

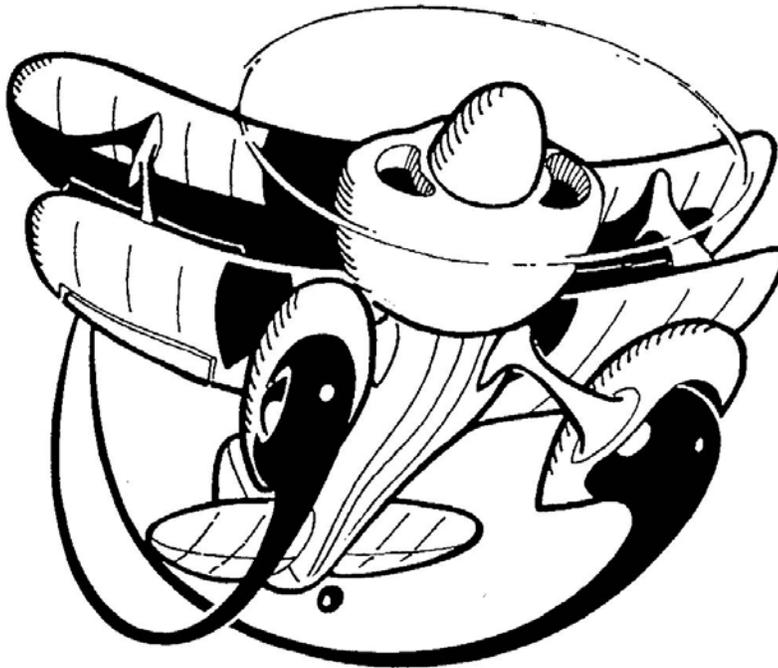


Newsletter for the Sentral Illinois Radio Society, Bloomington, IL

A.M.A. Chapter 621

January-February, 2005

# Happy New Year



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The *SIRS Newsletter* is published monthly as a membership service of the

**Central Illinois Radio Society, Inc.  
RR3  
Bloomington, IL 61704**

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**Club Meetings**

Club meetings are held on the second Saturday of each month at the flying field in Covell, IL. Meetings begin at 7:00pm during the winter (CST) and 8:00pm during the summer (CDT).

# Time for Dues

It's that time of year again, time to pay your yearly dues. Please fill out the form below and return it with your payment. This will help us update our mailing list. Some members have not updated their info recently (i.e. new 911 compliant addresses). Also, if you have been receiving a newsletter via regular mail and have access to the internet make sure we have your email address. As of last month we only have 27 members that were still getting the newsletter the old fashioned way. Not only does electronically save postage but is also a big savings on copy costs. Dues are \$72. Thank you.

Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

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# Which is Better: PPM vs PCM

from the River District RC Eagles, Saint Clair MI  
by Ed Olszewski

Aside from all the other choices when selecting an RC radio system, the terms PPM and PCM comes up. PPM or Pulse Position Modulation is standard FM. The next step up is PCM or Pulse Code Modulation which seems to be shrouded in mysticism. In a nutshell, it is not what frequency each is on, but how they use their frequencies. To demystify PCM somewhat you should understand that there is no range increase with PCM. It is not on some special side band or frequency. It shares the exact same FM frequency everyone else on your channel is using, and is susceptible to the same interference. There is, however, improvement in noise reduction and safe performance while the noise is received.

Noise is the undesirable signals on your frequency. They can be caused by anything from sunspots to another transmitter horning in on your frequency. Today's modern radios operate on a narrow band that eliminates most of the random noise.

Basically, the PCM radio takes your FM signal and "codes" it digitally (the "C" in PCM). Then the PCM receiver "decodes" the signal to utilize it.

Since noise is not a normally recognized code, it is ignored by the PCM receiver, and is not sent as servo instructions. In addition PCM does not transmit position signals for each servo in each transmitter pulse. Rather it transmits movement commands as required, and occasional positions confirmation commands. Short periods of interference will simply leave the servo at its last known position, and not show such radio interference as glitches or fluttering.

If your PCM receiver continuously receives interference past the preset time, it then switches into "failsafe mode," and obeys some preset commands you programmed in the receiver. For example, you may set failsafe to throttle down and move all other surfaces to the neutral position. This is great if you are in level flight, but disastrous if you are exiting a loop. If set to continue the last command, it will often keep your model in the loop. Unfortunately, failsafe settings will put your model in a precarious situation you didn't want it locked into.

A third level of protection may be obtained by using a pilot assist module in combination with preset positions on the failsafe settings. You can help ensure your model will go to level flight at a slow—but safe—airspeed and hopefully safely ride out the interference.

Even though the radio does not glitch, it is not to say the PCM radio was in good contact at all times. If another radio is transmitting on your frequency, it can—and likely will—interfere with your receiver's ability to receive the proper signal from your transmitter. The CB radio enthusiast in the seventies used to call this being "walked on." PCM will help keep your receiver from acting on a bad signal, but there is nothing it can do if a good signal can not be received over the interference.

*Continued: see PPM vs PCM on page 5*

# Safety in the Workshop

Taken from the January AMA insider newsletter

It's winter and the building season is in full swing. Just as the safety coordinator focus on flight safety during the flying season, he should not forget about shop safety during the building season. Below are some general tips to share with your club:

## Keep it Clean

Many injuries result from poor housekeeping in the shop. Trips, slips, and falls account for the bulk of these mishaps.

Scrap material and wrappings, loose parts, scattered tools and equipment, or oil spills can cause injury. Debris should be swept up and disposed of. Parts should be kept on work benches. Tools should be placed where they cannot fall and cause damage or injury. Oil spills should be covered with absorbent material and cleaned up.

## Lighting, Heating, and Ventilation

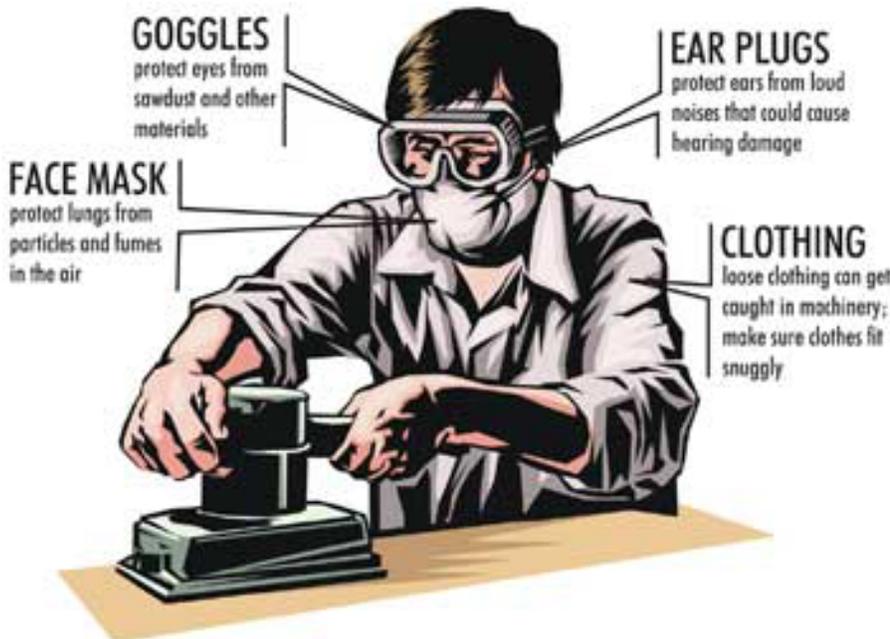
Enough windows and overhead lights are required for a good level of overall illumination. Additional lighting should be available over benches and stationary tools.

When supplemental heating is required for winter workshop operations, the heating unit should be located to provide an adequate, even distribution of heat; but should not cause a fire hazard.

Adequate systems are needed to vent smoke, fumes and exhaust gases. Open windows and doors may provide enough ventilation in the summer. Special systems may be needed to remove exhaust fumes and other gases during the cold-weather months.

## Little Things Can Make a Big difference

When working on your next building project do not forget the safety precautions below:



The logic of PCM is that it is better to momentarily do nothing than act on a bad signal. PCM benefits are purely in precise transmitter/receiver communication. PCM does, unfortunately, have a serious weakness. Even minimal atmospheric or external noise can foul up those wonderful intricate binary numbers beyond any correction. In that case, the receiver is up a creek without a paddle. Think of it as if trying to communicate a grocery list via cell phone in a “one bar” area—some things are not going to make it in the grocery cart. With PCM the main purpose is to hide glitches by not transmitting them to a control surface command. As far as the pilot is concerned, there is only an unnoticeable momentary loss of control. If the radio interference is persistent, the pilot will probably be unaware and may lead to total loss of control sending the airplane either into the wild blue yonder or to the ground.

On the other hand, the simple PPM pulses may be corrupted with some information getting through. When things go bad, the choice is between no control (PCM)—and some control (PPM). Most RC pilots would prefer having some control even if erratic. When a model aircraft is suddenly doing the funky chicken, it is normally a signal to land.

Most radio interferences are normally small glitches and are recoverable, giving the PPM pilot a chance to land and find the cause of the problem.

The bottom line is if you are looking for a bullet-proof radio system to keep your airplane from falling from the sky, it does not exist. A system sporting PCM is an excellent choice for larger acrobatic and 3-D fliers with quick throws, where a small glitch may send it suddenly into the ground. PCM will of course work on smaller, more docile airplanes. These airplanes will benefit less from the added features, and PPM is probably a good bet.

Remember there is no substitute for a good battery charge and a range check. If another radio on your frequency is turned on, there is little any radio can do to keep you from being “shot down.”



## Note from the Editor

I just wanted to let you know due to timing of work commitments, there will not be a February newsletter next month. I will be traveling out of the state and not have access to my home computer with the newsletter program. Thank you for your understanding.

Andy Cogswell,  
SIRS Newsletter Editor



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# January 2006

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