

The R2 Builders Club



From left to right: Disneyworld's R2-D2, R2-KT, and ILM's R2-D2.

by K. Stiles Howard

“Adherents to the Jedi way closely follow an ancient code that guides their actions in the service of the Republic. It reads, in part:

**There is no emotion;
there is peace.**

**There is no ignorance;
there is knowledge.**

**There is no passion;
there is serenity.**

**There is no death;
there is the Force.”¹**

and the Jedi Code

About nine years ago, in this galaxy, in a continent far, far away from North America, Australian Dave Everett began an Internet-based *Star Wars* fan club, which he named the R2 Builders Club (R2BC). Established for people interested in building 1:1-scale R2-D2s, the R2BC has evolved into an online community of more than 6,600 members worldwide (<http://movies.groups.yahoo.com/group/r2builders/>). Once created, these R-series astromech droids do not merely sit around gathering dust. Quite the contrary, they live very active lives, joining their humans in performing service projects that raise money for charitable organizations and educate children about science, computer technology, engineering, and robotics.

“It is from the ranks of the Jedi Masters that the High Council is chosen ...”¹

Committed to creating a community of R2-D2 Builders, as well as

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fostering the construction of high-quality replica robots, founder Everett was determined that the club put measures in place to ensure parts compatibility and also safeguard against profiteering. This prompted a brilliant and inspired move: the assemblage of a Builders Council. This five-person council approves each and every one of the club's parts suppliers. These suppliers — who are also members of the group — work from R2BC's "official blueprints" and offer all their robot parts at cost.

“It is not a venture to be undertaken lightly. As such, Jedi instruction is rigidly structured and codified to enforce discipline and hinder transgression.”¹

The official blueprints for building R-series astromech droid replicas were developed by early members of the R2BC. This research and design phase lasted a couple of years. Everett recruited a small group of Builders to assist him in this endeavor. They collected measurements from Star Wars exhibits and dimensions from actual droids. These Builders then used this information to draft blueprints and perform test builds. They created their initial R2-D2 replicas by hand and adjusted the blueprints as needed. This process enabled them to make sure all the pieces fit together. The accuracy of the resulting blueprints provided the group with standardized plans, which ensures the uniformity of the robot parts made by Builders, as well as parts suppliers. So, if an R2 Builder in Paris, TX bought a pair of aluminum outer ankle brackets from an approved supplier in Paris, France, those French brackets would be compatible with that Texan's other aluminum robot parts. (To read more about how the R2BC official blueprints benefited a German fellow who was creating an R2 on his own, visit www.r2-d2.de/index5.htm/.)

When enough R2BC members post to the group expressing interest in a particular robot part, an approved supplier will offer a "parts run." First, the supplier collects payment from all interested parties. Then, the supplier pays a shop (for example, a machine shop) to make the part that has been requested. The supplier also submits contact information for the chosen shop and that run's buyers to the Builders Council. Longtime R2BC member Craig Smith explains: *"The R2BC does not offer complete R2-D2s for sale. Group parts that are available from time to time are made by Builders for Builders as a hobby. The parts are not mass produced for profit, and no kits are available."*

Once a particular batch of parts is created, the supplier ships those parts to the Builders who ordered them. The duration of a parts run can vary from weeks to months — even years, in some cases. Soon after the shipments are made, cheers of glee are emitted around the globe as Builders collect their newly crafted parts from their porches. At approximately the same time (particularly if the shipped parts are aluminum), UPS and Fed-Ex carriers the world over



A father and daughter meet R2-KT.



R2-KT in all her glory.

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can be heard grumbling about lower back pain.

“As the Jedi mature, the apprentice is paired with a master to continue the next phase of the training.”

So, how does the R2 Builders Club online community work? When Builders have difficulties — say, locating a part, figuring out the blueprints, deciding which foot motor to use, or simply wondering where to begin — they post to the group, and they get answers. Of the group's 6,600+ members, only 100 or so actively post to the group.

Longtime members delight in coaching new members on the process of building these replica robots. Master astromech Builder Jerry “JAG” Greene enjoys helping out fellow club members. One of the first dozen members of the group, founder Dave Everett recruited JAG to assist him in creating the official R2BC blueprints. Needless to say, Jerry has a wealth of knowledge and experience in all R2 related topics. JAG's advice to new R2 Builders is *“Have fun. Don't stress out about it. The R2BC includes design engineers, helicopter pilots, and machinists. If you don't know how to do something, someone in the group will.”*

“To become a Jedi requires the deepest commitment and most serious mind.”

R2-D2 may be diminutive in size (with a height of 0.96 meters or 3'2"), but building a 1:1 scale replica of its likeness is no small feat. It requires an enormous time commitment, some disposable income, meticulous research, and tireless dedication. It also helps to have supportive family and friends. Another necessary component is the realization that this enterprise cannot be done alone. Each member of the R2BC needs this group — its standardized blueprints, its expertise, its parts runs, its camaraderie — to see this task to completion.

Craig Smith advises prospective members about the amount of time it takes to create a droid: “R2 built from scratch or built from club parts is not a quick project. It will take months to complete a static, non-moving display — even years for a motorized version. When I look at the parts on my droid, I recall the week it took to make the shoulders, the days it took to make the ankle covers, the days it took to re-make the ankles themselves because I did not offset them correctly. And there are dozens more parts on the droid with similar

memories. A project such as this is a huge commitment!”

I spoke with Jerry Greene by phone one recent Saturday afternoon. The first droid he built was a replica of R2-R9, which is red and silver. According to JAG's website (www.r2-r9.com/), R2-R9 made a brief appearance in *Star Wars Episode I: The Phantom Menace*. While “serving aboard Queen Amidala's Royal Starship as a repair droid, he was shot off the hull during a repair.” It took Jerry three years to build his first droid. I asked him about the average time and financial investment involved in building an all-aluminum R2-D2. He responded, “About two years and around \$9,000 — about the cost of a nice, mid-sized car.” Needless to say, if you're going to spend that much time and that much money building a droid, it doesn't hurt to have a healthy sense of humor.

However, it doesn't have to cost an arm and a leg to build — well, an arm and a leg. Astromech droids can be built using any sort of material imaginable. Whatever medium one can afford, has available, and feels comfortable using can be fashioned into a lovable R2-D2. Many R2 Builders pride themselves in building on the cheap. The club has even offered workshops on “Droid Building on a Budget.” Here's what longtime R2 Builders Club member Craig Smith has to say on the range of astromech-building media that he's seen used: *“The most impressive droids I've seen are almost 100% home built. For the body, I've seen skins on frames in both aluminum and plastic — even wood. Rolled aluminum cylinder, fiberglass and, of course, 18" PVC pipe have been used. The method of building a droid directly reflects what materials a Builder is comfortable working with.”*

As for what an astromech droid can do, that is a matter only its Builder can decide. According to the R2 Builders

Club brochure, some people start out by making a static droid to display at home or at work. After building one droid and gaining some confidence, a Builder might get more adventurous. Some club members create remote control droids that emit sounds and have blinking lights. An experienced R2 Builder like Smith can create a droid that can do very impressive tricks indeed.

“I have three astromechs that are R/C and do the

show-stopping 2-3-2 leg transformation. Lucasfilm had one filming unit that could go into the three-leg mode via an air piston with locks at the end of the function, but it could not go back into the two-leg position. My systems use electric motors that are geared down to provide much-needed torque to control the transitions. Limit switches at the ends of the functions stop the transitions where they need to. My design has improved from one droid to the next. So, naturally, I left my latest droid without coverings so people

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can see how the final design works.”

As for how to power an R/C astromech, apparently, there is some very fancy footwork involved. Smith offers the following recommendations: *“I cannot say enough good things about the Robot Power Scorpion XL dual-speed controller for the foot drives. This little \$120 unit learns your radio, shuts down in signal loss, has dual or single-stick control, direct output throttle, or sweep exponential control (and has a) battery eliminator that powers the receiver. I have not heard of one fried controller in the field as of yet.”*

“For foot motors, many (R2 Builders) were using surplus motors and finding ways to adapt them to a good gear ratio wheeled drive. But since the electric scooters have become popular, one can afford to buy a pair of scooters and hack/modify the frame to fit in the foot. Scooter parts are also now hitting the surplus and aftermarket parts suppliers. One can get a pre-fab drive system that goes much faster for way cheaper today than the options we had just a few years ago.”

Members of the R2 Builders Club enjoy meeting other Builders in person, and there are many opportunities for them to do so. There are regional groups, such as the New England (NE) Builders (www.r2-r9.com/Gallery_R2-MA.html) and the Midwest Builders (<http://stevesr2.blogspot.com/2007/08/so-this-saturday-was-annual-mid-west-r2.html>), who gather from time to time. Regional R2 Builders groups may meet up at one area Builder’s shop to make parts or just spend time together. The NE Builders get together every six months or so. Someone will have a barbecue and the Builders will swap stories and catch up with each other’s news. For larger gatherings of Builders, there are always comic book conventions and fan-based conferences (for example, *Star Wars Celebrations* (www.starwars.com/celebration/), San Diego Comic Con (www.comic-con.org/cci/), and Dragon Con (www.dragoncon.org/)). At such events, R2BC members exhibit their droids, lead panel discussions, and hold workshops. Celebration III featured 50 fan-built droids on display. George Lucas even viewed the R2 replicas at that event, much to the delight of the Builders. Over the years, the R2 Builders Club has also developed a unique relationship with Lucasfilm Limited — George Lucas’ production company — and the creative force behind the *Star Wars* movies. When I asked Jerry Greene to characterize Lucasfilm’s relationship with R2BC, he said, “As long as we play nice, they leave us alone.” Well, apparently they do play nice, because Lucasfilm has called on an R2 Builder or two from time to time to ask a favor — and, on at least one occasion, to grant a favor.

According to Wookieepedia, the *Star Wars* wiki (http://starwars.wikia.com/wiki/Main_Page), the R2BC’s “official club logo was adopted by the Lucasfilm R2-D2 Unit for their crew gear during the filming of *Star Wars Episode II: Attack of the Clones* in Australia.” Needless to say, the club’s members were thrilled at this nod to their work. Greene also informed me that Lucasfilm has contacted R2 Builders in the New York City

and Los Angeles areas to request that their astromech droids make appearances at movie premieres. For a *Star Wars* fan and R2 replica builder, attending a premiere at the behest of Lucasfilm must be a dream come true. A red carpet event must prove a most exciting venue in which to show off an astromech droid that was years in the making.

Greene also commented that Don Bies, a Modelmaker and R2-D2 Operator for Industrial Light and Magic (ILM) who has worked on several *Star Wars* movies, is a member of the R2 Builders Club (see www.donbies.com/bio.htm). When Bies needed a spun aluminum, laser-cut, R2 dome to use in *Star Wars Episode III: The Revenge of the Sith*, he knew who to call: Master R2-Dome Creator and fellow R2BC member Ron Barkley. Ron’s dome appears in a scene in which an R2 unit’s dome is ripped off of a ship. No matter how brief the scene, I have little doubt that R2 Builders the world over are immensely proud of it.

The Jedi are “a noble order of protectors unified by their belief and observance of the Force.”²

To say that Albin Johnson is an active member of the *Star Wars* community would be a vast understatement. Albin is the founder of Vader’s Fist: 501st Legion (The World’s Definitive Imperial Costuming Organization). His 501st Legion not only entertains *Star Wars* fans during their appearances, this group works year-round to raise money for charitable organizations worldwide. Albin is greatly admired and respected for his devotion to his family, as well as his



R2BC droids on display at Celebration IV.

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desire to make a positive impact in the world. And so it was devastating to all who know Alvin and his family when they learned that his six-year-old daughter Katie had a brain tumor. A bright and shining star to all who knew her, Katie's friends and family were deeply saddened by this news.

While attending a church service with his family shortly after his daughter's diagnosis, Albin had a lightbulb moment. According to the R2-KT website (www.r2kt.com/): *"Albin noticed something funny about the sanctuary's windows. Call it a sign, call it AI not paying attention in church, but the window looked eerily like an R2 unit and it gave him an idea: Why not build an R2 to watch over Katie as she slept (just like R2-D2 watched over Padme in Episode II)? Katie's older sister Allie went one step further: Why not paint it pink and name it after Katie: R2-KT? An idea was born ..."*

In April of 2005, Albin discovered the R2 Builders Club. Upon hearing of Albin's intentions to build his courageous and wonderful daughter a pink R2-D2, the group was eager to help him realize this goal. Given that an R2 Builder's first droid can take years to complete, it was clear to the group that something unprecedented would need to occur in order for R2-KT to take shape.

Greene suggested that the R2 Builders Club build an all-aluminum R2-KT and donate it to the Johnson family. Greene offered to orchestrate this group build and assemble the droid himself. Albin graciously and humbly gave the club

permission to proceed. Shortly thereafter, Jerry began creating sketches of R2-KT and posting requests to the group to donate the parts he would need to build this one-of-a-kind, pink astromech droid. The response was overwhelming. While the group set about building an all-aluminum R2-KT, R2BC member Andy Schwartz did something quite extraordinary, as well. He disassembled his own R2-D2, painted all of the blue sections pink, put it back together again, and arranged for this original R2-KT to be delivered to the Johnsons' home. This act of generosity allowed Katie to have her very own pink astromech droid to keep her company and lift her spirits.

After a brave fight, Katie Johnson passed away on August 9, 2005. Her family, her friends, and the *Star Wars* community mourned her loss.

The R2 Builders Club decided to continue building R2-KT as a memorial to this wonderful girl. It was an emotional process for everyone involved. Eager to express their compassion for this family, dozens of R2 Builders from around the globe donated astromech parts to the R2-KT project. Over the next year, box after box of donated parts arrived at Greene's Rhode Island home, where he worked tirelessly in his basement studio to assemble this unique droid. (Visit JAG's "Project R2-KT" website at www.r2-r9.com/Project%20R2-KT.html to read a chronology of the build and see images of all this robot's parts.)

By July 2006, R2-KT was complete. Greene and the R2 Builders Club constructed this adorable, circus pink and white astromech droid in record time, taking little more than one year from start to finish. Once the robot was complete, Greene and his girlfriend, Lisa, loaded R2-KT in their minivan and took it on its first adventure. Jerry and Lisa drove



More R2BC droids on display at Celebration IV.

The R2 Builders Club decided to continue building R2-KT as a memorial to this wonderful girl."

seven hours from Rhode Island to the annual Shoreleave *Star Trek* convention in Hunt Valley, MD. The reason for this journey: to deliver R2-KT to the Johnson family.

Schwartz and other members of the R2 Builders Club joined Jerry and Lisa at the convention, where they met Albin, his wife Kathy, and their daughters Allie and Emily. On behalf of the R2 Builders Club, R2-KT was presented to the Johnson family as a gift. Albeit an emotional meeting, it was also a beautiful, loving celebration of young Katie's life.

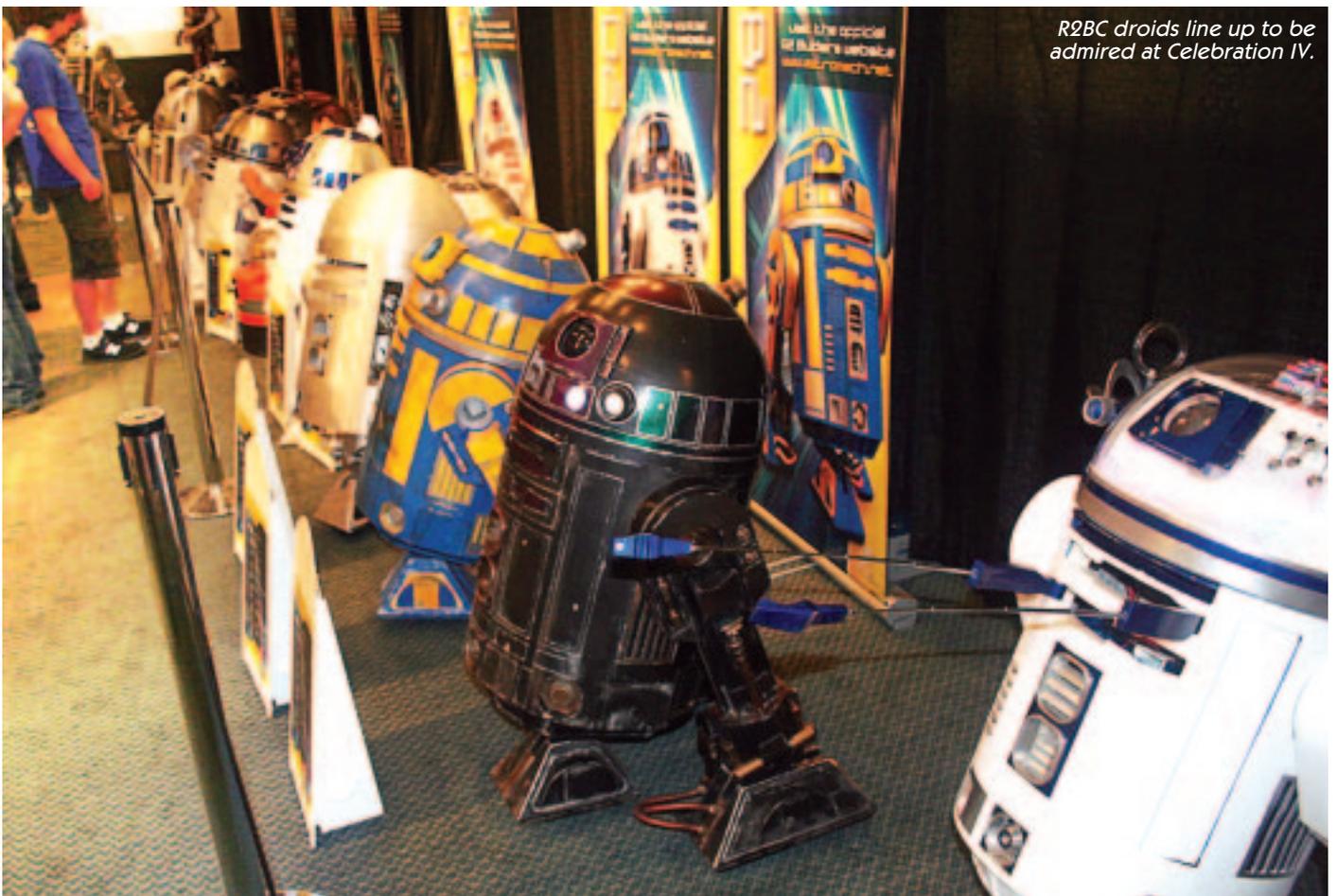
And that was only the beginning of R2-KT's adventures. Like her fellow R-series replica robots and the members of the 501st Legion, this little droid has a mission. Not only that — she has a mission statement. According to the R2-KT website (www.r2kt.com/): *"R2-KT's mission is to entertain children, raise awareness of pediatric cancer, and raise money for such charities as Make-A-Wish and Children's Cancer Fund."*

In November 2006, R2-KT participated in her first toy drive. Appearing alongside the 501st Legion and the United States Marine Corps at a Toys-for-Tots drive at a Toys R Us store in Columbia, SC, R2-KT was a huge hit. In February 2007, R2-KT brightened the day for patients and staff at Palmetto Richland Children's Hospital, where Katie Johnson received treatment. And it seems that this lovable droid is not only cute, she's smart, too. In March of that year, R2-KT went to college. She accompanied the Johnson clan at Albin's alma mater for the University of South Carolina's FIRST Robotics

Competition. She proved vastly entertaining to the children in attendance, and she also (with Albin's help, no doubt) offered instruction on robotics. *"For his courage, Artoo was personally thanked and recognized by Queen Amidala."*³

In early 2007, the Hasbro toy company contacted Albin. Hasbro and Lucasfilm had heard of R2-KT, and they were partnering to create a limited edition action figure in her likeness. Lucasfilm invited the Johnson family and R2-KT to attend the Celebration IV *Star Wars* convention in Los Angeles, CA. Hasbro and Lucasfilm's official announcement of the R2-KT action figure occurred on May 25, 2007, the 30th anniversary of the theatrical release of *Star Wars*. Available exclusively at the 2007 San Diego Comic Con, hasbrotoyshop.com, and starwarsonline, all proceeds from R2-KT sales were donated to the Make-A-Wish Foundations of San Diego and South Carolina. The projected benefits exceeded \$100,000.

Since the R2-KT project, the R2 Builders Club continues building accurate replicas of R-series robots. And even though engineering and computer technology are major components of these models, these creations are also gorgeous works of art. Although, technically, they are reproductions of robot models made for a series of blockbuster movies, they represent much more than that. These R2s represent the joys and complexities of childhood. They celebrate the seemingly limitless expanse of the



R2BC droids line up to be admired at Celebration IV.

Resources

<http://movies.groups.yahoo.com/group/r2builders/>

http://starwars.wikia.com/wiki/R2_Builders_Club

www.r2-r9.com

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human imagination. And these adorable little astromech droids offer us a glimpse into what is possible when human beings work diligently, share knowledge, and strive for

excellence. The excellent craftsmanship of the R2 Builders Club's robot replicas, the group's success in thwarting profiteering, as well as its contributions to educational outreach programs and charitable organizations may have played a role in opening the door to a mutually respectful relationship with Lucasfilm. We'll never know for certain. When founder Everett established the Builders Council, he had no way of knowing that he was setting the stage for a project in which dozens of builders from around the planet would donate robot parts to create a unique astromech droid to honor one very special girl.

"During the restructuring of the Jedi Order by the now Jedi Grand Master Luke Skywalker, a new code was established for easier interpretation for the newer generation of Jedi. The code retained the same core beliefs as the millennia old code, rewritten for better understanding.

Jedi are the guardians of peace in the galaxy.

Jedi use their powers to defend and protect, never to attack others.

Jedi respect all life, in any form.

Jedi serve others rather than ruling over them, for the good of the galaxy.

Jedi seek to improve themselves through knowledge and training."⁴

At a recent educational outreach event, Jerry Greene had the honor of introducing his R2-R9 to a blind *Star Wars* fan. Having often wondered what an R2 unit looked like, this 12-year-old boy was overjoyed to be in the presence of an astromech droid, be allowed to explore its entire surface, and be able to experience all of its tactile qualities. For Greene, having an opportunity such as this – to quietly observe as a fellow human being embraces the opportunity to experience his world in an entirely new way – all the time, research, money, and effort invested in building an R2 unit just melts away into space.

To read a profile of an R2BC member who is crafting an all-aluminum astromech droid and see images of hand-milled robot parts this Builder has created, check out Vern Graner's "Personal Robotics" column in the May issue of *Nuts & Volts Magazine*. **SV**

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