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## SUMMARY OF STATISTICAL ANALYSIS

Based on Shipboard Observations of Maneuver (A) - 3 October 1944.

### CONCLUSIONS ON TARGET ANGLE DECEPTION (Ships Seen on Overcast Morning)

1. Pattern Measures 32 and 33 had the greatest overall positive target angle deception. The DE-355 was most deceptive when seen at angles on the bow of  $0^{\circ}$  to  $20^{\circ}$ , starboard or port. These measures were more effective at closer ranges. The use of binoculars tended to increase the deception. There was no difference between Measures 32 and 33.
2. Graded Measures 12 and 22 were intermediate between the Pattern Measures and Admiralty types. From bow angles, they showed no deception whatever. When viewed from angles of  $20^{\circ}$  to  $60^{\circ}$  however, they were just as deceptive as the Pattern Measures. There was no difference between Measures 12 and 22.
3. The Admiralty Types A and D were least deceptive. There was no difference in confusion of inclination between Types A and D. The bow views were as deceptive as the port and starboard views. Both measures were about equally effective at greater or lesser ranges.

### REDUCTION OF VISIBILITY AND RANGE DECEPTION (Ships Seen Down Sun in Afternoon)

Based on Shipboard Observations of Maneuver C - 2 October 1944.

1. All observers agreed that the Graded Measures were better than the Admiralty, and that there was no significant difference between the Admiralty and Pattern Measures.

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CONSENSUS OF SHIPBOARD  
OBSERVERS' OPINIONS

OPINIONS OF INDIVIDUAL MEASURES

A - ADMIRALTY MEASURES (DE-354)

- Most conspicuous down sun, down moon. - Lt.Comdr. Evans, USNR; Lt.Comdr. Williams, RN; Lt.Comdr. Ingle, USN; Lt. Oates, RNVR; Dr. Warner; Lt. Brown, USNR.
- Best reduction of visibility at dawn and dusk. Lt.Comdr. Evans; Lt.Comdr. Williams, RN; Lt. Richards, RN; Lt. Oates, RNVR; Lt. Buck, USNR; Lt. Rucknick, USNR; Mr. Walter; Mr. O'Hara; S. Kagy, SP(X)2C; Lt. Brown, USNR.
- Reduction of visibility in overcast. Lt. Oates, RNVR; Dr. Warner; Mr. O'Hara
- Best range deception at dawn and dusk. Lt. Richards, RN
- Best range deception at night. (Appeared closer). Lt. Asplund, USNR
- White mast least visible dawn, dusk. Lt. Richards, RN
- White mast conspicuous in bright light. Lt. Buck, USNR; Lt. Asplund, USNR; Lt. Richards, RN; S. Kagy, SP(X)2C.
- No target angle deception. Lt.Comdr. Williams, RN; Lt. Richards, RN
- No type deception. Lt.Comdr. Williams, RN; Lt. Richards, RN.
- Effective at night and under haze conditions.- Lt.Comdr. Evans.

B - Graded Measures 12 and 22 (DE-353)

- Best reduction of visibility down sun.- Lt.Comdr. Evans, USNR; Lt.Comdr. Williams, RN; Lt. Richards, RN; Lt. Buck, USNR; Lt. Rucknick, USNR; Mr. Walter; S. Kagy, SP(X)2C; Lt. Brown, USNR.
- Best in range deception down sun, moon. Lt.Comdr. Auld, USN; Lt. Richards, RN; Lt. Buck, USNR; Lt. Brown, USNR.
- Ineffective at dawn, dusk. Lt.Comdr. Williams, RN; Lt. Richards, RN; Lt. Brown, USNR

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Authority JND 803073

- No target angle deception.  
Lt. Comdr. Williams, RN; Lt. Brown, USNR.
- Most conspicuous in gray weather.  
Lt. Cowden, USNR; Dr. Warner; Mr. O'Hara; Lt. Brown, USNR.
- Measure 12 better than Measure 22.  
Dr. Warner; S. Kagy, SP(X)2C, USNR.
- Most most visible at dawn, dusk.  
Lt. Richards, RN.

C - Pattern Measures 32 and 33 (DE-355)

- Less conspicuous than Admiralty A down sun, moon.  
Lt. Comdr. Williams, RN; Lt. Comdr. Ingle, USNR;  
S. Kagy, SP(X)2C.
- Less conspicuous than B at dawn and dusk.  
Lt. Comdr. Williams, RN; Lt. (jg) Buck, USNR.
- Best target angle deception.  
Comdr. Stinchcomb, USN; Lt. Comdr. Williams, RN; Lt. Richards,  
RN; Lt. Buck, USNR; Lt. Cowden, USNR; Lt. Asplund, USNR;  
Dr. Warner; Mr. O'Hara; Mr. Walter; S. Kagy, SP(X)2C; Lt. Brown,  
USNR.
- Best in type deception.  
Lt. Comdr. Williams, RN; Lt. Comdr. Auld, USNR; Dr. Warner;  
S. Kagy, SP(X)2C; Lt. Brown, USNR
- Most most visible at dawn, dusk.  
Lt. Richards, RN.
- Best range deception.  
Lt. Ruckmick, USNR.
- Best in disruption.  
Lt. Comdr. Evans, USNR.
- Conspicuous in moonlight.  
Sailor on DE-354.
- Effective at considerable ranges.  
Lt. Comdr. Evans, USNR.

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### General Observations

- Test results not considered applicable to other conditions of weather, locale, etc.  
Comdr. Stinchcomb, USN; Lt. Comdr. Williams, RN; Lt. Comdr. Auld, USNR; Lt. Comdr. Evans, USNR; Lt. Oates, RNVR; Dr. Warner; Mr. O'Hara; S. Kagy, SP(X)2C.
- Observations confirmed theoretical predictions.  
Lt. Comdr. Williams, RN; Lt. Comdr. Evans, USNR; Lt. Oates, RNVR; Mr. O'Hara.
- All camouflage not comparable. - Dr. Warner;  
Lt. Comdr. Evans, USNR.
- Preference for course deception patterns.  
Commander Stinchcomb, USN;
- Achromatic Schemes recommended.  
Lt. Comdr. Evans, USNR.
- Need for Fleet Camouflage Observer.  
Lt. Comdr. Evans, USNR.
- Each measure good under certain conditions.  
Lt. Comdr. Evans, USNR; Lt. Brown, USNR.
- Further tests at sea under operational conditions by camouflage observers recommended.  
Lt. Comdr. Evans, USNR.
- Camouflage designs should be based on knowledge of operational conditions of vessels.  
Lt. Comdr. Evans, USNR; Lt. Brown, USNR.
- Use of variety of designs recommended.  
Lt. Brown, USNR; Mr. O'Hara.

General Observations

- Test results not considered applicable to other conditions of weather, locale, etc.  
Comdr. Stinchoomb, USN; Lt. Comdr. Williams, RN; Lt. Comdr. Auld, USNR; Lt. Comdr. Evans, USNR; Lt. Oates, RNVR; Dr. Warner; Mr. O'Hara; S. Kagy, SP(X)2C.
- Observations confirmed theoretical predictions.  
Lt. Comdr. Williams, RN; Lt. Comdr. Evans, USNR; Lt. Oates, RNVR; Mr. O'Hara.
- All camouflage not comparable. - Dr. Warner;  
Lt. Comdr. Evans, USNR.
- Preference for course deception patterns.  
Commander Stinchoomb, USN;
- Achromatic Schemes recommended.  
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Lt. Brown, USNR; Mr. O'Hara.

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CONSENSUS OF AERIAL OBSERVERS' OPINIONS

Based on observations of tests between 1445 and 1750 on  
2 October 1944.

Weather - Clear, with pronounced haze.

Wake seen first.

Down Sunlight - USN graded measures least visible.

Ship 1 (Admiralty) picked up first.

Ship 3 (Pattern) picked up second.

Ship 2 (Graded) picked up last.

Cross Sun - USN graded measures least visible.

Ship 1 (Admiralty) picked up first.

Ship 3 (Pattern) picked up second.

Ship 2 (Graded) picked up last.

Up Sun -

All ships equally visible.

Ship 3 (Pattern) had strong target angle deception at altitude  
of 200 ft. None at 2000 ft. altitude.

Deck paint, (20% Gray), of Ship 1 (Admiralty) was more visible  
than Deck Blue (5%) of Ships 2 and 3. (Graded and Pattern)

No appreciable difference between sides of same vessel.

Ship 3 (Pattern) most difficult to pick up at altitude of  
2000 ft. Under the test conditions, Ship 3 (Pattern) was  
least conspicuous at higher altitudes and longer ranges.

Ship 2 (Graded) best under most conditions at low altitudes.

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SECTION 2

OPINIONS OF OBSERVERS

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NAMES OF OBSERVERS

OBSERVATIONS ON FACE

British Admiralty

Aboard Ship

|                         |    |
|-------------------------|----|
| Comdr. Rebbeck, RN      | 16 |
| Lt. Comdr. Williams, RN | 16 |
| Lt. Richards, RN        | 16 |
| Lt. Oates, RNVR         | 17 |

U. S. Navy

Aboard Ship

|                          |    |
|--------------------------|----|
| Comdr. Bittinger, USNR   |    |
| Lt. Comdr. Evans, USNR   | 18 |
| Lt. Comdr. Catlin, USNR  |    |
| Lt.(jg) Brown, USNR      | 21 |
| Lt.(jg) Buck, USNR       | 20 |
| Lt.(jg) Rubenstein, USNR |    |
| Dr. Warner               | 17 |
| Mr. O'Hara               | 20 |
| Mr. Walter               | 23 |
| SP(X)2C                  | 23 |

In Plane

|                          |    |
|--------------------------|----|
| Comdr. Hoffman, USN      | 24 |
| Lt. Comdr. Aldrich, USNR | "  |
| Lt. Lingle               | "  |
| Lt. McCray               | "  |
| SP(X)3C Clark            | "  |

Cooperating Officers

COTCLANT

|  |    |
|--|----|
| Capt. Beck, USN                                  |    |
| Comdr. Stinchcomb, USN<br>(Task Group Commodore) | 24 |

Destroyer Escort Captains

|                           |    |
|---------------------------|----|
| Lt. Comdr. Auld (531)     | 24 |
| Lt. Comdr. Ingle (353)    | 24 |
| Lt. Comdr. Flynn (354)    |    |
| Lt. Comdr. Hamilton (355) |    |

Camera Direction

|                      |    |
|----------------------|----|
| Lt. Rucknick, BUAER  | 25 |
| Lt. Shafton, BUSHIPS |    |