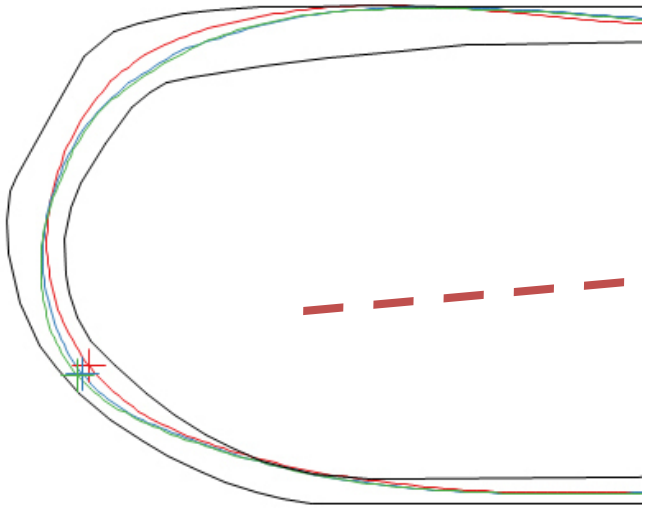
Why traditional cornering techniques aren't always the fastest

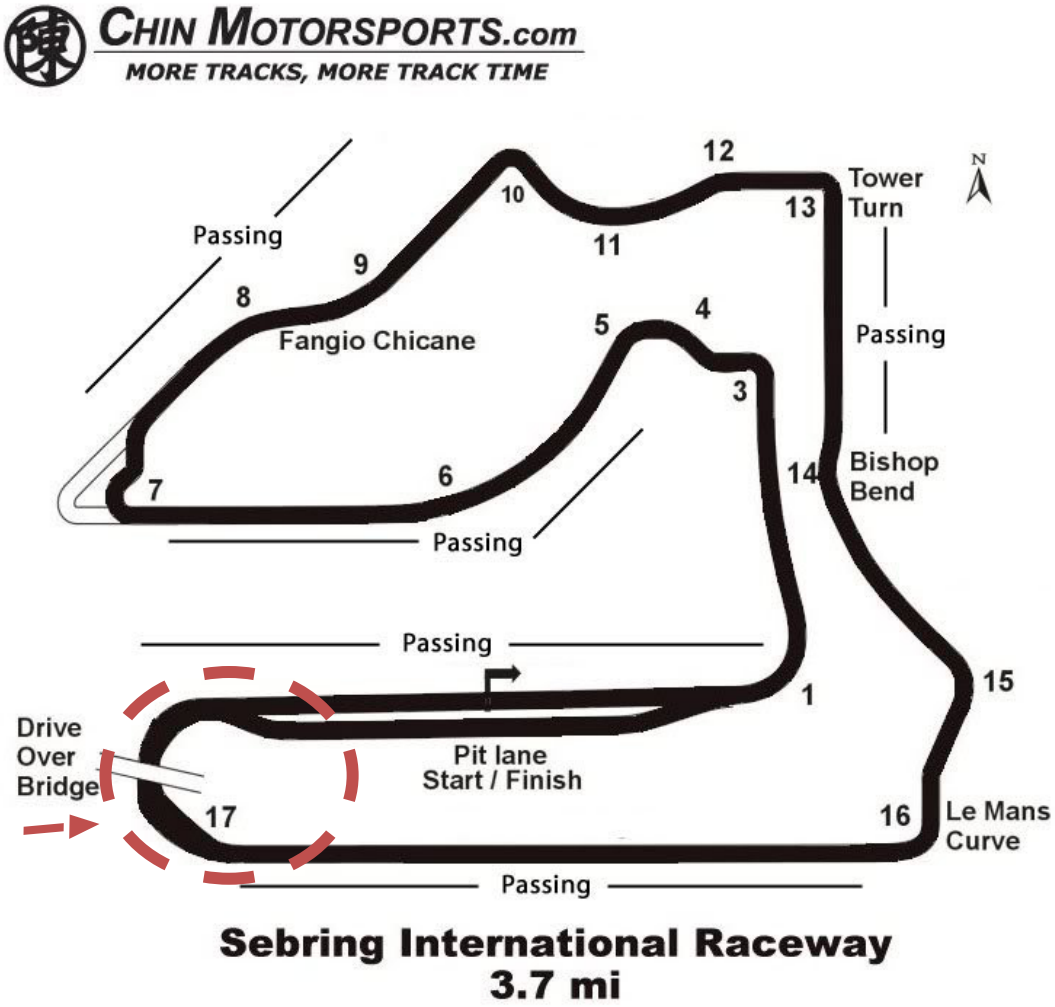
One racing driver reveals his secrets on how he tackles long corners, showing how he gained half a second on 'Sunset Bend' at Sebring over other drivers who were using the traditional racing line.

Sebring, Florida. If you're involved in USA motorsport, you've either been there or you want to go.Built on an old WWII aire base, the classic circuit is often recognised for its famous, high-speed turn 17, otherwise known as 'Sunset Bend'.

It's a long, bumpy, fast right hander that can make or break your speed down the finishing straight. Because it can fit up to three cars wide, drivers are often divided on the best way to take the corner to maximise the available space and handle the challenging surface.

As the fifth in our series of articles discussing advanced circuit driving techniques, racing driver and instructor Nigel Greensall gives us a controversial perspective on how to best tackle the 500m long turn 17. He reveals his secrets on gear selection, driving line, surface awareness, and corner exit, and why they're essential in getting a fast lap. He also explains why cornering is not just about the entry and exit – and why what you do in the middle of a long corner can make a huge difference to your time.





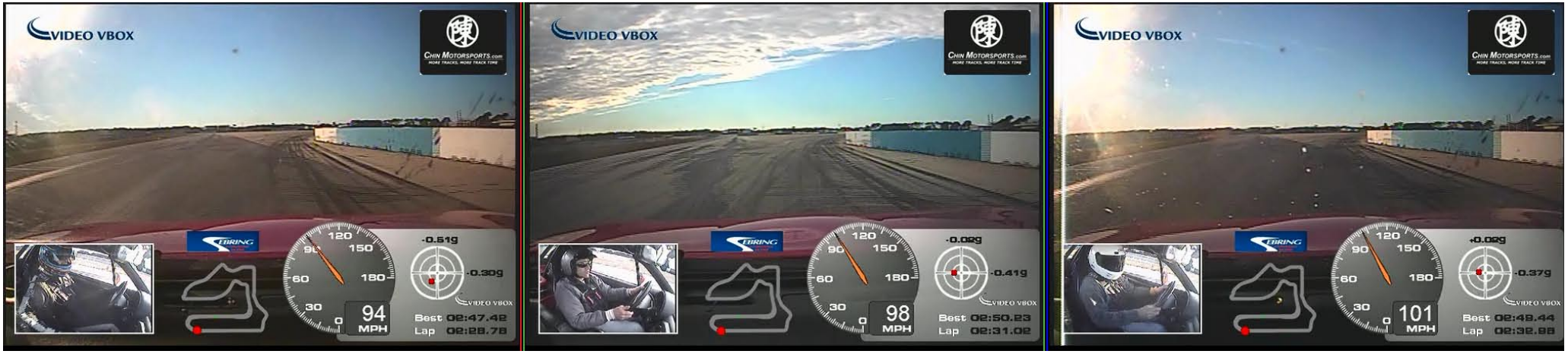
The following video and data was taken at a Chin Motorsport test session, where Nigel compared his technique with two fast Sebring locals in a Mazda Miata track car.

Taking the fastest lap of each driver, each took a different approach at 17, with Nigel having the lowest entry speed by some margin. However, Nigel's time for the whole corner was still half a second faster. Read on to find out why.

Nigel Greensall:

1. Entry

“The success of the corner depends on your preparation. The three screenshots (Corner Entry, below) are taken at the point the two other drivers start braking for turn 17. As can see, my speed is much lower than the other two drivers. In fact I started to brake 50m earlier. It is very tempting to brake late here, and you will often hear talk in the Sebring paddock of just how late some drivers like to brake for Sunset Bend. However, I have found that this can compromise mid corner balance and speed, as I will demonstrate.



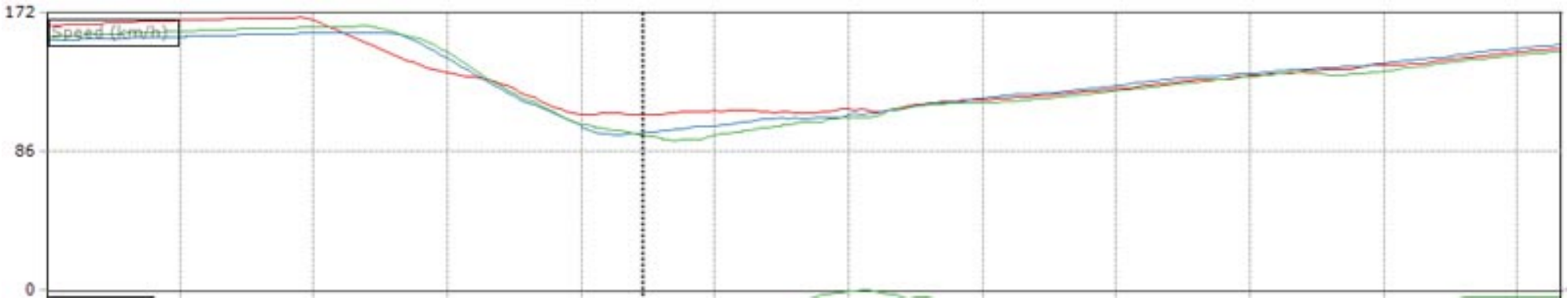
Corner Entry: Video screenshots taken from the best lap of each driver. Nigel Greensall above left, outlined in red. He’s braking earlier to balance the car and maintain speed around the long bend.

2. Mid-corner

“In the screenshot below (Mid Corner), I have finished braking, and am back on the power (see the positive G on the graphic overlay of the screenshot outlined in red), which shifts the weight backwards and balances the rear end. This allows me to hold a tight line through the mid section of the long bend. The two other drivers are still braking, which carries them deeper into the corner.

Mid Corner: Nigel’s speed is 5mph greater than the next fastest drive. He’s holding a tight line and is back on the power now.

"At this point my minimum speed is at least 5mph more than the other drivers (shown by the speed trace graph, below), and also I am on a shorter, tighter line. This is where I gain the majority of the time in turn 17.



Speed trace for Turn 17: Nigel's lap is in red. He clearly brakes earlier than the other drivers, and his minimum speed is much higher through the bend, which helps him gain half a second.

"Gear selection is also crucial at this stage. Having previously tried taking the corner in 4th gear, I soon found that this caused the car to run too wide over the bumps and compromise exit speed. By using 3rd gear I was able to stay tighter to the apex which helped avoid the bumpy surface.

2. Exit

“On the exit of the turn, just before the bridge, there are several bumps which are caused by the large concrete slabs that made up the old air base runway. This change of surface occurs just where you are accelerating onto the straight, so it is critical that the car is balanced here! In a more powerful car, you may want to turn more before this point, allowing you to straight line the bumps, gaining more traction out of the corner.

The exit onto the start/finish straight is critical as it is 0.5 miles long. In taking the tighter line through the mid part of turn 17 instead of a traditional wide line with a late apex, it didn’t give me the maximum possible speed onto the straight. However, the small speed I have lost (around 1mph in this example (shown in the screenshot below, ‘exit’) only leads to a 0.1s loss down the main straight, whereas I have gained 0.5s in the corner.

Exit: Nigel takes advantage of the whole width of the track to build speed

In order to maximise my speed onto the approaching finish line straight, I ensured that my left wheels reached the white concrete on the far left of the corner. The challenge was to see how close I could get to the exit wall to use all the available space and use maximum power.

As you can see by the screenshots above ('exit'), the other drivers managed to get fairly close to the wall, but it was those extra few inches that ensured my exit speed almost managed to match theirs, even though they took the deeper, slow in-fast out approach through turn 17.

The screenshot below, highlighting turn 17 in Racelogic's free Circuit Tools analysis software shows the whole of turn 17, and you can see the different line I took (the red trace) compared with the other drivers. You can also see the delta-T channel graph at the bottom of the screenshot, which is the lap-time lost or gained through this section.

Turn 17 video and data. This and all other graph and video screenshots are taken from Racelogic's' Circuit Tools software, included free with Video VBOX video and GPS data-loggers. It automatically recognises the circuit you are driving and compares your laps or those of other drivers. The video and data is synchronised to provide simple pointers on how to reduce lap-times.

The Delta-T graph, shown at the bottom, shows where the other two drivers lost time in comparison to Nigel (shown by the red line). It's possible to see this delta time live in the car with Racelogic's OLED display predictive lap timer, which connects to a Video VBOX. The predictive lap-timer takes your best lap and shows you a real time, easy to glance at graphic, showing where you are losing or gaining time.

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"As you have seen, this is opposite to traditional cornering technique, and is contrary to what many experts say is the only way to tackle a corner. For the Mazda Miata track car on turn 17, the mid-corner was maximised and the entry and exit speeds were sacrificed to gain more time overall. This demonstrates the fact that concentrating your efforts on a small portion of the corner can help you gain a lot of time. To ensure you're always improving and getting faster, it's important to keep pushing the limits and challenging the conventional wisdom!

However, it should be noted that different cars do have different characteristics. The less traditional line explained above worked very well in the Miata, but didn't work so well when I was driving a Corvette Trans-Am car which responded better to going wider into the corner and straightening out the bumps.

When cars and tracks are different, with varying levels of grip and surfaces, you need to be experimental and open minded when finding the fastest route. The best way to do this is with video data-logging and easy to understand analysis software that synchronises the video and data for you. This will enable you to easily pinpoint areas to improve. In addition to synchronised data I now find predictive lap timing very useful. By using a graphical display which uses GPS position to compare my current lap with my fastest so far, I can immediately see whether a new technique or line is making me quicker or slower.

The best technique is to try the traditional, recommended line to get some feedback and a reference time, and then see if you can better it by experimenting with different techniques. You might just find other drivers beginning to copy you!”

Watch a video of the corner here:

We hope you've enjoyed reading this article, and that it has provided an interesting insight into how one racing driver approaches longer corners, using turn 17 at Sebring as an example. There are, of course, many ways to tackle a long corner, and looking at the video and data quickly shows which are the most effective!

All data and video in this article was recorded with **Video VBOX**, and the data screenshots were taken from the intuitive Circuit Tools software which comes included with every Video VBOX.

Video VBOX incorporates a GPS and video data logger with customisable graphic overlay, and is designed and manufactured by Racelogic.

More information and the online shop is available on **www.VideoVBOX.com**

Video VBOX Lite, shown with optional Predictive lap timing display. More info: www.videovbox.com

You can add your thoughts to the discussion on the Racelogic forum here (link to discussion of this article once uploaded)