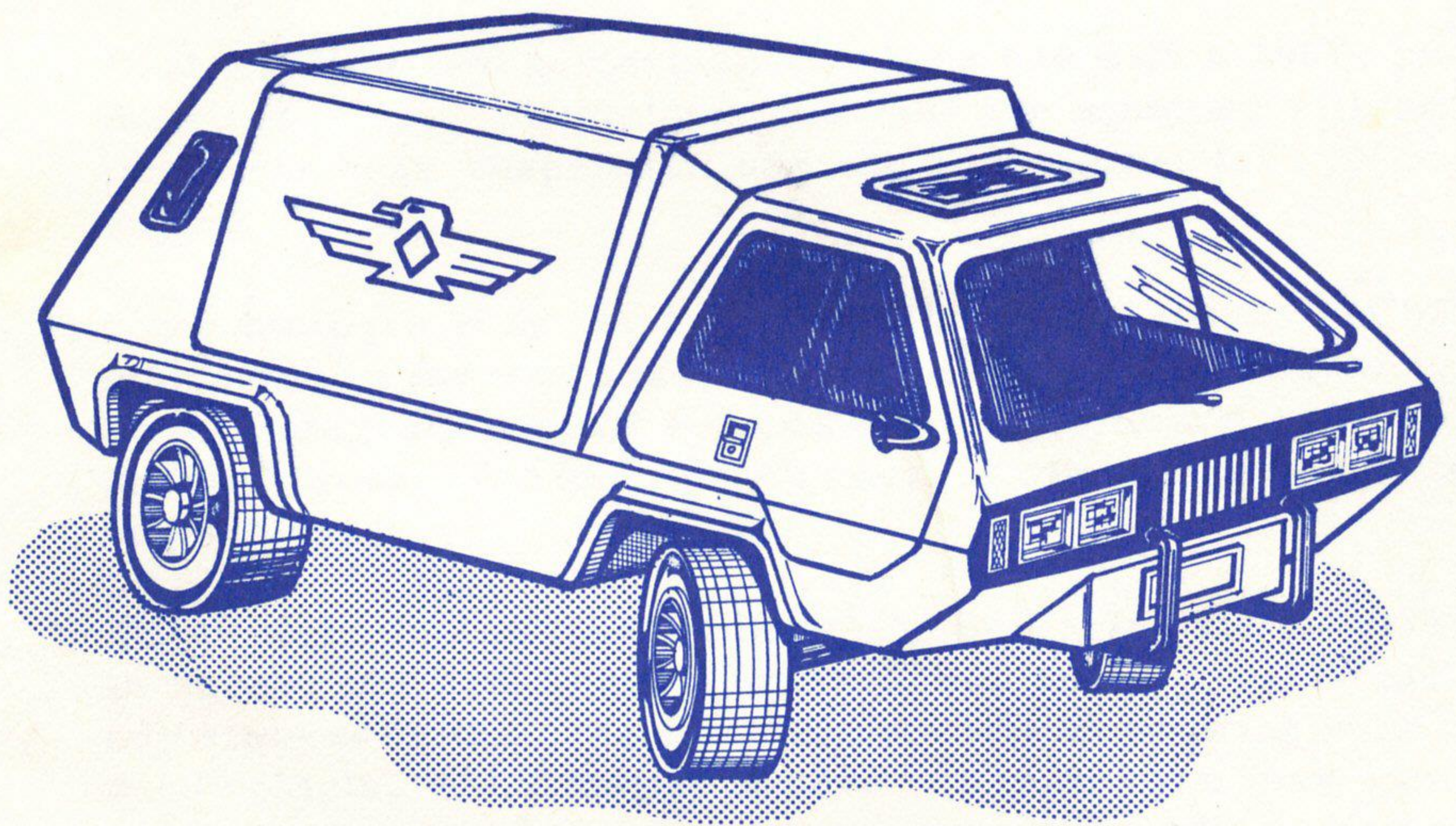


Popular Mechanics



PHOENIX CAMPER

An Expandable Camper Van you build yourself

Developed by
Quincy-Lynn Enterprises
Box 26081
Phoenix, Ariz. 85020

PRICE \$15

INTRODUCTION

This booklet is written in the order in which Phoenix is built. It includes construction procedures, hints on building, and special warning and caution notes covering areas that require special attention. Carefully read the booklet and study the plans sheets before beginning construction.

Phoenix is built on a stock VW transporter chassis. Our chassis is from a 1969 van. However, any year bus, Kombi, transporter, or caravette may be used. They are all built on the transporter chassis, which has remained dimensionally unchanged since it was first imported in the mid 1950's.

Best handling and performance will be had with a 1967, or later, chassis. These later chassis' are equipped with an improved rear suspension and the more powerful 1600cc engine.

Some builders may want to build Phoenix, but may not be interested in the expandable camper feature. The body may be left integral, without the fold-down side-doors and expandable roof. The inside back cover illustrates an alternate van set-up.

These plans include instructions for preparing the chassis to accept the new body. Plans do not cover repairs and adjustments to the chassis. Since you'll be working with a used vehicle, which may be in need of repair, you may want to purchase a repair manual covering the VW you'll be using. Most auto parts stores and VW speed shops will carry a repair manual for your vehicle. We purchased a copy of VW Transporter 1600 Owners Workshop Manual, by J. H. Haynes, and found it very helpful. The book is distributed by Haynes Publications, Inc., 9421 Winnetka Ave., Chatsworth, California 91311.

Foam, fiberglass cloth, and resin should be available locally. If not, material may be purchased from Antex Plastics, Inc., 922 N. 17th Ave., Phoenix, Arizona 85007.

I will be happy to answer questions about the construction of Phoenix from the purchasers of plans. Write to me at the address on the following page, not to the magazine in which the article appeared. Only those questions accompanied by a stamped, self-addressed envelope will be answered.

Great care was taken to prepare plans that will enable the builder to construct a safe and proper operating vehicle. However, neither Quincy-Lynn Enterprises, Inc., nor the publishers of any magazine that may offer plans for sale can assume any liability for the safe and proper operation of any vehicle based on these plans.

Robert Q. Riley
Quincy-Lynn Enterprises, Inc.
P. O. Box 26081
Phoenix, Arizona 85020

MATERIALS LIST

Wood:

- 60 ft. - 2 X 2 inch fir
- 30 ft. - 1 X 2 inch fir
- 70 ft. - 1 X 1 inch fir corner molding
- 4 - 2 X 4 inch X 8 ft. fir
- 1 sht. - 4 X 8 ft. X 1/8 inch wood-grain panel
- 4 - 1/8 inch veneer door skins
- 2 sht. - 4 X 8 ft. X 1/2 inch plywood
- 1 sht. - 4 X 8 ft. X 3/8 inch plywood
- 1 sht. - 4 X 8 ft. X 3/4 inch plywood

Plastic:

- 75 yd. - 60 inch 8 ounce glass cloth
- 25 yd. - 4 inch fiberglass tape
- 20 gal. - laminating resin with catalyst, polyester
- 5 gal. - finishing resin with catalyst, polyester
- 8 sht. - 1 X 48 X 96 inch rigid urethane foam
- 1 gal. - styro-bond foam adhesive contact cement
- 3 gal. - fiberglass body filler (bondo)
- 1 pc. - 2 X 5 ft. X 1/8 inch clear acrylic

Metal:

- 40 ft. - 2 X 2 X .120 inch square steel tube
- 16 ft. - 1 X 1-1/2 X .065 inch steel tube
- 10.5 ft. - 1-1/2 X .120 inch round steel tube
- 50 ft - 1/2 inch electrical conduit

- 1.5 ft. - 3/4 X .120 inch round steel tube
- 5 ft. - 3/16 X 1 inch steel strap
- 30 inch - 1/4 X 1 inch steel strap
- 20 ft. - 3/4 X 1/8 inch steel strap
- 4 pc. - 3 X 3 X 1/4 inch steel plate
- 1 pc. - 2 X 3 ft. 18 ga. steel
- 1 pc. - 48 X 30 X .032 inch aluminum
- 1 pc. - 30 X 33 X .120 inch aluminum
- 14 ft. - 1-1/2 X 1-1/2 inch aluminum angle
- 4 ft. - 1/4 inch aluminum H molding
- 1 pc. - 2 X 4 ft. X .020 inch stainless steel

RV Items:

- 2 - surface-mount heat-resistant dome light
- 1 - surface-mount double turret light
- 1 - 13 X 10-3/4 inch stainless steel sink
- 1 - sink drain with 5/8 inch nipple
- 1 - push button faucet with 3/8 inch fitting
- 1 - drain cock
- 1 - filler spout
- 1 - 9 gal. rocket water tank
- 1 - barbed elbow fill kit
- 2 - barbed elbow drain fitting
- 10 ft. - 1-1/4 inch water fill hose
- 10 ft. - 3/8 inch vinyl water hose
- 5 ft. - 5/8 inch drain hose
- 1 - #603-291 Trav'ler ice box
- 1 - #302-20-A Trav'ler drop-in stove
- 1 - 23 X 42 inch formica table
- 1 - table base
- 1 - table leg
- 1 - table floor flange
- 3 roll - putty tape, 1 X 1/8 inch
- 70 ft. - 1 inch flat steel molding, pre-drilled

Auto Parts:

- 1 pr. - fiberglass bucket seat
- 1 pr. - '73 Datsun CB210 coupe nitrogen cylinder
- 1 - #6032 Bugpack chrome dune buggy gas cap
- 1 - #1252648 Buick headlight bezel
- 1 - #1252649 Buick headlight bezel

- 1 each - #5966076 thru #5966079 capsule assembly
- 2 - surface-mount turn signal lamp, as desired
- 2 - '78 Chevette tail light asmy, or sub as desired
- 1 - license plate bracket with light
- 1 pr. - outside mount rear view mirror
- 1 pr. - 18 inch wiper blade
- 70 ft. - rubber door molding

Miscellaneous:

- 12 yd. - carpet as desired
- 20 yd. - 54 inch 7.3 ounce Corduca nylon, or sub.
- 24 ft. - tent zipper
- 3 yd. - plastic screen
- 3 - 6 ft. length piano hinge
- 2 - 3-5/8 X 4-5/8 inch chrome paddle latch
- 4 - four-prong faucet handle
- 3 yd. - diamond-pattern vinyl
- 10 yd - heavy-weave upholstery fabric as desired
- 2 pc. - 37 X 71 X 3 inch foam
- 2 pc. - 22 X 72 X 3 inch foam
- 1 pc. - 41 X 72 X 1-1/2 inch foam
- 1 pc. - 48 X 48 X 1/2 inch foam
- 3 gal. - upholstery contact cement
- 25 yd. - Hide-um edge welt

CHASSIS

Prepare Vehicle:

Before removing the body, strip the interior of all bolt-on components. The following check list will be helpful. Save items marked with an asterisk (*) and reuse them on the new body. Tag and catalog wiring as it is disconnected.

1. Drain fuel *
2. Remove battery *
3. Remove engine door latch *
4. Remove tail lights
5. Remove headlights and turn signal lamps
6. Remove all doors
7. Remove seats
8. Remove floor covering
9. Remove interior paneling

10. Remove park brake handle and brackets *
11. Disconnect steering column from dash
12. Remove wiper assembly *
13. Disconnect speedometer cable
14. Remove insrtument panel *
15. Disconnect heater controls
16. Remove dash (save instruments, switches, and wiring)
17. Remove heater and defroster ducts *
18. Remove windshield washer system *
19. Disconnect master cylinder reservoir
20. Remove radio *
21. Remove bumpers
22. Remove exhaust system *
23. Remove license plates *
24. Remove pedal cluster cover plate *
25. Remove engine compartment cross panel

Depending on the year and model of your vehicle, some of the above items may not apply, and there may be items not listed that should be removed. A good rule is, if it's bolted on, remove it. Also, it's a good idea to save all nuts, bolts, and miscellaneous fittings and hinges. These items are easily stored out of the way and could come in handy during construction.

Remove Body: See sheet #2

The transporter body does not bolt to the chassis, as does the body of the VW Beetle. Consequently, it will have to be cut free of the floor pan with an air chisel. Sheet #2 shows the correct cutting line. Essentially it is a simple job of cutting through the side of the body from the outside and following along the top edge of the floor pan.

A compressor and air chisel should be available for rent. If you have properly prepared the vehicle, figure about one day's rental to complete the job.

Caution: Wear heavy leather gloves to avoid being cut by the sheet metal.

When the body is free of the floor pan, tie a rope to the top and pull the body off the side of the chassis and into a trailer. The body is quite heavy so you'll need several assistants. Stand well away from the vehicle.

Prepare Chassis: See sheets #2 - #8

Thoroughly clean the chassis with soap and water. If the rocker panels are separated from the floor pan, re-attach them with a spot weld about every 6 inches. Trim the floor pan over the engine (engine cover) to the length shown on sheet #2. Smooth all rough edges on the chassis.

Install a new battery bracket on the left side of the engine, forward against the firewall (see sheet #8). Remove the bolt-on splashpan located just ahead of, and above the engine. That will allow air into the engine compartment when the new body is installed.

While the running gear is easily accessible, reline brakes, replace heater hoses, or rebuild the engine as needed to put the chassis in top condition.

Wheels:

Stock wheels and tires may be used. Our van is equipped with 14 inch, F60 tires, mounted on 8 inch centered wheels. Adaptor plates adapt the new wheels to the VW bolt pattern. This set-up widens the tread and provides improved handling. The increased tread, however, will cause the tires to rub the rear of the wheel wells during a sharp turn.

To eliminate tire-rub, cut away the front wall and web of the frame crossmembers that are located at the lower rear edge of the wheel wells. Turn the wheels to full lock and observe the point-of-contact with the crossmember. That will locate the section that must be removed.

Note: Cut through the front wall only. Cutting through the rear wall of the crossmember will put a hole into the interior of the van.

Roll Bars: See sheets #2 - #3

Build the front and rear roll bars on a flat garage floor, then bolt them in place on the chassis. Locate the front roll bar against the rear of the front wheel wells. The rear roll bar is located on top of the engine cover, 73 inches behind the front roll bar. That should place it just behind the forward edge of the engine cover.

Check to be sure the roll bars are parallel, then weld the two longitudinal members in place at the belt line as shown on sheet #2. Tack weld a temporary cross-brace to the base of the front roll bar as shown in figure #7. Figures #1 and #2 show the chassis ready for the body.



FIG. 1

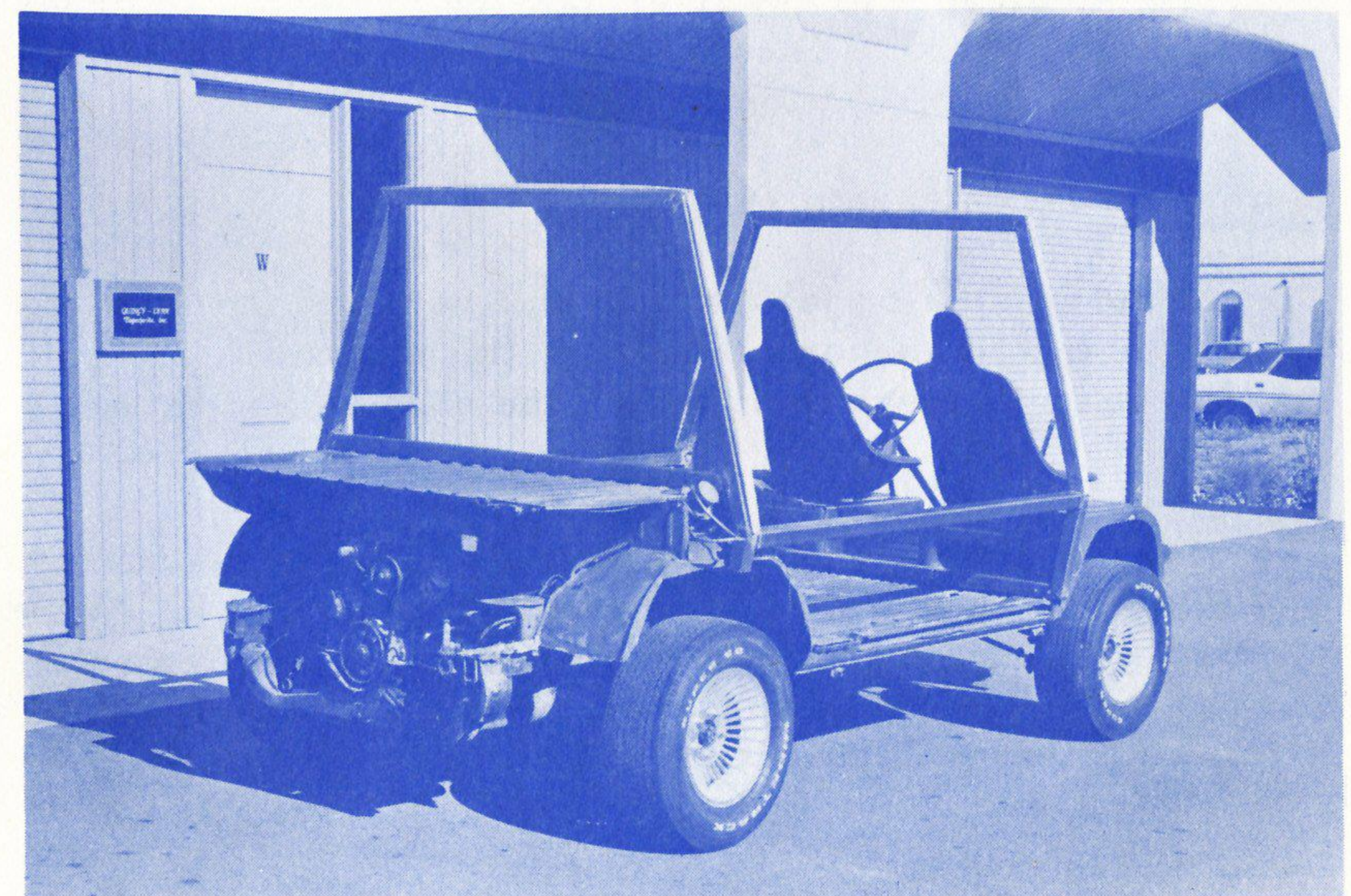


FIG. 2

BODY

Build the fiberglass body in the order in which the text is written. The body is made of one inch rigid urethane foam sheets. Assemble the foam core (body), then cover it with two layers of 8 ounce glass cloth and polyester laminating resin, both outside and inside. Apply the resin with a large paint brush or short-nap roller. Remove air bubbles and wrinkles before the resin sets. Clean tools with acetone.

Until you become familiar with the material, add the catalyst sparingly to allow plenty of working time. The required amount of catalyst will vary between brands of resin. Follow the manufacturer's instructions for the resin you purchase.

If you have never worked with fiberglass, it would be a good idea to experiment by fiberglassing a length of wood or a small scrap of urethane foam before going on to the body. That will provide knowledge of how the material handles and how long it will take to set up. Also, you'll be able to develop technique for overlapping edges and eliminating air bubbles. Technique comes quickly and fiberglass is surprisingly easy to work with.

For an in-depth study of fiberglass and its properties, you may want to purchase a copy of "How To Fiberglass Boats". The book deals specifically with boat building but the information is applicable to any fiberglassing project. To order the book send \$5.95 to Glen-L-Marine Designs, 9152 Rosecrans, Bellflower, California 90706.

Foam Core: See sheets #4 - #5

Elevate the chassis on jack stands and remove the wheels. Assemble the foam core (body) on the chassis. The roll bars serve as formers to establish the shape and contour of the body.

Use a razor knife to cut the foam to shape. A steel yardstick will help guide the knife to insure clean, straight cuts. Mitre all mating edges for maximum contact area. Cut the panels slightly oversize so they can be shaped and fitted during assembly. Use contact cement or foam adhesive to glue the panels together.

Assemble panels A-1, A-2, B, C, E-1, E-2, and D, then install the floor fillets.

Note: Apply two layups of 4 inch fiberglass tape to the foam along the contact area between the foam and the roll bars. Raw foam should not come in contact with the steel roll bars.

Floor fillets simply bridge the gap between the chassis and the sides of the body. Cut the fillets from 1/2 inch plywood and cement in place around the perimeter of the body, as shown on sheet #5 and in figure #7. Make the fillets to fit the curved wheel wells by stacking 1/8 inch veneer to a thickness of 1/2 inch. Glue the veneer together with white glue. Temporarily attach the fillets to the floor pan with #10 sheet metal screws placed at random.

Note: Place scraps of 1/8 inch veneer between the floor pan and the fillets. This will provide a 1/8 inch gap for putty tape, which is placed under the fillets when the body is permanently installed.

Secure the plywood fillets to the body with two layups of 4 inch wide fiberglass tape. Figure #3 shows the floor fillets being glassed in place along the body side.



FIG. 3

Figure #4 shows the floorboard ready for the fillets. Note the section of the floorboard above panel C that must be removed to allow the body to clear the chassis. Figure #5 shows the floorboard after the body has been painted. However, the fillets must be installed at this stage.



FIG. 4



FIG. 5

Assemble the remaining body panels in alphabetical order, as shown on sheet #5. Install the engine cover fillets just before capping the rear with panel L.

Note: Sheet #5 shows three 73 inch 2 X 2's located between the front and rear rollbars. These 2 X 2's are temporarily nailed in place, flush with the outside edge of the rollbars, to keep the foam panels from sagging between the roll bars. Remove them before fiberglassing the interior.

Round corners as desired using a Surform file and sandpaper. Block sand a 1/4 inch recess into the foam around the perimeter of the windshield and the windows in the doors. This will form a lip for mounting the glass slightly recessed from the outside. Sheet #8 shows a cross-section view of the lip.

Figure #6 shows a completed foam core. Note that window and door openings are outlined with a felt marker. These lines will show through the fiberglass and provide cutting lines for removing the doors and windows after fiberglassing.

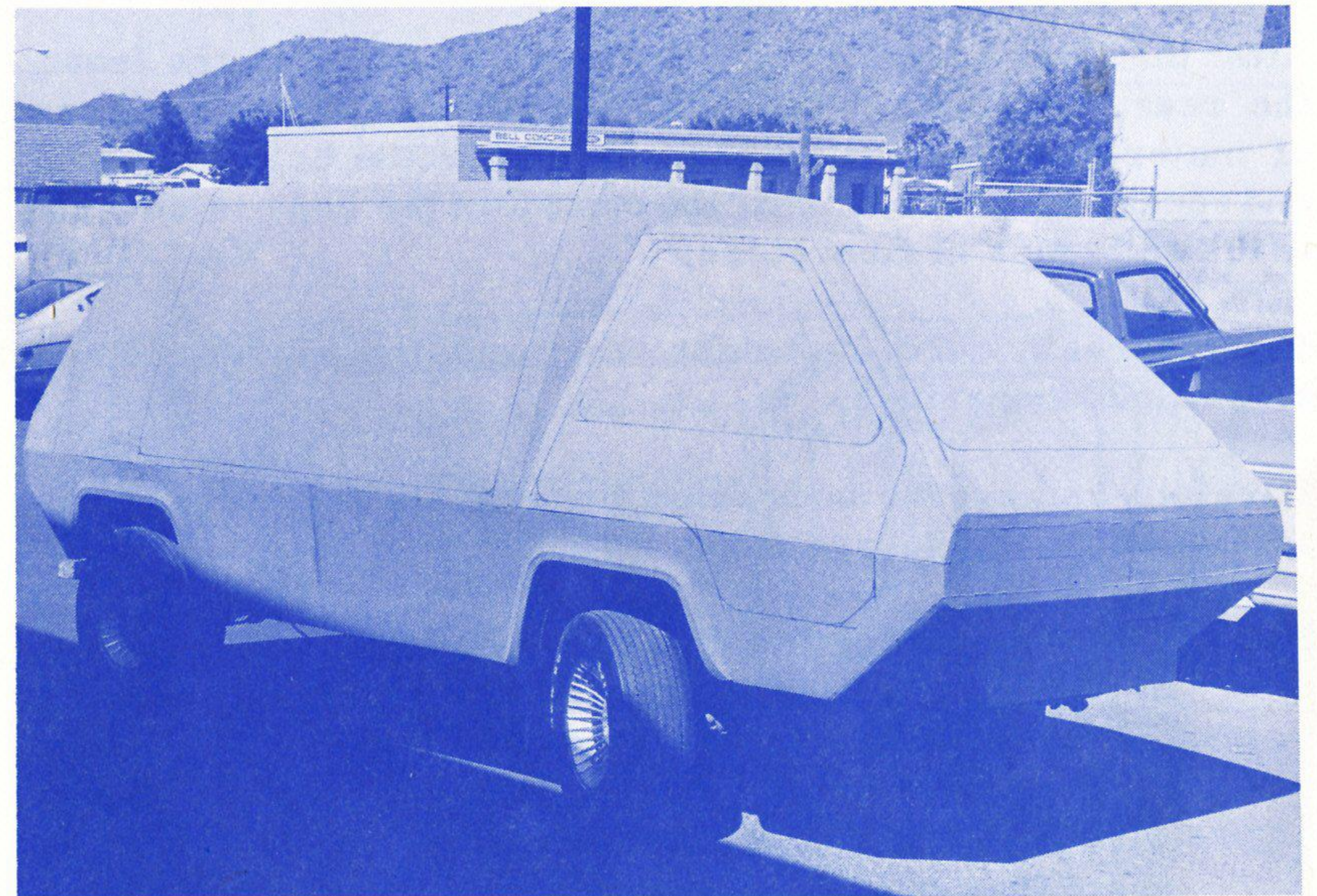


FIG. 6

Fiberglass Exterior:

With the body still on the chassis, cover the exterior with two layups of 8 ounce glass cloth and polyester laminating resin. Cover the sides first. Cut the cloth to shape, covering an entire side with one section of material. Leave a 3 inch overlap around the edges. Lay the dry cloth over the body, then saturate it with resin, working one side at a time.

Do not cut window openings in the cloth. Simply apply the resin about 2 inches past the window recesses, allowing the greater window area to remain dry. Make sure the cloth is thoroughly saturated. Remove wrinkles and bubbles before the resin cures. Trim at the wheel wells to allow the cloth to wrap 2 inches under the edge. Cut, trim, and patch as needed to get the cloth to smoothly cover all areas.

The process will go smoothly if you work with a helper. One person should apply the bulk of the resin with a roller, while the other follows behind with a brush, removing bubbles and trimming and smoothing the material. Take care that the lead person does not get too far ahead of the helper or the resin could set before it's detailed.

After the sides are covered with one layup, go on to the front, the rear, and then to the roof. Overlap adjoining sections of material at least 3 inches. Return to the beginning side and repeat the process until the outside of the body is covered with two layups of fiberglass.

Let the resin cure overnight, then cut the windshield and side-window openings.

Carefully remove the body from the chassis and place it upside down on the garage floor.

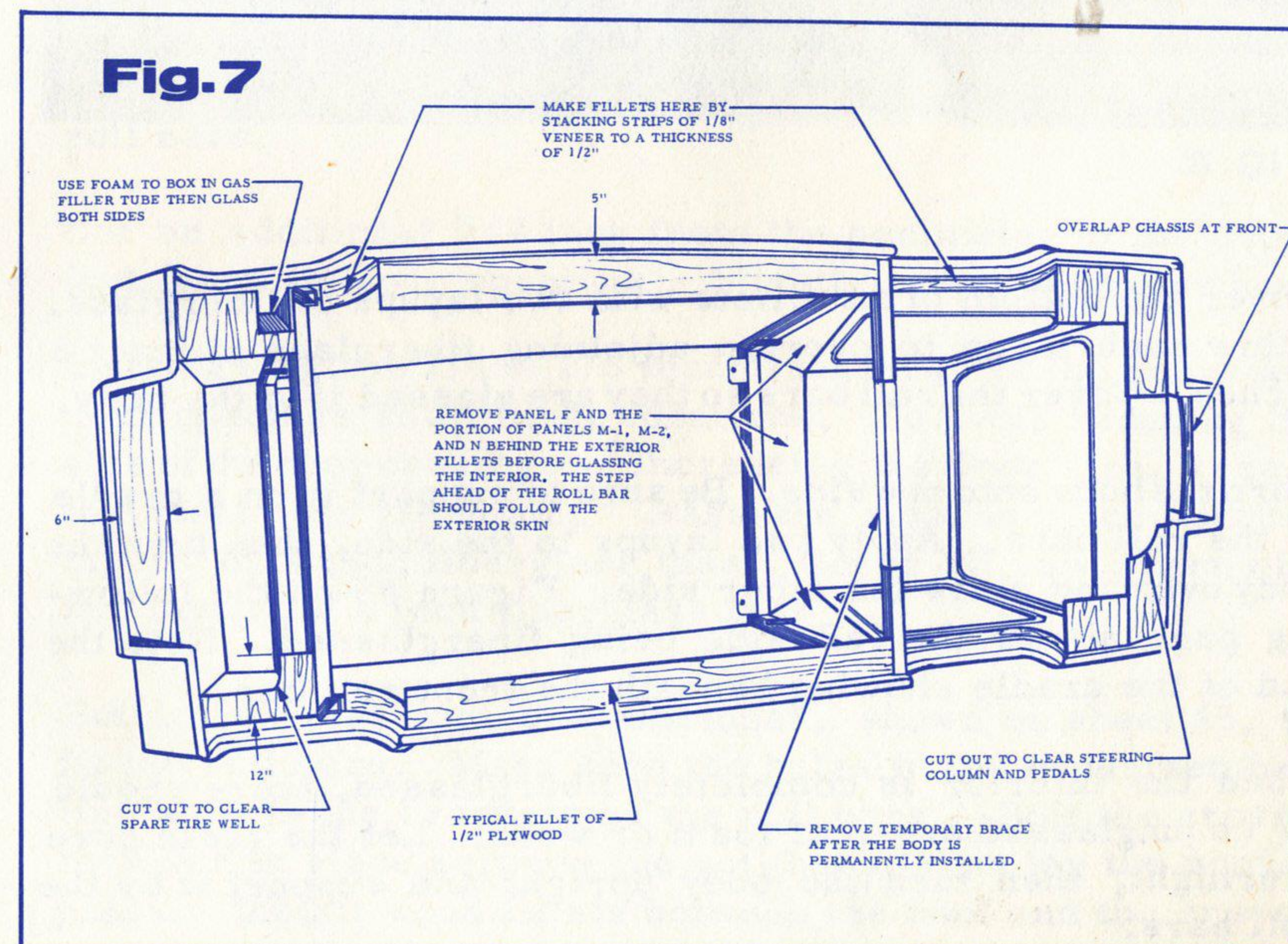
Note: To avoid distorting the body, build a simple cradle, cut to match the curve across the roof, then support the body in the cradle at the roll bars. A simple cradle can be made by cutting the body-curve lengthwise in a pair of 2 X 4's. Place the 2 X 4's 73 inches apart then cross-brace them with a third 73 inch 2 X 4, creating a large, expanded "H" structure.

Prepare Interior:

Before fiberglassing the interior it must be detailed. Illustrations on sheet #8 show typical methods of forming the lip around the window and headlight openings. The windshield and the door windows are slightly recessed from the outside. The headlights are flush with the exterior skin.

Block sand the foam through to the exterior fiberglass skin at the lip around the side windows and the windshield. Round the edges of the foam to form a smooth curve into the lip. Use the exterior headlight bezels to determine the shape and location of the headlight openings. Sand the foam away on the inside, leaving only the exterior skin over the light locations. Remove the foam back about 1 inch from where the edges of the light opening will be, then round the foam so it flows smoothly into the exterior skin. Cut the light openings after the interior has been fiberglassed.

Remove the boxed-in areas around panel F so the step ahead of the front roll bar follows the shape of the exterior skin (see figure #7).



Fiberglass Interior:

Begin by fiberglassing the roof. Lay a walk-board across the two roll bars so you can walk into the interior. Apply two layups of fiberglass to the roof, allowing the material to extend 3 inches onto the side-walls. Apply two layups to the front and rear panels. Figure #8 is a view toward the front after the roof has been fiberglassed.

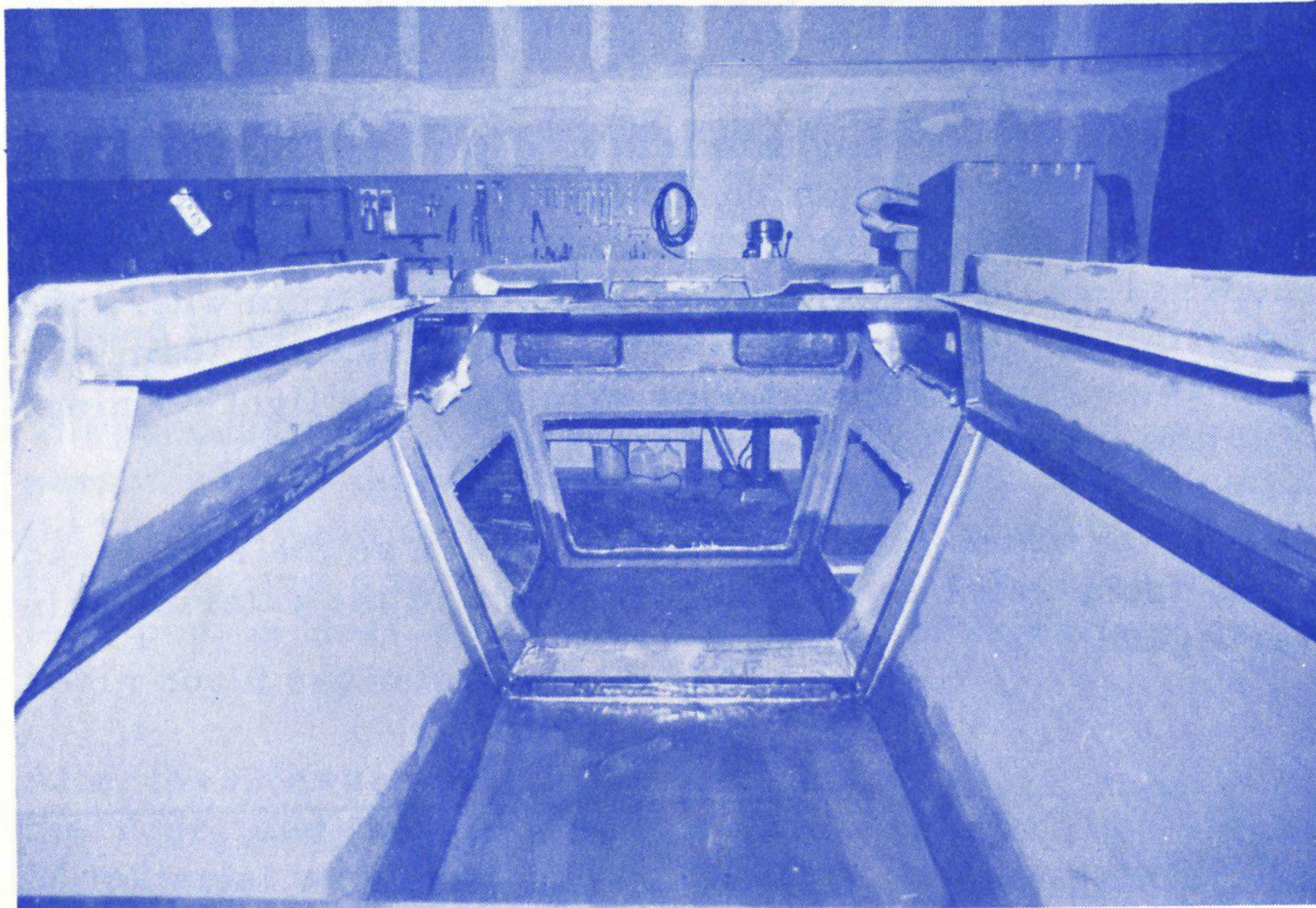


FIG. 8

Cover the bottom of the fillets with two layups of fiberglass. Allow each layup to overlap adjoining fiberglass at least 3 inches. Cover the roll bars so they are glassed into the body.

Turn the body onto one side. Be sure to support it on a cradle at the roll bars. Apply two layups to the side, then turn the body over and glass the other side. Figure #9 on the following page shows the left side being fiberglassed. Note the end of the cradle showing beneath the front roll bar.

When the interior is completely fiberglassed, there should be no unglased areas of foam or wood. Let the resin cure overnight, then turn the body upright and support it by the roll bars.

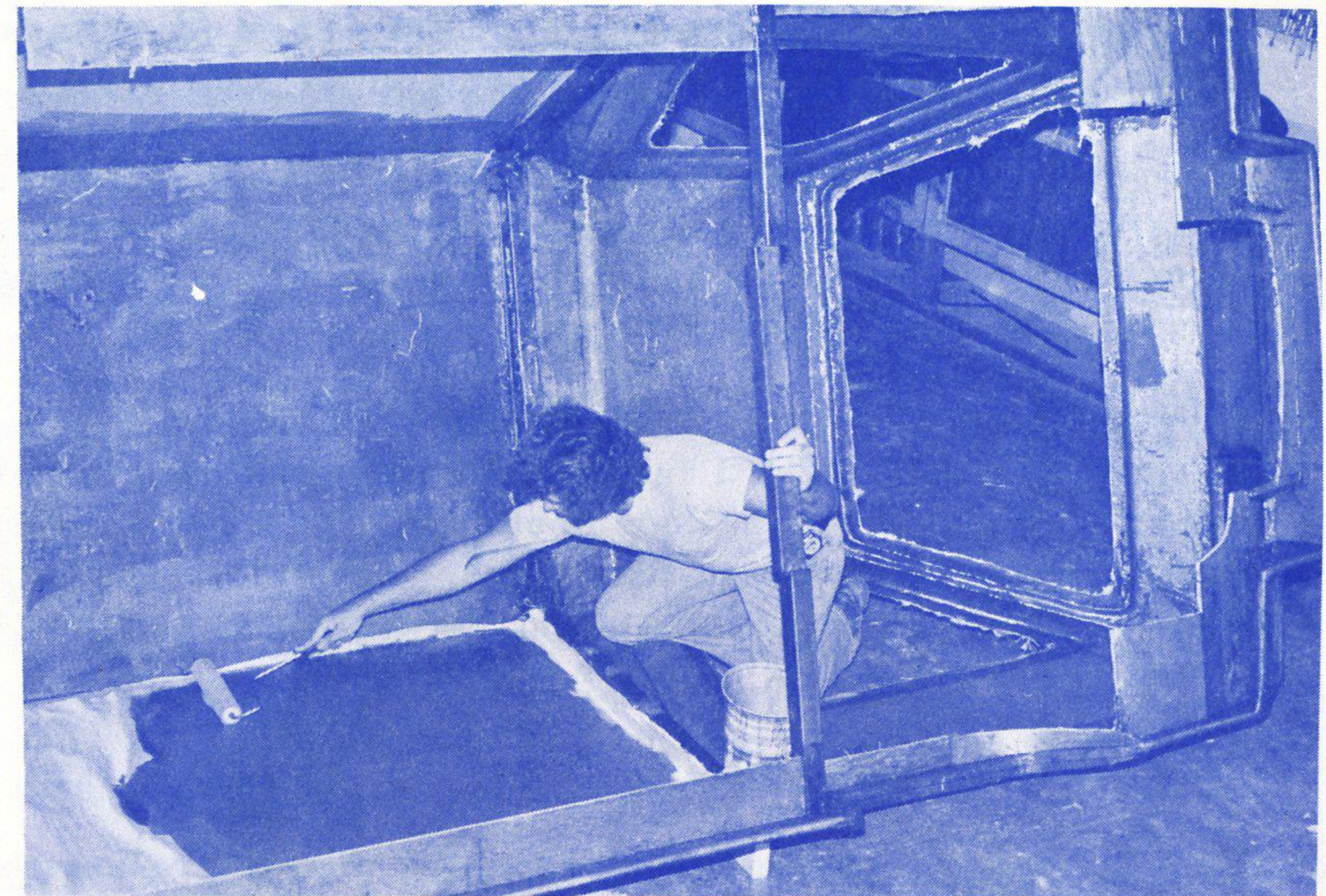


FIG. 9

Remove And Fit Doors: See sheets #3 - #4 - #5 - #8

Cut all doors from the body using a portable jig saw. Take special care to make straight cuts. When cutting the large side-doors and the roof, follow the roll bars 1/4 inch toward the inside. A helper on the inside can watch the saw blade and make sure you are holding the correct distance from the roll bars.

Cut an additional 1/4 inch from the perimeter of the doors (not from the door openings). Slightly round the raw edges.

Install a length of 3/4 X 1/8 inch steel strap in the doors and door openings at all hinge locations. To avoid reducing the size of the door openings or increasing the door size, recess the steel into the foam. Glass the steel in place with two layups of 4 inch fiberglass tape. Cover all raw edges with two layups of 4 inch fiberglass tape.

Build the steel roof crossmember, shown on sheet #3, to fit the roll bars. Make sure the holes in the crossmember line up with the brackets on the roll bars. Bolt the crossmember in place between the roll bars, then lay the roof in place. Install wood fillets between the roof and the crossmember as shown on sheet #8. Secure the crossmember to

the roof with a few randomly placed patches of fiberglass. Be sure the roof is flush with the body on the exterior.

After the patches cure, remove the roof, then secure the crossmember by covering it with four layups of fiberglass. Allow the fiberglass to extend at least 6 inches onto the roof on each side of the crossmember.

A typical door jam fabrication is shown on sheet #8. They are made by glassing 1 X 1 inch wood corner molding around the inside perimeter of the door openings. Secure the corner molding with two layups of fiberglass. Allow the fiberglass to cover the exposed foam around the door openings and to extend at least 3 inches onto the body.

Dash: See sheets #4 - #6

Build the dash according to the drawings, then fiberglass the top and front. Shape the dash to fit snugly inside the body. It makes contact just below the windshield across the front, and down the sides to the belt line.

Locate the radio, switches, and any other items that might later be installed. Remove foam from behind the fixture locations, as you did when locating the headlights (see section "Prepare Interior"), then fiberglass the remainder of the dash. Cover it with two layups of fiberglass.

Finish the dash according to instructions in section "Finishing". Leave a 2 inch wide strip along the body-to-dash mating edges free of fiberglass body filler. Install the dash just before the body is painted. Secure it to the body with two layups of 4 inch fiberglass tape, applied both on the top and underneath along all mating edges. Cover the mating edges with fiberglass body filler, blending it into the body, then sand smooth. See figure #5.

Install Body:

Place a strip of 1/8 X 1 inch putty tape around the perimeter of the chassis, following the location of the floor fillet. Lift the body onto the chassis. Install #10 sheet metal screws on 6 inch centers through the floor fillet around the perimeter of the body to secure the body to the chassis. Secure the roll

bars to the floor pan with a 3/8 inch bolt at each of the four corners. Remove the temporary cross-brace at the base of the front roll bar (see figure #7).

Carefully inspect the perimeter of the body for possible water leaks. Seal potential leaks by pressing putty tape into cracks and crevices.

Finishing:

Apply a coat of finishing resin to all exterior fiberglass surfaces. Finishing resin will fill the weave of the cloth and provide a more easily sanded surface. Unlike laminating resin, finishing resin cures leaving a thin coat of wax on the surface. This wax must be removed by sanding if additional coats of resin are applied.

Before applying the finishing resin, increase the viscosity by adding a thixotropic agent. We used a product called Cab-O-Sil. Add Cab-O-Sil until the resin reaches the viscosity of cold molasses. Cab-O-Sil will retard the catalytic action, so you'll need more catalyst.

Apply the resin, then smooth it with a squeegee. The thickness of the application should be no greater than is needed to fill the weave of the cloth and to fill surface shallows. Too heavy an application will cause surface crazing later on. Let the resin cure overnight, then sand smooth.

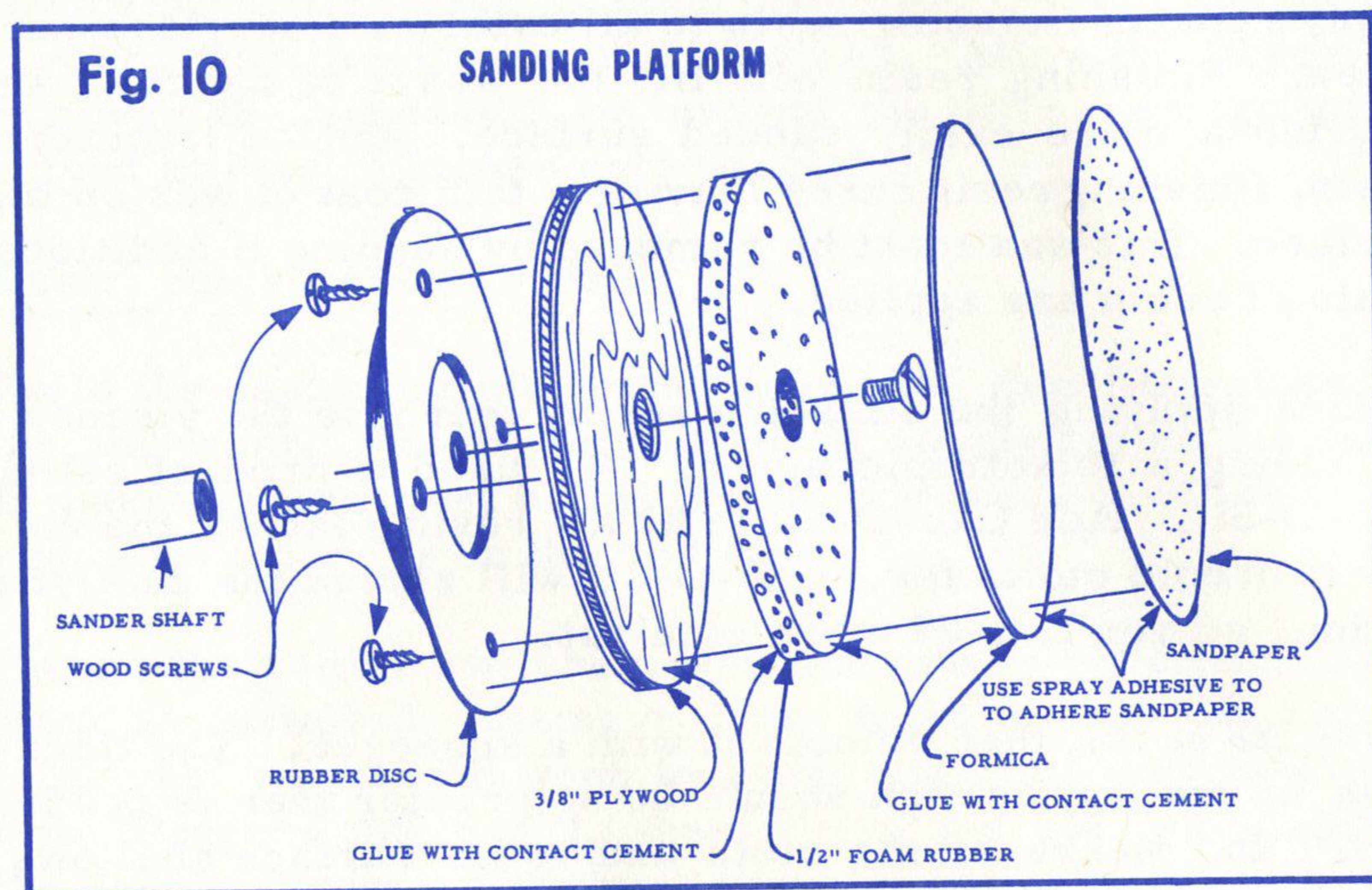
Begin sanding with a heavy duty disc sander. Do not use the rubber disc as it comes with the sander. Figure #10 shows how to make the sanding disc. A sanding disc made in this manner will be self-leveling, which will help avoid gouges in the finish.

Begin sanding with 50 grit paper, then progress to finer paper as the surface smooths out. Fill shallows, dimples, and pits with fiberglass body filler, then sand smooth with a vibrator sander.

For the most durable and least expensive finish, use finishing resin and body filler throughout the finishing process. However, you can considerably reduce the time and work involved by using a spray-on product called Featherfil.

Featherfil is body filler that has been thinned to a sprayable state. Once the exterior has been sanded to a state that surface ripples are no more than 20 mils deep, the entire body may be sprayed with Featherfil, then sanded to a glass-smooth finish. Block sanding will eliminate waves and ripples.

Cover with a good laguer primer, wet sand with 400 grit paper, then paint as desired.



Galley And Bench Seats: See sheets #9 - #11

Begin the galley by installing the 2 X 2 inch fir facing-frame. The facing-frame should fit snugly in place inside the rear roll bar. Secure the frame with 1/4 inch bolts threaded into the roll bar. Place two bolts at the top and two bolts at the bottom of the ice box location.

The 1 X 2 inch rear framework is glassed to the rear wall of the body. Locate it directly behind the facing-frame. Use two layups of fiberglass to laminate the 1 X 2 inch material in place.

Install the two counter tops, one on each side of the ice box, with wood screws. Hand fit wood-grain paneling to box in

the bay on the sink side only. Line the stove bay with .020 inch stainless steel or aluminum. Figure #11 shows a partially finished galley.

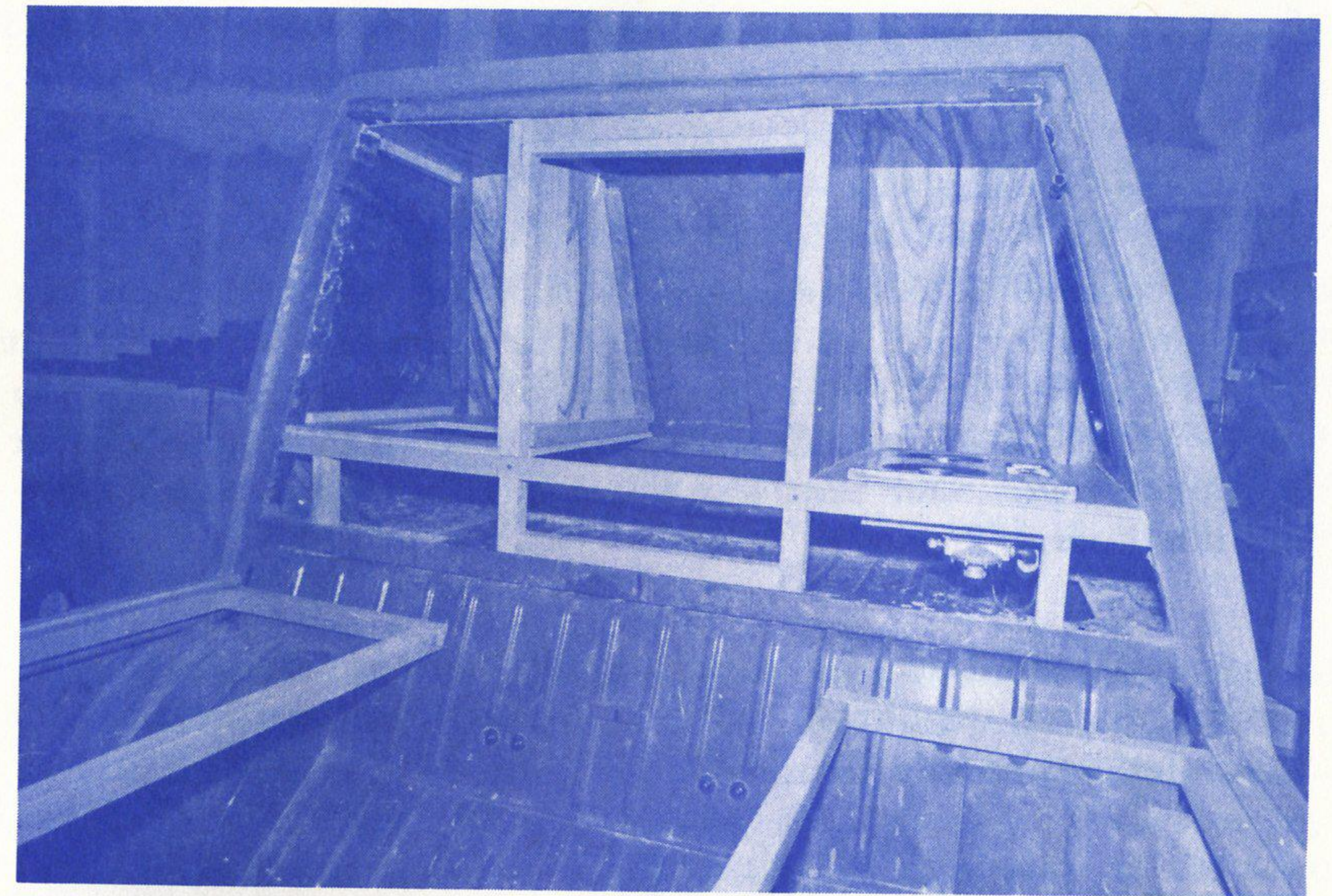


FIG. 11

Warning: The photo in figure #11 shows wood-grain paneling in the stove bay. The stove bay must be lined with .020 inch stainless steel or aluminum to avoid a fire hazard.

The water tank is located below the ice box. Route the sink and tank drains through the engine cover behind the right wheel well. Seal the hole in the engine cover with putty tape. Locate the stove on the left side over the spare tire well. The spare tire well provides room for the fuel canister.

Warning: Operate the stove only when the camper is expanded. Open the windows to provide ventilation. Do not use the stove for space-heating.

The bench seats along each side of the van become part of the beds when the camper is expanded. The large side-doors provide the remainder of the beds. Make sure that the doors fold out horizontal and that the cushion height will be equal at the side-doors and the seats when the camper is expanded. The bench seat cushions lay in place on top of the seat frames.

Locate the dinette floor flange off-center so the flange cup will clear the heater tube, which is located beneath the floor. The table top will be centered if the table flange is positioned off-center an equal distance. The table top may be ordered from a local RV dealer, or cut from 3/4 inch plywood and surfaced with formica. The table fixtures are stock RV items.

Tent: See sheets #10 - #11

Unless you're a good seamstress, take the van and the plans to a tent maker and let him fabricate the tent. Make the tent of 7.3 ounce, or lighter, waterproof nylon. If you plan to make the tent yourself, the heavier material will be easier to work with. Our tent was sewn on a standard home sewing machine.

To install the tent, first expand the camper and assemble the metal tent supports. Figure #12 shows the finished and expanded van ready to accept the tent.

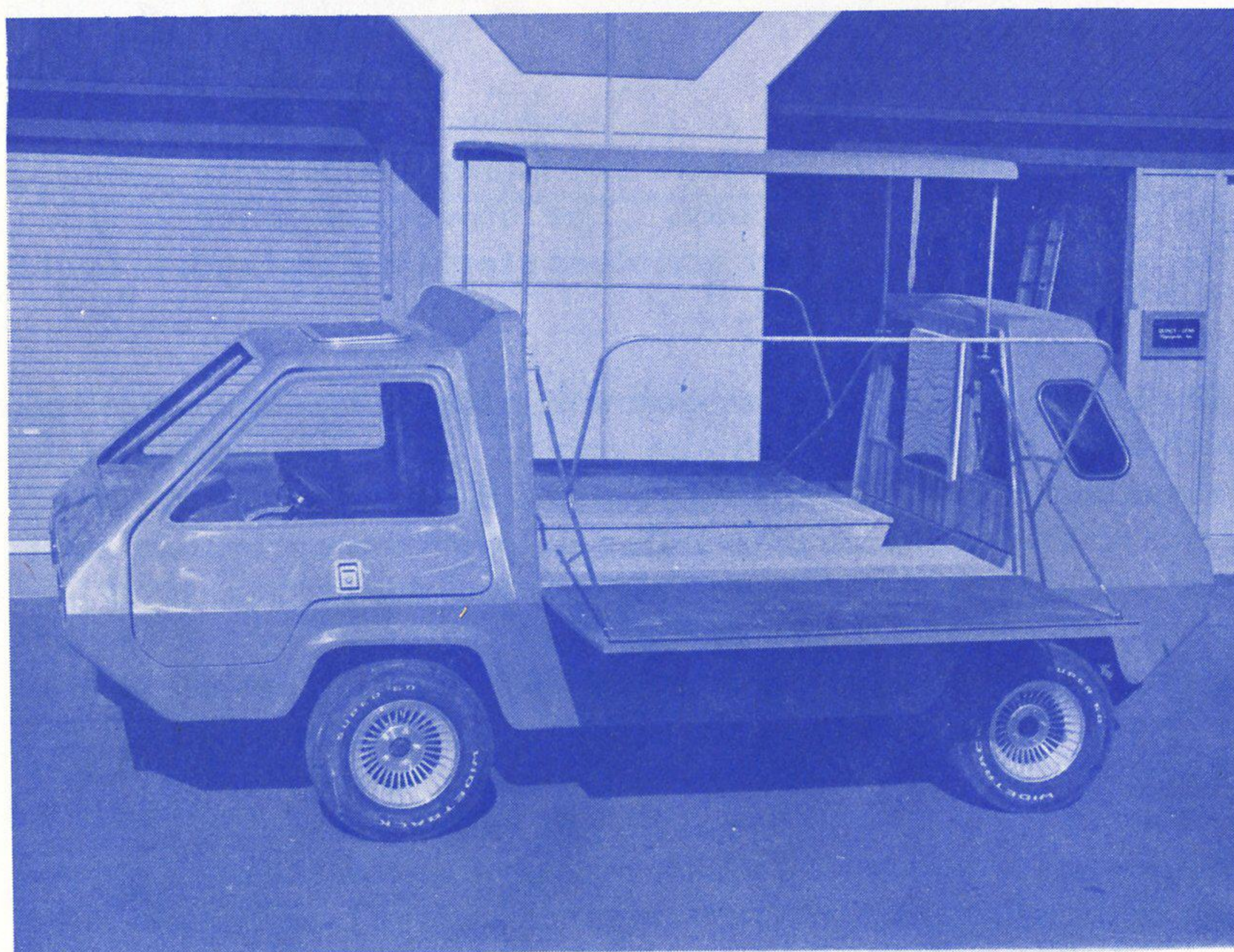


FIG. 12

Drape the finished tent over the tent supports, then attach the fabric to the roof. Seal the tent to the roof by placing a strip of putty tape between the fabric and the fiberglass roof. Secure the fabric by overlaying 1 inch wide, flat steel molding along the edges. Attach the molding with #8 sheet metal screws placed on 3-1/2 inch centers. The molding should be available, pre-drilled, from a local RV dealer.

After the tent is attached to the roof, pull the material taught and attach it along the outside edge of the beds, again using putty tape to seal the fabric and the 1 inch molding to secure it. Attach the tent about 1 inch inside the edge of the doors so the material will clear the door sills on the body when the doors are closed. Work along the front and rear of the beds (side-doors), toward the van, until the tent is secured to both beds.

Attach the tent to the body last, working from the top, down. Attach the molding along the face of the roll bars at the body. Trim the fabric even with the inside edge of the metal molding. Remove putty tape squeeze-out from the exterior by running a plastic knife along the outside edge against the tent.

When the camper is collapsed the tent is rolled up and stowed around the perimeter of the beds and across the roof. A flap attached to the upholstery bridges the gap between the body and the expandable panels and hides the tent.

Upholstery:

Cover the floor of the chassis with 3/8 inch plywood to provide an even base for the carpet. Install the carpet with contact cement and staples. Cut it to size as you go. Accurately fitted but-seams will not show in the carpet. Allow the carpet to cover the outside of the seat bases and to extend rearward to the base of the galley. A removeable, carpeted plywood kick-panel may be installed across the front, just ahead of the doors, to hide the headlight buckets and wiring.

Prepare the roof of the cab for upholstery by cementing 1/2 inch foam in place on the roof. Hand fit the vinyl headliner, then glue it in place over the foam. Cut the headliner long enough to extend rearward and overlap the front roll bar. Trim it even with the door sills. Remember to install wiring

for lights before the headliner is cemented in place.

Raw edges of the headliner around the door sills may be covered with a product called Hide-um. Hide-um is a narrow strip of vinyl with a staple groove sewn into the center. It's simply stapled in place over the edge of the material.

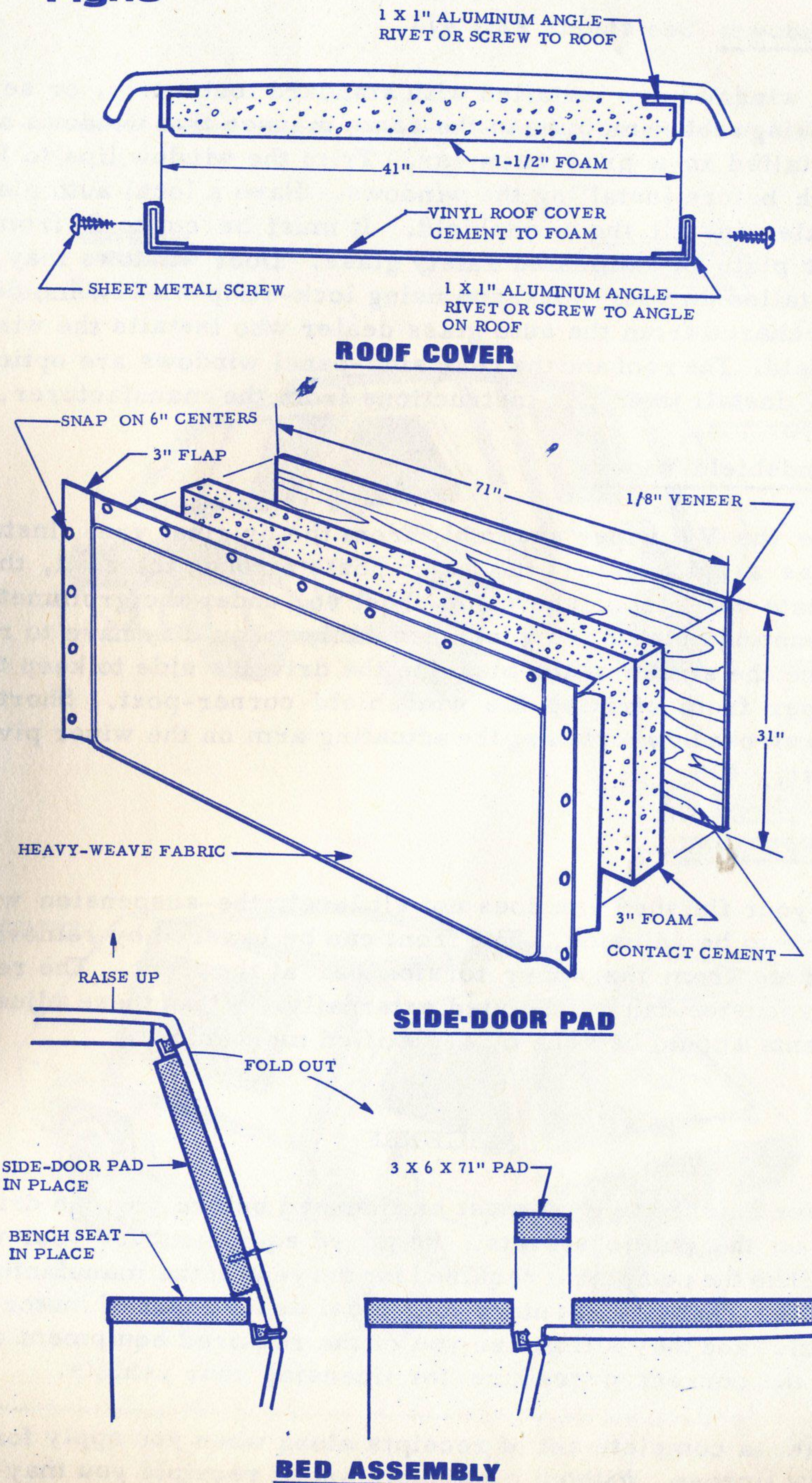
Cover the expandable roof with a vinyl to match the headliner. Prepare the roof by installing a 65 inch length of 1-1/2 inch aluminum angle along each side of the roof, running front to rear. Space the two aluminum angles 41 inches apart as shown in figure #13. Cut a section of vinyl measuring 47 X 80 inches. Take a 1 inch hem at both ends of the vinyl rectangle. The finished size should measure 47 X 78 inches. Install snaps on 6 inch centers across the front and rear of the vinyl (the hemmed ends).

Use contact cement to cement the vinyl in place on the roof. Finish the sides by wrapping the vinyl over a second length of 1-1/2 inch aluminum angle and pop-riveting it in place along the angle that is attached to the roof. Figure #13 shows a cross-section view of how the assembly goes together. Decorative screws may be placed along the steel crossmember to help hold the headliner in place. The front and rear are left free to bridge the gap between the roof and the body. Install mating snap bases along the roll bars at the front and rear.

Cover the bench seats and the fold-down side-doors with a heavy-weave fabric. If you take the 3/4 inch plywood bench seats to an upholsterer, he can sew the fabric to fit. Cement 3 inch foam to the top of the bench seats, then pull the covers over the foam and staple them to the undersides of the seats.

Figure #13 shows how the large side-door pads are made. Cut the 1/8 inch veneer pad-bases to 31 X 71 inches. Make sure the pads will fit between the metal tent-support brackets. Dimensions for your vehicle may vary slightly. Have the pad covers sewn to fit the veneer pad bases. Cement 3 inch foam in place on the veneer, then pull the covers over the bases and staple them to the back side. Cement the pads to the side-doors then secure them with six #6 pan-head wood screws in each pad. The screws may be threaded through the heavy-weave fabric without damaging the material.

Fig.13



Windows: See sheets #8 - #11

All windows are installed with standard lock-strip, or self-locking rubber molding in the same manner that windows are installed in a production car. Trim the window lips to 1/2 inch before installing the windows. Have a local auto glass dealer install the windshield. It must be cut to fit from a flat plate of laminated safety glass. Door windows may be installed in your workshop using lock-strip window molding purchased from the auto glass dealer who installs the windshield. The roof and the rear side-panel windows are optional. Install them per instructions from the manufacturer.

Windshield Wipers:

Use the VW wiper assembly from the original van. Install it as a unit. Insert the wiper posts through the cowl, then locate the block, shown on sheet #6, under the grommited mounting hole on the wiper assembly. You may have to reduce the stroke of the blade on the driver's side to keep the wiper from striking the windshield corner-post. Shorten the stroke by shortening the actuating arm on the wiper pivot post.

Suspension:

If your finished van does not sit level, the suspension will have to be adjusted. The front can be lowered by removing leaves from the upper torsion bar at the front. The rear suspension can be adjusted externally. Both of these adjustments should be done by a qualified mechanic.

LICENSE

Your finished vehicle must be licensed before you can drive it on the public streets. Required equipment for your van will be the equipment required for the year of the manufacture of the chassis. Contact your local department of motor vehicles and they will advise you of the required equipment and of the correct procedure for licensing your vehicle.

Take a complete set of receipts along when you apply for a new license. Without a complete set of receipts you may be required to purchase a title bond.

