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Those of you who were fortunate enough to attend Brodhead '94 may know that we were able to measure weight and center of gravity information for eight of the aircraft attending the event.

The reason for undertaking this exercise was to provide a bank of information that Piet builders could refer to and use in configuring their aircraft. Over the past several years we have noticed that there are a variety of types of Air Campers flying with different engines, at least two common fuselage lengths, different wing positions, and different flying characteristics (if you doubt this take a close look at the various aircraft taking off and landing at Brodhead!). Collecting the weight and balance information on a number of flying aircraft seemed like a good way to gain some insight in this area.

The data table (below) summarizes the most important information which was accumulated.

We were fortunate to be able to inspect examples of each of the three most common powerplants (Ford, Corvair, and Continental).

In the third column we categorize the fuselage as 'short' (the original design) or long (the so-called 'improved' air camper).

In column 4 we show the aircraft's empty weight. In each case the aircraft was presented for weighing with some amount of fuel on board. We asked each owner to estimate how much fuel was in the aircraft, and then corrected to an empty weight using that estimate and the standard value of 6 lbs. per gallon for gasoline.

While there is some degree of 'estimating' in these numbers, we are comfortable that they are reasonably accurate.

In the fifth column, we show the empty aircraft's center of gravity location with respect to the wing leading edge. We chose the wing leading edge as a datum because it was the best way to normalize the data to a large variety of aircraft and also because that's what Mr. Pietenpol used!

For comparative purposes there is a published weight and balance summary, done in 1965, showing a Corvair powered Air Camper with an empty C.G. 8.71 inches aft of datum. Very few of us fly airplanes empty, with no passengers! Fortunatly, using the data we collected, we are able to calculate center of gravity location for any loading condition.

In the sixth column, we show the calculated C.G. location when the aircraft was loaded with an FAA standard 170 pound pilot in the back seat, and 7 gallons of fuel in the 'main' fuel tank. This might represent a 'typical' loading for pilot only. Since we weighed some aircraft with both wing tanks and fueslage tanks we elected to (mathematically) put the 7 gallons of fuel in whichever tank was bigger. Again a comparison is available.

The previously mentioned weight and balance chart included a C.G. calculation for that aircraft with 7 gallons of fuel and a 166 pound pilot on board (Did BHP weigh 166 pounds?). His example aircraft has a C.G. 9.51" aft of datum in that loading condition.

As a final set of calculations we've shown aircraft weight and C.G. location when each aircraft is loaded with a 170 pilot, a 170 pound passenger, and it's fuel tank(s) full. These weights are shown in column G and the C.G. location is in column H. We found these weights interesting in that some of the aircraft have surprisingly high gross weights. Also, there are several aircraft which, in one loading condition or another, seem to violate BHP's recommendation to never exceed 20" aft of datum C.G. (also shown in the 1965 weight and balance sheet).

Because of the conditions under which all of our information was collected and because there was no chance to double check any measurements there is some real chance that there may be errors in our analysis. However, there is enough consistency in the data to feel fairly confident about it's accuracy.

We would like to thank all the fine folks at Brodhead for helping us with this project. And special thanks are due to the eight aircraft owners who donated their aircraft as well as their time and help. We'd like to think this activity has produced information of real value to the community of Pietenpol builders and pilots! Anyone who has any questions can feel free to contact either of us at the addresses above.

Pietenpol Weight & Balance
Brodhead -1994

Tail Number	Engine Type	Fuselage Length	Empty Weight	CG empty / inches aft of datum	CG w/170# pilot & 7 gal. fuel	Wt. w/170# pilot & 170# pass & 7 gal. fuel	CG w/170# pilot & 170# pass & 7 gal. fuel
N444MH	Ford 'A'	Short	648	7.49	17.72	1048	18.83
NX13691	Ford 'A'	Short	676	11.83	21.04	1088	22.02
NX4662T	Ford 'A'	Short	671	13.69	20.45	1071	20.7
NX5228	Ford 'A'	Long	684	6.69	16.16	1084	17.33
C FCMG	0-200	Long	774	15.25	20.42	1208	19.43
N 396S	C-85	Long	820	15.2	18.61	1256	16.57
N 687MB	0-200	Long	705	5.59	14.57	1143	15.79
N 778DD	Corvair	Long	731	9.08	15.93	1191	14.98