1-D Ablation Model for a Thermal Protection System

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by

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ABSTRACT
1D ABLATION MODEL FOR A THERMAL PROTECTION SYSTEM
by Reine Dominique Ntone Sike

During the past decades, human presence is expanding beyond earth. Manned space vehicles are required to withstand extreme temperatures during atmospheric reentry. The focus of the project is on ablative thermal protection system. A deep understanding of thermo-chemical ablation of carbon-based materials is fundamental to assess results from numerical simulations. Ablation is a complex process to model since the majority of ablative materials are still not fully understood. This report is devoted to investigate ablative material's behavior in operational conditions, present two different computational approaches, and study a thermal protection system sizing using TRAJ code and FIAT. Apollo 4 (AS-501) and Apollo 10, exposed to conditions similar to those during atmospheric reentry, are the selected test cases for the analysis. TRAJ trajectory code and FIAT are used to analyze the impact of changing parameters on the thermal protection system. The results show that for similar selected body geometry and initial conditions, an implementation of Apollo Guidance Computer subroutine is essential to obtain accurate results for thermal protection system sizing.

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Abbreviations

ACC	Advanced Carbon-Carbon
AETB	Alumina-Enhanced Thermal Barrier
AFRSI	Advanced Flexible Reusable Surface Insulation
AGC	Apollo Guidance Controller
BC	Ballistic Coefficient
BLA	Boeing Lightweight Ablator
BPA	Boeing Phenolic Ablator
BRI	Boeing Rigid Insulation
EDLS	Entry, Descent, and Landing System
FIAT	Fully Implicit Ablation and Thermal Analysis Program
FRSI	Felt Reusable Surface Insulation
ISS	International Space Station
LEO	Low Earth Orbit
MMOD	Micrometeoroids and Orbital Debris
MSL	Mars Science Laboratory
NASA	National Aeronautics and Space Administration
PA	Polymeric Ablative
PICA	Phenolic Impregnated Carbon Ablators
RTV	Room Temperature Vulcanizing
SNC	Sierra Nevada Corporation
SpaceX	Space Exploration Technologies Corporation
TPS	Thermal Protection System
TUFROC	Toughened Unipiece Fibrous Reinforced Oxidation-Resistant Composite
TWCP	Tape-Wrapped Carbon Phenolic
VKI	Von Karman Institute

Symbols

C_D	Drag coefficient
$\tilde{K}_g$	Elemental carbon mass fraction
$\tilde{K}_{gE}$	Mass fraction of the gas
$\tilde{K}_{kC}$	Mass of element k per unit mass of char
$\tilde{K}_{kP}$	Mass of element k per unit of virgin plastic
$\dot{m}_{coke}$	Coking potential
m_c	Mass of char after decomposing in an inert atmosphere at a temperature from 2,000 to 3,000 degrees Rankine
m_p	Mass of virgin plastic sample
p_0	Stagnation pressure
$\dot{q}$	Heat flux
Δh	Apparent ablation enthalpy
$\propto$	Empirical coefficient for porous particles
A	Surface Area
A_i	Frequency factor
E_i	Activation energy
m	Mass
M	Molar mass
m_c	Mass of condensed carbon
m_g	Mass of gas
m_I	Mass of inert constituents
m_r	Mass of all *i* reactive constituents
V	Velocity
β	Empirical coefficient for porous particles
γ	Flight path angle
ν	Velocity vector
ρ	Freestream density
ϕ	Orbital angle

1. Introduction

1.1 Problem Statement

During the past decades, human presence is expanding beyond Earth. Previous NASA missions such as Gemini, Apollo, and Mars Viking used an ablative Thermal Protection System (TPS) to protect space vehicles from extreme thermal environments during ascent and reentry, natural environments, and orbital environments (Davis, 2017). Forty years ago, the first TPS were Viking- or Pathfinder-era materials, but their performance does not meet the requirements of future exploration missions. A significant breakthrough—called Ablative TPS concept—has been made regarding TPS materials technology to enable human exploration beyond Low Earth Orbit (LEO). Sending humans to Mars also implies larger payloads; hence, it is necessary to develop lighter ablative materials. The state-of-the-art TPS structure that currently insulates spacecraft is commonly an aluminum or composite "sandwich" with a Room Temperature Vulcanizing (RTV) adhesive to bond the underlying structure (Greene, 2013). Ablators are single-use, semi-passive TPS capable of withstanding extreme temperature and heating. The use of ablators allows efficient thermal load management since heat is blocked and absorbed during the ablation process. Advanced Carbon-Carbon (ACC) ablators and others, such as Phenolic Impregnated Carbon Ablators (PICA), have the property to be lightweight, flexible insulation (Greene, 2013). Previous studies (Greene, 2013) (S. Langston, 2017) (Rindal, 1968) demonstrated multiple possible uses of ablative materials according to the various mission requirements.

1.2 Project Objective and Methodology

1.2.1 Project Objective

In this project, the properties of the most commonly used ablative materials are studied to perform a comparative and parametric analysis based on space vehicle design parameters and reentry trajectory. The Fully Implicit Ablation and Thermal Analysis Program (FIAT) is a numerical tool used to simulate 1-D thermal energy transport in a multilayer stack of isotropic materials and structures which are able to ablate from the front surface and decompose in depth. Internal decomposition (pyrolysis), gas species transport, and solid morphology evolution (surface ablation) are the main focuses. FIAT is essential to grow the understanding of the ablative materials' behavior in operational conditions (S. Langston, 2017). The goal of the project is to perform a parametric study of an ablative TPS for a reentry capsule. The heatshield thermal analysis assesses the impact that changing selected parameters can have on the ability to withstand extreme conditions.

1.2.2 Methodology

The project takes the results from two case scenarios and feeds the resulting data into the FIAT numerical tool for parametric analysis. As shown in Figure 1, Case 1 is developed by using TRAJ code to input a set of initial conditions to generate the reentry trajectory environment. Case 2 is developed using the same TRAJ code, but this time considering an ablator in FIAT.

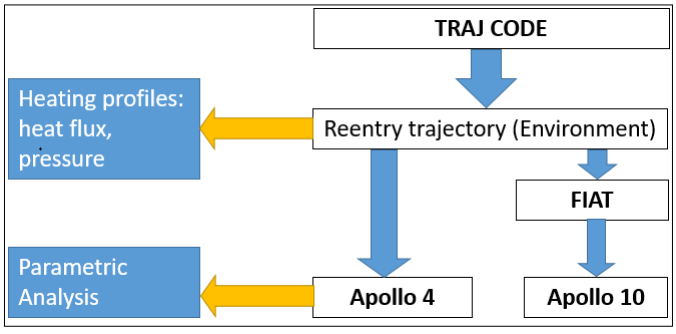


Figure 1. Methodology

1.3 Reentry Phase

A crewed reentering vehicle is also defined as an Entry, Descent, and Landing System (EDLS). Figure 2 shows the Genesis Spacecraft which was launched in 2011 to collect solar wind samples for study (A. Turchi, 2014). The vehicle is equipped with a Lander and a TPS, which is separated from its carrier with low-speed rotation with the aim of ensuring a fixed-direction Galilean frame of reference.

The angle of reentry is the angle between the momentum and the local horizontal. Decreasing the entry path angle minimizes peak fluxes and corresponds with a decrease in vehicle velocity, which is critical in low-density regions of the atmosphere. There are three families of cone angles:

- 8 to 10 degrees: Low-drag vehicles
- 45 degrees: Supersonic flow on the conical part
- 60 to 70 degrees: Subsonic flow until the rear of the conical part is at zero incidence

The ballistic phase lasts from 10 minutes to several hours. The different steps of the entry phase are the following (Duffa, Ablation, 1996):

- Slowdown to transonic: Phase during which all the phenomena of heating occurs.
- Deep stall (divided into two phases):
    - Transonic pilot chute of small diameter
    - Stabilizer and main parachute of large diameter

During the parachute phase, the front portion of the TPS is dropped, since the rear portion is attached to the parachute. This process also involves the thrusters and articulated arms of the airbags.

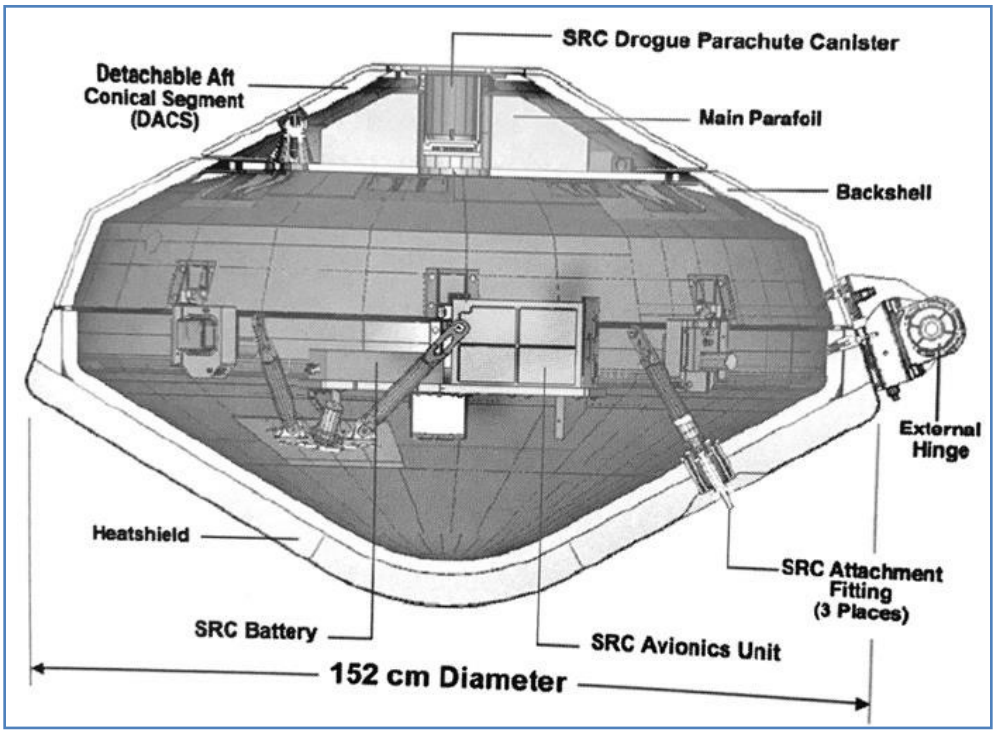


Figure 2. Genesis.

1.4 Composition of the Atmosphere

The composition of the atmosphere is an important thermal factor. Table 1 summarizes the composition depending on the planet (Duffa, Ablation, 1996).

Table 1. Composition of the atmosphere

Planet	Composition- Volume Fraction	Minor Species (0.5%)	Mean Ground Pressure < 10^5Pa
Earth	N_2 = 78.1 % O_2 = 21 % Ar = 0.9 % CO_2 = 95 %	CO_2	1.01
Mars	CO_2 = 95 % Ar = 1.6 %	O_2, H_2O	0.064
Venus	CO_2 = 96.5 % N_2 = 3.4 %	Ar, SO_2	90
Jupiter	H_2 = 86 % He = 14 %	CH_4, N_2	-
Titan	N_2 = 94 % CH_4 = 5 %	Ar, H_2	1.5

1.5 Major Classes of Materials for Thermal Protection System

During reentry, the spacecraft experiences extremely high temperatures. Therefore, the range of options for the materials is constrained because of the severity of the melting, sublimation, and decomposition temperatures. The most common solutions use covalent bonds, which are chemical bond that involve the sharing of electron pairs between atoms (Figure 3).

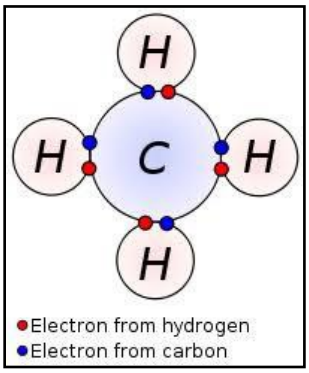


Figure 3. Hydrocarbon covalent bond.

The main materials used include strong chemical covalent bond molecules (silica, boron and carbon) and metallo-covalent bond elements (d-block elements: titanium, tungsten, tantalum and rhenium). Out of this list of elements, the most commonly used materials are silica and carbon. The performance of these materials is measured in terms of enthalpy of sublimation. Thus, by consuming energy, highly endothermic materials improve the thermal protection. However, these materials do not endure shear stresses. The solution to minimize the shear stresses is to carefully include composite materials in the TPS in such a way that they withstand the structural stresses.

2. Early Thermal Protection Systems

To increase the capability of sending astronauts to the International Space Station (ISS), NASA has worked in collaboration with the three following companies: Space Exploration Technologies Corporation (SpaceX), Boeing Company, and Sierra Nevada Corporation (SNC) (Rindal, 1968). They compete to become the provider of transportation to the ISS. In this section, their three different TPS are presented.

2.1 Apollo Capsule

Apollo Program is the pioneer regarding the need for TPS able to withstand the return from lunar orbit (Rindal, 1968). The goal is to protect the spacecraft not only from micrometeoroids and orbital debris (MMOD) but especially from vacuum and ultraviolet exposure. An ablative heatshield is needed to endure the heat produced from lunar orbit reentry. Since the ablator dissipates heat by melting its heatshield, a TPS results in a single use. The Crew Module also has a limit temperature at the ablator-steel interface of 600 degrees Fahrenheit during reentry (Rindal, 1968). The material used to protect the Apollo Capsule is Avcoat 5026-39, which is a combination of epoxy Novolac resin and fiberglass honeycomb matrix. The heatshield is composed by an ablator, a bond line, an aluminum honeycomb, and a slip-stringer strain isolation system (Figure 4).

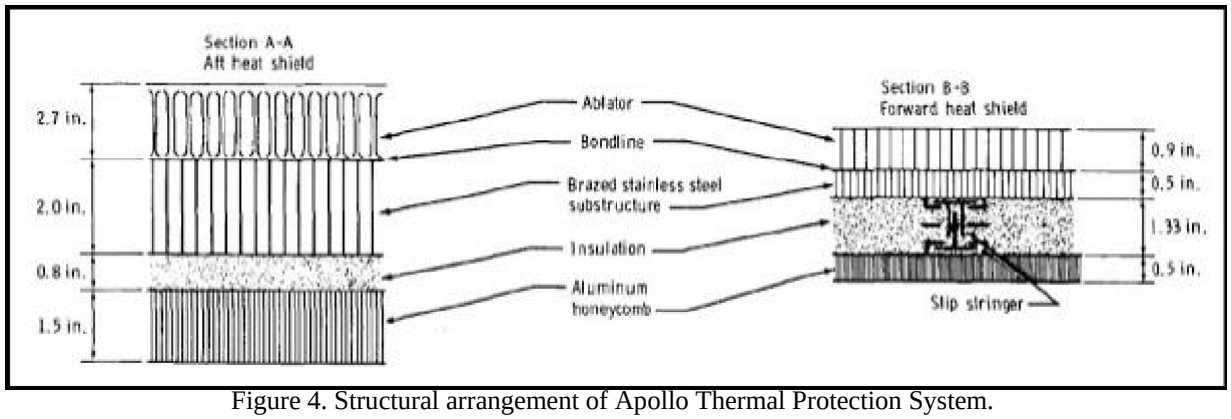


Figure 4. Structural arrangement of Apollo Thermal Protection System.

The phenolic honeycomb is attached to the stainless-steel shell with HT-424 adhesive before the ablator is inserted into the honeycomb cells with a hypodermic device, which can be assimilated to a caulking gun.

2.2 SpaceX Dragon Capsule

The SpaceX Dragon Capsule is a Commercial Crew Program. There are two versions: the manned version capable of ground landing and the cargo version, which is equipped with parachutes to enable a water landing. The heatshield uses a Phenolic Impregnated Carbon Ablator (PICA). PICA is a class of low-density ablators previously used on Mars Science Laboratory (MSL) and Stardust (Rindal, 1968). PICA is as efficient for reentry from LEO as for lunar returns, which makes it a contender for the majority of ablators.

Figure 5. Dragon Capsule.

2.3 Boeing's CST-100 Crew Module

The CST-100 is a 7-crewmember capsule consisting of a single-use heatshield but a reusable back shell capable of operating up to 10 flights (Rindal, 1968). Unlike the Apollo Capsule, the CST-100 is programmed for ground landings with airbags and parachutes. The back shell is comprised of Boeing Rigid Insulation-18 (BRI-18) tiles, Felt Reusable Surface Insulation (FRSI), and Advanced Flexible Reusable Surface Insulation (AFRSI) blankets. Avcoat is used in

combination with Boeing Phenolic Ablator (BPA) and Boeing Lightweight Ablator (BLA), two specific ablator concepts developed by Boeing Company.

Figure 6. Boeing CST-100.

2.4 Sierra Nevada Corporation's Dream Chaser

The Dream Chaser is, unlike previously cited capsules, an aircraft-shaped lifting body designed spacecraft. This 40-feet-long ship is capable of transporting seven astronauts to ISS and LEO. The landing is operated on a skid plate and two back wheels. The reusable TPS is designed with the purpose of having a black Alumina-Enhanced Thermal Barrier (AETB) tiles at the bottom with 17-pound density. The top surface experiences a lower amount of heat; thus, FRSI and white AETB are used to protect it. In contrast, the nose cone, body flaps, and leading edge of the wings experience high heat loads, and for this reason, are designed with Toughened Unipiece Fibrous Reinforced Oxidation-Resistant Composite (TUFROC) (Rindal, 1968).

Figure 7. Dream Chaser.

3. Flight Mechanics

Flight mechanics, also called orbital mechanics, is the study of the motion of space vehicles moving under the influence of forces such as gravity and atmospheric drag. The aerospace applications of flight mechanics include ascent and reentry trajectories. The aim of this section is to define design requirements, study the equations of motion, and present the trajectory considerations.

3.1 Trade-Offs For Reentry Design Requirements

During space mission design, one of the most important steps of the process is the identification of critical design considerations required to achieve mission objectives. To satisfy the fundamental mission objectives, three important concepts are analyzed:

- Deceleration
- Heating
- Accuracy of landing or impact

3.1.1 Deceleration

Due to the vehicle structure and payload, the maximum deceleration in terms of “g’s” is limited. In the case of a manned spacecraft, the gravitational acceleration can be up to 12 g’s. During mission design, the space vehicle has to significantly slow down to avoid skipping off the atmosphere.

3.1.2 Heating

The second limitation of the reentry phase is heating. Note that the space shuttle’s surfaces experience a temperature of up to 1477 degrees Celsius. To withstand these high temperatures, the reentry trajectory and the vehicle have to be designed accordingly.

3.1.3 Accuracy of Landing or Impact

Apollo capsules are required to land in large areas in the Pacific Ocean. In this case, only the trajectory and vehicle shape have to be adjusted to meet the accuracy requirements; this introduces the notion of reentry corridor. The reentry corridor is an area in space through which the reentering spacecraft must fly. Above the corridor, the vehicle may skip out, and below the corridor, it may burn, as shown in Figure 8.

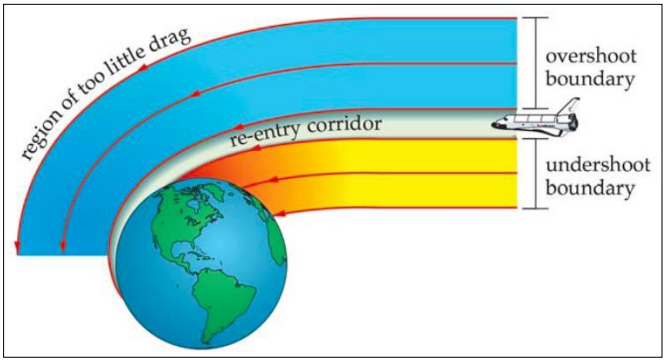


Figure 8. Reentry corridor

3.2 Reentry Motion

The reentry flight path angle γ, also called the orbital angle ϕ, is the angle between the local horizontal and the velocity vector.

The three main forces acting on a reentering Shuttle are listed as follow:

- Lift
- Drag
- Force of gravity

The reentry flight path angle is a function of the coordinate system with respect to an inertial reference frame. The reentry coordinate system places its origin at the vehicle's center of mass at the beginning of reentry. The analysis of the motion is done with respect to this center.

The equation of motion (3.1) is a function of the ballistic coefficient, which describes how the vehicle moves through the atmosphere.

$$\vec{a} = \frac{1}{2}\,\rho\, V^2\, \frac{C_D A}{m} \tag{3.1}$$

Where the ballistic coefficient is:

$$\mathrm{BC} = \frac{C_D A}{m} \tag{3.2}$$

The deceleration is inversely proportional to the ballistic coefficient. Therefore, the lower the ballistic coefficient is, the faster the vehicle decelerates.

For this project, a light blunt vehicle is considered, which is slowed down more rapidly due to the high amount of drag produced on the surface body, given the vehicle shape.

3.3 Equations of Motion

During an atmospheric reentry, the equations of motion can be written as a function of inertial coordinates for a rotating planet. For the purposes of the analysis, the decision is made to consider a constant vehicle mass because the vehicle is assumed to be in planar motion over a nonrotating planet. Assuming no thrust and no mass loss due to ablation, the equations of motion are a function of the lift-drag ratio and ballistic coefficient (Rivell, 2006).

$$\frac{dV}{dt} = \frac{-\rho V^2}{2BP} - g\sin\gamma \tag{3.3}$$

$$\frac{d\gamma}{dt} = \frac{\left(\frac{L}{D}\right)\rho V}{2BP} - \frac{\left(g - \frac{V^2}{r}\right)\cos\gamma}{V} \tag{3.4}$$

$$\frac{dy}{dt} = V\sin\gamma \tag{3.5}$$

3.4 Vehicle Design and Trajectory Considerations

Crewed vehicles enter Earth's atmosphere at high speeds. Mercury, Gemini and Apollo, which have blunt and ablative heatshields, are reentry spacecraft (Rivell, 2006). For a hypervelocity reentry, vehicles must be designed to ensure survival of the vehicle payload. High-drag bodies,

with their large nose radius, are selected to minimize convective heat transfer. Various parameters also need to be minimized, such as:

- Vehicle weight
- Surface area
- Skin friction drag
- Aerodynamic force sensitivity to angle of attack

The vehicle surface should be stiff, strong, and curved, with the purpose of withstanding structural stresses. In flight, the vehicle should rotate to equate the heat transfer to all surface elements. This maneuver reduces the temperature gradients and achieves uniform surface temperature.

In this project, the focus is on the maximum heat flux and total heat load since they have a direct impact on aerodynamic and aerothermodynamics design factors.

4. Ablative materials

Ablative materials are at the foundation of the aerospace industry. These materials are used to protect spacecraft during hypersonic flight through a planetary atmosphere. In this section, the focus is on Polymeric Ablatives (PA), which represent the widest family of sacrificial TPS materials. Studying the ablation of carbon, pyrolysis and pyrolyzable materials is fundamental to understand the protective function of ablators.

4.1 Ablation of Carbon

In this subsection, physico-chemical mechanisms involved in a carbon heatshield are studied. Sublimation and gas phase reactions form the following products:

- ☐ Carbon oxides (CO, CO2)
- ☐ Linear chains of carbon (C_1, C_2, C_3, C_4, C_5)
- ☐ Carbon nitrides (CN, C_2N, C_2N_2, C_4N_2)

In this study, the cyclic molecules of carbon existing in small quantities are neglected.

4.1.1 Oxidation

Oxidation, in presence of high temperatures and oxygen diffusion, is a factor-limiting reaction in the boundary layer. Table 2 summarizes the reactions required to analyze ablation at extreme temperatures. C_s is a solid where C is an atom. *Site–O* represents the chemical reaction of an oxygen atom “glued” on a carbon wall at a specific location without any potential energy involved. The reactions involve in ablation are reversible.

Table 2. Oxidation Reactions

Reaction R_1	$2\text{Site} + O_2 \leftrightarrow 2\text{Site} - O$
Reaction R_2	$Site{-}O \leftrightarrow 2\text{Site} + O$
Reaction R_3	$Site{-}O + O \leftrightarrow \text{Site} + O_2$
Reaction R_4	$Site{-}O + CO \leftrightarrow \text{Site} + CO_2$
Reaction R_5	$Site{-}O\ (+C_s) \leftrightarrow \text{Site} + CO$
Reaction R_6	$Site{-}O + O\ (+C_s) \leftrightarrow \text{Site} + CO_2$

Reactions on surfaces are reactions in which at least one of the steps of the mechanism is the absorption of one or more reactants. For heterogeneous catalysis, the mechanisms behind reactions on surfaces are of extreme importance. There are two types of bimolecular reactions:

- ☐ Langmuir-Hinshelwood mechanism: two molecules absorb on neighboring sites and the absorbed molecules are part of a bimolecular reaction
- ☐ Eley-Rideal mechanism: only one of the molecules absorbs and the other one reacts with it from the gas phase

. Considering the catalytic recombination, the conservation of the site number is:

$$\frac{d}{dt}(N_s\theta) = -\frac{d}{dt}(N_s\theta_O) = \sum_i \tau_i \tag{4.1}$$

The surface terms during oxidation are:

$$N_{\tau_5} = k_{f_5}\theta_o - k_{b_5}\theta p_{CO} \tag{4.2}$$

$$N_{\tau_6} = k_{f_6}\theta_o p_o - k_{b_6}\theta p_{CO_2} \tag{4.3}$$

The flux of ablation is written as follow:

$$\dot{m}_c = \dot{m}_c = M_c\left(\frac{\tau_5}{M_{CO}} + \frac{\tau_6}{M_{CO2}}\right) M_c\left(\frac{\tau_5}{M_{CO}} + \frac{\tau_6}{M_{CO2}}\right) \tag{4.4}$$

where M is the molar mass.

4.1.2 Reactions with Nitrogen

Nitrogen species exist only when the external flow experiences extreme temperature conditions. Planetary reentries of probes at very high speeds are the unique scenarios during which these conditions are met. Reactions involving carbon and nitrogen are still only briefly known since their impact is negligible compared to oxidation. The reactions of carbon nitridation are listed in the following Table 3.

Table 3. Reactions of Carbon Nitridation

Reaction R_7	Site + N ↔ Site – N
Reaction R_8	Site – N + N ↔ Site + N_2
Reaction R_9	Site + N (+C_s) ↔ Site + CN

The surface terms creation for oxidation are

$$N_{\tau_7} = k_{f_7}\theta p_N - k_{b_7}\theta_N \quad (4.5)$$
$$N_{\tau_8} = k_{f_8}\theta_N p_N - k_{b_8}\theta p_{N_2} \quad (4.6)$$
$$N_{\tau_9} = k_{f_9}\theta - k_{b_9}\theta p_{CN} \quad (4.7)$$

For these reactions, the flux of ablation is expressed as follow:

$$\dot{m}_c = M_c \left(\frac{\tau_9}{M_{CN}}\right) \quad (4.8)$$

4.1.3 Sublimation

Sublimation of carbon releases different molecules and is characterized by the Knudsen-Langmuir law:

$$\dot{m}_c = \alpha_i \left(\frac{M_{C_i}}{2\pi RT}\right)^{1/2} \left(p_{C_{ieq}} - p_{C_i}\right) \quad (4.9)$$

Where the sticking coefficient α_i depends on experimental data. This category of reactions forms the species C_1 to C_3 as summarized in Table 4.

The surface terms creation for oxidation are:

$$N_{\tau_{10}} = k_{10}\theta - k_{b_{10}}\theta p_C \quad (4.10)$$
$$N_{\tau_{11}} = k_{f_{11}}\theta^2 - k_b \theta^2 p_{C_2} \quad (4.11)$$
$$N_{\tau_{12}} = k_{f_{12}}\theta^3 - k_b \theta^3 p_{C_3} \quad (4.12)$$

For the most part, the gas phase is composed by carbonaceous species in combination with homogenous reactions.

Table 4. Reactions of sublimation

Reaction R_{10}	Site ($+C_s$) ↔ Site – C
Reaction R_{11}	2Site ($+2C_s$) ↔ 2Site + C_2
Reaction R_{12}	3Site ($+3C_s$) ↔ 3Site + C_3

4.1.4 Partition of Energy 1-D Model

It is possible to study the impact of energy and gas injection during radiation processes, chemical reactions, and also conduction. The stationary 1-D model implies a final steady state. The heat flux is obtained from a mass and energy balance at wall:

$$\dot{q}_{cond} = \rho_e u_e C_H (h_a - h^*)_g - \dot{q}_R + \dot{m}\,\Delta h \tag{4.13}$$

The incident flux (4.13) describes a change in conduction, radiation, and solid gas with a specific mass flow rate for the carbon removed. The apparent ablation enthalpy Δh is defined by

$$-\dot{m}\,\Delta h = \rho_e u_e C_H (h^*_g - h_g) + \dot{m}(h_s - h_g) + \dot{m}_g (h_{gp} - h_p) \tag{4.14}$$

and it expresses both the variation of enthalpy due to the physico-chemical reactions, and the influence of the convective term due to the change in composition at the wall.

The 1-D model has a stationary solution, which conducts to evaluate the flux of conduction by bringing the temperature from $T_o = 300\ K$ at "infinity" to T close to the wall. This phenomenon causes the temperature profile to be constant in the moving direction to the wall.

Note that the problem considers a stagnation point for a given atmosphere assuming the stagnation pressure to be $p_0 = constant$ while varying the fluid velocity V_{inf}. A set of values for stationary ablation is obtained by defining the resolution of the system $f(T) = 0$, which is calculated as follow:

$$\frac{d(\rho c_i)}{dt} + \frac{J_{i_\delta} - J_{i_p}}{\delta} = \dot{\omega}_i \tag{4.15}$$

With

$$J_{i_p} = \dot{m}_i \tag{4.16}$$

$$J_{i_\delta} = \rho_e u_e C_M (c_{i_e} - c_i) + \dot{m}\, c_i \tag{4.17}$$

Note that $\dot{m}\, c_i$ equals $\rho v c_i$ and relates to the gas injection.

For every configuration (4.15), the heat flux is calculated and compared to each convective flux in absence of injection, given the same wall temperature. Therefore, the wall temperature at the stagnation point can be determined based on the heat flux from the following equation:

$$\dot{q}_0 = \rho_e u_e C_H (h_a - h^*)_{g_0} \tag{4.18}$$

The partition of energy on carbon ablative wall is shown in Figure 9. The results, which are independent of the density of carbon, show—in the case of ablation—that an increase in V_{inf} leads to an increase in temperature.

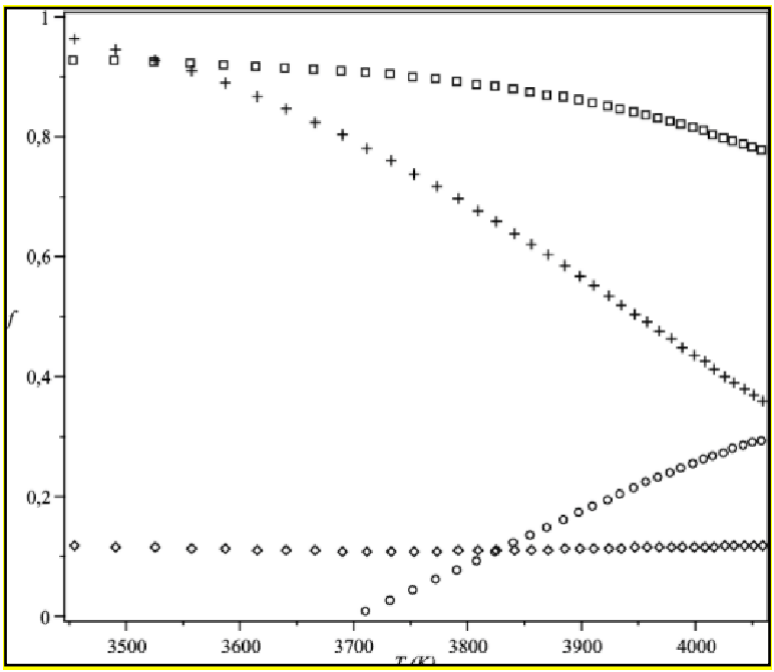


Figure 9. Partition of energy on carbon ablative wall. (Duffa, Ablative Thermal Protection Systems Modeling, 2013)

The *y*-axis and *x*-axis represent the fraction of q_o and the temperature respectively. The following Table 5 explains the designations related to Figure 9.

Table 5. Curves - Designation

Symbol	Designation
o	Convection
+	Radiation
◇	Conduction
□	Ablation

The term of ablation is initially exothermic and then increases considerably. Compared to the value of the convective flux at the current temperature, the ablation through radiation, injections, and chemical reactions has reduced by an order of magnitude the flux of conduction.

4.2 Pyrolysis and Pyrolyzable Materials

The most common material used for a TPS is a resin binder to a fiber network:

- ☐ 2-D resin-silica materials
- ☐ 3-D resin silica materials
- ☐ Carbon-resin tape-wrapped carbon phenolic (TWCP)
- ☐ Phenolic-impregnated carbon ablator (PICA)

Resins endure a thermal degradation, which acts like a thermal 'barrier.' This phenomenon is called pyrolysis. Pyrolysis is an endothermic reaction during which the gases produced migrate to the surface while producing an energy exchange with the solid. This process causes the porosity to increase and therefore, the heat conduction decreases. Endo-energetic reactions between the products formed occur in the boundary layer. In the process of being ejected from the boundary layer, the gases experience exchanges of mass and energy. This phenomenon is called blowing. Note that the material should reach a sufficient level of porosity to be able to withstand the thermomechanical stresses, since the density has a significant impact on the ablation velocity.

4.2.1 Phenolic Resin

Phenolic resin also called Phenol-formaldehyde polymer is widely used in aerospace industry. It has the advantage of being easy to implement. Its density is 1270 kg/m^3. The elemental composition of Phenolic Resin is given in the following table.

Table 6. Elemental composition of Phenolic Resin

Element	Mass fraction [%]
C	71 to 78
O	16 to 78
H	5 to 6
N	0 to 7

The gases resulting from the pyrolysis end up at the surface. Hence, the thermal decomposition occurs in an atmosphere composed by the gases themselves in the absence of oxygen. There are three sets of pyrolysis reactions:

- Depolymerization $(-CH_2-) + (-OH)$
  - Temperature in Kelvin between 600 and 800
- Condensation $(-OH) + (-OH)$
  - Temperature in kelvin between 700 and 1100
- ☐ Hydrogen abstraction
  - Temperature in Kelvin greater than 900

After 1600 K, the porosity of the material decreases due to the nano-level rearrangement of carbon. Hence, these reactions are not sufficient to explain the chemical evolution. As evident in Table 7, the reported molar quantities of produced gases change from author to author. Therefore, the pyrolysis mass loss law for phenolic resin varies. In this case, the study emphasizes the values found in previous analyses (J.B Henderson, 1980). Pyrolysis global reactions are listed below:

$$R_{CH2} \rightarrow R_2 + 0.5\ H_2O + 0.5\ R(CH_3)_n$$
$$R_2 \rightarrow R + 0.13\ H_2O + 0.13CO + 0.15\ CH_4 + 0.59\ H_2$$
$$R \ \rightarrow R_d + H_2$$

Table 7. Pyrolysis Mass Loss Law for Phenolic Resin (Duffa, Ablative Thermal Protection Systems Modeling, 2013)

Author	Number of steps	G	A	T_A	n
Duffa (E. Venkatapathy, 2017)	3	0.64	20.1	5,500	1
		0.84	115	7,000	1
		0.94	122	10,000	1
Sutton (Trick, 1994)	1	0.5	4.7×10^{16}	24,536	1
			4.96×10^{14}	25,137	1
Trick & Al (Duffa, Ablation, 1996)	1	0.5	227	8,885	1
			1931	11,733	1
			10.55	9,270	1
			6.6×10^{6}	23,830	1
Duffa & Al (H-K Ahn, 2002)	1	0.5	1390	8,070	1
Ahn & Al (G. Duffa, 2005)	1	0.5	677	3,544	1
			1.64×10^{9}	19,680	1

The experiments related to the pyrolysis mass loss law are extremely difficult due to the level of uncertainty. The large range of results obtained by the authors justifies the necessity of considering the reactions according to previously published data.

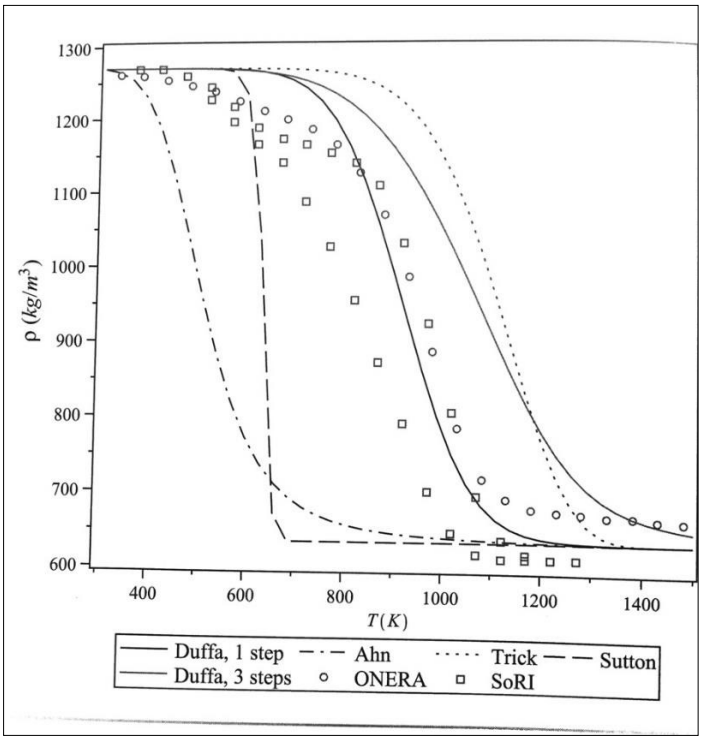


Figure 10. Phenolic resin mass loss. (Duffa, Ablative Thermal Protection Systems Modeling, 2013)

5. Multi-Dimensional Transient Computation of the Conduction inside the Ablator

5.1.1 Physical Procedure

This approach is used to analyze the coupled chemically reacting boundary layer and charring ablator (S. Langston, 2017) (S. Walker, 2015). It can also be described as an approach for characterizing charring ablator response with in-depth coking reactions.

Coking reactions studied in this project include thermal cracking of gaseous hydrocarbons. The focus is on one type of ablation, which consists of reactive, inert, and carbon constituents. The types of subsurface reactions are the following:

- ☐ Decomposition of a maximum value of three organic constituents to form char and pyrolysis gas products
- ☐ Kinetically controlled decomposition of pyrolysis gas
- ☐ Chemical erosion of the subsurface char matrix during chemical erosion

An ablation material has two constituents: inert and reactive. The inert constituents, such as silica, are not subject to molecular changes. The reactive constituents, which may be vaporized chemically by other pyrolysis products, consists in organic materials. For instance, carbon and graphite.

The initial decomposition of the composite is expressed as follow:

$$\text{Inert} + \text{Reactive} \rightarrow \text{Inert} + \text{Carbon (S)} + \text{Gas (0)} \qquad (5.1)$$

The previously cited equation demonstrates that the inert does not intervene in the reaction but it is transferred into the initial decomposed material. However, the reactive constituents are subject to changes in molecular configuration and phase. In this case, the initial reaction results in solid carbon and pyrolysis gas. Equation (5.1) describes the initial pyrolysis with a focus on coking.

The equation considered to analyze the initial off-gas elemental composition is the following:

$$\tilde{K}_{k,g,o} = \frac{m_p * \tilde{K}_p - m_c \tilde{K}_c}{m_p - m_c} \quad (5.2)$$

Table 8 lists the variables necessary to calculate the mass of element K per unit of gas evolved.

Table 8. Variables involved in the initial off-gas elemental composition

m_p	Mass of virgin plastic sample
m_c	Mass of char after decomposing in an inert atmosphere at a temperature from 2,000 to 3,000 degrees Rankine
$\tilde{K}_C$	Mass of element k per unit mass of char
$\tilde{K}_P$	Mass of element k per unit of virgin plastic

The initial decomposition gas causes an increase in temperature and a decrease in pressure. These changes will lead the initial gas products to experience a considerable number of chemical reactions (S. Walker, 2015):

- ☐ Decomposition of the gas composed by high-molecular-weight hydrocarbons
- ☐ Decomposition of CO_2, H_2O and H_2
- ☐ Decomposition of hydrocarbons resulting in coking (5.3)
- ☐ Char density buildup
- ☐ Chemical erosion below the heated surface by the gases containing carbon vaporization

$$CH_4 \underset{\rightarrow}{\leftarrow} 2H_2 + C\ (S) \quad (5.3)$$

At this stage, using the following Equation (5.4) in Arrhenius form specifies the coking rate. The forward rate coefficient in Arrhenius is:

$$K_{f\,I} = A_i\, e^{-E_i/R\,T} \quad (5.4)$$

where A_i is the frequency factor and E_i the activation energy. Note that *i* is the number of iterations.

$$mi_{\text{coke}} = \sum_i mi_{\text{coke I}} \quad (5.5)$$

From the gaseous pyrolysis products, the total coking rate is obtained by summing the coking rates corresponding to each reaction. Both physical constants A_i and E_i have to be specified since the rate is highly depended upon each specific molecular species (S. Walker, 2015).

Considering simultaneously the initial decomposition of the composite, initial off-gas elemental composition, and decomposition of hydrocarbons resulting in coking in Arrhenius form is sufficient to obtain a charring ablation solution. Thus, regardless of the intensity of kinetics, the approach predicts the coking rates with the previously cited equations.

This procedure allows specifying the coking rate as function of coking potential (carbon mass fraction) and rate coefficient. The effect of considered coking reactions is expressed in Arrhenius Form ((5.4). The coking potential is calculated as follow:

$$\dot{m}_{\text{coke}} \propto k_f (\tilde{K}_g - \tilde{K}_{gE}) \tag{5.6}$$

Where $\tilde{K}_g$ is the elemental carbon mass fraction and $\tilde{K}_{gE}$ the mass fraction of the gas (equilibrium state).

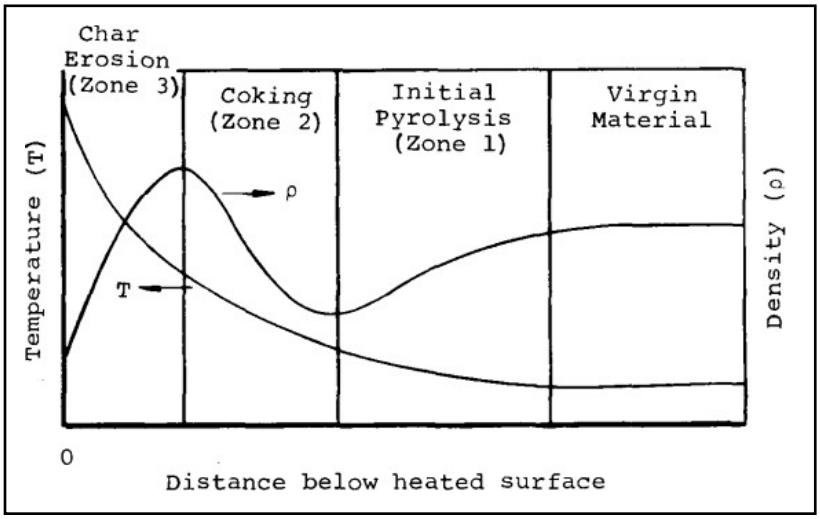


Figure 11. Reactions occurring when the gas passes through char (Trick, 1994)

Various types of reactions occur when the gas passes through char. They are represented in Figure 11. The reactions are: Initial Pyrolysis, Coking, and Char Erosion. During Initial pyrolysis, the gas reacts with itself. Thus, $\tilde{K}_{kg} = \tilde{K}_{kgo}$. Between Zone 2 and Zone 3, the reactions are reversible. From Zone 3 to Zone 2, the carbon is added to the initial gas with a decrease in density and temperature.

$$\text{gas (0)} \rightarrow \text{Gas + Carbon (S)} \tag{5.7}$$

During the opposite transition ($2 \rightarrow 3$), the temperature increases exponentially since the following reaction occurs:

$$\text{Gas + Carbon (S)} \rightarrow \text{gas (0)} \tag{5.8}$$

Coking reactions characterize chemical reactions that occur when the carbon atoms are transferred between the pyrolysis gases and char structure. Coking and Char Erosion involve a transfer of carbon elements between the gas and porous char.

Each reaction regime is characterized and related to an adapted physical model. The following paragraphs describe the reactions.

Type 1 Reactions – A computation of the subsurface composition predicts a formation of a considerably dense char since it allows observing simultaneously chemical equilibrium considerations during char density experiments. From this point, two conclusions are possible: a formation of an unable-to-stick condensed phase carbon or high molecular weight hydrocarbons incapable to decompose with respect to the chemical equilibrium. Since irrefutable experimental evidence is not yet available, type 1 reactions are studied by computing the initial gas phase elemental composition as expressed in Equation (5.2).

The following assumptions are made:

- ☐ Gas phase chemical equilibrium
- ☐ Condensed phase carbon not being a consequence of the reaction
- ☐ Equilibrium calculations to eliminate undesirable species

Type 2 Reactions – Conclusive experimental evidence exists. It justifies that char densification occurs between two areas: decomposition zone and heated surface. Char densification is the consequence of a formation of a condensed phase carbon in the organic pyrolysis gas products. The previous statement is validated by the fact that the gases are composed by more carbon than if they would have been in an equilibrium state. A kinetic equation is used to obtain the rate of each coking reaction (Equations (5.2(5.4(5.5(5.6).

Type 3 Reactions – Chemical equilibrium is highly predicted to occur between pyrolysis and char with local char layer temperatures able to reach 4,500 degrees Rankine. A sufficient amount of carbon is added during the reaction with the purpose of maintaining the chemical equilibrium. The main consequence of the char erosion is the decrease in density. In the extreme range of cases, the density is close to zero.

5.1.2 Species Conservation

In order to have a deep understanding of the rate of decomposition and pyrolysis, an assessment of the ablation material and the pyrolysis gases is required. Several factors define the ablation of a material beside relative quantities (reactive, inert and carbon): temperature, pressure, and gas carbon content. The previously cited factors are obtained respectively from the energy and momentum equations presented in the following sections.

The species conservation equations relates the rate of change of ablation material and pyrolysis gas compositions to decomposition and coking process. This process occurs in the char layer and

decomposition zone. Recall in Reaction 1 and 3, the ablation material is a mixture of 3 species: inert, reactive, and carbon.

The total mass is calculated with the following equation (S. Walker, 2015):

$$m = m_i + m_r + m_c + m_g \tag{5.9}$$

The total mass is a function of the mass of inert constituents (m_i), mass of condensed carbon (m_c), mass of gas (m_g) and mass of all i reactive constituents (m_r). The gas mass is generally much smaller than all other quantities involve in Equation (5.9).

Considering a control volume and mass change rates of a constituent *a*, 3 chemical reactions are possible (cited below) and convection:

- ☐ Organic decomposition
- ☐ Coking
- ☐ Char erosion

The mass of constituent is a function of time and position.

$$m_a = m_a(\theta, y) \tag{5.10}$$

$$\frac{\partial m}{\partial \theta}\Big|_x = \frac{\partial}{\partial \theta}\left(\sum_a m_a\right)_x \tag{5.11}$$

The chain rule is applied to Eq. (5.11 with respect to time at constant *x* yields

$$\frac{\partial m_a}{\partial \theta}\Big|_x = \frac{\partial m_a}{\partial \theta}\Big|_y + \frac{\partial m_a}{\partial y}\Big|_\theta \frac{\partial y}{\partial \theta}\Big|_x \tag{5.12}$$

Taking into consideration the surface recession rate S, S is differentiated with respect to *x* and *y*.

$$\frac{\partial s}{\partial \theta}\Big|_x = \frac{dS}{d\theta} = S \tag{5.13}$$

The conservation equation for condensed phase species below the considered surface is expressed as follow:

$$\frac{\partial m_a}{\partial \theta}\Big|_x = \frac{\partial m_a}{\partial \theta}\Big|_y + \frac{\partial m_a}{\partial y}\Big|_\theta S \tag{5.14}$$

Where, $\frac{\partial m^a}{\partial y}\Big|_\theta S$ represents the convection term, which can be easily determined. However, the species change rates related to chemical reactions, $\frac{\partial m^a}{\partial \theta}\Big|_y$, varies depending on the nature of the species. The gas generation rate resulting from the coking reactions is a function of decomposition and gas-to-condensed-phase transfer (S. Walker, 2015).

$$\frac{\partial \dot{m}_{ga}}{\partial y}\Big|_\theta = \frac{\partial}{\partial \theta}(\rho_a A)_y \tag{5.15}$$

Replacing the variable *a* by *c* (carbon), the gas phase conservation of carbon depends essentially on the total mass fraction of the element carbon and pre-exponential constant for kinetic decomposition equation.

$$\frac{\partial}{\partial y}(\tilde{K}_{\epsilon g}\dot{m}_g)_\theta = \frac{\partial}{\partial \theta}(\tilde{K}_\epsilon \rho A)_y \tag{5.16}$$

Table 9 summarizes the equations of species conservation depending on the studied element.

Table 9. Equations of species conservation with respect to the studied element

Rate of change	Equation	
Species conservation for carbon, when a=c	$\frac{\partial}{\partial y}(\tilde{K}_{\epsilon g}\dot{m}_g)_\theta = \frac{\partial}{\partial \theta}(\tilde{K}_\epsilon \rho A)_y$	(5.17)
Organic decomposition reaction	$\frac{\partial m_c}{\partial \theta})_{y,d} = \sum_{i=1,2,3} -K^\circ_{c_{if}} m_{io} \frac{\partial K^\circ_i}{\partial \theta})_y$	(5.18)

Rate of change	Equation	
Forward coking reactions (Carbon is transferred from the pyrolysis gas to the char	$\left(\frac{\partial \tilde{K}_{cg}}{\partial \theta}\right)_{y,K_i} = -k_c e^{-Ec/RT}(P)^{nc}\left(\tilde{K}_{cgE}\right)^{n_c}$	(5.19)
Reverse coking reactions (Carbon is removed from the charring material to the pyrolysis gas)	$\left(\frac{\partial \tilde{K}_{cg}}{\partial \theta}\right)_{\theta} = \left(\frac{\partial \tilde{K}_{cgE}}{\partial T}\right)_{P}\left(\frac{\partial T}{\partial y}\right)_{\theta} + \left(\frac{\partial \tilde{K}_{cgE}}{\partial P}\right)_{T}\left(\frac{\partial P}{\partial y}\right)_{\theta}$	(5.20)

5.1.3 Momentum Equation

Forward and reverse coking reactions are function of pressure. Since the evaluation of char stresses is pressure dependent, it is necessary to calculate the pressure at each point in the char layer. The momentum equation relates the gas flow rate to the pressure distribution throughout the char layer. The generalization of experimental data allows for obtaining the local pressure in the char layer.

The pressure gradient is expressed in terms of viscous and inertial forces in the following correlation equation:

$$\frac{dP}{dy} = \propto \mu v + \beta \rho v^2 \tag{5.21}$$

Where:

- Velocity vector is $v = \frac{\dot{m}_g}{\rho g^A}$
- Gas flow rate per unit total area is $\dot{m}_g = \rho v$
- Empirical coefficients for porous particles are $\propto$ and β.

Viscous and momentum forces are summed in Eq. (5.21). Equation (5.21) is used to obtain an accurate estimate of pressures in the char layer of ablating materials. In addition, it is valid for a wide range of conditions.

5.1.4 Energy Equation

The subsurface energy equation for a charring ablator is expressed in terms of density and enthalpy. It is the rate of energy storage of conduction and convection. Density and enthalpy are assumed to be sufficient to represent the material state only in the case where mass transfer occurs between the char and the pyrolysis gas. Considering a control volume and assuming that the storage term is function of mass and enthalpy, a subsurface energy conservation equation (S. Langston, 2017) is obtained:

$$\sum_a m_a c_{p_a} \frac{\partial T}{\partial \theta}\Big|_x = \Delta\left(kA \frac{\partial T}{\partial x}\right)_\theta + \Delta(\dot{m}_g h_g)_\theta + S \sum_a m_a c_{p_a} \frac{\partial T}{\partial x}\Big|_\theta + \sum_a h_a \frac{\partial m_a}{\partial \theta}\Big|_y \quad (5.22)$$

5.1.5 Energy Conservation

A finite difference interpretation with respect to temperature is obtained from the subsurface energy equation conservation Eq. (5.22).

$$T_{n\theta^*} = T_{n\theta} + \frac{\Delta\theta}{\sum_{a=I,c,r}(m_a c_{p_a})_n}\left\{\frac{(T_{n-1}-T_n)_\theta}{\frac{\delta_{n-1}}{2k_{n-1}A_{n-1}} + \frac{\delta_n}{2k_n A_n}} - \frac{(T_n - T_{n+1})_\theta}{\frac{\delta_n}{2k_n A_n} + \frac{\delta_{n+1}}{2k_n A_n}} + (\dot{m}_g h_g)_{n+1} - (\dot{m}_g h_g)_n + \sum_{a=c,r} h_{a_n} \frac{\partial m_a}{\partial \theta}\right)_y\Big\} + \dot{S}\left[\frac{T_{n+1}-T_n}{(\delta_{n+1}+\delta_n)/2}\right]\Delta\theta \quad (5.23)$$

Where

$$\sum_{a=c,r} \frac{\partial m_a}{\partial \theta}\Big|_y = \frac{\partial m_c}{\partial \theta}\Big|_{Y,decom} + \frac{\partial m_r}{\partial \theta}\Big|_y \quad (5.24)$$

$\frac{\partial m_c}{\partial \theta}\Big|_{Y,decom}$ is given by Eq. (5.18)

$\frac{\partial m_r}{\partial \theta}\Big|_y$ $\frac{\partial m_a}{\partial \theta}\Big|_y$ $\sum_{a=c,r}$ is defined in section 5.2

Contrary to Eq. (5.24), Eq. (5.25) is explicit in temperature and implicit in mass. Both of them are appropriate to study ablation materials except in the case where the heated surface node equals 1.

$$
\begin{aligned}
T_{n\theta^*} = T_{n\theta} + \frac{\Delta\theta}{\sum_{a=l,c,r}(m_a c_{p_a})_n}\Bigg\{ & \frac{(T_{n-1} - T_n)_{\theta^*}}{\frac{\delta_{n-1}}{2k_{n-1}A_{n-1}} + \frac{\delta_n}{2k_n A_n}} \\
& - \frac{(T_n - T_{n+1})_{\theta^*}}{\frac{\delta_n}{2k_n A_n} + \frac{\delta_{n+1}}{2k_{n+1}A_{n+1}}} \\
& + \dot{m}_{g_{n+1,\theta}}\left[h_{g_{n+1,\theta}} + c_{p_{g_{n,\theta}}}(T_{n+1,\theta^*} - T_{n+1,\theta})\right] \\
& - m_{g_{n,\theta}}\left[h_{g_{n,\theta}} + c_{p_{g_{n,\theta}}}(T_{n,\theta^*} - T_{n,\theta})\right] \\
& + \sum_{a=c,r}\left[h_{a_{n,\theta}} + c_{p_{a_{n,\theta}}}(T_{n,\theta^*} - T_{n,\theta})\right]\left(\frac{\partial m_a}{\partial\theta}\right)_Y\Bigg\} + S\Delta\theta\left[\frac{T_{n+1,\theta^*} - T_{n,\theta^*}}{(\delta_{n+1}+\delta_n)/2}\right]
\end{aligned}
\tag{5.25}
$$

6. CFD Simulation of the Flow Fields for Simplified Boundary Conditions

The ablation model based on plasma wind tunnel experiments was developed and tested at Von Karman Institute using the VKI Plasmatron described in 8.1.1. The approach used for the experiments is simplified boundary conditions in the CFD simulation of the flow fields. The main goal of this analysis is to study a carbon-cased non-charring material behavior with an emphasis on the gas-surface interface (A. Turchi, 2014).

6.1.1 Governing Equations

Thermal equilibrium and chemical non equilibrium flows for spherical blunt bodies are expressed by the following equation:

$$\frac{\partial U}{\partial t} + \frac{\partial F}{\partial r} + \frac{\partial F^d}{\partial r} = S \tag{6.1}$$

where U, F and F^d are respectively the vector of the conservative variables, the inviscid fluxes and diffusive fluxes (A. Turchi, 2014).

The pressure distribution around the blunt body assuming hypersonic flows is:

$$p - p_\infty = \frac{1}{2}\rho_\infty u_\infty^2 cos^2\theta \tag{6.2}$$

In case of a subsonic flow, Eq.(6.3) is obtained from the potential flow theory.

$$p - p_\infty = \frac{1}{2}\rho_\infty u_\infty^2 (cos^2\theta - \frac{5}{4} sin^2\theta) \tag{6.3}$$

From Eq. (5.22), the solid-phase energy conservation is found representing the variation of the material sensible energy as function of time. The variation of sensible energy in Eq. (5.23) is due to a combination of converted energy and conduction occurring inside the material.

$$\frac{\partial}{\partial t}(\rho_s h_s A) = \frac{\partial}{\partial r}(A\lambda_s \frac{\partial T_s}{\partial r}) + \dot{s}\frac{\partial}{\partial r}(\rho_s h_s A) \tag{6.4}$$

The initial temperature is assumed to be constant. Hence, the solid density and solid thermal conductivity are also invariable through the material. In other words, if the thickness of the material is adequate, the temperature does not vary with respect to the moving coordinate system as expressed in Eq. (6.5) relating a steady-state solid conductive heat flux.

$$\dot{q}_{cond} = \lambda_s \frac{\partial T}{\partial r} + \dot{s}\rho_s(h_{s_w} - h_{s_b}) \tag{6.5}$$

Where $\dot{s} = \frac{\dot{m}_s}{\rho_s}$

Eq. (6.4) and Eq. (6.5) are solid-phase governing equations for non-charring ablative materials (A. Turchi, 2014)

A non-pyrolyzing ablative materials implies neglecting any loss of condensed phase. Thus, the species conservation equation can be written as function of species conductive flux and diffusive flux. The gas-surface interface expresses the catalytic balance in absence of ablation. Since the blowing velocity is zero, and only the surface heterogeneous reactions are taken into account for the mass injections, the following equation is obtained:

$$(\rho u)_w = \dot{m}_s \tag{6.6}$$

where the mass of ablated material is $m_s = \sum_i^{N_s} w_{i_w}$.

The subsurface energy conservation equation Eq. (5.23) is derived in order to find the balance of energy fluxes at the surface:

$$\lambda_w \left[\frac{\partial T}{\partial r}\right]_w - \sum_i^{N_s}(h_i \rho_i u_w^d) + \dot{q}_{net}^{rad} + \dot{m}_s h_w = (h\rho u)_w + \dot{m}_s(h_{s_w} - h_{s_b}) \tag{6.7}$$

Note that Eq. (6.5) to obtain Eq. (6.7) can be used since we consider the solid conductive heat flux at steady state.

The following Table 10 describes each term from Eq. (6.7).

Table 10. Terms from Equation (6.7)

Terms	Description
$\lambda_w \left[\frac{\partial T}{\partial r}\right]_w$	Gas conduction
$\sum_i^{N_s} (h_i \rho_i u_i^d)_w$	Diffusion consumption
$\dot{q}_{rad_{net}}$	Radiation consumption
$\dot{m}_s h_{s_w}$	Surface material consumption
$(h\rho u)_w$	Existing energy fluxes due to gas blowing
$\dot{m}_s (h_{s_w} - h_{s_b})$	Solid conduction

The net radiative heat flux is obtained by assuming a constant integral emissivity and an absence of coupling with radiation code:

$$\dot{q}_{rad_{net}} = \dot{q}_{rad_{in}} - \dot{q}_{rad_{out}} = -\sigma \varepsilon_s T_w^4 \tag{6.8}$$

where ε_s is the constant integral emissivity from experimental data.

Computation of source items requires to define a range of surface reactions and assess the material consumption. The surface reaction velocity of each reaction depends on the following parameters and theory:

- ☐ Number flux of the reactant species getting to the surface
- ☐ Probability of each reaction to take place
- ☐ Kinetic theory

$$k_i^r = \frac{\gamma_i}{4} \sqrt{\frac{8\,RT_w}{\pi M_i}} \tag{6.9}$$

Where the reactions probabilities for ablative and catalytic surface reactions are expressed by γ_i^r. The mass equation Eq. (5.9) is expressed as function of time with the aim of evaluating the contribution of each constituent of the two oxidation reactions, and the simultaneous nitridation and sublimation reactions.

$$\dot{m}_s = \dot{m}_O + \dot{m}_{O_2} + \dot{m}_N + \dot{m}_{subl} = \left(\frac{\dot{w}_O}{M_{O_2}} + \frac{2\dot{w}_{O_2}}{M_O} + \frac{\dot{w}_N}{M_N} + \frac{\dot{w}_{C_3}}{M_C}\right) M_C \tag{6.10}$$

6.1.2 Numerical Modeling

Munafo developed the VKI stagnation-line code. The solver uses the spatial discretization of Equation (6.1) while considering the cell-centered finite volume method. The upwind reconstruction is used to find cell interface variables. Roe's Approximate Riemann solver computes numerical convective fluxes. Primitive variables are defined to describe the diffusive fluxes and source terms: ρ_i, u, v, T. The weighted average and central finite difference approximations estimate the primitive variables and their gradients. The cell center value of primitive variables is an important parameter in the evaluation of diffusive fluxes.

VKI code is used simultaneously with Mutation ++ Library presented in section 8.1.2. The program uses thermodynamic properties from NASA. Kinetic theory provides equations for macroscopic transport coefficients. Arrhenius law form calculates the forward reaction rate coefficients needed to evaluate the chemical production rate for species. The backward reaction rate is obtained only if the equilibrium relation is satisfied.

The ablative boundary conditions are implemented from different approaches used for previous applications. The convective and diffusive fluxes at the gas-surface interface are obtained by solving Equation (6.10).

6.1.3 Experimental Conditions and Preliminary Test

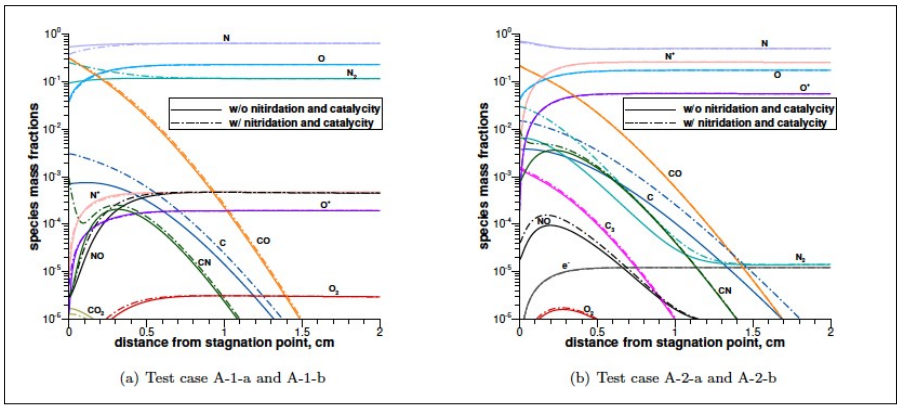
The nitridation reaction probability through the gas-surface interaction model is computed by taking into consideration the surface mass balance. The ablation is assumed to be at a steady state. Hence, Equation. (6.7) is used to compute the temperature. The experimental results (A. Turchi, 2014)prove the pertinence of using the governing equations previously cited. The freestream conditions for the Arcjet are listed in Table 11.

Table 11. Arcjet – Freestream Conditions

Variable	Numerical value
Velocity, m/s	5354
Density, kg/m^3	0.003
Temperature, K	1428
y_{O_2}	0.617
y_{NO}	0.005
y_O	0.121
y_N	0.257

6.1.4 Results

In this case, several tests of a carbon fiber were performed in nitrogen and air environment. The gas-surface interaction processing occurred up to a maximum temperature of 2650 Kelvin. A comparison between numerical results and experimental results confirms a surface temperature of 2000K during catalycity of the carbon fiber.



(a) Test case A-1-a and A-1-b (b) Test case A-2-a and A-2-b

Figure 12. Stagnation streamline mass fraction distribution for the Air test cases (A. Turchi, 2014)

Table 12. Comparison between experimental and numerical results (A. Turchi, 2014)

Test ID	Experimental		Numerical			
	$\dot{m}_{s_{\mathrm{exp}}}$, kg/m^{2}s	$T_{w_{\mathrm{exp}}}$, K	$\dot{m}_{s_{\mathrm{num}}}$, kg/m^{2}s	$\dot{m}_{\mathrm{O}}$, kg/m^{2}s	$\dot{m}_{\mathrm{N}}$, kg/m^{2}s	$T_{w_{\mathrm{num}}}$, K
A-1-a	0.0086–0.01034	2160–2200	0.0075	0.0075	—	1845
A-1-b	0.0086–0.01034	2160–2200	0.0082	0.0080	0.0002	2067
A-2-a	0.0082–0.01006	2828–2868	0.0082	0.0082	—	2712
A-2-b	0.0082–0.01006	2828–2868	0.0098	0.0082	0.0015	2719

7. Parametric Study of an Ablative TPS for a Lunar Return Capsule Vehicle

7.1 Methodology

For this analysis, two trajectories are simulated using Trajectory Analysis Program with the purpose of studying the heating parameters and sizing a TPS. In this section, the body geometry and initial conditions are presented, the heating profiles from Apollo 4 and Apollo 10 are compared, and a method of TPS sizing is discussed based on different initial assumptions.

7.2 Body Geometry and Initial Conditions

7.2.1 Body Geometry

Table 13. Body Geometry – Apollo 4 & Apollo 10

Variable	Apollo 4	Apollo 10
Vehicle entry mass (kg)	5424.51	5498.22
Nose radius (m)	4.6609	4.6609
Base radius (m)	1.9609	1.9558
Reference length (m)	3.9218	3.9116
Corner radius (m)	0.1778	0.1778
Reference area (m^2)	12.0796	12.0171
Angle of attack (deg)	154	161.450

7.2.2 Atmospheric Entry Conditions

Table 14. Atmospheric Entry Conditions – Apollo 4 & Apollo 10

Variable	Apollo 4	Apollo 10
Hyperbolic excess velocity (km/sec)	1.438877	
Altitude at entry (km)	121.92	123.883305
Radial distance at entry (km)	6490.92	6498.602775
Inertial velocity at entry (km/sec)	11.175340	11.067062
Inertial entry angle (gamma) (deg)	-7.209085	-6.616517
Inertial heading angle (deg)	68.141149	71.928267
(geo/areo)centric latitude (deg)	21.55	-23.510640

7.3 Heat transfer and TPS

Heat transfer prediction is critical to a thermal protection system design. An appropriate selection of heatshield material and thickness is highly dependent on heat flux, total heat load, and surface temperature. Heat is transferred from the high-temperature shock layer to the vehicle by forced convection and radiation. Hence, this section discusses convective heat flux, radiative heat flux, and stagnation pressure for Apollo 4 (AS-501) and Apollo 10. The results obtained from TRAJ code and FIAT are analyzed based on heatshield design process.

7.3.1 Convective Heat Transfer

The roof of many of the approximations for convective heat transfer can be traced back to the work of Fay and Riddel in 1958. Convective heat flux is a function of freestream velocity, mass density, and enthalpy. Enthalpy is not only a function of wall temperature and stagnation pressure but also the sum of internal energy per unit mass and the ratio of the pressure divided by density. Note that internal energy is the kinetic energy due to translational, rotational, and vibrational motion.

Numerical simulations were conducted using TRAJ trajectory code written by Gary A. Allen (NASA Ames).

Table 13 lists the geometric parameters for Apollo 4 and 10. The difference between the two designs is assumed to be negligible since it is evaluated to less than 5%. The same reasoning has been followed regarding the atmospheric entry conditions presented in Table 14. Contrary to Apollo 4, the trajectory of Apollo 10 was ran based on Apollo Guidance Computer (AGC) algorithm with a fixed angle of attack and no roll modulation (Figure 13). The thermal analysis of Apollo 4 was conducted assuming a fixed lift-to-drag ratio. It is relevant to study the effects of the previously cited assumptions on the accuracy of the results.

```
24152 ▼ P67 predict3: time 705.650000
24153       latang 0.000000 deg, y 0.000000 deg
24154       predangl 2.543332 q->bank 15.203604 deg
```

Figure 13. TRAJ Code – AGC fixed angle of attack without roll modulation

Figure 14 and Figure 15 show respectively the convective heat flux as a function of time for Apollo 4 and Apollo 10. AS-501 reaches a peak convective heat flux of 243.57 W/cm^2 at an altitude of 52.95 km, and a velocity of 9.62 km/s. As for Apollo 10, the peak convective heat flux has a maximum value of 199.36 W/cm^2 at an altitude of 56.76 km and a velocity equal to 9.66 km/s. The discrepancy between the two peaks proves that similar geometric parameters and reentry conditions do not guarantee an exact agreement of convective heating profiles. However, the similar shape of the curves not only validates the accuracy of the results but also confirms the importance of considering the Apollo Guidance Computer algorithm.

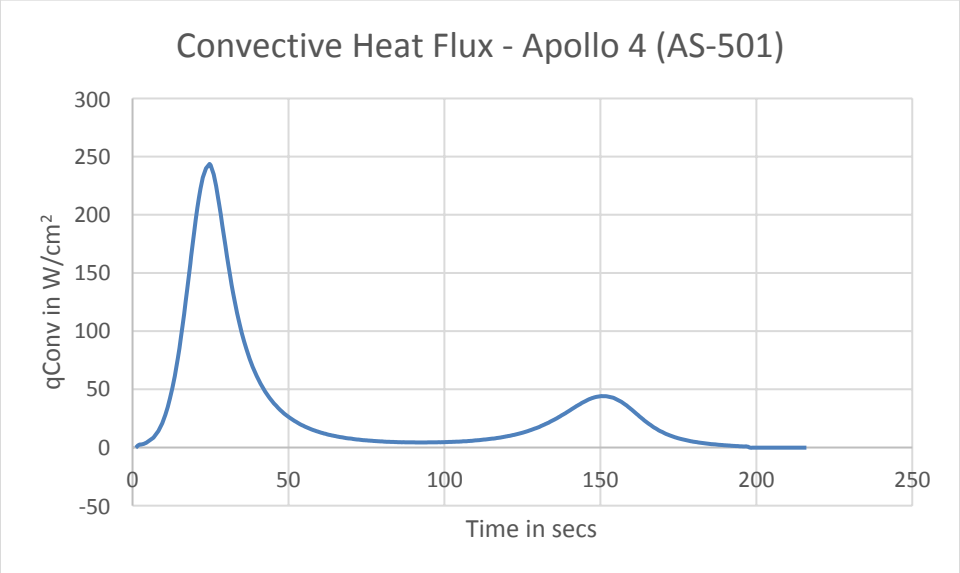


Figure 14. Convective heat flux – Apollo 4.

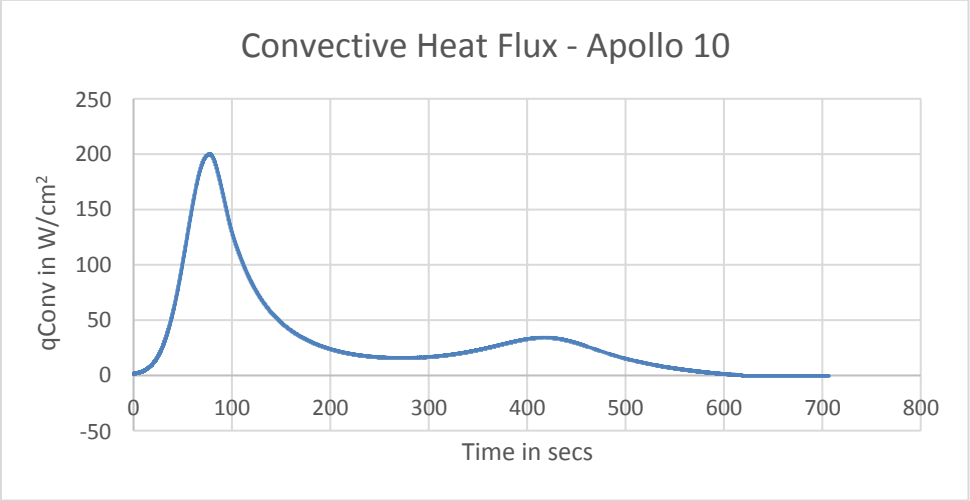


Figure 15. Convective heat flux– Apollo 10.

7.3.2 Radiative Heat Transfer

Lunar-return entry vehicle is subject to considerable amount of radiative heating during the reentry. The dominant form of heat transfer for a reentry vehicle is convective heat transfer at the vehicle surface. Note that radiative heating is caused by high temperature shock layer gasses. In some cases, the radiative heating can exceed the convective heating. Due to the complexity of the radiative phenomenon, computational methods to study in depth radiative heat transfer are tedious, especially with the introduction of ablation products into the boundary layer. For this reason, it appears more accurate to consider the results from Apollo 10 simulations with AGC algorithm since they are based on flight data. Figure 19 shows that during the reentry, the peak value of radiative heat flux is much greater than the peak value of convective heat flux. However, Figure 17 and Figure 18 focus on radiative heat flux. The first observation is based on the shape of the curves since it reveals an absence of radiative heat after around 70 secs for Apollo 10 and 55 seconds for Apollo 4.

The stagnation point radiative heat flux increases with increased nose radius. From Table 13, Apollo 4 and 10 have the same nose radius. Hence, this design consideration is not relevant in this study.

It is pertinent to evaluate the portion of radiative heating with respect to total heat flux. Table 15 shows the peak stagnation point heat flux and total heat load for Apollo 4 and 10. The TRAJ simulation results

confirm that at entry velocities less than 12 km/s (Rivell, 2006), the stagnation point heat flux and the stagnation point heat load are dominated by convective heating as shown in **Error! Reference source not found.**. For Apollo 4, the total heat load is 30 percent radiative and 70 percent convective. As for Apollo 10, the total heat load is 21 percent radiative and 79 percent convective.

Table 15. Peak stagnation point heat flux and total heat load – Apollo 4 and 10

Entry vehicle	BP Kg/m^2	Q_{CONV} J/cm^2	Q_{RAD} J/cm^2	Q_{TOT} J/cm^2	$\%Q_{RAD}$	$\% Q_{CONV}$
Apollo 4	385.2	20191.91	8857.53	29049.43	30.49	69.51
Apollo 10	347.80	23196.10	6327.76	29496.87	21.45	78.64

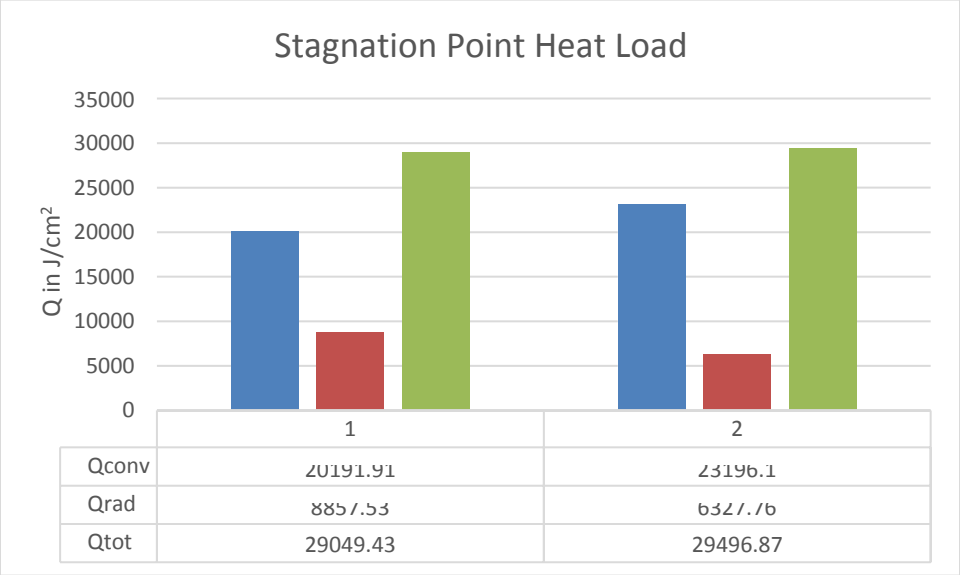


Figure 16. Stagnation point heat load

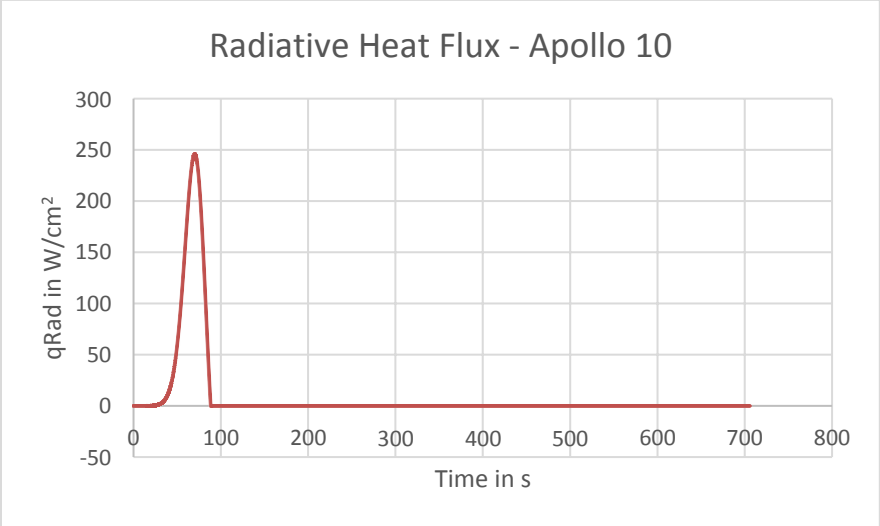


Figure 17. Radiative heat flux – Apollo 10

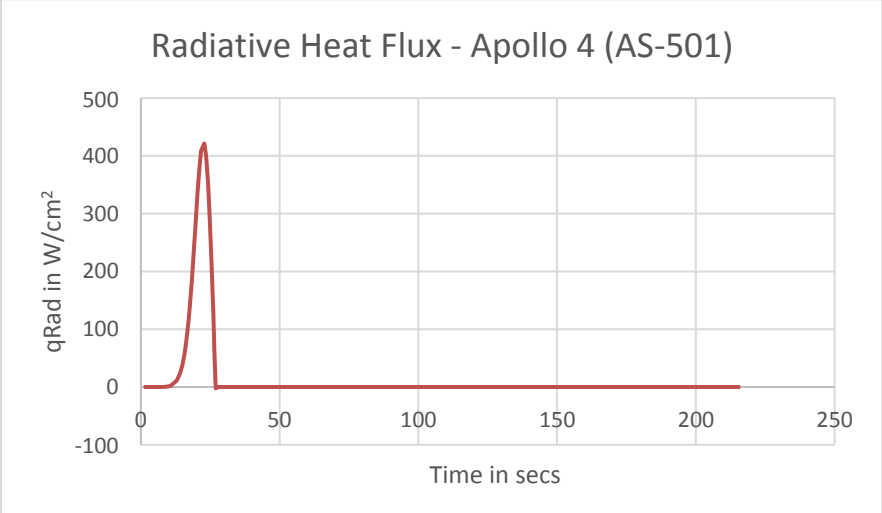


Figure 18. Radiative heat flux – Apollo 4

7.3.3 Total Heat Flux

Figure 19 and Figure 20 graphically illustrates that the total heat flux is the sum of convective heat flux and radiative heat flux. The figures also emphasize the major impact of convective heat flux (blue curve) on the total heat flux (green curve). It validates the analysis in the previous sub-section.

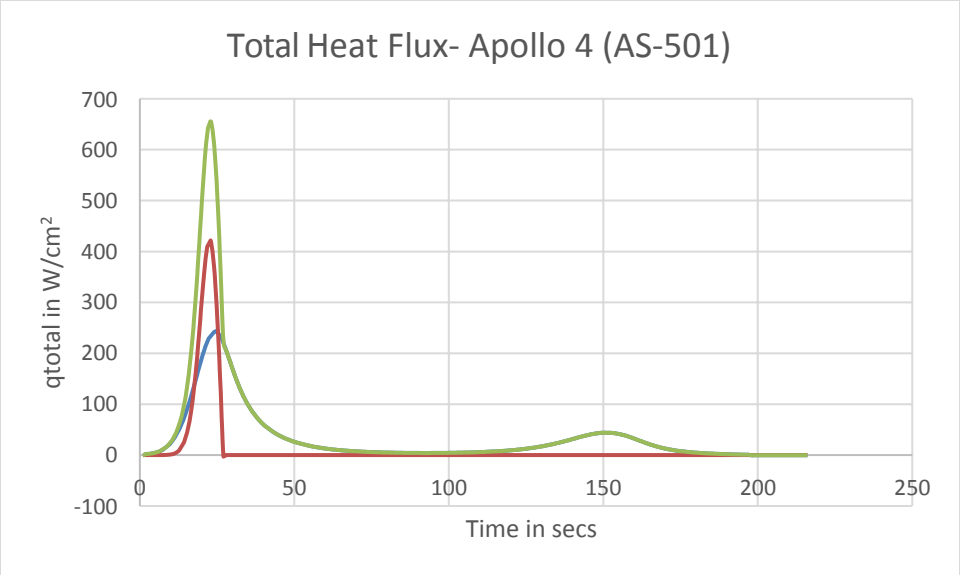


Figure 19. Total heat flux – Apollo 4

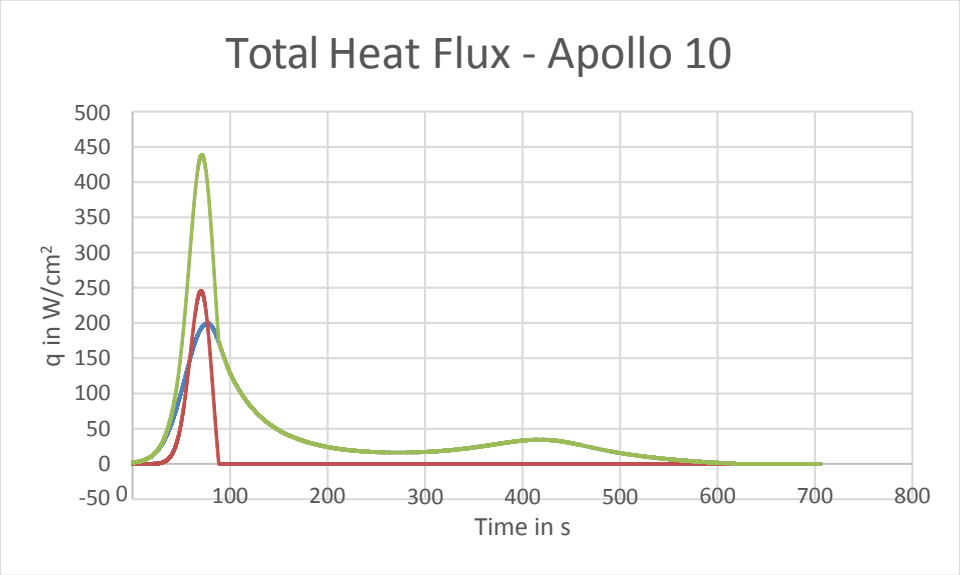


Figure 20. Total heat flux – Apollo 10

7.3.4 Stagnation Pressure

Stagnation pressure is the static pressure at a point in the fluid where the fluid velocity is zero. This point is called the stagnation point. In this section, the stagnation pressure is studied with respect to entry velocity. For both missions, the plots look similar as shown in Figure 21 and Figure 22. The peak stagnation pressure is 4.38×10^4 Pa when the velocity reaches 9.80 m/s during atmospheric reentry of Apollo 10. Apollo 4 reaches a much higher maximum value of stagnation pressure at a velocity of 8.98

m/s. The peak stagnation pressure is $7.07x10^4$ Pa. A second increase in stagnation pressure is noticed during the last phase of reentry.

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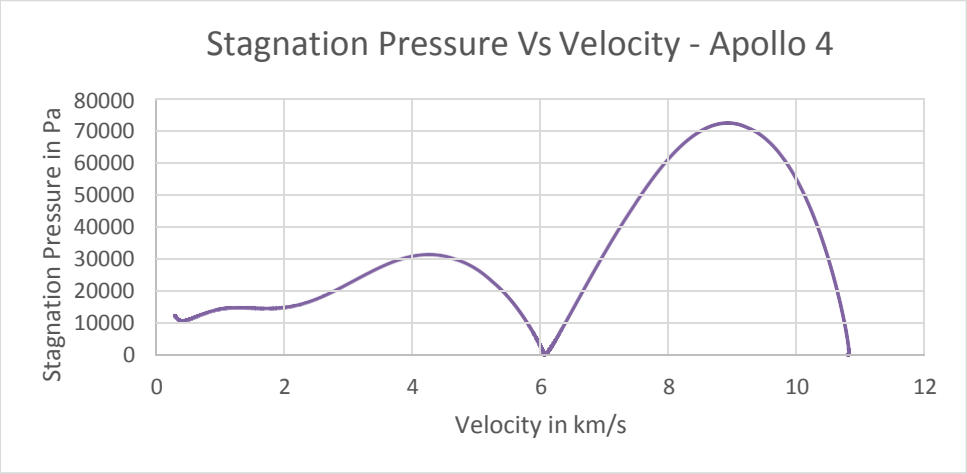

Figure 21. Stagnation pressure Vs Velocity – Apollo 4

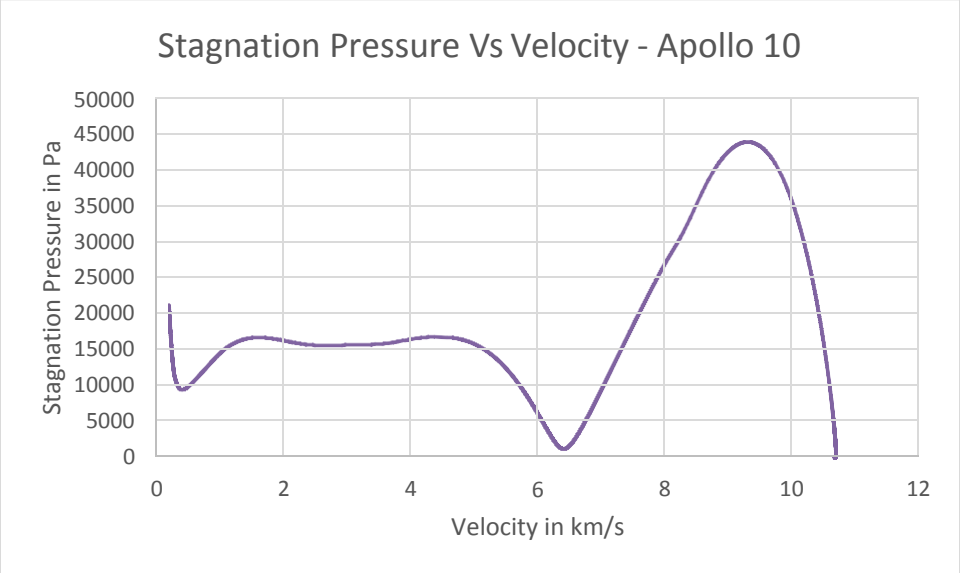

Figure 22. Stagnation pressure Vs Velocity – Apollo 10

7.4 TPS Sizing

Thermal protection system design is critical for reentry vehicle mission success (Rivell, 2006). Apollo 4 & 10 reentering at velocity around 10 km/s encounter severe heat loads and heat flux as shown in Table 15. Several methods exist to estimate convective and radiative heat fluxes. For this project, TRAJ code and FIAT were used to assess the best ablating material capable of withstanding severe temperatures.

Ablation is a complex process explained in details in section 4. In the online version of NASA's dictionary of technical terms (Glover, 2006): *Ablative materials are used on the surfaces of some reentry vehicles to absorb heat by removal of mass, thus blocking the transfer of heat to the rest of the vehicle and maintaining temperatures within design limits. Ablating materials absorb heat by increasing in temperature and changing in chemical or physical state. The heat is carried away from the surface by a loss of mass (liquid or vapor). The departing mass also blocks part of the convective heat transfer to the remaining material in the same manner as transportation cooling.*

Ablation material sizing is performed using FIAT. FIAT code is incorporated in NASA's TRAJ trajectory simulation code. Due to the restricted amount of ablative materials available in the unclassified version of the code, the simulations were only performed for PICA. From previously published data, it is known that Apollo command capsule used Avcoat 5026-39 with a density of 529 kg/m^3. Phenolic impregnated carbon ablator can be produced in a range of densities from 225 to 880 kg/m^2. PICA starts to spall when the stagnation pressure gets over 100,000 Pa but the results from TRAJ identified a peak stagnation pressure of $1.41x10^5$Pa. Hence, PICA is not an appropriate TPS for Apollo. It appeared that running TRAJ with AGC algorithm for TPS sizing causes the code to glitch. Therefore, a simulation has been conducted assuming a fixed angle of

attack. Figure 23 shows a section of page 15 from NASA TM-X report. The peak value obtained from TRAJ simulation is 6.88g's, which is less than 2 percent greater than the Best Estimate Trajectory (BET) value of 6.76g's. The DSKY predicted value of GMAX is 6.56g's. Note that TRAJ predicted more accurately the peak deceleration.

The LVO was displayed in the up orientation. At EI - 18 minutes, 50 seconds, the DSKY predicted values of GMAX = 6.56g's, velocity at EI = 36,311 ft/sec and flight path angle at EI = -6.48 degrees were displayed. These values compared very favorably to the actual (BET) conditions of GMAX = 6.76g's, Velocity (EI)= 36,314 ft/sec and flight path angle (EI) = -6.54. At EI - 18 minutes, 26 seconds, the final DSKY display of P61 was obtained. The pre-

Figure 23. NASA TM-X report Page15 – DSKY prediction.

The TPS sizing process in TRAJ starts with the specification of the geometry and initial conditions as shown in the following in Figure 24 and Figure 25. The next step consists in selecting the heatshield material and thickness. Radiation equilibrium heating at an adiabatic outer wall with constant emissivity is assumed. The remaining assumptions are listed in Figure 26.

```
    Vehicle entry mass:        5498.220  kilograms
    Angle-of-attack:            161.450  degrees
    Bank angle:                   0.000  degrees
    Nose radius [default]:        4.6609 meters
    Base radius:                  1.9558 meters
    Reference length:             3.9116 meters
    Corner radius:                0.1778 meters
    Reference area:              12.0171 meters^2
```

Figure 24. TPS sizing - Geometry.

```
Atmospheric Entry Conditions:
     entered from planet centered orbit.
     altitude at entry             =  123.883305 km
     radial distance at entry      = 6498.602775 km
     inertial velocity at entry    =   11.067062 km/sec
     inertial entry angle (gamma)  =   -6.616517 deg
     inertial heading angle        =   71.928267 deg
     (geo/areo)centric latitude    =  -23.510640 deg
```

Figure 25. TPS sizing – Initial conditions.

The stagnation point thermal protection system sizing was computed considering PICA with zero thickness margin. A series of 12 iterations lead to an optimal thickness of TPS equal to 1.448 inches as showed in Figure 27. The code calculates the optimal heatshield thickness for a

specified backface temperature. Note that the option of generating plots is suggested at this stage of the simulation but the choice has been made to export output data to Excel with the purposes of including detailed summary table in the report and studying the impact that changing certain parameters can have on the design.

```
Earth selected as the destination planet.
Gravitational model includes J2 harmonic.
US_1976 selected as the atmospheric model.
Default convective heat flux model selected.
Default radiative heat flux model selected.
Destination planet is assumed to be rotating:
     relative velocity at entry    =   10.657662 km/sec
     relative entry angle (gamma)  =   -6.871884 deg
     relative heading angle        =   71.198319 deg
     (geo)areographic latitude     =  -23.651741 deg
Bank angle set to -180.00 deg. at t =   115.00 sec.
     TPS material model:  PICA_air
     Planar "radius exponent" assumed for Fiat.
```

Figure 26. TPS sizing- Selection of heatshield material and thickness

```
Fiat algorithm 0:  Fiat_3_1_2_zero
     TPS thickness guess:   4.392107 inches  538.34700 deg.C
     TPS thickness guess:   2.588160 inches   42.44576 deg.C
     TPS thickness guess:   1.686186 inches  118.73058 deg.C
     TPS thickness guess:   1.235200 inches  203.77609 deg.C
     TPS thickness guess:   1.460693 inches  314.02732 deg.C
     TPS thickness guess:   1.347946 inches  246.14525 deg.C
     TPS thickness guess:   1.404320 inches  276.46641 deg.C
     TPS thickness guess:   1.432506 inches  259.33208 deg.C
     TPS thickness guess:   1.446600 inches  252.60860 deg.C
     TPS thickness guess:   1.439553 inches  249.33290 deg.C
     TPS thickness guess:   1.443076 inches  250.96500 deg.C
     TPS thickness guess:   1.444838 inches  250.14831 deg.C
 TPS recession:  0.4699 cm,  0.1850 inches
 Maximum Fiat calculated Wall temperature:   2886.35 K at    72.0 sec.
 Optimal TPS thickness: 1.4448 inches, 3.6699 cm after 12 iterations.
```

Figure 27. TPS sizing – Thickness iterations and optimal thickness

Note that the peak deceleration is found to be 22.57g's but it is because the simulation was ran without AGC subroutine. PICA is not appropriate for lunar return missions since the high dynamic pressure will tear off the TPS. Avcoat 5026-39 is the correct TPS for Apollo Command Module but its complexity makes it difficult to model.

The maximum values and stagnation point heat loads are listed in the following Figure 28 and Figure 29.

Maximum Values					
Value	Quantity	Time (sec)	Altitude (km)	Velocity (km/sec)	Ball.Coef. (kg/m^2)
Deceleration Magnitude	221.29 m/sec^2 22.57 g	1036.0	30.38	2.92	348.04
Dyn. Pressure	7.42e+04 pascals	1036.0	30.38	2.92	348.04
Stg. Pressure	1.41e+05 pascals	1036.0	30.38	2.92	348.04
Cnv. Heat Flux	198.41 W/cm^2	77.5	56.88	9.67	347.80
Rad. Heat Flux	243.54 W/cm^2	70.5	59.20	10.06	347.80
Tot. Heat Flux	435.64 W/cm^2	71.2	58.89	10.02	347.80
Wall Temp.	3048.12 K	Same as above line.			

Figure 28. TPS sizing – Maximum values

Stagnation Point Heat Loads	
Value	Quantity
Convective	22746.90 joules/cm^2
Radiative	6317.67 joules/cm^2
Total	29064.57 joules/cm^2

Figure 29. TPS sizing – Stagnation point heat loads.

8. Facilities & Numerical Tool Testing

During a hypersonic flight through the planetary atmosphere, the spacecraft experiences high temperatures and high heat fluxes. A thermal protection system is a single point-of-failure subsystem. It is the main reason why its performance has to be validated through ground tests and analysis. (A. Turchi, 2014)

8.1.1 Von Karman Institute Plasmatron

Von Karman Institute Plasmatron is a facility developed in order to develop and test new TPS. The absence of electrodes and their associated erosion ensure a high purity of plasma flows since the gas is heated by induction through a coil. VKI Plasmatron is designed to study complex gas-surface interaction such as ablation and catalysis. It also helps to have a deep understanding of chemical interactions between gaseous species and solid material constituents. The Plasmatron test chamber enables accurate monitoring of the freestream conditions during the tests while measuring the following parameters: Recession rate, surface temperature, and spectrally resolved Boundary Layer Emission. These previously cited factors are fundamental for ablation experiment validation.

8.1.2 Mutation++ library

Mutation++ is a numerical tool, which computes the thermal and transport properties of gas mixtures in order to evaluate the gas-phase chemical source terms.

8.1.3 Fully Implicit Ablation and Thermal Analysis Program

FIAT simulates one-dimensional thermal energy transport in a multilayer stack of isotropic materials and structures that can ablate from the front surface and decompose in depth. The implicit solution algorithm and general solution technique make the program very stable and robust for application to both robotic

and crewed vehicles entering a planetary atmosphere from space. For input, the code reads material property information from a database file.

(FIAT NASA Software,2018)

9. Conclusion and Future Work

A study of previous thermal protection systems has been conducted to evaluate the state-of-the-art and identify major challenges. During atmospheric reentry, space vehicles are subject to forces such as gravity and atmospheric drag. Therefore, an analysis of the motion of spacecraft moving under the previously cited forces was essential to define design requirements and present the trajectory considerations.

The most common ablative materials used to protect reentry capsules are carbon-based ablators. For this reason, the focus of the study was on ablation of carbon, pyrolysis, and pyrolyzable materials. A deep understanding of chemical reactions relating to ablation was crucial in order to investigate two different approaches conducted by experts from Von Karman Institute in Belgium. The results showed that the gas-surface interaction process occurs up to a maximum temperature of 2650K with a surface temperature of 2000K during catalycity of the carbon fiber.

A parametric study of an ablative TPS for a lunar return capsule vehicle was performed considering Apollo 4 and Apollo 10. Thanks to the available flight data, also called in this report Apollo Guidance Controller (AGC) subroutine, the simulations for Apollo 10 predicted more accurately the peak deceleration than the Best Estimate Trajectory (BET). The analysis of heating profiles revealed that the total heat flux was approximately 70 percent convective and 30 percent radiative. This outcome confirmed that at entry velocities less than 12km/h, the stagnation point heat flux and the stagnation heat load are dominated by convective heat. However, the results from Apollo 4 shows that the peak radiative heat flux can exceed the peak convective heat flux.

A TPS sizing was performed using simultaneously TRAJ code and FIAT without AGC subroutine. It is known from previous similar missions that the optimal TPS for lunar return

missions is Avcoat but unfortunately, this ablative material is still complex to model. A simulation with PICA was conducted to present in detail the TPS sizing process from defining the reentry environment to obtaining the optimal thickness of the ablator.

In order to obtain more accurate results, a guidance controller algorithm should be implemented into the TRAJ code so as to enable FIAT to run simultaneously with TRAJ code. This improvement will enable an optimization of the TPS thickness based on a reentry environment. In future work, a detailed analysis of Avcoat will be conducted to have a deep understanding of its behavior during the reentry phase.

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Appendix

TRAJ- Output – Apollo 4

Time s	Vel km/s	q Conv W/cm2	q Rad W/cm2	q tot W/cm2	Stag P Pas
0	10.771	2.2	0	2.2	2.03
3	10.775	2.8	0	2.8	3.35
6	10.779	3.7	0	3.7	5.96
9	10.782	5.1	0	5.1	1.17E+01
12	10.785	7	0	7	2.31E+01
15	10.789	9.6	0.1	9.7	4.51E+01
18	10.792	13.2	0.3	13.5	8.82E+01
21	10.794	18	0.6	18.6	1.71E+02
24	10.796	24.3	1.3	25.6	3.24E+02
27	10.798	32.4	2.8	35.2	6.01E+02
30	10.797	42.5	5.9	48.4	1.07E+03
33	10.795	54.5	11.5	66	1.82E+03
36	10.788	68.8	21.4	90.2	3.00E+03
39	10.775	85.5	38.4	123.9	4.79E+03
42	10.754	104.6	65.6	170.2	7.43E+03
45	10.72	125.2	105.3	230.5	1.10E+04
48	10.669	147.1	159.9	307	1.58E+04
51	10.596	169.5	228.1	397.6	2.19E+04
54	10.496	191	303.3	494.3	2.91E+04
57	10.365	210.4	372.3	582.7	3.74E+04
60	10.199	226.2	416.8	643	4.61E+04
63	9.998	236.8	418.8	655.6	5.44E+04
66	9.766	242.1	368.8	610.9	6.16E+04
69	9.509	242.7	271.4	514.1	6.67E+04
72	9.235	234.8	143.9	378.7	6.97E+04
75	8.954	221	0	221	7.07E+04
78	8.673	204.6	0	204.6	6.94E+04
81	8.402	186.8	0	186.8	6.62E+04
84	8.146	169	0	169	6.15E+04
87	7.91	151.9	0	151.9	5.61E+04
90	7.697	136.1	0	136.1	5.03E+04
93	7.507	122.1	0	122.1	4.48E+04
96	7.337	109.6	0	109.6	3.95E+04
99	7.188	98.6	0	98.6	3.46E+04
102	7.057	88.9	0	88.9	3.02E+04
105	6.943	80.3	0	80.3	2.62E+04
108	6.844	72.8	0	72.8	2.27E+04

Time s	Vel km/s	q Conv W/cm2	q Rad W/cm2	q tot W/cm2	Stag P Pas
111	6.758	66.1	0	66.1	1.96E+04
114	6.684	60.2	0	60.2	1.69E+04
117	6.619	55	0	55	1.46E+04
120	6.564	50.3	0	50.3	1.25E+04
123	6.515	46.1	0	46.1	1.08E+04
126	6.474	42.4	0	42.4	9.28E+03
129	6.438	39	0	39	7.98E+03
132	6.406	36	0	36	6.87E+03
135	6.379	33.2	0	33.2	5.91E+03
138	6.356	30.7	0	30.7	5.09E+03
141	6.335	28.4	0	28.4	4.39E+03
144	6.317	26.4	0	26.4	3.78E+03
147	6.302	24.5	0	24.5	3.27E+03
150	6.288	22.8	0	22.8	2.83E+03
153	6.276	21.2	0	21.2	2.45E+03
156	6.265	19.7	0	19.7	2.12E+03
159	6.256	18.4	0	18.4	1.84E+03
162	6.248	17.1	0	17.1	1.60E+03
165	6.24	16	0	16	1.39E+03
168	6.234	15	0	15	1.21E+03
171	6.228	14.1	0	14.1	1.06E+03
174	6.222	13.2	0	13.2	9.34E+02
177	6.218	12.4	0	12.4	8.22E+02
180	6.213	11.7	0	11.7	7.26E+02
183	6.209	11	0	11	6.43E+02
186	6.206	10.4	0	10.4	5.71E+02
189	6.203	9.9	0	9.9	5.09E+02
192	6.2	9.3	0	9.3	4.56E+02
195	6.197	8.9	0	8.9	4.09E+03
198	6.194	8.4	0	8.4	3.68E+02
201	6.192	8	0	8	3.32E+02
204	6.19	7.7	0	7.7	3.02E+02
207	6.188	7.3	0	7.3	2.75E+02
210	6.186	7	0	7	2.50E+02
213	6.184	6.7	0	6.7	2.29E+02
216	6.183	6.4	0	6.4	2.10E+02
219	6.181	6.2	0	6.2	1.93E+02
222	6.18	6	0	6	1.78E+02
225	6.178	5.8	0	5.8	1.66E+02
228	6.177	5.6	0	5.6	1.55E+02
231	6.176	5.4	0	5.4	1.45E+02
234	6.175	5.3	0	5.3	1.37E+02

Time s	Vel km/s	q Conv W/cm2	q Rad W/cm2	q tot W/cm2	Stag P Pas
237	6.174	5.1	0	5.1	1.29E+02
240	6.173	5	0	5	1.23E+02
243	6.172	4.9	0	4.9	1.18E+02
246	6.171	4.8	0	4.8	1.13E+02
249	6.17	4.7	0	4.7	1.09E+02
252	6.17	4.6	0	4.6	1.05E+02
255	6.169	4.6	0	4.6	1.02E+02
258	6.168	4.5	0	4.5	1.00E+02
261	6.168	4.5	0	4.5	9.82E+01
264	6.167	4.5	0	4.5	9.68E+01
267	6.167	4.4	0	4.4	9.60E+01
270	6.166	4.4	0	4.4	9.55E+01
273	6.166	4.4	0	4.4	9.55E+01
276	6.165	4.4	0	4.4	9.60E+01
279	6.165	4.5	0	4.5	9.68E+01
282	6.165	4.5	0	4.5	9.82E+01
285	6.165	4.5	0	4.5	1.00E+02
288	6.164	4.6	0	4.6	1.02E+02
291	6.164	4.6	0	4.6	1.05E+02
294	6.164	4.7	0	4.7	1.09E+02
297	6.164	4.8	0	4.8	1.13E+02
300	6.164	4.9	0	4.9	1.17E+02
303	6.164	5	0	5	1.23E+02
306	6.164	5.1	0	5.1	1.29E+02
309	6.164	5.2	0	5.2	1.37E+02
312	6.164	5.4	0	5.4	1.45E+02
315	6.163	5.5	0	5.5	1.55E+02
318	6.163	5.7	0	5.7	1.65E+02
321	6.163	5.9	0	5.9	1.78E+02
324	6.163	6.2	0	6.2	1.92E+02
327	6.163	6.4	0	6.4	2.09E+02
330	6.163	6.7	0	6.7	2.28E+02
333	6.163	7	0	7	2.50E+02
336	6.163	7.3	0	7.3	2.73E+02
339	6.162	7.6	0	7.6	3.00E+02
342	6.162	7.9	0	7.9	3.31E+02
345	6.162	8.3	0	8.3	3.67E+02
348	6.161	8.7	0	8.7	4.07E+02
351	6.16	9.2	0	9.2	4.53E+02
354	6.159	9.7	0	9.7	5.07E+02
357	6.158	10.2	0	10.2	5.68E+02
360	6.157	10.8	0	10.8	6.39E+02

Time s	Vel km/s	q Conv W/cm2	q Rad W/cm2	q tot W/cm2	Stag P Pas
363	6.156	11.4	0	11.4	7.20E+02
366	6.154	12.1	0	12.1	8.15E+02
369	6.152	12.8	0	12.8	9.25E+02
372	6.149	13.6	0	13.6	1.05E+03
375	6.146	14.5	0	14.5	1.20E+03
378	6.142	15.4	0	15.4	1.37E+03
381	6.138	16.4	0	16.4	1.57E+03
384	6.132	17.4	0	17.4	1.80E+03
387	6.126	18.6	0	18.6	2.06E+03
390	6.119	19.8	0	19.8	2.37E+03
393	6.11	21	0	21	2.72E+03
396	6.1	22.4	0	22.4	3.13E+03
399	6.088	23.8	0	23.8	3.59E+03
402	6.074	25.2	0	25.2	4.12E+03
405	6.058	26.8	0	26.8	4.73E+03
408	6.04	28.4	0	28.4	5.43E+03
411	6.018	30	0	30	6.21E+03
414	5.993	31.7	0	31.7	7.10E+03
417	5.965	33.4	0	33.4	8.10E+03
420	5.932	35.1	0	35.1	9.22E+03
423	5.894	36.7	0	36.7	1.05E+04
426	5.851	38.3	0	38.3	1.18E+04
429	5.803	39.7	0	39.7	1.33E+04
432	5.748	41.1	0	41.1	1.49E+04
435	5.687	42.2	0	42.2	1.65E+04
438	5.619	43.1	0	43.1	1.83E+04
441	5.543	43.8	0	43.8	2.01E+04
444	5.461	44.2	0	44.2	2.19E+04
447	5.371	44.2	0	44.2	2.37E+04
450	5.273	44.1	0	44.1	2.56E+04
453	5.168	43.7	0	43.7	2.75E+04
456	5.055	42.9	0	42.9	2.93E+04
459	4.935	41.8	0	41.8	3.08E+04
462	4.809	40.4	0	40.4	3.22E+04
465	4.677	38.8	0	38.8	3.35E+04
468	4.541	36.9	0	36.9	3.45E+04
471	4.401	34.8	0	34.8	3.52E+04
474	4.258	32.6	0	32.6	3.56E+04
477	4.115	30.3	0	30.3	3.56E+04
480	3.972	28	0	28	3.54E+04
483	3.831	25.7	0	25.7	3.49E+04
486	3.692	23.5	0	23.5	3.41E+04

Time s	Vel km/s	q Conv W/cm2	q Rad W/cm2	q tot W/cm2	Stag P Pas
489	3.556	21.4	0	21.4	3.32E+04
492	3.424	19.5	0	19.5	3.21E+04
495	3.297	17.6	0	17.6	3.09E+04
498	3.174	16	0	16	2.97E+04
501	3.056	14.4	0	14.4	2.85E+04
504	2.943	13.1	0	13.1	2.73E+04
507	2.835	11.8	0	11.8	2.61E+04
510	2.731	10.7	0	10.7	2.50E+04
513	2.632	9.7	0	9.7	2.39E+04
516	2.538	8.8	0	8.8	2.30E+04
519	2.447	8	0	8	2.21E+04
522	2.36	7.3	0	7.3	2.13E+04
525	2.276	6.6	0	6.6	2.06E+04
528	2.195	6	0	6	1.99E+04
531	2.117	5.5	0	5.5	1.93E+04
534	2.041	5	0	5	1.88E+04
537	1.967	4.6	0	4.6	1.84E+04
540	1.895	4.2	0	4.2	1.80E+04
543	1.825	3.8	0	3.8	1.76E+04
546	1.756	3.5	0	3.5	1.73E+04
549	1.689	3.2	0	3.2	1.71E+04
552	1.622	2.9	0	2.9	1.68E+04
555	1.557	2.7	0	2.7	1.66E+04
558	1.492	2.4	0	2.4	1.65E+04
561	1.429	2.2	0	2.2	1.63E+04
564	1.366	2	0	2	1.61E+04
567	1.303	1.8	0	1.8	1.60E+04
570	1.242	1.6	0	1.6	1.58E+04
573	1.181	1.4	0	1.4	1.57E+04
576	1.121	1.3	0	1.3	1.55E+04
579	1.062	1.1	0	1.1	1.53E+04
582	1.004	1	0	1	1.50E+04
585	0.947	0.9	0	0.9	1.47E+04
588	0.893	0	0	0	1.44E+04
591	0.839	0	0	0	1.41E+04
594	0.788	0	0	0	1.37E+04
597	0.738	0	0	0	1.34E+04
600	0.691	0	0	0	1.30E+04
603	0.645	0	0	0	1.27E+04
606	0.602	0	0	0	1.24E+04
609	0.561	0	0	0	1.20E+04
612	0.523	0	0	0	1.17E+04

Time s	Vel km/s	q Conv W/cm2	q Rad W/cm2	q tot W/cm2	Stag P Pas
615	0.488	0	0	0	1.15E+04
618	0.456	0	0	0	1.13E+04
621	0.426	0	0	0	1.12E+04
624	0.399	0	0	0	1.11E+04
627	0.376	0	0	0	1.12E+04
630	0.356	0	0	0	1.14E+04
633	0.337	0	0	0	1.17E+04
636	0.32	0	0	0	1.20E+04
639	0.304	0	0	0	1.25E+04
640.94	0.295	0	0	0	1.27E+04

TRAJ- Output – Apollo 10 AGC

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
0	10.658	1.61E+00	26.5	2	0	2
0.1	10.658	1.63E+00	26.5	2	0	2
0.2	10.658	1.65E+00	26.6	2	0	2
0.3	10.658	1.68E+00	26.6	2	0	2
0.4	10.658	1.70E+00	26.7	2	0	2
0.5	10.658	1.72E+00	26.7	2	0	2
0.6	10.658	1.74E+00	26.8	2.1	0	2.1
0.7	10.658	1.76E+00	26.8	2.1	0	2.1
0.8	10.659	1.79E+00	26.8	2.1	0	2.1
0.9	10.659	1.82E+00	26.9	2.1	0	2.1
1	10.659	1.84E+00	26.9	2.1	0	2.1
1.1	10.659	1.87E+00	27	2.1	0	2.1
1.2	10.659	1.89E+00	27	2.1	0	2.1
1.3	10.659	1.92E+00	27.1	2.2	0	2.2
1.4	10.659	1.94E+00	27.1	2.2	0	2.2
1.5	10.659	1.97E+00	27.2	2.2	0	2.2
1.6	10.659	2.00E+00	27.2	2.2	0	2.2
1.7	10.66	2.03E+00	27.3	2.2	0	2.2
1.8	10.66	2.06E+00	27.4	2.2	0	2.2
1.9	10.66	2.09E+00	27.4	2.2	0	2.2
2	10.66	2.12E+00	27.5	2.3	0	2.3
2.1	10.66	2.15E+00	27.5	2.3	0	2.3
2.2	10.66	2.18E+00	27.6	2.3	0	2.3
2.3	10.66	2.21E+00	27.6	2.3	0	2.3
2.4	10.66	2.24E+00	27.7	2.3	0	2.3
2.5	10.66	2.27E+00	27.7	2.3	0	2.3
2.6	10.661	2.31E+00	27.8	2.4	0	2.4
2.7	10.661	2.34E+00	27.8	2.4	0	2.4
2.8	10.661	2.38E+00	27.9	2.4	0	2.4
2.9	10.661	2.41E+00	28	2.4	0	2.4
3	10.661	2.45E+00	28	2.4	0	2.4
3.1	10.661	2.48E+00	28.1	2.4	0	2.4
3.2	10.661	2.52E+00	28.1	2.5	0	2.5
3.3	10.661	2.56E+00	28.2	2.5	0	2.5
3.4	10.661	2.60E+00	28.2	2.5	0	2.5
3.5	10.662	2.64E+00	28.3	2.5	0	2.5
3.6	10.662	2.68E+00	28.4	2.5	0	2.5
3.7	10.662	2.72E+00	28.4	2.5	0	2.5
3.8	10.662	2.76E+00	28.5	2.6	0	2.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
3.9	10.662	2.80E+00	28.5	2.6	0	2.6
4	10.662	2.85E+00	28.6	2.6	0	2.6
4.1	10.662	2.89E+00	28.7	2.6	0	2.6
4.2	10.662	2.94E+00	28.7	2.6	0	2.6
4.3	10.662	2.99E+00	28.8	2.7	0	2.7
4.4	10.663	3.03E+00	28.8	2.7	0	2.7
4.5	10.663	3.08E+00	28.9	2.7	0	2.7
4.6	10.663	3.12E+00	29	2.7	0	2.7
4.7	10.663	3.17E+00	29	2.7	0	2.7
4.8	10.663	3.23E+00	29.1	2.8	0	2.8
4.9	10.663	3.28E+00	29.2	2.8	0	2.8
5	10.663	3.34E+00	29.2	2.8	0	2.8
5.1	10.663	3.39E+00	29.3	2.8	0	2.8
5.2	10.663	3.44E+00	29.4	2.8	0	2.8
5.3	10.664	3.50E+00	29.4	2.9	0	2.9
5.4	10.664	3.55E+00	29.5	2.9	0	2.9
5.5	10.664	3.61E+00	29.6	2.9	0	2.9
5.6	10.664	3.67E+00	29.6	2.9	0	2.9
5.7	10.664	3.74E+00	29.7	2.9	0	2.9
5.8	10.664	3.80E+00	29.8	3	0	3
5.9	10.664	3.87E+00	29.8	3	0	3
6	10.664	3.93E+00	29.9	3	0	3
6.1	10.664	3.99E+00	30	3	0	3
6.2	10.664	4.06E+00	30	3.1	0	3.1
6.3	10.665	4.12E+00	30.1	3.1	0	3.1
6.4	10.665	4.20E+00	30.2	3.1	0	3.1
6.5	10.665	4.27E+00	30.2	3.1	0	3.1
6.6	10.665	4.35E+00	30.3	3.2	0	3.2
6.7	10.665	4.43E+00	30.4	3.2	0	3.2
6.8	10.665	4.50E+00	30.5	3.2	0	3.2
6.9	10.665	4.58E+00	30.5	3.2	0	3.2
7	10.665	4.66E+00	30.6	3.3	0	3.3
7.1	10.665	4.73E+00	30.7	3.3	0	3.3
7.2	10.666	4.82E+00	30.8	3.3	0	3.3
7.3	10.666	4.91E+00	30.8	3.4	0	3.4
7.4	10.666	5.00E+00	30.9	3.4	0	3.4
7.5	10.666	5.10E+00	31	3.4	0	3.4
7.6	10.666	5.19E+00	31.1	3.4	0	3.4
7.7	10.666	5.28E+00	31.1	3.5	0	3.5
7.8	10.666	5.37E+00	31.2	3.5	0	3.5
7.9	10.666	5.46E+00	31.3	3.5	0	3.5
8	10.666	5.56E+00	31.4	3.6	0	3.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
8.1	10.667	5.67E+00	31.5	3.6	0	3.6
8.2	10.667	5.78E+00	31.5	3.6	0	3.6
8.3	10.667	5.89E+00	31.6	3.7	0	3.7
8.4	10.667	6.01E+00	31.7	3.7	0	3.7
8.5	10.667	6.12E+00	31.8	3.7	0	3.7
8.6	10.667	6.23E+00	31.9	3.7	0	3.7
8.7	10.667	6.34E+00	31.9	3.8	0	3.8
8.8	10.667	6.45E+00	32	3.8	0	3.8
8.9	10.667	6.58E+00	32.1	3.8	0	3.8
9	10.667	6.72E+00	32.2	3.9	0	3.9
9.1	10.668	6.86E+00	32.3	3.9	0	3.9
9.2	10.668	6.99E+00	32.4	4	0	4
9.3	10.668	7.13E+00	32.4	4	0	4
9.4	10.668	7.26E+00	32.5	4	0	4
9.5	10.668	7.40E+00	32.6	4.1	0	4.1
9.6	10.668	7.54E+00	32.7	4.1	0	4.1
9.7	10.668	7.69E+00	32.8	4.1	0	4.1
9.8	10.668	7.85E+00	32.9	4.2	0	4.2
9.9	10.668	8.02E+00	33	4.2	0	4.2
10	10.668	8.19E+00	33.1	4.3	0	4.3
10.1	10.669	8.36E+00	33.2	4.3	0	4.3
10.2	10.669	8.52E+00	33.2	4.3	0	4.3
10.3	10.669	8.69E+00	33.3	4.4	0	4.4
10.4	10.669	8.86E+00	33.4	4.4	0	4.4
10.5	10.669	9.03E+00	33.5	4.5	0	4.5
10.6	10.669	9.24E+00	33.6	4.5	0	4.5
10.7	10.669	9.45E+00	33.7	4.6	0	4.6
10.8	10.669	9.65E+00	33.8	4.6	0	4.6
10.9	10.669	9.86E+00	33.9	4.6	0	4.6
11	10.67	1.01E+01	34	4.7	0	4.7
11.1	10.67	1.03E+01	34.1	4.7	0	4.7
11.2	10.67	1.05E+01	34.2	4.8	0	4.8
11.3	10.67	1.07E+01	34.3	4.8	0	4.8
11.4	10.67	1.09E+01	34.4	4.9	0	4.9
11.5	10.67	1.12E+01	34.5	4.9	0	4.9
11.6	10.67	1.14E+01	34.6	5	0	5
11.7	10.67	1.17E+01	34.7	5	0	5
11.8	10.67	1.19E+01	34.8	5.1	0	5.1
11.9	10.67	1.22E+01	34.8	5.1	0	5.1
12	10.671	1.24E+01	34.9	5.2	0	5.2
12.1	10.671	1.27E+01	35	5.2	0	5.2
12.2	10.671	1.29E+01	35.1	5.3	0	5.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
12.3	10.671	1.32E+01	35.1	5.3	0	5.3
12.4	10.671	1.35E+01	35.2	5.4	0	5.4
12.5	10.671	1.37E+01	35.3	5.4	0	5.4
12.6	10.671	1.40E+01	35.3	5.5	0	5.5
12.7	10.671	1.43E+01	35.4	5.5	0	5.5
12.8	10.671	1.46E+01	35.5	5.6	0	5.6
12.9	10.671	1.49E+01	35.5	5.6	0	5.6
13	10.672	1.52E+01	35.6	5.7	0	5.7
13.1	10.672	1.55E+01	35.6	5.7	0	5.7
13.2	10.672	1.58E+01	35.7	5.8	0	5.8
13.3	10.672	1.61E+01	35.8	5.9	0	5.9
13.4	10.672	1.65E+01	35.8	5.9	0	5.9
13.5	10.672	1.68E+01	35.9	6	0	6
13.6	10.672	1.71E+01	35.9	6	0	6
13.7	10.672	1.75E+01	36	6.1	0	6.1
13.8	10.672	1.78E+01	36	6.1	0	6.1
13.9	10.672	1.81E+01	36.1	6.2	0	6.2
14	10.673	1.85E+01	36.1	6.2	0	6.2
14.1	10.673	1.89E+01	36.2	6.3	0	6.3
14.2	10.673	1.93E+01	36.2	6.4	0	6.4
14.3	10.673	1.97E+01	36.3	6.4	0	6.4
14.4	10.673	2.01E+01	36.3	6.5	0	6.5
14.5	10.673	2.05E+01	36.4	6.6	0	6.6
14.6	10.673	2.09E+01	36.4	6.6	0	6.6
14.7	10.673	2.13E+01	36.4	6.7	0	6.7
14.8	10.673	2.17E+01	36.5	6.7	0	6.7
14.9	10.673	2.21E+01	36.5	6.8	0	6.8
15	10.674	2.26E+01	36.6	6.9	0	6.9
15.1	10.674	2.31E+01	36.6	6.9	0	6.9
15.2	10.674	2.36E+01	36.7	7	0	7
15.3	10.674	2.40E+01	36.7	7.1	0	7.1
15.4	10.674	2.45E+01	36.7	7.1	0	7.1
15.5	10.674	2.50E+01	36.8	7.2	0	7.2
15.6	10.674	2.54E+01	36.8	7.2	0	7.2
15.7	10.674	2.59E+01	36.9	7.3	0	7.3
15.8	10.674	2.64E+01	36.9	7.4	0.1	7.5
15.9	10.674	2.70E+01	36.9	7.5	0.1	7.6
16	10.674	2.76E+01	37	7.5	0.1	7.6
16.1	10.675	2.81E+01	37	7.6	0.1	7.7
16.2	10.675	2.87E+01	37	7.7	0.1	7.8
16.3	10.675	2.92E+01	37.1	7.7	0.1	7.8
16.4	10.675	2.98E+01	37.1	7.8	0.1	7.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
16.5	10.675	3.03E+01	37.1	7.9	0.1	8
16.6	10.675	3.09E+01	37.2	7.9	0.1	8
16.7	10.675	3.16E+01	37.2	8	0.1	8.1
16.8	10.675	3.22E+01	37.2	8.1	0.1	8.2
16.9	10.675	3.29E+01	37.3	8.2	0.1	8.3
17	10.675	3.36E+01	37.3	8.3	0.1	8.4
17.1	10.676	3.42E+01	37.3	8.3	0.1	8.4
17.2	10.676	3.49E+01	37.4	8.4	0.1	8.5
17.3	10.676	3.56E+01	37.4	8.5	0.1	8.6
17.4	10.676	3.62E+01	37.4	8.6	0.1	8.7
17.5	10.676	3.69E+01	37.5	8.6	0.1	8.7
17.6	10.676	3.77E+01	37.5	8.7	0.1	8.8
17.7	10.676	3.85E+01	37.5	8.8	0.1	8.9
17.8	10.676	3.93E+01	37.5	8.9	0.1	9
17.9	10.676	4.00E+01	37.6	9	0.1	9.1
18	10.676	4.08E+01	37.6	9.1	0.1	9.2
18.1	10.676	4.16E+01	37.6	9.1	0.1	9.2
18.2	10.677	4.24E+01	37.7	9.2	0.1	9.3
18.3	10.677	4.32E+01	37.7	9.3	0.1	9.4
18.4	10.677	4.40E+01	37.7	9.4	0.1	9.5
18.5	10.677	4.49E+01	37.7	9.5	0.1	9.6
18.6	10.677	4.58E+01	37.8	9.6	0.1	9.7
18.7	10.677	4.68E+01	37.8	9.6	0.1	9.7
18.8	10.677	4.77E+01	37.8	9.7	0.1	9.8
18.9	10.677	4.86E+01	37.8	9.8	0.1	9.9
19	10.677	4.96E+01	37.9	9.9	0.1	10
19.1	10.677	5.05E+01	37.9	10	0.1	10.1
19.2	10.677	5.14E+01	37.9	10.1	0.1	10.2
19.3	10.678	5.24E+01	37.9	10.2	0.1	10.3
19.4	10.678	5.35E+01	38	10.3	0.1	10.4
19.5	10.678	5.46E+01	38	10.4	0.1	10.5
19.6	10.678	5.57E+01	38	10.5	0.1	10.6
19.7	10.678	5.68E+01	38	10.6	0.1	10.7
19.8	10.678	5.79E+01	38.1	10.7	0.1	10.8
19.9	10.678	5.90E+01	38.1	10.8	0.1	10.9
20	10.678	6.01E+01	38.1	10.9	0.1	11
20.1	10.678	6.12E+01	38.1	10.9	0.1	11
20.2	10.678	6.23E+01	38.1	11	0.1	11.1
20.3	10.678	6.36E+01	38.2	11.1	0.2	11.3
20.4	10.679	6.49E+01	38.2	11.3	0.2	11.5
20.5	10.679	6.62E+01	38.2	11.4	0.2	11.6
20.6	10.679	6.75E+01	38.2	11.5	0.2	11.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
20.7	10.679	6.88E+01	38.2	11.6	0.2	11.8
20.8	10.679	7.03E+01	38.3	11.7	0.2	11.9
20.9	10.679	7.17E+01	38.3	11.8	0.2	12
21	10.679	7.31E+01	38.3	11.9	0.2	12.1
21.1	10.679	7.45E+01	38.3	12	0.2	12.2
21.2	10.679	7.60E+01	38.3	12.1	0.2	12.3
21.3	10.679	7.75E+01	38.4	12.2	0.2	12.4
21.4	10.679	7.91E+01	38.4	12.3	0.2	12.5
21.5	10.679	8.06E+01	38.4	12.5	0.2	12.7
21.6	10.68	8.22E+01	38.4	12.6	0.2	12.8
21.7	10.68	8.39E+01	38.4	12.7	0.2	12.9
21.8	10.68	8.55E+01	38.4	12.8	0.2	13
21.9	10.68	8.72E+01	38.5	12.9	0.2	13.1
22	10.68	8.89E+01	38.5	13	0.2	13.2
22.1	10.68	9.07E+01	38.5	13.2	0.2	13.4
22.2	10.68	9.25E+01	38.5	13.3	0.2	13.5
22.3	10.68	9.43E+01	38.5	13.4	0.3	13.7
22.4	10.68	9.62E+01	38.5	13.5	0.3	13.8
22.5	10.68	9.80E+01	38.5	13.6	0.3	13.9
22.6	10.68	1.00E+02	38.6	13.8	0.3	14.1
22.7	10.68	1.02E+02	38.6	13.9	0.3	14.2
22.8	10.681	1.04E+02	38.6	14	0.3	14.3
22.9	10.681	1.06E+02	38.6	14.2	0.3	14.5
23	10.681	1.08E+02	38.6	14.3	0.3	14.6
23.1	10.681	1.10E+02	38.6	14.4	0.3	14.7
23.2	10.681	1.12E+02	38.6	14.5	0.3	14.8
23.3	10.681	1.15E+02	38.7	14.7	0.3	15
23.4	10.681	1.17E+02	38.7	14.8	0.3	15.1
23.5	10.681	1.19E+02	38.7	14.9	0.3	15.2
23.6	10.681	1.21E+02	38.7	15.1	0.3	15.4
23.7	10.681	1.24E+02	38.7	15.2	0.4	15.6
23.8	10.681	1.26E+02	38.7	15.4	0.4	15.8
23.9	10.681	1.28E+02	38.7	15.5	0.4	15.9
24	10.681	1.31E+02	38.7	15.6	0.4	16
24.1	10.682	1.34E+02	38.7	15.8	0.4	16.2
24.2	10.682	1.36E+02	38.8	15.9	0.4	16.3
24.3	10.682	1.39E+02	38.8	16.1	0.4	16.5
24.4	10.682	1.41E+02	38.8	16.2	0.4	16.6
24.5	10.682	1.44E+02	38.8	16.4	0.4	16.8
24.6	10.682	1.47E+02	38.8	16.5	0.4	16.9
24.7	10.682	1.50E+02	38.8	16.6	0.5	17.1
24.8	10.682	1.53E+02	38.8	16.8	0.5	17.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
24.9	10.682	1.55E+02	38.8	16.9	0.5	17.4
25	10.682	1.58E+02	38.8	17.1	0.5	17.6
25.1	10.682	1.62E+02	38.8	17.2	0.5	17.7
25.2	10.682	1.65E+02	38.8	17.4	0.5	17.9
25.3	10.682	1.68E+02	38.9	17.6	0.5	18.1
25.4	10.682	1.71E+02	38.9	17.7	0.5	18.2
25.5	10.683	1.74E+02	38.9	17.9	0.5	18.4
25.6	10.683	1.77E+02	38.9	18	0.6	18.6
25.7	10.683	1.81E+02	38.9	18.2	0.6	18.8
25.8	10.683	1.84E+02	38.9	18.3	0.6	18.9
25.9	10.683	1.88E+02	38.9	18.5	0.6	19.1
26	10.683	1.91E+02	38.9	18.7	0.6	19.3
26.1	10.683	1.95E+02	38.9	18.8	0.6	19.4
26.2	10.683	1.99E+02	38.9	19	0.6	19.6
26.3	10.683	2.02E+02	38.9	19.2	0.7	19.9
26.4	10.683	2.06E+02	38.9	19.3	0.7	20
26.5	10.683	2.10E+02	38.9	19.5	0.7	20.2
26.6	10.683	2.14E+02	38.9	19.7	0.7	20.4
26.7	10.683	2.18E+02	38.9	19.8	0.7	20.5
26.8	10.683	2.22E+02	38.9	20	0.7	20.7
26.9	10.683	2.26E+02	39	20.2	0.8	21
27	10.683	2.30E+02	39	20.4	0.8	21.2
27.1	10.684	2.35E+02	39	20.5	0.8	21.3
27.2	10.684	2.39E+02	39	20.7	0.8	21.5
27.3	10.684	2.43E+02	39	20.9	0.8	21.7
27.4	10.684	2.48E+02	39	21.1	0.9	22
27.5	10.684	2.52E+02	39	21.3	0.9	22.2
27.6	10.684	2.57E+02	39	21.4	0.9	22.3
27.7	10.684	2.62E+02	39	21.6	0.9	22.5
27.8	10.684	2.66E+02	39	21.8	0.9	22.7
27.9	10.684	2.71E+02	39	22	1	23
28	10.684	2.76E+02	39	22.2	1	23.2
28.1	10.684	2.81E+02	39	22.4	1	23.4
28.2	10.684	2.86E+02	39	22.6	1	23.6
28.3	10.684	2.91E+02	39	22.7	1	23.7
28.4	10.684	2.97E+02	39	22.9	1.1	24
28.5	10.684	3.02E+02	39	23.1	1.1	24.2
28.6	10.684	3.08E+02	39	23.3	1.1	24.4
28.7	10.684	3.13E+02	39	23.5	1.1	24.6
28.8	10.684	3.19E+02	39	23.7	1.2	24.9
28.9	10.684	3.25E+02	39	23.9	1.2	25.1
29	10.684	3.31E+02	39	24.1	1.2	25.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
29.1	10.684	3.37E+02	39	24.3	1.3	25.6
29.2	10.685	3.43E+02	39	24.5	1.3	25.8
29.3	10.685	3.49E+02	39	24.7	1.3	26
29.4	10.685	3.55E+02	39	25	1.3	26.3
29.5	10.685	3.62E+02	39	25.2	1.4	26.6
29.6	10.685	3.68E+02	39	25.4	1.4	26.8
29.7	10.685	3.75E+02	39	25.6	1.4	27
29.8	10.685	3.81E+02	39	25.8	1.5	27.3
29.9	10.685	3.88E+02	39	26	1.5	27.5
30	10.685	3.95E+02	39	26.2	1.5	27.7
30.1	10.685	4.02E+02	39	26.5	1.6	28.1
30.2	10.685	4.09E+02	39	26.7	1.6	28.3
30.3	10.685	4.16E+02	39	26.9	1.6	28.5
30.4	10.685	4.24E+02	39	27.1	1.7	28.8
30.5	10.685	4.32E+02	39	27.3	1.7	29
30.6	10.685	4.39E+02	39	27.6	1.8	29.4
30.7	10.685	4.47E+02	39	27.8	1.8	29.6
30.8	10.685	4.55E+02	39	28	1.8	29.8
30.9	10.685	4.63E+02	39	28.3	1.9	30.2
31	10.685	4.71E+02	39	28.5	1.9	30.4
31.1	10.685	4.80E+02	39	28.7	2	30.7
31.2	10.685	4.88E+02	39	29	2	31
31.3	10.685	4.96E+02	39	29.2	2.1	31.3
31.4	10.685	5.05E+02	39	29.4	2.1	31.5
31.5	10.685	5.15E+02	39	29.7	2.1	31.8
31.6	10.685	5.24E+02	39	29.9	2.2	32.1
31.7	10.685	5.33E+02	39	30.2	2.2	32.4
31.8	10.685	5.42E+02	39	30.4	2.3	32.7
31.9	10.685	5.51E+02	39	30.7	2.3	33
32	10.685	5.61E+02	39	30.9	2.4	33.3
32.1	10.685	5.71E+02	39	31.2	2.4	33.6
32.2	10.685	5.81E+02	39	31.4	2.5	33.9
32.3	10.685	5.91E+02	39	31.7	2.6	34.3
32.4	10.685	6.01E+02	39	31.9	2.6	34.5
32.5	10.685	6.12E+02	39	32.2	2.7	34.9
32.6	10.685	6.23E+02	39	32.5	2.7	35.2
32.7	10.685	6.33E+02	39	32.7	2.8	35.5
32.8	10.685	6.44E+02	39	33	2.8	35.8
32.9	10.685	6.55E+02	39	33.3	2.9	36.2
33	10.685	6.67E+02	39	33.5	3	36.5
33.1	10.685	6.79E+02	39	33.8	3	36.8
33.2	10.685	6.90E+02	39	34.1	3.1	37.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
33.3	10.685	7.02E+02	39	34.3	3.2	37.5
33.4	10.685	7.14E+02	39	34.6	3.2	37.8
33.5	10.685	7.27E+02	39	34.9	3.3	38.2
33.6	10.685	7.39E+02	39	35.2	3.4	38.6
33.7	10.685	7.52E+02	39	35.5	3.5	39
33.8	10.685	7.65E+02	39	35.7	3.5	39.2
33.9	10.685	7.77E+02	39	36	3.6	39.6
34	10.685	7.90E+02	39	36.3	3.7	40
34.1	10.685	8.02E+02	38.9	36.6	3.8	40.4
34.2	10.685	8.15E+02	38.9	36.8	3.8	40.6
34.3	10.685	8.28E+02	38.9	37.1	3.9	41
34.4	10.685	8.42E+02	38.9	37.4	4	41.4
34.5	10.685	8.55E+02	38.9	37.7	4.1	41.8
34.6	10.685	8.69E+02	38.8	37.9	4.2	42.1
34.7	10.685	8.82E+02	38.8	38.2	4.2	42.4
34.8	10.685	8.96E+02	38.8	38.5	4.3	42.8
34.9	10.685	9.11E+02	38.8	38.8	4.4	43.2
35	10.685	9.25E+02	38.8	39.1	4.5	43.6
35.1	10.684	9.40E+02	38.7	39.4	4.6	44
35.2	10.684	9.55E+02	38.7	39.6	4.7	44.3
35.3	10.684	9.70E+02	38.7	39.9	4.8	44.7
35.4	10.684	9.85E+02	38.7	40.2	4.9	45.1
35.5	10.684	1.00E+03	38.7	40.5	5	45.5
35.6	10.684	1.02E+03	38.7	40.8	5.1	45.9
35.7	10.684	1.03E+03	38.6	41.1	5.2	46.3
35.8	10.684	1.05E+03	38.6	41.4	5.3	46.7
35.9	10.684	1.06E+03	38.6	41.7	5.4	47.1
36	10.684	1.08E+03	38.6	42	5.5	47.5
36.1	10.684	1.10E+03	38.6	42.3	5.6	47.9
36.2	10.684	1.11E+03	38.5	42.6	5.7	48.3
36.3	10.684	1.13E+03	38.5	42.9	5.8	48.7
36.4	10.684	1.15E+03	38.5	43.2	5.9	49.1
36.5	10.683	1.17E+03	38.5	43.5	6	49.5
36.6	10.683	1.18E+03	38.5	43.9	6.1	50
36.7	10.683	1.20E+03	38.4	44.2	6.3	50.5
36.8	10.683	1.22E+03	38.4	44.5	6.4	50.9
36.9	10.683	1.24E+03	38.4	44.8	6.5	51.3
37	10.683	1.26E+03	38.4	45.1	6.6	51.7
37.1	10.683	1.28E+03	38.4	45.4	6.7	52.1
37.2	10.683	1.30E+03	38.4	45.7	6.9	52.6
37.3	10.683	1.32E+03	38.3	46.1	7	53.1
37.4	10.683	1.34E+03	38.3	46.4	7.1	53.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
37.5	10.682	1.36E+03	38.3	46.7	7.3	54
37.6	10.682	1.38E+03	38.3	47	7.4	54.4
37.7	10.682	1.40E+03	38.3	47.4	7.6	55
37.8	10.682	1.42E+03	38.2	47.7	7.7	55.4
37.9	10.682	1.44E+03	38.2	48	7.8	55.8
38	10.682	1.46E+03	38.2	48.4	8	56.4
38.1	10.682	1.48E+03	38.2	48.7	8.1	56.8
38.2	10.682	1.50E+03	38.2	49	8.3	57.3
38.3	10.681	1.53E+03	38.2	49.4	8.4	57.8
38.4	10.681	1.55E+03	38.1	49.7	8.6	58.3
38.5	10.681	1.57E+03	38.1	50.1	8.8	58.9
38.6	10.681	1.59E+03	38.1	50.4	8.9	59.3
38.7	10.681	1.62E+03	38.1	50.7	9.1	59.8
38.8	10.681	1.64E+03	38.1	51.1	9.2	60.3
38.9	10.68	1.67E+03	38	51.4	9.4	60.8
39	10.68	1.69E+03	38	51.8	9.6	61.4
39.1	10.68	1.71E+03	38	52.1	9.8	61.9
39.2	10.68	1.74E+03	38	52.5	9.9	62.4
39.3	10.68	1.76E+03	38	52.8	10.1	62.9
39.4	10.68	1.79E+03	38	53.2	10.3	63.5
39.5	10.679	1.82E+03	37.9	53.5	10.5	64
39.6	10.679	1.84E+03	37.9	53.9	10.7	64.6
39.7	10.679	1.87E+03	37.9	54.3	10.9	65.2
39.8	10.679	1.90E+03	37.9	54.6	11.1	65.7
39.9	10.679	1.92E+03	37.9	55	11.3	66.3
40	10.678	1.95E+03	37.9	55.4	11.5	66.9
40.1	10.678	1.98E+03	37.8	55.7	11.7	67.4
40.2	10.678	2.01E+03	37.8	56.1	11.9	68
40.3	10.678	2.03E+03	37.8	56.5	12.1	68.6
40.4	10.678	2.06E+03	37.8	56.8	12.3	69.1
40.5	10.677	2.09E+03	37.8	57.2	12.5	69.7
40.6	10.677	2.12E+03	37.8	57.6	12.8	70.4
40.7	10.677	2.15E+03	37.7	57.9	13	70.9
40.8	10.677	2.18E+03	37.7	58.3	13.2	71.5
40.9	10.676	2.21E+03	37.7	58.7	13.4	72.1
41	10.676	2.24E+03	37.7	59.1	13.7	72.8
41.1	10.676	2.27E+03	37.7	59.5	13.9	73.4
41.2	10.676	2.31E+03	37.6	59.9	14.2	74.1
41.3	10.675	2.34E+03	37.6	60.2	14.4	74.6
41.4	10.675	2.37E+03	37.6	60.6	14.7	75.3
41.5	10.675	2.40E+03	37.6	61	14.9	75.9
41.6	10.675	2.44E+03	37.6	61.4	15.2	76.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
41.7	10.674	2.47E+03	37.6	61.8	15.4	77.2
41.8	10.674	2.50E+03	37.5	62.2	15.7	77.9
41.9	10.674	2.54E+03	37.5	62.6	16	78.6
42	10.673	2.57E+03	37.5	63	16.2	79.2
42.1	10.673	2.61E+03	37.5	63.4	16.5	79.9
42.2	10.673	2.64E+03	37.5	63.8	16.8	80.6
42.3	10.672	2.68E+03	37.5	64.2	17.1	81.3
42.4	10.672	2.72E+03	37.4	64.6	17.4	82
42.5	10.672	2.75E+03	37.4	65	17.7	82.7
42.6	10.671	2.79E+03	37.4	65.4	17.9	83.3
42.7	10.671	2.83E+03	37.4	65.8	18.3	84.1
42.8	10.671	2.87E+03	37.4	66.2	18.6	84.8
42.9	10.67	2.90E+03	37.4	66.6	18.9	85.5
43	10.67	2.94E+03	37.3	67	19.2	86.2
43.1	10.67	2.98E+03	37.3	67.5	19.5	87
43.2	10.669	3.02E+03	37.3	67.9	19.8	87.7
43.3	10.669	3.06E+03	37.3	68.3	20.2	88.5
43.4	10.669	3.10E+03	37.3	68.7	20.5	89.2
43.5	10.668	3.15E+03	37.3	69.1	20.8	89.9
43.6	10.668	3.19E+03	37.2	69.6	21.2	90.8
43.7	10.667	3.23E+03	37.2	70	21.5	91.5
43.8	10.667	3.27E+03	37.2	70.4	21.9	92.3
43.9	10.667	3.31E+03	37.2	70.8	22.2	93
44	10.666	3.36E+03	37.2	71.3	22.6	93.9
44.1	10.666	3.40E+03	37.2	71.7	22.9	94.6
44.2	10.665	3.45E+03	37.1	72.1	23.3	95.4
44.3	10.665	3.49E+03	37.1	72.6	23.7	96.3
44.4	10.664	3.54E+03	37.1	73	24.1	97.1
44.5	10.664	3.58E+03	37.1	73.4	24.5	97.9
44.6	10.664	3.63E+03	37.1	73.9	24.9	98.8
44.7	10.663	3.68E+03	37.1	74.3	25.3	99.6
44.8	10.663	3.72E+03	37	74.8	25.7	100.5
44.9	10.662	3.77E+03	37	75.2	26.1	101.3
45	10.662	3.82E+03	37	75.6	26.5	102.1
45.1	10.661	3.87E+03	37	76.1	26.9	103
45.2	10.661	3.92E+03	37	76.5	27.3	103.8
45.3	10.66	3.97E+03	37	77	27.7	104.7
45.4	10.66	4.02E+03	36.9	77.4	28.2	105.6
45.5	10.659	4.07E+03	36.9	77.9	28.6	106.5
45.6	10.659	4.12E+03	36.9	78.3	29.1	107.4
45.7	10.658	4.17E+03	36.9	78.8	29.5	108.3
45.8	10.657	4.22E+03	36.9	79.2	30	109.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
45.9	10.657	4.28E+03	36.9	79.7	30.4	110.1
46	10.656	4.33E+03	36.8	80.2	30.9	111.1
46.1	10.656	4.39E+03	36.8	80.6	31.4	112
46.2	10.655	4.44E+03	36.8	81.1	31.9	113
46.3	10.655	4.50E+03	36.8	81.6	32.4	114
46.4	10.654	4.55E+03	36.8	82	32.9	114.9
46.5	10.653	4.61E+03	36.8	82.5	33.3	115.8
46.6	10.653	4.66E+03	36.7	83	33.9	116.9
46.7	10.652	4.72E+03	36.7	83.4	34.4	117.8
46.8	10.652	4.78E+03	36.7	83.9	34.9	118.8
46.9	10.651	4.84E+03	36.7	84.4	35.4	119.8
47	10.65	4.90E+03	36.7	84.8	35.9	120.7
47.1	10.65	4.96E+03	36.7	85.3	36.5	121.8
47.2	10.649	5.02E+03	36.7	85.8	37	122.8
47.3	10.648	5.08E+03	36.6	86.3	37.6	123.9
47.4	10.648	5.14E+03	36.6	86.8	38.1	124.9
47.5	10.647	5.20E+03	36.6	87.2	38.7	125.9
47.6	10.646	5.27E+03	36.6	87.7	39.3	127
47.7	10.646	5.33E+03	36.6	88.2	39.8	128
47.8	10.645	5.39E+03	36.6	88.7	40.4	129.1
47.9	10.644	5.46E+03	36.5	89.2	41	130.2
48	10.643	5.52E+03	36.5	89.7	41.6	131.3
48.1	10.643	5.59E+03	36.5	90.2	42.2	132.4
48.2	10.642	5.66E+03	36.5	90.6	42.8	133.4
48.3	10.641	5.72E+03	36.5	91.1	43.4	134.5
48.4	10.64	5.79E+03	36.5	91.6	44.1	135.7
48.5	10.639	5.86E+03	36.4	92.1	44.7	136.8
48.6	10.639	5.93E+03	36.4	92.6	45.3	137.9
48.7	10.638	6.00E+03	36.4	93.1	46	139.1
48.8	10.637	6.07E+03	36.4	93.6	46.6	140.2
48.9	10.636	6.14E+03	36.4	94.1	47.3	141.4
49	10.635	6.21E+03	36.4	94.6	48	142.6
49.1	10.635	6.28E+03	36.3	95.1	48.6	143.7
49.2	10.634	6.36E+03	36.3	95.6	49.3	144.9
49.3	10.633	6.43E+03	36.3	96.1	50	146.1
49.4	10.632	6.50E+03	36.3	96.6	50.7	147.3
49.5	10.631	6.58E+03	36.3	97.1	51.4	148.5
49.6	10.63	6.65E+03	36.3	97.6	52.1	149.7
49.7	10.629	6.73E+03	36.2	98.2	52.8	151
49.8	10.628	6.81E+03	36.2	98.7	53.6	152.3
49.9	10.627	6.89E+03	36.2	99.2	54.3	153.5
50	10.626	6.96E+03	36.2	99.7	55	154.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
50.1	10.625	7.04E+03	36.2	100.2	55.8	156
50.2	10.624	7.12E+03	36.2	100.7	56.5	157.2
50.3	10.623	7.20E+03	36.1	101.2	57.3	158.5
50.4	10.622	7.28E+03	36.1	101.7	58	159.7
50.5	10.621	7.36E+03	36.1	102.2	58.8	161
50.6	10.62	7.44E+03	36.1	102.7	59.5	162.2
50.7	10.619	7.52E+03	36.1	103.2	60.3	163.5
50.8	10.618	7.60E+03	36	103.7	61.1	164.8
50.9	10.617	7.68E+03	36	104.2	61.9	166.1
51	10.616	7.77E+03	36	104.7	62.7	167.4
51.1	10.615	7.85E+03	36	105.3	63.5	168.8
51.2	10.614	7.93E+03	35.9	105.8	64.3	170.1
51.3	10.613	8.02E+03	35.9	106.3	65.1	171.4
51.4	10.612	8.10E+03	35.9	106.8	65.9	172.7
51.5	10.611	8.19E+03	35.9	107.3	66.7	174
51.6	10.609	8.28E+03	35.9	107.8	67.6	175.4
51.7	10.608	8.36E+03	35.8	108.3	68.4	176.7
51.8	10.607	8.45E+03	35.8	108.8	69.3	178.1
51.9	10.606	8.54E+03	35.8	109.4	70.1	179.5
52	10.605	8.63E+03	35.8	109.9	71	180.9
52.1	10.603	8.72E+03	35.8	110.4	71.8	182.2
52.2	10.602	8.81E+03	35.7	110.9	72.7	183.6
52.3	10.601	8.90E+03	35.7	111.4	73.6	185
52.4	10.6	8.99E+03	35.7	111.9	74.5	186.4
52.5	10.598	9.09E+03	35.7	112.4	75.4	187.8
52.6	10.597	9.18E+03	35.7	113	76.3	189.3
52.7	10.596	9.27E+03	35.6	113.5	77.2	190.7
52.8	10.595	9.37E+03	35.6	114	78.1	192.1
52.9	10.593	9.46E+03	35.6	114.5	79.1	193.6
53	10.592	9.56E+03	35.6	115	80	195
53.1	10.591	9.66E+03	35.5	115.6	80.9	196.5
53.2	10.589	9.75E+03	35.5	116.1	81.9	198
53.3	10.588	9.85E+03	35.5	116.6	82.8	199.4
53.4	10.586	9.95E+03	35.5	117.1	83.8	200.9
53.5	10.585	1.01E+04	35.5	117.6	84.7	202.3
53.6	10.584	1.02E+04	35.4	118.2	85.7	203.9
53.7	10.582	1.03E+04	35.4	118.7	86.7	205.4
53.8	10.581	1.04E+04	35.4	119.2	87.7	206.9
53.9	10.579	1.05E+04	35.4	119.7	88.7	208.4
54	10.578	1.06E+04	35.4	120.3	89.7	210
54.1	10.576	1.07E+04	35.3	120.8	90.7	211.5
54.2	10.575	1.08E+04	35.3	121.3	91.7	213

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
54.3	10.573	1.09E+04	35.3	121.8	92.7	214.5
54.4	10.572	1.10E+04	35.3	122.4	93.7	216.1
54.5	10.57	1.11E+04	35.3	122.9	94.8	217.7
54.6	10.568	1.12E+04	35.2	123.4	95.8	219.2
54.7	10.567	1.13E+04	35.2	123.9	96.8	220.7
54.8	10.565	1.14E+04	35.2	124.4	97.9	222.3
54.9	10.564	1.15E+04	35.2	125	98.9	223.9
55	10.562	1.16E+04	35.1	125.5	100	225.5
55.1	10.56	1.17E+04	35.1	126	101.1	227.1
55.2	10.559	1.18E+04	35.1	126.5	102.1	228.6
55.3	10.557	1.20E+04	35.1	127.1	103.2	230.3
55.4	10.555	1.21E+04	35.1	127.6	104.3	231.9
55.5	10.553	1.22E+04	35	128.1	105.4	233.5
55.6	10.552	1.23E+04	35	128.6	106.5	235.1
55.7	10.55	1.24E+04	35	129.2	107.6	236.8
55.8	10.548	1.25E+04	35	129.7	108.7	238.4
55.9	10.546	1.26E+04	35	130.2	109.8	240
56	10.545	1.28E+04	34.9	130.7	110.9	241.6
56.1	10.543	1.29E+04	34.9	131.3	112	243.3
56.2	10.541	1.30E+04	34.9	131.8	113.2	245
56.3	10.539	1.31E+04	34.9	132.3	114.3	246.6
56.4	10.537	1.32E+04	34.9	132.8	115.4	248.2
56.5	10.535	1.33E+04	34.8	133.4	116.6	250
56.6	10.533	1.35E+04	34.8	133.9	117.7	251.6
56.7	10.531	1.36E+04	34.8	134.4	118.9	253.3
56.8	10.529	1.37E+04	34.8	134.9	120	254.9
56.9	10.527	1.38E+04	34.8	135.4	121.2	256.6
57	10.525	1.40E+04	34.7	136	122.4	258.4
57.1	10.523	1.41E+04	34.7	136.5	123.5	260
57.2	10.521	1.42E+04	34.7	137	124.7	261.7
57.3	10.519	1.43E+04	34.7	137.5	125.9	263.4
57.4	10.517	1.44E+04	34.6	138	127.1	265.1
57.5	10.515	1.46E+04	34.6	138.6	128.3	266.9
57.6	10.513	1.47E+04	34.6	139.1	129.4	268.5
57.7	10.511	1.48E+04	34.6	139.6	130.6	270.2
57.8	10.509	1.50E+04	34.6	140.1	131.8	271.9
57.9	10.507	1.51E+04	34.5	140.6	133	273.6
58	10.504	1.52E+04	34.5	141.1	134.2	275.3
58.1	10.502	1.53E+04	34.5	141.6	135.4	277
58.2	10.5	1.55E+04	34.5	142.2	136.6	278.8
58.3	10.498	1.56E+04	34.5	142.7	137.8	280.5
58.4	10.495	1.57E+04	34.4	143.2	139.1	282.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
58.5	10.493	1.59E+04	34.4	143.7	140.3	284
58.6	10.491	1.60E+04	34.4	144.2	141.5	285.7
58.7	10.489	1.61E+04	34.4	144.7	142.7	287.4
58.8	10.486	1.63E+04	34.4	145.2	143.9	289.1
58.9	10.484	1.64E+04	34.3	145.7	145.2	290.9
59	10.481	1.65E+04	34.3	146.2	146.4	292.6
59.1	10.479	1.67E+04	34.3	146.7	147.6	294.3
59.2	10.477	1.68E+04	34.3	147.2	148.8	296
59.3	10.474	1.69E+04	34.2	147.8	150.1	297.9
59.4	10.472	1.71E+04	34.2	148.3	151.3	299.6
59.5	10.469	1.72E+04	34.2	148.8	152.5	301.3
59.6	10.467	1.74E+04	34.2	149.3	153.7	303
59.7	10.464	1.75E+04	34.2	149.8	155	304.8
59.8	10.462	1.76E+04	34.1	150.3	156.2	306.5
59.9	10.459	1.78E+04	34.1	150.8	157.4	308.2
60	10.457	1.79E+04	34.1	151.3	158.7	310
60.1	10.454	1.81E+04	34.1	151.7	159.9	311.6
60.2	10.451	1.82E+04	34.1	152.2	161.1	313.3
60.3	10.449	1.83E+04	34	152.7	162.4	315.1
60.4	10.446	1.85E+04	34	153.2	163.6	316.8
60.5	10.443	1.86E+04	34	153.7	164.8	318.5
60.6	10.441	1.88E+04	34	154.2	166	320.2
60.7	10.438	1.89E+04	34	154.7	167.3	322
60.8	10.435	1.91E+04	33.9	155.2	168.5	323.7
60.9	10.432	1.92E+04	33.9	155.7	169.7	325.4
61	10.43	1.93E+04	33.9	156.1	170.9	327
61.1	10.427	1.95E+04	33.9	156.6	172.2	328.8
61.2	10.424	1.96E+04	33.8	157.1	173.4	330.5
61.3	10.421	1.98E+04	33.8	157.6	174.6	332.2
61.4	10.418	1.99E+04	33.8	158.1	175.8	333.9
61.5	10.415	2.01E+04	33.8	158.5	177	335.5
61.6	10.412	2.02E+04	33.8	159	178.2	337.2
61.7	10.409	2.04E+04	33.7	159.5	179.4	338.9
61.8	10.406	2.05E+04	33.7	159.9	180.6	340.5
61.9	10.403	2.07E+04	33.7	160.4	181.8	342.2
62	10.4	2.08E+04	33.7	160.9	183	343.9
62.1	10.397	2.10E+04	33.7	161.3	184.2	345.5
62.2	10.394	2.11E+04	33.6	161.8	185.4	347.2
62.3	10.391	2.13E+04	33.6	162.3	186.5	348.8
62.4	10.388	2.14E+04	33.6	162.7	187.7	350.4
62.5	10.385	2.16E+04	33.6	163.2	188.9	352.1
62.6	10.382	2.17E+04	33.5	163.6	190	353.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
62.7	10.379	2.19E+04	33.5	164.1	191.2	355.3
62.8	10.375	2.20E+04	33.5	164.6	192.3	356.9
62.9	10.372	2.22E+04	33.5	165	193.5	358.5
63	10.369	2.23E+04	33.5	165.4	194.6	360
63.1	10.366	2.25E+04	33.4	165.9	195.7	361.6
63.2	10.362	2.26E+04	33.4	166.3	196.9	363.2
63.3	10.359	2.28E+04	33.4	166.8	198	364.8
63.4	10.356	2.29E+04	33.4	167.2	199.1	366.3
63.5	10.352	2.31E+04	33.4	167.7	200.2	367.9
63.6	10.349	2.32E+04	33.3	168.1	201.3	369.4
63.7	10.346	2.34E+04	33.3	168.5	202.4	370.9
63.8	10.342	2.35E+04	33.3	169	203.4	372.4
63.9	10.339	2.37E+04	33.3	169.4	204.5	373.9
64	10.335	2.39E+04	33.2	169.8	205.6	375.4
64.1	10.332	2.40E+04	33.2	170.2	206.6	376.8
64.2	10.328	2.42E+04	33.2	170.7	207.7	378.4
64.3	10.325	2.43E+04	33.2	171.1	208.7	379.8
64.4	10.321	2.45E+04	33.2	171.5	209.7	381.2
64.5	10.318	2.46E+04	33.1	171.9	210.7	382.6
64.6	10.314	2.48E+04	33.1	172.3	211.7	384
64.7	10.31	2.49E+04	33.1	172.7	212.7	385.4
64.8	10.307	2.51E+04	33.1	173.1	213.7	386.8
64.9	10.303	2.53E+04	33	173.5	214.7	388.2
65	10.299	2.54E+04	33	173.9	215.6	389.5
65.1	10.295	2.56E+04	33	174.3	216.6	390.9
65.2	10.292	2.57E+04	33	174.7	217.5	392.2
65.3	10.288	2.59E+04	33	175.1	218.5	393.6
65.4	10.284	2.60E+04	32.9	175.5	219.4	394.9
65.5	10.28	2.62E+04	32.9	175.9	220.3	396.2
65.6	10.276	2.64E+04	32.9	176.3	221.2	397.5
65.7	10.273	2.65E+04	32.9	176.7	222	398.7
65.8	10.269	2.67E+04	32.8	177.1	222.9	400
65.9	10.265	2.68E+04	32.8	177.4	223.7	401.1
66	10.261	2.70E+04	32.8	177.8	224.6	402.4
66.1	10.257	2.71E+04	32.8	178.2	225.4	403.6
66.2	10.253	2.73E+04	32.8	178.6	226.2	404.8
66.3	10.249	2.74E+04	32.7	178.9	227	405.9
66.4	10.245	2.76E+04	32.7	179.3	227.8	407.1
66.5	10.241	2.78E+04	32.7	179.7	228.6	408.3
66.6	10.237	2.79E+04	32.7	180	229.3	409.3
66.7	10.233	2.81E+04	32.6	180.4	230.1	410.5
66.8	10.229	2.82E+04	32.6	180.7	230.8	411.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
66.9	10.224	2.84E+04	32.6	181.1	231.5	412.6
67	10.22	2.85E+04	32.6	181.4	232.2	413.6
67.1	10.216	2.87E+04	32.6	181.8	232.8	414.6
67.2	10.212	2.88E+04	32.5	182.1	233.5	415.6
67.3	10.208	2.90E+04	32.5	182.4	234.2	416.6
67.4	10.203	2.92E+04	32.5	182.8	234.8	417.6
67.5	10.199	2.93E+04	32.5	183.1	235.4	418.5
67.6	10.195	2.95E+04	32.4	183.4	236	419.4
67.7	10.19	2.96E+04	32.4	183.8	236.6	420.4
67.8	10.186	2.98E+04	32.4	184.1	237.1	421.2
67.9	10.182	2.99E+04	32.4	184.4	237.7	422.1
68	10.177	3.01E+04	32.4	184.7	238.2	422.9
68.1	10.173	3.02E+04	32.3	185	238.7	423.7
68.2	10.168	3.04E+04	32.3	185.3	239.2	424.5
68.3	10.164	3.05E+04	32.3	185.6	239.7	425.3
68.4	10.159	3.07E+04	32.3	185.9	240.1	426
68.5	10.155	3.08E+04	32.2	186.2	240.5	426.7
68.6	10.15	3.10E+04	32.2	186.5	241	427.5
68.7	10.146	3.11E+04	32.2	186.8	241.4	428.2
68.8	10.141	3.13E+04	32.2	187.1	241.7	428.8
68.9	10.137	3.15E+04	32.1	187.4	242.1	429.5
69	10.132	3.16E+04	32.1	187.7	242.4	430.1
69.1	10.127	3.18E+04	32.1	188	242.8	430.8
69.2	10.123	3.19E+04	32.1	188.2	243.1	431.3
69.3	10.118	3.20E+04	32.1	188.5	243.3	431.8
69.4	10.113	3.22E+04	32	188.8	243.6	432.4
69.5	10.108	3.23E+04	32	189	243.8	432.8
69.6	10.104	3.25E+04	32	189.3	244.1	433.4
69.7	10.099	3.26E+04	32	189.6	244.3	433.9
69.8	10.094	3.28E+04	31.9	189.8	244.5	434.3
69.9	10.089	3.29E+04	31.9	190.1	244.6	434.7
70	10.084	3.31E+04	31.9	190.3	244.8	435.1
70.1	10.079	3.32E+04	31.9	190.6	244.9	435.5
70.2	10.075	3.34E+04	31.8	190.8	245	435.8
70.3	10.07	3.35E+04	31.8	191	245.1	436.1
70.4	10.065	3.37E+04	31.8	191.3	245.1	436.4
70.5	10.06	3.38E+04	31.8	191.5	245.1	436.6
70.6	10.055	3.39E+04	31.8	191.7	245.2	436.9
70.7	10.05	3.41E+04	31.7	191.9	245.2	437.1
70.8	10.045	3.42E+04	31.7	192.2	245.1	437.3
70.9	10.04	3.44E+04	31.7	192.4	245.1	437.5
71	10.035	3.45E+04	31.7	192.6	245	437.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
71.1	10.03	3.46E+04	31.6	192.8	244.9	437.7
71.2	10.024	3.48E+04	31.6	193	244.8	437.8
71.3	10.019	3.49E+04	31.6	193.2	244.7	437.9
71.4	10.014	3.51E+04	31.6	193.4	244.5	437.9
71.5	10.009	3.52E+04	31.5	193.6	244.3	437.9
71.6	10.004	3.53E+04	31.5	193.8	244.1	437.9
71.7	9.999	3.55E+04	31.5	194	243.9	437.9
71.8	9.993	3.56E+04	31.5	194.1	243.7	437.8
71.9	9.988	3.57E+04	31.5	194.3	243.4	437.7
72	9.983	3.59E+04	31.4	194.5	243.1	437.6
72.1	9.978	3.60E+04	31.4	194.7	242.8	437.5
72.2	9.972	3.61E+04	31.4	194.8	242.5	437.3
72.3	9.967	3.63E+04	31.4	195	242.1	437.1
72.4	9.962	3.64E+04	31.3	195.1	241.8	436.9
72.5	9.956	3.65E+04	31.3	195.3	241.4	436.7
72.6	9.951	3.66E+04	31.3	195.4	240.9	436.3
72.7	9.945	3.68E+04	31.3	195.6	240.5	436.1
72.8	9.94	3.69E+04	31.2	195.7	240	435.7
72.9	9.934	3.70E+04	31.2	195.9	239.6	435.5
73	9.929	3.71E+04	31.2	196	239.1	435.1
73.1	9.924	3.73E+04	31.2	196.1	238.5	434.6
73.2	9.918	3.74E+04	31.2	196.3	238	434.3
73.3	9.913	3.75E+04	31.1	196.4	237.4	433.8
73.4	9.907	3.76E+04	31.1	196.5	236.8	433.3
73.5	9.901	3.77E+04	31.1	196.6	236.2	432.8
73.6	9.896	3.79E+04	31.1	196.7	235.6	432.3
73.7	9.89	3.80E+04	31	196.9	234.9	431.8
73.8	9.885	3.81E+04	31	197	234.2	431.2
73.9	9.879	3.82E+04	31	197.1	233.5	430.6
74	9.873	3.83E+04	31	197.2	232.8	430
74.1	9.868	3.84E+04	30.9	197.3	232.1	429.4
74.2	9.862	3.86E+04	30.9	197.3	231.3	428.6
74.3	9.856	3.87E+04	30.9	197.4	230.5	427.9
74.4	9.851	3.88E+04	30.9	197.5	229.7	427.2
74.5	9.845	3.89E+04	30.8	197.6	228.9	426.5
74.6	9.839	3.90E+04	30.8	197.7	228.1	425.8
74.7	9.833	3.91E+04	30.8	197.7	227.2	424.9
74.8	9.828	3.92E+04	30.8	197.8	226.3	424.1
74.9	9.822	3.93E+04	30.8	197.9	225.4	423.3
75	9.816	3.94E+04	30.7	197.9	224.5	422.4
75.1	9.81	3.95E+04	30.7	198	223.5	421.5
75.2	9.804	3.96E+04	30.7	198	222.6	420.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
75.3	9.799	3.97E+04	30.7	198.1	221.6	419.7
75.4	9.793	3.98E+04	30.6	198.2	220.6	418.8
75.5	9.787	3.99E+04	30.6	198.3	219.5	417.8
75.6	9.781	4.00E+04	30.6	198.4	218.5	416.9
75.7	9.775	4.01E+04	30.6	198.5	217.4	415.9
75.8	9.769	4.02E+04	30.5	198.6	216.4	415
75.9	9.763	4.03E+04	30.5	198.7	215.3	414
76	9.757	4.04E+04	30.5	198.8	214.1	412.9
76.1	9.751	4.05E+04	30.5	198.8	213	411.8
76.2	9.745	4.06E+04	30.4	198.9	211.8	410.7
76.3	9.739	4.07E+04	30.4	199	210.7	409.7
76.4	9.733	4.08E+04	30.4	199	209.5	408.5
76.5	9.727	4.09E+04	30.4	199.1	208.3	407.4
76.6	9.721	4.09E+04	30.4	199.1	207	406.1
76.7	9.715	4.10E+04	30.3	199.2	205.8	405
76.8	9.709	4.11E+04	30.3	199.2	204.5	403.7
76.9	9.703	4.12E+04	30.3	199.3	203.2	402.5
77	9.697	4.13E+04	30.3	199.3	202	401.3
77.1	9.691	4.14E+04	30.2	199.3	200.6	399.9
77.2	9.685	4.14E+04	30.2	199.3	199.3	398.6
77.3	9.679	4.15E+04	30.2	199.3	198	397.3
77.4	9.672	4.16E+04	30.2	199.4	196.6	396
77.5	9.666	4.17E+04	30.1	199.4	195.2	394.6
77.6	9.66	4.17E+04	30.1	199.4	193.8	393.2
77.7	9.654	4.18E+04	30.1	199.4	192.4	391.8
77.8	9.648	4.19E+04	30.1	199.3	191	390.3
77.9	9.642	4.20E+04	30.1	199.3	189.6	388.9
78	9.635	4.20E+04	30	199.3	188.1	387.4
78.1	9.629	4.21E+04	30	199.3	186.7	386
78.2	9.623	4.22E+04	30	199.3	185.2	384.5
78.3	9.617	4.22E+04	30	199.2	183.7	382.9
78.4	9.61	4.23E+04	29.9	199.2	182.2	381.4
78.5	9.604	4.23E+04	29.9	199.1	180.7	379.8
78.6	9.598	4.24E+04	29.9	199.1	179.1	378.2
78.7	9.592	4.25E+04	29.9	199	177.6	376.6
78.8	9.585	4.25E+04	29.8	199	176	375
78.9	9.579	4.26E+04	29.8	198.9	174.5	373.4
79	9.573	4.26E+04	29.8	198.8	172.9	371.7
79.1	9.566	4.27E+04	29.8	198.8	171.3	370.1
79.2	9.56	4.28E+04	29.8	198.7	169.7	368.4
79.3	9.554	4.28E+04	29.7	198.6	168.1	366.7
79.4	9.548	4.29E+04	29.7	198.5	166.4	364.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
79.5	9.541	4.29E+04	29.7	198.4	164.8	363.2
79.6	9.535	4.30E+04	29.7	198.3	163.1	361.4
79.7	9.528	4.30E+04	29.6	198.2	161.5	359.7
79.8	9.522	4.30E+04	29.6	198.1	159.8	357.9
79.9	9.516	4.31E+04	29.6	198	158.1	356.1
80	9.509	4.31E+04	29.6	197.9	156.5	354.4
80.1	9.503	4.32E+04	29.5	197.7	154.8	352.5
80.2	9.497	4.32E+04	29.5	197.6	153.1	350.7
80.3	9.49	4.33E+04	29.5	197.5	151.3	348.8
80.4	9.484	4.33E+04	29.5	197.3	149.6	346.9
80.5	9.477	4.33E+04	29.5	197.2	147.9	345.1
80.6	9.471	4.34E+04	29.4	197	146.2	343.2
80.7	9.465	4.34E+04	29.4	196.9	144.4	341.3
80.8	9.458	4.34E+04	29.4	196.7	142.7	339.4
80.9	9.452	4.35E+04	29.4	196.6	140.9	337.5
81	9.445	4.35E+04	29.3	196.4	139.1	335.5
81.1	9.439	4.35E+04	29.3	196.2	137.4	333.6
81.2	9.432	4.35E+04	29.3	196.1	135.6	331.7
81.3	9.426	4.36E+04	29.3	195.9	133.8	329.7
81.4	9.42	4.36E+04	29.2	195.7	132	327.7
81.5	9.413	4.36E+04	29.2	195.5	130.2	325.7
81.6	9.407	4.36E+04	29.2	195.3	128.4	323.7
81.7	9.4	4.37E+04	29.2	195.1	126.6	321.7
81.8	9.394	4.37E+04	29.2	194.9	124.8	319.7
81.9	9.387	4.37E+04	29.1	194.7	123	317.7
82	9.381	4.37E+04	29.1	194.5	121.2	315.7
82.1	9.374	4.37E+04	29.1	194.3	119.4	313.7
82.2	9.368	4.37E+04	29.1	194.1	117.5	311.6
82.3	9.361	4.38E+04	29	193.8	115.7	309.5
82.4	9.355	4.38E+04	29	193.6	113.9	307.5
82.5	9.349	4.38E+04	29	193.4	112	305.4
82.6	9.342	4.38E+04	29	193.1	110.2	303.3
82.7	9.336	4.38E+04	29	192.9	108.4	301.3
82.8	9.329	4.38E+04	28.9	192.6	106.5	299.1
82.9	9.323	4.38E+04	28.9	192.4	104.7	297.1
83	9.316	4.38E+04	28.9	192.1	102.9	295
83.1	9.31	4.38E+04	28.9	191.9	101	292.9
83.2	9.303	4.38E+04	28.9	191.6	99.2	290.8
83.3	9.297	4.38E+04	28.8	191.4	97.3	288.7
83.4	9.29	4.38E+04	28.8	191.1	95.5	286.6
83.5	9.284	4.38E+04	28.8	190.8	93.7	284.5
83.6	9.277	4.38E+04	28.8	190.5	91.8	282.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
83.7	9.271	4.38E+04	28.7	190.2	90	280.2
83.8	9.264	4.38E+04	28.7	190	88.1	278.1
83.9	9.258	4.38E+04	28.7	189.7	86.3	276
84	9.251	4.38E+04	28.7	189.4	84.4	273.8
84.1	9.245	4.38E+04	28.7	189.1	82.6	271.7
84.2	9.238	4.38E+04	28.6	188.8	80.8	269.6
84.3	9.232	4.38E+04	28.6	188.5	78.9	267.4
84.4	9.225	4.37E+04	28.6	188.2	77.1	265.3
84.5	9.219	4.37E+04	28.6	187.8	75.3	263.1
84.6	9.212	4.37E+04	28.5	187.5	73.5	261
84.7	9.206	4.37E+04	28.5	187.2	71.6	258.8
84.8	9.2	4.37E+04	28.5	186.9	69.8	256.7
84.9	9.193	4.37E+04	28.5	186.6	68	254.6
85	9.187	4.36E+04	28.5	186.2	66.2	252.4
85.1	9.18	4.36E+04	28.4	185.9	64.4	250.3
85.2	9.174	4.36E+04	28.4	185.6	62.6	248.2
85.3	9.167	4.36E+04	28.4	185.3	60.8	246.1
85.4	9.161	4.35E+04	28.4	184.9	59	243.9
85.5	9.154	4.35E+04	28.4	184.6	57.2	241.8
85.6	9.148	4.35E+04	28.3	184.2	55.4	239.6
85.7	9.142	4.35E+04	28.3	183.9	53.6	237.5
85.8	9.135	4.34E+04	28.3	183.6	51.9	235.5
85.9	9.129	4.34E+04	28.3	183.2	50.1	233.3
86	9.122	4.34E+04	28.3	182.9	48.3	231.2
86.1	9.116	4.33E+04	28.2	182.5	46.6	229.1
86.2	9.109	4.33E+04	28.2	182.2	44.8	227
86.3	9.103	4.33E+04	28.2	181.8	43.1	224.9
86.4	9.097	4.32E+04	28.2	181.5	41.3	222.8
86.5	9.09	4.32E+04	28.2	181.1	39.6	220.7
86.6	9.084	4.31E+04	28.1	180.8	37.9	218.7
86.7	9.077	4.31E+04	28.1	180.4	36.1	216.5
86.8	9.071	4.31E+04	28.1	180.1	34.4	214.5
86.9	9.065	4.30E+04	28.1	179.7	32.7	212.4
87	9.058	4.30E+04	28	179.4	31	210.4
87.1	9.052	4.29E+04	28	179	29.3	208.3
87.2	9.046	4.29E+04	28	178.7	27.7	206.4
87.3	9.039	4.28E+04	28	178.3	26	204.3
87.4	9.033	4.28E+04	28	177.9	24.3	202.2
87.5	9.027	4.27E+04	27.9	177.6	22.7	200.3
87.6	9.02	4.27E+04	27.9	177.2	21	198.2
87.7	9.014	4.26E+04	27.9	176.8	19.4	196.2
87.8	9.008	4.26E+04	27.9	176.5	17.7	194.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
87.9	9.001	4.25E+04	27.9	176.1	16.1	192.2
88	8.995	4.25E+04	27.9	175.7	14.5	190.2
88.1	8.989	4.24E+04	27.8	175.4	12.9	188.3
88.2	8.982	4.24E+04	27.8	175	11.3	186.3
88.3	8.976	4.23E+04	27.8	174.6	9.7	184.3
88.4	8.97	4.23E+04	27.8	174.2	8.1	182.3
88.5	8.964	4.22E+04	27.8	173.9	6.6	180.5
88.6	8.957	4.21E+04	27.7	173.5	5	178.5
88.7	8.951	4.21E+04	27.7	173.1	3.5	176.6
88.8	8.945	4.20E+04	27.7	172.7	1.9	174.6
88.9	8.939	4.20E+04	27.7	172.4	0.4	172.8
89	8.932	4.19E+04	27.7	172	0	172
89.1	8.926	4.18E+04	27.6	171.6	0	171.6
89.2	8.92	4.18E+04	27.6	171.2	0	171.2
89.3	8.914	4.17E+04	27.6	170.8	0	170.8
89.4	8.908	4.16E+04	27.6	170.4	0	170.4
89.5	8.902	4.16E+04	27.6	170.1	0	170.1
89.6	8.895	4.15E+04	27.5	169.7	0	169.7
89.7	8.889	4.14E+04	27.5	169.3	0	169.3
89.8	8.883	4.14E+04	27.5	168.9	0	168.9
89.9	8.877	4.13E+04	27.5	168.5	0	168.5
90	8.871	4.12E+04	27.5	168.1	0	168.1
90.1	8.865	4.12E+04	27.5	167.7	0	167.7
90.2	8.859	4.11E+04	27.4	167.4	0	167.4
90.3	8.853	4.10E+04	27.4	167	0	167
90.4	8.847	4.09E+04	27.4	166.6	0	166.6
90.5	8.84	4.09E+04	27.4	166.2	0	166.2
90.6	8.834	4.08E+04	27.4	165.8	0	165.8
90.7	8.828	4.07E+04	27.3	165.4	0	165.4
90.8	8.822	4.06E+04	27.3	165	0	165
90.9	8.816	4.05E+04	27.3	164.6	0	164.6
91	8.81	4.05E+04	27.3	164.2	0	164.2
91.1	8.804	4.04E+04	27.3	163.8	0	163.8
91.2	8.798	4.03E+04	27.3	163.4	0	163.4
91.3	8.792	4.02E+04	27.2	163	0	163
91.4	8.786	4.01E+04	27.2	162.7	0	162.7
91.5	8.78	4.01E+04	27.2	162.3	0	162.3
91.6	8.775	4.00E+04	27.2	161.9	0	161.9
91.7	8.769	3.99E+04	27.2	161.5	0	161.5
91.8	8.763	3.98E+04	27.1	161.1	0	161.1
91.9	8.757	3.97E+04	27.1	160.7	0	160.7
92	8.751	3.96E+04	27.1	160.3	0	160.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
92.1	8.745	3.95E+04	27.1	159.9	0	159.9
92.2	8.739	3.95E+04	27.1	159.5	0	159.5
92.3	8.733	3.94E+04	27.1	159.1	0	159.1
92.4	8.728	3.93E+04	27	158.7	0	158.7
92.5	8.722	3.92E+04	27	158.3	0	158.3
92.6	8.716	3.91E+04	27	157.9	0	157.9
92.7	8.71	3.90E+04	27	157.5	0	157.5
92.8	8.704	3.89E+04	27	157.1	0	157.1
92.9	8.699	3.88E+04	27	156.7	0	156.7
93	8.693	3.87E+04	26.9	156.3	0	156.3
93.1	8.687	3.87E+04	26.9	155.9	0	155.9
93.2	8.681	3.86E+04	26.9	155.5	0	155.5
93.3	8.676	3.85E+04	26.9	155.1	0	155.1
93.4	8.67	3.84E+04	26.9	154.7	0	154.7
93.5	8.664	3.83E+04	26.9	154.3	0	154.3
93.6	8.659	3.82E+04	26.8	153.9	0	153.9
93.7	8.653	3.81E+04	26.8	153.5	0	153.5
93.8	8.647	3.80E+04	26.8	153.1	0	153.1
93.9	8.642	3.79E+04	26.8	152.7	0	152.7
94	8.636	3.78E+04	26.8	152.3	0	152.3
94.1	8.63	3.77E+04	26.8	152	0	152
94.2	8.625	3.76E+04	26.8	151.6	0	151.6
94.3	8.619	3.75E+04	26.7	151.2	0	151.2
94.4	8.614	3.74E+04	26.7	150.8	0	150.8
94.5	8.608	3.73E+04	26.7	150.4	0	150.4
94.6	8.603	3.72E+04	26.7	150	0	150
94.7	8.597	3.71E+04	26.7	149.6	0	149.6
94.8	8.592	3.70E+04	26.7	149.2	0	149.2
94.9	8.586	3.69E+04	26.6	148.8	0	148.8
95	8.581	3.68E+04	26.6	148.4	0	148.4
95.1	8.575	3.67E+04	26.6	148	0	148
95.2	8.57	3.66E+04	26.6	147.6	0	147.6
95.3	8.564	3.65E+04	26.6	147.2	0	147.2
95.4	8.559	3.64E+04	26.6	146.8	0	146.8
95.5	8.553	3.63E+04	26.6	146.4	0	146.4
95.6	8.548	3.62E+04	26.5	146	0	146
95.7	8.543	3.61E+04	26.5	145.7	0	145.7
95.8	8.537	3.60E+04	26.5	145.3	0	145.3
95.9	8.532	3.59E+04	26.5	144.9	0	144.9
96	8.527	3.58E+04	26.5	144.5	0	144.5
96.1	8.521	3.57E+04	26.5	144.1	0	144.1
96.2	8.516	3.56E+04	26.4	143.7	0	143.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
96.3	8.511	3.55E+04	26.4	143.3	0	143.3
96.4	8.505	3.54E+04	26.4	143	0	143
96.5	8.5	3.53E+04	26.4	142.6	0	142.6
96.6	8.495	3.52E+04	26.4	142.2	0	142.2
96.7	8.49	3.51E+04	26.4	141.8	0	141.8
96.8	8.485	3.50E+04	26.4	141.4	0	141.4
96.9	8.479	3.49E+04	26.3	141.1	0	141.1
97	8.474	3.48E+04	26.3	140.7	0	140.7
97.1	8.469	3.47E+04	26.3	140.3	0	140.3
97.2	8.464	3.46E+04	26.3	140	0	140
97.3	8.459	3.45E+04	26.3	139.6	0	139.6
97.4	8.454	3.44E+04	26.3	139.2	0	139.2
97.5	8.448	3.43E+04	26.3	138.8	0	138.8
97.6	8.443	3.42E+04	26.2	138.5	0	138.5
97.7	8.438	3.41E+04	26.2	138.1	0	138.1
97.8	8.433	3.40E+04	26.2	137.8	0	137.8
97.9	8.428	3.39E+04	26.2	137.4	0	137.4
98	8.423	3.38E+04	26.2	137	0	137
98.1	8.418	3.37E+04	26.2	136.7	0	136.7
98.2	8.413	3.36E+04	26.2	136.3	0	136.3
98.3	8.408	3.35E+04	26.2	136	0	136
98.4	8.403	3.34E+04	26.1	135.6	0	135.6
98.5	8.398	3.33E+04	26.1	135.3	0	135.3
98.6	8.393	3.33E+04	26.1	134.9	0	134.9
98.7	8.388	3.32E+04	26.1	134.6	0	134.6
98.8	8.383	3.31E+04	26.1	134.2	0	134.2
98.9	8.378	3.30E+04	26.1	133.9	0	133.9
99	8.374	3.29E+04	26.1	133.5	0	133.5
99.1	8.369	3.28E+04	26	133.2	0	133.2
99.2	8.364	3.27E+04	26	132.8	0	132.8
99.3	8.359	3.26E+04	26	132.5	0	132.5
99.4	8.354	3.25E+04	26	132.2	0	132.2
99.5	8.349	3.24E+04	26	131.8	0	131.8
99.6	8.344	3.24E+04	26	131.5	0	131.5
99.7	8.34	3.23E+04	26	131.2	0	131.2
99.8	8.335	3.22E+04	26	130.9	0	130.9
99.9	8.33	3.21E+04	25.9	130.5	0	130.5
100	8.325	3.20E+04	25.9	130.2	0	130.2
100.1	8.321	3.19E+04	25.9	129.9	0	129.9
100.2	8.316	3.18E+04	25.9	129.6	0	129.6
100.3	8.311	3.18E+04	25.9	129.2	0	129.2
100.4	8.306	3.17E+04	25.9	128.9	0	128.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
100.5	8.302	3.16E+04	25.9	128.6	0	128.6
100.6	8.297	3.15E+04	25.8	128.3	0	128.3
100.7	8.292	3.14E+04	25.8	128	0	128
100.8	8.288	3.13E+04	25.8	127.7	0	127.7
100.9	8.283	3.13E+04	25.8	127.4	0	127.4
101	8.278	3.12E+04	25.8	127.1	0	127.1
101.1	8.274	3.11E+04	25.8	126.8	0	126.8
101.2	8.269	3.10E+04	25.8	126.5	0	126.5
101.3	8.265	3.10E+04	25.8	126.2	0	126.2
101.4	8.26	3.09E+04	25.7	125.9	0	125.9
101.5	8.255	3.08E+04	25.7	125.6	0	125.6
101.6	8.251	3.07E+04	25.7	125.3	0	125.3
101.7	8.246	3.07E+04	25.7	125	0	125
101.8	8.242	3.06E+04	25.7	124.7	0	124.7
101.9	8.237	3.05E+04	25.7	124.4	0	124.4
102	8.233	3.04E+04	25.7	124.1	0	124.1
102.1	8.228	3.04E+04	25.7	123.9	0	123.9
102.2	8.224	3.03E+04	25.6	123.6	0	123.6
102.3	8.219	3.02E+04	25.6	123.3	0	123.3
102.4	8.215	3.02E+04	25.6	123	0	123
102.5	8.21	3.01E+04	25.6	122.7	0	122.7
102.6	8.206	3.00E+04	25.6	122.5	0	122.5
102.7	8.201	2.99E+04	25.6	122.2	0	122.2
102.8	8.197	2.99E+04	25.6	121.9	0	121.9
102.9	8.192	2.98E+04	25.6	121.6	0	121.6
103	8.188	2.97E+04	25.5	121.4	0	121.4
103.1	8.183	2.97E+04	25.5	121.1	0	121.1
103.2	8.179	2.96E+04	25.5	120.8	0	120.8
103.3	8.175	2.95E+04	25.5	120.6	0	120.6
103.4	8.17	2.95E+04	25.5	120.3	0	120.3
103.5	8.166	2.94E+04	25.5	120	0	120
103.6	8.162	2.94E+04	25.5	119.8	0	119.8
103.7	8.157	2.93E+04	25.5	119.5	0	119.5
103.8	8.153	2.92E+04	25.4	119.3	0	119.3
103.9	8.149	2.92E+04	25.4	119	0	119
104	8.144	2.91E+04	25.4	118.7	0	118.7
104.1	8.14	2.90E+04	25.4	118.5	0	118.5
104.2	8.136	2.90E+04	25.4	118.2	0	118.2
104.3	8.131	2.89E+04	25.4	118	0	118
104.4	8.127	2.88E+04	25.4	117.7	0	117.7
104.5	8.123	2.88E+04	25.4	117.5	0	117.5
104.6	8.118	2.87E+04	25.3	117.2	0	117.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
104.7	8.114	2.87E+04	25.3	117	0	117
104.8	8.11	2.86E+04	25.3	116.7	0	116.7
104.9	8.106	2.85E+04	25.3	116.5	0	116.5
105	8.101	2.85E+04	25.3	116.2	0	116.2
105.1	8.097	2.84E+04	25.3	116	0	116
105.2	8.093	2.83E+04	25.3	115.7	0	115.7
105.3	8.089	2.83E+04	25.3	115.5	0	115.5
105.4	8.085	2.82E+04	25.3	115.2	0	115.2
105.5	8.08	2.82E+04	25.2	115	0	115
105.6	8.076	2.81E+04	25.2	114.7	0	114.7
105.7	8.072	2.80E+04	25.2	114.5	0	114.5
105.8	8.068	2.80E+04	25.2	114.2	0	114.2
105.9	8.064	2.79E+04	25.2	114	0	114
106	8.06	2.79E+04	25.2	113.8	0	113.8
106.1	8.055	2.78E+04	25.2	113.5	0	113.5
106.2	8.051	2.77E+04	25.2	113.3	0	113.3
106.3	8.047	2.77E+04	25.1	113	0	113
106.4	8.043	2.76E+04	25.1	112.8	0	112.8
106.5	8.039	2.76E+04	25.1	112.6	0	112.6
106.6	8.035	2.75E+04	25.1	112.3	0	112.3
106.7	8.031	2.74E+04	25.1	112.1	0	112.1
106.8	8.027	2.74E+04	25.1	111.8	0	111.8
106.9	8.023	2.73E+04	25.1	111.6	0	111.6
107	8.019	2.72E+04	25.1	111.4	0	111.4
107.1	8.015	2.72E+04	25.1	111.1	0	111.1
107.2	8.011	2.71E+04	25	110.9	0	110.9
107.3	8.006	2.71E+04	25	110.6	0	110.6
107.4	8.002	2.70E+04	25	110.4	0	110.4
107.5	7.998	2.69E+04	25	110.2	0	110.2
107.6	7.994	2.69E+04	25	109.9	0	109.9
107.7	7.99	2.68E+04	25	109.7	0	109.7
107.8	7.986	2.67E+04	25	109.4	0	109.4
107.9	7.982	2.67E+04	25	109.2	0	109.2
108	7.979	2.66E+04	25	109	0	109
108.1	7.975	2.66E+04	24.9	108.7	0	108.7
108.2	7.971	2.65E+04	24.9	108.5	0	108.5
108.3	7.967	2.64E+04	24.9	108.3	0	108.3
108.4	7.963	2.64E+04	24.9	108	0	108
108.5	7.959	2.63E+04	24.9	107.8	0	107.8
108.6	7.955	2.62E+04	24.9	107.6	0	107.6
108.7	7.951	2.62E+04	24.9	107.3	0	107.3
108.8	7.947	2.61E+04	24.9	107.1	0	107.1

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
108.9	7.943	2.61E+04	24.9	106.9	0	106.9
109	7.939	2.60E+04	24.8	106.6	0	106.6
109.1	7.936	2.59E+04	24.8	106.4	0	106.4
109.2	7.932	2.59E+04	24.8	106.2	0	106.2
109.3	7.928	2.58E+04	24.8	105.9	0	105.9
109.4	7.924	2.57E+04	24.8	105.7	0	105.7
109.5	7.92	2.57E+04	24.8	105.5	0	105.5
109.6	7.916	2.56E+04	24.8	105.2	0	105.2
109.7	7.913	2.56E+04	24.8	105	0	105
109.8	7.909	2.55E+04	24.8	104.8	0	104.8
109.9	7.905	2.54E+04	24.8	104.5	0	104.5
110	7.901	2.54E+04	24.7	104.3	0	104.3
110.1	7.897	2.53E+04	24.7	104.1	0	104.1
110.2	7.894	2.52E+04	24.7	103.9	0	103.9
110.3	7.89	2.52E+04	24.7	103.6	0	103.6
110.4	7.886	2.51E+04	24.7	103.4	0	103.4
110.5	7.882	2.50E+04	24.7	103.2	0	103.2
110.6	7.879	2.50E+04	24.7	103	0	103
110.7	7.875	2.49E+04	24.7	102.7	0	102.7
110.8	7.871	2.49E+04	24.7	102.5	0	102.5
110.9	7.868	2.48E+04	24.7	102.3	0	102.3
111	7.864	2.47E+04	24.6	102.1	0	102.1
111.1	7.86	2.47E+04	24.6	101.8	0	101.8
111.2	7.857	2.46E+04	24.6	101.6	0	101.6
111.3	7.853	2.46E+04	24.6	101.4	0	101.4
111.4	7.849	2.45E+04	24.6	101.2	0	101.2
111.5	7.846	2.44E+04	24.6	100.9	0	100.9
111.6	7.842	2.44E+04	24.6	100.7	0	100.7
111.7	7.838	2.43E+04	24.6	100.5	0	100.5
111.8	7.835	2.42E+04	24.6	100.3	0	100.3
111.9	7.831	2.42E+04	24.6	100.1	0	100.1
112	7.827	2.41E+04	24.5	99.9	0	99.9
112.1	7.824	2.41E+04	24.5	99.6	0	99.6
112.2	7.82	2.40E+04	24.5	99.4	0	99.4
112.3	7.817	2.39E+04	24.5	99.2	0	99.2
112.4	7.813	2.39E+04	24.5	99	0	99
112.5	7.81	2.38E+04	24.5	98.8	0	98.8
112.6	7.806	2.38E+04	24.5	98.6	0	98.6
112.7	7.803	2.37E+04	24.5	98.3	0	98.3
112.8	7.799	2.36E+04	24.5	98.1	0	98.1
112.9	7.795	2.36E+04	24.5	97.9	0	97.9
113	7.792	2.35E+04	24.5	97.7	0	97.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
113.1	7.788	2.35E+04	24.4	97.5	0	97.5
113.2	7.785	2.34E+04	24.4	97.3	0	97.3
113.3	7.782	2.33E+04	24.4	97.1	0	97.1
113.4	7.778	2.33E+04	24.4	96.9	0	96.9
113.5	7.775	2.32E+04	24.4	96.7	0	96.7
113.6	7.771	2.32E+04	24.4	96.5	0	96.5
113.7	7.768	2.31E+04	24.4	96.2	0	96.2
113.8	7.764	2.30E+04	24.4	96	0	96
113.9	7.761	2.30E+04	24.4	95.8	0	95.8
114	7.757	2.29E+04	24.4	95.6	0	95.6
114.1	7.754	2.29E+04	24.4	95.4	0	95.4
114.2	7.751	2.28E+04	24.3	95.2	0	95.2
114.3	7.747	2.28E+04	24.3	95	0	95
114.4	7.744	2.27E+04	24.3	94.8	0	94.8
114.5	7.74	2.26E+04	24.3	94.6	0	94.6
114.6	7.737	2.26E+04	24.3	94.4	0	94.4
114.7	7.734	2.25E+04	24.3	94.2	0	94.2
114.8	7.73	2.25E+04	24.3	94	0	94
114.9	7.727	2.24E+04	24.3	93.8	0	93.8
115	7.724	2.23E+04	24.3	93.6	0	93.6
115.1	7.72	2.23E+04	24.3	93.4	0	93.4
115.2	7.717	2.22E+04	24.3	93.2	0	93.2
115.3	7.714	2.22E+04	24.3	93	0	93
115.4	7.71	2.21E+04	24.2	92.8	0	92.8
115.5	7.707	2.21E+04	24.2	92.6	0	92.6
115.6	7.704	2.20E+04	24.2	92.4	0	92.4
115.7	7.701	2.19E+04	24.2	92.2	0	92.2
115.8	7.697	2.19E+04	24.2	92	0	92
115.9	7.694	2.18E+04	24.2	91.8	0	91.8
116	7.691	2.18E+04	24.2	91.6	0	91.6
116.1	7.687	2.17E+04	24.2	91.4	0	91.4
116.2	7.684	2.17E+04	24.2	91.2	0	91.2
116.3	7.681	2.16E+04	24.2	91	0	91
116.4	7.678	2.16E+04	24.2	90.9	0	90.9
116.5	7.675	2.15E+04	24.2	90.7	0	90.7
116.6	7.671	2.14E+04	24.1	90.5	0	90.5
116.7	7.668	2.14E+04	24.1	90.3	0	90.3
116.8	7.665	2.13E+04	24.1	90.1	0	90.1
116.9	7.662	2.13E+04	24.1	89.9	0	89.9
117	7.659	2.12E+04	24.1	89.7	0	89.7
117.1	7.655	2.12E+04	24.1	89.5	0	89.5
117.2	7.652	2.11E+04	24.1	89.3	0	89.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
117.3	7.649	2.11E+04	24.1	89.1	0	89.1
117.4	7.646	2.10E+04	24.1	89	0	89
117.5	7.643	2.09E+04	24.1	88.8	0	88.8
117.6	7.64	2.09E+04	24.1	88.6	0	88.6
117.7	7.637	2.08E+04	24.1	88.4	0	88.4
117.8	7.634	2.08E+04	24	88.2	0	88.2
117.9	7.63	2.07E+04	24	88	0	88
118	7.627	2.07E+04	24	87.8	0	87.8
118.1	7.624	2.06E+04	24	87.7	0	87.7
118.2	7.621	2.06E+04	24	87.5	0	87.5
118.3	7.618	2.05E+04	24	87.3	0	87.3
118.4	7.615	2.05E+04	24	87.1	0	87.1
118.5	7.612	2.04E+04	24	86.9	0	86.9
118.6	7.609	2.04E+04	24	86.8	0	86.8
118.7	7.606	2.03E+04	24	86.6	0	86.6
118.8	7.603	2.02E+04	24	86.4	0	86.4
118.9	7.6	2.02E+04	24	86.2	0	86.2
119	7.597	2.01E+04	24	86	0	86
119.1	7.594	2.01E+04	23.9	85.9	0	85.9
119.2	7.591	2.00E+04	23.9	85.7	0	85.7
119.3	7.588	2.00E+04	23.9	85.5	0	85.5
119.4	7.585	1.99E+04	23.9	85.3	0	85.3
119.5	7.582	1.99E+04	23.9	85.1	0	85.1
119.6	7.579	1.98E+04	23.9	85	0	85
119.7	7.576	1.98E+04	23.9	84.8	0	84.8
119.8	7.573	1.97E+04	23.9	84.6	0	84.6
119.9	7.57	1.97E+04	23.9	84.4	0	84.4
120	7.567	1.96E+04	23.9	84.3	0	84.3
120.1	7.564	1.96E+04	23.9	84.1	0	84.1
120.2	7.561	1.95E+04	23.9	83.9	0	83.9
120.3	7.559	1.95E+04	23.9	83.7	0	83.7
120.4	7.556	1.94E+04	23.9	83.6	0	83.6
120.5	7.553	1.94E+04	23.8	83.4	0	83.4
120.6	7.55	1.93E+04	23.8	83.2	0	83.2
120.7	7.547	1.93E+04	23.8	83.1	0	83.1
120.8	7.544	1.92E+04	23.8	82.9	0	82.9
120.9	7.541	1.92E+04	23.8	82.7	0	82.7
121	7.538	1.91E+04	23.8	82.5	0	82.5
121.1	7.535	1.91E+04	23.8	82.4	0	82.4
121.2	7.533	1.90E+04	23.8	82.2	0	82.2
121.3	7.53	1.90E+04	23.8	82	0	82
121.4	7.527	1.89E+04	23.8	81.9	0	81.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
121.5	7.524	1.89E+04	23.8	81.7	0	81.7
121.6	7.521	1.88E+04	23.8	81.5	0	81.5
121.7	7.519	1.88E+04	23.8	81.4	0	81.4
121.8	7.516	1.87E+04	23.8	81.2	0	81.2
121.9	7.513	1.87E+04	23.7	81	0	81
122	7.51	1.86E+04	23.7	80.9	0	80.9
122.1	7.507	1.86E+04	23.7	80.7	0	80.7
122.2	7.505	1.85E+04	23.7	80.5	0	80.5
122.3	7.502	1.85E+04	23.7	80.4	0	80.4
122.4	7.499	1.84E+04	23.7	80.2	0	80.2
122.5	7.496	1.84E+04	23.7	80.1	0	80.1
122.6	7.494	1.83E+04	23.7	79.9	0	79.9
122.7	7.491	1.83E+04	23.7	79.7	0	79.7
122.8	7.488	1.82E+04	23.7	79.6	0	79.6
122.9	7.485	1.82E+04	23.7	79.4	0	79.4
123	7.483	1.81E+04	23.7	79.3	0	79.3
123.1	7.48	1.81E+04	23.7	79.1	0	79.1
123.2	7.477	1.80E+04	23.7	78.9	0	78.9
123.3	7.475	1.80E+04	23.7	78.8	0	78.8
123.4	7.472	1.79E+04	23.6	78.6	0	78.6
123.5	7.469	1.79E+04	23.6	78.5	0	78.5
123.6	7.467	1.78E+04	23.6	78.3	0	78.3
123.7	7.464	1.78E+04	23.6	78.1	0	78.1
123.8	7.461	1.77E+04	23.6	78	0	78
123.9	7.459	1.77E+04	23.6	77.8	0	77.8
124	7.456	1.77E+04	23.6	77.7	0	77.7
124.1	7.453	1.76E+04	23.6	77.5	0	77.5
124.2	7.451	1.76E+04	23.6	77.4	0	77.4
124.3	7.448	1.75E+04	23.6	77.2	0	77.2
124.4	7.445	1.75E+04	23.6	77	0	77
124.5	7.443	1.74E+04	23.6	76.9	0	76.9
124.6	7.44	1.74E+04	23.6	76.7	0	76.7
124.7	7.438	1.73E+04	23.6	76.6	0	76.6
124.8	7.435	1.73E+04	23.6	76.4	0	76.4
124.9	7.432	1.72E+04	23.6	76.3	0	76.3
125	7.43	1.72E+04	23.5	76.1	0	76.1
125.1	7.427	1.71E+04	23.5	76	0	76
125.2	7.425	1.71E+04	23.5	75.8	0	75.8
125.3	7.422	1.70E+04	23.5	75.7	0	75.7
125.4	7.42	1.70E+04	23.5	75.5	0	75.5
125.5	7.417	1.70E+04	23.5	75.4	0	75.4
125.6	7.415	1.69E+04	23.5	75.2	0	75.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
125.7	7.412	1.69E+04	23.5	75.1	0	75.1
125.8	7.41	1.68E+04	23.5	74.9	0	74.9
125.9	7.407	1.68E+04	23.5	74.8	0	74.8
126	7.405	1.67E+04	23.5	74.6	0	74.6
126.1	7.402	1.67E+04	23.5	74.5	0	74.5
126.2	7.4	1.66E+04	23.5	74.3	0	74.3
126.3	7.397	1.66E+04	23.5	74.2	0	74.2
126.4	7.395	1.66E+04	23.5	74	0	74
126.5	7.392	1.65E+04	23.5	73.9	0	73.9
126.6	7.39	1.65E+04	23.5	73.7	0	73.7
126.7	7.387	1.64E+04	23.4	73.6	0	73.6
126.8	7.385	1.64E+04	23.4	73.5	0	73.5
126.9	7.382	1.63E+04	23.4	73.3	0	73.3
127	7.38	1.63E+04	23.4	73.2	0	73.2
127.1	7.377	1.62E+04	23.4	73	0	73
127.2	7.375	1.62E+04	23.4	72.9	0	72.9
127.3	7.373	1.62E+04	23.4	72.7	0	72.7
127.4	7.37	1.61E+04	23.4	72.6	0	72.6
127.5	7.368	1.61E+04	23.4	72.4	0	72.4
127.6	7.365	1.60E+04	23.4	72.3	0	72.3
127.7	7.363	1.60E+04	23.4	72.2	0	72.2
127.8	7.361	1.59E+04	23.4	72	0	72
127.9	7.358	1.59E+04	23.4	71.9	0	71.9
128	7.356	1.59E+04	23.4	71.7	0	71.7
128.1	7.353	1.58E+04	23.4	71.6	0	71.6
128.2	7.351	1.58E+04	23.4	71.5	0	71.5
128.3	7.349	1.57E+04	23.4	71.3	0	71.3
128.4	7.346	1.57E+04	23.4	71.2	0	71.2
128.5	7.344	1.56E+04	23.3	71	0	71
128.6	7.342	1.56E+04	23.3	70.9	0	70.9
128.7	7.339	1.56E+04	23.3	70.8	0	70.8
128.8	7.337	1.55E+04	23.3	70.6	0	70.6
128.9	7.335	1.55E+04	23.3	70.5	0	70.5
129	7.332	1.54E+04	23.3	70.4	0	70.4
129.1	7.33	1.54E+04	23.3	70.2	0	70.2
129.2	7.328	1.54E+04	23.3	70.1	0	70.1
129.3	7.325	1.53E+04	23.3	69.9	0	69.9
129.4	7.323	1.53E+04	23.3	69.8	0	69.8
129.5	7.321	1.52E+04	23.3	69.7	0	69.7
129.6	7.319	1.52E+04	23.3	69.5	0	69.5
129.7	7.316	1.51E+04	23.3	69.4	0	69.4
129.8	7.314	1.51E+04	23.3	69.3	0	69.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
129.9	7.312	1.51E+04	23.3	69.1	0	69.1
130	7.309	1.50E+04	23.3	69	0	69
130.1	7.307	1.50E+04	23.3	68.9	0	68.9
130.2	7.305	1.49E+04	23.3	68.7	0	68.7
130.3	7.303	1.49E+04	23.3	68.6	0	68.6
130.4	7.301	1.49E+04	23.3	68.5	0	68.5
130.5	7.298	1.48E+04	23.2	68.3	0	68.3
130.6	7.296	1.48E+04	23.2	68.2	0	68.2
130.7	7.294	1.47E+04	23.2	68.1	0	68.1
130.8	7.292	1.47E+04	23.2	67.9	0	67.9
130.9	7.289	1.47E+04	23.2	67.8	0	67.8
131	7.287	1.46E+04	23.2	67.7	0	67.7
131.1	7.285	1.46E+04	23.2	67.6	0	67.6
131.2	7.283	1.45E+04	23.2	67.4	0	67.4
131.3	7.281	1.45E+04	23.2	67.3	0	67.3
131.4	7.279	1.45E+04	23.2	67.2	0	67.2
131.5	7.276	1.44E+04	23.2	67	0	67
131.6	7.274	1.44E+04	23.2	66.9	0	66.9
131.7	7.272	1.43E+04	23.2	66.8	0	66.8
131.8	7.27	1.43E+04	23.2	66.7	0	66.7
131.9	7.268	1.43E+04	23.2	66.5	0	66.5
132	7.266	1.42E+04	23.2	66.4	0	66.4
132.1	7.263	1.42E+04	23.2	66.3	0	66.3
132.2	7.261	1.42E+04	23.2	66.2	0	66.2
132.3	7.259	1.41E+04	23.2	66	0	66
132.4	7.257	1.41E+04	23.2	65.9	0	65.9
132.5	7.255	1.40E+04	23.2	65.8	0	65.8
132.6	7.253	1.40E+04	23.1	65.6	0	65.6
132.7	7.251	1.40E+04	23.1	65.5	0	65.5
132.8	7.249	1.39E+04	23.1	65.4	0	65.4
132.9	7.247	1.39E+04	23.1	65.3	0	65.3
133	7.245	1.39E+04	23.1	65.2	0	65.2
133.1	7.242	1.38E+04	23.1	65	0	65
133.2	7.24	1.38E+04	23.1	64.9	0	64.9
133.3	7.238	1.37E+04	23.1	64.8	0	64.8
133.4	7.236	1.37E+04	23.1	64.7	0	64.7
133.5	7.234	1.37E+04	23.1	64.5	0	64.5
133.6	7.232	1.36E+04	23.1	64.4	0	64.4
133.7	7.23	1.36E+04	23.1	64.3	0	64.3
133.8	7.228	1.36E+04	23.1	64.2	0	64.2
133.9	7.226	1.35E+04	23.1	64.1	0	64.1
134	7.224	1.35E+04	23.1	63.9	0	63.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
134.1	7.222	1.34E+04	23.1	63.8	0	63.8
134.2	7.22	1.34E+04	23.1	63.7	0	63.7
134.3	7.218	1.34E+04	23.1	63.6	0	63.6
134.4	7.216	1.33E+04	23.1	63.5	0	63.5
134.5	7.214	1.33E+04	23.1	63.3	0	63.3
134.6	7.212	1.33E+04	23.1	63.2	0	63.2
134.7	7.21	1.32E+04	23.1	63.1	0	63.1
134.8	7.208	1.32E+04	23.1	63	0	63
134.9	7.206	1.32E+04	23	62.9	0	62.9
135	7.204	1.31E+04	23	62.8	0	62.8
135.1	7.202	1.31E+04	23	62.6	0	62.6
135.2	7.2	1.30E+04	23	62.5	0	62.5
135.3	7.198	1.30E+04	23	62.4	0	62.4
135.4	7.196	1.30E+04	23	62.3	0	62.3
135.5	7.194	1.29E+04	23	62.2	0	62.2
135.6	7.192	1.29E+04	23	62.1	0	62.1
135.7	7.19	1.29E+04	23	61.9	0	61.9
135.8	7.188	1.28E+04	23	61.8	0	61.8
135.9	7.187	1.28E+04	23	61.7	0	61.7
136	7.185	1.28E+04	23	61.6	0	61.6
136.1	7.183	1.27E+04	23	61.5	0	61.5
136.2	7.181	1.27E+04	23	61.4	0	61.4
136.3	7.179	1.27E+04	23	61.3	0	61.3
136.4	7.177	1.26E+04	23	61.1	0	61.1
136.5	7.175	1.26E+04	23	61	0	61
136.6	7.173	1.26E+04	23	60.9	0	60.9
136.7	7.171	1.25E+04	23	60.8	0	60.8
136.8	7.169	1.25E+04	23	60.7	0	60.7
136.9	7.168	1.25E+04	23	60.6	0	60.6
137	7.166	1.24E+04	23	60.5	0	60.5
137.1	7.164	1.24E+04	23	60.4	0	60.4
137.2	7.162	1.24E+04	23	60.2	0	60.2
137.3	7.16	1.23E+04	23	60.1	0	60.1
137.4	7.158	1.23E+04	23	60	0	60
137.5	7.156	1.23E+04	22.9	59.9	0	59.9
137.6	7.155	1.22E+04	22.9	59.8	0	59.8
137.7	7.153	1.22E+04	22.9	59.7	0	59.7
137.8	7.151	1.22E+04	22.9	59.6	0	59.6
137.9	7.149	1.21E+04	22.9	59.5	0	59.5
138	7.147	1.21E+04	22.9	59.4	0	59.4
138.1	7.145	1.21E+04	22.9	59.3	0	59.3
138.2	7.144	1.20E+04	22.9	59.2	0	59.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
138.3	7.142	1.20E+04	22.9	59	0	59
138.4	7.14	1.20E+04	22.9	58.9	0	58.9
138.5	7.138	1.19E+04	22.9	58.8	0	58.8
138.6	7.136	1.19E+04	22.9	58.7	0	58.7
138.7	7.135	1.19E+04	22.9	58.6	0	58.6
138.8	7.133	1.18E+04	22.9	58.5	0	58.5
138.9	7.131	1.18E+04	22.9	58.4	0	58.4
139	7.129	1.18E+04	22.9	58.3	0	58.3
139.1	7.128	1.17E+04	22.9	58.2	0	58.2
139.2	7.126	1.17E+04	22.9	58.1	0	58.1
139.3	7.124	1.17E+04	22.9	58	0	58
139.4	7.122	1.16E+04	22.9	57.9	0	57.9
139.5	7.121	1.16E+04	22.9	57.8	0	57.8
139.6	7.119	1.16E+04	22.9	57.7	0	57.7
139.7	7.117	1.15E+04	22.9	57.6	0	57.6
139.8	7.115	1.15E+04	22.9	57.5	0	57.5
139.9	7.114	1.15E+04	22.9	57.4	0	57.4
140	7.112	1.15E+04	22.9	57.3	0	57.3
140.1	7.11	1.14E+04	22.9	57.2	0	57.2
140.2	7.108	1.14E+04	22.9	57.1	0	57.1
140.3	7.107	1.14E+04	22.9	57	0	57
140.4	7.105	1.13E+04	22.8	56.8	0	56.8
140.5	7.103	1.13E+04	22.8	56.7	0	56.7
140.6	7.102	1.13E+04	22.8	56.6	0	56.6
140.7	7.1	1.12E+04	22.8	56.5	0	56.5
140.8	7.098	1.12E+04	22.8	56.4	0	56.4
140.9	7.097	1.12E+04	22.8	56.3	0	56.3
141	7.095	1.11E+04	22.8	56.2	0	56.2
141.1	7.093	1.11E+04	22.8	56.1	0	56.1
141.2	7.091	1.11E+04	22.8	56	0	56
141.3	7.09	1.11E+04	22.8	55.9	0	55.9
141.4	7.088	1.10E+04	22.8	55.8	0	55.8
141.5	7.086	1.10E+04	22.8	55.7	0	55.7
141.6	7.085	1.10E+04	22.8	55.6	0	55.6
141.7	7.083	1.09E+04	22.8	55.5	0	55.5
141.8	7.082	1.09E+04	22.8	55.4	0	55.4
141.9	7.08	1.09E+04	22.8	55.3	0	55.3
142	7.078	1.08E+04	22.8	55.3	0	55.3
142.1	7.077	1.08E+04	22.8	55.2	0	55.2
142.2	7.075	1.08E+04	22.8	55.1	0	55.1
142.3	7.073	1.08E+04	22.8	55	0	55
142.4	7.072	1.07E+04	22.8	54.9	0	54.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
142.5	7.07	1.07E+04	22.8	54.8	0	54.8
142.6	7.069	1.07E+04	22.8	54.7	0	54.7
142.7	7.067	1.06E+04	22.8	54.6	0	54.6
142.8	7.065	1.06E+04	22.8	54.5	0	54.5
142.9	7.064	1.06E+04	22.8	54.4	0	54.4
143	7.062	1.06E+04	22.8	54.3	0	54.3
143.1	7.061	1.05E+04	22.8	54.2	0	54.2
143.2	7.059	1.05E+04	22.8	54.1	0	54.1
143.3	7.057	1.05E+04	22.8	54	0	54
143.4	7.056	1.04E+04	22.8	53.9	0	53.9
143.5	7.054	1.04E+04	22.8	53.8	0	53.8
143.6	7.053	1.04E+04	22.8	53.7	0	53.7
143.7	7.051	1.04E+04	22.8	53.6	0	53.6
143.8	7.05	1.03E+04	22.7	53.5	0	53.5
143.9	7.048	1.03E+04	22.7	53.4	0	53.4
144	7.046	1.03E+04	22.7	53.3	0	53.3
144.1	7.045	1.02E+04	22.7	53.2	0	53.2
144.2	7.043	1.02E+04	22.7	53.2	0	53.2
144.3	7.042	1.02E+04	22.7	53.1	0	53.1
144.4	7.04	1.02E+04	22.7	53	0	53
144.5	7.039	1.01E+04	22.7	52.9	0	52.9
144.6	7.037	1.01E+04	22.7	52.8	0	52.8
144.7	7.036	1.01E+04	22.7	52.7	0	52.7
144.8	7.034	1.01E+04	22.7	52.6	0	52.6
144.9	7.033	1.00E+04	22.7	52.5	0	52.5
145	7.031	1.00E+04	22.7	52.4	0	52.4
145.1	7.03	9.97E+03	22.7	52.3	0	52.3
145.2	7.028	9.95E+03	22.7	52.2	0	52.2
145.3	7.027	9.92E+03	22.7	52.2	0	52.2
145.4	7.025	9.89E+03	22.7	52.1	0	52.1
145.5	7.024	9.87E+03	22.7	52	0	52
145.6	7.022	9.84E+03	22.7	51.9	0	51.9
145.7	7.021	9.81E+03	22.7	51.8	0	51.8
145.8	7.019	9.79E+03	22.7	51.7	0	51.7
145.9	7.018	9.76E+03	22.7	51.6	0	51.6
146	7.016	9.73E+03	22.7	51.5	0	51.5
146.1	7.015	9.71E+03	22.7	51.4	0	51.4
146.2	7.013	9.68E+03	22.7	51.3	0	51.3
146.3	7.012	9.66E+03	22.7	51.3	0	51.3
146.4	7.01	9.63E+03	22.7	51.2	0	51.2
146.5	7.009	9.60E+03	22.7	51.1	0	51.1
146.6	7.007	9.58E+03	22.7	51	0	51

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
146.7	7.006	9.55E+03	22.7	50.9	0	50.9
146.8	7.005	9.53E+03	22.7	50.8	0	50.8
146.9	7.003	9.50E+03	22.7	50.7	0	50.7
147	7.002	9.48E+03	22.7	50.6	0	50.6
147.1	7	9.45E+03	22.7	50.6	0	50.6
147.2	6.999	9.42E+03	22.7	50.5	0	50.5
147.3	6.997	9.40E+03	22.7	50.4	0	50.4
147.4	6.996	9.37E+03	22.7	50.3	0	50.3
147.5	6.995	9.35E+03	22.7	50.2	0	50.2
147.6	6.993	9.32E+03	22.7	50.1	0	50.1
147.7	6.992	9.30E+03	22.7	50	0	50
147.8	6.99	9.27E+03	22.6	50	0	50
147.9	6.989	9.25E+03	22.6	49.9	0	49.9
148	6.988	9.22E+03	22.6	49.8	0	49.8
148.1	6.986	9.20E+03	22.6	49.7	0	49.7
148.2	6.985	9.17E+03	22.6	49.6	0	49.6
148.3	6.983	9.15E+03	22.6	49.5	0	49.5
148.4	6.982	9.13E+03	22.6	49.5	0	49.5
148.5	6.981	9.10E+03	22.6	49.4	0	49.4
148.6	6.979	9.08E+03	22.6	49.3	0	49.3
148.7	6.978	9.05E+03	22.6	49.2	0	49.2
148.8	6.977	9.03E+03	22.6	49.1	0	49.1
148.9	6.975	9.00E+03	22.6	49	0	49
149	6.974	8.98E+03	22.6	49	0	49
149.1	6.973	8.96E+03	22.6	48.9	0	48.9
149.2	6.971	8.93E+03	22.6	48.8	0	48.8
149.3	6.97	8.91E+03	22.6	48.7	0	48.7
149.4	6.968	8.88E+03	22.6	48.6	0	48.6
149.5	6.967	8.86E+03	22.6	48.6	0	48.6
149.6	6.966	8.84E+03	22.6	48.5	0	48.5
149.7	6.964	8.81E+03	22.6	48.4	0	48.4
149.8	6.963	8.79E+03	22.6	48.3	0	48.3
149.9	6.962	8.76E+03	22.6	48.2	0	48.2
150	6.96	8.74E+03	22.6	48.1	0	48.1
150.1	6.959	8.72E+03	22.6	48.1	0	48.1
150.2	6.958	8.69E+03	22.6	48	0	48
150.3	6.957	8.67E+03	22.6	47.9	0	47.9
150.4	6.955	8.65E+03	22.6	47.8	0	47.8
150.5	6.954	8.63E+03	22.6	47.7	0	47.7
150.6	6.953	8.60E+03	22.6	47.7	0	47.7
150.7	6.951	8.58E+03	22.6	47.6	0	47.6
150.8	6.95	8.56E+03	22.6	47.5	0	47.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
150.9	6.949	8.53E+03	22.6	47.4	0	47.4
151	6.947	8.51E+03	22.6	47.4	0	47.4
151.1	6.946	8.49E+03	22.6	47.3	0	47.3
151.2	6.945	8.47E+03	22.6	47.2	0	47.2
151.3	6.944	8.44E+03	22.6	47.1	0	47.1
151.4	6.942	8.42E+03	22.6	47	0	47
151.5	6.941	8.40E+03	22.6	47	0	47
151.6	6.94	8.38E+03	22.6	46.9	0	46.9
151.7	6.938	8.35E+03	22.6	46.8	0	46.8
151.8	6.937	8.33E+03	22.6	46.7	0	46.7
151.9	6.936	8.31E+03	22.6	46.7	0	46.7
152	6.935	8.29E+03	22.6	46.6	0	46.6
152.1	6.933	8.26E+03	22.6	46.5	0	46.5
152.2	6.932	8.24E+03	22.6	46.4	0	46.4
152.3	6.931	8.22E+03	22.6	46.4	0	46.4
152.4	6.93	8.20E+03	22.6	46.3	0	46.3
152.5	6.928	8.18E+03	22.6	46.2	0	46.2
152.6	6.927	8.15E+03	22.6	46.1	0	46.1
152.7	6.926	8.13E+03	22.6	46	0	46
152.8	6.925	8.11E+03	22.6	46	0	46
152.9	6.924	8.09E+03	22.6	45.9	0	45.9
153	6.922	8.07E+03	22.5	45.8	0	45.8
153.1	6.921	8.05E+03	22.5	45.7	0	45.7
153.2	6.92	8.03E+03	22.5	45.7	0	45.7
153.3	6.919	8.00E+03	22.5	45.6	0	45.6
153.4	6.917	7.98E+03	22.5	45.5	0	45.5
153.5	6.916	7.96E+03	22.5	45.5	0	45.5
153.6	6.915	7.94E+03	22.5	45.4	0	45.4
153.7	6.914	7.92E+03	22.5	45.3	0	45.3
153.8	6.913	7.90E+03	22.5	45.2	0	45.2
153.9	6.911	7.88E+03	22.5	45.2	0	45.2
154	6.91	7.86E+03	22.5	45.1	0	45.1
154.1	6.909	7.84E+03	22.5	45	0	45
154.2	6.908	7.82E+03	22.5	44.9	0	44.9
154.3	6.907	7.79E+03	22.5	44.9	0	44.9
154.4	6.906	7.77E+03	22.5	44.8	0	44.8
154.5	6.904	7.75E+03	22.5	44.7	0	44.7
154.6	6.903	7.73E+03	22.5	44.7	0	44.7
154.7	6.902	7.71E+03	22.5	44.6	0	44.6
154.8	6.901	7.69E+03	22.5	44.5	0	44.5
154.9	6.9	7.67E+03	22.5	44.4	0	44.4
155	6.898	7.65E+03	22.5	44.4	0	44.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
155.1	6.897	7.63E+03	22.5	44.3	0	44.3
155.2	6.896	7.61E+03	22.5	44.2	0	44.2
155.3	6.895	7.59E+03	22.5	44.2	0	44.2
155.4	6.894	7.57E+03	22.5	44.1	0	44.1
155.5	6.893	7.55E+03	22.5	44	0	44
155.6	6.892	7.53E+03	22.5	43.9	0	43.9
155.7	6.89	7.51E+03	22.5	43.9	0	43.9
155.8	6.889	7.49E+03	22.5	43.8	0	43.8
155.9	6.888	7.47E+03	22.5	43.7	0	43.7
156	6.887	7.45E+03	22.5	43.7	0	43.7
156.1	6.886	7.43E+03	22.5	43.6	0	43.6
156.2	6.885	7.41E+03	22.5	43.5	0	43.5
156.3	6.884	7.39E+03	22.5	43.5	0	43.5
156.4	6.883	7.37E+03	22.5	43.4	0	43.4
156.5	6.881	7.35E+03	22.5	43.3	0	43.3
156.6	6.88	7.33E+03	22.5	43.2	0	43.2
156.7	6.879	7.32E+03	22.5	43.2	0	43.2
156.8	6.878	7.30E+03	22.5	43.1	0	43.1
156.9	6.877	7.28E+03	22.5	43	0	43
157	6.876	7.26E+03	22.5	43	0	43
157.1	6.875	7.24E+03	22.5	42.9	0	42.9
157.2	6.874	7.22E+03	22.5	42.8	0	42.8
157.3	6.873	7.20E+03	22.5	42.8	0	42.8
157.4	6.871	7.18E+03	22.5	42.7	0	42.7
157.5	6.87	7.16E+03	22.5	42.6	0	42.6
157.6	6.869	7.14E+03	22.5	42.6	0	42.6
157.7	6.868	7.13E+03	22.5	42.5	0	42.5
157.8	6.867	7.11E+03	22.5	42.4	0	42.4
157.9	6.866	7.09E+03	22.5	42.4	0	42.4
158	6.865	7.07E+03	22.5	42.3	0	42.3
158.1	6.864	7.05E+03	22.5	42.2	0	42.2
158.2	6.863	7.03E+03	22.5	42.2	0	42.2
158.3	6.862	7.01E+03	22.5	42.1	0	42.1
158.4	6.861	7.00E+03	22.5	42	0	42
158.5	6.86	6.98E+03	22.5	42	0	42
158.6	6.859	6.96E+03	22.5	41.9	0	41.9
158.7	6.858	6.94E+03	22.5	41.8	0	41.8
158.8	6.856	6.92E+03	22.5	41.8	0	41.8
158.9	6.855	6.91E+03	22.5	41.7	0	41.7
159	6.854	6.89E+03	22.5	41.6	0	41.6
159.1	6.853	6.87E+03	22.5	41.6	0	41.6
159.2	6.852	6.85E+03	22.5	41.5	0	41.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
159.3	6.851	6.83E+03	22.5	41.4	0	41.4
159.4	6.85	6.82E+03	22.5	41.4	0	41.4
159.5	6.849	6.80E+03	22.5	41.3	0	41.3
159.6	6.848	6.78E+03	22.5	41.3	0	41.3
159.7	6.847	6.76E+03	22.5	41.2	0	41.2
159.8	6.846	6.74E+03	22.5	41.1	0	41.1
159.9	6.845	6.73E+03	22.5	41.1	0	41.1
160	6.844	6.71E+03	22.5	41	0	41
160.1	6.843	6.69E+03	22.5	40.9	0	40.9
160.2	6.842	6.67E+03	22.5	40.9	0	40.9
160.3	6.841	6.66E+03	22.5	40.8	0	40.8
160.4	6.84	6.64E+03	22.5	40.7	0	40.7
160.5	6.839	6.62E+03	22.5	40.7	0	40.7
160.6	6.838	6.61E+03	22.4	40.6	0	40.6
160.7	6.837	6.59E+03	22.4	40.6	0	40.6
160.8	6.836	6.57E+03	22.4	40.5	0	40.5
160.9	6.835	6.55E+03	22.4	40.4	0	40.4
161	6.834	6.54E+03	22.4	40.4	0	40.4
161.1	6.833	6.52E+03	22.4	40.3	0	40.3
161.2	6.832	6.50E+03	22.4	40.3	0	40.3
161.3	6.831	6.49E+03	22.4	40.2	0	40.2
161.4	6.83	6.47E+03	22.4	40.1	0	40.1
161.5	6.829	6.45E+03	22.4	40.1	0	40.1
161.6	6.828	6.44E+03	22.4	40	0	40
161.7	6.827	6.42E+03	22.4	39.9	0	39.9
161.8	6.826	6.40E+03	22.4	39.9	0	39.9
161.9	6.825	6.39E+03	22.4	39.8	0	39.8
162	6.824	6.37E+03	22.4	39.8	0	39.8
162.1	6.823	6.35E+03	22.4	39.7	0	39.7
162.2	6.822	6.34E+03	22.4	39.6	0	39.6
162.3	6.821	6.32E+03	22.4	39.6	0	39.6
162.4	6.82	6.30E+03	22.4	39.5	0	39.5
162.5	6.819	6.29E+03	22.4	39.5	0	39.5
162.6	6.818	6.27E+03	22.4	39.4	0	39.4
162.7	6.817	6.26E+03	22.4	39.3	0	39.3
162.8	6.816	6.24E+03	22.4	39.3	0	39.3
162.9	6.816	6.22E+03	22.4	39.2	0	39.2
163	6.815	6.21E+03	22.4	39.2	0	39.2
163.1	6.814	6.19E+03	22.4	39.1	0	39.1
163.2	6.813	6.18E+03	22.4	39	0	39
163.3	6.812	6.16E+03	22.4	39	0	39
163.4	6.811	6.14E+03	22.4	38.9	0	38.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
163.5	6.81	6.13E+03	22.4	38.9	0	38.9
163.6	6.809	6.11E+03	22.4	38.8	0	38.8
163.7	6.808	6.10E+03	22.4	38.8	0	38.8
163.8	6.807	6.08E+03	22.4	38.7	0	38.7
163.9	6.806	6.07E+03	22.4	38.6	0	38.6
164	6.805	6.05E+03	22.4	38.6	0	38.6
164.1	6.804	6.03E+03	22.4	38.5	0	38.5
164.2	6.803	6.02E+03	22.4	38.5	0	38.5
164.3	6.802	6.00E+03	22.4	38.4	0	38.4
164.4	6.802	5.99E+03	22.4	38.4	0	38.4
164.5	6.801	5.97E+03	22.4	38.3	0	38.3
164.6	6.8	5.96E+03	22.4	38.2	0	38.2
164.7	6.799	5.94E+03	22.4	38.2	0	38.2
164.8	6.798	5.93E+03	22.4	38.1	0	38.1
164.9	6.797	5.91E+03	22.4	38.1	0	38.1
165	6.796	5.90E+03	22.4	38	0	38
165.1	6.795	5.88E+03	22.4	38	0	38
165.2	6.794	5.87E+03	22.4	37.9	0	37.9
165.3	6.793	5.85E+03	22.4	37.8	0	37.8
165.4	6.793	5.84E+03	22.4	37.8	0	37.8
165.5	6.792	5.82E+03	22.4	37.7	0	37.7
165.6	6.791	5.81E+03	22.4	37.7	0	37.7
165.7	6.79	5.79E+03	22.4	37.6	0	37.6
165.8	6.789	5.78E+03	22.4	37.6	0	37.6
165.9	6.788	5.76E+03	22.4	37.5	0	37.5
166	6.787	5.75E+03	22.4	37.5	0	37.5
166.1	6.786	5.73E+03	22.4	37.4	0	37.4
166.2	6.785	5.72E+03	22.4	37.3	0	37.3
166.3	6.785	5.71E+03	22.4	37.3	0	37.3
166.4	6.784	5.69E+03	22.4	37.2	0	37.2
166.5	6.783	5.68E+03	22.4	37.2	0	37.2
166.6	6.782	5.66E+03	22.4	37.1	0	37.1
166.7	6.781	5.65E+03	22.4	37.1	0	37.1
166.8	6.78	5.63E+03	22.4	37	0	37
166.9	6.779	5.62E+03	22.4	37	0	37
167	6.779	5.60E+03	22.4	36.9	0	36.9
167.1	6.778	5.59E+03	22.4	36.9	0	36.9
167.2	6.777	5.58E+03	22.4	36.8	0	36.8
167.3	6.776	5.56E+03	22.4	36.7	0	36.7
167.4	6.775	5.55E+03	22.4	36.7	0	36.7
167.5	6.774	5.53E+03	22.4	36.6	0	36.6
167.6	6.773	5.52E+03	22.4	36.6	0	36.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
167.7	6.773	5.51E+03	22.4	36.5	0	36.5
167.8	6.772	5.49E+03	22.4	36.5	0	36.5
167.9	6.771	5.48E+03	22.4	36.4	0	36.4
168	6.77	5.47E+03	22.4	36.4	0	36.4
168.1	6.769	5.45E+03	22.4	36.3	0	36.3
168.2	6.768	5.44E+03	22.4	36.3	0	36.3
168.3	6.768	5.42E+03	22.4	36.2	0	36.2
168.4	6.767	5.41E+03	22.4	36.2	0	36.2
168.5	6.766	5.40E+03	22.4	36.1	0	36.1
168.6	6.765	5.38E+03	22.4	36.1	0	36.1
168.7	6.764	5.37E+03	22.4	36	0	36
168.8	6.763	5.36E+03	22.4	36	0	36
168.9	6.763	5.34E+03	22.4	35.9	0	35.9
169	6.762	5.33E+03	22.4	35.8	0	35.8
169.1	6.761	5.32E+03	22.4	35.8	0	35.8
169.2	6.76	5.30E+03	22.4	35.7	0	35.7
169.3	6.759	5.29E+03	22.4	35.7	0	35.7
169.4	6.759	5.28E+03	22.4	35.6	0	35.6
169.5	6.758	5.26E+03	22.4	35.6	0	35.6
169.6	6.757	5.25E+03	22.4	35.5	0	35.5
169.7	6.756	5.24E+03	22.4	35.5	0	35.5
169.8	6.755	5.22E+03	22.4	35.4	0	35.4
169.9	6.755	5.21E+03	22.4	35.4	0	35.4
170	6.754	5.20E+03	22.4	35.3	0	35.3
170.1	6.753	5.18E+03	22.4	35.3	0	35.3
170.2	6.752	5.17E+03	22.4	35.2	0	35.2
170.3	6.751	5.16E+03	22.4	35.2	0	35.2
170.4	6.751	5.15E+03	22.4	35.1	0	35.1
170.5	6.75	5.13E+03	22.4	35.1	0	35.1
170.6	6.749	5.12E+03	22.4	35	0	35
170.7	6.748	5.11E+03	22.4	35	0	35
170.8	6.747	5.09E+03	22.4	34.9	0	34.9
170.9	6.747	5.08E+03	22.4	34.9	0	34.9
171	6.746	5.07E+03	22.4	34.8	0	34.8
171.1	6.745	5.06E+03	22.4	34.8	0	34.8
171.2	6.744	5.04E+03	22.4	34.7	0	34.7
171.3	6.744	5.03E+03	22.4	34.7	0	34.7
171.4	6.743	5.02E+03	22.4	34.6	0	34.6
171.5	6.742	5.01E+03	22.4	34.6	0	34.6
171.6	6.741	4.99E+03	22.4	34.5	0	34.5
171.7	6.741	4.98E+03	22.4	34.5	0	34.5
171.8	6.74	4.97E+03	22.4	34.4	0	34.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
171.9	6.739	4.96E+03	22.4	34.4	0	34.4
172	6.738	4.94E+03	22.4	34.3	0	34.3
172.1	6.737	4.93E+03	22.4	34.3	0	34.3
172.2	6.737	4.92E+03	22.4	34.3	0	34.3
172.3	6.736	4.91E+03	22.4	34.2	0	34.2
172.4	6.735	4.90E+03	22.4	34.2	0	34.2
172.5	6.734	4.88E+03	22.4	34.1	0	34.1
172.6	6.734	4.87E+03	22.4	34.1	0	34.1
172.7	6.733	4.86E+03	22.4	34	0	34
172.8	6.732	4.85E+03	22.4	34	0	34
172.9	6.731	4.83E+03	22.4	33.9	0	33.9
173	6.731	4.82E+03	22.4	33.9	0	33.9
173.1	6.73	4.81E+03	22.4	33.8	0	33.8
173.2	6.729	4.80E+03	22.4	33.8	0	33.8
173.3	6.729	4.79E+03	22.4	33.7	0	33.7
173.4	6.728	4.78E+03	22.4	33.7	0	33.7
173.5	6.727	4.76E+03	22.4	33.6	0	33.6
173.6	6.726	4.75E+03	22.4	33.6	0	33.6
173.7	6.726	4.74E+03	22.4	33.5	0	33.5
173.8	6.725	4.73E+03	22.4	33.5	0	33.5
173.9	6.724	4.72E+03	22.4	33.4	0	33.4
174	6.723	4.70E+03	22.4	33.4	0	33.4
174.1	6.723	4.69E+03	22.4	33.3	0	33.3
174.2	6.722	4.68E+03	22.4	33.3	0	33.3
174.3	6.721	4.67E+03	22.4	33.3	0	33.3
174.4	6.721	4.66E+03	22.4	33.2	0	33.2
174.5	6.72	4.65E+03	22.4	33.2	0	33.2
174.6	6.719	4.63E+03	22.4	33.1	0	33.1
174.7	6.718	4.62E+03	22.4	33.1	0	33.1
174.8	6.718	4.61E+03	22.4	33	0	33
174.9	6.717	4.60E+03	22.4	33	0	33
175	6.716	4.59E+03	22.4	32.9	0	32.9
175.1	6.716	4.58E+03	22.4	32.9	0	32.9
175.2	6.715	4.57E+03	22.4	32.8	0	32.8
175.3	6.714	4.55E+03	22.4	32.8	0	32.8
175.4	6.714	4.54E+03	22.4	32.7	0	32.7
175.5	6.713	4.53E+03	22.4	32.7	0	32.7
175.6	6.712	4.52E+03	22.4	32.7	0	32.7
175.7	6.711	4.51E+03	22.4	32.6	0	32.6
175.8	6.711	4.50E+03	22.4	32.6	0	32.6
175.9	6.71	4.49E+03	22.4	32.5	0	32.5
176	6.709	4.48E+03	22.4	32.5	0	32.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
176.1	6.709	4.47E+03	22.4	32.4	0	32.4
176.2	6.708	4.45E+03	22.4	32.4	0	32.4
176.3	6.707	4.44E+03	22.4	32.3	0	32.3
176.4	6.707	4.43E+03	22.4	32.3	0	32.3
176.5	6.706	4.42E+03	22.4	32.3	0	32.3
176.6	6.705	4.41E+03	22.4	32.2	0	32.2
176.7	6.705	4.40E+03	22.4	32.2	0	32.2
176.8	6.704	4.39E+03	22.4	32.1	0	32.1
176.9	6.703	4.38E+03	22.4	32.1	0	32.1
177	6.703	4.37E+03	22.4	32	0	32
177.1	6.702	4.36E+03	22.4	32	0	32
177.2	6.701	4.35E+03	22.4	31.9	0	31.9
177.3	6.701	4.34E+03	22.4	31.9	0	31.9
177.4	6.7	4.32E+03	22.4	31.9	0	31.9
177.5	6.699	4.31E+03	22.4	31.8	0	31.8
177.6	6.699	4.30E+03	22.4	31.8	0	31.8
177.7	6.698	4.29E+03	22.4	31.7	0	31.7
177.8	6.697	4.28E+03	22.4	31.7	0	31.7
177.9	6.697	4.27E+03	22.4	31.6	0	31.6
178	6.696	4.26E+03	22.4	31.6	0	31.6
178.1	6.695	4.25E+03	22.4	31.6	0	31.6
178.2	6.695	4.24E+03	22.4	31.5	0	31.5
178.3	6.694	4.23E+03	22.4	31.5	0	31.5
178.4	6.693	4.22E+03	22.4	31.4	0	31.4
178.5	6.693	4.21E+03	22.4	31.4	0	31.4
178.6	6.692	4.20E+03	22.4	31.3	0	31.3
178.7	6.691	4.19E+03	22.4	31.3	0	31.3
178.8	6.691	4.18E+03	22.4	31.3	0	31.3
178.9	6.69	4.17E+03	22.4	31.2	0	31.2
179	6.689	4.16E+03	22.4	31.2	0	31.2
179.1	6.689	4.15E+03	22.4	31.1	0	31.1
179.2	6.688	4.14E+03	22.4	31.1	0	31.1
179.3	6.688	4.13E+03	22.4	31	0	31
179.4	6.687	4.12E+03	22.4	31	0	31
179.5	6.686	4.11E+03	22.4	31	0	31
179.6	6.686	4.10E+03	22.4	30.9	0	30.9
179.7	6.685	4.09E+03	22.4	30.9	0	30.9
179.8	6.684	4.08E+03	22.4	30.8	0	30.8
179.9	6.684	4.07E+03	22.4	30.8	0	30.8
180	6.683	4.06E+03	22.4	30.8	0	30.8
180.1	6.682	4.05E+03	22.4	30.7	0	30.7
180.2	6.682	4.04E+03	22.4	30.7	0	30.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
180.3	6.681	4.03E+03	22.4	30.6	0	30.6
180.4	6.681	4.02E+03	22.4	30.6	0	30.6
180.5	6.68	4.01E+03	22.4	30.6	0	30.6
180.6	6.679	4.00E+03	22.4	30.5	0	30.5
180.7	6.679	3.99E+03	22.4	30.5	0	30.5
180.8	6.678	3.98E+03	22.4	30.4	0	30.4
180.9	6.678	3.97E+03	22.4	30.4	0	30.4
181	6.677	3.96E+03	22.4	30.4	0	30.4
181.1	6.676	3.95E+03	22.4	30.3	0	30.3
181.2	6.676	3.94E+03	22.4	30.3	0	30.3
181.3	6.675	3.94E+03	22.4	30.2	0	30.2
181.4	6.674	3.93E+03	22.4	30.2	0	30.2
181.5	6.674	3.92E+03	22.4	30.2	0	30.2
181.6	6.673	3.91E+03	22.4	30.1	0	30.1
181.7	6.673	3.90E+03	22.4	30.1	0	30.1
181.8	6.672	3.89E+03	22.4	30	0	30
181.9	6.671	3.88E+03	22.4	30	0	30
182	6.671	3.87E+03	22.4	30	0	30
182.1	6.67	3.86E+03	22.4	29.9	0	29.9
182.2	6.67	3.85E+03	22.4	29.9	0	29.9
182.3	6.669	3.84E+03	22.4	29.8	0	29.8
182.4	6.668	3.83E+03	22.4	29.8	0	29.8
182.5	6.668	3.82E+03	22.4	29.8	0	29.8
182.6	6.667	3.82E+03	22.4	29.7	0	29.7
182.7	6.667	3.81E+03	22.4	29.7	0	29.7
182.8	6.666	3.80E+03	22.4	29.6	0	29.6
182.9	6.666	3.79E+03	22.4	29.6	0	29.6
183	6.665	3.78E+03	22.4	29.6	0	29.6
183.1	6.664	3.77E+03	22.4	29.5	0	29.5
183.2	6.664	3.76E+03	22.4	29.5	0	29.5
183.3	6.663	3.75E+03	22.4	29.5	0	29.5
183.4	6.663	3.74E+03	22.4	29.4	0	29.4
183.5	6.662	3.74E+03	22.4	29.4	0	29.4
183.6	6.661	3.73E+03	22.4	29.3	0	29.3
183.7	6.661	3.72E+03	22.4	29.3	0	29.3
183.8	6.66	3.71E+03	22.4	29.3	0	29.3
183.9	6.66	3.70E+03	22.4	29.2	0	29.2
184	6.659	3.69E+03	22.4	29.2	0	29.2
184.1	6.659	3.68E+03	22.4	29.1	0	29.1
184.2	6.658	3.67E+03	22.4	29.1	0	29.1
184.3	6.657	3.67E+03	22.4	29.1	0	29.1
184.4	6.657	3.66E+03	22.4	29	0	29

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
184.5	6.656	3.65E+03	22.4	29	0	29
184.6	6.656	3.64E+03	22.4	29	0	29
184.7	6.655	3.63E+03	22.4	28.9	0	28.9
184.8	6.655	3.62E+03	22.4	28.9	0	28.9
184.9	6.654	3.62E+03	22.4	28.9	0	28.9
185	6.654	3.61E+03	22.4	28.8	0	28.8
185.1	6.653	3.60E+03	22.4	28.8	0	28.8
185.2	6.652	3.59E+03	22.4	28.7	0	28.7
185.3	6.652	3.58E+03	22.4	28.7	0	28.7
185.4	6.651	3.57E+03	22.4	28.7	0	28.7
185.5	6.651	3.57E+03	22.4	28.6	0	28.6
185.6	6.65	3.56E+03	22.4	28.6	0	28.6
185.7	6.65	3.55E+03	22.4	28.6	0	28.6
185.8	6.649	3.54E+03	22.4	28.5	0	28.5
185.9	6.649	3.53E+03	22.4	28.5	0	28.5
186	6.648	3.52E+03	22.4	28.5	0	28.5
186.1	6.647	3.52E+03	22.4	28.4	0	28.4
186.2	6.647	3.51E+03	22.4	28.4	0	28.4
186.3	6.646	3.50E+03	22.4	28.3	0	28.3
186.4	6.646	3.49E+03	22.4	28.3	0	28.3
186.5	6.645	3.48E+03	22.4	28.3	0	28.3
186.6	6.645	3.48E+03	22.4	28.2	0	28.2
186.7	6.644	3.47E+03	22.4	28.2	0	28.2
186.8	6.644	3.46E+03	22.4	28.2	0	28.2
186.9	6.643	3.45E+03	22.4	28.1	0	28.1
187	6.643	3.44E+03	22.4	28.1	0	28.1
187.1	6.642	3.44E+03	22.4	28.1	0	28.1
187.2	6.642	3.43E+03	22.4	28	0	28
187.3	6.641	3.42E+03	22.4	28	0	28
187.4	6.641	3.41E+03	22.4	28	0	28
187.5	6.64	3.41E+03	22.4	27.9	0	27.9
187.6	6.639	3.40E+03	22.4	27.9	0	27.9
187.7	6.639	3.39E+03	22.4	27.9	0	27.9
187.8	6.638	3.38E+03	22.4	27.8	0	27.8
187.9	6.638	3.37E+03	22.4	27.8	0	27.8
188	6.637	3.37E+03	22.4	27.8	0	27.8
188.1	6.637	3.36E+03	22.4	27.7	0	27.7
188.2	6.636	3.35E+03	22.4	27.7	0	27.7
188.3	6.636	3.34E+03	22.4	27.7	0	27.7
188.4	6.635	3.34E+03	22.4	27.6	0	27.6
188.5	6.635	3.33E+03	22.4	27.6	0	27.6
188.6	6.634	3.32E+03	22.4	27.5	0	27.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
188.7	6.634	3.31E+03	22.4	27.5	0	27.5
188.8	6.633	3.31E+03	22.4	27.5	0	27.5
188.9	6.633	3.30E+03	22.4	27.4	0	27.4
189	6.632	3.29E+03	22.4	27.4	0	27.4
189.1	6.632	3.28E+03	22.4	27.4	0	27.4
189.2	6.631	3.28E+03	22.4	27.3	0	27.3
189.3	6.631	3.27E+03	22.4	27.3	0	27.3
189.4	6.63	3.26E+03	22.4	27.3	0	27.3
189.5	6.63	3.26E+03	22.4	27.2	0	27.2
189.6	6.629	3.25E+03	22.4	27.2	0	27.2
189.7	6.629	3.24E+03	22.4	27.2	0	27.2
189.8	6.628	3.23E+03	22.4	27.1	0	27.1
189.9	6.628	3.23E+03	22.4	27.1	0	27.1
190	6.627	3.22E+03	22.4	27.1	0	27.1
190.1	6.627	3.21E+03	22.4	27	0	27
190.2	6.626	3.21E+03	22.4	27	0	27
190.3	6.626	3.20E+03	22.4	27	0	27
190.4	6.625	3.19E+03	22.4	27	0	27
190.5	6.625	3.18E+03	22.4	26.9	0	26.9
190.6	6.624	3.18E+03	22.4	26.9	0	26.9
190.7	6.624	3.17E+03	22.4	26.9	0	26.9
190.8	6.623	3.16E+03	22.4	26.8	0	26.8
190.9	6.623	3.16E+03	22.4	26.8	0	26.8
191	6.622	3.15E+03	22.4	26.8	0	26.8
191.1	6.622	3.14E+03	22.4	26.7	0	26.7
191.2	6.621	3.13E+03	22.4	26.7	0	26.7
191.3	6.621	3.13E+03	22.4	26.7	0	26.7
191.4	6.62	3.12E+03	22.4	26.6	0	26.6
191.5	6.62	3.11E+03	22.4	26.6	0	26.6
191.6	6.619	3.11E+03	22.4	26.6	0	26.6
191.7	6.619	3.10E+03	22.4	26.5	0	26.5
191.8	6.618	3.09E+03	22.4	26.5	0	26.5
191.9	6.618	3.09E+03	22.4	26.5	0	26.5
192	6.617	3.08E+03	22.4	26.4	0	26.4
192.1	6.617	3.07E+03	22.4	26.4	0	26.4
192.2	6.616	3.07E+03	22.4	26.4	0	26.4
192.3	6.616	3.06E+03	22.4	26.3	0	26.3
192.4	6.615	3.05E+03	22.4	26.3	0	26.3
192.5	6.615	3.05E+03	22.4	26.3	0	26.3
192.6	6.615	3.04E+03	22.4	26.3	0	26.3
192.7	6.614	3.03E+03	22.4	26.2	0	26.2
192.8	6.614	3.03E+03	22.4	26.2	0	26.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
192.9	6.613	3.02E+03	22.4	26.2	0	26.2
193	6.613	3.01E+03	22.4	26.1	0	26.1
193.1	6.612	3.01E+03	22.4	26.1	0	26.1
193.2	6.612	3.00E+03	22.4	26.1	0	26.1
193.3	6.611	2.99E+03	22.4	26	0	26
193.4	6.611	2.99E+03	22.4	26	0	26
193.5	6.61	2.98E+03	22.4	26	0	26
193.6	6.61	2.98E+03	22.4	26	0	26
193.7	6.609	2.97E+03	22.4	25.9	0	25.9
193.8	6.609	2.96E+03	22.4	25.9	0	25.9
193.9	6.608	2.96E+03	22.4	25.9	0	25.9
194	6.608	2.95E+03	22.4	25.8	0	25.8
194.1	6.608	2.94E+03	22.4	25.8	0	25.8
194.2	6.607	2.94E+03	22.4	25.8	0	25.8
194.3	6.607	2.93E+03	22.4	25.7	0	25.7
194.4	6.606	2.92E+03	22.4	25.7	0	25.7
194.5	6.606	2.92E+03	22.4	25.7	0	25.7
194.6	6.605	2.91E+03	22.4	25.7	0	25.7
194.7	6.605	2.91E+03	22.4	25.6	0	25.6
194.8	6.604	2.90E+03	22.4	25.6	0	25.6
194.9	6.604	2.89E+03	22.4	25.6	0	25.6
195	6.603	2.89E+03	22.4	25.5	0	25.5
195.1	6.603	2.88E+03	22.4	25.5	0	25.5
195.2	6.603	2.88E+03	22.4	25.5	0	25.5
195.3	6.602	2.87E+03	22.4	25.4	0	25.4
195.4	6.602	2.86E+03	22.4	25.4	0	25.4
195.5	6.601	2.86E+03	22.4	25.4	0	25.4
195.6	6.601	2.85E+03	22.4	25.4	0	25.4
195.7	6.6	2.85E+03	22.4	25.3	0	25.3
195.8	6.6	2.84E+03	22.4	25.3	0	25.3
195.9	6.599	2.83E+03	22.4	25.3	0	25.3
196	6.599	2.83E+03	22.4	25.2	0	25.2
196.1	6.599	2.82E+03	22.4	25.2	0	25.2
196.2	6.598	2.82E+03	22.4	25.2	0	25.2
196.3	6.598	2.81E+03	22.4	25.2	0	25.2
196.4	6.597	2.80E+03	22.4	25.1	0	25.1
196.5	6.597	2.80E+03	22.4	25.1	0	25.1
196.6	6.596	2.79E+03	22.4	25.1	0	25.1
196.7	6.596	2.79E+03	22.4	25	0	25
196.8	6.596	2.78E+03	22.4	25	0	25
196.9	6.595	2.77E+03	22.4	25	0	25
197	6.595	2.77E+03	22.4	25	0	25

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
197.1	6.594	2.76E+03	22.4	24.9	0	24.9
197.2	6.594	2.76E+03	22.4	24.9	0	24.9
197.3	6.593	2.75E+03	22.4	24.9	0	24.9
197.4	6.593	2.75E+03	22.4	24.9	0	24.9
197.5	6.593	2.74E+03	22.4	24.8	0	24.8
197.6	6.592	2.73E+03	22.4	24.8	0	24.8
197.7	6.592	2.73E+03	22.4	24.8	0	24.8
197.8	6.591	2.72E+03	22.4	24.7	0	24.7
197.9	6.591	2.72E+03	22.4	24.7	0	24.7
198	6.59	2.71E+03	22.4	24.7	0	24.7
198.1	6.59	2.71E+03	22.4	24.7	0	24.7
198.2	6.59	2.70E+03	22.4	24.6	0	24.6
198.3	6.589	2.70E+03	22.4	24.6	0	24.6
198.4	6.589	2.69E+03	22.4	24.6	0	24.6
198.5	6.588	2.68E+03	22.4	24.5	0	24.5
198.6	6.588	2.68E+03	22.4	24.5	0	24.5
198.7	6.587	2.67E+03	22.4	24.5	0	24.5
198.8	6.587	2.67E+03	22.4	24.5	0	24.5
198.9	6.587	2.66E+03	22.4	24.4	0	24.4
199	6.586	2.66E+03	22.4	24.4	0	24.4
199.1	6.586	2.65E+03	22.4	24.4	0	24.4
199.2	6.585	2.64E+03	22.4	24.4	0	24.4
199.3	6.585	2.64E+03	22.4	24.3	0	24.3
199.4	6.585	2.63E+03	22.4	24.3	0	24.3
199.5	6.584	2.63E+03	22.4	24.3	0	24.3
199.6	6.584	2.62E+03	22.4	24.2	0	24.2
199.7	6.583	2.62E+03	22.4	24.2	0	24.2
199.8	6.583	2.61E+03	22.4	24.2	0	24.2
199.9	6.583	2.61E+03	22.4	24.2	0	24.2
200	6.582	2.60E+03	22.4	24.1	0	24.1
200.1	6.582	2.60E+03	22.4	24.1	0	24.1
200.2	6.581	2.59E+03	22.4	24.1	0	24.1
200.3	6.581	2.59E+03	22.4	24.1	0	24.1
200.4	6.581	2.58E+03	22.4	24	0	24
200.5	6.58	2.57E+03	22.4	24	0	24
200.6	6.58	2.57E+03	22.4	24	0	24
200.7	6.579	2.56E+03	22.4	24	0	24
200.8	6.579	2.56E+03	22.4	23.9	0	23.9
200.9	6.579	2.55E+03	22.4	23.9	0	23.9
201	6.578	2.55E+03	22.4	23.9	0	23.9
201.1	6.578	2.54E+03	22.4	23.9	0	23.9
201.2	6.577	2.54E+03	22.4	23.8	0	23.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
201.3	6.577	2.53E+03	22.4	23.8	0	23.8
201.4	6.577	2.53E+03	22.4	23.8	0	23.8
201.5	6.576	2.52E+03	22.4	23.8	0	23.8
201.6	6.576	2.52E+03	22.4	23.7	0	23.7
201.7	6.575	2.51E+03	22.4	23.7	0	23.7
201.8	6.575	2.51E+03	22.4	23.7	0	23.7
201.9	6.575	2.50E+03	22.4	23.6	0	23.6
202	6.574	2.50E+03	22.4	23.6	0	23.6
202.1	6.574	2.49E+03	22.4	23.6	0	23.6
202.2	6.573	2.49E+03	22.4	23.6	0	23.6
202.3	6.573	2.48E+03	22.4	23.5	0	23.5
202.4	6.573	2.48E+03	22.4	23.5	0	23.5
202.5	6.572	2.47E+03	22.4	23.5	0	23.5
202.6	6.572	2.47E+03	22.4	23.5	0	23.5
202.7	6.571	2.46E+03	22.4	23.4	0	23.4
202.8	6.571	2.46E+03	22.4	23.4	0	23.4
202.9	6.571	2.45E+03	22.4	23.4	0	23.4
203	6.57	2.45E+03	22.4	23.4	0	23.4
203.1	6.57	2.44E+03	22.4	23.3	0	23.3
203.2	6.57	2.44E+03	22.4	23.3	0	23.3
203.3	6.569	2.43E+03	22.4	23.3	0	23.3
203.4	6.569	2.43E+03	22.4	23.3	0	23.3
203.5	6.568	2.42E+03	22.4	23.2	0	23.2
203.6	6.568	2.42E+03	22.4	23.2	0	23.2
203.7	6.568	2.41E+03	22.4	23.2	0	23.2
203.8	6.567	2.41E+03	22.4	23.2	0	23.2
203.9	6.567	2.41E+03	22.4	23.2	0	23.2
204	6.567	2.40E+03	22.4	23.1	0	23.1
204.1	6.566	2.40E+03	22.4	23.1	0	23.1
204.2	6.566	2.39E+03	22.4	23.1	0	23.1
204.3	6.565	2.39E+03	22.4	23.1	0	23.1
204.4	6.565	2.38E+03	22.4	23	0	23
204.5	6.565	2.38E+03	22.4	23	0	23
204.6	6.564	2.37E+03	22.4	23	0	23
204.7	6.564	2.37E+03	22.4	23	0	23
204.8	6.564	2.36E+03	22.4	22.9	0	22.9
204.9	6.563	2.36E+03	22.4	22.9	0	22.9
205	6.563	2.35E+03	22.4	22.9	0	22.9
205.1	6.562	2.35E+03	22.4	22.9	0	22.9
205.2	6.562	2.35E+03	22.4	22.8	0	22.8
205.3	6.562	2.34E+03	22.4	22.8	0	22.8
205.4	6.561	2.34E+03	22.4	22.8	0	22.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
205.5	6.561	2.33E+03	22.4	22.8	0	22.8
205.6	6.561	2.33E+03	22.4	22.7	0	22.7
205.7	6.56	2.32E+03	22.4	22.7	0	22.7
205.8	6.56	2.32E+03	22.4	22.7	0	22.7
205.9	6.56	2.31E+03	22.4	22.7	0	22.7
206	6.559	2.31E+03	22.4	22.7	0	22.7
206.1	6.559	2.31E+03	22.4	22.6	0	22.6
206.2	6.558	2.30E+03	22.4	22.6	0	22.6
206.3	6.558	2.30E+03	22.4	22.6	0	22.6
206.4	6.558	2.29E+03	22.4	22.6	0	22.6
206.5	6.557	2.29E+03	22.4	22.5	0	22.5
206.6	6.557	2.28E+03	22.4	22.5	0	22.5
206.7	6.557	2.28E+03	22.4	22.5	0	22.5
206.8	6.556	2.27E+03	22.4	22.5	0	22.5
206.9	6.556	2.27E+03	22.4	22.5	0	22.5
207	6.556	2.27E+03	22.4	22.4	0	22.4
207.1	6.555	2.26E+03	22.4	22.4	0	22.4
207.2	6.555	2.26E+03	22.4	22.4	0	22.4
207.3	6.555	2.25E+03	22.4	22.4	0	22.4
207.4	6.554	2.25E+03	22.4	22.3	0	22.3
207.5	6.554	2.25E+03	22.4	22.3	0	22.3
207.6	6.554	2.24E+03	22.4	22.3	0	22.3
207.7	6.553	2.24E+03	22.4	22.3	0	22.3
207.8	6.553	2.23E+03	22.4	22.3	0	22.3
207.9	6.552	2.23E+03	22.4	22.2	0	22.2
208	6.552	2.22E+03	22.4	22.2	0	22.2
208.1	6.552	2.22E+03	22.4	22.2	0	22.2
208.2	6.551	2.22E+03	22.4	22.2	0	22.2
208.3	6.551	2.21E+03	22.4	22.1	0	22.1
208.4	6.551	2.21E+03	22.4	22.1	0	22.1
208.5	6.55	2.20E+03	22.4	22.1	0	22.1
208.6	6.55	2.20E+03	22.4	22.1	0	22.1
208.7	6.55	2.20E+03	22.4	22.1	0	22.1
208.8	6.549	2.19E+03	22.4	22	0	22
208.9	6.549	2.19E+03	22.4	22	0	22
209	6.549	2.18E+03	22.4	22	0	22
209.1	6.548	2.18E+03	22.4	22	0	22
209.2	6.548	2.18E+03	22.4	21.9	0	21.9
209.3	6.548	2.17E+03	22.4	21.9	0	21.9
209.4	6.547	2.17E+03	22.4	21.9	0	21.9
209.5	6.547	2.16E+03	22.4	21.9	0	21.9
209.6	6.547	2.16E+03	22.4	21.9	0	21.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
209.7	6.546	2.16E+03	22.4	21.8	0	21.8
209.8	6.546	2.15E+03	22.4	21.8	0	21.8
209.9	6.546	2.15E+03	22.4	21.8	0	21.8
210	6.545	2.14E+03	22.4	21.8	0	21.8
210.1	6.545	2.14E+03	22.4	21.8	0	21.8
210.2	6.545	2.14E+03	22.4	21.7	0	21.7
210.3	6.544	2.13E+03	22.4	21.7	0	21.7
210.4	6.544	2.13E+03	22.4	21.7	0	21.7
210.5	6.544	2.13E+03	22.4	21.7	0	21.7
210.6	6.543	2.12E+03	22.4	21.7	0	21.7
210.7	6.543	2.12E+03	22.4	21.6	0	21.6
210.8	6.543	2.11E+03	22.4	21.6	0	21.6
210.9	6.542	2.11E+03	22.4	21.6	0	21.6
211	6.542	2.11E+03	22.4	21.6	0	21.6
211.1	6.542	2.10E+03	22.4	21.6	0	21.6
211.2	6.541	2.10E+03	22.4	21.5	0	21.5
211.3	6.541	2.10E+03	22.4	21.5	0	21.5
211.4	6.541	2.09E+03	22.4	21.5	0	21.5
211.5	6.54	2.09E+03	22.4	21.5	0	21.5
211.6	6.54	2.08E+03	22.4	21.5	0	21.5
211.7	6.54	2.08E+03	22.4	21.4	0	21.4
211.8	6.539	2.08E+03	22.4	21.4	0	21.4
211.9	6.539	2.07E+03	22.4	21.4	0	21.4
212	6.539	2.07E+03	22.4	21.4	0	21.4
212.1	6.538	2.07E+03	22.4	21.4	0	21.4
212.2	6.538	2.06E+03	22.4	21.3	0	21.3
212.3	6.538	2.06E+03	22.4	21.3	0	21.3
212.4	6.537	2.06E+03	22.4	21.3	0	21.3
212.5	6.537	2.05E+03	22.4	21.3	0	21.3
212.6	6.537	2.05E+03	22.4	21.3	0	21.3
212.7	6.536	2.04E+03	22.4	21.2	0	21.2
212.8	6.536	2.04E+03	22.4	21.2	0	21.2
212.9	6.536	2.04E+03	22.4	21.2	0	21.2
213	6.535	2.03E+03	22.4	21.2	0	21.2
213.1	6.535	2.03E+03	22.4	21.2	0	21.2
213.2	6.535	2.03E+03	22.4	21.1	0	21.1
213.3	6.535	2.02E+03	22.4	21.1	0	21.1
213.4	6.534	2.02E+03	22.4	21.1	0	21.1
213.5	6.534	2.02E+03	22.4	21.1	0	21.1
213.6	6.534	2.01E+03	22.4	21.1	0	21.1
213.7	6.533	2.01E+03	22.4	21	0	21
213.8	6.533	2.01E+03	22.4	21	0	21

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
213.9	6.533	2.00E+03	22.4	21	0	21
214	6.532	2.00E+03	22.4	21	0	21
214.1	6.532	2.00E+03	22.4	21	0	21
214.2	6.532	1.99E+03	22.4	20.9	0	20.9
214.3	6.531	1.99E+03	22.4	20.9	0	20.9
214.4	6.531	1.99E+03	22.4	20.9	0	20.9
214.5	6.531	1.98E+03	22.4	20.9	0	20.9
214.6	6.53	1.98E+03	22.4	20.9	0	20.9
214.7	6.53	1.98E+03	22.4	20.9	0	20.9
214.8	6.53	1.97E+03	22.4	20.8	0	20.8
214.9	6.53	1.97E+03	22.4	20.8	0	20.8
215	6.529	1.97E+03	22.4	20.8	0	20.8
215.1	6.529	1.96E+03	22.4	20.8	0	20.8
215.2	6.529	1.96E+03	22.4	20.8	0	20.8
215.3	6.528	1.96E+03	22.4	20.7	0	20.7
215.4	6.528	1.95E+03	22.4	20.7	0	20.7
215.5	6.528	1.95E+03	22.4	20.7	0	20.7
215.6	6.527	1.95E+03	22.4	20.7	0	20.7
215.7	6.527	1.94E+03	22.4	20.7	0	20.7
215.8	6.527	1.94E+03	22.4	20.7	0	20.7
215.9	6.527	1.94E+03	22.4	20.6	0	20.6
216	6.526	1.93E+03	22.4	20.6	0	20.6
216.1	6.526	1.93E+03	22.4	20.6	0	20.6
216.2	6.526	1.93E+03	22.4	20.6	0	20.6
216.3	6.525	1.92E+03	22.4	20.6	0	20.6
216.4	6.525	1.92E+03	22.4	20.5	0	20.5
216.5	6.525	1.92E+03	22.4	20.5	0	20.5
216.6	6.524	1.92E+03	22.4	20.5	0	20.5
216.7	6.524	1.91E+03	22.4	20.5	0	20.5
216.8	6.524	1.91E+03	22.4	20.5	0	20.5
216.9	6.523	1.91E+03	22.4	20.5	0	20.5
217	6.523	1.90E+03	22.4	20.4	0	20.4
217.1	6.523	1.90E+03	22.4	20.4	0	20.4
217.2	6.523	1.90E+03	22.4	20.4	0	20.4
217.3	6.522	1.89E+03	22.4	20.4	0	20.4
217.4	6.522	1.89E+03	22.4	20.4	0	20.4
217.5	6.522	1.89E+03	22.4	20.4	0	20.4
217.6	6.521	1.88E+03	22.4	20.3	0	20.3
217.7	6.521	1.88E+03	22.4	20.3	0	20.3
217.8	6.521	1.88E+03	22.4	20.3	0	20.3
217.9	6.521	1.88E+03	22.4	20.3	0	20.3
218	6.52	1.87E+03	22.4	20.3	0	20.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
218.1	6.52	1.87E+03	22.4	20.3	0	20.3
218.2	6.52	1.87E+03	22.4	20.2	0	20.2
218.3	6.519	1.86E+03	22.4	20.2	0	20.2
218.4	6.519	1.86E+03	22.4	20.2	0	20.2
218.5	6.519	1.86E+03	22.4	20.2	0	20.2
218.6	6.519	1.86E+03	22.4	20.2	0	20.2
218.7	6.518	1.85E+03	22.4	20.1	0	20.1
218.8	6.518	1.85E+03	22.4	20.1	0	20.1
218.9	6.518	1.85E+03	22.4	20.1	0	20.1
219	6.517	1.84E+03	22.4	20.1	0	20.1
219.1	6.517	1.84E+03	22.4	20.1	0	20.1
219.2	6.517	1.84E+03	22.4	20.1	0	20.1
219.3	6.516	1.84E+03	22.4	20	0	20
219.4	6.516	1.83E+03	22.4	20	0	20
219.5	6.516	1.83E+03	22.4	20	0	20
219.6	6.516	1.83E+03	22.4	20	0	20
219.7	6.515	1.82E+03	22.4	20	0	20
219.8	6.515	1.82E+03	22.4	20	0	20
219.9	6.515	1.82E+03	22.4	20	0	20
220	6.514	1.82E+03	22.4	19.9	0	19.9
220.1	6.514	1.81E+03	22.4	19.9	0	19.9
220.2	6.514	1.81E+03	22.4	19.9	0	19.9
220.3	6.514	1.81E+03	22.4	19.9	0	19.9
220.4	6.513	1.80E+03	22.4	19.9	0	19.9
220.5	6.513	1.80E+03	22.4	19.9	0	19.9
220.6	6.513	1.80E+03	22.4	19.8	0	19.8
220.7	6.513	1.80E+03	22.4	19.8	0	19.8
220.8	6.512	1.79E+03	22.4	19.8	0	19.8
220.9	6.512	1.79E+03	22.4	19.8	0	19.8
221	6.512	1.79E+03	22.4	19.8	0	19.8
221.1	6.511	1.79E+03	22.4	19.8	0	19.8
221.2	6.511	1.78E+03	22.4	19.7	0	19.7
221.3	6.511	1.78E+03	22.4	19.7	0	19.7
221.4	6.511	1.78E+03	22.4	19.7	0	19.7
221.5	6.51	1.78E+03	22.4	19.7	0	19.7
221.6	6.51	1.77E+03	22.4	19.7	0	19.7
221.7	6.51	1.77E+03	22.4	19.7	0	19.7
221.8	6.509	1.77E+03	22.4	19.7	0	19.7
221.9	6.509	1.76E+03	22.4	19.6	0	19.6
222	6.509	1.76E+03	22.4	19.6	0	19.6
222.1	6.509	1.76E+03	22.4	19.6	0	19.6
222.2	6.508	1.76E+03	22.4	19.6	0	19.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
222.3	6.508	1.75E+03	22.4	19.6	0	19.6
222.4	6.508	1.75E+03	22.4	19.6	0	19.6
222.5	6.508	1.75E+03	22.4	19.5	0	19.5
222.6	6.507	1.75E+03	22.4	19.5	0	19.5
222.7	6.507	1.74E+03	22.4	19.5	0	19.5
222.8	6.507	1.74E+03	22.4	19.5	0	19.5
222.9	6.506	1.74E+03	22.4	19.5	0	19.5
223	6.506	1.74E+03	22.4	19.5	0	19.5
223.1	6.506	1.73E+03	22.4	19.5	0	19.5
223.2	6.506	1.73E+03	22.4	19.4	0	19.4
223.3	6.505	1.73E+03	22.4	19.4	0	19.4
223.4	6.505	1.73E+03	22.4	19.4	0	19.4
223.5	6.505	1.72E+03	22.4	19.4	0	19.4
223.6	6.505	1.72E+03	22.4	19.4	0	19.4
223.7	6.504	1.72E+03	22.4	19.4	0	19.4
223.8	6.504	1.72E+03	22.4	19.4	0	19.4
223.9	6.504	1.71E+03	22.4	19.3	0	19.3
224	6.503	1.71E+03	22.4	19.3	0	19.3
224.1	6.503	1.71E+03	22.4	19.3	0	19.3
224.2	6.503	1.71E+03	22.4	19.3	0	19.3
224.3	6.503	1.71E+03	22.4	19.3	0	19.3
224.4	6.502	1.70E+03	22.4	19.3	0	19.3
224.5	6.502	1.70E+03	22.4	19.3	0	19.3
224.6	6.502	1.70E+03	22.4	19.2	0	19.2
224.7	6.502	1.70E+03	22.4	19.2	0	19.2
224.8	6.501	1.69E+03	22.4	19.2	0	19.2
224.9	6.501	1.69E+03	22.4	19.2	0	19.2
225	6.501	1.69E+03	22.4	19.2	0	19.2
225.1	6.501	1.69E+03	22.4	19.2	0	19.2
225.2	6.5	1.68E+03	22.4	19.2	0	19.2
225.3	6.5	1.68E+03	22.4	19.1	0	19.1
225.4	6.5	1.68E+03	22.4	19.1	0	19.1
225.5	6.5	1.68E+03	22.4	19.1	0	19.1
225.6	6.499	1.67E+03	22.4	19.1	0	19.1
225.7	6.499	1.67E+03	22.4	19.1	0	19.1
225.8	6.499	1.67E+03	22.4	19.1	0	19.1
225.9	6.498	1.67E+03	22.4	19.1	0	19.1
226	6.498	1.67E+03	22.4	19	0	19
226.1	6.498	1.66E+03	22.4	19	0	19
226.2	6.498	1.66E+03	22.4	19	0	19
226.3	6.497	1.66E+03	22.4	19	0	19
226.4	6.497	1.66E+03	22.4	19	0	19

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
226.5	6.497	1.65E+03	22.4	19	0	19
226.6	6.497	1.65E+03	22.4	19	0	19
226.7	6.496	1.65E+03	22.4	18.9	0	18.9
226.8	6.496	1.65E+03	22.4	18.9	0	18.9
226.9	6.496	1.65E+03	22.4	18.9	0	18.9
227	6.496	1.64E+03	22.4	18.9	0	18.9
227.1	6.495	1.64E+03	22.4	18.9	0	18.9
227.2	6.495	1.64E+03	22.4	18.9	0	18.9
227.3	6.495	1.64E+03	22.4	18.9	0	18.9
227.4	6.495	1.64E+03	22.4	18.9	0	18.9
227.5	6.494	1.63E+03	22.4	18.8	0	18.8
227.6	6.494	1.63E+03	22.4	18.8	0	18.8
227.7	6.494	1.63E+03	22.4	18.8	0	18.8
227.8	6.494	1.63E+03	22.4	18.8	0	18.8
227.9	6.493	1.62E+03	22.4	18.8	0	18.8
228	6.493	1.62E+03	22.4	18.8	0	18.8
228.1	6.493	1.62E+03	22.4	18.8	0	18.8
228.2	6.493	1.62E+03	22.4	18.7	0	18.7
228.3	6.492	1.62E+03	22.4	18.7	0	18.7
228.4	6.492	1.61E+03	22.4	18.7	0	18.7
228.5	6.492	1.61E+03	22.4	18.7	0	18.7
228.6	6.492	1.61E+03	22.4	18.7	0	18.7
228.7	6.491	1.61E+03	22.4	18.7	0	18.7
228.8	6.491	1.61E+03	22.4	18.7	0	18.7
228.9	6.491	1.60E+03	22.4	18.7	0	18.7
229	6.491	1.60E+03	22.4	18.6	0	18.6
229.1	6.49	1.60E+03	22.4	18.6	0	18.6
229.2	6.49	1.60E+03	22.4	18.6	0	18.6
229.3	6.49	1.60E+03	22.4	18.6	0	18.6
229.4	6.49	1.59E+03	22.4	18.6	0	18.6
229.5	6.489	1.59E+03	22.4	18.6	0	18.6
229.6	6.489	1.59E+03	22.4	18.6	0	18.6
229.7	6.489	1.59E+03	22.4	18.6	0	18.6
229.8	6.489	1.59E+03	22.4	18.5	0	18.5
229.9	6.488	1.58E+03	22.4	18.5	0	18.5
230	6.488	1.58E+03	22.4	18.5	0	18.5
230.1	6.488	1.58E+03	22.4	18.5	0	18.5
230.2	6.488	1.58E+03	22.4	18.5	0	18.5
230.3	6.487	1.58E+03	22.4	18.5	0	18.5
230.4	6.487	1.57E+03	22.4	18.5	0	18.5
230.5	6.487	1.57E+03	22.4	18.5	0	18.5
230.6	6.487	1.57E+03	22.4	18.5	0	18.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
230.7	6.486	1.57E+03	22.4	18.4	0	18.4
230.8	6.486	1.57E+03	22.4	18.4	0	18.4
230.9	6.486	1.57E+03	22.4	18.4	0	18.4
231	6.486	1.56E+03	22.4	18.4	0	18.4
231.1	6.485	1.56E+03	22.4	18.4	0	18.4
231.2	6.485	1.56E+03	22.4	18.4	0	18.4
231.3	6.485	1.56E+03	22.4	18.4	0	18.4
231.4	6.485	1.56E+03	22.4	18.4	0	18.4
231.5	6.484	1.55E+03	22.4	18.3	0	18.3
231.6	6.484	1.55E+03	22.4	18.3	0	18.3
231.7	6.484	1.55E+03	22.4	18.3	0	18.3
231.8	6.484	1.55E+03	22.4	18.3	0	18.3
231.9	6.483	1.55E+03	22.4	18.3	0	18.3
232	6.483	1.55E+03	22.4	18.3	0	18.3
232.1	6.483	1.54E+03	22.4	18.3	0	18.3
232.2	6.483	1.54E+03	22.4	18.3	0	18.3
232.3	6.483	1.54E+03	22.4	18.3	0	18.3
232.4	6.482	1.54E+03	22.4	18.2	0	18.2
232.5	6.482	1.54E+03	22.4	18.2	0	18.2
232.6	6.482	1.53E+03	22.4	18.2	0	18.2
232.7	6.482	1.53E+03	22.4	18.2	0	18.2
232.8	6.481	1.53E+03	22.4	18.2	0	18.2
232.9	6.481	1.53E+03	22.4	18.2	0	18.2
233	6.481	1.53E+03	22.4	18.2	0	18.2
233.1	6.481	1.53E+03	22.4	18.2	0	18.2
233.2	6.48	1.52E+03	22.4	18.2	0	18.2
233.3	6.48	1.52E+03	22.4	18.1	0	18.1
233.4	6.48	1.52E+03	22.4	18.1	0	18.1
233.5	6.48	1.52E+03	22.4	18.1	0	18.1
233.6	6.479	1.52E+03	22.4	18.1	0	18.1
233.7	6.479	1.52E+03	22.4	18.1	0	18.1
233.8	6.479	1.51E+03	22.4	18.1	0	18.1
233.9	6.479	1.51E+03	22.4	18.1	0	18.1
234	6.479	1.51E+03	22.4	18.1	0	18.1
234.1	6.478	1.51E+03	22.4	18.1	0	18.1
234.2	6.478	1.51E+03	22.4	18	0	18
234.3	6.478	1.51E+03	22.4	18	0	18
234.4	6.478	1.50E+03	22.4	18	0	18
234.5	6.477	1.50E+03	22.4	18	0	18
234.6	6.477	1.50E+03	22.4	18	0	18
234.7	6.477	1.50E+03	22.4	18	0	18
234.8	6.477	1.50E+03	22.4	18	0	18

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
234.9	6.476	1.50E+03	22.4	18	0	18
235	6.476	1.49E+03	22.4	18	0	18
235.1	6.476	1.49E+03	22.4	17.9	0	17.9
235.2	6.476	1.49E+03	22.4	17.9	0	17.9
235.3	6.475	1.49E+03	22.4	17.9	0	17.9
235.4	6.475	1.49E+03	22.4	17.9	0	17.9
235.5	6.475	1.49E+03	22.4	17.9	0	17.9
235.6	6.475	1.48E+03	22.4	17.9	0	17.9
235.7	6.475	1.48E+03	22.4	17.9	0	17.9
235.8	6.474	1.48E+03	22.4	17.9	0	17.9
235.9	6.474	1.48E+03	22.4	17.9	0	17.9
236	6.474	1.48E+03	22.4	17.9	0	17.9
236.1	6.474	1.48E+03	22.4	17.8	0	17.8
236.2	6.473	1.48E+03	22.4	17.8	0	17.8
236.3	6.473	1.47E+03	22.4	17.8	0	17.8
236.4	6.473	1.47E+03	22.4	17.8	0	17.8
236.5	6.473	1.47E+03	22.4	17.8	0	17.8
236.6	6.473	1.47E+03	22.4	17.8	0	17.8
236.7	6.472	1.47E+03	22.4	17.8	0	17.8
236.8	6.472	1.47E+03	22.4	17.8	0	17.8
236.9	6.472	1.46E+03	22.4	17.8	0	17.8
237	6.472	1.46E+03	22.4	17.8	0	17.8
237.1	6.471	1.46E+03	22.4	17.7	0	17.7
237.2	6.471	1.46E+03	22.4	17.7	0	17.7
237.3	6.471	1.46E+03	22.4	17.7	0	17.7
237.4	6.471	1.46E+03	22.4	17.7	0	17.7
237.5	6.47	1.46E+03	22.4	17.7	0	17.7
237.6	6.47	1.45E+03	22.4	17.7	0	17.7
237.7	6.47	1.45E+03	22.4	17.7	0	17.7
237.8	6.47	1.45E+03	22.4	17.7	0	17.7
237.9	6.47	1.45E+03	22.4	17.7	0	17.7
238	6.469	1.45E+03	22.4	17.7	0	17.7
238.1	6.469	1.45E+03	22.4	17.7	0	17.7
238.2	6.469	1.45E+03	22.4	17.6	0	17.6
238.3	6.469	1.44E+03	22.4	17.6	0	17.6
238.4	6.468	1.44E+03	22.4	17.6	0	17.6
238.5	6.468	1.44E+03	22.4	17.6	0	17.6
238.6	6.468	1.44E+03	22.4	17.6	0	17.6
238.7	6.468	1.44E+03	22.4	17.6	0	17.6
238.8	6.468	1.44E+03	22.4	17.6	0	17.6
238.9	6.467	1.44E+03	22.4	17.6	0	17.6
239	6.467	1.44E+03	22.4	17.6	0	17.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
239.1	6.467	1.43E+03	22.4	17.6	0	17.6
239.2	6.467	1.43E+03	22.4	17.6	0	17.6
239.3	6.466	1.43E+03	22.4	17.5	0	17.5
239.4	6.466	1.43E+03	22.4	17.5	0	17.5
239.5	6.466	1.43E+03	22.4	17.5	0	17.5
239.6	6.466	1.43E+03	22.4	17.5	0	17.5
239.7	6.466	1.43E+03	22.4	17.5	0	17.5
239.8	6.465	1.42E+03	22.4	17.5	0	17.5
239.9	6.465	1.42E+03	22.4	17.5	0	17.5
240.1	6.465	1.42E+03	22.4	17.5	0	17.5
240.2	6.464	1.42E+03	22.4	17.5	0	17.5
240.3	6.464	1.42E+03	22.4	17.5	0	17.5
240.4	6.464	1.42E+03	22.4	17.4	0	17.4
240.5	6.464	1.42E+03	22.4	17.4	0	17.4
240.6	6.464	1.41E+03	22.4	17.4	0	17.4
240.7	6.463	1.41E+03	22.4	17.4	0	17.4
240.8	6.463	1.41E+03	22.4	17.4	0	17.4
240.9	6.463	1.41E+03	22.4	17.4	0	17.4
241	6.463	1.41E+03	22.4	17.4	0	17.4
241.1	6.463	1.41E+03	22.4	17.4	0	17.4
241.2	6.462	1.41E+03	22.4	17.4	0	17.4
241.3	6.462	1.41E+03	22.4	17.4	0	17.4
241.4	6.462	1.40E+03	22.4	17.4	0	17.4
241.5	6.462	1.40E+03	22.4	17.4	0	17.4
241.6	6.461	1.40E+03	22.4	17.3	0	17.3
241.7	6.461	1.40E+03	22.4	17.3	0	17.3
241.8	6.461	1.40E+03	22.4	17.3	0	17.3
241.9	6.461	1.40E+03	22.4	17.3	0	17.3
242	6.461	1.40E+03	22.4	17.3	0	17.3
242.1	6.46	1.40E+03	22.4	17.3	0	17.3
242.2	6.46	1.39E+03	22.4	17.3	0	17.3
242.3	6.46	1.39E+03	22.4	17.3	0	17.3
242.4	6.46	1.39E+03	22.4	17.3	0	17.3
242.5	6.46	1.39E+03	22.4	17.3	0	17.3
242.6	6.459	1.39E+03	22.4	17.3	0	17.3
242.7	6.459	1.39E+03	22.4	17.3	0	17.3
242.8	6.459	1.39E+03	22.4	17.2	0	17.2
242.9	6.459	1.39E+03	22.4	17.2	0	17.2
243	6.458	1.39E+03	22.4	17.2	0	17.2
243.1	6.458	1.38E+03	22.4	17.2	0	17.2
243.2	6.458	1.38E+03	22.4	17.2	0	17.2
243.3	6.458	1.38E+03	22.4	17.2	0	17.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
243.4	6.458	1.38E+03	22.4	17.2	0	17.2
243.5	6.457	1.38E+03	22.4	17.2	0	17.2
243.6	6.457	1.38E+03	22.4	17.2	0	17.2
243.7	6.457	1.38E+03	22.4	17.2	0	17.2
243.8	6.457	1.38E+03	22.4	17.2	0	17.2
243.9	6.457	1.38E+03	22.4	17.2	0	17.2
244.3	6.456	1.37E+03	22.4	17.1	0	17.1
244.4	6.455	1.37E+03	22.4	17.1	0	17.1
244.5	6.455	1.37E+03	22.4	17.1	0	17.1
244.6	6.455	1.37E+03	22.4	17.1	0	17.1
244.7	6.455	1.37E+03	22.4	17.1	0	17.1
244.8	6.455	1.37E+03	22.4	17.1	0	17.1
244.9	6.454	1.37E+03	22.4	17.1	0	17.1
245	6.454	1.36E+03	22.4	17.1	0	17.1
245.1	6.454	1.36E+03	22.4	17.1	0	17.1
245.2	6.454	1.36E+03	22.4	17.1	0	17.1
245.3	6.454	1.36E+03	22.4	17.1	0	17.1
245.4	6.453	1.36E+03	22.4	17.1	0	17.1
245.5	6.453	1.36E+03	22.4	17	0	17
245.6	6.453	1.36E+03	22.4	17	0	17
245.7	6.453	1.36E+03	22.4	17	0	17
245.8	6.453	1.36E+03	22.4	17	0	17
245.9	6.452	1.36E+03	22.4	17	0	17
246	6.452	1.35E+03	22.4	17	0	17
246.1	6.452	1.35E+03	22.4	17	0	17
246.2	6.452	1.35E+03	22.4	17	0	17
246.3	6.452	1.35E+03	22.4	17	0	17
246.4	6.451	1.35E+03	22.4	17	0	17
246.5	6.451	1.35E+03	22.4	17	0	17
246.6	6.451	1.35E+03	22.4	17	0	17
246.7	6.451	1.35E+03	22.4	17	0	17
246.8	6.45	1.35E+03	22.4	17	0	17
246.9	6.45	1.35E+03	22.4	16.9	0	16.9
247	6.45	1.34E+03	22.4	16.9	0	16.9
247.1	6.45	1.34E+03	22.4	16.9	0	16.9
247.2	6.45	1.34E+03	22.4	16.9	0	16.9
247.3	6.449	1.34E+03	22.4	16.9	0	16.9
247.4	6.449	1.34E+03	22.4	16.9	0	16.9
247.5	6.449	1.34E+03	22.4	16.9	0	16.9
247.6	6.449	1.34E+03	22.4	16.9	0	16.9
247.7	6.449	1.34E+03	22.4	16.9	0	16.9
247.8	6.448	1.34E+03	22.4	16.9	0	16.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
247.9	6.448	1.34E+03	22.4	16.9	0	16.9
248	6.448	1.34E+03	22.4	16.9	0	16.9
248.1	6.448	1.33E+03	22.4	16.9	0	16.9
248.2	6.448	1.33E+03	22.4	16.9	0	16.9
248.3	6.447	1.33E+03	22.4	16.9	0	16.9
248.4	6.447	1.33E+03	22.4	16.9	0	16.9
248.5	6.447	1.33E+03	22.4	16.8	0	16.8
248.6	6.447	1.33E+03	22.4	16.8	0	16.8
248.7	6.447	1.33E+03	22.4	16.8	0	16.8
248.8	6.446	1.33E+03	22.4	16.8	0	16.8
248.9	6.446	1.33E+03	22.4	16.8	0	16.8
249	6.446	1.33E+03	22.4	16.8	0	16.8
249.1	6.446	1.33E+03	22.4	16.8	0	16.8
249.2	6.446	1.33E+03	22.4	16.8	0	16.8
249.3	6.445	1.32E+03	22.4	16.8	0	16.8
249.4	6.445	1.32E+03	22.4	16.8	0	16.8
249.5	6.445	1.32E+03	22.4	16.8	0	16.8
249.6	6.445	1.32E+03	22.4	16.8	0	16.8
249.7	6.445	1.32E+03	22.4	16.8	0	16.8
249.8	6.444	1.32E+03	22.4	16.8	0	16.8
249.9	6.444	1.32E+03	22.4	16.8	0	16.8
250	6.444	1.32E+03	22.4	16.8	0	16.8
250.1	6.444	1.32E+03	22.4	16.8	0	16.8
250.2	6.444	1.32E+03	22.4	16.7	0	16.7
250.3	6.443	1.32E+03	22.4	16.7	0	16.7
250.4	6.443	1.32E+03	22.4	16.7	0	16.7
250.5	6.443	1.32E+03	22.4	16.7	0	16.7
250.6	6.443	1.31E+03	22.4	16.7	0	16.7
250.7	6.443	1.31E+03	22.4	16.7	0	16.7
250.8	6.442	1.31E+03	22.4	16.7	0	16.7
250.9	6.442	1.31E+03	22.4	16.7	0	16.7
251	6.442	1.31E+03	22.4	16.7	0	16.7
251.1	6.442	1.31E+03	22.4	16.7	0	16.7
251.2	6.442	1.31E+03	22.4	16.7	0	16.7
251.3	6.441	1.31E+03	22.4	16.7	0	16.7
251.4	6.441	1.31E+03	22.4	16.7	0	16.7
251.5	6.441	1.31E+03	22.4	16.7	0	16.7
251.6	6.441	1.31E+03	22.4	16.7	0	16.7
251.7	6.441	1.31E+03	22.4	16.7	0	16.7
251.8	6.44	1.31E+03	22.4	16.7	0	16.7
251.9	6.44	1.31E+03	22.4	16.7	0	16.7
252	6.44	1.30E+03	22.4	16.6	0	16.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
252.1	6.44	1.30E+03	22.4	16.6	0	16.6
252.2	6.44	1.30E+03	22.4	16.6	0	16.6
252.3	6.439	1.30E+03	22.4	16.6	0	16.6
252.4	6.439	1.30E+03	22.4	16.6	0	16.6
252.5	6.439	1.30E+03	22.4	16.6	0	16.6
252.6	6.439	1.30E+03	22.4	16.6	0	16.6
252.7	6.439	1.30E+03	22.4	16.6	0	16.6
252.8	6.438	1.30E+03	22.4	16.6	0	16.6
252.9	6.438	1.30E+03	22.4	16.6	0	16.6
253	6.438	1.30E+03	22.4	16.6	0	16.6
253.1	6.438	1.30E+03	22.4	16.6	0	16.6
253.2	6.438	1.30E+03	22.4	16.6	0	16.6
253.3	6.437	1.30E+03	22.4	16.6	0	16.6
253.4	6.437	1.30E+03	22.4	16.6	0	16.6
253.5	6.437	1.30E+03	22.4	16.6	0	16.6
253.6	6.437	1.29E+03	22.4	16.6	0	16.6
253.7	6.437	1.29E+03	22.4	16.6	0	16.6
253.8	6.436	1.29E+03	22.4	16.6	0	16.6
253.9	6.436	1.29E+03	22.4	16.6	0	16.6
254	6.436	1.29E+03	22.4	16.6	0	16.6
254.1	6.436	1.29E+03	22.4	16.5	0	16.5
254.2	6.436	1.29E+03	22.4	16.5	0	16.5
254.3	6.435	1.29E+03	22.4	16.5	0	16.5
254.4	6.435	1.29E+03	22.4	16.5	0	16.5
254.5	6.435	1.29E+03	22.4	16.5	0	16.5
254.6	6.435	1.29E+03	22.4	16.5	0	16.5
254.7	6.435	1.29E+03	22.4	16.5	0	16.5
254.8	6.434	1.29E+03	22.4	16.5	0	16.5
254.9	6.434	1.29E+03	22.4	16.5	0	16.5
255	6.434	1.29E+03	22.4	16.5	0	16.5
255.1	6.434	1.29E+03	22.4	16.5	0	16.5
255.2	6.434	1.29E+03	22.4	16.5	0	16.5
255.3	6.434	1.29E+03	22.4	16.5	0	16.5
255.4	6.433	1.28E+03	22.4	16.5	0	16.5
255.5	6.433	1.28E+03	22.4	16.5	0	16.5
255.6	6.433	1.28E+03	22.4	16.5	0	16.5
255.7	6.433	1.28E+03	22.4	16.5	0	16.5
255.8	6.433	1.28E+03	22.4	16.5	0	16.5
255.9	6.432	1.28E+03	22.4	16.5	0	16.5
256	6.432	1.28E+03	22.4	16.5	0	16.5
256.1	6.432	1.28E+03	22.4	16.5	0	16.5
256.2	6.432	1.28E+03	22.4	16.5	0	16.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
256.3	6.432	1.28E+03	22.4	16.5	0	16.5
256.4	6.431	1.28E+03	22.4	16.4	0	16.4
256.5	6.431	1.28E+03	22.4	16.4	0	16.4
256.6	6.431	1.28E+03	22.4	16.4	0	16.4
256.7	6.431	1.28E+03	22.4	16.4	0	16.4
256.8	6.431	1.28E+03	22.4	16.4	0	16.4
256.9	6.43	1.28E+03	22.4	16.4	0	16.4
257	6.43	1.28E+03	22.4	16.4	0	16.4
257.1	6.43	1.28E+03	22.4	16.4	0	16.4
257.2	6.43	1.28E+03	22.4	16.4	0	16.4
257.3	6.43	1.28E+03	22.4	16.4	0	16.4
257.4	6.429	1.27E+03	22.4	16.4	0	16.4
257.5	6.429	1.27E+03	22.4	16.4	0	16.4
257.6	6.429	1.27E+03	22.4	16.4	0	16.4
257.7	6.429	1.27E+03	22.4	16.4	0	16.4
257.8	6.429	1.27E+03	22.4	16.4	0	16.4
257.9	6.429	1.27E+03	22.4	16.4	0	16.4
258	6.428	1.27E+03	22.4	16.4	0	16.4
258.1	6.428	1.27E+03	22.4	16.4	0	16.4
258.2	6.428	1.27E+03	22.4	16.4	0	16.4
258.3	6.428	1.27E+03	22.4	16.4	0	16.4
258.4	6.428	1.27E+03	22.4	16.4	0	16.4
258.5	6.427	1.27E+03	22.4	16.4	0	16.4
258.6	6.427	1.27E+03	22.4	16.4	0	16.4
258.7	6.427	1.27E+03	22.4	16.4	0	16.4
258.8	6.427	1.27E+03	22.4	16.4	0	16.4
258.9	6.427	1.27E+03	22.4	16.4	0	16.4
259	6.426	1.27E+03	22.4	16.4	0	16.4
259.1	6.426	1.27E+03	22.4	16.4	0	16.4
259.2	6.426	1.27E+03	22.4	16.3	0	16.3
259.3	6.426	1.27E+03	22.4	16.3	0	16.3
259.4	6.426	1.27E+03	22.4	16.3	0	16.3
259.5	6.425	1.27E+03	22.4	16.3	0	16.3
259.6	6.425	1.27E+03	22.4	16.3	0	16.3
259.7	6.425	1.27E+03	22.4	16.3	0	16.3
259.8	6.425	1.27E+03	22.4	16.3	0	16.3
259.9	6.425	1.27E+03	22.4	16.3	0	16.3
260	6.425	1.27E+03	22.4	16.3	0	16.3
260.1	6.424	1.26E+03	22.4	16.3	0	16.3
260.2	6.424	1.26E+03	22.4	16.3	0	16.3
260.3	6.424	1.26E+03	22.4	16.3	0	16.3
260.4	6.424	1.26E+03	22.4	16.3	0	16.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
260.5	6.424	1.26E+03	22.4	16.3	0	16.3
260.6	6.423	1.26E+03	22.4	16.3	0	16.3
260.7	6.423	1.26E+03	22.4	16.3	0	16.3
260.8	6.423	1.26E+03	22.4	16.3	0	16.3
260.9	6.423	1.26E+03	22.4	16.3	0	16.3
261	6.423	1.26E+03	22.4	16.3	0	16.3
261.1	6.422	1.26E+03	22.4	16.3	0	16.3
261.2	6.422	1.26E+03	22.4	16.3	0	16.3
261.3	6.422	1.26E+03	22.4	16.3	0	16.3
261.4	6.422	1.26E+03	22.4	16.3	0	16.3
261.5	6.422	1.26E+03	22.4	16.3	0	16.3
261.6	6.421	1.26E+03	22.4	16.3	0	16.3
261.7	6.421	1.26E+03	22.4	16.3	0	16.3
261.8	6.421	1.26E+03	22.4	16.3	0	16.3
261.9	6.421	1.26E+03	22.4	16.3	0	16.3
262	6.421	1.26E+03	22.4	16.3	0	16.3
262.1	6.421	1.26E+03	22.4	16.3	0	16.3
262.2	6.42	1.26E+03	22.4	16.3	0	16.3
262.3	6.42	1.26E+03	22.4	16.3	0	16.3
262.4	6.42	1.26E+03	22.4	16.3	0	16.3
262.5	6.42	1.26E+03	22.4	16.3	0	16.3
262.6	6.42	1.26E+03	22.4	16.3	0	16.3
262.7	6.419	1.26E+03	22.3	16.3	0	16.3
262.8	6.419	1.26E+03	22.3	16.3	0	16.3
262.9	6.419	1.26E+03	22.3	16.2	0	16.2
263	6.419	1.26E+03	22.3	16.2	0	16.2
263.1	6.419	1.26E+03	22.3	16.2	0	16.2
263.2	6.418	1.26E+03	22.3	16.2	0	16.2
263.3	6.418	1.26E+03	22.3	16.2	0	16.2
263.4	6.418	1.26E+03	22.3	16.2	0	16.2
263.5	6.418	1.26E+03	22.3	16.2	0	16.2
263.6	6.418	1.26E+03	22.3	16.2	0	16.2
263.7	6.418	1.26E+03	22.3	16.2	0	16.2
263.8	6.417	1.26E+03	22.3	16.2	0	16.2
263.9	6.417	1.26E+03	22.3	16.2	0	16.2
264	6.417	1.26E+03	22.3	16.2	0	16.2
264.1	6.417	1.26E+03	22.3	16.2	0	16.2
264.2	6.417	1.26E+03	22.3	16.2	0	16.2
264.3	6.416	1.26E+03	22.3	16.2	0	16.2
264.4	6.416	1.26E+03	22.3	16.2	0	16.2
264.5	6.416	1.26E+03	22.3	16.2	0	16.2
264.6	6.416	1.26E+03	22.3	16.2	0	16.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
264.7	6.416	1.26E+03	22.3	16.2	0	16.2
264.8	6.415	1.25E+03	22.3	16.2	0	16.2
264.9	6.415	1.25E+03	22.3	16.2	0	16.2
265	6.415	1.25E+03	22.3	16.2	0	16.2
265.1	6.415	1.25E+03	22.3	16.2	0	16.2
265.2	6.415	1.25E+03	22.3	16.2	0	16.2
265.3	6.415	1.25E+03	22.3	16.2	0	16.2
265.4	6.414	1.25E+03	22.3	16.2	0	16.2
265.5	6.414	1.25E+03	22.3	16.2	0	16.2
265.6	6.414	1.25E+03	22.3	16.2	0	16.2
265.7	6.414	1.25E+03	22.3	16.2	0	16.2
265.8	6.414	1.25E+03	22.3	16.2	0	16.2
265.9	6.413	1.25E+03	22.3	16.2	0	16.2
266	6.413	1.25E+03	22.3	16.2	0	16.2
266.1	6.413	1.25E+03	22.3	16.2	0	16.2
266.2	6.413	1.25E+03	22.3	16.2	0	16.2
266.3	6.413	1.25E+03	22.3	16.2	0	16.2
266.4	6.413	1.25E+03	22.3	16.2	0	16.2
266.5	6.412	1.25E+03	22.3	16.2	0	16.2
266.6	6.412	1.25E+03	22.3	16.2	0	16.2
266.7	6.412	1.25E+03	22.3	16.2	0	16.2
266.8	6.412	1.25E+03	22.3	16.2	0	16.2
266.9	6.412	1.25E+03	22.3	16.2	0	16.2
267	6.411	1.25E+03	22.3	16.2	0	16.2
267.1	6.411	1.25E+03	22.3	16.2	0	16.2
267.2	6.411	1.25E+03	22.3	16.2	0	16.2
267.3	6.411	1.25E+03	22.3	16.2	0	16.2
267.4	6.411	1.25E+03	22.3	16.2	0	16.2
267.5	6.41	1.25E+03	22.3	16.2	0	16.2
267.6	6.41	1.25E+03	22.3	16.2	0	16.2
267.7	6.41	1.25E+03	22.3	16.2	0	16.2
267.8	6.41	1.25E+03	22.3	16.2	0	16.2
267.9	6.41	1.25E+03	22.3	16.2	0	16.2
268	6.41	1.25E+03	22.3	16.2	0	16.2
268.1	6.409	1.25E+03	22.3	16.2	0	16.2
268.2	6.409	1.25E+03	22.3	16.2	0	16.2
268.3	6.409	1.25E+03	22.3	16.2	0	16.2
268.4	6.409	1.25E+03	22.3	16.2	0	16.2
268.5	6.409	1.25E+03	22.3	16.2	0	16.2
268.6	6.408	1.25E+03	22.3	16.2	0	16.2
268.7	6.408	1.25E+03	22.3	16.2	0	16.2
268.8	6.408	1.25E+03	22.3	16.2	0	16.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
268.9	6.408	1.25E+03	22.3	16.2	0	16.2
269	6.408	1.25E+03	22.3	16.2	0	16.2
269.1	6.407	1.25E+03	22.3	16.2	0	16.2
269.2	6.407	1.25E+03	22.3	16.2	0	16.2
269.3	6.407	1.25E+03	22.3	16.2	0	16.2
269.4	6.407	1.25E+03	22.3	16.2	0	16.2
269.5	6.407	1.25E+03	22.3	16.2	0	16.2
269.6	6.407	1.25E+03	22.3	16.2	0	16.2
269.7	6.406	1.25E+03	22.3	16.2	0	16.2
269.8	6.406	1.25E+03	22.3	16.2	0	16.2
269.9	6.406	1.25E+03	22.3	16.2	0	16.2
270	6.406	1.25E+03	22.3	16.2	0	16.2
270.1	6.406	1.25E+03	22.3	16.2	0	16.2
270.2	6.405	1.25E+03	22.3	16.2	0	16.2
270.3	6.405	1.25E+03	22.3	16.2	0	16.2
270.4	6.405	1.25E+03	22.3	16.2	0	16.2
270.5	6.405	1.26E+03	22.3	16.2	0	16.2
270.6	6.405	1.26E+03	22.3	16.2	0	16.2
270.7	6.405	1.26E+03	22.3	16.2	0	16.2
270.8	6.404	1.26E+03	22.3	16.2	0	16.2
270.9	6.404	1.26E+03	22.3	16.2	0	16.2
271	6.404	1.26E+03	22.3	16.2	0	16.2
271.1	6.404	1.26E+03	22.3	16.2	0	16.2
271.2	6.404	1.26E+03	22.3	16.2	0	16.2
271.3	6.403	1.26E+03	22.3	16.2	0	16.2
271.4	6.403	1.26E+03	22.3	16.2	0	16.2
271.5	6.403	1.26E+03	22.3	16.2	0	16.2
271.6	6.403	1.26E+03	22.3	16.2	0	16.2
271.7	6.403	1.26E+03	22.3	16.2	0	16.2
271.8	6.403	1.26E+03	22.3	16.2	0	16.2
271.9	6.402	1.26E+03	22.3	16.2	0	16.2
272	6.402	1.26E+03	22.3	16.2	0	16.2
272.1	6.402	1.26E+03	22.3	16.2	0	16.2
272.2	6.402	1.26E+03	22.3	16.2	0	16.2
272.3	6.402	1.26E+03	22.3	16.2	0	16.2
272.4	6.401	1.26E+03	22.3	16.2	0	16.2
272.5	6.401	1.26E+03	22.3	16.2	0	16.2
272.6	6.401	1.26E+03	22.3	16.2	0	16.2
272.7	6.401	1.26E+03	22.3	16.2	0	16.2
272.8	6.401	1.26E+03	22.3	16.2	0	16.2
272.9	6.4	1.26E+03	22.3	16.2	0	16.2
273	6.4	1.26E+03	22.3	16.2	0	16.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
273.1	6.4	1.26E+03	22.3	16.2	0	16.2
273.2	6.4	1.26E+03	22.3	16.2	0	16.2
273.3	6.4	1.26E+03	22.3	16.2	0	16.2
273.4	6.4	1.26E+03	22.3	16.2	0	16.2
273.5	6.399	1.26E+03	22.3	16.2	0	16.2
273.6	6.399	1.26E+03	22.3	16.2	0	16.2
273.7	6.399	1.26E+03	22.3	16.2	0	16.2
273.8	6.399	1.26E+03	22.3	16.2	0	16.2
273.9	6.399	1.26E+03	22.3	16.2	0	16.2
274	6.398	1.26E+03	22.3	16.2	0	16.2
274.1	6.398	1.26E+03	22.3	16.2	0	16.2
274.2	6.398	1.26E+03	22.3	16.2	0	16.2
274.3	6.398	1.26E+03	22.3	16.2	0	16.2
274.4	6.398	1.26E+03	22.3	16.2	0	16.2
274.5	6.398	1.26E+03	22.3	16.2	0	16.2
274.6	6.397	1.26E+03	22.3	16.2	0	16.2
274.7	6.397	1.26E+03	22.3	16.2	0	16.2
274.8	6.397	1.26E+03	22.3	16.2	0	16.2
274.9	6.397	1.26E+03	22.3	16.2	0	16.2
275	6.397	1.26E+03	22.3	16.2	0	16.2
275.1	6.396	1.26E+03	22.3	16.2	0	16.2
275.2	6.396	1.26E+03	22.3	16.2	0	16.2
275.3	6.396	1.26E+03	22.3	16.2	0	16.2
275.4	6.396	1.26E+03	22.3	16.2	0	16.2
275.5	6.396	1.27E+03	22.3	16.2	0	16.2
275.6	6.395	1.27E+03	22.3	16.2	0	16.2
275.7	6.395	1.27E+03	22.3	16.2	0	16.2
275.8	6.395	1.27E+03	22.3	16.2	0	16.2
275.9	6.395	1.27E+03	22.3	16.2	0	16.2
276	6.395	1.27E+03	22.3	16.2	0	16.2
276.1	6.395	1.27E+03	22.3	16.2	0	16.2
276.2	6.394	1.27E+03	22.3	16.2	0	16.2
276.3	6.394	1.27E+03	22.3	16.2	0	16.2
276.4	6.394	1.27E+03	22.3	16.2	0	16.2
276.5	6.394	1.27E+03	22.2	16.2	0	16.2
276.6	6.394	1.27E+03	22.2	16.2	0	16.2
276.7	6.393	1.27E+03	22.2	16.2	0	16.2
276.8	6.393	1.27E+03	22.2	16.2	0	16.2
276.9	6.393	1.27E+03	22.2	16.2	0	16.2
277	6.393	1.27E+03	22.2	16.2	0	16.2
277.1	6.393	1.27E+03	22.2	16.2	0	16.2
277.2	6.393	1.27E+03	22.2	16.2	0	16.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
277.3	6.392	1.27E+03	22.2	16.2	0	16.2
277.4	6.392	1.27E+03	22.2	16.2	0	16.2
277.5	6.392	1.27E+03	22.2	16.2	0	16.2
277.6	6.392	1.27E+03	22.2	16.2	0	16.2
277.7	6.392	1.27E+03	22.2	16.2	0	16.2
277.8	6.391	1.27E+03	22.2	16.2	0	16.2
277.9	6.391	1.27E+03	22.2	16.2	0	16.2
278	6.391	1.27E+03	22.2	16.2	0	16.2
278.1	6.391	1.27E+03	22.2	16.2	0	16.2
278.2	6.391	1.27E+03	22.2	16.2	0	16.2
278.3	6.39	1.27E+03	22.2	16.2	0	16.2
278.4	6.39	1.28E+03	22.2	16.2	0	16.2
278.5	6.39	1.28E+03	22.2	16.2	0	16.2
278.6	6.39	1.28E+03	22.2	16.2	0	16.2
278.7	6.39	1.28E+03	22.2	16.2	0	16.2
278.8	6.39	1.28E+03	22.2	16.2	0	16.2
278.9	6.389	1.28E+03	22.2	16.2	0	16.2
279	6.389	1.28E+03	22.2	16.2	0	16.2
279.1	6.389	1.28E+03	22.2	16.2	0	16.2
279.2	6.389	1.28E+03	22.2	16.2	0	16.2
279.3	6.389	1.28E+03	22.2	16.2	0	16.2
279.4	6.388	1.28E+03	22.2	16.2	0	16.2
279.5	6.388	1.28E+03	22.2	16.2	0	16.2
279.6	6.388	1.28E+03	22.2	16.2	0	16.2
279.7	6.388	1.28E+03	22.2	16.2	0	16.2
279.8	6.388	1.28E+03	22.2	16.2	0	16.2
279.9	6.388	1.28E+03	22.2	16.2	0	16.2
280	6.387	1.28E+03	22.2	16.2	0	16.2
280.1	6.387	1.28E+03	22.2	16.2	0	16.2
280.2	6.387	1.28E+03	22.2	16.2	0	16.2
280.3	6.387	1.28E+03	22.2	16.2	0	16.2
280.4	6.387	1.28E+03	22.2	16.2	0	16.2
280.5	6.386	1.28E+03	22.2	16.2	0	16.2
280.6	6.386	1.29E+03	22.2	16.2	0	16.2
280.7	6.386	1.29E+03	22.2	16.2	0	16.2
280.8	6.386	1.29E+03	22.2	16.2	0	16.2
280.9	6.386	1.29E+03	22.2	16.2	0	16.2
281	6.385	1.29E+03	22.2	16.2	0	16.2
281.1	6.385	1.29E+03	22.2	16.2	0	16.2
281.2	6.385	1.29E+03	22.2	16.2	0	16.2
281.3	6.385	1.29E+03	22.2	16.3	0	16.3
281.4	6.385	1.29E+03	22.2	16.3	0	16.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
281.5	6.385	1.29E+03	22.2	16.3	0	16.3
281.6	6.384	1.29E+03	22.2	16.3	0	16.3
281.7	6.384	1.29E+03	22.2	16.3	0	16.3
281.8	6.384	1.29E+03	22.2	16.3	0	16.3
281.9	6.384	1.29E+03	22.2	16.3	0	16.3
282	6.384	1.29E+03	22.2	16.3	0	16.3
282.1	6.383	1.29E+03	22.2	16.3	0	16.3
282.2	6.383	1.29E+03	22.2	16.3	0	16.3
282.3	6.383	1.29E+03	22.2	16.3	0	16.3
282.4	6.383	1.29E+03	22.2	16.3	0	16.3
282.5	6.383	1.30E+03	22.2	16.3	0	16.3
282.6	6.382	1.30E+03	22.2	16.3	0	16.3
282.7	6.382	1.30E+03	22.2	16.3	0	16.3
282.8	6.382	1.30E+03	22.2	16.3	0	16.3
282.9	6.382	1.30E+03	22.2	16.3	0	16.3
283	6.382	1.30E+03	22.2	16.3	0	16.3
283.1	6.382	1.30E+03	22.2	16.3	0	16.3
283.2	6.381	1.30E+03	22.2	16.3	0	16.3
283.3	6.381	1.30E+03	22.2	16.3	0	16.3
283.4	6.381	1.30E+03	22.2	16.3	0	16.3
283.5	6.381	1.30E+03	22.2	16.3	0	16.3
283.6	6.381	1.30E+03	22.2	16.3	0	16.3
283.7	6.38	1.30E+03	22.2	16.3	0	16.3
283.8	6.38	1.30E+03	22.2	16.3	0	16.3
283.9	6.38	1.30E+03	22.2	16.3	0	16.3
284.3	6.379	1.31E+03	22.2	16.3	0	16.3
284.4	6.379	1.31E+03	22.2	16.3	0	16.3
284.5	6.379	1.31E+03	22.2	16.3	0	16.3
284.6	6.379	1.31E+03	22.2	16.3	0	16.3
284.7	6.379	1.31E+03	22.2	16.3	0	16.3
284.8	6.378	1.31E+03	22.2	16.3	0	16.3
284.9	6.378	1.31E+03	22.2	16.3	0	16.3
285	6.378	1.31E+03	22.2	16.3	0	16.3
285.1	6.378	1.31E+03	22.2	16.3	0	16.3
285.2	6.378	1.31E+03	22.2	16.3	0	16.3
285.3	6.377	1.31E+03	22.2	16.4	0	16.4
285.4	6.377	1.31E+03	22.2	16.4	0	16.4
285.5	6.377	1.31E+03	22.2	16.4	0	16.4
285.6	6.377	1.31E+03	22.2	16.4	0	16.4
285.7	6.377	1.32E+03	22.2	16.4	0	16.4
285.8	6.376	1.32E+03	22.2	16.4	0	16.4
285.9	6.376	1.32E+03	22.2	16.4	0	16.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
286	6.376	1.32E+03	22.2	16.4	0	16.4
286.1	6.376	1.32E+03	22.2	16.4	0	16.4
286.2	6.376	1.32E+03	22.2	16.4	0	16.4
286.6	6.375	1.32E+03	22.2	16.4	0	16.4
286.7	6.375	1.32E+03	22.2	16.4	0	16.4
286.8	6.375	1.32E+03	22.1	16.4	0	16.4
286.9	6.374	1.32E+03	22.1	16.4	0	16.4
287	6.374	1.32E+03	22.1	16.4	0	16.4
287.1	6.374	1.33E+03	22.1	16.4	0	16.4
287.2	6.374	1.33E+03	22.1	16.4	0	16.4
287.3	6.374	1.33E+03	22.1	16.4	0	16.4
287.4	6.373	1.33E+03	22.1	16.4	0	16.4
287.5	6.373	1.33E+03	22.1	16.4	0	16.4
287.6	6.373	1.33E+03	22.1	16.4	0	16.4
287.7	6.373	1.33E+03	22.1	16.4	0	16.4
287.8	6.373	1.33E+03	22.1	16.4	0	16.4
287.9	6.372	1.33E+03	22.1	16.4	0	16.4
288	6.372	1.33E+03	22.1	16.4	0	16.4
288.1	6.372	1.33E+03	22.1	16.4	0	16.4
288.2	6.372	1.33E+03	22.1	16.4	0	16.4
288.3	6.372	1.34E+03	22.1	16.4	0	16.4
288.4	6.371	1.34E+03	22.1	16.5	0	16.5
288.5	6.371	1.34E+03	22.1	16.5	0	16.5
288.9	6.371	1.34E+03	22.1	16.5	0	16.5
289	6.37	1.34E+03	22.1	16.5	0	16.5
289.1	6.37	1.34E+03	22.1	16.5	0	16.5
289.2	6.37	1.34E+03	22.1	16.5	0	16.5
289.3	6.37	1.34E+03	22.1	16.5	0	16.5
289.4	6.37	1.34E+03	22.1	16.5	0	16.5
289.5	6.369	1.35E+03	22.1	16.5	0	16.5
289.6	6.369	1.35E+03	22.1	16.5	0	16.5
289.7	6.369	1.35E+03	22.1	16.5	0	16.5
289.8	6.369	1.35E+03	22.1	16.5	0	16.5
289.9	6.369	1.35E+03	22.1	16.5	0	16.5
290	6.368	1.35E+03	22.1	16.5	0	16.5
290.1	6.368	1.35E+03	22.1	16.5	0	16.5
290.2	6.368	1.35E+03	22.1	16.5	0	16.5
290.3	6.368	1.35E+03	22.1	16.5	0	16.5
290.4	6.368	1.35E+03	22.1	16.5	0	16.5
290.5	6.367	1.35E+03	22.1	16.5	0	16.5
290.6	6.367	1.35E+03	22.1	16.5	0	16.5
290.7	6.367	1.36E+03	22.1	16.5	0	16.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
290.8	6.367	1.36E+03	22.1	16.5	0	16.5
291.2	6.366	1.36E+03	22.1	16.6	0	16.6
291.3	6.366	1.36E+03	22.1	16.6	0	16.6
291.4	6.366	1.36E+03	22.1	16.6	0	16.6
291.5	6.365	1.36E+03	22.1	16.6	0	16.6
291.6	6.365	1.36E+03	22.1	16.6	0	16.6
291.7	6.365	1.37E+03	22.1	16.6	0	16.6
291.8	6.365	1.37E+03	22.1	16.6	0	16.6
291.9	6.365	1.37E+03	22.1	16.6	0	16.6
292	6.365	1.37E+03	22.1	16.6	0	16.6
292.1	6.364	1.37E+03	22.1	16.6	0	16.6
292.2	6.364	1.37E+03	22.1	16.6	0	16.6
292.3	6.364	1.37E+03	22.1	16.6	0	16.6
292.4	6.364	1.37E+03	22.1	16.6	0	16.6
292.5	6.364	1.37E+03	22.1	16.6	0	16.6
292.6	6.363	1.37E+03	22.1	16.6	0	16.6
292.7	6.363	1.38E+03	22.1	16.6	0	16.6
292.8	6.363	1.38E+03	22.1	16.6	0	16.6
292.9	6.363	1.38E+03	22.1	16.6	0	16.6
293	6.363	1.38E+03	22.1	16.6	0	16.6
293.1	6.362	1.38E+03	22.1	16.7	0	16.7
293.2	6.362	1.38E+03	22.1	16.7	0	16.7
293.3	6.362	1.38E+03	22.1	16.7	0	16.7
293.4	6.362	1.38E+03	22.1	16.7	0	16.7
293.5	6.362	1.38E+03	22.1	16.7	0	16.7
293.6	6.361	1.38E+03	22.1	16.7	0	16.7
293.7	6.361	1.39E+03	22.1	16.7	0	16.7
293.8	6.361	1.39E+03	22.1	16.7	0	16.7
293.9	6.361	1.39E+03	22.1	16.7	0	16.7
294	6.361	1.39E+03	22.1	16.7	0	16.7
294.1	6.36	1.39E+03	22.1	16.7	0	16.7
294.2	6.36	1.39E+03	22.1	16.7	0	16.7
294.3	6.36	1.39E+03	22.1	16.7	0	16.7
294.4	6.36	1.39E+03	22.1	16.7	0	16.7
294.5	6.36	1.39E+03	22.1	16.7	0	16.7
294.6	6.359	1.40E+03	22.1	16.7	0	16.7
294.7	6.359	1.40E+03	22.1	16.7	0	16.7
294.8	6.359	1.40E+03	22.1	16.7	0	16.7
294.9	6.359	1.40E+03	22.1	16.7	0	16.7
295	6.359	1.40E+03	22.1	16.7	0	16.7
295.1	6.358	1.40E+03	22.1	16.8	0	16.8
295.2	6.358	1.40E+03	22	16.8	0	16.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
295.3	6.358	1.40E+03	22	16.8	0	16.8
295.4	6.358	1.40E+03	22	16.8	0	16.8
295.5	6.358	1.41E+03	22	16.8	0	16.8
295.6	6.357	1.41E+03	22	16.8	0	16.8
295.7	6.357	1.41E+03	22	16.8	0	16.8
295.8	6.357	1.41E+03	22	16.8	0	16.8
295.9	6.357	1.41E+03	22	16.8	0	16.8
296	6.357	1.41E+03	22	16.8	0	16.8
296.1	6.356	1.41E+03	22	16.8	0	16.8
296.2	6.356	1.41E+03	22	16.8	0	16.8
296.3	6.356	1.41E+03	22	16.8	0	16.8
296.4	6.356	1.42E+03	22	16.8	0	16.8
296.5	6.356	1.42E+03	22	16.8	0	16.8
296.6	6.355	1.42E+03	22	16.8	0	16.8
296.7	6.355	1.42E+03	22	16.8	0	16.8
296.8	6.355	1.42E+03	22	16.8	0	16.8
296.9	6.355	1.42E+03	22	16.8	0	16.8
297	6.355	1.42E+03	22	16.9	0	16.9
297.1	6.354	1.42E+03	22	16.9	0	16.9
297.2	6.354	1.43E+03	22	16.9	0	16.9
297.3	6.354	1.43E+03	22	16.9	0	16.9
297.4	6.354	1.43E+03	22	16.9	0	16.9
297.5	6.354	1.43E+03	22	16.9	0	16.9
297.6	6.353	1.43E+03	22	16.9	0	16.9
297.7	6.353	1.43E+03	22	16.9	0	16.9
297.8	6.353	1.43E+03	22	16.9	0	16.9
297.9	6.353	1.43E+03	22	16.9	0	16.9
298	6.353	1.44E+03	22	16.9	0	16.9
298.1	6.352	1.44E+03	22	16.9	0	16.9
298.2	6.352	1.44E+03	22	16.9	0	16.9
298.3	6.352	1.44E+03	22	16.9	0	16.9
298.4	6.352	1.44E+03	22	16.9	0	16.9
298.5	6.352	1.44E+03	22	16.9	0	16.9
298.6	6.351	1.44E+03	22	16.9	0	16.9
298.7	6.351	1.44E+03	22	17	0	17
298.8	6.351	1.45E+03	22	17	0	17
298.9	6.351	1.45E+03	22	17	0	17
299	6.351	1.45E+03	22	17	0	17
299.1	6.35	1.45E+03	22	17	0	17
299.2	6.35	1.45E+03	22	17	0	17
299.3	6.35	1.45E+03	22	17	0	17
299.4	6.35	1.45E+03	22	17	0	17

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
299.5	6.349	1.45E+03	22	17	0	17
299.6	6.349	1.46E+03	22	17	0	17
299.7	6.349	1.46E+03	22	17	0	17
299.8	6.349	1.46E+03	22	17	0	17
299.9	6.349	1.46E+03	22	17	0	17
300	6.348	1.46E+03	22	17	0	17
300.1	6.348	1.46E+03	22	17	0	17
300.2	6.348	1.46E+03	22	17	0	17
300.3	6.348	1.47E+03	22	17.1	0	17.1
300.4	6.348	1.47E+03	22	17.1	0	17.1
300.5	6.347	1.47E+03	22	17.1	0	17.1
300.6	6.347	1.47E+03	22	17.1	0	17.1
300.7	6.347	1.47E+03	22	17.1	0	17.1
300.8	6.347	1.47E+03	22	17.1	0	17.1
300.9	6.347	1.47E+03	22	17.1	0	17.1
301	6.346	1.48E+03	22	17.1	0	17.1
301.1	6.346	1.48E+03	22	17.1	0	17.1
301.2	6.346	1.48E+03	22	17.1	0	17.1
301.3	6.346	1.48E+03	22	17.1	0	17.1
301.4	6.346	1.48E+03	22	17.1	0	17.1
301.5	6.345	1.48E+03	22	17.1	0	17.1
301.6	6.345	1.48E+03	22	17.1	0	17.1
301.7	6.345	1.49E+03	22	17.1	0	17.1
301.8	6.345	1.49E+03	22	17.2	0	17.2
301.9	6.344	1.49E+03	22	17.2	0	17.2
302	6.344	1.49E+03	22	17.2	0	17.2
302.1	6.344	1.49E+03	22	17.2	0	17.2
302.2	6.344	1.49E+03	22	17.2	0	17.2
302.3	6.344	1.49E+03	22	17.2	0	17.2
302.4	6.343	1.50E+03	22	17.2	0	17.2
302.5	6.343	1.50E+03	21.9	17.2	0	17.2
302.6	6.343	1.50E+03	21.9	17.2	0	17.2
302.7	6.343	1.50E+03	21.9	17.2	0	17.2
302.8	6.343	1.50E+03	21.9	17.2	0	17.2
302.9	6.342	1.50E+03	21.9	17.2	0	17.2
303	6.342	1.51E+03	21.9	17.2	0	17.2
303.1	6.342	1.51E+03	21.9	17.2	0	17.2
303.2	6.342	1.51E+03	21.9	17.2	0	17.2
303.3	6.342	1.51E+03	21.9	17.3	0	17.3
303.4	6.341	1.51E+03	21.9	17.3	0	17.3
303.5	6.341	1.51E+03	21.9	17.3	0	17.3
303.6	6.341	1.51E+03	21.9	17.3	0	17.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
303.7	6.341	1.52E+03	21.9	17.3	0	17.3
303.8	6.34	1.52E+03	21.9	17.3	0	17.3
303.9	6.34	1.52E+03	21.9	17.3	0	17.3
304	6.34	1.52E+03	21.9	17.3	0	17.3
304.1	6.34	1.52E+03	21.9	17.3	0	17.3
304.2	6.34	1.52E+03	21.9	17.3	0	17.3
304.3	6.339	1.53E+03	21.9	17.3	0	17.3
304.4	6.339	1.53E+03	21.9	17.3	0	17.3
304.5	6.339	1.53E+03	21.9	17.3	0	17.3
304.6	6.339	1.53E+03	21.9	17.4	0	17.4
304.7	6.339	1.53E+03	21.9	17.4	0	17.4
304.8	6.338	1.53E+03	21.9	17.4	0	17.4
304.9	6.338	1.54E+03	21.9	17.4	0	17.4
305	6.338	1.54E+03	21.9	17.4	0	17.4
305.1	6.338	1.54E+03	21.9	17.4	0	17.4
305.2	6.337	1.54E+03	21.9	17.4	0	17.4
305.3	6.337	1.54E+03	21.9	17.4	0	17.4
305.4	6.337	1.54E+03	21.9	17.4	0	17.4
305.5	6.337	1.55E+03	21.9	17.4	0	17.4
305.6	6.337	1.55E+03	21.9	17.4	0	17.4
305.7	6.336	1.55E+03	21.9	17.4	0	17.4
305.8	6.336	1.55E+03	21.9	17.4	0	17.4
305.9	6.336	1.55E+03	21.9	17.4	0	17.4
306	6.336	1.55E+03	21.9	17.5	0	17.5
306.1	6.335	1.56E+03	21.9	17.5	0	17.5
306.2	6.335	1.56E+03	21.9	17.5	0	17.5
306.3	6.335	1.56E+03	21.9	17.5	0	17.5
306.4	6.335	1.56E+03	21.9	17.5	0	17.5
306.5	6.335	1.56E+03	21.9	17.5	0	17.5
306.6	6.334	1.56E+03	21.9	17.5	0	17.5
306.7	6.334	1.57E+03	21.9	17.5	0	17.5
306.8	6.334	1.57E+03	21.9	17.5	0	17.5
306.9	6.334	1.57E+03	21.9	17.5	0	17.5
307	6.333	1.57E+03	21.9	17.5	0	17.5
307.1	6.333	1.57E+03	21.9	17.5	0	17.5
307.2	6.333	1.58E+03	21.9	17.6	0	17.6
307.3	6.333	1.58E+03	21.9	17.6	0	17.6
307.4	6.333	1.58E+03	21.9	17.6	0	17.6
307.5	6.332	1.58E+03	21.9	17.6	0	17.6
307.6	6.332	1.58E+03	21.9	17.6	0	17.6
307.7	6.332	1.58E+03	21.9	17.6	0	17.6
307.8	6.332	1.59E+03	21.9	17.6	0	17.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
307.9	6.331	1.59E+03	21.9	17.6	0	17.6
308	6.331	1.59E+03	21.9	17.6	0	17.6
308.1	6.331	1.59E+03	21.9	17.6	0	17.6
308.2	6.331	1.59E+03	21.9	17.6	0	17.6
308.3	6.331	1.60E+03	21.9	17.6	0	17.6
308.4	6.33	1.60E+03	21.9	17.7	0	17.7
308.5	6.33	1.60E+03	21.9	17.7	0	17.7
308.6	6.33	1.60E+03	21.9	17.7	0	17.7
308.7	6.33	1.60E+03	21.9	17.7	0	17.7
308.8	6.329	1.60E+03	21.9	17.7	0	17.7
308.9	6.329	1.61E+03	21.8	17.7	0	17.7
309	6.329	1.61E+03	21.8	17.7	0	17.7
309.1	6.329	1.61E+03	21.8	17.7	0	17.7
309.2	6.329	1.61E+03	21.8	17.7	0	17.7
309.3	6.328	1.61E+03	21.8	17.7	0	17.7
309.4	6.328	1.62E+03	21.8	17.7	0	17.7
309.5	6.328	1.62E+03	21.8	17.7	0	17.7
309.6	6.328	1.62E+03	21.8	17.8	0	17.8
309.7	6.327	1.62E+03	21.8	17.8	0	17.8
309.8	6.327	1.62E+03	21.8	17.8	0	17.8
309.9	6.327	1.63E+03	21.8	17.8	0	17.8
310	6.327	1.63E+03	21.8	17.8	0	17.8
310.1	6.326	1.63E+03	21.8	17.8	0	17.8
310.2	6.326	1.63E+03	21.8	17.8	0	17.8
310.3	6.326	1.63E+03	21.8	17.8	0	17.8
310.4	6.326	1.64E+03	21.8	17.8	0	17.8
310.5	6.326	1.64E+03	21.8	17.8	0	17.8
310.6	6.325	1.64E+03	21.8	17.8	0	17.8
310.7	6.325	1.64E+03	21.8	17.9	0	17.9
310.8	6.325	1.64E+03	21.8	17.9	0	17.9
310.9	6.325	1.65E+03	21.8	17.9	0	17.9
311	6.324	1.65E+03	21.8	17.9	0	17.9
311.1	6.324	1.65E+03	21.8	17.9	0	17.9
311.2	6.324	1.65E+03	21.8	17.9	0	17.9
311.3	6.324	1.65E+03	21.8	17.9	0	17.9
311.4	6.323	1.66E+03	21.8	17.9	0	17.9
311.5	6.323	1.66E+03	21.8	17.9	0	17.9
311.6	6.323	1.66E+03	21.8	17.9	0	17.9
311.7	6.323	1.66E+03	21.8	17.9	0	17.9
311.8	6.323	1.66E+03	21.8	18	0	18
311.9	6.322	1.67E+03	21.8	18	0	18
312	6.322	1.67E+03	21.8	18	0	18

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
312.1	6.322	1.67E+03	21.8	18	0	18
312.2	6.322	1.67E+03	21.8	18	0	18
312.3	6.321	1.68E+03	21.8	18	0	18
312.4	6.321	1.68E+03	21.8	18	0	18
312.5	6.321	1.68E+03	21.8	18	0	18
312.6	6.321	1.68E+03	21.8	18	0	18
312.7	6.32	1.68E+03	21.8	18	0	18
312.8	6.32	1.69E+03	21.8	18	0	18
312.9	6.32	1.69E+03	21.8	18.1	0	18.1
313	6.32	1.69E+03	21.8	18.1	0	18.1
313.1	6.319	1.69E+03	21.8	18.1	0	18.1
313.2	6.319	1.69E+03	21.8	18.1	0	18.1
313.3	6.319	1.70E+03	21.8	18.1	0	18.1
313.4	6.319	1.70E+03	21.8	18.1	0	18.1
313.5	6.319	1.70E+03	21.8	18.1	0	18.1
313.6	6.318	1.70E+03	21.8	18.1	0	18.1
313.7	6.318	1.71E+03	21.8	18.1	0	18.1
313.8	6.318	1.71E+03	21.8	18.1	0	18.1
313.9	6.318	1.71E+03	21.8	18.2	0	18.2
314	6.317	1.71E+03	21.8	18.2	0	18.2
314.1	6.317	1.71E+03	21.8	18.2	0	18.2
314.2	6.317	1.72E+03	21.8	18.2	0	18.2
314.3	6.317	1.72E+03	21.8	18.2	0	18.2
314.4	6.316	1.72E+03	21.8	18.2	0	18.2
314.5	6.316	1.72E+03	21.8	18.2	0	18.2
314.6	6.316	1.73E+03	21.8	18.2	0	18.2
314.7	6.316	1.73E+03	21.8	18.2	0	18.2
314.8	6.315	1.73E+03	21.7	18.2	0	18.2
314.9	6.315	1.73E+03	21.7	18.3	0	18.3
315	6.315	1.74E+03	21.7	18.3	0	18.3
315.1	6.315	1.74E+03	21.7	18.3	0	18.3
315.2	6.314	1.74E+03	21.7	18.3	0	18.3
315.3	6.314	1.74E+03	21.7	18.3	0	18.3
315.4	6.314	1.74E+03	21.7	18.3	0	18.3
315.5	6.314	1.75E+03	21.7	18.3	0	18.3
315.6	6.313	1.75E+03	21.7	18.3	0	18.3
315.7	6.313	1.75E+03	21.7	18.3	0	18.3
315.8	6.313	1.75E+03	21.7	18.3	0	18.3
315.9	6.313	1.76E+03	21.7	18.4	0	18.4
316	6.312	1.76E+03	21.7	18.4	0	18.4
316.1	6.312	1.76E+03	21.7	18.4	0	18.4
316.2	6.312	1.76E+03	21.7	18.4	0	18.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
316.3	6.312	1.77E+03	21.7	18.4	0	18.4
316.4	6.311	1.77E+03	21.7	18.4	0	18.4
316.5	6.311	1.77E+03	21.7	18.4	0	18.4
316.6	6.311	1.77E+03	21.7	18.4	0	18.4
316.7	6.311	1.78E+03	21.7	18.4	0	18.4
316.8	6.31	1.78E+03	21.7	18.4	0	18.4
316.9	6.31	1.78E+03	21.7	18.5	0	18.5
317	6.31	1.78E+03	21.7	18.5	0	18.5
317.1	6.31	1.79E+03	21.7	18.5	0	18.5
317.2	6.309	1.79E+03	21.7	18.5	0	18.5
317.3	6.309	1.79E+03	21.7	18.5	0	18.5
317.4	6.309	1.79E+03	21.7	18.5	0	18.5
317.5	6.309	1.80E+03	21.7	18.5	0	18.5
317.6	6.308	1.80E+03	21.7	18.5	0	18.5
317.7	6.308	1.80E+03	21.7	18.5	0	18.5
317.8	6.308	1.80E+03	21.7	18.6	0	18.6
317.9	6.308	1.81E+03	21.7	18.6	0	18.6
318	6.307	1.81E+03	21.7	18.6	0	18.6
318.1	6.307	1.81E+03	21.7	18.6	0	18.6
318.2	6.307	1.81E+03	21.7	18.6	0	18.6
318.3	6.307	1.82E+03	21.7	18.6	0	18.6
318.4	6.306	1.82E+03	21.7	18.6	0	18.6
318.5	6.306	1.82E+03	21.7	18.6	0	18.6
318.6	6.306	1.82E+03	21.7	18.6	0	18.6
318.7	6.306	1.83E+03	21.7	18.7	0	18.7
318.8	6.305	1.83E+03	21.7	18.7	0	18.7
318.9	6.305	1.83E+03	21.7	18.7	0	18.7
319	6.305	1.84E+03	21.7	18.7	0	18.7
319.1	6.305	1.84E+03	21.7	18.7	0	18.7
319.2	6.304	1.84E+03	21.7	18.7	0	18.7
319.3	6.304	1.84E+03	21.7	18.7	0	18.7
319.4	6.304	1.85E+03	21.7	18.7	0	18.7
319.5	6.304	1.85E+03	21.7	18.7	0	18.7
319.6	6.303	1.85E+03	21.7	18.8	0	18.8
319.7	6.303	1.85E+03	21.7	18.8	0	18.8
319.8	6.303	1.86E+03	21.7	18.8	0	18.8
319.9	6.303	1.86E+03	21.7	18.8	0	18.8
320	6.302	1.86E+03	21.7	18.8	0	18.8
320.1	6.302	1.86E+03	21.6	18.8	0	18.8
320.2	6.302	1.87E+03	21.6	18.8	0	18.8
320.3	6.302	1.87E+03	21.6	18.8	0	18.8
320.4	6.301	1.87E+03	21.6	18.8	0	18.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
320.5	6.301	1.88E+03	21.6	18.9	0	18.9
320.6	6.301	1.88E+03	21.6	18.9	0	18.9
320.7	6.3	1.88E+03	21.6	18.9	0	18.9
320.8	6.3	1.88E+03	21.6	18.9	0	18.9
320.9	6.3	1.89E+03	21.6	18.9	0	18.9
321	6.3	1.89E+03	21.6	18.9	0	18.9
321.1	6.299	1.89E+03	21.6	18.9	0	18.9
321.2	6.299	1.90E+03	21.6	18.9	0	18.9
321.3	6.299	1.90E+03	21.6	18.9	0	18.9
321.4	6.299	1.90E+03	21.6	19	0	19
321.5	6.298	1.90E+03	21.6	19	0	19
321.6	6.298	1.91E+03	21.6	19	0	19
321.7	6.298	1.91E+03	21.6	19	0	19
321.8	6.298	1.91E+03	21.6	19	0	19
321.9	6.297	1.92E+03	21.6	19	0	19
322	6.297	1.92E+03	21.6	19	0	19
322.1	6.297	1.92E+03	21.6	19	0	19
322.2	6.296	1.92E+03	21.6	19.1	0	19.1
322.3	6.296	1.93E+03	21.6	19.1	0	19.1
322.4	6.296	1.93E+03	21.6	19.1	0	19.1
322.5	6.296	1.93E+03	21.6	19.1	0	19.1
322.6	6.295	1.94E+03	21.6	19.1	0	19.1
322.7	6.295	1.94E+03	21.6	19.1	0	19.1
322.8	6.295	1.94E+03	21.6	19.1	0	19.1
322.9	6.295	1.95E+03	21.6	19.1	0	19.1
323	6.294	1.95E+03	21.6	19.1	0	19.1
323.1	6.294	1.95E+03	21.6	19.2	0	19.2
323.2	6.294	1.95E+03	21.6	19.2	0	19.2
323.3	6.294	1.96E+03	21.6	19.2	0	19.2
323.4	6.293	1.96E+03	21.6	19.2	0	19.2
323.5	6.293	1.96E+03	21.6	19.2	0	19.2
323.6	6.293	1.97E+03	21.6	19.2	0	19.2
323.7	6.292	1.97E+03	21.6	19.2	0	19.2
323.8	6.292	1.97E+03	21.6	19.2	0	19.2
323.9	6.292	1.98E+03	21.6	19.3	0	19.3
324	6.292	1.98E+03	21.6	19.3	0	19.3
324.1	6.291	1.98E+03	21.6	19.3	0	19.3
324.2	6.291	1.98E+03	21.6	19.3	0	19.3
324.3	6.291	1.99E+03	21.6	19.3	0	19.3
324.4	6.29	1.99E+03	21.6	19.3	0	19.3
324.5	6.29	1.99E+03	21.6	19.3	0	19.3
324.6	6.29	2.00E+03	21.6	19.3	0	19.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
324.7	6.29	2.00E+03	21.6	19.4	0	19.4
324.8	6.289	2.00E+03	21.6	19.4	0	19.4
324.9	6.289	2.01E+03	21.6	19.4	0	19.4
325	6.289	2.01E+03	21.6	19.4	0	19.4
325.1	6.289	2.01E+03	21.5	19.4	0	19.4
325.2	6.288	2.02E+03	21.5	19.4	0	19.4
325.3	6.288	2.02E+03	21.5	19.4	0	19.4
325.4	6.288	2.02E+03	21.5	19.4	0	19.4
325.5	6.287	2.03E+03	21.5	19.5	0	19.5
325.6	6.287	2.03E+03	21.5	19.5	0	19.5
325.7	6.287	2.03E+03	21.5	19.5	0	19.5
325.8	6.287	2.04E+03	21.5	19.5	0	19.5
325.9	6.286	2.04E+03	21.5	19.5	0	19.5
326	6.286	2.04E+03	21.5	19.5	0	19.5
326.1	6.286	2.05E+03	21.5	19.5	0	19.5
326.2	6.285	2.05E+03	21.5	19.6	0	19.6
326.3	6.285	2.05E+03	21.5	19.6	0	19.6
326.4	6.285	2.06E+03	21.5	19.6	0	19.6
326.5	6.285	2.06E+03	21.5	19.6	0	19.6
326.6	6.284	2.06E+03	21.5	19.6	0	19.6
326.7	6.284	2.07E+03	21.5	19.6	0	19.6
326.8	6.284	2.07E+03	21.5	19.6	0	19.6
326.9	6.283	2.07E+03	21.5	19.6	0	19.6
327	6.283	2.08E+03	21.5	19.7	0	19.7
327.1	6.283	2.08E+03	21.5	19.7	0	19.7
327.2	6.282	2.08E+03	21.5	19.7	0	19.7
327.3	6.282	2.09E+03	21.5	19.7	0	19.7
327.4	6.282	2.09E+03	21.5	19.7	0	19.7
327.5	6.282	2.09E+03	21.5	19.7	0	19.7
327.6	6.281	2.10E+03	21.5	19.7	0	19.7
327.7	6.281	2.10E+03	21.5	19.7	0	19.7
327.8	6.281	2.10E+03	21.5	19.8	0	19.8
327.9	6.28	2.11E+03	21.5	19.8	0	19.8
328.3	6.279	2.12E+03	21.5	19.8	0	19.8
328.4	6.279	2.12E+03	21.5	19.8	0	19.8
328.5	6.279	2.13E+03	21.5	19.9	0	19.9
328.6	6.278	2.13E+03	21.5	19.9	0	19.9
328.7	6.278	2.14E+03	21.5	19.9	0	19.9
328.8	6.278	2.14E+03	21.5	19.9	0	19.9
328.9	6.277	2.14E+03	21.5	19.9	0	19.9
329	6.277	2.15E+03	21.5	19.9	0	19.9
329.1	6.277	2.15E+03	21.5	19.9	0	19.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
329.2	6.277	2.15E+03	21.5	20	0	20
329.3	6.276	2.16E+03	21.5	20	0	20
329.4	6.276	2.16E+03	21.5	20	0	20
329.5	6.276	2.16E+03	21.5	20	0	20
329.6	6.275	2.17E+03	21.5	20	0	20
329.7	6.275	2.17E+03	21.4	20	0	20
329.8	6.275	2.18E+03	21.4	20	0	20
329.9	6.274	2.18E+03	21.4	20.1	0	20.1
330	6.274	2.18E+03	21.4	20.1	0	20.1
330.1	6.274	2.19E+03	21.4	20.1	0	20.1
330.2	6.274	2.19E+03	21.4	20.1	0	20.1
330.3	6.273	2.19E+03	21.4	20.1	0	20.1
330.4	6.273	2.20E+03	21.4	20.1	0	20.1
330.5	6.273	2.20E+03	21.4	20.1	0	20.1
330.6	6.272	2.21E+03	21.4	20.1	0	20.1
330.7	6.272	2.21E+03	21.4	20.2	0	20.2
330.8	6.272	2.21E+03	21.4	20.2	0	20.2
330.9	6.271	2.22E+03	21.4	20.2	0	20.2
331	6.271	2.22E+03	21.4	20.2	0	20.2
331.1	6.271	2.22E+03	21.4	20.2	0	20.2
331.2	6.27	2.23E+03	21.4	20.2	0	20.2
331.3	6.27	2.23E+03	21.4	20.2	0	20.2
331.4	6.27	2.24E+03	21.4	20.3	0	20.3
331.5	6.269	2.24E+03	21.4	20.3	0	20.3
331.6	6.269	2.24E+03	21.4	20.3	0	20.3
331.7	6.269	2.25E+03	21.4	20.3	0	20.3
331.8	6.269	2.25E+03	21.4	20.3	0	20.3
331.9	6.268	2.26E+03	21.4	20.3	0	20.3
332	6.268	2.26E+03	21.4	20.4	0	20.4
332.1	6.268	2.26E+03	21.4	20.4	0	20.4
332.2	6.267	2.27E+03	21.4	20.4	0	20.4
332.3	6.267	2.27E+03	21.4	20.4	0	20.4
332.4	6.267	2.28E+03	21.4	20.4	0	20.4
332.5	6.266	2.28E+03	21.4	20.4	0	20.4
332.6	6.266	2.28E+03	21.4	20.4	0	20.4
332.7	6.266	2.29E+03	21.4	20.5	0	20.5
332.8	6.265	2.29E+03	21.4	20.5	0	20.5
332.9	6.265	2.30E+03	21.4	20.5	0	20.5
333	6.265	2.30E+03	21.4	20.5	0	20.5
333.1	6.264	2.30E+03	21.4	20.5	0	20.5
333.2	6.264	2.31E+03	21.4	20.5	0	20.5
333.3	6.264	2.31E+03	21.4	20.5	0	20.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
333.4	6.263	2.32E+03	21.4	20.6	0	20.6
333.5	6.263	2.32E+03	21.4	20.6	0	20.6
333.6	6.263	2.32E+03	21.4	20.6	0	20.6
333.7	6.262	2.33E+03	21.4	20.6	0	20.6
333.8	6.262	2.33E+03	21.4	20.6	0	20.6
333.9	6.262	2.34E+03	21.4	20.6	0	20.6
334	6.261	2.34E+03	21.3	20.6	0	20.6
334.1	6.261	2.35E+03	21.3	20.7	0	20.7
334.2	6.261	2.35E+03	21.3	20.7	0	20.7
334.3	6.26	2.35E+03	21.3	20.7	0	20.7
334.4	6.26	2.36E+03	21.3	20.7	0	20.7
334.5	6.26	2.36E+03	21.3	20.7	0	20.7
334.6	6.259	2.37E+03	21.3	20.7	0	20.7
334.7	6.259	2.37E+03	21.3	20.8	0	20.8
334.8	6.259	2.38E+03	21.3	20.8	0	20.8
334.9	6.258	2.38E+03	21.3	20.8	0	20.8
335	6.258	2.38E+03	21.3	20.8	0	20.8
335.1	6.258	2.39E+03	21.3	20.8	0	20.8
335.2	6.257	2.39E+03	21.3	20.8	0	20.8
335.3	6.257	2.40E+03	21.3	20.8	0	20.8
335.4	6.257	2.40E+03	21.3	20.9	0	20.9
335.5	6.256	2.41E+03	21.3	20.9	0	20.9
335.6	6.256	2.41E+03	21.3	20.9	0	20.9
335.7	6.256	2.41E+03	21.3	20.9	0	20.9
335.8	6.255	2.42E+03	21.3	20.9	0	20.9
335.9	6.255	2.42E+03	21.3	20.9	0	20.9
336	6.255	2.43E+03	21.3	21	0	21
336.1	6.254	2.43E+03	21.3	21	0	21
336.2	6.254	2.44E+03	21.3	21	0	21
336.3	6.254	2.44E+03	21.3	21	0	21
336.4	6.253	2.45E+03	21.3	21	0	21
336.5	6.253	2.45E+03	21.3	21	0	21
336.6	6.253	2.45E+03	21.3	21	0	21
336.7	6.252	2.46E+03	21.3	21.1	0	21.1
336.8	6.252	2.46E+03	21.3	21.1	0	21.1
336.9	6.252	2.47E+03	21.3	21.1	0	21.1
337	6.251	2.47E+03	21.3	21.1	0	21.1
337.1	6.251	2.48E+03	21.3	21.1	0	21.1
337.2	6.251	2.48E+03	21.3	21.1	0	21.1
337.3	6.25	2.49E+03	21.3	21.2	0	21.2
337.4	6.25	2.49E+03	21.3	21.2	0	21.2
337.5	6.25	2.49E+03	21.3	21.2	0	21.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
337.6	6.249	2.50E+03	21.3	21.2	0	21.2
337.7	6.249	2.50E+03	21.3	21.2	0	21.2
337.8	6.249	2.51E+03	21.2	21.2	0	21.2
337.9	6.248	2.51E+03	21.2	21.3	0	21.3
338	6.248	2.52E+03	21.2	21.3	0	21.3
338.1	6.247	2.52E+03	21.2	21.3	0	21.3
338.2	6.247	2.53E+03	21.2	21.3	0	21.3
338.3	6.247	2.53E+03	21.2	21.3	0	21.3
338.4	6.246	2.54E+03	21.2	21.3	0	21.3
338.5	6.246	2.54E+03	21.2	21.3	0	21.3
338.6	6.246	2.55E+03	21.2	21.4	0	21.4
338.7	6.245	2.55E+03	21.2	21.4	0	21.4
338.8	6.245	2.55E+03	21.2	21.4	0	21.4
338.9	6.245	2.56E+03	21.2	21.4	0	21.4
339	6.244	2.56E+03	21.2	21.4	0	21.4
339.1	6.244	2.57E+03	21.2	21.4	0	21.4
339.2	6.244	2.57E+03	21.2	21.5	0	21.5
339.3	6.243	2.58E+03	21.2	21.5	0	21.5
339.4	6.243	2.58E+03	21.2	21.5	0	21.5
339.5	6.242	2.59E+03	21.2	21.5	0	21.5
339.6	6.242	2.59E+03	21.2	21.5	0	21.5
339.7	6.242	2.60E+03	21.2	21.5	0	21.5
339.8	6.241	2.60E+03	21.2	21.6	0	21.6
339.9	6.241	2.61E+03	21.2	21.6	0	21.6
340	6.241	2.61E+03	21.2	21.6	0	21.6
340.1	6.24	2.62E+03	21.2	21.6	0	21.6
340.2	6.24	2.62E+03	21.2	21.6	0	21.6
340.3	6.24	2.63E+03	21.2	21.6	0	21.6
340.4	6.239	2.63E+03	21.2	21.6	0	21.6
340.5	6.239	2.64E+03	21.2	21.7	0	21.7
340.6	6.238	2.64E+03	21.2	21.7	0	21.7
340.7	6.238	2.65E+03	21.2	21.7	0	21.7
340.8	6.238	2.65E+03	21.2	21.7	0	21.7
340.9	6.237	2.66E+03	21.2	21.7	0	21.7
341	6.237	2.66E+03	21.1	21.7	0	21.7
341.1	6.237	2.67E+03	21.1	21.8	0	21.8
341.2	6.236	2.67E+03	21.1	21.8	0	21.8
341.3	6.236	2.68E+03	21.1	21.8	0	21.8
341.4	6.235	2.68E+03	21.1	21.8	0	21.8
341.5	6.235	2.69E+03	21.1	21.8	0	21.8
341.6	6.235	2.69E+03	21.1	21.8	0	21.8
341.7	6.234	2.70E+03	21.1	21.9	0	21.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
341.8	6.234	2.70E+03	21.1	21.9	0	21.9
341.9	6.234	2.71E+03	21.1	21.9	0	21.9
342	6.233	2.71E+03	21.1	21.9	0	21.9
342.1	6.233	2.72E+03	21.1	21.9	0	21.9
342.2	6.232	2.72E+03	21.1	21.9	0	21.9
342.3	6.232	2.73E+03	21.1	22	0	22
342.4	6.232	2.73E+03	21.1	22	0	22
342.5	6.231	2.74E+03	21.1	22	0	22
342.6	6.231	2.74E+03	21.1	22	0	22
342.7	6.23	2.75E+03	21.1	22	0	22
342.8	6.23	2.75E+03	21.1	22	0	22
342.9	6.23	2.76E+03	21.1	22.1	0	22.1
343	6.229	2.76E+03	21.1	22.1	0	22.1
343.1	6.229	2.77E+03	21.1	22.1	0	22.1
343.2	6.229	2.77E+03	21.1	22.1	0	22.1
343.3	6.228	2.78E+03	21.1	22.1	0	22.1
343.4	6.228	2.79E+03	21.1	22.1	0	22.1
343.5	6.227	2.79E+03	21.1	22.2	0	22.2
343.6	6.227	2.80E+03	21.1	22.2	0	22.2
343.7	6.227	2.80E+03	21.1	22.2	0	22.2
343.8	6.226	2.81E+03	21.1	22.2	0	22.2
343.9	6.226	2.81E+03	21.1	22.2	0	22.2
344	6.225	2.82E+03	21.1	22.3	0	22.3
344.1	6.225	2.82E+03	21	22.3	0	22.3
344.2	6.225	2.83E+03	21	22.3	0	22.3
344.3	6.224	2.83E+03	21	22.3	0	22.3
344.4	6.224	2.84E+03	21	22.3	0	22.3
344.5	6.223	2.84E+03	21	22.3	0	22.3
344.6	6.223	2.85E+03	21	22.4	0	22.4
344.7	6.223	2.86E+03	21	22.4	0	22.4
344.8	6.222	2.86E+03	21	22.4	0	22.4
344.9	6.222	2.87E+03	21	22.4	0	22.4
345	6.221	2.87E+03	21	22.4	0	22.4
345.1	6.221	2.88E+03	21	22.4	0	22.4
345.2	6.221	2.88E+03	21	22.5	0	22.5
345.3	6.22	2.89E+03	21	22.5	0	22.5
345.4	6.22	2.89E+03	21	22.5	0	22.5
345.5	6.219	2.90E+03	21	22.5	0	22.5
345.6	6.219	2.91E+03	21	22.5	0	22.5
345.7	6.219	2.91E+03	21	22.5	0	22.5
345.8	6.218	2.92E+03	21	22.6	0	22.6
345.9	6.218	2.92E+03	21	22.6	0	22.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
346	6.217	2.93E+03	21	22.6	0	22.6
346.1	6.217	2.93E+03	21	22.6	0	22.6
346.2	6.216	2.94E+03	21	22.6	0	22.6
346.3	6.216	2.95E+03	21	22.7	0	22.7
346.4	6.216	2.95E+03	21	22.7	0	22.7
346.5	6.215	2.96E+03	21	22.7	0	22.7
346.6	6.215	2.96E+03	21	22.7	0	22.7
346.7	6.214	2.97E+03	21	22.7	0	22.7
346.8	6.214	2.98E+03	21	22.7	0	22.7
346.9	6.214	2.98E+03	21	22.8	0	22.8
347	6.213	2.99E+03	21	22.8	0	22.8
347.1	6.213	2.99E+03	20.9	22.8	0	22.8
347.2	6.212	3.00E+03	20.9	22.8	0	22.8
347.3	6.212	3.00E+03	20.9	22.8	0	22.8
347.4	6.211	3.01E+03	20.9	22.8	0	22.8
347.5	6.211	3.02E+03	20.9	22.9	0	22.9
347.6	6.211	3.02E+03	20.9	22.9	0	22.9
347.7	6.21	3.03E+03	20.9	22.9	0	22.9
347.8	6.21	3.03E+03	20.9	22.9	0	22.9
347.9	6.209	3.04E+03	20.9	22.9	0	22.9
348	6.209	3.05E+03	20.9	23	0	23
348.1	6.208	3.05E+03	20.9	23	0	23
348.2	6.208	3.06E+03	20.9	23	0	23
348.3	6.208	3.07E+03	20.9	23	0	23
348.4	6.207	3.07E+03	20.9	23	0	23
348.5	6.207	3.08E+03	20.9	23	0	23
348.6	6.206	3.08E+03	20.9	23.1	0	23.1
348.7	6.206	3.09E+03	20.9	23.1	0	23.1
348.8	6.205	3.10E+03	20.9	23.1	0	23.1
348.9	6.205	3.10E+03	20.9	23.1	0	23.1
349	6.205	3.11E+03	20.9	23.1	0	23.1
349.1	6.204	3.11E+03	20.9	23.2	0	23.2
349.2	6.204	3.12E+03	20.9	23.2	0	23.2
349.3	6.203	3.13E+03	20.9	23.2	0	23.2
349.4	6.203	3.13E+03	20.9	23.2	0	23.2
349.5	6.202	3.14E+03	20.9	23.2	0	23.2
349.6	6.202	3.15E+03	20.9	23.2	0	23.2
349.7	6.201	3.15E+03	20.9	23.3	0	23.3
349.8	6.201	3.16E+03	20.9	23.3	0	23.3
349.9	6.201	3.16E+03	20.9	23.3	0	23.3
350	6.2	3.17E+03	20.8	23.3	0	23.3
350.1	6.2	3.18E+03	20.8	23.3	0	23.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
350.2	6.199	3.18E+03	20.8	23.4	0	23.4
350.3	6.199	3.19E+03	20.8	23.4	0	23.4
350.4	6.198	3.20E+03	20.8	23.4	0	23.4
350.5	6.198	3.20E+03	20.8	23.4	0	23.4
350.6	6.197	3.21E+03	20.8	23.4	0	23.4
350.7	6.197	3.22E+03	20.8	23.5	0	23.5
350.8	6.196	3.22E+03	20.8	23.5	0	23.5
350.9	6.196	3.23E+03	20.8	23.5	0	23.5
351	6.196	3.24E+03	20.8	23.5	0	23.5
351.1	6.195	3.24E+03	20.8	23.5	0	23.5
351.2	6.195	3.25E+03	20.8	23.5	0	23.5
351.3	6.194	3.26E+03	20.8	23.6	0	23.6
351.4	6.194	3.26E+03	20.8	23.6	0	23.6
351.5	6.193	3.27E+03	20.8	23.6	0	23.6
351.6	6.193	3.28E+03	20.8	23.6	0	23.6
351.7	6.192	3.28E+03	20.8	23.6	0	23.6
351.8	6.192	3.29E+03	20.8	23.7	0	23.7
351.9	6.191	3.30E+03	20.8	23.7	0	23.7
352	6.191	3.30E+03	20.8	23.7	0	23.7
352.1	6.19	3.31E+03	20.8	23.7	0	23.7
352.2	6.19	3.32E+03	20.8	23.7	0	23.7
352.3	6.19	3.32E+03	20.8	23.8	0	23.8
352.4	6.189	3.33E+03	20.8	23.8	0	23.8
352.5	6.189	3.34E+03	20.8	23.8	0	23.8
352.6	6.188	3.34E+03	20.8	23.8	0	23.8
352.7	6.188	3.35E+03	20.8	23.8	0	23.8
352.8	6.187	3.36E+03	20.7	23.9	0	23.9
352.9	6.187	3.36E+03	20.7	23.9	0	23.9
353	6.186	3.37E+03	20.7	23.9	0	23.9
353.1	6.186	3.38E+03	20.7	23.9	0	23.9
353.2	6.185	3.38E+03	20.7	23.9	0	23.9
353.3	6.185	3.39E+03	20.7	23.9	0	23.9
353.4	6.184	3.40E+03	20.7	24	0	24
353.5	6.184	3.41E+03	20.7	24	0	24
353.6	6.183	3.41E+03	20.7	24	0	24
353.7	6.183	3.42E+03	20.7	24	0	24
353.8	6.182	3.43E+03	20.7	24	0	24
353.9	6.182	3.43E+03	20.7	24.1	0	24.1
354	6.181	3.44E+03	20.7	24.1	0	24.1
354.1	6.181	3.45E+03	20.7	24.1	0	24.1
354.2	6.18	3.46E+03	20.7	24.1	0	24.1
354.3	6.18	3.46E+03	20.7	24.1	0	24.1

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
354.4	6.179	3.47E+03	20.7	24.2	0	24.2
354.5	6.179	3.48E+03	20.7	24.2	0	24.2
354.6	6.178	3.48E+03	20.7	24.2	0	24.2
354.7	6.178	3.49E+03	20.7	24.2	0	24.2
354.8	6.177	3.50E+03	20.7	24.2	0	24.2
354.9	6.177	3.51E+03	20.7	24.3	0	24.3
355	6.176	3.51E+03	20.7	24.3	0	24.3
355.1	6.176	3.52E+03	20.7	24.3	0	24.3
355.2	6.175	3.53E+03	20.7	24.3	0	24.3
355.3	6.175	3.53E+03	20.7	24.3	0	24.3
355.4	6.174	3.54E+03	20.7	24.4	0	24.4
355.5	6.174	3.55E+03	20.6	24.4	0	24.4
355.6	6.173	3.56E+03	20.6	24.4	0	24.4
355.7	6.173	3.56E+03	20.6	24.4	0	24.4
355.8	6.172	3.57E+03	20.6	24.4	0	24.4
355.9	6.172	3.58E+03	20.6	24.5	0	24.5
356	6.171	3.59E+03	20.6	24.5	0	24.5
356.1	6.171	3.59E+03	20.6	24.5	0	24.5
356.2	6.17	3.60E+03	20.6	24.5	0	24.5
356.3	6.17	3.61E+03	20.6	24.5	0	24.5
356.4	6.169	3.62E+03	20.6	24.6	0	24.6
356.5	6.169	3.62E+03	20.6	24.6	0	24.6
356.6	6.168	3.63E+03	20.6	24.6	0	24.6
356.7	6.168	3.64E+03	20.6	24.6	0	24.6
356.8	6.167	3.65E+03	20.6	24.6	0	24.6
356.9	6.167	3.65E+03	20.6	24.7	0	24.7
357	6.166	3.66E+03	20.6	24.7	0	24.7
357.1	6.166	3.67E+03	20.6	24.7	0	24.7
357.2	6.165	3.68E+03	20.6	24.7	0	24.7
357.3	6.165	3.69E+03	20.6	24.7	0	24.7
357.4	6.164	3.69E+03	20.6	24.8	0	24.8
357.5	6.164	3.70E+03	20.6	24.8	0	24.8
357.6	6.163	3.71E+03	20.6	24.8	0	24.8
357.7	6.163	3.72E+03	20.6	24.8	0	24.8
357.8	6.162	3.72E+03	20.6	24.8	0	24.8
357.9	6.162	3.73E+03	20.6	24.9	0	24.9
358	6.161	3.74E+03	20.6	24.9	0	24.9
358.1	6.161	3.75E+03	20.5	24.9	0	24.9
358.2	6.16	3.76E+03	20.5	24.9	0	24.9
358.3	6.159	3.76E+03	20.5	24.9	0	24.9
358.4	6.159	3.77E+03	20.5	25	0	25
358.5	6.158	3.78E+03	20.5	25	0	25

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
358.6	6.158	3.79E+03	20.5	25	0	25
358.7	6.157	3.80E+03	20.5	25	0	25
358.8	6.157	3.80E+03	20.5	25	0	25
358.9	6.156	3.81E+03	20.5	25.1	0	25.1
359	6.156	3.82E+03	20.5	25.1	0	25.1
359.1	6.155	3.83E+03	20.5	25.1	0	25.1
359.2	6.155	3.84E+03	20.5	25.1	0	25.1
359.3	6.154	3.84E+03	20.5	25.1	0	25.1
359.4	6.154	3.85E+03	20.5	25.2	0	25.2
359.5	6.153	3.86E+03	20.5	25.2	0	25.2
359.6	6.152	3.87E+03	20.5	25.2	0	25.2
359.7	6.152	3.88E+03	20.5	25.2	0	25.2
359.8	6.151	3.88E+03	20.5	25.2	0	25.2
359.9	6.151	3.89E+03	20.5	25.3	0	25.3
360	6.15	3.90E+03	20.5	25.3	0	25.3
360.1	6.15	3.91E+03	20.5	25.3	0	25.3
360.2	6.149	3.92E+03	20.5	25.3	0	25.3
360.3	6.149	3.93E+03	20.5	25.3	0	25.3
360.4	6.148	3.93E+03	20.5	25.4	0	25.4
360.5	6.147	3.94E+03	20.5	25.4	0	25.4
360.6	6.147	3.95E+03	20.5	25.4	0	25.4
360.7	6.146	3.96E+03	20.4	25.4	0	25.4
360.8	6.146	3.97E+03	20.4	25.4	0	25.4
360.9	6.145	3.98E+03	20.4	25.5	0	25.5
361	6.145	3.99E+03	20.4	25.5	0	25.5
361.1	6.144	3.99E+03	20.4	25.5	0	25.5
361.2	6.143	4.00E+03	20.4	25.5	0	25.5
361.3	6.143	4.01E+03	20.4	25.5	0	25.5
361.4	6.142	4.02E+03	20.4	25.6	0	25.6
361.5	6.142	4.03E+03	20.4	25.6	0	25.6
361.6	6.141	4.04E+03	20.4	25.6	0	25.6
361.7	6.141	4.05E+03	20.4	25.6	0	25.6
361.8	6.14	4.05E+03	20.4	25.6	0	25.6
361.9	6.139	4.06E+03	20.4	25.7	0	25.7
362	6.139	4.07E+03	20.4	25.7	0	25.7
362.1	6.138	4.08E+03	20.4	25.7	0	25.7
362.2	6.138	4.09E+03	20.4	25.7	0	25.7
362.3	6.137	4.10E+03	20.4	25.7	0	25.7
362.4	6.137	4.11E+03	20.4	25.8	0	25.8
362.5	6.136	4.12E+03	20.4	25.8	0	25.8
362.6	6.135	4.12E+03	20.4	25.8	0	25.8
362.7	6.135	4.13E+03	20.4	25.8	0	25.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
362.8	6.134	4.14E+03	20.4	25.9	0	25.9
362.9	6.134	4.15E+03	20.4	25.9	0	25.9
363	6.133	4.16E+03	20.4	25.9	0	25.9
363.1	6.132	4.17E+03	20.4	25.9	0	25.9
363.2	6.132	4.18E+03	20.3	25.9	0	25.9
363.3	6.131	4.19E+03	20.3	26	0	26
363.4	6.131	4.20E+03	20.3	26	0	26
363.5	6.13	4.20E+03	20.3	26	0	26
363.6	6.129	4.21E+03	20.3	26	0	26
363.7	6.129	4.22E+03	20.3	26	0	26
363.8	6.128	4.23E+03	20.3	26.1	0	26.1
363.9	6.128	4.24E+03	20.3	26.1	0	26.1
364	6.127	4.25E+03	20.3	26.1	0	26.1
364.1	6.126	4.26E+03	20.3	26.1	0	26.1
364.2	6.126	4.27E+03	20.3	26.1	0	26.1
364.3	6.125	4.28E+03	20.3	26.2	0	26.2
364.4	6.125	4.29E+03	20.3	26.2	0	26.2
364.5	6.124	4.30E+03	20.3	26.2	0	26.2
364.6	6.123	4.30E+03	20.3	26.2	0	26.2
364.7	6.123	4.31E+03	20.3	26.2	0	26.2
364.8	6.122	4.32E+03	20.3	26.3	0	26.3
364.9	6.122	4.33E+03	20.3	26.3	0	26.3
365	6.121	4.34E+03	20.3	26.3	0	26.3
365.1	6.12	4.35E+03	20.3	26.3	0	26.3
365.2	6.12	4.36E+03	20.3	26.4	0	26.4
365.3	6.119	4.37E+03	20.3	26.4	0	26.4
365.4	6.118	4.38E+03	20.3	26.4	0	26.4
365.5	6.118	4.39E+03	20.3	26.4	0	26.4
365.6	6.117	4.40E+03	20.2	26.4	0	26.4
365.7	6.117	4.41E+03	20.2	26.5	0	26.5
365.8	6.116	4.42E+03	20.2	26.5	0	26.5
365.9	6.115	4.43E+03	20.2	26.5	0	26.5
366	6.115	4.44E+03	20.2	26.5	0	26.5
366.1	6.114	4.45E+03	20.2	26.5	0	26.5
366.2	6.113	4.46E+03	20.2	26.6	0	26.6
366.3	6.113	4.47E+03	20.2	26.6	0	26.6
366.4	6.112	4.48E+03	20.2	26.6	0	26.6
366.5	6.111	4.49E+03	20.2	26.6	0	26.6
366.6	6.111	4.49E+03	20.2	26.7	0	26.7
366.7	6.11	4.50E+03	20.2	26.7	0	26.7
366.8	6.11	4.51E+03	20.2	26.7	0	26.7
366.9	6.109	4.52E+03	20.2	26.7	0	26.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
367	6.108	4.53E+03	20.2	26.7	0	26.7
367.1	6.108	4.54E+03	20.2	26.8	0	26.8
367.2	6.107	4.55E+03	20.2	26.8	0	26.8
367.3	6.106	4.56E+03	20.2	26.8	0	26.8
367.4	6.106	4.57E+03	20.2	26.8	0	26.8
367.5	6.105	4.58E+03	20.2	26.8	0	26.8
367.6	6.104	4.59E+03	20.2	26.9	0	26.9
367.7	6.104	4.60E+03	20.2	26.9	0	26.9
367.8	6.103	4.61E+03	20.2	26.9	0	26.9
367.9	6.102	4.62E+03	20.1	26.9	0	26.9
368	6.102	4.63E+03	20.1	26.9	0	26.9
368.1	6.101	4.64E+03	20.1	27	0	27
368.2	6.1	4.65E+03	20.1	27	0	27
368.3	6.1	4.66E+03	20.1	27	0	27
368.4	6.099	4.67E+03	20.1	27	0	27
368.5	6.098	4.68E+03	20.1	27.1	0	27.1
368.6	6.098	4.69E+03	20.1	27.1	0	27.1
368.7	6.097	4.70E+03	20.1	27.1	0	27.1
368.8	6.096	4.71E+03	20.1	27.1	0	27.1
368.9	6.096	4.72E+03	20.1	27.1	0	27.1
369	6.095	4.74E+03	20.1	27.2	0	27.2
369.1	6.094	4.75E+03	20.1	27.2	0	27.2
369.2	6.094	4.76E+03	20.1	27.2	0	27.2
369.3	6.093	4.77E+03	20.1	27.2	0	27.2
369.4	6.092	4.78E+03	20.1	27.2	0	27.2
369.5	6.092	4.79E+03	20.1	27.3	0	27.3
369.6	6.091	4.80E+03	20.1	27.3	0	27.3
369.7	6.09	4.81E+03	20.1	27.3	0	27.3
369.8	6.09	4.82E+03	20.1	27.3	0	27.3
369.9	6.089	4.83E+03	20.1	27.4	0	27.4
370	6.088	4.84E+03	20.1	27.4	0	27.4
370.1	6.087	4.85E+03	20.1	27.4	0	27.4
370.2	6.087	4.86E+03	20	27.4	0	27.4
370.3	6.086	4.87E+03	20	27.4	0	27.4
370.4	6.085	4.88E+03	20	27.5	0	27.5
370.5	6.085	4.89E+03	20	27.5	0	27.5
370.6	6.084	4.90E+03	20	27.5	0	27.5
370.7	6.083	4.91E+03	20	27.5	0	27.5
370.8	6.083	4.92E+03	20	27.5	0	27.5
370.9	6.082	4.93E+03	20	27.6	0	27.6
371	6.081	4.95E+03	20	27.6	0	27.6
371.1	6.08	4.96E+03	20	27.6	0	27.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
371.2	6.08	4.97E+03	20	27.6	0	27.6
371.3	6.079	4.98E+03	20	27.7	0	27.7
371.4	6.078	4.99E+03	20	27.7	0	27.7
371.5	6.078	5.00E+03	20	27.7	0	27.7
371.6	6.077	5.01E+03	20	27.7	0	27.7
371.7	6.076	5.02E+03	20	27.7	0	27.7
371.8	6.075	5.03E+03	20	27.8	0	27.8
371.9	6.075	5.04E+03	20	27.8	0	27.8
372	6.074	5.05E+03	20	27.8	0	27.8
372.1	6.073	5.07E+03	20	27.8	0	27.8
372.2	6.073	5.08E+03	20	27.8	0	27.8
372.3	6.072	5.09E+03	20	27.9	0	27.9
372.4	6.071	5.10E+03	19.9	27.9	0	27.9
372.5	6.07	5.11E+03	19.9	27.9	0	27.9
372.6	6.07	5.12E+03	19.9	27.9	0	27.9
372.7	6.069	5.13E+03	19.9	28	0	28
372.8	6.068	5.14E+03	19.9	28	0	28
372.9	6.067	5.15E+03	19.9	28	0	28
373	6.067	5.17E+03	19.9	28	0	28
373.1	6.066	5.18E+03	19.9	28	0	28
373.2	6.065	5.19E+03	19.9	28.1	0	28.1
373.3	6.064	5.20E+03	19.9	28.1	0	28.1
373.4	6.064	5.21E+03	19.9	28.1	0	28.1
373.5	6.063	5.22E+03	19.9	28.1	0	28.1
373.6	6.062	5.23E+03	19.9	28.1	0	28.1
373.7	6.061	5.25E+03	19.9	28.2	0	28.2
373.8	6.061	5.26E+03	19.9	28.2	0	28.2
373.9	6.06	5.27E+03	19.9	28.2	0	28.2
374	6.059	5.28E+03	19.9	28.2	0	28.2
374.1	6.058	5.29E+03	19.9	28.3	0	28.3
374.2	6.058	5.30E+03	19.9	28.3	0	28.3
374.3	6.057	5.31E+03	19.9	28.3	0	28.3
374.4	6.056	5.33E+03	19.9	28.3	0	28.3
374.5	6.055	5.34E+03	19.9	28.3	0	28.3
374.6	6.055	5.35E+03	19.8	28.4	0	28.4
374.7	6.054	5.36E+03	19.8	28.4	0	28.4
374.8	6.053	5.37E+03	19.8	28.4	0	28.4
374.9	6.052	5.38E+03	19.8	28.4	0	28.4
375	6.052	5.40E+03	19.8	28.4	0	28.4
375.1	6.051	5.41E+03	19.8	28.5	0	28.5
375.2	6.05	5.42E+03	19.8	28.5	0	28.5
375.3	6.049	5.43E+03	19.8	28.5	0	28.5

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
375.4	6.048	5.44E+03	19.8	28.5	0	28.5
375.5	6.048	5.46E+03	19.8	28.6	0	28.6
375.6	6.047	5.47E+03	19.8	28.6	0	28.6
375.7	6.046	5.48E+03	19.8	28.6	0	28.6
375.8	6.045	5.49E+03	19.8	28.6	0	28.6
375.9	6.044	5.50E+03	19.8	28.6	0	28.6
376	6.044	5.51E+03	19.8	28.7	0	28.7
376.1	6.043	5.53E+03	19.8	28.7	0	28.7
376.2	6.042	5.54E+03	19.8	28.7	0	28.7
376.3	6.041	5.55E+03	19.8	28.7	0	28.7
376.4	6.041	5.56E+03	19.8	28.7	0	28.7
376.5	6.04	5.58E+03	19.8	28.8	0	28.8
376.6	6.039	5.59E+03	19.8	28.8	0	28.8
376.7	6.038	5.60E+03	19.7	28.8	0	28.8
376.8	6.037	5.61E+03	19.7	28.8	0	28.8
376.9	6.036	5.62E+03	19.7	28.9	0	28.9
377	6.036	5.64E+03	19.7	28.9	0	28.9
377.1	6.035	5.65E+03	19.7	28.9	0	28.9
377.2	6.034	5.66E+03	19.7	28.9	0	28.9
377.3	6.033	5.67E+03	19.7	28.9	0	28.9
377.4	6.032	5.69E+03	19.7	29	0	29
377.5	6.032	5.70E+03	19.7	29	0	29
377.6	6.031	5.71E+03	19.7	29	0	29
377.7	6.03	5.72E+03	19.7	29	0	29
377.8	6.029	5.73E+03	19.7	29	0	29
377.9	6.028	5.75E+03	19.7	29.1	0	29.1
378	6.027	5.76E+03	19.7	29.1	0	29.1
378.1	6.027	5.77E+03	19.7	29.1	0	29.1
378.2	6.026	5.78E+03	19.7	29.1	0	29.1
378.3	6.025	5.80E+03	19.7	29.2	0	29.2
378.4	6.024	5.81E+03	19.7	29.2	0	29.2
378.5	6.023	5.82E+03	19.7	29.2	0	29.2
378.6	6.022	5.84E+03	19.7	29.2	0	29.2
378.7	6.022	5.85E+03	19.7	29.2	0	29.2
378.8	6.021	5.86E+03	19.6	29.3	0	29.3
378.9	6.02	5.87E+03	19.6	29.3	0	29.3
379	6.019	5.89E+03	19.6	29.3	0	29.3
379.1	6.018	5.90E+03	19.6	29.3	0	29.3
379.2	6.017	5.91E+03	19.6	29.3	0	29.3
379.3	6.017	5.92E+03	19.6	29.4	0	29.4
379.4	6.016	5.94E+03	19.6	29.4	0	29.4
379.5	6.015	5.95E+03	19.6	29.4	0	29.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
379.6	6.014	5.96E+03	19.6	29.4	0	29.4
379.7	6.013	5.98E+03	19.6	29.4	0	29.4
379.8	6.012	5.99E+03	19.6	29.5	0	29.5
379.9	6.011	6.00E+03	19.6	29.5	0	29.5
380	6.011	6.01E+03	19.6	29.5	0	29.5
380.1	6.01	6.03E+03	19.6	29.5	0	29.5
380.2	6.009	6.04E+03	19.6	29.6	0	29.6
380.3	6.008	6.05E+03	19.6	29.6	0	29.6
380.4	6.007	6.07E+03	19.6	29.6	0	29.6
380.5	6.006	6.08E+03	19.6	29.6	0	29.6
380.6	6.005	6.09E+03	19.6	29.6	0	29.6
380.7	6.004	6.11E+03	19.6	29.7	0	29.7
380.8	6.004	6.12E+03	19.5	29.7	0	29.7
380.9	6.003	6.13E+03	19.5	29.7	0	29.7
381	6.002	6.15E+03	19.5	29.7	0	29.7
381.1	6.001	6.16E+03	19.5	29.7	0	29.7
381.2	6	6.17E+03	19.5	29.8	0	29.8
381.3	5.999	6.19E+03	19.5	29.8	0	29.8
381.4	5.998	6.20E+03	19.5	29.8	0	29.8
381.5	5.997	6.21E+03	19.5	29.8	0	29.8
381.6	5.996	6.23E+03	19.5	29.8	0	29.8
381.7	5.996	6.24E+03	19.5	29.9	0	29.9
381.8	5.995	6.25E+03	19.5	29.9	0	29.9
381.9	5.994	6.27E+03	19.5	29.9	0	29.9
382	5.993	6.28E+03	19.5	29.9	0	29.9
382.1	5.992	6.29E+03	19.5	29.9	0	29.9
382.2	5.991	6.31E+03	19.5	30	0	30
382.3	5.99	6.32E+03	19.5	30	0	30
382.4	5.989	6.33E+03	19.5	30	0	30
382.5	5.988	6.35E+03	19.5	30	0	30
382.6	5.987	6.36E+03	19.5	30	0	30
382.7	5.986	6.38E+03	19.4	30.1	0	30.1
382.8	5.986	6.39E+03	19.4	30.1	0	30.1
382.9	5.985	6.40E+03	19.4	30.1	0	30.1
383	5.984	6.42E+03	19.4	30.1	0	30.1
383.1	5.983	6.43E+03	19.4	30.2	0	30.2
383.2	5.982	6.44E+03	19.4	30.2	0	30.2
383.3	5.981	6.46E+03	19.4	30.2	0	30.2
383.4	5.98	6.47E+03	19.4	30.2	0	30.2
383.5	5.979	6.49E+03	19.4	30.2	0	30.2
383.6	5.978	6.50E+03	19.4	30.3	0	30.3
383.7	5.977	6.51E+03	19.4	30.3	0	30.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
383.8	5.976	6.53E+03	19.4	30.3	0	30.3
383.9	5.975	6.54E+03	19.4	30.3	0	30.3
384	5.974	6.56E+03	19.4	30.3	0	30.3
384.1	5.973	6.57E+03	19.4	30.4	0	30.4
384.2	5.972	6.58E+03	19.4	30.4	0	30.4
384.3	5.971	6.60E+03	19.4	30.4	0	30.4
384.4	5.97	6.61E+03	19.4	30.4	0	30.4
384.5	5.97	6.63E+03	19.4	30.4	0	30.4
384.6	5.969	6.64E+03	19.4	30.5	0	30.5
384.7	5.968	6.65E+03	19.3	30.5	0	30.5
384.8	5.967	6.67E+03	19.3	30.5	0	30.5
384.9	5.966	6.68E+03	19.3	30.5	0	30.5
385	5.965	6.70E+03	19.3	30.5	0	30.5
385.1	5.964	6.71E+03	19.3	30.6	0	30.6
385.2	5.963	6.73E+03	19.3	30.6	0	30.6
385.3	5.962	6.74E+03	19.3	30.6	0	30.6
385.4	5.961	6.75E+03	19.3	30.6	0	30.6
385.5	5.96	6.77E+03	19.3	30.6	0	30.6
385.6	5.959	6.78E+03	19.3	30.7	0	30.7
385.7	5.958	6.80E+03	19.3	30.7	0	30.7
385.8	5.957	6.81E+03	19.3	30.7	0	30.7
385.9	5.956	6.83E+03	19.3	30.7	0	30.7
386	5.955	6.84E+03	19.3	30.7	0	30.7
386.1	5.954	6.86E+03	19.3	30.8	0	30.8
386.2	5.953	6.87E+03	19.3	30.8	0	30.8
386.3	5.952	6.88E+03	19.3	30.8	0	30.8
386.4	5.951	6.90E+03	19.3	30.8	0	30.8
386.5	5.95	6.91E+03	19.3	30.8	0	30.8
386.6	5.949	6.93E+03	19.2	30.9	0	30.9
386.7	5.948	6.94E+03	19.2	30.9	0	30.9
386.8	5.947	6.96E+03	19.2	30.9	0	30.9
386.9	5.946	6.97E+03	19.2	30.9	0	30.9
387	5.945	6.99E+03	19.2	30.9	0	30.9
387.1	5.944	7.00E+03	19.2	31	0	31
387.2	5.943	7.02E+03	19.2	31	0	31
387.3	5.942	7.03E+03	19.2	31	0	31
387.4	5.941	7.05E+03	19.2	31	0	31
387.5	5.94	7.06E+03	19.2	31	0	31
387.6	5.939	7.08E+03	19.2	31.1	0	31.1
387.7	5.938	7.09E+03	19.2	31.1	0	31.1
387.8	5.937	7.11E+03	19.2	31.1	0	31.1
387.9	5.936	7.12E+03	19.2	31.1	0	31.1

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
388	5.935	7.14E+03	19.2	31.1	0	31.1
388.1	5.934	7.15E+03	19.2	31.1	0	31.1
388.2	5.933	7.17E+03	19.2	31.2	0	31.2
388.3	5.932	7.18E+03	19.2	31.2	0	31.2
388.4	5.931	7.20E+03	19.1	31.2	0	31.2
388.5	5.93	7.21E+03	19.1	31.2	0	31.2
388.6	5.928	7.23E+03	19.1	31.2	0	31.2
388.7	5.927	7.24E+03	19.1	31.3	0	31.3
388.8	5.926	7.26E+03	19.1	31.3	0	31.3
388.9	5.925	7.27E+03	19.1	31.3	0	31.3
389	5.924	7.29E+03	19.1	31.3	0	31.3
389.1	5.923	7.30E+03	19.1	31.3	0	31.3
389.2	5.922	7.32E+03	19.1	31.4	0	31.4
389.3	5.921	7.33E+03	19.1	31.4	0	31.4
389.4	5.92	7.35E+03	19.1	31.4	0	31.4
389.5	5.919	7.36E+03	19.1	31.4	0	31.4
389.6	5.918	7.38E+03	19.1	31.4	0	31.4
389.7	5.917	7.39E+03	19.1	31.4	0	31.4
389.8	5.916	7.41E+03	19.1	31.5	0	31.5
389.9	5.915	7.43E+03	19.1	31.5	0	31.5
390	5.914	7.44E+03	19.1	31.5	0	31.5
390.1	5.913	7.46E+03	19.1	31.5	0	31.5
390.2	5.911	7.47E+03	19	31.5	0	31.5
390.3	5.91	7.49E+03	19	31.6	0	31.6
390.4	5.909	7.50E+03	19	31.6	0	31.6
390.5	5.908	7.52E+03	19	31.6	0	31.6
390.6	5.907	7.53E+03	19	31.6	0	31.6
390.7	5.906	7.55E+03	19	31.6	0	31.6
390.8	5.905	7.56E+03	19	31.7	0	31.7
390.9	5.904	7.58E+03	19	31.7	0	31.7
391	5.903	7.60E+03	19	31.7	0	31.7
391.1	5.902	7.61E+03	19	31.7	0	31.7
391.2	5.901	7.63E+03	19	31.7	0	31.7
391.3	5.899	7.64E+03	19	31.7	0	31.7
391.4	5.898	7.66E+03	19	31.8	0	31.8
391.5	5.897	7.67E+03	19	31.8	0	31.8
391.6	5.896	7.69E+03	19	31.8	0	31.8
391.7	5.895	7.71E+03	19	31.8	0	31.8
391.8	5.894	7.72E+03	19	31.8	0	31.8
391.9	5.893	7.74E+03	19	31.9	0	31.9
392	5.892	7.75E+03	18.9	31.9	0	31.9
392.1	5.89	7.77E+03	18.9	31.9	0	31.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
392.2	5.889	7.79E+03	18.9	31.9	0	31.9
392.3	5.888	7.80E+03	18.9	31.9	0	31.9
392.4	5.887	7.82E+03	18.9	31.9	0	31.9
392.5	5.886	7.83E+03	18.9	32	0	32
392.6	5.885	7.85E+03	18.9	32	0	32
392.7	5.884	7.87E+03	18.9	32	0	32
392.8	5.882	7.88E+03	18.9	32	0	32
392.9	5.881	7.90E+03	18.9	32	0	32
393	5.88	7.91E+03	18.9	32	0	32
393.1	5.879	7.93E+03	18.9	32.1	0	32.1
393.2	5.878	7.95E+03	18.9	32.1	0	32.1
393.3	5.877	7.96E+03	18.9	32.1	0	32.1
393.4	5.876	7.98E+03	18.9	32.1	0	32.1
393.5	5.874	8.00E+03	18.9	32.1	0	32.1
393.6	5.873	8.01E+03	18.9	32.1	0	32.1
393.7	5.872	8.03E+03	18.8	32.2	0	32.2
393.8	5.871	8.04E+03	18.8	32.2	0	32.2
393.9	5.87	8.06E+03	18.8	32.2	0	32.2
394	5.869	8.08E+03	18.8	32.2	0	32.2
394.1	5.867	8.09E+03	18.8	32.2	0	32.2
394.2	5.866	8.11E+03	18.8	32.3	0	32.3
394.3	5.865	8.13E+03	18.8	32.3	0	32.3
394.4	5.864	8.14E+03	18.8	32.3	0	32.3
394.5	5.863	8.16E+03	18.8	32.3	0	32.3
394.6	5.862	8.18E+03	18.8	32.3	0	32.3
394.7	5.86	8.19E+03	18.8	32.3	0	32.3
394.8	5.859	8.21E+03	18.8	32.4	0	32.4
394.9	5.858	8.22E+03	18.8	32.4	0	32.4
395	5.857	8.24E+03	18.8	32.4	0	32.4
395.1	5.856	8.26E+03	18.8	32.4	0	32.4
395.2	5.854	8.27E+03	18.8	32.4	0	32.4
395.3	5.853	8.29E+03	18.8	32.4	0	32.4
395.4	5.852	8.31E+03	18.8	32.5	0	32.5
395.5	5.851	8.32E+03	18.7	32.5	0	32.5
395.6	5.85	8.34E+03	18.7	32.5	0	32.5
395.7	5.848	8.36E+03	18.7	32.5	0	32.5
395.8	5.847	8.37E+03	18.7	32.5	0	32.5
395.9	5.846	8.39E+03	18.7	32.5	0	32.5
396	5.845	8.41E+03	18.7	32.5	0	32.5
396.1	5.843	8.42E+03	18.7	32.6	0	32.6
396.2	5.842	8.44E+03	18.7	32.6	0	32.6
396.3	5.841	8.46E+03	18.7	32.6	0	32.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
396.4	5.84	8.47E+03	18.7	32.6	0	32.6
396.5	5.838	8.49E+03	18.7	32.6	0	32.6
396.6	5.837	8.51E+03	18.7	32.6	0	32.6
396.7	5.836	8.53E+03	18.7	32.7	0	32.7
396.8	5.835	8.54E+03	18.7	32.7	0	32.7
396.9	5.834	8.56E+03	18.7	32.7	0	32.7
397	5.832	8.58E+03	18.7	32.7	0	32.7
397.1	5.831	8.59E+03	18.6	32.7	0	32.7
397.2	5.83	8.61E+03	18.6	32.7	0	32.7
397.3	5.829	8.63E+03	18.6	32.8	0	32.8
397.4	5.827	8.64E+03	18.6	32.8	0	32.8
397.5	5.826	8.66E+03	18.6	32.8	0	32.8
397.6	5.825	8.68E+03	18.6	32.8	0	32.8
397.7	5.823	8.69E+03	18.6	32.8	0	32.8
397.8	5.822	8.71E+03	18.6	32.8	0	32.8
397.9	5.821	8.73E+03	18.6	32.8	0	32.8
398	5.82	8.75E+03	18.6	32.9	0	32.9
398.1	5.818	8.76E+03	18.6	32.9	0	32.9
398.2	5.817	8.78E+03	18.6	32.9	0	32.9
398.3	5.816	8.80E+03	18.6	32.9	0	32.9
398.4	5.815	8.81E+03	18.6	32.9	0	32.9
398.5	5.813	8.83E+03	18.6	32.9	0	32.9
398.6	5.812	8.85E+03	18.6	32.9	0	32.9
398.7	5.811	8.87E+03	18.6	33	0	33
398.8	5.809	8.88E+03	18.5	33	0	33
398.9	5.808	8.90E+03	18.5	33	0	33
399	5.807	8.92E+03	18.5	33	0	33
399.1	5.806	8.93E+03	18.5	33	0	33
399.2	5.804	8.95E+03	18.5	33	0	33
399.3	5.803	8.97E+03	18.5	33	0	33
399.4	5.802	8.99E+03	18.5	33.1	0	33.1
399.5	5.8	9.00E+03	18.5	33.1	0	33.1
399.6	5.799	9.02E+03	18.5	33.1	0	33.1
399.7	5.798	9.04E+03	18.5	33.1	0	33.1
399.8	5.796	9.06E+03	18.5	33.1	0	33.1
399.9	5.795	9.07E+03	18.5	33.1	0	33.1
400	5.794	9.09E+03	18.5	33.1	0	33.1
400.1	5.792	9.11E+03	18.5	33.2	0	33.2
400.2	5.791	9.13E+03	18.5	33.2	0	33.2
400.3	5.79	9.14E+03	18.5	33.2	0	33.2
400.4	5.788	9.16E+03	18.4	33.2	0	33.2
400.5	5.787	9.18E+03	18.4	33.2	0	33.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
400.6	5.786	9.20E+03	18.4	33.2	0	33.2
400.7	5.784	9.21E+03	18.4	33.2	0	33.2
400.8	5.783	9.23E+03	18.4	33.3	0	33.3
400.9	5.782	9.25E+03	18.4	33.3	0	33.3
401	5.78	9.27E+03	18.4	33.3	0	33.3
401.1	5.779	9.28E+03	18.4	33.3	0	33.3
401.2	5.778	9.30E+03	18.4	33.3	0	33.3
401.3	5.776	9.32E+03	18.4	33.3	0	33.3
401.4	5.775	9.34E+03	18.4	33.3	0	33.3
401.5	5.774	9.35E+03	18.4	33.3	0	33.3
401.6	5.772	9.37E+03	18.4	33.4	0	33.4
401.7	5.771	9.39E+03	18.4	33.4	0	33.4
401.8	5.769	9.41E+03	18.4	33.4	0	33.4
401.9	5.768	9.42E+03	18.4	33.4	0	33.4
402	5.767	9.44E+03	18.3	33.4	0	33.4
402.1	5.765	9.46E+03	18.3	33.4	0	33.4
402.2	5.764	9.48E+03	18.3	33.4	0	33.4
402.3	5.763	9.50E+03	18.3	33.4	0	33.4
402.4	5.761	9.51E+03	18.3	33.5	0	33.5
402.5	5.76	9.53E+03	18.3	33.5	0	33.5
402.6	5.758	9.55E+03	18.3	33.5	0	33.5
402.7	5.757	9.57E+03	18.3	33.5	0	33.5
402.8	5.756	9.58E+03	18.3	33.5	0	33.5
402.9	5.754	9.60E+03	18.3	33.5	0	33.5
403	5.753	9.62E+03	18.3	33.5	0	33.5
403.1	5.751	9.64E+03	18.3	33.5	0	33.5
403.2	5.75	9.66E+03	18.3	33.5	0	33.5
403.3	5.749	9.67E+03	18.3	33.6	0	33.6
403.4	5.747	9.69E+03	18.3	33.6	0	33.6
403.5	5.746	9.71E+03	18.3	33.6	0	33.6
403.6	5.744	9.73E+03	18.2	33.6	0	33.6
403.7	5.743	9.74E+03	18.2	33.6	0	33.6
403.8	5.741	9.76E+03	18.2	33.6	0	33.6
403.9	5.74	9.78E+03	18.2	33.6	0	33.6
404	5.739	9.80E+03	18.2	33.6	0	33.6
404.1	5.737	9.82E+03	18.2	33.7	0	33.7
404.2	5.736	9.83E+03	18.2	33.7	0	33.7
404.3	5.734	9.85E+03	18.2	33.7	0	33.7
404.4	5.733	9.87E+03	18.2	33.7	0	33.7
404.5	5.731	9.89E+03	18.2	33.7	0	33.7
404.6	5.73	9.91E+03	18.2	33.7	0	33.7
404.7	5.728	9.92E+03	18.2	33.7	0	33.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
404.8	5.727	9.94E+03	18.2	33.7	0	33.7
404.9	5.726	9.96E+03	18.2	33.7	0	33.7
405	5.724	9.98E+03	18.2	33.7	0	33.7
405.1	5.723	1.00E+04	18.1	33.8	0	33.8
405.2	5.721	1.00E+04	18.1	33.8	0	33.8
405.3	5.72	1.00E+04	18.1	33.8	0	33.8
405.4	5.718	1.01E+04	18.1	33.8	0	33.8
405.5	5.717	1.01E+04	18.1	33.8	0	33.8
405.6	5.715	1.01E+04	18.1	33.8	0	33.8
405.7	5.714	1.01E+04	18.1	33.8	0	33.8
405.8	5.712	1.01E+04	18.1	33.8	0	33.8
405.9	5.711	1.01E+04	18.1	33.8	0	33.8
406	5.709	1.02E+04	18.1	33.8	0	33.8
406.1	5.708	1.02E+04	18.1	33.9	0	33.9
406.2	5.706	1.02E+04	18.1	33.9	0	33.9
406.3	5.705	1.02E+04	18.1	33.9	0	33.9
406.4	5.703	1.02E+04	18.1	33.9	0	33.9
406.5	5.702	1.02E+04	18.1	33.9	0	33.9
406.6	5.7	1.03E+04	18.1	33.9	0	33.9
406.7	5.699	1.03E+04	18	33.9	0	33.9
406.8	5.697	1.03E+04	18	33.9	0	33.9
406.9	5.696	1.03E+04	18	33.9	0	33.9
407	5.694	1.03E+04	18	33.9	0	33.9
407.1	5.693	1.04E+04	18	33.9	0	33.9
407.2	5.691	1.04E+04	18	34	0	34
407.3	5.69	1.04E+04	18	34	0	34
407.4	5.688	1.04E+04	18	34	0	34
407.5	5.687	1.04E+04	18	34	0	34
407.6	5.685	1.04E+04	18	34	0	34
407.7	5.684	1.05E+04	18	34	0	34
407.8	5.682	1.05E+04	18	34	0	34
407.9	5.681	1.05E+04	18	34	0	34
408	5.679	1.05E+04	18	34	0	34
408.1	5.678	1.05E+04	18	34	0	34
408.2	5.676	1.06E+04	17.9	34	0	34
408.3	5.675	1.06E+04	17.9	34	0	34
408.4	5.673	1.06E+04	17.9	34.1	0	34.1
408.5	5.671	1.06E+04	17.9	34.1	0	34.1
408.6	5.67	1.06E+04	17.9	34.1	0	34.1
408.7	5.668	1.06E+04	17.9	34.1	0	34.1
408.8	5.667	1.07E+04	17.9	34.1	0	34.1
408.9	5.665	1.07E+04	17.9	34.1	0	34.1

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
409	5.664	1.07E+04	17.9	34.1	0	34.1
409.1	5.662	1.07E+04	17.9	34.1	0	34.1
409.2	5.66	1.07E+04	17.9	34.1	0	34.1
409.3	5.659	1.08E+04	17.9	34.1	0	34.1
409.4	5.657	1.08E+04	17.9	34.1	0	34.1
409.5	5.656	1.08E+04	17.9	34.1	0	34.1
409.6	5.654	1.08E+04	17.8	34.1	0	34.1
409.7	5.653	1.08E+04	17.8	34.1	0	34.1
409.8	5.651	1.08E+04	17.8	34.2	0	34.2
409.9	5.649	1.09E+04	17.8	34.2	0	34.2
410	5.648	1.09E+04	17.8	34.2	0	34.2
410.1	5.646	1.09E+04	17.8	34.2	0	34.2
410.2	5.645	1.09E+04	17.8	34.2	0	34.2
410.3	5.643	1.09E+04	17.8	34.2	0	34.2
410.4	5.641	1.10E+04	17.8	34.2	0	34.2
410.5	5.64	1.10E+04	17.8	34.2	0	34.2
410.6	5.638	1.10E+04	17.8	34.2	0	34.2
410.7	5.637	1.10E+04	17.8	34.2	0	34.2
410.8	5.635	1.10E+04	17.8	34.2	0	34.2
410.9	5.633	1.11E+04	17.8	34.2	0	34.2
411	5.632	1.11E+04	17.8	34.2	0	34.2
411.1	5.63	1.11E+04	17.7	34.2	0	34.2
411.2	5.628	1.11E+04	17.7	34.2	0	34.2
411.3	5.627	1.11E+04	17.7	34.2	0	34.2
411.4	5.625	1.11E+04	17.7	34.2	0	34.2
411.5	5.624	1.12E+04	17.7	34.3	0	34.3
411.6	5.622	1.12E+04	17.7	34.3	0	34.3
411.7	5.62	1.12E+04	17.7	34.3	0	34.3
411.8	5.619	1.12E+04	17.7	34.3	0	34.3
411.9	5.617	1.12E+04	17.7	34.3	0	34.3
412	5.615	1.13E+04	17.7	34.3	0	34.3
412.1	5.614	1.13E+04	17.7	34.3	0	34.3
412.2	5.612	1.13E+04	17.7	34.3	0	34.3
412.3	5.61	1.13E+04	17.7	34.3	0	34.3
412.4	5.609	1.13E+04	17.7	34.3	0	34.3
412.5	5.607	1.13E+04	17.6	34.3	0	34.3
412.6	5.605	1.14E+04	17.6	34.3	0	34.3
412.7	5.604	1.14E+04	17.6	34.3	0	34.3
412.8	5.602	1.14E+04	17.6	34.3	0	34.3
412.9	5.6	1.14E+04	17.6	34.3	0	34.3
413	5.599	1.14E+04	17.6	34.3	0	34.3
413.1	5.597	1.15E+04	17.6	34.3	0	34.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
413.2	5.595	1.15E+04	17.6	34.3	0	34.3
413.3	5.594	1.15E+04	17.6	34.3	0	34.3
413.4	5.592	1.15E+04	17.6	34.3	0	34.3
413.5	5.59	1.15E+04	17.6	34.3	0	34.3
413.6	5.589	1.15E+04	17.6	34.3	0	34.3
413.7	5.587	1.16E+04	17.6	34.3	0	34.3
413.8	5.585	1.16E+04	17.6	34.3	0	34.3
413.9	5.584	1.16E+04	17.6	34.4	0	34.4
414	5.582	1.16E+04	17.5	34.4	0	34.4
414.1	5.58	1.16E+04	17.5	34.4	0	34.4
414.2	5.578	1.17E+04	17.5	34.4	0	34.4
414.3	5.577	1.17E+04	17.5	34.4	0	34.4
414.4	5.575	1.17E+04	17.5	34.4	0	34.4
414.5	5.573	1.17E+04	17.5	34.4	0	34.4
414.6	5.572	1.17E+04	17.5	34.4	0	34.4
414.7	5.57	1.17E+04	17.5	34.4	0	34.4
414.8	5.568	1.18E+04	17.5	34.4	0	34.4
414.9	5.566	1.18E+04	17.5	34.4	0	34.4
415	5.565	1.18E+04	17.5	34.4	0	34.4
415.1	5.563	1.18E+04	17.5	34.4	0	34.4
415.2	5.561	1.18E+04	17.5	34.4	0	34.4
415.3	5.559	1.19E+04	17.5	34.4	0	34.4
415.4	5.558	1.19E+04	17.4	34.4	0	34.4
415.5	5.556	1.19E+04	17.4	34.4	0	34.4
415.6	5.554	1.19E+04	17.4	34.4	0	34.4
415.7	5.552	1.19E+04	17.4	34.4	0	34.4
415.8	5.551	1.19E+04	17.4	34.4	0	34.4
415.9	5.549	1.20E+04	17.4	34.4	0	34.4
416	5.547	1.20E+04	17.4	34.4	0	34.4
416.1	5.545	1.20E+04	17.4	34.4	0	34.4
416.2	5.544	1.20E+04	17.4	34.4	0	34.4
416.3	5.542	1.20E+04	17.4	34.4	0	34.4
416.4	5.54	1.20E+04	17.4	34.4	0	34.4
416.5	5.538	1.21E+04	17.4	34.4	0	34.4
416.6	5.537	1.21E+04	17.4	34.4	0	34.4
416.7	5.535	1.21E+04	17.4	34.4	0	34.4
416.8	5.533	1.21E+04	17.3	34.4	0	34.4
416.9	5.531	1.21E+04	17.3	34.4	0	34.4
417	5.529	1.22E+04	17.3	34.4	0	34.4
417.1	5.528	1.22E+04	17.3	34.4	0	34.4
417.2	5.526	1.22E+04	17.3	34.4	0	34.4
417.3	5.524	1.22E+04	17.3	34.4	0	34.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
417.4	5.522	1.22E+04	17.3	34.4	0	34.4
417.5	5.52	1.22E+04	17.3	34.4	0	34.4
417.6	5.519	1.23E+04	17.3	34.4	0	34.4
417.7	5.517	1.23E+04	17.3	34.4	0	34.4
417.8	5.515	1.23E+04	17.3	34.4	0	34.4
417.9	5.513	1.23E+04	17.3	34.4	0	34.4
418	5.511	1.23E+04	17.3	34.4	0	34.4
418.1	5.51	1.24E+04	17.2	34.4	0	34.4
418.2	5.508	1.24E+04	17.2	34.4	0	34.4
418.3	5.506	1.24E+04	17.2	34.4	0	34.4
418.4	5.504	1.24E+04	17.2	34.4	0	34.4
418.5	5.502	1.24E+04	17.2	34.4	0	34.4
418.6	5.501	1.24E+04	17.2	34.4	0	34.4
418.7	5.499	1.25E+04	17.2	34.4	0	34.4
418.8	5.497	1.25E+04	17.2	34.4	0	34.4
418.9	5.495	1.25E+04	17.2	34.4	0	34.4
419	5.493	1.25E+04	17.2	34.4	0	34.4
419.1	5.491	1.25E+04	17.2	34.4	0	34.4
419.2	5.489	1.25E+04	17.2	34.4	0	34.4
419.3	5.488	1.26E+04	17.2	34.4	0	34.4
419.4	5.486	1.26E+04	17.2	34.4	0	34.4
419.5	5.484	1.26E+04	17.1	34.4	0	34.4
419.6	5.482	1.26E+04	17.1	34.4	0	34.4
419.7	5.48	1.26E+04	17.1	34.4	0	34.4
419.8	5.478	1.27E+04	17.1	34.4	0	34.4
419.9	5.476	1.27E+04	17.1	34.4	0	34.4
420	5.475	1.27E+04	17.1	34.4	0	34.4
420.1	5.473	1.27E+04	17.1	34.4	0	34.4
420.2	5.471	1.27E+04	17.1	34.4	0	34.4
420.3	5.469	1.27E+04	17.1	34.4	0	34.4
420.4	5.467	1.28E+04	17.1	34.4	0	34.4
420.5	5.465	1.28E+04	17.1	34.3	0	34.3
420.6	5.463	1.28E+04	17.1	34.3	0	34.3
420.7	5.461	1.28E+04	17.1	34.3	0	34.3
420.8	5.46	1.28E+04	17	34.3	0	34.3
420.9	5.458	1.28E+04	17	34.3	0	34.3
421	5.456	1.29E+04	17	34.3	0	34.3
421.1	5.454	1.29E+04	17	34.3	0	34.3
421.2	5.452	1.29E+04	17	34.3	0	34.3
421.3	5.45	1.29E+04	17	34.3	0	34.3
421.4	5.448	1.29E+04	17	34.3	0	34.3
421.5	5.446	1.29E+04	17	34.3	0	34.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
421.6	5.444	1.30E+04	17	34.3	0	34.3
421.7	5.443	1.30E+04	17	34.3	0	34.3
421.8	5.441	1.30E+04	17	34.3	0	34.3
421.9	5.439	1.30E+04	17	34.3	0	34.3
422	5.437	1.30E+04	17	34.3	0	34.3
422.1	5.435	1.31E+04	17	34.3	0	34.3
422.2	5.433	1.31E+04	16.9	34.3	0	34.3
422.3	5.431	1.31E+04	16.9	34.3	0	34.3
422.4	5.429	1.31E+04	16.9	34.3	0	34.3
422.5	5.427	1.31E+04	16.9	34.3	0	34.3
422.6	5.425	1.31E+04	16.9	34.3	0	34.3
422.7	5.423	1.32E+04	16.9	34.3	0	34.3
422.8	5.421	1.32E+04	16.9	34.2	0	34.2
422.9	5.419	1.32E+04	16.9	34.2	0	34.2
423	5.417	1.32E+04	16.9	34.2	0	34.2
423.1	5.415	1.32E+04	16.9	34.2	0	34.2
423.2	5.414	1.32E+04	16.9	34.2	0	34.2
423.3	5.412	1.33E+04	16.9	34.2	0	34.2
423.4	5.41	1.33E+04	16.9	34.2	0	34.2
423.5	5.408	1.33E+04	16.8	34.2	0	34.2
423.6	5.406	1.33E+04	16.8	34.2	0	34.2
423.7	5.404	1.33E+04	16.8	34.2	0	34.2
423.8	5.402	1.33E+04	16.8	34.2	0	34.2
423.9	5.4	1.34E+04	16.8	34.2	0	34.2
424	5.398	1.34E+04	16.8	34.2	0	34.2
424.1	5.396	1.34E+04	16.8	34.2	0	34.2
424.2	5.394	1.34E+04	16.8	34.2	0	34.2
424.3	5.392	1.34E+04	16.8	34.2	0	34.2
424.4	5.39	1.34E+04	16.8	34.1	0	34.1
424.5	5.388	1.35E+04	16.8	34.1	0	34.1
424.6	5.386	1.35E+04	16.8	34.1	0	34.1
424.7	5.384	1.35E+04	16.8	34.1	0	34.1
424.8	5.382	1.35E+04	16.7	34.1	0	34.1
424.9	5.38	1.35E+04	16.7	34.1	0	34.1
425	5.378	1.35E+04	16.7	34.1	0	34.1
425.1	5.376	1.36E+04	16.7	34.1	0	34.1
425.2	5.374	1.36E+04	16.7	34.1	0	34.1
425.3	5.372	1.36E+04	16.7	34.1	0	34.1
425.4	5.37	1.36E+04	16.7	34.1	0	34.1
425.5	5.368	1.36E+04	16.7	34.1	0	34.1
425.6	5.366	1.36E+04	16.7	34.1	0	34.1
425.7	5.364	1.36E+04	16.7	34	0	34

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
425.8	5.362	1.37E+04	16.7	34	0	34
425.9	5.36	1.37E+04	16.7	34	0	34
426	5.358	1.37E+04	16.7	34	0	34
426.1	5.356	1.37E+04	16.6	34	0	34
426.2	5.354	1.37E+04	16.6	34	0	34
426.3	5.352	1.37E+04	16.6	34	0	34
426.4	5.35	1.38E+04	16.6	34	0	34
426.5	5.348	1.38E+04	16.6	34	0	34
426.6	5.346	1.38E+04	16.6	34	0	34
426.7	5.344	1.38E+04	16.6	34	0	34
426.8	5.342	1.38E+04	16.6	34	0	34
426.9	5.34	1.38E+04	16.6	33.9	0	33.9
427	5.338	1.39E+04	16.6	33.9	0	33.9
427.1	5.336	1.39E+04	16.6	33.9	0	33.9
427.2	5.334	1.39E+04	16.6	33.9	0	33.9
427.3	5.331	1.39E+04	16.6	33.9	0	33.9
427.4	5.329	1.39E+04	16.5	33.9	0	33.9
427.5	5.327	1.39E+04	16.5	33.9	0	33.9
427.6	5.325	1.40E+04	16.5	33.9	0	33.9
427.7	5.323	1.40E+04	16.5	33.9	0	33.9
427.8	5.321	1.40E+04	16.5	33.9	0	33.9
427.9	5.319	1.40E+04	16.5	33.8	0	33.8
428	5.317	1.40E+04	16.5	33.8	0	33.8
428.1	5.315	1.40E+04	16.5	33.8	0	33.8
428.2	5.313	1.40E+04	16.5	33.8	0	33.8
428.3	5.311	1.41E+04	16.5	33.8	0	33.8
428.4	5.309	1.41E+04	16.5	33.8	0	33.8
428.5	5.307	1.41E+04	16.5	33.8	0	33.8
428.6	5.305	1.41E+04	16.5	33.8	0	33.8
428.7	5.303	1.41E+04	16.4	33.8	0	33.8
428.8	5.3	1.41E+04	16.4	33.7	0	33.7
428.9	5.298	1.42E+04	16.4	33.7	0	33.7
429	5.296	1.42E+04	16.4	33.7	0	33.7
429.1	5.294	1.42E+04	16.4	33.7	0	33.7
429.2	5.292	1.42E+04	16.4	33.7	0	33.7
429.3	5.29	1.42E+04	16.4	33.7	0	33.7
429.4	5.288	1.42E+04	16.4	33.7	0	33.7
429.5	5.286	1.42E+04	16.4	33.7	0	33.7
429.6	5.284	1.43E+04	16.4	33.7	0	33.7
429.7	5.282	1.43E+04	16.4	33.6	0	33.6
429.8	5.279	1.43E+04	16.4	33.6	0	33.6
429.9	5.277	1.43E+04	16.4	33.6	0	33.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
430	5.275	1.43E+04	16.3	33.6	0	33.6
430.1	5.273	1.43E+04	16.3	33.6	0	33.6
430.2	5.271	1.43E+04	16.3	33.6	0	33.6
430.3	5.269	1.44E+04	16.3	33.6	0	33.6
430.4	5.267	1.44E+04	16.3	33.6	0	33.6
430.5	5.265	1.44E+04	16.3	33.5	0	33.5
430.6	5.263	1.44E+04	16.3	33.5	0	33.5
430.7	5.26	1.44E+04	16.3	33.5	0	33.5
430.8	5.258	1.44E+04	16.3	33.5	0	33.5
430.9	5.256	1.44E+04	16.3	33.5	0	33.5
431	5.254	1.45E+04	16.3	33.5	0	33.5
431.1	5.252	1.45E+04	16.3	33.5	0	33.5
431.2	5.25	1.45E+04	16.2	33.4	0	33.4
431.3	5.248	1.45E+04	16.2	33.4	0	33.4
431.4	5.245	1.45E+04	16.2	33.4	0	33.4
431.5	5.243	1.45E+04	16.2	33.4	0	33.4
431.6	5.241	1.45E+04	16.2	33.4	0	33.4
431.7	5.239	1.46E+04	16.2	33.4	0	33.4
431.8	5.237	1.46E+04	16.2	33.4	0	33.4
431.9	5.235	1.46E+04	16.2	33.4	0	33.4
432	5.233	1.46E+04	16.2	33.3	0	33.3
432.1	5.23	1.46E+04	16.2	33.3	0	33.3
432.2	5.228	1.46E+04	16.2	33.3	0	33.3
432.3	5.226	1.46E+04	16.2	33.3	0	33.3
432.4	5.224	1.47E+04	16.2	33.3	0	33.3
432.5	5.222	1.47E+04	16.1	33.3	0	33.3
432.6	5.22	1.47E+04	16.1	33.3	0	33.3
432.7	5.217	1.47E+04	16.1	33.2	0	33.2
432.8	5.215	1.47E+04	16.1	33.2	0	33.2
432.9	5.213	1.47E+04	16.1	33.2	0	33.2
433	5.211	1.47E+04	16.1	33.2	0	33.2
433.1	5.209	1.48E+04	16.1	33.2	0	33.2
433.2	5.206	1.48E+04	16.1	33.2	0	33.2
433.3	5.204	1.48E+04	16.1	33.1	0	33.1
433.4	5.202	1.48E+04	16.1	33.1	0	33.1
433.5	5.2	1.48E+04	16.1	33.1	0	33.1
433.6	5.198	1.48E+04	16.1	33.1	0	33.1
433.7	5.196	1.48E+04	16	33.1	0	33.1
433.8	5.193	1.48E+04	16	33.1	0	33.1
433.9	5.191	1.49E+04	16	33.1	0	33.1
434	5.189	1.49E+04	16	33	0	33
434.1	5.187	1.49E+04	16	33	0	33

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
434.2	5.185	1.49E+04	16	33	0	33
434.3	5.182	1.49E+04	16	33	0	33
434.4	5.18	1.49E+04	16	33	0	33
434.5	5.178	1.49E+04	16	33	0	33
434.6	5.176	1.50E+04	16	32.9	0	32.9
434.7	5.173	1.50E+04	16	32.9	0	32.9
434.8	5.171	1.50E+04	16	32.9	0	32.9
434.9	5.169	1.50E+04	16	32.9	0	32.9
435	5.167	1.50E+04	15.9	32.9	0	32.9
435.1	5.165	1.50E+04	15.9	32.9	0	32.9
435.2	5.162	1.50E+04	15.9	32.8	0	32.8
435.3	5.16	1.50E+04	15.9	32.8	0	32.8
435.4	5.158	1.51E+04	15.9	32.8	0	32.8
435.5	5.156	1.51E+04	15.9	32.8	0	32.8
435.6	5.153	1.51E+04	15.9	32.8	0	32.8
435.7	5.151	1.51E+04	15.9	32.8	0	32.8
435.8	5.149	1.51E+04	15.9	32.7	0	32.7
435.9	5.147	1.51E+04	15.9	32.7	0	32.7
436	5.145	1.51E+04	15.9	32.7	0	32.7
436.1	5.142	1.51E+04	15.9	32.7	0	32.7
436.2	5.14	1.52E+04	15.8	32.7	0	32.7
436.3	5.138	1.52E+04	15.8	32.6	0	32.6
436.4	5.136	1.52E+04	15.8	32.6	0	32.6
436.5	5.133	1.52E+04	15.8	32.6	0	32.6
436.6	5.131	1.52E+04	15.8	32.6	0	32.6
436.7	5.129	1.52E+04	15.8	32.6	0	32.6
436.8	5.127	1.52E+04	15.8	32.6	0	32.6
436.9	5.124	1.52E+04	15.8	32.5	0	32.5
437	5.122	1.53E+04	15.8	32.5	0	32.5
437.1	5.12	1.53E+04	15.8	32.5	0	32.5
437.2	5.118	1.53E+04	15.8	32.5	0	32.5
437.3	5.115	1.53E+04	15.8	32.5	0	32.5
437.4	5.113	1.53E+04	15.7	32.4	0	32.4
437.5	5.111	1.53E+04	15.7	32.4	0	32.4
437.6	5.108	1.53E+04	15.7	32.4	0	32.4
437.7	5.106	1.53E+04	15.7	32.4	0	32.4
437.8	5.104	1.53E+04	15.7	32.4	0	32.4
437.9	5.102	1.54E+04	15.7	32.3	0	32.3
438	5.099	1.54E+04	15.7	32.3	0	32.3
438.1	5.097	1.54E+04	15.7	32.3	0	32.3
438.2	5.095	1.54E+04	15.7	32.3	0	32.3
438.3	5.093	1.54E+04	15.7	32.3	0	32.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
438.4	5.09	1.54E+04	15.7	32.2	0	32.2
438.5	5.088	1.54E+04	15.7	32.2	0	32.2
438.6	5.086	1.54E+04	15.7	32.2	0	32.2
438.7	5.083	1.54E+04	15.6	32.2	0	32.2
438.8	5.081	1.55E+04	15.6	32.2	0	32.2
438.9	5.079	1.55E+04	15.6	32.1	0	32.1
439	5.077	1.55E+04	15.6	32.1	0	32.1
439.1	5.074	1.55E+04	15.6	32.1	0	32.1
439.2	5.072	1.55E+04	15.6	32.1	0	32.1
439.3	5.07	1.55E+04	15.6	32.1	0	32.1
439.4	5.067	1.55E+04	15.6	32	0	32
439.5	5.065	1.55E+04	15.6	32	0	32
439.6	5.063	1.55E+04	15.6	32	0	32
439.7	5.06	1.56E+04	15.6	32	0	32
439.8	5.058	1.56E+04	15.6	32	0	32
439.9	5.056	1.56E+04	15.5	31.9	0	31.9
440.3	5.047	1.56E+04	15.5	31.9	0	31.9
440.4	5.044	1.56E+04	15.5	31.8	0	31.8
440.5	5.042	1.56E+04	15.5	31.8	0	31.8
440.6	5.04	1.57E+04	15.5	31.8	0	31.8
440.7	5.037	1.57E+04	15.5	31.8	0	31.8
440.8	5.035	1.57E+04	15.5	31.8	0	31.8
440.9	5.033	1.57E+04	15.5	31.7	0	31.7
441	5.03	1.57E+04	15.5	31.7	0	31.7
441.1	5.028	1.57E+04	15.4	31.7	0	31.7
441.2	5.026	1.57E+04	15.4	31.7	0	31.7
441.3	5.023	1.57E+04	15.4	31.6	0	31.6
441.4	5.021	1.57E+04	15.4	31.6	0	31.6
441.5	5.019	1.57E+04	15.4	31.6	0	31.6
441.6	5.016	1.58E+04	15.4	31.6	0	31.6
441.7	5.014	1.58E+04	15.4	31.6	0	31.6
441.8	5.012	1.58E+04	15.4	31.5	0	31.5
441.9	5.009	1.58E+04	15.4	31.5	0	31.5
442	5.007	1.58E+04	15.4	31.5	0	31.5
442.1	5.005	1.58E+04	15.4	31.5	0	31.5
442.2	5.002	1.58E+04	15.4	31.4	0	31.4
442.6	4.993	1.58E+04	15.3	31.4	0	31.4
442.7	4.991	1.59E+04	15.3	31.3	0	31.3
442.8	4.988	1.59E+04	15.3	31.3	0	31.3
442.9	4.986	1.59E+04	15.3	31.3	0	31.3
443	4.983	1.59E+04	15.3	31.3	0	31.3
443.1	4.981	1.59E+04	15.3	31.2	0	31.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
443.2	4.979	1.59E+04	15.3	31.2	0	31.2
443.3	4.976	1.59E+04	15.3	31.2	0	31.2
443.4	4.974	1.59E+04	15.3	31.2	0	31.2
443.5	4.972	1.59E+04	15.2	31.1	0	31.1
443.6	4.969	1.59E+04	15.2	31.1	0	31.1
443.7	4.967	1.59E+04	15.2	31.1	0	31.1
443.8	4.965	1.60E+04	15.2	31.1	0	31.1
443.9	4.962	1.60E+04	15.2	31.1	0	31.1
444	4.96	1.60E+04	15.2	31	0	31
444.1	4.957	1.60E+04	15.2	31	0	31
444.2	4.955	1.60E+04	15.2	31	0	31
444.3	4.953	1.60E+04	15.2	31	0	31
444.4	4.95	1.60E+04	15.2	30.9	0	30.9
444.5	4.948	1.60E+04	15.2	30.9	0	30.9
444.9	4.938	1.61E+04	15.1	30.8	0	30.8
445	4.936	1.61E+04	15.1	30.8	0	30.8
445.1	4.934	1.61E+04	15.1	30.8	0	30.8
445.2	4.931	1.61E+04	15.1	30.7	0	30.7
445.3	4.929	1.61E+04	15.1	30.7	0	30.7
445.4	4.927	1.61E+04	15.1	30.7	0	30.7
445.5	4.924	1.61E+04	15.1	30.7	0	30.7
445.6	4.922	1.61E+04	15.1	30.6	0	30.6
445.7	4.919	1.61E+04	15.1	30.6	0	30.6
445.8	4.917	1.61E+04	15.1	30.6	0	30.6
445.9	4.915	1.61E+04	15	30.6	0	30.6
446	4.912	1.61E+04	15	30.5	0	30.5
446.1	4.91	1.61E+04	15	30.5	0	30.5
446.2	4.907	1.62E+04	15	30.5	0	30.5
446.3	4.905	1.62E+04	15	30.5	0	30.5
446.4	4.903	1.62E+04	15	30.4	0	30.4
446.5	4.9	1.62E+04	15	30.4	0	30.4
446.6	4.898	1.62E+04	15	30.4	0	30.4
446.7	4.895	1.62E+04	15	30.4	0	30.4
446.8	4.893	1.62E+04	15	30.3	0	30.3
447.2	4.883	1.62E+04	14.9	30.2	0	30.2
447.3	4.881	1.62E+04	14.9	30.2	0	30.2
447.4	4.879	1.62E+04	14.9	30.2	0	30.2
447.5	4.876	1.62E+04	14.9	30.2	0	30.2
447.6	4.874	1.63E+04	14.9	30.1	0	30.1
447.7	4.871	1.63E+04	14.9	30.1	0	30.1
447.8	4.869	1.63E+04	14.9	30.1	0	30.1
447.9	4.866	1.63E+04	14.9	30.1	0	30.1

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
448	4.864	1.63E+04	14.9	30	0	30
448.1	4.862	1.63E+04	14.9	30	0	30
448.2	4.859	1.63E+04	14.9	30	0	30
448.3	4.857	1.63E+04	14.8	29.9	0	29.9
448.4	4.854	1.63E+04	14.8	29.9	0	29.9
448.5	4.852	1.63E+04	14.8	29.9	0	29.9
448.6	4.85	1.63E+04	14.8	29.9	0	29.9
448.7	4.847	1.63E+04	14.8	29.8	0	29.8
448.8	4.845	1.63E+04	14.8	29.8	0	29.8
448.9	4.842	1.63E+04	14.8	29.8	0	29.8
449	4.84	1.63E+04	14.8	29.8	0	29.8
449.1	4.837	1.64E+04	14.8	29.7	0	29.7
449.2	4.835	1.64E+04	14.8	29.7	0	29.7
449.3	4.833	1.64E+04	14.8	29.7	0	29.7
449.4	4.83	1.64E+04	14.8	29.7	0	29.7
449.5	4.828	1.64E+04	14.7	29.6	0	29.6
449.6	4.825	1.64E+04	14.7	29.6	0	29.6
449.7	4.823	1.64E+04	14.7	29.6	0	29.6
449.8	4.82	1.64E+04	14.7	29.6	0	29.6
449.9	4.818	1.64E+04	14.7	29.5	0	29.5
450	4.816	1.64E+04	14.7	29.5	0	29.5
450.1	4.813	1.64E+04	14.7	29.5	0	29.5
450.2	4.811	1.64E+04	14.7	29.4	0	29.4
450.3	4.808	1.64E+04	14.7	29.4	0	29.4
450.4	4.806	1.64E+04	14.7	29.4	0	29.4
450.5	4.803	1.64E+04	14.7	29.4	0	29.4
450.6	4.801	1.64E+04	14.7	29.3	0	29.3
450.7	4.798	1.64E+04	14.6	29.3	0	29.3
450.8	4.796	1.64E+04	14.6	29.3	0	29.3
450.9	4.794	1.65E+04	14.6	29.3	0	29.3
451	4.791	1.65E+04	14.6	29.2	0	29.2
451.1	4.789	1.65E+04	14.6	29.2	0	29.2
451.2	4.786	1.65E+04	14.6	29.2	0	29.2
451.3	4.784	1.65E+04	14.6	29.1	0	29.1
451.4	4.781	1.65E+04	14.6	29.1	0	29.1
451.5	4.779	1.65E+04	14.6	29.1	0	29.1
451.6	4.776	1.65E+04	14.6	29.1	0	29.1
451.7	4.774	1.65E+04	14.6	29	0	29
451.8	4.772	1.65E+04	14.6	29	0	29
451.9	4.769	1.65E+04	14.5	29	0	29
452	4.767	1.65E+04	14.5	28.9	0	28.9
452.1	4.764	1.65E+04	14.5	28.9	0	28.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
452.2	4.762	1.65E+04	14.5	28.9	0	28.9
452.3	4.759	1.65E+04	14.5	28.9	0	28.9
452.4	4.757	1.65E+04	14.5	28.8	0	28.8
452.5	4.754	1.65E+04	14.5	28.8	0	28.8
452.6	4.752	1.65E+04	14.5	28.8	0	28.8
452.7	4.749	1.65E+04	14.5	28.7	0	28.7
452.8	4.747	1.65E+04	14.5	28.7	0	28.7
452.9	4.744	1.65E+04	14.5	28.7	0	28.7
453	4.742	1.66E+04	14.5	28.7	0	28.7
453.1	4.74	1.66E+04	14.4	28.6	0	28.6
453.2	4.737	1.66E+04	14.4	28.6	0	28.6
453.3	4.735	1.66E+04	14.4	28.6	0	28.6
453.4	4.732	1.66E+04	14.4	28.6	0	28.6
453.5	4.73	1.66E+04	14.4	28.5	0	28.5
453.6	4.727	1.66E+04	14.4	28.5	0	28.5
453.7	4.725	1.66E+04	14.4	28.5	0	28.5
453.8	4.722	1.66E+04	14.4	28.4	0	28.4
453.9	4.72	1.66E+04	14.4	28.4	0	28.4
454	4.717	1.66E+04	14.4	28.4	0	28.4
454.1	4.715	1.66E+04	14.4	28.4	0	28.4
454.2	4.712	1.66E+04	14.4	28.3	0	28.3
454.3	4.71	1.66E+04	14.3	28.3	0	28.3
454.4	4.708	1.66E+04	14.3	28.3	0	28.3
454.5	4.705	1.66E+04	14.3	28.2	0	28.2
454.6	4.703	1.66E+04	14.3	28.2	0	28.2
454.7	4.7	1.66E+04	14.3	28.2	0	28.2
454.8	4.698	1.66E+04	14.3	28.1	0	28.1
454.9	4.695	1.66E+04	14.3	28.1	0	28.1
455	4.693	1.66E+04	14.3	28.1	0	28.1
455.1	4.69	1.66E+04	14.3	28.1	0	28.1
455.2	4.688	1.66E+04	14.3	28	0	28
455.3	4.685	1.66E+04	14.3	28	0	28
455.4	4.683	1.66E+04	14.3	28	0	28
455.5	4.68	1.66E+04	14.2	27.9	0	27.9
455.6	4.678	1.66E+04	14.2	27.9	0	27.9
455.7	4.675	1.66E+04	14.2	27.9	0	27.9
455.8	4.673	1.67E+04	14.2	27.9	0	27.9
455.9	4.67	1.67E+04	14.2	27.8	0	27.8
456	4.668	1.67E+04	14.2	27.8	0	27.8
456.1	4.665	1.67E+04	14.2	27.8	0	27.8
456.2	4.663	1.67E+04	14.2	27.7	0	27.7
456.3	4.66	1.67E+04	14.2	27.7	0	27.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
456.4	4.658	1.67E+04	14.2	27.7	0	27.7
456.5	4.656	1.67E+04	14.2	27.7	0	27.7
456.6	4.653	1.67E+04	14.2	27.6	0	27.6
456.7	4.651	1.67E+04	14.1	27.6	0	27.6
456.8	4.648	1.67E+04	14.1	27.6	0	27.6
456.9	4.646	1.67E+04	14.1	27.5	0	27.5
457	4.643	1.67E+04	14.1	27.5	0	27.5
457.1	4.641	1.67E+04	14.1	27.5	0	27.5
457.2	4.638	1.67E+04	14.1	27.4	0	27.4
457.3	4.636	1.67E+04	14.1	27.4	0	27.4
457.4	4.633	1.67E+04	14.1	27.4	0	27.4
457.5	4.631	1.67E+04	14.1	27.4	0	27.4
457.6	4.628	1.67E+04	14.1	27.3	0	27.3
457.7	4.626	1.67E+04	14.1	27.3	0	27.3
457.8	4.623	1.67E+04	14.1	27.3	0	27.3
457.9	4.621	1.67E+04	14	27.2	0	27.2
458	4.618	1.67E+04	14	27.2	0	27.2
458.1	4.616	1.67E+04	14	27.2	0	27.2
458.2	4.613	1.67E+04	14	27.1	0	27.1
458.3	4.611	1.67E+04	14	27.1	0	27.1
458.4	4.608	1.67E+04	14	27.1	0	27.1
458.5	4.606	1.67E+04	14	27.1	0	27.1
458.6	4.603	1.67E+04	14	27	0	27
458.7	4.601	1.67E+04	14	27	0	27
458.8	4.598	1.67E+04	14	27	0	27
458.9	4.596	1.67E+04	14	26.9	0	26.9
459	4.593	1.67E+04	14	26.9	0	26.9
459.1	4.591	1.67E+04	13.9	26.9	0	26.9
459.2	4.588	1.67E+04	13.9	26.8	0	26.8
459.3	4.586	1.67E+04	13.9	26.8	0	26.8
459.4	4.583	1.67E+04	13.9	26.8	0	26.8
459.5	4.581	1.67E+04	13.9	26.8	0	26.8
459.6	4.578	1.67E+04	13.9	26.7	0	26.7
459.7	4.576	1.67E+04	13.9	26.7	0	26.7
459.8	4.573	1.67E+04	13.9	26.7	0	26.7
459.9	4.571	1.67E+04	13.9	26.6	0	26.6
467.5	4.381	1.68E+04	13.3	24.4	0	24.4
467.9	4.371	1.68E+04	13.3	24.2	0	24.2
468.6	4.354	1.68E+04	13.2	24	0	24
468.7	4.351	1.68E+04	13.2	24	0	24
469.1	4.341	1.68E+04	13.2	23.9	0	23.9
470.1	4.316	1.68E+04	13.1	23.6	0	23.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
470.2	4.314	1.68E+04	13.1	23.6	0	23.6
470.6	4.304	1.68E+04	13.1	23.4	0	23.4
471.9	4.271	1.68E+04	13	23	0	23
472	4.269	1.68E+04	12.9	23	0	23
472.4	4.259	1.67E+04	12.9	22.9	0	22.9
473.7	4.226	1.67E+04	12.8	22.5	0	22.5
474.1	4.216	1.67E+04	12.8	22.4	0	22.4
474.5	4.206	1.67E+04	12.8	22.3	0	22.3
475.8	4.174	1.67E+04	12.7	21.9	0	21.9
476.5	4.157	1.67E+04	12.6	21.7	0	21.7
476.9	4.147	1.66E+04	12.6	21.6	0	21.6
478.2	4.115	1.66E+04	12.5	21.2	0	21.2
479.2	4.09	1.66E+04	12.4	20.9	0	20.9
479.6	4.08	1.66E+04	12.4	20.8	0	20.8
481.2	4.041	1.65E+04	12.3	20.3	0	20.3
482.2	4.016	1.65E+04	12.2	20	0	20
482.6	4.006	1.65E+04	12.1	19.9	0	19.9
483.3	3.989	1.64E+04	12.1	19.7	0	19.7
483.7	3.979	1.64E+04	12.1	19.6	0	19.6
484.4	3.962	1.64E+04	12	19.4	0	19.4
484.5	3.96	1.64E+04	12	19.4	0	19.4
485.8	3.928	1.63E+04	11.9	19	0	19
486.6	3.909	1.63E+04	11.9	18.8	0	18.8
487	3.899	1.63E+04	11.8	18.7	0	18.7
488	3.875	1.63E+04	11.7	18.4	0	18.4
488.1	3.872	1.63E+04	11.7	18.4	0	18.4
489.4	3.841	1.62E+04	11.6	18.1	0	18.1
489.8	3.831	1.62E+04	11.6	17.9	0	17.9
490.5	3.814	1.62E+04	11.6	17.8	0	17.8
490.9	3.805	1.61E+04	11.5	17.7	0	17.7
492.2	3.774	1.61E+04	11.4	17.3	0	17.3
492.3	3.771	1.61E+04	11.4	17.3	0	17.3
493.6	3.74	1.60E+04	11.3	17	0	17
494	3.731	1.60E+04	11.3	16.9	0	16.9
495	3.707	1.60E+04	11.2	16.6	0	16.6
495.4	3.697	1.60E+04	11.2	16.5	0	16.5
497	3.66	1.59E+04	11.1	16.1	0	16.1
497.1	3.657	1.59E+04	11.1	16.1	0	16.1
498.4	3.626	1.59E+04	11	15.8	0	15.8
498.5	3.624	1.59E+04	11	15.8	0	15.8
498.6	3.622	1.59E+04	11	15.8	0	15.8
498.7	3.619	1.59E+04	11	15.7	0	15.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
499.1	3.61	1.59E+04	10.9	15.7	0	15.7
500.1	3.586	1.59E+04	10.9	15.4	0	15.4
500.5	3.577	1.58E+04	10.8	15.3	0	15.3
502.4	3.532	1.58E+04	10.7	14.9	0	14.9
502.5	3.53	1.58E+04	10.7	14.9	0	14.9
504.1	3.493	1.58E+04	10.6	14.5	0	14.5
504.2	3.49	1.58E+04	10.6	14.5	0	14.5
504.3	3.488	1.58E+04	10.6	14.5	0	14.5
504.4	3.486	1.58E+04	10.6	14.5	0	14.5
504.8	3.476	1.58E+04	10.5	14.4	0	14.4
506.1	3.446	1.58E+04	10.4	14.1	0	14.1
506.5	3.436	1.58E+04	10.4	14	0	14
508.4	3.392	1.57E+04	10.3	13.6	0	13.6
508.5	3.39	1.57E+04	10.3	13.6	0	13.6
510.1	3.352	1.57E+04	10.2	13.3	0	13.3
510.2	3.35	1.57E+04	10.2	13.3	0	13.3
510.3	3.348	1.57E+04	10.2	13.3	0	13.3
510.4	3.345	1.57E+04	10.2	13.2	0	13.2
510.8	3.336	1.57E+04	10.1	13.2	0	13.2
512.1	3.306	1.57E+04	10	12.9	0	12.9
512.2	3.303	1.57E+04	10	12.9	0	12.9
512.3	3.301	1.57E+04	10	12.9	0	12.9
512.4	3.299	1.57E+04	10	12.9	0	12.9
512.5	3.296	1.57E+04	10	12.8	0	12.8
514.4	3.252	1.57E+04	9.9	12.5	0	12.5
514.5	3.25	1.57E+04	9.9	12.5	0	12.5
516.1	3.213	1.57E+04	9.8	12.1	0	12.1
516.2	3.21	1.57E+04	9.8	12.1	0	12.1
516.3	3.208	1.57E+04	9.8	12.1	0	12.1
516.4	3.206	1.57E+04	9.8	12.1	0	12.1
516.8	3.196	1.57E+04	9.7	12	0	12
518.1	3.166	1.57E+04	9.7	11.8	0	11.8
518.2	3.164	1.57E+04	9.6	11.8	0	11.8
518.3	3.161	1.57E+04	9.6	11.7	0	11.7
518.4	3.159	1.57E+04	9.6	11.7	0	11.7
518.5	3.157	1.57E+04	9.6	11.7	0	11.7
520.4	3.112	1.57E+04	9.5	11.3	0	11.3
520.5	3.11	1.57E+04	9.5	11.3	0	11.3
522.1	3.073	1.57E+04	9.4	11	0	11
522.2	3.071	1.57E+04	9.4	11	0	11
522.3	3.068	1.57E+04	9.4	11	0	11
522.4	3.066	1.57E+04	9.4	11	0	11

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
522.8	3.057	1.57E+04	9.3	10.9	0	10.9
522.9	3.054	1.57E+04	9.3	10.9	0	10.9
523.3	3.045	1.57E+04	9.3	10.8	0	10.8
523.4	3.043	1.57E+04	9.3	10.8	0	10.8
524.1	3.026	1.57E+04	9.3	10.7	0	10.7
524.2	3.024	1.57E+04	9.3	10.7	0	10.7
524.3	3.022	1.57E+04	9.2	10.6	0	10.6
524.4	3.02	1.57E+04	9.2	10.6	0	10.6
524.5	3.017	1.57E+04	9.2	10.6	0	10.6
524.6	3.015	1.57E+04	9.2	10.6	0	10.6
524.7	3.013	1.57E+04	9.2	10.6	0	10.6
525.7	2.989	1.57E+04	9.2	10.4	0	10.4
526.4	2.973	1.57E+04	9.1	10.3	0	10.3
526.5	2.971	1.57E+04	9.1	10.3	0	10.3
528.1	2.934	1.56E+04	9	10	0	10
528.2	2.931	1.56E+04	9	10	0	10
528.3	2.929	1.56E+04	9	10	0	10
528.4	2.927	1.56E+04	9	9.9	0	9.9
528.8	2.918	1.56E+04	8.9	9.9	0	9.9
528.9	2.915	1.56E+04	8.9	9.9	0	9.9
529.3	2.906	1.56E+04	8.9	9.8	0	9.8
529.4	2.904	1.56E+04	8.9	9.8	0	9.8
530.1	2.888	1.56E+04	8.9	9.7	0	9.7
530.2	2.885	1.56E+04	8.9	9.6	0	9.6
530.3	2.883	1.56E+04	8.9	9.6	0	9.6
530.4	2.881	1.56E+04	8.8	9.6	0	9.6
530.5	2.878	1.56E+04	8.8	9.6	0	9.6
530.6	2.876	1.56E+04	8.8	9.6	0	9.6
530.7	2.874	1.56E+04	8.8	9.6	0	9.6
531.7	2.851	1.56E+04	8.8	9.4	0	9.4
532.4	2.834	1.56E+04	8.7	9.3	0	9.3
532.5	2.832	1.56E+04	8.7	9.3	0	9.3
532.6	2.83	1.56E+04	8.7	9.2	0	9.2
533	2.821	1.56E+04	8.7	9.2	0	9.2
534	2.798	1.56E+04	8.6	9	0	9
534.1	2.795	1.56E+04	8.6	9	0	9
534.2	2.793	1.56E+04	8.6	9	0	9
534.3	2.791	1.56E+04	8.6	9	0	9
534.4	2.788	1.56E+04	8.6	9	0	9
534.8	2.779	1.56E+04	8.6	8.9	0	8.9
534.9	2.777	1.56E+04	8.5	8.9	0	8.9
535.3	2.768	1.56E+04	8.5	8.8	0	8.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
535.4	2.765	1.56E+04	8.5	8.8	0	8.8
536.1	2.749	1.56E+04	8.5	8.7	0	8.7
536.2	2.747	1.56E+04	8.5	8.7	0	8.7
536.3	2.745	1.56E+04	8.5	8.7	0	8.7
536.4	2.742	1.56E+04	8.5	8.6	0	8.6
536.5	2.74	1.56E+04	8.4	8.6	0	8.6
536.6	2.738	1.56E+04	8.4	8.6	0	8.6
536.7	2.736	1.56E+04	8.4	8.6	0	8.6
537.7	2.713	1.56E+04	8.4	8.4	0	8.4
538.4	2.696	1.56E+04	8.3	8.3	0	8.3
538.5	2.694	1.56E+04	8.3	8.3	0	8.3
538.6	2.692	1.56E+04	8.3	8.3	0	8.3
539	2.683	1.56E+04	8.3	8.2	0	8.2
539.1	2.68	1.56E+04	8.3	8.2	0	8.2
539.2	2.678	1.56E+04	8.3	8.2	0	8.2
539.9	2.662	1.56E+04	8.2	8.1	0	8.1
540	2.66	1.56E+04	8.2	8.1	0	8.1
540.1	2.657	1.56E+04	8.2	8.1	0	8.1
540.2	2.655	1.56E+04	8.2	8.1	0	8.1
540.3	2.653	1.56E+04	8.2	8.1	0	8.1
540.4	2.651	1.56E+04	8.2	8	0	8
540.8	2.641	1.56E+04	8.2	8	0	8
540.9	2.639	1.56E+04	8.2	8	0	8
541.3	2.63	1.56E+04	8.1	7.9	0	7.9
541.4	2.628	1.56E+04	8.1	7.9	0	7.9
542.1	2.612	1.56E+04	8.1	7.8	0	7.8
542.2	2.609	1.56E+04	8.1	7.8	0	7.8
542.3	2.607	1.56E+04	8.1	7.8	0	7.8
542.4	2.605	1.56E+04	8.1	7.7	0	7.7
542.5	2.602	1.56E+04	8.1	7.7	0	7.7
542.6	2.6	1.56E+04	8	7.7	0	7.7
542.7	2.598	1.56E+04	8	7.7	0	7.7
543.7	2.575	1.56E+04	8	7.6	0	7.6
544.4	2.559	1.56E+04	7.9	7.5	0	7.5
544.5	2.557	1.56E+04	7.9	7.5	0	7.5
544.6	2.554	1.56E+04	7.9	7.4	0	7.4
544.7	2.552	1.56E+04	7.9	7.4	0	7.4
544.8	2.55	1.56E+04	7.9	7.4	0	7.4
544.9	2.547	1.56E+04	7.9	7.4	0	7.4
545	2.545	1.56E+04	7.9	7.4	0	7.4
545.1	2.543	1.56E+04	7.9	7.4	0	7.4
545.2	2.541	1.56E+04	7.9	7.4	0	7.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
545.9	2.524	1.56E+04	7.8	7.3	0	7.3
546	2.522	1.56E+04	7.8	7.2	0	7.2
546.1	2.52	1.56E+04	7.8	7.2	0	7.2
546.2	2.518	1.56E+04	7.8	7.2	0	7.2
546.3	2.515	1.56E+04	7.8	7.2	0	7.2
546.4	2.513	1.56E+04	7.8	7.2	0	7.2
546.8	2.504	1.56E+04	7.8	7.1	0	7.1
546.9	2.502	1.56E+04	7.8	7.1	0	7.1
547.3	2.492	1.56E+04	7.7	7.1	0	7.1
547.4	2.49	1.56E+04	7.7	7.1	0	7.1
548.1	2.474	1.57E+04	7.7	7	0	7
548.2	2.472	1.57E+04	7.7	6.9	0	6.9
548.3	2.469	1.57E+04	7.7	6.9	0	6.9
548.4	2.467	1.57E+04	7.7	6.9	0	6.9
548.5	2.465	1.57E+04	7.7	6.9	0	6.9
548.6	2.463	1.57E+04	7.7	6.9	0	6.9
548.7	2.46	1.57E+04	7.6	6.9	0	6.9
549.4	2.444	1.57E+04	7.6	6.8	0	6.8
549.5	2.442	1.57E+04	7.6	6.8	0	6.8
549.6	2.44	1.57E+04	7.6	6.8	0	6.8
549.7	2.437	1.57E+04	7.6	6.7	0	6.7
550.4	2.421	1.57E+04	7.5	6.7	0	6.7
550.5	2.419	1.57E+04	7.5	6.6	0	6.6
550.6	2.417	1.57E+04	7.5	6.6	0	6.6
550.7	2.414	1.57E+04	7.5	6.6	0	6.6
550.8	2.412	1.57E+04	7.5	6.6	0	6.6
550.9	2.41	1.57E+04	7.5	6.6	0	6.6
551	2.408	1.57E+04	7.5	6.6	0	6.6
551.1	2.405	1.57E+04	7.5	6.6	0	6.6
551.2	2.403	1.57E+04	7.5	6.5	0	6.5
551.9	2.387	1.57E+04	7.4	6.5	0	6.5
552	2.385	1.57E+04	7.4	6.4	0	6.4
552.1	2.382	1.57E+04	7.4	6.4	0	6.4
552.2	2.38	1.57E+04	7.4	6.4	0	6.4
552.3	2.378	1.57E+04	7.4	6.4	0	6.4
552.4	2.376	1.57E+04	7.4	6.4	0	6.4
552.8	2.366	1.57E+04	7.4	6.3	0	6.3
552.9	2.364	1.57E+04	7.4	6.3	0	6.3
553.3	2.355	1.57E+04	7.3	6.3	0	6.3
553.4	2.353	1.57E+04	7.3	6.3	0	6.3
553.5	2.35	1.57E+04	7.3	6.3	0	6.3
553.6	2.348	1.58E+04	7.3	6.2	0	6.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
554	2.339	1.58E+04	7.3	6.2	0	6.2
554.1	2.336	1.58E+04	7.3	6.2	0	6.2
554.2	2.334	1.58E+04	7.3	6.2	0	6.2
554.3	2.332	1.58E+04	7.3	6.2	0	6.2
554.4	2.33	1.58E+04	7.3	6.1	0	6.1
554.5	2.327	1.58E+04	7.3	6.1	0	6.1
554.6	2.325	1.58E+04	7.3	6.1	0	6.1
554.7	2.323	1.58E+04	7.3	6.1	0	6.1
555.4	2.307	1.58E+04	7.2	6	0	6
555.5	2.304	1.58E+04	7.2	6	0	6
555.6	2.302	1.58E+04	7.2	6	0	6
555.7	2.3	1.58E+04	7.2	6	0	6
556.4	2.284	1.58E+04	7.1	5.9	0	5.9
556.5	2.281	1.58E+04	7.1	5.9	0	5.9
556.6	2.279	1.58E+04	7.1	5.9	0	5.9
556.7	2.277	1.58E+04	7.1	5.9	0	5.9
556.8	2.274	1.58E+04	7.1	5.8	0	5.8
556.9	2.272	1.58E+04	7.1	5.8	0	5.8
557	2.27	1.58E+04	7.1	5.8	0	5.8
557.1	2.267	1.59E+04	7.1	5.8	0	5.8
557.2	2.265	1.59E+04	7.1	5.8	0	5.8
557.3	2.263	1.59E+04	7.1	5.8	0	5.8
557.7	2.254	1.59E+04	7.1	5.7	0	5.7
557.8	2.251	1.59E+04	7	5.7	0	5.7
557.9	2.249	1.59E+04	7	5.7	0	5.7
558	2.247	1.59E+04	7	5.7	0	5.7
558.1	2.244	1.59E+04	7	5.7	0	5.7
558.2	2.242	1.59E+04	7	5.7	0	5.7
558.3	2.24	1.59E+04	7	5.7	0	5.7
558.4	2.238	1.59E+04	7	5.7	0	5.7
558.8	2.228	1.59E+04	7	5.6	0	5.6
558.9	2.226	1.59E+04	7	5.6	0	5.6
559.3	2.217	1.59E+04	6.9	5.5	0	5.5
559.4	2.214	1.59E+04	6.9	5.5	0	5.5
559.5	2.212	1.59E+04	6.9	5.5	0	5.5
559.6	2.21	1.59E+04	6.9	5.5	0	5.5
560	2.201	1.59E+04	6.9	5.5	0	5.5
560.1	2.198	1.60E+04	6.9	5.5	0	5.5
560.2	2.196	1.60E+04	6.9	5.4	0	5.4
560.3	2.194	1.60E+04	6.9	5.4	0	5.4
560.4	2.191	1.60E+04	6.9	5.4	0	5.4
560.5	2.189	1.60E+04	6.9	5.4	0	5.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
560.6	2.187	1.60E+04	6.9	5.4	0	5.4
560.7	2.184	1.60E+04	6.9	5.4	0	5.4
560.8	2.182	1.60E+04	6.9	5.4	0	5.4
560.9	2.18	1.60E+04	6.8	5.4	0	5.4
561	2.177	1.60E+04	6.8	5.3	0	5.3
561.4	2.168	1.60E+04	6.8	5.3	0	5.3
561.5	2.166	1.60E+04	6.8	5.3	0	5.3
561.6	2.164	1.60E+04	6.8	5.3	0	5.3
561.7	2.161	1.60E+04	6.8	5.3	0	5.3
561.8	2.159	1.60E+04	6.8	5.3	0	5.3
562.2	2.15	1.60E+04	6.8	5.2	0	5.2
562.3	2.147	1.60E+04	6.8	5.2	0	5.2
562.4	2.145	1.60E+04	6.7	5.2	0	5.2
562.5	2.143	1.60E+04	6.7	5.2	0	5.2
562.6	2.14	1.60E+04	6.7	5.2	0	5.2
562.7	2.138	1.60E+04	6.7	5.2	0	5.2
562.8	2.136	1.61E+04	6.7	5.1	0	5.1
562.9	2.133	1.61E+04	6.7	5.1	0	5.1
563	2.131	1.61E+04	6.7	5.1	0	5.1
563.1	2.129	1.61E+04	6.7	5.1	0	5.1
563.2	2.126	1.61E+04	6.7	5.1	0	5.1
563.3	2.124	1.61E+04	6.7	5.1	0	5.1
563.7	2.115	1.61E+04	6.7	5	0	5
563.8	2.112	1.61E+04	6.7	5	0	5
563.9	2.11	1.61E+04	6.6	5	0	5
564	2.108	1.61E+04	6.6	5	0	5
564.1	2.105	1.61E+04	6.6	5	0	5
564.2	2.103	1.61E+04	6.6	5	0	5
564.3	2.101	1.61E+04	6.6	5	0	5
564.4	2.098	1.61E+04	6.6	5	0	5
564.8	2.089	1.61E+04	6.6	4.9	0	4.9
564.9	2.087	1.61E+04	6.6	4.9	0	4.9
565	2.084	1.61E+04	6.6	4.9	0	4.9
565.1	2.082	1.62E+04	6.6	4.9	0	4.9
565.2	2.08	1.62E+04	6.6	4.9	0	4.9
565.3	2.077	1.62E+04	6.5	4.9	0	4.9
565.4	2.075	1.62E+04	6.5	4.9	0	4.9
565.5	2.073	1.62E+04	6.5	4.8	0	4.8
565.6	2.07	1.62E+04	6.5	4.8	0	4.8
566	2.061	1.62E+04	6.5	4.8	0	4.8
566.1	2.059	1.62E+04	6.5	4.8	0	4.8
566.2	2.056	1.62E+04	6.5	4.8	0	4.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
566.3	2.054	1.62E+04	6.5	4.8	0	4.8
566.4	2.052	1.62E+04	6.5	4.7	0	4.7
566.5	2.049	1.62E+04	6.5	4.7	0	4.7
566.6	2.047	1.62E+04	6.5	4.7	0	4.7
566.7	2.045	1.62E+04	6.5	4.7	0	4.7
566.8	2.042	1.62E+04	6.4	4.7	0	4.7
566.9	2.04	1.62E+04	6.4	4.7	0	4.7
567	2.038	1.62E+04	6.4	4.7	0	4.7
567.4	2.028	1.62E+04	6.4	4.6	0	4.6
567.5	2.026	1.63E+04	6.4	4.6	0	4.6
567.6	2.024	1.63E+04	6.4	4.6	0	4.6
567.7	2.021	1.63E+04	6.4	4.6	0	4.6
567.8	2.019	1.63E+04	6.4	4.6	0	4.6
567.9	2.017	1.63E+04	6.4	4.6	0	4.6
568	2.014	1.63E+04	6.4	4.6	0	4.6
568.1	2.012	1.63E+04	6.4	4.6	0	4.6
568.2	2.01	1.63E+04	6.4	4.5	0	4.5
568.3	2.007	1.63E+04	6.3	4.5	0	4.5
568.4	2.005	1.63E+04	6.3	4.5	0	4.5
568.5	2.003	1.63E+04	6.3	4.5	0	4.5
568.6	2	1.63E+04	6.3	4.5	0	4.5
568.7	1.998	1.63E+04	6.3	4.5	0	4.5
568.8	1.996	1.63E+04	6.3	4.5	0	4.5
568.9	1.993	1.63E+04	6.3	4.5	0	4.5
569	1.991	1.63E+04	6.3	4.5	0	4.5
569.1	1.989	1.63E+04	6.3	4.4	0	4.4
569.2	1.986	1.63E+04	6.3	4.4	0	4.4
569.3	1.984	1.63E+04	6.3	4.4	0	4.4
569.7	1.974	1.63E+04	6.3	4.4	0	4.4
569.8	1.972	1.63E+04	6.2	4.4	0	4.4
569.9	1.97	1.64E+04	6.2	4.4	0	4.4
570	1.967	1.64E+04	6.2	4.4	0	4.4
570.1	1.965	1.64E+04	6.2	4.3	0	4.3
570.2	1.963	1.64E+04	6.2	4.3	0	4.3
570.3	1.96	1.64E+04	6.2	4.3	0	4.3
570.4	1.958	1.64E+04	6.2	4.3	0	4.3
570.5	1.956	1.64E+04	6.2	4.3	0	4.3
570.6	1.953	1.64E+04	6.2	4.3	0	4.3
570.7	1.951	1.64E+04	6.2	4.3	0	4.3
570.8	1.949	1.64E+04	6.2	4.3	0	4.3
570.9	1.946	1.64E+04	6.2	4.3	0	4.3
571	1.944	1.64E+04	6.2	4.2	0	4.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
571.1	1.942	1.64E+04	6.2	4.2	0	4.2
571.2	1.939	1.64E+04	6.1	4.2	0	4.2
571.3	1.937	1.64E+04	6.1	4.2	0	4.2
571.4	1.934	1.64E+04	6.1	4.2	0	4.2
571.5	1.932	1.64E+04	6.1	4.2	0	4.2
571.6	1.93	1.64E+04	6.1	4.2	0	4.2
572	1.92	1.64E+04	6.1	4.1	0	4.1
572.1	1.918	1.64E+04	6.1	4.1	0	4.1
572.2	1.916	1.64E+04	6.1	4.1	0	4.1
572.3	1.913	1.64E+04	6.1	4.1	0	4.1
572.4	1.911	1.64E+04	6.1	4.1	0	4.1
572.5	1.908	1.64E+04	6.1	4.1	0	4.1
572.6	1.906	1.65E+04	6.1	4.1	0	4.1
572.7	1.904	1.65E+04	6	4.1	0	4.1
572.8	1.901	1.65E+04	6	4.1	0	4.1
572.9	1.899	1.65E+04	6	4	0	4
573	1.897	1.65E+04	6	4	0	4
573.1	1.894	1.65E+04	6	4	0	4
573.2	1.892	1.65E+04	6	4	0	4
573.3	1.89	1.65E+04	6	4	0	4
573.4	1.887	1.65E+04	6	4	0	4
573.5	1.885	1.65E+04	6	4	0	4
573.6	1.883	1.65E+04	6	4	0	4
573.7	1.88	1.65E+04	6	4	0	4
573.8	1.878	1.65E+04	6	4	0	4
573.9	1.875	1.65E+04	6	3.9	0	3.9
574	1.873	1.65E+04	6	3.9	0	3.9
574.1	1.871	1.65E+04	5.9	3.9	0	3.9
574.2	1.868	1.65E+04	5.9	3.9	0	3.9
574.3	1.866	1.65E+04	5.9	3.9	0	3.9
574.4	1.864	1.65E+04	5.9	3.9	0	3.9
574.5	1.861	1.65E+04	5.9	3.9	0	3.9
574.6	1.859	1.65E+04	5.9	3.9	0	3.9
574.7	1.856	1.65E+04	5.9	3.9	0	3.9
574.8	1.854	1.65E+04	5.9	3.8	0	3.8
574.9	1.852	1.65E+04	5.9	3.8	0	3.8
575	1.849	1.65E+04	5.9	3.8	0	3.8
575.1	1.847	1.65E+04	5.9	3.8	0	3.8
575.2	1.845	1.65E+04	5.9	3.8	0	3.8
575.3	1.842	1.65E+04	5.9	3.8	0	3.8
575.4	1.84	1.65E+04	5.9	3.8	0	3.8
575.5	1.838	1.65E+04	5.9	3.8	0	3.8

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
575.6	1.835	1.65E+04	5.8	3.8	0	3.8
575.7	1.833	1.65E+04	5.8	3.8	0	3.8
575.8	1.83	1.66E+04	5.8	3.7	0	3.7
575.9	1.828	1.66E+04	5.8	3.7	0	3.7
576	1.826	1.66E+04	5.8	3.7	0	3.7
576.1	1.823	1.66E+04	5.8	3.7	0	3.7
576.2	1.821	1.66E+04	5.8	3.7	0	3.7
576.3	1.819	1.66E+04	5.8	3.7	0	3.7
576.4	1.816	1.66E+04	5.8	3.7	0	3.7
576.5	1.814	1.66E+04	5.8	3.7	0	3.7
576.6	1.811	1.66E+04	5.8	3.7	0	3.7
576.7	1.809	1.66E+04	5.8	3.7	0	3.7
576.8	1.807	1.66E+04	5.8	3.6	0	3.6
576.9	1.804	1.66E+04	5.8	3.6	0	3.6
577	1.802	1.66E+04	5.7	3.6	0	3.6
577.1	1.8	1.66E+04	5.7	3.6	0	3.6
577.2	1.797	1.66E+04	5.7	3.6	0	3.6
577.3	1.795	1.66E+04	5.7	3.6	0	3.6
577.4	1.792	1.66E+04	5.7	3.6	0	3.6
577.5	1.79	1.66E+04	5.7	3.6	0	3.6
577.6	1.788	1.66E+04	5.7	3.6	0	3.6
577.7	1.785	1.66E+04	5.7	3.6	0	3.6
577.8	1.783	1.66E+04	5.7	3.5	0	3.5
577.9	1.781	1.66E+04	5.7	3.5	0	3.5
578	1.778	1.66E+04	5.7	3.5	0	3.5
578.1	1.776	1.66E+04	5.7	3.5	0	3.5
578.2	1.773	1.66E+04	5.7	3.5	0	3.5
578.3	1.771	1.66E+04	5.7	3.5	0	3.5
578.4	1.769	1.66E+04	5.7	3.5	0	3.5
578.5	1.766	1.66E+04	5.6	3.5	0	3.5
578.6	1.764	1.66E+04	5.6	3.5	0	3.5
578.7	1.762	1.66E+04	5.6	3.5	0	3.5
578.8	1.759	1.66E+04	5.6	3.4	0	3.4
578.9	1.757	1.66E+04	5.6	3.4	0	3.4
579	1.754	1.66E+04	5.6	3.4	0	3.4
579.1	1.752	1.66E+04	5.6	3.4	0	3.4
579.2	1.75	1.66E+04	5.6	3.4	0	3.4
579.3	1.747	1.66E+04	5.6	3.4	0	3.4
579.4	1.745	1.66E+04	5.6	3.4	0	3.4
579.5	1.743	1.66E+04	5.6	3.4	0	3.4
579.6	1.74	1.66E+04	5.6	3.4	0	3.4
579.7	1.738	1.66E+04	5.6	3.4	0	3.4

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
579.8	1.735	1.66E+04	5.6	3.4	0	3.4
579.9	1.733	1.66E+04	5.5	3.3	0	3.3
580	1.731	1.67E+04	5.5	3.3	0	3.3
580.1	1.728	1.67E+04	5.5	3.3	0	3.3
580.2	1.726	1.67E+04	5.5	3.3	0	3.3
580.3	1.724	1.67E+04	5.5	3.3	0	3.3
580.4	1.721	1.67E+04	5.5	3.3	0	3.3
580.5	1.719	1.67E+04	5.5	3.3	0	3.3
580.6	1.716	1.67E+04	5.5	3.3	0	3.3
580.7	1.714	1.67E+04	5.5	3.3	0	3.3
580.8	1.712	1.67E+04	5.5	3.3	0	3.3
580.9	1.709	1.67E+04	5.5	3.2	0	3.2
581	1.707	1.67E+04	5.5	3.2	0	3.2
581.1	1.705	1.67E+04	5.5	3.2	0	3.2
581.2	1.702	1.67E+04	5.5	3.2	0	3.2
581.3	1.7	1.67E+04	5.4	3.2	0	3.2
581.4	1.697	1.67E+04	5.4	3.2	0	3.2
581.5	1.695	1.67E+04	5.4	3.2	0	3.2
581.6	1.693	1.67E+04	5.4	3.2	0	3.2
581.7	1.69	1.67E+04	5.4	3.2	0	3.2
581.8	1.688	1.67E+04	5.4	3.2	0	3.2
581.9	1.685	1.67E+04	5.4	3.2	0	3.2
582	1.683	1.67E+04	5.4	3.1	0	3.1
582.1	1.681	1.67E+04	5.4	3.1	0	3.1
582.2	1.678	1.67E+04	5.4	3.1	0	3.1
582.3	1.676	1.67E+04	5.4	3.1	0	3.1
582.4	1.674	1.67E+04	5.4	3.1	0	3.1
582.5	1.671	1.67E+04	5.4	3.1	0	3.1
582.6	1.669	1.67E+04	5.4	3.1	0	3.1
582.7	1.666	1.67E+04	5.3	3.1	0	3.1
582.8	1.664	1.67E+04	5.3	3.1	0	3.1
582.9	1.662	1.67E+04	5.3	3.1	0	3.1
583	1.659	1.67E+04	5.3	3	0	3
583.1	1.657	1.67E+04	5.3	3	0	3
583.2	1.655	1.67E+04	5.3	3	0	3
583.3	1.652	1.67E+04	5.3	3	0	3
583.4	1.65	1.67E+04	5.3	3	0	3
583.5	1.647	1.67E+04	5.3	3	0	3
583.6	1.645	1.67E+04	5.3	3	0	3
583.7	1.643	1.67E+04	5.3	3	0	3
583.8	1.64	1.67E+04	5.3	3	0	3
583.9	1.638	1.67E+04	5.3	3	0	3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
584	1.636	1.67E+04	5.3	3	0	3
584.1	1.633	1.67E+04	5.2	2.9	0	2.9
584.2	1.631	1.67E+04	5.2	2.9	0	2.9
584.3	1.628	1.67E+04	5.2	2.9	0	2.9
584.4	1.626	1.67E+04	5.2	2.9	0	2.9
584.5	1.624	1.67E+04	5.2	2.9	0	2.9
584.6	1.621	1.67E+04	5.2	2.9	0	2.9
584.7	1.619	1.67E+04	5.2	2.9	0	2.9
584.8	1.616	1.67E+04	5.2	2.9	0	2.9
584.9	1.614	1.67E+04	5.2	2.9	0	2.9
585	1.612	1.67E+04	5.2	2.9	0	2.9
585.1	1.609	1.67E+04	5.2	2.9	0	2.9
585.2	1.607	1.67E+04	5.2	2.8	0	2.8
585.3	1.605	1.67E+04	5.2	2.8	0	2.8
585.4	1.602	1.67E+04	5.2	2.8	0	2.8
585.5	1.6	1.67E+04	5.2	2.8	0	2.8
585.6	1.597	1.67E+04	5.1	2.8	0	2.8
585.7	1.595	1.67E+04	5.1	2.8	0	2.8
585.8	1.593	1.67E+04	5.1	2.8	0	2.8
585.9	1.59	1.67E+04	5.1	2.8	0	2.8
586	1.588	1.67E+04	5.1	2.8	0	2.8
586.1	1.586	1.67E+04	5.1	2.8	0	2.8
586.2	1.583	1.67E+04	5.1	2.8	0	2.8
586.3	1.581	1.67E+04	5.1	2.7	0	2.7
586.4	1.578	1.67E+04	5.1	2.7	0	2.7
586.5	1.576	1.67E+04	5.1	2.7	0	2.7
586.6	1.574	1.67E+04	5.1	2.7	0	2.7
586.7	1.571	1.67E+04	5.1	2.7	0	2.7
586.8	1.569	1.67E+04	5.1	2.7	0	2.7
586.9	1.567	1.67E+04	5.1	2.7	0	2.7
587	1.564	1.67E+04	5	2.7	0	2.7
587.1	1.562	1.67E+04	5	2.7	0	2.7
587.2	1.559	1.67E+04	5	2.7	0	2.7
587.3	1.557	1.67E+04	5	2.7	0	2.7
587.4	1.555	1.67E+04	5	2.6	0	2.6
587.5	1.552	1.67E+04	5	2.6	0	2.6
587.6	1.55	1.67E+04	5	2.6	0	2.6
587.7	1.548	1.67E+04	5	2.6	0	2.6
587.8	1.545	1.67E+04	5	2.6	0	2.6
587.9	1.543	1.67E+04	5	2.6	0	2.6
588	1.541	1.67E+04	5	2.6	0	2.6
588.1	1.538	1.67E+04	5	2.6	0	2.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
588.2	1.536	1.67E+04	5	2.6	0	2.6
588.3	1.533	1.67E+04	5	2.6	0	2.6
588.4	1.531	1.67E+04	4.9	2.6	0	2.6
588.5	1.529	1.67E+04	4.9	2.6	0	2.6
588.6	1.526	1.67E+04	4.9	2.5	0	2.5
588.7	1.524	1.67E+04	4.9	2.5	0	2.5
588.8	1.522	1.67E+04	4.9	2.5	0	2.5
588.9	1.519	1.67E+04	4.9	2.5	0	2.5
589	1.517	1.67E+04	4.9	2.5	0	2.5
589.1	1.514	1.67E+04	4.9	2.5	0	2.5
589.2	1.512	1.67E+04	4.9	2.5	0	2.5
589.3	1.51	1.67E+04	4.9	2.5	0	2.5
589.4	1.507	1.67E+04	4.9	2.5	0	2.5
589.5	1.505	1.66E+04	4.9	2.5	0	2.5
589.6	1.503	1.66E+04	4.9	2.5	0	2.5
589.7	1.5	1.66E+04	4.9	2.4	0	2.4
589.8	1.498	1.66E+04	4.8	2.4	0	2.4
589.9	1.496	1.66E+04	4.8	2.4	0	2.4
590	1.493	1.66E+04	4.8	2.4	0	2.4
590.1	1.491	1.66E+04	4.8	2.4	0	2.4
590.2	1.488	1.66E+04	4.8	2.4	0	2.4
590.3	1.486	1.66E+04	4.8	2.4	0	2.4
590.4	1.484	1.66E+04	4.8	2.4	0	2.4
590.5	1.481	1.66E+04	4.8	2.4	0	2.4
590.6	1.479	1.66E+04	4.8	2.4	0	2.4
590.7	1.477	1.66E+04	4.8	2.4	0	2.4
590.8	1.474	1.66E+04	4.8	2.4	0	2.4
590.9	1.472	1.66E+04	4.8	2.3	0	2.3
591	1.47	1.66E+04	4.8	2.3	0	2.3
591.1	1.467	1.66E+04	4.8	2.3	0	2.3
591.2	1.465	1.66E+04	4.7	2.3	0	2.3
591.3	1.462	1.66E+04	4.7	2.3	0	2.3
591.4	1.46	1.66E+04	4.7	2.3	0	2.3
591.5	1.458	1.66E+04	4.7	2.3	0	2.3
591.6	1.455	1.66E+04	4.7	2.3	0	2.3
591.7	1.453	1.66E+04	4.7	2.3	0	2.3
591.8	1.451	1.66E+04	4.7	2.3	0	2.3
591.9	1.448	1.66E+04	4.7	2.3	0	2.3
592	1.446	1.66E+04	4.7	2.3	0	2.3
592.1	1.444	1.66E+04	4.7	2.2	0	2.2
592.2	1.441	1.66E+04	4.7	2.2	0	2.2
592.3	1.439	1.66E+04	4.7	2.2	0	2.2

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
592.4	1.437	1.66E+04	4.7	2.2	0	2.2
592.5	1.434	1.66E+04	4.7	2.2	0	2.2
592.6	1.432	1.66E+04	4.6	2.2	0	2.2
592.7	1.43	1.65E+04	4.6	2.2	0	2.2
592.8	1.427	1.65E+04	4.6	2.2	0	2.2
592.9	1.425	1.65E+04	4.6	2.2	0	2.2
593	1.422	1.65E+04	4.6	2.2	0	2.2
593.1	1.42	1.65E+04	4.6	2.2	0	2.2
593.2	1.418	1.65E+04	4.6	2.2	0	2.2
593.3	1.415	1.65E+04	4.6	2.2	0	2.2
593.4	1.413	1.65E+04	4.6	2.1	0	2.1
593.5	1.411	1.65E+04	4.6	2.1	0	2.1
593.6	1.408	1.65E+04	4.6	2.1	0	2.1
593.7	1.406	1.65E+04	4.6	2.1	0	2.1
593.8	1.404	1.65E+04	4.6	2.1	0	2.1
593.9	1.401	1.65E+04	4.6	2.1	0	2.1
594	1.399	1.65E+04	4.5	2.1	0	2.1
594.1	1.397	1.65E+04	4.5	2.1	0	2.1
594.2	1.394	1.65E+04	4.5	2.1	0	2.1
594.3	1.392	1.65E+04	4.5	2.1	0	2.1
594.4	1.39	1.65E+04	4.5	2.1	0	2.1
594.5	1.387	1.65E+04	4.5	2.1	0	2.1
594.6	1.385	1.65E+04	4.5	2.1	0	2.1
594.7	1.383	1.64E+04	4.5	2	0	2
594.8	1.38	1.64E+04	4.5	2	0	2
594.9	1.378	1.64E+04	4.5	2	0	2
595	1.376	1.64E+04	4.5	2	0	2
595.1	1.373	1.64E+04	4.5	2	0	2
595.2	1.371	1.64E+04	4.5	2	0	2
595.3	1.369	1.64E+04	4.5	2	0	2
595.4	1.366	1.64E+04	4.4	2	0	2
595.5	1.364	1.64E+04	4.4	2	0	2
595.6	1.362	1.64E+04	4.4	2	0	2
595.7	1.359	1.64E+04	4.4	2	0	2
595.8	1.357	1.64E+04	4.4	2	0	2
595.9	1.355	1.64E+04	4.4	2	0	2
596	1.352	1.64E+04	4.4	1.9	0	1.9
596.1	1.35	1.64E+04	4.4	1.9	0	1.9
596.2	1.348	1.64E+04	4.4	1.9	0	1.9
596.3	1.345	1.63E+04	4.4	1.9	0	1.9
596.4	1.343	1.63E+04	4.4	1.9	0	1.9
596.5	1.341	1.63E+04	4.4	1.9	0	1.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
596.6	1.338	1.63E+04	4.4	1.9	0	1.9
596.7	1.336	1.63E+04	4.4	1.9	0	1.9
596.8	1.334	1.63E+04	4.3	1.9	0	1.9
596.9	1.332	1.63E+04	4.3	1.9	0	1.9
597	1.329	1.63E+04	4.3	1.9	0	1.9
597.1	1.327	1.63E+04	4.3	1.9	0	1.9
597.2	1.325	1.63E+04	4.3	1.9	0	1.9
597.3	1.322	1.63E+04	4.3	1.8	0	1.8
597.4	1.32	1.63E+04	4.3	1.8	0	1.8
597.5	1.318	1.63E+04	4.3	1.8	0	1.8
597.6	1.315	1.62E+04	4.3	1.8	0	1.8
597.7	1.313	1.62E+04	4.3	1.8	0	1.8
597.8	1.311	1.62E+04	4.3	1.8	0	1.8
597.9	1.308	1.62E+04	4.3	1.8	0	1.8
598	1.306	1.62E+04	4.3	1.8	0	1.8
598.1	1.304	1.62E+04	4.3	1.8	0	1.8
598.2	1.302	1.62E+04	4.3	1.8	0	1.8
598.3	1.299	1.62E+04	4.2	1.8	0	1.8
598.4	1.297	1.62E+04	4.2	1.8	0	1.8
598.5	1.295	1.62E+04	4.2	1.8	0	1.8
598.6	1.292	1.62E+04	4.2	1.8	0	1.8
598.7	1.29	1.62E+04	4.2	1.7	0	1.7
598.8	1.288	1.61E+04	4.2	1.7	0	1.7
598.9	1.286	1.61E+04	4.2	1.7	0	1.7
599	1.283	1.61E+04	4.2	1.7	0	1.7
599.1	1.281	1.61E+04	4.2	1.7	0	1.7
599.2	1.279	1.61E+04	4.2	1.7	0	1.7
599.3	1.276	1.61E+04	4.2	1.7	0	1.7
599.4	1.274	1.61E+04	4.2	1.7	0	1.7
599.5	1.272	1.61E+04	4.2	1.7	0	1.7
599.6	1.27	1.61E+04	4.2	1.7	0	1.7
599.7	1.267	1.61E+04	4.1	1.7	0	1.7
599.8	1.265	1.61E+04	4.1	1.7	0	1.7
599.9	1.263	1.60E+04	4.1	1.7	0	1.7
600	1.26	1.60E+04	4.1	1.7	0	1.7
600.1	1.258	1.60E+04	4.1	1.6	0	1.6
600.2	1.256	1.60E+04	4.1	1.6	0	1.6
600.3	1.254	1.60E+04	4.1	1.6	0	1.6
600.4	1.251	1.60E+04	4.1	1.6	0	1.6
600.5	1.249	1.60E+04	4.1	1.6	0	1.6
600.6	1.247	1.60E+04	4.1	1.6	0	1.6
600.7	1.245	1.60E+04	4.1	1.6	0	1.6

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
600.8	1.242	1.60E+04	4.1	1.6	0	1.6
600.9	1.24	1.59E+04	4.1	1.6	0	1.6
601	1.238	1.59E+04	4.1	1.6	0	1.6
601.1	1.235	1.59E+04	4	1.6	0	1.6
601.2	1.233	1.59E+04	4	1.6	0	1.6
601.3	1.231	1.59E+04	4	1.6	0	1.6
601.4	1.229	1.59E+04	4	1.6	0	1.6
601.5	1.226	1.59E+04	4	1.6	0	1.6
601.6	1.224	1.59E+04	4	1.5	0	1.5
601.7	1.222	1.59E+04	4	1.5	0	1.5
601.8	1.22	1.59E+04	4	1.5	0	1.5
601.9	1.217	1.58E+04	4	1.5	0	1.5
602	1.215	1.58E+04	4	1.5	0	1.5
602.1	1.213	1.58E+04	4	1.5	0	1.5
602.2	1.211	1.58E+04	4	1.5	0	1.5
602.3	1.209	1.58E+04	4	1.5	0	1.5
602.4	1.206	1.58E+04	4	1.5	0	1.5
602.5	1.204	1.58E+04	4	1.5	0	1.5
602.6	1.202	1.58E+04	3.9	1.5	0	1.5
602.7	1.2	1.58E+04	3.9	1.5	0	1.5
602.8	1.197	1.58E+04	3.9	1.5	0	1.5
602.9	1.195	1.57E+04	3.9	1.5	0	1.5
603	1.193	1.57E+04	3.9	1.5	0	1.5
603.1	1.191	1.57E+04	3.9	1.4	0	1.4
603.2	1.188	1.57E+04	3.9	1.4	0	1.4
603.3	1.186	1.57E+04	3.9	1.4	0	1.4
603.4	1.184	1.57E+04	3.9	1.4	0	1.4
603.5	1.182	1.57E+04	3.9	1.4	0	1.4
603.6	1.18	1.57E+04	3.9	1.4	0	1.4
603.7	1.177	1.57E+04	3.9	1.4	0	1.4
603.8	1.175	1.56E+04	3.9	1.4	0	1.4
603.9	1.173	1.56E+04	3.9	1.4	0	1.4
604	1.171	1.56E+04	3.8	1.4	0	1.4
604.1	1.168	1.56E+04	3.8	1.4	0	1.4
604.2	1.166	1.56E+04	3.8	1.4	0	1.4
604.3	1.164	1.56E+04	3.8	1.4	0	1.4
604.4	1.162	1.56E+04	3.8	1.4	0	1.4
604.5	1.16	1.56E+04	3.8	1.4	0	1.4
604.6	1.157	1.56E+04	3.8	1.4	0	1.4
604.7	1.155	1.55E+04	3.8	1.3	0	1.3
604.8	1.153	1.55E+04	3.8	1.3	0	1.3
604.9	1.151	1.55E+04	3.8	1.3	0	1.3

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
605	1.149	1.55E+04	3.8	1.3	0	1.3
605.1	1.146	1.55E+04	3.8	1.3	0	1.3
605.2	1.144	1.55E+04	3.8	1.3	0	1.3
605.3	1.142	1.55E+04	3.8	1.3	0	1.3
605.4	1.14	1.55E+04	3.8	1.3	0	1.3
605.5	1.138	1.54E+04	3.7	1.3	0	1.3
605.6	1.136	1.54E+04	3.7	1.3	0	1.3
605.7	1.133	1.54E+04	3.7	1.3	0	1.3
605.8	1.131	1.54E+04	3.7	1.3	0	1.3
605.9	1.129	1.54E+04	3.7	1.3	0	1.3
606	1.127	1.54E+04	3.7	1.3	0	1.3
606.1	1.125	1.54E+04	3.7	1.3	0	1.3
606.2	1.123	1.54E+04	3.7	1.3	0	1.3
606.3	1.12	1.53E+04	3.7	1.3	0	1.3
606.4	1.118	1.53E+04	3.7	1.2	0	1.2
606.5	1.116	1.53E+04	3.7	1.2	0	1.2
606.6	1.114	1.53E+04	3.7	1.2	0	1.2
606.7	1.112	1.53E+04	3.7	1.2	0	1.2
606.8	1.11	1.53E+04	3.7	1.2	0	1.2
606.9	1.107	1.53E+04	3.7	1.2	0	1.2
607	1.105	1.53E+04	3.6	1.2	0	1.2
607.1	1.103	1.52E+04	3.6	1.2	0	1.2
607.2	1.101	1.52E+04	3.6	1.2	0	1.2
607.3	1.099	1.52E+04	3.6	1.2	0	1.2
607.4	1.097	1.52E+04	3.6	1.2	0	1.2
607.5	1.095	1.52E+04	3.6	1.2	0	1.2
607.6	1.092	1.52E+04	3.6	1.2	0	1.2
607.7	1.09	1.51E+04	3.6	1.2	0	1.2
607.8	1.088	1.51E+04	3.6	1.2	0	1.2
607.9	1.086	1.51E+04	3.6	1.2	0	1.2
608	1.084	1.51E+04	3.6	1.2	0	1.2
608.1	1.082	1.51E+04	3.6	1.2	0	1.2
608.2	1.08	1.51E+04	3.6	1.1	0	1.1
608.3	1.077	1.51E+04	3.6	1.1	0	1.1
608.4	1.075	1.50E+04	3.5	1.1	0	1.1
608.5	1.073	1.50E+04	3.5	1.1	0	1.1
608.6	1.071	1.50E+04	3.5	1.1	0	1.1
608.7	1.069	1.50E+04	3.5	1.1	0	1.1
608.8	1.067	1.50E+04	3.5	1.1	0	1.1
608.9	1.065	1.50E+04	3.5	1.1	0	1.1
609	1.063	1.49E+04	3.5	1.1	0	1.1
609.1	1.061	1.49E+04	3.5	1.1	0	1.1

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
609.2	1.059	1.49E+04	3.5	1.1	0	1.1
609.3	1.056	1.49E+04	3.5	1.1	0	1.1
609.4	1.054	1.49E+04	3.5	1.1	0	1.1
609.5	1.052	1.49E+04	3.5	1.1	0	1.1
609.6	1.05	1.48E+04	3.5	1.1	0	1.1
609.7	1.048	1.48E+04	3.5	1.1	0	1.1
609.8	1.046	1.48E+04	3.5	1.1	0	1.1
609.9	1.044	1.48E+04	3.4	1.1	0	1.1
610	1.042	1.48E+04	3.4	1.1	0	1.1
610.1	1.04	1.48E+04	3.4	1	0	1
610.2	1.038	1.47E+04	3.4	1	0	1
610.3	1.036	1.47E+04	3.4	1	0	1
610.4	1.034	1.47E+04	3.4	1	0	1
610.5	1.031	1.47E+04	3.4	1	0	1
610.6	1.029	1.47E+04	3.4	1	0	1
610.7	1.027	1.47E+04	3.4	1	0	1
610.8	1.025	1.46E+04	3.4	1	0	1
610.9	1.023	1.46E+04	3.4	1	0	1
611	1.021	1.46E+04	3.4	1	0	1
611.1	1.019	1.46E+04	3.4	1	0	1
611.2	1.017	1.46E+04	3.4	1	0	1
611.3	1.015	1.46E+04	3.4	1	0	1
611.4	1.013	1.45E+04	3.3	1	0	1
611.5	1.011	1.45E+04	3.3	1	0	1
611.6	1.009	1.45E+04	3.3	1	0	1
611.7	1.007	1.45E+04	3.3	1	0	1
611.8	1.005	1.45E+04	3.3	1	0	1
611.9	1.003	1.45E+04	3.3	1	0	1
612	1.001	1.44E+04	3.3	1	0	1
612.1	0.999	1.44E+04	3.3	0.9	0	0.9
612.2	0.997	1.44E+04	3.3	0.9	0	0.9
612.3	0.995	1.44E+04	3.3	0.9	0	0.9
612.4	0.993	1.44E+04	3.3	0.9	0	0.9
612.5	0.991	1.44E+04	3.3	0.9	0	0.9
612.6	0.989	1.43E+04	3.3	0.9	0	0.9
612.7	0.987	1.43E+04	3.3	0.9	0	0.9
612.8	0.985	1.43E+04	3.3	0.9	0	0.9
612.9	0.983	1.43E+04	3.2	0.9	0	0.9
613	0.981	1.43E+04	3.2	0.9	0	0.9
613.1	0.979	1.43E+04	3.2	0.9	0	0.9
613.2	0.977	1.42E+04	3.2	0.9	0	0.9
613.3	0.975	1.42E+04	3.2	0.9	0	0.9

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
613.4	0.973	1.42E+04	3.2	0.9	0	0.9
613.5	0.971	1.42E+04	3.2	0.9	0	0.9
613.6	0.969	1.42E+04	3.2	0.9	0	0.9
613.7	0.967	1.42E+04	3.2	0.9	0	0.9
613.8	0.965	1.41E+04	3.2	0.9	0	0.9
613.9	0.963	1.41E+04	3.2	0.9	0	0.9
614	0.961	1.41E+04	3.2	0.9	0	0.9
614.1	0.959	1.41E+04	3.2	0.9	0	0.9
614.2	0.957	1.41E+04	3.2	0.9	0	0.9
614.3	0.955	1.40E+04	3.2	0.8	0	0.8
614.4	0.953	1.40E+04	3.2	0.8	0	0.8
614.5	0.951	1.40E+04	3.1	0.8	0	0.8
614.6	0.949	1.40E+04	3.1	0.8	0	0.8
614.7	0.947	1.40E+04	3.1	0.8	0	0.8
614.8	0.945	1.40E+04	3.1	0.8	0	0.8
614.9	0.943	1.39E+04	3.1	0.8	0	0.8
615	0.941	1.39E+04	3.1	0.8	0	0.8
615.1	0.94	1.39E+04	3.1	0.8	0	0.8
615.2	0.938	1.39E+04	3.1	0.8	0	0.8
615.3	0.936	1.39E+04	3.1	0.8	0	0.8
615.4	0.934	1.39E+04	3.1	0.8	0	0.8
615.5	0.932	1.38E+04	3.1	0.8	0	0.8
615.6	0.93	1.38E+04	3.1	0.8	0	0.8
615.7	0.928	1.38E+04	3.1	0.8	0	0.8
615.8	0.926	1.38E+04	3.1	0.8	0	0.8
615.9	0.924	1.38E+04	3.1	0.8	0	0.8
616	0.922	1.37E+04	3.1	0.8	0	0.8
616.1	0.92	1.37E+04	3	0.8	0	0.8
616.2	0.918	1.37E+04	3	0.8	0	0.8
616.3	0.917	1.37E+04	3	0.8	0	0.8
616.4	0.915	1.37E+04	3	0.8	0	0.8
616.5	0.913	1.37E+04	3	0.8	0	0.8
616.6	0.911	1.36E+04	3	0.8	0	0.8
616.7	0.909	1.36E+04	3	0.8	0	0.8
616.8	0.907	1.36E+04	3	0.7	0	0.7
616.9	0.905	1.36E+04	3	0.7	0	0.7
617	0.903	1.36E+04	3	0.7	0	0.7
617.1	0.901	1.36E+04	3	0.7	0	0.7
617.2	0.9	1.35E+04	3	0.7	0	0.7
617.3	0.898	1.35E+04	3	0.7	0	0.7
617.4	0.896	1.35E+04	3	0.7	0	0.7
617.5	0.894	1.35E+04	3	0.7	0	0.7

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
617.6	0.892	1.35E+04	3	0.7	0	0.7
617.7	0.89	1.34E+04	2.9	0.7	0	0.7
617.8	0.888	1.34E+04	2.9	0.7	0	0.7
617.9	0.887	1.34E+04	2.9	0.7	0	0.7
618	0.885	1.34E+04	2.9	0	0	0
618.1	0.883	1.34E+04	2.9	0	0	0
618.2	0.881	1.34E+04	2.9	0	0	0
618.3	0.879	1.33E+04	2.9	0	0	0
618.4	0.877	1.33E+04	2.9	0	0	0
618.5	0.876	1.33E+04	2.9	0	0	0
618.6	0.874	1.33E+04	2.9	0	0	0
618.7	0.872	1.33E+04	2.9	0	0	0
618.8	0.87	1.33E+04	2.9	0	0	0
618.9	0.868	1.32E+04	2.9	0	0	0
619	0.866	1.32E+04	2.9	0	0	0
619.1	0.865	1.32E+04	2.9	0	0	0
619.2	0.863	1.32E+04	2.9	0	0	0
619.3	0.861	1.32E+04	2.9	0	0	0
619.4	0.859	1.31E+04	2.8	0	0	0
619.5	0.857	1.31E+04	2.8	0	0	0
619.6	0.856	1.31E+04	2.8	0	0	0
619.7	0.854	1.31E+04	2.8	0	0	0
619.8	0.852	1.31E+04	2.8	0	0	0
619.9	0.85	1.31E+04	2.8	0	0	0
620	0.848	1.30E+04	2.8	0	0	0
620.1	0.847	1.30E+04	2.8	0	0	0
620.2	0.845	1.30E+04	2.8	0	0	0
620.3	0.843	1.30E+04	2.8	0	0	0
620.4	0.841	1.30E+04	2.8	0	0	0
620.5	0.84	1.30E+04	2.8	0	0	0
620.6	0.838	1.29E+04	2.8	0	0	0
620.7	0.836	1.29E+04	2.8	0	0	0
620.8	0.834	1.29E+04	2.8	0	0	0
620.9	0.832	1.29E+04	2.8	0	0	0
621	0.831	1.29E+04	2.8	0	0	0
621.1	0.829	1.29E+04	2.7	0	0	0
621.2	0.827	1.28E+04	2.7	0	0	0
621.3	0.825	1.28E+04	2.7	0	0	0
621.4	0.824	1.28E+04	2.7	0	0	0
621.5	0.822	1.28E+04	2.7	0	0	0
621.6	0.82	1.28E+04	2.7	0	0	0
621.7	0.819	1.27E+04	2.7	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
621.8	0.817	1.27E+04	2.7	0	0	0
621.9	0.815	1.27E+04	2.7	0	0	0
622	0.813	1.27E+04	2.7	0	0	0
622.1	0.812	1.27E+04	2.7	0	0	0
622.2	0.81	1.27E+04	2.7	0	0	0
622.3	0.808	1.26E+04	2.7	0	0	0
622.4	0.806	1.26E+04	2.7	0	0	0
622.5	0.805	1.26E+04	2.7	0	0	0
622.6	0.803	1.26E+04	2.7	0	0	0
622.7	0.801	1.26E+04	2.7	0	0	0
622.8	0.8	1.26E+04	2.7	0	0	0
622.9	0.798	1.25E+04	2.6	0	0	0
623	0.796	1.25E+04	2.6	0	0	0
623.1	0.795	1.25E+04	2.6	0	0	0
623.2	0.793	1.25E+04	2.6	0	0	0
623.3	0.791	1.25E+04	2.6	0	0	0
623.4	0.79	1.25E+04	2.6	0	0	0
623.5	0.788	1.24E+04	2.6	0	0	0
623.6	0.786	1.24E+04	2.6	0	0	0
623.7	0.785	1.24E+04	2.6	0	0	0
623.8	0.783	1.24E+04	2.6	0	0	0
623.9	0.781	1.24E+04	2.6	0	0	0
624	0.78	1.24E+04	2.6	0	0	0
624.1	0.778	1.23E+04	2.6	0	0	0
624.2	0.776	1.23E+04	2.6	0	0	0
624.3	0.775	1.23E+04	2.6	0	0	0
624.4	0.773	1.23E+04	2.6	0	0	0
624.5	0.771	1.23E+04	2.6	0	0	0
624.6	0.77	1.23E+04	2.6	0	0	0
624.7	0.768	1.23E+04	2.6	0	0	0
624.8	0.766	1.22E+04	2.5	0	0	0
624.9	0.765	1.22E+04	2.5	0	0	0
625	0.763	1.22E+04	2.5	0	0	0
625.1	0.761	1.22E+04	2.5	0	0	0
625.2	0.76	1.22E+04	2.5	0	0	0
625.3	0.758	1.22E+04	2.5	0	0	0
625.4	0.757	1.21E+04	2.5	0	0	0
625.5	0.755	1.21E+04	2.5	0	0	0
625.6	0.753	1.21E+04	2.5	0	0	0
625.7	0.752	1.21E+04	2.5	0	0	0
625.8	0.75	1.21E+04	2.5	0	0	0
625.9	0.749	1.21E+04	2.5	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
626	0.747	1.21E+04	2.5	0	0	0
626.1	0.745	1.20E+04	2.5	0	0	0
626.2	0.744	1.20E+04	2.5	0	0	0
626.3	0.742	1.20E+04	2.5	0	0	0
626.4	0.741	1.20E+04	2.5	0	0	0
626.5	0.739	1.20E+04	2.5	0	0	0
626.6	0.737	1.20E+04	2.5	0	0	0
626.7	0.736	1.19E+04	2.4	0	0	0
626.8	0.734	1.19E+04	2.4	0	0	0
626.9	0.733	1.19E+04	2.4	0	0	0
627	0.731	1.19E+04	2.4	0	0	0
627.1	0.73	1.19E+04	2.4	0	0	0
627.2	0.728	1.19E+04	2.4	0	0	0
627.3	0.726	1.19E+04	2.4	0	0	0
627.4	0.725	1.18E+04	2.4	0	0	0
627.5	0.723	1.18E+04	2.4	0	0	0
627.6	0.722	1.18E+04	2.4	0	0	0
627.7	0.72	1.18E+04	2.4	0	0	0
627.8	0.719	1.18E+04	2.4	0	0	0
627.9	0.717	1.18E+04	2.4	0	0	0
628	0.716	1.18E+04	2.4	0	0	0
628.1	0.714	1.17E+04	2.4	0	0	0
628.2	0.713	1.17E+04	2.4	0	0	0
628.3	0.711	1.17E+04	2.4	0	0	0
628.4	0.709	1.17E+04	2.4	0	0	0
628.5	0.708	1.17E+04	2.4	0	0	0
628.6	0.706	1.17E+04	2.4	0	0	0
628.7	0.705	1.17E+04	2.3	0	0	0
628.8	0.703	1.16E+04	2.3	0	0	0
628.9	0.702	1.16E+04	2.3	0	0	0
629	0.7	1.16E+04	2.3	0	0	0
629.1	0.699	1.16E+04	2.3	0	0	0
629.2	0.697	1.16E+04	2.3	0	0	0
629.3	0.696	1.16E+04	2.3	0	0	0
629.4	0.694	1.15E+04	2.3	0	0	0
629.5	0.693	1.15E+04	2.3	0	0	0
629.6	0.691	1.15E+04	2.3	0	0	0
629.7	0.69	1.15E+04	2.3	0	0	0
629.8	0.688	1.15E+04	2.3	0	0	0
629.9	0.687	1.15E+04	2.3	0	0	0
630	0.685	1.15E+04	2.3	0	0	0
630.1	0.684	1.14E+04	2.3	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
630.2	0.683	1.14E+04	2.3	0	0	0
630.3	0.681	1.14E+04	2.3	0	0	0
630.4	0.68	1.14E+04	2.3	0	0	0
630.5	0.678	1.14E+04	2.3	0	0	0
630.6	0.677	1.14E+04	2.3	0	0	0
630.7	0.675	1.14E+04	2.2	0	0	0
630.8	0.674	1.13E+04	2.2	0	0	0
630.9	0.672	1.13E+04	2.2	0	0	0
631	0.671	1.13E+04	2.2	0	0	0
631.1	0.669	1.13E+04	2.2	0	0	0
631.2	0.668	1.13E+04	2.2	0	0	0
631.3	0.666	1.13E+04	2.2	0	0	0
631.4	0.665	1.13E+04	2.2	0	0	0
631.5	0.664	1.13E+04	2.2	0	0	0
631.6	0.662	1.12E+04	2.2	0	0	0
631.7	0.661	1.12E+04	2.2	0	0	0
631.8	0.659	1.12E+04	2.2	0	0	0
631.9	0.658	1.12E+04	2.2	0	0	0
632	0.656	1.12E+04	2.2	0	0	0
632.1	0.655	1.12E+04	2.2	0	0	0
632.2	0.654	1.12E+04	2.2	0	0	0
632.3	0.652	1.11E+04	2.2	0	0	0
632.4	0.651	1.11E+04	2.2	0	0	0
632.5	0.649	1.11E+04	2.2	0	0	0
632.6	0.648	1.11E+04	2.2	0	0	0
632.7	0.647	1.11E+04	2.2	0	0	0
632.8	0.645	1.11E+04	2.1	0	0	0
632.9	0.644	1.11E+04	2.1	0	0	0
633	0.642	1.10E+04	2.1	0	0	0
633.1	0.641	1.10E+04	2.1	0	0	0
633.2	0.64	1.10E+04	2.1	0	0	0
633.3	0.638	1.10E+04	2.1	0	0	0
633.4	0.637	1.10E+04	2.1	0	0	0
633.5	0.635	1.10E+04	2.1	0	0	0
633.6	0.634	1.10E+04	2.1	0	0	0
633.7	0.633	1.10E+04	2.1	0	0	0
633.8	0.631	1.09E+04	2.1	0	0	0
633.9	0.63	1.09E+04	2.1	0	0	0
634	0.629	1.09E+04	2.1	0	0	0
634.1	0.627	1.09E+04	2.1	0	0	0
634.2	0.626	1.09E+04	2.1	0	0	0
634.3	0.624	1.09E+04	2.1	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
634.4	0.623	1.09E+04	2.1	0	0	0
634.5	0.622	1.09E+04	2.1	0	0	0
634.6	0.62	1.08E+04	2.1	0	0	0
634.7	0.619	1.08E+04	2.1	0	0	0
634.8	0.618	1.08E+04	2.1	0	0	0
634.9	0.616	1.08E+04	2.1	0	0	0
635	0.615	1.08E+04	2.1	0	0	0
635.1	0.614	1.08E+04	2	0	0	0
635.2	0.612	1.08E+04	2	0	0	0
635.3	0.611	1.08E+04	2	0	0	0
635.4	0.61	1.07E+04	2	0	0	0
635.5	0.608	1.07E+04	2	0	0	0
635.6	0.607	1.07E+04	2	0	0	0
635.7	0.606	1.07E+04	2	0	0	0
635.8	0.604	1.07E+04	2	0	0	0
635.9	0.603	1.07E+04	2	0	0	0
636	0.602	1.07E+04	2	0	0	0
636.1	0.601	1.07E+04	2	0	0	0
636.2	0.599	1.06E+04	2	0	0	0
636.3	0.598	1.06E+04	2	0	0	0
636.4	0.597	1.06E+04	2	0	0	0
636.5	0.595	1.06E+04	2	0	0	0
636.6	0.594	1.06E+04	2	0	0	0
636.7	0.593	1.06E+04	2	0	0	0
636.8	0.592	1.06E+04	2	0	0	0
636.9	0.59	1.06E+04	2	0	0	0
637	0.589	1.06E+04	2	0	0	0
637.1	0.588	1.05E+04	2	0	0	0
637.2	0.586	1.05E+04	2	0	0	0
637.3	0.585	1.05E+04	2	0	0	0
637.4	0.584	1.05E+04	1.9	0	0	0
637.5	0.583	1.05E+04	1.9	0	0	0
637.6	0.581	1.05E+04	1.9	0	0	0
637.7	0.58	1.05E+04	1.9	0	0	0
637.8	0.579	1.05E+04	1.9	0	0	0
637.9	0.578	1.04E+04	1.9	0	0	0
638	0.576	1.04E+04	1.9	0	0	0
638.1	0.575	1.04E+04	1.9	0	0	0
638.2	0.574	1.04E+04	1.9	0	0	0
638.3	0.573	1.04E+04	1.9	0	0	0
638.4	0.571	1.04E+04	1.9	0	0	0
638.5	0.57	1.04E+04	1.9	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
638.6	0.569	1.04E+04	1.9	0	0	0
638.7	0.568	1.04E+04	1.9	0	0	0
638.8	0.567	1.04E+04	1.9	0	0	0
638.9	0.565	1.03E+04	1.9	0	0	0
639	0.564	1.03E+04	1.9	0	0	0
639.1	0.563	1.03E+04	1.9	0	0	0
639.2	0.562	1.03E+04	1.9	0	0	0
639.3	0.561	1.03E+04	1.9	0	0	0
639.4	0.559	1.03E+04	1.9	0	0	0
639.5	0.558	1.03E+04	1.9	0	0	0
639.6	0.557	1.03E+04	1.9	0	0	0
639.7	0.556	1.03E+04	1.9	0	0	0
639.8	0.555	1.02E+04	1.9	0	0	0
639.9	0.553	1.02E+04	1.8	0	0	0
640	0.552	1.02E+04	1.8	0	0	0
640.1	0.551	1.02E+04	1.8	0	0	0
640.2	0.55	1.02E+04	1.8	0	0	0
640.3	0.549	1.02E+04	1.8	0	0	0
640.4	0.548	1.02E+04	1.8	0	0	0
640.5	0.546	1.02E+04	1.8	0	0	0
640.6	0.545	1.02E+04	1.8	0	0	0
640.7	0.544	1.02E+04	1.8	0	0	0
640.8	0.543	1.02E+04	1.8	0	0	0
640.9	0.542	1.01E+04	1.8	0	0	0
641	0.541	1.01E+04	1.8	0	0	0
641.1	0.539	1.01E+04	1.8	0	0	0
641.2	0.538	1.01E+04	1.8	0	0	0
641.3	0.537	1.01E+04	1.8	0	0	0
641.4	0.536	1.01E+04	1.8	0	0	0
641.5	0.535	1.01E+04	1.8	0	0	0
641.6	0.534	1.01E+04	1.8	0	0	0
641.7	0.533	1.01E+04	1.8	0	0	0
641.8	0.531	1.01E+04	1.8	0	0	0
641.9	0.53	1.01E+04	1.8	0	0	0
642	0.529	1.00E+04	1.8	0	0	0
642.1	0.528	1.00E+04	1.8	0	0	0
642.2	0.527	1.00E+04	1.8	0	0	0
642.3	0.526	1.00E+04	1.8	0	0	0
642.4	0.525	1.00E+04	1.8	0	0	0
642.5	0.524	1.00E+04	1.8	0	0	0
642.6	0.523	9.99E+03	1.7	0	0	0
642.7	0.521	9.98E+03	1.7	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
642.8	0.52	9.98E+03	1.7	0	0	0
642.9	0.519	9.97E+03	1.7	0	0	0
643	0.518	9.96E+03	1.7	0	0	0
643.1	0.517	9.95E+03	1.7	0	0	0
643.2	0.516	9.94E+03	1.7	0	0	0
643.3	0.515	9.94E+03	1.7	0	0	0
643.4	0.514	9.93E+03	1.7	0	0	0
643.5	0.513	9.92E+03	1.7	0	0	0
643.6	0.512	9.91E+03	1.7	0	0	0
643.7	0.511	9.90E+03	1.7	0	0	0
643.8	0.51	9.90E+03	1.7	0	0	0
643.9	0.508	9.89E+03	1.7	0	0	0
644	0.507	9.88E+03	1.7	0	0	0
644.1	0.506	9.87E+03	1.7	0	0	0
644.2	0.505	9.87E+03	1.7	0	0	0
644.3	0.504	9.86E+03	1.7	0	0	0
644.4	0.503	9.85E+03	1.7	0	0	0
644.5	0.502	9.85E+03	1.7	0	0	0
644.6	0.501	9.84E+03	1.7	0	0	0
644.7	0.5	9.83E+03	1.7	0	0	0
644.8	0.499	9.82E+03	1.7	0	0	0
644.9	0.498	9.82E+03	1.7	0	0	0
645	0.497	9.81E+03	1.7	0	0	0
645.1	0.496	9.80E+03	1.7	0	0	0
645.2	0.495	9.80E+03	1.7	0	0	0
645.3	0.494	9.79E+03	1.7	0	0	0
645.4	0.493	9.78E+03	1.7	0	0	0
645.5	0.492	9.78E+03	1.6	0	0	0
645.6	0.491	9.77E+03	1.6	0	0	0
645.7	0.49	9.77E+03	1.6	0	0	0
645.8	0.489	9.76E+03	1.6	0	0	0
645.9	0.488	9.75E+03	1.6	0	0	0
646	0.487	9.75E+03	1.6	0	0	0
646.1	0.486	9.74E+03	1.6	0	0	0
646.2	0.485	9.73E+03	1.6	0	0	0
646.3	0.484	9.73E+03	1.6	0	0	0
646.4	0.483	9.72E+03	1.6	0	0	0
646.5	0.482	9.72E+03	1.6	0	0	0
646.6	0.481	9.71E+03	1.6	0	0	0
646.7	0.48	9.71E+03	1.6	0	0	0
646.8	0.479	9.70E+03	1.6	0	0	0
646.9	0.478	9.69E+03	1.6	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
647	0.477	9.69E+03	1.6	0	0	0
647.1	0.476	9.68E+03	1.6	0	0	0
647.2	0.475	9.68E+03	1.6	0	0	0
647.3	0.474	9.67E+03	1.6	0	0	0
647.4	0.473	9.67E+03	1.6	0	0	0
647.5	0.472	9.66E+03	1.6	0	0	0
647.6	0.471	9.66E+03	1.6	0	0	0
647.7	0.47	9.65E+03	1.6	0	0	0
647.8	0.469	9.65E+03	1.6	0	0	0
647.9	0.468	9.64E+03	1.6	0	0	0
648	0.467	9.64E+03	1.6	0	0	0
648.1	0.466	9.63E+03	1.6	0	0	0
648.2	0.465	9.63E+03	1.6	0	0	0
648.3	0.464	9.62E+03	1.6	0	0	0
648.4	0.464	9.62E+03	1.6	0	0	0
648.5	0.463	9.61E+03	1.6	0	0	0
648.6	0.462	9.61E+03	1.5	0	0	0
648.7	0.461	9.60E+03	1.5	0	0	0
648.8	0.46	9.60E+03	1.5	0	0	0
648.9	0.459	9.60E+03	1.5	0	0	0
649	0.458	9.59E+03	1.5	0	0	0
649.1	0.457	9.59E+03	1.5	0	0	0
649.2	0.456	9.58E+03	1.5	0	0	0
649.3	0.455	9.58E+03	1.5	0	0	0
649.4	0.454	9.58E+03	1.5	0	0	0
649.5	0.453	9.57E+03	1.5	0	0	0
649.6	0.452	9.57E+03	1.5	0	0	0
649.7	0.452	9.56E+03	1.5	0	0	0
649.8	0.451	9.56E+03	1.5	0	0	0
649.9	0.45	9.56E+03	1.5	0	0	0
650	0.449	9.55E+03	1.5	0	0	0
650.1	0.448	9.55E+03	1.5	0	0	0
650.2	0.447	9.55E+03	1.5	0	0	0
650.3	0.446	9.54E+03	1.5	0	0	0
650.4	0.445	9.54E+03	1.5	0	0	0
650.5	0.444	9.53E+03	1.5	0	0	0
650.6	0.443	9.53E+03	1.5	0	0	0
650.7	0.443	9.53E+03	1.5	0	0	0
650.8	0.442	9.53E+03	1.5	0	0	0
650.9	0.441	9.52E+03	1.5	0	0	0
651	0.44	9.52E+03	1.5	0	0	0
651.1	0.439	9.52E+03	1.5	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
651.2	0.438	9.51E+03	1.5	0	0	0
651.3	0.437	9.51E+03	1.5	0	0	0
651.4	0.436	9.51E+03	1.5	0	0	0
651.5	0.436	9.50E+03	1.5	0	0	0
651.6	0.435	9.50E+03	1.5	0	0	0
651.7	0.434	9.50E+03	1.5	0	0	0
651.8	0.433	9.50E+03	1.5	0	0	0
651.9	0.432	9.49E+03	1.5	0	0	0
652	0.431	9.49E+03	1.4	0	0	0
652.1	0.43	9.49E+03	1.4	0	0	0
652.2	0.43	9.49E+03	1.4	0	0	0
652.3	0.429	9.49E+03	1.4	0	0	0
652.4	0.428	9.48E+03	1.4	0	0	0
652.5	0.427	9.48E+03	1.4	0	0	0
652.6	0.426	9.48E+03	1.4	0	0	0
652.7	0.425	9.48E+03	1.4	0	0	0
652.8	0.425	9.48E+03	1.4	0	0	0
652.9	0.424	9.47E+03	1.4	0	0	0
653	0.423	9.47E+03	1.4	0	0	0
653.1	0.422	9.47E+03	1.4	0	0	0
653.2	0.421	9.47E+03	1.4	0	0	0
653.3	0.42	9.47E+03	1.4	0	0	0
653.4	0.42	9.47E+03	1.4	0	0	0
653.5	0.419	9.47E+03	1.4	0	0	0
653.6	0.418	9.47E+03	1.4	0	0	0
653.7	0.417	9.46E+03	1.4	0	0	0
653.8	0.416	9.46E+03	1.4	0	0	0
653.9	0.416	9.46E+03	1.4	0	0	0
654	0.415	9.46E+03	1.4	0	0	0
654.1	0.414	9.46E+03	1.4	0	0	0
654.2	0.413	9.46E+03	1.4	0	0	0
654.3	0.412	9.46E+03	1.4	0	0	0
654.4	0.412	9.46E+03	1.4	0	0	0
654.5	0.411	9.46E+03	1.4	0	0	0
654.6	0.41	9.46E+03	1.4	0	0	0
654.7	0.409	9.46E+03	1.4	0	0	0
654.8	0.408	9.46E+03	1.4	0	0	0
654.9	0.408	9.46E+03	1.4	0	0	0
655	0.407	9.46E+03	1.4	0	0	0
655.1	0.406	9.46E+03	1.4	0	0	0
655.2	0.405	9.46E+03	1.4	0	0	0
655.3	0.405	9.46E+03	1.4	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
655.4	0.404	9.46E+03	1.4	0	0	0
655.5	0.403	9.46E+03	1.4	0	0	0
655.6	0.402	9.46E+03	1.4	0	0	0
655.7	0.402	9.47E+03	1.4	0	0	0
655.8	0.401	9.47E+03	1.3	0	0	0
655.9	0.4	9.47E+03	1.3	0	0	0
656	0.399	9.47E+03	1.3	0	0	0
656.1	0.399	9.47E+03	1.3	0	0	0
656.2	0.398	9.47E+03	1.3	0	0	0
656.3	0.397	9.47E+03	1.3	0	0	0
656.4	0.397	9.48E+03	1.3	0	0	0
656.5	0.396	9.48E+03	1.3	0	0	0
656.6	0.395	9.48E+03	1.3	0	0	0
656.7	0.394	9.48E+03	1.3	0	0	0
656.8	0.394	9.48E+03	1.3	0	0	0
656.9	0.393	9.49E+03	1.3	0	0	0
657	0.392	9.49E+03	1.3	0	0	0
657.1	0.392	9.49E+03	1.3	0	0	0
657.2	0.391	9.50E+03	1.3	0	0	0
657.3	0.39	9.50E+03	1.3	0	0	0
657.4	0.39	9.50E+03	1.3	0	0	0
657.5	0.389	9.50E+03	1.3	0	0	0
657.6	0.388	9.51E+03	1.3	0	0	0
657.7	0.387	9.51E+03	1.3	0	0	0
657.8	0.387	9.51E+03	1.3	0	0	0
657.9	0.386	9.52E+03	1.3	0	0	0
658	0.385	9.52E+03	1.3	0	0	0
658.1	0.385	9.53E+03	1.3	0	0	0
658.2	0.384	9.53E+03	1.3	0	0	0
658.3	0.383	9.53E+03	1.3	0	0	0
658.4	0.383	9.54E+03	1.3	0	0	0
658.5	0.382	9.54E+03	1.3	0	0	0
658.6	0.381	9.55E+03	1.3	0	0	0
658.7	0.381	9.55E+03	1.3	0	0	0
658.8	0.38	9.56E+03	1.3	0	0	0
658.9	0.38	9.56E+03	1.3	0	0	0
659	0.379	9.57E+03	1.3	0	0	0
659.1	0.378	9.57E+03	1.3	0	0	0
659.2	0.378	9.58E+03	1.3	0	0	0
659.3	0.377	9.58E+03	1.3	0	0	0
659.4	0.376	9.59E+03	1.3	0	0	0
659.5	0.376	9.59E+03	1.3	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
659.6	0.375	9.60E+03	1.3	0	0	0
659.7	0.374	9.60E+03	1.3	0	0	0
659.8	0.374	9.61E+03	1.3	0	0	0
659.9	0.373	9.61E+03	1.3	0	0	0
660	0.373	9.62E+03	1.3	0	0	0
660.1	0.372	9.63E+03	1.3	0	0	0
660.2	0.371	9.63E+03	1.3	0	0	0
660.3	0.371	9.64E+03	1.2	0	0	0
660.4	0.37	9.65E+03	1.2	0	0	0
660.5	0.37	9.65E+03	1.2	0	0	0
660.6	0.369	9.66E+03	1.2	0	0	0
660.7	0.368	9.66E+03	1.2	0	0	0
660.8	0.368	9.67E+03	1.2	0	0	0
660.9	0.367	9.68E+03	1.2	0	0	0
661	0.367	9.69E+03	1.2	0	0	0
661.1	0.366	9.69E+03	1.2	0	0	0
661.2	0.365	9.70E+03	1.2	0	0	0
661.3	0.365	9.71E+03	1.2	0	0	0
661.4	0.364	9.71E+03	1.2	0	0	0
661.5	0.364	9.72E+03	1.2	0	0	0
661.6	0.363	9.73E+03	1.2	0	0	0
661.7	0.363	9.74E+03	1.2	0	0	0
661.8	0.362	9.74E+03	1.2	0	0	0
661.9	0.361	9.75E+03	1.2	0	0	0
662	0.361	9.76E+03	1.2	0	0	0
662.1	0.36	9.77E+03	1.2	0	0	0
662.2	0.36	9.77E+03	1.2	0	0	0
662.3	0.359	9.78E+03	1.2	0	0	0
662.4	0.358	9.79E+03	1.2	0	0	0
662.5	0.358	9.80E+03	1.2	0	0	0
662.6	0.357	9.81E+03	1.2	0	0	0
662.7	0.357	9.82E+03	1.2	0	0	0
662.8	0.356	9.82E+03	1.2	0	0	0
662.9	0.356	9.83E+03	1.2	0	0	0
663	0.355	9.84E+03	1.2	0	0	0
663.1	0.355	9.85E+03	1.2	0	0	0
663.2	0.354	9.86E+03	1.2	0	0	0
663.3	0.353	9.87E+03	1.2	0	0	0
663.4	0.353	9.88E+03	1.2	0	0	0
663.5	0.352	9.88E+03	1.2	0	0	0
663.6	0.352	9.89E+03	1.2	0	0	0
663.7	0.351	9.90E+03	1.2	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
663.8	0.351	9.91E+03	1.2	0	0	0
663.9	0.35	9.92E+03	1.2	0	0	0
664	0.35	9.93E+03	1.2	0	0	0
664.1	0.349	9.94E+03	1.2	0	0	0
664.2	0.348	9.95E+03	1.2	0	0	0
664.3	0.348	9.96E+03	1.2	0	0	0
664.4	0.347	9.97E+03	1.2	0	0	0
664.5	0.347	9.98E+03	1.2	0	0	0
664.6	0.346	9.99E+03	1.2	0	0	0
664.7	0.346	1.00E+04	1.2	0	0	0
664.8	0.345	1.00E+04	1.2	0	0	0
664.9	0.345	1.00E+04	1.2	0	0	0
665	0.344	1.00E+04	1.2	0	0	0
665.1	0.344	1.00E+04	1.2	0	0	0
665.2	0.343	1.00E+04	1.2	0	0	0
665.3	0.342	1.01E+04	1.2	0	0	0
665.4	0.342	1.01E+04	1.2	0	0	0
665.5	0.341	1.01E+04	1.2	0	0	0
665.6	0.341	1.01E+04	1.2	0	0	0
665.7	0.34	1.01E+04	1.1	0	0	0
665.8	0.34	1.01E+04	1.1	0	0	0
665.9	0.339	1.01E+04	1.1	0	0	0
666	0.339	1.01E+04	1.1	0	0	0
666.1	0.338	1.01E+04	1.1	0	0	0
666.2	0.338	1.01E+04	1.1	0	0	0
666.3	0.337	1.02E+04	1.1	0	0	0
666.4	0.337	1.02E+04	1.1	0	0	0
666.5	0.336	1.02E+04	1.1	0	0	0
666.6	0.336	1.02E+04	1.1	0	0	0
666.7	0.335	1.02E+04	1.1	0	0	0
666.8	0.334	1.02E+04	1.1	0	0	0
666.9	0.334	1.02E+04	1.1	0	0	0
667	0.333	1.02E+04	1.1	0	0	0
667.1	0.333	1.02E+04	1.1	0	0	0
667.2	0.332	1.02E+04	1.1	0	0	0
667.3	0.332	1.03E+04	1.1	0	0	0
667.4	0.331	1.03E+04	1.1	0	0	0
667.5	0.331	1.03E+04	1.1	0	0	0
667.6	0.33	1.03E+04	1.1	0	0	0
667.7	0.33	1.03E+04	1.1	0	0	0
667.8	0.329	1.03E+04	1.1	0	0	0
667.9	0.329	1.03E+04	1.1	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
668	0.328	1.03E+04	1.1	0	0	0
668.1	0.328	1.03E+04	1.1	0	0	0
668.2	0.327	1.04E+04	1.1	0	0	0
668.3	0.327	1.04E+04	1.1	0	0	0
668.4	0.326	1.04E+04	1.1	0	0	0
668.5	0.326	1.04E+04	1.1	0	0	0
668.6	0.325	1.04E+04	1.1	0	0	0
668.7	0.325	1.04E+04	1.1	0	0	0
668.8	0.324	1.04E+04	1.1	0	0	0
668.9	0.324	1.04E+04	1.1	0	0	0
669	0.323	1.05E+04	1.1	0	0	0
669.1	0.323	1.05E+04	1.1	0	0	0
669.2	0.322	1.05E+04	1.1	0	0	0
669.3	0.322	1.05E+04	1.1	0	0	0
669.4	0.321	1.05E+04	1.1	0	0	0
669.5	0.321	1.05E+04	1.1	0	0	0
669.6	0.32	1.05E+04	1.1	0	0	0
669.7	0.32	1.05E+04	1.1	0	0	0
669.8	0.319	1.05E+04	1.1	0	0	0
669.9	0.319	1.06E+04	1.1	0	0	0
670	0.318	1.06E+04	1.1	0	0	0
670.1	0.318	1.06E+04	1.1	0	0	0
670.2	0.317	1.06E+04	1.1	0	0	0
670.3	0.317	1.06E+04	1.1	0	0	0
670.4	0.316	1.06E+04	1.1	0	0	0
670.5	0.316	1.06E+04	1.1	0	0	0
670.6	0.315	1.07E+04	1.1	0	0	0
670.7	0.315	1.07E+04	1.1	0	0	0
670.8	0.314	1.07E+04	1.1	0	0	0
670.9	0.314	1.07E+04	1.1	0	0	0
671	0.313	1.07E+04	1.1	0	0	0
671.1	0.313	1.07E+04	1.1	0	0	0
671.2	0.312	1.07E+04	1.1	0	0	0
671.3	0.312	1.08E+04	1.1	0	0	0
671.4	0.311	1.08E+04	1.1	0	0	0
671.5	0.311	1.08E+04	1.1	0	0	0
671.6	0.31	1.08E+04	1.1	0	0	0
671.7	0.31	1.08E+04	1.1	0	0	0
671.8	0.31	1.08E+04	1	0	0	0
671.9	0.309	1.08E+04	1	0	0	0
672	0.309	1.09E+04	1	0	0	0
672.1	0.308	1.09E+04	1	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
672.2	0.308	1.09E+04	1	0	0	0
672.3	0.307	1.09E+04	1	0	0	0
672.4	0.307	1.09E+04	1	0	0	0
672.5	0.306	1.09E+04	1	0	0	0
672.6	0.306	1.09E+04	1	0	0	0
672.7	0.306	1.10E+04	1	0	0	0
672.8	0.305	1.10E+04	1	0	0	0
672.9	0.305	1.10E+04	1	0	0	0
673	0.304	1.10E+04	1	0	0	0
673.1	0.304	1.10E+04	1	0	0	0
673.2	0.303	1.10E+04	1	0	0	0
673.3	0.303	1.11E+04	1	0	0	0
673.4	0.302	1.11E+04	1	0	0	0
673.5	0.302	1.11E+04	1	0	0	0
673.6	0.302	1.11E+04	1	0	0	0
673.7	0.301	1.11E+04	1	0	0	0
673.8	0.301	1.11E+04	1	0	0	0
673.9	0.3	1.11E+04	1	0	0	0
674	0.3	1.12E+04	1	0	0	0
674.1	0.3	1.12E+04	1	0	0	0
674.2	0.299	1.12E+04	1	0	0	0
674.3	0.299	1.12E+04	1	0	0	0
674.4	0.298	1.12E+04	1	0	0	0
674.5	0.298	1.12E+04	1	0	0	0
674.6	0.297	1.13E+04	1	0	0	0
674.7	0.297	1.13E+04	1	0	0	0
674.8	0.297	1.13E+04	1	0	0	0
674.9	0.296	1.13E+04	1	0	0	0
675	0.296	1.13E+04	1	0	0	0
675.1	0.295	1.14E+04	1	0	0	0
675.2	0.295	1.14E+04	1	0	0	0
675.3	0.295	1.13E+04	1	0	0	0
675.4	0.294	1.13E+04	1	0	0	0
675.5	0.294	1.13E+04	1	0	0	0
675.6	0.293	1.14E+04	1	0	0	0
675.7	0.293	1.14E+04	1	0	0	0
675.8	0.293	1.14E+04	1	0	0	0
675.9	0.292	1.14E+04	1	0	0	0
676	0.292	1.14E+04	1	0	0	0
676.1	0.292	1.15E+04	1	0	0	0
676.2	0.291	1.15E+04	1	0	0	0
676.3	0.291	1.15E+04	1	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
676.4	0.29	1.15E+04	1	0	0	0
676.5	0.29	1.15E+04	1	0	0	0
676.6	0.29	1.15E+04	1	0	0	0
676.7	0.289	1.16E+04	1	0	0	0
676.8	0.289	1.16E+04	1	0	0	0
676.9	0.289	1.16E+04	1	0	0	0
677	0.288	1.16E+04	1	0	0	0
677.1	0.288	1.16E+04	1	0	0	0
677.2	0.287	1.17E+04	1	0	0	0
677.3	0.287	1.17E+04	1	0	0	0
677.4	0.287	1.17E+04	1	0	0	0
677.5	0.286	1.17E+04	1	0	0	0
677.6	0.286	1.18E+04	1	0	0	0
677.7	0.286	1.18E+04	1	0	0	0
677.8	0.285	1.18E+04	1	0	0	0
677.9	0.285	1.18E+04	1	0	0	0
678	0.285	1.18E+04	1	0	0	0
678.1	0.284	1.19E+04	1	0	0	0
678.2	0.284	1.19E+04	1	0	0	0
678.3	0.284	1.19E+04	1	0	0	0
678.4	0.283	1.19E+04	1	0	0	0
678.5	0.283	1.19E+04	1	0	0	0
678.6	0.283	1.20E+04	1	0	0	0
678.7	0.282	1.20E+04	1	0	0	0
678.8	0.282	1.20E+04	1	0	0	0
678.9	0.282	1.20E+04	1	0	0	0
679	0.281	1.21E+04	1	0	0	0
679.1	0.281	1.21E+04	1	0	0	0
679.2	0.281	1.21E+04	1	0	0	0
679.3	0.28	1.21E+04	0.9	0	0	0
679.4	0.28	1.21E+04	0.9	0	0	0
679.5	0.28	1.22E+04	0.9	0	0	0
679.6	0.279	1.22E+04	0.9	0	0	0
679.7	0.279	1.22E+04	0.9	0	0	0
679.8	0.279	1.22E+04	0.9	0	0	0
679.9	0.278	1.23E+04	0.9	0	0	0
680	0.278	1.23E+04	0.9	0	0	0
680.1	0.278	1.23E+04	0.9	0	0	0
680.2	0.277	1.23E+04	0.9	0	0	0
680.3	0.277	1.24E+04	0.9	0	0	0
680.4	0.277	1.24E+04	0.9	0	0	0
680.5	0.276	1.24E+04	0.9	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
680.6	0.276	1.24E+04	0.9	0	0	0
680.7	0.276	1.25E+04	0.9	0	0	0
680.8	0.275	1.25E+04	0.9	0	0	0
680.9	0.275	1.25E+04	0.9	0	0	0
681	0.275	1.25E+04	0.9	0	0	0
681.1	0.274	1.26E+04	0.9	0	0	0
681.2	0.274	1.26E+04	0.9	0	0	0
681.3	0.274	1.26E+04	0.9	0	0	0
681.4	0.273	1.26E+04	0.9	0	0	0
681.5	0.273	1.27E+04	0.9	0	0	0
681.6	0.273	1.27E+04	0.9	0	0	0
681.7	0.272	1.27E+04	0.9	0	0	0
681.8	0.272	1.27E+04	0.9	0	0	0
681.9	0.272	1.28E+04	0.9	0	0	0
682	0.272	1.28E+04	0.9	0	0	0
682.1	0.271	1.28E+04	0.9	0	0	0
682.2	0.271	1.28E+04	0.9	0	0	0
682.3	0.271	1.29E+04	0.9	0	0	0
682.4	0.27	1.29E+04	0.9	0	0	0
682.5	0.27	1.29E+04	0.9	0	0	0
682.6	0.27	1.29E+04	0.9	0	0	0
682.7	0.269	1.30E+04	0.9	0	0	0
682.8	0.269	1.30E+04	0.9	0	0	0
682.9	0.269	1.30E+04	0.9	0	0	0
683	0.268	1.30E+04	0.9	0	0	0
683.1	0.268	1.31E+04	0.9	0	0	0
683.2	0.268	1.31E+04	0.9	0	0	0
683.3	0.268	1.31E+04	0.9	0	0	0
683.4	0.267	1.32E+04	0.9	0	0	0
683.5	0.267	1.32E+04	0.9	0	0	0
683.6	0.267	1.32E+04	0.9	0	0	0
683.7	0.266	1.32E+04	0.9	0	0	0
683.8	0.266	1.33E+04	0.9	0	0	0
683.9	0.266	1.33E+04	0.9	0	0	0
684	0.265	1.33E+04	0.9	0	0	0
684.1	0.265	1.33E+04	0.9	0	0	0
684.2	0.265	1.34E+04	0.9	0	0	0
684.3	0.265	1.34E+04	0.9	0	0	0
684.4	0.264	1.34E+04	0.9	0	0	0
684.5	0.264	1.35E+04	0.9	0	0	0
684.6	0.264	1.35E+04	0.9	0	0	0
684.7	0.263	1.35E+04	0.9	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
684.8	0.263	1.35E+04	0.9	0	0	0
684.9	0.263	1.36E+04	0.9	0	0	0
685	0.263	1.36E+04	0.9	0	0	0
685.1	0.262	1.36E+04	0.9	0	0	0
685.2	0.262	1.37E+04	0.9	0	0	0
685.3	0.262	1.37E+04	0.9	0	0	0
685.4	0.261	1.37E+04	0.9	0	0	0
685.5	0.261	1.37E+04	0.9	0	0	0
685.6	0.261	1.38E+04	0.9	0	0	0
685.7	0.26	1.38E+04	0.9	0	0	0
685.8	0.26	1.38E+04	0.9	0	0	0
685.9	0.26	1.39E+04	0.9	0	0	0
686	0.26	1.39E+04	0.9	0	0	0
686.1	0.259	1.39E+04	0.9	0	0	0
686.2	0.259	1.39E+04	0.9	0	0	0
686.3	0.259	1.40E+04	0.9	0	0	0
686.4	0.258	1.40E+04	0.9	0	0	0
686.5	0.258	1.40E+04	0.9	0	0	0
686.6	0.258	1.41E+04	0.9	0	0	0
686.7	0.258	1.41E+04	0.9	0	0	0
686.8	0.257	1.41E+04	0.9	0	0	0
686.9	0.257	1.42E+04	0.9	0	0	0
687	0.257	1.42E+04	0.9	0	0	0
687.1	0.256	1.42E+04	0.9	0	0	0
687.2	0.256	1.42E+04	0.9	0	0	0
687.3	0.256	1.43E+04	0.9	0	0	0
687.4	0.256	1.43E+04	0.9	0	0	0
687.5	0.255	1.43E+04	0.9	0	0	0
687.6	0.255	1.44E+04	0.9	0	0	0
687.7	0.255	1.44E+04	0.9	0	0	0
687.8	0.254	1.44E+04	0.9	0	0	0
687.9	0.254	1.45E+04	0.9	0	0	0
688	0.254	1.45E+04	0.9	0	0	0
688.1	0.254	1.45E+04	0.9	0	0	0
688.2	0.253	1.46E+04	0.9	0	0	0
688.3	0.253	1.46E+04	0.9	0	0	0
688.4	0.253	1.46E+04	0.9	0	0	0
688.5	0.253	1.46E+04	0.9	0	0	0
688.6	0.252	1.47E+04	0.9	0	0	0
688.7	0.252	1.47E+04	0.9	0	0	0
688.8	0.252	1.47E+04	0.9	0	0	0
688.9	0.251	1.48E+04	0.9	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
689	0.251	1.48E+04	0.9	0	0	0
689.1	0.251	1.48E+04	0.9	0	0	0
689.2	0.251	1.49E+04	0.8	0	0	0
689.3	0.25	1.49E+04	0.8	0	0	0
689.4	0.25	1.49E+04	0.8	0	0	0
689.5	0.25	1.50E+04	0.8	0	0	0
689.6	0.249	1.50E+04	0.8	0	0	0
689.7	0.249	1.50E+04	0.8	0	0	0
689.8	0.249	1.51E+04	0.8	0	0	0
689.9	0.249	1.51E+04	0.8	0	0	0
690	0.248	1.51E+04	0.8	0	0	0
690.1	0.248	1.52E+04	0.8	0	0	0
690.2	0.248	1.52E+04	0.8	0	0	0
690.3	0.247	1.52E+04	0.8	0	0	0
690.4	0.247	1.53E+04	0.8	0	0	0
690.5	0.247	1.53E+04	0.8	0	0	0
690.6	0.247	1.53E+04	0.8	0	0	0
690.7	0.246	1.54E+04	0.8	0	0	0
690.8	0.246	1.54E+04	0.8	0	0	0
690.9	0.246	1.54E+04	0.8	0	0	0
691	0.246	1.55E+04	0.8	0	0	0
691.1	0.245	1.55E+04	0.8	0	0	0
691.2	0.245	1.55E+04	0.8	0	0	0
691.3	0.245	1.56E+04	0.8	0	0	0
691.4	0.244	1.56E+04	0.8	0	0	0
691.5	0.244	1.56E+04	0.8	0	0	0
691.6	0.244	1.57E+04	0.8	0	0	0
691.7	0.244	1.57E+04	0.8	0	0	0
691.8	0.243	1.57E+04	0.8	0	0	0
691.9	0.243	1.58E+04	0.8	0	0	0
692	0.243	1.58E+04	0.8	0	0	0
692.1	0.243	1.58E+04	0.8	0	0	0
692.2	0.242	1.59E+04	0.8	0	0	0
692.3	0.242	1.59E+04	0.8	0	0	0
692.4	0.242	1.59E+04	0.8	0	0	0
692.5	0.241	1.60E+04	0.8	0	0	0
692.6	0.241	1.60E+04	0.8	0	0	0
692.7	0.241	1.60E+04	0.8	0	0	0
692.8	0.241	1.61E+04	0.8	0	0	0
692.9	0.24	1.61E+04	0.8	0	0	0
693	0.24	1.61E+04	0.8	0	0	0
693.1	0.24	1.62E+04	0.8	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
693.2	0.24	1.62E+04	0.8	0	0	0
693.3	0.239	1.62E+04	0.8	0	0	0
693.4	0.239	1.63E+04	0.8	0	0	0
693.5	0.239	1.63E+04	0.8	0	0	0
693.6	0.238	1.64E+04	0.8	0	0	0
693.7	0.238	1.64E+04	0.8	0	0	0
693.8	0.238	1.64E+04	0.8	0	0	0
693.9	0.238	1.65E+04	0.8	0	0	0
694	0.237	1.65E+04	0.8	0	0	0
694.1	0.237	1.65E+04	0.8	0	0	0
694.2	0.237	1.66E+04	0.8	0	0	0
694.3	0.237	1.66E+04	0.8	0	0	0
694.4	0.236	1.66E+04	0.8	0	0	0
694.5	0.236	1.67E+04	0.8	0	0	0
694.6	0.236	1.67E+04	0.8	0	0	0
694.7	0.235	1.67E+04	0.8	0	0	0
694.8	0.235	1.68E+04	0.8	0	0	0
694.9	0.235	1.68E+04	0.8	0	0	0
695	0.235	1.69E+04	0.8	0	0	0
695.1	0.234	1.69E+04	0.8	0	0	0
695.2	0.234	1.69E+04	0.8	0	0	0
695.3	0.234	1.70E+04	0.8	0	0	0
695.4	0.234	1.70E+04	0.8	0	0	0
695.5	0.233	1.70E+04	0.8	0	0	0
695.6	0.233	1.71E+04	0.8	0	0	0
695.7	0.233	1.71E+04	0.8	0	0	0
695.8	0.232	1.72E+04	0.8	0	0	0
695.9	0.232	1.72E+04	0.8	0	0	0
696	0.232	1.72E+04	0.8	0	0	0
696.1	0.232	1.73E+04	0.8	0	0	0
696.2	0.231	1.73E+04	0.8	0	0	0
696.3	0.231	1.73E+04	0.8	0	0	0
696.4	0.231	1.74E+04	0.8	0	0	0
696.5	0.231	1.74E+04	0.8	0	0	0
696.6	0.23	1.74E+04	0.8	0	0	0
696.7	0.23	1.75E+04	0.8	0	0	0
696.8	0.23	1.75E+04	0.8	0	0	0
696.9	0.23	1.76E+04	0.8	0	0	0
697	0.229	1.76E+04	0.8	0	0	0
697.1	0.229	1.76E+04	0.8	0	0	0
697.2	0.229	1.77E+04	0.8	0	0	0
697.3	0.228	1.77E+04	0.8	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
697.4	0.228	1.78E+04	0.8	0	0	0
697.5	0.228	1.78E+04	0.8	0	0	0
697.6	0.228	1.78E+04	0.8	0	0	0
697.7	0.227	1.79E+04	0.8	0	0	0
697.8	0.227	1.79E+04	0.8	0	0	0
697.9	0.227	1.79E+04	0.8	0	0	0
698	0.227	1.80E+04	0.8	0	0	0
698.1	0.226	1.80E+04	0.8	0	0	0
698.2	0.226	1.81E+04	0.8	0	0	0
698.3	0.226	1.81E+04	0.8	0	0	0
698.4	0.226	1.81E+04	0.8	0	0	0
698.5	0.225	1.82E+04	0.8	0	0	0
698.6	0.225	1.82E+04	0.8	0	0	0
698.7	0.225	1.83E+04	0.8	0	0	0
698.8	0.224	1.83E+04	0.8	0	0	0
698.9	0.224	1.83E+04	0.8	0	0	0
699	0.224	1.84E+04	0.8	0	0	0
699.1	0.224	1.84E+04	0.8	0	0	0
699.2	0.223	1.84E+04	0.8	0	0	0
699.3	0.223	1.85E+04	0.8	0	0	0
699.4	0.223	1.85E+04	0.8	0	0	0
699.5	0.223	1.86E+04	0.8	0	0	0
699.6	0.222	1.86E+04	0.8	0	0	0
699.7	0.222	1.86E+04	0.8	0	0	0
699.8	0.222	1.87E+04	0.8	0	0	0
699.9	0.222	1.87E+04	0.8	0	0	0
700	0.221	1.88E+04	0.8	0	0	0
700.1	0.221	1.88E+04	0.7	0	0	0
700.2	0.221	1.88E+04	0.7	0	0	0
700.3	0.221	1.89E+04	0.7	0	0	0
700.4	0.22	1.89E+04	0.7	0	0	0
700.5	0.22	1.90E+04	0.7	0	0	0
700.6	0.22	1.90E+04	0.7	0	0	0
700.7	0.219	1.90E+04	0.7	0	0	0
700.8	0.219	1.91E+04	0.7	0	0	0
700.9	0.219	1.91E+04	0.7	0	0	0
701	0.219	1.92E+04	0.7	0	0	0
701.1	0.218	1.92E+04	0.7	0	0	0
701.2	0.218	1.93E+04	0.7	0	0	0
701.3	0.218	1.93E+04	0.7	0	0	0
701.4	0.218	1.93E+04	0.7	0	0	0
701.5	0.217	1.94E+04	0.7	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
701.6	0.217	1.94E+04	0.7	0	0	0
701.7	0.217	1.95E+04	0.7	0	0	0
701.8	0.217	1.95E+04	0.7	0	0	0
701.9	0.216	1.95E+04	0.7	0	0	0
702	0.216	1.96E+04	0.7	0	0	0
702.1	0.216	1.96E+04	0.7	0	0	0
702.2	0.216	1.97E+04	0.7	0	0	0
702.3	0.215	1.97E+04	0.7	0	0	0
702.4	0.215	1.97E+04	0.7	0	0	0
702.5	0.215	1.98E+04	0.7	0	0	0
702.6	0.215	1.98E+04	0.7	0	0	0
702.7	0.214	1.99E+04	0.7	0	0	0
702.8	0.214	1.99E+04	0.7	0	0	0
702.9	0.214	2.00E+04	0.7	0	0	0
703	0.214	2.00E+04	0.7	0	0	0
703.1	0.213	2.00E+04	0.7	0	0	0
703.2	0.213	2.01E+04	0.7	0	0	0
703.3	0.213	2.01E+04	0.7	0	0	0
703.4	0.213	2.02E+04	0.7	0	0	0
703.5	0.212	2.02E+04	0.7	0	0	0
703.6	0.212	2.03E+04	0.7	0	0	0
703.7	0.212	2.03E+04	0.7	0	0	0
703.8	0.211	2.03E+04	0.7	0	0	0
703.9	0.211	2.04E+04	0.7	0	0	0
704	0.211	2.04E+04	0.7	0	0	0
704.1	0.211	2.05E+04	0.7	0	0	0
704.2	0.21	2.05E+04	0.7	0	0	0
704.3	0.21	2.06E+04	0.7	0	0	0
704.4	0.21	2.06E+04	0.7	0	0	0
704.5	0.21	2.06E+04	0.7	0	0	0
704.6	0.209	2.07E+04	0.7	0	0	0
704.7	0.209	2.07E+04	0.7	0	0	0
704.8	0.209	2.08E+04	0.7	0	0	0
704.9	0.209	2.08E+04	0.7	0	0	0
705	0.208	2.09E+04	0.7	0	0	0
705.1	0.208	2.09E+04	0.7	0	0	0
705.2	0.208	2.09E+04	0.7	0	0	0
705.3	0.208	2.10E+04	0.7	0	0	0
705.4	0.207	2.10E+04	0.7	0	0	0
705.5	0.207	2.11E+04	0.7	0	0	0
705.6	0.207	2.11E+04	0.7	0	0	0
705.7	0.207	2.12E+04	0.7	0	0	0

Time sec.	Vel. km/sec	Stg. Prs. pascals	Mach no.	q Cnv. W/cm^2	q Rad. W/cm^2	q Tot
705.78	0.207	2.12E+04	0.7	0	0	0