We welcome two new linemen this week, Mr. James Harvey Mounce and Mr. Orville Gray Burton.

Our janitor, Arthur Chandler, has returned from Washington. He reports that his daughter was seriously hurt, but she is getting along fairly well now.

***************

## WEIGHT AND BALANCE

By F. H. Ponish

You know now how to find the center of gravity location measured from the front wheel axle. The engineer designing the airplane makes use of a reference line on his drawings to locate all parts of the structure in the proper place. Such a reference line is called DATUM LINE. In all Weight and Balance reports made for the CAA all arms have to be given with reference to the datum line.

Let us suppose that the distance of the center of gravity location of a certain airplane is 15" from the front wheel axle. By consulting the Form 309 or the pertinent aircraft specifications, the arm of the front wheel axle may be found. All arms from the datum to the tailwheel are considered positive and from the datum to the propeller, all arms are considered negative. If you find the front wheel listed as having an arm of ∕ 2, the center of gravity location measured from the datum would be 15 ∕ 2 or 17" in the above case. If the arm were listed as -2, the center of gravity location from the datum would be 15 - 2 or 13".

To make use of what we know so far, let us work the following actual problem, A J3C-65 was weighed and the following data had been obtained: Net weight of left front wheel 315 lbs., net weight of right front wheel 318 lbs., net tailwheel weight 54 lbs., distance between front wheel axle and tailwheel axle 200". Arm of front wheel ∕ 3.

In working all problems from now on, use the following abbreviations:

Left Front Wheel.....LW
Right Front Wheel.....RW
Tailwheel.....TW
Aircraft Empty Weight.....AEW
Center of Gravity.....CG

| | |
|---|---|
| LW | 315 lbs. |
| RW | 318 |
| TW | 54 |
| AEW | 687 lbs. |

$\frac{54 \times 200}{687} = 15.72$

The CG location from the front wheel axle is 15.72.

The CG location from datum is 15.72 ∕ 3 or 18.72

PROBLEMS:

Find empty CG in all of the following problems.

1. LW, 315 lbs.; RW, 323 lbs.; TW 56 lbs. Distance between front wheel and tailwheel axle 201". Arm of Front Wheel ∕ 3. Answer 19.22

2. LW, 1376 lbs.; RW 1393 lbs.; TW 181 lbs. Distance between front wheel and tailwheel axle 195". Arm of front wheel -2. Answer 9.96

3. LW, 331 lbs.; RW, 336 lbs.; TW 59 lbs. Distance between front wheel and tailwheel axle 201". Arm of front wheel ∕ 3. Answer 19.33

***************

## AVIATION VOCABULARY

FIN- a fixed or adjustable airfoil, attached to an aircraft approximately parallel to the plane of symmetry, to afford directional stability.

AILERON- a hinged or movable portion of an airplane wing, the primary function of which is to impress a rolling motion on the airplane. Ailerons produc roll about the longitudinal axis.

WASHER- a ring of metal, leather, or other material used for various purpos as around a bolt or screw to form a se for the head or nut.

PYRALIN- A trade name for plastic win shield and window material used on airplanes. It is usually made of either nitro-cellulose or cellulose acetate.

NEW WORDS: Dihedral, Cathedral, Angel of Incidence, PCIM