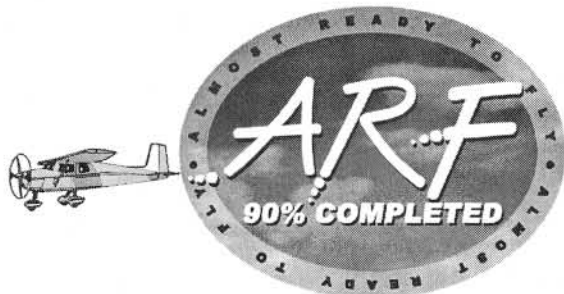
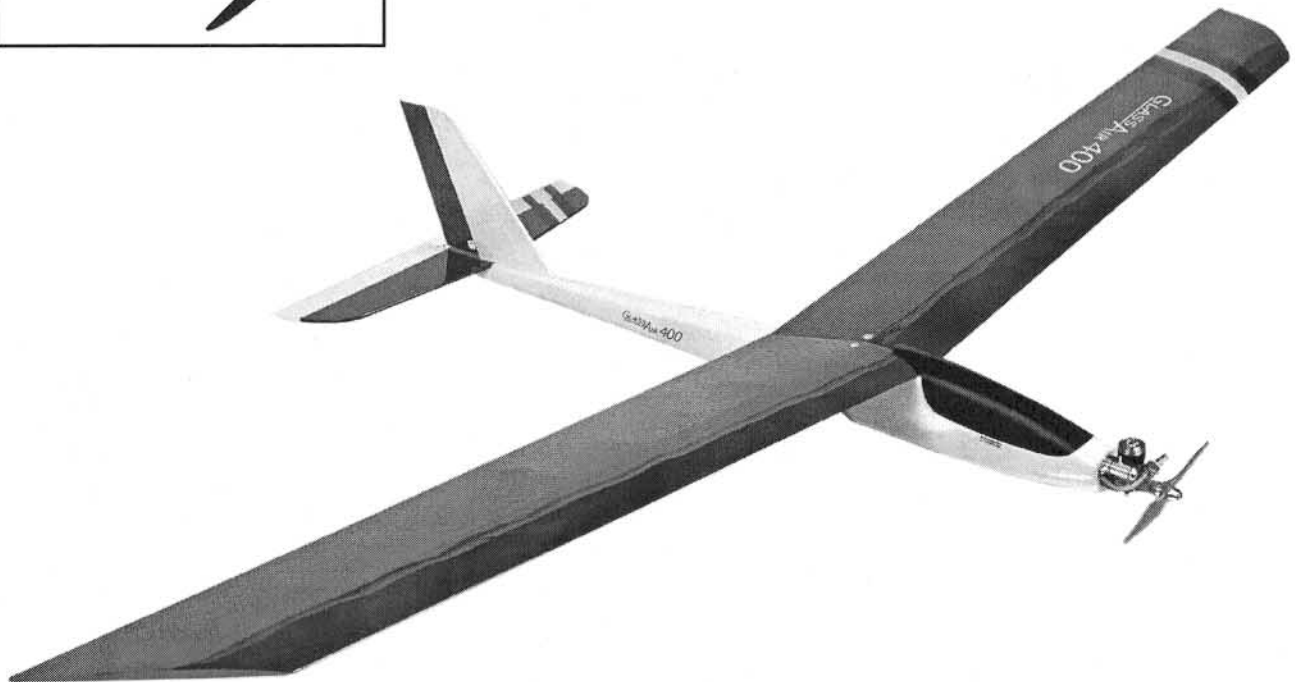
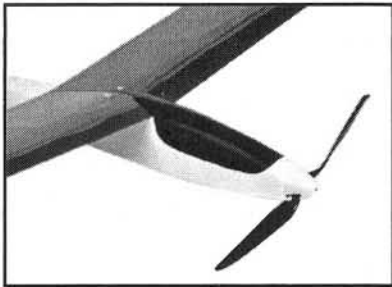


GLASSAIR 400

By

NORVEL

GLASSAIR 400 ARF INSTRUCTION MANUAL



- All-fiberglass fuselage keeps flying weight at a thermal-catching 22 oz.
- Top-notch European quality
- Electric or glow power
- Decal Sheet & Hardware Included

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Introduction

Congratulations on your purchase of the GlassAir 400, a new concept in all-fiberglass fuselage ARF glider quality and affordability.

We know you must be a really smart person because you bought our airplane. So, you're also smart enough to know that it's never a good idea to build a flying model airplane without reading the instruction manual first.

We have tried to put together a manual that explains how to build the GlassAir 400 as easily as possible. If you would like to make a comment on this manual, please don't hesitate to contact us.

The Glass Air 400 is mostly assembled. But, the work left for you to do is very important. Please read through the manual completely before starting assembly until you are familiar with each step and required parts.

Important:

Read Instructions Completely Before Beginning Assembly

The GlassAir radio-controlled airplane is not a toy. Adult supervision required. It is a flying machine capable of causing property damage and serious bodily harm to the operator and spectators if it is not built and operated correctly and responsibly.

READ INSTRUCTIONS CAREFULLY!

Fuel and Fire Safety

Use NORVEL NVX glow fuel or other recommended glow fuel. **DO NOT USE GASOLINE!** Gasoline will ruin your model engine and can explode, causing injury to **YOU** and **OTHERS**.

Model fuel is **FLAMMABLE** and **BURNS WITH AN ALMOST INVISIBLE FLAME**.

Model fuel contains Methanol and Nitro Methane; it cannot be made non-poisonous. Model fuel can cause death or blindness if swallowed. If swallowed, induce vomiting and get medical assistance immediately.

Model fuel is an eye irritant. In case of contact with eyes, flush thoroughly with warm water.

KEEP FROM SMALL CHILDREN – USE WITH ADULT SUPERVISION

Use common sense and follow these rules:

- DO NOT OPERATE MODEL ENGINES INDOORS.
- NEVER FUEL OR PRIME WITH THE GLOW-PLUG BATTERY CONNECTED TO ENGINE.
- NEVER FUEL, PRIME, OR OPERATE YOUR MODEL WHILE SMOKING.
- STORE FUEL IN A COOL, DRY PLACE PROTECTED FROM SUNLIGHT, HEAT, AND IGNITION SOURCES. DO NOT STORE IN OPEN OR UNLABELED CONTAINER.
- REMOVE EXCESS FUEL FROM YOUR MODEL WITH A CLOTH AFTER FUELING OR PRIMING.
- DO NOT STORE FUEL IN YOUR MODEL.
- Raw fuel and engine exhaust will damage some types of plastic, including prescription lenses for eyeglasses. Avoid contact and clean with household window cleaner if contact occurs.

IF FIRE SHOULD OCCUR --- USE A FIRE EXTINGUISHER OR SMOTHER WITH A CLEAN, HEAVY CLOTH. If fire persists, get AWAY!

Propeller Safety

- A propeller which has been damaged with nicks, chips, cracks, or one that has been modified or altered in any way can break apart during engine operation and can cause serious injury to you and others.
- INSPECT PROPELLER BEFORE EACH USE.
- Discard and replace nicked, chipped, cracked, or altered products.
- Use only propellers that have been approved for use with your engine.
- Be sure propeller is tight before operating engine. A loose propeller will cause engine to lose power and can cause injury to YOU and OTHERS.

Flight Safety

- WEAR HIGH-IMPACT PROTECTIVE EYE-WEAR WHEN OPERATING YOUR MODEL.
- WEAR HEARING PROTECTION WHEN OPERATING YOUR ENGINE. Once model is started and flying, hearing protection is not necessary.
- Keep face, hands, and clothing clear of spinning propeller.
- Always keep model at a safe distance from spectators. Never fly near or over people.
- Use only the engines recommended by Neofun for your model.
- Do not touch engine immediately after running. A hot engine will burn you.
- Never wind spring starter more than one turn. It could bend or break, causing injury.
- DO NOT Fly in wind of 10 miles per hour or more.
- Fly only at approved flying fields or in open areas. Never fly near trees or power lines.
- Beginners should have the model checked and adjusted for flight by an experienced modeler.

General Maintenance and Safety

- It is important to check your model periodically for tightness of bolts, screws, nuts, and fixtures. Loose parts could be ejected from your model causing injury or a crash.
- Replace worn or broken components with original parts only. Information on obtaining parts is available at the back of this manual.
- Do not store your airplane in direct sunlight.
- Keep radio equipment, model, engine, and field equipment clean and well-maintained.

Requirements to Complete Model (Not Included)

Radio and Engine:

- Two to three channel radio with two to three standard servos (Micro gear recommended)
- NORVEL .049—.061 engine (glow power).
- Graupner Speed 400 6V electric motor with 4:1 gear drive.
Jeti 250 Speed control. 500 AR 8 cell battery pack (electric power).

Adhesives:

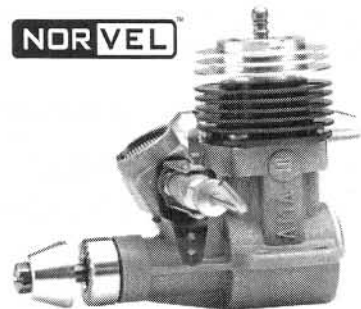
- CA Glue (Thick)
- CA Kicker (optional)
- 5 minute epoxy
- Clear silicon (optional)

Tools & Accessories:

- 1 oz. round fuel tank
- If using NORVEL .049—.061 glow engine, you will need NORVEL #NVL0506 nylon mount.
- Slotted head screwdriver & Phillips head screwdriver
- Needle Nose Pliers & Wire Cutting Tool
- Modelers Knife & Common household scissors
- 3/32" Allen wrench
- Ruler
- Tweezers
- 5/64", 5/32", & 9/64" drill bits & drill
- Sandpaper (1 piece each Medium & Fine)
- Foam Padding (any type)

Engine Starting Equipment (for glow power):

- NORVEL #NVL0600 Deluxe Engine Starting Kit recommended. Includes 1 Qt NORVEL NVX25 fuel, NO-RUB fuel-filler, rechargeable glow igniter with charger, and engine head wrench.



BigMig .061 R/C Revlite

Before Assembly, Check Parts

If you have questions, email us at <neofun@norvel.com> or call (800) 665-9575. In this manual “right” and “left” refer to pilot’s view sitting in the cockpit.

Ref #	Qty.	Description
1	1	Wing, left half
2	1	Wing, right half
3	1	Fuselage
4	1	Stabilizer/elevator
5	1	Vertical fin/rudder
6	1	Canopy
7	2	Control rods for elevator & rudder 25 3/4", z-bend on one end
8	1	Control rod for throttle 13", z-bend on one end
9	2	Control rod sleeves 24"
10	1	Control rod sleeve 8"
11	2	Threaded coupler
12	2	Clevis, plastic
13	2	Control horn with base
14	4	1/2" Phillips head screws
15	4	1/2" slotted head machine screws for control horns
16	1	3/8" Phillips head screw for canopy
17	1	3/8" slotted head for tapping wing retention holes in fuselage
18	2	Plastic wing retention screws
19	1	Dihedral brace, metal
20	3	Servo tray 5/8" x 3/4" plywood
21	2	1 1/4" plywood nose-ring (for glow power)
22	1	1 1/2" plywood nose-ring
23	2	3/8" x 5/8" pine blocks
24	1	1 5/8" x 4 3/8" balsa battery tray for electric power
25	1	1 3/4" x 1 1/2" balsa stiffening tray (semi circular)
26	1	7/8" x 1 5/8" plywood (semi circular for canopy hold down)
27	2	1/8" dowels (one long, one short)
28		Decal sheet (not pictured)

Photo 7-1

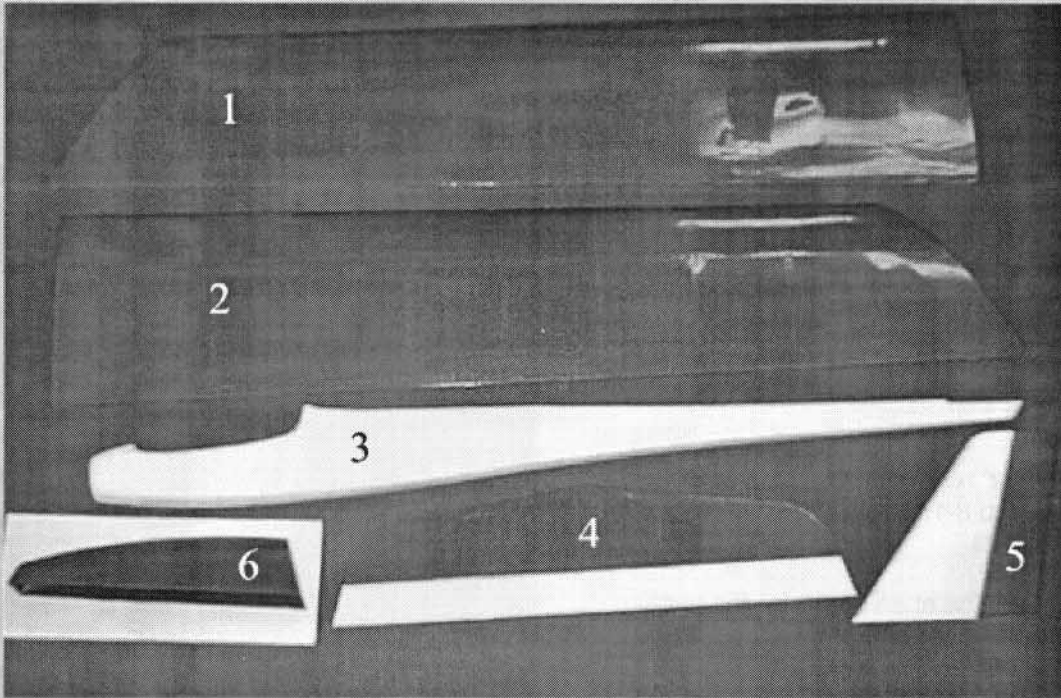
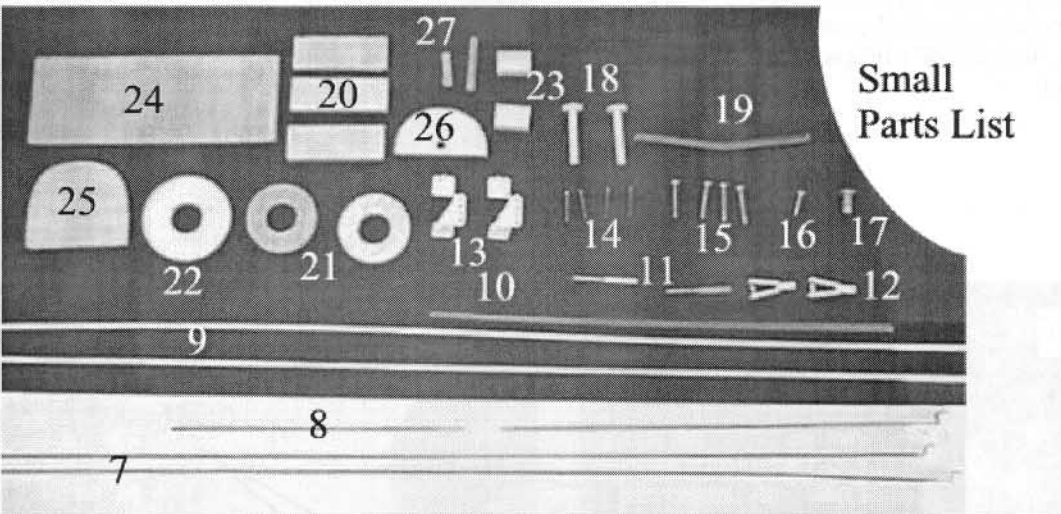


Photo 7-2



Prepare & Install Canopy

Ref #	Qty.	Description
6	1	Canopy
27	1	1/8" dowel (one short)
26	1	7/8" x 1 5/8" plywood
16	1	3/8" Phillips head screw

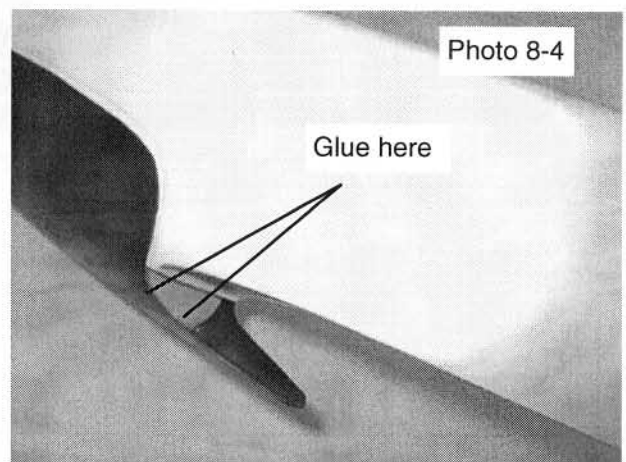
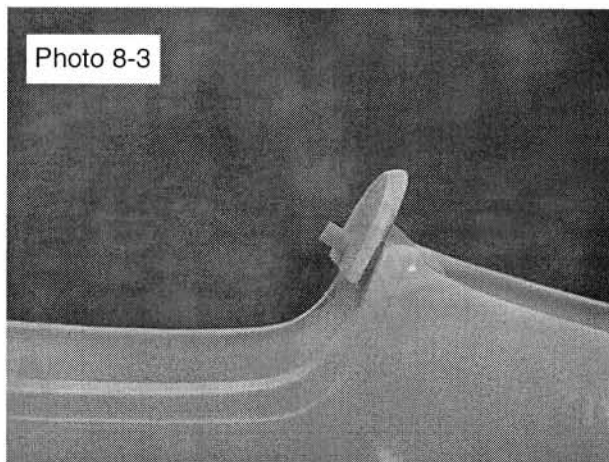
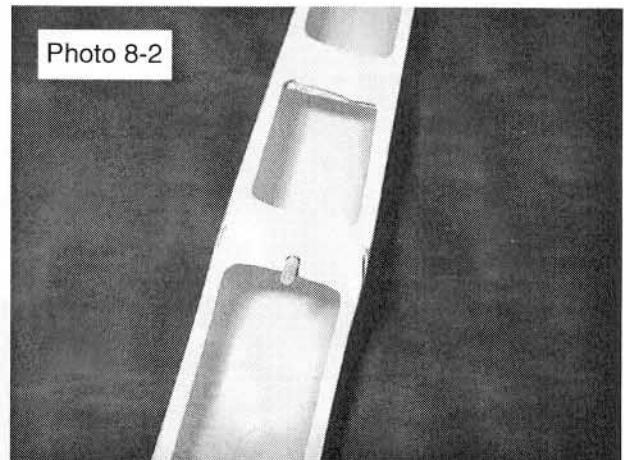
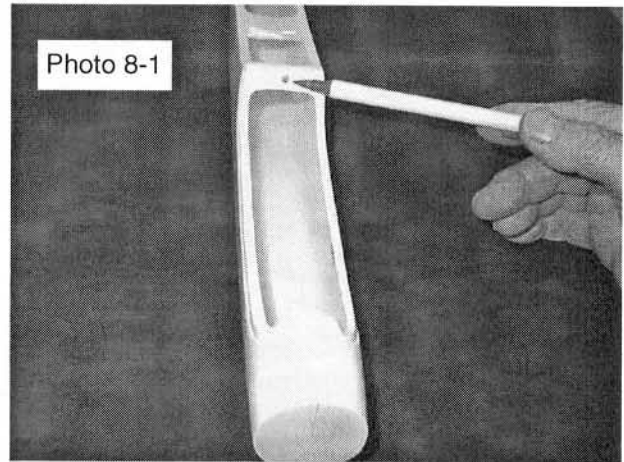
Cut out canopy on scribed line molded into canopy. An easy way is to trace the line with an exacto knife then bend on scribed line to break off.

Next, drill 5/32" hole in front of fuse at point shown in Photo 8-1. Epoxy short dowel into hole. Photo 8-2.

Sand the flat edge at an angle, on the half round plywood former (one with hole) Install former over dowel **DO NOT GLUE TO DOWEL**. Photo 8-3.

Check fit canopy. While canopy is in place, **TACK GLUE** top of former to canopy. **HINT:** while holding canopy in place turn fuse over, put a drop or two of thick CA glue onto former where it contacts canopy. Photo 8-4.

While canopy is still in place, drill 5/64" hole through notch in front of canopy and through fuselage. Install 3/8" phillips screw into hole just drilled.



Assemble Wing

Ref #	Qty.	Description
1	1	Wing, left half
2	1	Wing, right half
19	1	Dihedral brace, metal
18	2	Plastic wing retention screws
27	1	1/8" dowels (one long)
17	1	3/8" slotted head for tapping wing retention holes in fuselage

Trial fit dihedral brace and dowel into provided holes in center of one wing half. Slide other wing half onto dihedral brace and dowel. When satisfied with fit, epoxy dihedral brace and dowel into one wing half. **MAKE SURE DIHEDRAL BRACE ANGLE IS UPWARD.** Photo 9-1.

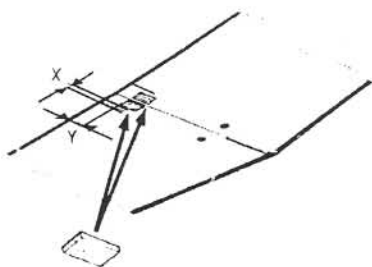
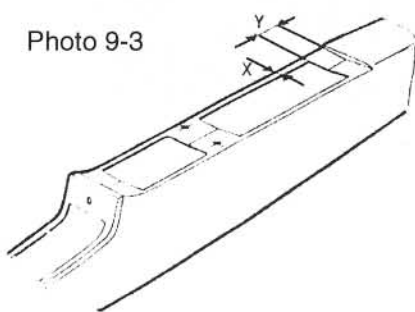
Find pre-drilled holes in wing halves and cut out covering around two holes in wing. Photo 9-2.

Put wing halves together, position on fuselage. Mark and drill 9/64" holes through two holes in wing and through fuselage.

Remove wing. Tap holes with self tapping screw provided. Reinstall wing with two plastic bolts.

On bottom of wing, at rear, mark slight pencil line on each side where fuselage meets wing.

Remove wing.



Measure y dimension on fuselage. Transfer this dimension to wing and mark with pencil. Measure x dimension on fuselage. Transfer this dimension to wing and mark with pencil. Where these dimensions meet is where the corner of blocks are when blocks are installed on wing as shown.

Don't forget to remove covering before gluing blocks. You may have trim the blocks a little for good fit. The blocks will hold the wing firmly in the correct position during flight. Photo 9-3 and 9-4.

After wing assembly, remove canopy and complete gluing of former to canopy with full bead of thick CA glue.

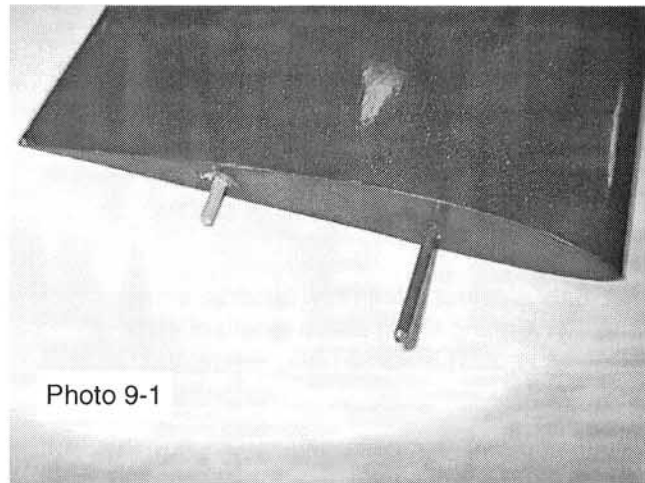


Photo 9-1

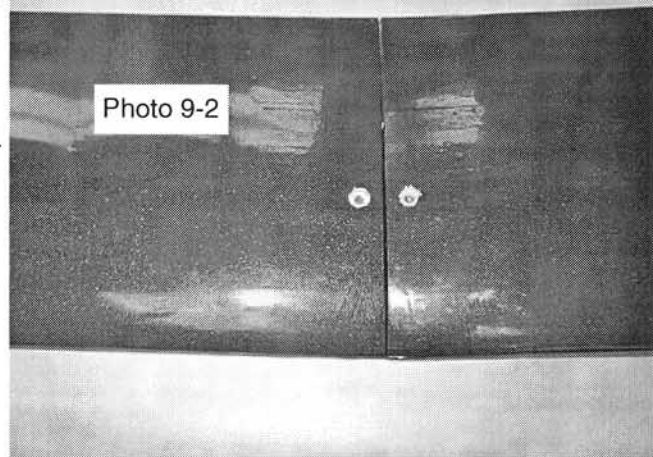


Photo 9-2

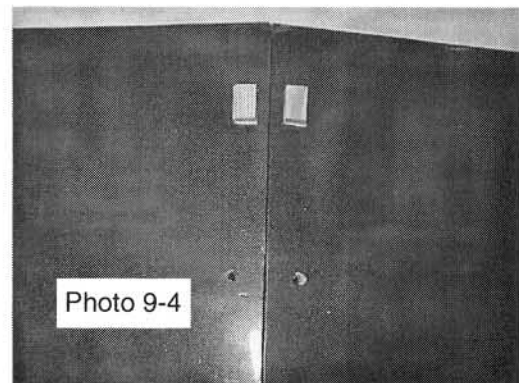


Photo 9-4

Assemble Stabilizer

Install wing on fuselage.

Take stab/ elevator assembly, observe elevator hinge line running along entire length of stab. Hinge line is on TOP OF STAB. Hinge open side faces down.

Draw center line on BOTTOM of stabilizer. This will help you place stabilizer on fuselage in line with center. Place stabilizer on fuselage and draw pencil line all around bottom, where fuse meets stab. Remove stab from fuselage. Remove covering around pencil line. BE CAREFUL NOT TO CUT INTO WOOD, CUT MARK COULD CAUSE STAB TO FAIL IN FLIGHT. Photo 10-1.

Position stabilizer on fuselage. Check for perfect wing/stab alignment. When satisfied, epoxy glue stab onto fuselage with 5 min epoxy. HINT: Sand area on fuse where stab attaches for good adhesion of epoxy.

Remove wing.

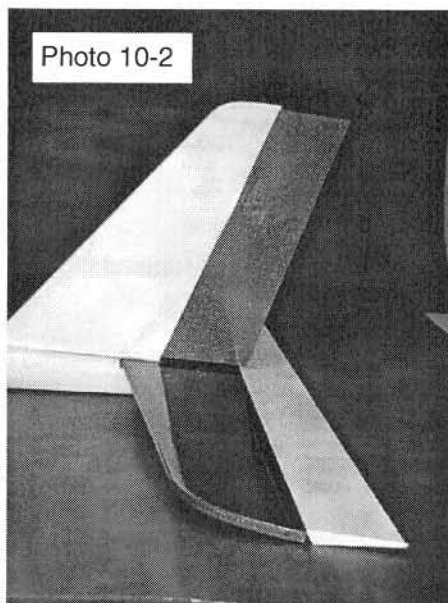
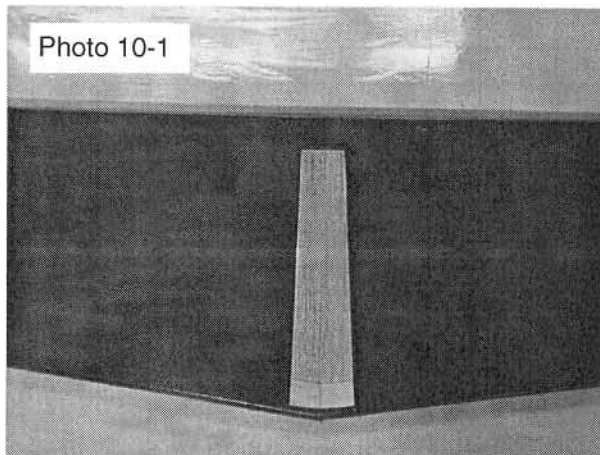
Assemble Vertical Fin & Rudder

Mark position of vertical fin/rudder on fuselage. Fin MUST be installed at 90 degrees from stabilizer.

Cut out small portion of covering on stabilizer where fin will sit. When satisfied with alignment, epoxy glue fin/rudder in place on fuselage.

NOTE: fin/rudder must be mounted forward enough on fuselage to allow for elevator movement. Photo 10-2.

HINT: Sand slightly the area on fuselage where fin will be glued for better adhesion.



Install Control Horns

Ref #	Qty.	Description
13	2	Control horn with base
15	4	1/2" slotted head machine screws for control horns

Cut the bases off control horns. Rudder control horn mounts on left side of rudder ABOUT 1/8" UP FROM BOTTOM OF RUDDER.

Align the four holes on the control horn in line with hinge line of rudder. Drill two holes through rudder with a 5/64" drill bit. Install base with two machine screws. Photo 11-1.

Elevator control horn mounts in same way, on bottom of elevator in middle. Photo 11-2.

Install Servos

Ref #	Qty.	Description
20	3	Servo tray 5/8" x 3/4" plywood
	2-3	Servos

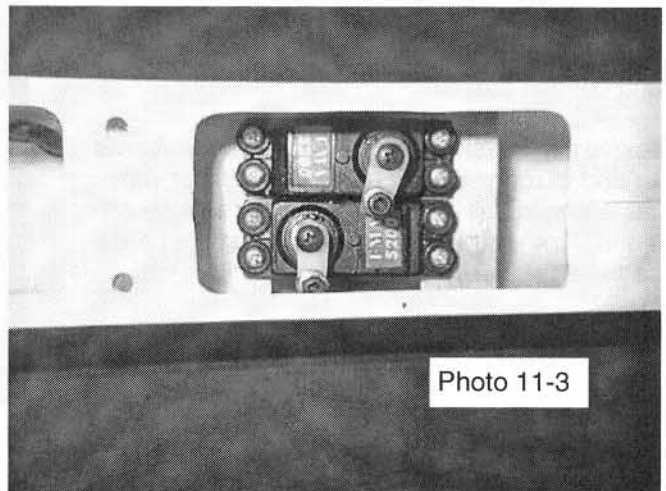
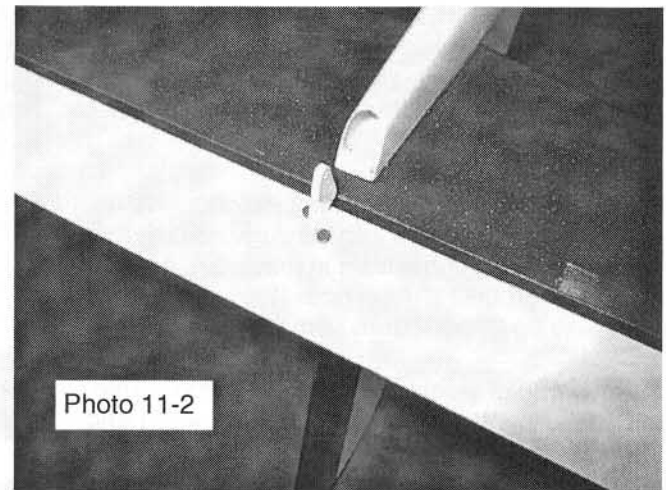
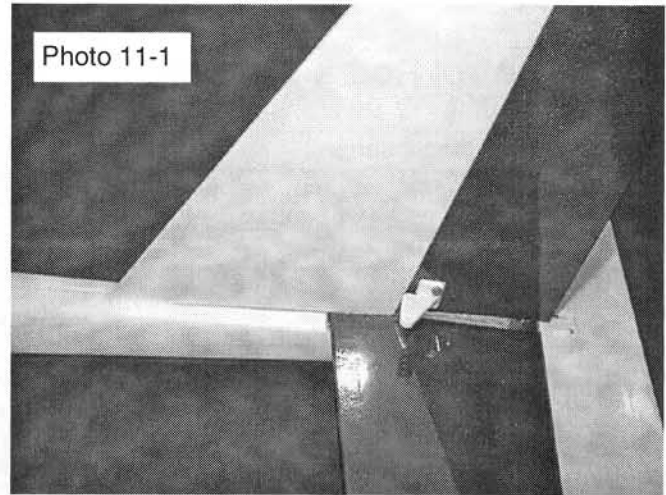
Use 2 micro servos (e.g. Hitec HS-81 type) for electric power or 2-3 micro servos for fuel power.

USE ONLY TWO RAILS IF MOUNTING SERVOS SIDE BY SIDE. USE THREE RAILS IF MOUNTING SERVOS FRONT TO BACK.

Mount servos on rails. Photo 11-3 shows side by side installation of 2 micro servos. Pay attention to height of servos. Control rods later will be fastened to top of inside of fuselage, so servos should not be mounted too low. Other methods of servo mounting are acceptable (e.g. servo tape).

Always clean inside of fuselage with alcohol before gluing to ensure optimal adhesion.

If building fuel version, throttled engine is a nice option. You will need a third servo. Location of servo is your choice. Just be sure the servo is secure and throttle control rod movement is smooth.



Install Control Rod & Sleeves

Ref #	Qty.	Description
7	2	Control rods for elevator & rudder 25 3/4", z-bend on one end
9	2	Control rod sleeves 24"
11	2	Threaded coupler
12	2	Clevis, plastic

Cut a small slot in fuselage at rear on left side about 1/2" long and 3/4" behind start of rudder. This slot will accept sleeve. Photo 12-1.

Also cut or drill an access hole in fuselage behind wing saddle, to glue sleeves down. Photo 12-2.

Tape control rod sleeves together with tape of your choice (not supplied) about every 2" along length of sleeves.

Cut rudder sleeve 2" shorter than elevator sleeve at rear. Slide the taped unit into fuselage, fishing the rudder sleeve through the slit in fuselage. As you go pull through until 2" from horn (Elevator sleeve should also be 2" back from horn inside fuse.

Cut servo end of sleeves about 1-1/2" from servo arms. Install control wires into sleeves and Z-bend end onto servo arm. (Make sure servo arm is in neutral position).

Center rudder in neutral position. Install threaded coupler on clevis then install clevis on horn. Mark rod at coupler and cut.

Remove clevis from horn and slide coupler /clevis over end of rod you just cut. Crimp coupler with pliers and reinstall clevis onto horn. You may solder coupler to rod if desired. Repeat same procedure for elevator control rod.

Glue rudder sleeve to fuse at slot you cut. Also glue other end of sleeves to fuse through access hole you made.

There are numerous other ways to hook up control rods. This is just one way of doing it. If you have your own method, use it.

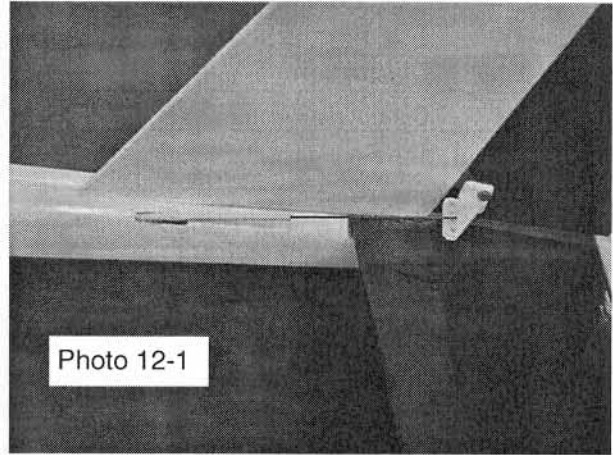


Photo 12-1

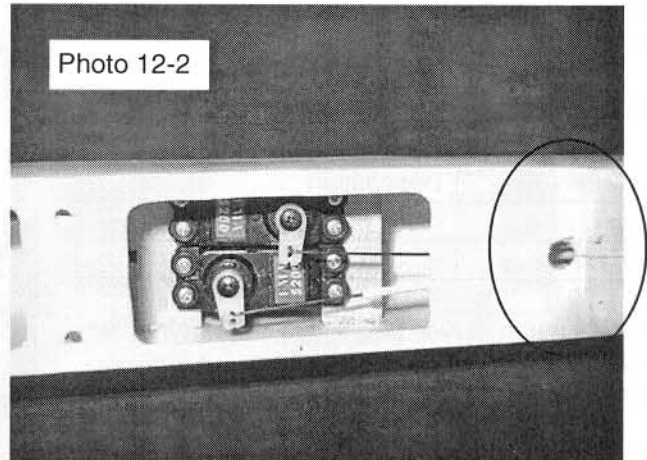


Photo 12-2

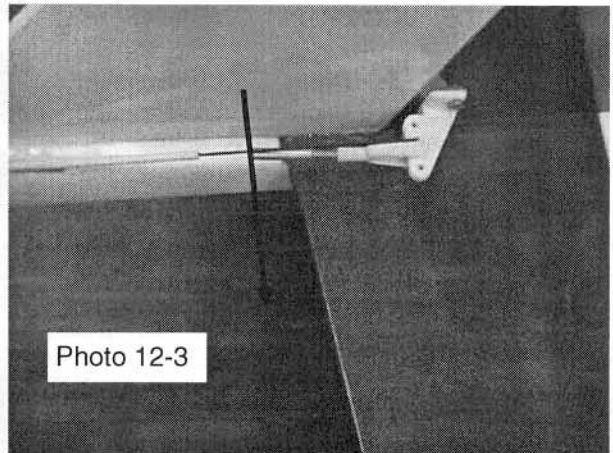


Photo 12-3

Install Electric Motor

Ref #	Qty.	Description
22	1	1 1/2" plywood nose-ring
	1	Graupner Speed 400 motor w/ gear 4:1, 6 Volt
	1	Graupner folding propeller set
	1	Jeti 250 speed controller

Drill mounting holes in nose ring to fit your motor. Photo 13-1. Transfer nose ring to outer front of fuse, mark hole locations, drill holes in front of fuse where marked. Photo 13-2. Glue nose ring inside fuse. Make sure holes are lined up. Photo 13-3.

Mount motor per manufacturer's instructions. You may need to use one or two of other supplied nose rings, depending on electric motor dimensions.

Install Glow Motor Mount

Ref #	Qty.	Description
21	2	1 1/4" plywood nose-ring
22	1	1 1/2" plywood nose-ring
	1	NVL0506 motor mount
14	4	1/2" Phillips head screws
	1	1 oz. fuel tank
	1	NORVEL .049—.061 engine
	1	Piece of NORVEL #0830 fuel tubing

Center two small nose rings onto large nose ring, glue together.

Glue nose rings inside fuse behind firewall. Center motor mount on outside of fire wall, drill holes. Install motor mount with 4 screws provided. Photo 13-4.

Install your engine on mount, drill hole in firewall along side mount for throttle sleeve and control rod. Remove engine temporarily.

Drill hole in firewall for fuel and pressure feed line.

Install fuel tank per manufacturer's instructions.

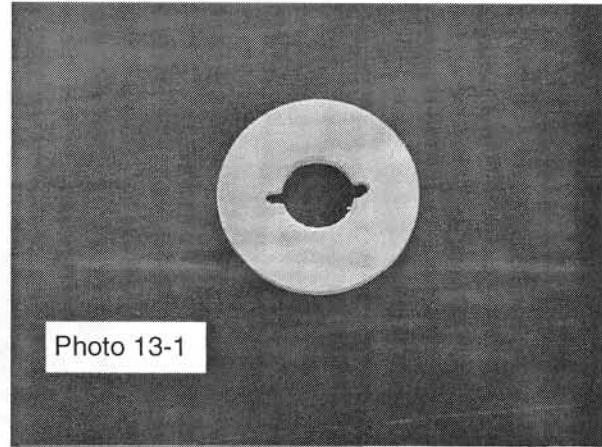


Photo 13-1

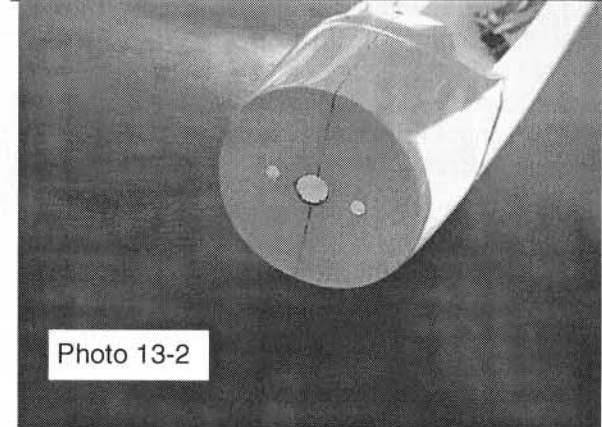


Photo 13-2

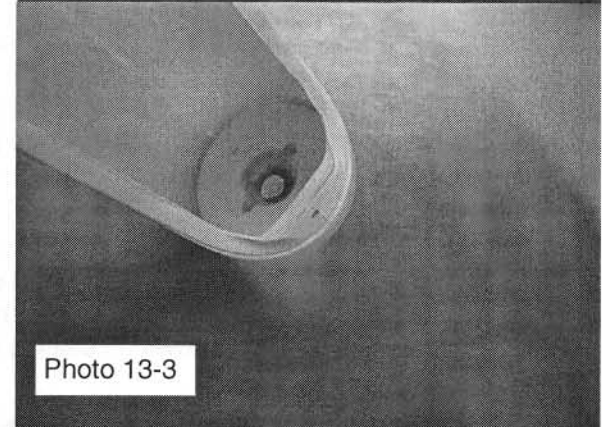


Photo 13-3

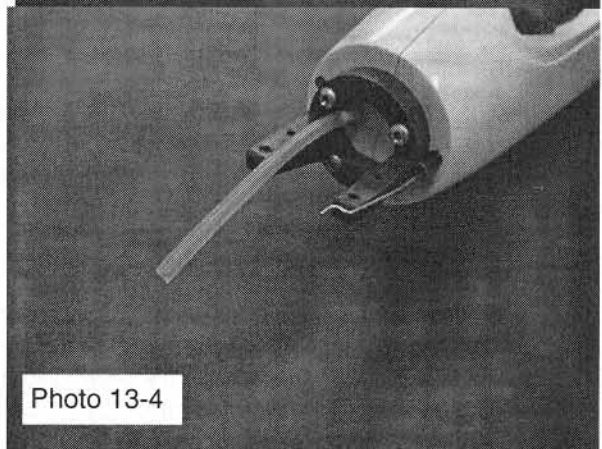


Photo 13-4

Install Radio System & Control Throw Check

Install receiver, switch, and battery in location of your choice. For electric version, DO NOT GLUE IN BATTERY TRAY UNTIL PLANE HAS BEEN BALANCED. YOU WILL USE BATTERY POSITION TO BALANCE PLANE.. Photo 14-1.

After installing your servos, control rods, and radio equipment, you need to check that everything is moving smoothly in the right direction.

Check that the rudder, elevator, and throttle move the correct way.

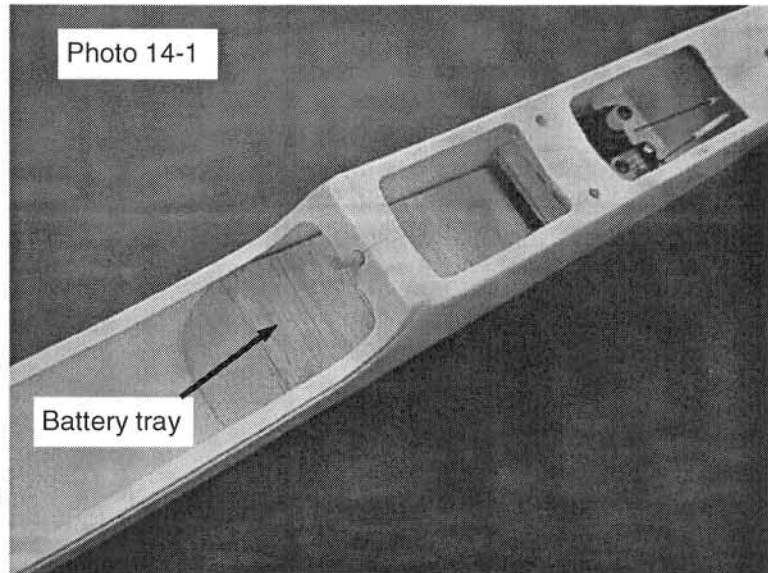
Sometimes when checking your radio system, you'll find that a control surface moves opposite of the correct way. If radio has "reversing" option, flip switch on transmitter to reverse servo. If radio does not have "reversing option," then put the control rod on the opposite side of servo control horn and direction will be reversed mechanically.

If using a NORVEL engine, throttle rod should move forward towards idle and rearward towards full-speed.

Control throws should be set as follows:

Elevator: 1/2" up, 1/2" down

Rudder: 1" left, 1" right



Balancing the Plane

Balance the airplane 2-7/16" behind leading edge of wing. HINT: Battery can be moved in different locations to achieve balance point.

(ELECTRIC VERSION). After balance point is located, with battery, glue the battery tray, and half round balsa former in battery location. Velcro tape (not included) is a good method of holding battery down on battery tray.

Wing Alignment

Lay one panel of the wing onto a flat, even surface while the other half is lofted in the air. The panel should lay perfectly flat. If it does not lay flat, your model will turn or roll in flight, making controlling it very difficult or impossible. Use a covering sealing iron or a household iron set to medium to correct wing alignment.

Gently twist wing ever so slightly past the point of alignment (important to correct for spring-back). Wrinkles in the covering will be created. Apply iron to the wrinkles to tighten these areas, which will hold the wing in alignment.

If both wings' trailing edges equally are 1/16" or less raised, then no adjustment is required. The leading edge of the wing at the tip must never be higher than the trailing edge or your model will be difficult or impossible to control. Also, check for twists and warping in the horizontal stabilizer/vertical fin and use the same technique to correct them.

Check Control Surface Alignment

Check control surface alignment when servos are in neutral position. Rudder should be in line with vertical fin when rudder servo is in neutral position. Elevator should be in line with horizontal stabilizer when elevator servo is in neutral position. It's a good idea to periodically check for warping/alignment, as heat and various other natural environmental factors can affect your model's alignment. That's one reason why you should store your airplane in a cool, dry place.

Maintenance and Care

Model airplanes, like their full-size counterparts, require regular maintenance and care to fly properly over a long operating life. Check all parts of your GlassAir 400, including engine and radio equipment, for breakage, fatigue cracks, loose screws, and normal wear before flying each day and when cleaning up at home. Plywood and balsa compress slightly over time, and bolts and screws can loosen. Check servos for proper operation periodically.

Keep your airplane as clean as possible, and keep the radio equipment free of oil and debris. Oil collects dust and dirt which can cause problems in servo connections and the switch harness. Other than incorrect assembly, most ongoing problems with aircraft are caused by poor maintenance. Poor maintenance will lead to frustration and safety hazards.

Cleaning Model

After flying, remove oil and dirt to preserve your model's sharp appearance. Spray with window cleaner and wipe with paper towels or rag. Don't spray engine with cleaner. Wipe engine with clean, dry cloth.

90 Day Warranty

READ ALL INSTRUCTIONS AND SAFETY INFORMATION BEFORE USING THIS PRODUCT. This warranty applies only if you properly assemble, maintain, and operate this model in accordance with these instructions, AMA safety codes, local laws and ordinances, and common sense.

NORVEL warrants that this product will be free from defects in materials and workmanship for a period of 90 days after date of purchase. NORVEL will repair or replace (at its sole option) any defective part. Glow plugs are not warranted since they normally require replacement.

This warranty specifically does not cover damage caused by crashes, wear and tear, or customer abuse. CRASH DAMAGE, REGARDLESS OF CAUSE OF CRASH, IS NOT COVERED UNDER WARRANTY. MODEL SHOULD BE INSPECTED AND FLOWN BY EXPERIENCED MODELER BEFORE IT IS FLOWN BY A BEGINNER — OTHERWISE CRASHING IS HIGHLY LIKELY.

For warranty claims, contact service at <glassair@norvel.com> or (800) 665-9575 for technical support and return authorization.

NORVEL assumes no liability except for the exclusive remedy of repair or replacement of parts. NORVEL shall not be liable for consequential or incidental damages. Some states do not allow the exclusion of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Ordering Replacement Parts

Replacement parts can be ordered from the store where your GlassAir 400 was purchased. If your local dealer doesn't stock GlassAir parts, call TOLL-FREE (800) 665-9575.

Part Number	Description	Price
GLS901	Wing kit	\$39.00
GLS903	Fuselage	39.00
GLS905	Tail Kit	19.00
GLS907	Control Rods & Wire Set	12.00
GLS909	Miscellaneous Hardware Set	12.00
GLS910	Decal Sheet	12.00

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