Características Aerodinámicas

Aircraft type	V_D kts EAS	M_D -	V_{MC} kts EAS	Max. cross-wind kts	$\frac{S_v}{S}$	A_v	Λ_v deg.	Airfoil Section root / tip	Average t/c %	$\frac{S_v l_v}{Sb}$	$\frac{S_r}{S_v}$	Hinge Position root/tip % c_v	Balance Ratio % c_r	$\pm\delta_r$ max. deg.	Tabs *	Remarks
Wright Flyer (1903)					.045	2.91	0	"flat plates"	-	.0133	1	30	42.8			biplane in front
Scottish Aviation Pup				30	.182	.89	33		12	.0750	.350	64		25	T	Horn balance
Cessna 177				20	.107	1.41	35	NACA 0009/0006	7.5	.0411	.368	60				
Scottish Av. Jetstream		.60	85		.212	1.44	43			.0820	.350	65				Horn balance
Aérospatiale N262	260		90	30	.184	1.60	9.5	NACA 0012 mod.	12	.0763	.270	68	31.2		T/C	
Fokker-VFW F 27 Mk 200	288	.51	78	30	.203	1.55	3.3	NACA 63A-015 mod.	15	.0765	.218	76	44.6	20	T/C	
Lockheed Hercules C-130E	325	.64	93.5		.180	1.84	18.8	NACA 64A-015	15	.0575	.239	75		35	T/C	
Lockheed Electra 188A		.711	110		.145	1.93	14.0	NACA 0012	12	.0707	.250	69	25.8	+23.5 -30	T	
Bristol Britannia 310	300				.197	1.65	10	RAF30 mod.	13	.0774	.225	60/67	30	25	T/S	$\delta_r \pm 16^o$ for CL-44
Aérospat. Corvette SN-600			90		.177	.88	50.3		9	.0720	.250	72	25	30	T	
Cessna Citation 500					.191	1.58	33.0	NACA 0012/0008	10	.0806	.220	75			T	
Hawker Siddeley HS-125/400	370	.825	90		.161	1.19	52		11.5	.0548	.197	72	25	28.5	T	Approx. T-tail
Yakovlev YAK-40					.162	.81	47.5		10	.0442	.222	78		30	T	T-tail
VFW-Fokker 614	330	.74			.174	1.28	32.4			.0682	.321			35	T/S	
Fokker-VFW F 28 Mk1000	390	.83	71	25	.203	1.00	40	NACA mod.	10.15	.0910	.187	78	30	33		T-tail
Aérospat. Caravelle 10.R	375	.87			.106	1.24	37.9	NACA 65-011	11	.0379	.258	76/40		24		
BAC-111/200,400	410	.86		30	.132	.91	41.0		12.5	.0482	.254	70	30			T-tail
McDonnell Douglas DC-9/10		.89			.192	.95	43.5	DSMA	11	.0810	.270	68	35	30	T/C	T-tail
Boeing 737/100	400	.89			.268	1.88	35		12	.1117	.250	75			T	
Dassault Mercure					.232	1.96	35		9	.1025	.221	71.5				Split rudder
Boeing 727/100		.95			.238	.78	55		9	.0905	.168	80				T-tail
Airbus A-300B	420	.90	103		.204	1.62	40		12.5	.1020	.248	70				
Boeing KC-135					.143	1.49	31		10	.0628	.250	65		20	S	
Boeing 707/120			107.5		.148	1.62	31		10	.0656	.282	65		25	S	
Boeing 707/320B		.95	122		.144	1.81	31		10	.0626	.242	65		25	S	
McDonnell Douglas DC-8/10,50	405	.95	$<V_{LOF}$	34	.122	1.91	35	DSMA-111/-112	9.85	.0494	.269	65	37.2	32.5	C	
BAC VC-10/1101	380	.94			.142	1.10	38.5			.0453	.251					T-tail
Lockh. Tristar L-1011/1	435	.95		30	.231	1.83	35		10	.0830	.161	70				
McDonnell Douglas DC-10/10		.95		30	.221	1.92	40	~12%/~10%	11	.0811	.145	62		23/46.5		Tandem rudder
Boeing 747/100,200	445	.97	103/138	30	.196	1.38	44			.0990	.173	77	42	25	T	Split rudder
Lockheed C-5A	410	.875		43	.191	.84	34.9			.0951	.191					T-tail

*C = control tab; S = servo tab; T = trim tab

Table 9-3. Vertical tailplane design dat

JET AIRCRAFT

	AIRCRAFT TYPE	1st flight prototype	Aspect ratio A	Taper ratio λ	Sweep angle $\Lambda_{.25}$ deg.	Geom. twist deg.	Dihedral Γ deg.	Profile type and streamwise thickness root %	tip %	$(\overline{t/c})$ %	V_{MO}*** km/h EAS	M_{MO}	V_D km/h EAS	M_D	Flap type* T.E./L.E.	$(\overline{c_f/c})$ streamwise	b_f/b %	Flap angle takeoff deg.	Flap angle landing deg.	$C_{L_{max}}$ (flight test) takeoff	$C_{L_{max}}$ (flight test) landing
JET TRANSPORT AIRCRAFT	Yakovlev YAK 40	1966	9	.396	0	-	4°30'	15	10	12.5		.70	-	-	P	31.5	67	-	-	-	2.10
	VFW-Fokker 614	1971	7.22	.402	15	3°45'	3°	63$_2$A-015 a=.4 mod.	63$_1$A-012 a=.5 mod.	13,5	528	.650	615	.740	F1	31	69	20	40	2.12	2.37
	Grumman Gulfstream II	1966	5.97	.370	25	-	3	13 Naca-6 series		-	680	.860	-	-	F1	30	73	20	40	-	1.80?
	Fokker-VFW F 28	1967	7.27	.355	16	-	2°30'	13.2	10	13	611	.750	-	.830	F1-2	32	69.5	25	42	2.16	2.53
	BAC One-Eleven Srs 200/400	1963	8.00	.321	20	-	2	12.5	11	11,8	652*	.780	760	.860	F1	30	75	18	45	1.86	2.40
	McDonnell-Douglas DC-9 srs 10	1965	8.56	.246	24	-4	3	13.65	9.8	11,65	630	.840	-	.890	S2	36	67	15	50	-	2.40
	McDonnell-Douglas DC-9 srs 30	1966	8.72	.226	24	-4	3	13.65	9.6	11,6	630	.840	-	.890	S3/I	36	67	15	50	2.45	2.98
	Tupolev Tu 134/134A	1964	7.42	.287	35	-	-1°30'	-	-	-	-	.817	-	-	S2	23	60.5	25	30	1.51	1.67
	Boeing 737 srs 100/200	1967	8.83	.251	25	-	6	14	11.5	12,9	648	.840	722	.890	F3/I,II	29	74	15?	40	2.20	3.05
	Aérospatiale Caravelle	1955	8.02	.354	20	-2	3	65$_1$-212	65$_1$-212	12	556	.810	-	.870	S1	27	66	10	45	1.74	2.10
	Hawker Siddeley Trident 2E	1967	6.57	.240	35	-5	3	11.5	-	9,8	630	.880	732	.950	S2/I	28	69	20	50	1.93	2.40
	Boeing 727 srs 100/200	1963	7.67	.323	32	-	3	13	9	11	722	.900	-	.950	F3/I,II	30	74	25	40	2.35	2.75
	Tupolev Tu 154	1968	8.14	.250	35	-	-	-	-	-	575	.900	-	-	S3/I	31	75	-	-	2.05	2.70
	Boeing 707/720	1957/60	7.11	.293	35	-	7	12.5	9	10	710*	.900	787	.950	F1/I,II	27	67	15	50	1.76	1.94/2.06
	McDonnell-Douglas DC-8 srs 10,50,61	1958/60/66	7.30	.244	30	-	6°30'	12	10.16	11,1	630	.880	751	.950	S2/II	30	76	25	50	1.87	2.03
	McDonnell-Douglas DC-8 srs 62/63	1966/67	7.65	.194	30	-	6°30'	-	-	-	-	-	770	.950	S2/II	30	73	23	50	1.87	2.05
	BAC VC-10 srs 1100/Super VC-10	1962/64	7.49	.273	32°30'	-	3	12.5	9.75	10	562	.860	704	.940	F1/I	29	62	-	45	-	2.27
	Lockheed L-300 Starlifter	1963	7.90	.350	25	-5°30'	-1°26'	0013 mod.	0010 mod.	11,5	-	-	760*	.890	S2/I	32	66	-	-	-	2.32
	Ilyushin IL 62	1963	6.675	.262	35	-	-	-	-	-	-	-	-	-	S2	24	72	-	30	-	2.36
	BAC Three-Eleven	1972	8.00	.255	25	-	-	12.5	10	14,2	656*	.840	-	-	F1/I	-	75	22	45	-	3.19
	A 300B	1972	8.60	.364	28	-	-	15	-	13,5	668	.840	-	-	F2/I	32.5	82	15	35	2.70	3.00
	Lockheed 1011	1970	7.16	.296	35	-3°40'	7°31'/5°30'	12.4	9	10,7	-	.858	-	.950	S2/I	26	77	22	42	2.46	2.65
	McDonnell-Douglas DC-10 srs 10	1970	6.90	.250	35	-	-	12.5	10	11	-	.880	-	-	S2/I	25?	77.5	25	50	2.34	2.73
	McDonnell-Douglas DC-10 srs 30	1971	7.21	.230	35	-	-	12.2	8.4	11	-	.880	-	-	S2/I	25?	77.5	15	55	2.15	2.98
	Boeing 747/747B	1969/70	6.96	.309	37°30'	-3°30'	7	13.44	8	9,4	695	.920	824	.970	S3/II	30	70	20	30	1.89	2.55
	Lockheed L500 Galaxy	1968	7.75	.256	25	-	-5° 6'	12.5	9.7	11,5	648*	.825	745/726*	.875	F1/I	24	72	30	40	2.21	2.63
JET EXECUTIVE AIRCRAFT	Potez-Air Fouga CM170 Magister	1952	7.42	.400	9°50'	-	0	64-219	64-212	15,5	700	-	740	.820	S1	25	59.5	15	40	-	-
	Aermacchi MB 326	1957	5.26	.600	8°22'	-	2°55'	63A-213.7	63A-212	12,9	806	-	-	.800	S1	25	61	-	-	-	1.70
	Cessna Model 500 Citation	1969	7.45	.390	1°10'	-	-	23014 mod.	23012	13	531*	.700	-	-	S1	25	56	20	-	1.55	1.72
	SNIAS 600 Corvette	1970	7.45	.447	20° 6'	-1°13'	3° 6'	13.65	11.50	12,6	657**	.77	695	.82	S2	31	73	15	40	-	2.40
	Cessna 318 (A/T37)	1954	6.20	.681	≈ 0	-2°38'	3	2418 mod.	2412 mod.	16	816**	.705**	843	-	S1	24	53	-	-	-	1.93
	Gates Lear Jet Model 25	1969	5.02	.510	13°	-	2°30'	64A 109	64A 109	9	617	.765	833	.850	S1	28	61	20	40	1.37	1.37
	Aerocommander Jet Commander	1963	6.19	.333	4°37'	-2	2	64$_1$-212	64$_1$-212	12	667	.800	833	.890	P	25	60	20	60	-	2.00
	Dassault Minifalcon 10	1970	7.11	.263	≈27°45'	-	-	-	-	-	-	.87	-	-	S2/I	31.5	67	15	55	2.04	2.35
	MBB 320 Hansa Jet	1964	6.00	.333	-15	-	6	63A-1.5-13	63A-1.8-11	12	825	-	700	.830	S2	22.5	67	-	-	1.61	1.91
	Piaggio Douglas PD 808	1964	6.25	.410	1°50'	-	3	DES0010-1.1- 40/11° mod.	DES0008-1.1- 40/9° mod.	9	852**		788	.850	S1	30	61	-	-	-	1.71
	North Am. Rockwell Sabre Liner	1958	5.77	.313	28°33'	-	-	-	-	..	617	.765	-	.850	S1/I			-	-	-	2.37
	Hawker Siddeley HS.125 srs 400B	1962	6.25	.300	20	-2°30'	2	14	11	12,5	528	.755	685	.825	S2	29	65	15	50	1.84	2.19
	Dassault Fan Jet Falcon 20.F	1963	6.40	.312	30	-	2	10.5	8	9,3	685**	.850	-	-	S1/II	25	61	10	40	-	2.32
	Lockheed Jetstar	1957	5.47	.335	30	-2	2	63A 112	63A 309	10,5	710**	.870	787	.90	S2/II	21	69.5	-	-	-	1.67

Table 7-1. Wing design data

*CAS or IAS

**maximum level flight speed

***V_{NE} is taken equal to V_{MO}

*P - plain or split flap

S - slotted flap; 1, 2 or 3: number of slots

F - Fowler flap

I - slat

II - droop nose, leading edge flap or slot

PROPELLER AIRCRAFT

	AIRCRAFT TYPE	1st flight prototype	Aspect Ratio A	Taper Ratio λ	Sweep angle $\Lambda_{.25}$ deg.	Geom. twist ϵ_g deg.	Dihedral Γ deg.	Profile type and streamwise thickness root %	tip %	$(\overline{t/c})$ %	V_{MO} (EAS) km/h	M_{MO}	V_D (EAS) km/h	M_D	flap type T.E./L.E.	$(\overline{c_f/c})$ streamwise %	b_f/b %	Flapangle takeoff deg.	Flapangle landing deg.	$C_{L_{max}}$ flight test takeoff	$C_{L_{max}}$ flight test landi
TURBOPROP TRANSPORT AIRCRAFT	LET L-410 Turbolet	1969	9.30	.500	0	-2°30'	1°45'	63A 418	63A 412	15	385	-	518	-	S-2	29	66	-	45-70	-	2.4
	Short Skyvan Srs 3	1963	11.30	1.0	0	0	2° 2'	63A srs	63A srs	14	402	-	445	-	S-1	30	69	18/8	20/45	2.07	2.7
	IAI Arava	1969	10.00	1.0	0	-	1°30'	63 (215) A 417 (mod.)		17	350	-	466	-	S-2	-	79	-	-	-	2.4
	Beriev Be 30	1967	9.04	.475	0	-	-	-	-		480	-	-	-	S-2	38.4	62.5	-	-	-	-
	DHC 6 Twin Otter Srs 300	1965	10.05	1.0	0	0	3°	6A srs meanline;0016 (mod) thickness distribution		16	-	-	-	-	S-2	27	96.3	-	-	2.2	2.5
	Handley Page Jetstream	1967	10.01	.333	0°34'	-2°	7°	63A 418	63A 412	15	398	≈ .5	518	≈ .7	S-2	30	61	20	60	1.93	2.3
	Swearingen Metro	1969	7.71	.400	0°54'	-2°	5°	65_2A 215	64_2A 415	15	422	-	-	-	S-2	20	62	-	-	-	-
	SNIAS (NORD) 262 Fregat	1962	8.72	.580	0	-	3°	23016 mod.	23012 mod.	14	386	-	496	-	S-1	24.8	66	15	25/35	1.55	2.2
	DHC-7 STOL	1975	10.00	.400	3°13'	-	4°30'	63A 418	63A 415	-	444	-	-	-	S-2	36	80	25	25/60	2.70	3.1
	HP Dart Herald srs 200	1958	10.20	.521	0°23'	-	4°	23016.5	4412	14.3	443	-	494	-	F-1	32	66	5°	-	-	2.8
	Fokker VFW F 27 Friendship	1955	12.00	.400	1°13'	-2°	2°30'	64_4-421 mod.	64_2-415 mod.	18	421	-	533	-	S-1	31.3	69	16,5	26°20'/40	2.435	2.9
	Hawker Siddeley 748 Srs 2A	1960	11.97	.386	2°54'	-	7°	23018	4412	15	417	-	528	-	F-1	31.5	66.5	15	-	2.11	2.8
	Antonov AN 24V srs II	1960	11.77	-	-	-	-	-	-	-	450	-	-	-	F-1	18	64.7	-	-	-	2.7
	NAMC YS-11A	1962	10.81	.340	3°11'	-	6°19'	64A 218 mod.	64A 412 mod.	15	245	.475	546	.601	F-1	30	65	-	-	-	2.7
	Breguet 941C STOL	1961	6.56	.530	0	-	4°	63A 416	63A 416	16	-	-	-	-	S-2	25	100	45°/30°	98°/65°	-	-
	Vickers Vanguard	1959	9.10	.380	-	-	6°	63-X15	63-X13	14	645	-	717	-	F-1	31	64	-	40	-	2.4
	Lockheed L188 Electra	1957	7.50	.40	-	-	6°	0014-1.10	0012-1.10	13	675	-	756	.711	F-1	32	65	-	40	-	2.5
	Antonov AN 10	1957	12.03	-	-	-	-	-	-	-	-	-	-	-	S-2	24	65	-	-	-	-
	Ilyushin IL-18	1957	10.00	.333	-	-	-	-	-	14	-	-	-	-	S-2	-	63	-	-	-	-
	Lockheed L100 Hercules	1954	10.07	.513	-	-3°	2°30'	64A 318	64A 412	15	550	.660	611	.710	F-1	30	70	18	36	2.17	2.2
	Bristol Britannia	1951	9.53	.300	7° 3'	2°24'	3°	25017	4413	15	533	.650	593	.700	S-2	32	67	15	45	-	2.5
	Tupolev Tu-114	1957	8.39	.350	35	-	-	-	-	-	-	-	-	-	F1	-	-	-	-	-	-
	Antonov AN 22	1965	12.02	.360	2°51'	-	-2°30'	-	-	-	740	-	-	-	S-2	22	62.7	-	-	-	-
											V_{max}(TAS) km/h		V_D(TAS) km/h								
PISTON ENGINED GENERAL AVIATION AIRCRAFT	Beagle Pup B.121	1967	8.04	.550	2°56'	-2°	6°30'	63_2-615	63_2-615	15	259	-	314	-	S-1	21	59	10	40	1.60	1.8
	Beagle B.206	1961	10.00	.400	≈0	-1°12'	5°	23015	4412 mod.	13.5	372	-	483	-	S-2	28	50.5	20	-	-	2.1
	Beechcraft Queen Air Model 65	1958	7.51	≈ .42	0	-4°48'	7°	23018	23012	15	384	-	433	-	S-1	-	-	65%	100%	1.22	1.7
	Beechcraft Musketeer	1961	7.50	1.0	0	-2°	6°30'	63_2A 415	63_2A 415	15	235	-	-	-	S-1	-	-	-	-	-	1.8
	Beechcraft Bonanza V35A-TC	1945	6.10	.457	0	-3°	6°	23016.5	23012 mod.	14.3	402	-	-	-	S-1	22	54.4	20	30	-	1.8
	Beechcraft Baron D 55	1960	7.16	.410	0	-5°	6°	23017.5	23010.5	14	390	-	-	-	S-1	23	48.7	-	-	-	1.7
	Bölkow Bo 208C Junior	1962	6.90	1.0	-3°	-	1°	23009 mod.	23009 mod.	9	230	-	283	-	P-1	22	65.5	-	-	-	-
	Messerschmitt-Bölkow Bo 209 Monsun	1969	6.90	.650	1°24'	-	2°30'	64-215	64-212	13.5	274	-	320	-	-	23.5	69.5	-	-	-	1.9
	Cessna Model 150	1957	7.00	.687	0	-1°	1°	2412	2412→ symm.	12	196	-	261	-	S-1	27.5	61.5	-	40	-	1.7
	Cessna Model 172	1956	7.52	.672	0	-3°	1°44'	2412	2412→ symm.	12	224	-	280	-	S-1	32.9	46.1	20	40	-	2.1
	Cessna T 210 Centurion	1965	7.66	.726	0	-3	1°30'	64_2A215(a=.5)	64_1A412 (a=.5)	13.5	322	-	-	-	S-1	-	65.0	-	40	-	1.8
	Cessna Mod. 337 Super Skymaster	1961	7.18	.650	0	-2	3	2412	2409	10.5	322	-	-	-	S-1	-	70.5	20	40	-	1.8
	Cessna Model 401/402	1965	7.50	.679	0	-2°30'	0/5°	23018	23009	14	-	-	428	-	-	27.5	-	-	-	-	2.0
	Dornier D027	1955	7.72	1.0	0	0	0	23018	23018	18	-	-	-	-	S-2/I	33	71	26	42	-	-
	Dornier D028 Skyservant	1959	8.50	1.0	0	0	1°30'	23018	23018	18	-	-	-	-	S-2/I	33	71	-	-	-	2.3
	Helio H-295 Super Courier STOL	1965	6.58	1.0	0	0	1°	23012	23012	12	269	-	304	-	S-1/I	27	74	-	-	-	6.4
	Piper PA 23 Aztec D	1961	6.80	1.0	0	-1°12'	5°	USA 35B mod.	USA 35B mod.	14	348	-	446	-	P-1	25	50	-	50	-	2.1
	Piper PA 24-260 Comanche C	1956	7.28	.460	-2°30'	-3°	5°	64_2A 215	64_2A 215	15	314	-	365	-	S-1	18	60	-	-	-	1.7
	Piper PA 28-140C Cherokee	1960	5.63	1.0	0	-	7°	65_2-415	65_2-415	15	245	-	-	-	S-1	17	57	10-25	50	-	1.7
	Piper PA 31 Navajo	1964	7.25	.372	0°30'	-2°30'	5°	63_2-415	63_1-212	13.5	365	-	-	-	S-1	-	65.6	-	-	-	2.1
	SNIAS GY-80 Horizon	1962	7.20	.570		-2°30'	7°	63-517	4413.6	15.3	-	-	-	-	F-1	-	70	-	-	-	-

Pesos de los grupos principales

AIRPLANE CATEGORY AND TYPE		MTOW	WING GROUP		TAIL GROUP		FUSELAGE GROUP		LANDING GEAR		SURFACE CONTROLS		NACELLE GROUP	
		10^3 lb	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%
LIGHT SINGLES RECIPROCATING	Cessna - 150A	1.50	0.213	14.2	0.041	2.73	0.166	11.1	0.106	7.07	0.031	2.07	0.024	1.60
	- 172B	2.20	0.236	10.7	0.061	2.77	0.253	11.5	0.122	5.55	0.031	1.41	0.031	1.41
	- 180D	2.65	0.254	9.58	0.059	2.23	0.270	10.2	0.119	4.49	0.036	1.36	0.037	1.40
	- 182D	2.65	0.254	9.58	0.061	2.30	0.273	10.3	0.136	5.13	0.036	1.36	0.036	1.36
	- 185	3.20	0.266	8.31	0.071	2.22	0.290	9.06	0.132	4.13	0.036	1.13	0.041	1.28
	- 210	2.90	0.261	9.0	0.071	2.45	0.316	10.90	0.207	7.14	0.044	1.52	0.031	1.07
	Beechcraft J-35	2.90	0.379	13.1	0.058	2.00	0.200	6.90	0.205	7.07	0.056	1.93	0.062	2.14
	Saab Safir	2.66	0.276	10.4	0.060	2.26	0.386	14.5	0.119	4.47	**	-	**	-
LIGHT TWINS RECIPROCATING	Cessna C-310	4.83	0.454	9.40	0.118	2.44	0.319	6.60	0.263	5.45	0.066	1.37	0.129	2.67
	Beechcraft G-50	7.15	0.656	9.17	0.156	2.18	0.495	6.92	0.447	6.25	0.120	1.68	0.261	3.65
	-65	7.37	0.670	9.09	0.153	2.08	0.601	8.15	0.444	6.02	0.132	1.79	0.285	3.87
	-95	4.00	0.458	11.5	0.079	1.98	0.276	6.90	0.218	5.45	0.073	1.83	0.180	4.50
	D-18S	8.75	0.858	9.81	0.177	2.02	0.733	8.38	0.560	6.40	0.115*	1.31	0.311	3.55
	E-18S	9.70	0.874	9.01	0.180	1.86	0.768	7.92	0.585	6.03	0.115	1.19	0.331	3.41
	De Havilland Dove	8.80	0.930	10.6	0.196	2.23	0.745	8.47	0.391	4.44	**	-	0.220*	2.50
JET TRAINERS	Cessna T-37	6.44	0.531	8.24	0.128	1.99	0.839	13.0	0.330	5.12	0.154	2.39	-	-
	Fouga Magister	6.28	1.089	17.3	0.165	2.63	0.743	11.8	0.459	7.31	0.260	4.14	-	-
	Canadair CL-41	6.50	0.892	13.7	0.201	3.09	0.955	14.7	0.318	4.89	0.172	2.65	0.040	0.62
JET EXECUTIVES	H. Siddeley - 125	21.200	1.968	9.28	0.608	2.87	1.628	7.68	0.659	3.11	0.217	1.02	**	-
	Jet Commander 1121	16.000	1.322	8.26	0.425	2.66	1.622	10.1	0.443	2.76	0.223	1.39	0.35	2.19
	N.Am.Sabreliner	16.700	1.753	10.5	0.297	1.78	2.014	12.1	0.728	4.36	0.344	2.06	0.315	1.89
	Lockheed Jetstar	30.680	2.827	9.21	0.879	2.87	3.491	11.4	1.061	3.46	0.768	2.50	0.792	2.58

* estimated

** included in other items

PROPELLER TRANSPORTS

		AIRPLANE CATEGORY AND TYPE	MTOW	WING GROUP		TAIL GROUP		FUSELAGE GROUP		LANDING GEAR		SURFACE CONTROLS		NACELLE GROUP	
			10^3 lb	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%
RECIPROCATING	2 ENGINES	De Havilland DHC-4	24.000	2.925	12.2	0.790	3.29	2.849	11.9	1.23	5.13	0.326	1.36	0.781	3.25
		Saab Scandia	35.273	4.195	11.9	0.584	1.66	2.773	7.86	1.841	5.22	0.369	1.05	1.479	4.19
		H. Page Herald	37.500	4.365	11.6	0.987	2.63	2.986	7.96	1.625	4.33	0.364	0.97	0.830	2.21
		S.A. Twin Pioneer	14.600	2.121	14.5	0.576	3.95	1.381	9.46	0.703	4.82	0.300	2.05	0.230	1.58
		Canadair CL-21	32.500	3.99	12.3	1.055	3.25	3.260	10.0	1.609	4.95	0.371	1.14	1.29	3.97
	4 ENGINES	Douglas DC-6B	81.500	7.506	9.21	1.406	1.73	5.471	6.71	4.165	5.11	1.052	1.29	2.871	3.52
		DC-7C	143.000	11.100	7.76	1.900	1.33	8.450	5.91	5.130	3.59	1.215	0.85	4.130	2.89
		Lockheed L-749	102.072	11.102	10.9	2.059	2.02	7.407	7.26	4.782	4.68	1.488	1.46	3.869	3.79
		L-1049	137.500	11.542	8.39	2.604	1.89	12.839	9.34	5.422	3.94	1.685	1.23	4.420	3.21
TURBOPROPELLER	2 ENGINES	Nord 262	23.050	2.698	11.7	0.805	3.49	3.675	15.9	1.085	4.71	0.408	1.77	0.236	1.02
		Fokker F-27/100	39.000	4.408	11.3	0.977	2.51	4.122	10.6	1.940	4.97	0.613	1.57	0.628	1.61
		F-27/200	43.500	4.505	10.4	1.501	2.42	4.303	2.89	1.825	4.20	0.620	1.43	0.667	1.53
		F-27/500	45.000	4.510	10.0	1.060	2.35	5.142	11.4	1.865	4.14	0.626	1.39	0.668	1.48
		Grumman Gulfstream	33.600	3.735	11.2	0.874	2.60	3.718	11.1	1.207	3.59	0.461	1.37	1.136	3.38
		Short Skyvan	12.500	1.220	9.76	0.374	2.99	2.154	17.2	0.466	3.73	0.265	2.12	0.254	2.03
	4 ENGINES	Bréguet 941	58.421	4.096	7.01	1.387	2.37	6.481	11.1	2.626	4.94	1.056	1.81	***	-
		H.S. Argosy	82.000	10.800	13.2	1.300	1.59	11.100*	13.5	3.180	3.88	**	-	1.200	1.46
		Vickers Viscount 810	69.000	6.25	9.06	1.245	1.80	6.900	10.0	2.469	3.58	0.824	1.19	1.816	2.62
		Bristol Brit. 300	155.000	13.433	8.6	3.202	2.07	11.100	7.16	5.785	3.73	1.221	0.79	4.930	3.18
		Brit. 320	184.523	14.199	7.69	3.221	1.75	11.750	6.38	6.500	3.52	2.048	1.11	7.350	3.98
		Canadair CL-44C	205.000	15.710	7.66	3.749	1.83	20.524	10.0	7.083	3.46	2.146	1.05	6.834	3.33
		CL-44D	205.000	15.588	7.60	3.540	1.73	16.047	7.83	7.300	3.56	1.830	0.89	6.043	2.95
		Lockheed Electra	106.700	7.670	7.19	1.924	1.80	9.954	9.33	3.817	3.58	***	-	4.417	4.14
		C-130E	151.522	11.697	7.72	3.425	2.26	14.340	9.46	5.341	3.53	1.702	1.12	2.675	1.77
		C-133A	275.000	27.403	9.96	6.011	2.19	30.940	11.3	10.635	3.87	1.804	0.66	3.512	1.28

* tail booms (2,360 lb) included ** included in other items *** no data available

	AIRPLANE CATEGORY AND TYPE	MTOW	WING GROUP		TAIL GROUP		FUSELAGE GROUP		LANDING GEAR		SURFACE CONTROLS		NACELLE GROUP	
		10^3 lb	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%	10^3 lb	%
2 ENGINES	VFW-Fokker 614	40.981	5.767	14.1	1.121	2.74	5.233	12.8	1.620	3.45	0.745	1.82	0.971	2.37
	Fokker-VFW F-28/1000	65.000	7.330	11.3	1.632	2.46	7.043	10.8	2.759	4.24	1.387	2.13	0.834	1.28
	F-28/2000	65.000	7.347	11.3	1.632	2.46	7.649	11.8	2.759	4.24	1.400	2.15	0.834	1.28
	F-28/5000	70.800	8.223	11.6	1.632	2.31	7.043	9.95	2.759	3.90	1.665	2.35	0.849	1.20
	F-28/6000	70.800	8.244	11.6	1.632	2.31	7.649	10.8	2.789	3.94	1.674	2.36	0.849	1.20
	BAC 1-11/300	87.000	9.643	11.1	2.369	2.72	9.713	11.2	2.865	3.29	1.481	1.76	**	-
	1-11/400	87.000	9.670	11.1	2.419	2.78	9.743	11.3	2.899	3.33	1.207	1.39	**	-
	Mc D. Douglas DC-9/10	91.500	9.470	10.3	2.630	2.87	11.206	12.2	3.660	4.00	1.264	1.38	1.417	1.55
	Boeing 737-100M	97.800	9.968	10.2	2.700	2.76	12.380	12.7	3.687	3.77	1.589	1.62	***	-
	737-200	100.000	10.613	10.6	2.718	2.72	12.108	12.1	4.354	4.35	2.348	2.35	1.392	1.39
	Aerospat. Caravelle VIR	110.230	14.735	13.4	1.957	1.77	11.570	10.5	5.110	4.63	2.063	1.87	1.581	1.43
	Airbus A300B/2	304.000	44.131	14.5	5.941	1.95	35.820	11.8	13.611	4.47	5.808	1.94	7.039	2.32
3 ENGINES	H. Siddeley 121-IC	115.000	12.600	11.0	3.225	2.80	12.469	10.8	4.413	3.84	1.792	1.56	**	-
	121-IE	134.000	13.462	10.0	3.341	2.49	13.328	9.95	5.073	3.79	1.689	1.26	**	-
	Boeing 727-100	161.000	17.764	11.0	4.133	2.57	17.681	10.9	7.211	4.48	2.996	1.86	3.864*	2.40
	727-100C	160.000	17.492	10.9	4.142	2.59	20.044	12.5	6.860	4.29	2.957	1.85	3.839	2.40
4 ENGINES	Boeing KC-135	297.000	25.251	8.50	5.074	1.71	18.867	6.35	10.180	3.43	2.044	0.69	2.575	0.87
	707-121	246.000	24.024	9.76	5.151	2.09	20.061	8.15	9.763	3.97	2.044*	0.83	4.639	1.89
	707-320	311.000	29.762	9.57	5.511	1.77	21.650	6.96	12.700	4.08	2.400*	0.77	4.497	1.45
	707-320C	330.000	32.255	9.77	6.165	1.87	26.937	8.16	12.737	3.86	3.052	0.92	4.183	1.27
	707-321	301.000	28.647	9.52	6.004	1.99	22.129	7.35	11.122	3.70	2.408	0.80	5.119	1.70
	720-022	203.000	22.850	11.3	5.230	2.58	19.035	9.38	8.110	4.00	2.430	1.21	4.510	2.22
	747-100	710.000	86.402	12.2	11.850	1.67	71.845	10.1	31.427	4.43	6.982	0.98	10.031	1.41
	747-200B	775.000	92.542	11.9	11.842	1.53	72.053	9.30	32.693	4.22	7.073	0.91	10.136	1.31
	Mc D. Douglas DC-8-10	273.000	26.235	9.61	4.740	1.74	21.495	7.87	10.185	3.73	2.000*	0.73	3.505	1.28
	DC-8-55	328.000	34.759	10.6	4.889	1.49	22.248	6.78	11.255	3.43	2.253	0.69	4.685	1.43
	BAC VC-10-1101	312.000	34.672	11.1	6.958	2.23	25.113	8.05	10.489	3.36	***	-	**	-
	G. Dynamics 880	184.500	17.669	9.58	4.247	2.30	13.699	7.42	6.203	3.36	***	-	3.685	2.00
	990	253.000	26.871	10.6	5.326	2.11	16.673	6.59	8.718	3.44	***	-	6.772	2.68

* estimated ** included in other items *** no data available

Pesos de sistemas

	AIRPLANE TYPE	MTOW	A.P.U.-GROUP	INSTR. NAV.EQPT.	HYDR. PNEUM.	ELEC-TRICAL	ELEC-TRONICS	FURNISH. EQPT.	AIRCOND. ANTI-ICE	MISC.	TOTAL
JET TRANSPORTS	Atlas Airbus A-300 B2	302,000	983	377	3,701	4,923	1,726	13,161	3,642	732	29,245
	BAC 1-11 Srs 300	87,000	457	182	997	2,317	1,005	4,933	1,579	-	11,465
	Boeing 707/320 C	330,000	151	515	1,086	4,179	2,338	9,527	3,608	-389	21,015
	707/321	301,000	-	561	498	3,959	1,716	14,854	3,290	-	24,878
	720/022	203,000	-	555	505	4,070	1,200	13,055	2,890	-	22,275
	727/100	160,000	60	756	1,418	2,142	1,591	10,257	1,976	85	18,285
	727/100C	160,000	52	802	843	3,617	1,559	6,729	2,401	75	16,078
	737/200	100,400	836	625	873	1,066	956	6,643	1,416	124	13,539
	747/100	710,000	1,130	1,909	4,471	3,348	4,429	37,245	3,969	-421	54,380
	Fokker VFW F-28 Mk 1000	65,000	346	302	364	1,023	869	4,030	1,074	-	8,008
	Mk 2000	65,000	353	309	366	1,045	869	4,614	1,111	-	8,667
	Lockheed Jetstar	30,680	-	153	262	973	318	1,521	510	560	4,297
	McDonnell Douglas DC-8/55	328,000	-	1,271	2,196	2,398	1,551	14,335	3,144	57	24,952
	DC-9/10 RC	91,500	818	719	714	1,663	914	7,408	1,476	24	13,736
	North Am. T-39A Sabreliner	16,700	-	122	116	720	407	857	333	-	2,555
	Aerospatiale Caravelle VI R	114,640	-	236	1,376	2,846	1,187	6,481	1,752	-	13,878
	VFW Fokker - 614	40,981	305	215	403	1,054	436	2,655	719	49	5,836
PROPELLER TRANSPORTS	Bristol Britannia 300A	155,000	-	505	650	1,800	1,040	6,866	3,000	-	13,861
	Canadair CL-44C	205,000	-	858	630	3,040	1,229	12,349	2,536	-	20,662
	CL-44D	205,000	-	783	640	2,875	1,046	3,155	4,090	-	12,589
	Fokker VFW F-27 Mk 100	39,000	-	81	242	835	386	2,291	1,225	-	5,060
	Mk 500	45,000	-	126	256	840	329	3,035	1,257	-	5,843
	Grumman Gulfstream I	33,600	355	97	235	966	99	415	755	6	2,929
	Lockheed C-130 E	151,522	466	665	671	2,300	2,432	4,765	2,126	62	13,487
	L-1049 E	133,000	-	503	654	1,505	1,371	7,405	3,298	-	14,736
	Nord 262	23,050	-	133	765		238	1,324	527	33	3,020
	Vickers Viscount 702	50,044	-	154	331	2,048	447	2,519	1,516	-	7,015
JET TRAINERS	Beechcraft MS 760	7,650	-	70	-	284	158	169	48	30	759
	Cessna T-37	6,436	-	132	56	194	86	256	69	3	796
	Northrop T-38A Talon	11,651	-	211	154	296	246	460	142	24	1,539
LIGHT TWINS	Beechcraft 95 Travel Air	2,900	-	49	-	96	26	194	48	25	438
	G-50	7,150	-	80	-	184	9	333	81	27	834
	E-18 S	9,700	-	100	-	295	63	524	144	58	1,184
	Cessna 310 C	4,830	-	46	-	121	-	154	46	65	498
SINGLE ENGINE A/C	Beechcraft Bonanza J-35	2,900	-	16	-	72	-	174	12	7	281
	Cessna 150A	1,500	-	7	2	41	-	42	4	-	96
	172B	2,200	-	7	3	41	-	99	4	-	154
	180D	2,650	-	8	3	59	-	105	6	-	181
	210A	2,900	-	16	4	60	-	116	12	20	228

ALL WEIGHTS IN LB

Horizontal Plane Design

Aircraft type	Design Dive Speed' V_D kts EAS	Design Dive Speed' M_D	$\frac{S_h}{S}$ -	A_h -	λ_h	Λ_h deg.	Airfoil Section root/tip	Average t/c %	Tail Type *	i_{max} + deg.	i_{max} - deg.	$\frac{S_h l_h}{S\bar{c}}$ —	Γ_h deg.	$\frac{S_e}{S_h}$ —	Hinge Pos. % c_h	Balance Ratio % c_e	$\delta_{e_{max}}$ + deg.	$\delta_{e_{max}}$ - deg.	Tabs **
Wright Flyer (1903)	-	-	.163	5.72	1	0	curved "plates"	few	M			-.357	0	0	-	-	-	-	-
Scottish Aviation Pup			.229	4.40	1	0		12	F	-	-	.730	0	.377	60	-	25	27	T
Cessna 177			.202	4.00	1	0	NACA 0012/0009	10.5	M			.600	0	0	25	-	-	-	S
Aérospatiale N-262	260	-	.285	3.84	.568	8.2	23015 mod. inv.	15	F	-	-	1.015	0	.242	75	31.1/36.2			T/S
Fokker-VFW F-27 Mk200	288	.51	.229	6.00	.400	0	NACA 63A-014 mod.	14	F	-	-	.962	6	.198	78	42.7	22	25	T
Lockh. Hercules C-130B	325	.64	.313	5.20	.358	7.5	NACA 23012 inv.	12	F	-	-	1.000	0	.332	65		15	40	T/S
Lockh. Electra 188A		.711	.246	5.25	.335	8.6			F	-	-	.800	8.5	.247	65		15	30	T
Bristol Britannia 310	301	-	.282	5.14	.500	6	RAF 30 mod.	13	F	-	-	1.040	0	.300	66	30	15	35	T/S
Cessna Citation 500			.260	5.20	.500		NACA 0010/0008	9	F	-	-	.755	9	.310	67	-			
Hawker Sidd. HS-125/400B	370	.825	.283	4.00	.580	19.6		10	F	-	-	.677	0	.408	58.7	25	9	24	
Aérospat. SN-600 Corvette			.237	4.79	.523	28.6	neg. cambered	9	V	2.5	7.5	.640	0	.320	64	-	15	25	S
Yakovlev YAK40			.207	4.33	.430	11.5		10	V	3.0	6.0	.621	0	.377	70	-	25	25	-
VFW-Fokker 614	330	.74	.281	4.50	.400	20			V	1.5	12.0	.834	10.5	.273	67		20	25	T
Fokker-VFW F-28 Mk1000	390	.83	.255	3.83	.480	27.5	NACA mod.	10.45	V	2.67	8.33	.972	0	.197	78	45	15	25	T
Aérospat. Caravelle 10-R	375	.87	.204	4.03	.326	30	NACA 65-011	11	F	-	-	.995	0	.235	75	-	12	30	-
BAC-111/200-400	410	.86	.256	3.38	.600	25		10	V			.908	0	.274	65	41		25	S
McDonnell Douglas DC-9 project		.89	.242	4.21	.310	32	DSMA;9.5%/8%	8.75	V	2	10	.941	0	.280	70	35	15	25	S
McDonnell Douglas DC-9/10		.89	.295	4.93	.352	31.6		8.7	V	1	9	1.147	0	.280	70	35	15	25	S
Boeing 737/100	398	.89	.319	4.16	.380	30	12%/9%	10.5	V			1.140	7	.224	75	-	20	20	S
Boeing 727/100		.95	.221	3.40	.400	35		8.5	V	4	12.5	.902	-3	.230	75	-	16	26	S
Boeing 727/200		.95	.221	3.40	.400	35		8.5	V	0	12	1.062	-3	.230	75	-	16	26	S
Dassault Mercure			.275	3.79	.360	32.5		8?	V			1.050	0	.251	75	-			-
Airbus A-300B	420	.90	.267	4.13	.500	32.5			M	3	12	1.068	6	.295	70	-			-
Boeing 707/320		.95	.216	3.37	.421	35	BAC-317	11.6	V	0.5	14	.630	7	.251			15	25	T/S
McDonnell Douglas DC-8 proj		.95	.215	4.04	.329	35	DSMA-89/-90	8.75	V	2	10	.626	10	.225	75	35	10	25	S
McDonnell Douglas DC-8/10		.95	.203	4.04	.329	35	DSMA-89/-90	8.75	V	2	10	.590	10	.225	75	35.2	16.5	27	S
Lockheed L-1011 Tristar	435	.95	.371	4.00	.333	35		8	V	0	14	.928	3	.215	77	-	0	25	-
McDonnell Douglas DC-10/10		.95	.346	3.78	.375	35		9	V	5	15	.855	10	.235	75	30	8.5	11	-
Boeing 747/100-200	445	.97	.267	3.60	.264	37		9	V	3	12	1.000	8.5	.185	77	31	17	23	T
Lockheed C-5A	410	.875	.156	4.89	.364	24.5		10	V	4	12	.700	-4.5	.268	65	30	10	20	-

* F = fixed; M = all-flying; V = variable incidence

** S = servo tab; T = trim tab

Table 9-2. Horizontal tailplane design data

Vertical Plane Design

Aircraft type	V_D kts EAS	M_D -	V_{MC} kts EAS	Max. cross-wind kts	$\frac{S_v}{S}$	A_v	Λ_v deg.	Airfoil Section root / tip	Average t/c %	$\frac{S_v l_v}{Sb}$	$\frac{S_r}{S_v}$	Hinge Position root/tip % c_v	Balance Ratio % c_r	$\pm\delta_r$ max. deg.	Tabs *	Remarks
Wright Flyer (1903)					.045	2.91	0	"flat plates"	-	.0133	1	30	42.8			biplane in front
Scottish Aviation Pup				30	.182	.89	33		12	.0750	.350	64		25	T	Horn balance
Cessna 177				20	.107	1.41	35	NACA 0009/0006	7.5	.0411	.368	60				
Scottish Av. Jetstream		.60	85		.212	1.44	43			.0820	.350	65				Horn balance
Aérospatiale N262	260		90	30	.184	1.60	9.5	NACA 0012 mod.	12	.0763	.270	68	31.2		T/C	
Fokker-VFW F 27 Mk 200	288	.51	78	30	.203	1.55	3.3	NACA 63A-015 mod.	15	.0765	.218	76	44.6	20	T/C	
Lockheed Hercules C-130E	325	.64	93.5		.180	1.84	18.8	NACA 64A-015	15	.0575	.239	75		35	T/C	
Lockheed Electra 188A		.711	110		.145	1.93	14.0	NACA 0012	12	.0707	.250	69	25.8	+23.5 -30	T	
Bristol Britannia 310	300				.197	1.65	10	RAF30 mod.	13	.0774	.225	60/67	30	25	T/S	$\delta_r \pm 16^o$ for CL-44
Aérospat. Corvette SN-600			90		.177	.88	50.3		9	.0720	.250	72	25	30	T	
Cessna Citation 500					.191	1.58	33.0	NACA 0012/0008	10	.0806	.220	75			T	
Hawker Siddeley HS-125/400	370	.825	90		.161	1.19	52		11.5	.0548	.197	72	25	28.5	T	Approx. T-tail
Yakovlev YAK-40					.162	.81	47.5		10	.0442	.222	78		30	T	T-tail
VFW-Fokker 614	330	.74			.174	1.28	32.4			.0682	.321			35	T/S	
Fokker-VFW F 28 Mk1000	390	.83	71	25	.203	1.00	40	NACA mod.	10.15	.0910	.187	78	30	33		T-tail
Aérospat. Caravelle 10.R	375	.87			.106	1.24	37.9	NACA 65-011	11	.0379	.258	76/40		24		
BAC-111/200,400	410	.86		30	.132	.91	41.0		12.5	.0482	.254	70	30			T-tail
McDonnell Douglas DC-9/10		.89			.192	.95	43.5	DSMA	11	.0810	.270	68	35	30	T/C	T-tail
Boeing 737/100	400	.89			.268	1.88	35		12	.1117	.250	75			T	
Dassault Mercure					.232	1.96	35		9	.1025	.221	71.5				Split rudder
Boeing 727/100		.95			.238	.78	55		9	.0905	.168	80				T-tail
Airbus A-300B	420	.90	103		.204	1.62	40		12.5	.1020	.248	70				
Boeing KC-135					.143	1.49	31		10	.0628	.250	65		20	S	
Boeing 707/120			107.5		.148	1.62	31		10	.0656	.282	65		25	S	
Boeing 707/320B		.95	122		.144	1.81	31		10	.0626	.242	65		25	S	
McDonnell Douglas DC-8/10,50	405	.95	$<V_{LOF}$	34	.122	1.91	35	DSMA-111/-112	9.85	.0494	.269	65	37.2	32.5	C	
BAC VC-10/1101	380	.94			.142	1.10	38.5			.0453	.251					T-tail
Lockh. Tristar L-1011/1	435	.95		30	.231	1.83	35		10	.0830	.161	70				
McDonnell Douglas DC-10/10		.95		30	.221	1.92	40	~12%/~10%	11	.0811	.145	62		23/46.5		Tandem rudder
Boeing 747/100,200	445	.97	103/138	30	.196	1.38	44			.0990	.173	77	42	25	T	Split rudder
Lockheed C-5A	410	.875		43	.191	.84	34.9			.0951	.191					T-tail

*C = control tab; S = servo tab; T = trim tab

Table 9-3. Vertical tailplane design dat