

Aeronaut

The Newsletter for the Association of Experimental Rocketry of the Pacific

Triploi Rocketry Association, Inc. Prefecture no. 23

February 2002: Volume 14, Number 1

First Commissioner's Corner

by Tom Rouse

First off, I would like to take this opportunity to acknowledge William Walby for all the years he has volunteered his services to our AERO-PAC club. William has served both as treasurer and Prefect. As a thanks for all the years of service, William was voted in as a lifetime member by the Board last year.

I miss his presence at the meetings and launches. Hopefully we can entice him to again serve when his career workload lightens up again.

THANKS WILLIAM, FROM ALL OF US IN AERO-PAC.

The 2002 year also features a new makeup in the volunteer BOD. Newcomers are Becky Green as Treasurer and Anthony Alcocer as Second Commissioner. They are valuable additions to the board.

To make it easier on the new people, please send in all renewals as early as possible to give Becky time to settle into the new job. Last minute renewals and on-site renewals will end up as a big inconvenience to her, so please cooperate and send in the renewals early.

One other item of mention, is that if everyone sends in their renewals early, the club will generate enough cash-flow to allow us to order some more T-shirts and DaveyFire 28B's (low current ones for ejection charges). These items will chew up a few thousand dollars and we wish to order all this stuff early enough to have them available for the first meeting and launch.

The 2002 AERO-PAC fees will remain the same as the last few years, with the possibility of a small increase in the launch fee for the XPRS launch.

Enclosed in this newsletter, John has included the 2002 membership forms for your convenience!

To clarify the meanings of the 2 membership categories, the first category is for be-

ing an AERO-PAC member that entitles you to the newsletter and membership privileges like being on the e-mail list for receiving any e-mails regarding the club.

The second category is the full membership which includes all launch fees.

We did this two tier category system, so people not planning on attending launches in a season can still stay updated by receiving the newsletter and e-mails.

We have just received the 2002 Tripoli insurance certificates from the insurance carrier that will enable us to again launch from Black Rock.

All of the launch dates have been set, so everything is set for the upcoming season.

You can check out all the info on the AERO-PAC web site, which has been reworked by Paul Campbell and John Coker. A lot of time goes into maintaining the web pages and keeping all the e-mail lists updated. Many thanks to both Paul Campbell and John Coker for all their effort in these areas.

I have talked to both Gary Rosenfield and Karl Bauman in regards to motor availability for this season, and have been assured that we will be in good shape, even for the first launch. Aerotech has now secured a new facility and will soon resume motor manufacturing. By the time June rolls around, most motors should be available. Get your orders in to Karl Bauman as early as possible!

Last year, AERO-PAC saw an increase in vendor participation in our launches and in supporting the club. We have had Shadow Composites, Rocket Motion, G-Wiz, Black Sky, Mojave Desert High Power, BSD Rocketry, AEROCON, All Hobbies, Photos By Nadine, Igniter Man, Dr. Rocket, Blackrock Technology and Aerotech all show up to launches. There have been others too, their names escape me, but nevertheless, we are getting many vendors showing up. Try to patronize these folks and purchase a few things while at the launch or order items for delivery.

On a sad note, a cherished member of our

club recently passed away. Tom Cloud, the big happy-go-lucky fellow we all enjoyed, lost his battle with heart disease. He was a rocketeer from the beginning, with a TRA number of 109! "Bubba" will be missed.

This year, AERO-PAC will hold the first annual XPRS launch. We are renaming the end of the year launch to XPRS from Black Rock. This was the idea of several members while at LDRS. Ken Biba, Tom Cloud, John Coker and a few other AERO-PAC members started talking about the need for an EXTREME launch, the equivalent of BALLS, but only with certified motors. Black Rock is the best place in the country (or the world for that matter) to launch rockets. Each year, AERO-PAC has people travel from all over the US and even travel from other countries to fly at our Black Rock launches. So, we will now be emphasizing the advantages of Black Rock and offer an EXTREME launch for people to attend with their projects. There will be competition categories for altitude in each motor class and also for speed in certain classes. Trophies will be given out for the winners.

Bob Fortune has secured Extreme Rocketry as a participant/sponsor in this event, and will do full coverage of the launch. AERO-PAC will be advertising heavily this wonderful launch to attract the rocketeers to bring all those EXTREME rockets to the same launch and let it all hang out.

For more information contact Bob Fortune. Bob has graciously volunteered to coordinate the launch activities and advertising.

And lastly, remember that AERO-PAC will be in the spotlight with the BLM again this year. The continuing evolution of the National Conservation Area places anyone who goes to Black Rock under scrutiny. So, remember, while on the playa, no fires of any kind, cleanup everything and try to show up early and stay late for all the setup and tear-down activities!

See you all at the next function- the trailer/equipment party.

Tom

Tom Cloud Memorial

by Tony Alcocer

The first time AJ and I met Tom was at Aeronaut 2000. AJ and I were walking around seeing what was going on. Out in the distance we could see a group of people gathered around some guy. As we walked towards the group the guy that was doing all of the talking kept getting bigger and bigger. As we approached the van a gust of wind blew one of the rockets down that had been leaning against the van. The guy simply kicked the rocket under the van! Now we had to see who this guy was! It was Tom Cloud! He was telling the group how he made his rockets. How he made the body tubes and the couplers, from scratch!

To demonstrate how strong his rockets were he had one of the guys jump up and down on them. Everyone there was totally amazed including AJ and I. That was the first time that AJ and I had met Tom. We had talked to Tom many of times in the chat room and on the phone. We learned many things from Tom. The one thing that we learned about Tom from the very beginning was that he was always willing to help, whether it was answering our question or just lending us a hand. We only wish that we had known Tom longer than we did.

We will miss the Big Ol Guy!



by Sue McMurray

Tom Cloud was my friend. He made me smile every time I saw him. He made me laugh in surprise. He was warm and kind and he hugged me. He smelled better than Frank. I miss him in a way I can't describe right now. I'm afraid that I will miss him even more when he is not with us on the playa.



by John Coker

Tom was always fun and funny. Each meeting he would bring some new find or invention.

Despite being on the "enemy" team, he jumped in and helped out with the N1 out at Lucerne when we needed him.

We will all miss him. Goodbye.



by Bob Fortune

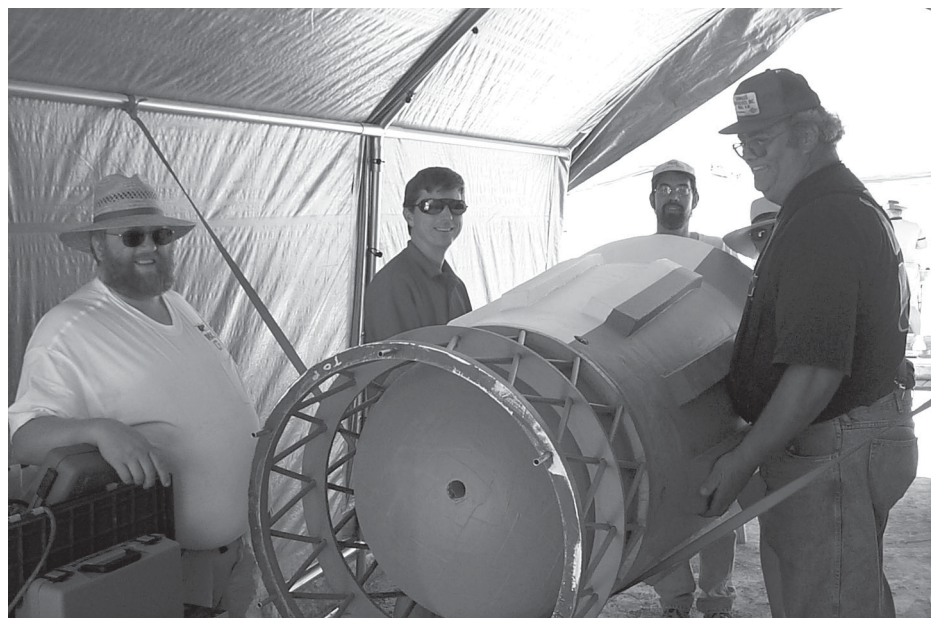
Tom Cloud was a big guy. Tall, barrel chested, his scale hadn't seen the other side of 300 pounds for quite a few years, deep voice, with eyes squinting at the tobacco smoke that curled from the perpetual cigarette hanging from the corner of his mouth. Maybe the squint was from the sun as he tracked the rockets that left the pads at Black Rock. Tom liked rockets in a big way, big rockets, big projects, big plans. Ibyronski (that's how a lot of us knew him from his email address "I be Pyro-n-ski") had a nice L3 project all ready to go which he talked about often. He was this close to flying it, I'm holding my thumb and forefinger together so they barely touch, at Mudroc in June. Formed the tubes by hand in his garage using a fantastic system of his own

In Loving Memory of
TOM CLOUD
Born into this Life
June 5, 1951
Indiana
Entered into Eternal Life
December 28, 2001
Antioch, California
Aged
Fifty Years
Funeral Service
11am Friday January 4, 2001
Immanuel Church
Antioch, California

design which you can read here in this newsletter. I'm lucky enough to own a couple of those tubes, one day I'll make a nice rocket with them and call it the Cloudbopper or something zippy. We would laugh and joke about his rocketeering. He was really homespun. One memorable get-together I called him Bubba von Braun and the name stuck, he thought it was hilarious. From then on he was Bubba von B, Werner's distant Appalachian relative. I'm going to miss old Mr. Cloud, TRA 0109.

Adios Bubba and rest in peace.

If my rocket zips by the cloud you're sitting on, make sure the parachute deploys, would you?



Our Unconventional L3

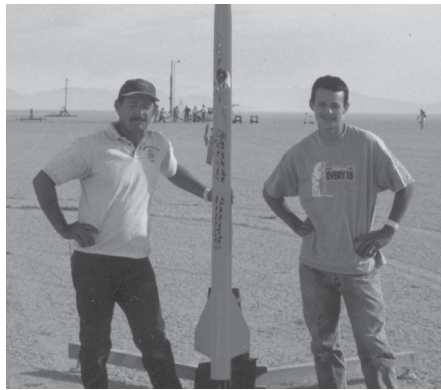
by Tony Alcocer

My name is Tony Alcocer and my son AJ and I have been into HPR for about 3 years now. We certified L1 and 2 and it seemed natural for us to move onto L3. We have been scratch building most of our rockets and wanted to do the same for L3. We had seen several L3 flights and were impressed with each one of them. Some of the challenges we saw with these flights was that these M motors sure pack a punch and the rocket needs to be built strong enough for them and most L3 flight did not go that high or fast. And then there was the cost of the project.

Being thrifty is one of my strong points, unless you ask my wife and she says I'm cheap. I needed to find a way to stay under budget and have a successful flight to boot. What is under budget? I was not sure.

So my search began for anything that could be used as rocket materials. We hit pay dirt right off the bat. We heard about some fiberglass pipe that was being thrown away and off we go. Sure enough we find a few hundred feet of it in a dumpster. It is used for the underground delivery and transfer of fuels and oils. Will it work? We start playing with it and find, that with some work it will do the trick. The next step was coming up with a nose cone, or cones (after all we have a few hundred feet of this stuff now) for this 3.5" body tube. We buy a block of Bass wood drill a 1/2 hole through the center and chuck it up in the drill press and turn ourselves a nice blank. The next step was to encase this blank in fiberglass and make a mold from it. It takes us 2 or 3 tries before we finally figure out how thick to make them. We end up with 4 layers of 6 oz glass and 1 layer of 5.75oz carbon fiber and we are happy with it. We ran a quick SIM and got some encouraging news. With an M1315 it should go almost 18,000' at about 1100 mph.

The next step was trying to make centering rings for a 3"MT in a 3.5"rocket. This was not going to be easy. We decided that we could use spruce strips to center the motor tube inside the body tube. The strips are 3/16" by 1/4" and with a little sanding it is a nice snug fit. We wanted to use TWC fin attachment and cut the fin slots with the aide of a hand held grinder and a piece of 2" angle iron as a guide. The .125 G-10 fins are imbedded in a mixture of epoxy and carbon fiber pulp. The next step was to glass the fins to the body in one fell swoop. This way we did not end up with cold joints between each layer of glass. The external filets, again with epoxy and car-



bon fiber, are applied along with 3 layers of 6 oz cloth. For added strength 2-part foam was used to fill up the any remaining area in the fin can. Soda straws were used to blow the mixture down into the fin can.

The electronics bay and couplers were the next hurdles. We used the same fiberglass pipe to make the couplers. They were cut to length and then cut lengthwise. A narrow piece was cut out of them to allow them to fit inside the body tube. They were then glassed back together with 2 layers of 6 oz cloth.

The rocket was painted and was just less than 12 pounds ready to go less the motor. We figured that we needed a 9 to 10' chute for the main. The problem was that we could not find one to fit inside the body. Then I remember my wife saying something about needing a new family tent last summer. So out comes the old family Dome tent. It measures 10' across and is made of rip stop nylon! A 9 1/2' chute is made and it fit nicely into the rocket!

So we head out to Black Rock 13 in hopes of achieving L3 status.

We take our time in prepping the rocket and work from our check sheet to avoid any

problems. AJ talks me through the building of the M1315. We start prepping the G-Wiz and our new Missile Works RC2 40K and realize that we had left the instructions for the RC2 at home. We head out in different directions in search of some. With the instructions in hand we set the dipswitches in their proper locations. We then pack the drogue and the main and install the shear pins and feel we are ready. Out at the away cell we continue to work from our check off sheet and everything goes as planned. As we stand on the flight line waiting for our flight, I begin to second-guess the flight. Maybe one more layer of glass on the fin can, maybe we should have bought a kit. As they read from the flight card I listen to the Walston receiver, borrowed from Tom Rouse, beeping away.

As the M1315 comes to life the rocket streaks into the sky higher and faster it goes until all that is left is a trail of smoke. It holds together and now we wait for 20 some seconds until it reaches apogee. AJ sees the entire flight with the binoculars as my ears strain to hear the beeping coming from the Walston unit. AJ says "we have a drogue" and another member of our launch team confirms that. I stare up into the sky in hopes that my 40-year-old eyes can see something to no avail. AJ and I hop into the truck and drive out in the playa. We stop in time to see the main charge fire and watch as the chute inflates and slows the rockets decent. As the rocket touches down I breathe a sigh of relief. As we drive up on the landing site. The rocket is in perfect condition. We open up the electronics bay to find that the G-Wiz is blinking out 20,305'and the RC is beeping out 20,831' The rocket held together had some impressive altitude and speed and came in under budget. Mission Accomplished!



Creating Fiberglass Tubing

By Tom Cloud

[This article was originally a set of postings Tom made on R.M.R.]

Introduction

My name is Tom Cloud and I'll post some info here to show you how to roll up a glass airframe tube in whatever material that you choose to use for the construction of the tube. I.E., Carbon, E-glass or my favorite, S2 cloth.

The mandrel is reusable and will last a long time with a bit of care. This will spread the cost of the mandrel over many tubes and keep you out of hot water with the wife/SO in your life. The mandrel is covered with a piece of sheet mylar. The mylar acts as the carrier for the glass tube and slides off the mandrel leaving the mandrel intact for reuse.

The mandrels that I use are made from full length phenolic coupler tubes that I buy from Red Arrow hobbies. I make the mandrels 60 inches long so that I can use either 38 or 50 inch cloth widths and trim to 36 or 48 inch long tubes. I use sheet mylar in either the .002 or .005 thickness as the carrier for the airframe, the mylar thickness is determined by rolling a small test piece using glass tape to test fit to a nosecone to see how tight it fits.

Mandrel construction

I make my mandrels all 60 inches long to allow the use of either 38 or 50 inch wide material. The full length couplers are usually 36 inches long in the smaller sizes and 48 inches in the larger sizes (6 inch and up) so this means that you need to join 2 lengths of coupler together to use the same process that I use. I cut a second coupler tube to the correct length to make up 60 inches I.E. a full 36 inch coupler and the second coupler cut to 24 inches long.

To join the 2 pieces you'll need to make a split tube coupler. I always make the joining coupler twice as long as the tube OD. I.E. a 4 inch (3.900) tube would have a joining coupler 8 inches long. It is plain to see that you need to keep the 2 pieces as straight as possible. I join the 2 pieces together using white glue to allow a long working time and the pieces laid in a 3X3 angle iron to keep them straight while the glue sets. This makes the basic mandrel for use.

I have found that to make it easier to remove the glass tube from the mandrel I developed the next step of adding a reinforced center to the mandrel. I make two end rings from 1/2 plywood scraps (cheap) with a center hole to clear a 60 inch length

of 1 inch EMT. Epoxy one of the end rings in an end of the mandrel. Clean the length of EMT with a solvent like MEK to remove the oil from the surface and rough the EMT with course sand paper. Take the second end ring and place 3 or 4 push pins placed in the side of the ring near the top as a way to keep it from falling inside the mandrel for the next step. Set the cleaned EMT in the center hole of the epoxyied in ring and place the mandrel in an upright position with the first ring facing down on the floor and the EMT in the middle of the mandrel. Mix some 2 part foam and pour into the mandrel, quickly place the top ring in the mandrel to keep the EMT centered and at the same time hold the EMT with a finger down so that it will still be flush with the first ring. The expanding foam WILL try to push the EMT up as it cures. Finish filling the mandrel with 2 part foam until it's full. Cut off the excess expanded foam and enough inside so the second end ring can be epoxyied in place.

I draw 2 lines down the length of the mandrel about 180 degrees apart with a permanent marker pen. One is for laying out the mylar carrier sheet and the other is for lining up the first wrap of cloth to keep it straight on the mandrel. I also place lines at 38 and 50 inches (centered of course) around the OD of the mandrel to help keep the cloth centered while rolling the tube.

I went into great detail for the construction of the mandrel only to help avoid any questions. Basically you want to have a length of coupler tube about a foot or so longer than the widest material that you want to use. You need the extra length on each end to turn the mandrel and not touch the wet cloth that you are rolling the tube from. The center piece of EMT gives you a way to support the mandrel and a way to remove the rolled airframe after its cured (more on removal in a moment).

Here's what makes it all so easy, the mylar carrier on the mandrel. For all intents and purposes the carrier is just a mylar tube that you make to fit over the mandrel to keep any epoxy from getting on it. (the mandrel) The carrier will slide off of the mandrel and be stuck to the inside of the airframe. The carrier is the same length as the mandrel, and has about a 1 inch overlap on the OD.

Cut the sheet mylar the same as the length as the mandrel, in my case 60 inches long. The width is determined by the OD of the mandrel, in this case 3.90. The OD (3.90) X 3.14 (12.246) plus about a 1 inch overlap to seal the carrier, a 13 inch wide piece of mylar 60 inches long is needed. The mylar needs to be cut square, 90 degree angles, to make

it easy to wrap the mandrel. The carrier is held together with plain cello tape. use a length of 3/4 inch EMT between two supports (I use 2 saw horses made for this purpose) through the 1 inch EMT in the mandrel core.

Tear off 5 or 6 small pieces of tape to hold the mylar in place while you make the carrier. Place the piece of mylar on the mandrel using one of the lines as a guide to keep it straight and parallel. Starting in the center hold the mylar with one hand and snug it up to the mandrel with the other hand. Put a small piece of tape on the seam to hold it in place. Keeping the mylar flat and smooth on the mandrel tape the seam in several places to hold it in place. **DO NOT TAPE THE MYLAR TO THE MANDREL!** Only tape the mylar to itself at the overlapped seam.

When you have the carrier so that it's flat and smooth against the mandrel and it slides on the mandrel without any slop, it's time to tape the entire seam. Start at one end and pull out a foot or so of tape from the roll, use one hand to hold the tape roll and the other to smooth the tape as you go down the seam. Seal the entire length of the seam and make sure the cello tape is flat and smooth. Leave the small pieces of tape in place that you used in the start and just go over the top of them.

You now have a mylar tube that will slide up and down the mandrel but is not loose or sloppy. If you have wrinkles in the mylar carrier you will have ridges in the completed airframe. It wont hurt anything but it just looks bad when cured. More later when I get home from taking the kids out for lunch.

. . .

Back from lunch so lets finish up the mandrel.

Mylar comes in many different thicknesses and can be found online at tapplastics.com and other online vendors as well. The common sizes that are listed online seem to be the .002, .005 and the .014. The latter is very heavy and stiff, its also hard to work with on a small tube. I usually use the .002 or .005 anyway so it all works out in the end.

To determine what thickness mylar to use its easiest to roll a test piece with eglass tape as the material and make a glass ring to test fit to the nose cone. Before making the carrier tube take a piece of .002 and .005 mylar about 6 inches wide and long enough to make a "mini" carrier of each thickness and roll up a test ring from 4 or 5 wraps of eglass tape and epoxy. Allow to cure and try the

Creating Fiberglass Tubing (continued)

rings on the nose cone and see how it fits. You will, for the most part, be using the .002 mylar.

The phenolic coupler material varies from run to production run a small amount. Some of the mandrels will use the .002 mylar but a few will be smaller on the OD and require the .005 mylar to roll a slightly larger tube. I have mandrels here that are from the same vendor but use different thicknesses of mylar to get a good fit. It happens so be prepared.

If you went to the extra time and trouble to fill the mandrels as I suggested, they will last for years and are very tough. I stand the mandrels on end in a corner of the garage and have had a few "accidents" over the years. Dings and divots can be filled with a mixture of microspheres and epoxy and sanded smooth and the mandrel is as good as new. Just a piece of coupler that's not filled with the foam can be ruined beyond use, been there done that.

If you want to use a vacuum bagging setup you need to fill the mandrel to keep it from collapsing under the pressure of the vacuum. I know that 14 pounds a square inch doesn't sound like much, but look at it this way. If the material was laid out flat it would take a steel plate over a foot thick to exert the same pressure as a good bagging job at 29 inches of mercury (14 psi in air pressure). I never had much luck with bagging the airframe and always got wrinkles in the finished tube. The wraps of cloth move around on the mandrel and bunch up in different spots. Looks really bad.

Next figuring out the amount of cloth and how to determine wall thickness of the finished airframe.

Rolling the airframe

OK you now have a mandrel with a carrier in the size that you want to make the airframe in.

Safety First! Always wear a pair of latex or nitrile gloves and a long sleeve shirt, and have a fan moving the air in the area that you are working in. I work in the garage with the door open and a fan behind me blowing the epoxy fumes outside. In a matter of a few minutes after putting the epoxy in a mixing vessel my nose will start to run from a reaction to the resin/hardener. It makes no difference what brand that I use I still have some type of reaction to the material.

Don't think that you won't get to this point after years of exposure to the resin; you will if you don't work smart from the start in

using epoxys. Again safety first and avoid any problems. A respirator with HEPA filters is a good investment, the long sleeve shirt will keep the epoxy off of your arms if you bump in to the wet cloth.

You already know what you want the airframe rolled from be it carbon or E-glass or something in between. We need to determine how much cloth is needed to do the layup. Measure the thickness of the cloth with a cheap dial caliper or a mic. This thickness will determine how many wraps are needed to get the wall thickness that you want to end up with. To figure the length of the piece of cloth that's needed take the OD of the mandrel (in this post it's 3.90, a common size) and multiply by PI (3.14) to arrive at the length needed for *one* wrap ($3.90 \times 3.14 = 12.246$ inches). Let's say that the material is .010 thick and we want to end up with an .060 wall tube (most nosecones have a shoulder for this thickness) so that would mean that we need 6 wraps of cloth to make the tube. 12.246 inches per wrap \times 6 wraps means that we need a piece of cloth 73.476 inches long. Round this off to $73 \frac{1}{2}$ inches long and then we add about 2 inches to this figure to allow for the tube to grow in diameter and provide an over lap at the seam when completed. So a piece of cloth $75 \frac{1}{2}$ to 76 inches long is needed to roll a 3.90 airframe with an .060 wall. Easy.

You already have your mandrel supported in some way so that you can turn the mandrel but it stays in one place. I use a piece of $\frac{3}{4}$ inch EMT on two saw horses, remember the 1 inch EMT in the mandrel, the smaller EMT passes through this and gives you the support needed.

Wax the mylar carrier with a paste release wax and buff off the excess with a paper towel.

Set up everything that you need to do the layup on a table next to the mandrel *before* you start the layup. On my rolling table I have 4 or 5 throw away resin brushes, 4 or 5 two quart mixing tubs, 3 or 4 squeegees an X-acto knife with a sharp point tip and several dozen paper towels pulled from the roll.

The cans of resin and hardener are on one corner and have pumps in them. As a note punch a small hole in the top of the cans to vent them. It helps keep the pumps from "spitting" and also keeps the pumps from dripping material.

If you drop a brush or squeegee while rolling, leave it on the floor and pick up a new one and keep going.

Put the cloth on a cardboard tube or another length of EMT and roll it up and place it behind the mandrel away from the floor so that it stays clean.

Put on the safety items and mix some epoxy in a tub. Use the brush to coat the mandrel between the end lines all the way around the mandrel. You should have a heavy coat of epoxy on the carrier the same width as the cloth if you have done it correctly.

Turn the mandrel so that one of the lines, the one that runs the length of the mandrel of course, is facing up. Lay the cloth end on this line and between the end lines, use your brush to move the cloth where you need to so that the cloth is straight and matches the lines. Start rolling the cloth on the mandrel by turning it a small amount at a time and brushing down the cloth as you go. Only add more epoxy to the spots that aren't wetted out with the brush (they will look white or not as wet as the rest of the cloth).

Don't use your hands to smooth out the cloth, just the brush at this point. Your hands will leave ridges in the tube. Only use your hands to keep the material running true with the guide lines on the ends of the mandrel. Leave no dry areas in the layup; you can't go back later and touch it up.

After you get about a wrap and a half of cloth wrapped on the mandrel, pick up a squeegee and smooth out the cloth and tighten it up at the same time. This will force the excess resin *up* through the cloth and remove any small air voids. Turn the mandrel small amounts at a time and use the squeegee to press the cloth smooth and flat, use the brush to add more epoxy to any dry spots as you go around the mandrel.

Only handle the cloth at the outer edges with the gloved hands to keep it running true on the mandrel by pulling the cloth on the side that needs to be trued up. Keep doing the above steps until you get almost to the end of your cloth. Use the brush to smooth down the last few inches of cloth.

Don't brush across the end of the cloth when you get there. This will pull the cloth apart and leave threads on the outside of the tube. Just use the brush to push down the cloth at the seam.

Roll the mandrel on the support and look for any dry spots and small air voids. You shouldn't have any, but if you have a dry spot use the brush to stipple more epoxy into the cloth (use the brush corner and work the epoxy into the cloth). Be careful not to move the cloth and cause an air void

Creating Fiberglass Tubing (continued)

(bubble in the wetted out layup). Small air voids can be opened by using the X-acto knife point and poking the void. Use the brush end to push the cloth down again.

The tube when rolled around will look an even green color with a few shiny spots. The shiny spots are excess resin and need to be removed. Take a paper towel that's been folded several times and touch it to the shiny spots to blot up the excess resin. Go around the tube several times while the excess epoxy is bleeding itself through the cloth and remove it.

After you are happy with the layup. Leave it alone and let it cure on the mandrel. I have a birthday party to go to. I'll post removal and finishing info when I return.

...

Removal from the Mandrel

I so sorry to have taken so long to make this last post on the airframe construction thread. I have been very busy and also the WTC has been in my mind instead of this, again sorry.

The mylar carrier/fiberglass airframe will slide off of the mandrel in most cases without too much effort if you made the carrier correctly to begin with. A lot of times you can hold the mandrel/airframe in your hands and give it a sharp jerk and it will start to slide apart, then you just hold the airframe with one hand and pull the mandrel out the rest of the way.

If you rolled the tube a bit too snug you might need some one to help pull the tube off the mandrel. After many tubes I made a simple removal system that works every time. This is just another length of 1 inch EMT the same length as the mandrel and a length of 3/4 inch EMT two feet longer

than the mandrel. The 3/4 inch EMT acts as a guide to keep the mandrel and the second length of 1 inch EMT aligned.

To use the removal setup just slide the 3/4 inch EMT into the mandrel and then slide on the second length of 1 inch EMT. Set the end of the second length on the garage floor and pull down on the airframe, things should slide apart without too much effort. If you got super carried away with the squeegee when rolling your airframe and it's stuck on the mandrel, just raise the mandrel up a foot or so and hold the airframe and slam it down on the second length of 1 inch EMT like a slide hammer.

A few sharp raps like this will remove the airframe from the mandrel. When the airframe/mylar carrier is free from the mandrel you can remove the mylar by starting at one end and peel the carrier away from the airframe with your fingers.

Once you have an area free on the end, slide a long wooden dowel down the inside of the airframe between the carrier and the airframe until the dowel is exposed on both ends of the airframe. Push down on both ends of the dowel at the same time and the mylar carrier will pull away from the glass tube.

Turn the airframe a bit and repeat until the mylar is free all the way around the inside of the airframe.

Keep the mylar depressed and pull it out. The carrier will slide out with no effort. Even a small area that has not been peeled away from the carrier will hold it in the airframe; just keep working until the carrier is free of the airframe. You now have the airframe (YEA!), the mylar tube and the mandrel. Carefully slide the carrier back on the mandrel and re-wax and roll more air-

frame. I always remove 1 inch of the airframe from each end to play it safe.

I have made at least a hundred lengths of airframe in sizes from 54mm to 11.41 inches in diameter using the method that I have described here in this thread. It works and you no longer need to buy phenolic tube; just roll it in glass and enjoy.

A quick tip is to square up the cloth on both ends before you start rolling the tube. You can do this by pulling the loose threads of fiberglass on the end until a thread pulls clean all the way across the material. Take your scissors and trim the end fuzz until you have about an 1/8 of an inch exposed.

Also remember to work the epoxy *up* through the cloth. This will help control the amount of epoxy that you use and will keep air voids out of the finished airframe.

You want to use about 50% by weight epoxy. I.e., if your cloth for the tube weighs 12 ounces total, you want to use about 6 to 7 ounces of epoxy to roll the layup.

Remember that a squeegee is your best friend in rolling.

Plain weave cloths are the most stable and make good tubes. Start simple with open style cloths called boat fabric to learn with. Once you have the hang of the rolling, buy some tight weave, plain. The tubes will be lighter and stronger.

Also roll the tube from a single length of cloth, it makes a stronger airframe.

Carbon is super strong and you can roll a straight carbon tube easy enough. Remember that it lacks the mass for a good altitude. Save the carbon for the high velocity birds.

Enjoy!

Meet the New Board Members

Tony Alcocer, Second Commissioner

My name is Tony Alcocer and my son AJ and I got into HPR about 3 years ago. We do our flying based out of Santa Rosa CA where I am a Firefighter. We did our L1 at Lunar and our L2 at Tripoli Central California and out grew their launch site when we found Aeropac. We achieved our L3 cert at Black Rock 13 with a flight of 20,000'. We have slowly turned into Speed and Altitude junkies. We both love scratch building and pushing our rockets to their limits and on occasion past their limits.

Why did I join the BOD? Fresh meat, new blood...kind of thing. I'm looking forward to helping the new members advance in the hobby and am really looking forward

to the demonstrations at next year's launches.

Becky Green, Treasurer

My first exposure to rockets came in 1994 when my husband Jim bought his first high power rocket kit. He did rockets as a kid but this was so much larger than anything he ever had built before. He tried talking me into making one and going to BlackRock but I wasn't interested at all. Finally, he and a friend went to their first launch and came back telling me I just had to do it. Reluctantly, I agreed and went ahead and built my first kit. My first launch was July, 1995 where I certified level 1. Well, I guess you know what the rest of the story will be. Yes, I was hooked. The next launch, I certified level 2 and in

June of 1996 I certified level 3. I was the third person in Aeropac to certify level 3 and was the first woman ever to certify level 3. I guess you could say once I started, I couldn't stop. I was hooked. I have been part of the ARLISS team since it started three years ago. I enjoy building rockets so much that I have been working with two boys ages 12 & 13 helping them build rockets from scratch.

For a few years, I have thought about being a board member of Aeropac and finally decided I should just do it. It will give me another angle into rocketry. There is so much that goes into keeping an organization working well that I thought it was time I step up and help out.

AERO-PAC on the Web

by John Coker

Paul Campbell and I have revamped the AERO-PAC web site substantially. For those of you who haven't been to it recently, it is much changed.

The most obvious changes is one of format. Pages now have a consistent structure and a designed appearance.

However, the changes which are most important are only partly done. Good looks are important, but content is king. If you have more information to include, either in a newsletter or on the web site, please let us know.

It's easy to think of new things that would be nice to have on the web site. The harder part is coming up with the actual content.

One thing that we are woefully lacking in is launch photos and reports. At the launch, everyone is busy with their own projects and no one is free to be the reporter. However, if you do find yourself with free time at a launch, consider taking some general launch pictures and pictures of other people's rockets. And don't forget to write down the rocketeer and rocket names.



www.aeropac.org

Minutes of the Members Meeting

Members Meeting Dec. 8, 2001

The December 8 members meeting was less of a meeting and more of a large gathering of old and new friends talk'n rockets. Everyone had plenty of opportunity to stuff their faces with pizza and discuss their winter building projects. Ken and Zack Adams made the trip all the way from Nevada and Ken showed his video creation of his level 3 rocket being built, prepped and flown. Very nicely done.

The results of the big raffle were:
PML 29mm motor mount: Don Dowd
John Coker's "Big Bertha" kit: Zack Adams
Igniter Man Kit: Kevin McGrath
Aeropac adaptors (2): Becky Green and George Delli-Santi
Aeropac 54" motor retainer: Elton Davies
Aerocon parachutes and other items (2): Scott Bowman & ?
PML "Baby Pterodactyl": Paul Hopkins
John Coker's ARLISS fin can: Don Dowd
G-Wiz Deluxe LC: Thomas Brumley
G-Wiz MC: Kevin McGrath
Rocketman RC-7 parachute: Paul Hopkins
John Coker's "Honest John": Carl Reisinger
Shadow Composite's "Raven": A.J. Alcocer
Assorted Rocketman videos: Assorted

The donations for this raffle were obviously outstanding! Our collective thanks to these fine folks and vendors. The next time you need a rocket kit, parts, accessories or electronics, look to PML, Igniter Man, Aeropac, Aerocon, G-Wiz, Rocketman and Shadow Composites.

2002 Launch Schedule

June 21	Mudrock EX
June 22-23	Mudrock 9.0 Night launch on Saturday June 22
August 2-4	Aeronaut 2002 ARLISS launches on Friday and Saturday Night launch planned for Saturday No EX launch
Sept. 27-29	XPRS (Extreme Performance Rocket Ships) Certified motors only Events are in the planning phase

Minutes of the Board Meeting

Board OF Directors Meeting Minutes
December 8, 2001

1 - Board of Directors Nominations

- a) Nominations for the 2002 BOD are:
- Tom Rouse - Prefect
 - Tony Alcocer - 2nd Commissioner
 - Steve Preston - Launch Director
 - Scott Bowman - Secretary
 - Becky Green - Treasurer
 - John Coker - Newsletter Editor
 - Paul Campbell - Webmaster
 - Ken Biba - Member at Large

b) The discussion on the concept of the 2nd Commissioner position as being the training position for Prefect, ended with the general consciences that BOD experience is more important than the position held.

We cannot expect a person to accept a 2nd Commish position that comes with the expectation that this person is agreeing to become the next Prefect. We will need to discuss and plan for Tom's successor throughout this coming year.

2 - Membership issues

- a) Annual renewal dates will remain the same. The first newsletter of 2002 will include a membership application.
- b) Fees will remain the same for 2002.
- Regular members \$20 plus \$20/launch
 - Contributing members \$60
 - Nonmembers regular launches \$30
 - Nonmembers EX launches \$30
 - Spectators fee \$5/day per person

c) Improving membership communication/participation:

The plan is to have some type of event at each launch. At Mudroc, Jim Green has agreed to host a motor making class. The tentative plan is to have a demo flight on Friday morning at the EX launch with a class being held Friday (June 21). Other events for the other launches are open for discussion.

d) Policy towards new members:

New members will be sent their AERO-PAC badges, a letter from the Prefect and a copy of the latest newsletter. These items will be sent out in a timely fashion.

3 - XPRS

Bob Fortune will occupy a "Chair" position

Minutes of the Board Meeting (continued)

on the BOD for the purpose of managing the promotions for the XPRS launch. Tony Alcocer will also help. XPRS will replace the "Black Rock" launch. Bob will work towards a collaboration with "Extreme Rocketry" magazine. Contests, prizes and other activities are open for discussion.

4 - 2002 Launch Schedule

After discussing potential scheduling conflicts with LDRS, Burning Man, Balls, Hay Burner and hunting season, the following was decided upon:

June 21 **Mudrock EX**
 June 22-23 **Mudrock 9.0**
 Night launch on Saturday June 22
 August 2-4 **Aeronaut 2002**
 ARLISS launches on Friday and Saturday
 Night launch planned for Saturday
 No EX launch
 Sept. 27-29 **XPRS**
 (Extreme Performance Rocket Ships)
 Certified motors only
 Events are in the planning phase

Tony will check on obtaining 100K waivers for all the launch dates.

Ed Hackett will write up a list of night launch rules.

5 - Web Site

a) Paul will work on developing a "how to" page explaining how to join AERO-PAC and Tripoli.

b) Regarding on line membership sign-up: We would need a corporate identity and a tax number. It was decided that this is not a viable option.

6 - Equipment etc.

a) Insurance for trailer contents - Currently the contents are (or should be) covered by the individual policies of those who tow the trailer. If the trailer was to be stolen or broken into at the storage facility, we are vulnerable. Steve will purchase a locking trailer ball to reduce our risk in storage. Tom will do further research into additional insurance coverage.

b) Rails - Tom will donate 2 pro rails. Steve will buy a couple of 80-20 rails to try out this season. No aluminum rail buttons will be allowed. They damage the rails. The club will buy a bunch of plastic rail buttons and have them available for sale at the RSO (or Treasurers) table so that fliers have replacements available if needed. Karl Bauman also has plastic buttons available.

c) Equipment to eliminate - The Hypertech equipment will be removed from the equipment trailer. It hasn't been used for years. It may be decided at the equipment cleaning party that other items should also be removed. The date for cleaning the equipment was set for Saturday May 4 at Bob's shop (the same place as last year).

d) Satellite Phone - Steve was authorized to purchase the phone. Steve has researched providers extensively and has determined that the costs will be about \$500 for the phone and \$40/month. The phone is needed to communicate with the FAA and also in the case of emergencies. We can recoup some of the cost by allowing folks to use the phone at launches for a fee of \$5/minute.

e) Signs with launch rules - Tony has volunteered to create signs to be posted at the launches which list the basic rules of behavior at AERO-PAC launches.

f) T-shirts - We need a local member to work on the design and art work for a new AERO-PAC T-shirt. This will be a generic design (not launch name specific). Bob will also be working on shirt designs for XPRS.

7 - Treasurers Report

a) Per Richard the current account balance is \$3693.00. All outstanding bills (including the trailer) have been paid.

b) For the year 2002, Becky and Scott will work on developing a cash flow projection.

c) Treasurer items need to be transferred from Richard to Becky.

8 - Club functions and meetings

a) Field trips:

AeroJet in Sacramento - We are planning on holding the second members meeting (after the May 4 equip. cleaning party) in Sacramento. We will try to plan a trip to AeroJet as part of this get together. We need a member to volunteer to set up a tour at

AeroJet and find a place for a before or after tour meeting place. Tony also suggested that we invite the Sacramento area club SARG to join us.

NASA AMES - Per Tom, Bob Twiggs may be able to get us in for a tour.

b) Promotional activities:

1) Bob and Tony will work together for articles on XPRS for "Extreme Rocketry" and "High Power Rocketry".

2) Scott will work up launch reports for the other launches for publication in either or both of the aforementioned magazines. Members are encouraged to submit digital pictures of the launches for possible submission with articles.

c) Dates and places for the remaining members meetings have not yet been set. These and other club activities are open for discussion.

9 - Newsletter

It was agreed that the content and scheduling of the newsletters is quite good as is. Members are encouraged to provide articles and pictures for future newsletters.

10 - BLM issues

There is the outside possibility that our launches could be ruled as being "commercial events" by the BLM. This would increase our fees to the BLM dramatically and would discourage vendors from participating for the same reason. So far, it doesn't look like there is a very high probability that this will happen. As long as Burning Man is not considered a commercial event, then the AERO-PAC launches appear to be safe from this designation.

11 - Discussion of the policies and direction of AERO-PAC

Time restraints prevented further discussion.

Respectfully submitted: Scott Bowman

How to Contact the Board

First Commissioner	Tom Rouse	tomr@aeropac.org	(408) 997-9586
Second Commissioner	Tony Alcocer	tfish38@aol.com	(707) 526-4631
Treasurer	Becky Green	apfueled@aol.com	(415) 499-8214
Launch Director	Steven Preston	spreston@highpower.com	(408) 729-3401
Secretary	Scott Bowman	scottbow@sonic.net	(707) 894-3823
Newsletter Editor	John Coker	john@aeropac.org	(650) 685-1890
Webmaster	Paul Campbell	paul@aeropac.org	(510) 652-9396
Member At Large	Ken Biba	kbiba@forvalue.com	(415) 665-1812

Other AERO-PAC email addresses: board@aeropac.org and members@aeropac.org