

Performance Information

Diamant 16.5

Sink Rate Airmass (fpm)	Air Speed (mph)	Detent #	Flap Angle	Sink Rat Glider (fpm)	Sink Rate Airmass (fpm)	Vario Show (fpm)	L/D	Alt Lost (1 mile)	Alt Lost (5 mile)	Alt Lost (10 mile)	Alt Lost (15 mile)	Alt Lost (20 mile)
0	46	+2	5	120	0	120	33.8	156	782	1564	2346	3128
0	58	0	0	130	0	130	38.9	136	678	1356	2033	2711
0	69	-2	-5	170	0	170	35.7	148	739	1477	2216	2955
0	81	-3	-7.5	220	0	220	32.2	164	819	1639	2458	3277
0	92	-4	-10	310	0	310	26.1	202	1010	2020	3031	4041
100	46	+2	5	120	100	220	18.4	287	1434	2868	4302	5735
100	58	0	0	130	100	230	22.0	240	1199	2398	3598	4797
100	69	-2	-5	170	100	270	22.5	235	1173	2346	3519	4693
100	81	-3	-7.5	220	100	320	22.2	238	1192	2384	3575	4767
100	92	-4	-10	310	100	410	19.8	267	1336	2672	4008	5344
200	58	0	0	130	200	330	15.3	344	1721	3441	5162	6882
200	69	-2	-5	170	200	370	16.4	322	1608	3215	4823	6431
200	81	-3	-7.5	220	200	420	16.9	313	1564	3128	4693	6257
200	92	-4	-10	310	200	510	15.9	332	1662	3324	4986	6648
200	104	-4	-10	440	200	640	14.2	371	1854	3708	5562	7415
300	58	0	0	130	300	430	11.8	448	2242	4484	6726	8968
300	69	-2	-5	170	300	470	12.9	408	2042	4084	6126	8169
300	81	-3	-7.5	220	300	520	13.6	387	1937	3873	5810	7746
300	92	-4	-10	310	300	610	13.3	398	1988	3976	5963	7951
300	104	-4	-10	440	300	740	12.3	429	2144	4287	6431	8574
400	69	-2	-5	170	400	570	10.7	495	2477	4953	7430	9907
400	81	-3	-7.5	220	400	620	11.4	462	2309	4618	6927	9236
400	92	-4	-10	310	400	710	11.4	463	2314	4627	6941	9255
400	104	-4	-10	440	400	840	10.9	487	2433	4866	7300	9733
400	115	-4	-10	600	400	1000	10.1	521	2607	5214	7821	10428
500	69	-2	-5	170	500	670	9.1	582	2911	5822	8733	11645
500	81	-3	-7.5	220	500	720	9.8	536	2681	5363	8044	10726
500	92	-4	-10	310	500	810	10.0	528	2640	5279	7919	10558
500	104	-4	-10	440	500	940	9.7	545	2723	5446	8169	10891
500	115	-4	-10	600	500	1100	9.2	574	2868	5735	8603	11471
600	81	-3	-7.5	220	600	820	8.6	611	3054	6108	9162	12216
600	92	-4	-10	310	600	910	8.9	593	2965	5931	8896	11862
600	104	-4	-10	440	600	1040	8.8	603	3013	6025	9038	12050
600	115	-4	-10	600	600	1200	8.4	626	3128	6257	9385	12513
600	127	-5	-12.5	800	600	1400	8.0	664	3318	6636	9954	13272

Bank Angle	0	30.0	45	60
Min Sink A.S.	46	50.4	54	65

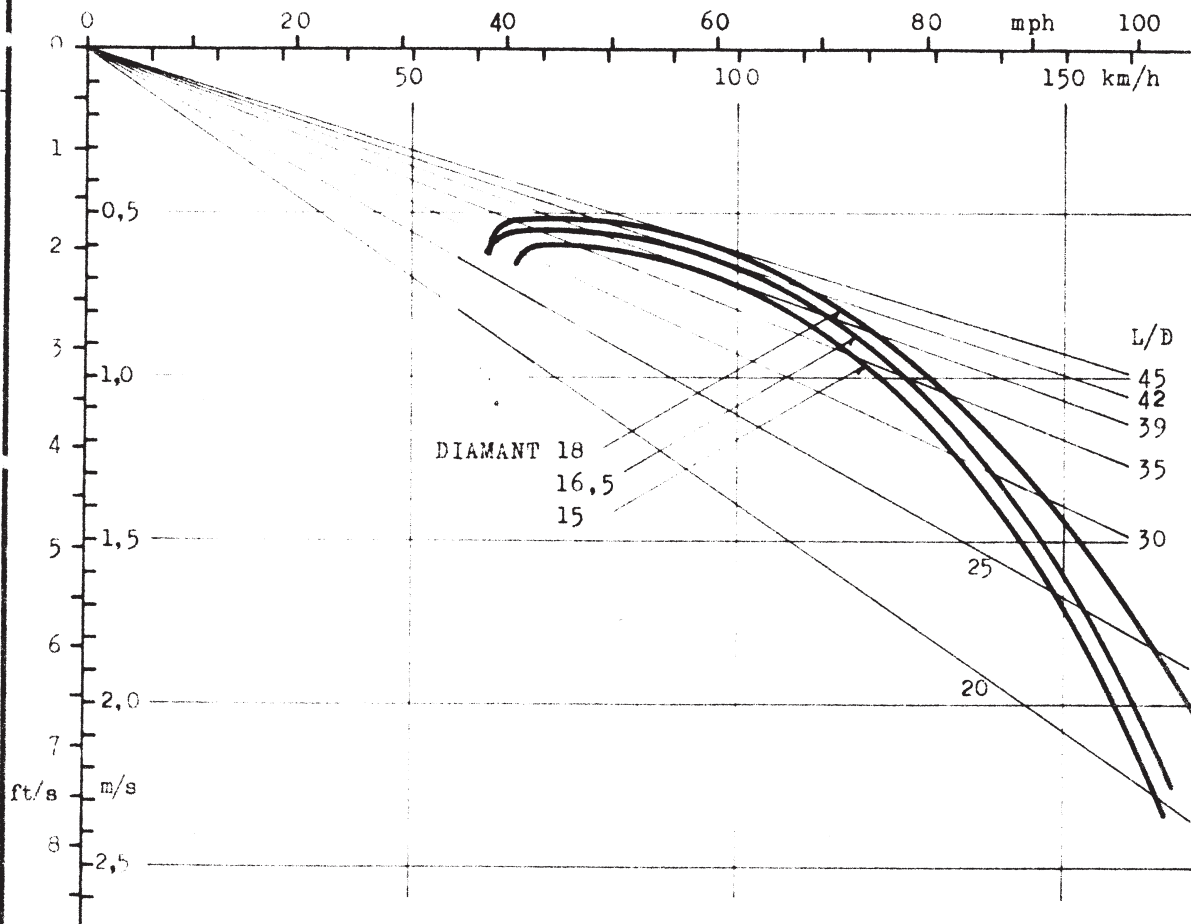
DIAMANT

GESCHWINDIGKEITSPOLAREN

POLAIRES DE VITESSE

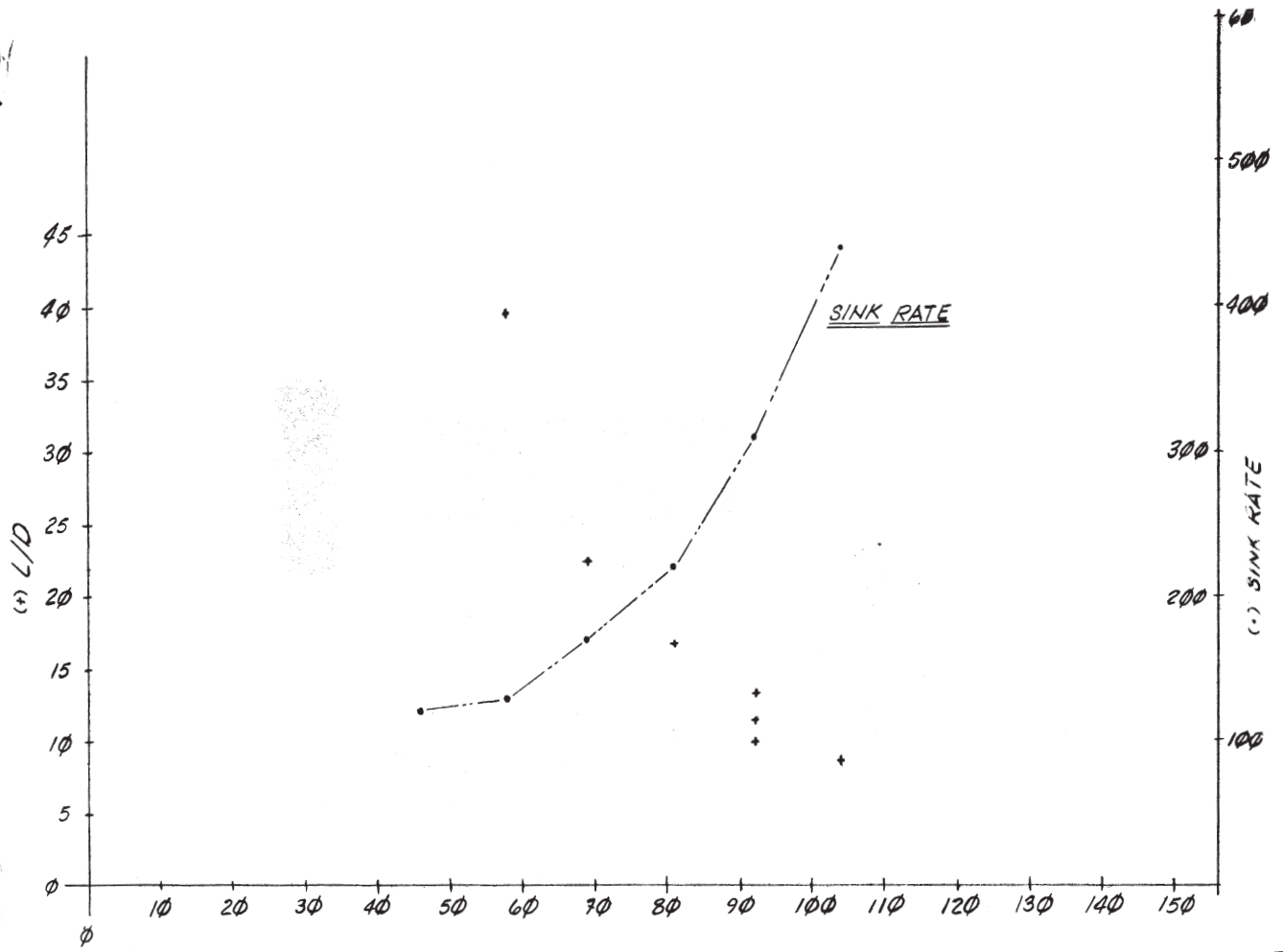
PERFORMANCE POLARS

	Fluggewicht Poids en vol All-up weight	Minimale Sinkgeschw. Vitesse de chute min. Minimum sinking speed	Beste Gleitzahl Finesse maximum Max. L/D
DIAMANT 15	300 kg 660 lbs	60 cm/s bei 72 km/h 2,0 ft/s at 45 mph	39 bei 100 km/h 39 at 62 mph
DIAMANT 16.5	350 kg 770 lbs	55 cm/s bei 70 km/h 1,8 ft/s at 44 mph	42 bei 100 km/h 42 at 62 mph
DIAMANT 18	400 kg 880 lbs	52 cm/s bei 69 km/h 1,7 ft/s at 43 mph	45 bei 95 km/h 45 at 59 mph



FLUG- & FAHRZEUGWERKE AG
ALTENRHEIN (SCHWEIZ/SWITZERLAND)

Dezember 1966



ably hold any bank with the stick in the middle. A piece of cake for cloud flying.

A short test: how is the transition from thermaling to high-speed flight? In my second attempt, I manage to accelerate from 50 to 94 mph in 11 seconds. A good time, though it requires rapid flap adjustment to negative and a definite forward push of the stick.

Eight hundred feet above ground: forgotten anything? Ventilation. Certainly important with so much plexi. The knob is in easy reach and well-adjustable over the whole range. Air intake is from the nose. It seems quite effective, though difficult to judge at today's -5°C .

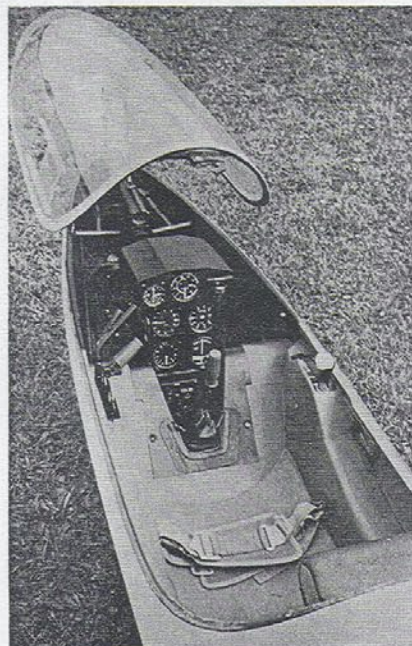
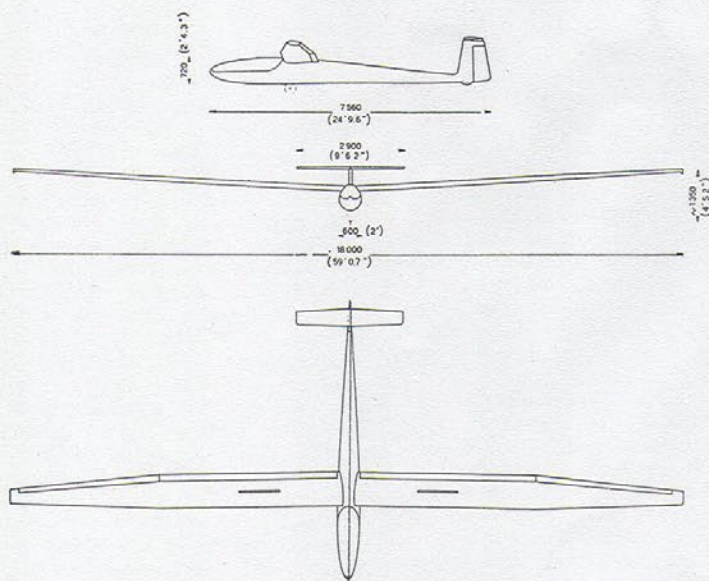
Approach with air brakes and

flaps. They told me that the best efficiency of the brakes would be at 75 mph. I find this a bit high for practical purposes. In competition the decision to land is often made so low that picking up 75 mph is not possible. I therefore try at 65 mph. Although forewarned, I am baffled by the way this thing goes down. To keep up the speed, I must dive at over a 20-degree angle. Against my judgment, I have crossed the threshold at 650 ft., but I am on the ground before using half the runway (2000 ft.). Flare-out is short due to the rapid deceleration, but it can be regulated with the air brakes. On final, one must know that aileron efficiency is reduced. Guiding the ship on the ground is normal. The wheel brak-

ing action is still insufficient, but I'm told that it takes about 20 landings to run in the brake discs.

Important: They don't publicize but still recommend belly landings in delicate situations. This would do no harm whatsoever on average soil (not tarmac). With this method, the landing just has to be exceptionally short: I've never flown any sailplane that offered so many possibilities and such a margin of safety in this respect.

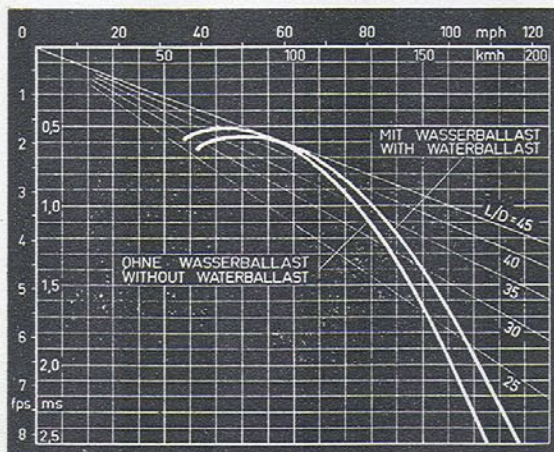
The Diamant 18 has in a nutshell: a comfortable cockpit, but no room to spare . . . excellent visibility . . . very good low-speed characteristics . . . pleasant control handling . . . outstanding landing aides for providing high safety on off-field landings.



FACTORY DATA

Span	59 ft.
Wing area	154 sq.ft.
Aspect ratio	22.7
Empty weight	615 lbs.
Useful load	185-355 lbs.*
All-up weight	800-970 lbs.*
Wing loading	5.2-6.3 lbs./sq.ft.*
Minimum sink	1.7 ft./sec.
at	44 mph
Max. L/D	45
at	56-62 mph*
Minimum speed	34 mph
Maximum speed	168 mph

*Depending on water ballast



Weight & Balance Calculations:

Section I

Aircraft Spec Wgts.:

- 900 # Max. Gross Wgt. of aircraft with water ballast
- 485 # Max. non-Lifting Wgt. limit

Flight Wgts.

- 711.00 Wgt. of fuse, and horiz. stab. as recorded by Inter-City Soaring
- 29.70 Removal of identified hardware (As defined in items "a" through "e", at right)
- 651.30 (sub-total)
- 3.25 Misc. Installed Equipment (As defined in items "f" through "g", at right)
- 684.55 Adjusted Total "Equipped" Wgt.
- 900.00 Max. Gross Wgt. "Ready-to-Fly"
- 215.45 Max. Pilot (and Parachute) Wgt. to remain "AT/UNDER" Max. Gross Wgt.

- 234.95 Max. Pilot (and Parachute) Wgt. for Non-Lifting Limit
- 215.45 Max. Pilot (and Parachute) Wgt. to remain "AT/UNDER" Max. Gross Wgt.
- 19.50 Delta "A/C Max. Gross Wgt." vs. "A/C Non-Lifting Limit"

Non-Lifting Wgt. Adjustments:

- 276.50 Wgt. of fuse and horiz. stab. as recorded by Inter-City Soaring
- 14.50 Removal of OZ system
- 0.50 Removal of Remote Speaker
- 2.70 Removal of Water Ballast System (in Fuse)
- 1.00 Removal of Static Pressure Flask
- 11.00 Removal of Cambridge Lift Director and Cambridge vari (From Flight Manual)
- 246.80 (Sub-Total)
- 2.25 Installed IEC SC-7 Variometer
- 1.00 Installed T.E. Probe on fin
- 250.05 Wgt. of fuse, and horiz. stab. as modified on 22-March-1997
- 485.00 Max. non-Lifting Wgt. limit
- 234.95 Max. Pilot (and Parachute) Wgt. for Non-Lifting Limit

References for Determining Center of Gravity:
(From Flight Manual)

Datum: Wing leading edge at "root rib"
The fuselage reference line "BL", which is parallel to a line defined by the following points:

- Point "A" = on the upper fuselage surface centerline at the aft end of the canopy, and
- Point "B" = 1 3/8 inches above the upper fuselage surface centerline 40 inches aft of point "A"

Section II

Aircraft Balance Formulae:
(FROM FLIGHT MANUAL)

Where:

- P1 = LE of wing at root
- P2 = wgt. on main wheel
- P3 = wgt. on tail wheel
- P3 = pilot wgt.
- a = distance from datum to main wheel
- b = distance from datum to tail wheel
- c = distance from main wheel to tail wheel
- d = pilot arm (distance from pilot center of mass to datum)

Solve for "x" d.t.:

Given:

Wgts. & measurements from existing Weighing No. 2 on 26-dec-1966, as performed by FFA technical representative Keller, and included in the aircraft flight manual.

$$\frac{(P1 * a) + (P2 * b)}{(P1 + P2)} = \text{(Equipped C.G.) } 24.37$$

$$\frac{(P1 * a) + (P2 * b) + (P3 * d)}{(P1 + P2 + P3)} = \text{(Flying C.G.) } 14.32$$

(Must be Between 9.50 and 16.00 to be safe!)

Section III

Data base information:

Date Obtained From:	Weighting No.	Date	(P1) lbs.	(P2) lbs.	(P3) lbs. * Load Factor % (Actual) @ (P3 Actual)	(P3) lbs. * (P3) lbs. * 2 (Min./Max.)	(a) inches	(b) inches	(c) inches	(d) inches	CG loc. using (P3) (inches aft of datum)	Condition #3	Remarks
Flight Manual	Wgt. No. 1	05/29/67	539.02	59.52	0.00	187.00/300.00	6.97	193.39	186.42	-14.48	25.506	equipped condition	
Flight Manual	Wgt. No. 2	12/24/68	586.00	50.80	0.00	135.00/270.00	7.48	193.31	185.83	-14.48	22.304	equipped condition	
	Wgt. No. 3						7.48	193.31	185.83	-14.48	12.701	living wgt.	
Inter-City Soaring	Wgt. No. 4	08/14/83	643.50	67.50	0.00	195.00/197.00	6.50	184.50	188.00	-14.48	24.348	equipped condition	
Dan Morris	Wgt. No. 5a	11/28/83			0.00			184.50	188.00	-14.48	15.014	living wgt.	
Dan Morris	Wgt. No. 5b	11/28/83			0.00					-14.48		living wgt.	Wgts. and Measurements are from Inter-City Soaring inclusive of items "a, through c," as identified above
George Wiederkehr	Wgt. No. 6	11/18/84	631.00	64.00	0.00	199.00/210.00	7.48	N/A	188.00	-14.48	24.656	equipped condition	Wgts. and Measurements are from Inter-City Soaring inclusive of items "b, and c," as identified above
Art Babiarz	Wgt. No. 7	03/22/97	627.25	63.00	0.00	175.00/215.00	6.50	194.50	188.00	-14.48	14.925	living wgt.	Reweighing of aircraft after accomplishing wing spar A.D.'s
George Wiederkehr	Wgt. No. 8	05/02/97	621.25	63.25	0.00	188.00/216.00	7.00	195.00	188.00	-14.48	13.850	living wgt.	Inclusive of items "a, through c," as identified above
Data for calculating current "Equipped Wgt."		07/25/87	621.25	63.25	0.00		7.00	195.00	188.00	-14.48	14.32	living wgt.	Inclusive of items "a, through g," as identified above
Data for calculating current "Flying Wgt."		07/25/87	621.25	63.25	239.00	102.61%	7.00	195.00	188.00	-14.48	24.372	equipped condition	
			621.25	63.25	239.00	102.61%	7.00	195.00	188.00	-14.48	14.317	living wgt.	

Must be <16.00
and > 9.50

Section IV

Aircraft Loading:

Actual Wgts.:

Total Wgt.	923.50	Total Non-Lifting Wgt.	489.05
Max. Gross Wgt.	900.00	Max. Non-Lifting Wgt.	485.00
Lbs. Over/(Under) M.G.W.	23.50	Lbs. Over/(Under) N-L.W.	4.05
PCT Over/(Under) M.G.W.	102.61%	PCT Over/(Under) N-L.W.	100.84%

- *1 (P3) is the "reactor" combined pilot and parachute wgt. (MGW load factor not to exceed 1.05%)
- *2 (P3 Min.) is with C.G. @ 16.00" from datum
- *3 (P3 Max.) is with MGW @ 900#

"Flying Wgt." equals aircraft, instruments, pilot and parachute