Unusual picture shows how Christopher looks from the pilot's point of view immediately after hitting the silk. Picture taken from Snapshot 2 camera plane with a mirror for rearward view.

Christopher: RC Parachutist

A radio-controlled parachutist for your model? Yes, that's something you can do, and it isn't too hard if you have sewing skills or if you can enlist the aid of someone who is handy in this area. The author's Christopher has never crashed. ■ Luther Hux

THE ARTICLE in Parachutist magazine began, "Only a dummy would jump from 500 feet." It went on to point out the many other risks with Christopher's first jump—things such as using a ram-air canopy, definitely not a beginner's chute, and the dangers of a chute made and packed by an inexperienced person. All of this makes Chris seem a bit foolhardy, but readers who have looked over the photos know that we are really talking about a one-foot-tall RC dummy.

Dawn, my wife, has flown the RC chutist for the Virginia Air Show Squadron for the past three years. Probably because of the simple static-line release of Chris, there has never been a failure of the parachute to open. With the use of a simple wing-mounted pod, we have always been able to carry the chutist up on another model if the scheduled lift ticket was unavailable. Some will prefer the cabin-contained chutist with free-fall capability, but this article will present a simple, sport version to encourage more modelers to try RC jumping.

The key to simplifying the project is the use of a wing-mounted pod and a self-contained release system. This allows the use of almost any model with enough power and ground clearance to carry the chutist. No special servo and release mechanism is required on the aircraft.

Releasing the parachutist from the wing is not unrealistic, since many full-scale jumps are made by exiting the plane onto a step and

Dramatic appearance was the author's ultimate challenge in duplicating a "live" jumper, but smoke stained both Christopher and Luther, so it was discontinued. Nelson Viegas photo.

holding onto the strut until over the drop zone. An added benefit is that having the model chutist on the wing usually allows enough distance between receivers to prevent coupling or interference between the receivers. Those who would put the chutist inside the fuselage will have to take precautions against receiver coupling. (See October 1981 MA, Letters to the Editor, for more information on this problem.)

Flying the chutist is so easy

Christopher's white release unit was designed for Snapshot 2, but it can be attached easily to many wing adapters with nylon bolts. In this picture, the largest adapter is rubberbanded to Ralph Heath's Quarter Scale J-3 Cub. Since the Cub and jumper are so popular at air shows, a tube and release tab later was attached directly to the adapter in order to reduce the overall weight.

These pictures show two different chute pods used on the author's Snapshot 2 plane—and two locations for the chutist. In any case, the pod should be sanded smooth to prevent fabric snags. With chutist on 72 MHz and the model on 53 MHz, the close proximity of receivers has not caused interference—while some same-band combinations have been troublesome in this regard. In the photo at right with the author's wife, Dawn, can be seen the mirror on the fuselage which allows the camera to look rearward (but the pilot has to be quick on the shutter for close-ups of releases).

that you can even hand the transmitter to your kids. They may have you climbing trees, but they can't actually crash.

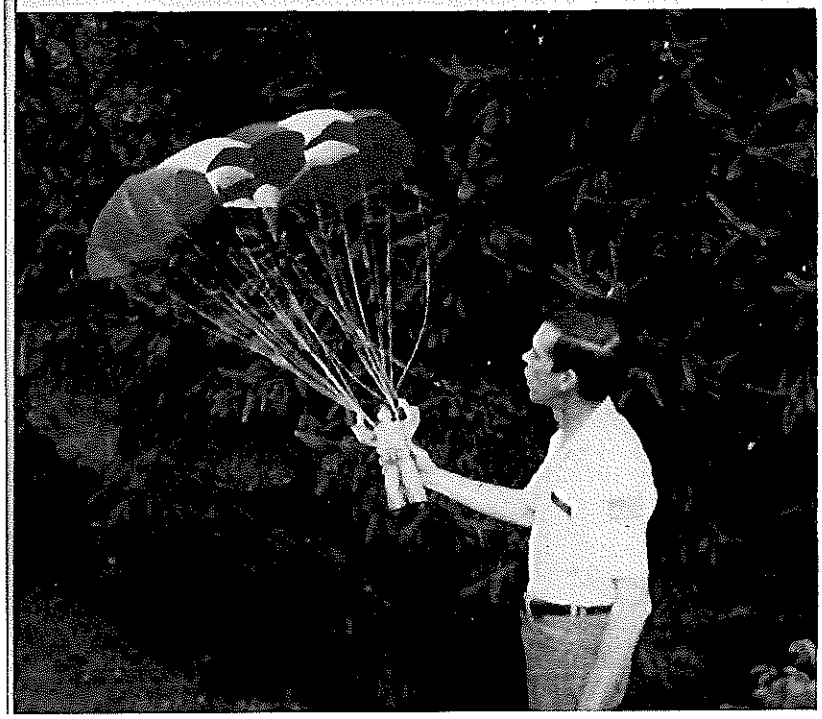
I asked her if she wanted to name the little guy. Immediately she replied, "Christopher." "Boy, that was fast. Why Christopher?" I asked. She had been watching a TV interview with Christopher Reeve who played the role of Superman. Why not? He flies, too.

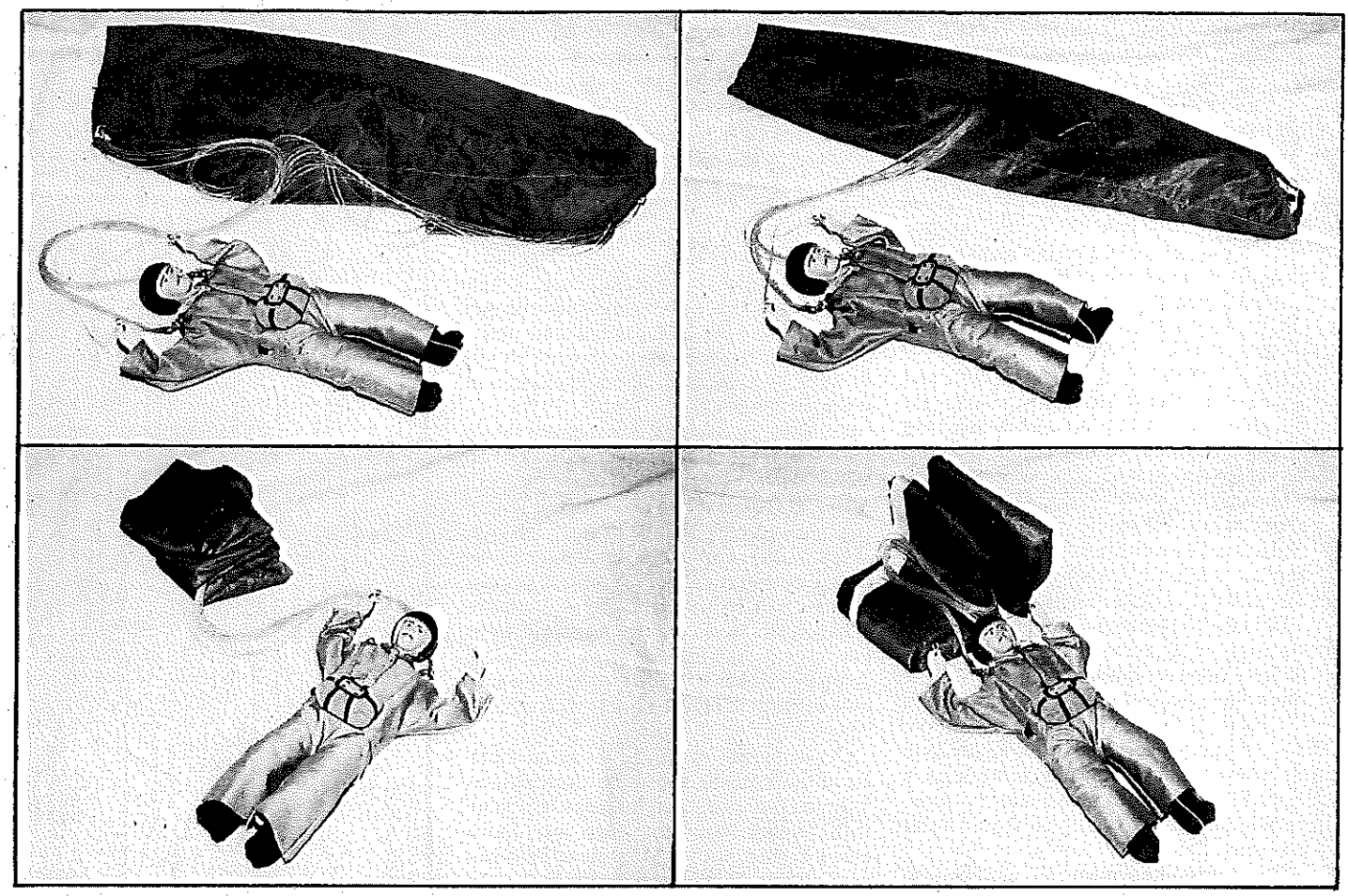
If Chris could talk, I could just imagine his comments on his first jump. It had rained the day before, and as he hung from the wing pod with his face right over the large balloon tires, I'm sure he was hoping not to run through any puddles on takeoff. Snapshot 2 cleared the puddles and took Chris to altitude in just a minute.

Guessing as best I could on wind speed and direction, I called on Dawn to release the chute. In a few seconds Chris was riding overhead toward the trees behind us. The wind was strong, and Chris could not penetrate it. The steering lines were much too short, so the trailing edge of the chute was too far down as it would be for flairing to land.

It would be a simple matter to correct it for the next flight, but how could we get Chris down within reach? Chuck Thomas,

Left: Luther tests his new red-and-white patriotic chute by inflating it in a light wind. Photo by Judy Ockert. The inventor of the parafoil design, Domina Jalbert, built the first fabric wings as a kite—later adapated for parachute use. Right: Flying the parachutist on a windy day often results in a long walk for retrieval, but photo shows Dawn Hux about to retrieve Chris without taking a step. Best to do learning on calm days.





These four pictures, plus another on the next page, show the sequence of packing the parachute. Top Left: First, hang the chute upside down to allow all panels to hang evenly between ribs. Then place chute on its side as shown on the drawing. Gather all lines into one column as far up on chute as possible. The excess line of the longer lines should be placed loosely over the center of the ribs. Top Right: Fold bottom half of ribs up over top half, enclosing the loose lines in the fold. Above Left: Begin at chute leading edge with about 3-in. folds in a zig-zag pattern, producing a nearly square pack. Rule: Folds must alternate; never fold more than once in any one direction. Above Right: The lines will exit from one fold. Open the pack at the next fold, before or after the one with the lines, and fold in the remaining lines until head of chutist is against the pack. Close the pack to its original shape. Attention to these details will help assure that your RC parachutist doesn't crash.

our team manager, took over the controls and began to steer along the edge of the tree line. Bruce Robertson then ran after the chutist while dodging a number of puddles in the field. Fortunately, Bruce was below Chris as Chris landed. Bruce was up to the top of his shoes in water; Chris would have been up to his servos in it.

The chute performed better when adjustments were made, but turns were very slow. Later, I cut two gores from the chute and increased Chris' weight to get more forward speed and better wind penetration. This is why you will see photos of the chute with both seven and five gores. The steering lines were removed from the hands and run through wire loops in the hands and attached to the main harness. This leverage change, along with the increased weight, provided very quick turn response.

Chris usually rode Snapshot 2 for his lift-ticket in the first year of his existence, but has since been aboard other models—such as Ralph Heath's Quarter Scale J-3. The Cub made the jumps look very realistic. A Ken doll rides as the pilot of the J-3. (Those Ken dolls look a little skinny when compared to Chris.)

Unfortunately, the day came when Chris was not jumping for fun but had to jump to save himself. Just as the Cub reached the drop zone area, the pilot alerted us that controls were not right. I called to Dawn to release immediately, and Chris was safely on his way. But as the Cub's engine went to idle the batteries gave out, and the Cub circled Chris most of the way down. The Cub missed Chris and was almost level during the approach. Then the left wing tip caught, and the Cub cartwheeled. It was later repaired and is now used in air shows.

Since Snapshot 2 is a camera plane, I couldn't resist the opportunity to take photos of Chris leaving from the plane. My camera usually views out the wing tip, so I added a first-surface mirror to allow the camera to view past the tail section. With Chris, camera, and mirror aboard, the takeoff roll was unusually long, but Snapshot 2 did the job and captured the exit shot of Chris with his chute just starting to open.

For easy flying practice I have used the parafoil chute wings made for ParaCraft as a kite to lift Chris to about 200 feet. Since there is no airplane to fly or land, Dawn and I can concentrate just on flying Chris.

Keep in mind that landing Chris on a target is like making a good dead-stick landing. We spent one afternoon at the Manassas flying field, which is reserved for non-powered models, using our kite for lift. Four Sailplane pilots (Larry Parks, Ray Vierling, Bob Engelmann, and Bud Welser) helped with the relaunching and flying of the kite so they could get a close look at this different type of glider.

Usually Dawn or I can land Chris right where we want to. Sometimes I set him right on the transmitter, but at several shows there was a strong thermal that kept Chris up for nearly five minutes and added unexpected drift to the descent. Needless to say, those flights were nowhere near target. Don't be discouraged if your own chutist gets blown away on occasion.

These long flights were surprising to me, since I have the weight of a smoke cartridge and extra battery to fire it. I have not included the smoke system in this article, as it is not a simple system. The cartridges are expensive, the miniature firing system is difficult, and the smoke often stains me and the chute.

The air show at the Leesburg Airport was right after a jump team demonstration. Dawn landed Chris just the way she had seen the parachutist land earlier. I picked up Chris and held him up so Dawn could operate the arms and wave to the audience. "That's great," one teenager yelled out, "Now let's see him pick up his chute and walk back."

Pick a name for your jumper, and let's start building him or her. I plan to give as much detail on sewing the chute as I can think of,

so those who can't talk a seamstress into helping will still have a good chance at success. Please read all of the instructions before starting each phase of construction.

To start the chutist, you must first select a suitable radio. The receiver must be small, the battery around 100 mil, and the servos large, heavy-duty type. Because of the long servo "arms" I cannot recommend miniature servos. The transmitter must have two vertical sticks, one for each arm of the chutist. Most two-channel transmitters have rotating sticks.

Lay out the radio parts over the plans, and decide if any adjustments must be made for the equipment to fit. Assemble the 1/32 plywood box after cutting out all openings for switch and servo shafts. Trim mounting tabs from the servo cases. (Don't worry about ruining the servos, as you can order replacement cases if you use the servos on another project.) Check rotation of the servos before installation.

With the chutist face-down on the table so you can see the servo shafts, the left servo should rotate counterclockwise when the transmitter stick in the throttle position is moved from full- to low-throttle position. The right servo (for right arm) should rotate clockwise when the elevator control stick is moved from down to up elevator position. Pulling the sticks toward you should lower the arms.

The transmitter must be modified to spring-load the sticks toward the top of the case. You could just remove all springs and manually move the sticks into the returned position, but the springs are simple to install.

Cut the plugs from the servo cables, and route servo wires through a new hole in the case facing the battery area. Solder plugs to the minimum amount of wire required to do the job. The body is too confined for excessive wire. Use silicon glue to hold the servos in place. Do not put glue on "back" area of box. Just glue the area touching the sides of the servos. This will let you cut the servos loose for any repairs by inserting an X-Acto blade between box and servo case. I have had no problems in getting servos out when needed.

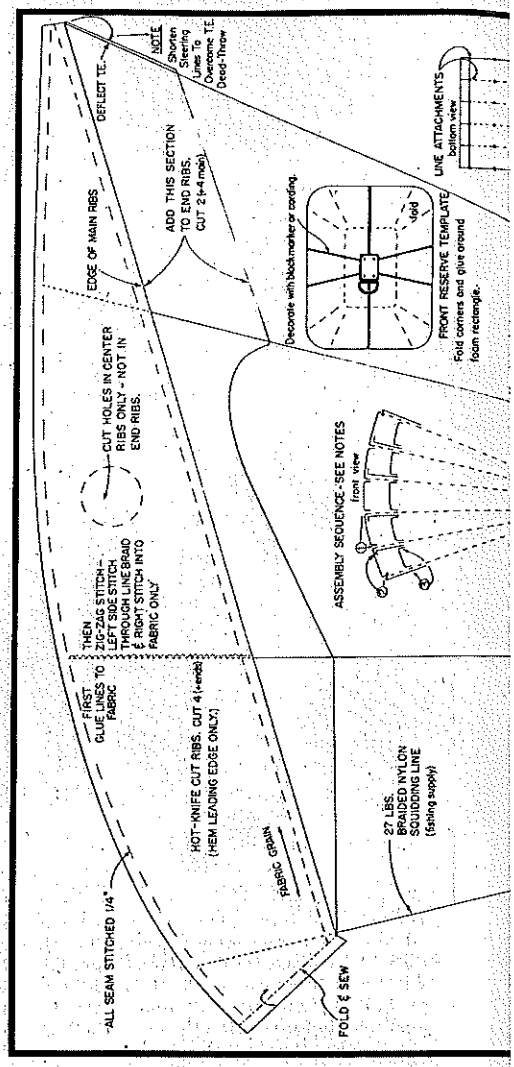
The receiver is wedged into foam and held in place by the switch and charge plug. If the battery fit is too tight, remove the plastic case, and wrap cells with tape; silicon-glue in place. Don't put glue over the battery vents (hole in + end).

Paint detail on the jumper's head. When dry, mount on plywood body. Bend support wires. Drill hole in bulkhead and notch shoulders of figure head so support wire will fit flush to body, then epoxy the wires in place.

Cut four leg patterns from muslin fabric (bed sheets). Stitch together to make two leg stockings, and turn right-side-out. Push plywood footprint into shoe area to flatten like a shoe sole. Then stuff each leg with strips of old nylon stockings until legs are firm. Don't worry about the weight, as most chutists will be too light and will require clay ballast. Stitch the two legs together at the crotch, and test for fit on the body. Adjust or gather if needed, and then white-glue to body. Color the boots with a black Magic Marker.

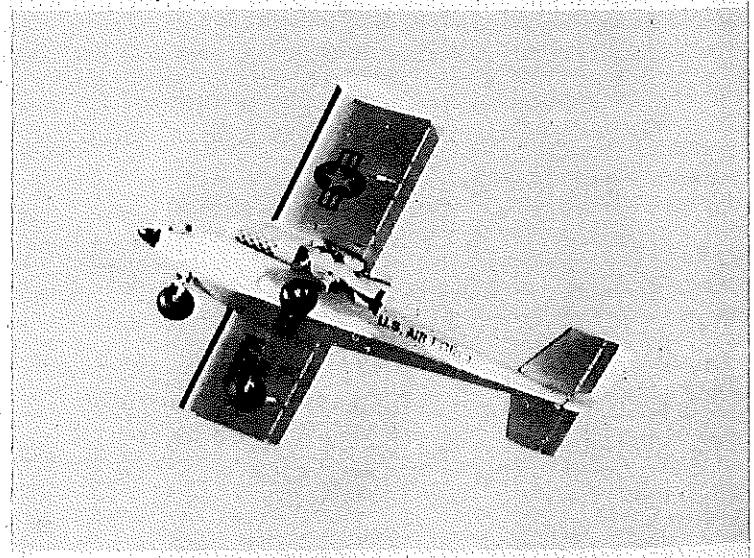
Cut two arms from 3/32-in. nylon sheet. Bend the arms as shown on drawings, as follows. Place arms on the edge of a table with forearm over the edge just above elbows. Heat with a MonoKote heat gun until pliable. Bend just beyond the desired angle, and hold until cool. White stress marks means you're bending the nylon before it's hot enough. Check for matching angles. Without this bend the chutist appears unnatural.

Drill hole in hands for the wire slide. This slide allows for double distance of pull on the steering lines. Cut holes for servo wheel shafts. Obtain large servo wheels if available for your radio system. Lightly sand *bottom* of servo wheel and shoulder area of arms. Place arms on wheels and wheels on the servo shafts. Turn on the radio, and move control sticks and trims toward the top of the transmitter case (arms in raised position).



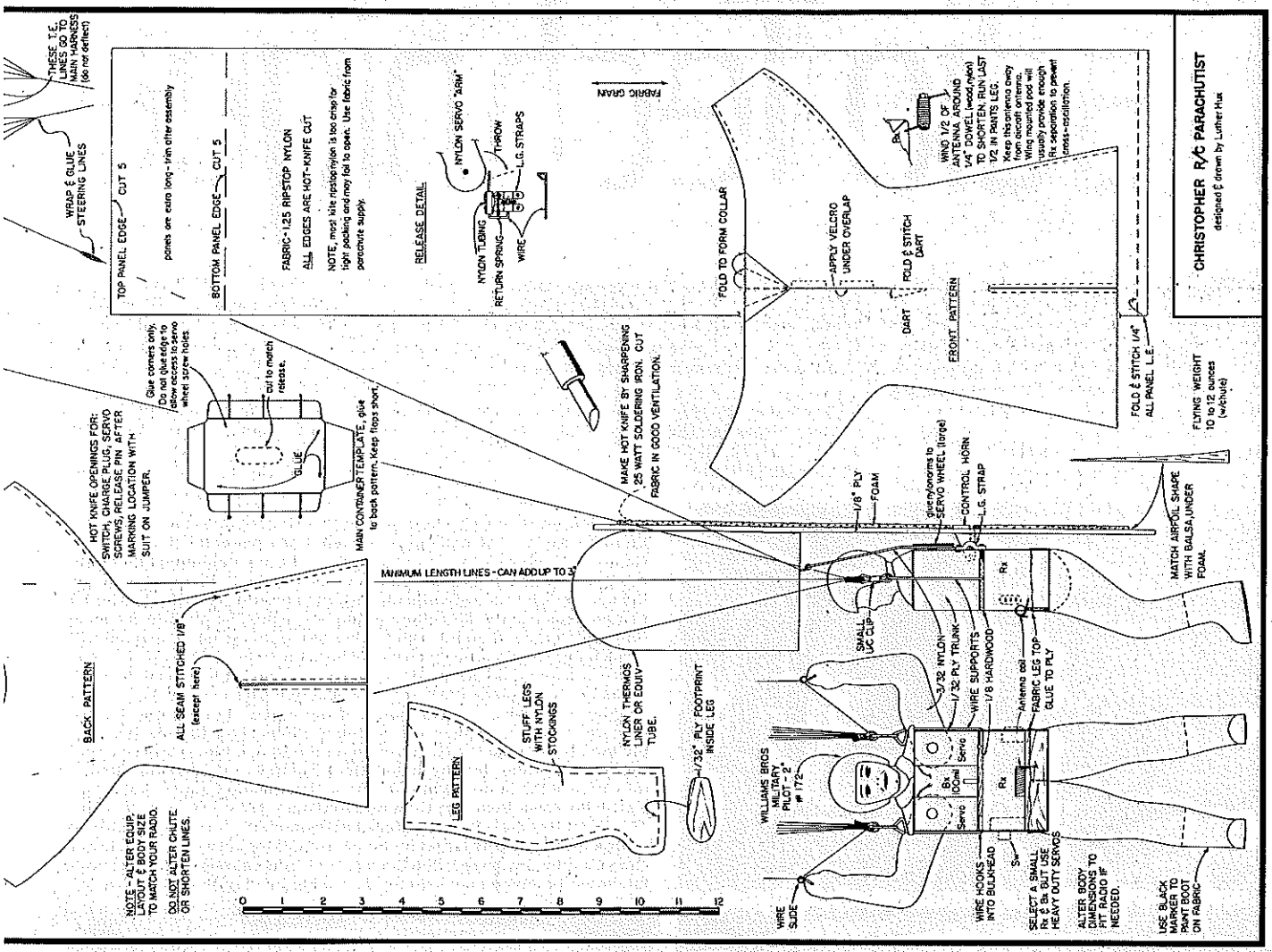
With the arms raised, mark the position of the wheel and nylon arm so you can remove them and Hot-Stuff the arms to the wheels in the proper position. Don't attempt this directly on the servo, as you may glue the shaft. Test the operaton: left stick should lower the left arm as you pull the stick

The previous step in packing the chute left you with a flat pack, but you may have a round tube to put it into, such as this one. Simply roll the pack into a U-shape, which will make it nearly round. Keep the chutist's head against the pack as you slide the chute into the tube. Reach behind chutist, and push the release bar until chutist is on release tab. Release pin will snap into place when properly aligned.



Christopher is on the way up for another jump. The rascal seems to like it! Ordinarily, Dawn Hux flies the parachutist while Luther mans the airplane and camera. It's fun to do something different with models.

Full-Size Plans Available . . . See Page 172



toward you, etc.

Follow the drawings for the release system. This "push-out" method allows you to attach or remove the chutist without the transmitter. Very handy for packing and testing. The screws used on the bulkhead side of the landing gear straps carry the weight, so epoxy these screws in place. The nylon control horn makes a good release tab, but a wire hook will also work. You will have to drill your own release hole in the nylon tab, as the ones already there are too close to the edge. Cut the hole over-size for easy movement of the release pin.

When you have all the release pieces in place, lightly Hot-Stuff the nylon tubing guide in place, and test the RC release. Adjust as needed until the release pin disappears completely into the landing gear strap on full-down arm movement. The release pin should go fully into the other strap with the arm up. Adjust the length of the wire and the position of the guide until the release works correctly. Then epoxy the guide tube in place. Be sure the edge of the arm will not slip over or under the wire angle that rides against the arm's edge.

For the balloon suit, select a washable fabric that can be hot-knife-cut, such as nylon. Make cardboard templates of the suit pattern. Shape the point of a 25-watt soldering iron like a blade as shown on the drawings. Practice cutting the fabric before cutting suit pieces. (This is good practice that you'll need before cutting the chute.)

Fold and stitch the dart in the front panel. Stitch the two patterns together, and turn right-side-out. Glue thin strips of Velcro on the edge of opening above the dart. Remove servo "arms," and fit the suit on the body. Reposition the servo arms temporarily, and make a decision about how the suit fits before going any further. If it looks good (or actually bulky, since it is a balloon suit) then mark all cutouts to be made. Turn on the radio, and test for easy movement of the arms. Enlarge suit if the arms bind.

Locate the switch, charger plug, support wires, release pin, and servo screw openings. Mark their location on the suit for cutting with the hot knife when the suit is removed. Place cardboard inside the suit to prevent burning unwanted holes while cutting the openings.

Try on the suit again. Pull the antenna through the pants leg, install the servo screws through the holes, and check other openings for location. Test the operation. If satisfied, begin decorating the suit.

Don't attach the harness with the suit off. use Middy Braid (sewing supplies) for the harness. Glue the braid to the suit, but don't let glue get all over the place. Glue main chute container to back of the suit, but don't glue over the servo screw access holes. Glue on front reserve chute if you choose to use one. There are thousands of decoration variations, so pick one from a book and copy it. Keep in mind that most of the detail cannot be seen across the room, let alone in the air, so make the trim simple.

To start the chute you must first order your ripstop nylon. The best fabric to work with is the lightest available for full-scale parachutes. I do not recommend uncoated fabric from surplus parachutes, as it can be a sewing nightmare. However, if it is the same as recently-made coated fabric, use it. I also do not recommend ripstop used for kites. It is very stiff and may not open properly. Stick with the real thing from a local parachute supply house. I purchased mine from National Parachute Supply, telephone 800-526-5946.

Next, locate a good sewing machine and (if possible) a knowledgeable helper. I will give as much advice as I can in case you cannot get such assistance.

Use a #9 or #11 ball-point needle. Test the thread tension carefully for this lightweight fabric according to machine instruc-

Continued on page 121

Propeller "explosions" or incidents in which one or more blades part company with the hub are by no means confined to nylon props. Judging from the accounts contained in letters from our readers, any prop, no matter what its material, should be regarded as a potential blade-thrower. However, we would venture to say that the number of incidents of blades separating compared to the number of props produced is small.

Nevertheless, no manufacturer of a volume product such as a prop can be expected to inspect 100% of his production, and a few bad ones may reach the shelves of your local hobby store. A letter from Bruce Devisser points this out. Bruce was lucky in that his "defective" prop broke while he was tightening the prop nut. Had this not happened it might well have caused an injury much more serious than the one which he relates: "Using a 4-way dogbone wrench, I started to tighten the prop nut on the new prop. I was gripping one blade, with my left hand wrapped around it, and my thumb resting on the top of the prop hub. The blade and hub suddenly separated, and the rotation of the hub, with sharp splinters exposed, tore a one-inch gash in my thumb. After first aid and serious consideration of cancelling flying for the day, I continued on. Very carefully, I attempted to loosen the prop nut, and as anticipated, the other blade snapped off.

"Careful inspection revealed a remarkably clean break on the rear face of the first blade, while the front was splintered. The second blade appeared to have some sort of dry rot or fungus *inside* the blade. Also, the grain ran perpendicular to the span of the blade.

"Defective propeller? You betcha. And I should have at least observed the grain problem."

To conclude this month's column, we have a safety tip from David Anderson of Burnsville, MN. David's tip also concerns avoiding injuries caused by propellers.

"Here's a simple and convenient safety device that we have been using at the Twin City Radio Controllers' field for several years.

"An old fuel jug is filled with gravel and kept in the pit area. When starting an engine, the jug is placed in front of the wing opposite to the engine-starter. Should the plane slip from the flier's grasp and lurch forward, the plane will be rotated *away* from the pilot, preventing an unwanted vasectomy. The jug also prevents the plane from creeping forward until it is ready to be taxied out to the runway."

A photograph shows the jug placed against the wing of David's Vultee BT-13 which, with its fat fuselage, is hard to hold with one hand. We would be pleased to publish any other safety tips that readers might have.

Have a safe month.

John Preston, 7012 Elvira Ct., Falls Church, VA 22042.

Christopher/Hux

Continued from page 27

tions. Set the stitch for about eight stitches to the inch. Use a double-feed foot if available. Set needle position far right for straight stitch work.

Cut templates for patterns from illustration board. To save work, cut the entire end template and then the fabric pieces that are required. Then trim off the bottom end plate portion to use the template for the inside ribs. Practice on spare fabric to get the knack for cutting with the hot blade.

I strongly recommend that you make up a list of pieces to cut before starting. List the color, shape, quantity, and make notes such as which ribs have holes and which side of each rib to attach lines so the lines will not be on the outside of the rib ends. Select a dark color for the right end rib, and memorize it for orientation when flying.

Your cutting should be done on formica, coated wallboard, or heavy aluminum foil to prevent the nylon from bonding to the surface. It bonds to these, too, but can easily be removed. Be sure you are cutting in a *well ventilated* area. The hot-knife

Continued on page 124

point must be kept clean to cut effectively.

Since the edges are hot-knife-cut there is no need for hemming. However, the leading edges (only) of all ribs and panels are hemmed to strengthen them.

Next, use a thick white glue like SoBo or Grrrip to attach nylon line to the ribs. Do not substitute another line, as the squidding line resists tangles best of all. Then set your sewing machine for zig-zag, and sew the lines to the ribs. As shown on the drawing, the "zig" goes through the line and the "zag" through the fabric.

Pull on the threads as you start the first few stitches to help start the line thickness through and prevent tension loss. Do not attach lines with a straight stitch; it will pucker badly. Tie knots in the threads at both ends of each stitch. Every knot is very important. Do not attach trailing edge (T.E.) lines until assembly is complete.

Once all lines are attached and leading edge (L.E.) hemmed you can begin sewing pieces together (see numbers on front view sketch). All stitching begins at the L.E. to ensure alignment. First, straight-stitch all top (long) panels together in correct color sequence. Second, attach ribs to top panel seams as shown on front view drawing. Third, begin at one end and attach bottom (short) panels to rib base. Start at one end panel and work across to the other end.

If you have difficulty aligning three layers of fabric on the inner ribs, reset your machine for six stitches to the inch, and attach the panel to one side of the rib first. Then attach the other panel. Return to eight stitches per inch on the end ribs which are only two layers. Use a chalk marker to show where the edge of the end panel is attached to the end ribs.

Lastly, chalk mark the T.E. where all ribs end. Then mark with a straightedge aligned along the marks, and stitch (as described in the next paragraph) on the line to close the T.E. Hot-knife-cut ¼-in. from this stitch.

To improve forward speed you can vent each gore at the T.E. Simply leave a one-inch-long section in the center of each gore unstitched so air can pass through the T.E. Layers of fabric will bond when hot-knife-cut, so you will need to separate fabric edges behind the sewing gap to complete the air passageway.

Now attach short steering lines to the T.E. The third line from each end is over a yard long and is trimmed only after rigging. Glue one inch of each steering line parallel to the T.E., and stitch in place. Lay chute on its top, and assemble steering lines as shown in the small sketch. Bind lightly with thread; wait to glue them until completed chute is ready for alignment.

Lay the chute on its side over the plans, aligning the ribs with the rib pattern. Weight the chute down with books. Assemble each half of the lines at the harness on a ½A Control Line clip (small Perfect Brand). Bind with thread and glue.

Thread the steering lines through the hand slides (which act as pulleys) and attach to clips. Deflect the T.E. attached to steering lines about one inch closer to the chutist than center T.E. lines that are attached to the main harness. This overcomes the dead throw created by the round edge of the chute when it is inflated.

Go outside in a light, steady wind (or run through the house if you have the room) to see if the chute has any extra-tight or extra-loose lines. A single loose line should be tightened. A single tight line should be lengthened. This is particularly true of the steering lines. Let the majority rule; change the odd tension line.

When lines appear to be even, glue the steering line joint and trim the excess line—except steering lines to hands are tucked inside the suit until jump-tested. With the chute hanging upside-down, the servo arms should be able to raise the T.E. up even with the L.E.

There's one more item to build before we jump-test. The pod can be a hundred different shapes as long as the tube holds the packed chute snugly and the board is strong enough to support the weight. I used Lite Ply for the board and a Thermos bottle nylon liner for the tube. You can use tubing and a L'Eggs hose "egg" for the nose cone. You get the idea: use whatever will fit your plane and whatever you have handy.

Don't allow any edges that can snag the lines or cut the fabric. Do not install the

release tab too near the T.E., as it could make some models tail-heavy.

The pod is attached with rubberbands, but nylon bolts can be used. Install blocks if bottom of wing is curved. For strip ailerons, add blocks to allow space for the aileron throw.

Follow the photo sequence for packing. Test the release over a bed. Since the chutist exits the plane at about 45°, you should hold the nose of the pod up at 45° for simulation. Do not hold the pod level. Since there is no slipstream, the chutist will exit straight down, and this may damage the fabric on the edge of the tube. In actual flight, the exit will be smooth as silk. Work out any malfunctions before trying it on the model.

If you choose to test the chute from a building, then do not pack the chute. Launch with the chute already open. Select a calm day so you can interpret what is happening. You should be able to complete a full 360° turn in about 100 feet or less.

Two things will make the turns slow: too little weight or T.E. not deflected enough in turns. If the chutist is underweight it will float, turn slowly, and fail to penetrate a headwind.

At best the chutist can only hold its ground position in a 10 mph wind. If turns are too fast and straight flight too tricky, reduce the weight and lengthen the steering lines.

For your first real jump choose a calm day. Spotting the jump point takes practice, and with any amount of wind the problem becomes more difficult. Release at about 300 feet upwind with the plane at about 45° elevation from you. Pull the transmitter sticks back, and immediately release them. Do not hold the sticks down, as this will increase the strain on the servos when the chute opens. Try to have the arms in the up position when it opens. This occurs about 15 feet behind the model. It is best to have the model at ⅓ to ¼ throttle.

Be sure the model you choose has the stab where the chutist will clear it. Also beware of antenna wires, counter balances on the stab, and other items that could snag the chute lines.

Stay off the controls at first. Like a wing, the chute will show up any warps in its glide. Adjust lines to overcome them. Then test the steering by pulling the control stick for the direction you want.

If the chutist is going overhead, then turn into the wind and try to hold your position. If the chutist is dropping in front of you, turn downwind to increase the speed toward you. You are making a dead-stick landing. Hitting the target takes practice.

If the chutist rolls on landing and the lines are tangled, study them carefully. It usually takes only one or two moves to straighten them out.

I've hung Chris over a car antenna and over a bee nest. Let's hope that all your landings will be good ones and that you have as much fun learning to jump as we've had.

Radio Technique/Myers

Continued from page 29

flying is done at part-throttle. (See? This is going to help more and more people get into Helicopters!)

Another possibility exists. The Servo Gard, manufactured by R.F. Enterprises, 106 North Main Street, Arlington, OH 45814 @ $37.95 postpaid, can do several things for you: 1) Shut the throttle down to a preset (by you) value when the flight pack battery voltage drops below some preset number (about 4.6 VDC)—you can set the throttle shutdown point to a value which lets the chopper descend at a comfortable rate, still under control on all other control channels; 2) Shut down the throttle (to the same point as described in the previous item) after loss of control pulses from the receiver—if the rest of the system is actually functioning properly, you can bring the engine speed up again, if the pulses resume; (Now, these two are fine, but if a battery wire breaks, the Servo Gard can't do anything! But even *this* can be fixed by a minor modification and the addition of a standby battery pack—see the sketch.); 3) With the modifications, total primary battery failure will still cause the Throttle servo to run to the preset value, and the chopper will descend, even if no other controls are functioning. A crash? Sure! But maybe not as severe as in a totally-out-of-control situation.

I think that a descent under power is somewhat less likely to destroy your Helicopter than would total stoppage of the engine. It depends on where and how it hits, but wherever that is, it has to be superior to a flyaway, or whatever would follow after total battery system failure. Having the warning shutdown occur *before* battery exhaustion makes the system unflyable strikes me as