

# Weight and Balance for the Flaglor Scooter

The source for the information recorded in this document is attributed to the work of Antoni "Tony" Bingelis. Tony was an aircraft homebuilder, author, Experimental Aircraft Association (EAA) columnist and one of the most knowledgeable experts in the world on homebuilt sport planes.

Tony was called the "Homebuilder's Homebuilder." Tony also served his country in the USAF. He was a veteran, retiring with the rank of Major and he then started a new career with the Texas Aeronautics Commission shortly thereafter.

In 1972, Tony was asked by EAA to write three articles for their *Sport Aviation* magazine. The work on these articles led to Tony being asked by EAA to write a monthly column entitled, "*The Designee Corner*" which later became "*The Sportplane Builder*." This column continued on a relentless monthly schedule of 299 consecutive how-to articles.

Tony also supplemented his knowledge transfer with several excellent books that have served as THE technical treatises on sport plane building technology. This set of books consists of the *SportPlane Builder*, *Firewall Forward*, *SportPlane Construction Techniques*, and *Tony Bingelis on Engines*. These books were all written while Tony constructed no less than two Emeraude aircraft, a Turner T-40, an Evans VP-1, Flaglor Scooter, Sequoia Falco, RV-6 and an RV-3.

Tony passed on so much aviation knowledge to all who would read his columns, his books, or just talk with him at the EAA Convention in Oshkosh each year. The Weight & Balance (W&B) information in this article is an example of the W&B Tony calculated on his very own Flaglor Scooter he called "Ichiban Skoota." We at Adams Aeronautics Company, Inc. have provided this document for educational purposes and it is intended to help the Flaglor Scooter builder/owners with balancing out their very own Scooter.

# Weight and Balance for the Flaglor Scooter

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Many aspects of this document have been edited and or rewritten as compared to the original document for clarity of wording and to display charts and images properly. The first page has been completely recreated due to the poor quality of the original document contained in the literature owned by Adams Aeronautics Company, Inc. Portions of the remaining pages that make up this Flaglor Scooter document have also been edited for clarity.

This weight and balance document has been furnished to show the builder the process used by Tony Bingelis to determine the center of gravity range on the Flaglor Scooter which he built. Tony's Scooter was based on the original and successful Flaglor Scooter flying prototype designed and built by Ken Flaglor.

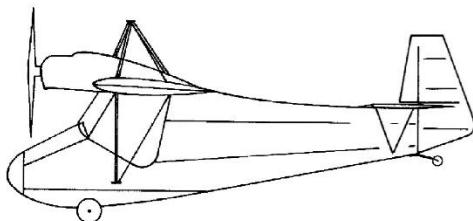
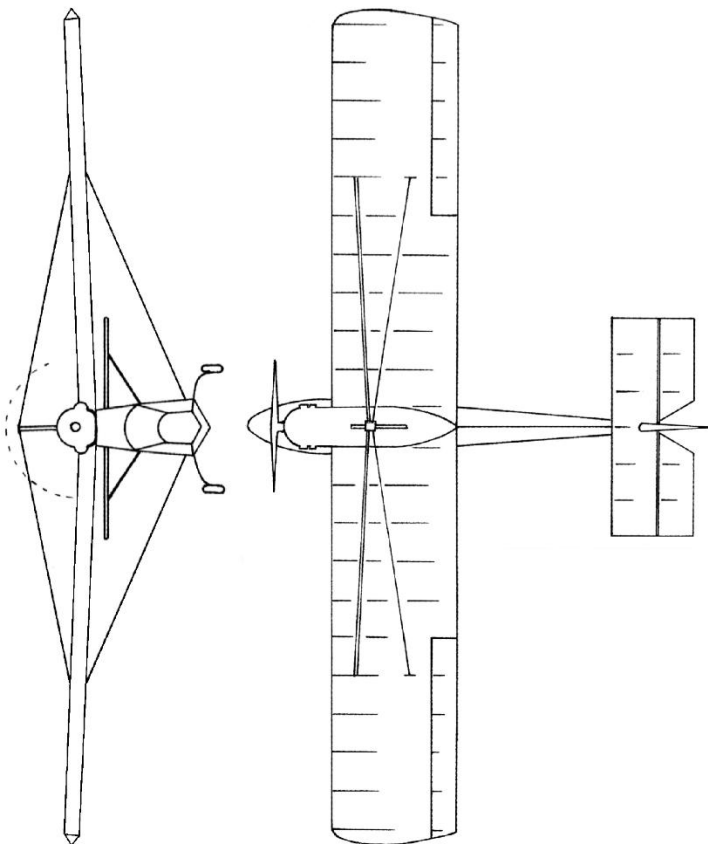
No warranty, written, express or implied, is made by Adams Aeronautics Company, Inc., as to the Flaglor Scooter's builder and or owner's ability to use this information to determine the proper weight and balance of their Flaglor Scooter.

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## Weight & Balance

### SCOOTER SPECIFICATIONS

Wingspan	28 ft.
Length	15 ft. 8 in.
Height (Pylon)	7 ft.
Total Wing Area	115 sq. ft.
Aileron Area	12.5 sq. ft.
Stab. Area	10.8 sq. ft.
Elev. Area	7.7 sq. ft.
Rudder Area	536 sq. ft.
VW-Corvair Eng.	50 hp
Max. Loads	
3.8 G Positive	
2.5 G Negative	
Empty CC. 29% MAC	14.5" aft/LE
Loaded CG. 26%	12.5" aft/LE
CG Loaded Limits	
Fwd limit 20%	10" aft/LE
AFT limit 32%	16" aft/LE

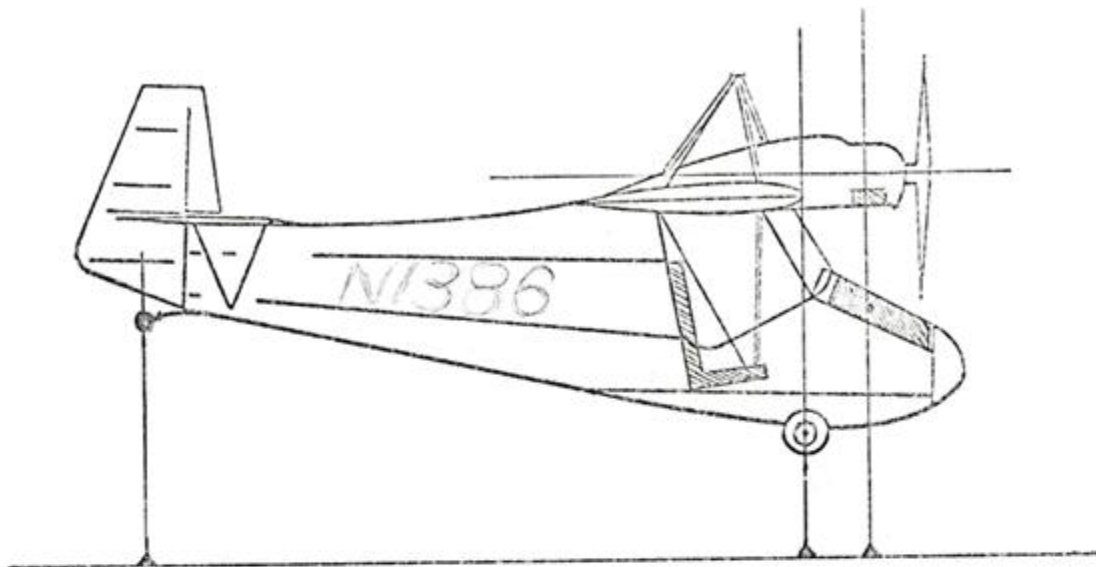
### PERFORMANCE (36 h.p. engine)

Red Line Speed	95 mph
Top Speed	80 mph
Cruise Speed	65 to 70 mph
Stall Speed	34 mph
Climb	325 fpm
Weight Empty	390 lbs
Weight Loaded	625 lbs

### ESTIMATED PERFORMANCE Corvair-VW (50 hp engine)

Red Line Speed	95 mph
Top Speed	90 mph
Cruise Speed	75 to 80 mph
Stall Speed	35 mph
Climb	500 fpm
Weight Empty	451 lbs
Weight Loaded	687 lbs

*Autumn: Ringold  
Feb 27, 1979*



**SCOOTER - Ichiban Skoota (N1386) WEIGHT AND BALANCE DATA**

**STATIONS**

**DISTANCE FROM DATUM**

Baggage	<i>None</i>
Gas	- 15
Landing Gear	0
Oil	- 13
Pilot	+ 20
Tail Wheel	+ 141

**DATUM**

Leading edge of the wing.

**LEVEL**

Cabin Floor

**C. G. Limits**

Rear limit is 32% or 16" aft of datum.  
Forward limit is 20% or 10" aft of datum.  
Empty C.G. is 29% or 14.5" aft of datum.

**LOAD FACTOR**

Positive 3.8G, Negative 2.5G at 625 pounds.  
Positive 3.4G, Negative 2.1G at 692 pounds.

# WEIGHT AND BALANCE REPORT

SCOOTER, ICHIKAWA SCOOTER SERIAL NO. FS-16 REGISTRATION N 1306

Datum: Leading edge of wing

Levelling: Top longeron

## 1. Weight Limits:

design empty weight 390 lbs.  
actual empty weight 451 lbs.  
maximum gross wgt. 687 lbs.

## 2. C.G. Limits: (from leading edge datum)

forward limit: 10" AFT (20% of chord). Rear limit: 16" AFT (32%)

## 3. Empty weight: (first subtract weight of oil if any)

Weighing point	scale reading	tare	Net weight
right	203	0	203
left	206	0	206
rear	42	0	42
Empty weight (W)	451	0	451 lbs.

## 4. Empty weight CG location:

$CG_e = D \div \frac{RL}{W}$  D = distance datum to front weighing points.  
L = distance front to rear weighing points.  
R = rear scale net weight.  
W = total net weight.  
 $CG_e = 0 + \frac{5922}{451}$   
 $CG_e = 13.1"$

## 5. Equipment list: Aircraft weighed with the following:

Item	Type	Weight	Arm	Moment
Radio	<del>NONE</del>			
Battery				
Wheel Fairings				
Spinner				

## 6. Check of most forward CG extreme, $CG_F$ : (forward limit: 10.0")

	Weight	Arm	Moment
Aircraft empty	451	+13.1	+5908
Full oil	6	-13.0	-78
Full fuel, main tank	50	-15.0	-750
Pilot	185	+20.0	+3600
TOTAL:	692		

$$CG_F = \frac{\text{Total moments}}{\text{Total weight}} = \frac{8680}{692} = 12.5" \text{ inches}$$

10" 2 1/2"

Weight and balance report-page 2

7. Check of most rearward CG extreme, CG<sub>2</sub>: (rear limit: 16")

	Weight	Arm	Moment
Aircraft empty	451	+ 13.1	+ 5908
Oil	6	- 13.0	- 78
Pilot (& chute)	185	+ 20.0	+ 3 00
Passenger	-	-	-
Baggage, max.	-	-	-
Minimum fuel	6	- 15.0	- 90

$$CG_2 = \frac{\text{Total moments} \text{ (# 640)}}{\text{Total weight}} = \frac{9440}{640} =$$

8. Maximum loading: = 14.6" inches.

Pilot & passenger (with chutes)	185	lbs.
Baggage, maximum	0	lbs.
Fuel, maximum <u>8.3</u> gals.	50	lbs.
TOTAL:	235	lbs.

9. Cockpit placards: Required only if weight limitations are necessary.

Aircraft weighed by: Anton Bingelis  
 Date of weighing : 11 MAY 1973  
 Report prepared by : Anton Bingelis  
 Date : 21 May 1973

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