CHAPTER ONE

DESIGN FEATURES

I. SPECIFICATIONS OF FAMILY CRUISER

Engine	Lycoming 0-235-Cl
HP and RPM	Take-off 115 at 2800 RPM
	Continuous operation 108 at 2600 RPM
Gross Weight	Normal category 1850 LBS
	Utility category 1550 LBS
Empty Weight (See Weight and Balance Report)	1020 LBS
Wing Span	35′5.5
Wing Area (sq. ft.)	179.3
Wing Chord	63″
Overall Length	23.25′
Overall Height	77″
Propeller Diameter	74″
Power Loading (lbs/hp)	17.1
Wing Loading (lbs/sq. ft.)	10.3

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Baggage Capacity	80 LBS
Top Speed (mph)	123
Cruising Speed (mph)	110
Stalling Speed (mph) — Flaps Down	46
Take-Off Run	720′
Landing Roll	470′
Best Rate of Climb Speed (mph)	73
Rate of Climb (ft/min)	600′
Cruising Range (miles)	500
Service Ceiling	12,500
Absolute Ceiling	14,500
Fuel Consumption (full rich)	7 GPH
(lean)	6.2 GPH
Fuel Capacity	35 GAL
Tire Pressure (lb/sq. in.)	22

NOTE: Performance figures are for airplane fully loaded at sea-level and at standard air temperatures. Specifications and data subject to change at manufacturer's option. The PA-14 must be operated in accordance with CAA Approved Airplane Flight Manual. If there is any information in this manual which contradicts the Airplane Flight Manual it is to be disregarded.

loading, intended to be used during training operations, includes two occupants on the front seat, parachutes, and fuel.

The empty weight of a standard PA-14 is about 1020 pounds. The useful load that can be carried in the normal category is therefore about 830 pounds. This weight can be distributed among fuel, passengers, and baggage in any desired way so long as the center of gravity limitations are not exceeded. Typical loadings are as follows:

(1) 2 Passengers averaging 170 lbs.	340 lbs.
Full fuel (35 gals.) plus 6 qts. oil	222
Baggage and cargo in baggage compartment and rear seat, up to	268
	830 lbs.
(2) 3 Passengers averaging 170 lbs.	510 lbs.
Full fuel and oil	222
Baggage and cargo	98
	830 lbs.
(3) 4 Passengers averaging 150 lbs.	600 lbs.
Full fuel and oil	222
Baggage	8
	830 lbs.

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(4)	4 Passengers averaging 170 lbs.	680 lbs.
	23 gallons gas (3.3 hours) plus oil	150
		830 lbs.
(5)	4 Passengers averaging 170 lbs.	680 lbs.
	18 gallons gas (2.6 hours) plus oil	120
	Baggage	30
		830 lbs.
(6)	4, 5 or 6 Passengers totaling	550 lbs.
	Full fuel and oil	222
	Baggage	58
		830 lbs.

The actual empty weight of each airplane can be found in the Weight and Balance Form supplied with the plane. All extra equipment of any significant weight must be listed on the Weight and Balance Form, and its weight should be considered in determining the loading of the airplane. Refer to the Airplane Flight Manual and to the Weight and Balance Sheet for further information.

When the engine has not been run for several days or is very cold, it is advisable to pull the engine through by hand six or eight times with the ignition switch off and throttle cracked before using the starter.

II. WARM-UP

The engine should be warmed up at 800 to 1000 RPM — Ground running should not exceed 2 minutes in warm weather, 4 minutes in cold weather. Magnetos should be checked at 1800 RPM, the drop not to exceed 100 RPM. The engine is warm enough for take-off when the throttle can be opened without backfiring or skipping of the engine.

Carburetor heat should be checked during the warm-up to clear out the engine if any ice has formed and to make sure the heat control operation is satisfactory. It should also be checked in flight occasionally when outside air temperatures are between 20° and 70° F. to see if icing is occurring in the carburetor. Any time the engine loses speed without apparent cause, the use of carburetor heat will probably correct the condition.

III. TAKE-OFF, CLIMB, AND STALLS

The stabilizer adjustment should be set approximately at the neutral position for take-off, depending on loading of the aircraft. Fuel selector should be on left tank, flaps down one-third or two-thirds if desired. After climbing airspeed has been reached, flaps should be retracted to achieve maximum rate of climb. The best rate of climb speed is 73 MPH.

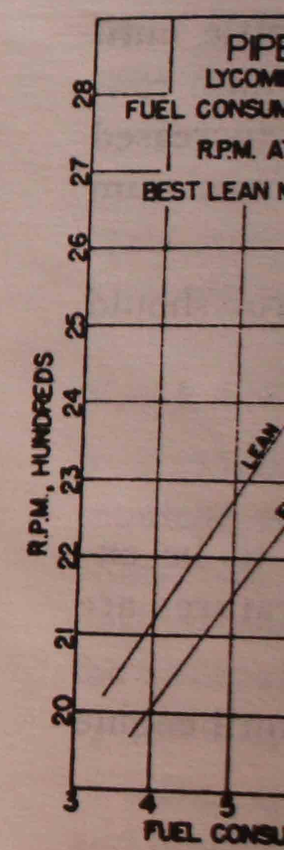
In climbing to high altitudes on cross-country flights the climbing airspeed should be increased to about 90 MPH because while there is not a very considerable decrease in rate of climb at this speed, appreciably more forward distance can be covered.

The gross weight power-off stalling speed is 46 MPH at sea level under normal conditions, flaps fully down. With the flaps up the stalling speed increases about 5 MPH.

IV. CRUISING

The cruising speed of the Family Cruiser is 110 MPH at sea level, gross load, under normal conditions, and at 75% of rated continuous power (108 HP). Cruising airspeed and engine RPM will depend on the propeller installed on the airplane. The following method can be used to determine proper cruising RPM for 75% of power at low altitudes:

1. Fly the aircraft as near sea-level as practicable at full throttle, until maximum speed is reached. Note RPM at top speed, level flight.

2. Reduce the maximum RPM by 10% and cruise at 90% of full RPM.

The average fixed pitch propeller will turn about 2700 RPM at full throttle, level flight. Ninety percent of 2700 is 2430, The figure at which the average propeller should be cruised. The correct cruising RPM will produce a cruising airspeed of about 110 MPH, and a fuel consumption of approximately 7 gallons per hour at full rich mixture or 6.2 gallons with a leaned out mixture.