The Story of the BRI

In 2002 we introduced the Bench Racers Index (BRI) – a handicapping system used to calculate a "corrected time", allowing us bench racers to compare our relative performances and talk some trash regarding the amazing results we would have achieved if only.....

Our 2002 handicapping system was based on the PAX (Professional Auto-X) system used by SCCA. We realized from the outset that applying an SCCA system to our PCA classes would have some problems, but what the heck, it was just for bragging rights anyway and it might give us some insight into how to create a system better geared for Porsches. Now that we've had several season's experience with the BRI, we have indeed been able to identify some significant flaws – in spite of which, the winners (of course!) generally thought the system worked pretty well.

I suppose that if one were smart enough, it should be possible to create a sophisticated model of vehicle performance that accounts for power, weight, tire compound, suspension geometry, brakes, gearing, etc. However most of us are not that knowledgeable, so we adopt a simpler empirical approach to modeling performance based on past race results. The PAX system was built upon a large national database of SCCA autocross results. But since Porsches are not very well represented in the SCCA, we wanted to compile a P-car database using results from our own events. With help from Tom Tweed and Chris Benbow, we have collected results from PCA-SDR events for the past four years. In compiling this database, we focused on the winning times for each class, rather than using the average time of all the cars in the class. We reasoned that the winner's time is more representative of the performance capabilities of a well-prepared and well-driven car of that class. With this approach, we make no distinction between the different Porsche models running within a particular class; so a 356, a 912, and a 914 running in AS/S will all have the same index.

2004 Update:

By mid 2004 we realized that over the past several years, many of our best drivers have jumped from one class to another as they bought different cars or made modifications to their old cars. There have even been rumors of drivers who may have changed classes looking for a greater (or lesser) level of competition. Being naively optimistic, we had hoped that with so many drivers shifting classes, averaging 4 years worth of race results would tend to even out the drivers' contributions and we'd be able to identify the performance characteristics of the cars in each class. But real world data is rarely as clean as one might wish and we're still left with obvious inconsistencies, such as classes in which drivers on street tires were faster than drivers using sticky tires.

Since a handicapping system based strictly on past performance data can lead to unacceptable results; it is necessary to apply some subjective judgments when creating a model that fits the data in some approximate manner. So we attempted to follow a couple of simple guidelines consistent with the Zone 8 rule permitting a competitor to run in a higher class:

1. As cars move up in class, the index should reflect increasing levels of performance (FS/S should be faster than CS/S, which should be faster than AS/S, etc.),
2. As cars within a given class become more modified, the index should reflect an increase in performance potential (Prepared should be faster than Stock, which should be faster than Street Stock).

In general, past race results are consistent with these trends, but there are some notable exceptions. We then attempted to fit a simple smoothed surface through the data consistent with these 2 rules.

All of these numbers are considerably higher than those used in 2002; due simply to the manner in which the race results were normalized. The PAX system creates a ratio relative to the TTOD. We found that the data become more consistent if we use the average winning time for all the classes on that particular day to normalize the data. An index greater than 1 corresponds to a class that's faster than average and an index that's less than 1 corresponds to a slower than average class. As before, your corrected time will be simply your actual time multiplied by your class index.

As a sanity check, the new 2004 index was been applied to the 2002 autocross and time-trial results. No single model or class dominated the results. Individual events would have been won by everything from a 1965 356 to a 2000 Boxster-S, and from AS/S to AR. Of course we hope that the current BRI is better that its precursor, but it seems certain that we will discover flaws in the new system as the years go along.

We'll certainly try to improve upon it again as we add more years worth of results to the database. But a certain number of flaws are actually desirable in that they provide us with a ready-made excuse when comparing our correct times with others. Have fun with it, but try to remember that it's just about bench racing.

2009 Update:

Once again it seemed the time was right to review the data, which we did for the beginning of 2009. After a few months it was felt that something was still not correct and we tweaked it a second time for the remainder of the year.

2010 Update:

The above text was put together by the autocross team and reflects their efforts. The Time Trial team has done similar things, however on a different schedule. The Time Trial BRI was last updated in 2006.

When new classes are created, and cars are shuffled around, generally the old BRI is looked at (where those cars used to be); also looking at where they are now and as necessary some interpolation is done between the classes to come up with the new BRI. None of this is based on performance statistics (they often don't exist yet for new models) and therefore is very much a rough guess.

For example, for 2010 we split 2009's class N into a new N and a new O, with half the models going into each. Since all the models were the same in the 2010 O as they were when they were in the 2009 N, the

new O class was given the same BRI numbers as the N class. Seems reasonable. Of course, the next higher classes all got bumped up one. Old O became new P, old P became new Q, old Q became new R. This was just a matter of shifting the BRI numbers up a class. However, occasionally we create new classes out of the blue, such as OM and LI in this example. Classes for which we have no performance data, and perhaps no cars even exist for them (yet). This was where math and judgment came into action. Maybe the numbers are good. Maybe they aren't.

One area where this has fallen down is the highly modified classes (AR1-AR2). The BRI goes up as you move from A to R and it also needs to go up as you move from Street Stock to Prepared, Improved, etc. So the chart moves up both vertically on the left and to the right horizontally. As the new models kept coming out and the stock cars got faster and faster the BRI numbers for those classes got higher and higher. Since none of these new cars have been modified enough to get into AR-1 and AR-2, we are now in a situation where OM has a higher BRI than AR-1. Obviously this is just based on the math and the fact that there aren't any GT3's in AR-1 right now. However, would a GT3 in AR-1 against a 40 year old 911S in AR-1 be comparable? How could you have one BRI number for both? The real way to fix this is probably through new classes – adding an LR-1 and LR-2 might be one solution.

One must remember that this is just fodder for conversation. While the goal may be to remove all variables except driver skill, it isn't realistic to expect these numbers to truly equalize the classes across the board.

2012 Update:

In 2011 for Time Trial and 2012 for Autocross we revamped the classification system. Basically, there were beginning to be way too many different models of Porsches to have classes based on grouping cars by model. The number of classes was exploding. So we switched to a points based classification system that tries to make it fair for all models based on their performance characteristics. Obviously the BRI had to change with this.

The big change is that we no longer use analysis of actual lap times for BRI. Our general finding is that there is way too much variation from driver skill, tire condition, car setup, and course variation, so with the new system, the process has been to tweak the BRI values based on a "semi-linear" extrapolation of the max equivalent points for each class. The basic assumption is that the points total is a more consistent and less subjective measure of car capability than event data. And so far this seems to be the case. Although this requires a standard equipment CC class points profile for EVERY new SS class car, the BRI is always based on the highest points car in a class (as we use the top of each class points range for BRI). As we are now looking at the cars and no actual event data, we also did away with separate BRI scales for Time Trial and Autocross. They now use identical BRI systems.