# Colorado Headwaters

Herm Hoops ~ 2015

Building an inflatable evacuation slide for the space shuttle and a pontoon to carry the 70,000 pound Bradley Fighting Vehicle across rivers makes a pretty good resume for entering the whitewater raft manufacturing business. As a co-founder of Maravia in 1975 Chris Pearson had the experience and knowledge to make that come true and when Pearson left Maravia he began building boats under the name Colorado Headwaters, incorporated in Colorado.(5)(#a.)

Pearson said, "We only decided to get into the river business if we could design something completely unique." The idea for Colorado Headwaters entry into the whitewater industry, a 14-foot self bailing raft, began when Pearson and his neighbor Dan Vork began discussing the idea of starting an inflatable business. Vork brought the financial expertise and Pearson the know-how.(5) Initially they targeted the commercial outfitting business for 80% of their business. By the fall of 1993 they reached full production and anticipated and annual output of 100 boats. Because Colorado Headwaters inflatables were made in the United States, and headquartered in Colorado, the company was structured to respond quickly to customer feedback on their boats.

Colorado headwaters inflatables were made from a ballistic-woven nylon (Kevlar®)(#d.) with a hypalon coating and built to Military Specifications. The fabric had a tear strength of 202 lbs./inch, far above the industry average. The 14 foot raft weighted 95 pounds and had an inflatable drop-stitch self-bailing floor. Most if not all of them had butt seams instead of overlapping seams.(5)

Augie Eieschen remembers a Colorado headwaters 20' outfitter prototype gear boat on the Snake River in the mid-1990s that originally had no floor. After a season it was sent back to have a floor installed. The rear part of the floor was laced in to be able to accommodate a motor for the flat water section of the river.(4)

As Riken transitioned away from building boats in the early 90's Dee Holladay began discussing building custom boats for his Holiday River Expeditions with other boat makers. Colorado Headwaters seemed anxious to listen to Dee and try and build what he wanted – which ultimately won him over.(6)

In 1994 Dee had visited Colorado Headwaters in Denver, Colorado and spent the day with Chris Pearson explaining what Holiday River Expeditions needed for their outfitting operation. Dee wanted a boat to use as a single raft, but also as a Triple Rig in high water in Cataract Canyon. The boats needed to have a self bailing floor. Other important considerations were the size of tubes and how they turned on each end of the boat, the size of inside section between two tubes, tapering bow and stern tubes, the location of d-rings and hand holds, the color and Holiday name printed neatly on the boats. The boats were built by Colorado Headwaters and in the spring of 1995 Dee and his wife Sue picked up the boats for the river season.

{Numbers in parenthesis (1) are REFERENCES; letters in parenthesis (#a) are described in SIGNIFICANT NOTES}

An April 4, 1995 issue of Key Solutions Newsletter stated: "Dee Holladay of Holiday Expeditions of Salt Lake City says Colorado Headwaters and CAD has met his need for a durable and high performance raft." "With the particular raft we want to use, the side and end tubes are of different diameter, and the sections must blend perfectly." "This design gets quite complex," he says, "If we want to experiment, CAD saves us a lot of time, expense and frustration."(1)(#c.)

In the fall of 1995, *Desktop Engineering Magazine* ran a case study in its premiere issue titled "Using CAD to Design Whitewater Rafts" by Belinda Jones. The article was a close look at how Colorado Headwaters, a custom-raft maker, used CADKEY software to draft, test, fit, and cut patterns for its product line. What Colorado Headwaters was doing with CADKEY was using it on PC to design in 3D which was an exception to the rule.(#b.) This pioneering use of a computer to have the ability to look at a customer's model and, instead of trying to remember how it was created or what the original intent, to just focus on the shape itself, and use geometry tools to extract information so that it's editable was powerful to the inflatable boat building process.(2)

Holiday received their first prototype boat in 1995: a purple, 16' design with very little rake nicknamed the Barney boat.(#e.) Over the next couple of years Holladay and Colorado Headwaters worked through a couple of design modifications, and Holiday River Expeditions began buying them in earnest: about 12 a year over 2-3 years.(6) The boats were made of lightweight neoprene with a white urethane coating. They had a nice soft feel and were very nice to row if not heavily loaded. The inflatable drop-stitch floor, with drain holes down the sides, was attached up the tubes a bit. The boats tracked very well and rowed a bit more like a bucket boat without any water in the floor. Although these boats were nice to row they had several problems that made them less than desirable. The urethane coating was quite thin and did not always adhere well to the neoprene – so they would begin to show signs of wear rather quickly.(6,7)

Dee Holladay worked through several different floor designs, starting with a 4" thick floor and then going to 4.75" and ending up at 6" floor thickness. The increased floor thickness was because a heavily loaded raft would have an inch or two of water on the floor causing rowing difficulties and keeping people's feet wet. This was a difficult problem to solve because one of the design pieces that made the boats row well – the height the flooring glued onto the side tubes allowed the boat to sit lower in the water and made for great tracking. But it did not work well with a heavy loaded raft on multi-day river trips. In addition the sealing of seams created leaks and the valves also had air retention problems, even when the boats were new. The bottom line was that they leaked like a sieve and by 2000 Holiday River Expeditions began purchasing boats manufactured by Maravia.(6) By 2002 Colorado Headwaters, Inc. had disappeared from manufacturing inflatable boats.(#a.)

While Colorado Headwaters no longer manufactures whitewater boats, the computer aided design they pioneered is now a standard for most inflatable raft manufacturers.

## REFERENCES

(1) Key Solutions Newsletter; April 4, 1995 issue;
(2) *Using CAD to Design Whitewater Rafts*, Belinda Jones; "Desktop Engineering Magazine," October 1995; (Magazine's premiere issue)
(3) Dee Holladay Email to Herm Hoops; December 7, 2014;
(4) Augie Eischen Email to Herm Hoops; December 7, 2014;
(5) "Paddler Magazine," Volume 53, issue 4, December 1993, pages 64-65;
(6) Tim Gaylord, Holiday River Expeditions, Email to Herm Hoops; January 20, 2015;
(7) Kerry Jones;, Holiday River Expeditions, Telephone Conversation with Herm Hoops; July 10, 2015;

## MISCELLANEOUS

- U.S. Coast Guard Hull Code: KKQ
- Colorado Headwaters, 2605 West 7th Avenue, Denver, CO, 80204; (303) 592-7150;
- 14' raft Specifications: Length 14'; Beam 7'2"; Tube Diameter 19.5"; Weight 95 pounds;
- See Holiday River Expeditions specifications on attachments;

## SIGNIFICANT NOTES:

**(#a.) Colorado Headwaters Inc. Patent**

On June 20, 1994 Colorado Headwaters Inc., of 18800 East Clarke Road, Parker, Colorado (80134) filed for a U.S. federal trademark registration. The U. S. Patent and Trade Office gave Headwaters trademark serial number of 74540197 for it's logo. In that document the goods and services produced were inflatable rafts for whitewater rafting. The trademark is filed in the category of Vehicles and Products for locomotion by land, air or water. On July 20, 2002, Under Section 8 the federal status of the trademark filing was cancelled.

**(#b.) Using CAD to Design Whitewater Rafts, by Belinda Jones**;

It appears that Colorado Headwaters was one of the first whitewater inflatable manufacturers to use the Computer-Aided Design. The October 1995 story in *Desktop Engineering Magazine* says: Now, 15 years later, both the advertiser and the software featured in the piece are still going strong. MathType is now owned by Design Science, a company specializing in software for mathematical notations. CADKEY is now known as KeyCreator, marketed by Kubotek (acquisition took place in October 2003). John McCullough, product manager for KeyCreator recalled: "Most CADKEY customer base [in 1995] and certainly AutoCAD users were doing 2D." "A lot of large companies had two CAD systems. Their major CAD system, typically ran on Unix or mainframes, and a secondary group using PCs was doing mostly 2D." At the time what Colorado Headwaters was doing with CADKEY, using it on PC to design in 3D was an exception to the rule. (The system specs for CADKEY in the article read, "8 MB of RAM, 16 MB recommended.") One of the milestones after Kubotek's acquisition of CADKEY, noted McCullough, "was the direct feature recognition, a forerunner of what would later become direct modeling. This is the ability to look at a model and, instead of trying to remember how it was created or what the original intent was, just focus on the shape itself, and use geometry tools to extract feature information so that it's editable." "Six, seven years ago when I started working with the KeyCreator team, we were all very aware that the main way we were communicating with the customers was a one-way street through the media, getting articles and taking advertisement in magazines," recalled Scott Sweeney, VP of marketing for CADKEY. "Today, most of our leads, 95% of the people looking to learn about our product, are coming from the internet. Once, people dreamt of futuristic metropolis with suspended highways and flying cars. This, however, has yet to come true." Sweeney anticipated, "The way we interact with our PCs, laptops, and devices will be dramatically different, it's gonna be an interesting ride."

**(#c.) Dee Holladay**
A friend took Dee Holladay down the Yampa River in 1960. The next year Dee took his wife Sue on a Yampa river trip and a lifelong passion began. In 1966 Dee and his wife, Sue, decided to become river outfitters. The Holladay's were inspired to use a new name "Holiday River Expeditions" to avoid potential confusion in the spelling of the name.

**(#d.) Kevlar®**
Kevlar is the registered trademark for a para-aramid synthetic fiber, related to other aramids such as Nomex and Technora. Developed by Stephanie Kwolek at DuPont™ in 1965, this high-strength material was first commercially used in the early 1970s as a replacement for steel in racing tires. Typically it is spun into ropes or fabric sheets that can be used as such or as an ingredient in composite material components. Kevlar has many applications, ranging from bicycle tires to body armor because of its high tensile strength-to-weight ratio; by this measure it is 5 times stronger than steel. A similar fiber called Twaron with roughly the same chemical structure was developed by Akzo in the 1970s; commercial production started in 1986, and Twaron is now manufactured by Teijin.

Versatile and strong, Kevlar® fiber is more than just a series of threads. Kevlar® fiber and filament come in a variety of types, each with its own unique set of properties and performance characteristics for different protection needs. Kevlar® 29 (K29) the original family of product types has similar tensile properties with many deniers and finishes. These yarns are used in ballistic applications, ropes and cables, protective apparel such as cut-resistant gloves, in life protection uses such as helmets, vehicular armor and as rubber reinforcement in tires, automotive hoses and inflatable boats.

**(#e.) Barney**
The prototype raft, Barney, was purple as that was the color fabric Colorado Headwaters had at the time. Subsequent orders were boats of white urethane.(7)

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