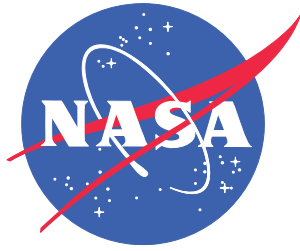


NASA/TM-2017-219619



# Estimates for the Aerodynamic Coefficients of Ringsail and Disk-Gap-Band Parachutes Operating on Mars

*Juan R. Cruz and Miranda L. Snyder  
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October 2017

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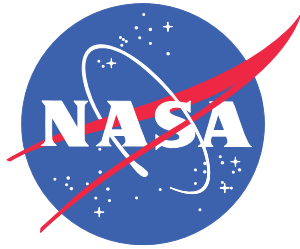
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National Aeronautics and  
Space Administration

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## Abstract

The creation of flight dynamics simulations is often part of the design, development, and flight operations of missions that include entry, descent, and landing (EDL) in their concept of operation. Such flight dynamics simulations include models for many of the EDL sub-systems. For EDL systems that include a parachute, models of the parachute's aerodynamic characteristics must be created for inclusion in the flight dynamics simulations. Models are presented for the aerodynamic coefficients (i.e.,  $C_D$ ,  $C_{Tot}$ ,  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$ ) of Supersonic Ringsail (SSRS) and Disk-Gap-Band (DGB) parachutes as functions of total porosity,  $\lambda_T$ , Mach number,  $M$ , and total angle of attack,  $\alpha_T$  (when necessary). The source aerodynamic coefficients data used for creating these models were obtained from a wind tunnel test of subscale parachutes. In this wind tunnel test, subscale parachutes of both parachute types were fabricated from two different fabrics with very different permeabilities. By varying the fabric permeability, while maintaining the parachute geometry constant, it was possible to vary  $\lambda_T$ . The fabric permeability test data necessary for the calculation of  $\lambda_T$  were obtained from samples of the same fabrics used to fabricate the subscale parachutes. Although the models for the aerodynamic coefficients are simple polynomial functions of  $\lambda_T$  and  $M$ , they are capable of producing good reproductions of the source data. The  $(\lambda_T, M)$  domains over which these models are applicable are clearly defined. The models and their domains are applicable to flight operations on Mars. The models presented in this report are not unique – other models could be created from the source data. To make the creation of alternative numerical models, the aerodynamic coefficients source data are included in this report.

## Symbols and Abbreviations

$a_0, a_1, a_2, a_3$ $a_{12}, a_{13}, a_{23}$	regressor coefficients for models of $C_D$ and $C_{Tot}$
$a_{0,\alpha_T}, a_{1,\alpha_T},$ $a_{2,\alpha_T}, a_{3,\alpha_T},$ $a_{12,\alpha_T}, a_{13,\alpha_T},$ $a_{23,\alpha_T}$	regressor coefficients for models of $C_T, C_N,$ and $C_{m,SLCP}$ at a specific value of $\alpha_T$
$C$	stand-in symbol for $C_D$ or $C_{Tot}$
$C_{\alpha_T}$	stand-in symbol for $C_T, C_N,$ or $C_{m,SLCP}$ at a specific value of $\alpha_T$
$C_D$	drag coefficient (using $S_0$ as the reference area)
$C_{m,SLCP}$	pitching moment coefficient about the suspension lines confluence point (using $S_0$ as the reference area and $D_0$ as the reference length)
$C_N$	normal force coefficient (using $S_0$ as the reference area)
$C_T$	tangential force coefficient (using $S_0$ as the reference area)
$C_{Tot}$	total force coefficient (using $S_0$ as the reference area)
$c_e$	effective porosity
$D_F$	forebody maximum diameter
$D_P$	projected diameter
$D_0$	nominal diameter
$I_{TBCP}$	pitch and yaw mass moment of inertia about the triple bridle confluence point
$K_1, K_2$	constants in the models for $c_e$
$k$	discharge coefficient
$L_{Riser}$	length of the riser
$L_{SL}$	length of the suspension lines
$M$	Mach number
$M_{Eff}$	effective Mach number (wind tunnel test)
$m_{Canopy}$	mass of the canopy
$N_{SL}$	number of suspension lines
$R^2$	coefficient of multiple determination
$R_{adj}^2$	adjusted coefficient of multiple determination
$\hat{R}e$	unit Reynolds number
$R_{I,Eff}$	effective mass moment of inertia ratio
$R_{m,Eff}$	effective mass ratio

$S_0$	nominal area
$\mathbf{V}$	freestream airspeed vector
$V_{\text{Eff}}$	effective airspeed
$\alpha_T$	total angle of attack
$\lambda_g$	geometric porosity
$\lambda_T$	total porosity
$\mu_{\text{Eff}}$	effective coefficient of viscosity
$\rho_{\text{Eff}}$	effective density
DGB	Disk-Gap-Band (parachute type)
EDL	Entry, Descent, and Landing
LowP	“Low” Permeability fabric (PIA-C-43478D Type I)
MSL	Mars Science Laboratory (mission)
PIA	Parachute Industry Association
RMSE	Root Mean Square Error
SIAD-R	Supersonic Inflatable Aerodynamic Decelerator – Robotic
SLCP	Suspension Lines Confluence Point
SN	Serial Number
SSRS	Supersonic Ringsail (parachute type)
StdP	“Standard” Permeability fabric (PIA-C-7020D Type I)
TBCP	Triple Bridle Confluence Point
TDT	Transonic Dynamics Tunnel

# 1 Introduction

The creation of flight dynamics simulations is often part of the design, development, and flight operations of missions that include entry, descent, and landing (EDL) in their concept of operation. Such flight dynamics simulations include models for many of the EDL sub-systems. For EDL systems that include a parachute, models of the parachute's aerodynamic characteristics must be created for inclusion in the flight dynamics simulations. Examples of such parachute aerodynamic models, as created for the Mars Science Laboratory (MSL) mission, can be found in reference 1. The parachute aerodynamic models for use in Mars-flight simulations need to take into account the unique operating conditions that missions encounter in the Martian atmosphere. Among these operating conditions are low atmospheric density, low dynamic pressure, and a broad range of Mach numbers (subsonic to supersonic).

This report presents models for the aerodynamic coefficients of two parachute types suitable for use on Mars. The source data used to create these models were obtained from two test programs. The first test program involved wind tunnel testing of subscale parachutes; this test yielded the source aerodynamic coefficients data (ref. 2). The second test program involved the measurement of the permeability characteristics of the fabrics used to fabricate the subscale parachute models used in the wind tunnel test (ref. 3). Using these fabric permeability data, the total porosities,  $\lambda_T$ , of the parachutes were determined.

The drag,  $C_D$ , and total force,  $C_{Tot}$ , coefficients were modeled as functions of the total porosity,  $\lambda_T$ , and effective<sup>1</sup> Mach number,  $M_{Eff}$ . The static coefficients,  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$  (defined later in this report), were modeled as functions of  $\lambda_T$ ,  $M_{Eff}$ , and the total angle of attack,  $\alpha_T$ . The range of applicability of the models are Mach numbers from approximately 0.25 to 0.50 (for all models) and total angles of attack less than or equal to 17 degrees (for the static coefficients models). The ranges of total porosity values for which the models are valid vary with the parachute type and are specified with the models in subsequent sections of this report.

In the Source Tests and Data section of this report the wind tunnel and fabric permeability tests are described, and the results relevant to the report are presented. The following section, Drag and Total Force Coefficients Modeling, describes the creation of, and resulting models for,  $C_D$  and  $C_{Tot}$ . Next, the Static Coefficients Modeling section similarly describes the creation of, and resulting models for,  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$ . A Concluding Remarks section closes the main text of the report.

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<sup>1</sup> The term "effective" in this report is used to describe the wind tunnel test operating conditions (e.g., Mach number, airspeed, density, coefficient of viscosity) at the parachute canopy, including the correction for wind tunnel blockage. In other words, the "effective" test conditions are the "freestream" test conditions corrected for wind tunnel blockage. In free-flight the effective and freestream conditions are identical.

## 2 Source Tests and Data

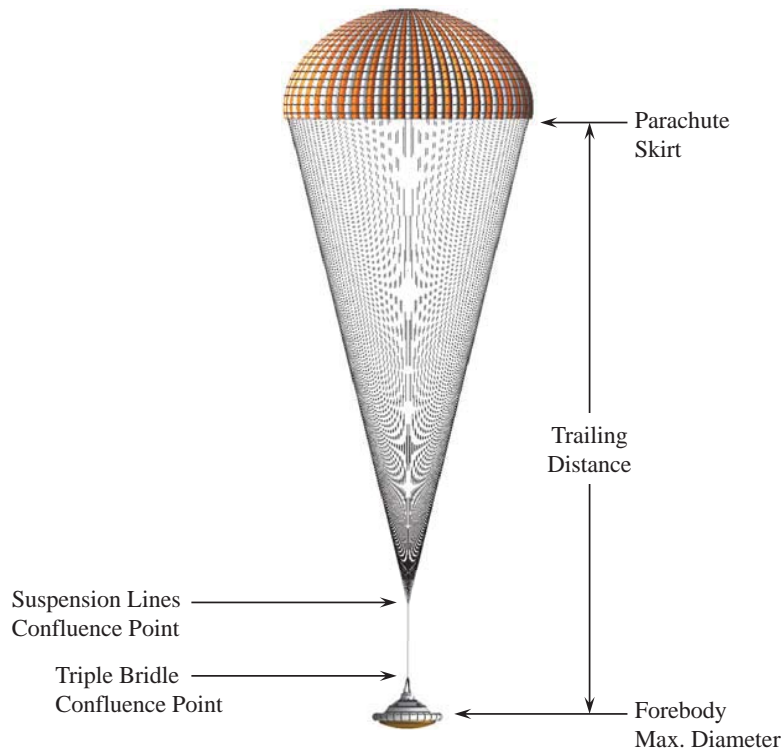
### 2.1 Wind Tunnel Test

A subsonic wind tunnel test of two parachute types for use on missions to Mars was conducted at the NASA Langley Research Center Transonic Dynamics Tunnel (TDT) during November 2014 using subscale model parachutes (ref. 2). This test was conducted on two types of parachutes: Supersonic Ringsail (SSRS) and Disk-Gap-Band (DGB). These two parachute types, with their appropriate forebodies, are shown in figures 1 and 2, respectively. The forebodies are the supersonic inflatable aerodynamic decelerator-robotic (SIAD-R) for the SSRS parachutes (ref. 4), and the MSL backshell for the DGB parachutes (ref. 1). The presence of the forebodies during the tests was important to capture the effect of their wakes on the parachute aerodynamic characteristics. The scales of the models were 5.0 percent (nominal) for the SSRS parachutes and 6.7 percent (nominal) for the DGB parachutes. All important elements of the parachute and forebody models were geometrically similar to their full-scale counterparts (e.g., trailing distance to parachute diameter ratio, forebody diameter to parachute diameter ratio). Details of the parachutes and forebodies are presented in table 1. For each of the parachute types, models were fabricated using one of two fabrics described by the Parachute Industry Association (PIA) specification PIA-C-7020D Type I or PIA-C-44378D Type I. For convenience in notation, these two fabric types will be denoted as Standard Permeability (StdP) and Low Permeability (LowP), respectively, for the rest of this report. Thus, there were four parachute type/fabric combinations: SSRS/StdP, SSRS/LowP, DGB/StdP, and DGB/LowP. The two fabrics, StdP and LowP, were manufactured per the PIA specifications cited in references 5 and 6, respectively. These two parachute fabrics have very different permeability characteristics. Using two parachute fabrics with different permeability characteristics allowed for the total porosity of the parachutes to be varied while retaining the same parachute geometry and test conditions. Tests were conducted in air at a variety of densities<sup>2</sup> and Mach numbers.

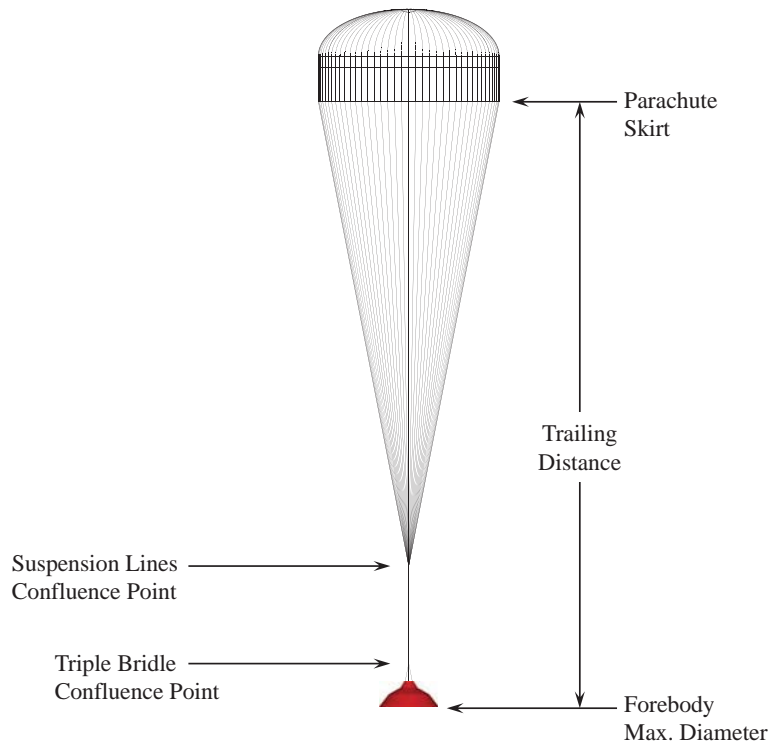
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<sup>2</sup> The TDT can operate at very low sub-atmospheric densities. For the wind tunnel test results presented herein, the density varied by a factor of 5.4.





**Figure 1. SSRS parachute and SIAD-R forebody overall geometry. (Image credit: Jet Propulsion Laboratory)**



**Figure 2. DGB parachute and MSL forebody (backshell) overall geometry. (Backshell image credit: Karl T. Edquist, NASA Langley Research Center)**

**Table 1. Details of the parachutes and forebodies.**

	SSRS/SIAD-R		DGB/MSL Backshell	
	Full-Scale	Model	Full-Scale	Model
Scale (%)	100	5.0000	100	6.7041
Nominal Diameter, $D_0$ (ft)	100.1	5.003	70.04	4.696
Nominal Area, $S_0$ (ft <sup>2</sup> )	7864	19.66	3853	17.32
Projected Diameter / Nominal Diameter, $D_P/D_0$		0.760		0.734
Geometric Porosity, $\lambda_g$ (%)	14.9	15.0	12.80	12.85
Number of Suspension Lines, $N_{SL}$	96	48	80	40
Suspension Lines Length, $L_{SL}$ (ft)	170.1	8.506	120.0	8.045
Riser Length, $L_{Riser}$ (ft)	20.02	1.001	24.76	1.660
Forebody Maximum Diameter, $D_F$ (ft)	19.69	0.984	14.54	0.975
Distance from Forebody Maximum Diameter to Triple Bridle Confluence Point (ft)	5.167	0.258	6.41	0.430

Notes to table 1

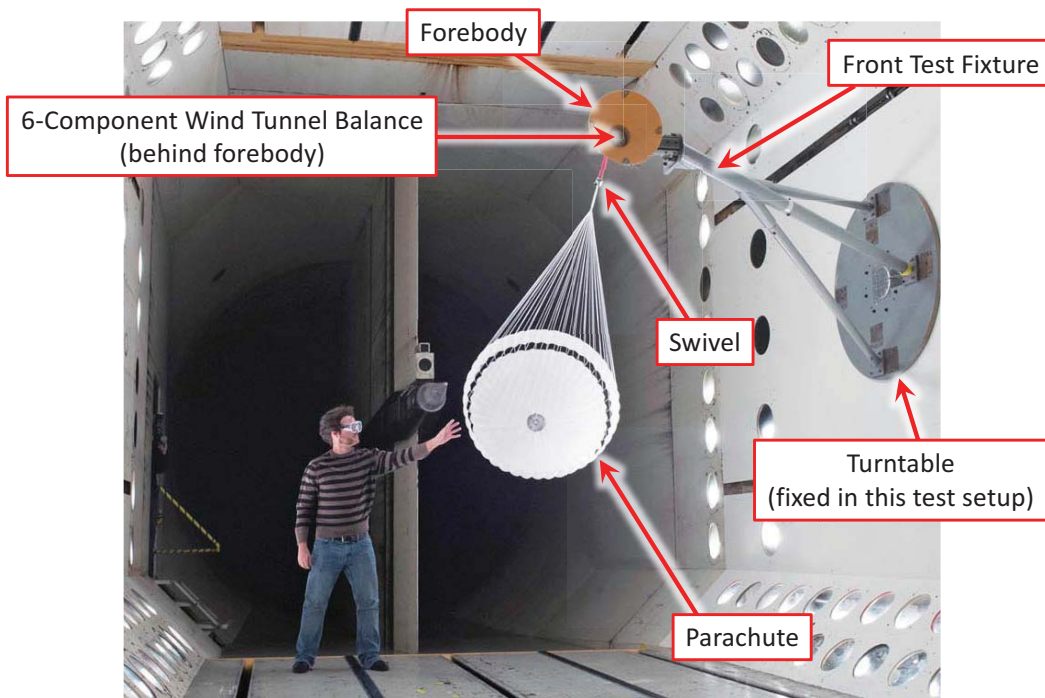
- 1) All quantities are as-designed except for  $D_P/D_0$ . The as-built parachute/forebody systems have slight variations from the numbers stated here.
- 2) The ratio  $D_P/D_0$  was determined from photographs taken during the wind tunnel test. This is not an as-designed quantity.
- 3) The geometric porosity is calculated using the parachute's constrained vent area.
- 4) The riser length,  $L_{Riser}$ , is the distance from the suspension lines confluence point to the triple bridle confluence point. See figures 1 and 2.
- 5) Additional details on the DGB parachute geometry can be found in ref. 1.

Results from this wind tunnel test included the parachute drag and total force coefficients ( $C_D$  and  $C_{Tot}$ , respectively) as well as the static coefficients ( $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$ ). The forces on the forebodies were not measured; thus, all coefficients were for the parachutes, not the total parachute/forebody system. The test setup for the drag and total force coefficients is shown in figure 3. The test setup for the static coefficients is shown in figure 4. Definitions and sign conventions for the static coefficients are shown in figure 5. Because the parachutes being considered here are assumed to be axisymmetric, the normal force associated with  $C_N$  lies in the total angle of attack plane.<sup>3</sup> Similarly, the pitching moment associated with  $C_{m,SLCP}$  is perpendicular to the total angle of attack plane. Note that the moment defined by  $C_{m,SLCP}$  is about

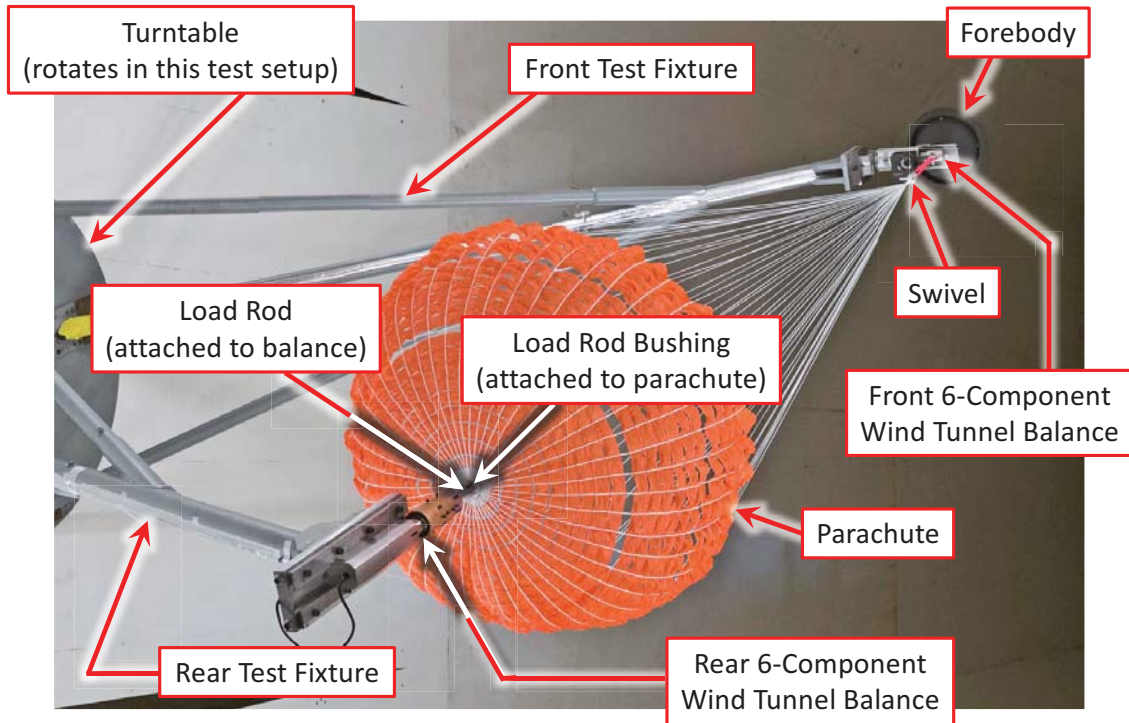
<sup>3</sup> The total angle of attack plane is defined as the plane that includes the freestream airspeed vector,  $\mathbf{V}$ , and the parachute's axis of symmetry. The plane of the paper in figure 5 is the total angle of attack plane.

the suspension lines confluence point (SLCP) as shown in figure 5. The drag and total force coefficients test setup allowed the parachute to oscillate, rotating about the triple bridge confluence point (i.e., the attachment point to the wind tunnel balance). The drag and total force coefficients are “long-term” averages for time intervals during which the parachutes oscillated and occupied various locations downstream of the forebodies. The static coefficients are also “long-term” averages, but the parachute’s total angle of attack was held at a fixed value by the test setup during the data acquisition time intervals. All coefficients used the parachute nominal area,  $S_0$ , as the reference area. Moment coefficients used the parachute nominal diameter,  $D_0$ , as the reference length.

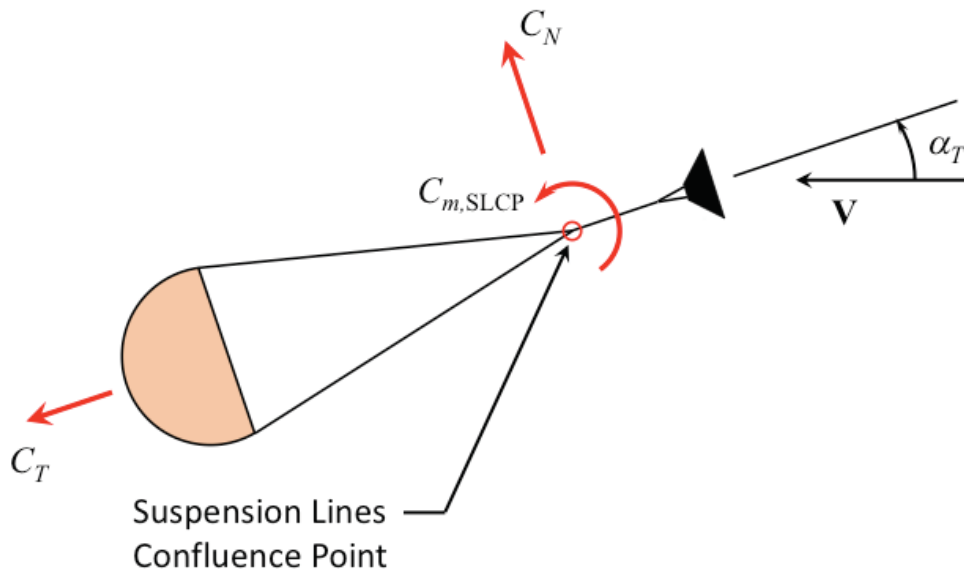
This section has just included a brief summary of the model parachutes and wind tunnel test. For more details, the reader should consult reference 2.



**Figure 3. Drag and total force coefficients test setup.**



**Figure 4. Static coefficients test setup.**



**Figure 5. Definition of the static coefficients.**

## 2.2 Fabric Permeability, Effective Porosity, and Total Porosity

The permeability<sup>4</sup> of the StdP and LowP fabrics was measured in air over a wide range of differential pressures. From these permeability results, the fabric's dimensionless effective porosities,  $c_e$ , were calculated and modeled as functions of the unit Reynolds number,  $\hat{R}e$  (the dimension of  $\hat{R}e$  is 1/Length). These models for  $c_e(\hat{R}e)$  were of the form

$$c_e = \frac{-K_2}{2K_1\hat{R}e} + \sqrt{\left(\frac{K_2}{2K_1\hat{R}e}\right)^2 + \frac{1}{2K_1}} \quad (1)$$

where  $K_1$  and  $K_2$  are the effective porosity modeling constants ( $K_1$  is dimensionless and  $K_2$  has the dimension 1/Length), dependent on the fabric type. The value of  $\hat{R}e$  was calculated for each parachute and test condition from

$$\hat{R}e = \frac{\rho_{\text{Eff}} V_{\text{Eff}}}{\mu_{\text{Eff}}} \left( \frac{D_0}{D_P} \sqrt{C_D} \right) \quad (2)$$

where  $D_P$  is the projected diameter of the parachute, and  $\rho_{\text{Eff}}$ ,  $V_{\text{Eff}}$ , and  $\mu_{\text{Eff}}$  are the effective test density, airspeed, and coefficient of viscosity, respectively, at the particular test condition (see footnote 1 for the definition of “effective”).

With  $c_e$  having been calculated, the total porosities of the parachutes were calculated from

$$\lambda_T = k\lambda_g + (1 - \lambda_g)c_e \quad (3)$$

where  $\lambda_g$  is the geometric porosity of the parachute, and  $k$  is the discharge coefficient. In the present work it was assumed that  $k = 0.7$ .<sup>5</sup> The quantities  $k$ ,  $\lambda_g$ , and  $\lambda_T$  are dimensionless. The

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<sup>4</sup> Fabric permeability is the volumetric flow of fluid through the fabric per unit area per unit time (e.g., ft<sup>3</sup>/(ft<sup>2</sup>•s)) at a given differential pressure across the fabric.

<sup>5</sup> The value  $k = 0.7$ , chosen for the present set of calculations, was based on the range of values suggested in reference 8. After the present work was completed, the first author of the present report was made aware of reference 9, in which values for  $k$  based on computational fluid dynamics analyses were presented. For a DGB parachute of similar (but not identical) geometry to those in the present study, the value  $k = 0.932$  was calculated and presented in reference 9.

A partial check was conducted on the effect of changing the value of  $k$  (which affects the value of  $\lambda_T$  calculated through equation (3)) in the creation and application of the mathematical models presented herein. As expected, changing the value of  $k$  had little effect on the aerodynamic coefficients *as long as a consistent value of  $k$  is used* (i.e., the same value of  $k$  is used for creating and applying the models). This insensitivity to the value of  $k$  is due to the fact that the mathematical models are intended to be used for parachutes of essentially identical geometry, with only small changes in  $\lambda_g$  due to manufacturing variability. Based on this check it was determined that it was not

data needed for the calculations described in equations (1) to (3) for the subscale parachute models are given in Appendix A.

The approach used here for modeling the fabric permeability and calculating the total porosity was presented by Lingard and Underwood in reference 7 and Lingard in reference 8. Details on the permeability and effective porosity of the StdP and LowP fabrics were presented in reference 3.

### 2.3 Source Data

It was decided to model the drag, total force, and static coefficients using the total porosity and Mach number as the independent variables. These two quantities were chosen as the independent variables because they (1) are dimensionless, (2) are known to have significant effects on the aerodynamic characteristics, (3) are directly applicable to full-scale parachutes, and (4) yielded good models within the  $(\lambda_T, M_{\text{Eff}})$  range of interest.

The source data used for modeling the drag and total force coefficients for the SSRS and DGB parachutes are presented in tables 2 and 3, respectively. The Run/Group identification and values of  $\lambda_T$  and  $M_{\text{Eff}}$  for the static coefficients of the SSRS and DGB parachutes are presented in tables 4 and 5, respectively. (Run/Group is a convenient identifier for a specific parachute type, fabric, and test condition.) The static coefficients  $C_T$ ,  $C_N$ , and  $C_{m,\text{SLCP}}$  as functions of  $\alpha_T$  for the values of  $\lambda_T$  and  $M_{\text{Eff}}$  listed in tables 4 and 5 are presented in Appendix B. The complete data set from the wind tunnel test in reference 2 includes test conditions at lower values of  $M_{\text{Eff}}$  (0.09 to 0.17). These additional data were not considered in the present work for two reasons. First, because the lower Mach numbers are not likely to occur in a mission to Mars given Mars' thin atmosphere (for example, the descent Mach number of MSL at descent stage separation was 0.324, see reference 10). Second, because trying to fit the simple models used in the present work over the complete data set (i.e., including the lower values of  $M_{\text{Eff}}$ ) reduced the fidelity of the models in the range of Mach numbers of interest for Mars.

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necessary to re-create the mathematical models using a different value of  $k$ , as long as  $k = 0.7$  is used in their application, and the parachutes are of essentially identical geometry to the wind tunnel model parachutes.

For readers interested in recalculating the values of  $\lambda_T$  for values of  $k$  other than 0.7, the required data are presented in Appendix A.

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**Table 2. Drag and total force coefficient data for the SSRS parachutes.**

Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$	$C_D$	$C_{\text{Tot}}$
StdP	15/47	0.1411	0.257	0.612	0.613
	15/46	0.1365	0.257	0.618	0.619
	15/45	0.1367	0.333	0.622	0.622
	15/44	0.1284	0.258	0.626	0.626
	15/43	0.1336	0.516	0.643	0.644
	15/42	0.1277	0.413	0.637	0.637
	15/41	0.1290	0.517	0.650	0.651
LowP	12/33	0.1063	0.261	0.658	0.658
	12/32	0.1062	0.337	0.667	0.668
	12/31	0.1060	0.263	0.651	0.655
	12/30	0.1060	0.420	0.676	0.677
	12/29	0.1061	0.523	0.702	0.702

**Table 3. Drag and total force coefficient data for the DGB parachutes.**

Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$	$C_D$	$C_{\text{Tot}}$
StdP	17/68	0.1212	0.255	0.564	0.564
	17/67	0.1163	0.254	0.565	0.565
	17/66	0.1166	0.331	0.568	0.568
	17/65	0.1083	0.255	0.573	0.573
	17/64	0.1134	0.513	0.586	0.586
	17/63	0.1073	0.409	0.583	0.584
	17/62	0.1087	0.512	0.589	0.589
LowP	16/56	0.0847	0.256	0.631	0.632
	16/55	0.0844	0.256	0.621	0.624
	16/54	0.0844	0.332	0.623	0.624
	16/53	0.0841	0.257	0.618	0.623
	16/52	0.0843	0.514	0.644	0.644
	16/51	0.0841	0.411	0.626	0.629
	16/50	0.0842	0.514	0.642	0.643

**Table 4. Values of  $\lambda_T$  and  $M_{\text{Eff}}$  for the static coefficients data of the SSRS parachutes.**

Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$
StdP	21/8	0.1411	0.257
	21/7	0.1365	0.257
	21/6	0.1368	0.333
	20/5	0.1292	0.257
	20/4	0.1340	0.515
	19/3	0.1275	0.410
	19/2	0.1295	0.514
LowP	25/29	0.1066	0.256
	25/28	0.1063	0.256
	25/27	0.1063	0.333
	25/26	0.1060	0.256
	25/25	0.1062	0.515
	25/24	0.1060	0.411
	25/23	0.1061	0.515

**Table 5. Values of  $\lambda_T$  and  $M_{\text{Eff}}$  for the static coefficients data of the DGB parachutes.**

Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$
StdP	31/43	0.1213	0.256
	29/41	0.1165	0.255
	29/40	0.1167	0.331
	29/39	0.1085	0.256
	29/38	0.1137	0.513
	29/37	0.1077	0.410
	29/36	0.1089	0.514
LowP	33/52	0.0847	0.256
	33/51	0.0844	0.257
	33/50	0.0844	0.333
	33/49	0.0841	0.258
	33/48	0.0843	0.515
	33/47	0.0841	0.412
	33/46	0.0842	0.515



### 3 Drag and Total Force Coefficients Modeling

Linear regression models of the general form

$$C = a_0 + a_1\lambda_T + a_2M_{\text{Eff}} + a_{12}\lambda_TM_{\text{Eff}} \quad (4)$$

were created for the SSRS and DGB parachutes using the method of least squares. The quantity  $C$  in equation (4) represents either  $C_D$  or  $C_{\text{Tot}}$  as necessary. Not all regressor coefficients (i.e.,  $a_0$ ,  $a_1$ ,  $a_2$ , and  $a_{12}$ ) were used for all models. The chosen models were those that maximized  $R_{\text{adj}}^2$  subject to the requirement that all regressor coefficients had to have a  $p$ -value of 0.05 or less.<sup>6</sup> The linear regression models for  $C_D$  and  $C_{\text{Tot}}$  are presented in table 6. Note that for these models to be valid,  $\lambda_T$  needs to be calculated as described by equation (3) with  $k = 0.7$ .

The values of  $\lambda_T$  and  $M_{\text{Eff}}$  used to create the models (see tables 2 and 3) are plotted versus each other in figures 6 and 7 for the SSRS and DGB parachutes, respectively. Dotted lines show the boundaries of the convex hull domains defined by the  $(\lambda_T, M_{\text{Eff}})$  points. Applying the models at points within the dotted lines is interpolation; otherwise it is extrapolation. Inequalities approximately defining the domain boundaries for the SSRS and DGB parachutes are presented in equations (5) and (6), respectively. All inequalities must be satisfied for a point to be inside the domain. Using the models at points outside their convex hulls is not recommended as they may yield inaccurate values of the drag and total force coefficients.

Notice that the models defined by equation (4) included only the linear and interaction regressors  $\lambda_T$ ,  $M_{\text{Eff}}$ , and  $\lambda_TM_{\text{Eff}}$ . Quadratic regressors such as  $\lambda_T^2$  and  $M_{\text{Eff}}^2$  were intentionally not included in the models. The reason for this was that there were few data points inside the domains, as can be seen from figures 6 and 7; most points were on the boundaries of the domains. This limited number of data points within the domains casted doubt on the accurate identification of coefficients associated with quadratic regressors. In addition, models with quadratic coefficients would be more likely to yield inaccurate values of  $C_D$  and  $C_{\text{Tot}}$  if applied outside their domains (i.e., when extrapolating). The models defined by equation (4) are considered to be more robust to minor extrapolations.

Other dimensionless independent variables and regressors were considered for inclusion in the linear regression models. Inclusion of other regressors yielded small improvements in the fidelity of the models as determined from  $R_{\text{adj}}^2$ . However, these regressors exhibited significant collinearity. Thus, it was not possible to identify which regressor should be added to the models for full-scale parachute applications. Because of the small accuracy improvements, and the difficulty in identifying the appropriate additional regressor to add to the models, the models described by equation (4) were used in the present work. Additional discussion on this topic is presented in Appendix C.

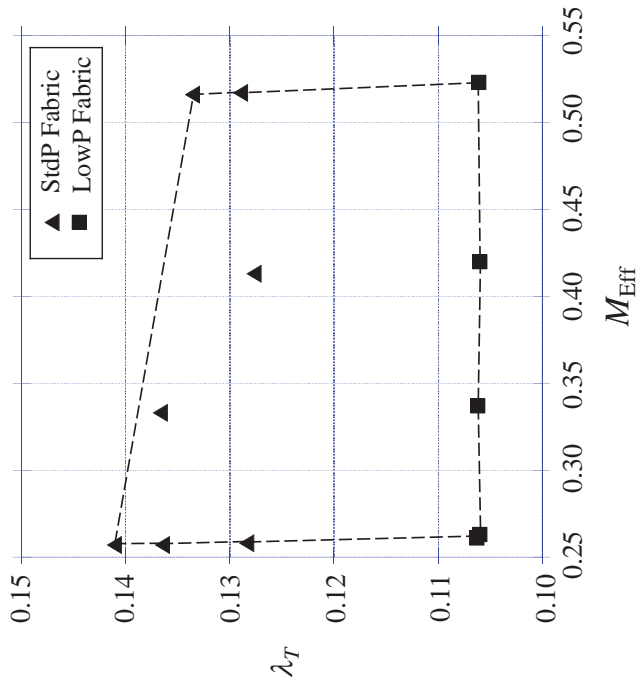
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<sup>6</sup> The regression and statistics were calculated using the JMP software published by SAS (ref. 11).

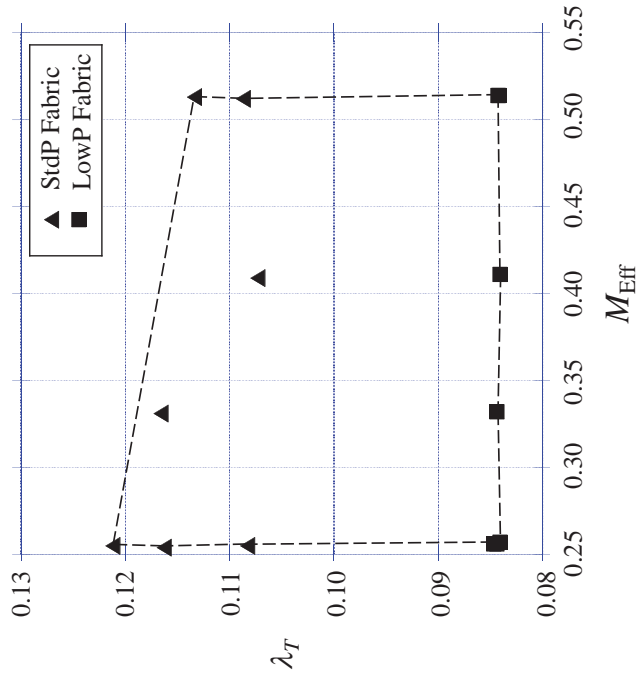
**Table 6. Models for  $C_D$  and  $C_{Tot}$ .**

Parachute Type	Coefficient	$a_0$	$a_1$	$a_2$	$a_{12}$	$R^2$	$R^2_{adj}$	RMSE	Max. $p$ -value	Max.  residual
SSRS	$C_D$	0.6031750	Not included	0.6312282	-4.199903	0.9843	0.9808	0.00365	< 0.0001	0.006
	$C_{Tot}$	0.6052009	Not included	0.6339054	-4.245635	0.9835	0.9798	0.00374	< 0.0001	0.006
DGB	$C_D$	0.7602148	-1.811319	0.0578995	Not included	0.9676	0.9617	0.00579	0.0019	0.009
	$C_{Tot}$	0.7690143	-1.872619	0.0533234	Not included	0.9719	0.9668	0.00552	0.0024	0.008

RMSE – Root Mean Square Error



**Figure 6. Domain of the  $C_D$  and  $C_{Tot}$  models for the SSRS parachutes.**



**Figure 7. Domain of the  $C_D$  and  $C_{Tot}$  models for the DGB parachutes.**

SSRS parachute domain definition for the  $C_D$  and  $C_{Tot}$  models

$$0.263 \leq M_{Eff} \leq 0.517 \tag{5a}$$

$$\lambda_T \geq 0.1063 \tag{5b}$$

$$\tag{5c}$$

DGB parachute domain definition for the  $C_D$  and  $C_{Tot}$  models

$$0.257 \leq M_{Eff} \leq 0.512 \tag{6a}$$

$$\lambda_T \geq 0.0847 \tag{6b}$$

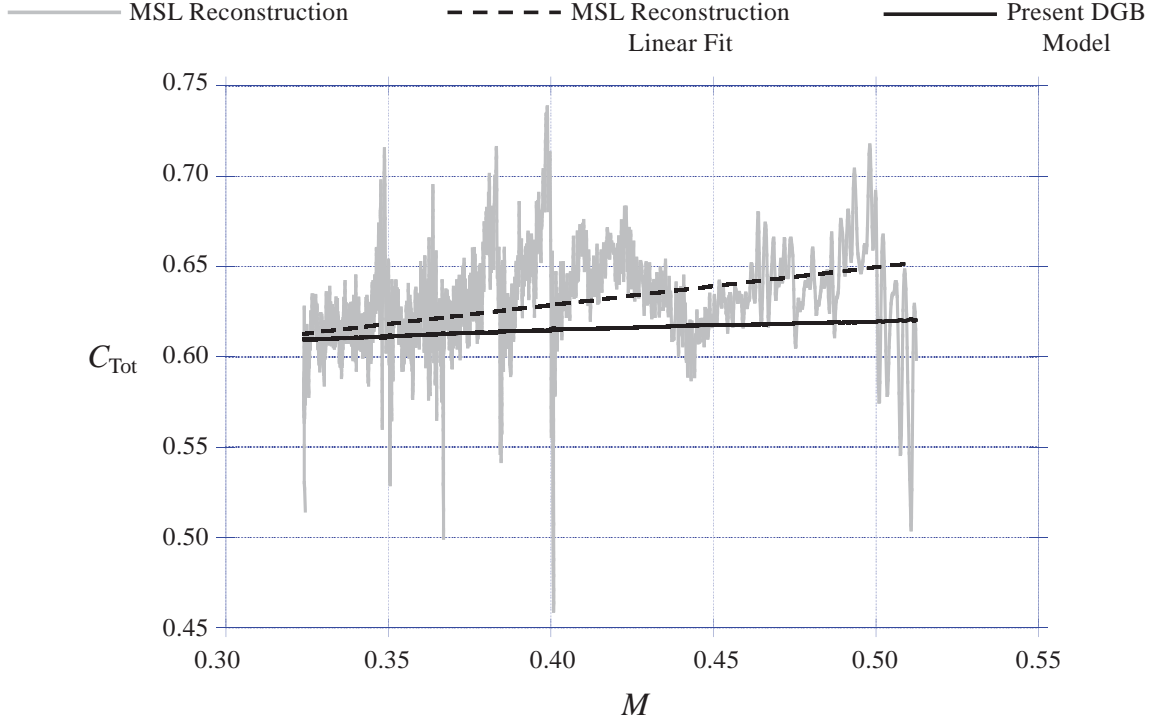
$$\lambda_T \leq 0.1290 - 0.03057M_{Eff} \tag{6c}$$

A partial check of the validity of the  $C_{Tot}$  model for the DGB parachute was conducted using data from the MSL mission (ref. 10). Figure 8 shows the values of  $C_{Tot}$  for the MSL flight reconstruction and the present DGB model. The light gray line in this figure is the raw data from the MSL reconstruction over the Mach number interval for which the present DGB model is valid [see equation (6)], and reconstruction data are available. This interval contains 89.92 s of the parachute phase of MSL; it ends with descent stage separation at a Mach number of 0.324. The oscillations in these raw data are expected; they are due to unsteadiness in the aerodynamic total force and parachute/payload oscillations. The dashed black line is a linear least squares fit to the raw data from the MSL reconstruction. (Note: the uncertainty in the MSL reconstruction on individual values of  $C_{Tot}$  was estimated to be  $\pm 0.052$  at the 95 percent level of confidence; see reference 10, table 7.) From the MSL reconstruction the values of  $\lambda_T$  and Mach number,  $M$ , were calculated.<sup>7</sup> ( $M$  is the equivalent of  $M_{Eff}$  in the present context.) The solid black line shows the results of the present DGB model using the values of  $\lambda_T$  and  $M$  obtained from the MSL reconstruction.<sup>8</sup> The agreement between the linear fit of the reconstruction data and the present model is very good. At the lowest Mach number ( $M = 0.324$ ), the two values of  $C_{Tot}$  agree within 0.5 percent. At the upper Mach number ( $M = 0.512$ ), the two values of  $C_{Tot}$  agree within 5 percent. Given the many steps and data required to create the present model, the agreement with the MSL flight reconstruction data is encouraging with regard to the accuracy of the present model.

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<sup>7</sup> The reconstructed values of  $C_{Tot}$  were used in lieu of  $C_D$  in equation (2) to calculate  $\hat{R}e$ , and subsequently  $c_e$  and  $\lambda_T$  from equations (1) and (3), respectively. The values of  $C_{Tot}$  and  $C_D$  were close enough to make this substitution acceptable. During the portion of the parachute phase discussed here ( $0.324 \leq M \leq 0.512$ ), the total porosity was nearly constant, with a range of  $0.0930 \leq \lambda_T \leq 0.0945$ . This range in  $\lambda_T$  yields a variation of  $C_{Tot}$  less than 0.003.

<sup>8</sup> Approximately 91 percent of the fabric used to fabricate the MSL parachute was PIA-C-7020B Type I and PIA-C-7020C Type I. These fabrics have the same permeability specifications as the PIA-C-7020D Type I (StdP) fabric. All three of these “7020” fabrics are woven using nylon fiber. The remaining 9 percent of the fabric used to fabricate the MSL parachute was woven to a proprietary Pioneer Aerospace specification using polyester fibers. (See reference 10 for more details on the MSL parachute.) The polyester fabric had a measured fabric permeability 9 percent higher than the StdP fabric at a differential pressure of 0.5 inches of water (standard test conditions in the U.S.). In the analysis presented here, the MSL parachute is assumed to have been constructed in its entirety from StdP fabric. Because of the small area of the MSL parachute that used the polyester fabric, and the small difference in fabric permeability between the polyester fabric and the StdP fabric, the assumption that the entire MSL parachute was constructed from StdP fabric has a negligible effect on the values of  $C_{Tot}$  calculated by the model and reported here.



**Figure 8. Comparison of the  $C_{Tot}$  values from the MSL reconstruction and the present model for the DGB parachute.**

#### 4 Static Coefficients Modeling

The source static coefficient source data (i.e.,  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$  as functions of  $\alpha_T$ ), are presented in Appendix B for the Run/Group and values of  $\lambda_T$  and  $M_{Eff}$  specified in tables 4 and 5. The data in Appendix B are presented in both graphical and tabular form. The range of  $\alpha_T$  for these data are from 0 to 17 degrees, at intervals of 0.2 degrees. These source static coefficient data were used to create the models.

Linear regression models of the general form

$$C_{\alpha_T} = a_{0,\alpha_T} + a_{1,\alpha_T} \lambda_T + a_{2,\alpha_T} M_{Eff} + a_{12,\alpha_T} \lambda_T M_{Eff} \quad (7)$$

were created for the SSRS and DGB parachutes using the method of least squares. The quantity  $C_{\alpha_T}$  in equation (7) represents  $C_T$ ,  $C_N$ , or  $C_{m,SLCP}$  as necessary, for a specific value of  $\alpha_T$ . The regressor coefficients,  $a_{0,\alpha_T}$ ,  $a_{1,\alpha_T}$ ,  $a_{2,\alpha_T}$ , and  $a_{12,\alpha_T}$ , are associated with the same specific value of  $\alpha_T$  associated with its corresponding  $C_{\alpha_T}$ . Thus, as an example, for a given parachute type (SSRS or DGB) at  $\alpha_T = 4.8^\circ$ ,

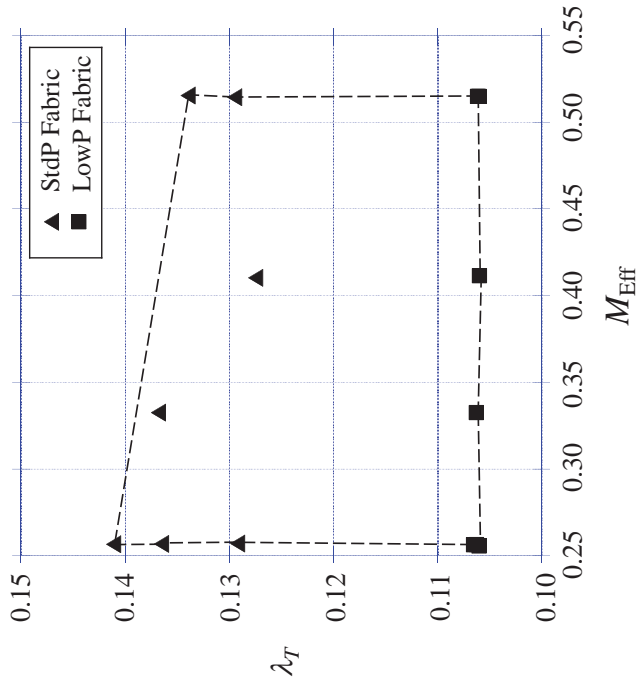
$$C_{T,\alpha_T=4.8^\circ} = a_{0,\alpha_T=4.8^\circ} + a_{1,\alpha_T=4.8^\circ} \lambda_T + a_{2,\alpha_T=4.8^\circ} M_{Eff} + a_{12,\alpha_T=4.8^\circ} \lambda_T M_{Eff} \quad (8)$$

where the values of the regressor coefficients  $a_{0,\alpha_T=4.8^\circ}$ ,  $a_{1,\alpha_T=4.8^\circ}$ ,  $a_{2,\alpha_T=4.8^\circ}$ , and  $a_{12,\alpha_T=4.8^\circ}$ , are specific to  $C_T$  at  $\alpha_T = 4.8^\circ$  and the parachute type. All models retained all regressor coefficients  $a_{0,\alpha_T}$ ,  $a_{1,\alpha_T}$ ,  $a_{2,\alpha_T}$ , and  $a_{12,\alpha_T}$ .<sup>9</sup> The linear regression models for  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$  (i.e., the values of the regressor coefficients  $a_{0,\alpha_T}$ ,  $a_{1,\alpha_T}$ ,  $a_{2,\alpha_T}$ , and  $a_{12,\alpha_T}$ ) are presented in Appendix D. For the static coefficient models to be valid,  $\lambda_T$  needs to be calculated as described by equation (3) with  $k = 0.7$ .

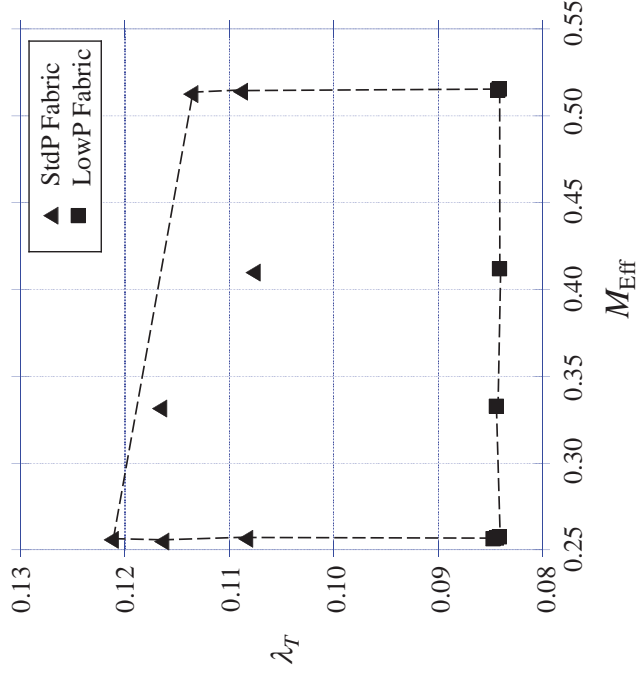
The values of  $\lambda_T$  and  $M_{\text{Eff}}$  used to create the models (see tables 4 and 5) are plotted versus each other in figures 9 and 10 for the SSRS and DGB parachutes, respectively. Dotted lines show the boundaries of the convex hull domains defined by the  $(\lambda_T, M_{\text{Eff}})$  points. Applying the models at points within the dotted lines is interpolation; otherwise it is extrapolation. Inequalities approximately defining the domain boundaries for the SSRS and DGB parachutes are presented in equations (9) and (10), respectively. These inequalities must be satisfied for a point to be inside the domains. As with the  $C_D$  and  $C_{\text{Tot}}$  models, using the static coefficient models at points outside their convex hulls is not recommended as they may yield inaccurate values of the static coefficients.

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<sup>9</sup> Note that functions of  $\alpha_T$  were not used in the models for the static coefficients. The relationships between the static coefficients and  $\alpha_T$  are complex, as can be seen from the figures in Appendix B, and thus difficult to model with simple functions.



**Figure 9. Domain of the  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$  models for the SSRS parachutes.**



**Figure 10. Domain of the  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$  models for the DGB parachutes.**

SSRS parachute domain definition for the static coefficient models

$$0.257 \leq M_{\text{Eff}} \leq 0.514 \quad (9a)$$

$$\lambda_T \geq 0.1066 \quad (9b)$$

$$\lambda_T \leq 0.1482 - 0.02765M_{\text{Eff}} \quad (9c)$$

DGB parachute domain definition for the static coefficient models

$$0.257 \leq M_{\text{Eff}} \leq 0.513 \quad (10a)$$

$$\lambda_T \geq 0.0847 \quad (10b)$$

$$\lambda_T \leq 0.1289 - 0.02964M_{\text{Eff}} \quad (10c)$$

The models defined by equation (7) include only the linear and interaction regressors:  $\lambda_T$ ,  $M_{\text{Eff}}$ , and  $\lambda_T M_{\text{Eff}}$ . Quadratic regressors such as  $\lambda_T^2$  and  $M_{\text{Eff}}^2$  were intentionally not included in the models. The reasons for this selection of regressors are the same as those described for the drag and total force coefficient models.

Other dimensionless independent variables and regressors were considered for inclusion in the linear regression models for the static coefficients. As was the case with the  $C_D$  and  $C_{\text{Tot}}$  models, adding other dimensionless regressors yielded some improvements in the fidelity of the static coefficient models. However, it was decided not to include any additional regressors to the models—the improvements were considered to have detrimental effects on the applicability of the models to full-scale parachutes. Thus, the models described by equation (7) were used in the present work. Additional discussion on this topic is presented in Appendix C.

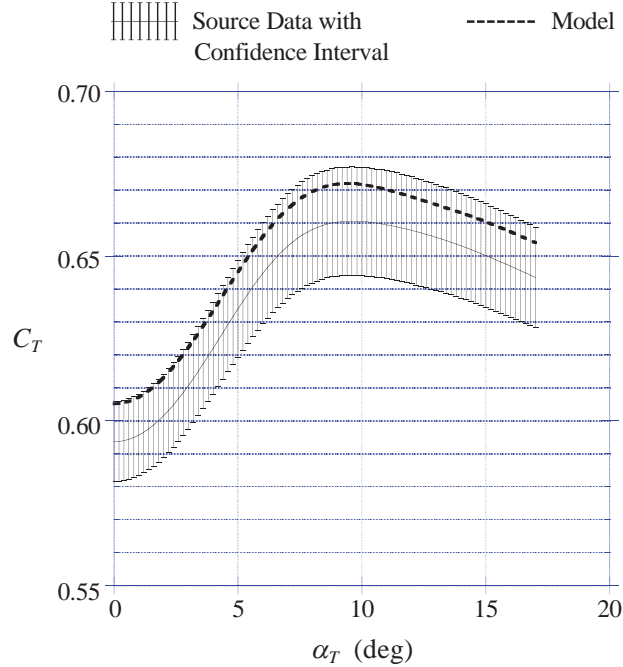
In figures B-1–B-28 (see Appendix B) the source static coefficient data and model results are shown plotted for every Run/Group listed in tables 4 and 5 (i.e., every parachute type/fabric combination and values of  $\lambda_T$  and  $M_{\text{Eff}}$  in the source static coefficient data). In each of these figures the source data and model values of  $C_T$ ,  $C_N$ , and  $C_{m,\text{SLCP}}$  are plotted versus  $\alpha_T$  for a specific Run/Group. The source data are shown as a solid line and the model values are shown as dashed lines. The scales used for the plots are the same across figures for each static coefficient.

The fidelity of the models was evaluated by comparing the source static coefficient data against the values predicted by the models as shown in figures B-1–B-28. The following observations were made by inspecting these figures:

1. In general the models performed well in reproducing the source static coefficient data.
2. The models were better at reproducing the source data for  $C_T$  as compared to  $C_N$  and  $C_{m,\text{SLCP}}$ .
3. The overall fidelity of the models was better for parachutes fabricated from LowP fabric as compared to those fabricated from StdP fabric.
4. No significant difference was found in the overall fidelity of the models for the SSRS parachutes and the DGB parachutes.

Some of the Run/Group with the largest discrepancies between the source static coefficient data and the models were selected for more detailed inspection, including consideration of the uncertainties associated with the source static coefficient data. The largest difference in  $C_T$  between the source static coefficient data and the model was observed in Run 19, Group 3 (SSRS/StdP parachute,  $\lambda_T = 0.1275$ ,  $M_{\text{Eff}} = 0.410$ ). Figure 11 shows  $C_T$  versus  $\alpha_T$  for the source data (thin solid line with uncertainty bars) and the model (dashed line). The uncertainty bars in figure 11 show the 95 percentile confidence interval around the source data, including both precision and bias uncertainty. As can be seen from figure 11, the model values are within the specified confidence interval around the source data. Thus, the difference between the source data and the model values vis-à-vis the confidence interval, and the absolute maximum difference between the source data and the model values (1.9 percent), do not constitute a significant degradation in the accuracy of the values of  $C_T$  calculated from the model. Examination of figures B-1–B-28 indicate that in all other cases the difference between the source data and model values for  $C_T$  are less than that for Run 19, Group 3.

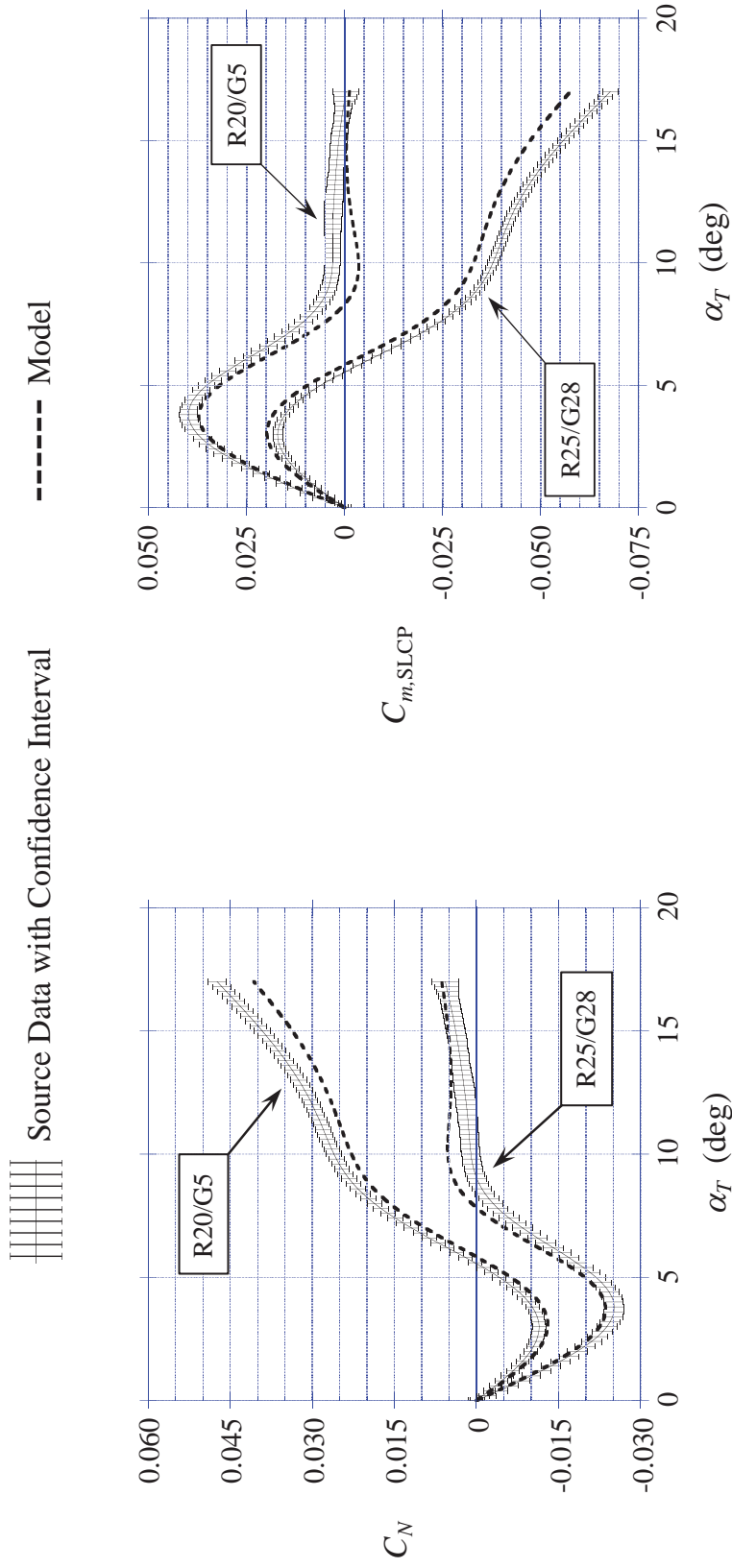




**Figure 11. Static coefficient  $C_T$  versus  $\alpha_T$  for the SSRS/StdP parachute, Run 19/Group 3,  $\lambda_T = 0.1275$ ,  $M_{\text{Eff}} = 0.410$ .**

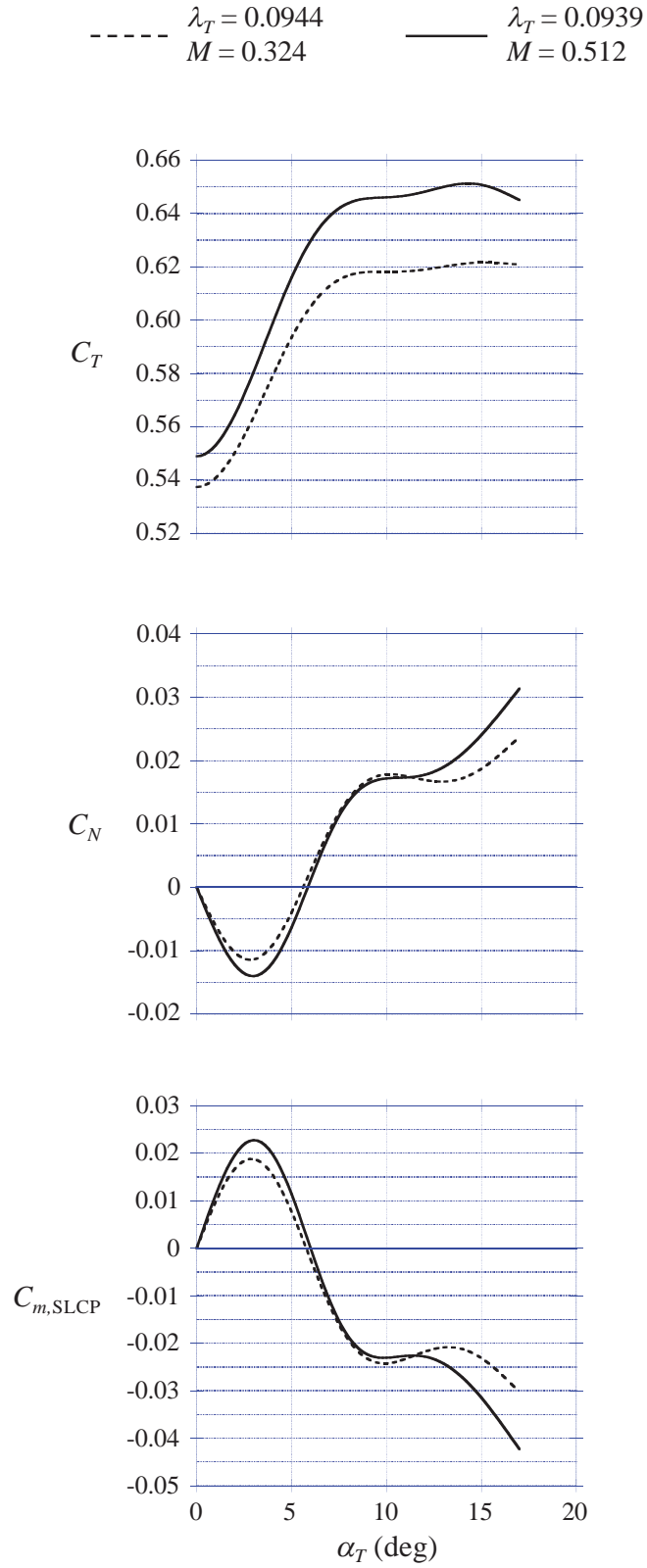
Significant differences in  $C_N$  and  $C_{m,\text{SLCP}}$  were observed for Run 20, Group 5 (SSRS/StdP parachute,  $\lambda_T = 0.1292$ ,  $M_{\text{Eff}} = 0.257$ ) and Run 25, Group 28 (SSRS/LowP parachute,  $\lambda_T = 0.1063$ ,  $M_{\text{Eff}} = 0.256$ ). Figure 12 shows  $C_N$  and  $C_{m,\text{SLCP}}$  versus  $\alpha_T$  for the source data (thin solid line with uncertainty bars) and the model (dashed line) for Run/Group 20/5 and 25/28. The meaning of the uncertainty bars is the same as that for figure 11. For the cases shown in figure 12, the models yield  $C_N$  and  $C_{m,\text{SLCP}}$  values outside the confidence intervals for their respective source data for some values of  $\alpha_T$ .

The differences between the source static coefficients data and the models have multiple explanations, two of which are discussed here. First is the simplicity of the model in equation (7), which contains only the first order linear terms in  $\lambda_T$  and  $M_{\text{Eff}}$  and their interaction term  $\lambda_T M_{\text{Eff}}$ . Even if the only independent variables retained were  $\lambda_T$  and  $M_{\text{Eff}}$ , more complex models (e.g., models including quadratic terms and/or transformations of  $\lambda_T$  and  $M_{\text{Eff}}$ ) are likely to have yielded better fidelity vis-à-vis the source static coefficients data. However, as discussed earlier, the simpler models used herein were chosen due to the distribution of the source static coefficients data within their domains and the perceived higher robustness of simpler models with respect to minor extrapolations in their use. A second explanation for the differences between the source static coefficients data and the models is likely to be the absence of other relevant dimensionless coefficients as independent variables. This issue is discussed in Appendix C.



**Figure 12. Static coefficients  $C_N$  and  $C_{m,SLCP}$  versus  $\alpha_T$  for the SSRS/StdP parachute, Run 20/Group 5,  $\lambda_T = 0.1292$ ,  $M_{Eff} = 0.257$ , and the SSRS/LowP parachute, Run 25/Group 28,  $\lambda_T = 0.1063$ ,  $M_{Eff} = 0.256$ .**

The models were used to calculate the static coefficients of the MSL parachute, assuming it was fabricated from StdP fabric (see footnote 8). These calculations were performed at two flight conditions: the upper and lower Mach number limits shown in figure 8. The corresponding values of  $\lambda_T$  were calculated from the reconstructed MSL flight parameters (e.g., airspeed, density, coefficient of viscosity) at the two Mach numbers. The values of  $\lambda_T$  and  $M$  were (0.0944, 0.324) and (0.0939, 0.512). These combinations of  $\lambda_T$  and  $M$  were within the domain of the models specified in equation (10) for the DGB parachutes. The static coefficients thus calculated are shown in figure 13. The differences between the two flight conditions are principally due to the Mach number. Because the total porosity is nearly the same for these two flight conditions, total porosity is not the primary source of the differences between the curves in figure 13. Reconstructed values of the static coefficients for the MSL descent on Mars are not available; there was insufficient data to reconstruct the static coefficients. Thus, a validation comparison cannot be conducted for the modeled static coefficients shown in figure 13.



**Figure 13. Modeled static coefficients for MSL during terminal descent.**

## 5 Concluding Remarks

Models were presented for the aerodynamic coefficients (i.e.,  $C_D$ ,  $C_{Tot}$ ,  $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$ ) of SSRS and DGB parachutes as functions of total porosity,  $\lambda_T$ , Mach number,  $M$ , and total angle of attack,  $\alpha_T$  (when necessary). The source aerodynamic coefficients data for creating these models were obtained during the wind tunnel test described in reference 2. The total porosity for these parachutes was calculated using the fabric permeability test data presented in reference 3. Although the models are simple functions of  $\lambda_T$  and  $M$ , they provide good reproductions of the source aerodynamic coefficient data. The  $(\lambda_T, M)$  domains of applicability for these models were defined. These domains are applicable to flight operations on Mars.

The models presented herein are not unique—other models could be created from the source data. To make this possible the aerodynamic coefficients source data are included in this report (see tables 2–5 and Appendix B).

## 6 References

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## Appendix A. Data for the Calculation of $\lambda_T$

This appendix presents the data needed for the calculation of  $\lambda_T$  as described by equations (1) to (3) for the subscale parachute models. Table A-1 provides the values of  $K_1$  and  $K_2$  for the StdP and LowP fabrics. Table A-2 provides information on the parachutes. Tables A-3–A-6 present additional data required for calculating  $\lambda_T$  (these tables are related to, and include some of the same information as, tables 2–5 in the main text of this report). Note that the last columns of tables A-3–A-6 show values of  $\lambda_T$  calculated under the assumption that  $k = 0.7$ . Alternative values of  $\lambda_T$  can be calculated from the data presented here by assuming a different value of  $k$ .

**Table A-1. Values of  $K_1$  and  $K_2$  for the StdP and LowP fabrics.**

Fabric	$K_1$ (dimensionless)	$K_2$ (1/ft)
StdP (PIA-C-7020D Type I)	1.5881679E+02	2.63019691E+06
LowP (PIA-C-44378D Type I)	1.1303031E+04	2.37148232E+08

Data from reference 3.

**Table A-2. Model parachute properties.**

Type	Serial Number (SN)	Fabric	$D_0$ (ft)	$D_P / D_0$	$\lambda_g$
SSRS	627385	StdP	4.920	0.760	0.151
	627387	LowP	4.939	0.760	0.151
DGB	627303	LowP	4.713	0.734	0.1197
	627304	StdP	4.682	0.734	0.1208
	627305	StdP	4.683	0.734	0.1210

**Table A-3. Additional data required for calculating  $\lambda_T$  for the SSRS parachutes drag and total force coefficients by Run/Group.**

Run/Group	Model Parachute SN	$\rho_{\text{Eff}}$ (slug/ft <sup>3</sup> )	$V_{\text{Eff}}$ (ft/s)	$\mu_{\text{Eff}}$ (lb•s/ft <sup>2</sup> )	$C_D$	$\hat{R}e$	$c_e$	$\lambda_T$ ( $k = 0.7$ )
15/47	627385	6.258E-04	289.9	3.806E-07	0.6121	4.907E+05	4.172E-02	0.1411
15/46	627385	4.168E-04	290.1	3.803E-07	0.6184	3.290E+05	3.632E-02	0.1365
15/45	627385	3.234E-04	374.5	3.780E-07	0.6219	3.325E+05	3.648E-02	0.1367
15/44	627385	2.286E-04	291.1	3.800E-07	0.6255	1.822E+05	2.676E-02	0.1284
15/43	627385	1.607E-04	572.9	3.700E-07	0.6435	2.626E+05	3.283E-02	0.1336
15/42	627385	1.338E-04	461.3	3.742E-07	0.6369	1.733E+05	2.591E-02	0.1277
15/41	627385	1.153E-04	572.1	3.683E-07	0.6500	1.900E+05	2.746E-02	0.1290
12/33	627387	4.137E-04	294.4	3.806E-07	0.6576	3.414E+05	7.115E-04	0.1063
12/32	627387	2.819E-04	379.6	3.783E-07	0.6671	3.040E+05	6.351E-04	0.1062
12/31	627387	2.266E-04	297.4	3.802E-07	0.6510	1.882E+05	3.955E-04	0.1060
12/30	627387	1.323E-04	469.2	3.745E-07	0.6762	1.794E+05	3.771E-04	0.1060
12/29	627387	1.190E-04	578.9	3.689E-07	0.7016	2.058E+05	4.321E-04	0.1061



**Table A-4. Additional data required for calculating  $\lambda_T$  for the DGB parachutes drag and total force coefficients by Run/Group.**

Run/Group	Model Parachute SN	$\rho_{\text{Eff}}$ (slug/ft <sup>3</sup> )	$V_{\text{Eff}}$ (ft/s)	$\mu_{\text{Eff}}$ (lb•s/ft <sup>2</sup> )	$C_D$	$\hat{R}e$	$c_e$	$\lambda_T$ ( $k = 0.7$ )
17/68	627305	6.248E-04	288.1	3.803E-07	0.5635	4.842E+05	4.156E-02	0.1212
17/67	627305	4.152E-04	286.7	3.800E-07	0.5653	3.208E+05	3.595E-02	0.1163
17/66	627305	3.231E-04	372.3	3.777E-07	0.5682	3.271E+05	3.624E-02	0.1166
17/65	627305	2.343E-04	287.4	3.798E-07	0.5731	1.828E+05	2.682E-02	0.1083
17/64	627305	1.612E-04	568.9	3.697E-07	0.5862	2.588E+05	3.259E-02	0.1134
17/63	627305	1.346E-04	456.4	3.733E-07	0.5835	1.713E+05	2.572E-02	0.1073
17/62	627305	1.166E-04	566.0	3.676E-07	0.5887	1.876E+05	2.725E-02	0.1087
16/56	627303	6.242E-04	289.4	3.806E-07	0.6311	5.136E+05	1.056E-03	0.0847
16/55	627303	4.161E-04	289.4	3.803E-07	0.6213	3.401E+05	7.090E-04	0.0844
16/54	627303	3.215E-04	373.9	3.781E-07	0.6232	3.420E+05	7.127E-04	0.0844
16/53	627303	2.317E-04	289.6	3.800E-07	0.6176	1.890E+05	3.971E-04	0.0841
16/52	627303	1.610E-04	570.8	3.700E-07	0.6435	2.714E+05	5.681E-04	0.0843
16/51	627303	1.365E-04	458.7	3.738E-07	0.6265	1.807E+05	3.797E-04	0.0841
16/50	627303	1.197E-04	568.4	3.680E-07	0.6417	2.017E+05	4.235E-04	0.0842

**Table A-5. Additional data required for calculating  $\lambda_T$  for the SSRS parachutes static coefficients by Run/Group.**

Run/Group	Model Parachute SN	$\rho_{\text{Eff}}$ (slug/ft <sup>3</sup> )	$V_{\text{Eff}}$ (ft/s)	$\mu_{\text{Eff}}$ (lb•s/ft <sup>2</sup> )	$C_D$	$\hat{R}e$	$c_e$	$\lambda_T$ ( $k = 0.7$ )
21/8	627385	6.262E-04	290.0	3.805E-07	0.6121	4.913E+05	4.173E-02	0.1411
21/7	627385	4.165E-04	290.0	3.802E-07	0.6184	3.287E+05	3.631E-02	0.1365
21/6	627385	3.276E-04	373.8	3.776E-07	0.6219	3.365E+05	3.666E-02	0.1368
20/5	627385	2.425E-04	290.2	3.801E-07	0.6255	1.927E+05	2.770E-02	0.1292
20/4	627385	1.658E-04	571.7	3.697E-07	0.6435	2.705E+05	3.331E-02	0.1340
19/3	627385	1.328E-04	458.9	3.746E-07	0.6369	1.708E+05	2.567E-02	0.1275
19/2	627385	1.201E-04	569.4	3.685E-07	0.6500	1.968E+05	2.806E-02	0.1295
25/29	627387	6.264E-04	289.6	3.806E-07	0.6580	5.089E+05	1.046E-03	0.1066
25/28	627387	4.160E-04	289.5	3.802E-07	0.6576	3.379E+05	7.045E-04	0.1063
25/27	627387	3.244E-04	374.3	3.783E-07	0.6671	3.450E+05	7.188E-04	0.1063
25/26	627387	2.357E-04	288.6	3.800E-07	0.6510	1.900E+05	3.992E-04	0.1060
25/25	627387	1.631E-04	571.8	3.704E-07	0.6890	2.751E+05	5.756E-04	0.1062
25/24	627387	1.359E-04	460.1	3.745E-07	0.6762	1.807E+05	3.797E-04	0.1060
25/23	627387	1.180E-04	570.9	3.695E-07	0.7016	2.010E+05	4.220E-04	0.1061

**Table A-6. Additional data required for calculating  $\lambda_T$  for the DGB parachutes static coefficients by Run/Group.**

Run/Group	Model Parachute SN	$\rho_{\text{Eff}}$ (slug/ft <sup>3</sup> )	$V_{\text{Eff}}$ (ft/s)	$\mu_{\text{Eff}}$ (lb•s/ft <sup>2</sup> )	$C_D$	$\hat{R}e$	$c_e$	$\lambda_T$ ( $k = 0.7$ )
31/43	627304	6.344E-04	287.6	3.778E-07	0.5635	4.941E+05	4.180E-02	0.1213
29/41	627305	4.191E-04	287.6	3.798E-07	0.5653	3.251E+05	3.615E-02	0.1165
29/40	627305	3.255E-04	372.7	3.777E-07	0.5682	3.299E+05	3.637E-02	0.1167
29/39	627305	2.354E-04	288.9	3.788E-07	0.5731	1.852E+05	2.703E-02	0.1085
29/38	627305	1.652E-04	567.6	3.687E-07	0.5862	2.652E+05	3.299E-02	0.1137
29/37	627305	1.380E-04	456.2	3.719E-07	0.5835	1.761E+05	2.619E-02	0.1077
29/36	627305	1.183E-04	566.5	3.661E-07	0.5887	1.914E+05	2.759E-02	0.1089
33/52	627303	6.345E-04	288.0	3.771E-07	0.6311	5.244E+05	1.077E-03	0.0847
33/51	627303	4.215E-04	288.3	3.766E-07	0.6213	3.465E+05	7.219E-04	0.0844
33/50	627303	3.275E-04	372.6	3.754E-07	0.6232	3.496E+05	7.282E-04	0.0844
33/49	627303	2.336E-04	290.3	3.791E-07	0.6176	1.915E+05	4.023E-04	0.0841
33/48	627303	1.626E-04	571.9	3.707E-07	0.6435	2.742E+05	5.738E-04	0.0843
33/47	627303	1.372E-04	459.9	3.735E-07	0.6265	1.822E+05	3.828E-04	0.0841
33/46	627303	1.197E-04	569.2	3.671E-07	0.6417	2.025E+05	4.252E-04	0.0842

## Appendix B. Static Coefficients

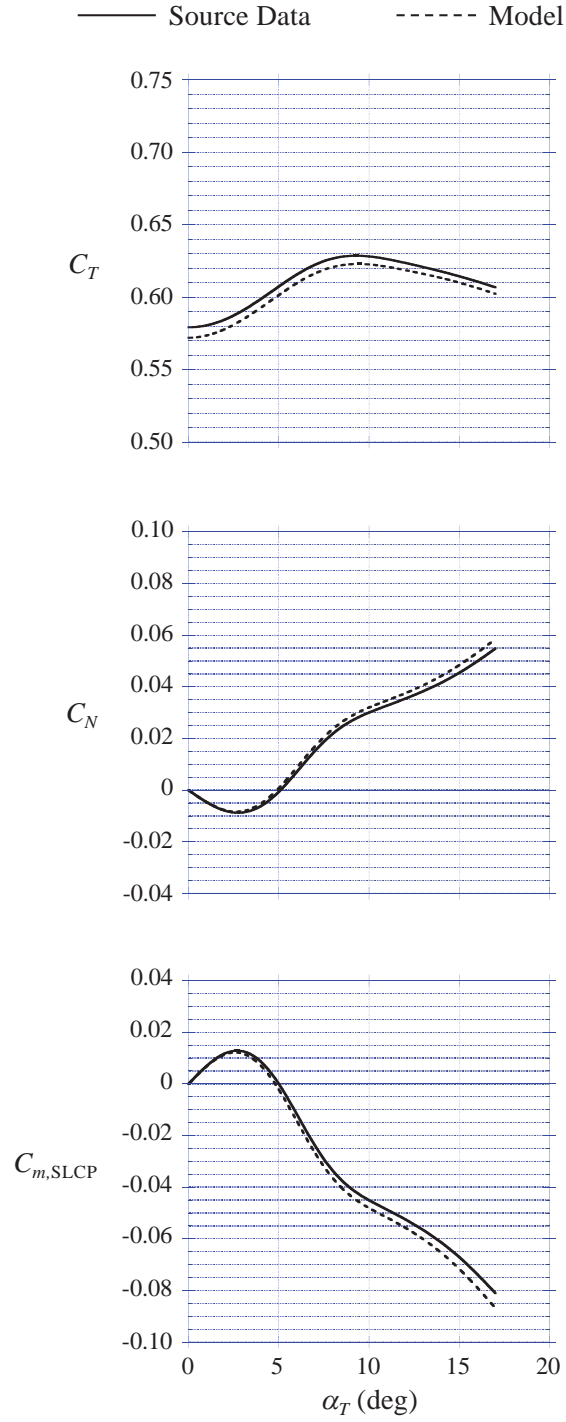
This appendix contains the source static coefficients data ( $C_T$ ,  $C_N$ , and  $C_{m,SLCP}$  versus  $\alpha_T$ ) in both graphical and tabulated form. The static coefficients as calculated from the models are included in the graphs as dashed lines. For the values of  $\lambda_T$  and  $M_{\text{Eff}}$  associated with the data in tables B-1–B-12 consult tables 4 and 5 in the main text of the present report. Below are indexes of the figures and tables in this appendix.

Index of figures in Appendix B.

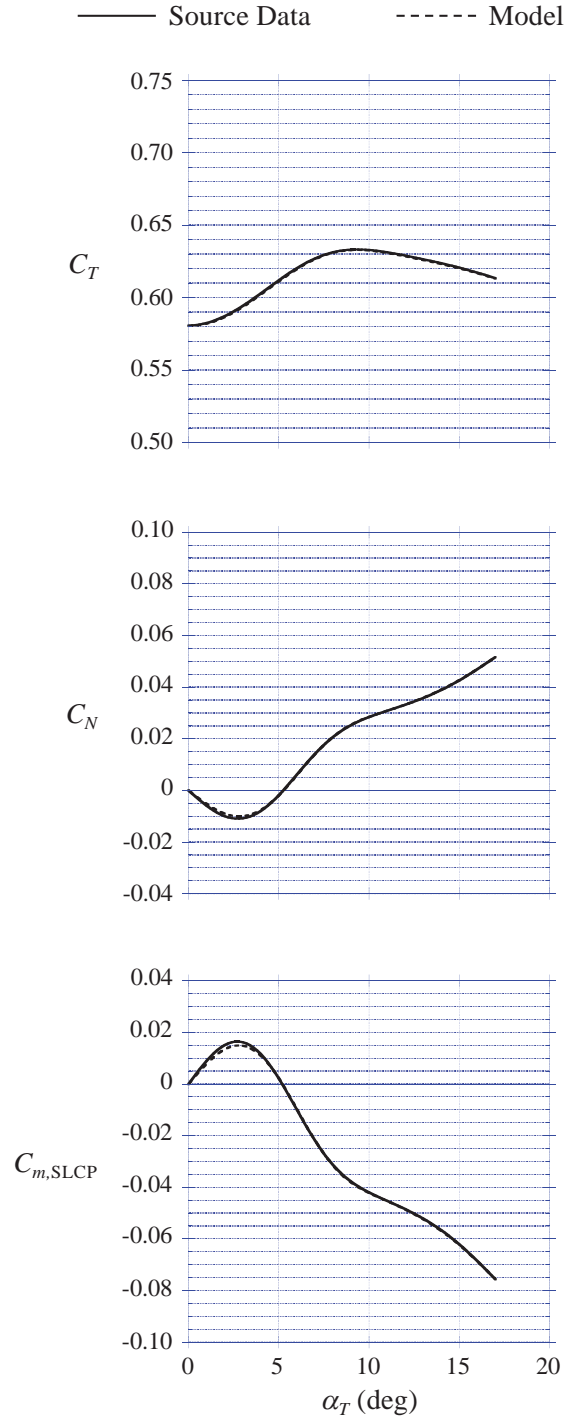
Parachute Type	Fabric Type	Figure	Run	Group	$\lambda_T$	$M_{\text{Eff}}$
SSRS	StdP	B-1	21	8	0.1411	0.257
		B-2	21	7	0.1365	0.257
		B-3	21	6	0.1368	0.333
		B-4	20	5	0.1292	0.257
		B-5	20	4	0.1340	0.515
		B-6	19	3	0.1275	0.410
		B-7	19	2	0.1295	0.514
	LowP	B-8	25	29	0.1066	0.256
		B-9	25	28	0.1063	0.256
		B-10	25	27	0.1063	0.333
		B-11	25	26	0.1060	0.256
		B-12	25	25	0.1062	0.515
		B-13	25	24	0.1060	0.411
		B-14	25	23	0.1061	0.515
DGB	StdP	B-15	31	43	0.1213	0.256
		B-16	29	41	0.1165	0.255
		B-17	29	40	0.1167	0.331
		B-18	29	39	0.1085	0.256
		B-19	29	38	0.1137	0.513
		B-20	29	37	0.1077	0.410
		B-21	29	36	0.1089	0.514
	LowP	B-22	33	52	0.0847	0.256
		B-23	33	51	0.0844	0.257
		B-24	33	50	0.0844	0.333
		B-25	33	49	0.0841	0.258
		B-26	33	48	0.0843	0.515
		B-27	33	47	0.0841	0.412
		B-28	33	46	0.0842	0.515

Index of tables in Appendix B.

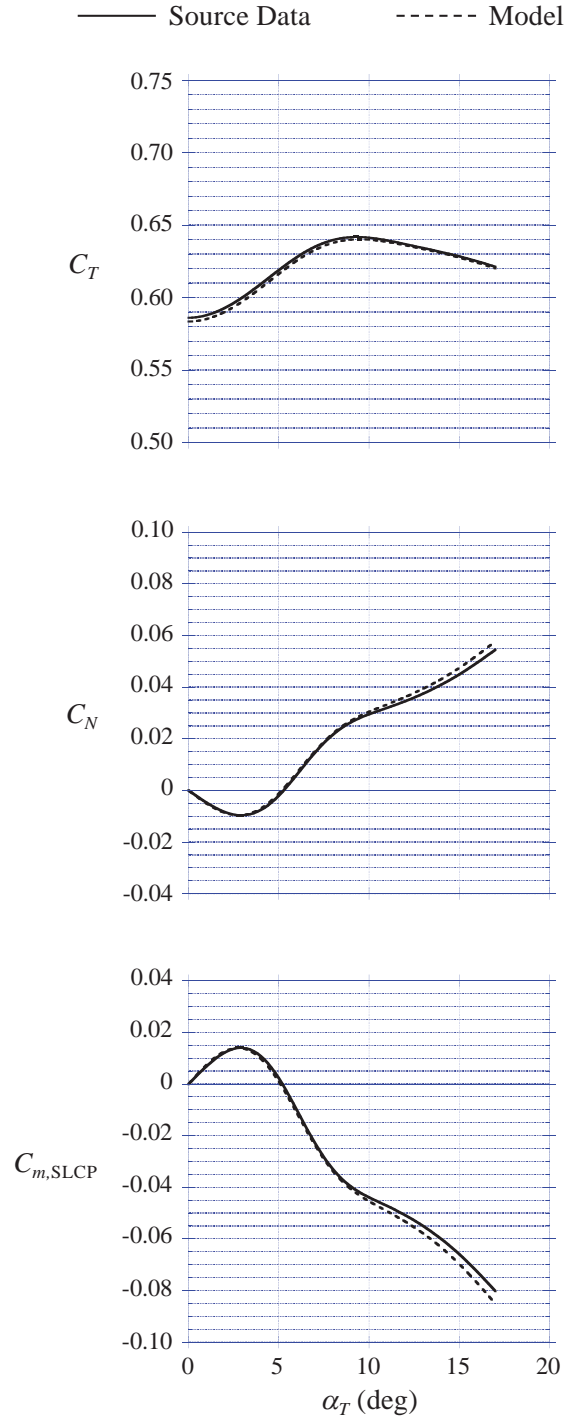
Parachute Type	Fabric Type	Run/Group	Table	Static Coefficient
SSRS	StdP	21/8, 21/7, 21/6, 20/5, 20/4, 19/3, 19/2	B-1	$C_T$
			B-2	$C_N$
			B-3	$C_{m,SLCP}$
	LowP	25/29, 25/28, 25/27, 25/26, 25/25, 25/24, 25/23	B-4	$C_T$
			B-5	$C_N$
			B-6	$C_{m,SLCP}$
DGB	StdP	31/43, 29/41, 29/40, 29/39, 29/38, 29/37, 29/36	B-7	$C_T$
			B-8	$C_N$
			B-9	$C_{m,SLCP}$
	LowP	33/52, 33/51, 33/50, 33/49, 33/48, 33/47, 33/46	B-10	$C_T$
			B-11	$C_N$
			B-12	$C_{m,SLCP}$



**Figure B-1. SSRS/StdP parachute static coefficients, Run 21/Group 8,  $\lambda_T = 0.1411$ ,  $M_{Eff} = 0.257$ .**

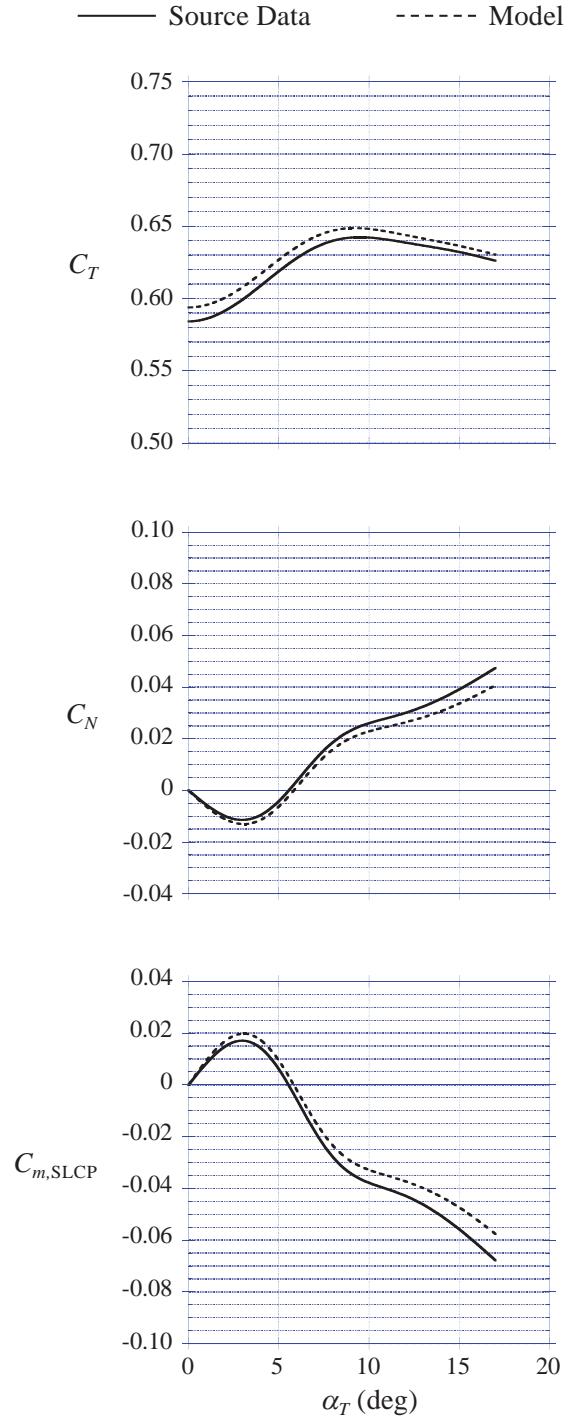


**Figure B-2. SSRS/StdP parachute static coefficients, Run 21/Group 7,  $\lambda_T = 0.1365$ ,  $M_{Eff} = 0.257$ .**

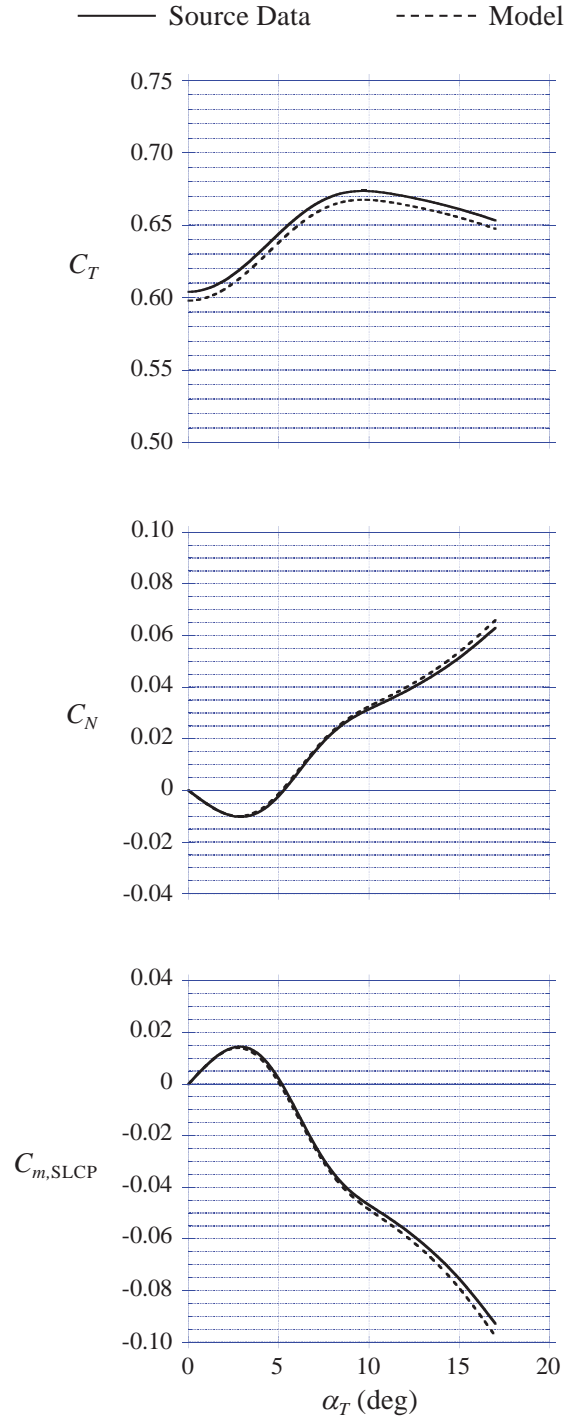


**Figure B-3. SSRS/StdP parachute static coefficients, Run 21/Group 6,  $\lambda_T = 0.1368$ ,  $M_{Eff} = 0.333$ .**

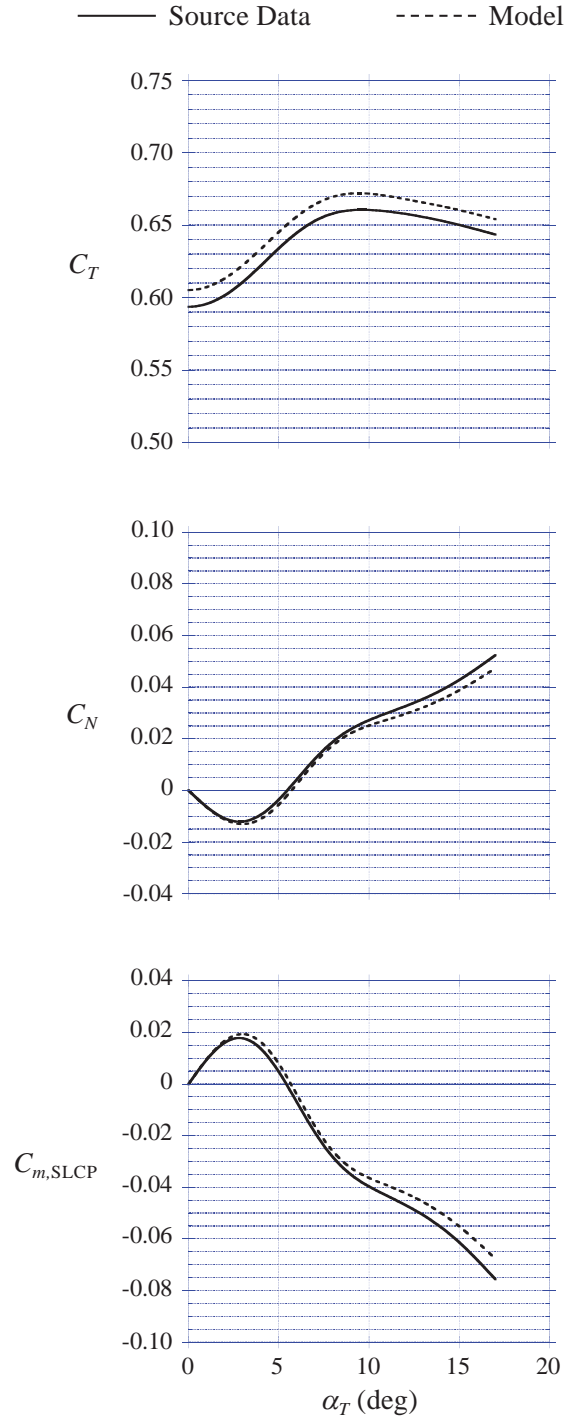




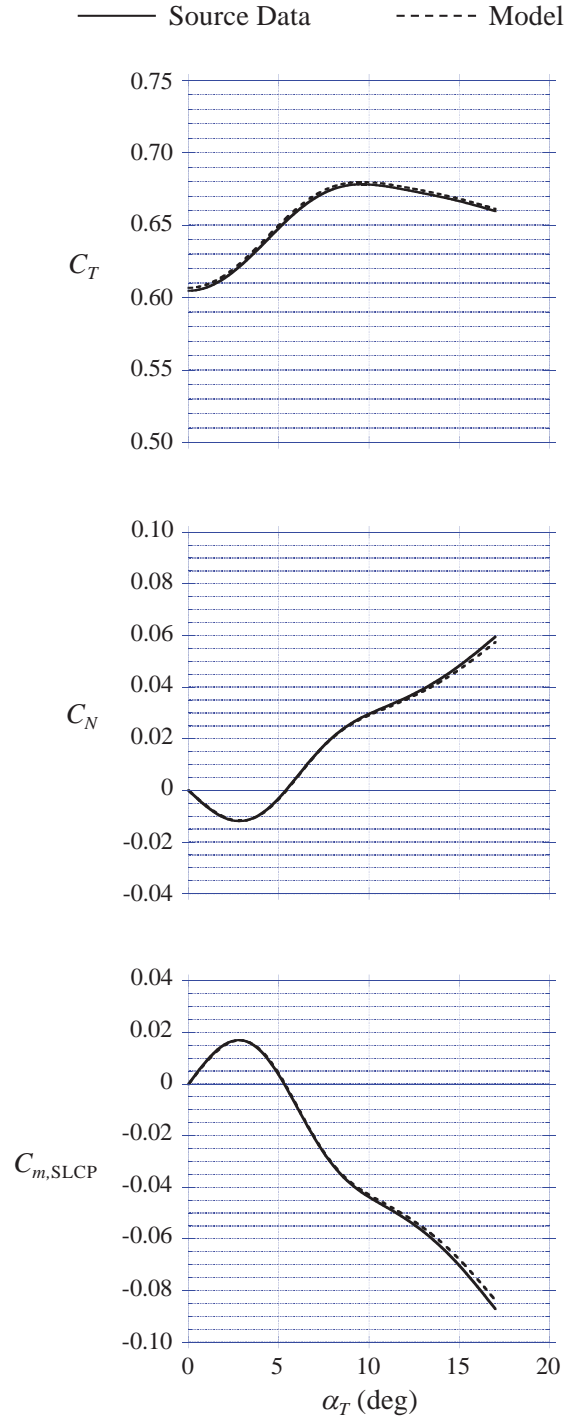
**Figure B-4. SSRS/StdP parachute static coefficients, Run 20/Group 5,  $\lambda_T = 0.1292$ ,  $M_{Eff} = 0.257$ .**



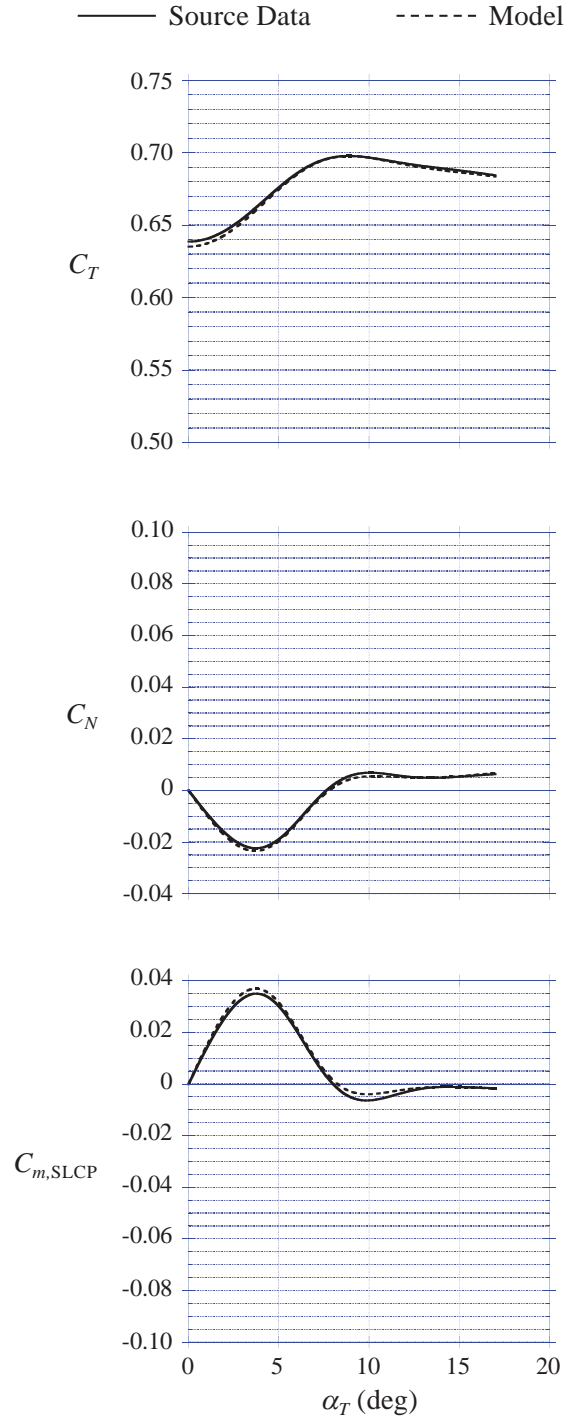
**Figure B-5. SSRS/StdP parachute static coefficients, Run 20/Group 4,  $\lambda_T = 0.1340$ ,  $M_{Eff} = 0.515$ .**



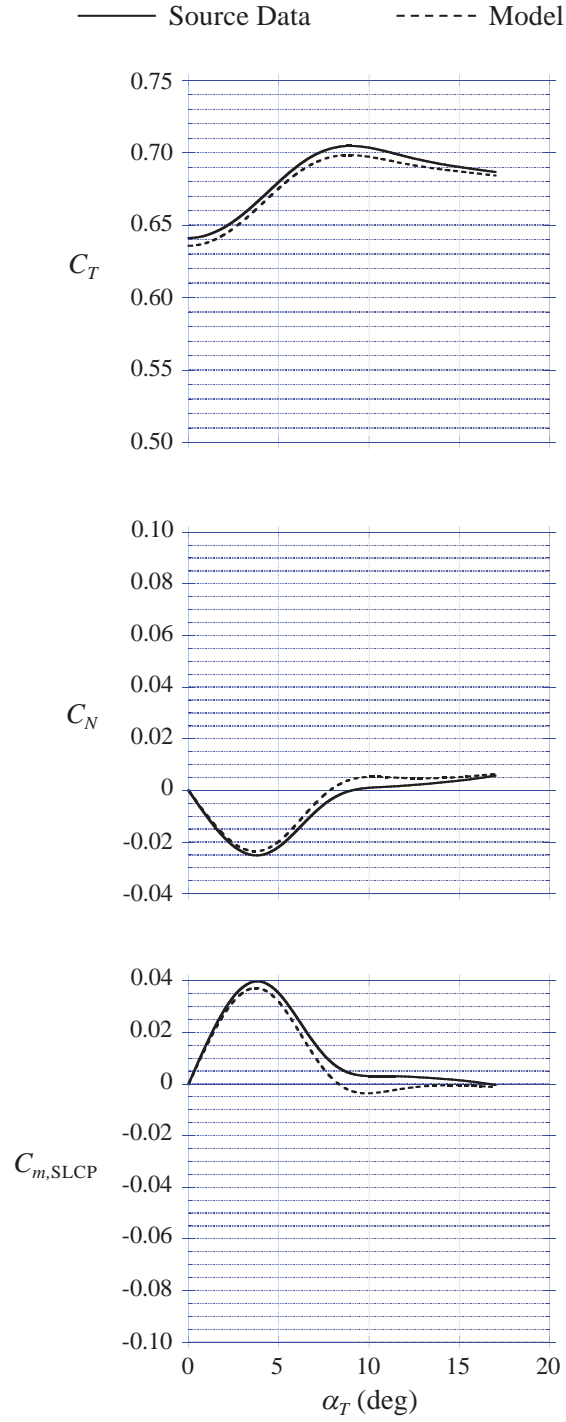
**Figure B-6. SSRS/StdP parachute static coefficients, Run 19/Group 3,  $\lambda_T = 0.1275$ ,  $M_{Eff} = 0.410$ .**



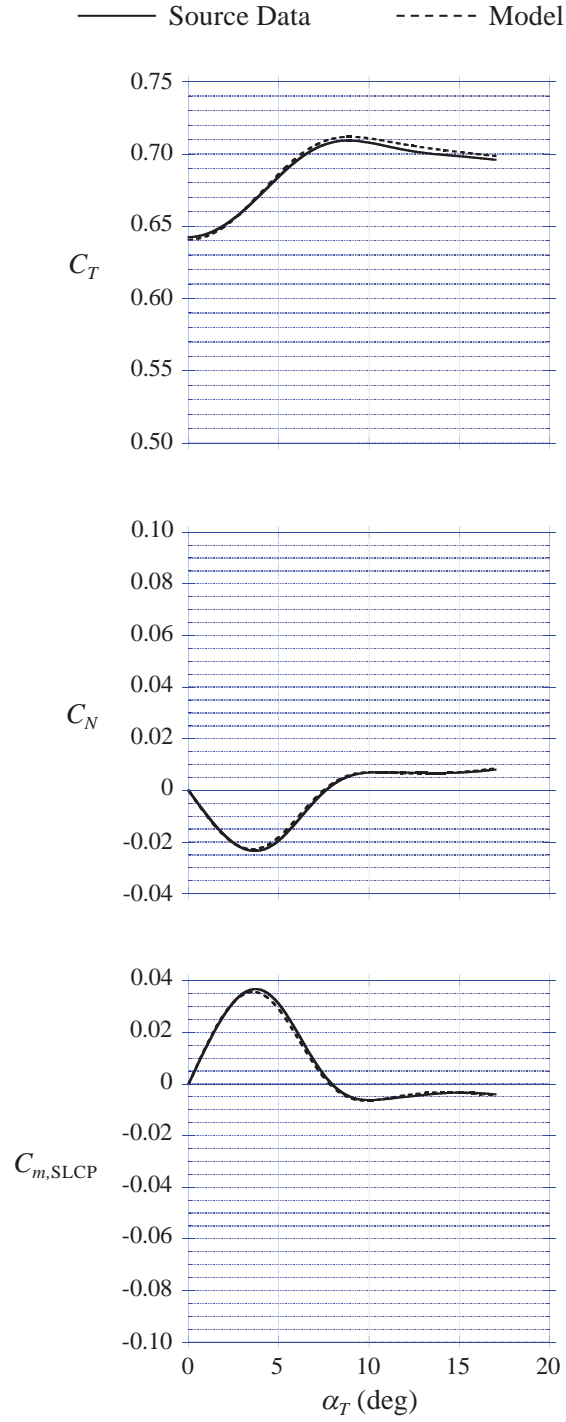
**Figure B-7. SSRS/StdP parachute static coefficients, Run 19/Group 2,  $\lambda_T = 0.1295$ ,  $M_{Eff} = 0.514$ .**



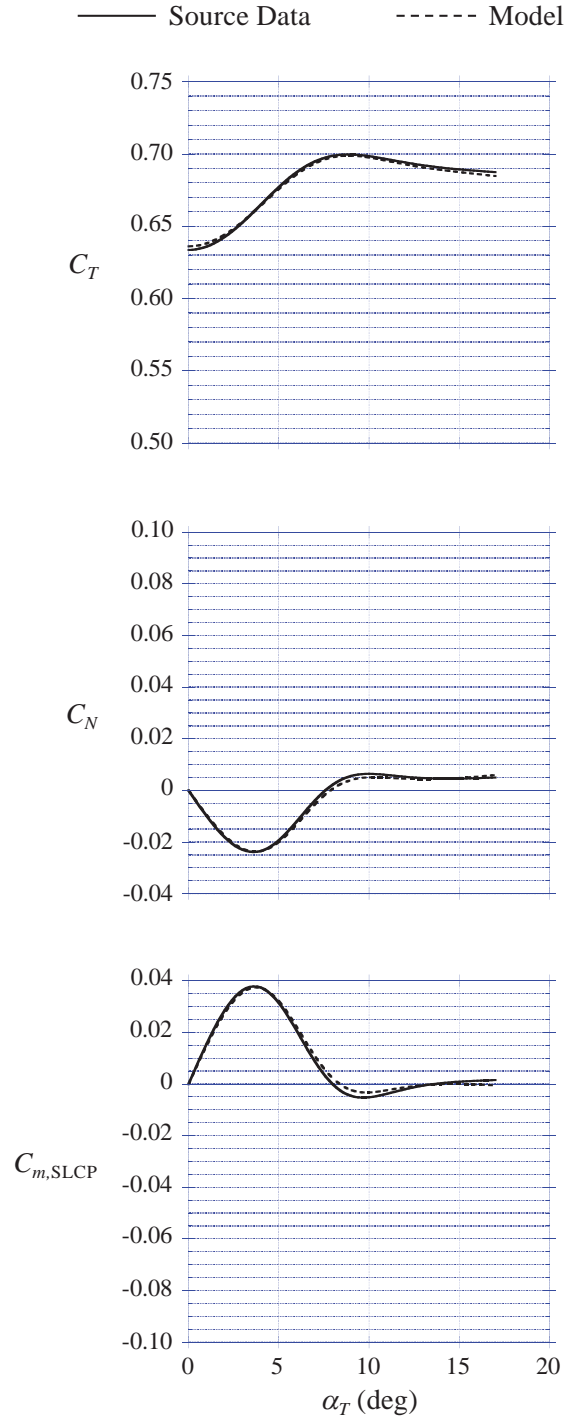
**Figure B-8. SSRS/LowP parachute static coefficients, Run 25/Group 29,  $\lambda_T = 0.1066$ ,  $M_{Eff} = 0.256$ .**



**Figure B-9. SSRS/LowP parachute static coefficients, Run 25/Group 28,  $\lambda_T = 0.1063$ ,  $M_{Eff} = 0.256$ .**

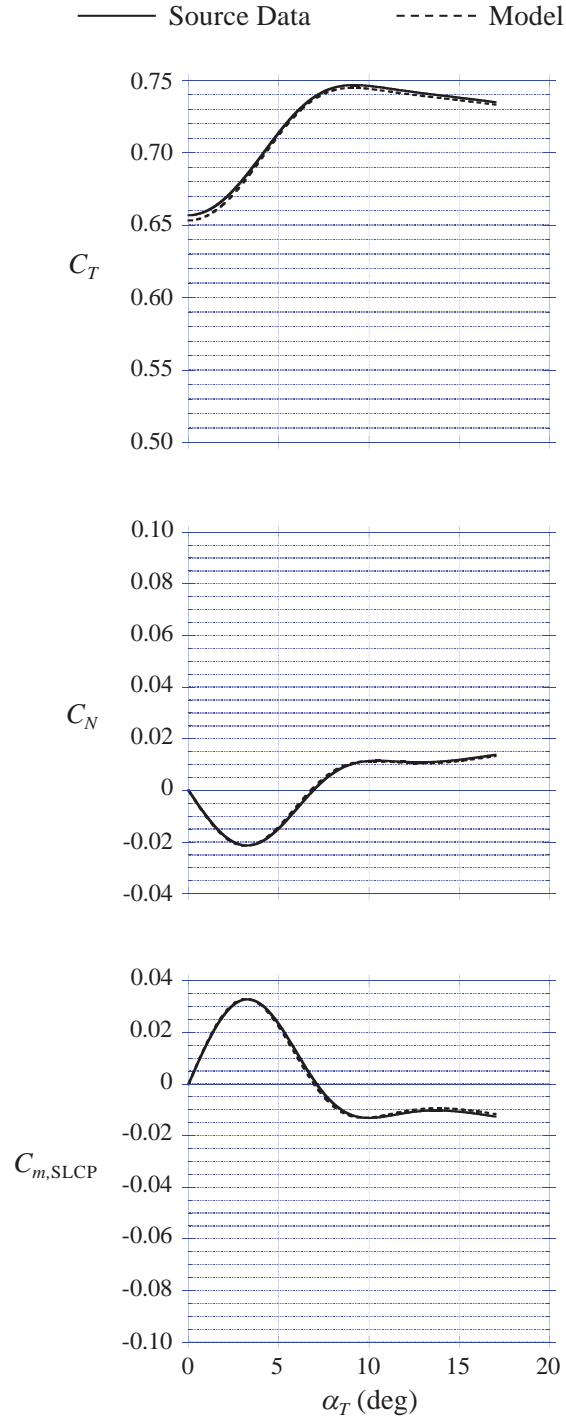


**Figure B-10. SSRS/LowP parachute static coefficients, Run 25/Group 27,  $\lambda_T = 0.1063$ ,  $M_{Eff} = 0.333$ .**

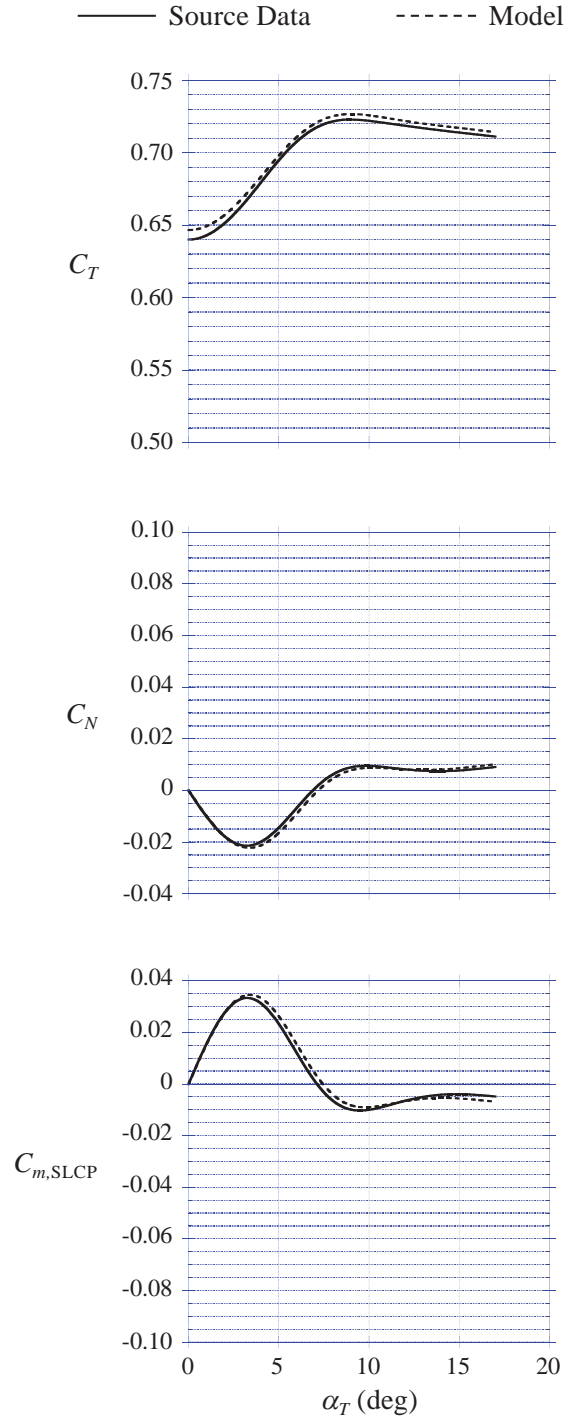


**Figure B-11. SSRS/LowP parachute static coefficients, Run 25/Group 26,  $\lambda_T = 0.1060$ ,  $M_{Eff} = 0.256$ .**

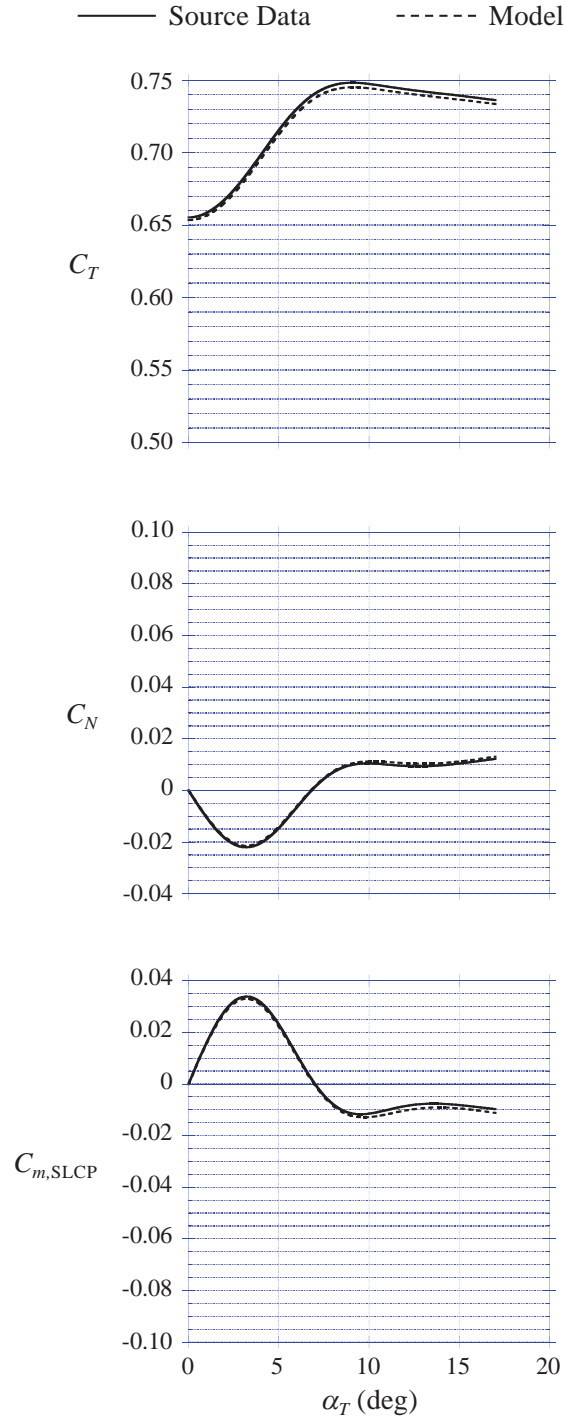




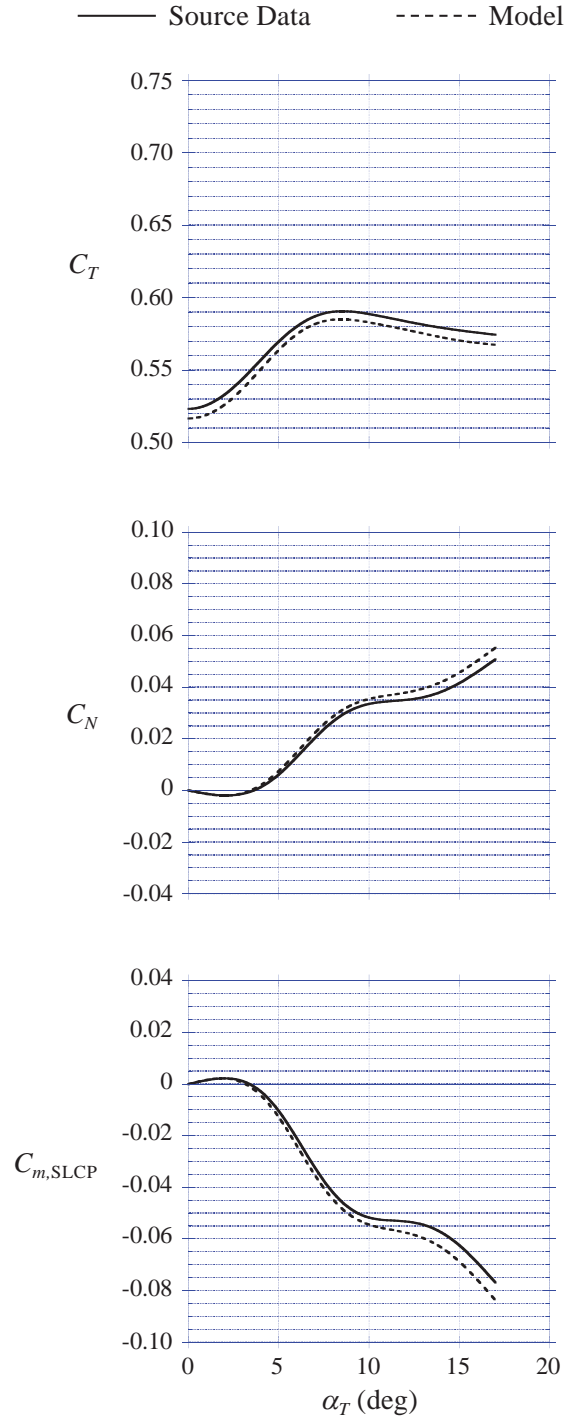
**Figure B-12. SSRS/LowP parachute static coefficients, Run 25/Group 25,  $\lambda_T = 0.1062$ ,  $M_{Eff} = 0.515$ .**



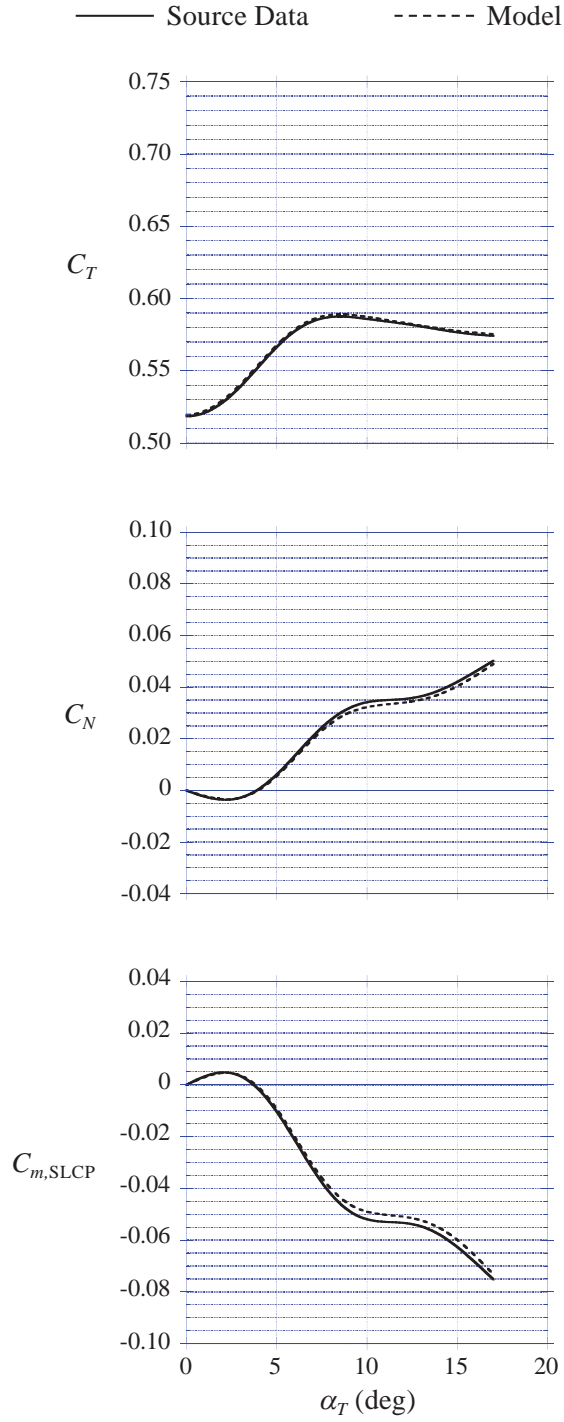
**Figure B-13. SSRS/LowP parachute static coefficients, Run 25/Group 24,  $\lambda_T = 0.1060$ ,  $M_{Eff} = 0.411$ .**



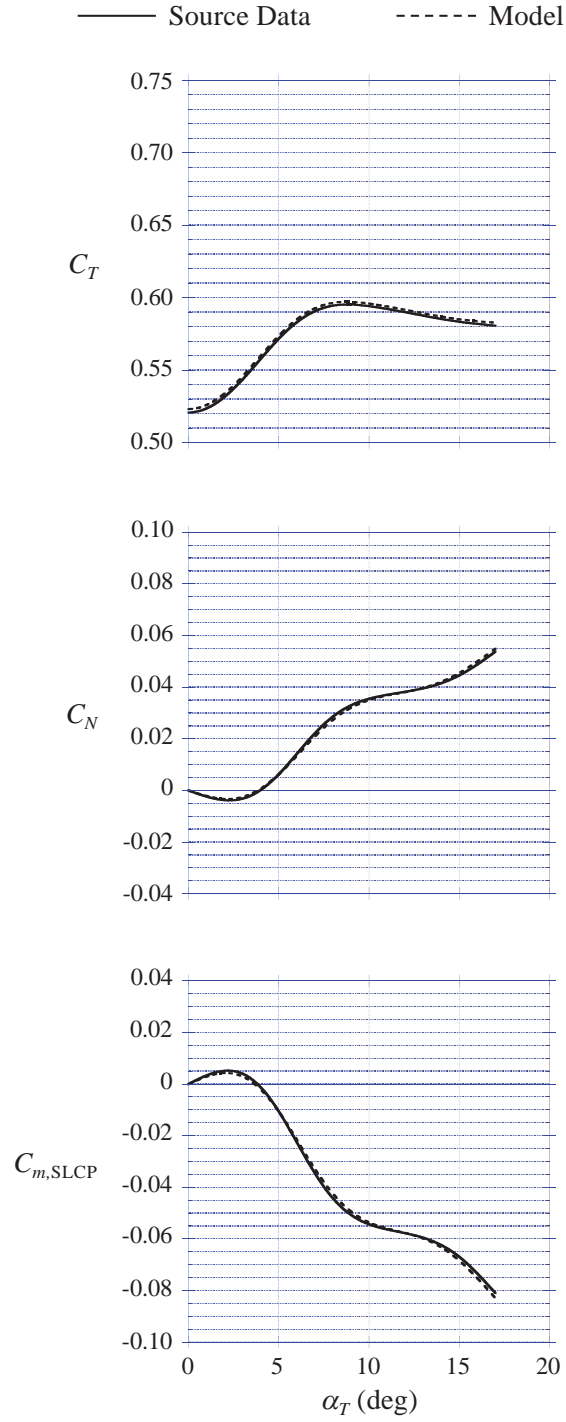
**Figure B-14. SSRS/LowP parachute static coefficients, Run 25/Group 23,  $\lambda_T = 0.1061$ ,  $M_{Eff} = 0.515$ .**



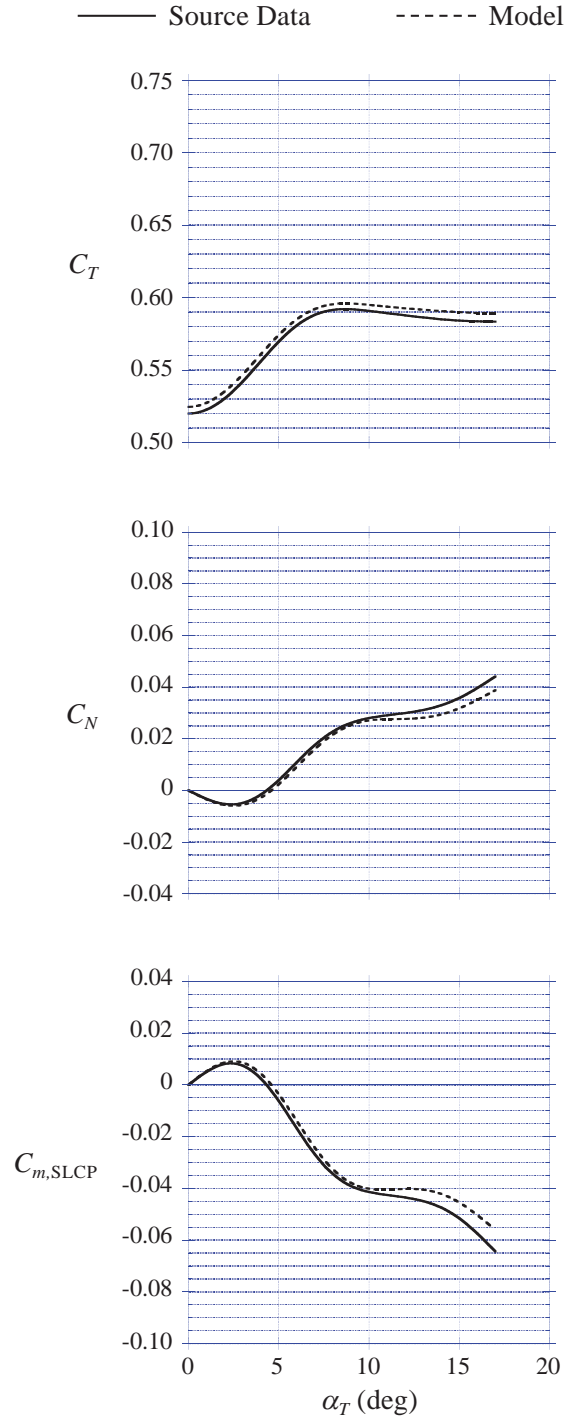
**Figure B-15. DGB/StdP parachute static coefficients, Run 31/Group 43,  $\lambda_T = 0.1213$ ,  $M_{Eff} = 0.256$ .**



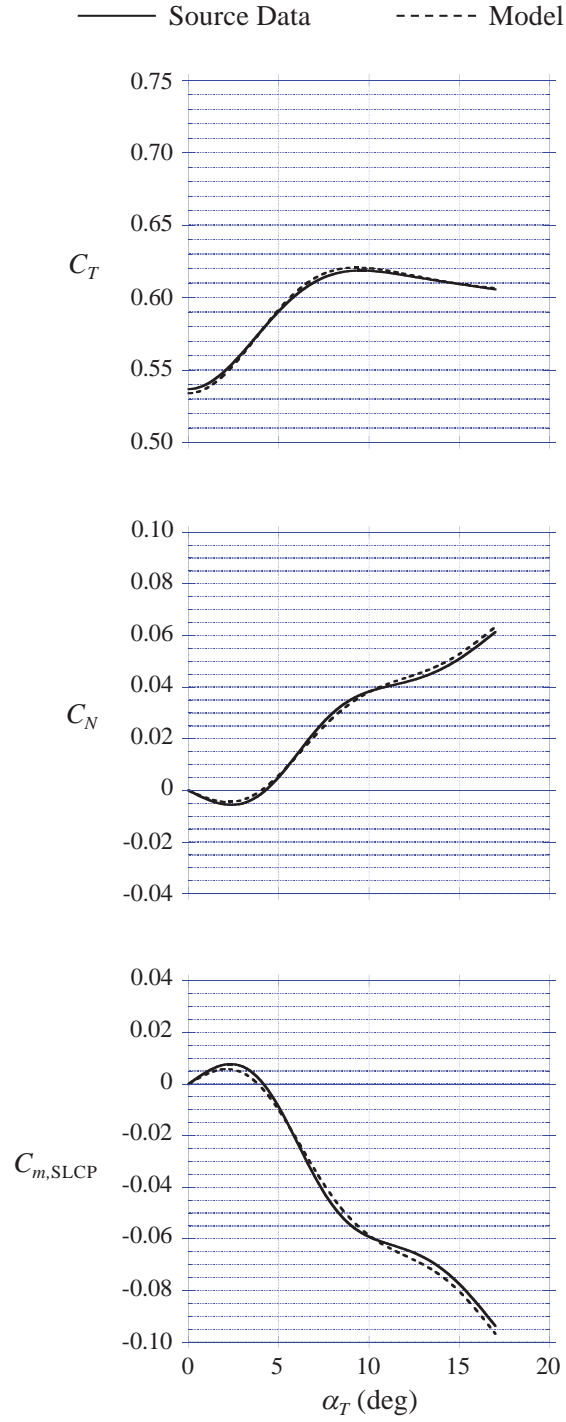
**Figure B-16. DGB/StdP parachute static coefficients, Run 29/Group 41,  $\lambda_T = 0.1165$ ,  $M_{Eff} = 0.255$ .**



**Figure B-17. DGB/StdP parachute static coefficients, Run 29/Group 40,  
 $\lambda_T = 0.1167$ ,  $M_{Eff} = 0.331$ .**

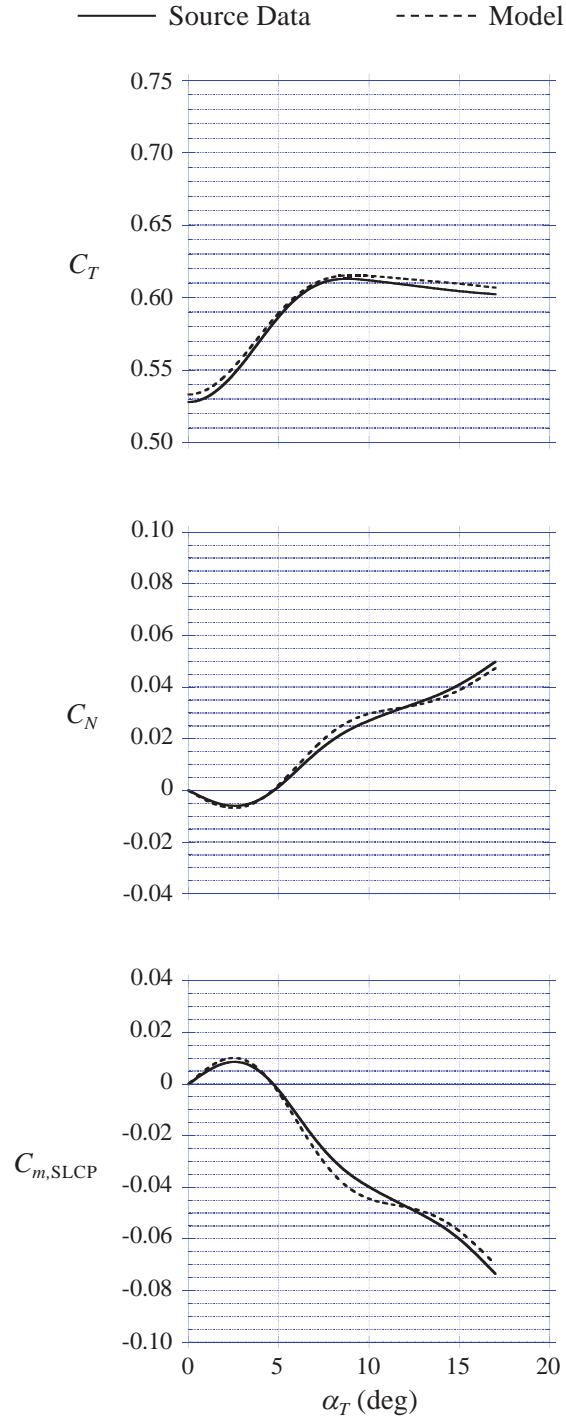


**Figure B-18. DGB/StdP parachute static coefficients, Run 29/Group 39,  $\lambda_T = 0.1085$ ,  $M_{Eff} = 0.256$ .**

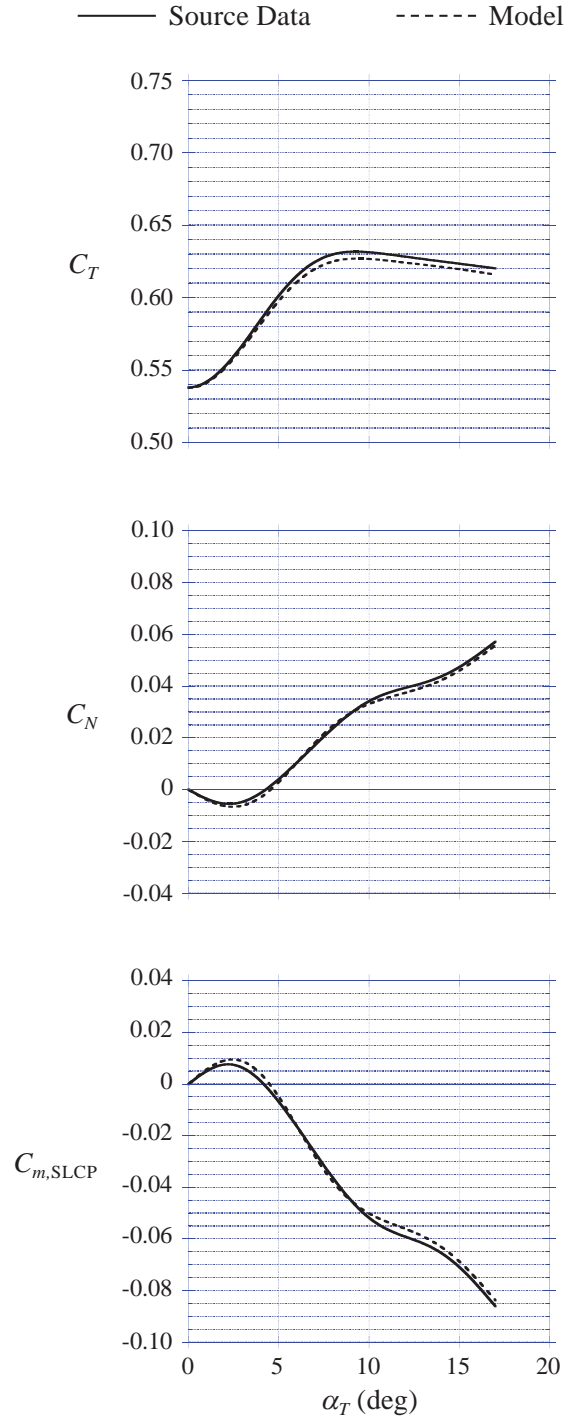


**Figure B-19. DGB/StdP parachute static coefficients, Run 29/Group 38,  $\lambda_T = 0.1137$ ,  $M_{Eff} = 0.513$ .**

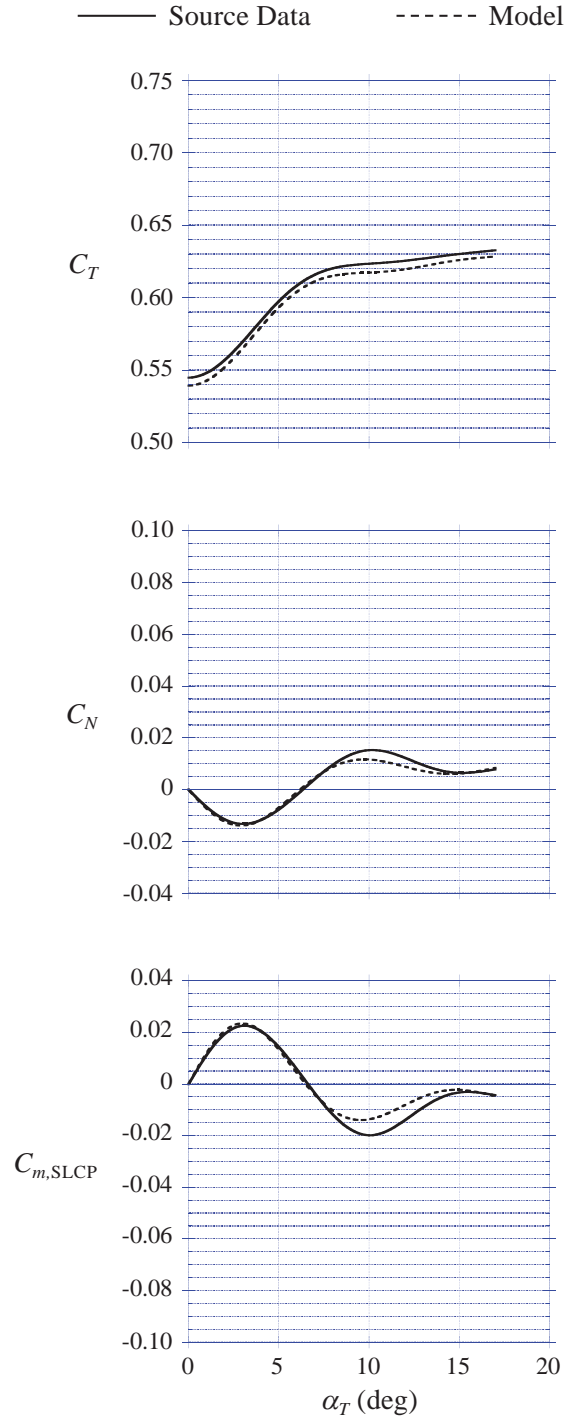




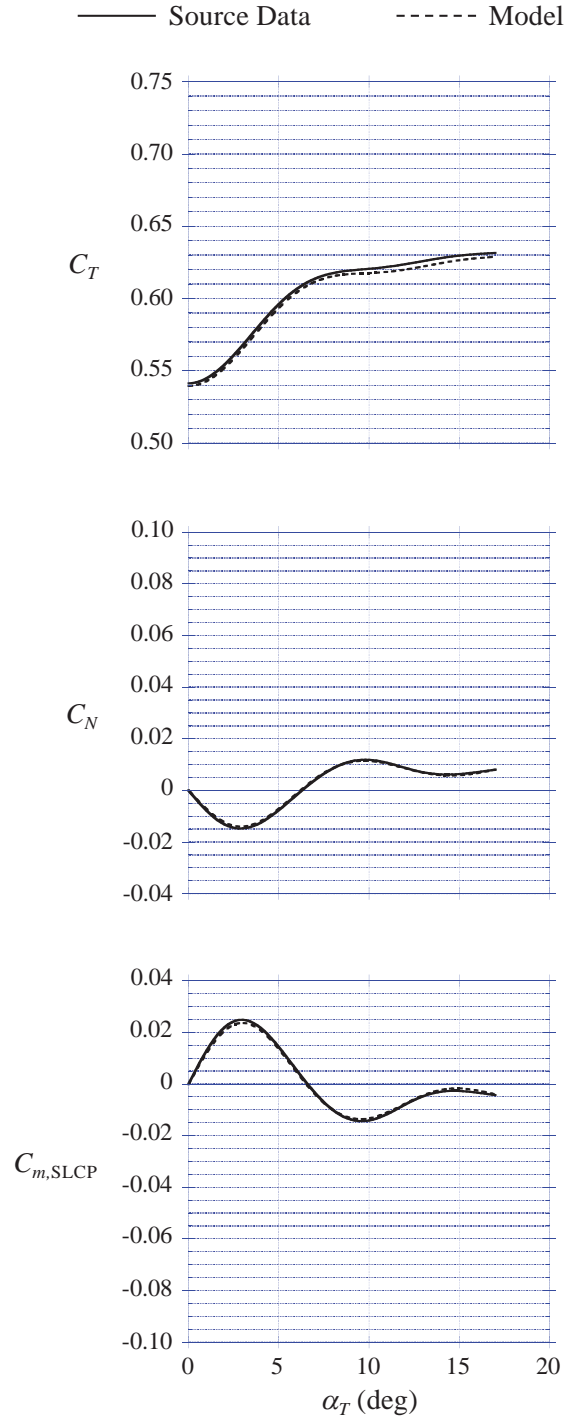
**Figure B-20. DGB/StdP parachute static coefficients, Run 29/Group 37,  $\lambda_T = 0.1077$ ,  $M_{Eff} = 0.410$ .**



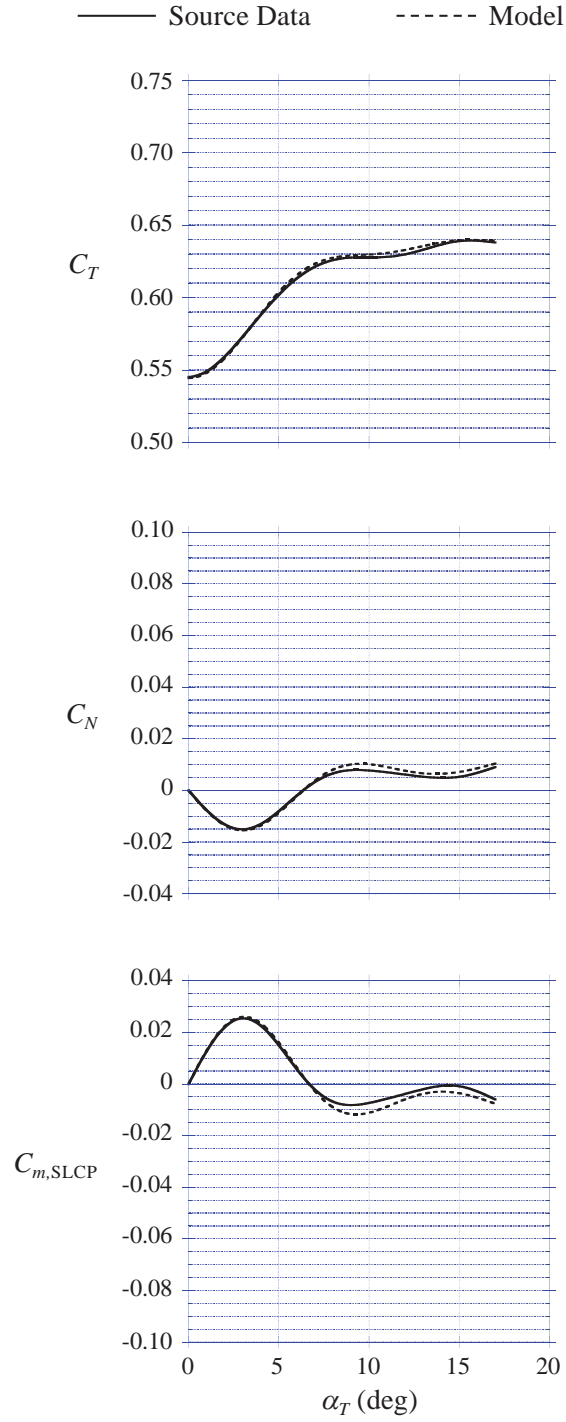
**Figure B-21. DGB/StdP parachute static coefficients, Run 29/Group 36,  $\lambda_T = 0.1089$ ,  $M_{Eff} = 0.514$ .**



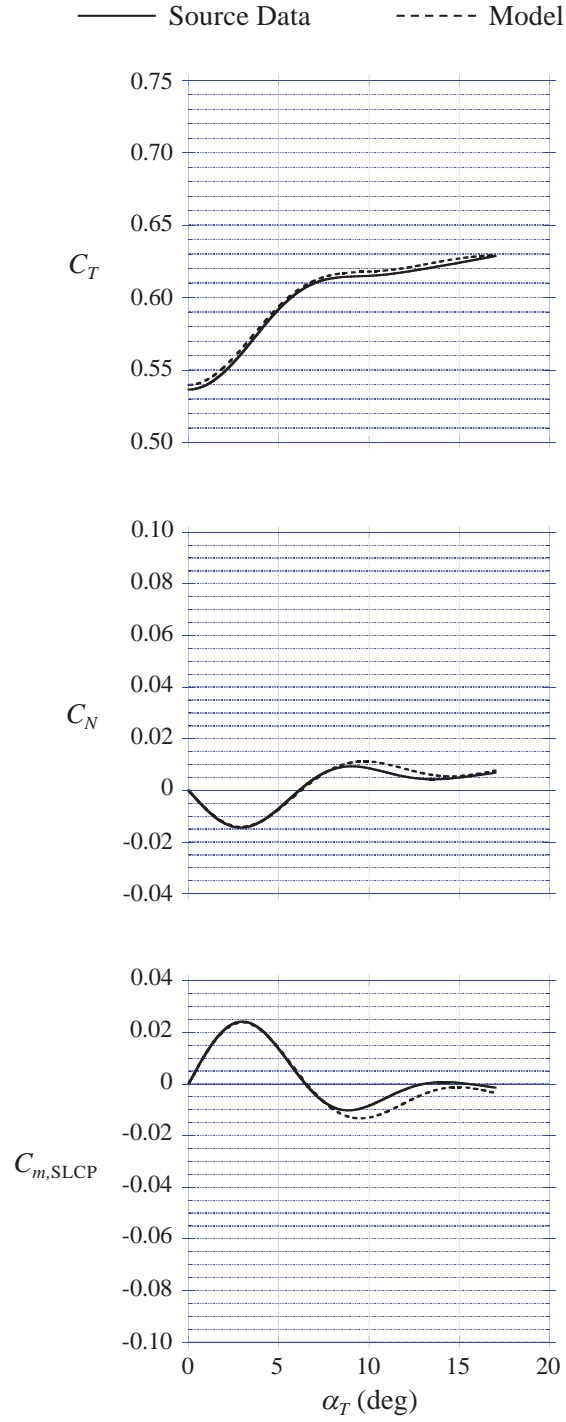
**Figure B-22. DGB/LowP parachute static coefficients, Run 33/Group 52,  $\lambda_T = 0.0847$ ,  $M_{Eff} = 0.256$ .**



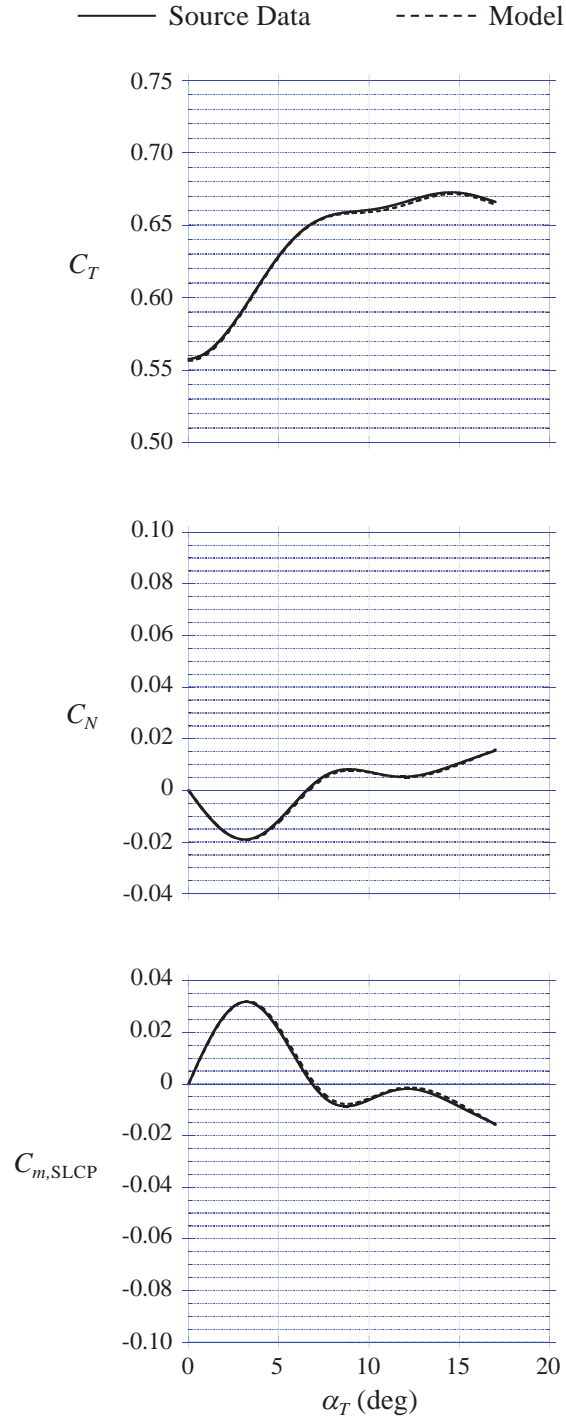
**Figure B-23. DGB/LowP parachute static coefficients, Run 33/Group 51,  
 $\lambda_T = 0.0844$ ,  $M_{Eff} = 0.257$ .**



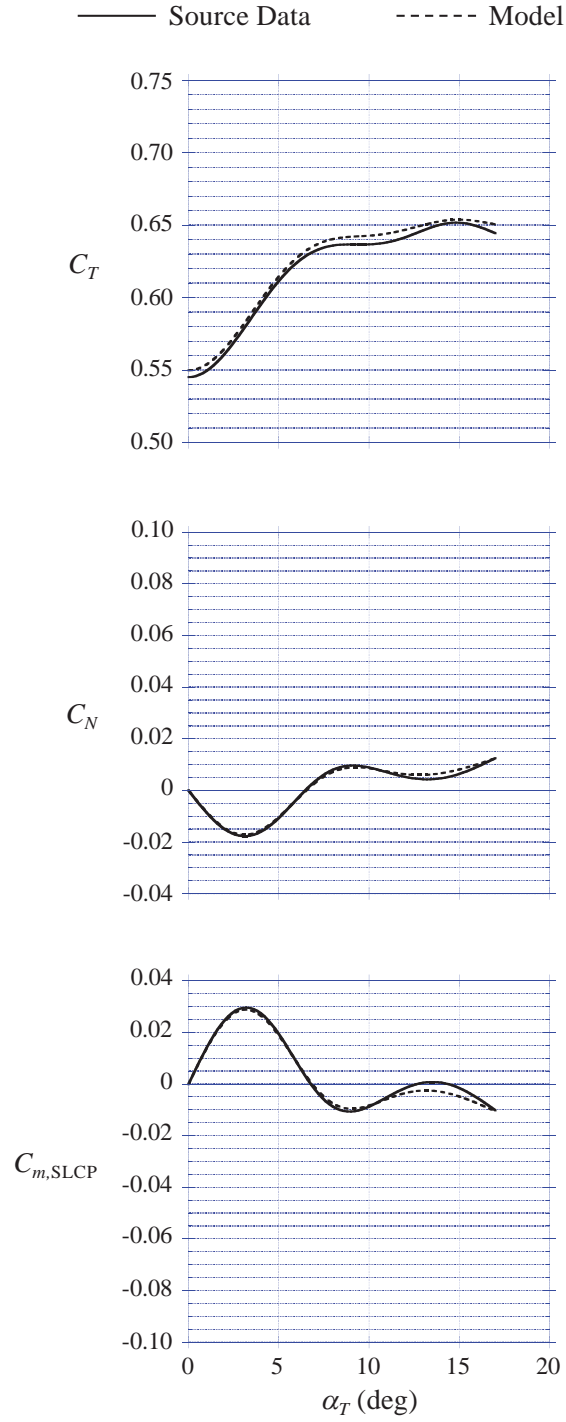
**Figure B-24. DGB/LowP parachute static coefficients, Run 33/Group 50,  $\lambda_T = 0.0844$ ,  $M_{Eff} = 0.333$ .**



**Figure B-25. DGB/LowP parachute static coefficients, Run 33/Group 49,  $\lambda_T = 0.0841$ ,  $M_{Eff} = 0.258$ .**

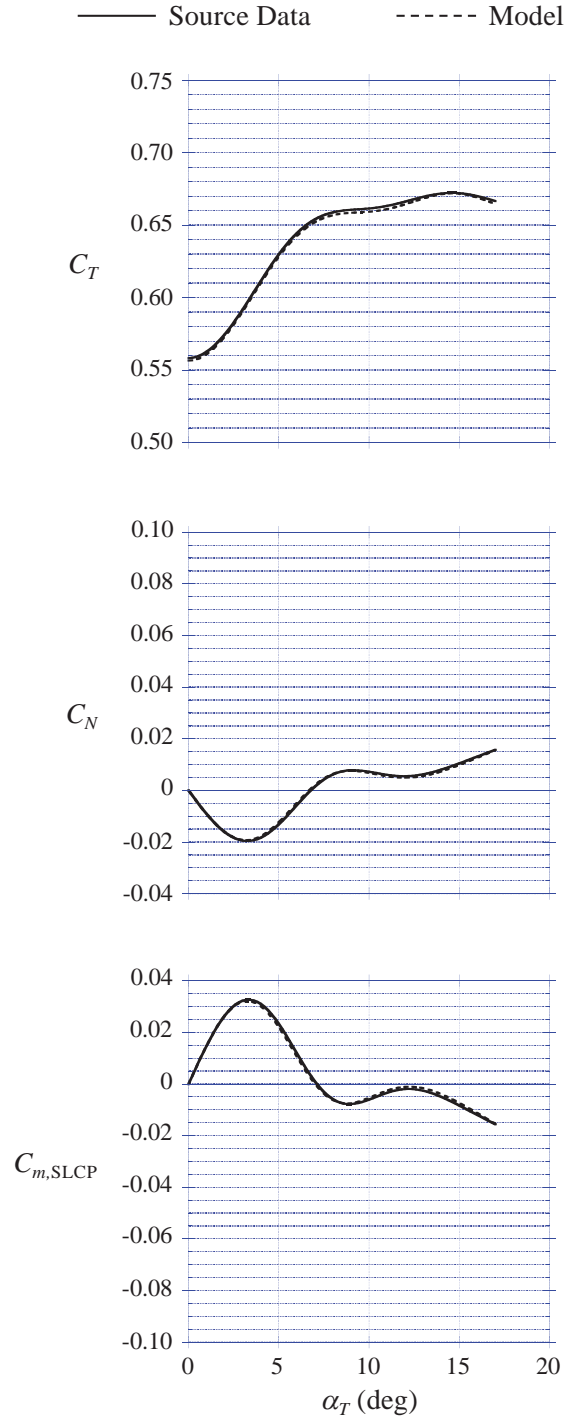


**Figure B-26. DGB/LowP parachute static coefficients, Run 33/Group 48,  $\lambda_T = 0.0843$ ,  $M_{Eff} = 0.515$ .**



**Figure B-27. DGB/LowP parachute static coefficients, Run 33/Group 47,  $\lambda_T = 0.0841$ ,  $M_{Eff} = 0.412$ .**





**Figure B-28. DGB/LowP parachute static coefficients, Run 33/Group 46,  $\lambda_T = 0.0842$ ,  $M_{Eff} = 0.515$ .**

**Table B-1. SSRS/StdP parachute,  $C_T$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	21/8	21/7	21/6	20/5	20/4	19/3	19/2
0.0	5.7925E-01	5.8089E-01	5.8615E-01	5.8420E-01	6.0403E-01	5.9369E-01	6.0475E-01
0.2	5.7931E-01	5.8096E-01	5.8622E-01	5.8428E-01	6.0411E-01	5.9377E-01	6.0484E-01
0.4	5.7947E-01	5.8116E-01	5.8644E-01	5.8451E-01	6.0436E-01	5.9402E-01	6.0512E-01
0.6	5.7974E-01	5.8150E-01	5.8679E-01	5.8490E-01	6.0477E-01	5.9442E-01	6.0559E-01
0.8	5.8012E-01	5.8196E-01	5.8728E-01	5.8543E-01	6.0534E-01	5.9499E-01	6.0623E-01
1.0	5.8060E-01	5.8255E-01	5.8790E-01	5.8611E-01	6.0607E-01	5.9571E-01	6.0704E-01
1.2	5.8119E-01	5.8326E-01	5.8865E-01	5.8692E-01	6.0696E-01	5.9658E-01	6.0803E-01
1.4	5.8188E-01	5.8409E-01	5.8952E-01	5.8787E-01	6.0799E-01	5.9761E-01	6.0917E-01
1.6	5.8267E-01	5.8503E-01	5.9051E-01	5.8894E-01	6.0916E-01	5.9878E-01	6.1048E-01
1.8	5.8356E-01	5.8608E-01	5.9161E-01	5.9013E-01	6.1048E-01	6.0010E-01	6.1193E-01
2.0	5.8455E-01	5.8722E-01	5.9282E-01	5.9143E-01	6.1193E-01	6.0156E-01	6.1353E-01
2.2	5.8563E-01	5.8847E-01	5.9414E-01	5.9284E-01	6.1351E-01	6.0315E-01	6.1527E-01
2.4	5.8680E-01	5.8980E-01	5.9555E-01	5.9435E-01	6.1522E-01	6.0487E-01	6.1713E-01
2.6	5.8805E-01	5.9122E-01	5.9704E-01	5.9595E-01	6.1703E-01	6.0671E-01	6.1911E-01
2.8	5.8938E-01	5.9272E-01	5.9862E-01	5.9762E-01	6.1895E-01	6.0866E-01	6.2119E-01
3.0	5.9079E-01	5.9428E-01	6.0028E-01	5.9938E-01	6.2097E-01	6.1071E-01	6.2337E-01
3.2	5.9227E-01	5.9591E-01	6.0199E-01	6.0120E-01	6.2307E-01	6.1285E-01	6.2564E-01
3.4	5.9381E-01	5.9759E-01	6.0377E-01	6.0307E-01	6.2525E-01	6.1507E-01	6.2799E-01
3.6	5.9540E-01	5.9932E-01	6.0560E-01	6.0499E-01	6.2750E-01	6.1736E-01	6.3040E-01
3.8	5.9704E-01	6.0108E-01	6.0746E-01	6.0695E-01	6.2980E-01	6.1970E-01	6.3285E-01
4.0	5.9872E-01	6.0287E-01	6.0936E-01	6.0893E-01	6.3215E-01	6.2207E-01	6.3535E-01
4.2	6.0043E-01	6.0468E-01	6.1128E-01	6.1093E-01	6.3452E-01	6.2448E-01	6.3787E-01
4.4	6.0216E-01	6.0651E-01	6.1321E-01	6.1294E-01	6.3692E-01	6.2689E-01	6.4040E-01
4.6	6.0390E-01	6.0833E-01	6.1514E-01	6.1494E-01	6.3932E-01	6.2929E-01	6.4293E-01
4.8	6.0565E-01	6.1014E-01	6.1707E-01	6.1692E-01	6.4171E-01	6.3168E-01	6.4545E-01
5.0	6.0739E-01	6.1193E-01	6.1898E-01	6.1889E-01	6.4408E-01	6.3403E-01	6.4793E-01
5.2	6.0911E-01	6.1369E-01	6.2086E-01	6.2081E-01	6.4642E-01	6.3632E-01	6.5038E-01
5.4	6.1081E-01	6.1542E-01	6.2270E-01	6.2269E-01	6.4871E-01	6.3856E-01	6.5277E-01
5.6	6.1248E-01	6.1710E-01	6.2450E-01	6.2452E-01	6.5095E-01	6.4071E-01	6.5509E-01
5.8	6.1410E-01	6.1873E-01	6.2625E-01	6.2629E-01	6.5312E-01	6.4279E-01	6.5734E-01
6.0	6.1566E-01	6.2030E-01	6.2793E-01	6.2799E-01	6.5521E-01	6.4477E-01	6.5951E-01
6.2	6.1716E-01	6.2180E-01	6.2954E-01	6.2961E-01	6.5721E-01	6.4664E-01	6.6157E-01
6.4	6.1859E-01	6.2322E-01	6.3107E-01	6.3116E-01	6.5912E-01	6.4840E-01	6.6354E-01
6.6	6.1994E-01	6.2456E-01	6.3251E-01	6.3261E-01	6.6092E-01	6.5005E-01	6.6539E-01
6.8	6.2121E-01	6.2582E-01	6.3386E-01	6.3397E-01	6.6261E-01	6.5157E-01	6.6713E-01
7.0	6.2239E-01	6.2698E-01	6.3511E-01	6.3524E-01	6.6419E-01	6.5297E-01	6.6874E-01
7.2	6.2347E-01	6.2805E-01	6.3626E-01	6.3640E-01	6.6564E-01	6.5424E-01	6.7022E-01
7.4	6.2444E-01	6.2902E-01	6.3731E-01	6.3746E-01	6.6697E-01	6.5539E-01	6.7158E-01
7.6	6.2532E-01	6.2988E-01	6.3824E-01	6.3841E-01	6.6818E-01	6.5641E-01	6.7280E-01
7.8	6.2609E-01	6.3065E-01	6.3907E-01	6.3926E-01	6.6925E-01	6.5730E-01	6.7389E-01
8.0	6.2675E-01	6.3132E-01	6.3979E-01	6.4001E-01	6.7020E-01	6.5808E-01	6.7485E-01
8.2	6.2731E-01	6.3188E-01	6.4039E-01	6.4065E-01	6.7103E-01	6.5874E-01	6.7568E-01
8.4	6.2777E-01	6.3234E-01	6.4088E-01	6.4118E-01	6.7172E-01	6.5928E-01	6.7638E-01
8.6	6.2812E-01	6.3271E-01	6.4127E-01	6.4161E-01	6.7230E-01	6.5972E-01	6.7696E-01
8.8	6.2838E-01	6.3299E-01	6.4156E-01	6.4195E-01	6.7277E-01	6.6007E-01	6.7742E-01

**Table B-1. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	21/8	21/7	21/6	20/5	20/4	19/3	19/2
9.0	6.2854E-01	6.3317E-01	6.4175E-01	6.4219E-01	6.7312E-01	6.6032E-01	6.7777E-01
9.2	6.2862E-01	6.3327E-01	6.4184E-01	6.4235E-01	6.7337E-01	6.6049E-01	6.7801E-01
9.4	6.2861E-01	6.3329E-01	6.4185E-01	6.4242E-01	6.7352E-01	6.6059E-01	6.7815E-01
9.6	6.2852E-01	6.3324E-01	6.4177E-01	6.4242E-01	6.7359E-01	6.6062E-01	6.7820E-01
9.8	6.2836E-01	6.3313E-01	6.4162E-01	6.4234E-01	6.7357E-01	6.6059E-01	6.7817E-01
10.0	6.2814E-01	6.3295E-01	6.4139E-01	6.4220E-01	6.7347E-01	6.6050E-01	6.7806E-01
10.2	6.2786E-01	6.3271E-01	6.4111E-01	6.4201E-01	6.7331E-01	6.6038E-01	6.7788E-01
10.4	6.2752E-01	6.3243E-01	6.4077E-01	6.4176E-01	6.7309E-01	6.6021E-01	6.7765E-01
10.6	6.2715E-01	6.3211E-01	6.4039E-01	6.4147E-01	6.7282E-01	6.6000E-01	6.7736E-01
10.8	6.2673E-01	6.3174E-01	6.3997E-01	6.4114E-01	6.7250E-01	6.5977E-01	6.7703E-01
11.0	6.2628E-01	6.3135E-01	6.3951E-01	6.4079E-01	6.7214E-01	6.5950E-01	6.7666E-01
11.2	6.2580E-01	6.3093E-01	6.3903E-01	6.4041E-01	6.7174E-01	6.5921E-01	6.7627E-01
11.4	6.2530E-01	6.3049E-01	6.3853E-01	6.4001E-01	6.7132E-01	6.5890E-01	6.7584E-01
11.6	6.2478E-01	6.3003E-01	6.3801E-01	6.3960E-01	6.7087E-01	6.5856E-01	6.7540E-01
11.8	6.2424E-01	6.2955E-01	6.3748E-01	6.3918E-01	6.7040E-01	6.5820E-01	6.7495E-01
12.0	6.2369E-01	6.2907E-01	6.3694E-01	6.3876E-01	6.6992E-01	6.5783E-01	6.7448E-01
12.2	6.2313E-01	6.2857E-01	6.3641E-01	6.3833E-01	6.6942E-01	6.5743E-01	6.7401E-01
12.4	6.2257E-01	6.2807E-01	6.3587E-01	6.3791E-01	6.6890E-01	6.5702E-01	6.7353E-01
12.6	6.2199E-01	6.2756E-01	6.3532E-01	6.3749E-01	6.6838E-01	6.5659E-01	6.7304E-01
12.8	6.2141E-01	6.2704E-01	6.3478E-01	6.3708E-01	6.6784E-01	6.5614E-01	6.7255E-01
13.0	6.2082E-01	6.2651E-01	6.3424E-01	6.3666E-01	6.6730E-01	6.5568E-01	6.7206E-01
13.2	6.2023E-01	6.2598E-01	6.3369E-01	6.3625E-01	6.6674E-01	6.5520E-01	6.7156E-01
13.4	6.1963E-01	6.2544E-01	6.3315E-01	6.3583E-01	6.6617E-01	6.5470E-01	6.7105E-01
13.6	6.1902E-01	6.2489E-01	6.3260E-01	6.3541E-01	6.6560E-01	6.5419E-01	6.7054E-01
13.8	6.1841E-01	6.2433E-01	6.3205E-01	6.3499E-01	6.6500E-01	6.5366E-01	6.7002E-01
14.0	6.1778E-01	6.2376E-01	6.3149E-01	6.3455E-01	6.6439E-01	6.5312E-01	6.6949E-01
14.2	6.1714E-01	6.2318E-01	6.3091E-01	6.3411E-01	6.6377E-01	6.5255E-01	6.6895E-01
14.4	6.1649E-01	6.2258E-01	6.3033E-01	6.3365E-01	6.6313E-01	6.5198E-01	6.6839E-01
14.6	6.1582E-01	6.2197E-01	6.2973E-01	6.3318E-01	6.6247E-01	6.5139E-01	6.6782E-01
14.8	6.1514E-01	6.2134E-01	6.2912E-01	6.3269E-01	6.6180E-01	6.5078E-01	6.6723E-01
15.0	6.1445E-01	6.2069E-01	6.2849E-01	6.3218E-01	6.6110E-01	6.5016E-01	6.6662E-01
15.2	6.1374E-01	6.2003E-01	6.2784E-01	6.3165E-01	6.6039E-01	6.4954E-01	6.6599E-01
15.4	6.1301E-01	6.1935E-01	6.2717E-01	6.3110E-01	6.5965E-01	6.4889E-01	6.6534E-01
15.6	6.1227E-01	6.1865E-01	6.2648E-01	6.3053E-01	6.5890E-01	6.4825E-01	6.6468E-01
15.8	6.1152E-01	6.1794E-01	6.2578E-01	6.2994E-01	6.5814E-01	6.4759E-01	6.6400E-01
16.0	6.1075E-01	6.1721E-01	6.2506E-01	6.2933E-01	6.5736E-01	6.4692E-01	6.6330E-01
16.2	6.0998E-01	6.1648E-01	6.2433E-01	6.2871E-01	6.5657E-01	6.4625E-01	6.6260E-01
16.4	6.0920E-01	6.1574E-01	6.2359E-01	6.2808E-01	6.5577E-01	6.4558E-01	6.6188E-01
16.6	6.0841E-01	6.1499E-01	6.2285E-01	6.2744E-01	6.5496E-01	6.4490E-01	6.6116E-01
16.8	6.0762E-01	6.1423E-01	6.2209E-01	6.2679E-01	6.5415E-01	6.4422E-01	6.6043E-01
17.0	6.0683E-01	6.1348E-01	6.2133E-01	6.2614E-01	6.5333E-01	6.4354E-01	6.5970E-01

**Table B-2. SSRS/StdP parachute,  $C_N$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	21/8	21/7	21/6	20/5	20/4	19/3	19/2
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	-9.7469E-04	-1.2390E-03	-9.8288E-04	-1.1740E-03	-1.0622E-03	-1.3326E-03	-1.3031E-03
0.4	-1.9381E-03	-2.4625E-03	-1.9569E-03	-2.3364E-03	-2.1144E-03	-2.6497E-03	-2.5913E-03
0.6	-2.8791E-03	-3.6552E-03	-2.9130E-03	-3.4758E-03	-3.1464E-03	-3.9356E-03	-3.8496E-03
0.8	-3.7864E-03	-4.8022E-03	-3.8425E-03	-4.5808E-03	-4.1480E-03	-5.1748E-03	-5.0631E-03
1.0	-4.6489E-03	-5.8882E-03	-4.7364E-03	-5.6399E-03	-5.1091E-03	-6.3517E-03	-6.2168E-03
1.2	-5.4559E-03	-6.8994E-03	-5.5857E-03	-6.6419E-03	-6.0196E-03	-7.4512E-03	-7.2961E-03
1.4	-6.1971E-03	-7.8239E-03	-6.3806E-03	-7.5760E-03	-6.8690E-03	-8.4610E-03	-8.2888E-03
1.6	-6.8627E-03	-8.6498E-03	-7.1111E-03	-8.4318E-03	-7.6466E-03	-9.3692E-03	-9.1829E-03
1.8	-7.4429E-03	-9.3653E-03	-7.7674E-03	-9.1991E-03	-8.3417E-03	-1.0164E-02	-9.9665E-03
2.0	-7.9276E-03	-9.9585E-03	-8.3394E-03	-9.8677E-03	-8.9435E-03	-1.0834E-02	-1.0628E-02
2.2	-8.3075E-03	-1.0419E-02	-8.8174E-03	-1.0427E-02	-9.4420E-03	-1.1368E-02	-1.1156E-02
2.4	-8.5761E-03	-1.0740E-02	-9.1922E-03	-1.0870E-02	-9.8280E-03	-1.1761E-02	-1.1545E-02
2.6	-8.7275E-03	-1.0918E-02	-9.4556E-03	-1.1190E-02	-1.0093E-02	-1.2008E-02	-1.1789E-02
2.8	-8.7562E-03	-1.0947E-02	-9.5991E-03	-1.1379E-02	-1.0228E-02	-1.2104E-02	-1.1883E-02
3.0	-8.6563E-03	-1.0823E-02	-9.6142E-03	-1.1432E-02	-1.0225E-02	-1.2045E-02	-1.1820E-02
3.2	-8.4232E-03	-1.0544E-02	-9.4927E-03	-1.1343E-02	-1.0077E-02	-1.1828E-02	-1.1598E-02
3.4	-8.0570E-03	-1.0113E-02	-9.2303E-03	-1.1108E-02	-9.7799E-03	-1.1456E-02	-1.1217E-02
3.6	-7.5593E-03	-9.5355E-03	-8.8249E-03	-1.0728E-02	-9.3335E-03	-1.0932E-02	-1.0681E-02
3.8	-6.9319E-03	-8.8140E-03	-8.2752E-03	-1.0203E-02	-8.7359E-03	-1.0262E-02	-9.9934E-03
4.0	-6.1765E-03	-7.9528E-03	-7.5793E-03	-9.5347E-03	-7.9860E-03	-9.4500E-03	-9.1569E-03
4.2	-5.2953E-03	-6.9572E-03	-6.7363E-03	-8.7231E-03	-7.0840E-03	-8.5005E-03	-8.1763E-03
4.4	-4.2933E-03	-5.8370E-03	-5.7496E-03	-7.7729E-03	-6.0368E-03	-7.4244E-03	-7.0617E-03
4.6	-3.1763E-03	-4.6036E-03	-4.6269E-03	-6.6921E-03	-4.8529E-03	-6.2329E-03	-5.8241E-03
4.8	-1.9501E-03	-3.2684E-03	-3.3763E-03	-5.4891E-03	-3.5409E-03	-4.9376E-03	-4.4748E-03
5.0	-6.2061E-04	-1.8428E-03	-2.0057E-03	-4.1723E-03	-2.1091E-03	-3.5499E-03	-3.0248E-03
5.2	8.0384E-04	-3.3924E-04	-5.2563E-04	-2.7515E-03	-5.6818E-04	-2.0821E-03	-1.4866E-03
5.4	2.3080E-03	1.2267E-03	1.0472E-03	-1.2409E-03	1.0649E-03	-5.4930E-04	1.2381E-04
5.6	3.8744E-03	2.8386E-03	2.6929E-03	3.4103E-04	2.7702E-03	1.0325E-03	1.7891E-03
5.8	5.4858E-03	4.4802E-03	4.3916E-03	1.9753E-03	4.5279E-03	2.6473E-03	3.4921E-03
6.0	7.1248E-03	6.1351E-03	6.1232E-03	3.6429E-03	6.3182E-03	4.2793E-03	5.2157E-03
6.2	8.7744E-03	7.7875E-03	7.8680E-03	5.3250E-03	8.1216E-03	5.9131E-03	6.9434E-03
6.4	1.0420E-02	9.4246E-03	9.6080E-03	7.0045E-03	9.9209E-03	7.5363E-03	8.6615E-03
6.6	1.2047E-02	1.1034E-02	1.1327E-02	8.6661E-03	1.1701E-02	9.1371E-03	1.0357E-02
6.8	1.3642E-02	1.2604E-02	1.3009E-02	1.0295E-02	1.3445E-02	1.0704E-02	1.2017E-02
7.0	1.5191E-02	1.4123E-02	1.4639E-02	1.1875E-02	1.5137E-02	1.2224E-02	1.3629E-02
7.2	1.6680E-02	1.5578E-02	1.6200E-02	1.3393E-02	1.6764E-02	1.3688E-02	1.5181E-02
7.4	1.8104E-02	1.6965E-02	1.7686E-02	1.4838E-02	1.8317E-02	1.5090E-02	1.6668E-02
7.6	1.9457E-02	1.8278E-02	1.9090E-02	1.6204E-02	1.9792E-02	1.6425E-02	1.8085E-02
7.8	2.0735E-02	1.9516E-02	2.0408E-02	1.7487E-02	2.1184E-02	1.7691E-02	1.9430E-02
8.0	2.1932E-02	2.0673E-02	2.1635E-02	1.8680E-02	2.2489E-02	1.8883E-02	2.0698E-02
8.2	2.3047E-02	2.1749E-02	2.2767E-02	1.9779E-02	2.3703E-02	2.0000E-02	2.1887E-02
8.4	2.4081E-02	2.2746E-02	2.3805E-02	2.0784E-02	2.4830E-02	2.1043E-02	2.2999E-02
8.6	2.5039E-02	2.3667E-02	2.4756E-02	2.1699E-02	2.5874E-02	2.2016E-02	2.4037E-02
8.8	2.5925E-02	2.4518E-02	2.5625E-02	2.2529E-02	2.6843E-02	2.2923E-02	2.5006E-02

**Table B-2. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	21/8	21/7	21/6	20/5	20/4	19/3	19/2
9.0	2.6745E-02	2.5301E-02	2.6418E-02	2.3278E-02	2.7742E-02	2.3767E-02	2.5908E-02
9.2	2.7502E-02	2.6023E-02	2.7141E-02	2.3952E-02	2.8579E-02	2.4551E-02	2.6747E-02
9.4	2.8205E-02	2.6689E-02	2.7803E-02	2.4558E-02	2.9362E-02	2.5283E-02	2.7532E-02
9.6	2.8862E-02	2.7308E-02	2.8413E-02	2.5103E-02	3.0102E-02	2.5968E-02	2.8268E-02
9.8	2.9480E-02	2.7886E-02	2.8982E-02	2.5599E-02	3.0808E-02	2.6613E-02	2.8964E-02
10.0	3.0067E-02	2.8430E-02	2.9519E-02	2.6054E-02	3.1490E-02	2.7225E-02	2.9628E-02
10.2	3.0632E-02	2.8948E-02	3.0033E-02	2.6477E-02	3.2159E-02	2.7809E-02	3.0265E-02
10.4	3.1180E-02	2.9444E-02	3.0532E-02	2.6878E-02	3.2820E-02	2.8371E-02	3.0883E-02
10.6	3.1715E-02	2.9925E-02	3.1020E-02	2.7263E-02	3.3477E-02	2.8915E-02	3.1488E-02
10.8	3.2243E-02	3.0393E-02	3.1503E-02	2.7637E-02	3.4135E-02	2.9446E-02	3.2084E-02
11.0	3.2766E-02	3.0856E-02	3.1988E-02	2.8009E-02	3.4800E-02	2.9970E-02	3.2678E-02
11.2	3.3290E-02	3.1316E-02	3.2480E-02	2.8384E-02	3.5474E-02	3.0489E-02	3.3276E-02
11.4	3.3817E-02	3.1778E-02	3.2980E-02	2.8767E-02	3.6160E-02	3.1009E-02	3.3880E-02
11.6	3.4348E-02	3.2243E-02	3.3492E-02	2.9162E-02	3.6859E-02	3.1530E-02	3.4494E-02
11.8	3.4886E-02	3.2716E-02	3.4016E-02	2.9573E-02	3.7572E-02	3.2057E-02	3.5120E-02
12.0	3.5432E-02	3.3197E-02	3.4556E-02	3.0002E-02	3.8300E-02	3.2591E-02	3.5763E-02
12.2	3.5988E-02	3.3690E-02	3.5112E-02	3.0452E-02	3.9044E-02	3.3136E-02	3.6425E-02
12.4	3.6554E-02	3.4196E-02	3.5686E-02	3.0927E-02	3.9804E-02	3.3694E-02	3.7107E-02
12.6	3.7133E-02	3.4718E-02	3.6278E-02	3.1425E-02	4.0581E-02	3.4267E-02	3.7811E-02
12.8	3.7725E-02	3.5256E-02	3.6888E-02	3.1948E-02	4.1374E-02	3.4855E-02	3.8538E-02
13.0	3.8331E-02	3.5813E-02	3.7516E-02	3.2494E-02	4.2184E-02	3.5462E-02	3.9290E-02
13.2	3.8953E-02	3.6389E-02	3.8164E-02	3.3063E-02	4.3011E-02	3.6088E-02	4.0068E-02
13.4	3.9591E-02	3.6986E-02	3.8832E-02	3.3656E-02	4.3856E-02	3.6735E-02	4.0872E-02
13.6	4.0247E-02	3.7606E-02	3.9520E-02	3.4272E-02	4.4720E-02	3.7405E-02	4.1703E-02
13.8	4.0923E-02	3.8248E-02	4.0229E-02	3.4909E-02	4.5605E-02	3.8098E-02	4.2561E-02
14.0	4.1620E-02	3.8916E-02	4.0960E-02	3.5568E-02	4.6512E-02	3.8817E-02	4.3447E-02
14.2	4.2340E-02	3.9608E-02	4.1714E-02	3.6247E-02	4.7442E-02	3.9561E-02	4.4361E-02
14.4	4.3083E-02	4.0327E-02	4.2491E-02	3.6947E-02	4.8396E-02	4.0332E-02	4.5303E-02
14.6	4.3852E-02	4.1073E-02	4.3292E-02	3.7666E-02	4.9377E-02	4.1130E-02	4.6272E-02
14.8	4.4647E-02	4.1845E-02	4.4117E-02	3.8403E-02	5.0384E-02	4.1955E-02	4.7269E-02
15.0	4.5469E-02	4.2643E-02	4.4967E-02	3.9159E-02	5.1419E-02	4.2807E-02	4.8292E-02
15.2	4.6318E-02	4.3469E-02	4.5842E-02	3.9932E-02	5.2483E-02	4.3687E-02	4.9341E-02
15.4	4.7194E-02	4.4320E-02	4.6741E-02	4.0721E-02	5.3574E-02	4.4591E-02	5.0413E-02
15.6	4.8093E-02	4.5192E-02	4.7662E-02	4.1524E-02	5.4691E-02	4.5517E-02	5.1507E-02
15.8	4.9013E-02	4.6085E-02	4.8601E-02	4.2340E-02	5.5829E-02	4.6463E-02	5.2619E-02
16.0	4.9951E-02	4.6994E-02	4.9558E-02	4.3168E-02	5.6988E-02	4.7426E-02	5.3746E-02
16.2	5.0906E-02	4.7918E-02	5.0530E-02	4.4004E-02	5.8164E-02	4.8403E-02	5.4887E-02
16.4	5.1873E-02	4.8853E-02	5.1514E-02	4.4849E-02	5.9354E-02	4.9392E-02	5.6038E-02
16.6	5.2849E-02	4.9797E-02	5.2506E-02	4.5699E-02	6.0554E-02	5.0389E-02	5.7197E-02
16.8	5.3833E-02	5.0747E-02	5.3506E-02	4.6553E-02	6.1763E-02	5.1391E-02	5.8361E-02
17.0	5.4819E-02	5.1700E-02	5.4509E-02	4.7410E-02	6.2975E-02	5.2396E-02	5.9527E-02

**Table B-3. SSRS/StdP parachute,  $C_{m,SLCP}$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	21/8	21/7	21/6	20/5	20/4	19/3	19/2
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	1.4579E-03	1.8903E-03	1.4390E-03	1.7523E-03	1.5254E-03	1.9775E-03	1.8865E-03
0.4	2.8984E-03	3.7563E-03	2.8651E-03	3.4877E-03	3.0360E-03	3.9317E-03	3.7510E-03
0.6	4.3041E-03	5.5741E-03	4.2652E-03	5.1891E-03	4.5168E-03	5.8393E-03	5.5716E-03
0.8	5.6576E-03	7.3198E-03	5.6264E-03	6.8396E-03	5.9527E-03	7.6768E-03	7.3264E-03
1.0	6.9416E-03	8.9699E-03	6.9357E-03	8.4224E-03	7.3290E-03	9.4211E-03	8.9934E-03
1.2	8.1396E-03	1.0503E-02	8.1798E-03	9.9207E-03	8.6305E-03	1.1050E-02	1.0551E-02
1.4	9.2360E-03	1.1899E-02	9.3442E-03	1.1318E-02	9.8417E-03	1.2543E-02	1.1982E-02
1.6	1.0216E-02	1.3142E-02	1.0414E-02	1.2600E-02	1.0947E-02	1.3885E-02	1.3267E-02
1.8	1.1063E-02	1.4212E-02	1.1373E-02	1.3749E-02	1.1930E-02	1.5056E-02	1.4390E-02
2.0	1.1764E-02	1.5092E-02	1.2208E-02	1.4752E-02	1.2775E-02	1.6040E-02	1.5332E-02
2.2	1.2302E-02	1.5764E-02	1.2903E-02	1.5592E-02	1.3467E-02	1.6820E-02	1.6078E-02
2.4	1.2670E-02	1.6221E-02	1.3444E-02	1.6256E-02	1.3993E-02	1.7387E-02	1.6618E-02
2.6	1.2858E-02	1.6454E-02	1.3819E-02	1.6736E-02	1.4339E-02	1.7734E-02	1.6944E-02
2.8	1.2857E-02	1.6457E-02	1.4013E-02	1.7020E-02	1.4494E-02	1.7855E-02	1.7047E-02
3.0	1.2660E-02	1.6225E-02	1.4014E-02	1.7099E-02	1.4443E-02	1.7742E-02	1.6919E-02
3.2	1.2259E-02	1.5754E-02	1.3809E-02	1.6963E-02	1.4177E-02	1.7391E-02	1.6554E-02
3.4	1.1655E-02	1.5051E-02	1.3392E-02	1.6607E-02	1.3691E-02	1.6807E-02	1.5953E-02
3.6	1.0852E-02	1.4123E-02	1.2758E-02	1.6032E-02	1.2984E-02	1.5996E-02	1.5123E-02
3.8	9.8524E-03	1.2977E-02	1.1906E-02	1.5237E-02	1.2054E-02	1.4964E-02	1.4067E-02
4.0	8.6598E-03	1.1620E-02	1.0833E-02	1.4225E-02	1.0899E-02	1.3718E-02	1.2791E-02
4.2	7.2782E-03	1.0061E-02	9.5373E-03	1.2995E-02	9.5191E-03	1.2268E-02	1.1301E-02
4.4	5.7160E-03	8.3163E-03	8.0238E-03	1.1555E-02	7.9257E-03	1.0628E-02	9.6131E-03
4.6	3.9827E-03	6.4047E-03	6.3049E-03	9.9174E-03	6.1317E-03	8.8161E-03	7.7436E-03
4.8	2.0881E-03	4.3444E-03	4.3930E-03	8.0948E-03	4.1502E-03	6.8511E-03	5.7096E-03
5.0	4.1761E-05	2.1540E-03	2.3009E-03	6.1002E-03	1.9941E-03	4.7504E-03	3.5283E-03
5.2	-2.1428E-03	-1.4644E-04	4.4813E-05	3.9489E-03	-3.2039E-04	2.5331E-03	1.2182E-03
5.4	-4.4418E-03	-2.5327E-03	-2.3489E-03	1.6631E-03	-2.7674E-03	2.2301E-04	-1.1955E-03
5.6	-6.8285E-03	-4.9797E-03	-4.8491E-03	-7.2811E-04	-5.3169E-03	-2.1551E-03	-3.6868E-03
5.8	-9.2757E-03	-7.4619E-03	-7.4244E-03	-3.1949E-03	-7.9390E-03	-4.5764E-03	-6.2290E-03
6.0	-1.1757E-02	-9.9543E-03	-1.0044E-02	-5.7074E-03	-1.0603E-02	-7.0161E-03	-8.7960E-03
6.2	-1.4245E-02	-1.2433E-02	-1.2676E-02	-8.2360E-03	-1.3281E-02	-9.4504E-03	-1.1362E-02
6.4	-1.6719E-02	-1.4877E-02	-1.5293E-02	-1.0754E-02	-1.5945E-02	-1.1860E-02	-1.3907E-02
6.6	-1.9156E-02	-1.7270E-02	-1.7869E-02	-1.3237E-02	-1.8574E-02	-1.4227E-02	-1.6411E-02
6.8	-2.1536E-02	-1.9593E-02	-2.0381E-02	-1.5662E-02	-2.1142E-02	-1.6533E-02	-1.8854E-02
7.0	-2.3836E-02	-2.1829E-02	-2.2804E-02	-1.8006E-02	-2.3628E-02	-1.8761E-02	-2.1217E-02
7.2	-2.6039E-02	-2.3960E-02	-2.5114E-02	-2.0245E-02	-2.6007E-02	-2.0893E-02	-2.3483E-02
7.4	-2.8133E-02	-2.5978E-02	-2.7299E-02	-2.2364E-02	-2.8270E-02	-2.2923E-02	-2.5642E-02
7.6	-3.0112E-02	-2.7879E-02	-2.9352E-02	-2.4354E-02	-3.0410E-02	-2.4845E-02	-2.7691E-02
7.8	-3.1970E-02	-2.9658E-02	-3.1266E-02	-2.6208E-02	-3.2421E-02	-2.6654E-02	-2.9624E-02
8.0	-3.3701E-02	-3.1310E-02	-3.3035E-02	-2.7919E-02	-3.4297E-02	-2.8344E-02	-3.1436E-02
8.2	-3.5300E-02	-3.2833E-02	-3.4652E-02	-2.9479E-02	-3.6032E-02	-2.9914E-02	-3.3123E-02
8.4	-3.6772E-02	-3.4234E-02	-3.6121E-02	-3.0889E-02	-3.7632E-02	-3.1368E-02	-3.4690E-02
8.6	-3.8125E-02	-3.5518E-02	-3.7454E-02	-3.2156E-02	-3.9106E-02	-3.2712E-02	-3.6142E-02
8.8	-3.9368E-02	-3.6694E-02	-3.8659E-02	-3.3289E-02	-4.0465E-02	-3.3953E-02	-3.7487E-02

**Table B-3. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	21/8	21/7	21/6	20/5	20/4	19/3	19/2
9.0	-4.0507E-02	-3.7769E-02	-3.9747E-02	-3.4296E-02	-4.1718E-02	-3.5097E-02	-3.8730E-02
9.2	-4.1552E-02	-3.8750E-02	-4.0730E-02	-3.5185E-02	-4.2876E-02	-3.6152E-02	-3.9878E-02
9.4	-4.2515E-02	-3.9650E-02	-4.1620E-02	-3.5970E-02	-4.3955E-02	-3.7127E-02	-4.0943E-02
9.6	-4.3408E-02	-4.0480E-02	-4.2434E-02	-3.6664E-02	-4.4968E-02	-3.8033E-02	-4.1936E-02
9.8	-4.4245E-02	-4.1252E-02	-4.3188E-02	-3.7283E-02	-4.5933E-02	-3.8882E-02	-4.2871E-02
10.0	-4.5040E-02	-4.1977E-02	-4.3899E-02	-3.7844E-02	-4.6865E-02	-3.9683E-02	-4.3758E-02
10.2	-4.5805E-02	-4.2667E-02	-4.4581E-02	-3.8361E-02	-4.7778E-02	-4.0448E-02	-4.4611E-02
10.4	-4.6548E-02	-4.3330E-02	-4.5245E-02	-3.8848E-02	-4.8682E-02	-4.1184E-02	-4.5438E-02
10.6	-4.7276E-02	-4.3973E-02	-4.5898E-02	-3.9316E-02	-4.9585E-02	-4.1897E-02	-4.6248E-02
10.8	-4.7996E-02	-4.4603E-02	-4.6550E-02	-3.9775E-02	-5.0492E-02	-4.2596E-02	-4.7051E-02
11.0	-4.8715E-02	-4.5228E-02	-4.7210E-02	-4.0234E-02	-5.1411E-02	-4.3286E-02	-4.7854E-02
11.2	-4.9439E-02	-4.5853E-02	-4.7884E-02	-4.0704E-02	-5.2348E-02	-4.3976E-02	-4.8665E-02
11.4	-5.0171E-02	-4.6485E-02	-4.8576E-02	-4.1192E-02	-5.3308E-02	-4.4668E-02	-4.9491E-02
11.6	-5.0915E-02	-4.7125E-02	-4.9290E-02	-4.1703E-02	-5.4290E-02	-4.5368E-02	-5.0336E-02
11.8	-5.1671E-02	-4.7779E-02	-5.0026E-02	-4.2242E-02	-5.5296E-02	-4.6079E-02	-5.1204E-02
12.0	-5.2444E-02	-4.8449E-02	-5.0789E-02	-4.2813E-02	-5.6328E-02	-4.6805E-02	-5.2100E-02
12.2	-5.3234E-02	-4.9139E-02	-5.1579E-02	-4.3422E-02	-5.7387E-02	-4.7549E-02	-5.3028E-02
12.4	-5.4044E-02	-4.9852E-02	-5.2398E-02	-4.4071E-02	-5.8474E-02	-4.8316E-02	-5.3991E-02
12.6	-5.4875E-02	-5.0590E-02	-5.3245E-02	-4.4759E-02	-5.9588E-02	-4.9107E-02	-5.4990E-02
12.8	-5.5728E-02	-5.1354E-02	-5.4122E-02	-4.5487E-02	-6.0731E-02	-4.9924E-02	-5.6027E-02
13.0	-5.6604E-02	-5.2148E-02	-5.5028E-02	-4.6253E-02	-6.1902E-02	-5.0771E-02	-5.7104E-02
13.2	-5.7505E-02	-5.2973E-02	-5.5964E-02	-4.7057E-02	-6.3102E-02	-5.1650E-02	-5.8223E-02
13.4	-5.8433E-02	-5.3831E-02	-5.6931E-02	-4.7897E-02	-6.4332E-02	-5.2564E-02	-5.9385E-02
13.6	-5.9390E-02	-5.4725E-02	-5.7930E-02	-4.8773E-02	-6.5594E-02	-5.3514E-02	-6.0591E-02
13.8	-6.0378E-02	-5.5655E-02	-5.8961E-02	-4.9683E-02	-6.6890E-02	-5.4502E-02	-6.1841E-02
14.0	-6.1400E-02	-5.6625E-02	-6.0028E-02	-5.0627E-02	-6.8222E-02	-5.5532E-02	-6.3136E-02
14.2	-6.2458E-02	-5.7636E-02	-6.1130E-02	-5.1603E-02	-6.9593E-02	-5.6604E-02	-6.4478E-02
14.4	-6.3553E-02	-5.8689E-02	-6.2270E-02	-5.2609E-02	-7.1003E-02	-5.7721E-02	-6.5864E-02
14.6	-6.4688E-02	-5.9784E-02	-6.3447E-02	-5.3646E-02	-7.2455E-02	-5.8881E-02	-6.7296E-02
14.8	-6.5863E-02	-6.0922E-02	-6.4664E-02	-5.4711E-02	-7.3951E-02	-6.0086E-02	-6.8772E-02
15.0	-6.7081E-02	-6.2103E-02	-6.5921E-02	-5.5804E-02	-7.5492E-02	-6.1337E-02	-7.0291E-02
15.2	-6.8342E-02	-6.3328E-02	-6.7219E-02	-5.6923E-02	-7.7080E-02	-6.2633E-02	-7.1853E-02
15.4	-6.9645E-02	-6.4594E-02	-6.8557E-02	-5.8066E-02	-7.8711E-02	-6.3971E-02	-7.3454E-02
15.6	-7.0984E-02	-6.5895E-02	-6.9930E-02	-5.9232E-02	-8.0383E-02	-6.5347E-02	-7.5090E-02
15.8	-7.2356E-02	-6.7229E-02	-7.1335E-02	-6.0418E-02	-8.2091E-02	-6.6755E-02	-7.6756E-02
16.0	-7.3757E-02	-6.8590E-02	-7.2768E-02	-6.1620E-02	-8.3830E-02	-6.8192E-02	-7.8448E-02
16.2	-7.5182E-02	-6.9975E-02	-7.4225E-02	-6.2837E-02	-8.5597E-02	-6.9653E-02	-8.0162E-02
16.4	-7.6628E-02	-7.1379E-02	-7.5702E-02	-6.4065E-02	-8.7386E-02	-7.1133E-02	-8.1893E-02
16.6	-7.8089E-02	-7.2797E-02	-7.7194E-02	-6.5303E-02	-8.9193E-02	-7.2627E-02	-8.3636E-02
16.8	-7.9560E-02	-7.4224E-02	-7.8697E-02	-6.6547E-02	-9.1012E-02	-7.4131E-02	-8.5389E-02
17.0	-8.1036E-02	-7.5656E-02	-8.0206E-02	-6.7794E-02	-9.2837E-02	-7.5640E-02	-8.7146E-02

**Table B-4. SSRS/LowP parachute,  $C_T$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	25/29	25/28	25/27	25/26	25/25	25/24	25/23
0.0	6.3869E-01	6.4116E-01	6.4253E-01	6.3360E-01	6.5687E-01	6.4009E-01	6.5533E-01
0.2	6.3877E-01	6.4123E-01	6.4262E-01	6.3370E-01	6.5699E-01	6.4020E-01	6.5546E-01
0.4	6.3900E-01	6.4147E-01	6.4288E-01	6.3399E-01	6.5735E-01	6.4056E-01	6.5585E-01
0.6	6.3938E-01	6.4185E-01	6.4331E-01	6.3447E-01	6.5794E-01	6.4115E-01	6.5649E-01
0.8	6.3991E-01	6.4239E-01	6.4391E-01	6.3513E-01	6.5876E-01	6.4197E-01	6.5738E-01
1.0	6.4059E-01	6.4308E-01	6.4468E-01	6.3597E-01	6.5980E-01	6.4302E-01	6.5852E-01
1.2	6.4141E-01	6.4392E-01	6.4561E-01	6.3699E-01	6.6107E-01	6.4428E-01	6.5989E-01
1.4	6.4237E-01	6.4490E-01	6.4669E-01	6.3818E-01	6.6256E-01	6.4576E-01	6.6150E-01
1.6	6.4347E-01	6.4602E-01	6.4793E-01	6.3953E-01	6.6426E-01	6.4744E-01	6.6332E-01
1.8	6.4470E-01	6.4727E-01	6.4932E-01	6.4103E-01	6.6617E-01	6.4932E-01	6.6537E-01
2.0	6.4605E-01	6.4866E-01	6.5085E-01	6.4268E-01	6.6827E-01	6.5138E-01	6.6761E-01
2.2	6.4754E-01	6.5018E-01	6.5251E-01	6.4447E-01	6.7055E-01	6.5363E-01	6.7006E-01
2.4	6.4913E-01	6.5182E-01	6.5431E-01	6.4639E-01	6.7302E-01	6.5604E-01	6.7269E-01
2.6	6.5084E-01	6.5357E-01	6.5622E-01	6.4842E-01	6.7565E-01	6.5860E-01	6.7549E-01
2.8	6.5264E-01	6.5543E-01	6.5825E-01	6.5056E-01	6.7843E-01	6.6130E-01	6.7844E-01
3.0	6.5454E-01	6.5738E-01	6.6037E-01	6.5280E-01	6.8134E-01	6.6412E-01	6.8152E-01
3.2	6.5652E-01	6.5942E-01	6.6258E-01	6.5511E-01	6.8438E-01	6.6704E-01	6.8473E-01
3.4	6.5857E-01	6.6155E-01	6.6488E-01	6.5749E-01	6.8752E-01	6.7005E-01	6.8804E-01
3.6	6.6068E-01	6.6374E-01	6.6724E-01	6.5992E-01	6.9074E-01	6.7313E-01	6.9143E-01
3.8	6.6283E-01	6.6598E-01	6.6965E-01	6.6238E-01	6.9403E-01	6.7625E-01	6.9488E-01
4.0	6.6502E-01	6.6826E-01	6.7210E-01	6.6487E-01	6.9736E-01	6.7940E-01	6.9837E-01
4.2	6.6722E-01	6.7058E-01	6.7457E-01	6.6736E-01	7.0071E-01	6.8256E-01	7.0187E-01
4.4	6.6944E-01	6.7291E-01	6.7705E-01	6.6984E-01	7.0406E-01	6.8569E-01	7.0536E-01
4.6	6.7165E-01	6.7524E-01	6.7953E-01	6.7229E-01	7.0738E-01	6.8879E-01	7.0882E-01
4.8	6.7383E-01	6.7756E-01	6.8198E-01	6.7470E-01	7.1066E-01	6.9183E-01	7.1222E-01
5.0	6.7597E-01	6.7985E-01	6.8440E-01	6.7705E-01	7.1387E-01	6.9479E-01	7.1554E-01
5.2	6.7807E-01	6.8210E-01	6.8676E-01	6.7932E-01	7.1699E-01	6.9764E-01	7.1875E-01
5.4	6.8010E-01	6.8430E-01	6.8906E-01	6.8151E-01	7.2001E-01	7.0038E-01	7.2185E-01
5.6	6.8205E-01	6.8643E-01	6.9127E-01	6.8360E-01	7.2290E-01	7.0299E-01	7.2481E-01
5.8	6.8392E-01	6.8848E-01	6.9340E-01	6.8558E-01	7.2566E-01	7.0546E-01	7.2763E-01
6.0	6.8569E-01	6.9044E-01	6.9542E-01	6.8745E-01	7.2827E-01	7.0778E-01	7.3028E-01
6.2	6.8736E-01	6.9230E-01	6.9732E-01	6.8919E-01	7.3072E-01	7.0994E-01	7.3276E-01
6.4	6.8891E-01	6.9404E-01	6.9910E-01	6.9080E-01	7.3299E-01	7.1192E-01	7.3506E-01
6.6	6.9035E-01	6.9567E-01	7.0074E-01	6.9228E-01	7.3509E-01	7.1374E-01	7.3717E-01
6.8	6.9166E-01	6.9718E-01	7.0225E-01	6.9363E-01	7.3701E-01	7.1538E-01	7.3909E-01
7.0	6.9284E-01	6.9855E-01	7.0362E-01	6.9483E-01	7.3875E-01	7.1685E-01	7.4082E-01
7.2	6.9389E-01	6.9978E-01	7.0483E-01	6.9589E-01	7.4029E-01	7.1814E-01	7.4234E-01
7.4	6.9480E-01	7.0087E-01	7.0589E-01	6.9681E-01	7.4165E-01	7.1925E-01	7.4368E-01
7.6	6.9559E-01	7.0183E-01	7.0680E-01	6.9760E-01	7.4283E-01	7.2021E-01	7.4482E-01
7.8	6.9625E-01	7.0264E-01	7.0757E-01	6.9825E-01	7.4384E-01	7.2100E-01	7.4579E-01
8.0	6.9678E-01	7.0332E-01	7.0819E-01	6.9877E-01	7.4468E-01	7.2164E-01	7.4658E-01
8.2	6.9719E-01	7.0385E-01	7.0866E-01	6.9917E-01	7.4535E-01	7.2213E-01	7.4721E-01
8.4	6.9749E-01	7.0425E-01	7.0899E-01	6.9944E-01	7.4587E-01	7.2249E-01	7.4768E-01
8.6	6.9767E-01	7.0453E-01	7.0920E-01	6.9961E-01	7.4626E-01	7.2273E-01	7.4800E-01
8.8	6.9776E-01	7.0468E-01	7.0929E-01	6.9969E-01	7.4651E-01	7.2286E-01	7.4820E-01



**Table B-4. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	25/29	25/28	25/27	25/26	25/25	25/24	25/23
9.0	6.9775E-01	7.0472E-01	7.0926E-01	6.9966E-01	7.4666E-01	7.2289E-01	7.4829E-01
9.2	6.9766E-01	7.0465E-01	7.0914E-01	6.9956E-01	7.4670E-01	7.2284E-01	7.4827E-01
9.4	6.9750E-01	7.0448E-01	7.0892E-01	6.9938E-01	7.4665E-01	7.2271E-01	7.4817E-01
9.6	6.9727E-01	7.0422E-01	7.0863E-01	6.9914E-01	7.4652E-01	7.2252E-01	7.4799E-01
9.8	6.9699E-01	7.0389E-01	7.0826E-01	6.9884E-01	7.4633E-01	7.2229E-01	7.4775E-01
10.0	6.9667E-01	7.0348E-01	7.0785E-01	6.9850E-01	7.4609E-01	7.2201E-01	7.4746E-01
10.2	6.9631E-01	7.0302E-01	7.0739E-01	6.9812E-01	7.4582E-01	7.2171E-01	7.4715E-01
10.4	6.9593E-01	7.0250E-01	7.0690E-01	6.9772E-01	7.4551E-01	7.2139E-01	7.4681E-01
10.6	6.9552E-01	7.0195E-01	7.0638E-01	6.9729E-01	7.4518E-01	7.2106E-01	7.4645E-01
10.8	6.9511E-01	7.0136E-01	7.0585E-01	6.9685E-01	7.4484E-01	7.2071E-01	7.4607E-01
11.0	6.9468E-01	7.0074E-01	7.0532E-01	6.9639E-01	7.4448E-01	7.2036E-01	7.4570E-01
11.2	6.9426E-01	7.0011E-01	7.0478E-01	6.9594E-01	7.4412E-01	7.2000E-01	7.4532E-01
11.4	6.9383E-01	6.9947E-01	7.0426E-01	6.9548E-01	7.4376E-01	7.1965E-01	7.4495E-01
11.6	6.9342E-01	6.9883E-01	7.0375E-01	6.9503E-01	7.4339E-01	7.1930E-01	7.4458E-01
11.8	6.9301E-01	6.9819E-01	7.0326E-01	6.9458E-01	7.4304E-01	7.1895E-01	7.4422E-01
12.0	6.9261E-01	6.9755E-01	7.0279E-01	6.9414E-01	7.4268E-01	7.1860E-01	7.4387E-01
12.2	6.9223E-01	6.9693E-01	7.0235E-01	6.9372E-01	7.4234E-01	7.1826E-01	7.4353E-01
12.4	6.9186E-01	6.9632E-01	7.0193E-01	6.9331E-01	7.4200E-01	7.1793E-01	7.4321E-01
12.6	6.9150E-01	6.9573E-01	7.0154E-01	6.9291E-01	7.4167E-01	7.1760E-01	7.4289E-01
12.8	6.9115E-01	6.9516E-01	7.0118E-01	6.9253E-01	7.4134E-01	7.1727E-01	7.4258E-01
13.0	6.9082E-01	6.9460E-01	7.0085E-01	6.9217E-01	7.4102E-01	7.1695E-01	7.4227E-01
13.2	6.9050E-01	6.9408E-01	7.0054E-01	6.9182E-01	7.4071E-01	7.1663E-01	7.4198E-01
13.4	6.9019E-01	6.9357E-01	7.0026E-01	6.9149E-01	7.4040E-01	7.1632E-01	7.4169E-01
13.6	6.8989E-01	6.9308E-01	7.0000E-01	6.9118E-01	7.4010E-01	7.1601E-01	7.4140E-01
13.8	6.8959E-01	6.9261E-01	6.9975E-01	6.9088E-01	7.3979E-01	7.1570E-01	7.4112E-01
14.0	6.8929E-01	6.9217E-01	6.9952E-01	6.9060E-01	7.3949E-01	7.1539E-01	7.4084E-01
14.2	6.8900E-01	6.9174E-01	6.9930E-01	6.9033E-01	7.3919E-01	7.1509E-01	7.4055E-01
14.4	6.8870E-01	6.9132E-01	6.9908E-01	6.9008E-01	7.3889E-01	7.1479E-01	7.4027E-01
14.6	6.8840E-01	6.9092E-01	6.9887E-01	6.8983E-01	7.3859E-01	7.1450E-01	7.3998E-01
14.8	6.8810E-01	6.9054E-01	6.9867E-01	6.8960E-01	7.3829E-01	7.1420E-01	7.3969E-01
15.0	6.8779E-01	6.9016E-01	6.9845E-01	6.8938E-01	7.3798E-01	7.1392E-01	7.3939E-01
15.2	6.8748E-01	6.8979E-01	6.9824E-01	6.8916E-01	7.3768E-01	7.1363E-01	7.3909E-01
15.4	6.8716E-01	6.8943E-01	6.9802E-01	6.8895E-01	7.3737E-01	7.1335E-01	7.3879E-01
15.6	6.8683E-01	6.8908E-01	6.9779E-01	6.8875E-01	7.3706E-01	7.1307E-01	7.3848E-01
15.8	6.8649E-01	6.8873E-01	6.9756E-01	6.8856E-01	7.3675E-01	7.1279E-01	7.3817E-01
16.0	6.8615E-01	6.8839E-01	6.9732E-01	6.8836E-01	7.3643E-01	7.1252E-01	7.3785E-01
16.2	6.8580E-01	6.8805E-01	6.9708E-01	6.8818E-01	7.3612E-01	7.1225E-01	7.3754E-01
16.4	6.8545E-01	6.8770E-01	6.9683E-01	6.8799E-01	7.3580E-01	7.1198E-01	7.3722E-01
16.6	6.8509E-01	6.8737E-01	6.9658E-01	6.8781E-01	7.3548E-01	7.1171E-01	7.3689E-01
16.8	6.8473E-01	6.8703E-01	6.9632E-01	6.8762E-01	7.3516E-01	7.1144E-01	7.3657E-01
17.0	6.8437E-01	6.8669E-01	6.9607E-01	6.8744E-01	7.3485E-01	7.1117E-01	7.3625E-01

**Table B-5. SSRS/LowP parachute,  $C_N$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	25/29	25/28	25/27	25/26	25/25	25/24	25/23
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	-1.8076E-03	-2.0416E-03	-1.9281E-03	-2.0317E-03	-2.0824E-03	-2.1061E-03	-2.1774E-03
0.4	-3.6051E-03	-4.0712E-03	-3.8450E-03	-4.0499E-03	-4.1449E-03	-4.1919E-03	-4.3336E-03
0.6	-5.3823E-03	-6.0767E-03	-5.7395E-03	-6.0411E-03	-6.1678E-03	-6.2372E-03	-6.4474E-03
0.8	-7.1291E-03	-8.0463E-03	-7.6004E-03	-7.9918E-03	-8.1312E-03	-8.2216E-03	-8.4975E-03
1.0	-8.8352E-03	-9.9678E-03	-9.4165E-03	-9.8887E-03	-1.0015E-02	-1.0125E-02	-1.0463E-02
1.2	-1.0490E-02	-1.1829E-02	-1.1176E-02	-1.1718E-02	-1.1801E-02	-1.1928E-02	-1.2323E-02
1.4	-1.2084E-02	-1.3618E-02	-1.2868E-02	-1.3467E-02	-1.3474E-02	-1.3614E-02	-1.4063E-02
1.6	-1.3603E-02	-1.5321E-02	-1.4478E-02	-1.5121E-02	-1.5018E-02	-1.5170E-02	-1.5666E-02
1.8	-1.5038E-02	-1.6927E-02	-1.5993E-02	-1.6668E-02	-1.6419E-02	-1.6578E-02	-1.7117E-02
2.0	-1.6376E-02	-1.8421E-02	-1.7402E-02	-1.8093E-02	-1.7662E-02	-1.7826E-02	-1.8400E-02
2.2	-1.7608E-02	-1.9793E-02	-1.8692E-02	-1.9385E-02	-1.8735E-02	-1.8898E-02	-1.9501E-02
2.4	-1.8721E-02	-2.1030E-02	-1.9850E-02	-2.0532E-02	-1.9631E-02	-1.9789E-02	-2.0410E-02
2.6	-1.9705E-02	-2.2124E-02	-2.0867E-02	-2.1524E-02	-2.0343E-02	-2.0492E-02	-2.1123E-02
2.8	-2.0551E-02	-2.3064E-02	-2.1730E-02	-2.2352E-02	-2.0868E-02	-2.1003E-02	-2.1634E-02
3.0	-2.1248E-02	-2.3838E-02	-2.2428E-02	-2.3004E-02	-2.1199E-02	-2.1315E-02	-2.1938E-02
3.2	-2.1786E-02	-2.4439E-02	-2.2951E-02	-2.3473E-02	-2.1333E-02	-2.1426E-02	-2.2032E-02
3.4	-2.2159E-02	-2.4863E-02	-2.3294E-02	-2.3755E-02	-2.1274E-02	-2.1339E-02	-2.1918E-02
3.6	-2.2364E-02	-2.5107E-02	-2.3453E-02	-2.3849E-02	-2.1028E-02	-2.1060E-02	-2.1604E-02
3.8	-2.2396E-02	-2.5171E-02	-2.3425E-02	-2.3754E-02	-2.0599E-02	-2.0596E-02	-2.1096E-02
4.0	-2.2252E-02	-2.5051E-02	-2.3207E-02	-2.3468E-02	-1.9995E-02	-1.9953E-02	-2.0402E-02
4.2	-2.1928E-02	-2.4747E-02	-2.2797E-02	-2.2991E-02	-1.9222E-02	-1.9139E-02	-1.9530E-02
4.4	-2.1430E-02	-2.4267E-02	-2.2202E-02	-2.2331E-02	-1.8292E-02	-1.8167E-02	-1.8495E-02
4.6	-2.0763E-02	-2.3619E-02	-2.1429E-02	-2.1499E-02	-1.7220E-02	-1.7053E-02	-1.7316E-02
4.8	-1.9934E-02	-2.2814E-02	-2.0489E-02	-2.0503E-02	-1.6020E-02	-1.5812E-02	-1.6007E-02
5.0	-1.8948E-02	-2.1862E-02	-1.9388E-02	-1.9355E-02	-1.4707E-02	-1.4461E-02	-1.4586E-02
5.2	-1.7814E-02	-2.0772E-02	-1.8140E-02	-1.8066E-02	-1.3296E-02	-1.3016E-02	-1.3071E-02
5.4	-1.6551E-02	-1.9565E-02	-1.6764E-02	-1.6656E-02	-1.1805E-02	-1.1498E-02	-1.1482E-02
5.6	-1.5179E-02	-1.8265E-02	-1.5285E-02	-1.5151E-02	-1.0255E-02	-9.9296E-03	-9.8418E-03
5.8	-1.3722E-02	-1.6895E-02	-1.3730E-02	-1.3574E-02	-8.6646E-03	-8.3309E-03	-8.1724E-03
6.0	-1.2201E-02	-1.5478E-02	-1.2121E-02	-1.1950E-02	-7.0547E-03	-6.7241E-03	-6.4958E-03
6.2	-1.0637E-02	-1.4038E-02	-1.0484E-02	-1.0303E-02	-5.4444E-03	-5.1297E-03	-4.8332E-03
6.4	-9.0519E-03	-1.2594E-02	-8.8398E-03	-8.6549E-03	-3.8502E-03	-3.5647E-03	-3.2023E-03
6.6	-7.4667E-03	-1.1166E-02	-7.2109E-03	-7.0259E-03	-2.2875E-03	-2.0448E-03	-1.6189E-03
6.8	-5.9022E-03	-9.7738E-03	-5.6187E-03	-5.4375E-03	-7.7163E-04	-5.8579E-04	-9.9285E-05
7.0	-4.3795E-03	-8.4373E-03	-4.0847E-03	-3.9107E-03	6.8207E-04	7.9646E-04	1.3406E-03
7.2	-2.9182E-03	-7.1740E-03	-2.6287E-03	-2.4651E-03	2.0593E-03	2.0881E-03	2.6859E-03
7.4	-1.5317E-03	-5.9931E-03	-1.2618E-03	-1.1123E-03	3.3519E-03	3.2823E-03	3.9293E-03
7.6	-2.3098E-04	-4.9016E-03	7.2922E-06	1.3894E-04	4.5540E-03	4.3744E-03	5.0658E-03
7.8	9.7276E-04	-3.9060E-03	1.1701E-03	1.2800E-03	5.6595E-03	5.3595E-03	6.0907E-03
8.0	2.0684E-03	-3.0133E-03	2.2181E-03	2.3022E-03	6.6626E-03	6.2328E-03	6.9991E-03
8.2	3.0465E-03	-2.2281E-03	3.1451E-03	3.1991E-03	7.5590E-03	6.9909E-03	7.7878E-03
8.4	3.9062E-03	-1.5466E-03	3.9541E-03	3.9730E-03	8.3506E-03	7.6374E-03	8.4607E-03
8.6	4.6490E-03	-9.6272E-04	4.6504E-03	4.6286E-03	9.0408E-03	8.1775E-03	9.0235E-03
8.8	5.2764E-03	-4.7017E-04	5.2392E-03	5.1705E-03	9.6329E-03	8.6164E-03	9.4819E-03

**Table B-5. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	25/29	25/28	25/27	25/26	25/25	25/24	25/23
9.0	5.7899E-03	-6.2773E-05	5.7257E-03	5.6032E-03	1.0130E-02	8.9595E-03	9.8414E-03
9.2	6.1922E-03	2.6651E-04	6.1163E-03	5.9326E-03	1.0537E-02	9.2125E-03	1.0109E-02
9.4	6.4916E-03	5.2818E-04	6.4212E-03	6.1689E-03	1.0860E-02	9.3845E-03	1.0293E-02
9.6	6.6977E-03	7.3362E-04	6.6518E-03	6.3232E-03	1.1109E-02	9.4852E-03	1.0405E-02
9.8	6.8202E-03	8.9423E-04	6.8196E-03	6.4068E-03	1.1291E-02	9.5243E-03	1.0456E-02
10.0	6.8688E-03	1.0214E-03	6.9359E-03	6.4310E-03	1.1414E-02	9.5115E-03	1.0456E-02
10.2	6.8532E-03	1.1257E-03	7.0115E-03	6.4064E-03	1.1487E-02	9.4562E-03	1.0415E-02
10.4	6.7838E-03	1.2136E-03	7.0537E-03	6.3420E-03	1.1517E-02	9.3660E-03	1.0342E-02
10.6	6.6711E-03	1.2903E-03	7.0692E-03	6.2462E-03	1.1513E-02	9.2479E-03	1.0245E-02
10.8	6.5257E-03	1.3611E-03	7.0646E-03	6.1274E-03	1.1482E-02	9.1092E-03	1.0132E-02
11.0	6.3580E-03	1.4313E-03	7.0462E-03	5.9937E-03	1.1431E-02	8.9569E-03	1.0011E-02
11.2	6.1781E-03	1.5055E-03	7.0201E-03	5.8529E-03	1.1367E-02	8.7976E-03	9.8888E-03
11.4	5.9929E-03	1.5851E-03	6.9890E-03	5.7092E-03	1.1297E-02	8.6356E-03	9.7711E-03
11.6	5.8084E-03	1.6704E-03	6.9548E-03	5.5661E-03	1.1224E-02	8.4744E-03	9.6614E-03
11.8	5.6307E-03	1.7620E-03	6.9195E-03	5.4270E-03	1.1154E-02	8.3177E-03	9.5635E-03
12.0	5.4657E-03	1.8602E-03	6.8850E-03	5.2953E-03	1.1089E-02	8.1690E-03	9.4811E-03
12.2	5.3186E-03	1.9655E-03	6.8529E-03	5.1741E-03	1.1036E-02	8.0315E-03	9.4177E-03
12.4	5.1916E-03	2.0769E-03	6.8237E-03	5.0642E-03	1.0994E-02	7.9069E-03	9.3740E-03
12.6	5.0854E-03	2.1934E-03	6.7975E-03	4.9658E-03	1.0967E-02	7.7960E-03	9.3503E-03
12.8	5.0010E-03	2.3139E-03	6.7744E-03	4.8788E-03	1.0954E-02	7.6998E-03	9.3466E-03
13.0	4.9395E-03	2.4372E-03	6.7545E-03	4.8035E-03	1.0958E-02	7.6194E-03	9.3633E-03
13.2	4.9013E-03	2.5624E-03	6.7379E-03	4.7397E-03	1.0980E-02	7.5557E-03	9.4003E-03
13.4	4.8853E-03	2.6894E-03	6.7254E-03	4.6869E-03	1.1019E-02	7.5088E-03	9.4566E-03
13.6	4.8896E-03	2.8183E-03	6.7180E-03	4.6446E-03	1.1075E-02	7.4787E-03	9.5308E-03
13.8	4.9124E-03	2.9493E-03	6.7164E-03	4.6121E-03	1.1148E-02	7.4654E-03	9.6215E-03
14.0	4.9518E-03	3.0824E-03	6.7216E-03	4.5887E-03	1.1237E-02	7.4688E-03	9.7273E-03
14.2	5.0059E-03	3.2180E-03	6.7345E-03	4.5738E-03	1.1342E-02	7.4890E-03	9.8467E-03
14.4	5.0726E-03	3.3569E-03	6.7565E-03	4.5670E-03	1.1461E-02	7.5255E-03	9.9782E-03
14.6	5.1497E-03	3.5003E-03	6.7888E-03	4.5679E-03	1.1593E-02	7.5778E-03	1.0120E-02
14.8	5.2348E-03	3.6493E-03	6.8329E-03	4.5761E-03	1.1738E-02	7.6454E-03	1.0272E-02
15.0	5.3259E-03	3.8051E-03	6.8899E-03	4.5914E-03	1.1894E-02	7.7280E-03	1.0430E-02
15.2	5.4208E-03	3.9686E-03	6.9611E-03	4.6132E-03	1.2060E-02	7.8249E-03	1.0595E-02
15.4	5.5186E-03	4.1396E-03	7.0459E-03	4.6411E-03	1.2235E-02	7.9347E-03	1.0766E-02
15.6	5.6185E-03	4.3178E-03	7.1432E-03	4.6745E-03	1.2418E-02	8.0561E-03	1.0940E-02
15.8	5.7199E-03	4.5027E-03	7.2519E-03	4.7126E-03	1.2607E-02	8.1874E-03	1.1119E-02
16.0	5.8222E-03	4.6940E-03	7.3710E-03	4.7551E-03	1.2801E-02	8.3273E-03	1.1300E-02
16.2	5.9247E-03	4.8911E-03	7.4993E-03	4.8012E-03	1.3000E-02	8.4743E-03	1.1483E-02
16.4	6.0272E-03	5.0930E-03	7.6351E-03	4.8502E-03	1.3201E-02	8.6269E-03	1.1668E-02
16.6	6.1298E-03	5.2985E-03	7.7766E-03	4.9014E-03	1.3406E-02	8.7839E-03	1.1855E-02
16.8	6.2325E-03	5.5064E-03	7.9218E-03	4.9540E-03	1.3612E-02	8.9437E-03	1.2042E-02
17.0	6.3351E-03	5.7155E-03	8.0690E-03	5.0075E-03	1.3819E-02	9.1049E-03	1.2229E-02

**Table B-6. SSRS/LowP parachute,  $C_{m,SLCP}$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	25/29	25/28	25/27	25/26	25/25	25/24	25/23
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	2.8344E-03	3.1969E-03	2.9914E-03	3.1974E-03	3.1947E-03	3.2571E-03	3.3373E-03
0.4	5.6522E-03	6.3753E-03	5.9660E-03	6.3737E-03	6.3590E-03	6.4831E-03	6.6421E-03
0.6	8.4369E-03	9.5168E-03	8.9067E-03	9.5080E-03	9.4626E-03	9.6473E-03	9.8823E-03
0.8	1.1172E-02	1.2603E-02	1.1797E-02	1.2579E-02	1.2475E-02	1.2719E-02	1.3025E-02
1.0	1.3841E-02	1.5615E-02	1.4619E-02	1.5566E-02	1.5366E-02	1.5666E-02	1.6039E-02
1.2	1.6426E-02	1.8535E-02	1.7357E-02	1.8448E-02	1.8108E-02	1.8460E-02	1.8893E-02
1.4	1.8912E-02	2.1343E-02	1.9990E-02	2.1204E-02	2.0675E-02	2.1077E-02	2.1562E-02
1.6	2.1280E-02	2.4019E-02	2.2501E-02	2.3814E-02	2.3046E-02	2.3493E-02	2.4024E-02
1.8	2.3513E-02	2.6545E-02	2.4868E-02	2.6256E-02	2.5200E-02	2.5686E-02	2.6254E-02
2.0	2.5593E-02	2.8900E-02	2.7074E-02	2.8511E-02	2.7113E-02	2.7633E-02	2.8229E-02
2.2	2.7505E-02	3.1067E-02	2.9098E-02	3.0558E-02	2.8767E-02	2.9314E-02	2.9927E-02
2.4	2.9233E-02	3.3028E-02	3.0924E-02	3.2382E-02	3.0151E-02	3.0717E-02	3.1335E-02
2.6	3.0762E-02	3.4768E-02	3.2533E-02	3.3968E-02	3.1258E-02	3.1835E-02	3.2444E-02
2.8	3.2077E-02	3.6271E-02	3.3909E-02	3.5299E-02	3.2080E-02	3.2660E-02	3.3249E-02
3.0	3.3164E-02	3.7522E-02	3.5033E-02	3.6362E-02	3.2609E-02	3.3184E-02	3.3742E-02
3.2	3.4010E-02	3.8506E-02	3.5891E-02	3.7142E-02	3.2842E-02	3.3401E-02	3.3916E-02
3.4	3.4606E-02	3.9219E-02	3.6474E-02	3.7636E-02	3.2783E-02	3.3318E-02	3.3778E-02
3.6	3.4950E-02	3.9658E-02	3.6778E-02	3.7842E-02	3.2444E-02	3.2944E-02	3.3339E-02
3.8	3.5035E-02	3.9819E-02	3.6797E-02	3.7759E-02	3.1832E-02	3.2290E-02	3.2609E-02
4.0	3.4858E-02	3.9701E-02	3.6527E-02	3.7385E-02	3.0957E-02	3.1366E-02	3.1601E-02
4.2	3.4415E-02	3.9302E-02	3.5964E-02	3.6721E-02	2.9830E-02	3.0183E-02	3.0328E-02
4.4	3.3715E-02	3.8635E-02	3.5120E-02	3.5778E-02	2.8472E-02	2.8762E-02	2.8814E-02
4.6	3.2766E-02	3.7714E-02	3.4006E-02	3.4573E-02	2.6903E-02	2.7129E-02	2.7086E-02
4.8	3.1580E-02	3.6554E-02	3.2638E-02	3.3121E-02	2.5148E-02	2.5307E-02	2.5167E-02
5.0	3.0166E-02	3.5170E-02	3.1028E-02	3.1439E-02	2.3228E-02	2.3320E-02	2.3086E-02
5.2	2.8536E-02	3.3579E-02	2.9194E-02	2.9545E-02	2.1166E-02	2.1195E-02	2.0868E-02
5.4	2.6719E-02	3.1813E-02	2.7169E-02	2.7470E-02	1.8990E-02	1.8964E-02	1.8545E-02
5.6	2.4746E-02	2.9908E-02	2.4991E-02	2.5252E-02	1.6731E-02	1.6660E-02	1.6152E-02
5.8	2.2649E-02	2.7899E-02	2.2698E-02	2.2928E-02	1.4419E-02	1.4316E-02	1.3721E-02
6.0	2.0460E-02	2.5823E-02	2.0330E-02	2.0536E-02	1.2083E-02	1.1965E-02	1.1286E-02
6.2	1.8211E-02	2.3715E-02	1.7922E-02	1.8112E-02	9.7529E-03	9.6384E-03	8.8790E-03
6.4	1.5932E-02	2.1607E-02	1.5510E-02	1.5689E-02	7.4531E-03	7.3619E-03	6.5257E-03
6.6	1.3654E-02	1.9528E-02	1.3125E-02	1.3299E-02	5.2064E-03	5.1596E-03	4.2503E-03
6.8	1.1408E-02	1.7508E-02	1.0802E-02	1.0974E-02	3.0356E-03	3.0554E-03	2.0769E-03
7.0	9.2236E-03	1.5578E-02	8.5730E-03	8.7474E-03	9.6337E-04	1.0733E-03	2.9488E-05
7.2	7.1298E-03	1.3764E-02	6.4686E-03	6.6477E-03	-9.8899E-04	-7.6550E-04	-1.8701E-03
7.4	5.1462E-03	1.2080E-02	4.5055E-03	4.6929E-03	-2.8097E-03	-2.4513E-03	-3.6110E-03
7.6	3.2890E-03	1.0537E-02	2.6962E-03	2.8963E-03	-4.4901E-03	-3.9771E-03	-5.1864E-03
7.8	1.5749E-03	9.1433E-03	1.0534E-03	1.2710E-03	-6.0219E-03	-5.3359E-03	-6.5894E-03
8.0	2.0303E-05	7.9099E-03	-4.1039E-04	-1.6981E-04	-7.3963E-03	-6.5206E-03	-7.8132E-03
8.2	-1.3609E-03	6.8433E-03	-1.6862E-03	-1.4163E-03	-8.6077E-03	-7.5268E-03	-8.8533E-03
8.4	-2.5668E-03	5.9370E-03	-2.7795E-03	-2.4723E-03	-9.6591E-03	-8.3603E-03	-9.7162E-03
8.6	-3.5990E-03	5.1810E-03	-3.6991E-03	-3.3450E-03	-1.0556E-02	-9.0295E-03	-1.0411E-02
8.8	-4.4592E-03	4.5652E-03	-4.4537E-03	-4.0414E-03	-1.1304E-02	-9.5430E-03	-1.0946E-02

**Table B-6. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	25/29	25/28	25/27	25/26	25/25	25/24	25/23
9.0	-5.1491E-03	4.0792E-03	-5.0522E-03	-4.5689E-03	-1.1908E-02	-9.9093E-03	-1.1332E-02
9.2	-5.6721E-03	3.7119E-03	-5.5050E-03	-4.9364E-03	-1.2375E-02	-1.0138E-02	-1.1577E-02
9.4	-6.0398E-03	3.4465E-03	-5.8285E-03	-5.1596E-03	-1.2716E-02	-1.0243E-02	-1.1697E-02
9.6	-6.2657E-03	3.2652E-03	-6.0408E-03	-5.2560E-03	-1.2945E-02	-1.0240E-02	-1.1709E-02
9.8	-6.3637E-03	3.1499E-03	-6.1599E-03	-5.2428E-03	-1.3073E-02	-1.0144E-02	-1.1628E-02
10.0	-6.3473E-03	3.0828E-03	-6.2038E-03	-5.1376E-03	-1.3113E-02	-9.9697E-03	-1.1471E-02
10.2	-6.2305E-03	3.0473E-03	-6.1894E-03	-4.9570E-03	-1.3079E-02	-9.7325E-03	-1.1254E-02
10.4	-6.0287E-03	3.0336E-03	-6.1281E-03	-4.7150E-03	-1.2981E-02	-9.4439E-03	-1.0990E-02
10.6	-5.7577E-03	3.0338E-03	-6.0296E-03	-4.4248E-03	-1.2832E-02	-9.1148E-03	-1.0692E-02
10.8	-5.4336E-03	3.0399E-03	-5.9035E-03	-4.0995E-03	-1.2643E-02	-8.7561E-03	-1.0370E-02
11.0	-5.0720E-03	3.0440E-03	-5.7597E-03	-3.7522E-03	-1.2427E-02	-8.3785E-03	-1.0039E-02
11.2	-4.6882E-03	3.0395E-03	-5.6067E-03	-3.3949E-03	-1.2193E-02	-7.9923E-03	-9.7086E-03
11.4	-4.2930E-03	3.0244E-03	-5.4483E-03	-3.0343E-03	-1.1950E-02	-7.6037E-03	-9.3869E-03
11.6	-3.8961E-03	2.9986E-03	-5.2870E-03	-2.6761E-03	-1.1705E-02	-7.2182E-03	-9.0795E-03
11.8	-3.5069E-03	2.9616E-03	-5.1253E-03	-2.3256E-03	-1.1465E-02	-6.8412E-03	-8.7921E-03
12.0	-3.1351E-03	2.9132E-03	-4.9655E-03	-1.9884E-03	-1.1237E-02	-6.4780E-03	-8.5305E-03
12.2	-2.7890E-03	2.8533E-03	-4.8098E-03	-1.6694E-03	-1.1026E-02	-6.1335E-03	-8.2997E-03
12.4	-2.4721E-03	2.7833E-03	-4.6585E-03	-1.3699E-03	-1.0836E-02	-5.8099E-03	-8.1010E-03
12.6	-2.1865E-03	2.7053E-03	-4.5114E-03	-1.0899E-03	-1.0669E-02	-5.5085E-03	-7.9347E-03
12.8	-1.9340E-03	2.6213E-03	-4.3684E-03	-8.2958E-04	-1.0526E-02	-5.2309E-03	-7.8008E-03
13.0	-1.7166E-03	2.5333E-03	-4.2294E-03	-5.8897E-04	-1.0411E-02	-4.9784E-03	-7.6996E-03
13.2	-1.5358E-03	2.4429E-03	-4.0944E-03	-3.6796E-04	-1.0323E-02	-4.7523E-03	-7.6310E-03
13.4	-1.3898E-03	2.3505E-03	-3.9646E-03	-1.6551E-04	-1.0264E-02	-4.5529E-03	-7.5934E-03
13.6	-1.2761E-03	2.2558E-03	-3.8414E-03	1.9668E-05	-1.0233E-02	-4.3802E-03	-7.5844E-03
13.8	-1.1920E-03	2.1587E-03	-3.7263E-03	1.8888E-04	-1.0229E-02	-4.2339E-03	-7.6019E-03
14.0	-1.1351E-03	2.0591E-03	-3.6207E-03	3.4343E-04	-1.0250E-02	-4.1142E-03	-7.6435E-03
14.2	-1.1025E-03	1.9567E-03	-3.5262E-03	4.8455E-04	-1.0297E-02	-4.0209E-03	-7.7070E-03
14.4	-1.0908E-03	1.8498E-03	-3.4451E-03	6.1321E-04	-1.0367E-02	-3.9533E-03	-7.7899E-03
14.6	-1.0966E-03	1.7367E-03	-3.3796E-03	7.3030E-04	-1.0459E-02	-3.9108E-03	-7.8897E-03
14.8	-1.1163E-03	1.6156E-03	-3.3320E-03	8.3667E-04	-1.0570E-02	-3.8926E-03	-8.0040E-03
15.0	-1.1463E-03	1.4846E-03	-3.3048E-03	9.3322E-04	-1.0700E-02	-3.8981E-03	-8.1303E-03
15.2	-1.1836E-03	1.3422E-03	-3.2997E-03	1.0208E-03	-1.0845E-02	-3.9263E-03	-8.2663E-03
15.4	-1.2263E-03	1.1885E-03	-3.3159E-03	1.1003E-03	-1.1005E-02	-3.9750E-03	-8.4108E-03
15.6	-1.2733E-03	1.0241E-03	-3.3519E-03	1.1725E-03	-1.1177E-02	-4.0420E-03	-8.5623E-03
15.8	-1.3234E-03	8.4946E-04	-3.4061E-03	1.2383E-03	-1.1360E-02	-4.1249E-03	-8.7195E-03
16.0	-1.3752E-03	6.6524E-04	-3.4767E-03	1.2986E-03	-1.1551E-02	-4.2215E-03	-8.8814E-03
16.2	-1.4278E-03	4.7213E-04	-3.5620E-03	1.3542E-03	-1.1749E-02	-4.3293E-03	-9.0465E-03
16.4	-1.4808E-03	2.7168E-04	-3.6593E-03	1.4060E-03	-1.1952E-02	-4.4462E-03	-9.2142E-03
16.6	-1.5341E-03	6.5697E-05	-3.7656E-03	1.4549E-03	-1.2159E-02	-4.5698E-03	-9.3837E-03
16.8	-1.5875E-03	-1.4398E-04	-3.8780E-03	1.5020E-03	-1.2369E-02	-4.6981E-03	-9.5546E-03
17.0	-1.6411E-03	-3.5552E-04	-3.9935E-03	1.5481E-03	-1.2580E-02	-4.8287E-03	-9.7260E-03

**Table B-7. DGB/StdP parachute,  $C_T$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	31/43	29/41	29/40	29/39	29/38	29/37	29/36
0.0	5.2329E-01	5.1851E-01	5.2077E-01	5.2007E-01	5.3691E-01	5.2796E-01	5.3814E-01
0.2	5.2340E-01	5.1861E-01	5.2088E-01	5.2018E-01	5.3705E-01	5.2810E-01	5.3829E-01
0.4	5.2371E-01	5.1891E-01	5.2122E-01	5.2051E-01	5.3747E-01	5.2851E-01	5.3876E-01
0.6	5.2423E-01	5.1940E-01	5.2179E-01	5.2105E-01	5.3814E-01	5.2918E-01	5.3953E-01
0.8	5.2495E-01	5.2009E-01	5.2258E-01	5.2180E-01	5.3907E-01	5.3011E-01	5.4059E-01
1.0	5.2586E-01	5.2097E-01	5.2358E-01	5.2276E-01	5.4024E-01	5.3129E-01	5.4192E-01
1.2	5.2696E-01	5.2205E-01	5.2480E-01	5.2392E-01	5.4164E-01	5.3272E-01	5.4353E-01
1.4	5.2825E-01	5.2331E-01	5.2623E-01	5.2528E-01	5.4326E-01	5.3438E-01	5.4539E-01
1.6	5.2971E-01	5.2475E-01	5.2784E-01	5.2682E-01	5.4508E-01	5.3627E-01	5.4749E-01
1.8	5.3134E-01	5.2638E-01	5.2965E-01	5.2854E-01	5.4709E-01	5.3837E-01	5.4982E-01
2.0	5.3313E-01	5.2817E-01	5.3163E-01	5.3044E-01	5.4927E-01	5.4067E-01	5.5235E-01
2.2	5.3506E-01	5.3013E-01	5.3377E-01	5.3250E-01	5.5161E-01	5.4316E-01	5.5508E-01
2.4	5.3714E-01	5.3224E-01	5.3606E-01	5.3471E-01	5.5408E-01	5.4582E-01	5.5797E-01
2.6	5.3934E-01	5.3450E-01	5.3848E-01	5.3706E-01	5.5668E-01	5.4864E-01	5.6102E-01
2.8	5.4165E-01	5.3689E-01	5.4103E-01	5.3953E-01	5.5937E-01	5.5159E-01	5.6419E-01
3.0	5.4406E-01	5.3939E-01	5.4367E-01	5.4211E-01	5.6215E-01	5.5466E-01	5.6748E-01
3.2	5.4655E-01	5.4199E-01	5.4641E-01	5.4478E-01	5.6500E-01	5.5782E-01	5.7085E-01
3.4	5.4910E-01	5.4467E-01	5.4921E-01	5.4753E-01	5.6789E-01	5.6106E-01	5.7429E-01
3.6	5.5170E-01	5.4742E-01	5.5206E-01	5.5033E-01	5.7081E-01	5.6436E-01	5.7777E-01
3.8	5.5434E-01	5.5021E-01	5.5494E-01	5.5316E-01	5.7375E-01	5.6768E-01	5.8127E-01
4.0	5.5698E-01	5.5302E-01	5.5783E-01	5.5601E-01	5.7668E-01	5.7101E-01	5.8476E-01
4.2	5.5962E-01	5.5582E-01	5.6071E-01	5.5885E-01	5.7958E-01	5.7432E-01	5.8823E-01
4.4	5.6223E-01	5.5861E-01	5.6355E-01	5.6166E-01	5.8245E-01	5.7758E-01	5.9166E-01
4.6	5.6480E-01	5.6134E-01	5.6635E-01	5.6443E-01	5.8526E-01	5.8079E-01	5.9501E-01
4.8	5.6731E-01	5.6400E-01	5.6908E-01	5.6712E-01	5.8800E-01	5.8390E-01	5.9828E-01
5.0	5.6973E-01	5.6658E-01	5.7172E-01	5.6973E-01	5.9066E-01	5.8690E-01	6.0144E-01
5.2	5.7206E-01	5.6903E-01	5.7425E-01	5.7222E-01	5.9322E-01	5.8978E-01	6.0447E-01
5.4	5.7427E-01	5.7136E-01	5.7666E-01	5.7459E-01	5.9568E-01	5.9250E-01	6.0736E-01
5.6	5.7637E-01	5.7355E-01	5.7894E-01	5.7683E-01	5.9802E-01	5.9508E-01	6.1010E-01
5.8	5.7834E-01	5.7560E-01	5.8108E-01	5.7892E-01	6.0025E-01	5.9748E-01	6.1269E-01
6.0	5.8017E-01	5.7748E-01	5.8308E-01	5.8087E-01	6.0235E-01	5.9972E-01	6.1511E-01
6.2	5.8185E-01	5.7919E-01	5.8492E-01	5.8265E-01	6.0432E-01	6.0177E-01	6.1736E-01
6.4	5.8339E-01	5.8074E-01	5.8660E-01	5.8427E-01	6.0617E-01	6.0364E-01	6.1943E-01
6.6	5.8477E-01	5.8212E-01	5.8813E-01	5.8573E-01	6.0788E-01	6.0532E-01	6.2134E-01
6.8	5.8601E-01	5.8332E-01	5.8950E-01	5.8702E-01	6.0946E-01	6.0682E-01	6.2306E-01
7.0	5.8708E-01	5.8436E-01	5.9071E-01	5.8816E-01	6.1090E-01	6.0814E-01	6.2462E-01
7.2	5.8801E-01	5.8524E-01	5.9176E-01	5.8913E-01	6.1221E-01	6.0928E-01	6.2600E-01
7.4	5.8878E-01	5.8595E-01	5.9266E-01	5.8995E-01	6.1339E-01	6.1025E-01	6.2721E-01
7.6	5.8941E-01	5.8652E-01	5.9342E-01	5.9062E-01	6.1444E-01	6.1105E-01	6.2826E-01
7.8	5.8991E-01	5.8695E-01	5.9404E-01	5.9116E-01	6.1536E-01	6.1170E-01	6.2915E-01
8.0	5.9027E-01	5.8725E-01	5.9452E-01	5.9156E-01	6.1616E-01	6.1220E-01	6.2990E-01
8.2	5.9051E-01	5.8744E-01	5.9488E-01	5.9184E-01	6.1684E-01	6.1257E-01	6.3050E-01
8.4	5.9063E-01	5.8752E-01	5.9512E-01	5.9202E-01	6.1740E-01	6.1282E-01	6.3098E-01
8.6	5.9065E-01	5.8751E-01	5.9526E-01	5.9209E-01	6.1786E-01	6.1296E-01	6.3133E-01
8.8	5.9058E-01	5.8742E-01	5.9531E-01	5.9209E-01	6.1822E-01	6.1300E-01	6.3158E-01

**Table B-7. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	31/43	29/41	29/40	29/39	29/38	29/37	29/36
9.0	5.9042E-01	5.8726E-01	5.9527E-01	5.9200E-01	6.1848E-01	6.1297E-01	6.3173E-01
9.2	5.9018E-01	5.8706E-01	5.9516E-01	5.9186E-01	6.1865E-01	6.1286E-01	6.3178E-01
9.4	5.8988E-01	5.8681E-01	5.9498E-01	5.9166E-01	6.1873E-01	6.1270E-01	6.3177E-01
9.6	5.8953E-01	5.8653E-01	5.9475E-01	5.9142E-01	6.1875E-01	6.1249E-01	6.3168E-01
9.8	5.8914E-01	5.8623E-01	5.9447E-01	5.9116E-01	6.1869E-01	6.1224E-01	6.3154E-01
10.0	5.8871E-01	5.8592E-01	5.9415E-01	5.9087E-01	6.1857E-01	6.1197E-01	6.3135E-01
10.2	5.8825E-01	5.8561E-01	5.9381E-01	5.9057E-01	6.1840E-01	6.1169E-01	6.3113E-01
10.4	5.8778E-01	5.8529E-01	5.9344E-01	5.9026E-01	6.1818E-01	6.1140E-01	6.3087E-01
10.6	5.8728E-01	5.8497E-01	5.9305E-01	5.8994E-01	6.1792E-01	6.1110E-01	6.3059E-01
10.8	5.8678E-01	5.8465E-01	5.9264E-01	5.8963E-01	6.1763E-01	6.1079E-01	6.3029E-01
11.0	5.8627E-01	5.8433E-01	5.9222E-01	5.8932E-01	6.1730E-01	6.1049E-01	6.2998E-01
11.2	5.8576E-01	5.8401E-01	5.9179E-01	5.8900E-01	6.1695E-01	6.1018E-01	6.2966E-01
11.4	5.8525E-01	5.8368E-01	5.9134E-01	5.8870E-01	6.1657E-01	6.0988E-01	6.2933E-01
11.6	5.8475E-01	5.8334E-01	5.9089E-01	5.8839E-01	6.1618E-01	6.0957E-01	6.2899E-01
11.8	5.8424E-01	5.8300E-01	5.9043E-01	5.8809E-01	6.1578E-01	6.0927E-01	6.2866E-01
12.0	5.8374E-01	5.8265E-01	5.8997E-01	5.8779E-01	6.1537E-01	6.0896E-01	6.2832E-01
12.2	5.8325E-01	5.8228E-01	5.8950E-01	5.8750E-01	6.1496E-01	6.0865E-01	6.2798E-01
12.4	5.8277E-01	5.8191E-01	5.8902E-01	5.8721E-01	6.1454E-01	6.0835E-01	6.2764E-01
12.6	5.8229E-01	5.8152E-01	5.8855E-01	5.8692E-01	6.1412E-01	6.0804E-01	6.2731E-01
12.8	5.8183E-01	5.8112E-01	5.8808E-01	5.8664E-01	6.1370E-01	6.0773E-01	6.2698E-01
13.0	5.8137E-01	5.8071E-01	5.8760E-01	5.8636E-01	6.1329E-01	6.0743E-01	6.2665E-01
13.2	5.8093E-01	5.8029E-01	5.8713E-01	5.8610E-01	6.1288E-01	6.0712E-01	6.2632E-01
13.4	5.8049E-01	5.7987E-01	5.8667E-01	5.8583E-01	6.1247E-01	6.0681E-01	6.2600E-01
13.6	5.8007E-01	5.7944E-01	5.8621E-01	5.8558E-01	6.1207E-01	6.0650E-01	6.2567E-01
13.8	5.7966E-01	5.7901E-01	5.8576E-01	5.8534E-01	6.1168E-01	6.0619E-01	6.2535E-01
14.0	5.7926E-01	5.7859E-01	5.8533E-01	5.8510E-01	6.1129E-01	6.0589E-01	6.2503E-01
14.2	5.7887E-01	5.7817E-01	5.8490E-01	5.8488E-01	6.1090E-01	6.0559E-01	6.2471E-01
14.4	5.7849E-01	5.7777E-01	5.8450E-01	5.8468E-01	6.1052E-01	6.0530E-01	6.2439E-01
14.6	5.7812E-01	5.7738E-01	5.8410E-01	5.8449E-01	6.1014E-01	6.0502E-01	6.2408E-01
14.8	5.7777E-01	5.7700E-01	5.8373E-01	5.8432E-01	6.0976E-01	6.0475E-01	6.2376E-01
15.0	5.7743E-01	5.7665E-01	5.8338E-01	5.8416E-01	6.0939E-01	6.0448E-01	6.2344E-01
15.2	5.7709E-01	5.7632E-01	5.8304E-01	5.8403E-01	6.0902E-01	6.0423E-01	6.2312E-01
15.4	5.7677E-01	5.7602E-01	5.8273E-01	5.8391E-01	6.0865E-01	6.0399E-01	6.2280E-01
15.6	5.7646E-01	5.7574E-01	5.8243E-01	5.8381E-01	6.0828E-01	6.0376E-01	6.2248E-01
15.8	5.7616E-01	5.7547E-01	5.8215E-01	5.8373E-01	6.0791E-01	6.0354E-01	6.2216E-01
16.0	5.7586E-01	5.7523E-01	5.8189E-01	5.8366E-01	6.0754E-01	6.0333E-01	6.2184E-01
16.2	5.7557E-01	5.7500E-01	5.8164E-01	5.8359E-01	6.0718E-01	6.0312E-01	6.2152E-01
16.4	5.7528E-01	5.7478E-01	5.8139E-01	5.8354E-01	6.0681E-01	6.0292E-01	6.2120E-01
16.6	5.7500E-01	5.7458E-01	5.8116E-01	5.8350E-01	6.0644E-01	6.0273E-01	6.2088E-01
16.8	5.7472E-01	5.7438E-01	5.8093E-01	5.8346E-01	6.0607E-01	6.0254E-01	6.2056E-01
17.0	5.7444E-01	5.7419E-01	5.8070E-01	5.8342E-01	6.0570E-01	6.0235E-01	6.2024E-01

**Table B-8. DGB/StdP parachute,  $C_N$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	31/43	29/41	29/40	29/39	29/38	29/37	29/36
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	-2.7149E-04	-5.1478E-04	-5.0787E-04	-7.0146E-04	-7.1770E-04	-7.1558E-04	-7.6661E-04
0.4	-5.3847E-04	-1.0200E-03	-1.0079E-03	-1.3919E-03	-1.4246E-03	-1.4216E-03	-1.5189E-03
0.6	-7.9638E-04	-1.5061E-03	-1.4923E-03	-2.0604E-03	-2.1099E-03	-2.1085E-03	-2.2425E-03
0.8	-1.0407E-03	-1.9636E-03	-1.9532E-03	-2.6959E-03	-2.7629E-03	-2.7667E-03	-2.9232E-03
1.0	-1.2668E-03	-2.3829E-03	-2.3827E-03	-3.2875E-03	-3.3727E-03	-3.3867E-03	-3.5466E-03
1.2	-1.4699E-03	-2.7547E-03	-2.7730E-03	-3.8244E-03	-3.9287E-03	-3.9592E-03	-4.0994E-03
1.4	-1.6445E-03	-3.0711E-03	-3.1157E-03	-4.2975E-03	-4.4213E-03	-4.4760E-03	-4.5726E-03
1.6	-1.7848E-03	-3.3248E-03	-3.4022E-03	-4.6982E-03	-4.8408E-03	-4.9291E-03	-4.9579E-03
1.8	-1.8852E-03	-3.5083E-03	-3.6241E-03	-5.0177E-03	-5.1776E-03	-5.3107E-03	-5.2471E-03
2.0	-1.9397E-03	-3.6141E-03	-3.7729E-03	-5.2473E-03	-5.4222E-03	-5.6129E-03	-5.4321E-03
2.2	-1.9426E-03	-3.6353E-03	-3.8403E-03	-5.3792E-03	-5.5655E-03	-5.8283E-03	-5.5063E-03
2.4	-1.8880E-03	-3.5677E-03	-3.8197E-03	-5.4086E-03	-5.6010E-03	-5.9524E-03	-5.4688E-03
2.6	-1.7700E-03	-3.4076E-03	-3.7043E-03	-5.3318E-03	-5.5228E-03	-5.9811E-03	-5.3199E-03
2.8	-1.5825E-03	-3.1514E-03	-3.4878E-03	-5.1450E-03	-5.3250E-03	-5.9103E-03	-5.0597E-03
3.0	-1.3195E-03	-2.7954E-03	-3.1635E-03	-4.8445E-03	-5.0017E-03	-5.7361E-03	-4.6887E-03
3.2	-9.7565E-04	-2.3366E-03	-2.7259E-03	-4.4272E-03	-4.5479E-03	-5.4553E-03	-4.2078E-03
3.4	-5.4728E-04	-1.7750E-03	-2.1733E-03	-3.8948E-03	-3.9630E-03	-5.0685E-03	-3.6223E-03
3.6	-3.1325E-05	-1.1120E-03	-1.5052E-03	-3.2504E-03	-3.2478E-03	-4.5777E-03	-2.9383E-03
3.8	5.7527E-04	-3.4861E-04	-7.2137E-04	-2.4972E-03	-2.4030E-03	-3.9846E-03	-2.1623E-03
4.0	1.2756E-03	5.1388E-04	1.7866E-04	-1.6383E-03	-1.4293E-03	-3.2912E-03	-1.3005E-03
4.2	2.0719E-03	1.4737E-03	1.1940E-03	-6.7795E-04	-3.2840E-04	-2.5000E-03	-3.5947E-04
4.4	2.9630E-03	2.5261E-03	2.3185E-03	3.7538E-04	8.9308E-04	-1.6168E-03	6.5313E-04
4.6	3.9461E-03	3.6652E-03	3.5447E-03	1.5122E-03	2.2270E-03	-6.4915E-04	1.7294E-03
4.8	5.0187E-03	4.8851E-03	4.8653E-03	2.7230E-03	3.6651E-03	3.9545E-04	2.8615E-03
5.0	6.1783E-03	6.1800E-03	6.2726E-03	3.9983E-03	5.1993E-03	1.5095E-03	4.0415E-03
5.2	7.4207E-03	7.5429E-03	7.7583E-03	5.3281E-03	6.8199E-03	2.6849E-03	5.2619E-03
5.4	8.7353E-03	8.9630E-03	9.3081E-03	6.6998E-03	8.5122E-03	3.9103E-03	6.5170E-03
5.6	1.0110E-02	1.0429E-02	1.0906E-02	8.0997E-03	1.0259E-02	5.1738E-03	7.8014E-03
5.8	1.1531E-02	1.1928E-02	1.2536E-02	9.5139E-03	1.2045E-02	6.4637E-03	9.1101E-03
6.0	1.2986E-02	1.3449E-02	1.4181E-02	1.0929E-02	1.3853E-02	7.7679E-03	1.0438E-02
6.2	1.4464E-02	1.4981E-02	1.5827E-02	1.2331E-02	1.5667E-02	9.0751E-03	1.1779E-02
6.4	1.5950E-02	1.6511E-02	1.7460E-02	1.3710E-02	1.7472E-02	1.0376E-02	1.3130E-02
6.6	1.7432E-02	1.8028E-02	1.9066E-02	1.5056E-02	1.9254E-02	1.1661E-02	1.4487E-02
6.8	1.8897E-02	1.9521E-02	2.0632E-02	1.6357E-02	2.0999E-02	1.2922E-02	1.5845E-02
7.0	2.0332E-02	2.0978E-02	2.2144E-02	1.7605E-02	2.2693E-02	1.4151E-02	1.7199E-02
7.2	2.1725E-02	2.2389E-02	2.3591E-02	1.8788E-02	2.4324E-02	1.5338E-02	1.8547E-02
7.4	2.3067E-02	2.3745E-02	2.4966E-02	1.9904E-02	2.5882E-02	1.6481E-02	1.9882E-02
7.6	2.4349E-02	2.5039E-02	2.6264E-02	2.0949E-02	2.7362E-02	1.7577E-02	2.1202E-02
7.8	2.5565E-02	2.6262E-02	2.7481E-02	2.1919E-02	2.8758E-02	1.8624E-02	2.2501E-02
8.0	2.6704E-02	2.7409E-02	2.8611E-02	2.2813E-02	3.0063E-02	1.9618E-02	2.3775E-02
8.2	2.7762E-02	2.8472E-02	2.9650E-02	2.3627E-02	3.1273E-02	2.0559E-02	2.5019E-02
8.4	2.8735E-02	2.9450E-02	3.0602E-02	2.4366E-02	3.2389E-02	2.1447E-02	2.6228E-02
8.6	2.9623E-02	3.0340E-02	3.1468E-02	2.5032E-02	3.3413E-02	2.2287E-02	2.7400E-02
8.8	3.0425E-02	3.1143E-02	3.2254E-02	2.5628E-02	3.4347E-02	2.3080E-02	2.8527E-02



**Table B-8. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	31/43	29/41	29/40	29/39	29/38	29/37	29/36
9.0	3.1141E-02	3.1856E-02	3.2961E-02	2.6160E-02	3.5195E-02	2.3829E-02	2.9607E-02
9.2	3.1771E-02	3.2480E-02	3.3594E-02	2.6630E-02	3.5959E-02	2.4537E-02	3.0635E-02
9.4	3.2319E-02	3.3019E-02	3.4160E-02	2.7045E-02	3.6646E-02	2.5210E-02	3.1608E-02
9.6	3.2790E-02	3.3477E-02	3.4665E-02	2.7411E-02	3.7264E-02	2.5850E-02	3.2523E-02
9.8	3.3190E-02	3.3860E-02	3.5116E-02	2.7734E-02	3.7819E-02	2.6463E-02	3.3378E-02
10.0	3.3523E-02	3.4172E-02	3.5520E-02	2.8021E-02	3.8319E-02	2.7052E-02	3.4170E-02
10.2	3.3797E-02	3.4420E-02	3.5884E-02	2.8278E-02	3.8772E-02	2.7623E-02	3.4898E-02
10.4	3.4019E-02	3.4612E-02	3.6214E-02	2.8510E-02	3.9186E-02	2.8178E-02	3.5565E-02
10.6	3.4199E-02	3.4760E-02	3.6515E-02	2.8721E-02	3.9567E-02	2.8718E-02	3.6175E-02
10.8	3.4347E-02	3.4873E-02	3.6792E-02	2.8916E-02	3.9924E-02	2.9246E-02	3.6734E-02
11.0	3.4470E-02	3.4963E-02	3.7050E-02	2.9101E-02	4.0264E-02	2.9765E-02	3.7245E-02
11.2	3.4580E-02	3.5039E-02	3.7296E-02	2.9279E-02	4.0594E-02	3.0276E-02	3.7715E-02
11.4	3.4683E-02	3.5111E-02	3.7532E-02	2.9454E-02	4.0922E-02	3.0780E-02	3.8149E-02
11.6	3.4788E-02	3.5188E-02	3.7763E-02	2.9629E-02	4.1251E-02	3.1279E-02	3.8554E-02
11.8	3.4901E-02	3.5278E-02	3.7993E-02	2.9809E-02	4.1588E-02	3.1775E-02	3.8939E-02
12.0	3.5031E-02	3.5390E-02	3.8225E-02	2.9996E-02	4.1939E-02	3.2269E-02	3.9311E-02
12.2	3.5184E-02	3.5532E-02	3.8464E-02	3.0194E-02	4.2308E-02	3.2762E-02	3.9675E-02
12.4	3.5365E-02	3.5709E-02	3.8713E-02	3.0406E-02	4.2699E-02	3.3256E-02	4.0041E-02
12.6	3.5577E-02	3.5925E-02	3.8976E-02	3.0636E-02	4.3116E-02	3.3754E-02	4.0413E-02
12.8	3.5825E-02	3.6183E-02	3.9258E-02	3.0886E-02	4.3562E-02	3.4258E-02	4.0800E-02
13.0	3.6112E-02	3.6489E-02	3.9561E-02	3.1159E-02	4.4041E-02	3.4770E-02	4.1208E-02
13.2	3.6441E-02	3.6844E-02	3.9890E-02	3.1460E-02	4.4555E-02	3.5293E-02	4.1643E-02
13.4	3.6816E-02	3.7248E-02	4.0248E-02	3.1791E-02	4.5106E-02	3.5829E-02	4.2110E-02
13.6	3.7237E-02	3.7700E-02	4.0639E-02	3.2154E-02	4.5696E-02	3.6382E-02	4.2612E-02
13.8	3.7707E-02	3.8200E-02	4.1068E-02	3.2553E-02	4.6326E-02	3.6955E-02	4.3153E-02
14.0	3.8226E-02	3.8745E-02	4.1538E-02	3.2991E-02	4.6998E-02	3.7552E-02	4.3737E-02
14.2	3.8797E-02	3.9335E-02	4.2051E-02	3.3470E-02	4.7713E-02	3.8175E-02	4.4366E-02
14.4	3.9418E-02	3.9965E-02	4.2612E-02	3.3991E-02	4.8471E-02	3.8826E-02	4.5041E-02
14.6	4.0087E-02	4.0632E-02	4.3220E-02	3.4556E-02	4.9270E-02	3.9508E-02	4.5763E-02
14.8	4.0804E-02	4.1332E-02	4.3879E-02	3.5165E-02	5.0112E-02	4.0223E-02	4.6529E-02
15.0	4.1565E-02	4.2062E-02	4.4589E-02	3.5819E-02	5.0994E-02	4.0971E-02	4.7341E-02
15.2	4.2369E-02	4.2816E-02	4.5351E-02	3.6519E-02	5.1916E-02	4.1753E-02	4.8198E-02
15.4	4.3213E-02	4.3593E-02	4.6162E-02	3.7261E-02	5.2875E-02	4.2567E-02	4.9095E-02
15.6	4.4090E-02	4.4389E-02	4.7017E-02	3.8041E-02	5.3867E-02	4.3410E-02	5.0027E-02
15.8	4.4997E-02	4.5199E-02	4.7911E-02	3.8854E-02	5.4886E-02	4.4279E-02	5.0991E-02
16.0	4.5929E-02	4.6022E-02	4.8839E-02	3.9697E-02	5.5931E-02	4.5170E-02	5.1980E-02
16.2	4.6880E-02	4.6854E-02	4.9795E-02	4.0563E-02	5.6995E-02	4.6081E-02	5.2991E-02
16.4	4.7847E-02	4.7692E-02	5.0775E-02	4.1449E-02	5.8075E-02	4.7006E-02	5.4019E-02
16.6	4.8827E-02	4.8536E-02	5.1772E-02	4.2349E-02	5.9168E-02	4.7943E-02	5.5059E-02
16.8	4.9814E-02	4.9383E-02	5.2781E-02	4.3259E-02	6.0269E-02	4.8889E-02	5.6108E-02
17.0	5.0806E-02	5.0232E-02	5.3797E-02	4.4175E-02	6.1374E-02	4.9838E-02	5.7162E-02

**Table B-9. DGB/StdP parachute,  $C_{m,SLCP}$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	31/43	29/41	29/40	29/39	29/38	29/37	29/36
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	3.2074E-04	7.0971E-04	7.1595E-04	1.0818E-03	1.0002E-03	1.0263E-03	1.0873E-03
0.4	6.3592E-04	1.4054E-03	1.4199E-03	2.1466E-03	1.9853E-03	2.0390E-03	2.1536E-03
0.6	9.3990E-04	2.0729E-03	2.0999E-03	3.1774E-03	2.9404E-03	3.0245E-03	3.1777E-03
0.8	1.2271E-03	2.6983E-03	2.7440E-03	4.1573E-03	3.8502E-03	3.9692E-03	4.1386E-03
1.0	1.4917E-03	3.2675E-03	3.3402E-03	5.0693E-03	4.6999E-03	4.8596E-03	5.0152E-03
1.2	1.7277E-03	3.7669E-03	3.8764E-03	5.8968E-03	5.4744E-03	5.6823E-03	5.7881E-03
1.4	1.9270E-03	4.1849E-03	4.3401E-03	6.6257E-03	6.1594E-03	6.4254E-03	6.4439E-03
1.6	2.0810E-03	4.5103E-03	4.7186E-03	7.2425E-03	6.7404E-03	7.0774E-03	6.9705E-03
1.8	2.1811E-03	4.7320E-03	4.9993E-03	7.7338E-03	7.2031E-03	7.6265E-03	7.3561E-03
2.0	2.2189E-03	4.8390E-03	5.1695E-03	8.0859E-03	7.5331E-03	8.0612E-03	7.5886E-03
2.2	2.1856E-03	4.8211E-03	5.2172E-03	8.2866E-03	7.7168E-03	8.3707E-03	7.6585E-03
2.4	2.0713E-03	4.6719E-03	5.1322E-03	8.3287E-03	7.7435E-03	8.5478E-03	7.5644E-03
2.6	1.8661E-03	4.3859E-03	4.9053E-03	8.2063E-03	7.6031E-03	8.5861E-03	7.3070E-03
2.8	1.5598E-03	3.9575E-03	4.5268E-03	7.9137E-03	7.2856E-03	8.4793E-03	6.8866E-03
3.0	1.1426E-03	3.3812E-03	3.9874E-03	7.4449E-03	6.7810E-03	8.2211E-03	6.3037E-03
3.2	6.0492E-04	2.6525E-03	3.2788E-03	6.7954E-03	6.0808E-03	7.8063E-03	5.5602E-03
3.4	-5.9674E-05	1.7715E-03	2.3988E-03	5.9679E-03	5.1827E-03	7.2355E-03	4.6635E-03
3.6	-8.5703E-04	7.3998E-04	1.3473E-03	4.9676E-03	4.0865E-03	6.5109E-03	3.6229E-03
3.8	-1.7930E-03	-4.4016E-04	1.2392E-04	3.7995E-03	2.7922E-03	5.6350E-03	2.4477E-03
4.0	-2.8733E-03	-1.7672E-03	-1.2716E-03	2.4689E-03	1.2995E-03	4.6100E-03	1.1472E-03
4.2	-4.1027E-03	-3.2383E-03	-2.8377E-03	9.8258E-04	-3.9018E-04	3.4391E-03	-2.6889E-04
4.4	-5.4795E-03	-4.8463E-03	-4.5649E-03	-6.4574E-04	-2.2675E-03	2.1310E-03	-1.7895E-03
4.6	-7.0001E-03	-6.5821E-03	-6.4420E-03	-2.4008E-03	-4.3205E-03	6.9661E-04	-3.4032E-03
4.8	-8.6609E-03	-8.4368E-03	-8.4577E-03	-4.2673E-03	-6.5371E-03	-8.5300E-04	-5.0984E-03
5.0	-1.0458E-02	-1.0401E-02	-1.0601E-02	-6.2300E-03	-8.9053E-03	-2.5069E-03	-6.8637E-03
5.2	-1.2386E-02	-1.2465E-02	-1.2858E-02	-8.2728E-03	-1.1411E-02	-4.2528E-03	-8.6881E-03
5.4	-1.4427E-02	-1.4612E-02	-1.5208E-02	-1.0376E-02	-1.4030E-02	-6.0736E-03	-1.0563E-02
5.6	-1.6561E-02	-1.6824E-02	-1.7628E-02	-1.2517E-02	-1.6736E-02	-7.9511E-03	-1.2482E-02
5.8	-1.8766E-02	-1.9083E-02	-2.0092E-02	-1.4674E-02	-1.9501E-02	-9.8671E-03	-1.4436E-02
6.0	-2.1023E-02	-2.1372E-02	-2.2578E-02	-1.6826E-02	-2.2301E-02	-1.1803E-02	-1.6419E-02
6.2	-2.3311E-02	-2.3671E-02	-2.5062E-02	-1.8951E-02	-2.5108E-02	-1.3742E-02	-1.8423E-02
6.4	-2.5608E-02	-2.5965E-02	-2.7522E-02	-2.1034E-02	-2.7899E-02	-1.5670E-02	-2.0442E-02
6.6	-2.7895E-02	-2.8236E-02	-2.9941E-02	-2.3057E-02	-3.0652E-02	-1.7571E-02	-2.2469E-02
6.8	-3.0149E-02	-3.0466E-02	-3.2296E-02	-2.5005E-02	-3.3342E-02	-1.9434E-02	-2.4498E-02
7.0	-3.2350E-02	-3.2639E-02	-3.4570E-02	-2.6862E-02	-3.5948E-02	-2.1245E-02	-2.6523E-02
7.2	-3.4479E-02	-3.4739E-02	-3.6742E-02	-2.8613E-02	-3.8449E-02	-2.2991E-02	-2.8539E-02
7.4	-3.6520E-02	-3.6752E-02	-3.8804E-02	-3.0251E-02	-4.0831E-02	-2.4667E-02	-3.0537E-02
7.6	-3.8463E-02	-3.8669E-02	-4.0748E-02	-3.1774E-02	-4.3084E-02	-2.6270E-02	-3.2511E-02
7.8	-4.0293E-02	-4.0478E-02	-4.2567E-02	-3.3176E-02	-4.5200E-02	-2.7795E-02	-3.4455E-02
8.0	-4.2000E-02	-4.2169E-02	-4.4252E-02	-3.4453E-02	-4.7168E-02	-2.9239E-02	-3.6361E-02
8.2	-4.3572E-02	-4.3732E-02	-4.5799E-02	-3.5604E-02	-4.8982E-02	-3.0600E-02	-3.8222E-02
8.4	-4.5007E-02	-4.5164E-02	-4.7211E-02	-3.6634E-02	-5.0642E-02	-3.1880E-02	-4.0030E-02
8.6	-4.6304E-02	-4.6465E-02	-4.8491E-02	-3.7548E-02	-5.2155E-02	-3.3085E-02	-4.1780E-02
8.8	-4.7464E-02	-4.7631E-02	-4.9646E-02	-3.8355E-02	-5.3525E-02	-3.4219E-02	-4.3463E-02

**Table B-9. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	31/43	29/41	29/40	29/39	29/38	29/37	29/36
9.0	-4.8486E-02	-4.8664E-02	-5.0680E-02	-3.9059E-02	-5.4756E-02	-3.5286E-02	-4.5073E-02
9.2	-4.9372E-02	-4.9561E-02	-5.1598E-02	-3.9669E-02	-5.5854E-02	-3.6293E-02	-4.6602E-02
9.4	-5.0129E-02	-5.0331E-02	-5.2411E-02	-4.0194E-02	-5.6831E-02	-3.7244E-02	-4.8046E-02
9.6	-5.0766E-02	-5.0979E-02	-5.3128E-02	-4.0645E-02	-5.7699E-02	-3.8149E-02	-4.9400E-02
9.8	-5.1292E-02	-5.1513E-02	-5.3760E-02	-4.1032E-02	-5.8470E-02	-3.9014E-02	-5.0661E-02
10.0	-5.1717E-02	-5.1941E-02	-5.4318E-02	-4.1366E-02	-5.9158E-02	-3.9845E-02	-5.1824E-02
10.2	-5.2049E-02	-5.2272E-02	-5.4812E-02	-4.1657E-02	-5.9774E-02	-4.0650E-02	-5.2887E-02
10.4	-5.2303E-02	-5.2519E-02	-5.5250E-02	-4.1913E-02	-6.0331E-02	-4.1433E-02	-5.3855E-02
10.6	-5.2493E-02	-5.2699E-02	-5.5643E-02	-4.2140E-02	-6.0841E-02	-4.2197E-02	-5.4734E-02
10.8	-5.2634E-02	-5.2826E-02	-5.5997E-02	-4.2346E-02	-6.1316E-02	-4.2944E-02	-5.5533E-02
11.0	-5.2740E-02	-5.2917E-02	-5.6322E-02	-4.2539E-02	-6.1768E-02	-4.3679E-02	-5.6258E-02
11.2	-5.2826E-02	-5.2986E-02	-5.6627E-02	-4.2724E-02	-6.2209E-02	-4.4404E-02	-5.6917E-02
11.4	-5.2902E-02	-5.3046E-02	-5.6917E-02	-4.2907E-02	-6.2647E-02	-4.5121E-02	-5.7522E-02
11.6	-5.2982E-02	-5.3112E-02	-5.7201E-02	-4.3093E-02	-6.3092E-02	-4.5833E-02	-5.8083E-02
11.8	-5.3076E-02	-5.3195E-02	-5.7484E-02	-4.3288E-02	-6.3551E-02	-4.6541E-02	-5.8612E-02
12.0	-5.3197E-02	-5.3310E-02	-5.7773E-02	-4.3495E-02	-6.4033E-02	-4.7247E-02	-5.9121E-02
12.2	-5.3354E-02	-5.3468E-02	-5.8075E-02	-4.3721E-02	-6.4546E-02	-4.7953E-02	-5.9621E-02
12.4	-5.3556E-02	-5.3678E-02	-5.8395E-02	-4.3971E-02	-6.5096E-02	-4.8663E-02	-6.0123E-02
12.6	-5.3808E-02	-5.3944E-02	-5.8741E-02	-4.4249E-02	-6.5688E-02	-4.9379E-02	-6.0638E-02
12.8	-5.4117E-02	-5.4275E-02	-5.9118E-02	-4.4560E-02	-6.6328E-02	-5.0106E-02	-6.1177E-02
13.0	-5.4489E-02	-5.4676E-02	-5.9532E-02	-4.4910E-02	-6.7020E-02	-5.0847E-02	-6.1751E-02
13.2	-5.4930E-02	-5.5152E-02	-5.9990E-02	-4.5303E-02	-6.7770E-02	-5.1606E-02	-6.2370E-02
13.4	-5.5444E-02	-5.5704E-02	-6.0498E-02	-4.5745E-02	-6.8580E-02	-5.2387E-02	-6.3041E-02
13.6	-5.6034E-02	-5.6331E-02	-6.1061E-02	-4.6241E-02	-6.9453E-02	-5.3195E-02	-6.3770E-02
13.8	-5.6703E-02	-5.7032E-02	-6.1684E-02	-4.6795E-02	-7.0392E-02	-5.4037E-02	-6.4564E-02
14.0	-5.7455E-02	-5.7807E-02	-6.2375E-02	-4.7412E-02	-7.1399E-02	-5.4917E-02	-6.5427E-02
14.2	-5.8292E-02	-5.8653E-02	-6.3136E-02	-4.8097E-02	-7.2477E-02	-5.5839E-02	-6.6365E-02
14.4	-5.9212E-02	-5.9566E-02	-6.3973E-02	-4.8853E-02	-7.3626E-02	-5.6809E-02	-6.7379E-02
14.6	-6.0214E-02	-6.0542E-02	-6.4886E-02	-4.9681E-02	-7.4844E-02	-5.7828E-02	-6.8469E-02
14.8	-6.1295E-02	-6.1574E-02	-6.5879E-02	-5.0582E-02	-7.6132E-02	-5.8900E-02	-6.9633E-02
15.0	-6.2455E-02	-6.2659E-02	-6.6953E-02	-5.1560E-02	-7.7489E-02	-6.0026E-02	-7.0871E-02
15.2	-6.3688E-02	-6.3790E-02	-6.8108E-02	-5.2615E-02	-7.8914E-02	-6.1209E-02	-7.2183E-02
15.4	-6.4990E-02	-6.4962E-02	-6.9340E-02	-5.3740E-02	-8.0401E-02	-6.2443E-02	-7.3562E-02
15.6	-6.6351E-02	-6.6169E-02	-7.0641E-02	-5.4930E-02	-8.1944E-02	-6.3725E-02	-7.5000E-02
15.8	-6.7764E-02	-6.7406E-02	-7.2001E-02	-5.6175E-02	-8.3535E-02	-6.5049E-02	-7.6488E-02
16.0	-6.9220E-02	-6.8666E-02	-7.3415E-02	-5.7469E-02	-8.5167E-02	-6.6409E-02	-7.8019E-02
16.2	-7.0711E-02	-6.9945E-02	-7.4872E-02	-5.8804E-02	-8.6834E-02	-6.7800E-02	-7.9586E-02
16.4	-7.2231E-02	-7.1238E-02	-7.6366E-02	-6.0172E-02	-8.8529E-02	-6.9217E-02	-8.1180E-02
16.6	-7.3772E-02	-7.2541E-02	-7.7886E-02	-6.1565E-02	-9.0245E-02	-7.0652E-02	-8.2796E-02
16.8	-7.5328E-02	-7.3852E-02	-7.9425E-02	-6.2975E-02	-9.1975E-02	-7.2101E-02	-8.4426E-02
17.0	-7.6891E-02	-7.5167E-02	-8.0973E-02	-6.4394E-02	-9.3712E-02	-7.3555E-02	-8.6064E-02

**Table B-10. DGB/LowP parachute,  $C_T$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	33/52	33/51	33/50	33/49	33/48	33/47	33/46
0.0	5.4482E-01	5.4137E-01	5.4533E-01	5.3657E-01	5.5781E-01	5.4514E-01	5.5829E-01
0.2	5.4495E-01	5.4152E-01	5.4549E-01	5.3671E-01	5.5800E-01	5.4532E-01	5.5847E-01
0.4	5.4535E-01	5.4195E-01	5.4597E-01	5.3711E-01	5.5854E-01	5.4586E-01	5.5901E-01
0.6	5.4601E-01	5.4267E-01	5.4675E-01	5.3778E-01	5.5943E-01	5.4675E-01	5.5988E-01
0.8	5.4692E-01	5.4365E-01	5.4781E-01	5.3870E-01	5.6066E-01	5.4797E-01	5.6109E-01
1.0	5.4806E-01	5.4488E-01	5.4915E-01	5.3987E-01	5.6221E-01	5.4950E-01	5.6263E-01
1.2	5.4943E-01	5.4636E-01	5.5075E-01	5.4128E-01	5.6407E-01	5.5133E-01	5.6447E-01
1.4	5.5101E-01	5.4807E-01	5.5258E-01	5.4292E-01	5.6622E-01	5.5344E-01	5.6660E-01
1.6	5.5280E-01	5.4999E-01	5.5462E-01	5.4477E-01	5.6865E-01	5.5580E-01	5.6901E-01
1.8	5.5477E-01	5.5210E-01	5.5686E-01	5.4682E-01	5.7132E-01	5.5839E-01	5.7167E-01
2.0	5.5691E-01	5.5439E-01	5.5927E-01	5.4905E-01	5.7422E-01	5.6119E-01	5.7457E-01
2.2	5.5921E-01	5.5684E-01	5.6183E-01	5.5146E-01	5.7734E-01	5.6418E-01	5.7768E-01
2.4	5.6165E-01	5.5942E-01	5.6451E-01	5.5403E-01	5.8064E-01	5.6733E-01	5.8099E-01
2.6	5.6420E-01	5.6212E-01	5.6731E-01	5.5673E-01	5.8410E-01	5.7061E-01	5.8447E-01
2.8	5.6686E-01	5.6492E-01	5.7019E-01	5.5955E-01	5.8770E-01	5.7400E-01	5.8809E-01
3.0	5.6960E-01	5.6779E-01	5.7313E-01	5.6247E-01	5.9140E-01	5.7747E-01	5.9183E-01
3.2	5.7241E-01	5.7072E-01	5.7611E-01	5.6546E-01	5.9519E-01	5.8101E-01	5.9566E-01
3.4	5.7526E-01	5.7368E-01	5.7912E-01	5.6851E-01	5.9903E-01	5.8457E-01	5.9956E-01
3.6	5.7814E-01	5.7665E-01	5.8213E-01	5.7159E-01	6.0291E-01	5.8815E-01	6.0350E-01
3.8	5.8102E-01	5.7961E-01	5.8514E-01	5.7467E-01	6.0678E-01	5.9171E-01	6.0745E-01
4.0	5.8389E-01	5.8254E-01	5.8811E-01	5.7775E-01	6.1064E-01	5.9523E-01	6.1138E-01
4.2	5.8673E-01	5.8543E-01	5.9103E-01	5.8078E-01	6.1444E-01	5.9870E-01	6.1527E-01
4.4	5.8952E-01	5.8825E-01	5.9390E-01	5.8376E-01	6.1817E-01	6.0208E-01	6.1909E-01
4.6	5.9225E-01	5.9098E-01	5.9670E-01	5.8665E-01	6.2181E-01	6.0536E-01	6.2282E-01
4.8	5.9489E-01	5.9362E-01	5.9941E-01	5.8945E-01	6.2532E-01	6.0852E-01	6.2643E-01
5.0	5.9743E-01	5.9614E-01	6.0202E-01	5.9212E-01	6.2869E-01	6.1154E-01	6.2989E-01
5.2	5.9986E-01	5.9853E-01	6.0452E-01	5.9464E-01	6.3190E-01	6.1441E-01	6.3318E-01
5.4	6.0217E-01	6.0078E-01	6.0691E-01	5.9702E-01	6.3493E-01	6.1712E-01	6.3630E-01
5.6	6.0436E-01	6.0290E-01	6.0918E-01	5.9924E-01	6.3778E-01	6.1965E-01	6.3923E-01
5.8	6.0641E-01	6.0487E-01	6.1132E-01	6.0130E-01	6.4044E-01	6.2200E-01	6.4196E-01
6.0	6.0833E-01	6.0670E-01	6.1334E-01	6.0319E-01	6.4291E-01	6.2417E-01	6.4448E-01
6.2	6.1011E-01	6.0838E-01	6.1521E-01	6.0491E-01	6.4517E-01	6.2616E-01	6.4680E-01
6.4	6.1176E-01	6.0992E-01	6.1695E-01	6.0646E-01	6.4724E-01	6.2795E-01	6.4891E-01
6.6	6.1326E-01	6.1132E-01	6.1856E-01	6.0785E-01	6.4911E-01	6.2956E-01	6.5081E-01
6.8	6.1464E-01	6.1258E-01	6.2002E-01	6.0907E-01	6.5079E-01	6.3099E-01	6.5251E-01
7.0	6.1588E-01	6.1371E-01	6.2134E-01	6.1014E-01	6.5228E-01	6.3223E-01	6.5402E-01
7.2	6.1699E-01	6.1471E-01	6.2252E-01	6.1106E-01	6.5359E-01	6.3330E-01	6.5532E-01
7.4	6.1798E-01	6.1560E-01	6.2357E-01	6.1185E-01	6.5473E-01	6.3419E-01	6.5645E-01
7.6	6.1886E-01	6.1637E-01	6.2448E-01	6.1250E-01	6.5571E-01	6.3493E-01	6.5741E-01
7.8	6.1962E-01	6.1704E-01	6.2526E-01	6.1304E-01	6.5654E-01	6.3552E-01	6.5821E-01
8.0	6.2029E-01	6.1762E-01	6.2591E-01	6.1348E-01	6.5724E-01	6.3597E-01	6.5888E-01
8.2	6.2086E-01	6.1812E-01	6.2645E-01	6.1382E-01	6.5783E-01	6.3631E-01	6.5941E-01
8.4	6.2135E-01	6.1855E-01	6.2688E-01	6.1409E-01	6.5830E-01	6.3653E-01	6.5984E-01
8.6	6.2176E-01	6.1891E-01	6.2721E-01	6.1430E-01	6.5870E-01	6.3667E-01	6.6018E-01
8.8	6.2211E-01	6.1922E-01	6.2746E-01	6.1446E-01	6.5903E-01	6.3674E-01	6.6045E-01

**Table B-10. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	33/52	33/51	33/50	33/49	33/48	33/47	33/46
9.0	6.2241E-01	6.1949E-01	6.2763E-01	6.1458E-01	6.5931E-01	6.3676E-01	6.6066E-01
9.2	6.2266E-01	6.1974E-01	6.2773E-01	6.1468E-01	6.5956E-01	6.3675E-01	6.6084E-01
9.4	6.2288E-01	6.1996E-01	6.2778E-01	6.1477E-01	6.5979E-01	6.3672E-01	6.6100E-01
9.6	6.2307E-01	6.2017E-01	6.2780E-01	6.1485E-01	6.6003E-01	6.3670E-01	6.6117E-01
9.8	6.2325E-01	6.2038E-01	6.2781E-01	6.1495E-01	6.6029E-01	6.3671E-01	6.6134E-01
10.0	6.2341E-01	6.2059E-01	6.2780E-01	6.1507E-01	6.6057E-01	6.3677E-01	6.6155E-01
10.2	6.2357E-01	6.2082E-01	6.2781E-01	6.1521E-01	6.6091E-01	6.3689E-01	6.6180E-01
10.4	6.2374E-01	6.2107E-01	6.2784E-01	6.1538E-01	6.6129E-01	6.3708E-01	6.6211E-01
10.6	6.2392E-01	6.2133E-01	6.2790E-01	6.1558E-01	6.6172E-01	6.3735E-01	6.6246E-01
10.8	6.2410E-01	6.2162E-01	6.2801E-01	6.1582E-01	6.6221E-01	6.3771E-01	6.6287E-01
11.0	6.2429E-01	6.2192E-01	6.2816E-01	6.1608E-01	6.6274E-01	6.3815E-01	6.6333E-01
11.2	6.2450E-01	6.2225E-01	6.2838E-01	6.1637E-01	6.6333E-01	6.3869E-01	6.6384E-01
11.4	6.2473E-01	6.2260E-01	6.2866E-01	6.1668E-01	6.6397E-01	6.3931E-01	6.6439E-01
11.6	6.2497E-01	6.2297E-01	6.2901E-01	6.1702E-01	6.6464E-01	6.4002E-01	6.6499E-01
11.8	6.2522E-01	6.2336E-01	6.2942E-01	6.1738E-01	6.6535E-01	6.4080E-01	6.6562E-01
12.0	6.2549E-01	6.2376E-01	6.2990E-01	6.1775E-01	6.6608E-01	6.4165E-01	6.6627E-01
12.2	6.2576E-01	6.2418E-01	6.3044E-01	6.1814E-01	6.6683E-01	6.4255E-01	6.6694E-01
12.4	6.2606E-01	6.2461E-01	6.3104E-01	6.1854E-01	6.6758E-01	6.4350E-01	6.6762E-01
12.6	6.2636E-01	6.2505E-01	6.3169E-01	6.1895E-01	6.6832E-01	6.4448E-01	6.6828E-01
12.8	6.2667E-01	6.2549E-01	6.3237E-01	6.1937E-01	6.6904E-01	6.4546E-01	6.6894E-01
13.0	6.2698E-01	6.2594E-01	6.3309E-01	6.1979E-01	6.6973E-01	6.4643E-01	6.6956E-01
13.2	6.2731E-01	6.2638E-01	6.3382E-01	6.2022E-01	6.7037E-01	6.4738E-01	6.7014E-01
13.4	6.2763E-01	6.2681E-01	6.3456E-01	6.2064E-01	6.7095E-01	6.4828E-01	6.7067E-01
13.6	6.2795E-01	6.2724E-01	6.3529E-01	6.2107E-01	6.7147E-01	6.4911E-01	6.7114E-01
13.8	6.2828E-01	6.2765E-01	6.3600E-01	6.2150E-01	6.7190E-01	6.4986E-01	6.7154E-01
14.0	6.2860E-01	6.2804E-01	6.3667E-01	6.2193E-01	6.7225E-01	6.5051E-01	6.7187E-01
14.2	6.2892E-01	6.2842E-01	6.3728E-01	6.2236E-01	6.7250E-01	6.5104E-01	6.7210E-01
14.4	6.2923E-01	6.2878E-01	6.3784E-01	6.2280E-01	6.7265E-01	6.5144E-01	6.7225E-01
14.6	6.2953E-01	6.2912E-01	6.3833E-01	6.2323E-01	6.7268E-01	6.5170E-01	6.7230E-01
14.8	6.2983E-01	6.2943E-01	6.3873E-01	6.2367E-01	6.7261E-01	6.5180E-01	6.7226E-01
15.0	6.3012E-01	6.2972E-01	6.3904E-01	6.2412E-01	6.7242E-01	6.5175E-01	6.7212E-01
15.2	6.3041E-01	6.2998E-01	6.3926E-01	6.2457E-01	6.7212E-01	6.5153E-01	6.7187E-01
15.4	6.3068E-01	6.3022E-01	6.3938E-01	6.2502E-01	6.7171E-01	6.5116E-01	6.7153E-01
15.6	6.3095E-01	6.3045E-01	6.3942E-01	6.2548E-01	6.7121E-01	6.5064E-01	6.7111E-01
15.8	6.3120E-01	6.3065E-01	6.3938E-01	6.2595E-01	6.7062E-01	6.5000E-01	6.7061E-01
16.0	6.3146E-01	6.3083E-01	6.3927E-01	6.2642E-01	6.6996E-01	6.4925E-01	6.7005E-01
16.2	6.3171E-01	6.3101E-01	6.3910E-01	6.2689E-01	6.6924E-01	6.4840E-01	6.6944E-01
16.4	6.3195E-01	6.3117E-01	6.3888E-01	6.2737E-01	6.6846E-01	6.4748E-01	6.6878E-01
16.6	6.3219E-01	6.3132E-01	6.3863E-01	6.2785E-01	6.6766E-01	6.4650E-01	6.6809E-01
16.8	6.3243E-01	6.3147E-01	6.3835E-01	6.2834E-01	6.6682E-01	6.4549E-01	6.6738E-01
17.0	6.3267E-01	6.3162E-01	6.3806E-01	6.2882E-01	6.6598E-01	6.4445E-01	6.6666E-01

**Table B-11. DGB/LowP parachute,  $C_N$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	33/52	33/51	33/50	33/49	33/48	33/47	33/46
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	-1.4049E-03	-1.6441E-03	-1.6003E-03	-1.5706E-03	-1.9093E-03	-1.7874E-03	-1.8845E-03
0.4	-2.7937E-03	-3.2673E-03	-3.1827E-03	-3.1224E-03	-3.7998E-03	-3.5570E-03	-3.7520E-03
0.6	-4.1502E-03	-4.8491E-03	-4.7290E-03	-4.6367E-03	-5.6527E-03	-5.2908E-03	-5.5858E-03
0.8	-5.4585E-03	-6.3687E-03	-6.2215E-03	-6.0949E-03	-7.4491E-03	-6.9712E-03	-7.3690E-03
1.0	-6.7024E-03	-7.8054E-03	-7.6421E-03	-7.4780E-03	-9.1704E-03	-8.5802E-03	-9.0848E-03
1.2	-7.8666E-03	-9.1390E-03	-8.9737E-03	-8.7687E-03	-1.0798E-02	-1.0100E-02	-1.0716E-02
1.4	-8.9402E-03	-1.0355E-02	-1.0203E-02	-9.9534E-03	-1.2317E-02	-1.1517E-02	-1.2249E-02
1.6	-9.9132E-03	-1.1441E-02	-1.1317E-02	-1.1020E-02	-1.3711E-02	-1.2817E-02	-1.3670E-02
1.8	-1.0776E-02	-1.2386E-02	-1.2303E-02	-1.1957E-02	-1.4968E-02	-1.3986E-02	-1.4964E-02
2.0	-1.1518E-02	-1.3179E-02	-1.3150E-02	-1.2751E-02	-1.6072E-02	-1.5012E-02	-1.6118E-02
2.2	-1.2131E-02	-1.3810E-02	-1.3845E-02	-1.3391E-02	-1.7011E-02	-1.5882E-02	-1.7119E-02
2.4	-1.2613E-02	-1.4279E-02	-1.4386E-02	-1.3876E-02	-1.7777E-02	-1.6591E-02	-1.7960E-02
2.6	-1.2963E-02	-1.4585E-02	-1.4769E-02	-1.4201E-02	-1.8365E-02	-1.7132E-02	-1.8633E-02
2.8	-1.3179E-02	-1.4731E-02	-1.4992E-02	-1.4366E-02	-1.8770E-02	-1.7500E-02	-1.9132E-02
3.0	-1.3260E-02	-1.4716E-02	-1.5051E-02	-1.4370E-02	-1.8985E-02	-1.7692E-02	-1.9449E-02
3.2	-1.3207E-02	-1.4543E-02	-1.4946E-02	-1.4211E-02	-1.9008E-02	-1.7702E-02	-1.9581E-02
3.4	-1.3023E-02	-1.4222E-02	-1.4684E-02	-1.3898E-02	-1.8841E-02	-1.7536E-02	-1.9528E-02
3.6	-1.2716E-02	-1.3763E-02	-1.4272E-02	-1.3439E-02	-1.8490E-02	-1.7198E-02	-1.9294E-02
3.8	-1.2291E-02	-1.3175E-02	-1.3718E-02	-1.2843E-02	-1.7963E-02	-1.6694E-02	-1.8883E-02
4.0	-1.1753E-02	-1.2469E-02	-1.3031E-02	-1.2118E-02	-1.7264E-02	-1.6029E-02	-1.8299E-02
4.2	-1.1109E-02	-1.1657E-02	-1.2220E-02	-1.1274E-02	-1.6401E-02	-1.5211E-02	-1.7547E-02
4.4	-1.0368E-02	-1.0750E-02	-1.1302E-02	-1.0325E-02	-1.5389E-02	-1.4252E-02	-1.6639E-02
4.6	-9.5386E-03	-9.7635E-03	-1.0290E-02	-9.2858E-03	-1.4244E-02	-1.3166E-02	-1.5590E-02
4.8	-8.6291E-03	-8.7094E-03	-9.2017E-03	-8.1720E-03	-1.2983E-02	-1.1969E-02	-1.4414E-02
5.0	-7.6487E-03	-7.6019E-03	-8.0523E-03	-6.9983E-03	-1.1621E-02	-1.0675E-02	-1.3124E-02
5.2	-6.6063E-03	-6.4539E-03	-6.8581E-03	-5.7797E-03	-1.0176E-02	-9.2990E-03	-1.1737E-02
5.4	-5.5109E-03	-5.2762E-03	-5.6357E-03	-4.5319E-03	-8.6701E-03	-7.8615E-03	-1.0274E-02
5.6	-4.3714E-03	-4.0791E-03	-4.4016E-03	-3.2705E-03	-7.1267E-03	-6.3829E-03	-8.7571E-03
5.8	-3.1968E-03	-2.8729E-03	-3.1725E-03	-2.0111E-03	-5.5692E-03	-4.8841E-03	-7.2104E-03
6.0	-1.9961E-03	-1.6678E-03	-1.9649E-03	-7.6951E-04	-4.0209E-03	-3.3859E-03	-5.6571E-03
6.2	-7.7793E-04	-4.7368E-04	-7.9417E-04	4.3956E-04	-2.5041E-03	-1.9086E-03	-4.1200E-03
6.4	4.4913E-04	7.0131E-04	3.2885E-04	1.6046E-03	-1.0368E-03	-4.6889E-04	-2.6180E-03
6.6	1.6768E-03	1.8496E-03	1.3944E-03	2.7151E-03	3.6377E-04	9.1755E-04	-1.1693E-03
6.8	2.8968E-03	2.9638E-03	2.3926E-03	3.7604E-03	1.6808E-03	2.2351E-03	2.0830E-04
7.0	4.1007E-03	4.0363E-03	3.3139E-03	4.7298E-03	2.8972E-03	3.4680E-03	1.4967E-03
7.2	5.2804E-03	5.0600E-03	4.1495E-03	5.6138E-03	3.9974E-03	4.6018E-03	2.6793E-03
7.4	6.4280E-03	6.0291E-03	4.8976E-03	6.4080E-03	4.9744E-03	5.6288E-03	3.7478E-03
7.6	7.5358E-03	6.9386E-03	5.5581E-03	7.1097E-03	5.8249E-03	6.5443E-03	4.6974E-03
7.8	8.5960E-03	7.7832E-03	6.1309E-03	7.7160E-03	6.5455E-03	7.3434E-03	5.5232E-03
8.0	9.6009E-03	8.5578E-03	6.6160E-03	8.2244E-03	7.1328E-03	8.0213E-03	6.2204E-03
8.2	1.0543E-02	9.2576E-03	7.0140E-03	8.6330E-03	7.5856E-03	8.5745E-03	6.7853E-03
8.4	1.1416E-02	9.8798E-03	7.3300E-03	8.9449E-03	7.9107E-03	9.0066E-03	7.2224E-03
8.6	1.2214E-02	1.0422E-02	7.5706E-03	9.1645E-03	8.1179E-03	9.3234E-03	7.5401E-03
8.8	1.2932E-02	1.0882E-02	7.7423E-03	9.2965E-03	8.2170E-03	9.5305E-03	7.7467E-03

**Table B-11. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	33/52	33/51	33/50	33/49	33/48	33/47	33/46
9.0	1.3562E-02	1.1258E-02	7.8518E-03	9.3454E-03	8.2179E-03	9.6339E-03	7.8508E-03
9.2	1.4099E-02	1.1548E-02	7.9057E-03	9.3163E-03	8.1310E-03	9.6396E-03	7.8613E-03
9.4	1.4541E-02	1.1752E-02	7.9113E-03	9.2168E-03	7.9707E-03	9.5573E-03	7.7916E-03
9.6	1.4886E-02	1.1872E-02	7.8761E-03	9.0556E-03	7.7526E-03	9.3978E-03	7.6565E-03
9.8	1.5131E-02	1.1911E-02	7.8074E-03	8.8413E-03	7.4924E-03	9.1723E-03	7.4708E-03
10.0	1.5274E-02	1.1870E-02	7.7129E-03	8.5823E-03	7.2056E-03	8.8917E-03	7.2494E-03
10.2	1.5314E-02	1.1753E-02	7.5994E-03	8.2873E-03	6.9071E-03	8.5671E-03	7.0065E-03
10.4	1.5257E-02	1.1567E-02	7.4709E-03	7.9646E-03	6.6080E-03	8.2086E-03	6.7539E-03
10.6	1.5110E-02	1.1322E-02	7.3296E-03	7.6226E-03	6.3188E-03	7.8260E-03	6.5020E-03
10.8	1.4880E-02	1.1027E-02	7.1778E-03	7.2695E-03	6.0501E-03	7.4292E-03	6.2615E-03
11.0	1.4576E-02	1.0691E-02	7.0178E-03	6.9138E-03	5.8122E-03	7.0280E-03	6.0428E-03
11.2	1.4204E-02	1.0324E-02	6.8518E-03	6.5634E-03	5.6149E-03	6.6320E-03	5.8560E-03
11.4	1.3775E-02	9.9335E-03	6.6812E-03	6.2244E-03	5.4635E-03	6.2484E-03	5.7072E-03
11.6	1.3299E-02	9.5297E-03	6.5072E-03	5.9019E-03	5.3613E-03	5.8836E-03	5.6003E-03
11.8	1.2785E-02	9.1217E-03	6.3308E-03	5.6009E-03	5.3118E-03	5.5441E-03	5.5394E-03
12.0	1.2245E-02	8.7185E-03	6.1533E-03	5.3265E-03	5.3182E-03	5.2362E-03	5.5286E-03
12.2	1.1689E-02	8.3289E-03	5.9760E-03	5.0828E-03	5.3828E-03	4.9660E-03	5.5709E-03
12.4	1.1125E-02	7.9591E-03	5.8013E-03	4.8713E-03	5.5038E-03	4.7370E-03	5.6658E-03
12.6	1.0563E-02	7.6142E-03	5.6322E-03	4.6930E-03	5.6782E-03	4.5524E-03	5.8115E-03
12.8	1.0013E-02	7.2994E-03	5.4713E-03	4.5489E-03	5.9033E-03	4.4149E-03	6.0062E-03
13.0	9.4818E-03	7.0199E-03	5.3215E-03	4.4399E-03	6.1763E-03	4.3275E-03	6.2483E-03
13.2	8.9797E-03	6.7800E-03	5.1857E-03	4.3666E-03	6.4941E-03	4.2930E-03	6.5357E-03
13.4	8.5120E-03	6.5805E-03	5.0680E-03	4.3275E-03	6.8523E-03	4.3121E-03	6.8645E-03
13.6	8.0835E-03	6.4213E-03	4.9728E-03	4.3206E-03	7.2458E-03	4.3853E-03	7.2308E-03
13.8	7.6988E-03	6.3022E-03	4.9046E-03	4.3438E-03	7.6694E-03	4.5128E-03	7.6301E-03
14.0	7.3628E-03	6.2231E-03	4.8678E-03	4.3952E-03	8.1179E-03	4.6950E-03	8.0584E-03
14.2	7.0795E-03	6.1835E-03	4.8666E-03	4.4726E-03	8.5863E-03	4.9319E-03	8.5114E-03
14.4	6.8496E-03	6.1809E-03	4.9044E-03	4.5732E-03	9.0700E-03	5.2222E-03	8.9853E-03
14.6	6.6730E-03	6.2118E-03	4.9841E-03	4.6942E-03	9.5647E-03	5.5640E-03	9.4762E-03
14.8	6.5495E-03	6.2730E-03	5.1085E-03	4.8326E-03	1.0066E-02	5.9555E-03	9.9803E-03
15.0	6.4791E-03	6.3612E-03	5.2806E-03	4.9854E-03	1.0570E-02	6.3947E-03	1.0494E-02
15.2	6.4610E-03	6.4731E-03	5.5027E-03	5.1499E-03	1.1072E-02	6.8796E-03	1.1013E-02
15.4	6.4913E-03	6.6055E-03	5.7723E-03	5.3243E-03	1.1572E-02	7.4058E-03	1.1537E-02
15.6	6.5643E-03	6.7553E-03	6.0848E-03	5.5068E-03	1.2069E-02	7.9686E-03	1.2063E-02
15.8	6.6746E-03	6.9192E-03	6.4356E-03	5.6958E-03	1.2563E-02	8.5630E-03	1.2591E-02
16.0	6.8165E-03	7.0942E-03	6.8200E-03	5.8897E-03	1.3054E-02	9.1842E-03	1.3121E-02
16.2	6.9845E-03	7.2772E-03	7.2334E-03	6.0869E-03	1.3541E-02	9.8275E-03	1.3650E-02
16.4	7.1736E-03	7.4665E-03	7.6702E-03	6.2866E-03	1.4024E-02	1.0488E-02	1.4179E-02
16.6	7.3788E-03	7.6606E-03	8.1248E-03	6.4882E-03	1.4505E-02	1.1163E-02	1.4709E-02
16.8	7.5951E-03	7.8578E-03	8.5917E-03	6.6911E-03	1.4985E-02	1.1846E-02	1.5238E-02
17.0	7.8176E-03	8.0568E-03	9.0649E-03	6.8947E-03	1.5463E-02	1.2535E-02	1.5767E-02

**Table B-12. DGB/LowP parachute,  $C_{m,SLCP}$  versus  $\alpha_T$ .**

$\alpha_T$ (deg)	Run/Group						
	33/52	33/51	33/50	33/49	33/48	33/47	33/46
0.0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.2	2.3466E-03	2.7254E-03	2.6610E-03	2.5822E-03	3.1373E-03	2.9169E-03	3.0696E-03
0.4	4.6671E-03	5.4174E-03	5.2930E-03	5.1347E-03	6.2448E-03	5.8061E-03	6.1130E-03
0.6	6.9357E-03	8.0427E-03	7.8672E-03	7.6280E-03	9.2928E-03	8.6397E-03	9.1042E-03
0.8	9.1262E-03	1.0568E-02	1.0355E-02	1.0033E-02	1.2252E-02	1.1390E-02	1.2017E-02
1.0	1.1213E-02	1.2960E-02	1.2727E-02	1.2319E-02	1.5092E-02	1.4029E-02	1.4825E-02
1.2	1.3171E-02	1.5187E-02	1.4955E-02	1.4458E-02	1.7784E-02	1.6531E-02	1.7503E-02
1.4	1.4982E-02	1.7224E-02	1.7018E-02	1.6431E-02	2.0302E-02	1.8870E-02	2.0028E-02
1.6	1.6631E-02	1.9053E-02	1.8897E-02	1.8217E-02	2.2625E-02	2.1027E-02	2.2378E-02
1.8	1.8102E-02	2.0655E-02	2.0569E-02	1.9797E-02	2.4728E-02	2.2980E-02	2.4530E-02
2.0	1.9378E-02	2.2013E-02	2.2017E-02	2.1152E-02	2.6589E-02	2.4708E-02	2.6464E-02
2.2	2.0446E-02	2.3111E-02	2.3221E-02	2.2266E-02	2.8188E-02	2.6192E-02	2.8159E-02
2.4	2.1303E-02	2.3947E-02	2.4176E-02	2.3131E-02	2.9512E-02	2.7422E-02	2.9601E-02
2.6	2.1946E-02	2.4522E-02	2.4876E-02	2.3746E-02	3.0553E-02	2.8388E-02	3.0781E-02
2.8	2.2373E-02	2.4839E-02	2.5317E-02	2.4108E-02	3.1300E-02	2.9083E-02	3.1685E-02
3.0	2.2583E-02	2.4899E-02	2.5495E-02	2.4214E-02	3.1745E-02	2.9497E-02	3.2303E-02
3.2	2.2576E-02	2.4706E-02	2.5409E-02	2.4065E-02	3.1881E-02	2.9624E-02	3.2626E-02
3.4	2.2360E-02	2.4273E-02	2.5068E-02	2.3671E-02	3.1715E-02	2.9471E-02	3.2656E-02
3.6	2.1944E-02	2.3619E-02	2.4486E-02	2.3047E-02	3.1254E-02	2.9045E-02	3.2399E-02
3.8	2.1338E-02	2.2758E-02	2.3676E-02	2.2206E-02	3.0510E-02	2.8355E-02	3.1859E-02
4.0	2.0552E-02	2.1710E-02	2.2651E-02	2.1161E-02	2.9491E-02	2.7408E-02	3.1042E-02
4.2	1.9596E-02	2.0489E-02	2.1429E-02	1.9928E-02	2.8208E-02	2.6215E-02	2.9955E-02
4.4	1.8484E-02	1.9119E-02	2.0032E-02	1.8530E-02	2.6685E-02	2.4796E-02	2.8618E-02
4.6	1.7230E-02	1.7620E-02	1.8488E-02	1.6990E-02	2.4949E-02	2.3175E-02	2.7054E-02
4.8	1.5849E-02	1.6014E-02	1.6821E-02	1.5332E-02	2.3024E-02	2.1374E-02	2.5285E-02
5.0	1.4356E-02	1.4323E-02	1.5058E-02	1.3579E-02	2.0939E-02	1.9416E-02	2.3333E-02
5.2	1.2764E-02	1.2569E-02	1.3225E-02	1.1756E-02	1.8720E-02	1.7326E-02	2.1222E-02
5.4	1.1089E-02	1.0768E-02	1.1349E-02	9.8861E-03	1.6403E-02	1.5136E-02	1.8988E-02
5.6	9.3448E-03	8.9385E-03	9.4576E-03	7.9953E-03	1.4027E-02	1.2880E-02	1.6667E-02
5.8	7.5462E-03	7.0960E-03	7.5778E-03	6.1078E-03	1.1629E-02	1.0591E-02	1.4297E-02
6.0	5.7079E-03	5.2573E-03	5.7363E-03	4.2485E-03	9.2474E-03	8.3033E-03	1.1918E-02
6.2	3.8440E-03	3.4387E-03	3.9584E-03	2.4409E-03	6.9187E-03	6.0499E-03	9.5650E-03
6.4	1.9682E-03	1.6532E-03	2.2614E-03	7.0289E-04	4.6721E-03	3.8577E-03	7.2701E-03
6.6	9.3819E-05	-8.6922E-05	6.6108E-04	-9.4861E-04	2.5352E-03	1.7525E-03	5.0624E-03
6.8	-1.7658E-03	-1.7696E-03	-8.2696E-04	-2.4969E-03	5.3587E-04	-2.4037E-04	2.9716E-03
7.0	-3.5972E-03	-3.3827E-03	-2.1870E-03	-3.9250E-03	-1.2985E-03	-2.0954E-03	1.0269E-03
7.2	-5.3872E-03	-4.9146E-03	-3.4055E-03	-5.2180E-03	-2.9423E-03	-3.7887E-03	-7.4442E-04
7.4	-7.1233E-03	-6.3563E-03	-4.4797E-03	-6.3688E-03	-4.3845E-03	-5.3082E-03	-2.3289E-03
7.6	-8.7934E-03	-7.6997E-03	-5.4101E-03	-7.3730E-03	-5.6199E-03	-6.6461E-03	-3.7187E-03
7.8	-1.0385E-02	-8.9366E-03	-6.1972E-03	-8.2263E-03	-6.6434E-03	-7.7948E-03	-4.9061E-03
8.0	-1.1886E-02	-1.0059E-02	-6.8415E-03	-8.9243E-03	-7.4497E-03	-8.7466E-03	-5.8834E-03
8.2	-1.3285E-02	-1.1059E-02	-7.3448E-03	-9.4642E-03	-8.0368E-03	-9.4960E-03	-6.6447E-03
8.4	-1.4572E-02	-1.1933E-02	-7.7158E-03	-9.8506E-03	-8.4165E-03	-1.0049E-02	-7.1977E-03
8.6	-1.5737E-02	-1.2677E-02	-7.9659E-03	-1.0091E-02	-8.6051E-03	-1.0415E-02	-7.5563E-03
8.8	-1.6772E-02	-1.3289E-02	-8.1065E-03	-1.0192E-02	-8.6190E-03	-1.0605E-02	-7.7349E-03



**Table B-12. Concluded.**

$\alpha_T$ (deg)	Run/Group						
	33/52	33/51	33/50	33/49	33/48	33/47	33/46
9.0	-1.7667E-02	-1.3764E-02	-8.1489E-03	-1.0160E-02	-8.4745E-03	-1.0627E-02	-7.7473E-03
9.2	-1.8413E-02	-1.4101E-02	-8.1048E-03	-1.0005E-02	-8.1891E-03	-1.0492E-02	-7.6090E-03
9.4	-1.9006E-02	-1.4300E-02	-7.9862E-03	-9.7377E-03	-7.7866E-03	-1.0216E-02	-7.3419E-03
9.6	-1.9443E-02	-1.4366E-02	-7.8055E-03	-9.3717E-03	-7.2926E-03	-9.8175E-03	-6.9708E-03
9.8	-1.9721E-02	-1.4302E-02	-7.5751E-03	-8.9203E-03	-6.7328E-03	-9.3140E-03	-6.5202E-03
10.0	-1.9837E-02	-1.4111E-02	-7.3075E-03	-8.3972E-03	-6.1331E-03	-8.7239E-03	-6.0146E-03
10.2	-1.9790E-02	-1.3799E-02	-7.0143E-03	-7.8158E-03	-5.5175E-03	-8.0651E-03	-5.4779E-03
10.4	-1.9587E-02	-1.3380E-02	-6.7012E-03	-7.1892E-03	-4.9042E-03	-7.3542E-03	-4.9291E-03
10.6	-1.9242E-02	-1.2867E-02	-6.3715E-03	-6.5306E-03	-4.3100E-03	-6.6068E-03	-4.3852E-03
10.8	-1.8767E-02	-1.2277E-02	-6.0282E-03	-5.8532E-03	-3.7516E-03	-5.8385E-03	-3.8633E-03
11.0	-1.8172E-02	-1.1623E-02	-5.6744E-03	-5.1701E-03	-3.2458E-03	-5.0652E-03	-3.3806E-03
11.2	-1.7472E-02	-1.0921E-02	-5.3129E-03	-4.4939E-03	-2.8082E-03	-4.3018E-03	-2.9531E-03
11.4	-1.6682E-02	-1.0186E-02	-4.9454E-03	-3.8342E-03	-2.4469E-03	-3.5600E-03	-2.5904E-03
11.6	-1.5817E-02	-9.4306E-03	-4.5730E-03	-3.1993E-03	-2.1672E-03	-2.8497E-03	-2.2988E-03
11.8	-1.4894E-02	-8.6711E-03	-4.1969E-03	-2.5971E-03	-1.9742E-03	-2.1808E-03	-2.0844E-03
12.0	-1.3930E-02	-7.9218E-03	-3.8183E-03	-2.0357E-03	-1.8728E-03	-1.5634E-03	-1.9533E-03
12.2	-1.2941E-02	-7.1965E-03	-3.4388E-03	-1.5218E-03	-1.8664E-03	-1.0067E-03	-1.9103E-03
12.4	-1.1941E-02	-6.5048E-03	-3.0622E-03	-1.0580E-03	-1.9516E-03	-5.1647E-04	-1.9540E-03
12.6	-1.0945E-02	-5.8547E-03	-2.6927E-03	-6.4582E-04	-2.1237E-03	-9.7260E-05	-2.0811E-03
12.8	-9.9667E-03	-5.2542E-03	-2.3346E-03	-2.8718E-04	-2.3780E-03	2.4644E-04	-2.2883E-03
13.0	-9.0215E-03	-4.7112E-03	-1.9923E-03	1.6200E-05	-2.7095E-03	5.1014E-04	-2.5724E-03
13.2	-8.1223E-03	-4.2324E-03	-1.6704E-03	2.6339E-04	-3.1133E-03	6.8974E-04	-2.9295E-03
13.4	-7.2783E-03	-3.8187E-03	-1.3759E-03	4.5650E-04	-3.5820E-03	7.8370E-04	-3.3535E-03
13.6	-6.4967E-03	-3.4695E-03	-1.1161E-03	5.9852E-04	-4.1074E-03	7.9148E-04	-3.8371E-03
13.8	-5.7852E-03	-3.1843E-03	-8.9865E-04	6.9242E-04	-4.6812E-03	7.1254E-04	-4.3733E-03
14.0	-5.1511E-03	-2.9625E-03	-7.3108E-04	7.4118E-04	-5.2949E-03	5.4632E-04	-4.9551E-03
14.2	-4.6006E-03	-2.8029E-03	-6.2064E-04	7.4799E-04	-5.9406E-03	2.9263E-04	-5.5754E-03
14.4	-4.1348E-03	-2.7010E-03	-5.7311E-04	7.1700E-04	-6.6108E-03	-4.6565E-05	-6.2278E-03
14.6	-3.7535E-03	-2.6514E-03	-5.9372E-04	6.5274E-04	-7.2989E-03	-4.6845E-04	-6.9061E-03
14.8	-3.4564E-03	-2.6486E-03	-6.8769E-04	5.5976E-04	-7.9980E-03	-9.7019E-04	-7.6042E-03
15.0	-3.2430E-03	-2.6870E-03	-8.6026E-04	4.4259E-04	-8.7013E-03	-1.5490E-03	-8.3158E-03
15.2	-3.1122E-03	-2.7611E-03	-1.1155E-03	3.0549E-04	-9.4028E-03	-2.2014E-03	-9.0351E-03
15.4	-3.0578E-03	-2.8661E-03	-1.4496E-03	1.5153E-04	-1.0101E-02	-2.9208E-03	-9.7592E-03
15.6	-3.0709E-03	-2.9969E-03	-1.8549E-03	-1.6560E-05	-1.0794E-02	-3.6994E-03	-1.0487E-02
15.8	-3.1427E-03	-3.1488E-03	-2.3239E-03	-1.9604E-04	-1.1483E-02	-4.5294E-03	-1.1216E-02
16.0	-3.2643E-03	-3.3168E-03	-2.8490E-03	-3.8417E-04	-1.2167E-02	-5.4029E-03	-1.1946E-02
16.2	-3.4270E-03	-3.4964E-03	-3.4223E-03	-5.7840E-04	-1.2846E-02	-6.3123E-03	-1.2675E-02
16.4	-3.6229E-03	-3.6851E-03	-4.0350E-03	-7.7723E-04	-1.3519E-02	-7.2504E-03	-1.3404E-02
16.6	-3.8442E-03	-3.8805E-03	-4.6774E-03	-9.7956E-04	-1.4189E-02	-8.2105E-03	-1.4132E-02
16.8	-4.0829E-03	-4.0806E-03	-5.3402E-03	-1.1843E-03	-1.4856E-02	-9.1856E-03	-1.4860E-02
17.0	-4.3314E-03	-4.2831E-03	-6.0138E-03	-1.3903E-03	-1.5522E-02	-1.0169E-02	-1.5587E-02

## Appendix C. Evaluation of Other Independent Variables and Regressors

Other independent variables and regressors were considered for the models of the drag and total force coefficients and the static coefficients. This appendix describes these independent variables and regressors, their effects on modeling, and the reasons why they were not included in the set of models presented in the main text of this report.

### C.1 Other Independent Variables

In addition to  $\lambda_T$  and  $M_{\text{Eff}}$ , the other independent variables that were considered were the effective mass moment of inertia ratio,  $R_{I,\text{Eff}}$ , and the effective canopy mass ratio,  $R_{m,\text{Eff}}$ . These quantities are defined by

$$R_{I,\text{Eff}} = \frac{I_{\text{TBCP}}}{(L_{\text{Riser}} + L_{\text{SL}})^2 \rho_{\text{Eff}} \left[ \frac{4}{3} \pi (D_0/2)^3 \right]} \quad (\text{C-1})$$

$$R_{m,\text{Eff}} = \frac{m_{\text{Canopy}}}{\rho_{\text{Eff}} \left[ \frac{4}{3} \pi (D_0/2)^3 \right]} \quad (\text{C-2})$$

where

- $I_{\text{TBCP}}$  is the pitch and yaw mass moment of inertia of the parachutes about the triple bridle confluence point (TBCP; see figs. 1 and 2). These quantities were calculated for the model parachutes based on a computer-aided design model and the mass properties of the various elements that comprised the model parachutes. Because the model parachutes were assumed to be axisymmetric, the pitch and yaw mass moments of inertia were the same, and a single symbol could stand for both of them.
- $L_{\text{Riser}}$  is the length of the riser; the distance from the triple bridle confluence point to the suspension lines confluence point (see figs. 1 and 2).
- $L_{\text{SL}}$  is the length of the suspension lines; the distance from the suspension lines confluence point to the skirt of the parachute (see figs. 1 and 2).
- $m_{\text{Canopy}}$  is the mass of the canopy. The canopy mass does not include the mass of any elements upstream of the canopy skirt (e.g., suspension lines, riser, swivel).

The other symbols in equations (1) and (2) have been defined in the main text of this report.

Note that  $(L_{\text{Riser}} + L_{\text{SL}})$  in equation (C-1) is a representative length from the triple bridle confluence point (about which the parachute is rotating) to the skirt of the canopy. The quantity  $(4/3) (D_0/2)^3$  is the volume of a sphere with diameter  $D_0$ . The mass of fluid filling such a sphere is  $\rho_{\text{Eff}} (4/3) (D_0/2)^3$ . Then, the denominator  $(L_{\text{Riser}} + L_{\text{SL}})^2 \rho_{\text{Eff}} (4/3) (D_0/2)^3$  of equation (C-1) is a representative moment of inertia related to the fluid (i.e.,  $\text{length}^2 \times \text{mass}$ ). Thus,  $R_{I,\text{Eff}}$  is the ratio of the physical moment of inertia about the triple bridle confluence point to a representative fluid moment of inertia about the same point. Similarly, it can be seen that  $R_{m,\text{Eff}}$  is the ratio of the

physical mass of the canopy, to a representative fluid mass. The independent variables  $R_{I, \text{Eff}}$  and  $R_{m, \text{Eff}}$  were considered because such mass ratios are known to affect some aspects of parachute behavior.

## C.2 Drag and Total Force Coefficients Modeling

The values of the dimensionless independent variables  $\lambda_T$ ,  $M_{\text{Eff}}$ ,  $R_{I, \text{Eff}}$ , and  $R_{m, \text{Eff}}$  are presented in table C-1 for the Run/Group(s) used to determine the drag and total force coefficient models. Models for  $C_D$  and  $C_{\text{Tot}}$  of the form

$$C = a_0 + a_1 \lambda_T + a_2 M_{\text{Eff}} + a_3 R_{I, \text{Eff}} + a_{12} \lambda_T M_{\text{Eff}} + a_{13} \lambda_T R_{I, \text{Eff}} + a_{23} M_{\text{Eff}} R_{I, \text{Eff}} \quad (\text{C-3})$$

were considered and selected using the criteria described in the main text of this report. The resulting models are presented in table C-2. Comparing the values of  $R_{\text{adj}}^2$  and Max. |residual| from tables 6 and C-2, it can be seen that improvements in the models caused by including  $R_{I, \text{Eff}}$  as an independent variable are very small. Considering  $R_{m, \text{Eff}}$  as an independent variable in a model similar to that shown in equation (C-3) would yield similarly small improvements because  $R_{I, \text{Eff}}$  and  $R_{m, \text{Eff}}$  are almost exactly linearly correlated as can be seen in figure C-1. The collinearity that exists between  $R_{I, \text{Eff}}$  and  $R_{m, \text{Eff}}$  prevents isolating the effect of these independent variables. For all these reasons it was decided not to include  $R_{I, \text{Eff}}$  or  $R_{m, \text{Eff}}$  in the models for  $C_D$  and  $C_{\text{Tot}}$  in the main body of this report. Instead, the simpler models using only  $\lambda_T$  and  $M_{\text{Eff}}$  as the independent variables were selected.

**Table C-1. Dimensionless independent variables associated with the drag and total force coefficients.**

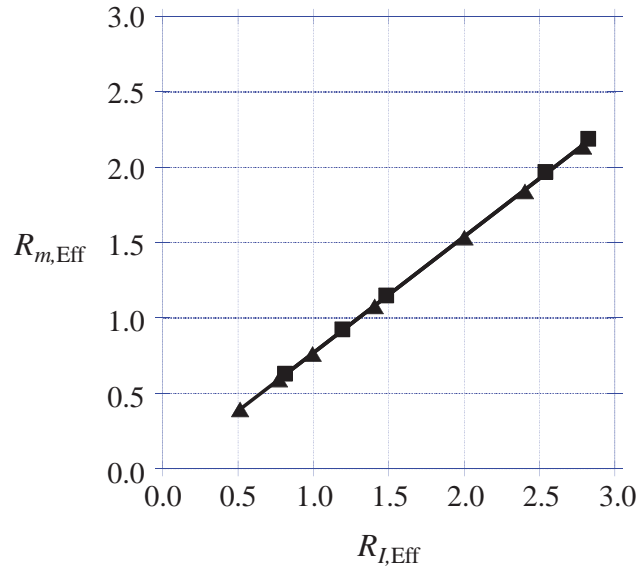
SSRS Parachutes							DGB Parachutes						
Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$	$R_{I,\text{Eff}}$	$R_{m,\text{Eff}}$		Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$	$R_{I,\text{Eff}}$	$R_{m,\text{Eff}}$	
StdP	15/47	0.1411	0.257	0.5140	0.3936		StdP	17/68	0.1212	0.255	0.3568	0.2610	
	15/46	0.1365	0.257	0.7720	0.5910			17/67	0.1163	0.254	0.5369	0.3928	
	15/45	0.1367	0.333	0.9950	0.7616			17/66	0.1166	0.331	0.6899	0.5048	
	15/44	0.1284	0.258	1.4070	1.0774			17/65	0.1083	0.255	0.9517	0.6963	
	15/43	0.1336	0.516	2.0020	1.5229			17/64	0.1134	0.513	1.3826	1.0116	
LowP	15/42	0.1277	0.413	2.4040	1.8404		17/63	0.1073	0.409	1.6561	1.2117		
	15/41	0.1290	0.517	2.7900	2.1364		17/62	0.1087	0.512	1.9127	1.3994		
	12/33	0.1063	0.261	0.8120	0.6299		16/56	0.0847	0.256	0.3674	0.2730		
	12/32	0.1062	0.337	1.1920	0.9245		16/55	0.0844	0.256	0.5510	0.4095		
	12/31	0.1060	0.263	1.4830	1.1499		16/54	0.0844	0.332	0.7132	0.5299		
LowP	12/30	0.1060	0.420	2.5400	1.9691		16/53	0.0841	0.257	0.9898	0.7355		
	12/29	0.1061	0.523	2.8240	2.1897		16/52	0.0843	0.514	1.4243	1.0584		
							16/51	0.0841	0.411	1.6794	1.2479		
							16/60	0.0842	0.514	1.9165	1.4241		

**Table C-2. Models for  $C_D$  and  $C_{\text{Tot}}$ .**

Parachute Type	Coef.	$a_0$	$a_1$	$a_2$	$a_3$	$a_{12}$	$a_{13}$	$a_{23}$	$R^2$	$R^2_{\text{adj}}$	RMSE	Max. $p$ -value	Max.  residual
SSRS	$C_D$	0.598661	Not included	0.702527	-0.00645095	-4.44333	Not included	Not included	0.9923	0.9895	0.00270	0.0200	0.004
	$C_{\text{Tot}}$	0.797934	-1.22715	Not included	Not included	Not included	-0.233025	0.0693112	0.9899	0.9861	0.00311	0.0002	0.004
DGB	$C_D$	0.794198	-1.86023	Not included	-0.0433238	Not included	Not included	0.0872518	0.9909	0.9881	0.00322	< 0.0001	0.006
	$C_{\text{Tot}}$	0.800067	-1.91692	Not included	-0.0395357	Not included	Not included	0.0798526	0.9905	0.9876	0.00337	0.0002	0.006

RMSE – Root Mean Square Error

▲ StdP Fabric    ■ LowP Fabric    — Linear Regression



**Figure C-1. Collinearity relationship between  $R_{m, \text{Eff}}$  and  $R_{I, \text{Eff}}$ .**

### C.3 Static Coefficients Modeling

The values of the dimensionless independent variables  $\lambda_T$ ,  $M_{\text{Eff}}$ ,  $R_{I, \text{Eff}}$ , and  $R_{m, \text{Eff}}$  are presented in table C-3 for the Run/Group(s) used to determine the static coefficient models. Models for  $C_T$ ,  $C_N$ , and  $C_{m, \text{SLCP}}$  of the form

$$C_{\alpha_T} = a_{0, \alpha_T} + a_{1, \alpha_T} \lambda_T + a_{2, \alpha_T} M_{\text{Eff}} + a_{3, \alpha_T} R_{I, \text{Eff}} + a_{12, \alpha_T} \lambda_T M_{\text{Eff}} + a_{13, \alpha_T} \lambda_T R_{I, \text{Eff}} + a_{23, \alpha_T} M_{\text{Eff}} R_{I, \text{Eff}} \quad (\text{C-4})$$

were created using the criteria described in the main text of this report for the previously considered SSRS parachutes Run/Group(s) 19/13 ( $C_T$  only), 20/5 and 25/28 ( $C_N$  and  $C_{m, \text{SLCP}}$ ). These were some of the Run/Group(s) that showed the largest differences between the models and the source data when  $\lambda_T$  and  $M_{\text{Eff}}$  were used as the only independent variables. The models that add  $R_{I, \text{Eff}}$  as an additional independent variable are shown graphically in figures C-2 and C-3. The following observations can be made from these figures for model parachutes using the StdP fabric type:

- Figure C-2. For Run/Group 19/3, the models using  $(\lambda_T, M_{\text{Eff}}, R_{I, \text{Eff}})$  as the independent variables were better at reproducing the source  $C_T$  data. However, it is noted that the models using only  $(\lambda_T, M_{\text{Eff}})$  were already within the confidence interval bands of the source data.
- Figure C-3. For Run/Group 20/5, the models using  $(\lambda_T, M_{\text{Eff}}, R_{I, \text{Eff}})$  as the independent variables were better at reproducing the source  $C_N$  and  $C_{m, \text{SLCP}}$  data; these modeled coefficients were now near or within the confidence interval bands of the source data.

- Figure C-3. For Run/Group 25/28, the models using ( $\lambda_T$ ,  $M_{\text{Eff}}$ ,  $R_{I,\text{Eff}}$ ) as the independent variables were slightly better at reproducing the source  $C_N$  and  $C_{m,\text{SLCP}}$  data.

Although adding  $R_{I,\text{Eff}}$  as an independent variable made some improvements in the ability of the models to reproduce the source data, it was decided to retain only  $\lambda_T$  and  $M_{\text{Eff}}$  as the independent variables for simplicity and to retain commonality with the drag and total force coefficients models. The collinearity issue between  $R_{I,\text{Eff}}$  and  $R_{m,\text{Eff}}$  described previously was also a consideration that argued against including  $R_{I,\text{Eff}}$  as an independent variable in the models. If alternative models for the static coefficients including  $R_{I,\text{Eff}}$  or  $R_{m,\text{Eff}}$  are desired, they can be created using the source data in Appendix B and the dimensionless quantities in table C-3.

**Table C-3. Dimensionless independent variables associated with the static coefficients.**

SSRS Parachutes					
Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$	$R_{I,\text{Eff}}$	$R_{m,\text{Eff}}$
StdP	21/8	0.1411	0.257	0.5205	0.3932
	21/7	0.1365	0.257	0.7825	0.5912
	21/6	0.1368	0.333	0.9949	0.7517
	20/5	0.1292	0.257	1.3440	1.0155
	20/4	0.1340	0.515	1.9663	1.4857
	19/3	0.1275	0.410	2.4548	1.8553
	19/2	0.1295	0.514	2.7150	2.0519
LowP	25/29	0.1066	0.256	0.5448	0.4161
	25/28	0.1063	0.256	0.8205	0.6267
	25/27	0.1063	0.333	1.0520	0.8036
	25/26	0.1060	0.256	1.4478	1.1059
	25/25	0.1062	0.515	2.0922	1.5982
	25/24	0.1060	0.411	2.5105	1.9178
	25/23	0.1061	0.515	2.8917	2.2090
DGB Parachutes					
Fabric Type	Run/Group	$\lambda_T$	$M_{\text{Eff}}$	$R_{I,\text{Eff}}$	$R_{m,\text{Eff}}$
StdP	31/43	0.1213	0.256	0.3587	0.2564
	29/41	0.1165	0.255	0.5430	0.3892
	29/40	0.1167	0.331	0.6991	0.5010
	29/39	0.1085	0.256	0.9668	0.6929
	29/38	0.1137	0.513	1.3778	0.9874
	29/37	0.1077	0.410	1.6496	1.1822
	29/36	0.1089	0.514	1.9238	1.3787
LowP	33/52	0.0847	0.256	0.3693	0.2685
	33/51	0.0844	0.257	0.5560	0.4043
	33/50	0.0844	0.333	0.7156	0.5203
	33/49	0.0841	0.258	1.0031	0.7294
	33/48	0.0843	0.515	1.4410	1.0478
	33/47	0.0841	0.412	1.7079	1.2419
	33/46	0.0842	0.515	1.9582	1.4240

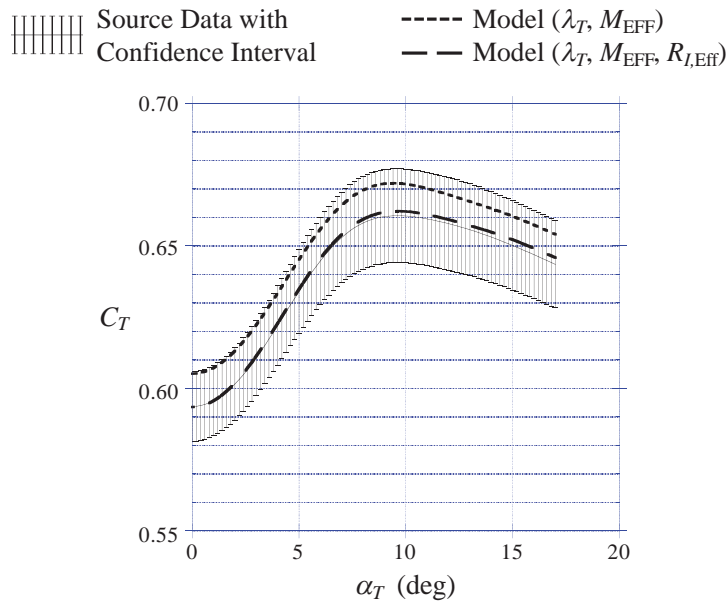


Figure C-2. SSRS/StdP parachute,  $C_T$  versus  $\alpha_T$ , Run 19/Group 3,  $\lambda_T = 0.1275$ ,  $M_{EFF} = 0.410$ .

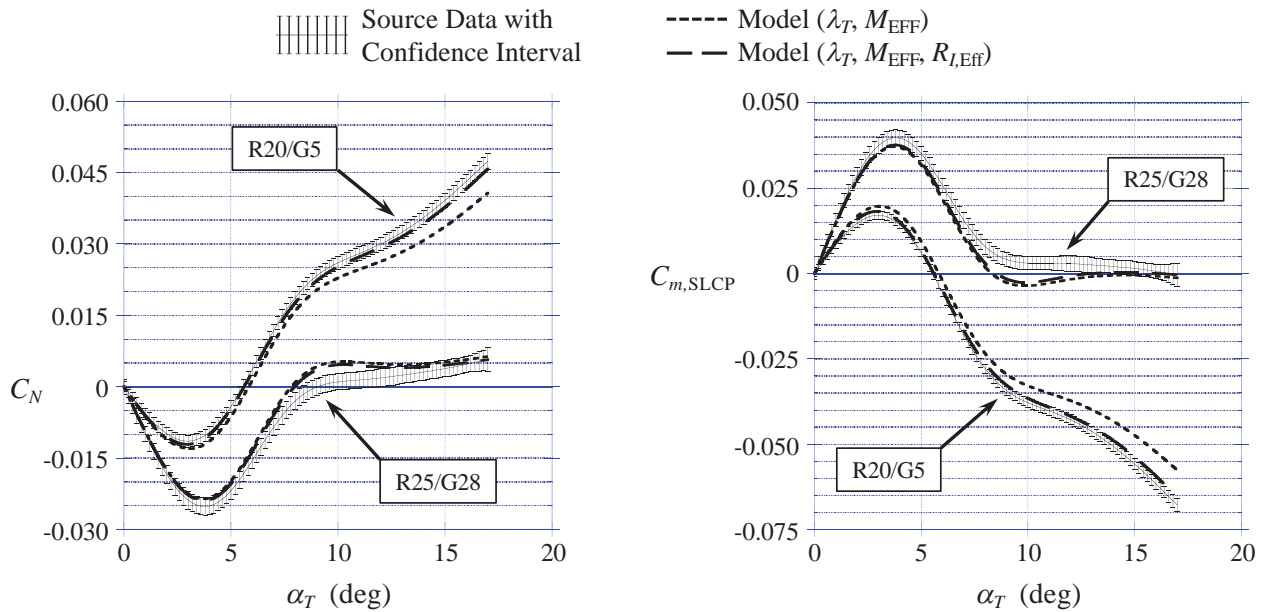


Figure C-3. Static coefficients  $C_N$  and  $C_{m,SLCP}$  versus  $\alpha_T$  for the SSRS/StdP parachute, Run 20/Group 5,  $\lambda_T = 0.1292$ ,  $M_{EFF} = 0.257$ , and the SSRS/LowP parachute, Run 25/Group 28,  $\lambda_T = 0.1063$ ,  $M_{EFF} = 0.256$ .

## Appendix D. Models for the Static Coefficients

**Table D-1. Model for  $C_T$  - SSRS parachute.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
0.0	7.95735E-01	-1.66648E+00	1.33957E-01	-6.30962E-01
0.2	7.95753E-01	-1.66624E+00	1.34475E-01	-6.34325E-01
0.4	7.95804E-01	-1.66551E+00	1.36025E-01	-6.44387E-01
0.6	7.95890E-01	-1.66432E+00	1.38593E-01	-6.61059E-01
0.8	7.96010E-01	-1.66268E+00	1.42165E-01	-6.84244E-01
1.0	7.96165E-01	-1.66062E+00	1.46726E-01	-7.13841E-01
1.2	7.96360E-01	-1.65819E+00	1.52248E-01	-7.49648E-01
1.4	7.96595E-01	-1.65543E+00	1.58696E-01	-7.91418E-01
1.6	7.96871E-01	-1.65235E+00	1.66037E-01	-8.38941E-01
1.8	7.97185E-01	-1.64897E+00	1.74239E-01	-8.92009E-01
2.0	7.97539E-01	-1.64532E+00	1.83270E-01	-9.50413E-01
2.2	7.97927E-01	-1.64139E+00	1.93100E-01	-1.01397E+00
2.4	7.98346E-01	-1.63717E+00	2.03673E-01	-1.08232E+00
2.6	7.98795E-01	-1.63271E+00	2.14915E-01	-1.15497E+00
2.8	7.99277E-01	-1.62805E+00	2.26748E-01	-1.23137E+00
3.0	7.99792E-01	-1.62324E+00	2.39093E-01	-1.31100E+00
3.2	8.00341E-01	-1.61832E+00	2.51871E-01	-1.39331E+00
3.4	8.00923E-01	-1.61333E+00	2.64978E-01	-1.47761E+00
3.6	8.01540E-01	-1.60834E+00	2.78296E-01	-1.56307E+00
3.8	8.02194E-01	-1.60341E+00	2.91703E-01	-1.64885E+00
4.0	8.02887E-01	-1.59860E+00	3.05081E-01	-1.73414E+00
4.2	8.03619E-01	-1.59399E+00	3.18311E-01	-1.81811E+00
4.4	8.04389E-01	-1.58960E+00	3.31274E-01	-1.89996E+00
4.6	8.05194E-01	-1.58547E+00	3.43852E-01	-1.97888E+00
4.8	8.06029E-01	-1.58162E+00	3.55926E-01	-2.05408E+00
5.0	8.06893E-01	-1.57809E+00	3.67379E-01	-2.12474E+00
5.2	8.07780E-01	-1.57490E+00	3.78106E-01	-2.19018E+00
5.4	8.08683E-01	-1.57204E+00	3.88056E-01	-2.25005E+00
5.6	8.09591E-01	-1.56951E+00	3.97194E-01	-2.30413E+00
5.8	8.10495E-01	-1.56728E+00	4.05482E-01	-2.35221E+00
6.0	8.11387E-01	-1.56533E+00	4.12885E-01	-2.39407E+00
6.2	8.12258E-01	-1.56367E+00	4.19371E-01	-2.42953E+00
6.4	8.13100E-01	-1.56226E+00	4.24951E-01	-2.45868E+00
6.6	8.13902E-01	-1.56107E+00	4.29658E-01	-2.48180E+00
6.8	8.14652E-01	-1.56003E+00	4.33521E-01	-2.49912E+00
7.0	8.15337E-01	-1.55911E+00	4.36571E-01	-2.51092E+00
7.2	8.15949E-01	-1.55825E+00	4.38845E-01	-2.51746E+00
7.4	8.16480E-01	-1.55743E+00	4.40408E-01	-2.51923E+00
7.6	8.16923E-01	-1.55659E+00	4.41339E-01	-2.51683E+00
7.8	8.17267E-01	-1.55568E+00	4.41720E-01	-2.51085E+00
8.0	8.17505E-01	-1.55463E+00	4.41632E-01	-2.50189E+00
8.2	8.17627E-01	-1.55338E+00	4.41163E-01	-2.49061E+00
8.4	8.17629E-01	-1.55188E+00	4.40411E-01	-2.47772E+00
8.6	8.17509E-01	-1.55009E+00	4.39467E-01	-2.46390E+00
8.8	8.17265E-01	-1.54796E+00	4.38426E-01	-2.44983E+00



**Table D-1. Concluded.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
9.0	8.16894E-01	-1.54545E+00	4.37380E-01	-2.43621E+00
9.2	8.16395E-01	-1.54252E+00	4.36418E-01	-2.42366E+00
9.4	8.15776E-01	-1.53919E+00	4.35603E-01	-2.41266E+00
9.6	8.15044E-01	-1.53547E+00	4.34992E-01	-2.40359E+00
9.8	8.14207E-01	-1.53137E+00	4.34644E-01	-2.39686E+00
10.0	8.13273E-01	-1.52691E+00	4.34614E-01	-2.39290E+00
10.2	8.12251E-01	-1.52211E+00	4.34949E-01	-2.39201E+00
10.4	8.11157E-01	-1.51704E+00	4.35636E-01	-2.39409E+00
10.6	8.10011E-01	-1.51182E+00	4.36646E-01	-2.39891E+00
10.8	8.08831E-01	-1.50653E+00	4.37950E-01	-2.40624E+00
11.0	8.07638E-01	-1.50128E+00	4.39518E-01	-2.41585E+00
11.2	8.06448E-01	-1.49615E+00	4.41321E-01	-2.42751E+00
11.4	8.05278E-01	-1.49124E+00	4.43322E-01	-2.44094E+00
11.6	8.04143E-01	-1.48663E+00	4.45478E-01	-2.45582E+00
11.8	8.03060E-01	-1.48243E+00	4.47745E-01	-2.47182E+00
12.0	8.02044E-01	-1.47871E+00	4.50080E-01	-2.48861E+00
12.2	8.01112E-01	-1.47558E+00	4.52439E-01	-2.50587E+00
12.4	8.00272E-01	-1.47308E+00	4.54794E-01	-2.52337E+00
12.6	7.99533E-01	-1.47129E+00	4.57115E-01	-2.54091E+00
12.8	7.98904E-01	-1.47027E+00	4.59373E-01	-2.55825E+00
13.0	7.98394E-01	-1.47009E+00	4.61539E-01	-2.57516E+00
13.2	7.98011E-01	-1.47081E+00	4.63588E-01	-2.59143E+00
13.4	7.97754E-01	-1.47244E+00	4.65515E-01	-2.60703E+00
13.6	7.97622E-01	-1.47498E+00	4.67324E-01	-2.62197E+00
13.8	7.97613E-01	-1.47843E+00	4.69014E-01	-2.63624E+00
14.0	7.97725E-01	-1.48279E+00	4.70588E-01	-2.64985E+00
14.2	7.97955E-01	-1.48807E+00	4.72051E-01	-2.66282E+00
14.4	7.98298E-01	-1.49421E+00	4.73414E-01	-2.67523E+00
14.6	7.98744E-01	-1.50118E+00	4.74697E-01	-2.68720E+00
14.8	7.99287E-01	-1.50894E+00	4.75915E-01	-2.69883E+00
15.0	7.99917E-01	-1.51742E+00	4.77084E-01	-2.71024E+00
15.2	8.00627E-01	-1.52660E+00	4.78221E-01	-2.72153E+00
15.4	8.01410E-01	-1.53641E+00	4.79334E-01	-2.73273E+00
15.6	8.02256E-01	-1.54678E+00	4.80430E-01	-2.74388E+00
15.8	8.03154E-01	-1.55763E+00	4.81517E-01	-2.75503E+00
16.0	8.04096E-01	-1.56887E+00	4.82602E-01	-2.76623E+00
16.2	8.05071E-01	-1.58043E+00	4.83694E-01	-2.77751E+00
16.4	8.06073E-01	-1.59224E+00	4.84792E-01	-2.78888E+00
16.6	8.07096E-01	-1.60424E+00	4.85895E-01	-2.80031E+00
16.8	8.08132E-01	-1.61638E+00	4.87002E-01	-2.81178E+00
17.0	8.09176E-01	-1.62859E+00	4.88111E-01	-2.82328E+00

**Table D-2. Model for  $C_N$  - SSRS parachute.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
0.0	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
0.2	-3.66433E-03	1.79912E-02	-4.85078E-03	3.87085E-02
0.4	-7.36743E-03	3.63673E-02	-9.51399E-03	7.60009E-02
0.6	-1.11469E-02	5.55026E-02	-1.38049E-02	1.10486E-01
0.8	-1.50404E-02	7.57705E-02	-1.75389E-02	1.40776E-01
1.0	-1.90849E-02	9.75410E-02	-2.05323E-02	1.65489E-01
1.2	-2.33069E-02	1.21097E-01	-2.26328E-02	1.83491E-01
1.4	-2.77067E-02	1.46522E-01	-2.37700E-02	1.94259E-01
1.6	-3.22783E-02	1.73849E-01	-2.38924E-02	1.97411E-01
1.8	-3.70157E-02	2.03113E-01	-2.29484E-02	1.92568E-01
2.0	-4.19129E-02	2.34349E-01	-2.08866E-02	1.79350E-01
2.2	-4.69593E-02	2.67551E-01	-1.76726E-02	1.57498E-01
2.4	-5.21133E-02	3.02464E-01	-1.33749E-02	1.27535E-01
2.6	-5.73178E-02	3.38699E-01	-8.11306E-03	9.03771E-02
2.8	-6.25148E-02	3.75866E-01	-2.00818E-03	4.69557E-02
3.0	-6.76465E-02	4.13570E-01	4.81810E-03	-1.79323E-03
3.2	-7.26529E-02	4.51394E-01	1.22362E-02	-5.48712E-02
3.4	-7.74733E-02	4.88887E-01	2.00806E-02	-1.11036E-01
3.6	-8.20387E-02	5.25517E-01	2.81537E-02	-1.68785E-01
3.8	-8.62795E-02	5.60747E-01	3.62564E-02	-2.26605E-01
4.0	-9.01262E-02	5.94041E-01	4.41899E-02	-2.82984E-01
4.2	-9.35173E-02	6.24923E-01	5.17686E-02	-3.36533E-01
4.4	-9.64258E-02	6.53160E-01	5.88619E-02	-3.86330E-01
4.6	-9.88299E-02	6.78536E-01	6.53462E-02	-4.31485E-01
4.8	-1.00707E-01	7.00829E-01	7.10972E-02	-4.71101E-01
5.0	-1.02035E-01	7.19815E-01	7.59904E-02	-5.04279E-01
5.2	-1.02797E-01	7.35295E-01	7.99146E-02	-5.30213E-01
5.4	-1.03030E-01	7.47444E-01	8.28767E-02	-5.48971E-01
5.6	-1.02791E-01	7.56549E-01	8.49258E-02	-5.60920E-01
5.8	-1.02138E-01	7.62895E-01	8.61105E-02	-5.66420E-01
6.0	-1.01126E-01	7.66766E-01	8.64794E-02	-5.65831E-01
6.2	-9.98113E-02	7.68452E-01	8.60852E-02	-5.59541E-01
6.4	-9.82589E-02	7.68310E-01	8.50104E-02	-5.48148E-01
6.6	-9.65376E-02	7.66742E-01	8.33503E-02	-5.32350E-01
6.8	-9.47166E-02	7.64157E-01	8.12005E-02	-5.12848E-01
7.0	-9.28654E-02	7.60960E-01	7.86569E-02	-4.90343E-01
7.2	-9.10470E-02	7.57517E-01	7.58075E-02	-4.65474E-01
7.4	-8.93008E-02	7.54050E-01	7.27099E-02	-4.38625E-01
7.6	-8.76647E-02	7.50797E-01	6.94206E-02	-4.10187E-01
7.8	-8.61770E-02	7.48002E-01	6.59968E-02	-3.80560E-01
8.0	-8.48760E-02	7.45906E-01	6.24958E-02	-3.50145E-01
8.2	-8.37954E-02	7.44731E-01	5.89758E-02	-3.19358E-01
8.4	-8.29386E-02	7.44511E-01	5.54553E-02	-2.88322E-01
8.6	-8.23012E-02	7.45243E-01	5.19328E-02	-2.57014E-01
8.8	-8.18792E-02	7.46929E-01	4.84075E-02	-2.25416E-01

**Table D-2. Concluded.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
9.0	-8.16686E-02	7.49571E-01	4.48788E-02	-1.93514E-01
9.2	-8.16616E-02	7.53145E-01	4.13413E-02	-1.61260E-01
9.4	-8.18320E-02	7.57509E-01	3.77661E-02	-1.28425E-01
9.6	-8.21512E-02	7.62511E-01	3.41208E-02	-9.47648E-02
9.8	-8.25912E-02	7.68004E-01	3.03735E-02	-6.00413E-02
10.0	-8.31237E-02	7.73843E-01	2.64926E-02	-2.40166E-02
10.2	-8.37225E-02	7.79891E-01	2.24518E-02	1.35041E-02
10.4	-8.43710E-02	7.86079E-01	1.82505E-02	5.25017E-02
10.6	-8.50544E-02	7.92342E-01	1.38940E-02	9.29170E-02
10.8	-8.57574E-02	7.98612E-01	9.38673E-03	1.34697E-01
11.0	-8.64647E-02	8.04821E-01	4.73337E-03	1.77788E-01
11.2	-8.71638E-02	8.10917E-01	-5.73920E-05	2.22107E-01
11.4	-8.78547E-02	8.16934E-01	-4.95887E-03	2.67430E-01
11.6	-8.85401E-02	8.22914E-01	-9.94226E-03	3.13521E-01
11.8	-8.92220E-02	8.28896E-01	-1.49794E-02	3.60150E-01
12.0	-8.99025E-02	8.34921E-01	-2.00422E-02	4.07088E-01
12.2	-9.05843E-02	8.41031E-01	-2.51045E-02	4.54120E-01
12.4	-9.12754E-02	8.47299E-01	-3.01439E-02	5.01066E-01
12.6	-9.19842E-02	8.53796E-01	-3.51417E-02	5.47786E-01
12.8	-9.27184E-02	8.60585E-01	-4.00801E-02	5.94147E-01
13.0	-9.34860E-02	8.67731E-01	-4.49410E-02	6.40019E-01
13.2	-9.42945E-02	8.75295E-01	-4.97085E-02	6.85282E-01
13.4	-9.51491E-02	8.83320E-01	-5.43819E-02	7.29938E-01
13.6	-9.60528E-02	8.91833E-01	-5.89690E-02	7.74056E-01
13.8	-9.70089E-02	9.00858E-01	-6.34776E-02	8.17709E-01
14.0	-9.80203E-02	9.10421E-01	-6.79158E-02	8.60969E-01
14.2	-9.90893E-02	9.20540E-01	-7.22935E-02	9.03920E-01
14.4	-1.00214E-01	9.31200E-01	-7.66289E-02	9.46710E-01
14.6	-1.01390E-01	9.42375E-01	-8.09436E-02	9.89505E-01
14.8	-1.02614E-01	9.54037E-01	-8.52589E-02	1.03247E+00
15.0	-1.03883E-01	9.66160E-01	-8.95962E-02	1.07579E+00
15.2	-1.05193E-01	9.78716E-01	-9.39737E-02	1.11958E+00
15.4	-1.06540E-01	9.91665E-01	-9.83973E-02	1.16389E+00
15.6	-1.07918E-01	1.00495E+00	-1.02868E-01	1.20871E+00
15.8	-1.09321E-01	1.01853E+00	-1.07388E-01	1.25403E+00
16.0	-1.10744E-01	1.03233E+00	-1.11959E-01	1.29985E+00
16.2	-1.12182E-01	1.04631E+00	-1.16580E-01	1.34615E+00
16.4	-1.13631E-01	1.06044E+00	-1.21245E-01	1.39286E+00
16.6	-1.15089E-01	1.07466E+00	-1.25943E-01	1.43989E+00
16.8	-1.16552E-01	1.08896E+00	-1.30666E-01	1.48714E+00
17.0	-1.18019E-01	1.10330E+00	-1.35402E-01	1.53452E+00

**Table D-3. Model for  $C_{m,SLCP}$  - SSRS parachute.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
0.0	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
0.2	5.98785E-03	-2.98244E-02	7.58273E-03	-6.31669E-02
0.4	1.20349E-02	-6.02444E-02	1.48736E-02	-1.24103E-01
0.6	1.81987E-02	-9.18391E-02	2.15850E-02	-1.80618E-01
0.8	2.45364E-02	-1.25186E-01	2.74299E-02	-2.30524E-01
1.0	3.11048E-02	-1.60858E-01	3.21224E-02	-2.71646E-01
1.2	3.79438E-02	-1.99292E-01	3.54259E-02	-3.02196E-01
1.4	4.50543E-02	-2.40620E-01	3.72300E-02	-3.21337E-01
1.6	5.24276E-02	-2.84904E-01	3.74533E-02	-3.28452E-01
1.8	6.00554E-02	-3.32206E-01	3.60144E-02	-3.22924E-01
2.0	6.79292E-02	-3.82588E-01	3.28318E-02	-3.04134E-01
2.2	7.60333E-02	-4.36052E-01	2.78508E-02	-2.71661E-01
2.4	8.43053E-02	-4.92212E-01	2.11764E-02	-2.26301E-01
2.6	9.26583E-02	-5.50479E-01	1.29932E-02	-1.69472E-01
2.8	1.01005E-01	-6.10260E-01	3.48762E-03	-1.02608E-01
3.0	1.09257E-01	-6.70957E-01	-7.15270E-03	-2.71537E-02
3.2	1.17323E-01	-7.31931E-01	-1.87268E-02	5.53399E-02
3.4	1.25111E-01	-7.92481E-01	-3.09765E-02	1.42920E-01
3.6	1.32513E-01	-8.51785E-01	-4.35936E-02	2.33232E-01
3.8	1.39423E-01	-9.09009E-01	-5.62679E-02	3.23901E-01
4.0	1.45735E-01	-9.63322E-01	-6.86894E-02	4.12556E-01
4.2	1.51352E-01	-1.01398E+00	-8.05688E-02	4.97016E-01
4.4	1.56233E-01	-1.06061E+00	-9.16993E-02	5.75801E-01
4.6	1.60342E-01	-1.10285E+00	-1.01885E-01	6.47477E-01
4.8	1.63641E-01	-1.14034E+00	-1.10928E-01	7.10598E-01
5.0	1.66095E-01	-1.17271E+00	-1.18631E-01	7.63715E-01
5.2	1.67674E-01	-1.19961E+00	-1.24817E-01	8.05529E-01
5.4	1.68434E-01	-1.22130E+00	-1.29493E-01	8.36101E-01
5.6	1.68459E-01	-1.23818E+00	-1.32729E-01	8.55944E-01
5.8	1.67830E-01	-1.25065E+00	-1.34595E-01	8.65562E-01
6.0	1.66630E-01	-1.25910E+00	-1.35161E-01	8.65456E-01
6.2	1.64943E-01	-1.26395E+00	-1.34503E-01	8.56176E-01
6.4	1.62863E-01	-1.26572E+00	-1.32745E-01	8.38617E-01
6.6	1.60495E-01	-1.26502E+00	-1.30033E-01	8.13840E-01
6.8	1.57943E-01	-1.26245E+00	-1.26514E-01	7.82912E-01
7.0	1.55312E-01	-1.25862E+00	-1.22333E-01	7.46900E-01
7.2	1.52696E-01	-1.25409E+00	-1.17626E-01	7.06777E-01
7.4	1.50158E-01	-1.24920E+00	-1.12484E-01	6.63153E-01
7.6	1.47757E-01	-1.24434E+00	-1.06998E-01	6.16665E-01
7.8	1.45553E-01	-1.23990E+00	-1.01261E-01	5.67966E-01
8.0	1.43609E-01	-1.23628E+00	-9.53658E-02	5.17712E-01
8.2	1.41978E-01	-1.23384E+00	-8.94064E-02	4.66580E-01
8.4	1.40669E-01	-1.23267E+00	-8.34179E-02	4.14813E-01
8.6	1.39680E-01	-1.23281E+00	-7.74066E-02	3.62445E-01
8.8	1.39012E-01	-1.23432E+00	-7.13795E-02	3.09520E-01

**Table D-3. Concluded.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
9.0	1.38662E-01	-1.23726E+00	-6.53441E-02	2.56085E-01
9.2	1.38624E-01	-1.24162E+00	-5.93003E-02	2.02135E-01
9.4	1.38863E-01	-1.24723E+00	-5.32109E-02	1.47379E-01
9.6	1.39340E-01	-1.25392E+00	-4.70337E-02	9.15058E-02
9.8	1.40017E-01	-1.26149E+00	-4.07273E-02	3.42105E-02
10.0	1.40855E-01	-1.26978E+00	-3.42505E-02	-2.48093E-02
10.2	1.41819E-01	-1.27860E+00	-2.75690E-02	-8.58021E-02
10.4	1.42884E-01	-1.28787E+00	-2.06837E-02	-1.48722E-01
10.6	1.44027E-01	-1.29748E+00	-1.36019E-02	-2.13487E-01
10.8	1.45225E-01	-1.30733E+00	-6.32954E-03	-2.80023E-01
11.0	1.46453E-01	-1.31729E+00	1.12723E-03	-3.48258E-01
11.2	1.47692E-01	-1.32730E+00	8.75638E-03	-4.18079E-01
11.4	1.48940E-01	-1.33738E+00	1.65199E-02	-4.89165E-01
11.6	1.50200E-01	-1.34757E+00	2.43776E-02	-5.61190E-01
11.8	1.51470E-01	-1.35792E+00	3.22903E-02	-6.33836E-01
12.0	1.52754E-01	-1.36847E+00	4.02190E-02	-7.06788E-01
12.2	1.54052E-01	-1.37925E+00	4.81277E-02	-7.79753E-01
12.4	1.55375E-01	-1.39037E+00	5.59864E-02	-8.52492E-01
12.6	1.56733E-01	-1.40190E+00	6.37705E-02	-9.24826E-01
12.8	1.58136E-01	-1.41394E+00	7.14570E-02	-9.96591E-01
13.0	1.59594E-01	-1.42655E+00	7.90225E-02	-1.06762E+00
13.2	1.61117E-01	-1.43982E+00	8.64468E-02	-1.13778E+00
13.4	1.62712E-01	-1.45380E+00	9.37313E-02	-1.20708E+00
13.6	1.64383E-01	-1.46853E+00	1.00890E-01	-1.27565E+00
13.8	1.66135E-01	-1.48403E+00	1.07938E-01	-1.34363E+00
14.0	1.67971E-01	-1.50036E+00	1.14888E-01	-1.41114E+00
14.2	1.69895E-01	-1.51753E+00	1.21759E-01	-1.47833E+00
14.4	1.71904E-01	-1.53551E+00	1.28578E-01	-1.54543E+00
14.6	1.73992E-01	-1.55428E+00	1.35379E-01	-1.61269E+00
14.8	1.76155E-01	-1.57380E+00	1.42195E-01	-1.68038E+00
15.0	1.78387E-01	-1.59403E+00	1.49057E-01	-1.74876E+00
15.2	1.80684E-01	-1.61493E+00	1.55996E-01	-1.81803E+00
15.4	1.83039E-01	-1.63644E+00	1.63017E-01	-1.88823E+00
15.6	1.85444E-01	-1.65849E+00	1.70121E-01	-1.95934E+00
15.8	1.87890E-01	-1.68098E+00	1.77310E-01	-2.03132E+00
16.0	1.90368E-01	-1.70385E+00	1.84584E-01	-2.10416E+00
16.2	1.92871E-01	-1.72700E+00	1.91942E-01	-2.17781E+00
16.4	1.95392E-01	-1.75038E+00	1.99373E-01	-2.25215E+00
16.6	1.97928E-01	-1.77392E+00	2.06859E-01	-2.32703E+00
16.8	2.00473E-01	-1.79759E+00	2.14383E-01	-2.40227E+00
17.0	2.03024E-01	-1.82132E+00	2.21931E-01	-2.47773E+00

**Table D-4. Model for  $C_T$  - DGB parachute.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
0.0	5.63471E-01	-4.81181E-01	1.10486E-01	-5.38117E-01
0.2	5.63647E-01	-4.82110E-01	1.10750E-01	-5.39177E-01
0.4	5.64154E-01	-4.84682E-01	1.11555E-01	-5.42598E-01
0.6	5.64957E-01	-4.88580E-01	1.12916E-01	-5.48701E-01
0.8	5.66023E-01	-4.93486E-01	1.14848E-01	-5.57808E-01
1.0	5.67317E-01	-4.99083E-01	1.17366E-01	-5.70237E-01
1.2	5.68803E-01	-5.05039E-01	1.20489E-01	-5.86360E-01
1.4	5.70440E-01	-5.10975E-01	1.24240E-01	-6.06610E-01
1.6	5.72184E-01	-5.16527E-01	1.28624E-01	-6.31288E-01
1.8	5.73993E-01	-5.21333E-01	1.33650E-01	-6.60689E-01
2.0	5.75827E-01	-5.25034E-01	1.39321E-01	-6.95105E-01
2.2	5.77646E-01	-5.27300E-01	1.45638E-01	-7.34754E-01
2.4	5.79420E-01	-5.27946E-01	1.52571E-01	-7.79551E-01
2.6	5.81123E-01	-5.26817E-01	1.60082E-01	-8.29342E-01
2.8	5.82728E-01	-5.23757E-01	1.68135E-01	-8.83969E-01
3.0	5.84208E-01	-5.18613E-01	1.76695E-01	-9.43276E-01
3.2	5.85539E-01	-5.11275E-01	1.85717E-01	-1.00702E+00
3.4	5.86719E-01	-5.01865E-01	1.95120E-01	-1.07455E+00
3.6	5.87750E-01	-4.90574E-01	2.04811E-01	-1.14505E+00
3.8	5.88635E-01	-4.77598E-01	2.14699E-01	-1.21773E+00
4.0	5.89376E-01	-4.63130E-01	2.24690E-01	-1.29179E+00
4.2	5.89979E-01	-4.47401E-01	2.34687E-01	-1.36639E+00
4.4	5.90467E-01	-4.30793E-01	2.44575E-01	-1.44042E+00
4.6	5.90863E-01	-4.13737E-01	2.54230E-01	-1.51274E+00
4.8	5.91194E-01	-3.96660E-01	2.63532E-01	-1.58218E+00
5.0	5.91484E-01	-3.79992E-01	2.72358E-01	-1.64758E+00
5.2	5.91766E-01	-3.64191E-01	2.80582E-01	-1.70774E+00
5.4	5.92069E-01	-3.49665E-01	2.88110E-01	-1.76176E+00
5.6	5.92422E-01	-3.36746E-01	2.94876E-01	-1.80898E+00
5.8	5.92849E-01	-3.25769E-01	3.00816E-01	-1.84876E+00
6.0	5.93378E-01	-3.17066E-01	3.05862E-01	-1.88046E+00
6.2	5.94032E-01	-3.10934E-01	3.09960E-01	-1.90353E+00
6.4	5.94824E-01	-3.07485E-01	3.13105E-01	-1.91795E+00
6.6	5.95758E-01	-3.06769E-01	3.15312E-01	-1.92388E+00
6.8	5.96842E-01	-3.08837E-01	3.16597E-01	-1.92147E+00
7.0	5.98081E-01	-3.13739E-01	3.16974E-01	-1.91088E+00
7.2	5.99482E-01	-3.21495E-01	3.16463E-01	-1.89233E+00
7.4	6.01031E-01	-3.31930E-01	3.15145E-01	-1.86662E+00
7.6	6.02713E-01	-3.44778E-01	3.13124E-01	-1.83480E+00
7.8	6.04507E-01	-3.59775E-01	3.10509E-01	-1.79793E+00
8.0	6.06396E-01	-3.76658E-01	3.07405E-01	-1.75707E+00
8.2	6.08361E-01	-3.95150E-01	3.03924E-01	-1.71332E+00
8.4	6.10375E-01	-4.14888E-01	3.00208E-01	-1.66803E+00
8.6	6.12409E-01	-4.35473E-01	2.96411E-01	-1.62273E+00
8.8	6.14433E-01	-4.56504E-01	2.92690E-01	-1.57892E+00

**Table D-4. Concluded.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
9.0	6.16417E-01	-4.77582E-01	2.89201E-01	-1.53810E+00
9.2	6.18333E-01	-4.98321E-01	2.86097E-01	-1.50174E+00
9.4	6.20157E-01	-5.18406E-01	2.83513E-01	-1.47111E+00
9.6	6.21869E-01	-5.37540E-01	2.81578E-01	-1.44741E+00
9.8	6.23445E-01	-5.55427E-01	2.80423E-01	-1.43186E+00
10.0	6.24865E-01	-5.71771E-01	2.80179E-01	-1.42566E+00
10.2	6.26112E-01	-5.86341E-01	2.80950E-01	-1.42979E+00
10.4	6.27196E-01	-5.99212E-01	2.82730E-01	-1.44409E+00
10.6	6.28135E-01	-6.10540E-01	2.85472E-01	-1.46807E+00
10.8	6.28946E-01	-6.20485E-01	2.89133E-01	-1.50122E+00
11.0	6.29646E-01	-6.29204E-01	2.93666E-01	-1.54304E+00
11.2	6.30252E-01	-6.36863E-01	2.99021E-01	-1.59297E+00
11.4	6.30791E-01	-6.43721E-01	3.05086E-01	-1.64992E+00
11.6	6.31295E-01	-6.50093E-01	3.11723E-01	-1.71253E+00
11.8	6.31795E-01	-6.56288E-01	3.18791E-01	-1.77943E+00
12.0	6.32323E-01	-6.62621E-01	3.26150E-01	-1.84927E+00
12.2	6.32912E-01	-6.69409E-01	3.33651E-01	-1.92061E+00
12.4	6.33593E-01	-6.76954E-01	3.41119E-01	-1.99182E+00
12.6	6.34397E-01	-6.85546E-01	3.48371E-01	-2.06120E+00
12.8	6.35355E-01	-6.95474E-01	3.55223E-01	-2.12708E+00
13.0	6.36497E-01	-7.07029E-01	3.61495E-01	-2.18776E+00
13.2	6.37853E-01	-7.20478E-01	3.67009E-01	-2.24163E+00
13.4	6.39441E-01	-7.35980E-01	3.71615E-01	-2.28736E+00
13.6	6.41275E-01	-7.53652E-01	3.75178E-01	-2.32373E+00
13.8	6.43371E-01	-7.73614E-01	3.77558E-01	-2.34953E+00
14.0	6.45743E-01	-7.95984E-01	3.78618E-01	-2.36354E+00
14.2	6.48403E-01	-8.20863E-01	3.78231E-01	-2.36464E+00
14.4	6.51354E-01	-8.48236E-01	3.76337E-01	-2.35234E+00
14.6	6.54588E-01	-8.78040E-01	3.72905E-01	-2.32640E+00
14.8	6.58102E-01	-9.10210E-01	3.67902E-01	-2.28655E+00
15.0	6.61891E-01	-9.44683E-01	3.61297E-01	-2.23256E+00
15.2	6.65948E-01	-9.81378E-01	3.53077E-01	-2.16435E+00
15.4	6.70249E-01	-1.02010E+00	3.43357E-01	-2.08293E+00
15.6	6.74767E-01	-1.06061E+00	3.32298E-01	-1.98974E+00
15.8	6.79471E-01	-1.10265E+00	3.20064E-01	-1.88625E+00
16.0	6.84334E-01	-1.14598E+00	3.06820E-01	-1.77388E+00
16.2	6.89328E-01	-1.19036E+00	2.92729E-01	-1.65411E+00
16.4	6.94425E-01	-1.23558E+00	2.77953E-01	-1.52834E+00
16.6	6.99602E-01	-1.28145E+00	2.62658E-01	-1.39804E+00
16.8	7.04833E-01	-1.32775E+00	2.47009E-01	-1.26462E+00
17.0	7.10094E-01	-1.37429E+00	2.31168E-01	-1.12953E+00

**Table D-5. Model for  $C_N$  - DGB parachute.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
0.0	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
0.2	-3.21254E-03	2.40254E-02	-4.45051E-03	3.66812E-02
0.4	-6.36652E-03	4.75859E-02	-8.94423E-03	7.38380E-02
0.6	-9.40375E-03	7.02197E-02	-1.35239E-02	1.11941E-01
0.8	-1.22660E-02	9.14650E-02	-1.82321E-02	1.51462E-01
1.0	-1.48951E-02	1.10860E-01	-2.31117E-02	1.92870E-01
1.2	-1.72391E-02	1.28002E-01	-2.81926E-02	2.36510E-01
1.4	-1.92747E-02	1.42745E-01	-3.34553E-02	2.82242E-01
1.6	-2.09874E-02	1.55023E-01	-3.88688E-02	3.29824E-01
1.8	-2.23629E-02	1.64767E-01	-4.44030E-02	3.79018E-01
2.0	-2.33867E-02	1.71910E-01	-5.00275E-02	4.29587E-01
2.2	-2.40527E-02	1.76459E-01	-5.57009E-02	4.81178E-01
2.4	-2.43879E-02	1.78707E-01	-6.13372E-02	5.32993E-01
2.6	-2.44281E-02	1.79024E-01	-6.68375E-02	5.84112E-01
2.8	-2.42093E-02	1.77781E-01	-7.21030E-02	6.33613E-01
3.0	-2.37673E-02	1.75350E-01	-7.70348E-02	6.80576E-01
3.2	-2.31419E-02	1.72128E-01	-8.15358E-02	7.24090E-01
3.4	-2.23834E-02	1.68584E-01	-8.55221E-02	7.63346E-01
3.6	-2.15442E-02	1.65194E-01	-8.89131E-02	7.97554E-01
3.8	-2.06769E-02	1.62437E-01	-9.16283E-02	8.25928E-01
4.0	-1.98338E-02	1.60791E-01	-9.35872E-02	8.47679E-01
4.2	-1.90651E-02	1.60702E-01	-9.47225E-02	8.62148E-01
4.4	-1.84036E-02	1.62425E-01	-9.50356E-02	8.69304E-01
4.6	-1.78767E-02	1.66154E-01	-9.45479E-02	8.69297E-01
4.8	-1.75117E-02	1.72082E-01	-9.32810E-02	8.62280E-01
5.0	-1.73357E-02	1.80404E-01	-9.12563E-02	8.48404E-01
5.2	-1.73673E-02	1.91221E-01	-8.85179E-02	8.28033E-01
5.4	-1.75805E-02	2.04187E-01	-8.52207E-02	8.02590E-01
5.6	-1.79344E-02	2.18803E-01	-8.15597E-02	7.73877E-01
5.8	-1.83879E-02	2.34567E-01	-7.77303E-02	7.43696E-01
6.0	-1.89000E-02	2.50979E-01	-7.39274E-02	7.13853E-01
6.2	-1.94291E-02	2.67539E-01	-7.03422E-02	6.86114E-01
6.4	-1.99328E-02	2.83740E-01	-6.71441E-02	6.62067E-01
6.6	-2.03685E-02	2.99079E-01	-6.44958E-02	6.43247E-01
6.8	-2.06937E-02	3.13051E-01	-6.25600E-02	6.31185E-01
7.0	-2.08660E-02	3.25152E-01	-6.14993E-02	6.27413E-01
7.2	-2.08461E-02	3.34918E-01	-6.14628E-02	6.33339E-01
7.4	-2.06197E-02	3.42145E-01	-6.25021E-02	6.49468E-01
7.6	-2.01830E-02	3.46738E-01	-6.46259E-02	6.75920E-01
7.8	-1.95325E-02	3.48602E-01	-6.78430E-02	7.12812E-01
8.0	-1.86645E-02	3.47644E-01	-7.21618E-02	7.60261E-01
8.2	-1.75806E-02	3.43825E-01	-7.75739E-02	8.18225E-01
8.4	-1.63114E-02	3.37422E-01	-8.39684E-02	8.85696E-01
8.6	-1.48997E-02	3.28835E-01	-9.11895E-02	9.61247E-01
8.8	-1.33885E-02	3.18466E-01	-9.90811E-02	1.04345E+00



**Table D-5. Concluded.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
9.0	-1.18208E-02	3.06716E-01	-1.07487E-01	1.13088E+00
9.2	-1.02412E-02	2.94010E-01	-1.16246E-01	1.22206E+00
9.4	-8.70518E-03	2.80902E-01	-1.25160E-01	1.31513E+00
9.6	-7.27204E-03	2.67998E-01	-1.34012E-01	1.40807E+00
9.8	-6.00116E-03	2.55900E-01	-1.42587E-01	1.49888E+00
10.0	-4.95189E-03	2.45211E-01	-1.50671E-01	1.58554E+00
10.2	-4.17627E-03	2.36475E-01	-1.58068E-01	1.66621E+00
10.4	-3.69988E-03	2.30011E-01	-1.64671E-01	1.73984E+00
10.6	-3.53934E-03	2.26060E-01	-1.70399E-01	1.80559E+00
10.8	-3.71109E-03	2.24861E-01	-1.75171E-01	1.86266E+00
11.0	-4.23158E-03	2.26655E-01	-1.78907E-01	1.91024E+00
11.2	-5.11372E-03	2.31647E-01	-1.81538E-01	1.94762E+00
11.4	-6.34811E-03	2.39823E-01	-1.83071E-01	1.97480E+00
11.6	-7.91623E-03	2.51085E-01	-1.83542E-01	1.99207E+00
11.8	-9.79951E-03	2.65331E-01	-1.82991E-01	1.99973E+00
12.0	-1.19794E-02	2.82464E-01	-1.81455E-01	1.99809E+00
12.2	-1.44342E-02	3.02347E-01	-1.78984E-01	1.98756E+00
12.4	-1.71284E-02	3.24698E-01	-1.75682E-01	1.96908E+00
12.6	-2.00228E-02	3.49190E-01	-1.71663E-01	1.94370E+00
12.8	-2.30778E-02	3.75495E-01	-1.67045E-01	1.91252E+00
13.0	-2.62542E-02	4.03286E-01	-1.61944E-01	1.87659E+00
13.2	-2.95149E-02	4.32255E-01	-1.56472E-01	1.83695E+00
13.4	-3.28285E-02	4.62127E-01	-1.50733E-01	1.79459E+00
13.6	-3.61637E-02	4.92624E-01	-1.44834E-01	1.75050E+00
13.8	-3.94893E-02	5.23466E-01	-1.38883E-01	1.70570E+00
14.0	-4.27740E-02	5.54373E-01	-1.32985E-01	1.66121E+00
14.2	-4.59888E-02	5.85084E-01	-1.27241E-01	1.61796E+00
14.4	-4.91157E-02	6.15420E-01	-1.21719E-01	1.57661E+00
14.6	-5.21403E-02	6.45229E-01	-1.16474E-01	1.53773E+00
14.8	-5.50482E-02	6.74361E-01	-1.11564E-01	1.50187E+00
15.0	-5.78252E-02	7.02666E-01	-1.07044E-01	1.46958E+00
15.2	-6.04596E-02	7.30016E-01	-1.02961E-01	1.44133E+00
15.4	-6.29568E-02	7.56427E-01	-9.93002E-02	1.41698E+00
15.6	-6.53309E-02	7.81986E-01	-9.60201E-02	1.39616E+00
15.8	-6.75958E-02	8.06783E-01	-9.30800E-02	1.37851E+00
16.0	-6.97656E-02	8.30907E-01	-9.04386E-02	1.36365E+00
16.2	-7.18546E-02	8.54450E-01	-8.80540E-02	1.35119E+00
16.4	-7.38776E-02	8.77516E-01	-8.58784E-02	1.34069E+00
16.6	-7.58502E-02	9.00217E-01	-8.38618E-02	1.33169E+00
16.8	-7.77880E-02	9.22662E-01	-8.19542E-02	1.32370E+00
17.0	-7.97062E-02	9.44963E-01	-8.01056E-02	1.31627E+00

**Table D-6. Model for  $C_{m,SLCP}$  - DGB parachute.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
0.0	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
0.2	5.56435E-03	-4.20859E-02	7.68344E-03	-6.66235E-02
0.4	1.10322E-02	-8.34040E-02	1.54353E-02	-1.33964E-01
0.6	1.63076E-02	-1.23192E-01	2.33229E-02	-2.02728E-01
0.8	2.12946E-02	-1.60689E-01	3.14137E-02	-2.73622E-01
1.0	2.58974E-02	-1.95132E-01	3.97749E-02	-3.47353E-01
1.2	3.00304E-02	-2.25854E-01	4.84542E-02	-4.24431E-01
1.4	3.36543E-02	-2.52607E-01	5.74181E-02	-5.04596E-01
1.6	3.67451E-02	-2.75273E-01	6.66139E-02	-5.87410E-01
1.8	3.92790E-02	-2.93737E-01	7.59891E-02	-6.72439E-01
2.0	4.12318E-02	-3.07881E-01	8.54916E-02	-7.59250E-01
2.2	4.25932E-02	-3.17707E-01	9.50510E-02	-8.47230E-01
2.4	4.34069E-02	-3.23688E-01	1.04525E-01	-9.35066E-01
2.6	4.37313E-02	-3.26421E-01	1.13750E-01	-1.02125E+00
2.8	4.36249E-02	-3.26505E-01	1.22564E-01	-1.10427E+00
3.0	4.31461E-02	-3.24538E-01	1.30803E-01	-1.18262E+00
3.2	4.23595E-02	-3.21164E-01	1.38308E-01	-1.25483E+00
3.4	4.13469E-02	-3.17134E-01	1.44941E-01	-1.31958E+00
3.6	4.01935E-02	-3.13220E-01	1.50574E-01	-1.37566E+00
3.8	3.89847E-02	-3.10191E-01	1.55076E-01	-1.42181E+00
4.0	3.78058E-02	-3.08819E-01	1.58318E-01	-1.45679E+00
4.2	3.67380E-02	-3.09821E-01	1.60190E-01	-1.47958E+00
4.4	3.58344E-02	-3.13603E-01	1.60700E-01	-1.49020E+00
4.6	3.51389E-02	-3.20472E-01	1.59888E-01	-1.48897E+00
4.8	3.46954E-02	-3.30734E-01	1.57793E-01	-1.47620E+00
5.0	3.45478E-02	-3.44694E-01	1.54455E-01	-1.45224E+00
5.2	3.47256E-02	-3.62513E-01	1.49950E-01	-1.41773E+00
5.4	3.51867E-02	-3.83629E-01	1.44536E-01	-1.37505E+00
5.6	3.58641E-02	-4.07235E-01	1.38537E-01	-1.32719E+00
5.8	3.66911E-02	-4.32519E-01	1.32275E-01	-1.27715E+00
6.0	3.76005E-02	-4.58674E-01	1.26075E-01	-1.22792E+00
6.2	3.85250E-02	-4.84888E-01	1.20252E-01	-1.18242E+00
6.4	3.93962E-02	-5.10358E-01	1.15085E-01	-1.14325E+00
6.6	4.01460E-02	-5.34284E-01	1.10841E-01	-1.11292E+00
6.8	4.07063E-02	-5.55864E-01	1.07785E-01	-1.09391E+00
7.0	4.10088E-02	-5.74300E-01	1.06185E-01	-1.08873E+00
7.2	4.09913E-02	-5.88856E-01	1.06283E-01	-1.09967E+00
7.4	4.06318E-02	-5.99229E-01	1.08162E-01	-1.12750E+00
7.6	3.99267E-02	-6.05293E-01	1.11831E-01	-1.17237E+00
7.8	3.88721E-02	-6.06926E-01	1.17301E-01	-1.23443E+00
8.0	3.74644E-02	-6.04004E-01	1.24582E-01	-1.31380E+00
8.2	3.57079E-02	-5.96495E-01	1.33656E-01	-1.41038E+00
8.4	3.36542E-02	-5.84867E-01	1.44337E-01	-1.52246E+00
8.6	3.13746E-02	-5.69793E-01	1.56367E-01	-1.64768E+00
8.8	2.89407E-02	-5.51947E-01	1.69486E-01	-1.78364E+00

**Table D-6. Concluded.**

$\alpha_T$ (deg)	$a_{0,\alpha_T}$	$a_{1,\alpha_T}$	$a_{2,\alpha_T}$	$a_{12,\alpha_T}$
9.0	2.64241E-02	-5.32004E-01	1.83434E-01	-1.92797E+00
9.2	2.38991E-02	-5.10672E-01	1.97944E-01	-2.07821E+00
9.4	2.14559E-02	-4.88854E-01	2.12688E-01	-2.23132E+00
9.6	1.91910E-02	-4.67529E-01	2.27314E-01	-2.38401E+00
9.8	1.72009E-02	-4.47675E-01	2.41470E-01	-2.53299E+00
10.0	1.55820E-02	-4.30270E-01	2.54802E-01	-2.67497E+00
10.2	1.44185E-02	-4.16187E-01	2.66995E-01	-2.80697E+00
10.4	1.37494E-02	-4.05915E-01	2.77876E-01	-2.92732E+00
10.6	1.35990E-02	-3.99808E-01	2.87320E-01	-3.03474E+00
10.8	1.39914E-02	-3.98220E-01	2.95203E-01	-3.12801E+00
11.0	1.49503E-02	-4.01504E-01	3.01400E-01	-3.20586E+00
11.2	1.64944E-02	-4.09960E-01	3.05804E-01	-3.26723E+00
11.4	1.86064E-02	-4.23542E-01	3.08432E-01	-3.31216E+00
11.6	2.12546E-02	-4.42067E-01	3.09348E-01	-3.34120E+00
11.8	2.44071E-02	-4.65348E-01	3.08621E-01	-3.35488E+00
12.0	2.80320E-02	-4.93200E-01	3.06316E-01	-3.35374E+00
12.2	3.20928E-02	-5.25387E-01	3.02520E-01	-3.33851E+00
12.4	3.65324E-02	-5.61454E-01	2.97400E-01	-3.31069E+00
12.6	4.12881E-02	-6.00881E-01	2.91142E-01	-3.27203E+00
12.8	4.62969E-02	-6.43148E-01	2.83937E-01	-3.22423E+00
13.0	5.14962E-02	-6.87736E-01	2.75970E-01	-3.16903E+00
13.2	5.68269E-02	-7.34157E-01	2.67424E-01	-3.10808E+00
13.4	6.22401E-02	-7.81990E-01	2.58464E-01	-3.04293E+00
13.6	6.76877E-02	-8.30811E-01	2.49258E-01	-2.97517E+00
13.8	7.31214E-02	-8.80196E-01	2.39976E-01	-2.90637E+00
14.0	7.84929E-02	-9.29720E-01	2.30785E-01	-2.83812E+00
14.2	8.37577E-02	-9.78987E-01	2.21842E-01	-2.77189E+00
14.4	8.88889E-02	-1.02773E+00	2.13253E-01	-2.70869E+00
14.6	9.38654E-02	-1.07575E+00	2.05102E-01	-2.64936E+00
14.8	9.86666E-02	-1.12281E+00	1.97476E-01	-2.59473E+00
15.0	1.03272E-01	-1.16870E+00	1.90459E-01	-2.54565E+00
15.2	1.07663E-01	-1.21325E+00	1.84123E-01	-2.50281E+00
15.4	1.11850E-01	-1.25646E+00	1.78443E-01	-2.46599E+00
15.6	1.15853E-01	-1.29846E+00	1.73356E-01	-2.43462E+00
15.8	1.19694E-01	-1.33940E+00	1.68795E-01	-2.40812E+00
16.0	1.23393E-01	-1.37938E+00	1.64696E-01	-2.38589E+00
16.2	1.26973E-01	-1.41855E+00	1.60993E-01	-2.36734E+00
16.4	1.30455E-01	-1.45705E+00	1.57613E-01	-2.35179E+00
16.6	1.33863E-01	-1.49504E+00	1.54477E-01	-2.33852E+00
16.8	1.37218E-01	-1.53267E+00	1.51510E-01	-2.32682E+00
17.0	1.40545E-01	-1.57009E+00	1.48634E-01	-2.31596E+00

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<b>14. ABSTRACT</b> Models are presented for the aerodynamic coefficients of Ringsail and Disk Gap Band parachutes as functions of total porosity, IT, Mach number, M, and total angle of attack, aT (when necessary). The source aerodynamic coefficients data used for creating these models were obtained from a wind tunnel test using subscale parachutes. The fabric permeability test data necessary for the calculation of IT were obtained from samples of the same fabrics used to fabricate the subscale parachutes. Although the models for the aerodynamic coefficients are simple polynomial functions of IT and M, they are capable of producing good reproductions of the source data. The domains over which these models are applicable are clearly defined. The models are suitable for estimating the aerodynamic coefficients of Ringsail and Disk-Gap-Band parachutes during flight on Mars.					
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