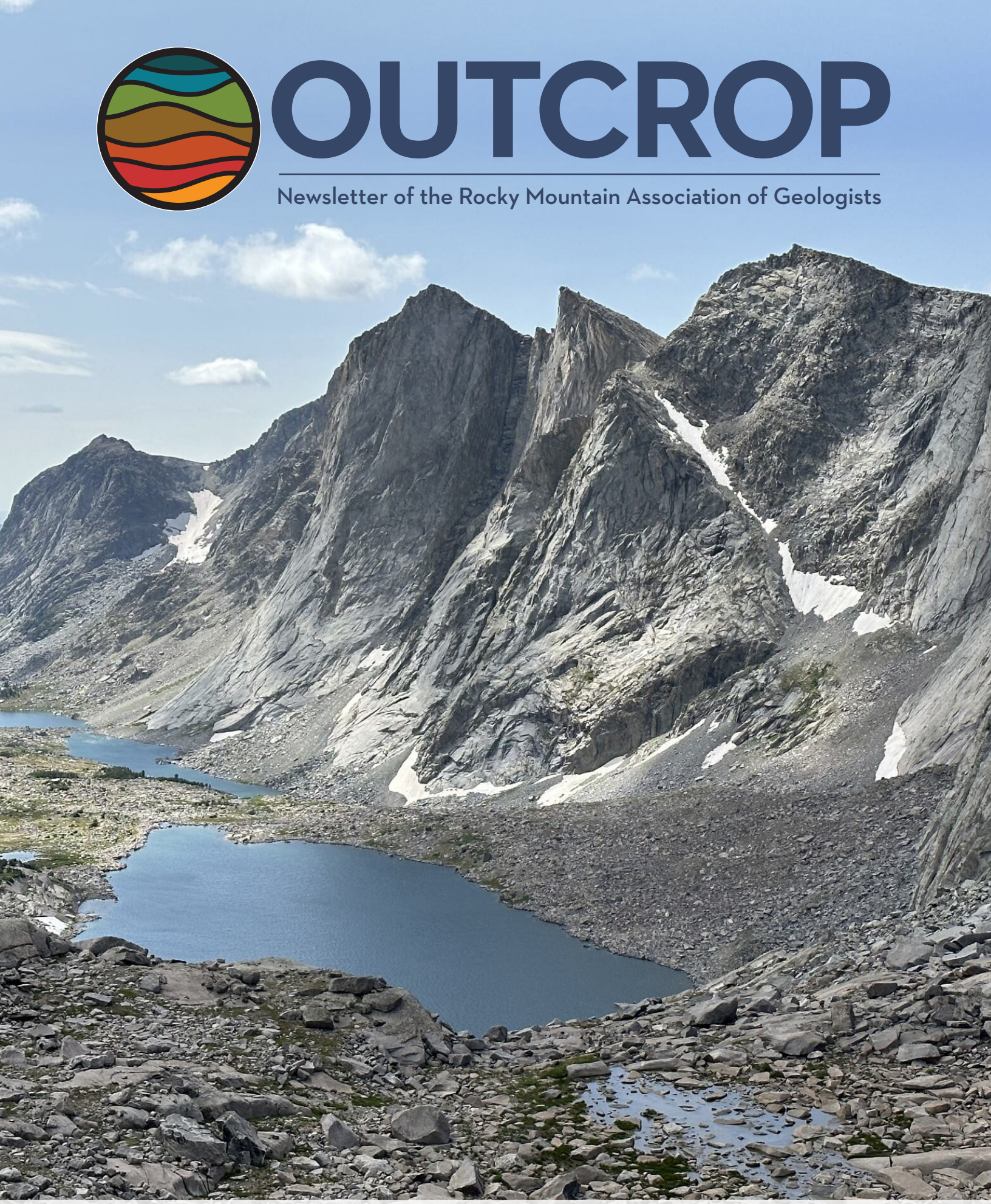
OUTCROP

Newsletter of the Rocky Mountain Association of Geologists



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OUTCROP
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Raid Peak Basin in the Winds by Lauren and Dave Heerschap.

OUTSTANDING IN THE FIELD SINCE 1894

A Brief History of Brunton, with an Update Regarding its New Ownership and a Paragraph about the Importance of Analog Measurements

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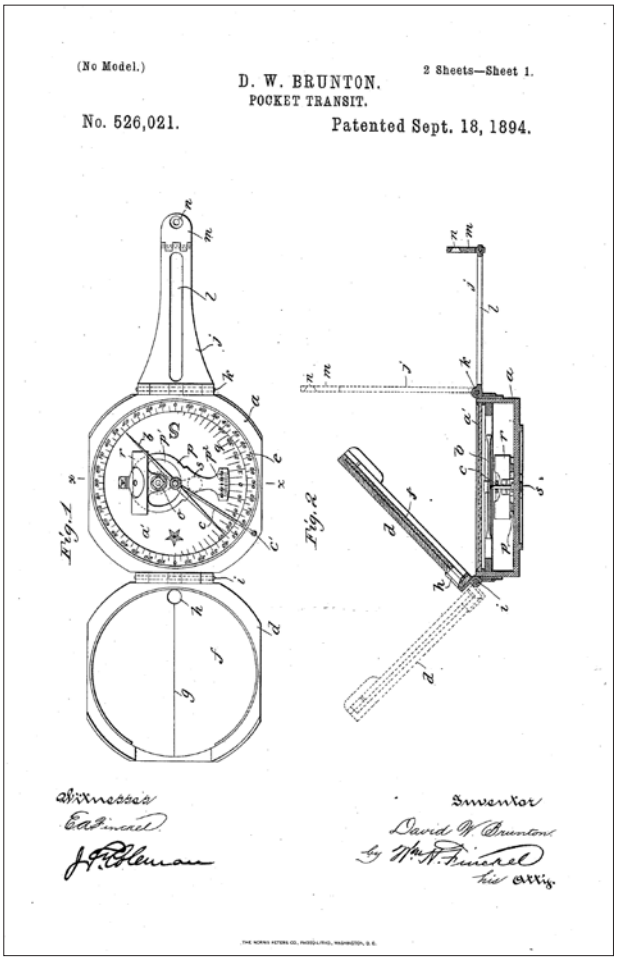
WHEN YOU FIND YOURSELF at an outcrop measuring strike and dip with your Brunton compass, how often do you think about the background of that trusty tool? It turns out that this humble instrument has a long, complicated story that mirrors the history of geology in the Western U.S. and reflects global events over the past 130 years.

Brunton is arguably the oldest brand in geology and one of the discipline's most recognizable names. It has the distinction of being the world's oldest compass brand and holds some of the longest-standing military contracts with the U.S. government of any company. In the realms of field geology, military, and outdoor recreation, the Brunton compass remains the steadfast tool around the world for navigation and field measurements not dependent on batteries, GPS signals, digital devices, or terrain conditions. The simple function of a magnetic needle pointing north leads to the enduring legacy of the Brunton compass, one that has no end in sight.

But let's start at the beginning. In the late 1800's, America's westward expansion had grown into a full-scale industrial boom fed by the rich natural resources of the West. Exploration for minerals and metals was in full swing; it was the golden age of most western mining efforts, when what are now ghost towns were bustling with all manner of industry and population diversity. Exploration efforts were reliant on bulky surveying equipment; it often took a mule or two to carry the transits, tripods, clinometers, alidades, and plane tables of the time.

It was in this setting that David William Brunton took the stage. D.W. Brunton was a Canadian-born mining engineer working in Aspen, Colorado, and he recognized that most exploratory geology didn't require such high-precision or burdensome equipment. Exploration efforts were also slowed down by the time-consuming setup process of all that equipment

2025 Paleo Purple
Standard Transit.



LEFT: D.W. Brunto.

RIGHT: 1894 Original Patent Drawing for pocket transit.

at each measurement-worthy locale. So, on September 18, 1894, D.W. Brunton was awarded his first patent for a pocket transit, cleverly named as a compact, portable version of the transit that could theoretically fit in one's vest pocket. His first design featured a direct sighting magnetic compass, a mirror, a sighting arm, and a clinometer with a level, all housed in a rugged aluminum body. The pocket transit could measure precise horizontal bearings and vertical angles; essentially what sets it apart from a simple compass. Before this invention, geological measurements such as strike and dip required two separate instruments: a compass and a clinometer. Now those capabilities were combined into one compact instrument. The design, shape, components, and function of D.W. Brunton's first model are still foundational to the classic Brunton pocket transit today.

D.W. Brunton licensed what became a growing list of patents to the Ainsworth Gold Scale Company in Denver, CO, where Brunton pocket transits were manufactured from 1894 until 1972. D.W. Brunton incrementally added improvements and experimented with design elements through a series of at least six additional patents. These innovations improved upon the leveling, sighting, and tripod-mounting capabilities of the original design. During World War I, D.W. Brunton adapted the pocket transit to military use, experimenting with illumination and additional adaptations. By the time of his passing in 1927, about 30,000 pocket transits had sold worldwide, and the U.S. military had begun ordering batches of what is now called the M2 transit for navigation and artillery aiming. The design had quickly become the preferred tool for geologists and any other professional who needed precision packed in a portable device.

By the 1960's, the manufacturer Ainsworth & Sons was in decline, with Brunton transits in jeopardy of disappearing with it. Thankfully in 1972 a group of

ABOVE: Geo Transit Production.

BELOW: Dave's Garage Shop in Winter of 2014.

ABOVE: Axis Transit Introduction at 2016 Denver GSA.

BELOW: Brunton Building.

History of the Brunton Compass.

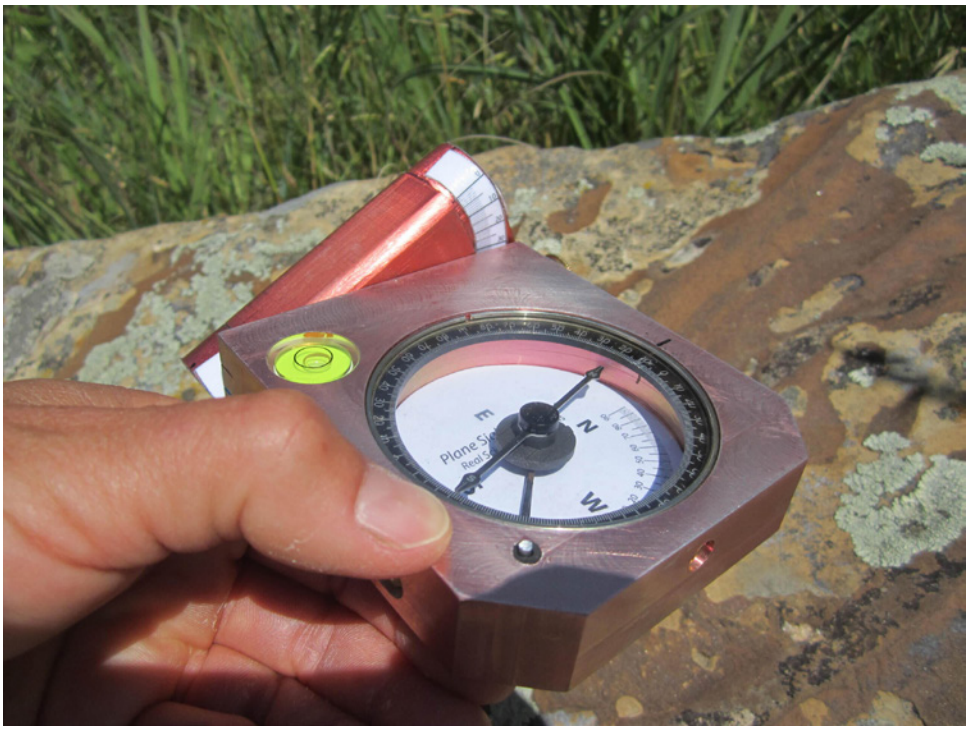
Wyoming businessmen backed by oil and gas funding purchased the Brunton brand, inventory, and assets, and moved it all (including machine shop machinery still in use today) up to Riverton, Wyoming. Riverton was, at the time, a major hub for the oil and gas industry, and the move was bolstered by economic development agencies eager to bring more manufacturing to the town.

Out in the middle of Wyoming, the Brunton company thrived and expanded. It took on new product lines, adding liquid-filled "recreational" compasses in 1976, binoculars and hunting optics in the early 1980's, and additional improvements to the pocket transit line such as magnetic declination adjustments and international needles. The lightweight ComPro Transit, with its plastic composite body, was developed in the mid 1980's. Through targeted marketing efforts, the Brunton brand took on a Wyoming identity, gradually becoming known mainly as a hunting optics and sportsman's brand in the region, all while steadily and quietly supplying the world's geologists with their pocket transits and the U.S. military with the M2.

Then in 1996, after 102 years as an American brand and company, Brunton was sold to Silva, a Swedish manufacturer of nautical compasses and gear. This brought on additional product development and blending of various models of liquid-filled compasses between the two brands. In addition to compasses, Silva attached the Brunton brand to headlamps, early GPS, camp stoves, and other high-end camping accessories. The Geo Transit was developed around the turn of the millennium and was the first significant

change in the pocket transit design since D.W. Brunton's original inventions. With its large hinge dials, the Geo added the capability to measure dip azimuth and dip angle simultaneously as well as certain lineation configurations more easily than the conventional models.

In 2007, Fiskars of Finland purchased Brunton from Silva. Monoculars were added to the optics line, and Fiskars brought an assortment of knives and other hunting accoutrement into the general brand line. Fiskars moved a lot of the recreational compass manufacturing overseas to China, but pocket transit manufacturing remained steadfastly quiet in Riverton, thanks to another community-wide effort to keep the company in town – this time by funding a new Brunton building.



2014 Plane Sight Lineation.

In 2010, yet another Scandinavian company took the reins with the Fenix Sweden takeover. Fenix moved all compass manufacturing back to Riverton but pushed all management to its North American headquarters near Boulder, Colorado. This caused a split in the product line, with the optics managers staying back in their beloved Wyoming and forming binocular companies of their own, including Lander's Maven Optics and Riverton's Lucid Optics. Compasses and transits were being manufactured in the new building, but the front office space started collecting dust soon after the paint had dried. With the move of management and the cutting of the optics line, a lot of the local Wyoming community assumed that Brunton had gone under. Fenix rapidly expanded into some additional imported camping accessories such as portable power and heat sources, possibly to try to fill the void left behind by binoculars, but then consolidated the Brunton line back to mainly compasses around 2016.

It was in this context that my husband, Dave, and I introduced a revolutionary new model of pocket transit and its associated measurement methods. I am a structural geologist who was at that time working as a lecturer at Fort Lewis College in Durango, Colorado. Dave was teaching high school science, mainly physics and engineering, at Animas High School – a project-based charter school in Durango. In 2013 while teaching my sixth summer of field methods, an idea popped into my head as I tried to get students to visualize the planes and lines foundational to geological measurements. Almost in a single field session, an idea developed in my mind into a tool that could simultaneously measure strike and dip while illustrating the fundamentals of the measurement itself. It could do the same for trend and plunge of a lineation, and with a lid that moves 360 degrees around two axes, it would solve the problems of tricky overhanging and also low-dip measurements.

A busy teaching semester went by for both of us, with the idea not leaving me alone until we resurfaced during the winter holiday break. Dave purchased a mill and taught himself how to machine metal, and he used his self-taught 3D modelling skills to make three functional prototypes over the course of that winter. At one point, we ran out of aluminum stock, so Dave made a forge and melted down old climbing

ABOVE: Blue Standard Transit Production.

BELOW: Lauren and Dave Heerschap.

carabiners that we had plenty of as avid climbers. He also anodized the prototypes so the aluminum wouldn't blacken users' hands – so in addition to the forge, we had electrified acid baths hanging out in the garage. It was an interesting winter at the Heerschap household, to say the least!

The prototypes did exactly what I had envisioned, so we started protecting the idea through various patent applications that spring. During the summer of 2014, I took the prototypes of what we were then calling the Plane Sight Compass, to various field camps I was instructing, and the model was a hit with students and faculty alike. It was especially popular with students who were having difficulty grasping measurement methods with conventional Bruntons, and the variety of users and settings helped me discover even more benefits of the model such as easily and intuitively measuring fold geometry, conjugate fractures, and sighting strike and dip from a distance.

Orange Axis Transit.

We knew we had a good idea that we had to run with, but we also knew we couldn't manufacture the Plane Sight Compass in our garage forever. We decided to reach out to Brunton to see if the company would be interested in the idea. In the Fall of 2014, we journeyed to Boulder and spent a full day pitching the idea to Brunton management. It would have been a shorter meeting, but none of the staff at the time knew how the conventional pocket transits took geological measurements, so we had to first show them those methods before we could expound upon the benefits of our invention.

What resulted was the licensing of the patent to Brunton to manufacture an official version of the invention. It was mutually decided to shorten the name to the Axis Transit, and we worked alongside Brunton's engineer at the time, Hank Iden, to create a Brunton version of the prototype. Iden had been the Brunton engineer for almost 40 years at that point, responsible for many of the incremental improvements to the pocket transit since D.W. Brunton himself. The collaboration with Brunton prompted us to uproot from Colorado and move to Lander, WY – a short drive from Brunton's headquarters in Riverton.

The Axis Transit officially launched in 2016, and the first public introduction of it was at GSA in Denver that fall. The Brunton booth was surrounded by three-deep crowds almost the entire meeting, with all ages and levels of geologists extremely psyched on the first significant innovation to the pocket transit since 1894. I remember daily visits from many of my geology heroes, including Eldridge Moores who even bowed to me over my invention. He also brought his 50+ year-old Brunton to the booth for some repairs…

We continued to assist Brunton with the launch of the Axis and with broader support of all geological products at various events during 2016 and 2017. As Hank Iden's health declined, Dave was officially hired as Brunton's Production Engineer in 2018, right around the time that our daughter was born. I continued to volunteer with Brunton on various professional product support projects, and the whole family went

to Sweden in 2019 for a Fenix sales meeting. We got to know the Brunton and Fenix management and leadership, and by late 2020, I was eager to get more deeply involved with Brunton. I started pushing the CEO to hire me as a much-needed Sales Manager for the geological line; little did I know that more was brewing behind the scenes.

In January 2021 in the midst of work-from-home Covid rules, I overheard a meeting between Dave and the Brunton CEO where the question was asked, "What would you and Lauren think of buying Brunton?" That started a year-long effort to negotiate a favorable deal across the Atlantic and to figure out financials that would enable two former educators to purchase a major brand. I did get hired on as the Geology Sales Manager, but we both had to keep the purchase deal a secret from almost all of the staff, including our direct supervisors. We felt the pressure building, too, realizing that the future of the entire Brunton brand depended upon the deal working out. Fenix had some other offers, and with other buyers there was a very real risk that Bruntons would soon be made in China or that the brand would get uprooted from its legacy products and turned into something else entirely.

In November 2021, the deal finally did work out, and we brought Brunton ownership and leadership back home to Wyoming after 25 years in Scandinavian hands. We regrew the management team in Riverton, and all of the existing production and warehouse staff stayed on with us, some of whom had been with Brunton for over 30 years. We quickly expanded from 18 employees to almost 30 people and helped bring back the family feel to the company. During the first three years, we have invested in several long-standing projects such as illuminating the M2 and ComPro (named the Miner's D-Light after a nearby ghost town), creating our own version of the military lensatic compass, and adding high-visibility colors so fewer geologists will leave their pocket transit hiding on an outcrop. And there are plenty of innovations still in the funnel.

We are enjoying the challenges that come with business ownership and are confident in the enduring nature of the magnetic compass. We know that digital devices are capable of taking and mapping geological measurements, but they vary widely in accuracy and should be calibrated with an analog compass daily. Pedagogically, geology students are receiving a great disservice if they are not taught traditional measurement methods. The spatial awareness that comes with using an analog compass, the visualization of the planes and lines involved in the measurement, and the inherent slowing down and field checking involved in hand mapping a symbol on the spot are all lost if only digital measurements and mapping are taught. We're confident that geoscience education will stay on course and continue to equip students with the foundational skills that field work provides – we'll continue to provide the most iconic tool.

So, if you ever find yourself in Riverton, WY, stop by the Brunton headquarters. It's a beautiful building next to the campus of Central Wyoming College. We enjoy giving tours, especially pre-arranged ones. You'll get to see all sorts of compasses and pocket transits being carefully hand-made by a dedicated team. And the next time you're at an outcrop measuring strike and dip, you'll have a deeper appreciation for the humble yet historied geological compass in your hands.