

Your Guide to better Astromeching...



Volume 3
September 2007

IT'S BIG
celebration IV



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TIPS & TRICKS **FROM THE PROS**

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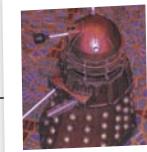
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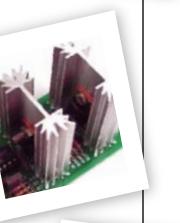
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PICK THIS UP

Golden Motor has introduced a 12V motor powerful enough to propel a bike with a 180lb. rider about 8mph. Small enough to fit inside the R2 foot shell on its own, at \$28 bucks each, this is an interesting find. Though untested, you can check it out at www.goldenmotor.com.

R-Series Editor Cory Pacione and Chris Simmonds lead an astromech conga line.



Letter from the Editor:

We're back!

Well, it's been a long time coming, but it's finally here: Issue #3 of R-Series. This issue was a much different experience for me as I basically only acted as

the editor-in-chief, while all graphic design, story gathering and organization was performed by fellow R2 builder Dan Baker (great job, Dan). My personal life has prevented me from being as active in the R2 building as I used to be, but I'm slowly getting back to my little buddy—and I am finding it good to be back.

This issue of R-Series has some very great articles, from the recent Super-Mega Star Wars gathering of the R2 Builders at C4 to another wonderful update on the R2-KT saga. I've never been more proud to be a part of the R2 Builders Club than I am right now. Our true colors (not Hypo colors either) have shown through. Our group spirit has gone far beyond what I felt an internet fan group could ever do. My hat goes off to every fellow builder. Well done.

Although I didn't make it to C4 this year, I did manage to make a very long drive to Washington DC to meet with fellow builders, and more recently met more of you in New Hampshire. Gatherings are a good time and always worth the trip. I encourage you all not to let a few hours of driving prevent you from attending. You'll be glad you did.

You'll find useful information in this issue, some of it over my head. But then again, when I started this project, I was armed with scissors, glue and fun foam, so don't worry. To all newbies in the group: you're among friends—and some of the most talented people I've ever met. You WILL have an incredible droid someday if you can manage one thing: patience. Just check out Wayne Orr in the Builder's Bio. That clown didn't know much when he started, and now look at him. He's making it hard for me to keep up, but that's half the fun isn't it? :)

Enjoy Issue #3 of R-Series. Dan has put a lot of hard work into it, and all praise should go to him.

Cory Pacione
R-Series Editor-in-Chief

Hey everyone! I'm Dan Baker, fellow builder and graphic designer in Chattanooga, TN. When CIV came, I thought It'd be a great time for another issue of R-Series. Cory has been super-busy, so I asked if he minded letting me take the reigns. He was glad for the help, and I was glad to contribute. The last few months of contacting builders, meeting the guys at Dragon*Con (my first con), and sitting under Cory's watchful eye has been a blast. Like Cory, I've found more and more reasons why I'm proud to be associated with the Club. I hope you get a lot out of Issue #3. I know I learned a TON during the process, and I'll be back next time (if Cory lets me!).

Dan



Issue 3, September 2007

credits

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Although most images in this e-publication are either group photos or renderings, some images have been used without permission from Lucasfilm... but it's all for fun... so hopefully... it's ok!

what's the latest in droid building news

living in the limelight

Wayne and his R2 unit appeared on the Gordon Keith Show, a Dallas local network show. Watch as Wayne's R2 hoses down the host online at <http://www.wfaa.com/video/gordonkeithshow-index.html?nvid=155194&shu=1>



one heck of a con

Dragon*Con 2007 in Atlanta was a huge success. This was the first year that the R2 Builders Club had an official fan table to represent our group. "Droid Building 101," an expert panel in the Matters of the Force room, was also presented to a packed audience. During the three days of the Con, hundreds of people came by the table, took photos with the four astromechs on display, and asked questions of the builders. In attendance were Andy Schwartz and his son Branden, Doug Dixon, Chris Lee, Jonathan Higgins, Carl Cunningham, John Castiello, Dan Baker, Marshall Peterson, and Heath Hammond from Sideshow Collectibles. Also, as a special guest, Barrie Clark brought his full-sized Dalek to display next to the R2 table.



show us your droid!

Andy Schwartz shows us his R7-S2.

I am a Quality Assurance Manager working for a large IT consulting firm in the Washington DC area. I am originally from the Midwest, and moved out here because of work a little over 4 years ago. I have 4 children and a wonderful fiancée named Melanie who is totally supportive of my R2 building. I joined the Club right before Celebration II. I am one half of A&A (Alex and Andy) and we offer low cost plastic droid building parts.

When Celebration IV was announced to be on the West Coast, we realized transporting either our R7 or our R2 was going to be expensive, so we decided to build a mini that would be small enough to be transported as checked luggage. We also decided that since R7-S1 had been such a hit at CIII we would make the mini into an R7 as well. We took the plans and shortened the A&A legs and basically removed the bottom layer of panels on the A&A R7 skins. After building the new R7, now dubbed R7-S2 (our second R7 unit), we decided it should have a little more colorful color scheme. We came up with a red and black design highlighted with some yellow. Scooter motors were used in the A&A scooter motor holder. We had used a Scorpion XL speed controller on the K9 we built for Dragon*Con the year before and found it worked well for small droids. A Vantec 411 is used to control the dome. We made the large door panels open on the front and added a robotic claw to one side and the buzz saw attachment to the other. Both attachments use small motors to extend them when the doors are open. The claw is operated by a servo so that it can grab things. The buzz saw was salvaged from a children's circular saw toy and makes sound as the blade turns. We were not able to get the doors to open mechanically by CIV, but they are designed to be opened with hobby servos. Start to finish, R7-S2 took four months and cost about \$400.

So far we have built 3 droids (R2D2, R7S1 and R7S2) one K9 based on the robot dog from Dr. Who, and we are accumulating parts for a B9 from lost in Space and a V.I.N.cent from the Black Hole. ☺

Each issue, we bring you a different member to show us their R-unit! If you'd like to show us your R-Series droid, just send us a pic and a few details of your droid's status.



droidprofile

R
2
-
Q
5

in the service of the empire



R2-Q5 could easily be mistaken for most of the other Imperial droids. Their black paint jobs helped convey their evil intent in the films, but it did more than that. It gives us an insight into how the greater Empire operates as a whole. Imperial astromechs were equipped with memory inhibitors to prevent them from developing individualized personalities. Just as TIE pilots knew that every reconditioned TIE fighter was identical to a factory-fresh ship, any astromech was the same as the next. "One is the same as many thousands" is the basis of the Imperial philosophy of absolute conformity.

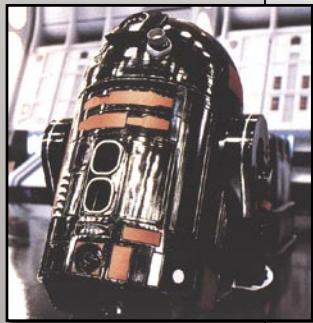
On that note, the TIE fighter was a close range fighter with no life-support or hyperdrive, and its design made it very agile, so an onboard

astromech was deemed unnecessary weight. As a result astromechs, instead of plotting hyperspace jumps and performing in-flight maintenance, were remanded to the more mundane tasks, like performing starship diagnostics. More complex targeting computers in later TIE generations, like Darth Vader's Advanced X1 prototype, meant that astromechs would probably have never been included in future designs, either.

Droids were not generally considered personnel by the Empire, but they functioned essentially as such. A garrison of storm troopers had a huge number of support droids, in some cases exceeding 2,000 units. Most of these droids were engaged in running droid-industrial tasks, which they did with only limited sentient supervision. The industrial droids most commonly in service were 12F series manufacturing droids, a highly competent model. The remaining staff droids were a fairly standard mix of mouse droids, astromechs, protocol, labor, servant, and security models.

Aboard starships, droids served a similar purpose. R2-Q5 was a well-equipped droid, complete with a full array of repair and diagnostic tools, as well as a variety

of spy devices. R2-Q5 served on many Imperial reconnaissance missions in the Expansion Region before being assigned to the Devastator's mission to capture the Tantive IV. He was accompanied on that mission by many other astromechs, since they were ideal for breaking into the data banks of the captured Blockade Runner. Among them were R2-A1, R2-Q2, and R4-M9. In the months to come, R2-Q5 and R5-J2 were reassigned to the second Death Star, where they helped maintain the station's elaborate weapons and security systems, as well as service all TIE Fighters and TIE Bombers. They presumably met their demise in the explosion that destroyed the installation. ☀



DID YOU KNOW?

R4-M9, the green and white astromech seen aboard the seige of the Tantive IV, was allegedly stolen from the Rebel Alliance by the Empire and used as a spy on various occasions. That explains why this Imperial astromech is not the standard black color scheme.

SCIFI

The R-Series Interview:

Wayne Orr

r2 building like a rockstar



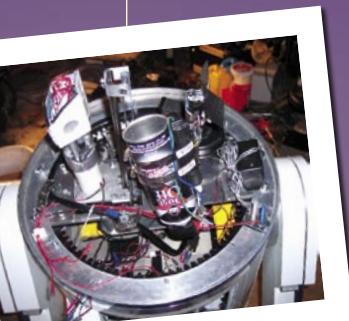
By Dan Baker

R: Tell us a little bit about yourself.

WO: My name is Wayne Orr and I live in Dallas Texas with my wife of 10 years and two beautiful little boys named Mitchell and Logan.

R: When did you get involved with the R2 Builders Club?

WO: I got involved with the Club about four years ago. I had always wanted to build an R2 since I was very little. I can vividly remember building him and R5 with my little droid factory when I was a kid. Also tried to make one out of a shoebox and aluminum foil. LOL! My first TX meeting was in Fort Worth at Jason Smith's house and I was hooked from then on—not on Jason... the droid!



R: Have you met many other members in person?

WO: Oh yes... Going to C3 and C4 was a pleasure! I met tons of fellow R2 builders—too many to mention for sure—but every single one of them made me feel like an old friend. Can't beat this group of guys...hands down the best people I have ever met.

R: Are you building a droid right now? What's its status?

WO: I have a completed R2 unit with tons of bells and whistles. It took me about 4 years to completely get him up and running...and I'm still not through adding junk.

R: How many have you built so far?

WO: Just one. I have enough for another, but I can't seem to will myself to finish it. Look out for a droid part sell off soon!

R: How did you ever get into supplying parts?

WO: When I started offering parts, it was mainly because no one was offering the stuff I needed at the time. There wasn't really a "parts superstore" like there is now. Tons of guys are offering quality stuff. So if I needed a part, I would usually ask JAG for some PDFs and then shop the quote around to machinists. I also wanted to help guys like me that were "tool-challenged" and help them complete their droids, too. I know it's cool to make parts, but it's also just as cool to open a box and see a piece you've been wanting for a while. It's kinda like Christmas!

R: You've always run aluminum parts, right? So what's your process for getting it done?

WO: The first thing I do is figure out what I want to run, which is usually something that hasn't been done in a while or something guys really need. I give JAG a ring and ask him if he has any plans for the part. I then shop around for the best quote for the group. The cheapest quote is not always the best one—you really have to be able to form a relationship with shops and get to know them. Sometimes a shop will want to jack the price up, or they will delay a part because of a bigger order.

These are very small runs for a shop, and I don't think that a lot of the builders understand that. But as the guy with the money, that's when you have to go to bat for the guys in the group. After the part is completed, it's time to make sure it gets to the right person. Overseas stuff is the hardest, especially when you have multiple parts going across the Earth. LOL. Anyway, I think keeping track of everyone's money is the most stressful part, but I guess if I didn't like to do it... I wouldn't!

R: How are you holding up with your recent stint into TV? Is R2 hogging all the limelight?

WO: HAHA! R2 is the rage for sure! I don't like to be on TV at all.



lit makes me realize just how much I need to cut my hair!

It really is something to see your little buddy beep, bloop and roll around.

R: Jokes aside, the fire extinguisher is really cool. How many different functions does your R2 perform and what are they?

WO: Well Mike Senna started me down this path to the Dark side! I remember seeing his extinguisher at C3 and thought it would be cool to have the smoke come out of the dome instead of the body. So I emailed him and got the low-down on how to build it and it works like a charm! Definitely one of the crowd pleasers... unless you're the one getting sprayed by it!

As far as the dome, every pie panel on the dome will open and two of them have stuff coming out of them. I have an ESB scanner that lifts and rotates under one, and the scope that R2 uses in the swamps of Dagoba directly across from the scanner. They are both home made lifts and I'm very proud of them... when they work!

The two long utility doors on the body open too, and I have a CPU arm that flips out, extends and rotates. The utility arms flip out, and the holo lights up and moves, too. The problem is I only have 15 channels [on my controller], so I have to pick and choose what to hook up when I go to events. I've been working with Jim Shima to be able to get everything working at one time. That guy is a genius for sure, and very soon all my stuff will be quite operational...

R: Did R2 inspire you to learn R/C robotics, or did you do any before?

WO: I had no idea how to do any R/C stuff before I joined the group. If it wasn't for the help of the guys in the builders group, none of this would have been possible. I also just jumped in with both feet. If I had a question, no matter how silly

it seemed, I asked. You always got a "jokester" that would give the "newbie" a hard time, but there were plenty of other guys that would offer real help. I'm grateful to them all!

R: What kind of and how many events do you take your R2 to in any given year?

WO: Not that much really. I usually hook up with the 501st and go to some of their stuff. I would say probably under 10 a year. The rest of the time he's in various states of repair and construction.

R: Do you have anything really interesting coming up?

WO: Well, I plan to put a CD out this year or early next. I do music for a living, and that's been another dream of mine since I was a kid (well, [back then] I dreamed of putting out an album, not a CD). Nothing really R2 related. Stuff just kind of presents itself here and there, and when it does I jump on it if I'm available.

R: You said it took you over four years to finish R2, mostly in aluminum and resin. Did you make most of your own parts? Did you buy parts?

WO: I bought most of the external parts in aluminum or steel. Everything on the inside I had to figure out and make for myself except for the frame. All the electronics and under-the-dome frame were constructed from scratch. All the lifters, smoke and special effects stuff I constructed too. It

really is amazing that I built it when the stuff actually works! I can't stress enough how I didn't know how to do any of this. It really is something to see your little buddy beep, bloop and roll around, and know YOU built it. The little kids' faces and the parents really make all the trial and error worth it.



R: What advice can you give to new members?

WO: Don't give up... EVER! Ask questions, no matter how stupid you think they are. Somebody will answer them. You'll probably get a knuckle-head or two that tells you to do a search or something, but don't worry about it. Just keep asking until you get a response. Fortunately for us, we have a great group of guys and gals that help each other out. Again I must stress how this group is the most unique bunch of people I've ever come across.

Very soon all of my stuff will be "quite operational..."



R: What advice would you give to old members?

WO: Remember where you came from. You were new, too, at one time. Help others when they ask— not everyone knows what we think they should. A gentle prodding will go a much longer way than scorning "newbies." I need to remind myself of this constantly! I want everyone to feel that we're a team. No inner circles and no cliques. Everybody has to start somewhere, and so did we! ☺



L.A., Here we come!

Celebration IV



By Victor Franco

One of the must-see attractions of Star Wars Celebration IV was, without a doubt, the R2 Builders Room. Thousands of fans poured through the room over five fun-filled days to see the results of our labors, bringing smiles and astonished looks to fans both young and old.

DAY 0: WEDNESDAY, MAY 23 - SETUP DAY

Builders from all over the country, and indeed all over the world, joined together in Room 501ABC to renew past friendships, and start new ones. Folks scrambled to trade their badges in for coveted Associate and Crew badges (or in **Rick Thame's** case, Associate, Crew, Media, and just about any other kind of badge you can think of). These badges allowed early access into the Convention Center.

Droids of all shapes, sizes and colors were set up. **Craig Smith** once again outdid himself by bringing two new droids to the show - his Mustafar lava droid, and his R8 unit featuring scratch-built brass accents (of course it does 2-3-2, need you ask?). Besides the multitude of R2-D2s, **Kelly Krider** brought his blue and yellow R3-B2, and his amazing Ralph McQuarrie prototype droid came to life. R2-KT took her special spot near the entrance of the room, where she

was immediately recognized by many fans. **Keith Henry's** color-shifting R2-X13 ("Chip"), **Jerry Greene's** famous R2-R9, **Max Cervantes'** RT-R2, **Chris Romines'** R2-A1, **Guy Averett's** R2-A6, and **Mike Senna's** DeeDee from the Pink Five fan films were some of the many original, non-R2-D2 droids set up that day.

Ron Barkley and **Michael McMaster** provided lights and helped with electronics and video, giving the room a subtle something extra that really added to the fan experience.

Wayne Orr served as ring-leader for our little circus, and everyone did a great job pitching in to make sure that our room would be a can't-miss destination for the week's visitors.

Of particular note, the Blockade Runner set (built by Michael McMaster with help from others) housed **Jim Shima's** C-3PO, and **Brian Mix'** R2-D2. This set was to become one of the most popular spots for fan photos, with the line commonly stretching outside the door and down the hall.

At the end of the day, we were permitted to spend even more of our money at the CIV store, which opened in the evening for those in attendance that were setting up.

DAY 1: THURSDAY, MAY 24 - FAN CLUB DAY

On Thursday, at 12:00 noon, we threw the doors open to the public for the first time.

It didn't take long for the fans to come streaming in. All day long, the R2 Builders Room was full of folks admiring our labors. **Tom Jozwiak** was usually one of the first R2 Builders that the visitors met as they strolled the room, and he did a great job of greeting folks and explaining the club and our shared hobby in general, but his mouse droid may have received more attention than poor R2. The R2 builders stood proudly near there droids, happy to explain to the fans how they were built and how the club works.

In the evening, **Mike Senna** and **Max Cervantes** gave a weathering tutorial, dirtying up Mike's second R2 unit. The club also watched a special greeting from our Aussie colleagues, who concluded the video message insisting the word is pronounced "ALUMINIUM!" (Well, we'll see about that on the CIV DVD.)



DAY 2: FRIDAY, MAY 25

Before the room opened to the public on Friday, we had a special visitor: **Kenny Baker**, along with **Val**, paid a visit to our room. **Andy Schwartz** and **Melanie** escorted Kenny around, and Kenny took in the magic of the room.



He stopped at the Blockade Runner set for a few photos, and walked around the room admiring the droids. The group presented Kenny with a plaque inducting him into our club as an honorary member, and Kenny was given a yearbook, club hat and shirt, and an interactive R2 toy.

In the afternoon, it was thrills, spills and chills as the Droid Races kicked off in the South Hall, seemingly miles from the R2 Builders room. Up for grabs for the winners were the coveted NPC 2212 motors, worth hundreds of dollars. Friday's schedule saw the qualifying and semi-final rounds, with the finals held on Saturday. Toward the end of the day's races, **Chris Bartlett** appeared as C-3PO, and threw down the starting flag.

However, Chris wasn't done with his adventures, they were just beginning. First up, he mischievously paid an unscheduled visit to **Anthony Daniels'** autograph station, where Anthony posed with Chris as C-3PO and Mike Senna's R2 for the fans waiting in line.

Next, the producers of G4 TV's live coverage of CIV brought Chris on the set, again with Mike's R2. Not much really came of that, so the droids bailed out of the set during a commercial break, and instead visited the celebrity autograph area, where they posed with various actors (who tried their hand at R2 navigation) and fans. More than one female actress was enamored with the golden droid, as both **Amy Allen** and **Femi Taylor** left a couple of lipstick smudges on C-3PO's face. Oh no, the vacuum metalizing is tarnished!

Back in the room, fans continued to pour in and take



DAY 3: SATURDAY, MAY 26

Saturday morning brought another special group of visitors to our room. No fewer than 18 white-costumed Princess Leias came by to shoot photos with several of our R2 units, including what must have been the largest hologram pose to date.

The **Droid Building on a Budget** and **Droid Building 101** panels were held this day. **Kelly Krider**, **Keith Henry**, **Max Cervantes**, **Scott Strong** and



Greg Tracy participated in the Droid Building on a Budget panel. **Vince Sanchez**, **Andy Schwartz** and **Chris Lee** comprised the Droid Building 101 panel, with **Guy Vardaman** hosting. Both panels drew large crowds, with lots of Q & A.

After the last panel had completed, it was time for the championship round of droid racing in the South Hall. Droid race results were as follows:

Scooter Drive: 1st Doug Dixon, 2nd Kelly Krider, 3rd William Miyamoto

Homebuilt Drive: 1st Jim Shima, 2nd Wayne Orr, 3rd Daren Murrer

Extreme Challenge: 1st Daren Murrer, 2nd Doug Dixon, 3rd Andy Schwartz

The day was bookended with another group of costumed Princess Leias, this time from the Slave Leia costuming group. There was no shortage



pictures and video of the droids. Several of the builders took their droids out for some play-time with the fans in the hallways. Other builders found time to visit some of the exhibits in the other rooms, or gather souvenirs. It seemed as though you could set your watch to **Rick Thame's** appearances in the R2 Builders room with another armful of treasure. Be it posters, drinking glasses, or action figures, Rick was clearly the master of vendor negotiation.



of cameras, nor builders willing to donate some time in the Blockade Runner set to pose with them.

Every night groups of builders went to dinner, and had great fun recounting the day's stories, and sharing the good times. It is rumored that alcohol was imbibed, although shouting out to the waitress "I loaf you!" whenever she delivered bread to the table is not clear-cut proof of inebriation. Shouting "I salmon you!" when the entree arrived was stronger evidence, however.

DAY 4: SUNDAY, MAY 27

The **Advanced Droid Building** panel was held on Sunday, from 11:30am-12:30pm. **Guy Vardaman** hosted the discussion with **Craig Smith**, **Jim Shima**, **Doug Dixon** and **Mike Senna**. Craig demonstrated the 2-3-2 mechanism to the audience, while Jim described and showed how his R5-D4's motivator goes bad. **Doug Dixon** talked about his droid's construction and how his remote works, and that he can cleverly disguise his remote as a blaster when necessary. **Mike Senna** showed how he can transform his R2-D2 into a completely different droid with a quick dome and panel swap-out.



The day ended with the big banquet, where the droid racing, extreme challenge, and special awards were handed out. After the fanfare, the club took a group picture.

DAY 5: MONDAY, MAY 28

The last day of CIV was a half-day, on Memorial Day, with the doors opening as usual at 9:00am. The crowds were just a bit smaller this day, but hundreds of people still filed through the room and posed for pictures in the Blockade Runner set. Many visitors



Jawas and Droids First!

By: Lynelle Phillips

Wow! Now that CIV is over, I am now officially a member of the R2 Builders Group. I guess this means I have to build an actual R2 unit. As the Jawa of my local Star Wars group I've always wanted an R2-D2 of my very own. He's the true hero of the whole saga, always getting into trouble but finding very clever ways to get out. With a strong purpose and great personality, even Jawas can find something about him to love! At CIV I got really inspired to build my own R2 unit. As the Denver Jawa I always thought it would be really cool to build one and have it follow the Jawa (or the Jawa follow it!). I never thought it would be possible until now.

This is an exciting new project for me since I have absolutely no experience in remote controls, electronics, resin, aluminum, etc. I have limited experience in power tools. My first was a circular saw so I can cut the trunk off of my fresh-cut Christmas tree just to get it in the door! I bought a power drill so I can put up a shower door. A giant staple gun was added to the arsenal to make repairs on my hand-me-down couch. And my pride and joy, a power jig saw so I can make picture frames - sorry to say I've never used it. So, on June 8th, while the father's day sales were on at Home Depot, I bought the latest addition to my private astromech lab - a Dremel with flex attachment and lots of bits and stuff to play with, and my first soldering iron. And now I'm dismantling an old dot-matrix blue-bar paper printer (has a motor, pulleys, LED lights, some glass and plastic panels, enough stuff to cannibalize and use). I think I'm well on my way to building a pretty good lab.

So, why would a costumer give up her sewing machine for a Dremel? Well, after putting together several elaborate costumes for Starfest and CIV in a six-month period, quite frankly I need a break from the sewing machine!! Besides, I like working with power tools... and this Jawa really needs an R2-D2 unit! ☺



The Not-Quite 40 Year Old Celebration Virgin

By: Ray Sanders

Let me start with this. I've never been to a convention before in my life. That being said, I was simply awe-struck at Celebration 4. Of course, in 2003 when I set out to build an R2 Replica for my wedding, my wife and I had no idea where this would lead. To borrow a quote: "Once you start down the dark path, forever will it dominate your destiny, consume you it will..." Fast forward to 2006, and I was actually able to start on the droid. I was able to bring about a half-finished droid to C4.

What a treat I was in for: One Man Star Wars Trilogy, The Robot Chicken and Family Guy panels, as well as the sneak preview of Return of Pink Five. Of course, getting to meet Kenny Baker was especially cool. While waiting in the VIP line for the Pink Five show, I offered to help Mike Senna unload R5-DD and wound up with a front row seat to the show, as well as meeting Trey Stokes and Amy Earheart.

As Celebration was wrapping up, I was able to get in on one of the main reasons I brought my overweight glob of grease to C4: Weathering Demo! Doug Dixon graciously helped me dab on some Tatooine "dirt" on my droid, as I live near Phoenix. The droid was really looking better at that point. Jason Neurath decided that I needed to have a trooper experience and hooked me up with a suit of Stormtrooper armor for a night. I ordered a kit for myself and joined the ranks of the 501st.

The tremendous amount of help I'd received from the group left me with a dilemma: How do I return the favor? Aside from sharing what I've learned from building my droid, in July, I took the initiative to help arrange a bulk order of R2-KT figures from Hasbro. The bulk order helps to insure that any R2 Builder who chose to order will get a small piece of R2 Builders Club history to cherish for years to come.

Speaking of years to come, the entire droid building experience and the great time I had at my first convention has turned me into a full-on "con addict" I'll be attending Comic Con in San Diego, as well as going to every 501st event I can (and taking flak for having an R2 droid—but hey, the kids love him). ☺



were attending for one day only, so while it was the fifth day for the R2 Builders, it was all brand new to these fans.



Around 11:30am, the builders prepared for the big droid parade. Everyone participating made their way to the freight elevator. There were so many droids, it took two trips on the elevator to get all the builders and their droids down to the first floor, where the parade was to start.

At 12:00 noon, the parade began. No fewer than 23 droids participated in the convoy that made its way around the main entrance of the West Hall, and then parked under the huge Star Wars sign near the lobby. Hundreds of fans lined the parade route, and a large crowd gathered to take photos of the builders posing with their creations. Afterward, **Craig Smith** and company found a spot for an impromptu Droid Drag Race. As Craig recalls, "'This is excellent guys,' I

said. 'Let's quickly do our drag races back here.' We all shuffled in and it was suggested we ask someone to get permission to do this. It was decided that we could be done and out before we even find someone to ask. Besides, it is better for us to ask forgiveness than to ask for permission and get a 'no.'...Cindy had taken the escalator up to the second floor to take pictures of all the droids coming out of the freight elevator, but it never arrived. She came in at the end of the race saying "There you all are! Twenty people and droids disappeared from 1st to 2nd floor via freight elevator. I couldn't figure out where you all went!"

William & Nikki Miyamoto's droid won the drag race.

Finally, the droids returned with their builders to the R2 Builders room, to help close out the day.

At 3:00pm, the doors were closed to the public, and CIV had officially come to an end. Slowly but surely, the displays started coming down, curtains were pulled, and droids packed. The Death Star corridor and Blockade Runner sets were partially dismantled, after hosting photos for thousands of fan pictures. We had done it, we had surpassed high expectations and delivered one of the all-time highlights of Celebration IV!

TUESDAY, MAY 29 - TEARDOWN DAY

Although CIV officially ended on Monday, Tuesday was move-out day. Several builders had left their droids overnight, and the Blockade Runner set still needed to be packed into a moving truck and shipped out for storage. R2-KT was also among the droids under our care on this day.



New friends and old said goodbye for now, knowing that we'd be back on the board having our usual fun soon, and this time knowing the real people behind the strange electronic monikers.

It had been a long week for us, but it was so worth the experience. Here's looking forward to Celebration V, and any other adventures that we may find ourselves in! ☺



fine then. we'll have our own party.

Darryl Sorensen sent us this pic of a simultaneous celebration they had in Benoit, Wisconsin, for those local builders who didn't get to go to Los Angeles this May.

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the lowdown **cheap** and **reliable**
on building a droid controller

By Dan Stuettgen

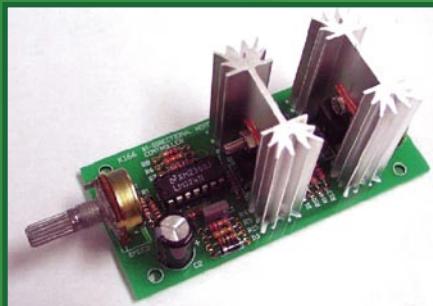
When I heard that Celebration III was going to be in Indianapolis, I knew I had to attend to see the work the others in the group had been doing, and to meet the guys that I had been talking to for 2 1/2 years on the website. But at that time I had no control system for my droid, so I had to come up with something that I could put together quickly and cheaply and that would work the first time.

Even though I have been in the electronics industry for over 25 years, and have been a seasoned R/C flyer for over 35 years, I still wanted something simple to build and use and above all *cheap*. I read all the posts every night and saw all the postings on this and that. At times it drove me nuts. For most of us, we want basic control of our droid, such as driving the two motors in the feet and turning the head and turning on the sounds and lights.

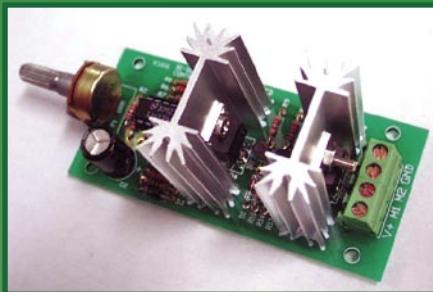
For those that just want to do that, this might be what you are looking for. For the rest that want ultimate control of all functions of your droid, [waves hand] "This is not the control system you're looking for." You will need PCB1 and PCB2 from Mark Hamester or Scott Gray's J.E.D.I. control system.

Even though this is a simple and easy to construct control system, you still need some basic knowledge of electronics and how to use a soldering iron, as circuit board assembly is required for this control system.

NOTE: My system uses some very efficient motors, and my droid only weighs about 125 lbs. For heavier droids using scooter motors, or any droid using a 24V system, this may not be the best method for you.



1.1 The K166 DC Speed Controller.
(potentiometer side)



1.2 The K166 DC Speed Controller.
(terminal block side)

1.3 Resistor Color Codes

The first three bands are read left to right.



Black	0	0	x 1
Brown	1	1	x 10
Red	2	2	x 100
Orange	3	3	x 1,000
Yellow	4	4	x 10,000
Green	5	5	x 100,000
Blue	6	6	x 1 million
Violet	7	7	x 10 million
Gray	8	8	x 100 million
White	9	9	

The fourth band indicates the tolerance of the resistor (Gold is 5%, Silver is 10%, no color is 20%). The above drawing is read as a 220K-ohm resistor.

The three Bi-Directional DC Speed Controllers I purchased online from Carl's Electronics are the core of this system (figure 1.1). It is their Kit number K166. The link: <http://www.electronickits.com/kit/complete/motor/k166.htm>. It is also available from Hobby Engineering website <http://www.hobbyengineering.com/H1742.html>. For you Down Under friends it is available from <http://www.ozitronics.com/kitlist.html#k166>, and in Canada it's at <http://store.qkits.com/moreinfo.cfm/qk166>.

This Bi-Directional motor controller uses a potentiometer to control the speed and direction of the DC motor. When the potentiometer is in the middle position, it is OFF. When you move it to the left the motor spins clockwise, and the farther you move the potentiometer, the faster the motor spins. When you move the potentiometer to the right, the motor spins counterclockwise, and also increases speed the farther you go.

The instructions that come with this kit state that the motor controller will handle a max voltage of 32volts, but everyone I know of that has tried using it with 24 volts (including myself) have had the traces cooked off the bottom of the board. The board as is will handle 5amps, due to the size of the traces on the circuit board. The instructions tell you that you can add heavy gauge wires to the bottom of the board from the MOSFETs to the Connector to be able to handle more amperage. One MOSFET can handle up to 49 amps and the other can handle up to 74 amps, but in doing some research I found that the max amount of current for the circuit is 12amps total, at which time the legs on the Mosfet start to melt. So as long as you don't exceed

12 amps, you should be fine with the wires added to the bottom of the board per the instructions.

Although I did not add additional wires to the bottom of the circuit board, I personally have never had an amperage problem and the heat sinks on the MOSFETS never got hot. On my first build, I did not use any fuses to protect the controllers, and I ran the motors for 4-5 hours at a time each of the three days at CIII. However if you plan on using these with scooter motors I highly suggest that you do add the wires to the bottom of the board and maybe use larger heat sinks as recommended in the instructions. Since the initial build, I have also added a fuse system to my original design.

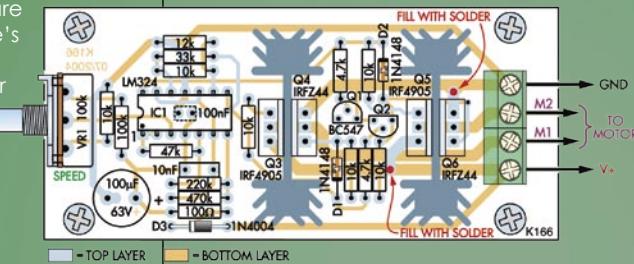
I assembled the kit per the instructions supplied after sorting out all the resistors to be used. I referenced the resistor color code list in the back of one of the Radio Shack's Mini Engineers notebooks. For those of you that do not have any of these, see figure 1.3.

The only deviation I made from the instructions was that I did not add the potentiometer as indicated in the instructions. I replaced it with a different one and mounted it separate from the circuit board. The potentiometer that I used in place of the one supplied is a linear slide potentiometer (figure 2.2) that was purchased from Mouser Electronics (<http://www.mouser.com>).

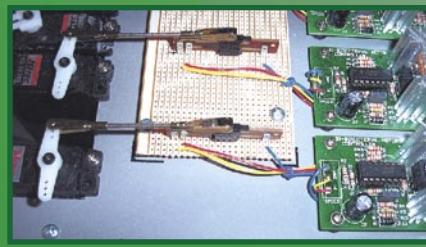
I chose to use this potentiometer because when prototyping the original control board I found that the servos could not turn the original potentiometer to the max limit in either direction, which did not provide full speed to the motors. I was only operating at half speed at CIII during the Droid Races! The new one is a slide potentiometer, and the servos have no problem getting it to go to its max limits in either direction. At full throttle on 12volts, the droid is almost too fast to walk with. These slide potentiometers (part #312-9500-100K) cost 97¢ each.

The slide potentiometers are mounted to a piece of preboard and the wires are running from the motor controller boards. After the three motor controller boards were assembled and tested, I laid them out on a piece of 1/4" thick Sintra to figure the spacing needed for the three Linear slide potentiometers on the preboard. Once I figured that out, I soldered the potentiometers to the preboard and added the wires from them to the appropriate solder pads on the motor controllers. The motor controllers were

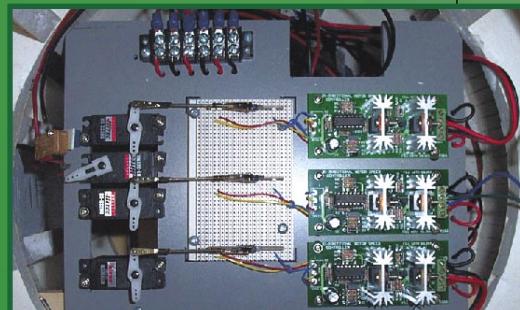
2.1 For those of you who are not schematic savvy, here's a detailed pic of how the controller should look after assembly.



2.2 Linear Slide Potentiometer



2.3 Servos connected to potentiometers



2.4 The whole shebang.

Dan and his R6-D1 hail from the Houston Outer Rim. You can see more photos of Dan's construction progress and tutorials at <http://www.geocities.com/imperialdroidworks>.



screwed down to the Sintra, followed by the Prefboard with the three slide potentiometers.

Next, I placed the servos in a hole I previously cut out of the Sintra and determined the length of the linkage I needed to go from the servos to the slide potentiometers. I used standard model aircraft linkage with 2-56 threaded rod and threaded clevises so I could adjust them as needed. The servos were set in the center position and the slide potentiometers were also set in the center position and then the threaded rod was cut to length and the clevises were added and attached to the servos and potentiometers (figure 2.3).

Two motor controllers operate the two motors in the feet and the third motor controller operates the motor that turns the head. A terminal block was added to the Sintra board and power wires were run from the power terminals on the motor controller boards to the terminal block. Wires were then run from the other side of the terminal block to the batteries with switches to turn power on and off to the three motors. See figure 3.1 for the full wiring diagram. The wires from the motors were then screwed to the motor terminals on the motor controllers.

The motors I used are pancake motors made by Mitsubishi that I picked up at a local surplus electronics store for \$13 each. They are 12volt motors and run at 3500 rpm, which gave a good walking speed with the pulley and belt arrangement I am using.

Another motor that may potentially work is by a company called Golden Motor (<http://www.goldenmotor.com>). They make a pancake motor that is meant to convert standard bicycles into motorized bikes. Their motor will fit inside the foot shell by itself,

continued on Page 15



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R2-KT

her **memory**
the **toy**
and a **big responsibility**

By Albin Johnson



After months of waiting by toy collectors and droid fans alike, Hasbro officially released the con exclusive R2-KT action figure at the 2007 San Diego Comic Con. And she was well received! Long lines of eager buyers wrapped around the Star Wars and Hasbro booths, where cases of the beautifully-sculpted astromech were stacked to the ceiling. Fans young and old crowded for pictures with the actual R2-KT who was flown in by Lucasfilm to be on-hand. At the Hasbro panel, Derryl DePriest and his Star Wars Marketing Team proudly briefed the crowds on the efforts made to bring the pink droid to the masses. And everywhere could be seen volunteers wearing the new R2-KT shirts and patches to help promote the event.

My eldest daughter Allie and I were lucky enough to be there as it happened. I applied replacement stickers on the back of R2-KT, wanting her to look her best for the show. Batteries were checked and of course nothing seemed to work. "Always take your toolkit with you," I thought to myself. Then William "Darth Will" Miyamoto joined me in taking our droids out on the floor. Allie autographed the R2-KT boxes and posed for pictures when people realized who she was. The reaction was ecstatic.

As father to Katie and R2-KT's operator, I could only watch in awe. A loving tribute to my late daughter had moved through the entire Star Wars community: from my daughter Allie who came up with the idea, to the R2 Builders who built the droid, to the huge corporations of Lucasfilm and Hasbro who made the figure, to countless thousands who now held its likeness in their hands, to the five hundred ailing children who would benefit from the donation to Make-A-Wish.

It reminded me just how important a role we play as custodians of the Star Wars legacy. On a recent trip to Celebration Europe, I was greeted by a dozen droid builders. They all shared the same aspirations and frustrations. It's universal. As droid builders, we are engineers, artists, and craftsmen. But we are also ambassadors. We bring some of the most memorable characters to the public. And we inspire like nobody else can. I hope every builder out there remembers that the next time they're knee-deep in aluminum and wiring. It's a beautiful business to be in. ☺



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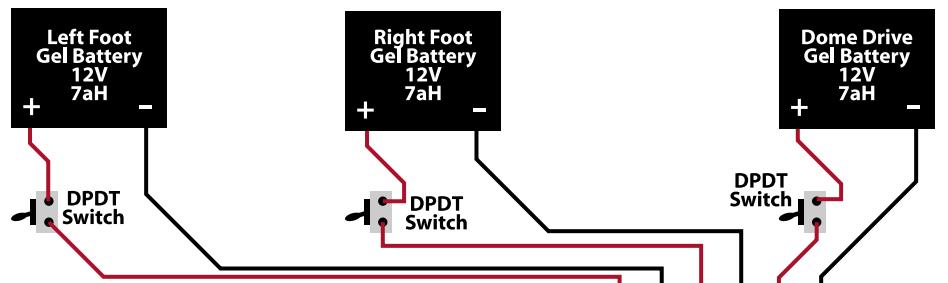
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and a single motor is able to propel a bike with a 180 lb. rider at around 8 mph. I've not tested this one, but it looks promising.

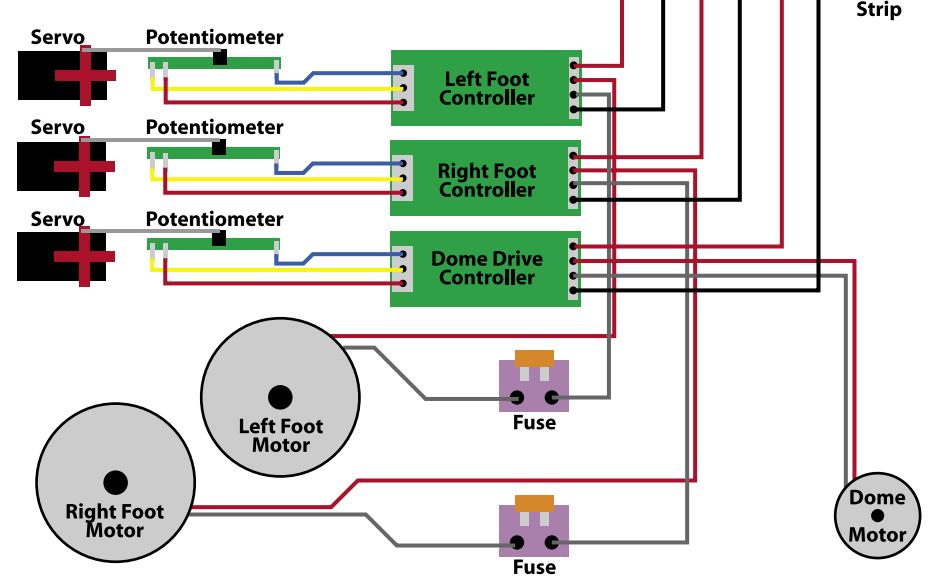
The forth servo facing the opposite direction (figure 2.3) is used to close a micro lever switch to turn on and off the super bright white LED in the Holo-Projector on the front of the head. This LED was bright enough to put a spotlight on the wall or individual in total darkness and see them clearly. It

was one of two that I purchased at my local auto parts store, used as accent lights.

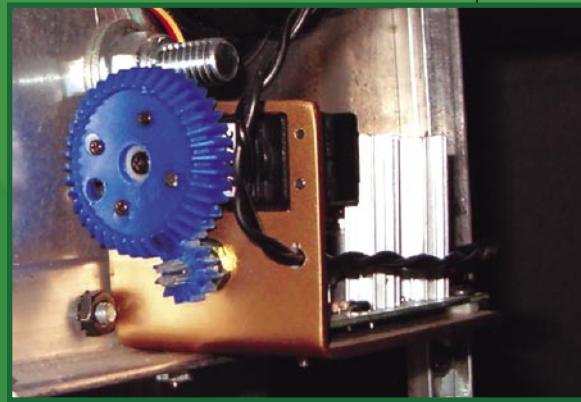
As you can see, this control system is simple, easy to put together, and no scripting or programming is required; but it is reliable and cheap. I have been using this system on my droid without any problems for 3 years now. 



3.1 Wiring Schematic



3.2 Sintra mount & gears make it easier



Since I built this system, Craig has used one of these controllers to operate the dome on one of his droids. He overcame the problem with the original potentiometer by adding a set of gears that give about a 3:1 gear ratio. One is a 12-toothed gear and the other is a 40-toothed gear.

The 12-tooth gear that mounts to the pot was drilled out to press on the knob shaft nice and snug. The 40-tooth servo gear was drilled out to fit over the raised center of the servo horn, so the horn and gear where self-centering. Craig then drilled holes into the gear that matched a round servo control horn, and then inserted screws to hold the gear to the servo control horn. He then made up a mounting bracket out of Sintra. He heat-bent it in to an "L" shape, which he mounted the speed controller and servo onto, allowing the gears to mesh together. Figure 3.2 shows how the gears mounted to the servo and pot. Craig's method works very well and I do recommend it.

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