

SECTION 6 - WEIGHT & BALANCE

SECTION 6 - WEIGHT & BALANCE

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WEIGHT AND BALANCE

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6.1 GENERAL

In order to achieve the performance and flying characteristics which are designed into the airplane, it must be flown with the weight and center of gravity (C.G.) position within the approved operating range (envelope). Although the airplane offers flexibility of loading it cannot be flown with the maximum number of adult passengers, full fuel tanks and maximum baggage. With the flexibility comes responsibility. The pilot must ensure that the airplane is loaded within the loading envelope before he makes a takeoff.

Misloading carries consequences for any aircraft. An overloaded airplane will not take off, climb or cruise as well as a properly loaded one. The heavier the airplane is loaded, the less climb performance it will have.

Center of gravity is a determining factor in flight characteristics. If the C.G. is too far forward in any airplane, it may be difficult to rotate for takeoff or landing. If the C.G. is too far aft, the airplane may rotate prematurely on takeoff or tend to pitch up during climb. Longitudinal stability will be reduced. This can lead to inadvertent stalls and even spins; and spin recovery becomes more difficult as the center of gravity moves aft of the approved limit.

A properly loaded airplane, however, will perform as intended. Before the airplane is licensed, it is weighed, and a basic empty weight and C.G. location is computed (basic empty weight consists of the standard empty weight of the airplane plus the optional equipment). Using the basic empty weight and C.G. location, the pilot can easily determine the weight and C.G. position for the loaded airplane by computing the total weight and moment and then determining whether they are within the approved envelope.

The basic empty weight and C.G. location are recorded in the Weight and Balance Data Form (Figure 6-5) and the Weight and Balance Record (Figure 6-7). The current values should always be used. Whenever new equipment is added or any modification work is done, the mechanic responsible for the work is required to compute a new basic empty weight and C.G. position and to write these in the Aircraft Log Book and the Weight and Balance Record. The owner should make sure that it is done.

A weight and balance calculation is necessary in determining how much fuel or baggage can be boarded so as to keep the C.G. within allowable limits. Check calculations prior to adding fuel to ensure against improper loading.

The following pages are forms used in weighing an airplane and in computing basic empty weight, C.G. position, and useful load. Note that the useful load includes usable fuel, baggage, cargo and passengers. Following this is the method for computing takeoff weight and C.G.

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PA-34-200T, SENECA II**

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6.3 AIRPLANE WEIGHING PROCEDURES

At the time of licensing, Piper Aircraft Corporation provides each airplane with the basic empty weight and center of gravity location. This data is supplied by Figure 6-5.

The removal or addition of equipment or airplane modifications can affect the basic empty weight and center of gravity. The following is a weighing procedure to determine this basic empty weight and center of gravity location:

(a) Preparation

- (1) Be certain that all items checked in the airplane equipment list are installed in the proper location in the airplane.**
- (2) Remove excessive dirt, grease, moisture, foreign items such as rags and tools from the airplane before weighing.**
- (3) Defuel airplane. Then open all fuel drains until all remaining fuel is drained. Operate each engine until all undrainable fuel is used and engine stops. Then add the unusable fuel (5.0 gallons total, 2.5 gallons each wing).**
- (4) Fill with oil to full capacity.**
- (5) Place pilot and copilot seats in fourth (4th) notch, aft of forward position. Put flaps in the fully retracted position and all control surfaces in the neutral position. Tow bar should be in the proper location and all entrance and baggage doors closed.**
- (6) Weigh the airplane inside a closed building to prevent errors in scale readings due to wind.**

(b) Leveling

- (1) With airplane on scales, block main gear oleo pistons in the fully extended position.**
- (2) Level airplane (refer to Figure 6-3) deflating nose wheel tire, to center bubble on level.**

(c) Weighing - Airplane Basic Empty Weight

- (1) With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading.

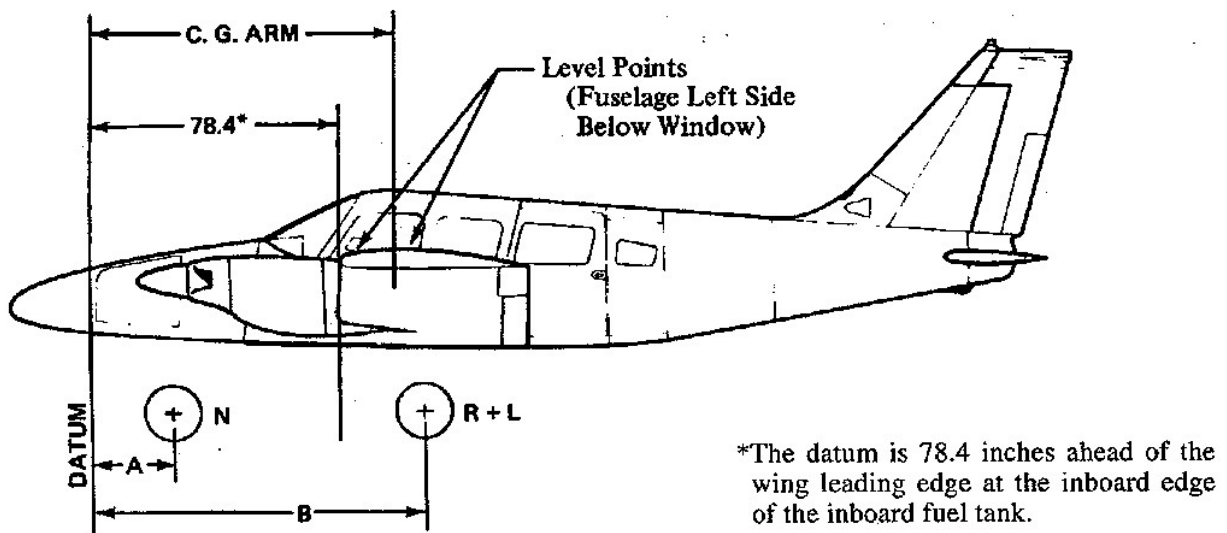
Scale Position and Symbol	Scale Reading	Tare	Net Weight
Nose Wheel (N)			
Right Main Wheel (R)			
Left Main Wheel (L)			
Basic Empty Weight, as Weighed (T)	— —	— —	

WEIGHING FORM

Figure 6-1

(d) Basic Empty Weight Center of Gravity

- (1) The following geometry applies to the PA-34-200T airplane when it is level. Refer to Leveling paragraph 6.3 (b).



A = 25.3
B = 109.8

LEVELING DIAGRAM

Figure 6-3

- (2) The basic empty weight center of gravity (as weighed including optional equipment, full and unusable fuel) can be determined by the following formula:

$$\text{C.G. Arm} = \frac{N(A) + (R+L)(B)}{T} \quad \text{inches}$$

Where: $T = N + R + L$

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6.5 WEIGHT AND BALANCE DATA AND RECORD

The Basic Empty Weight, Center of Gravity Location and Useful Load listed in Figure 6-5 are for the airplane as licensed from the factory. These figures apply only to the specific airplane serial number and registration number shown.

The basic empty weight of the airplane as licensed at the factory has been entered in the Weight and Balance Record (Figure 6-7). This form is provided to present the current status of the airplane basic empty weight and a complete history of previous modifications. Any change to the permanently installed equipment or modification which affects weight or moment must be entered in the Weight and Balance Record.

MODEL PA-34-200T SENECA II

Airplane Serial Number _____

Registration Number _____

Date _____

AIRPLANE BASIC EMPTY WEIGHT

Item		Weight (Lbs)	x	C.G. Arm (Inches Aft of Datum)	=	Moment (In-Lbs)
Standard Empty Weight*	Actual Computed					
Optional Equipment						
Basic Empty Weight						

*The standard empty weight includes full oil capacity and 5.0 gallons of unusable fuel.

AIRPLANE USEFUL LOAD - NORMAL CATEGORY OPERATION

(Gross Weight) - (Basic Empty Weight) = Useful Load

(4570 lbs) - (lbs) = lbs.

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS LICENSED AT THE FACTORY. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

WEIGHT AND BALANCE DATA FORM

Figure 6-5

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Figure 6-7

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6.6 GENERAL LOADING RECOMMENDATIONS

The following general loading recommendation is intended only as a guide. The charts, graphs, instructions and plotter should be checked to assure the airplane is within the allowable weight vs. center of gravity envelope.

- (a) Pilot only
Load rear baggage compartment to capacity first. Without aft baggage, fuel load may be limited by forward envelope for some combinations of optional equipment.
- (b) 2 occupants - pilot and passenger in front
Load rear baggage compartment to capacity first. Without aft baggage, fuel load may be limited by forward envelope for some combinations of optional equipment.
- (c) 3 occupants - 2 in front, 1 in middle
Load rear baggage compartment to capacity first. Baggage in nose may be limited by forward envelope. Without aft baggage, fuel may be limited by forward envelope for some combinations of optional equipment.
- (d) 4 occupants - 2 in front, 2 in middle
Load rear baggage compartment to capacity first. Baggage in nose may be limited by forward envelope. Without aft baggage, fuel may be limited by forward envelope for some combinations of optional equipment.
- (e) 5 occupants - 2 in front, 2 in middle, 1 in rear
Investigation is required to determine optimum location for baggage.
- (f) 5 occupants - 1 in front, 2 in middle, 2 in rear
Load forward baggage to capacity first. Rear baggage and/or fuel load may be limited by aft envelope.
- (g) 6 occupants - 2 in front, 2 in middle, 2 in rear
With six occupants fuel and/or baggage may be limited by envelope load forward baggage compartment to capacity first.
- (h) 7 occupants - 2 in front, 3 in middle, 2 in rear
With seven occupants fuel and/or baggage may be limited by envelope.

*For all airplane configurations, it is the responsibility of the pilot in command to make sure that the airplane always remains within the allowable weight vs. center of gravity while in flight.

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6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT

- (a) Add the weight of all items to be loaded to the basic empty weight.
- (b) Use the Loading Graph (Figure 6-13) to determine the moment of all items to be carried in the airplane.
- (c) Add the moment of all items to be loaded to the basic empty weight moment.
- (d) Divide the total moment by the total weight to determine the C.G. location.
- (e) By using the figures of item (a) and item (d) (above), locate a point on the C.G. range and weight graph (Figure 6-15). If the point falls within the C.G. envelope, the loading meets the weight and balance requirements.

	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight			
Pilot and Front Passenger	340.0	85.5	29070
Passengers (Center Seats) (Forward Facing)		118.1	
Passengers (Center Seats) (Aft Facing) (Optional)		119.1	
Passengers (Rear Seats)		157.6	
Passenger (Jump Seat) (Optional)		118.1	
Baggage (Forward)		22.5	
Baggage (Aft)		178.7	
Zero Fuel Weight (4000 Lbs Max - Std.) (See pages 6.61 and 6.62.)			
Fuel (93 Gallons Maximum) - Standard (123 Gallons Maximum) - Optional		93.6	
Total Loaded Airplane			

The center of gravity (C.G.) of this sample loading problem is at _____ inches aft of the datum line. Locate this point () on the C.G. range and weight graph. Since this point falls within the weight - C.G. envelope, this loading meets the weight and balance requirements.

IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY.

SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

Figure 6-9

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	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight			
Pilot and Front Passenger		85.5	
Passengers (Center Seats) (Forward Facing)		118.1	
Passengers (Center Seats) (Aft Facing) (Optional)		119.1	
Passengers (Rear Seats)		157.6	
Passenger (Jump Seat) (Optional)		118.1	
Baggage (Forward)		22.5	
Baggage (Aft)		178.7	
Zero Fuel Weight (4000 Lbs Max - Std.) (See pages 6.61 and 6.62.)			
Fuel (93 Gallons Maximum) - Standard (123 Gallons Maximum) - Optional		93.6	
Total Loaded Airplane			

Totals must be within approved weight and C.G. limits. It is the responsibility of the airplane owner and the pilot to insure that the airplane is loaded properly. The Basic Empty Weight C.G. is noted on the Weight and Balance Data Form (Figure 6-5). If the airplane has been altered, refer to the Weight and Balance Record for this information.

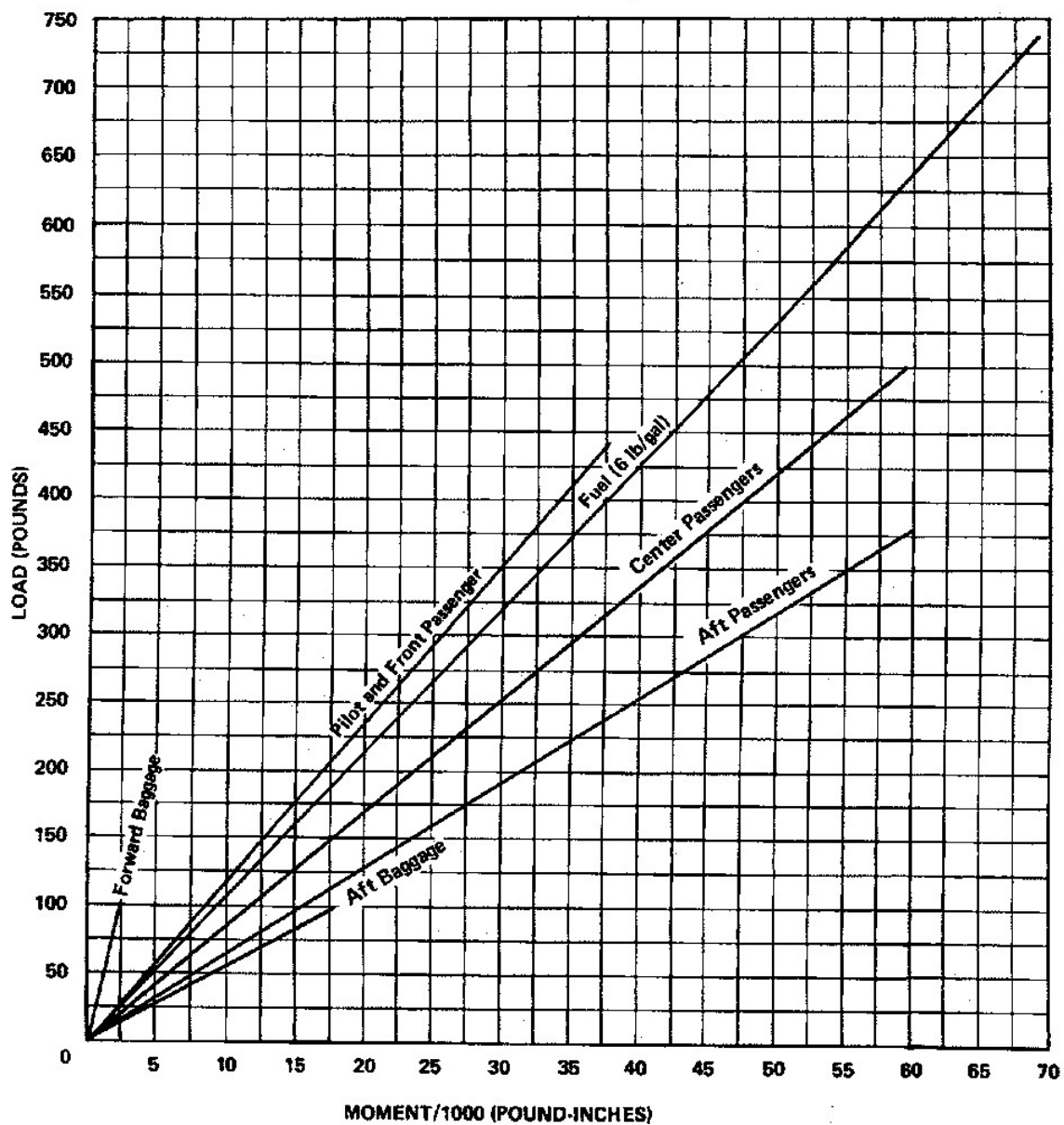
WEIGHT AND BALANCE LOADING FORM

Figure 6-11

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LOADING GRAPH

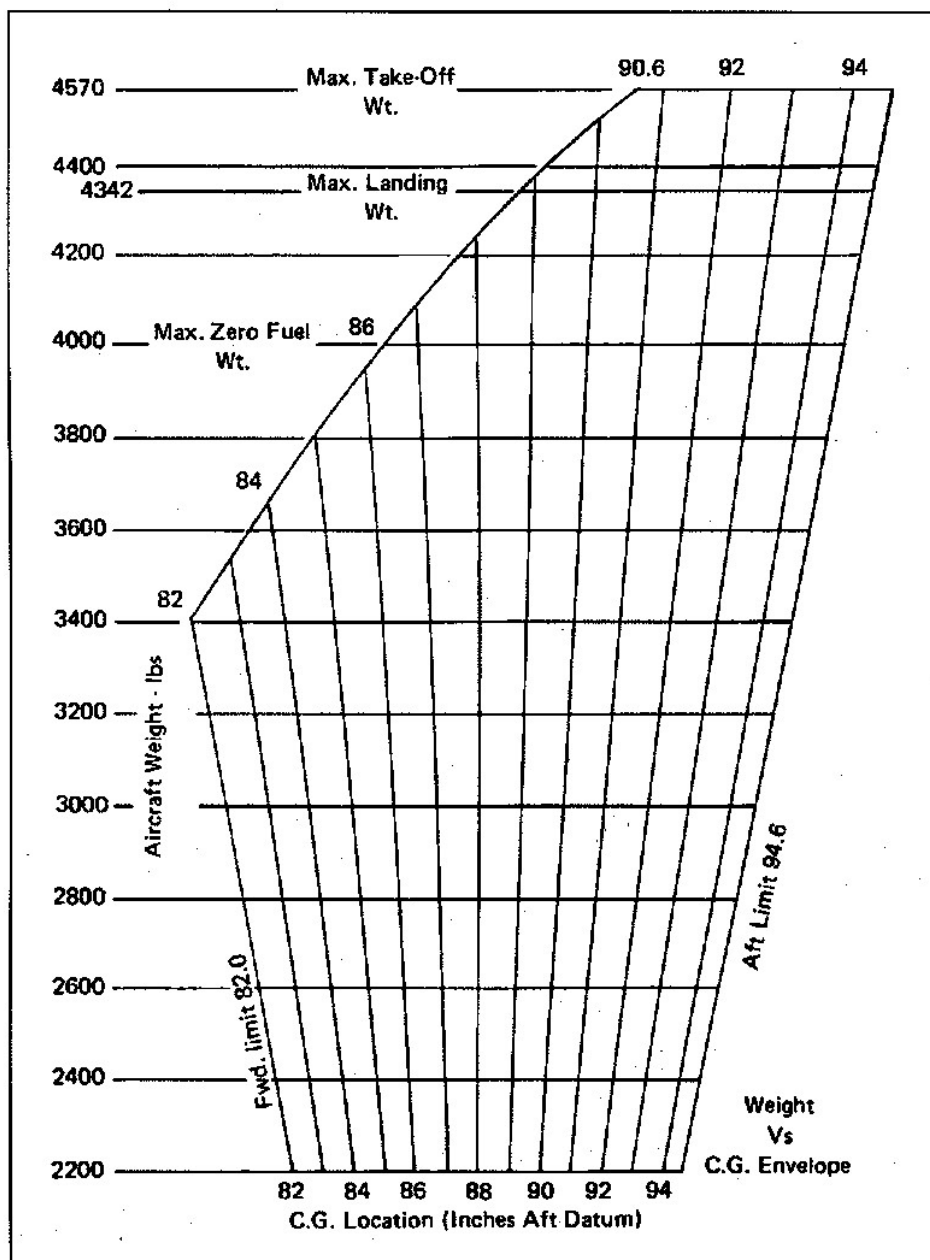


LOADING GRAPH

Figure 6-13

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Moment change due to retracting Landing Gear = - 32 in.-lbs

C. G. RANGE AND WEIGHT

Figure 6-15

6.8 INSTRUCTIONS FOR USING THE WEIGHT AND BALANCE PLOTTER

This plotter is provided to enable the pilot quickly and conveniently to:

- (a) Determine the total weight and C.G. position
- (b) Decide how to change his load if his first loading is not within the allowable envelope.

Heat can warp or ruin the plotter if it is left in the sunlight. Replacement plotters may be purchased from Piper dealers and distributors.

When the airplane is delivered, the basic weight and basic C.G. will be recorded on the computer. These should be changed any time the basic weight or C.G. location is changed.

The plotter enables the user to add weights and corresponding moments graphically. The effect of adding or disposing of useful load can easily be seen. The plotter does not cover the situation where cargo is loaded in locations other than on the seats or in the baggage compartments.

Brief instructions are given on the plotter itself. To use it, first plot a point on the grid to locate the basic weight and C.G. location. This can be put on more or less permanently because it will not change until the airplane is modified. Next, position the zero weight end of one of the six slots over this point. Using a pencil, draw a line along the slot to the weight which will be carried in that location. Then position the zero weight end of the next slot over the end of this line and draw another line representing the weight which will be located in this second position. When all the loads have been drawn in this manner, the final end of the segmented line locates the total load and the C.G. position of the airplane for takeoff. If this point is not within the allowable envelope it will be necessary to remove fuel, baggage, or passengers and/or to rearrange baggage and passengers to get the final point to fall within the envelope.

Fuel burn-off and gear movement do not significantly affect the center of gravity.

SAMPLE PROBLEM

A sample problem will demonstrate the use of the weight and balance plotter.

Assume a basic weight and C.G. location of 2850 pounds at 83.5 inches respectively. We wish to carry a pilot and 5 passengers. Two men weighing 180 and 200 pounds will occupy the front seats, two women weighing 115 and 135 pounds will occupy the middle seats and two children weighing 80 and 100 pounds will ride in the rear. Two 25 pound suitcases will be tied down in the front baggage compartment and two suitcases weighing 25 pounds and 20 pounds respectively, will be carried in the rear compartment. We wish to carry 60 gallons of fuel. Will we be within the safe envelope?

- (1) Place a dot on the plotter grid at 2850 pounds and 83.5 inches to represent the basic airplane. (See illustration.)
- (2) Slide the slotted plastic into position so that the dot is under the slot for the forward seats, at zero weight.
- (3) Draw a line up the slot to the 380 pound position (180 + 200) and put a dot.
- (4) Move the slotted plastic again to get the zero end of the middle seat slot over this dot.
- (5) Draw a line up this slot to the 250 pound position (115 + 135) and place the 3rd dot.

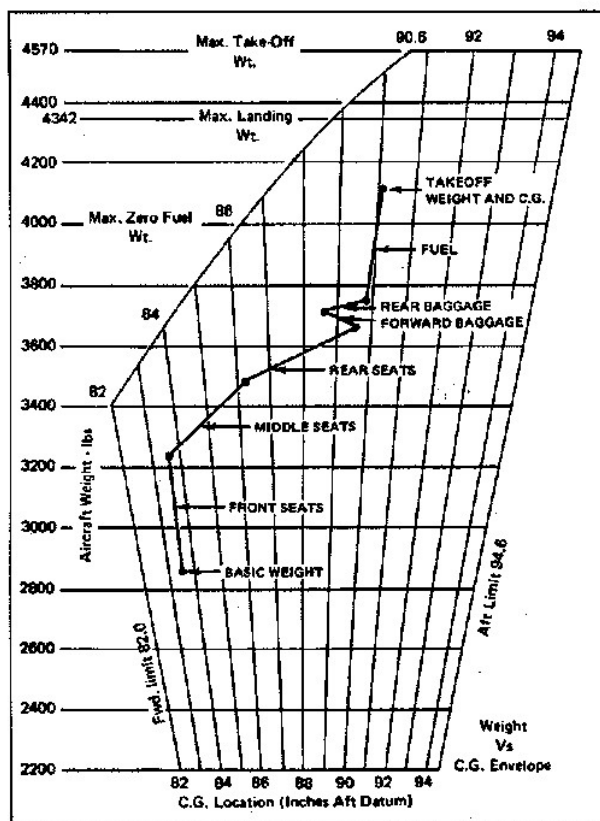
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- (6) Continue moving the plastic and plotting points to account for weight in the rear seats (80 + 100), forward baggage compartment (50), rear baggage compartment (45), and fuel tanks (360).
- (7) As can be seen from the illustration, the final dot shows the total weight to be 4115 pounds with the C.G. at 90.1. This is well within the envelope.
- (8) There will be room for more fuel.

As fuel is burned off, the weight and C.G. will follow down the fuel line and stay within the envelope for landing.

SAMPLE PROBLEM



Moment change due to retracting Landing Gear = -32 in.-lbs.

6.9 EQUIPMENT LIST

The following is a list of equipment which may be installed in the PA-34-200T. It consists of those items used for defining the configuration of an airplane when the basic empty weight is established at the time of licensing. Only those standard items which are alternate standard items and those required to be listed by the certifying authority (FAA) are presented. Items marked with an "X" are those items which were installed on the airplane described below as delivered by the manufacturer.

PIPER AIRCRAFT CORPORATION

PA-34-200T SENECA II

SERIAL NO. _____ REGISTRATION NO. _____ DATE: _____

(a) Propeller and Propeller Accessories

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
1	Two Propellers Cert. Basis - TC P920 Hartzell Model BHC-C2YF-2CKF/ FC8459-8R or FC8459B-8R (Left Wing) Hartzell Model BHC-C2YF-2CLKF/ FJC8459-8R or FJC8459B-8R (Right Wing) OR Hartzell Model BHC-C2YF-2CKUF/ FC8459-8R or FC8459B-8R (Left Wing) Hartzell Model BHC-C2YF-2CLKUF/ FJC8459-8R or FJC8459B-8R (Right Wing)				
3	Two Hydraulic Governors Cert. Basis - TC P920 Woodward Governor, Piper Dwg. 37476-0 (Left Wing)	_____	2.7	28.1	76
	Woodward Governor, Piper Dwg. 37476-2 (Right Wing)	_____	2.7	28.1	76
	OR Hartzell Governor Model E-3 (Left Wing)	_____	3.9	28.1	110
	Hartzell Governor Model E-3L (Right Wing)	_____	3.9	28.1	110

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(b) Engine and Engine Accessories

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
5	Two Engines Cert. Basis - TC E9CE Teledyne Continental Model TSIO-360-E or TSIO-360-EB Fuel Injected Turbocharged (Left Wing) Teledyne Continental Model LTSIO-360-E or LTSIO-360-EB Fuel Injected Turbocharged (Right Wing)				

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(c) Landing Gear and Brakes

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
11	Two Main Wheel Assemblies				
	a. Cleveland Aircraft Products				
	Wheel Assy. No. 40-90				
	Brake Assy. No. 30-65				
	Cert. Basis - TSO C26a				
	b. 6.00-6 Type III 8 Ply				
	Rating Tires with Regular Tubes				
	Cert. Basis - TSO C62				
13	Nose Wheel Assembly				
	a. Cleveland Aircraft Products				
	Wheel Assy. No. 40-76F				
	Cert. Basis - TSO C26a	_____	4.3	25.3	109
	b. McCauley Industrial Corp.				
	Wheel Assy. No. D-30625				
	Cert. Basis - TSO C26b	_____	5.5	25.3	139
	c. 6.00-6 Type III 6 Ply				
	Rating Tire with Regular Tubes				
	Cert. Basis - TSO C62				

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(d) Electrical Equipment

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
17	Navigation Light (Rear) Grimes A2064 Cert. Basis - TSO C30b				
19	Navigation Light (Wing) (2) Grimes A1285-G-12 A1285-R-12 Cert. Basis - TSO C30b				
21	Stall Warning Devices Piper Dwg. 37063-0 (Safe Flight P/N 186-501)	_____	0.4	80.2	32
23	Stall Warning Horn Piper Dwg. 37063-0 (Safe Flight P/N 35214)	_____	0.2	60.9	12

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(e) Instruments

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
25	Altimeter - Piper PS50008-4 or -5 Cert. Basis - TSO C10b				
27	Airspeed Indicator - Piper PS50049-40S Cert. Basis - TSO C2b				
29	Compass - Piper Dwg. 67462 Cert. Basis - TSO C7c				
31	Manifold Pressure (Dual) - Piper 37554 or 87374-2 Cert. Basis - TSO C45				
33	Fuel Flow Gauge (Dual) Piper 37341 Cert. Basis - TSO C47				

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(f) Miscellaneous					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
41	Front Seat Belts (2) Piper PS50039-4-2 Cert. Basis - TSO C22f (American Safety Eqpt. Corp. 500576) (Davis Acft. Prod. Inc. FDC-5900-120-5) (Black)	_____	1.9	86.9	165
43	Center Seat Belts (2) Piper PS50039-4-3 Cert. Basis - TSO C22f (American Safety Eqpt. Corp. 500577) (Davis Acft. Prod. Inc. FDC-5900-120-6) (Black)	_____	1.6	123.0	197
45	Aft Seat Belts (2) Piper PS50039-4-4 Cert. Basis - TSO C22f (American Safety Eqpt. Corp. 500578) (Davis Acft. Prod. Inc. FDC-5900-120-7) (Black)	_____	1.6	163.0	261
47	Shoulder Harness - Fixed (Front) (2) Piper PS50039-4-24 (American Safety Eqpt. Corp. 501385-405) (Davis Acft. Prod. Inc. FDC-7275-16-5) (Black)	_____	1.1	120.1	132
49	Combustion Heater Piper Dwg. 37164-0 (45,000 BTU) Cert. Basis - TC A760	_____	26.0	215.0	5590

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(g) Engine and Engine Accessories
(Optional Equipment)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
51	Optional Engine Primer System, Piper Dwg. 37865-2 Cert. Basis - TC A7SO	_____	3.1	38.5	119

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(h) Propeller and Propeller Accessories
(Optional Equipment)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
59	Two Propellers				
	McCauley Model				
	3AF34C502/80HA-4				
	(Left Wing)				
	McCauley Model				
	3AF34C503/L80HA-4				
	(Right Wing)				
	Cert. Basis - P 57GL	_____	*37.2	20.3	755
60	Synchrophasers				
	Piper Dwg. 36890				
	Cert. Basis - TCA7SO	_____	5.9	61.3	362

*Weight and moment difference between standard and optional equipment.

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(i) Landing Gear and Brakes
(Optional Equipment)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
67	Heavy Duty Group No. 1 a. Cleveland Aircraft Products 40-120 Wheel Assy. (2) 30-83 Brake Assy. (2) Cert. Basis - TSO C26a Goodrich 6.00 x 6 Ribbed Type III 8 Ply Rating Tire with Tube (2) Cert. Basis - TSO C62	_____	*2.9	109.8	318
69	b. Goodrich 6.00 x 6 Ribbed Type III 8 Ply Rating Tire with Tube Cert. Basis - TSO C62	_____	(Same as standard equipment)		

*Weight and moment difference between standard and optional equipment.

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(j) Electrical Equipment (Optional Equipment)						
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)	
79	Reading Lights					
	a. (2) Grimes * 10-0154-1	_____	0.5	149.3		75
	b. (2) Grimes * 10-0154-1	_____	0.5	115.0		58
	Cert. Basis - TC A7SO					
81	Strobe Lights (Wing Tip) (Whelen) Piper Dwg. 95267 Cert. Basis - TC A7SO	_____	*2.9	137.9		400
83	Piper Pitch Trim Piper Dwg. 95242-3 Cert. Basis - STC SA3023SW-D	_____	2.6	178.8		465
85	Auxiliary Power Receptacle, Piper Dwg. 68815 Cert. Basis - TC A7SO	_____	2.6	-7.8		-20
87	External Power Cable, Piper Dwg. 62355-2 Cert. Basis - TC A7SO	_____	4.6	33.0		152
89	Lighter, * 200462, 12 Volt Universal Cert. Basis - TC A7SO	_____	.2	67.9		14

* Weight and moment difference between standard and optional equipment.

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(j) **Electrical Equipment**
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
--------------------	-------------	---------------------------	----------------------------	--------------------------------	----------------------------

(k) Instruments (Optional Equipment)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
113	Vacuum System Installation	_____	2.2	67.3	148
	a. Two Vacuum Pumps, Piper Dwg. 79399-0 & -2	_____	4.6	54.3	250
	b. Two Vacuum Pumps, Piper Dwg. 36535-2 (Edo-Aire P/N IU128A) Cert. Basis - TC A7SO	_____	4.4	54.3	239
115	Attitude Gyro, Piper Dwg. 99002-2, -3, -4 or -8 Cert. Basis - TSO C4c	_____	2.2	64.4	142
117	Directional Gyro, Piper Dwg. 99003-2, -3, -4 or -7 Cert. Basis - TSO C5c	_____	2.6	64.7	168
119	NSD-360 Gyro Cert. Basis - TSO C6c, C9c, C52c	_____	5.0	77.8	389
121	Tru-Speed Indicator Piper PS50049-40T Cert. Basis - TSO C2b	_____	(Same as standard equipment)		
123	Encoding Altimeter, Piper PS50008-6 or -7 Cert. Basis - TSO C10b, C88	_____	* .9	65.9	59
124	Altitude Digitizer (United Instruments P/N 5125-P3) Cert. Basis - TSO C88	_____	1.0	56.2	56
125	Vertical Speed				
	a. Piper Dwg. 99010-2, -4 or -5	_____	1.0	65.9	66
	b. Piper Dwg. 99010-3 Cert. Basis - TSO C8b	_____	.5	67.2	34
127	Turn and Slip Indicator, Piper PS50030-2 or -3 Cert. Basis - TSO C3b	_____	2.6	64.7	168

* Weight and moment difference between standard and optional equipment.

SECTION 6
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
PA-34-200T, SENECA II

(k) Instruments
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
129	MK 10 Radar Altimeter Piper Dwg. 37693-2 Cert. Basis - TC A7SO	_____	5.4	181.3	979
130	King KRA-10 Radio Altimeter	_____	4.3	188.2	809
131	Engine Hour Meter Piper Dwg. 37731-0 Cert. Basis - TC A7SO	_____	0.3	62.9	19
133	Clock Cert. Basis - TC A7SO	_____	0.4	67.4	27
134	Control Wheel Digital Clock Piper Dwg. (37754-4)	_____	0.3	76.9	23
135	Air Temperature Gauge, Piper Dwg. 79316 Cert. Basis - TC A7SO	_____	0.2	77.6	16

(k) Instruments
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
Copilot's Advanced Instrumentation:					
137	Attitude Gyro, Piper Dwg. 99002-2, -3, -4 or -8 Cert. Basis - TSO C4c	_____	2.2	64.4	142
139	Directional Gyro, Piper Dwg. 99003-2, -3, -4 or -7 Cert. Basis - TSO C5c	_____	2.6	64.7	168
141	Tru-Speed Indicator, Piper PS50049-40T Cert. Basis - TSO C2b	_____	0.6	66.8	40
143	Vertical Speed a. Piper Dwg. 99010-2, -4 or -5 b. Piper Dwg. 99010-3 Cert. Basis - TSO C8b	_____ _____	1.0 .5	65.9 67.2	66 34
145	Altimeter, Piper PS50008-4 or -5 Cert. Basis - TSO C10b	_____	1.0	65.9	66
147	Turn and Slip Indicator, Piper PS50030-2 or -3 Cert. Basis - TSO C3b	_____	2.6	64.7	168
149	Clock Cert. Basis - TC A7SO	_____	0.4	67.4	27

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(I) Autopilots (Optional Equipment)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
161	AutoControl IIIB	_____	6.7	89.4	599
	a. Directional Gyro * 52D54	_____	3.2	63.8	204
	b. Omni Coupler 1C-388P	_____	0.9	64.4	58
	Cert. Basis - STC SA3024SW-D				
163	AltiMatic IIIC	_____	20.1	110.8	2227
	a. Directional Gyro * 52D54	_____	3.2	63.8	204
	b. Omni Coupler 1C-388P	_____	0.9	64.4	58
	c. G/S Coupler 1C-493	_____	0.9	60.1	54
165	Cert. Basis - STC SA3023SW-D				
	King KFC-200 Flight Control System. KI-256 Flight Director and 3" Gyros.				
	Cert. Basis - STC SA1147CE	_____	49.4	145.0	7163
166	King KFC-200 Flight Control System. KG-258 Attitude Horizon Indicator and 3" Gyros.				
	Cert. Basis - STC SA1147CE	_____	49.4	145.0	7163

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SECTION 6
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(m) Radio Equipment (Optional Equipment)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
167	Bendix 2011 Dual Comm, Nav Cert. Basis - TSO C34c, C35d, C36c, C37b, C40a	_____	16.8	66.8	1122
168	Bendix IU 2014B Indicator				
	Single	_____	1.9	63.4	121
	Dual	_____	3.8	63.4	241
	Cert. Basis - TSO C34c, C36c, C40a, C66c				
169	Bendix TR-2060 Transponder Cert. Basis - TSO C74c	_____	2.8*	63.6	178
170	Bendix ADF 2070 Cert. Basis - TSO C41c, C2a	_____	6.0*	118.1	709
171	Bendix DME 2030 Cert. Basis - TSO C66a	_____	10.3*	22.9	236
172	Bendix NCP-2040 Nav Programmer	_____	5.4	64.2	347
173	Bendix IU 2016A Interface Cert. Basis - TS DOT-160, C2a	_____	4.9	27.2	133
174	Bendix Blower 14VDC	_____	1.1	58.6	64
175	Collins VHF-250 or VHF-251 Comm Transceiver				
	Single	_____	4.0	61.9	248
	Dual	_____	8.1	61.9	501
	Cert. Basis - TSO C37b, C38b				
176	Collins VIR-350 or VIR-351 Nav Receiver				
	Single	_____	3.9	62.4	243
	Dual	_____	7.9	62.4	493
	Cert. Basis - TSO C40a, C36c				

* Weight includes antenna and cable.

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(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
177	Collins IND-350 () VOR/LOC Indicator				
	Single	_____	1.0	65.2	65
	Dual	_____	2.0	65.2	130
	Cert. Basis - TSO C40a, C36c				
178	Collins IND-351 () VOR/LOC/GS Indicator				
	Cert. Basis - TSO C40a, C36c	_____	1.3	65.2	85
179	Collins GLS-350 Glide Slope Receiver				
	Cert. Basis - TSO C34c	_____	*3.6	86.8	312
180	Collins ANS 351 R-NAV				
	Cert. Basis - TSO C36c	_____	3.8	63.2	240
181	Collins DCE 400 Distance Computing Equipment				
	Cert. Basis - TSO C40a	_____	2.1	63.9	134
182	Collins DME-451 with Ind. 450/451				
	Cert. Basis - TSO C66a	_____	8.8	185.4	1632
183	Collins RCR-650 ADF Receiver and Antenna and IND-650 Indicator				
	Cert. Basis - TSO C41c	_____	7.0	122.1	855
184	Collins RCR-650A ADF Receiver and Antennas and IND-650A Indicator				
	Cert. Basis - TSO C41c	_____	7.7	116.7	899

*Weight includes antenna and cable.

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WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
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(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
185	Collins AMR-350 Audio/Marker Panel Cert. Basis - TSO C35d, C50b	_____	*3.3	123.9	409
186	Collins TDR-950 Transponder Cert. Basis - TSO C74c	_____	*2.8	62.5	175
187	King KX 170 () (VHF Comm/Nav) Transceiver, Single	_____	7.5	61.6	462
	Transceiver, Dual	_____	15.0	61.6	924
	Cert. Basis - TC A7SO				
188	King KN-53 NAV/REC. with GS Receiver				
	a. Single	_____	3.2	63.0	202
	b. Dual	_____	6.4	63.0	404
189	King KN-53 NAV/Rec.	_____	2.8	63.0	176

*Weight includes antenna and cable.

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(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
190	King KX 175 () VHF				
	a. Transceiver	_____	7.5	61.6	462
	b. King KN 72 VOR/LOC Converter	_____	1.3	12.0	16
	c. King KN 73 Glide Slope Receiver	_____	2.4	12.7	30
	d. King KN 75 Glide Slope Receiver	_____	1.6	12.7	20
	e. King KN 77 VOR/LOC Converter	_____	2.2	12.0	26
	f. King KI-204 VOR/ILS Indicator	_____	2.8	65.5	183
	g. King KNI 520 VOR/ILS Indicator	_____	2.8	65.5	183
	Cert. Basis - TSO C36c, C37b, C38b, C40a				
191	King KX 175 () VHF				
	a. Transceiver (2nd),	_____	7.5	61.6	462
	b. King KN 72 VOR/LOC Converter	_____	1.3	12.0	16
	c. King KN 77 VOR/LOC Converter	_____	2.2	12.0	26
	d. King KI-203 VOR/LOC Indicator	_____	1.6	65.5	105
	e. King KNI 520 VOR/ILS Indicator	_____	2.8	65.5	183
	Cert. Basis - TSO C36c, C37b, C38b, C40a				
192	King KY 196E Transceiver				
	a. Single	_____	3.1	63.8	198
	b. Dual	_____	6.2	63.8	396
	Cert. Basis - TSO C37b, C38b				
193	King KY-197 Transceiver				
	a. Single	_____	4.2	63.7	267
	b. Dual	_____	8.4	63.7	534
	Cert. Basis - TSO C37b, C38b				
194	King KI 201 () VOR/LOC Indicator				
	Cert. Basis - TC A7SO	_____	2.5	64.9	162

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PIPER AIRCRAFT CORPORATION
PA-34-200T, SENECA II

(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
195	King KI-208 VOR/LOC Indicator Cert. Basis - TSO C34c, C36c, C40a	_____	1.0	64.9	65
196	King KI-209 VOR/LOC/GS Indicator Cert. Basis - TSO C34c, C36c, C40a	_____	1.2	64.9	78
197	King KI 213 VOR/LOC/GS Indicator Cert. Basis - TC A7SO	_____	2.5	64.9	162
198	King KI 214 () VOR/LOC/GS Ind. Cert. Basis - TC A7SO	_____	3.3	64.9	214
199	King KR-21 Marker Beacon Cert. Basis - TC A7SO	_____	*2.2	128.3	282
200	King KN-74 R-Nav Cert. Basis - TC A7SO	_____	4.7	61.3	288
201	King KNS-80-R-NAV	_____	7.0	62.3	436
202	King KI-206 R-Nav Indicator Cert. Basis - TSO C34c, C36c, C40a	_____	1.3	61.6	80
203	King KN 61 DME Cert. Basis - TC A7SO	_____	10.6	31.9	338
204	King KN-62A DME	_____	3.3	63.3	209
205	King KN 65A DME Cert. Basis - TSO C66a	_____	10.8	34.3	370
206	King KR 85 Digital ADF with KA-42B Loop and Sense Antenna a. Audio Amplifier Cert. Basis - TSO C41b	_____ _____	9.9 0.8	99.3 52.5	983 42
207	King KR 85 Digital ADF a. Audio Amplifier Cert. Basis - TSO C41b	_____ _____	9.0 0.8	99.3 52.5	894 42

*Weight includes antenna and cable.

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(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
208	King KR 86 ADF with KA-42B Loop and Sense Antenna				
	a. Single	_____	7.6	104.3	793
	b. Dual	_____	10.6	108.9	1154
	c. Audio Amplifier	_____	0.8	52.5	42
	Cert. Basis - TC A7SO				
209	King KR 86 ADF				
	a. Single	_____	6.7	104.3	699
	b. Dual	_____	**16.4	107.3	1760
	c. Audio Amplifier	_____	0.8	52.5	42
	Cert. Basis - TC A7SO				
210	King KR-87 Digital ADF with				
	a. Single	_____	*7.7	75.1	578
	b. Dual	_____	**13.9	74.9	1041
	c. Audio Amplifier	_____	0.8	54.1	43
211	King KI-225 Slaved Card ADF	_____	1.5	66.3	99
212	King KMA 20 () Audio Panel				
	Cert. Basis - TSO C35c, C50b	_____	*3.7	74.9	277
213	King KMA-24 Audio Control Panel	_____	1.7	65.3	111
214	King KT 76 ()/78 () Transponder				
	Cert. Basis - TSO C746	_____	*3.1	63.1	196
215	Narco Comm 11A VHF Transceiver				
	a. Single	_____	3.6	62.4	225
	b. Dual	_____	7.1	62.4	443
	Cert. Basis - TC A7SO				

*Weight includes antenna and cable.

**Weight includes dual antenna and cable.

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WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
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(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
217	Narco Comm 11B VHF Transceiver				
	a. Single	_____	3.9	62.4	243
	b. Dual	_____	7.7	62.4	480
	Cert. Basis - TC A7SO				
219	Narco Comm 111 VHF Transceiver				
	a. Single	_____	3.0	62.4	187
	b. Dual	_____	6.0	62.4	374
	Cert. Basis - TSO C37b, C38b				
221	Narco Comm 111B VHF Transceiver				
	a. Single	_____	3.9	62.4	243
	b. Dual	_____	7.8	62.4	487
	Cert. Basis - TSO C37b, C38b				
223	Narco Comm 120 VHF Transceiver				
	a. Single	_____	4.8	61.9	297
	b. Dual	_____	8.6	62.4	537
	Cert. Basis - TSO C37b, C38b				
225	Narco Nav 11 VHF Receiver				
	Cert. Basis - TC A7SO	_____	2.8	63.6	178
227	Narco Nav 12 VHF Receiver				
	Cert. Basis - TC A7SO	_____	3.4	63.6	216
229	Narco Nav 14 VHF Receiver				
	Cert. Basis - TC A7SO	_____	2.5	63.6	159
231	Narco Nav 111				
	Cert. Basis - TSO C36c, C40a, C66a	_____	2.5	63.6	159
233	Narco Nav 112 Receiver				
	Cert. Basis - TSO C36c, C40a, C66c, C34c	_____	3.3	58.6	193
235	Narco Nav 114 VHF Receiver				
	Cert. Basis - TSO C38b, C40a, C36c, C34c, C66a	_____	2.5	63.6	159

(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
237	Narco Nav 121 VHF Receiver				
	a. Single	_____	3.1	63.5	197
	b. Dual	_____	6.2	63.4	393
	Cert. Basis - TSO C36c, C40c, C66a				
239	Narco Nav 122 VHF Receiver				
	a. Single	_____	*5.3	105.7	560
	b. Dual	_____	*8.8	87.5	770
	Cert. Basis - TSO C35d, C36c, C40c, C66a				
241	Narco Nav 122A VHF Receiver				
	a. Single	_____	*5.4	104.6	565
	b. Dual	_____	*9.0	86.8	781
	Cert. Basis - TSO C34c, C35d, C36c, C40c, C66a				
243	Narco Nav 124A VHF Receiver				
	a. Single	_____	*6.4	100.3	642
	b. Dual	_____	*11.1	84.2	935
	Cert. Basis- TSO C35d, C36c, C40a, C66a				
245	Narco Nav 124R VHF Receiver				
	Cert. Basis - TSO C36c, C40a, C66a	_____	4.4	62.4	275
247	Narco ID 124 VOR/LOC/GS Indicator				
	a. Single	_____	1.2	65.5	79
	b. Dual	_____	2.4	65.5	157
	Cert. Basis - TSO C34c, C35d, C36c, C40c				
249	Narco OC-110 Converter and Mount				
	Cert. Basis - TSO C36c, C40a	_____	2.1	231.5	486
251	Narco UGR-2A Glide Slope				
	a. First	_____	3.0	40.0	120
	b. Second	_____	3.0	40.0	120
	c. Second	_____	3.0	231.5	695
	Cert. Basis - TSO C34b				

*Weight includes marker antenna and cable.

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(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
253	Narco UGR-3 Glide Slope Cert. Basis - TC A7SO	_____	2.9	40.0	116
255	Narco MBT-12-R, Marker Beacon Cert. Basis - TC A7SO	_____	4.2	77.4	325
257	Narco CP-125 Audio Selector Panel Cert. Basis - TC A7SO	_____	2.2	76.2	168
259	Narco CP 135 Audio Selector Panel Cert. Basis - TSO 650b	_____	2.2	76.2	168
261	Narco CP 135M Audio Selector Panel Cert. Basis - TSO C50b, C35d	_____	*3.9	132.6	517
263	Narco CLC-60A R-Nav a. Narco SA-11 Adapter Cert. Basis - TC A7SO	_____ _____	11.5 0.8	142.0 13.0	1633 10
265	Narco DME-190 Cert. Basis - TC A7SO	_____	**5.9	65.9	389
267	Narco DME-190 TSO Cert. Basis - TSO C66a	_____	**5.9	65.9	389
269	Narco DME-195 Receiver and Indicator Cert. Basis - TSO C66a	_____	**10.9	29.0	316
271	Narco ADF-140 a. Single b. Dual Cert. Basis - TSO C41c	_____ _____	6.0 * 17.9	104.7 96.3	628 1724
273	a. Single b. Dual Cert. Basis - TSO C41c	_____ _____	6.0 * 17.9	104.7 96.3	628 1724

*Weight includes dual antenna and cable.

**Weight includes antenna and cable.

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(m) Radio Equipment (Optional Equipment) (cont)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
275	Narco AT50A Transponder Cert. Basis - TSO C74b	_____	**3.0	62.3	187
	a. Narco AR-500 Altitude Encoder Cert. Basis - TSO C88	_____	1.0	57.5	58
277	Narco AT150 Transponder Cert. Basis - TSO C74c	_____	**3.0	62.3	187
	a. Narco AR-500 Altitude Encoder Cert. Basis - TSO C88	_____	1.0	57.5	58
289	Antenna and Cable				
	a. Nav Receiving	_____	1.6	206.9	331
	b. *1 VHF Comm	_____	0.8	147.5	118
	c. *2 VHF Comm	_____	0.9	167.8	151
	d. Glide Slope (Single)	_____	0.9	96.7	87
	e. Glide Slope (Dual)	_____	2.8	180.0	504
	f. Single ADF Sense	_____	0.4	160.0	64
	Cert. Basis - TC A7SO				
290	Marker Beacon Antenna Piper PS50040-15 King KA-23 or Narco VMA-15 or Comant CI-102				
			Included as part of marker beacon installation		
291	Anti Static Antenna and Cable				
	a. *1 VHF Comm	_____	1.5	162.7	252
	b. *2 VHF Comm	_____	1.6	192.5	308
	c. Single ADF Sense	_____	0.6	160.0	96
	Cert. Basis - TC A7SO				
293	Emergency Locator Transmitter, (C.C.C. Model CIR-11-2)	_____	1.7	267.2	454
	a. Antenna and Coax	_____	0.2	255.4	51
	b. Shelf and Access Hole	_____	0.5	266.4	133
	Cert. Basis - TSO C91				

**Weight includes antenna and cable.

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WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
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(m) Radio Equipment (Optional Equipment) (cont)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
294	Emergency Locator Transmitter (Narco Model ELT-10)	_____	3.5	267.2	935
	a. Antenna and Coax	_____	0.3	255.4	77
	b. Shelf and Access Hole	_____	0.5	266.4	133
	Cert. Basis - TSO C91				
295	Microphone				
	a. Piper Dwg. 68556-10	_____	0.3	70.8	21
	b. Piper Dwg. 68856-11	_____	0.6	69.9	42
	c. Piper Dwg. 68556-12 (Single)	_____	0.3	70.5	21
	Piper Dwg. 65856-12 (Dual)	_____	0.6	70.8	42
	d. Piper Dwg. 79036-5 (Single)	_____	0.6	69.9	42
	e. Piper Dwg. 79036-6 (Dual)	_____	1.2	69.9	84
	Cert. Basis - TC A7SO				
297	Boom Microphone - Headset Piper Dwg. - 37021-()				
	a. Single	_____	0.3	85.5	26
	b. Dual	_____	0.6	85.5	51
	Cert. Basis - TC A7SO				
299	Cabin Speaker, Piper Dwg. 99820				
	Cert. Basis - TC A7SO	_____	1.1	97.5	107
301	Headset, Piper				
	Cert. Basis - TC A7SO	_____	0.5	65.0	33
303	Bendix Radar Piper Dwg. 37916-2				
	Cert. Basis - TSO C63b	_____	19.5	12.4	242
304	Bendix Radar Piper Dwg. 37916-4				
	Cert. Basis - TSO C63b	_____	23.5	21.2	498
305	Radio Shelf Piper Dwg. 69977-2				
	Cert. Basis - TCA7SO	_____	0.9	229.0	206

(m) Radio Equipment
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
307	RCA - Weather Scout II Monochrome Radar Piper Dwg. 37916-5 Cert. Basis - TSO C63b	_____	15.7	9.2	144
309	RCA - Weather Scout II Color Radar Piper Dwg. 37916-7 Cert. Basis - TSO C63b	_____	25.0	24.3	607

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(n) Miscellaneous (Optional Equipment)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
351	Zinc Chromate Finish Cert. Basis - TC A7SO	_____	6.0	172.0	1032
353	Stainless Steel Control Cables Cert. Basis - TC A7SO	_____	—	—	—
355	Ice Protection System Installation Piper Dwg. 37700 Cert. Basis - TC A7SO				
	a. Windshield Heating Unit Piper Dwg. 78162-0	_____	2.6	59.6	155
	b. Heated Pitot Head and Lift Detectors	_____	0.4	100.0	40
	c. Ice Light Kit Piper Dwg. 37700-3	_____	0.4	72.0	29
	d. Electrothermal Hartzell Propeller Deicing System Piper Dwg. 37700-3	_____	11.6	39.2	455
	e. Electrothermal McCauley Propeller Deicing System Piper Dwg. 37700-8	_____	10.2	28.0	286
	f. Pneumatic Deicing System Including Vacuum Pumps Piper Dwg. 37700-2	_____	34.3	111.9	3839

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(n) Miscellaneous
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
357	Fuel Cells, Piper Dwg. 37077-3 Cert. Basis - TSO C80	_____	6.2	93.6	580
358	Air Conditioning Installation Cert. Basis - TC A7SO	_____	53.1	108.6	5767
359	Ground Ventilating Blower, Piper Dwg. 79273-5 Cert. Basis - TC A7SO	_____	8.1	207.3	1679
361	Super Cabin Sound Proofing, Piper Dwg. 78480 Cert. Basis - TC A7SO	_____	24.2	107.2	2594
363	Adjustable Front Seat (Left), Piper Dwg. 79592-0/79592-2 Cert. Basis - TC A7SO	_____	*4.6	84.7	390
365	Adjustable Front Seat (Right), Piper Dwg. 79592-1/79592-3 Cert. Basis - TC A7SO	_____	*4.6	84.1	387
367	Jump Seat (with seat belts), Piper Dwg. 78108-9 Cert. Basis - TC A7SO	_____	9.2	122.3	1125
369	Club Seating a. With Regular Headrests on Center Seats b. With Oversize Headrests on Center Seats Piper Dwg. 37825-3 Cert. Basis - TC A7SO	_____ _____ _____	*13.2 *14.2	90.4 90.4	1193 1284
371	Inboard Armrest - Aft Seats Cert. Basis - TC A7SO	_____	2.6	152.0	395
373	Headrests (2) Front, Piper Dwg. 79337-18 Cert. Basis - TC A7SO	_____	2.0	99.5	199

*Weight and moment difference between standard and optional equipment.

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(n) Miscellaneous (Optional Equipment) (cont)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
375	Headrests (2) Center, Piper Dwg. 79337-18 Cert. Basis - TC A7SO	_____	2.0	132.1	264
379	Headrests (2) Rear, Piper Dwg. 79337-18 Cert. Basis - TC A7SO	_____	2.0	171.5	343
381	Oversize Headrests - Front (2) Cert. Basis - TC A7SO	_____	3.2	99.5	318
385	Oversize Headrests - Center (2) (Fwd. facing seats only) Cert. Basis - TC A7SO	_____	3.2	132.1	423
387	Oversize Headrests - Aft (2) Cert. Basis - TC A7SO	_____	3.2	171.5	549
389	Inertia Safety Belts (Center) (2) .75 lbs. each, Piper PS50039-4-15 Cert. Basis - TC A7SO (Pacific Scientific 1107319-03) (American Safety Eqpt. Corp. 500853-403) (Black)	_____	1.5	133.9	201
391	Inertia Safety Belts (Rear) (2) 0.8 lbs. each, Piper PS50039-4-14 Cert. Basis - TC A7SO (Pacific Scientific 1107319-01) (American Safety Eqpt. Corp. 500853-401) (Black)	_____	1.6	181.5	290
392	Shoulder Harness - Inertia (Front) (2) Piper PS50039-4-21 (Pacific Scientific 1107447-05) (Black)	_____	1.3	120.1	156
393	Shoulder Harness - Fixed (Center) (2) Piper PS50039-4-22 (American Safety Eqpt. Corp. 501385-403) (Davis Acft. Prod. Inc. FDC-7275-16-2) (Black)	_____	1.1	133.9	147

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WEIGHT AND BALANCE

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(n) Miscellaneous
(Optional Equipment) (cont)

Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
394	Shoulder Harness - Inertia (Center) (2) Piper PS50039-4-19 (Pacific Scientific 1107447-01) (Black)	_____	1.3	133.9	174
395	Shoulder Harness- Fixed (Rear) (2) Piper PS50039-4-22 (American Safety Eqpt. Corp. 501385-403) (Davis Acft. Prod. Inc. FDC-7275-16-2) (Black)	_____	1.1	181.5	200
396	Shoulder Harness - Inertia (Rear) (2) Piper PS50039-4-19 (Pacific Scientific 1107447-01) (Black)	_____	1.3	181.5	236
397	Assist Straps, Piper Dwg. 79455 Cert. Basis - TC A7SO	_____	.3	120.0	36
398	Curtain and Rod Installation Piper Dwg. 79721-2 Cert. Basis - TC A7SO	_____	1.9	143.6	273
399	Curtain and Rod Installation Piper Dwg. 67955-3 Cert. Basis - TC A7SO	_____	5.2	143.6	747
400	Refreshment Console Cert. Basis - TC A7SO	_____	7.0	118.5	830
401	Executive Writing Table Piper Dwg. 36800-2 Cert. Basis - TC A7SO	_____	3.9	**185.6	724
402	Deluxe Carpeting Cert. Basis - TC A7SO	_____	*-3.4	120.0	-408

*Weight and moment difference between standard and optional equipment.

**Stowed Position

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(n) Miscellaneous (Optional Equipment) (cont)					
Item No	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
403	Luxurious Interior Piper Dwg. 67954-2 Cert. Basis - TC A7SO	_____	25.0	120.0	3000
405	Fire Extinguisher a. Piper Dwg. 78621-2 Scott 42211-00 b. Piper Dwg. 35680-2 Graviner HA1014-01 Cert. Basis - TC A7SO	_____ _____ _____	5.0 5.6	56.0 62.8	280 352
407	Tow Bar Piper Dwg. 96331-0 Cert. Basis - TC A7SO	_____	4.4	8.0	35
409	Oxygen System - Scott Aviation MKIII (Incl. (1) Mike Mask) a. Piper Dwg. 37684 (Forward Facing Seating Arrangement) Scott 802180-00 b. Piper Dwg. 37825-4 (Club Seating Arrangement) Scott 802180-01 Cert. Basis - TC A7SO	_____ _____ _____	41.0 41.6	112.9 112.9	4629 4697
410	Fixed Oxygen System - Scott Aviation, Ambassador MK III System, Piper Dwg. 36960-3 a. Charged b. Uncharged Cert. Basis - TC A7SO	_____ _____	45.5 40.2	201.3 200.1	9159 8044
TOTAL OPTIONAL EQUIPMENT			_____	_____	_____

EXTERIOR FINISH

Base Color _____ Registration No. Color _____
Trim Color _____ Type Finish _____
Accent Color _____

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(o) Maximum Zero Fuel Weight Increase

Certain items of optional equipment are either partially or wholly installed in the wing of the Seneca II, and hence need not be counted against the centerline loading restriction. The following is a list of these items:

Item	Mark if Instl.	Amount By Which Max. Zero Fuel Weight May Be Increased (Pounds)
Optional Engine Primer System Piper Dwg. 37865-2 Cert. Basis - TC A7SO	_____	1.4
Two Propellers McCauley Model 3AF34C502/80HA-4 (Left Wing) McCauley Model 3AF34C503/L80HA-4 (Right Wing) Cert. Basis - P57GL	_____	17.8
Synchrophasers Piper Dwg. 36890 Cert. Basis - TC A7SO	_____	1.4
Heavy Duty Group No. 1 a. Cleveland Aircraft Products 40-120 Wheel Assy. (2) 30-83 Brake Assy. (2) Cert. Basis - TSO C26a Goodrich 6.00 x 6 Ribbed Type III 8 Ply Rating Tire With Tube (2) Cert. Basis - TSO C62	_____	0.3
Strobe Lights (Wing Tip) (Whelen) Piper Dwg. 95267 Cert. Basis - TC A7SO	_____	2.5
Vacuum System Installation a. Two Vacuums Pumps, Piper Dwg. 79399-0 & -2* Cert. Basis - TC A7SO	_____	2.2*
Heated Pitot Head Piper Dwg. 37700 Cert. Basis - TC A7SO	_____	0.5

*Not installed with pneumatic deicing system.

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(o) Maximum Zero Fuel Weight
Increase (cont)

Item	Mark if Instl.	Amount By Which Max. Zero Fuel Weight May Be Increased (Pounds)
Electrothermal Hartzell Propeller Deicing System Piper Dwg. 37700 Cert. Basis - TC A7SO	_____	4.9
Electrothermal McCauley Propeller Deicing System Piper Dwg. 37700 Cert. Basis - TC A7SO	_____	4.2
Pneumatic Deicing System Including Vacuum Pumps Piper Dwg. 37700 Cert. Basis - TC A7SO	_____	22.4
Fuel Cells Piper Dwg. 37077-3 Cert. Basis - TSO C80	_____	7.9
Air Conditioning Installation Piper Dwg. 36809 Cert. Basis - TC A7SO	_____	19.3

Total of Installed Items = lbs.

Therefore, the new maximum zero fuel wt. of the airplane is:

Standard
(Max. Zero Fuel Wt.) + (Wing Options) = New Max. Zero Fuel Wt.

(4000 lbs.) + (lbs.) = lbs.