

Weighing and Calculating your KR Weight and Balance

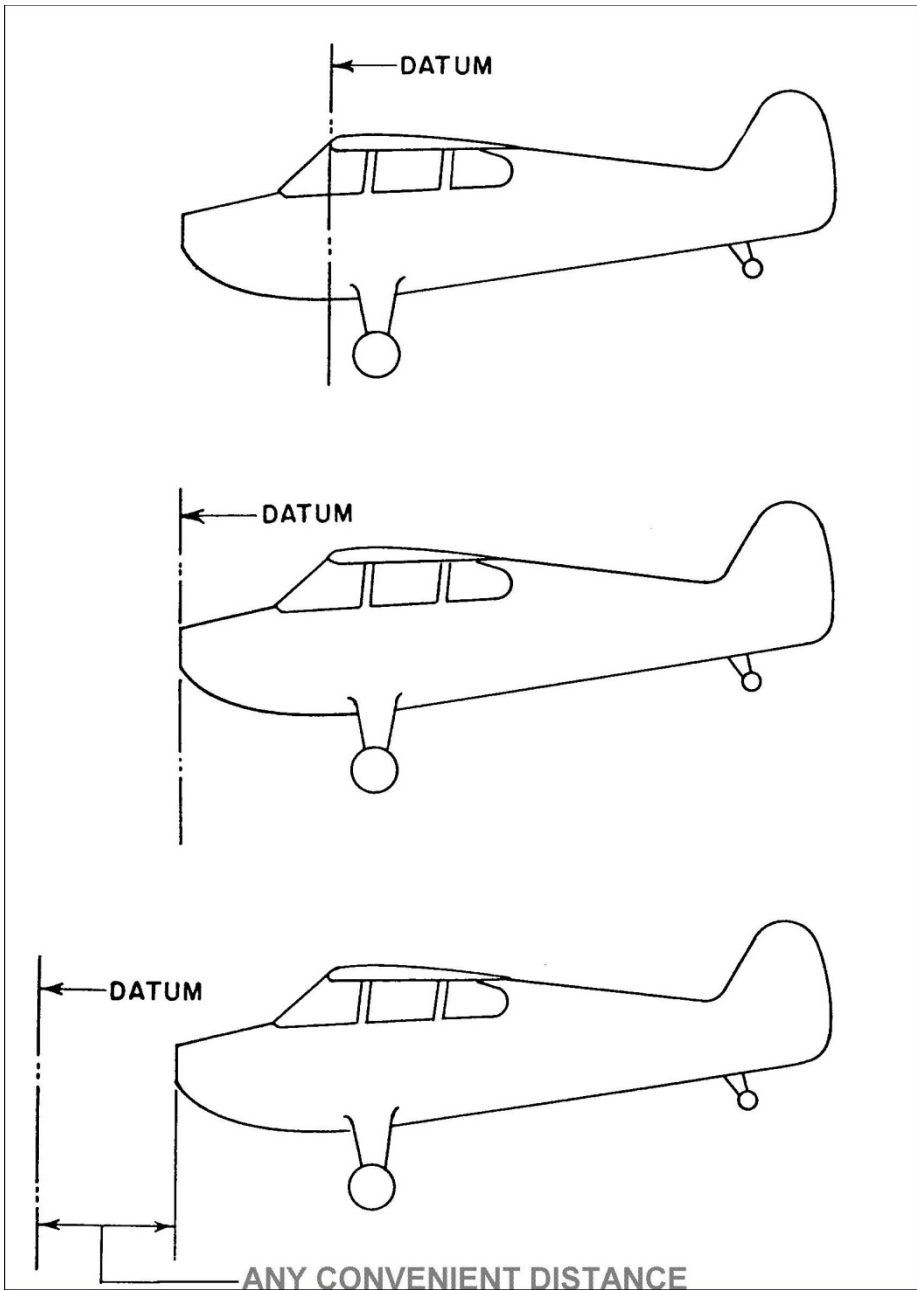
Jeff Scott

Tools?

- Flat floor space out of the breeze.
- Marker.
- Masking tape to mark on.
- Tape measure.
- Plumb bob.
- Level or Inclinometer.
- Chalk line might be helpful.
- Scales.

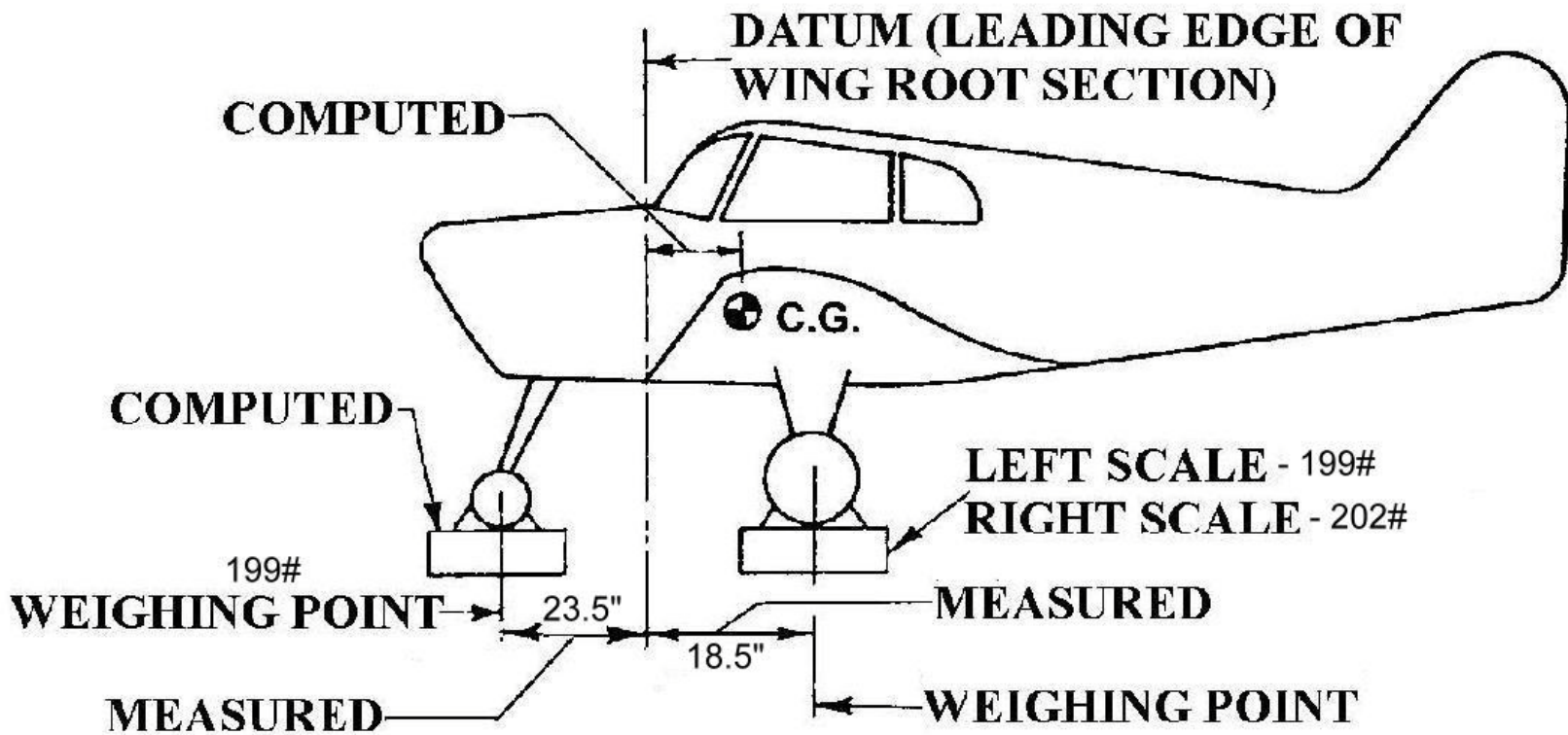
AC43-13-1B Weighing Procedures.

- a. Remove excessive dirt, grease, moisture, etc., from the aircraft before weighing. Vacuum inside of fuselage!
- b. Weigh the aircraft inside a closed building to prevent error in scale reading due to wind.
- c. Place the aircraft in a level flight attitude. What is level on a KR?
- d. Have all items of equipment that are included in the empty weight report installed in the aircraft when weighing. These items are a part of the current weight and balance report.
- e. The scales should have a current calibration before weighing begins.
- f. Drain the fuel system until the tanks are empty with the aircraft in the level flight attitude. The amount of fuel remaining in the tank, lines and engine is termed residual fuel and is to be included in the empty weight.
- g. Oil system should be filled to capacity. CAR-3 Aircraft had the weight of the oil subtracted for empty weight. In 14CFR, Part 23 aircraft, the weight of the oil is included in the empty weight. Which applies to your KR? W&B report should indicate whether weights include full oil or oil drained.



Where should the datum be located?
Why?

FIGURE 10-1. Typical datum locations.



Minimum Fuel Considerations.

Level Aircraft – Level at top Longeron along top of cockpit rail will suffice.

Measure distance from Nose Wheel to DATUM (LE of Wing).

Measure distance from Main Wheels to DATUM (LE of Wing).

Record Weight at each wheel.

All distances forward of the Datum are negative numbers.

All distances aft of the Datum are positive numbers.

Allowable CG for this aircraft will be 8 – 14 inches Aft of the Datum as loaded for flight.

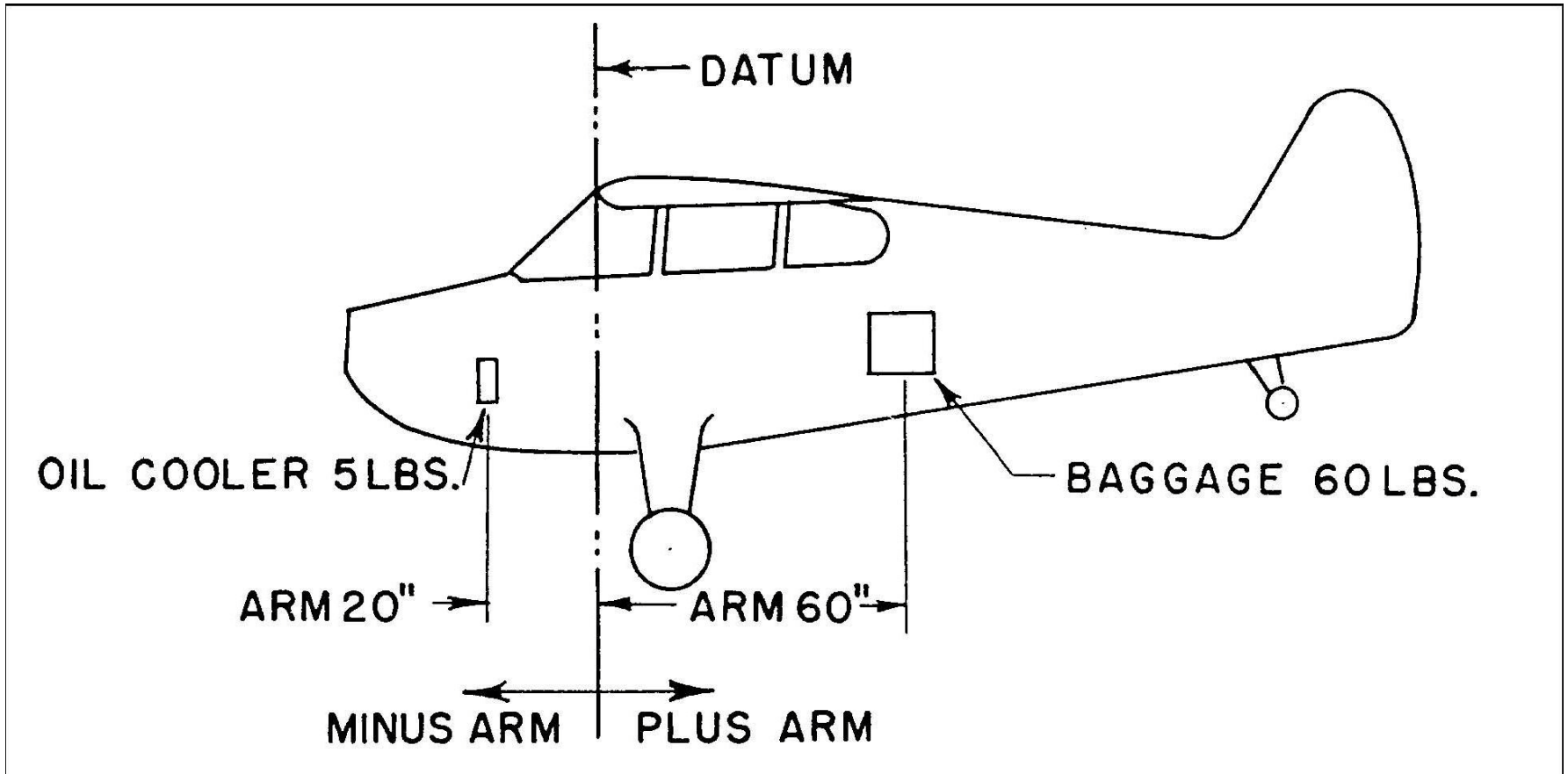
WEIGHT AND BALANCE DATASHEET FOR KR-2S TEST PLATFORM

Owner / Builder					

DATUM REFERENCE POINT IS LEADING EDGE OF THE WING

Weight at	WEIGHT (lb)	MOMENT ARM (in)	MOMENT WT. (in/lb)	
LEFT WHEEL	199	18.50	3681.50	
RIGHT WHEEL	202	18.50	3737.00	
NOSE WHEEL	199	-23.50	-4676.50	
	_____		_____	
EMPTY WEIGHT	600		2742.00	
EMPTY CG		4.57	CG (inches aft of datum)	
Allowable CG Range	8 - 14"			

Additional Loads



Additional Loading considerations

Oil???	16"
Wing Tanks	18"
Header Tank	9"
Pilot	30"
Passenger	30"
Luggage	42"

DATUM REFERENCE POINT IS LEADING EDGE OF THE WING					
Weight at	WEIGHT (lb)	MOMENT ARM (in)		MOMENT WT. (in/lb)	
LEFT WHEEL	199	18.5		3681.50	
RIGHT WHEEL	202	18.5		3737.00	
NOSE WHEEL	199	-23.50		-4676.50	
EMPTY WEIGHT	600			2742.00	
		4.57 CG (inches aft of datum)			
AIRCRAFT LOADING					
Fuel=6#/gal Oil=1.875#/qt					
	WEIGHT (lb)	VOLUMES	MOMENT ARM (in)		LOAD MOMENT. (in*lb)
LEFT WING LEADING EDGE (Datum)	0		0.00		0.00
MAIN SPAR (front for ref)	0		8		0.00
MAIN GEAR Empty(@axles)	401.00		18		7218.00
NOSEWHEEL (from Empty Weight	199.00		-23.50		-4676.50
FUEL (header 10 gal)	60.00	10	-9		-540.00
RIGHT FUEL (10 gal)	60.00	10	18		1080.00
LEFT FUEL (10 gal)	60.00	10	18		1080.00
PILOT	170		30		5100.00
PASSENGER			30		0.00
LUGGAGE	25		42		1050.00
GROSS WEIGHT	975.00				10311.50

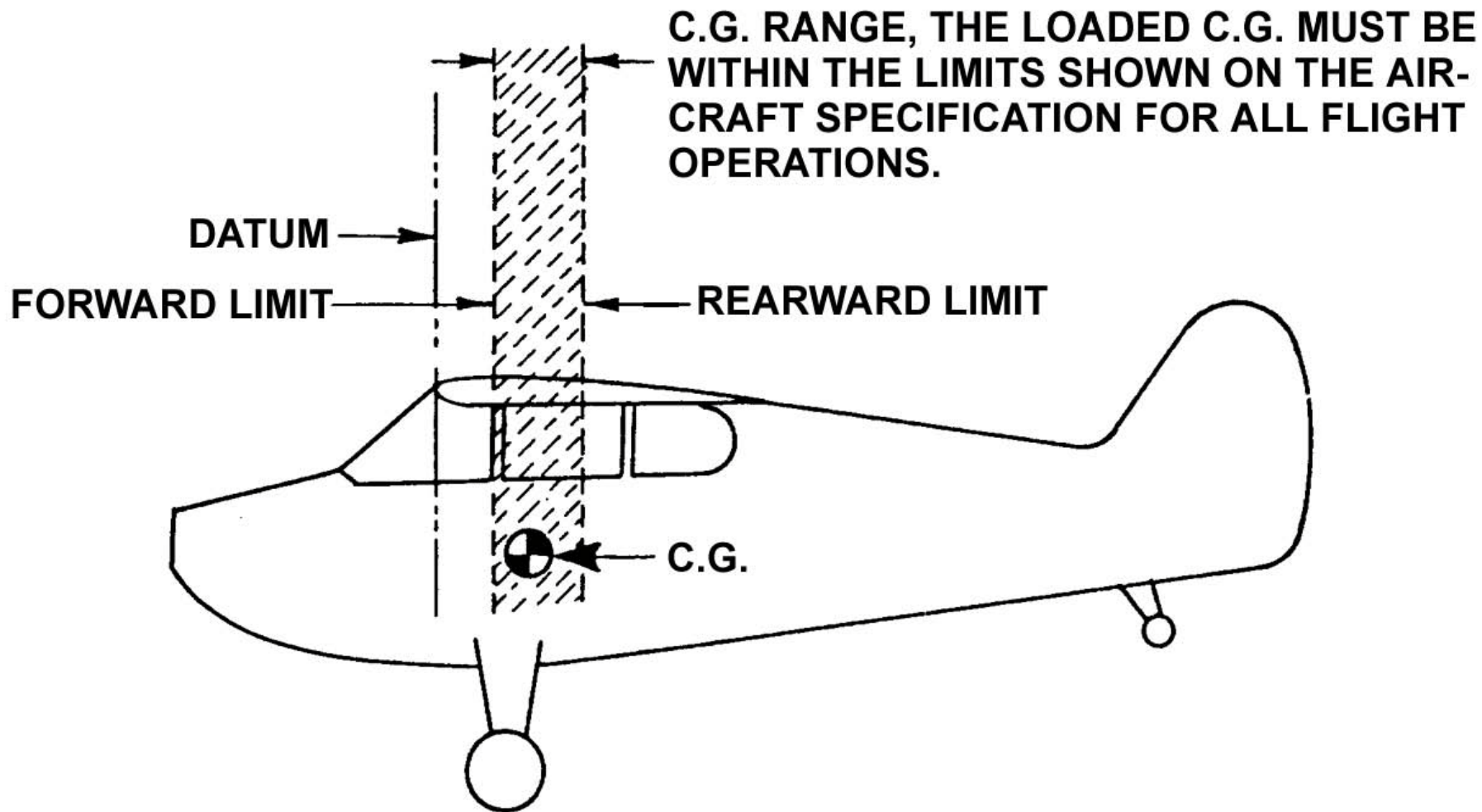
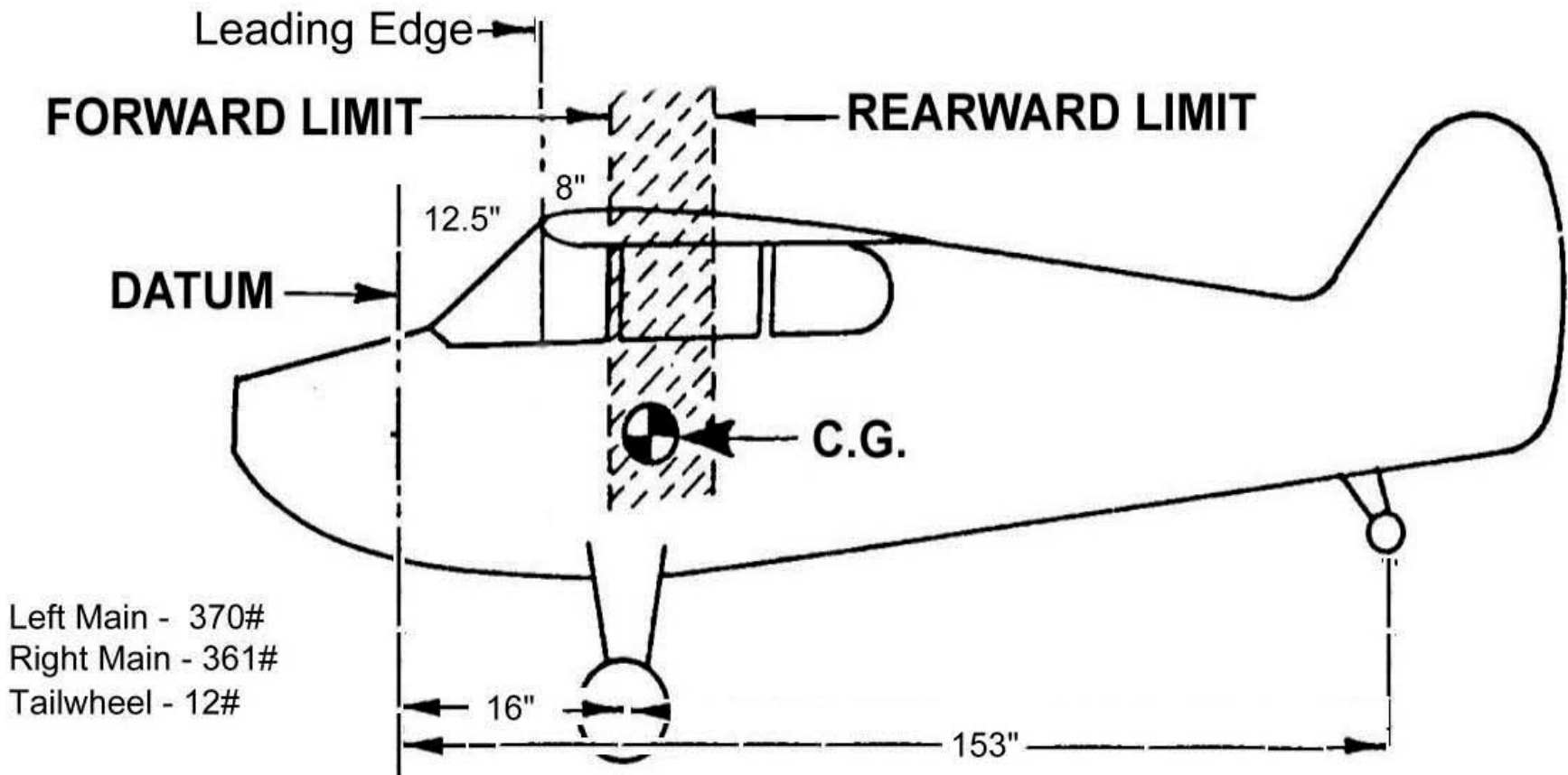


FIGURE 10-7. Operating center of gravity range.

Tailwheel Aircraft Exercise



DATUM REFERENCE POINT IS FRONT BOTTOM OF FIREWALL					
Weight at	WEIGHT (lb)	MOMENT ARM (in)	MOMENT WT. (in/lb)		
LEFT WHEEL	370	16	5920.00		
RIGHT WHEEL	361	16	5776.00		
TAIL WHEEL	12	153.00	1836.00		
EMPTY WEIGHT	743		13532.00		
		18.21	CG (inches aft of datum)		

Additional Loading considerations

Wing Tanks	8"
Header Tank	30"
Pilot	42"
Passenger	42"
Luggage	55"

AIRCRAFT LOADING						
Fuel=6#/gal Oil=1.875#/qt						
	WEIGHT (VOLUME	MOMENT ARM (in)	LOAD MOMENT. (in*lb)		
TAILWHEEL (Empty @axle)	12.00		153.00		1836.00	
LEFT WING LEADING EDGE	0		12.50		0.00	
MAIN SPAR (front for ref)	0		24		0.00	
MAIN GEAR Empty(@axles)	731.00		16		11696.00	
FUEL (header 9.0 gal)	0.00	0	8		0.00	
RIGHT FUEL (7.0 gal)	0.00	0	30		0.00	
LEFT FUEL (7.0 gal)	0.00	0	30		0.00	
PILOT	0		42		0.00	
PASSENGER	0		42		0.00	
LUGGAGE	0		55		0.00	
GROSS WEIGHT	731.00				13532.00	
C. G. Inches from DATUM	18.51					
C. G. Range	20.5 - 28.5					

AIRCRAFT LOADING						
Fuel=6#/gal Oil=1.875#/qt						
	WEIGHT (lb)	VOLUMES	MOMENT ARM (in)	LOAD MOMENT. (in*lb)		
TAILWHEEL (Empty @axle)	12.00		153.00	1836.00		
LEFT WING LEADING EDGE	0		12.50	0.00		
MAIN GEAR Empty(@axles)	731.00		16	11696.00		
FUEL (header 9.0 gal)	54.00	9	8	432.00		
RIGHT FUEL (7.0 gal)	42.00	7	30	1260.00		
LEFT FUEL (7.0 gal)	42.00	7	30	1260.00		
PILOT	150		42	6300.00		
PASSENGER	150		42	6300.00		
LUGGAGE	20		55	1100.00		
GROSS WEIGHT	1189.00			30184.00		
C. G. Inches from DATUM	25.39					
C. G. Range	20.5 - 28.5					

END

Thank you.

-Jeff