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CONFIDENTIAL REPORT
ON

TRIALS OF BRITISH ADMIRALTY AND
U.S. NAVY CAMOUFLAGE MEASURES.

OCTOBER 1944

BUREAU OF SHIPS
NAVY DEPARTMENT
WASHINGTON, D.C.

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Navy Department
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TRIALS OF BRITISH ADMIRALTY AND
U.S. NAVY CAMOUFLAGE MEASURES.

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- Reference:
- (a) ComNavEu Conf. Ser. X1804, Dated 10 May 1944.
 - (b) ALUSNA London Conf. Ltr. Serial No. L-319, dated 12 June 1944.
 - (c) CNO Conf. Ltr. Op23-1-CC, (SC)S19-7, Serial 0396223, dated 29 June 1944.
 - (d) BuShips Conf. Ltr. C-S19-7(330-332b) dated 8 August 1944 to CNO.
 - (e) CominCh Conf. Ltr. FF1/S19-7, Serial 02865, dated 18 August 1944.
 - (f) Naval Attache British Embassy Conf. Ltr. to 330 of 9 August 1944.
 - (g) BuShips Conf. Ltr. C-S19-7(330-332b) dated 4 Sept. 1944 to COTLANT.
 - (h) BuShips Conf. Ltr. to BuAer, S85-1(224) dated 9 Sept. 1944

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SECTION 1

ABSTRACT AND RESULTS OF TESTS

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Purpose of Trials - To evaluate the relative effectiveness of British and American Camouflage Measures under varied lighting and atmospheric conditions at sea.

Camouflage Measures Tested

1. British Admiralty System
 - A Type - General Purpose Design for all Fleet Units.
Object - to reduce visibility at dawn and dusk, and at night; to confuse inclination.
 - D Type - For Anti-Submarine Escort Vessels only.
Object - to delay sighting by surfaced submarines in darkness.

2. U.S. Navy Gradoc System (Measures 22 and 12)
Used predominantly in Atlantic.
Object - To give reduced visibility and range deception in bright weather when seen from bridge height or low angle aerial observation.

3. Pattern System (Measures 32 and 33)
Used predominantly in Pacific.
Object - Target angle deception, type deception, partial concealment.

Application of Camouflage Measures (Encl. (A))

Three WGT type Destroyer Escorts were painted respectively in the above mentioned camouflage systems. A different camouflage scheme was painted on the starboard and port sides of each:-

<u>Ship Designation</u>	<u>Camouflage Measure</u>	<u>Side</u>
1. A = DE-354 (KENNETH M. WILLET)	A=Admiralty A Design a=Admiralty D Design	Starboard Port
2. B = DE-353 (DOYLE C. BARNES)	B=USN Measure 12 b=USN Measure 22	Starboard Port
3. C = DE-355 (JACCARD)	C=USN Measure 32/3D c=USN Measure 33/3D	Starboard Port

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Description of Test Procedure

Continuous trials were held at sea in the Chesapeake Bay Area on the 2nd and 3rd of October 1944. Representatives of the British Admiralty and the U.S. Navy witnessed the exercises aboard the E. H. ALLEN (DE-531) and from the observation plane. Motion pictures and still photographs were made from the ship on both days and from the plane on the first day only.

The three camouflaged destroyer escorts operated in company according to previously planned maneuvers. During the trials, both the observing and observed ships kept detailed logs of course, relative bearing, range, visibility and weather conditions. (Section 4).

MANEUVERS (See Figs. 8 - 11)

Maneuver (A) - Planned primarily to test target angle deception, consisted of independent zig zag maneuvers on same general line of bearing. The courses of the three DEs were plotted on a random pattern capable of statistical analysis (See Section 3). Steaming together at 15 knots, the target ships followed the zig zag course consisting of nine legs - each four minutes in duration. When steady on each new course, the ships would flash a signal for the observers to make target angle, range estimate, etc.

On 2 October this maneuver was executed at 1536. The initial range was about 14000 yards. The ships were seen down sun. Weather, clear with moderate haze. Maximum visibility, about 7 miles. Maneuver A was repeated on 3 October at 0728 under overcast conditions. The initial range was about 10,000 yards. Maximum visibility about six miles.

Maneuver (C) - Countermarch maneuver designed to permit observers to make all possible comparisons of the six camouflage schemes under similar conditions.

The exercise was carried out on 2 October at 1640. Initial range - 6200 yards. Ships seen down sun. (Clear - hazy). Maximum visibility - 12,000 yards.

Maneuver (B) - Converging and diverging courses to determine relative visibility of target ships. Continuously from early evening on 2 October, through the morning of 3 October, the observation ship and target ships opened and closed ranges. Informal visibility observations were made during twilight, dusk, moonlight and dawn light.

On 2 October observations of maneuvers A and C were made from aircraft to view the camouflaged ships as they would be seen by distant enemy "snoopers" and attacking torpedo planes. The target ships were observed at varying altitudes, ranges and bearings from the sun.

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CONCLUSIONS

1. The British Admiralty Camouflage Measures reduced the surface visibility of the ship under the conditions for which they were planned - at dawn, dusk and in overcast.
2. Illuminated by strong sun or moon light, the Admiralty Measures were more conspicuous than the USN Camouflage Measures - seen both from the surface and the air.
3. Compared with the USN Camouflage Measures, the Admiralty (A) Type Camouflage, had neither the range deception of Measures 12 or 22, nor the target angle deception of Measures 32 or 33. Care must be taken, however, in comparing Camouflage Systems essentially different in purpose and function.
4. It cannot be assumed that the findings of these trials, based on a limited range of conditions, would be valid for the visibility and operational conditions prevailing in other theatres of war.
5. It is believed that the test results warrant no modification of the U.S. Navy's existing camouflage directives.

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RECOMMENDATIONS

1. It is recommended that further controlled trials be held at sea in critical areas or in latitudes where corresponding visibility conditions prevail.
2. Whenever possible, observations should be made of ships in training, convoy, and combat areas to determine the camouflage effectiveness under a wide variety of conditions.
3. It is considered imperative that seagoing camouflage be designed to meet the operational requirements of a vessel as to time, place and mission.
4. It is recommended that definite arrangements be made for collaboration with the British Admiralty on matters of camouflage policy concerning such Theatres where both Navies might operate together.