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TITLE		
WEIGHT, BALANCE AND MOMENT OF INERTIA CALCULATIONS FOR STRUCTURAL ANALYSIS		
REPORT NO.	DATE	MODEL NO.
LR 9095	4-10-53	C-130A
SUBMITTED UNDER (CONTRACT, SPEC., ETC.)		

Form 375-3

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REPORT NO. 9095

DATED April 10, 1953

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LOCKHEED AIRCRAFT CORPORATION

BURBANK, CALIFORNIA

TITLE

WEIGHT, BALANCE AND MOMENT OF INERTIA CALCULATIONS FOR STRUCTURAL ANALYSIS

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SUBMITTED UNDER

Contract AF 33(600)-22286

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MODEL C-130A REFERENCE

PREPARED BY J. G. Wickman GROUP Structures

J. G. Lewolt

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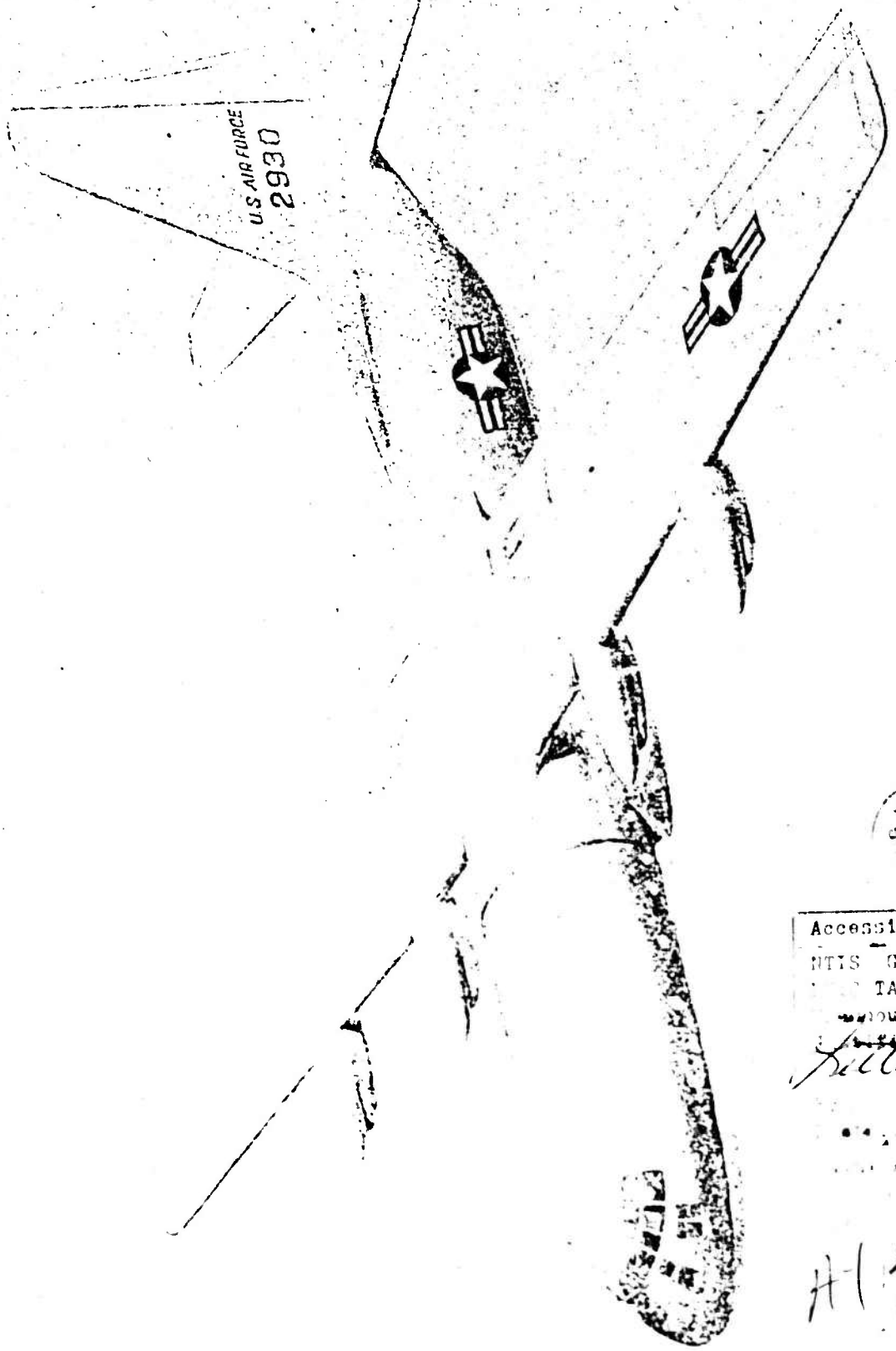

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INTRODUCTION

This report presents weight and inertia data used to calculate loads on the C-130A airplane. All design weights considered are based on specifications contained in LR 8721 (Ref. 3) and LR 8236 (Ref. 2), and are summarized on page 1.00 of this report.

Unit inertia shears, moments, and torsions are presented for empty wing and fuselage plus all critical fuel and cargo cases selected from numerous investigations. Moments of inertia for total airplane with various combinations of fuel and cargo are included for these cases involving rotational acceleration effects. Both pylon tanks on and off configurations are considered.

Cargo weight and c.g. data are obtained by balancing the airplane within the structural design weight - c.g. envelope (Fig. 2) for various combinations of gross weight and fuel. Data obtained are used to distribute the cargo in various combinations, within the payload distribution limits, Fig. 3, to give maximum effects wherever desired. All fuel weights considered are distributed according to fuel consumption sequence charts, Figs. 4 and 5

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REFERENCES

1. Lockheed Report No. 8900 "Weight Data For Structural Analysis"

2. Lockheed Report No. 8236 "Structural Design Criteria YC-130 & C-130A Medium Cargo Airplane"

3. Lockheed Report No. 8721 "Manufacturer's Model Specification for Model C-130A (TAC) Medium Range Cargo and Troop Carrier Aircraft"

4. Tech. Data for Army Field Forces, Report of the Army Field Forces Board No. 1, Fort Bragg, North Carolina.

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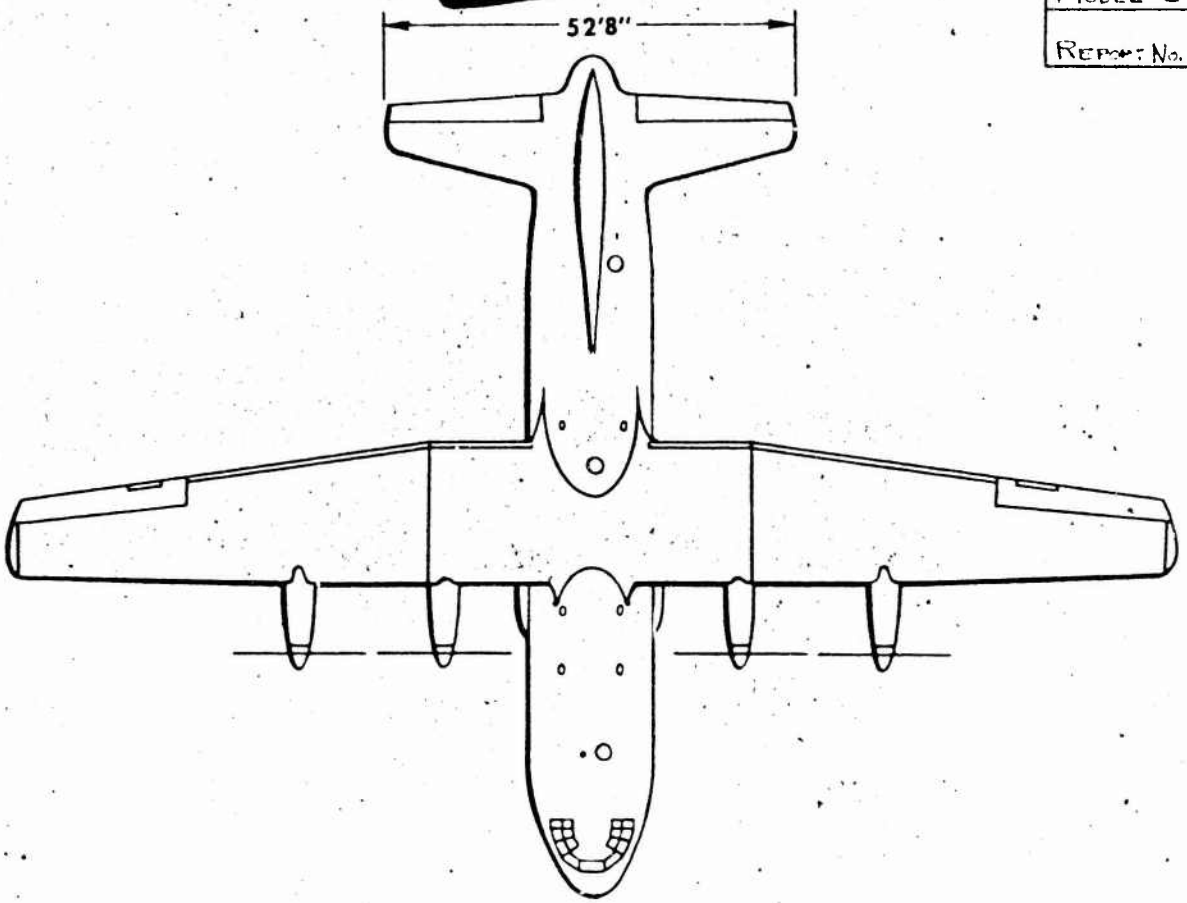

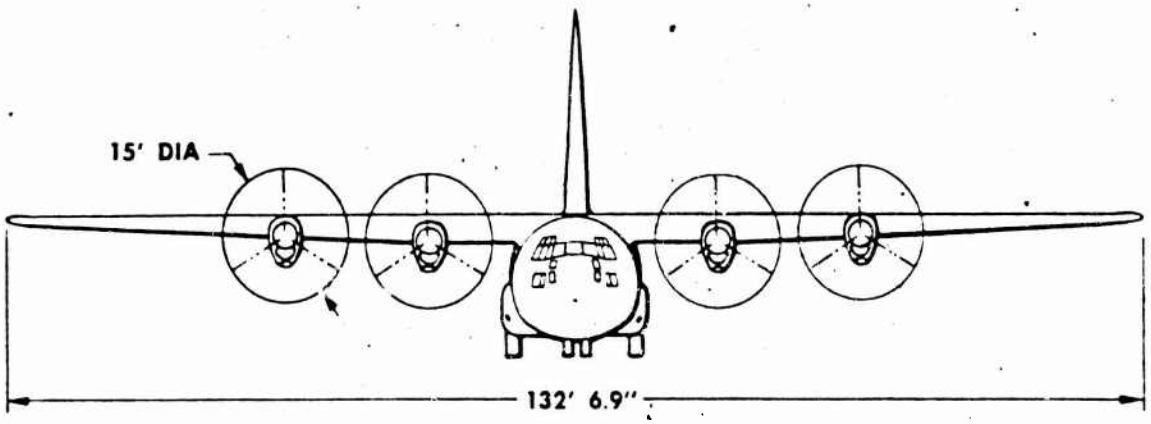

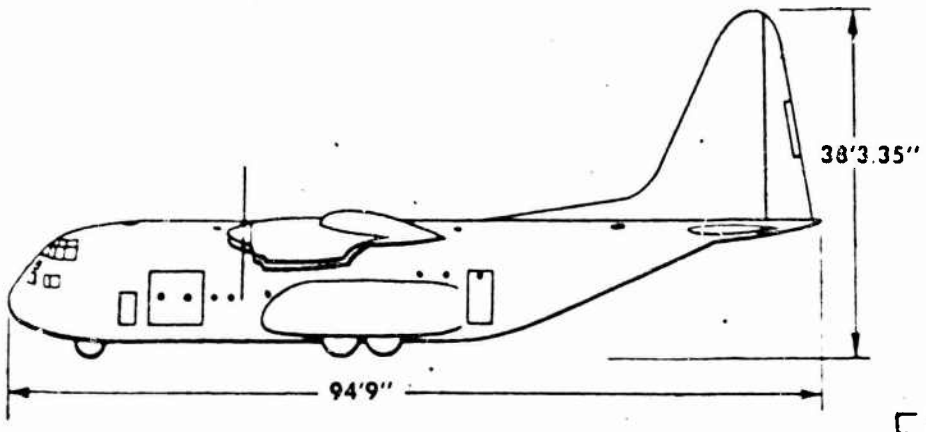

FIG. 1

BASIC DATA

Component Weight Data

A summary of airplane component weights and c.g. locations is shown on page 1.10. The values shown are based on preliminary estimates for LR 8900, "Weight Data For Structural Analysis" (Ref. 1), and have been used throughout the calculation of loads on the airplane. Differences between the data used and the data presented in LR 8900 have an insignificant effect on design loads.

Design Weights

Airplane weights for structural analysis itemized in this section are in accord with the design criteria, Lockheed Report No. 8236, and the model specifications, Lockheed Report No. 8721. The airplane weights are based on predicted weights of empty airplane and operating equipment, a payload of 35,000 lbs., and sufficient fuel to perform the specified missions. The design weights pertinent to structural design are:

	Pylon Tanks Off	Pylon Tanks On
Design Gross Weight	105,000 lbs.	108,000 lbs.
Design Landing Weight	96,000 lbs.	96,000 lbs.
Design Reserve Fuel Weight	8[illegible],000 lbs.	9[illegible],500 lbs.
Zero Fuel Weight	81,710 lbs.	86,[illegible]10 lbs.
Minimum Flying Weight	63,000 lbs.	64,[illegible]90 lbs.

The airplane is also designed for alternate weights with a payload of 35,000 lbs. It will be noted that carrying 35,000 lbs. of cargo at the maximum alternate weight of 124,200 lbs. necessitates the removal of approximately 2200 lbs. of operating equipment from the airplane.

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BASIC DATA (Cont'd)

Design Weights (Cont'd)

The alternate weights pertinent to structural design are:

	Pylon Tanks Off	Pylon Tanks On
Maximum Alternate Gross Weight	124,200 lbs.	124,200 lbs.
Alternate Landing Weight	105,000 lbs.	105,000 lbs.
Alternate Reserve Fuel Weight	96,000 lbs.	96,000 lbs.
Alternate Zero Fuel Weight	92,510 lbs.	93,910 lbs.
Alternate Minimum Flying Weight	61,000 lbs.	62,500 lbs.

Weight and c.g. Limits

Weight and c.g. limits for structural design are illustrated by the c.g. envelope, Figure 2. Fore and aft limits of 10% MAC and 25.5% MAC provide adequate range to accommodate the cg 's of all feasible cargo arrangements. For design, the aft limit of 28% MAC covers a 2-1/2% MAC aft limit rearward shift in accordance with design criteria, LR 8236 (Ref. 2).

For any weight case, the c.g. is at the most adverse position consistent with the assumed weight.

Payload Distribution Limits

Figure 3 on page 1.30 presents a payload distribution which covers all required loadings, provides maximum airplane utility and is relatively simple to apply. This figure is the result of a comprehensive study of all required and possible loading arrangements. The principal guide used in this study was "Report of the Army Field Forces Board Number 1" (Ref. 4). This report shows the physical characteristics of all vehicles currently used by the army Field Forces and lists their

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BASIC DATA (Cont'd)

Payload Distribution Limits (Cont'd.)

dimensions, gross weights, axle loadings, etc.

The cargo compartment is capable of accommodating a 35,000 lb. "package" with maximum single axle loadings of 13,000 lbs. or single wheel loadings of 6500 lbs. and with maximum dimensions of 9 feet in height, 10 feet in width and 40 feet in length.

Examination of those vehicles having axle loadings approaching 13,000 lbs. revealed that approximately 5 ft. beyond the axle is required to provide space for normal vehicle overhang and vehicle tie-down. Study of the structure in the vicinity of the forward cargo door indicated a 30-60lb. weight cost for designing to a 13,000 lb. axle load in this area. Based on these studies it was decided to design for single axle loadings of 13,000 lbs. between F.S. 337 and F.S. 682. These limits are simple to apply since they are respectively, the aft edge of the forward cargo door and the forward edge of the paratroop door.

To provide for low density cargo (20 lbs./ cu. ft.) a running load of 1000 lbs./ft. over the entire cargo compartment is assumed. This permits loading of low density cargo the entire width of the cargo compartment to a depth of 5 feet or to a depth of approximately 7 feet with a 3 foot aisle.

Provision for higher density cargo consists of a 3[illegible] lb./ft. running load between F.S. 457 and F.S. 627. This area of the floor is adjacent to the main gear wheel well. Structural provisions required

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BASIC DATA (Cont'd)

Payload Distribution Limits (Cont'd.)

by the wheel well are thus used to advantage in supporting the higher density cargo.

Fuel Distributions

Design fuel weights are defined as the difference between the gross weight under consideration and the zero fuel weight. Minimum reserve fuel weight is estimated from performance data and is based upon one and a half hour's flying time at optimum speed and altitude. The distribution of fuel used in loads calculations is:

Pylon Tanks Off: Consumption sequence is based on capacity fuel, using fuel from both tanks simultaneously. This leaves 670 lbs. more fuel in the outboard tank at all times due to its slightly greater capacity.

Pylon Tanks On: Consumption sequence is based on employing only the inboard tank with the pylon tank. Fuel is used from the wing tank first.

These fuel consumption sequences are illustrated in Figures 4 and 5, pages 140 and 141. The design fuel density is 6.5 lbs./gal.

AIRPLANE COMPONENTS AND COMPLETE AIRPLANE - WEIGHT AND C.G. LOCATIONS

The Weight Group's latest investigations have shown slight differences from the data listed below which was used throughout the loads calculations.

ITEM		WEIGHT	$\bar{x}$	$\bar{y}$	$\bar{z}$	
EMITY AIRPLANE	EMITY OPERATING AIRPLANE				Operating Wt. Only	
Fuselage	Fuselage	27425	488.6	—	—	
Empennage	Empennage	3002	1078.5	—	—	
	Crew (4)	800	157.3	—	—	211.8
	Operating Equipment	546	474.5	—	—	
Wing	Wing	12338	559.7	196.0	—	
Nacelles+Full & Trapped Oil	Nacelles+Full & Trapped Oil	15249	447.7	400.0	254.5	267.9
Trapped Fuel	Trapped Fuel	350	559.0	559.0	—	
Pylon Tanks	Pylon Tanks	1400	531.0	550.0	—	233.5
Total Airplane						
Tanks Off		58014	523.5	—	—	—
Tanks On		59414	523.7	—	—	—
	Total Airplane					
	Tanks Off	59710	518.4	—	—	238.1
	Tanks On	61110	518.6	—	—	238.0

	NAME	DATE
PREPARED	L. Wickman	3-9-53
CHECKED	J. Lewolt	3-19-53
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TITLE: LOCKHEED AIRCRAFT CORP.

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STRUCTURAL DESIGN C.G. ENVELOPE

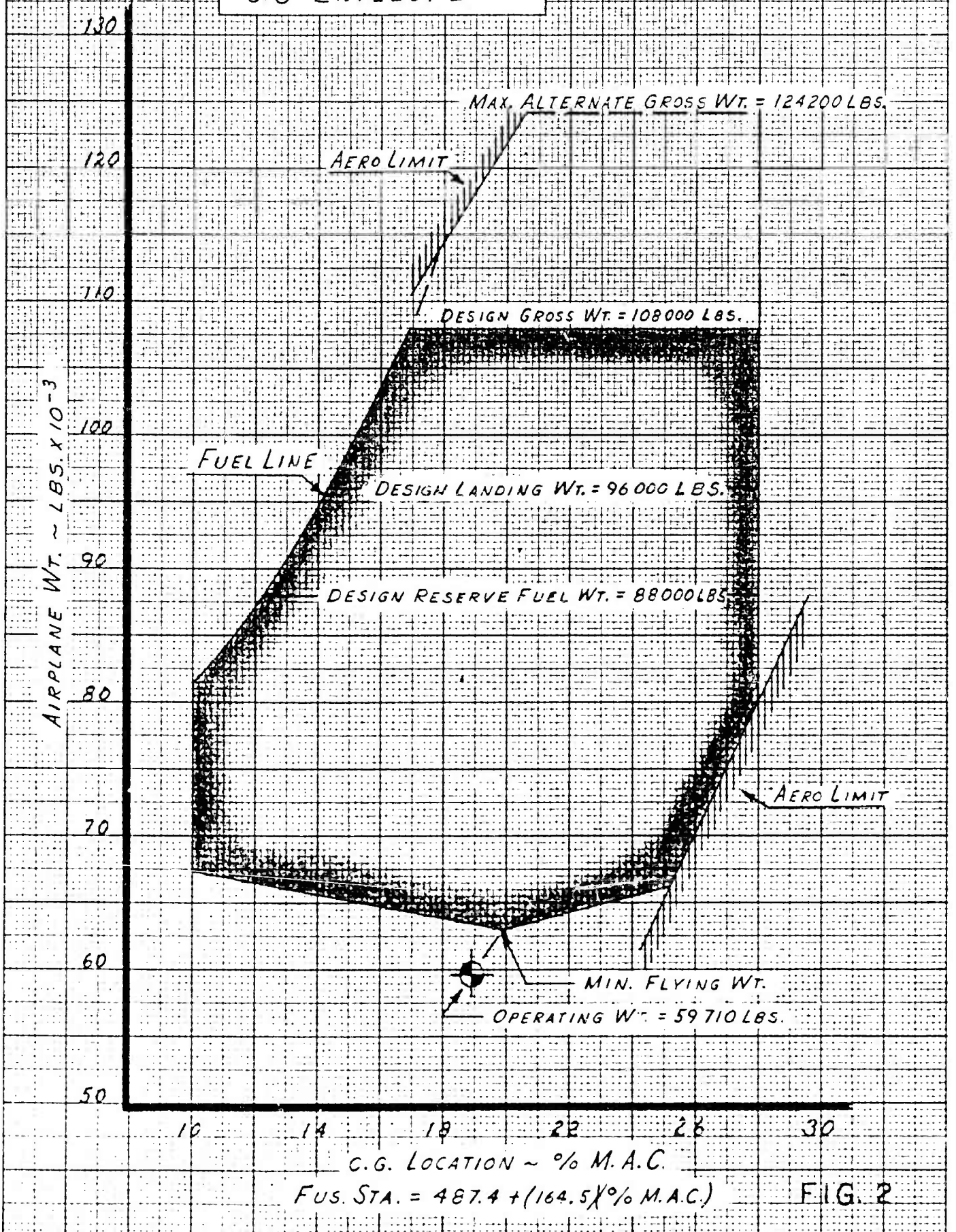

FIG. 2

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PAYLOAD DISTRIBUTION FOR FUSELAGE SHELL DESIGN LOADS

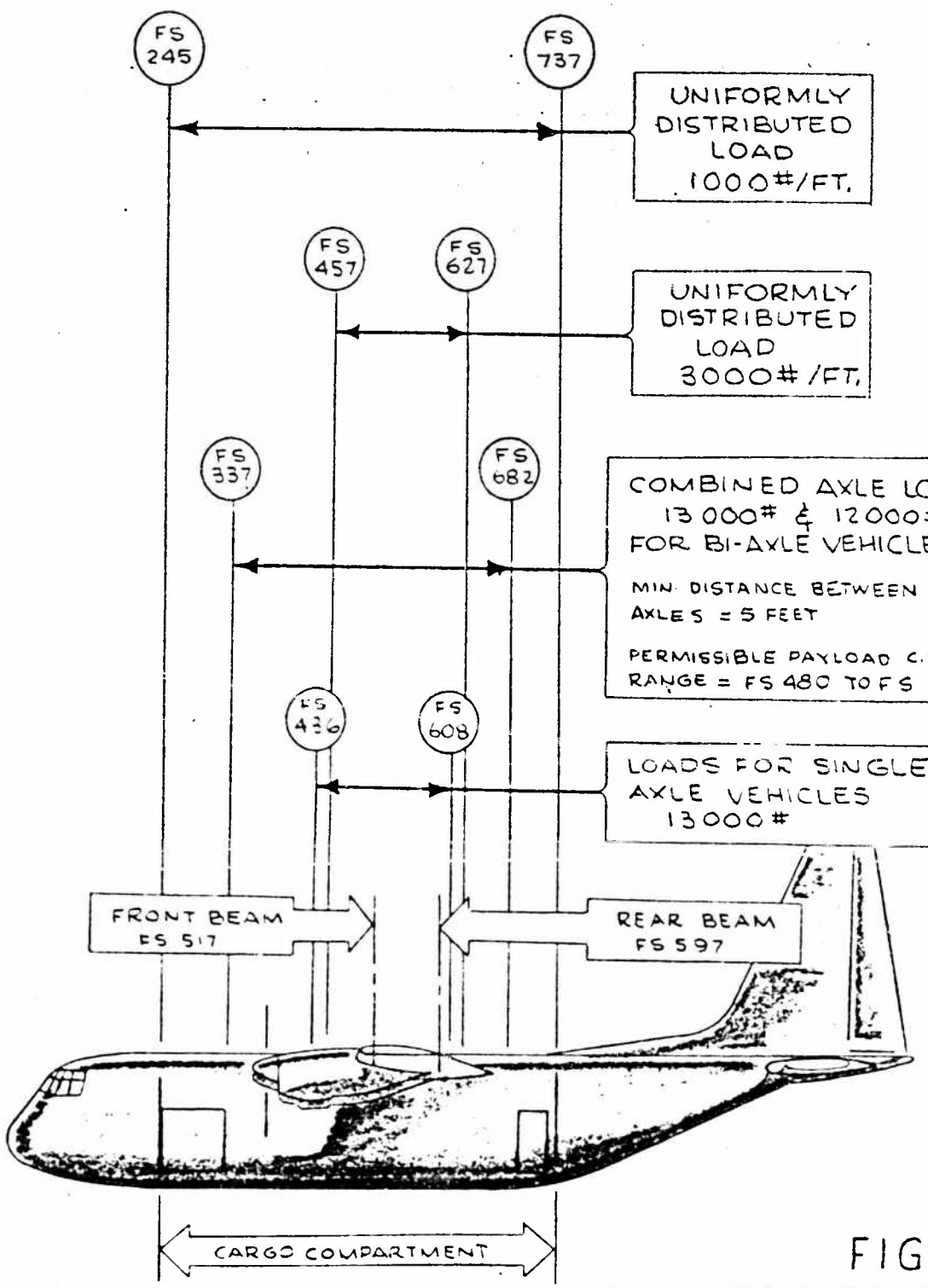

FIG. 3

FORM 361 B

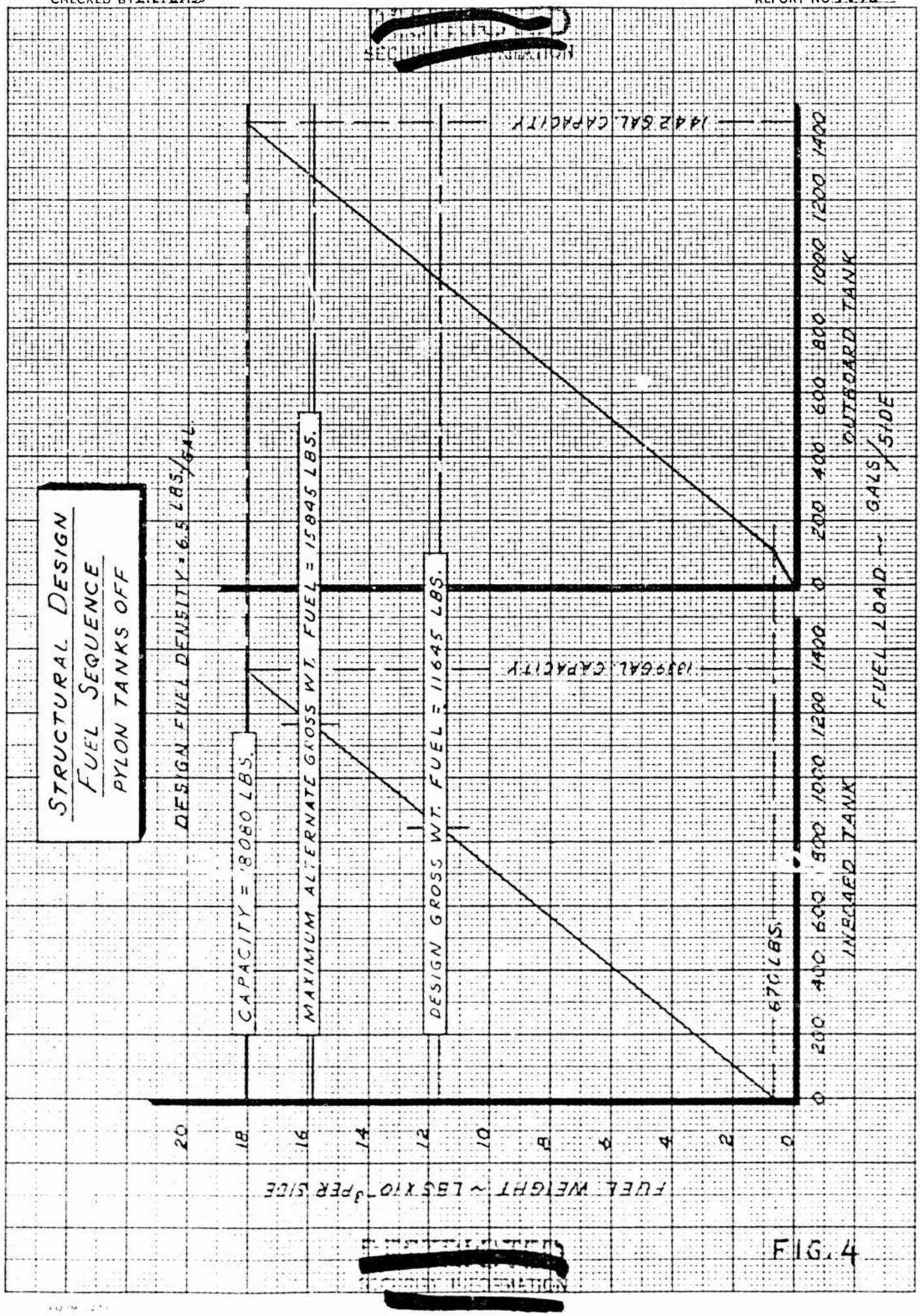
STRUCTURAL DESIGN
FUEL SEQUENCE
PYLON TANKS OFF
DESIGN FUEL DENSITY = 6.5 LBS./GAL.
CAPACITY = 8080 LBS.
MAXIMUM ALTERNATE GROSS WT. FUEL = 15845 LBS.
DESIGN GROSS WT. FUEL = 11645 LBS.
1442 GAL CAPACITY
1039 GAL CAPACITY
670 LBS.
INBOARD TANK
OUTBOARD TANK
FUEL LOAD — GALS/SIDE
FUEL WEIGHT ~ LBS X 10⁻³ PER SIDE
0 200 400 600 800 1000 1200 1400
0 2 4 6 8 10 12 14 16 18 20

FIG. 4

STRUCTURAL DESIGN
FUEL SEQUENCE
PYLON TANKS ON

DESIGN FUEL DENSITY = 6.5 LBS./GAL.
OUTBOARD TANKS EMPTY

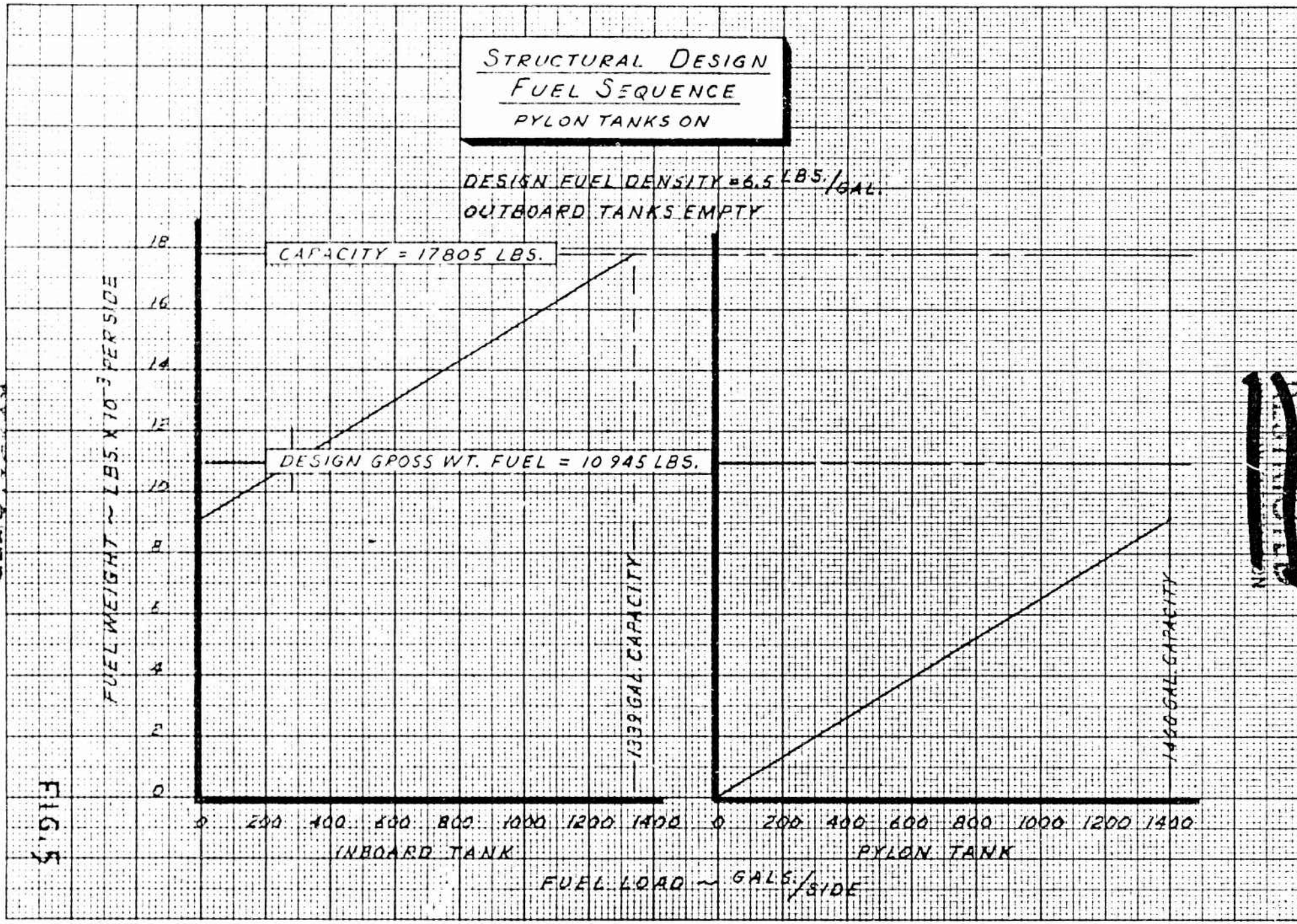

FIG. 5

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AIRPLANE WEIGHT CASE AND CARGO CODING

To readily identify any weight configuration, an airplane case code composed of a series of digits and letters is used to denote airplane weight, C.G. location and fuel weight, etc. A description of this coding system is given best by the explanation of a sample, as follows:

Airplane Case 88 R 28 T

- 88 — Airplane weight to nearest 1000 lbs.
- R — Fuel: R = Reserve Fuel; L = Landing Fuel; D = Design Gross Wt. Fuel; C = Capacity Fuel
- 28 — C.G. to nearest percent of MAC
- T — Pylon tanks on - omit if tanks off

*Use subscript 'a' to denote alternate airplane weight fuel cases.

Cargo loadings have been coded according to the airplane case with which they are used (i.e., airplane weight and C.G. location). Cargo weights and C.G. positions are determined from airplane balance computations. It is noted that innumerable distributions of cargo are possible for any particular cargo weight and C.G. location. An explanation of the code of a sample cargo loading follows:

Cargo Load T B 2 1

- T — Pylon tanks on airplane - omit if tanks off
- B — Airplane Case Reference:
  - A = 128D-
  - B = 108L-
  - C = 96L-
  - D = 88R-
  - E = 63R-, 67R-, 68R-
  - F = 82R-
  - G = 90R-
  - S = Special loadings to obtain specific effects
- 2 — Airplane C.G. Position:
  - A = Forward (most forward for airplane wt.)
  - Z = Aft (28% MAC)
  - M = Any intermediate position
- 1 — Distribution Variations: 1,2,3 etc.

In general, only as much identification as is necessary is shown with the various calculations in this report. The cargo designation is omitted unless a particular loading affects the calculation.

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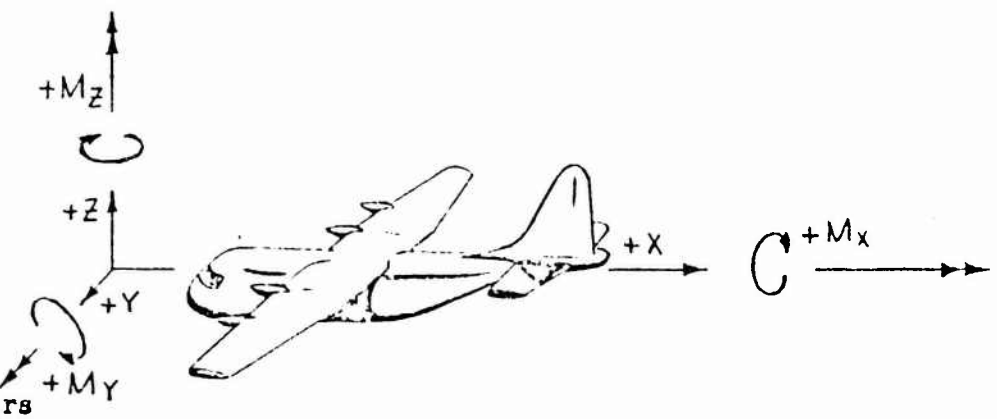
SIGN CONVENTIONS

Loads and Moments

Loads are positive in the direction of the positive airplane axes. Positive moments are determined by the left-hand rule (i.e., when the left thumb is pointed along the positive direction of an airplane axis, the curl of the remaining left fingers indicate the direction of positive moment about that axis).



Shears

Fuselage - The sign of the shear is the sign of the load aft of a cut at the given station.

Wing - The sign of the shear is the sign of the load outboard of a cut at the given station.

Accelerations

Translational accelerations are positive in the direction of the positive airplane axes.

Positive angular accelerations produce negative inertia accelerations.

A rotational acceleration is positive when the forcing moment is a positive moment (as defined by the left-hand rule).

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AIRPLANE MOMENTS OF INERTIA AND BALANCE

Assumptions and calculations used to find the airplane moments of inertia are given for the complete airplane, cargo and design fuel cases.

Balance for the airplane is computed at a sufficient number of points within the airplane weight - c.g. envelope to find all maximum loads necessary for structural analysis. Cargo weights and c.g. locations are determined from these calculations using various combinations of airplane and fuel weights.

Moments of inertia for the total loaded airplane are given on the balance sheets for those cases used in loads calculations involving rotational accelerations. These cases are selected as pertinent from numerous loads investigations. Weights, c.g. locations and moments of inertia for the empty operating airplane, fuel and cargo are obtained from the moments of inertia calculations (Pages 2.20 - 2.23) cargo unit inertia data (Pages 4.90 - 4.99) and cargo moment of inertia assumptions (Page 2.13).

Balance computations for the alternate weight cases, pylon tanks off, are made with a 32,800 lb. cargo load rather than calculating new airplane empty operating weight data with 2200 lbs. of operating equipment removed (Ref. Page 1.00). This action is slightly conservative. Due to a 1500 lb. increase in reserve fuel and airplane weight, a further reduction to 31,300 lbs. of cargo is used for the alternate weight, pylon tanks on configurations.

AIRPLANE MOMENTS OF INERTIA

Airplane moments of inertia about the x, y, and z axes are determined from the following general equations:

$$I_{xx_{cg}} = \sum\left(\frac{\Delta W}{g}\Delta y^2\right) + \sum\left(\frac{\Delta W}{g}\Delta z^2\right) + \sum\Delta I_{xx_o}$$

$$I_{yy_{cg}} = \sum\left(\frac{\Delta W}{g}\Delta x^2\right) + \sum\left(\frac{\Delta W}{g}\Delta z^2\right) + \sum\Delta I_{yy_o}$$

$$I_{zz_{cg}} = \sum\left(\frac{\Delta W}{g}\Delta x^2\right) + \sum\left(\frac{\Delta W}{g}\Delta y^2\right) + \sum\Delta I_{zz_o}$$

where, ΔW = weight of individual airplane components.

Δx, Δy and Δz = distance from c.g. of individual airplane components to c.g. of complete airplane.

ΔI_{xx_o}, ΔI_{yy_o} and ΔI_{zz_o} = moments of inertia of individual airplane components about their own c.g.

Data for the various major components are determined as follows:

Wing

ΔI_{yy_o} For the wing, pylon tanks off and on, are shown on pages 2.20 & 2.22. The ΔI_{yy_o} for the wing structure was approximated by the moment of inertia of a homogeneous rectangular prism 100" by 28.7".

$$\Delta I_{yy_o} = \frac{M}{12}(a^2 + b^2) \text{ slug-ft.-in.}$$

where, M = Mass of structure

a = Height of prism

b = Width of prism

$$\Delta I_{xx_o} = \frac{2Nx}{p} \text{ slug-ft.-in.}$$

where, $\frac{Nx}{p}$ is obtained from wing unit inertia data at W.S. 0 (Pages 4.10 & 4.11)

$\Delta I_{zz_o} = \Delta I_{xx_o}$ (For pylon tanks off)

FORM 361 B

AIRPLANE MOMENTS OF INERTIA (Cont'd.)

Fuselage

ΔI_{yy_o} is obtained from fuselage unit inertia data, $\sum \frac{\Delta y}{\theta}$ F.S. 517, on pages 4.70 & 4.71. Because this data gives ΔI_{yy} about the front frame (F.S. 517) a transfer is necessary to the c.g. of the fuselage, shown on page 2.23.

ΔI_{xx_o} is based on a preliminary estimate for LR 8000 and is used as 651,000 slug-ft.-in.

$\Delta I_{zz_o} = \Delta I_{yy_o}$

Pylon Tanks

$10^{-6}\Delta I_{yy_o}$ is approximated by the moment of inertia of a homogeneous cylinded 300" long and 48" in diameter. Each pylon and tank weights 700 lbs. and is located at W.S. 550 (Ref. Page 4.10).

$$= \frac{10^{-6}M}{4}\left[r^2 + \left(\frac{L^2}{3}\right)\right]2 = \frac{10^{-6}(1400)}{386\ (4)}\left[(24)^2 + \left(\frac{300}{3}\right)^2\right] = .028$$

slug-ft.-in.

$$10^{-6}\Delta I_{xx_o} = 10^{-6}\left[Mr^2 + M\,y^2\right]2 = 10^{-6}\left[\frac{700}{386}(24)^2 + \frac{700}{386}(550)^2\right]2$$

$= 1.100$ slug-ft.-in.

$$10^{-6}\Delta I_{zz_o} = 10^{-6}\Delta I_{yy_o} + 2M\Delta y^2 = 10^{-6}\left[.028 + \frac{2(700)(550)^2}{386}\right]$$

$= 1.128$ slug-ft.-in.

where, M = Mass of Pylon and Tank

r = Radius of cylinder

L = Length of cylinder

Δy = Distance of individual tank c.g. to W.S. o, the c.g. of the two pylons combined.

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AIRPLANE MOMENTS OF INERTIA (Cont'd.)

Fuel in Wing

$10^{-6}\,\Delta I_{yy_o}$ is approximated by the moment of inertia of a homogeneous rectangular prism 68.3" by 20.0".

$$10^{-6}\,\frac{M}{12}\,(a^2 + b^2) = \frac{10^{-6}W(68.3^2 + 20.0^2)}{386(12)} = 1.093\ W10^{-6}$$

slug-ft.-in.

where, M = Mass of fuel in wing tanks

a = Width of tank (along chord)

b = Height of Tank

$10^{-6}\,\Delta I_{xx_o} = 10^{-6}\,(2)\,\frac{Mx}{p}$ slug-ft.-in. (Pylon Tanks on or off)

where $\frac{Mx}{p}$ is obtained from fuel unit inertia data at W.S. o (Pages 4.20-4.25 & 4.30-4.33)

$10^{-6}\,\Delta I_{zz_o} = 10^{-6}\,\Delta I_{xx_o}$

Fuel In Pylon Tank

$10^{-6}\,\Delta I_{yy_o}$ is approximated by the moment of inertia of a homogeneous cylinder 220" long, and with a diameter consistent with the fuel volume.

$$= 10^{-6}\left[\frac{M}{L}r^2 + \left(\frac{L^2}{3}\right)\right] \quad \text{(Per Tank)}$$

Volume = Length x Area = $220\pi r$

= Weight ÷ Density

where, Density = $\frac{6.5\ \text{lbs./ga.}}{231\ \text{Cubic in./gal.}} = \frac{1}{35.54}$ lbs./in.^{3}

Then, $220r\pi = 35.54W$

$$r^2 = \frac{35.54W}{220\pi} = .05111W$$

$$= \frac{10^{-6}W}{4(386)}\left[.05111W + \frac{(220)^2}{3}\right]$$

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AIRPLANE MOMENTS OF INERTIA (Cont'd.)

$10^{-6}\,\Delta I_{yy_o} = 10^{-6}\left(\frac{W}{15L}\right)(.0511W + 16133)$ slug-ft.-in. (Per Tank)

(See Page 2.21, Rows 5, 6, and 7)

where, W = Weight of pylon fuel

r = Radius of effective cylinder

L = Length of cylinder

$10^{-6}\,\Delta I_{xx_o}$ of pylon fuel is included in the total fuel ΔI_{xx_o} obtained from the fuel unit inertia data. See page 2.12.

$10^{-6}\,\Delta I_{zz_o} = 10^{-6}\,\Delta L_{yy_o}$ (Per Tank)

Cargo

$10^{-6}\,\Delta I_{yy_o}$ is obtained from cargo unit inertia data

$$10^{-6}\sum\frac{\Delta y}{\theta} \text{ F.S. } 517 \quad - \frac{10^{-6}\Delta W\,\Delta x^2}{g}$$

where, ΔW = Weight of cargo

Δx = Distance of cargo c.g. to the front frame (F.S. 517).

$10^{-6}\,\Delta I_{xx_o}$ is approximated by the moment of inertia of a rectangular prism 6 ft. by 9 ft.

$$10^{-6}\,\frac{M}{12}\,(a^2 + b^2) = \frac{10^{-6}W}{(386)(12)}\left((72)^2 + (108)^2\right)$$

$$10^{-6}\,\Delta I_{xx_o} = 3.637\,W\,10^{-6} \text{ slug-ft.-in.}^2$$

$10^{-6}\,\Delta I_{zz_o} = 10^{-6}\,\Delta I_{yy_o}$

The C.G. location for all cargo cases is assumed to be W.L. 182.0.

FORM 361 B

MOMENT OF INERTIA CALCULATIONS
TOTAL WING & FUEL INCREMENTS - PYLON TANKS OFF

① ITEM	② WEIGHT	③ C.G. LOCATION X	④ C.G. LOCATION Z	⑤ ΔX	⑥ $10^{-6}\frac{W\Delta X^2}{9}$	⑦ $10^{-6}\Delta I_{xx_o}$ & $10^{-6}\Delta I_{zz_o}$	⑧ $10^{-6}\Delta I_{yy_o}$	⑨ $10^{-6}\Delta I_{yy_{C.G.}}$ TOTAL WING
	Pgs. 1.10, 3.10 3.13	Pgs. 1.10, 3.10, 3.13	Pgs. 1.10, 3.10, 3.13	③ − X_{cg}	$\frac{10^{-6}\,②\,⑤^2}{386}$	(2) $\frac{I_x}{P}\,10^{-6}$ FROM Pgs. 4.10 4.20-4.28	NOTE	∑⑥ + ∑⑧ −
STRUCTURE + TRAPPED FUEL (+ TRAPPED OIL)	12 688	559.6	—	61.1	.123	—	.029	—
POWER PODS + FULL OIL	15 249	447.7	—	-50.8	.102	—	—	—
TOTAL WING ~ OPERATING WT	27 937	498.5	267.9	—	—	8.763	—	.254
FUEL INCREMENTS								
RESERVE FUEL ~ R	3230	552.3	268.4	—	—	1.593	.004	—
LANDING FUEL ~ L	11 290	551.1	270.4	—	—	5.546	.012	—
DESIGN GR. WT FUEL ~ D	23 290	550.2	274.5	—	—	12.370	.025	—
CAPACITY FUEL ~ C	36 160	549.5	278.8	—	—	20.092	.040	—

NOTE: $10^{-6}\Delta I_{yy_o}$ FOR STRUCTURE IS $\frac{12\,688\,(100^2+24.7^2)\,10^{-6}}{386\,(12)} = .029$ SLUG-FT-IN. (REF. Pg. 2.10).

$10^{-6}\Delta I_{yy}$ FOR FUEL INCREMENTS IS $1.093\,W\,10^{-6}$ SLUG-FT-IN. (REF. Pg. 2.12)

Prepared	J.L. EWOLT	3-31-53	LOCKHEED AIRCRAFT CORP.	Page	TEMP. 2.20
Checked	I. WICKMAN	4-2-53			
Approved				Model C-130A	
				Report No. 9095	

CLASSIFIED

Prepared	NAME J. LEWICKI	DATE 3-31-53	LOCKHEED AIRCRAFT CORP.	Page	TEMP.	PERM. 2.21
Checked	I. WICKMAN	4-2-53	TITLE	Model C-130 A		
Approved				Report No. 9095		

MOMENT OF INERTIA CALCULATIONS
FUEL INCREMENTS ~ PYLON TANKS ON

Row	ITEM		Fuel Increments / Ref. or Operation	R Minimum Reserve Fuel	L Landing Fuel	D Design Gross Wt. Fuel	C Capacity Fuel
1	PYLON TANK	W	PGS. 3.12 & 3.13	1.695	4 945	9 100	9 100
2		Z	"	210.1	218.6	226.2	226.2
3		ΔZ	2 - 19	—	—	-6.1	-23.4
4		$10^{-6} W \Delta Z^2 / g$	10^{-6} 1 13 $^2 \div 386$	—	—	.0009	.0129
5		$W / 1544$	1 ÷ 1544	1.098	3.203	5.894	5.894
6		.05141 W.	.05141 1	87	254	468	468
7		$10^{-6} I_{yy_{oo}} = 10^{-6} I_{zz_o}$	10^{-6} 5 [6 + 16 133] *	.0178	.0525	.0978	.0978
8	WING PANEL 220-300	W	PGS 3.12 & 3.13	—	—	1 315	5 215
9		Z	"	—	—	262.0	273.3
10		ΔZ	9 - 19	—	—	29.7	23.7
11		$10^{-6} W \Delta Z^2 / g$	10^{-6} 8 19 $^2 \div 386$	—	—	.0030	.0076
12		$10^{-6} \Delta I_{yy_{oo}}$	1.093 8 10^{-6} *	—	—	.0014	.0057
13	WING PANEL 300-364.5	W	PGS 3.12 & 3.13	—	—	530	3 490
14		Z	"	—	—	263.6	275.2
15		ΔZ	14 - 19	—	—	31.3	25.6
16		$10^{-6} W \Delta Z^2 / g$	10^{-6} 13 15 $^2 \div 386$	—	—	.0013	.0059
17		$10^{-6} \Delta I_{yy_{oo}}$	1.093 13 10^{-6} *	—	—	.0006	.0038
18	TOTAL FUEL BOTH WINGS	W	2 [1 + 8 + 13]	3 390	9 890	21 890	35 610
19		Z	[1 2 + 8 9 + 13 14] $\div \frac{18}{2}$	210.1	218.6	232.3	249.6
20		$10^{-6} \Delta I_{yy_o}$	[4 + 7 + 11 + 12 + 16 + 17] 2	.036	.105	.210	.267
21		$10^{-6} \Delta I_{xx_o}$	(2) $\frac{M_{xx}}{2}$ (10^{-6}) PGS. 4.30 - 4.33	2.656	7.751	15.004	19.042
22		$10^{-6} \Delta I_{zz_o}$	21 + 2 7	2.692	7.856	15.200	18.235

* SEE PG. 2.12 FOR DEVELOPEMENT OF $\Delta I_{yy_{oo}}$ FOR PYLON FUEL AND WING PANEL FUEL.

ALL MOMENTS OF INERTIA ARE GIVEN IN UNITS OF SLUG-FT-IN

[redacted]

FORM 8362 1

MOMENT OF INERTIA CALCULATIONS
TOTAL WING & FUEL INCREMENTS - PYLON TANKS ON

① ITEM	② WEIGHT	③ CG LOCATION X	④ CG LOCATION Z	⑤ Δ X	⑥ Δ Z	⑦ $10^{-6} W \Delta x^2 / g$	⑧ $10^{-6} W \Delta z^2 / g$	⑨ $10^{-6} \Delta I_{xx_o}$	⑩ $10^{-6} \Delta I_{yy_o}$	⑪ $10^{-6} \Delta I_{zz_o}$	⑫ TOTAL WING $10^{-6} \Delta I_{xx_{c.g.}}$	⑬ TOTAL WING $10^{-6} \Delta I_{yy_{c.g.}}$	⑭ TOTAL WING $10^{-6} \Delta I_{zz_{c.g.}}$
	Pgs. 1.10, 3.12, 3.13	Pgs. 1.10, 3.12, & 3.13		③ - $X_{c.g.}$	④ - $Z_{c.g.}$	$10^{-6} \frac{(②)(⑤)^2}{386}$	$10^{-6} \frac{(②)(⑥)^2}{386}$	Pgs. 2.20, 2.11 & 2.21	Pgs. 2.20, 2.11 & 2.21	Pgs. 2.20, 2.11 & 2.21	$\sum$⑨ + ⑧	$\sum$⑩ + ⑦	$\sum$⑪ + ⑦
WING - NO PYLON	27 937	498.5	267.9	-1.6	1.6	0	0	8.763	.254	8.763	—	—	—
PYLON & TANK	1 400	531.0	233.5	30.9	-32.8	.003	.004	1.100	.028	1.126	—	—	—
TOTAL WING - OPERATING WT	29 337	500.1	266.3	—	—	—	—	—	—	—	9.867	.285	9.892
FUEL INCREMENTS													
RESERVE FUEL - R	3 390	531.5	210.1	—	—	—	—	2.656	.036	2.692	—	—	—
LANDING FUEL - L	9 890	526.8	218.6	—	—	—	—	7.751	.105	7.856	—	—	—
DESIGN FUEL - D	21 890	531.6	232.3	—	—	—	—	15.004	.210	15.200	—	—	—
CAPACITY FUEL - C	25 610	540.2	249.6	—	—	—	—	18.042	.267	18.238	—	—	—

NOTE: ALL MOMENTS OF INERTIA ARE GIVEN IN UNITS OF SLUG-FT-IN.

Prepared	J.LEWOLT	DATE	3-21-53
Checked	I.WICKMAN		4-2-53
Approved			

LOCKHEED AIRCRAFT CORP.

Model C-130A | Report No. 9095 | Page | TEMP. | PERM. 2.22

[redacted]

Prepared	NAME J LEWOLT	DATE 4-1-53	LOCKHEED AIRCRAFT CORP.	Page	TEMP.	PERM. 2.23
Checked	I. WICKMAN	4-2-53	TITLE	Model C-130A		
Approved				Report No. 9035		

MOMENT OF INERTIA CALCULATIONS
COMPLETE AIRPLANE ~ OPERATING WEIGHT EMPTY

Row	Item		Ref. or Operation / Config.	Pylon Tanks Off	Pylon Tanks On
1	Fuselage & Tail	W	Pg 1.10	31 773	31 773
2		X	"	535.8	535.8
3		Z	"	211.8	211.8
4		$10^{-6}\Delta I_{xx_o}$	Pg 2.11	.651	.651
5		$\sum 10^{-6} \frac{My}{5} e_{Fs\,517}$	Pg 4.70 & 4.71	6.859	6.859
6		$10^{-6}\Delta I_{yy_o} = 10^{-6}\Delta I_{zz_o}$	[5] − [1]([2] − 517)² 10⁻⁶ ÷ 386	6.830	6.830
7		ΔX	[2] − [22]	17.4	17.1
8		ΔZ	[3] − [23]	-26.3	-26.2
9		$10^{-6} W\Delta x^2/g$	10^{-6} [1] [7]² ÷ 386	.025	.024
10		$10^{-6} W\Delta z^2/g$	10^{-6} [1] [8]² ÷ 386	.057	.056
11	Wing	W	Pg 2.20 & 2.22	27 937	29 337
12		X	"	498.6	502.1
13		Z	"	267.9	266.5
14		$10^{-6}\Delta I_{xx_o}$	"	8.763	9.867
15		$10^{-6}\Delta I_{zz_o}$	"	8.763	9.892
16		$10^{-6}\Delta I_{yy_o}$	"	.254	.285
17		ΔX	[12] − [22]	-19.2	-18.6
18		ΔZ	[13] − [23]	29.9	29.3
19		$10^{-6} W\Delta x^2/g$	10^{-6} [11] [17]² ÷ 386	.023	.026
20		$10^{-6} W\Delta z^2/g$	10^{-6} [11] [18]² ÷ 386	.065	.061
21	Empty Airplane	W	[1] + [11]	59 710	61 110
22		X	([1][2] + [11][12]) ÷ [21]	518.4	518.7
23		Z	([1][3] + [11][13]) ÷ [21]	238.1	238.0
24		$10^{-6} \Delta I_{xx}$	[4] + [10] + [14] + [20]	Slugs-Ft-In	9.683	10.635
25		$10^{-6} \Delta I_{yy}$	[6] + [9] + [16] + [19]	Slugs-Ft-In	7.137	7.165
26		$10^{-6} \Delta I_{zz}$	[6] + [9] + [15] + [19]	Slugs-Ft-In	15 646	16 772

[redacted]

FORM 8362-1

FORM 8514

PREPARED A. Ignatowski | CHECKED I. Wickman | APPROVED

DATE 3-18-53 | 3-18-53 | 3-18-53

TITLE: **LOCKHEED AIRCRAFT CORP.**

REPORT NO. 9095 | MODEL C-130A | PAGE 2.30

BALANCE & MOMENTS OF INERTIA - COMPLETE AIRPLANE

All moments of inertia are given in units of slug-ft.-in.

① ITEM	② W	③ X	④ ΔX	⑤ $\frac{10^{-6} w \Delta X^2}{g}$	⑥ Z	⑦ ΔZ	⑧ $\frac{10^{-6} w \Delta Z^2}{g}$	⑨ $10^{-6} I_{xx_o}$	⑩ $10^{-6} I_{yy_o}$	⑪ $10^{-6} I_{zz_o}$	⑫ $10^{-6} I_{xx}$	⑬ $10^{-6} I_{yy}$	⑭ $10^{-6} I_{zz}$
			③ $-X_{cg}$	$\frac{10^{-6} ② ④^2}{386}$		⑥ $-Z_{cg}$	$\frac{10^{-6} ② ⑦^2}{386}$				$\sum ⑧ + \sum ⑨$	$\sum ⑤ + \sum ⑩$	$\sum ⑤ + \sum ⑪$
Empty	59710	518.4									Case	124 D_a20	
Fuel	31690	549.9									Cargo	AA 1, 2	
Cargo	32800	492.5											
Total	124200	519.6											
Empty	59710	518.4									Case	124 D_a28	
Fuel	31690	549.9									Cargo	AZ 1,2,3	
Cargo	32800	545.1											
Total	124200	533.5											
Empty	59710	518.4	3.2	.002	238.1	5.1	.004	9.536	7.137	15.646	Case	108 D 17	
Fuel	23290	550.2	35.0	.074	274.9	41.5	.104	12.370	.025	12.370	Cargo	BA 1	
Cargo	25000	475.0	-40.2	.105	182.0	-51.0	.168	.091	1.966	1.966			
Total	108000	515.2			233.0						22.273	9.309	30.163
Empty	59710	518.4	-15.1	.035						15.646	Case	108 D 28	
Fuel	23290	550.2	16.7	.017					.025	12.370	Cargo	BZ 3	
Cargo	25000	554.0	20.5	.027						.265			
Total	108000	533.5											28.360
Empty	59710	518.4	7.5	.009	238.1	10.3	.018	9.536	7.137		Case	96 L 14	
Fuel	11290	551.1	40.2	.047	270.4	43.1	.054	5.546	.012		Cargo	DA 7	
Cargo	25000	474.9	-36.0	.084	182.0	45.3	.133	.091	1.979				
Total	96000	510.9			227.3						15.378	9.268	

FORM 2814

BALANCE & MOMENTS OF INERTIA - COMPLETE AIRPLANE

All moments of inertia are given in units of slug-ft.-in.

ITEM	W	X	ΔX	$10^{-6} W \Delta X^2 / g$	Z	ΔZ	$10^{-6} W \Delta Z^2 / g$	$10^{-6} I_{xx_o}$	$10^{-6} I_{yy_o}$	$10^{-6} I_{zz_o}$	$10^{-6} I_{xx}$	$10^{-6} I_{yy}$	$10^{-6} I_{zz}$
			③ $-X_{cg}$	10^{-6} ② ④^2 / 386		⑥ $-Z_{cg}$	10^{-6} ② ⑦^2 / 386				Σ⑧ + Σ⑨	Σ⑤ + Σ⑩	Σ⑤ + Σ⑪
Empty	59710	518.4	0.3	0					7.137		Case 96 L 19		
Fuel	11290	551.1	33.0	.032					.012		Cargo S 4		
Cargo	25000	502.6	-15.5	.016					1.924				
Total	96000	518.1										9.121	
Empty	59710	518.4	-15.1	.035					7.137		Case 96 L 28		
Fuel	11290	551.1	17.6	.009					.012		Cargo CZ 1		
Cargo	25000	561.6	28.1	.051					1.885				
Total	96000	533.5										9.223	
Empty	59710	518.4	11.1	.019	238.1	14.8	.034	9.536	7.137		Case 88 R 12		
Fuel	3290	552.3	45.0	.017	268.4	45.1	.017	1.593	.004		Cargo D A 5		
Cargo	25000	474.9	-32.4	.068	182.0	-41.3	.110	.091	1.627				
Total	88000	507.3			223.3						11.381	8.872	
Empty	59710	518.4	5.2	.004					7.137		Case 88 R 16		
Fuel	3290	552.3	39.1	.013					.004		Cargo S 3		
Cargo	25000	495.7	-17.5	.020					1.811				
Total	88000	513.2										8.989	
Empty	59710	518.4	+ 2.0	.001					7.137		Case 88 R 18		
Fuel	3290	552.3	35.9	.011					.004		Cargo S 2		
Cargo	25000	500.8	- 3.6	.006					2.201				
Total	88000	516.4										9.360	

PREPARED	NAME A. Ignatowski	DATE 3-18-53	TITLE: LOCKHEED AIRCRAFT CORP.
CHECKED	I. Wickman	3-18-53	
APPROVED			
REPORT NO. 9095	MODEL C-130A	PAGE 2.31	

RESTRICTED

FORM 8018

PREPARED: A. Ignatowski | CHECKED: I. Wickman | APPROVED:

NAME | DATE: 3-17-53 | 3-17-53

TITLE:

LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 | MODEL C-130 | PAGE 2.3.2

BALANCE & MOMENTS OF INERTIA - COMPLETE AIRPLANE

All moments of inertia are given in units of slug-ft.-in.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭
		X	ΔX	$\frac{10^{-6} W \Delta X^2}{g}$	Z	ΔZ	$\frac{10^{-6} W \Delta Z^2}{g}$	$10^{-6} I_{xx_o}$	$10^{-6} I_{yy_o}$	$10^{-6} I_{zz_o}$	$10^{-6} I_{xx}$	$10^{-6} I_{yy}$	$10^{-6} I_{zz}$
Mat	W		③ $-X_{cg}$	$\frac{10^{-6} ③ ④^2}{386}$		⑥ $-Z_{cg}$	$\frac{10^{-6} ② ⑦^2}{386}$				$\sum ⑧ + \sum ⑨$	$\sum ⑤ + \sum ⑩$	$\sum ⑤ + \sum ⑰$
Empty	59710	518.4	- 5.1	.004					7.137		Case	88 R 22	
Fuel	3290	552.3	28.8	.007					0.004		Cargo	g 1	
Cargo	25000	532.0	8.5	.005					1.907				
Total	88000	523.5										9.064	
Empty	59710	518.4	-15.1	.035					7.137	15.646	Case	88 R 28	
Fuel	3290	552.3	18.8	.003					.004	1.593	Cargo	D Z 7	
Cargo	25000	567.1	33.6	.073					.050	.050			
Total	88000	533.5										7.302	17.400
Empty	59710	518.4	14.6	.0330					7.137	15.646	Case	82 R 10	
Fuel	3290	552.3	48.3	.0199					.004	1.593	Cargo	FA 2	
Cargo	18500	448.1	-55.7	.1487					1.619	1.619			
Total	81500	503.8										7.343	
Empty	59710	518.4	14.6	.033					7.137	15.646	Case	67 R 10	
Fuel	3290	552.3	48.5	.020					.004	1.593	Cargo	EA	
Cargo	4440	271.6	232.2	.620					.003	.003			
Total	67440	503.8										7.817	17.915
Empty	59710	518.4	1.6	.001	238.1				7.137		Case	63 R 20	
Fuel	3290	552.3	32.1	.009	268.4				.004		Cargo		
Cargo	—	—	—	—	—				—				
Total	63000	520.7			239.7							7.151	

FORM 5814

BALANCE & MOMENTS OF INERTIA - COMPLETE AIRPLANE

All moments of inertia are given in units of slug-ft.-in.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭
		X	ΔX	$\frac{10^{-6} W \Delta X^2}{\varepsilon}$	Z	ΔZ	$\frac{10^{-6} W \Delta Z^2}{g}$	$10^{-6} I_{xx_o}$	$10^{-6} I_{yy_o}$	$10^{-6} I_{zz_o}$	$10^{-6} I_{xx}$	$10^{-6} I_{yy}$	$10^{-6} I_{zz}$
			③ $-X_{CG}$	$\frac{10^{-6} \text{②} \text{④}^2}{386}$		⑥ $-Z_{CG}$	$\frac{10^{-6} \text{②} \text{⑦}^2}{386}$				$\sum$⑥ $+\sum$⑨	$\sum$⑤ $+\sum$⑩	$\sum$⑤ $+\sum$⑪
Empty	59710	518.4	15.1	.035	238.1				7.137	15.646	Case 68 R 28		
Fuel	3290	552.3	18.8	.003	268.4				.004	1.593	Cargo EZ		
Cargo	4810	708.2	174.7	.380	182.0				.003	.003			
Total	67810	533.5			235.6							7.562	17.660
Empty	59710	518.4	-11.8	.022	238.1	-15.4	.037		7.084		Case 96 C 26		
Fuel	36160	549.5	+19.3	.035	278.8	+25.3	.060		.040		Cargo		
Cargo													
Total	95870	530.2			253.5							7.181	
Empty	61110	518.7									Case 124D 20T		
Fuel	31790	538.7									Cargo TAA 1		
Cargo	31300	502.0											
Total	124200	519.8											
Empty	61110	518.7									Case 124 D 28T		
Fuel	31790	538.7									Cargo T A Z 1		
Cargo	31300	557.1											
Total	124200	533.5											
Empty	61110	518.7	3.5	.002					7.166	16.773	Case 108 D 17T		
Fuel	21890	531.6	16.4	.015					.210	15.200	Cargo TB A 1		
Cargo	25000	492.3	-22.9	.034					2.032	2.032			
Total	108000	515.2										9.459	34.056

PREPARED	NAME A. Ignatowski		
CHECKED	I. Wickman	DATE 3-17-53	PAGE 2.3.3
APPROVED		3-17-53	
TITLE: LOCKHEED AIRCRAFT CORP.			
REPORT NO. 9095	MODEL C-130A		

FORM 501-B

BALANCE & MOMENTS OF INERTIA - COMPLETE AIRPLANE

All moments of inertia are given in units of slug-ft.-in.

① ITEM	② W	③ X	④ ΔX	⑤ $10^{-6} w \Delta X^2 / g$	⑥ Z	⑦ ΔZ	⑧ $10^{-6} w \Delta Z^2 / g$	⑨ $10^{-6} I_{xx_o}$	⑩ $10^{-6} I_{yy_o}$	⑪ $10^{-6} I_{zz_o}$	⑫ $10^{-6} I_{xx}$	⑬ $10^{-6} I_{yy}$	⑭ $10^{-6} I_{zz}$
			③ $-X_{cg}$	$10^{-6} ② ④^2 / 386$		⑥ $-Z_{cg}$	$10^{-6} ② ⑦^2 / 386$				$\sum ⑧ + \sum ⑨$	$\sum ⑤ + \sum ⑩$	$\sum ⑤ + \sum ⑪$
Empty	61110	518.7	-14.8	.035	238.0	14.1	.031	10.635	7.166	16.773	Case 108 D 28 T		
Fuel	21890	531.6	-1.9	—	232.3	8.4	.004	15.004	.210	15.200	Cargo TBZ 1		
Cargo	25000	571.3	37.8	.093	182.0	41.9	.114	.091	1.422	1.422			
Total	108000	533.5			223.9						25.879	8.926	33.523
Empty	61110	518.7	7.8	.010					7.166		Case 96 L 14 T		
Fuel	9890	526.8	15.9	.006					.105		Cargo TC A 1		
Cargo	25000	485.5	-25.4	.042					1.745				
Total	96000	510.9										9.074	
Empty	61110	518.7	2.3	.001					7.166		Case 96 L 18 T		
Fuel	9890	526.8	10.4	.003					.105		Cargo S 2		
Cargo	25000	506.8	-9.6	.006					2.201				
Total	96000	516.4										9.482	
Empty	61110	518.7	-4.3	.003					7.166		Case 96 L 22 T		
Fuel	9890	526.8	3.8	0					.105		Cargo S 1		
Cargo	25000	532.0	9.0	.005					1.907				
Total	96000	523.0										9.186	
Empty	61110	518.7			238.0	16.6	.044	10.635			Case 96 L 28 T		
Fuel	9890	526.8			218.6	2.8	0	7.751			Cargo T C Z 1, 2		
Cargo	25000	572.3			182.0	39.4	.101	.091					
Total	96000	533.5			221.4						18.622		

PREPARED A. Ignatowski 3-18-53
CHECKED I. Wickman 3-18-53
APPROVED

TITLE:

LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 MODEL C-130A PAGE 2.3 4

FORM 3818

BALANCE & MOMENTS OF INERTIA - COMPLETE AIRPLANE

All moments of inertia are given in units of slug-ft.-in.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭
	W	X	ΔX	$\frac{10^{-6} \Delta X^2}{g}$	Z	ΔZ	$\frac{10^{-6} \Delta Z^2}{g}$	$10^{-6} I_{xx_o}$	$10^{-6} I_{yy_o}$	$10^{-6} I_{zz_o}$	$10^{-6} I_{xx}$	$10^{-6} I_{yy}$	$10^{-6} I_{zz}$
			③ $-X_{cg}$	$\frac{10^{-6} \cdot ② \cdot ④^2}{386}$		⑥ $-Z_{cg}$	$\frac{10^{-6} \cdot ② \cdot ⑦^2}{386}$				$\sum ⑧ + \sum ⑨$	$\sum ⑤ + \sum ⑩$	$\sum ⑤ + \sum ⑪$
Empty	61110	518.7									Case	90 R 13 T	
Fuel	3390	531.5									Cargo	T GA	
Cargo	25000	479.0											
Total	89500	508.1											
Empty	61110	518.7			238.0	16.7	.044	10.635			Case	90 R 28 T	
Fuel	3390	531.5			210.1	11.2	.001	2.656			Cargo	T GZ	
Cargo	25000	569.9			182.0	39.3	.100	.091					
Total	89500	533.5			221.3						13.527		
Empty	61110	518.7	-7.9	.010	238.0	-4.3	.003		7.112		Case	97 C 24 T	
Fuel	35610	540.2	+13.6	.017	249.6	+7.3	.005		.267		Cargo	———	
Cargo	—	—	---										
Total	96720	526.6			242.3							7.406	
Empty	61110	518.7									Case	64 R 19 T	
Fuel	3390	531.5									Cargo	———	
Cargo	——	——											
Total	64500	519.4											
Empty	61110	518.7									Case	82 R 10T	
Fuel	3390	531.5									Cargo	———	
Cargo	17000	444.7											
Total	81500	503.8											

PREPARED	NAME A. Ignatowski	DATE 3-16-53	
CHECKED	J. Lawolt	3-16-53	
APPROVED			

TITLE: **LOCKHEED AIRCRAFT CORP.**

REPORT NO. 9095 | MODEL C-130A | PAGE 2.35

PREPARED	NAME	DATE	LOCKHEED AIRCRAFT CORP.	PAGE 3.00
CHECKED	J. Lewolt	4-6-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

Fuel Distributions - Weight and c.g. Data

On the following pages, weight and c.g. locations of fuel in various wing panels are given for the fuel cases used in structural analysis. Fuel capacities used for loads calculations vary slightly from estimates used elsewhere. However, resulting load differences are also slight and are considered negligible. The data contained herein are summarized from curves of fuel in tank vs. panel weight and c.g. location given in LR 8900. (Ref. 1).

FORM 361 B

RESTRICTED
SECURITY INFORMATION

Prepared	NAME	DATE	SECURITY INFORMATION
	I. WICKMAN	2-25-53	LOCKHEED AIRCRAFT CORP.
Checked	J. LEWOLT	2-26-53	
Approved			TITLE

FUEL DISTRIBUTIONS - PYLON TANKS OFF

FUEL CASE	MINIMUM RESERVE FUEL FUEL CODE = R FUEL/SIDE = 1645 LBS. INB'D. TANK = 74.9 GALS. OUTB'D. TANK = 178.2 GALS.				LANDING FUEL FUEL CODE = L FUEL/SIDE = 5645 LBS. INB'D. TANK = 382.6 GALS. OUTB'D TANK = 485.8 GALS.				DESIGN GROSS WEIGHT FUEL FUEL CODE = D FUEL/SIDE = 11645 LBS. INB'D. TANK = 844.2 GALS. OUTB'D TANK = 947.4 GALS.			
WING PANEL	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$
792 — 782.5	—	—	—	—	—	—	—	—	—	—	—	—
782.5 - 700	—	—	—	—	—	—	—	—	478	539.2	733.0	284.0
700 - 600	—	—	—	—	458	542.8	634.0	278.7	1305	542.6	644.0	281.8
600 - 500	400	547.4	532.0	273.4	1300	546.3	544.0	276.4	2270	546.0	546.0	279.4
500 - 434.2	758	549.4	464.0	271.6	1400	549.0	465.0	274.4	2105	548.8	466.0	277.5
434.2 - 400	—	—	—	—	—	—	—	—	—	—	—	—
400 - 364.5	—	—	—	—	—	—	—	—	—	—	—	—
364.5 - 300	22	561.2	310.0	260.7	807	555.0	330.0	264.8	2100	553.8	331.0	269.9
300 - 220	465	560.7	250.0	259.2	1680	557.0	257.0	263.0	3387	556.2	258.0	268.1
220 - 196	—	—	—	—	—	—	—	—	—	—	—	—
196 - 100	—	—	—	—	—	—	—	—	—	—	—	—
100 - 60	—	—	—	—	—	—	—	—	—	—	—	—
60 - 0	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	1645	552.3	418.0	268.4	5645	551.1	415.7	270.4	11645	550.2	427.7	274.5

PAGE	TEMP.	PERM.
		3.10

Report No. 9095 | Model C-1304

Prepared	NAME J. LEWOLT	DATE 3-3-53	LOCKHEED AIRCRAFT CORP.	Page	TEMP.	PERM. 3.11
Checked	D. BAKALAR	3-3-53	TITLE	Model C-130A		
Approved				Report No. 9095		

FUEL DISTRIBUTIONS - PYLON TANKS OFF

AIRPLANE ALTERNATE GROSS WEIGHT FUEL CASES

FUEL CASE	MIN. RES. (ALT.)				GROSS WT. (MAX. ALT)			
FUEL CODE	R_a				D_a			
FUEL / SIDE	1745 LBS				15 845 LBS			
INB'D TANK	82.6 GALS				1167.2 GALS			
OUTB'D TANK	185.8 GALS				1270.5 GALS			
WING PANEL	WT	$\overline{X}$	$\overline{Y}$	$\overline{Z}$	WT	$\overline{X}$	$\overline{Y}$	$\overline{Z}$
792-782.5	—	—	—	—	—	—	—	—
782.5-700	—	—	—	—	893	539.3	736.0	286.2
700-600	—	—	—	—	1880	542.5	646.0	284.0
600-500	430	547.3	532.0	273.5	2920	545.9	547.0	281.5
500-434.2	778	549.4	464.0	271.8	2565	548.6	466.0	279.4
434.2-400	—	—	—	—	—	—	—	—
400-364.5	—	—	—	—	—	—	—	—
364.5-300	37	561.1	312.0	2608	3007	553.6	331.0	273.4
300-220	500	560.5	250.0	253.3	4580	556.0	258.0	271.5
220-193	—	—	—	—	—	—	—	—
193-100	—	—	—	—	—	—	—	—
100-60	—	—	—	—	—	—	—	—
60-0	—	—	—	—	—	—	—	—
TOTAL	1745	552.3	416.2	268.4	15845	544.3	431.8	277.3

FORM 6362

RES
SECURI

Prepared	NAME	DATE	TITLE	TEMP.
	J. WICKMAN	2-25-53	STRUCTURAL INFORMATION	
Checked	J LEWOLT	2-26-53	LOCKHEED AIRCRAFT CORP.	
Approved				PERM. 3.12

Model C-1304 Page

Report No. 9095

FUEL DISTRIBUTIONS - PYLON TANKS ON

FUEL CASE	MINIMUM RESERVE FUEL				LANDING FUEL				DESIGN GROSS WEIGHT FUEL			
FUEL CODE	R				L				D			
FUEL/SIDE	1695 LBS.				4945 LBS.				10945 LBS.			
INB'D TANK	0 GALS.				0 GALS.				283.8 GALS.			
OUTB'D TANK	0 GALS.				0 GALS.				0 GALS.			
PYLON TANK	260.8 GALS.				760.8 GALS.				1400.0 GALS.			
WING PANEL	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$
792 - 782.5												
782.5 - 700												
700 - 600												
600 - 550$^+$												
550$^+$ - 550$^-$	1695	531.5	550.0	210.1	4945	526.8	550.0	218.6	9100	526.5	550.0	226.2
550$^-$ - 500												
500 - 434.2												
434.2 - 400												
400 - 364.5												
364.5 - 300									530	556.0	328.0	260.8
300 - 220									1315	557.0	256.0	259.3
220 - 196												
196 - 100												
100 - 60												
60 - 0												
TOTAL	1695	531.5	550.0	210.1	4945	526.8	550.0	218.6	10945	531.6	503.9	231.9

[redacted]

Prepared	NAME J. LEWOLT	DATE 2-26-53	LOCKHEED AIRCRAFT CORP.	Page	TEMP.	PERM. 3.13
Checked	I. WICKMAN	2-27-53	TITLE	Model C-130A		
Approved				Report No. 9095		

FUEL DISTRIBUTIONS

CAPACITY FUEL ~ TANKS ON & OFF

(FUEL CODE: C)

	PYLON TANKS OFF				PYLON TANKS ON			
FUEL/SIDE	18080 LBS				17805 LBS			
INB'D TANK	1339.2 GALS.				1339.2 GALS.			
OUTB'D TANK	1442.3 GALS.				0			
PYLON TANK	NO PYLON TANKS				1400 GALS			
WING PANEL	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$	WT	$\bar{X}$	$\bar{Y}$	$\bar{Z}$
792-782.5	—	—	—	—	—	—	—	—
782.5-700	1195	539.4	738.0	287.5	—	—	—	—
700-600	2260	542.4	647.0	285.3	—	—	—	—
600-550+	3240	545.8	547.0	282.6	—	—	—	—
550+-550-					9100	526.5	550.0	226.2
550--500					—	—	—	—
500-434.2	2650	548.4	466.0	280.2	—	—	—	—
434.2-400	—	—	—	—	—	—	—	—
400-364.5	—	—	—	—	—	—	—	—
364.5-300	3490	553.4	331.0	275.3	3490	553.4	331.0	275.3
300-220	5215	555.4	255.0	273.3	5215	555.4	255.0	273.3
220-196	—	—	—	—	—	—	—	—
196-100	—	—	—	—	—	—	—	—
100-60	—	—	—	—	—	—	—	—
60-0	—	—	—	—	—	—	—	—
TOTAL	18080	549.6	438.1	278.5	17805	542.2	421.5	249.6

[redacted]

Prepared	NAME J. LEWOLT	DATE 3-12-53	LOCKHEED AIRCRAFT CORP.	Page	TEMP.	PERM. 3.14
Checked	I. WICKMAN	3-12-53	TITLE	Model C-130A		
Approved				Report No. 9095		

FUEL DISTRIBUTIONS

DYNAMIC LANDING FUEL ~ PYLON TANKS ON

FUEL / SIDE	7300 LBS.			
INB'D TANK	0			
OUTB'D TANK	0			
PYLON TANK	1123 GALS.			
WING PANEL	WT.	$\bar{X}$	$\bar{Y}$	$\bar{Z}$
792 - 782.5	—	—	—	—
782.5 - 700	—	—	—	—
700 - 600	—	—	—	—
600 - 550^{+}	—	—	—	—
550^{+} - 550^{-}	7300	525.9	550.0	223.2
550^{-} - 500	—	—	—	—
500 - 434.2	—	—	—	—
434.2 - 400	—	—	—	—
400 - 364.5	—	—	—	—
364.5 - 300	—	—	—	—
300 - 220	—	—	—	—
220 - 196	—	—	—	—
196 - 100	—	—	—	—
100 - 60	—	—	—	—
60 - 0	—	—	—	—
TOTAL	7300	525.9	550.0	223.2

PREPARED	NAME	DATE	LOCKHEED AIRCRAFT CORP.	PAGE 4.00
CHECKED	J. Lewolt	4-6-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

Unit Inertia Shears, Moments and Torsions

In all unit inertia calculations the load axes used are F.S. 517, W.S. 0, and W.L. 262.8. Airplane section weight and c.g. locations are found in LR 8900 (Ref. 1).

Wing and Fuel

Shears, moments and torsions for the empty operating wing and investigated fuel cases are given per unit of acceleration. Only those data used in loads calculations are presented. Values are included for translational (n_x, n_y, n_z) and rotational (rolling, $\dot{p}$; pitching, $\ddot{\theta}$; yawing, $\ddot{\psi}$) accelerations. Since the empty operating wing and fuel cases are computed separately, summary sheets combining them are also given. Pylon tanks on and off configurations are shown separately.

Fuselage and Cargo

Unit inertia data are given for the empty operating fuselage (forebody and afterbody) and all cargo cases used to calculate critical loads.

Cargo unit inertia data are shown on summary sheets giving also an arrangement diagram, balance computations, and cargo moments of inertia. No attempt is made to show summaries of the empty fuselage and the numerous cargo cases, since the method of loads analysis used employs them individually.

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS OFF

Wing - Operating Weight Empty (Includes Full & Trapped Oil)

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
WING STA.	PANEL W	PANEL $\bar{Y}-Y_n$	PANEL $\bar{X}$	ΔY	ΔX_{1a}	$\frac{W\bar{Y}}{g}$	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
				$①_n - ①_{n+1}$	④ - 517	[① + ③] × ② ÷ 386	Σ②	$-\Sigma$⑦	See Below	See Below	$-10^{-3}\Sigma$②⑥	$10^{-3}\Sigma$⑦⑥
740				92			0	0	0	0	0	0
700	368.1	1.6	549.9	100	32.9	711.4	368	-711	.0169	-.0327	-12.11	23.41
600	482.9	50	553.2	50	36.2	813.2	851	-1525	.0779	-.1445	-29.59	52.84
550-	296.6	25	555.0	50	38.0	441.8	1148	-1966	.1279	-.2318	-40.86	69.63
500	296.5	25	556.9	100	39.9	403.3	1444	-2370	.1927	-.3402	-52.69	85.72
436+2												
400+	673.5	50	561.4	0	44.4	785.2	2118	-3155	.3708	-.6164	-82.60	+120.59
400-	3812.3	0	447.7	100	-69.3	3950.6	5930	-7106	.3708	-.6164	+181.60	-153.19
364+5												
300	907.7	50	557.8	80	40.8	823.0	6838	-7928	1.0092	-1.3681	144.56	-119.61
220	875.5	40	559.8	24	42.8	589.7	7713	-8513	1.5912	-2.0260	107.09	-94.37
196+	268.4	12	563.4	0	46.4	143.9	7978	-8661	1.7795	-2.2321	94.78	-87.74
196-	3812.3	0	447.7	96	-69.3	1935.7	11791	-10597	1.7795	-2.2321	358.96	-221.88
100	1116.7	48	547.6	40	50.6	628.2	12907	-11025	2.9650	-3.2700	302.46	-200.22
60	462.0	20	552.9	40	45.9	95.8	13369	-11121	3.4905	-3.7129	281.25	-195.81
0	599.4	30	556.7	0	39.7	46.6	13969	-11168	4.3106	-4.3816	257.45	-193.97

$$⑩ = \sum\left[⑤_{n-1}\ ⑧_{n-1} + ②_n\ ③_n\right] 10^{-6} \quad ; \quad ⑪ = \sum\left[⑤_{n-1}\ ⑨_{n-1} - ③_n\ ⑦_n\right] 10^{-6}$$

PREPARED A. Ignatowski — DATE 3-16-53
CHECKED J. Lewolt — 3-16-53
APPROVED

TITLE: LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 — MODEL C-130A — PAGE 4.10

UNIT INERCIA SHEAR, MOMENT, & TORSION - PYLON TANKS ON

Wing - Operating Weight Empty (Includes Full and Trapped Oil)

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
WING STA.	PANEL $\bar{Y}_n$	PANEL $\bar{Y}-\bar{Y}_n$	PANEL $\bar{X}$	ΔY	ΔX_{1a}	$\frac{\bar{W}\bar{Y}}{g}$	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6}M_x}{n_z}$	$\frac{10^{-6}M_x}{\dot{p}}$	$\frac{10^{-3}M_y}{n_z}$	$\frac{10^{-3}M_y}{\dot{p}}$
Y	Ref. Pg. — LR 8900			①$_n$ - ①$_{n+1}$	④ - 517	[① + ③] x ② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3} ⑫ ⑥	10^{-3} Σ⑦ ⑥
0	0	———	———	92	———	0	0	0	0	0	0	0
~~200~~	368.1	46	518.9	100	38.9	711.4	368	- 711	.0169	-.0327	-12.11	23.41
192	492.9	50	553.2	50	36.2	812.2	851	- 1525	.0779	-.1445	-29.59	52.84
550+	296.6	25	555.0	0	38.0	441.8	1148	- 1966	.1279	-.2318	-40.86	69.63
550-	700.0	0	531.0	50	14.0	927.4	1848	- 2964	.1279	-.2318	-50.66	83.59
500	296.5	25	556.9	100	39.9	403.3	2144	- 3367	.2277	-.3901	-62.49	99.69
~~434+2~~												
400+	673.5	50	561.4	0	44.4	785.2	2818	- 4152	.4758	-.7660	-92.40	+134.55
400-	3812.3	0	447.7	100	-69.3	3950.6	6630	- 8103	.4758	-.7660	+171.80	-139.23
~~364+5~~												
300	907.7	50	557.8	80	40.8	823.0	7538	- 8926	1.1842	-1.6175	134.76	-105.65
220	875.5	40	559.8	24	42.8	589.7	8413	- 9516	1.8222	-2.3551	97.29	- 80.41
196+	265.4	12	563.4	0	46.4	143.0	8678	- 9659	2.0273	-2.5852	84.98	- 73.77
196-	3812.2	0	447.7	96	-69.3	1935.7	12491	-11594	2.0273	-2.5852	349.16	-207.92
100	1116.7	48	563.6	40	50.6	428.2	13607	-12022	3.2800	-3.7188	292.66	-186.25
60	462.6	30	562.9	60	45.9	96.8	14069	-12118	3.8335	-4.2016	271.45	-181.85
0	599.4	30	556.7	0	39.7	46.6	14469	-12165	4.6956	-4.9301	247.65	-180.00

⑩ = $\sum$[⑤$_{n-1}$ ⑧$_{n-1}$ + ②$_n$ ③$_n$] 10^{-6} ; ⑪ = $\sum$[⑤$_{n-1}$ ⑨$_{n-1}$ - ③$_n$ ⑦$_n$] 10^{-6}

APPROVED | CHECKED I. Wickman | PREPARED H. Spicer | NAME | DATE 10-10-52

TITLE:

LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 | MODEL C-130A | PAGE 4.11

FORM 8362-1

UNIT PITCHING INERTIA ABOUT THE LOAD AXIS

EMPTY OPERATING WING – PYLON TANKS OFF

X_{LA} = F.S. 517

Z_{LA} = W.L. 262.8

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
WING STA.	W	ΔX_{LA}	ΔZ_{LA}	$\frac{W\Delta x_{LA}}{g}$	$\frac{W\Delta z_{LA}}{g}$	$\frac{S_{ZLA}}{\ddot{\theta}}$	$\frac{S_{XLA}}{\ddot{\theta}}$	$\frac{10^{-6}M_{YLA}}{\ddot{\theta}}$
Y	LR8900	PANEL X_{CG} $-X_{LA}$ LR8900	PANEL Z_{CG} $-Z_{LA}$ LR8900	$\frac{(2)(3)}{386}$	$\frac{(2)(4)}{386}$	$\sum(5)$	$-\sum(6)$	$\sum[-(3)(5)+(4)(6)]10^{-6}$
700	368	32.9	25.4	31.37	24.22	31	-24	-.0004
600	483	36.2	22.8	45.30	28.53	77	-53	-.0014
500	593	38.9	19.9	59.76	30.57	136	-83	-.0031
400+	674	44.4	17.2	77.53	30.03	+214	-113	-.0060
400-	3812	-69.3	1.2	-684.38	11.85	-470	-125	-.0535
300	908	40.8	14.4	95.98	33.87	-374	-159	-.0568
220	876	42.8	11.8	97.13	26.78	-277	-186	-.0607
196+	265	46.4	10.7	31.85	7.35	-246	-193	-.0621
196-	3812	-69.3	-6.8	-684.38	-67.15	-930	-126	-.1091
100	1117	50.6	10.7	146.43	30.96	-783	-157	-.1161
60	462	45.9	10.7	54.94	12.81	-728	-170	-.1185
0	599	39.7	10.7	61.61	16.60	-667	-186	-.1208

	NAME	DATE
Prepared	D. BAKALAR	12-21-52
Checked	I. WICKMAN A. IGNATOWSKI	3-13-53
Approved		

TITLE: LOCKHEED AIRCRAFT CORP.

Model C-130A

Report No. 9095

PAGE | TEMP. | PERM. 4.12

U.L. INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS OFF

MINIMUM RESERVE FUEL (DESIGN GROSS WEIGHT)

X_{LA} = FS 517

FUEL IN TANKS
Inboard Tank . . . . 74.9 Gal
Outboard Tank . . 178.2 Gals.

① WING STA.	② PANEL $\bar{Y}$	③ PANEL $\bar{Y}-Y_n$	④ PANEL $\bar{X}$	⑤ ΔY	⑥ ΔX_{la}	⑦ $\frac{\bar{W}\bar{Y}}{g}$	⑧ $\frac{S_z}{n_z}$	⑨ $\frac{S_z}{\dot{p}}$	⑩ $\frac{10^{-6}M_x}{n_z}$	⑪ $\frac{10^{-6}M_x}{\dot{p}}$	⑫ $\frac{10^{-3}M_y}{n_z}$	⑬ $\frac{10^{-3}M_y}{\dot{p}}$
		See Pg. 3.10		$(1)_n - (1)_{n+1}$	④ - 517	$[① + ③] \times ② \div 386$	$\Sigma ②$	$-\Sigma ⑦$	See Below	See Below	$-10^{-3} ② ④$	$10^{-3} \Sigma ⑦ ⑥$
				9.5								
				82.5								
				100.0								
				50.0								
550-				50.0			0	0	0	0	0	0
500	400	32.0	547.4	65.8	30.4	551.3	400	-551	.0128	-.0176	-12.16	16.76
434.2	758	29.8	549.4	34.2	32.4	911.2	1158	-1462	.0617	-.0811	-36.72	46.28
400+												
400-				35.5			1158	-1462	.1013	-.1311	-36.72	46.28
364.5				64.5			1158	-1462	.1424	-.1830	-36.72	46.28
300	22	10.0	561.2	80.0	44.2	17.7	1180	-1480	.2173	-.2774	-37.69	47.06
220	465	30.0	560.7	24.0	43.7	301.2	1645	-1781	.3257	-.4049	-58.01	60.23
196+												
196-				96.0			1645	-1781	.3652	-.4476	-58.01	60.23
100				40.0			1645	-1781	.5231	-.6186	-58.01	60.23
60				60.0			1645	-1781	.5889	-.6898	-58.01	60.23
0				0			1645	-1781	.6876	-.7967	-58.01	60.23

⑩ = $\sum [⑤_{n-1} \; ⑧_{n-1} + ②_n \; ③_n] \; 10^{-6}$; ⑪ = $\sum [⑤_{n-1} ⑨_{n-1} - ③_n \; ⑦_n] \; 10^{-6}$

PREPARED H.C. NAME Spicer
CHECKED I.G. Wickman
APPROVED
DATE 10-7-51 10-8-51
TITLE: LOCKHEED AIRCRAFT CORP.
MODEL C-130A
REPORT NO. 9095
PAGE 4.20

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS OFF

X_{LA} = FS 517

LANDING FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank. . . 382.6 Gals.
Outboard Tank . . 485.8 Gals.

① WING STA.	② PANEL $\bar{W}$	③ PANEL $\bar{Y}-Y_n$	④ PANEL $\bar{X}$	⑤ ΔY	⑥ ΔX_{la}	⑦ $\frac{\bar{W}\bar{Y}}{g}$	⑧ $\frac{S_z}{n_z}$	⑨ $\frac{S_z}{\dot{p}}$	⑩ $\frac{10^{-6} M_x}{n_z}$	⑪ $\frac{10^{-6} M_x}{\dot{p}}$	⑫ $\frac{10^{-3} M_y}{n_z}$	⑬ $\frac{10^{-3} M_y}{\dot{p}}$
				$(1)_n - (1)_{n+1}$	④ - 517	$[(1)+(3)] \times (2) \div 386$	$\Sigma(2)$	$-\Sigma(7)$	See Below	See Below	$-10^{-3}\Sigma(2)(6)$	$10^{-3}\Sigma(7)(6)$
~~734~~				9.5								
~~732~~				82.5								
700				100.0			0	0	0	0	0	0
600	458	34	542.8	100.0	25.8	752.3	458	-752	.0156	-.0256	-11.82	19.41
~~500~~												
~~434.2~~												
500	1300	44	546.3	65.8	29.3	1832.1	1758	-2584	.1186	-.1814	-49.91	73.09
434.2	1400	30.8	549.0	34.2	32.0	1686.5	3158	-4271	.2774	-.4034	-94.71	127.06
~~400~~												
400				35.5			3158	-4271	.3854	-.5494	-94.71	127.06
364.5				64.5			3158	-4271	.4975	-.7011	-94.71	127.06
300	807	30.0	555.0	80.0	38.0	689.9	3965	-4961	.7254	-.9972	-125.37	153.27
220	1680	37.0	557.0	24.0	40.0	1118.5	5645	-6079	1.1047	-1.4355	-192.57	198.01
~~196~~												
196				96.0			5645	-6079	1.2402	-1.5814	-192.57	198.01
100				40.0			5645	-6079	1.7821	-2.1650	-192.57	198.01
60				60.0			5645	-6079	2.0079	-2.4081	-192.57	198.01
0				0			5645	-6079	2.3466	-2.7729	-192.57	198.01

$$⑩ = \sum[(5)_{n-1}(8)_{n-1} + (2)_n(3)_n]\,10^{-6} \quad ; \quad ⑪ = \sum[(5)_{n-1}(9)_{n-1} - (3)_n(7)_n]\,10^{-6}$$

PREPARED: H. C. Spicer 10-6-52
CHECKED: I. G. Wickman 10-7-52
APPROVED:
TITLE: LOCKHEED AIRCRAFT CORP.
PAGE 4.21
MODEL C-130A
REPORT NO. 9095

[redacted]

PREPARED	H.C. Spicer	10-7-52	LOCKHEED AIRCRAFT CORP.	PAGE 4.22
CHECKED	I.G. Wickman	10-8-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS OFF

X_{LA} = FS 517 TAKE OFF FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank . . 844.2 Gals.
Outboard Tank . . 947.4 Gals.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
WING STA.	PANEL W	PANEL $\bar{Y}-Y_n$	PANEL $\bar{X}$	ΔY	ΔX_{1a}	$\frac{W\bar{Y}}{g}$	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
Y	Cf. Pg. 3.10			$①_n - ①_{n+1}$	④ - 517	[① + ③] × ② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3} Σ② ⑥	10^{-3} Σ⑦ ⑥
[illegible]				9.5								
[illegible]				82.5			0	0	0	0	0	0
[illegible]	478	33.0	539.2	100.0	22.2	907.7	478	-908	.0158	-.0300	-10.61	20.15
[illegible]	1305	44.0	542.6	100.0	25.6	2177.3	1783	-3085	.1210	-.2166	-44.02	75.89
[illegible]												
500	2270	46.0	546.0	65.8	29.0	3210.9	4053	-6296	.4037	-.6728	-109.85	169.01
434.2	2105	31.8	548.8	34.2	31.8	2541.3	6158	-8837	.7373	-1.1678	-176.79	249.82
400+												
400-				35.5			6158	-8837	.9479	-1.4701	-176.79	249.82
364.5				64.5			6158	-8837	1.1666	-1.7838	-176.79	249.82
300	2100	31.0	553.8	80.0	36.8	1800.8	8258	-10638	1.6288	-2.4096	-254.07	316.09
220	3387	38.0	556.2	24.0	39.2	2263.8	11645	-12902	2.4182	-3.3467	-386.84	404.83
196+												
196-				96.0			11645	-12902	2.6977	-3.6563	-386.84	404.83
100				40.0			11645	-12902	3.8156	-4.8949	-386.84	404.83
60				60.0			11645	-12902	4.2814	-5.4110	-386.84	404.83
0				0			11645	-12902	4.9801	-6.1851	-386.84	404.83

$⑩ = \sum [⑤_{n-1} ⑧_{n-1} + ②_n ③_n] 10^{-6}$; $⑪ = \sum [⑤_{n-1} ⑨_{n-1} - ③_n ⑦_n] 10^{-6}$

[redacted]

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS OFF

X_{LE} = F.S. 517 CAPACITY FUEL (DESIGN GROSS WT.)

FUEL IN TANKS
Inboard Tank. . .1339.2 Gals.
Outboard Tank . .1442.3 Gals.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
[illegible]	PANEL [illegible]	PANEL $\bar{Y}-Y_n$	PANEL $\bar{X}$	ΔY	ΔX_{la}	$\frac{W\bar{Y}}{g}$	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6}M_x}{n_z}$	$\frac{10^{-6}M_x}{\dot{p}}$	$\frac{10^{-3}M_y}{n_z}$	$\frac{10^{-3}M_y}{\dot{p}}$
[illegible]												
[illegible]	Ref. Pg. 3.13			$(1)_n - (1)_{n+1}$	④ - 517	[① + ③] x ② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3}Σ②⑥	10^{-3}Σ⑦⑥
[illegible]				9.5								
382.5				82.5			0	0	0	0	0	0
440	1195	38.0	539.4	100.0	22.4	2284.7	1195	-2285	.0454	-.0868	-26.77	51.18
400	2260	47.0	542.4	100.0	25.4	3788.1	3455	-6073	.2711	-.4934	-84.17	147.40
[illegible]												
[illegible]												
500	3240	47.0	545.8	65.8	28.8	4591.4	6695	-10664	.7689	-1.3165	-177.48	279.63
434.2	2680	31.8	548.4	34.2	31.4	3235.4	9375	-13900	1.2947	-2.1210	-261.64	381.22
~~400+~~												
400-				35.5			9375	-13900	1.6153	-2.5964	-261.64	381.22
364.5				64.5			9375	-13900	1.9481	-3.0899	-261.64	381.22
300	3490	31.0	553.4	80.0	36.4	2992.7	12865	-16892	2.6610	-4.0792	-388.67	490.15
220	5215	38.0	555.4	24.0	38.4	3485.7	18080	-20378	3.8884	-5.5630	-588.93	624.00
~~196+~~												
196-				96.0			18080	-20378	4.3223	-6.0521	-588.93	624.00
100				40.0			18080	-20378	6.0580	-8.0084	-588.93	624.00
60				60.0			18080	-20378	6.7812	-8.8235	-588.93	624.00
0				0			18080	-20378	7.8660	-10.0462	-588.93	624.00

⑩ = $\sum\left[⑤_{n-1}\ ⑧_{n-1} + ②_n\ ③_n\right] 10^{-6}$; ⑪ = $\sum\left[⑤_{n-1}⑨_{n-1} - ③_n\ ⑦_n\right] 10^{-6}$

PREPARED	H. C. Spicer	DATE	10-14-52
CHECKED	H. Kraus		10-16-52
APPROVED			

LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 MODEL C-130A PAGE 4.2.3

SECURITY INFORMATION

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS OFF

X_{LA} = FS 517 MINIMUM RESERVE FUEL (ALTERNATE GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank. . 82.6 Gals.
Outboard Tank .185.8 Gals.

① WING STA.	② PANEL WT	③ PANEL $\bar{Y}-Y_n$	④ PANEL $\bar{X}$	⑤ ΔY	⑥ ΔX_{la}	⑦ $\frac{\bar{W}\bar{Y}}{g}$	⑧ $\frac{S_z}{n_z}$	⑨ $\frac{S_z}{\dot{p}}$	⑩ $\frac{10^{-6}M_x}{n_z}$	⑪ $\frac{10^{-6}M_x}{\dot{p}}$	⑫ $\frac{10^{-3}M_y}{n_z}$	⑬ $\frac{10^{-3}M_y}{\dot{p}}$
	Ref. Pg. 3.11			①$_n$ - ①$_{n+1}$	④ - 517	[① + ③] x ② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3} Σ② ⑤	10^{-3} Σ⑦ ⑥
~~700~~	—	—	—	9.5	—	—	—	—	—	—	—	—
~~600~~	—	—	—	82.5	—	—	—	—	—	—	—	—
500	—	—	—	100.0	—	—	—	—	—	—	—	—
400	—	—	—	100.0	—	—	—	—	—	—	—	—
~~450+~~	—	—	—	—	—	—	—	—	—	—	—	—
~~450-~~	—	—	—	—	—	—	—	—	—	—	—	—
500	430	32.0	547.3	65.8	30.3	592.6	430	-593	.0138	-.0190	-13.03	17.96
434.2	778	29.8	549.4	34.2	32.4	935.2	1208	-1528	.0652	-.0859	-38.24	48.26
~~400+~~	—	—	—	—	—	—	—	—	—	—	—	—
400-	—	—	—	35.5	—	—	1208	-1528	.1066	-.1381	-38.24	48.26
364.5	—	—	—	64.5	—	—	1208	-1528	.1494	-.1924	-38.24	48.26
300	37	12.0	561.1	80.0	44.1	29.9	1245	-1558	.2278	-.2913	-39.87	49.57
220	500	30.0	560.5	24.0	43.5	323.8	1745	-1882	.3424	-.4256	-61.62	63.66
~~196+~~	—	—	—	—	—	—	—	—	—	—	—	—
196-	—	—	—	96.0	—	—	1745	-1882	.3843	-.4708	-61.62	63.66
100	—	—	—	40.0	—	—	1745	-1882	.5518	-.6515	-61.62	63.66
60	—	—	—	60.0	—	—	1745	-1882	.6216	-.7267	-61.62	63.66
0	—	—	—	0	—	—	1745	-1882	.7263	-.8397	-61.62	63.66

⑩ = $\sum$[⑤$_{n-1}$ ⑧$_{n-1}$ + ②$_n$ ③$_n$] 10^{-6} ; ⑪ = $\sum$[⑤$_{n-1}$ ⑨$_{n-1}$ - ③$_n$ ⑦$_n$] 10^{-6}

	NAME	DATE
PREPARED	H.C. Spicer	10-9-52
CHECKED	I.G. Wickman	10-9-52
APPROVED		

TITLE: LOCKHEED AIRCRAFT CORP.

MODEL C-130A

REPORT NO. 9095

PAGE 4.2.4

SECURITY INFORMATION

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS OFF

TAKE OFF FUEL (MAXIMUM ALTERNATE GROSS WEIGHT)

X_{LA} - FS 517

FUEL IN TANKS
Inboard Tank. . .1167.2 Gals
Outboard Tank . .1270.5 Gals

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
WING STA.	PANEL WT	PANEL $\bar{Y}-Y_n$	PANEL $\bar{X}$	ΔY	ΔX_{la}	$\frac{W\bar{Y}}{g}$	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6}M_x}{n_z}$	$\frac{10^{-6}M_x}{\dot{p}}$	$\frac{10^{-3}M_y}{n_z}$	$\frac{10^{-3}M_y}{\dot{p}}$
Y	Ref. Pg. 3.11			$(\ )_n - (\ )_{n+1}$	④ - 517	[① + ③] x ② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3}Σ②⑥	10^{-3}Σ⑦⑥
[illegible]				9.5								
482.5				82.5			0	0	0	0	0	0
700	893	36	539.3	100.0	22.3	1702.7	893	-1703	.0321	-.0613	-19.91	37.97
600	1880	46	542.5	100.0	25.5	3146.3	2773	-4849	.2079	-.3763	-67.85	118.20
~~500+~~												
~~500-~~												
500	2920	47	545.9	65.8	28.9	4137.9	5693	-8987	.6225	-1.0557	-152.24	237.79
434.2	2565	31.8	548.6	34.2	31.6	3096.6	8258	-12084	1.0786	-1.7455	-233.30	335.64
~~400+~~												
400-				35.5			8258	-12084	1.3611	-2.1588	-233.30	335.64
364.5				64.5			8258	-12084	1.6542	-2.5878	-233.30	335.64
300	3007	31	553.6	80.0	36.6	2578.5	11265	-14662	2.2801	-3.4471	-343.35	430.01
220	4580	38	556.0	24.0	39.0	3061.2	15845	-17723	3.3553	-4.7364	-521.97	549.40
~~196+~~												
196-				96.0			15845	-17723	3.7356	-5.1618	-521.97	549.40
100				40.0			15845	-17723	5.2567	-6.8632	-521.97	549.40
60				60.0			15845	-17723	5.8905	-7.5721	-521.97	549.40
0				0			15845	-17723	6.8412	-8.6355	-521.97	549.40

⑩ = $\sum\left[⑤_{n-1}\ ⑧_{n-1} + ②_n\ ③_n\right] 10^{-6}$; ⑪ = $\sum\left[⑤_{n-1}\ ⑨_{n-1} - ③_n\ ⑦_n\right] 10^{-6}$

PREPARED H.C. Spicer NAME 10-10-52 DATE
CHECKED H. Kraus 10-10-52
APPROVED

TITLE: LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 MODEL C-130A PAGE 4.2.5

SECURITY INFORMATION

RESTRICTED

UNIT PITCHING INERTIA ABOUT LOAD AXIS

FUEL CASES - PYLON TANKS OFF

X_{LA} = F.S. 611

Z_{LA} = F.S. 263.5

	① WING STA. Y	② W	③ ΔX_{LA}	④ ΔZ_{LA}	⑤ $\frac{W \Delta X_{LA}}{g}$	⑥ $\frac{W \Delta Z_{LA}}{g}$	⑦ $\frac{S_{ZLA}}{\ddot{\theta}}$	⑧ $\frac{S_{KLA}}{\ddot{\theta}}$	⑨ $\frac{10^6 M_{YLA}}{\ddot{\theta}}$	
			PANEL X_{cg} - X_{LA}	PANEL Z_{cg} - Z_{LA}	$\frac{②③}{386}$	$\frac{②④}{386}$	$\sum ⑤$	$-\sum ⑥$	$\sum[④⑥ - ③⑤]10^6$	FUEL IN TANKS
		I.E.F. I_Y = 3.10								
MINIMUM RESERVE FUEL	500	400	30.4	10.6	31.50	10.98	32	-11	-.0008	INB'D.
	434.2	758	32.4	8.5	63.62	17.28	95	-28	-.0028	74.9 GALS.
	300	22	44.2	-2.1	2.52	-.12	98	-28	-.0029	OUTB'D.
	220	465	43.7	-5.6	52.64	-4.34	150	-24	-.0051	178.2 GALS.
LANDING FUEL	600	450	25.5	15.9	30.61	18.87	31	-19	-.0005	
	500	1300	29.3	13.6	98.68	45.80	129	-65	-.0028	INB'D.
	432	1400	32.0	11.6	116.06	42.07	245	-107	-.0060	382.6 GAL.
	400	-	-	-	-	-	245	-107	-.0060	OUTB'D.
	300	807	38.0	2.0	79.45	4.18	325	-111	-.0090	485.8 GAL.
	220	1680	40.0	0.2	174.09	.87	499	-112	-.0160	
DESIGN GROSS WEIGHT FUEL	700	478	22.2	21.2	27.49	26.25	27	-26	-.0001	
	600	1305	25.6	19.0	86.55	64.24	114	-90	-.0010	INB'D.
	500	2270	29.0	16.6	170.55	97.62	285	-188	-.0044	844.2 GAL.
	400	2105	31.5	14.7	173.42	80.17	458	-268	-.0087	OUTB'D.
	300	2100	36.8	7.1	200.21	39.63	658	-307	-.0158	947.4 GAL.
	220	3387	39.2	5.3	343.97	46.51	1002	-353	-.0290	

	NAME	DATE
Prepared	D. BAKALAR	12-21-52
Checked	I. WICKMAN A. IGNATOWSKI	3-13-53
Approved		

LOCKHEED AIRCRAFT CORP.

TITLE

Model C-130A

Report No. 9095

Page

TEMP.

PERM. 4.26

FORM 8382-1

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS ON

X_{LE} = FS 517 MINIMUM RESERVE FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank . . . 0 Gals
Pylon Tank . . . 260.8 Gals

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
WING STA.	PANEL W	PANEL $\bar{Y}-Y_n$	PANEL $\bar{Y}$	ΔY	ΔY_{la}	$\frac{W\bar{Y}}{g}$	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6}M_x}{n_z}$	$\frac{10^{-6}M_x}{\dot{p}}$	$\frac{10^{-3}M_y}{n_z}$	$\frac{10^{-3}M_y}{\dot{p}}$
Y	C. Pg. 3.12			$D_n - D_{n+1}$	④ - 517	[① ÷ ③] × ② ÷ 386	Σ②	$-\Sigma$⑦	See Below	See Below	$-10^{-3}\Sigma$②⑥	$10^{-3}\Sigma$⑦⑥
700												
680												
650+				0			0	0	0	0	0	0
650-	1695	0	531.5	50	14.5	2415	1695	-2415	0	0	-24.58	35.02
500				100			1695	-2415	.0848	-.1208	-24.58	35.02
~~434.2~~												
400+				0			1695	-2415	.2542	-.3622	-24.58	35.02
400-				100			1695	-2415	.2542	-.3622	-24.58	35.02
~~364.5~~												
300				80			1695	-2415	.4238	-.6038	-24.58	35.02
220				24			1695	-2415	.5594	-.7970	-24.58	35.02
196+				0			1695	-2415	.6000	-.8549	-24.58	35.02
196-				96			1695	-2415	.6000	-.8549	-24.58	35.02
100				40			1695	-2415	.7628	-1.0868	-24.58	35.02
60				60			1695	-2415	.8306	-1.1834	-24.58	35.02
0				0			1695	-2415	.9322	-1.3282	-24.58	35.02

⑩ = $\sum[⑤_{n-1}\ ⑧_{n-1} + ②_n\ ③_n]\ 10^{-6}$; ⑪ = $\sum[⑤_{n-1}⑨_{n-1} - ③_n\ ⑦_n]\ 10^{-6}$

PREPARED H.C. Spicer NAME DATE 10-24-52
CHECKED I. Wickman 10-27-52
APPROVED

TITLE: LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 MODEL C-130A PAGE 4.30

RESTRICTED SECURITY INFORMATION

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS ON LANDING FUEL (DESIGN GROSS WEIGHT)

X_{LA} = FS 517

FUEL IN TANKS
Inboard Tank . . 0 Gals.
Pylon Tank . . 760.8 Gals.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
WING STA.	PANEL $\bar{Y}$	PANEL $\bar{Y}-Y_n$	PANEL $\bar{X}$	ΔY	ΔX_{la}	$\frac{W\bar{Y}}{g}$	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6}M_x}{n_z}$	$\frac{10^{-6}M_x}{\dot{p}}$	$\frac{10^{-3}M_y}{n_z}$	$\frac{10^{-3}M_y}{\dot{p}}$
	Ref. Pg. 3.12			①$_n$ - ①$_{n+1}$	④ - 517	[①+③] x② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3}Σ②⑥	10^{-3}Σ⑦⑥
732												
732-												
720												
640												
560+				0			0	0	0	0	0	0
560-	4945	0	526.8	50	9.8	7046	4945	-7046	0	0	-48.46	69.05
				100			4945	-7046	.2472	-.3523	-48.46	69.05
440+												
400+				0			4945	-7046	.7418	-1.0569	-48.46	69.05
400-				100			4945	-7046	.7418	-1.0569	-48.46	69.05
364.5												
300				80			4945	-7046	1.2362	-1.7615	-48.46	69.05
220				24			4945	-7046	1.6318	-2.3252	-48.46	69.05
196+				0			4945	-7046	1.7505	-2.4943	-48.46	69.05
196-				96			4945	-7046	1.7505	-2.4943	-48.46	69.05
100				40			4945	-7046	2.2252	-3.1707	-48.46	69.05
60				60			4945	-7046	2.4230	-3.4525	-48.46	69.05
0				0			4945	-7046	2.7198	-3.8753	-48.46	69.05

⑩ = $\sum[⑤_{n-1}\ ⑧_{n-1} + ②_n\ ③_n]\ 10^{-6}$; ⑪ = $\sum[⑤_{n-1}\ ⑨_{n-1} - ③_n\ ⑦_n]\ 10^{-6}$

PREPARED H.C. Spicer 10-24-52
CHECKED I. Wichman 10-27-52
APPROVED

LOCKHEED AIRCRAFT CORP.
TITLE:
REPORT NO. 9095 MODEL C-130A PAGE 4.31

SECURITY INFORMATION
REGRADED

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS ON

TAKE OFF FUEL (DESIGN GROSS WEIGHT)

X_{LA} = FS 517

FUEL IN TANKS
Inboard Tank . . . 283.8 Gals
Pylon Tank . . . 1400.0 Gals

① WING STA.	② PANEL W_p	③ PANEL $\bar{Y}-Y_n$	④ PANEL $\bar{X}$	⑤ ΔY	⑥ ΔX_{la}	⑦ $\frac{W\bar{Y}}{g}$	⑧ $\frac{S_z}{n_z}$	⑨ $\frac{S_z}{\dot{p}}$	⑩ $\frac{10^{-6}M_x}{n_z}$	⑪ $\frac{10^{-6}M_x}{\dot{p}}$	⑫ $\frac{10^{-3}M_y}{n_z}$	⑬ $\frac{10^{-3}M_y}{\dot{p}}$
Y	Ref. Pg. 3.12			①$_n$ - ①$_{n+1}$	④ - 517	[① + ③] × ② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3}Σ②⑥	10^{-3}Σ⑤⑥
732	—	—	—	—	—	—	—	—	—	—	—	—
702	—	—	—	—	—	—	—	—	—	—	—	—
700	—	—	—	—	—	—	—	—	—	—	—	—
600	—	—	—	—	—	—	—	—	—	—	—	—
550+	—	—	—	—	—	—	0	0	0	0	0	0
550-	9100	0	526.5	50	9.5	12966	9100	-12966	0	0	-86.45	123.18
500	—	—	—	100	—	—	9100	-12966	.4550	-.6483	-86.45	123.18
~~434.2~~	—	—	—	—	—	—	—	—	—	—	—	—
~~400+~~	—	—	—	—	—	—	—	—	—	—	—	—
400-	—	—	—	35.5	—	—	9100	-12966	1.3650	-1.9449	-86.45	123.18
364.5	—	—	—	64.5	—	—	9100	-12966	1.6880	-2.4052	-86.45	123.18
300	530	28.0	556.0	80.	39.0	450	9630	-13416	2.2898	-3.2547	-107.12	140.73
220	1315	36.0	557.4	24	40.4	872	10945	-14288	3.1076	-4.3588	-160.25	175.96
~~196+~~	—	—	—	—	—	—	—	—	—	—	—	—
196-	—	—	—	96	—	—	10945	-14288	3.3703	-4.7017	-160.25	175.96
100	—	—	—	40	—	—	10945	-14288	4.4210	-6.2733	-160.25	175.96
60	—	—	—	60	—	—	10945	-14288	4.8588	-6.6449	-160.25	175.96
0	—	—	—	0	—	—	10945	-14288	5.5155	-7.5021	-160.25	175.96

⑩ = $\sum$[⑤$_{n-1}$ ⑧$_{n-1}$ + ②$_n$ ③$_n$] 10^{-6} ; ⑪ = $\sum$[⑤$_{n-1}$ ⑨$_{n-1}$ - ③$_n$ ⑦$_n$] 10^{-6}

APPROVED	CHECKED	PREPARED
	J. Lewolt	H.C. Spicer
	10-27-52	10-24-52

TITLE:

LOCKHEED AIRCRAFT CORP.

REPORT NO. 9095 | MODEL C-130A | PAGE 4.32

SECURITY INFORMATION

DECLASSIFIED

UNIT INERTIA SHEAR, MOMENT, & TORSION - PYLON TANKS ON

X_{la} = FS 517 CAPACITY FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank. . . . 1339.2 Gals.
Pylon Tank . . . 1400.0 Gals.

① WING STA.	② PANEL $\bar{W}$	③ PANEL $\bar{Y}-Y_n$	④ PANEL $\bar{X}$	⑤ ΔY	⑥ ΔX_{la}	⑦ $\frac{\bar{W}\bar{Y}}{g}$	⑧ $\frac{S_z}{n_z}$	⑨ $\frac{S_z}{\dot{p}}$	⑩ $\frac{10^{-6}M_x}{n_z}$	⑪ $\frac{10^{-6}M_x}{\dot{p}}$	⑫ $\frac{10^{-3}M_y}{n_z}$	⑬ $\frac{10^{-3}M_y}{\dot{p}}$
Y	See Pg. 3.13			$①_n - ①_{n+1}$	④ - 517	[① + ③] × ② ÷ 386	Σ②	-Σ⑦	See Below	See Below	-10^{-3} Σ②⑥	10^{-3} Σ⑦⑥
[illegible]	—	—	—	—	—	—	—	—	—	—	—	—
[illegible]	—	—	—	—	—	—	—	—	—	—	—	—
[illegible]	—	—	—	—	—	—	—	—	—	—	—	—
[illegible]	—	—	—	—	—	—	—	—	—	—	—	—
450-	9100	0	526.5	50	9.5	12966	9100	-12966	0	0	-86.45	123.18
500	—	—	—	100	—	—	9100	-12966	.455	-.648	-86.45	123.18
~~436.2~~	—	—	—	—	—	—	—	—	—	—	—	—
~~400+~~	—	—	—	—	—	—	—	—	—	—	—	—
400-	—	—	—	35.5	—	—	9100	-12966	1.365	-1.945	-86.45	123.18
364.5	—	—	—	64.5	—	—	9100	-12966	1.688	-2.405	-86.45	123.18
300	3490	31.0	553.4	80.0	36.4	2993	12590	-15959	2.383	-3.334	-213.49	232.12
220	5215	38.0	555.4	24.0	38.4	3486	17805	-19445	3.589	-4.743	-413.74	365.98
~~196+~~	—	—	—	—	—	—	—	—	—	—	—	—
196-	—	—	—	96.0	—	—	17805	-19445	4.016	-5.210	-413.74	365.98
100	—	—	—	40.0	—	—	17805	-19445	5.725	-7.077	-413.74	365.98
60	—	—	—	60.0	—	—	17805	-19445	6.437	-7.855	-413.74	365.98
0	—	—	—	0	—	—	17805	-19445	7.506	-9.021	-413.74	365.98

⑩ = $\sum\left[⑤_{n-1}\ ⑧_{n-1} + ②_n\ ③_n\right] 10^{-6}$; ⑪ = $\sum\left[⑤_{n-1}⑨_{n-1} - ③_n\ ⑦_n\right] 10^{-6}$

PREPARED H. C. Spicer (NAME)
CHECKED I. Wichman
APPROVED
DATE 10-27-52
TITLE:
LOCKHEED AIRCRAFT CORP.
MODEL C-130A
REPORT NO 9095
PAGE 4.33

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS OFF

OPERATING WEIGHT EMPTY + MINIMUM RESERVE FUEL (DESIGN GROSS WT.)
FUEL IN TANKS
Inboard Tank . . . . 74.9 Gals.
Outboard Tank . . . 178.2 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * Col.⑧ + Col.⑧ **	Col.⑨ * Col.⑨ + Col.⑨ **	Col.⑩ * Col.⑩ + Col.⑩ **	Col.⑪ * Col.⑪ + Col.⑪ **	Col.⑫ * Col.⑫ + Col.⑫ **	Col.⑬ * Col.⑬ + Col.⑬ **
792	0	0	0	0	0	0
700	368	- 711	.0169	- .0327	- 12.11	23.41
600	851	- 1525	.0779	- .1445	- 29.59	52.84
550+						
550-						
500	1844	- 2921	.2055	- .3578	- 64.85	102.48
400+	3276	- 4617	.4721	- .7475	-119.32	+166.87
400-	7088	- 8568	.4721	- .7475	+144.88	-106.19
300	8018	- 9408	1.2265	-1.6455	106.87	- 72.55
196+	9623	-10442	2.1447	-2.6797	36.77	- 27.51
196-	13436	-12378	2.1447	-2.6797	300.95	-161.65
100	14552	-12806	3.4881	-3.8886	244.45	-139.99
60	15014	-12902	4.0794	-4.4027	223.24	-135.58
0	15614	-12949	4.9982	-5.1783	199.44	-133.74

* Page 4.10

** Page 4.20

FORM 301 B

PREPARED	NAME H.C. Spicer	DATE 10-8-52	LOCKHEED AIRCRAFT CORP.	PAGE 4.41
CHECKED	I.G. Wickman	10-10-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS OFF

OPERATING WEIGHT EMPTY + LANDING FUEL (DESIGN GROSS WT.)

FUEL IN TANKS
Inboard Tank . . . . 382.6 Gals.
Outboard Tank . . . 485.8 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * Col.⑧ + **	Col.⑨ * Col.⑨ + **	Col.⑩ * Col.⑩ + **	Col.⑪ * Col.⑪ + **	Col.⑫ * Col.⑫ + **	Col.⑬ * Col.⑬ + **
792	0	0	0	0	0	0
700	368	- 711	.0169	- .0327	- 12.11	23.41
600	1309	- 2277	.0935	- .1701	- 41.41	72.25
550+	-	-	-	-	-	-
550-	-	-	-	-	-	-
500	3202	- 4954	.3113	- .5216	-102.60	158.61
400+	5276	- 7426	.7562	-1.1658	-177.31	+247.65
400-	9088	-11377	.7562	-1.1658	+ 86.89	- 26.13
300	10803	-12889	1.7346	-2.3653	+ 19.19	+ 33.66
196+	13623	-14740	3.0197	-3.8135	- 97.79	+110.27
196-	17436	-16676	3.0197	-3.8135	+166.39	- 23.87
100	18552	-17104	4.7471	-5.4350	109.89	- 2.21
60	19018	-17200	5.4984	-6.1210	88.68	+ 2.20
0	19614	-17247	6.6572	-7.1545	64.88	+ 4.04

* Page 4.10

** Page 4.21

FORM 361 B

PREPARED	H.C. Spicer (NAME)	10-8-52 (DATE)	LOCKHEED AIRCRAFT CORP.	PAGE 4.42
CHECKED	I.G. Wickman	10-10-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS OFF

OPERATING WEIGHT EMPTY + TAKE-OFF FUEL (DESIGN GROSS WT.)
FUEL IN TANKS
Inboard Tank . . . . 844.2 Gals.
Outboard Tank . . . 947.4 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * + Col.⑧ **	Col.⑨ * + Col.⑨ **	Col.⑩ * + Col.⑩ **	Col.⑪ * + Col.⑪ **	Col.⑫ * + Col.⑫ **	Col.⑬ * + Col.⑬ **
792	0	0	0	0	0	0
700	646	- 1619	.0327	- .0627	- 22.72	43.56
600	2634	- 4610	.1989	- .3611	- 73.61	128.73
550+	-	-	-	-	-	-
550-	-	-	-	-	-	-
500	5497	- 8666	.5964	- 1.0130	-162.54	254.73
400+	8276	-11992	1.3187	- 2.0865	-259.39	370.41
400-	12088	-15943	1.3187	- 2.0865	+ 4.81	96.63
300	15096	-18566	2.6380	- 3.7777	-109.51	196.48
196+	19623	-21563	4.4772	- 5.8884	-292.06	317.09
196-	23436	-23499	4.4772	- 5.8884	- 27.88	182.95
100	24552	-23927	6.7606	- 8.1649	- 84.38	204.61
60	25014	-24023	7.7729	- 9.1239	-105.59	209.02
0	25614	-24070	9.2907	-10.5667	-129.39	210.86

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FORM 361 B

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS OFF

OPERATING WEIGHT EMPTY + CAPACITY FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS

Inboard Tank . . . . 1339.2 Gals.
Outboard Tank . . . . 1442.3 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * / Col.⑧ **	Col.⑨ * / Col.⑨ **	Col.⑩ * / Col.⑩ **	Col.⑪ * / Col.⑪ **	Col.⑫ * / Col.⑫ **	Col.⑬ * / Col.⑬ **
792	0	0	0	0	0	0
700	1563	- 2996	.0623	- .1195	- 38.88	74.59
600	4306	- 7598	.3490	- .6379	-113.76	200.24
550+	-	-	-	-	-	-
550-	-	-	-	-	-	-
500	8139	-13034	.9616	- 1.6567	-230.17	365.35
400+	11493	-17055	1.9861	- 3.2128	-344.24	501.81
400-	15305	-21006	1.9861	- 3.2128	- 80.04	228.03
300	19703	-24820	3.6702	- 5.4473	-244.11	370.54
196+	26058	-29039	6.1018	- 8.2842	-494.15	536.26
196-	29871	-30975	6.1018	- 8.2842	-229.97	402.12
100	30987	-31403	9.0230	-11.2764	-286.47	423.78
60	31449	-31499	10.2717	-12.5364	-307.68	428.19
0	32049	-31546	12.1766	-14.4278	-331.48	430.03

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FORM 361 B

[redacted]

PREPARED	I.G. Wickman (NAME)	10-10-52 (DATE)	LOCKHEED AIRCRAFT CORP.	PAGE 4.44
CHECKED	H.C. Spicer	10-13-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS OFF

OPERATING WEIGHT EMPTY + MINIMUM RESERVE FUEL (ALT. GR. WT.)

FUEL IN TANKS
Inboard Tank . . . 82.6 Gals.
Outboard Tank . .185.8 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * + Col.⑧ **	Col.⑨ * + Col.⑨ **	Col.⑩ * + Col.⑩ **	Col.⑪ * + Col.⑪ **	Col.⑫ * + Col.⑫ **	Col.⑬ * + Col.⑬ **
792	0	0	0	0	0	0
700	368	- 711	.0169	- .0327	- 12.11	23.41
600	851	- 1525	.0779	- .1445	- 29.59	52.84
550+	-	-	-	-	-	-
550-	-	-	-	-	-	-
500	1674	- 2963	.2065	- .3592	- 65.72	103.68
400+	3328	- 4683	.4774	- .7545	-120.84	+168.95
400-	7138	- 8634	.4774	- .7545	+183.36	-104.93
300	8083	- 9136	1.2370	-1.6594	+104.69	- 70.04
196+	9703	-10543	2.1638	-2.7029	33.16	- 24.08
196-	13796	-12479	2.1638	-2.7029	297.34	-158.22
100	14652	-12907	3.5168	-3.9215	240.84	-136.56
60	15114	-13003	4.1121	-4.4396	219.63	-132.15
0	15724	-13050	5.0369	-5.2213	195.83	-130.31

* Page 4.10

** Page 4.24

FORM 361 B

PREPARED	NAME I.G. Wickman	DATE 10-13-52	LOCKHEED AIRCRAFT CORP.	PAGE 4.45
CHECKED	H.C. Spicer	10-13-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS OFF

OPERATING WEIGHT EMPTY + TAKE-OFF FUEL (MAX. ALT: GR. WT.)
FUEL IN TANKS
Inboard Tank . . . 1167.2 Gals.
Outboard Tank . . 1270.5 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * + Col.⑧ **	Col.⑨ * + Col.⑨ **	Col.⑩ * + Col.⑩ **	Col.⑪ * + Col.⑪ **	Col.⑫ * + Col.⑫ **	Col.⑬ * + Col.⑬ **
792	0	0	0	0	0	0
700	1261	- 2414	.0490	- .0940	- 32.02	61.38
600	3624	- 6374	.2858	- .5208	- 97.44	171.04
550+	-	-	-	-	-	-
550-	-	-	-	-	-	-
500	7137	-11557	.8152	- 1.3959	-204.93	323.51
400+	10376	-15239	1.7319	- 2.7752	-315.90	486.23
400-	14188	-19190	1.7319	- 2.7752	- 51.70	182.45
300	18103	-22590	3.2893	- 4.8152	-198.79	319.40
196+	23823	-26384	5.5151	- 7.3939	-427.19	461.66
196-	27636	-28320	5.5151	- 7.3939	-263.01	327.52
100	28752	-28748	8.2217	-10.1332	-219.51	349.18
60	29214	-28814	9.3810	-11.2850	-240.72	353.59
0	29814	-28891	11.1518	-13.0171	-264.52	355.43

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FORM 361 B

TORSION ABOUT LOAD AXIS DUE TO n_x
NYLON TANKS OFF

	INB'D. TANK		74.9 GALS.		382.6 GALS.		844.2 GALS.		1339.2 GALS.					
	OUTB'D. TANK		178.2 GALS.		485.8 GALS.		947.4 GALS.		1442.3 GALS.					
	OPER EMPTY WING		(A) RES. FUEL		(B) LANDING FUEL		(C) TAKE OFF FUEL		(D) CAPACITY FUEL		(A)	(B)	(C)	(D)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
WING STA.	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	$\frac{10^6 \Delta M_y}{n_x}$	$\frac{10^6 \Delta M_y}{n_x}$	$\frac{10^6 \Delta M_y}{n_x}$	$\frac{10^6 \Delta M_y}{n_x}$
y		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$	$[\Sigma(4)(5)]10^6$	$[\Sigma(6)(7)]10^6$	$[\Sigma(8)(9)]10^6$	$[\Sigma(10)(11)]10^6$
	LRB900		PG. 3.10		PG. 3.10		PG. 3.10		PG. 3.13		$+\Sigma(2)(3)]10^6$	$+\Sigma(2)(3)]10^6$	$+\Sigma(2)(3)]10^6$	$+\Sigma(2)(3)]10^6$
792	0	———	———	———	———	———	———	———	———	———	0	0	0	0
700	368.1	25.4	———	———	———	———	478	21.2	1195	24.6	.0093	.0093	.0195	.0387
600	482.9	22.3	———	———	455	15.9	1305	19.0	2260	22.5	.0204	.0277	.0553	.1006
550+	296.6	20.6	———	———	———	———	———	———	———	———	.0265	.0338	.0614	.1067
550-	0	———	———	———	———	———	———	———	———	———	.0265	.0338	.0614	.1067
500	296.5	19.2	400	10.6	1300	13.6	2270	16.6	3240	19.8	.0364	.0572	.1048	.1766
400+	673.5	17.2	758	8.8	1400	11.6	2105	14.7	2680	17.4	.0546	.0849	.1473	.2348
400-	3812.3	1.2	———	———	———	———	———	———	———	———	.0592	.0895	.1589	.2394
300	907.7	14.4	22	-2.1	807	2.0	2100	7.1	3490	12.5	.0723	.1042	.1799	.2960
220	875.5	11.8	465	-3.6	1680	0.2	3387	5.3	5215	10.5	.0809	.1149	.2081	.3611
196+	265.4	10.7	———	———	———	———	———	———	———	———	.0838	.1178	.2110	.3640
196-	3512.2	-6.3	———	———	———	———	———	———	———	———	.0578	.0918	.1851	.3381
100	1116.7	10.7	———	———	———	———	———	———	———	———	.0698	.1038	.1970	.3500
60	462.0	10.7	———	———	———	———	———	———	———	———	.0747	.1087	.2019	.3549
0	599.4	10.7	———	———	———	———	———	———	———	———	.0811	.1151	.2084	.3614

Z_{LA} = W.L. 262.8

Prepared: H.C. SPICER — Checked: J LEWALT — Approved:
NAME — DATE: 11-10-52, 3-6-53
TITLE: SECURITY INFORMATION LOCKHEED AIRCRAFT CORP.
Model C-130A — Report No. 9095 — Page — TEMP. — PERM. 4.46

UNIT PITCHING INERTIA ABOUT LOAD AXIS

CAPACITY FUEL - PYLON TANKS OFF + OPERATING WING EMPTY

FUEL IN TANKS
Inb'd Tank..1339.2 Gals.
Outb'd Tank.1442.3 Gals.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Wing Sta.	$\frac{\Delta y}{2}$	Panel Wt.	Δx_{LA}	Δz_{LA}	$\frac{W \Delta x_{LA}}{g}$	$\frac{W \Delta z_{LA}}{g}$	$\frac{S_{z_{LA}}}{\ddot{\theta}}$	$\frac{S_{x_{LA}}}{\ddot{\theta}}$	$10^{-6}\frac{M_{x_{LA}}}{\ddot{\theta}}$	$10^{-6}\frac{M_{z_{LA}}}{\ddot{\theta}}$	$10^{-6}\frac{M_{y_{LA}}}{\ddot{\theta}}$
y	$\frac{(1)_{n-1}-(1)_n}{2}$	See Below	See Below	See Below	$\frac{(3)(4)}{386}$	$\frac{(3)(5)}{386}$	$\Sigma(6)$	$-\Sigma(7)$	$10^{-6}\int(8)dy$	$-10^{-6}\int(9)dy$	$\Sigma[-(6)(4)+(7)(5)]10^{-6}$
792	--	--	--	--	0	0	0	0	0	0	0
700	46	1563	24.9	24.8	100	100	100	-100	.0046	.0046	0
600	50	2743	27.3	22.5	194	160	294	-260	.0243	.0226	-.0017
500	50	3833	30.4	19.8	302	197	596	-457	.0688	.0584	-.0070
400+	50	3354	34.0	17.3	+295	150	891	-607	.1432	.1116	-.0144
400-	0	3812	-69.3	1.2	-684	12	207	-619	.1432	.1116	-.0618
300	50	4398	37.3	12.9	+425	147	632	-766	.1851	.1809	-.0758
220	40	6090	39.0	10.7	615	169	1247	-935	.2603	.2489	-.0979
196+	12	265	46.4	10.7	+ 32	+ 7	1279	-942	.2906	.2715	-.0994
196-	0	3812	-69.3	- 6.8	-684	- 67	595	-875	.2906	.2715	-.1463
100	48	1117	50.6	10.7	+146	+ 31	741	-906	.3547	.3570	-.1534
60	20	462	45.9	10.7	55	13	796	-919	.3854	.3935	-.1557
0	30	599	39.7	10.7	62	17	858	-936	.4351	.4491	-.1580

(3) = (2) (Pg. 4.10) + (2) (Pg. 4.23)

(4) = [(2)(6) (Pg. 4.10) + (2)(6) (Pg. 4.23)] ÷ (3)

(5) = [(2)(3) + (10)(11)] (Pg. 4.46) ÷ (3)

FORM 361 B

UNIT INERTIA TORSION DUE TO YAWING ACCELERATION

OPERATING WING EMPTY + TAKE OFF FUEL (DESIGN GROSS WT.) PYLON TANKS OFF

$$\frac{M_{y_{LA}}}{\ddot{\psi}} = \frac{S_x}{\ddot{\psi}}\bar{z} = -\frac{S_z}{\rho}\bar{z}$$

FUEL IN TANKS
INB'D. TANK 844.2 GALS.
OUTB'D. TANK 947.4 GALS.

	OPERATING WING EMPTY				TAKE OFF FUEL				TOTAL
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
WING STATION	$-\frac{S_z}{\rho}$	$-\Delta\frac{S_z}{\rho}$	$\Delta\bar{z}_{LA}$	$\frac{10^{-6}M_{y_{LA}}}{\ddot{\psi}}$	$-\frac{S_z}{\rho}$	$-\Delta\frac{S_z}{\rho}$	$\Delta\bar{z}_{LA}$	$\frac{10^{-6}M_{y_{LA}}}{\ddot{\psi}}$	$\frac{10^{-6}M_{y_{LA}}}{\ddot{\psi}}$
y	$-$ (9) PG. 4.10	(2)$_n$ − (2)$_{n-1}$	(3) PG. 4.46	$10^{-6}\sum$ (3)(4)	$-$ (9) PG. 4.22	(6)$_n$ − (6)$_{n-1}$	(9) PG. 4.46	$10^{-6}\sum$ (7)(8)	(5) + (9)
792	—	—	—	—	—	—	—	—	—
700	711	711	25.4	.0181	908	908	21.2	.0192	.0373
600	1525	814	22.8	.0366	3085	2177	19.0	.0606	.0972
500	2370	845	19.9	.0534	6296	3211	16.6	.1139	.1673
400$^+$	3155	785	17.2	.0669	8837	2541	14.7	.1513	.2182
400$^-$	7106	3951	1.2	.0717	8837	0	—	.1513	.2230
300	7928	822	14.4	.0835	10638	1801	7.1	.1641	.2476
220	8518	590	11.8	.0905	12902	2264	5.3	.1761	.2666
196$^+$	8661	143	10.7	.0920	↕	0	—	.1761	.2681
196$^-$	10597	1936	-6.8	.0788	↕	0	—	.1761	.2549
100	11025	428	10.7	.0834	↕	0	—	1761	.2595
60	11121	96	10.7	.0844	↕	0	—	.1761	.2605
0	11168	47	10.7	.0850	12902	0	—	.1761	.2611

Prepared: J. LEWOLT | Checked: I. WICKMAN | Approved:
DATE: 11-26-52 | 11-26-52
TITLE: LOCKHEED AIRCRAFT CORP.
Report No. 9095 | Model C-130A | Page | TEMP. | PERM. 4.48

FORM 8562-1

RESTRICTED SECURITY INFORMATION

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS ON

OPERATING WEIGHT EMPTY + MINIMUM RESERVE FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank . . . 0 Gals.
Pylon Tank . . . 260.8 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * + Col.⑧ **	Col.⑨ * + Col.⑨ **	Col.⑩ * + Col.⑩ **	Col.⑪ * + Col.⑪ **	Col.⑫ * + Col.⑫ **	Col.⑬ * + Col.⑬ **
792	0	0	0	0	0	0
700	368	-711	.0169	-.0327	-12.11	23.41
600	851	-1525	.0779	-.1445	-29.59	52.84
550+	1148	-1966	.1279	-.2318	-40.86	69.63
550-	3543	-5379	.1279	-.2318	-75.24	118.61
500	3839	-5782	.3125	-.5109	-87.07	134.71
400+	4513	-6567	.7300	-1.1282	-116.98	+169.57
400-	8325	-10518	.7300	-1.1282	+147.22	-104.21
300	9233	-11341	1.6080	-2.2213	110.18	-70.63
196+	10373	-12074	2.6273	-3.4401	60.40	-38.75
196-	14186	-14009	2.6273	-3.4401	324.58	-172.90
100	15302	-14437	4.0428	-4.8056	268.08	-151.23
60	15764	-14533	4.6641	-5.3850	246.87	-146.83
0	16364	-14580	5.6278	-6.2583	223.07	-144.98

* Page 4.11

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FORM 361 B

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS ON

OPERATING WEIGHT EMPTY + LANDING FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank . . . 0 Gals.
Pylon Tank . . .760.8 Gals.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.(8) * Col.(8)+ **	Col.(9) * Col.(9)+ **	Col.(10) * Col.(10)+ **	Col.(11) * Col.(11)+ **	Col.(12) * Col.(12)+ **	Col.(13) * Col.(13)+ **
792	0	0	0	0	0	0
700	368	-711	.0169	-.0327	-12.11	23.41
600	851	-1525	.0779	-.1445	-29.59	52.84
550+	1148	-1966	.1279	-.2318	-40.86	69.63
550-	6793	-10010	.1279	-.2318	-99.12	152.64
500	7089	-10413	.4749	-.7424	-110.95	168.74
400+	7763	-11198	1.2176	-1.8229	-140.86	+203.60
400-	11575	-15149	1.2176	-1.8229	+123.34	-70.18
300	12483	-15972	2.4204	-3.3790	86.30	-36.60
196+	13623	-16705	3.7778	-5.0795	36.52	-4.72
196-	17436	-18640	3.7778	-5.0795	300.70	-138.87
100	18552	-19068	5.5052	-6.8895	244.20	-117.20
60	19014	-19164	6.2565	-7.6541	222.99	-112.80
0	19614	-19211	7.4154	-8.8054	199.19	-110.95

* Page 4.11

** Page 4.31

FORM 361 B

PREPARED	NAME I.Wickman	DATE 10-27-52	LOCKHEED AIRCRAFT CORP.	PAGE 4.62
CHECKED	D. Bakalar	10-27-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS ON

OPERATING WEIGHT EMPTY + TAKE OFF FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS
Inboard Tank . . . 283.8 Gals.
Pylon Tank . . . 1400.0 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * + Col.⑧ **	Col.⑨ * + Col.⑨ **	Col.⑩ * + Col.⑩ **	Col.⑪ * + Col.⑪ **	Col.⑫ * + Col.⑫ **	Col.⑬ * + Col.⑬ **
792	0	0	0	0	0	0
700	368	-711	.0169	-.0327	-12.11	23.41
600	851	-1525	.0779	-.1445	-29.59	52.84
550+	1148	-1966	.1279	-.2318	-40.86	69.63
550-	10948	-15930	.1279	-.2318	-137.11	206.77
500	11244	-16333	.6827	-1.0384	-148.94	222.87
400+	11918	-17118	1.8408	-2.7109	-178.85	+257.73
400-	15730	-21069	1.8408	-2.7109	+85.35	-16.05
300	17168	-22342	3.4740	-4.8716	+27.64	+35.08
196+	19623	-23947	5.3976	-7.2869	-75.27	+102.19
196-	23436	-25882	5.3976	-7.2869	+188.91	-31.96
100	24552	-26310	7.7010	-9.7921	132.41	-10.29
60	25014	-26406	8.6923	-10.8465	111.20	-5.89
0	25614	-26453	10.2111	-12.4322	87.40	-4.04

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** Page 4.32

FORM 361 B

SUMMARY SHEET
UNIT INERTIA SHEARS, MOMENTS, AND TORSIONS

PYLON TANKS ON

OPERATING WEIGHT EMPTY + CAPACITY FUEL (DESIGN GROSS WEIGHT)

FUEL IN TANKS

Inbcard Tank . . . 1339.2 Gals.
Pylon Tank . . . 1400.0 Gals.

①	②	③	④	⑤	⑥	⑦
WING STATION	$\frac{S_z}{n_z}$	$\frac{S_z}{\dot{p}}$	$\frac{10^{-6} M_x}{n_z}$	$\frac{10^{-6} M_x}{\dot{p}}$	$\frac{10^{-3} M_y}{n_z}$	$\frac{10^{-3} M_y}{\dot{p}}$
	Col.⑧ * + Col.⑧ **	Col.⑨ * + Col.⑨ **	Col.⑩ * + Col.⑩ **	Col.⑪ * + Col.⑪ **	Col.⑫ * + Col.⑫ **	Col.⑬ * + Col.⑬ **
792	0	0	0	0	0	0
700	368	-711	.0169	-.0327	-12.11	23.41
600	851	-1525	.0779	-.1445	-29.59	52.84
550+	1148	-1966	.1279	-.2318	-40.86	69.63
550-	9948	-15930	.1279	-.2318	-137.11	235.77
500	11244	-16333	.6827	-1.0381	-148.94	222.87
400+	11918	-17118	1.8408	-2.7110	-178.85	+257.73
400-	15730	-21069	1.8408	-2.7110	+ 85.35	-16.05
300	20128	-24885	3.5672	-4.9515	- 78.73	+126.47
196+	26483	-29104	6.0433	-7.7952	-328.76	292.21
196-	30296	-31039	6.0433	-7.7952	-64.58	158.06
100	31412	-31467	9.0050	-10.7958	-121.08	179.73
60	31874	-31563	10.2705	-12.0566	-142.29	184.13
0	32474	-31610	12.2016	-13.9511	-166.09	185.98

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FORM 361 B

TORSION ABOUT LOAD AXIS DUE TO n_x

PYLON TANKS ON

	INB'D TANK	0 GALS	0 GALS.	283.8 GALS.	1339.2 GALS.
	PYLON TANK	260.8 GALS.	760.8 GALS.	1400.0 GALS.	1400.0 GALS.
	OPER EMPTY WING	(A) RES FUEL	(B) LANDING FUEL	(C) TAKE OFF FUEL	(D) CAPACITY FUEL

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(A) (12)	(B) (13)	(C) (14)	(D) (15)
WING STA.	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	PANEL WT	ΔZ_{LA}	$10^5 \Delta M_y / n_x$	$10^5 \Delta M_y / n_x$	$10^5 \Delta M_y / n_x$	$10^5 \Delta M_y / n_x$
y		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$		PANEL $Z_{CG} - Z_{LA}$	$\Sigma[(4)(6) + (2)(3)]10^5$	$\Sigma[(6)(7) + (2)(3)]10^5$	$\Sigma[(8)(9) + (2)(3)]10^5$	$\Sigma[(10)(11) + (2)(3)]10^5$
	LR 87[illegible]0		PG. 3.12		PG. 3.12		PG. 3.12		PG. 3.13					
722	0	———	———	———	———	———	———	———	———	———	0	0	0	0
700	358.1	25.4	———	———	———	———	———	———	———	———	.0093	.0093	.0093	.0093
600	4[illegible]2.9	22.6	———	———	———	———	———	———	———	———	.0204	.0204	.0204	.0204
550+	2[illegible]6.6	20.6	———	———	———	———	———	———	———	———	+.0265	+.0265	+.0265	+.0265
550-	7000	-36.—	1695	-52.7	4945	-44.2	9100	-36.6	9100	-36.6	-.0882	-.2174	-.3320	-.3319
500	2965	19.4	———	———	———	———	———	———	———	———	-.0825	-.2118	-.3263	-.3262
400+	6734	17.2	———	———	———	———	———	———	———	———	-.0709	-.2002	-.3147	-.3147
400-	3512.3	1.2	———	———	———	———	———	———	———	———	-.0663	-.1956	-.3101	-.3101
300	9077	1.4	———	———	———	———	530	0.8	3490	12.5	-.0532	-.1825	-.2965	-.2534
220	8755	11.8	———	———	———	———	1315	-0.9	5215	10.5	-.0429	-.1722	-.2874	-.1883
193+	2354	10.7	———	———	———	———	———	———	———	———	-.0401	-.1694	-.2846	-.1855
193-	3512.2	-6.8	———	———	———	———	———	———	———	———	-.0660	-.1953	-.3105	-.2115
100	1113.7	10.7	———	———	———	———	———	———	———	———	-.0541	-.1834	-.2986	-.1995
60	462.0	10.7	———	———	———	———	———	———	———	———	-.0491	-.1784	-.2936	-.1945
0	593.4	10.7	———	———	———	———	———	———	———	———	-.0427	-.1720	-.2872	-.1881

$Z_{LA} = 262.8$

Prepared: H.C. SPICER — Checked: J LEWOLT — Approved:
NAME — DATE: 11-10-52, 3-6-53
TITLE: LOCKHEED AIRCRAFT CORP.
Model C-130A — Report No. 9025 — Page — TEMP. — PERM. 4.64

FORM 3018

UNIT PITCHING INERTIA ABOUT LOAD AXIS

CAPACITY FUEL - PYLON TANKS ON + OPERATING WING EMPTY

FUEL IN TANKS
Inb'd Tank 1339.2 Gals.
Pylon Tank 1400.0 Gals.

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
Wing Sta.	$\frac{\Delta Y}{2}$	Panel Wt.	ΔX_{LA}	ΔZ_{LA}	$\frac{W \Delta X_{LA}}{g}$	$\frac{W \Delta Z_{LA}}{g}$	$\frac{S_{Z_{LA}}}{\ddot{\theta}}$	$\frac{S_{X_{LA}}}{\ddot{\theta}}$	$10^{-6} \frac{M_{X_{LA}}}{\ddot{\theta}}$	$10^{-6} \frac{M_{Z_{LA}}}{\ddot{\theta}}$	$10^{-6} \frac{M_{y_{LA}}}{\ddot{\theta}}$
y	$\frac{①_{n-1} - ①_n}{2}$	See Below	See Below	See Below	$\frac{③④}{386}$	$\frac{③⑤}{386}$	$\Sigma ⑥$	$-\Sigma ⑦$	$10^{-6} \int ⑧ dy$	$-10^{-6} \int ⑨ dy$	$\Sigma[-⑥④ + ⑦⑤]10^{-6}$
772	--	--	--	--	0	0	0	0	0	0	0
700	46	368	32.9	25.4	31	24	31	- 24	.0014	+.0011	-.0004
600	50	483	36.2	22.8	45	29	76	- 53	.0068	.0050	-.0014
550+	25	297	38.0	20.6	29	16	105	- 69	.0113	+.0080	-.0022
550-	0	9800	9.8	-35.6	249	-929	354	+860	.0113	+.0080	+.0294
500	25	296	39.9	19.2	31	15	385	845	.0298	-.0346	.0285
450+	50	574	44.4	17.2	78	30	+463	815	.0722	-.1176	+.0255
400-	0	3812	-69.3	1.2	-684	12	-221	803	.0722	-.1176	-.0219
300	50	4398	37.3	12.9	425	147	+204	.656	.0713	-.1906	-.0358
196+	12	265	46.4	10.7	32	7	851	480	.1323	-.2479	-.0594
196-	0	3812	-69.3	- 6.8	-684	- 67	167	547	.1323	-.2479	-.1064
100	48	1117	50.6	10.7	146	31	313	516	.1553	-.2989	-.1134
50	20	462	45.9	10.7	55	13	368	503	.1689	-.3193	-.1158
0	30	599	39.7	10.7	62	17	430	486	.1929	-.3490	-.1181

③ = ② (Pg. 4.11) + ② (Pg. 4.33)

④ = [② ⑥ (Pg. 4.11) + ② ⑥ (Pg. 4.33)] ÷ ③

⑤ = [② ③ + ⑩ ⑪] (Pg. 4.64) ÷ ③

PREPARED	NAME H.C. Spicer	PAGE 4.65	
CHECKED	H. Kraus	DATE 11-20-52	
APPROVED		DATE 11-21-52	
TITLE:	LOCKHEED AIRCRAFT CORP.	MODEL C-130A	
		REPORT NO. 9095	

RESTRICTED SECURITY INFORMATION

PREPARED	NAME H. Kraus	DATE 10-9-52	LOCKHEED AIRCRAFT CORP.	PAGE 4.70
CHECKED	I. Wickman	10-9-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

UNIT INERTIA DATA - OPERATING WEIGHT - FUSELAGE FOREBODY

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Fus. Sta.	$\frac{\Delta X}{2}$	X_{cg} Panel	$(517-X_{cg})$	ΔW	$\frac{\Delta W}{g}(517-X_{cg})$	$\frac{S_z}{n_z}$	$10^{-6}\frac{M_y}{n_z}$	$\frac{S_z}{\ddot{\theta}}$	$10^{-6}\frac{M_y}{\ddot{\theta}}$
$\frac{①_n - ①_{n-1}}{2}$		$①_{n-1} + ②_n$	517.0 - ③	LR8900	$\frac{④⑤}{386}$	$\sum ⑤$	$10^{-6}\int ⑦\,dx$	$\sum ⑧$	$10^{-6}\int ⑨\,dx$
75	38.0	37	480	10.0	12.4	- 10	- .000	12	.000
125	25.0	100	417	1260.9	1362.2	- 1271	- .032	1375	.035
171	23.0	148	369	2453.5	2345.4	- 3724	- .147	3720	.152
200	12.5	185	332	1363.3	1172.6	- 5088	- .275	4893	.277
245	22.5	223	294	1421.5	1082.7	- 6509	- .536	5975	.533
309	27.5	272	245	1364.5	866.1	- 7874	- 932	6811	.874
337	18.5	319	198	1383.4	709.6	- 9257	- 1.248	7551	1.180
400	31.5	368	149	1436.6	565.0	- 10721	- 1.678	8116	1.731
457	28.5	428	89	1452.0	334.8	- 12173	- 2.530	8451	2.136
517	30.0	487	30	2952.1	229.4	- 15125	- 3.349	8680	2.620

X_{LA} = F.S 517

FORM 361 B

PREPARED	NAME H. Kraus	DATE 10-9-52	LOCKHEED AIRCRAFT CORP.	PAGE 4.71
CHECKED	I. Wickman	10-9-52	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

UNIT INERTIA DATA - OPERATING WEIGHT - FUSELAGE AFTBODY

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
Fus. Sta.	$\frac{\Delta X}{2}$	X_{cg} Panel	$(X_{cg}-517)$	ΔW	$\frac{\Delta W}{g}(X-517)$	$\frac{S_z}{n_z}$	$10^{-6}\frac{M_y}{n_z}$	$\frac{S_z}{\ddot{\theta}}$	$10^{-6}\frac{M_y}{\ddot{\theta}}$
$\frac{①_{n-1}-③_n}{2}$		① + ②	③ - 517.0	LR8900	$\frac{④ ⑤}{386}$	$\sum ⑤$	$-10^{-6}\int ⑦ dx$	$\sum ⑥$	$-10^{-6}\int ⑨ dx$
1041	38.3	1079.3	562.3	3162.5	4606.9	3162	- .121	4607	- .176
1000	20.5	1020	503	639.7	833.6	3802	- .264	5441	- .382
950	25.0	975	458	488.2	579.3	4290	- .466	6020	- .669
875	37.5	912	395	717.5	734.2	5008	- .815	6754	- 1.148
800	37.5	837	320	1203.3	997.6	6211	- 1.236	7752	- 1.692
737	31.5	768	251	1019.7	663.1	7231	- 1.659	8415	- 2.201
682	37.5	720	193	1312.3	556.0	8543	- 2.093	9071	- 2.682
627	37.5	684	237	1141.0	606.0	9687	- 2.594	9477	- 3.199
597	15.0	612	95	1204.9	296.6	10892	- 2.903	9773	- 3.461
517	37.9	547	30	5755.1	447.4	16648	- 3.947	10221	- 4.239

X_{LA} = F.S 517

FORM 361 B

	NAME	DATE	LOCKHEED AIRCRAFT CORP.		TEMP.	PERM.
Prepared	J. LEWOLT	3-19-53		Page		4.80
Checked	I. WICKMAN	3-19-53	TITLE	Model	C-130A	
Approved				Report No.	9095	

SAMPLE CALCULATIONS - CARGO UNIT INERTIA DATA CARGO DA 2 (PG. 4.92) & MOMENTS OF INERTIA

FOREBODY

X_{LA} = F.S. 517

① Fus. Sta.	② $\frac{\Delta X}{2}$	③ CG Panel	④	⑤ ΔW	⑥ $\frac{\Delta W}{g}(X)_{ARM}$	⑦ $\frac{S_z}{n_z}$	⑧ $\frac{10^{-6} M_Y}{n_z}$	⑨ $\frac{S_z}{\ddot{\theta}}$	⑩ $\frac{10^{-6} M_Y}{\ddot{\theta}}$
$\frac{①_n - ①_{n-1}}{2}$		$①_{n-1} + ②_n$	517 − ③	PG. 4.92	$\frac{④⑤}{386}$	$-\sum ⑤$	$10^{-6}\int ⑦\,dx$	$\sum ⑥$	$10^{-6}\int ⑨\,dx$
245	—	—	—	—	—	0	0	0	0
300	27.50	272.5	244.5	4583	29030	-4583	-.126	2903	.080
337	18.50	318.5	198.5	3083	1585.4	-7666	-.353	4488	.217
400	31.50	368.5	148.5	5250	2019.8	-12916	-1.001	6508	.563
420.5	10.25	410.2	106.8	1713	473.7	-14629	-1283	6982	.701
457	18.25	438.8	78.2	0	0	-14629	-1.817	6982	.956
517	30.00	487.0	30.0	0	0	-14629	-2.695	6982	1.375

AFTBODY

$\frac{①_n - ①_{n-1}}{2}$		① + ②	③ − 517	PG. 4.92	$\frac{④⑤}{386}$	$\sum ⑤$	$-10^{-6}\int ⑦\,dx$	$\sum ⑥$	$-10^{-6}\int ⑨\,dx$
709.5	13.75	723.2	206.2	2292	12247	2292	−.032	1225	−.017
682	13.75	695.8	178.8	2292	1061.4	4584	-.126	2286	-.065
654.5	13.75	668.2	151.2	2292	893.1	6876	-.284	3184	-.140
627	13.75	640.8	123.8	2291	734.5	9167	-.504	3919	-.238
622.2	2.40	624.6	107.6	1204	3.[illegible]	10371	-.551	4254	-.258
597	12.60	609.6	92.6	0	0	10371	-.812	4254	-.355
517	40.00	557.0	40.0	0	0	10371	-1.642	4254	-.705

MOMENT OF INERTIA

$$10^{-6} I_{YY_0} = 10^{-6} I_{ZZ_0} = \left[\frac{10^{-6} M_Y}{\ddot{\theta}}\right]_{517}^{FB} + \left[\frac{10^{-6} M_Y}{\ddot{\theta}}\right]_{517}^{AB} - \frac{10^{-6} W(\Delta x)^2}{386}$$

$W = 25{,}000\#$; $X_{C.G.} = 474.9$

$$10^{-6} I_{YY_0} = 10^{-6} I_{ZZ_0} = 1.375 + .705 - \frac{10^{-6}(25000)(517-474.9)^2}{386}$$

$10^{-6} I_{YY_0} = 10^{-6} I_{ZZ_0} = 1.375 + .705 - .115 = 1.965$ SLUG-FT-IN.

$10^{-6} I_{XX_0} = \frac{M(a^2+b^2)}{12}(10^{-6}) = 10^{-6} W(3.637) = .091$ SLUG-FT-IN.

WHERE $\begin{cases} a = 6 \text{ FT} \\ b = 9 \text{ FT} \end{cases}$ FOR ALL CARGOS

RESTRICTED SECURITY INFORMATION

FORM 8362-1

PREPARED	NAME A. Ignatowski	DATE 2-19-53	LOCKHEED AIRCRAFT CORP.	PAGE 4.90
CHECKED	J. Lewoit	2-19-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

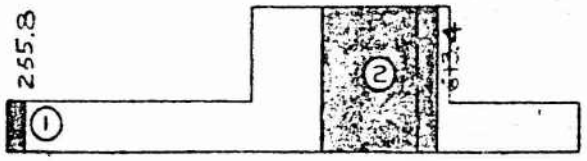
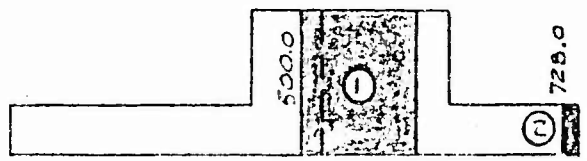
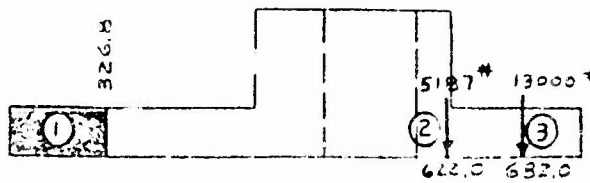
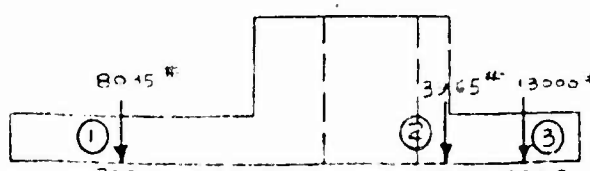
SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	S_z/n_z	10^{-6} M_y/n_z	$S_z/\ddot{\theta}$	10^{-6} $M_y/\ddot{\theta}$
245			457 517 597 627	737					
					300	0	0	0	0
					337	0	0	0	0
					400	0	0	0	0
					457	0	0	0	0
					517	-9375	-.176	455	.011
						10^{-6} I_{yy_o} = .115 Slug - Ft.-In.			
AS 1					682	0	0	0	0
					627	0	0	0	0
	1	32800	545.1	17.8793	597	3425	-.023	770	-.005
	Σ	32800	545.1	17.8793					
					300	-3307	-.1162	2160	.0759
					337	↕	-.2386	↕	.1558
					400	↕	-.4469	↕	.2919
					457	↕	-.6354	↕	.4150
					517	-3307	-.8339	2160	.5446
						10^{-6} I_{yy_o} = .834 Slug - Ft.-In.			
AS 2	1	3307	264.8	.8757	682	0	0	0	0
	2	27500	572.0	15.7300	627	1993	-.024	630	-.008
	3	1993	639.0	1.2735	597	9493	-.196	2476	-.054
	Σ	32800	545.1	17.8792					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-8133	-.864	4703	.512
					457	-8133	-1.327	4703	.780
					517	-8133	-1.815	4703	1.063
						10^{-6} I_{yy_o} = 1.925 Slug- Ft.-In.			
AS 3	1	8133	293.8	2.3895	682	4584	-.126	2286	-.065
	2	15500	596.0	9.2380	627	9167	-.504	3919	-.238
	3	9167	682.0	6.2519	597	16667	-.892	5765	-.383
	Σ	32800	545.1	17.8794					
					300	0	0	0	0
					337	0	0	0	0
					400	0	0	0	0
					457	0	0	0	0
					517	-3250	.021	55	.0004
						10^{-6} I_{yy_o} = .050 Slug- Ft.-In.			
BS 2					682	0	0	0	0
					627	0	0	0	0
	1	25000	554.0	13.8500	597	1750	-.006	379	-.001
	Σ	25000	554.0	13.8500					

FORM 331 B

PREPARED	NAME A. Ignatowski	DATE 2-19-53	LOCKHEED AIRCRAFT CORP.	PAGE 4.91
CHECKED	J. Lewolt	2-19-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

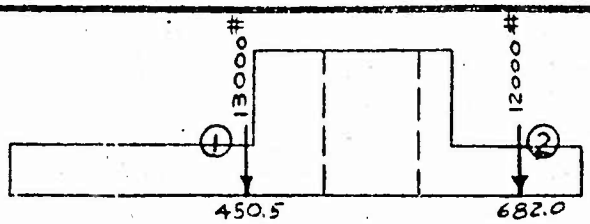
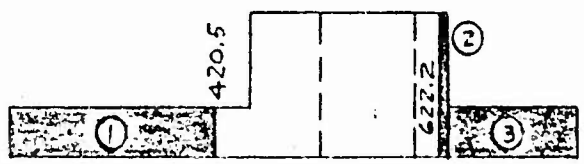
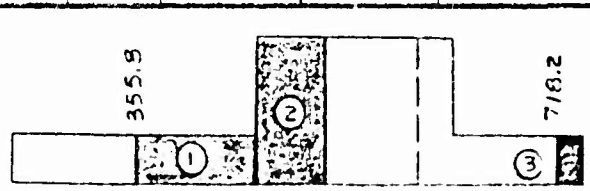
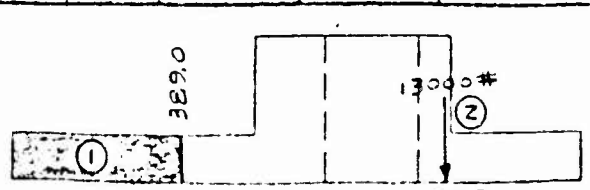
SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	S_z / n_z	10^{-6} M_y / n_z	S_z / $\ddot{\theta}$	10^{-6} M_y / $\ddot{\theta}$
245			457 517 597 627	737					
					300	-890	-.044	615	.031
					337		-.077		.053
					400		-.133		.092
					457		-.184		.127
					517	-890	-.237	615	.164
						10^{-6} I_{yyo} = .265 Slug - Ft.-In.			
BS 3	1	890	250.4	.2229	682	0	0	0	0
	2	24110	565.2	13.6270	627	0	0	0	0
	Σ	25000	554.0	13.8499	597	4110	-.034	939	-.008
					300	0	0	0	0
					337	0	0	0	0
					400	0	0	0	0
					457	0	0	0	0
					517	-4253	-.036	94	.001
						10^{-6} I_{yyo} = .109 Slug - Ft.-In.			
BS 4	1	24253	548.5	13.3028	682	747	-.038	417	-.021
	2	747	732.5	.5472	627	747	-.079	417	-.044
	Σ	25000	554.0	13.8500	597	747	-.101	417	-.057
					300	-4583	-.126	2903	.080
					337	-6813	-.348	4079	.215
					400	-6813	-.777	4079	.477
					457	-6813	-1.166	4079	.704
					517	-6813	-1.575	4079	.949
						10^{-6} I_{yyo} = 1.885 Slug - Ft.-In.			
CS 1	1	6813	285.9	1.9478	682	13000	0	5557	0
	2	5187	622.0	3.2263	627	13000	-.715	5557	-.306
	3	13000	682.0	8.8660	597	18187	-1.235	6968	-.508
	Σ	25000	561.6	14.0401					
					300				
					337	-8035	0	3747	0
					400	-8035	-.506	3747	.236
					457	-8035	-.964	3747	.450
					517	-8035	-1.446	3747	.674
						10^{-6} I_{yyo} = 1.575 Slug- Ft.-In.			
CS 2	1	8035	337.0	2.7078	682	13000	0	5557	0
	2	3965	622.0	2.4662	627	13000	-.715	5557	-.306
	3	13000	682.0	8.8660	597	16965	-1.204	6636	-.499
	Σ	25000	561.6	14.0400					

FORM 361 B

PREPARED	NAME A. Ignatowski	DATE 2-23-53	LOCKHEED AIRCRAFT CORP.	PAGE 4.92
CHECKED	J. Lewolt	2-23-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	S_z / n_z	10^{-6} M_y / n_z	S_z / $\ddot{\theta}$	10^{-6} M_y / $\ddot{\theta}$
245			457 517	597 627 737					
					300	0	0	0	0
					337	0	0	0	0
					400	0	0	0	0
					457	-13000	-.0845	2240	.0146
					517	-13000	-.8645	2240	.1489
						10^{-6} I_{yy_o} = .866 Slug - Ft.-In.			
C2 4	1	13000	450.5	5.8560	682	12000	0	5130	0
	2	12000	682.0	8.1840	627	12000	-.660	5130	-.282
	Σ	25000	561.6	14.0400	597	12000	-1.020	5130	-.436
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12916	-1.001	6508	.563
					457	-14629	-1.817	6982	.956
					517	-14629	-2.695	6982	1.375
						10^{-6} I_{yy_o} = 1.965 Slug - Ft.-In.			
DA 2	1	14629	332.8	4.8685	682	4584	-.126	2286	-.065
	2	1204	624.6	.7520	627	9167	-.504	3919	-.238
	3	9167	682.0	6.2519	597	10371	-.812	4254	-.365
	Σ	25000	474.9	11.8724					
					300	0	0	0	0
					337	0	0	0	0
					400	-3682	-.081	1327	.029
					457	-8432	-.427	2416	.138
					517	-23432	-1.383	3582	.327
						10^{-6} I_{yy_o} = .392 Slug - Ft. In.			
DA 4	1	8432	406.4	3.4267	682	1563	-.072	855	-.039
	2	15000	487.0	7.3050	627	1568	-.158	855	-.086
	3	1568	727.6	1.1409	597	1568	-.205	855	-.112
	Σ	25000	474.9	11.8726					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12000	-.996	6217	.563
					457	-12000	-1.630	6217	.918
					517	-12000	-2.400	6217	1.291
						10^{-6} I_{yy_o} = 1.538 Slug - Ft. In.			
DA 6	1	12000	317.0	3.8040	682	0	0	0	0
	2	13000	620.7	8.0691	627	0	0	0	0
	Σ	25000	474.9	11.8731	597	13000	- .308	3493	-.083

FORM 361 B

PREPARED	NAME A. Ignatowski	DATE 2-23-53	LOCKHEED AIRCRAFT CORP.	PAGE 4.94
CHECKED	I. Wickman	2-23-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	$\frac{S_z}{n_z}$	$\frac{10^{-6} M_y}{n_z}$	$\frac{S_z}{\ddot{\theta}}$	$\frac{10^{-6} M_y}{\ddot{\theta}}$
245			457 517 597 627	737					
					300 337 400 457 517	NO CARGO IN FOREBODY			
						10^{-6} I_{yy_o} = .003 Slug - Ft.-In.			
E 2	1	4810	708.2	3.4064	682	4584	-.126	2286	-.065
	1	4810	708.2	3.4064	627	4810	-.390	2382	-.196
	Σ	4810	708.2	3.4064	597	4810	-.535	2382	-.267
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-8333	-.875	4793	.517
					457	-8333	-1.350	4793	.791
					517	-8333	-1.850	4793	1.078
						10^{-6} I_{yy_o} = 1.907 Slug - Ft.-In.			
S 1	1	8333	295.0	2.4582	682	4584	-.126	2286	-.065
	2	7500	612.0	4.5900	627	9167	-.504	3919	-.238
	3	9167	682.0	6.2519	597	16667	-.892	5765	-.383
	Σ	25000	532.0	13.3001					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12000	-.996	6217	.5[illegible]
					457	-12000	-1.680	6217	.918
					517	-12000	-2.400	6217	1.291
						10^{-6} I_{yy_o} = 2.201 Slug - Ft -In.			
S 2	1	12000	317.0	3.8040	682	13000	0	5557	0
	2	13000	682.0	8.8660	627	13000	-.715	5557	-.306
	Σ	25000	506.8	12.6700	597	13000	-1.105	5557	-.472
					300	0	0	0	0
					337	-13000	0	6062	0
					400	-13000	-.819	6062	.382
					457	-13000	-1.560	6062	.727
					517	-13000	-2.340	6062	1.091
						10^{-6} I_{yy_o} = 1.924 Slug - Ft -In.			
S 4	1	13000	337.0	4.3810	682	12000	0	5130	0
	2	12000	682.0	8.1840	627	12000	-.660	5130	-.282
	Σ	25000	502.6	12.5650	597	12000	-1.020	5130	-.436

FORM 381 B

PREPARED	NAME A. Ignatowski	DATE 2-23-53	LOCKHEED AIRCRAFT CORP.	PAGE 4.95
CHECKED	I. Wickman	2-23-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	S_z / n_z	10^{-6} M_y / n_z	S_z / $\ddot{\theta}$	10^{-6} M_y / $\ddot{\theta}$
245			457 517 597 627	737					
					300	0	0	0	0
					337	0	0	0	0
					400	-13000	-.084	4159	.027
					457	-13000	-.826	4159	.264
					517	-13000	-1.606	4159	.514
						10^{-6} I_{yy_o} = 1.345 Slug - Ft.-In.			
S 5	1	13000	393.5	5.1160	682	12000	0	5130	0
	2	12000	682.0	8.1840	627	12000	-.660	5130	-.282
	Σ	25000	532.0	13.3000	597	12000	-1.020	5130	-.436
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12553	-1.000	6396	.564
					457	-12553	-1.716	6396	.928
					517	-12553	-2.469	6396	1.312
						10^{-6} I_{yy_o} = 2.032 Slug - Ft.-In.			
TEA 1	1	12553	320.3	4.0207	682	4584	-.126	2286	-.065
	2	3280	620.4	2.0349	627	9167	-.504	3919	-.238
	3	9167	682.0	6.2519	597	12447	-.856	4798	-.376
	Σ	25000	492.3	12.3075					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12916	-1.001	6508	.563
					457	-13270	-1.757	6613	.940
					517	-13270	-2.553	6613	1.336
						10^{-6} I_{yy_o} = 2.123 Slug - Ft.-In.			
TEA 2	1	[illegible]	317.0	3.8040	682	11730	0	5014	0
	2	1270	396.5	.5037	627	11730	.645	5014	-.276
	3	11730	682.0	7.9999	597	11730	-.997	5014	-.426
	Σ	25000	492.3	12.3076					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12000	-.996	6217	.563
					457	-12000	-1.680	6217	.918
					517	-12000	-2.400	6217	1.291
						10^{-6} I_{yy_o} = 1.884 Slug - Ft.-In.			
TEA 3	1	12000	317.0	3.8040	682	0	0	0	0
	2	13000	654.1	8.5033	627	13000	-.352	4617	-.125
	Σ	25000	492.3	12.3073	597	13000	-.742	4617	-.264

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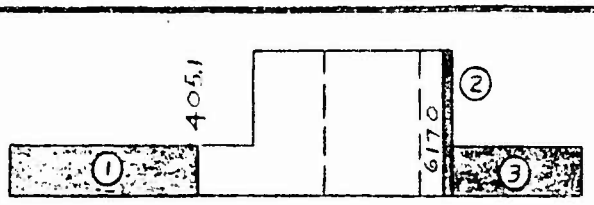
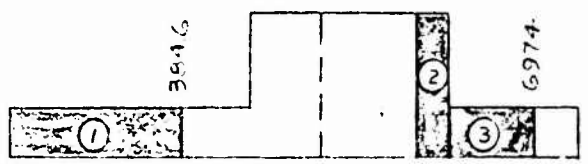
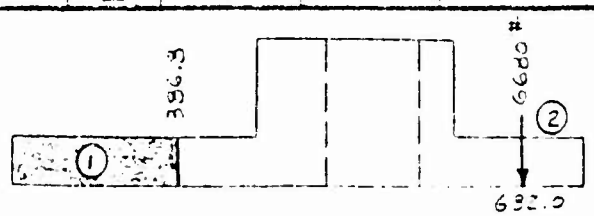
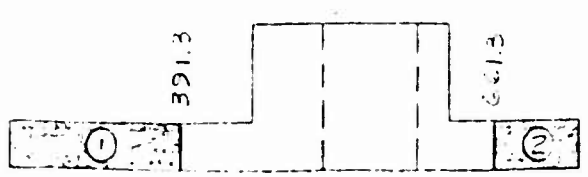
SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	S_z/n_z	10^{-6} M_y/n_z	$S_z/\ddot{\theta}$	10^{-6} $M_y/\ddot{\theta}$
245			457 517	597 627 737					
					300	-4583	-.126	2903	.080
					337	-4649	-.298	2940	.189
					400	-4649	-.591	2940	.374
					457	-4649	-.856	2940	.541
					517	-4649	-1.135	2940	.718
						10^{-6} I_{yy_o} = 1.422 Slug - Ft.-In.			
TBE 1	1	4649	272.9	1.2687	682	4584	-.126	2286	-.065
	2	11184	604.6	6.7618	627	9167	-.504	3919	-.238
	3	9167	682.0	6.2519	597	16667	-.892	5765	-.383
	Σ	25000	571.3	14.2824					
					300	-4583	-.126	2903	.080
					337	-6004	-.336	3671	.209
					400	-6004	-.714	3671	.440
					457	-6004	-1.057	3671	.650
					517	-6004	-1.417	3671	.870
						10^{-6} I_{yy_o} = 1.767 Slug - Ft.-In.			
TBE 2	1	6004	281.0	1.6871	682	13000	0	5557	0
	2	5996	622.0	3.7295	627	13000	-.715	5557	-.306
	3	13000	682.0	8.8660	597	18996	-1.255	7188	-.513
	Σ	25000	571.3	14.2826					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4483	.217
					400	-12000	-.996	6217	.563
					457	-12000	-1.680	6217	.918
					517	-12000	-2.400	6217	1.291
						10^{-6} I_{yy_o} = 1.745 Slug - Ft.-In.			
TCA 1	1	12000	317.0	3.8040	682	0	0	0	0
	2	13000	641.0	8.3330	627	13000	-.182	4176	-.058
	Σ	25000	485.5	12.1370	597	13000	-.572	4176	-.184
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12916	-1.001	6508	.563
					457	-13889	-1.781	6788	.948
					517	-13889	-2.620	6788	1.355
						10^{-6} I_{yy_o} = 2.075 Slug - Ft.-In.			
TCA 2	1	13889	328.3	4.5598	682	11111	0	4750	0
	2	11111	682.0	7.5777	627	11111	-.611	4750	-.261
	Σ	25000	485.5	12.1375	597	11111	-.944	4750	-.404

FORM 381 B

PREPARED	NAME A. Ignatowski	DATE 2-23-53	LOCKHEED AIRCRAFT CORP.	PAGE 4.97
CHECKED	I. Wickman	2-23-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO. 9095

SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	S_z / n_z	10^{-6} M_y / n_z	$S_z / \ddot{\theta}$	10^{-6} $M_y / \ddot{\theta}$
245			457 517 597 627	737					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12916	-1.001	6508	.563
					457	-13342	-1.760	6634	.941
					517	-13342	-2.561	6634	1.339
						10^{-6} I_{yy_o} = 2.015 Slug - Ft.-In.			
TCA 3	1	13342	325.0	4.3362	682	4584	-.126	2286	-.065
	2	2491	622.0	1.5492	627	9167	-.504	3919	-.238
	3	9167	682.0	6.2519	597	11658	-.842	4596	-.372
	Σ	25000	485.5	12.1375					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-11632	-.991	6093	.562
					457	-11632	-1.654	6093	.910
					517	-11632	-2.352	6093	1.275
						10^{-6} I_{yy_o} = 1.712 Slug - Ft.-In.			
TCA 4	1	11632	314.8	3.6618	682	1285	-.010	575	-.004
	2	7500	612.0	4.5900	627	5868	-.207	2208	-.083
	3	5868	662.2	3.8858	597	13368	-.495	4053	-.177
	Σ	25000	485.5	12.1376					
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-11820	-.994	6158	.563
					457	-11820	-1.668	6158	.914
					517	-11820	-2.377	6158	1.283
						10^{-6} I_{yy_o} = 1.526 Slug - Ft.-In.			
FA 1	1	11820	315.9	3.7339	682	6680	0	2855	0
	2	6680	682.0	4.5558	627	6680	-.367	2855	-.157
	Σ	18500	448.1	8.2897	597	6680	-.568	2855	-.243
					300	-4583	-.126	2903	.080
					337	-7666	-.353	4488	.217
					400	-12188	-.993	6279	.564
					457	-12188	-1.692	6279	.921
					517	-12188	-2.424	6279	1.298
						10^{-6} I_{yy_o} = 1.619 Slug - Ft.-In.			
FA 2	1	12188	318.1	3.8770	682	4584	-.126	2286	-.065
	2	6312	699.1	4.4127	627	6312	-.455	2978	-.222
	Σ	18500	448.1	8.2897	597	6312	-.645	2978	-.311

PREPARED	NAME A. Ignatowski	DATE 2-19-53	LOCKHEED AIRCRAFT CORP.	PAGE 4.99
CHECKED	I. Wickman	2-19-53	TITLE:	MODEL C-130A
APPROVED				REPORT NO.

SUMMARY OF CARGO BALANCE AND INERTIA DATA

Code	Unit	W	C.G.	10^{-6} M_o	Fus. Sta.	S_z / n_z	10^{-6} M_y / n_z	S_z / $\ddot{\theta}$	10^{-6} M_y / $\ddot{\theta}$
245			457 517 597 627	737					
					300				
					337	-13000	0	6062	0
					400	-13000	-.819	6062	.382
					457	-13000	-1.560	6062	.727
					517	-13000	-2.340	6062	1.091
						10^{-6} I_{yy_o} = 1.811 Slug-Ft.-In.			
S 3	1	13000	337.0	4.3810	682	4584	-.126	2286	-.065
	2	2833	621.3	1.7601	627	9167	-.504	3919	-.238
	3	9167	682.0	6.2519	597	12000	-.848	4685	-.374
	Σ	25000	495.7	12.3930					
					300	-4440	-.126	2822	.082
					337	-4440	-.290	2822	.186
					400	-4440	-.570	2822	.364
					457	-4440	-.823	2822	.525
					517	-4440	-1.089	2822	.694
						10^{-6} I_{yy_o} = .003 Slug-Ft.-In.			
EA					682				
					627	No Cargo In Aftbody			
					597				
	1	4440	271.6	1.2059					
	Σ	4440	271.6	1.2059					
					300	-4583	-.1260	2903	.0798
					337	-5925	-.3345	3629	.2083
					400	-5925	-.7077	3629	.4369
					457	-5925	-1.0455	3629	.6437
					517	-5925	-1.4010	3629	.8615
						10^{-6} I_{yy_o} = 1.754 Slug-Ft.-In.			
TC Z1	1	5925	280.6	1.6626	682	13000	0	5557	0
	2	6075	622.0	3.7786	627	13000	-.715	5557	-.306
	3	13000	682.0	8.8660	597	19075	-1.257	7210	-.514
	Σ	25000	572.3	14.3075					
					300				
					337				
					400				
					457				
					517				
						10^{-6} I_{yy_o} =			
					682				
					627				
					597				
	Σ								

FORM 321 B