Cruise-Control for Airplanes©
Learning to trim for level flight requires that you think in terms of
setting as many constants as possible for a given flight situation.
First, get a constant level attitude. Using the nose/horizon reference
is more difficult than using the wing. The wing level with the horizon
works best with the high-wing types. Second, get a constant speed at
cruise speed or lower. If you exceed cruise speed without reducing power
your trim setting will set for the higher speed. You should practice
reducing power to 75% power setting as cruise. 2450 rpm is a good set.
Third, trim off the pressure.

Is their only one way to trim? No. With experience you may just give a
few flips and make a fine adjustment as needed.   You can even make
numerous small changes. Doing it differently does not make it wrong.
There is no one way to do anything in flying. Different aircraft and
different trim systems require different techniques. The aim of my
following suggestions is that it gets the beginner into anticipating
trim movements as may be required for every change of configuration.
Trim then becomes another constant.

Trimming off pressure is a search for the trim position that allows the
aircraft to be flown with only one finger and the thumb. Which ever one
you are using to hold altitude tells you which way to move the trim.
Most students tend to move the trim more than required. You might do
well as a student to use half as much movement as you think is required.
You are trimmed when both finger and thumb need only to lightly brush
the yoke. Getting trimmed to this point makes flying enjoyable and
relaxing. Unlike an automobile, a correctly trimmed airplane can be
flown hands-off. Once this sense of 'feel' is acquired you will not
want to fly any other way. Every pilot has a slightly different 'feel'
of an aircraft so changing pilots usually involves changing trim.

Every student and pilot should use trim to create times to fly with just
rudder. Training aircraft usually have a rudder tab that has been set
by prior pilots so that very little rudder is required in straight-and-
level cruise. You can make slight turns using just the rudder with
little difficulty. Steeper turns with the rudder will cause a loss of
altitude. Much of this altitude is regained when using hard rudder to
level the wings. Practice flying with just the rudder when copying the
ATIS, using the sectional, or just for fun.

Once an aircraft is trimmed for a particular airspeed in level flight,
additional power or a reduction in power will cause the aircraft to
climb and descend at that airspeed. You must exercise some yoke control
and rudder to correct for any transitional oscillations. Trim remains
the same. Trim is the cruise control of flying an aircraft. I very
much recommend not changing trim when descending from cruise to pattern
altitude. Descend by reducing power. Enter downwind at cruise speed
until abeam the numbers. The deceleration in airspeed while holding
altitude on downwind will allow you to trim for the approach speed while
reaching the appropriate 'key' position for turning base.

Cessna has engineered its trim so that certain changes in trim can be
anticipated to correspond to flight path changes in different models.
For example, in the C-150 from level cruise abeam the numbers, a power
reduction to 1500 can be trimmed off by holding heading and altitude to
60 knots. It will take three full top-button to the full travel bottom
to do this. Pinching between the buttons will leave you short. 10
degrees of flaps while holding sixty with the yoke can be re-trimmed to

a 60 knot descent by undoing one of the previous three turns. Bottom button all the way to the top. Let go and if the nose begins to change pitch make the slight trim adjustment required. 10 more degrees of flap while holding 60 knots can be locked there by taking off another full turn of trim. Full flaps while holding sixty can be set by taking off the last turn. You, every student and pilot, should learn a count or feel system for applying and removing flaps. Learn to use the flaps without looking at the indicator during application. A four count works well for 10 degrees on a Cessna.

Removal of the flaps during the go-around finds you trimmed for level cruise. One full trim down will give Vy climb at 65 knots. This same procedure can illustrate why, when making a short approach, reduction of power to 1500 and application of full flaps at the white arc will give you a hands-off approach speed of 60 knots.

The same process works with the C-172 except you use 70 knots for downwind and final adding two ten-degree notches of flaps while taking off two full turns of trim. On final you put in full flaps and no trim change. You are on a stabilized approach hands-off at 60 knots. For the go-around, on bringing up the flaps you will be trimmed for a 75 knot climb. The hard part of flying the C-172 is leveling off. The old joke about how long does it take a student to level off a C-172 is answered with, "Thirty-five hours". It will take about one and one-third turns of trim and a close eye on the altitude while the plane accelerates. The trick is to reduce to 2450 as soon as you reach 100 knots. Otherwise, you will be jockeying airspeed and trim for quite a while. The cause of this problem is that the C-172 has less power for its weight than the C-150. The time to accelerate to 100 knots seems to take forever. Initially you will be holding back pressure and then forward pressure on the yoke while the airspeed gets sorted out. Due to deceleration the C-172 power should only be reduced to 1700. At approach speed the power will have dropped to 1500 rpm.

Cessna ruined a terrific engineering design when they build the C-152. The trim/flap ratios of the C-152 are there but not at 1 to 1. You can develop the procedure for stabilized airspeeds by using the suggested procedure of the C-150 and keeping track of the amount of trim required for each ten degrees of flap. It can be done but the neat engineering isn't there. Abeam the numbers the C-152's power should be set at 1600. By the 'key' position it will be at 1500.