PREPARED	PIPER AIRCRAFT CORP. DEVELOPMENT CENTER, VERO BEACH, FLA.	
CHECKED		
APPROVED		PAGE _____

AIRPLANE FLIGHT MANUAL

MODEL PA-28-140

FAA APPROVED: H. E. Waterman

H. E. Waterman
Supervisor, EMDO 42
FAA Southern Region
Atlanta, Georgia

DATE: February 14, 1964

Log of Revisions

REVISION NO.	PAGE	DESCRIPTION	APPROVED	DATE
1	1	Deleted Propeller - And Static RPM - Information	H.E. Waterman Supervisor SO-EMDO-42	3/24/64
2	1	Added Static R.P.M. Information	H. E. Waterman Supervisor SO-EMDO-42	5/25/64
3	3	Placards Section: Added Placard No. 4	H. E. Waterman Supervisor SO-EMDO-42	7/8/64
4	2	Maneuvers Section: Deleted Stalls in Utility Category	H. C. Faller Supervisor SO-EMDO-43	8/31/64
5c	2,3	Increased Gross Weight to 2150 and Baggage Capacity to 200 Lbs.	H. C. Faller Supervisor SO-EMDO-43	5/21/65
6	1	Limitations Section: Revised Oil Temperature and Fuel Pressure Range	H. C. Faller Supervisor, SO-EMDO-43	6/23/65
7	1	Static RPM Corrected	H. C. Faller Supervisor SO-EMDO-43	8/12/65
8	1	Revised Static RPM, Oil Temperature and Fuel Pressure Limitations	H. C. Faller Supervisor SO-EMDO-43	12/13/65
	2	Added Note to Maximum Weight Callout		
	3	Revised Placard No. 4		

FAA APPROVED 2/14/64

Piper Model PA 28-140
Normal and Utility Categories

FAA Identification No. N6358R

Serial No. 28-21529

AIRPLANE FLIGHT MANUAL

1. Limitations Section. The following limitations must be observed in the operation on this airplane:

Engine	Lycoming 0-320-E2A
Engine Limits	For all operations 2700 rpm, 150 Hp.
Fuel	80/87 Octane Aviation Fuel
Propeller	Sensenich M74DM, Maximum diameter 74 inches. Minimum diameter 72 1/2 inches. Static RPM at Maximum permissible throttle setting: 2150 - 2425 for Maximum allowable weight of 1950 lbs. 2275 - 2425 for Maximum allowable weight of 2150 lbs. No additional tolerance permitted.
Power Instruments	Oil temperature: GREEN arc (normal operating range) 120° F. to 245° F.; YELLOW arc (caution range) 60° F. to 120° F.; RED line (maximum) 245° F. (S/N 20,000 to 20,550). Oil temperature: GREEN arc (normal operating range) 75° F. to 245° F.; RED line (maximum) 245° F. (S/N 20,551 and Up). Oil pressure: GREEN arc (normal operating range) 60 psi to 85 psi; YELLOW arc (caution range) 25 psi to 60 psi; RED line (minimum) 60 psi; RED line (maximum) 85 psi. Fuel Pressure: GREEN arc (normal operating range) .5 psi to 5 psi; RED line (minimum) .5 psi; RED line (maximum) 5 psi (S/N 20,000 to 20,550). Fuel Pressure: GREEN arc (normal operating range) .5 psi to 8 psi; RED line (minimum) .5 psi; RED line (maximum) 8 psi (S/N 20,551 and Up). Tachometer: GREEN arc (normal operating range) 500 to 2700 rpm; RED line (maximum continuous power) 2700 rpm.

Airspeed Limits (Calibrated Airspeed) (Miles per Hour)	Never Exceed	171
	Maximum structural cruise	140
	Maneuvering	129
	Flaps extended	115
	Maximum positive load factor	3.8 Normal Category
	Maximum positive load factor	4.4 Utility Category
	Maximum negative load factor	No inverted maneuvers approved.

FAA APPROVED 2/14/64
Revised 12/13/65 Rev. No. 8

Maximum Weight — 2150 Lbs. (See Limitations Section for Static RPM limits.)

Baggage Capacity — 200 Lbs.

C. G. Range — The datum used is 78.4 inches ahead of the wing leading edge at the intersection of the straight and tapered section.

1. Normal Category

Weight (Pounds)	Forward Limit (In. aft of datum)	Rearward Limit (In. aft of datum)
2150	90.1	94.0
1950	86.5	94.0
1850	85.1	94.0
1650	84.0	94.0

2. Utility Category

Weight (Pounds)	Forward Limit (In. aft of datum)	Rearward Limit (In. aft of datum)
1950	86.5	86.5
1850	85.1	86.5
1650	84.0	86.5

Straight line variation between given points.

Note: It is the responsibility of the airplane owner and/or the pilot to insure that the airplane is properly loaded. See weight and balance section for loading information.

Maneuvers

1. Normal Category - All acrobatic maneuvers including spins prohibited.
2. Utility Category - Approved maneuvers for Utility Category only.

	Entry Speed
Spins (Flaps Up)	Stall
Steep Turns	129
Lazy Eights	129
Chandelles	129

Placards

1. On the instrument panel in full view of the pilot: "THIS AIRPLANE MUST BE OPERATED AS A NORMAL OR UTILITY CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

   ALL MARKINGS AND PLACARDS ON THIS AIRPLANE APPLY TO ITS OPERATION AS A UTILITY CATEGORY AIRPLANE. FOR NORMAL AND UTILITY CATEGORY OPERATIONS, REFER TO THE AIRPLANE FLIGHT MANUAL.

Placards (Cont'd.)

FOR SPIN RECOVERY, USE FULL RUDDER AGAINST SPIN, FOLLOWED IMMEDIATELY BY FORWARD WHEEL.

NO ACROBATIC MANEUVERS (INCLUDING SPINS) ARE APPROVED FOR NORMAL CATEGORY OPERATIONS."

2. Adjacent to upper door latch: "ENGAGE LATCH BEFORE FLIGHT".
3. On aft side of baggage compartment: "UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED.
   NORMAL CATEGORY OPERATION - SEE AIRPLANE FLIGHT MANUAL WEIGHT AND BALANCE SECTION FOR BAGGAGE AND AFT PASSENGER LIMITATIONS."
4. On the instrument panel in full view of the pilot when the oil cooler winterization kit is installed: "OIL COOLER WINTERIZATION PLATE TO BE REMOVED WHEN AMBIENT TEMPERATURE EXCEEDS 50° F.

Airspeed Instrument Markings	RED radial line	Never Exceed	171 mph (148 knots)
	YELLOW arc	Caution Range (Smooth Air Only)	140 to 171 mph (121 to 148 knots)
	GREEN arc	Normal Operating Range	64 to 140 mph (56 to 121 knots)
	WHITE arc	Flaps Down Range	55 to 115 mph (48 to 100 knots)

2. Procedures Section

1. The stall warning system is inoperative with the master switch off.
2. The electric fuel pump must be on for both take-off and landing.
3. Except as noted above, all operating procedures for this airplane are normal.

3. Performance Section

All performance is given for a weight of 2150 pounds.

Loss of altitude during stalls can be as great as 200 feet, depending on configuration and power.

Stalling speeds, in MPH, power off, versus angle of bank (Calibrated Airspeed):

Angle of Bank	0	20	40	50	60
Flaps Up	64	66	73	80	91
Flaps Down	55	--	--	--	--

FAA APPROVED 2/14/64
REVISED 12/13/65 Rev. No 8

PREPARED	PIPER AIRCRAFT CORP.	Weight and Balance Data
CHECKED	DEVELOPMENT CENTER, VERO BEACH, FLA.	Model PA 28-140
APPROVED		PAGE 1 Section 1

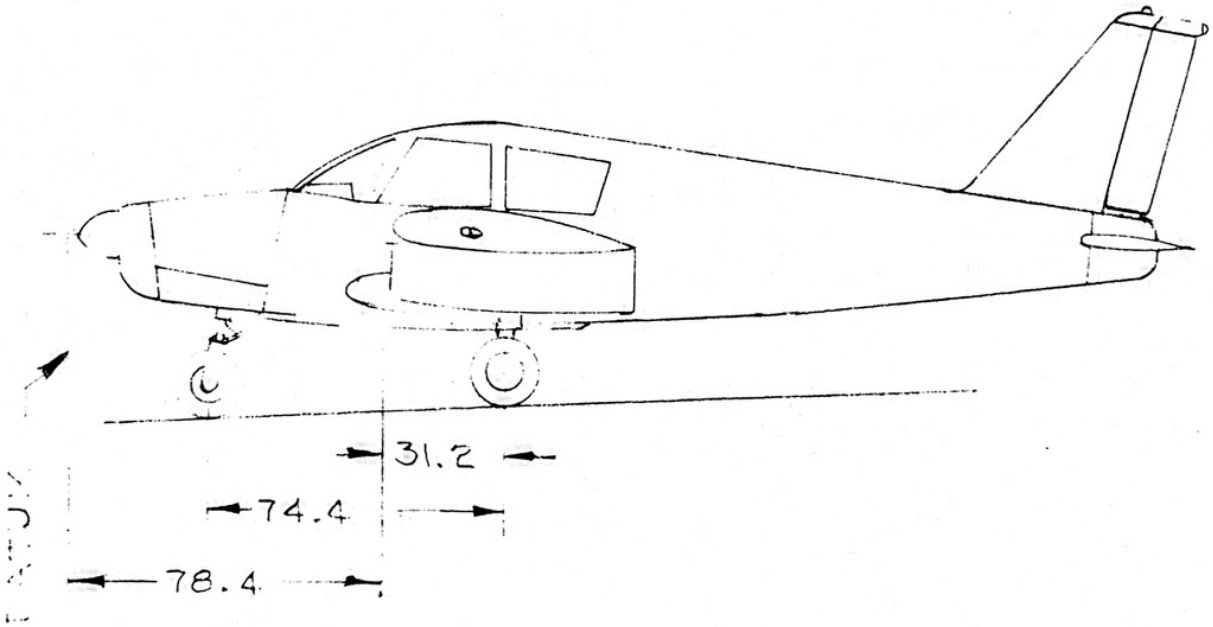
ACTUAL WEIGHT AND BALANCE

MODEL PA 28-140

SERIAL NUMBER 28- 21529

CERTIFICATE NUMBER N6358R

DATE March 16, 1966



Ronald Pitcher

Ronald Pitcher
DMIR-2049

WEIGHT AND BALANCE
STANDARD EQUIPMENT LIST
MODEL PA 28-140

Check if Installed	ITEM	WEIGHT (LBS.)	ARM AFT DATUM	MOMENT
	Engine Accessories			
X	Engine - Lycoming Model 0-320-E2A (Starter Weight Included)	272.0	26.1	7099
X	Fuel Pump, Electric Auxiliary, Bendix Model 478360	1.8	41.8	75
X	Fuel Pump, Engine Driven, Lycoming Dwg. No. 73297, 74082, 75148 or 75246	1.6	41.3	66
X	Oil Cooler, Piper Dwg. Harrison # C-8526250 Bracket BA-104	2.6	18.1	47
X replaced	Filter, ~~Fram Model CA-161PL~~ or AC No. A48C or Purolator AFP-2	.9	20.1	18
*X	Starter - Delco Remy #1109657 or Lycoming #69952	16.5	19.5	322
X	Alternator, 35 Amp., Chrysler No. 2098615	12.5	19.0	238
	Propeller and Propeller Accessories			
X	Propeller, Sensenich M74DM58	30.0	10.1	303
X	Spinner and Attachment Plates	2.0	8.0	16
	Landing Gear and Brakes			
X	Two Main Wheel Assemblies 6.00-6 (a) Cleveland Aircraft Products (2) Wheel Assembly No. 40-86 (2) Brake Assembly No. 30-55 (b) Two Main 4-Ply Rating Tires 6.00-6 with Regular Tubes	32.0	109.6	3507
X	One Nose Wheel 6.00-6 (a) Cleveland Aircraft Products Wheel Assembly No. 38501 (less brake drum) (b) One Nose Wheel 4-Ply Rating Tire 6.00-6 with Regular Tubes	14.0	34.3	480

PREPARED	PIPER AIRCRAFT CORP.	Weight and Balance Data
CHECKED	DEVELOPMENT CENTER, VERO BEACH, FLA.	Model PA 28-140
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Check if Installed	ITEM	WEIGHT (LBS.)	ARM AFT DATUM	MOMENT
	Electrical Equipment			
X	Stall Warning Device, Safe Flight Inst. Corp. No. C52207-4	.2	80.2	16
X	Voltage Regulator, Chrysler No. 2098613	.5	57.8	29
	Battery 12V., 25 A.H., Rebat Model S-25	21.5	114.9	2470
	Instruments			
[redacted]	Compass - Airpath No. C2350-L41	.9	66.6	60
	Airspeed Indicator, PAC 63205	.6	67.7	41
X	Tachometer, AC 1548302	.8	67.7	54
	Tachometer, Stewart Warner PAC 62177	.7	67.7	47
	Altimeter, Aero Marine No. 522	1.4	66.8	94
X	Engine Cluster - Piper Dwg. 63922	.8	68.8	55
	Engine Cluster - Piper Dwg. 63922-2	.8	68.8	55
	Miscellaneous			
X	Fwd. Seat Belts	1.0	86.9	87
X	Flight Manual	-----		-----

TOTAL

AIRCRAFT AVERAGE EMPTY WEIGHT	1204	84.5	101731
AS CALCULATED LESS Battery	21.5	114.9	2470
(INCLUDES ITEMS CHECK ON STANDARD	1182.5	83.9	99261

EQUIPMENT LIST) (This weight includes unusable oil and undrainable fuel)

OPTIONAL EQUIPMENT LIST

MODEL PA 28-140

Check if Installed	ITEM	WEIGHT (LBS.)	ARM AFT DATUM	MOMENT
	Engine Accessories			
X (replaced)	Vacuum Pump, Airborne Mechanisms 211C Model No. 10-113A1 or 113A5 or 200 cc	3.6	36.3	131
	Starter - Delco Remy #1109511 or Lycoming #74092	18.0	19.5	351
X	Oil Filter - ~~Lycoming #77528~~ CH48110	2.0	36.3	73
	Electrical Equipment			
	Rotating Beacon, Grimes Model D7080	2.0	263.4	527
X	Landing Light, G. E. Model 4509	.5	18.1	9
X	Navigation Lights (2) Grimes Model A1285 Red and Green	.4	106.6	43
X	Navigation Light (Rear) (1) Grimes Model 2064 (White)	.1	280.9	28
X	Battery 12V., 35 A.H. Reading R-35	27.0	114.9	3102
	Roll Servo Mitchell 1X221E-CH-1	2.8	60.6	170
	Console Amplifier and Cables Mitchell 1X214E	1.8	66.6	120
X	Cabin Light and Speaker	1.1	99.4	105
X	Rotating Beacon, Whelan Model WRM L-12	1.6	263.4	421
	Auxiliary Power Receptacle 65529	2.6	126.0	328
	External Power Cable 62355-7	4.6	129.0	593
	Piper AutoControl - Mitchell # AKO85	4.5	60.0	270
	Piper Pitch Trim	3.0	158.0	474

Check if Installed	ITEM	WEIGHT (LBS.)	ARM AFT DATUM	MOMENT
	Instruments			
replaced X	Turn and Bank, ~~Pioneer A-5~~ EGC T100-7	1.~~2~~	66.4	100
	Suction Gauge, AN5771-11	.4	68.1	27
	Suction Gauge, U. S. Gauge AW1821AFO3	.4	68.1	27
X	Suction Gauge, Airborne Mech. 163-4	.4	68.1	27
X	Altimeter, AN5760-2 (C-12 or C-13)	Same as Standard Equipment Weight		
	Rate of Climb, Pioneer C-7	1.4	66.8	94
X	Rate of Climb, ~~AN5825~~ Karnish AC-119	1.4	66.8	94
replaced X	Directional Gyro, AN5735-1A	2.5	66.6	167
replaced X	Artificial Horizon, AN5736-1A	2.7	66.1	179
X	Air Temperature Gauge, Rochester Manufacturing Co., No. 1592-C2	.2	82.6	17
X	Clock, 8 Day - MIL-C-7939	.4	68.3	27
	Directional Gyro, Mitchell #52B15E (Auto Pilot)	4.3	66.6	286
	Artificial Horizon, Mitchell #52B9 (Auto Pilot)	4.5	66.1	298
	Piper Course Selector PAC 31058	3.0	66.6	200
X	Tru-Speed Indicator, PAC 62143	Same as Standard Equipment Weight		

Check if Installed	ITEM	WEIGHT (LBS.)	ARM AFT DATUM	MOMENT
	Radio			
	Piper Radio Compass PRC-3	4.5	64.4	290
	Piper VHF Transceiver PTR-1	5.0	64.8	324
	Piper Omni Convertor O-1	2.5	65.3	163
	King KX150A	9.1	62.8	572
X	Omni Receiving Antenna, Narco VTP-37	1.2	203.0	243
X	VHF Transmitting Antenna, Narco VTP-17	.7	131.0	92
	Low Frequency Antenna	.5	167.0	84
	Loop Antenna (PRC-3)	.3	54.5	16
removed	Narco Mark 12A VHF Transceiver	9.0	59.4	535
	Narco VOA-6 Omni Convertor	1.8	65.3	118
	Narco VOA-5 Omni Convertor	2.9	65.3	189
X removed	Narco VOA-4 Omni Convertor	2.9	65.3	189
	Narco Omnigator VTR-2A Installation (Less Ant.)	14.0	58.0	812
	Marker Antenna	1.2	64.8	78
	Narco Mark III	7.5	63.5	476
	Piper Radio Compass PRC-4	4.9	64.4	316
	Loop Antenna (PRC-4)	.4	112.6	45
	Piper Omni Convertor OL-1	2.8	65.3	183

PREPARED	PIPER AIRCRAFT CORP.	Weight and Balance Data
CHECKED	DEVELOPMENT CENTER, VERO BEACH, FLA.	Model PA 28-140
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Check if Installed	ITEM	WEIGHT (LBS.)	ARM AFT DATUM	MOMENT
	Radio (Cont'd.)			
_____	Narco ADF-31 (Panel Unit)	4.8	64.4	309
_____	Loop Antenna (ADF-31)	2.5	114.9	287
_____	Loop Cable (ADF-31)	2.3	89.0	205
	Miscellaneous			
_____	Fire Extinguisher - Stop Fire #A-20	7.5	93.0	698
X	Nose Wheel Fairing	3.3	34.3	113
X	Main Wheel Fairing's	7.4	109.6	811
_____	Toe Brakes (Dual)	10.5	54.6	574
X	Toe Brakes (Single)	5.0	54.6	273
X	Assist Step	1.8	156.0	281
X	Jump Seat (2)	16.5	118.0	1947
_____	Inertia Safety Belt PAC 65766	2.5	111.6	279
	TOTAL	93.2		9007

AIRCRAFT EMPTY WEIGHT		1182.5	99261
OPTIONAL EQUIPMENT		93	9007
LICENSED EMPTY WEIGHT	TOTAL	1275.5	108268

EMPTY C. G. AFT DATUM IS 84.9

REMOVED ~~X~~ ELT (Narco 7900) 2.5 3875

New Total 1278 108655.5

New Empty C.G. AFT datum is 85.0

WEIGHT & BALANCE

N6358R

2-21-2008

PIPER PA-28-140
SN 28-21529

WEIGHED AIRCRAFT LEVAL WITH FULL FUEL AND OIL.

	WEIGHT	ARM	MOMENT
LEFT MAIN GEAR	563	110	61930
NOSE GEAR	520	35.5	18460
RIGHT MAIN GEAR	572	110	62920
REMOVE 48 GAL USEABLE 6lbs FUEL	-288	95	-27360
NEW EMPTY WEIGHT	1367	84.8	115950

GROSS WEIGHT 2150
NEW EMPTY WEIGHT 1367
NEW USEFUL LOAD 783

NEW E.W.C.G. 84.8

DARYL DASHER 574563202 IA Daryl Dasher

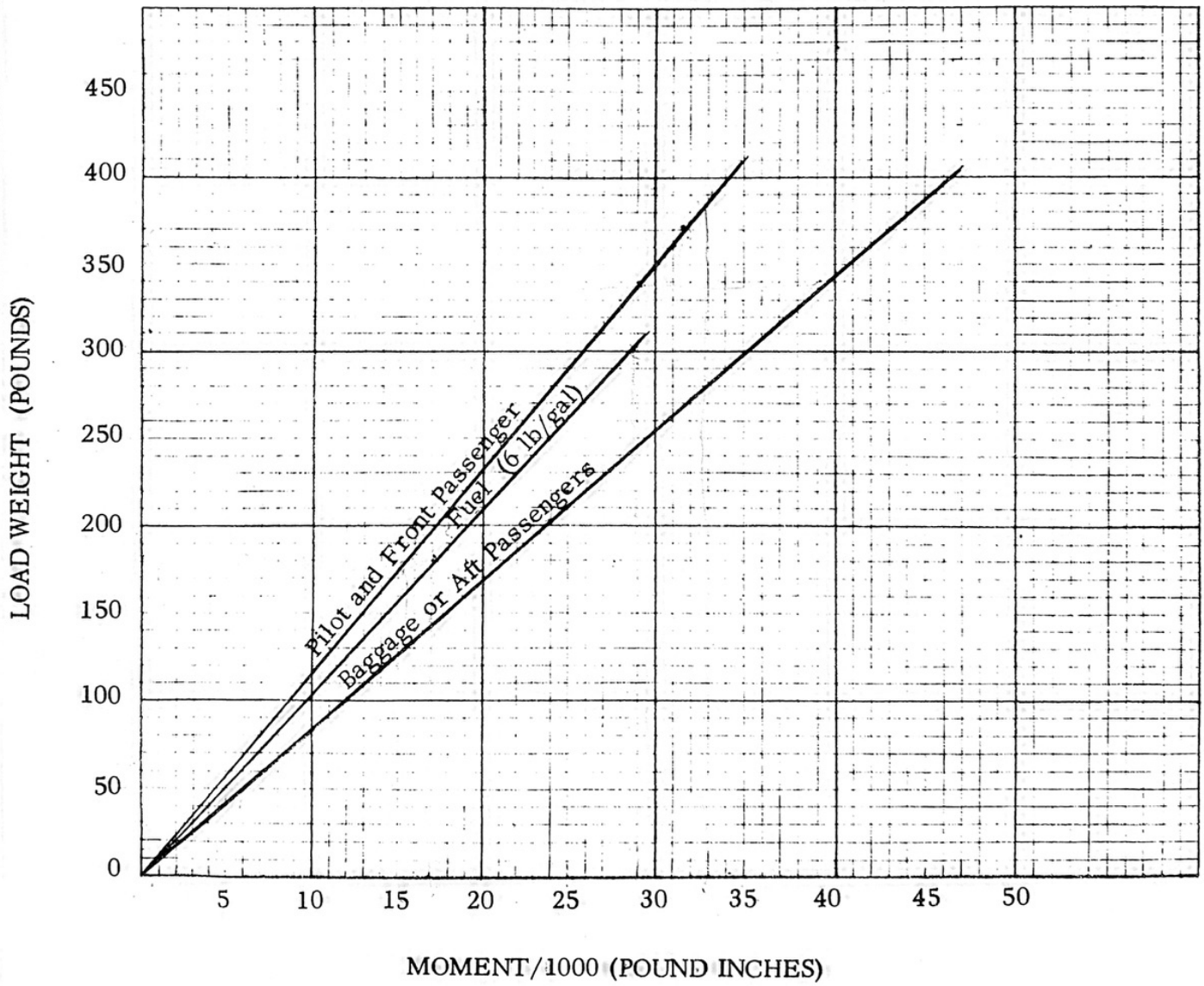
N6358R
22 May 2020; Tach 3937

Old empty Weight and CG

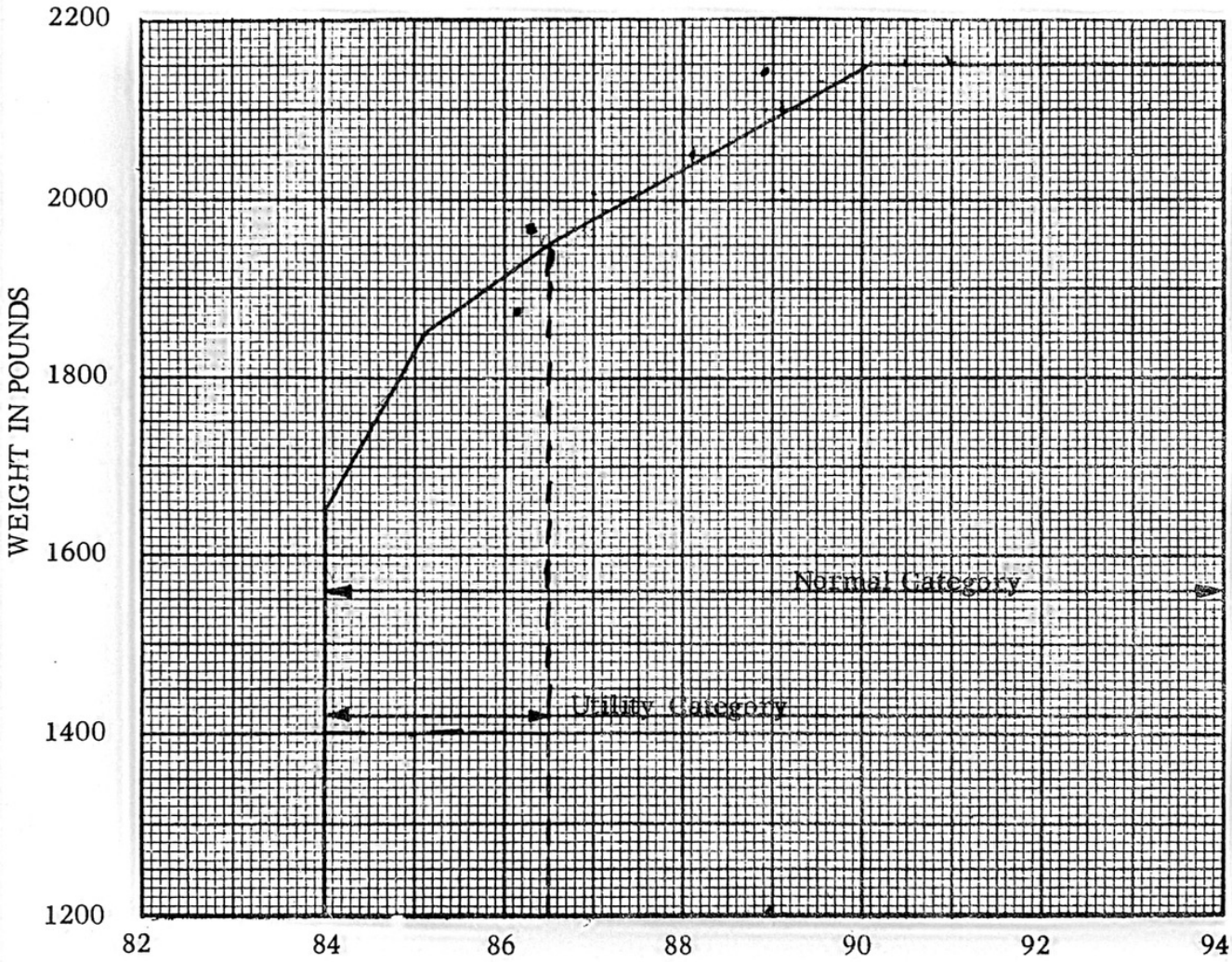
	Empty weight	Arm	Moment
	1367	84.8	115 950
Remove Nose wheel Pant Weight	-3.3	34.3	-113
Remove Main Wheel Pants Weight	-7.4	109.6	-811
New Calculated Empty Weight an CG	1356	84.8	115026

New Useful Load 794

LOADING GRAPH



C. G. RANGE AND WEIGHT



PREPARED	PIPER AIRCRAFT CORP.	Weight and Balance Data
CHECKED	DEVELOPMENT CENTER, VERO BEACH, FLA.	Model PA 28-140
APPROVED		PAGE 8 Section 1

AS OF 5/22/2020

IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT C. G. IS FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-337 WHEN ALTERATIONS HAVE BEEN MADE.

C. G. RANGE AND WEIGHT INSTRUCTIONS

1. Add the weight of all items to be loaded to the licensed empty weight.
2. Use the loading graph to determine the moment of all items to be carried in the airplane.
3. Add the moment of all items to be loaded to the licensed empty weight moment.
4. Divide the total weight moment by the total weight to determine the C. G. location.
5. By using the figures of item 1 and item 4, locate a point on the C.G. range and weight graph. If the point falls within the C.G. envelope, the loading meets all weight and balance requirements.

Note: With Optional Jump Seats installed, aft passenger weight is restricted only by Airplane Weight and Balance limitations (See page 10 of this Section). Baggage capacity is limited to 200 pounds by tiedown requirements.

SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

	WEIGHT (LBS.)	ARM AFT DATUM (INCHES)	MOMENT (POUND-INCHES)
LICENSED EMPTY WEIGHT	1356	84.8	115026
PILOT & PASSENGER	340	85.5	29070
PASSENGERS (AFT) *			
FUEL 29.9 gal	179.5	95.0	17053
BAGGAGE *	30	117.0	3510
	= 1905		164659

TOTAL LOADED AIRPLANE

$$\frac{164659}{1905} = 86.5$$ INCES (ARM AFT DATUM)

LOCATE THIS POINT (86.5) ON THE C. G. RANGE AND WEIGHT GRAPH. SINCE THIS POINT FALLS WITHIN THE C. G. ENVELOPE THE LOADING MEETS ALL WEIGHT AND BALANCE REQUIREMENTS.

* UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED.

IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT C. G. IS FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-337 WHEN ALTERATIONS HAVE BEEN MADE.

C. G. RANGE AND WEIGHT INSTRUCTIONS

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SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

	WEIGHT (LBS.)	ARM AFT DATUM (INCHES)	MOMENT (POUND-INCHES)
LICENSED EMPTY WEIGHT			
PILOT & PASSENGER	340		
PASSENGERS (AFT) *		85.5	29070
FUEL 29.9 gal	179.5		
BAGGAGE *		95.0	17053
		117.0	
TOTAL LOADED AIRPLANE			

_____ = _____ INCES (ARM AFT DATUM)

LOCATE THIS POINT ( ) ON THE C. G. RANGE AND WEIGHT GRAPH. SINCE THIS POINT FALLS WITHIN THE C. G. ENVELOPE THE LOADING MEETS ALL WEIGHT AND BALANCE REQUIREMENTS.

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3. Add the moment of all items to be loaded to the licensed empty weight moment.
4. Divide the total weight moment by the total weight to determine the C. G. location.
5. By using the figures of item 1 and item 4, locate a point on the C.G. range and weight graph. If the point falls within the C.G. envelope, the loading meets all weight and balance requirements.

Note: With Optional Jump Seats installed, aft passenger weight is restricted only by Airplane Weight and Balance limitations (See page 10 of this Section). Baggage capacity is limited to 200 pounds by tiedown requirements.

SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

	WEIGHT (LBS.)	ARM AFT DATUM (INCHES)	MOMENT (POUND-INCHES)
LICENSED EMPTY WEIGHT			
PILOT & PASSENGER	340	85.5	29070
PASSENGERS (AFT) *			
FUEL 29.9 gal	179.5	95.0	17053
BAGGAGE *		117.0	
TOTAL LOADED AIRPLANE	_____		_____

_____ = INCES (ARM AFT DATUM)

LOCATE THIS POINT ( ) ON THE C. G. RANGE AND WEIGHT GRAPH. SINCE THIS POINT FALLS WITHIN THE C. G. ENVELOPE THE LOADING MEETS ALL WEIGHT AND BALANCE REQUIREMENTS.

* UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED.

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C. G. RANGE AND WEIGHT INSTRUCTIONS

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3. Add the moment of all items to be loaded to the licensed empty weight moment.
4. Divide the total weight moment by the total weight to determine the C. G. location.
5. By using the figures of item 1 and item 4, locate a point on the C.G. range and weight graph. If the point falls within the C.G. envelope, the loading meets all weight and balance requirements.

Note: With Optional Jump Seats installed, aft passenger weight is restricted only by Airplane Weight and Balance limitations (See page 10 of this Section). Baggage capacity is limited to 200 pounds by tiedown requirements.

SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

	WEIGHT (LBS.)	ARM AFT DATUM (INCHES)	MOMENT (POUND-INCHES)
LICENSED EMPTY WEIGHT			
PILOT & PASSENGER	340	85.5	29070
PASSENGERS (AFT) *			
FUEL 29.9 gal	179.5	95.0	17053
BAGGAGE *		117.0	
TOTAL LOADED AIRPLANE	_____		_____

_____ = INCES (ARM AFT DATUM)

LOCATE THIS POINT ( ) ON THE C. G. RANGE AND WEIGHT GRAPH. SINCE THIS POINT FALLS WITHIN THE C. G. ENVELOPE THE LOADING MEETS ALL WEIGHT AND BALANCE REQUIREMENTS.

* UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED.

IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY. THE EMPTY WEIGHT C. G. IS FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO FORM FAA-337 WHEN ALTERATIONS HAVE BEEN MADE.

C. G. RANGE AND WEIGHT INSTRUCTIONS

1. Add the weight of all items to be loaded to the licensed empty weight.
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4. Divide the total weight moment by the total weight to determine the C. G. location.
5. By using the figures of item 1 and item 4, locate a point on the C.G. range and weight graph. If the point falls within the C.G. envelope, the loading meets all weight and balance requirements.

Note: With Optional Jump Seats installed, aft passenger weight is restricted only by Airplane Weight and Balance limitations (See page 10 of this Section). Baggage capacity is limited to 200 pounds by tiedown requirements.

SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

	WEIGHT (LBS.)	ARM AFT DATUM (INCHES)	MOMENT (POUND-INCHES)
LICENSED EMPTY WEIGHT			
PILOT & PASSENGER	340	85.5	29070
PASSENGERS (AFT) *			
FUEL 29.9 gal	179.5	95.0	17053
BAGGAGE *		117.0	
TOTAL LOADED AIRPLANE			

_____ = INCES (ARM AFT DATUM)

LOCATE THIS POINT ( ) ON THE C. G. RANGE AND WEIGHT GRAPH. SINCE THIS POINT FALLS WITHIN THE C. G. ENVELOPE THE LOADING MEETS ALL WEIGHT AND BALANCE REQUIREMENTS.

* UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED.

uAvionix Corporation
300 Pine Needle Lane
Bigfork, MT 59911 U.S.A.

FAA-APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

uAvionix tailBeacon

as installed on

Piper PA28-140

Airplane Make and Model per AML

Registration Number: N6358R
Serial Number: 28-21529

This supplement must be attached to the FAA-approved Airplane Flight Manual when the tailBeacon is installed in accordance with Approved Model List Supplemental Type Certificate SA04427CH.

The information contained herein supplements the basic manual only in those areas listed. For limitations, procedures, performance and loading information not contained in this supplement, consult the FAA-approved Airplane Flight Manual, markings, or placards.

FAA Approved By: EDWARD M WARD Digitally signed by EDWARD M WARD Date: 2019.09.12 14:55:12 -05'00' for

Manager, Southwest Flight Test Section, AIR-713
Federal Aviation Administration
Ft. Worth, TX

Date: 9/12/2019

Log of Revisions

Revision No.	Pages Affected	Description	FAA Approved	Date
A	All	Initial release	EDWARD M WARD Digitally signed by EDWARD M WARD Date: 2019.09.12 14:57:11 -05'00'	9/12/2019

Table of Contents

1 GENERAL

1.1 tailBeacon

tailBeacon is a tail mounted unit that contains a 978 MHz transmitter, powerline transponder monitor, GPS/SBAS receiver, and LED rear navigation light. This device transmits ownship Automatic Dependent Surveillance-Broadcast (ADS-B) data through the UAT data link.

tailBeacon performs the following functions:

- Position determination
  - An internal GPS/SBAS receiver allows the unit to function as its own position source.
- Transmission of ADS-B Out data on 978MHz UAT
  - Integration of data from internal and external sources to transmit data in compliance with 14 CFR 91.227.
- Transponder monitoring
  - The integrated Power Transcoder ensures proper synchronization of data elements between Secondary Surveillance Radar (SSR) replies and ADS-B transmissions. These elements include Mode A squawk code, Mode C altitude, and IDENT status. In remote areas where you may not be interrogated by Secondary Surveillance Radar, aircraft Mode A squawk code may be broadcast as unavailable.
- Altitude encoder with Continuous Calibration™
  - The integrated altitude encoder provides pressure altitude information and is continuously adjusted for correspondence with the transponder's altitude encoder.
- "Anonymous" mode
  - "Anonymous" mode transmits a temporary randomized address instead of the aircraft's FAA assigned ICAO address, and "VFR" instead of the aircraft's call sign. When this option is configured during installation, it may be enabled by selecting a squawk code of 1200 on the installed transponder. The temporary address and

Call Sign are disabled if the operator selects a non-1200 squawk code on the transponder.
    - When enabled, and after January 1, 2020, the operator will be unable to operate on an IFR flight plan, unable to receive IFR or VFR separation services, and may experience other effects such as potential loss of enhanced search and rescue benefits.
- Annunciator LED
    - A red annunciator LED is visible beneath the lens cover on the device, indicating the operating status of the tailBeacon. This indicator is not visible in flight and is advisory in nature only.

Red LED	Status	Meaning
On (Steady)	Failed	Internal self-test failure, Invalid ICAO configured
Blinking On/Off (each second)	Failed	No GPS fix, ADS-B broadcast failure
Off	Normal	No Failure **

    - NOTE: ** It is possible that the OFF indication could be a rare failure of the LED annunciator. To confirm proper LED operation, illumination may be observed immediately after navigation lights being powered on.
- White rear position light
    - A TSO-C30c Type III (white) LED position/navigation light replaces or supplements existing lighting.

1.2 Required Equipment

The tailBeacon must have the following system interfaced equipment fully functional to be compliant with the requirements for 14 CFR 91.227 ADS-B Out operations:

Interfaced Equipment	Number Installed	Number Required
Mode A/C or Mode S Transponder	1	1

In remote areas where you may not be interrogated by Secondary Surveillance Radar, aircraft Mode A squawk code may be broadcast as unavailable.

1.3 Capabilities

The tailBeacon as installed on this aircraft has been shown to meet the equipment performance requirements of 14 CFR 91.227, when operating in accordance with this supplement.

2 LIMITATIONS

2.1 Navigation Lights

The navigation lights must remain on at all times that ADS-B Out operation is required. The following placard should be installed:

NAVIGATION LIGHTS MUST REMAIN ON FOR ADS-B OUT

2.2 Maximum ADS-B Operating Altitude

In accordance with 14 CFR 91.225, operation of tailBeacon ADS-B Out UAT on 978 MHz is prohibited at altitudes of 18,000 feet MSL and above.

2.3 Anonymous Mode Operation

Anonymous Mode must not be enabled when tailBeacon is installed on an aircraft with a Mode S transponder. Doing so will present an ICAO code mismatch to ATC.

3 EMERGENCY PROCEDURES

No Change.

4 ABNORMAL PROCEDURES

4.1 ADS-B Transmission Incomplete

When GPS position information is unavailable or the transmitter is experiencing broadcast failures, the annunciator LED will blink. tailBeacon will continue attempting to transmit, but the ADS-B messages will be incomplete and non-compliant.

tailBeacon Location . . . . . **ENSURE CLEAR VIEW OF SKY, NOTE INITIAL FIX COULD TAKE UP TO 20 MINUTES**

4.2 Device Failure

When the device experiences a self-test failure or has not been properly configured, the annunciator LED will be constantly illuminated. Resolving may require a maintenance action, but the pilot may attempt cycling the power once to resolve.

Navigation Lights . . . . . **CYCLE POWER ONCE**

4.3 Loss of Aircraft Electrical Power Generation

In the event of the electrical charging system becoming inoperative, attention must be paid to aircraft battery power. tailBeacon uses minimal electrical power, considerably less than a traditional incandescent navigation light, but the pilot should be familiar with electrical load-shedding methods and equipment requirements for various phases of flight. If an electrical emergency exists, the pilot should consider turning off the tailBeacon to preserve the operation of essential avionics.

Subject to aircraft equipment electrical load-shedding priorities,

Navigation Lights Circuit Breaker Position . . . . . **CONSIDER**

4.4 tailBeacon Unit Disable

The tailBeacon may be disabled by turning off the Navigation Lights. Doing so will disable the aircraft Navigation Lights. 14 CFR 91.209 requires these lights to be lighted on the surface and in flight from sunset to sunrise. Consideration should be given to the consequences of disabling aircraft lighting.

Navigation Lights . . . . . **OFF**

5 NORMAL PROCEDURES

The tailBeacon requires no pilot intervention or direct control for normal operation. The tailBeacon is powered on with the navigation lights and will be fully operational once the configured Mode A/C transponder is set to ALT and a GPS/SBAS position is available.

Primary user interface controls are provided by the aircraft's existing transponder, including selection of Mode A squawk code and IDENT.

Additional configuration and control may be provided through the "uAvionix skyBeacon Installer" app.

5.1 tailBeacon Unit Power On

The tailBeacon should be powered on after starting the engine, and prior to entering an airport movement area. This is typically part of the TAXIING or BEFORE TAKEOFF procedure, or when avionics power is enabled.

Navigation Lights . . . . . **ON**

Transponder . . . . . **ALT, Code set**

NOTE

In addition to in flight use requirements, AIM 4-1-20. a. 3. encourages pilots to operate with the transponder in the altitude reporting mode and ADS-B Out transmissions enabled at all airports, any time the aircraft is positioned on any portion of an airport movement area.

After power on, the tailBeacon Annunciator LED may illuminate momentary as the unit begins to receive input from external systems, including the GPS/SBAS position source.

The configured Mode A/C transponder must be set to ALT and the tailBeacon Annunciator LED must be **EXTINGUISHED** for the system to meet the requirements specified in 14 CFR 91.227. This system must be operational in certain airspaces after January 1, 2020 as specified by 14 CFR 91.225.

5.2 Call Sign

The configured aircraft call sign may be adjusted on the ground using the "uAvionix skyBeacon Installer" app. It may not be adjusted in flight. If an aircraft will use identification other than an N-number for a given flight (as referred to by ATC or in flight plans), the configured call sign must be adjusted. Example applications are commercial, medical, or volunteer flight operations.

Within five minutes of tailBeacon being powered on, connect to the device with the app. Adjust the Call Sign field but not the ICAO Number. When changing the Call Sign ensure no other installation parameters are adjusted. The configured Call Sign persists through power cycles.

If necessary after the flight, cycle power to the device, connect with the app, and adjust the Call Sign field to back to the appropriate (N-number) value.

For more information on using the app, see the "tailBeacon TSO User and Installation Guide".

5.3 tailBeacon Unit Power Off

The tailBeacon should remain powered during flight and when in airport movement areas. The unit should be powered off immediately prior to stopping the engine, or may be powered off upon exiting the airport movement area.

Navigation Lights . . . . . **OFF**

6 PERFORMANCE

No change.

7 WEIGHT AND BALANCE

No change.

8 RELATED DOCUMENTATION

The uAvionix tailBeacon documents, part numbers, and revisions listed below contain additional information regarding tailBeacon system description and function.

Part Number	Revision	Title
UAV-1002185-001	B (or subsequent)	tailBeacon TSO User and Installation Guide
UAV-1002514-001	B (or subsequent)	tailBeacon STC Installation Manual
UAV-1002513-001	A (or subsequent)	tailBeacon STC Instructions for Continued Airworthiness and Maintenance Manual

UNITED STATES OF AMERICA — FEDERAL AVIATION AGENCY

STANDARD AIRWORTHINESS CERTIFICATE

1. NATIONALITY AND REGISTRATION MARKS	2. MANUFACTURER AND MODEL	3. AIRCRAFT SERIAL NUMBER	4. CATEGORY
N6358R	Piper PA 28-140	28-21529	Normal or Utility

5. AUTHORITY AND BASIS FOR ISSUANCE

This airworthiness certificate is issued pursuant to the Federal Aviation Act of 1958 and certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to conform to the type certificate therefor, to be in condition for safe operation, and has been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein.

Exceptions:

6. TERMS AND CONDITIONS

Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator, this airworthiness certificate is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with Parts 21, 43, and 91 of the Federal Aviation Regulations, as appropriate, and the aircraft is registered in the United States.

DATE OF ISSUANCE	FAA REPRESENTATIVE	DESIGNATION NUMBER
3-16-66	Ronald Pitcher	DMIR-2049

Any alteration, reproduction, or misuse of this certificate may be punishable by a fine not exceeding $1,000, or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

FAA Form 1362 (7-65) 0052-040-8000 (8100)