8)	646.3	(359.0)	637.7	(354.3)	631.5	(350.8)
448.4	648.8	(360.5)	647.3	(359.6)	638.6	(354.8)	632.2	(351.2)
448.5	650.0	(361.1)	648.4	(360.2)	639.4	(355.2)	632.9	(351.6)
448.6	651.0	(361.7)	649.4	(360.8)	640.3	(355.7)	633.6	(352.0)
448.7	652.0	(362.2)	650.3	(361.3)	641.1	(356.2)	634.3	(352.4)
448.8	652.9	(362.7)	651.3	(361.8)	641.9	(356.6)	635.0	(352.8)
448.9	653.7	(363.2)	652.3	(362.4)	642.7	(357.0)	635.8	(353.2)
449.0	654.6	(363.7)	653.2	(362.9)	643.4	(357.4)	636.5	(353.6)
449.1	655.7	(364.3)	654.1	(363.4)	644.1	(357.9)	637.4	(354.1)
449.2	656.8	(364.9)	655.0	(363.9)	644.9	(358.3)	638.2	(354.6)
449.3	658.0	(365.6)	655.8	(364.3)	645.6	(358.6)	639.0	(355.0)
449.4	659.3	(366.3)	656.6	(364.8)	646.2	(359.0)	639.8	(355.5)
449.5	660.6	(367.0)	657.5	(365.3)	647.0	(359.4)	640.7	(355.9)
449.6	661.9	(367.7)	658.3	(365.7)	647.7	(359.8)	641.6	(356.4)
449.7	663.1	(368.4)	659.0	(366.1)	648.4	(360.2)	642.5	(356.9)
449.8	664.3	(369.1)	659.8	(366.6)	649.2	(360.7)	643.4	(357.4)
449.9	665.4	(369.7)	660.7	(367.0)	650.0	(361.1)	644.2	(357.9)
450.0	666.5	(370.3)	661.6	(367.5)	650.9	(361.6)	645.1	(358.4)
450.1	667.5	(370.8)	662.5	(368.0)	651.8	(362.1)	646.0	(358.9)
450.2	668.5	(371.4)	663.3	(368.5)	652.8	(362.6)	646.8	(359.4)
450.3	669.6	(372.0)	664.3	(369.1)	653.7	(363.2)	647.7	(359.8)
450.4	670.7	(372.6)	665.3	(369.6)	654.8	(363.8)	648.5	(360.3)
450.5	671.8	(373.2)	666.4	(370.2)	655.9	(364.4)	649.4	(360.8)
450.6	673.1	(373.9)	667.6	(370.9)	657.0	(365.0)	650.3	(361.3)
450.7	674.4	(374.7)	668.7	(371.5)	658.1	(365.6)	651.2	(361.8)
450.8	675.9	(375.5)	670.0	(372.2)	659.3	(366.3)	652.1	(362.3)
450.9	677.4	(376.3)	671.3	(373.0)	660.6	(367.0)	653.0	(362.8)
451.0	679.0	(377.2)	672.7	(373.7)	661.8	(367.7)	654.0	(363.3)
451.1	680.6	(378.1)	674.1	(374.5)	663.1	(368.4)	654.9	(363.8)
451.2	682.3	(379.0)	675.6	(375.3)	664.4	(369.1)	655.9	(364.4)
451.3	683.9	(380.0)	677.1	(376.2)	665.6	(369.8)	657.0	(365.0)
451.4	685.5	(380.9)	678.6	(377.0)	666.9	(370.5)	658.0	(365.6)
451.5	687.2	(381.8)	680.2	(377.9)	668.2	(371.2)	659.1	(366.2)
451.6	688.8	(382.6)	681.8	(378.8)	669.5	(371.9)	660.2	(366.8)
451.7	690.3	(383.5)	683.3	(379.6)	670.8	(372.6)	661.3	(367.4)
451.8	691.9	(384.4)	684.9	(380.5)	672.1	(373.4)	662.5	(368.0)
451.9	693.4	(385.2)	686.4	(381.3)	673.3	(374.1)	663.6	(368.6)
452.0	694.9	(386.1)	687.9	(382.2)	674.6	(374.8)	664.7	(369.3)
452.1	696.5	(387.0)	689.4	(383.0)	675.8	(375.5)	665.8	(369.9)
452.2	698.2	(387.9)	690.9	(383.8)	677.1	(376.2)	667.0	(370.5)
452.3	699.9	(388.8)	692.4	(384.6)	678.3	(376.9)	668.0	(371.1)
452.4	701.6	(389.8)	693.8	(385.5)	679.6	(377.6)	669.1	(371.7)
452.5	703.5	(390.8)	695.3	(386.3)	680.9	(378.3)	670.1	(372.3)
452.6	705.4	(391.9)	696.8	(387.1)	682.1	(379.0)	671.2	(372.9)
452.7	707.4	(393.0)	698.3	(387.9)	683.4	(379.7)	672.2	(373.5)
452.8	709.3	(394.1)	699.8	(388.8)	684.7	(380.4)	673.3	(374.0)
452.9	711.2	(395.1)	701.3	(389.6)	686.0	(381.1)	674.3	(374.6)
453.0	713.0	(396.1)	702.9	(390.5)	687.3	(381.8)	675.3	(375.1)
453.1	714.8	(397.1)	704.5	(391.4)	688.6	(382.5)	676.3	(375.7)
453.2	716.5	(398.1)	706.2	(392.3)	689.9	(383.3)	677.4	(376.3)
453.3	718.4	(399.1)	707.9	(393.3)	691.3	(384.1)	678.6	(377.0)
453.4	720.2	(400.1)	709.7	(394.3)	692.7	(384.8)	679.8	(377.6)
453.5	722.1	(401.2)	711.7	(395.4)	694.1	(385.6)	681.0	(378.3)
453.6	724.0	(402.2)	713.6	(396.5)	695.7	(386.5)	682.2	(379.0)
453.7	726.2	(403.4)	715.6	(397.6)	697.2	(387.3)	683.5	(379.7)
453.8	728.4	(404.7)	717.6	(398.7)	698.8	(388.2)	684.8	(380.4)
453.9	730.7	(406.0)	719.6	(399.8)	700.4	(389.1)	686.2	(381.2)
454.0	733.2	(407.3)	721.6	(400.9)	702.1	(390.1)	687.6	(382.0)
454.1	735.7	(408.7)	723.6	(402.0)	703.8	(391.0)	689.0	(382.8)
454.2	738.2	(410.1)	725.6	(403.1)	705.6	(392.0)	690.5	(383.6)
454.3	740.8	(411.6)	727.6	(404.2)	707.3	(392.9)	692.1	(384.5)
454.4	743.6	(413.1)	729.7	(405.4)	709.0	(393.9)	693.6	(385.3)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(m) Station 73 in. (185.42 cm), ray 90°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	746.6	(414.8)	731.8	(406.6)	710.7	(394.9)	695.2	(386.2)
454.6	749.7	(416.5)	734.0	(407.8)	712.5	(395.8)	696.8	(387.1)
454.7	752.8	(418.2)	736.3	(409.1)	714.3	(396.8)	698.4	(388.0)
454.8	755.9	(420.0)	738.8	(410.4)	716.1	(397.8)	700.1	(388.9)
454.9	758.9	(421.6)	741.4	(411.9)	718.0	(398.9)	701.7	(389.9)
455.0	761.6	(423.1)	744.2	(413.4)	719.9	(400.0)	703.4	(390.8)
455.1	764.5	(424.7)	747.2	(415.1)	721.9	(401.1)	705.1	(391.7)
455.2	767.5	(426.4)	750.4	(416.9)	724.0	(402.2)	706.9	(392.7)
455.3	771.4	(428.5)	753.9	(418.8)	726.2	(403.5)	708.7	(393.7)
455.4	775.2	(430.6)	757.8	(421.0)	728.5	(404.7)	710.5	(394.7)
455.5	780.2	(433.4)	762.1	(423.4)	731.0	(406.1)	712.4	(395.8)
455.6	786.6	(437.0)	766.6	(425.9)	733.6	(407.5)	714.4	(396.9)
455.7	793.8	(441.0)	771.5	(428.6)	736.4	(409.1)	716.4	(398.0)
455.8	801.1	(445.1)	776.5	(431.4)	739.5	(410.9)	718.5	(399.2)
455.9	809.4	(449.6)	781.9	(434.4)	742.8	(412.7)	720.6	(400.4)
456.0	817.7	(454.3)	787.5	(437.5)	746.2	(414.5)	722.8	(401.6)
456.1	826.6	(459.2)	793.3	(440.7)	749.7	(416.5)	725.1	(402.8)
456.2	835.9	(464.4)	799.4	(444.1)	753.4	(418.6)	727.5	(404.2)
456.3	845.7	(469.8)	805.8	(447.7)	757.3	(420.7)	730.0	(405.6)
456.4	856.0	(475.5)	812.5	(451.4)	761.3	(422.9)	732.7	(407.1)
456.5	866.3	(481.3)	819.4	(455.2)	765.5	(425.3)	735.5	(408.6)
456.6	890.0	(494.4)	826.8	(459.4)	769.8	(427.7)	738.4	(410.2)
456.7	915.6	(508.7)	843.8	(468.8)	774.3	(430.2)	741.4	(411.9)
456.8	941.8	(523.2)	863.1	(479.5)	778.9	(432.7)	744.7	(413.7)
456.9	968.5	(538.1)	882.3	(490.2)	786.6	(437.0)	748.2	(415.7)
457.0	995.6	(553.1)	901.7	(500.9)	798.4	(443.6)	752.0	(417.8)
457.1	1023.1	(568.4)	921.3	(511.8)	808.4	(449.1)	756.0	(420.0)
457.2	1052.5	(584.7)	941.4	(523.0)	818.0	(454.5)	760.2	(422.4)
457.3	1081.9	(601.1)	962.2	(534.6)	828.2	(460.1)	764.9	(424.9)
457.4	1113.3	(618.5)	983.8	(546.5)	838.7	(466.0)	769.8	(427.7)
457.5	1148.3	(638.0)	1006.1	(558.9)	849.7	(472.1)	775.2	(430.7)
457.6	1183.5	(657.5)	1029.1	(571.7)	861.2	(478.5)	780.9	(433.8)
457.7	1219.4	(677.5)	1052.7	(584.8)	873.2	(485.1)	787.2	(437.3)
457.8	1255.8	(697.7)	1076.9	(598.3)	885.5	(492.0)	793.8	(441.0)
457.9	1292.1	(717.8)	1101.5	(611.9)	898.4	(499.1)	801.1	(445.0)
458.0	1328.4	(738.0)	1126.5	(625.8)	911.6	(506.5)	808.6	(449.2)
458.1	1364.8	(758.2)	1151.9	(639.9)	925.4	(514.1)	816.5	(453.6)
458.2	1401.3	(778.5)	1177.6	(654.2)	939.6	(522.0)	824.9	(458.3)
458.3	1437.8	(798.8)	1203.7	(668.7)	954.4	(530.2)	833.6	(463.1)
458.4	1474.5	(819.2)	1230.3	(683.5)	969.8	(538.8)	842.9	(468.3)
458.5	1509.7	(838.7)	1257.4	(698.6)	985.3	(547.4)	852.5	(473.6)
458.6	1544.0	(857.6)	1284.9	(713.9)	1001.4	(556.4)	862.4	(479.1)
458.7	1577.5	(876.4)	1312.9	(729.4)	1017.9	(565.5)	872.6	(484.8)
458.8	1610.3	(894.6)	1341.2	(745.1)	1034.7	(574.8)	883.2	(490.7)
458.9	1642.4	(912.4)	1369.5	(760.8)	1051.8	(584.3)	894.1	(496.7)
459.0			1398.0	(776.7)	1069.3	(594.0)	905.3	(503.0)
459.1			1426.7	(792.6)	1087.1	(603.9)	916.8	(509.3)
459.2			1455.5	(808.6)	1105.1	(614.0)	928.5	(515.8)
459.3			1484.3	(824.6)	1123.3	(624.1)	940.5	(522.5)
459.4			1513.1	(840.6)	1141.5	(634.2)	952.7	(529.3)
459.5			1541.5	(856.4)	1159.9	(644.4)	965.0	(536.1)
459.6			1569.5	(871.9)	1178.5	(654.7)	977.5	(543.1)
459.7			1597.2	(887.3)	1197.2	(665.1)	990.2	(550.1)
459.8			1624.8	(902.7)	1216.0	(675.5)	1003.1	(557.3)
459.9			1652.7	(918.2)	1235.0	(686.1)	1016.1	(564.5)
460.0			1681.3	(934.0)	1254.0	(696.7)	1029.3	(571.8)
460.1			1710.6	(950.3)	1273.3	(707.4)	1042.6	(579.2)
460.2			1740.6	(967.0)	1292.8	(718.2)	1056.1	(586.7)
460.3			1771.1	(983.9)	1312.4	(729.1)	1069.7	(594.3)
460.4			1801.6	(1000.9)	1332.3	(740.2)	1083.3	(601.9)
460.5					1352.2	(751.2)	1097.1	(609.5)
460.6					1372.4	(762.4)	1111.1	(617.3)
460.7					1392.7	(773.7)	1125.2	(625.1)
460.8					1413.3	(785.1)	1139.4	(633.0)
460.9					1434.0	(796.7)	1153.8	(641.0)
461.0					1454.9	(808.3)	1168.3	(649.1)
461.1					1475.9	(820.0)	1183.0	(657.2)
461.2					1497.2	(831.8)	1197.8	(665.4)
461.3					1518.6	(843.7)	1212.8	(673.8)
461.4					1540.2	(855.7)	1227.9	(682.1)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued
(n) Station 144 in. (365.76 cm), ray 90°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	585.9	(325.5)	587.8	(326.5)	586.1	(325.6)	582.5	(323.6)
444.0	592.7	(329.3)	592.3	(329.1)	588.0	(326.7)	585.1	(325.1)
445.0	597.0	(331.7)	596.5	(331.4)	589.1	(327.3)	587.8	(326.6)
446.0	600.4	(333.6)	599.6	(333.1)	592.1	(328.9)	590.4	(328.0)
447.0	605.2	(336.2)	602.6	(334.8)	597.9	(332.2)	595.2	(330.7)
448.0	613.2	(340.7)	608.6	(338.1)	604.4	(335.8)	601.9	(334.4)
448.1	614.3	(341.3)	609.3	(338.5)	605.0	(336.1)	602.3	(334.6)
448.2	615.3	(341.9)	610.1	(338.9)	605.6	(336.4)	602.5	(334.7)
448.3	616.3	(342.4)	610.9	(339.4)	606.2	(336.8)	602.7	(334.8)
448.4	617.2	(342.9)	611.6	(339.8)	606.9	(337.2)	602.9	(334.9)
448.5	618.1	(343.4)	612.4	(340.2)	607.5	(337.5)	603.0	(335.0)
448.6	618.8	(343.8)	613.1	(340.6)	608.1	(337.8)	603.0	(335.0)
448.7	619.4	(344.1)	613.8	(341.0)	608.7	(338.1)	602.9	(335.0)
448.8	620.0	(344.5)	614.6	(341.5)	609.3	(338.5)	603.0	(335.0)
448.9	620.5	(344.7)	615.4	(341.9)	609.9	(338.8)	603.0	(335.0)
449.0	621.0	(345.0)	616.1	(342.3)	610.4	(339.1)	603.2	(335.1)
449.1	621.5	(345.3)	616.8	(342.7)	610.8	(339.4)	603.4	(335.2)
449.2	622.0	(345.6)	617.5	(343.1)	611.3	(339.6)	603.7	(335.4)
449.3	622.7	(345.9)	618.2	(343.4)	611.7	(339.9)	604.1	(335.6)
449.4	623.3	(346.3)	618.8	(343.8)	612.2	(340.1)	604.6	(335.9)
449.5	624.0	(346.7)	619.5	(344.2)	612.7	(340.4)	605.2	(336.2)
449.6	624.9	(347.2)	620.1	(344.5)	613.2	(340.6)	605.9	(336.6)
449.7	625.7	(347.6)	620.8	(344.9)	613.7	(340.9)	606.6	(337.0)
449.8	626.6	(348.1)	621.4	(345.2)	614.2	(341.2)	607.5	(337.5)
449.9	627.5	(348.6)	622.2	(345.6)	614.9	(341.6)	608.4	(338.0)
450.0	628.4	(349.1)	622.9	(346.0)	615.6	(342.0)	609.5	(338.6)
450.1	629.4	(349.6)	623.6	(346.5)	616.3	(342.4)	610.5	(339.2)
450.2	630.2	(350.1)	624.5	(346.9)	617.1	(342.8)	611.5	(339.7)
450.3	631.0	(350.6)	625.3	(347.4)	617.8	(343.2)	612.5	(340.3)
450.4	631.8	(351.0)	626.2	(347.9)	618.6	(343.7)	613.4	(340.8)
450.5	632.5	(351.4)	627.1	(348.4)	619.5	(344.2)	614.2	(341.2)
450.6	633.2	(351.8)	628.1	(348.9)	620.4	(344.7)	615.0	(341.7)
450.7	634.0	(352.2)	629.1	(349.5)	621.3	(345.2)	615.8	(342.1)
450.8	634.8	(352.7)	630.1	(350.0)	622.3	(345.7)	616.4	(342.5)
450.9	635.7	(353.2)	631.1	(350.6)	623.2	(346.2)	617.0	(342.8)
451.0	636.7	(353.7)	632.2	(351.2)	624.2	(346.8)	617.6	(343.1)
451.1	637.9	(354.4)	633.3	(351.8)	625.2	(347.3)	618.2	(343.5)
451.2	639.2	(355.1)	634.3	(352.4)	626.1	(347.8)	618.8	(343.8)
451.3	640.5	(355.8)	635.4	(353.0)	627.0	(348.3)	619.4	(344.1)
451.4	641.8	(356.6)	636.4	(353.6)	627.8	(348.8)	620.0	(344.4)
451.5	643.2	(357.3)	637.5	(354.1)	628.6	(349.2)	620.5	(344.7)
451.6	644.5	(358.1)	638.5	(354.7)	629.4	(349.7)	621.1	(345.0)
451.7	645.8	(358.8)	639.6	(355.3)	630.2	(350.1)	621.7	(345.4)
451.8	646.9	(359.4)	640.7	(355.9)	631.1	(350.6)	622.3	(345.7)
451.9	648.1	(360.0)	641.8	(356.6)	631.9	(351.0)	623.0	(346.1)
452.0	649.3	(360.7)	643.0	(357.2)	632.6	(351.4)	623.7	(346.5)
452.1	650.5	(361.4)	644.3	(357.9)	633.4	(351.9)	624.4	(346.9)
452.2	651.9	(362.1)	645.6	(358.7)	634.2	(352.3)	625.3	(347.4)
452.3	653.3	(362.9)	647.0	(359.4)	635.1	(352.8)	626.2	(347.9)
452.4	654.7	(363.7)	648.5	(360.3)	635.9	(353.3)	627.3	(348.5)
452.5	656.2	(364.6)	650.0	(361.1)	636.9	(353.8)	628.3	(349.1)
452.6	657.9	(365.5)	651.6	(362.0)	637.8	(354.3)	629.3	(349.6)
452.7	659.8	(366.6)	653.4	(363.0)	638.8	(354.9)	630.2	(350.1)
452.8	662.1	(367.8)	655.2	(364.0)	640.0	(355.5)	631.1	(350.6)
452.9	664.6	(369.2)	657.0	(365.0)	641.1	(356.2)	632.0	(351.1)
453.0	667.2	(370.7)	659.0	(366.1)	642.4	(356.9)	633.0	(351.6)
453.1	670.0	(372.2)	661.0	(367.2)	643.8	(357.7)	633.8	(352.1)
453.2	673.7	(374.3)	663.1	(368.4)	645.3	(358.5)	634.6	(352.6)
453.3	677.8	(376.5)	665.3	(369.6)	646.9	(359.4)	635.4	(353.0)
453.4	682.3	(379.1)	667.6	(370.9)	648.8	(360.4)	636.3	(353.5)
453.5	687.3	(381.8)	669.9	(372.2)	650.7	(361.5)	637.2	(354.0)
453.6	692.8	(384.9)	672.3	(373.5)	652.8	(362.7)	638.2	(354.6)
453.7	698.7	(388.1)	674.8	(374.9)	655.1	(364.0)	639.2	(355.1)
453.8	705.0	(391.7)	677.4	(376.3)	657.6	(365.4)	640.2	(355.7)
453.9	717.6	(398.6)	680.1	(377.8)	660.4	(366.9)	641.3	(356.3)
454.0	731.3	(406.3)	688.3	(382.4)	663.6	(368.7)	642.7	(357.0)
454.1	745.1	(413.9)	702.4	(390.2)	667.3	(370.7)	644.2	(357.9)
454.2	759.1	(421.7)	716.4	(398.0)	671.4	(373.0)	646.1	(359.0)
454.3	773.2	(429.5)	730.1	(405.6)	675.8	(375.4)	648.2	(360.1)
454.4	787.5	(437.5)	743.4	(413.0)	680.6	(378.1)	650.6	(361.4)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(n) Station 144 in. (365.76 cm), ray 90°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	802.0	(445.6)	756.3	(420.2)	685.8	(381.0)	653.3	(362.9)
454.6	816.6	(453.7)	768.8	(427.1)	691.3	(384.1)	656.4	(364.7)
454.7	831.3	(461.8)	780.7	(433.7)	697.3	(387.4)	659.8	(366.6)
454.8	845.5	(469.7)	792.1	(440.0)	703.5	(390.8)	663.6	(368.7)
454.9	859.7	(477.6)	803.0	(446.1)	710.1	(394.5)	667.8	(371.0)
455.0	873.5	(485.3)	813.4	(451.9)	716.9	(398.3)	672.2	(373.5)
455.1	887.0	(492.8)	823.4	(457.5)	724.1	(402.3)	677.0	(376.1)
455.2	898.7	(499.3)	833.2	(462.9)	731.6	(406.4)	682.0	(378.9)
455.3	911.2	(506.2)	842.8	(468.2)	739.2	(410.7)	687.2	(381.8)
455.4	923.5	(513.1)	852.5	(473.6)	747.0	(415.0)	692.6	(384.8)
455.5	935.6	(519.8)	862.3	(479.1)	755.0	(419.4)	698.3	(387.9)
455.6	948.3	(526.8)	872.6	(484.8)	763.1	(424.0)	704.0	(391.1)
455.7	960.9	(533.9)	883.2	(490.7)	771.3	(428.5)	709.8	(394.3)
455.8	973.9	(541.0)	894.3	(496.8)	779.6	(433.1)	715.7	(397.6)
455.9	987.1	(548.4)	905.6	(503.1)	788.0	(437.8)	721.7	(400.9)
456.0	1000.7	(556.0)	917.2	(509.5)	796.2	(442.4)	727.8	(404.3)
456.1	1014.4	(563.6)	928.9	(516.1)	804.5	(447.0)	734.0	(407.8)
456.2	1028.8	(571.6)	940.8	(522.7)	813.0	(451.6)	740.2	(411.2)
456.3	1043.4	(579.7)	952.9	(529.4)	821.6	(456.4)	746.4	(414.7)
456.4	1058.5	(588.1)	965.2	(536.2)	830.3	(461.3)	752.9	(418.3)
456.5	1074.5	(597.0)	977.8	(543.2)	839.2	(466.2)	759.5	(421.9)
456.6	1090.5	(605.8)	990.7	(550.4)	848.3	(471.3)	766.1	(425.6)
456.7	1106.5	(614.7)	1004.0	(557.8)	857.6	(476.4)	772.7	(429.3)
456.8	1123.8	(624.3)	1017.8	(565.4)	867.0	(481.7)	779.4	(433.0)
456.9	1141.0	(633.9)	1032.0	(573.3)	876.5	(486.9)	786.1	(436.7)
457.0	1158.8	(643.8)	1046.7	(581.5)	886.0	(492.2)	792.9	(440.5)
457.1	1176.9	(653.9)	1061.8	(589.9)	895.8	(497.6)	799.8	(444.3)
457.2	1196.2	(664.5)	1077.1	(598.4)	905.6	(503.1)	806.8	(448.2)
457.3	1215.6	(675.4)	1092.8	(607.1)	915.6	(508.7)	813.8	(452.1)
457.4	1235.2	(686.2)	1108.6	(615.9)	925.7	(514.3)	820.9	(456.1)
457.5	1255.8	(697.6)	1124.6	(624.8)	936.1	(520.0)	828.2	(460.1)
457.6	1276.9	(709.4)	1140.8	(633.8)	946.7	(526.0)	835.6	(464.2)
457.7	1298.8	(721.6)	1157.4	(643.0)	957.6	(532.0)	843.1	(468.4)
457.8	1322.1	(734.5)	1174.5	(652.5)	968.6	(538.1)	850.8	(472.6)
457.9	1345.6	(747.5)	1192.0	(662.2)	979.8	(544.3)	858.6	(477.0)
458.0	1370.0	(761.1)	1210.1	(672.3)	991.4	(550.8)	866.6	(481.4)
458.1	1396.1	(775.6)	1228.6	(682.5)	1003.4	(557.4)	874.7	(485.9)
458.2	1422.5	(790.3)	1247.4	(693.0)	1015.5	(564.2)	882.9	(490.5)
458.3	1449.4	(805.2)	1266.6	(703.7)	1027.8	(571.0)	891.3	(495.2)
458.4	1477.0	(820.6)	1286.1	(714.5)	1040.5	(578.1)	900.0	(500.0)
458.5	1504.6	(835.9)	1306.2	(725.7)	1053.5	(585.3)	908.9	(504.9)
458.6	1534.1	(852.3)	1327.0	(737.2)	1066.9	(592.7)	918.1	(510.0)
458.7	1562.2	(867.9)	1348.7	(749.3)	1080.8	(600.4)	927.5	(515.3)
458.8	1593.7	(885.4)	1371.4	(761.9)	1095.0	(608.3)	937.2	(520.7)
458.9	1625.0	(902.8)	1395.2	(775.1)	1109.5	(616.4)	947.1	(526.2)
459.0	1657.0	(920.5)	1419.8	(788.8)	1124.3	(624.6)	957.4	(531.9)
459.1	1691.1	(939.5)	1445.2	(802.9)	1139.4	(633.0)	967.7	(537.6)
459.2	1726.0	(958.9)	1470.9	(817.2)	1154.8	(641.6)	978.2	(543.5)
459.3	1760.4	(978.0)	1496.9	(831.6)	1170.5	(650.3)	988.9	(549.4)
459.4	1796.2	(997.9)	1522.7	(846.0)	1186.3	(659.0)	999.8	(555.4)
459.5	1832.5	(1018.0)	1548.4	(860.2)	1202.2	(667.9)	1010.8	(561.6)
459.6	1869.2	(1038.4)	1573.9	(874.4)	1218.4	(676.9)	1022.0	(567.8)
459.7	1906.3	(1059.0)	1599.3	(888.5)	1234.8	(686.0)	1033.3	(574.0)
459.8	1943.6	(1079.8)	1624.6	(902.6)	1251.2	(695.1)	1044.6	(580.4)
459.9	1981.3	(1100.7)	1650.1	(916.7)	1267.7	(704.3)	1056.1	(586.7)
460.0	2019.3	(1121.8)	1675.8	(931.0)	1284.4	(713.5)	1067.8	(593.2)
460.1	2057.6	(1143.1)	1702.0	(945.5)	1301.2	(722.9)	1079.6	(599.8)
460.2	2096.1	(1164.5)	1728.6	(960.3)	1318.2	(732.4)	1091.5	(606.4)
460.3	2134.7	(1186.0)	1755.6	(975.3)	1335.4	(741.9)	1103.6	(613.1)
460.4	2173.3	(1207.4)	1783.0	(990.6)	1352.8	(751.6)	1115.8	(619.9)
460.5	2211.9	(1228.8)	1810.8	(1006.0)	1370.3	(761.3)	1128.2	(626.8)
460.6	2250.5	(1250.3)	1838.7	(1021.5)	1388.0	(771.1)	1140.7	(633.7)
460.7	2289.1	(1271.7)	1866.7	(1037.0)	1405.9	(781.0)	1153.3	(640.7)
460.8	2327.7	(1293.1)	1894.7	(1052.6)	1423.9	(791.1)	1166.1	(647.8)
460.9	2366.3	(1314.6)	1922.8	(1068.2)	1442.1	(801.2)	1179.1	(655.0)
461.0	2404.8	(1336.0)	1951.0	(1083.9)	1460.5	(811.4)	1192.1	(662.3)
461.1	2443.4	(1357.5)						
461.2								
461.3								
461.4								

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(o) Station 52 in. (132.08 cm), ray 180°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	621.7	(345.4)	622.0	(345.5)	616.2	(342.3)	609.6	(338.7)
444.0	629.5	(349.7)	628.6	(349.2)	623.2	(346.2)	613.3	(340.7)
445.0	635.1	(352.8)	635.9	(353.3)	628.4	(349.1)	617.1	(342.8)
446.0	645.0	(358.4)	642.6	(357.0)	635.9	(353.3)	621.3	(345.2)
447.0	652.0	(362.8)	650.0	(361.1)	644.1	(357.8)	626.0	(347.8)
448.0	662.3	(367.9)	658.6	(365.9)	651.9	(362.2)	633.3	(351.8)
448.1	662.9	(368.3)	659.6	(366.4)	652.6	(362.6)	634.0	(352.2)
448.2	663.5	(368.6)	660.5	(367.0)	653.3	(362.9)	634.7	(352.6)
448.3	664.2	(369.0)	661.5	(367.5)	653.9	(363.3)	635.3	(352.9)
448.4	665.0	(369.4)	662.4	(368.0)	654.5	(363.6)	635.9	(353.3)
448.5	665.8	(369.9)	663.4	(368.5)	655.2	(364.0)	636.5	(353.6)
448.6	666.7	(370.4)	664.3	(369.1)	655.9	(364.4)	637.0	(353.9)
448.7	667.8	(371.0)	665.2	(369.6)	656.7	(364.9)	637.6	(354.2)
448.8	668.8	(371.5)	666.2	(370.1)	657.7	(365.4)	638.1	(354.5)
448.9	669.7	(372.1)	667.1	(370.6)	658.6	(365.9)	638.7	(354.8)
449.0	670.7	(372.6)	668.1	(371.2)	659.6	(366.4)	639.3	(355.1)
449.1	671.7	(373.2)	669.0	(371.7)	660.6	(367.0)	639.9	(355.5)
449.2	672.7	(373.7)	670.0	(372.2)	661.4	(367.5)	640.6	(355.9)
449.3	673.8	(374.3)	671.0	(372.8)	662.2	(367.9)	641.2	(356.2)
449.4	675.0	(375.0)	672.1	(373.4)	663.0	(368.3)	641.9	(356.6)
449.5	676.2	(375.7)	673.1	(374.0)	663.7	(368.7)	642.7	(357.0)
449.6	677.6	(376.4)	674.2	(374.6)	664.5	(369.1)	643.4	(357.5)
449.7	679.1	(377.3)	675.3	(375.2)	665.3	(369.6)	644.2	(357.9)
449.8	680.6	(378.1)	676.5	(375.8)	666.3	(370.2)	644.9	(358.3)
449.9	682.3	(379.0)	677.8	(376.5)	667.4	(370.8)	645.7	(358.7)
450.0	683.8	(379.9)	679.0	(377.2)	668.5	(371.4)	646.5	(359.2)
450.1	685.3	(380.7)	680.3	(378.0)	669.7	(372.1)	647.3	(359.6)
450.2	686.8	(381.5)	681.6	(378.7)	670.8	(372.7)	648.1	(360.1)
450.3	688.3	(382.4)	683.0	(379.5)	671.9	(373.3)	648.9	(360.5)
450.4	689.8	(383.2)	684.4	(380.2)	673.0	(373.9)	649.8	(361.0)
450.5	691.4	(384.1)	685.9	(381.1)	674.0	(374.5)	650.7	(361.5)
450.6	693.1	(385.0)	687.5	(381.9)	675.1	(375.0)	651.7	(362.1)
450.7	694.9	(386.0)	689.0	(382.8)	676.1	(375.6)	652.8	(362.7)
450.8	696.8	(387.1)	690.6	(383.6)	677.3	(376.3)	653.8	(363.2)
450.9	698.7	(388.2)	692.2	(384.6)	678.5	(376.9)	654.9	(363.8)
451.0	700.7	(389.3)	693.8	(385.5)	679.8	(377.7)	656.0	(364.4)
451.1	702.8	(390.4)	695.5	(386.4)	681.1	(378.4)	657.2	(365.1)
451.2	704.8	(391.6)	697.2	(387.3)	682.5	(379.1)	658.4	(365.8)
451.3	706.9	(392.7)	698.9	(388.3)	683.8	(379.9)	659.6	(366.4)
451.4	708.6	(393.7)	700.7	(389.3)	685.2	(380.7)	660.8	(367.1)
451.5	710.4	(394.7)	702.4	(390.2)	686.6	(381.5)	662.1	(367.8)
451.6	712.0	(395.6)	704.2	(391.2)	688.1	(382.3)	663.4	(368.6)
451.7	713.5	(396.4)	706.0	(392.2)	689.6	(383.1)	664.7	(369.3)
451.8	715.1	(397.3)	707.9	(393.3)	691.1	(384.0)	666.0	(370.0)
451.9	716.8	(398.2)	709.7	(394.2)	692.7	(384.8)	667.3	(370.7)
452.0	718.6	(399.2)	711.6	(395.3)	694.3	(385.7)	668.5	(371.4)
452.1	720.4	(400.2)	713.4	(396.3)	695.9	(386.6)	669.8	(372.1)
452.2	722.5	(401.4)	715.2	(397.3)	697.5	(387.5)	671.0	(372.8)
452.3	724.7	(402.6)	717.0	(398.3)	699.1	(388.4)	672.1	(373.4)
452.4	727.0	(403.9)	718.8	(399.3)	700.6	(389.2)	673.3	(374.0)
452.5	729.5	(405.3)	720.6	(400.3)	702.1	(390.1)	674.4	(374.7)
452.6	731.8	(406.6)	722.4	(401.3)	703.6	(390.9)	675.6	(375.3)
452.7	734.0	(407.8)	724.1	(402.3)	705.0	(391.7)	676.8	(376.0)
452.8	736.1	(409.0)	725.8	(403.2)	706.5	(392.5)	677.9	(376.6)
452.9	738.1	(410.1)	727.6	(404.2)	708.0	(393.3)	679.1	(377.3)
453.0	740.1	(411.2)	729.3	(405.2)	709.5	(394.2)	680.3	(377.9)
453.1	742.1	(412.3)	731.0	(406.1)	711.1	(395.0)	681.5	(378.6)
453.2	744.2	(413.4)	732.7	(407.1)	712.7	(395.9)	682.8	(379.3)
453.3	746.2	(414.6)	734.4	(408.0)	714.4	(396.9)	684.1	(380.1)
453.4	748.3	(415.7)	736.2	(409.0)	716.1	(397.9)	685.4	(380.8)
453.5	750.5	(416.9)	738.1	(410.0)	717.9	(398.8)	686.8	(381.6)
453.6	752.7	(418.2)	740.0	(411.1)	719.7	(399.9)	688.2	(382.3)
453.7	755.2	(419.6)	742.0	(412.2)	721.5	(400.9)	689.7	(383.2)
453.8	757.7	(420.9)	744.0	(413.3)	723.3	(401.9)	691.2	(384.0)
453.9	760.3	(422.4)	746.2	(414.5)	725.1	(402.9)	692.8	(384.9)
454.0	762.9	(423.8)	748.4	(415.8)	726.9	(403.9)	694.3	(385.7)
454.1	765.6	(425.3)	750.7	(417.1)	728.8	(404.9)	696.0	(386.7)
454.2	768.4	(426.9)	753.1	(418.4)	730.6	(405.9)	697.7	(387.6)
454.3	771.2	(428.5)	755.5	(419.7)	732.5	(407.0)	699.4	(388.6)
454.4	774.2	(430.1)	758.1	(421.1)	734.5	(408.1)	701.1	(389.5)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(o) Station 52 in. (132.08 cm), ray 180°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	777.2	(431.8)	760.6	(422.6)	736.6	(409.2)	702.9	(390.5)
454.6	780.1	(433.4)	763.3	(424.1)	738.7	(410.4)	704.6	(391.5)
454.7	783.2	(435.1)	766.0	(425.6)	740.9	(411.6)	706.4	(392.5)
454.8	786.3	(436.9)	768.8	(427.1)	743.2	(412.9)	708.3	(393.5)
454.9	789.6	(438.7)	771.6	(428.7)	745.5	(414.2)	710.1	(394.5)
455.0	792.9	(440.5)	774.5	(430.3)	747.8	(415.5)	711.9	(395.5)
455.1	796.3	(442.4)	777.2	(431.8)	750.1	(416.7)	713.8	(396.6)
455.2	799.7	(444.3)	780.0	(433.3)	752.4	(418.0)	715.8	(397.6)
455.3	803.2	(446.2)	782.8	(434.9)	754.6	(419.2)	717.7	(398.7)
455.4	806.9	(448.3)	785.6	(436.4)	756.7	(420.4)	719.7	(399.8)
455.5	810.7	(450.4)	788.5	(438.1)	758.8	(421.6)	721.7	(400.9)
455.6	814.8	(452.7)	791.6	(439.8)	760.9	(422.7)	723.8	(402.1)
455.7	818.9	(455.0)	794.8	(441.6)	763.1	(423.9)	725.9	(403.3)
455.8	823.2	(457.3)	798.3	(443.5)	765.4	(425.2)	728.0	(404.4)
455.9	827.6	(459.8)	802.0	(445.6)	767.8	(426.6)	730.2	(405.6)
456.0	832.5	(462.5)	806.1	(447.9)	770.5	(428.1)	732.4	(406.9)
456.1	837.5	(465.3)	810.5	(450.3)	773.4	(429.7)	734.7	(408.2)
456.2	842.6	(468.1)	815.2	(452.9)	776.6	(431.4)	737.1	(409.5)
456.3	848.0	(471.1)	820.8	(456.0)	780.0	(433.3)	739.6	(410.9)
456.4	853.5	(474.2)	826.9	(459.4)	783.6	(435.3)	742.1	(412.3)
456.5	859.3	(477.4)	833.3	(463.0)	787.4	(437.4)	744.7	(413.7)
456.6	865.0	(480.1)	840.2	(466.8)	791.4	(439.6)	747.4	(415.2)
456.7	884.9	(491.6)	847.4	(470.8)	795.5	(441.9)	750.2	(416.8)
456.8	891.1	(495.0)	855.0	(475.0)	799.6	(444.2)	753.2	(418.4)
456.9	900.1	(500.1)	863.0	(479.4)	803.9	(446.6)	756.1	(420.1)
457.0	913.5	(507.5)	871.3	(484.1)	808.3	(449.0)	759.1	(421.7)
457.1	931.1	(517.3)	880.1	(489.0)	812.8	(451.6)	762.2	(423.5)
457.2	951.4	(528.6)	889.3	(494.0)	817.6	(454.2)	765.5	(425.3)
457.3	972.2	(540.1)	898.8	(499.4)	822.8	(457.1)	768.9	(427.2)
457.4	991.5	(550.8)	908.8	(504.9)	828.4	(460.2)	772.4	(429.1)
457.5	1008.4	(560.2)	927.7	(515.4)	834.5	(463.6)	775.9	(431.0)
457.6	1023.6	(568.7)	946.5	(525.8)	841.1	(467.3)	779.6	(433.1)
457.7	1038.7	(577.0)	956.8	(531.6)	848.2	(471.2)	783.5	(435.3)
457.8	1055.7	(586.5)	967.7	(537.6)	855.7	(475.4)	787.6	(437.5)
457.9	1076.3	(597.9)	980.1	(544.5)	863.5	(479.7)	791.9	(439.9)
458.0	1100.8	(611.6)	994.6	(552.6)	871.7	(484.3)	796.4	(442.4)
458.1	1129.3	(627.4)	1011.4	(561.9)	880.4	(489.1)	801.1	(445.0)
458.2	1161.6	(645.4)	1030.4	(572.4)	889.6	(494.2)	806.1	(447.8)
458.3	1196.5	(665.8)	1051.6	(584.2)	899.5	(499.7)	811.4	(450.8)
458.4	1239.6	(688.7)	1075.4	(597.4)	910.3	(505.7)	817.2	(454.0)
458.5	1285.4	(714.1)	1102.1	(612.3)	922.1	(512.3)	823.2	(457.4)
458.6	1336.5	(742.5)	1131.8	(628.8)	935.0	(519.4)	829.7	(460.9)
458.7	1393.5	(774.2)	1164.7	(647.1)	948.9	(527.2)	836.6	(464.8)
458.8	1457.1	(809.5)	1200.9	(667.2)	964.0	(535.6)	844.0	(468.9)
458.9	1527.0	(848.3)	1240.7	(689.3)	980.3	(544.6)	852.0	(473.3)
459.0	1601.1	(889.5)	1284.0	(713.3)	997.7	(554.3)	860.7	(478.2)
459.1	1675.6	(930.9)	1330.4	(739.1)	1016.1	(564.5)	869.9	(483.3)
459.2	1747.2	(970.7)	1378.4	(765.8)	1035.6	(575.3)	879.7	(488.7)
459.3	1814.5	(1008.0)	1426.4	(792.4)	1056.0	(586.7)	890.3	(494.6)
459.4	1879.1	(1044.0)	1473.0	(818.4)	1077.4	(598.5)	901.3	(500.7)
459.5			1517.9	(843.3)	1099.5	(610.9)	912.9	(507.1)
459.6			1560.8	(867.1)	1122.4	(623.5)	925.0	(513.9)
459.7			1601.6	(889.8)	1145.7	(636.5)	937.7	(521.0)
459.8			1640.6	(911.4)	1169.4	(649.7)	951.0	(528.3)
459.9			1678.1	(932.3)	1193.4	(663.0)	964.6	(535.9)
460.0			1715.0	(952.8)	1217.5	(676.4)	978.7	(543.7)
460.1			1752.0	(973.3)	1241.7	(689.8)	993.0	(551.7)
460.2			1789.2	(994.0)	1265.9	(703.3)	1007.8	(559.9)
460.3			1826.8	(1014.9)	1290.1	(716.7)	1022.6	(568.1)
460.4					1314.4	(730.2)	1037.8	(576.5)
460.5							1053.3	(585.2)
460.6							1069.2	(594.0)
460.7							1085.4	(603.0)
460.8							1102.0	(612.2)
460.9							1119.0	(621.7)
461.0							1136.3	(631.3)
461.1							1154.0	(641.1)
461.2							1172.0	(651.1)
461.3							1190.4	(661.3)
461.4							1209.1	(671.7)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(p) Station 73 in. (185.42 cm), ray 180°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	611.0	(339.4)	612.0	(340.0)	608.9	(338.3)	605.6	(336.4)
444.0	617.9	(343.3)	616.8	(342.7)	613.3	(340.7)	609.8	(338.8)
445.0	622.8	(346.0)	623.4	(346.3)	618.5	(343.6)	614.0	(341.1)
446.0	630.2	(350.1)	629.3	(349.6)	623.7	(346.5)	619.1	(343.9)
447.0	637.5	(354.2)	636.1	(353.4)	629.3	(349.6)	624.8	(347.1)
448.0	645.1	(358.4)	643.8	(357.6)	636.4	(353.6)	630.7	(350.4)
448.1	646.0	(358.9)	644.5	(358.1)	637.1	(354.0)	631.3	(350.7)
448.2	647.0	(359.5)	645.2	(358.5)	637.8	(354.3)	631.8	(351.0)
448.3	648.0	(360.0)	646.0	(358.9)	638.5	(354.7)	632.4	(351.3)
448.4	649.0	(360.5)	646.7	(359.3)	639.2	(355.1)	632.9	(351.6)
448.5	649.9	(361.0)	647.4	(359.6)	639.9	(355.5)	633.5	(351.9)
448.6	650.7	(361.5)	648.0	(360.0)	640.6	(355.9)	634.0	(352.2)
448.7	651.5	(361.9)	648.7	(360.4)	641.3	(356.3)	634.6	(352.5)
448.8	652.2	(362.4)	649.4	(360.8)	642.0	(356.7)	635.1	(352.9)
448.9	653.0	(362.8)	650.1	(361.2)	642.7	(357.1)	635.7	(353.2)
449.0	653.8	(363.2)	650.7	(361.5)	643.4	(357.5)	636.3	(353.5)
449.1	654.7	(363.7)	651.4	(361.9)	644.2	(357.9)	636.8	(353.8)
449.2	655.6	(364.2)	652.2	(362.3)	645.0	(358.3)	637.4	(354.1)
449.3	656.5	(364.7)	652.9	(362.7)	645.8	(358.8)	638.0	(354.4)
449.4	657.5	(365.3)	653.6	(363.1)	646.6	(359.2)	638.6	(354.8)
449.5	658.4	(365.8)	654.4	(363.6)	647.3	(359.6)	639.2	(355.1)
449.6	659.4	(366.3)	655.3	(364.0)	648.1	(360.1)	639.9	(355.5)
449.7	660.3	(366.9)	656.1	(364.5)	648.9	(360.5)	640.6	(355.9)
449.8	661.3	(367.4)	657.0	(365.0)	649.7	(360.9)	641.3	(356.3)
449.9	662.3	(367.9)	657.9	(365.5)	650.4	(361.3)	642.1	(356.7)
450.0	663.3	(368.5)	658.8	(366.0)	651.1	(361.7)	642.8	(357.1)
450.1	664.2	(369.0)	659.8	(366.6)	651.9	(362.2)	643.6	(357.6)
450.2	665.2	(369.6)	660.9	(367.2)	652.6	(362.6)	644.4	(358.0)
450.3	666.4	(370.2)	662.0	(367.8)	653.4	(363.0)	645.3	(358.5)
450.4	667.4	(370.8)	663.2	(368.5)	654.2	(363.4)	646.1	(359.0)
450.5	668.8	(371.5)	664.5	(369.1)	655.0	(363.9)	647.0	(359.5)
450.6	670.1	(372.3)	665.8	(369.9)	655.8	(364.4)	647.9	(359.9)
450.7	671.8	(373.2)	667.2	(370.7)	656.7	(364.9)	648.8	(360.4)
450.8	673.6	(374.2)	668.6	(371.4)	657.7	(365.4)	649.7	(360.9)
450.9	675.3	(375.2)	670.1	(372.3)	658.8	(366.0)	650.7	(361.5)
451.0	677.1	(376.2)	671.5	(373.1)	659.9	(366.6)	651.7	(362.1)
451.1	678.9	(377.2)	673.1	(373.9)	661.1	(367.3)	652.7	(362.6)
451.2	680.5	(378.1)	674.6	(374.8)	662.3	(368.0)	653.8	(363.2)
451.3	682.1	(378.9)	676.2	(375.7)	663.6	(368.7)	654.8	(363.8)
451.4	683.4	(379.7)	677.8	(376.6)	665.0	(369.4)	655.9	(364.4)
451.5	684.7	(380.4)	679.4	(377.5)	666.4	(370.2)	657.0	(365.0)
451.6	686.0	(381.1)	681.1	(378.4)	667.8	(371.0)	658.1	(365.6)
451.7	687.4	(381.9)	682.8	(379.3)	669.3	(371.8)	659.1	(366.2)
451.8	688.9	(382.7)	684.4	(380.2)	670.7	(372.6)	660.2	(366.8)
451.9	690.6	(383.7)	686.1	(381.2)	672.2	(373.4)	661.3	(367.4)
452.0	692.4	(384.7)	687.7	(382.1)	673.6	(374.2)	662.4	(368.0)
452.1	694.2	(385.7)	689.4	(383.0)	675.0	(375.0)	663.5	(368.6)
452.2	696.2	(386.8)	691.0	(383.9)	676.3	(375.7)	664.6	(369.2)
452.3	698.2	(387.9)	692.6	(384.8)	677.6	(376.5)	665.7	(369.8)
452.4	700.3	(389.1)	694.2	(385.7)	678.9	(377.2)	666.8	(370.4)
452.5	702.4	(390.2)	695.7	(386.5)	680.2	(377.9)	667.9	(371.0)
452.6	704.5	(391.4)	697.3	(387.4)	681.4	(378.5)	669.0	(371.7)
452.7	706.5	(392.5)	698.8	(388.2)	682.6	(379.2)	670.1	(372.3)
452.8	708.3	(393.5)	700.3	(389.1)	683.7	(379.8)	671.2	(372.9)
452.9	710.1	(394.5)	701.8	(389.9)	684.8	(380.5)	672.3	(373.5)
453.0	711.7	(395.4)	703.3	(390.7)	685.9	(381.1)	673.4	(374.1)
453.1	713.4	(396.3)	704.7	(391.5)	687.0	(381.7)	674.5	(374.7)
453.2	715.0	(397.2)	706.2	(392.3)	688.2	(382.3)	675.6	(375.3)
453.3	716.7	(398.1)	707.7	(393.2)	689.3	(383.0)	676.7	(375.9)
453.4	718.3	(399.1)	709.2	(394.0)	690.6	(383.6)	677.8	(376.5)
453.5	720.0	(400.0)	710.7	(394.8)	691.9	(384.4)	678.9	(377.2)
453.6	721.8	(401.0)	712.3	(395.7)	693.2	(385.1)	680.1	(377.8)
453.7	723.7	(402.1)	714.0	(396.6)	694.5	(385.9)	681.2	(378.4)
453.8	725.8	(403.2)	715.7	(397.6)	696.0	(386.7)	682.3	(379.1)
453.9	727.9	(404.4)	717.5	(398.6)	697.5	(387.5)	683.5	(379.7)
454.0	730.1	(405.6)	719.4	(399.7)	699.0	(388.3)	684.7	(380.4)
454.1	732.4	(406.9)	721.5	(400.8)	700.6	(389.2)	685.9	(381.1)
454.2	734.8	(408.2)	723.6	(402.0)	702.3	(390.2)	687.1	(381.7)
454.3	737.5	(409.7)	725.8	(403.2)	704.0	(391.1)	688.4	(382.4)
454.4	740.3	(411.3)	728.1	(404.5)	705.8	(392.1)	689.6	(383.1)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(p) Station 73 in. (185.42 cm), ray 180°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	743.3	(412.9)	730.6	(405.9)	707.6	(393.1)	690.9	(383.8)
454.6	746.2	(414.6)	733.2	(407.3)	709.5	(394.2)	692.2	(384.6)
454.7	749.5	(416.4)	735.9	(408.8)	711.4	(395.2)	693.6	(385.3)
454.8	753.0	(418.4)	738.8	(410.4)	713.4	(396.3)	695.0	(386.1)
454.9	756.8	(420.4)	741.8	(412.1)	715.4	(397.5)	696.4	(386.9)
455.0	760.6	(422.6)	744.9	(413.8)	717.6	(398.6)	697.8	(387.7)
455.1	764.6	(424.8)	748.2	(415.6)	719.8	(399.9)	699.2	(388.5)
455.2	768.8	(427.1)	751.6	(417.5)	722.0	(401.1)	700.7	(389.3)
455.3	773.1	(429.5)	755.2	(419.5)	724.4	(402.5)	702.2	(390.1)
455.4	777.6	(432.0)	758.9	(421.6)	727.0	(403.9)	703.7	(391.0)
455.5	782.1	(434.5)	762.9	(423.8)	729.6	(405.3)	705.3	(391.8)
455.6	787.1	(437.3)	767.0	(426.1)	732.4	(406.9)	706.8	(392.7)
455.7	792.3	(440.2)	771.2	(428.5)	735.4	(408.6)	708.5	(393.6)
455.8	798.1	(443.4)	775.6	(430.9)	738.6	(410.3)	710.2	(394.5)
455.9	804.4	(446.9)	780.2	(433.4)	742.0	(412.2)	711.9	(395.5)
456.0	811.0	(450.5)	784.9	(436.0)	745.6	(414.2)	713.9	(396.6)
456.1	817.9	(454.4)	789.8	(438.8)	749.5	(416.4)	716.0	(397.8)
456.2	825.3	(458.5)	794.8	(441.5)	753.5	(418.6)	718.2	(399.0)
456.3	833.0	(462.8)	799.9	(444.4)	757.7	(421.0)	720.5	(400.3)
456.4	841.1	(467.3)	805.3	(447.4)	762.1	(423.4)	723.0	(401.7)
456.5	849.5	(472.1)	810.7	(450.4)	766.7	(425.9)	725.8	(403.2)
456.6	858.3	(476.9)	816.6	(455.4)	771.4	(428.6)	728.8	(404.5)
456.7	867.6	(482.0)	829.5	(466.4)	776.4	(431.3)	732.0	(406.7)
456.8	876.5	(514.7)	858.3	(476.9)	781.5	(434.2)	735.4	(408.6)
456.9	952.8	(529.4)	877.0	(487.2)	786.8	(437.1)	739.2	(410.6)
457.0	984.7	(547.1)	896.8	(498.2)	792.3	(440.2)	743.1	(412.8)
457.1	1021.4	(567.4)	918.0	(510.0)	798.0	(443.3)	747.4	(415.2)
457.2	1061.1	(589.5)	941.0	(522.8)	804.2	(446.8)	752.0	(417.8)
457.3	1102.0	(612.2)	965.5	(536.4)	815.9	(453.3)	757.0	(420.5)
457.4	1142.8	(634.9)	991.3	(550.7)	828.6	(460.3)	762.3	(423.5)
457.5	1182.6	(657.0)	1018.0	(565.6)	841.6	(467.6)	767.9	(426.6)
457.6	1221.3	(678.5)	1045.4	(580.8)	855.1	(475.0)	774.0	(430.0)
457.7	1259.1	(699.5)	1073.0	(596.1)	868.9	(482.7)	780.5	(433.6)
457.8	1296.3	(720.2)	1100.9	(611.6)	883.1	(490.6)	787.3	(437.4)
457.9	1333.4	(740.8)	1128.9	(627.2)	897.7	(498.7)	794.7	(441.5)
458.0	1370.6	(761.4)	1156.9	(642.7)	912.7	(507.0)	802.6	(445.9)
458.1	1407.7	(782.0)	1184.9	(658.3)	928.1	(515.6)	810.9	(450.5)
458.2	1444.5	(802.5)	1212.8	(673.8)	943.9	(524.4)	819.7	(455.4)
458.3	1481.3	(823.0)	1240.4	(689.1)	960.1	(533.4)	829.0	(460.6)
458.4	1518.1	(843.4)	1268.0	(704.5)	976.7	(542.6)	838.7	(466.0)
458.5	1554.1	(863.4)	1295.7	(719.8)	993.7	(552.0)	849.1	(471.7)
458.6	1589.1	(882.8)	1323.5	(735.3)	1011.3	(561.8)	859.9	(477.7)
458.7	1623.5	(901.9)	1351.4	(750.8)	1029.2	(571.8)	871.1	(484.0)
458.8	1658.2	(921.2)	1379.5	(766.4)	1047.5	(581.9)	882.8	(490.4)
458.9	1693.6	(940.9)	1407.9	(782.1)	1066.3	(592.4)	894.7	(497.0)
459.0	1729.8	(961.0)	1436.5	(798.1)	1085.2	(602.9)	907.0	(503.9)
459.1	1766.4	(981.3)	1465.7	(814.3)	1104.3	(613.5)	919.6	(510.9)
459.2			1495.4	(830.8)	1123.6	(624.2)	932.4	(518.0)
459.3			1525.6	(847.6)	1143.0	(635.0)	945.5	(525.3)
459.4			1556.3	(864.6)	1162.4	(645.8)	958.9	(532.7)
459.5			1587.0	(881.6)	1182.0	(656.7)	972.4	(540.2)
459.6			1617.5	(898.6)	1201.5	(667.5)	986.1	(547.8)
459.7			1648.0	(915.5)	1221.1	(678.4)	1000.0	(555.5)
459.8			1678.4	(932.4)	1240.7	(689.3)	1013.9	(563.3)
459.9			1709.1	(949.5)	1260.3	(700.2)	1028.1	(571.1)
460.0			1740.3	(966.8)	1280.1	(711.2)	1042.3	(579.1)
460.1			1772.1	(984.5)	1300.0	(722.2)	1056.7	(587.0)
460.2			1804.5	(1002.5)	1320.0	(733.3)	1071.2	(595.1)
460.3			1837.6	(1020.9)	1340.3	(744.6)	1085.8	(603.2)
460.4			1870.8	(1039.4)	1360.7	(756.0)	1100.6	(611.4)
460.5			1904.4	(1058.0)	1381.5	(767.5)	1115.5	(619.7)
460.6			1938.3	(1076.9)	1402.5	(779.2)	1130.6	(628.1)
460.7			1972.4	(1095.8)	1423.7	(791.0)	1145.8	(636.6)
460.8			2006.7	(1114.8)	1445.2	(802.9)	1161.2	(645.1)
460.9			2041.3	(1134.0)	1466.8	(814.9)	1176.7	(653.7)
461.0					1488.7	(827.0)	1192.4	(662.5)
461.1					1510.7	(839.3)	1208.2	(671.2)
461.2					1533.0	(851.7)	1224.2	(680.1)
461.3					1555.5	(864.2)	1240.3	(689.1)
461.4					1578.2	(876.8)	1256.6	(698.1)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(q) Station 99 in. (251.46 cm), ray 180°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	601.3	(334.1)	602.4	(334.7)	598.3	(332.4)	596.1	(331.2)
444.0	608.4	(338.0)	606.5	(337.0)	603.6	(335.3)	600.3	(333.5)
445.0	611.9	(339.9)	611.4	(339.7)	608.4	(338.0)	604.2	(335.7)
446.0	618.5	(343.6)	617.4	(343.0)	612.4	(340.2)	607.8	(337.7)
447.0	624.7	(347.1)	622.4	(345.8)	617.1	(342.8)	611.2	(339.6)
448.0	631.2	(350.7)	627.9	(348.9)	623.1	(346.2)	617.9	(343.3)
448.1	631.9	(351.1)	628.7	(349.3)	623.7	(346.5)	618.6	(343.7)
448.2	632.6	(351.5)	629.5	(349.7)	624.4	(346.9)	619.3	(344.1)
448.3	633.4	(351.9)	630.3	(350.2)	625.0	(347.2)	619.9	(344.4)
448.4	634.1	(352.3)	631.1	(350.6)	625.6	(347.5)	620.5	(344.7)
448.5	634.9	(352.7)	632.0	(351.1)	626.2	(347.9)	621.1	(345.0)
448.6	635.5	(353.1)	632.9	(351.6)	626.8	(348.2)	621.6	(345.3)
448.7	636.2	(353.5)	633.8	(352.1)	627.4	(348.6)	622.1	(345.6)
448.8	636.8	(353.8)	634.6	(352.6)	628.0	(348.9)	622.6	(345.9)
448.9	637.4	(354.1)	635.5	(353.0)	628.6	(349.2)	623.1	(346.2)
449.0	638.0	(354.5)	636.3	(353.5)	629.3	(349.6)	623.6	(346.4)
449.1	638.6	(354.8)	637.1	(353.9)	629.9	(349.9)	624.1	(346.7)
449.2	639.2	(355.1)	637.9	(354.4)	630.5	(350.3)	624.6	(347.0)
449.3	639.9	(355.5)	638.6	(354.8)	631.2	(350.7)	625.1	(347.3)
449.4	640.6	(355.9)	639.4	(355.2)	631.8	(351.0)	625.6	(347.6)
449.5	641.4	(356.3)	640.1	(355.6)	632.5	(351.4)	626.1	(347.8)
449.6	642.2	(356.8)	640.9	(356.1)	633.1	(351.7)	626.7	(348.1)
449.7	643.1	(357.3)	641.7	(356.5)	633.8	(352.1)	627.2	(348.4)
449.8	644.1	(357.8)	642.4	(356.9)	634.5	(352.5)	627.7	(348.7)
449.9	645.1	(358.4)	643.2	(357.3)	635.2	(352.9)	628.3	(349.1)
450.0	646.1	(358.9)	644.0	(357.8)	636.0	(353.3)	628.9	(349.4)
450.1	647.1	(359.5)	644.8	(358.2)	636.7	(353.7)	629.5	(349.7)
450.2	648.2	(360.1)	645.7	(358.7)	637.5	(354.2)	630.1	(350.1)
450.3	649.2	(360.7)	646.6	(359.2)	638.3	(354.6)	630.8	(350.4)
450.4	650.2	(361.2)	647.6	(359.8)	639.1	(355.1)	631.4	(350.8)
450.5	651.2	(361.8)	648.6	(360.3)	640.0	(355.5)	632.2	(351.2)
450.6	652.2	(362.3)	649.7	(360.9)	640.8	(356.0)	632.9	(351.6)
450.7	653.4	(363.0)	650.8	(361.6)	641.8	(356.5)	633.6	(352.0)
450.8	654.7	(363.7)	652.0	(362.2)	642.7	(357.1)	634.3	(352.4)
450.9	656.2	(364.6)	653.2	(362.9)	643.7	(357.6)	635.1	(352.8)
451.0	658.0	(365.5)	654.5	(363.6)	644.7	(358.2)	635.9	(353.3)
451.1	659.7	(366.5)	655.7	(364.3)	645.8	(358.8)	636.8	(353.8)
451.2	661.4	(367.4)	656.9	(365.0)	646.9	(359.4)	637.6	(354.2)
451.3	662.9	(368.3)	658.1	(365.6)	648.0	(360.0)	638.5	(354.7)
451.4	664.5	(369.2)	659.4	(366.3)	649.1	(360.6)	639.5	(355.3)
451.5	665.9	(370.0)	660.6	(367.0)	650.2	(361.2)	640.4	(355.8)
451.6	667.2	(370.7)	661.9	(367.7)	651.4	(361.9)	641.3	(356.3)
451.7	668.4	(371.3)	663.2	(368.4)	652.5	(362.5)	642.2	(356.8)
451.8	669.6	(372.0)	664.5	(369.2)	653.7	(363.1)	643.2	(357.3)
451.9	671.0	(372.8)	665.8	(369.9)	654.8	(363.8)	644.1	(357.8)
452.0	672.4	(373.6)	667.2	(370.7)	655.9	(364.4)	645.0	(358.4)
452.1	674.0	(374.5)	668.5	(371.4)	657.0	(365.0)	646.0	(358.9)
452.2	675.7	(375.4)	669.8	(372.1)	658.1	(365.6)	646.9	(359.4)
452.3	677.3	(376.3)	671.1	(372.8)	659.3	(366.3)	647.8	(359.9)
452.4	678.9	(377.2)	672.4	(373.6)	660.5	(366.9)	648.8	(360.4)
452.5	680.4	(378.0)	673.7	(374.3)	661.6	(367.6)	649.8	(361.0)
452.6	682.0	(378.9)	675.0	(375.0)	662.8	(368.2)	650.8	(361.5)
452.7	683.5	(379.7)	676.4	(375.8)	664.0	(368.9)	651.8	(362.1)
452.8	684.9	(380.5)	677.8	(376.5)	665.1	(369.5)	652.8	(362.7)
452.9	686.3	(381.3)	679.2	(377.3)	666.3	(370.1)	653.9	(363.3)
453.0	687.6	(382.0)	680.7	(378.2)	667.4	(370.8)	655.0	(363.9)
453.1	688.9	(382.7)	682.2	(379.0)	668.6	(371.4)	656.1	(364.5)
453.2	690.2	(383.4)	683.9	(379.9)	669.7	(372.1)	657.1	(365.1)
453.3	691.5	(384.2)	685.6	(380.9)	670.9	(372.7)	658.2	(365.7)
453.4	692.8	(384.9)	687.4	(381.9)	672.1	(373.4)	659.4	(366.3)
453.5	694.4	(385.8)	689.4	(383.0)	673.4	(374.1)	660.6	(367.0)
453.6	696.1	(386.7)	691.4	(384.1)	674.6	(374.8)	661.8	(367.6)
453.7	698.0	(387.8)	693.6	(385.3)	676.0	(375.5)	662.9	(368.3)
453.8	700.2	(389.0)	695.8	(386.6)	677.4	(376.3)	664.1	(369.0)
453.9	703.0	(390.5)	698.1	(387.8)	678.8	(377.1)	665.3	(369.6)
454.0	706.8	(392.7)	700.5	(389.2)	680.3	(378.0)	666.5	(370.3)
454.1	710.3	(394.6)	703.0	(390.6)	681.9	(378.8)	667.7	(371.0)
454.2	714.6	(397.0)	705.6	(392.0)	683.6	(379.8)	669.0	(371.7)
454.3	719.5	(399.7)	708.2	(393.5)	685.5	(380.8)	670.2	(372.4)
454.4	724.8	(402.7)	711.0	(395.0)	687.5	(381.9)	671.5	(373.1)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(q) Station 99 in. (251.46 cm), ray 180°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	730.7	(405.9)	713.8	(396.5)	689.7	(383.1)	672.9	(373.8)
454.6	737.0	(409.4)	716.8	(398.2)	692.1	(384.5)	674.3	(374.6)
454.7	744.9	(413.8)	721.7	(400.9)	695.0	(386.1)	675.9	(375.5)
454.8	757.5	(420.8)	731.6	(406.5)	698.1	(387.8)	677.5	(376.4)
454.9	769.9	(427.7)	741.2	(411.8)	701.6	(389.8)	679.3	(377.4)
455.0	783.3	(435.1)	751.0	(417.2)	705.4	(391.9)	681.2	(378.5)
455.1	797.6	(443.1)	761.1	(422.8)	709.7	(394.3)	683.4	(379.6)
455.2	813.0	(451.7)	771.7	(428.7)	714.3	(396.9)	685.7	(380.9)
455.3	830.1	(461.1)	782.8	(434.9)	719.6	(399.8)	688.3	(382.4)
455.4	847.1	(470.6)	794.5	(441.4)	725.4	(403.0)	691.1	(384.0)
455.5	866.1	(481.2)	806.9	(448.3)	731.5	(406.4)	694.2	(385.7)
455.6	884.7	(491.5)	820.1	(455.6)	738.3	(410.1)	697.5	(387.5)
455.7	905.7	(503.2)	834.0	(463.4)	745.5	(414.2)	701.2	(389.6)
455.8	927.2	(515.1)	848.8	(471.6)	753.3	(418.5)	705.2	(391.8)
455.9	950.0	(527.8)	864.4	(480.2)	761.6	(423.1)	709.6	(394.2)
456.0	973.5	(540.8)	880.8	(489.3)	770.4	(428.0)	714.3	(396.8)
456.1	997.3	(554.0)	897.8	(498.8)	779.5	(433.1)	719.3	(399.6)
456.2	1021.1	(567.3)	915.4	(508.6)	789.1	(438.4)	724.7	(402.6)
456.3	1044.9	(580.5)	933.3	(518.5)	799.1	(443.9)	730.3	(405.7)
456.4	1068.8	(593.8)	951.4	(528.6)	809.3	(449.6)	736.2	(409.0)
456.5	1090.9	(606.1)	969.4	(538.6)	819.8	(455.5)	742.4	(412.5)
456.6	1112.4	(618.0)	987.4	(548.5)	830.7	(461.5)	749.0	(416.1)
456.7	1133.9	(629.9)	1005.2	(558.4)	841.7	(467.6)	755.9	(419.9)
456.8	1155.3	(641.8)	1022.8	(568.2)	852.8	(473.8)	763.0	(423.9)
456.9	1176.9	(653.8)	1040.4	(578.0)	864.2	(480.1)	770.4	(428.0)
457.0	1197.0	(665.0)	1057.9	(587.7)	875.7	(486.5)	778.0	(432.2)
457.1	1218.5	(676.9)	1075.3	(597.4)	887.3	(493.0)	785.9	(436.6)
457.2	1239.8	(688.8)	1092.8	(607.1)	899.1	(499.5)	794.0	(441.1)
457.3	1261.7	(700.9)	1110.5	(616.9)	910.9	(506.0)	802.3	(445.7)
457.4	1283.5	(713.0)	1128.3	(626.9)	922.8	(512.7)	810.8	(450.4)
457.5	1306.9	(726.1)	1146.6	(637.0)	934.8	(519.3)	819.5	(455.3)
457.6	1329.9	(738.8)	1165.2	(647.3)	947.0	(526.1)	828.4	(460.2)
457.7	1354.8	(752.7)	1184.2	(657.9)	959.4	(533.0)	837.5	(465.3)
457.8	1381.4	(767.4)	1203.8	(668.8)	972.0	(540.0)	846.8	(470.4)
457.9	1407.4	(781.9)	1223.8	(679.9)	984.7	(547.1)	856.3	(475.7)
458.0	1434.1	(796.7)	1244.3	(691.3)	997.7	(554.3)	866.0	(481.1)
458.1	1461.2	(811.8)	1265.1	(702.9)	1011.0	(561.6)	875.9	(486.6)
458.2	1489.5	(827.5)	1286.4	(714.7)	1024.4	(569.1)	885.9	(492.2)
458.3	1517.7	(843.2)	1308.1	(726.7)	1038.2	(576.8)	896.2	(497.9)
458.4	1546.5	(859.2)	1330.2	(739.0)	1052.2	(584.6)	906.6	(503.7)
458.5	1577.5	(876.4)	1352.6	(751.5)	1066.6	(592.5)	917.2	(509.6)
458.6	1608.1	(893.4)	1375.5	(764.2)	1081.3	(600.7)	928.1	(515.6)
458.7	1640.4	(911.4)	1398.8	(777.1)	1096.3	(609.0)	938.9	(521.6)
458.8	1673.5	(929.7)	1422.6	(790.4)	1111.6	(617.6)	950.0	(527.8)
458.9	1707.7	(948.7)	1447.1	(803.9)	1127.3	(626.3)	961.1	(534.0)
459.0	1744.4	(969.1)	1472.1	(817.8)	1143.3	(635.1)	972.5	(540.3)
459.1	1781.8	(989.9)	1497.8	(832.1)	1159.6	(644.2)	984.1	(546.7)
459.2	1820.1	(1011.2)	1524.2	(846.8)	1176.2	(653.5)	995.8	(553.2)
459.3	1859.9	(1033.3)	1551.2	(861.8)	1193.2	(662.9)	1007.7	(559.8)
459.4	1899.1	(1055.0)	1578.9	(877.1)	1210.4	(672.4)	1019.7	(566.5)
459.5	1939.6	(1077.6)	1607.1	(892.8)	1227.8	(682.1)	1031.9	(573.3)
459.6	1981.5	(1100.8)	1635.8	(908.8)	1245.5	(691.9)	1044.3	(580.2)
459.7	2024.3	(1124.6)	1664.9	(925.0)	1263.3	(701.8)	1056.9	(587.1)
459.8	2068.1	(1148.9)	1694.5	(941.4)	1281.3	(711.8)	1069.6	(594.2)
459.9	2112.8	(1173.8)	1724.5	(958.0)	1299.5	(721.9)	1082.5	(601.4)
460.0			1754.8	(974.9)	1317.8	(732.1)	1095.5	(608.6)
460.1			1785.6	(992.0)	1336.4	(742.4)	1108.8	(616.0)
460.2			1816.7	(1009.3)	1354.9	(752.7)	1122.3	(623.5)
460.3			1848.1	(1026.7)	1373.5	(763.1)	1136.0	(631.1)
460.4			1879.9	(1044.4)	1392.3	(773.5)	1149.9	(638.8)
460.5			1911.9	(1062.2)	1411.2	(784.0)	1164.0	(646.6)
460.6			1944.2	(1080.1)	1430.2	(794.5)	1178.2	(654.6)
460.7			1976.8	(1098.2)	1449.3	(805.2)	1192.7	(662.6)
460.8			2009.8	(1116.5)	1468.6	(815.9)	1207.3	(670.7)
460.9			2043.2	(1135.1)	1488.1	(826.7)	1222.2	(679.0)
461.0			2077.1	(1154.0)	1507.6	(837.6)	1237.2	(687.3)
461.1			2111.6	(1173.1)	1527.4	(848.5)	1252.4	(695.8)
461.2			2146.6	(1192.6)	1547.2	(859.6)	1267.9	(704.4)
461.3			2181.9	(1212.2)	1567.2	(870.7)	1283.5	(713.0)
461.4			2217.4	(1231.9)	1587.3	(881.8)	1299.3	(721.8)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(r) Station 121 in. (307.34 cm), ray 180°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	598.0	(332.2)	600.0	(333.4)	597.9	(332.1)	597.4	(331.9)
444.0	606.1	(336.7)	603.2	(335.1)	601.4	(334.1)	599.4	(333.0)
445.0	608.2	(337.9)	606.8	(337.1)	604.2	(335.7)	600.9	(333.8)
446.0	613.4	(340.8)	609.9	(338.8)	608.0	(337.8)	603.5	(335.3)
447.0	618.8	(343.8)	614.6	(341.4)	611.7	(339.8)	609.2	(338.4)
448.0	624.8	(347.1)	623.7	(346.5)	619.3	(344.0)	617.1	(342.8)
448.1	625.7	(347.6)	624.4	(346.9)	620.0	(344.4)	617.6	(343.1)
448.2	626.6	(348.1)	625.0	(347.2)	620.7	(344.8)	618.0	(343.3)
448.3	627.5	(348.6)	625.5	(347.5)	621.3	(345.2)	618.4	(343.6)
448.4	628.3	(349.1)	625.9	(347.7)	621.8	(345.5)	618.8	(343.8)
448.5	629.0	(349.5)	626.3	(347.9)	622.3	(345.7)	619.1	(344.0)
448.6	629.7	(349.8)	626.7	(348.1)	622.8	(346.0)	619.4	(344.1)
448.7	630.3	(350.2)	627.0	(348.4)	623.2	(346.2)	619.8	(344.3)
448.8	630.9	(350.5)	627.4	(348.5)	623.7	(346.5)	620.1	(344.5)
448.9	631.5	(350.8)	627.7	(348.7)	624.1	(346.7)	620.5	(344.7)
449.0	632.1	(351.2)	628.1	(348.9)	624.4	(346.9)	620.7	(344.9)
449.1	632.7	(351.5)	628.4	(349.1)	624.7	(347.1)	621.0	(345.0)
449.2	633.4	(351.9)	628.7	(349.3)	625.0	(347.2)	621.2	(345.1)
449.3	634.1	(352.3)	629.2	(349.5)	625.2	(347.4)	621.4	(345.2)
449.4	634.8	(352.7)	629.7	(349.8)	625.5	(347.5)	621.7	(345.4)
449.5	635.6	(353.1)	630.3	(350.2)	625.7	(347.6)	622.0	(345.6)
449.6	636.4	(353.5)	631.0	(350.5)	626.0	(347.8)	622.3	(345.7)
449.7	637.1	(353.9)	631.8	(351.0)	626.4	(348.0)	622.6	(345.9)
449.8	637.8	(354.3)	632.7	(351.5)	626.9	(348.3)	623.0	(346.1)
449.9	638.5	(354.7)	633.7	(352.1)	627.5	(348.6)	623.6	(346.4)
450.0	639.2	(355.1)	634.8	(352.7)	628.1	(349.0)	624.3	(346.8)
450.1	639.8	(355.5)	635.9	(353.3)	628.8	(349.3)	625.0	(347.2)
450.2	640.5	(355.8)	637.1	(354.0)	629.5	(349.7)	625.7	(347.6)
450.3	641.3	(356.3)	638.3	(354.6)	630.3	(350.2)	626.4	(348.0)
450.4	642.2	(356.8)	639.6	(355.3)	631.2	(350.6)	627.1	(348.4)
450.5	643.3	(357.4)	640.9	(356.0)	632.1	(351.2)	627.8	(348.8)
450.6	644.6	(358.1)	642.1	(356.7)	633.1	(351.7)	628.5	(349.1)
450.7	646.1	(358.9)	643.3	(357.4)	634.1	(352.3)	629.1	(349.5)
450.8	647.6	(359.8)	644.5	(358.0)	635.1	(352.8)	629.8	(349.9)
450.9	649.2	(360.7)	645.7	(358.7)	636.1	(353.4)	630.5	(350.3)
451.0	650.8	(361.6)	647.0	(359.4)	637.2	(354.0)	631.3	(350.7)
451.1	652.3	(362.4)	648.2	(360.1)	638.3	(354.6)	632.2	(351.2)
451.2	653.6	(363.1)	649.4	(360.8)	639.4	(355.2)	633.0	(351.7)
451.3	654.8	(363.8)	650.6	(361.4)	640.5	(355.8)	633.9	(352.2)
451.4	655.9	(364.4)	651.7	(362.1)	641.5	(356.4)	634.7	(352.6)
451.5	657.0	(365.0)	652.8	(362.7)	642.5	(356.9)	635.6	(353.1)
451.6	657.9	(365.5)	653.9	(363.3)	643.5	(357.5)	636.5	(353.6)
451.7	658.8	(366.0)	654.9	(363.8)	644.5	(358.1)	637.6	(354.2)
451.8	659.7	(366.5)	655.9	(364.4)	645.4	(358.6)	638.6	(354.8)
451.9	660.6	(367.0)	656.8	(364.9)	646.3	(359.1)	639.8	(355.4)
452.0	661.6	(367.6)	657.8	(365.4)	647.3	(359.6)	640.9	(356.1)
452.1	662.9	(368.3)	658.8	(366.0)	648.2	(360.1)	642.1	(356.7)
452.2	664.2	(369.0)	659.8	(366.6)	649.2	(360.7)	643.5	(357.5)
452.3	665.7	(369.8)	660.8	(367.1)	650.1	(361.2)	645.0	(358.3)
452.4	667.3	(370.7)	661.9	(367.7)	651.0	(361.7)	646.4	(359.1)
452.5	669.0	(371.7)	663.0	(368.3)	651.8	(362.1)	647.8	(359.9)
452.6	670.9	(372.7)	664.2	(369.0)	652.6	(362.5)	649.0	(360.5)
452.7	672.7	(373.7)	665.4	(369.7)	653.3	(363.0)	650.0	(361.1)
452.8	674.4	(374.7)	666.9	(370.5)	654.1	(363.4)	650.9	(361.6)
452.9	675.9	(375.5)	668.4	(371.3)	654.9	(363.9)	651.8	(362.1)
453.0	677.3	(376.3)	670.0	(372.2)	655.7	(364.3)	652.4	(362.5)
453.1	678.5	(377.0)	671.6	(373.1)	656.6	(364.8)	653.0	(362.8)
453.2	679.8	(377.7)	673.4	(374.1)	657.5	(365.3)	653.4	(363.0)
453.3	681.1	(378.4)	675.2	(375.1)	658.7	(365.9)	653.7	(363.1)
453.4	682.9	(379.4)	677.1	(376.2)	659.9	(366.6)	653.9	(363.3)
453.5	685.1	(380.6)	679.0	(377.2)	661.3	(367.4)	654.1	(363.4)
453.6	687.5	(381.9)	681.1	(378.4)	662.8	(368.2)	654.3	(363.5)
453.7	690.2	(383.4)	683.2	(379.5)	664.5	(369.2)	654.4	(363.5)
453.8	693.1	(385.1)	685.3	(380.7)	666.4	(370.2)	654.4	(363.6)
453.9	696.3	(386.9)	687.6	(382.0)	668.7	(371.5)	654.6	(363.7)
454.0	702.4	(390.2)	691.6	(384.2)	671.4	(373.0)	654.9	(363.8)
454.1	718.8	(399.3)	702.0	(390.0)	674.5	(374.7)	655.6	(364.2)
454.2	732.2	(406.8)	711.9	(395.5)	678.0	(376.7)	656.6	(364.8)
454.3	746.2	(414.6)	721.7	(400.9)	682.0	(378.9)	657.8	(365.4)
454.4	761.1	(422.8)	731.7	(406.5)	686.4	(381.3)	659.3	(366.3)

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(r) Station 121 in. (307.34 cm), ray 180°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	776.9	(431.6)	742.0	(412.2)	691.2	(384.0)	661.2	(367.3)
454.6	793.0	(440.6)	752.8	(418.2)	696.4	(386.9)	663.5	(368.6)
454.7	809.2	(449.5)	764.1	(424.5)	701.7	(389.8)	666.1	(370.1)
454.8	825.5	(458.6)	775.7	(430.9)	707.3	(392.9)	669.2	(371.8)
454.9	841.8	(467.7)	787.6	(437.6)	713.1	(396.2)	672.5	(373.6)
455.0	858.0	(476.7)	799.7	(444.3)	719.2	(399.6)	676.2	(375.6)
455.1	873.7	(485.4)	811.8	(451.0)	725.7	(403.1)	680.2	(377.9)
455.2	889.1	(493.9)	823.5	(457.5)	732.3	(406.8)	684.6	(380.3)
455.3	904.2	(502.3)	835.0	(463.9)	739.2	(410.6)	689.3	(382.9)
455.4	919.2	(510.7)	846.2	(470.1)	746.2	(414.6)	694.3	(385.7)
455.5	934.3	(519.1)	857.2	(476.2)	753.6	(418.7)	699.7	(388.7)
455.6	949.6	(527.5)	868.3	(482.4)	761.2	(422.9)	705.4	(391.9)
455.7	964.8	(536.0)	879.7	(488.7)	769.2	(427.3)	711.2	(395.1)
455.8	980.0	(544.5)	891.5	(495.3)	777.4	(431.9)	717.4	(398.5)
455.9	995.4	(553.0)	903.6	(502.0)	785.7	(436.5)	723.6	(402.0)
456.0	1011.4	(561.9)	916.2	(509.0)	794.1	(441.2)	730.1	(405.6)
456.1	1027.8	(571.0)	929.1	(516.2)	802.8	(446.0)	736.6	(409.2)
456.2	1044.3	(580.2)	942.4	(523.5)	811.7	(450.9)	743.4	(413.0)
456.3	1060.7	(589.3)	955.9	(531.1)	820.8	(456.0)	750.3	(416.8)
456.4	1077.0	(598.3)	969.8	(538.8)	830.1	(461.2)	757.3	(420.7)
456.5	1093.4	(607.4)	984.1	(546.7)	839.7	(466.5)	764.5	(424.7)
456.6	1110.2	(616.8)	998.5	(554.7)	849.5	(471.9)	771.9	(428.8)
456.7	1127.4	(626.3)	1013.2	(562.9)	859.6	(477.5)	779.5	(433.1)
456.8	1145.0	(636.1)	1028.0	(571.1)	869.8	(483.2)	787.3	(437.4)
456.9	1163.1	(646.2)	1042.9	(579.4)	880.2	(489.0)	795.0	(441.7)
457.0	1182.2	(656.8)	1058.0	(587.8)	890.6	(494.8)	803.0	(446.1)
457.1	1201.9	(667.7)	1073.2	(596.2)	901.1	(500.6)	811.0	(450.6)
457.2	1221.8	(678.8)	1088.7	(604.8)	911.7	(506.5)	819.2	(455.1)
457.3	1241.7	(689.8)	1104.4	(613.6)	922.4	(512.4)	827.4	(459.7)
457.4	1261.8	(701.0)	1120.5	(622.5)	933.1	(518.4)	835.8	(464.3)
457.5	1282.9	(712.7)	1137.0	(631.7)	943.9	(524.4)	844.3	(469.1)
457.6	1305.5	(725.3)	1154.0	(641.1)	955.0	(530.6)	852.9	(473.9)
457.7	1329.3	(738.5)	1171.5	(650.8)	966.3	(536.8)	861.6	(478.7)
457.8	1353.6	(752.0)	1189.5	(660.9)	977.8	(543.2)	870.3	(483.5)
457.9	1378.2	(765.7)	1208.2	(671.2)	989.3	(549.6)	879.2	(488.5)
458.0	1403.2	(779.6)	1227.4	(681.9)	1001.2	(556.2)	888.2	(493.5)
458.1	1429.0	(793.9)	1247.2	(692.9)	1013.4	(563.0)	897.4	(498.5)
458.2	1456.0	(808.9)	1267.5	(704.2)	1025.8	(569.9)	906.5	(503.6)
458.3	1484.2	(824.6)	1288.3	(715.7)	1038.5	(576.9)	915.8	(508.8)
458.4	1513.1	(840.6)	1309.5	(727.5)	1051.4	(584.1)	925.2	(514.0)
458.5	1542.3	(856.9)	1331.0	(739.5)	1064.8	(591.5)	934.8	(519.3)
458.6	1571.7	(873.2)	1353.0	(751.7)	1078.4	(599.1)	944.5	(524.7)
458.7	1601.2	(889.6)	1375.6	(764.2)	1092.5	(606.9)	954.4	(530.2)
458.8	1631.0	(906.1)	1399.0	(777.2)	1106.9	(615.0)	964.5	(535.8)
458.9	1660.9	(922.7)	1423.2	(790.7)	1121.7	(623.2)	974.7	(541.5)
459.0	1690.8	(939.4)	1448.4	(804.6)	1136.9	(631.6)	985.2	(547.3)
459.1			1474.3	(819.0)	1152.5	(640.3)	996.0	(553.3)
459.2			1500.7	(833.7)	1168.4	(649.1)	1007.0	(559.4)
459.3			1527.5	(848.6)	1184.6	(658.1)	1018.2	(565.7)
459.4			1554.3	(863.5)	1201.0	(667.2)	1029.7	(572.1)
459.5			1581.0	(878.3)	1217.5	(676.4)	1041.3	(578.5)
459.6			1607.8	(893.2)	1234.2	(685.7)	1053.1	(585.1)
459.7			1634.8	(908.2)	1251.1	(695.0)	1065.2	(591.8)
459.8			1662.0	(923.3)	1268.0	(704.4)	1077.4	(598.6)
459.9			1689.6	(938.7)	1284.9	(713.9)	1089.8	(605.4)
460.0			1717.6	(954.2)	1301.9	(723.3)	1102.4	(612.4)
460.1			1745.9	(969.9)	1318.5	(732.5)	1115.2	(619.5)
460.2			1774.5	(985.8)	1335.2	(741.8)	1128.2	(626.8)
460.3			1803.4	(1001.9)	1352.0	(751.1)	1141.3	(634.1)
460.4			1832.6	(1018.1)	1368.8	(760.4)	1154.7	(641.5)
460.5			1862.2	(1034.6)	1385.6	(769.8)	1168.3	(649.0)
460.6			1892.3	(1051.3)	1402.4	(779.1)	1182.0	(656.7)
460.7			1922.8	(1068.2)	1419.3	(788.5)	1196.0	(664.4)
460.8			1953.9	(1085.5)	1436.2	(797.9)	1210.1	(672.3)
460.9			1985.4	(1103.0)	1453.2	(807.3)	1224.5	(680.3)
461.0			2017.2	(1120.6)	1470.2	(816.8)	1239.0	(688.3)
461.1								
461.2								
461.3								
461.4								

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(s) Station 144 in. (365.76 cm), ray 180°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	589.9	(327.7)	590.5	(328.0)	585.9	(325.5)	584.4	(324.6)
444.0	595.4	(330.8)	593.7	(329.9)	588.2	(326.8)	587.1	(326.2)
445.0	599.1	(332.8)	596.4	(331.3)	592.2	(329.0)	590.4	(328.0)
446.0	604.6	(335.9)	599.2	(332.9)	595.2	(330.7)	591.5	(328.6)
447.0	609.3	(338.5)	605.5	(336.4)	598.1	(332.3)	595.4	(330.8)
448.0	615.3	(341.9)	612.2	(340.1)	605.2	(336.2)	602.6	(334.8)
448.1	615.9	(342.2)	612.7	(340.4)	605.7	(336.5)	603.1	(335.1)
448.2	616.4	(342.5)	613.1	(340.6)	606.2	(336.8)	603.6	(335.3)
448.3	617.0	(342.8)	613.5	(340.8)	606.7	(337.1)	604.1	(335.6)
448.4	617.5	(343.1)	613.8	(341.0)	607.1	(337.3)	604.4	(335.8)
448.5	618.1	(343.4)	614.2	(341.2)	607.6	(337.5)	604.8	(336.0)
448.6	618.7	(343.7)	614.5	(341.4)	608.0	(337.8)	605.1	(336.2)
448.7	619.4	(344.1)	614.8	(341.6)	608.3	(338.0)	605.4	(336.3)
448.8	620.2	(344.5)	615.1	(341.7)	608.7	(338.2)	605.6	(336.5)
448.9	620.9	(344.9)	615.5	(341.9)	609.1	(338.4)	605.9	(336.6)
449.0	621.7	(345.4)	615.8	(342.1)	609.4	(338.6)	606.2	(336.8)
449.1	622.5	(345.8)	616.2	(342.3)	609.7	(338.7)	606.4	(336.9)
449.2	623.1	(346.2)	616.6	(342.6)	610.0	(338.9)	606.6	(337.0)
449.3	623.8	(346.5)	617.1	(342.8)	610.4	(339.1)	606.8	(337.1)
449.4	624.3	(346.8)	617.6	(343.1)	610.7	(339.3)	607.0	(337.2)
449.5	624.8	(347.1)	618.1	(343.4)	611.0	(339.4)	607.4	(337.4)
449.6	625.2	(347.4)	618.7	(343.7)	611.4	(339.6)	607.8	(337.7)
449.7	625.8	(347.7)	619.4	(344.1)	611.8	(339.9)	608.3	(337.9)
449.8	626.5	(348.0)	620.3	(344.6)	612.4	(340.2)	608.9	(338.3)
449.9	627.1	(348.4)	621.2	(345.1)	613.2	(340.6)	609.6	(338.7)
450.0	627.8	(348.8)	622.3	(345.7)	614.0	(341.1)	610.5	(339.2)
450.1	628.6	(349.2)	623.4	(346.3)	614.9	(341.6)	611.3	(339.6)
450.2	629.6	(349.8)	624.5	(346.9)	615.8	(342.1)	612.1	(340.1)
450.3	630.7	(350.4)	625.6	(347.6)	616.7	(342.6)	612.9	(340.5)
450.4	631.9	(351.0)	626.8	(348.2)	617.7	(343.2)	613.8	(341.0)
450.5	633.0	(351.7)	628.1	(348.9)	618.8	(343.8)	614.6	(341.5)
450.6	634.3	(352.4)	629.3	(349.6)	619.8	(344.3)	615.5	(341.9)
450.7	635.6	(353.1)	630.4	(350.2)	620.8	(344.9)	616.2	(342.4)
450.8	637.1	(353.9)	631.6	(350.9)	621.9	(345.5)	617.0	(342.8)
450.9	638.6	(354.8)	632.7	(351.5)	623.0	(346.1)	617.7	(343.2)
451.0	640.1	(355.6)	633.9	(352.2)	624.1	(346.7)	618.4	(343.6)
451.1	641.6	(356.4)	634.9	(352.7)	625.3	(347.4)	619.1	(343.9)
451.2	642.8	(357.1)	635.9	(353.3)	626.4	(348.0)	619.8	(344.3)
451.3	644.0	(357.8)	636.9	(353.8)	627.4	(348.5)	620.4	(344.7)
451.4	645.2	(358.4)	637.9	(354.4)	628.4	(349.1)	620.9	(345.0)
451.5	646.1	(359.0)	639.0	(355.0)	629.3	(349.6)	621.4	(345.2)
451.6	647.0	(359.4)	639.9	(355.5)	630.2	(350.1)	621.9	(345.5)
451.7	647.8	(359.9)	640.8	(356.0)	631.1	(350.6)	622.5	(345.8)
451.8	648.7	(360.4)	641.5	(356.4)	631.9	(351.0)	623.0	(346.1)
451.9	649.6	(360.9)	642.3	(356.8)	632.6	(351.4)	623.6	(346.5)
452.0	650.5	(361.4)	643.0	(357.2)	633.3	(351.8)	624.2	(346.8)
452.1	651.5	(362.0)	643.8	(357.7)	634.0	(352.2)	624.9	(347.1)
452.2	652.7	(362.6)	644.7	(358.2)	634.7	(352.6)	625.6	(347.6)
452.3	654.1	(363.4)	645.7	(358.7)	635.4	(353.0)	626.5	(348.0)
452.4	655.4	(364.1)	646.8	(359.3)	636.1	(353.4)	627.4	(348.5)
452.5	656.7	(364.8)	648.1	(360.0)	636.8	(353.8)	628.2	(349.0)
452.6	658.0	(365.6)	649.5	(360.8)	637.4	(354.1)	629.0	(349.5)
452.7	659.4	(366.3)	651.1	(361.7)	638.0	(354.5)	629.8	(349.9)
452.8	660.9	(367.2)	653.1	(362.8)	638.8	(354.9)	630.7	(350.4)
452.9	662.8	(368.2)	655.5	(364.2)	639.6	(355.3)	631.5	(350.8)
453.0	664.9	(369.4)	658.2	(365.7)	640.5	(355.8)	632.3	(351.3)
453.1	667.6	(370.9)	661.1	(367.3)	641.6	(356.5)	633.1	(351.7)
453.2	670.7	(372.6)	664.3	(369.0)	643.0	(357.2)	633.9	(352.1)
453.3	674.3	(374.6)	667.6	(370.9)	644.7	(358.2)	634.7	(352.6)
453.4	678.2	(376.8)	671.2	(372.9)	646.8	(359.3)	635.5	(353.1)
453.5	682.6	(379.2)	675.0	(375.0)	649.1	(360.6)	636.4	(353.5)
453.6	687.4	(381.9)	679.0	(377.2)	651.8	(362.1)	637.2	(354.0)
453.7	692.6	(384.8)	683.3	(379.6)	654.8	(363.8)	638.0	(354.5)
453.8	708.9	(393.8)	687.8	(382.1)	658.2	(365.7)	639.0	(355.0)
453.9	726.6	(403.7)	692.5	(384.7)	662.1	(367.8)	640.1	(355.6)
454.0	742.5	(412.5)	701.1	(389.5)	666.3	(370.2)	641.4	(356.3)
454.1	757.8	(421.0)	718.8	(399.3)	671.0	(372.8)	643.0	(357.2)
454.2	772.6	(429.2)	735.6	(408.7)	676.0	(375.6)	645.0	(358.3)
454.3	786.8	(437.1)	745.0	(413.9)	681.4	(378.6)	647.3	(359.6)
454.4	800.4	(444.7)	754.3	(419.0)	687.1	(381.7)	649.9	(361.0)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(s) Station 144 in. (365.76 cm), ray 180°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	813.1	(451.7)	763.6	(424.2)	692.9	(385.0)	652.7	(362.6)
454.6	825.4	(458.6)	773.0	(429.4)	699.0	(388.3)	656.0	(364.4)
454.7	837.3	(465.2)	782.3	(434.6)	705.2	(391.8)	659.7	(366.5)
454.8	849.1	(471.7)	791.7	(439.8)	711.4	(395.2)	663.6	(368.7)
454.9	860.5	(478.1)	801.1	(445.1)	717.7	(398.7)	667.7	(371.0)
455.0	871.9	(484.4)	810.5	(450.3)	724.0	(402.2)	672.1	(373.4)
455.1	883.2	(490.7)	819.8	(455.5)	730.3	(405.7)	676.8	(376.0)
455.2	894.6	(497.0)	829.0	(460.6)	736.7	(409.3)	681.6	(378.7)
455.3	906.0	(503.3)	838.2	(465.7)	743.1	(412.8)	686.7	(381.5)
455.4	918.0	(510.0)	847.4	(470.8)	749.6	(416.4)	691.9	(384.4)
455.5	930.1	(516.7)	856.6	(475.9)	756.2	(420.1)	697.4	(387.4)
455.6	942.4	(523.5)	866.0	(481.1)	763.1	(424.0)	703.0	(390.6)
455.7	955.1	(530.6)	875.8	(486.5)	770.2	(427.9)	708.8	(393.8)
455.8	968.4	(538.0)	885.9	(492.2)	777.5	(432.0)	714.6	(397.0)
455.9	980.7	(544.9)	896.4	(498.0)	785.0	(436.1)	720.5	(400.3)
456.0	995.7	(553.1)	907.3	(504.1)	792.7	(440.4)	726.3	(403.5)
456.1	1010.8	(561.6)	918.6	(510.3)	800.5	(444.7)	732.3	(406.8)
456.2	1026.3	(570.2)	930.5	(516.9)	808.6	(449.2)	738.3	(410.2)
456.3	1041.6	(578.7)	942.9	(523.8)	817.0	(453.9)	744.6	(413.7)
456.4	1058.7	(588.2)	955.8	(531.0)	825.6	(458.7)	751.0	(417.2)
456.5	1075.6	(597.6)	969.1	(538.4)	834.4	(463.6)	757.6	(420.9)
456.6	1092.8	(607.1)	982.9	(546.0)	843.4	(468.6)	764.4	(424.7)
456.7	1110.4	(616.9)	997.1	(553.9)	852.7	(473.7)	771.4	(428.6)
456.8	1128.3	(626.9)	1011.6	(562.0)	862.2	(479.0)	778.6	(432.6)
456.9	1146.9	(637.1)	1026.5	(570.3)	871.9	(484.4)	785.9	(436.6)
457.0	1165.5	(647.5)	1041.6	(578.7)	881.8	(489.9)	793.3	(440.7)
457.1	1185.6	(658.7)	1056.8	(587.1)	891.9	(495.5)	800.8	(444.9)
457.2	1205.2	(669.5)	1072.3	(595.7)	902.2	(501.2)	808.4	(449.1)
457.3	1225.8	(681.0)	1088.0	(604.4)	912.6	(507.0)	816.1	(453.4)
457.4	1247.7	(693.1)	1104.0	(613.4)	923.3	(512.9)	823.8	(457.6)
457.5	1270.4	(705.8)	1120.5	(622.5)	934.1	(519.0)	831.6	(462.0)
457.6	1293.6	(718.7)	1137.4	(631.9)	945.2	(525.1)	839.6	(466.4)
457.7	1318.1	(732.3)	1154.9	(641.6)	956.6	(531.5)	847.7	(470.9)
457.8	1342.6	(745.9)	1173.0	(651.6)	968.3	(538.0)	855.8	(475.5)
457.9	1368.5	(760.3)	1191.7	(662.1)	980.3	(544.6)	864.3	(480.2)
458.0	1393.3	(774.0)	1211.1	(672.8)	992.7	(551.5)	873.0	(485.0)
458.1	1419.8	(788.8)	1231.5	(684.2)	1005.6	(558.6)	881.9	(490.0)
458.2	1452.7	(807.0)	1252.9	(696.1)	1018.7	(566.0)	891.0	(495.0)
458.3	1483.8	(824.3)	1275.2	(708.5)	1032.2	(573.4)	900.3	(500.2)
458.4	1514.2	(841.2)	1298.6	(721.4)	1045.9	(581.1)	909.8	(505.4)
458.5	1545.8	(858.8)	1322.7	(734.8)	1060.0	(588.9)	919.5	(510.8)
458.6	1577.4	(876.3)	1347.8	(748.8)	1074.2	(596.8)	929.5	(516.4)
458.7	1607.1	(892.8)	1373.6	(763.1)	1088.8	(604.9)	939.8	(522.1)
458.8	1637.9	(909.9)	1400.0	(777.8)	1103.6	(613.1)	950.4	(528.0)
458.9	1672.9	(929.4)	1427.2	(792.9)	1118.8	(621.5)	961.3	(534.1)
459.0	1710.4	(950.2)	1454.5	(808.1)	1134.2	(630.1)	972.5	(540.3)
459.1	1748.4	(971.3)	1482.1	(823.4)	1149.8	(638.8)	984.0	(546.7)
459.2	1791.4	(995.2)	1510.0	(838.9)	1165.8	(647.6)	995.7	(553.2)
459.3	1831.8	(1017.7)	1538.0	(854.5)	1182.0	(656.7)	1007.7	(559.8)
459.4	1873.6	(1040.9)	1566.2	(870.1)	1198.5	(665.9)	1019.8	(566.6)
459.5	1916.3	(1064.6)	1594.6	(885.9)	1215.3	(675.2)	1032.2	(573.4)
459.6	1958.7	(1088.1)	1623.1	(901.7)	1232.5	(684.7)	1044.7	(580.4)
459.7	2000.9	(1111.6)	1651.9	(917.7)	1250.0	(694.5)	1057.4	(587.4)
459.8	2043.4	(1135.2)	1680.9	(933.8)	1267.9	(704.4)	1070.2	(594.6)
459.9	2086.7	(1159.3)	1710.2	(950.1)	1286.0	(714.5)	1083.2	(601.8)
460.0	2130.3	(1183.5)	1740.1	(966.7)	1304.5	(724.7)	1096.5	(609.2)
460.1	2174.2	(1207.9)	1770.6	(983.6)	1323.2	(735.1)	1109.9	(616.6)
460.2	2218.3	(1232.4)	1801.4	(1000.8)	1342.3	(745.7)	1123.5	(624.2)
460.3	2262.5	(1257.0)	1832.7	(1018.2)	1361.7	(756.5)	1137.2	(631.8)
460.4	2307.1	(1281.7)	1864.4	(1035.8)	1381.4	(767.5)	1151.2	(639.5)
460.5			1896.4	(1053.6)	1401.4	(778.6)	1165.3	(647.4)
460.6			1928.8	(1071.6)	1421.7	(789.9)	1179.6	(655.3)
460.7			1961.6	(1089.8)	1442.4	(801.3)	1194.1	(663.4)
460.8			1994.9	(1108.3)	1463.3	(812.9)	1208.8	(671.6)
460.9			2028.4	(1126.9)	1484.5	(824.7)	1223.7	(679.8)
461.0							1238.7	(688.2)
461.1							1253.9	(696.6)
461.2							1269.3	(705.2)
461.3							1284.9	(713.9)
461.4								

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Continued

(t) Station 144 in. (365.76 cm), ray 270°

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
443.0	591.2	(328.4)	592.9	(329.4)	590.2	(327.9)	588.6	(327.0)
444.0	598.3	(332.4)	595.1	(330.6)	592.9	(329.4)	591.9	(328.8)
445.0	600.2	(333.4)	596.2	(331.2)	594.7	(330.4)	594.2	(330.1)
446.0	604.4	(335.8)	599.2	(332.9)	597.2	(331.8)	595.3	(330.7)
447.0	610.3	(339.0)	605.3	(336.3)	602.7	(334.8)	600.8	(333.8)
448.0	617.4	(343.0)	612.9	(340.5)	611.0	(339.4)	607.4	(337.4)
448.1	618.3	(343.5)	613.6	(340.9)	611.5	(339.7)	607.8	(337.7)
448.2	619.3	(344.1)	614.1	(341.2)	611.9	(339.9)	608.2	(337.9)
448.3	620.3	(344.6)	614.7	(341.5)	612.2	(340.1)	608.6	(338.1)
448.4	620.9	(345.0)	615.2	(341.8)	612.5	(340.3)	608.9	(338.3)
448.5	621.6	(345.3)	615.7	(342.0)	612.7	(340.4)	609.3	(338.5)
448.6	622.0	(345.6)	616.1	(342.3)	612.9	(340.5)	609.6	(338.7)
448.7	622.5	(345.8)	616.5	(342.5)	613.0	(340.5)	609.9	(338.8)
448.8	622.9	(346.1)	617.0	(342.8)	613.1	(340.6)	610.2	(339.0)
448.9	623.3	(346.3)	617.5	(343.1)	613.2	(340.7)	610.5	(339.2)
449.0	623.7	(346.5)	618.1	(343.4)	613.4	(340.8)	610.9	(339.4)
449.1	624.2	(346.8)	618.6	(343.6)	613.5	(340.8)	611.3	(339.6)
449.2	624.9	(347.2)	619.1	(343.9)	613.6	(340.9)	611.6	(339.8)
449.3	625.7	(347.6)	619.6	(344.2)	613.7	(341.0)	611.9	(339.9)
449.4	626.6	(348.1)	620.3	(344.6)	613.9	(341.1)	612.2	(340.1)
449.5	627.5	(348.6)	620.9	(345.0)	614.1	(341.2)	612.6	(340.3)
449.6	628.4	(349.1)	621.6	(345.4)	614.5	(341.4)	613.0	(340.6)
449.7	629.4	(349.6)	622.4	(345.8)	614.9	(341.6)	613.6	(340.9)
449.8	630.3	(350.2)	623.3	(346.3)	615.4	(341.9)	614.2	(341.2)
449.9	631.2	(350.7)	624.3	(346.8)	616.2	(342.4)	614.8	(341.6)
450.0	632.1	(351.1)	625.4	(347.4)	617.2	(342.9)	615.6	(342.0)
450.1	632.9	(351.6)	626.5	(348.1)	618.2	(343.5)	616.4	(342.5)
450.2	633.7	(352.0)	627.6	(348.7)	619.4	(344.1)	617.4	(343.0)
450.3	634.7	(352.6)	628.8	(349.3)	620.6	(344.8)	618.3	(343.5)
450.4	635.7	(353.2)	630.0	(350.0)	621.8	(345.5)	619.2	(344.0)
450.5	636.9	(353.8)	631.2	(350.7)	623.1	(346.2)	620.1	(344.5)
450.6	638.1	(354.5)	632.4	(351.3)	624.4	(346.9)	621.1	(345.0)
450.7	639.5	(355.3)	633.7	(352.0)	625.7	(347.6)	622.1	(345.6)
450.8	640.8	(356.0)	634.8	(352.7)	626.9	(348.3)	623.1	(346.2)
450.9	642.2	(356.8)	635.9	(353.3)	628.1	(349.0)	624.1	(346.7)
451.0	643.5	(357.5)	637.1	(353.9)	629.3	(349.6)	625.1	(347.3)
451.1	644.8	(358.2)	638.2	(354.5)	630.6	(350.3)	626.0	(347.8)
451.2	645.9	(358.8)	639.3	(355.2)	631.7	(351.0)	627.0	(348.3)
451.3	647.0	(359.4)	640.4	(355.8)	632.9	(351.6)	628.0	(348.9)
451.4	648.1	(360.0)	641.3	(356.3)	634.0	(352.2)	628.9	(349.4)
451.5	649.2	(360.6)	642.2	(356.8)	635.0	(352.8)	629.7	(349.8)
451.6	650.3	(361.3)	642.9	(357.2)	635.9	(353.3)	630.3	(350.2)
451.7	651.4	(361.9)	643.6	(357.6)	636.6	(353.7)	630.9	(350.5)
451.8	652.6	(362.5)	644.3	(358.0)	637.4	(354.1)	631.5	(350.8)
451.9	653.8	(363.2)	645.0	(358.4)	638.1	(354.5)	632.2	(351.2)
452.0	655.1	(363.9)	645.8	(358.8)	638.7	(354.8)	632.8	(351.6)
452.1	656.3	(364.6)	646.6	(359.2)	639.3	(355.2)	633.5	(351.9)
452.2	657.5	(365.3)	647.5	(359.7)	640.0	(355.5)	634.2	(352.3)
452.3	658.8	(366.0)	648.5	(360.3)	640.7	(356.0)	634.8	(352.7)
452.4	660.3	(366.8)	649.8	(361.0)	641.6	(356.4)	635.6	(353.1)
452.5	661.8	(367.7)	651.2	(361.8)	642.5	(357.0)	636.5	(353.6)
452.6	663.5	(368.6)	652.7	(362.6)	643.5	(357.5)	637.4	(354.1)
452.7	665.3	(369.6)	654.8	(363.8)	644.4	(358.0)	638.3	(354.6)
452.8	667.4	(370.8)	657.0	(365.0)	645.4	(358.6)	639.3	(355.1)
452.9	669.4	(371.9)	659.5	(366.4)	646.5	(359.2)	640.2	(355.7)
453.0	671.6	(373.1)	662.1	(367.8)	647.8	(359.9)	641.2	(356.2)
453.1	674.0	(374.4)	664.9	(369.4)	649.0	(360.6)	642.3	(356.8)
453.2	676.4	(375.8)	667.9	(371.0)	650.4	(361.3)	643.3	(357.4)
453.3	678.9	(377.2)	671.1	(372.8)	651.8	(362.1)	644.4	(358.0)
453.4	681.4	(378.6)	674.4	(374.7)	653.4	(363.0)	645.5	(358.6)
453.5	688.3	(382.4)	678.0	(376.7)	655.4	(364.1)	646.6	(359.2)
453.6	697.3	(387.4)	681.7	(378.7)	657.7	(365.4)	647.9	(360.0)
453.7	707.1	(392.9)	685.6	(380.9)	660.2	(366.8)	649.3	(360.7)
453.8	717.7	(398.7)	688.9	(382.7)	663.0	(368.4)	650.8	(361.6)
453.9	729.1	(405.0)	691.7	(384.3)	666.2	(370.1)	652.3	(362.4)
454.0	741.4	(411.9)	699.7	(388.7)	669.6	(372.0)	653.9	(363.3)
454.1	754.9	(419.4)	709.9	(394.4)	673.4	(374.1)	655.6	(364.2)
454.2	768.8	(427.1)	720.4	(400.2)	677.6	(376.5)	657.5	(365.3)
454.3	782.9	(434.9)	730.9	(406.1)	682.3	(379.0)	659.7	(366.5)
454.4	797.5	(443.1)	741.7	(412.0)	687.4	(381.9)	662.2	(367.9)

[redacted]

[redacted]

TABLE IV.- SMOOTHED TEMPERATURE DATA - Concluded

(t) Station 144 in. (365.76 cm), ray 270°. Concluded

Time, sec	TC 1		TC 2		TC 3		TC 4	
	°R	(°K)	°R	(°K)	°R	(°K)	°R	(°K)
454.5	812.4	(451.3)	752.5	(418.1)	692.9	(384.9)	665.0	(369.4)
454.6	827.4	(459.7)	763.6	(424.2)	698.8	(388.2)	667.9	(371.1)
454.7	842.4	(468.0)	774.8	(430.4)	705.0	(391.7)	671.2	(372.9)
454.8	857.3	(476.3)	786.1	(436.7)	711.7	(395.4)	674.8	(374.9)
454.9	872.1	(484.5)	797.7	(443.2)	718.7	(399.3)	678.7	(377.1)
455.0	886.9	(492.7)	809.6	(449.8)	726.1	(403.4)	682.9	(379.4)
455.1	901.3	(500.7)	821.6	(456.5)	733.6	(407.6)	687.4	(381.9)
455.2	915.6	(508.7)	833.7	(463.2)	741.4	(411.9)	692.1	(384.5)
455.3	929.5	(516.4)	846.0	(470.0)	749.3	(416.3)	697.0	(387.2)
455.4	943.1	(523.9)	858.2	(476.8)	757.3	(420.7)	702.3	(390.2)
455.5	956.4	(531.3)	870.3	(483.5)	765.5	(425.3)	707.9	(393.3)
455.6	969.9	(538.8)	882.4	(490.2)	773.8	(429.9)	713.7	(396.5)
455.7	982.6	(545.9)	894.4	(496.9)	782.2	(434.6)	719.8	(399.9)
455.8	995.4	(553.0)	906.4	(503.5)	790.7	(439.3)	726.0	(403.4)
455.9	1008.4	(560.2)	918.3	(510.2)	799.2	(444.0)	732.7	(407.0)
456.0	1021.3	(567.4)	930.3	(516.8)	808.0	(448.9)	739.5	(410.8)
456.1	1035.0	(575.0)	942.3	(523.5)	816.8	(453.8)	746.5	(414.7)
456.2	1049.4	(583.0)	954.6	(530.3)	825.8	(458.8)	753.6	(418.7)
456.3	1063.8	(591.0)	966.9	(537.2)	834.7	(463.7)	760.9	(422.7)
456.4	1078.1	(599.0)	979.4	(544.1)	843.8	(468.8)	768.3	(426.9)
456.5	1093.2	(607.3)	992.0	(551.1)	853.0	(473.9)	775.8	(431.0)
456.6	1108.4	(615.8)	1004.9	(558.3)	862.2	(479.0)	783.4	(435.2)
456.7	1123.4	(624.1)	1018.0	(565.6)	871.6	(484.2)	791.2	(439.6)
456.8	1139.7	(633.2)	1031.5	(573.0)	881.1	(489.5)	799.1	(444.0)
456.9	1155.9	(642.2)	1045.2	(580.7)	890.8	(494.9)	807.1	(448.4)
457.0	1172.6	(651.4)	1059.2	(588.4)	900.5	(500.3)	815.2	(452.9)
457.1	1189.6	(660.9)	1073.5	(596.4)	910.3	(505.7)	823.1	(457.3)
457.2	1207.2	(670.7)	1088.3	(604.6)	920.3	(511.3)	831.1	(461.7)
457.3	1225.0	(680.5)	1103.3	(613.0)	930.3	(516.9)	839.1	(466.2)
457.4	1243.4	(690.8)	1118.4	(621.4)	940.6	(522.5)	847.2	(470.7)
457.5	1262.5	(701.4)	1133.6	(629.8)	950.9	(528.3)	855.3	(475.2)
457.6	1281.9	(712.1)	1149.1	(638.4)	961.4	(534.1)	863.5	(479.7)
457.7	1302.1	(723.4)	1165.0	(647.2)	971.9	(539.9)	871.8	(484.3)
457.8	1323.4	(735.2)	1181.2	(656.2)	982.6	(545.9)	880.2	(489.0)
457.9	1345.8	(747.7)	1197.8	(665.5)	993.5	(551.9)	888.7	(493.7)
458.0	1369.2	(760.7)	1214.9	(674.9)	1004.6	(558.1)	897.4	(498.5)
458.1	1394.2	(774.6)	1232.4	(684.7)	1016.0	(564.4)	906.2	(503.4)
458.2	1419.5	(788.6)	1250.6	(694.8)	1027.7	(570.9)	915.1	(508.4)
458.3	1445.5	(803.0)	1269.4	(705.2)	1039.7	(577.6)	924.2	(513.5)
458.4	1471.3	(817.4)	1288.9	(716.0)	1052.0	(584.4)	933.5	(518.6)
458.5	1498.1	(832.3)	1309.0	(727.2)	1064.6	(591.4)	942.9	(523.8)
458.6	1524.6	(847.0)	1329.8	(738.8)	1077.6	(598.6)	952.3	(529.1)
458.7	1551.6	(862.0)	1351.3	(750.7)	1090.8	(606.0)	961.8	(534.4)
458.8	1579.9	(877.7)	1373.9	(763.3)	1104.4	(613.5)	971.5	(539.7)
458.9	1610.2	(894.6)	1397.0	(776.1)	1118.3	(621.3)	981.4	(545.2)
459.0	1640.5	(911.4)	1420.6	(789.2)	1132.4	(629.1)	991.3	(550.7)
459.1	1672.3	(929.1)	1444.9	(802.7)	1146.9	(637.2)	1001.4	(556.3)
459.2	1704.5	(947.0)	1469.6	(816.5)	1161.7	(645.4)	1011.7	(562.0)
459.3	1738.0	(965.5)	1494.7	(830.4)	1176.7	(653.7)	1022.1	(567.9)
459.4	1772.3	(984.6)	1520.0	(844.4)	1192.1	(662.3)	1032.7	(573.7)
459.5	1808.0	(1004.4)	1545.6	(858.6)	1207.7	(670.9)	1043.4	(579.7)
459.6	1844.1	(1024.5)	1571.6	(873.1)	1223.4	(679.7)	1054.3	(585.7)
459.7	1880.9	(1044.9)	1597.8	(887.7)	1239.4	(688.6)	1065.5	(591.9)
459.8	1917.7	(1065.4)	1624.4	(902.4)	1255.7	(697.6)	1077.0	(598.3)
459.9	1955.0	(1086.1)	1651.1	(917.3)	1272.2	(706.8)	1088.7	(604.9)
460.0	1992.4	(1106.9)	1678.3	(932.4)	1289.0	(716.1)	1100.7	(611.5)
460.1	2029.9	(1127.7)	1705.7	(947.6)	1306.0	(725.6)	1112.8	(618.2)
460.2	2067.6	(1148.7)	1733.5	(963.1)	1323.3	(735.1)	1125.2	(625.1)
460.3	2105.4	(1169.7)	1761.7	(978.7)	1340.8	(744.9)	1137.7	(632.1)
460.4	2143.3	(1190.7)	1790.1	(994.5)	1358.6	(754.8)	1150.5	(639.2)
460.5			1818.8	(1010.5)	1376.6	(764.8)	1163.5	(646.4)
460.6			1847.9	(1026.6)	1394.9	(775.0)	1176.6	(653.7)
460.7			1877.2	(1042.9)	1413.5	(785.3)	1190.0	(661.1)
460.8			1906.9	(1059.4)	1432.3	(795.7)	1203.6	(668.7)
460.9			1936.9	(1076.1)			1217.4	(676.4)
461.0								
461.1								
461.2								
461.3								
461.4								

[redacted]

TABLE V.-SURFACE TEMPERATURE

(a) U.S. Customary Units

Time, sec	Temperature, T_s, °R, at - ϕ = 0° Station, inches											
	16	31	40	52	59.25	73	85	99	109	121	133	144
443.0	680.6	641.6	633.2	624.0	619.3	612.9	604.6	604.1	602.4	600.0	596.8	591.4
444.0	694.8	651.5	642.4	633.1	628.6	620.9	610.7	610.3	610.0	606.7	604.3	598.3
445.0	707.9	662.1	649.2	639.3	633.3	624.4	616.9	614.8	613.6	610.7	607.9	602.3
446.0	719.9	669.7	656.4	645.2	639.5	630.7	621.1	619.1	617.0	613.5	610.3	604.0
447.0	740.1	683.0	669.1	655.5	649.3	639.5	629.9	625.5	624.2	621.0	616.5	609.3
448.0	762.8	700.2	684.1	667.3	660.6	649.3	638.0	635.4	633.7	630.5	624.8	617.8
448.2	767.8	703.5	687.3	670.3	663.5	651.3	640.2	637.7	635.8	632.3	626.5	619.8
448.4	773.0	706.8	690.0	673.3	666.4	653.8	642.7	639.5	637.6	633.8	628.2	621.7
448.6	778.3	710.4	692.6	675.9	669.2	656.3	645.1	641.0	639.2	635.2	629.8	623.4
448.8	783.7	714.0	695.1	678.4	671.8	658.7	647.4	642.4	640.8	636.8	631.5	624.8
449.0	789.1	717.6	697.7	681.0	673.9	660.7	649.3	644.0	642.3	638.4	633.1	626.0
449.2	794.9	721.2	700.6	683.7	675.8	662.7	651.2	646.0	644.1	640.0	634.4	627.3
449.4	801.2	724.9	703.8	686.8	678.1	665.0	653.4	648.4	646.1	641.6	635.9	628.9
449.6	807.6	728.7	707.4	689.9	681.0	667.8	655.9	650.8	648.3	643.4	637.5	630.8
449.8	814.3	732.8	711.3	692.9	684.5	670.8	658.5	653.5	650.5	645.4	639.5	632.8
450.0	821.2	737.2	715.4	696.3	688.3	673.8	661.2	656.2	652.7	647.5	641.8	634.9
450.2	827.9	741.8	719.5	699.6	691.6	676.5	663.5	658.8	654.9	649.6	644.0	636.9
450.4	834.4	746.4	723.5	702.7	694.5	679.0	665.8	661.2	657.2	651.5	645.9	638.7
450.6	840.3	751.0	727.5	705.8	696.6	681.5	668.1	663.3	659.3	653.3	647.6	640.5
450.8	845.5	755.6	731.4	708.9	698.9	684.0	670.3	665.1	661.5	655.1	649.3	642.3
451.0	850.6	760.2	735.2	712.2	701.6	686.7	672.5	667.2	663.7	657.2	651.2	644.4
451.2	856.3	765.0	739.2	715.6	704.9	689.4	675.0	669.4	666.1	659.6	653.2	646.7
451.4	863.1	770.2	743.5	719.3	708.7	692.4	677.8	671.9	668.7	662.1	655.7	649.2
451.6	871.6	775.8	748.6	723.0	712.7	695.7	681.1	674.8	671.6	665.0	658.3	651.7
451.8	880.8	781.7	753.9	727.2	716.9	699.2	684.9	677.8	674.7	668.1	661.2	654.1
452.0	890.0	787.9	758.9	731.6	721.2	702.7	688.6	680.9	677.8	671.0	664.1	656.5
452.2	899.0	793.9	763.4	736.1	725.4	706.3	692.0	684.3	680.7	673.5	666.8	658.9
452.4	907.6	799.5	767.7	740.5	729.6	710.0	695.0	688.0	683.6	676.0	669.5	661.4
452.6	916.1	805.2	772.2	744.9	733.5	714.0	698.1	691.4	686.4	678.7	672.2	664.3
452.8	925.1	811.2	777.4	749.2	737.5	718.2	701.3	694.8	689.2	682.0	675.3	667.7
453.0	934.3	817.5	783.0	754.2	741.7	722.4	705.0	698.0	692.0	685.6	679.3	671.9
453.2	943.8	824.3	788.7	759.6	745.9	726.4	708.8	700.9	694.8	689.0	684.3	677.9
453.4	953.7	831.3	794.4	764.9	750.4	730.2	712.6	704.0	697.8	692.6	689.6	685.6
453.6	964.5	838.7	800.5	770.2	755.4	734.3	716.6	707.8	701.3	696.6	695.8	694.9
453.8	975.9	846.6	806.9	775.4	760.9	738.6	720.6	712.2	705.9	702.2	702.5	709.2
454.0	988.0	855.2	813.7	781.1	766.8	743.6	724.9	717.2	711.8	709.5	716.2	745.3
454.2	1000.5	863.8	820.9	787.4	772.7	749.0	730.0	722.8	718.4	718.9	745.0	778.6

TABLE V.-SURFACE TEMPERATURE - Continued

(a) U.S. Customary Units - Continued

Time, sec	Temperature, T_s, °R, at - ø = 0° Station, inches											
	16	31	40	52	59.25	73	85	99	109	121	133	144
454.4	1013.4	872.5	828.2	794.1	778.5	754.4	735.8	728.9	726.4	731.4	773.6	808.2
454.6	1026.3	881.3	835.9	800.9	784.6	760.1	742.1	735.2	735.3	746.6	802.1	836.2
454.8	1038.6	890.0	843.5	807.4	790.5	765.8	748.4	741.5	744.7	765.5	831.6	864.1
455.0	1051.0	899.0	851.2	813.8	796.4	771.5	753.8	747.6	755.0	788.4	863.6	892.2
455.2	1062.4	907.7	858.5	819.9	802.1	776.5	758.3	753.6	766.0	814.6	897.0	920.5
455.4	1073.3	915.8	865.5	825.9	807.5	781.2	762.8	760.1	778.7	842.6	931.1	948.0
455.6	1083.2	923.7	872.3	831.8	812.6	785.9	767.5	768.1	792.1	875.3	964.3	975.2
455.8	1092.4	931.2	878.7	837.2	817.6	790.8	773.1	777.5	806.7	913.5	996.1	1002.2
456.0	1100.6	938.3	884.4	842.1	822.2	796.1	779.2	787.7	831.5	955.2	1026.4	1028.9
456.2	1107.7	945.3	890.0	846.4	827.0	802.1	785.7	798.9	875.3	999.6	1056.6	1055.7
456.4	1114.0	952.3	895.5	850.9	832.0	808.8	792.5	822.8	926.1	1040.1	1086.2	1082.4
456.6	1119.9	959.0	901.4	856.3	837.3	816.0	822.0	891.3	981.8	1073.9	1113.0	1109.7
456.8	1125.8	965.4	907.7	862.8	844.5	828.1	869.9	955.6	1032.8	1107.1	1140.8	1138.3
457.0	1131.0	970.8	913.9	869.4	853.3	858.2	920.0	1014.1	1077.6	1141.8	1173.0	1168.4
457.2	1135.1	975.1	919.5	876.0	864.8	897.4	972.7	1067.8	1119.4	1178.0	1206.4	1200.1
457.4	1138.1	977.8	923.7	882.8	878.9	941.0	1025.0	1114.9	1160.9	1213.2	1241.4	1232.9
457.6	1140.0	979.5	926.8	891.3	894.1	980.6	1076.0	1161.9	1203.7	1250.1	1279.4	1266.7
457.8	1141.6	980.6	930.6	901.6	910.9	1016.8	1127.3	1210.4	1247.4	1291.3	1316.6	1303.0
458.0	1143.1	981.7	936.3	916.3	929.3	1058.4	1179.8	1258.6	1291.1	1331.7	1356.4	1341.4
458.2	1144.5	983.8	944.3	933.7	961.0	1113.6	1232.0	1306.7	1335.6	1373.1	1398.4	1381.7
458.4	1145.5	986.4	954.0	953.9	998.0	1170.8	1283.0	1355.6	1381.3	1417.5	1442.4	1425.3
458.6	1146.2	989.2	965.6	981.0	1055.5	1227.9	1333.1	1403.5	1428.3	1464.2	1490.4	1470.8
458.8	1146.3	1023.8	1029.3	1067.8	1131.3	1289.2	1383.2	1451.8	1479.5	1512.8	1541.1	1520.4
459.0	1154.2	1086.6	1116.9	1159.2	1215.7	1350.8	1436.3	1504.2	1534.5	1565.5	1594.1	1572.3
459.2	1207.4	1158.1	1201.0	1242.9	1296.5	1413.8	1492.1	1560.8	1590.1	1623.8	1650.2	1627.1
459.4	1259.9	1223.3	1272.5	1315.6	1367.5	1477.2		1619.3	1647.2	1683.4	1708.4	1684.2
459.6	1307.0	1273.1	1331.0	1381.1	1430.5	1539.6		1677.5	1705.9	1740.1	1764.8	1741.4
459.8	1345.1	1309.9	1378.3	1439.5	1489.1	1597.0		1732.5	1763.4	1795.0	1815.6	1797.2
460.0	1379.9	1338.7	1417.4	1488.9	1541.5	1645.9		1784.5	1818.1	1848.7		1852.4
460.2	1411.7	1370.5	1458.2	1533.1	1587.9	1690.8		1835.2	1871.0	1902.7		1909.0
460.4	1442.7	1409.0	1504.1	1577.2	1632.2	1736.2		1888.0	1925.3	1960.5		1966.8
460.6	1480.4	1450.1	1550.5	1621.9	1674.1	1781.3		1948.0	1981.5	2018.3		2025.2
460.8	1526.0	1494.4	1590.1	1656.7	1709.7	1819.5			2034.6			2084.4
461.0	1573.2	1538.3	1617.6	1679.6	1735.6	1843.5						
461.2	1610.7	1571.7	1641.1	1702.7	1757.9	1864.3						

TABLE V.-SURFACE TEMPERATURE - Continued

(a) U.S. Customary Units - Continued

Time, sec	Temperature, T_s, °R, at -							
	ø = 90°		ø = 180°					ø=270°
	Station, in.		Station, inches					Sta,in
	73	144	52	73	99	121	144	144
443.0	609.8	586.3	622.6	611.6	602.3	598.7	590.9	591.9
444.0	617.3	593.3	630.0	618.3	608.6	605.9	596.3	598.3
445.0	622.6	598.4	636.1	623.6	612.2	608.4	599.5	600.0
446.0	628.3	601.7	645.3	630.9	619.2	613.0	604.5	604.0
447.0	635.3	605.6	652.8	638.5	625.3	618.7	610.2	610.1
448.0	645.1	613.3	662.1	646.1	631.6	625.4	616.3	617.0
448.2	647.6	615.3	663.6	648.0	633.1	627.2	617.3	618.9
448.4	650.1	617.2	665.2	649.9	634.7	628.7	618.3	620.5
448.6	652.3	618.7	667.1	651.5	636.2	629.9	619.4	621.7
448.8	654.2	620.0	669.1	653.0	637.7	631.0	620.7	622.8
449.0	656.1	621.1	671.0	654.5	639.0	632.1	622.1	623.8
449.2	658.3	622.2	673.0	656.2	640.3	633.3	623.5	625.2
449.4	660.7	623.6	675.3	658.0	641.8	634.8	624.7	627.0
449.6	663.3	625.2	678.0	659.8	643.4	636.5	625.8	629.0
449.8	665.6	626.9	681.0	661.8	645.2	638.1	627.1	630.9
450.0	667.7	628.8	684.1	663.8	647.2	639.8	628.7	632.8
450.2	669.7	630.6	687.1	665.9	649.2	641.4	630.6	634.5
450.4	671.8	632.3	690.2	668.3	651.3	643.4	633.0	636.5
450.6	674.2	633.4	693.6	671.2	653.4	645.8	635.4	638.9
450.8	676.9	635.4	697.4	674.7	655.9	648.8	638.2	641.5
451.0	680.0	637.4	701.5	678.3	659.2	652.0	641.1	644.1
451.2	683.2	639.8	705.6	681.8	662.5	654.8	643.6	646.4
451.4	686.6	642.4	709.5	684.9	665.6	657.1	645.8	648.4
451.6	689.8	645.0	713.1	687.6	668.3	659.1	647.7	650.4
451.8	693.0	647.5	716.3	690.6	670.8	661.0	649.3	652.6
452.0	696.2	650.0	719.9	694.1	673.6	663.0	651.1	655.0
452.2	699.5	652.8	723.8	697.9	676.9	665.5	653.3	657.4
452.4	702.9	655.9	728.3	702.0	680.0	668.6	656.0	660.2
452.6	706.7	659.4	733.0	706.2	683.1	672.2	659.0	663.6
452.8	710.5	663.7	737.3	710.0	686.1	675.9	662.5	668.1
453.0	714.2	668.9	741.3	713.5	688.9	679.1	667.4	673.0
453.2	717.8	675.2	745.3	716.9	691.7	682.1	673.9	678.6
453.4	721.6	683.4	749.3	720.3	694.7	685.4	681.9	684.5
453.6	725.6	693.0	753.6	723.8	698.5	690.0	691.3	689.8
453.8	730.1	704.1	758.5	727.8	703.0	695.4	711.3	718.6
454.0	734.9	729.0	763.7	732.1	709.6	704.3	743.0	741.3
454.2	739.8	760.8	769.3	736.9	717.5	735.4	778.8	770.2

TABLE V.-SURFACE TEMPERATURE - Continued

(a) U.S. Customary Units - Concluded

Time, sec	Temperature, T_s, °R, at -							
	ø = 90°		ø = 180°					ø=270°
	Station, in.		Station, inches					Sta, in
	73	144	52	73	99	121	144	144
454.4	745.2	792.5	775.3	742.4	727.4	765.1	806.6	800.1
454.6	751.2	823.7	781.3	748.5	738.9	797.5	831.9	830.8
454.8	757.4	853.8	787.6	755.4	760.5	830.9	856.0	861.4
455.0	763.3	882.3	794.2	763.1	788.0	864.5	879.4	891.7
455.2	769.7	907.5	801.0	771.5	819.0	896.7	902.5	921.4
455.4	777.9	932.0	808.2	780.5	853.9	927.4	926.3	949.9
455.6	789.7	956.7	816.3	790.2	892.5	957.9	950.9	977.7
455.8	804.3	982.5	824.9	801.3	935.9	988.6	977.1	1004.3
456.0	820.9	1009.8	834.6	813.9	983.2	1020.5	1004.8	1031.1
456.2	839.1	1038.4	845.2	827.8	1032.3	1054.1	1035.8	1059.8
456.4	859.1	1068.6	857.1	843.1	1081.5	1087.7	1068.8	1089.3
456.6	881.6	1100.9	870.6	860.6	1126.9	1122.0	1103.7	1120.2
456.8	906.8	1134.7	885.8	880.9	1171.4	1157.7	1140.2	1152.4
457.0	1001.9	1170.6	919.0	992.1	1214.4	1195.5	1178.4	1186.1
457.2	1060.0	1208.9	956.1	1070.8	1258.5	1235.7	1218.8	1221.8
457.4	1122.2	1248.8	995.2	1152.9	1303.3	1276.5	1261.8	1259.0
457.6	1193.1	1291.2	1033.2	1233.1	1350.9	1321.0	1308.2	1298.3
457.8	1266.4	1336.7	1065.0	1310.5	1403.5	1369.8	1357.7	1340.6
458.0	1340.1	1385.1	1109.8	1387.1	1457.6	1420.5	1409.2	1387.0
458.2	1414.3	1437.7	1170.9	1462.9	1514.4	1474.5	1469.3	1437.7
458.4	1488.7	1492.3	1249.4	1538.0	1572.9	1532.7	1532.2	1490.3
458.6	1560.3	1549.7	1347.4	1610.5	1635.6	1592.2	1597.6	1544.8
458.8	1629.3	1609.9	1469.4	1681.3	1702.0	1652.9	1661.4	1601.8
459.0		1674.5	1615.5	1754.2	1773.7	1714.8	1736.2	1664.0
459.2		1744.6	1766.4		1850.1		1818.5	1729.8
459.4		1815.8			1930.1		1901.8	1798.9
459.6		1889.1			2013.6		1987.6	1871.7
459.8		1963.3			2101.2		2073.0	1946.3
460.0		2038.6					2160.6	2022.1
460.2		2108.4					2249.5	2098.5
460.4							2339.3	2175.6

TABLE V.-SURFACE TEMPERATURE - Continued

(b) SI Units

Time sec	Temperature, T_s, °K, at - ø = 0° Station, cm											
	40.64	78.74	101.60	132.08	150.50	185.42	215.90	251.46	276.86	307.34	337.82	365.76
443.0	378.1	356.4	351.8	346.7	344.1	340.5	335.9	335.6	334.7	333.3	331.6	328.6
444.0	386.0	361.9	356.9	351.7	349.2	344.9	339.3	339.1	338.9	337.1	335.7	332.4
445.0	393.3	367.8	360.7	355.2	351.8	346.9	342.7	341.6	340.9	339.3	337.7	334.6
446.0	399.9	372.1	364.7	358.4	355.3	350.4	345.1	343.9	342.8	340.8	339.1	335.6
447.0	411.2	379.4	371.7	364.2	360.7	355.3	349.9	347.5	346.8	345.0	342.5	338.5
448.0	423.8	389.0	380.1	370.7	367.0	360.7	354.4	353.0	352.1	350.3	347.1	343.2
448.2	426.6	390.8	381.8	372.4	368.6	361.8	355.7	354.3	353.2	351.3	348.1	344.3
448.4	429.4	392.7	383.3	374.1	370.2	363.2	357.1	355.3	354.2	352.1	349.0	345.4
448.6	432.4	394.7	384.8	375.5	371.8	364.6	358.4	356.1	355.1	352.9	349.9	346.3
448.8	435.4	396.7	386.2	376.9	373.2	365.9	359.7	356.9	356.0	353.8	350.8	347.1
449.0	438.4	398.7	387.6	378.3	374.4	367.1	360.7	357.8	356.8	354.7	351.7	347.8
449.2	441.6	400.7	389.2	379.8	375.4	368.2	361.8	358.9	357.8	355.6	352.4	348.5
449.4	445.1	402.7	391.0	381.6	376.7	369.4	363.0	360.2	358.9	356.4	353.3	349.4
449.6	448.7	404.8	393.0	383.3	378.3	371.0	364.4	361.6	360.2	357.4	354.2	350.4
449.8	452.4	407.1	395.2	384.9	380.3	372.7	365.8	363.1	361.4	358.6	355.3	351.6
450.0	456.2	409.6	397.4	386.8	382.4	374.3	367.3	364.6	362.6	359.7	356.6	352.7
450.2	459.9	412.1	399.7	388.7	384.2	375.8	368.6	366.0	363.8	360.9	357.8	353.8
450.4	463.6	414.7	401.9	390.4	385.8	377.2	369.9	367.3	365.1	361.9	358.8	354.8
450.6	466.8	417.2	404.2	392.1	387.0	378.6	371.2	368.5	366.3	362.9	359.8	355.8
450.8	469.7	419.8	406.3	393.8	388.3	380.0	372.4	369.5	367.5	363.9	360.7	356.8
451.0	472.6	422.3	408.4	395.7	389.8	381.5	373.6	370.7	368.7	365.1	361.8	358.0
451.2	475.7	425.0	410.7	397.6	391.6	383.0	375.0	371.9	370.1	366.4	362.9	359.3
451.4	479.5	427.9	413.1	399.6	393.7	384.7	376.6	373.3	371.5	367.8	364.3	360.7
451.6	484.2	431.0	415.9	401.7	395.9	386.5	378.4	374.9	373.1	369.4	365.7	362.1
451.8	489.3	434.3	418.8	404.0	398.3	388.4	380.5	376.6	374.8	371.2	367.3	363.4
452.0	494.4	437.7	421.6	406.4	400.7	390.4	382.6	378.3	376.6	372.8	368.9	364.7
452.2	499.4	441.1	424.1	408.9	403.0	392.4	384.4	380.2	378.2	374.2	370.4	366.1
452.4	504.2	444.2	426.5	411.4	405.3	394.4	386.1	382.2	379.8	375.6	371.9	367.4
452.6	508.9	447.3	429.0	413.8	407.5	396.7	387.8	384.1	381.3	377.1	373.4	369.1
452.8	513.9	450.7	431.9	416.2	409.7	399.0	389.6	386.0	382.9	378.9	375.2	370.9
453.0	519.1	454.2	435.0	419.0	412.1	401.3	391.7	387.8	384.4	380.9	377.4	373.3
453.2	524.3	457.9	438.2	422.0	414.4	403.6	393.8	389.4	386.0	382.8	380.2	376.6
453.4	529.8	461.8	441.3	424.9	416.9	405.7	395.9	391.1	387.7	384.8	383.1	380.9
453.6	535.8	465.9	444.7	427.9	419.7	407.9	398.1	393.2	389.6	387.0	386.6	386.1
453.8	542.2	470.3	448.3	430.8	422.7	410.3	400.3	395.7	392.2	390.1	390.3	394.0
454.0	548.9	475.1	452.1	433.9	426.0	413.1	402.7	398.4	395.4	394.2	397.9	414.1
454.2	555.8	479.9	456.1	437.4	429.3	416.1	405.6	401.6	399.1	399.4	413.9	432.6

TABLE V.-SURFACE TEMPERATURE - Continued

(b) SI Units - Continued

Time, sec	Temperature, T_s, °K, at - ø = 0° Station, cm											
	40.64	78.74	101.60	132.08	150.50	185.42	215.90	251.46	276.86	307.34	337.82	365.76
454.4	563.0	484.7	460.1	441.2	432.5	419.1	408.8	404.9	403.6	406.3	429.8	449.0
454.6	570.2	489.6	464.4	444.9	435.9	422.3	412.3	408.4	408.5	414.8	445.6	464.6
454.8	577.1	494.4	468.6	448.6	439.2	425.4	415.8	411.9	413.7	425.3	462.0	480.1
455.0	583.9	499.4	472.9	452.1	442.4	428.6	418.8	415.3	419.4	438.0	479.8	495.7
455.2	590.2	504.3	476.9	455.5	445.6	431.4	421.3	418.7	425.6	452.6	498.3	511.4
455.4	596.3	508.8	480.8	458.8	448.6	434.0	423.8	422.3	432.6	468.1	517.3	526.7
455.6	601.8	513.2	484.6	462.1	451.4	436.6	426.4	426.7	440.1	486.3	535.7	541.8
455.8	606.9	517.3	488.2	465.1	454.2	439.3	429.5	431.9	448.2	507.5	553.4	556.8
456.0	611.4	521.3	491.3	467.8	456.8	442.3	432.9	437.6	461.9	530.7	570.2	571.6
456.2	615.4	525.2	494.4	470.2	459.4	445.6	436.5	443.8	486.3	555.3	587.0	586.5
456.4	618.9	529.1	497.5	472.7	462.2	449.3	440.3	457.1	514.5	577.8	603.4	601.3
456.6	622.2	532.8	500.8	475.7	465.2	453.3	456.7	495.2	545.4	596.6	618.3	616.5
456.8	625.4	536.3	504.3	479.3	469.2	460.1	483.3	530.9	573.8	615.1	633.8	632.4
457.0	628.3	539.3	507.7	483.0	474.1	476.8	511.1	563.4	598.7	634.3	651.7	649.1
457.2	630.6	541.7	510.8	486.7	480.4	498.6	540.4	593.2	621.9	654.4	670.2	666.7
457.4	632.3	543.2	513.2	490.4	488.3	522.8	569.4	619.4	644.9	674.0	689.7	684.9
457.6	633.3	544.2	514.9	495.2	496.7	544.8	597.8	645.5	668.7	694.5	710.8	703.7
457.8	634.2	544.8	517.0	500.9	506.1	564.9	626.3	672.4	693.0	717.4	731.4	723.9
458.0	635.1	545.4	520.2	509.1	516.3	588.0	655.4	699.2	717.3	739.8	753.6	745.2
458.2	635.8	546.6	524.6	518.7	533.9	618.7	684.4	725.9	742.0	762.8	776.9	767.6
458.4	636.4	548.0	530.0	529.9	554.4	650.4	712.8	753.1	767.4	787.7	801.3	791.8
458.6	636.8	549.6	536.4	545.0	586.4	682.2	740.6	779.7	793.5	813.4	828.0	817.1
458.8	636.8	568.8	571.8	593.2	628.5	716.2	768.4	806.6	821.9	840.4	856.2	844.7
459.0	641.2	603.7	620.5	644.0	675.4	750.4	797.9	835.7	852.5	869.7	885.6	873.5
459.2	670.8	643.4	667.2	690.5	720.3	785.4	828.9	867.1	883.4	902.1	916.8	903.9
459.4	699.9	679.6	706.9	730.9	759.7	820.7		899.6	915.1	935.2	949.1	935.7
459.6	726.1	707.3	739.4	767.3	794.7	855.3		931.9	947.7	966.7	980.4	967.4
459.8	747.3	727.7	765.7	799.7	827.3	887.2		962.5	979.7	997.2	1008.7	998.4
460.0	766.6	743.7	787.4	827.2	856.4	914.4		991.4	1010.1	1027.1		1029.1
460.2	784.3	761.4	810.1	851.7	882.2	939.3		1019.6	1039.4	1057.1		1060.6
460.4	801.5	782.8	835.6	876.2	906.8	964.6		1048.9	1069.6	1089.2		1092.7
460.6	822.4	805.6	861.4	901.1	930.1	989.6		1082.2	1100.8	1121.3		1125.1
460.8	847.8	830.2	883.4	920.4	949.8	1010.8			1130.3			1158.0
461.0	874.0	854.6	898.7	933.1	964.2	1024.2						
461.2	894.8	873.2	911.7	945.9	976.6	1035.7						

TABLE V.-SURFACE TEMPERATURE - Continued

(b) SI Units - Continued

Time, sec	Temperature, T_s, °K, at -							
	ø = 90°		ø = 180°					ø=270°
	Station, cm.		Station, cm					Sta, cm
	185.42	365.76	132.08	185.42	251.46	307.34	365.76	365.76
443.0	338.8	325.7	345.9	339.8	334.6	332.6	328.3	328.8
444.0	342.9	329.6	350.0	343.5	338.1	336.6	331.3	332.4
445.0	345.9	332.4	353.4	346.4	340.1	338.0	333.1	333.3
446.0	349.1	334.3	358.5	350.5	344.0	340.6	335.8	335.6
447.0	352.9	336.4	362.7	354.7	347.4	343.7	339.0	338.9
448.0	358.4	340.7	367.8	358.9	350.9	347.4	342.4	342.8
448.2	359.8	341.8	368.7	360.0	351.7	348.4	342.9	343.8
448.4	361.2	342.9	369.6	361.1	352.6	349.3	343.5	344.7
448.6	362.4	343.7	370.6	361.9	353.4	349.9	344.1	345.4
448.8	363.4	344.4	371.7	362.8	354.3	350.6	344.8	346.0
449.0	364.5	345.1	372.8	363.6	355.0	351.2	345.6	346.6
449.2	365.7	345.7	373.9	364.6	355.7	351.8	346.4	347.3
449.4	367.1	346.4	375.2	365.6	356.6	352.7	347.1	348.3
449.6	368.5	347.3	376.7	366.6	357.4	353.6	347.7	349.4
449.8	369.8	348.3	378.3	367.7	358.4	354.5	348.4	350.5
450.0	370.9	349.3	380.1	368.8	359.6	355.4	349.3	351.6
450.2	372.1	350.3	381.7	369.9	360.7	356.3	350.3	352.5
450.4	373.2	351.3	383.4	371.3	361.8	357.4	351.7	353.6
450.6	374.6	351.9	385.3	372.9	363.0	358.8	353.0	354.9
450.8	376.1	353.0	387.4	374.8	364.4	360.4	354.6	356.4
451.0	377.8	354.1	389.7	376.8	366.2	362.2	356.2	357.8
451.2	379.6	355.4	392.0	378.8	368.1	363.8	357.6	359.1
451.4	381.4	356.9	394.2	380.5	369.8	365.1	358.8	360.2
451.6	383.2	358.3	396.2	382.0	371.3	366.2	359.8	361.3
451.8	385.0	359.7	397.9	383.7	372.7	367.2	360.7	362.6
452.0	386.8	361.1	399.9	385.6	374.2	368.3	361.7	363.9
452.2	388.6	362.7	402.1	387.7	376.1	369.7	362.9	365.2
452.4	390.5	364.4	404.6	390.0	377.8	371.4	364.4	366.8
452.6	392.6	366.3	407.2	392.3	379.5	373.4	366.1	368.7
452.8	394.7	368.7	409.6	394.4	381.2	375.5	368.1	371.2
453.0	396.8	371.6	411.8	396.4	382.7	377.3	370.8	373.9
453.2	398.8	375.1	414.1	398.3	384.3	378.9	374.4	377.0
453.4	400.9	379.7	416.3	400.2	385.9	380.8	378.8	380.3
453.6	403.1	385.0	418.7	402.1	388.1	383.3	384.1	388.8
453.8	405.6	391.2	421.4	404.3	390.6	386.3	395.2	399.2
454.0	408.3	405.0	424.3	406.7	394.2	391.3	412.8	411.8
454.2	411.0	422.7	427.4	409.4	398.6	408.6	432.7	427.9

TABLE V.-SURFACE TEMPERATURE - Concluded

(b) SI Units - Concluded

Time, sec	Temperature, T_s, °K, at -							
	ø = 90°		ø = 180°					ø=270°
	Station, cm		Station, cm					Sta, cm
	185.42	365.76	132.08	185.42	251.46	307.34	365.76	365.76
454.4	414.0	440.3	430.7	412.4	404.1	425.1	448.1	444.5
454.6	417.3	457.6	434.1	415.8	410.5	443.1	462.2	461.6
454.8	420.8	474.3	437.6	419.7	422.5	461.6	475.6	478.6
455.0	424.1	490.2	441.2	423.9	437.8	480.3	488.6	495.4
455.2	427.6	504.2	445.0	428.6	455.0	498.2	501.4	511.9
455.4	432.2	517.8	449.0	433.6	474.4	515.2	514.6	527.7
455.6	438.7	531.5	453.5	439.0	495.8	532.2	528.3	543.2
455.8	446.8	545.8	458.3	445.2	519.9	549.2	542.8	557.9
456.0	456.1	561.0	463.7	452.2	546.2	566.9	558.2	572.8
456.2	466.2	576.9	469.6	459.9	573.5	585.6	575.4	588.8
456.4	477.3	593.7	476.2	468.4	600.8	604.3	593.8	605.2
456.6	495.3	611.6	488.1	489.2	626.1	623.3	613.2	622.3
456.8	526.0	630.4	497.7	517.2	650.8	643.2	633.4	640.2
457.0	556.6	650.3	510.6	551.2	674.7	664.2	654.7	658.9
457.2	588.9	671.6	531.2	594.9	699.2	686.5	677.1	678.8
457.4	623.4	693.8	552.9	640.5	724.1	709.2	701.0	699.4
457.6	662.8	717.3	574.0	685.1	750.5	733.9	726.8	721.3
457.8	703.6	742.6	591.7	728.1	779.7	761.0	754.3	744.8
458.0	744.5	769.5	616.6	770.6	809.8	789.2	782.9	770.6
458.2	785.7	798.7	650.5	812.7	841.3	819.2	816.3	798.7
458.4	827.1	829.1	694.1	854.4	873.8	851.5	851.2	827.9
458.6	866.8	860.9	748.6	894.7	908.7	884.6	887.6	858.2
458.8	905.2	894.4	816.3	934.1	945.6	918.3	923.0	889.9
459.0		930.3	897.5	974.6	985.4	952.7	964.6	924.4
459.2		969.2	981.3		1027.8		1010.3	961.0
459.4		1008.8			1072.3		1056.6	999.4
459.6		1049.5			1118.7		1104.2	1039.8
459.8		1090.7			1167.3		1151.7	1081.3
460.0		1132.6					1200.3	1123.4
460.2		1171.3					1249.7	1165.8
460.4							1299.6	1208.7
460.6								
460.8								
461.0								
461.2								

TABLE VI.- ESTIMATES OF LATERAL CONDUCTION

(a) Estimates of longitudinal conduction due to mechanical joint

L'		Time, sec	Equation	q_c (a)		Input q		q_c/q, percent
in.	cm			Btu/ft^2-sec	W/cm^2	Btu/ft^2-sec	W/cm^2	
3.8	9.65	459.0	2	-0.94	-1.07	670	760.38	0.14
3.8	9.65	459.0	3	-1.13	-1.28	670	760.38	.17
3.8	9.65	461.0	2	-1.39	-1.58	1050	1191.65	.13
3.8	9.65	461.0	3	-1.34	-1.52	1050	1191.65	.13
4.2	10.67	459.0	2	-.33	-.37	670	760.38	.049
4.2	10.67	459.0	3	-.45	-.51	670	760.38	.067
4.2	10.67	461.0	2	-.45	-.51	1050	1191.65	.043
4.2	10.67	461.0	3	-.56	-.64	1050	1191.65	.053

[a]Negative sign indicates that heat is being lost.

TABLE VI.- ESTIMATES OF LATERAL CONDUCTION – Continued

(b) Estimates of longitudinal conduction due to temperature variation along surface at 458.1 sec

Station		Temperature at TC 1		q_c		q		q_c/q, percent
in.	cm	^oR	^oK	Btu/ft^2-sec	W/cm^2	Btu/ft^2-sec	W/cm^2	
16	40.64	1138.4	632.4	0.278	0.3155	210	238.329	0.13
31	78.74	976.6	542.6	.0312	.0354	380	431.262	.008
40	101.60	934.0	518.9	.0583	.0662	493	559.506	.01
52	132.08	924.6	513.7	.0765	.0868	546	619.655	.01
59.25	150.50	938.1	521.2	.1199	.1361	575	652.568	.021
73	185.42	1070.6	594.8	.0263	.0298	568	644.623	.005
85	215.90	1180.9	656.1	-.0555	-.0630	570	646.893	.010
99	251.46	1267.5	704.2	-.0128	-.0145	590	669.591	.002
109	276.86	1295.5	719.7	-.0064	-.0073	585	663.917	.001
121	307.34	1336.3	742.4	-.0017	-.0019	585	663.917	.0003
133	337.82	1362.6	757.0	-.0168	-.0191	581	659.377	.0029
144	365.76	1350.0	750.0	-.1043	-.1184	560	635.544	.019

TABLE VI.- ESTIMATES OF LATERAL CONDUCTION – Concluded

(c) Estimates of circumferential conduction

Station		Time, sec	$\Delta\overline{T}$		q_c		q		q_c/q, percent
in.	cm		^oR	^oK	Btu/ft^2-sec	W/cm^2	Btu/ft^2-sec	W/cm^2	
16	40.64	456.5	21	11.7	3.128	3.550	112	127.109	2.8
		458.0	93	51.7	13.543	15.370	73	82.848	18.6
		458.8	157	87.2	22.234	25.233	51	57.880	43.6
		460.0	305	169.4	41.971	47.633	291	330.256	14.4
		461.4	545	302.8	70.993	80.570	370	419.913	19.2
31	78.74	456.5	13	7.2	0.519	0.589	100	113.490	0.5
		458.0	78	43.3	3.049	3.460	68	77.173	4.5
		458.6	141	78.3	5.450	6.185	66	74.903	8.3
		458.8	163	90.6	6.291	7.140	237	268.971	2.7
		460.0	296	164.4	10.640	12.075	361	409.699	2.9
		461.4	497	276.1	16.383	18.595	386	438.071	4.2
40	101.60	456.5	16	8.9	0.385	0.437	91	103.276	0.4
		458.0	80	44.4	1.881	2.135	84	95.332	2.2
		458.6	131	72.8	3.000	3.405	105	119.165	2.9
		460.0	279	155.0	5.880	6.673	467	529.998	1.2
		461.4	465	258.3	8.892	10.092	446	506.165	1.9
52	132.08	456.5	15	8.3	0.215	0.244	75	85.118	0.3
		458.0	47	26.1	.661	.750	127	144.132	.5
		460.0	224	124.4	2.701	3.065	554	628.735	.4
73	185.42	456.5	15	8.3	0.110	0.125	75	85.118	0.1
		458.0	110	61.1	.7657	.869	362	410.834	.2
		460.0	240	133.3	1.341	1.522	602	683.210	.2

TABLE VII.- ESTIMATED HEATING RATES FOR FORWARD STATIONS ON HOT SIDE (ϕ = 180°) OF SPACECRAFT

Time, sec	q, Btu/ft^2-sec (W/cm^2), for station –					
	16 in.	(40.64 cm)	31 in.	(78.74 cm)	40 in.	(101.60 cm)
455.0	133	(151)	110	(125)	100	(113)
455.5	140	(159)	115	(131)	109	(124)
456.0	155	(176)	128	(145)	121	(137)
456.5	184	(209)	152	(172)	144	(163)
457.0	230	(261)	195	(221)	180	(204)
457.5	280	(318)	240	(272)	240	(272)
458.0	300	(340)	270	(306)	280	(318)
458.5	330	(374)	465	(528)	570	(647)
459.0	500	(567)	665	(755)	745	(845)
459.5	654	(742)	800	(908)	877	(995)
460.0	830	(942)	945	(1072)	985	(1118)
460.5	875	(993)	975	(1107)	1003	(1138)
461.0	900	(1020)	990	(1123)	1020	(1159)
461.5	900	(1020)	975	(1107)	1006	(1141)

TABLE VIII.-FAIRED VALUES OF HEATING RATE

(a) U.S. Customary Units

Time, sec	Heating rate, q, Btu/ft^2-sec, at- ø = 0° Station, inches											
	16	31	40	52	59.25	73	85	99	109	121	133	144
443.0	17.0	12.2	11.2	11.9	9.3	8.7	7.4	7.7	5.8	2.7	2.9	4.4
444.0	24.6	18.4	17.9	16.5	14.7	13.6	11.5	11.1	10.4	8.1	12.4	8.9
445.0	25.6	20.9	16.4	14.4	12.6	11.8	11.0	11.5	10.0	8.4	8.2	8.2
446.0	29.7	21.1	18.2	16.1	15.0	15.2	13.0	10.8	10.7	9.2	6.7	7.7
447.0	40.6	29.6	26.8	21.8	22.2	18.4	18.6	16.3	15.5	14.8	14.8	12.3
448.0	47.5	35.7	32.0	27.9	26.2	22.8	20.9	21.1	19.9	20.8	18.2	19.6
448.2	49.2	36.5	32.1	29.2	27.8	23.9	22.0	21.2	20.1	20.0	18.7	20.0
448.4	51.1	37.2	32.1	30.0	28.8	25.0	23.1	21.0	20.1	19.5	19.0	19.8
448.6	52.6	38.3	32.4	30.3	29.1	25.8	23.8	20.3	20.1	18.9	19.1	19.0
448.8	54.3	39.4	32.9	30.7	29.0	26.0	23.9	20.0	20.3	18.5	18.8	17.8
449.0	56.5	40.8	33.8	31.3	29.0	26.0	23.9	21.0	20.7	18.1	17.9	16.4
449.2	58.8	42.0	35.0	32.8	29.2	26.7	24.9	21.4	21.4	18.1	17.4	16.1
449.4	61.1	43.5	36.8	33.8	30.6	28.0	26.1	22.5	22.2	19.1	18.0	17.0
449.6	63.5	45.1	38.7	34.5	32.1	29.5	27.2	24.0	23.0	21.0	19.8	18.8
449.8	65.4	47.0	40.5	35.1	33.5	30.6	27.8	25.3	24.0	22.8	21.2	20.1
450.0	67.0	48.4	42.3	35.9	34.1	31.4	28.0	26.6	24.7	23.9	22.8	21.2
450.2	68.0	50.0	43.8	36.3	34.0	31.8	28.2	27.8	25.2	24.6	23.5	22.0
450.4	68.7	51.2	45.0	37.0	33.8	31.9	28.8	28.6	26.0	25.1	23.9	23.0
450.6	68.9	52.4	46.0	37.2	34.0	32.0	29.1	28.6	26.7	25.8	24.0	24.0
450.8	68.9	53.2	46.7	37.9	34.5	32.6	29.6	28.0	27.5	26.0	24.3	25.0
451.0	68.7	54.0	47.0	38.2	35.9	33.1	30.0	28.0	28.0	26.1	25.1	25.5
451.2	71.4	56.0	48.2	40.0	38.0	34.0	31.3	28.8	29.2	26.8	26.5	26.0
451.4	75.5	58.0	50.2	42.2	40.5	36.0	33.5	30.0	30.0	27.8	27.4	26.0
451.6	80.2	60.8	53.2	44.3	42.3	37.8	34.7	31.0	31.5	29.0	28.0	26.2
451.8	84.0	64.2	55.0	46.5	44.0	39.4	36.5	32.0	33.0	30.0	28.2	26.8
452.0	86.0	65.2	55.2	48.0	44.8	40.8	38.0	33.5	34.0	30.0	29.2	27.6
452.2	88.0	66.0	56.0	49.5	46.0	42.0	38.8	35.0	36.0	30.2	30.0	28.7
452.4	90.5	66.5	57.0	50.2	46.8	43.4	40.0	36.0	34.4	31.5	31.6	30.2
452.6	93.0	67.8	58.2	51.5	48.0	44.0	40.2	36.7	34.2	33.4	33.5	33.4
452.8	95.5	70.0	61.0	52.5	49.0	45.0	41.4	37.8	34.0	34.5	35.8	36.5
453.0	98.8	72.4	63.5	54.2	50.0	46.0	42.0	38.0	34.5	36.0	40.5	41.4
453.2	102.0	75.0	65.2	56.8	52.0	46.7	43.2	38.2	35.5	38.0	45.6	47.8
453.4	105.8	78.0	67.3	59.5	54.5	47.5	44.2	39.5	36.8	41.4	51.5	55.3
453.6	110.2	82.0	70.0	62.0	57.4	49.0	46.0	41.4	39.5	45.0	58.0	65.0
453.8	114.5	85.5	73.5	64.2	60.8	51.8	48.0	44.0	42.2	50.0	65.0	129.0
454.0	119.8	89.0	76.0	67.5	63.4	54.2	51.0	47.0	47.5	58.0	123.0	187.0
454.2	125.0	93.0	78.0	70.0	66.0	58.0	54.0	51.0	55.0	73.0	155.0	205.0

TABLE VIII.-FAIRED VALUES OF HEATING RATE - Continued

(a) U.S. Customary Units - Continued

Time, sec	Heating rate, q, Btu/ft^2-sec, at- ø = 0° Station, inches											
	16	31	40	52	59.25	73	85	99	109	121	133	144
454.4	128.0	95.0	82.5	73.0	67.5	60.0	58.0	60.0	68.0	94.0	183.0	222.0
454.6	132.0	97.5	85.0	75.0	69.0	62.0	62.0	63.0	75.0	115.0	208.0	236.0
454.8	135.0	100.0	87.0	76.0	70.0	64.0	64.0	65.0	83.0	139.0	230.0	248.5
455.0	135.0	100.0	88.0	76.0	70.0	65.0	65.0	68.0	90.0	166.0	252.0	259.0
455.2	134.0	100.0	89.0	76.0	71.0	65.0	64.0	71.0	100.0	193.0	270.0	267.5
455.4	132.0	100.0	88.0	76.0	71.0	65.0	63.0	75.0	109.0	226.0	287.5	274.0
455.6	129.0	100.0	87.0	75.0	70.0	65.0	65.0	81.0	118.0	260.0	300.0	281.0
455.8	125.0	100.0	86.0	75.0	69.0	65.0	67.0	88.0	127.5	296.0	312.0	292.5
456.0	122.0	100.0	85.0	75.0	70.0	67.0	70.0	96.0	215.0	329.0	322.0	302.0
456.2	117.0	100.0	85.0	75.0	70.0	70.0	74.0	105.0	284.0	352.0	330.0	311.0
456.4	113.0	99.0	85.0	74.0	73.0	73.0	84.0	249.0	338.0	358.0	337.0	320.0
456.6	110.0	98.0	85.0	75.0	77.5	77.0	212.5	344.0	377.5	362.0	342.5	327.5
456.8	105.0	95.0	87.0	78.0	83.0	128.0	268.0	392.0	391.0	370.0	352.0	337.5
457.0	100.0	92.0	88.0	82.0	93.0	195.0	317.5	413.0	400.0	386.0	365.0	348.0
457.2	93.0	87.5	85.0	85.0	107.0	247.5	357.5	421.0	411.5	398.5	378.0	360.0
457.4	86.0	82.0	82.0	90.0	120.0	275.0	382.0	435.0	426.0	408.0	393.0	373.0
457.6	80.0	75.0	76.0	100.0	134.0	290.0	410.0	453.0	440.0	420.0	411.0	389.0
457.8	75.0	70.0	76.0	113.0	145.0	314.0	441.0	471.0	454.0	436.0	430.0	407.5
458.0	71.0	67.0	82.5	127.5	170.0	364.0	466.0	486.0	466.0	452.5	450.0	427.0
458.2	66.0	64.0	90.0	143.0	222.5	414.0	489.0	500.0	485.0	472.5	473.0	450.0
458.4	60.0	62.0	97.5	159.0	292.5	457.0	505.5	514.0	504.0	494.0	494.0	474.0
458.6	55.0	68.0	195.0	300.0	397.5	493.0	520.0	529.0	525.0	517.0	520.0	499.0
458.8	50.0	242.5	365.0	475.0	490.5	525.0	533.0	550.0	549.0	540.0	544.0	524.0
459.0	155.0	342.5	470.0	535.0	457.0	556.0	555.0	580.0	572.5	572.0	572.5	549.0
459.2	253.0	399.0	502.0	556.0	586.0	581.0	590.0	604.0	598.0	599.0	591.5	571.0
459.4	282.5	404.0	505.0	566.5	590.0	601.5	623.0	625.0	619.0	617.5	608.0	590.0
459.6	288.0	388.0	490.0	570.0	588.0	615.0	627.5	634.0	638.0	628.5	617.0	607.5
459.8	290.0	367.0	473.5	564.0	585.0	612.5	612.0	635.0	646.0	637.0	625.0	624.0
460.0	292.0	361.0	467.5	554.0	582.0	602.5	610.0	638.0	649.5	645.0	640.0	638.0
460.2	296.0	377.5	482.0	549.0	582.0	599.0	616.0	646.0	653.0	660.0	656.0	652.0
460.4	312.5	398.0	500.0	548.5	578.0	598.0	632.0	654.5	668.0	685.0	671.5	666.0
460.6	345.0	418.5	498.0	541.0	560.0	592.0	619.0	658.0	680.0	699.0	686.5	679.0
460.8	378.0	439.0	476.0	509.0	532.5	560.0	580.0	641.0	675.0		702.5	688.0
461.0	383.0	438.0	447.5	482.0	495.0	518.0	542.5	610.0	650.0			
461.2	374.0	422.0	446.0	476.0	477.0	513.0	510.0	527.5	609.0			
461.4	352.0	387.5	446.5		488.0							

[redacted]

TABLE VIII.-FAIRED VALUES OF HEATING RATE-Continued

(a) U.S. Customary Units - Continued

Time, sec	Heating rate, q, Btu/ft^2-sec, at-							
	ø = 90°		ø = 180°					ø=270°
	Station, in.		Station, inches					Sta, in
	73	144	52	73	99	121	144	144
443.0	7.8	4.4	11.0	6.8	7.9	4.8	8.9	5.1
444.0	11.3	9.0	14.7	11.4	10.4	7.9	8.0	7.2
445.0	12.9	9.0	17.0	13.8	11.7	8.5	10.1	5.8
446.0	13.1	8.7	18.6	15.3	14.1	8.9	9.4	9.4
447.0	16.9	11.1	20.0	17.6	15.2	13.2	14.2	13.2
448.0	23.0	16.6	22.1	19.5	16.4	17.5	14.4	17.0
448.2	24.1	17.8	21.9	19.9	17.5	16.7	13.5	16.9
448.4	24.7	17.8	22.2	19.8	18.4	15.7	13.2	16.0
448.6	24.3	17.6	23.0	19.7	18.7	15.2	13.2	14.8
448.8	23.9	17.6	23.6	19.4	18.4	14.6	13.6	14.6
449.0	23.9	17.0	23.8	19.6	18.4	14.3	14.0	14.7
449.2	24.4	16.9	24.7	20.3	18.4	14.7	14.2	15.4
449.4	25.0	17.1	26.0	21.0	18.8	16.0	14.2	17.1
449.6	25.1	17.7	27.4	21.7	19.5	17.4	15.0	17.9
449.8	25.2	18.4	29.6	22.4	20.2	19.2	17.2	20.0
450.0	25.5	19.3	30.7	23.2	21.1	20.2	19.0	21.3
450.2	25.8	20.0	31.9	24.8	22.1	21.4	21.0	22.3
450.4	27.0	20.5	33.7	26.5	23.0	23.3	23.1	23.9
450.6	28.5	20.9	35.0	29.0	24.8	25.0	24.2	25.7
450.8	30.7	21.2	37.8	31.7	27.4	27.2	25.5	26.5
451.0	32.6	23.8	40.0	33.5	29.2	28.0	26.2	27.0
451.2	34.0	24.8	41.4	34.6	30.0	28.5	26.4	26.6
451.4	35.5	25.6	41.8	35.4	30.8	27.6	26.0	25.8
451.6	36.2	26.0	42.0	36.0	31.0	26.5	25.4	25.0
451.8	37.2	27.2	43.2	37.0	31.4	26.5	24.2	25.5
452.0	37.8	28.4	44.5	38.2	33.0	27.5	24.5	26.0
452.2	38.2	30.2	46.0	40.0	34.5	29.2	26.0	28.2
452.4	39.4	32.2	47.2	41.4	35.4	31.6	28.0	31.8
452.6	40.0	35.6	48.0	42.0	36.0	33.5	31.0	35.7
452.8	40.8	39.6	47.6	41.8	36.5	34.8	36.0	40.0
453.0	42.2	44.0	48.0	41.0	37.0	35.6	43.0	43.4
453.2	44.0	52.4	49.2	41.0	38.0	37.6	52.0	48.5
453.4	45.5	64.4	50.5	42.0	40.0	41.2	62.6	64.0
453.6	47.4	79.5	53.0	43.5	43.4	45.6	75.5	95.6
453.8	49.2	111.0	55.4	45.8	48.0	50.5	138.0	127.4
454.0	50.6	156.0	57.8	49.0	57.5	109.5	187.5	158.7
454.2	53.0	184.8	60.5	52.8	64.0	152.5	206.0	188.0

[redacted]

TABLE VIII.-FAIRED VALUES OF HEATING RATE- Continued

(a) U.S. Customary Units - Concluded

Time, sec	Heating rate, q, Btu/ft^2-sec, at-							
	ø = 90°		ø = 180°					ø=270°
	Station, in.		Station, inches					Sta, in
	73	144	52	73	99	121	144	144
454.4	55.8	208.2	63.6	57.0	75.2	184.0	216.0	212.5
454.6	59.7	229.0	67.0	61.4	91.0	213.0	221.8	231.5
454.8	62.5	245.0	70.0	68.0	146.C	240.0	230.0	250.0
455.0	67.5	255.0	72.0	74.0	180.0	257.0	237.0	268.0
455.2	75.0	256.0	74.0	80.0	212.5	269.0	243.0	281.0
455.4	85.0	262.0	76.0	86.0	249.0	280.0	250.0	288.0
455.6	99.0	272.0	81.0	94.0	288.0	293.0	263.0	295.0
455.8	115.0	284.0	88.0	103.0	329.0	309.0	276.0	304.0
456.0	130.0	297.5	96.0	113.0	369.0	325.0	292.5	315.0
456.2	145.0	311.0	106.0	124.0	399.0	342.0	313.0	326.0
456.4	157.5	328.0	120.0	135.0	419.0	357.5	333.0	339.0
456.6	257.0	345.0	139.0	255.0	434.0	374.0	353.0	351.0
456.8	328.0	364.0	161.0	309.0	444.0	388.0	374.0	366.0
457.0	380.0	384.0	198.0	400.0	455.0	403.0	393.0	380.0
457.2	424.0	404.0	259.0	491.0	468.0	421.0	417.0	396.0
457.4	477.0	423.0	286.0	553.0	489.0	443.0	440.0	412.5
457.6	526.0	444.0	290.0	595.0	513.0	468.0	465.0	431.0
457.8	569.0	470.0	314.0	630.0	539.0	495.0	496.0	457.5
458.0	610.0	498.0	372.0	658.0	563.0	523.0	535.0	485.0
458.2	646.0	523.0	462.0	686.0	589.C	553.0	576.0	512.5
458.4	675.0	550.0	570.0	708.0	616.0	581.0	611.0	544.0
458.6	697.5	584.0	700.0	723.0	647.0	611.0	643.0	573.0
458.8	718.0	621.0	837.5	745.0	681.0	641.0	680.0	607.0
459.0	751.0	660.0	985.0	774.0	720.0	692.0	725.0	640.0
459.2	772.0	696.0	1064.0	810.0	760.0	721.0	767.5	671.0
459.4	783.0	724.0	1065.0	838.0	798.5	740.0	805.0	704.0
459.6	785.0	755.0	1032.0	849.5	832.5	759.0	838.0	735.0
459.8	801.0	785.0	1000.0	867.0	865.0	786.0	870.0	765.0
460.0	838.0	813.0	1013.0	902.0	897.0	815.0	900.0	793.0
460.2	877.0		1054.0	944.0	927.0	842.0	930.0	820.0
460.4				971.0	956.0	872.0	959.0	847.5
460.6				999.0	986.0	904.0		874.0
460.8				1026.0	1016.0	938.0		900.0
461.0					1047.0			
461.2					1079.0			
461.4								

TABLE VIII.-FAIRED VALUES OF HEATING RATE- Continued

(b) SI Units

Time, sec	Heating rate, watts/cm^2, at -											
	ø = 0°											
	Station, cm											
	40.64	78.74	101.60	132.08	150.50	185.42	215.90	251.46	276.86	307.34	337.82	365.76
443.0	19.3	13.8	12.7	13.5	10.6	9.9	8.4	8.7	6.6	3.1	3.3	5.0
444.0	27.9	20.9	20.3	18.7	16.7	15.4	13.1	12.6	11.8	9.2	14.1	10.1
445.0	29.1	23.7	18.6	16.3	14.3	13.4	12.5	13.1	11.3	9.5	9.3	9.3
446.0	33.7	23.9	20.7	18.3	17.0	17.3	14.8	12.3	12.1	10.4	7.6	8.7
447.0	46.1	33.6	30.4	24.7	25.2	20.9	21.1	18.5	17.6	16.8	16.8	14.0
448.0	53.9	40.5	36.3	31.7	29.7	25.9	23.7	23.9	22.6	23.6	20.7	22.2
448.2	55.8	41.4	36.4	33.1	31.6	27.1	25.0	24.1	22.8	22.7	21.2	22.7
448.4	58.0	42.2	36.4	34.0	32.7	28.4	26.2	23.8	22.8	22.1	21.6	22.5
448.6	59.7	43.5	36.8	34.4	33.0	29.3	27.0	23.0	22.8	21.4	21.7	21.6
448.8	61.6	44.7	37.3	34.8	32.9	29.5	27.1	22.7	23.0	21.0	21.3	20.2
449.0	64.1	46.3	38.4	35.5	32.9	29.5	27.1	23.8	23.5	20.5	20.3	18.6
449.2	66.7	47.7	39.7	37.2	33.1	30.3	28.3	25.5	24.3	20.5	19.7	18.3
449.4	69.3	49.4	41.8	38.4	34.7	31.8	29.6	27.2	25.2	21.7	20.4	19.3
449.6	72.1	51.2	43.9	39.2	36.4	33.5	30.9	28.7	26.1	23.8	22.5	21.3
449.8	74.2	53.3	46.0	39.8	38.0	34.7	31.6	30.2	27.2	25.9	24.1	22.8
450.0	76.0	54.9	48.0	40.7	38.7	35.6	31.8	31.6	28.0	27.1	25.9	24.1
450.2	77.2	56.7	49.7	41.2	38.6	36.1	32.0	32.5	28.6	27.9	26.7	25.0
450.4	78.0	58.1	51.1	42.0	38.4	36.2	32.7	32.5	29.5	28.5	27.1	26.1
450.6	78.2	59.5	52.2	42.2	38.6	36.3	33.0	31.8	30.3	29.3	27.2	27.2
450.8	78.2	60.4	53.0	43.0	39.2	37.0	33.6	31.8	31.2	29.5	27.6	28.4
451.0	78.0	61.3	53.3	43.4	40.7	37.6	34.0	32.7	31.8	29.6	28.5	28.9
451.2	81.0	63.6	54.7	45.4	43.1	38.6	35.5	34.0	33.1	30.4	30.1	29.5
451.4	85.7	65.8	57.0	47.9	46.0	40.9	38.0	35.2	34.0	31.6	31.1	29.5
451.6	91.0	69.0	60.4	50.3	48.0	42.9	39.4	36.3	35.7	32.9	31.8	29.7
451.8	95.3	72.9	62.4	52.8	49.9	44.7	41.4	38.0	37.5	34.0	32.0	30.4
452.0	97.6	74.0	62.6	54.5	50.8	46.3	43.1	39.7	38.6	34.0	33.1	31.3
452.2	99.9	74.9	63.6	56.2	52.2	47.7	44.0	40.9	39.0	34.3	34.0	32.6
452.4	102.7	75.5	64.7	57.0	53.1	49.3	45.4	41.7	38.8	35.7	35.9	34.3
452.6	105.5	76.9	66.1	58.4	54.5	49.9	45.6	42.9	38.6	37.9	38.0	37.9
452.8	108.4	79.4	69.2	59.6	55.6	51.1	47.0	43.1	39.2	39.2	40.6	41.4
453.0	112.1	82.2	72.1	61.5	56.7	52.2	47.7	43.4	40.3	40.9	46.0	47.0
453.2	115.8	85.1	74.0	64.5	59.0	53.0	49.0	44.8	41.8	43.1	51.8	54.2
453.4	120.1	88.5	76.4	67.5	61.9	53.9	50.2	47.0	44.8	47.0	58.4	62.8
453.6	125.1	93.1	79.4	70.4	65.1	55.6	52.2	49.9	47.9	51.1	65.8	73.8
453.8	129.9	97.0	83.4	72.9	69.0	58.8	54.5	53.3	53.9	56.7	73.8	146.4
454.0	136.0	101.0	86.3	76.6	72.0	61.5	57.9	57.9	62.4	65.8	139.6	212.2
454.2	141.9	105.5	88.5	79.4	74.9	65.8	61.3	62.4	68.1	82.8	175.9	232.7

TABLE VIII.-FAIRED VALUES OF HEATING RATE - Continued

(b) SI Units - Continued

Time, sec	Heating rate, q, watts/cm^2, at - ø = 0° Station, cm											
	40.64	78.74	101.60	132.08	150.50	185.42	215.90	251.46	276.86	307.34	337.82	365.76
454.4	145.3	107.8	93.6	82.8	76.6	68.1	65.8	68.1	77.2	106.7	207.7	251.9
454.6	149.8	110.7	96.5	85.1	78.3	70.4	70.4	71.5	85.1	130.5	236.1	267.8
454.8	153.2	113.5	98.7	86.3	79.4	72.6	72.6	73.8	94.2	157.8	261.0	282.0
455.0	153.2	113.5	99.9	86.3	79.4	73.8	73.8	77.2	102.1	188.4	286.0	293.9
455.2	152.1	113.5	101.0	86.3	80.6	73.8	72.6	80.6	113.5	219.0	306.4	303.6
455.4	149.8	113.5	99.9	86.3	80.6	73.8	71.5	85.1	123.7	256.5	326.3	311.0
455.6	146.4	113.5	98.7	85.1	79.4	73.8	73.8	91.9	133.9	295.1	340.5	318.9
455.8	141.9	113.5	97.6	85.1	78.3	73.8	76.0	99.9	144.7	335.9	354.1	332.0
456.0	138.5	113.5	96.5	85.1	79.4	76.0	79.4	109.0	244.0	373.4	365.4	342.7
456.2	132.8	113.5	96.5	85.1	79.4	79.4	84.0	119.2	322.3	399.5	374.5	353.0
456.4	128.2	112.4	96.5	84.0	82.8	82.8	95.3	282.6	383.6	406.3	382.5	363.2
456.6	124.8	111.2	96.5	85.1	88.0	87.4	241.2	390.4	428.4	410.8	388.7	371.7
456.8	119.2	107.8	98.7	88.5	94.2	145.3	304.2	444.9	443.7	419.9	399.5	383.0
457.0	113.5	104.4	99.9	93.1	105.5	221.3	360.3	468.7	454.0	438.1	414.2	394.9
457.2	105.5	99.3	96.5	96.5	121.4	280.9	405.7	477.8	467.0	452.3	429.0	408.6
457.4	97.6	93.1	93.1	102.1	136.2	312.1	433.5	493.7	483.5	463.0	446.0	423.3
457.6	90.8	85.1	86.3	113.5	152.1	329.1	465.3	514.1	499.4	476.7	466.4	441.5
457.8	85.1	79.4	86.3	128.2	164.6	356.4	500.5	534.5	515.2	494.8	488.0	462.5
458.0	80.6	76.0	93.6	144.7	192.9	413.1	528.9	551.6	528.9	513.5	510.7	484.6
458.2	74.9	72.6	102.1	162.3	252.5	469.8	555.0	567.5	550.4	536.2	536.8	510.7
458.4	68.1	70.4	110.7	180.4	332.0	518.6	573.7	583.3	572.0	560.6	560.6	537.9
458.6	62.4	77.2	221.3	340.5	451.1	559.5	590.1	600.4	595.8	586.7	590.1	566.3
458.8	56.7	275.2	414.2	539.1	556.7	595.8	604.9	624.2	622.1	612.8	617.4	594.7
459.0	175.9	388.7	533.4	607.2	518.6	631.0	629.9	658.2	649.7	649.2	649.7	623.1
459.2	287.1	452.8	569.7	631.0	665.1	659.4	669.6	685.5	678.7	679.8	671.3	648.0
459.4	320.6	458.5	573.1	642.9	669.6	682.6	707.0	709.3	702.5	700.8	690.0	669.6
459.6	326.9	440.3	556.1	646.9	667.3	698.0	712.1	719.5	724.1	713.3	700.2	689.5
459.8	329.1	416.5	537.4	640.1	663.9	695.1	694.6	720.7	733.1	722.9	709.3	708.2
460.0	331.4	409.7	530.6	628.7	660.5	683.8	692.3	724.1	737.1	732.0	726.3	724.1
460.2	335.9	428.4	547.0	623.1	660.5	679.8	699.1	733.1	741.1	749.0	744.5	740.0
460.4	354.7	451.7	567.5	622.5	656.0	678.7	717.3	742.8	758.1	777.4	762.1	755.8
460.6	391.5	475.0	565.2	614.0	635.5	671.9	702.5	746.8	771.7	793.3	779.1	770.6
460.8	429.0	498.2	540.2	577.7	604.3	635.5	658.2	727.5	766.1		797.3	780.8
461.0	434.7	497.1	507.9	547.0	561.8	587.9	615.7	692.3	737.7			
461.2	424.5	478.9	506.2	540.2	541.3	582.2	578.8	598.7	691.2			
461.4	399.5	439.8	506.7		553.8							

TABLE VIII.-FAIRED VALUES OF HEATING RATE - Continued
(b) SI Units - Continued

Time, sec	Heating rate, watts/cm^2, at -							
	ø = 90°		ø = 180°					ø=270°
	Station, cm		Station, cm					Sta, cm
	185.42	365.76	132.08	185.42	251.46	307.34	365.76	365.76
443.0	8.9	5.0	12.5	7.7	9.0	5.4	10.1	5.8
444.0	12.8	10.2	16.7	12.9	11.8	9.0	9.1	8.2
445.0	14.6	10.2	19.3	15.7	13.3	9.6	11.5	6.6
446.0	14.9	9.9	21.1	17.4	16.0	10.1	10.7	10.7
447.0	19.2	12.6	22.7	20.0	17.3	15.0	16.1	15.0
448.0	26.1	18.8	25.1	22.1	18.6	19.9	16.3	19.3
448.2	27.4	20.2	24.9	22.6	19.9	19.0	15.3	19.2
448.4	28.0	20.2	25.2	22.5	20.9	17.8	15.0	18.2
448.6	27.6	20.0	26.1	22.4	21.2	17.3	15.0	16.8
448.8	27.1	20.0	26.8	22.0	20.9	16.6	15.4	16.6
449.0	27.1	19.3	27.0	22.2	20.9	16.2	15.9	16.7
449.2	27.7	19.2	28.0	23.0	20.9	16.7	16.1	17.5
449.4	28.4	19.4	29.5	23.8	21.2	18.2	16.1	19.4
449.6	28.5	20.1	31.1	24.6	22.1	19.7	17.0	20.3
449.8	28.6	20.9	33.6	25.4	22.9	21.8	19.5	22.7
450.0	28.9	21.9	34.8	26.3	23.9	22.9	21.6	24.2
450.2	29.3	22.7	36.2	28.1	25.1	24.3	23.8	25.3
450.4	30.6	23.3	38.2	30.1	26.1	26.4	26.2	27.1
450.6	32.3	23.7	39.7	32.9	28.1	28.4	27.5	29.2
450.8	34.8	24.1	42.9	36.0	31.1	30.9	28.9	30.1
451.0	37.0	27.0	45.4	38.0	33.1	31.8	29.7	30.6
451.2	38.6	28.1	47.0	39.3	34.0	32.3	30.0	30.2
451.4	40.3	29.1	47.4	40.2	35.0	31.3	29.5	29.3
451.6	41.1	29.5	47.7	40.9	35.2	30.1	28.8	28.4
451.8	42.2	30.9	49.0	42.0	35.6	30.1	27.5	28.9
452.0	42.9	32.2	50.5	43.4	37.5	31.2	27.8	29.5
452.2	43.4	34.3	52.2	45.4	39.2	33.1	29.5	32.0
452.4	44.7	36.5	53.6	47.0	40.2	35.9	31.8	36.1
452.6	45.4	40.4	54.5	47.7	40.9	38.0	35.2	40.5
452.8	46.3	44.9	54.0	47.4	41.4	39.5	40.9	45.4
453.0	47.9	49.9	54.5	46.5	42.0	40.4	48.8	49.3
453.2	49.9	59.5	55.8	46.5	43.1	42.7	59.0	55.0
453.4	51.6	73.1	57.3	47.7	45.4	46.8	71.0	72.6
453.6	53.8	90.2	60.1	49.4	49.3	51.8	85.7	108.5
453.8	55.8	126.0	62.9	52.0	54.5	57.3	156.6	144.6
454.0	57.4	177.0	65.6	55.6	65.3	124.3	212.8	180.1
454.2	60.1	209.7	68.7	59.9	72.6	173.1	233.8	213.4

TABLE VIII.-FAIRED VALUES OF HEATING RATE - Concluded

(b) SI Units - Concluded

Time, sec	Heating rate, watts/cm^2, at -							
	ø = 90°		ø = 180°					ø=270°
	Station, cm		Station, cm					Sta, cm
	185.42	365.76	132.08	185.42	251.46	307.34	365.76	365.76
454.4	63.3	236.3	72.2	64.7	85.3	208.8	245.1	241.2
454.6	67.8	259.9	76.0	69.7	103.3	241.7	251.7	262.7
454.8	70.9	278.1	79.4	77.2	165.7	272.4	261.0	283.7
455.0	76.6	289.4	81.7	84.0	204.3	291.7	269.0	304.2
455.2	85.1	290.5	84.0	90.8	241.2	305.3	275.8	318.9
455.4	96.5	297.3	86.3	97.6	282.6	317.8	283.7	326.9
455.6	112.4	308.7	91.9	106.7	326.9	332.5	298.5	334.8
455.8	130.5	322.3	99.9	116.9	373.4	350.7	313.2	345.0
456.0	147.5	337.6	109.0	128.2	418.8	368.8	332.0	357.5
456.2	164.6	353.0	120.3	140.7	452.8	388.1	355.2	370.0
456.4	178.7	372.2	136.2	153.2	475.5	405.7	377.9	384.7
456.6	291.7	391.5	157.8	289.4	492.5	424.5	400.6	398.3
456.8	372.2	413.1	182.7	350.7	503.9	440.3	424.5	415.4
457.0	431.3	435.8	224.7	454.0	516.4	457.4	446.0	431.3
457.2	481.2	458.5	293.9	557.2	531.1	477.8	473.3	449.4
457.4	541.3	480.1	324.6	627.6	555.0	502.8	499.4	468.1
457.6	597.0	503.9	329.1	675.3	582.2	531.1	527.7	489.1
457.8	645.8	533.4	356.4	715.0	611.7	561.8	562.9	519.2
458.0	692.3	565.2	422.2	746.8	638.9	593.6	607.2	550.4
458.2	733.1	593.6	524.3	778.5	668.5	627.6	653.7	581.6
458.4	766.1	624.2	646.9	803.5	699.1	659.4	693.4	617.4
458.6	791.6	662.8	754.4	820.5	734.3	693.4	729.7	650.3
458.8	814.9	704.8	950.5	845.5	772.9	727.5	771.7	688.9
459.0	852.3	749.0	1117.9	878.4	817.1	785.4	822.8	726.3
459.2	876.1	789.9	1207.5	919.3	862.5	818.3	871.0	761.5
459.4	888.6	821.7	1208.7	951.0	906.2	839.8	913.6	799.0
459.6	890.9	856.8	1171.2	964.1	944.8	861.4	951.0	834.2
459.8	909.1	890.9	1134.9	984.0	981.7	892.0	987.4	868.2
460.0	951.0	922.7	1149.7	1023.7	1018.0	924.9	1021.4	900.0
460.2	995.3		1196.2	1071.3	1052.1	955.6	1055.5	930.6
460.4				1102.0	1085.0	989.6	1088.4	961.8
460.6				1133.8	1119.0	1025.9		991.9
460.8				1164.4	1153.1	1064.5		1021.4
461.0					1188.2			
461.2					1224.6			
461.4								

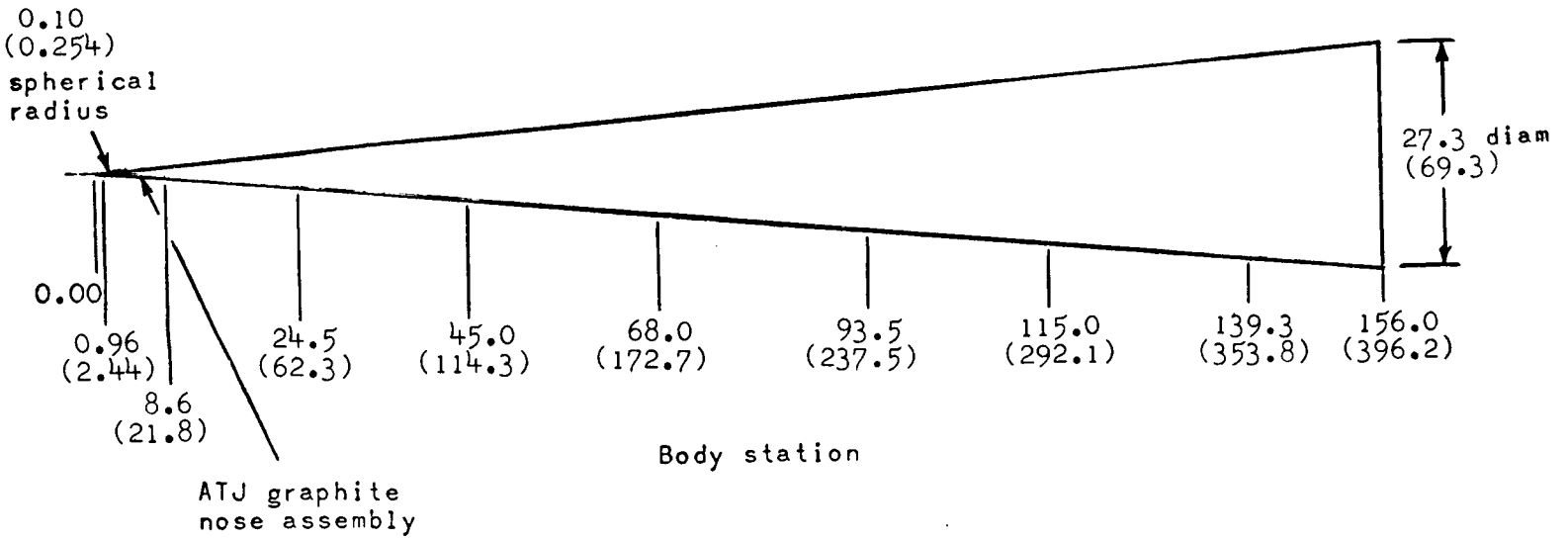


Figure 1.- Configuration of spacecraft with joint locations noted. All dimensions in inches (centimeters).

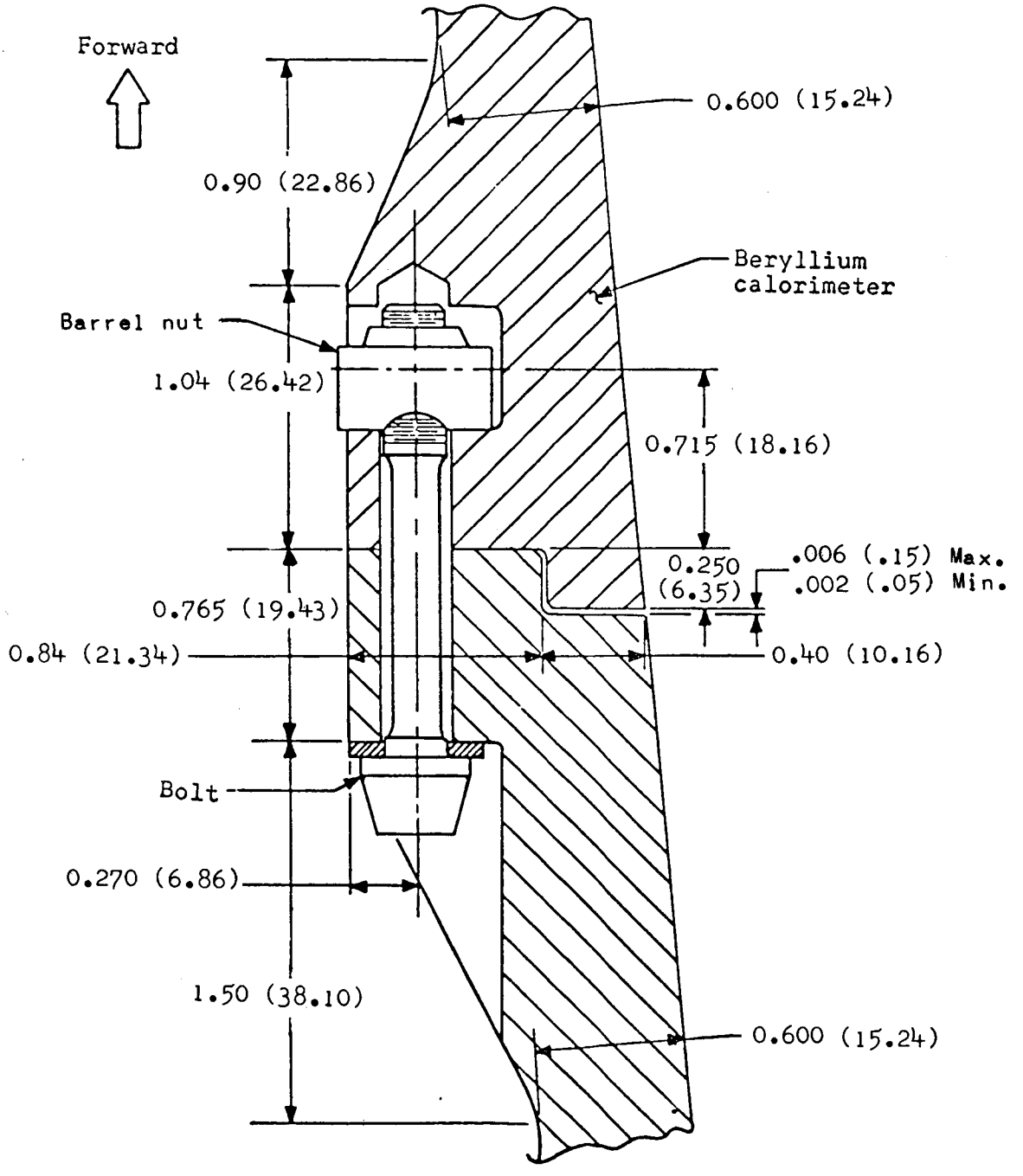


Figure 2.- Typical calorimeter bolted joint. All dimensions in inches (millimeters).

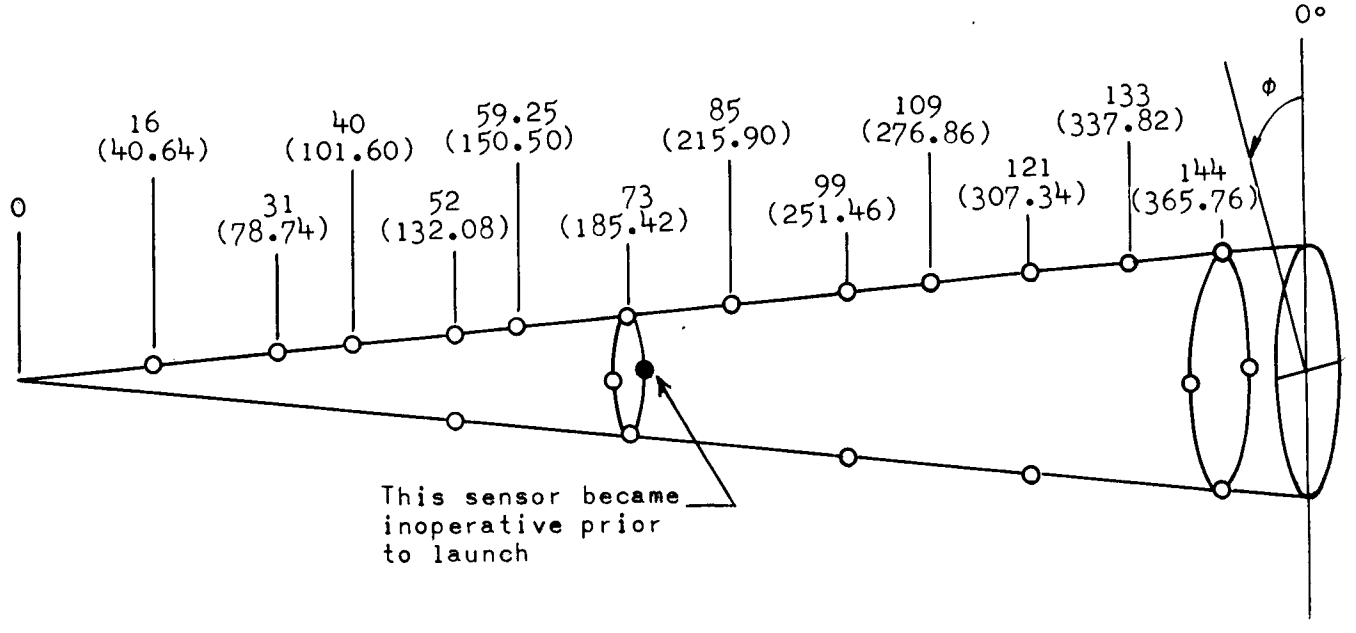


Figure 3.- Test configuration and location of temperature measurement stations in inches (centimeters).

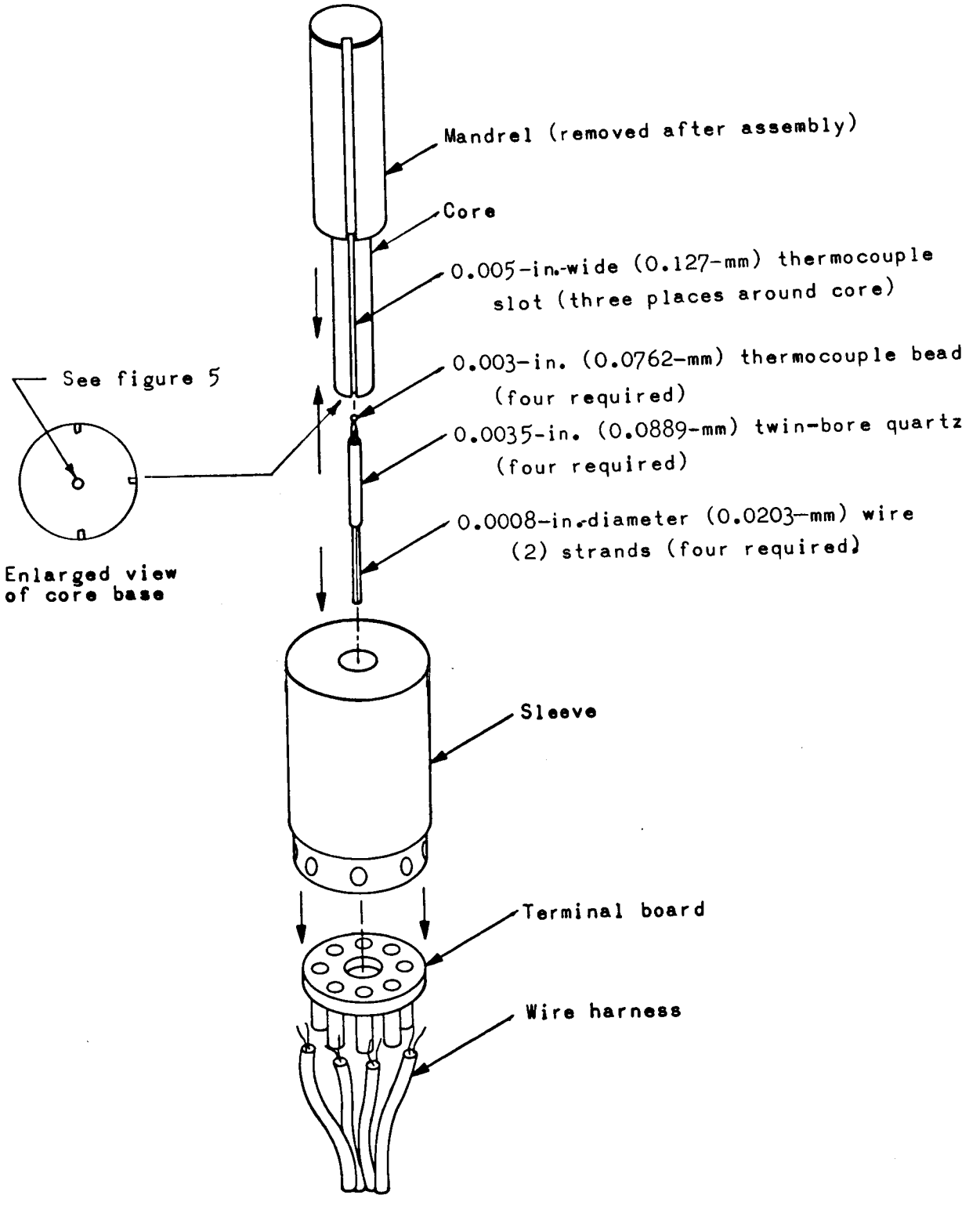


Figure 4.- Exploded view of thermal-sensor assembly.

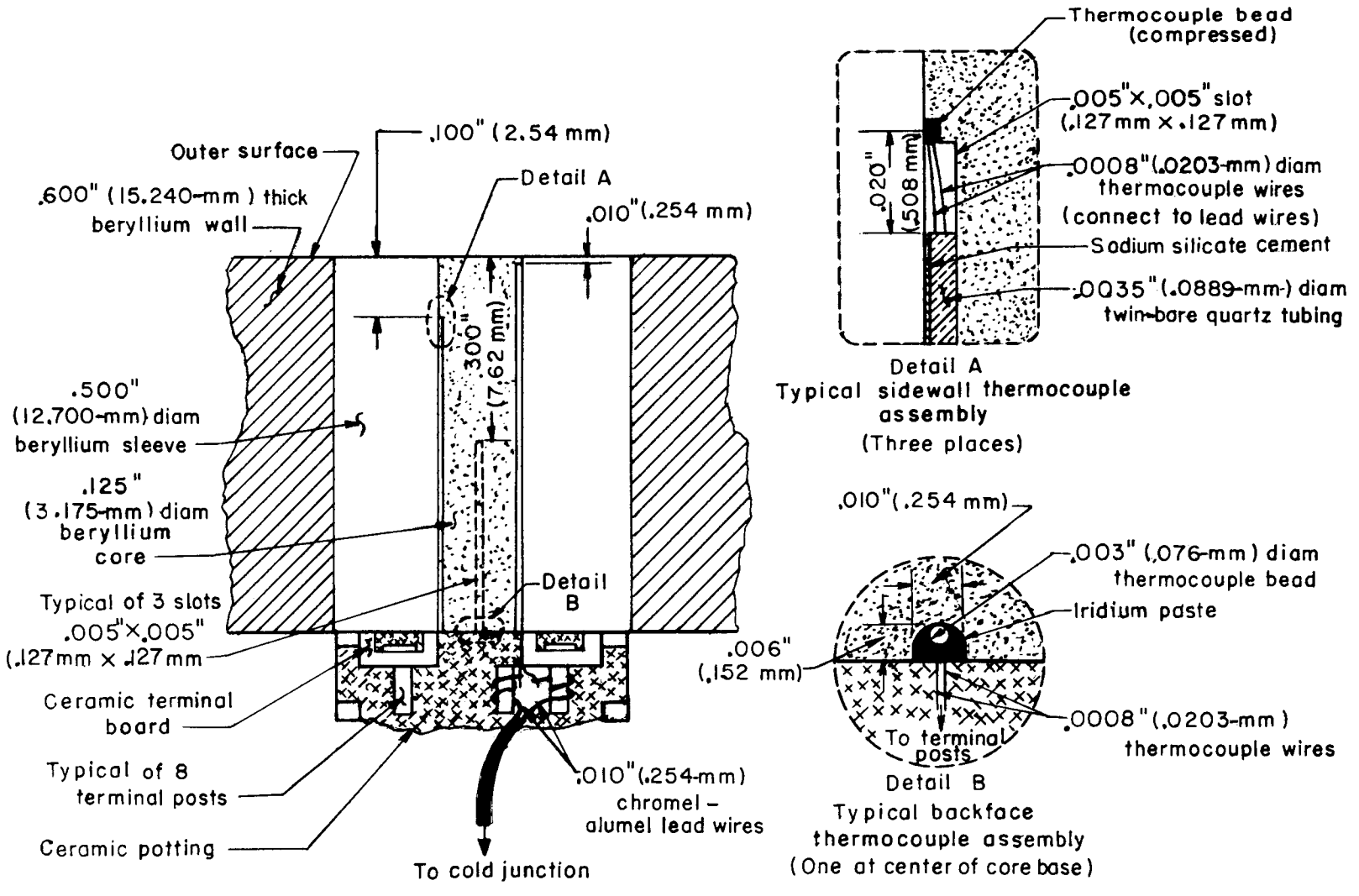


Figure 5.- Typical thermal-sensor installation.

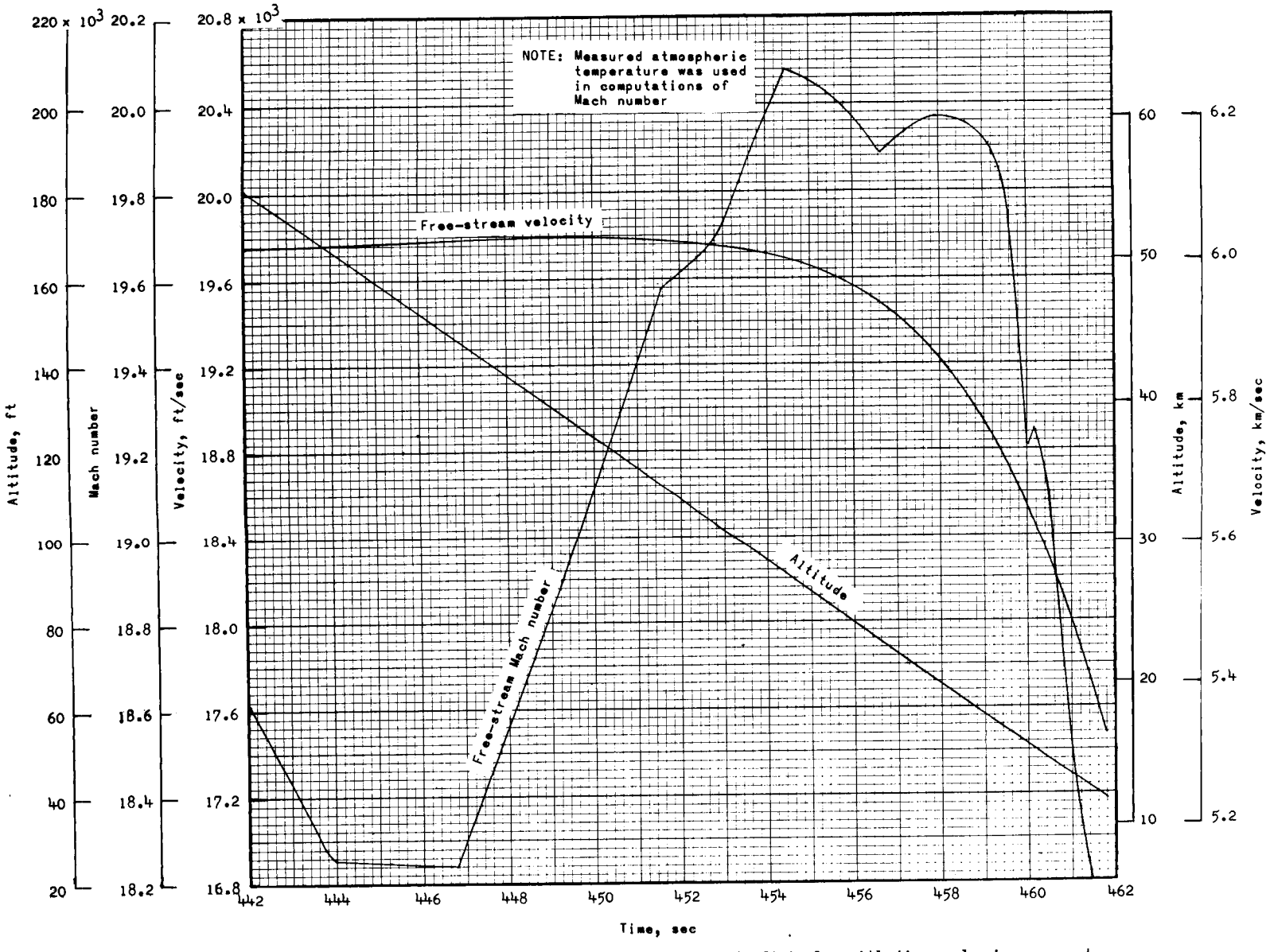
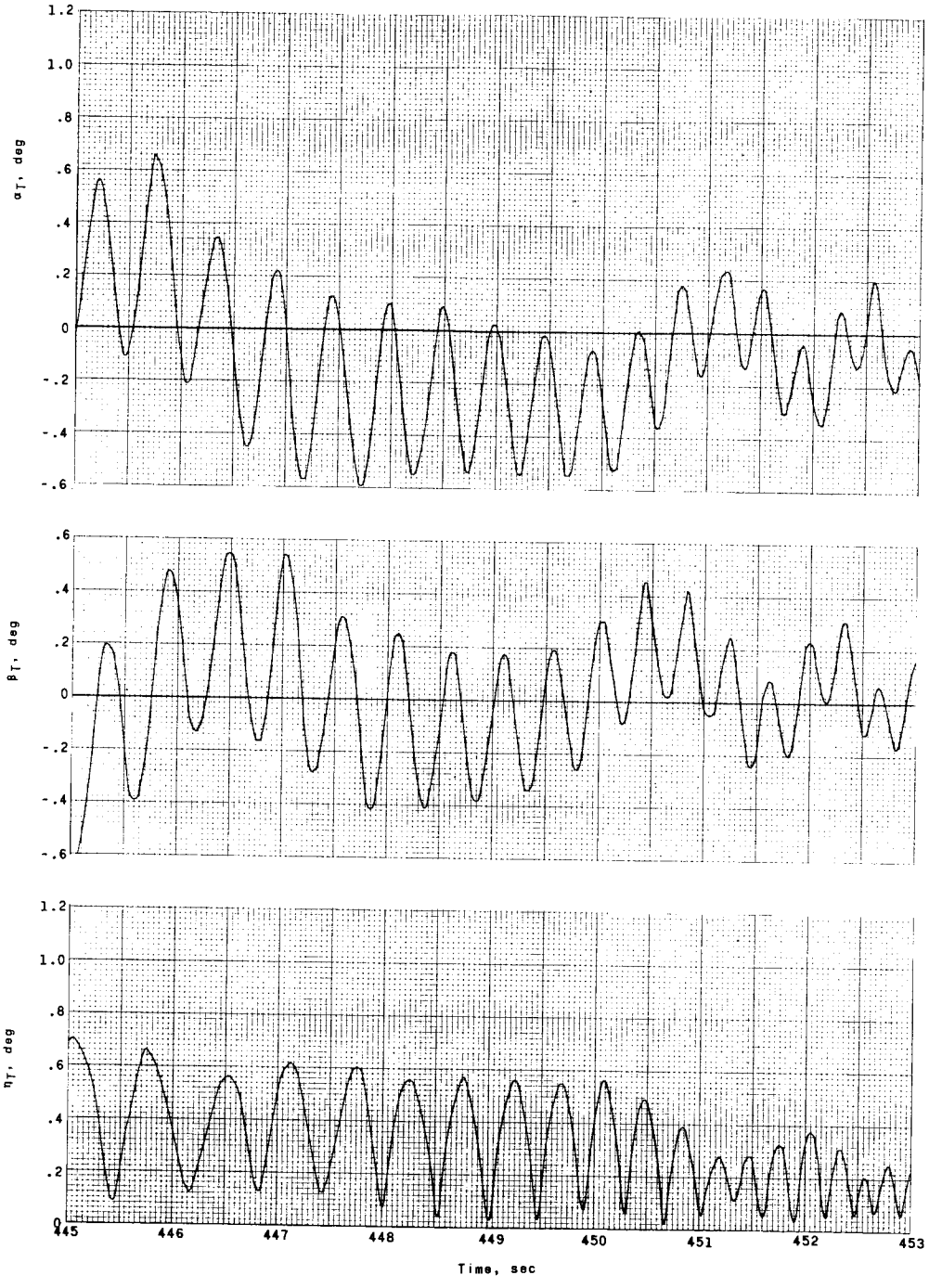
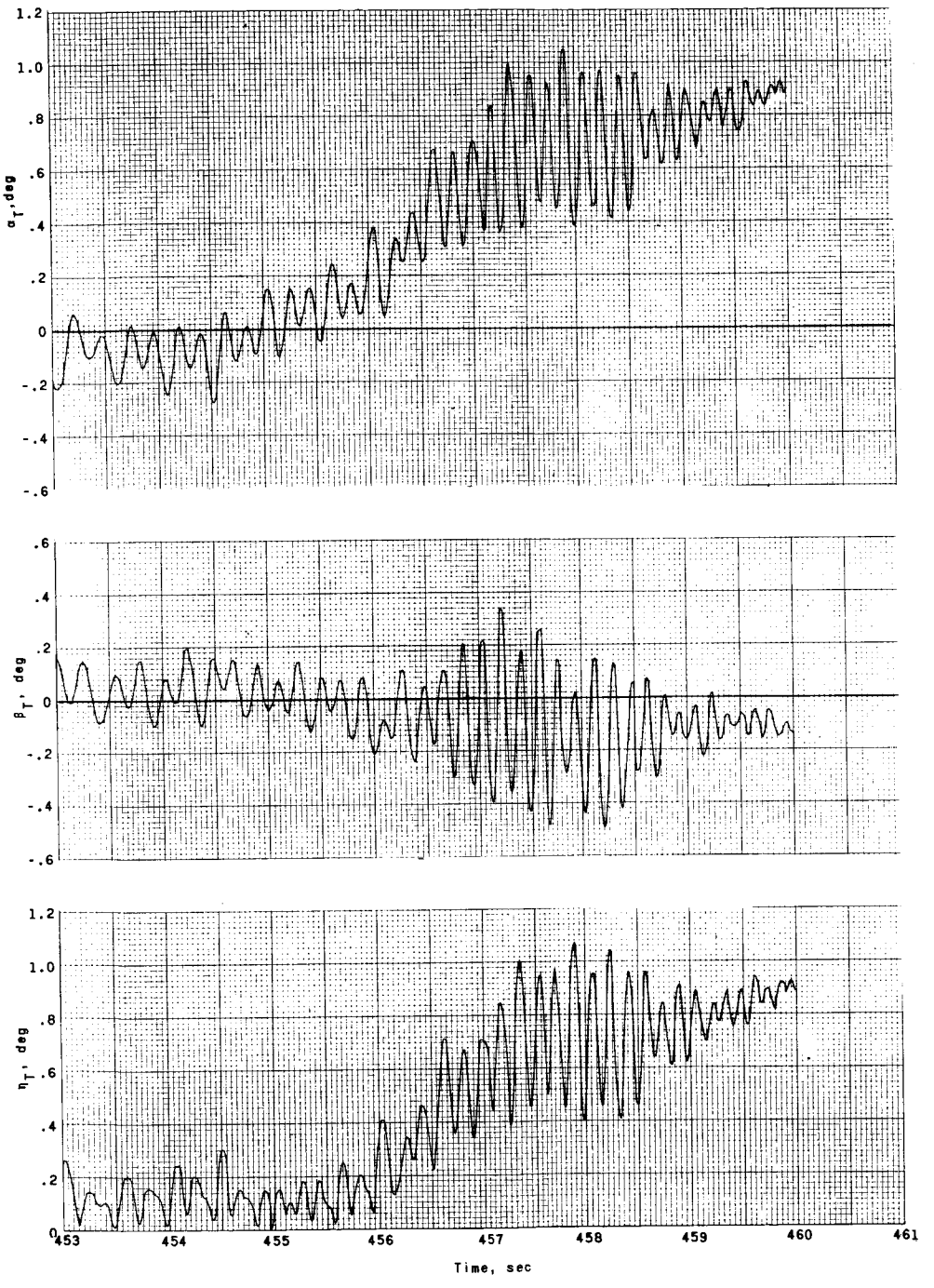


Figure 6.- Variation of Mach number, velocity, and altitude with time during reentry.



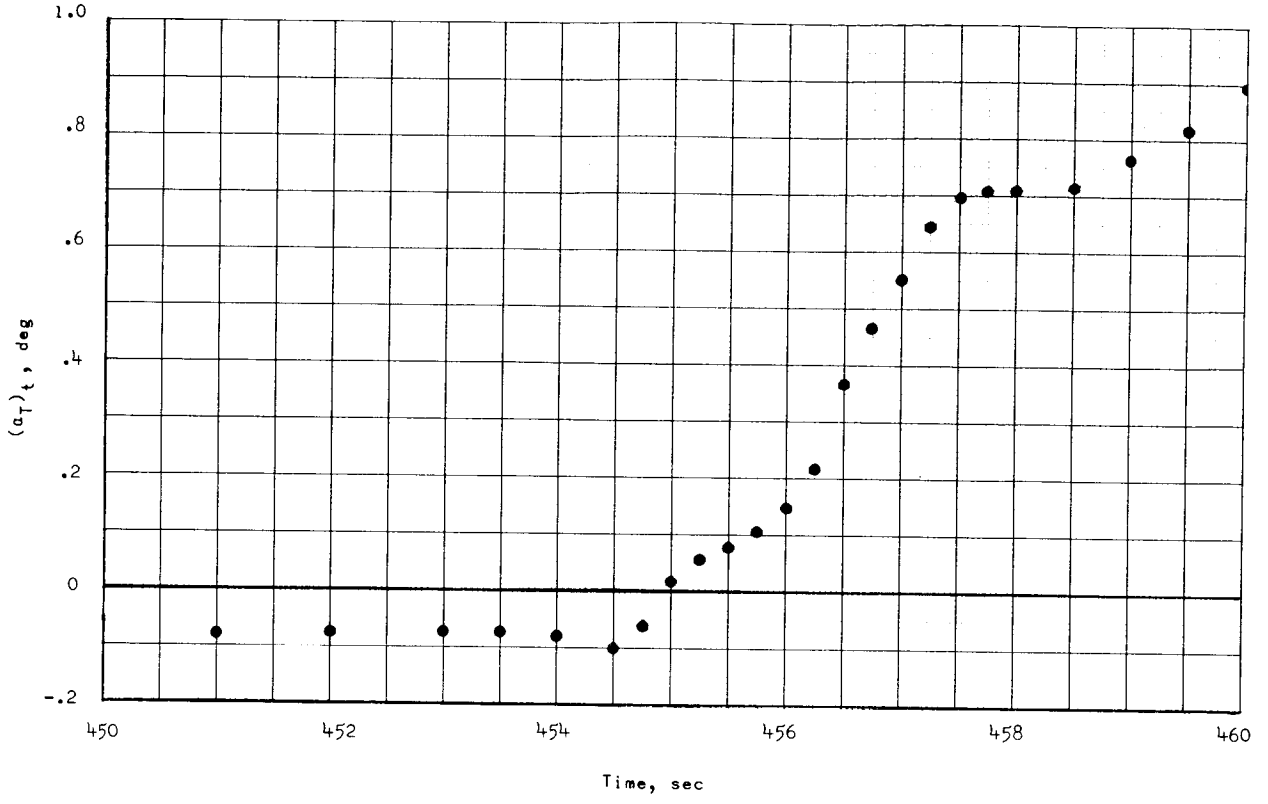
(a) Time = 445 to 453 seconds.

Figure 7.- Angle of attack, angle of sideslip, and total angle of attack as a function of time.

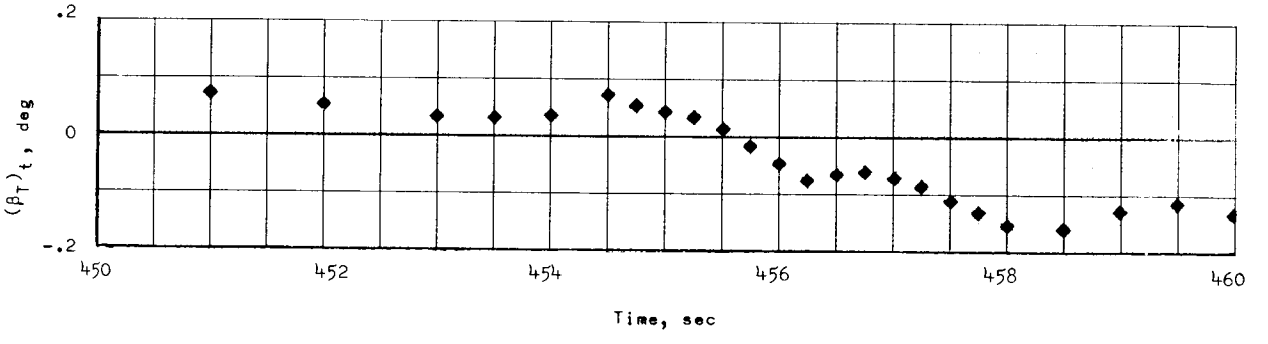


(b) Time = 453 to 461 seconds.

Figure 7.- Concluded.



(a) $(\alpha_T)_t$ as a function of time.



(b) $(\beta_T)_t$ as a function of time.

Figure 8.- Computed trim values.

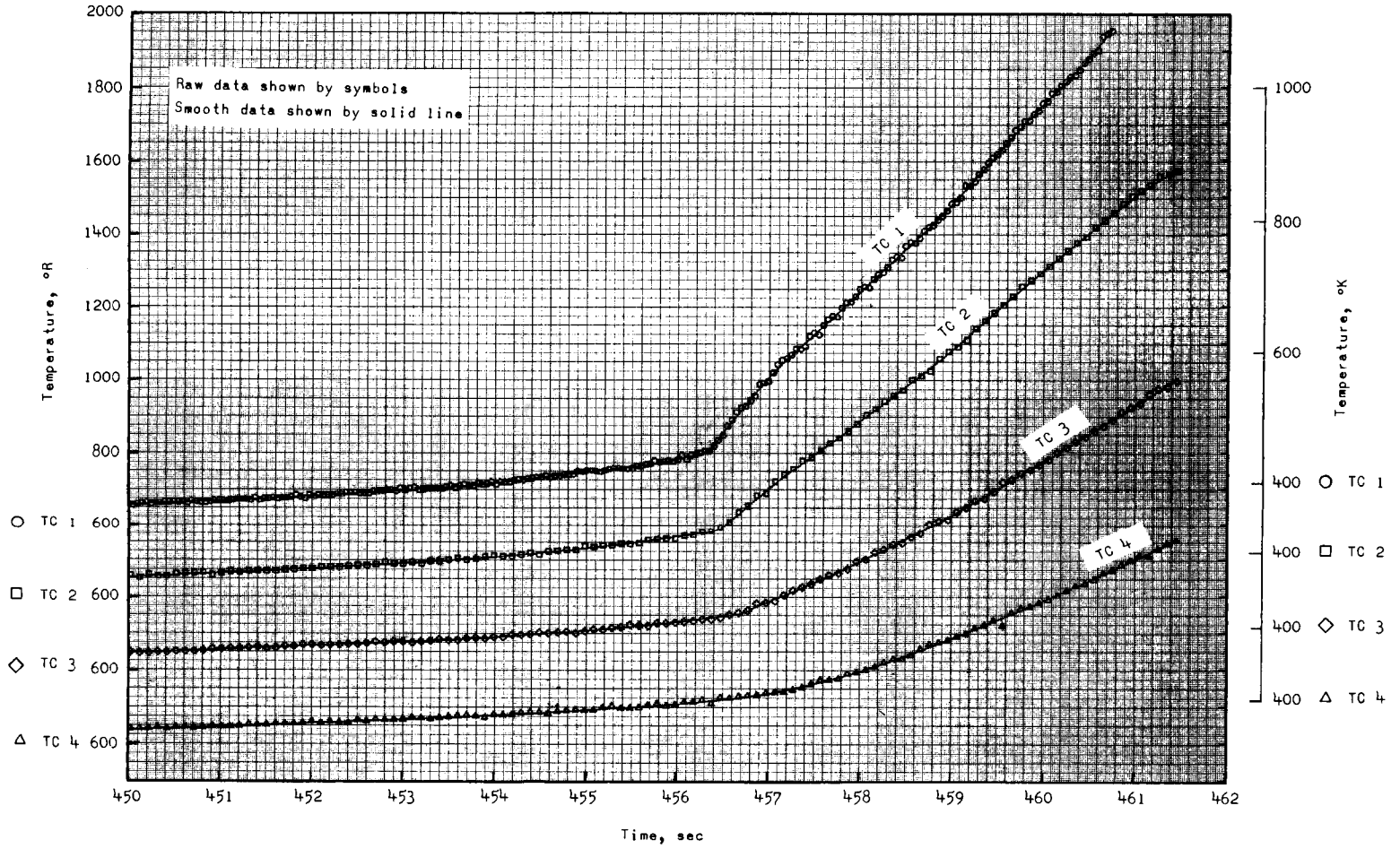
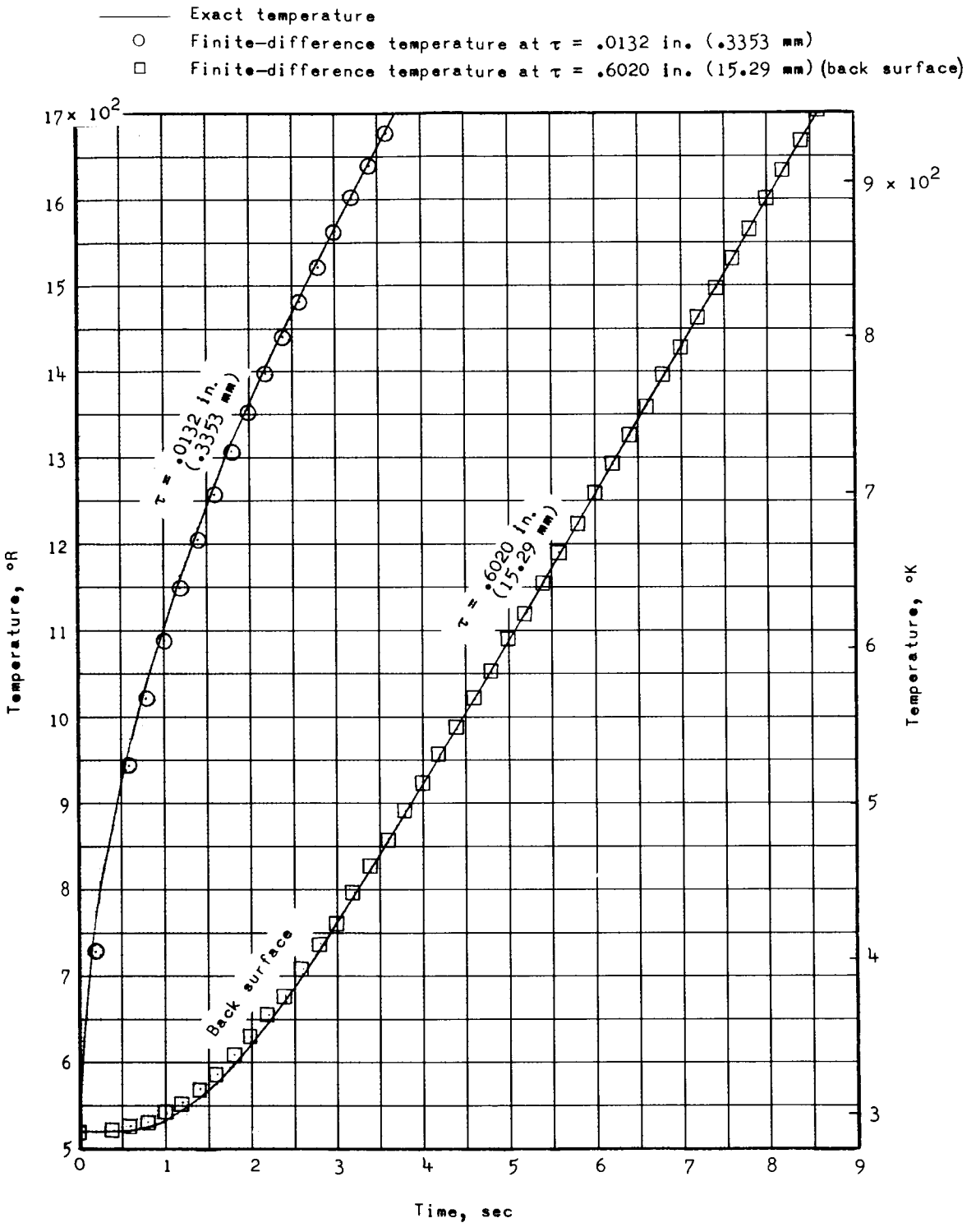
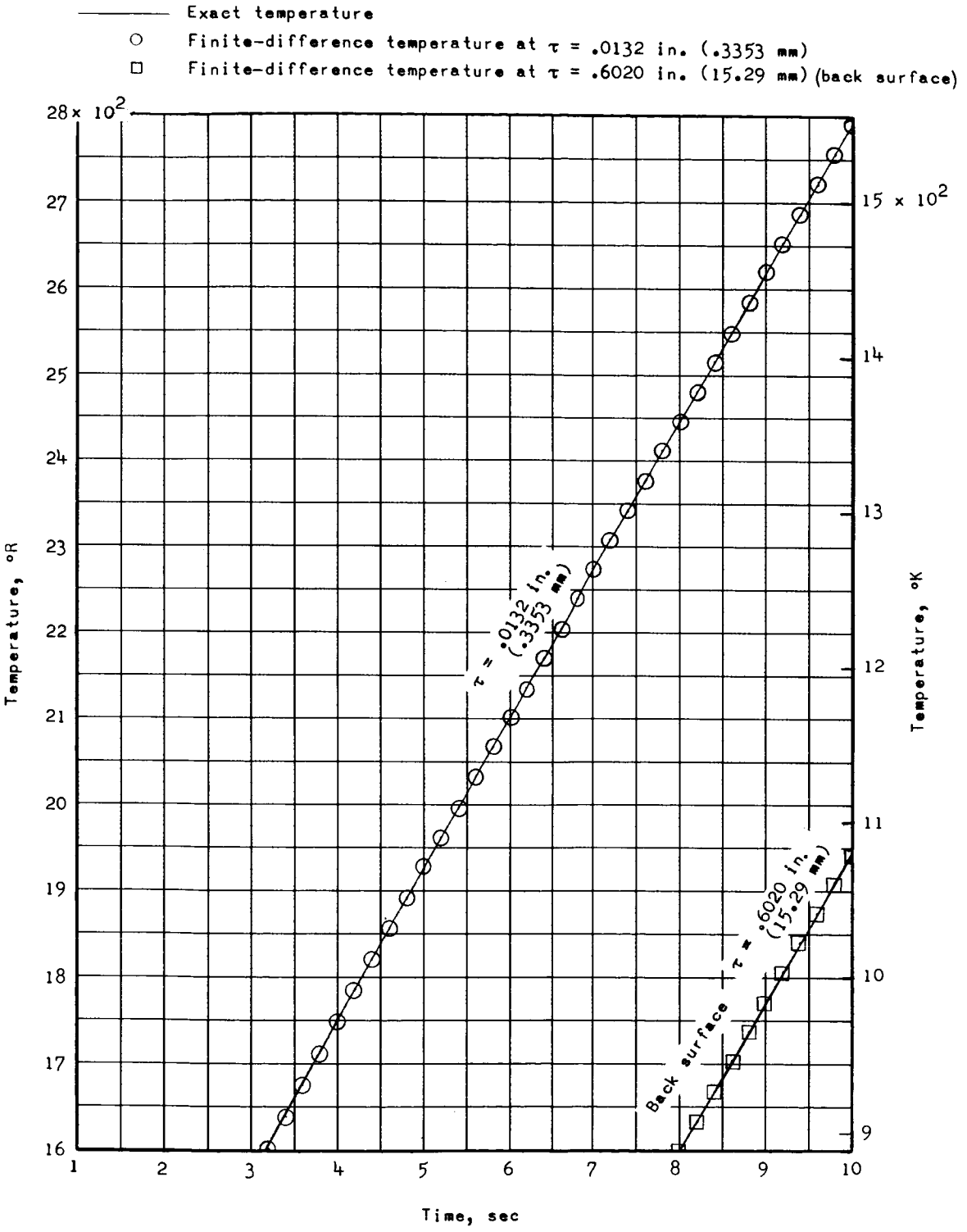


Figure 9.- Reduced example of typical CalComp plots of temperature as a function of time. Station 251.46 cm (99 in.); ray 0^{o}.



(a) Low temperature range.

Figure 10.- Temperatures calculated by finite-difference solution in comparison with exact solution for a constant input heat flux of 680.94 W/cm^2 (600 Btu/ft^2-sec); τ_t = 15.29 mm (0.6020 in.).



(b) High temperature range.

Figure 10.- Concluded.

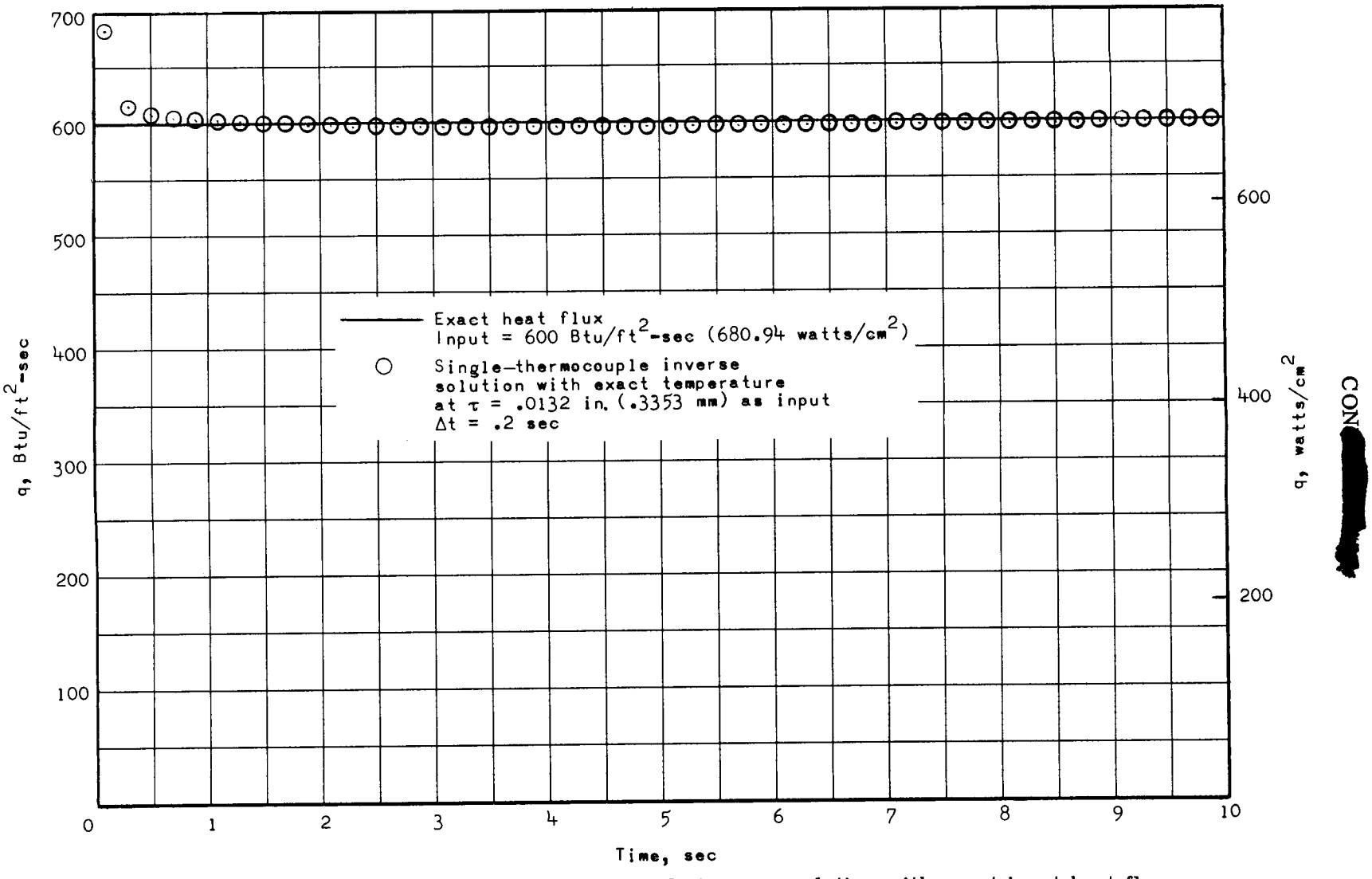


Figure 11.- Comparison of single-thermocouple inverse solution with exact input heat flux. τ_t = 15.29 mm (0.6020 in.).

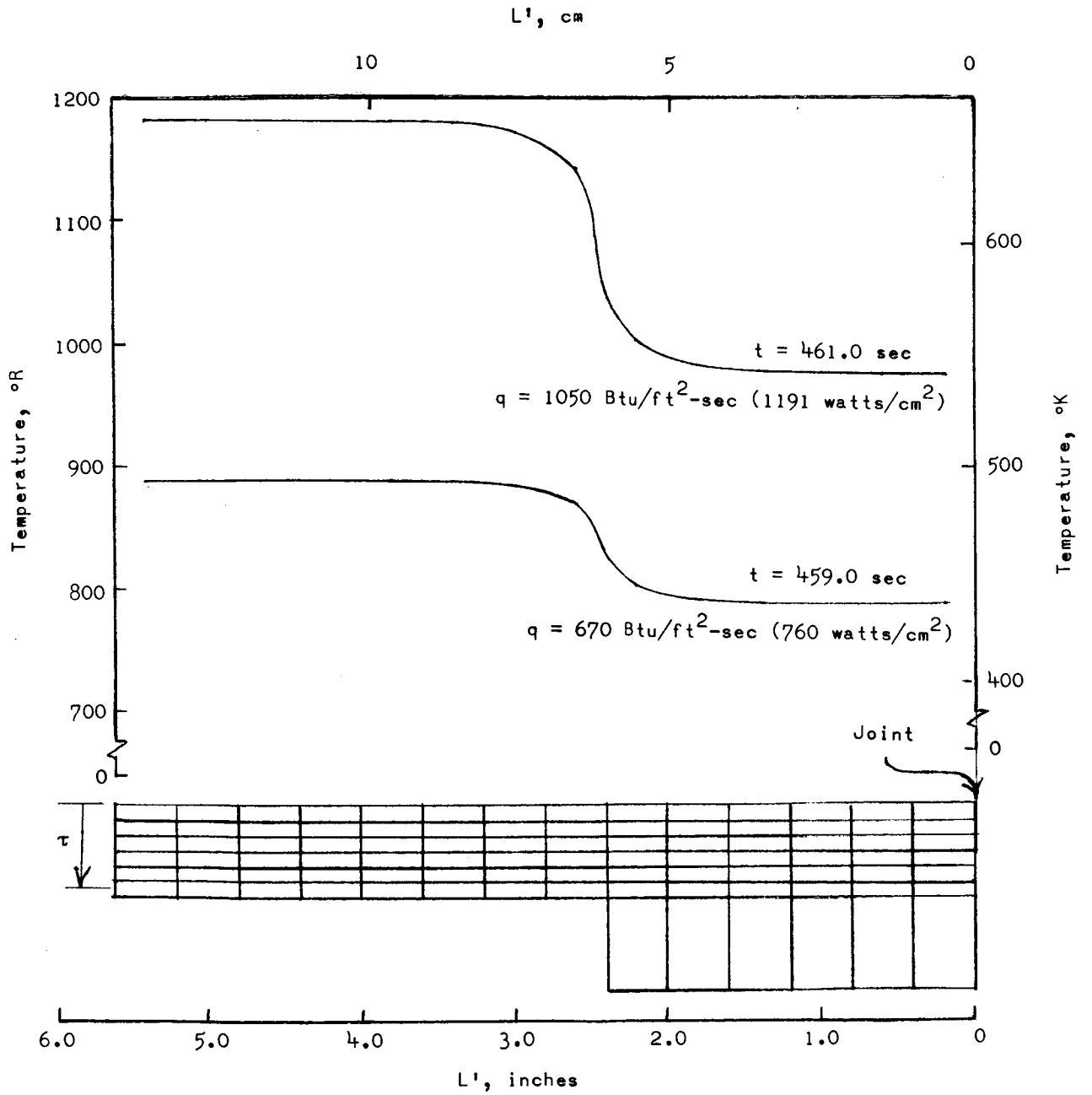


Figure 12.- Thermal model for computations in the region of the mechanical joints and temperature distributions at a depth τ of 13.97 mm (0.55 in.) for two times during the reentry.

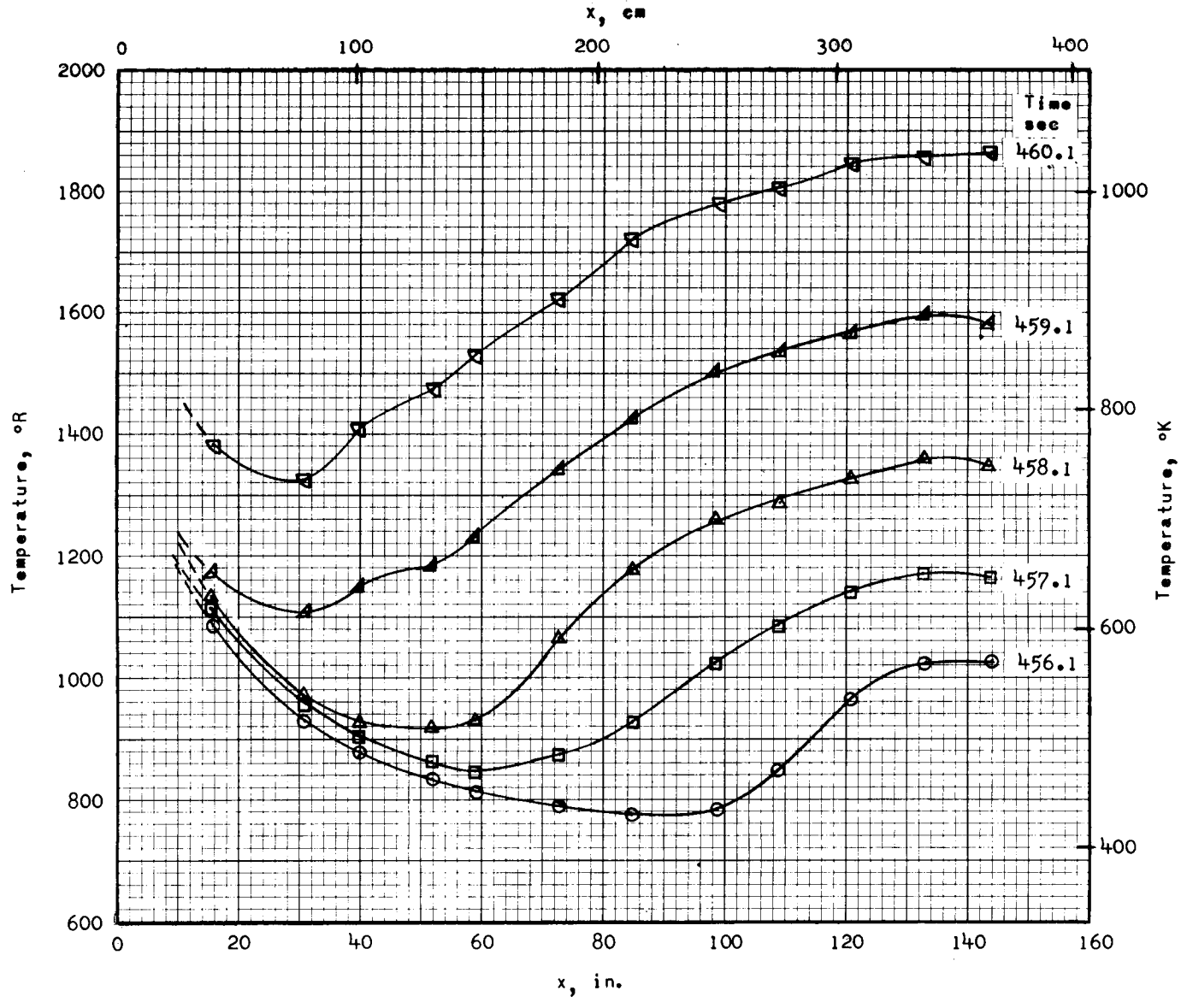


Figure 13.- Variation of temperature with distance along body at TC 1 depth.

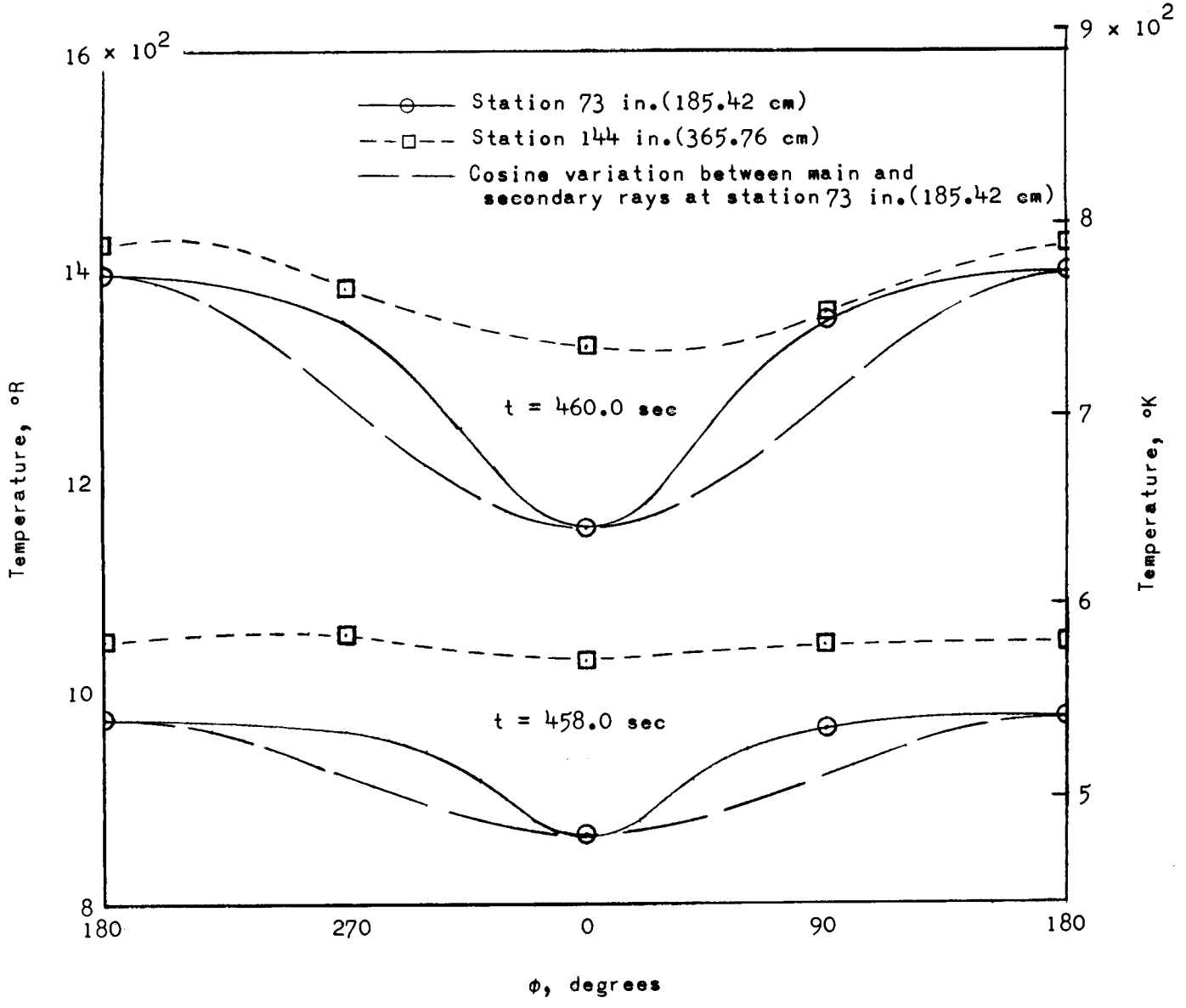
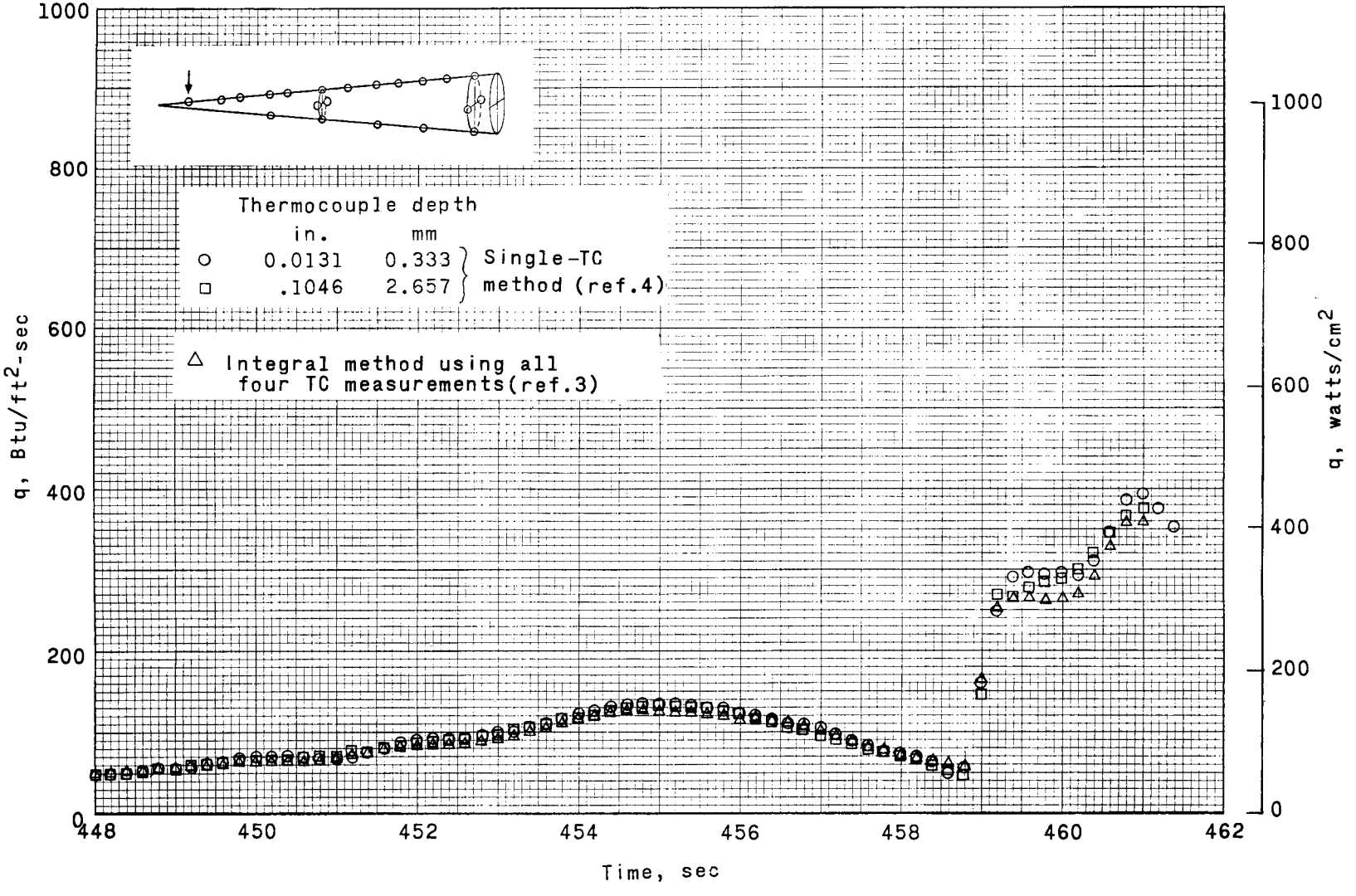
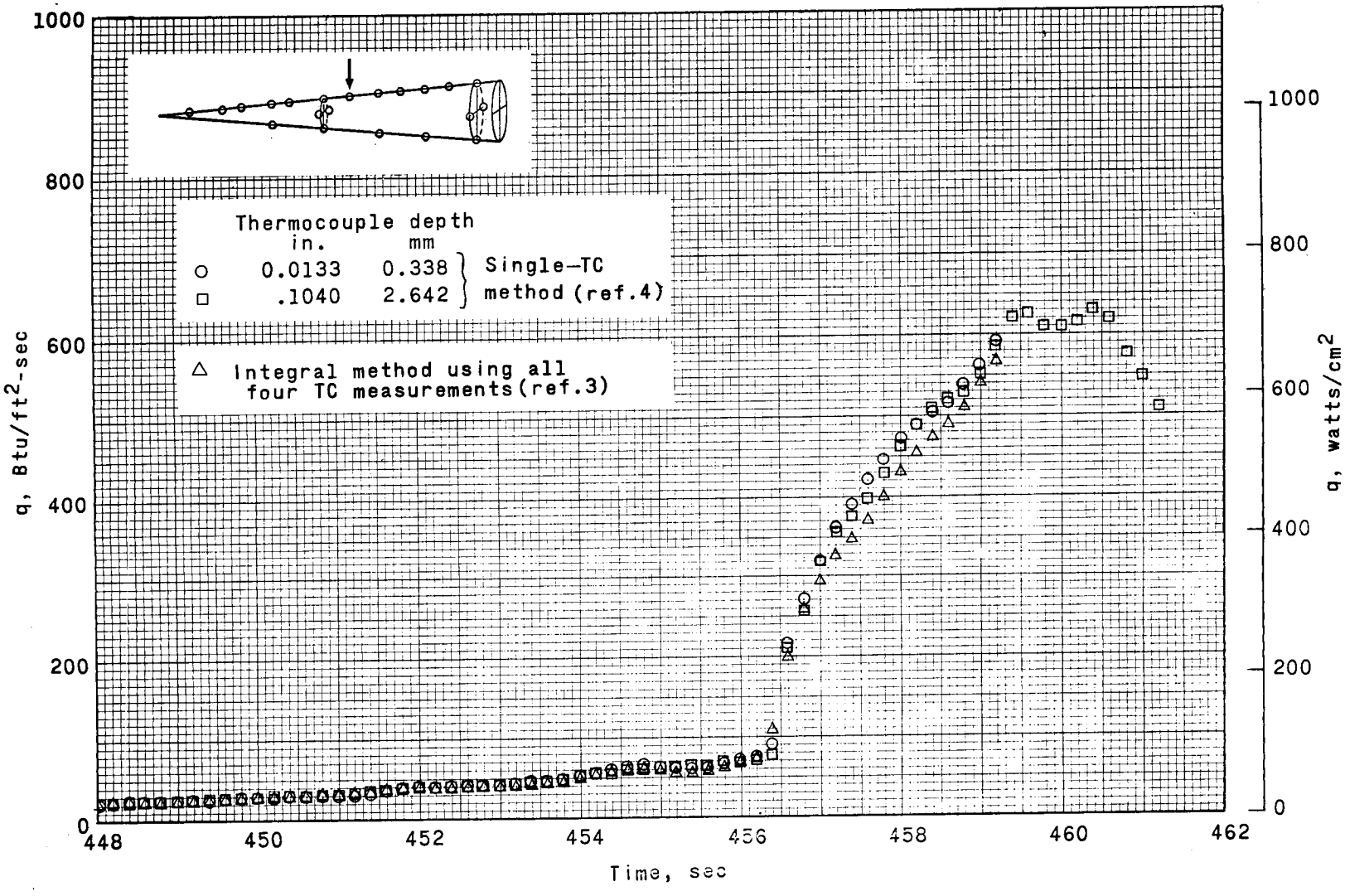


Figure 14.- Circumferential distribution of mean temperature at stations 185.42 cm (73 in.) and 365.76 cm (144 in.).



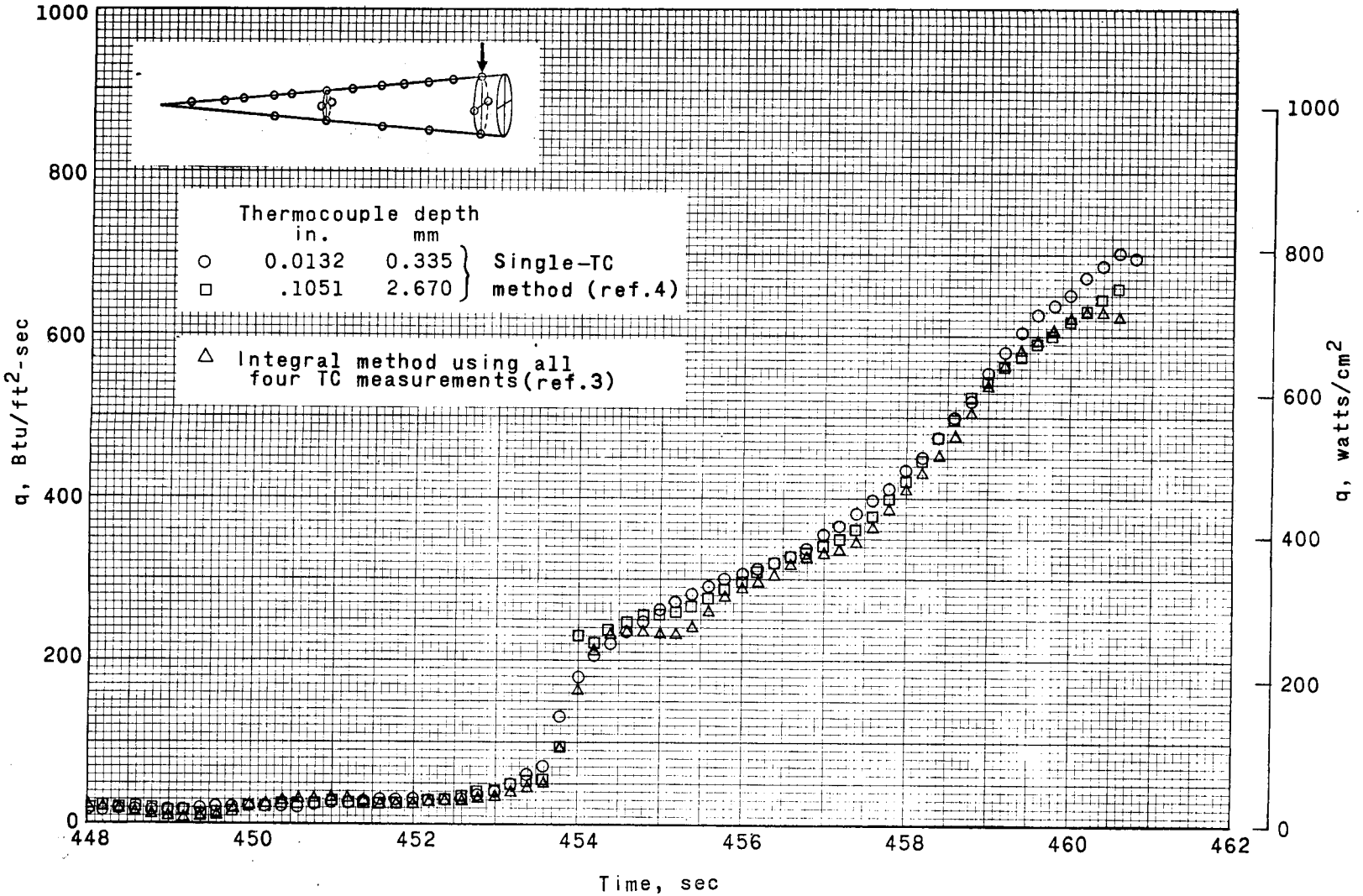
(a) Station 40.64 cm (16 in.); ray 0°.

Figure 15.- Comparison of heating rates determined by the single-thermocouple method from measurements at thermocouples 1 and 2 and by the integral method from measurements at all four thermocouples.



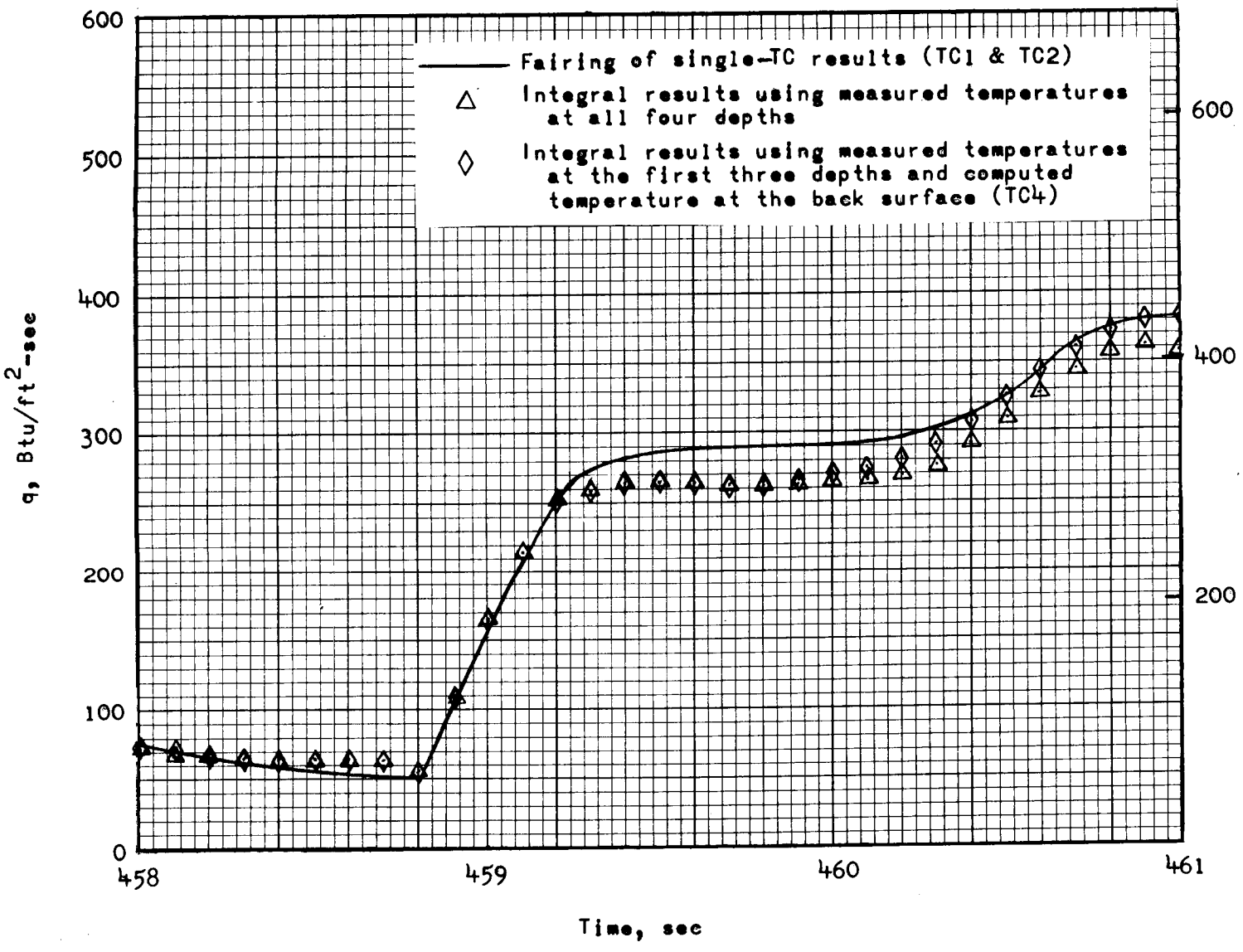
(b) Station 215.90 cm (85 in.); ray 0°.

Figure 15.- Continued.



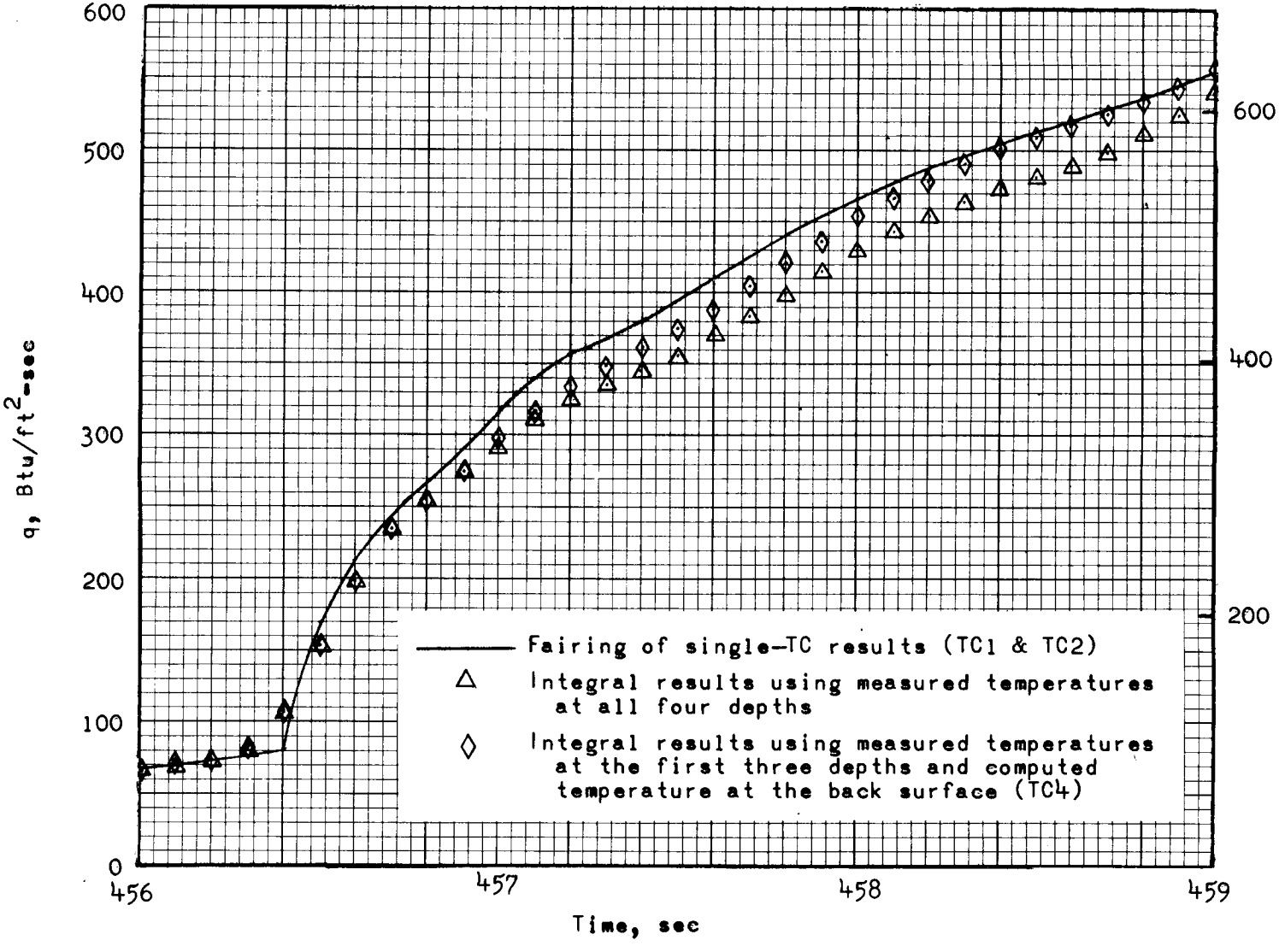
(c) Station 365.76 cm (144 in.); ray 0°.

Figure 15.- Concluded.



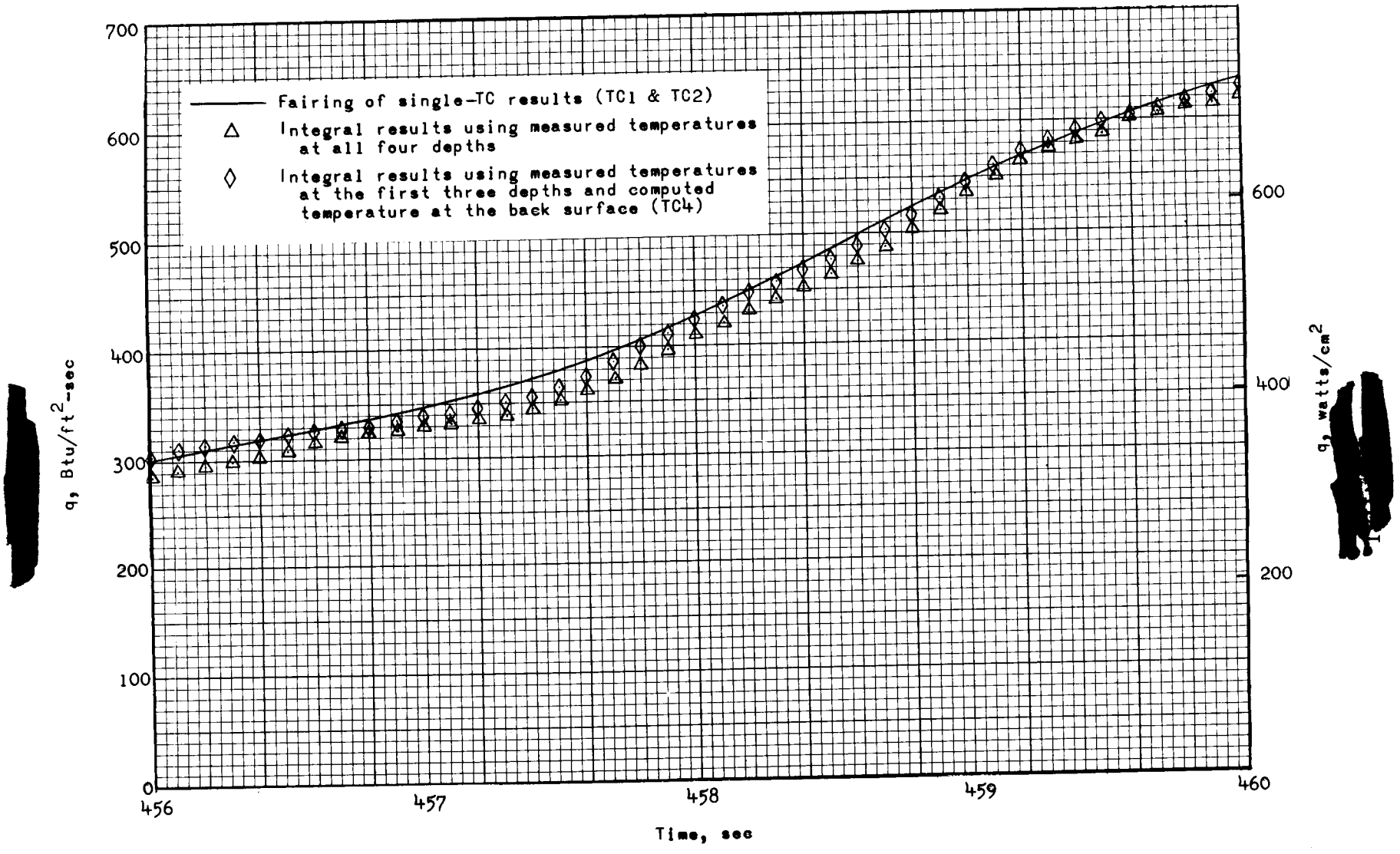
(a) Station 40.64 cm (16 in.).

Figure 16.- Effect of modified back-surface temperature on heating results by integral method.



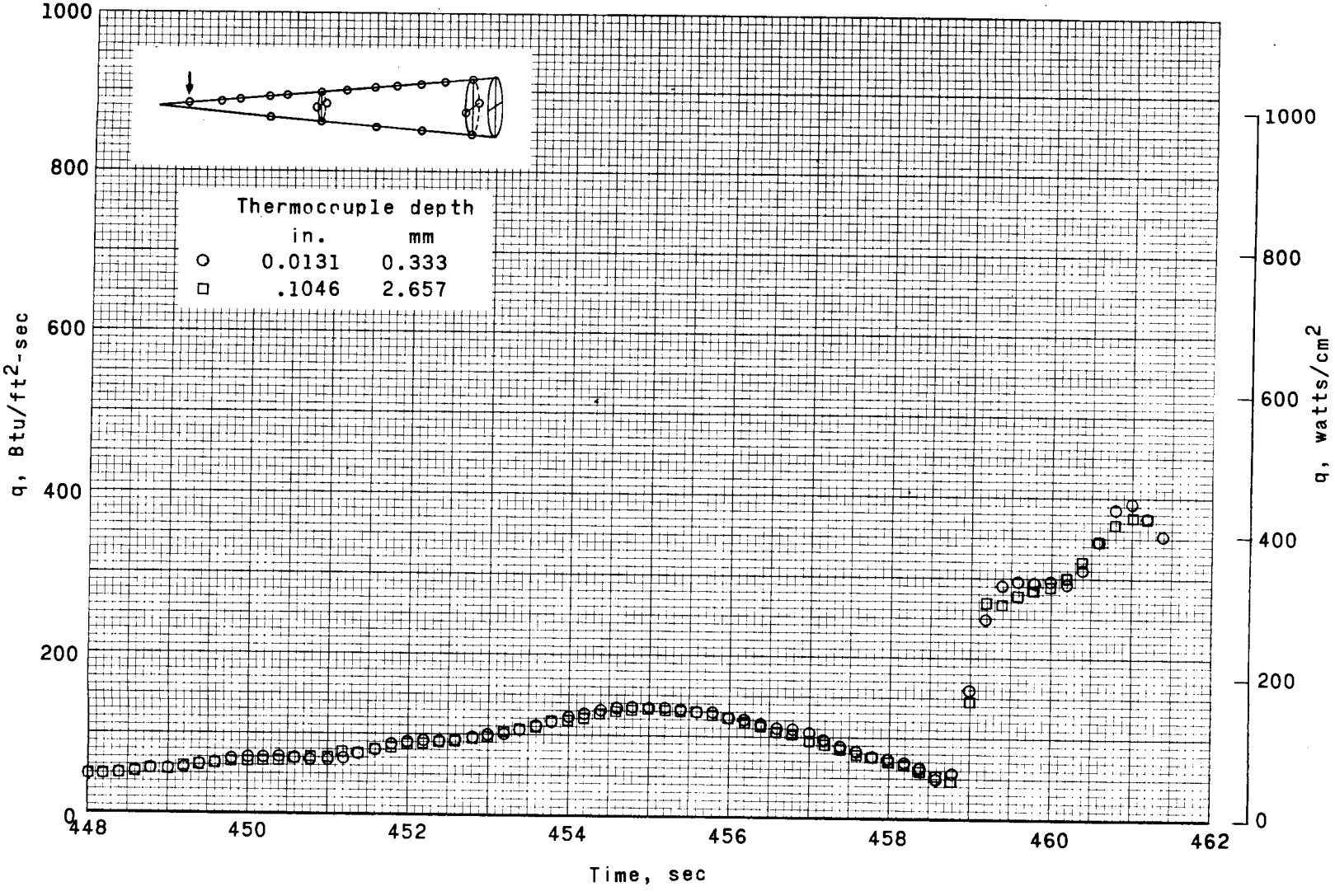
(b) Station 215.90 cm (85 in.).

Figure 16.- Continued.



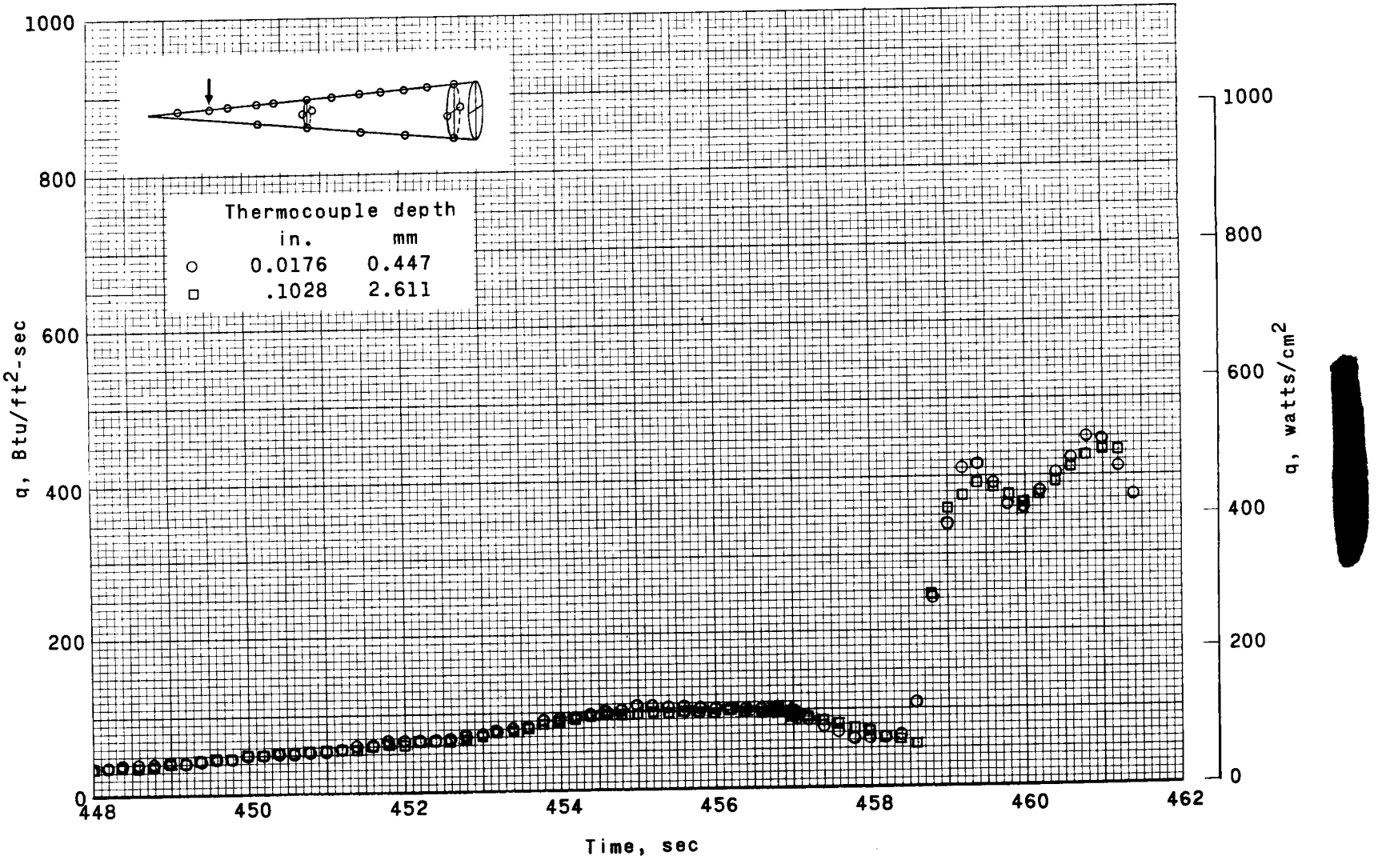
(c) Station 365.76 cm (144 in.).

Figure 16.- Concluded.



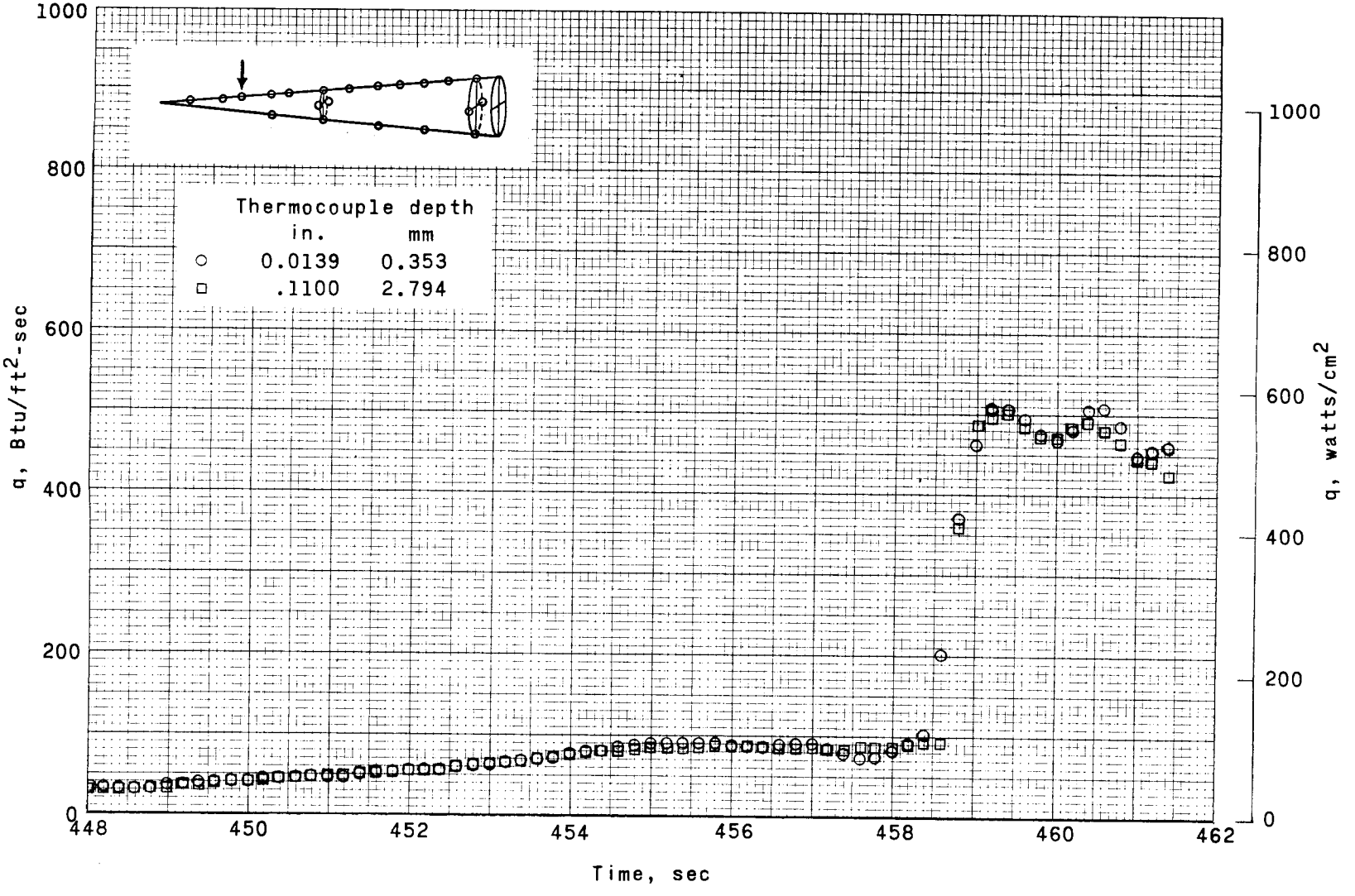
(a) Station 40.64 cm (16 in.); ray 0°.

Figure 17.- Heating-rate histories for the 20 thermal-sensor locations.



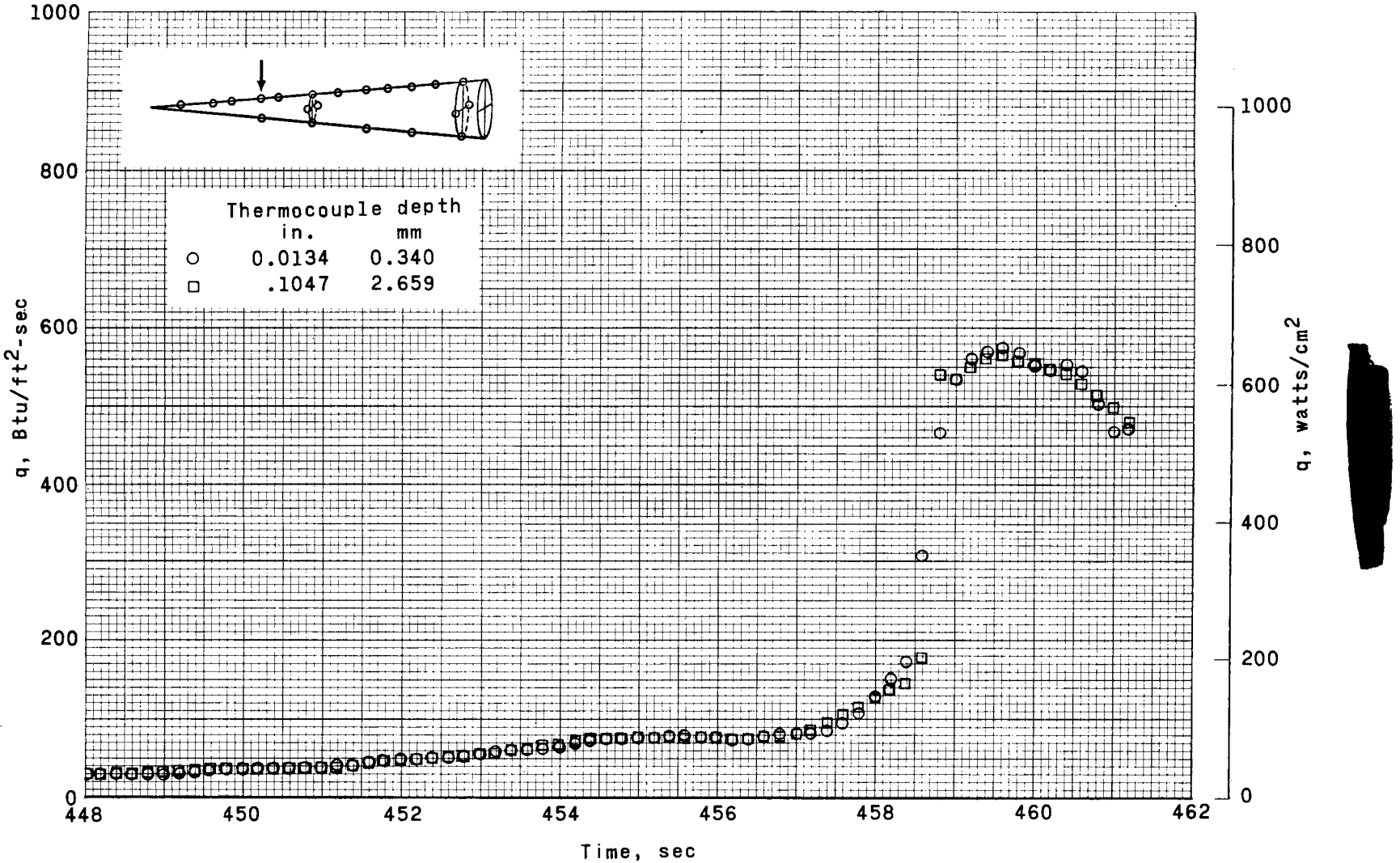
(b) Station 78.74 cm (31 in.); ray 0°.

Figure 17.- Continued.



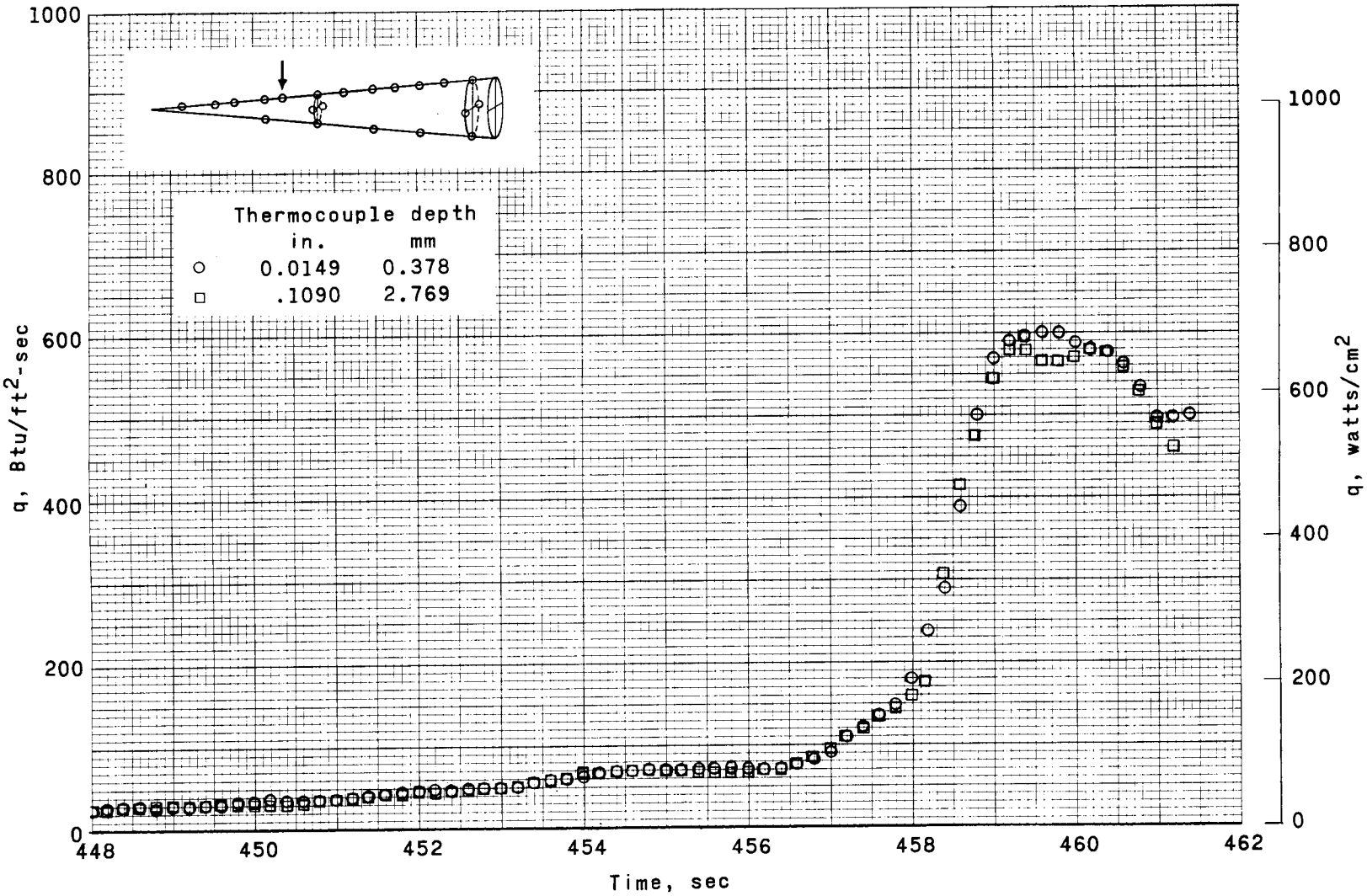
(c) Station 101.60 cm (40 in.); ray 0°.

Figure 17.- Continued.



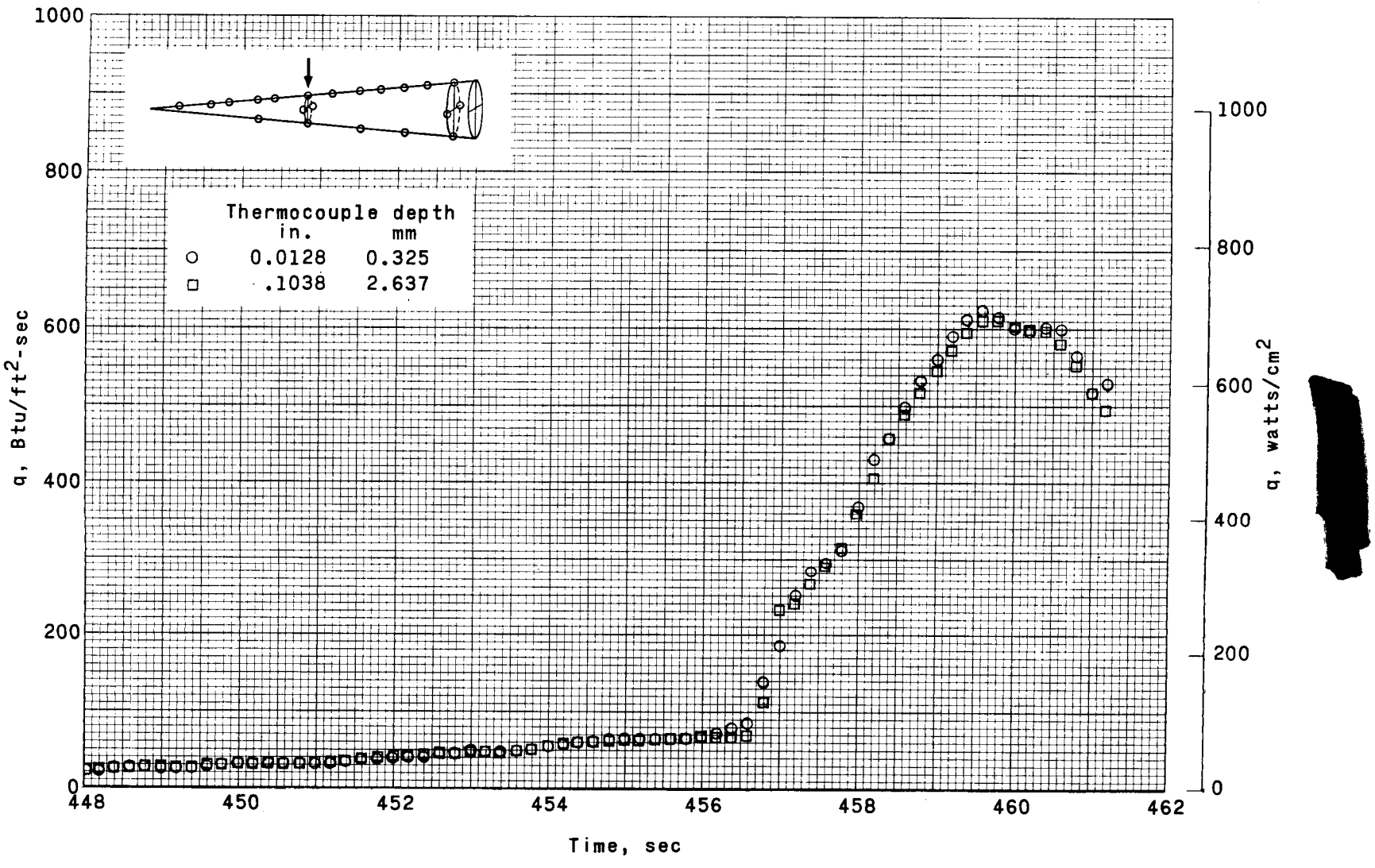
(d) Station 132.08 cm (52 in.); ray 0^{o}.

Figure 17.- Continued.



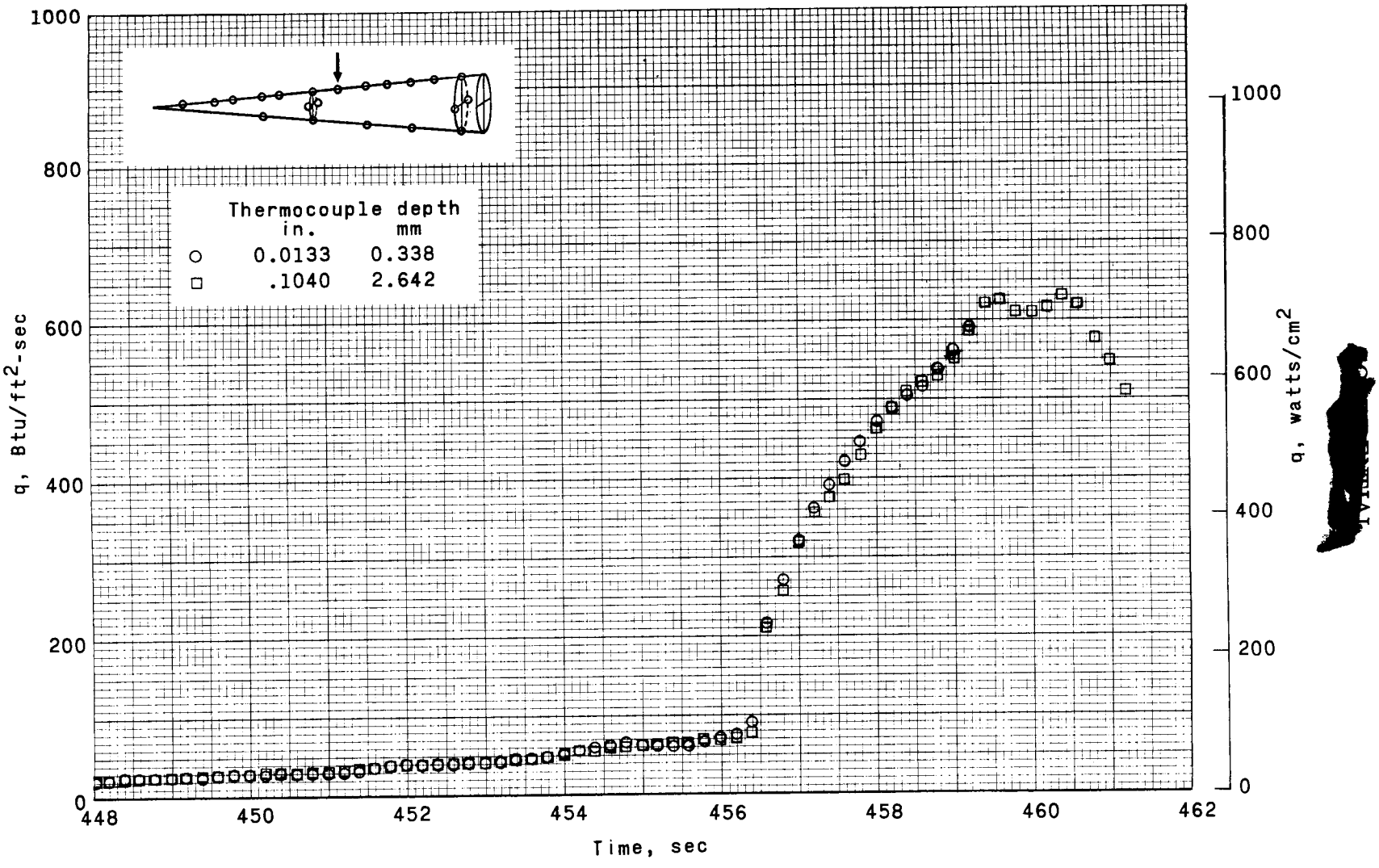
(e) Station 150.50 cm (59.25 in.); ray 0°.

Figure 17.- Continued.



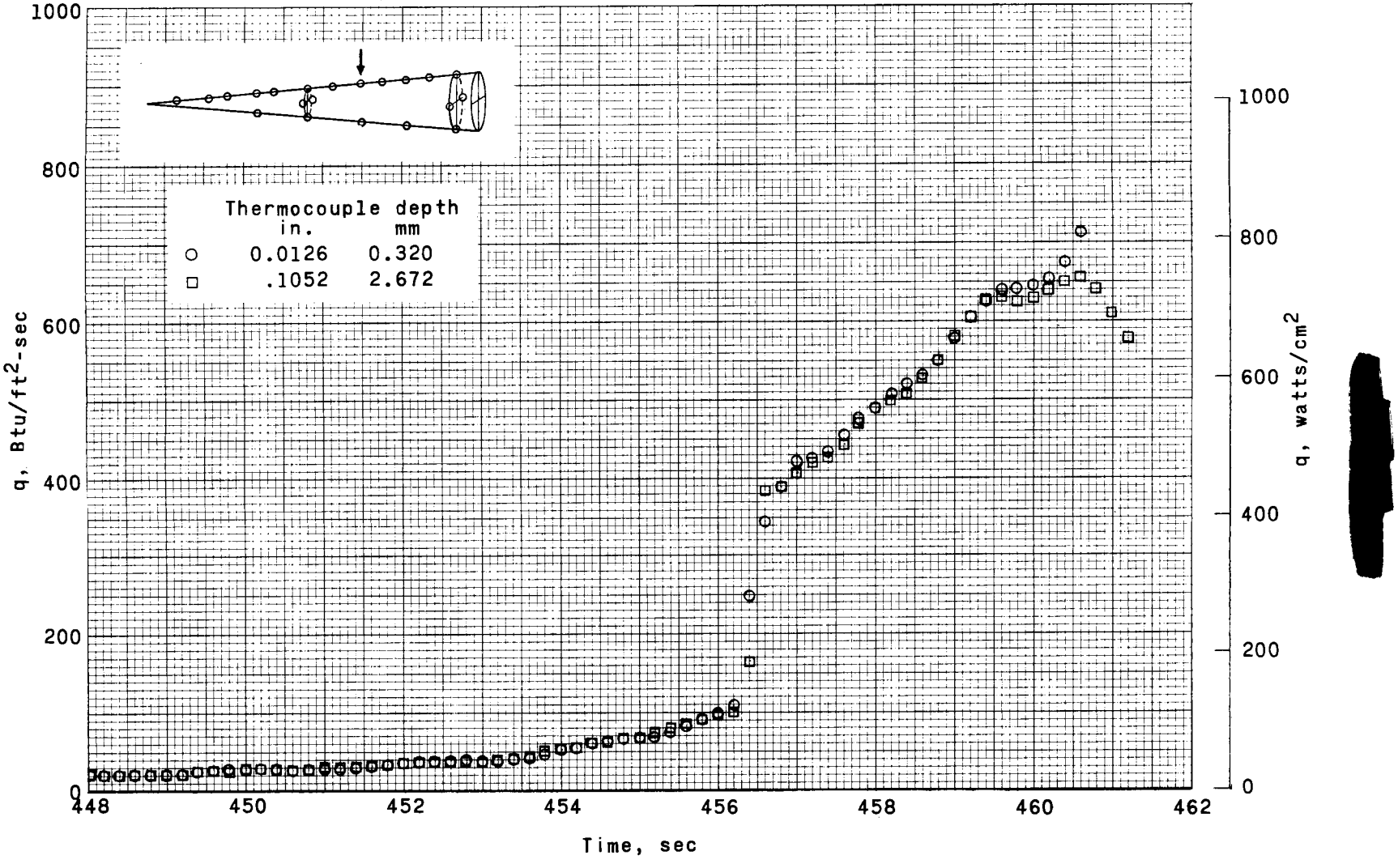
(f) Station 185.42 cm (73 in.); ray 0°.

Figure 17.- Continued.



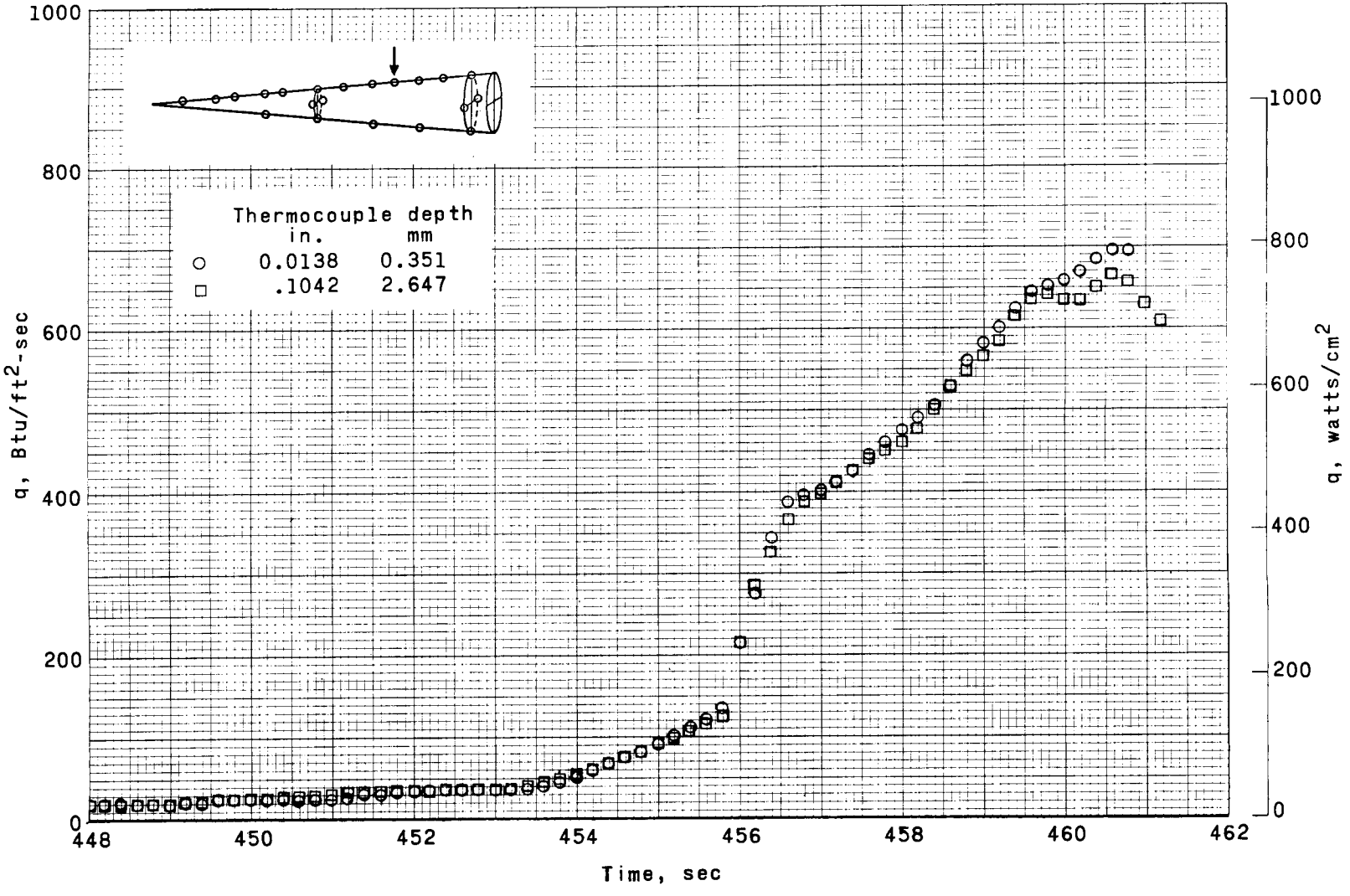
(g) Station 215.90 cm (85 in.); ray 0°.

Figure 17.- Continued.



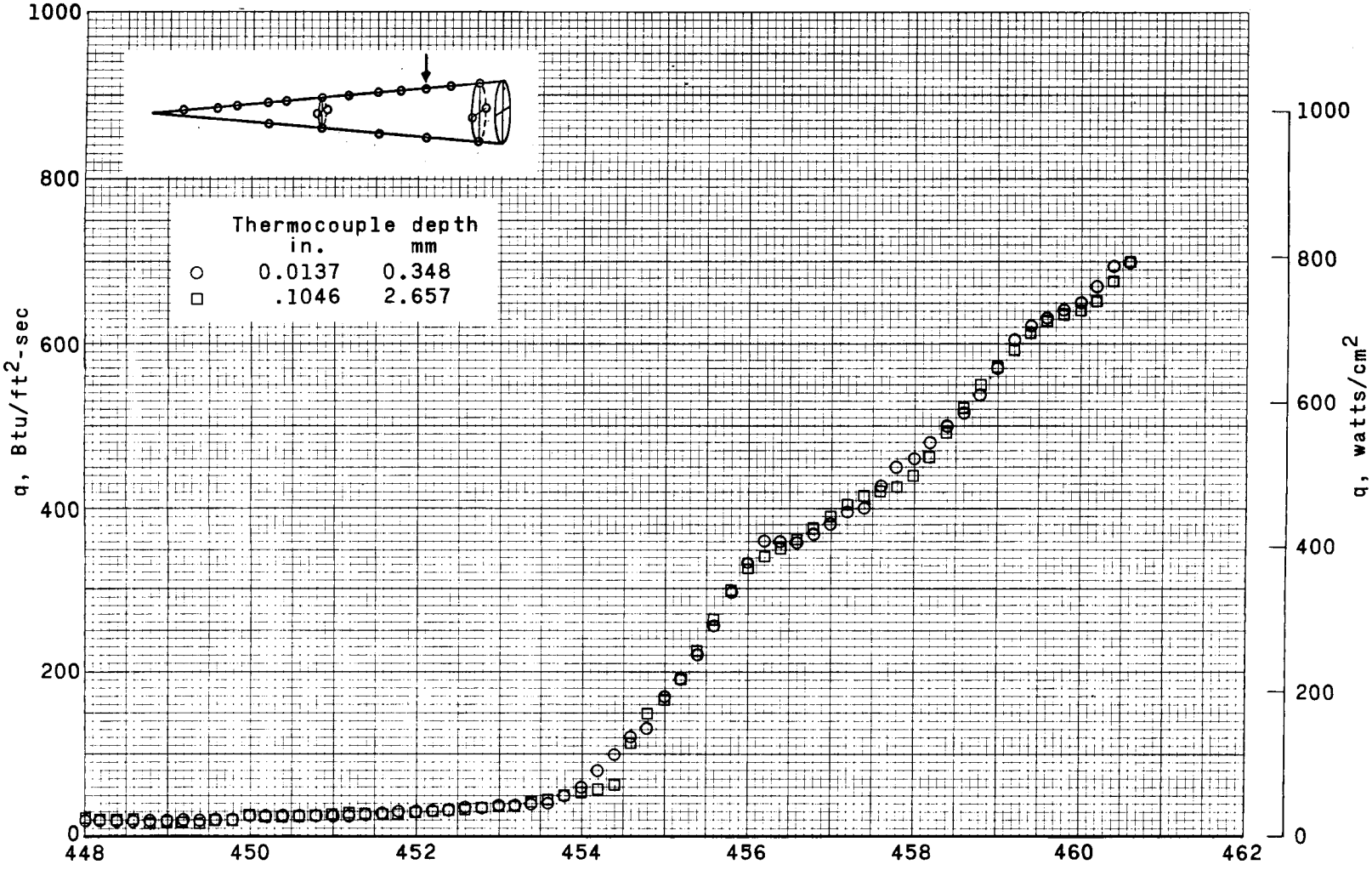
(h) Station 251.46 cm (99 in.); ray 0°.

Figure 17.- Continued.



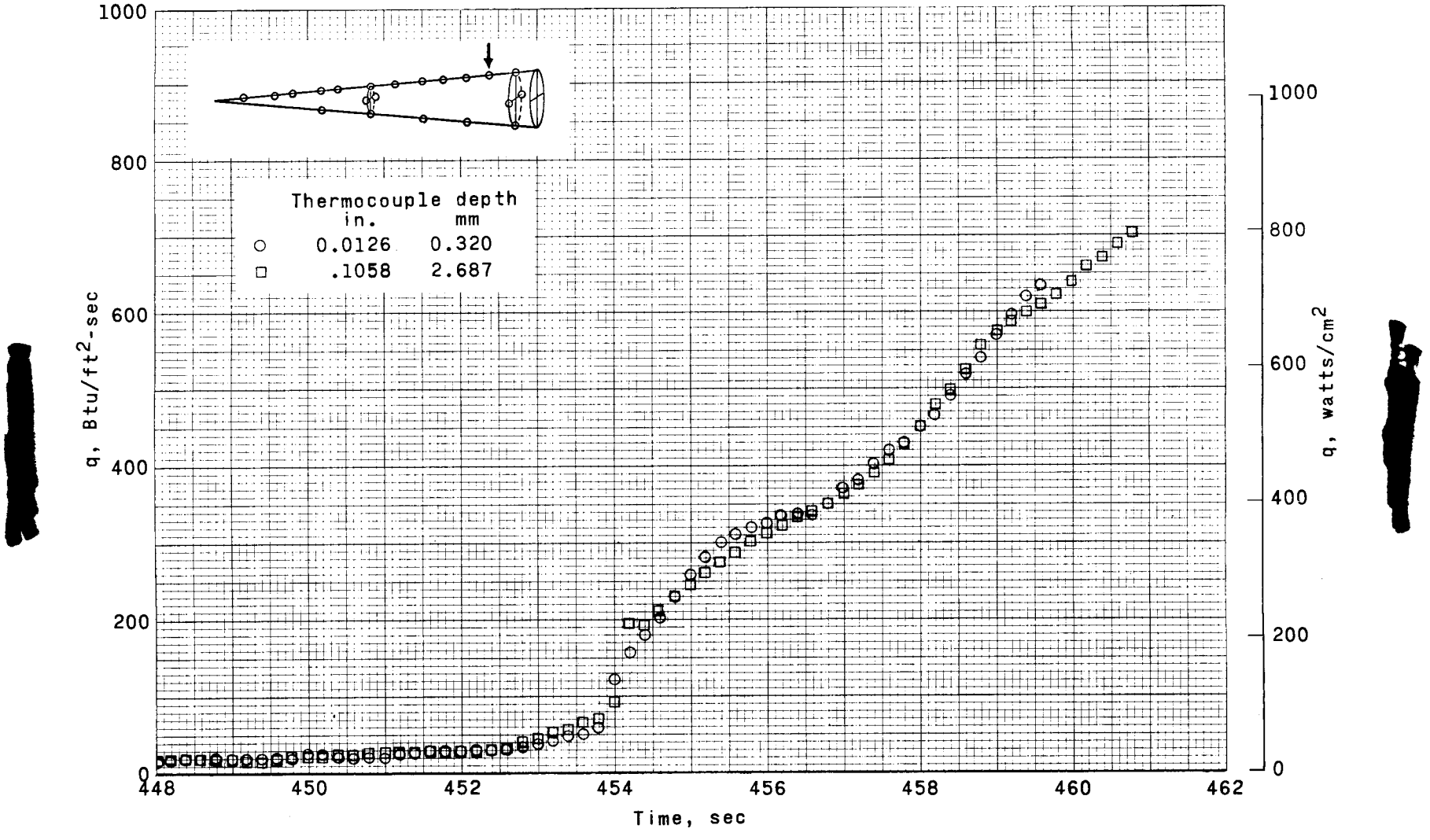
(i) Station 276.86 cm (109 in.); ray 0°.

Figure 17.- Continued.



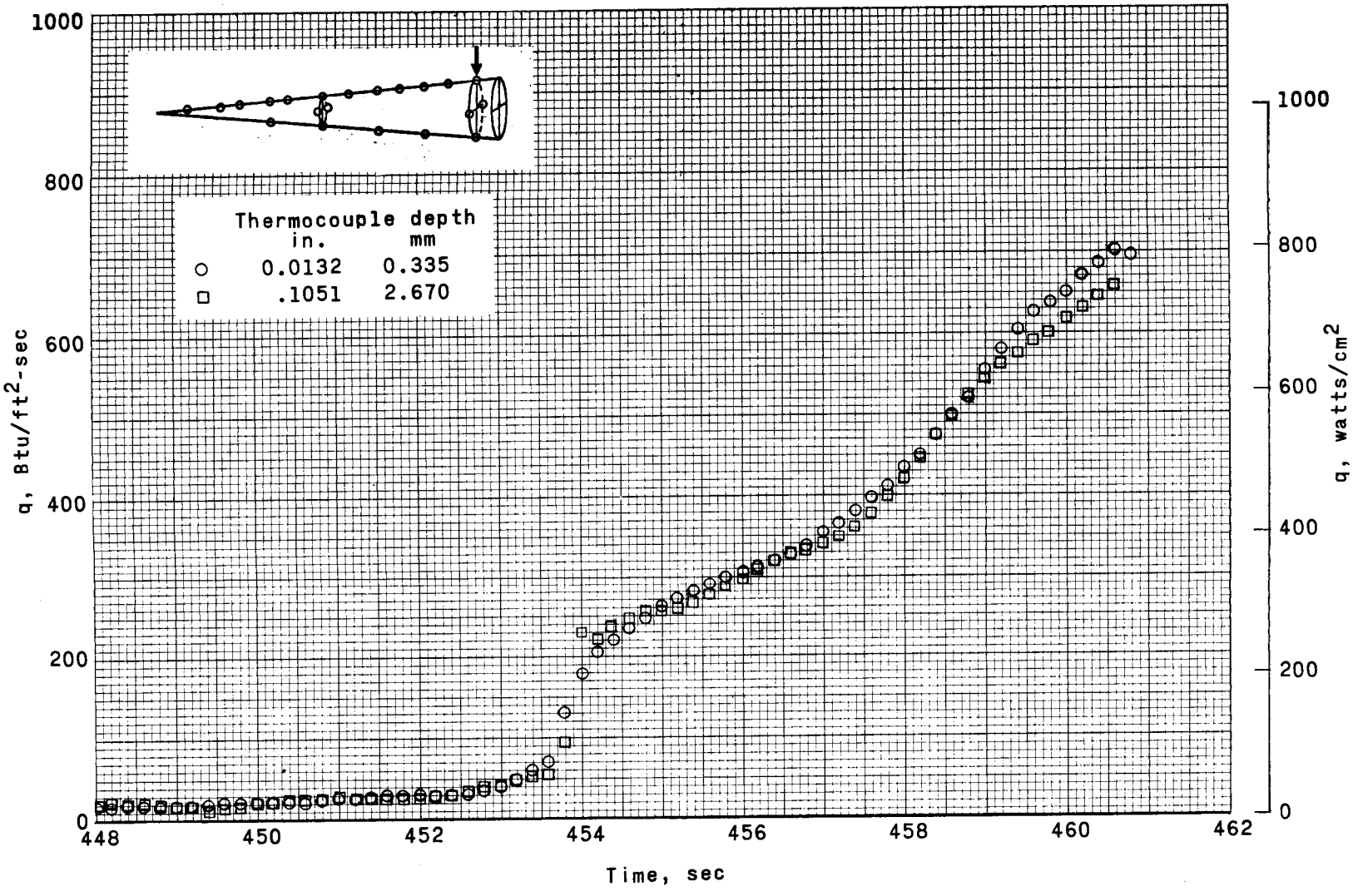
(j) Station 307.34 cm (121 in.); ray 0°.

Figure 17.- Continued.



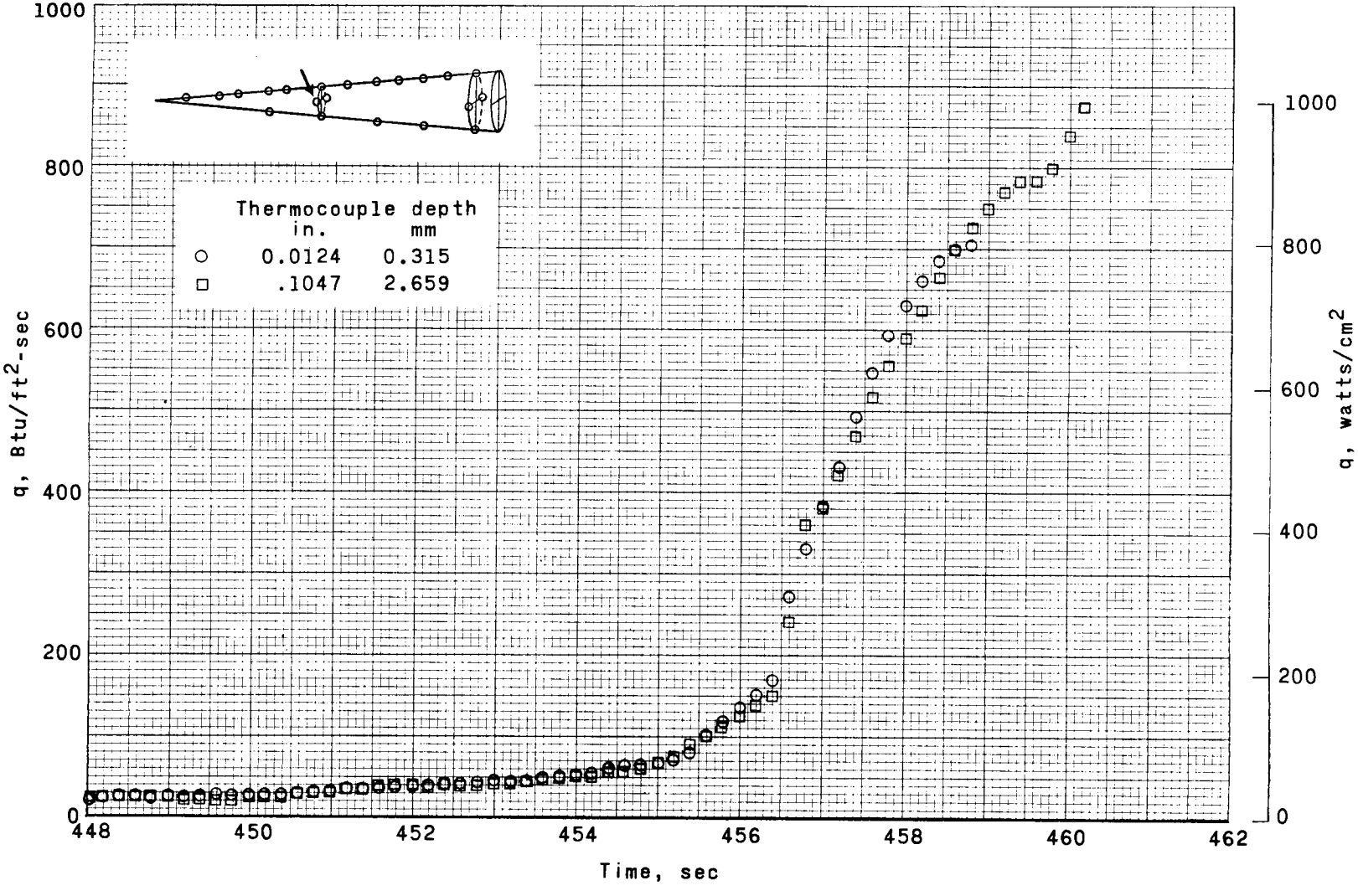
(k) Station 337.82 cm (133 in.); ray 0°.

Figure 17.- Continued.



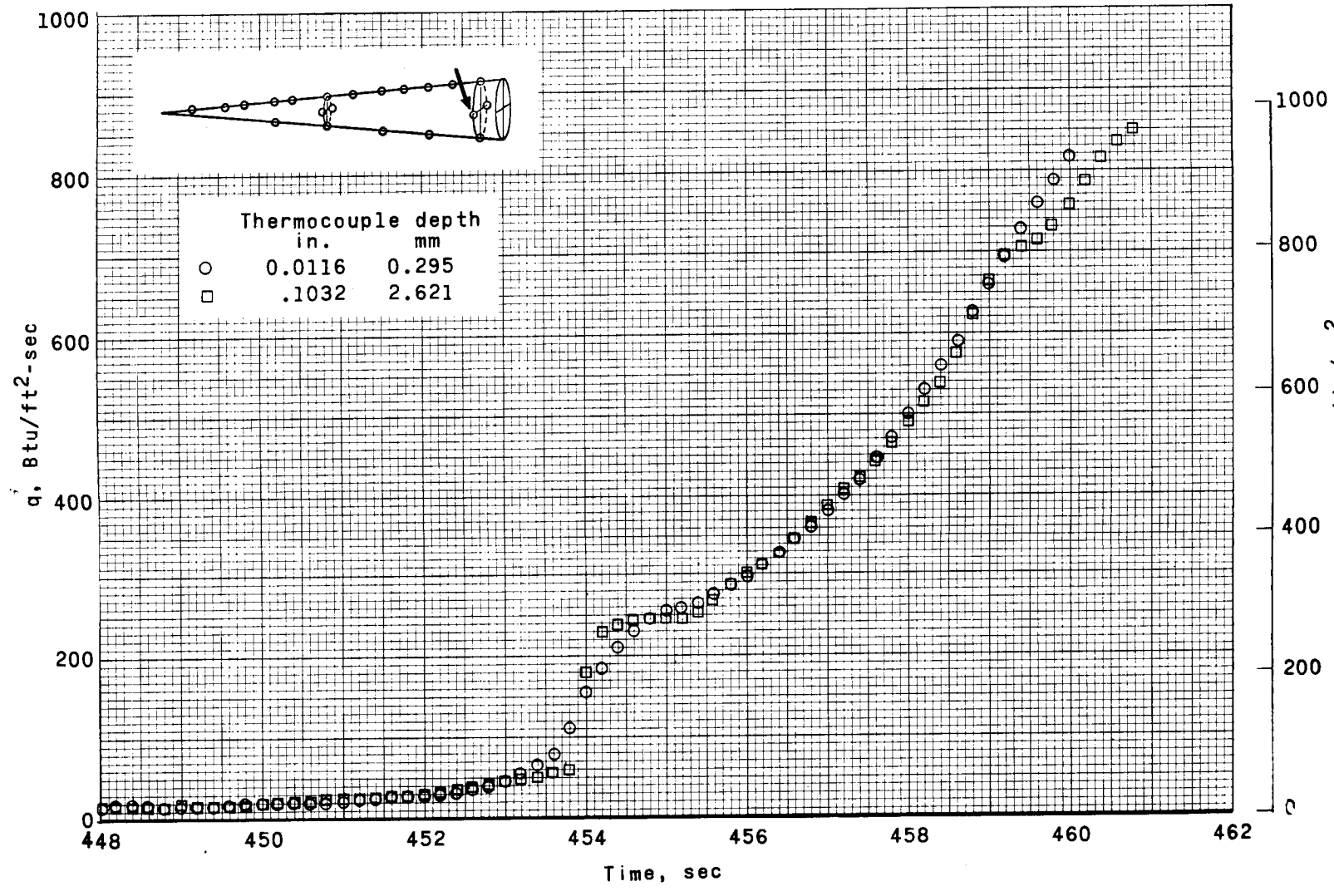
(l) Station 365.76 cm (144 in.); ray 0^{o}.

Figure 17.- Continued.



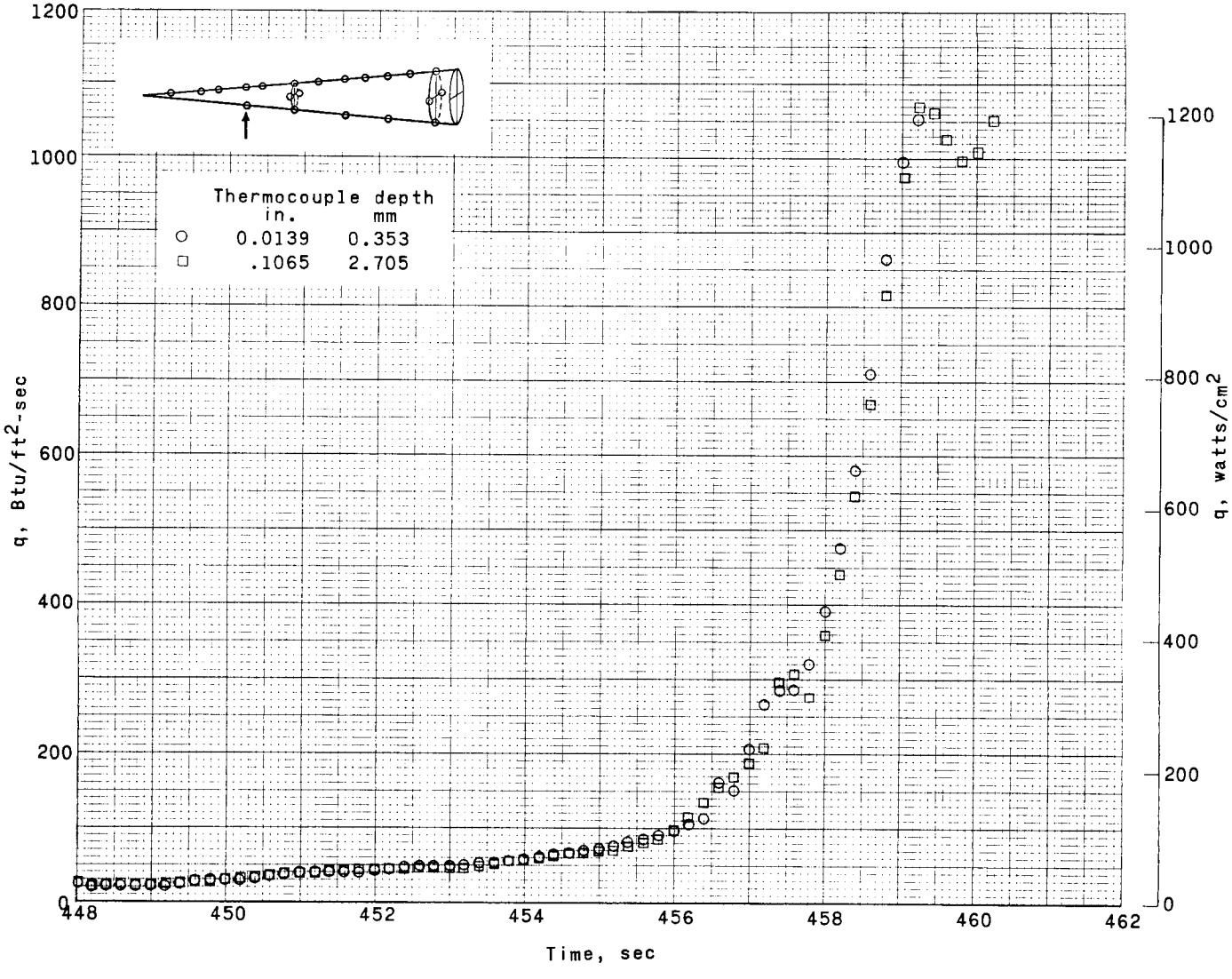
(m) Station 185.42 cm (73 in.); ray 90°

Figure 17.- Continued.



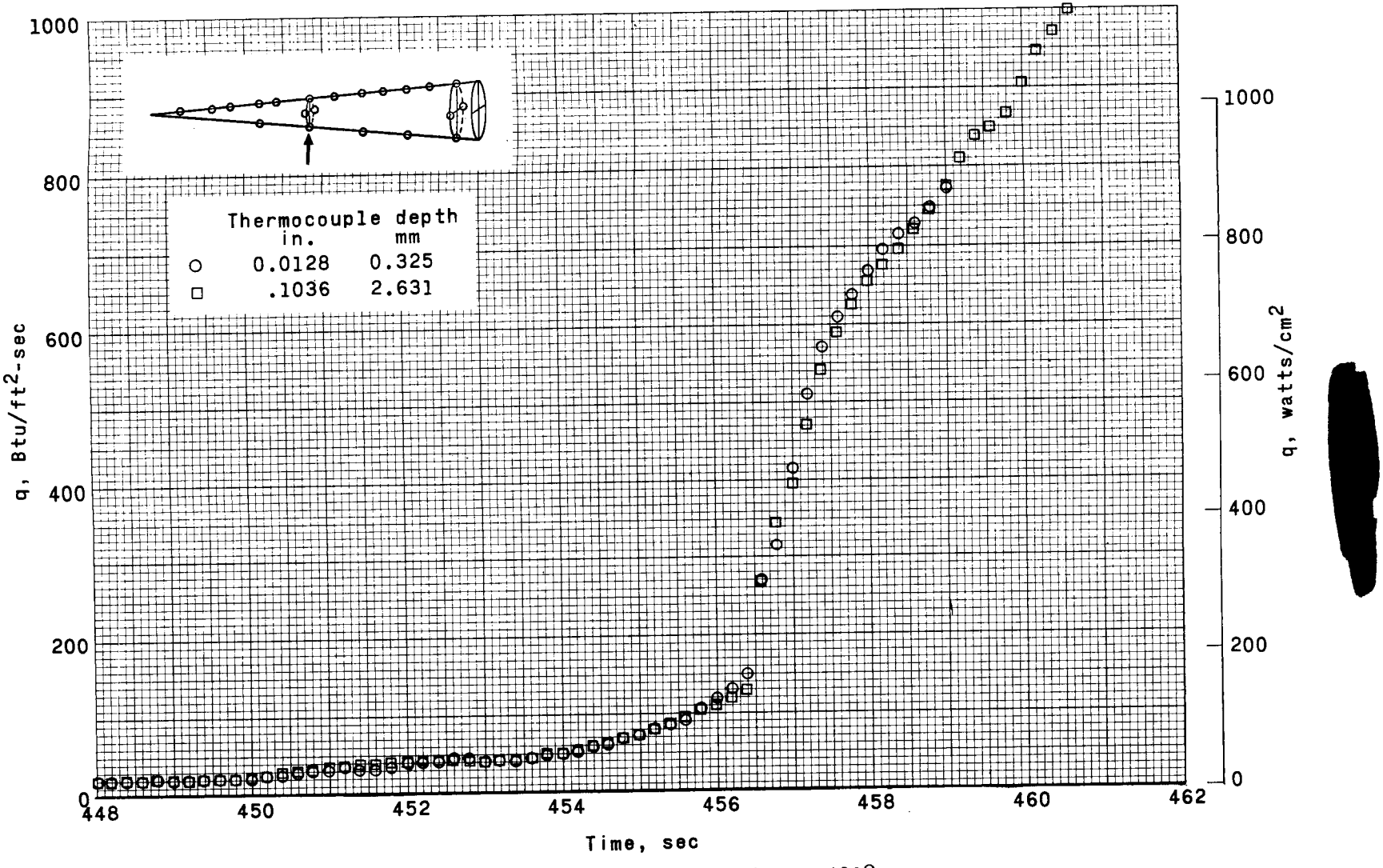
(n) Station 365.76 cm (144 in.); ray 90°.

Figure 17.- Continued.



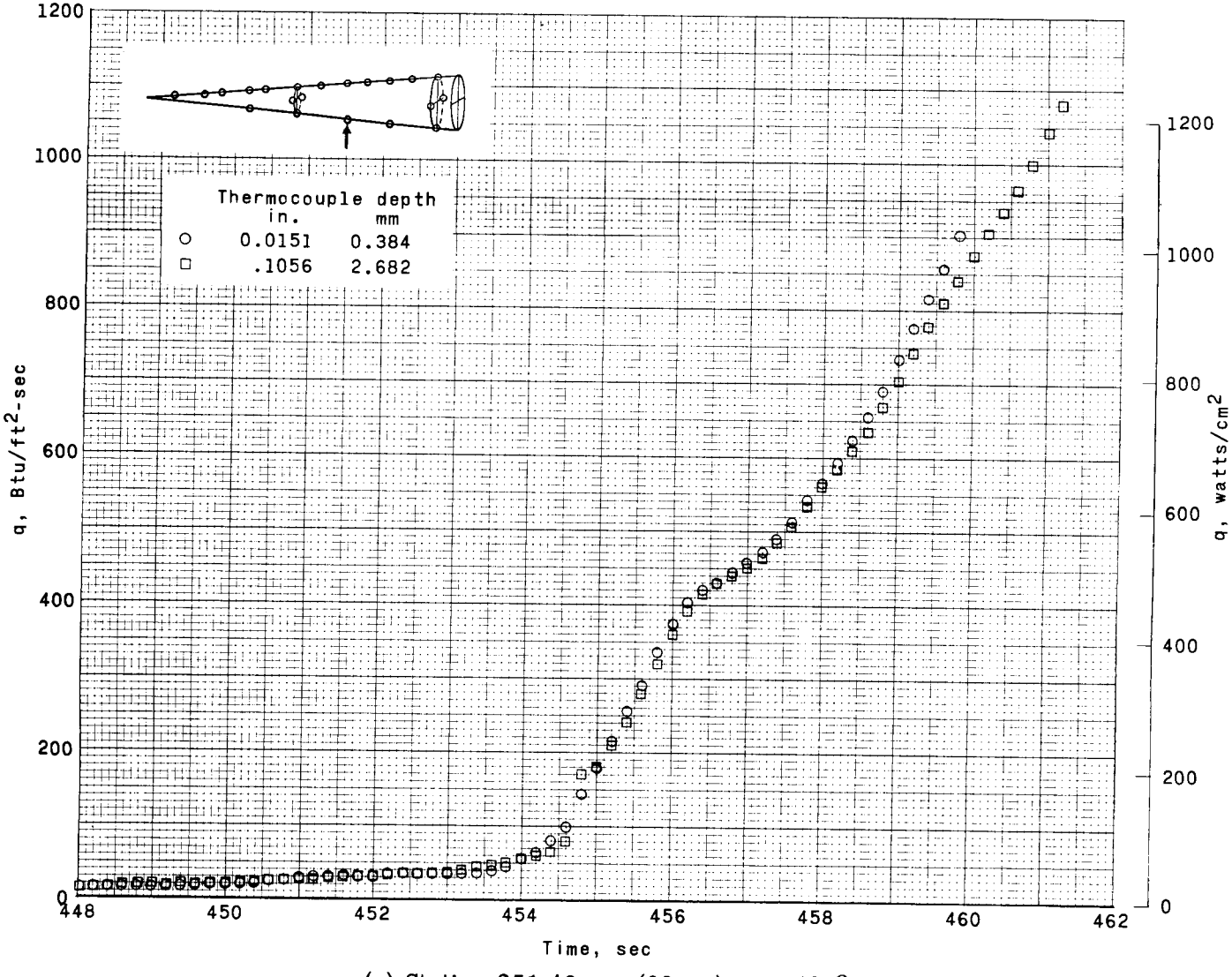
(o) Station 132.08 cm (52 in.); ray 180°.

Figure 17.- Continued.



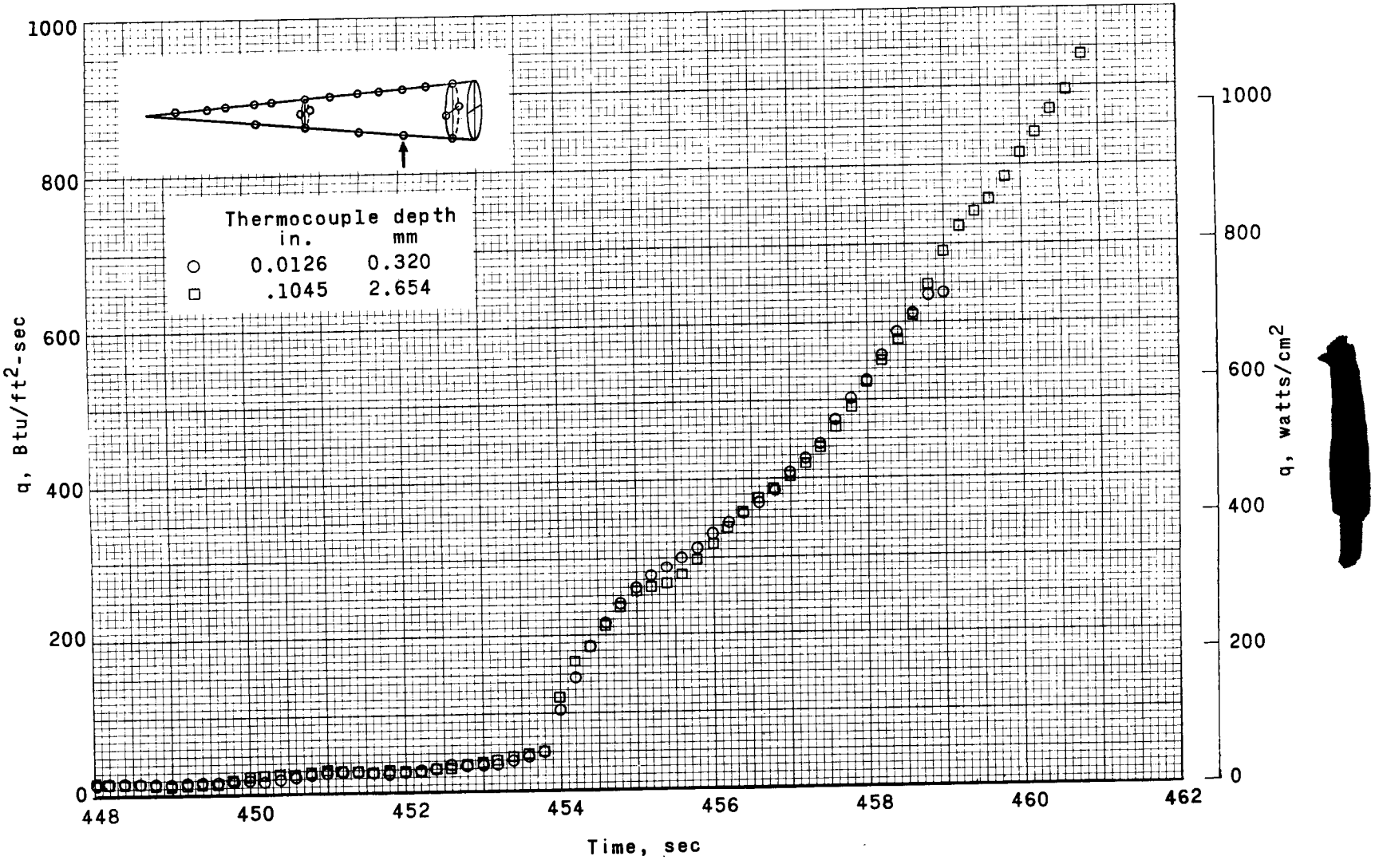
(p) Station 185.42 cm (73 in.); ray 180°.

Figure 17.- Continued.



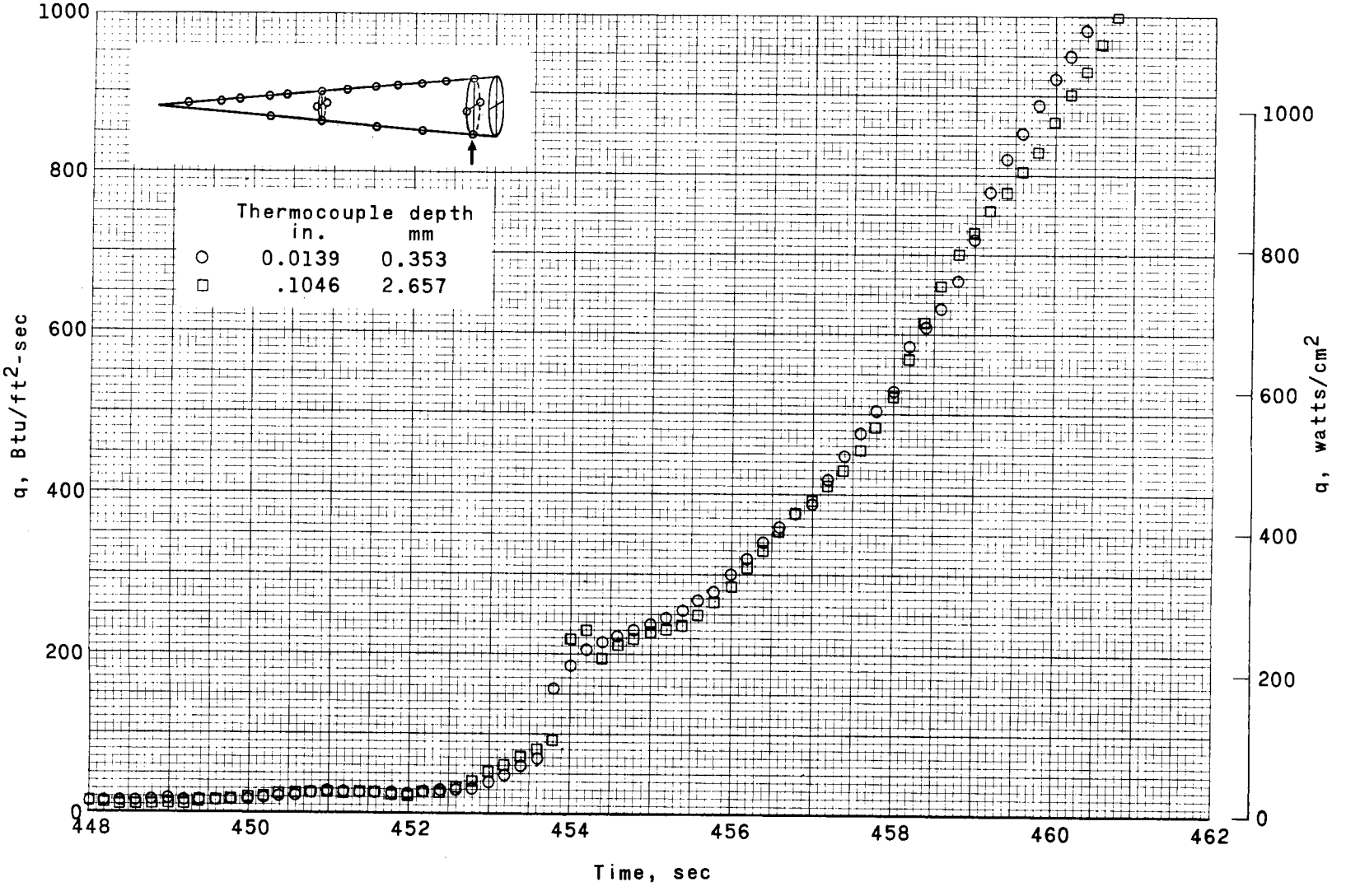
(q) Station 251.46 cm (99 in.); ray 180°.

Figure 17.- Continued.



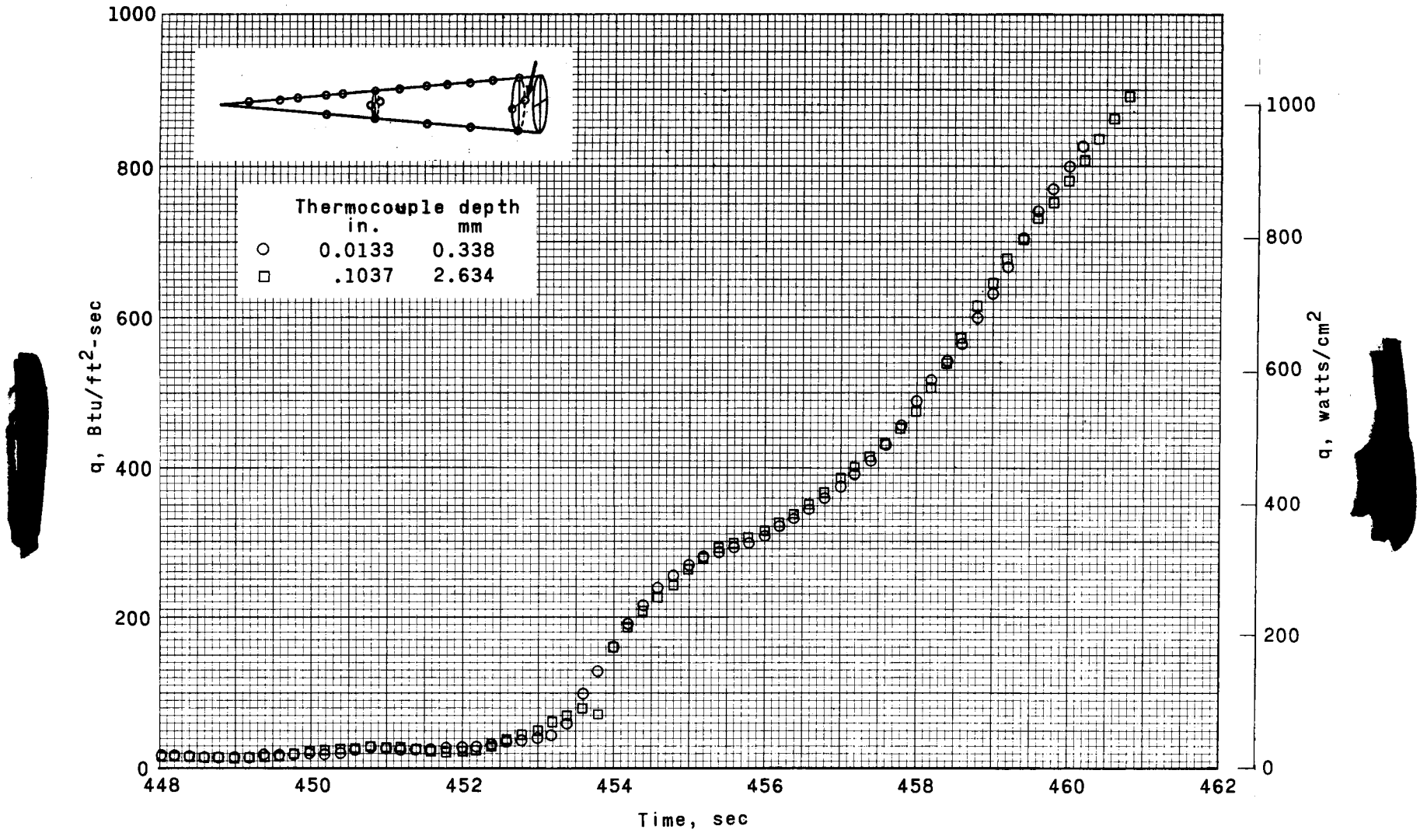
(r) Station 307.34 cm (121 in.); ray 180°.

Figure 17.- Continued.



(s) Station 365.76 cm (144 in.); ray 180°.

Figure 17.- Continued.



(t) Station 365.76 cm (144 in.); ray 270°.

Figure 17.- Concluded.

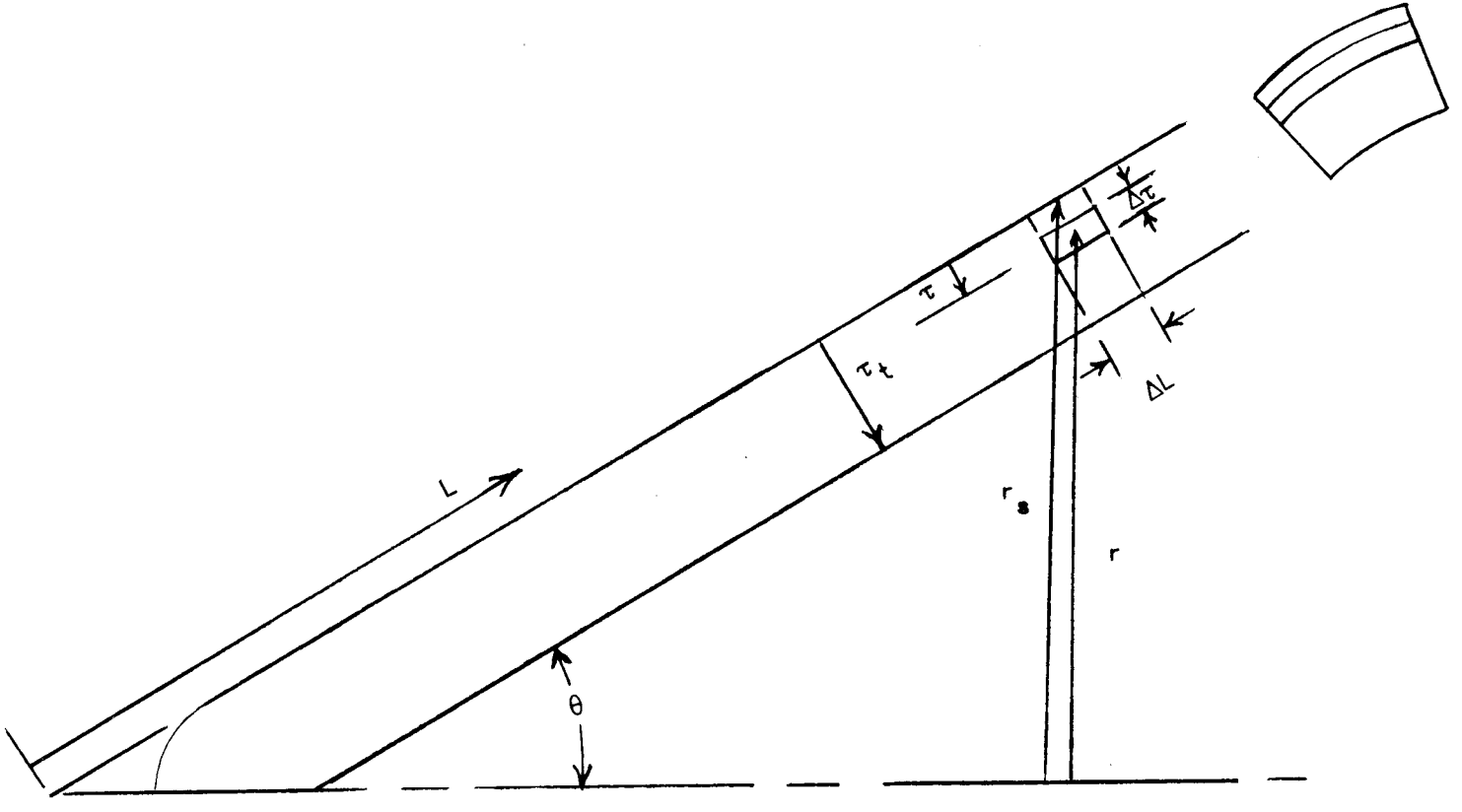


Figure 18.- Effect of conical shape on heat capacity per unit surface area.

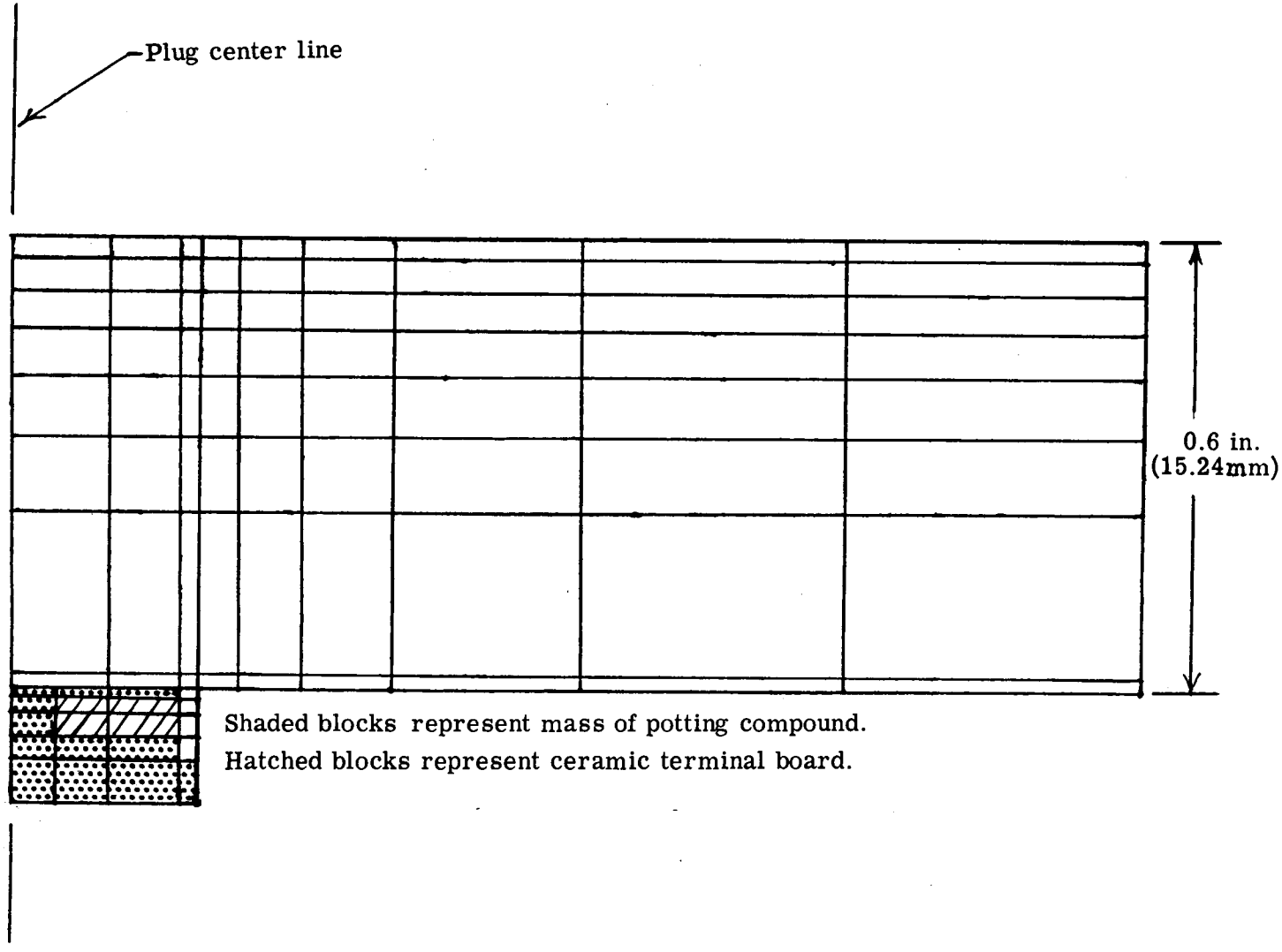


Figure 19.- Three-dimensional thermal model used to investigate the effect of potting compound on temperature measurements. Note: Each block is a concentric cylinder.

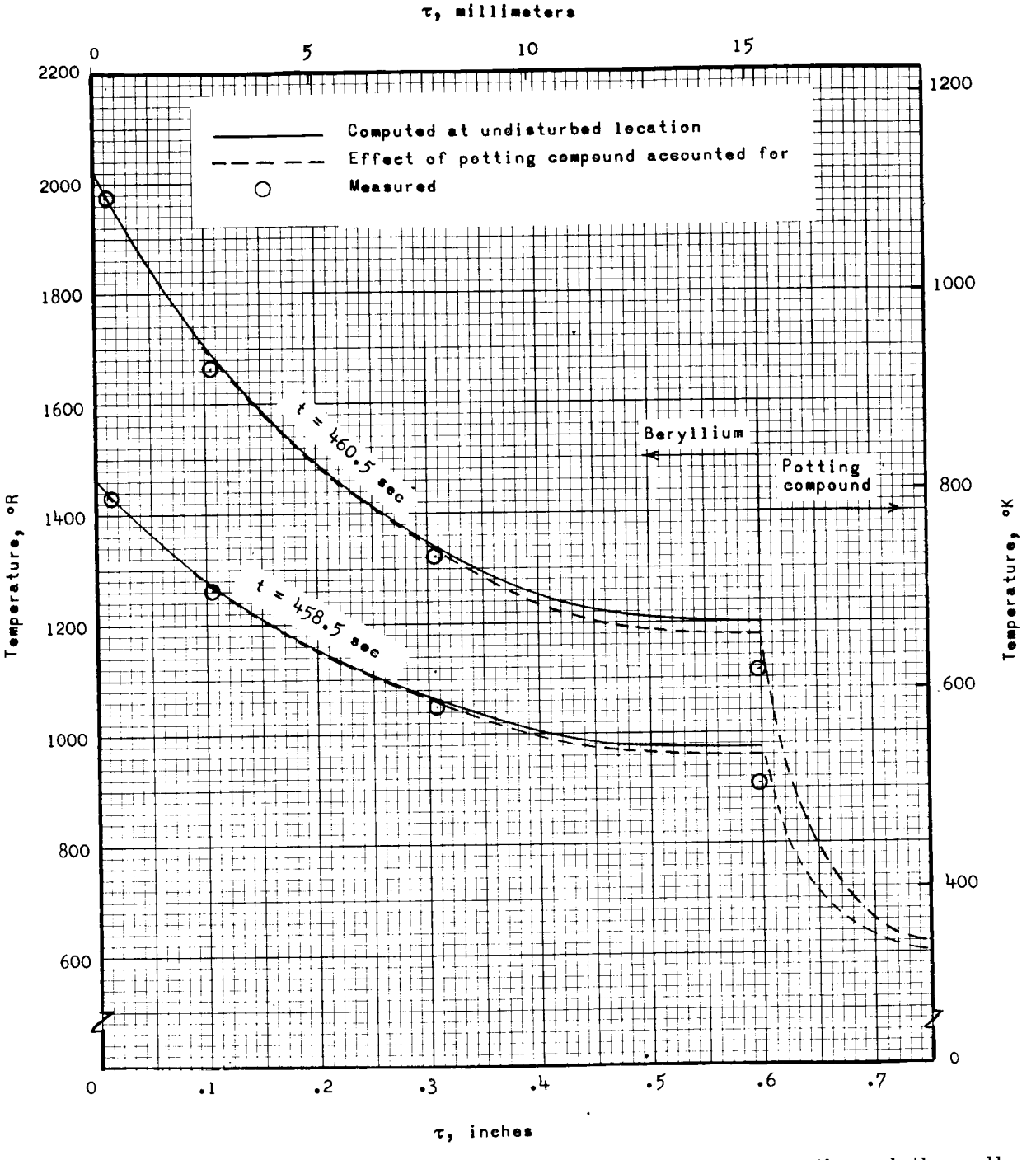


Figure 20.- Effect of potting compound on temperature distribution through the wall.

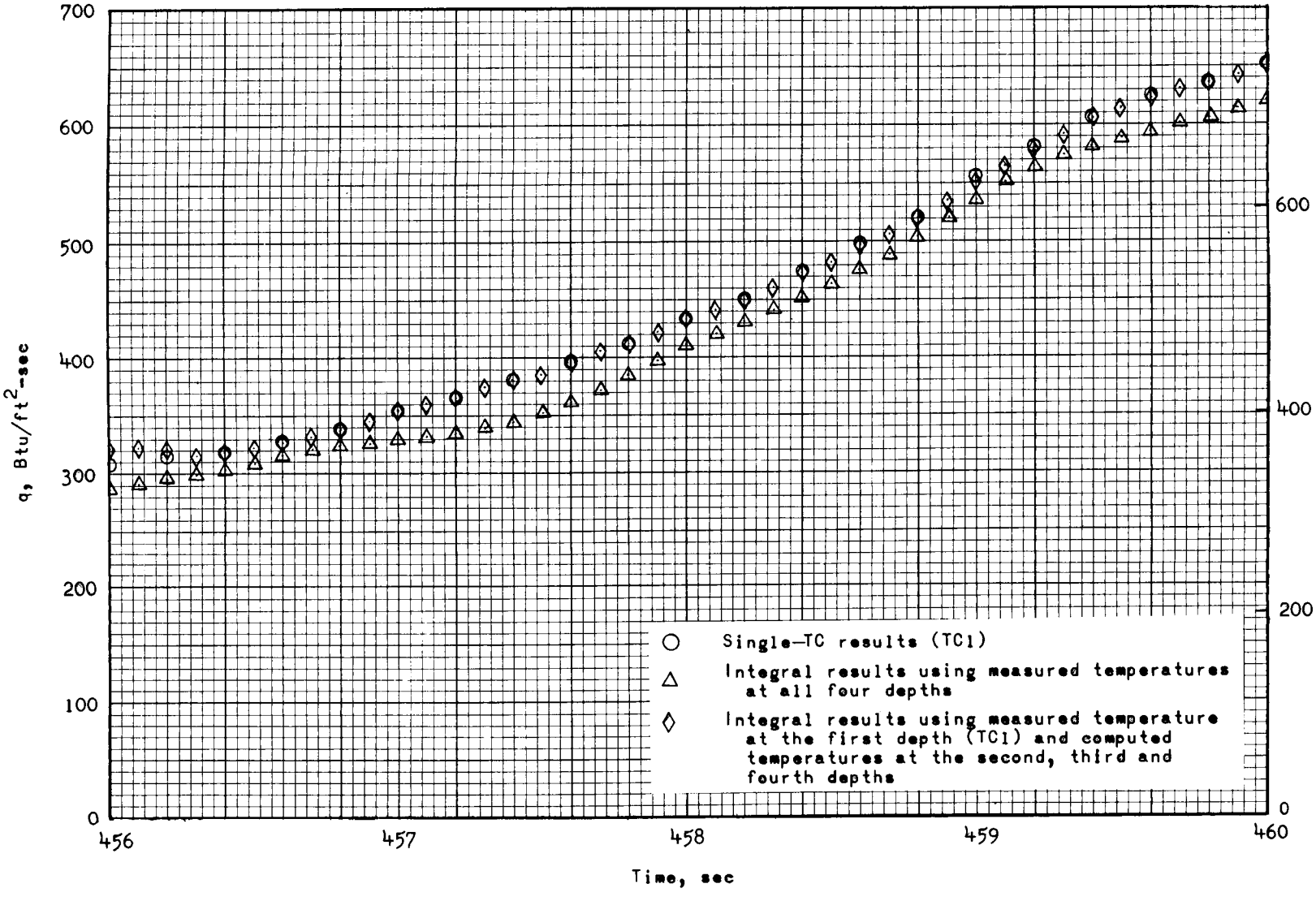


Figure 21.- Comparison of single-thermocouple results with integral results when both methods incorporated identical temperature histories for all thermocouple locations.

[redacted]

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TM X-2282		

4. Title and Subtitle	5. Report Date
THERMAL ANALYSIS METHODS AND BASIC HEAT-TRANSFER DATA FOR A TURBULENT HEATING FLIGHT EXPERIMENT AT MACH 20 (REENTRY F) (U)	May 1971
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
Floyd G. Howard	L-7520
9. Performing Organization Name and Address	10. Work Unit No.
NASA Langley Research Center Hampton, Va. 23365	711-02-09-01
	11. Contract or Grant No.
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	Technical Memorandum
National Aeronautics and Space Administration Washington, D.C. 20546	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

A heat-transfer experiment was flight conducted on a 5° half-angle cone, 396.2 cm (13 feet) in length, as it entered the sensible atmosphere under laminar, transitional, and turbulent boundary-layer conditions at a free-stream Mach number of about 20. Accurate turbulent-heat-transfer data with natural transition were obtained for correlation with theories in regions of simultaneous high Mach number, Reynolds number, enthalpy, and total-to-wall temperature ratio. Temperatures were measured at four depths through the 15.24-mm-thick (0.600-in.) beryllium wall. Experimental heating rates at 20 stations on the cone were determined independently from the outermost temperature measurement and from the temperature measurement at the second depth by a single-thermocouple inverse method and also from the temperature histories at all four depths by an integral method. The thermal data analysis procedure, associated problems, and results are presented herein.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Heat-transfer data reduction techniques Heat-transfer results	[redacted] Available to U.S. Government Agencies and Their Contractors Only Restriction/Classification Cancelled

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
[redacted]	Unclassified	139	

[redacted]

[redacted]