

HOW TO INTEGRATE ELECTROSTIMULATION

IN TRAIL PREPARATION



TESTIMONIAL



KILIAN JORNET

Ultra trail and Ski mountaineering athlete

For 12 or 13 years I used Compex after training or competitions, mainly for recovery, but in February 2014, I met Heiko, Compex's scientific expert. I had a problem with my left leg, a wound which meant there was a noticeable difference in the capabilities of my legs. Heiko prepared a program for building strength and endurance with Compex, and I followed the program during the winter. After 3 months with Compex, I felt a big improvement: my bad leg was better and had re-developed its musculature.

From that moment I began to see Compex not just as a tool for recovery, but also as a way to develop the muscle.

I don't like going to the gym, I love racing, I love being in the mountains, not locked up. Also, Compex is ideal for me: I also use it to beef up my shoulders and legs, improving my climbing skills. It better prepares my muscles for the transition between the ski season and the trail season.

To me, at least, Compex means training more and going further: in the recovery process and building muscle.

"COMPEX WILL NOT WIN A RACE, BUT COMPEX WILL FACILITATE THE DRIVE TO WIN A RACE"

BIO

Kilian Jornet is a medalist in the Ski Mountaineering World Championships, including vertical stroke. He is three-time world skyrunning champion, winning the most prestigious ultra-trails such as the UTMB, the Western States 100 and the Grand Raid.

He also holds several ascension records, such as the Mont Blanc and the Matterhorn.

Kilian is considered one of the greatest mountain-runners of all the time. He is sometimes nicknamed "the alien of trail"









HOW TO USE COMPEX IMPORTANT TIPS

WHEN TO START PREPARING

- This booklet offers three training plans: a 23 km trail, a 42 km marathon and a 80 km trail. These 3 distances indicate 3 levels of difficulty: beginner, intermediate and advanced. Depending on the distance, the preparation will be from 8 to 12 weeks.
- The prerequisite is an overall good physical condition with regular physical activity during the month previous to starting the training regime.
- For trail runners who have never experienced electrostimulation, including qualitative sessions (strength), an initiation period of 2 to 3 weeks is strongly recommended.

SIMILAR PROGRAMS ACROSS DIFFERENT COMPEX DEVICES

Sometimes, Compex models will use different names to refer to the same program type. Below is a key so you can identify the correct program: Capillarization = Oxygenation

Core stabilization = Muscle building

Training recovery = Active recovery

Ankle twist prevention = Explosive strength

SETTING THE INTENSITY IS KEY

For Development sessions (Strength, Core stabilization, Anke twist prevention)

• Maximum toleration: It is crucial to reach the highest level of intensity possible (though the session must always remain bearable). Intensity determines the number of muscle fibers which are engaged or 'recruited' by the stimulation. The best way to determine your maximum toleration is simply through your own judgement of what your body can cope with. The contractions must be powerful without ever becoming intolerable. The progress of a stimulated muscle will be greater if the Compex device recruits a high number of its fibers.

Some general rules to help you train:

- Observe the electrode placements indicated and note their polarity (+ and). For wireless devices: the + polarity is located on the electrodes where there is an on / off button; for wired models, the + polarity comes from the color wire.*
- Consider changing your electrodes on a regular basis. If the gel layer on the electrode deteriorates, it will be less conductive and you will not be able to achieve higher levels of stimulation.
- Always look to progress
 - Increase the intensity marginally every 3,4 or 5 contractions throughout a session.
 - In subsequent sessions aim to exceed the level of intensity reached in the previous session
 - It is often more comfortable to voluntarily contract the muscles, synchronised with the stimulation

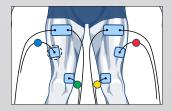
For Training recovery and Capillarization sessions:

Increase the intensity gradually; it should produce visible muscular twitches.

*For older generation devices, the + polarity is located alongside the red connector.

BODY POSITIONINGAND COMBINED WORKOUT

QUADRICEPS: STRENGTH PROGRAMME



ELECTRODE PLACEMENT (WIRED)



ELECTRODE PLACEMENT (WIRELESS)



OR



- Sit with knees bent at approximately one
- Secure the ankles to avoid knee extension when there is a powerful contraction
- Sit on a chair
- When the contraction begins, position yourself in a semi-squat
- Sit back down at the end of the contraction
- Keep the back straight, lower back arched and eyes facing forward (horizontal)

HOW TO INCLUDE SOME DYNAMIC CONTRACTIONS



START POSITION



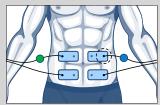
FLEXURE POSITION



EXTENDED POSITION

- The reference position is the same during the first 3 weeks:
 - Sit during warm up sessions and recovery time
 - Remain in a half-squat position with each contraction (except the first, in which you steadily increase the intensity)
- During each contraction combining a dynamic voluntary contraction synchronised with the stimulation:
 - Slowly bend the knees and arch the back without going to the limit of the joint's range of motion. This movement should take roughly 1 whole second.
 - Repeat this movement 3 or 4 times for the duration of each contraction.
- Don't do more contractions than specified in your training plan.
- Increase the number of contractions if the previous session was comfortable (mild or no muscle soreness).
- In the second session of the week, you can speed up the squatting movement (5-6 per contraction). Do not exceed 5-6 squats per contraction.

ABS AND LOW BACK: CORE STABILIZATION PROGRAMME





WIRE ELECTRODE PLACEMENT





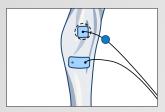
WIRELESS ELECTRODE PLACEMENT



- Sit on a firm chair with a straight back.
- With each contraction, perform the following routine:
 - Breath slowly emptying the lungs for the duration of the contraction.
 - Pull in the belly.

BODY POSITIONING AND COMBINED WORKOUT

PERONEAL MUSCLES: ANKLE TWIST PREVENTION PROGRAMME



ELECTRODE PLACEMENT (WIRED)



ELECTRODE PLACEMENT (WIRELESS)

Related exercises

- Combine the Compex electrostimulation with voluntary exercises
 - First stand on both feet: alternate between standing with eyes open, then closed, and standing on firm ground and uneven
 - With increased confidence, stand on one leg (stimulated side): Eyes open and closed / On firm ground and on soft ground.

For all exercises, try to maintain body balance while remaining upright. The monopodal position (on a one foot) should be maintained at the time of the contraction, the second leg should be rested for about thirty seconds.

Further exercises



Settle in a sitting position where the the stimulated foot/ankle does not rest on the ground



As soon as you begin to experience contractions, stand up.



During the session, raise the leg gradually (the one without the electrodes)

At the end of the warm up, check to ensure that eversion of the ankle (where the sole of the foot is turned away from the inside of the leg) is possible. If this is not the case, then the intensity of the session was insufficient and needs to be increased until the eversion is possible.

1. WHAT IS AN ANKLE SPRAIN?

A sprain is an injury to a ligament or resilient structure which contributes to the stability of a joint. There are several stages of severity, depending on the nature of the injury, from simple excessive stretching or tearing, to a number of the ligament being affected by the lesion.

A sprain occurs when the ankle turns in a movement called inversion (the sole of the foot is twisted so it is facing towards in the inside of the leg).

2. WHY ARE SPRAIN RECURRENCES SO FREQUENT?

Sprains affect small muscles located on the outside of the leg. These are called the peroneal muscles and they assure ankle protection when it undergoes an inverse twisting motion. When this occurs peroneal muscles have to contract very rapidly, to allow the recall of the joint to a neutral position. Given the weight of the body supported by the joint, these muscles can develop a high level of strength.

The potential quality and strength of the peroneal muscles is unfortunately sometimes insufficiently developed, which greatly affects the stability of the ankle and makes the joint vulnerable to repeated injury.

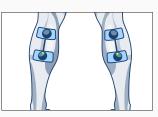
The trail is an activity which renders one vulnerable to the risk of sprains. It is therefore advisable, for the runners at risk (those who have already suffered a sprained ankle) to integrate a specific workout for the peroneal muscles to improve the strength of the ankle and reduce the risk of injury.

TRAINING RECOVERY AND CAPILLARISATION PROGRAMMES









WIRE ELECTRODE PLACEMENT



• Comfortable position.

• With the legs extended and elevated as much as possible

WIRELESS ELECTRODE PLACEMENT

OBJECTIVES

TRAIL PREPARATION (20 TO 40 KM)

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
WEEK 1	REST	MAS FLAT SESSION Warming up 30min 10x 30s/30s 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	THRESHOLD FLAT SESSION Warming up 30min 3x6min 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	REST Ankle twist prevention	HILLY LONG RUN 1h20 Capillarisation Quads/Calves
WEEK 2	REST	MAS HILLY SESSION Warming up 30min 10x 30s/30s 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 3x6min 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	REST Ankle twist prevention	HILLY LONG RUN +D 1h30 Capillarisation Quads/Calves
WEEK 3	REST	MAS HILLY SESSION Warming up 30min 10x 45s/30s 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 3x6min 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	REST Ankle twist prevention	HILLY LONG RUN ++D 1h30 Capillarisation Quads/Calves
WEEK 4	REST	MAS HILLY SESSION Warming up 30min 2x (10x 30s/30s) 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	FOOTING 1h	REST Strength 1 Quadriceps	REST Ankle twist prevention	HILLY LONG RUN OR HILLY RACE 2h30 Training recovery Quads/Calves
WEEK 5	REST	MAS HILLY SESSION Warming up 30min 8x 60s/45s 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	THRESHOLD HILLY SESSION Warming up 40min 2x12min 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	REST Ankle twist prevention	HILLY LONG RUN ++D 2h00 Capillarisation Quads/Calves

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
WEEK 6	REST	MAS HILLY SESSION Warming up 30min 10x 60s/45s 15min relax Training recovery Quads/Calves Training recovery Quads/Calves	REST Strength 2 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 3x10min 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	REST Ankle twist prevention	HILLY LONG RUN OR HILLY RACE 3h00 Capillarisation Quads/Calves
WEEK 7	REST	MAS HILLY SESSION Warming up 30min 12x 30s/30s 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 4x5min 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	REST Ankle twist prevention	HILLY LONG RUN +D 1h30 Capillarisation Quads/Calves
WEEK 8	REST	FOOTING 45min + 6 Straight lines Capillarisation Quads/Calves	REST Capillarisation Quads/Calves	FOOTING 1h30 + 10 straight lines Capillarisation Quads/Calves	REST Capillarisation Quads/Calves	REST	RACE

Optional: 3x/week Core stabilization programme during week 1 to 7

OBJECTIVES

TRAIL PREPARATION (40 TO 70 KM)

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
WEEK 1	REST	MAS HILLY SESSION Warming up 30min 10x 30s/30s 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	ENDURANCE 50min 5 Straight lines Ankle twist prevention	REST Strength 1 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 3x6min 15min relax Training recovery Quads/Calves	LONG RUN ENDURANCE- FARTLEK 1h30 Capillarisation Quads/Calves
WEEK 2	REST	MAS HILLY SESSION Warming up 30min 10x 45s/30s 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	ENDURANCE 55min 5 Straight lines Ankle twist prevention	REST Strength 1 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 4x5min 15min relax Training recovery Quads/Calves	LONG RUN ENDURANCE- FARTLEK 1h45 Capillarisation Quads/Calves
WEEK 3	REST	MAS HILLY SESSION Warming up 30min 10x 60s/45s 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	ENDURANCE 1h00min 6 Straight lines Ankle twist prevention	REST Strength 1 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 3x7min 15min relax Training recovery Quads/Calves	LONG RUN ENDURANCE- FARTLEK 2h00 Capillarisation Quads/Calves
WEEK 4	REST	MAS HILLY SESSION Warming up 30min 2x (10x 30s/30s) 15min relax Training recovery Quads/Calves	REST Strength 1 Quadriceps	ENDURANCE 1h05min 6 Straight lines Ankle twist prevention	REST Strength 1 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 3x8min 15min relax Training recovery Quads/Calves	HILLY LONG RUN OR HILLY RACE 3h00 Training recovery Quads/Calves
WEEK 5	REST	ENDURANCE 50min	REST Strength 1 Quadriceps	FARTLEK SESSION 1h Training recovery Quads/Calves	REST Ankle twist prevention	ENDURANCE 1h00min 6 Straight lines	FLAT LONG RUN 1h30 Capillarisation Quads/Calves

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
WEEK 6	REST	MAS HILLY SESSION Warming up 30min 10x 60s/45s 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	ENDURANCE 1h00min 5 Straight lines Ankle twist prevention	REST Strength 2 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 4x5min 15min relax Training recovery Quads/Calves	LONG RUN OR RACE 4h00 Race preparation (max 30Km) Capillarisation Quads/Calves
WEEK 7	REST	MAS HILLY SESSION Warming up 30min 2x (8x 30s/45s) 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	ENDURANCE 1h10min 6 Straight lines Ankle twist prevention	REST Strength 2 Quadriceps	THRESHOLD HILLY SESSION Warming up 30min 3x8min 15min relax Training recovery Quads/Calves	HILLY LONG RUN +D 2h00 to 2h20 Capillarisation Quads/Calves
WEEK 8	REST	MAS HILLY SESSION Warming up 30min 10x (1m10/50s) 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	ENDURANCE 1h15min Ankle twist prevention	REST Training recovery Quads/Calves	THRESHOLD HILLY SESSION Warming up 30min 5min - 7min30 - 10min 15min relax Training recovery Quads/Calves	LONG RUN OR RACE 4h30 to 5h00 Capillarisation Quads/Calves
WEEK 9	REST	MAS HILLY SESSION Warming up 30min 10x (60s/45s) 15min relax Training recovery Quads/Calves	REST Strength 2 Quadriceps	ENDURANCE 1h15min Strength 2 Quadriceps	REST Training recovery Quads/Calves	REST Ankle twist prevention	CYCLING 1h30 or 50min jogging Capillarisation Quads/Calves
WEEK 10	REST	JOGGING 30min 6 Straight lines Capillarisation 2 sessions Quads/Calves	REST Capillarisation 2 sessions Quads/Calves	JOGGING 20min 10 Straight lines Capillarisation 2 sessions Quads/Calves	REST Capillarisation 2 sessions Quads/Calves	REST	RACE

Optional: 3x/week Core stabilization programme during week 1 to 8

OBJECTIVES

TRAIL PREPARATION (+ 70 KM)

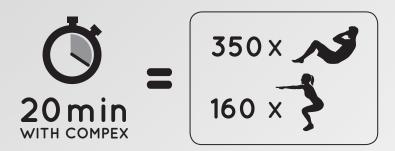
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
WEEK 1	REST	MAS HILLY SESSION Warming up 30min 12x 30s/30s 15min relax Training recovery Quads/Calves	ENDURANCE 60min 5 Straight lines Strength 1 Quads	REST Ankle twist prevention	ENDURANCE HILLY 1h15min Strength 1 Quads	THRESHOLD HILLY SESSION Warming up 30min 3x6min 15min relax Training recovery Quads/Calves	LONG RUN ENDURANCE- FARTLEK 2h15 Capillarisation Quads/Calves
WEEK 2	REST	MAS HILLY SESSION Warming up 30min 12x 45s/30s 15min relax Training recovery Quads/Calves	ENDURANCE 1h10 5 Straight lines Strength 1 Quads	REST Ankle twist prevention	ENDURANCE HILLY 1h30min Strength 1 Quads	THRESHOLD HILLY SESSION Warming up 30min 3x8min 15min relax Training recovery Quads/Calves	LONG RUN ENDURANCE- FARTLEK 2h30 Capillarisation Quads/Calves
WEEK 3	REST	MAS HILLY SESSION Warming up 30min 10x 60s/45s 15min relax Training recovery Quads/Calves	ENDURANCE 1h15 5 Straight lines Strength 1 Quads	REST Ankle twist prevention	ENDURANCE HILLY 1h40min Strength 1 Quads	THRESHOLD HILLY SESSION Warming up 30min 3x10min 15min relax Training recovery Quads/Calves	HILLY LONG RUN 4h00 Capillarisation Quads/Calves
WEEK 4 (4 WEEK SESSIONS)	REST	ENDURANCE 1h00 5 Straigtht lines	REST Strength 1 Quads	FARTLEK SESSION 1h00 Training recovery Quads/Calves	REST Ankle sprain prevention	CYCLING 2h00 OR ENDURANCE 1h00	LONG RUN ENDURANCE- FARTLEK 1h45 Capillarisation Quads/Calves
WEEK 5	REST	MAS FLAT SESSION Warming up 30min 2x (10x 30s/30s) 15min relax Training recovery Quads/Calves	ENDURANCE 1h15 6 Straight lines Strength 2 Quads 1 dynamic contraction every 8	FARTLEK SESSION 1h00 Training recovery Quads/Calves	ENDURANCE HILLY 1h40min Strength 2 Quads 1 dynamic contraction every 8	ENDURANCE 1h30 6 Straight lines	HILLY LONG RUN 4h15 Capillarisation Quads/Calves
WEEK 6	REST	MAS HILLY SESSION Warming up 30min 12x 45s/30s 15min relax Training recovery Quads/Calves	ENDURANCE 1h15 6 Straight lines Strength 2 Quads 1 dynamic contraction every 6	REST Ankle twist prevention	ENDURANCE HILLY 1h40min Strength 2 Quads 1 dynamic contraction every 6	THRESHOLD HILLY SESSION Warming up 30min 4x5min 15min relax Training recovery Quads/Calves	LONG RUN ENDURANCE- FARTLEK 2h30 Capillarisation Quads/Calves

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
WEEK 7	REST	MAS HILLY SESSION Warming up 30min 10 x (1m10/50s) 15min relax Training recovery Quads/Calves	ENDURANCE 1h20 6 Straight lines Strength 2 Quads 1 dynamic contraction every 4	REST Ankle twist prevention	ENDURANCE HILLY 1h45min Strength 2 Quads 1 dynamic contraction every 4	THRESHOLD HILLY SESSION Warming up 30min 3x12min 15min relax Training recovery Quads/Calves	HILLY LONG RUN 5h00 OR RACE 40km max Capillarisation Quads/Calves
WEEK 8 (4 WEEK SESSIONS)	REST	ENDURANCE 1h00 5 Straight lines Training recovery Quads/Calves	REST Strength 2 Quads	FARTLEK 1h10 Training recovery Quads/Calves	REST Ankle twist prevention	CYCLING 2h00 OR ENDURANCE 1h00	LONG RUN ENDURANCE- FARTLEK 1h50 Capillarisation Quads/Calves
WEEK 9	REST	MAS HILLY SESSION Warming up 40min 10 x (60s/45s) 15min relax Training recovery Quads/Calves	ENDURANCE 1h30 6 Straight lines Strength 2 Quads Isometric contraction (to do as pre- fatigue before the endurance session)	REST Ankle twist prevention	ENDURANCE HILLY 1h40min Strength 2 Quads Isometric contraction (to do as pre- fatigue before the endurance session)	THRESHOLD HILLY SESSION Warming up 30min 3x8min 15min relax Training recovery Quads/Calves	HILLY LONG RUN 5h00 Capillarisation Quads/Calves
WEEK 10	REST	MAS Warming up 45min 10 x (1m10/50s) 15min relax Training recovery Quads/Calves	ENDURANCE 1h30 6 Straight lines Strength 2 Quads	REST Ankle twist prevention	ENDURANCE HILLY 1h45min Strength 2 Quads	PYRAMIDAL THRESHOLD HILLY SESSION Warming up 45min 5min – 7min30 - 10min 15min relax Training recovery Quads/Calves	HILLY LONG RUN 2h15 Capillarisation Quads/Calves
WEEK 11	REST	MAS FLAT SESSION Warming up 30min 10 x (30s/30s) 15min relax Training recovery Quads/Calves	REST Strength 2 Quads	ENDURANCE 1h15 Ankle twist prevention	FARTLEK 1h00 Training recovery Quads/Calves	REST	CYCLING 1h30 or Jogging 50min Capillarisation Quads/Calves
WEEK 12	REST	JOGGING 30min 6 Straight lines Capillarisation 2 sessions Quads/Calves	JOGGING 20min (optional) Capillarisation 2 sessions Quads/Calves	REST Capillarisation 2 sessions Quads/Calves	REST Capillarisation 2 sessions Quads/Calves	REST	RACE

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^{*} Scientific studies available on compex.info



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