



# tech talk

Fellow students on GUE's CCR 1 course engage in multiple practice dives each day to practice new skills (right); The author's rebreather rig (below)

Text and photos by Adam Hanlon

I completed a Module 1 course on the Inspiration Classic back in the late '90s but found that my limited ability meant that maintaining situational awareness while also having to continually monitor handsets was very difficult. In the early 2000s, I also did a series of technical diving courses with Global Underwater Explorers (GUE), and I still rate these lessons as the most significant dive training that I have ever undertaken.



## Going Through the Paces of GUE's CCR1 Course

The arrival of heads-up displays (HUDs) and wrist-mounted pO<sub>2</sub> monitoring has meant that maintaining situational awareness has become a great deal easier. In early 2019, GUE launched a revised series of courses, training individuals to use closed circuit

rebreathers (CCR), or more specifically, the JJ CCR rebreather in a GUE modified configuration. Given my positive experience of previous GUE training, it made sense to me to sign up for the CCR1 course with GUE instructor Richard Walker.

### Theory and preparation

Day one of the course saw my fellow students, Richard Savenije and Will Zhou, and I being introduced to the general theory about rebreathers by Richard and then building up and preparing the units

under his watchful eye. The GUE version of the JJ CCR has several notable features. First among these is the addition of a pair of (typically) 7-litre cylinders manifolded via a flexible isolation manifold. These provide diluent (via the right-hand





post regulator and the JJ's ADV) and bailout (via either OC necklace regulator or BOV). The configuration retains GUE's signature OC long hose, feeding off the left post and stowed in a "Hogarthian" loop under the rebreather's loop.

Oxygen is supplied via a rear-mounted cylinder, which feeds the unit's solenoid and MAV. Both diluent and O<sub>2</sub> gauges are routed to the left-hand side and clipped off onto a hip D-ring. As the bailout/diluent cylinders will typically be using heli-



Diver deploys a delayed surface marker buoy during a drill (left); Pre-dive checklists were completed and placed on gear to show it was "ready to go." (right and below)

um-based breathing mixtures, drysuit inflation is done via a small cylinder mounted on the backplate, or a larger cylinder mounted on the rear of the unit, if required.

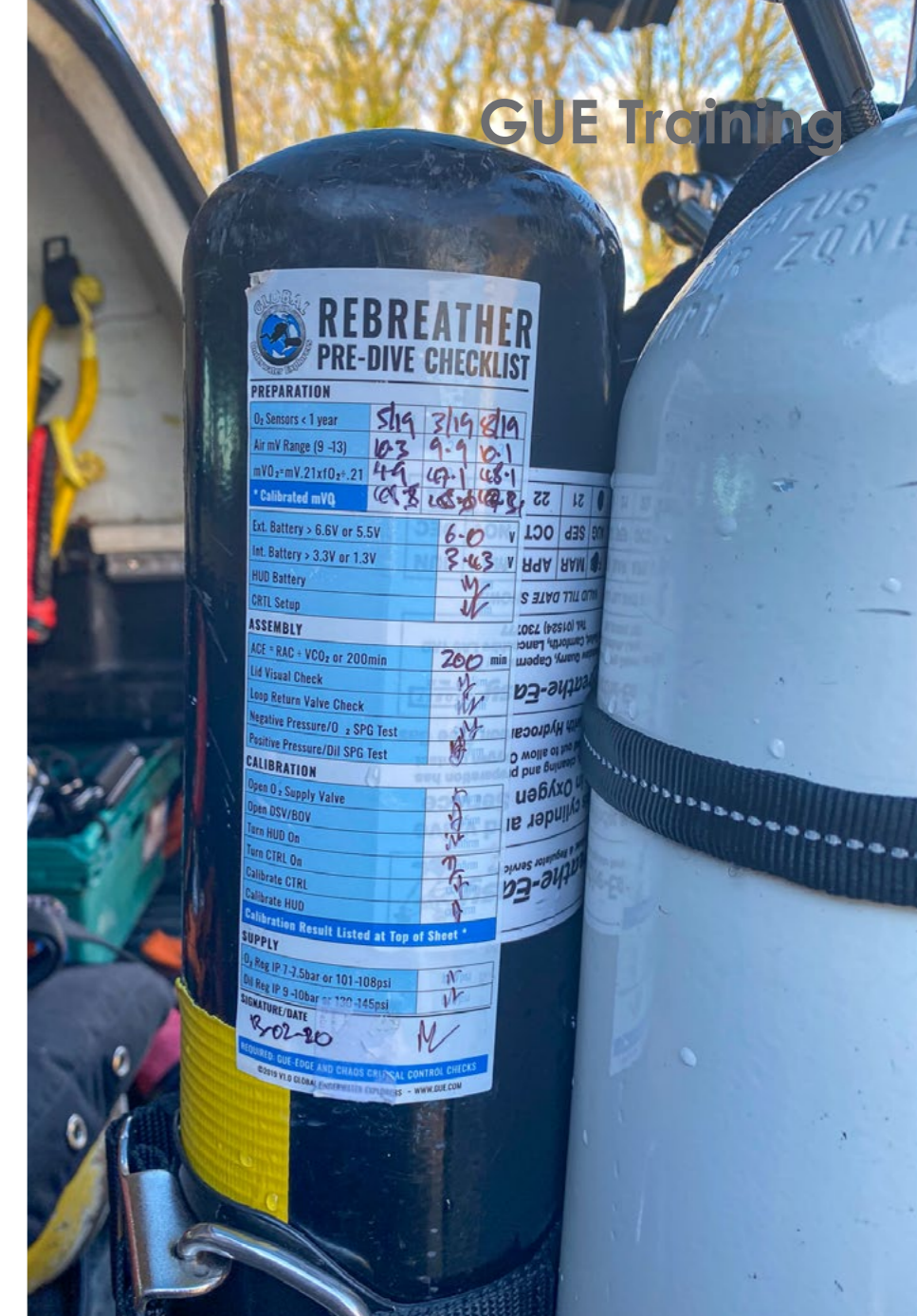
### Checklists

GUE's approach to rebreather safety has, as one of its cornerstones, rigid adherence to a series of checklists. This includes a pre-dive checklist that ensures that the unit is assembled and working correctly. This should be completed each time the unit is assembled, with additional checks before each day and each dive. The pre-dive checklist is completed and then attached to the unit to ensure that in an environment that has multiple similar units, it is immediately apparent which units are "ready to go."

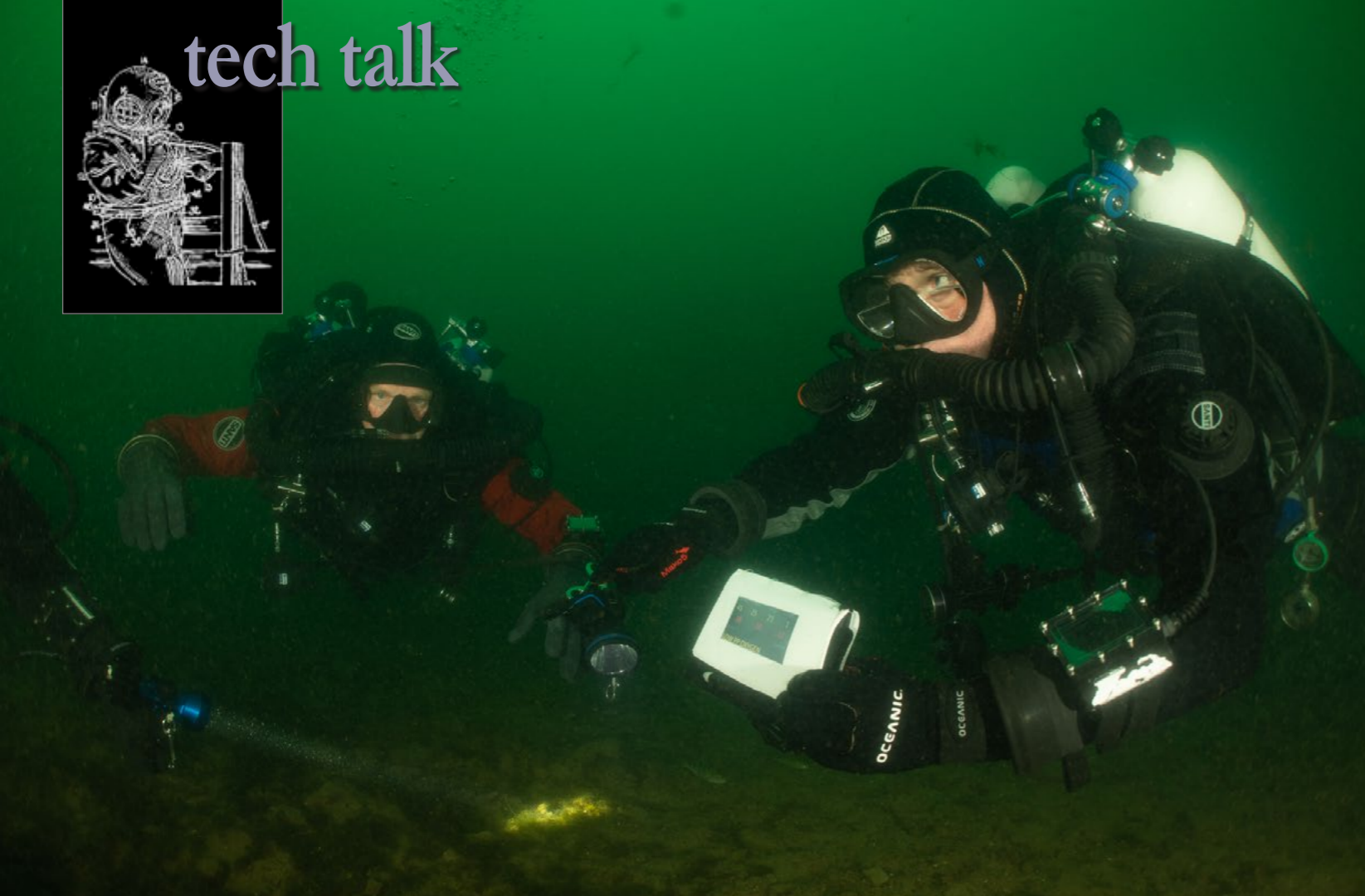
Once the units were ready, Richard took us through a "dry dive," discussing how to come on and off the loop, mouth-piece seals, achieving optimal loop volume, pO<sub>2</sub>

awareness, and communications.

Before each dive, GUE mandates a five-minute pre-breathe, during which the user carries out a series of function tests, known as a CHAOS drill. So, after completing this, we planned a dive using the standard GUE EDGE dive planning tool and went diving!



Checklist for GUE CHAOS five-minute pre-breathe protocol



The fourth course day focused on “failure cards,” to which the team had to respond for various failure scenarios shown.

## Diving

On the first day, we did four dives, each one introducing new skills on the unit. These included bailouts, gas sharing, flying the unit manually, dewatering, flood recovery and diluent flushes. Also, we completed some of GUE's standard skills, including delayed surface marker buoy (DSMB) deployments and ascents, situational awareness, team drills, and all the usual buoyancy, trim and propulsion skills.

We split the units down and returned to the classroom for a debrief and discussion, before Richard introduced some of the features of GUE's gas choices and how they integrate into CCR use, monitoring  $pO_2$  and the issues around failing to do so. Finally, we rebuilt the rebreathers and carried out the pre-dive checklist, ready for the next day.

## Bailout

Day three commenced with a CHAOS drill and GUE EDGE planning session

before completing two longer dives. During these dives, we further practised the skills that had been introduced the previous day.

The GUE JJ CCR setup provides a swift and efficient bailout option. If equipped with a BOV, a twist gives access to 14 litres of back gas. This provides plenty of time to make crucial decisions and to figure out what to do next!

If it is decided that a full bailout is required, the protocol is to deploy the long hose, run it over the rebreather's loop, and to breathe from it, removing any issues with the work of breathing. If not equipped with a BOV, the user would switch to the necklaced second stage to achieve the same effect.

Day three involved practising ascents after bailing out, including gas sharing with another diver during an ascent. After the dives, we again stripped, reassembled and checked the units, and returned to the classroom where

Richard covered gas management and dive planning, along with decompression strategies. GUE's stance on dive computer use is that they are one of several tools that can be used, and while their input can be valuable, understanding decompression and utilising a variety of planning tools is more important than relying on any single device.

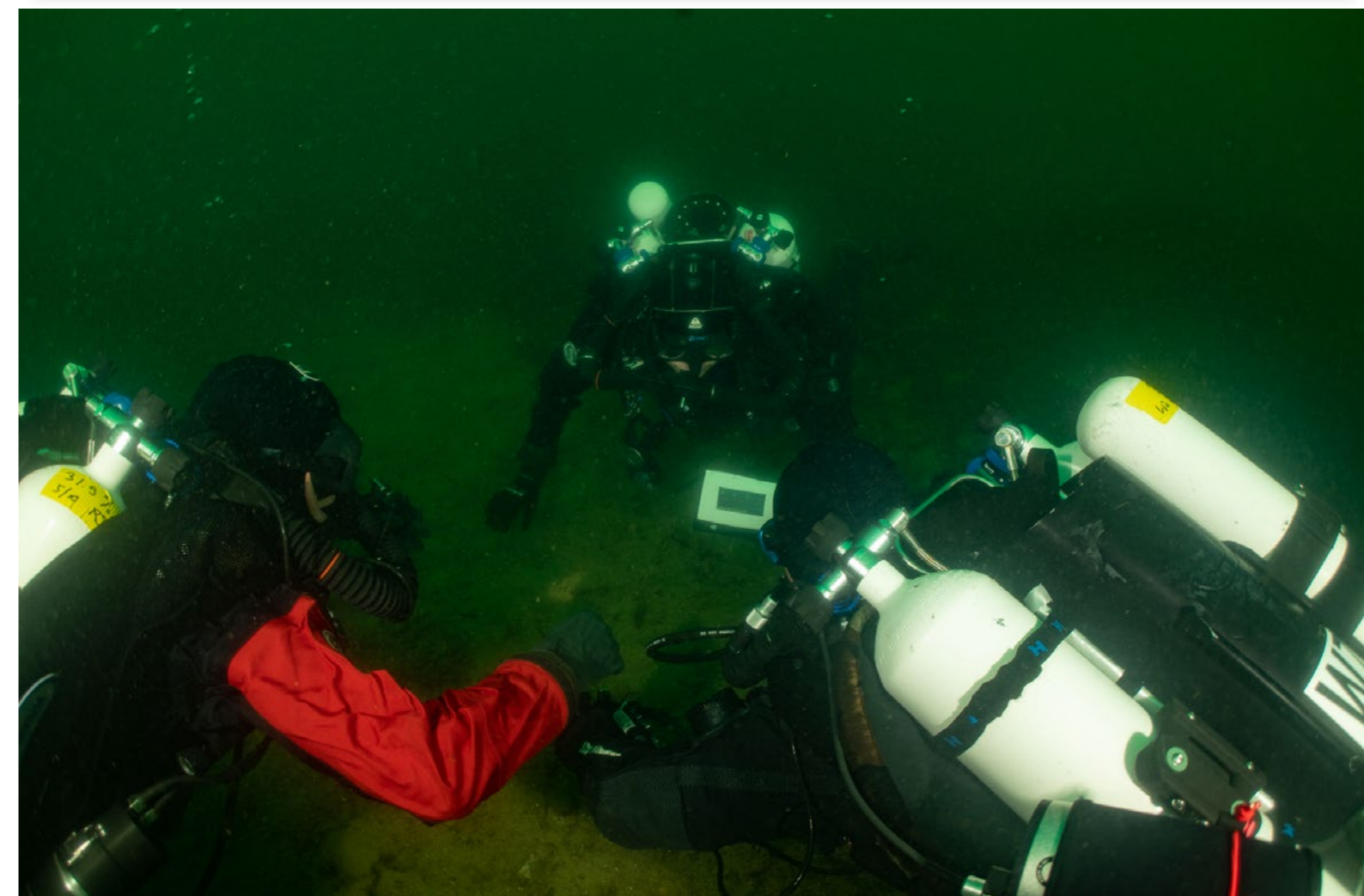
## Failure cards

Richard introduced “failure cards” on day four. These showed a picture of the screen of the Shearwater dive computer, displaying specific failure modes. We then reacted as a team to these and

took (what we thought were) appropriate actions.

Pretty rapidly, the scenarios became pretty complicated and required both troubleshooting and decision making, along with team input and communication. As always, it was required that this

all took place with good buoyancy control, situational awareness and propulsion techniques. Richard's topic for the theory was an introduction to human factors in rebreather diving safety and how to quantify, and hence, reduce risks.





The last course day focused on in-water rescue techniques, ending with a final exam, swim tests and a "fun" dive.

### Rescue techniques and final exams

Our final "school day" introduced us to in-water rescue techniques both on the surface and underwater. We completed one more training dive, in which the cards made an appearance again, forcing us to refine our responses and troubleshooting skills. We then did a couple of experience dives, before finishing up with a session in the workshop, looking at servicing and repairing the unit. Along the way, we completed the CCR1 exam, and Richard reviewed our answers with us as well as the mandatory GUE swim test (500yds/450m in less than 14 minutes and 60ft/18m on a breath-hold).

Our final dive together was a "fun" 84-minute dive. GUE, rightly, does not allow photo shoots to take place during training dives, so we use this post-course dive

to get some pictures and to enjoy using our new-found skills to explore the dive site.

### Afterthoughts

GUE's CCR1 course is thorough and demanding, and provides a very solid grounding in using the JJ CCR as configured by GUE. Given that it currently has a prerequisite of GUE Tech 1 to attend, it builds on the skills emphasised in this course and applies them to using the rebreather.

It was interesting that the three of us on the course had never dived together yet were able to operate as an effective dive team from the very first dive. Dive conditions during the course were a little challenging, and this presented no problems at all in terms of situational awareness and team cohesion, primarily due to our prerequisite training.

I began this report by mention-

ing that my experience with GUE training still rates as the best diver training experience I have had. I am delighted to report that CCR1 upholds this standard, and the training I received will continue to be something that will be a part of every dive I carry out. ■

*The author offers his humble thanks to his team members Richard Savenije and Will Zhou and special thanks to his excellent instructor, Richard Walker.*

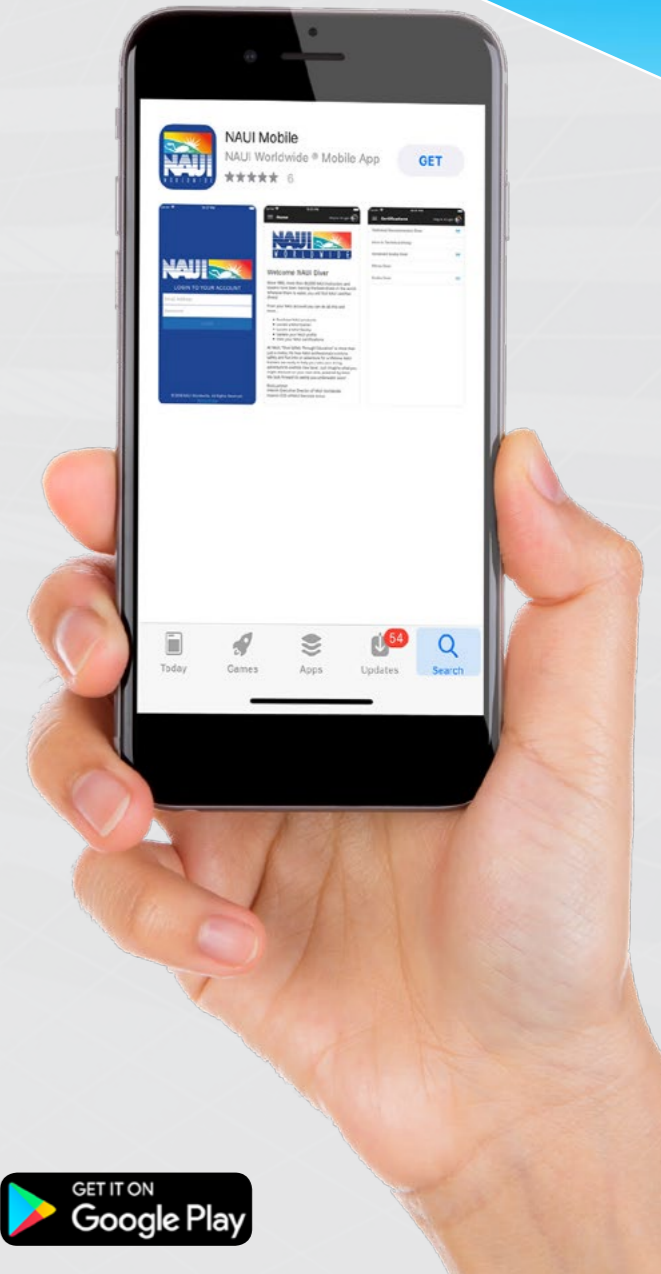
*Underwater photographer Adam Hanlon is the publisher and owner of Wetpixel (wetpixel.com), the premiere online resource for underwater image-makers. He holds qualifications from PADI, IANTD, TDI, CMAS, NAUI and GUE and owns a dive school based at Capernwray Diving Center near Lancaster, United Kingdom. To see more of his images, please visit: hanlon-photography.com.*



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