The Eyes Have It

By Ed Valpey

I once had a student who was unable to get his eyes more than about 20 feet ahead of the car on the skid pad. He could correct oversteer, a bit sloppily, but when asked to maintain a drift he would look at the next cone coming his way and spin every time. After a fair amount of shared frustration, I tipped a cone over on one side of the skid pad and stood next to a cone on the opposite side. I told him to induce the slide at the tipped over cone while looking me in the eyes, and keep looking me in the eyes while he kept the car sliding. For six or eight attempts he couldn't do it... his eyes could barely glance at me. Finally, after a couple of stops spent visibly cursing to himself in the car, he determined to keep our eyes locked. The next time he did so and he held the drift until he went flying past me, eventually looking back over his shoulder trying to keep our eyes locked… which, of course, made him spin. When the car settled he sat scowling into space for a moment, and then, before I could walk over to say anything, he took off around the skid pad again. In half a lap he kicked the car sideways and began drifting it like a pro. He kept drifting it lap after lap after lap until I had to walk on to the skid pad and kick him off. His driving skills had made a very rare quantum leap in the span of about 30 seconds. At the end of the session there was no pride or hubris, no chest-pounding or fist-pumping, he merely expressed how dumbfounded he was that his eyes could have such a dramatic impact on his ability to control the car.

So what does this have to do with driving at the limit on the track? Quite simply, the skills that allow us to powerslide a skid pad are the same skills that allow us to rotate a car into a corner, maintain the drift through the corner and end the drift with a third of our tire hanging off the edge of the pavement at our track-out point. The further ahead we keep our eyes the more information we get and the more time we give ourselves to react. Mistakes are seen much sooner and, as a consequence, require much less input to rectify.

The following photo, taken in Turn 1 at Beaverun, shows what our brain sees from the turn-in point if our eyes are low and close to the front of the car...

The next photo shows what our brain sees from the turn-in point if our eyes are up and looking ahead...

Keep in mind that both of these photos were taken from the turn-in point. Note that the “heads up” driver not only sees the apex of Turn 2, he also sees the track out of Turn 2 and the pit exit (where a car could be entering the track). There’s something else you may note when looking at the second photo. If you focus your eyes on the leading edge of the apron in Turn 1 you don’t get much information about Turn 2. But if you focus your eyes on the apex of Turn 2, your peripheral vision is still able to register the apron of Turn 1. Now imagine yourself drifting on a line that carries you to the apex of Turn 1 (two thirds of the way around the apron). This reveals an important point... your peripheral vision works very well on objects closer than your point of focus, but very poorly on objects beyond it. In the real world, where this scene would be in 3-D, the difference is even more pronounced. One last thing, this photo was taken from about 5.5 feet above the pavement. Those driving formula cars likely won’t see the apex pylons for Turn 2, but they should still be looking for them.

The next series of six photos shows the view entering Turn 9 at NHMS. Photo 1 shows a grassy knoll just appearing to driver’s left. At this point in the corner we should be looking at the grassy knoll. By the time we get to the position shown in Photo 3, we should be looking “through” the grassy knoll to find the stack of tires that will mark our apex for Turn 9. At this point in the corner most drivers are still looking at the pavement in the middle of Turn 9.

Photo 1 Photo 2 Photo 3

Photo 4 Photo 5 Photo 6

In Photo 4 we can just see the tire wall starting to peek from behind the grassing knoll, and in Photo 5 we see it in full. Note also in Photo 5 that we can now see our apex and much of our exit for Turn 10, thus allowing us to judge our path through both turns long before we get to the apex of Turn 9.

The last thing we'll examine on this topic is driving using the "sight picture," which is how a marksman lines up his gun sights with his target. The relative positions of near and far objects tell the marksman whether he is properly aimed, and they can tell the racing driver when and where to make his inputs. Instead of focusing on traditional reference points, we look through the corner, focusing on no particular feature, and allow the relative position of many features to tell us where we are. This method is extremely effective, but generally requires a great many laps to perfect. The following pictures, also taken in Turn 9 at NHMS, show how the technique works.

Picture 7 Picture 8

Notice in Picture 7 that the gap in the grandstands is offset relative to the edge of the wall in Turn 10, as illustrated by the red arrows. At our turn-in point, the gap and the edge of the wall are aligned. Instead of looking for a cone or other mark that is whizzing past our head on the left, we are instead looking as far through the Turn 10 as possible... our eyes are pre-placed to the greatest advantage. The gap in the grandstands and the edge of the wall are only two examples of the dozens that our eyes and brain will register, and we want to avoid attempting to identify any of them specifically. Instead, we incorporate a benign version of the thousand-yard-stare as we repeatedly travel through each corner, envisioning that imaginary line that shows the best path through the corner