

ver per applicable governmental regulations. This weight includes the weight of taxi and run-up fuel.

14. Maximum Design Zero Fuel Weight (MZFW)

The "Maximum Design Zero Fuel Weight" is the maximum weight of an aircraft less the weight of all usable fuel and other consumable propulsive agents in particular sections of the aircraft that are limited structurally by this condition. This is a weight at which the subsequent addition of fuel and other consumable propulsive agents (as limited by other design gross weights) will not exceed the aircraft design strength. When restrictions and variations of this weight are specified, proper provisions for loading and usage of consumable propulsive agents are made by the operator so that governmental or other structural limitations are not exceeded.

15. Maximum Payload

"Maximum Payload" is determined by subtracting the appropriate "Operational Empty Weight" from the "Maximum Design Zero Fuel Weight".

Note: The following are Company terms and definitions:

a. Maximum Structural Payload

The "Maximum Structural Payload" is determined by subtracting the appropriate "Operational Empty Weight" from the "Maximum Design Zero Fuel Weight".

b. Maximum Operational Payload

The "Maximum Operational Payload" is determined by subtracting the appropriate "Operational Empty Weight" and take-off fuel from the "Maximum Take-Off Weight This Flight".

c. Maximum Payload This Flight

The "Maximum Payload This Flight" is the "Maximum Structural Payload" or the "Maximum Operational Payload" whichever is less.

16. Operational Empty Weight (OEW)

"Operational Empty Weight" is the "Basic Empty Weight" or "Fleet Empty Weight" plus the "Operational Items".

17. Operational Items

"Operational Items are those items of personnel, equipment, and supplies that are necessary on a particular operation unless already included in the "Basic Empty Weight". These items may vary for a particular aircraft configuration according to the operator's allowances for the service intended. These items include:

- (a) Manuals, navigational equipment, cockpit crew, and their baggage
- (b) Cabin crew and their baggage

- (c) Removable cabin, meal, and liquor service equipment
- (d) Food and beverage, including liquor
- (e) Usable fluids other than those designated as useful load
- (f) Emergency equipment
- (g) Cargo handling system, cargo containers, and/or cargo tiedown equipment if used.

18. Operational Landing Weight (OLW)

The "Operational Landing Weight" of an aircraft is the maximum weight authorized for the landing of an aircraft when this weight is subject to a varying degree of airport limitations. It must never exceed the "Maximum Design Landing Weight".

19. Operational Take-off Weight (OTOW)

The "Operational Take-off Weight" of an aircraft is the maximum weight authorized for the take-off condition of a dispatch loaded aircraft when this weight is subject to a varying degree of departure and destination airport limitations and by enroute conditions. It excludes the weight of taxi and run-up fuel, unless otherwise stipulated. This is the aircraft weight at brake release or start of take-off run. It must never exceed the "Maximum Design Take-off Weight".

20. Payload (P/L)

The "Payload" is the weight of passengers, passenger baggage and/or cargo. It consists of revenue and nonrevenue load.

Note: "Payload" also includes mail (incorporated in the cargo weight) and x-crew assigned passenger seat(s) and their baggage.

21. Space Limited Payload (SLP)

The "Space Limited Payload" is the maximum payload available for passengers, passenger baggage and/or cargo when restricted by seating and/or volumetric limitations of the cabin, cargo, and baggage compartments. It must never exceed the "Maximum Payload".

22. Standard Items

"Standard Items" are those of equipment or system fluids that are not considered an integral part of a particular aircraft configuration not included in "Manufacturer's Empty Weight" but do not vary for aircraft of the same type. These items include:

- (a) Unusable fuel, unusable oil, and unusable engine injection fluid
- (b) Unusable drinking and washing water

- (c) Lavatory water and/or chemical
- (d) Basic emergency equipment, fire extinguishers, pyrotechnics, etc.
- (e) Buffet, bar and/or galley structure
- (f) Electronic equipment required by the operator.

23. Standard Item Variations (SIV)

"Standard Item Variations" are those items which the operators choose to add to, omit from, or change in the "Standard Items" to suit the operator's own convenience.

24. Trapped Fuel

"Trapped Fuel" is the undrainable fuel remaining when the aircraft is defueled in a specified attitude by the normal means and procedures specified for draining the tanks.

25. Unusable Fuel

"Unusable fuel" is the fuel remaining after a fuel runout test has been completed per applicable governmental regulations. It includes "Drainable Unusable Fuel" and that portion of "Trapped Fuel" which is unusable.

26. Usable Engine Injection Fluid

"Usable Engine Injection Fluid" is all engine injection fluid carried for a particular operation less unusable engine injection fluid.

27. Usable Fuel

"Usable Fuel" is all fuel carried for a particular operation less "Unusable Fuel".

28. Useful Load

"Useful Load" is the difference between the applicable "Operational Take-Off Weight" and the "Operational Empty Weight". It includes "Payload", "Usable Fuel", and other usable fluids not included in the "Operational Items".

29. Weight Limited Payload (WLP)

The "Weight Limited Payload" of an aircraft is that weight remaining after the sum of the "Operational Empty Weight" and the weight of minimum fuel required is deducted from the "Operational Take-Off Weight". "Weight Limited Payload" plus "Operational Empty Weight" must never exceed the "Maximum Design Zero Fuel Weight". "Weight Limited Payload" may also, in special cases, result from structural limitations imposed by passenger occupancy and seating configuration as these will affect the placarded cargo compartment weight capacities.

ADDENDUM

Military terms and definitions are somewhat at variance with the IATA terms and definitions; therefore, a list of military terms and definitions and their correlation with IATA terms is reproduced below:

MILITARY TERMS AND DEFINITIONS

<u>TERM</u>	<u>DEFINITION</u>	<u>REFERENCE</u>	<u>EQUIVALENT IATA TERM</u>
1. Weight Empty	Weight Empty is the weight of the aircraft structure plus power plant, instruments, control system, communicating system, armament provisions, (including gunfire protection, and turrets), furnishings, anti-icing equipment, auxiliary power plant, anchor and towing arresting, and flotation gears.	T.O. 1-1B-50 Sec. II, Page 2-1	Manufacturer's Empty Weight (MEW)
2. Useful Load	Useful Load is the difference between Weight Empty and Gross Weight and includes fuel, oil, crew, passengers, cargo, ordnance, and other material necessarily carried.	T.O. 1-1B-50 Sec. II, Page 2-1	Useful Load
3. Basic Weight	The Basic Weight of an aircraft includes all fixed operating equipment and trapped fuel and oil to which it is only necessary to add the variable or expendable load items for the various missions.	T.O. 1-1B-40 Sec. II, Page 2-1	Basic Empty Weight (BEW)
4. Operating Weight	The Operating Weight of an aircraft is the Basic Weight plus those variable items which remain substantially constant for the type missions. These items include oil, crew, crew's baggage, steward's equipment, emergency and extra equipment that may be required.	T.O. 1-1B-40 Sec. II, Page 2-1	Operational Empty Weight (OEW)

<u>TERM</u>	<u>DEFINITION</u>	<u>REFERENCE</u>	<u>EQUIVALENT IATA TERM</u>
5. Gross Weight	The Gross Weight is the total weight of an aircraft and its contents.	T.O. 1-1B-40 Sec. II, Page 2-2	- -
6. Take-Off Gross Weight	The Take-off Gross Weight is the Operating Weight plus the variable and expendable load items which vary with the mission. These items include fuel, water injection fluid, JATO or RATO, cargo, passengers, ammunition, bombs, rockets, and external auxiliary fuel tanks if to be disposed of during flight.	T.O. 1-1B-40 Sec. II, Page 2-2	Operational Take-off Weight (OTOW)
7. Landing Gross Weight	The Landing Gross Weight is the Take-off Gross Weight minus the expended load items.	T.O. 1-1B-40 Sec. II, Page 2-2	Operational Landing Weight (OLW)

BASIC EMPTY WEIGHT - STANDARD ITEMS

"Standard Items" are those of equipment or system fluids that are not considered an integral part of a particular aircraft configuration not included in "Manufacturer's Empty Weight" but do not vary for aircraft of the same type. These items include:

- (a) Unusable fuel, unusable oil and unusable engine injection fluid
- (b) Unusable drinking and washing water
- (c) Lavatory water and/or chemical
- (d) Basic emergency equipment, fire extinguishers, pyrotechnics, etc.
- (e) Buffet, bar and/or galley structure
- (f) Electronic equipment required by the operator



MAXIMUM TAKE-OFF WEIGHT THIS FLIGHT COMPUTATIONS

A. Definition

The "Maximum Take-off Weight This Flight" of an aircraft is the maximum weight authorized for the take-off condition of a dispatch loaded aircraft when the limitations (if applicable) imposed by the:

- a. Operational Take-off Weight
- b. Maximum Design Landing Weight

have been computed for the particular flight. The over-riding limitation shall apply. The "Maximum Take-off Weight This Flight" must never exceed the "Maximum Design Take-off Weight".

B. Computations

1. Operational Take-off Weight Limitation

a. Operational Take-off Weight

The "Operational Take-off Weight" of an aircraft is the maximum weight authorized for the take-off condition of a dispatch loaded aircraft when this weight is subject to a varying degree of departure and destination airport limitations and by enroute conditions. It excludes the weight of taxi and run-up fuel, unless otherwise stipulated. This is the aircraft weight at brake release or start of take-off run. It must never exceed the "Maximum Design Take-off Weight".

b. Operational Landing Weight

The "Operational Landing Weight" of an aircraft is the maximum weight authorized for the landing of an aircraft when this weight is subject to a varying degree of airport limitations. It must never exceed the "Maximum Design Landing Weight".

After the Estimated Fuel Consumed Enroute weight has been established, apply the formula:

$$\text{Operational Landing Weight} + \text{Estimated Fuel Consumed Enroute} = \text{Maximum Take-off Weight This Flight (OLW limitation)}$$

c. Operational Take-off Weight and Operational Landing Weight Limitations

- i. Effective Runway Length/Heading
- ii. Runway Gradient
- iii. Wind Direction/Velocity
- iv. Field Elevation/Temperature
- v. Other Limitations/Conditions, e.g.,

- (a) Terrain in proximity of field and enroute
- (b) Runway conditions, i.e., waterlogged, soft, poor brake action, etc.
- (c) Obstruction off end of runway, i.e., floating crane, etc.
- (d) Etc.

d. Operational Limitations Computations

Refer to aircraft Operations Manuals (and handbooks) for graphs, tables and associated data for computation of operational limitations.

2. Maximum Design Landing Weight Limitation

After the Estimated Fuel Consumed Enroute weight has been established, apply the formula:

$$\text{Maximum Design Landing Weight} + \text{Estimated Fuel Consumed Enroute} = \text{Maximum Take-off Weight This Flight (MLW limitation)}$$

C. Procedures

1. When the Maximum Take-off Weight This Flight is less than the Maximum Design Take-off Weight, check (✓) the over-riding limitation on the Weight & Balance Manifest.
2. If the Operational Take-off Weight Limitation is the over-riding limitation, check (✓) and fill in particulars.

MAXIMUM PAYLOAD COMPUTATION

A. Definition

The Maximum Payload This Flight is the Maximum Structural Payload or the Maximum Operational Payload whichever is less.

B. Computation

For Cargo C-47 aircraft, the Maximum Structural Payload computation does not apply, therefore the Maximum Payload This Flight will be the Maximum Operational Payload according to the following computation:

$$\text{Maximum Take-Off Wt. This Flight} - \text{Operational Empty Wt. plus Flight Fuel Wt.} = \text{Maximum Operational Payload}$$

GENERAL SPECIFICATION

Wing Span	95 ft
Length	64 ft 5 $\frac{1}{2}$ in.
Height	16 ft 11-1/8 in.
Horizontal Tail Span	26 ft 8 in.
Wing Area (with Ailerons)	988.9 sq. ft.
Gross Weight, Max.	28,000 lbs.
Landing Weight, Max.	26,000 lbs.
Center of Gravity (Aft of Datum) Gear Extended)	
Fwd Limit	239.6 in. (11% MAC)
Aft Limit	263.1 in. (28% MAC)
Datum	192.5 in fwd. of leading edge of center section wing
Oil Capacity	58 U.S. Gal (one tank in each nacelle)
Oil Specification	
For Engine	MIL-L-6082B Grade 1100
Fuel Capacity (Usable)	804 U.S. Gal (4 Tanks in cs wing)
Fuel Specification	91 min. grade aviation gasolines

DESIGN LIMITATIONS & LOADING LIMITATIONS

A. Design Limitations

1. Maximum Design Take Off Weight - 28,000 lbs.
2. Maximum Design Landing Weight - 26,000 lbs.
3. C.G. Range: (Landing gear extended)

Fwd Limit - 11%  
Aft Limit - 28%

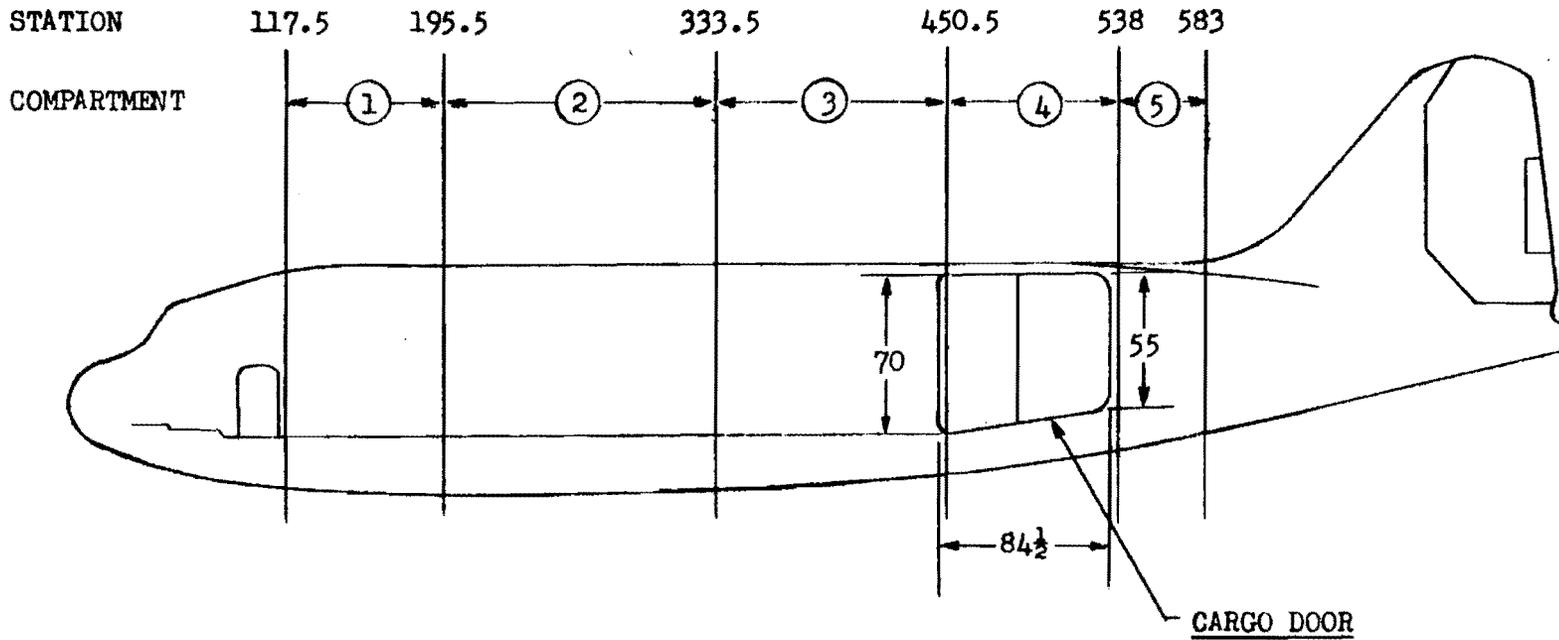
B. Load Limitations

1. Compartment Structural Limitations

<u>Compartment</u>	<u>Structural Limitations (lbs)</u>	<u>Maximum Unit/Floor Loading (lbs/sq.ft.)</u>
1	1,850	66
2	4,240	66
3	3,600	66
4	1,300	66

2. If cargo is to be carried in the passenger cabin (with passengers), the following conditions shall be complied with:
  - a. The cargo shall be carried forward of the foremost seated passengers.
  - b. The cargo shall be loaded in accordance with the following requirements:
    - (1) It shall be properly secured by means of safety belts or other tiedowns having sufficient strength to eliminate the possibility of shifting under all normally anticipated flight and ground conditions;
    - (2) It shall be packed or covered in manner to avoid possible injury to passengers;
    - (3) It shall not impose any load on seats or the floor structure which exceeds the structural load limitation for components;
    - (4) It shall not be located in a position which restricts the access to or use of any required emergency or regular exit, or the use of the aisle in the passenger compartment; and
    - (5) It shall not be located in the position which obscures any passengers view of the "Seat Belt" or "No Smoking" sign, nor shall any required exit sign be blocked from view, unless an auxiliary sign or other approved means for proper notification of such passenger is provided.

C-47 FLOOR LOADING AND CARGO CAPACITY DATA



COMPARTMENT	CABIN				
	1	2	3	4	5
∅ COMPT. VOLUME-CUBIC FT.	239	424	360	242	--
∅ AVG. CARGO DENSITY PCF	7.7	10	10	5.4	--
* MAX. CAPACITY LBS	1,850	4,240	3,600	1,300	No cargo permitted
* MAX. FLOOR LOAD PSF	50	50	50	50	--

NOTE: ∅ COMPUTED \* FROM MANUAL

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CARGO C-47 WEIGHT & BALANCE DATA

A. STANDARD CONFIGURATIONS

1. Passenger/Cargo Configuration - 27 Nylon or Metal Seats
2. Air-Drop Configuration - 27 Nylon or Metal Seats plus Roller Conveyor Tracks Installation
3. Passenger Configuration - 27 Burns or Rumbold seats

B. STANDARD CONFIGURATION OPERATIONAL EMPTY CONDITION - OPERATIONAL ITEMS

Standard Configuration	Maximum Cabin Seats	Operational Empty Weight includes Operational Items						
		Removable Passenger Seats	Crew	Standard Nacelle Oil	SEA Crew Equipment	First Kit	Wheel Chocks	Special Operational Items
Pax/Cgo	27	Nil	2 (Capt, F/O -340 lbs	27 gals each Nacelle 54 gals- 405 lbs	Parachute, Survival Kit/Vest, Pilot Flight Kit, etc. 60 lbs	6 lbs	36 lbs	Nil
Air-Drop	27	Nil	Same as above	Same as above	Same as above	Same as above	Same as above	Roller Con- veyor Tracks Installation
Pax	27 $\emptyset$	9D + 9S Burns or Rumbold	Same as above	Same as above	Same as above	Same as above	Same as above	Nil

$\emptyset$  27 nylon seats folded against side-walls, not useable in passenger configuration.

NOTE: Current Operational Empty Weight and Operational Empty Weight Index for the 3 standard configurations may be obtained from the duty dispatcher.

C. NON-STANDARD CONFIGURATIONS

Occasionally non-standard configurations are required. The duty dispatcher shall compute the Operational Empty Weight and Operational Empty Weight Index for a non-standard configuration by adding/subtracting Operational Items weights/index changes to/from the current Operational Empty Weight/Operational Empty Weight Index of the standard configuration which is nearest to the non-standard configuration required.

D. NON-STANDARD CONFIGURATIONS - OPERATIONAL ITEMS WEIGHTS/INDEX CHANGES

Operational Item	Weight (lbs)	Location	Index Change When Item	
			Added	Removed
4 Man Nylon Seat	18	Comp 1	Negligible	Negligible
		Comp 2	-0.05	+0.05
3 Man Nylon Seat	12	Comp 2	Negligible	Negligible
		Comp 3	+0.15	-0.15
Burns Double Seat (1D-2H)	42	Comp 2	Negligible	Negligible
		Comp 3	+0.55	-0.55
		Comp 4	+0.95	-0.95
Burns Single Seat (9121-1)	21	Comp 2	Negligible	Negligible
		Comp 3	+0.25	-0.25
Modified Rumbold Double Seat	56	Comp 2	Negligible	Negligible
		Comp 3	+0.70	-0.70
		Comp 4	+1.30	-1.30
Modified Rumbold Single Seat	34	Comp 2	Negligible	Negligible
		Comp 3	+0.45	-0.45
Roller Conveyor Tracks Installation	323	Comp 1 - 4	+2.5	-2.5
LORAN (APN-9)	36	Cockpit	-0.6	+0.6
Wash Water	5 gal	Tail Section (Rear)	+1.4	-1.4
	4 $\frac{1}{4}$ gal		+1.1	-1.1
X-Crew (incl. baggage)	200	Cockpit	-3.6	+3.6
AFS (incl. baggage)	200	Comp 3	+3.7	-3.7
AFD (incl. baggage)	180	Comp 3	+3.3	-3.3
Male F/A (incl. bagg.)	180	Comp 3	+3.3	-3.3
Thermos Flasks (4)	18	Comp 4	+0.5	-0.5

E. OPERATIONAL EMPTY WEIGHT - OPERATIONAL ITEMS

1. Variable Emergency Equipment - Life Raft(s) and Life Vest(s)

Item	Weight (lbs)	Location	Index Change
25 Man Life Raft	150	Tail Section (Rear)	+ 4.5
20 Man Life Raft	130	"	+ 3.8
15 Man Life Raft	100	"	+ 3.0
AD-4 Life Vest	2	Associated with Crew/passenger seat	Negligible
Emergency Radio AN/CRT-3	37	Tail Section (Rear)	+ 0.25
Emergency Radio RESCU/1	5	Tail Section (Rear)	Negligible

2. Passenger Comfort & Service/Commissary Items

Category	Item	Weight (lbs)	Location	Index Change
Passenger Comfort Items	Blanket	3	Associated with passenger seat	Negligible
	Pillow/Pillow Case	1	Associated with passenger seat	Negligible
Passenger Service/Commissary Items	Food/Beverage Items and Serving Equipment	As Required	Comp. 4	+ 0.25 for each 10 lbs added

3. Extra Equipment (if not already included in the Basic Empty Weight)

Item, weight and location will depend on the requirement. The item, weight and location shall be inserted in the Distributive Data section of the Cargo C-47 Weight & Balance Manifest and the weight and balance change involved computed as a Payload item.

F. CARGO C-47 ROLLER CONVEYOR/TROOP SEATS/PLUSH SEATS/FOLDABLE LIGHT WEIGHT NYLON SEATS CONFIGURATION TABLE

The following table serves as a quick reference for installation of Roller Conveyor, Troop Seats or Plush Seats on Company or Bailed Cargo C-47 aircraft.

Aircraft No.	Roller Conveyor Installation	Troop Seats (Metal or Nylon)	Plush (VIP) Seats	Maximum Seating
B-817	Yes	27	-	27
B-879	"	27	4D & 4S	27
B-933	"	27	4D & 4S	27
43-15559	"	27	9D & 9S	27
43-16083	"	27	-	27
43-16147A	"	27	9D & 9S	27
43-48084	"	27	-	27
45-994	"	27	9D & 9S	27

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CARGO C-47 OPERATIONAL EMPTY WEIGHT/STARTING INDEX TABLE

A. OPERATIONAL ITEMS LIST

1. PASSENGER/CARGO CONFIGURATION OPERATIONAL ITEMS LIST

<u>Operational Item</u>	<u>Weight (lbs)</u>	<u>Index Change</u>
a. Captain & First Officer	340	-6.5
b. Standard Nacelle Oil - 54 gal	405	-3.2
c. SEA Crew Equipment	60	-1.1
d. First Aid Kit	6	-0.1
e. Wheel Chocks	36	+1.0

Total Operational Items Weight  
Total Index Change

R-817	B-879	B-933	43-15559	43-16083	43-16147	43-48084	45-994
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
847	847	847	847	847	847	847	847
-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9

2. AIR DROP CONFIGURATION OPERATIONAL ITEMS LIST

a. Captain & First Officer	340	-6.5
b. Standard Nacelle Oil - 54 gal	405	-3.2
c. SEA Crew Equipment	60	-1.1
d. First Aid Kit	6	-0.1
e. Wheel Chocks	36	+1.0
f. Roller Conveyor Tracks	323	+2.5

Total Operational Items Weight  
Total Index Change

✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	✓
1170	1170	1170	1170	1170	1170	1170	1170
-7.4	-7.4	-7.4	-7.4	-7.4	-7.4	-7.4	-7.4

PIRINT MANUAL

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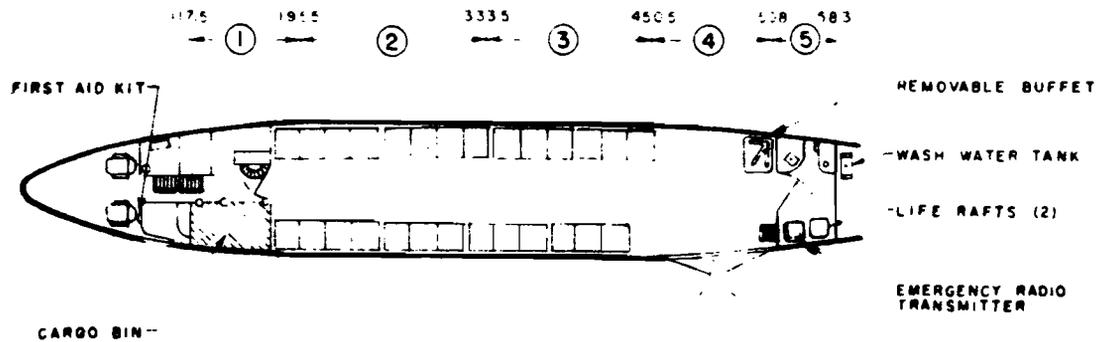
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3. PASSENGER CONFIGURATION OPERATIONAL ITEMS LIST

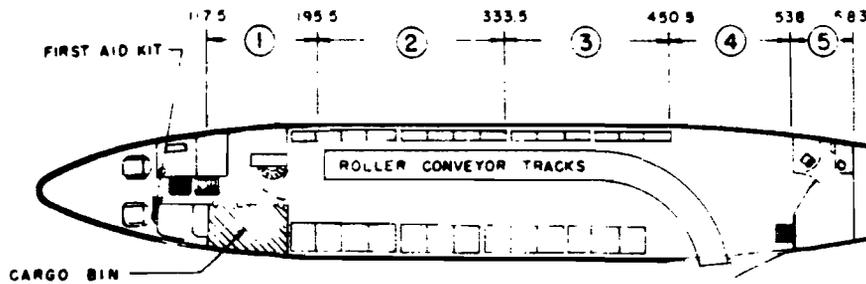
<u>Operational Item</u>	<u>Weight (lbs)</u>	<u>Index Change</u>
a. Captain & First Officer	340	-6.5
b. Standard Nacelle Oil - 54 gal	405	-3.2
c. SEA Crew Equipment	60	-1.1
d. First Aid Kit	6	-0.1
e. Wheel Chocks	36	+1.0
f. 9 Double & 9 Single Burns Seats	567	+4.5
g. 9 Double & 9 Single Rumbold Seats	793	+6.3
Total Operational Items Weight		
Total Index Change		

B-817	B-879	B-933	43-15559	43-16083	43-16147	43-48084	45-994
			✓		✓		✓
			✓		✓		✓
			✓		✓		✓
			✓		✓		✓
			✓		✓		✓
							✓
			1414		1414		1640
			-5.4		-5.4		-3.6

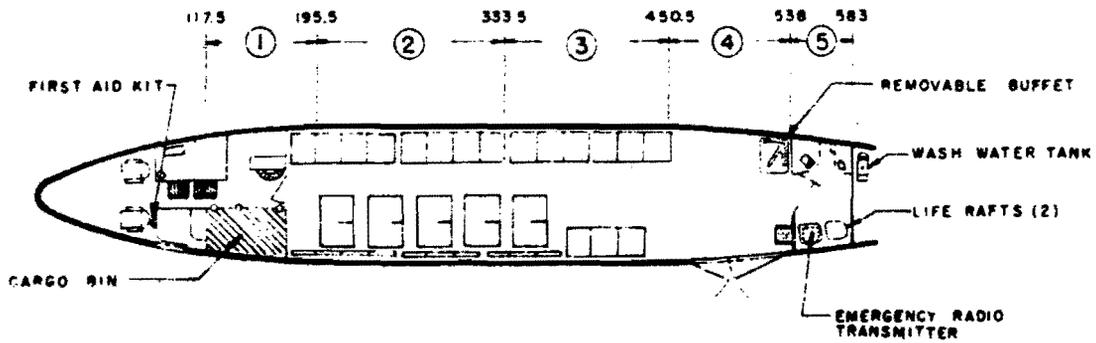
CARGO C-47 SEATING CONFIGURATION CHARTS



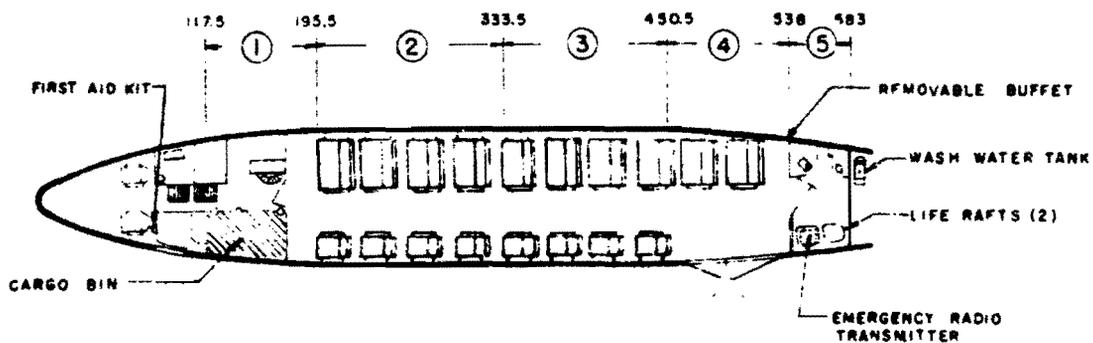
PAX/CGO CONFIGURATION - 27 NYLON OR CANVAS SEATS



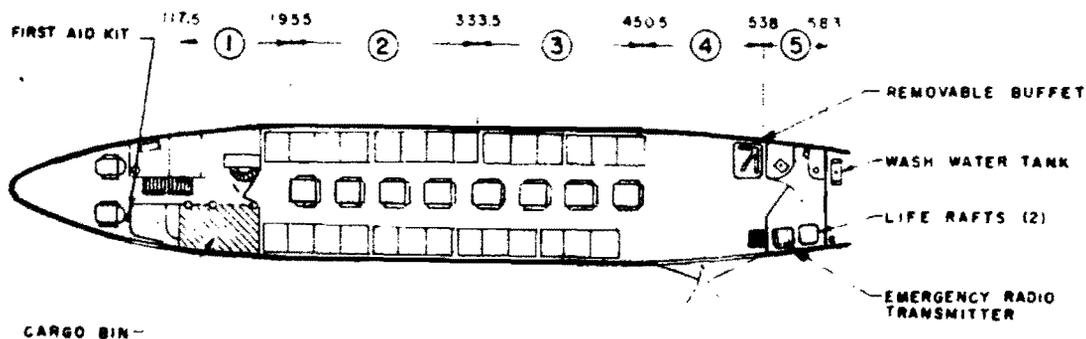
AIR-DROP CONFIGURATION



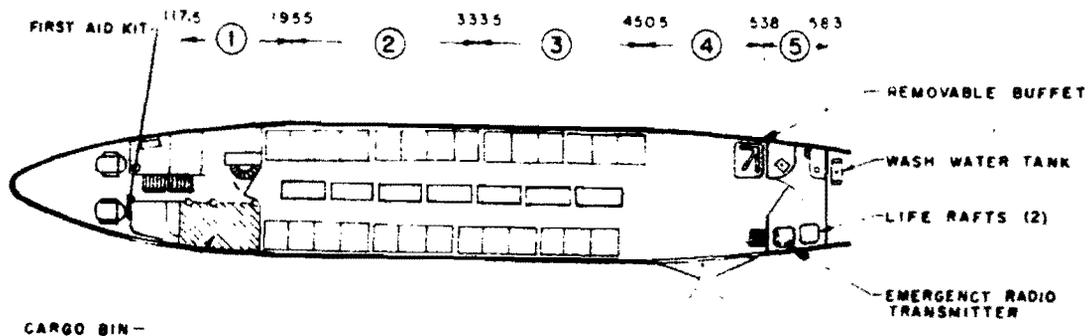
PASSENGER CONFIGURATION (A) - 27 SEATS (17 NYLON OR CANVAS SEATS & 5 DOUBLE WARREN MCARTHUR SEATS)



PASSENGER CONFIGURATION (B) - 28 SEATS (10 DOUBLE & 8 SINGLE BURN SEATS)

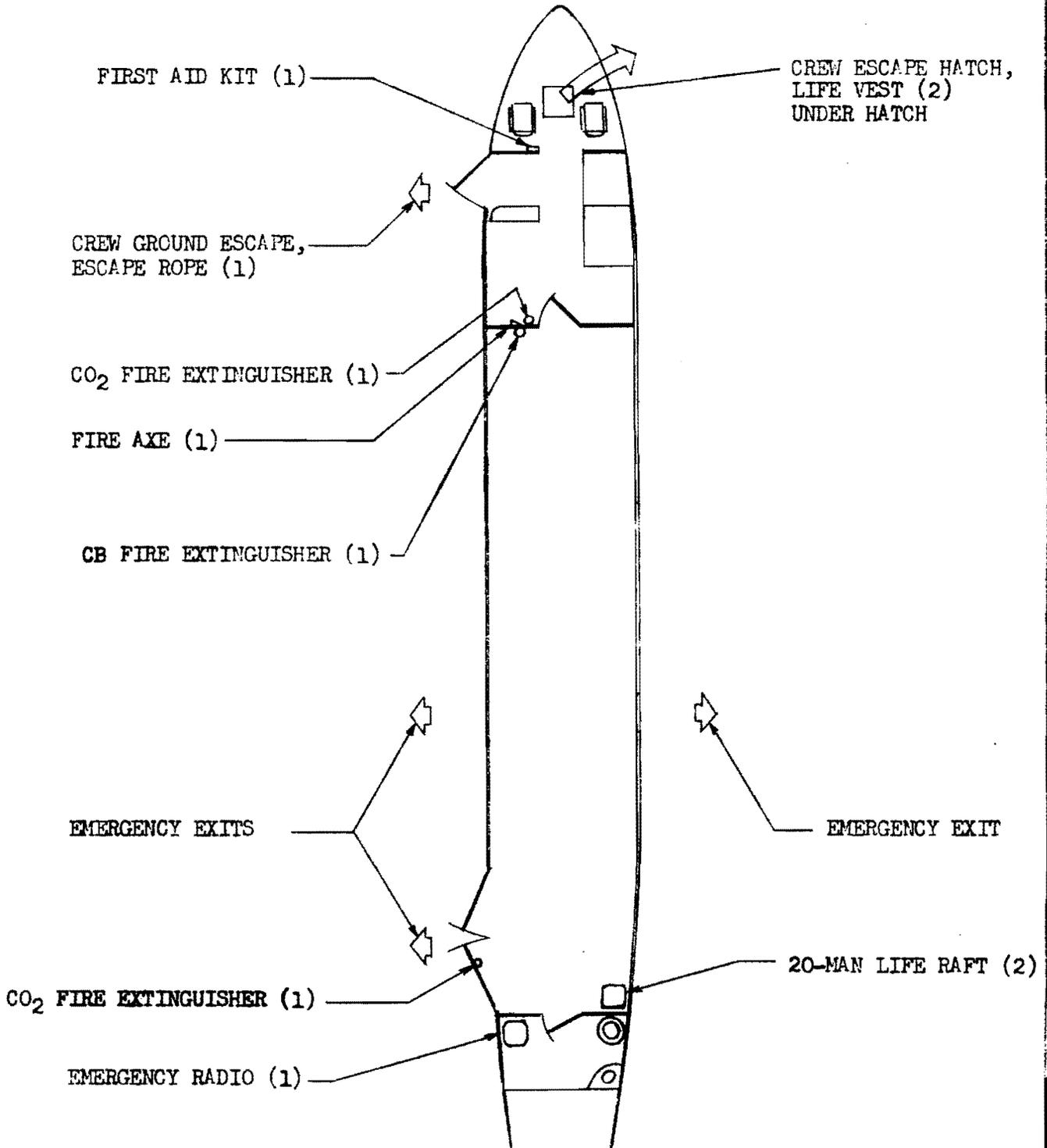


HI-DENSITY PASSENGER CONFIGURATION (A) - 35 SEATS  
(27 NYLON OR CANVAS SEATS & 8 SINGLE PLUSH SEATS)



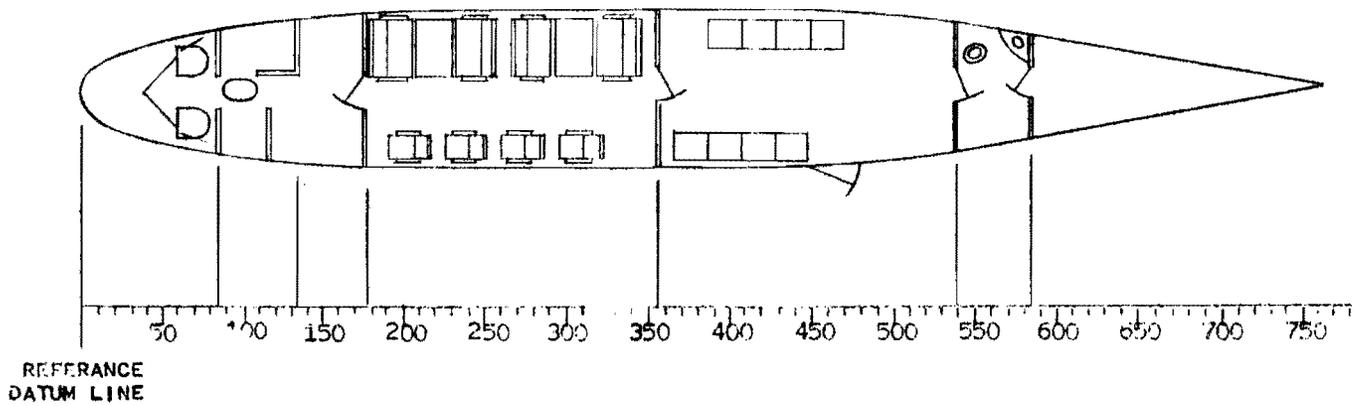
HI-DENSITY PASSENGER CONFIGURATION (B) - 41 SEATS (27 NYLON OR  
CANVAS SEATS & 7 DOUBLE FOLDABLE LIGHT WEIGHT NYLON SEATS)

CARGO C-47 EMERGENCY EQUIPMENT CHART



SEMI-PLUSH C-47 - B-879

VIP CONFIGURATION SEATING CHART



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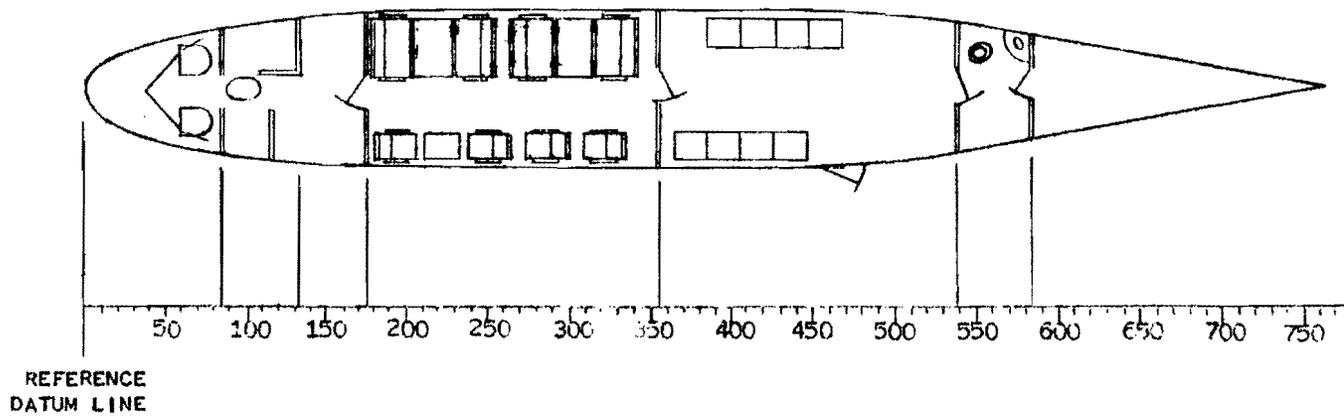
PASSENGER TABLE

(VIP Configuration - B-879)

Passenger occupied on passenger seat in VIP compartment										
Row	Arm	1 Passenger Per Row		2 Passengers Per Row (RH only)		2 Passengers Per Row (1 RH & 1 LH)		3 Passengers Per Row		
		Wt.	Index Change	Wt.	Index Change	Wt.	Index Change	Wt.	Index Change	
1	RH	197.5	170	-1.12	340	-2.23	340	-2.12	510	-3.23
	LH	204.5	170	-1.00	<del>                    </del>					
2	RH	243.5	170	-0.33	340	-0.67	340	-0.75	510	-1.09
	LH	238.5	170	-0.42	<del>                    </del>					
3	RH	281.5	170	+0.31	340	+0.63	340	+0.47	510	+0.63
	LH	272.5	170	+0.16	<del>                    </del>					
4	RH	331.5	170	+1.16	340	+2.33	340	+1.90	510	+2.64
	LH	306.5	170	+0.74	<del>                    </del>					

Passenger occupied on troop seat in rear cabin									
Row	Arm	1 Passenger		2 Passengers		3 Passengers		4 Passengers	
		Wt.	Index Change	Wt.	Index Change	Wt.	Index Change	Wt.	Index Change
RH	414.9	170	+2.58	340	+5.16	510	+7.74	680	+10.32
LH	394.5	170	+2.23	340	+4.47	510	+6.70	680	+8.94

SEMI-PLUSH C-47 - B-933  
VIP CONFIGURATION SEATING CHART



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PASSENGER TABLE

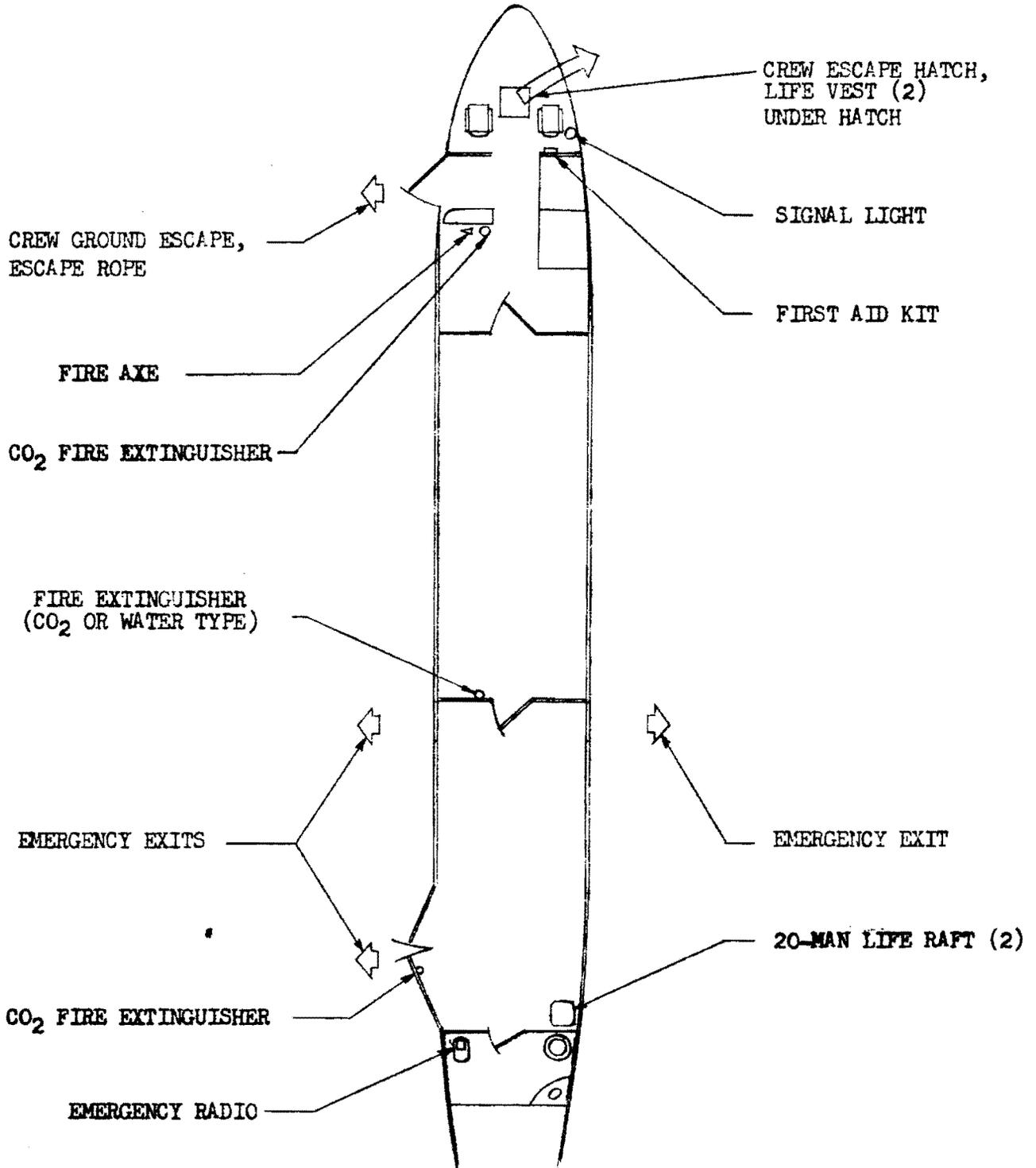
(VIP Configuration - B-933)

Passenger occupied on passenger seat in VIP compartment										
Row	Arm	1 Passenger Per Row		2 Passengers Per Row (RH only)		2 Passengers Per Row (1 RH & 1 LH)		3 Passengers Per Row		
		Wt.	Index Change	Wt.	Index Change	Wt.	Index Change	Wt.	Index Change	
1	RH	197.5	170	-1.12	340	-2.23	340	-2.29	510	-3.43
	LH	192.5	170	-1.2	X					
2	RH	243.5	170	-0.33	340	-0.67	340	-0.58	510	-0.92
	LH	248.5	170	-0.25	X					
3	RH	281.5	170	+0.31	340	+0.63	340	+0.64	510	+0.96
	LH	282.5	170	+0.33	X					
4	RH	331.5	170	+1.16	340	+2.33	340	+2.07	510	+3.23
	LH	316.5	170	+0.91	X					

Passenger occupied on troop seat in rear cabin									
Row	Arm	1 Passenger		2 Passengers		3 Passengers		4 Passengers	
		Wt.	Index Change	Wt.	Index Change	Wt.	Index Change	Wt.	Index Change
RH	414.9	170	+2.58	340	+5.16	510	+7.74	680	+10.32
LH	394.5	170	+2.23	340	+4.47	510	+6.70	680	+8.94

VIP CONFIGURATION EMERGENCY EQUIPMENT CHART

(B-879 & B-933)



NOTE: PASSENGERS' LIFE VESTS STOWED ON BACKS OF PASSENGERS' SEATS.

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PREPARATION & HANDLING OF CARGO C-47 WEIGHT & BALANCE MANIFEST

The Company designed Cargo C-47 Weight & Balance Manifest consists of 7 main sections:

1. NON-STANDARD OPERATIONAL EMPTY WEIGHT COMPUTATION
2. FLIGHT DATA
3. WEIGHT COMPUTATION
4. DISTRIBUTION DATA
5. LIMITS
6. BALANCE COMPUTATION
7. WEIGHT & BALANCE CORRECTION

Procedures covering the employment of the Cargo C-47 Weight & Balance Manifest are illustrated by attached example of a completed manifest.

Section 1. NON-STANDARD OPERATIONAL EMPTY WEIGHT COMPUTATION

Most of the flights in SEA operations do not carry life rafts/vests, passenger comfort & service/commissary or extra equipment items; however, for the infrequent occasions when life rafts/vests, passenger comfort & service/commissary and/or extra equipment items are required, the Non-standard Operational Empty Weight Computation section shall be employed. The duty dispatcher shall incorporate the weights/index changes of these items in the Operational Empty Weight/Index to constitute a Non-standard Operational Empty Weight/Index.

I. Operational Empty weight

- a. Insert number of passenger seats installed and number of crew assigned based on Traffic and Operations requirements.
- b. Obtain current Operational Empty Weight/Index from the duty dispatcher.

The Operational Empty Weight/Index of B-879 as of 2 Jul. 1970 for Pax (VIP) Configuration (20 pax seats and 2 crew - Capt. & F/O) is 19,242/10.2. Since one AFD assigned in cabin, the Operational Empty Weight/Index for Pax (VIP) Configuration (20 pax seats and 3 crew- Capt., F/O & AFD) is:

<u>Operational Empty Weight (lbs)</u>	<u>Operational Empty weight Index</u>
19,242	10.2
+ 180	+ 3.3
<u>19,422</u>	<u>13.5</u>

II. Emergency Equipment

Insert the number of life rafts/vests assigned and the total weight of these items. As shown in the attached example, one 20-man life raft, 20 life vest and one emergency

radio RESCU/1 are assigned to this flight, the weights/index changes are as follows:

	<u>Weight</u>	<u>Index Change</u>
1 20-man Life Raft	130	+3.8
20 Life Vests	40	Negligible
1 RESCU/1	+ 5	<u>Negligible</u>
	<u>175</u>	<u>+3.8</u>

NOTE: The weight of the First Aid Kit is included in the Operational Empty Weight since this item is permanently assigned.

III. Passenger Comfort & Service/Commissary Items

Insert the total weight of these items. As in the attached example, 20 lbs service/commissary items are assigned and the index change is +0.5.

IV. Extra Equipment

Insert the total weight of extra equipment such as additional seats, etc.

V. Non-standard Operational Empty Weight

- a. The sum of items I, II, III and IV.
- b. In the attached example, the Non-standard Operational Empty Weight is 19,617 lbs derived as follows:

	<u>Weight (lbs)</u>	<u>Index Change</u>
I. Operational Empty Weight (20 pax seats 3 crew)	19,422	13.5
II. Emergency Equipment (1 ERT, 1 L/R, 20 L/V)	175	+ 3.8
III. Pax Comfort & Service/Commissary Items	20	+ 0.5
IV. Extra Equipment	+ -	-
V. Non-standard Operational Empty Weight	<u>19,617</u>	<u>17.8</u>

Section 2. FLIGHT DATA

Insertions of DATE, FLT. NO., A/C No. and routing are self-explanatory.

Section 3. WEIGHT COMPUTATION

1. Operational Empty Weight

- a. Insert number of passenger seats installed and number of crew assigned based on Traffic and Operations requirements.
- b. When life rafts/vests, passenger comfort & service/commissary items and/or extra equipment are required, use the Non-standard Operational Empty Weight Computation section as appropriate.

2. Take-off Fuel

- a. Take-off Fuel (U.S. gallons) x Fuel Density = Weight of fuel on take-off
- b. Take-off fuel must NOT include the 10 gallons required for C-47 aircraft taxi-out and run-up.

3. Operational Empty Weight plus Take-off Fuel

The sum of items 1 and 2.

Section 4. DISTRIBUTION DATA

A. Passenger/X-crew

a. Company established SEA average body weight (lbs) - Passengers

Occidental Male or Female	- 170 lbs
Oriental Male or Female	- 140 lbs
Occidental or Oriental Child (age 2 - 12)	- 80 lbs
Occidental or Oriental Infant (under 2 years old)	- Nil

When weight (or balance) is a critical factor, actual or asked passenger weights shall be used.

b. Company established SEA average body weight (lbs) - Crew

<u>Category</u>	<u>Average Body Weight</u>	<u>Average Baggage Weight</u>	<u>Total</u>
Cockpit Crew (Occidental or Oriental)	170	30	200
AFS (Occidental)	170	30	200
AFD (Oriental)	150	30	180
Male F/A	150	30	180
Female F/A	130	20	150

B. Baggage/Cargo

- a. Actual weights of passenger baggage and cargo (including mail) shall be used.
- b. On flights within SEA, crew members normally do not carry baggage but usually carry gear such as personal flight kit, survival vest, parachute (if required), etc., therefore for such flights the gear shall be considered equivalent to baggage at the standard average weight.
- c. For special missions when additional gear is required or when baggage and gear are both required, SOM/OM will establish (and publish in the

Base Operations Procedures Guide) a special standard applicable for such contingencies.

4. Payload

Add the total weights in each compartment to obtain this figure which must not exceed the figure established for Maximum Payload this Flight (Item 11).

NOTE: Items to be air-dropped shall be indicated by inserting "A/D" against the total weight of the items.

5. Take-off Weight

The sum of items 3 and 4. This figure must not exceed the figure established for Maximum Take-off Weight this Flight (Item 10).

6. Take-off C. G. & MAC

After the balance computation is completed, insert the figure obtained which must be within the established limits shown on the C. G. & MAC scale.

7. Estimated Fuel Consumed Enroute

After the estimated flight time has been computed on the flight plan, refer to the appropriate fuel consumption chart and insert the figure obtained.

8. Estimated Landing Weight at Destination

Subtract the Estimated Fuel Consumed Enroute (Item 7) from the Take-off Weight (Item 5) to obtain this figure which must not exceed the Maximum Design Landing Weight (Item 12).

Section 5. LIMITS

9. Maximum Design Take-off Weight

Maximum Design Take-off Weight of Company operated C-47 aircraft is 28,000 lbs.

10. Maximum Take-off Weight this Flight

The Maximum Take-off Weight this Flight must not exceed the Maximum Design Take-off Weight (Item 9).

11. Maximum Payload this Flight

Subtract the Operational Empty Weight plus Take-off Fuel (Item 3) from the Maximum Take-off Weight this Flight (Item 10) to obtain this figure.

12. Maximum Design Landing Weight

Maximum Design Landing Weight of Company operated C-47 aircraft is 26,000 lbs.

Section 6. BALANCE COMPUTATION

A. Index

Insert Operational Empty Weight Index.

B. Fuel Scale

Insert the quantity of fuel in each tank and calculate the index change graduations from the respective scale.

C. Cabin Compartments

Balance changes as shown in the attached example are self-explanatory.

D. Scale of C. G. % MAC

As shown in the attached example, the Take-off C. G. at Take-off Weight of 26,753 lbs is 15.5 % MAC.

Section 7. WEIGHT & BALANCE CORRECTION

A. Weight & Balance Correction Box

As shown in the attached example, one passenger was added in the Rear Cabin (Comp. 3) thus making the Corrected Take-off Weight 26,923 lbs and the Corrected Take-off C. G. 16.4 % MAC.

B. Balance Correction

As shown in the attached example, the dotted pencil line was moved to the right the equivalent of 1.7 graduations of the Rear Cabin (Comp.3) scale then dropped vertically to the C. G. envelope to obtain the Corrected Take-off C. G. at 16.4% MAC.

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CARGO C-47

# WEIGHT & BALANCE MANIFEST

DATE: 1 Dec. 1971 CONT./FLT. NO: AID - 66

A/C NO: B-879 FROM BKK TO: SGN

NON-STANDARD OPERATIONAL EMPTY WEIGHT COMPUTATION										INDEX COMPUT.			
I. OPNL. EMPTY WT.	20	PAX SEATS	3	CREW	1	9	4	2	2	CR	1	3	5
II. EMERGENCY EQUIPMENT	1	ERT	1	L/R	20	L/V	1	7	5			3	3
III. PAX COMFORT & SERVICE/COMMISSARY ITEMS									2	0			5
IV. EXTRA EQUIPMENT													
V. NON-STANDARD OPNL. EMPTY WT. (I+II+III+IV)	1												
	1	9	6	1	7						1	7	8

(FILL IN ONLY WHEN NON-STANDARD OPERATIONAL EMPTY WEIGHT REQUIRED)

CONFIG: PAX/CGO  AIR-DROP  PAX

WEIGHT COMPUTATION

1. OPNL. EMPTY WT.	20	PAX SEATS	3	CREW	1	9	6	1	7
2. TAKE-OFF FUEL	470	GALS @	5.8	LB/GAL	2	7	2	6	
3. OPNL. EMPTY WT PLUS TAKE-OFF FUEL (1+2)	2	2	3	4	3				

DISTRIBUTION DATA

COMPARTMENT	PASSENGERS/X-CREW**				BODY WEIGHT	BAGG/CGO WEIGHT	TOTAL WT EACH COMP
	ADULT	CH	IN	X-C			
① (2 SEATS)						1500	1 5 0 0
② (14 SEATS)	10					380	1 9 0 0
③ (11 SEATS)	6					80	1 0 1 0
④							

4. PAYLOAD (INCL 16 PAX - X-CREW\*) 4 4 1 0

5. TAKE-OFF WEIGHT (3+4) 2 6 7 5 3

6. TAKE-OFF CG 15.5 %MAC

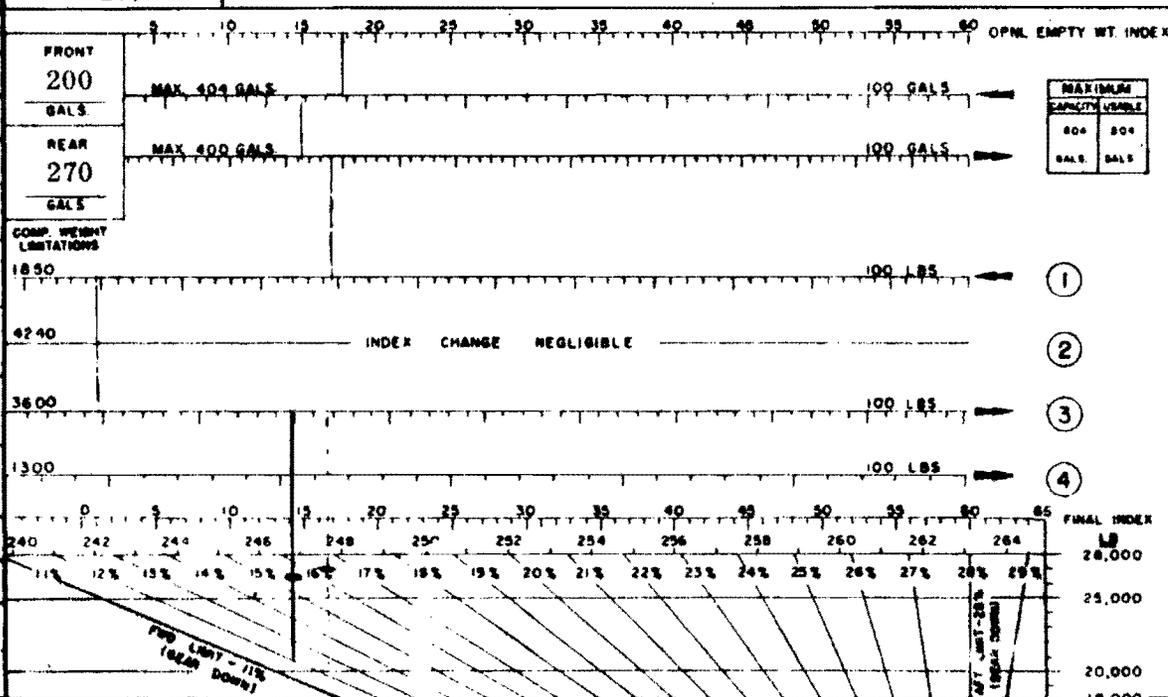
7. ESTIMATED FUEL CONSUMED ENROUTE (LB) 1 7 6 8

8. ESTIMATED LANDING WT AT DESTINATION (5-7) 2 4 9 8 5

LIMITS

9. MAXIMUM DESIGN TAKE-OFF WEIGHT	28000
10. MAXIMUM TAKE-OFF WEIGHT THIS FLIGHT	27768
11. MAXIMUM PAYLOAD THIS FLIGHT (10-3)	5605
12. MAXIMUM DESIGN LANDING WEIGHT	26000

INDEX: 17.8 BALANCE COMPUTATION



1. OPERATIONAL TAKE-OFF WEIGHT LIMITATION - (L/PARTURE  DESTINATION   
 AIRPORT LIMITATIONS/ENROUTE CONDITIONS:   
 A. R/W NO. EFF. LENGTH GRADIENT %  
 B. WIND DIRECTION / VELOCITY KTS  
 C. FIELD ELEVATION / TEMPERATURE  
 D. OTHER LIMITATIONS / CONDITIONS  
 TAKE-OFF WT - OPERATIONAL   
 7. MAXIMUM DESIGN LANDING LIMITATION  
 MAXIMUM DESIGN LANDING WEIGHT 26000  
 ENTER ITEM 1 + 1768  
 TAKE-OFF WT - LANDING LIMITED 27768  
 (NOT TO EXCEED ABOVE OPERATIONAL LIMITATIONS OR ITEM 9)

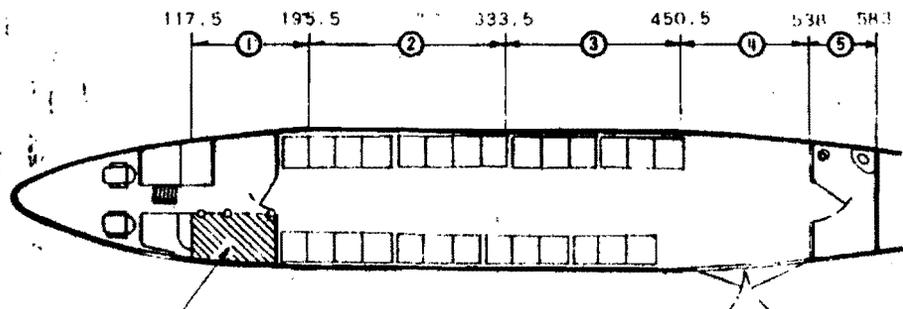
WEIGHT & BALANCE CORRECTION			
COMP	ITEM	OR	WEIGHT
3	1 Pax	+	170
CORRECTED TAKE-OFF WEIGHT			26928
CORRECTED TAKE-OFF CG			16.4 %MAC

\*INCLUDING X-CREW ASSIGNED CREW SEAT  
 \*\*X-CREW ASSIGNED PASSENGER SEAT

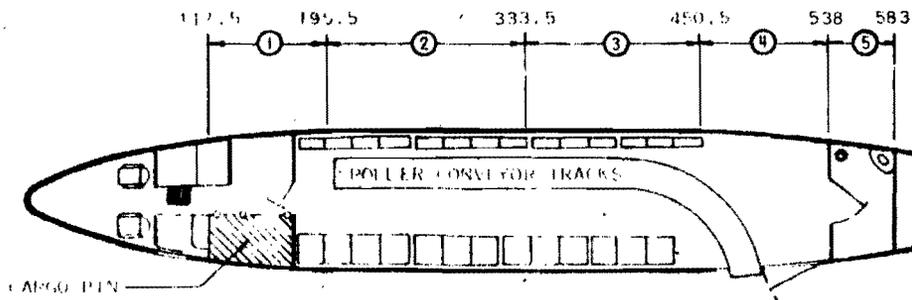
ALL WEIGHTS IN LBS

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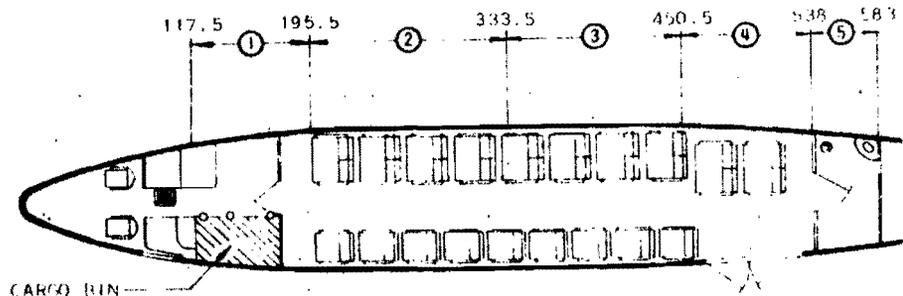
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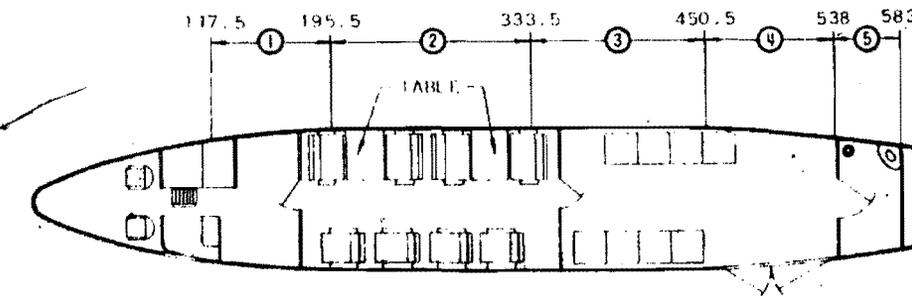
CARGO BIN  
**PAX/CGO CONFIGURATION - 27 NYLON SEATS**



**AIR-DROP CONFIGURATION**



CARGO BIN  
**PASSENGER CONFIGURATION - 29 SEATS  
(10 DOUBLE & 9 SINGLE BURNS SEATS)**



**PASSENGER (VIP) CONFIGURATION - 20 SEATS  
(12 BURNS SEATS & 8 NYLON SEATS)**

COMPARTMENT

- ①
- ②
- ③
- ④

LOCATION

- FWD CABIN
- MID CABIN
- REAR CABIN
- TAIL SECT. (FWD)

MAXIMUM LOAD  
EVENLY  
DISTRIBUTED  
OVER ENTIRE  
COMPARTMENT  
(LB/SQ. FT)

- 50
- 50
- 50
- 50