

**ADVENTIGNITIONS**

Anaheim, CA USA

# **SportTACH**

## **User Manual**

Revision J (02-22-11)

**Install SportTACH**  
**Install EGT Probes**

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# User Instructions

## SportTACH/EGT

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## SportTach / EGT

### User Manual

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#### What can this thing do?

The SportTACH incorporates the important features in a single product. No other tachometer has such a

feature-rich offering.

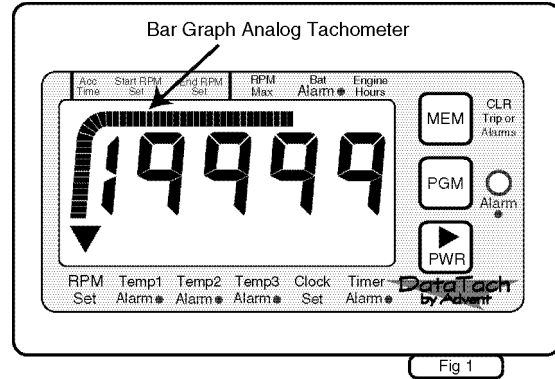
### Displays 10 different measurements

- Digital RPM with simultaneous analog RPM
- Acceleration (hole shot) time
- Maximum RPM
- Battery voltage
- Total engine hours
- Timer - 24 hr format
- Time of Day - 12 hour format
- Optional temperature sensors for EGT, water, air etc

### Stores nine different Limit & Alarm settings

**Setups:** Select number of Sparks per Rev (S/R)  
Set current Time of Day (TOD)

**Limits & Alarms:** Set Timer Alarm - Alarm  
Battery low voltage - Alarm  
Acceleration time starting RPM - Limit  
Acceleration time ending RPM - Limit  
Over temperature for Temp1 - Alarm  
Over temperature for Temp2 - Alarm  
Over temperature for Temp3 - Alarm



### What's on the Display?

The Liquid Crystal Display (LCD) is comprised of three separate sections, see Figure 1.

4 ½ digit large format (.75" high) decimal display.

**Bar Graph** – 4 functions, 60 segments


1. Tachometer mode - the bar functions as an “analog” RPM meter
2. Time keeping modes - to indicate the seconds or minutes portion of the displayed time
3. Top menu function selected indicator
4. Indicates digits selected for change during programming (PGM) mode

**Bottom Pointers** – Indicates which bottom function is selected.

### Key Pad Functions

The SportTACH provides three user keys. The following is an overview of each key. A detailed description of the key functions and usage is found in later sections.

#### MEM Key

The memory  key provides four functions:

1. Reset timer

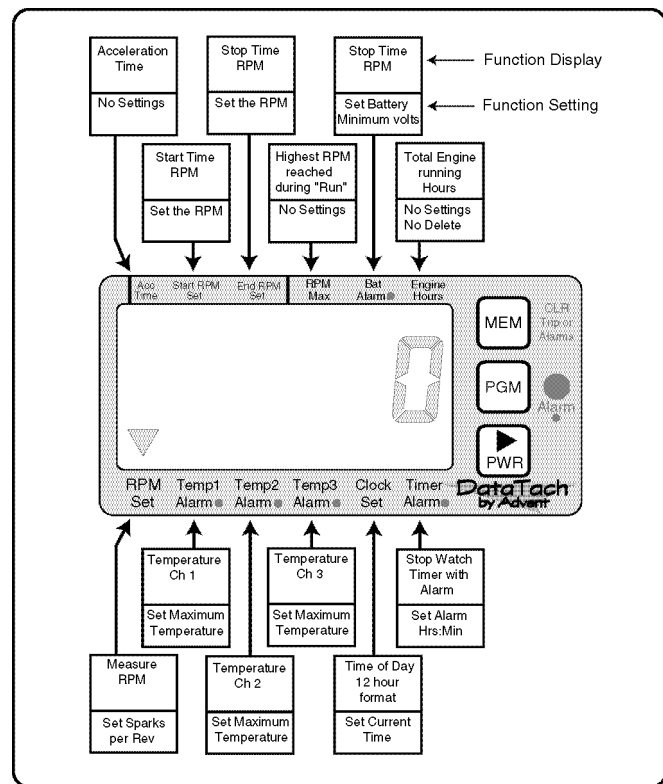



Fig 2


2. Turn off Timer alarm
3. Select logger data display mode
4. In logger mode: select 1 of 6 memories to view

### PGM Key

The program  key provides two functions:

1. Enter programming mode for selected function
2. Select digits to change when in programming mode

### Power Key


The power  key provides four functions:

1. Power ON - Turn on the SportTACH
2. Select the bottom or top function menus
3. Select a function in current menu
4. Increments selected digits value in Program Mode

## Measurement Functions and Alarm memory organization


The SportTACH functions are arranged in two function menus. Functions that are used most often are arranged along the bottom of the display. The less used are arranged along the top.

## Accessing and Changing Alarm Memories

The Limit & Alarm memories are associated with their related measurement functions. Example: When “Battery Meter” is selected, the minimum battery voltage Limit memory can be accessed by depressing the  key, then follow the procedure in the **Programming Memories** section.

## Turning the SportTACH ON/OFF


### Turn the SportTACH ON (engine not running)

- The SportTACH turns ON automatically when the engine starts
- Or, momentarily depressing  turns the SportTACH ON when the engine is not running

### Turn the SportTACH OFF

- The SportTACH will power OFF automatically two minutes after the engine is shut off
- If the power is turned ON when the engine is not running, the SportTACH will automatically turn OFF two minutes after the last key press

## Moving around the Display

The  key is used to move around the display by selecting the top or bottom function menu, then moving through the choices on that menu.

## Moving between the TOP and BOTTOM function menus

1. Depress & hold (1.5 seconds) to move between the top and bottom menu
2. The current function menu is active until the other function menu is selected

### Select a Function within its menu

Depress to sequence through each of the six functions in the current menu. Some functions have memory associated with them. The related memory can be programmed once the display function is selected.

**NOTE:** EGT functions are available on the SportTACH / EGT and not the SportTACH.

### Set Sparks per Revolution for 2-& 4-Stroke-Engine

1. Select the bottom function menu if not already selected
2. Depress until RPM function is selected as indicated by the display pointer. The current sparks per revolution value is shown on the display
3. Depress to enable sparks-per-rev editing
4. Depress until the desired number selected from the table below is displayed

- 0 = 1 spark per 2 revs (4-stroke engine)
- 1 = 1 spark per rev (2-stroke engine with one coil for each cylinder)
- 2 = 2 sparks per rev (2-stroke engine with one coil for two cylinders)
- 3 = 3 sparks per rev (digital tach signal from most 3-cyl 2-stroke engines)

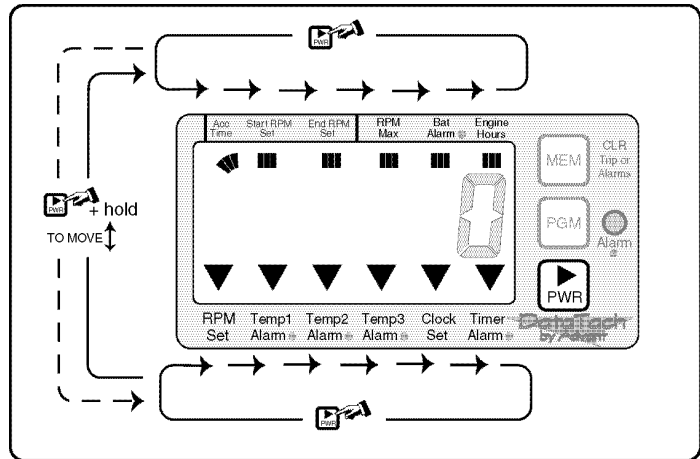


Fig 3

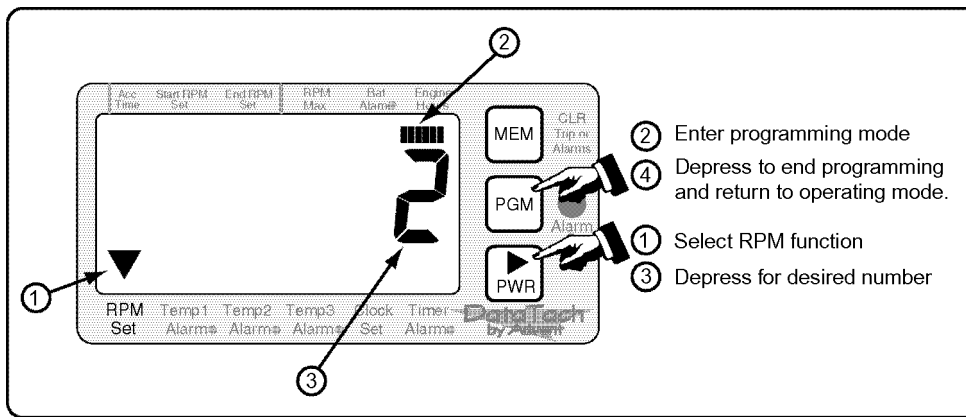


Figure 4





Note: If no keys are depressed for 5 sec SportTACH returns to normal operating mode

5. Depress to accept new setting and exit programming, or wait 4 seconds and the setup editing operation will close automatically.

### Set Clock to Time of Day – 12 hour format

Refer to Figures 5a, 5b, & 5c and the instructions that follow.

- (Fig 5a) ① Depress to select Clock
- (Fig 5a) ② Depress to select the Clock hours memory
- (Fig 5a) ③
- (Fig 5b) ④
- (Fig 5b) ⑤
- (Fig 5c) ⑥

- Depress  until the correct hours value (00 - 12) is displayed
- Depress  to accept value and move to the TIME OF DAY minutes memory
- Depress  until the correct minutes value (00 - 59) is displayed
- Depress  to accept new setting and exit memory programming

## Programming Limit & Alarm Memories

The following example may be used for programming all other memory functions in the SportTACH. Follow the example below exactly for each of the function memories you wish to change.

### Example: Temperature 1 Alarm memory programming (EGT model only);

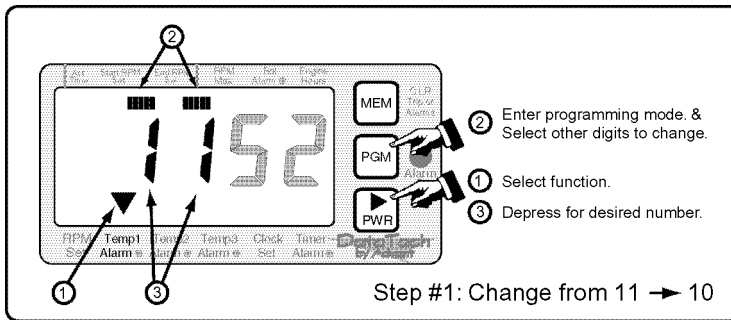


Figure 5a

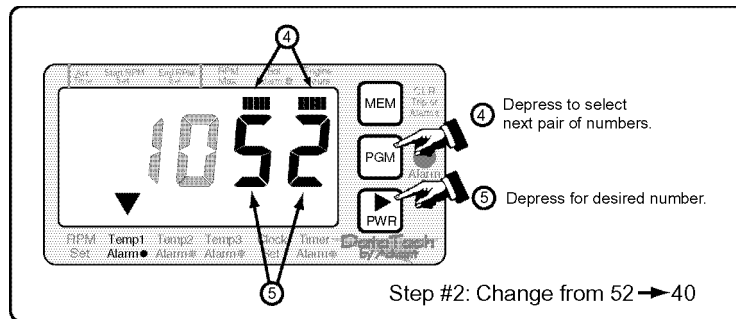


Figure 5b

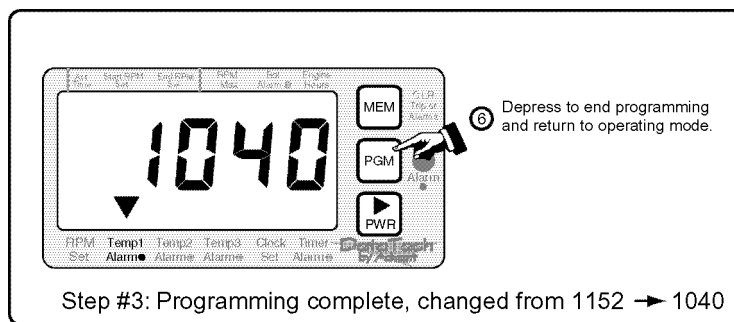












Figure 5c

## Set Temperature 1, 2 & 3 Limit Alarms - (DT/EGT model only)

Refer to Figures 5a, 5b, & 5c and the instructions that follow.

The procedure is the same for each of the Temperature Limit Alarms.







- (Fig 5a) ① Depress  to select Temp1, Temp2 or Temp3. Its current setting is displayed
- (Fig 5a) ② Depress  to enter the '1000s' digit
- (Fig 5a) ③ Depress  until the correct value (0 - 1) is displayed
- (Fig 5b) ④ Depress  to accept the value and select the '100s' digit
- (Fig 5b) ⑤ Depress  until the correct value (0 - 5) is displayed
- (Fig 5b) ④ Depress  to accept the value and select the '10s' digit.
- (Fig 5b) ⑤ Depress  until the correct value (0 - 9) is displayed
- (Fig 5b) ④ Depress  to accept the value and select the '1s' digit
- (Fig 5b) ⑤ Depress  until the correct value (0 - 9) is displayed
- (Fig 5c) ⑥ Depress  to accept the new setting and exit memory programming

### **Set Timer Alarm – 24 hour format**

### **Set Low Battery Alarm Voltage**

### **Set Acceleration Timer Beginning & Ending RPM**

Refer to Figures 5a, 5b, & 5c and the instructions that follow.

- (Fig 5a) ① Depress  to select Function
- (Fig 5a) ② Depress  to select first digit (left most)
- (Fig 5a) ③ Depress  until the desired value is displayed
- (Fig 5b) ④ Depress  to accept the value and select next digit
- (Fig 5b) ⑤ Depress  until the desired value is displayed
- (Fig 5c) ⑥ Depress  to accept the new setting and exit programming

## **Using the SportTACH**

### **Turning the SportTACH ON**

- Starting the engine turns ON the SportTACH
- Depress the  key to turn ON the SportTACH when the engine is not running

### **Measuring RPM**

Select the RPM display mode. The RPM is displayed in both digital and analog format. The digital display is best for

making accurate measurements during tuning and other service work. The analog is best when you are riding and have only a moment to view the display. It takes the brain longer to recognize a digital number and Figure out what it means. The analog meter gives you a quick relative RPM view that the brain can understand quickly. The beauty of the analog tachometer is that you will find it to be an easily read reference when riding once you have used it for a while.

### Maximum RPM measurement

Select the Max RPM mode to view the highest RPM the engine reached during the last run. An interesting use of this function is selecting Max RPM prior to the run. This allows you to view the Max RPM at any time during the current run.

Each time you start your engine, a new Max RPM measurement starts. This means that a new Max RPM measurement starts when the engine starts, then holds the highest RPM reached when the engine is stopped.

## Clock and Timers

### Time of Day Clock

The clock is a 12-hour format. There is no AM/PM indicator provided.

### Timer and its Alarm


A timer is provided to measure elapsed time that begins when the engine is started. Once started, the timer runs continuously even when the engine is stopped. This timer can be used to monitor how long you've been out on a ride, how long it took to reach your destination, etc.

Once the engine starts the timer will always run until Stopped/Reset. This is the only time the timer will not run and will be show 00:00.





### Starting the Timer

Before the timer can be restarted it must be stopped (if currently running). Use the **Stopped/Reset** function, See "Stop/Reset the Timer" below. Once Stopped/Reset the timer will automatically start the next time the engine is started. The timer continues to run from that moment whether the engine is running or not. To stop the timer use the "Stop/Reset the Timer" function.

### Reading the Timer

1. Select the bottom function if not already selected. Depress  to select TIMER display  
The timer is displayed and can be read. Note that the timer is still running.

### Stop/Reset the Timer

1. Depress  to turn ON SportTACH if required
2. Depress  to select TIMER display
3. Depress  + **HOLD** (1.5 seconds). Release  and timer will stop and display shows 00:00

### Set Timer Alarm

The timer includes an Alarm function. You can set the alarm just like an alarm clock. The maximum settable alarm time is 23 hours 59 minutes. When the timer is running and the alarm time is reached, the Alarm LED turns ON.

### Shut off Timer Alarm LED

When the Timer Alarm LED is lighted the SportTACH automatically selects the Timer display. This is a hands free function so the rider can note the event. Alarms have priority, no other function may be selected while the Timer Alarm LED is lit. The user must turn off the Alarm LED before any other function can be selected.



Depress  to turn OFF the Alarm LED, The SportTACH then automatically returns to the previously selected function display.

- The Timer will continue to run but the Alarm LED will no longer be ON

If the Timer is running and the Alarm LED was previously turned off, it will turn ON when the engine is restarted. You may shut off the timer's Alarm LED again by following the procedure above. If you want to shut off the timer, perform the "Stop/Reset Timer" function (while engine is not running). The timer will start once again when the engine is started but the Alarm LED will not be lit until the programmed alarm time is reached.

## Engine Hour Meter

The engine hour meter is an 'odometer' of the total time the engine has been run. The timer is capable of recording up to 19,999 hours and 59 minutes in one-minute increments over the entire time. The digital display indicates full hours while the analog bar graph indicates minutes. This is useful for service and maintenance reasons, not to mention just knowing how much use the vehicle has gotten.

The engine hour meter cannot be changed by the customer. The SportTACH may be returned post paid to Advent if it becomes necessary to reset the timer. A nominal charge will apply, plus shipping.

## Battery Voltage Measurement and Alarm

The SportTACH has a built-in voltmeter to monitor the battery condition. This is an important tool to confirm the overall quality of your battery for safety and maintenance reasons. It could save you from being stranded while on a ride.

The voltmeter has an alarm. You can set the low battery voltage alarm as low as 5.0V. The SportTACH will monitor the battery voltage and when it discharges to voltage set the Alarm LED lights and the display indicates battery voltage.

If you are running a total loss ignition, the SportTACH battery voltage monitor is a very useful instrument to have with you.

## Acceleration Timer

This is a great feature that can help you improve your race skills in an area that really counts, during the hole shot. The hole shot is where races are often won or lost. The "Acc Time" function measures the time it takes your engine to accelerate between a low "START RPM" up to the higher "END RPM".

The user programs any starting and ending RPM values into the "Acc Time" memory. Please note it is important to enter the lower RPM value into the "START RPM" memory, and the higher RPM value into the "END RPM" memory. Failure to follow this simple requirement will result in no measurement being made.

As an example, say the "START RPM" is set to 2500 RPM and the "END RPM" is set to 7100 RPM. Out of the hole, when the engine accelerates through 2500 RPM, the timer starts. The timer runs until the engine reaches the passes through the 7100 RPM ending point where the timer stops. The time recorded is the amount of time it took the engine to accelerate from 2500 to 7100 RPM.

This function can be used to tune the engine, drive system, and handling package. It can also be used to improve the rider's "hole shot" and acceleration techniques.

## Temperature Measurements – EGTs required

The EGT ready SportTACH supports attachment of up to three temperature probes. The probes can be used to measure temperatures from 32° F up to 1600° F.

Each temperature probe has a separate over-temp alarm memory that may be set to any value above 32° F. This allows each temp sensor to be monitored independently as required for each cylinder specific and unique characteristics.

**NOTE: Temperature Alarms cannot be disabled, and no other function can be selected while a temperature**

**alarm is active. Resolve the cause of the over-temperature problem; bring the temperature below the alarm value and then the SportTACH will resume normal operation.**

## 6x DATA LOGGER

### What is Data Logging?

Data logging is the process of recording information measured by the SportTACH for future playback and analysis.

### 6x Data Logger “Function” Overview

- Data is stored even if the SportTACH is unplugged
- Data Logging records the time of day when “Run” started.
- The SportTACH stores up to seven data values from each “Run”, see Table 1a
- The Data Logger function saves data from the last six “Runs”
- The oldest of 6 stored “Runs” data is lost as the current “Run” data is stored
- Reading the memory is non-destructive

**Note: The Data Logger Memory cannot be deleted, the previous 6 “Runs” are viewable and older ones are deleted.**

### Data Logger Mode indicator

When the Data Logger display mode is active the SportTACH display appears to be in the measurement mode to the casual observer. Further, if you depress PWR button to move between menu items you'll find that it jumps to readings in a seemingly random order as compared to the consensual order seen in normal mode operation. To deal with this possible confusion the Alarm Lamp will blink slowly when the instrument is in the Data Logger display mode. Read further for how to enter and exit the Data Logger mode.

Table 1a and 1b show the data types stored in each “Run” memory for the SportTACH.

DataTach / EGT Data Logger - data format

"Run" Memory Contents		Data Maximum Values
"Run" Data Contents	RECORDED DATA	DISPLAY FUNCTION
1.	Time Stamp	Start of Run, time of day
2.	Maximum Temp1	2000 degrees, EGT model only
3.	Maximum Temp2	2000 degrees, EGT model only
4.	Maximum Temp3	2000 degrees, EGT model only
5.	Acceleration time	hole shot 99.99 seconds
6.	Maximum engine RPM	19990 RPM
7.	Length of event	99 minutes 59 seconds maximum

Table 1a

## DataTach Data Logger - data format

"Run" Memory Contents		Data Maximum Values
"Run" Data Contents	RECORDED DATA	DISPLAY FUNCTION
1.	Time Stamp	Start of Run, time of day
2.	Acceleration time	hole shot 99.99 seconds
3.	Maximum engine RPM	19990 RPM
4.	Length of event	99 minutes 59 seconds maximum

Table 1b

## Retrieving Logger "Run" Data

### Select and view the stored data from the most recent six "Runs"

- The logged (stored) data can be retrieved and viewed **only** when the engine is **not** running.
- The most recent 6 "runs" are held in memory and are viewable.

### Select a "Run" by the Time of Day Time Stamp

As you cycle through the stored run data the the value displayed for each run is the time of day (TOD). This is your indicator of what data set you have selected. This cataloging method gives you an indication as to what the logged data is based on time of day. Each data set has a time stamp where data set (#6) will have the earliest time-of-dat stamp and the most resent (#1) data set will have the latest time-of-day stamp

## SportTACH / EGT - 6X Data Logger

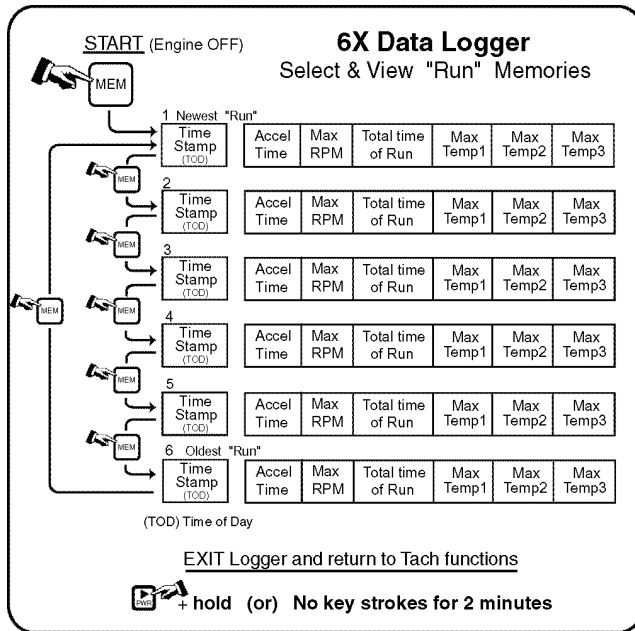


Figure 6a

(1.5 seconds). OR the SportTACH will be depressed for 2

**NOTE:** The Logger mode may be entered from any display except the Timer display.

1. With the **engine OFF**, depress to turn on the SportTACH.
2. Depress to enter the "Data Logger" mode, see Figure 6a, the alarm LED blinks.

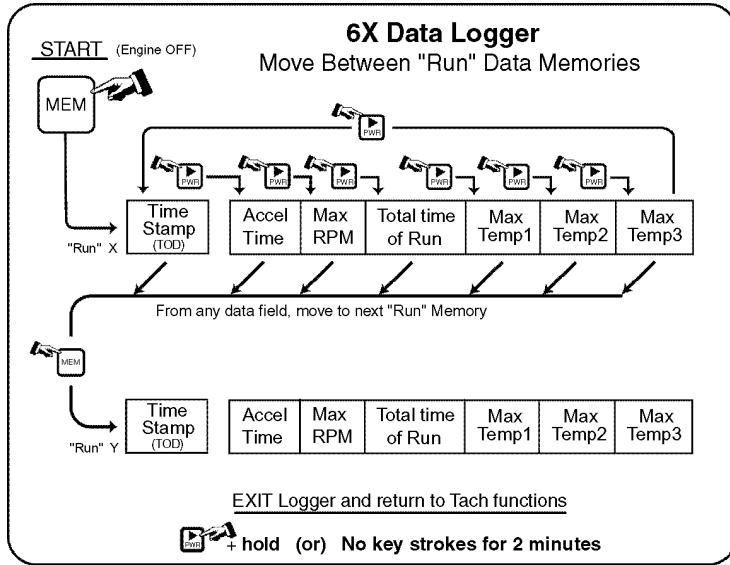
2. The display shows the "Time-of-day Stamp" for the most recent "run"

**Note:** The "Time Stamp" is the Time-of-Day the "Run" was started.

3. Depress to step through the other "Runs" Time Stamps in order of time-of-day to select the "Run" of interest
4. Refer to the next section on how to view the data associated with a selected Time-of-day Stamp
5. To exit the View Data Logger function and return to the measurement function mode simply depress + **HOLD** for 1.5 seconds, or automatically turn off if no keys are depressed for 2 minutes

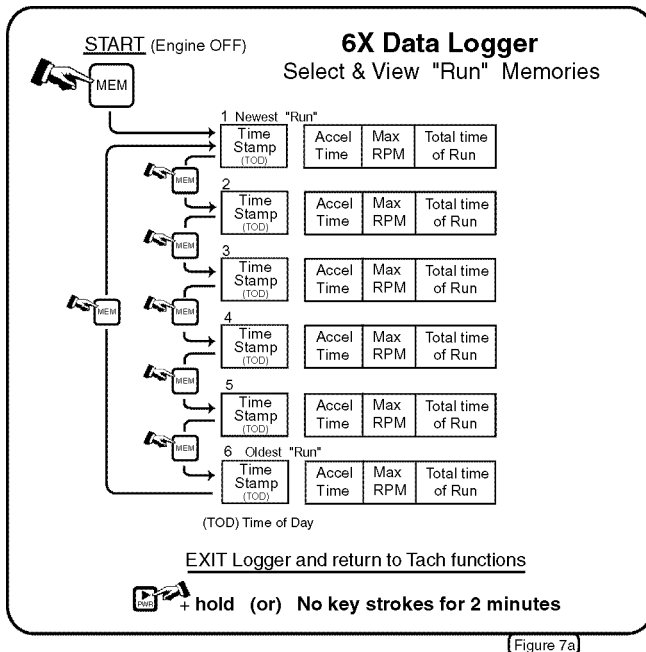
## Move around within the Data Sets of each “Run”

1. After selecting the desired “Run”, depress to enable stepping through the data memory, see Figure 6b
2. Depress to step through and view the stored “Run” Data associated with the selected time-of-day stamp



3. To exit the View Data Logger function depress + HOLD for 1.5 seconds. OR the SportTACH will automatically turn off after 2 minutes.

## SportTACH (no EGT) - 6X Data Logger



3. With the engine OFF, depress to turn on the SportTACH.

1. With the engine OFF, depress . The SportTACH enters the “Data Logger” mode, see Figure 6a
2. The display shows the “Time Stamp” for the most recent “Run”

**Note: The “Time Stamp” is used to identify the “Run” you are interested in viewing**

3. Depress to step through the other “Run” Time Stamps to select of “Run” of interest
4. Refer to the next section on how to view the data associated with a selected Time Stamp
5. To exit the view Data Logger function and return to the measurement functions mode simply depress + **HOLD** (1.5 seconds). OR, the SportTACH will automatically turn off after 2 minutes.

## Move around within the Data of each "Run"

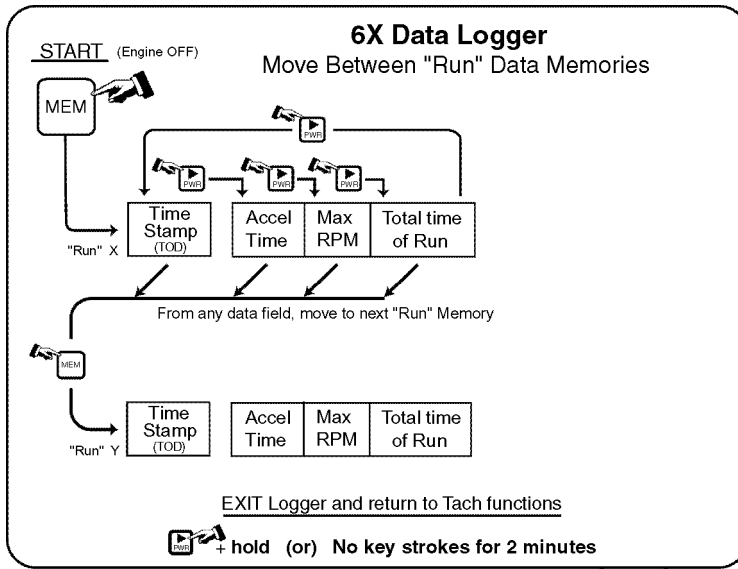


Figure 7b

1. After selecting the desired "Run" by time-of-day stamp, depress to step through that data memory, see Figure 6b
2. Depress from any data window to exit the current Run data set
3. To exit the Data Logger function and return to the measurement functions mode simply depress + 1.5 sec HOLD. OR the SportTACH will automatically turn off if no keys are depressed for 2 minutes

## Definition of Terms:

<b>Alarms</b>	Except for the Clock function, Alarms are programmed into functions as a warning that a measurement is “Out of Range” and may cause harm to the engine. The exception is the Clock Function where the Alarm does not indicate danger of damage.
<b>Acceleration Time</b>	Measures the elapsed time of engine acceleration between a low starting RPM and a higher ending RPM value. Range is .01 seconds to 99.90 seconds.
<b>Bar Graph</b>	A series of 60 segments positioned along the left side and top of the display. The Bar Graph is used to display various measurements as well as act as Top function indicators.
<b>Battery Voltage</b>	The voltage of the primary battery in the sport vehicle as measured by the SportTACH.
<b>Data Logger</b>	A data logger is a function that collects data about the “Run” and stores it in memory. The SportTACH has six Data Logger memories to store six sets of data from six “Runs”.
<b>SportTACH</b>	Integrated test and measurement instrument.
<b>EGT</b>	Exhaust Gas Temperature
<b>Limits</b>	A number entered into a Function memory that is used to perform the function. The only Limit values used in the SportTACH are associated with the Hole Shot Timer function.
<b>Maximum RPM</b>	The highest RPM reached by an engine as measured over a time period.
<b>Memory</b>	Functions that use settings, limits, or alarms store this data in memory locations that are non-volatile (do not lose the data when the power is turned OFF). The data in these memories can be changed at any time.
<b>RPM</b>	Revolutions per Minute of any spinning device, such as an engine crankshaft.
<b>Run</b>	Defined as a single trip that starts when the engine is started and ends when the engine is turned OFF. This includes a course race, drag race, an excursion trip or short test runs.
<b>Settings</b>	The SportTACH requires the “Sparks per Revolution” and the “Time of Day Clock” settings to be made prior to the SportTACH's use. These settings are made in the same manner as Limits and Alarms.
<b>Sparks per Revolution</b>	A setting required in order to display the correct RPM values for a specific engine. If the value is incorrect, the RPM reading will also be incorrect.
<b>Temperature Sensor</b>	A device used to measure temperatures.
<b>Time-of-Day</b>	The current clock time or a recorded time when a data set was being logged.
<b>Timer</b>	24 hr format, similar to a stopwatch. Timer can be started and run until stopped. When started the Timer runs whether or not the engine is running.
<b>Timer Alarm</b>	The Timer has an alarm that can be set for up to 24 hours. Acts as an alarm clock.
<b>Time Stamp</b>	When data logging is active the first data saved is the time of day (12 hr format) for each “Run”. The time stamp helps categorize each run based on time.
<b>Total Engine Hours</b>	A special clock contained in the SportTACH that measures the time the engine has been running.

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