KEEP IT SIMPLE... FINDING YOUR BASELINE

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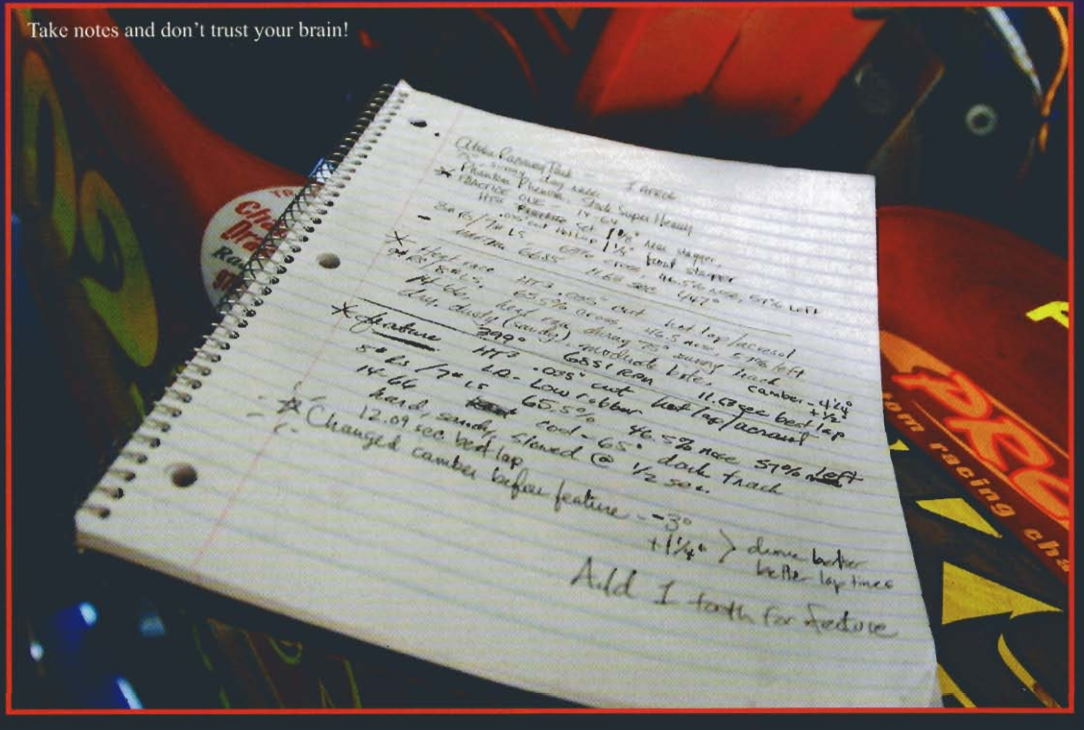
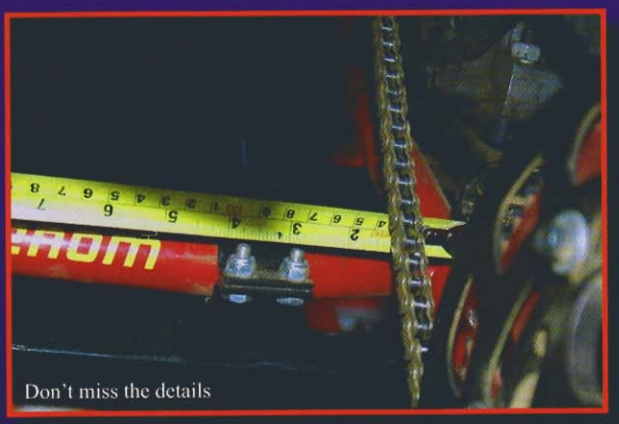
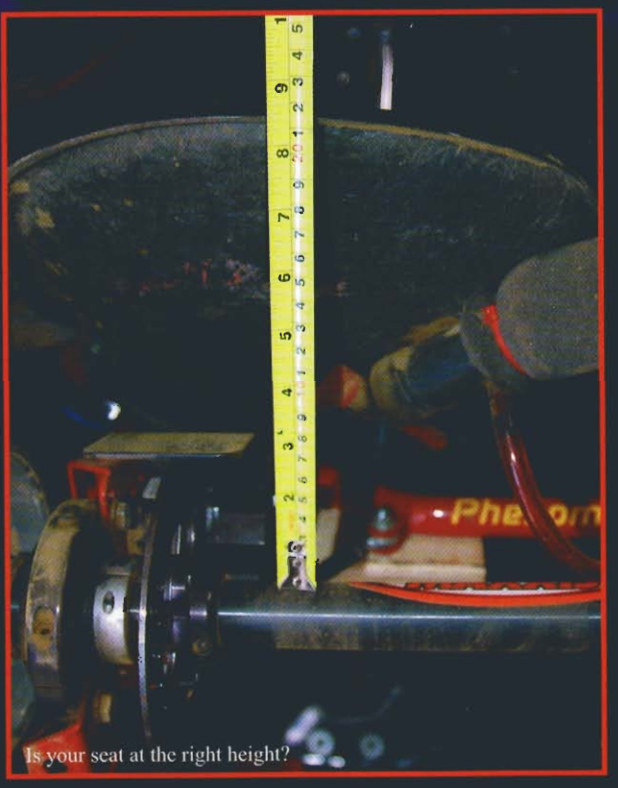
Over the years the number of adjustments available to the karter has continued to grow. In addition to all these adjustments, there are tons of theories and reports on how all these adjustments work and how everyone needs to be using this or that to go faster. You go online and read that this Ackermann setting or that castor setting is exactly what you need to do to make your kart take off. Armed with all this information you change three or four things and head off to the track. At the end of the night the kart might be better or might be worse but the likelihood is that it wasn't as fast as it needed to be and you're confused about what to do next. With all these possibilities and opinions on exactly what it is that will light your kart on fire what is a racer to do? How do we figure it out? How do we deal with all this complexity? The trick is to keep it simple and take it step by step.


Take notes and don't trust your brain!

The best place to start is a well-proven, baseline setup for your kart. What is a baseline setup? It's a set of setup numbers which are in the normal range for your chassis, class and track type which you have fine-tuned over time to locate the precise places within those normal ranges where it works the very best for you and your conditions. The manufacturer or your dealer should be able to give you this baseline for conditions similar to what you run and this is most often the best place to start. I know some are thinking, "but if I run the baseline I'll be on the same setup as everyone else and that's no way to gain an advantage." While this statement seems logical it is very rarely the best way to run well. The reason the baseline is such a good starting place is that every chassis is designed to work around certain numbers - it's inherent in the kart before you buy it. When you get far away from the baseline you often start working against the way the chassis was designed to work and the kart will have a tendency to be much more temperamental. For example, if you try to run ultra high cross on a kart that typically runs best on mid cross, there may be times when you can get it fast; the problem is that all the conditions have to be perfect for it to work correctly. If the track changes just a little or you go to a different track all these things aren't perfect any more and all of a sudden you slow down. So then, if we're not running "out there" setups, making big changes and really wrenching on the kart, then how is it that we can gain the advantage that we need to win?

The answer: Start with a good baseline and make small improvements from week to week so that we're steadily improving our performance – winning is found in the small details, not the giant things. For example, let's say we've got a kart that has a good baseline of 55 left, 46 nose, 58 cross, -3 RF camber, +0.5 LF camber and a 39.25 inch tread width. We put that setup on the kart and head to the track. If we've done our homework our baseline is a good one for our class and our track conditions and we should be reasonably fast right out of the box. If for some reason the kart isn't relatively fast then rather than starting to change everything we need to STOP! and try to figure out why the baseline setup that works for everyone else isn't working for us. The reason might be that we forgot to get the information on one or two of the setup parameters. One example of this might be the seat back height, the rear stagger, the seat location side to side, the axle height, etc. These settings aren't talked about as much as some of the others but they are as critical as any and more critical than most in getting a kart fast. No matter what though, we must continue to investigate until we figure out why the baseline didn't work. While we're talking about this we need to cover the dreaded, "I've tried everything: high cross, low cross, high left and low left and nothing works; no matter what I do it just runs the same." If you've ever heard anyone say these words or if you've ever said them yourself, there are one or two reasons why the kart isn't responding and for all our effort we aren't seeing it. What's the problem? Most of the time it is as simple as this: **the kart isn't making enough grip**. A kart that isn't biting just sits on top of the track and the kart can't really tell if it's turning or going straight. When this happens it is very typical that it won't respond to any adjustments - everything seems flat and dead. It may also be that sometimes the kart will be loose and other times pushing with no predictable pattern as to when either will occur. If this is the case then we need to go to work to make the kart make some grip. Maybe it's softer or harder tires (yes, harder tires, too soft of a tire on a hard track will sometimes slide and not grip), less air pressure, a different prep or whatever. No matter what the solution, we've got to keep trying things until we've got it making grip and responding. The one other reason I've seen a kart unresponsive is that something is very bound up or broken. I'd start looking at the seat and if it's ok look at the body and nerf bars. If any of these things are really bound up it'll keep the kart from flexing like it needs to. Another good place to look is at all of the front-end components. The advantage of starting with the baseline and continuing to work with until it works is that you will never get to the point of saying, "I've tried everything and nothing works." A well-designed, well-built chassis can be made to work most anywhere on a good baseline setup. Staying focused on finding what aspect of the baseline that is being overlooked will often help you get fast faster.

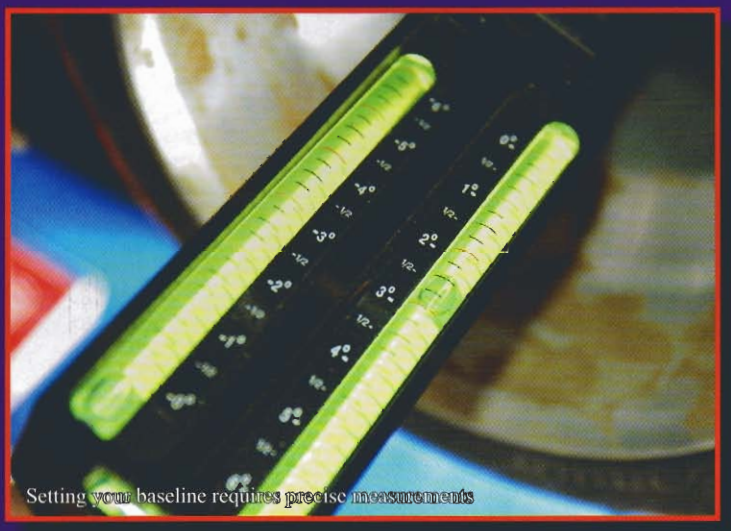

Don't miss the details


Is your seat at the right height?

Where do we start when the baseline doesn't work? The first thing is to ensure that we actually got a good baseline. When this happens I like to go back to the manufacturer because they're the ones that should know their chassis best. Another good place to go is to a dealer. The critical thing here is to talk to someone who works with lots of people rather than just getting one person's setup. As a manufacturer or dealer talks to many different karters running in many different conditions they are able to see trends of what is working. It is this trend that is at the heart of a good baseline. Once we've made sure that our starting numbers were good ones we need to start to look into the finer detail of the setup. The first place I start is with the seat. If the manufacturer thought you had your seat at 9 inches off the axle and it's really at 8 or 10 then that could be the reason you couldn't get going. Likewise if the "norm" for seat position has the RR strut about 3.25 inches from the motor rail and you've got yours 5 inches away then it could be that which kept the setup from working. All of these things are more subtle and easy to forget when you're trying to get the kart working. The point is this: keep digging until the baseline gets you close. Maybe you've got some work to do to your tires or your rim selection. Whatever the case, once you've gotten close then the kart will respond consistently and will give you a platform which is predictable and responsive. Once you have this then you can really start making the small tweaks that it will take to bring the kart in just perfect.

At this point we've got a good chassis, we've got a good baseline and we've got that baseline working for us. With this in place we should be able to run mid pack or better

consistently from week to week. Now it's time to start tweaking on the setup to wrench the speed out of the package that will get us the last few hundredths of a second we need to get to the front. The important concept here is to make changes one at a time so that we can see if they bring us closer to or further away from where we need to be. One comment, we want to make relatively small changes so that we don't end up out in left field but we don't want them to be so small that we can't really feel them. If we're taking good notes then if we make a change and it doesn't work out we can always go right back to where we were. Now is when I'd really pay attention to what the kart is doing. Is it well balanced? Does the kart snap down into the corner without getting loose? Are we able to carry our speed through the apex? Does the kart pitch just past the apex and start to accelerate off the corner? Is the LR planting at the right time to help the RR drive us up out of the corner? As we think about these questions and identify their answers we are searching for anything that might not be working as effectively as we need it to work. For example, maybe our kart is a touch lazy getting in the corner or maybe it won't turn under someone coming off the corner as well as we'd like it to. In either case we might choose to reduce our RF camber from our baseline setting of –3 to –2.75. This will help plant the RF and may give the kart the extra turning power it needs to really get the kart to the apex and help it rotate for the run off. Notice this about the change: we've made a change but it hasn't carried us way out of the baseline range. For each of the baseline setup parameters we should try to understand what the normal range is. If –3 is the baseline then we might find out that –2.5 to –3.25 are fairly common. Understanding this we can feel comfortable that we've made a change which is likely to help the kart without making it temperamental.



Setting your baseline requires precise measurements

In addition to looking at how the kart navigates each part of the corner, we need to look at how the kart evolves over the race. Maybe it takes 4 or 5 laps to come in and continues getting faster the whole race. Or maybe it comes in quickly and begins to slow over the course of the race. In either case

we need to understand what it's doing so we can understand how we can help it. In the case of the kart taking 4 or 5 laps to come in but continuing to speed up throughout the race, it may be that we lose so much time at the start that we can never quite catch up. It might also be that we never get the fastest laps out of the kart because even after 20 laps it's still getting faster. In either of these cases we need to get the kart to come in faster. We might use a different tire prep, change our air pressures or air pressure split, run less left or cross or something like that to get it to come in faster. Remember, the idea is not to turn the fastest lap but rather to run all 20 the fastest.

At this point we've got a good baseline setup, we're looking hard at each phase of the corner to ensure that the kart is working and feeling like it should, we're working to ensure the kart is coming in quickly and running all 20 laps and we should be finishing pretty near the front on a regular basis.

What do we do next? This can be a tricky question to answer but we'll try. This is a time when you can start working the left, cross, nose and camber around a little at the time to see if you can pick the kart up. There may not be a clear indication of which way to go and if not, just pick a direction and go that way; if it doesn't work you can always go back. We might choose to raise our left a percent to see what happens. If it works then leave it at its new setting and if it doesn't take it down to a percent below our baseline point and try that. Notice that no matter what we change we always know where we are with respect to the baseline. It's like traveling, we want to know where we are in reference to either our home or our destination and if we lose site of these then we end up lost without a clue where we are, how we got there and where we need to go next. As we search we gain speed and anytime something unexpected happens or we slow down we can always get back to our baseline that we know should

work for us. One last thing to mention; it is in this phase of the tuning where truly great drivers shine. They are able to feel small things that most drivers cannot. They take this extra sensitivity and use it to identify very small problems which helps them get the last bit of speed out of their chassis while the rest of us are left to try this and try that hoping that we will find that last bit of speed that we can't feel.

What happens if we slow down, reset everything to our baseline that we proved out earlier, but now it doesn't work? This is a very powerful indicator that something has changed. It may be obvious like a new track surface or a significant climate change (spring to summer or summer to fall) but more often it will be an indicator that something isn't right with the chassis. Just as before, rather than trying a bunch of wild things we need to start digging to understand why our baseline no longer works. Some of the things that I've seen cause this is a worn out front end, a bent spindle, bad bearings (front or rear), a worn rear bearing cassette, a seat with wallowed out holes, a bent chassis, etc. The fact that we have proven out a good baseline in which we have confidence allows us to detect problems like these that may be very difficult to identify otherwise. I've seen karters struggle for a year or two on a chassis with something bad in the front end because they kept trying to fix a part problem with setup. I've also seen karters identify the same types of parts problems in one or two weeks of racing because they knew that their baseline should be working but wasn't.

At this point it should be clear just how important having a good baseline setup is but I'm sure there is the question, "developing this will take weeks and weeks of racing; I want to go fast now." This "now" temptation is often compounded by the fact that we see someone show up at our track who's never been there who hits the setup right off and kicks everyone's butts. The fact that they win right off is obvious but what is not so obvious is that the karter who showed up out of nowhere and won was most likely on a good baseline that he or she had developed over weeks or years of racing. They knew their equipment, they knew their setup, they had a list in their head of how they had typically had to adjust their baseline for differing track conditions, they had confidence in their package and that is why they were able to show up an win. The importance of this confidence cannot be overstated. When a driver gets on track it is often their confidence in their kart that allows them to drive it to the max. This confidence isn't generated in an instant but comes over time through experience. It comes from understanding and predictability and it is what makes great karters great. Don't get in a big rush, don't get out in left field and get frustrated, take it slow and easy, step by step and in the end you'll be the one with the confidence and the speed to take the win.

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