Liability Exclusion and Damages

You have acquired a kit, which can be assembled into a fully working R/C model when fitted out with suitable accessories, as described in the instruction manual with the kit.

However, we at Chip Hyde Products Inc. are not in a position to influence the way you build and operate your model, and we have no control over the methods you use to install, operate and maintain the radio control system components. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect application and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by binding law, the obligation of Chip Hyde Products Inc. to pay compensation is excluded, regardless of the legal argument employed.

This applies to personal injury, death, damage to buildings, loss of turnover and business, interruption of business or other direct and indirect consequent damages.

BY OPERATING THIS MODEL YOU ASSUME FULL RESPONSIBILITY FOR YOUR ACTIONS.

It is important to understand that Chip Hyde Products Inc. is unable to monitor whether you follow the instructions contained in this instruction manual regarding the construction, operation and maintenance of the aircraft, nor whether you install and use the radio control system correctly. For this reason we at Chip Hyde Products Inc. are unable to guarantee or provide a contractual agreement with any individual or company that the model you have made will function correctly and safely. You, as operator of the model, must rely upon your own expertise and judgment in acquiring and operating this model.

An R/C aircraft is not a toy! If misused, it can cause serious bodily harm and damage to property. Fly only in open areas, preferably AMA (Academy of Model Aeronautics) approved flying sites, following all instructions included with your radio and engine. Do not fly this or any other model airplane after consuming any alcohol and/or drugs (both legal and/or illegal).

SUPPLEMENTARY SAFETY NOTES:

Before every session check that all of the model's working systems function correctly, and be sure to carry out a range check.

The first time you fly any new model aircraft we strongly recommend that you enlist the help of an experienced modeler to help you check the model and offer advice while you are flying. He should be capable of detecting potential weak points and errors.

Be certain to keep to the recommended CG position and control surface travels. If adjustments are required, carry them out before operating the model. Be aware of any instructions and warnings of other manufacturers, whose product(s) you use to fly this particular aircraft, especially engines and radio equipment.

Please don’t ignore our warnings, or those provided by other manufacturers. They refer to things and processes, which, if ignored, could result in permanent damage or fatal injury.
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1. Introduction

The Vision 3D is a highly aerobatic monoplane designed and sold by world renowned aerobatic RC pilot Chip Hyde - multiple USA National, World and TOC champion. The model is fully capable of both precision F3A type aerobatics and full blown more extreme 3-D aerobatics.

The Vision 3D may be assembled rapidly due to plug-in wings and plug-in horizontal stabilizers. Not only does this make assembly at your flying site fast, but makes the model easy and accurate to construct.

The wings and stabilizers slide onto pre-fitted tubes and are aligned by anti-rotation pins. There is a minimal amount of gluing and drilling required to complete the assembly. This greatly reduces the time to assemble the model and get you to your flying site.

The Vision 3D can be disassembled and broken down into two wing panels, two stabilizer halves and a fuselage to facilitate transportation in almost any size of vehicle. The larger the vehicle, the less you will need to remove!

The Vision 3D is designed for gas motors in the 50-cc category. The recommended motor is the DA 50 that is shown in the assembly instructions. The final choice of power plant is left up to the builder.

A computer radio is recommended for the Vision 3D. This is primarily because then the Pilot can take advantage of the full capabilities of this model, using the various mixing and servo adjustments functions that are typically available.

Either a single or a pair of servos may be used for each aileron. The allows either a single high torque servo to be used to drive each aileron, or in the event only lower powered servos are available; a pair may be used.

2. Intended Use

The Vision 3D should not be regarded as a toy. This is an advanced aerobatic plane and is recommended for pilots who are well beyond the trainer-stage and are comfortable with flying at least an aerobatic sport plane.

3. Warranty

Defective parts will be exchanged/replaced once the original item is returned at the owner’s expense. Contact Chip Hyde Products if you are located in North America or Probuild Aircraft if you are located in Europe.
4. Kit Contents

The contents of the Vision 3D shipping box should be as follows:
<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Wing panels</td>
</tr>
<tr>
<td>1</td>
<td>Light weight aluminium wing tube</td>
</tr>
<tr>
<td>2</td>
<td>Horizontal stabilizer panels</td>
</tr>
<tr>
<td>1</td>
<td>Carbon fibre horizontal stabilizer tube</td>
</tr>
<tr>
<td>1</td>
<td>Light weight aluminium horizontal stabilizer anti rotation pin</td>
</tr>
<tr>
<td>1</td>
<td>Fin</td>
</tr>
<tr>
<td>1</td>
<td>Fuselage</td>
</tr>
<tr>
<td>1</td>
<td>Canopy</td>
</tr>
<tr>
<td>1</td>
<td>Light weight aluminium undercarriage, in three pieces + 4 retaining bolts</td>
</tr>
<tr>
<td>6</td>
<td>Anodised light weight aluminium control horns with integral bearings and fixing screws</td>
</tr>
<tr>
<td>1</td>
<td>Tail wheel unit with 3 mounting screws, spring and plastic spring retainer</td>
</tr>
<tr>
<td>2</td>
<td>4mm black cap head bolts for the U/C centre plate</td>
</tr>
</tbody>
</table>
5. **Items Needed to Complete the Vision 3D**

5.1 **Components and Hardware Needed to Complete the Vision 3D**

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50cc Motor and Propeller</td>
</tr>
<tr>
<td>1</td>
<td>3-1/2 inch ultimate Truturn spinner</td>
</tr>
<tr>
<td>1</td>
<td>16-24oz fuel tank</td>
</tr>
<tr>
<td>2</td>
<td>3-1/2 inch main wheels</td>
</tr>
<tr>
<td>2</td>
<td>4 &amp; ¼ inch 4-40 thread elevator pushrods</td>
</tr>
<tr>
<td>2</td>
<td>4 &amp; ¼ inch 4-40 thread in-board aileron servo pushrods <strong>WHEN USING ONE SERVO PER AILERON</strong></td>
</tr>
<tr>
<td>4</td>
<td>4 &amp; ¼ inch 4-40 thread in-board aileron servo pushrods <strong>WHEN USING TWO SERVOS PER AILERON</strong></td>
</tr>
<tr>
<td>1</td>
<td>Bag of 4-40 lock nuts for all linkages</td>
</tr>
<tr>
<td>6</td>
<td>4-40 pin clevises</td>
</tr>
<tr>
<td>6</td>
<td>4-40 ball-links</td>
</tr>
<tr>
<td>2</td>
<td>Aileron servos (130 oz inch) <strong>WHEN USING ONE SERVO PER AILERON</strong></td>
</tr>
<tr>
<td>4</td>
<td>Aileron servos (60 oz inch) <strong>WHEN USING TWO SERVOS PER AILERON</strong></td>
</tr>
<tr>
<td>1</td>
<td>Rudder servo (200 oz inch)</td>
</tr>
<tr>
<td>2</td>
<td>Elevator servos (130 oz inch)</td>
</tr>
<tr>
<td>1</td>
<td>Throttle Servo</td>
</tr>
</tbody>
</table>

**Extension Leads**

- 2 x for in-board aileron servos (approx. 16 - 20 inches in length)
- 2 x for out-board aileron servos (approx. 40 – inches in length) **WHEN USING TWO SERVOS PER AILERON**
- 2 x for elevator servos (approx. 28 inches in length)
- 1 x for rudder servo (approx. 28 inches in length)
- 2 x for permanent connection to Rx aileron connectors (short)

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Receiver</td>
</tr>
<tr>
<td>1</td>
<td>Receiver switch (heavy duty)</td>
</tr>
<tr>
<td>1</td>
<td>Receiver battery (2000 mAh minimum)</td>
</tr>
</tbody>
</table>
5.2 Tools Needed to Complete the Vision 3D

- Modelling Knife
- Fine blade saw
- Flat file
- Circular file
- Electric drill and a selection of drill bits
- 3mm tap
- 4mm tap
- Philips screwdriver (small)
- Pliers
- Allen wrenches/keys both USA and Metric
- A cordless drill
- Drill sets both USA and Metric
- Dremel sanding drum tool
- Sand paper
- A thin marker pen 1/32 line thickness or thinner

5.3 Adhesives Needed to Complete the Vision 3D

- Thin CA
- Medium CA
- Slow CA
- CA kicker (optional)
- 20 minute Epoxy
6 Vision 3D Building Instructions

6.1 Overview and Useful Information

Welcome to the assembly instruction for your Vision 3D. These instructions have been sequenced to make the handling of the model as easy as possible and ensure that it is fitted out in a logical order.

For example the batteries are not fitted until very near to the end of the assembly process, allowing them to be positioned to achieve a perfect centre of gravity without the addition of extra, unnecessary weight.

Items such as radio gear, engine and other equipment/components are shown as options and examples. As the owner and builder of this model you are at liberty to substitute products of your own preference.

The Vision 3D is intended for experienced builders and pilots and NOT as a first model. As such it is assumed that the builder will have previously assembled other models.

Accordingly these instructions are not exhaustive as it is assumed that the builder will have experience of the basics required to assemble a radio controlled model aeroplane.

We strongly suggest that the builder obtains a foam cradle to hold the fuselage during the assembly and fitting out process. This will provide support and protect the covering from becoming damaged or marked when sitting on a workbench surface.

We also recommend that the wings and stabs are placed on a large sheet of soft foam during their assembly and fitting out, again to protect them against marks or damage from a workbench surface.

6.2 Covering

It is important to seal all the edges of the film covering & trim of the model with a sealing iron from out of the box before attempting to fly the model – especially the up-wind portions. In the event that any sections of film will not seal due to oil or dirt residue clean them with Windex or 409 cleaner.

To greatly increase the life span of the covering it is advisable to seal all the edges of the film with clear nail varnish. This procedure will prevent trim from detaching during the life of the model.
7 Wing Assembly

7.1 Fitting and Hinging the Ailerons

Each aileron is supplied with 7 Mylar hinges.

First mark a centerline across each hinge – be careful to orientate the hinge correctly, drawing the centerline across the width of the hinge.

Then fold the hinge a few times along the centerline and gently compress the hinge line fold with a pair of pliers, to help form a good hinge point.

Next use two pins to center each hinge, as pictured below. The pins are pushed through the hinge centerline.

Now fit an aileron (leaving the hinge pins in place) to its corresponding wing panel. Ensure that all 7 hinges have been fitted.

There should be no gap between the leading edge of the aileron and the training edge of the wing panel.
Now remove the pins and then carefully drip thin CA onto the exposed section of each hinge as pictured below. Gently work the aileron up and down while adding CA. This will help the CA to fully wick into each hinge.

We suggest adding CA to the inner and outer most hinges first, as this will help ensure that the aileron is properly aligned with the wing itself and avoid tapering wing/aileron gaps.

Repeat the above process for the second wing panel and aileron.

If available, use Acetone dripped onto a rag to wipe away any excess CA that happens to run. Use denatured alcohol to clean up later.
7.2 Aileron Servo Installation

The Vision 3D is designed to use either a single high torque (130 oz inch) aileron servo, or a pair of medium torque (60 oz inch) aileron servos.

While either approach will work successfully, we prefer the use of a single high torque servo and the following instructions describe the fitting process.

Select a wing panel and a servo. Add an extension lead to the servo long enough that the lead can exit the wing root and be fed into the fuselage, leaving sufficient extension lead length to reach the receiver – approximately 8 inches.

Ensure the servo lead/extension lead connectors are taped or tied together to provide a secure connection that will not pull apart once installed. Shrinking a 1 inch length of heat shrink tubing over the joined connectors is a particularly good solution.

Pull cords are fitted to the outer servo mounting points. These are only used when fitting two aileron servos per wing panel.

When using a single servo, hold the wing panel vertically with the face of the wing tip pointing upwards. Now feed the end of the extension lead attached to the servo into the inboard servo mounting point. There is a generous hole located in the wing rib just inboard of the mounting point. Feed the extension lead through this hole until the end of the lead has been fed through to the wing root.

Now insert the servo into its mounting point as pictured below.

Using a suitably sized drill bit for your chosen servos, drill holes into the servo mounting plates for the servo mounting screws.
Remove the servo and add a few drops of thin CA into each hole.

Finally re-fit the servo and screw it into place. Cover over the unused mounting position for the optional second aileron servo.

7.3 Aileron Linkage Installation

**IMPORTANT**

THIS SECTION WILL EXPLAIN THE AILERON LINKAGE INSTALLATION. AS PART OF THIS YOU WILL INSTALL THE BALL BEARING CONTROL HORNS AND ACCOMPANYING METAL PINNED CLEVISES.

DO NOT TRY TO INSTALL THE CLEVIS INTO THE BALL BEARING CONTROL HORNS BUY SPREADING THE CLEVIS WITH A FLAT TIP SCREW DRIVER, THAT IS NOT THE WAY THEY ARE DESIGNED TO WORK.

UNSCREW THE PHILLIPS HEAD SCREW PIN AND REMOVE IT COMPLETELY FROM THE CLEVIS ITSELF. THEN SLIP THE HORN THROUGH THE EMPTY SLOT AND REINSTALL THE SCREW IN THE CLEVIS.

NOT FOLLOWING THESE INSTRUCTIONS CAN CAUSE THE PLASTIC THE CLEVIS IS MADE FROM TO FATIGUE AND FAILURES IN THE BALL BEARING FROM THE EXCESSIVE SIDE LOADS PUT ON THE INNER RACE. THIS IS NOT THE TYPE OF LOADS THESE BEARINGS ARE DESIGNED TO WITHSTAND.

WE RECOMMEND THE USE OF THE SUPPLIED CLEVIS ONLY AS THEY WERE DESIGNED SPECIFICALLY FOR THIS HORN.

CHIP
If it is not already in place, fit the servo arm - it will be used as a guide. We recommend the use of 1 inch length servo arms.

Now use a small square to set the position of the end of the horn, so that the aileron control rod will be positioned at 90 degrees to the hinge line of the ailerons. Mark this position on the leading edge of the aileron itself using a fine marker pen. Now draw a second parallel line on the aileron 1/5th inch inboard (as marked in the diagram below in blue).

This is the correct center line position of the aileron ballbearing control horn, which will stop large servo arm movements from straining the aileron ball bearing control horn and clevis.

Now place a ballbearing control horn onto the plywood triangular mounting plate that is installed into the surface of the aileron. The center of the horn should be over the centerline you have just marked, facing down this line and angled very slightly towards the end of the servo horn/arm.

The center of the control horn ball bearing should be positioned directly over the hinge point.

Dry fitting the aileron control rod to the servo arm and ball bearing aileron control horn may assist with the above alignment procedures, as will taping the servo into the neutral position with masking tape.
Once properly aligned mark the positions for the ball bearing aileron control horn fixing screws and then using a 1/32 drill bit, drill fixing holes into the aileron. Be careful not to drill the whole way through the aileron!

Remove a small triangle of covering material in between the three screw holes you have just drilled. Finally apply a layer of CA (slow cure CA) to the wood area exposed by the film removal, & also a small amount of CA to each hole drilled for the horn mounting holes, then immediately screw the horn into place, this provides an extremely strong & light weight fixing of the control horn.

You may now fit the aileron control rod. The supplied metal pin clevises are used to connect to the ball bearing control horn and we recommend ball links for attachment to the servo horn.

Now repeat the above steps on the opposite wing panel.

In the event you are fitting dual aileron servos, obviously the above steps will have to be repeated 3 more time to complete both wings. Care should be taken when using dual servos to ensure that the servos are not ‘fighting’ each other through their movement ranges.

This may be achieved by fitting match boxes, or by cutting each aileron in half, plugging each servo into an individual receiver channel with appropriate transmitter mixing and then matching each servos movement using end point transmitter adjustments.
8 Engine Installation

8.1 Mounting the Engine

The Vision 3D has been specifically designed for the DA50R gas motor, designed and manufactured by Desert Aircraft.

Many other suitable motors are available that can be used to power the Vision 3D, but the next steps in the instructions describe the mounting and fitting out process for the DA50R.

First, using the template provided below (a template of the correct size is at the end of these instructions), mark mounting holes for the 4 DA50R standoffs.

The template positions the motor with the cylinder head at about the 7 O’clock position. This will allow a pitts style muffler or header for a pipe to be fitted, with minimal cutting required in the side of the cowling to clear these items.

Now drill the standoff mounting holes and remove the section of firewall that is required to clear the carburetor.

It is important that 1-inch squares of 2-6 oz per sq inch fiberglass cloth are applied to the firewall over each standoff mounting position. This will stop the standoff from compressing and more importantly wearing the wood, which will cause the motor to loosen. Clue the squares of cloth in place using medium CA.
Loosely mount the motor in place as pictured below:

1 & ¼ inch long standoffs are needed to obtain the correct balance point for the Vision 3D with convenient battery positioning/mounting.

Mark the hole positions for the firewall for the throttle and choke linkages. Also mark the hole positions for the fuel tube line from the tank to the carburetor and a filler tube line to the tank.

Remove the motor and drill the required holes for the linkages and fuel tubing.

Fuel proof the firewall and other exposed wood around the underbelly area. Once dry, securely re-mount the motor.

Use large diameter washers on the bolts that pass through the firewall into the standoffs, again to stop the wood being compressed and eliminate wear. Use red Loctite on the 8 standoff bolts to stop them from vibrating loose.
8.2 Fitting the Ignition Module

Mount the ignition module on a foam pad or within a foam box. We suggest that the module is mounted within the fuselage immediately behind the firewall.

It is important to ensure that the ignition leads are kept away from sharp edges. Broken shielding on the plug lead may cause radio interference!

A ring of foam used to line the fuselage cut out hole for the leads will provide protection against chafing, as pictured below:

---

8.3 Fitting the Exhaust and Fibreglass Pipe Tunnel

Now fit the exhaust system of your choice.

For pipe muffler systems a header is available that has been specifically designed to fit the Vision 3D.

We advise that pipe mufflers (such as the MTW TD75) are supported at both ends.

Because the manifold is non-flexible, it is advisable to install the pipe on a flexible mounting system front & rear of the silencer. The Dave Brown “Hush clamps” work well, but have to be insulated from the heat of the Gas engine exhaust. You will have to find a larger “o” ring from a motorist store of sufficient length for the large diameter of the MTW silencer.

Hard mounting points for the pipe mounts can be installed between the fuselage formers prior to the fitting of the pipe tunnel. We would recommend Dave brown 40 Hush clamp for the front mounting, this being placed on the manifold /pipe joiner which is made of a Teflon material, as this will help isolate the heat from the hush clamp.
To further insulate the hush clamp, slide a length of appropriate sized silicon tube over the Teflon tube where the hush clamp will be placed. The silicon isolator will protect the “o” ring as well as the clamp from the intense heat of the exhaust.

The rear pipe mount needs insulating from the heat also, we recommend the “60” Hush clamp with silicon insulation as described for the front hush clamp installation.

The fibreglass pipe tunnel may now be fitted, ensure that any holes necessary for the installation of the pipe mounts are already drilled to ensure a easy installation.

This can be screwed in place or glued with 20 minute epoxy and micro balloons. The section of the tunnel over the undercarriage mounting plate (between the two adjacent formers) will need to be carefully removed with the razor saw, after the tunnel has been fixed in place.
9. Undercarriage and Tail Wheel Unit Installation

9.1 Undercarriage Installation

The vision 3D has been designed with a three-piece undercarriage assembly that allows the legs to be removed, for easier transportation and storage of the fuselage. This assembly is pictured below:

The fuselage is supplied with captive nuts fitted in place for the 4mm undercarriage mounting bolts. Using the 6 mounting bolts fit the undercarriage in place. Use red Loctite on the two center bolts for the joining plate; as in the event the undercarriage legs are removed these bolts will be left in place.

For now leave the axels, wheels and pants unfitted.

9.2 Tail Wheel Unit Installation

While the fuselage is still upside down from fitting the undercarriage, fit the tail wheel unit using the supplied mounting screws as shown in the picture below.

Add some thin CA to the fixing holes after drilling them and before screwing the tail wheel unit and black plastic (rudder) spring retainer in place.
10. Fin, Rudder and Rudder Servo/linkage Installation

10.1 Fin Preparation and Gluing

The fin is pre-keyed for accurate alignment with the fuselage. Remove the rudder and the mylar hinges before gluing the fin into place.

Next remove the covering from the sides of the fin post, slide the fin temporarily onto the fuselage & with a ball-point pen draw onto the top of the fuselage around the base of the fin.

Remove the fin from the fuselage & carefully with a very sharp scalpel remove the film from where the fin will be glued to the fuselage, this will greatly increase the strength of the fin/fuselage joint, pictured on the next page.
Now glue the fin post in place with 20 minute epoxy. Clamp the fin post in place during this step. Apply clamps here to ensure good fin post adhesive bond. Glue fin into position ensuring that the fin is upright & also aligned straight down the center of the fuselage.

10.2 Fitting and Hinging the Rudder

To complete the fin and rudder installation, fit/hinge the rudder in place. This should be done following the same steps used for the ailerons, fitting the rudder in place and then applying CA to the hinges.

10.3 Rudder Servo and Control Linkage Installation

Remove the covering at the rear of the fuselage over the opening for the rudder servo mounting point. Take one of the lite-ply servo mounting plates and glue it over the rear mounting point for the rudder servo using medium CA – this will require removing a small rectangle of covering material.
Now using the same approach for fitting the aileron servos, fit the rudder servo. Remember to attach the 28-inch extension lead before doing this and to tape or heat-shrink the connectors together.

After fitting the rudder servo fit the ball bearing rudder control horn and the rudder control rod. Remember to align the horn so that it is set at 90 degrees to the hinge line and positioned over the hardwood mounting plate in the rudder surface.

Tape the rudder into the neutral position while doing this. Ensure that the center of the rudder control horn ball bearing is positioned over the rudder hinge line.
11 Horizontal Stabilizers and Servos/linkages Installation

The Vision 3D has plug in horizontal Stabilizers that may be permanently fitted or alternatively screwed into position, allowing them to be removed aiding transportation and storage of the fuselage.

11.1 Elevator Servos Installation

Install the two elevator servos. First remove the covering material over their mounting points, including rectangles of material under the rear servo mounting points for the Lite-ply mounting plates.

Next glue the Lite-ply plates in place with medium CA and then drill and screw the servos into position. Remember to fit the 28-inch extension leads and tape or heat-shrink the connectors together.

11.2 Fitting and Hinging the Elevators

Following the same steps used for the ailerons and the rudder, fit in place the elevators to the horizontal stabilizer halves and then apply CA to the hinges.
11.3 Fitting the Horizontal Stabilizers

As part of this next step, the carbon stabilizer joiner tube will be drilled and tapped in each end for the stabilizer fixing screws. The hollow ends of the tube should be plugged with 1 inch long pieces of hardwood, secured in place with CA. This will provide added material into which the thread can be tapped. It will also stop the tube ends from splitting during the drilling and tapping procedure.

After adding the hardwood plugs to the carbon tube, insert it and the aluminum anti rotation pin into the fuselage as shown in the picture below:

Now fit the stabilizer halves and turn the fuselage upside down. The use of a foam cradle and a second pair of hands is recommended to support the fuselage/stabilizers during this next set of steps.

Locate the hard point in the underside of the stabilizer surfaces.

Now CAREFULLY drill a hole for self-tapping screw though each of the two hard points and into the carbon tube. Take care not drill or tap the whole way through the stabilizer halves! Finally screw the self tapping screws into place.
11.4 Fitting the Elevator Control Rods and Ball Raced Horns

Fit and bolt the horizontal stabilizers in place, using a washer with each of the two bolts.

Now tape the elevators into the neutral positions with masking tape.

You may now fit the control rods and ball raced elevator hinges using the same steps used for the aileron and rudder setups.

It is particularly important that you take particular care to ensure that the elevator horns on each elevator are fitted in exactly the same position. This may require adjusting their neutral position using a computerised transmitter.

If the horns are fitted in different places the movements of the elevators will not be matched. Adjustments on the transmitter may not be able to fully compensate for this throughout the full range of the elevator movement.

Once you have completed fitting the horns and linkages please disconnect the control rods from the elevator servo and remove the stabilizer halves, anti-rotation pin and carbon tube. The stabilizers should remain unfitted until the end of the assembly process for the Vision 3D. This is to protect them against damage as the fuselage is turned over and moved within your workshop.
12. Wing Retainer Installation

12.1 Wing Retainer Method

The wings on the Vision 3D are retained using the supplied light weight aluminum fixtures. A wooden mounting box is supplied with each fixture to provide a mounting system within the fuselage. These items are pictured below:

12.2 Fitting the Wing Retainers into the Fuselage

Take a sharp knife and carefully cut away the fuselage covering material over the openings for the wing tube, servo leads and wing retaining pins (two per wing half) as pictured below:
Now glue the wooden pin retainer boss mounts (containing the glued in position retainer bosses) into position within the fuselage using 20-minute epoxy.

*Take care to align the hole in each wooden mount with adjacent hole in the side of the fuselage!*

Note that the small mounts are fitted BEHIND the wing tube and the large mounts INFRONT of the wing tube.

Using a piece of coarse sandpaper or a file, heavily key the circular side faces of the aluminium pin retainer bosses.

Now glue the pin retainer bosses (with the big flat head screws facing upwards) into their wooden mounts using 20-minute epoxy.

*Take care to ensure that the hole in the side of each aluminium boss is in line with the hole in it’s wooden mount!*
12.3 Fitting the Anti Rotation Pins into the Wing Halves

Apply red Loctite to each anti rotation pin thread and screw them into place in the wing halves.

12.4 Final Wing Retainer Setup and Adjustment

While the Loctite on the anti rotation pin threads is still wet, insert the wing tube into the fuselage.

Now remove the large flat head screws from each pin retaining boss and fit the wings. Ensure that when the wing halves are fitted up against the fuselage sides, the narrow ‘V’ section at the end of each anti rotation pin is in the centre of its retaining boss. If this is not the case, remove the wings and adjust the position of the ‘V’ section by screwing the pins in or out.

Now remove the wings from the model and place them somewhere away from your workbench, to protect them against damage while you are completing the Vision 3D.
13. Fuselage Hatch and Canopy

Take the canopy and carefully cut away the waste material by cutting along the outline.

At this stage a pilot, instrument panel and battery indicator may be attached to the fuselage hatch if desired.

Attach the canopy to the fuselage hatch. This may be screwed in place, but we prefer the use of chemotropic evo-stick to glue the canopy in place.

This is done by removing a ¼” of film away from the edge of the canopy line & applying the glue to the canopy & the wood that is showing after the film is removed.

The thixotropic glue allows positioning of the canopy before pressing permanently pressing into place. The subsequent unsightly bear wood that shows through the canopy can then be disguised with red vinyl trim to make a very neat canopy installation, as shown in the picture below.

Lastly fit and tape the fuselage hatch in place and then drill through the fuselage sides into the centre of the hatch locating tongues with a 3mm drill. Now remove the fuselage hatch and use a 4mm tap to thread the holes in the tongues – drip some thin CA onto the tapped threads.

With the hatch removed drill out the holes in the fuselage with a 4mm drill.

The fuselage hatch may now be retained using plastic 4mm bolts. Plastic bolts will grip the wood and should not vibrate loose.
14. Tank Installation

The fuel tank mounts into the Vision 3D on a Lite-ply mounting plate. Glue a thick piece of foam onto the mounting plate to isolate the tank from excessive motor vibration. Now CA in place a pair of Velcro straps to secure the tank to the mounting plate.

Now glue the mounting plate into the fuselage using 20 minute epoxy.

*Be sure to glue the plate in place with the foam and straps facing upwards!*

Now fit the tank to the mounting plate and plumb in the fuel lines between the tank and the engine.
15. **Cowling, Prop and Spinner**

Dry fit the cowling by making the appropriate cut-outs using the Dremel sanding tool, as shown in the picture below.

![Cowling Image]

When dry fitting the cowling ensure that all orifices of the engine are completely covered over, these being the exhaust, carb inlet & also the fuel inlet nipple.

Once the cut outs of the cowling are correct & you have allowed some clearance from around the engine, slide the cowling onto the model. Place the spinner back plate onto the engine along with the prop & bolt these items into place.

With the spinner back plate now dictating the amount of side & down thrust align the cowling with the spinner, allow at least 1/16” gap between the back of the back plate to the front of the cowling so the two have no chance of rubbing together during operation.

Once happy with the cowling fit, tape it onto the fuselage. Drill through the cowling (just below the side cheeks) and into the sides of the firewall with a 3mm drill. Next drill through the underside of the cowling (at the rear) and into the fuselage with a 3mm drill.

Tap the holes with a 4mm thread and drip thin CA onto the thread. Secure the cowl in place with 4mm plastic bolts.

Now fit the spinner and prop.
16. Wheels, Axels and Pants

Using a thick mixture of 20-minute epoxy and microballoons, glue some squares of ply on the inside of the pants over the area that the axel and fixing screw will pass through. To ensure a good bond, it will be necessary to key the inside surface of each pant with rough sandpaper.

Fit the Dubro axels to the undercarriage legs and then make a small cut out in the pants to clear the hex shaped end face of each axel.

Fit the wheels to the axels and dry fit the pants over the wheels, so that they are positioned in line with the fuselage centre line.

Carefully drill through the fixing hole in each undercarriage leg, into each pant. Open each of the Holes out to accept a 3mm captive nut, which will be used to screw each pant in place to the undercarriage.

Now fit the pants, using Loctite to secure the fixing blots in place.
17. CofG and Remaining Radio Installation

17.1 Receiver, Throttle Servo and Choke Servo Installation

Fit the throttle servo, choke Servo and receiver as shown on the picture below. Be sure to mount the receiver on a thick layer of foam to protect it against motor vibrations.
17.2 Center of Gravity and Fitting the Batteries

Attach the wings, stabilizers and hatch to the fuselage. At this stage you should now have every component fitted to the Vision 3D except for the switches and batteries, allowing the balance of the model to be assessed and adjusted using the batteries.

Trial balance the Vision 3D – the correct safe starting balance point for 3D flight & experienced 3D pilots is 3.75" & 4.25" back from the leading edge of the wing AT THE TIP.

Move the ignition and receiver the batteries within the fuselage until the correct centre of gravity has been obtained.

We have found that if the batteries are positioned above the tank in the forward decking, the centre of gravity should be approximately correct.

Using foam plenty of foam to protect the batteries against motor vibration, mount them in the required position for the correct centre of gravity.

Now remove the wings and stabilizers and move them away from your workbench to avoid damage while completing the Vision 3D.

17.3 Receiver and Ignition Module Switches

Fit the switches for the receiver and ignition module. We advise the use of heavy-duty switches for the best reliability.

Attempt to position the switches between the batteries and receiver/ignition module such that extension leads are not required. Remember to tape or heat-shrink the connectors together.
18. **Final Finishing and Checks**

The Vision 3D is now very close to completion – only a few steps and checks are left to ensure that the model ready and safe to fly:

- Balance the assembled model laterally (from wing tip to wing tip). Add tip weight if required to obtain perfect lateral balance

- Ensure that all servos are moving freely though their full movement range and are not ‘straining’ at the extremes of movement – this is particularly important for digital servos which will drain significant current under load

- Ensure that ALL radio gear lead connectors are secured to each other using tape or heat-shrink tubing

- Ensure that all radio gear leads are restricted from moving about within the airframe by using tyraps and/or foam blocks. This will stop the leads chafing in flight

- Ensure that all fixing bolts have been screwed in place with Loctite.

- Ensure that all fixing/threaded holes drilled/tapped into the airframe have been strengthened with thin or medium CA

- Range check the model, with the motor both off AND running - for safety please use a helper when checking with the motor running

- Test your batteries to make sure they are holding their charge and do not have failing/failed cells.

- Ensure that any loose debris from building is removed from the fuselage – preferable by vacuuming it out! This will stop your motor ingesting any debris through the carburettor hole in the firewall.
19. Chip’s Recommended Control Throws

<table>
<thead>
<tr>
<th>Surface</th>
<th>Low Rate</th>
<th>High Rate</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Movement</td>
<td>Exponential</td>
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<td><strong>Ailerons</strong></td>
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<tr>
<td><strong>Elevators</strong></td>
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</tbody>
</table>

Thank you again for choosing to purchase the Vision 3D – we know you will like it!

Chip Hyde
Vision 3D Engine mount template

Scale 1:1