

Computer Timekeeping

Believe you won't have to think anymore? Think again....



By Paul Clipper
[Trail Rider Magazine](#)

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That is the biggest mistake most new enduro computer owners make--they expect to be able to ride like a hare scrambler, since the computer is going to do all the thinking. A lot of new computer owners expect to be able to program the beast and forget about it, and if they do just that they're only going to wind up miserable. The bottom line of all this is why we've waited so long in this series to introduce the topic of computers, and this is it: you can only understand what a computer is doing if you completely understand everything there is to know about timekeeping. You have to know timekeeping so well, and with such confidence, that you easily accept the fact that the computer is there only to help you out, not to do the entire job. There is no worse feeling than being on top of your minute in an enduro, riding great, and then having something go wrong with your computer--if you don't know what you're doing. If you do understand timekeeping, and have done your homework on that particular event that you're riding, the loss of a computer will just cause a slight inconvenience, and may not cost you any points.

So knowing what you're doing is the ability to go to "Plan B" if something goes wrong. In this article we'll take a look at how enduro computers think, and give you some hints on what "Plan B" might be, if you need it.

How it All Works

There have been a number of brands of enduro computers over the years, but any more we're down to just two, from the companies ICO and A-Loop Offroad. ICO makes the Pro Comp, which does AMA rules, and the PCX, which does AMA and Brand-X rules. They also make a good enduro device called the Pro-3, which is not strictly a computer; we call the Pro-3 a comparator, because it simply converts time into a mileage figure you match to your odometer. A-Loop makes a computer called the Pacemaker, the latest version is known as the P-3. The P-3, Pro-Comp and PCX are all true computers; they will tell you if you're late or early, and whole lot more. They can do this because in addition to computing time they also have an electronic odometer built in so they can add distance data to the mix.

The toughest part of installing a computer is accommodating the electronic odometer. To make the odometer work, you're going to have to install a magnet on the front hub, and then a sensor on your fork leg. The sensor counts every time the magnet crosses in front of it--that's all it does, it just counts. There's no speed function at all, it only counts how many times the wheel has rotated. The programming inside the box tells it what to do with all the revolutions it's counted. One of the things you must program into the computer is the circumference of your front wheel. So, the machine now knows that if your front wheel is 96 inches in circumference, every time you complete one rotation you've moved forward eight feet (actually front wheels average about 85 inches). The dumb box is getting smarter.

Naturally, this sensor and magnet are your life blood, so when you install them you must make sure they can survive a nuclear war. The magnet has to be screwed to the hub, and we usually glue them as well; with epoxy, Shoe Goo, silicone, whatever seems appropriate at the time. The sensor usually mounts on a bracket of your own design, or through the brake caliper mount, and then the sensor wire is attached to the front brake hose up to the handlebars. Sensor wires getting ripped loose is a very common problem with computers, so we recommend the use of accessory disc guards to cover everything up, and real close attention to how you tape the wire to the brake hose. With the sensor installed you have your distance input, and the time input is already in the computer in the form of a clock chip. Install the batteries and the device will leap into life, ready to receive your data. Programming the machines, although different between the ICO and the A-Loop, is pretty much like filling out a multiple choice quiz. You start to enter speed changes, and the box prompts you for the first speed average and the distance you're expected to go at that speed. So if the route sheet says 24 mph until 12.2, you would enter that and then the machine would prompt you for the next speed change. Once you have all the speed changes in, you go on to enter resets, and then free time periods. It can get complicated, when you have multiple loops to enter, and resets back to zero between them, numerous little resets and bizarre speed changes. This is one of the significant ways computers have changed enduros--the clubs now go out of their way to make entering race data into your computer a tricky task. It's just another part of the game, and the real reason you have to study the instructions and learn the computer until you can program it in the dark, by feel, and know every little nuance of that little box's programming code. If you don't, you won't be able to react when something goes wrong on the starting line or the trail, and all you'll have at that point is a \$300 chunk of dumb plastic on your handlebars.

Riding With It

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minute countdown; I'm sure the Pacemaker can, if you think you need more than one minute. When your row is waved off, the computer will start running the race program, and will attempt to be your guide for the next hundred miles or so. What happens next depends on what sort of computer you have. The true computers are processing plenty of information, and trying to display it all to you at once. Both the Pro-Comp and the Pacemaker compute your time and distance and tell you how late or early you are, with a display of actual seconds (and minutes, if you start getting really late or hot). In an ideal world, you would ride at a pace that keeps this display right at zero, meaning neither early nor late. In the real world, it doesn't work out this way. Keeping the computer display right at zero is just as hard as matching up your roll chart to your odometer and clock, but since it is only one number, it takes less time and thought to stay on top of it. Also, you have to keep in mind that the computer is telling you that you're on time--at zero--when you're right at the top of your minute. You already know from our preceding stories on timekeeping that to be perfectly on time you have to be 30 seconds into your minute. That's not to say that you should ride with your computer perpetually reading 30 seconds late, but it pays to remember what being at the top of your minute means. Consider the average checkpoint--you might peg-walk in, following your computer as it ticks down to zero, but the check may be off by a second or two, or your mileage may be off slightly, and in either case the late/early readout of your computer doesn't mean beans as far as accuracy goes. Making sure the mileage is accurate is the most important thing when it comes to computer riding. Like we said earlier, the posted course mileage is the only official mileage, so you must reset your computer to match the course mileage at every possible posted mileage along the course. We can't over-emphasize this, because if your mileage value is off, your early/late display is wrong, and once that is wrong you might as well be riding blind. So what do the pros do when it comes down to hair-splitting seconds? They forget all about the computer display and switch to watching the clock. The ICO will roll over to a clock display with the touch of a button, and the Pacemaker always has a clock display active, unless you change the standard display. As you're coming up to the check location, or the possible check location, and you know you're on time or slightly early, you forget about the early/late display and watch the clock. Sometimes, if your mileage really is off a bit, this can produce some awkward surprises; like maybe you're 20 seconds earlier than you expected, or twelve seconds later than expected. Try this, and think about it, and you'll realize that a true expert enduro rider is always aware of where he is in the minute, no matter what the rest of his timekeeping equipment may be trying to tell him. On every computer, you'll have to reset the mileage often, we already said that. Some of them have an auto-recalibration feature that will do its best to synch you up to the odometer used to lay out the course, and occasionally this feature works really well. Most times it doesn't, but not because it's a bad feature. The mileage never works out because the club is playing games with the mileage (remember, the only official mileage is the mileage marked on the course, and sometimes clubs mileage sections short or long just to make sure you're paying attention). Or, they could have used a different machine to lay out each section, or each half. Never blame a screwy mileage readout on your equipment; just reset carefully, stay on your toes, and don't let it make you crazy.

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computer takes that into consideration and gives you a visual indication that there are no possible checks for the next three miles. Very handy, but it doesn't work that way for Brand-X rules, so what do you do there?

Brand-X is a very useful sub-feature in the PCX and Pacemaker. Through simple programming they have both greatly reduced the burden associated with riding a Brand-X enduro. In Brand-X, you assume whatever number the checkpoint is on when you arrive late, thus putting yourself back on time at that moment. You can see that this makes normal roll charts almost useless, since your number keeps changing all day. With the Pacemaker and PCX it's not a problem. When you set these machines up for Brand-X rules, you are prompted for your starting row number. Then, when you arrive at a check you hold a button down and the machine asks you for your new row number. You adjust it to your new row number, hit another button, and your programming is recalculated and your timekeeping gear is once again accurate. If you've ever ridden a Brand-X enduro, you know how fine this little feature can be.

When Things Go Wrong

Okay, so you're cruising along, everything is working fine, and suddenly your computer shuts off. It does happen; to some it happens a lot. Batteries die, wires get ripped out, a good crash can k.o. your computer. In this case, we've only got one thing to say: if you just programmed the computer and stuck it on your handlebars with nothing else as a backup, you're screwed. You're either going to have to key off the other minutes around you, or give up and plan on trail riding the rest of the day. However, if you've read all the other installments of this series, you probably know the answer we're going to give you: even though you're running a computer, you should also have a roll chart fully annotated and already rolled up on your handlebars. You should be wearing a digital wristwatch as a backup timepiece, and with these two things plus the turn mileages posted along the course, you should be able to do a fair job of staying on time. If the computer goes off and then comes back on, as a result of a bad bump or who knows what, there's a chance that you can get it right back to where it was. The Pacemaker has a feature where you can rapidly advance the clock once the race program is running, and thus "fast-forward" to the point where the program stopped. Also, if you know your programming inside and out, like you should, you can clear out whatever's in the machine and re-program from that point on. Or you can run backups. Randy Hawkins runs two Pro-Comps, one on mileage only, one on late/early, and a Pro-3 showing minutes and seconds. All three are fully functional and programmed, and if one fails he has plenty of backup. "I always buy a Jart Chart when they're available, too, because it's the best backup." Randy admits he'll study the Jart Chart the night before the event, highlighting all the changes and tricky spots. "I sometimes look it over as many as three times before the start." By doing so, he's already got a good idea of what the course is about, the speed changes, etc. This way he's not riding blind, and starts with the maximum advantage. And he has won a few national enduro championships.

Bells and Whistles

Aside from just enduro programming, all of these computers can offer extras that make life easier, more interesting, or just entertaining. A classic is the "top speed" feature of the ICO, wherein the unit keeps track of the fastest speed you've attained during the day. Who doesn't want to know how fast they went? The ICO will also track total instrument mileage, the length of your last race, and the last wheel size the AutoCal odometer correction gave you (these three features aren't available on the PCX). The Pacemaker is packed with this kind of extras, including a DataLog feature that can record your performance during the entire race, so you can go back later and see exactly where you went wrong. It also has an infrared communications port that allows the unit to download a completed race program from another Pacemaker, or, in the future, from your Windows-based personal computer!

Is It Worth It?

The bottom-line question is, will you have an advantage by using a computer? The answer is yes, assuming you know the computer backwards and forwards, and also assuming you're smart enough and prepared well enough to run a backup system along with it. As a human, you've probably recognized how your I.Q. decreases with fatigue. You just can't do the mental math when you're tired, and as long as you trust your computer completely it will relieve you of the burden of thinking. To accomplish this you have to be smart enough to trust the computer--and only your computer--no matter what it's telling you. You have to know that it's right, no matter how tired you are, because computers don't "make mistakes," people do. The only way you're going to get maximum benefit out of a computer is to know this up front. The computer is a dumb brute. It is only as good as the information you feed it, and it is only as useful as your ability to interpret and understand what it's trying to tell you. So if you don't know what you're doing, both in timekeeping and in operating the computer, you're never going to get the maximum benefit out of it. And if you do know what you're doing, the computer will help you win. No doubt about it.

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