Mechanix ILLUSTRATED

MI

minihome

A MOTOR HOME YOU CAN BUILD

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

Published by
Mechanix Illustrated Plans Service
Fawcett Building
Greenwich, Conn. 06830

PLAN NO. RV-6-77

PRICE $15

INTRODUCTION

MI's Minihome was designed during the gasoline shortage of 1973-'74, with the first prototype reaching completion in June, 1974. Since then, more than 150 of these mini-motor homes have been built. These plans incorporate refinements based on feed-back from many thousands of owner-driven miles.

Since the coach construction follows standard practices used in building trailers and campers, most of what might be considered specialized items will be available, in stock or on special-order, from a local supplier of RV, trailer, and camper components. Doors and windows are purchased complete with latches, jams, and moldings, built to fit the openings called out in the plans. Stock, wood-grain metal interior garnish is used to finish all inside window and vent openings.

Before beginning construction, check with your local agency in charge of inspecting newly licensed vehicles. They will inform you of the correct procedure for licensing your completed vehicle and of the required safety and lighting equipment. All cabinet doors should be equipped with positive locking latches. The cab-over bed section should be strapped or latched in place when not in use.

Great care was taken to prepare plans that will enable a builder to construct a safe and proper operating vehicle. However, neither Quincy-Lynn Enterprises nor the publishers of Mechanix Illustrated can assume any liability for the safe and proper operation of any vehicle based on these plans. Patent pending rights to this vehicle design are owned by Mike Galleher. Although these plans entitle a builder to build one vehicle for his or her personal use, no vehicle or vehicle components based on this design may be manufactured or sold to the public without written agreement from Mike Galleher.

I will be happy to answer questions about the construction of MI's Minihome from the purchasers of plans. Write to me at the address below, not to Mechanix Illustrated. Please include a stamped self-addressed envelope.

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

MATERIALS LIST

1 sheet	-4 x 8ft. x 3/8 inch plywood, exterior grade
3 sheets	-4 x 8ft. x 3/4 inch plywood, exterior
4 sheets	-4 x 8ft. x 1/8 inch wood veneer, decorator finish (roof interior or ceiling)
6 sheets	-4 x 8ft. x 1/8 inch wood veneer, wood grain finish (walls)
300 ft.	-3/4 x 1-1/2 inch fir (rip from 1 x 10 inch material)
156 ft.	-1 x 1-1/2 inch fir (rip from 2 x 4 or 2 x 6 inch material)
30 ft.	-3/4 x 1 inch fir (rip from 1 x 10 inch material)
170 sq. ft.	-one inch blanket insulation, or substitute
1	-roof cap (see Exterior Roof Cap)
8 ft.	-one inch dia. aluminum tube
14	-8 ft. courses Yoder side skin
50 ft.	-drip molding or substitute as desired
21 ft.	-aluminum angle or corner molding
53 ft.	-wood-grain interior window garnish
1	-10-3/4 x 13 inch sink (cutout size 9-5/8inch x 12 inch)
1	-24 inch flex drain unit
1	-hand pump water fixture, or substitute
1	-exterior filler spout
1	-ABS water tank, 9 gallon with fill kit & drain kit
12 ft.	-1-1/4 inch flexible water hose
1	-2 burner drop-in stove, 16-3/8 x 11-5/8 inch
1	-14 x 14 inch roof vent
1	-15-1/2 x 6 inch LP gas cylinder
1	-2 cubic foot ice box, 19-1/2 x 21-7/8 inch (cutout size 17-1/2 inches x 20-1/4 inches)
1	-12 volt range hood
40 ft.	-gimp
4 rolls	-1/8 x 1 inch putty tape
1 gallon	-white glue
1	-19 x 30 inch louvered door, top hinge with latch
2	-9 x 14 inch louvered door, side hinge with latch
1	-26-1/2 x 64-1/2 inch left door with frame & hinges
1	-26-1/2 x 64-1/2 inch right door with frame & hinges
1	-21-1/2 x 29 inch picture/slide window
1	-21-1/2 x 29 inch slide/picture window
2	-15 x 22 inch S-2 picture window
1	-15 x 48 inch picture window
1	-11 x 29 inch picture window
1	-13-1/2 x 50-1/2 inch S-1 windshield
4	-12 volt flush-mount interior light, as desired
2	-motor home seat with swivel base

4	-amber marker lights
1	-rear license plate bracket with light
1	-79 x 5 inch channel rear bumper with brackets
2	-exterior-mount rear-view mirror
4	-four-way equalizer shocks
2	-10 inch deep dish rear wheels and tires
1	-3 x 3 x 42 x .120 inch square steel tube

CHASSIS

Although some units have been built on Pinto and VW Thing chassis these plans show dimensions for converting the standard Volkswagen sedan. Because of certain design differences in the chassis, do not use the Super Beetle chassis. We recommend that you use a 1968 or later chassis. An earlier chassis can be substituted, but you have to make an alteration to the 3 x 3 inch coach support crossmember, shown on sheet #8, to allow it to clear the transaxle. A further disadvantage of the older cars is that they are generally in a bad state of disrepair, and the smaller engines installed in the earlier models do not provide enough power to give you a well performing vehicle. If you are not familiar with VW's, I reccommend that you invest in a repair manual covering the VW that you plan to convert.

Chassis preparation: See sheet #8. Begin by removing the seats, the battery and the voltage regulator, (located under the rear seat), the doors, and the front windshield. Disconnect the wire loom at the engine and rear lights, pull the wires free of the body from the front of the door jam, back. The wire loom runs along the left side of the floor pan through the tunnel just below the door, consequently you may have to cut away a section of the tunnel to gain access to the loom. Tag all wires to simplify rerouting.

Using a hacksaw or an air chisel, cut the windshield posts and the underbody section even with the front of the door jam. Unbolt the body and remove the entire rear section. Cut the front seat rails from the floor pan, then cut the jack stands flush with the edge of the floor pan. Remove the valance that runs across the floor under the front of the rear seat. Take care not to damage the body number, which is located on the wishbone near the rear of the floor pan. Remove floor mats and rubber body molding.

With the body removed, repairs can be easily made to the brakes and the drive train.

Changes in the chassis include the addition of an oil cooler, a crossmember to support the rear coach, four-way equalizer shocks at all four wheels, 10 inch deep-dish wheels at the rear, and increasing the tension on the rear torsion bars two notches. Resetting the torsion bars should be done by a qualified mechanic. Installation instructions will be provided with the oil cooler and the shock absorbers. With repairs and modifications completed, cover the chassis with a heavy coat of paint.

COACH

The coach may be built on a flat garage floor. No jig is required. Carefully follow the assembly procedure outlined below. Cut studs and stringers from straight and clear fir or pine. Lumber dimensions called out on the drawings are actual dimensions rather than the nomenclature for stock-cut lumber. For example, the 3/4 x 1-1/2 inch side-wall studs and stringers are ripped from 1x10 inch lumber. You'll get about 5 lengths of 3/4 x 1-1/2 inch stud material from 1 x 10 inch lumber. The same holds true for the roof rafters. Cut the 1 x1-1/2 inch roof rafters from stock-cut 2 x 4 inch material. Each 2 x 4 will provide about three roof rafters. If you decide to substitute stock-cut sizes for those called out on the drawings, be sure to hold the inside dimensions of all window, door, and vent openings.

Side-walls and substructures: See sheets 2, 3, & 4. Assemble both side-walls on a flat garage floor using corregated nails. It is not necessary to glue the butt-joints. Using the side-wall frames as a template, cut the side-wall inner skin from 1/8 inch wood veneer, then glue and nail the skin to the inside of the frame. Use standard white glue and color finished panel nails.

Next, assemble the over-cab panel, the front cab-over wall, the front quarter-panels, the elevated floor-support, and the engine cover. Glue and nail 1/8 inch wood veneer on both sides of these assemblies, with the exception of the cab-over wall and the front quarter-panels, which are paneled only on the inside.

Assemble and skin the cabinet assembly per sheet #4. Build the verticle cabinet walls over the side-walls, using the side-walls as a jig to insure that the rear contour of the cabinets will match that of the side-walls.

Floorboard: See sheet #2. Cut the two floorboards from 3/4 inch plywood. The floorboards should be hand-fitted to the chassis. The floorboards rest in the recess at the rear of the wishbone, and against the tunnel along the center of the floor pan. When in place, the overall width of the floorboard should measure 78-1/2 inches. The side-walls, the elevated floor support, and the front quarter-panels rest on top of the floorboard, while the windshield frame rests against the front edge of the floorboard. Locate the seat positions and install a 16 x 16 inch square of 3/4 inch plywood directly under the seat positions. See sheet #6.

Assemble: See sheets 5, 6, & 7. Stand the side-walls on the garage floor, 76-1/2 inches apart. Place 3/4 inch material under the bottom stringers to elevate the walls to the correct height. Install the elevated floor-support with 1-1/2 inch #8 hex head screws. The elevated floor-support should line up with the stud bordering the rear of the battery box on one side and the butane box on the other side. Flush the bottom edge of the floor-support with the bottom edge of the bottom-wall stringers.

Install the elevated floor with hex head screws. Attach securely along the top of the floor-support, placing screws on five inch centers, but use only one screw at each rear corner to allow for height adjustment after the cabinets are in place. Take care to keep the side-walls squared as you go along. Install the engine cover and the water tank storage area.

Staple gimp around the edges of the cabinet assembly to cover the cabinet-to-walls-and-roof seam. Install the cabinet assembly, flushing it with the top and rear edges of the side-walls. Screw firmly in place, then reposition the elevated floor flush against the bottom of the cabinets. Screw securely in place, placing #8 hex head screws every six inches along the side stringers and the bottom of the cabinet assembly, tying the side-wall, the elevated floor, and the cabinets together.

At this stage, the structure should be square and stable. Roll the coach back on it's rear and install the floorboards with 1-1/2 inch #8 hex head screws. Flush the rear of the floorboards with the rear edge of the elevated floor-support.

Position the coach upright, then install the front cab-over wall. Flush the top of the wall with the top edges of the side-walls, then screw securely in place. Slide the over-cab panel in place against the front wall. Secure with #8 hex head screws spaced along the mating side-wall stringers and across the front corner. Do not be concerned that the front wall and the over-cab panel do not meet flush. The gap provides a radius which allows the outside skin to curve smoothly around the bend.

Install the front quarter-panels and the windshield frame. The quarter-panels rest on top of the floorboard, while the windshield frame rests against the front edge of the floorboard. Miter the front and rear sides of the quarter-panels to meet flush against the door stud and the windshield frame. Screw the windshield frame securely to the over-cab panel and the quarter panels.

Mate coach to chassis: Unless you have a hoist, it's a good idea to mate the coach to the chassis at this stage. Before mating, apply a heavy coat of automobile undercoat to the floorboard, the engine compartment, and the wheel wells. If you live in an area that gets a good deal of rain, it would be a good idea to protect the floorboard by covering it with sheet metal. Seal all seams with silicone calking. Apply 1/8 x 1 inch putty tape along the sides and across the rear of the floor pan where the coach will make contact with the chassis.

Now lift the coach onto the chassis. Make sure the floorboard fits into the correct recess along the rear of the wishbone. Check to see that the front of the windshield frame falls in line with the outer recess of the Volkswagen door jam, see illustration A. Use 5/16 inch through-bolts spaced on 10 inch centers along the outside and inside edges for the floor pan to secure the floorboard to the cassis. Use 5/16 inch through-bolts to secure the rear of the coach to the 3 x 3 inch crossmenber on the chassis.

The windshield frame is faced with 3/8 inch plywood. Trim the facing on the outside edges to match the outside edge of the windshield frame, and along the inside to follow the contour of the car. Take a cardboard template from the car, cut the facing to shape, then glue and nail it securely to the windshield frame. Use silicone calking to seal the facing to the car. Secure the 3/8 inch facing to the door jam with 1 inch #8 hex head screws, overlay a length of 1 x 1-1/2 inch fir, then run a second

set of screws through both the 1 x 1-1/2 inch fir and the 3/8 inch plywood to insure a firm bond along the door jam. Caulk along the coach-to-cowl seam with putty tape. Take a cardboard template from the dash, then finish the inside of the window frame with 1/8 inch wood veneer paneling. After the coach is skinned with metal siding, cover the outside on the coach-to-cowl seam with rubber corner-molding. Install the molding with contact cement. This rubber molding serves only to hide the seam, and may be finished as desired.

Roof skin: See sheet #7. Staple gimp, or welting, along the edges of the side-walls where the side-wall-to-roof seam might show on the inside. Install the roof skin in two sections, beginning at the front and working toward the rear. Cut the ceiling panels from 4 x 8 foot sheets of 1/8 inch wood paneling. Generally, a white or light colored decorative finish will provide a bright interior. Trim the 8 foot length to 78-1/2 inches, which is the outside width of the coach. Mark both sides of the panel to locate the position of the rafters. Lay the panel on the floor with the finished side up, apply white glue liberally to the 77 inch roof rafters, slide the rafters under the panel then nail in place through the finished side of the paneling. Roof rafters are installed laying flat, not on edge. Use drive-nails, or cement coated nails, then cover the nail head with flush wood-grain garnish after the roof is installed. Leave a 3/4 inch relief between the ends of the rafters and the edge of the skin. Butt two 48 inch panels together, joining them at a rafter, to create one panel measuring 78-1/2 x 96 inches. The rafter at each end of the panel should measure the full 78-1/2 inch width on the coach.

The roof will be installed from the front to back, so make a second panel in the same manner, sizing it to cover the remainder of the coach. The roof skin ends at the stringer bordering the bottom of the engine door. Allow the glue to set over night before installing.

Begin installation by squaring the roof skin with the front cab-over wall. Once squared, nail the roof across the front. Use cement coated nails. Working toward the rear, nail through the skin into the top stringer of the side-walls, while keeping the side-walls flush with the edge of the skin. It is not necessary to glue the roof skin to the side-walls.

Rip several lengths of 3/4 x 1 inch material, then glue and nail along the top edge of the roof to further secure the skin to the walls, and fill in the gap at the ends of the roof rafters. Trim window and vent openings flush with the bordering studs.

Wiring: Relocate the voltage regulator into the engine compartment. Be sure to ground it to the chassis. The coach will have two seperate electrical systems. The interior system, which includes the power hood and the interior lights, and the exterior system which includes the marker lamps, the tail lamps, and the license plate lamp. The interior fixtures should be energized from the battery side of the voltage regulator while the exterior lights are powered by the wire loom stripped from the VW chassis. Marker lamps should come on with the headlights and parking lamps.

Use stock RV interior light fixtures, as desired, and space them evenly around the interior, about four or five inches from the roof. Secure the fixtures to the walls with wood screws. Four fixtures should provide ample lighting. String #14 insulated wire from the engine compartment forward to the fixtures. Since the fixtures are mounted to wood, run a ground as well as a hot wire. Drill 1/4 inch through-holes where wires intersect studs and stringer, then runthe wires through the holes. Do not run wires between the skin and studs as abrasion may cause a short circuit. The positive source should be fused at 30 amps.

Marker lamps and tail lamps are stock RV fixtures and may be installed as desired, as long as they meet requirements of your particular state. Since the later VW wiring system incorporated a separate circuit for the turn signals, the stock RV tail lamp fixture must be modified for the VW system. Simply remove the lense and install a second, bolt-on bulb fixture, then run the turn signal circuit to the new fixture. These bolt-on bulb fixtures are a stock automotive or RV accessory item. Be sure to ground the skin to the chassis.

Exterior side Skin: Before installing the skin, cover the exterior with one inch blanket insulation. Simply staple it to the stringer and studs, then trim window, door, and vent openings. The aluminum Yoder type side skin is installed in courses which run the length of the coach.

Each course will cover a strip about 10 inches high. Each side will take seven courses, so you'll need 14 courses of 8 foot material. The siding is available in stock, or special order from your local supplier of RV components.

Begin at the top and work down. Flush the first course with the top of the roof then nail in place along the top. Locate the marker lamps, drill a 1/2 inch hole in the skin at each location, pull the marker lamp wires through the skin, then nail the course in place along the bottom edge. Nail only at each vertical stud location.

Slide the next course into engagement lip along the bottom edge of the top course. Shove it up as far as it will go, then pull down 1/8 inch and nail in place along the bottom edge. The 1/8 inch pull-down allows for expansion. If the skin is installed too tightly, it will buckle under the heat of the sun. Continue down in this manner until the side is covered.

Trim flush with the roof and the sides. Use metal shears to trim door, window, and vent openings. Nail sparingly around doors, windows, and vents to allow for expansion. Cover the front quarter panels and under the cab-over sections in like manner. Trim the bottom edge of the coach and the wheel well edges with aluminum corner molding.

Exterior roof cap: Purchase the roof cap cut to size. The roof cap covers the same area covered by the interior skin. Take overall dimensions from your coach, leaving a 1/2 inch overhang around the edges. Have your local RV dealer order the roof cap to fit.

Before installing the roof cap, cover the roof with one inch blanket insulation. Begin at the front and work toward the rear. Nail the roof cap in place at the front corners, then pull from the rear, stretching the material as tight as possible. Make sure the roof cap is squared with the coach, then tack in place near the rear. Working toward the rear, bend the roof cap over the side and nail in place as you go along. Nail into the side, not through the top. Continue in this manner until the roof is covered. The roof cap should end at the stringer running the width of the coach, under the engine cover. Nail sparingly around vent and window openings, then trim flush with the openings.

Cover the seam along the sides of the roof with stock RV drip molding. Apply 1/8 x 1 inch putty tape along the seam, then screw the drip molding in place. Remove bellies between screws by blocking the molding flush against the side of the coach. Using a short length of 2 x 4 inch lumber and a hammer. Simply tap the molding flush against the wall. Remove putty squeeze-out by running a blunt screwdriver along the edges of the molding.

Windows and doors: See sheet #8. Order the windows and doors sized to fit the openings. They should come ready to install, complete with molding and interior garnish.

Nail window and door garnish in place on the inside. Place 1 inch putty tape around the outside openings. Insert the windows and doors from the outside, then screw in place. Remove putty squeeze-out by running blunt screwdriver along the edges of the molding.

Be sure the roof vent opens toward the rear. If the entire coach is built off the chassis, do not set the doors until the coach is mated to the chassis.

The windshield must be S-1 safety plate, while the front quarter windows and the door windows may be S-2 safety plate. At this writing there are no regulations covering the remaining windows.

Exterior compartment doors may be aluminum siding, then trimmed with aluminum angle. Install the aluminum angle with pop rivets, then mount the doors with piano hinge. Inexpensive key latches are available from your local RV dealer. The engine door, and the battery and butane tank compartment doors must be louvered to provide adequate ventilation.

Fixtures and finishing: The interior may be carpeted as desired. Cover both beds and bed extensions with 1 inch foam before installing the carpet. Install shades and curtains as desired, using standard household or RV fixtures. Nails along the roof rafters may be covered with wood-grain flush garnish or molding.

Seats are standard motor home swivel seats. However the base must be shortened to 5 inches. Use through-bolts to secure the seats to the floor. Check with your local department of motor vehicles for regulations on seat belts.

Because the sink-stove assembly is mounted on tracks, adequate lengths of flexible plumbing must be installed under the drawer to allow full movement of the assembly. After the plumbing is installed, have your local RV dealer check the butane system for leaks Butane gas is odorless and very explosive. A leak in the system could cause an explosion.

The water tank is located under the rear bed. Locate the water fill cap at least 6 inches above water level. The sink drain empties into the left wheel well, just below the drawer bed. The ice box drain is routed into the engine compartment. The drain hose extends to the lower end of the engine compartment side wall and is fixed to the right wall with plastic clips. When installing the ice box, take care not to kink the drain hose.

Drawer facings and closet doors may be cut from 3/8 inch plywood. Cut them 1/2 inch over size of the openings, face them with 1/8 inch wood veneer, then trim with standard edge, or corner molding. Install with standard household cabinet hinges and positive locking latches.

Setting up Beds: To make the beds, turn both seat backs toward the windshield. Put the lower bed supports in place between the front quarter-panels and the elevated floor-support. Place the lower bed extension on top of the bed supports. The front of each upper bed support fits into conduit clip, which is screwed to the underside of the front bed, or the front over-cab panel. The rear of the supports fit into a cabinet latch fixture which is screwed to the wall, one on each side of the coach, between the door and the side window. The upper bed extension lays on top of the upper bed supports. When the beds are dismantled, store the lower bed on top of the rear seat. The upper bed extension lays on top of the over-cab panel. Be sure to strap or latch the bed extension in place when stored. Store the bed supports on the over-cab panel, in front of the bed extension.

LICENSE

Your completed vehicle must be licensed before you can drive it on the public streets. Contact your local department of motor vehicles and they will advise you of the correct procedure. When you apply for a license, be sure to take along your receipts for components, as well as the registration of the original vehicle. They will be your only proof that you own the car. Without a complete set of receipts, you may be required to purchase a title bond guaranteeing that you are the owner of the car.

ILLUSTRATION A