LOAD AND TRIM SHEET

LOAD SHEETS

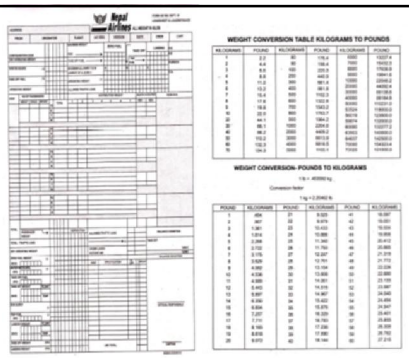
- Two Types :
  Manual and Electronic

For NAC DOMESTIC OPERATION:
Manual Load sheet

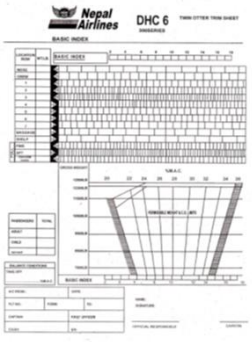
MANUAL LOAD/TRIM SHEETS

- Manual Load sheets involve a pro forma calculation of Maximum Ramp Weight (MRW), Maximum Take Off Weight (MTOW) and Maximum Landing Weight (MLW)

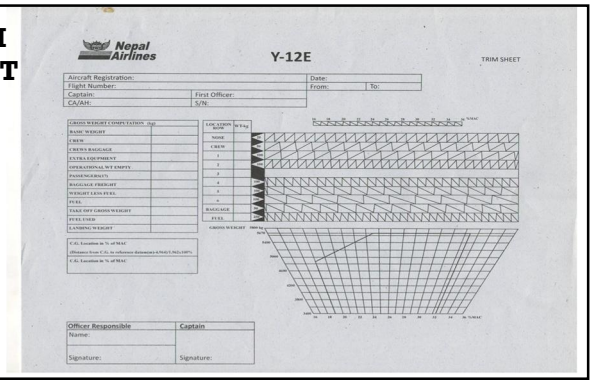
LOAD SHEET



TRIM SHEET



TRIM SHEET



FILLING UP A LOAD SHEET

First of All fill the relevant Aircraft Details, Flight Numbers etc. in the Load Sheet

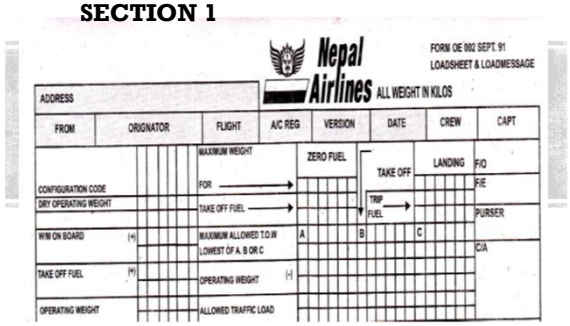
3 SECTIONS

1 | 2 | 3

SECTION 1

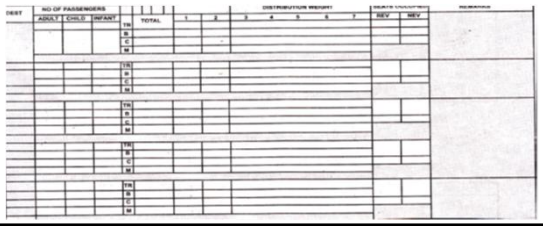
- **Used to establish Limiting Take-off Mass**
- **Maximum allowable traffic load**
- **Underload before Last Minute Change**

SECTION 1



SECTION 2

- **Shows the Distribution of Traffic Load**



SECTION 3

- **Summarizes the Loading**
- **Checks that the limiting Values are not exceeded**

FILLING UP A LOAD SHEET

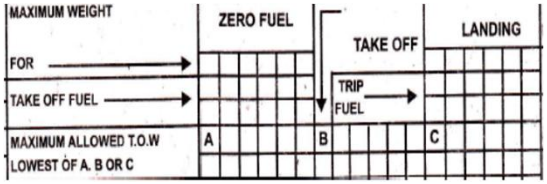
SECTION 1

- **Used to establish Limiting Take-off Mass – STEP 1**
- **Maximum allowable traffic load – STEP 3**
- **Underload before Last Minute Change -STEP 5**

FILLING UP A LOAD SHEET

STEP 1. ESTABLISH LIMITING WEIGHT

SECTION 1



Y12 E LIMIT LOADS

	WEIGHT LIMITS		WEIGHT (IN KG)
1	MAXIMUM RAMP WEIGHT		5700
2	MAXIMUM TAKE-OFF WEIGHT		5670
3	MAXIMUM LANDING WEIGHT		5400
4	MAXIMUM ZERO FUEL WEIGHT		5188
5	MAXIMUM WEIGHTS IN LUGGAGE COMPARTMENT		
	a	FORWARD	100
	b	AFT	260

TWIN-OTTER LIMITING LOADS

Max. Take-off.....12500 Lbs
Max. Landing weight.....12300 Lbs
Max. Zero fuel weight.....Not Defined
BASIC EMPTY WEIGHT.....AIRCRAFT DEPENDANT

MAXIMUM WEIGHTS

MAX TAKE-OFF WEIGHT	12500 lbs	5675 kg
MAX LANDING WEIGHT	12300 lbs	
MAX ZERO FUEL WEIGHT		NOT DEFINED
BASIC EMPTY WEIGHT	DEPENDEN ON AIRCRAFT REGISTRATION	

MAXIMUM WEIGHTS

LUGGAGE COMPARTMENT

FWD COMPARTMENT	330 lbs	136 kg
AFT COMPARTMENT	500 lbs	227 kg
MAX PERMISSIBLE FLOOR LOADING		100 lbs / sq ft

MAXIMUM WEIGHTS- TWINOTTER

FUEL

FWD TANK	1235 lbs	575 kg
AFT TANK	1341 lbs	608 kg
TOTAL FUEL	2576 lbs	1182 kg
USABLE FUEL	2550 lbs	1170 kg
TRAPPED FUEL (PART OF BASIC EMPTY WEIGHT)		12 lbs

FUEL

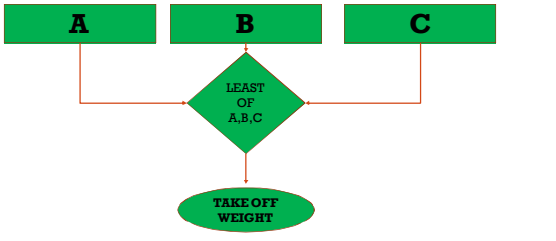
FWD TANK	1235 lbs	575 kg
AFT TANK	1341 lbs	608 kg
TOTAL FUEL	2576 lbs	1182 kg
USABLE FUEL	2550 lbs	1170 kg
TRAPPED FUEL (PART OF BASIC EMPTY WEIGHT)		12 lbs

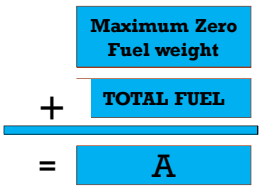
MAXIMUM WEIGHTS

FUEL

MAXIMUM FUEL CAPACITY	1260 KG	2777 lb
UNUSABLE FUEL	30 KG	66 lb
MAXIMIM FUEL ASYMMETRY	50 KG	110 lb

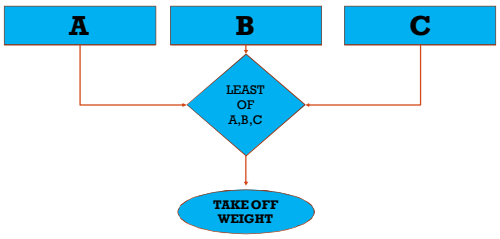
ABC METHOD OF LOAD SHEET





B = **WEIGHT FROM RTOW CHART**

C = **MAXIMUM LANDING WEIGHT+ TRIP FUEL**



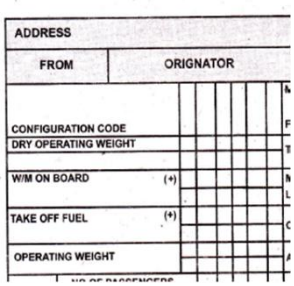
STEP 2. DETERMINE OPERATING WEIGHT

ADD

1. **DOW**
2. **CREW WEIGHT**
3. **TAKE-OFF Fuel**

Transfer this Operating Weight Value to the relevant column A, B or C as established in STEP 1

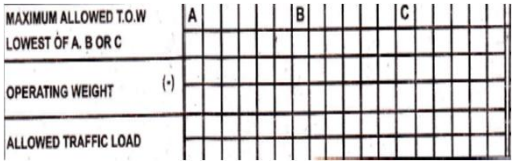
SECTION 1



STEP 3- MAXIMUM ALLOWED TRAFFIC LOAD

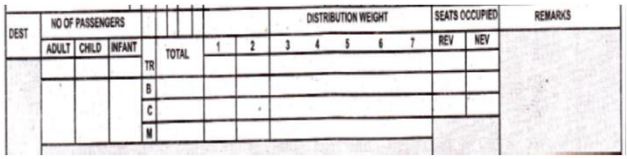
- **Subtract result of STEP 2 from Result of STEP 1**

SECTION 1



FILLING UP A LOAD SHEET

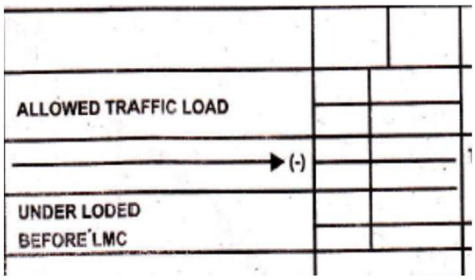
SECTION 2 : Traffic Distribution



STEP 4.

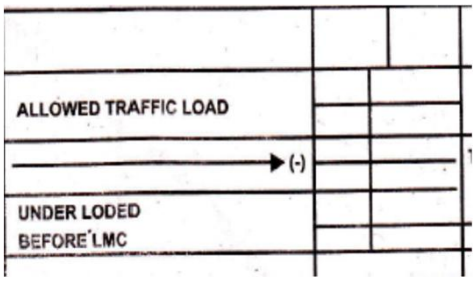
Calculate the Weight of the Available Traffic

ADD:
1. Passenger weight,
2. Baggage if any extra and
3. Cargo



STEP5. CALCULATE UNDERLOAD(OVERLOAD) BEFORE LMC

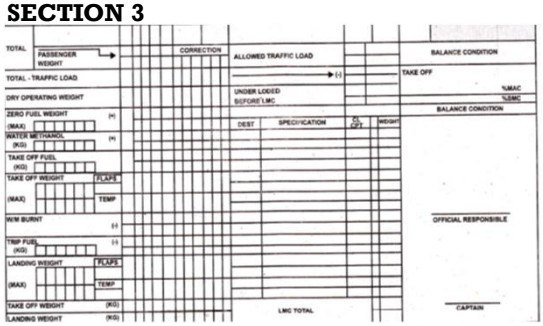
SUBTRACT Result of Step 4 from Result of Step 3,



FILLING UP A LOAD SHEET

SECTION 3 : Summarize Loading Values Against the Limiting Values

SECTION 3

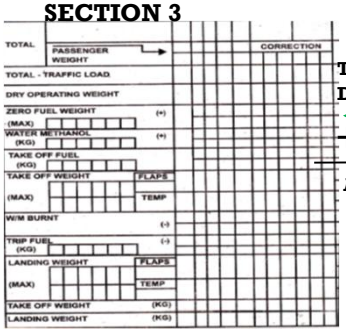


STEP 6. SUMMARIZE THE ACTUAL WEIGHTS

Calculate:
1. **Actual Zero Fuel Weight**
2. **Actual Take Off Weight**
3. **Actual Landing Weight**

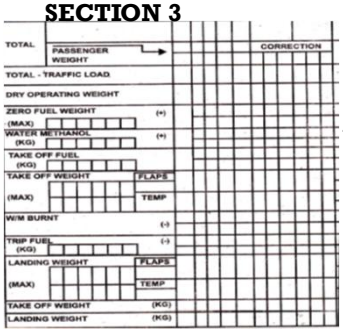
Check the calculated values against the corresponding Limiting Weights Listed in Section A

SECTION 3



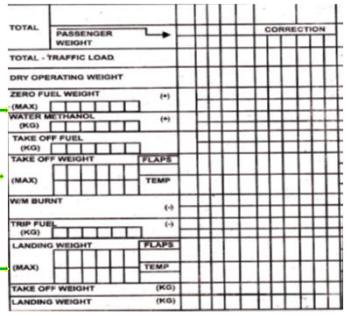
TOTAL TRAFFIC WEIGHT
DRY OPERATING WEIGHT
+ CREW WEIGHT
ACTUAL ZERO FUEL WEIGHT

SECTION 3



ACTUAL ZERO FUEL WEIGHT
+ TAKEOFF FUEL
ACTUAL TAKE-OFF WEIGHT
- TRIP FUEL
ACTUAL LANDING WEIGHT

SECTION 3

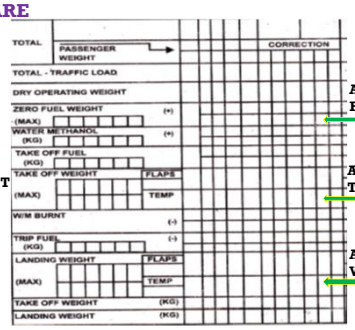


MAX ZERO FUEL WEIGHT

MAX REGULATED TAKE-OFF WEIGHT

MAX LANDING WEIGHT

COMPARE



MAX ZERO FUEL WEIGHT → **ACTUAL ZERO FUEL WEIGHT**

MAX REGULATED TAKE-OFF WEIGHT → **ACTUAL REGULATED TAKE-OFF WEIGHT**

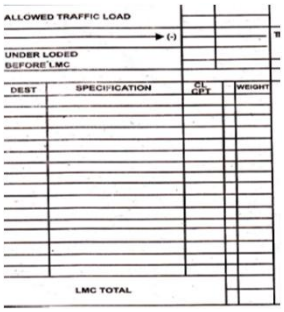
MAX LANDING WEIGHT → **ACTUAL LANDING WEIGHT**

VALUES ON THE RIGHT SIDE SHOULD NEVER BE GREATER THAN VALUES ON THE LEFT

STEP 7. PROPER LISTING OF LMC

1. **Allowable LMC is established in STEP 5**
2. **List all the LMCs in the load sheet and get it accepted by the PIC**

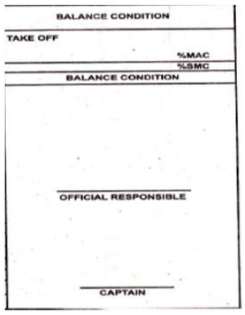
SECTION 3



STEP 8. SIGNING OF THE LOAD SHEET

1. **LOAD SHEET must be signed by the personnel preparing it and the PIC**

SECTION 3



TRIM SHEET

- the center of gravity is located by marking the requisite aircraft operating weight (vertical scale) on a 'drop line' located on a center of gravity 'index' scale which forms the horizontal axis.
- If the position so found is within the areas shown as the permitted safe flight envelope, (and remains within the safe area as fuel reduces to planned landing weight) then operation as loaded is possible.

DHC-6/300 TRIM SHEET

The CG limits for take-off are as follows:

FORWARD	20% MAC (203.84 ARM) at 11,600 pounds rising linearly to 25% MAC (207.74 ARM) at 12,500 pounds.
AFT	36% MAC (216.32 ARM) at all weights.

The CG limits for landing are as follows:

FORWARD	20% MAC (203.84 ARM) at 11,000 pounds rising linearly to 25% MAC (fuselage station 207.74) at 12,300 pounds.
AFT	36% MAC (216.32 ARM) at all weights.

CG LIMITATION

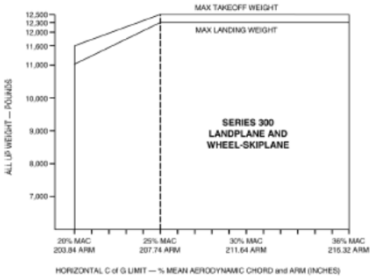


Table 6-8b Sample working card (for 17 seats arrangement)

Item		Weight kg (lb)	Arm m (ft)	Moment kg.m (lb.ft)
Current basic empty weight		3400 (7496)	5.496(18.031)	18686.4 (135159)
Pilot seats		154 (340)	2.580 (8.465)	397.32 (2874)
1st row		231 (509)	3.960(12.992)	914.76 (6616)
2nd row		231 (509)	4.710(15.453)	1088.01 (7870)
3rd row		231 (509)	5.460(17.913)	1261.26 (9123)
4th row		231 (509)	6.210(20.374)	1434.51 (10376)
5th row		231 (509)	6.960(22.835)	1607.76 (11629)
6th row		154 (340)	7.770(25.492)	1196.58 (8655)
Fwd Compt		40 (88)	0.900(2.953)	36 (260)
Aft Compt		100 (220)	8.690(28.510)	869 (6285)
Fuel	Take-off	667 (1470)	5.725 (18.783)	3818.58 (27620)
	Landing	167 (368)		956.08 (6915)
Total weight	Take-off	5670 (12500)	Total moment	31310.18 (226467)
	Landing	5170 (11398)		28447.68 (205763)
C.G location from nose during take-off and landing: Take-off 5.522(18.117) m (ft) Landing 5.502(18.053) m (ft)				
C.G location(%MAC) (Distance from C.G to datum plane (m) -4.964)/1.962×100% (Distance from C.G to datum plane(ft)-16.286)/6.437×100% Take-off 28.44 %MAC Landing 27.44 %MAC				

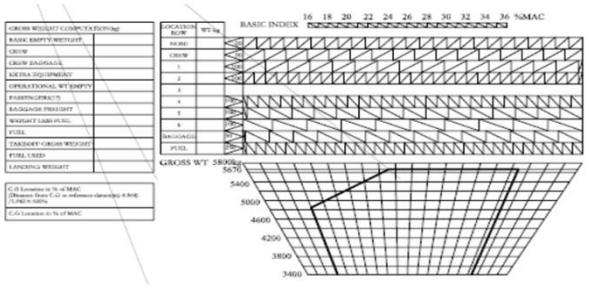


Fig.6-7 Load & Trim Sheet-17 Passenger Version

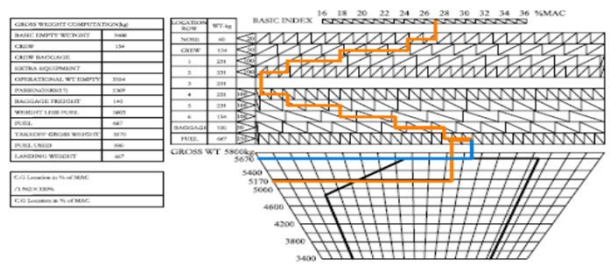


Fig.6-8 Sample Load & Trim Sheet-17 Passenger Version

GENERAL LOADING RECOMMENDATIONS

- Refer to flight envelope for the weight and C.G. envelope of Y12E aircraft
- Y12E aircraft can be safely operated within this envelope.

GENERAL LOADING RECOMMENDATIONS

- In order to maintain the aircraft center of gravity at the favorable location, start loading occupants at left row 3 first and then balance occupants in the order of right 3, left 4, right 4, left 2, right 2, left 5, right 5, left 1, right 1, left 6 and right 6 if the number of passengers is less than 18.

GENERAL LOADING RECOMMENDATIONS

- Luggage should be evenly loaded into fwd and aft baggage compartments. All the remaining baggage should be loaded into the aft baggage compartment when the weight of baggage is up to 100kg(200lb) in FWD baggage compartment.
- Recommended favorable location of C.G. is 25 ~ 26%MAC.