UNUSUAL ATTITUDE RECOVERY
OR
HOW TO FLY AWAY FROM AN "UPSET"
SAFELY WITHOUT DAMAGING THE AIRPLANE

"Unusual Attitude" has many descriptions as a quick internet search will show. For the purposes of this paper, an Unusual Attitude will be considered to be any aircraft attitude that results in discomfort to the pilot or is on the verge of, or has resulted in the loss of control of the aircraft. The causes of Unusual Attitudes are many including, but not limited to, wake turbulence encounter, clear air turbulence, malfunctioning autopilot, or simple loss of control due to inattention by the pilot.

Recovery from an Unusual Attitude could be as simple as rolling the wings level or raising or lowering the nose to return to stabilized flight.

The descriptions of recovery techniques in this paper will assume that the Unusual Attitude has progressed to an "extremely" nose high or nose low condition which may or may not have a bank associated.

When recovering from an Unusual Attitude there are three main considerations:

1. **A**ltitude; Minimizing altitude loss or gain should be a consideration.

2. **S**peed; Controlling the airspeed to keep from stalling the aircraft or exceeding the maximum allowable airspeed.

3. **S**tress on the airframe; The goal should be to avoid exceeding the airframe limit of positive G's and to avoid altogether negative G's.
   Generally speaking, the load limits for normal category aircraft are 3.8 positive and 1.5 negative.

For the purposes of this paper, Unusual Attitudes will be put into 2 main categories; Nose High and Nose Low. The recovery techniques for both these categories can be broken down to 3 steps; the following procedure assumes that the elevator control is in the neutral position, not forward or aft:

1. Power; Move the power lever as appropriate.

2. Rudder; Forcefully push on the appropriate rudder

3. Roll; Use the aileron control to roll the aircraft in the direction desired.

Nose High Attitude:

A nose high attitude has some special considerations. The natural instinct is to push the nose down to recover. This can have serious consequences both to the airframe and passengers. Pushing the nose down to recover from a nose high attitude can and most probably will exceed the negative G limit of the airframe resulting in damage to or failure of the airframe. It also has the high possibility of injuring passengers whose seat belts are not securely fastened. With the elevator control neutral, the quickest way to get the nose down is to unload the wing by rolling the aircraft into a 90 degree bank while forcefully applying rudder pressure in the direction of the roll. The nose will fall toward the horizon with no G forces present. As the nose approaches level flight, roll back upright and fly out of the slow flight regime without further altitude loss.

The proper recovery technique with elevator control neutral is as follows:

1. **P**ower; Apply full power to minimize airspeed loss.
2. **R**udder; Apply forceful pressure to the rudder toward the nearest horizon.
3. **R**oll; Roll rapidly toward the nearest horizon. (If the wings are level pick a direction.) and don't stop rolling until you have a 90 degree bank or the nose approaches the horizon.

OK, let's go over this one more time. When you recognize that you are in an extremely nose high attitude, neutralize the elevator, apply full power, apply forceful rudder pressure toward the nearest horizon, roll into a 90 degree bank toward the nearest horizon. As the nose approaches level flight, roll wings level and fly out of the resultant slow flight regime without further altitude loss.

This recovery will only take a few seconds and with a little practice will seem routine as there are no unusual forces at work during the process.

Nose Low Attitude:

The nose low attitude recovery is a little more problematic. Most modern aircraft will build airspeed extremely rapidly when the nose is well below the horizon. With this in mind, the recovery must be started as quickly as possible to avoid exceeding the maximum allowable airspeed.

If the nose low attitude is accompanied by a bank you must roll the wings level before initiating a pull up. A rolling pull up can exceed airframe G limits quickly and also will result in taking a longer time to get the nose up as you are pulling the nose sideways instead of straight up. Generally, the pull up should not exceed 3 G's in order to maintain a safety margin below the maximum allowable airframe limit.

The Recovery:

1. **P**ower; Move the throttle to idle to minimize airspeed gain.

2. **R**udder; Apply forceful pressure to the rudder toward the nearest sky.

3. **R**oll; Rapidly roll the wings level toward the nearest sky. (If the aircraft has not reached the fully inverted mode, reverse the roll and roll back in the direction toward the nearest sky, if the aircraft has passed the fully inverted mode, apply the aileron control to continue the roll toward the nearest sky.)

Once the wings are level, and not before, initiate a 3 G pullout until the aircraft is in a climb attitude and as the airspeed returns back toward the normal climb speed add climb power and recover the lost altitude.

OK, let's go over this one more time. When you recognize that you are in an extreme nose low attitude move the elevator control to neutral, reduce the power to idle, apply forceful rudder pressure toward the nearest sky, and roll the wings level rolling towards the nearest sky. Then when the wings are level initiate a 3 G pullout right up into a climb attitude. As the airspeed returns back toward normal climb speed add climb power and recover the lost altitude.

It may seem like it takes forever to raise the nose while you are screaming toward the red line on the airspeed indicator, but if you have the altitude, you should not exceed 3 G's in the pull out, if however, you are nearing the ground you must do what must be done to stop the descent. If it results in damage to the airframe, so be it.

The above techniques are counter intuitive and may sound complicated while reading them, but they are really simple if you practice them. Practice will also allow you to "feel" what 3 G's feels like. Please don't try to practice them in a normal category aircraft. Find an instructor with an aerobatic aircraft and practice under proper supervision in a properly rated aircraft. It may just save your life someday.