

Research Compiled for the Painting of the USS Arizona Model

Don Preul

Presented at the



April 1 & 2, 2011
Newport Beach, CA

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www.shipmodelersassociation.org



www.nhnm.org

Research Completed for the Painting of the



USS Arizona Model

Questions

- What color were the ships?
- Why do some of the turret tops appear to be a different color than the rest of the ship?

Obstacles to Overcome

1. Color Photography
2. Arizona's Records

Route Slip – Dated March 28, 1944

JOURNALLY ~~~~~ JUDGE
By NARA Date 7-21-60

ROUTE SLIP

Code of Originating Section _____ Initialed by _____ Date *me*

OFFICE	INITIALED		REMARKS
	BY	DATE	
811	<i>MLL</i>	<i>3/17/a</i>	
202	<i>Jobe</i>	<i>3/28</i>	for action, please recommend approval of request for authority to destroy these records. See no reason for your keeping them. C-811 Enclosed to Rec. Admin 3/28 Jobe (202)

3250568

DATE - SERIAL NUMBER _____

ENCLOSURES	CROSS FILE	FILE NO.
HW EC	<i>Jobe</i> <i>3/28</i>	<i>BB 39/LH-3</i>

38

Authority NJUGP
 BY NARA Date 9-21-60

COPY

BB39/A6-5(M-11) PUGET SOUND NAVY YARD
 Bremerton, Washington

Division: PUGET SOUND NAVY YARD Subdivision: FLAMING DIVISION
INDUSTRIAL DEPARTMENT

Location of Records: Building 35A

Person in Immediate Charge: Thomas E. Marsh
Principal Staff File and Record Clerk

To: Chief of Bureau of Ships

Item No.	Subject	Disposition of Correspondence	Disposition of Duplicate	Disposition of Correspondence Covered in Linear Post
1.	Enclosure (A) is forwarded in compliance with reference. It is recommended that the contents be destroyed.	USS ARIZONA (BB39) Correspondence	BB39/1113(81) and 29 Duplicates	3 7
2.	22 samples are furnished for use in obtaining authority from the National Archives.	22 samples are furnished for use in obtaining authority from the National Archives.		
3.	31-7(2)	Air Planks - Test of		
4.	47(1)	Cooking and Painting	S.A. Taffinder Commandant	
5.	52-7(20)	Eye compass - Sinesales		
6.	52-7(3)	Chain Cable		
7.	53-2(2)	Admiral's Emergency cabin	C.S. Gillette, Rear Admiral, USN Manager By Direction	
8.	51-4(1)	Main Turbines		
9.	57-1(6)	Age Gun - Platforms		
10.	52-2(1)	Catapult		
11.	52-2(1)	Lockers for Tools		

Authority: 12 JUL 42
 By: SE MARA Date: 9-21-46

THE NATIONAL ARCHIVES
 Form C-2

NAVY

Department of Agency
PLANNING DIVISION
INDUSTRIAL DEPARTMENT

Division: FUGET SOUND NAVY YARD

Subdivision: INDUSTRIAL DEPARTMENT

Location of Records: Building 551

Person in Immediate Charge: Thomas E. Marsh
~~Principal Navy File and Record Clerk~~

USS ARIZONA

Item No.	File Number	TITLE OR DESCRIPTION	Original or Duplicate	Period Covered	Quantity in Linear Feet
	892/43- 1(1) to 893(6)	Correspondence with the Bureau of the Navy Department and with other yards covering alterations and repair of the USS ARIZONA.	Originals and Duplicates	1925 to 1942	57' Approx. 75 file jackets
SAMPLES OF ABOVE CORRESPONDENCE RECOMMENDED FOR DESTRUCTION					
1.	892/ 87-3(1)	List of work for ships fuses			
2.	81-7(2)	Air Finske - Test of			
3.	87(1)	Docking and Painting			
4.	82-7(20)	Eye compass - Binnacle			
5.	82-3(3)	Chain Cable			
6.	83-2(2)	Admirals Emergency cabin			
7.	84-1(7)	Main Turbines			
8.	87-1(6)	A.A. Guns - Platforms			
9.	88-2(1)	Catapults			
10.	892/835(1)	Lockers for Tools			

Authority WJUPP
By SE NARA Date 9-21-4

FORM OF SHIPS ROUTINE ENDORSEMENT OFFICE FORM-24
SHIPS (24)

CGPY

INSTRUCTIONS: This form may be filled out with pencil. If so, write legibly. Indicate file copies by listing the correct file room code. Do not use "extra" portion of form if statements listed suffice. Avoid excess markings. If endorsement is addressed to NAVY YARD, IAW, or SUPERVISOR, the city should be written out in full.

FILE NO. BB39/L11-3(202)

DATE 28 March 1944

BUSINESS ENDORSEMENT ON LETTER DATED 18 March 1944 from Puget Sound Navy Yard BB39/A6-5

(M-11)

(Check routing in boxes below)

<input type="checkbox"/>	BUSANDA	<input type="checkbox"/>	BUDOCKS	<input type="checkbox"/>	NAVCORPS	<input type="checkbox"/>	NAVY YARD (City)
<input type="checkbox"/>	BUORD	<input type="checkbox"/>	CHIEF of the BUREAU	<input type="checkbox"/>	USC. CR. SHIPS	<input type="checkbox"/>	I.R.N. (City)
<input type="checkbox"/>	BUPERS	<input type="checkbox"/>	J.A.C.	<input type="checkbox"/>	COMINCH	<input type="checkbox"/>	SUPERVISOR (City)
<input type="checkbox"/>	BUAER	<input type="checkbox"/>	CONFERENCE	<input type="checkbox"/>	SECY (Rec. Adm.)	<input type="checkbox"/>	

ATTENTION 1102 Main Building BusShip's Ltr. BB39/L11-3(211) of 29

SUBJECT USS ARIZONA (BB39) - Disposition of Correspondence

REFERENCE Enclosure (HW)

1. FORWARDED (Note item(s) checked below) if any correspondence files in BB39 ARIZONA
- (1) Form C-2, in quadruplicate, description
- (2) Sample of correspondence
- (3) Sample of correspondence

(Check only applicable items)

<input checked="" type="checkbox"/>	FOR APPROPRIATE ACTION	Enclosure (a) is forwarded in compliance with reference (a). It is recommended that these records be destroyed.	<input type="checkbox"/>	BASIC CORRESPONDENCE HAS NOT BEEN ACKNOWLEDGED
<input type="checkbox"/>	AS A MATTER UNDER YOUR COGNIZANCE		<input type="checkbox"/>	AS A MATTER OF POSSIBLE INTEREST
<input type="checkbox"/>	FOR INFORMATION AND/OR FILE	2. Samples are furnished for use in obtaining authority from the National Archives	<input type="checkbox"/>	RETURNED
<input type="checkbox"/>	APPROVAL RECOMMENDED		<input type="checkbox"/>	BUREAU HAS NO RECORD OF THE ITEM(S) MENTIONED IN THE BASIC CORRESPONDENCE
<input type="checkbox"/>	DISAPPROVAL RECOMMENDED		<input type="checkbox"/>	SUBJECT REQUISITION WAS FORWARDED TO YOUR BUREAU OF YOUR COGNIZANCE, AS A MATTER UNDER
<input type="checkbox"/>	FOR COMMENT AND/OR RECOMMENDATION AND RETURN OF PAPERS		<input type="checkbox"/>	BUREAU ADVISORS HAVE RECOMMENDED THAT SUBJECT BE RECORDED IN THE BASIC CORRESPONDENCE
<input type="checkbox"/>	FOR TAKING FURTHER ACTION		<input type="checkbox"/>	SUBJECT REQUISITION WAS APPROVED BY SUPERVISOR AND FORWARDED TO YOU.

REMARKS

Reference (a) asks that the enclosed be forwarded.

C.C. 102

40842

US Navy Camouflage 1941

- Ships – 2 Ship Camouflage Instructions
January, 1941

LANTFLT, 22 Mar 41. Pending availability proper mixtures, convert stocks light gray paint as follows:

Dark gray	Formula 5-D	1 gal. light gray (formula 5), 8 oz black striping paint (formula 38).
Ocean gray	"	5-O 1 gal light gray, 4 oz black striping
Light gray	"	5-L Formula 5

LantFLT surface ships to be painted IAW Ships-2 as follows:
Escort Force: Measure 2, except: DESDIVS 4, 16 each paint 1 ship IAW Measures 1, 2, 3, 4. CRUDEV 2 paint 1 ship Measure 1, one Meas. 2, one Meas. 3.
 Either NEW YORK or TEXAS to be painted modified Meas. 2: Hull to main deck dark gray, upperworks ocean gray to 2' above top of high turret, rest of ship light gray.
Support Force: Measure 2
Other Forces (Patrols): Measure 1

Paint or cover all brightwork on weather decks outside of superstructures. Black paint not to be used except where specified in Ships-2. Report by message ships not painted IAW this order on 10 Apr 41, with reasons therefor.
 (CINCLANTFLT CONF Ltr S19/0213), 3.22.41.)

LANTFLT, 23 Apr 41. COMCRULANT to CINCLANTFLT. Camouflaged ships more difficult to observe than before. Target angle more difficult to observe in TEXAS. Dark single color harder to locate from air; more effective for average North Atlantic. Recommend "very dark paint" for hulls, taper off with superstructure dark but less so than hulls, upper works to "dull flat gray without gloss." (Jonas H. Ingram)

LANTFLT, 26 Jun 41. CINCLANTFLT TO BUSHIPS. Experience w/measures 1 & 2 of Ships-2 (Jan 1941) indicates Measure 1 too dark, Meas. 2 too light for all-round use. Go dark/light as to make ships conspicuous rather than opposite. Has had experience with in-between system:

Dark gray to level of first continuous sheer line
Ocean gray to level of top of upper turret, including stacks & surrounding structure(s)
light gray above.

This intermediate system--called Measure 12--has advantages of being suited to weather conditions in 40-degree-North area, not requiring changes in painting to suit marked latitude changes. Combines good features of both Measures Excl 1 & 2. Recommends "Measure 12" be auth. for appropriate use.

10 Jul 41: CNO TO BUSHIPS. CNO approves Measure 12, auth for inclusion Ships-2.

GENERAL, 14 Jul 41. BUSHIPS TO CNO. Measure 12 can be done with dark gray, ocean gray, light gray. Indications dark gray too dark, light gray too light, for most efficient low visibility. Two shades "purple blue" have been recm. by some concerned with PACFLT camouflage tests. Samples to be at tested; if adopted, ocean gray to be eliminated.

REFERENCES: Handbook of Instruction for Naval Aircraft Camouflage (NRL, 15 Mar 35).
 Handbook on Ship Camouflage (Feb 1937)(NRLT)
 Naval Camouflage Tests at Sea of May and June 1938. (NRL Rept H-1496, 9 Dec 38.)
 Some Paint Compositions Applicable to Camouflage of Fleet Aircraft.
 (NRL Restricted Rept P-1593, 12 Feb 1940.)

LANTFLT, 19 Jul 1941. LANTFLT CONF LTR #CL-41. Prescribes 3-tone painting "Measure 12" for all LANTFLT ships not later than next painting and earlier as practicable (except Greenlaw Patrol). Instructions covering wood decks will be issued when available. Colors: dark gray/ocean gray/light gray. When new shades developed, colors will be sea blue/ocean gray/haze gray.

GENERAL, 30 Jul 41. BUSHIPS TO MARE I., NORFOLK, CAVITE. Decided to adopt Haze Gray/Ocean Gray/Sea Blue spectrum. To be produced by adding blue-black paste to white next untinted base formula:

COLOR	WHITE BASE (5-U)	BLUE-BLACK TINTING PASTE (5-TM)
Haze Gray 5-H	5 gals.	2 pints
Ocean Gray 5-O	"	5 lbs.
Sea Blue 5-S	"	10 pts.

USS Arizona August 11, 1941



October 13, 1941



July 30, 1941 Documentation

C-819-7 (341)

30 Jul 1941
30 JUL 1941

CONFIDENTIAL

From: Bureau of Ships.
To: Commandant, Mare Island.
Commandant, Norfolk.
Commandant, Cavite.

Subject: Low Visibility Gray Paints - Change in Manufacturing Formula.

Reference:
(a) Buships Conf.let.No.C-819-1-(5)(341), dated July 11/1941.

- Reference (a) informed the addressees of a prospective change in manufacturing formula and practice in using low visibility gray paints.
- Decision has been made to adapt "Haze Gray", formula designation 5-H, as the lightest gray paint, "Sea Blue", formula designation 5-S as the darkest shade, and "Ocean Gray", formula designation 5-O, for an intermediate shade of gray paint. Decision has been made also to produce these three shades of gray paint when required by adding specified amounts of the composite blue black paste which has been described in detail in paragraph 3 of reference (a), to the white untinted base formula 5-U. The following amounts of composite paste added to five gallons of the white untinted base, formula 5-U, will yield the shades of paint as indicated:

<u>Amount of tinting paste</u>	<u>Resultant Paint</u>
2 pints	"Haze Gray"
5 "	"Ocean Gray"
10 "	"Sea Blue"

C-819-7 (341)
CONFIDENTIAL
From: Buships
To: Comdt., MI
Comdt., Norfolk
Comdt., Cavite

DPG/McG
(Via Air Mail)
" " "

It will be noted that if only one gallon of white untinted base formula 5-U is to be tinted to the "Ocean Gray" or "Sea Blue" shade, one pint and two pints, respectively, of the composite paste are required.

3. It is requested that low visibility paint manufacture conform to the following instructions:

- Cease the manufacture of any dark gray paint formula 5-D.
- Stop the manufacture of any composite tinting material formula 5-TM required to produce light gray formula 5-L or "Ocean Gray" formula 5-O.
- Continue the manufacture and issue of white untinted base formula 5-U in 5-gallon buckets and one-gallon pail units.
- Begin the manufacture and issue of the blue black composite paste referred to above in one-pint, quart and gallon containers. This product shall receive formula designation 5-TM.

4. A revision of the Camouflage Instructions, "Ships - 2", is in preparation. This revision suggested by letter instruction will indicate to the Fleet the desired effects in using the new shades of paint "Haze Gray", "Ocean Gray", and "Sea Blue", and the simplified procedure for securing these shades.

Copy to:

OPNAV
CinCpac
CinClant
CinCaf
Sanda

V. S. Ingalls
As Director

S19(SU)
(45)

CONFIDENTIAL

August 22, 1941

From: Commandant, Navy Yard, Mare Island
To: Commanding Officer, U.S.S. ARIZONA

SUBJECT: Low-visibility gray paints—Change in manufacturing
formula

References: (a) USS ARIZONA Reqn. 138-42 dated Aug. 13, 1941
(b) BuShips conf. ltr S19-7(341) dated July 30, 1941

1. Reference (b) directs that this Navy Yard cease the manufacture of dark gray paint, formula 5-D; tinting Material, formula 5-TM, required to produce light gray, formula 5-L or ocean gray, formula 5-O; to continue the manufacture and issue of white untinted base, formula 5-U in five-gallon buckets and one-gallon pails; also to manufacture and issue blue-black composite paste in one-pint, quart and gallon containers, designated as formula 5-TM.

2. In view of the above, the items of paint required under reference (a) will be considered cancelled. A requisition should be submitted for a sufficient quantity of white untinted base, formula 5-U, together with tinting paste, formula 5-TM, to produce the desired amounts of haze-gray, ocean-gray and sea-blue as per the following formula:

To obtain haze-gray, add 2 Pts. 5-TM to 5 Gals. 5-U.
To obtain ocean-gray, add 5 Pts. 5-TM to 5 Gals. 5-U.
To obtain sea-blue, add 10 Pts. 5-TM to 5 Gals. 5-U.

W L FRIEDEL

A J MARSHALL
By direction

Ship Camouflage
Instructions
September, 1941

DECLASSIFIED

SHIP CAMOUFLAGE INSTRUCTIONS

UNITED STATES NAVY

SHIPS - 2

FIRST REVISION

DECLASSIFIED--ART. 0445, OPNAVINST 5510.1G
BY OP---09091C DATE 11/21/21

Bureau of Ships

September, 1941

1

Revised
September 1941

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	Course Deception by Painted Splashes
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	Visibility of Wakes
	All Ships Not Painted Alike
	Flexibility of Choice of Camouflage

45429

DECLASSIFIED
Authority 803073
By 6/1/21 NARA Date 9/18/21

DECLASSIFIED
Authority 803073
By 6/1/21 NARA Date 9/18/21

Chapter 3. DISCUSSION OF SHIP CAMOUFLAGE.

References

Results of Surface Ship Camouflage Experiments

Discussion of Measures 11, 12, 13 and 14

Discussion of Splotch Patterns

Discussion of Measure 9 for Submarines

Discussion of Visibility of a Surface Ship at Sea

Camouflage Paint

Color

Reflectivity

Gloss

CHAPTER 1
 INTRODUCTION

DEFINITION OF SHIP CAMOUFLAGE.

Ship camouflage means painting a ship for the purpose of low visibility and of deception in course and range estimation. Low visibility is secured by reduction of contrast with the background. Course estimation is rendered difficult by using dark colors, which make shadows less conspicuous, or by a pattern of confusing spots.

SCOPE OF THESE INSTRUCTIONS

Chapter 2 gives specific and detailed measures for the painting of surface ships and submarines for the purpose of low visibility and deception. In order to give a reader unfamiliar with the subject a clear understanding of developments up to the present time, there is included in Chapter 3 a brief but fairly complete survey of information resulting from experiments on which the measures are based.

FIRST REVISION

This is the first revision of the publication "Ship Camouflage Instructions United States Navy, Ships-2, January, 1941." It supplants the original edition in its entirety. Experimentation consequent upon the issuance of that publication has led to changes in the colors used. Minor modifications have been made in the measures themselves. Certain measures were found to be ineffective. This caused Measures 1, 2, 3, 4, 5, 6, 7 and 8 to become obsolete, and left Measure 9 unchanged. The present revision presents the old Measure 9 and new Measures 11, 12, 13, and 14. There has been no Measure 10.

CHAPTER 2

CAMOUFLAGE MEASURES

The following camouflage measures for combatant and merchant ships are to be placed in effect when ordered by competent authority.

CAMOUFLAGE PAINT.

Five colors are employed in camouflage painting, black and four shades of blue-gray, the black being used exclusively on submarines. The blue-gray colors are called "Sea Blue", "Ocean Gray", "Haze Gray" and "Deck Blue", designated by formulas 5-S, 5-O, 5-H and 20-B, respectively. They are shown approximately in Plate 12, but the colors of Plate 12 must not be used as standards from which to mix paint.

The three topside paints 5-H, 5-O and 5-S are made from untinted white base paint formula 5-U by adding certain amounts of a dark blue-black tinting material, formula 5-TM, as follows:

To five gallons of 5-U,

add 2 pints of 5-TM to get Haze Gray 5-H,



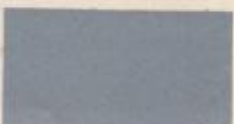
add 5 pints of 5-TM to get Ocean Gray 5-O,

add 10 pints of 5-TM to get Sea Blue 5-S.

The Deck Blue paint 20-B is made from untinted deck paint formula 20-U by adding a tinting material 20-TM in the proportions 20 pints of 20-TM to 5 gallons of 20-U.

The tinting materials 5-TM and 20-TM will be supplied in completely filled cans.

DECLASSIFIED
Authority 803073
By *WMA* NARA Date 7/18/2004

NAME	FORMULA	REFLECTANCE	SPECULAR GLOSS	
	DECK BLUE	20-B	7%	14
	SEA BLUE	5-S	11%	17.5
	OCEAN GRAY	5-O	17%	12
	HAZE GRAY	5-H	28%	12

CAMOUFLAGE COLORS

PLATE 12

DECLASSIFIED
Authority 803073
By *WMA* NARA Date 7/18/2004

USS *Enterprise*

PUGET SOUND NAVY YARD
BREMERTON, WASHINGTON

CVS/S11(M-17)

84

VIA AIR MAIL

From: Commandant
To: Chief of the Bureau of Ships

18 MAR 1941

Subject: U.S.S. ENTERPRISE (CVS) - Cracks in Structure Above Main Deck and Failure of Mainmast.

References: (a) Buships conf. dispatch 181800 of 14 Mar. 1941.
(b) BuC&R plan No. 012044 - Aircraft Carriers Nos. 5 and 6, YORKTOWN and ENTERPRISE - Longitudinal Bending Moment Curves, Emergency Load Condition.
(c) Comdt., P.S. let. S29-1/FS(2)(M-17) of 1 Nov. 1940.
(d) Buships let. C-8339/S71(8-29-MBE) of 16 Sept. 1940.
(e) Comdt., P.S. let. BE32/S71-8(30)(M-17) of 28 Aug. 1940.

Enclosures: (Herewith)

- (A) Starboard Outboard Profile - 1 Marked-up white print.
- (B) Port Outboard Profile - 1 Marked-up white print.
- (C) Plan of Maindeck - 1 Marked-up white print.
- (D) Sketch showing cracks and distortion of mainmast - 1 blueprint.
- (E) Sketch showing temporary method of reinforcing mainmast (Proposed) - 1 blueprint.
- (F) Broken out piece of mainmast.

1. Enclosures (A), (B) and (C) have been marked up, showing the location of cracks in the structure of the U.S.S. ENTERPRISE above the main deck and are forwarded in compliance with reference (a). Sketch on enclosure (A) shows the character and extent of the worst cracks and notes on enclosures (A), (B) and (C) indicate the same information for the remaining cracks.

2. It will be noted from enclosures (A) and (B) that the structure showing evidence of distress is in each case in the vicinity of some abrupt changes in section such as the lower end of an expansion joint, and that the worst damage is near midships, where the change in section is the greatest and the bending moment approximately the largest (reference (b) gives frame 106 maximum sagging and frame 97 $\frac{1}{2}$ maximum hogging moment in emergency condition). Since the structure above the main deck is, in general, lighter than the main deck stringer or the shear strake, the failure has been at the point of attachment or through the weakest section of the structure close to the point of abrupt change in section.

3. The last report on the condition II displacement of the ENTERPRISE, reference (c), indicates that there has been an increase of nearly

CVS/S11(M-17)

VIA AIR MAIL

materials have superior resistances to corrosion. It is noted from the detail plan of the mast that the material used is aluminum alloy 27ST conforming to the physical and chemical requirements of Navy Department specifications SFS 999, which material is in general accordance with AL-27. The use of aluminum 44T30 would undoubtedly also result in a heavier mast due to the lower tensile strength of this material. Alternative remedial methods are as follows:

- (a) Remove the damaged section of the tube (approximately 4"), rethread the section and reassemble in the same manner as at present. Reinforce the mast by means of a steel band shrunk on over the joint, provide a liner of required thickness around the smaller diameter upper tube section and secure in place with cadmium plated tap rivets. This scheme will necessitate modifications to the mast supports at the uptake top and fid table in order to permit housing the mast, due to increasing the mast diameter by the provision of the reinforcing band.

- (b) Remove the threaded section of the mast (approximately 6") and provide a shouldered steel sleeve fitted inside the mast as a connecting piece for the two sections of tubing and secure in place with cadmium plated tap rivets. This scheme is recommended for a permanent installation in case the present aluminum mast is to be retained.

The provision of backstays in addition to the present forestays appears impracticable due to interference with the gun director, .50" caliber machine guns and fouling of signal flags.

7. It is recommended, as a temporary measure, that reinforcement of the weakened section of the mast be accomplished in accordance with sketch (E). This can be accomplished without removing the mast. The band must be removed, however, whenever the mast is hoisted.

8. It is requested that arrangement and detail plans of the present mast and stress analysis be forwarded for the Yard's information.

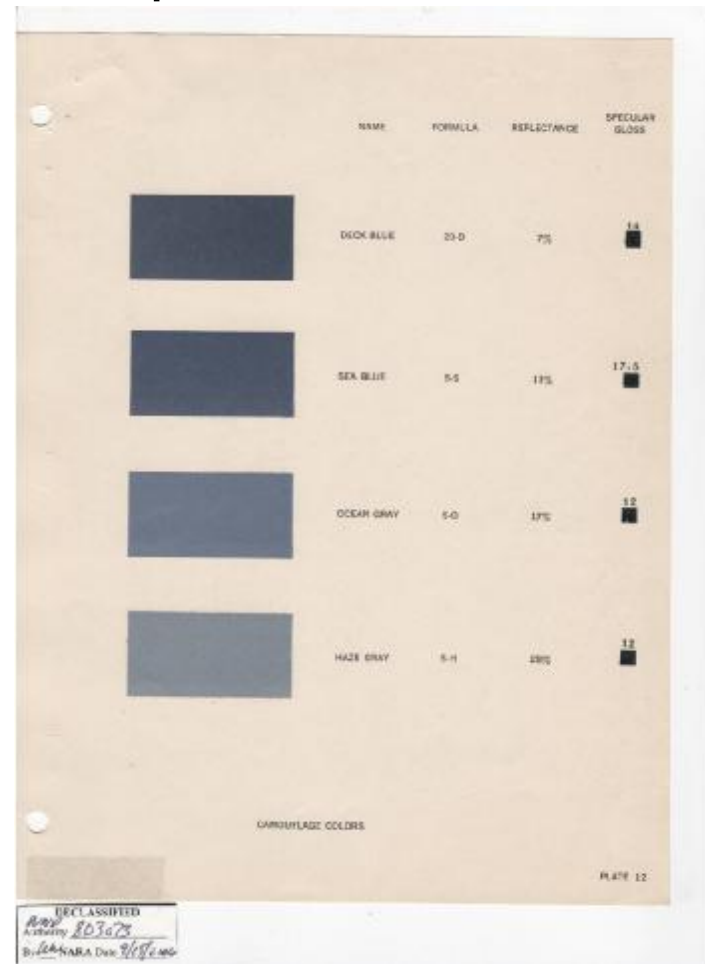
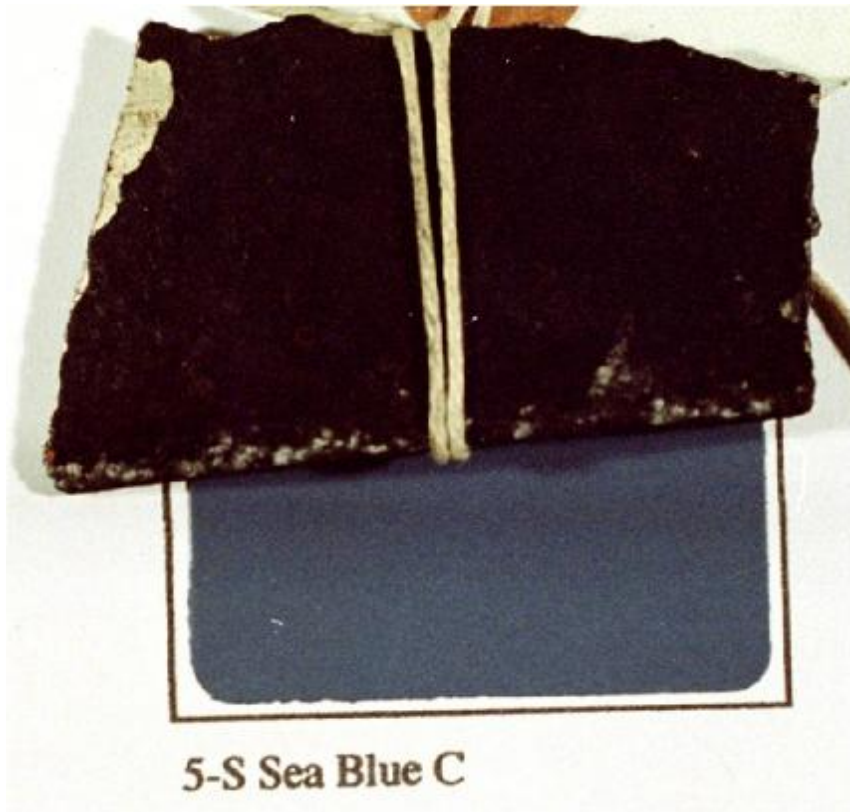
9. Action by dispatch on the above recommendations is requested.

Copy to:
C.O., ENTERPRISE

C. S. FREEMAN

Alex W. Charlton
A. W. CHARLTON,
BY DIRECTION

Photo of fresh Mare Island manufactured 5-D on a portion of CV-6's mast that fractured out May 24, 1941 right after she was painted into Ms1.
 This portion is set against S&S chip 5-S Sea Blue C.



***Arizona's* Drydocking**

Okay, folks, here's the latest update. Last year when I reported the answers to questions the discussion was polite and chivalric, and that would be nice for this as well. After all, I'm only reporting and not trying to draw a line in the sand.

THE SHORT VERSION: Arizona may very well have had an incomplete painting, which some photos seem to suggest.

THE FULL VERSION:

This could be starting to make more sense. I mean, there's plenty of evidence on both sides, so confusing. And making it even weightier for me personally is that despite some evidence suggesting the other possibility, EVERY survivor I know who was aboard in early November '41 remembers painting a very light blue over the dark gray.

SO, tonight I talked a while with Lauren Bruner. He was one of the miracle survivors from the portside AA director on the foremast, one of 4 who made it hand over hand down a line to the Vestal, along with Don Stratton. Last year he was with the others remembering how the new, lighter paint was being craned aboard in cargo nets and then passed down to all hands while they were finishing their drydock time following the collision with the Okie.

Conversation tonight was something like this:

Me: So the new paint was lighter than the previous color?

Bruner: Oh, yeah, a lot lighter. The older stuff from the summer, the gunmetal paint (5D) was so dark, and the new stuff was so damned transparent it was tough.

Me: You mean the blue was translucent, and you could see the old color through it?

Bruner: Yeah, at first, it took a while. Stuff seemed to blend with the sea, and the sky, until you couldn't tell one from the other. (wasn't totally sure what he meant by it, but it was clear he wasn't a huge fan of the new stuff)

Me: You know, now that you mention it, there are some folks who think that, judging from the photos of the ship once the fires went out, that there were actually areas where the old dark gray was showing. Any chance the painting wasn't finished yet?

Bruner: Oh, no, it was never finished.

Me: (stunned) So, the masts were never finished?

Bruner: No, didn't get to them. We started at the bottom and worked our way up.

Me: So you did the hull and the turrets and the bridge area, then?

Bruner: No, not even the bridge. That was next. That was my area, and I know we didn't get that far.

Me: So just the hull and turrets?

Bruner: Just hull and turrets.

Me: How about the area around the five inch casemates?

Bruner: (paused, thinking) I don't know about those, I wasn't part of that detail. But the rest of it, definitely.

Me: Was the new color supposed to color the white mast tops?

Bruner: (chuckling) Oh, I don't know; they didn't tell me that.

CONCLUSION: I know Tracy had pondered this very possibility, and now it seems to make more sense.

So IF THIS IS AT ALL TRUE, we could be dealing with an Arizona with 5S hull and turrets, weathered 5D bridge and stack structures and masts and probably casemates and spud locker areas, and 5L mast tops. Actually a really neat thought!!!

BE RELEASED FOR PUBLICATIO







Some additional research has surfaced since my initial investigation which has helped to clarify some of the mysteries but also created some new ones



Turret Tops

CinC File No.
~~100-117-147~~
F39/(756)

UNITED STATES FLEET
U. S. S. PENNSYLVANIA, Flagship

Pearl Harbor, T. H.
March 24, 1941.

RESTRICTED

U. S. FLEET LETTER NO. 1 USL-41.

From: Commander-in-Chief, United States Fleet.
To : FLEET.
Subject: Turret Markings for Identification by Own Aircraft.

1. This letter replaces U. S. Fleet Letter No. 13L-40, which letter is hereby cancelled, since colored tails for aircraft are being eliminated.

2. Battleships and cruisers shall paint the tops of any or all of their forward turrets or enclosed mounts with the following colors for identification by their own aircraft. When stripes are involved, they shall be painted parallel to the axis of the guns.

BATTLESHIPS

Battleship Division ONE	Red (solid)
Battleship Division TWO	White (solid)
Battleship Division THREE	Blue (solid)
Battleship Division FOUR	Black (solid)
Battleship Division FIVE	Yellow (solid)

CRUISERS

Cruiser Division TWO	Yellow (double stripe)
Cruiser Division THREE	Red (double stripe)
Cruiser Division FOUR	Blue (single stripe)
Cruiser Division FIVE	Yellow (single stripe)
Cruiser Division SIX	Black (single stripe)
Cruiser Division SEVEN	Green (single stripe)
Cruiser Division EIGHT	Black (double stripe)
Cruiser Division NINE	Green (double stripe)
DETROIT and RALEIGH	Blue (double stripe)
RICHMOND	Red (double stripe)
AUGUSTA and OMAHA	Red (single stripe)

3. In addition, battleships and cruisers shall paint the top of their after turret or enclosed mount to correspond with the section their aircraft are in. The colors are red, white, blue, black, green and yellow for first, second, third, fourth, fifth and sixth sections respectively.

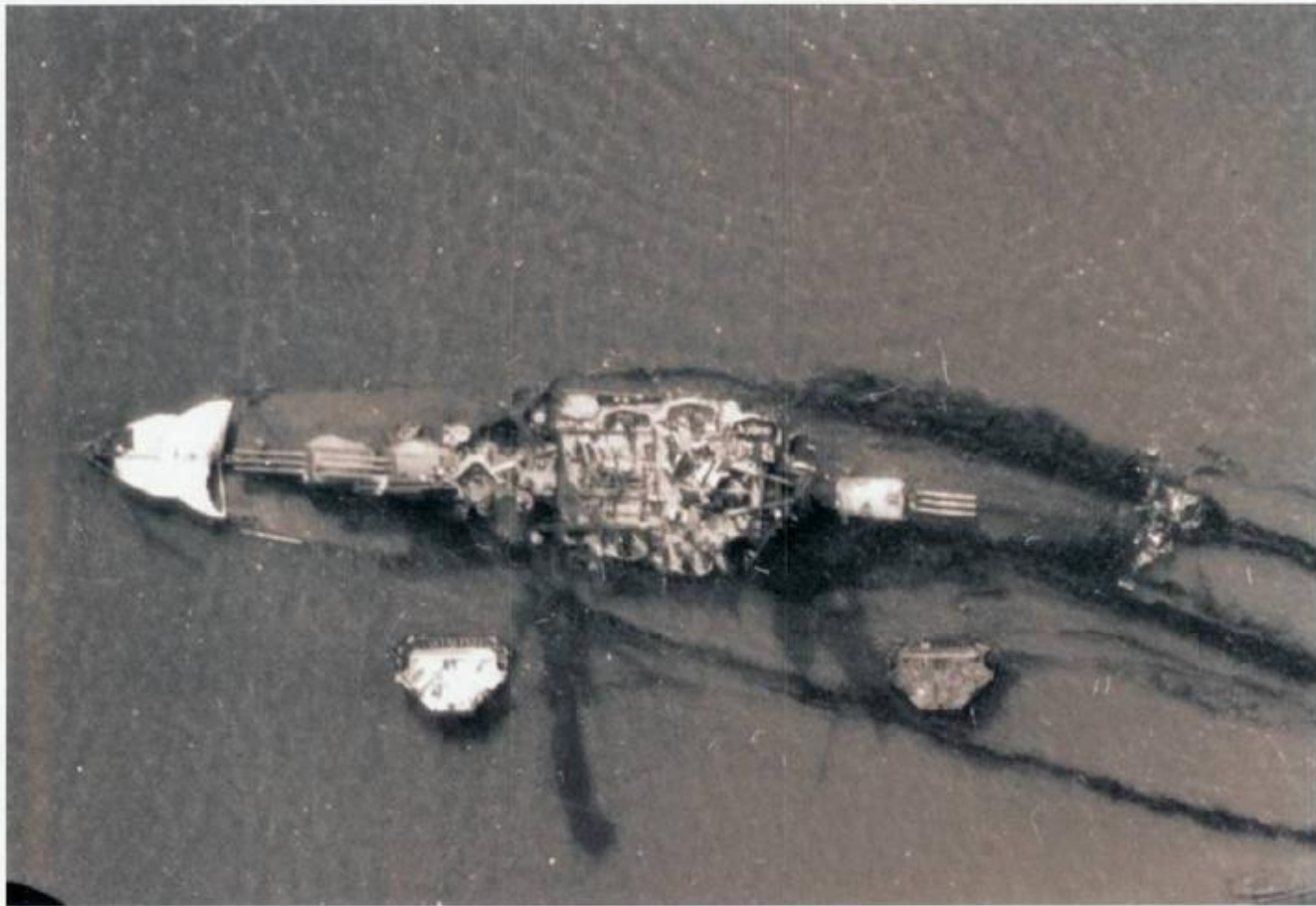
H. E. KIMMEL.

DISTRIBUTION:

List II, Case 2, O, X.
List II, AI, AAH, EN1-EN11,
NA4-NA56, NB18, ND1-ND16, NY1-NY10.

P. C. Crosley,
Flag Secretary.

USS *Arizona* BB-39



USS *Pennsylvania* BB-38



USS *Maryland* BB-46



USS *West Virginia* BB- 48 & USS *Tennessee* BB- 43



USS California BB- 44



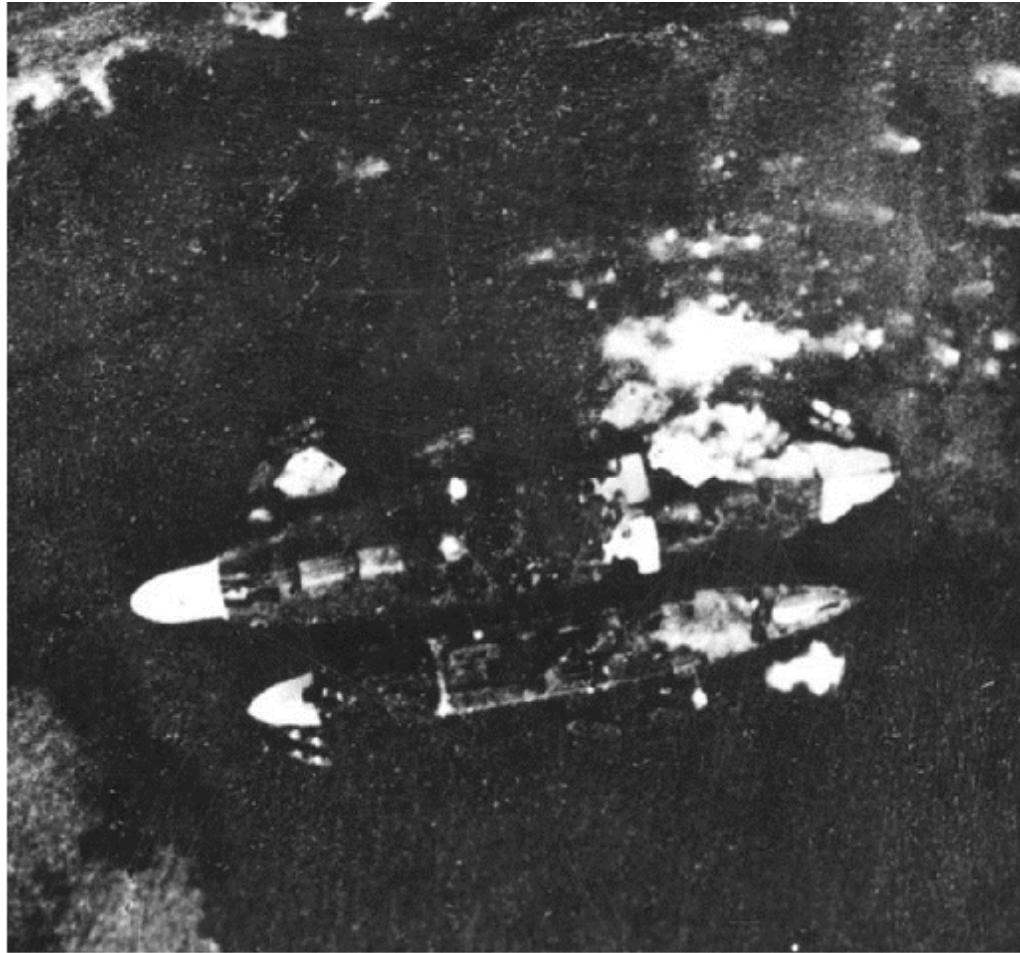
USS Nevada BB-36



Turret Tops

USS *Arizona*

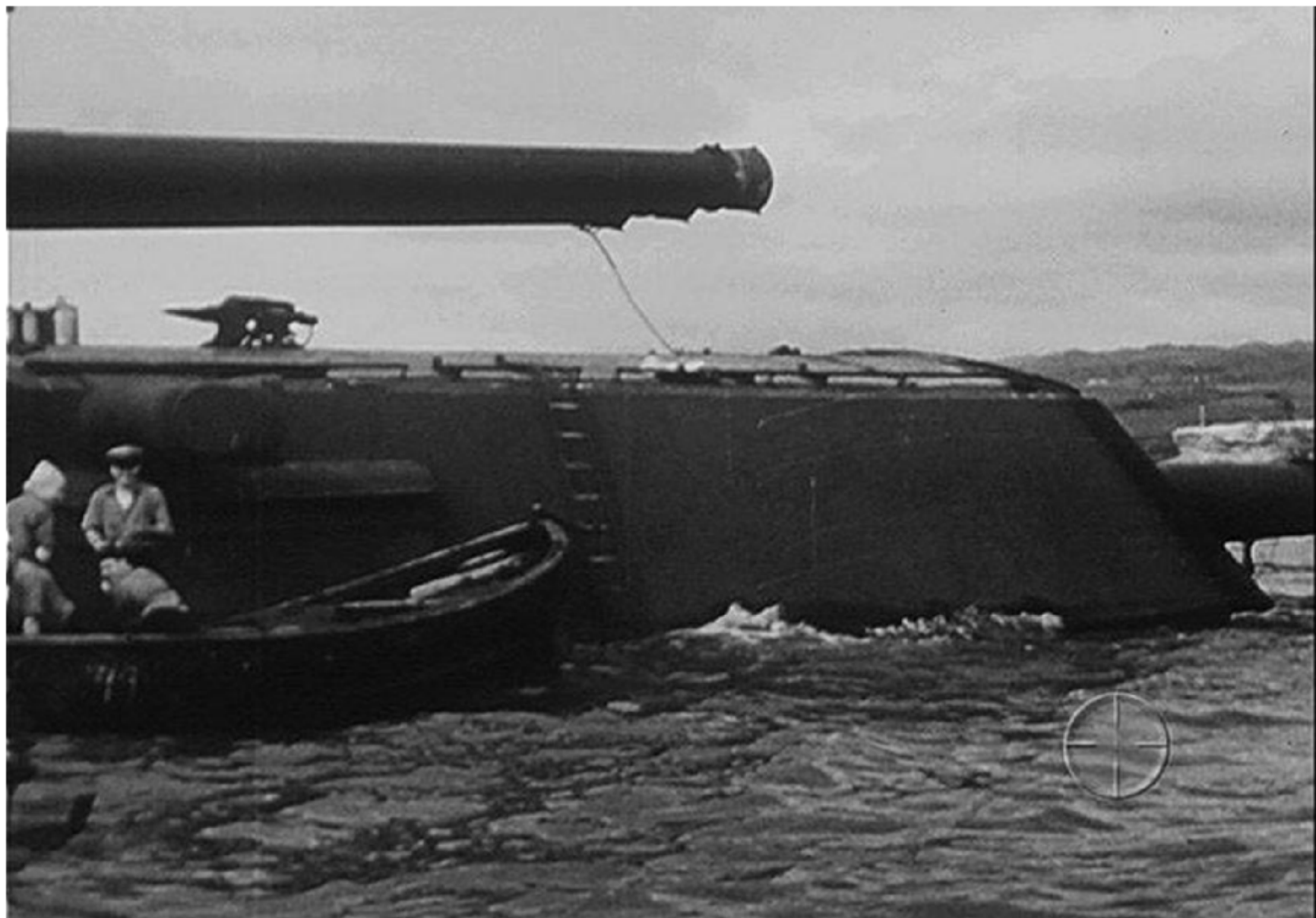
USS *Arizona* During the Attack



USS *Arizona* BB-39

After the attack







AGE OF THE BATTLESHIP

A symbol of national power and naval dominance, battleships are considered the mightiest weapons of war.

"There are many who believe the day of the battleship is over," Admiral William B. Forstie stated. "It is my opinion that who best this world knows what they are talking about." The United States, Japan, and other nations supported Forstie's view. They had recognized that the United States had the most powerful fleet of battleships in the world.

USS Iowa (BB-61) at sea, circa 1945. U.S. Navy.



YEAR OF SABOTAGE

The year 1941 was a year of sabotage for the United States Navy. The attack on Pearl Harbor on December 7, 1941, was a devastating blow to the fleet. The USS Iowa (BB-61) was damaged during the attack and spent several months in the shipyard for repairs.



"DEAR FAMILY, THIS IS MY BATTLE STATION"

USS Iowa (BB-61) at sea, circa 1945. U.S. Navy.

USS Iowa (BB-61) at sea, circa 1945. U.S. Navy.

USS Iowa (BB-61) at sea, circa 1945. U.S. Navy.

USS Iowa (BB-61) at sea, circa 1945. U.S. Navy.

EVOLUTION OF A BATTLESHIP

The evolution of the battleship has been a long and complex process. From the wooden-hulled ships of the 17th century to the modern steel-hulled ships of the 20th century, the battleship has evolved into a more powerful and versatile weapon of war.



BO. VGE

A symbol of naval dominance, battleships are considered the mightiest weapons of war.

"There are many who would say that the battleship is dead," Admiral William H. Pratt said. "It is my opinion that those who hold this view don't know what they are talking about." The United States, Japan, and other nations supported Pratt's view. They had negotiated treaties based on the loss of battleships. But despite their great firepower and armor, battleships were vulnerable to the new weapons—aircraft.

F SABOTAGE

The crew of the USS Arizona was...
...the ship was...
...the ship was...
...the ship was...

FAMILY... THIS BATTLE STATION

...the ship was...
...the ship was...
...the ship was...
...the ship was...

I have been on this ship since February and there lived parts of it that I have not been in yet. It is so big. I am sending you a picture of it ... (I have it marked on the picture where we stand watches.)

William S. ...
...the ship was...
...the ship was...

PAINT SCHEME

The Arizona's paint scheme served as camouflage. The light gray blended with the sky and the dark blue blended with the ocean, making it hard to identify the ship from a distance. Red paint on top of these gun barrels helped U.S. aircraft identify the ship as part of Battleship Division One.

MAIN BATTERY

A battleship's big guns were its main tactical strength. The Arizona's 14-inch, 51-caliber guns were mounted in four triple gun turrets. Each gun was 57 feet (18 m) long and weighed more than 70 tons.

HULL ARMOR

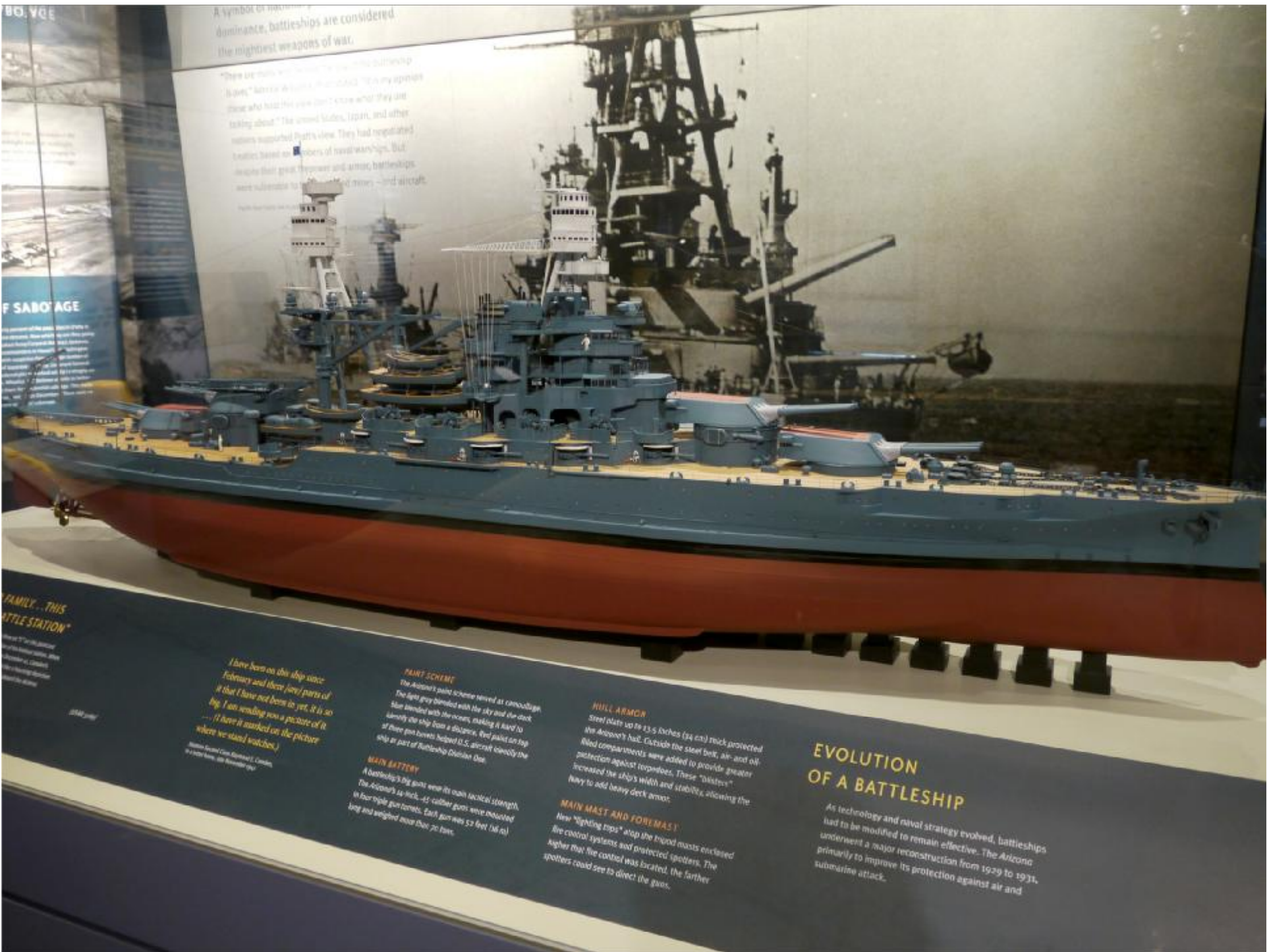
Steel plates up to 13.5 inches (34 cm) thick protected the Arizona's hull. Outside the steel belt, air- and oil-filled compartments were added to provide greater protection against torpedoes. These "blisters" increased the ship's width and stability, allowing the Navy to add heavy deck armor.

MAIN MAST AND FORE MAST

New "fighting tops" atop the tripod masts enclosed fire control systems and protected spotters. The higher that the control was braced, the farther spotters could see to direct the guns.

EVOLUTION OF A BATTLESHIP

As technology and naval strategy evolved, battleships had to be modified to remain effective. The Arizona underwent a major reconstruction from 1929 to 1931, primarily to improve its protection against air and submarine attack.





USS ARIZONA'S GUNS FIRED MASSIVE SHELLS

Smart training projectiles resemble the fired from the Arizona's biggest. These shells have the and were used. Each practice

Actual armor piercing projectiles fired from the Arizona's main battery weighed 4,500 pounds (675 kg). They were designed to destroy other and exploding below the armor could fire its 12 big guns at once, at targets up to 10 miles (6.2 mi) away.

THE ULTIMATE WEAPON OF WAR

The torpedo was unique among the weapons of the day in that it released the power of nuclear war with an explosion equivalent to...

FEAR OF SABOTAGE



...the attack on Pearl Harbor...