IFAC

International Federation of Automatic Control

BENCHMARK PROBLEMS FOR CONTROL SYSTEM DESIGN

REPORT OF THE IFAC THEORY COMMITTEE

Edited by Edward J. Davison, Chairman

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List of Benchmark Problems

List of Contributors to Report

Benchmark Problem No.	90-01:	E.J. Davison
	90-02:	E.J. Davison
	90-03:	J.C. Kantor
	90-04:	H.W. Smith
	90-05:	U. Hartmann, G. Grebing
	90-06:	B.D.O. Anderson, U-L. Ly, Yi Liu
	90-07:	M. Senning
	90-08:	H.W. Smith
	90-09:	E.J. Davison
	90-10:	K.J. Astrom
	90-11:	J. Ackermann, W. Darenberg
	90-12:	I. Troch, K. Desoyer
	90-13:	Ph. de Larminat

Problem #90-06 LOWER ORDER CONTROLLER DESIGN FOR A HIGH ORDER PLANT

(A) Motivation for the Problem

The motivation for the problem is to provide a *uniform* testbed for the evaluation of different approaches and algorithms in design of low-order linear feedback controllers for a high-order plant (typical of most industrial problems). In this case, a design example from the aircraft industry is provided. The open-loop plant model possesses key features that render the application of conventional design techniques difficult, if not impossible, in achieving the specified design requirements. They are:

(i) High dynamic order (55^{th}-order);

(ii) Multivariable system with two inputs and two outputs;

(iii) Open-loop instability (i.e., Flutter mode);

(iv) Numerous highly oscillatory modes (i.e., lightly damped structural modes);

(v) Nonminimum-phase characteristics.

(B) Brief Description of Problem Origin

This plant is an aeroelastic model for a modified Boeing B-767 airplane, at a flutter condition, that was used in a research study of active control technology [1] where a linear-quadratic-gaussian (LQG)-based design has been developed for flutter control and gust load alleviation. The resulting 55^{th}-order controller has been subsequently reduced to a 10^{th}-order controller for practical implementation using a standard modal residualization technique. Description of the design philosophy and related details on final design performance can be found in reference [1] and [2]. Additional results on controller reduction applied to this problem can be found in reference [3].

(C) Problem Description

The problem is to synthesize a linear feedback control-law of low order (preferably less than 10) that achieves the following design objectives:

(i) Stabilizes the flutter mode with damping of at least 0.015;

(ii) Provides minimal damping of 0.1 to the remaining low-frequency modes;

(iii) Reduces the mean-square responses of aircraft dynamic load variables to turbulence;

(iv) Possesses desirable robustness in terms of phase and gain margins at each control loop.

The following are a set of design requirements for the benchmark problem:

(i) *Minimum damping of 0.015 for the flutter mode identified by its frequency near* $\omega \approx 20$ rad/sec (e.g., flutter mode damping achieved by the LQG controller in references [1] and [2] is 0.074);

(ii) Minimum damping of 0.40 for the remaining low-frequency modes (e.g., aircraft short-period mode, compensator modes, etc.);

(iii) Adequate attenuation of aircraft dynamic load responses to a 10ft/sec rms turbulence w_1 (e.g., comparable with those achieved by the LQG controller in references [1] and [2]);

(iv) Moderate control activities based on mean-square responses of control deflections and their rates to a 10ft/sec turbulence $w_1(t)$ (i.e., comparable with results in references [1] and [2]);

(v) Adequate phase and gain margins:

- Gain margin of ± 6 dB
- Phase margin of ±45°

in the elevator and aileron control lops. Stability margins are evaluated one-loop-at-a-time using classical single-loop analysis).

The linear feedback control system could be designed *directly*, or from the *reduction of a high-order controller* (for example, using a previously designed LQG controller of references [1] and [2] meets the above design objectives). The LQG controller design in references [1] and [2] was obtained from the following quadratic cost function with process and sensor noise characteristics for the plant model described in Appendix I.

- **Design cost function:** The cost function is of the form:

$$J = \int_0^\infty [Q_1 y_1^2(t) + Q_2 y_2^2(t) + Q_3 y_3^2(t) + R_1 u_1^2(t) + R_2 u_2^2(t)]dt$$

The following output variables y_i $(i = 1, 2, 3)$ have been penalized in the cost function with weighting factors Q_i $(i = 1, 2, 3)$:

Output Variables y_i	Weighting Factor Q_i
(1) Inboard bending moment (BMOMI)	3.76×10^{-14}
(2) Inboard torsion (TORI)	1.20×10^{-13}
(3) Outboard torsion (TORO)	2.45×10^{-12}

along with the input variables u_i and their weighting factors R_i $(i = 1, 2)$:

Input Variable u_i	Weighting Factor R_i
(1) Elevator control (ELEVC)	3.647×10^2
(2) Aileron control (AILC)	1.459×10^1

- **Process and sensor noise characteristics:** A Kalman filter was designed using the measurement of aircraft pitch rate QCG and wing-tip acceleration WTIPDD. The process noises w_i ($i = 1,2,3$) have input distribution matrix B_n and spectral densities W_i ($i = 1,2,3$):

Process Noise w_i	Spectral Density W_i
(1) Vertical gust (WG)	2.8224×10^4 (in/sec)^2/rad/sec)
(2) Elevator input noise (ELEVN)	2.742×10^{-5}(rad)^2/(rad/sec)
(3) Aileron input noise (AILN)	6.854×10^{-4}(rad)^2/(rad/sec)

The sensor noises v_i ($i = 1,2$) for the above two measurements have the following spectral densities:

Sensor Noise v_i	Spectral Density V_i
(1) Pitch rate (QCG)	6.85×10^{-6}(rad)^2/(rad/sec)
(2) Wing-tip acceleration (WTIPDD)	3.73×10^2 (in/sec^2)^2/(rad/sec)

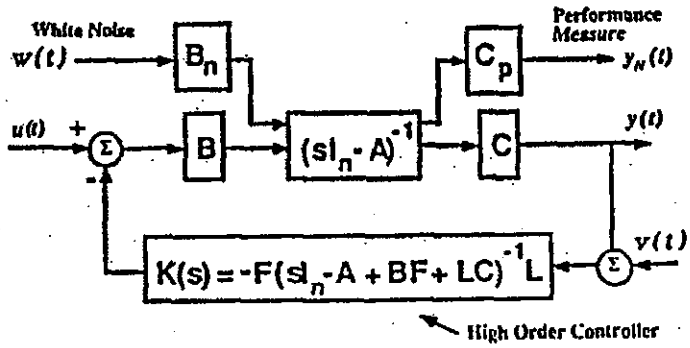

Fig.1 Closed-loop system structure with a full order controller

Appendix I shows the resulting gain matrices F and L of the regulator and Kalman filter design respectively, using the above design parameters. Figure 1 shows a block diagram of the closed-loop system constructed with a full-order LQG controller where the matrices A, B, C, B_n, C_p, F and L are given in Appendix I.

For convenience, design evaluation of the above full-order LQG controller, a 10^{th}-order (reduced) controller [1,2] and a 5^{th}-order controller [3] are given in Table 1.

Table 1

Closed-Loop Evaluation for Full (LQG Design) and Reduced Order Controllers

Controller Order	$55^{[A]}$[2]	$10^{[A]}$[2]	$5^{[A]}$[3,LCFW]
Flutter Mode Damping	0.074	0.070	0.0501
Inboard Wing Station:[†]			
Bending Moment ($\times 10^5$ in-lbs)	2.348	2.349	2.624
Shear (lbs)	854.	861.	950.
Torsion ($\times 10^4$ in-lbs)	4.437	4.597	4.969
Outboard Wing Station:[†]			
Bending Moment ($\times 10^5$ in-lbs)	0.259	0.262	0.239
Shear (lbs)	259.	260.	286.
Torsion ($\times 10^4$ in-lbs)	1.196	1.206	1.274
Control Surface Activities:[†]			
Elevator Control Deflection (rad)	0.00054	0.00056	0.000339
Elevator Control Surface Rate (rad/sec)	0.00407	0.00436	0.00401
Aileron Control Deflection (rad)	0.00158	0.00163	0.00176
Aileron Control Surface Rate (rad/sec)	0.0275	0.0276	0.0332
Stability Margins:[*]			
Elevator Control Loop: Gain Margin (dB)	15.9	36.4	18.2
Phase Margin (deg)	180	180	-102
Aileron Control Loop: Gain Margin (dB)	14	25	(-15,14.4)
Phase Margin (deg)	58.6	(-138.9,146)	(-140,82.3)

[†] Root-Mean-Square (rms) to a 10ft/sec vertical Dryden turbulence [by injecting white-noise at the input $w_1(t)$ with a power spectral density of $(10ft/sec)^2(rad/sec)$].

[*] Frequency range considered is $0.01 \leq \omega \leq 100$ rad/sec.

(D) Previous Results Obtained

Discussion of the aircraft aeroelastic model and design in the LQG Controller can be found in the following references:

1. Ly, U.-L. and D. Gangsaas, "Application of Modified Linear Quadratic Guassian Design to Active Control of a Transport Airplane", *AIAA*, Guidance and Control Conference, Boulder, Colorado, August 1979.

2. Ly, U.-L., D. Gangsaas and D.C. Norman, "Practical Gust Load Aleviation and Flutter Suppression Control Laws Based on an LQG Methodology", *AIAA*, Aerospace Sciences Meeting, 1981.

A discussion of some controller reduction methods used on the full order LQG designed controller to generate lower order controllers appears in the following:

3. Liu, Y., B.D.O. Anderson, U.-L. Ly, "Coprime Factorization Controller Reduction with Bezout Identity Induced Frequency Weighting", *Automatica*, to appear.

(E) Name of Persons Submitting the Problem

Prof. B.D.O. Anderson
Dept. of Systems Engineering
Research School of Physical Sciences
Australian National University
C.P.O. Box, 4, ACT 2601, Australia
Tel: 062-492461 (International + 61-62-492461)
Fax: 062-491884 (International + 61-62-491884)
Telex: +107-19236

Dr. H.-L. Ly
Dept. of Aeronautics and Astronautics
The University of Washington
Seattle, WA 98155, USA
Tel: (206) 543-6670
Fax: (206) 543-9285
Telex: 4740096
Data files for the model state matrices can be obtained directly from Dr. Ly through electronic mail via Arpanet.

Mr. Yi Liu
CSIRO, Division of Mineral and Process Engineering
Lucas Heights Research Laboratories
Private Mail Bag 7
Menai, NSW 2234, Australia
Tel: 02-5433459 (International + 61-2-5433459)
Fax: 02-5434434 (International + 61-2-5434434)
Telex: AA73341

Appendix I
Plant Model State Matrices

Aeroelastic model of a modified B767-aircraft at a flutter condition is a linear state model of the form

$$\dot{x}(t) = Ax(t) + Bu(t) + B_n w(t)$$

where

- $x(t)$ is a state vector (of dimension 55) containing the aircraft rigid and aeroelastic modes, actuator modes, Dryden turbulence filter and other noise shaping filters;
- $u(t)$ is a control vector (of dimension 2) containing the elevator control ELEVC and the aileron control AILC;
- $w(t)$ is a process noise input vector (of dimension 3) containing the vertical turbulence input $w_1(t)$, the elevator noise input $w_2(t)$ and the aileron noise input $w_3(t)$.

The sensor output $y(t) = [\text{QCG} \quad \text{WTIPDD}]^T$ consists of the aircraft pitch rate QCG and the wing-tip acceleration WTIPDD variables and is given by

$$y(t) = Cx(t) + v(t)$$

The performance output variables

$$y_N(t) = [\text{SHRI,BMOMI,TORI,SHRO,BMOMO,TORO,ELD,EL,AILOD,AILO}]^T$$

given by

$$y_N(t) = C_p x(t)$$

represent those outputs to be used in the covariance analysis of the aircraft subjected to a vertical turbulence of 10ft/sec rms. They represent the dynamic loads of the aircraft at the inboard and outboard wing stations, the elevator and aileron control deflections and rates respectively, i.e.,

SHRI:	Shear force at the inboard wing station (lbs)
BMOMI:	Bending moment at the inboard wing station (in-lbs)
TORI:	Torsion at the inboard wing station (in-lbs)
SHRO:	Shear force at the outboard wing station (lbs)
BMOMO:	Bending moment at the outboard wing station (lbs)
TORO:	Torsion at the outboard wing station (in-lbs)
ELD:	Elevator control surface rate (rad/sec)
EL:	Elevator control surface deflection (rad)
AILOD:	Aileron control surface rate (rad/sec)
AILO:	Aileron control surface deflection (rad)

A closed-loop system with a full-order LQG controller is shown in Figure 1. State matrices A, B, B_n, C and C_p along with the full-state feedback gain matrix F and the Kalman gain matrix L corresponding to the LQG controller in [1,2] are shown below.

x1	x2	x3	x4	x5	x6	x7	x8	x9	x10
0.1015	-19.77	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
19.77	0.1015	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	-2.3202E-02	-9.2543E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	9.2543E-02	-2.3202E-02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-0.3165	-14.33	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	14.33	-0.3165	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-0.3892	-22.29	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	22.29	-0.3892	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-0.9883	-36.16
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	36.16	-0.9883
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0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
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0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

x11	x12	x13	x14	x15	x16	x17	x18	x19	x20
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0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
-1.342	-2.547	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.547	-1.342	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	-2.312	-21.51	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	21.51	-2.312	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-2.792	-26.71	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	26.71	-2.792	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-2.796	-63.79	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	63.79	-2.796	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-3.332	-56.37
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	56.37	-3.332

X21	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X22	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X23	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X24	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X25	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X26	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X27	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X28	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X29	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X30	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X31	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X32	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X33	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X34	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X35	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X36	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X37	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X38	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X39	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X40	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X41	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X42	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X43	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X44	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X45	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
ELEV	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
ELEVD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
ELEVDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
AIL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
AILD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
AILDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
WIND1	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
WIND2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
ENOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
ANOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0

	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30
X1	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X4	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0

X5	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X6	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X7	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X8	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X9	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X10	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X11	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X12	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X13	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X15	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X16	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X17	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X18	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X19	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X20	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X21	-3.418	-88.67	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X22	88.67	-3.418	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X23	0.0000E+00	0.0000E+00	-4.441	-69.45	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X24	0.0000E+00	0.0000E+00	69.45	-4.441	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X25	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-5.108	-53.39	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X26	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	53.39	-5.108	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X27	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-5.199	-50.64	0.0000E+00	0.0000E+0
X28	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	50.64	-5.199	0.0000E+00	0.0000E+0
X29	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-5.301	0.0000E+0
X30	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-5.670
X31	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	92.96
X32	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X33	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X34	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X35	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X36	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X37	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X38	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X39	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X40	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X41	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X42	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X43	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X44	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
X45	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0
ELEV	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+0

ELEVD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELEVDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AIL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
WIND1	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
WIND2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ENOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ANOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40
X1	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X4	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X5	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X6	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X7	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X8	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X9	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X10	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X11	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X12	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X13	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X15	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X16	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X17	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X18	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X19	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X20	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X21	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X22	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X23	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X24	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X25	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X26	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X27	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X28	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X29	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X30	-92.96	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

X31	-5.670	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X32	0.0000E+00	-5.197	-40.00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X33	0.0000E+00	40.00	-6.197	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X34	0.0000E+00	0.0000E+00	0.0000E+00	-8.177	-16.61	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X35	0.0000E+00	0.0000E+00	0.0000E+00	16.61	-9.177	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X36	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-8.221	-139.1	0.0000E+00	0.0000E+00	0.0000E+00
X37	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	139.1	-8.221	0.0000E+00	0.0000E+00	0.0000E+00
X38	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-10.35	-163.0	0.0000E+00
X39	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	163.0	-10.35	0.0000E+00
X40	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-11.72
X41	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	109.3
X42	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X43	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X44	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
X45	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELEV	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELEVD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELEVDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AIL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
WIND1	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
WIND2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ENOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ANOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

	X41	X42	X43	X44	X45	ELEV	ELEVD	ELEVDD	AIL	AILD
X1	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-1970.	6.796	-0.1334	-1429.	18.03
X2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-2665.	7.196	-0.1568	-2222.	-2.684
X3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	586.9	1.7334E-03	-4.3119E-05	119.8	4.8611E-04
X4	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-501.1	4.1488E-03	-8.0848E-05	-105.9	1.0274E-03
X5	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	134.5	-0.2690	4.9694E-03	-146.8	-0.7097
X6	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-164.5	0.4627	-8.4320E-03	196.0	1.345
X7	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	608.5	-1.835	3.6978E-02	175.1	-1.082
X8	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-77.54	0.1595	-2.0525E-03	9.616	0.6370
X9	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-1117.	4.615	-8.4286E-02	-14.14	6.425
X10	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1790.	-3.752	7.1871E-02	-222.7	1.899
X11	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-1.3858E+04	0.5550	-1.2727E-02	-2014.	-5.0439E-02
X12	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.5010E+04	-3.138	6.5016E-02	2668.	-1.060
X13	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-2.1697E+04	61.46	-1.286	-3652.	5.074
X14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.9966E+04	-53.56	1.121	2881.	-26.77

X15	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-2561.	13.14	-0.2426	-1080.	48.49
X16	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	6583.	-19.32	0.3841	-3883.	-12.93
X17	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-2212.	-12.28	0.1229	-1647.	-5.130
X18	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	6321.	-27.17	0.2049	-1045.	-15.59
X19	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.3964E+04	-17.24	3.5851E-02	562.0	-25.48
X20	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2382.	-20.08	0.3605	902.6	-1.623
X21	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-303.7	2.624	-0.1208	1129.	4.399
X22	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	542.8	0.5789	0.1194	-1258.	-6.993
X23	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-527.1	-36.01	0.3072	-1267.	7.583
X24	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2658.	3.812	-3.7101E-02	-49.11	-4.347
X25	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.5341E+04	-36.45	0.4514	4360.	-131.3
X26	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	6538.	-28.56	0.3244	3790.	90.71
X27	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	4.2048E+04	-59.43	0.7558	2501.	-17.39
X28	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	210.6	-39.51	0.5076	-470.4	-18.75
X29	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+
X30	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	994.2	13.57	-2.1971E-02	828.4	12.90
X31	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	769.2	10.60	-9.2043E-02	810.0	19.07
X32	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	4.2702E+04	-120.7	1.940	-3077.	35.90
X33	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-7.6982E+04	140.6	-2.796	-348.3	-38.56
X34	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-288.8	-0.9428	2.3831E-02	-1499.	0.9758
X35	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-2237.	8.455	-0.1565	-6578.	49.50
X36	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-1.6942E+04	94.43	-1.144	-60.89	0.2221
X37	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-1.2513E+04	68.02	-0.6821	-29.37	0.4639
X38	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	5748.	-35.78	0.2067	-39.31	-0.6830
X39	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-1.4657E+04	216.8	-0.6615	123.4	9.043
X40	-109.3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-4089.	-258.1	-1.059	33.03	-2.040
X41	-11.72	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	7940.	309.0	1.175	61.04	2.311
X42	0.0000E+00	-11.79	-304.6	0.0000E+00	0.0000E+00	9582.	37.30	-3.1126E-02	140.9	2.627
X43	0.0000E+00	304.6	-11.79	0.0000E+00	0.0000E+00	9474.	41.40	-5.0827E-02	156.3	3.098
X44	0.0000E+00	0.0000E+00	0.0000E+00	-33.27	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+
X45	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-221.2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+
ELEV	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.000	0.0000E+00	0.0000E+00	0.0000E+
ELEVD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.000	0.0000E+00	0.0000E+
ELEVDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-8.0000E+05	-6.0800E+04	-1060.	0.0000E+00	0.0000E+
AIL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.000
AILD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+
AILDD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-8.0000E+05	-6.0800E+
WIND1	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+
WIND2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+
ENOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+
ANOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+

	AILDD	WIND1	WIND2	ENOISE	ANOISE
X1	-0.1517	0.0000E+00	-3.158	0.0000E+00	0.0000E+00
X2	-5.0292E-02	0.0000E+00	1.779	0.0000E+00	0.0000E+00
X3	-7.4279E-06	0.0000E+00	5.3132E-03	0.0000E+00	0.0000E+00
X4	-1.1816E-05	0.0000E+00	8.0111E-03	0.0000E+00	0.0000E+00
X5	1.2317E-03	0.0000E+00	0.1066	0.0000E+00	0.0000E+00
X6	-3.9645E-03	0.0000E+00	-0.4078	0.0000E+00	0.0000E+00
X7	1.1391E-02	0.0000E+00	0.1001	0.0000E+00	0.0000E+00
X8	-2.8823E-03	0.0000E+00	-0.1571	0.0000E+00	0.0000E+00
X9	-4.9071E-02	0.0000E+00	-1.060	0.0000E+00	0.0000E+00
X10	-1.5192E-02	0.0000E+00	0.4854	0.0000E+00	0.0000E+00
X11	1.0263E-03	0.0000E+00	-2.733	0.0000E+00	0.0000E+00
X12	1.1647E-02	0.0000E+00	2.067	0.0000E+00	0.0000E+00
X13	-0.1277	0.0000E+00	3.001	0.0000E+00	0.0000E+00
X14	0.2540	0.0000E+00	3.544	0.0000E+00	0.0000E+00
X15	-0.3712	0.0000E+00	-7.199	0.0000E+00	0.0000E+00
X16	1.0825E-02	0.0000E+00	7.207	0.0000E+00	0.0000E+00
X17	2.0187E-02	0.0000E+00	0.6186	0.0000E+00	0.0000E+00
X18	6.4588E-02	0.0000E+00	1.076	0.0000E+00	0.0000E+00
X19	0.1072	0.0000E+00	2.821	0.0000E+00	0.0000E+00
X20	7.7575E-02	0.0000E+00	-0.7866	0.0000E+00	0.0000E+00
X21	-2.7240E-02	0.0000E+00	-0.1111	0.0000E+00	0.0000E+00
X22	2.9297E-02	0.0000E+00	1.509	0.0000E+00	0.0000E+00
X23	-6.5626E-03	0.0000E+00	-0.3659	0.0000E+00	0.0000E+00
X24	-8.4969E-03	0.0000E+00	0.8635	0.0000E+00	0.0000E+00
X25	0.8394	0.0000E+00	7.433	0.0000E+00	0.0000E+00
X26	-0.3495	0.0000E+00	-15.36	0.0000E+00	0.0000E+00
X27	0.1113	0.0000E+00	4.570	0.0000E+00	0.0000E+00
X28	0.1395	0.0000E+00	-0.2771	0.0000E+00	0.0000E+00
X29	0.0000E+00	0.0000E+00	-1.251	0.0000E+00	0.0000E+00
X30	-3.6967E-02	0.0000E+00	-0.5031	0.0000E+00	0.0000E+00
X31	-8.1012E-02	0.0000E+00	-0.4524	0.0000E+00	0.0000E+00
X32	-0.2467	0.0000E+00	-1.592	0.0000E+00	0.0000E+00
X33	0.1981	0.0000E+00	1.956	0.0000E+00	0.0000E+00
X34	-4.1943E-02	0.0000E+00	-5.981	0.0000E+00	0.0000E+00
X35	-0.4980	0.0000E+00	-10.88	0.0000E+00	0.0000E+00
X36	-1.1955E-02	0.0000E+00	-1.121	0.0000E+00	0.0000E+00
X37	-9.9611E-03	0.0000E+00	0.1532	0.0000E+00	0.0000E+00
X38	7.8189E-01	0.0000E+00	-0.4254	0.0000E+00	0.0000E+00
X39	-8.7434E-02	0.0000E+00	-0.7886	0.0000E+00	0.0000E+00
X40	2.3536E-02	0.0000E+00	-0.1053	0.0000E+00	0.0000E+00

X41	-2.8729E-02	0.0000E+00	-2.037	0.0000E+00	0.0000E+00
X42	-1.8542E-02	0.0000E+00	0.1886	0.0000E+00	0.0000E+00
X43	-2.2171E-02	0.0000E+00	9.2049E-03	0.0000E+00	0.0000E+00
X44	0.0000E+00	0.0000E+00	-17.07	0.0000E+00	0.0000E+00
X45	0.0000E+00	0.0000E+00	-37.83	0.0000E+00	0.0000E+00
ELEV	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELEVD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELEVDD	0.0000E+00	0.0000E+00	0.0000E+00	-1.6000E+07	0.0000E+00
AIL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILD	1.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILDD	-1060.	0.0000E+00	0.0000E+00	0.0000E+00	-1.6000E+07
WIND1	0.0000E+00	0.0000E+00	-0.2668	0.0000E+00	0.0000E+00
WIND2	0.0000E+00	1.000	-1.033	0.0000E+00	0.0000E+00
ENOISE	0.0000E+00	0.0000E+00	0.0000E+00	-20.00	0.0000E+00
ANOISE	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	-20.00

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	ELEVC	AILC
X1	0.0000E+00	0.0000E+00
X2	0.0000E+00	0.0000E+00
X3	0.0000E+00	0.0000E+00
X4	0.0000E+00	0.0000E+00
X5	0.0000E+00	0.0000E+00
X6	0.0000E+00	0.0000E+00
X7	0.0000E+00	0.0000E+00
X8	0.0000E+00	0.0000E+00
X9	0.0000E+00	0.0000E+00
X10	0.0000E+00	0.0000E+00
X11	0.0000E+00	0.0000E+00
X12	0.0000E+00	0.0000E+00
X13	0.0000E+00	0.0000E+00
X14	0.0000E+00	0.0000E+00
X15	0.0000E+00	0.0000E+00
X16	0.0000E+00	0.0000E+00
X17	0.0000E+00	0.0000E+00
X18	0.0000E+00	0.0000E+00
X19	0.0000E+00	0.0000E+00
X20	0.0000E+00	0.0000E+00
X21	0.0000E+00	0.0000E+00
X22	0.0000E+00	0.0000E+00
X23	0.0000E+00	0.0000E+00
X24	0.0000E+00	0.0000E+00
X25	0.0000E+00	0.0000E+00
X26	0.0000E+00	0.0000E+00
X27	0.0000E+00	0.0000E+00
X28	0.0000E+00	0.0000E+00
X29	0.0000E+00	0.0000E+00
X30	0.0000E+00	0.0000E+00
X31	0.0000E+00	0.0000E+00
X32	0.0000E+00	0.0000E+00
X33	0.0000E+00	0.0000E+00
X34	0.0000E+00	0.0000E+00
X35	0.0000E+00	0.0000E+00
X36	0.0000E+00	0.0000E+00
X37	0.0000E+00	0.0000E+00
X38	0.0000E+00	0.0000E+00
X39	0.0000E+00	0.0000E+00
X40	0.0000E+00	0.0000E+00
X41	0.0000E+00	0.0000E+00
X42	0.0000E+00	0.0000E+00
X43	0.0000E+00	0.0000E+00
X44	0.0000E+00	0.0000E+00
X45	0.0000E+00	0.0000E+00
ELEV	0.0000E+00	0.0000E+00
ELEVD	0.0000E+00	0.0000E+00
ELEVDD	8.0000E+05	0.0000E+00
AIL	0.0000E+00	0.0000E+00
AILD	0.0000E+00	0.0000E+00
AILDD	0.0000E+00	8.0000E+05
WIND1	0.0000E+00	0.0000E+00
WIND2	0.0000E+00	0.0000E+00
ENOISE	0.0000E+00	0.0000E+00
ANOISE	0.0000E+00	0.0000E+00

B_1

	w_1	w_2	w_3
X1	0.0000E+00	0.0000E+00	0.0000E+00
X2	0.0000E+00	0.0000E+00	0.0000E+00
X3	0.0000E+00	0.0000E+00	0.0000E+00
X4	0.0000E+00	0.0000E+00	0.0000E+00
X5	0.0000E+00	0.0000E+00	0.0000E+00
X6	0.0000E+00	0.0000E+00	0.0000E+00
X7	0.0000E+00	0.0000E+00	0.0000E+00
X8	0.0000E+00	0.0000E+00	0.0000E+00
X9	0.0000E+00	0.0000E+00	0.0000E+00
X10	0.0000E+00	0.0000E+00	0.0000E+00
X11	0.0000E+00	0.0000E+00	0.0000E+00
X12	0.0000E+00	0.0000E+00	0.0000E+00
X13	0.0000E+00	0.0000E+00	0.0000E+00
X14	0.0000E+00	0.0000E+00	0.0000E+00
X15	0.0000E+00	0.0000E+00	0.0000E+00
X16	0.0000E+00	0.0000E+00	0.0000E+00
X17	0.0000E+00	0.0000E+00	0.0000E+00
X18	0.0000E+00	0.0000E+00	0.0000E+00
X19	0.0000E+00	0.0000E+00	0.0000E+00
X20	0.0000E+00	0.0000E+00	0.0000E+00
X21	0.0000E+00	0.0000E+00	0.0000E+00
X22	0.0000E+00	0.0000E+00	0.0000E+00
X23	0.0000E+00	0.0000E+00	0.0000E+00
X24	0.0000E+00	0.0000E+00	0.0000E+00
X25	0.0000E+00	0.0000E+00	0.0000E+00
X26	0.0000E+00	0.0000E+00	0.0000E+00
X27	0.0000E+00	0.0000E+00	0.0000E+00
X28	0.0000E+00	0.0000E+00	0.0000E+00
X29	0.0000E+00	0.0000E+00	0.0000E+00
X30	0.0000E+00	0.0000E+00	0.0000E+00
X31	0.0000E+00	0.0000E+00	0.0000E+00
X32	0.0000E+00	0.0000E+00	0.0000E+00
X33	0.0000E+00	0.0000E+00	0.0000E+00
X34	0.0000E+00	0.0000E+00	0.0000E+00
X35	0.0000E+00	0.0000E+00	0.0000E+00
X36	0.0000E+00	0.0000E+00	0.0000E+00
X37	0.0000E+00	0.0000E+00	0.0000E+00
X38	0.0000E+00	0.0000E+00	0.0000E+00
X39	0.0000E+00	0.0000E+00	0.0000E+00
X40	0.0000E+00	0.0000E+00	0.0000E+00
X41	0.0000E+00	0.0000E+00	0.0000E+00
X42	0.0000E+00	0.0000E+00	0.0000E+00
X43	0.0000E+00	0.0000E+00	0.0000E+00
X44	0.0000E+00	0.0000E+00	0.0000E+00
X45	0.0000E+00	0.0000E+00	0.0000E+00
ELEV	0.0000E+00	0.0000E+00	0.0000E+00
ELEVD	0.0000E+00	0.0000E+00	0.0000E+00
ELEVDD	0.0000E+00	8.0000E+05	0.0000E+00
AIL	0.0000E+00	0.0000E+00	0.0000E+00
AILD	0.0000E+00	0.0000E+00	0.0000E+00
AILDD	0.0000E+00	0.0000E+00	8.0000E+05
WIND1	0.3713	0.0000E+00	0.0000E+00
WIND2	1.2450	0.0000E+00	0.0000E+00
ENOISE	0.0000E+00	1.0000	0.0000E+00
ANOISE	0.0000E+00	0.0000E+00	1.0000

C

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
QCG	4.4247E-05	4.3403E-05	4.9713E-05	4.5556E-05	-4.1311E-06	7.9201E-06	7.2496E-06	-6.7385E-05	-1.8236E-04	2.0657E-05
WTIPDD	35.92	-12.46	-0.5332	-0.5659	-0.9664	12.75	-21.45	6.822	33.88	17.00
	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
QCG	1.3194E-04	-1.5849E-04	-6.7655E-05	-8.7358E-06	-9.8119E-05	3.1119E-05	-5.7479E-05	3.1600E-04	-5.7750E-04	7.1000E-04
WTIPDD	-0.1380	-0.8803	5.465	-1.614	55.18	30.10	-4.878	14.36	62.54	55.18
	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30
QCG	-3.6843E-05	2.9934E-05	5.4014E-04	-4.7620E-04	-4.1630E-06	-2.1609E-04	-1.0541E-04	-3.1883E-05	-1.5062E-04	-2.7714E-04
WTIPDD	-138.8	-104.4	6.831	-11.78	-55.04	-30.66	1.402	-30.33	4.869	-74.28
	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40
QCG	-2.4361E-04	2.7990E-05	-1.6592E-04	1.2748E-05	-2.0762E-05	-1.2546E-04	-4.4360E-05	-1.0147E-05	1.5343E-04	2.1956E-05
WTIPDD	74.14	16.30	3.118	8.728	-74.53	1.460	-3.334	-7.367	-1.032	2.867
	X41	X42	X43	X44	X45	ELEV	ELEVD	ELEVDD	AIL	AILD
QCG	-2.9386E-05	6.5513E-05	6.1813E-05	1.9995E-05	8.9674E-06	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
WTIPDD	6.583	-1.361	1.350	10.71	-25.91	48.52	-7.932	7.9915E-02	-2.5618E+04	-167.4
	AILDD	WIND1	WIND2	ENOISE	ANOISE					
QCG	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
WTIPDD	0.2213	0.0000E+00	1.880	0.0000E+00	0.0000E+00					

C_p

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
SHRI	-280.4	-189.2	54.94	64.24	151.2	53.66	169.9	70.45	-118.0	-29.86
BMOMI	-1.0116E+04	-9214.	1.9756E+04	2.1545E+04	1.3993E+04	1.7694E+04	-7984.	-3842.	-1.7279E+04	1314.
TORI	-3.5918E+04	-1.8298E+04	1444.	2675.	1.6733E+04	7989.	3.4725E+04	1.1489E+04	3528.	9170.
SHRO	-1.008	-5.628	22.26	24.73	5.535	17.59	5.685	-1.131	-17.83	-4.329
BMOMO	8616.	-576.7	1146.	1214.	-872.0	3613.	-3028.	1084.	8362.	5560.
TORO	-3685.	1359.	546.4	605.9	71.67	-1539.	2550.	-599.8	2050.	1803.
ELD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILOD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
SHRI	102.8	101.8	6.202	-19.80	-204.1	-168.5	38.07	17.06	237.5	253.3
BMOMI	3.2923E+04	3.3817E+04	-1082.	2076.	-3.9871E+04	-3.6494E+04	-7038.	1.1182E+04	8002.	1.0350E+04
TORI	3849.	3825.	-3369.	-1.0423E+04	-4762.	-1033.	-0.8833	4619.	3448.	1303.
SHRO	37.01	36.72	-4.403	-3.027	-27.42	-23.76	-13.45	2.659	-49.80	-48.30
BMOMO	1935.	2152.	830.2	-882.3	1.1555E+04	9556.	660.9	2046.	8408.	7455.
TORO	786.8	911.5	-899.7	-540.4	-1427.	-1640.	-693.1	3405.	1955.	530.8
ELD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILOD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30
SHRI	7.799	97.62	-29.15	5.759	-33.32	-7.012	-103.5	-139.6	-159.0	-326.0
BMOMI	-5.7674E+04	-5.8520E+04	-9678.	-1.7572E+04	-4136.	-493.0	152.7	-2391.	-5.4007E+04	1.4065E+04
TORI	-1.6288E+04	917.4	-6520.	-4420.	1.3953E+04	1.0935E+04	-1.2971E+04	2265.	-6697.	-6.6463E+04
SHRO	-37.52	-36.55	3.951	-4.938	6.345	5.479	25.88	34.74	-62.23	-10.69
BMOMO	-6012.	-5724.	-3113.	-2967.	1289.	583.2	-6625.	-5544.	-2987.	2461.
TORO	-1239.	-1711.	-5337.	-5925.	7784.	6242.	-8377.	-2130.	-2052.	8424.
ELD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILOD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40
SHRI	287.0	14.71	-11.49	93.88	203.2	-1.189	1.220	1.539	0.8601	3.222
BMOMI	-1.8204E+04	-4219.	-1617.	4.2055E+04	3.3610E+04	95.83	-530.3	-423.9	-90.47	560.5
TORI	5.9803E+04	-4749.	-3525.	-6148.	2.4890E+04	137.6	-1595.	-2912.	-203.6	2433.
SHRO	10.05	-16.66	-2.834	55.84	28.73	0.2784	-1.598	-2.559	-0.3003	1.781
BMOMO	-3217.	2832.	324.2	7562.	-1.2172E+04	9.422	-27.31	0.5400	-0.7739	14.79
TORO	-8033.	159.6	-1013.	-4374.	9713.	-41.64	-7.796	20.11	25.14	56.85
ELD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILOD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

	X41	X42	X43	X44	X45	ELEV	ELEVD	ELEVDD	AIL	AILD
SHRI	6.416	0.6052	-0.5647	-97.82	-1.384	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
BMOMI	667.4	-20.59	28.40	-3.2517E+04	-1345.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TORI	3134.	-170.6	202.4	-1.4519E+04	-691.2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SHRO	2.065	-0.1941	0.2183	-35.76	-1.258	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
BMOMO	5.506	-2.632	2.610	1184.	-38.55	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TORO	-202.9	1.613	1.493	-7454.	-471.2	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.000	0.0000E+00	0.0000E+00	0.0000E+00
EL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILOD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.000
AILO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.000	0.0000E+00

	AILDD	WIND1	WIND2	ENOISE	ANOISE
SHRI	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
BMOMI	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TORI	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SHRO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
BMOMO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TORO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ELD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EL	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILOD	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AILO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

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	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
ELEVC	1.5832E-04	-2.3582E-04	1.1387E-04	1.8312E-04	-4.1426E-05	4.8676E-05	2.6735E-04	1.7564E-04	-9.1525E-06	-1.9235E-05
AILC	3.0315E-03	2.6654E-03	4.1091E-04	7.8271E-04	1.4589E-04	-8.5377E-04	-1.2540E-03	4.6786E-04	1.3813E-06	-6.7161E-05

	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
ELEVC	2.1995E-04	-4.5889E-05	-1.7184E-04	-4.3851E-05	-8.0336E-05	-2.5128E-05	-6.4003E-06	9.7488E-06	-2.4859E-06	1.1835E-05
AILC	9.5182E-04	3.5894E-04	6.2767E-05	3.7742E-04	-9.2428E-05	6.5354E-04	4.6382E-05	-2.8777E-04	-1.6007E-04	-1.7710E-04

	X21	X22	X23	X24	X25	X26	X27	X28	X29	X30
ELEVC	-3.6349E-06	7.3601E-06	-1.4395E-05	-8.0966E-06	-2.9199E-05	7.3229E-06	2.0059E-05	1.9455E-06	-5.0617E-05	-1.4932E-05
AILC	2.4929E-04	8.8603E-05	3.1912E-04	2.5139E-04	-1.1683E-04	-9.9825E-04	2.7410E-04	7.8487E-04	-9.1330E-04	-6.2633E-04

	X31	X32	X33	X34	X35	X36	X37	X38	X39	X40
ELEVC	2.9402E-05	6.3263E-06	2.3606E-06	-7.1657E-05	1.0550E-05	-2.3694E-08	6.8456E-08	1.2641E-08	3.0596E-10	4.0774E-07
AILC	5.0017E-04	-5.6772E-05	1.5107E-05	1.5403E-03	1.0277E-03	-9.3928E-08	-5.9855E-07	-3.5760E-07	3.5076E-07	5.9781E-06

	X41	X42	X43	X44	X45	ELEV	ELEVD	ELEVDD	AIL	AILD
ELEVC	-2.9662E-07	9.0481E-10	-5.4855E-10	3.9594E-06	1.6946E-09	-0.4132	-6.8441E-03	-6.4513E-06	-2.1111E-02	-2.7671E-04
AILC	6.4990E-06	-2.7729E-09	5.3934E-09	-3.8792E-04	-3.7901E-08	-0.6329	-7.2630E-03	-7.0158E-06	-1.360	-2.1233E-02

	AILDD	WIND1	WIND2	ENOISE	ANOISE
ELEVC	-2.8063E-07	8.0010E-05	1.0842E-04	3.541	0.1928
AILC	-2.0544E-05	2.2294E-04	1.4034E-03	2.677	8.327

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	QCG	WTIPDD
X1	1785.	2.272
X2	3319.	2.6873E-02
X3	70.88	2.3472E-02
X4	554.4	2.5272E-02
X5	-689.6	-0.2266
X6	-43.74	0.1884
X7	-39.38	-9.2332E-02
X8	-108.3	4.5919E-02
X9	-105.6	0.2794
X10	777.9	0.2092
X11	1.8692E+04	4.8515E-02
X12	-9112.	-1.195
X13	2483.	-0.3082
X14	8.407	-2.693
X15	3332.	4.719
X16	6892.	0.1216
X17	189.0	0.1776
X18	-14.07	-0.3136
X19	-698.0	-0.6674
X20	960.5	-0.7365
X21	90.55	0.2265
X22	-6.130	9.7791E-02
X23	306.2	0.1553
X24	44.03	5.8746E-02
X25	-2799.	-5.226
X26	634.2	0.6398
X27	1756.	-1.150
X28	3578.	-0.9081
X29	3122.	0.3963
X30	13.31	-2.7236E-02
X31	-30.99	0.1238
X32	6683.	1.259
X33	-8069.	-0.6234
X34	-7828.	0.6847
X35	8514.	4.343
X36	86.05	1.0999E-02
X37	-20.95	9.2423E-02
X38	43.47	-9.7774E-02
X39	82.23	5.1789E-02
X40	-296.3	-0.2155
X41	60.50	1.2172E-02
X42	-20.62	-9.3657E-03
X43	18.70	4.0876E-04
X44	7830.	3.815
X45	2354.	1.587
ELEV	0.8878	-4.1163E-06
ELEVD	11.43	-1.2973E-03
ELEVDD	380.9	1.298
AIL	-3.558	1.2771E-03
AILD	-98.84	-0.5599
AILDD	1.7817E+04	40.63
WIND1	-4600.	-2.597
WIND2	-1.3619E+04	-8.357
ENOISE	-3.9461E-02	3.3987E-08
ANOISE	-0.3878	-3.7938E-04