



Rick:

I run the Androbot web page and was wondering if you would be interested in adding anything?

Doug:

Hi Rick, Great site! It brought back a bunch of memories. I have 2 gold statues. I have a Topo II upstairs with an Androwagon and the original AndroTrays. I also have a copy of the design patent for the Body and a few goodies nobody knows about...AndroVac a Robotic vacuum cleaner prototype actually two models upstairs in my design lab. I also have a 4-wheel drive, eccentric wheel, drive base prototype that really drove the software guys crazy. Here is a picture of me:

The original BOB in a Topo body with a turning head. He has 6 sensors in his head, human detection behind the grill [thermal sensors], and 5 ultrasonics. One down sensor, and the status display sensor in his chest. The floor absence detectors are not installed on this model though. I have some goodies kicking around but don't have a scanner. If anybody is looking for more images let me know. I will write a short story for you about what I remember and send it to you soon...I am in the middle of a project now but will add it to my list of things to do...*Rick:*

Great stuff. Please keep it coming! I also know where one Androman is (no transmitters or cartridges), the early? Bob with the large removable front and back panels (guttled) and a Bob/XA with the headpiece and claw, but no electronics. And a blue Topo.

Doug:

Have you heard from Mike Sorri [sp?]? He has a few Topo's one blue one but has done some serious mods to it now. Jack Larson was in charge of the human detector and has some interesting stories to tell. John Kearney was the first person I hired in as a mechanical engineer. He did the second drive base along with Sigfried Salat? Bill Law was our resident PHD that tried to figure out what was coming from my brain... I am the inventor type. Designer and prototype developer. Designed all the plastic

parts and did the Industrial Design.

Rick:

I have only seen the one picture of the vacuum and had never heard of the 4 wheel drive!

Doug:

Was it the gray one with a single turban or the floating head with dual turbans and a white body? The 4 wheel drive was reviewed but never went past the prototype stage. It had a gate or a walk feel that was mimicking an animal walk. When it got to a wall it would climb up till it rolled over on its back. The eccentric wheel was stable to the drive base via a cam link Y bar making it a illusion to watch work. Its main feat was it could go out doors over thresholds and climb up on top of low profile objects. One of my demos was to drive it over my foot or the spectators foot and keep on going. I think I have a picture of it somewhere but it does not do it justice. My cat would just sit and watch my other drive bases but when I ran the eccentric one, he would jump off the couch and stalk it like it was an animal scurrying across the floor. Its only about 4 inches tall so having it go over your shoe meant it was climbing over half its height.

Because the wheels have offset centers the wheels turn at different speeds and with 2 per motor the wheels would push pull as it traveled linearly.

Rick:

Needless to say, you have me very excited to say the least! I will be happy to send you a scanner or ?

Doug:

What I could do is pack up my documents and pictures and send them to you. They're just sitting around somewhere collecting dust. The design Patent on the body is a "book" I don't remember how many pages it has, maybe 25-30?? Anyway send me your address and I will collect the stuff I have.

Rick:

Let me know what I can do for you! It's great to find that someone kept some of the Androbot equipment and documentation! Even Noland Busnell didn't hang on to anything but a Topo!

Doug:

By the way, the image you have of the gold statue has the X value wider than the image making it look squashed. The body never had a drawing to produce it. Nolan came into my office on Oct 7 and wanted to know if I could have 25 robots by Dec20. Body, drive base and internal hardware...he wanted to go to the CES show in Jan....hehehehe Yeah right, I said if I could do it my way, the chances were good....well I had 22 body parts assembled in Tom Fresina's office on the 23rd. John and I worked around the clock the last few days and for kicks, we unloaded the truck at midnight when nobody was around so when he came in the next day he could not get to his desk. They were stacked floor to ceiling in three colors.... The CES models were match drilled and did not have time to develop drill templates for the rivets. Each robot had to be numbered when dismantled so they could be re-assembled after the electronics were installed. The internal arm plug was left off to gain access for connections.....We had 15 performing Robots when we were finished....15 working prototypes I should say. The body was developed flat and folded into the shape with cardboard. It was reinforced with plaster of Paris and filled with epoxy. Then the molds were cleaned up and used for vacuum formed and router trimmed parts with lap joints, riveted, some painted.....It was all done in 50 days or less.... without drawings...just flat patterns. I used my Hyper-trig math system to develop them with.... but that's another story...*Rick:*

And by the way, one of the magazines I am looking for is Machine Design, March 24, 1983! In it you are quoted

"Jones admits that he got the idea for the canted wheels in an off beat way". What was the something else that had two canted rollers?

Doug:

I had just finished building a few prototypes for a perpetual motion machine idea I have and the roll

track design was canted at 30 degrees each. I am still working on the concepts now that I am retired. The roll tracks were mounted to a platform and by chance I set them on the floor up side down and pushed it away from me and noticed the stability. Logged the idea of a canted wheels and set it aside. Then I went back looking for a job and found the Androbot position. I worked at Androbot for about 2 months before I introduced the idea to them as a concept.... they liked it. I built a model at home and took it in one Monday with a cable and switches for driving it around. It was all made with casting resin. The wheels were at 20 deg though and the battery locations were outboard, past the axis. The drive was a worm gear and single 80:1 gear, real quiet. The stability was 5 times better than the production and did not have casters. The bearings were from a lazy Susan dish 11" in diameter directly below the batteries. The mass of the batteries was distributed through the wheel at the "toe" area, on the outside of the wheel. Imagine a 12" wheel 11" bearing and an 8lb battery per wheel, out on the edge of the wheel. This was the best weight distribution possible but the robot wheel profile was dominated by the battery and it was preferred the wheels edge was exposed better so it would not hang on a corner if it got too close to a wall. Well, that should be a sensor and software problem, not a design restriction for stability/maneuverability trade off. ...Anyway, it's done now. Due to time constraints the production units were designed without testing and the base became unstable with the batteries at center above the axis. If I could do it again [hindsight] I would have forced the testing of the design change due to others more educated than I, to prove their changes would work as well as my original...It gets tough when you design by intuition and a guy comes along with a PHD and says stuff like " It will work just as good this way"...Well it didn't and the robots had to have casters added at the last minute. Oh well, designed by a committee is what happens when your part of a team.....*Rick:*

Gosh, I feel like a kid locked in a candy store. Tell me to go away if I ask to many questions:) I always felt Topo and BOB were supposed to have a different control then the casters! How cool to have the Androbot budget now with electronics controls like the Segway! The robot hackers are getting close to the same stable controls as the Segway for two wheeled robots!

Doug:

This is fun, Talking about the good old days...

Yep I have been watching the Segway and the gyro tech stuff get up to speed. I remember one Saturday Nolan and I were sitting in my development lab talking about what it would take to get rid of the casters. The idea of equal Librium came with shifting the battery pack back and forth pending the travel direction. I was working on a new wheel design with 3point contact wheels. We made some soft rubber wheels and did some research but the main goal was to ship product after the show. We were a marketing driven company that should have been an engineering driven company. Marketing was selling stuff we did not have ready to market. That picture you have of AndroVac is an example.... it was all faked. There never was a vacuum attachment for Topo or Bob. The original concept was to be a shorter robot. More like a pet [cat dog] in height. The body grew in height past the stability point without testing it. It was a last resort to add the casters. We had a huge meeting the day the production drive base was up and running. It was out doors in an internal courtyard. It was running around on grass with a radio remote control unit without a body. Everybody had a chance to play with it, to evaluate and test all kinds of movements. That little guy, about 10' tall was great. It could go anywhere. Through the bushes and over the lawn, never flipped over and was a fantastic drive base all by its self. But no, it had to be a android type robot, 36" tall and be more human than animal/pet. Oh well.... on came the casters after the bodies came in. Maybe balloon bodies, inflatable, would have been better. They wanted sensors 30" above the floor. Something that could look over tabletops.

Rick:

Did you have anything to do with the Fred and Androman? Or did someone else just try to

make them look like the Topo?

Doug:

No that was all done externally. Sub contracted out to a firm. The market was showing the greatest interest in education to teach programming skills in schools. Both Fred and Androman were focused in that area, more like that programmable tank or arm-a-tron toy that was out then.

Rick:

I assume you were long gone by the time BOB/XA shown up?

Doug:

You mean the fork lift BOB? The black tuxedo bow tie Bob? I did that one as well. He had the stable drive base with the IBM on board. He was designed for a 75lb payload and was developed for Kodak to deliver parts to the assembly line. All I did there was the fender skirt and shoulder parts with the sensor packs. The forklift was done by Sigfried Salat and the drive base was done by John Kearney I think. I was working on the "2" piece body for Topo II and just a few parts for BOB/xa I worked on AndroFridge and the beverage dispenser attachments with the docking station for Topo when BOB/xa was under development. We could not get BOB/xa working well enough for the Kodak contract (75 each) and the deal was canceled. Then Androbot in general was closed down and AndroMan remained. I was let go and developed a robotic vacuum cleaner at home with some parts I had kicking around and went back to Nolan personally and gave him a demo. He dumped his Pipe ashes-tobacco and all on the floor. The robot ran across the pile and cleaned it all up, he did it again, and again, he took it home for the weekend and I went back on Monday to see what he had to say...He bought it and hired me back to develop it under the Androman company shell. I worked on it for 6 months then Androman failed and the vacuum cleaner never made production. I am the only person to have been in all division and even started a division at the end when all else failed. My only wish now would have been to design a robot that would work around the house. But as the rule goes, take 20 people and design a robot for 20 ideals and you wind up with a robot that you cant build for the price target the public is willing to pay. We had so many dreams but not enough time to develop them all. Oh, I wish I could do it all again with what I know now...*Rick:*

Wow, a vacuum cleaner with a company called AndroMan?

Doug:

It was still called Androbot. The vacuum robot was very hush-hush. The development story is somewhat sad. I should tell the story some day.

Rick:

I got this picture and it is suppose to be from Axlon and their vacuum cleaner robot project.

It is clearly a modified chassis from a BOB/XA with a sonar sensor on top:)

Doug:

Hmmm not sure about that. Bob/xa had a square base with front wheel drive and 2 swivel casters. He had 2- 12-volt batteries at the rear above the casters. They were in a compartment similar to Topo with clamps. They served as the counter weight for the payload on the Claw/forklift.

Rick:

I am currently building a mold for the BOB/XA fender skirt now in the shop. They did not hold up well in storage without the wheels on:) It appears only one shoulder robot survived! The others XA robots appear to be headless with just the keypad on top.

Doug:

Yep that makes sense, It was a cosmetic piece only, not a structural item. Not designed to support the weight of the robot.

Rick:

The only big mystery on BOB/XA is where were the batteries suppose to mount and how? I

am assuming they were to be the same batteries used in Topo? There appears to be no battery hold down that makes sense? Any ideas?

Doug:

The BOB/xa drive base was L shaped rotated 90 so the bottom was like a stair step the casters were under the thinner section and the motor compartment and wheels were at th thicker section. Bob's batteries were wider than Topo's. The foam blocks used with Topo were not used on BOB You could use BOB's batteries on TOPO if you wanted to.

Rick:

On the AndroFridge, looks like there was two designs.

Doug:

There was a "marketing Photo" all faked, then a real "cooler" style fridge that was sold.

Rick:

One, attached to the front of the office size fridge and another that was all the great Androbot styling!

Doug:

Yep, That's the one I did when we were adding "usefulness" to Topo. People wanted the Robot to do things and Noland wanted the Robot to get him a cold beer....

Rick

The latter is only seen on a history channel tape! Have you seen the history channel tape on Androbot?

So, i guess that since even the BOB/XA's did not sell, it is still pretty safe to say that not even one BOB robot was ever sold?

Doug:

We had a contract with Kodak for 75 BOB's and he was developed with the contract specs. He could read barcode and follow a stripe on the floor, lift 75 lbs and wound up with whiskers/curb feelers to detect walls and stuff. It felt like we were going the wrong way with curb feelers to me. Ultrasonic back then had a blind distance. 0-9" was a dead zone so we added bumper sensors or whiskers. The fender skirt was flexible with micro switches at the corners [8] One thing that kept happening was when software failed they resorted to mechanical devices. I don't think a robot is possible without good software and sensors and the software was not there for the sensors. Today things could be a lot better. GPS and Gyro's, optical mice and most all the Digital camera chips could be used today to help out.

Rick:

Yes, the same dollars spent in 83-84 could do so much more today with what we have now!

Doug:

Wow 20 years ago. That's a long time in technology years.

Rick:

Would be cool to get that time machine up and running though...

Doug:

I have often wondered why "The Robots" are not around today. There is a lot of things to consider still that we just cant do yet. The Robovac on TV looks pretty good, A random cleaner I guess. Where are all the radio controlled lawn mowers or vacuum cleaners?. Roving security cams and smoke detectors. I guess the bomb and explosives area is under way with some tank type robots...

Rick:

The later Topo's (II and III) have 4 1" black plastic hole covers glued just above the wheels on

both sides just above the diaper seam. There appears to be no use whatsoever I can think of. They do not align with anything on the chassis and with them glued in from the inside; you cannot pop them on and off. What are they for?

Doug:

TopoIII was designed with plugs for a sensor belt. The electronics and hardware was extra \$\$ but factory installed. The plugs were removed pending the order for sensors. If I remember right the card cage in topo III had 8 slots. The sensor belt was plugged into the connectors at the hole location and was about 2" thick. You could upgrade or order Topo sensors anytime.

Rick:

Everybody asked about arms. Was there ever any design work for working arms on Topo or B.O.B.? I have seen several owners attempts, but they just do not look right. I am sure marketing would have forced it to happen, since Heathkit Hero, RB5X, and others offered them. If you were to design an arm or two for Topo, what would you have them look like?

Doug:

Not mechanical arms. We had a few Armatrons kicking around but nothing planed for production. Topo had the slip on tracks for trays and soda dispensers. BOB had the "forklift" that could pickup pedestal style trays and part bins [screw drive]. Funny you should bring this up. When I interviewed for the job. I presented a Nitinol arm design I dreamed up the night before the interview. Nitinol is a memory metal that responds to heat and electric current. I made a 6-cord mussel that would move the arm without motors. It was pie in the sky and never got much attention after I started the main Robot design.

Rick:

Since the Topo was sort of a rush job, what was the main influence in the design?

Doug:

It was my development of Hypertrig or 3d trig that was the main reason the robot was geometric. My NDE had a big roll in my research I did with the pyramids and that led to my need to develop a system to model 2 dimension images into 3 dimensional objects. If I had to design and produce drawings to build molds with, Topo and BOB would not have made the 83 CES show.

Rick:

I picture a group of guys drawing things on a napkin at lunch:)

Doug:

Nope, nobody knew what it was going to look like when we started. It was going to be something like what my first prototype looked like. I was designing parts as fast as I could from the ground up. I had a bunch of rules setup by the software and sensor guys for what had to be on the body though and a different drive base than the first prototype. Everything was first attempt, accept and go to the show, or reject and don't go to the show...I had to go back and tweak the legs a bit when I finished the chest parts for the floor sensors. The IR sensors in the upper chest area that look at the floor needed a co-plane sensor position in the leg to "watch" the IR spot projected to the floor.

Rick:

Would love to see the rejects! Of the thousands of people who have visited the web site and many of those who have emailed me, the design is what attracts them. (plus the heavy media marketing!) The design does not appear to have dated it self like the other robot companies of the eighties. Is there anything you like or dislike about the looks that you would change, not counting the mechanics we talked about earlier? Or was this just a bit of luck? Of all the robots I have collected, everyone goes to the Androbot Topo's first!

Doug:

People were commenting about the sexy robot Topo at the show and it was not my intent to have it

sexy. The chest protrusions were a design requirement to detect floor absent so it would not go down the stairs or over the edge of a pool. Later in production they became the handles that people used to pick it by. The belly pan handles were not used much. I had to leave the internal arm parts off the first build to serve as access openings. I never liked the access for cable connections in any of the designs and wanted panels in the belly and back. I was working on a wheel design that would remove the casters....but the caster became the docking station guides for AndroFridge.....I had a nice induction charger the robot would "nest on" that did not like the casters....

Rick:

Okay, with your permission, I would like to combine our conversations, have you approve the text and post an outline on the website.

Doug:

That's fine. One of these days I will sit down and write a story about my 'internal' companion. Now that I am retired I can say some stuff I have been keeping to myself about designs and how some of them came to into my mind.

Rick:

Oh, just one more question. The rectangular sensors (B.O.B.s breastplate center and BOB/XA's corner sensor pods). Are they IR sensors, PIR, or barcode reader?

Doug:

Odds are they are the Barcode readers. They got those working pretty good. IR was to watch a floor stripe and should have been in the center panel. B.O.B center sensor was human detector or thermal sensor feedback. It was more glitter than anything though. Whenever a sensor was triggered, one light would come on . Thermal in center, ultrasonic and IR outboard. 9 total lights

Rick

I had heard of a sensor belt for the Atari robot camp. I was told the plastic rotted away and all that is left are the wires and switches. It was just a modified wireless set of joystick switches hung on Topo and the receiver was plugged into the joystick port. I have never seen any pictures or paperwork, etc on an optional sensor belt. But that makes sense that those hole location would be the place to do it! As a matter of fact, there does not seem to be much of anything printed once the Topo III came out with the snack trays that slide on.

Doug:

It was a plan for the future. The belts were in the design process when Androbot closed the doors. I had one prototype running around. There was a sensor box that snapped onto the belt. The box could hold a IR, Ultrasonic or Whisker and I think there was 8 positions.

Rick:

Speaking of forklift BOB and his pedestal style tray. What the heck are those things made of (wood, cement, plastic) and the design escapes me as to where they would have come from?

Doug:

The base diameter was critical as it slid up and down in the fender-base plastics. It had to be taller than the ground clearance. The dish or pedestal top diameter was a bit larger to clear the sensor guides and the pole was PVC or wood. As light as possible. They were round because the approach angle was any degree. It was not easy to get the robot to roll up to the pedestal first time and pick it up. It took more than a few approaches and along time to get the approach angle set from a distance. It was not even close to a drive to and pick up process like a person does on a fork lift. I think that is reflector tape on the pedestal shaft.

Arms on robots have been very much asked for, but do not seem to get used. I find most people have no idea what it takes to find and pick up a object! But, everyone thinks a robot should have arms.

Doug:

Yes and they want it to wash windows and do the dishes. Vision seems to be the most critical thing. To see dirt, and clean dirt away.... oh what a dream. Imagine trying to see dirt on a window...wow that's a big order to fill.

Rick: Yes,. I have one of each model change complete, but want to put one together with newer electronics and one with sensors and lights just like BOB is shown in most of the magazines.

Doug:

The original BOB had a turning head. There was a stepper motor, a large open bearing plate for cables and an internal cone. It was bit of a challenge to assemble. The head was assembled to the shoulder first then that assembly was added to the main body. The head had mechanical stops so it would not turn more the 180 - 90 per side. The sensor were also 90 per side so he could really see 360. He also had a thermal sensor behind the grill [mask] Moving cables is tricky stuff and need clamps between the solder joints.

Rick: On the Topo Sensor Belt, had you done any design work on the plastics, or was just the sensors working? Sounds like a challenge to keep the correct look and just add on to the robot. Would be much easier if Topo was just a box:)

Doug:

Yep the body was a favored look and sensors were planned to be internal. Then Marketing started doing stuff without the engineers and designers so it got out of control fast. Most of the pictures are marketing hype trying to find a response from the public. The sensors were plastic boxes. They were on the BOB/xa model in the corners of the tower. The belt was just a C shaped plastic part to mount the sensors on. It had a cable through and connectors planned but never went into production.

Rick:

When you said you made Topo molds from cardboard I got to looking and drew up a couple of pictures. (Attached) Is this close to the shape of the cardboard or did I miss something in the idea of going from flat to 3d? What a cool way to make a 3d object.

Doug:

You got it. The hat is close; the face needs some work but that's the general idea. The head is a truncated dodecahedron with 12 equal faces. The main angle is 35.26 degrees/side. I was imploding a cube to center then exploding the implosion to get the shape, someone told me it was a dodecahedron later, but its not the dictionary version as it has equal faces. The cardboard is illustration board about .010" thick and the first rule is the folded edges are the longest edge. The pattern is taped and mounted to polyester film with spray adhesive. Folded and taped closed then paraffin waxed to seal it then plaster of Paris is applied to give the shape strength to support the weight of the epoxy. When the catalytic reaction kicks in, the wax melts and the plaster/cardboard separate. Shrinkage pops the cardboard off and the polyester film is the finish film that is peeled off the epoxy. There is some flash at seams that are not folds so that's why the pattern is assembled with the larger edges first.

Rick:

I saw your bike on your web page, what else have you created?

Doug:

That bike is all organic form, air foils including conic fillets, The wind tunnel tests reduced the drag by

.10 of a second/mile. Its a 3,600 dollar bike weighing 3 lbs made of carbon fiber I won 4 design awards in the same year for it. It is a single piece bike, no seams/joints anywhere. I worked for Atari on the first pong game, did stunt cycle and pro-am pong, Breakout and few more games, then went to Commodore and did the pet, then went to VideoBrain and did a laptop/cassette portable...Arnson pool sweep. pansy Ellen servers. Diablo Nuclear Reactor inspection equipment... then developed Hypertrig on my own. Androbot, then Dynabook PCs in magnesium cases, Unysis, Momenta Pen based computer.... and wound up at IDE and did the SGI portable the SGI flat panel and a bunch of odd stuff like pagers, phones palm pcs and more notebook computers. Then did 4 bikes for Kestrell and retired at 56. Oh I did the movie props for Twister.... all the notebook pc's in the movie were props.

Rick:

After taking more measurements, I would guess that most of the mold work was done equal and square and then sanded/machined with a taper to come out of the vacuum formed plastic?

Doug:

The head was the only part I added draft to from the original design. All the parts were air assist or blown off the molds. The legs were at the limit of the plastic, it got pretty thin in the sensor pocket. I used a 4'x4' machine in Palo Alto. Heck they may still have the patterns?? W&M Plastics [if they are still around] Buster Woo was the owner. The plastic is Kydex with a UL rating [non-flammable] That little guy can wonder into a fireplace and not catch on fire. He melts but wont burn.

Rick:

I have one picture of BOB with a Flat face

<http://www.homerobots.com/robotworkshop/projects/androbot/bob/ces4jpg>

Looks like the black eye stickers are just on the head back panel. Nothing machined out for the eyes and grill covered pocket. Is this correct or just a bad picture?

Doug:

Yep that's a bad picture. The first few had a white mask [grill] until the black ones came in. If the robot had a heat sensor, the back was cut out and a metal parabolic dish was mounted on that pocket face. Have you ever seen a solar cigarette lighter? Heat rays bounce off the dish and are focused to a center point much like a magnifying glass can focus light to a spot to start fires with. Anyway, the human sensor looked for warm spots and Bob would go and talk to a warm spot. If there was no response, he would wonder away and look for another warm spot... well he would go up to black filing cabinets and talk to them. His threshold was too high. I think it was set to a 9-degree difference. Dark metal objects were a real problem.

Rick:

Also, I only have access to a rear view of BOB on videotape. It looks like it has the Topo style switches and charger plug, but has a black area just above that. Same shape as the 6 led recess panel on the front. Is this a sticker, Plexiglas, or?

Doug:

Boy it's been a while. In those days some of the earlier bobs had one of a kind connectors or test ports for all kinds of things Some had a cable connection from a desktop for testing stuff and odds are its a connector or two.

Rick:

Being a metal working type guy, I was thinking of cutting and bending some sheet metal and trying some 1/3 scale molds for kicks. I got my artwork for a shoulder panel attached. I am really excited about taking the flat material and making it a 3d shape. Going to try some other shapes too! Wish I had spent more time learning higher math. This from a guy who makes calculator controlled robots for Texas Instruments! Hindsight is always 20/20!

Doug:

I did make two Topo's with clear acrylic. They were a big hit but did not pass the UL requirements for a mobile consumer product. Now metal that's a good bet. Be careful though with static charge. You may need a grounding strap dragging on the nylon carpet :-)

Rick:

Stumbled on your picture in a very early brochure. You and Larry Dick look the happiest! Hairstyles have changed...

Doug:

Wow, Larry Dick, haven't heard that name in a long time. Yep I have a buzz cut now and a beard, and my hair is gray-white now. The shoulder looks pretty good. I always join inside folds with a material thickness spacer and tape the out side edges. There is something wrong with the front and back area. They might pop into shape but I think there is a open seam in there. Metal might be different though if your welding inside seams. Think about the cleanup and filing part of it

Rick:

Okay, My artwork was moving along fine until I got to the breastplate. Wow! I thought the only headache would be the legs/motor covers. I have started in several places on the breastplate, but I am sure now that it was two parts at least put together at the belt line?

Doug:

Yes I think it was a 3-part assembly. The sensor pockets were inserted but I think the belt was ok. I am not sure though, its been a long time.

Rick:

And the sensor pockets cut separate and taped in?

Doug:

Yep, but I only made one pattern and molded it twice.

Rick:

You must have put in a ton of hours to get this all done in less than 3 month! My idea on the metal is to use it like you did originally with cardboard for a resin mold and being able to skip the plaster part. 26 gauge metal at 1/3 scale will fit in my 2'x2' home made thermo-forming machine and not need a lot of resin too! Just glue the paper pattern to the sheet metal, cut and bend it. Seal the seams with sealer on the outside, wax the inside, and fill!

Doug:

You mean weld it right? I had allot to cardboard molds pop the seams with the weight of the epoxy. By the time I was building the robot molds I had a lot of experience and it went pretty good. I must have spent a year developing the film molding process and built 100 molds of all kinds of things before I did Topo. Metal is going to be tricky I think. You may get cracks if it is too stiff, the resin shrinks when cooling and gets real hot. Its not hard for 24 hrs after you take the pattern off. Cardboard peels and bends, actually warps with the shrinkage, .023 % I think is the number. I mix 1/2 type B resin, with 1/2 Bondo. You need vacuum holes in the pocket areas so the mold need to be hollow say 2' thick max should do it. You can put Styrofoam blocks in it to make it hollow. I had to get 6" long drill bits for it. Otherwise it will not have the definition if the plastic traps air.

Rick:

As I learn every bend, I wonder, did the fold down arms just happen or were they planned from the start?

Doug:

They were planned but the internal arms were an after thought. They were the last parts made. I don't think they were ever used though as we started Topo II right after the show.

Rick

Also, do you feel the 1000 Topo's sold is accurate?

Doug:

No. 500 is more like what I remember. I remember one night I was closing up the building and I went into the production store room and there were 200 in there all built up and ready to go. I felt like a father with 200 kids, all my sons sitting there waiting for a on switch...Did you ever hear about the Androbot Christmas party with the dancing Topo's on the dance floor? I think we had 3 pair out there. When opposing, the shapes would interlock when both were going forward, they would offset and spin, strongest motor wins. Quite interesting to watch.....

Rick:

I love how you used the same parts twice on the robot! I know the later BOB's had a potbelly panel, just did not look right to me in the pictures. The seam from the diaper to the breastplate gives Topo a better look I think.

Doug:

Basically the hardware and software guys could do anything they wanted to the body during the development process. After the show it was a free for all to get access to the "guts" as fast as possible. Some of the pictures you have are development photos. We had so many variations running around it was like each team had their own robot. We split into groups and Tom Fresenia had areal problem on his hands. We went to the show and had nothing to sell when we got back...so he created FRED and AndroMan on the outside....

Rick:

Anything you designed and built molds for I would recognize today?

Doug:

No It was all personal stuff, art related. Wax sculpture with Optical casting resin. Studies for my perpetual motion machine and a few pillows and Christmas box designs.

Rick:

Nothing more fun than watching a flat piece of plastic turn into a shape before your very eyes! I have several friends who get mad if I make something and don't let them watch:) Been doing a lot of stuff with acrylic sheets and a laser cutter lately. Just like the Star Trek replicator. I draw it at home, email it, and pick it up in the morning. Have checked out a few 3D machines, but haven't found anyone to let me play with one yet! So cool watching the shape come out of the floor of the machine!!!!

Doug:

I have done a lot of SLA-STL parts to check databases with.

Rick

I noticed that the numbers Noland says were sold do not match the profits Androbot showed. 500 sounds much closer.

I am guessing about 200 of the first radio controlled Topo's, 2-300 of the infrared Topo II and perhaps 100 of the Topo III with the serving trays.

One rumor is an Italian company bought the rights?

Doug:

That's a new one for me...maybe Fred was bought.

Rick:

Also, no Andromans ever sold and less than 100 Freds sold? And what, less than a half dozen of the Topo skin Bob's and Pot belly Bob made, but never sold. And what, perhaps 10 Bob/XA's, most without heads? Sound close?

Doug:

Ummm not sure. The multi piece body for Topo and bob was to expensive to sell and Topo II was the cost reduced unit but still cost more than we wanted to spend. We had people coming to pick them up and some were delivered locally, some were shipped. We built 500 but I don't think we sold all of them.... We had an inventory when they closed the doors and I don't know what happened to the stock.

Rick;

I know one thing; the marketing guys sure did there job. They must have been taking pictures every day Androbot was open!

Doug:

In a way, the marketing destroyed the company. Selling product without a product to sell. No way could we meet shipping delivery dates. We all laughed at them from engineering. It got to be a real problem and wound up destroying us in the end. They were taking pictures of things that did not exist....I wish I could do it all over again though and do it right from the start with engineering leading the company instead of marketing. Doug Jones