for the so-called "PCM" servos that one manufacturer advertised in the early days of that technique.

There are design differences in servos from different makers, and even in those of different classes (read: price!) by the same manufacturer. But basically, very briefly, what is going on is this. The incoming pulse is compared to an internally generated reference, also set to 1.5 mS. The difference, if any, turns on a transistor which applies the properly polarized current to the motor. As it runs, is also mechanically drives a small "pot", (a variable resistor) that adjusts the length of the internal pulse to match that of the incoming pulse. When they are of equal length and there is no longer an error between the two, the drive to the transistor is removed and the motor stops! That is it in a very compact nutshell!

Now the servo will consume a certain amount of battery current just to get from center to wherever you are sending it. This drain is increased when a load is placed on the servo, that is, when your airplane is in the air and the control surfaces are under air pressure. Working on the bench, commanded to a certain point, the current drops to a very low value, that consumed by the amplifier, but none by the motor. In the air, at any off-center position, the current drain is determined by the load on the control surface.

Now how about those latest wonder of wonders, the "digital" servos. Backing up a bit, notice that I said the transmitter generates those 1.0 to 2.0 mS control pulses some fifty times a minute. Therefore, the motor does not actually receive drive voltage constantly when it is running - it does so in one-fiftieth of a second spurts. However, that is fast enough so that we don't see the effects - the servo output rotation seems to be constant. In the digital servo, with the miracle of a computer micro-processor, the now- slow fifty Hertz pulse rate is speeded up to thousands of pulses a second, the exact rate varying from maker to maker. The results are that the motor is now under power a much larger percentage of the time, thus producing greater amounts of torque. Digital servos are aimed at the more experienced competition flyer, and are produced with the highest grade of components throughout, thus their high price. Do you need them? In my opinion, the jury is not yet in, but I am certain of one thing: you'll see little difference, if any, in the performance of that Ugly Stick if you install high priced digitals in it.

MORE! There is a whole lot more to servos - but I don't think I will be allowed to use up the whole issue. However, there are a couple of things worth mentioning. The torque figure, often given as Inch/Ounces or Ounce/Inches is incorrectly presented to us. Inch/Ounces of course means Inches divided by Ounces, and that is not the case. The figure is supposed to indicate the amount of ounces that the servo is capable of lifting from a point one inch from the center of its output shaft and I think should be written as ounce-inches.

Oh well, at least they give us comparison data. What I have never heard from any servo maker is just how this figure is measured, and more importantly, how the speed is measured. It must take some pretty sophisticated equipment, and I would be glad to include it in a future column and give credit to whatever company furnishes it.

Anyway, since most of our equipment now comes from some Asian country, we are seeing some servo specs not in In/Oz (or whatever!) but in Kilograms per Centimeter (kG/cM). Since we here in the U.S. are not yet fully metricized, that information is not of much value. So, here are some back and forth conversions for you: kG-cM times 13.89 = Oz-In; Oz-In divided by 13.89 equals kG-cM. Just thought you'd want to know!

FOKKER D.VII

First appearing over the World War I battlefield in May 1918, the Fokker D.VII quickly showed its superior performance over Allied fighters. With its high rate of climb, higher ceiling, and excellent handling characteristics, the German pilots were able to score 565 victories over Allied aircraft during August 1918.

Designed by Reinhold Platz, the D.VII was chosen over several other designs during a competition held in January and February 1918. Baron Manfred von Richthofen, the famous Red Baron, flew the prototype, designated V11. He found it easy to fly, able to dive at