NASA-SE Time Trial Vehicle Classification

NASA Time Trial (TT) follows the same classification system as does the Super Touring (ST) wheel to wheel racing class. With NASA Time Trial serving as a gateway to racing, this allows for a relatively seamless transition for drivers looking to make the transition from Time Trial to wheel-to-wheel racing that do not fall into a spec vehicle racing series.

All NASA Time Trial classes are designated based upon vehicle horsepower to weight ratio, which allows just about any vehicle to fit into one of the classes. From the completely unlimited TTU and TTGT classes, where you simply race what you brought, to the most limited TT6 class, there is certain to be a class for every competitor. The TT/ST classification system is progressive, which means that as the class number goes up, so do the restrictions. All classes except for TTU and TTGT utilize modification factors, which can either add to or subtract from the power to weight ratio of your car based upon multiple factors.

- TTU – Unlimited class requiring no classification forms or dyno testing submissions – Race what you bring, as you bring it!

  NOTE: This class also applies to those vehicles with a weight to power ratio that is below the TT1 limit of 6:1 and cannot otherwise fit into any of the power/weight restricted classes.

- TTGT – Unlimited class for production vehicles to compete separately from non-production and track only vehicles, such as sports racers and tube frame chassis cars. This class was created primarily for points purposes for drivers intending to attend the NASA national championships, to ensure that production and non-production cars are not grouped together for championship competition.

- TT1 – Class limited Horsepower to Weight Ratio of 6 to 1 with minimal additional restrictions or power to weight ratio modification factors.

- TT2 – Class limited Horsepower to Weight Ratio of 8 to 1 with minimal additional restrictions or power to weight ratio modification factors.

- TT3 – Class limited Horsepower to Weight Ratio of 10 to 1 with minimal but increased additional restrictions or power to weight ratio modification factors versus TT2 based upon things like NASA Section Width (NSW) of tires used, tire compound, and overall weight of the vehicle.

- TT4 – Class limited Horsepower to Weight Ratio of 12 to 1 with moderate power to weight ratio modification factors based upon changes to the vehicle from its stock setup. Restrictions begin appearing in TT4 related to tires, suspension, and aerodynamic aids, and vehicle weight.

- TT5 – Class limited Horsepower to Weight Ratio of 14.5 to 1 with significant restrictions or power to weight ratio modification factors based upon changes to the vehicle from its stock setup. Restrictions in TT5 increase markedly over TT4, with more limiting restrictions on horsepower, suspension, aerodynamic aids, tires, and vehicle weight.

- TT6 – Class limited Horsepower to Weight Ratio of 19 to 1, with considerable, class specific restrictions or power to weight ratio modification factors based upon changes to the vehicle from its stock setup. Restrictions for TT6 are greater than those of TT5, limiting such factors as horsepower, weight, tires, chassis, body panel and structural alterations, and aerodynamic aids.

- Time Trial Street (New in 2026) – TT Street is not a separate class, but a "class within a class," in that competitors will simply register for their normal Time Trial class (e.g., TT5, TT2, etc.) and, if they meet the "Street" criteria, they will also be eligible for the TT Street Program awards for each event. To be eligible for TT Street, a car must meet two (2) requirements:

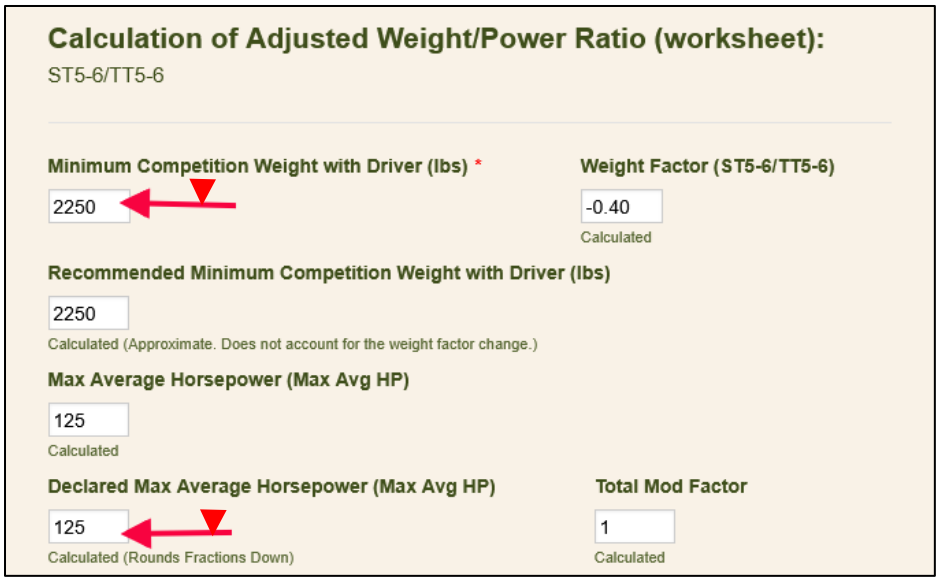
    1. Be equipped with 200+ treadwear tires,
    2. The vehicle must hold a valid, current street vehicle registration (a current state-issued vehicle registration and corresponding current state-issued vehicle license plate).

Full Rules TT1-TT4, TTU & TTGT

Full Rules TT5-TT6

Please note that by default, you should have your classification form to reflect the maximum theoretical HP and minimum theoretical competition weight possible for your vehicle and remain within the class. Doing this allows you to make minor changes to the vehicle throughout the season without having to submit a new classification form each time, so long as those changes don't result in your car exceeding the class power to weight ratio. Since you have to have dyno testing (3 pulls + 50 RPM breakdown of highest HP pull) and a Dyno Certification Form (see "Dyno Certification" below) completed and submitted to compete in one of the power to weight ratio classes (TT1-TT6), your peak HP number from the three pulls on the dyno (or average HP if utilizing that benefit) will be the fixed metric/number used when entering numbers into the online classification form. To get a starting point, enter what you think your car weighs into the minimum competition weight with driver (MCW) box. You will then increase or decrease the MCW number until the box for "Declared Max Average Horsepower" shows the correct horsepower number from your dyno testing already completed. See the following example.

For a car to fall into TT6, it must have a power to weight ratio of 19:1 or above. For this example, we are using a 1999 Mazda Spec Miata. After having the vehicle dyno tested and having the dyno operator complete and sign the Dyno Certification Form, the average HP for the vehicle is 125 horsepower, so that will be your fixed number. Then by adjusting the Minimum Competition Weight number up or down in the designated box (top red arrow), we want to get the Max Avg HP box to equal our dyno tested 125 HP. (bottom red arrow)



Then we would go to the "modification factors" section below the calculation section and select all of those which would apply to our vehicle, which will then automatically add to or subtract from the "adjusted weight/horsepower ratio. For this, we selected the modification factors for:

- Manually, mechanically actuated throttle body (no electronic servo) (+0.3)
- Tire Type (+1.4 – Toyo Proxes RR)
- Suspension design utilizing upper "A-Arm" or "wishbone" type control arms (front or rear) (-0.5)
- Non-OEM metallic and/or spherical design replacement suspension bushing modifications on control/camber/toe arms/links, panhard rods, watts links, and torque arms (includes replaced, modified, adjustable, or altered control arm ball joints) (-0.2)
- NASA Section Width 226mm or less with MCW between 2400 lbs and 2749 lbs (205/50/15 tire +0.3)
- One or more cage bars that penetrate the front bulkhead/firewall (-0.3)
- BTM (Base Trim Model) Aero (see TT rules section 6.1.4) (+0.4)

Power (ST5-6/TT5-6) *

- [x] Manually, mechanically actuated throttle body (no electronic servo) +0.3
- [ ] Not Applicable

Tire Size (ST5-6/TT5-6) *

- ( ) NASA Section Width 257mm or less with MCW greater than 2749 lbs +0.3
- (•) NASA Section Width 226mm or less with MCW between 2400 lbs and 2749 lbs +0.3
- ( ) Not Applicable

Tire Type (ST5-6/TT5-6) *

- ( ) BFGoodrich g-Force Rival +/ g-Force Phenom T/A, Continental Extreme Contact Force/ EC Sport/ EC Sport 02, Cooper RS3-R, Falken Azenis RT615K+, Hankook Ventus RS4, Maxxis Victra VR-1, Michelin Pilot Sport 4S, Nankang AR-1/ NS-2R 180, Toyo Proxes R1R/ R888/ R888R/ RA-1, Valino VR08GP +2.0
- (•) Bridgestone Potenza RE-71R/ RE-71RS, BFGoodrich g-Force Rival S 1.5, Dunlop Direzza ZIII, Falken Azenis RT660, Federal 595 RS-RR, Goodyear Eagle FI SuperCar 3, Hoosier RCES/ Track Attack Pro, Kumho ECSTA V730, Maxxis Victra RC-1/ VR-2, Michelin Pilot Sport Cup 2/ 2 Connect, Nankang CR-1/ CR-S, Nexen Nfera SUR4G, Nitto NT01, Toyo Proxes R/ RR, Yokohama Advan A052/ Advan Neova AD09 +1.4
- ( ) Bridgestone RE71RZ, Goodyear Eagle F1 Supercar 3R, Vitour Tempesta P1 +0.5
- ( ) Hoosier R7, Yokohama A055 +0.0
- ( ) Hoosier R8 or tire type not listed above -1.0

Suspension (ST5-6/TT5-6) *

- [x] Suspension design utilizing upper “A-arm” or “wishbone” type control arms (front or rear) -0.5
- [ ] Replace, modify, or remove control arms, camber arms/links, toe arms/links (Applies only if beyond the allowances of Section 6.1.9.4) -0.5
- [ ] Add, replace, or modify a Watts link, Panhard Rod, or Torque Arm -0.5
- [x] Non-OEM metallic and/or spherical design replacement suspension bushing modifications on control/camber/toe arms/links, panhard rods, watts links, and torque arms (includes replaced, modified, adjustable, or altered control arm ball joints) -0.2
- [ ] Non-OEM shocks/struts with an external reservoir (or piggyback) OR with shaft diameter 40mm or greater -0.7
- [ ] Increase in track width greater than four (4) inches -0.7
- [ ] Conversion from leaf spring or torsion bar to coilover shock springs -0.5
- [ ] Not Applicable

Chassis (ST5-6/TT5-6) *

- [x] One or more cage bars that penetrate the front bulkhead/firewall -0.3
- [ ] Not Applicable

Body (ST6/TT6) *

- [x] BTM Aero (see 6.1.4) +0.4
- [ ] Modification of the OEM roof line/shape and/or windshield/frame removal (convertibles only) -0.4
- [ ] Modification of the floor pan for exhaust clearance only and/or the rocker panel for side exit exhaust only -0.2
- [ ] Single element rear wing or spoiler -1.0
- [ ] Single, Flat, Horizontal Front Splitter (no greater than 4") -1.0
- [ ] Front Air Dam -1.0
- [ ] Not Applicable

With these modification factors having been automatically calculated and figured into the form, our total modification factor is +1.0 (bottom red box), which takes into consideration our weight factor of -0.40 (top red box). The weight factor figures in and adjusts for the weight of vehicles, with penalties for lighter vehicles and a marginal benefit for heavy vehicles per 6.3.2 – Modification Factors of the TT5-TT6 rules:

6.3.2 **Modification Factors**
The "Modification Factor" listed after each item below is added or subtracted from the actual measured Wt/HP ratio to calculate the "Adjusted Wt/HP Ratio" which determines vehicle compliance.
Competition Weight:

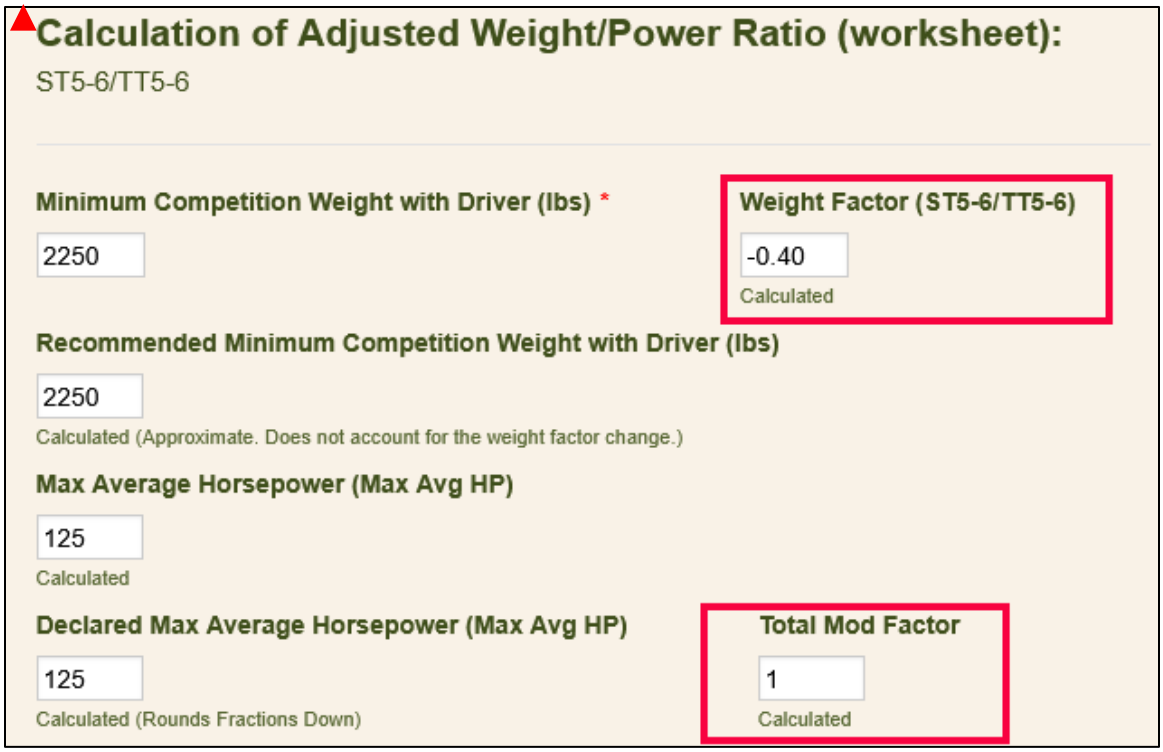
Less Than:

2850 lbs = -0.1	2450 lbs = -0.4
2650 lbs = -0.2	2250 lbs = -0.5
2550 lbs = -0.3	2150 lbs = -0.6

Greater Than:

3300 lbs = +0.1	3500 lbs = +0.3
3400 lbs = +0.2	3600 lbs = +0.4

After all addition and subtraction from the modification and weight factors, we ended up on the positive (beneficial) side and our final weight to power ratio has gone from 19.0 to 1, to 18.0 to 1, since that +1.0 was factored into the 19.0.



Calculation of Adjusted Weight/Power Ratio (worksheet):

ST5-6/TT5-6

Minimum Competition Weight with Driver (lbs) *

2250

Weight Factor (ST5-6/TT5-6)

-0.40

Calculated

Recommended Minimum Competition Weight with Driver (lbs)

2250

Calculated (Approximate. Does not account for the weight factor change.)

Max Average Horsepower (Max Avg HP)

125

Calculated

Declared Max Average Horsepower (Max Avg HP)

125

Calculated (Rounds Fractions Down)

Total Mod Factor

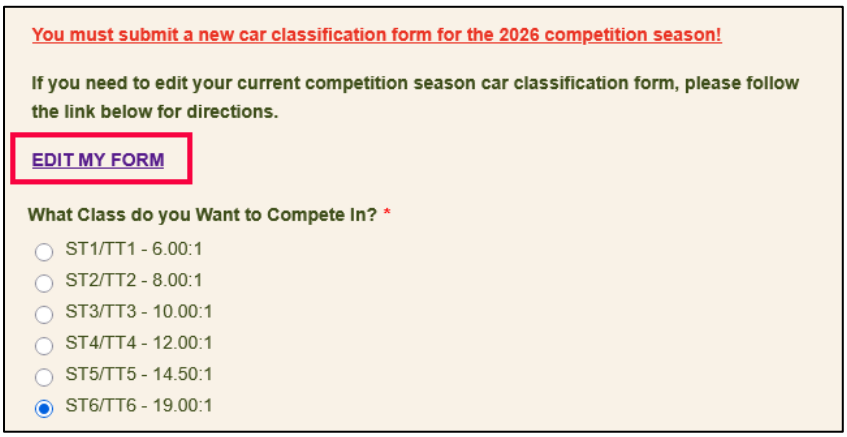
1

Calculated

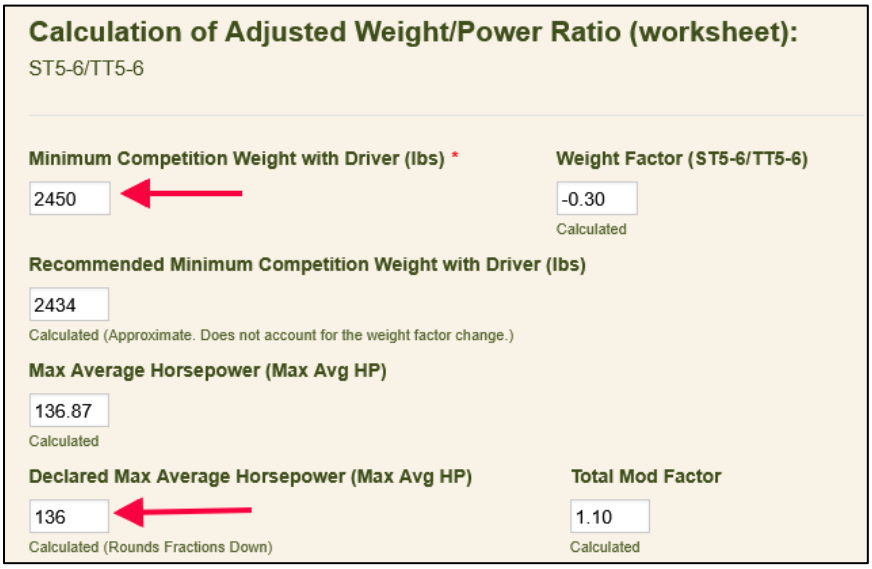
Since the classification form automatically sets your minimum competition weight to the lowest possible number based on your horsepower, the number shown on the form for your minimum weight may be a little or a lot lower than your actual weight with driver, which is fine. In this case, the actual weight + driver of the example Miata is 2400 lbs; however, with the 125 HP dyno-tested power level, and all modification factors figured in, this Miata could remove 150 lbs of weight from the car, down to 2,250 lbs, and still be TT6 compliant.

If you are driving this example Spec Miata, you may decide that you want to add more HP to compete in TT6, so you take it out of Spec Miata trim and remove the 38mm restrictor plate at the throttle body. For this example, since you removed the restrictor plate, and you have thus increased the power level of your car, you must take the car back to the dyno to have a new 3-pull dyno testing done along with a new signed dyno certification form by the dyno operator. Per the 3-pulls dyno testing, your new maximum average HP number is 136 horsepower so you will need to edit your TT6 classification form to reflect that new higher HP number.

***NOTE**: When you first submit your online TT classification form, you receive an email confirmation that includes a copy of the classification form in PDF format. **SAVE THE EMAIL CONFIRMATION**. On the email confirmation will be a link that says "EDIT MY FORM" or something to that effect. If you need to update your classification form, you only need to click that "EDIT MY FORM" link and it will bring up your existing form so that all you must do is adjust what is needed to be accurate. If you do not have your email confirmation, then at the top of the classification form is a hyperlink that shows "EDIT MY FORM" which will take you to the instructions for accessing your classification form to update it with the new HP number.*



Once you go to your saved email classification form confirmation and click the link to edit the form, where in the case of the 99 Spec Miata, we will need to increase the minimum competition weight number until the declared average HP (Max Avg HP) number reflects our new 136 HP number.



As seen above, our new horsepower of 136 means that our new minimum competition weight is 2450 lbs. Therefore, once you've updated your classification form and notified the TT Directors (TimeTrial@nasa-se.com) that you submitted an updated form, when you roll across the scales at post-competition impound at your next TT event, the scales cannot read your car + driver to weigh any LESS than 2,450 lbs.

PLEASE NOTE: The figures reflected on your classification form are the basis used for post-competition impound of competitors' vehicles. If we dyno impound your vehicle and it makes more power than you have reflected on your class form, you will be disqualified from that full day of competition. Just the same, if we weigh your car and it comes in *under* your listed MCW (with a 5 lb cushion for scale variance), you will be disqualified from that full day of competition.

Check out the NASA ST/TT online car classification form where you can check into which class your car may fit along with the full extent of the progressively increasing modification factors for each class. You can also check out all of the NASA TT rules, class rules, contingency award programs, and more on the official NASA Time Trial forms and rules page found at https://members.drivenasa.com/rules.

DYNO CERTIFICATION

We had multiple situations in recent seasons where due to non-compliance issues with a dyno certification form, testing data, or 50 RPM breakout of the highest HP pull of the 3 mandatory pulls, a competitor had to have his dyno testing and certification redone before the upcoming event, or else compete in the TTU or TTGT classes for the weekend. We do not want to see that happen to anyone. Therefore, we are making it abundantly clear as to what the expectations are for both the competitor, and the dyno operator to be compliant with the TT classification rules. The dyno certification form that you will need to PRINT and bring with you to your appointment at the dyno can be found at the following link: https://www.nasaproracing.com/forms/ST_dyno_certification_form.pdf

On the **FIRST PAGE** of the dyno certification form, you will find the step-by-step instructions for what is needed to obtain dyno testing results that are compliant with the rules. If the dyno operator you are using has not done dyno testing for NASA competition before, it would behoove you to send him the dyno certification form ahead of time AND bring the printed copy with you to the appointment on the dyno. Just so that there is no confusion, the page with the instructions is page 1 of 3 pages in the PDF document, and it looks like this:

NATIONAL AUTO SPORT ASSOCIATION

NATIONAL AUTO SPORT ASSOCIATION ®

NASA Super Touring (ST) and Time Trial (TT) Official Dyno Certification Form (rev 3/22)

Dyno Testing Procedures:

1) All Dyno tests must be performed in a commercial facility or on a portable Dyno that offers chassis dynamometer testing as part of their business and is open to the public. The Dyno operator cannot be the vehicle owner, the competitor, or a crew member, and must work for the business.

2) All Front Wheel Drive (FWD) and Rear Wheel Drive (RWD) vehicles must be tested on a Dynojet model dynamometer.

3) All Wheel Drive (AWD) vehicles may be tested on a Dynojet, Mustang, Dyno Dynamics, or Dynapack dynamometer. Mustang and Dyno Dynamics results will have 10% added for classing calculations.

4) An inductive pickup or other direct sensor shall be used to measure engine RPM, not via the ECU/OBD port or from calibration from the vehicle's tachometer. (If it is physically impossible to obtain RPM data from an inductive pickup or direct sensor due to vehicle configuration, the Dyno operator must note on the Dyno sheet the method used for obtaining RPM data, and the reason for not using an inductive pickup or direct sensor, and the competitor must notify the National ST Director and/or National TT Director before competition).

5) At least three (3) separate, reproducible tests shall be made for each permitted power configuration, with graphs printed together on the same sheet, with horsepower and torque on the Y-axis and RPM on the X-axis. SAE J1349 Rev JUN 90 correction shall be used, along with a smoothing factor of five (5).

6) The numerical table of horsepower and RPM for the run with the highest Max HP shall be printed out in 50 RPM increments (unless the competitor elects to simply use Max HP for all classing calculations).

7) The Dyno graph printout and numerical table must identify the date/time, car owner's name, car number, car year/make/model, shop name and phone number, and Dyno operator's name.

8) The vehicle must be tested at normal operating temperature (as when on track).

9) The tires must be inflated to at least 28 psi (but should be at normal operating track tire pressure if higher to obtain results that will correlate as closely as possible with post-competition Dyno testing.)

10) The hood shall be open, with a cooling fan placed in front of the engine/radiator during testing.

11) The vehicle must be tested in the gear producing the highest horsepower readings, which is typically the gear closest to a 1:1 ratio—commonly 5th gear for BMW M3's, Honda S2000's, Mazda RX-8's, Nissan 350/370Z's. (Note that it is the competitor's responsibility to ensure that the vehicle is compliant in all gears).

12) All Dyno graphs must show decreasing power for 1500 RPM from the Maximum horsepower level, or the car must reach the physical rev-limiter during the Dyno testing.

13) Engine, ECU, boost controller, restrictor plate, etc. adjustments shall only be made between Dyno runs in order to obtain the required additional sets of three Dyno tests for each configuration. Any restriction device placed in the air intake system must be clearly identified and marked to indicate its dimensions.

14) All horsepower measurements shall be rounded to the nearest whole number before calculations.

If you have classification questions for competing in NASA-SE Time Trial, please submit an email to TimeTrial@nasa-se.com and we will either answer your questions or find someone who can, and get the answers for you.

Thank you,

Brendan Shattles & Roy Parsons
Your NASA-SE TT Directors