1994-09

Thermal analysis of PANSAT batteries and electrical power subsystem

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https://hdl.handle.net/10945/28605

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE September 1994	3. REPORT TYPE AND DATES COVERED Master's Thesis

4. TITLE AND SUBTITLE Thermal Analysis of PANSAT Batteries and Electrical Power Subsystem	FUNDING NUMBERS
6. AUTHOR(S) Patterson, Sheila A.	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey CA 93943-5000	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.	12b. DISTRIBUTION CODE A

13. ABSTRACT *(maximum 200 words)*

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14. SUBJECT TERMS PANSAT, Thermal, Conduction, Radiation, ITAS, THANSS, TASS, Printed circuit boards, Transient, Steady State	15. NUMBER OF PAGES 204
	16. PRICE CODE

17. S ECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFI-CATION OF THIS PAGE	19. SECURITY CLASSIFI-CATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89)

Prescribed by ANSI Std. 239-18 298-102

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THERMAL ANALYSIS OF PANSAT BATTERIES AND ELECTRICAL POWER SUBSYSTEM

by

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Submitted in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE IN ASTRONAUTICAL ENGINEERING

from the

NAVAL POSTGRADUATE SCHOOL
September 1994

ABSTRACT

The thermal design of a spacecraft ensures proper heat transfer so all components and subsystems remain within prescribed temperature limits during all aspects of the spacecraft's mission. This thesis develops a point-to-point heat flow model of the Electrical Power Subsystem (EPS) and its associated housing for the Petite Amateur Navy Satellite (PANSAT). The analysis is performed to identify physical locations in the EPS where temperature may exceed the limits established to protect sensitive electronic components, and to define the expected environment of the batteries. The Integrated Thermal Analysis System (ITAS) and a Steady State Thermal Analyzer and Model Builder were used to perform steady state and transient analyses on the EPS; analysis of the batteries was performed using ITAS only. The simulated transient temperatures within the EPS housing remained within limits, but the batteries exceeded specifications. It is suggested that a passive thermal control technique be adapted for the batteries and its design be experimentally validated before flight.

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I. INTRODUCTION

A. REASON FOR ANALYSIS

The thermal environment for components within a spacecraft is a function of the irradiation from the sun and earth, internal heat dissipation, radiation from external surfaces to the space sink, and the conductive and radiatitive heat transfer paths between the heat sources and sinks. Thermal control design ensures proper heat transfer so that all components and subsystems remain within prescribed temperature limits during all aspects of the spacecraft's mission.[Larson and Wertz, 1992] Early thermal design forces the determination of operating temperature limits and identifies the power dissipation patterns of components to allow for maximum use of passive thermal control methods.

To build a thermal model of a spacecraft, a knowledge of dimensions, equipment placement and material properties is required. The spacecraft or area to be analyzed is divided into nodes. The nodes are chosen so that the conductive and radiative heat flow paths accurately represent point-to-point heat flows within the spacecraft.

The thermal design of the spacecraft is also highly dependent on the mission and stabilization system of the satellite. Typically unmanned, low earth orbit spacecraft can be controlled passively. Table 1 lists a typical operating environment for electric power system (EPS) components.

The power subsystem typically has the greatest interaction with the thermal control subsystem because all of the dissipated electrical energy within the spacecraft must be radiated into space. The terrestrial batteries to be used in the Petite Amateur Navy Satellite (PANSAT) have even a narrower temperature range than that listed in Table 1: the ideal operational

SYSTEM COMPONENT	TEMPERATURE RANGE
MILITARY PIECE PARTS FOR INTEGRATED CIRCUITS	-55 TO 125 DEGREES CELSIUS
BATTERIES	-6 TO 26 DEGREES CELSIUS
SOLAR ARRAY PANELS	-100 TO 100 DEGREES CELSIUS

Table 1. Temperature Ranges for Some Electrical Power System Components

temperature for charging and discharging is 23 °C. Operations outside the published temperature range will cause the battery cells to degrade and become less efficient. This condition is explained fully in Chapter VI.

PANSAT has a very low power margin and must be able to maximize the power from the solar arrays and batteries. The sunlight and shadow zones of the orbit require that the batteries must operate for 40 percent of the time. There is only one EPS box for PANSAT. Other vital subsystems are redundant ; for example, the Digital Control Subsystem has two fully capable boxes. The batteries within the Electrical Power Subsystem itself are redundant, but must be able to be recharged to full capacity after each use to ensure proper Depth of Discharge. The batteries and the EPS will be discussed more fully in the following chapters.

B. SCOPE OF THESIS

The purpose of this thesis is to develop a transient thermal model of the Electrical Power System and the associated housing for the Petite Amateur Navy Satellite (PANSAT) . This thesis will also develop a steady state and transient analysis for the preliminary Nickel-Cadmium battery design, identifying any physical locations within the EPS and batteries where temperature limits are exceeded, and offering some recommendations for passive thermal methods. Computer generated steady state and transient analyses using radiation, contact conductances and thermal capacitances through the equipment housing and the upper and lower equipment plates of the satellite were used to evaluate temperature ranges at the node points representing physical locations in the structure. To perform the analysis, circuit board layouts, heat dissipations of components, subsystem materials and cell efficiencies were required. Inward viewing box geometry was used to physically model the EPS and the battery model. Two models were used to verify steady state temperatures for the EPS. The transient analyses used equipment plate temperature profiles obtained from a recent transient analysis of the entire PANSAT structure.

II. BACKGROUND

A. PETITE AMATEUR NAVY SATELLITE (PANSAT)

PANSAT was initiated in 1989 to provide interdisciplinary educational opportunities in space related areas to prepare postgraduate students for follow on work in space systems acquisition and design, and to develop a cadre of engineers and technicians at the Naval Postgraduate School (NPS) capable of developing and producing space qualified hardware. The current PANSAT design is the result of five years of research by NPS thesis students and the personnel of the Space Systems Academic Group (SSAG). Preliminary Design Review (PDR) was held in 1993 with the Critical Design Review to be held in late 1994.

The payload will be a direct sequence spread spectrum with a differentially coded, binary phase shift keyed (BPSK) communications system with an operating frequency of 436.5 MHz. The satellite will relay messages on a user-to-user basis in a simplex mode. The store and forward communication will allow amateur radio operators to send and receive messages through several short windows daily.[FRD, 1993]

The spacecraft will weigh approximately 150 pounds and is being designed to launch as a secondary platform from the space shuttle as part of the Hitchhiker Program. PANSAT has no attitude control and is free to tumble. Operational life is expected to be two years, with three to five minute communications segments per orbital pass. PANSAT will operate between 28.5° and 51.6° inclination and between 160-220 nautical miles.

The spacecraft consists of five subsystems: Communication (COMM), Electrical Power, Computer, Structure, and Ground Station Support. This thesis focuses on the Electrical Power Subsystem, where the thermal control functions reside.

The PANSAT structure is Aluminum 6061-T6, built about a main load bearing cylinder connected to a lower equipment plate. The satellite is a tumbler, and since the solar panels will be mounted on the spacecraft skin, maximizing surface area increases power generation. A 26 sided polyhedron was the chosen structural configuration, already demonstrated on a Shuttle launch. A view of PANSAT is shown in Figure 1.

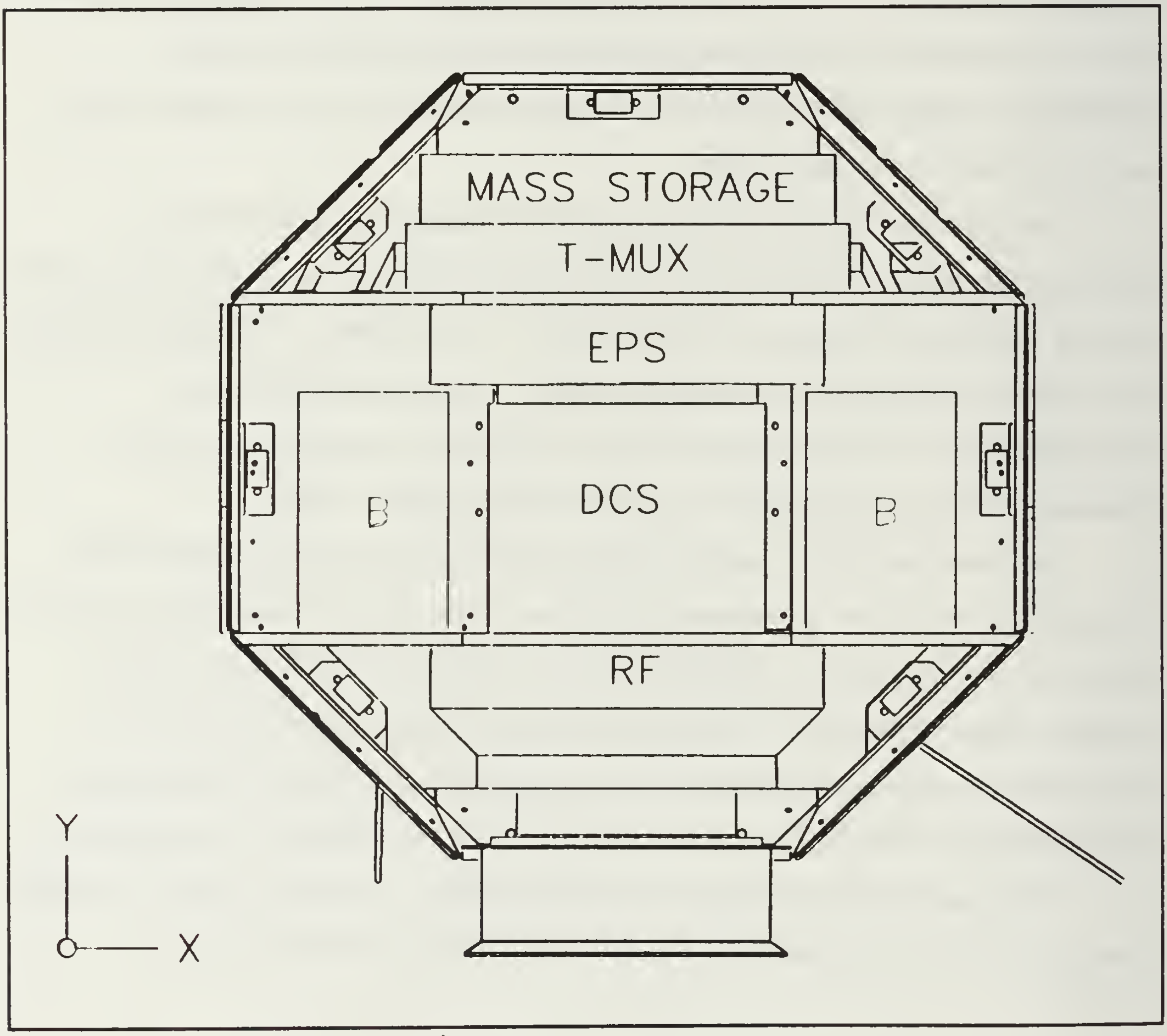


Figure 1. PANSAT Design

B. ELECTRICAL POWER SYSTEM (EPS)

The power to PANSAT is provided by seventeen 256 cm^2 solar panels consisting of silicon (Si) solar cells. The solar cells are K6700 Si cells connected in series in 4 strings of 8 cells each. The EPS also consists of electrical components needed to generate, regulate, and provide ± 15 V and +5 V power for the various power control electronics. In eclipse, two Nickel-Cadmium batteries of ten cells each maintain the bus voltage at 12 Vdc. The EPS control interface provides the power switching of all modules on the printed circuit boards (PCBs) in the Digital Control Subsystem (DCS) and COMM. The watchdog timer in the EPS is used to reset the DCS in the event of a failure. The EPS is also dependent on the Ni-Cd batteries for voltage regulation during all modes of operation. An EPS block diagram developed by the SSAG is shown in Figure 2.

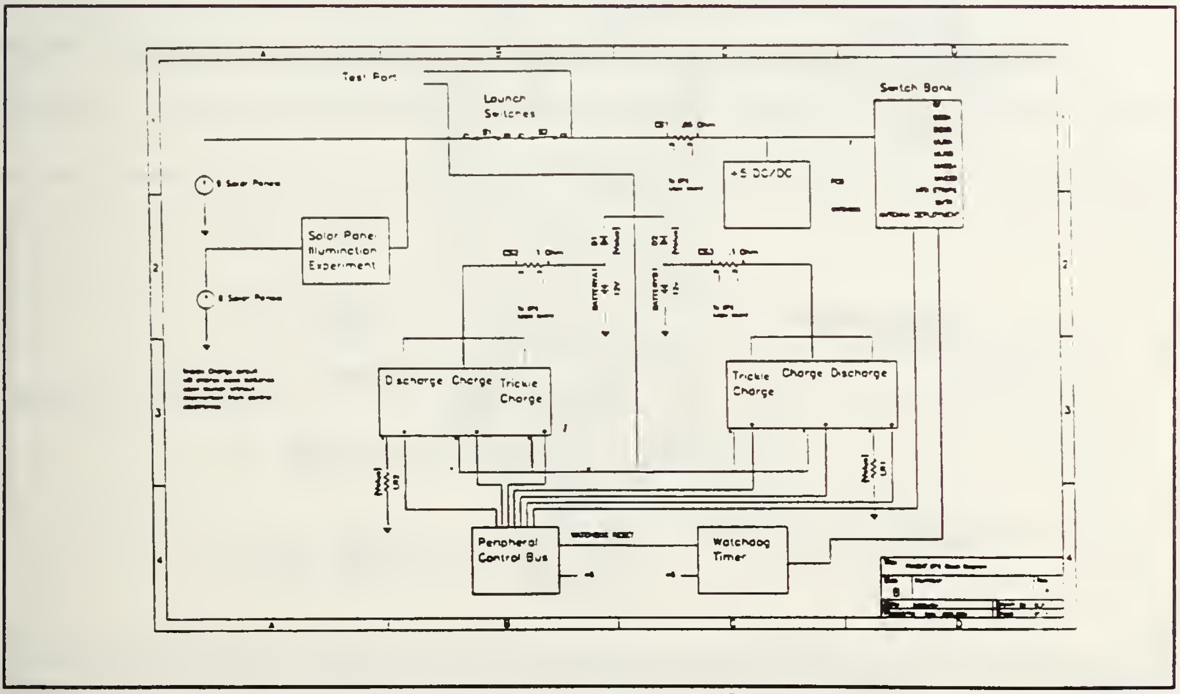


Figure 2. Electrical Power System Block Diagram

Voltage sensors monitor the solar panel bus and battery voltages, and thermal sensors monitor the temperature of the solar panels, batteries and electronics housings. Figure 3 shows the solar panels and box placement. The triangular panels of the satellite do not have solar panels and could be used for passive thermal control if required. The EPS is mounted underneath the upper equipment plate, and above the DCS and batteries, which are mounted on the top of the lower equipment plate.

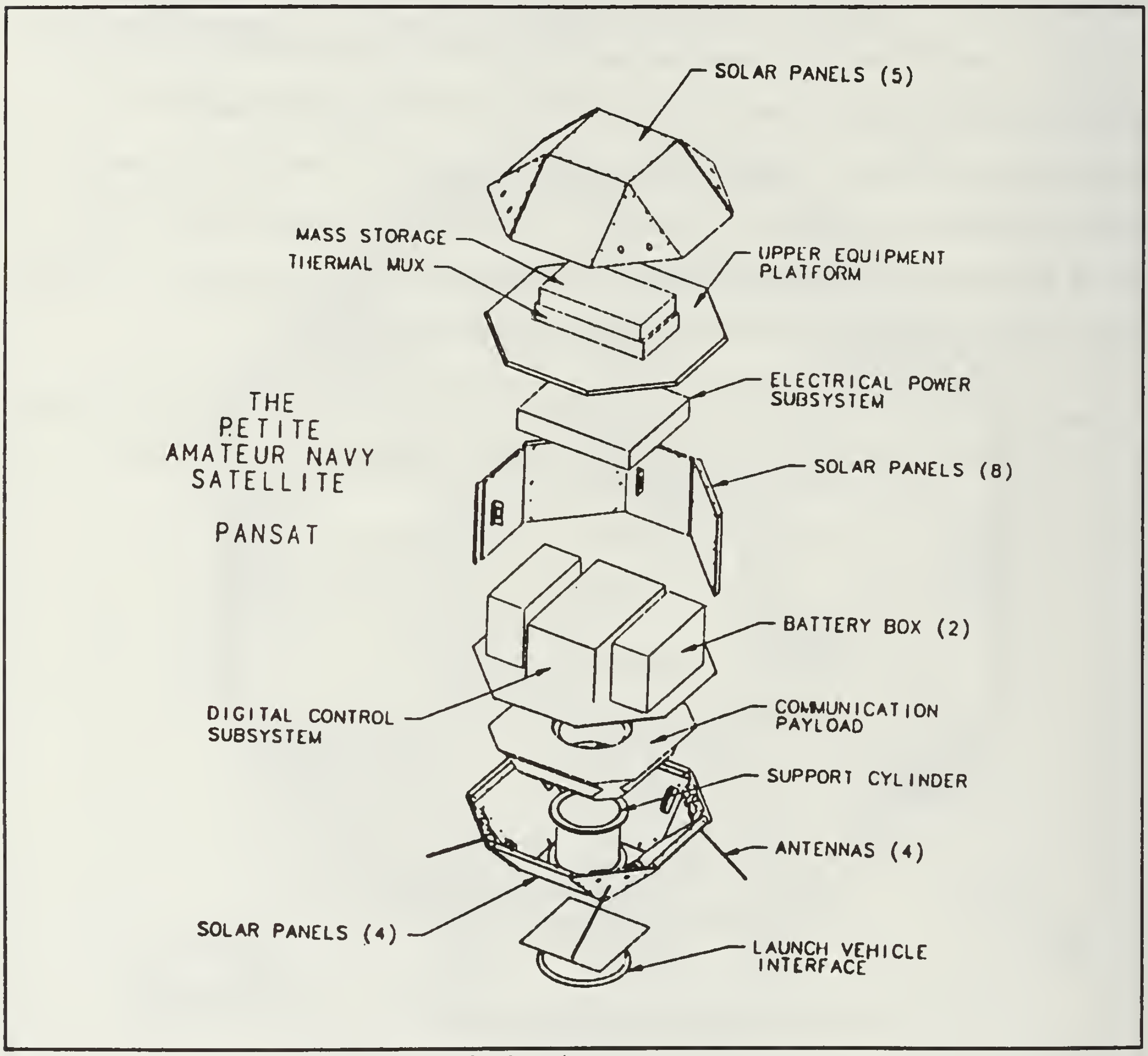


Figure 3. PANSAT Exploded View

PANSAT Design requirements include:

- 21.5 Watts at 15.2 Vdc average minimum electrical power at end of life (EOL)

- Minimum of 60 percent power conversion efficiency

- 12 Volt regulated bus

- Nickel-Cadmium batteries with a 10 percent Depth of Discharge (DOD)

- Mission life of 24 months [FRD, 1993]

Terrestrial Ni-Cd batteries are the chosen type due to high energy density, cycle life and reliability. Space rated batteries will not be used because of their prohibitively high cost. Figure 4 shows the proposed F-cell,

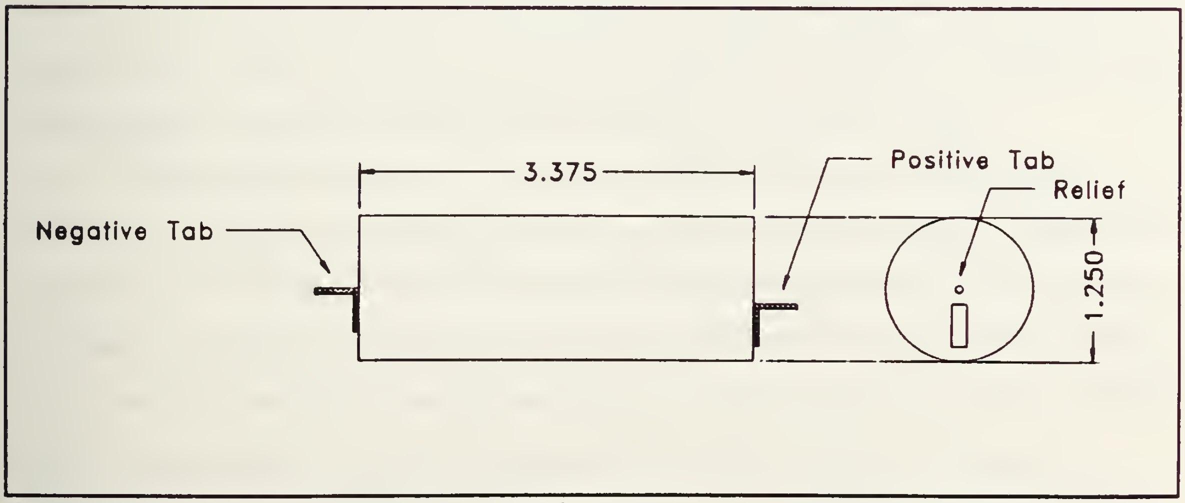


Figure 4. Ni-Cd Cell Dimensions

its 32 psi pressure relief valve and the cell dimensions. Although the F-cell has a pressure relief valve it is still considered a closed cell. The batteries will be fully discussed in Chapter VI.

III. STEADY STATE THERMAL ANALYSIS

A. BACKGROUND

A nodal analysis based on a finite difference model of PANSAT structure was performed in 1992 using the Intercept Thermal Analyzer Software Package. Input into the analyzer program is written by a model builder program which can be saved for modification for later use. THANSS is the model builder and the thermal analyzer is TASS. TASS provides the solution of Equation 3.1 using the Cholesky reduction in an iterative scheme

$$[A] \ x \ [T] = [B] \qquad 3.1$$

to solve for T (the node temperature vector). THANSS uses conductance paths to generate node to node conductances to form a set of heat balance equations (Equations 3.2, 3.4, and 3.13) where A is the matrix of conductances and B is a column vector of constant temperatures and heat inputs. The node temperatures obtained after each iteration are used to update the temperature dependent terms in the A matrix. This process continues until the change in the nodal temperatures between successive iterations is smaller than 0.05. When the iterative solution is obtained, the temperatures are then written into an output file. [Kraus, 1990]

This analysis resulted in a steady state temperature map of the PANSAT structure (including the square panels where the solar panels are mounted, the triangular panels, and both equipment plates). To accurately model the structure, the square panels were divided into nine equal nodes, the triangular panels were divided into six nodes, and the equipment plates eight nodes each. The model connects the nodes together through a network of user defined conduction paths and connects individual nodes through constant temperature sinks through conduction and radiation. Results of the steady state analysis for sunlight and shadow zones both with internal heat dissipation are shown in Appendix A.

Conductance values are either calculated or input by the analyst from separate calculations. There are ten different modes that can be selected to characterize node-to-node heat flow. Three of these methods were used for analysis of the Electrical Power System: heat flow between nodes for conduction (method designator 1), heat flow between nodes for radiation (method designator 3), and a constant heat input (method designator 10). The heat balance equation for conduction is

$$q = K_1 \ (T_2 - T_1) \qquad 3.2$$

with the conductance, K_1 determined from the Fourier Law and [A] = [K]

$$K_1 = k \frac{A}{\Delta L} \qquad 3.3$$

where q is the heat flow, T_1 and T_2 define the node-to-node temperature difference for the path, k is the thermal conductivity of the material in Btu / ft - hr - °F or W/m° C, A is the cross sectional area for heat flow and L is the length of the heat flow path. The units of the conductance are Btu/hr ° F or W / ° C.

The heat flow equation by radiation is governed by the Stefan-Boltzmann Law shown in Equation 3.4.

$$q = \sigma \ F_A \ F_\epsilon \ A(T_2^4 - T_1^4) \qquad 3.4$$

or

$$q = k_3 (T_2 - T_1) \qquad 3.5$$

where

$$K_3 = \sigma F_A F_\epsilon A(T_2 + T_1)(T_2^2 + T_1^2) \qquad 3.6$$

Equation 3.6 derives from the fact that $T_2^4 - T_1^4$ can be written as the sum and difference of squares

$$(T_2^4 - T_1^4) = (T_2^2 + T_1^2)(T_2^2 - T_1^2) = (T_2^2 + T_1^2)(T_2 + T_1)(T_2 - T_1) \qquad 3.7$$

Here σ is the Stefan-Boltzmann constant (1.713×10^{-9} Btu/ft^2-R^4 or 5.669×10^{-8}W/m^2-K^4), F_A is the arrangement or shape factor and F_E is the emissivity factor. For radiation between two non-black surfaces, (where a blackbody is a perfect absorber and emitter of radiation), the emissivity and absorptivity of the surfaces will not be equal to 1. The departure from ideal surfaces for two infinite plates in full view of one another is

$$F_E = \frac{1}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} \qquad 3.8$$

where ϵ_1 is the emissivity of the first plate and ϵ_2 is the emissivity of the second plate. [Class notes AA 3804, July 1993] This closely approximates the configuration of the two printed circuit boards (PCBs) in the EPS. The shape factor (F_A) accounts for the situation where the alignment of the surfaces prevents the interception of all of the emissions from the source. Other terms used to describe the shape factor include view, configuration and arrangement factor.

For radiation, TASS handles the heat flow by developing K_3 to permit the use of a linear temperature difference (Equation 3.9)

$$q_r = K(T_2 - T_1) \quad 3.9$$

by computing K_3 from

$$K_3 = \frac{\sigma\ A\ F_A\ F_E(T_2^4 - T_1^4)}{T_2 - T_1}$$

$$= \frac{\sigma\ A\ F_A\ F_E(T_2^2 + T_1^2)(T_2^2 - T_1^2)}{T_2 - T_1}$$

$$= \frac{\sigma\ A\ F_A\ F_E(T_2^2 + T_1^2)(T_2 + T_1)(T_2 - T_1)}{T_2 - T_1} \quad 3.10$$

so that K_3 is indeed

$$K = \sigma\ A\ F_A\ F_E(T_2^2 + T_1^2)(T_2 + T_1) \quad 3.6$$

Because heat transfer by radiation is governed by

$$q = \sigma\ F_A\ F_E\ A(T_2^4 - T_1^4) \quad 3.4$$

the conductance value is entered by the user so that

$$q = K(T_2 - T_1) \quad 3.11$$

The user needs only to enter the value
and TASS handles the computation in accordance with Equation 3.6.

$$K = \sigma F_A F_E A \qquad 3.12$$

When a node is to have a constant temperature input, a tag of 10 is entered and the connecting node is specified as 999. Thus the third method of heat flow is in the form

$$q = K_q \qquad 3.13$$

where K_q is a constant.

B. BOUNDARY CONDITIONS FOR EPS ANALYSIS

The steady state structural analysis of PANSAT was conducted in 1992 with the transient analysis of the structure completed in January 1994. The segmented panels (or nodes) were taken individually to determine the number of connections (also known as branches) to other nodes. The type of connection (i.e., the mode of heat transfer for conduction, radiation and constant temperature) is specified as the tag number for the particular branch. Tag is used to avoid confusion between node and mode. Constant temperatures are given node numbers, beginning with 301. A total of 983 conductances from 232 nodes determined the total PANSAT thermal model. When the thermal analysis was run, the first file was a summary of the final temperatures of all the nodes, and was followed by the node temperatures after each iteration.

Models were run for steady state conditions in sunlight and shadow with and without internal heat dissipation. The runs with heat dissipations were used because the satellite low power mode is not much less than the high power mode. Appendix A shows that for the steady state analysis for sunlight with internal heat dissipation the temperatures range from 45.3 °C to 60.2 °C. The steady state analysis in the shadow zone (Appendix B) with internal heat dissipation resulted in a temperature range of -70.6 °C to 66.6°C.

A transient analysis for the satellite was performed a year later using the same nodes. Average temperatures for the upper equipment plate for the first fourteen orbits are plotted in Figure 5, and for the lower equipment plate in Figure 6. Starting temperature was assumed to be 25 ° C for Kennedy Space Center temperatures in October. Table 2 and Table 3 show the data breakout by node numbers for the upper equipment plate (nodes 211 to 218) and the lower equipment plate (node numbers 219 to 226). The average temperatures for the equipment plates were used as boundary conditions for the transient analysis of the Electrical Power System and the steady state and transient battery analysis.

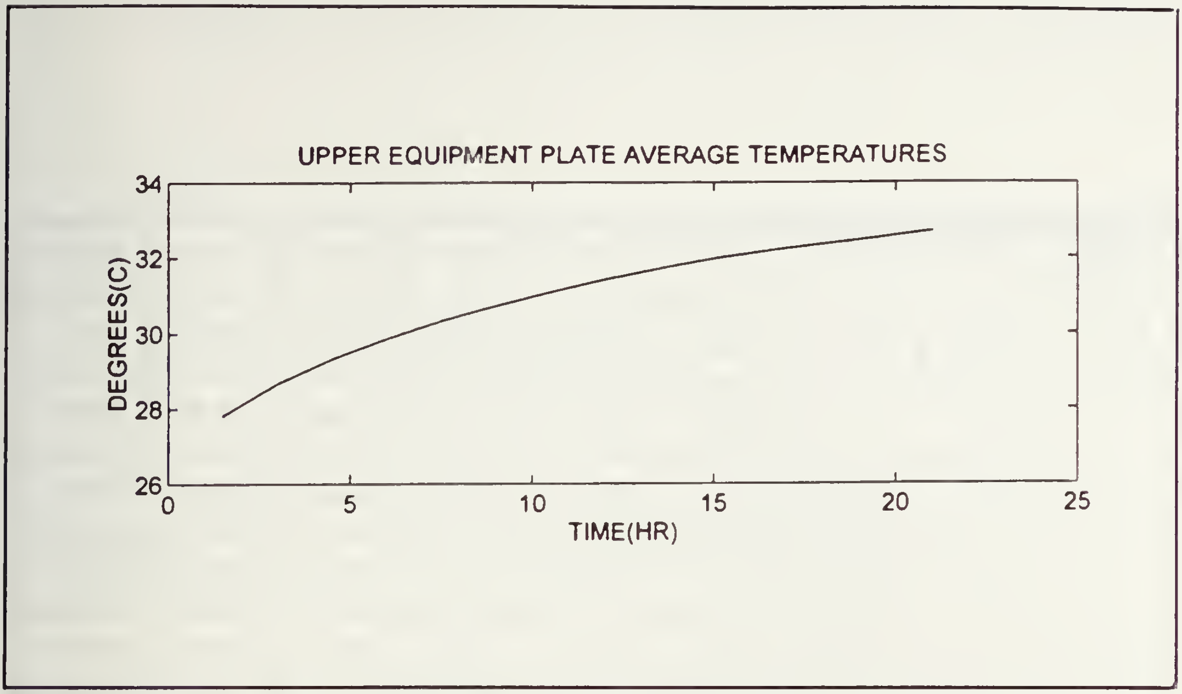


Figure 5. Upper Equipment Plate Average Temperatures

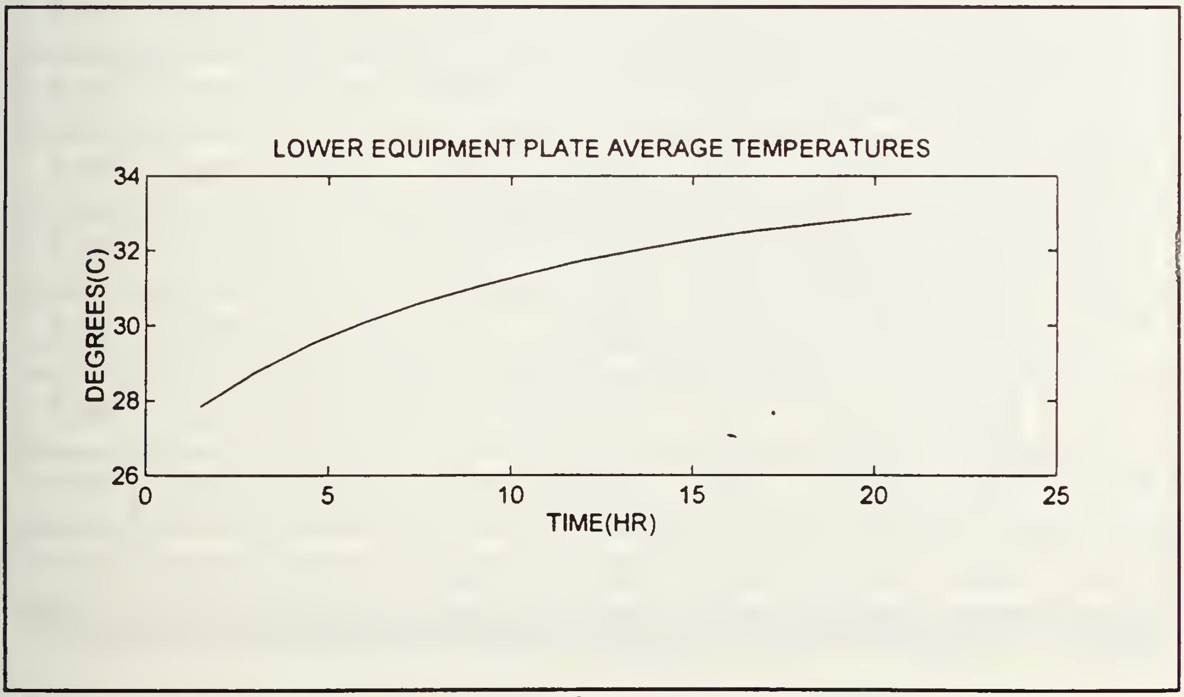


Figure 6. Lower Equipment Plate Average Temperatures

PASS	211	212	213	214	215	216	217	218
1	28.8	29.3	29.3	29.3	27.2	26.9	26.5	26.3
2	28.8	30.4	30.4	29.3	28.1	27.8	27.3	27.1
3	30.5	31.1	31.1	23.0	28.7	28.4	28.0	27.6
4	31.0	31.2	31.7	30.6	29.3	28.9	28.5	28.2
5	31.5	32.2	32.1	31.5	29.8	29.4	29.0	28.7
6	31.5	32.6	32.6	31.4	30.2	29.3	29.4	29.1
7	32.3	33.0	32.5	31.5	30.6	30.2	29.8	29.5
8	32.9	33.3	33.3	32.2	30.9	30.6	30.1	29.8
9	32.9	33.6	33.6	32.5	31.2	30.9	30.4	30.1
10	33.2	33.9	33.3	32.2	31.5	31.1	30.2	30.4
11	33.4	34.1	31.1	33.0	31.4	31.4	30.9	30.6
12	33.8	34.3	34.3	33.2	31.6	31.6	31.1	30.8
13	33.8	34.5	34.5	33.3	32.1	31.4	31.3	31.0
14	34.0	34.7	34.6	33.5	32.2	31.9	31.5	31.2

Table 2. Upper Equipment Plate Temperatures in Degrees C by Node

PASS	219	220	221	222	223	224	225	226
1	29.2	23.8	29.8	28.2	27.7	27.8	27.8	27.9
2	29.2	29.3	29.3	29.3	28.8	23.0	29.0	28.9
3	30.6	30.7	30.7	30.4	23.0	29.8	29.2	29.7
4	30.6	31.3	31.7	30.7	30.3	30.4	30.4	30.3
5	31.6	31.3	31.4	30.7	30.3	30.4	30.4	30.3
6	31.6	32.3	32.4	31.7	31.3	31.4	31.4	31.3
7	32.0	32.7	32.7	32.1	31.7	31.8	31.6	31.7
8	32.4	33.1	33.1	32.1	32.0	32.2	32.1	32.1
9	32.7	33.4	33.4	32.7	32.3	32.5	32.4	32.4
10	32.9	33.6	33.7	33.0	32.5	32.7	32.7	32.9
11	33.2	33.9	33.6	33.2	32.8	33.0	32.9	32.9
12	33.1	34.1	34.1	33.4	33.1	33.2	33.1	33.1
13	33.5	34.2	34.3	33.6	33.7	30.3	33.3	33.2
14	33.7	34.4	34.4	33.8	33.3	33.5	33.4	33.4

Table 3. Lower Equipment Plate Temperatures in Degrees C by Node

IV. STEADY STATE ANALYSIS OF THE EPS USING THANSS

A. PROCEDURE THEORY

A thermal resistance may be defined as the reciprocal of the conductance.

$$R = \frac{1}{K} \qquad 4.1$$

R is the resistance in ° F-hr/ Btu or ° C/W. This relationship does not apply exclusively to the conduction mode of heat transfer . If the analogy exists between the heat flow and the direct current statement of Ohm's Law

$$q = K \Delta T = \frac{\Delta T}{R} \qquad 4.2$$

then it is analogous to

$$I = \frac{\Delta V}{R_E} \qquad 4.3$$

where R_E is the electrical resistance and all of the d-c network thorems apply. The addition of thermal resistances in series and the combination of resistances in parallel are permitted operations. For example, the combination of two resistors in series is given by

$$R_C = R_A + R_B \qquad 4.4$$

and in parallel where R_C is the equivalent resistance.

$$R_C = \frac{R_A R_B}{R_A + R_B} \qquad 4.5$$

B. DESCRIPTION OF NODES

To simplify calculations and to assure accuracy in the node descriptions, the printed circuit boards were divided into 72 nodes with each node having an area of 1 square inch. This size results in relatively easy calculations when using areas and lengths between nodes and between printed circuit boards. The top board nodes were numbered 1-72 with the bottom board nodes numbered 73-144. Appendix C shows the node numbering, which will be used for reference later in this chapter.

The boards have six layers, alternating copper and epoxy. It was assumed for the analysis that copper covered 25% of the top layer. This takes circuit board components into consideration. This layer is designated by R_1. The other two copper layers were assumed to have 100% coverage and are designated by R_4. The epoxy layers are homogeneous. Figure 7 describes the Node 1 to Node 2 upper board conductances. Appendix 3 shows the node numbers and their relationshps for reference. R_2 describes the conductance of the polyimide (epoxy) layers in each node. To calculate the resistances of R_1 through R_4 Equation 4.6 is used.

$$R = \frac{12\ L_i}{k_i\ w_i\ (th_i)} \qquad 4.6$$

where L is the lenght of the heat flow path, th is the thickness of the contact area, w is the width, and k is the thermal conductivity of the material. Each epoxy layer is 0.01933 inches thick: each copper layer is 0.00134 inches thick. Table 4 lists the resistances calculated by equation 4.6 for the network shown in Figure 7. R_A through R_E are the equivalent resistances as the network is calculated, beginning with resistance R_A and working to resistance R_E. A sample calculation is included for resistance A.

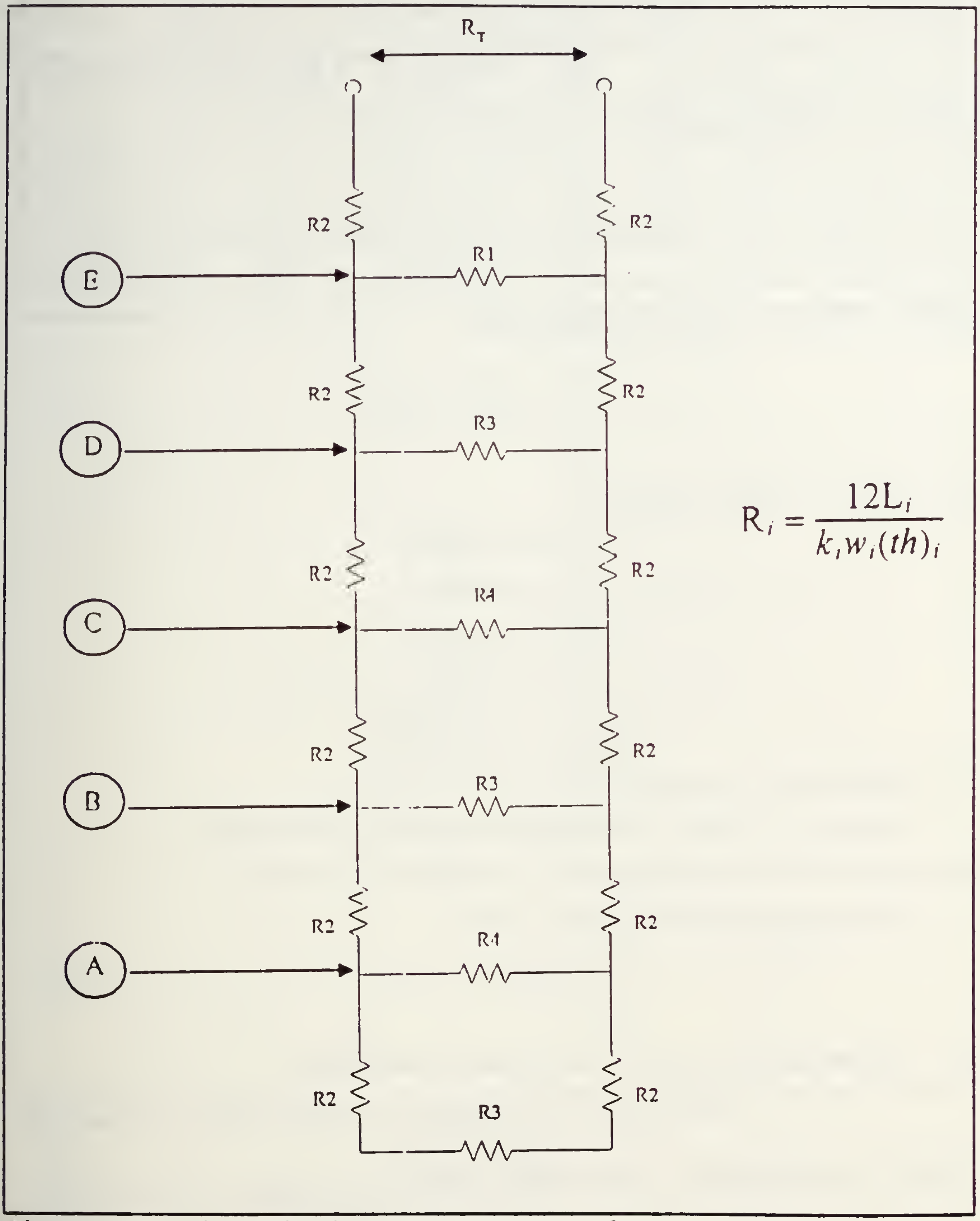


Figure 7. Electrical Power System Node 1 to Node 2

$R_i^{\#}$	L_i	w_i	th_i	k_i	R_i
1	1.00	1.00	0.00134	385 (.25)	93.04129
2	.01933/2	1.00	1.00	0.15	0.77320
3	1.00	1.00	0.01933	0.15	4138.645
4	1.00	1.00	0.00134	385	23.26032

Table 4. Node 1 to Node 2 Resistances

$$R_A = \frac{(R_3 + R_2 + R_2)\ R_4}{R_3 + R_4 + 2\ R_2} \tag{4.7}$$

As a result, for Node 1 to Node 2

$$R_A = 23.13037$$

$$R_B = 24.53051$$

$$R_C = 12.79438$$

$$R_D = 13.79438$$

$$R_E = R_T = 13.16939$$

Using Equation 4.1, K = 0.075934 °F-hr / Btu.

The node 1 to node 9 calculations are based on the same relationships, so that conductance is 0.075934 °F- hr / Btu.

For the radiation from board to board

$$K = 0.1732\ F_A\ F_E\ A \tag{4.8}$$

F_A = 1.00 because the boards are parallel to each other.

$$F_E = \frac{1}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} \tag{3.8}$$

Because the emissivity of both boards is assumed to be 0.8, $F_E = 0.6667$. After converting the node area into square feet

$$K = 0.1732\ (1.0)\left(\frac{2}{3}\right)\left(\frac{1}{144}\right) = 0.801852 \times 10^{-3} \qquad 4.9$$

Figure 8 describes the contact of the board layers to the housing rails.

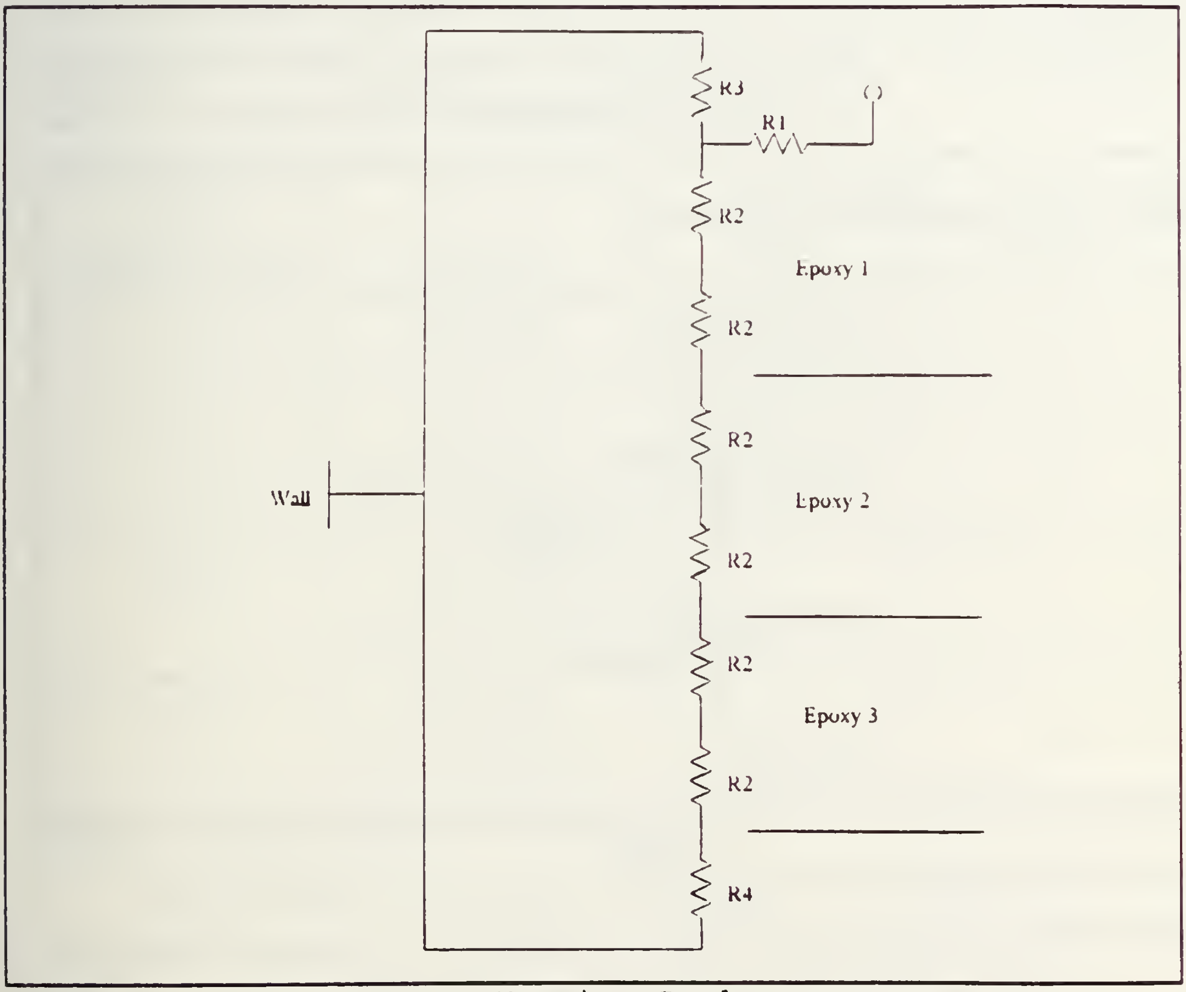


Figure 8. PCB Layers To Housing Conductances

Resistance R_1 is copper and resistance R_2 is epoxy. Resistances R_3 and R_4 are contacts with the railings.

R_1 is half that of the previous R_1 (the path length has been halved).

$$R_2 = \frac{(12)(0.01933/2)}{(1)(0.2)(0.15)} \qquad 4.10$$

$h_c = 500$ for copper contact

$h_c = 400$ for epoxy contact

$$R_4 = \frac{1}{400(0.2)(1/144)} = 1.88 \qquad 4.11$$

$$R_3 = \frac{1}{500\ (0.2)(1/144)} = 1.44 \qquad 4.12$$

Figure 9 is a simplification of Figure 8.

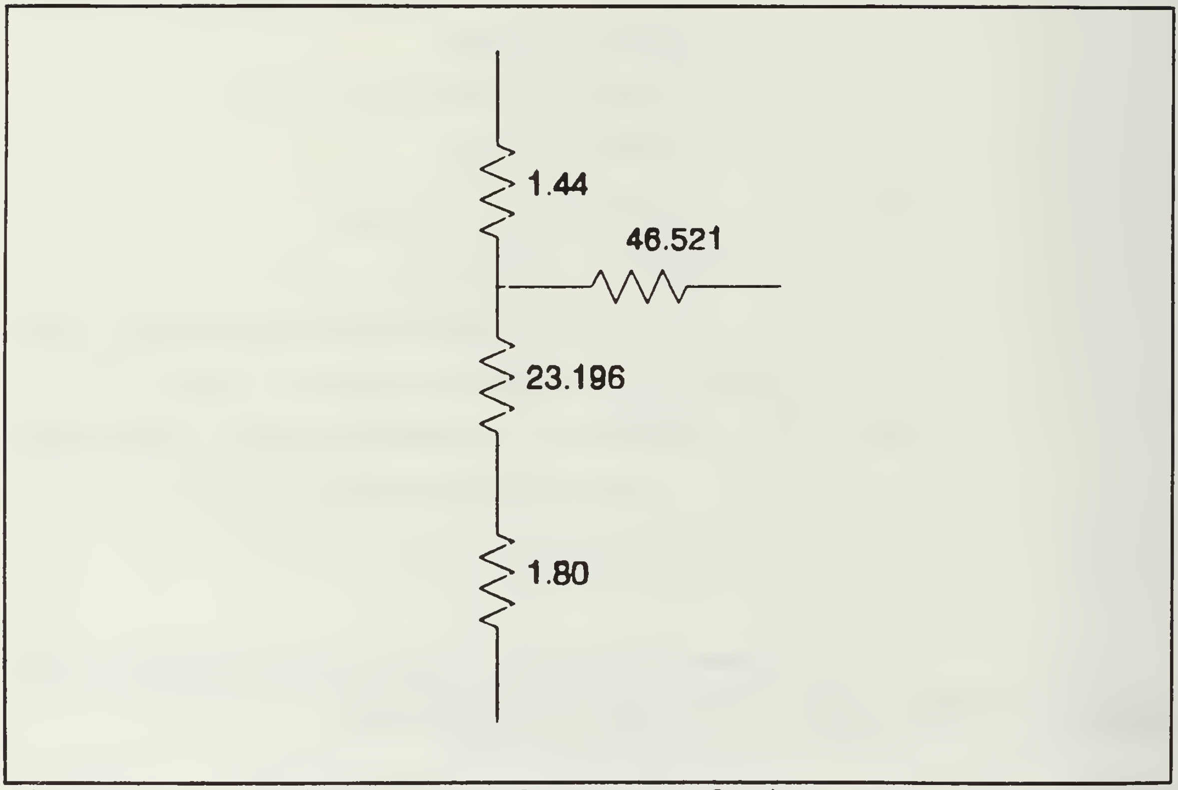


Figure 9. Equivalent Conductance of Figure 8

The equivalent resistance from the network shown in Figure 9 (R_T) = 47.88. K_T is the equivalent conductance, or 0.020885 ° F-hr/ Btu.

Once the conductances were calculated an input file was created, listing the conductances for each node with its associated mode. The input file is shown in Appendix D. The conductance values are listed by node. Beginning at lines 7 and 8 in Appendix D, the node equation describes what node is connected to what, by how much, and by which tag. At line seven, the fixed point integer values are connections and tags. Table 5 describes Node 1 connections contained in line 7.

NODE CONNECTION	POSITION	HOW	TAG
2	TOP PCB	CONDUCTION	1
9	TOP PCB	CONDUCTION	1
73	BOTTOM PCB	RADIATION	3
301	CONSTANT TEMPERATURE	CONDUCTION	1
303	CONSTANT TEMPERATURE	RADIATION	3

Table 5. Node Connections To Node 1

Line 8 contains floating point real numbers which are the appropriate conductance values for the connection. Each node requires an even number of lines. The three constant temperatures defined for the railings and housing were all 33.5 °C. Appendix E lists the heat dissipation by node in watts. The conductances need only be input in one direction as THANSS calculates the reverse connection automatically.

Table 6 lists the results of the steady state analysis of the circuit boards. The highest temperatures appeared on the bottom boards where the heat dissipations were the highest. However, the amount of dissipated heat is relatively low. Temperatures ranged from 34.42 °C to 36.31 °C on the upper board to 34.77 ° to 38.02 °C on the lower board, well within standard operating temperatures for electronic piece parts. A run at 25 °C constant heat source temperatures compared very favorably with an earlier steady state analysis performed using the Integrated Thermal Analysis System (ITAS).

PRINTED CIRCUIT BOARDS - S PATTERSON - RUN A

Temperatures, degC

1	35.38	2	35.78	3	35.96	4	35.92	5	35.80	6	35.67
7	35.48	8	35.19	9	35.62	10	36.14	11	36.31	12	36.12
13	35.88	14	35.72	15	35.54	16	35.34	17	35.56	18	36.00
19	36.15	20	36.10	21	35.91	22	35.71	23	35.48	24	35.18
25	35.65	26	36.16	27	36.24	28	36.25	29	35.95	30	35.64
31	35.36	32	35.00	33	35.48	34	35.91	35	36.05	36	36.05
37	36.07	38	35.56	39	35.24	40	34.90	41	35.55	42	35.96
43	35.80	44	35.69	45	35.58	46	35.32	47	35.10	48	34.86
49	35.36	50	35.60	51	35.65	52	35.42	53	35.27	54	35.08
55	34.87	56	34.63	57	35.01	58	35.34	59	35.28	60	35.17
61	35.06	62	34.91	63	34.72	64	34.49	65	34.80	66	35.03
67	35.08	68	35.04	69	34.95	70	34.81	71	34.64	72	34.42
73	35.53	74	36.12	75	36.49	76	36.67	77	36.91	78	37.19
79	37.02	80	36.25	81	35.66	82	36.56	83	36.93	84	36.90
85	37.20	86	38.02	87	37.99	88	36.51	89	35.63	90	36.28
91	36.75	92	37.10	93	37.32	94	37.94	95	37.80	96	36.43
97	35.63	98	36.23	99	36.82	100	37.78	101	37.44	102	37.35
103	37.06	104	36.08	105	35.46	106	36.01	107	36.63	108	37.69
109	37.25	110	36.91	111	36.50	112	35.74	113	35.43	114	35.90
115	36.26	116	36.54	117	36.55	118	36.43	119	36.15	120	35.46
121	35.11	122	35.60	123	35.75	124	35.91	125	36.05	126	36.03
127	35.83	128	35.23	129	34.85	130	35.18	131	35.38	132	35.53
133	35.68	134	35.70	135	35.55	136	35.02	137	34.71	138	34.99
139	35.19	140	35.32	141	35.41	142	35.38	143	35.21	144	34.86
301	33.50	302	33.50	303	33.50						

Figure 10. PANSAT PCB Temperature by Node

V. TRANSIENT ANALYSIS OF EPS USING ITAS

A. GEOMETRY GENERATION

To begin the analysis of the electrical power system, the geometry of the EPS was reproduced in the computer using the Integrated Thermal Analysis System (ITAS). The geometry was generated by piecing together, rotating and translating shapes from a geometry generation menu. These shapes were then stored in a PARTS file, which were then selectively plotted to allow for surface number and node number displays. The EPS was divided into three distinctly separate entities: the housing and the upper and lower circuit boards. Figure 10 and Figure 11 show the surface numbers and corresponding node numbers for the EPS housing. Each surface generated by ITAS is accessible for thermal node definitions and optical

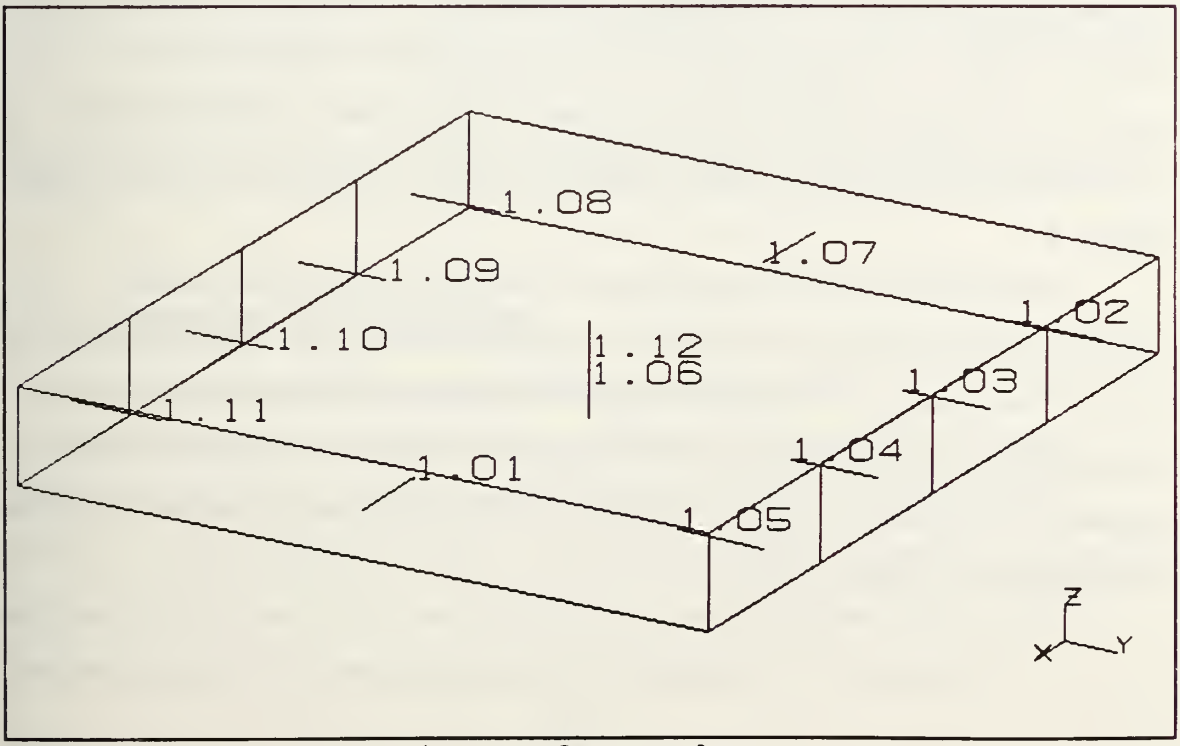


Figure 10. EPS Housing Surface Nodes

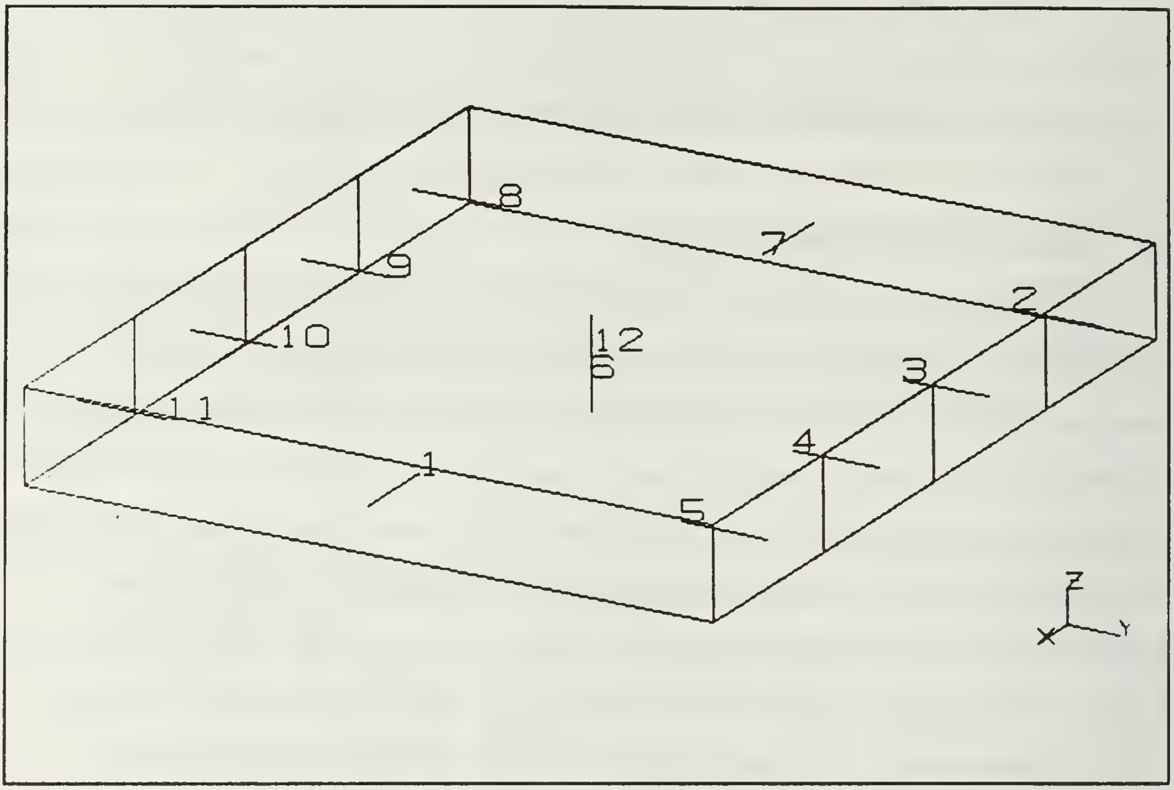


Figure 11. EPS Housing Node Numbers

properties definition. The housing is modelled as a six-sided box having 12 physical nodes. The dimensions of the housing are 9 inches in the X direction, 8 inches in the Y direction, and 1.569 inches in the Z direction. It is mounted underneath the upper equipment plate as seen in Figure 2 and Figure 3.

The upper printed circuit board is modelled as two four sided polygons. The polygons have node numbers from 2.01 to 2.18 and 3.01 to 3.12. This division of the upper equipment panel was done to accurately represent heat dissipations on the board and to define a workable number of conductance values. Appendix F shows both the surface numbers and node numbers for the upper PCB.

The lower PCB was constructed from 5 separate polygons: these node numbers ranged from 4.00 to 8.00. Appendix G shows the surface numbers and corresponding node numbers for the lower PCB. Figure 12 is a view of the integrated thermal nodes of both PCBs and the housing.

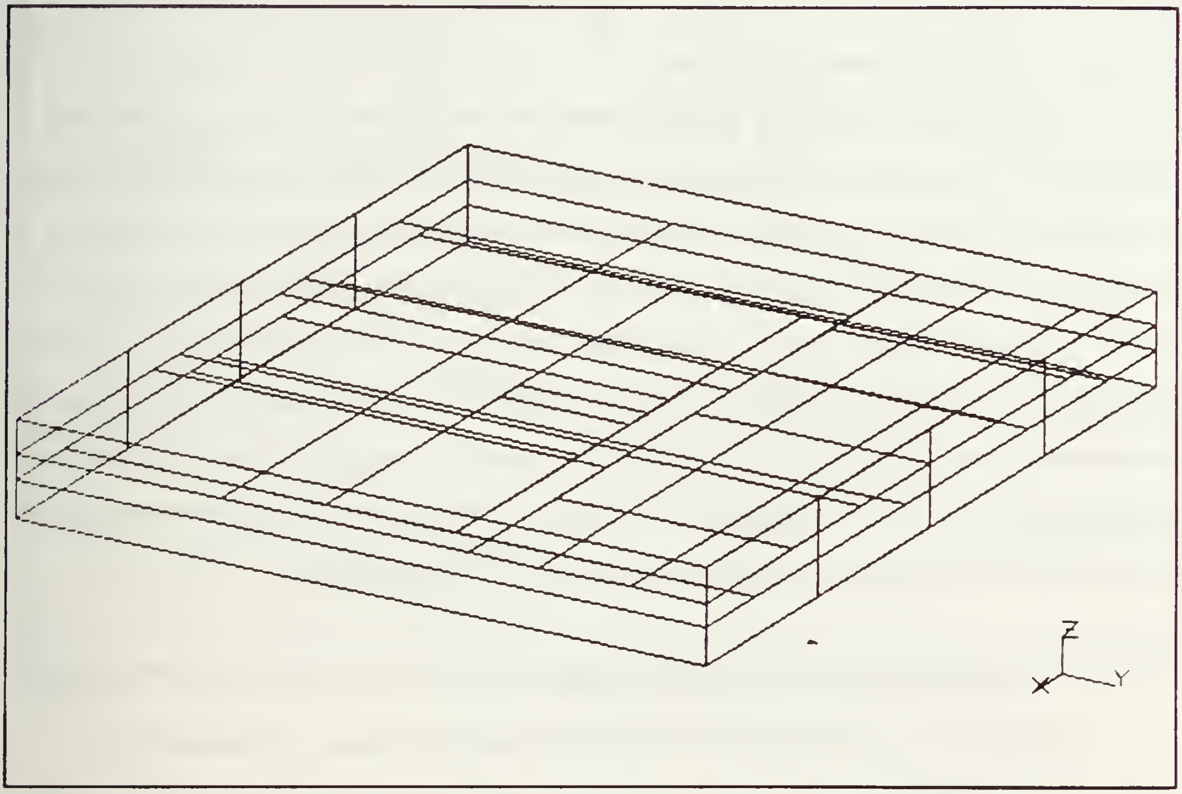


Figure 12. Geometry Model of the Electrical Power System

B. THERMAL PARAMETERS

1. Radiation Conductance Parameters (Script-F)

Script-F factors are the energy quantities incident on each of the surfaces of an enclosure after multiple reflections from the surrounding surfaces. (ITAS User's Manual). The Script Fs are in the IR wavelength and are used during the thermal analysis to account for all thermal radiation interchange, and are calculated from the blackbody view factors in conjunction with surface optical properties. Since the EPS is an enclosure with no view to space, the program is set to ignore the space node inclusion in the Script F calculations since surfaces inside the enclosures do not "see" surfaces outside the enclosure. [ITAS User's Manual, 1992]

2. Optical Properties Data

The optical properties data defines the properties of all surfaces and combines the geometric surfaces that have been created into thermal nodes. The optical properties listed in the Material Properties Library of ITAS were used for the housing (Aluminum 6061-T6) and for the copper layers of the printed circuit boards. These properties include the solar absorptivity (alpha) and infrared emissivity (epsilon) values. Individual capacitances and thermal dissipations were not defined in these screens but were defined in the User Node section. The surfaces that are listed in the Optical Properties entries in Appendix H are the geometric surfaces that ITAS generates.

3. Non-Geometric Node Definitions

In addition to the Optical Property node generation, additional non-geometric nodes were created. These nodes do not have a physical presence in ITAS. Examples of these nodes included the rails in the EPS housing to which the circuit boards are secured; the PCB board layers, which alternate copper and polyimide; the upper equipment plate, to which the top of the EPS is mounted; and the component pin nodes. Table 6 indicates the non-geometric node assignments. These nodes are also known as diffusion nodes: diffusion nodes, although not part of the ITAS geometry file still have finite mass. Nodes are not numbered consecutively to allow for flexibility and also to allow easy identification. For example, all nodes that are numbered 9XX are either housing or railing nodes: all of these nodes are made of aluminum. Nodes 16XX and 6XX, 14XX and 4XX, 12XX and 2XX are all copper layers of the printed circuit boards.

Node Number	Identification	Node Number	Identification
901-912	EPS housing	913	Equipment Plate
921-926	EPS rails	201-230	Top PCB top Cu
401-430	Top PCB mid Cu	501-530	Top PCB bot Cu
1201-1217	Bot PCB top Cu	1401-1417	Bot PCB mid Cu
1601-1617	Bot PCB bot Cu	101-130	Top PCB T poly
301-330	Top PCB M poly	501-530	Top PCB B poly
1101-1117	Bot PCB T poly	1301-1317	Bot PCB M poly
1501-1517	Bot PCB B poly	2XXX	Pins-Top PCB
3XXX	Pins- Bot PCB		

Table 6. Non-Geometric Node Numbers

The thermal capacitance of the diffusion nodes is entered in this screen. Thermal mass is also another name for thermal capacitance.

$$\text{Thermal Mass} = C = c\,\rho\,V \qquad 5.1$$

where c is specific heat in cal/g °C,

ρ = density of the material in kg/m^3,

V = volume of the material in m^3.

ITAS requires C to be in W-min / °C. To convert to the correct units the following conversion factor is used.

$$C = \left(\frac{cal}{g\ ^{\circ}C}\right)\left(\frac{kg}{m^3}\right)(m^3) = \frac{cal}{(.001)^{\circ}C} \qquad 5.2$$

$$1\ cal = 1.163\ x\ 10^{-6}\ kw\text{-}hr = 1163\ x\ 10^{-6}\ W\text{-}hr \qquad 5.3$$

$$1163\ x\ 10^{-6}\ W\text{-}hr = 6.978\ x\ 10^{-2}\ W\text{-min} \qquad 5.4$$

$$\frac{6.978\ x\ 10^{-2}\ W\text{-min}}{(0.001)\ ^{\circ}C} = 69.78\ W\text{-min}/^{\circ}C \qquad 5.5$$

This is the conversion factor used in Appendix I to calculate the thermal masses of all physical nodes. The following values were used in the calculations. [Penton Publishers, 1986]

EPS Housing Thickness	0.2 in
Equipment Plate Thickness	0.125 in
PCB Board Copper Layer	0.000134 in
PCB Board Poly Layer	0.001933
Density of Aluminum	2728 kg/m^3
Density of Polyimide	1950 kg/m^3
Density of Pin Material	8378 kg/m^3
Density of Copper	8666 kg/m^3
Specific Heat of Al	0.199 cal/kg °C
Specific Heat of Cu	0.098 cal/kg °C
Specific heat of Ni-Steel	0.11 cal/kg ° C
Specific Heat of Polyimide	0.31 cal/kg °C

Since ITAS allows total capacitance of each surface of the nodes to be entered into the model if the remaining surfaces are zeroed out. For pin conductances, the total thermal mass of the pins in each major node were considered as one node. For example, Node 2011 is the total capacitance of all pins through the top layer of geometric node 3.01.

Heat dissipations were also entered in this screen. These dissipations were obtained from the PANSAT design team. The component list and PCB board layouts are included as Appendix J. The top board design is currently much more mature than the lower board design and estimated heat dissipations were more accurate. Appendix K is the Node Data Entry for Thermal Analysis for the EPS.

4. Conductance Definitions

All conductances entered into the EPS model were defined as linear (two way); this type of conductance also applies to the nodes defined by ITAS. All conductance values were precalculated and entered into the model: unlike THANSS, radiation modes are calculated by ITAS. Equation 3.3 was used to calculated all conductances not involving contact conductances.

$$K = \frac{k\,A}{L} \qquad 3.3$$

Conductances not involving contact conductances included EPS housing to housing nodes; EPS housing to railing nodes (since the rails will be part of the housing); copper board nodes to copper board nodes and polyimide to polyimide nodes: and pin segment nodes to pin segments. Pins were modeled as one equivalent pin through each geometric node; however, each pin was divided into six nodes since they traverse through the board layers.

5. Contact Conductances

Contact conductance is defined in Equation 5.6.

$$h_c = \frac{(1.25)(k_s)\left(\frac{P}{H}\right)^{.95}}{S_r} \qquad 5.6$$

$$k_s = \frac{2\ k_1\ k_2}{k_1 + k_2} \qquad 5.7$$

where P = contact pressure of the surfaces, chosen as 15 psi for all contact.

H = hardness of the material. Brinell hardness numbers were used.

S_r = surface roughness

To calculate total conductance, first the conductance of the first material is calculated using Equation 3.3, resulting in K_1. Then the conductance of the second material is calculated, resulting in K_2. The total conductance (K_T) is calculated by Equation 5.8, with the results in W /° C.

$$K_T = \frac{1}{\frac{1}{K_1} + \frac{1}{h_c} + \frac{1}{K_2}} \qquad 5.8$$

The ITAS node-to-node conductance calculations are shown in Appendix L, with the conductance data entry in Appendix M.

6. Temperature Profile

ITAS uses temperature profiles for time varying boundary nodes. Boundary nodes without time variation must be input into the user-node definition section. A temperature profile (Figure 13) of the upper equipment plate obtained from the THANSS/TASS transient analysis of the spacecraft structure used in the EPS analysis. The initial temperature was an estimate of Kennedy Space Center temperatures in October.

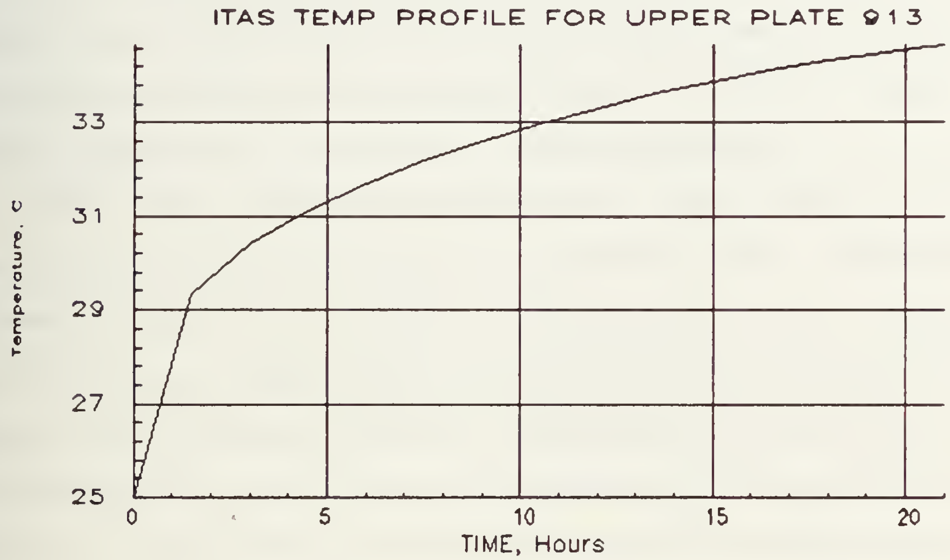


Figure 13. ITAS Temperature Profile For Equipment Plate

VI. THERMAL ANALYSIS OF BATTERIES

A. NICKEL-CADMIUM BATTERIES

Batteries can either be primary or secondary; secondary batteries can be recharged and reused. Batteries are made of cells that can be linked together in series or parallel. Cells linked in series have the positive terminal linked to the next cell's negative terminal: in a parallel connection positive terminals are linked to positive terminals and negative to negative. PANSAT's two batteries have 10 cells each linked in series. In series connections the voltage of the connected cells add while the capacity (normally measured in ampere hours) remains constant.

Sealed nickel cadmium cells operate as a closed system that recycle gases created within the cell, so that no electrolye is lost. Sealed cells with a resealable vent for safety are still considered sealed cells. Nickel-cadmium cells (Ni-Cd) have a higher energy to volume ratio than most other secondary batteries, have a relatively high rate of discharge, and can recharge quickly. Ni-Cd batteries are known for their long storage and operating life, can operate over a wide range of temperatures and environments maintenance free. Additionally, Ni-Cd batteries can handle continuous overcharge so the battery can be maintained in a ready state until needed. [Gates Energy Products, 1992]

Temperature is a very important condition for Ni-Cd batteries. The effective internal resistance of these cells is at a minimum when cell temperature is between 20 °C and 40 °C. Figure 14 shows the relationship between cell disharge temperature and the effective internal resistance. Temperature also effects a cell's effective no-load voltage. For an Ni-Cd cell, the effective no-load voltage is near the peak at room temperature: the decline is more pronounced at cooler temperatures. Figure 15 shows the

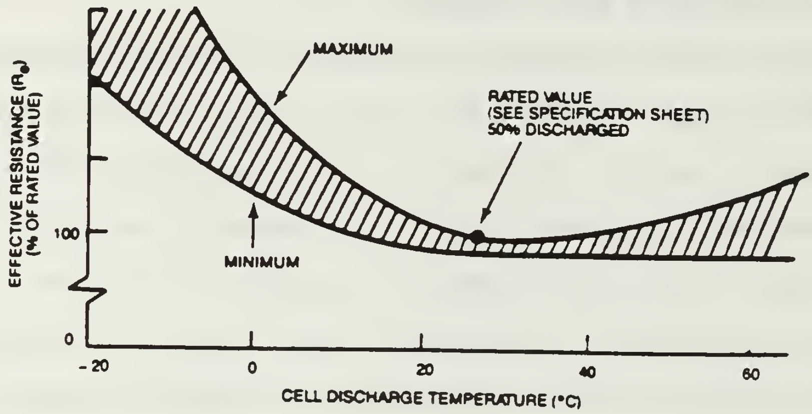


Figure 14. Cell Discharge Temp vs Internal Resistance "From Ref. [Gates, 1992]".

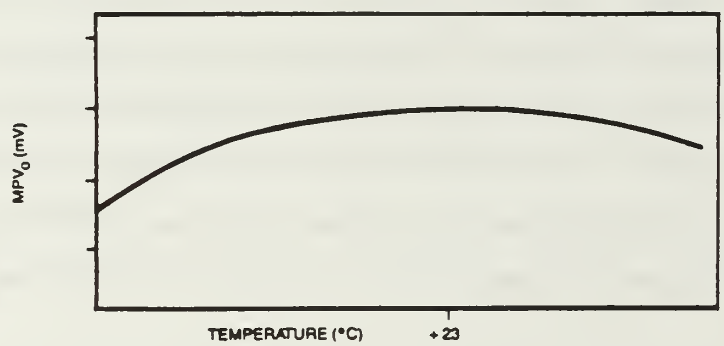


Figure 15. Cell Discharge Temperature vs No-Load Voltage "From Ref. [Gates, 1992]".

relationship between cell discharge temperature and no-load voltage.

An increase in cell temperature also has a negative effect on cell capacity. At elevated temperatures more charge is required for the cell to become fully charged, and the higher temperatures also decrease the cell capacity to below standard. Cell capacity while charging is not normally affected by temperatures below 23 °C, however, lower temperatures (below 23 °C) have a negative effect on cell capacity during discharge. Room temperature is the ideal environment for PANSAT's batteries. Space rated Ni-Cd batteries would be the technical choice for PANSAT; however, the cost of space rated batteries (approximately $200,000) is prohibitive.

PANSAT batteries are redundant: only one battery will operate at a time. However, the batteries must recharge to full capacity between each use for optimum performance. The current power budget is being examined to determine how long each battery will take to recharge after each use. A typical Ni-Cd battery will require about 160% of energy stored to recharge.

B. BATTERY GEOMETRY MODEL

To model the PANSAT battery, it was necessary to include the Digital Control Subsystem and the Electrical Power Subsystem in the model due to the proximity in the spacecraft. The model was built using ITAS. The two batteries and the DCS were the mounted on the lower equipment plate, built by connecting seven polygons. The spacecraft structure was built around the lower equipment plate, and the upper equipment plate, with the Electrical Power Subsystem (EPS) attached was added. The build progression is demonstrated in Appendix N. The geometric battery thermal model is shown in Figure 16.

After building the geometry model each surface was assigned a surface number and a node number. An example of this assignment is shown in Appendix O. The surface number and node number are related in the property data information of the model, shown in Appendix P. This is where the absorptivities and emissivities of the structure and box housings

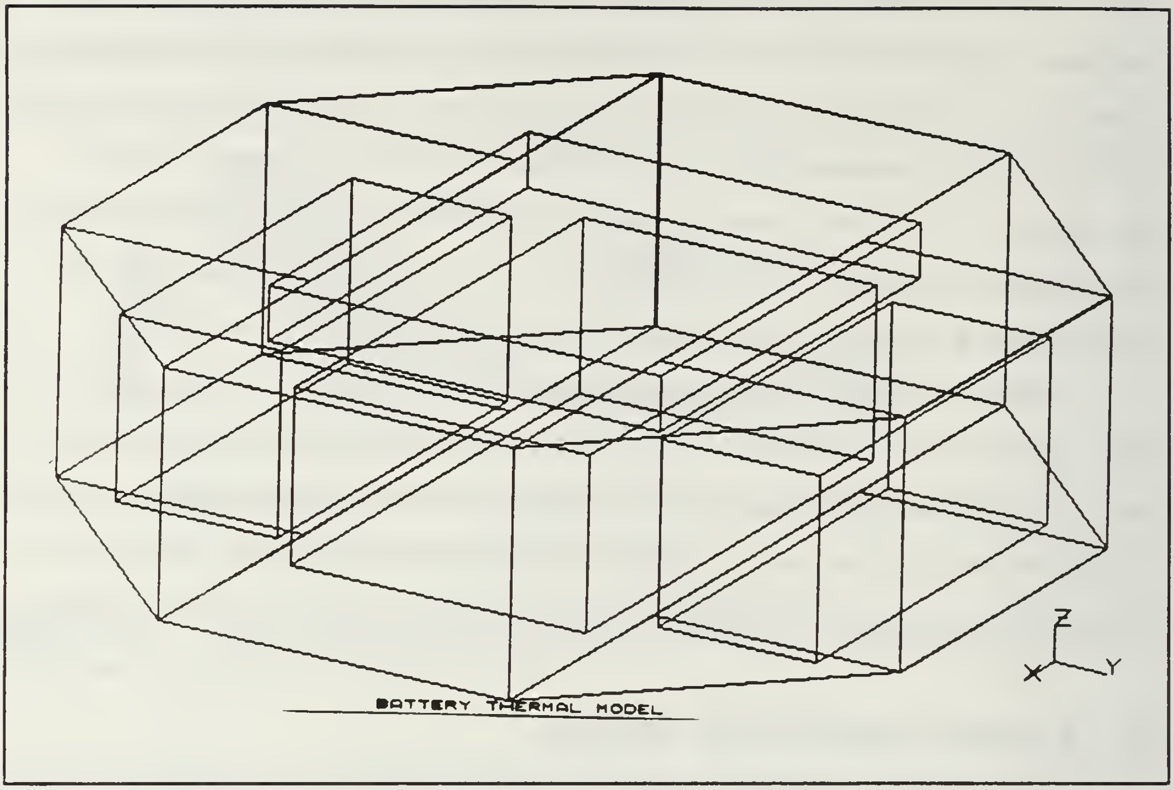


Figure 16. Battery Thermal Model

are listed. Since the box housing designs are not finalized, Aluminum- 6061-T6 was chosen. This material has an absorptivity of 0.4 and an emissivity of 0.79. Additionally, every surface on the boxes is given its own surface number and node number.

C. BOUNDARY CONDITIONS

Since a large percent of the model required the incorporation of PANSAT's structure, boundary nodes were used to define temperatures on areas that had already been analyzed. Surfaces that were defined as boundary nodes have temperatures which remain constant. The results from the transient analysis of PANSAT's structure were used. The structure was divided into areas as seen in Figure 17. Each square area is divided into nine equal nodes: the triangular areas are divided into six unequal nodes. The sections affecting the battery model are sections one through eight.

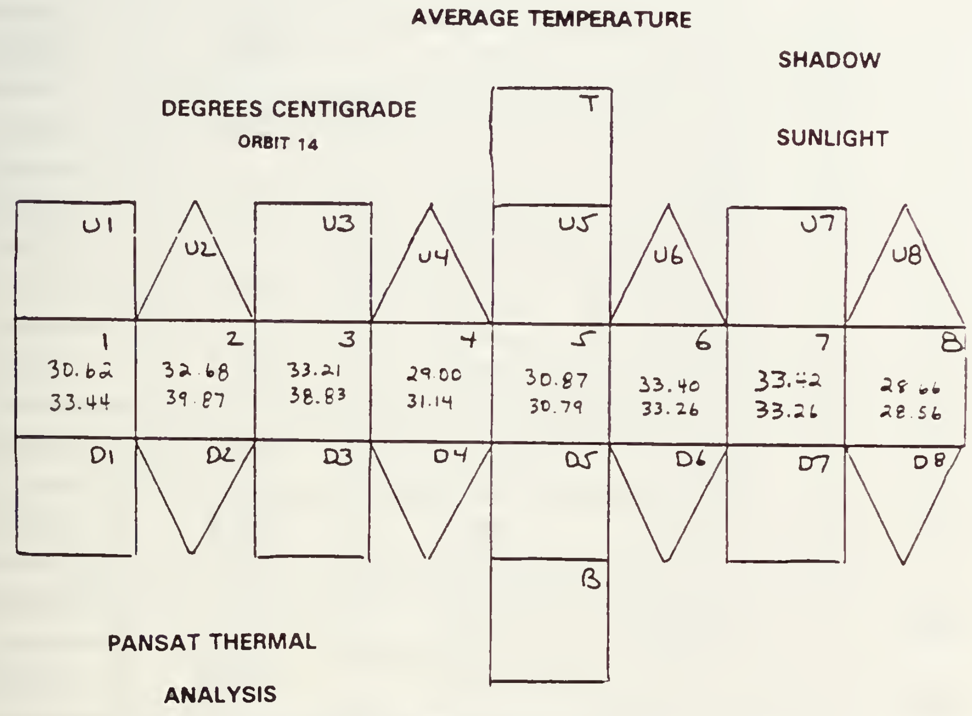


Figure 17. PANSAT Structural Divisions

Appendix Q lists the transient temperatures with internal heat dissipation by node for the shadow and sunlit zones for orbit 14. This was chosen since the spacecraft temperatures are leveling out: however, worst case temperatures were not extrapolated. Table 7 relates the structural number of Figure 17 to the node numbers of Appendix Q, and then lists the average temperature for that area for both shadow and sunlight.

	NODE	AVG. TEMP	AVG. TEMP	
SECTION	NUMBERS	SHADOW	SUNLIGHT	S/C AREA
1	1-9	30.6	33.4	WALL
2	10-18	32.7	39.9	WALL
3	19-27	33.2	38.8	WALL
4	28-36	28.7	31.1	WALL
5	37-45	30.8	39.9	WALL
6	46-54	33.4	33.3	WALL
7	55-63	33.4	33.3	WALL
8	64-72	28.7	28.6	WALL
N/A	219-226	32.9	33.7	LOWER PL
N/A	211-218	32.1	32.9	UPPER PL

Table 7. Average Temperatures in Celcius for Pass 14

These temperatures were used as boundary nodes, indicated as negative numbers in Appendix R. This appendix also lists the thermal masses (capacitances) for all hardware nodes. The explanation for thermal mass calculation is contained in Chapter V; the thermal mass calculations are included as Appendix S. Heat inputs to each box were estimated and defined in Appendix R as a node with no mass. This heat input was attached to the six walls of the housing where that heat input resides, and the heat was conducted outward through the walls. EPS boundary conditions were derived from the transient analysis.

Conductance values were calculated as in Chapter V and included in the ITAS Conductor Data Entry. Only surfaces within the boxes themselves or conductances between the heat nodes and the boxes are included since the upper plate, lower plate, and sidewalls are defined to have constant temperatures.

VII. RESULTS AND RECOMMENDATIONS

A. ELECTRICAL POWER SYSTEM

The analysis of the EPS transient analysis can be divided into three areas; the housing nodes, the upper board nodes, and the lower board nodes.

1. EPS Housing Nodes

Figures 18 and 19 show the temperature versus time plots for the EPS housing sidewalls and the top and bottom of the housing. As it would be be expected for a node which touches the outside edges of the housing, the

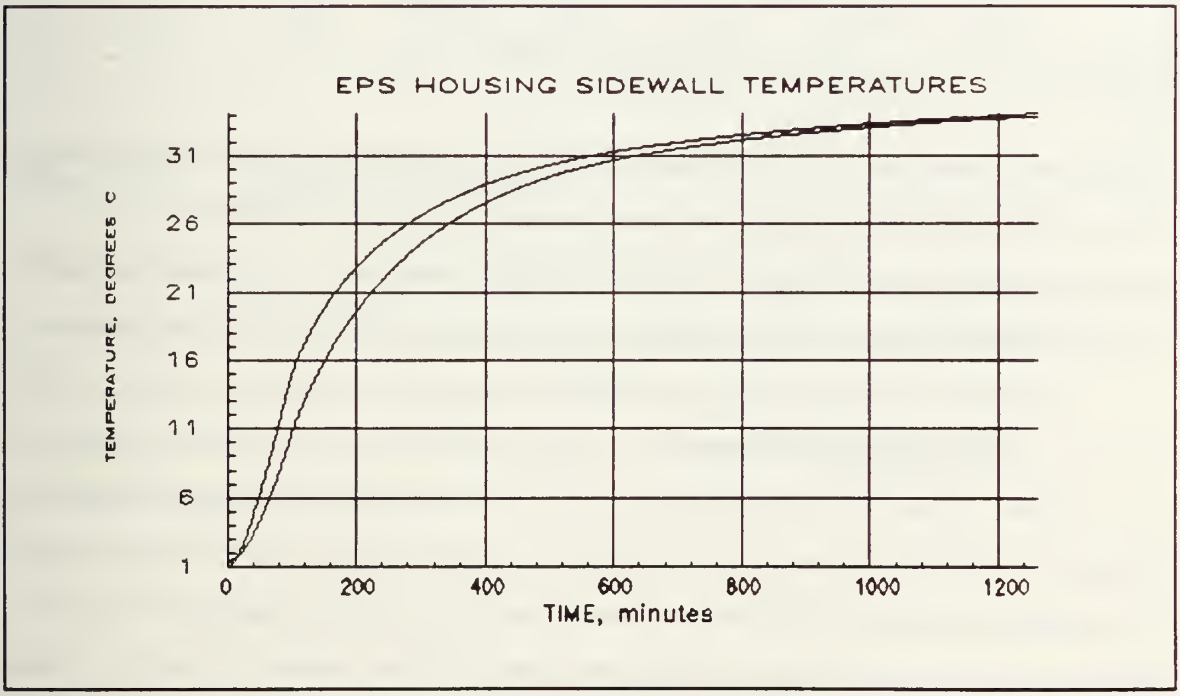


Figure 18. EPS Housing Temperature Trends

temperatures start low and become warmer. The bottom plate in the EPS housing would tend to be warmer than the top because the bottom has

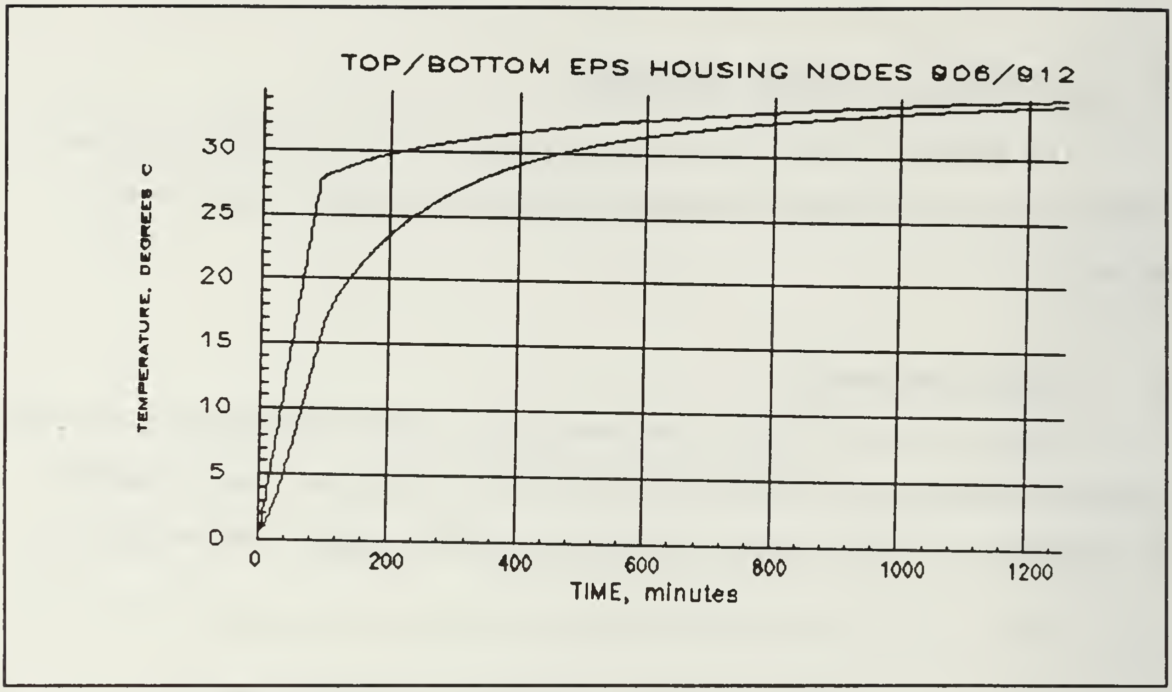


Figure 19. EPS Housing Trends

more heat dissipation. One drawback to the present analysis is that there was only enough information for a temperature profile of the lower equipment plate for 14 orbits. This, in effect, results in a transient analysis for that period of time and a steady state analysis for the following time.

2. Printed Circuit Boards

From Figure 20 it is apparent that any node that is attached to the housing sidewalls is going to experience a trend similar to the housing itself. In the case of the top PCB, nodes which butt up to the housing start cold and see a decreasing slope, starting to level off after about 17 hours. Nodes that do not touch the sidewalls (midboard in this case) remain between 20°C to 25 °C for the duration. This board remains cooler than the bottom PCB because the heat dissipations in the upper board are relatively low.

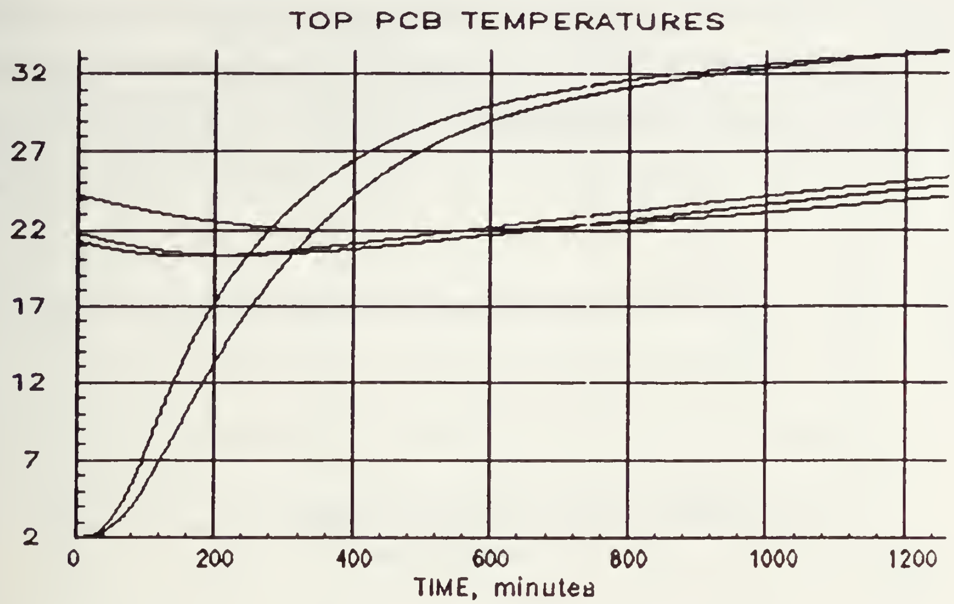


Figure 20. Upper PCB Results

The bottom PCB, as shown in Figure 21, has a similar curve for those nodes which attach to the rails, with the resulting final temperature very similar to the upper PCB. However, midboard nodes are approximately 4-5 degrees warmer on the bottom board, where the highest heat dissipations are concentrated.

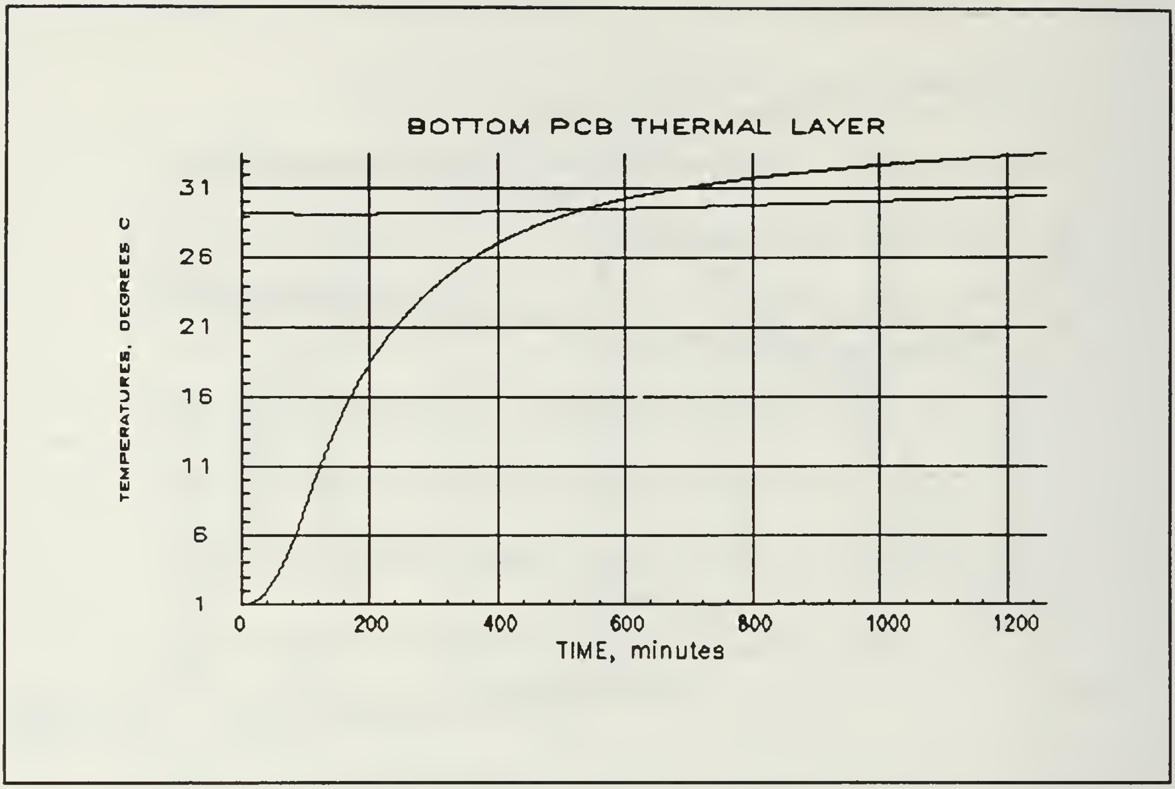


Figure 21. Bottom PCB Trends

B. BATTERIES

A steady state analysis was performed first on the battery. A copy of the results of both the steady state and the transient analysis is included as Appendix V. The transient analysis shows Battery A, Battery B, and the DCS at 33.7 ° C.

ITAS would not allow the model to be run as an enclosure. An ideal case would have been to run the battery first as an enclosure similar to the procedure used for the EPS. Since the cell information was not available, this run was performed to give a general battery environmental range. The analysis was effectively a steady state analysis since most of the structure had boundary nodes attached. This temperature is within the advertised

advertised operating ranges for a battery but is some distance from the ideal 23 °C. A second analysis was performed simulating a layer of Multilayer Insulation (MLI) on the bottom of both batteries. The result of this analysis can be seen from Figure 22. Although the initial temperatures are lower, the boxes quickly heat up. A third run insulating all six sides reduced the temperature by 3 °C to 30.7 °C.

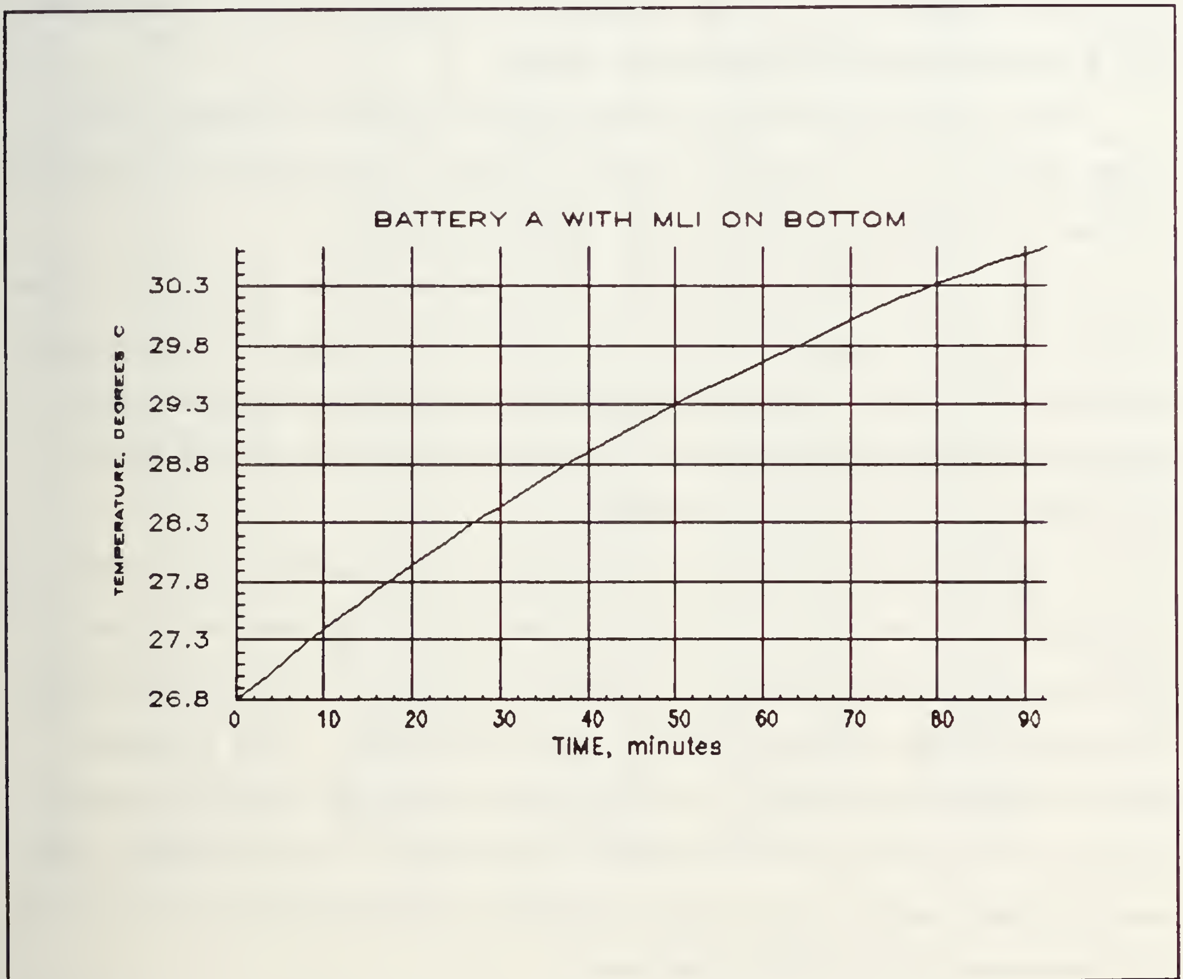


Figure 22. Temperature vs Time for Battery with MLI

C. RECOMMENDATIONS

To make the thermal analysis more realistic for the Electrical Power System, duty cycles for the printed circuit boards need to be established. This would give a more accurate time versus temperature plot. For the batteries, cell selection would allow the modelling of the cells inside the batteries as demonstrated in Appendix W. Dissipations for the high power use boxes would contribute to the accuracy of the model. As the individual boxes are created by ITAS, the spacecraft subsystems can be combined into a viable and accurate spacecraft model.

This analysis is only as accurate as the boundary conditions. This model should be rerun when boundary conditions obtained from the transient analysis of PANSAT structure using ITAS are completed.

ITAS was created to model spinning and stationary spacecraft. When PANSAT design is mature enough to run the entire model, there is an option in the Parameter Set Up and Alteration Menu for user defined spacecraft attitudes, where the satellite can be rotated in time on the X-Y-Z axes to more accurately represent a tumbling body.

ITAS can accurately represent the orbit of the satellite, and allows two methods. The first method requires the definition of the inclination, sun Right Ascension and Declination, and the Longitude of the Ascending Node. The other method requires definition of the beta angles. Both methods define perigee and apogee, so that time spent in sunlight and time spent in shadow are considered in the satellite's environment. The most likely orbit, looking ahead with shuttle mission manifests, suggests planning for a 51.6° inclination and a 213 NM circular orbit.

APPENDIX A. PANSAT STEADY STATE TEMPS IN SUNLIGHT

PANSAT - STEADY STATE - SUNLIGHT ZONE - WITH INTERNAL HEAT DISSIPATION

Temperatures, degC

1	54.98	2	57.32	3	59.02	4	53.88	5	56.55	6	58.84
7	53.63	8	55.55	9	57.55	10	64.39	11	65.71	12	65.90
13	64.44	14	66.16	15	66.49	16	61.06	17	62.18	18	62.52
19	64.12	20	63.05	21	61.13	22	65.46	23	64.24	24	61.74
25	62.28	26	61.51	27	59.63	28	55.48	29	53.59	30	52.79
31	54.99	32	52.71	33	51.62	34	53.55	35	52.01	36	51.35
37	51.82	38	51.59	39	51.60	40	50.76	41	50.59	42	50.82
43	51.37	44	51.37	45	51.53	46	51.62	47	51.80	48	52.02
49	52.04	50	52.41	51	52.65	52	52.10	53	52.33	54	52.55
55	52.52	56	52.34	57	51.47	58	52.86	59	52.60	60	51.47
61	53.11	62	52.98	63	52.18	64	48.10	65	47.91	66	49.27
67	47.95	68	47.46	69	48.96	70	48.85	71	48.42	72	49.51
73	49.42	74	52.32	75	58.48	76	51.94	77	56.38	78	59.60
79	53.83	80	57.12	81	59.59	82	64.99	83	64.86	84	63.83
85	65.70	86	65.11	87	66.18	88	62.35	89	59.82	90	57.10
91	64.39	92	62.35	93	59.92	94	63.36	95	61.71	96	59.46
97	52.58	98	51.86	99	52.36	100	51.26	101	53.86	102	52.37
103	48.07	104	44.92	105	44.12	106	48.10	107	46.00	108	45.74
109	50.27	110	49.21	111	48.95	112	45.59	113	45.67	114	47.48
115	47.75	116	49.05	117	49.52	118	44.90	119	44.92	120	45.32
121	46.75	122	46.39	123	46.29	124	49.21	125	48.94	126	48.41
127	45.90	128	46.22	129	44.97	130	45.43	131	46.38	132	47.89
133	49.96	134	51.51	135	53.56	136	47.60	137	49.41	138	53.08
139	46.96	140	48.34	141	53.13	142	57.85	143	58.21	144	58.69
145	58.77	146	62.04	147	62.32	148	57.53	149	56.13	150	54.21
151	57.53	152	54.98	153	52.82	154	56.64	155	53.07	156	51.50
157	50.39	158	49.35	159	49.92	160	49.00	161	50.82	162	50.60
163	50.26	164	50.41	165	50.65	166	48.66	167	48.35	168	49.35
169	48.97	170	47.28	171	49.22	172	50.37	173	50.63	174	50.98
175	51.27	176	54.24	177	54.37	178	51.72	179	51.14	180	50.49
181	50.83	182	49.86	183	48.86	184	50.46	185	48.74	186	48.11
187	47.21	188	47.06	189	47.15	190	46.91	191	48.63	192	48.54
193	44.30	194	46.16	195	50.51	196	44.97	197	47.58	198	52.66
199	46.52	200	49.44	201	54.75	202	47.11	203	46.56	204	47.86
205	46.43	206	45.95	207	48.40	208	45.99	209	46.81	210	50.18
211	58.00	212	58.41	213	58.30	214	56.97	215	54.40	216	53.37
217	52.53	218	52.18	219	54.88	220	56.02	221	56.09	222	54.86
223	53.86	224	53.78	225	53.69	226	54.02	227	53.85	228	53.26
229	51.16	230	50.79	231	48.47	232	47.90				
301	-272.80										

APPENDIX B. PANSAT STEADY STATE TEMPS IN SHADOW

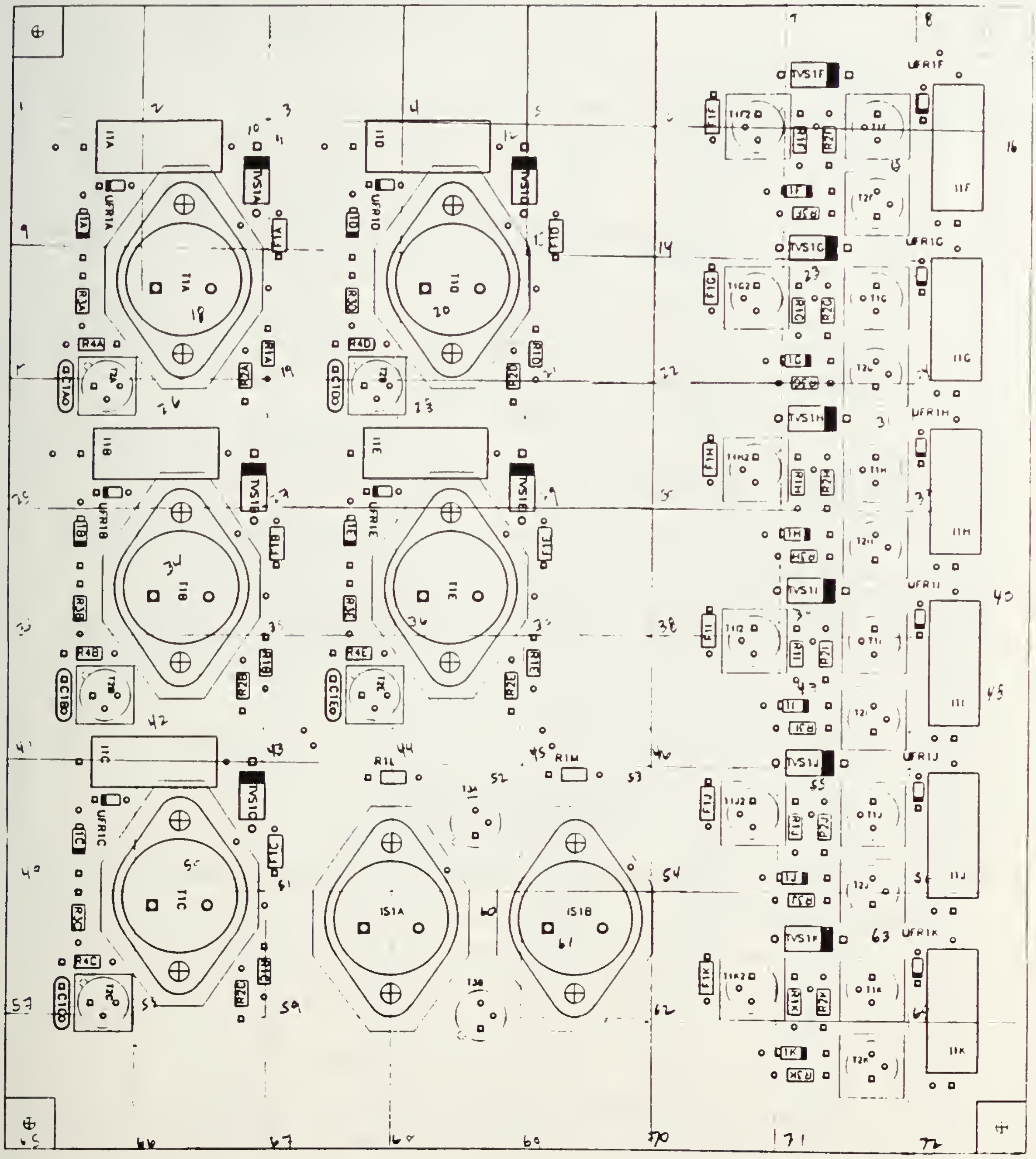
Page No. 1

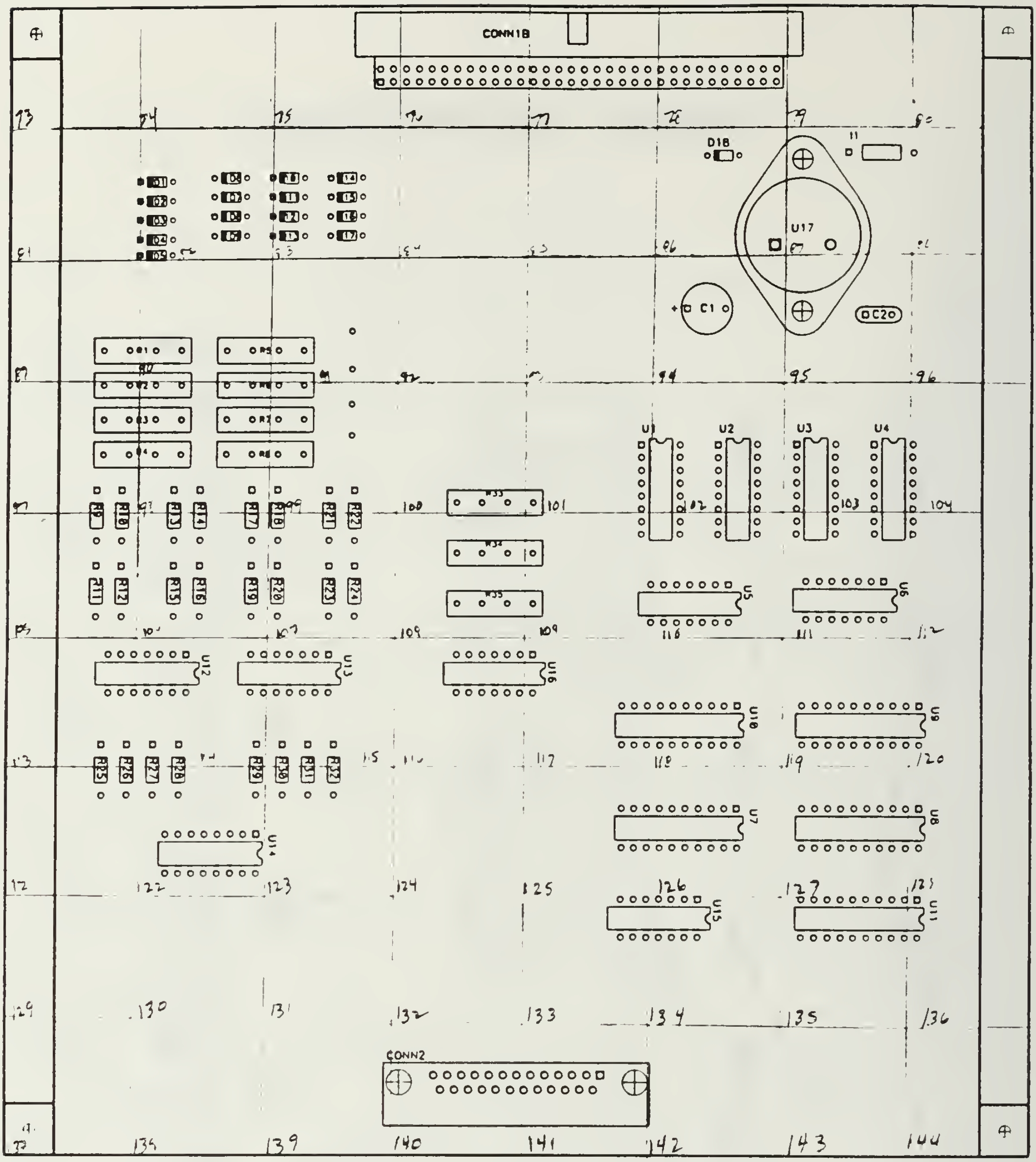
PANSAT - STEADY STATE - SHADOW ZONE - WITH INTERNAL HEAT DISSIPATION

Temperatures, degC

1	-19.14	2	-19.99	3	-20.56	4	-18.34	5	-19.32	6	-19.99
7	-16.10	8	-17.14	9	-17.65	10	-21.82	11	-21.92	12	-21.63
13	-20.83	14	-20.72	15	-19.87	16	-18.65	17	-18.29	18	-15.44
19	-20.86	20	-20.75	21	-20.73	22	-20.03	23	-20.14	24	-20.19
25	-17.47	26	-17.81	27	-17.93	28	-20.84	29	-20.63	30	-19.70
31	-20.23	32	-19.81	33	-18.54	34	-18.17	35	-17.85	36	-16.89
37	-15.75	38	-14.72	39	-13.46	40	-14.94	41	-13.27	42	-11.58
43	-13.84	44	-12.45	45	-11.21	46	-10.08	47	-9.24	48	-8.99
49	-7.89	50	-6.78	51	-6.50	52	-8.06	53	-7.29	54	-7.12
55	-9.28	56	-9.74	57	-10.81	58	-6.96	59	-7.61	60	-9.01
61	-7.67	62	-8.18	63	-9.19	64	-14.46	65	-15.52	66	-16.85
67	-13.05	68	-14.63	69	-15.68	70	-12.57	71	-13.70	72	-14.61
73	-22.36	74	-24.09	75	-25.30	76	-22.12	77	-23.14	78	-24.54
79	-20.75	80	-21.69	81	-22.36	82	-25.89	83	-25.88	84	-24.88
85	-24.87	86	-23.35	87	-23.37	88	-25.80	89	-25.26	90	-24.27
91	-24.93	92	-24.34	93	-22.48	94	-22.66	95	-22.31	96	-21.87
97	-23.37	98	-23.22	99	-22.69	100	-22.34	101	-22.11	102	-21.47
103	-22.51	104	-20.87	105	-18.13	106	-21.13	107	-19.28	108	-16.09
109	-19.15	110	-17.80	111	-15.57	112	-15.17	113	-15.02	114	-12.88
115	-12.24	116	-11.56	117	-10.70	118	-15.61	119	-17.25	120	-18.41
121	-13.71	122	-14.89	123	-15.65	124	-12.85	125	-13.81	126	-14.76
127	-19.81	128	-20.18	129	-18.39	130	-18.92	131	-16.96	132	-18.62
133	-15.03	134	-15.38	135	-17.14	136	-15.21	137	-17.17	138	-18.68
139	-14.50	140	-17.04	141	-18.87	142	-18.88	143	-16.47	144	-19.43
145	-19.44	146	-19.59	147	-19.64	148	-17.73	149	-17.47	150	-17.44
151	-19.37	152	-19.00	153	-18.53	154	-19.44	155	-18.79	156	-18.08
157	-18.05	158	-17.21	159	-18.05	160	-17.13	161	-17.16	162	-16.83
163	-13.53	164	-11.66	165	-10.02	166	-13.95	167	-11.47	168	-8.60
169	-14.16	170	-11.15	171	-7.36	172	-8.40	173	-7.93	174	-7.32
175	-6.85	176	-2.19	177	-2.04	178	-8.09	179	-9.45	180	-9.83
181	-6.35	182	-7.57	183	-9.09	184	-5.65	185	-7.91	186	-9.34
187	-12.97	188	-14.11	189	-12.09	190	-13.32	191	-11.10	192	-11.38
193	-20.05	194	-22.76	195	-24.46	196	-21.20	197	-24.10	198	-25.41
199	-21.99	200	-24.54	201	-25.83	202	-10.78	203	-13.59	204	-15.85
205	-12.25	206	-14.59	207	-16.46	208	-13.09	209	-15.07	210	-17.72
211	-18.92	212	-19.12	213	-19.11	214	-18.23	215	-15.99	216	-14.82
217	-14.09	218	-14.19	219	-13.66	220	-14.04	221	-14.20	222	-13.39
223	-12.32	224	-11.53	225	-11.48	226	-12.52	227	-13.80	228	-12.66
229	-14.06	230	-13.39	231	-14.59	232	-13.79				
301	-272.80										

APPENDIX C. EPS NODE DIVISIONS




CONN1B
D18
U17
C1
C20
U1
U2
U3
U4
U5
U6
U12
U13
U16
U18
U9
U7
U8
U14
U15
U11
CONN2

APPENDIX D. THANSS/TASS INPUT FILE

```
PRINTED CIRCUIT BOARDS - S. PATTERSON - RUN B
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    0     0     0
  300    50     6     2     4     6     0     0     0     0
.500000E-01 .666670            12 .800000     77.0000
92.3000     92.3000     92.3000
   5    21          91         733        3011        3033
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03
   5    11          31         101         743        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
   5    21          41         111         753        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
   5    31          51         121         763        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
   5    41          61         131         773        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  .6    51          71         141         783        3033        9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .102390E-01
   6    61          81         151         793        3033        9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E-02
   6    71         161         803        3011        3033        9991
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .102390E-01
   7    11         101         171         813        3011        3033           9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .682600E
   7    21          91         111         181         823        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .139933
   7    31         101         121         191         833        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .139933
   7    41         111         131         201         843        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .546080E
   7    51         121         141         211         853        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
   7    61         131         151         221         863        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
   7    71         141         161         231         873        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .170650E
   7    81         151         241         883        3011        3033           9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .000000     .801852E-03 .204780E
   7    91         181         251         893        3011        3033           9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .170650E
   7   101         171         191         261         903        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .204780E
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.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .136520E
   7   121         191         211         281         923        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .136520E
   7   131         201         221         291         933        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
   7   141         211         231         301         943        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .136520E
   7   151         221         241         311         953        3033           9
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.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .307170E
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   7   181         251         271         341         983        3033           9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .139933
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.500000E-01 .666670                 12 .800000     77.0000
92.3000     92.3000      92.3000
    5    21          91         733        3011        3033
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03
    5    11          31         101         743        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5    21          41         111         753        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5    31          51         121         763        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5    41          61         131         773        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    6    51          71         141         783        3033        9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .102390E-01
    6    61          81         151         793        3033        9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E-02
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    7    21          91         111         181         823        3033       9
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    7    71         141         161         231         873        3033       9
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    7    91         181         251         893        3011        3033       9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .170650E
    7   101         171         191         261         903        3033       9
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    7   131         201         221         291         933        3033       9
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    7   191         261         281         351         993        3033       9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
```

7 201	271	291	361	1003	3033	9
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6 211	281	301	371	1013	3033	
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7 221	291	311	381	1023	3033	9
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7 231	301	321	391	1033	3033	9
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6 241	311	401	1043	3011	3033	
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7 251	341	411	1053	3011	3033	9
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7 261	331	351	421	1063	3033	9
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7 271	341	361	431	1073	3033	9
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7 291	361	381	451	1093	3033	9
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6 301	371	391	461	1103	3033	
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	
7 311	381	401	471	1113	3033	9
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	.102390E
7 321	391	481	1123	3011	3033	9
.759341E-01	.759341E-01	.759341E-01	.801852E-03	.208850E-01	.801852E-03	.341300E
7 331	421	491	1133	3011	3033	9
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7 341	411	431	501	1143	3033	9
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6 351	421	441	511	1153	3033	
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	
6 361	431	451	521	1163	3033	
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	
7 371	441	461	531	1173	3033	9
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7 381	451	471	541	1183	3033	9
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7 391	461	481	551	1193	3033	9
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.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	.341300E
7 431	501	521	591	1233	3033	9
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	.853250E
6 441	511	531	601	1243	3033	
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	
6 451	521	541	611	1253	3033	
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	
6 461	531	551	621	1263	3033	
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	
6 471	541	561	631	1273	3033	
.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.801852E-03	
6 481	551	641	1283	3011	3033	
.759341E-01	.759341E-01	.759341E-01	.801852E-03	.208850E-01	.801852E-03	
7 491	581	651	1293	3011	3033	9
.759341E-01	.759341E-01	.759341E-01	.801852E-03	.208850E-01	.801852E-03	.102390E

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.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .784990E
  6    511         581         601         671        1313        3033
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  6    521         591         611         681        1323        3033
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  6    531         601         621         691        1333        3033
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  6    541         611         631         701        1343        3033
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  6    551         621         641         711        1353        3033
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  6    561         631         721        1363        3011        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03
  5    571         661        1373        3011        3033
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03
  5    581         651         671        1383        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  5    591         661         681        1393        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  5    601         671         691        1403        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  5    611         681         701        1413        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  5    621         691         711        1423        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  5    631         701         721        1433        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
  5    641         711        1443        3011        3033
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03
  5     13         741         811        3011        3023
.801852E-03 .759341E-01 .759341E-01 .208850E-01 .801852E-03
  5     23         731         751         821        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  5     33         741         761         831        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  5     43         751         771         841        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  5     53         761         781         851        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  5     63         771         791         861        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  5     73         781         801         871        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  5     83         791         881        3011        3023
.801852E-03 .759341E-01 .759341E-01 .208850E-01 .801852E-03
  6     93         731         821         891        3011        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
  7    103         741         811         831         901        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .204780
  7    113         751         821         841         911        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .180889
  6    123         761         831         851         921        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  6    133         771         841         861         931        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
  7    143         781         851         871         941        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .307170
  7    153         791         861         881         951        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .426625
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6 163	801	871	961	3011	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	
7 173	811	901	971	3011	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	.102390E
7 183	821	891	911	981	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.238910E
7 193	831	901	921	991	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.170650E
6 203	841	911	931	1001	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	
6 213	851	921	941	1011	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	
7 223	861	931	951	1021	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.238910
7 233	871	941	961	1031	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.307170
6 243	881	951	1041	3011	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	
7 253	891	981	1051	3011	3022	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	.238910E
7 263	901	971	991	1061	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.511950E
7 273	911	981	1001	1071	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341F-01	.759341E-01	.801852E-03	.238910E
7 283	921	991	1011	1081	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.341300
7 293	931	1001	1021	1091	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.614340E
7 303	941	1011	1031	1101	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.614340E
7 313	951	1021	1041	1111	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.122868
6 323	961	1031	1121	3011	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	
6 333	971	1061	1131	3011	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	
6 343	981	1051	1071	1141	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	
6 353	991	1061	1081	1151	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	
7 363	1001	1071	1091	1161	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.409560
7 373	1011	1081	1101	1171	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.102390
7 383	1021	1091	1111	1181	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.614340E
7 393	1031	1101	1121	1191	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.614340E
6 403	1041	1111	1201	3011	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	
7 413	1051	1141	1211	3011	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.208850E-01	.801852E-03	.648470E
7 423	1061	1131	1151	1221	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.648470E
7 433	1071	1141	1161	1231	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.648470E
6 443	1081	1151	1171	1241	3023	
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	
7 453	1091	1161	1181	1251	3023	9
.801852E-03	.759341E-01	.759341E-01	.759341E-01	.759341E-01	.801852E-03	.341300E

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 7    463        1101        1171        1191        1261        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .511950E
 7    473        1111        1181        1201        1271        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
 6    483        1121        1191        1281        3011        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
 6    493        1131        1221        1291        3011        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
 7    503        1141        1211        1231        1301        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
 6    513        1151        1221        1241        1311        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 6    523        1161        1231        1251        1321        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 7    533        1171        1241        1261        1331        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .341300E
 7    543        1181        1251        1271        1341        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .511950E
 7    553        1191        1261        1281        1351        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
 6    563        1201        1271        1361        3011        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
 6    573        1211        1301        1371        3011        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
 6    583        1221        1291        1311        1381        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 6    593        1231        1301        1321        1391        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 6    603        1241        1311        1331        1401        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 7    613        1251        1321        1341        1411        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .341300E
 7    623        1261        1331        1351        1421        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .511950E
 7    633        1271        1341        1361        1431        3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
 6    643        1281        1351        1441        3011        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
 5    653        1291        1381        3011        3023
.801852E-03 .759341E-01 .759341E-01 .208850E-01 .801852E-03
 5    663        1301        1371        1391        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 5    673        1311        1381        1401        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 5    683        1321        1391        1411        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 5    693        1331        1401        1421        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 5    703        1341        1411        1431        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 5    713        1351        1421        1441        3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
 5    723        1361        1431        3011        3023
.801852E-03 .759341E-01 .759341E-01 .208850E-01 .801852E-03
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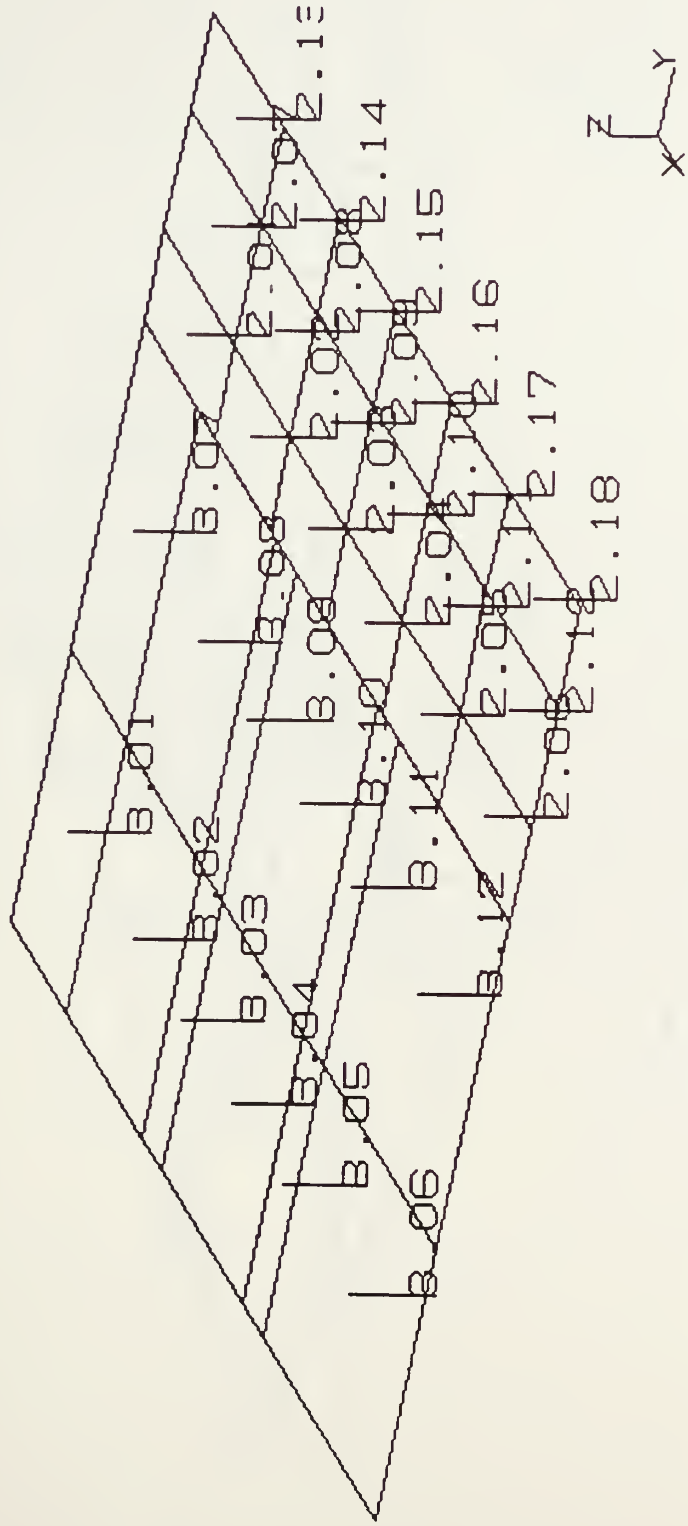
APPENDIX E. HEAT DISSIPATIONS BY NODE

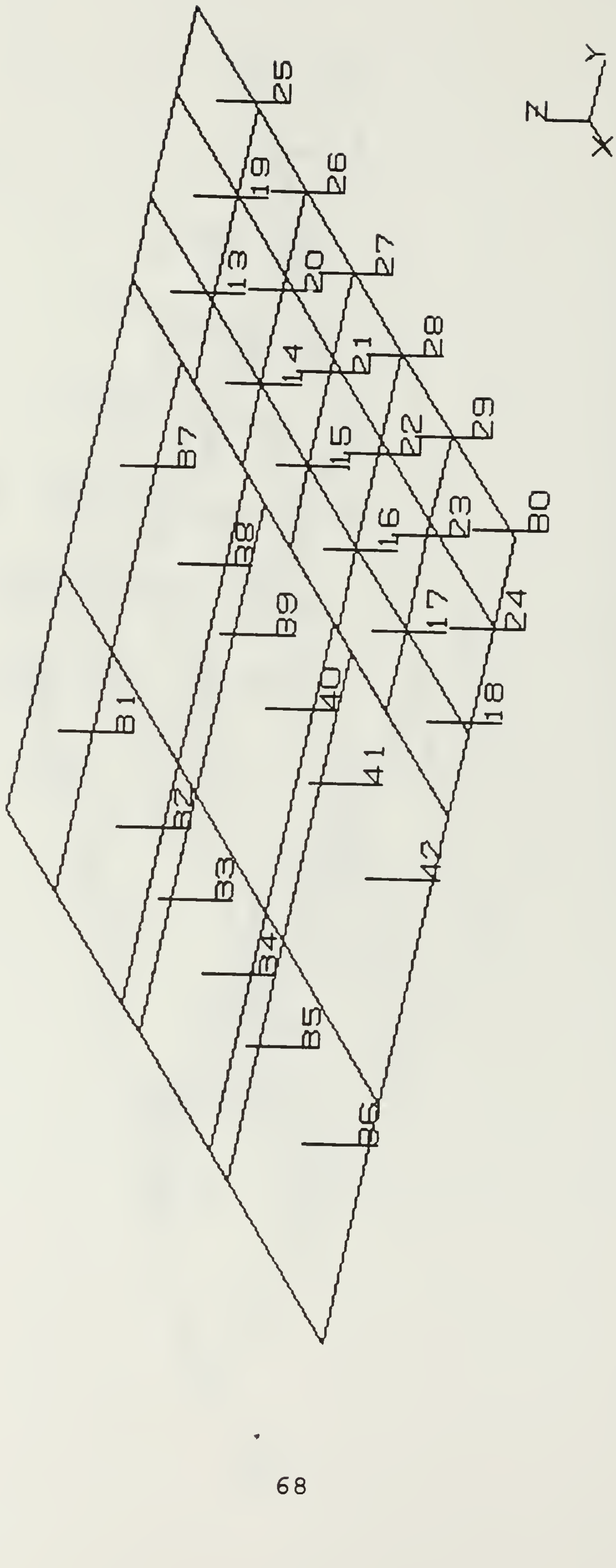
NODE	WATTS	NODE	WATTS	NODE	WATTS	NODE	WATT S
8	.003	25	.02	49	.023	102	.018
7	.002	26	.041	90	.010	103	.036
8	.003	27	.020	91	.025	108	.120
8	.020	28	.030	57	.003	109	.030
10	.041	90	.001	98	.023	110	.018
11	.011	31	.003	82	.060	111	.018
12	.016	33	.001	83	.053	113	.015
13	.002	34	.006	86	.090	114	.019
14	.002	39	.014	87	.125	118	.015
19	.005	36	.008	89	.003	117	.010
16	.005	37	.050	90	.007	118	.01[illegible]
17	.005	39	.003	91	.008	118	.025
18	.006	40	.001	94	.070	122	.025
19	.004	41	.023	95	.090	125	.010
20	.004	47	.046	97	.007	125	.015
21	.002	45	.002	86	.015	127	.025
22	.004	46	.001	99	.007	133	.010
23	.004	47	.005	100	.100	134	.01[illegible]
24	.009	48	.001	101	.018	135	.025

PCB HEAT DISSIPATIONS BY NODE

APPENDIX F. SURFACE/NODE NUMBERS FOR TOP PCB



SURFACE NUMBERS FOR TOP PCB



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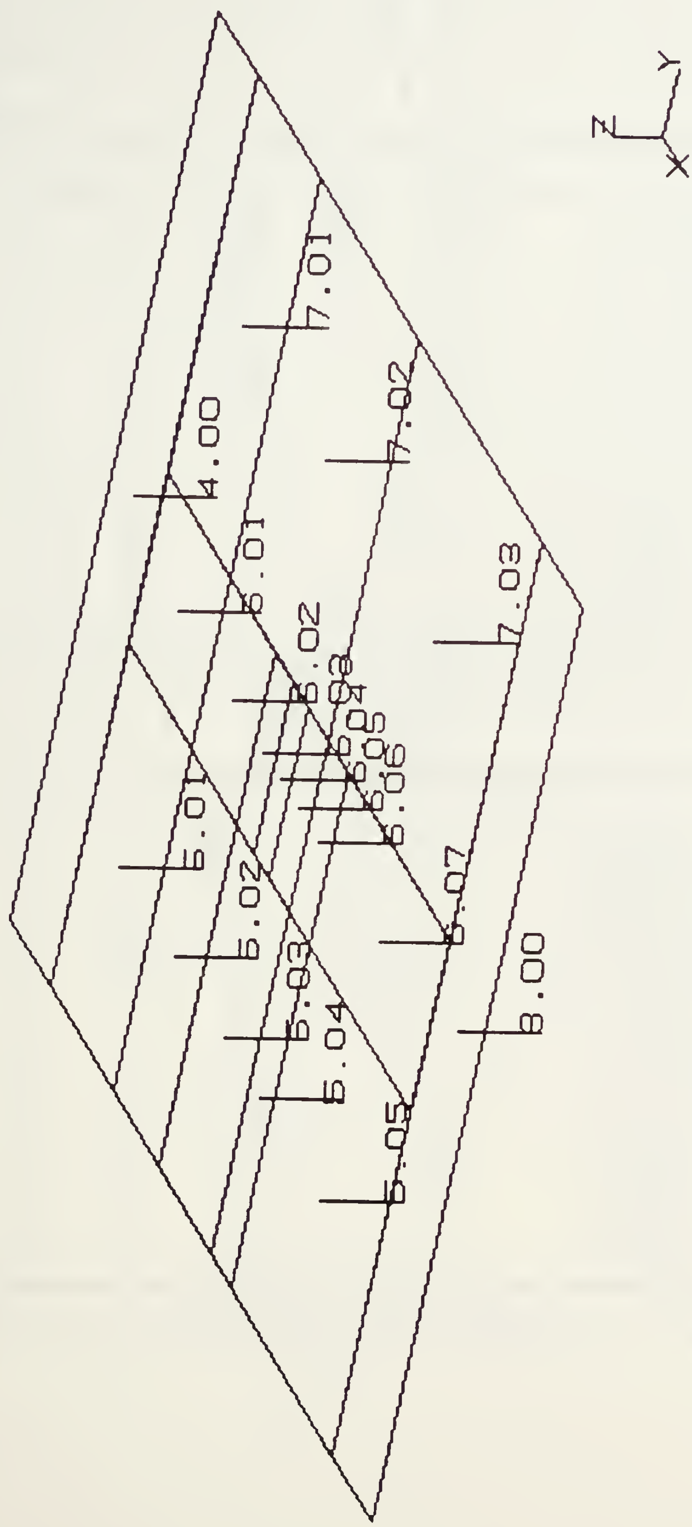
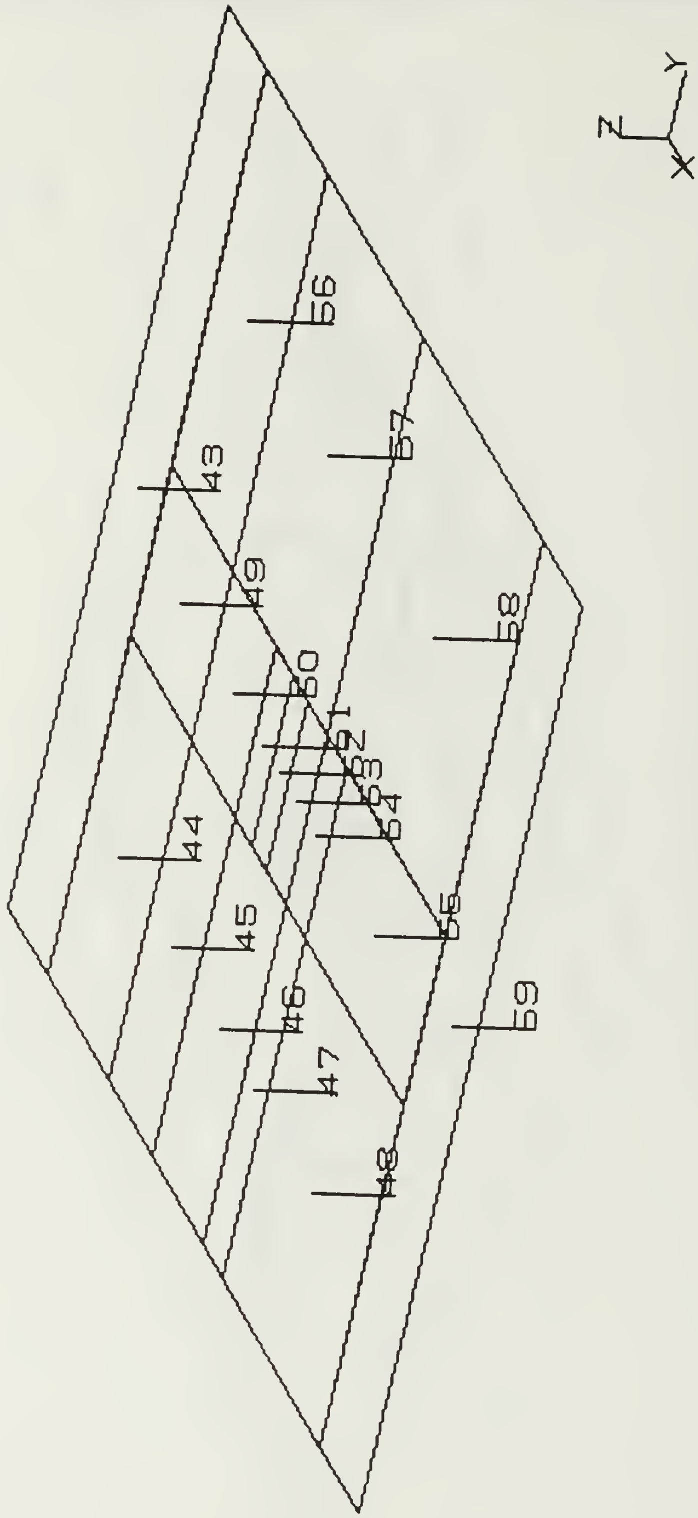
APPENDIX G. SURFACE/NODE NUMBERS FOR BOTTOM PCB



SURFACE NUMBERS FOR BOTTOM PCB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Y
Z

APPENDIX H. OPTICAL PROPERTY DATA FOR EPS

PgDn PgUp Home End F2Help

èëë Ctrl : Copy (See F2)ëë ITAS Property Data Entry ëëëëëëëëëëëëëëëëëëëëëëëëëë

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
1	1.01	1	.4	.79	1.	0.		EPS HOUSING
2	1.02	2	.4	.79	1.	0.		EPS HOUSING
3	1.03	3	.4	.79	1.	0.		EPS HOUSING
4	1.04	4	.4	.79	1.	0.		EPS HOUSING
5	1.05	5	.4	.79	1.	0.		EPS HOUSING
6	1.06	6	.4	.79	1.	0.		EPS HOUSING
7	1.07	7	.4	.79	1.	0.		EPS HOUSING
8	1.08	8	.4	.79	1.	0.		EPS HOUSING
9	1.09	9	.4	.79	1.	0.		EPS HOUSING
10	1.10	10	.4	.79	1.	0.		EPS HOUSING
11	1.11	11	.4	.79	1.	0.		EPS HOUSING
12	1.12	12	.4	.79	1.	0.		EPS HOUSING
13	2.01	13	0.	.01	1.	0.		PRINTED CIRCUIT 1
14	2.02	14	0.	.01	1.	0.		PRINTED CIRCUIT 1
15	2.03	15	0.	.01	1.	0.		PRINTED CIRCUIT 1
16	2.04	16	0.	.01	1.	0.		PRINTED CIRCUIT 1
17	2.05	17	0.	.01	1.	0.		PRINTED CIRCUIT 1
18	2.06	18	0.	.01	1.	0.		PRINTED CIRCUIT 1

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

èëë Ctrl : Copy (See F2)ëë ITAS Property Data Entry ëëëëëëëëëëëëëëëëëëëëëëëëëë

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
19	2.07	19	0	.01	1.	0.		PRINTED CIRCUIT 1
20	2.08	20	0	.01	1.	0.		PRINTED CIRCUIT 1
21	2.09	21	0	.01	1.	0.		PRINTED CIRCUIT 1
22	2.10	22	0	.01	1.	0.		PRINTED CIRCUIT 1
23	2.11	23	0	.01	1.	0.		PRINTED CIRCUIT 1
24	2.12	24	0	.01	1.	0.		PRINTED CIRCUIT 1
25	2.13	25	0	.01	1.	0.		PRINTED CIRCUIT 1
26	2.14	26	0	.01	1.	0.		PRINTED CIRCUIT 1
27	2.15	27	0	.01	1.	0.		PRINTED CIRCUIT 1
28	2.16	28	0	.01	1.	0.		PRINTED CIRCUIT 1
29	2.17	29	0	.01	1.	0.		PRINTED CIRCUIT 1
30	2.18	30	0	.01	1.	0.		PRINTED CIRCUIT 1
31	3.01	31	0	.01	1.	0.		PRINTED CIRCUIT 1
32	3.02	32	0	.01	1.	0.		PRINTED CIRCUIT 1
33	3.03	33	0	.01	1.	0.		PRINTED CIRCUIT 1
34	3.04	34	0	.01	1.	0.		PRINTED CIRCUIT 1
35	3.05	35	0	.01	1.	0.		PRINTED CIRCUIT 1
36	3.06	36	0	.01	1.	0.		PRINTED CIRCUIT 1

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

èëë Ctrl : Copy (See F2)ëë ITAS Property Data Entry ëëëëëëëëëëëëëëëëëëëëëëëëëëë£

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
37	3.07	37	0.	.01	1.	0.		PRINTED CIRCUIT 1
38	3.08	38	0.	.01	1.	0.		PRINTED CIRCUIT 1
39	3.09	39	0.	.01	1.	0.		PRINTED CIRCUIT 1
40	3.10	40	0.	.01	1.	0.		PRINTED CIRCUIT 1
41	3.11	41	0.	.01	1.	0.		PRINTED CIRCUIT 1
42	3.12	42	0.	.01	1.	0.		PRINTED CIRCUIT 1
43	4.00	43	0.	.01	1.	0.		PRINTED CIRCUIT 2
44	5.01	44	0.	.01	1.	0.		PRINTED CIRCUIT 2
45	5.02	45	0.	.01	1.	0.		PRINTED CIRCUIT 2
46	5.03	46	0.	.01	1.	0.		PRINTED CIRCUIT 2
47	5.04	47	0.	.01	1.	0.		PRINTED CIRCUIT 2
48	5.05	48	0.	.01	1.	0.		PRINTED CIRCUIT 2
49	6.01	49	0.	.01	1.	0.		PRINTED CIRCUIT 2
50	6.02	50	0.	.01	1.	0.		PRINTED CIRCUIT 2
51	6.03	51	0.	.01	1.	0.		PRINTED CIRCUIT 2
52	6.04	52	0.	.01	1.	0.		PRINTED CIRCUIT 2
53	6.05	53	0.	.01	1.	0.		PRINTED CIRCUIT 2
54	6.06	54	0.	.01	1.	0.		PRINTED CIRCUIT 2

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S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

èëë Ctrl : Copy (See F2)ëë ITAS Property Data Entry ëëëëëëëëëëëëëëëëëëëëëëëëëëë£

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
42	3.12	42	0.	.01	1.	0.		PRINTED CIRCUIT 1
43	4.00	43	0.	.01	1.	0.		PRINTED CIRCUIT 2
44	5.01	44	0.	.01	1.	0.		PRINTED CIRCUIT 2
45	5.02	45	0.	.01	1.	0.		PRINTED CIRCUIT 2
46	5.03	46	0.	.01	1.	0.		PRINTED CIRCUIT 2
47	5.04	47	0.	.01	1.	0.		PRINTED CIRCUIT 2
48	5.05	48	0.	.01	1.	0.		PRINTED CIRCUIT 2
49	6.01	49	0.	.01	1.	0.		PRINTED CIRCUIT 2
50	6.02	50	0.	.01	1.	0.		PRINTED CIRCUIT 2
51	6.03	51	0.	.01	1.	0.		PRINTED CIRCUIT 2
52	6.04	52	0.	.01	1.	0.		PRINTED CIRCUIT 2
53	6.05	53	0.	.01	1.	0.		PRINTED CIRCUIT 2
54	6.06	54	0.	.01	1.	0.		PRINTED CIRCUIT 2
55	6.07	55	0.	.01	1.	0.		PRINTED CIRCUIT 2
56	7.01	56	0.	.01	1.	0.		PRINTED CIRCUIT 2
57	7.02	57	0.	.01	1.	0.		PRINTED CIRCUIT 2
58	7.03	58	0.	.01	1.	0.		PRINTED CIRCUIT 2
59	8.00	59	0.	.01	1.	0.		PRINTED CIRCUIT 2

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S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

APPENDIX I. THERMAL MASS FOR THE EPS

				kg/cubic m	cal/kg c			cubic meters	THERMAL
NODE	X/Y	Y/Z	thickness	ro(Cu/Al/poly)	specific heat	CONV FACTOR	IN TO M	VOLUME	MASS
901	9.4	1.569	0.2	2787	0.199	69.78	61024	4.8337E-05	1.870687
902	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
903	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
904	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
905	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
906	9.4	8.4	0.2	2787	0.199	69.78	61024	0.000258783	10.01515
907	9.4	1.569	0.2	2787	0.199	69.78	61024	4.8337E-05	1.870687
908	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
909	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
910	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
911	2.1	1.569	0.2	2787	0.199	69.78	61024	1.07987E-05	0.417919
912	9.4	8.4	0.2	2787	0.199	69.78	61024	0.000258783	10.01515
-913	9.4	8.4	0.125	2787	0.199	69.78	61024	0.00016174	6.259469
921	8.4	0.25	0.2	2787	0.199	69.78	61024	6.88254E-06	0.26636
922	8.4	0.375	0.2	2787	0.199	69.78	61024	1.03238E-05	0.399541
923	8.4	0.199	0.2	2787	0.199	69.78	61024	5.4785E-06	0.212023
924	8.4	2.5	0.2	2787	0.199	69.78	61024	6.88254E-05	2.663604
925	8.4	0.375	0.2	2787	0.199	69.78	61024	1.03238E-05	0.399541
926	8.4	0.199	0.2	2787	0.199	69.78	61024	5.4785E-06	0.212023
601	1.375	2.375	0.00134	8666	0.098	69.78	61024	7.17085E-08	0.00425
602	1.875	2.375	0.00134	8666	0.098	69.78	61024	9.77843E-08	0.005795
603	0.5	2.375	0.00134	8666	0.098	69.78	61024	2.60758E-08	0.001545
604	2	2.375	0.00134	8666	0.098	69.78	61024	1.04303E-07	0.006181
605	0.5	2.375	0.00134	8666	0.098	69.78	61024	2.60758E-08	0.001545
606	2.75	2.375	0.00134	8666	0.098	69.78	61024	1.43417E-07	0.008499
607	1.375	2.875	0.00134	8666	0.098	69.78	61024	8.6805E-08	0.005144
608	1.875	2.875	0.00134	8666	0.098	69.78	61024	1.1837E-07	0.007015
609	0.5	2.875	0.00134	8666	0.098	69.78	61024	3.15654E-08	0.001871
610	2	2.875	0.00134	8666	0.098	69.78	61024	1.26262E-07	0.007483
611	0.5	2.875	0.00134	8666	0.098	69.78	61024	3.15654E-08	0.001871
612	2.75	2.875	0.00134	8666	0.098	69.78	61024	1.7361E-07	0.010288
613	1.75	0.8125	0.00134	8666	0.098	69.78	61024	3.12223E-08	0.00185

614	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
615	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
616	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
617	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
618	1.75	0.8125	0.00134	8666	0.098	69.78	61024	3.12223E-08	0.00185
619	1.75	1.0625	0.00134	8666	0.098	69.78	61024	4.08292E-08	0.00242
620	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
621	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
622	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
623	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
624	1.75	1.0625	0.00134	8666	0.098	69.78	61024	4.08292E-08	0.00242
625	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
626	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
627	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
628	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
629	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
630	1.75	0.875	0.00134	8666	0.098	69.78	61024	3.36241E-08	0.001993
1601	8	1	0.00134	8666	0.098	69.78	61024	1.75669E-07	0.01041
1602	3	1.563	0.00134	8666	0.098	69.78	61024	1.02964E-07	0.006102
1603	3	1.125	0.00134	8666	0.098	69.78	61024	7.41102E-08	0.004392
1604	3	1.3125	0.00134	8666	0.098	69.78	61024	8.64619E-08	0.005124
1605	3	0.5	0.00134	8666	0.098	69.78	61024	3.29379E-08	0.001952
1606	3	2.5	0.00134	8666	0.098	69.78	61024	1.64689E-07	0.00976
1607	1.5	1.563	0.00134	8666	0.098	69.78	61024	5.14819E-08	0.003051
1608	1.5	1.125	0.00134	8666	0.098	69.78	61024	3.70551E-08	0.002196
1609	1.5	1.4375	0.00134	8666	0.098	69.78	61024	4.73482E-08	0.002806
1610	1.5	0.375	0.00134	8666	0.098	69.78	61024	1.23517E-08	0.000732
1611	1.5	0.5	0.00134	8666	0.098	69.78	61024	1.64689E-08	0.000976
1612	1.5	0.5	0.00134	8666	0.098	69.78	61024	1.64689E-08	0.000976
1613	1.5	2.5	0.00134	8666	0.098	69.78	61024	8.23447E-08	0.00488
1614	3.5	1.563	0.00134	8666	0.098	69.78	61024	1.20124E-07	0.007119
1615	3.5	2.4375	0.00134	8666	0.098	69.78	61024	1.87334E-07	0.011102
1616	3.5	3	0.00134	8666	0.098	69.78	61024	2.30565E-07	0.013664
1617	3.5	1	0.00134	8666	0.098	69.78	61024	7.6855E-08	0.004555
501	1.375	2.375	0.01933	1950	0.31	69.78	61024	1.03442E-06	0.043634
502	1.875	2.375	0.01933	1950	0.31	69.78	61024	1.41057E-06	0.059501
503	0.5	2.375	0.01933	1950	0.31	69.78	61024	3.76153E-07	0.015867

504	2	2.375	0.01933	1950	0.31	69.78	61024	1.50461E-06	0.063468
505	0.5	2.375	0.01933	1950	0.31	69.78	61024	3.76153E-07	0.015867
506	2.75	2.375	0.01933	1950	0.31	69.78	61024	2.06884E-06	0.087268
507	1.375	2.875	0.01933	1950	0.31	69.78	61024	1.25219E-06	0.05282
508	1.875	2.875	0.01933	1950	0.31	69.78	61024	1.70754E-06	0.072027
509	0.5	2.875	0.01933	1950	0.31	69.78	61024	4.55343E-07	0.019207
510	2	2.875	0.01933	1950	0.31	69.78	61024	1.82137E-06	0.076829
511	0.5	2.875	0.01933	1950	0.31	69.78	61024	4.55343E-07	0.019207
512	2.75	2.875	0.01933	1950	0.31	69.78	61024	2.50439E-06	0.10564
513	1.75	0.8125	0.01933	1950	0.31	69.78	61024	4.50394E-07	0.018999
514	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
515	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
516	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
517	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
518	1.75	0.8125	0.01933	1950	0.31	69.78	61024	4.50394E-07	0.018999
519	1.75	1.0625	0.01933	1950	0.31	69.78	61024	5.88977E-07	0.024844
520	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
521	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
522	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
523	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
524	1.75	1.0625	0.01933	1950	0.31	69.78	61024	5.88977E-07	0.024844
525	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
526	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
527	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
528	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
529	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
530	1.75	0.875	0.01933	1950	0.31	69.78	61024	4.8504E-07	0.02046
1501	8	1	0.01933	1950	0.31	69.78	61024	2.53408E-06	0.106893
1502	3	1.563	0.01933	1950	0.31	69.78	61024	1.48529E-06	0.062653
1503	3	1.125	0.01933	1950	0.31	69.78	61024	1.06907E-06	0.045095
1504	3	1.3125	0.01933	1950	0.31	69.78	61024	1.24724E-06	0.052611
1505	3	0.5	0.01933	1950	0.31	69.78	61024	4.75141E-07	0.020042
1506	3	2.5	0.01933	1950	0.31	69.78	61024	2.3757E-06	0.100212
1507	1.5	1.563	0.01933	1950	0.31	69.78	61024	7.42645E-07	0.031326
1508	1.5	1.125	0.01933	1950	0.31	69.78	61024	5.34534E-07	0.022548
1509	1.5	1.4375	0.01933	1950	0.31	69.78	61024	6.83015E-07	0.028811
1510	1.5	0.375	0.01933	1950	0.31	69.78	61024	1.78178E-07	0.007516

PIN THERMAL MASSES

NODE	# OF PINS	pi	RADIUS	HEIGHT	VOLUME	cal/kg C c	kg/cubic m ro	CONV. FACTOR	cubic in to cubic m	THERMAL MASS
2011	6	3.14159	0.0165	0.01933	9.92E-05	0.11	8378	69.78	61024	0.000105
2012	6	3.14159	0.0165	0.00134	6.88E-06	0.11	8378	69.78	61024	7.25E-06
2021	23	3.14159	0.0165	0.01933	0.00038	0.11	8378	69.78	61024	0.000401
2022	23	3.14159	0.0165	0.00134	2.64E-05	0.11	8378	69.78	61024	2.78E-05
2031	4	3.14159	0.0165	0.01933	6.61E-05	0.11	8378	69.78	61024	6.97E-05
2032	4	3.14159	0.0165	0.00134	4.58E-06	0.11	8378	69.78	61024	4.83E-06
2041	25	3.14159	0.0165	0.01933	0.000413	0.11	8378	69.78	61024	0.000436
2042	25	3.14159	0.0165	0.00134	2.87E-05	0.11	8378	69.78	61024	3.02E-05
2051	3	3.14159	0.0165	0.01933	4.96E-05	0.11	8378	69.78	61024	5.23E-05
2052	3	3.14159	0.0165	0.00134	3.44E-06	0.11	8378	69.78	61024	3.62E-06
2121	12	3.14159	0.0165	0.01933	0.000198	0.11	8378	69.78	61024	0.000209
2122	12	3.14159	0.0165	0.00134	1.38E-05	0.11	8378	69.78	61024	1.45E-05
2131	8	3.14159	0.0165	0.01933	0.000132	0.11	8378	69.78	61024	0.000139
2132	8	3.14159	0.0165	0.00134	9.17E-06	0.11	8378	69.78	61024	9.66E-06
2191	14	3.14159	0.0165	0.01933	0.000231	0.11	8378	69.78	61024	0.000244
2192	14	3.14159	0.0165	0.00134	1.6E-05	0.11	8378	69.78	61024	1.69E-05
3011	64	3.14159	0.0165	0.01933	0.001058	0.11	8378	69.78	61024	0.001115
3012	64	3.14159	0.0165	0.00134	7.34E-05	0.11	8378	69.78	61024	7.73E-05
3021	34	3.14159	0.0165	0.01933	0.000562	0.11	8378	69.78	61024	0.000592
3022	34	3.14159	0.0165	0.00134	3.9E-05	0.11	8378	69.78	61024	4.11E-05
3031	32	3.14159	0.0165	0.01933	0.000529	0.11	8378	69.78	61024	0.000558
3032	32	3.14159	0.0165	0.00134	3.67E-05	0.11	8378	69.78	61024	3.86E-05
3051	28	3.14159	0.0165	0.01933	0.000463	0.11	8378	69.78	61024	0.000488
3052	28	3.14159	0.0165	0.00134	3.21E-05	0.11	8378	69.78	61024	3.38E-05
3141	10	3.14159	0.0165	0.01933	0.000165	0.11	8378	69.78	61024	0.000174
3142	10	3.14159	0.0165	0.00134	1.15E-05	0.11	8378	69.78	61024	1.21E-05
3151	100	3.14159	0.0165	0.01933	0.001653	0.11	8378	69.78	61024	0.001742
3152	100	3.14159	0.0165	0.00134	0.000115	0.11	8378	69.78	61024	0.000121
3161	114	3.14159	0.0165	0.01933	0.001885	0.11	8378	69.78	61024	0.001986
3162	114	3.14159	0.0165	0.00134	0.000131	0.11	8378	69.78	61024	0.000138

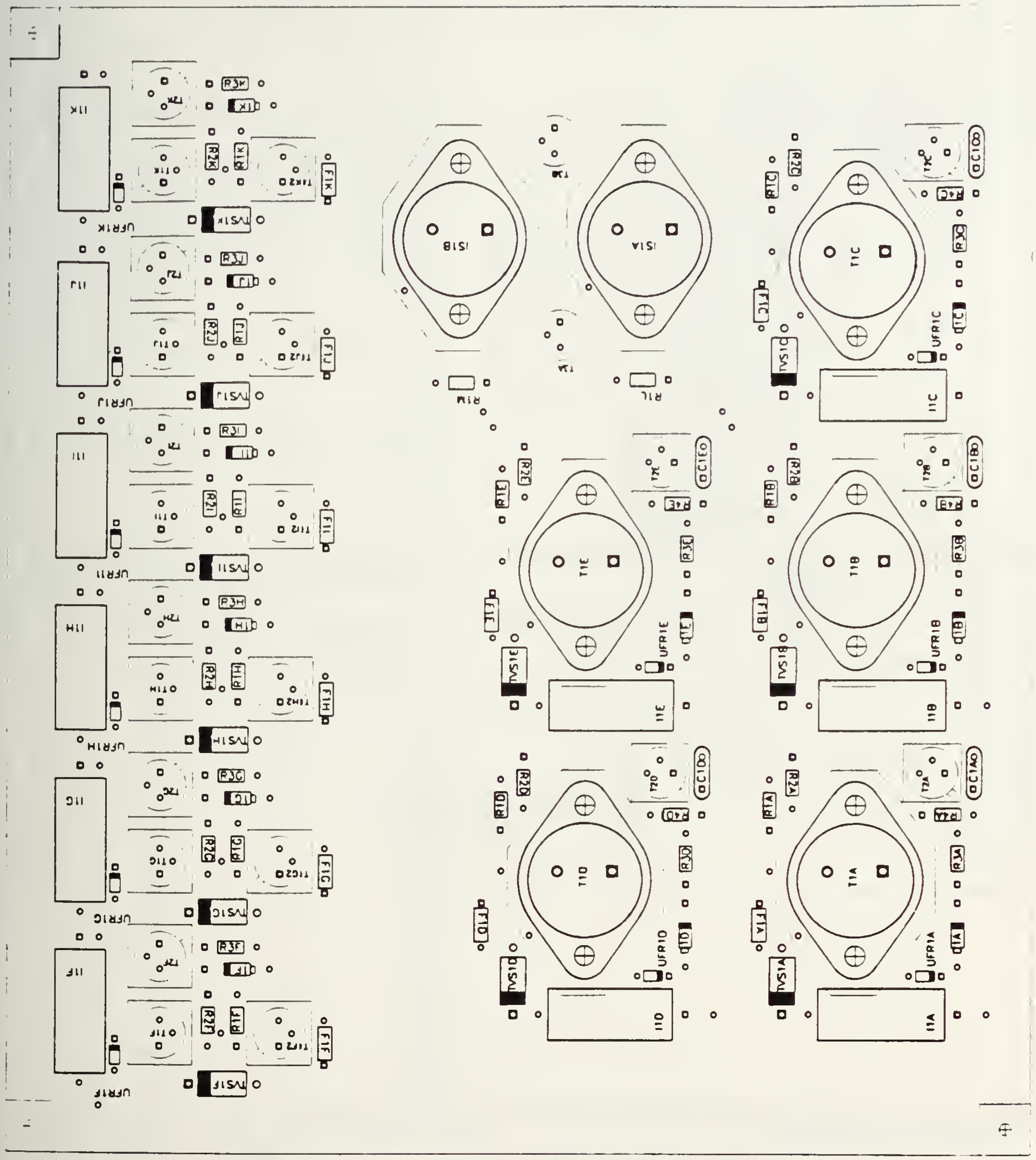
APPENDIX J. EPS PCB BOARD DATA

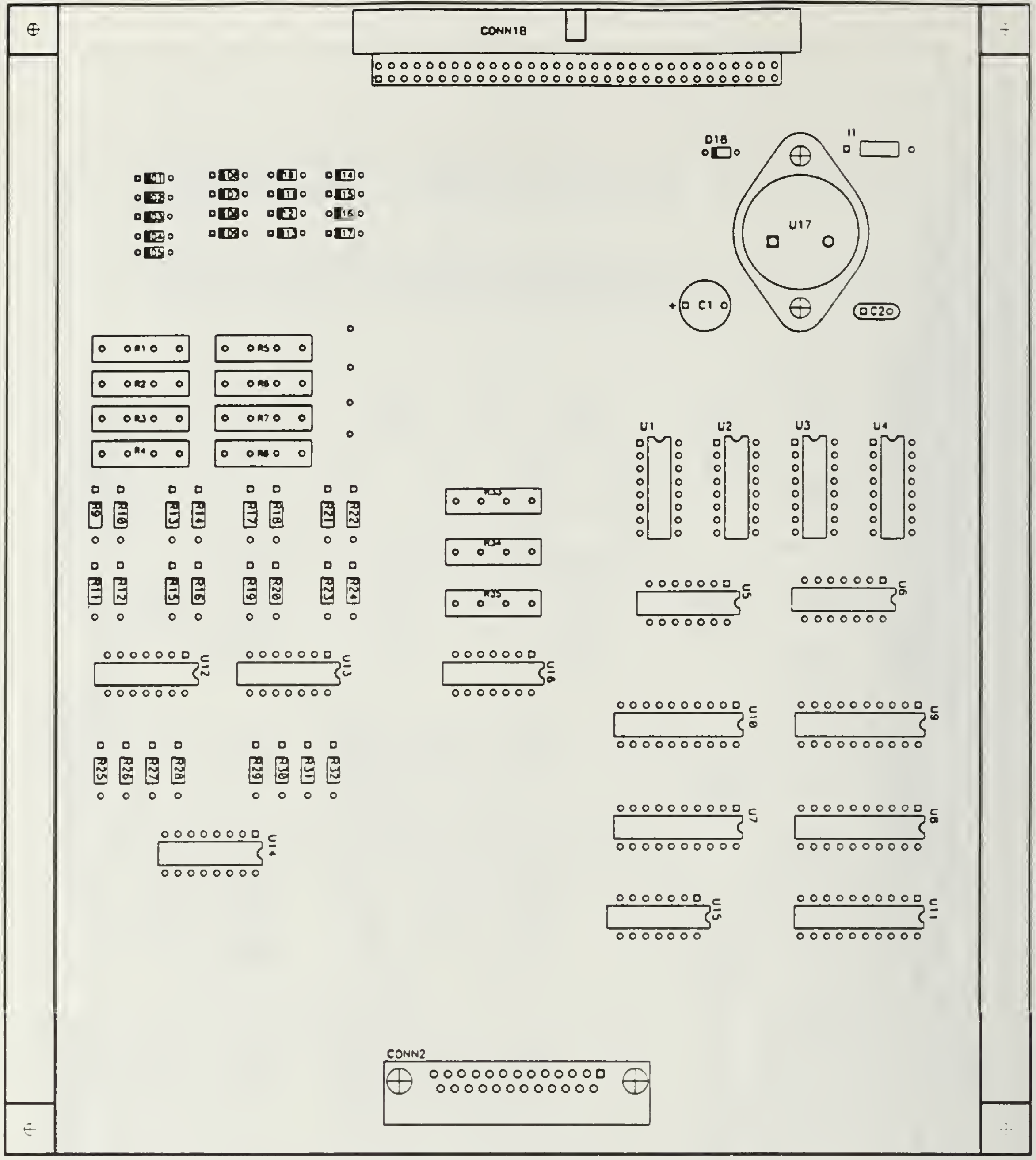
Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)
Inductor	I1A	DCSA Power Switch	100	0.039	0.061
Transient Voltage Suppressor	TVS1A	"	~0		
Ultra Fast Recovery Diode	UFR1A	"	~0		
12v Zener Bi-Directional	D1A	"	~0		
PMOSFET Gate Bias Resister	R1A	"	100	0.002	0.001
PMOSFET Gate Bias Resister	R2A	"	100	0.000	0.000
NMOSFET Gate Protection Resister	R3A	"	100	0.003	0.003
PMOSFET	T1A	"	100	0.006	0.009
NMOSFET	T2A	"	100	0.000	0.000
Pico Fuse	F1A	"	100	0.007	0.011
Inductor	I1B	DCSB Power Switch	100	0.039	0.061
Transient Voltage Suppressor	TVS1B	"	~0		
Ultra Fast Recovery Diode	UFR1B	"	~0		
12v Zener Bi-Directional	D1B	"	~0		
PMOSFET Gate Bias Resister	R1B	"	100	0.002	0.001
PMOSFET Gate Bias Resister	R2B	"	100	0.000	0.000
NMOSFET Gate Protection Resister	R3B	"	100	0.003	0.003
PMOSFET	T1B	"	100	0.006	0.009
NMOSFET	T2B	"	100	0.000	0.000
Pico Fuse	F1B	"	100	0.007	0.011
Inductor	I1C	RF Power Switch - ***Rx only***	70	0.010	0.015
Transient Voltage Suppressor	TVS1C	"	~0		
Ultra Fast Recovery Diode	UFR1C	"	~0		
12v Zener Bi-Directional	D1C	"	~0		
PMOSFET Gate Bias Resister	R1C	"	100	0.002	0.001
PMOSFET Gate Bias Resister	R2C	"	100	0.000	0.000
NMOSFET Gate Protection Resister	R3C	"	70	0.003	0.003
PMOSFET	T1C	"	70	0.006	0.009
NMOSFET	T2C	"	70	0.000	0.000
Pico Fuse	F1C	"	70	0.002	0.003
Inductor	I1C	RF Power Switch - ***Rx and Tx***	30	0.088	0.138
Transient Voltage Suppressor	TVS1C	"	~0		
Ultra Fast Recovery Diode	UFR1C	"	~0		
12v Zener Bi-Directional	D1C	"	~0		
PMOSFET Gate Bias Resister	R1C	"	30	0.002	0.001

Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)	X-Coord	Y-Coord
PMOSFET Gate Bias Resister	R2C	"	30	0.000	0.000		
NMOSFET Gate Protection Resister	R3C	"	30	0.003	0.003		
PMOSFET	T1C	"	30	0.014	0.021		
NMOSFET	T2C	"	30	0.000	0.000		
Pico Fuse	F1C	"	30	0.016	0.025		
Inductor	I1D	CHARG Battery A Power Switch	60	0.012	N/A	4.300	8.900
Transient Voltage Suppressor	TVS1D	"	~0		"	5.025	8.637
Ultra Fast Recovery Diode	UFR1D	"	~0		"	3.925	8.600
12v Zener Bi-Directional	D1D	"	~0		"	3.750	8.125
PMOSFET Gate Bias Resister	R1D	"	60	0.002	"	5.125	7.250
PMOSFET Gate Bias Resister	R2D	"	60	0.000	"	4.950	7.075
NMOSFET Gate Protection Resister	R3D	"	60	0.003	0.003	3.750	7.575
PMOSFET	T1D	"	60	0.008	"	4.475	7.850
NMOSFET	T2D	"	60	0.000	"	3.875	7.000
Pico Fuse	F1D	"	60	0.002	"	5.250	8.175
Inductor	I1E	CHARG Battery B Power Switch	60	0.050	N/A	4.300	6.475
Transient Voltage Suppressor	TVS1E	"	~0		"	5.025	6.212
Ultra Fast Recovery Diode	UFR1E	"	~0		"	3.925	6.175
12v Zener Bi-Directional	D1E	"	~0		"	3.750	5.700
PMOSFET Gate Bias Resister	R1E	"	60	0.002	"	5.125	4.825
PMOSFET Gate Bias Resister	R2E	"	60	0.000	"	4.950	4.650
NMOSFET Gate Protection Resister	R3E	"	60	0.003	0.003	3.750	5.150
PMOSFET	T1E	"	60	0.008	"	4.475	5.425
NMOSFET	T2E	"	60	0.000	"	3.875	4.575
Pico Fuse	F1E	"	60	0.050	"	5.250	5.650
Inductor	I1F	MUX A	30	0.006	0.009	8.400	8.875
Transient Voltage Suppressor	TVS1F	"	~0			7.297	9.450
Ultra Fast Recovery Diode	UFR1F	"	~0			8.125	9.225
12v Zener Bi-Directional	D1F	"	~0			7.175	8.550
PMOSFET Gate Bias Resister	R1F	"	30	0.002	0.001	7.175	8.950
PMOSFET Gate Bias Resister	R2F	"	30	0.000	0.000	7.400	8.950
NMOSFET Gate Protection Resister	R3F	"	30	0.003	0.003	7.225	8.375
PMOSFET	T1F	"	30	0.003	0.004	7.775	9.050
PMOSFET	T1F2	"	30	0.003	0.004	6.850	9.050
NMOSFET	T2F	"	30	0.000	0.000	7.775	8.450
Pico Fuse	F1F	"	100	0.001	0.002	6.475	9.125

Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)	X-Coord	Y-Coord
Inductor	I1G	MUX B	30	0.006	0.009	8.400	7.525
Transient Voltage Suppressor	TVS1G	"	~0			7.297	8.100
Ultra Fast Recovery Diode	UFR1G	"	~0			8.125	7.875
12v Zener Bi-Directional	D1G	"	~0			7.175	7.200
PMOSFET Gate Bias Resister	R1G	"	30	0.002	0.001	7.175	7.600
PMOSFET Gate Bias Resister	R2G	"	30	0.000	0.000	7.400	7.600
NMOSFET Gate Protection Resister	R3G	"	30	0.003	0.003	7.225	7.025
PMOSFET	T1G	"	30	0.003	0.004	7.775	7.700
PMOSFET	T1G2	"	30	0.003	0.004	6.850	7.700
NMOSFET	T2G	"	30	0.000	0.000	7.775	7.100
Pico Fuse	F1G	"	100	0.001	0.009	6.475	7.775
Inductor	I1H	MASS A	30	0.001	0.002	8.400	6.175
Transient Voltage Suppressor	TVS1H	"	~0			7.297	6.750
Ultra Fast Recovery Diode	UFR1H	"	~0			8.125	6.525
12v Zener Bi-Directional	D1H	"	~0			7.175	5.850
PMOSFET Gate Bias Resister	R1H	"	30	0.002	0.001	7.175	6.250
PMOSFET Gate Bias Resister	R2H	"	30	0.000	0.000	7.400	6.250
NMOSFET Gate Protection Resister	R3H	"	30	0.003	0.003	7.225	5.675
PMOSFET	T1H	"	30	0.001	0.001	7.775	6.350
PMOSFET	T1H2	"	30	0.001	0.001	6.850	6.350
NMOSFET	T2H	"	30	0.000	0.000	7.775	5.750
Pico Fuse	F1H	"	100	0.000	0.000	6.475	6.425
Inductor	I1I	MASS B	30	0.001	0.002	8.400	4.825
Transient Voltage Suppressor	TVS1I	"	~0			7.297	5.400
Ultra Fast Recovery Diode	UFR1I	"	~0			8.125	5.175
12v Zener Bi-Directional	D1I	"	~0			7.175	4.500
PMOSFET Gate Bias Resister	R1I	"	30	0.002	0.001	7.175	4.900
PMOSFET Gate Bias Resister	R2I	"	30	0.000	0.000	7.400	4.900
NMOSFET Gate Protection Resister	R3I	"	30	0.003	0.003	7.225	4.325
PMOSFET	T1I	"	30	0.001	0.001	7.775	5.000
PMOSFET	T1I2	"	30	0.001	0.001	6.850	5.000
NMOSFET	T2I	"	30	0.000	0.000	7.775	4.400
Pico Fuse	F1I	"	100	0.000	0.000	6.475	5.075
Inductor	I1J	TRICKLE A	~0			8.400	3.475
Transient Voltage Suppressor	TVS1J	"	~0			7.297	4.050

Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)	X-Coord	Y-Coord	
Ultra Fast Recovery Diode	UFR1J	"	~0			8.125	3.825	
12v Zener Bi-Directional	D1J	"	~0			7.175	3.150	
PMOSFET Gate Bias Resister	R1J	"	~0			7.175	3.550	
PMOSFET Gate Bias Resister	R2J	"	~0			7.400	3.550	
NMOSFET Gate Protection Resister	R3J	"	~0			7.225	2.975	
PMOSFET	T1J	"	~0			7.775	3.650	
PMOSFET	T1J2	"	~0			6.850	3.650	
NMOSFET	T2J	"	~0			7.775	3.050	
Pico Fuse	F1J	"	~0			6.475	3.725	
Inductor	I1K	TRICKLE B	~0			8.400	2.100	
Transient Voltage Suppressor	TVS1K	"	~0			7.297	2.675	
Ultra Fast Recovery Diode	UFR1K	"	~0			8.125	2.450	
12v Zener Bi-Directional	D1K	"	~0			7.175	1.775	
PMOSFET Gate Bias Resister	R1K	"	~0			7.175	2.175	
PMOSFET Gate Bias Resister	R2K	"	~0			7.400	2.175	
NMOSFET Gate Bias Resister	R3K	"	~0			7.225	1.600	
PMOSFET	T1K	"	~0			7.775	2.275	
PMOSFET	T1K2	"	~0			6.850	2.275	
NMOSFET	T2K	"	~0			7.775	1.675	
Pico Fuse	F1K	"	~0			6.475	2.350	
NMOSFET	T3A	Discharge Battery A				5.750	5.300	
NMOSFET	T3B	Discharge Battery B				5.775	3.650	
LM150	IS1A	Constant Current Source				3.975	3.092	
LM150	IS1B	Constant Current Source				5.225	3.092	
			Total Power	#REF!	0.280W			




CONN1B
D18
U17
C1
C20
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U4
U5
U6
R9
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R13
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R17
R18
R21
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U9
R25
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R28
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APPENDIX K. ITAS THERMAL MASS/DISSIPATIONS

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
1	901	30	-1.870	0	EPS HOUSING WALL
2	902	30	-.4179	0	EPS HOUSING WALL
3	903	30	-.4179	0	EPS HOUSING WALL
4	904	30	-.4179	0	EPS HOUSING WALL
5	905	30	.4179	0	EPS HOUSING WALL
6	906	30	-10.15	0	BOTTOM EPS HOUSING
7	907	30	-1.871	0	EPS HOUSING WALL
8	908	30	-.4179	0	EPS HOUSING WALL
9	909	30	-.4179	0	EPS HOUSING WALL
10	910	30	-.4179	0	EPS HOUSING WALL
11	911	30	-.4179	0	EPS HOUSING WALL
12	912	30	-10.02	0	EPS HOUSING WALL
13	913	30	-6.259	0	EQUIPMENT PLATE TO BOTTOM EPS
14	921	30	-.2664	0	BOTTOM RAIL (+Y)
15	922	30	-.3995	0	MIDDLE RAIL (+Y)
16	923	30	-.2120	0	TOP RAIL (+Y)
17	924	30	-.2664	0	BOTTOM RAIL (-Y)
18	925	30	-.3995	0	MIDDLE RAIL (-Y)

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CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
19	926	30	-.2120	0	TOP RAIL (-Y)
20	601	30	-.0043	0	TOP PCB THERMAL LAYER
21	602	30	-.0058	0	
22	603	30	-.0016	0	
23	604	30	-.0062	0	
24	605	30	-.0016	0	
25	606	30	-.0085	0	
26	607	30	-.0051	0	
27	608	30	-.0070	0	
28	609	30	-.0019	0	
29	610	30	-.0075	0	
30	611	30	-.0019	0	
31	612	30	-.0103	0	
32	613	30	-.0019	0	
33	614	30	-.0015	0	
34	615	30	-.0015	0	
35	616	30	-.0015	0	
36	617	30	-.0015	0	

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CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
37	618	30	-.0019	0	TOP PCB THERMAL LAYER
38	619	30	-.0024	0	
39	620	30	-.0019	0	
40	621	30	-.0019	0	
41	622	30	-.0019	0	
42	623	30	-.0019	0	
43	624	30	-.0024	0	
44	625	30	-.0016	0	
45	626	30	-.0016	0	
46	627	30	-.0016	0	
47	628	30	-.0016	0	
48	629	30	-.0016	0	
49	630	30	-.0020	0	
50	1601	30	-.0104	0	BOTTOM PCB THERMAL LAYER
51	1602	30	-.0061	0	BOTTOM PCB THERMAL LAYER
52	1603	30	-.0044	0	BOTTOM PCB THERMAL LAYER
53	1604	30	-.0051	0	BOTTOM PCB THERMAL LAYER
54	1605	30	-.0020	0	BOTTOM PCB THERMAL LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
55	1606	30	-.0098	0	BOTTOM PCB THERMAL LAYER
56	1607	30	-.0031	0	BOTTOM PCB THERMAL LAYER
57	1608	30	-.0022	0	BOTTOM PCB THERMAL LAYER
58	1609	30	-.0028	0	BOTTOM PCB THERMAL LAYER
59	1610	30	-.0007	0	BOTTOM PCB THERMAL LAYER
60	1611	30	-.0010	0	BOTTOM PCB THERMAL LAYER
61	1612	30	-.0010	0	BOTTOM PCB THERMAL LAYER
62	1613	30	-.0049	0	BOTTOM PCB THERMAL LAYER
63	1614	30	-.0071	0	BOTTOM PCB THERMAL LAYER
64	1615	30	-.0111	0	BOTTOM PCB THERMAL LAYER
65	1616	30	-.0137	0	BOTTOM PCB THERMAL LAYER
66	1617	30	-.0046	0	BOTTOM PCB THERMAL LAYER
67	501	30	-.0436	0	TOP PCB BOTTOM POLY LAYER
68	502	30	-.0595	0	TOP PCB BOTTOM POLY LAYER
69	503	30	-.0159	0	TOP PCB BOTTOM POLY LAYER
70	504	30	-.0635	0	TOP PCB BOTTOM POLY LAYER
71	505	30	-.0159	0	TOP PCB BOTTOM POLY LAYER
72	506	30	-0.087	0	TOP PCB BOTTOM POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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ëëCtrl:Copyëëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitëë
                                                                          
  SEQN   NodeNo   Temp-C   ThrMass   Dissip   Comment                     
    73   507      30       -.0528    0        TOP PCB BOTTOM POLY LAYER   
    74   508      30       -.0720    0        TOP PCB BOTTOM POLY LAYER   
    75   509      30       -.0192    0        TOP PCB BOTTOM POLY LAYER   
    76   510      30       -.0768    0        TOP PCB BOTTOM POLY LAYER   
    77   511      30       -.0192    0        TOP PCB BOTTOM POLY LAYER   
    78   512      30       -.1056    0        TOP PCB BOTTOM POLY LAYER   
    79   513      30       -.0190    0        TOP PCB BOTTOM POLY LAYER   
    80   514      30       -.0149    0        TOP PCB BOTTOM POLY LAYER   
    81   515      30       -.0149    0        TOP PCB BOTTOM POLY LAYER   
    82   516      30       -.0149    0        TOP PCB BOTTOM POLY LAYER   
    83   517      30       -.0149    0        TOP PCB BOTTOM POLY LAYER   
    84   518      30       -.0190    0        TOP PCB BOTTOM POLY LAYER   
    85   519      30       -.0248    0        TOP PCB BOTTOM POLY LAYER   
    86   520      30       -.0195    0        TOP PCB BOTTOM POLY LAYER   
    87   521      30       -.0195    0        TOP PCB BOTTOM POLY LAYER   
    88   522      30       -.0195    0        TOP PCB BOTTOM POLY LAYER   
    89   523      30       -.0195    0        TOP PCB BOTTOM POLY LAYER   
    90   524      30       -.0248    0        TOP PCB BOTTOM POLY LAYER   
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CTRL-F1Import ITAS_NC    UDC Allowed                     PgDn PgUp Home End
SHFT-F1Import Column                       Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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  SEQN   NodeNo   Temp-C   ThrMass   Dissip   Comment                     
    91   525      30       -.0161    0        TOP PCB BOTTOM POLY LAYER   
    92   526      30       -.0161    0        TOP PCB BOTTOM POLY LAYER   
    93   527      30       -.0161    0        TOP PCB BOTTOM POLY LAYER   
    94   528      30       -.0161    0        TOP PCB BOTTOM POLY LAYER   
    95   529      30       -.0161    0        TOP PCB BOTTOM POLY LAYER   
    96   530      30       -.0205    0        TOP PCB BOTTOM POLY LAYER   
    97   1501     30       -.1069    0        BOTTOM PCB BOTTOM POLY LAYER
    98   1502     30       -.0627    0        BOTTOM PCB BOTTOM POLY LAYER
    99   1503     30       -.0451    0        BOTTOM PCB BOTTOM POLY LAYER
   100   1504     30       -.0526    0        BOTTOM PCB BOTTOM POLY LAYER
   101   1505     30       -.0200    0        BOTTOM PCB BOTTOM POLY LAYER
   102   1506     30       -.1002    0        BOTTOM PCB BOTTOM POLY LAYER
   103   1507     30       -.0313    0        BOTTOM PCB BOTTOM POLY LAYER
   104   1508     30       -.0226    0        BOTTOM PCB BOTTOM POLY LAYER
   105   1509     30       -.0288    0        BOTTOM PCB BOTTOM POLY LAYER
   106   1510     30       -.0075    0        BOTTOM PCB BOTTOM POLY LAYER
   107   1511     30       -.0100    0        BOTTOM PCB BOTTOM POLY LAYER
   108   1512     30       -.0100    0        BOTTOM PCB BOTTOM POLY LAYER
äëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë
CTRL-F1Import ITAS_NC    UDC Allowed                     PgDn PgUp Home End
SHFT-F1Import Column                       Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
109	1513	30	-.0501	0	BOTTOM PCB BOTTOM POLY LAYER
110	1514	30	-.0731	0	BOTTOM PCB BOTTOM POLY LAYER
111	1515	30	-.1140	0	BOTTOM PCB BOTTOM POLY LAYER
112	1516	30	-.1403	0	BOTTOM PCB BOTTOM POLY LAYER
113	1517	30	-.0468	0	BOTTOM PCB BOTTOM POLY LAYER
114	401	30	-.0043	0	TOP PCB THERMAL COPPER LAYER
115	402	30	-.0058	0	TOP PCB THERMAL COPPER LAYER
116	403	30	-.0016	0	TOP PCB THERMAL COPPER LAYER
117	404	30	-.0062	0	TOP PCB THERMAL COPPER LAYER
118	405	30	-.0016	0	TOP PCB THERMAL COPPER LAYER
119	406	30	-.0085	0	TOP PCB THERMAL COPPER LAYER
120	407	30	-.0051	0	TOP PCB THERMAL COPPER LAYER
121	408	30	-.0071	0	TOP PCB THERMAL COPPER LAYER
122	409	30	-.0019	0	TOP PCB THERMAL COPPER LAYER
123	410	30	-.0075	0	TOP PCB THERMAL COPPER LAYER
124	411	30	-.0019	0	TOP PCB THERMAL COPPER LAYER
125	412	30	-.0103	0	TOP PCB THERMAL COPPER LAYER
126	413	30	-.0019	0	TOP PCB THERMAL COPPER LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
127	414	30	-.0015	0	TOP PCB THERMAL COPPER LAYER
128	415	30	-.0015	0	TOP PCB THERMAL COPPER LAYER
129	416	30	-.0015	0	TOP PCB THERMAL COPPER LAYER
130	417	30	-.0015	0	TOP PCB THERMAL COPPER LAYER
131	418	30	-.0019	0	TOP PCB THERMAL COPPER LAYER
132	419	30	-.0024	0	TOP PCB THERMAL COPPER LAYER
133	420	30	-.0019	0	TOP PCB THERMAL COPPER LAYER
134	421	30	-.0019	0	TOP PCB THERMAL COPPER LAYER
135	422	30	-.0019	0	TOP PCB THERMAL COPPER LAYER
136	423	30	-.0019	0	TOP PCB THERMAL COPPER LAYER
137	424	30	-.0024	0	TOP PCB THERMAL COPPER LAYER
138	425	30	-.0016	0	TOP PCB THERMAL COPPER LAYER
139	426	30	-.0016	0	TOP PCB THERMAL COPPER LAYER
140	427	30	-.0016	0	TOP PCB THERMAL COPPER LAYER
141	428	30	-.0016	0	TOP PCB THERMAL COPPER LAYER
142	429	30	-.0016	0	TOP PCB THERMAL COPPER LAYER
143	430	30	-.0020	0	TOP PCB THERMAL COPPER LAYER
144	1401	30	-.0104	0	BOTTOM PCB GROUND (COPPER) LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
145	1402	30	-.0061	0	BOTTOM PCB GROUND (COPPER) LAYER
146	1403	30	-.0044	0	BOTTOM PCB GROUND (COPPER) LAYER
147	1404	30	-.0051	0	BOTTOM PCB GROUND (COPPER) LAYER
148	1405	30	-.0020	0	BOTTOM PCB GROUND (COPPER) LAYER
149	1406	30	-.0098	0	BOTTOM PCB GROUND (COPPER) LAYER
150	1407	30	-.0031	0	BOTTOM PCB GROUND (COPPER) LAYER
151	1408	30	-.0022	0	BOTTOM PCB GROUND (COPPER) LAYER
152	1409	30	-.0028	0	BOTTOM PCB GROUND (COPPER) LAYER
153	1410	30	-.0007	0	BOTTOM PCB GROUND (COPPER) LAYER
154	1411	30	-.0010	0	BOTTOM PCB GROUND (COPPER) LAYER
155	1412	30	-.0010	0	BOTTOM PCB GROUND (COPPER) LAYER
156	1413	30	-.0049	0	BOTTOM PCB GROUND (COPPER) LAYER
157	1414	30	-.0071	0	BOTTOM PCB GROUND (COPPER) LAYER
158	1415	30	-.0111	0	BOTTOM PCB GROUND (COPPER) LAYER
159	1416	30	-.0137	0	BOTTOM PCB GROUND (COPPER) LAYER
160	1417	30	-.0046	0	BOTTOM PCB GROUND (COPPER) LAYER
161	301	30	-.0436	0	TOP PCB MIDDLE POLY LAYER
162	302	30	-.0595	0	TOP PCB MIDDLE POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
163	303	30	-.0159	0	TOP PCB MIDDLE POLY LAYER
164	304	30	-.0635	0	TOP PCB MIDDLE POLY LAYER
165	305	30	-.0159	0	TOP PCB MIDDLE POLY LAYER
166	306	30	-.0873	0	TOP PCB MIDDLE POLY LAYER
167	307	30	-.0528	0	TOP PCB MIDDLE POLY LAYER
168	308	30	-.0720	0	TOP PCB MIDDLE POLY LAYER
169	309	30	-.0192	0	TOP PCB MIDDLE POLY LAYER
170	310	30	-.0768	0	TOP PCB MIDDLE POLY LAYER
171	311	30	-.0192	0	TOP PCB MIDDLE POLY LAYER
172	312	30	-.1056	0	TOP PCB MIDDLE POLY LAYER
173	313	30	-.0190	0	TOP PCB MIDDLE POLY LAYER
174	314	30	-.0149	0	TOP PCB MIDDLE POLY LAYER
175	315	30	-.0149	0	TOP PCB MIDDLE POLY LAYER
176	316	30	-.0149	0	TOP PCB MIDDLE POLY LAYER
177	317	30	-.0149	0	TOP PCB MIDDLE POLY LAYER
178	318	30	-.0190	0	TOP PCB MIDDLE POLY LAYER
179	319	30	-.0248	0	TOP PCB MIDDLE POLY LAYER
180	320	30	-.0195	0	TOP PCB MIDDLE POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
181	321	30	-.0195	0	TOP PCB MIDDLE POLY LAYER
182	322	30	-.0195	0	TOP PCB MIDDLE POLY LAYER
183	323	30	-.0195	0	TOP PCB MIDDLE POLY LAYER
184	324	30	-.0248	0	TOP PCB MIDDLE POLY LAYER
185	325	30	-.0161	0	TOP PCB MIDDLE POLY LAYER
186	326	30	-.0161	0	TOP PCB MIDDLE POLY LAYER
187	327	30	-.0161	0	TOP PCB MIDDLE POLY LAYER
188	328	30	-.0161	0	TOP PCB MIDDLE POLY LAYER
189	329	30	-.0161	0	TOP PCB MIDDLE POLY LAYER
190	330	30	-.0205	0	TOP PCB MIDDLE POLY LAYER
191	1301	30	-.1069	0	BOTTOM PCB MIDDLE POLY LAYER
192	1302	30	-.0627	0	BOTTOM PCB MIDDLE POLY LAYER
193	1303	30	-.0451	0	BOTTOM PCB MIDDLE POLY LAYER
194	1304	30	-.0526	0	BOTTOM PCB MIDDLE POLY LAYER
195	1305	30	-.0200	0	BOTTOM PCB MIDDLE POLY LAYER
196	1306	30	-.1000	0	BOTTOM PCB MIDDLE POLY LAYER
197	1307	30	-.0313	0	BOTTOM PCB MIDDLE POLY LAYER
198	1308	30	-.0226	0	BOTTOM PCB MIDDLE POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
199	1309	30	-.0288	0	BOTTOM PCB MIDDLE POLY LAYER
200	1310	30	-.0075	0	BOTTOM PCB MIDDLE POLY LAYER
201	1311	30	-.0100	0	BOTTOM PCB MIDDLE POLY LAYER
202	1312	30	-.0100	0	BOTTOM PCB MIDDLE POLY LAYER
203	1313	30	-.0501	0	BOTTOM PCB MIDDLE POLY LAYER
204	1314	30	-.0731	0	BOTTOM PCB MIDDLE POLY LAYER
205	1315	30	-.1140	0	BOTTOM PCB MIDDLE POLY LAYER
206	1316	30	-.1403	0	BOTTOM PCB MIDDLE POLY LAYER
207	1317	30	-.0468	0	BOTTOM PCB MIDDLE POLY LAYER
208	201	30	-.0043	0	TOP PCB TOP COPPER LAYER
209	202	30	-.0058	0	TOP PCB TOP COPPER LAYER
210	203	30	-.0016	0	TOP PCB TOP COPPER LAYER
211	204	30	-.0062	0	TOP PCB TOP COPPER LAYER
212	205	30	-.0016	0	TOP PCB TOP COPPER LAYER
213	206	30	-.0085	0	TOP PCB TOP COPPER LAYER
214	207	30	-.0051	0	TOP PCB TOP COPPER LAYER
215	208	30	-.0070	0	TOP PCB TOP COPPER LAYER
216	209	30	-.0019	0	TOP PCB TOP COPPER LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
217	210	30	-.0075	0	TOP PCB TOP COPPER LAYER
218	211	30	-.0019	0	TOP PCB TOP COPPER LAYER
219	212	30	-.0103	0	TOP PCB TOP COPPER LAYER
220	213	30	-.0019	0	TOP PCB TOP COPPER LAYER
221	214	30	-.0015	0	TOP PCB TOP COPPER LAYER
222	215	30	-.0015	0	TOP PCB TOP COPPER LAYER
223	216	30	-.0015	0	TOP PCB TOP COPPER LAYER
224	217	30	-.0015	0	TOP PCB TOP COPPER LAYER
225	218	30	-.0187	0	TOP PCB TOP COPPER LAYER
226	219	30	-.0024	0	TOP PCB TOP COPPER LAYER
227	220	30	-.0019	0	TOP PCB TOP COPPER LAYER
228	221	30	-.0019	0	TOP PCB TOP COPPER LAYER
229	222	30	-.0019	0	TOP PCB TOP COPPER LAYER
230	223	30	-.0019	0	TOP PCB TOP COPPER LAYER
231	224	30	-.0024	0	TOP PCB TOP COPPER LAYER
232	225	30	-.0016	0	TOP PCB TOP COPPER LAYER
233	226	30	-.0016	0	TOP PCB TOP COPPER LAYER
234	227	30	-.0016	0	TOP PCB TOP COPPER LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
235	228	30	-.0016	0	TOP PCB TOP COPPER LAYER
236	229	30	-.0016	0	TOP PCB TOP COPPER LAYER
237	230	30	-.0020	0	TOP PCB TOP COPPER LAYER
238	1201	30	-.0104	0	BOTTOM PCB TOP COPPER LAYER
239	1202	30	-.0061	0	BOTTOM PCB TOP COPPER LAYER
240	1203	30	-.0044	0	BOTTOM PCB TOP COPPER LAYER
241	1204	30	-.0051	0	BOTTOM PCB TOP COPPER LAYER
242	1205	30	-.0020	0	BOTTOM PCB TOP COPPER LAYER
243	1206	30	-.0098	0	BOTTOM PCB TOP COPPER LAYER
244	1207	30	-.0031	0	BOTTOM PCB TOP COPPER LAYER
245	1208	30	-.0022	0	BOTTOM PCB TOP COPPER LAYER
246	1209	30	-.0028	0	BOTTOM PCB TOP COPPER LAYER
247	1210	30	-.0007	0	BOTTOM PCB TOP COPPER LAYER
248	1211	30	-.0010	0	BOTTOM PCB TOP COPPER LAYER
249	1212	30	-.0010	0	BOTTOM PCB TOP COPPER LAYER
250	1213	30	-.0049	0	BOTTOM PCB TOP COPPER LAYER
251	1214	30	-.0071	0	BOTTOM PCB TOP COPPER LAYER
252	1215	30	-.0111	0	BOTTOM PCB TOP COPPER LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
253	1216	30	-.0137	0	BOTTOM PCB TOP COPPER LAYER
254	1217	30	-.0046	0	BOTTOM PCB TOP COPPER LAYER
255	101	30	-.0436	0	TOP PCB TOP POLY LAYER
256	102	30	-.0595	0	TOP PCB TOP POLY LAYER
257	103	30	-.0159	0	TOP PCB TOP POLY LAYER
258	104	30	-.0635	0	TOP PCB TOP POLY LAYER
259	105	30	-.0159	0	TOP PCB TOP POLY LAYER
260	106	30	-.0873	0	TOP PCB TOP POLY LAYER
261	107	30	-.0528	0	TOP PCB TOP POLY LAYER
262	108	30	-.0720	0	TOP PCB TOP POLY LAYER
263	109	30	-.0192	0	TOP PCB TOP POLY LAYER
264	110	30	-.0768	0	TOP PCB TOP POLY LAYER
265	111	30	-.0192	0	TOP PCB TOP POLY LAYER
266	112	30	-.1056	0	TOP PCB TOP POLY LAYER
267	113	30	-.0190	0	TOP PCB TOP POLY LAYER
268	114	30	-.0149	0	TOP PCB TOP POLY LAYER
269	115	30	-.0149	0	TOP PCB TOP POLY LAYER
270	116	30	-.0149	0	TOP PCB TOP POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
271	117	30	-.0149	0	TOP PCB TOP POLY LAYER
272	118	30	-.0190	0	TOP PCB TOP POLY LAYER
273	119	30	-.0248	0	TOP PCB TOP POLY LAYER
274	120	30	-.0195	0	TOP PCB TOP POLY LAYER
275	121	30	-.0195	0	TOP PCB TOP POLY LAYER
276	122	30	-.0195	0	TOP PCB TOP POLY LAYER
277	123	30	-.0195	0	TOP PCB TOP POLY LAYER
278	124	30	-.0248	0	TOP PCB TOP POLY LAYER
279	125	30	-.0161	0	TOP PCB TOP POLY LAYER
280	126	30	-.0161	0	TOP PCB TOP POLY LAYER
281	127	30	-.0161	0	TOP PCB TOP POLY LAYER
282	128	30	-.0161	0	TOP PCB TOP POLY LAYER
283	129	30	-.0161	0	TOP PCB TOP POLY LAYER
284	130	30	-.0205	0	TOP PCB TOP POLY LAYER
285	1101	30	-.1069	0	BOTTOM PCB TOP POLY LAYER
286	1102	30	-.0627	0	BOTTOM PCB TOP POLY LAYER
287	1103	30	-.0451	0	BOTTOM PCB TOP POLY LAYER
288	1104	30	-.0526	0	BOTTOM PCB TOP POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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¤                                                                                ¤
¤ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                        ¤
¤  289    1105      30        -.0200    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  290    1106      30        -.1000    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  291    1107      30        -.0313    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  292    1108      30        -.0226    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  293    1109      30        -.0288    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  294    1110      30        -.0075    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  295    1111      30        -.0100    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  296    1112      30        -.0100    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  297    1113      30        -.0501    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  298    1114      30        -.0731    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  299    1115      30        -.1140    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  300    1116      30        -.1403    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  301    1117      30        -.0468    0         BOTTOM PCB TOP POLY LAYER      ¤
¤  302    2011      30        -.0001    .039      PIN THROUGH NODE 3.01          ¤
¤  303    2012      30        -.0001    0         PIN THROUGH NODE 3.01          ¤
¤  304    2013      30        -.0001    0         PIN THROUGH NODE 3.01          ¤
¤  305    2014      30        -.0001    0         PIN THROUGH NODE 3.01          ¤
¤  306    2015      30        -.0001    0         PIN THROUGH NODE 3.01          ¤
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CTRL-F1Import ITAS_NC    UDC Allowed                         PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search
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¤                                                                                ¤
¤ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                        ¤
¤  307    2016      30        -.0001    0         PIN THROUGH NODE 3.01          ¤
¤  308    2021      30        -.0004    .018      PIN THROUGH 3.02 POLY LAYERS   ¤
¤  309    2023      30        -.0004    0         PIN THROUGH 3.02 POLY LAYERS   ¤
¤  310    2025      30        -.0004    0         PIN THROUGH 3.02 POLY LAYERS   ¤
¤  311    2022      30        -.0001    0         PIN THROUGH 3.02 COPPER LAYERS ¤
¤  312    2024      30        -.0001    0         PIN THROUGH 3.02 COPPER LAYERS ¤
¤  313    2026      30        -.0001    0         PIN THROUGH 3.02 COPPER LAYERS ¤
¤  314    2031      30        -.0001    .039      PIN THROUGH 3.03 POLY LAYERS   ¤
¤  315    2033      30        -.0001    0         PIN THROUGH 3.03 POLY LAYERS   ¤
¤  316    2035      30        -.0001    0         PIN THROUGH 3.03 POLY LAYERS   ¤
¤  317    2032      30        -.0001    0         PIN THROUGH 3.03 COPPER LAYERS ¤
¤  318    2034      30        -.0001    0         PIN THROUGH 3.03 COPPER LAYERS ¤
¤  319    2036      30        -.0001    0         PIN THROUGH 3.03 COPPER LAYERS ¤
¤  320    2041      30        -.0004    .018      PIN THROUGH 3.04 POLY LAYERS   ¤
¤  321    2043      30        -.0004    0         PIN THROUGH 3.04 POLY LAYERS   ¤
¤  322    2045      30        -.0004    0         PIN THROUGH 3.04 POLY LAYERS   ¤
¤  323    2042      30        -.0001    0         PIN THROUGH 3.04 COPPER LAYERS ¤
¤  324    2044      30        -.0001    0         PIN THROUGH 3.04 COPPER LAYERS ¤
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CTRL-F1Import ITAS_NC    UDC Allowed                         PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search
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¤                                                                               ¤
¤ SEQN    NodeNo    Temp-C     ThrMass    Dissip     Comment                    ¤
¤  325    2046      30         -.0001     0          PIN THROUGH 3.04 COPPER LAYERS  ¤
¤  326    2051      30         -.0001     .088       PIN THROUGH 3.05 POLY LAYERS    ¤
¤  327    2053      30         -.0001     0          PIN THROUGH 3.05 POLY LAYERS    ¤
¤  328    2055      30         -.0001     0          PIN THROUGH 3.05 POLY LAYERS    ¤
¤  329    2061      30         -.0004     .035       PIN THROUGH 3.06 POLY LAYERS    ¤
¤  330    2063      30         -.0004     0          PIN THROUGH 3.06 POLY LAYERS    ¤
¤  331    2065      30         -.0004     0          PIN THROUGH 3.06 POLY LAYERS    ¤
¤  332    2052      30         -.0001     0          PIN THROUGH 3.05 COPPER LAYERS  ¤
¤  333    2054      30         -.0001     0          PIN THROUGH 3.05 COPPER LAYERS  ¤
¤  334    2062      30         -.0001     0          PIN THROUGH 3.06 COPPER LAYER   ¤
¤  335    2064      30         -.0001     0          PIN THROUGH 3.06 COPPER LAYER   ¤
¤  336    2066      30         -.0001     0          PIN THROUGH 3.06 COPPER LAYER   ¤
¤  337    2071      30         -.0001     .012       PIN THROUGH 3.07 POLY LAYERS    ¤
¤  338    2073      30         -.0001     0          PIN THROUGH 3.07 POLY LAYERS    ¤
¤  339    2075      30         -.0001     0          PIN THROUGH 3.07 POLY LAYERS    ¤
¤  340    2072      30         -.0001     0          PIN THROUGH 3.07 COPPER LAYERS  ¤
¤  341    2074      30         -.0001     0          PIN THROUGH 3.07 COPPER LAYERS  ¤
¤  342    2076      30         -.0001     0          PIN THROUGH 3.07 COPPER LAYERS  ¤
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CTRL-F1Import ITAS_NC   UDC Allowed                       PgDn PgUp Home End
SHFT-F1Import Column                      Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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¤                                                                               ¤
¤ SEQN    NodeNo    Temp-C     ThrMass    Dissip     Comment                    ¤
¤  343    2081      30         -.0004     .015       PIN THROUGH 3.08 POLY LAYERS    ¤
¤  344    2083      30         -.0004     0          PIN THROUGH 3.08 POLY LAYERS    ¤
¤  345    2085      30         -.0004     0          PIN THROUGH 3.08 POLY LAYERS    ¤
¤  346    2082      30         -.0001     0          PIN THROUGH 3.08 COPPER LAYERS  ¤
¤  347    2084      30         -.0001     0          PIN THROUGH 3.08 COPPER LAYERS  ¤
¤  348    2086      30         -.0001     0          PIN THROUGH 3.08 COPPER LAYERS  ¤
¤  349    2091      30         -.0001     .05        PIN THROUGH 3.09 POLY LAYERS    ¤
¤  350    2093      30         -.0001     0          PIN THROUGH 3.09 POLY LAYERS    ¤
¤  351    2095      30         -.0001     0          PIN THROUGH 3.09 POLY LAYERS    ¤
¤  352    2092      30         -.0001     0          PIN THROUGH 3.09 COPPER LAYERS  ¤
¤  353    2094      30         -.0001     0          PIN THROUGH 3.09 COPPER LAYERS  ¤
¤  354    2096      30         -.0001     0          PIN THROUGH 3.09 COPPER LAYERS  ¤
¤  355    2101      30         -.0004     .015       PIN THROUGH 3.10 POLY LAYERS    ¤
¤  356    2103      30         -.0004     0          PIN THROUGH 3.10 POLY LAYERS    ¤
¤  357    2105      30         -.0004     0          PIN THROUGH 3.10 POLY LAYERS    ¤
¤  358    2102      30         -.0001     0          PIN THROUGH 3.10 COPPER LAYERS  ¤
¤  359    2104      30         -.0001     0          PIN THROUGH 3.10 COPPER LAYERS  ¤
¤  360    2106      30         -.0001     0          PIN THROUGH 3.10 COPPER LAYERS  ¤
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CTRL-F1Import ITAS_NC   UDC Allowed                       PgDn PgUp Home End
SHFT-F1Import Column                      Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
361	2111	30	-.0001	0	PIN THROUGH 3.11 POLY LAYERS
362	2113	30	-.0001	0	PIN THROUGH 3.11 POLY LAYERS
363	2115	30	-.0001	0	PIN THROUGH 3.11 POLY LAYERS
364	2112	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
365	2114	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
366	2116	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
367	2121	30	-.0002	0	PIN THROUGH 3.12 POLY LAYER
368	2123	30	-.0002	0	PIN THROUGH 3.12 POLY LAYER
369	2125	30	-.0002	0	PIN THROUGH 3.12 POLY LAYER
370	2122	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
371	2131	30	-.0001	.004	PIN THROUGH 2.01 POLY LAYER
372	2133	30	-.0001	0	PIN THROUGH 2.01 POLY LAYER
373	2135	30	-.0001	0	PIN THROUGH 2.01 POLY LAYER
374	2132	30	-.0001	0	PIN THROUGH 2.01 COPPER LAYERS
375	2134	30	-.0001	0	PIN THROUGH 2.01 COPPER LAYERS
376	2136	30	-.0001	0	PIN THROUGH 2.01 COPPER LAYERS
377	2141	30	-.0001	.004	PIN THROUGH 2.02 POLY LAYERS
378	2143	30	-.0001	0	PIN THROUGH 2.02 POLY LAYERS

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CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
379	2145	30	-.0001	0	PIN THROUGH 2.02 POLY LAYERS
380	2142	30	-.0001	0	PIN THROUGH 2.02 COPPER LAYERS
381	2144	30	-.0001	0	PIN THROUGH 2.02 COPPER LAYERS
382	2146	30	-.0001	0	PIN THROUGH 2.02 COPPER LAYERS
383	2151	30	-.0001	.001	PIN THROUGH 2.03 POLY LAYER
384	2153	30	-.0001	0	PIN THROUGH 2.03 POLY LAYER
385	2155	30	-.0001	0	PIN THROUGH 2.03 POLY LAYER
386	2152	30	-.0001	0	PIN THROUGH 2.03 COPPER LAYERS
387	2154	30	-.0001	0	PIN THROUGH 2.03 COPPER LAYERS
388	2156	30	-.0001	0	PIN THROUGH 2.03 COPPER LAYERS
389	2161	30	-.0001	.001	PIN THROUGH 2.04 POLY LAYER
390	2163	30	-.0001	0	PIN THROUGH 2.04 POLY LAYER
391	2165	30	-.0001	0	PIN THROUGH 2.04 POLY LAYER
392	2162	30	-.0001	0	PIN THROUGH 2.04 COPPER LAYERS
393	2164	30	-.0001	0	PIN THROUGH 2.04 COPPER LAYERS
394	2166	30	-.0001	0	PIN THROUGH 2.04 COPPER LAYERS
395	2171	30	-.0001	0	PIN THROUGH 2.05 POLY LAYERS
396	2173	30	-.0001	0	PIN THROUGH 2.05 POLY LAYERS

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CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
397	2175	30	-.0001	0	PIN THROUGH 2.05 POLY LAYERS
398	2172	30	-.0001	0	PIN THROUGH 2.05 COPPER LAYERS
399	2174	30	-.0001	0	PIN THROUGH 2.05 COPPER LAYERS
400	2176	30	-.0001	0	PIN THROUGH 2.05 COPPER LAYERS
401	2181	30	-.0001	0	PIN THROUGH 2.06 POLY LAYERS
402	2183	30	-.0001	0	PIN THROUGH 2.06 POLY LAYERS
403	2185	30	-.0001	0	PIN THROUGH 2.06 POLY LAYERS
404	2182	30	-.0001	0	PIN THROUGH 2.06 COPPER LAYERS
405	2184	30	-.0001	0	PIN THROUGH 2.06 COPPER LAYERS
406	2186	30	-.0001	0	PIN THROUGH 2.06 COPPER LAYERS
407	2191	30	-.0003	.008	PIN THROUGH 2.07 POLY LAYERS
408	2193	30	-.0003	0	PIN THROUGH 2.07 POLY LAYERS
409	2195	30	-.0003	0	PIN THROUGH 2.07 POLY LAYERS
410	2192	30	-.0001	0	PIN THROUGH 2.07 COPPER LAYERS
411	2194	30	-.0001	0	PIN THROUGH 2.07 COPPER LAYERS
412	2196	30	-.0001	0	PIN THROUGH 2.07 COPPER LAYERS
413	2201	30	-.0003	.008	PIN THROUGH 2.08 POLY LAYERS
414	2203	30	-.0003	0	PIN THROUGH 2.08 POLY LAYERS

CTRL-F1Import ITAS_NC   UDC Allowed   PgDn PgUp Home End
SHFT-F1Import Column   Shift-F5Del/Pur
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
415	2205	30	-.0003	0	PIN THROUGH 2.08 POLY LAYERS
416	2202	30	-.0001	0	PIN THROUGH 2.08 COPPER LAYERS
417	2204	30	-.0001	0	PIN THROUGH 2.08 COPPER LAYERS
418	2206	30	-.0001	0	PIN THROUGH 2.08 COPPER LAYERS
419	2211	30	-.0003	.003	PIN THROUGH 2.09 POLY LAYERS
420	2213	30	-.0003	0	PIN THROUGH 2.09 POLY LAYERS
421	2215	30	-.0003	0	PIN THROUGH 2.09 POLY LAYERS
422	2212	30	-.0001	0	PIN THROUGH 2.09 COPPER LAYERS
423	2214	30	-.0001	0	PIN THROUGH 2.09 COPPER LAYERS
424	2216	30	-.0001	0	PIN THROUGH 2.09 COPPER LAYERS
425	2221	30	-.0003	.006	PIN THROUGH 2.10 POLY LAYERS
426	2223	30	-.0003	0	PIN THROUGH 2.10 POLY LAYERS
427	2225	30	-.0003	0	PIN THROUGH 2.10 POLY LAYERS
428	2222	30	-.0001	0	PIN THROUGH 2.10 COPPER LAYERS
429	2224	30	-.0001	0	PIN THROUGH 2.10 COPPER LAYERS
430	2226	30	-.0001	0	PIN THROUGH 2.10 COPPER LAYERS
431	2231	30	-.0003	0	PIN THROUGH 2.11 POLY LAYERS
432	2233	30	-.0003	0	PIN THROUGH 2.11 POLY LAYERS

CTRL-F1Import ITAS_NC   UDC Allowed   PgDn PgUp Home End
SHFT-F1Import Column   Shift-F5Del/Pur
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                      □
□  433    2235      30        -.0003    0         PIN THROUGH 2.11 POLY LAYERS   □
□  434    2232      30        -.0001    0         PIN THROUGH 2.11 COPPER LAYERS □
□  435    2234      30        -.0001    0         PIN THROUGH 2.11 COPPER LAYERS □
□  436    2236      30        -.0001    0         PIN THROUGH 2.11 COPPER LAYERS □
□  437    2241      30        -.0003    0         PIN THROUGH 2.12 POLY LAYER    □
□  438    2243      30        -.0003    0         PIN THROUGH 2.12 POLY LAYER    □
□  439    2245      30        -.0003    0         PIN THROUGH 2.12 POLY LAYER    □
□  440    2242      30        -.0001    0         PIN THROUGH 2.12 COPPER LAYERS □
□  441    2244      30        -.0001    0         PIN THROUGH 2.12 COPPER LAYERS □
□  442    2246      30        -.0001    0         PIN THROUGH 2.12 COPPER LAYERS □
□  443    2251      30        -.0001    .006      PIN THROUGH 2.13 POLY LAYERS   □
□  444    2253      30        -.0001    0         PIN THROUGH 2.13 POLY LAYERS   □
□  445    2255      30        -.0001    0         PIN THROUGH 2.13 POLY LAYERS   □
□  446    2252      30        -.0001    0         PIN THROUGH 2.13 COPPER LAYERS □
□  447    2254      30        -.0001    0         PIN THROUGH 2.13 COPPER LAYERS □
□  448    2256      30        -.0001    0         PIN THROUGH 2.13 COPPER LAYERS □
□  449    2261      30        -.0001    .006      PIN THROUGH 2.14 POLY LAYERS   □
□  450    2263      30        -.0001    0         PIN THROUGH 2.14 POLY LAYERS   □
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CTRL-F1Import ITAS_NC   UDC Allowed                       PgDn PgUp Home End
SHFT-F1Import Column                      Shift-F5Del/Pur
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£
□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                      □
□  451    2265      30        -.0001    0         PIN THROUGH 2.14 POLY LAYERS   □
□  452    2262      30        -.0001    0         PIN THROUGH 2.14 COPPER LAYERS □
□  453    2264      30        -.0001    0         PIN THROUGH 2.14 COPPER LAYERS □
□  454    2266      30        -.0001    0         PIN THROUGH 2.14 COPPER LAYERS □
□  455    2271      30        -.0001    .001      PIN THROUGH 2.15 POLY LAYERS   □
□  456    2273      30        -.0001    0         PIN THROUGH 2.15 POLY LAYERS   □
□  457    2275      30        -.0001    0         PIN THROUGH 2.15 POLY LAYERS   □
□  458    2272      30        -.0001    0         PIN THROUGH 2.15 COPPER LAYERS □
□  459    2274      30        -.0001    0         PIN THROUGH 2.15 COPPER LAYERS □
□  460    2276      30        -.0001    0         PIN THROUGH 2.15 COPPER LAYERS □
□  461    2281      30        -.0001    .001      PIN THROUGH 2.16 POLY LAYERS   □
□  462    2283      30        -.0001    0         PIN THROUGH 2.16 POLY LAYERS   □
□  463    2285      30        -.0001    0         PIN THROUGH 2.16 POLY LAYERS   □
□  464    2282      30        -.0001    0         PIN THROUGH 2.16 COPPER LAYERS □
□  465    2284      30        -.0001    0         PIN THROUGH 2.16 COPPER LAYERS □
□  466    2286      30        -.0001    0         PIN THROUGH 2.16 COPPER LAYERS □
□  467    2291      30        -.0001    0         PIN THROUGH 2.17 POLY LAYERS   □
□  468    2293      30        -.0001    0         PIN THROUGH 2.17 POLY LAYERS   □
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CTRL-F1Import ITAS_NC   UDC Allowed                       PgDn PgUp Home End
SHFT-F1Import Column                      Shift-F5Del/Pur
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
469	2295	30	-.0001	0	PIN THROUGH 2.17 POLY LAYERS
470	2292	30	-.0001	0	PIN THROUGH 2.17 COPPER LAYERS
471	2294	30	-.0001	0	PIN THROUGH 2.17 COPPER LAYERS
472	2296	30	-.0001	0	PIN THROUGH 2.17 COPPER LAYERS
473	2301	30	-.0001	0	PIN THROUGH 2.18 POLY LAYERS
474	2303	30	-.0001	0	PIN THROUGH 2.18 POLY LAYERS
475	2305	30	-.0001	0	PIN THROUGH 2.18 POLY LAYERS
476	2302	30	-.0001	0	PIN THROUGH 2.18 COPPER LAYERS
477	2304	30	-.0001	0	PIN THROUGH 2.18 COPPER LAYERS
478	2306	30	-.0001	0	PIN THROUGH 2.18 COPPER LAYERS
479	3011	30	-.0011	0	PIN THROUGH 4.00 POLY LAYERS
480	3013	30	-.0011	0	PIN THROUGH 4.00 POLY LAYERS
481	3015	30	-.0011	0	PIN THROUGH 4.00 POLY LAYERS
482	3012	30	-.0001	0	PIN THROUGH 4.00 COPPER LAYERS
483	3014	30	-.0001	0	PIN THROUGH 4.00 COPPER LAYERS
484	3016	30	-.0001	0	PIN THROUGH 4.00 COPPER LAYERS
485	3021	30	-.0006	.113	PIN THROUGH 5.01 POLY LAYERS
486	3023	30	-.0006	0	PIN THROUGH 5.01 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
487	3025	30	-.0006	0	PIN THROUGH 5.01 POLY LAYERS
488	3022	30	-.0001	0	PIN THROUGH 5.01 COPPER LAYERS
489	3024	30	-.0001	0	PIN THROUGH 5.01 COPPER LAYERS
490	3026	30	-.0001	0	PIN THROUGH 5.01 COPPER LAYERS
491	3031	30	-.0006	.036	PIN THROUGH 5.02 POLY LAYERS
492	3033	30	-.0006	0	PIN THROUGH 5.02 POLY LAYERS
493	3035	30	-.0006	0	PIN THROUGH 5.02 POLY LAYERS
494	3032	30	-.0001	0	PIN THROUGH 5.02 COPPER LAYERS
495	3034	30	-.0001	0	PIN THROUGH 5.02 COPPER LAYERS
496	3036	30	-.0001	0	PIN THROUGH 5.02 COPPER LAYERS
497	3041	30	-.0002	0	PIN THROUGH 5.03 POLY LAYERS
498	3043	30	-.0002	0	PIN THROUGH 5.03 POLY LAYERS
499	3045	30	-.0002	0	PIN THROUGH 5.03 POLY LAYERS
500	3042	30	-.0001	0	PIN THROUGH 5.03 COPPER LAYERS
501	3044	30	-.0001	0	PIN THROUGH 5.03 COPPER LAYERS
502	3046	30	-.0001	0	PIN THROUGH 5.03 COPPER LAYERS
503	3051	30	-.0005	.05	PIN THROUGH 5.04 POLY LAYERS
504	3053	30	-.0005	0	PIN THROUGH 5.04 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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ëëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitëë
□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass    Dissip    Comment                     □
□  505    3055      30        -.0005     0         PIN THROUGH 5.04 POLY LAYERS      □
□  506    3052      30        -.0001     0         PIN THROUGH 5.04 COPPER LAYERS    □
□  507    3054      30        -.0001     0         PIN THROUGH 5.04 COPPER LAYERS    □
□  508    3056      30        -.0001     0         PIN THROUGH 5.04 COPPER LAYERS    □
□  509    3061      30        -.0006     .025      PIN THROUGH 5.05 POLY LAYERS      □
□  510    3063      30        -.0006     0         PIN THROUGH 5.05 POLY LAYERS      □
□  511    3065      30        -.0006     0         PIN THROUGH 5.05 POLY LAYERS      □
□  512    3062      30        -.0006     0         PIN THROUGH 5.05 COPPER LAYERS    □
□  513    3064      30        -.0001     0         PIN THROUGH 5.05 COPPER LAYERS    □
□  514    3066      30        -.0001     0         PIN THROUGH 5.05 COPPER LAYERS    □
□  515    3091      30        -.0001     .1        PIN THROUGH 6.03 POLY LAYERS      □
□  516    3093      30        -.0001     0         PIN THROUGH 6.03 POLY LAYERS      □
□  517    3095      30        -.0001     0         PIN THROUGH 6.03 POLY LAYERS      □
□  518    3092      30        -.0001     0         PIN THROUGH 6.03 COPPER LAYERS    □
□  519    3094      30        -.0001     0         PIN THROUGH 6.03 COPPER LAYERS    □
□  520    3096      30        -.0001     0         PIN THROUGH 6.03 COPPER LAYERS    □
□  521    3101      30        -.0001     .125      PIN THROUGH 6.04 POLY LAYERS      □
□  522    3103      30        -.0001     0         PIN THROUGH 6.04 POLY LAYERS      □
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CTRL-F1Import ITAS_NC    UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                       Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitëë
□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass    Dissip    Comment                     □
□  523    3105      30        -.0001     0         PIN THROUGH 6.04 POLY LAYERS      □
□  524    3102      30        -.0001     0         PIN THROUGH 6.04 COPPER LAYERS    □
□  525    3104      30        -.0001     0         PIN THROUGH 6.04 COPPER LAYERS    □
□  526    3106      30        -.0001     0         PIN THROUGH 6.04 COPPER LAYERS    □
□  527    3111      30        -.0001     .025      PIN THROUGH 6.05 POLY LAYERS      □
□  528    3113      30        -.0001     0.        PIN THROUGH 6.05 POLY LAYERS      □
□  529    3115      30        -.0001     0         PIN THROUGH 6.05 POLY LAYERS      □
□  530    3112      30        -.0001     0         PIN THROUGH 6.05 COPPER LAYER     □
□  531    3114      30        -.0001     0         PIN THROUGH 6.05 COPPER LAYER     □
□  532    3116      30        -.0001     0         PIN THROUGH 6.05 COPPER LAYER     □
□  533    3121      30        -.0003     .025      PIN THROUGH 6.06 POLY LAYERS      □
□  534    3123      30        -.0003     0         PIN THROUGH 6.06 POLY LAYERS      □
□  535    3125      30        -.0003     0         PIN THROUGH 6.06 POLY LAYERS      □
□  536    3122      30        -.0001     0         PIN THROUGH 6.06 COPPER LAYERS    □
□  537    3124      30        -.0001     0         PIN THROUGH 6.06 COPPER LAYERS    □
□  538    3126      30        -.0001     0         PIN THROUGH 6.06 COPPER LAYERS    □
□  539    3141      30        -.0002     .375      PIN THROUGH 7.01 POLY LAYERS      □
□  540    3143      30        -.0002     0         PIN THROUGH 7.01 POLY LAYERS      □
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CTRL-F1Import ITAS_NC    UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                       Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
541	3145	30	-.0002	0	PIN THROUGH 7.01 POLY LAYERS
542	3142	30	-.0001	0	PIN THROUGH 7.01 COPPER LAYER
543	3144	30	-.0001	0	PIN THROUGH 7.01 COPPER LAYER
544	3146	30	-.0001	0	PIN THROUGH 7.01 COPPER LAYER
545	3151	30	-.0017	.105	PIN THROUGH 7.02 POLY LAYERS
546	3153	30	-.0017	0	PIN THROUGH 7.02 POLY LAYERS
547	3155	30	-.0017	0	PIN THROUGH 7.02 POLY LAYERS
548	3152	30	-.0001	0	PIN THROUGH 7.02 COPPER LAYERS
549	3154	30	-.0001	0	PIN THROUGH 7.02 COPPER LAYERS
550	3156	30	-.0001	0	PIN THROUGH 7.02 COPPER LAYERS
551	3161	30	-.0020	.150	PIN THROUGH 7.03 POLY LAYERS
552	3163	30	-.0020	0	PIN THROUGH 7.03 POLY LAYERS
553	3165	30	-.0020	0	PIN THROUGH 7.03 POLY LAYERS
554	3162	30	-.0001	0	PIN THROUGH 7.03 COPPER LAYERS
555	3164	30	-.0001	0	PIN THROUGH 7.03 COPPER LAYERS
556	3166	30	-.0001	0	PIN THROUGH 7.03 COPPER LAYERS
557	3171	30	-.0004	0	PIN THROUGH 8.00 POLY LAYERS
558	3173	30	-.0004	0	PIN THROUGH 8.00 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
559	3175	30	-.0004	0	PIN THROUGH 8.00 POLY LAYERS
560	3172	30	-.0001	0	PIN THROUGH 8.00 COPPER LAYERS
561	3174	30	-.0001	0	PIN THROUGH 8.00 COPPER LAYERS
562	3176	30	-.0001	0	PIN THROUGH 8.00 COPPER LAYERS
563	2056	30	-.0001	0	PIN THROUGH 3.05 COPPER LAYER
564	2124	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYER
565	2126	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

APPENDIX L. NODE TO NODE CONDUCTANCE CALCULATIONS

	HOUSING TO HOUSING NODES				
From	To	Area	Length	k	Conductance
901	905	0.3138	5.175	4.31	0.261348406
901	906	1.88	5.2845	4.31	1.53331441
901	911	0.3138	4.925	4.31	0.274614822
901	912	1.6	5.0845	4.31	1.356278887
902	903	0.3138	2.25	4.31	0.601101333
902	906	0.47	4.7845	4.31	0.423388024
902	907	0.3138	4.925	4.31	0.274614822
902	912	0.45	4.5845	4.31	0.423055949
903	904	0.3138	2.25	4.31	0.601101333
903	906	0.45	4.5845	4.31	0.423055949
903	912	0.45	4.5845	4.31	0.423055949
904	905	0.3138	2.25	4.31	0.601101333
904	906	0.45	4.5845	4.31	0.423055949
904	912	0.45	4.5845	4.31	0.423055949
905	906	0.45	4.5845	4.31	0.423055949
905	912	0.45	4.5845	4.31	0.423055949
907	906	4.925	1.6	4.31	13.26671875
907	908	0.3138	4.925	4.31	0.274614822
907	912	4.925	1.6	4.31	13.26671875
908	906	0.45	4.5845	4.31	0.423055949
908	909	0.3138	2.25	4.31	0.601101333
908	912	0.45	4.5845	4.31	0.423055949
909	906	0.45	4.5845	4.31	0.423055949
909	910	0.3138	2.25	4.31	0.601101333
909	912	0.45	4.5845	4.31	0.423055949
910	906	0.45	4.5845	4.31	0.423055949
910	911	0.3138	2.25	4.31	0.601101333
910	912	0.45	4.5845	4.31	0.423055949
911	906	0.45	4.5845	4.31	0.423055949
911	912	0.45	4.5845	4.31	0.423055949

		PCB BOARD TO RAIL CONDUCTANCES					
		FROM	TO	AREA	LENGTH	k	Conductance
BOTTOM RAIL TO		921	901	0.0625	4.6	4.31	0.058559783
EPS HOUSING (+Y)		921	907	0.0625	4.6	4.31	0.058559783
		921	902	0.587	0.225	4.31	11.24431111
		921	903	0.587	0.225	4.31	11.24431111
		921	904	0.587	0.225	4.31	11.24431111
		921	905	0.587	0.225	4.31	11.24431111
		921	906	2.25	2.25	4.31	4.31
MIDDLE RAIL TO		922	901	0.09375	4.6	4.31	0.087839674
EPS HOUSING (+Y)		922	907	0.09375	4.6	4.31	0.087839674
		922	902	0.881	0.225	4.31	16.87604444
		922	903	0.881	0.225	4.31	16.87604444
		922	904	0.881	0.225	4.31	16.87604444
		922	905	0.881	0.225	4.31	16.87604444
TOP RAIL TO		923	901	0.04975	4.6	4.31	0.046613587
EPS HOUSING (+Y)		923	907	0.04975	4.6	4.31	0.046613587
		923	902	0.4279	0.225	4.31	8.196662222
		923	903	0.4677	0.225	4.31	8.959053333
		923	904	0.4677	0.225	4.31	8.959053333
		923	905	0.4279	0.225	4.31	8.196662222
		923	906	1.791	2.25	4.31	3.43076
BOTTOM RAIL TO		924	901	0.0625	4.6	4.31	0.058559783
EPS HOUSING (-Y)		924	907	0.0625	4.6	4.31	0.058559783
		924	908	0.5875	0.225	4.31	11.25388889
		924	909	0.5875	0.225	4.31	11.25388889
		924	910	0.587	0.225	4.31	11.24431111
		924	911	0.5875	0.225	4.31	11.25388889
		924	912	2.25	2.25	4.31	4.31
MIDDLE RAIL TO		925	901	0.09375	4.6	4.31	0.087839674
EPS HOUSING (-Y)		925	907	0.09375	4.6	4.31	0.087839674
		925	908	0.881	0.225	4.31	16.87604444
		925	909	0.881	0.225	4.31	16.87604444
		925	910	0.881	0.225	4.31	16.87604444
		925	911	0.881	0.225	4.31	16.87604444
TOP RAIL TO		926	901	0.04975	4.6	4.31	0.046613587
EPS HOUSING (-Y)		926	907	0.04975	4.6	4.31	0.046613587
		926	908	0.4279	0.225	4.31	8.196662222
		926	909	0.4677	0.225	4.31	8.959053333
		926	910	0.4677	0.225	4.31	8.959053333
		926	911	0.4279	0.225	4.31	8.196662222
		926	912	1.791	2.25	4.31	3.43076

PCB TO RAILINGS

	FROM	TO	A1,2	L1	L2	k-Cu/kpol	k-Al	hc'	hc	K1	K2	K0
BOTTOM	1601	924	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
PCB	1602	924	0.39	0.00067	0.125	9.65	4.31	3.78	1.4742	5617.164	13.4472	1.328238
THRMAL	1603	924	0.281	0.00067	0.125	9.65	4.31	3.78	1.06218	4047.239	9.68888	0.957013
LAYER	1604	924	0.328	0.00067	0.125	9.65	4.31	3.78	1.23984	4724.179	11.30944	1.117082
TO	1605	924	0.125	0.00067	0.125	9.65	4.31	3.78	0.4725	1800.373	4.31	0.425717
BOTTOM	1606	924	0.625	0.00067	0.125	9.65	4.31	3.78	2.3625	9001.866	21.55	2.128587
RAIL	1617	924	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
	1601	921	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
	1614	921	0.39	0.00067	0.125	9.65	4.31	3.78	1.4742	5617.164	13.4472	1.328238
	1615	921	0.609	0.00067	0.125	9.65	4.31	3.78	2.30202	8771.418	20.99832	2.074095
	1616	921	0.75	0.00067	0.125	9.65	4.31	3.78	2.835	10802.24	25.86	2.554304
	1617	921	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
BOTTOM	1101	925	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
PCB POLY	1102	925	0.39	0.00967	0.1875	0.2	4.31	0.242	0.09438	8.066184	8.9648	0.092328
LAYER	1103	925	0.281	0.00967	0.1875	0.2	4.31	0.242	0.068002	5.811789	6.459253	0.066523
TO	1104	925	0.328	0.00967	0.1875	0.2	4.31	0.242	0.079376	6.783868	7.539627	0.07765
MIDDLE	1105	925	0.125	0.00967	0.1875	0.2	4.31	0.242	0.03025	2.585315	2.873333	0.029592
RAIL	1106	925	0.625	0.00967	0.1875	0.2	4.31	0.242	0.15125	12.92658	14.36667	0.147961
	1117	925	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
	1101	922	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
	1114	922	0.39	0.00967	0.1875	0.2	4.31	0.242	0.09438	8.066184	8.9648	0.092328
	1115	922	0.609	0.00967	0.1875	0.2	4.31	0.242	0.147378	12.59566	13.99888	0.144173
	1116	922	0.75	0.00967	0.1875	0.2	4.31	0.242	0.1815	15.51189	17.24	0.177553
	1117	922	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
TOP PCB	601	925	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
THERMAL	602	925	0.4688	0.00067	0.1875	9.65	4.31	3.78	1.772064	6752.119	10.77615	1.521469
LAYER	603	925	0.125	0.00067	0.1875	9.65	4.31	3.78	0.4725	1800.373	2.873333	0.405682
TO	604	925	0.5	0.00067	0.1875	9.65	4.31	3.78	1.89	7201.493	11.49333	1.622728
MIDDLE	605	925	0.125	0.00067	0.1875	9.65	4.31	3.78	0.4725	1800.373	2.873333	0.405682
RAIL	606	925	0.6875	0.00067	0.1875	9.65	4.31	3.78	2.59875	9902.052	15.80333	2.231251
	625	922	0.6875	0.00067	0.1875	9.65	4.31	3.78	2.59875	9902.052	15.80333	2.231251
	626	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
	627	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788

	628	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
	629	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
	630	922	0.6875	0.00067	0.1875	9.65	4.31	3.78	2.59875	9902.052	15.80333	2.231251
TOP PCB	101	926	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
THERMAL	102	926	0.4688	0.00967	0.0995	0.2	4.31	0.242	0.11345	9.695967	20.30681	0.111522
LAYER	103	926	0.125	0.00967	0.0995	0.2	4.31	0.242	0.03025	2.585315	5.414573	0.029736
TO	104	926	0.5	0.00967	0.0995	0.2	4.31	0.242	0.121	10.34126	21.65829	0.118944
MIDDLE	105	926	0.125	0.00967	0.0995	0.2	4.31	0.242	0.03025	2.585315	5.414573	0.029736
RAIL	106	926	0.6875	0.00967	0.0995	0.2	4.31	0.242	0.166375	14.21923	29.78015	0.163548
	125	923	0.6875	0.00967	0.0995	0.2	4.31	0.242	0.166375	14.21923	29.78015	0.163548
	126	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	127	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	128	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	129	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	130	923	0.6875	0.00967	0.0995	0.2	4.31	0.242	0.166375	14.21923	29.78015	0.163548

		TOP PCB THERMAL LAYER NODE TO NODE					
		FROM	TO	AREA	LENGTH	k	Conductance
APPLIES TO LAYERS		601	602	0.003183	1.625	9.65	0.018902123
4XX AND 2XX		601	607	0.00184	2.625	9.65	0.00676419
		602	603	0.003183	1.1875	9.65	0.025866063
		602	608	0.02513	2.625	9.65	0.092382667
		603	604	0.003138	1.25	9.65	0.02422536
		603	609	0.0007	2.625	9.65	0.002573333
		604	605	0.003183	1.25	9.65	0.02457276
		604	610	0.00268	2.625	9.65	0.00985219
		605	606	0.003138	2	9.65	0.018634892
		605	611	0.0007	2.625	9.65	0.002573333
		606	612	0.00369	2.625	9.65	0.013565143
		607	608	0.00385	1.625	9.65	0.022863077
		607	613	0.00184	1.84375	9.65	0.009630373
		608	609	0.00385	1.875	9.65	0.019814667
		608	613	0.0005	1.84375	9.65	0.002616949
		608	614	0.00184	1.84375	9.65	0.009630373
		608	615	0.00775	1.84375	9.65	0.040562712
		609	610	0.00385	1.25	9.65	0.029722
		609	615	0.0007	1.84375	9.65	0.003663729
		610	611	0.00385	1.25	9.65	0.029722
		610	615	0.001	1.84375	9.65	0.005233898
		610	616	0.00168	1.84375	9.65	0.008792949
		611	612	0.00385	1.625	9.65	0.022863077
		611	616	0.00168	1.84375	9.65	0.008792949
		611	617	0.0005	1.84375	9.65	0.002616949
		612	617	0.00134	1.84375	9.65	0.007013424
		612	618	0.00235	1.84375	9.65	0.012299661
		613	614	0.00116	1.5625	9.65	0.00716416
		613	619	0.00235	0.9375	9.65	0.024189333
		614	615	0.00116	1.375	9.65	0.008141091
		614	620	0.00184	0.9375	9.65	0.018939733
		615	616	0.00116	1.375	9.65	0.008141091

		615	621	0.00178	0.9375	9.65	0.018322133
		616	617	0.00116	1.375	9.65	0.008141091
		616	622	0.00184	0.9375	9.65	0.018939733
		617	618	0.00116	2	9.65	0.00716416
		617	623	0.00184	0.9375	9.65	0.018939733
		618	624	0.001	0.9375	9.65	0.010293333
		619	620	0.00142	1.5625	9.65	0.00876992
		619	625	0.00235	0.96875	9.65	0.023409032
		620	621	0.00142	1.375	9.65	0.009965818
		620	626	0.00184	0.96875	9.65	0.018328774
		621	622	0.00142	1.375	9.65	0.009965818
		621	627	0.00178	0.96875	9.65	0.017731097
		622	623	0.00142	0.96875	9.65	0.014145032
		622	628	0.00184	1.375	9.65	0.012913455
		623	624	0.00142	1.5625	9.65	0.00876992
		623	629	0.00184	0.96875	9.65	0.018328774
		624	630	0.001	0.96875	9.65	0.00996129
		625	626	0.00173	1.5625	9.65	0.01068448
		626	627	0.00173	1.375	9.65	0.012141455
		627	628	0.00173	1.375	9.65	0.012141455
		628	629	0.00173	1.375	9.65	0.012141455
		629	630	0.00173	1.5625	9.65	0.01068448

TOP PCB POLYIMIDE LAYER NODE TO NODE

APPLIES TO LAYERS	FROM	TO	AREA	LENGTH	k	CONDUCTANCE
3XX AND 1XX	501	502	0.04591	1.625	0.2	0.005650462
	501	507	0.02658	2.625	0.2	0.002025143
	502	503	0.04591	1.1874	0.2	0.007732862
	502	508	0.03624	2.625	0.2	0.002761143
	503	504	0.04591	1.25	0.2	0.0073456
	503	509	0.09665	2.625	0.2	0.00736381
	504	505	0.04591	1.25	0.2	0.0073456
	504	510	0.03866	2.625	0.2	0.002945524
	505	506	0.04591	1.625	0.2	0.005650462
	505	511	0.09665	2.625	0.2	0.00736381
	506	512	0.05316	2.625	0.2	0.004050286
	507	508	0.05557	1.625	0.2	0.006839385
	507	513	0.02658	1.184375	0.2	0.004488443
	508	509	0.05557	1.1875	0.2	0.009359158
	508	513	0.00725	1.184375	0.2	0.001224274
	508	514	0.02658	1.184375	0.2	0.004488443
	508	515	0.00242	1.184375	0.2	0.000408654
	509	510	0.05557	1.25	0.2	0.0088912
	509	515	0.09665	1.184375	0.2	0.016320844
	510	511	0.05557	1.25	0.2	0.0088912
	510	515	0.0145	1.184375	0.2	0.002448549
	510	516	0.024163	1.184375	0.2	0.004080296
	511	512	0.05557	2	0.2	0.006839385
	511	516	0.02416	1.184375	0.2	0.004079789
	511	517	0.007249	1.184375	0.2	0.001224106
	512	517	0.01933	1.184375	0.2	0.003264169
	512	518	0.033828	1.184375	0.2	0.00571238
	513	514	0.01576	1.562	0.2	0.002017926
	513	519	0.03383	0.9375	0.2	0.007217067
	514	515	0.015706	1.375	0.2	0.002284509
	514	520	0.02658	0.9375	0.2	0.0056704
	515	516	0.015706	1.375	0.2	0.002284509
	515	521	0.02658	0.9375	0.2	0.0056704

	516	517	0.015706	1.375	0.2	0.002284509
	516	522	0.02658	0.9375	0.2	0.0056704
	517	518	0.015706	1.5625	0.2	0.002010368
	517	523	0.02658	0.9375	0.2	0.0056704
	518	524	0.03383	0.9375	0.2	0.007217067
	519	520	0.02054	1.5625	0.2	0.00262912
	519	525	0.03383	0.96875	0.2	0.006984258
	520	521	0.02054	1.375	0.2	0.002987636
	520	526	0.02658	0.96875	0.2	0.005487484
	521	522	0.02054	1.375	0.2	0.002987636
	521	527	0.02658	0.96875	0.2	0.005487484
	522	523	0.02054	1.375	0.2	0.002987636
	522	528	0.02658	0.96875	0.2	0.005487484
	523	524	0.02054	1.5625	0.2	0.00262912
	523	529	0.02658	0.96875	0.2	0.005487484
	524	530	0.03383	0.96875	0.2	0.006984258
	525	526	0.01691	1.5625	0.2	0.00216448
	526	527	0.01691	1.375	0.2	0.002459636
	527	528	0.01691	1.375	0.2	0.002459636
	528	529	0.01691	1.375	0.2	0.002459636
	529	530	0.01691	1.5625	0.2	0.00216448

TOP PCB LAYER CONDUCTANCES

APPLIES TO	FROM	TO	A1.2	L1	L2	k-Cu	k-poly	hc'	hc	K1	K2	K0
ALL TOP PCB	601	501	3.2656	0.00067	0.00967	9.65	0.2	0.1933	0.63124	974.806	67.54085	0.624995
LAYERS	602	502	4.4531	0.00067	0.00967	9.65	0.2	0.1933	0.860784	1329.284	92.10134	0.852267
	603	503	1.1875	0.00067	0.00967	9.65	0.2	0.1933	0.229544	354.4776	24.5605	0.227272
	604	504	4.75	0.00067	0.00967	9.65	0.2	0.1933	0.918175	1417.91	98.24199	0.90909
	605	505	4.75	0.00067	0.00967	9.65	0.2	0.1933	0.918175	1417.91	98.24199	0.90909
	606	506	6.531	0.00067	0.00967	9.65	0.2	0.1933	1.262442	1949.552	135.0776	1.249951
	607	507	3.953	0.00067	0.00967	9.65	0.2	0.1933	0.764115	1180	81.75801	0.756554
	608	508	5.391	0.00067	0.00967	9.65	0.2	0.1933	1.04208	1609.254	111.4995	1.031769
	609	509	1.4375	0.00067	0.00967	9.65	0.2	0.1933	0.277869	429.1045	29.73113	0.275119
	610	510	5.75	0.00067	0.00967	9.65	0.2	0.1933	1.111475	1716.418	118.9245	1.100477
	611	511	5.75	0.00067	0.00967	9.65	0.2	0.1933	1.111475	1716.418	118.9245	1.100477
	612	512	7.906	0.00067	0.00967	9.65	0.2	0.1933	1.52823	2360	163.516	1.513108
	613	513	1.421	0.00067	0.00967	9.65	0.2	0.1933	0.274679	424.1791	29.38987	0.271961
	614	514	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	615	515	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	616	516	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	617	517	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	618	518	1.421	0.00067	0.00967	9.65	0.2	0.1933	0.274679	424.1791	29.38987	0.271961
	619	519	1.859	0.00067	0.00967	9.65	0.2	0.1933	0.359345	554.9254	38.44881	0.355789
	620	520	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	621	521	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	622	522	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	623	523	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	624	524	1.859	0.00067	0.00967	9.65	0.2	0.1933	0.359345	554.9254	38.44881	0.355789
	625	525	1.531	0.00067	0.00967	9.65	0.2	0.1933	0.295942	457.0149	31.66494	0.293014
	626	526	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	627	527	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	628	528	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	629	529	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	630	530	1.531	0.00067	0.00967	9.65	0.2	0.1933	0.295942	457.0149	31.66494	0.293014

BOTTOM PCB THERMAL LAYER NODE TO NODE

	FROM	TO	AREA	LENGTH	k	CONDUCTANCE
APPLIES TO LAYERS	1601	1602	0.00402	1.281	0.2	0.000627635
4XX AND 2XX	1601	1607	0.00201	1.281	0.2	0.000313817
	1601	1614	0.00469	1.281	0.2	0.00073224
	1602	1603	0.00402	1.3438	0.2	0.000598303
	1602	1607	0.00294	2.25	0.2	0.000261333
	1603	1604	0.00402	1.2188	0.2	0.000659665
	1603	1608	0.00151	2.25	0.2	0.000134222
	1604	1605	0.00402	0.906	0.2	0.000887417
	1604	1609	0.00059	2.25	0.2	5.24444E-05
	1604	1610	0.0005	2.25	0.2	4.44444E-05
	1604	1611	0.00067	2.25	0.2	5.95556E-05
	1605	1606	0.00402	1.5	0.2	0.000536
	1605	1612	0.00059	2.25	0.2	5.24444E-05
	1606	1617	0.00402	1.75	0.2	0.000459429
	1606	1613	0.00335	2.25	0.2	0.000297778
	1607	1608	0.00201	1.3438	0.2	0.000299152
	1607	1614	0.002094	2.25	0.2	0.000186133
	1608	1609	0.00201	1.438	0.2	0.000279555
	1608	1615	0.001508	2.25	0.2	0.000134044
	1609	1610	0.00201	0.406	0.2	0.000990148
	1609	1615	0.00059	2.25	0.2	5.24444E-05
	1610	1611	0.00201	0.438	0.2	0.000917808
	1610	1615	0.0005	2.25	0.2	4.44444E-05
	1611	1612	0.00201	0.5	0.2	0.000804
	1611	1615	0.00067	2.25	0.2	5.95556E-05
	1612	1613	0.00201	1.5	0.2	0.000268
	1612	1616	0.00067	2.25	0.2	5.95556E-05
	1613	1617	0.00335	1.75	0.2	0.000382857
	1613	1616	0.00469	2.5	0.2	0.0003752
	1614	1615	0.00469	2	0.2	0.000469
	1615	1616	0.00469	2.719	0.2	0.00034498
	1616	1617	0.00469	2	0.2	0.000469

BOTTOM PCB POLY LAYER NODE TO NODE

APPLIES TO LAYERS		FROM	TO	AREA	LENGTH	k	CONDUCTANCE
13XX TO 11XX		1501	1502	0.058	1.281	0.2	0.009055425
		1501	1507	0.029	1.281	0.2	0.004527713
		1501	1514	0.0677	1.281	0.2	0.010569867
		1502	1503	0.058	1.344	0.2	0.008630952
		1502	1507	0.0302	2.25	0.2	0.002684444
		1503	1504	0.058	1.219	0.2	0.009515997
		1503	1508	0.0217	2.25	0.2	0.001928889
		1504	1505	0.058	0.906	0.2	0.012803532
		1504	1509	0.00846	2.25	0.2	0.000752
		1504	1510	0.00725	2.25	0.2	0.000644444
		1504	1511	0.00967	2.25	0.2	0.000859556
		1505	1506	0.058	1.5	0.2	0.007733333
		1505	1512	0.00967	2.25	0.2	0.000859556
		1506	1517	0.058	1.75	0.2	0.006628571
		1506	1513	0.0483	2.25	0.2	0.004293333
		1507	1508	0.029	1.344	0.2	0.004315476
		1507	1514	0.0302	2.5	0.2	0.002416
		1508	1509	0.029	1.438	0.2	0.00403338
		1508	1515	0.029	2.5	0.2	0.00232
		1509	1510	0.029	0.406	0.2	0.014285714
		1509	1515	0.00864	2.5	0.2	0.0006912
		1510	1511	0.029	0.438	0.2	0.013242009
		1510	1515	0.00725	2.5	0.2	0.00058
		1511	1512	0.029	0.5	0.2	0.0116
		1511	1515	0.00967	2.5	0.2	0.0007736
		1512	1513	0.029	1.5	0.2	0.003866667
		1512	1516	0.00967	2.5	0.2	0.0007736
		1513	1517	0.029	1.75	0.2	0.003314286
		1513	1516	0.0483	2.5	0.2	0.003864
		1514	1515	0.0677	2	0.2	0.00677
		1515	1516	0.0677	2.719	0.2	0.004979772
		1516	1517	0.0677	2	0.2	0.00677

BOTTOM PCB LAYER CONDUCTANCES

LAYERS	FROM	TO	A1.2	L-Cu	L-poly	k-Cu	k-poly	hc'	hc	K1	K2	K0
16XX TO 15XX	1601	1501	8	0.00067	0.00967	9.65	0.2	0.1933	1.5464	115223.9	165.4602	1.532061
	1602	1502	4.688	0.00067	0.00967	9.65	0.2	0.1933	0.90619	67521.19	96.95967	0.897788
APPLIES TO	1603	1503	3.375	0.00067	0.00967	9.65	0.2	0.1933	0.652388	48610.07	69.80352	0.646338
ALL LAYER	1604	1504	3.938	0.00067	0.00967	9.65	0.2	0.1933	0.761215	56718.96	81.44778	0.754157
TO LAYER	1605	1505	1.5	0.00067	0.00967	9.65	0.2	0.1933	0.28995	21604.48	31.02378	0.287261
CONDUCTANCES	1606	1506	7.5	0.00067	0.00967	9.65	0.2	0.1933	1.44975	108022.4	155.1189	1.436307
	1607	1507	2.344	0.00067	0.00967	9.65	0.2	0.1933	0.453095	33760.6	48.47983	0.448894
	1608	1508	1.688	0.00067	0.00967	9.65	0.2	0.1933	0.32629	24312.24	34.9121	0.323265
	1609	1509	0.6536	0.00067	0.00967	9.65	0.2	0.1933	0.126341	9413.791	13.5181	0.125169
	1610	1510	0.562	0.00067	0.00967	9.65	0.2	0.1933	0.108635	8094.478	11.62358	0.107627
	1611	1511	0.75	0.00067	0.00967	9.65	0.2	0.1933	0.144975	10802.24	15.51189	0.143631
	1612	1512	0.75	0.00067	0.00967	9.65	0.2	0.1933	0.144975	10802.24	15.51189	0.143631
	1613	1513	3.75	0.00067	0.00967	9.65	0.2	0.1933	0.724875	54011.19	77.55946	0.718153
	1614	1514	5.471	0.00067	0.00967	9.65	0.2	0.1933	1.057544	78798.73	113.1541	1.047738
	1615	1515	8.531	0.00067	0.00967	9.65	0.2	0.1933	1.649042	122871.9	176.4426	1.633751
	1616	1516	10.5	0.00067	0.00967	9.65	0.2	0.1933	2.02965	151231.3	217.1665	2.01083
	1617	1517	8	0.00067	0.00967	9.65	0.2	0.1933	1.5464	115223.9	165.4602	1.532061

FROM	TO	AREA	k-Ni	L1	K1	R1	K tot	k (Cu/poly)	hc'	hc	L2	K2	K0
2011	101	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2013	301	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2015	501	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2012	201	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2014	401	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2016	601	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2021	102	0.00204	1.77	0.0165	0.218836	4.569624	5.033236	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2023	302	0.00204	1.77	0.0165	0.218836	4.569624	5.033236	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2025	502	0.00204	1.77	0.0165	0.218836	4.569624	5.033236	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2022	202	0.000139	1.77	0.0165	0.014911	67.06499	0.342951	9.65	1.476	0.000205	0.25	0.005365	0.000197
2024	402	0.000139	1.77	0.0165	0.014911	67.06499	0.342951	9.65	1.476	0.000205	0.25	0.005365	0.000197
2026	602	0.000139	1.77	0.0165	0.014911	67.06499	0.342951	9.65	1.476	0.000205	0.25	0.005365	0.000197
2031	103	0.00204	1.77	0.0165	0.218836	4.569624	0.875345	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2033	303	0.00204	1.77	0.0165	0.218836	4.569624	0.875345	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2035	503	0.00204	1.77	0.0165	0.218836	4.569624	0.875345	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2032	203	0.000139	1.77	0.0165	0.014911	67.06499	0.059644	9.65	1.476	0.000205	0.25	0.005365	0.000197
2034	403	0.000139	1.77	0.0165	0.014911	67.06499	0.059644	9.65	1.476	0.000205	0.25	0.005365	0.000197
2036	603	0.000139	1.77	0.0165	0.014911	67.06499	0.059644	9.65	1.476	0.000205	0.25	0.005365	0.000197
2041	104	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2043	304	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2045	504	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2042	204	0.000139	1.77	0.0165	0.014911	67.06499	0.372773	9.65	1.476	0.000205	0.25	0.005365	0.000198
2044	404	0.000139	1.77	0.0165	0.014911	67.06499	0.372773	9.65	1.476	0.000205	0.25	0.005365	0.000198
2046	604	0.000139	1.77	0.0165	0.014911	67.06499	0.372773	9.65	1.476	0.000205	0.25	0.005365	0.000198
2051	105	0.00204	1.77	0.0165	0.218836	4.569624	0.656509	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2053	305	0.00204	1.77	0.0165	0.218836	4.569624	0.656509	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2055	505	0.00204	1.77	0.0165	0.218836	4.569624	0.656509	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2052	205	0.000139	1.77	0.0165	0.014911	67.06499	0.044733	9.65	1.476	0.000205	0.25	0.005365	0.000197
2054	405	0.000139	1.77	0.0165	0.014911	67.06499	0.044733	9.65	1.476	0.000205	0.25	0.005365	0.000197
2056	605	0.000139	1.77	0.0165	0.014911	67.06499	0.044733	9.65	1.476	0.000205	0.25	0.005365	0.000197
2061	106	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2063	306	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2065	506	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296

2251	125	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2253	325	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2255	525	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2252	225	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2254	425	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2256	625	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2261	126	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2263	326	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2265	526	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2262	226	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2264	426	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2266	626	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2271	127	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2273	327	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2275	527	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2272	227	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2274	427	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2276	627	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2281	128	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2283	328	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2285	528	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2282	228	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2284	428	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2286	628	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2291	129	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2293	329	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2295	529	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2292	229	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2294	429	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2296	629	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2301	130	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2303	330	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2305	530	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2302	230	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2304	430	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2306	630	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197

FROM	TO	AREA	k-Ni	L1	K1	R1	Ktot	k(Cu/poly)	hc'	hc	L2	K2	K0
3011	1101	0.00204	1.77	0.0165	0.218836	4.569624	14.00553	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3013	1301	0.00204	1.77	0.0165	0.218836	4.569624	14.00553	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3015	1501	0.00204	1.77	0.0165	0.218836	4.569624	14.00553	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3012	1201	0.00139	1.77	0.0165	0.149109	6.706499	9.542982	9.65	1.476	0.002052	0.025	0.53654	0.002043
3014	1401	0.00139	1.77	0.0165	0.149109	6.706499	9.542982	9.65	1.476	0.002052	0.025	0.53654	0.002043
3016	1601	0.00139	1.77	0.0165	0.149109	6.706499	9.542982	9.65	1.476	0.002052	0.025	0.53654	0.002043
3021	1102	0.00204	1.77	0.0165	0.218836	4.569624	7.440436	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3023	1302	0.00204	1.77	0.0165	0.218836	4.569624	7.440436	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3025	1502	0.00204	1.77	0.0165	0.218836	4.569624	7.440436	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3022	1202	0.00139	1.77	0.0165	0.149109	6.706499	5.069709	9.65	1.476	0.002052	0.025	0.53654	0.002043
3024	1402	0.00139	1.77	0.0165	0.149109	6.706499	5.069709	9.65	1.476	0.002052	0.025	0.53654	0.002043
3026	1602	0.00139	1.77	0.0165	0.149109	6.706499	5.069709	9.65	1.476	0.002052	0.025	0.53654	0.002043
3031	1103	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3033	1303	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3035	1503	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3032	1203	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3034	1403	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3036	1603	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3041	1104	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3043	1304	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3045	1504	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3042	1204	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3044	1404	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3046	1604	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3051	1105	0.00204	1.77	0.0165	0.218836	4.569624	6.127418	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3053	1305	0.00204	1.77	0.0165	0.218836	4.569624	6.127418	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3055	1505	0.00204	1.77	0.0165	0.218836	4.569624	6.127418	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3052	1205	0.00139	1.77	0.0165	0.149109	6.706499	4.175055	9.65	1.476	0.002052	0.025	0.53654	0.002043
3054	1405	0.00139	1.77	0.0165	0.149109	6.706499	4.175055	9.65	1.476	0.002052	0.025	0.53654	0.002043
3056	1605	0.00139	1.77	0.0165	0.149109	6.706499	4.175055	9.65	1.476	0.002052	0.025	0.53654	0.002043
3061	1106	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3063	1306	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3065	1506	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354

3154	1415	0.00139	1.77	0.0165	0.149109	6.706499	14.91091	9.65	1.476	0.002052	0.025	0.53654	0.002044
3156	1615	0.00139	1.77	0.0165	0.149109	6.706499	14.91091	9.65	1.476	0.002052	0.025	0.53654	0.002044
3161	1116	0.00204	1.77	0.0165	0.218836	4.569624	24.94735	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3163	1316	0.00204	1.77	0.0165	0.218836	4.569624	24.94735	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3165	1516	0.00204	1.77	0.0165	0.218836	4.569624	24.94735	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3162	1216	0.00139	1.77	0.0165	0.149109	6.706499	16.99844	9.65	1.476	0.002052	0.025	0.53654	0.002044
3164	1416	0.00139	1.77	0.0165	0.149109	6.706499	16.99844	9.65	1.476	0.002052	0.025	0.53654	0.002044
3166	1616	0.00139	1.77	0.0165	0.149109	6.706499	16.99844	9.65	1.476	0.002052	0.025	0.53654	0.002044
3171	1117	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3173	1317	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3175	1517	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3172	1217	0.00139	1.77	0.0165	0.149109	6.706499	3.727727	9.65	1.476	0.002052	0.025	0.53654	0.002043
3174	1417	0.00139	1.77	0.0165	0.149109	6.706499	3.727727	9.65	1.476	0.002052	0.025	0.53654	0.002043
3176	1617	0.00139	1.77	0.0165	0.149109	6.706499	3.727727	9.65	1.476	0.002052	0.025	0.53654	0.002043

		PIN TO PIN CONDUCTANCES						
	FROM	TO	# OF PINS	AREA	ADJ AREA	LENGTH	k	K
	2011	2012	6	0.0008553	0.0051318	0.06201	1.77	0.146481
	2021	2022	23	0.0008553	0.0196719	0.237705	1.77	0.146481
	2031	2032	4	0.0008553	0.0034212	0.04134	1.77	0.146481
	2041	2042	25	0.0008553	0.0213825	0.258375	1.77	0.146481
	2051	2052	3	0.0008553	0.0025659	0.031005	1.77	0.146481

APPENDIX M. ITAS CONDUCTANCE DATA

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
1	1	1	901	1000	L	GEOMETRY TO HOUSING NODE
2	1	2	902	1000	L	GEOMETRY TO HOUSING NODE
3	1	3	903	1000	L	GEOMETRY TO HOUSING NODE
4	1	4	904	1000	L	GEOMETRY TO HOUSING NODE
5	1	5	905	1000	L	GEOMETRY TO HOUSING NODE
6	1	6	906	1000	L	GEOMETRY TO HOUSING NODE
7	1	7	907	1000	L	GEOMETRY TO HOUSING NODE
8	1	8	908	1000	L	GEOMETRY TO HOUSING NODE
9	1	9	909	1000	L	GEOMETRY TO HOUSING NODE
10	1	10	910	1000	L	GEOMETRY TO HOUSING NODE
11	1	11	911	1000	L	GEOMETRY TO HOUSING NODE
12	1	12	912	1000	L	GEOMETRY TO HOUSING NODE
13	1	13	613	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
14	1	14	614	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
15	1	15	615	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
16	1	16	616	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
17	1	17	617	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
18	1	18	618	1000	L	GEOMETRY TO PCB1 THERMAL LAYER

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
19	1	19	619	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
20	1	20	620	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
21	1	21	621	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
22	1	22	622	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
23	1	23	623	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
24	1	24	624	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
25	1	25	625	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
26	1	26	626	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
27	1	27	627	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
28	1	28	628	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
29	1	29	629	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
30	1	30	630	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
31	1	31	601	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
32	1	32	602	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
33	1	33	603	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
34	1	34	604	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
35	1	35	605	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
36	1	36	606	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

Ctrl:Copy ITAS Conductor Data Entry ESC:Quit

SqNo	FACTOR	From	To	Cond. Value	L/R	Description
1	1	1	901	1000	L	GEOMETRY TO HOUSING NODE
2	1	2	902	1000	L	GEOMETRY TO HOUSING NODE
3	1	3	903	1000	L	GEOMETRY TO HOUSING NODE
4	1	4	904	1000	L	GEOMETRY TO HOUSING NODE
5	1	5	905	1000	L	GEOMETRY TO HOUSING NODE
6	1	6	906	1000	L	GEOMETRY TO HOUSING NODE
7	1	7	907	1000	L	GEOMETRY TO HOUSING NODE
8	1	8	908	1000	L	GEOMETRY TO HOUSING NODE
9	1	9	909	1000	L	GEOMETRY TO HOUSING NODE
10	1	10	910	1000	L	GEOMETRY TO HOUSING NODE
11	1	11	911	1000	L	GEOMETRY TO HOUSING NODE
12	1	12	912	1000	L	GEOMETRY TO HOUSING NODE
13	1	13	613	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
14	1	14	614	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
15	1	15	615	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
16	1	16	616	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
17	1	17	617	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
18	1	18	618	1000	L	GEOMETRY TO PCB1 THERMAL LAYER

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

Ctrl:Copy ITAS Conductor Data Entry ESC:Quit

SqNo	FACTOR	From	To	Cond. Value	L/R	Description
19	1	19	619	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
20	1	20	620	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
21	1	21	621	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
22	1	22	622	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
23	1	23	623	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
24	1	24	624	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
25	1	25	625	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
26	1	26	626	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
27	1	27	627	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
28	1	28	628	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
29	1	29	629	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
30	1	30	630	1000	L	GEOMETRY TO PCB1 THERMAL LAYER
31	1	31	601	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
32	1	32	602	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
33	1	33	603	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
34	1	34	604	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
35	1	35	605	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
36	1	36	606	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
37	1	37	607	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
38	1	38	608	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
39	1	39	609	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
40	1	40	610	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
41	1	41	611	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
42	1	42	612	1000	L	GEOMETRY TO TOP PCB THERMAL LAYER
43	1	43	1601	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
44	1	44	1602	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
45	1	45	1603	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
46	1	46	1604	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
47	1	47	1605	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
48	1	48	1606	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
49	1	49	1607	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
50	1	50	1608	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
51	1	51	1609	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
52	1	52	1610	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
53	1	53	1611	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
54	1	54	1612	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
55	1	55	1613	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
56	1	56	1614	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
57	1	57	1615	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
58	1	58	1616	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
59	1	59	1617	1000	L	GEOMETRY TO BOTTOM PCB THERMA LYR
60	1	913	912	178.47	L	EQUIPMENT PLATE TO EPS HOUSING
61	1	901	905	.26135	L	HOUSING NODES TO HOUSING NODES
62	1	901	906	1.5333	L	HOUSING NODES TO HOUSING NODES
63	1	901	911	.27461	L	HOUSING NODES TO HOUSING NODES
64	1	901	912	1.3563	L	HOUSING NODES TO HOUSING NODES
65	1	902	903	.60110	L	HOUSING NODES TO HOUSING NODES
66	1	902	906	.42339	L	HOUSING NODES TO HOUSING NODES
67	1	902	907	.27461	L	HOUSING NODES TO HOUSING NODES
68	1	902	912	.42306	L	HOUSING NODES TO HOUSING NODES
69	1	903	904	.60110	L	HOUSING NODES TO HOUSING NODES
70	1	903	906	.42306	L	HOUSING NODES TO HOUSING NODES
71	1	903	912	.42306	L	HOUSING NODES TO HOUSING NODES
72	1	904	905	.60110	L	HOUSING NODES TO HOUSING NODES

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□   73 1      904    906    .42306        L  HOUSING TO HOUSING NODES          □
□   74 1      904    912    .42306        L  HOUSING TO HOUSING NODES          □
□   75 1      905    906    .42306        L  HOUSING TO HOUSING NODES          □
□   76 1      905    912    .42306        L  HOUSING TO HOUSING NODES          □
□   77 1      907    906    13.2667       L  HOUSING TO HOUSING NODES          □
□   78 1      907    908    .27461        L  HOUSING TO HOUSING NODES          □
□   79 1      907    912    13.2667       L  HOUSING TO HOUSING NODES          □
□   80 1      908    906    .42306        L  HOUSING TO HOUSING NODES          □
□   81 1      908    910    .60110        L  HOUSING TO HOUSING NODES          □
□   82 1      908    912    .42306        L  HOUSING TO HOUSING NODES          □
□   83 1      909    906    .42306        L  HOUSING TO HOUSING NODES          □
□   84 1      909    910    .60110        L  HOUSING TO HOUSING NODES          □
□   85 1      909    912    .42306        L  HOUSING TO HOUSING NODES          □
□   86 1      910    906    .42306        L  HOUSING TO HOUSING NODES          □
□   87 1      910    911    .60110        L  HOUSING TO HOUSING NODES          □
□   88 1      910    912    .42306        L  HOUSING TO HOUSING NODES          □
□   89 1      911    906    .42306        L  HOUSING TO HOUSING NODES          □
□   90 1      911    912    .42306        L  HOUSING TO HOUSING NODES          □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                   End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□   91 1      921    901    .05856        L  BOTTOM RAIL TO EPS HOUSING (+Y)   □
□   92 1      921    907    .05856        L  BOTTOM RAIL TO EPS HOUSING (+Y)   □
□   93 1      921    902    11.2443       L  BOTTOM RAIL TO EPS HOUSING (+Y)   □
□   94 1      921    903    11.2443       L  BOTTOM RAIL TO EPS HOUSING (+Y)   □
□   95 1      921    904    11.2443       L  BOTTOM RAIL TO EPS HOUSING (+Y)   □
□   96 1      921    905    11.2443       L  BOTTOM RAIL TO EPS HOUSING (+Y)   □
□   97 1      921    906    4.31          L  BOTTOM RAIL TO EPS HOUSING (+Y)   □
□   98 1      922    901    .08784        L  MIDDLE RAIL TO EPS HOUSING (+Y)   □
□   99 1      922    907    .08784        L  MIDDLE RAIL TO EPS HOUSING (+Y)   □
□  100 1      922    902    16.8760       L  MIDDLE RAIL TO EPS HOUSING (+Y)   □
□  101 1      922    903    16.8760       L  MIDDLE RAIL TO EPS HOUSING (+Y)   □
□  102 1      922    904    16.8760       L  MIDDLE RAIL TO EPS HOUSING (+Y)   □
□  103 1      922    905    16.8760       L  MIDDLE RAIL TO EPS HOUSING (+Y)   □
□  104 1      923    901    .04661        L  TOP RAIL TO EPS HOUSING (+Y)      □
□  105 1      923    907    .04661        L  TOP RAIL TO EPS HOUSING (+Y)      □
□  106 1      923    902    8.19666       L  TOP RAIL TO EPS HOUSING (+Y)      □
□  107 1      923    903    8.95905       L  TOP RAIL TO EPS HOUSING (+Y)      □
□  108 1      923    904    8.95905       L  TOP RAIL TO EPS HOUSING (+Y)      □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                   End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value   L/R Description                    □
□  109 1      923     905     8.19666        L  TOP RAIL TO EPS HOUSING (+Y)   □
□  110 1      923     906     3.43076        L  TOP RAIL TO EPS HOUSING (+Y)   □
□  111 1      924     901     .05856         L  BOTTOM RAIL TO EPS HOUSING (-Y) □
□  112 1      924     907     .05856         L  BOTTOM RAIL TO EPS HOUSING (-Y) □
□  113 1      924     908     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y) □
□  114 1      924     909     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y) □
□  115 1      924     910     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y) □
□  116 1      924     911     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y) □
□  117 1      924     912     4.31           L  BOTTOM RAIL TO EPS HOUSING (-Y) □
□  118 1      925     901     .08784         L  MIDDLE RAIL TO EPS HOUSING (-Y) □
□  119 1      925     907     .08784         L  MIDDLE RAIL TO EPS HOUSING (-Y) □
□  120 1      925     908     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y) □
□  121 1      925     909     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y) □
□  122 1      925     910     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y) □
□  123 1      925     911     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y) □
□  124 1      926     901     .04661         L  TOP RAIL TO EPS HOUSING (-Y)   □
□  125 1      926     907     .04661         L  TOP RAIL TO EPS HOUSING (-Y)   □
□  126 1      926     908     8.19666        L  TOP RAIL TO EPS HOUSING (-Y)   □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur               End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value   L/R Description                    □
□  127 1      926     909     8.95905        L  TOP RAIL TO EPS HOUSING (-Y)   □
□  128 1      926     910     8.95905        L  TOP RAIL TO EPS HOUSING (-Y)   □
□  129 1      926     911     8.19666        L  TOP RAIL TO EPS HOUSING (-Y)   □
□  130 1      926     912     3.43076        L  TOP RAIL TO EPS HOUSING (-Y)   □
□  131 1      1601    924     .85144         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) □
□  132 1      1602    924     1.3282         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) □
□  133 1      1603    924     .95701         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) □
□  134 1      1604    924     1.1171         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) □
□  135 1      1605    924     .42572         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) □
□  136 1      1606    924     2.12859        L  BOTTOM PCB Cu LYR TO BTM RL (-Y) □
□  137 1      1617    924     .85144         L                                 □
□  138 1      1601    921     .85144         L  BOTTOM PCB Cu LYR TO BTM RL (+Y) □
□  139 1      1614    921     1.32824        L  BOTTOM PCB Cu LYR TO BTM RL (+Y) □
□  140 1      1615    921     2.0741         L  BOTTOM PCB Cu LYR TO BTM RL (+Y) □
□  141 1      1616    921     2.55430        L  BOTTOM PCB Cu LYR TO BTM RL (+Y) □
□  142 1      1617    921     .85144         L  BOTTOM PCB Cu LYR TO BTM RL (+Y) □
□  143 1      1101    925     .05918         L  BTM PCB POLY LYR TO MID RL (-Y)  □
□  144 1      1102    925     .09233         L  BTM PCB POLY LYR TO MID RL (-Y)  □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur               End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
145	1	1103	925	.06652	L	BTM PCB POLY LYR TO MID RL (-Y)
146	1	1104	925	.07765	L	BTM PCB POLY LYR TO MID RL (-Y)
147	1	1105	925	.02959	L	BTM PCB POLY LYR TO MID RL (-Y)
148	1	1106	925	.14796	L	BTM PCB POLY LYR TO MID RL (-Y)
149	1	1117	925	.059184	L	BTM PCB POLY LYR TO MID RL (-Y)
150	1	1101	922	.059184	L	BTM PCB POLY LYR TO MID RL (+Y)
151	1	1114	922	.092328	L	BTM PCB POLY LYR TO MID RL (+Y)
152	1	1115	922	.144173	L	BTM PCB POLY LYR TO MID RL (+Y)
153	1	1116	922	.177553	L	BTM PCB POLY LYR TO MID RL (+Y)
154	1	1117	922	.059184	L	BTM PCB POLY LYR TO MID RL (+Y)
155	1	601	925	1.11579	L	TOP PCB Cu LYR TO MID RL (-Y)
156	1	602	925	1.52147	L	TOP PCB Cu LYR TO MID RL (-Y)
157	1	603	925	.405689	L	TOP PCB Cu LYR TO MID RL (-Y)
158	1	604	925	1.62273	L	TOP PCB Cu LYR TO MID RL (-Y)
159	1	605	925	.405689	L	TOP PCB Cu LYR TO MID RL (-Y)
160	1	606	925	2.23125	L	TOP PCB Cu LYR TO MID RL (-Y)
161	1	625	922	2.23125	L	TOP PCB Cu LYR TO MID RL (+Y)
162	1	626	922	1.11579	L	TOP PCB Cu LYR TO MID RL (+Y)

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
163	1	627	922	1.11579	L	TOP PCB Cu LYR TO MID RL (+Y)
164	1	628	922	1.11579	L	TOP PCB Cu LYR TO MID RL (+Y)
165	1	629	922	1.11579	L	TOP PCB Cu LYR TO MID RL (+Y)
166	1	630	922	2.23125	L	TOP PCB Cu LYR TO MID RL (+Y)
167	1	101	926	.08179	L	TOP PCB POLY LYR TO MID RL (-Y)
168	1	102	926	.11152	L	TOP PCB POLY LYR TO MID RL (-Y)
169	1	103	926	.02974	L	TOP PCB POLY LYR TO MID RL (-Y)
170	1	104	926	.11894	L	TOP PCB POLY LYR TO MID RL (-Y)
171	1	105	926	.02974	L	TOP PCB POLY LYR TO MID RL (-Y)
172	1	106	926	.16355	L	TOP PCB POLY LYR TO MID RL (-Y)
173	1	125	923	.16355	L	TOP PCB POLY LYR TO TOP RL (+Y)
174	1	126	923	.08179	L	TOP PCB POLY LYR TO TOP RL (+Y)
175	1	127	923	.08179	L	TOP PCB POLY LYR TO TOP RL (+Y)
176	1	128	923	.08179	L	TOP PCB POLY LYR TO TOP RL (+Y)
177	1	129	923	.08179	L	TOP PCB POLY LYR TO TOP RL (+Y)
178	1	130	923	.16355	L	TOP PCB POLY LYR TO TOP RL (+Y)
179	1	601	602	.018635	L	TOP PCB THERMAL LAYER NODE-NODE
180	1	601	607	.006764	L	

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
181	1	602	603	.025866	L	TOP PCB THERMAL LYR NODE-NODE
182	1	602	608	.092383	L	
183	1	603	604	.02423	L	
184	1	603	609	.002573	L	
185	1	604	605	.02457	L	
186	1	604	610	.009852	L	
187	1	605	606	.018635	L	
188	1	605	611	.00257	L	
189	1	606	612	.013565	L	
190	1	607	608	.02286	L	
191	1	607	613	.009630	L	
192	1	608	609	.019815	L	
193	1	608	613	.002617	L	
194	1	608	614	.009630	L	
195	1	608	615	.04057	L	
196	1	609	610	.02972	L	
197	1	609	615	.003664	L	
198	1	610	611	.02972	L	

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
199	1	610	615	.005234	L	TOP PCB THRML LYR NODE-NODE
200	1	610	616	.008793	L	
201	1	611	612	.022863	L	
202	1	611	616	.008793	L	
203	1	611	617	.002617	L	
204	1	612	617	.007013	L	
205	1	612	618	.01230	L	
206	1	613	614	.007164	L	
207	1	613	619	.024189	L	
208	1	614	615	.008141	L	
209	1	614	620	.018940	L	
210	1	615	616	.008141	L	
211	1	615	621	.01832	L	
212	1	616	617	.008141	L	
213	1	616	622	.018940	L	
214	1	617	618	.007164	L	
215	1	617	623	.018940	L	
216	1	618	624	.010293	L	

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
217	1	619	620	.008770	L	TOP PCB THERMAL LYR NODE-NODE
218	1	619	625	.023410	L	
219	1	620	621	.009967	L	
220	1	620	625	.018329	L	
221	1	621	622	.009967	L	
222	1	621	627	.017731	L	
223	1	622	623	.014145	L	
224	1	622	628	.012913	L	
225	1	623	624	.008770	L	
226	1	623	629	.018324	L	
227	1	624	630	.009961	L	
228	1	625	626	.010684	L	
229	1	626	627	.012141	L	
230	1	627	628	.012141	L	
231	1	628	629	.012141	L	
232	1	629	630	.010684	L	
233	1	501	502	.005651	L	TOP PCB LOWEST POLY LYR NODE-NODE
234	1	501	507	.002025	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
235	1	502	503	.005650	L	TOP PCB BTM POLY LYR NODE-NODE
236	1	502	508	.002025	L	
237	1	503	504	.007733	L	
238	1	503	509	.002761	L	
239	1	504	505	.007346	L	
240	1	504	510	.007364	L	
241	1	505	506	.007346	L	
242	1	505	511	.002946	L	
243	1	506	512	.005650	L	
244	1	507	508	.007364	L	
245	1	507	513	.004050	L	
246	1	508	509	.006839	L	
247	1	508	513	.004488	L	
248	1	508	514	.009359	L	
249	1	508	515	.001224	L	
250	1	509	510	.004488	L	
251	1	509	515	.0004087	L	
252	1	510	511	.008891	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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□                                                                              □
□ SqNo FACTOR From    To     Cond. Value  L/R Description                     □
□  253 1       510    515    .002449       L  TOP PCB BTM POLY LYR NODE-NODE  □
□  254 1       510    516    .004080       L                                  □
□  255 1       511    512    .006839       L                                  □
□  256 1       511    516    .004080       L                                  □
□  257 1       511    517    .001224       L                                  □
□  258 1       512    517    .003264       L                                  □
□  259 1       512    518    .005712       L                                  □
□  260 1       513    514    .002018       L                                  □
□  261 1       513    519    .007217       L                                  □
□  262 1       514    515    .002285       L                                  □
□  263 1       514    520    .005670       L                                  □
□  264 1       515    516    .002284       L                                  □
□  265 1       515    521    .005670       L                                  □
□  266 1       516    517    .002285       L                                  □
□  267 1       516    522    .005670       L                                  □
□  268 1       517    518    .002010       L                                  □
□  269 1       517    523    .005670       L                                  □
□  270 1       518    524    .007217       L                                  □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To     Cond. Value  L/R Description                     □
□  271 1       519    520    .002629       L  TOP PCB BTM POLY LYR NODE-NODE  □
□  272 1       519    525    .006984       L                                  □
□  273 1       520    521    .002988       L                                  □
□  274 1       520    526    .005487       L                                  □
□  275 1       521    522    .002988       L                                  □
□  276 1       521    527    .005487       L                                  □
□  277 1       522    523    .002988       L                                  □
□  278 1       522    528    .005487       L                                  □
□  279 1       523    524    .002629       L                                  □
□  280 1       523    529    .005487       L                                  □
□  281 1       525    526    .002164       L                                  □
□  282 1       526    527    .002460       L                                  □
□  283 1       527    528    .002460       L                                  □
□  284 1       528    529    .002460       L                                  □
□  285 1       529    530    .002164       L                                  □
□  286 1       401    402    .018902       L  TOP PCB GRND LYR NODE-NODE      □
□  287 1       401    407    .006764       L                                  □
□  288 1       402    403    .025866       L                                  □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
289	1	402	408	.09238	L	TOP PCB GRND LYR NODE-NODE
290	1	403	404	.02422	L	
291	1	403	409	.00257	L	
292	1	404	405	.02457	L	
293	1	404	410	.009852	L	
294	1	405	406	.01863	L	
295	1	405	411	.002573	L	
296	1	406	412	.013565	L	
297	1	407	408	.02286	L	
298	1	407	413	.009630	L	
299	1	408	409	.01981	L	
300	1	408	413	.002617	L	
301	1	408	414	.009630	L	
302	1	408	415	.04056	L	
303	1	409	410	.02972	L	
304	1	409	415	.003664	L	
305	1	410	411	.029722	L	
306	1	410	415	.005234	L	

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CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
307	1	410	416	.008793	L	TOP PCB GRND LYR NODE-NODE
308	1	411	412	.022863	L	
309	1	411	416	.008793	L	
310	1	411	417	.002617	L	
311	1	412	417	.007013	L	
312	1	412	418	.01230	L	
313	1	413	414	.007164	L	
314	1	413	419	.024189	L	
315	1	414	415	.008141	L	
316	1	414	420	.018940	L	
317	1	415	416	.008141	L	
318	1	415	421	.018322	L	
319	1	416	417	.008141	L	
320	1	416	422	.018940	L	
321	1	417	418	.007164	L	
322	1	417	423	.018940	L	
323	1	418	424	.010293	L	
324	1	419	420	.008770	L	

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CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□  325 1      419    425    .02341        L  TOP PCB GRND LYR NODE-NODE         □
□  326 1      420    421    .009966       L                                     □
□  327 1      420    426    .018329       L                                     □
□  328 1      421    422    .009966       L                                     □
□  329 1      421    427    .017731       L                                     □
□  330 1      422    423    .014145       L                                     □
□  331 1      422    428    .012913       L                                     □
□  332 1      423    424    .008770       L                                     □
□  333 1      423    429    .018329       L                                     □
□  334 1      424    430    .009961       L                                     □
□  335 1      425    426    .01068        L                                     □
□  336 1      426    427    .01214        L                                     □
□  337 1      427    428    .01214        L                                     □
□  338 1      428    429    .01214        L                                     □
□  339 1      429    430    .01068        L                                     □
□  340 1      301    302    .005650       L  TOP PCB MID POLY LYR NODE-NODE     □
□  341 1      301    307    .002025       L                                     □
□  342 1      302    303    .007733       L                                     □
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□  343 1      302    308    .002761       L  TOP PCB MID POLY LYR NODE-NODE     □
□  344 1      303    304    .007346       L                                     □
□  345 1      303    309    .007364       L                                     □
□  346 1      304    305    .007346       L                                     □
□  347 1      304    310    .002946       L                                     □
□  348 1      305    306    .005650       L                                     □
□  349 1      305    311    .007364       L                                     □
□  350 1      306    312    .004050       L                                     □
□  351 1      307    308    .006840       L                                     □
□  352 1      307    313    .004488       L                                     □
□  353 1      308    309    .009359       L                                     □
□  354 1      308    313    .001224       L                                     □
□  355 1      308    314    .004488       L                                     □
□  356 1      308    315    .000408       L                                     □
□  357 1      309    310    .008991       L                                     □
□  358 1      309    315    .016321       L                                     □
□  359 1      310    311    .00889        L                                     □
□  360 1      310    315    .002449       L                                     □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
361	1	310	316	.004080	L	TOP PCB MID POLY LAYER NODE-NODE
362	1	311	312	.006840	L	
363	1	311	316	.004080	L	
364	1	311	317	.001224	L	
365	1	312	317	.003264	L	
366	1	312	318	.005712	L	
367	1	313	314	.002018	L	
368	1	313	319	.007217	L	
369	1	314	315	.002285	L	
370	1	314	320	.005670	L	
371	1	315	316	.002285	L	
372	1	315	321	.005670	L	
373	1	316	317	.002285	L	
374	1	316	322	.005670	L	
375	1	317	318	.002010	L	
376	1	317	323	.005670	L	
377	1	318	324	.0007217	L	
378	1	319	320	.002629	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
379	1	319	325	.006984	L	TOP PCB MID POLY LYR NODE-NODE
380	1	320	321	.002988	L	
381	1	320	326	.005487	L	
382	1	321	322	.002988	L	
383	1	321	327	.005487	L	
384	1	322	323	.002988	L	
385	1	322	328	.005487	L	
386	1	323	324	.002629	L	
387	1	323	329	.005487	L	
388	1	324	330	.06984	L	
389	1	325	326	.002164	L	
390	1	326	327	.002460	L	
391	1	327	328	.002460	L	
392	1	328	329	.002460	L	
393	1	329	330	.002164	L	
394	1	201	202	.018902	L	TOP PCB TOP Cu LYR NODE-NODE
395	1	201	207	.006764	L	
396	1	202	203	.025866	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
397	1	202	208	.09238	L	TOP PCB TOP Cu LYR NODE-NODE
398	1	203	2045	.02423	L	
399	1	203	209	.002573	L	
400	1	204	205	.02457	L	
401	1	204	210	.00985	L	
402	1	205	206	.01863	L	
403	1	205	211	.002573	L	
404	1	206	212	.013565	L	
405	1	207	208	.022863	L	
406	1	207	213	.009630	L	
407	1	208	209	.01981	L	
408	1	208	213	.002670	L	
409	1	208	214	.009630	L	
410	1	208	215	.04056	L	
411	1	209	210	.02972	L	
412	1	209	215	.003663	L	
413	1	210	211	.02972	L	
414	1	210	215	.005234	L	

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
415	1	210	216	.008793	L	TOP PCB TOP Cu LYR NODE-NODE
416	1	211	212	.02286	L	
417	1	211	216	.008793	L	
418	1	211	217	.0026170	L	
419	1	212	217	.0070134	L	
420	1	212	218	.001230	L	
421	1	213	214	.0071641	L	
422	1	213	219	.024190	L	
423	1	214	215	.008141	L	
424	1	214	220	.018940	L	
425	1	215	216	.0081410	L	
426	1	215	221	.018322	L	
427	1	216	217	.0189397	L	
428	1	216	222	.018940	L	
429	1	217	218	.007164	L	
430	1	217	223	.0018940	L	
431	1	218	224	.010293	L	
432	1	219	220	.008770	L	

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
433	1	219	225	.02341	L	TOP PCB TOP Cu LYR NODE-NODE
434	1	220	221	.009966	L	
435	1	220	226	.018329	L	
436	1	221	222	.009966	L	
437	1	221	227	.017731	L	
438	1	222	223	.014145	L	
439	1	222	228	.01291	L	
440	1	223	224	.008770	L	
441	1	223	229	.018329	L	
442	1	224	230	.009961	L	
443	1	225	226	.010684	L	
444	1	226	227	.012141	L	
445	1	227	228	.012141	L	
446	1	228	229	.012141	L	
447	1	229	230	.010684	L	
448	1	101	102	.005650	L	TOP PCB TOP POLY LYR NODE-NODE
449	1	101	107	.002025	L	
450	1	102	103	.007733	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
451	1	102	108	.002761	L	TOP PCB TOP POLY LYR NODE-NODE
452	1	103	104	.0073456	L	
453	1	103	109	.0073638	L	
454	1	104	105	.007346	L	
455	1	104	110	.0029455	L	
456	1	105	106	.005650	L	
457	1	105	111	.0073638	L	
458	1	106	112	.004050	L	
459	1	107	108	.006839	L	
460	1	107	113	.004488	L	
461	1	108	109	.009359	L	
462	1	108	113	.001224	L	
463	1	108	114	.004488	L	
464	1	108	115	.0004087	L	
465	1	109	110	.0088991	L	
466	1	109	115	.01632	L	
467	1	110	111	.008891	L	
468	1	110	115	.002449	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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¤                                                                             ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                     ¤
¤  469 1      110    116    .004080       L  TOP PCB TOP POLY LYR NODE-NODE   ¤
¤  470 1      111    112    .006839       L                                   ¤
¤  471 1      111    116    .004080       L                                   ¤
¤  472 1      111    117    .001224       L                                   ¤
¤  473 1      112    117    .032642       L                                   ¤
¤  474 1      112    118    .005712       L                                   ¤
¤  475 1      113    114    .002018       L                                   ¤
¤  476 1      113    119    .007217       L                                   ¤
¤  477 1      114    115    .002285       L                                   ¤
¤  478 1      114    120    .005670       L                                   ¤
¤  479 1      115    116    .002285       L                                   ¤
¤  480 1      115    621    .005670       L                                   ¤
¤  481 1      116    117    .002845       L                                   ¤
¤  482 1      116    122    .005670       L                                   ¤
¤  483 1      117    118    .002010       L                                   ¤
¤  484 1      117    123    .005670       L                                   ¤
¤  485 1      118    124    .007217       L                                   ¤
¤  486 1      119    120    .002629       L                                   ¤
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
¤                                                                             ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                     ¤
¤  487 1      119    125    .006984       L  TOP PCB TOP POLY LYR NODE-NODE   ¤
¤  488 1      120    121    .002988       L                                   ¤
¤  489 1      120    126    .005487       L                                   ¤
¤  490 1      121    122    .002988       L                                   ¤
¤  491 1      121    127    .005487       L                                   ¤
¤  492 1      122    123    .002988       L                                   ¤
¤  493 1      122    128    .005487       L                                   ¤
¤  494 1      123    124    .002629       L                                   ¤
¤  495 1      123    129    .005487       L                                   ¤
¤  496 1      124    130    .006984       L                                   ¤
¤  497 1      125    126    .002164       L                                   ¤
¤  498 1      126    127    .002460       L                                   ¤
¤  499 1      127    128    .002460       L                                   ¤
¤  500 1      128    129    .002460       L                                   ¤
¤  501 1      129    130    .000164       L                                   ¤
¤  502 1      601    501    .625          L  TOP PCB LAYER 6XX TO 5XX         ¤
¤  503 1      602    502    .85227        L  TOP PCB LAYER 6XX TO 5XX         ¤
¤  504 1      603    503    .22727        L  TOP PCB LAYER 6XX TO 5XX         ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
505	1	604	504	.90909	L	TOP PCB LAYER 6XX TO 5XX
506	1	605	505	.90909	L	TOP PCB LAYER 6XX TO 5XX
507	1	606	506	1.2450	L	TOP PCB LAYER 6XX TO 5XX
508	1	607	507	.75655	L	TOP PCB LAYER 6XX TO 5XX
509	1	608	508	1.03177	L	TOP PCB LAYER 6XX TO 5XX
510	1	609	509	.27512	L	TOP PCB LAYER 6XX TO 5XX
511	1	610	510	1.10048	L	TOP PCB LAYER 6XX TO 5XX
512	1	611	511	1.10048	L	TOP PCB LAYER 6XX TO 5XX
513	1	612	512	1.51311	L	TOP PCB LAYER 6XX TO 5XX
514	1	613	513	.02720	L	TOP PCB LAYER 6XX TO 5XX
515	1	614	514	.21378	L	TOP PCB LAYER 6XX TO 5XX
516	1	615	515	.21378	L	TOP PCB LAYER 6XX TO 5XX
517	1	616	516	.21378	L	TOP PCB LAYER 6XX TO 5XX
518	1	617	517	.21378	L	TOP PCB LAYER 6XX TO 5XX
519	1	618	518	.27197	L	TOP PCB LAYER 6XX TO 5XX
520	1	619	519	.35579	L	TOP PCB LAYER 6XX TO 5XX
521	1	620	520	.27962	L	TOP PCB LAYER 6XX TO 5XX
522	1	621	521	.27962	L	TOP PCB LAYER 6XX TO 5XX

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
523	1	622	522	.27962	L	TOP PCB LAYER 6XX TO 5XX
524	1	623	523	.27962	L	TOP PCB LAYER 6XX TO 5XX
525	1	624	524	.35579	L	TOP PCB LAYER 6XX TO 5XX
526	1	625	525	.29301	L	TOP PCB LAYER 6XX TO 5XX
527	1	626	526	.23024	L	TOP PCB LAYER 6XX TO 5XX
528	1	627	527	.23024	L	TOP PCB LAYER 6XX TO 5XX
529	1	628	528	.23024	L	TOP PCB LAYER 6XX TO 5XX
530	1	629	529	.23024	L	TOP PCB LAYER 6XX TO 5XX
531	1	630	530	.29301	L	TOP PCB LAYER 6XX TO 5XX
532	1	501	401	.62509	L	TOP PCB LAYER 5XX TO 4XX
533	1	502	402	.85227	L	TOP PCB LAYER 5XX TO 4XX
534	1	503	403	.22727	L	TOP PCB LAYER 5XX TO 4XX
535	1	504	404	.90909	L	TOP PCB LAYER 5XX TO 4XX
536	1	505	405	.90909	L	TOP PCB LAYER 5XX TO 4XX
537	1	506	406	1.25	L	TOP PCB LAYER 5XX TO 4XX
538	1	507	407	.75655	L	TOP PCB LAYER 5XX TO 4XX
539	1	508	408	1.03177	L	TOP PCB LAYER 5XX TO 4XX
540	1	509	409	.27512	L	TOP PCB LAYER 5XX TO 4XX

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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□                                                                               □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□  541 1      510    410    1.10047       L  TOP PCB LAYER 5XX TO 4XX           □
□  542 1      511    411    1.10047       L  TOP PCB LAYER 5XX TO 4XX           □
□  543 1      512    412    1.51311       L  TOP PCB LAYER 5XX TO 4XX           □
□  544 1      513    413    .27196        L  TOP PCB LAYER 5XX TO 4XX           □
□  545 1      514    414    .21378        L  TOP PCB LAYER 5XX TO 4XX           □
□  546 1      515    415    .21378        L  TOP PCB LAYER 5XX TO 4XX           □
□  547 1      516    416    .21378        L  TOP PCB LAYER 5XX TO 4XX           □
□  548 1      517    417    .21378        L  TOP PCB LAYER 5XX TO 4XX           □
□  549 1      518    418    .27196        L  TOP PCB LAYER 5XX TO 4XX           □
□  550 1      519    419    .35579        L  TOP PCB LAYER 5XX TO 4XX           □
□  551 1      520    420    .27962        L  TOP PCB LAYER 5XX TO 4XX           □
□  552 1      521    421    .27962        L  TOP PCB LAYER 5XX TO 4XX           □
□  553 1      522    422    .27962        L  TOP PCB LAYER 5XX TO 4XX           □
□  554 1      523    423    .27962        L  TOP PCB LAYER 5XX TO 4XX           □
□  555 1      524    424    .35579        L  TOP PCB LAYER 5XX TO 4XX           □
□  556 1      525    425    .29301        L  TOP PCB LAYER 5XX TO 4XX           □
□  557 1      526    426    .23024        L  TOP PCB LAYER 5XX TO 4XX           □
□  558 1      527    427    .23024        L  TOP PCB LAYER 5XX TO 4XX           □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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□                                                                               □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□  559 1      528    428    .23024        L  TOP PCB LAYER 5XX TO 4XX           □
□  560 1      529    429    .23024        L  TOP PCB LAYER 5XX TO 4XX           □
□  561 1      530    430    .29301        L  TOP PCB LAYER 5XX TO 4XX           □
□  562 1      401    301    .625          L  TOP PCB LAYER 4XX TO 3XX           □
□  563 1      402    302    .85227        L  TOP PCB LAYER 4XX TO 3XX           □
□  564 1      403    303    .22727        L  TOP PCB LAYER 4XX TO 3XX           □
□  565 1      404    304    .90909        L  TOP PCB LAYER 4XX TO 3XX           □
□  566 1      405    305    .90909        L  TOP PCB LAYER 4XX TO 3XX           □
□  567 1      406    306    1.25          L  TOP PCB LAYER 4XX TO 3XX           □
□  568 1      407    307    .75655        L  TOP PCB LAYER 4XX TO 3XX           □
□  569 1      408    308    1.03177       L  TOP PCB LAYER 4XX TO 3XX           □
□  570 1      409    309    .27512        L  TOP PCB LAYER 4XX TO 3XX           □
□  571 1      410    310    1.10048       L  TOP PCB LAYER 4XX TO 3XX           □
□  572 1      411    311    1.10048       L  TOP PCB LAYER 4XX TO 3XX           □
□  573 1      412    312    1.51311       L  TOP PCB LAYER 4XX TO 3XX           □
□  574 1      413    313    .27196        L  TOP PCB LAYER 4XX TO 3XX           □
□  575 1      414    314    .21378        L  TOP PCB LAYER 4XX TO 3XX           □
□  576 1      415    315    .21378        L  TOP PCB LAYER 4XX TO 3XX           □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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eee Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                               □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                      □
□  577 1       416     316     .21378        L  TOP PCB LAYER 4XX TO 3XX         □
□  578 1       417     317     .21378        L  TOP PCB LAYER 4XX TO 3XX         □
□  579 1       418     318     .27196        L  TOP PCB LAYER 4XX TO 3XX         □
□  580 1       419     319     .27196        L  TOP PCB LAYER 4XX TO 3XX         □
□  581 1       420     320     .35579        L  TOP PCB LAYER 4XX TO 3XX         □
□  582 1       421     321     .27196        L  TOP PCB LAYER 4XX TO 3XX         □
□  583 1       422     322     .27196        L  TOP PCB LAYER 4XX TO 3XX         □
□  584 1       423     323     .27196        L  TOP PCB LAYER 4XX TO 3XX         □
□  585 1       424     324     .90909        L  TOP PCB LAYER 4XX TO 3XX         □
□  586 1       425     325     .35579        L  TOP PCB LAYER 4XX TO 3XX         □
□  587 1       426     326     .29301        L  TOP PCB LAYER 4XX TO 3XX         □
□  588 1       427     327     .23024        L  TOP PCB LAYER 4XX TO 3XX         □
□  589 1       428     328     .23024        L  TOP PCB LAYER 4XX TO 3XX         □
□  590 1       429     329     .23024        L  TOP PCB LAYER 4XX TO 3XX         □
□  591 1       430     330     .29301        L  TOP PCB LAYER 4XX TO 3XX         □
□  592 1       301     201     .625          L  TOP PCB LAYER 3XX TO 2XX         □
□  593 1       302     202     .85227        L  TOP PCB LAYER 3XX TO 2XX         □
□  594 1       303     203     .22727        L  TOP PCB LAYER 3XX TO 2XX         □
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                               □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                      □
□  595 1       304     204     .90909        L  TOP PCB LAYER 3XX TO 2XX         □
□  596 1       305     205     .90909        L  TOP PCB LAYER 3XX TO 2XX         □
□  597 1       306     206     1.25          L  TOP PCB LAYER 3XX TO 2XX         □
□  598 1       307     207     .75655        L  TOP PCB LAYER 3XX TO 2XX         □
□  599 1       308     208     1.03177       L  TOP PCB LAYER 3XX TO 2XX         □
□  600 1       309     209     .27512        L  TOP PCB LAYER 3XX TO 2XX         □
□  601 1       310     210     1.10048       L  TOP PCB LAYER 3XX TO 2XX         □
□  602 1       311     211     1.10048       L  TOP PCB LAYER 3XX TO 2XX         □
□  603 1       312     212     1.51311       L  TOP PCB LAYER 3XX TO 2XX         □
□  604 1       313     213     .27196        L  TOP PCB LAYER 3XX TO 2XX         □
□  605 1       314     214     .21378        L  TOP PCB LAYER 3XX TO 2XX         □
□  606 1       315     215     .21378        L  TOP PCB LAYER 3XX TO 2XX         □
□  607 1       316     216     .21378        L  TOP PCB LAYER 3XX TO 2XX         □
□  608 1       317     217     .21378        L  TOP PCB LAYER 3XX TO 2XX         □
□  609 1       318     218     .27196        L  TOP PCB LAYER 3XX TO 2XX         □
□  610 1       319     219     .35559        L  TOP PCB LAYER 3XX TO 2XX         □
□  611 1       320     220     .27196        L  TOP PCB LAYER 3XX TO 2XX         □
□  612 1       321     221     .27196        L  TOP PCB LAYER 3XX TO 2XX         □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                             □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                    □
□  613 1       322    222     .27196        L  TOP PCB LAYER 3XX TO 2XX       □
□  614 1       323    223     .27196        L  TOP PCB LAYER 3XX TO 2XX       □
□  615 1       324    224     .35579        L  TOP PCB LAYER 3XX TO 2XX       □
□  616 1       325    225     .29301        L  TOP PCB LAYER 3XX TO 2XX       □
□  617 1       326    226     .23024        L  TOP PCB LAYER 3XX TO 2XX       □
□  618 1       327    227     .23024        L  TOP PCB LAYER 3XX TO 2XX       □
□  619 1       328    228     .23024        L  TOP PCB LAYER 3XX TO 2XX       □
□  620 1       329    229     .23024        L  TOP PCB LAYER 3XX TO 2XX       □
□  621 1       330    230     .29301        L  TOP PCB LAYER 3XX TO 2XX       □
□  622 1       201    101     .625          L  TOP PCB LAYER 2XX TO1XX        □
□  623 1       202    102     .85227        L  TOP PCB LAYER 2XX TO1XX        □
□  624 1       203    103     .22727        L  TOP PCB LAYER 2XX TO1XX        □
□  625 1       204    104     .90909        L  TOP PCB LAYER 2XX TO1XX        □
□  626 1       205    105     .90909        L  TOP PCB LAYER 2XX TO1XX        □
□  627 1       206    106     1.25          L  TOP PCB LAYER 2XX TO1XX        □
□  628 1       207    107     .75655        L  TOP PCB LAYER 2XX TO1XX        □
□  629 1       208    108     1.03177       L  TOP PCB LAYER 2XX TO1XX        □
□  630 1       209    109     .27512        L  TOP PCB LAYER 2XX TO1XX        □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                             □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                    □
□  631 1       210    110     1.10048       L  TOP PCB LAYER 2XX TO1XX        □
□  632 1       211    111     1.10048       L  TOP PCB LAYER 2XX TO1XX        □
□  633 1       212    112     1.51311       L  TOP PCB LAYER 2XX TO1XX        □
□  634 1       213    113     .27196        L  TOP PCB LAYER 2XX TO1XX        □
□  635 1       214    114     .21378        L  TOP PCB LAYER 2XX TO1XX        □
□  636 1       215    115     .21378        L  TOP PCB LAYER 2XX TO1XX        □
□  637 1       216    116     .21378        L  TOP PCB LAYER 2XX TO1XX        □
□  638 1       217    117     .21378        L  TOP PCB LAYER 2XX TO1XX        □
□  639 1       218    118     .27196        L  TOP PCB LAYER 2XX TO1XX        □
□  640 1       219    119     .35579        L  TOP PCB LAYER 2XX TO1XX        □
□  641 1       220    120     .27196        L  TOP PCB LAYER 2XX TO1XX        □
□  642 1       221    121     .27196        L  TOP PCB LAYER 2XX TO1XX        □
□  643 1       222    122     .27196        L  TOP PCB LAYER 2XX TO1XX        □
□  644 1       223    123     .27196        L  TOP PCB LAYER 2XX TO1XX        □
□  645 1       224    124     .35579        L  TOP PCB LAYER 2XX TO1XX        □
□  646 1       225    125     .29301        L  TOP PCB LAYER 2XX TO1XX        □
□  647 1       226    126     .23024        L  TOP PCB LAYER 2XX TO1XX        □
□  648 1       227    127     .23024        L  TOP PCB LAYER 2XX TO1XX        □
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
649	1	228	128	.23024	L	TOP PCB LAYER 2XX TO1XX
650	1	229	129	.23024	L	TOP PCB LAYER 2XX TO1XX
651	1	230	130	.29301	L	TOP PCB LAYER 2XX TO1XX
652	1	1601	1602	.0006276	L	BOTTOM PCB THERMAL LYR NODE-NODE
653	1	1601	1607	.0003138	L	
654	1	1601	1614	.0007322	L	
655	1	1602	1603	.0005983	L	
656	1	1602	1607	.0002613	L	
657	1	1603	1604	.0006597	L	
658	1	1603	1608	.0001342	L	
659	1	1604	1605	.0008874	L	
660	1	1604	1609	.0000524	L	
661	1	1604	1610	.0000444	L	
662	1	1604	1611	.0000560	L	
663	1	1605	1606	.000536	L	
664	1	1605	1612	.0000524	L	
665	1	1606	1617	.0004594	L	
666	1	1606	1613	.0002978	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
667	1	1607	1608	.0002992	L	BOTTOM PCB THERMAL LYR NODE-NODE
668	1	1607	1614	.0001861	L	
669	1	1608	1609	.0002780	L	
670	1	1608	1615	.0001340	L	
671	1	1609	1610	.0009901	L	
672	1	1609	1615	.0000524	L	
673	1	1610	1611	.0009178	L	
674	1	1610	1615	.0000444	L	
675	1	1611	1612	.000804	L	
676	1	1611	1615	.0000560	L	
677	1	1612	1613	.000268	L	
678	1	1612	1616	.0000596	L	
679	1	1613	1617	.0003829	L	
680	1	1613	1616	.0003752	L	
681	1	1614	1615	.000469	L	
682	1	1615	1616	.0003450	L	
683	1	1616	1617	.000469	L	
684	1	1501	1502	.009055	L	BOTTOM PCB BTM POLY LYR NODE-NODE

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
685	1	1501	1507	.004528	L	BOTTOM PCB BTM POLY LYR NODE-NODE
686	1	1501	1514	.010570	L	
687	1	1502	1503	.008631	L	
688	1	1502	1507	.002684	L	
689	1	1503	1504	.009516	L	
690	1	1503	1508	.001929	L	
691	1	1504	1505	.01280	L	
692	1	1504	1509	.000752	L	
693	1	1504	1510	.000644	L	
694	1	1504	1511	.000860	L	
695	1	1505	1506	.007733	L	
696	1	1505	1512	.000860	L	
697	1	1506	1517	.006629	L	
698	1	1506	1513	.004293	L	
699	1	1507	1508	.004315	L	
700	1	1507	1514	.002416	L	
701	1	1508	1509	.004033	L	
702	1	1508	1515	.00232	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
703	1	1509	1510	.01429	L	BOTTOM PCB BTM POLY LYR NODE-NODE
704	1	1509	1515	.000691	L	
705	1	1510	1511	.01324	L	
706	1	1510	1515	.00058	L	
707	1	1511	1512	.0116	L	
708	1	1511	1516	.000774	L	
709	1	1512	1513	.003867	L	
710	1	1512	1516	.000774	L	
711	1	1513	1517	.003314	L	
712	1	1513	1516	.003864	L	
713	1	1514	1515	.00677	L	
714	1	1515	1516	.004980	L	
715	1	1516	1517	.00677	L	
716	1	1401	1402	.000628	L	BOTTOM PCB GRND LYR NODE-NODE
717	1	1401	1407	.000314	L	
718	1	1401	1414	.000732	L	
719	1	1402	1403	.000598	L	
720	1	1402	1407	.000261	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
721	1	1403	1404	.0006597	L	BOTTOM PCB GRND LYR NODE-NODE
722	1	1403	1408	.0001342	L	
723	1	1404	1405	.0008874	L	
724	1	1404	1409	.0000524	L	
725	1	1404	1410	.0000444	L	
726	1	1404	1411	.0000596	L	
727	1	1405	1406	.0005366	L	
728	1	1405	1412	.0000524	L	
729	1	1406	1417	.0004594	L	
730	1	1406	1413	.0002978	L	
731	1	1407	1408	.0002991	L	
732	1	1407	1414	.0001861	L	
733	1	1408	1409	.0002796	L	
734	1	1408	1415	.0001340	L	
735	1	1409	1410	.0009901	L	
736	1	1409	1415	.0000524	L	
737	1	1410	1411	.0009178	L	
738	1	1410	1415	.0000444	L	

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CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
739	1	1411	1412	.000804	L	BOTTOM PCB GRND LYR NODE-NODE
740	1	1411	1415	.0000596	L	
741	1	1412	1413	.000268	L	
742	1	1412	1416	.0000596	L	
743	1	1413	1417	.0003829	L	
744	1	1413	1416	.0003752	L	
745	1	1414	1415	.000469	L	
746	1	1415	1416	.0003450	L	
747	1	1416	1417	.000469	L	
748	1	1301	1302	.009055	L	
749	1	1301	1307	.004528	L	BOTTOM PCB MID POLY LYR NODE-NODE
750	1	1301	1314	.01060	L	
751	1	1302	1303	.00863	L	
752	1	1302	1307	.002684	L	
753	1	1303	1304	.009516	L	
754	1	1303	1308	.001929	L	
755	1	1304	1305	.01280	L	
756	1	1304	1309	.000752	L	

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CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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¤                                                                              ¤
¤ SqNo FACTOR From    To      Cond. Value  L/R Description                     ¤
¤  757 1       1304   1310    .000644       L  BOTTOM PCB MID POLY LYR NODE-NODE ¤
¤  758 1       1304   1311    .000860       L                                  ¤
¤  759 1       1305   1306    .007733       L                                  ¤
¤  760 1       1305   1312    .000860       L                                  ¤
¤  761 1       1306   1317    .006629       L                                  ¤
¤  762 1       1306   1313    .004293       L                                  ¤
¤  763 1       1307   1308    .004315       L                                  ¤
¤  764 1       1307   1314    .002416       L                                  ¤
¤  765 1       1308   1309    .004033       L                                  ¤
¤  766 1       1308   1315    .00232        L                                  ¤
¤  767 1       1309   1310    .01439        L                                  ¤
¤  768 1       1309   1315    .000691       L                                  ¤
¤  769 1       1310   1311    .01324        L                                  ¤
¤  770 1       1310   1315    .00058        L                                  ¤
¤  771 1       1311   1312    .0116         L                                  ¤
¤  772 1       1311   1315    .000774       L                                  ¤
¤  773 1       1312   1313    .003867       L                                  ¤
¤  774 1       1312   1316    .000774       L                                  ¤
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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¤                                                                              ¤
¤ SqNo FACTOR From    To      Cond. Value  L/R Description                     ¤
¤  775 1       1313   1317    .003314       L  BOTTOM PCB MID POLY LYR NODE-NODE ¤
¤  776 1       1313   1316    .003864       L                                  ¤
¤  777 1       1314   1315    .00677        L                                  ¤
¤  778 1       1315   1316    .004980       L                                  ¤
¤  779 1       1316   1317    .00677        L                                  ¤
¤  780 1       1201   1202    .0006276      L  BOTTOM PCB TOP Cu LYR NODE-NODE ¤
¤  781 1       1201   1207    .0003138      L                                  ¤
¤  782 1       1201   1214    .0007322      L                                  ¤
¤  783 1       1202   1203    .0005983      L                                  ¤
¤  784 1       1202   1207    .0002613      L                                  ¤
¤  785 1       1203   1204    .0006597      L                                  ¤
¤  786 1       1203   1208    .0001342      L                                  ¤
¤  787 1       1204   1205    .0008874      L                                  ¤
¤  788 1       1204   1209    .0000524      L                                  ¤
¤  789 1       1204   1210    .0000444      L                                  ¤
¤  790 1       1204   1211    .0000596      L                                  ¤
¤  791 1       1205   1206    .000536       L                                  ¤
¤  792 1       1205   1212    .0000524      L                                  ¤
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□  793 1      1206   1217   .0004594      L  BOTTOM PCB TOP Cu LYR NODE-NODE   □
□  794 1      1206   1213   .0002978      L                                    □
□  795 1      1207   1208   .0002992      L                                    □
□  796 1      1207   1214   .0001861      L                                    □
□  797 1      1208   1209   .0002796      L                                    □
□  798 1      1208   1215   .0001340      L                                    □
□  799 1      1209   1210   .0009901      L                                    □
□  800 1      1209   1215   .0000524      L                                    □
□  801 1      1210   1211   .0009178      L                                    □
□  802 1      1210   1215   .0000444      L                                    □
□  803 1      1211   1212   .000804       L                                    □
□  804 1      1211   1215   .0000596      L                                    □
□  805 1      1212   1213   .000268       L                                    □
□  806 1      1212   1216   .0000596      L                                    □
□  807 1      1213   1217   .0003829      L                                    □
□  808 1      1213   1216   .0003752      L                                    □
□  809 1      1214   1215   .000469       L                                    □
□  810 1      1215   1216   .0003450      L                                    □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                  End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□  811 1      1216   1217   .000469       L  BOTTOM PCB TOP Cu LYR NODE-NODE   □
□  812 1      1101   1102   .009055       L  BOTTOM PCB TOP POLY LYR NODE-NODE □
□  813 1      1101   1107   .004528       L                                    □
□  814 1      1101   1114   .010570       L                                    □
□  815 1      1102   1103   .008631       L                                    □
□  816 1      1102   1107   .002684       L                                    □
□  817 1      1103   1104   .009516       L                                    □
□  818 1      1103   1108   .001929       L                                    □
□  819 1      1104   1105   .012804       L                                    □
□  820 1      1104   1109   .000752       L                                    □
□  821 1      1104   1110   .000644       L                                    □
□  822 1      1104   1111   .0008596      L                                    □
□  823 1      1105   1106   .007733       L                                    □
□  824 1      1105   1112   .0008596      L                                    □
□  825 1      1106   1117   .006629       L                                    □
□  826 1      1106   1113   .004293       L                                    □
□  827 1      1107   1108   .004315       L                                    □
□  828 1      1107   1114   .002416       L                                    □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                  End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
829	1	1108	1109	.004033	L	BOTTOM PCB TOP POLY LYR NODE-NODE
830	1	1108	1115	.00232	L	
831	1	1109	1110	.01429	L	
832	1	1109	1115	.000691	L	
833	1	1110	1111	.013242	L	
834	1	1110	1115	.00058	L	
835	1	1111	1112	.0116	L	
836	1	1111	1115	.000774	L	
837	1	1112	1113	.003867	L	
838	1	1112	1116	.000774	L	
839	1	1113	1117	.003314	L	
840	1	1113	1116	.003864	L	
841	1	1114	1115	.00677	L	
842	1	1115	1116	.004980	L	
843	1	1116	1117	.00677	L	
844	1	1601	1501	1.53206	L	BOTTOM PCB LAYER 16XX TO 15XX
845	1	1602	1502	.89779	L	BOTTOM PCB LAYER 16XX TO 15XX
846	1	1603	1503	.64634	L	BOTTOM PCB LAYER 16XX TO 15XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
847	1	1604	1504	.75416	L	BOTTOM PCB LAYER 16XX TO 15XX
848	1	1605	1505	.28726	L	BOTTOM PCB LAYER 16XX TO 15XX
849	1	1606	1506	1.43631	L	BOTTOM PCB LAYER 16XX TO 15XX
850	1	1607	1507	.44889	L	BOTTOM PCB LAYER 16XX TO 15XX
851	1	1608	1508	.323276	L	BOTTOM PCB LAYER 16XX TO 15XX
852	1	1609	1509	.12517	L	BOTTOM PCB LAYER 16XX TO 15XX
853	1	1610	1510	.10763	L	BOTTOM PCB LAYER 16XX TO 15XX
854	1	1611	1511	.14363	L	BOTTOM PCB LAYER 16XX TO 15XX
855	1	1612	1512	.14363	L	BOTTOM PCB LAYER 16XX TO 15XX
856	1	1613	1513	.71815	L	BOTTOM PCB LAYER 16XX TO 15XX
857	1	1614	1514	1.04774	L	BOTTOM PCB LAYER 16XX TO 15XX
858	1	1615	1515	1.63375	L	BOTTOM PCB LAYER 16XX TO 15XX
859	1	1616	1516	2.0108	L	BOTTOM PCB LAYER 16XX TO 15XX
860	1	1617	1517	1.53206	L	BOTTOM PCB LAYER 16XX TO 15XX
861	1	1501	1401	1.53206	L	BOTTOM PCB LAYER 15XX TO 14XX
862	1	1502	1402	.89779	L	BOTTOM PCB LAYER 15XX TO 14XX
863	1	1503	1403	.64634	L	BOTTOM PCB LAYER 15XX TO 14XX
864	1	1504	1404	.75416	L	BOTTOM PCB LAYER 15XX TO 14XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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¤                                                                               ¤
¤ SqNo FACTOR From    To      Cond. Value  L/R Description                      ¤
¤  865 1      1505    1405    .28726        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  866 1      1506    1406    1.43631       L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  867 1      1507    1407    .44889        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  868 1      1508    1408    .32327        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  869 1      1509    1409    .12517        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  870 1      1510    1410    .10763        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  871 1      1511    1411    .14363        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  872 1      1512    1412    .14363        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  873 1      1513    1413    .71815        L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  874 1      1514    1414    1.04774       L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  875 1      1515    1415    1.63375       L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  876 1      1516    1416    2.01083       L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  877 1      1517    1417    1.53206       L  BOTTOM PCB LAYER 15XX TO 14XX    ¤
¤  878 1      1401    1301    1.53206       L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  879 1      1402    1302    .89779        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  880 1      1403    1303    .64634        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  881 1      1404    1304    .75416        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  882 1      1405    1305    .28726        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed                PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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¤                                                                               ¤
¤ SqNo FACTOR From    To      Cond. Value  L/R Description                      ¤
¤  883 1      1406    1306    1.43631       L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  884 1      1407    1307    .44889        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  885 1      1408    1308    .32327        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  886 1      1409    1309    .12517        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  887 1      1410    1310    .10763        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  888 1      1411    1311    .14363        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  889 1      1412    1312    .14363        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  890 1      1413    1313    .71815        L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  891 1      1414    1314    1.04774       L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  892 1      1415    1315    1.63375       L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  893 1      1416    1316    2.01083       L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  894 1      1417    1317    1.53206       L  BOTTOM PCB LAYER 14XX TO13XX     ¤
¤  895 1      1301    1201    1.53206       L  BOTTOM PCB LAYER 13XX TO 12XX    ¤
¤  896 1      1302    1202    .89779        L  BOTTOM PCB LAYER 13XX TO 12XX    ¤
¤  897 1      1303    1203    .64634        L  BOTTOM PCB LAYER 13XX TO 12XX    ¤
¤  898 1      1304    1204    .75416        L  BOTTOM PCB LAYER 13XX TO 12XX    ¤
¤  899 1      1305    1205    .28726        L  BOTTOM PCB LAYER 13XX TO 12XX    ¤
¤  900 1      1306    1206    1.43631       L  BOTTOM PCB LAYER 13XX TO 12XX    ¤
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed                PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
901	1	1307	1207	.44889	L	BOTTOM PCB LAYER 13XX TO 12XX
902	1	1308	1208	.32327	L	BOTTOM PCB LAYER 13XX TO 12XX
903	1	1309	1209	.12517	L	BOTTOM PCB LAYER 13XX TO 12XX
904	1	1310	1210	.10763	L	BOTTOM PCB LAYER 13XX TO 12XX
905	1	1311	1211	.14363	L	BOTTOM PCB LAYER 13XX TO 12XX
906	1	1312	1212	.14363	L	BOTTOM PCB LAYER 13XX TO 12XX
907	1	1313	1213	.71815	L	BOTTOM PCB LAYER 13XX TO 12XX
908	1	1314	1214	1.04774	L	BOTTOM PCB LAYER 13XX TO 12XX
909	1	1315	1215	1.63375	L	BOTTOM PCB LAYER 13XX TO 12XX
910	1	1316	1216	2.01083	L	BOTTOM PCB LAYER 13XX TO 12XX
911	1	1317	1217	1.53206	L	BOTTOM PCB LAYER 13XX TO 12XX
912	1	1201	1101	1.53206	L	BOTTOM PCB LAYER 12XX TO11XX
913	1	1202	1102	.89779	L	BOTTOM PCB LAYER 12XX TO11XX
914	1	1203	1103	.64634	L	BOTTOM PCB LAYER 12XX TO11XX
915	1	1204	1104	.75416	L	BOTTOM PCB LAYER 12XX TO11XX
916	1	1205	1105	.28726	L	BOTTOM PCB LAYER 12XX TO11XX
917	1	1206	1106	1.43631	L	BOTTOM PCB LAYER 12XX TO11XX
918	1	1207	1107	.44889	L	BOTTOM PCB LAYER 12XX TO11XX

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
919	1	1208	1108	.32327	L	BOTTOM PCB LAYER 12XX TO11XX
920	1	1209	1109	.12517	L	BOTTOM PCB LAYER 12XX TO11XX
921	1	1210	1110	.10763	L	BOTTOM PCB LAYER 12XX TO11XX
922	1	1211	1111	.14363	L	BOTTOM PCB LAYER 12XX TO11XX
923	1	1212	1112	.14363	L	BOTTOM PCB LAYER 12XX TO11XX
924	1	1213	1113	.71815	L	BOTTOM PCB LAYER 12XX TO11XX
925	1	1214	1114	1.04774	L	BOTTOM PCB LAYER 12XX TO11XX
926	1	1215	1115	1.63375	L	BOTTOM PCB LAYER 12XX TO11XX
927	1	1216	1116	2.01083	L	BOTTOM PCB LAYER 12XX TO11XX
928	1	1217	1117	1.53206	L	BOTTOM PCB LAYER 12XX TO11XX
929	1	2011	101	.000296	L	EQUIV PIN CONDUCTANCE 3.01
930	1	2012	201	.000197	L	EQUIV PIN CONDUCTANCE 3.01
931	1	2013	301	.000296	L	EQUIV PIN CONDUCTANCE 3.01
932	1	2014	401	.000176	L	EQUIV PIN CONDUCTANCE 3.01
933	1	2015	501	.000296	L	EQUIV PIN CONDUCTANCE 3.01
934	1	2016	601	.000197	L	EQUIV PIN CONDUCTANCE 3.01
935	1	2021	102	.000296	L	EQUIV CONDUCTANCE FOR 3.02
936	1	2022	202	.000197	L	EQUIV CONDUCTANCE FOR 3.02

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
937	1	2023	302	.000296	L	EQUIV CONDUCTANCE FOR 3.02
938	1	2024	402	.000197	L	EQUIV CONDUCTANCE FOR 3.02
939	1	2025	502	.000296	L	EQUIV CONDUCTANCE FOR 3.02
940	1	2026	602	.000197	L	EQUIV CONDUCTANCE FOR 3.02
941	1	2031	103	.000296	L	EQUIV COND FOR 3.03
942	1	2032	203	.000197	L	EQUIV COND FOR 3.03
943	1	2033	303	.000296	L	EQUIV COND FOR 3.03
944	1	2034	403	.000197	L	EQUIV COND FOR 3.03
945	1	2035	503	.000296	L	EQUIV COND FOR 3.03
946	1	2036	603	.000197	L	EQUIV COND FOR 3.03
947	1	2041	104	.000296	L	EQUIV PIN COND FOR 3.04
948	1	2042	204	.000198	L	EQUIV PIN COND FOR 3.04
949	1	2043	304	.000296	L	EQUIV PIN COND FOR 3.04
950	1	2044	404	.000198	L	EQUIV PIN COND FOR 3.04
951	1	2045	504	.000296	L	EQUIV PIN COND FOR 3.04
952	1	2046	604	.000198	L	EQUIV PIN COND FOR 3.04
953	1	2051	105	.000296	L	EQUIV PIN COND FOR 3.05
954	1	2052	205	.000197	L	EQUIV PIN COND FOR 3.05

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
955	1	2053	305	.000296	L	EQUIV PIN COND FOR 3.05
956	1	2054	405	.000197	L	EQUIV PIN COND FOR 3.05
957	1	2055	505	.000296	L	EQUIV PIN COND FOR 3.05
958	1	2056	605	.000197	L	EQUIV PIN COND FOR 3.05
959	1	2061	106	.000296	L	EQUIV PIN COND FOR 3.06
960	1	2062	206	.000198	L	EQUIV PIN COND FOR 3.06
961	1	2063	306	.000296	L	EQUIV PIN COND FOR 3.06
962	1	2064	406	.000198	L	EQUIV PIN COND FOR 3.06
963	1	2065	506	.000296	L	EQUIV PIN COND FOR 3.06
964	1	2066	606	.000198	L	EQUIV PIN COND FOR 3.06
965	1	2071	107	.000296	L	EQUIV PIN COND FOR 3.07
966	1	2072	207	.000197	L	EQUIV PIN COND FOR 3.07
967	1	2073	307	.000296	L	EQUIV PIN COND FOR 3.07
968	1	2074	407	.000197	L	EQUIV PIN COND FOR 3.07
969	1	2075	507	.000296	L	EQUIV PIN COND FOR 3.07
970	1	2076	607	.000197	L	EQUIV PIN COND FOR 3.07
971	1	2081	108	.000296	L	EQUIV PIN COND FOR 3.08
972	1	2082	208	.000197	L	EQUIV PIN COND FOR 3.08

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
973	1	2083	308	.000296	L	EQUIV PIN COND FOR 3.08
974	1	2084	408	.000197	L	EQUIV PIN COND FOR 3.08
975	1	2085	508	.000296	L	EQUIV PIN COND FOR 3.08
976	1	2086	608	.000197	L	EQUIV PIN COND FOR 3.08
977	1	2091	109	.000296	L	EQUIV PIN COND FOR 3.09
978	1	2092	110	.000197	L	EQUIV PIN COND FOR 3.09
979	1	2093	111	.000296	L	EQUIV PIN COND FOR 3.09
980	1	2094	112	.000197	L	EQUIV PIN COND FOR 3.09
981	1	2095	113	.000296	L	EQUIV PIN COND FOR 3.09
982	1	2096	114	.000197	L	EQUIV PIN COND FOR 3.09
983	1	2101	110	.000296	L	EQUIV PIN COND FOR 3.10
984	1	2102	210	.000197	L	EQUIV PIN COND FOR 3.10
985	1	2103	310	.000296	L	EQUIV PIN COND FOR 3.10
986	1	2104	410	.000197	L	EQUIV PIN COND FOR 3.10
987	1	2105	510	.000296	L	EQUIV PIN COND FOR 3.10
988	1	2106	610	.000197	L	EQUIV PIN COND FOR 3.10
989	1	2111	111	.000296	L	EQUIV PIN COND FOR 3.11
990	1	2112	211	.000197	L	EQUIV PIN COND FOR 3.11

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
991	1	2113	311	.000296	L	EQUIV PIN COND FOR 3.11
992	1	2114	411	.000197	L	EQUIV PIN COND FOR 3.11
993	1	2115	511	.000296	L	EQUIV PIN COND FOR 3.11
994	1	2116	611	.000197	L	EQUIV PIN COND FOR 3.11
995	1	2121	112	.000296	L	EQUIV PIN COND FOR 3.12
996	1	2122	212	.000197	L	EQUIV PIN COND FOR 3.12
997	1	2123	312	.000296	L	EQUIV PIN COND FOR 3.12
998	1	2124	412	.000197	L	EQUIV PIN COND FOR 3.12
999	1	2125	512	.000296	L	EQUIV PIN COND FOR 3.12
1000	1	2126	612	.000197	L	EQUIV PIN COND FOR 3.12
1001	1	2131	113	.000296	L	EQUIV PIN COND FOR 2.01
1002	1	2132	213	.000197	L	EQUIV PIN COND FOR 2.01
1003	1	2133	313	.000296	L	EQUIV PIN COND FOR 2.01
1004	1	2134	413	.000197	L	EQUIV PIN COND FOR 2.01
1005	1	2135	513	.000296	L	EQUIV PIN COND FOR 2.01
1006	1	2136	613	.000197	L	EQUIV PIN COND FOR 2.01
1007	1	2141	114	.000296	L	EQUIV PIN COND FOR 2.02
1008	1	2142	214	.000197	L	EQUIV PIN COND FOR 2.02

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□ 1009 1      2143   314    .000296       L  EQUIV PIN COND FOR 2.02            □
□ 1010 1      2144   414    .000197       L  EQUIV PIN COND FOR 2.02            □
□ 1011 1      2145   514    .000296       L  EQUIV PIN COND FOR 2.02            □
□ 1012 1      2146   614    .000197       L  EQUIV PIN COND FOR 2.02            □
□ 1013 1      2151   115    .000296       L  EQUIV PIN COND FOR 2.03            □
□ 1014 1      2152   215    .000197       L  EQUIV PIN COND FOR 2.03            □
□ 1015 1      2153   315    .000296       L  EQUIV PIN COND FOR 2.03            □
□ 1016 1      2154   415    .000197       L  EQUIV PIN COND FOR 2.03            □
□ 1017 1      2155   515    .000296       L  EQUIV PIN COND FOR 2.03            □
□ 1018 1      2156   615    .000197       L  EQUIV PIN COND FOR 2.03            □
□ 1019 1      2161   116    .000296       L  EQUIV PIN COND FOR 2.04            □
□ 1020 1      2162   216    .000197       L  EQUIV PIN COND FOR 2.04            □
□ 1021 1      2163   316    .000296       L  EQUIV PIN COND FOR 2.04            □
□ 1022 1      2164   416    .000197       L  EQUIV PIN COND FOR 2.04            □
□ 1023 1      2165   516    .000296       L  EQUIV PIN COND FOR 2.04            □
□ 1024 1      2166   616    .000197       L  EQUIV PIN COND FOR 2.04            □
□ 1025 1      2171   117    .000296       L  EQUIV PIN COND FOR 2.05            □
□ 1026 1      2172   217    .000197       L  EQUIV PIN COND FOR 2.05            □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□ 1027 1      2173   317    .000296       L  EQUIV PIN COND FOR 2.05            □
□ 1028 1      2174   417    .000197       L  EQUIV PIN COND FOR 2.05            □
□ 1029 1      2175   517    .000296       L  EQUIV PIN COND FOR 2.05            □
□ 1030 1      2176   617    .000197       L  EQUIV PIN COND FOR 2.05            □
□ 1031 1      2181   118    .000296       L  EQUIV PIN COND FOR 2.06            □
□ 1032 1      2182   218    .000197       L  EQUIV PIN COND FOR 2.06            □
□ 1033 1      2183   318    .000296       L  EQUIV PIN COND FOR 2.06            □
□ 1034 1      2184   418    .000197       L  EQUIV PIN COND FOR 2.06            □
□ 1035 1      2185   518    .000296       L  EQUIV PIN COND FOR 2.06            □
□ 1036 1      2186   618    .000197       L  EQUIV PIN COND FOR 2.06            □
□ 1037 1      2191   119    .000296       L  EQUIV PIN COND FOR 2.07            □
□ 1038 1      2192   219    .000197       L  EQUIV PIN COND FOR 2.07            □
□ 1039 1      2193   319    .000296       L  EQUIV PIN COND FOR 2.07            □
□ 1040 1      2194   419    .000197       L  EQUIV PIN COND FOR 2.07            □
□ 1041 1      2195   519    .000296       L  EQUIV PIN COND FOR 2.07            □
□ 1042 1      2196   619    .000197       L  EQUIV PIN COND FOR 2.07            □
□ 1043 1      2201   120    .000296       L  EQUIV PIN COND FOR 2.08            □
□ 1044 1      2202   220    .000197       L  EQUIV PIN COND FOR 2.08            □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
¤                                                                                ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                         ¤
¤ 1045 1      2203   320    .000296       L  EQUIV PIN COND FOR 2.08             ¤
¤ 1046 1      2204   420    .000197       L  EQUIV PIN COND FOR 2.08             ¤
¤ 1047 1      2205   520    .000296       L  EQUIV PIN COND FOR 2.08             ¤
¤ 1048 1      2206   620    .000197       L  EQUIV PIN COND FOR 2.08             ¤
¤ 1049 1      2211   121    .000296       L  EQUIV PIN COND FOR 2.09             ¤
¤ 1050 1      2212   221    .000197       L  EQUIV PIN COND FOR 2.09             ¤
¤ 1051 1      2213   321    .000296       L  EQUIV PIN COND FOR 2.09             ¤
¤ 1052 1      2214   421    .000197       L  EQUIV PIN COND FOR 2.09             ¤
¤ 1053 1      2215   521    .000296       L  EQUIV PIN COND FOR 2.09             ¤
¤ 1054 1      2216   621    .000197       L  EQUIV PIN COND FOR 2.09             ¤
¤ 1055 1      2221   122    .000296       L  EQUIV PIN COND FOR 2.10             ¤
¤ 1056 1      2222   222    .000197       L  EQUIV PIN COND FOR 2.10             ¤
¤ 1057 1      2223   322    .000296       L  EQUIV PIN COND FOR 2.10             ¤
¤ 1058 1      2224   422    .000197       L  EQUIV PIN COND FOR 2.10             ¤
¤ 1059 1      2225   522    .000296       L  EQUIV PIN COND FOR 2.10             ¤
¤ 1060 1      2226   622    .000197       L  EQUIV PIN COND FOR 2.10             ¤
¤ 1061 1      2231   123    .000296       L  EQUIV PIN COND FOR 2.11             ¤
¤ 1062 1      2232   223    .000197       L  EQUIV PIN COND FOR 2.11             ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëY
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
¤                                                                                ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                         ¤
¤ 1063 1      2233   323    .000296       L  EQUIV PIN COND FOR 2.11             ¤
¤ 1064 1      2234   423    .000197       L  EQUIV PIN COND FOR 2.11             ¤
¤ 1065 1      2235   523    .000296       L  EQUIV PIN COND FOR 2.11             ¤
¤ 1066 1      2236   623    .000197       L  EQUIV PIN COND FOR 2.11             ¤
¤ 1067 1      2241   124    .000296       L  EQUIV PIN COND FOR 2.12             ¤
¤ 1068 1      2242   224    .000197       L  EQUIV PIN COND FOR 2.12             ¤
¤ 1069 1      2243   324    .000296       L  EQUIV PIN COND FOR 2.12             ¤
¤ 1070 1      2244   424    .000197       L  EQUIV PIN COND FOR 2.12             ¤
¤ 1071 1      2245   524    .000296       L  EQUIV PIN COND FOR 2.12             ¤
¤ 1072 1      2246   624    .000197       L  EQUIV PIN COND FOR 2.12             ¤
¤ 1073 1      2251   125    .000296       L  EQUIV PIN COND FOR 2.13             ¤
¤ 1074 1      2252   225    .000197       L  EQUIV PIN COND FOR 2.13             ¤
¤ 1075 1      2253   325    .000296       L  EQUIV PIN COND FOR 2.13             ¤
¤ 1076 1      2254   425    .000197       L  EQUIV PIN COND FOR 2.13             ¤
¤ 1077 1      2255   525    .000296       L  EQUIV PIN COND FOR 2.13             ¤
¤ 1078 1      2256   625    .000197       L  EQUIV PIN COND FOR 2.13             ¤
¤ 1079 1      2261   126    .000296       L  EQUIV PIN COND FOR 2.14             ¤
¤ 1080 1      2262   226    .000197       L  EQUIV PIN COND FOR 2.14             ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëY
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To     Cond. Value  L/R Description                      □
□ 1081 1      2263    326    .000296       L  EQUIV PIN COND FOR 2.14          □
□ 1082 1      2264    426    .000197       L  EQUIV PIN COND FOR 2.14          □
□ 1083 1      2265    526    .000296       L  EQUIV PIN COND FOR 2.14          □
□ 1084 1      2266    626    .000197       L  EQUIV PIN COND FOR 2.14          □
□ 1085 1      2271    127    .000296       L  EQUIV PIN COND FOR 2.15          □
□ 1086 1      2272    227    .000197       L  EQUIV PIN COND FOR 2.15          □
□ 1087 1      2273    327    .000296       L  EQUIV PIN COND FOR 2.15          □
□ 1088 1      2274    427    .000197       L  EQUIV PIN COND FOR 2.15          □
□ 1089 1      2275    527    .000296       L  EQUIV PIN COND FOR 2.15          □
□ 1090 1      2276    627    .000197       L  EQUIV PIN COND FOR 2.15          □
□ 1091 1      2281    128    .000296       L  EQUIV PIN COND FOR 2.16          □
□ 1092 1      2282    228    .000197       L  EQUIV PIN COND FOR 2.16          □
□ 1093 1      2283    328    .000296       L  EQUIV PIN COND FOR 2.16          □
□ 1094 1      2284    428    .000197       L  EQUIV PIN COND FOR 2.16          □
□ 1095 1      2285    528    .000296       L  EQUIV PIN COND FOR 2.16          □
□ 1096 1      2286    628    .000197       L  EQUIV PIN COND FOR 2.16          □
□ 1097 1      2291    129    .000296       L  EQUIV PIN COND FOR 2.17          □
□ 1098 1      2292    229    .000197       L  EQUIV PIN COND FOR 2.17          □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To     Cond. Value  L/R Description                      □
□ 1099 1      2293    329    .000296       L  EQUIV PIN COND FOR 2.17          □
□ 1100 1      2294    429    .000197       L  EQUIV PIN COND FOR 2.17          □
□ 1101 1      2295    529    .000296       L  EQUIV PIN COND FOR 2.17          □
□ 1102 1      2296    629    .000197       L  EQUIV PIN COND FOR 2.17          □
□ 1103 1      2301    130    .000296       L  EQUIV PIN COND FOR 2.18          □
□ 1104 1      2302    230    .000197       L  EQUIV PIN COND FOR 2.18          □
□ 1105 1      2303    330    .000296       L  EQUIV PIN COND FOR 2.18          □
□ 1106 1      2304    430    .000197       L  EQUIV PIN COND FOR 2.18          □
□ 1107 1      2305    530    .000296       L  EQUIV PIN COND FOR 2.18          □
□ 1108 1      2306    630    .000197       L  EQUIV PIN COND FOR 2.18          □
□ 1109 1      3011    1101   .000296       L  EQUIV PIN COND FOR 4.00          □
□ 1110 1      3012    1201   .000197       L  EQUIV PIN COND FOR 4.00          □
□ 1111 1      3013    1301   .000296       L  EQUIV PIN COND FOR 4.00          □
□ 1112 1      3014    1401   .000197       L  EQUIV PIN COND FOR 4.00          □
□ 1113 1      3015    1501   .000296       L  EQUIV PIN COND FOR 4.00          □
□ 1114 1      3016    1601   .000197       L  EQUIV PIN COND FOR 4.00          □
□ 1115 1      3021    1102   .000296       L  EQUIV PIN COND FOR 5.01          □
□ 1116 1      3022    1202   .000197       L  EQUIV PIN COND FOR 5.01          □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value   L/R Description                    □
□ 1117 1      3023    1302    .000296        L  EQUIV PIN COND FOR 5.01        □
□ 1118 1      3024    1402    .000197        L  EQUIV PIN COND FOR 5.01        □
□ 1119 1      3025    1502    .000296        L  EQUIV PIN COND FOR 5.01        □
□ 1120 1      3026    1602    .000197        L  EQUIV PIN COND FOR 5.01        □
□ 1121 1      3031    1103    .000296        L  EQUIV PIN COND FOR 5.02        □
□ 1122 1      3032    1203    .000197        L  EQUIV PIN COND FOR 5.02        □
□ 1123 1      3033    1303    .000296        L  EQUIV PIN COND FOR 5.02        □
□ 1124 1      3034    1403    .000197        L  EQUIV PIN COND FOR 5.02        □
□ 1125 1      3035    1503    .000296        L  EQUIV PIN COND FOR 5.02        □
□ 1126 1      3036    1603    .000197        L  EQUIV PIN COND FOR 5.02        □
□ 1127 1      3041    1104    .000296        L  EQUIV PIN COND FOR 5.03        □
□ 1128 1      3042    1204    .000197        L  EQUIV PIN COND FOR 5.03        □
□ 1129 1      3043    1304    .000296        L  EQUIV PIN COND FOR 5.03        □
□ 1130 1      3044    1404    .000197        L  EQUIV PIN COND FOR 5.03        □
□ 1131 1      3045    1504    .000296        L  EQUIV PIN COND FOR 5.03        □
□ 1132 1      3046    1604    .000197        L  EQUIV PIN COND FOR 5.03        □
□ 1133 1      3051    1105    .000296        L  EQUIV PIN COND FOR 5.04        □
□ 1134 1      3052    1205    .000197        L  EQUIV PIN COND FOR 5.04        □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value   L/R Description                    □
□ 1135 1      3053    1305    .000296        L  EQUIV PIN COND FOR 5.04        □
□ 1136 1      3054    1405    .000197        L  EQUIV PIN COND FOR 5.04        □
□ 1137 1      3055    1505    .000296        L  EQUIV PIN COND FOR 5.04        □
□ 1138 1      3056    1605    .000197        L  EQUIV PIN COND FOR 5.04        □
□ 1139 1      3061    1106    .000296        L  EQUIV PIN COND FOR 5.05        □
□ 1140 1      3062    1206    .000197        L  EQUIV PIN COND FOR 5.05        □
□ 1141 1      3063    1306    .000296        L  EQUIV PIN COND FOR 5.05        □
□ 1142 1      3064    1406    .000197        L  EQUIV PIN COND FOR 5.05        □
□ 1143 1      3065    1506    .000296        L  EQUIV PIN COND FOR 5.05        □
□ 1144 1      3066    1606    .000197        L  EQUIV PIN COND FOR 5.05        □
□ 1145 1      3091    1109    .000296        L  EQUIV PIN COND FOR 6.03        □
□ 1146 1      3092    1209    .000197        L  EQUIV PIN COND FOR 6.03        □
□ 1147 1      3093    1309    .000296        L  EQUIV PIN COND FOR 6.03        □
□ 1148 1      3094    1409    .000197        L  EQUIV PIN COND FOR 6.03        □
□ 1149 1      3095    1509    .000296        L  EQUIV PIN COND FOR 6.03        □
□ 1150 1      3096    1609    .000197        L  EQUIV PIN COND FOR 6.03        □
□ 1151 1      3101    1110    .000296        L  EQUIV PIN COND FOR 6.04        □
□ 1152 1      3102    1210    .000197        L  EQUIV PIN COND FOR 6.04        □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £

SqNo	FACTOR	From	To	Cond. Value	L/R	Description
1153	1	3103	1310	.000296	L	EQUIV PIN COND FOR 6.04
1154	1	3104	1410	.000197	L	EQUIV PIN COND FOR 6.04
1155	1	3105	1510	.000296	L	EQUIV PIN COND FOR 6.04
1156	1	3106	1610	.000197	L	EQUIV PIN COND FOR 6.04
1157	1	3111	1111	.000296	L	EQUIV PIN COND FOR 6.05
1158	1	3112	1211	.000197	L	EQUIV PIN COND FOR 6.05
1159	1	3113	1311	.000296	L	EQUIV PIN COND FOR 6.05
1160	1	3114	1411	.000197	L	EQUIV PIN COND FOR 6.05
1161	1	3115	1511	.000296	L	EQUIV PIN COND FOR 6.05
1162	1	3116	1611	.000197	L	EQUIV PIN COND FOR 6.05
1163	1	3121	1112	.000296	L	EQUIV PIN COND FOR 6.06
1164	1	3122	1212	.000197	L	EQUIV PIN COND FOR 6.06
1165	1	3123	1312	.000296	L	EQUIV PIN COND FOR 6.06
1166	1	3124	1412	.000197	L	EQUIV PIN COND FOR 6.06
1167	1	3125	1512	.000296	L	EQUIV PIN COND FOR 6.06
1168	1	3126	1612	.000197	L	EQUIV PIN COND FOR 6.06
1169	1	3141	1114	.000296	L	EQUIV PIN COND FOR 7.01
1170	1	3142	1214	.000197	L	EQUIV PIN COND FOR 7.01

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £

SqNo	FACTOR	From	To	Cond. Value	L/R	Description
1171	1	3143	1314	.000197	L	EQUIV PIN COND FOR 7.01
1172	1	3144	1414	.000296	L	EQUIV PIN COND FOR 7.01
1173	1	3145	1514	.000197	L	EQUIV PIN COND FOR 7.01
1174	1	3146	1614	.000296	L	EQUIV PIN COND FOR 7.01
1175	1	3151	1115	.000197	L	EQUIV PIN COND FOR 7.02
1176	1	3152	1215	.000296	L	EQUIV PIN COND FOR 7.02
1177	1	3153	1315	.000197	L	EQUIV PIN COND FOR 7.02
1178	1	3154	1415	.000296	L	EQUIV PIN COND FOR 7.02
1179	1	3155	1515	.000197	L	EQUIV PIN COND FOR 7.02
1180	1	3156	1615	.000296	L	EQUIV PIN COND FOR 7.02
1181	1	3161	1116	.000197	L	EQUIV PIN COND FOR 7.03
1182	1	3162	1216	.000296	L	EQUIV PIN COND FOR 7.03
1183	1	3163	1316	.000197	L	EQUIV PIN COND FOR 7.03
1184	1	3164	1416	.000296	L	EQUIV PIN COND FOR 7.03
1185	1	3165	1516	.000197	L	EQUIV PIN COND FOR 7.03
1186	1	3166	1616	.000296	L	EQUIV PIN COND FOR 7.03
1187	1	3171	1117	.000197	L	EQUIV PIN COND FOR 8.00
1188	1	3172	1217	.000296	L	EQUIV PIN COND FOR 8.00

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                               □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□ 1189 1      3173   1317   .000296       L  EQUIV PIN COND FOR 8.00            □
□ 1190 1      3174   1417   .000197       L  EQUIV PIN COND FOR 8.00            □
□ 1191 1      3175   1517   .000296       L  EQUIV PIN COND FOR 8.00            □
□ 1192 1      3176   1617   .000197       L  EQUIV PIN COND FOR 8.00            □
□ 1193 1      2011   2012   .1465         L  PIN COND                           □
□ 1194 1      2012   2013   .1465         L  PIN COND                           □
□ 1195 1      2013   2014   .1465         L  PIN COND                           □
□ 1196 1      2014   2015   .1465         L  PIN COND                           □
□ 1197 1      2015   2016   .1465         L  PIN COND                           □
□ 1198 1      2021   2022   .1465         L  PIN COND                           □
□ 1199 1      2022   2023   .1465         L  PIN COND                           □
□ 1200 1      2023   2024   .1465         L  PIN COND                           □
□ 1201 1      2024   2025   .1465         L  PIN COND                           □
□ 1202 1      2025   2026   .1465         L  PIN COND                           □
□ 1203 1      2031   2032   .1465         L  PIN COND                           □
□ 1204 1      2032   2033   .1465         L  PIN COND                           □
□ 1205 1      2033   2034   .1465         L  PIN COND                           □
□ 1206 1      2034   2035   .1465         L  PIN COND                           □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                               □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                        □
□ 1207 1      2035   2036   .1465         L  PIN COND                           □
□ 1208 1      2041   2042   .1465         L  PIN COND                           □
□ 1209 1      2042   2043   .1465         L  PIN COND                           □
□ 1210 1      2043   2044   .1465         L  PIN COND                           □
□ 1211 1      2044   2045   .1465         L  PIN COND                           □
□ 1212 1      2045   2046   .1465         L  PIN COND                           □
□ 1213 1      2051   2052   .1465         L  PIN COND                           □
□ 1214 1      2052   2053   .1465         L  PIN COND                           □
□ 1215 1      2053   2054   .1465         L  PIN COND                           □
□ 1216 1      2054   2055   .1465         L  PIN COND                           □
□ 1217 1      2055   2056   .1465         L  PIN COND                           □
□ 1218 1      2061   2062   .1465         L  PIN COND                           □
□ 1219 1      2062   2063   .1465         L  PIN COND                           □
□ 1220 1      2063   2064   .1465         L  PIN COND                           □
□ 1221 1      2064   2065   .1465         L  PIN COND                           □
□ 1222 1      2065   2066   .1465         L  PIN COND                           □
□ 1223 1      2071   2072   .1465         L  PIN COND                           □
□ 1224 1      2072   2073   .1465         L  PIN COND                           □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□ 1225 1      2073   2074   .1465         L  PIN COND                          □
□ 1226 1      2074   2075   .1465         L  PIN COND                          □
□ 1227 1      2075   2076   .1465         L  PIN COND                          □
□ 1228 1      2081   2082   .1465         L  PIN COND                          □
□ 1229 1      2082   2083   .1465         L  PIN COND                          □
□ 1230 1      2083   2084   .1465         L  PIN COND                          □
□ 1231 1      2084   2085   .1465         L  PIN COND                          □
□ 1232 1      2085   2086   .1465         L  PIN COND                          □
□ 1233 1      2091   2092   .1465         L  PIN COND                          □
□ 1234 1      2092   2093   .1465         L  PIN COND                          □
□ 1235 1      2093   2094   .1465         L  PIN COND                          □
□ 1236 1      2094   2095   .1465         L  PIN COND                          □
□ 1237 1      2095   2096   .1465         L  PIN COND                          □
□ 1238 1      2101   2102   .1465         L  PIN COND                          □
□ 1239 1      2102   2103   .1465         L  PIN COND                          □
□ 1240 1      2103   2104   .1465         L  PIN COND                          □
□ 1241 1      2104   2105   .1465         L  PIN COND                          □
□ 1242 1      2105   2106   .1465         L  PIN COND                          □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur             End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□ 1243 1      2111   2112   .1465         L  PIN COND                          □
□ 1244 1      2112   2113   .1465         L  PIN COND                          □
□ 1245 1      2113   2114   .1465         L  PIN COND                          □
□ 1246 1      2114   2115   .1465         L  PIN COND                          □
□ 1247 1      2115   2116   .1465         L  PIN COND                          □
□ 1248 1      2121   2122   .1465         L  PIN COND                          □
□ 1249 1      2122   2123   .1465         L  PIN COND                          □
□ 1250 1      2123   2124   .1465         L  PIN COND                          □
□ 1251 1      2124   2125   .1465         L  PIN COND                          □
□ 1252 1      2125   2126   .1465         L  PIN COND                          □
□ 1253 1      2131   2132   .1465         L  PIN COND                          □
□ 1254 1      2132   2133   .1465         L  PIN COND                          □
□ 1255 1      2133   2134   .1465         L  PIN COND                          □
□ 1256 1      2134   2135   .1465         L  PIN COND                          □
□ 1257 1      2135   2136   .1465         L  PIN COND                          □
□ 1258 1      2141   2142   .1465         L  PIN COND                          □
□ 1259 1      2142   2143   .1465         L  PIN COND                          □
□ 1260 1      2143   2144   .1465         L  PIN COND                          □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur             End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £

SqNo	FACTOR	From	To	Cond.	Value	L/R	Description
1261	1	2144	2145	.1465		L	PIN COND
1262	1	2145	2146	.1465		L	PIN COND
1263	1	2151	2152	.1465		L	PIN COND
1264	1	2152	2153	.1465		L	PIN COND
1265	1	2153	2154	.1465		L	PIN COND
1266	1	2154	2155	.1465		L	PIN COND
1267	1	2155	2156	.1465		L	PIN COND
1268	1	2161	2162	.1465		L	PIN COND
1269	1	2162	2163	.1465		L	PIN COND
1270	1	2163	2164	.1465		L	PIN COND
1271	1	2164	2165	.1465		L	PIN COND
1272	1	2165	2166	.1465		L	PIN COND
1273	1	2171	2172	.1465		L	PIN COND
1274	1	2172	2173	.1465		L	PIN COND
1275	1	2173	2174	.1465		L	PIN COND
1276	1	2174	2175	.1465		L	PIN COND
1277	1	2175	2176	.1465		L	PIN COND
1278	1	2181	2182	.1465		L	PIN COND

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £

SqNo	FACTOR	From	To	Cond.	Value	L/R	Description
1279	1	2182	2183	.1465		L	PIN COND
1280	1	2183	2184	.1465		L	PIN COND
1281	1	2184	2185	.1465		L	PIN COND
1282	1	2185	2186	.1465		L	PIN COND
1283	1	2191	2192	.1465		L	PIN COND
1284	1	2192	2193	.1465		L	PIN COND
1285	1	2193	2194	.1465		L	PIN COND
1286	1	2194	2195	.1465		L	PIN COND
1287	1	2195	2196	.1465		L	PIN COND
1288	1	2201	2202	.1465		L	PIN COND
1289	1	2202	2203	.1465		L	PIN COND
1290	1	2203	2204	.1465		L	PIN COND
1291	1	2204	2205	.1465		L	PIN COND
1292	1	2205	2206	.1465		L	PIN COND
1293	1	2211	2212	.1465		L	PIN COND
1294	1	2212	2213	.1465		L	PIN COND
1295	1	2213	2214	.1465		L	PIN COND
1296	1	2214	2215	.1465		L	PIN COND

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
¤                                                                                 ¤
¤ SqNo FACTOR From    To      Cond. Value   L/R Description                       ¤
¤ 1297 1      2215    2216    .1465          L  PIN COND                          ¤
¤ 1298 1      2221    2222    .1465          L  PIN COND                          ¤
¤ 1299 1      2222    2223    .1465          L  PIN COND                          ¤
¤ 1300 1      2223    2224    .1465          L  PIN COND                          ¤
¤ 1301 1      2224    2225    .1465          L  PIN COND                          ¤
¤ 1302 1      2225    2226    .1465          L  PIN COND                          ¤
¤ 1303 1      2231    2232    .1465          L  PIN COND                          ¤
¤ 1304 1      2232    2233    .1465          L  PIN COND                          ¤
¤ 1305 1      2233    2234    .1465          L  PIN COND                          ¤
¤ 1306 1      2234    2235    .1465          L  PIN COND                          ¤
¤ 1307 1      2235    2236    .1465          L  PIN COND                          ¤
¤ 1308 1      2241    2242    .1465          L  PIN COND                          ¤
¤ 1309 1      2242    2243    .1465          L  PIN COND                          ¤
¤ 1310 1      2243    2244    .1465          L  PIN COND                          ¤
¤ 1311 1      2244    2245    .1465          L  PIN COND                          ¤
¤ 1312 1      2245    2246    .1465          L  PIN COND                          ¤
¤ 1313 1      2251    2252    .1465          L  PIN COND                          ¤
¤ 1314 1      2252    2253    .1465          L  PIN COND                          ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
¤                                                                                 ¤
¤ SqNo FACTOR From    To      Cond. Value   L/R Description                       ¤
¤ 1315 1      2253    2254    .1465          L  PIN COND                          ¤
¤ 1316 1      2254    2255    .1465          L  PIN COND                          ¤
¤ 1317 1      2255    2256    .1465          L  PIN COND                          ¤
¤ 1318 1      2261    2262    .1465          L  PIN COND                          ¤
¤ 1319 1      2262    2263    .1465          L  PIN COND                          ¤
¤ 1320 1      2263    2264    .1465          L  PIN COND                          ¤
¤ 1321 1      2264    2265    .1465          L  PIN COND                          ¤
¤ 1322 1      2265    2266    .1465          L  PIN COND                          ¤
¤ 1323 1      2271    2272    .1465          L  PIN COND                          ¤
¤ 1324 1      2272    2273    .1465          L  PIN COND                          ¤
¤ 1325 1      2273    2274    .1465          L  PIN COND                          ¤
¤ 1326 1      2274    2275    .1465          L  PIN COND                          ¤
¤ 1327 1      2275    2276    .1465          L  PIN COND                          ¤
¤ 1328 1      2281    2282    .1465          L  PIN COND                          ¤
¤ 1329 1      2282    2283    .1465          L  PIN COND                          ¤
¤ 1330 1      2283    2284    .1465          L  PIN COND                          ¤
¤ 1331 1      2284    2285    .1465          L  PIN COND                          ¤
¤ 1332 1      2285    2286    .1465          L  PIN COND                          ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ëëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□ 1333 1      2291    2292    .1465         L  PIN COND                        □
□ 1334 1      2292    2293    .1465         L  PIN COND                        □
□ 1335 1      2293    2294    .1465         L  PIN COND                        □
□ 1336 1      2294    2295    .1465         L  PIN COND                        □
□ 1337 1      2295    2296    .1465         L  PIN COND                        □
□ 1338 1      2301    2302    .1465         L  PIN COND                        □
□ 1339 1      2302    2303    .1465         L  PIN COND                        □
□ 1340 1      2303    2304    .1465         L  PIN COND                        □
□ 1341 1      2304    2305    .1465         L  PIN COND                        □
□ 1342 1      2305    2306    .1465         L  PIN COND                        □
□ 1343 1      3011    3012    .1465         L  PIN COND                        □
□ 1344 1      3012    3013    .1465         L  PIN COND                        □
□ 1345 1      3013    3014    .1465         L  PIN COND                        □
□ 1346 1      3014    3015    .1465         L  PIN COND                        □
□ 1347 1      3015    3016    .1465         L  PIN COND                        □
□ 1348 1      3021    3022    .1465         L  PIN COND                        □
□ 1349 1      3022    3023    .1465         L  PIN COND                        □
□ 1350 1      3023    3024    .1465         L  PIN COND                        □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur               End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ëëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□ 1351 1      3024    3025    .1465         L  PIN COND                        □
□ 1352 1      3025    3026    .1465         L  PIN COND                        □
□ 1353 1      3031    3032    .1465         L  PIN COND                        □
□ 1354 1      3032    3033    .1465         L  PIN COND                        □
□ 1355 1      3033    3034    .1465         L  PIN COND                        □
□ 1356 1      3034    3035    .1465         L  PIN COND                        □
□ 1357 1      3035    3036    .1465         L  PIN COND                        □
□ 1358 1      3041    3042    .1465         L  PIN COND                        □
□ 1359 1      3042    3043    .1465         L  PIN COND                        □
□ 1360 1      3043    3044    .1465         L  PIN COND                        □
□ 1361 1      3044    3045    .1465         L  PIN COND                        □
□ 1362 1      3045    3046    .1465         L  PIN COND                        □
□ 1363 1      3051    3052    .1465         L  PIN COND                        □
□ 1364 1      3052    3053    .1465         L  PIN COND                        □
□ 1365 1      3053    3054    .1465         L  PIN COND                        □
□ 1366 1      3054    3055    .1465         L  PIN COND                        □
□ 1367 1      3055    3056    .1465         L  PIN COND                        □
□ 1368 1      3061    3062    .1465         L  PIN COND                        □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur               End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                            ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                     ¤
¤ 1369 1      3062   3063   .1465         L  PIN COND                        ¤
¤ 1370 1      3063   3064   .1465         L  PIN COND                        ¤
¤ 1371 1      3064   3065   .1465         L  PIN COND                        ¤
¤ 1372 1      3065   3066   .1465         L  PIN COND                        ¤
¤ 1373 1      3091   3092   .1465         L  PIN COND                        ¤
¤ 1374 1      3092   3093   .1465         L  PIN COND                        ¤
¤ 1375 1      3093   3094   .1465         L  PIN COND                        ¤
¤ 1376 1      3094   3095   .1465         L  PIN COND                        ¤
¤ 1377 1      3095   3096   .1465         L  PIN COND                        ¤
¤ 1378 1      3101   3102   .1465         L  PIN COND                        ¤
¤ 1379 1      3102   3103   .1465         L  PIN COND                        ¤
¤ 1380 1      3103   3104   .1465         L  PIN COND                        ¤
¤ 1381 1      3104   3105   .1465         L  PIN COND                        ¤
¤ 1382 1      3105   3106   .1465         L  PIN COND                        ¤
¤ 1383 1      3111   3112   .1465         L  PIN COND                        ¤
¤ 1384 1      3112   3113   .1465         L  PIN COND                        ¤
¤ 1385 1      3113   3114   .1465         L  PIN COND                        ¤
¤ 1386 1      3114   3115   .1465         L  PIN COND                        ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur               End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                            ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                     ¤
¤ 1387 1      3115   3116   .1465         L  PIN COND                        ¤
¤ 1388 1      3121   3122   .1465         L  PIN COND                        ¤
¤ 1389 1      3122   3123   .1465         L  PIN COND                        ¤
¤ 1390 1      3123   3124   .1465         L  PIN COND                        ¤
¤ 1391 1      3124   3125   .1465         L  PIN COND                        ¤
¤ 1392 1      3125   3126   .1465         L  PIN COND                        ¤
¤ 1393 1      3141   3142   .1465         L  PIN COND                        ¤
¤ 1394 1      3142   3143   .1465         L  PIN COND                        ¤
¤ 1395 1      3143   3144   .1465         L  PIN COND                        ¤
¤ 1396 1      3144   3145   .1465         L  PIN COND                        ¤
¤ 1397 1      3145   3146   .1465         L  PIN COND                        ¤
¤ 1398 1      3151   3152   .1465         L  PIN COND                        ¤
¤ 1399 1      3152   3153   .1465         L  PIN COND                        ¤
¤ 1400 1      3153   3154   .1465         L  PIN COND                        ¤
¤ 1401 1      3154   3155   .1465         L  PIN COND                        ¤
¤ 1402 1      3155   3156   .1465         L  PIN COND                        ¤
¤ 1403 1      3161   3162   .1465         L  PIN COND                        ¤
¤ 1404 1      3162   3163   .1465         L  PIN COND                        ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur               End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond.  Value  L/R Description                      □
□ 1405 1      3163   3164   .1465          L  PIN COND                         □
□ 1406 1      3164   3165   .1465          L  PIN COND                         □
□ 1407 1      3165   3166   .1465          L  PIN COND                         □
□ 1408 1      3171   3172   .1465          L  PIN COND                         □
□ 1409 1      3172   3173   .1465          L  PIN COND                         □
□ 1410 1      3173   3174   .1465          L  PIN COND                         □
□ 1411 1      3174   3175   .1465          L  PIN COND                         □
□ 1412 1      3175   3176   .1465          L  PIN COND                         □
□                                                                              □
□                                                                              □
□                                                                              □
□                                                                              □
□                                                                              □
□                                                                              □
□                                                                              □
□                                                                              □
□                                                                              □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur              End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```
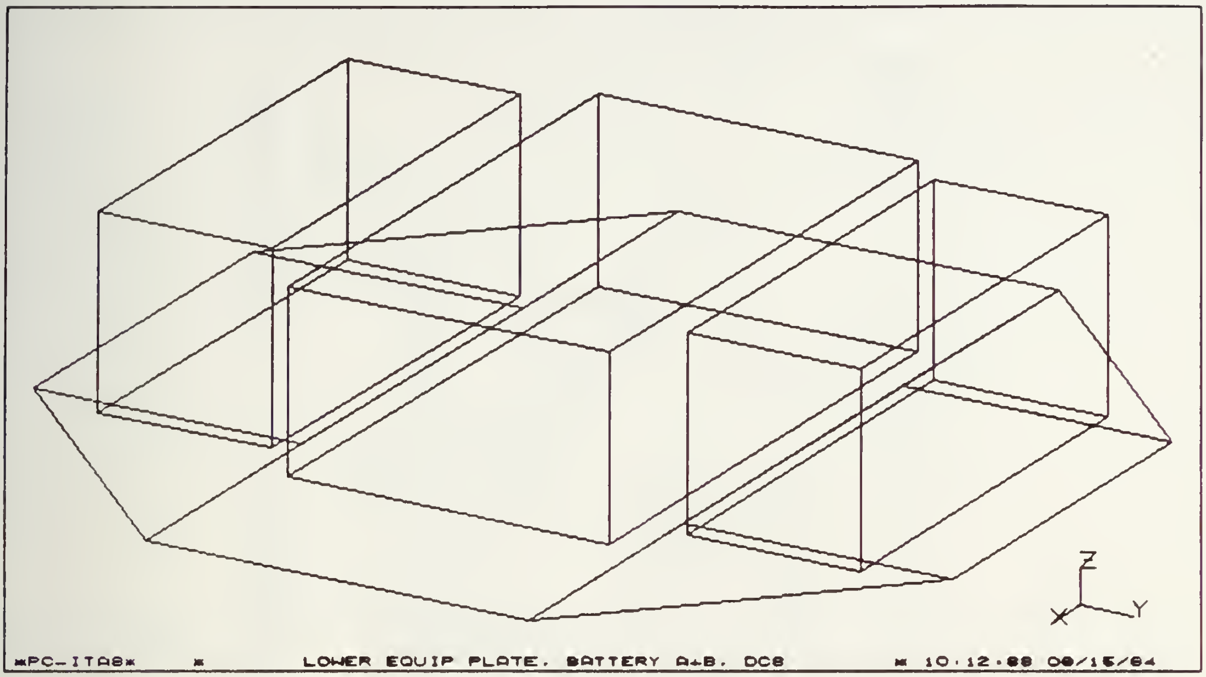
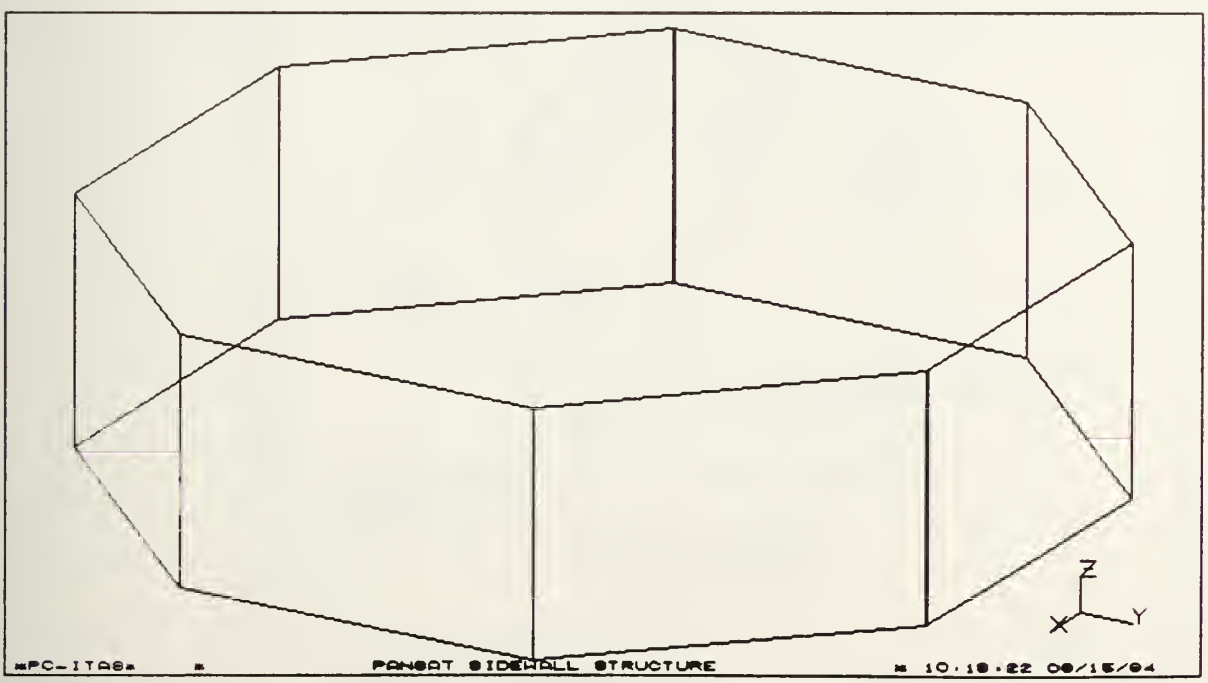
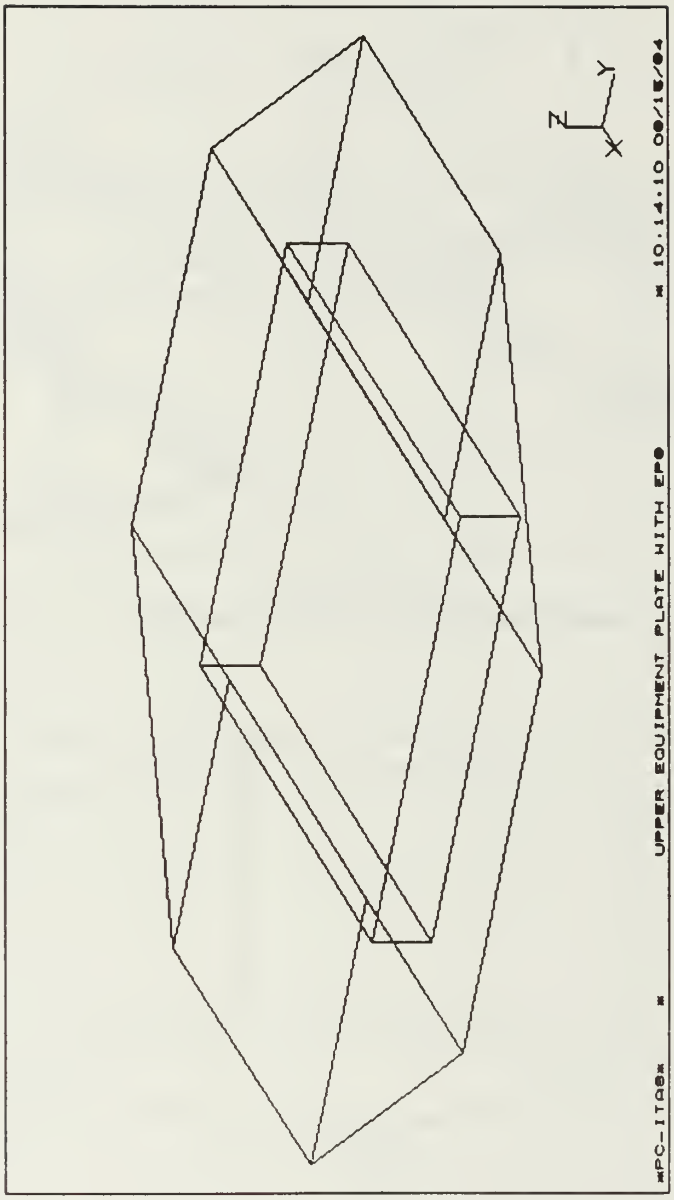
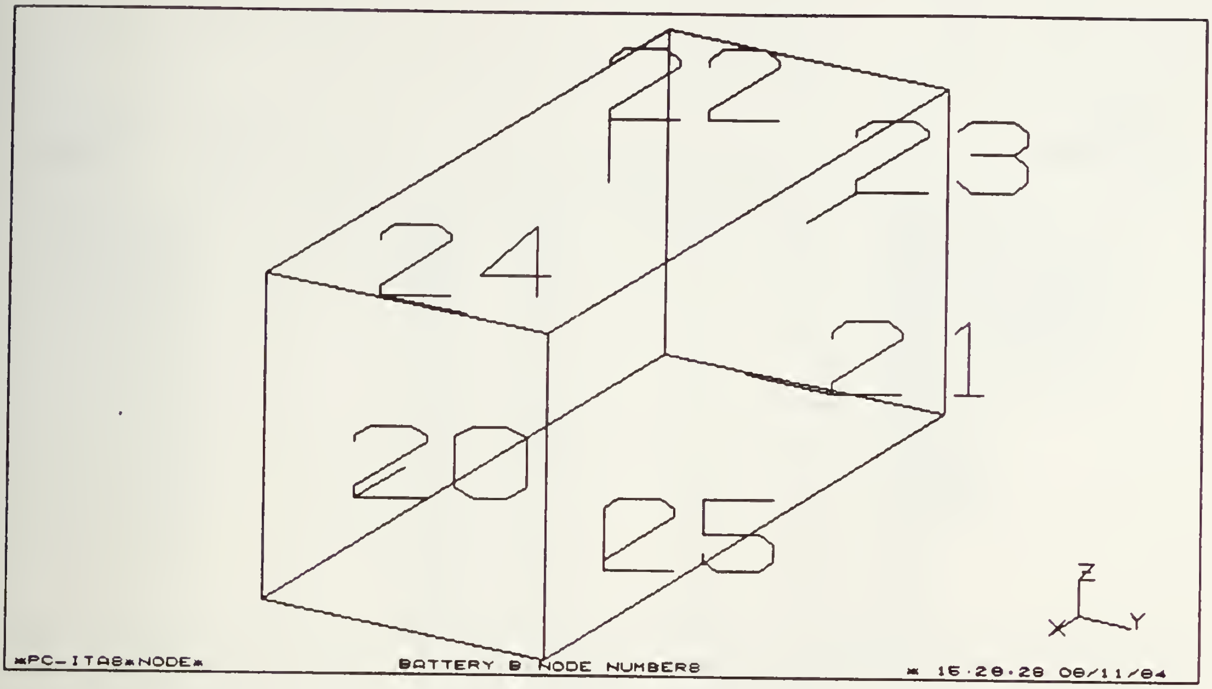

APPENDIX N. ITAS BATTERY GEOMETRY MODEL

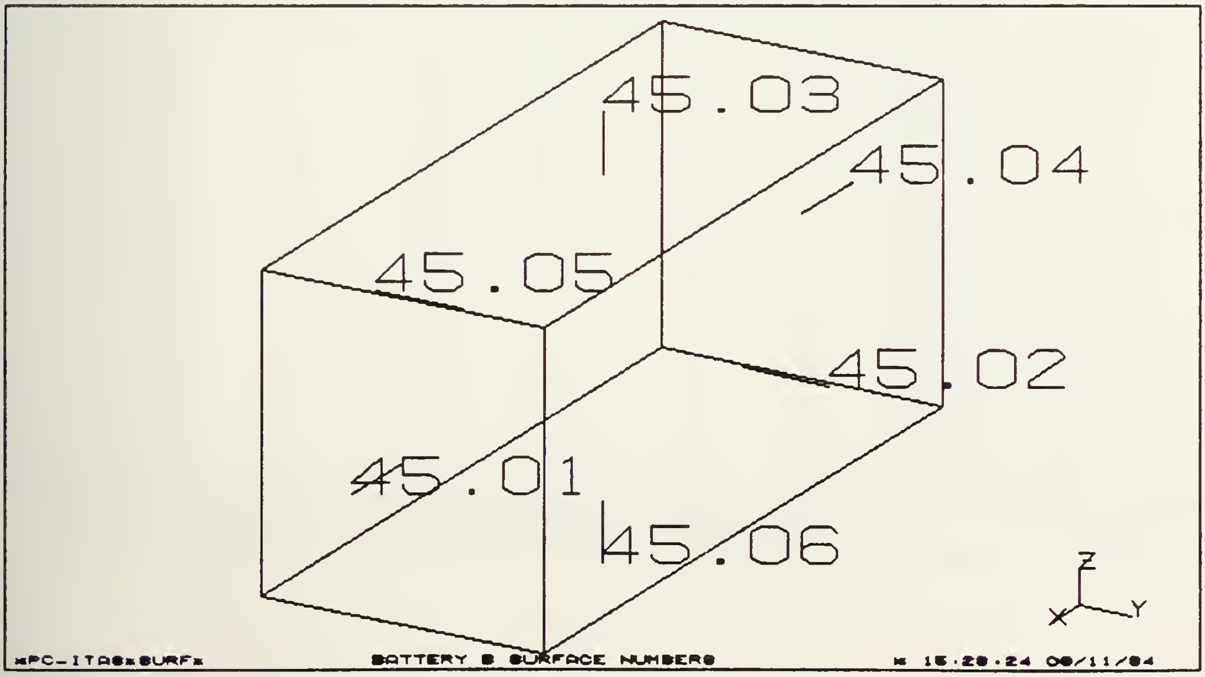





PC-ITAS
UPPER EQUIPMENT PLATE WITH EPS
10:14:10
Z
Y
X

APPENDIX O. BATTERY B SURFACE AND NODE NUMBERS





APPENDIX P. BATTERY OPTICAL PROPERTIES

PgDn PgUp Home End F2Help

èëë Ctrl : Copy (See F2)ëë ITAS Property Data Entry ëëëëëëëëëëëëëëëëëëëëëëëëëëëë

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
1	1.00	1	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
2	5.00	2	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
3	10.00	3	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
4	15.00	4	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
5	20.00	5	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
6	25.00	6	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
7	30.00	7	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
8	35.01	8	0.400	0.790	1.	0.	144	BATTERY A
9	35.02	9	0.400	0.790	1.	0.	144	BATTERY A
10	35.03	10	0.400	0.790	1.	0.	144	BATTERY A
11	35.04	11	0.400	0.790	1.	0.	144	BATTERY A
12	35.05	12	0.400	0.790	1.	0.	144	BATTERY A
13	35.06	13	0.400	0.790	1.	0.	144	BATTERY A
14	40.01	14	0.400	0.790	1.	0.	144	DCS
15	40.02	15	0.400	0.790	1.	0.	144	DCS
16	40.03	16	0.400	0.790	1.	0.	144	DCS
17	40.04	17	0.400	0.790	1.	0.	144	DCS
18	40.05	18	0.400	0.790	1.	0.	144	DCS

àëë¥

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

èëë Ctrl : Copy (See F2)ëë ITAS Property Data Entry ëëëëëëëëëëëëëëëëëëëëëëëëëëëë

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
19	40.06	19	0.400	0.790	1.	0.	144	DCS
20	45.01	20	0.400	0.790	1.	0.	144	BATTERY B
21	45.02	21	0.400	0.790	1.	0.	144	BATTERY B
22	45.03	22	0.400	0.790	1.	0.	144	BATTERY B
23	45.04	23	0.400	0.790	1.	0.	144	BATTERY B
24	45.05	24	0.400	0.790	1.	0.	144	BATTERY B
25	45.06	25	0.400	0.790	1.	0.	144	BATTERY B
26	51.00	26	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
27	55.00	27	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
28	60.00	28	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
29	65.00	29	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
30	70.00	30	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
31	75.00	31	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
32	80.00	32	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
33	82.00	33	0.400	0.790	1.	0.	144	STRUCTURE FRONT MI
34	84.00	34	0.400	0.790	1.	0.	144	STRUCTURE BACK MID
35	86.00	35	0.400	0.790	1.	0.	144	STRUCTURE RIGHT
36	88.00	36	0.400	0.790	1.	0.	144	STRUCTURE LEFT

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S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

èëë Ctrl : Copy (See F2)ëë ITAS Property Data Entry ëëëëëëëëëëëëëëëëëëëëëëëëëëëë

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
29	65.00	29	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
30	70.00	30	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
31	75.00	31	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
32	80.00	32	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
33	82.00	33	0.400	0.790	1.	0.	144	STRUCTURE FRONT MI
34	84.00	34	0.400	0.790	1.	0.	144	STRUCTURE BACK MID
35	86.00	35	0.400	0.790	1.	0.	144	STRUCTURE RIGHT
36	88.00	36	0.400	0.790	1.	0.	144	STRUCTURE LEFT
37	92.00	37	0.400	0.790	1.	0.	144	RIGHT FRONT SLANT
38	94.00	38	0.400	0.790	1.	0.	144	RIGHT FRONT SLANT
39	96.00	39	0.400	0.790	1.	0.	144	BACK RIGHT SLANT
40	98.00	40	0.400	0.790	1.	0.	144	RIGHT BACK SLANT
41	99.01	41	0.400	0.790	1.	0.	144	EPS
42	99.02	42	0.400	0.790	1.	0.	144	EPS
43	99.03	43	0.400	0.790	1.	0.	144	EPS
44	99.04	44	0.400	0.790	1.	0.	144	EPS
45	99.05	45	0.400	0.790	1.	0.	144	EPS
46	99.06	46	0.400	0.790	1.	0.	144	EPS

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

APPENDIX Q. PANSAT TRANSIENT STRUCTURAL ANALYSIS

Page No. 14

PANSAT - TRANSIENT - SUNLIGHT ZONE - INTERNAL HEAT DISSIPATION - PASS

emperatures, degC

1	32.40	2	33.67	3	35.07	4	32.09	5	33.59	6
7	32.47	8	33.54	9	34.69	10	39.58	11	40.61	12
3	39.76	14	41.05	15	41.37	16	37.92	17	38.77	18
9	39.37	20	38.62	21	37.18	22	40.80	23	39.98	24
5	39.06	26	38.54	27	37.08	28	32.28	29	30.99	30
1	32.08	32	30.41	33	30.00	34	31.71	35	30.53	36
7	30.37	38	30.57	39	31.03	40	30.01	41	30.40	42
3	30.86	44	31.25	45	31.81	46	32.11	47	32.55	48
9	33.21	50	33.87	51	34.13	52	33.26	53	33.70	54
5	33.03	56	32.75	57	31.78	58	34.11	59	33.68	60
1	34.11	62	33.80	63	32.85	64	28.40	65	27.87	66
7	28.78	68	27.91	69	28.55	70	29.55	71	28.89	72
3	27.73	74	29.43	75	33.79	76	29.45	77	32.27	78
9	31.11	80	33.04	81	35.23	82	40.46	83	40.30	84
5	41.20	86	40.80	87	41.71	88	37.21	89	35.10	90
1	38.88	92	37.05	93	35.60	94	38.35	95	36.90	96
7	30.16	98	29.48	99	30.39	100	29.48	101	31.61	102
3	26.29	104	24.59	105	24.93	106	26.60	107	25.48	108
9	28.50	110	27.98	111	28.44	112	26.73	113	26.73	114
5	28.95	116	29.86	117	30.52	118	26.24	119	25.88	120
1	27.85	122	27.19	123	26.76	124	29.65	125	29.14	126
7	25.70	128	25.89	129	25.45	130	25.64	131	26.63	132
3	29.72	134	30.52	135	32.04	136	28.14	137	28.85	138
9	28.05	140	28.30	141	32.10	142	35.42	143	36.06	144
5	37.12	146	41.06	147	41.32	148	34.91	149	33.95	150
1	34.88	152	32.97	153	31.51	154	34.69	155	31.77	156
7	29.53	158	28.94	159	29.44	160	28.94	161	30.75	162
3	30.26	164	30.91	165	31.62	166	29.16	167	29.75	168
9	29.46	170	29.18	171	31.59	172	32.18	173	32.52	174
5	33.63	176	36.91	177	37.05	178	33.01	179	32.11	180
1	33.09	182	31.86	183	30.65	184	33.02	185	31.00	186
7	28.43	188	28.02	189	28.73	190	28.23	191	30.26	192
3	25.04	194	25.51	195	28.20	196	25.32	197	26.39	198
9	25.99	200	27.55	201	31.35	202	29.36	203	27.91	204
5	28.22	206	27.24	207	28.56	208	27.73	209	27.67	210
1	33.97	212	34.66	213	34.63	214	33.51	215	32.24	216
7	31.45	218	31.15	219	33.70	220	34.39	221	34.43	222
3	33.33	224	33.48	225	33.44	226	33.39	227	32.78	228
9	30.58	230	30.52	231	28.77	232	28.61			
1	-272.80									

PANSAT - TRANSIENT - SHADOW ZONE - INTERNAL HEAT DISSIPATION - PA
Temperatures, degC

1	29.93	2	30.88	3	31.83	4	29.32	5	30.44	
7	30.08	8	30.85	9	31.66	10	33.00	11	33.64	
13	33.67	14	34.77	15	35.60	16	32.55	17	33.56	
19	33.64	20	33.04	21	31.97	22	34.48	23	33.54	
25	33.96	26	33.09	27	31.99	28	29.65	29	28.59	
31	29.66	32	28.44	33	28.27	34	29.57	35	28.79	
37	30.28	38	30.75	39	31.22	40	29.99	41	30.63	
43	30.77	44	31.38	45	31.91	46	32.44	47	32.83	
49	33.37	50	34.00	51	34.25	52	33.25	53	33.66	
55	33.23	56	32.94	57	31.97	58	34.26	59	33.84	
61	34.21	62	33.93	63	32.98	64	28.56	65	27.97	
67	28.95	68	28.07	69	28.38	70	29.67	71	28.99	
73	24.95	74	26.06	75	28.75	76	26.75	77	29.08	
79	28.75	80	30.26	81	31.09	82	29.42	83	29.52	
85	30.26	86	30.81	87	31.24	88	30.37	89	29.63	
91	31.86	92	31.57	93	30.88	94	32.42	95	32.12	
97	25.67	98	25.50	99	25.41	100	25.33	101	26.88	1
103	25.04	104	24.21	105	24.73	106	25.75	107	25.58	1
109	27.92	110	28.13	111	28.74	112	26.58	113	26.76	1
115	29.25	116	30.62	117	30.90	118	25.99	119	25.53	1
121	27.98	122	27.30	123	26.85	124	29.88	125	29.35	1
127	24.68	128	24.63	129	25.13	130	25.13	131	26.53	1
133	28.85	134	29.98	135	30.14	136	27.17	137	27.61	1
139	27.11	140	26.83	141	27.67	142	30.15	143	30.95	1
145	29.18	146	27.85	147	27.92	148	31.26	149	30.80	1
151	29.86	152	29.29	153	28.08	154	28.63	155	28.18	1
157	27.54	158	27.46	159	26.82	160	26.90	161	26.93	1
163	30.13	164	31.00	165	31.55	166	28.82	167	29.84	1
169	28.68	170	29.32	171	31.50	172	31.67	173	32.01	1
175	32.24	176	36.36	177	36.47	178	32.95	179	32.13	1
181	32.83	182	31.96	183	30.78	184	32.92	185	31.11	1
187	28.45	188	27.85	189	28.67	190	27.96	191	30.00	1
193	23.23	194	22.92	195	24.73	196	22.97	197	23.03	1
199	23.42	200	23.94	201	26.55	202	29.35	203	27.73	2
205	28.20	206	26.93	207	27.28	208	27.49	209	27.03	21
211	32.31	212	32.69	213	32.56	214	32.18	215	31.74	21
217	31.56	218	31.32	219	32.66	220	33.00	221	32.89	22
223	32.82	224	33.13	225	33.10	226	32.81	227	32.29	22
229	30.60	230	30.64	231	28.51	232	28.55			
301	-272.80									

APPENDIX R. ITAS BATTERY THERMAL MASSES

èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
1	-101	33.74	19.438	0	LOWER EQUIPMENT PLATE
2	-102	33.74	5.692	0	LOWER EQUIPMENT PLATE
3	-103	33.74	5.692	0	LOWER EQUIPMENT PLATE
4	-104	33.74	2.014	0	LOWER EQUIPMENT PLATE
5	-105	33.74	2.014	0	LOWER EQUIPMENT PLATE
6	-106	33.74	2.014	0	LOWER EQUIPMENT PLATE
7	-107	33.74	2.014	0	LOWER EQUIPMENT PLATE
8	201	30	2.169	0	BATTERY A
9	202	30	5.327	0	BATTERY A
10	203	30	3.3	0	BATTERY A
11	204	30	2.169	0	BATTERY A
12	205	30	5.327	0	BATTERY A
13	206	30	3.3	0	BATTERY A
14	301	30	3.805	0	DCS
15	302	30	6.342	0	DCS
16	303	30	7.610	0	DCS
17	304	30	3.805	0	DCS
18	305	30	6.342	0	DCS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
19	306	30	7.610	0	DCS
20	401	30	2.169	0	BATTERY B
21	402	30	5.327	0	BATTERY B
22	403	30	3.3	0	BATTERY B
23	404	30	2.169	0	BATTERY B
24	405	30	5.327	0	BATTERY B
25	406	30	3.3	0	BATTERY B
26	-501	33.08	9.719	0	UPPER EQUIPMENT PLATE
27	-502	33.08	2.846	0	UPPER EQUIPMENT PLATE
28	-503	33.08	2.846	0	UPPER EQUIPMENT PLATE
29	-504	33.08	1.068	0	UPPER EQUIPMENT PLATE
30	-505	33.08	1.068	0	UPPER EQUIPMENT PLATE
31	-506	33.08	1.068	0	UPPER EQUIPMENT PLATE
32	-507	33.08	1.068	0	UPPER EQUIPMENT PLATE
33	-601	33.44	2.014	0	PANSAT STRUCTURE
34	-602	39.87	2.014	0	PANSAT STRUCTURE
35	-603	38.83	2.014	0	PANSAT STRUCTURE
36	-604	31.14	2.014	0	PANSAT STRUCTURE

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

```
eeCtrl:Copyeeeeeee ITAS Node Data Entry For Thermal Analysis eeeeeeeeESC:Quitee
¤                                                                                ¤
¤ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                        ¤
¤   37    -605      30.79     2.014     0         PANSAT STRUCTURE               ¤
¤   38    -606      33.26     2.014     0         PANSAT STRUCTURE               ¤
¤   39    -607      33.26     2.014     0         PANSAT STRUCTURE               ¤
¤   40    -608      28.56     2.014     0         PANSAT STRUCTURE               ¤
¤   41    701       30        1.598     0         EPS                            ¤
¤   42    702       30        1.788     0         EPS                            ¤
¤   43    703       30        9.132     0         EPS                            ¤
¤   44    704       30        1.598     0         EPS                            ¤
¤   45    705       30        1.788     0         EPS                            ¤
¤   46    706       30        9.132     0         EPS                            ¤
¤   47    1500      30        0         1         HEAT DISSIPATION IN BATTERY A  ¤
¤   48    1600      30        0         6.25      HEAT DISSIPATION IN DCS        ¤
¤   49    1700      30        0         .5        HEAT DISSIPATION IN BATTERY B  ¤
¤   50    1800      30        0         .5        HEAT DISSIPATION IN EPS        ¤
¤                                                                                ¤
¤                                                                                ¤
¤                                                                                ¤
¤                                                                                ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC   UDC Allowed                       PgDn PgUp Home End
SHFT-F1Import Column                    Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search
```

APPENDIX S. BATTERY THERMAL MASS CALCULATIONS

			BATTERY THERMAL CAPACITANCES					
NODE	area	thickness	volume	ro-Al	c-Al	conv fact	in-m	thr mass
101	122.6	0.25	30.65	2787	0.199	69.78	61024	19.43797
102	35.9	0.25	8.975	2787	0.199	69.78	61024	5.691868
103	35.9	0.25	8.975	2787	0.199	69.78	61024	5.691868
104	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
105	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
106	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
107	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
201	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
202	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
203	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
204	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
205	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
206	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
301	30	0.2	6	2787	0.199	69.78	61024	3.805148
302	50	0.2	10	2787	0.199	69.78	61024	6.341914
303	60	0.2	12	2787	0.199	69.78	61024	7.610297
304	30	0.2	6	2787	0.199	69.78	61024	3.805148
305	50	0.2	10	2787	0.199	69.78	61024	6.341914
306	60	0.2	12	2787	0.199	69.78	61024	7.610297
401	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
402	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
403	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
404	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
405	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
406	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
501	122.6	0.125	15.325	2787	0.199	69.78	61024	9.718983
502	35.9	0.125	4.4875	2787	0.199	69.78	61024	2.845934
503	35.9	0.125	4.4875	2787	0.199	69.78	61024	2.845934
504	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
505	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
506	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
507	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
601	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
602	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558

603	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
604	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
605	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
606	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
607	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
608	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
701	12.6	0.2	2.52	2787	0.199	69.78	61024	1.598162
702	14.1	0.2	2.82	2787	0.199	69.78	61024	1.78842
703	72	0.2	14.4	2787	0.199	69.78	61024	9.132356
704	12.6	0.2	2.52	2787	0.199	69.78	61024	1.598162
705	14.1	0.2	2.82	2787	0.199	69.78	61024	1.78842
706	72	0.2	14.4	2787	0.199	69.78	61024	9.132356

APPENDIX T. BATTERY CONDUCTANCE CALCULATIONS

			BATTERY CONDUCTANCES				
From	To	width	th	area	length	k (Al)	conductance
201	202	5.25	0.2	1.05	5.625	4.31	0.804533333
201	205	5.25	0.2	1.05	5.625	4.31	0.804533333
201	203	3.25	0.2	0.65	6.625	4.31	0.422867925
201	206	3.25	0.2	0.65	6.625	4.31	0.422867925
202	204	3.25	0.2	0.65	6.625	4.31	0.422867925
202	203	8	0.2	1.6	4.25	4.31	1.622588235
202	206	8	0.2	1.6	4.25	4.31	1.622588235
203	205	8	0.2	1.6	4.25	4.31	1.622588235
203	204	3.25	0.2	0.65	6.625	4.31	0.422867925
204	206	3.25	0.2	0.65	6.625	4.31	0.422867925
204	205	3.25	0.2	0.65	5.625	4.31	0.498044444
205	206	8	0.2	1.6	4.25	4.31	1.622588235
301	302	5	0.2	1	8	4.31	0.53875
301	305	5	0.2	1	8	4.31	0.53875
301	303	6	0.2	1.2	7.5	4.31	0.6896
301	306	6	0.2	1.2	7.5	4.31	0.6896
302	304	5	0.2	1	8	4.31	0.53875
302	303	10	0.2	2	5.5	4.31	1.567272727
302	306	10	0.2	2	5.5	4.31	1.567272727
303	305	10	0.2	2	5.5	4.31	1.567272727
303	304	6	0.2	1.2	7.5	4.31	0.6896
304	306	6	0.2	1.2	7.5	4.31	0.6896
304	305	5	0.2	1	8	4.31	0.53875
305	306	10	0.2	2	5.5	4.31	1.567272727
401	402	5.25	0.2	1.05	5.625	4.31	0.804533333
401	405	5.25	0.2	1.05	5.625	4.31	0.804533333
401	403	3.25	0.2	0.65	6.625	4.31	0.422867925
401	406	3.25	0.2	0.65	6.625	4.31	0.422867925
402	404	3.25	0.2	0.65	6.625	4.31	0.422867925
402	403	8	0.2	1.6	4.25	4.31	1.622588235
402	406	8	0.2	1.6	4.25	4.31	1.622588235
403	405	8	0.2	1.6	4.25	4.31	1.622588235

403	404	3.25	0.2	0.65	6.625	4.31	0.422867925
404	406	3.25	0.2	0.65	6.625	4.31	0.422867925
404	405	5.25	0.2	1.05	5.625	4.31	0.804533333
405	406	8	0.2	1.6	4.25	4.31	1.622588235
1500	201			17.1	0.2	4.31	368.505
1500	202			42	0.2	4.31	905.1
1500	203			26	0.2	4.31	560.3
1500	204			17.1	0.2	4.31	368.505
1500	205			42	0.2	4.31	905.1
1500	206			26	0.2	4.31	560.3
1600	301			30	0.2	4.31	646.5
1600	302			50	0.2	4.31	1077.5
1600	303			60	0.2	4.31	1293
1600	304			30	0.2	4.31	646.5
1600	305			50	0.2	4.31	1077.5
1600	306			60	0.2	4.31	1293
1700	401			17.1	0.2	4.31	368.505
1700	402			42	0.2	4.31	905.1
1700	403			26	0.2	4.31	560.3
1700	404			17.1	0.2	4.31	368.505
1700	405			42	0.2	4.31	905.1
1700	406			26	0.2	4.31	560.3
206	102	3.25	7.13	23.1725	0.225	4.31	443.8821111
206	104	3.25	0.435	1.41375	0.225	4.31	27.08116667
206	105	3.25	0.435	1.41375	0.225	4.31	27.08116667
306	101	6	10	60	0.225	4.31	1149.333333
406	103	3.25	7.13	23.1725	0.225	4.31	443.8821111
406	106	3.25	0.435	1.41375	0.225	4.31	27.08116667
406	107	3.25	0.435	1.41375	0.225	4.31	27.08116667
703	501	7.13	7.13	50.8369	0.225	4.31	973.8090622
703	502	0.435	7.13	3.10155	0.225	4.31	59.41191333
703	503	0.435	7.13	3.10155	0.225	4.31	59.41191333
703	504	0.435	0.935	0.406725	0.225	4.31	7.791043333
703	505	0.435	0.935	0.406725	0.225	4.31	7.791043333
703	506	0.435	0.935	0.406725	0.225	4.31	7.791043333
703	507	0.435	0.935	0.406725	0.225	4.31	7.791043333

APPENDIX U. BATTERY MODEL CONDUCTOR DATA ENTRY

```
èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                            □
□ SqNo FACTOR From    To     Cond. Value  L/R Description                    □
□    1 1      1       101    1000          L  GEOMETRY TO LOWER PLATE NODE   □
□    2 1      2       102    1000          L  GEOMETRY TO LOWER PLATE NODE   □
□    3 1      3       103    1000          L  GEOMETRY TO LOWER PLATE NODE   □
□    4 1      4       104    1000          L  GEOMETRY TO LOWER PLATE NODE   □
□    5 1      5       105    1000          L  GEOMETRY TO LOWER PLATE NODE   □
□    6 1      6       106    1000          L  GEOMETRY TO LOWER PLATE NODE   □
□    7 1      7       107    1000          L  GEOMETRY TO LOWER PLATE NODE   □
□    8 1      8       201    1000          L  GEOMETRY TO BATTERY A NODE     □
□    9 1      9       202    1000          L  GEOMETRY TO BATTERY A NODE     □
□   10 1      10      203    1000          L  GEOMETRY TO BATTERY A NODE     □
□   11 1      11      204    1000          L  GEOMETRY TO BATTERY A NODE     □
□   12 1      12      205    1000          L  GEOMETRY TO BATTERY A NODE     □
□   13 1      13      206    1000          L  GEOMETRY TO BATTERY A NODE     □
□   14 1      14      301    1000          L  GEOMETRY TO DCS NODE           □
□   15 1      15      302    1000          L  GEOMETRY TO DCS NODE           □
□   16 1      16      303    1000          L  GEOMETRY TO DCS NODE           □
□   17 1      17      304    1000          L  GEOMETRY TO DCS NODE           □
□   18 1      18      305    1000          L  GEOMETRY TO DCS NODE           □
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                            □
□ SqNo FACTOR From    To     Cond. Value  L/R Description                    □
□   19 1      19      306    1000          L  GEOMETRY TO DCS NODE           □
□   20 1      20      401    1000          L  GEOMETRY TO BATTERY B NODE     □
□   21 1      21      402    1000          L  GEOMETRY TO BATTERY B NODE     □
□   22 1      22      403    1000          L  GEOMETRY TO BATTERY B NODE     □
□   23 1      23      404    1000          L  GEOMETRY TO BATTERY B NODE     □
□   24 1      24      405    1000          L  GEOMETRY TO BATTERY B NODE     □
□   25 1      25      406    1000          L  GEOMETRY TO BATTERY B NODE     □
□   26 1      26      501    1000          L  GEOMETRY TO UPPER PLATE        □
□   27 1      27      502    1000          L  GEOMETRY TO UPPER PLATE        □
□   28 1      28      503    1000          L  GEOMETRY TO UPPER PLATE        □
□   29 1      29      504    1000          L  GEOMETRY TO UPPER PLATE        □
□   30 1      30      505    1000          L  GEOMETRY TO UPPER PLATE        □
□   31 1      31      506    1000          L  GEOMETRY TO UPPER PLATE        □
□   32 1      32      506    1000          L  GEOMETRY TO UPPER PLATE        □
□   33 1      33      601    1000          L  GEOMETRY TO STRUCTURE NODE     □
□   34 1      34      602    1000          L  GEOMETRY TO STRUCTURE NODE     □
□   35 1      35      603    1000          L  GEOMETRY TO STRUCTURE NODE     □
□   36 1      36      604    1000          L  GEOMETRY TO STRUCTURE NODE     □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëV
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT    Shift-F5Del/Pur                  End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £

SqNo	FACTOR	From	To	Cond. Value	L/R	Description
37	1	37	605	1000	L	GEOMETRY TO STRUCTURE NODE
38	1	38	606	1000	L	GEOMETRY TO STRUCTURE NODE
39	1	39	607	1000	L	GEOMETRY TO STRUCTURE NODE
40	1	40	608	1000	L	GEOMETRY TO STRUCTURE NODE
41	1	41	701	1000	L	GEOMETRY TO EPS NODE
42	1	42	702	1000	L	GEOMETRY TO EPS NODE
43	1	43	703	1000	L	GEOMETRY TO EPS NODE
44	1	44	704	1000	L	GEOMETRY TO EPS NODE
45	1	45	705	1000	L	GEOMETRY TO EPS NODE
46	1	46	706	1000	L	GEOMETRY TO EPS NODE
47	1	201	202	.80453	L	BATTERY A NODE TO NODE
48	1	201	205	.80453	L	BATTERY A NODE TO NODE
49	1	201	203	.42287	L	BATTERY A NODE TO NODE
50	1	201	206	.42287	L	BATTERY A NODE TO NODE
51	1	202	204	.42287	L	BATTERY A NODE TO NODE
52	1	202	203	1.62259	L	BATTERY A NODE TO NODE
53	1	202	206	1.62259	L	BATTERY A NODE TO NODE
54	1	203	205	1.62259	L	BATTERY A NODE TO NODE

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
55	1	203	204	.42287	L	BATTERY A NODE TO NODE
56	1	204	206	.42287	L	BATTERY A NODE TO NODE
57	1	204	205	.49804	L	BATTERY A NODE TO NODE
58	1	205	206	1.62259	L	BATTERY A NODE TO NODE
59	1	301	302	.53875	L	DCS NODE TO NODE
60	1	301	305	.53875	L	DCS NODE TO NODE
61	1	301	303	.6896	L	DCS NODE TO NODE
62	1	301	306	.6896	L	DCS NODE TO NODE
63	1	302	304	.53875	L	DCS NODE TO NODE
64	1	302	303	1.56727	L	DCS NODE TO NODE
65	1	302	306	1.56727	L	DCS NODE TO NODE
66	1	303	305	1.56727	L	DCS NODE TO NODE
67	1	303	304	.6896	L	DCS NODE TO NODE
68	1	304	306	.6896	L	DCS NODE TO NODE
69	1	304	305	.53875	L	DCS NODE TO NODE
70	1	305	306	1.56727	L	DCS NODE TO NODE
71	1	401	402	.80453	L	BATTERY B NODE TO NODE
72	1	401	405	.80453	L	BATTERY B NODE TO NODE

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                             □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                    □
□   73 1      401     403     .42287        L  BATTERY B NODE TO NODE         □
□   74 1      401     406     .42287        L  BATTERY B NODE TO NODE         □
□   75 1      402     404     .42287        L  BATTERY B NODE TO NODE         □
□   76 1      402     403     1.62259       L  BATTERY B NODE TO NODE         □
□   77 1      402     406     1.62259       L  BATTERY B NODE TO NODE         □
□   78 1      403     405     1.62259       L  BATTERY B NODE TO NODE         □
□   79 1      403     404     .42287        L  BATTERY B NODE TO NODE         □
□   80 1      404     406     .42287        L  BATTERY B NODE TO NODE         □
□   81 1      404     405     .80453        L  BATTERY B NODE TO NODE         □
□   82 1      405     406     1.62259       L  BATTERY B NODE TO NODE         □
□   83 1      1500    201     368.5         L  HEAT NODE TO BATTERY A         □
□   84 1      1500    202     950.1         L  HEAT NODE TO BATTERY A         □
□   85 1      1500    203     560.3         L  HEAT NODE TO BATTERY A         □
□   86 1      1500    204     368.5         L  HEAT NODE TO BATTERY A         □
□   87 1      1500    205     950.1         L  HEAT NODE TO BATTERY A         □
□   88 1      1500    206     560.3         L  HEAT NODE TO BATTERY A         □
□   89 1      1600    301     646.5         L  HEAT NODE TO DCS               □
□   90 1      1600    302     1077.5        L  HEAT NODE TO DCS               □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur              End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                             □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                    □
□   91 1      1600    303     1293          L  HEAT NODE TO DCS               □
□   92 1      1600    304     646.5         L  HEAT NODE TO DCS               □
□   93 1      1600    305     1077.5        L  HEAT NODE TO DCS               □
□   94 1      1600    306     1293          L  HEAT NODE TO DCS               □
□   95 1      1700    401     368.51        L  HEAT NODE TO BATTERY B         □
□   96 1      1700    402     905.1         L  HEAT NODE TO BATTERY B         □
□   97 1      1700    403     560.3         L  HEAT NODE TO BATTERY B         □
□   98 1      1700    404     368.51        L  HEAT NODE TO BATTERY B         □
□   99 1      1700    405     905.1         L  HEAT NODE TO BATTERY B         □
□  100 1      1700    406     560.3         L  HEAT NODE TO BATTERY B         □
□  101 1      206     102     443.88        L  BATTERY A TO LOWER PLATE       □
□  102 1      206     104     27.08         L  BATTERY A TO LOWER PLATE       □
□  103 1      206     105     27.08         L  BATTERY A TO LOWER PLATE       □
□  104 1      306     101     1149.3        L  DCS TO LOWER PLATE             □
□  105 1      406     103     443.88        L  BATTERY B TO LOWER PLATE       □
□  106 1      406     106     27.08         L  BATTERY B TO LOWER PLATE       □
□  107 1      406     107     27.08         L  BATTERY B TO LOWER PLATE       □
□  108 1      703     501     973.81        L  EPS TO UPPER PLATE             □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur              End
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                                □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                         □
□  109 1      703    502    27.08         L  EPS TO UPPER PLATE                  □
□  110 1      703    503    27.08         L  EPS TO UPPER PLATE                  □
□  111 1      703    504    7.791         L  EPS TO UPPER PLATE                  □
□  112 1      703    505    7.791         L  EPS TO UPPER PLATE                  □
□  113 1      703    506    7.791         L  EPS TO UPPER PLATE                  □
□  114 1      703    507    7.791         L  EPS TO UPPER PLATE                  □
□                                                                                □
□                                                                                □
□                                                                                □
□                                                                                □
□                                                                                □
□                                                                                □
□                                                                                □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur               End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

APPENDIX V. BATTERY THERMAL ANALYSIS RESULTS

```
Öââââââââââââââââââââââââââââââââ PC-ITAS âââââââââââââââââââââââââââââââââââââc
°LINE NO.      1 to      18      RESULTS REVIEW                                  °
ââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââl
*********************************************************************************
Date: 09/15/94                                                Time: 17:08:37.10
*********************************************************************************
=================================================================================
                        Thermal Analysis Parameters
=================================================================================
 1.  Solution Method:1.Steady-State 2.Transient 3. (1&2).......         1
 2.  Solution Time Step ........(minutes).....................        0.10
 3.  Final Time (minutes);if <0 then no of orbs...............       -1.00
 4.  Starting Temperature ......(Kelvin )......................     300.00
 5.  Temperature Print Interval (minutes)......................         20
 6.  No. of Iterations For Convergence (NLOOP).................       9999
 7.  Temperature Unit 1:K, 2:C, 3:F, 4:R.......................          2
 8.  Solution Accuracy Parameter (not used)....................        130
 9.  Solution Convergence Parameter (not used).................       1.30
 10. Solution Tolerance (ARLXCA, DRLXCA).......................    0.00100
 11. Transient Solution Stability Factor (not used)............      0.850
 12. Include User-Defined Network.......(Y/N)..................          Y

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu


Öââââââââââââââââââââââââââââââââ PC-ITAS âââââââââââââââââââââââââââââââââââââc
°LINE NO.     19 to      36      RESULTS REVIEW                                  °
ââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââââl
 13. Print RADK, POWER..................(Y/N)..................          N
 14. Print Transient Time/Temperature...(Y/N)..................          N
 15. Starting Temperatures Forced (No.4)(Y/N)..................          N
 16. Thermal Analyses Without Orbital Loads (Y/N)..............          N
 17. Stand-Alone Thermal Analyzer (ITAS-Format Models).........          N
 18. No. of Isolated Cavities (RADK files).....................          0

=================================================================================


/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\
                           *ITAS THERMAL ANALYSIS*
/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\
*********************************************************************************
 ITAS ABSORBED HEAT RATES FROM ORBITAL INCIDENT & IR AND UV MARICES
*********************************************************************************
*********************************************************************************
Date: 09/15/94                                                Time: 17:08:37.10

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

```
Öááááááááááááááááááááááááááááááááá PC-ITAS áááááááááááááááááááááááááááááááááááá¢
°LINE NO.      1 to      18       RESULTS REVIEW                                  °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá1
*********************************************************************************
Date: 09/16/94                                                Time: 10:17:03.10
*********************************************************************************
=================================================================================
                        Thermal Analysis Parameters
=================================================================================
 1.  Solution Method:1.Steady-State 2.Transient 3. (1&2).......          1
 2.  Solution Time Step ........(minutes)......................       0.10
 3.  Final Time (minutes);if <0 then no of orbs................      -1.00
 4.  Starting Temperature ......(Kelvin )......................     300.00
 5.  Temperature Print Interval (minutes)......................         20
 6.  No. of Iterations For Convergence (NLOOP).................       9999
 7.  Temperature Unit 1:K, 2:C, 3:F, 4:R.......................          2
 8.  Solution Accuracy Parameter (not used)....................        130
 9.  Solution Convergence Parameter (not used).................       1.30
 10. Solution Tolerance (ARLXCA, DRLXCA).......................    0.00100
 11. Transient Solution Stability Factor (not used)............      0.850
 12. Include User-Defined Network.......(Y/N)..................          Y

   Use PgDn PgUp Home End        F1Save   F10Search For    ESCQuit/Main Menu
```

```
Öááááááááááááááááááááááááááááááááá PC-ITAS áááááááááááááááááááááááááááááááááááá¢
°LINE NO.     19 to      36       RESULTS REVIEW                                  °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá1
 13. Print RADK, POWER.................(Y/N)..................          N
 14. Print Transient Time/Temperature...(Y/N)..................          N
 15. Starting Temperatures Forced (No.4)(Y/N)..................          N
 16. Thermal Analyses Without Orbital Loads (Y/N)..............          N
 17. Stand-Alone Thermal Analyzer (ITAS-Format Models).........          N
 18. No. of Isolated Cavities (RADK files).....................          0

=================================================================================


/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\
                            *ITAS THERMAL ANALYSIS*
/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\
*********************************************************************************
 ITAS ABSORBED HEAT RATES FROM ORBITAL INCIDENT & IR AND UV MARICES
*********************************************************************************
*********************************************************************************
Date: 09/16/94                                                Time: 10:17:04.10

   Use PgDn PgUp Home End        F1Save   F10Search For    ESCQuit/Main Menu
```

```
Öááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááááá¢
°LINE NO.   1423 to   1440       RESULTS REVIEW                                     °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá1
 CHECKOUT PHASE OF PC-ITAS THERMAL ANALYSIS

 TOTAL CARDS ENCOUNTERED:    2092
 TOTAL THERMAL MASSES USED (W-Min/C)=     7102.07
 TOTAL THERMAL MASSES USED (BTU/F  )=     224.440
=================================================================================
 NO. OF THERMAL NODES=            96

 ITAS STEADY-STATE SOLUTION ALGORITHM (SUCCESSIVE POINT ITERATION) PARAMETERS:
 ARLXCA=0.10000E-02, DRLXCA=0.10000E-02 NLOOP=  9999
*********************************************************************************
 ITAS STEADY-STATE SOLUTION (SUCCESSIVE POINT ITERATION)
 NO. OF ITERATIONS=   68 TOTAL INPUT ENERGY (W)=  9.6800
 SYSTEM ENERGY BALANCE (W)=  5.1598     (  53.303    %)
*********************************************************************************
 T      1=     33.71 T      2=     33.73 T      3=     33.73 T      4=     33.74
 T      5=     33.74 T      6=     33.74 T      7=     33.74 T      8=     33.69
 T      9=     33.68 T     10=     33.69 T     11=     33.69 T     12=     33.69

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

```
Öááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááááá¢
°LINE NO.   1441 to   1458       RESULTS REVIEW                                     °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá1
 T     13=     33.69 T     14=     33.72 T     15=     33.72 T     16=     33.72
 T     17=     33.72 T     18=     33.72 T     19=     33.69 T     20=     33.70
 T     21=     33.70 T     22=     33.70 T     23=     33.70 T     24=     33.69
 T     25=     33.69 T     26=     33.08 T     27=     33.08 T     28=     33.08
 T     29=     33.08 T     30=     33.08 T     31=     33.08 T     32=     33.08
 T     33=     33.44 T     34=     39.87 T     35=     38.83 T     36=     31.14
 T     37=     30.79 T     38=     33.26 T     39=     33.26 T     40=     28.56
 T     41=     33.00 T     42=     33.00 T     43=     33.97 T     44=     33.00
 T     45=     33.00 T     46=     33.97 T     47=   -273.16 T    101=     33.74
 T    102=     33.74 T    103=     33.74 T    104=     33.74 T    105=     33.74
 T    106=     33.74 T    107=     33.74 T    201=     33.69 T    202=     33.69
 T    203=     33.69 T    204=     33.69 T    205=     33.69 T    206=     33.70
 T    301=     33.72 T    302=     33.72 T    303=     33.72 T    304=     33.72
 T    305=     33.72 T    306=     33.72 T    401=     33.70 T    402=     33.70
 T    403=     33.70 T    404=     33.70 T    405=     33.69 T    406=     33.71
 T    501=     33.08 T    502=     33.08 T    503=     33.08 T    504=     33.08
 T    505=     33.08 T    506=     33.08 T    507=     33.08 T    601=     33.44
 T    602=     39.87 T    603=     38.83 T    604=     31.14 T    605=     30.79

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

```
Öááááááááááááááááááááááááááááááááá PC-ITAS áááááááááááááááááááááááááááááááááááááá¢
°LINE NO.   1459 to   1476       RESULTS REVIEW                                       °
âáááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá¹
 T   606=      33.26 T   607=     33.26 T   608=     28.56 T   701=     33.00
 T   702=      33.00 T   703=     34.00 T   704=     33.00 T   705=     33.00
 T   706=      34.00 T  1500=     33.69 T  1600=     33.72 T  1700=     33.70

                      ASCENDING NODE NUMBER : TEMPERATURE
*******************************************************************************
 ITAS STEADY-STATE SOLUTION (SUCCESSIVE POINT ITERATION)
 NO. OF ITERATIONS=   68 TOTAL INPUT ENERGY (W)=  9.6800
 SYSTEM ENERGY BALANCE (W)=  5.1598      (  53.303    %)
*******************************************************************************
 T     1=      33.710 T     2=      33.730 T     3=      33.730 T     4=      33.739
 T     5=      33.739 T     6=      33.739 T     7=      33.739 T     8=      33.688
 T     9=      33.684 T    10=      33.688 T    11=      33.688 T    12=      33.687
 T    13=      33.689 T    14=      33.721 T    15=      33.716 T    16=      33.722
 T    17=      33.722 T    18=      33.716 T    19=      33.691 T    20=      33.695
 T    21=      33.697 T    22=      33.696 T    23=      33.696 T    24=      33.692
 T    25=      33.693 T    26=      33.080 T    27=      33.080 T    28=      33.080
 T    29=      33.080 T    30=      33.080 T    31=      33.080 T    32=      33.080

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

```
Öááááááááááááááááááááááááááááááááá PC-ITAS áááááááááááááááááááááááááááááááááááááá¢
°LINE NO.   1477 to   1494       RESULTS REVIEW                                       °
âáááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá¹
 T    33=      33.439 T    34=      39.867 T    35=      38.828 T    36=      31.140
 T    37=      30.790 T    38=      33.259 T    39=      33.260 T    40=      28.561
 T    41=      32.996 T    42=      32.996 T    43=      33.972 T    44=      32.996
 T    45=      32.996 T    46=      33.966 T    47=    -273.159 T   101=      33.740
 T   102=      33.740 T   103=      33.740 T   104=      33.740 T   105=      33.740
 T   106=      33.740 T   107=      33.740 T   201=      33.689 T   202=      33.687
 T   203=      33.689 T   204=      33.688 T   205=      33.688 T   206=      33.702
 T   301=      33.722 T   302=      33.719 T   303=      33.722 T   304=      33.722
 T   305=      33.719 T   306=      33.719 T   401=      33.696 T   402=      33.697
 T   403=      33.697 T   404=      33.697 T   405=      33.695 T   406=      33.706
 T   501=      33.080 T   502=      33.080 T   503=      33.080 T   504=      33.080
 T   505=      33.080 T   506=      33.080 T   507=      33.080 T   601=      33.440
 T   602=      39.870 T   603=      38.830 T   604=      31.140 T   605=      30.790
 T   606=      33.260 T   607=      33.260 T   608=      28.560 T   701=      33.000
 T   702=      33.000 T   703=      34.000 T   704=      33.000 T   705=      33.000
 T   706=      34.000 T  1500=      33.691 T  1600=      33.722 T  1700=      33.698
                      ASCENDING NODE NUMBER : IMPRESSED Q
 Q     1=       0.000 Q     2=       0.000 Q     3=       0.000 Q     4=       0.000

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp Node — Plot Flags (X or Y)

Time	103	104	105	106	107	201	202
63.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
65.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
67.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
69.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
71.95	33.74	33.74	33.74	33.74	33.74	33.72	33.71
73.95	33.74	33.74	33.74	33.74	33.74	33.72	33.71
75.95	33.74	33.74	33.74	33.74	33.74	33.72	33.71
77.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
79.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
81.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
83.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
85.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
87.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
89.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
91.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
92.33	33.74	33.74	33.74	33.74	33.74	33.71	33.71
92.33	33.74	33.74	33.74	33.74	33.74	33.71	33.71

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp Node — Plot Flags (X or Y)

Time	203	204	205	206	301	302	303
63.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
65.95	33.71	33.71	33.71	33.72	33.72	33.72	33.72
67.95	33.71	33.71	33.71	33.72	33.73	33.72	33.73
69.95	33.72	33.71	33.71	33.72	33.73	33.73	33.73
71.95	33.72	33.72	33.72	33.72	33.73	33.73	33.73
73.95	33.72	33.72	33.72	33.72	33.73	33.73	33.73
75.95	33.72	33.72	33.71	33.72	33.73	33.72	33.73
77.95	33.71	33.71	33.71	33.71	33.72	33.72	33.73
79.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
81.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
83.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
85.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
87.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
89.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
91.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
92.33	33.71	33.71	33.71	33.71	33.72	33.72	33.72
92.33	33.71	33.71	33.71	33.71	33.72	33.72	33.72

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Tempááá¢ ÖááNode ÖáááááááPlot Flags (X or Y)

Time	304	305	306	401	402	403	404
63.95 â	33.72	33.72	33.72	33.71	33.71	33.71	33.71
65.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
67.95	33.73	33.72	33.73	33.71	33.72	33.71	33.71
69.95	33.73	33.73	33.73	33.72	33.72	33.72	33.72
71.95	33.73	33.73	33.73	33.72	33.72	33.72	33.72
73.95	33.73	33.73	33.73	33.72	33.72	33.72	33.72
75.95	33.73	33.72	33.72	33.72	33.72	33.72	33.72
77.95	33.73	33.72	33.72	33.71	33.72	33.72	33.72
79.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
81.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
83.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
85.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
87.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
89.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
91.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
92.33	33.72	33.72	33.72	33.71	33.71	33.71	33.71
92.33	33.72	33.72	33.72	33.71	33.71	33.71	33.71

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Tempááá¢ ÖááNode ÖáááááááPlot Flags (X or Y)

Time	405	406	501	502	503	504	505
63.95 â	33.71	33.71	33.08	33.08	33.08	33.08	33.08
65.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
67.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
69.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
71.95	33.72	33.72	33.08	33.08	33.08	33.08	33.08
73.95	33.72	33.72	33.08	33.08	33.08	33.08	33.08
75.95	33.72	33.72	33.08	33.08	33.08	33.08	33.08
77.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
79.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
81.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
83.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
85.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
87.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
89.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
91.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
92.33	33.71	33.71	33.08	33.08	33.08	33.08	33.08
92.33	33.71	33.71	33.08	33.08	33.08	33.08	33.08

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

```
Õåååååååååååååååååååååååååååååå PC-ITAS åååååååååååååååååååååååååååååååååå¢
•LINE NO.      1 to     18      RESULTS REVIEW                                 •
åååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååål
 TOTAL SURFACES IN THIS MODEL=   46
*********************************************************************************
                    PC-ITAS Summary of Input Parameters
          These parameters reflect the latest values assigned to them
                           prior to any computation
*********************************************************************************
Date: 09/17/94                                                 Time: 18:30:45.10
*********************************************************************************

=================================================================================
                         Thermal Analysis Parameters
=================================================================================
 1.  Solution Method:1.Steady-State 2.Transient 3. (1&2).......          2
 2.  Solution Time Step ........(minutes).....................        0.10
 3.  Final Time (minutes);if <0 then no of orbs...............       -1.00
 4.  Starting Temperature ......(Kelvin )......................      300.00
 5.  Temperature Print Interval (minutes)......................          20
 6.  No. of Iterations For Convergence (NLOOP)................        9999
 7.  Temperature Unit 1:K, 2:C, 3:F, 4:R.......................           2

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu


Õåååååååååååååååååååååååååååååå PC-ITAS åååååååååååååååååååååååååååååååååå¢
•LINE NO.     19 to     36      RESULTS REVIEW                                 •
åååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååååål
 8.  Solution Accuracy Parameter (not used)...................        1.00
 9.  Solution Convergence Parameter (not used).................        1.00
10.  Solution Tolerance (ARLXCA, DRLXCA)......................     0.00100
11.  Transient Solution Stability Factor (not used)............       0.850
12.  Include User-Defined Network.......(Y/N)..................           Y
13.  Print RADK, POWER..................(Y/N)..................           N
14.  Print Transient Time/Temperature...(Y/N)..................           N
15.  Starting Temperatures Forced (No.4)(Y/N)..................           N
16.  Thermal Analyses Without Orbital Loads (Y/N)..............           N
17.  Stand-Alone Thermal Analyzer (ITAS-Format Models).........           N
18.  No. of Isolated Cavities (RADK files).....................           0

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                           *ITAS THERMAL ANALYSIS*
/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
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PgDn PgUp Home End   ITAS Time ( ) / Temperature ( ) Results          ^^
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¤ Tempááá¢ ÖááNode                                   ÖááááááPlot Flags (X or Y) ¤
¤          °  °                                                             ¤
¤  Time    °        8         9        10        11        12        13       14¤
¤    0.00  â    26.84     26.84     26.84     26.84     26.84     26.84     26.84¤
¤    1.95       26.93     26.93     26.94     26.93     26.94     27.10     26.99¤
¤    3.95       27.06     27.06     27.06     27.06     27.07     27.23     27.19¤
¤    5.95       27.18     27.18     27.19     27.18     27.19     27.35     27.37¤
¤    7.95       27.30     27.31     27.31     27.30     27.31     27.47     27.56¤
¤    9.95       27.42     27.42     27.43     27.42     27.43     27.58     27.73¤
¤   11.95       27.54     27.54     27.54     27.54     27.54     27.69     27.91¤
¤   13.95       27.65     27.65     27.65     27.65     27.66     27.80     28.07¤
¤   15.95       27.76     27.76     27.77     27.76     27.77     27.91     28.23¤
¤   17.95       27.87     27.87     27.88     27.87     27.88     28.02     28.39¤
¤   19.95       27.98     27.98     27.98     27.98     27.98     28.12     28.54¤
¤   21.95       28.08     28.08     28.09     28.08     28.09     28.22     28.68¤
¤   23.95       28.19     28.19     28.19     28.19     28.19     28.32     28.82¤
¤   25.95       28.29     28.29     28.29     28.29     28.29     28.42     28.96¤
¤   27.95       28.38     28.39     28.39     28.38     28.39     28.51     29.09¤
¤   29.95       28.48     28.48     28.48     28.48     28.49     28.61     29.22¤
¤   31.95       28.57     28.58     28.58     28.57     28.58     28.70     29.34¤
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               S-F3Save ASCII
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PgDn PgUp Home End   ITAS Time ( ) / Temperature ( ) Results               ^^
èëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë£
¤ Tempááá¢ ÖááNode                                     ÖááááááPlot Flags (X or Y) ¤
¤          ° °                                                                    ¤
¤  Time    °      15        16        17        18        19        20        21¤
¤   0.00 â     26.84     26.84     26.84     26.84     26.84     26.84     26.84¤
¤   1.95       26.99     27.00     26.99     26.99     27.15     26.93     26.94¤
¤   3.95       27.18     27.19     27.19     27.18     27.34     27.06     27.07¤
¤   5.95       27.37     27.38     27.38     27.37     27.52     27.18     27.19¤
¤   7.95       27.55     27.56     27.56     27.55     27.70     27.30     27.31¤
¤   9.95       27.73     27.74     27.73     27.73     27.87     27.42     27.43¤
¤  11.95       27.90     27.91     27.91     27.90     28.04     27.54     27.55¤
¤  13.95       28.07     28.08     28.07     28.07     28.20     27.65     27.66¤
¤  15.95       28.23     28.24     28.23     28.23     28.35     27.77     27.77¤
¤  17.95       28.38     28.39     28.39     28.38     28.50     27.88     27.88¤
¤  19.95       28.53     28.54     28.54     28.53     28.65     27.98     27.99¤
¤  21.95       28.68     28.69     28.68     28.68     28.79     28.09     28.10¤
¤  23.95       28.82     28.83     28.82     28.82     28.93     28.19     28.20¤
¤  25.95       28.96     28.96     28.96     28.96     29.06     28.29     28.30¤
¤  27.95       29.09     29.10     29.09     29.09     29.19     28.39     28.40¤
¤  29.95       29.22     29.22     29.22     29.22     29.31     28.49     28.49¤
¤  31.95       29.34     29.35     29.34     29.34     29.43     28.58     28.59¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
                S-F3Save ASCII
   F1Plot  F2Help  F3Save Binary  F4SelPlot  F8PageLeft  F9PageRight  ESCQuit
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PgDn PgUp Home End   ITAS Time ( ) / Temperature ( ) Results          ^^
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¤ Tempáááá¢ ÖááNode                                    ÖááááááPlot Flags (X or Y) ¤
¤           °  °                                                               ¤
¤  Time     °        22        23        24        25        26        27        28¤
¤    0.00 â       26.84     26.84     26.84     26.84     26.84     26.84     26.84¤
¤    1.95         26.94     26.93     26.93     27.10     33.08     33.08     33.08¤
¤    3.95         27.06     27.06     27.06     27.23     33.08     33.08     33.08¤
¤    5.95         27.19     27.18     27.18     27.35     33.08     33.08     33.08¤
¤    7.95         27.31     27.31     27.31     27.47     33.08     33.08     33.08¤
¤    9.95         27.43     27.42     27.43     27.58     33.08     33.08     33.08¤
¤   11.95         27.54     27.54     27.54     27.70     33.08     33.08     33.08¤
¤   13.95         27.66     27.66     27.66     27.81     33.08     33.08     33.08¤
¤   15.95         27.77     27.77     27.77     27.91     33.08     33.08     33.08¤
¤   17.95         27.88     27.88     27.88     28.02     33.08     33.08     33.08¤
¤   19.95         27.99     27.98     27.98     28.12     33.08     33.08     33.08¤
¤   21.95         28.09     28.09     28.09     28.23     33.08     33.08     33.08¤
¤   23.95         28.19     28.19     28.19     28.33     33.08     33.08     33.08¤
¤   25.95         28.29     28.29     28.29     28.42     33.08     33.08     33.08¤
¤   27.95         28.39     28.39     28.39     28.52     33.08     33.08     33.08¤
¤   29.95         28.49     28.49     28.49     28.61     33.08     33.08     33.08¤
¤   31.95         28.58     28.58     28.58     28.70     33.08     33.08     33.08¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
              S-F3Save ASCII
  F1Plot  F2Help  F3Save Binary  F4SelPlot  F8PageLeft  F9PageRight  ESCQuit
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PgDn PgUp Home End   ITAS Time ( ) / Temperature ( ) Results   ^^

Tempááááᢠ ÖááNode   ÖáááááááPlot Flags (X or Y)

Time	8	9	10	11	12	13	14
0.00	30.67	30.67	30.67	30.67	30.67	30.73	31.73
1.95	30.68	30.67	30.68	30.67	30.68	30.73	31.74
3.95	30.68	30.66	30.68	30.68	30.68	30.73	31.74
5.95	30.68	30.66	30.69	30.68	30.68	30.72	31.75
7.95	30.69	30.66	30.69	30.68	30.68	30.72	31.75
9.95	30.69	30.66	30.70	30.69	30.68	30.72	31.75
11.95	30.70	30.66	30.70	30.69	30.69	30.72	31.76
13.95	30.70	30.66	30.70	30.69	30.69	30.72	31.76
15.95	30.70	30.66	30.71	30.69	30.69	30.72	31.76
17.95	30.70	30.66	30.71	30.70	30.69	30.72	31.76
19.95	30.71	30.66	30.71	30.70	30.69	30.72	31.76
21.95	30.71	30.66	30.71	30.70	30.70	30.72	31.76
23.95	30.71	30.66	30.72	30.70	30.70	30.72	31.76
25.95	30.71	30.66	30.72	30.70	30.70	30.72	31.76
27.95	30.71	30.66	30.72	30.70	30.70	30.72	31.76
29.95	30.72	30.66	30.72	30.71	30.70	30.72	31.76
31.95	30.72	30.66	30.72	30.71	30.70	30.73	31.76

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End   ITAS Time ( ) / Temperature ( ) Results   ^^

Tempááá¢ ÖááNode   ÖááááááPlot Flags (X or Y)

Time	15	16	17	18	19	20	21
0.00	31.72	31.73	31.73	31.72	31.74	30.68	30.69
1.95	31.72	31.74	31.74	31.72	31.71	30.69	30.70
3.95	31.72	31.75	31.75	31.72	31.69	30.69	30.70
5.95	31.71	31.76	31.75	31.71	31.67	30.69	30.71
7.95	31.71	31.76	31.76	31.71	31.65	30.70	30.71
9.95	31.71	31.77	31.76	31.71	31.64	30.70	30.72
11.95	31.70	31.77	31.77	31.70	31.63	30.70	30.72
13.95	31.70	31.77	31.77	31.70	31.62	30.70	30.73
15.95	31.70	31.78	31.77	31.70	31.61	30.71	30.73
17.95	31.70	31.78	31.77	31.70	31.61	30.71	30.73
19.95	31.69	31.78	31.78	31.69	31.60	30.71	30.74
21.95	31.69	31.78	31.78	31.69	31.60	30.71	30.74
23.95	31.69	31.78	31.78	31.69	31.59	30.72	30.74
25.95	31.69	31.78	31.78	31.69	31.59	30.72	30.75
27.95	31.68	31.78	31.78	31.68	31.59	30.72	30.75
29.95	31.68	31.78	31.78	31.68	31.58	30.72	30.75
31.95	31.68	31.78	31.78	31.68	31.58	30.73	30.75

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

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PgDn PgUp Home End   ITAS Time ( ) / Temperature ( ) Results              ^^
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¤ Tempáááá¢ ÖááNode                                   ÖáááááááPlot Flags (X or Y) ¤
¤          °  °                                                                 ¤
¤  Time    °       22         23         24         25         26         27         28¤
¤    0.00 â     30.68      30.68      30.68      30.74      33.08      33.08      33.08¤
¤    1.95       30.69      30.69      30.68      30.74      33.08      33.08      33.08¤
¤    3.95       30.70      30.70      30.67      30.74      33.08      33.08      33.08¤
¤    5.95       30.70      30.70      30.67      30.73      33.08      33.08      33.08¤
¤    7.95       30.71      30.70      30.67      30.73      33.08      33.08      33.08¤
¤    9.95       30.71      30.71      30.67      30.73      33.08      33.08      33.08¤
¤   11.95       30.71      30.71      30.67      30.73      33.08      33.08      33.08¤
¤   13.95       30.72      30.72      30.67      30.73      33.08      33.08      33.08¤
¤   15.95       30.72      30.72      30.67      30.73      33.08      33.08      33.08¤
¤   17.95       30.72      30.72      30.67      30.73      33.08      33.08      33.08¤
¤   19.95       30.73      30.73      30.67      30.73      33.08      33.08      33.08¤
¤   21.95       30.73      30.73      30.67      30.73      33.08      33.08      33.08¤
¤   23.95       30.73      30.73      30.67      30.73      33.08      33.08      33.08¤
¤   25.95       30.74      30.74      30.67      30.73      33.08      33.08      33.08¤
¤   27.95       30.74      30.74      30.67      30.74      33.08      33.08      33.08¤
¤   29.95       30.74      30.74      30.67      30.74      33.08      33.08      33.08¤
¤   31.95       30.74      30.74      30.68      30.74      33.08      33.08      33.08¤
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                 S-F3Save ASCII
  F1Plot   F2Help   F3Save Binary   F4SelPlot   F8PageLeft   F9PageRight   ESCQuit
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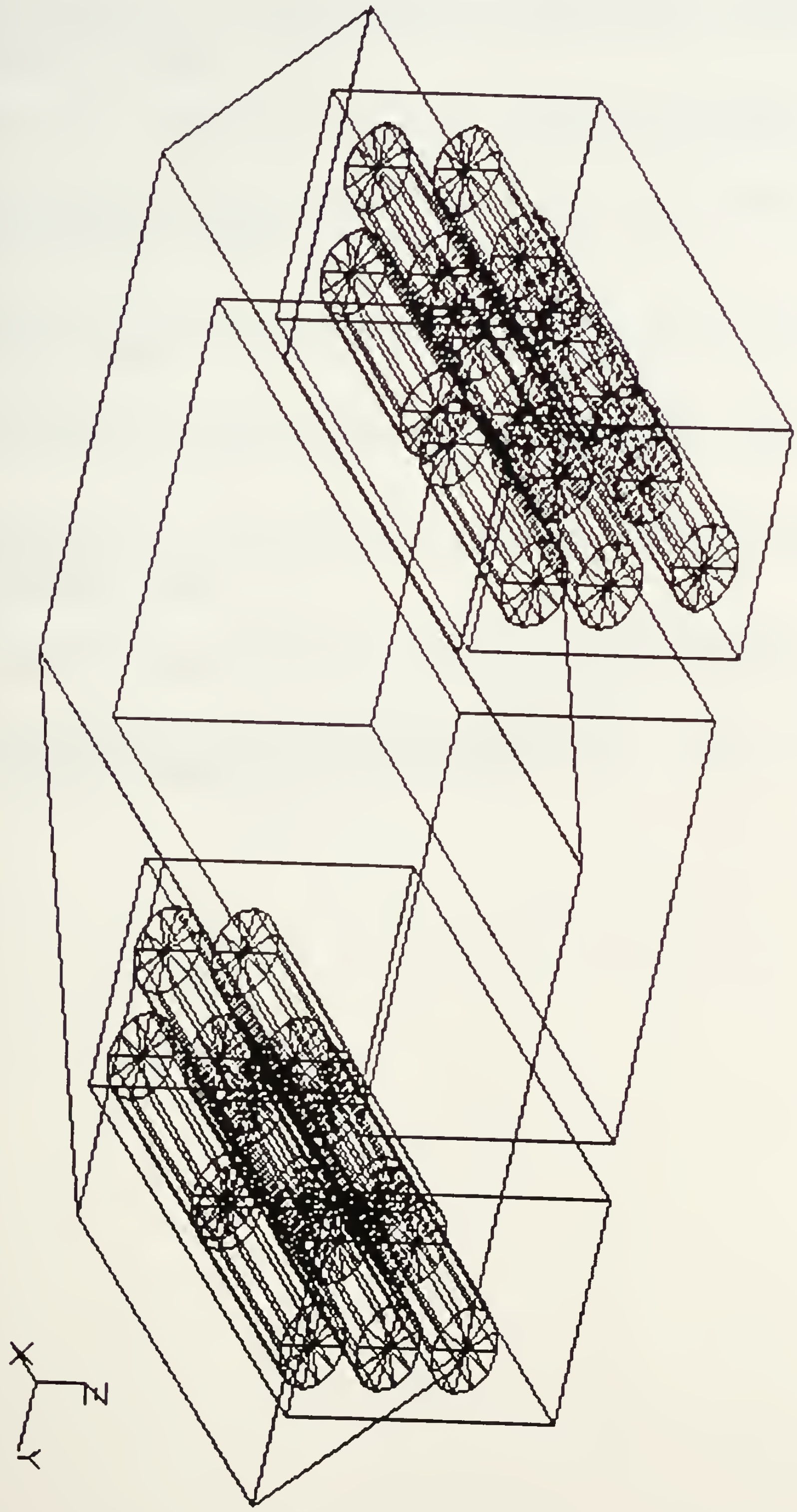
APPENDIX W. BATTERY THERMAL MODEL (INWARD VIEWING)



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   Code PMW 177
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   Arlington, Virginia 22245