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WEIGHT AND BALANCE

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SECTION 6

WEIGHT AND BALANCE

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, 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 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 within allowable limits. Check calculations prior to adding fuel to insure 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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6.3 AIRPLANE WEIGHING PROCEDURE

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 engine on each tank until all undrainable fuel is used and engine stops. Then add the unusable fuel (2.0 gallons total, 1.0 gallons each wing).

CAUTION

Whenever the fuel system is completely drained and fuel is replenished it will be necessary to run the engine for a minimum of 3 minutes at 1000 RPM on each tank to ensure no air exists in the fuel supply lines.

- (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.

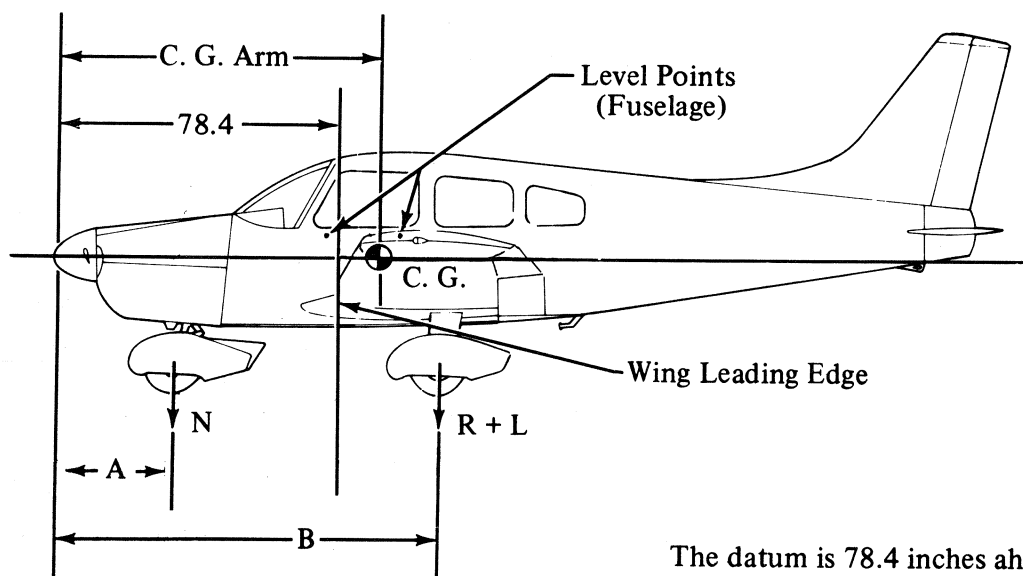
Scale Position and Symbol	Scale Reading	Tare	Net Weight
Nose Wheel (N)			
Right Main Wheel (R)			
Left Main Wheel (L)			
Basic Empty Weight, as Weighed (T)	—	—	

WEIGHING FORM

Figure 6-1

(d) Basic Empty Weight Center of Gravity

- (1) The following geometry applies to the PA-28-181 airplane when it is level. Refer to Leveling paragraph 6.3 (b).



The datum is 78.4 inches ahead of the wing leading edge at the intersection of the straight and tapered section.

A = 31.0

B = 109.7

LEVELING DIAGRAM

Figure 6-3

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

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

Where: $T = N + R + L$

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 at 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.

Hawk Avionics, LLC
Certified Repair Station # OI7R070N
Weight and Balance Recalculation Form

Manufacturer: Piper	Model: PA-28-181	S/N: 28-7790002	Reg #: N4052F
---------------------	------------------	-----------------	---------------

Removed Items (Manufacturer and Model)	Weight	X	Arm =	Moment
Dual Collins VHF-251 comm transceivers		6.8	56.9	387
Dual Collins VIR-351 nav receivers		5.4	57.4	310
Collins IND-350 VOR/LOC indicator		1	60.2	60
Totals of Removed Items				757

Installed Items (Manufacturer and Model)	Weight X	Arm =	Moment
Garmin SL30 nav/comm	2.4	57.0	136.8
Totals of Installed Items	2.4	X	136.8

Previous empty weight: 1547.71 lbs.

Previous moment: 134770.66

New empty weight: 1536.91 lbs.

New moment: 134150.46

New useful load: 1013.09 lbs.

New Center of Gravity: 87.285827

Prepared by:

Date: 9/6/2010

Supercedes weight & balance dated 02-08-2010

Hawk Avionics, LLC
 Certified Repair Station # OI7R070N
 Weight and Balance Recalculation Form

Manufacturer: Piper	Model: PA-28-181	S/N: 28-7790002	Reg #: N4052F
----------------------------	-------------------------	------------------------	----------------------

Removed Items (Manufacturer and Model)	Weight X	Arm =	Moment
Collins TDR-950 Transponder	2.8	62.9	176
IIMorrow 612B LORAN-C	3.68	66.0	242.75
Totals of Removed Items	6.48	X	418.75

Installed Items (Manufacturer and Model)	Weight	X	Arm =	Moment
Garmin GTX 327 Transponder		3	60.0	180
Air Gizmos GPS Panel Dock		0.25	62.4	15.6
Totals of Installed Items		3.25	X	195.6

Previous empty weight: 1550.94 lbs.

```
Previous moment: 134993.81
```

New empty weight: 1547.71 lbs.

New moment: 134770.66

New useful load: 1002.29 lbs.

New Center of Gravity: 87.077463

Prepared by:

Date: 2/8/2010

Supercedes weight & balance dated 11-12-2004

WEIGHT AND BALANCE CHANGE

DATE 11-12-2004

MAKE PIPER
 MODEL PA28-181
 SERIAL NO. 28-7790002
 REG. NO. N4052F

	WEIGHT	ARM	MOMENT
OLD EMPTY WEIGHT AND C.G.	1551.84	87.21	135330.41
EQUIPMENT ADDED OR REMOVED			
REMOVE CIR-11-2 ELT	3.50	236.20	826.70
ADD AMERI-KW6 ELT	2.60	188.50	490.10
NEW EMPTY WEIGHT AND C.G.	1550.94	87.04	134993.81

MAXIMUM GROSS WEIGHT 2550.00
 LESS EMPTY WEIGHT 1550.94
 USEFUL LOAD 999.06

IT IS THE RESPONSIBILITY OF THE PILOT IN
 COMMAND TO ENSURE THAT THE AIRPLANE IS
 PROPERLY LOADED.
 MAXIMUM GROSS WEIGHT IS 2550 lbs.

SIGNATURE Kim E Bay
 CERTIFICATE NO. 241889821

(803) 377-1444

DE **#H**

	Equipment Serial Number				
Equipment Description	Removed	Installed	Weight	Arm	Moment
PREVIOUS DATA >>>	/ / / / / / / /	\ \ \ \ \ \ \ \	1564.40	87.88	137485.00
B/K KLN88 LORAN-C RCVR	U1576		-6.20	104.00	-644.80
B/K KA-33 LORAN ANTENNA	1755		0.00	0.00	0.00
3M WX1000 DISPLAY	UWD04002985		-2.30	104.00	-239.20
WX1000 PROCESSOR	UWP04002985		-6.50	181.00	-1176.50
WX1000 ANTENNA	UWA04002985		-1.80	217.00	-390.60
NAT RS08 RELAY	7245		0.00	0.00	0.00
IIM APOLLO 612B LORAN-C		14336	3.68	66.00	242.75
IIM A-16 PREAMP ANTENNA		N/A	0.56	96.00	53.76
TOTAL			1551.84		135330.41

New Empty Moment:	135330.41			
New Empty Weight:	1551.84	lbs.		
New Empty C.G.:	87.21	inches	AFT	of the datum
New Useful Load:	998.16	lbs.@	2550.00	lbs. Gross Weight

Jeffrey A. Jones

for CRS # ZE4R697M

CUSTOMER Atkinson/Dyer/Watson Architects PA. WEIGHT & BALANCE
ADDRESS 5101 Monroe Road AND
Charlotte, N.C. 28205 EQUIPMENT LIST

Q. # 9910

EQUIPMENT

A/C MODEL PA 28-191
SERIAL NO. 28-7790002
REGISTRATION NO. N405ZF.
TACH ☐ HOBBS ☐
CHANGE DATE 9/14/90.

MFG.	MODEL	DESCRIPTION OF UNIT	SERIAL NO.	AMPS	LOC	WEIGHT (lb.)	ARM (in.)	MOMENT (in./lb.)
		Aircraft Empty Weight						
RING.	KLN-84	LOBAN REC.	41976			1548.5	87.2	135033
	HA-33	LOBAN ANT.	1755			6.2	104.0	645
						NEG.	-	
scope	WX-1000	PROCCAP	UWPO4002985			6.5	181.0	1177
"	WX-1000	Antenna.	UWPO4002985			1.0.	217	391
"	WX-1000	Display	UWPO4002985			2.3	104.0	239
N.A.T.	RS-08-1001	Loran Relay	7245			NEG.		
					TOTAL	1565.4	88.0	137485
Superseded 7/3/93								
		GROSS WT.	2550.0	LBS.				
		NEW empty wt.	1565.4	LBS				
		NEW C.G.	99.0	in.				
		NEW MOMENT.	137485					
		NEW useful load.	984.6	LBS.				



Inc., North Church Street, Rocky Mount, N. C. 27801 · Phone (919) 442-0101

WEIGHT AND BALANCE

REVISION NUMBER I

DATE Jan. 26, 1977

TYPE AIRCRAFT Piper PA-28-181 N 4052F

SERIAL NUMBER 28-7790002 TACH

WORK ORDER NUMBER 1635 TOTAL TIME

ITEM	WEIGHT	ARM	MOMENT
1. <u>Previous</u>	<u>1528.5</u>	<u>87.1</u>	<u>133070</u>
<u>Installed:</u>			
2. <u>Collins VHF 251</u>	<u>3.4</u>	<u>56.9</u>	<u>193</u>
<u>Collins VIR 351</u>	<u>2.7</u>	<u>57.4</u>	<u>155</u>
3. <u>Collins IND 351</u>	<u>1.3</u>	<u>60.2</u>	<u>78</u>
<u>Collins GLS 350</u>	<u>2.0</u>	<u>181.8</u>	<u>364</u>
4. <u>Collins ADF 650</u>	<u>6.6</u>	<u>104.8</u>	<u>692</u>
<u>Collins AMR 350/Ant</u>	<u>3.3</u>	<u>110.0</u>	<u>363</u>
5. <u>Collins VHF Ant.</u>	<u>.8</u>	<u>147.5</u>	<u>118</u>
6. <u></u>	<u></u>	<u></u>	<u></u>
TOTALS	<u>1548.6</u>	<u>87.2</u>	<u>(135033)</u>
NEW AIRCRAFT EMPTY WEIGHT	<u>1548.6</u>	POUNDS	
NEW AIRCRAFT EMPTY C. G.	<u>87.2</u>	INCHES	
NEW AIRCRAFT USEFUL LOAD	<u>1001.4</u>	POUNDS	
AIRCRAFT LICENSED GROSS WEIGHT	<u>2550.0</u>	POUNDS	

*Superceded
a/14/90*

MODEL PA-28-181 CHEROKEE ARCHER II

Airplane Serial Number 28-7790002

Registration Number N4052F

Date 8/4/76

AIRPLANE BASIC EMPTY WEIGHT

Item	Weight (Lbs)	x	C. G. Arm (Inches Aft of Datum)	=	Moment (In-Lbs)
Standard Empty Weight* Computed ^{Actual}	1415.3		85.4		120833
Optional Equipment	113.2		108.1		12237
Basic Empty Weight	1528.5		87.1		133070

*The standard empty weight includes full oil capacity and 2.0 gallons of unusable fuel.

AIRPLANE USEFUL LOAD

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

Normal Category (2550 lbs) - (1528.5lbs) = 1021.5 lbs.

Utility Category (1950 lbs) - (1528.5lbs) = 421.5 lbs.

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

SUPERCEDED
By Supplement #1 Date JAN 26, 77

WEIGHT AND BALANCE DATA FORM

Figure 6-5

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SUPERCEDED

Date

By

MODEL PA-28-181 CHEROKEE ARCHER 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 2.0 gallons of unusable fuel.

AIRPLANE USEFUL LOAD

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

Normal Category (2550 lbs) - (lbs) = lbs.

Utility Category (2130 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

**SECTION 6
WEIGHT AND BALANCE**

**PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II**

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REPORT: VB-790
6-9

SECTION 6

WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION

PA-28-181, CHEROKEE ARCHER II

[illegible]**WEIGHT AND BALANCE RECORD (cont)**

Figure 6-7 (cont)

REPORT: VB-790
6-9

PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II

ISSUED: JUNE 18, 1976
REVISED: MARCH 30, 1984

6.7 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT

- Add the weight of all items to be loaded to the basic empty weight.
- Use the Loading Graph (Figure 6-13) to determine the moment of all items to be carried in the airplane.
- Add the moment of all items to be loaded to the basic empty weight moment.
- Divide the total moment by the total weight to determine the C.G. location.
- 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	1528.5	87.1	133070
Pilot and Front Passenger	340.0	80.5	27370
Passengers (Rear Seats)*	340.0	118.1	40154
Fuel (48 Gallon Maximum)	288	95.0	27360
Baggage*	53.5	142.8	7640
Total Loaded Airplane	2550	92.4	235594

The center of gravity (C.G.) of this sample loading problem is at 92.4 inches aft of the datum line. Locate this point (92.4) 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.

*Utility Category Operation - No baggage or rear passengers allowed.

SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

Figure 6-9

SECTION 6
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II

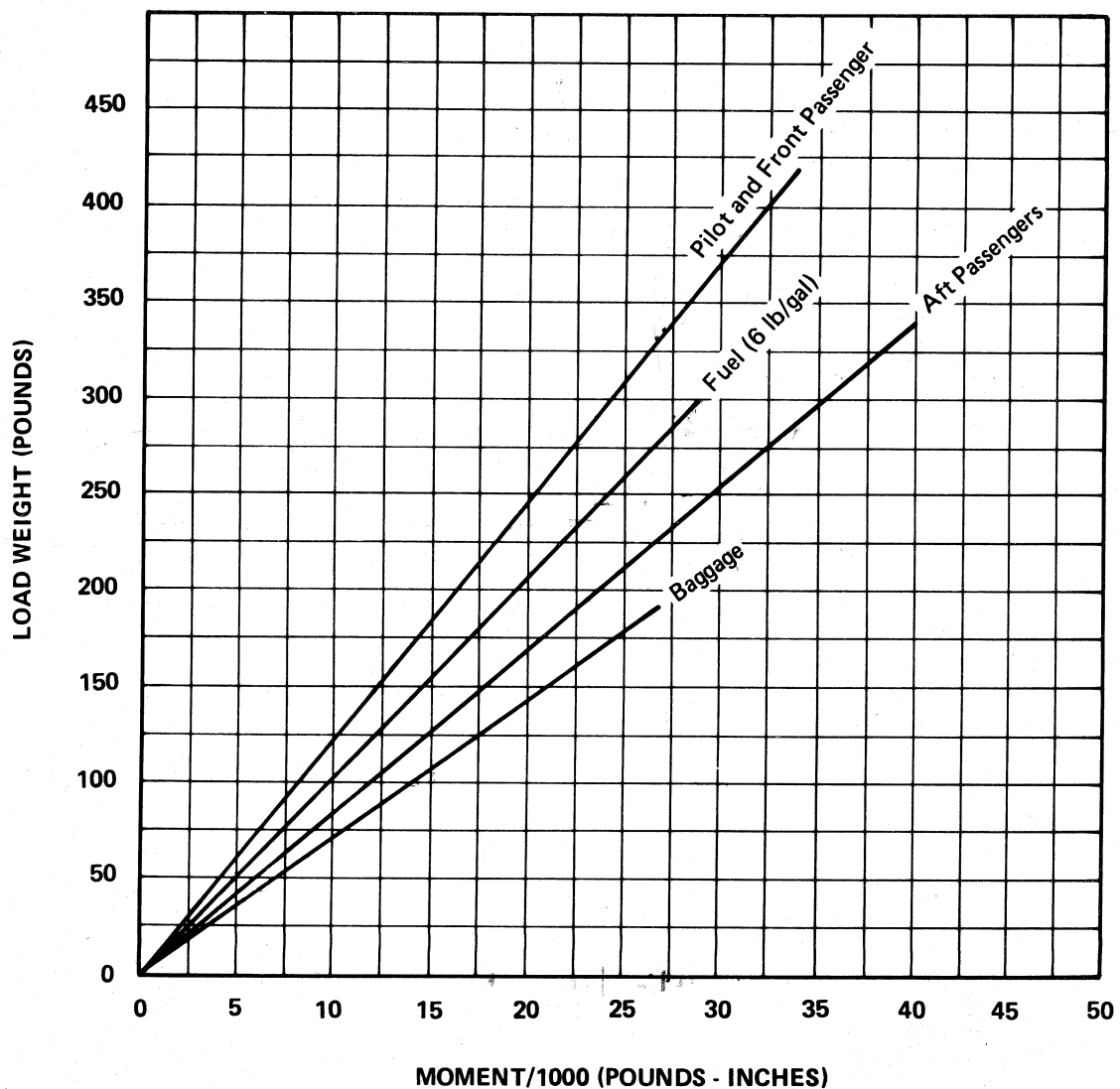
	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight			
Pilot and Front Passenger		80.5	
Passengers (Rear Seats)*		118.1	
Fuel (48 Gallon Maximum)		95.0	
Baggage*		142.8	
Total Loaded Airplane			

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.

*Utility Category Operation - No baggage or rear passengers allowed.

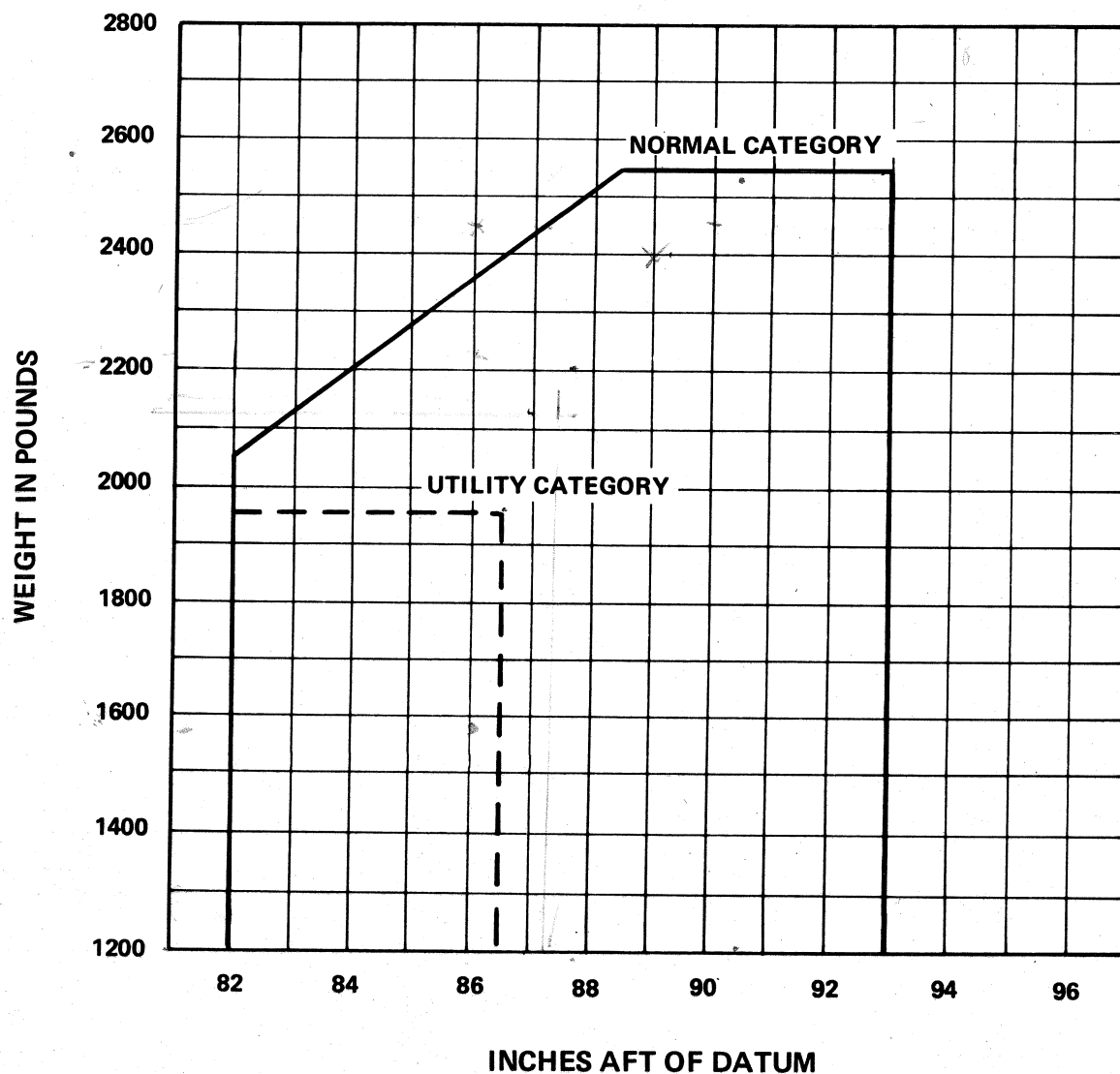
WEIGHT AND BALANCE LOADING FORM

Figure 6-11



LOADING GRAPH

Figure 6-13



C. G. RANGE AND WEIGHT

Figure 6-15

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6.9 EQUIPMENT LIST

The following is a list of equipment which may be installed in the PA-28-181. It consists of those items used for defining the configuration of an airplane when the basic empty weight is established at the time of delivery. Only those standard items which are alternate standard items and those required to be listed by the certificating 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-28-181 CHEROKEE ARCHER II

SERIAL NO. 28-7790002 REGISTRATION NO. N4052F DATE: 8/2/76

(a) Propeller and Propeller Accessories

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
1	Propeller, Sensenich 76EM8S5-0-60, Piper Spec. PS50077-8 Cert. Basis - TC P4EA				
3	Propeller, Sensenich 76EM8S5-0-62, Piper Spec. PS50077-42 Cert. Basis - TC P4EA				

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6.9 EQUIPMENT LIST

The following is a list of equipment which may be installed in the PA-28-181. 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 certificating 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-28-181 CHEROKEE ARCHER 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	Propeller, Sensenich 76EM8S5-0-60, Piper Spec. PS50077-8 Cert. Basis - TC P4EA				
3	Propeller, Sensenich 76EM8S5-0-62, Piper Spec. PS50077-42 Cert. Basis - TC P4EA				

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(b) Engine and Engine Accessories

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
11	Engine - Lycoming Model O-360-A4M Piper Dwg. 62941-16 Cert. Basis - TC E286				
13	Oil Filter - Lycoming No. 75528 (AC *OF5578770) Cert. Basis - TC E286	_____	3.3	35.5	117
15	Oil Filter - Lycoming *LW-13743 (Champion *CH-48110) Cert. Basis - TC E286	X _____	2.8	35.5	99

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(c) Landing Gear and Brakes

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
27	Two Main Wheel Assemblies Piper Dwg. 63370-0 & -1 a. Cleveland Aircraft Products Wheel Assembly No. 40-86 Brake Assembly No. 30-55 Cert. Basis - TSO C26a b. Two Main 4-Ply Rating Tires 6.00-6 with Regular Tubes Cert. Basis - TSO C62				
29	One Nose Wheel a. Cleveland Aircraft Products Wheel Assembly No. 40-76B (Less Brake Drum) Cert Basis - TSO C26a	_____	4.3	31.0	133
	b. McCauley Industrial Corp. Wheel Assy. No. D-30625 Cert. Basis - TSO C26b	_____	5.5	31.0	171
	c. One Nose Wheel 4-Ply Rating Tire 6.00-6 with Regular Tube Cert. Basis - TSO C62				

**SECTION 6
WEIGHT AND BALANCE**

**PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II**

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(d) Electrical Equipment

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

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(e) Instruments

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
53	Airspeed Indicator, Piper Spec. PS50049-30S Cert. Basis - TSO C2b				
55	Altimeter, Piper Spec. PS50008-2 or -3 Cert. Basis - TSO C10b				
57	Compass Cert. Basis - TSO C7c				

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(f) Miscellaneous

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
65	Forward Seat Belts (2) Piper Spec. PS50039-4-2A Cert. Basis - TSO C22f				
67	Rear Seat Belts (2) Piper Spec. PS50039-4-3 Cert. Basis - TSO C22f				

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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.)
-------------	------	-------------------	--------------------	------------------------	--------------------

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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.)
-------------	------	-------------------	--------------------	------------------------	--------------------

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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.)
73	Nose Wheel Fairing Piper Dwg. 65348-2 Cert. Basis - TC 2A13	X	3.6	36.3	131
75	Main Wheel Fairings Piper Dwg. 65237 Cert. Basis - TC 2A13	X	7.6	113.6	863
76	Nose Wheel Fairing Piper Dwg. 37896-3 Cert. Basis - TC 2A13	_____	10.3	36.3	374
77	Main Wheel Fairings Piper Dwg. 37885-2, -3 Cert. Basis - TC 2A13	_____	20.6	113.6	2340

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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	Instrument Panel Lights Cert. Basis - TC 2A13	<u>X</u>	0.3	62.8	19
81	Instrument Light Grimes 15-0083-7 Cert. Basis - TC 2A13	<u>X</u>	0.1	99.0	10
83	Cabin Light Cert. Basis - TC 2A13	<u>X</u>	0.3	99.0	30
85	Landing Light, G. E. Model 4509 Cert. Basis - TC 2A13	<u>X</u>	.5	13.1	7
87	Navigation Lights (Wing) (2) Grimes Model A1285 (Red and Green) Cert. Basis - TC 2A13	<u> </u>	0.4	106.6	43
89	Navigation Light (Rear) (1), Grimes Model 2064 (White) Cert. Basis - TC 2A13	<u>X</u>	.2	281.0	56
91	Rotating Beacon Cert. Basis - TC 2A13	<u>X</u>	1.5	263.4	395
93	Anti-Collision Lights (Wing Tip) (Whelen) Cert. Basis - STC SA615EA	<u>X</u>	5.7	157.9	900
95	Heated Pitot Head, Piper Dwg. 69041-7 Cert. Basis - TC 2A13	<u>X</u>	.4	100.0	40
97	Piper Pitch Trim Piper Dwg. 69378-3 Cert. Basis - TC 2A13	<u>X</u>	4.7	145.6	684
99	Battery 12V 35 A.H. Rebat R35 (Wt. 27.2 lbs.) Cert. Basis - TC 2A13	<u>X</u>	*5.3	168.0	890

*Weight and moment difference between standard and optional equipment.

SECTION 6
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
101	Auxiliary Power Receptacle, Piper Dwg. 68815 Cert. Basis - TC 2A13	<u>X</u>	2.7	178.5	482
103	External Power Cable, Piper Dwg. 62355 Cert. Basis - TC 2A13	<u>X</u>	4.6	142.8	657
105	Lighter, #200462, 12 Volt Universal Cert. Basis - TC 2A13	<u>X</u>	.2	62.9	13

(k) Instruments
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
113	Vacuum System Installation Cert. Basis - TC 2A13	<u>X</u>	4.5	39.1	176
115	Attitude Gyro, Piper Dwg. 99002-2, -3, -4 or -8 Cert. Basis - TSO C4c	<u> </u>	2.2	59.4	131
117	Directional Gyro, Piper Dwg. 99003-2, -3, -4 or -7 Cert. Basis - TSO C5c	<u> </u>	2.6	59.7	155
119	Tru-Speed Indicator, Piper Spec. PS50049-30T Cert. Basis - TSO C2b	<u>X</u>	(same as standard equipment)		
121	Encoding Altimeter, Piper PS50008-6 or -7 Cert. Basis - TSO C10b, C88	<u> </u>	* .9	60.3	54
123	Vertical Speed Piper Dwg. 99010-2, -4 or -5 Cert. Basis - TSO C8b	<u>X</u>	1.0	65.9	66
125	Alternate Static Source Cert. Basis - TC 2A13	<u>X</u>	.4	61.0	24
127	Turn and Slip Indicator, Piper PS50030-2 or -3 Cert. Basis - TSO C3b	<u>X</u>	2.6	59.7	155
129	Exhaust Gas Temperature, Piper Dwg. 99026 Cert. Basis - TC 2A13	<u>X</u>	.7	55.4	39
131	Manifold Pressure Gauge Piper Spec. PS50031-3 or -4 Cert. Basis - TC 2A13	<u> </u>	0.9	60.8	55

*Weight and moment difference between standard and optional equipment.

SECTION 6
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II

(k) Instruments
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
133	Engine Hour Meter Piper Dwg. 79548-0 Cert. Basis - TC 2A13	<u> </u>	0.3	61.2	18
135	Clock Cert. Basis - TC 2A13	<u> X </u>	.4	62.4	25
137	Air Temperature Gauge, Piper Dwg. 99479-0 or -2 Cert. Basis - TC 2A13	<u> X </u>	.2	72.6	15

(I) Autopilots
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
157	AutoFlite II Cert. Basis - STC SA3066SW-D	_____	5.6	91.8	514
159	AutoControl IIIB a. Omni Coupler, *1C388 Cert. Basis - STC SA3065SW-D	_____ X _____	9.6 1.0	77.6 59.3	745 59

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(m) Radio Equipment
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
169	Collins VHF-251 Comm Transceiver	X			
	a. Single	_____	3.4	56.9	193
	b. Dual	_____	6.8	56.9	387
	Cert. Basis - TSO C37b, C38b				
171	Collins VIR-351 Nav Receiver	X			
	a. Single	_____	2.7	57.4	155
	b. Dual	_____	5.4	57.4	310
	Cert. Basis - TSO C40a, C36c				
173	Collins IND-350 VOR/LOC Indicator	X			
	a. Single	_____	1.0	60.2	60
	b. Dual	_____	2.0	60.2	120
	Cert. Basis - TSO C40a, C36c				
175	Collins IND-351 VOR/LOC/ GS Indicator				
	Cert. Basis - TSO C40a, C36c	_____	1.3	60.2	78
177	Collins GLS-350 Glide Slope Receiver				
	Cert. Basis - TSO C34c	_____	2.0	181.8	364
179	Collins RCR-650 ADF Receiver and Antenna and IND-650 Indicator				
	Cert. Basis - TSO C41c	_____	6.6	104.8	692
181	Collins AMR-350 Audio/Marker Panel				
	Cert. Basis - TSO C35d, C50b	_____	*3.3	110.0	363

*Weight includes antenna and cable.

SECTION 6
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
183	Collins TDR-950 Transponder Cert. Basis - TSO C74c	<u>X</u>	*2.8	62.9	176

*Weight includes antenna.

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
187	King KX 170 () VHF Comm/Nav				
	a. Transceiver, Single	_____	7.5	56.6	425
	b. Transceiver, Dual	_____	15.0	56.6	849
	Cert. Basis - TC 2A13				
189	King KX 175 () VHF				
	a. Transceiver,	_____	9.4	56.6	532
	b. King KN 73 Glide Slope Receiver,	_____	3.2	184.3	590
	c. King KN 77 VOR/LOC Converter,	_____	3.6	183.6	661
	d. King KNI 520 VOR/ILS Indicator	_____	2.8	60.5	169
	Cert. Basis - TSO C3bc, C37b, C38b, C40a				
191	King KX 175 () VHF				
	a. Transceiver (2nd),	_____	8.6	56.6	487
	b. King KN 77 VOR/LOC Converter,	_____	4.2	183.6	771
	c. King KNI 520 VOR/ILS Indicator	_____	2.8	60.5	169
	Cert. Basis - TSO C36c, C37b, C38b, C40a				
193	King KI 201 () VOR/LOC Ind.				
	a. Single	_____	2.5	59.6	149
	b. Dual	_____	5.0	59.9	300
	Cert. Basis - TC 2A13				
195	King KI 213 VOR/LOC/GS Indicator				
	Cert. Basis - TC 2A13	_____	2.5	60.4	151
197	King KI 214 () VOR/LOC/GS Ind.				
	Cert. Basis - TC 2A13	_____	3.3	59.9	198
199	King KN 74 R-Nav				
	Cert. Basis - TC 2A13	_____	4.7	56.6	266

SECTION 6
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
201	King KN 61 DME Cert. Basis - TC 2A13	_____	12.5	179.0	2237
203	King KN 65A DME Cert. Basis - TSO C66a	_____	13.0	174.9	2274
205	King KR 85 Digital ADF a. Audio Amplifier Cert. Basis - TSO C41b	_____ _____	8.6 0.8	85.2 51.0	733 41
207	King KR 86 ADF a. First b. Second c. Audio Amplifier Cert. Basis - TC 2A13	_____ _____ _____	6.7 9.7 0.8	91.6 107.0 51.0	614 1038 41
209	King KMA 20 () Audio Panel Cert. Basis - TSO C35c, C50b	_____	*3.7	70.8	262
211	King KT 76/78 Transponder Cert. Basis - TSO C74b	_____	*3.1	58.1	180

*Weight includes antenna and cable.

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
213	Narco Comm 10A VHF Transceiver Cert. Basis - TC 2A13	_____	3.9	57.4	224
215	Narco Comm 11A VHF Transceiver				
	a. Single	_____	3.6	57.4	207
	b. Dual	_____	7.1	57.4	408
	Cert. Basis - TC 2A13				
217	Narco Comm 11B VHF Transceiver				
	a. Single	_____	3.9	57.4	224
	b. Dual	_____	7.8	57.4	448
219	Narco Comm 111 VHF Transceiver				
	a. Single	_____	3.0	57.4	172
	b. Dual	_____	6.0	57.4	344
	Cert. Basis - TSO C37b, C38b				
221	Narco Comm 111B VHF Transceiver				
	a. Single	_____	3.9	57.4	224
	b. Dual	_____	7.8	57.4	448
	Cert. Basis - TSO C37b, C38b				
223	Narco Comm 120 VHF Transceiver				
	a. Single	_____	4.8	56.9	273
	b. Dual	_____	8.6	57.4	494
	Cert. Basis - TSO C37b, C38b				
225	Narco Nav 10 VHF Receiver Cert. Basis - TC 2A13	_____	1.9	58.6	111
227	Narco Nav 11 VHF Receiver				
	a. Single	_____	2.8	58.6	164
	b. Dual	_____	5.6	58.6	328
	Cert. Basis - TC 2A13				
229	Narco Nav 12 VHF Receiver Cert. Basis - TC 2A13	_____	3.4	58.6	199

SECTION 6
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
231	Narco Nav 14 VHF Receiver Cert. Basis - TC 2A13	_____	2.5	57.4	144
233	Narco Nav 111 Cert. Basis - TSO C36c, C40a, C66a	_____	2.5	58.6	147
235	Narco Nav 112 Receiver Cert. Basis - TSO C36c, C40a, C66c, C34c	_____	3.3	58.6	193
237	Narco Nav 114 VHF Receiver Cert. Basis - TSO C38b, C40a, C36c, C34c, C66a	_____	2.5	57.4	144
239	Narco Nav 121 VHF Receiver a. Single b. Dual Cert. Basis - TSO C36c, C40c, C66a	_____ _____ _____	3.1 6.2	58.4 58.4	181 362
241	Narco Nav 122 VHF Receiver a. Single b. Dual Cert. Basis - TSO C35d, C36c, C40c, C66a	_____ _____ _____	* 5.1 * 8.6	99.4 82.9	507 713
243	Narco Nav 122A VHF Receiver a. Single b. Dual Cert. Basis - TSO C34c, C35d, C36c, C40c, C66a	_____ _____ _____	* 5.2 * 8.8	98.5 82.2	512 723
245	Narco Nav 124A VHF Receiver a. Single b. Dual Cert. Basis - TSO C35d, C36c, C40a, C66a	_____ _____ _____	* 6.2 * 10.9	92.3 77.2	572 841

*Weight includes marker antenna and cable

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
247	Narco ID 124 VOR/LOC/GS Indicator				
	a. Single	_____	1.2	60.5	73
	b. Dual	_____	2.4	60.5	145
	Cert. Basis - TSO C34c, C35d, C36c, C40c				
249	Narco UGR-2A Glide Slope				
	a. Single	_____	4.2	154.0	647
	b. Dual	_____	8.4	220.0	1848
	Cert. Basis - TSO C34b				
251	Narco UGR-3 Glide Slope				
	Cert. Basis - TC 2A13	_____	4.2	154.0	647
253	Narco MBT-12-R, Marker Beacon				
	Cert. Basis - TC 2A13	_____	3.1	69.1	214
255	Narco CP-125 Audio Selector Panel				
	Cert. Basis - TC 2A13	_____	2.2	55.0	121
257	Narco CP-135 Audio Selector Panel				
	Cert. Basis - TSO C50b	_____	2.2	55.0	121
259	Narco CP-135M Audio Selector Panel				
	Cert. Basis - TSO C50b, C35d	_____	* 3.7	114.3	423
261	Narco DME-190				
	Cert. Basis - TC 2A13	_____	** 5.9	60.9	359
263	Narco DME-190 TSO				
	Cert. Basis - TSO C66a	_____	** 5.9	60.9	359
265	Narco DME-195 Receiver and Indicator				
	Cert. Basis - TSO C66a	_____	**13.2	154.5	2039

*Weight includes marker antenna and cable.

**Weight includes antenna and cable.

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WEIGHT AND BALANCE

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PA-28-181, CHEROKEE ARCHER II

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
267	Narco ADF-140				
	a. Single	<u> </u>	6.0	91.2	547
	b. Dual	<u> </u>	*17.9	107.6	1926
	Cert. Basis - TSO C41c				
269	Narco ADF-141				
	a. Single	<u> </u>	6.0	91.2	547
	b. Dual	<u> </u>	*17.9	107.6	1926
	Cert. Basis - TSO C41c				
271	Narco AT50A Transponder				
	Cert. Basis - TSO C74b	<u> </u>	** 3.0	57.3	172
	a. Narco AR-500 Altitude Encoder				
	Cert. Basis - TSO C88	<u> </u>	1.0	51.5	52
273	Narco AT150 Transponder				
	Cert. Basis - TSO C74c	<u> </u>	** 3.0	57.3	172
	a. Narco AR-500 Altitude Encoder				
	Cert. Basis - TSO C88	<u> </u>	1.0	51.5	52
275	Antenna and Cable				
	a. Nav Receiving	<u> X </u>	1.4	195.7	274
	b. # 1 VHF Comm	<u> X </u>	0.7	125.7	88
	c. # 2 VHF Comm	<u> X </u>	0.8	147.5	118
	d. Glide Slope (Single)	<u> X </u>	0.9	120.0	108
	e. Glide Slope (Dual)	<u> </u>	2.8	154.0	431
	f. Single ADF Sense	<u> </u>	0.4	150.0	60
	Cert. Basis - TC 2A13				
277	Anti Static Antenna and Cable				
	a. # 1 VHF Comm	<u> </u>	1.4	144.3	202
	b. # 2 VHF Comm	<u> </u>	1.5	170.7	256
	c. Single ADF Sense	<u> </u>	0.5	147.5	74
	Cert. Basis - TC 2A13				
279	Emergency Locator Transmitter				
	a. Antenna and Coax	<u> X </u>	3.5	1-1-81 CORROPHON 236.2	826 402
	b. Shelf and Access Hole	<u> X </u>	0.2	224.4	45
	Cert. Basis - TC 2A13	<u> X </u>	0.3	235.4	71

*Weight includes dual antenna and cable.

**Weight includes antenna and cable.

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

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
281	Microphone				
	a. Piper Dwg. 68856-10	<u> </u>	0.3	64.9	19
	b. Piper Dwg. 68856-11	<u> </u>	0.6	69.9	42
	c. Piper Dwg. 68856-12	<u> X </u>	0.3	64.9	19
	Cert. Basis - TC 2A13				
283	Boom Microphone - Headset				
	Piper Dwg. 37921-2				
	Cert. Basis - TC 2A13	<u> </u>	0.3	80.5	24
285	Cabin Speaker				
	Cert. Basis - TC 2A13	<u> X </u>	0.8	99.0	79
287	Headset, Piper Dwg. 68856-10				
	Cert. Basis - TC 2A13	<u> X </u>	0.5	60.0	30

**SECTION 6
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**PIPER AIRCRAFT CORPORATION
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(n) Miscellaneous
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)	
321	Zinc Chromate Finish Cert. Basis - TC 2A13	_____	5.0	158.0	790	
323	Stainless Steel Control Cables Cert. Basis - TC 2A13	_____	—	—	—	
325	Air Conditioner, Piper Dwg. 99575-3 Cert. Basis - TC 2A13	_____	68.3	103.6	7076	
327	Overhead Vent System Piper Dwg. 76304-9 Cert. Basis - TC 2A13	_____	6.4	159.6	1022	
329	Overhead Vent System with Ground Ventilating Blower Piper Dwg. 76304-10 Cert. Basis - TC 2A13	_____	14.9	172.2	2566	
331	Assist Step, Piper Dwg. 65384 Cert. Basis - TC 2A13	_____	1.8	156.0	281	
333	Super Cabin Sound Proofing, Piper Dwg. 79601-3 Cert. Basis - TC 2A13	_____	18.1	86.8	1571	
335	Adjustable Front Seat (Left), Piper Dwg. 79591-0/79591-2 Cert. Basis - TC 2A13	_____	*6.6	80.7	533	
337	Adjustable Front Seat (Right), Piper Dwg. 79591-1/79591-3 Cert. Basis - TC 2A13	_____	*6.8	80.0	544	

*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.)
339	Headrests (2) Front, Piper Dwg. 79337-18 Cert. Basis - TC 2A13	<u>X</u>	2.2	94.5	208
341	Headrests (2) Rear, Piper Dwg. 79337-18 Cert. Basis - TC 2A13	<u>X</u>	2.2	132.1	291
343	Inertia Safety Belts (Rear) (2) 0.8 lbs. each, Piper PS50039-4-14 Cert. Basis - TC 2A13	<u> </u>	1.6	140.3	224
345	Assist Strap, Piper Dwg. 79455 Cert. Basis - TC 2A13	<u>X</u>	0.2	109.5	22
347	Deluxe Carpeting Cert. Basis - TC 2A13	<u>X</u>	*2.8	101.9	285
349	Fire Extinguisher,				
	a. Piper Dwg. 76167-2 b. Piper Dwg. 37872-2 Cert. Basis - TC 2A13	<u> </u> <u> </u>	4.6 5.6	71.0 57.9	327 324

*Weight and moment difference between standard and optional equipment.

(n) Miscellaneous
(Optional Equipment) (cont)

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

113.2

108.1

12237

EXTERIOR FINISH

Base Color Juneau White

Registration No. Color Green

Trim Color Lime Green

Type Finish Lacquer

Accent Color Baja Yellow

ISSUED: JUNE 18, 1976

REPORT: VB-790

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