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STORY AT LAST

Olivier Isler has been setting penetration records in France's Doux De Coly since the early 1980s. This summer, he did it again—a solo cave push of two-and-a-half miles on a triple-redundant rebreather.

STORY BY OLIVIER ISLER AS WRITTEN BY JOHN SIMENON

Doux de Coly, Sunday, August 2, 1998, 6:00 a.m.

Outside the tent, a pale sunshine is drying the early morning mist. Temperature is still nice and cool, humidity quite bearable, but ominous thunderclouds are already lining the horizon to the west.

I am lying on my sleeping bag, clad in my underwear, eyes wide open. Although I went to sleep at 10:00 p.m. last night, I feel unrested and in half an hour, sitting around the breakfast table with the rest of the team, I will be too tense to eat my usual breakfast meal of müssli mixed in soy milk. This morning, like before every important dive, I will simply drink a cup of hot tea with Overstim's, the slow release energetic meal originally invented for professional cyclists.

Today is my last chance.

My permit expires in four days, and with a team of 25, I've already been here for close to three weeks. Lack of cooperation and sensitivity from the expedition manager and a few others on the team have turned this preparation into a painful experience and severely delayed my plans. Defeat looms ahead. In a few minutes, a small team will dive to try to untangle the lines of the deco habitat, which is secured in a vertical shaft 984 feet (300m) into the cave, a task that should have been completed last night.

T-Time is set at 11 a.m., and we still have so much to do...

Back on August 4, 1991, I had reached a dead end after having achieved a linear penetration of 13,303 feet (4055m) into what was then the longest known siphon in the world.

In 1997, after negotiations lasting several years, (the siphon being on private property) I was finally allowed to go back. With the help of stronger lights, my goal was to check whether the siphon continued any further.

By then, however, water visibility had badly deteriorated (to an average of 20 feet [6m] from the previous 40 feet [12m] minimum) because of a new hog farm built over the source's basin. In addition, the line was broken in several places or buried in the sand and clay lining the bottom of the cave, thus impeding my progression. After 7052 feet (2150m), I had collided at full speed into a rock blade: I was watching the line too closely, and despite the protection afforded by the shell of the rebreather, the blade had pierced one of the hoses of my RI 2000. With one of three circuits shut down, I had no choice but to abort the dive.

After such a failure, simply going back to 1991's furthest point became a real challenge: we needed to change all the lines in the tunnel, and completely redesign the double scooter system, as its speed (164 feet-180 feet/min [50-55m/min]) was too dangerous for the low visibility conditions.

Shortly after the 1997 attempt, a team of friends had relined the first 5576 feet (1700m) of the siphon, and my German friend Reinhard Buchaly had later prepared two new high autonomy scooters.

We had obtained a limited three-week permit for the summer of 1998, and Reinhard and I had hoped to start early the relining job from point 8200 feet (2500m) onwards. Unfortunately, a dive accident at the other side of France had retained the divers (Fred Badier and Sylvain Redoutey) scheduled to finish the first 8200 feet (2500m). Michael Walz had eventually lined 1312 additional feet (400m), so, two days later and three days late from schedule, Reinhard and I could finally start from point 6888 feet (2100m). It was absolutely crucial for us to reach point 9184 feet (2800m) if I wanted another chance of reaching more than 13,120 feet (4000m) on my next dive. Reinhard was diving a Halcyon; I was using my RI 2000. The previous days, Reinhard had staged five emergency tanks in case of problems with his rebreather. Our morale was low, as we knew we had to spend more than 10 hours

photos both pages by Gavin Newman

in the water just for some tedious preparation work. Our progress was slow. At about 8036 feet (2450m), the width of the gallery and poor visibility forced us twice to waste precious time looking around for the right direction. The first time we even went around a full 360° circle while following the wrong wall! Later, we had to follow the ceiling to find the right passage to the incline at around 9184 feet (2800m) that I had found previously without problem.

But by the end of the dive, we had reached our goal.

11:30 a.m.

The divers surface with some good news: the deco habitat is now fully operational. As I finish gearing up, Reinhard takes my two "stallions" to the deepest point of the sump, 328 feet (100m) away from the bottom of the shaft.

1:15 p.m.

More than two hours late from schedule, I am finally in the water, reaching my scooters, alone and apprehensive, 197 feet (60m) deep and 1476 feet (450m) from the entrance. Time to put all the problems behind me and look ahead. The gallery from the entrance to the shaft is not more than 26 feet (8m) deep and I felt a touch hypoxic at the end.

Following a sudden gut feeling, I move away from the wall, and after a few seconds, I can make out a large descending turn to the left...

Today, I am not towing the long emergency scooter, but a shorter standard version. I carry on my back all the bottom mix for the dive: two 125-cubic-foot (20 liter) and two 72-cubic-foot (12 liter) tanks of heliox. No staged tanks except for the six tanks of decompression mix staged in the shaft with the deco bell.

On average, the tunnel averaged 30 feet (8-10m) wide and 23 feet (1.5-7m) high, and depth varies between an average of 187 feet (57m) for the first 9184 feet (2800m) and 115 feet (35m) thereafter. I make good progress, the scooter is humming, and, except for a few shivers 90 minutes into the dive, this is turning out to be a fairly uneventful cruise so far. I feel more relaxed now, and I begin to feel hopeful that luck is back with me, that I may, at last, reach my goal when, at about 6560 feet (2000m), the scooter begins to rattle.

There must be a problem with the engine or the propeller shaft. Unbelievable! This is where I had burst my hose the last time. This area must be jinxed.

As I prepare to turn around and once more abort the dive, I realize that an 8-inch (20cm) rope tie on the nose of the towed scooter has come loose and is now dangling. Could it be that this piece of rope was hitting the propeller of the scooter in front, making all this racket?

I cut it off, make a halfhearted test. No more noise. What a relief! Without any further delay, I forge ahead, and at 9184 feet (2800m), I pick up the relining work. At 11,808 feet (3600m), as I am nearing the spot where large boulders obstruct the gallery for about 33 feet (10m), hardly leaving any room for a fully equipped diver, I leave the main scooter behind and continue with the smaller one, pushing it in front of me. After this difficult tract, the 1991 line looks acceptable at last, and I decide to follow it without deploying a new one.

As I am nearing the difficult stretch between 12,792 feet (3900m) and 12,858 feet (3920m) – the old marks are illegible – which had stopped me in 1991, I drop the scooter, and tie a new line. Bottom time so far: 165 minutes. Depth: 135 feet (41m). I make progress very slowly, using my fins, sweeping the gallery with my torch, totally focused on finding a prolongation to the cave.

At about 13,153 feet (4010m), following a sudden gut feeling, I move away from the right wall, and after a few seconds, in the soft glow of my torch, I can make out a large descending turn to the left. What a glorious emotion: there in front of me is the continuation of the sump! In 1991, by following the right wall, I had entered a short, dead-ended side gallery.

For about 33 feet (10m) now, the floor is littered with ugly little clay mounds. Then the cave regains a friendlier look (23-26 feet [7-8m] wide and eight feet [2-3m] high), and I continue to fin ahead. But the turnaround point is not to be compromised, and I have to stop and tie down my line after having unspooled a mere 1148 feet (350m). Point reached: 13,940 feet (4250m). Bottom time so far: 202 minutes.

I am thirsty. Having elected to carry no food and no drink with me, I drink a few sips of water from the source. It is polluted, I know, but I don't expect any nasty side effect before my return!

Time to go back. On the way, I pick up the small scooter, then the bigger one. At the deepest point (7052 feet [2150m]), I hit the wall of the tunnel pretty badly as I maneuver around the line, but return without any further hitch to the shaft, which I reach after 5 hours and 42 minutes in the water. First short deco stop at 115 feet (35m), where Reinhard and his warm handshake meet me under the watchful eye of a small ROV's TV camera. I know Chris is watching at the other end, and can't help but kiss the camera. I'm so happy to be back. In a few hours, I will be holding her in my arms again.

At 79 feet (24m), I plug a big battery into my warming jacket (the water is 54° [12°C]). The heliox table cut by Jean-Pierre Imbert is long (9 hours, 15 minutes), but I don't want to take any chance: so far away from the exit and from the closest chamber, any DCI would be unforgiving. According to my computations, and taking into account the average depth of the sump and my workload, I reached full saturation about five hours into the dive.

I breathe the deco mixes by plugging them into my RI 2000. At 53 feet (16m), Claude and Daniel have the delicate task of "deboosting" me so that I can enter the deco habitat. It takes 35 minutes more than planned, as the ROV's umbilical cord is wrapped around the habitat's cables. But once inside, I expect to relax and communicate by phone with the surface.

Unfortunately, this decompression sours into another painful episode: between 33 feet (10m) and 40 feet (12m), I even have to haul the deco bell to the next stage myself, all 2200 pounds (1000kg) of apparent weight! I experience some breathing problems and suspect a mild case of pulmonary toxicity due to a higher than expected PO2. Two bananas mashed in water, washed with some more Overstim's and mildly sweetened hot tea help me wrap my deco with three hours spent at 26 feet (8m) on 100 percent O2.

I finally leave the bell with the help of two safety divers. Visibility in the siphon is now down to three feet (1m), and it takes a further 19 minutes to get back at the surface, at 5:37 a.m., 15 hours and 22 minutes after having left, I am exhausted, but happy, and Christine's smile is so comforting.

With only three days left on our permit, any new attempt at further exploration is out of the question: there is not enough time to recover fully from this dive.

From a technical point of view, the outcome was a complete success: I had discovered and explored the prolongation of "my" gallery, using only 144 cubic feet (4.1m³) of bottom mix out of the 585 cubic feet (16.7m³) I was carrying with me. My RI 2000, with its triple redundancy, and

despite its nine years of age, still proves to be the only rebreather adapted for this type of dive. Using the rule of thirds, I could have easily stayed another six hours at 148 feet (45m)!

Nevertheless, 5 hours 42 minutes of bottom time, a penetration of 2.64 miles (4250m), performed entirely solo on a rebreather, including decompression, with no staged emergency tanks, that is still unique. It is my victory.

But the joy and satisfaction I expected were not there: with pollution being so visible and pervasive, the source appeared sad and unattractive. The gloom was further heightened by the pain I felt from the unnecessary dissentions in the team.

So, although I have a few plans for further exciting explorations, I do not expect to go back to the Doux de Coly.

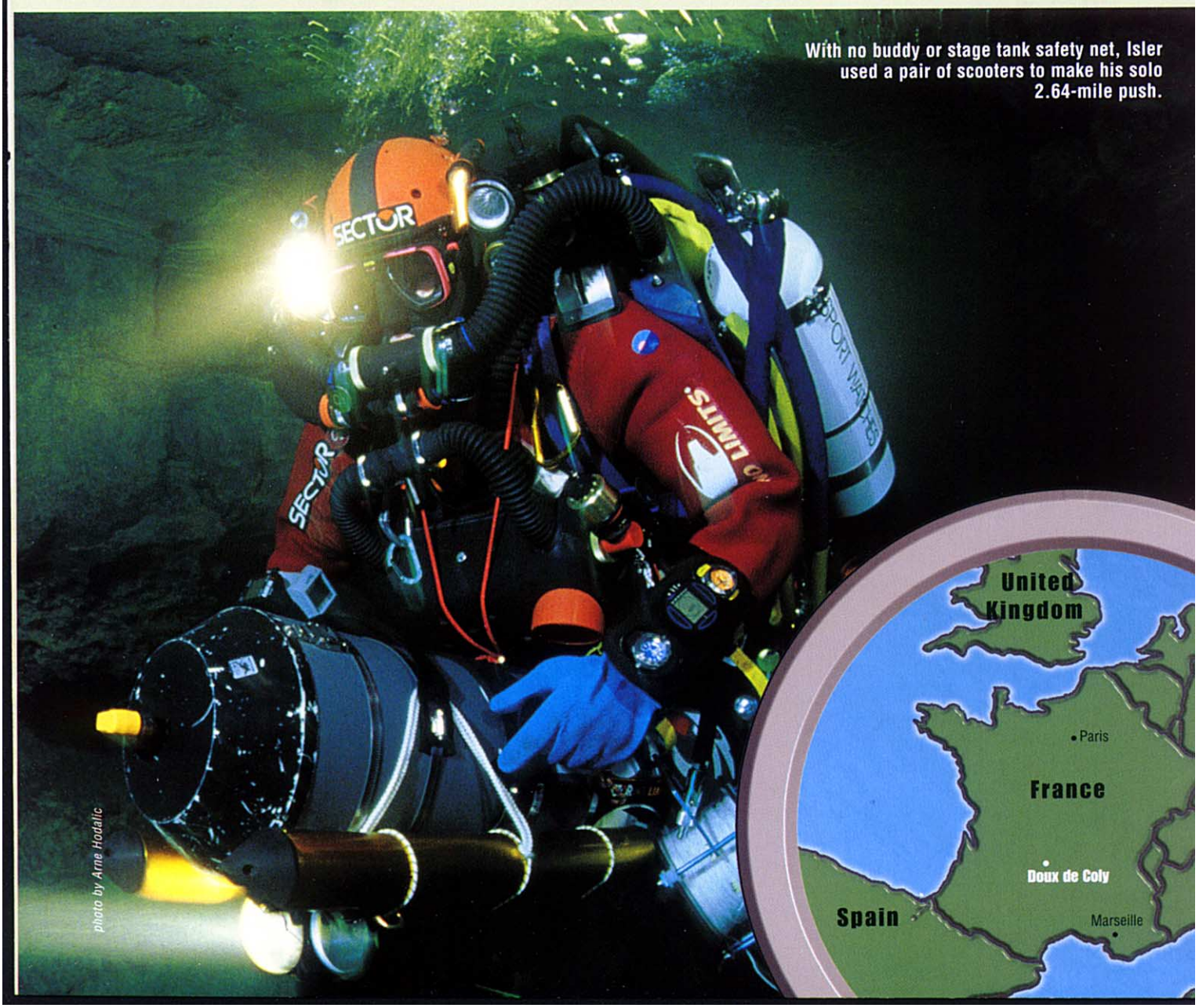
The challenge is up for grabs. It is clear that any new attempt will require totally free access to the source, and not these episodic limited permits, which limit efficiency and compromise safety.

An exclusive interview with Olivier Isler

Olivier Isler, 48, is one of the world's leading cave divers. His modesty is legendary. He chooses his dives for their extreme difficulties, and many of his achievements have yet to be surpassed or even equaled: first penetrations ever across the Emergence du Ressel sump (6117 feet/1865m penetration, 263 feet/80m depth), deepest penetration into Cogol dei Veci (7675 feet/2340m, 177 feet/54m), Atlantida Tunnel (5307 feet/1618m, 210 feet/64m), Su Gologone (1312 feet/400m, 341 feet/104m) and Emergence de Bourne (7380 feet/2250m, 151 feet/46m). He also conquered the Petit Goul (3608 feet/1100m, 541 feet/165m), Touvre d'Angoulème (485 feet/148m depth), Loue Spring (5642 feet/1720m, 157 feet/48m), Chaudanne Spring (1968 feet/600m, 344 feet/105m) and many others.

A natural science teacher in the suburbs of Lausanne, Switzerland, Isler is also an ingenious inventor who conceived, designed and pioneered such devices as the drysuit dorsal buoyancy bladder, the integrated P-valve, the auto-hoistable mini deco habitat, and underwater scooter couplers. His pride and joy, however, is the RI 2000, a semi-closed circuit rebreather devised and tested in 1989.

It is with this device that in 1991 he achieved at the Doux de Coly what was then the longest penetration dive ever, in terms of length, duration and depth: 13,300 feet (4055m) at an average of 151 feet (46m). Having hit a dead end during the dive, he was intent on finding the continuation of the cave. After a failed attempt in 1997, a team of divers from all over Europe gathered at the end of July 1998 to assist Isler and give him the necessary logistical support. Equipment was stored at a nearby farmhouse that became the headquarters for the operation. ►



With no buddy or stage tank safety net, Isler used a pair of scooters to make his solo 2.64-mile push.

photo by Arne Hodalic

photos by Gavin Newman

THE EQUIPMENT

Tanks

Bottom mix: 2 x 125cu.ft. (20L) and 2 x 72cu.ft. (12L) heliox 25/75.

Decompression mixes:

- 1 x 50cu.ft.(8L) + 1 x 25cu.ft. (4L) (emergency) heliox 40/60 (115 feet)
- 1 x 72cu.ft. (12L) heliox 50/50 (66 feet)
- 1 x 125cu.ft. (20L) heliox 60/40 (53 feet)
- 1 x 125cu.ft. (20L) heliox 70/30 (40 feet)
- 2 x 95cu.ft. (15L) 100% O2.(26 feet)

Dry suit: 1 x 13cu.ft. (2L) Argon

Scooters

Each scooter uses four 24V lead/acid batteries delivering 33 Amps each, with a top speed of 115 feet/min. with full exploration gear.

Five- and three-feet-long, both scooters are similar in design to those used by the famous Woodville Karst Plains Project team. The only significant difference: the diver straddles the scooter (like a Farallon MK8, for example) instead of being pulled behind it. If this were the case, the ventral section of the RI 2000 would be directly in the vortex of the blades, thus creating strong turbulence that would make the ride too uncomfortable and too slow.

Lamps

Helmet mounted:

- 1 x 10W + 1 x 20W, both powered by an external 12V battery, cannot be used together, 9-hour autonomy in total
- 2 x 2W emergency lamps, integrated batteries, 4-hour autonomy each
- 2 x 1.5W emergency lamps, integrated batteries, 3-hour autonomy each

Mounted under main scooter: 2 x 50W Duolights, integrated batteries, 2-hour autonomy each

Mounted under main scooter: 1 x 35W Starlight by DolphinTech, integrated rechargeable NiMh batteries, 30-minute autonomy

Drysuit: Custom made by Burkhard in 7.5 mil Rubatex neoprene. Integrated 25-litre dorsal bag.

Fins: Esclapez

Warm jacket: 60 Watt

Rebreather: Triple redundancy RI 2000.

Deco habitat: Stainless steel frame, with rotating safety seat allowing exit in less that 3 seconds. Soft cordura/ dacron (triple layer) outside shell, neoprene inner lining. Volume: 35cu.ft.

one of these systems is made of redundant subsystems such as injectors, etc.

It is only after many tests in pools and lakes, some simulating up to four hours of total failure of all the electronic circuitries, that I took the decision to take it in the caves. But I can't claim to know its limits, having not really reached them yet.

DT: Could you go back to your notion of achievement?

OI: Sure. With the RI 2000, I need to test my concept of full autonomy, and find out if it can contribute to the advancement of diving. The first step was to show how far I could go, not necessarily how deep: machines can easily replace man at depth, but beyond a certain distance, extreme cave diving is a human exclusivity.

To be convincing, tests have to be done in extreme conditions. That's why I dive in the most difficult caves, alone, with no staged tanks, as far as I can go. I want to show that the RI 2000 can take me there and bring me back safely. At the Doux de Coly, I was the test pilot proving that the RI 2000 could provide safe autonomy for close to 12 hours at an average depth of 148 feet (45m). Not bad for a garage-made prototype! It can still be perfected, and my next plans are to test its use to depths largely beyond 328 feet (100m) with penetrations farther than 3280 feet (1000m), distances never achieved safely with SCRs.

DT: What do you say to those who criticize you for diving solo?

OI: First, many sites are simply too restricted for several divers to deco safely together. Second, dive teams are often looked at as complete systems, the overall safety of which is analyzed from the perspective of failure points, with the diver usually seen as the most likely failure point.

My question is: from that point of view, what is safer, three divers each wearing a traditional SCR, or one diver carrying three SCRs? This doesn't mean that I can't conceive of diving other than solo. My only wish is that it be done solely for pleasure, and not out of safety considerations.

DT: Are you ever scared when you dive?

OI: I am always very apprehensive. I would be suicidal otherwise. I believe that fear of dying is a crucial part of risk management. Without it, safety is compromised.

DT: Did you ever have a close call?

OI: Twice. I remember a terrible ear equalization problem in 1982 in the Emergence de la Bourne, and the fateful collision during my failed attempt at Doux de Coly in 1997. I also lost my friend and colleague Jacques Brasey in three feet (1m) of water in a spring in 1992. That was a terrible loss that kept me out of diving for four years.

DT: Do you have a hero?

OI: Sheck Exley. Definitely. An incredible man, so strong in his head, yet so simple, a true gentleman. Cave diving owes him a lot. DT

John Simenon is a TDI Instructor Trainer in Switzerland.

Olivier Isler would like to extend special thanks to: Sector, without the help of which this expedition could not have taken place; Guy Quessada from AGA who provided the gas needed for the dives; Jean-Pierre Imbert for his ultra-safe tables; Karl Von Basel, for his ROV and telephone system; Philippe and Léon for their surface help, and of course to all the members of the team, from six countries, who gave so much during these three weeks:

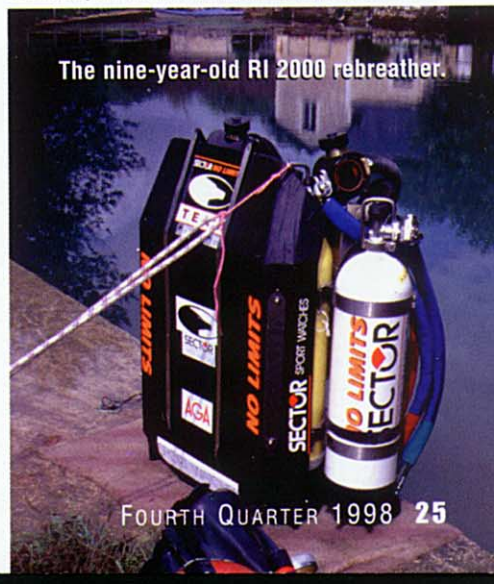
From Great Britain: the outstanding CDG team of core members Robin Brown, Russel Carter, Malcolm Foyle, Jez Nasse, Gavin Newman, Dave Ryall, Scoff (B. Schoffield), Michael Thomas, Steve Thomas, with Mark Goodwin, Dewi Lloyd, and Paul Monico also participating.

From Germany: Core member Reinhard Buchaly.

From France: Core members Daniel Cance, Claude Huret, Alain Ronjat. Also participated: Marc Chocat, Daniel Dumas, and Michel Léonard, Roland Gillet (Belgium)

From Slovenia: Core member Arne Hodalic

From Switzerland: Core members Yves Marmillon, Sebastien Schoepfer, Alain Vuagniaux. Also participated: Bruno Grégoire, Toni Dema, Arno Murith, and Michael Walz.



The nine-year-old RI 2000 rebreather.