

Modifying Graupner's© Wiesel Patrol Boat Kit

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Graupner's decision to make a kit of the German Navy's Zobel-class "Schnellboot" was a good one. These boats have a unique design – the classic high speed hull of WW-II torpedo E-Boats with old style open gun turrets combined with an array of modern antennas and radars electronics. Unfortunately, for the modeler looking for a well detailed accurate model, this kit falls short.

Disclaimer

Graupner© is a registered trademark of Graupner GmbH & Co. KG. There is no intent to discredit or abuse the name of this fine company. The only reason for this document is to assist model builders of a Zobel-class schnellboot to build a handsome model. There is very little information available elsewhere.

When I purchased this kit in 1975, Graupner's advertisement in *Model Boats Magazine* stated "Superbly seaworthy & maneuverable – and highly authentic. A true 1/40th scale model." They now (their web site in 2008) call this a "quick build" kit.

Forward

This document was created for the detail modeler wanting to modify the Wiesel kit to provide an accurate model. Herein I have provided documentation to modify the kit. It is up to the builder to use some or all of this information as well as any other information they might have. (More about this is below.) Finding the information was not easy, and took place over a period of many years. Most of the information came from the internet in the form of pictures, some from other documents. Also note that because sketches for parts were made based on relative sizes taken from photos, accuracy is not guaranteed. Where possible, photos taken from different angles were used to confirm the size, shape, and location of the parts.

Graupner's Wiesel kit (no. 2145) has a number of problems: Accuracy; lack of detail, and missing items. Some of the "lack of detail" problems are due to vacuum molding, while others from shortcuts. Some of the kit's details are wrong. Some of the missing items were on all of the boats, and some on specific boats.

Many missing details should be added to complete the model to reflect the original boats "as built." One example is the NBC washers found all over the boat. Other details should be added to reflect a typical day the boat is "ready for duty." Examples are line (ropes), bumpers, spars, etc.

Note that there were some minor differences in the ten Zobel class boats. This document is for the S-32 Wiesel, NATO number P6093, but much of it applies to others in this class as well. Those modeling one of the other boats will need to obtain information on that particular boat.

Kit builders can be defined in several categories: Those wishing to make a very accurate model down to those wanting to add some key items. Being where you are in building the kit is a big impact on these decisions. If you already built the kit you might not want to hack it up and start over. If you haven't started yet, you might plan on taking the accurate course. (*I was in the process of building the kit, so I did not feel that making major modifications of the whole deck layout would be worth the time. However, I did rebuild several parts from scratch including the forward superstructure.*)

The part numbers in the Wiesel kit follow the sequence of assembling the model. I will follow Graupner's use of part numbers as well as their figure numbers (on the photographs) in order to make modifying the kit easier. New parts will be indicated as "new" followed by the name of the part. ...So, let's get started!

Materials

I experimented with various materials used to make the new parts added to the model as well as replacements and modifications. For the most part I used styrene sheets and shapes (round, square, flats, and sheets) available from Evergreen and Plastruct. For metal, I used brass tubing, rod, and sheet, as well as some strands of stranded wire for smaller diameter items. For the exhaust shield and treads for the bridge ladders I used K&S Engineering's (www.ksmetals.com) photo etched 3/64 (inch) diamond mesh. Most of the cements were liquid plastic cement (for the styrene) and gel type super glue.

Tools

Some handy tools other than the usual hobby tools were a set of hole punches (the type you use with a hammer), steel plates

(I used some parts I machined years ago) and magnets (to hold items in position for cementing), a small drill press vise, etc. I have a well lit work bench with a magnifier lamp. For drilling holes I use a pin vise to handle very small drills up to about 1/8-inch. This pin vise has four chucks for a variety of small drill sizes.

Major Modifications

I will not dwell too much on this topic as I did not take this route. However, I will try to get the diehard detail builder on the right course.

Hull Depth (draft)

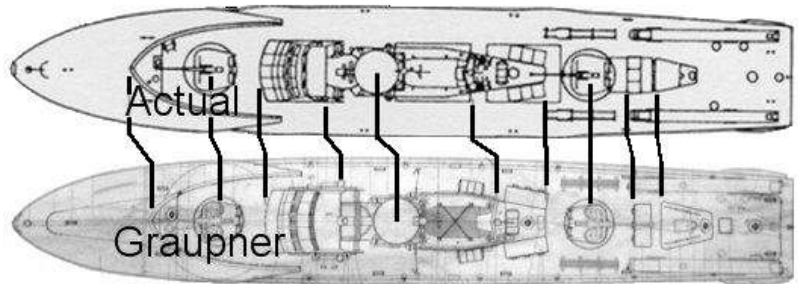
Graupner stated that the draft (depth of the hull below the waterline) of the hull (part 1) was increased to accommodate the R/C components. I have no way of identifying this as well as how much it was increased. Appearance-wise, it might not be that noticeable to be of concern.

Propellers – Drive Shafts, Rudders

First item is the drives (motors, shafts, props). Graupner has designed the kit for three drives. In reality, the original model had four. As this is a very visible detail when the boat is out of the water (which is most of the time for models) this is important for correctness. Following the drives, the originals had two rudders, spaced between and just aft of the inner and outer propellers. Graupner has opted for three, one behind each propeller. I consider this another important detail. This modification is all covered in a separate document.

Deck Layout

The general layout of the deck, including the wave breaker, the guns, superstructures and the aft deck, are not right. Graupner had decided to have a large foredeck sacrificing space aft. This is most noticeable in two areas: Between the torpedo tubes; on the lower (aft) portion of the main superstructure near the large vent. This could be a major modification requiring re-making the pilot house and engine house (superstructure) in addition to moving the wave breaker and the other items listed.



As I have not done this and opted to increase the aft end of the engine house and move the aft turret aft, I do not have specific dimensions for the corrections. If you want to make the deck proportioned correctly, you will need to move the wave breaker, forward gun, pilot house and engine house forward (but not all the same amount). The very rear of the engine house (the rear of the low stepped portion) and the aft gun are about in the right place. The aft storage bin and aft structure should also be moved forward.

Significant and Minor Modifications

This section of this procedure will assume that the builder has decided to either make the major deck layout modifications or not, and no further information will be supplied on modification of the deck layout with the exception of the rear end of the superstructure.

Hull

The hull has six reinforcing plates on each side located just below the gunwales. (The one furthest forward are located one above the other. The remaining four are spaced along the hull. They are approximately 3/8-inch square and have a chamfered edge. (See my photos.)

There are also a number of round ports on the hull (scuppers, etc.). Note that they are not on the same location (not symmetrical) on each side, and are at least two different sizes.

There are four diesel engine exhaust ports (two per side) located just below the waterline. The forward ones are about 5/8" aft of the big vent on the engine house and the aft ones about 5/16" aft of the center of the aft turret.

Most of the photos show a hawse pipe (near the bow). It is not evident in some photos, either they are not clear enough or possibly some of the boats did not have them.

The chine (where the side meets the bottom) underside of the hull is not rounded. It has a sharp edge from the transom forward to about where the prop shafts exit the hull. Build up the chine using epoxy filler.

Deck Sections

Graupner's *Figures 2 to 6* show the deck components, parts 20-54. I did not like the long seam for the big opening when I completed this step. I decided to leave the aft end under the torpedo tubes as one large opening for access to the prop shafts and rudder linkage (*photo, right*). So here is how I changed it (starting with having made the large opening per Graupner's instructions):



1. Place the superstructure on the deck and mark the outline completely around the pilot house and engine house superstructure.
2. Mark a line across the deck even with the edge aft of the rear storage bin (part 159); this should be about 7-5/8-inch from the stern.
3. Remove the removable deck and cut the aft end in two at the line drawn across the deck. Reinforce the aft portion to keep the deck curvature.
4. Draw lines 1/4-inch parallel to the inside of the superstructure outline. Cut this out and reinforce the edge underside with 1/4-inch square wood. Also cutout the deck where the real engine removing hatch is located.
5. Cement 1/4-inch square wood to the bottom of the superstructure so that it will fit into the deck opening.
6. Cement the removable main portion of the deck back on the hull and fill in the seam, then sand smooth.
7. Make a step across the forward end of the aft opening to match the sides to hold the waterproofing foam gasket.

If you follow the above information, you should wind up with a complete hull and deck assembly with only two openings, one under the superstructure and one on the aft deck. This avoids having long seams three-quarters the length of the hull and those unsightly plastic latches and screws.

Deck Details

The original boats had a small rub-rail along the edge of the forward deck starting near the bow and ending about even with the center of the forward gun. This is made up of one continuous piece (can use .03 X .06-inch styrene) spaced off the deck by a number of smaller pieces (each the same material as the rail).

Wave Breaker (part 49) - remove existing poorly molded (rounded edges and hinges) hatch doors (five per side) and place with new doors, hinges, and handles and add two louvered vents per side toward front of wave breaker between the hatches and the step just forward of the forward gun.

Wave Breaker (part 49) – The outside edge of the wave breaker has a rounded tube welded to it (probably to eliminate the sharp edge). This can be accomplished by adding .035-inch diameter styrene rod along this edge.

There are three NBC washers on the forward deck (like those on the superstructure). One is just off center (to the port) and slightly forward of the tip of the wave breaker. One each side just to the outside of the wave breaker, located even with the bow gun's outer ring. There are also two NBC deck flooders, very slight convex dimples in the forward deck located about 1/4 the way (between the forward bit and the wave breaker tip) back, and about 2/3 the way between the deck centerline and the edge of the deck (one each side).

Capstan. The capstan (parts 223 through 224), can be is not quite accurate per the plan. Note that there are six grip ribs on the concave area, and four places for handles around the mushroom top. See drawing at the end of this document.

There is trim (angle) along the step and around the sloped hatch area on the step inside of the wave breaker. This is painted the same color as the superstructure.

Torpedo tube loading tacks (2) are quite incorrect. There are not four straight bars, but two with a step to one end. The vertical supports are wrong as well.

Superstructure Group

The superstructure (*Figures 7 & 8*) is divided into two main components:

- The “Pilot House” (part 65 as well as various other small parts)
- The “Engine House” (parts 55 – 67)

Originally I followed the instructions but did not like the look of the structure. I decided to cut them apart and keep them as two separate sub-assemblies (“Pilot House” and “Engine House”), both are removable from the model.

Superstructure – Pilot House

After assembling the pilot house (part 65), I did not like the look of it and it was too flimsy so I built a completely one from scratch using .030-inch styrene. (See drawing at the end of this document.) The new pilot house has crisp edges and much better detailing. I recommend that other modelers do the same. The interior and flying bridge is now detailed, but some of these small details were made up rather than leave blank areas as no photographic information is available. There was however, one hatch on the flying bridge swinging into the interior (starboard side). The flying bridge decking is of wood slats spaced apart and dark in color, and well as two seats.

The antenna conduit on the port side is wrong in shape as is the mounting of the side marker board. There is also a small parts box on the port side between the marker board and the superstructure.

The windscreen (parts 153, 154) on the flying bridge on the kit was completely wrong, both in style and location. The center 5 (not 3 per Graupner) windscreen sections were actually straight across (above the three center windshields) and both ends are angled back. There is a long un-rimmed visor on each side running fore-aft. The windscreen is actually two layers spaced apart, the forward one being curved to deflect air, and spaced behind that is a flat windscreen. Refer to my drawing and photos for the right layout. This is a noticeable difference in the Graupner model and the original.

There are three NBC washers on the pilot house. One on each side of the flying bridge with long pipes down to the deck and one near the main windshields (exact location varies depending on which boat you are modeling).

The ladders (steps) on either side of the bridge are completely wrong. Graupner specifies to make a rather “boxy” staircase rather than ladders.

The center three windows (windshields) have circular high speed wipers (they use centrifugal force to sling water off). Toss the decals and make new ones to give the correct 3-D look. The motors are mounted on the inside.

Each of the ships had their particular crest on the Bridge superstructure, horizontally centered on the panel below the starboard side windshield, slightly above the horizontal centerline of the panel.

The side marker navigation board/lights (parts 235) are mounted differently on each side. The port side is spaced out because of the antenna boxes and duct.

Superstructure - Engine House

The front end (circular area with rail) of the engine house (part 66) is completely wrong. This area is actually larger and longer than the model structure, plus the sides are completely different. I recommend cutting the end off about one-inch from the end and cutting the round area out per my drawing. All new material can be styrene. This is also a noticeable difference in the Graupner model and the original. The decking is of wood slats spaced apart and dark in color. At this time I can't identify the spotting device so I opted to have it “canvas” covered. (See drawing at the end of this document.)

The aft vent section (part 71) is OK but the use of a decal to simulate the vent is not good. I cut a large opening for the vent and made a new vent with shallow slits to simulate the vent, and inserted it in this part. The sensor dome (part 72) is OK but if you want it to look right, you need to modify the base of it per my photos. The two exhaust tube shells (part 73) should be tossed and a new stack with a grill guard made. This new assembly is cemented to part 71.

The aft section of the low level part of the engine house is way too short. I added 7/8-inch to the end which is still not enough. I suspect that adding about 1-1/2-inches would be about right. Space is needed to accommodate the four electric cable reels (that have been omitted), the hatch (part 163) which is too thick and needs to be shaved down and added “hinges,” and the emergency raft container, and the tool box, which was re-made to the correct shape with a flange and pipe butted up against it per the original photos.

Toss the little vacuum molded power outlet box (part 146, left in the photo) and make a new one with some sharp corners and crisp looking connectors (right in the photo). There is a thin spacer between the box and the structure, slightly smaller than the outline of the box.



Doors (parts 79 & 80) can be vastly improved with the elimination of the handle decals and adding handles made of wire, as well as adding hinges. (See drawing at the end of this document.)

There are two NBC washers with short pipes on the pilot house. One is located on each rear corner just outside of the rear antennas.

Nameplates (parts 155, 156) mounting brackets are wrong as best I can tell from the photos. See my photos for what I did. Also, they are painted a sky blue color and have the ship's name in black (Arial Rounded MT font).

The inflatable dingy mounted inverted on the engine house can be improved detail wise as well. There are three handles per side inside of a circular area painted a darker gray (*photo, right*). The plates (part 81) supporting the dingy can be improved as well. Make the plates of a thinner material and add a narrow flange ("T" shape) all of the way around except where it is cemented to the engine house pylons.



Radar Mast and Dome

Graupner instructs the mast assembly to be made from various materials, including metal wire, wood and plastic. Most of my dome was made by using styrene.

The small critical stress area near the top of the mast (parts 104, 105, 106, 107, 116, & 117) was made using brass tube and wire, soldered together. This was cemented to the plastic parts using gel superglue. The whip antenna and cross piece, part 98, are also brass.

Note that there are two flanges at the base of each mast leg. One is welded to each leg and the other set are the mating flanges welded to the top of the superstructure. I did the same, but ran a short leg (about 3/4-inch) straight down from each leg. These will slide into a hole in the flanges on the superstructure making the mast assembly removable. Also on the flanges are simulated "nut" and "bolt" heads.



The very noticeable difference between my model and Graupner's instructions is the frame supporting the radar dome (*photo, right*). I used styrene to make brackets and simulate the six shock absorbers (replacing part 136) on this frame. This entire frame (parts 131-135, 137, 141) is made of styrene.

Another small but nice detail is to add a ship's bell on the forward port side leg of the mast. It has a shore woven rope to the "clangor." I also added the Wiesel crest to the side of each mast brace (part 91).

On my model, I made the base of the radar dome removable from the mast allowing any possible repairs to the dome and/or mast to be made.

Accessory Boxes and Other Parts

The three accessory boxes (parts 159) are poorly made (vacuum forming limit). The corners of the doors and the hinges are all rounded. Your choice is to cut all of the hinges and doors off and add new materiel or build them from scratch (which is easier). Make handles and shape the bottoms for the deck camber per the instructions.

The extruded plastic mushroom ventilators (part 207) are not shaped right. The tops are way too rounded. They have a slight dome shape, where the spherical top has a sharp edge where it meets the sides. Hatches (four parts 163) are too thick and need to be shaved down. Also add "hinges" to the port side.

The three emergency (parts 233, 234) life raft containers are OK. I added some "quick release" cables and "mechanisms" to them.

Aft Structure

Decals were used to simulate the vents. It looks better to make "vents" from scratch. Note that the vents are not the same on each side. Hatch (part 163) is too thick and needs to be shaved down. Also add a "hinge" to the port side.

Torpedo Tubes

My cardboard tubes (early kit production, parts 168) were not usable because of moisture, so I made new ones from styrene. If you use the cardboard, make sure they are well sealed inside and out. I also fashioned correct crank levers on the breech ends of the tubes.

All four torpedo tube mounts (parts 177) are completely incorrect. Create new mounts. The aft mounts are different from the forward ones. Fabricate mounts as close to the original as possible. No drawings exist to make this easy. Photos help some. Even approximating the look is a lot better than the kits "stepped blocks."

Turrets

Turret Assembly. The turrets (parts 182-203) built via the instructions are unacceptable for those wanting a good level of detail and accuracy. *This will be documented in the future.*

Turret bases. Both forward (part 181) and aft (part 179) bases are incorrect. They can be modified by removing the flange on the bottom and scribing the armor joints and adding features. More *documentation on this is in progress.*

Turret Shields (outer rings). Both forward (part 180) and aft (part 181) rings are incorrect. These rings are not attached to the turret, but rather directly to the deck. They are built up using a tubular frame with armor plates suspended between them. *More documentation on this is in progress.*

Deck Items

The Wiesel has three inflatable life raft canisters (parts 233 & 234). The photos of the actual boats seem to indicate the two canisters on either side of the Engine House are different from the one on top of the structure (them seem squattier). All of the canisters have the automatic opening mechanism like the ones I have made (photo, right). The two in this photo have black slip pads on them. The third one on the structure's beavertail does not have the mat.



The small life jackets (parts 222) don't have "small bundles from 6-inch lengths of rigging yam (as per fig. 12) and glue them to the topmost station" – there is actually a small basket near each jacket with that holds the life line.

The aft flagstaff (part 216 with parts 217-220) is not very good looking. Remake it to be more convincing. You actually don't need it as it seems that it is used only when the boat is docked in port. I made mine removable (like the original) and will most likely not use it as the boat has the crew in place as if it were in action.

The engine house flagstaff (part 142) is in place but doesn't appear to be used. The lines are tied back to the radar mast.

There are two open chock fittings running parallel to the transom on either side of the aft deck near the transom.

Railings. Add a gap in the railing on each side – close with small chains. Note that there was no fixed railing between the torpedo tubes. There are removable vertical stanchions strung with netting. This is in case the boat was laying mines off the stern.

Additions, Finishing Details

New (Additional) Parts

Fire hoses and reels. There are four of these reels located just aft of the large vent on the lower portion of the engine house. I made the reels out of styrene rod, and used a woven cord painted red for the hoses and a brass painted tip for the nozzles. (See drawing at the end of this document.)

Cable reel. There is a cable reel located near the forward hatch (starboard and forward of the forward gun). I made the reel out of styrene rod and sheet, and used a woven cord for the line with a loop on the end. (See drawing at the end of this document.)

Bridge signal flares box. This box (about 9/16-inch high, 3/4-inch long, and 3/8-inch deep) has a flip top and is painted red. It is located on the flying bridge against the rear bulkhead.

Bridge tool box. This box (about 1/2-inch high, 3/4-inch long, and 1/4-inch deep) has a flip top and is painted the same color as the superstructure. It is located on just outside of the rangefinder pit rail (under the radar mast) slightly toward the port side.

Large deck tool boxes. These boxes (about 1-inch high, 1-1/2-inches long, and 9/16-inch deep) has a flip top and is painted the same color as the superstructure. For the Wiesel version, they are located on both sides of pilot house, by the railing. The hinged side faces out.

Bridge Rail Canvas. Add "Canvas" to inside of circular rail behind the flying bridge. This appears on all photos where the railing is in view.

Deck Rail Canvas. Add “Canvas” to inside of deck rail. This appears on virtually all photos. Notice cutouts for the mooring lines. Avoid a coiled tie to the rail. Photos show loop ties.

Emergency ladders. *(Used for rescues at sea) more to follow in the future.*

Fenders. *(Used for docking) more to follow in the future.*

Lines. *(Misc. use) more to follow in the future.*

Painting

There are many color schemes for the Wiesel. Perhaps this is due to old color photos (remember, these boats were before digital cameras) being scanned and put on the internet. This is obvious when looking at those photos. I used the following main colors:

Superstructure, torpedo tubes, turrets, etc.: Testors “Light Aircraft Gray” (flat) #1233

Deck: Krylon “Primer”

Canvas: Testors “Dark Aircraft Gray” (flat) #1226

Hull (above waterline sides): Testors “Light Aircraft Gray” (flat) #1233

Hull (waterline): Testors “Gloss Green” #1224 (cover with clear flat, Testors “Dullcoat” #1260)

Hull (below waterline): Testors “Red” (flat) #1250

Decal cover coat: Testors “Dullcoat” #1260

Wood decking in flying bridge: Dark brown with black grain, cover with flat

Other colors were used for various parts, the dingy, gun parts, etc. A little weathering is also good.

Decals

The only decals you will need are the three “P6093” NATO numbers (transom, and pilot house sides) and the ships name plate. If you rebuild the pilot house from scratch you may need to make new decals as the extended shape of the number on the port side will be different. This can be done making the artwork printed on white decal paper for inkjet printers and.

The “Wiesel” name plates on the side of the engine house have black lettering on a blue background opposed to the Graupner decals that have white letters on a black background. You will need to use new lettering, by making the artwork and printing on clear decal paper for inkjet printers.

I did not find any detailed information on lettering on the three “inflatable life raft” canisters. Using other photos of these type of auto-inflating lifeboats I made decals with “Rettungsinsel” (lifeboat) and “Inspiziert 4 Juli 1976” (Inspected 4 July 1976) in very small lettering on one end of each canister.

You can also use the gauges for the torpedo tubes or make new ones with a printer and stick them on. The latter gives a better, 3-D appearance.

There are no stripes on the turret guards. This is actually pipe and plates and the decals were to simulate those. In all of the photos I have yet to see any circular marking on the decks showing the arc of the guns.

Flags

Signal flags can improve the looks of the model. Use the international signal code. A few photos have the Bundesmarine (West German Navy) ensign flying on the staff above the transom. Most photos show ensign flying from the radar and antenna mast. Very few photos have the Bundesmarine jack on a short staff at the bow while in port. The mast centered above the rear vent does not appear to be used often and is removable. You can also have a removable short mast on the bow for a navy jack (while in port).

R/C and Operation

Channel: Rudder

Channel: Outboard motors (speed controllers) **

Channel: Inboard motors (switched) **

Channel: Sound (motor and/or horn, possible)

** I plan to have the two outboard motors operated by individual speed controllers. This will allow great maneuvering at slow speeds, including tight turns afforded by operating one motor forward and the other in reverse at the same time. The two center motors will be operated by a servo controlled switch turning the motors to either full on or off. To accelerate the boat, use the outboard motors, then kick in the inboard motors. There is no need to use the inboard motors for reverse.

More to follow in the future.

Drawings

(Drawings are in a separate file.)