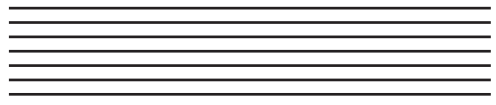


THE
FLEET TYPE



SUBMARINE



WOOD vs. METAL DECKS

This is a small and early investigation,
comments are welcome

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Gato & Balao - Wooden Decks vs. Perforated Metal

WOOD 'N Metal

Which boats had wooden decks, and which had metal? First, some definitions.

“Wooden Deck” here means: *the **entire deck** from Bow Cleats to the giant Stern Cleat were strips of teak wood* (bullnose for a couple yards was always flat metal, and the turtleback stern always metal).

“Metal Deck” here means: *metal from the Bow Cleats to just past the Companionway aft of the Escape Hatch, then wood midships to past the aft Gun Mount, then picking up metal again to the Stern Cleat; the metal having holes, most roughly $\frac{3}{4}$ of an inch or 19-20mm) in evenly spaced rows.*

This study only uses a small number of photos as evidence, because only a small number show the relevant bits. It's frustrating to see a very clear shot from a low angle, or only midships! (If the photographer could have stood on tiptoes, or panned left or right an inch!)

Some pictures are unclear, and sometimes the moiré of photo printing halftone screens (crazy fly screen effect) presents both cases at once: the moiré looks like long thin lines of wood, *and* lines of holes in metal. Some boats were wood one year, metal after a refit. Sometimes just the shadow of raised deck planking is all to go one.

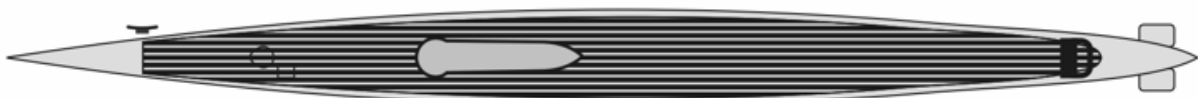
But in the end, the evidence is hopefully enough to build a model with some accuracy.

COMBO

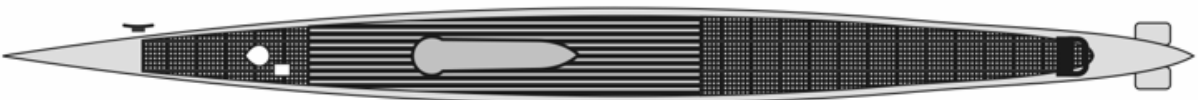
There is no evidence to suggest that there were mixes of metal bow and wood stern or vice versa (other than a plan view of *Greenling* in Squadron's *US Subs in Action*). It seems the only configurations were:

(bow) WOOD / (mid) WOOD / (stern) WOOD

(bow) METAL / (mid) WOOD / (stern) METAL



WOOD



METAL / WOOD / METAL

Gato & Balao - Wooden Decks vs. Perforated Metal

A possible exception is SS309 *Aspro*: the Floating Drydock CD describes the photo of *Aspro* as “Note this boat has the perforated metal decking rather than the wood slat deck.” *Does that mean total metal?* The CD goes on to say that most Balaos were built with metal decks due to a teak wood shortage, and that they usually always had wood slats at the fairwater and gun working areas.

DECK CONSTRUCTION

The Floating Drydock plans (CD and hardcopies) show a “U” bar at the edge of the wood deck. This cannot be seen in *any* photos, though there is some kind of border only at the rail stanchions. The wood itself was teak (Floating Drydock), and it was a teak shortage that led to metal decks. The strip size and spacing seems to vary according to sources. I would guess all sources are accurate, just a matter of what was available and different yard specs.

Floating Drydock Plans (early EB Boats)

	<i>Strip Width</i>	<i>Thickness</i>	<i>Gap</i>
1:1 imperial	2.0”	1.5”	.75”
1:1 metric (rounded)	50mm	38mm	19mm
1:72 imperial (rounded)	.027”	.020”	.010”
1:72 metric (rounded)	.7mm	.53mm	.26mm

COD (NEW modern refit deck, scaled from photos with quarter coin) photos by Tim Smalley

	<i>Strip Width</i>	<i>Thickness</i>	<i>Gap</i>
1:1 imperial	2.0”	???”	.75”
1:1 metric (rounded)	50mm		19mm
1:72 imperial (rounded)	.027”		.010”
1:72 metric (rounded)	.7mm		.26mm

Amberjack (SS522, from qual specs by Mike Keating)

	<i>Strip Width</i>	<i>Thickness</i>	<i>Gap</i>
1:1 imperial	2.25”	1.75”	.75”
1:1 metric (rounded)	57mm	44mm	19mm
1:72 imperial (rounded)	.030”	.025”	.010”
1:72 metric (rounded)	.8mm	.6mm	.26mm

The Floating Drydock plans seem to be the early government plans. The *Amberjack* info comes courtesy Mike Keating, an Amberjack sailor who knows the dims because they were part of his quals! The slightly thicker/wider strips are probably because this

Gato & Balao - Wooden Decks vs. Perforated Metal

Amberjack was built later, (1946), and by Boston Navy Yard (only built about 5 boats).

The metal deck seems to have been about 1/8th or 3mm thick, based on “eyeballing” photos both in the *COD* guide and visitor close-ups of *Cobia* by Tim Smalley, Sub Committee president. (1:72 scale: .0017” or practically .002”, or .05mm).

Things We Know

These are things about the decks we know for certain:

- The Government Plans called for all wood decks
- Metal was introduced when teak ran short
- Electric Boat followed the government plans closer than other yards
- Electric Boat was slow and reluctant to introduce change
- Most Electric Boat boats seem to have had wood decks until late 43
- Most Portsmouth boats seem to have had metal decks
- Some boats changed decks (wood to metal) when refitted
- Some boats didn't change decks (at least until very, very late, or after the war when GUPPified)

If you're building an EB boat pre late 1943, it probably had or started with a wooden deck.

If you're building a boat by another yard, it had a good chance (especially late), of being metal.

Gato & Balao - Wooden Decks vs. Perforated Metal

BOATS BY NUMBER

BOAT	COMM	YARD	W/M(inPic)	PIC	SOURCE
SS212 Gato	Dec 41	EB	W	Nov 44	FDCD p7
SS213 Greenling	Jan 42	EB	W	May 45 1945	WP28 p56 FDCD p19,22
SS214 Grouper	Feb 42	EB	W	Plans Dec 43 Jul 45	FDCD p22 NAV 0821410.jpg
SS218 Albacore	Jun 42	EB	W	Apr 44	WP28 p30
SS220 Barb	Jul 42	EB	W	May 45 Early45 Feb 44 Jul 42	FDCD p19,22 WP28 p65 WP28 p31,34,51 WP28 p11
SS222 Bluefish	May 43	EB	W	1945	SQUS p48
SS223 Bonefish	May 43	EB	M	May 43 1943	NAV 0822304.jpg NAV 0822305.jpg
SS224 Cod	Jun 43	EB	M	COD Guide 1945	SQUS p48
sketchy					
<i>NOTE: FDCD p 21 shows Cod's AFT BATT HATCH in a wooden deck (no date, presumably during war period - mislabelled pic?)</i>					
SS234 Kingfish	May 42	PORT	W	Sep 44	WP28 p35
SS235 Shad	Jun 42	PORT	M	early	WP28 p12
SS236 Silversides	Dec 41	MI	M		museum
SS237 Trigger	Jan 42	EB	W	Aug 44 Aug 44	WP28 p38 FDCD p19
SS238 Wahoo	May 42	MI	M	Aug 42	WP28 p16-17
SS239 Whale	Jun 42	MI	M	Apr 45	NAV 0823916.jpg

Gato & Balao - Wooden Decks vs. Perforated Metal

SS241	Bashaw	Oct 43	EB	M	Aug 44	SQUS p40
					Aug 45	WP28 p55
					Aug 45	FDCD p19
SS242	Bluegill	Nov 43	EB	M	May 51	NAV 0824217.jpg
SS245	Cobia	Mar 44	EB	M	Apr 45	Jean Vandruff
					Feb 45	NAV 0824515.jpg
SS250	Flier	Oct 43	EB	M	Apr 44	WP28 p39
					Apr 44	FDCD p19
SS251	Flounder	Nov 43	EB	M	44or45	NAV 0825110.jpg
SS253	Gunnel	Aug 42	EB	W	late 42	WP28 p21
SS254	Gurnard	Sep 42	EB	W	Jul 45	WP28 p58-9
SS255	Haddo	Oct 42	EB	W	Apr 45	WP28 p71
					"	NAV 0825504.jpg
SS256	Hake	Oct 42	EB	W	May 45	WP28 p60
					May 45	FDCD p19
SS257	Harder	Dec 42	EB	W	Feb 44	FDCD p22
SS258	Hoe	Dec 42	EB	W	Dec 42	WP28 p21
						VERY CLEARLY WOOD
				M	Feb 43	SQUS p37
						VERY CLEARLY METAL
						mislabeled photo!
				W	Jun 45	NAV 0825807.jpg
SS259	Jack	Jan 43	EB	W	Dec 45	NAV 0825906.jpg
SS260	Lapon			W	Jan 44	NAV 0826008.jpg
SS261	Mingo	Feb 43	EB	W	Feb 44	FDCD p9,19,22
SS262	Muskallunge	Mar 43	EB	W	Apr 44	WP28 p42-3
SS264	Pargo	Apr 43	EB	W	Mar 44	FDCD p19,22
					Jun 45	WP28 p63
SS266	Pogy	Jan 43	MAN	W	Aug 44	FDCD p19
					Jun 44	NAV 0826617.jpg

Gato & Balao - Wooden Decks vs. Perforated Metal

SS267	Pompon	Mar 43	MAN	W	Nov 44	FDCD p22
					Nov 44	WP28 p46-7
					Aug 42	NAV 0826706.jpg
SS268	Puffer	Apr 43	MAN	W	Nov 44	NAV 0826823.jpg
SS269	Rasher	Jun 43	MAN	W	Dec 44	FDCD p22
					Dec 44	NAV 0826907.jpg
SS270	Raton	Jul 43	MAN	W	Mar 45	NAV 0827018.jpg
SS274	Rock	Oct 43	MAN	W	May 56	NAV 0827418.jpg
SS278	Scorpion	Oct 42	PORT	M	Oct 42	NAV 0827801.jpg
SS280	Steelhead	Dec 42	PORT	M	1945	FDCD p22
SS281	Sunfish	Jul 42	MI	M	Oct 42	WP28 p18,48,62
SS282	Tunny	Sep 42	MI	M	Sep 42	NAV 0828226.jpg
SS283	Tinosa	Jan 43	MI	M	1945	SQUS p43
SS285	Balao	Feb 43	PORT	M	1943	WP28 p24
	Balao					
SS287	Bowfin	May 43	PORT	M	Nov 44	FDCD p55
	Balao					
SS291	Crevalle	Jun 43	PORT	M?	Jan 45	FDCDp55
	Balao					
SS297	Ling	Jun 45	BOS	M		contemporary NAV 08/0829712.jpg
	Balao					
SS304	Seahorse	Mar 43	MI	M	Jan 44	FDCD p61
	Balao					
SS305	Skate	Apr 43	MI	M	Mar 43	FDCD p55
	Balao					
SS309	Aspro	Jul 43	PORT	M	May 45	FDCD p44
	Balao				Jul 51	NAV 08309.htm
SS327	Boarfish	Sep 44	EB	W	Aug 46	FDCD p55
	Balao				Aug 46	NAV 0832711.jpg

Gato & Balao - Wooden Decks vs. Perforated Metal

SS335 Dentuda Dec 44 EB W Oct 46 NAV 0819611.jpg
(This is rare to see 44 and Wood)

SS367 Icefish Jun 44 MAN W? Jun 44 FD CD p53
Balao Feb 44 NAV 0836701.jpg

SS397 Scabbardfish Apr 44 PORT M May 44 SQUS p49

SS411 Spadefish Mar 44 MI M 1945 SQUS p15
Balao

YARDS:

EB Electric Boat
MAN Manitowoc
MI Mare Island
PORT Portsmouth
BOS Boston Naval Yard

SOURCES:

FD CD Floating Drydock *Sub plan e-Book*
WP28 Warship Pictorial #28
SQUS Squadron *US Subs in Action*
NAV Navsource (web)
Jean Vandruff (pilot, web)

"?" = evidence but unclear

Cigarette Decks

These seem to have started in wood but there is no pattern to changing to steel. Some boats modified their cig decks to metal, others not so much, some new seem to be wood. The inconsistencies are possibly due to Fairwaters changing so drastically and continually.

The Revell Kit

The Revell kit is modeled on the Metal / Wood / Metal deck of the *Cobia*. Though an EB boat, she was late (1944), after the teak shortage.

The wood portion seems to be scale-accurate for width and gap, but it is flush, instead of standing up .020" or .5mm. The metal portion does not have open holes, and the plates don't have the scale look of thin, uneven plates on framework. (This screams for replacement with Photo Etch.)

But worse, if your boat had an all wood deck, some serious modification is needed!

Gato & Balao - Wooden Decks vs. Perforated Metal

So your boat had a wooden deck...

Without After Market (AM) parts, the only way to an all wood deck is to plank it yourself, probably best done with strip styrene in scale size (.020 x .030"). This sounds daunting, and it is! But it has been done successfully in small areas (cigarette deck) by Robert Hargrave on Hobby Talk forums:

(<http://www.hobbytalk.com/bbs1/showthread.php?t=164881>
page 3 of post

It is not impossible to do an entire 52" (132cm) model, but you can see there will be problems.

I did some AM for the Revell 1:72 U-Boat VIIC, and am keen to tackle the Gato. But each solution has pros and cons. Only three possible solutions come to mind:

Brass Photo Etch (PE) Deck

This might be the easiest to design and produce (in two or 3 sections that interlock like staggered bricks to hide seams or show real ones). But gluing that much metal to styrene seems like a lot of trouble to ask for, especially with modelers who used brass decks on the VIIC saying winter/summer contraction/expansion of brass against plastic means a lot of movement and seam cracking.

PROs

Easy to design and manufacture
Easy to install

CONs

Bad adhesion?
Expand/Contract?
Expensive!

Laser Etch Styrene Deck

Styrene tends to show laser pulsing and melty bits. But adhesion would be excellent!

PROs

Easy to design and manufacture
Easy to install

CONs

Bad cut/detail

Gato & Balao - Wooden Decks vs. Perforated Metal

Laser Etch Wood Deck

There's talk Nautilus is working on this now. Will the deck just replace the fairwater midships wood part, or also cater for the all wood decks? Would a competing deck be more accurate?

PROs

Easy to design and manufacture

CONs

Difficult installation

So what is the best solution? No idea yet. Any comments are welcome!

Conclusion

We know some boats (many, and early ones) had wood decks. If you have picked out such a boat, it seems a shame to model it inaccurately, or to model a generic Gato/Balao instead. There must be an answer!