

PROVISIONAL ISSUE

CHAPTER 3

LOADING AND C.G. DATA

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General

1. It is essential that the loading of an aircraft is kept within the limitations of the approved C.G. range and the all-up weight. So far as the C.G. range of this aircraft is concerned only the fore-and-aft location of the C.G. need be calculated. To determine the C.G. position the aircraft is considered standing with the fuselage datum line horizontal and the undercarriage down. Reference should be made to A.P.1464D, Vol.1, Part 2, Sect.1, Chap.3 for general information on aircraft loading.

Datum Point

2. This is the foremost face of a spigot hole situated in the wheel bay on the fuselage skin just forward of the undercarriage door hydraulic jack. This fixed point is located 19 inches aft of the main spar frame and 4 inches below the fuselage datum.

Weight Limitations

3. The maximum permissible all-up weight for all forms of flying is 18,000 lb. The normal maximum permissible weight for landings is 15,650 lb. Maximum overload for take-off and gentle manoeuvres is 20,000 lb.

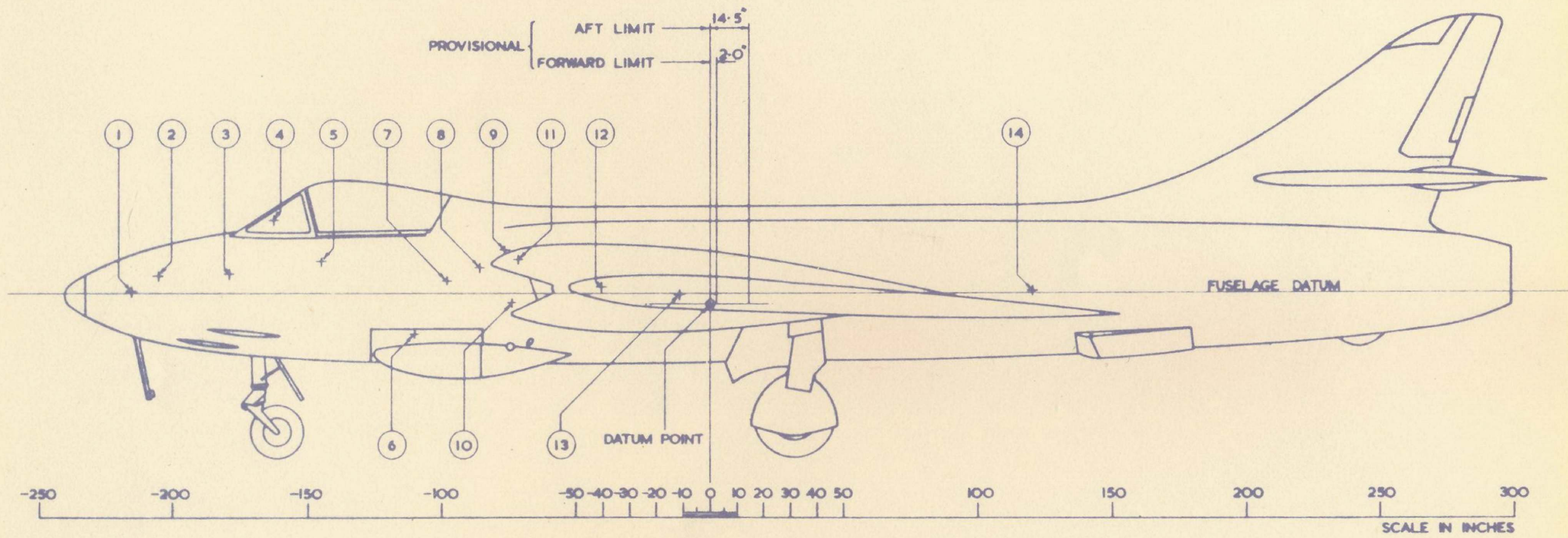


FIG. I. LOADING AND C.G. DIAGRAM

C.G. Range

4. The provisional limits of C.G. travel, measured parallel to the fuselage datum are 2.0 inches to 14.5 inches aft of the C.G. datum point, as illustrated on fig.1.

Operational Notes

5. The following notes are inserted to give guidance on particular items of loading peculiar to the type:-

- (1) In order to maintain the C.G. position between the given provisional limits, it is essential that ballast is fitted if the following items of equipment are not carried:-
 - (a) When the radar head and ranging unit are removed, fit ballast Stores Ref. 26FX/100021 (Mod.21).
 - (b) When I.F.F. is removed, fit ballast Pt. No. C.206617 (Mod.247).
 - (c) When D.M.E. is removed, fit ballast Pt. No. C.206618 (Mod.246).
- (2) When external link collectors (Mod.302) are fitted the weight of 600 retained links is 75 lb., with a load arm of -98.28 in. (Moment -7371 lb. in.). In all C.G.

calculations which allow for the expenditure of ammunition, the effect of these retained links must be included.

Modifications included in given tare weight

6. The typical tare weight and moment given in Table 1 include the following modifications:-

Airframe Mods.

Hunter Mod.146:-

Plus. 188, 198, 208, 210, 228, 231, 233, 248, 254,
256, 257, 281, 289, 290, 302, 304, 305, 311, 314,
319, 323, 327, 333, 334, 341, 342, 346, 349, 359,
363, 368, 376, 379, 380, 381, 382, 390, 392, 394,
396, 398, 401, 403, 411, 413, 415, 420, 423, 429,
432, 433, 434, 435, 439, 443, 450, 451, 453, 456,
457, 458, 459, 461, 462, 464, 465, 467, 471, 474,
475, 476, 477, 478, 479, 483, 484, 496, 497, 499,
503, 504, 506, 509, 511, 513, 521, 523, 552, 569,
570, 571, 572, 573, 577, 580, 581, 585.

Changes in Weight and Moment Due to Modifications

7. Any modifications that are incorporated on an aircraft but are not included in the given tare weight are additional and must be allowed for when calculating the total weight and C.G. position. The following table gives changes in weight and moment due to such additional modifications:-

Mod. No.	Description	Tare Weight		Removable Load	
		Weight (lb.)	Moment (lb.in.)	Weight (lb.)	Moment (lb.in.)
21	Ballast in lieu of radar head and ranging unit.			+1.0	-216
157	V.G.recorder - removable parts.			+2.5	-190
197	U.C. leg pressure recuperators introduced.	+10.0	+463		
246	Ballast in lieu of Rebecca Mk.7 T.R. unit.			+5.25	-434
247	Ballast in lieu of I.F.F. Mk.3 receiver unit.			+0.75	-54
294	Hydraulics, brake accumulators with filters.	+1.0	-185		
330	Hydraulic press.gauge in aileron booster accumulator line.	+0.75	+20		
421	U/c wheel door controls improved.	+1.25	+43		
425	Generator cooling ducted overboard	+2.50	+25		
427	Wings, R.P. electrical connections Polythene type introduced.	+0.75	+49		
428	Hydraulics, emergency control isolated from power control.	+0.75	-118		
431	Rotol flow proportioner clearances at Frame 22 improved.	+0.75	-31		
436	R.P. Ripple/Normal facilities introduced.	+1.25	-81		
466	Fuel system modified for inboard drop tanks.	+1.0	+27		
468	Elevator booster Type A.H.613 in lieu of Type 544.	+0.5	+113		
480	Access door for starter safety disc introduced.	+1.25	+17		
481	Flap attachment bolt locking improved.	+0.50	+28		
491	Access door for L.P. filter revised.	+0.25	+9		
524	Additional red lamp at stbd.console introduced.	+0.25	-37		
527	Jet pipe mounting chamels strengthened.	+0.25	+58		
531	Air intake trailing edges rear portions changed to steel.	+0.5	+4		
532	High energy ignition units new type introduced.	-0.5	+31		
539	Oxygen valve 6D/1872 introduced in lieu of 6D/223.	-0.5	-96		
549	Main undercarriage, strengthened top fitting introduced.	+7.0	+224		

The following modifications have been omitted from the foregoing table because their effect on the weight and C.G. position is considered as nil:- 202, 279, 320, 348, 362, 364, 377, 399, 400, 416, 422, 438, 446, 447, 449, 472, 490, 510, 517, 547, 551, 557, 559, 564, 567 and 578.

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Engine included in Given Tare Weight

8.

TO BE ISSUED LATER

Changes of Engine

9. Any engine change which introduces an engine to a Technical Certificate other than than given in Para.8 must be allowed for as follows:-

TO BE ISSUED LATER

RESTRICTED

TABLE 1
Items comprising normal load

Item No.	Description	Weight (lb)	Arm (in.)	Moment -	(lb.in.) +
5	Pilot	180	-145.92	26,266	
6 *	Guns and accessories	827	-110.40	91,301	
7	Ammunition	676	-98.28	66,437	
4	Gunsight	9	-162.60	1,463	
2	Camera gun G.45 and recorder	8	-205.44	1,644	
10	Radio V.H.F. A.R.I. 18064	54	-73.44	3,966	
8	Radio D.M.E. A.R.I. 5849	34	-86.88	2,954	
9	Radio A.R.I. 18044	5	-76.80	384	
11	Radar I.F.F. A.R.I. 5131A	37	-72.24	2,673	
1	Radar Ranging A.R.I. 5820	76	-216.0	16,416	
3 †	Miscellaneous	5	-179.04	895	
12	Fuel, front tanks,galls. at 7.7 lb. per gall.		-40.50		
14	Fuel, rear tanks, galls. at 7.7 lb. per gall.		+119.50		
13	Fuel, wing tanks, galls. at 7.7 lb. per gall.		- 11.50		
	Aircraft at tare weight. (These are typical figures and should only be used if R.A.F. Form 480† is out of date or inaccurate.)	12,756			347,712

* Item 6 includes Mk.4 30 m.m. Aden Guns complete with Mk.2 barrels, firing units and cocking units, feed necks, link chutes, case chute extensions, link collector tanks (Mod.302) and the removable portion of the rear gun mountings.

† Item 3 includes the aircraft destructor, clock and crowbar.

TABLE 2

Additional items of load, not included in Table 1

Item No.	Description	Weight (lb)	Arm (in.)	Moment -	(lb.in)
	Two inboard pylons	115	+15.77		1,814
	Two drop tanks on inboard pylons.	240	+12.82		3,077
	Overload fuel in inboard drop tanks.		+ 8.82		

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