

T6 FOR DUMMIES

version 1.0

Jan van Die

INTRODUCTION

Congratulations! You just bought a Suunto T6, one of the most sophisticated wristopcomputers for runners, and a footpod, a clever device to measure your speed.

You should first read the manual that Suunto includes with the watch. With this information you will learn how to choose between parameters like 'kilometres or miles' and 'Celsius or Fahrenheit' on the watch.

This document helps you to tune the Suunto Training Manager, the software that came with the watch. In this text we speak of STraM because we don't want to get RSI.

Visit <http://www.suunto.com> and make sure you have the latest version of STraM.

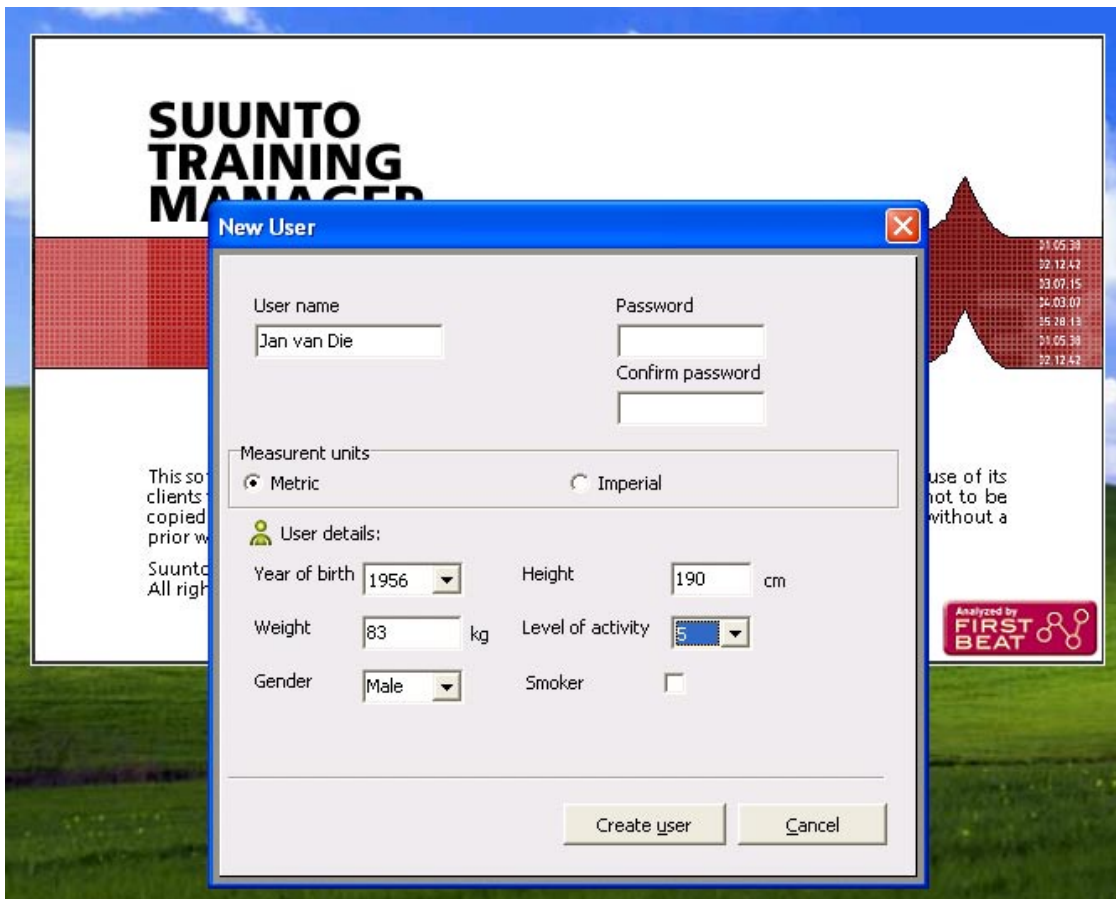
1. PREPARE THE SOFTWARE

You will get very fond of the T6, but it is a one-sided love. All the information about your present condition is not kept by the watch, but only in the STraM. Your watch just remembers the runs. Okay, it also saves your heartbeat boundaries in memory, but that's about it.

When you start the software for the first time, it will ask you to create a new user. You have to enter your name, age, weight, gender, length and whether you smoke or not. If you need help answering these questions, search for the document 'T6 for Blondes' on the internet.

The first difficult question is: What is your 'level of activity'? If you are a real dummy (like I was when I bought the T6) you don't know the answer. I will help you to find the correct value later on. For now, just give STraM your best guess:

0= very bad, 1 = bad, 2 = very weak, 3 = weak, 4 = average,
5 = good, 6 = very good, 7 = excellent.



After you login with your new username, the STraM will show your Settings. Go to the tab named Personal.

The T6 has used the entered information to determine six personal parameters: resting heartbeat, maximum heartbeat, maximum performance capability, maximum respiration rate, maximum ventilation and vital capacity. If you know the estimate of the T6 isn't correct in your case, you can change a few of these parameters. If not: just accept them for the time being.

Example:

Since I practise all sort of sports five times a week I tried 'level of activity' 5.

The STraM returned:

- resting heartbeat: 60 beats/minute
- maximum heartbeat: 178 beats/minute
- maximum performance capability: 12 METS
- maximum respiration rate: 34 breaths/minute
- maximum ventilation: 125 litre/minute
- vital capacity: 6 litre

Level	EPOC	Description
5	Over 178	Overreaching tra
4	112 - 178	Highly improvin
3	49 - 112	Improving train
2	16 - 49	Maintaining tra
1	Under 16	Minor training e

2. CONNECT THE WATCH

Now connect the T6 to the computer and press the connect-button in the tab 't6 Device'. After a while you will see the parameters you have set into the watch earlier on. You have chosen between kilometres and miles for example. Check the list and see if you still are happy. If not: change the item with a mouse click.

At the bottom of the list you will see the 'store interval' the T6 uses (how often it will register your speed). This value is 2 seconds or 10 seconds and you can't change it on the watch.

I recommend that you choose 2 seconds, if you want the quickest response from your watch when you change your pace while you are running.

Click on the 'Update settings' button to send the new values from STraM to the T6 if you changed something.

3. CALIBRATE THE WATCH

Get into your running clothes, mount your footpod so that it cannot move on your shoe and find a 400 metre athletic court. Ask permission to do a test run.

Use the inner circle of the court, because only there will you run exactly 400 metres each round.

Start 50 metres before the starting line and begin your run.

Push the start/stop-button on the T6 when you are crossing the starting line for the first time.

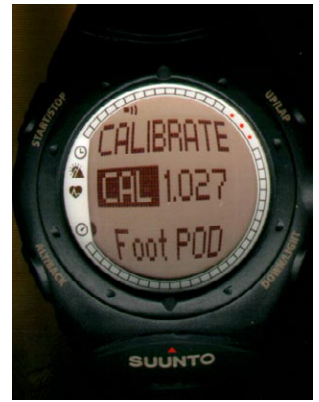
Run at least three rounds and press the start/stop-button again when you pass the finishing line for the last time.



Go into the Speed/Distance-menu of the watch, push the Suunto-button, select Calibrate, push the Suunto-button, select Footpod and push the Suunto-button again.

Next select Calibrate and push the Suunto-button once more.

Enter the distance you just ran: 1.200, 1.600 or 2.000 kilometre and push the Suunto-button to process it. The T6 will change its calibration value to an amount that is just right for your shoes, your way of running and the specific running track.



Remember that this value won't last forever. If you buy new shoes, run on a different track or start running faster through practice, you should calibrate the watch again.

4. CALIBRATE YOURSELF

The next thing you should do, is take a test. In fact I advice you to do three tests, but for the time being you can work with only the second and the third.

4.1 Medical test

An extensive medical test will cost you \$ 150 or more, but sometimes your health insurance will cover it (partly).

During such a test you will have to workout until you are really exhausted. Try to find a place where they use a treadmill. Sometimes you will have to settle for a bike.

The test will give you valuable information about your condition.

Your report should include at least:

- the vital capacity of your lungs
- your resting heartbeat
- your maximum heartbeat
- your VO_2 max (maximum oxygen consumption)

If you are a runner and had to use a bike for your test, you should add 10% to your maximum heartbeat, because you use more muscles during a run than on a bike.

Example:

My medical test on a bike returned a report with these parameters:

- vital capacity: 6.49 litre
- resting heartbeat: 54 beats/minute
- maximum workload: 3.6 Watt/kilo
- maximum heartbeat: 163 beats/minute
- recovery rate (after 3 minutes): 118 beats/minute
- VO_2 max: 3.70 litre/minute
- VO_2 max/kg: 44 millilitre/kilo/minute

For the purpose of running I calculated a maximum heartbeat of 179 (163 x 1.1).

4.2 Resting test

This one is really nice to do. Put the T6 and the chest strap on and have a good night's sleep. Next day, see on the computer how low your heartbeat can go.

Do this for three days in a row and make sure you measure only when you are feeling really lazy. Don't choose the night after a strong training or a heavy meal if you want to find your lower boundary.

Example:

My resting test returned:

- resting heartbeat: 44 beats/minute

4.3 Cooper test

If you don't want to spend \$ 150 dollar on a medical test (yet), you can use the T6 to estimate some of the parameters. One of the ways to do that is to take a Cooper test.

Configure your T6 like this:

- In the Training menu, press the Suunto button.
- Select Timers and press Suunto again.
- Select WARM-UP and set it to at least 3 minutes.
- Press the Back button.
- Select INTERVAL and choose 1 round.
- Set the first interval to 12 minutes.
- Leave the second interval on 0 minutes.

Now find a court where you can run without worrying about traffic lights or other obstacles. Start the watch and run the first part at a very low pace to get your muscles warm.

When the beeper sounds, start running for your life. The idea of a Cooper test is to cover as much distance as you can in 12 minutes, so try to find your best average speed.

Press the start/stop-button of the T6 after the next beep. Push and hold the Split/lap-button to save the Cooper test in the Logbook of the T6. Now crawl home and take a shower.

After that, it is nice to see where you stand according to Mr. Cooper. The next table comes from the Suunto T6 Training Guidebook 'How Not to Rely on Luck' (page 29) and is presented for your amusement only.

Age	Weak	Fair	Average	Good	Excellent
Fitness enthusiasts					
Men 20 to 29	<1600m	1600 – 2199m	2200 – 2399m	2400 – 2800m	>2800m
Men 30 to 39	<1500m	1500 – 1899m	1900 – 2299m	2300 – 2700m	>2700m
Men 40 to 49	<1400m	1400 – 1699m	1700 – 2099m	2100 – 2500m	>2500m
Men over 50	<1300m	1300 – 1599m	1600 – 1999m	2000 – 2400m	>2400m
Women 20 to 29	<1500m	1500 – 1799m	1800 – 2199m	2200 – 2700m	>2700m
Women 30 to 39	<1400m	1400 – 1699m	1700 – 1999m	2000 – 2500m	>2500m
Women 40 to 49	<1200m	1200 – 1499m	1500 – 1899m	1900 – 2300m	>2300m
Women over 50	<1100m	1100 – 1399m	1400 – 1699m	1700 – 2200m	>2200m
Athletes					
Men	<2800m	2800 – 3099m	3100 – 3399m	3400 – 3700m	>3700m
Women	<2100m	2100 – 2399m	2400 – 2699m	2700 – 3000m	>3000m

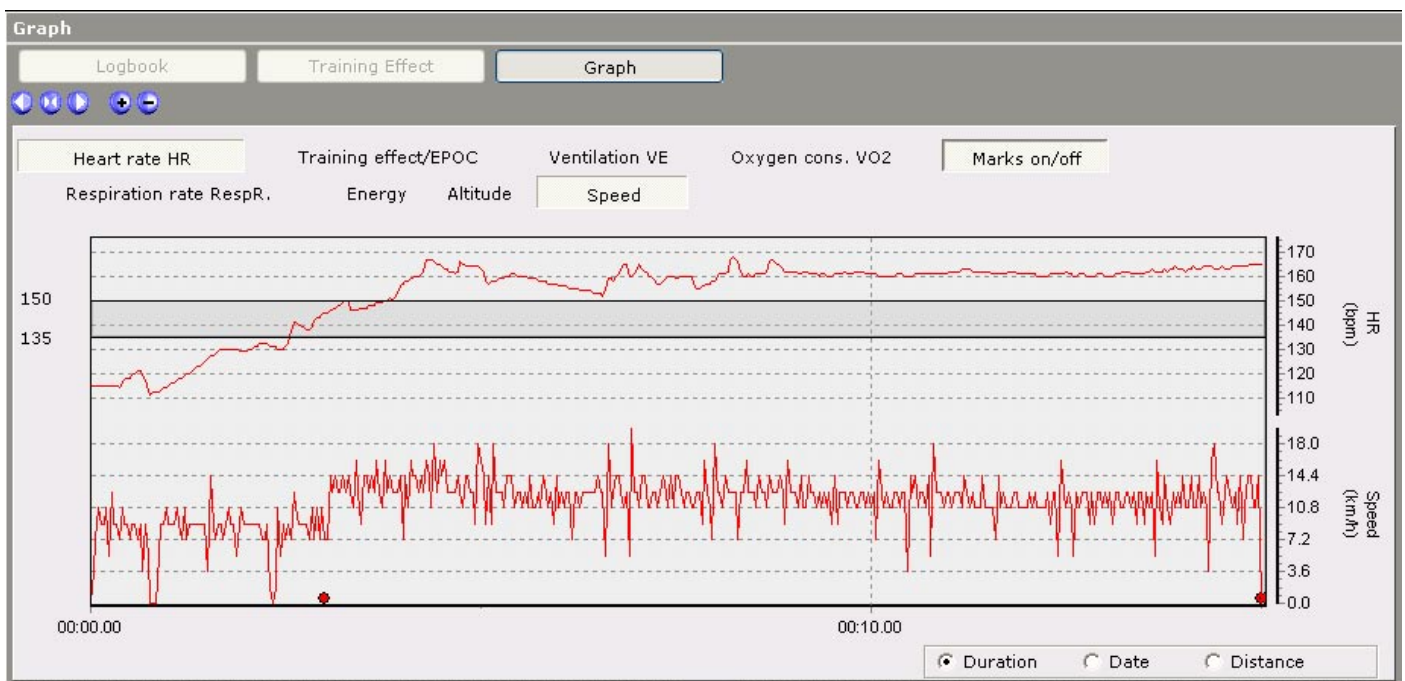
Table 5. Fitness classification based on the result of the 12-minute Cooper running test (Oja et al, 1979)

Now connect the T6 with the STraM, upload your Cooper test and wait till the software processes the data. When it is ready, you will find most of the parameters of your run in the tab Details 1. The distance you ran during your Cooper is shown in the tab Marks. Look for the second lap. Write all parameters down.

Example:

I ran a Cooper test as described. On the first three minutes I covered 0.40 kilometre. Then I pressed the button and ran twelve minutes to reach 2.84 kilometre. After processing this run through STraM, the software produced these values:

- distance: 2.44 kilometres (the Lap Distance of lap 2 in the tab Marks)
- maximum heartbeat: 168 beats/minute (in the middle of the tab Details 1)
- ventilation: 143 litres/minute (on the right side of the tab Details 1)
- oxygen consumption 39 millilitres/kilo/minute (on the right side of the tab Details 1)
- respiration rate 51 breaths/minute (on the right side of the tab Details 1)



Log: 03.08 / 22:27

Details 1		Details 2		Marks		Data	
Name	03.08 / 22:27	Heart rate		Other body parameters			
Activity		High limit	150	EPOC Peak	97 ml/kg		
Date	3-8-2005	Low limit	135	Training effect	3		
Start	22:27:57	Above	00:11.12	Ventilation	143 l/min		
End	22:43:00	In	00:01.18	Oxygen cons.	39 ml/kg/min		
Duration	00:15.03	Below	00:02.34	Respiration rate	51 bpm		
Distance	2.84 km	Max	168 bpm	Total energy cons.	210 kcal		
Max speed	19.8 km/h	Avg	153 bpm				
Avg speed	11.3 km/h	Min	111 bpm				

Log: 03.08 / 22:27

Details 1		Details 2		Marks		Data							
Nbr.	/	Split time	Lap time	HR	Avg HR	Lap Distance	Lap Speed	Distance from start	Speed from start	Altitude	Ascent	Descent	Notes
1	/	00:03.00	00:03.00	139 bpm	124 bpm	0.40 km	8.0 km/h	0.40 km	8.0 km/h	-79 m	5 m	6 m	
2	/	00:15.00	00:12.00	164 bpm	162 bpm	2.44 km	12.2 km/h	2.84 km	11.4 km/h	-78 m	8 m	6 m	
3	/	00:15.03	00:00.03	164 bpm	164 bpm	0.00 km	0.0 km/h	2.84 km	11.3 km/h	-78 m	0 m	0 m	log stopped

Add mark

5. FINE-TUNE SUUNTO TRAINING MANAGER

I hope all went well with the Cooper test. Now enter the values of all tests in STraM manually. In my example, I have chosen from the parameters that I marked with a red bullet earlier in this text. I will discuss each parameter separately.

5.1 Activity level

What it is:

A rough indication of your present condition.

What you should set it to:

From the Suunto T6 Training Guidebook 'How Not to Rely on Luck' (page 16) comes a table that gives your 'Activity level'. What you need is your age, your gender and your VO_{2max} .

If you did a medical test, you know your VO_{2max} .

If you only did a Cooper test, you can use its result to get a reasonable and inexpensive approximation of your VO_{2max} .

The formula is easy, but you will need a calculator:

For men:

$$VO_{2max} = 0.0175 \times \text{distance in metres}$$

For women:

$$VO_{2max} = 0.018 \times \text{distance in metres}$$

Now search for your VO_{2max} in your age row and look at the top to find your 'Activity level'.

Enter the value in the STraM.

VO_{2max} classification	1	2	3	4	5	6	7
Age \ Fitness level	Weak			Average			Excellent
20–24	<32	32–37	38–43	44–50	51–56	57–62	>62
25–29	<31	32–35	36–42	43–48	49–53	54–59	>59
30–34	<29	29–34	35–40	41–45	46–51	52–56	>56
35–39	<28	28–32	33–38	39–43	44–48	49–54	>54
40–44	<26	26–31	32–35	36–41	42–46	47–51	>51
45–49	<25	25–29	30–34	35–39	40–43	44–48	>48
50–54	<24	24–27	28–32	33–36	37–41	42–46	>46
55–59	<22	22–26	27–30	31–34	35–39	40–43	>43
60–65	<21	21–24	25–28	29–32	33–36	37–40	>40

Table 1. Aerobic fitness norms for men. (VO_{2max} unit ml/kg/min)
(Shvartz, Reibold 1990)

VO_{2max} classification	1	2	3	4	5	6	7
Age \ Fitness level	Weak			Average			Excellent
20–24	<27	27–31	32–36	37–41	42–46	47–51	>51
25–29	<26	26–30	31–35	36–40	41–44	45–49	>49
30–34	<25	25–29	30–33	34–37	38–42	43–46	>46
35–39	<24	24–27	28–31	32–35	36–40	41–44	>44
40–44	<22	22–25	26–29	30–33	34–37	38–41	>41
45–49	<21	21–23	24–27	28–31	32–35	36–38	>38
50–54	<19	19–22	23–25	26–29	30–32	33–36	>36
55–59	<18	18–20	21–23	24–27	28–30	31–33	>33
60–65	<16	16–18	19–21	22–24	25–27	28–30	>30

Table 2. Aerobic fitness norms for women. (VO_{2max} unit ml/kg/min)
(Shvartz, Reibold 1990)

Example:

My Cooper test ended with a distance of 2440 metre so I calculated my VO_2 max like this:

$$VO_2\text{max} = 0.0175 \times 2440 = 42.7$$

(That is a little worse than my medical test of 44 (higher is better).

I'm only human, so I use 44 as my VO_2 max to tune STraM.)

The 'Activity level' that belongs to age 49 and VO_2 max 44 is level 6.

I started STraM and clicked on my username. In the Personal tab I changed the value of the 'Activity class' from a five to a six.

Next I pushed the Calculate button.

This is what I got:

- resting heartbeat: 60 beats/minute
- maximum heartbeat: 178 beats/minute
- maximum performance capability: 12 METS
- maximum respiration rate: 34 breaths/minute
- maximum ventilation: 127 litres/minute
- vital capacity: 6 litre

Only the value of the maximum ventilation has been changed. It went from 125 to 127.

I get the feeling it doesn't matter much how you set your 'Activity class' initially.

Important: we will change most results of the STRaM calculation in the next steps.

Only these values will influence the way the STRaM analyses your future runs.

After the tuning the 'Activity class' plays no role anymore.

5.2 Rest HR

What it is:

The number of heartbeats per minute at rest when the body is in a recovered and relaxed state.

What you should set it to:

Use the value of your resting test.

Example:

In my case I entered: 44 beats/minute

5.3 Max HR

What it is:

The number of heartbeats per minute at maximal exercise (requiring large muscle mass, e.g. uphill running).

What you should set it to:

Use the value of your medical test on a treadmill (add 10% if you had to use a bike).

or

Use the value of your Cooper test.

Example:

In my case I used the value of my medical test and entered: 179 beats/minute (163 x 1,1)

The Cooper would have given me 168 beats/minute (I probably didn't hurt myself enough).

5.4 Max performance capability

What it is:

The functional capacity of the cardiorespiratory system.

What you should set it to:

Use the VO_2 max value of your medical test and divide by 3.5.

or

Use the VO_2 max value of your Cooper test and divide by 3.5.

Example:

In my case I entered: 12.57 METS (44 / 3.5)

The Cooper test would have given me 12.2 METS (42.7 / 3.5) – a small difference.

5.5 Max respiration rate

What it is:

The number of breaths taken per minute at maximal exercise (requiring large muscle mass, e.g. uphill running).

What you should set it to:

Take the value of your Cooper test.

Example:

In my case I entered: 51 breaths/minute

5.6 Max ventilation

What it is:

The litres of air breathed per minute at maximal exercise (requiring large muscle mass, e.g. uphill running).

What you should set it to:

Take the value of your Cooper test.

Example:

In my case I entered: 143 litre/minute

5.7 Vital capacity

What it is:

The lung volume in litres.

What you should set it to:

Take the value of your medical test.

or

Accept the estimate of the STraM.

Example:

In my case I entered: 6,49 litre

The STraM would have kept me on 6 litres.

The picture shows my new parameters in the middle of the tab Personal.

User: Jan van Die

Settings | **Personal** | Custom

Year of birth * 1956

Weight * 83 kg

Height * 190 cm

Gender * Male

Smoking

Activity class * 6

Participate regularly in heavy physical exercise such as running or jogging, swimming, cycling, rowing, skipping rope, running in place or engaging vigorous aerobic activity type exercise such as tennis, basketball or handball. Run 5 to 10 miles per week

Calculate

Rest HR	44 bpm
Max HR	179 bpm
Max performance capability	12,5 METS
Max respiration rate	51 bpm
Max ventilation	143 l/min
Vital capacity	6,49 l

Training effect levels		
Level	EPOC	Description
5	Over 194	Overreaching training effect
4	123 - 194	Highly improving training effect
3	54 - 123	Improving training effect
2	18 - 54	Maintaining training effect
1	Under 18	Minor training effect

Your new parameters will be saved automatically when you exit STraM.

Beware: If you accidentally push the Calculate button later on, you will destroy your work, because STraM will replace all values by the result of its standard algorithms.

CONCLUSION

Hopefully by now you have successfully fine-tuned your software. You are ready to run as much as your heart desires and can be sure the STraM will report fair results. Remember that the parameters represent only your starting point. By training they will change, so you have to update them regularly.

A fine tool to assist you was developed by Willem Minten. The software is called 't6 Swiss Army Knife' and you need Excel 2004 or better to run it.

You can find the program on <http://health.groups.yahoo.com/group/WriststopTrainers/> in the Files section. Open the folder 'WM Stuff' and download the 't6 Swiss Army Knife' to your computer.

Willem Minten also runs a website which contains tons of technical information about the T6.

Go to:

<http://users.telenet.be/wy/sport/t6/t6%20Accurate%20Speed-Distance%20Measuremnt.htm> and read it!

You are now officially beyond the dummy-stage!

Jan van Die

December 2005