OBSERVED SUICIDE ATTACKS 
BY JAPANESE AIRCRAFT 
AGAINST ALLIED SHIPS

Instructors Reading this Document

Sign Below (File No. .........)

Name __________________________ Date __________

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23 May 1945
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STANDARD AIG DISTRIBUTION 
WITH ENCLOSURE ADDED

AIR INTELLIGENCE GROUP 
DIVISION OF NAVAL INTELLIGENCE 
OFFICE OF THE CHIEF OF 
NAVAL OPERATIONS, NAVY 
DEPARTMENT, WASHINGTON, D.C.

6 AUG 1945
MEMORANDUM

From: Air Intelligence Group.
To: Addressees Listed.

SUBJECT: Observed Suicide Attacks by Japanese Aircraft Against Allied Ships.

Enclosure: (A) Summary of Observed Suicide Attacks by Japanese Aircraft Against Allied Ships during May and June 1945, as Reported in Dispatches, and Recap of Suicide Attacks for the Period October 1944 through June 1945.

1. A study has been made of suicide attacks by Japanese aircraft during the period October 1944 - April 1945 inclusive for the purpose of determining from the evidence at hand the characteristics and success of this tactic as employed by the Japanese.

2. On the basis of this study the following tentative conclusions have been reached:

(a) A minimum of 173 suicide attempts were made in April 1945 as compared with 45 attempts in October 1944.

(b) In the period October 1944 through March 1945, a total of 356 suicide crashes were attempted, 130 (or 39%) of which resulted in hits, and 59 (or 17%) in damaging near misses. A total of 130 ships were hit of which 20 were sunk. Provisional data for April obtained from dispatches show a minimum of 173 attempts. A total of 106 hits was scored on 87 ships of which 5 were sunk. Damaging near misses totaled 17.

(c) Attacks with some measure of coordination on specific ship targets may be a developing feature of suicide air attacks.

(d) There has been a significant increase in the proportion of destroyers in the total of combatant ships hit by suicide air attacks, indicating either that Japanese suicide pilots are attacking targets of opportunity or that such attacks on destroyers are part of a tactical plan.

(e) Battleships have been more successful in protecting themselves from suicide attacks than any other type of ship. Merchant vessels have been the least successful. Large carriers have been more susceptible to damage than any other type of naval vessel.

(f) Credit for approximately 80% of all plane kills by AA in suicide actions goes to the automatic weapons, with 40 mm approximately twice as effective as 20 mm.

* Reprinted 5 July 1945 for Air Intelligence Group Distribution with Enclosure (A) Dated 5 July added.
(g) From October 1944 through 21 January 1945 no raid by a single group of enemy planes succeeded in putting any aircraft over our task groups in position to make suicide dives. However, almost all raids consisting of two or more separated groups succeeded in putting some planes over our task groups in position to make suicide dives.

(h) Greater emphasis is now being placed on the low approach, although attacks from altitude at a 40-50 degree glide angle are still employed.

(i) Excellent use of deceptive tactics has been noted.

(j) Although the rocket propelled piloted suicide aircraft (Baka) has been employed on a few occasions to date, it is not possible to evaluate the effectiveness of this weapon in the case of a multiple coordinated attack until further data is available.

Distribution

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<td>5</td>
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<td>Navy Liaison Officer, Orlando, Fla.</td>
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<td>OpIntel, ComAirPac</td>
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<td>Marine Aviation (Capt. King)</td>
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<td>War College</td>
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Standard Air Intelligence Group Distribution List
OBSERVED SUICIDE ATTACKS
BY JAPANESE AIRCRAFT AGAINST ALLIED SHIPS

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AIR INTELLIGENCE GROUP
DIVISION OF NAVAL INTELLIGENCE
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
NAVY DEPARTMENT
WASHINGTON, D.C.
1. Introduction.

From 1 October, 1944 through 30 April, 1945 a minimum of 529 observed suicide attempts were made by Japanese aircraft against Allied ships.

This report summarizes the available data covering the scope and effectiveness of Japanese suicide air attacks, and discusses in some detail enemy air tactics, and countermeasures developed by the Fleet to combat this form of attack.

2. Scale of Effort.

The information presented in the following tables and accompanying text reflect the increasing importance attached by the enemy to the suicide type of attack, as well as the extent to which it is being fashioned into a deliberate and persistent form of warfare.

### Table I

<table>
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<tr>
<th></th>
<th>1944</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th>TOTAL</th>
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<td></td>
<td>OCT.</td>
<td>NOV.</td>
<td>DEC.</td>
<td>JAN.</td>
<td>FEB.</td>
<td>MAR.</td>
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<td>Suicide Attempts</td>
<td>42</td>
<td>73</td>
<td>97</td>
<td>99</td>
<td>17</td>
<td>27</td>
<td>356</td>
</tr>
<tr>
<td>Suicide Hits</td>
<td>18</td>
<td>28</td>
<td>33</td>
<td>42</td>
<td>8</td>
<td>11</td>
<td>140</td>
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<tr>
<td>% Suicide Hits</td>
<td>42%</td>
<td>38%</td>
<td>34%</td>
<td>42%</td>
<td>47%</td>
<td>41%</td>
<td>39%</td>
</tr>
<tr>
<td>%Damaging Near Misses</td>
<td>7</td>
<td>11</td>
<td>13</td>
<td>22</td>
<td>2</td>
<td>4</td>
<td>59</td>
</tr>
<tr>
<td>% Damaging Near Misses</td>
<td>16%</td>
<td>15%</td>
<td>13%</td>
<td>22%</td>
<td>12%</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>% Hits or Damaging Near</td>
<td>5%</td>
<td>53%</td>
<td>47%</td>
<td>64%</td>
<td>59%</td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>Ships Hit</td>
<td>17</td>
<td>26</td>
<td>30</td>
<td>42</td>
<td>4</td>
<td>11</td>
<td>130</td>
</tr>
<tr>
<td>Ships Sunk</td>
<td>3</td>
<td>2</td>
<td>11</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>20</td>
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</tbody>
</table>

The data for Table I were obtained from AA action reports. A study of dispatches covering the month of April reveals a significant increase in the Japanese suicide effort. 173 suicide attempts were reported, 106 of which (or 61%) scored hits, while 17 (or 10%) scored damaging near misses. 87 ships were hit of which 5 were sunk. These figures have not been included in the above table because they are necessarily tentative and subject to revision — particularly as to the number of suicide attempts reported, and the division of enemy successes into hits and damaging near misses. Thus an incomplete survey of AA action reports for the month of April shows 64 attempts (of which 2 were by Baka), 25 hits (39%), 12 damaging near misses (19%), and 19 ships hit of which 5 were sunk. Both Baka attempts in April resulted in hits.

* The data for October through January were taken from Anti-Aircraft Action Summary - April 1945.
TABLE II

<table>
<thead>
<tr>
<th></th>
<th>1944</th>
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<tr>
<td></td>
<td>OCT.</td>
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<tr>
<td>Total Enemy A/C Taken Under AA Fire</td>
<td>510</td>
<td>282</td>
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<tr>
<td>Suicide Attempts</td>
<td>43</td>
<td>73</td>
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<tr>
<td>% Suicide Attempts</td>
<td>8.5%</td>
<td>26%</td>
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</table>

Table II, based on data collected from AA action reports, shows that the proportion of attempts in which the pilot was committed to a suicide attack to total enemy aircraft taken under fire increased from 8.5% in October 1944 to 30% in December 1944 and January 1945. Data are not yet available for a continuation of this table, but available information indicates that the ratio of suicide effort to total enemy offensive air effort has, if anything, increased still further in recent months.

TABLE III

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>BB</td>
<td>5 (8%)</td>
<td>4 (6.5%)</td>
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<tr>
<td>CA-CL</td>
<td>13 (21%)</td>
<td>1 (1.6%)</td>
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<tr>
<td>CV</td>
<td>9 (14%)</td>
<td>10 (16%)</td>
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<tr>
<td>CVL</td>
<td>2 (3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>CVE</td>
<td>12 (19%)</td>
<td>4 (6.5%)</td>
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<tr>
<td>DD</td>
<td>22 (35%)</td>
<td>43 (70%)</td>
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<tr>
<td>TOTAL</td>
<td>63 (100%)</td>
<td>62 (100%)</td>
</tr>
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</table>

In Table III data obtained from AA action reports are compared with the result of a study of despatch reports covering February - April 1945. This comparison reveals a significant increase in the proportion of destroyers in the total of combatant ships hit by suicide air attacks. To interpret this increase would require additional information concerning the tactical situation at the time of the attacks. One possible explanation is that pilots taking off on deliberate suicide missions are being briefed to attack targets of opportunity, among which destroyer pickets would be prominent. On the other hand, briefing may point specifically to destroyer targets with an ultimate tactical purpose to be gained.

* Anti-Aircraft Action Summary - CominCh P-009 April 1945.
<table>
<thead>
<tr>
<th>TYPE SHIP</th>
<th>H</th>
<th>D</th>
<th>S</th>
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<td>12</td>
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<td>0</td>
</tr>
<tr>
<td>CVL</td>
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<td>7</td>
<td>3</td>
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<tr>
<td>BB</td>
<td>9</td>
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<td>0</td>
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<tr>
<td>CA &amp; CL</td>
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<td>0</td>
</tr>
<tr>
<td>DD</td>
<td>56</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>DE</td>
<td>8</td>
<td>1</td>
<td>0</td>
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<tr>
<td>ISMechaniz.</td>
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<tr>
<td>LST Tank</td>
<td>12</td>
<td>9</td>
<td>5</td>
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<tr>
<td>LCI Inf.</td>
<td>7</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>LCS</td>
<td>6</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Merchant</td>
<td>24</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Other Craft</td>
<td>57</td>
<td>12</td>
<td>9</td>
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<tr>
<td>(YMS, AM, DMS, AV, APA, AKA)</td>
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</table>

H = Number of ships receiving at least one suicide A/C hit.
D = Number of ships receiving only a damaging near miss.
S = Ships sunk as result of suicide crash.

**Cruisers (Cont.)**

<table>
<thead>
<tr>
<th>CVE (Cont.)</th>
<th>CRUISERS (Cont.)</th>
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<td>KATASHAN BAY</td>
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<td>SAGINAW BAY</td>
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<td>LUNA POINT</td>
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<tr>
<td>BISMARCK SEA</td>
<td>D (Sunk)</td>
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<td>AMORE</td>
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<td>ANDERSON</td>
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<td>R.P. LEARY</td>
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<td>ROSS</td>
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<td>AULICK</td>
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<td>DRAYTON</td>
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<td>MUGFORD</td>
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<td>IDAHO</td>
<td>MAHAN</td>
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<tr>
<td>NEW YORK</td>
<td>HHH (Sunk)</td>
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<tr>
<td>BATTLESHIPS</td>
<td>CLAXTON</td>
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<td>BUSH</td>
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<td>DDHH</td>
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<td>BRYANT</td>
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<td>WAKE</td>
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<td>MONTPELLIER</td>
<td>O'BRIEN</td>
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<td>ST. LOUIS</td>
<td>HH</td>
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<td>NASHVILLE</td>
<td>BUSH</td>
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**Destroyers**

H = Hit
D = Damaging Near Miss
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<td>MADDOX</td>
<td>LOWRY</td>
<td>LCI 407</td>
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<td>KIMBERLY</td>
<td>HUDSON</td>
<td>LCI 580</td>
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<td>H. POWELL</td>
<td>CALLAGHAN</td>
<td>LCI 82 (G) H (Sunk)</td>
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<tr>
<td>MULLANY</td>
<td></td>
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<tr>
<td>NEWCOMBE</td>
<td></td>
<td></td>
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<tr>
<td>GREGORY</td>
<td>STAFFORD</td>
<td>LST 693 D</td>
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<tr>
<td>HYMAN</td>
<td>HODGES</td>
<td>LST 66 H</td>
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<tr>
<td>KIDD</td>
<td>LEROY WILSON</td>
<td>LST 737 H</td>
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<tr>
<td>ZELLAWS</td>
<td>GALLIGAN</td>
<td>LST 909 D</td>
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<tr>
<td>LAFFREY</td>
<td>R.W. SUESSENS</td>
<td>LST 670 D</td>
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<td>H. YOUNG</td>
<td>FOREMAN</td>
<td>LST 472 H (Sunk)</td>
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<td>PURDY</td>
<td>FIBERLING</td>
<td>LST 738 H (Sunk)</td>
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<td>WESSON</td>
<td>LST 460 H (Sunk)</td>
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<td>MILES</td>
<td>LST 749 H (Sunk)</td>
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<td>RIDDLE</td>
<td>LST 1014 D</td>
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<td>STANLEY</td>
<td>BOWERS</td>
<td>LST 205 D</td>
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<tr>
<td>HAYNESWORTH</td>
<td>BUTLER</td>
<td>LST 912 D</td>
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<td>INGRAHAM</td>
<td>RALL</td>
<td>LST 700 HD</td>
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<tr>
<td>LSUTZE</td>
<td>WITTER</td>
<td>LST 268 D</td>
</tr>
<tr>
<td>BENNETT</td>
<td>SEDERSTROM</td>
<td>LST 579 D</td>
</tr>
<tr>
<td>COLLINS</td>
<td>ENGLAND</td>
<td>LST 599 H</td>
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<tr>
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<td>LUCE</td>
<td>LST 824 D</td>
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<tr>
<td>ISHERWOOD</td>
<td></td>
<td>LST 884 H</td>
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<td>HAGGARD</td>
<td></td>
<td>LST 447 H (Sunk)</td>
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<tr>
<td>HAZELWOOD</td>
<td></td>
<td>LST 477 H</td>
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<tr>
<td>TWIGGS</td>
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<td>LSM 23 H</td>
<td>LCS 116 H</td>
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<td>STERETT</td>
<td>LSM 318 (Sunk)</td>
<td>LCS 31 DD</td>
</tr>
<tr>
<td>BEALE</td>
<td>LSM 18 D</td>
<td>LCS 57 DD</td>
</tr>
<tr>
<td>WADSWORTH</td>
<td>LSM 194 (Sunk)</td>
<td>LCS 25 H</td>
</tr>
<tr>
<td>COWELL</td>
<td>LSM 190 (Sunk)</td>
<td>LCS(L)(3) H (Sunk)</td>
</tr>
<tr>
<td>HUDSON</td>
<td>LSM 195 (Sunk)</td>
<td>LCS 15 H (Sunk)</td>
</tr>
<tr>
<td>BENNISON</td>
<td>LSM 186 H</td>
<td>LCS 33 H (Sunk)</td>
</tr>
<tr>
<td>FRICKETT</td>
<td>LSM 189 H</td>
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<tr>
<td>MORRISON</td>
<td>LCI 65 H</td>
<td>Merchant 24 D 7</td>
</tr>
<tr>
<td>BACHE</td>
<td>LCI 1065 (Sunk)</td>
<td>Other Craft 52 9 9</td>
</tr>
</tbody>
</table>
3. Japanese Suicide Air Tactics.

Although, since 25 October, 1944, the suicide crash dive has become the standard form of Japanese air attack, there is little that is standard about the attack itself. Suicide tactics are far from static. They are continually being improved and varied and they are further complicated by the personal touch lent by each individual pilot. In brief, one of their great sources of danger lies in the fact that they are to a great extent unpredictable.

Enough evidence, however, has been gleaned from attacks to date to evaluate their general methods so that while a single instance may show startling deviations the average suicide sally will lie well within the stipulated bounds.

Viewed from the tactical aspect alone, this suicidal form of warfare falls into three phases: the rather sporadic, hit-or-miss methods that characterized the attacks in October; the well-organized and carefully planned attacks at and subsequent to Lingayen Gulf; and the new phase on which we are now entering in which new suicide craft like BAKA will be employed.

A study of the methods employed would seem to indicate that in the first phase the suicide weapon was more or less being tested with an eye to its subsequent use on a dangerously widespread scale. That this actually occurred a study of the second phase will show. Not only were the size and scope of attacks increased but the pilots appeared to be no longer of the relatively untrained class and many of them were superb both in evasive tactics and in the understanding of the principles needed to achieve success.

From these and subsequent attacks up to the present, it has been possible to make an evaluation of the major tactics now in use, making note however that these may not apply to attacks to be launched by BAKA or similar aircraft.

A. Approach:

1. Altitude

Greater emphasis is now being placed on the low approach. This provides:

a. Avoidance of early radar detection.
b. Avoidance of early visual detection by ships or planes.
c. Greater security from attack by planes as the attacking fighter risks plunging into the sea.
d. Greater security from ships' gunfire as the presence of some defending ships in the line of fire reduces A/A opposition.
e. Greater assurance of hitting a target ship, as the low flying plane cannot be thrown off so easily by maneuver as a plane in a long high dive.

By the low approach is meant an altitude ranging from 20 to 50 feet above sea level. A large number of attacks have been made so low as to leave a wake from the propellor wash.

The older methods of attack have not been entirely scrapped however. The Japanese still attack from the horizontal up to the vertical and still have a strong tendency toward the 40-50 degree glide angle. Especially is this true of attacks on carriers where the higher angle is more effective against carrier flight decks than is the low-level approach. However, a frequent tactic developing from the low approach is a rapid climb to altitude followed by a diving attack.

Approaches at more than 20,000 feet also take advantage of radar null areas.

Moreover, many suicide planes make a series of dives and climbs in their approach, rarely flying a straight course within 40 miles of the target ships.
2. Types

Approach types may be classified as follows:

a. Single - where one suicide plane or one group of suicide planes approach from one direction at approximately one altitude. This is frequently used when operating near coasts to take advantage of the radar null spots offered by land masses.

b. Double - where two groups of suicide planes (or one group which eventually breaks up into two groups) approach from different directions or different altitudes in the hope that planes will be vectored or ships' guns trained on only one of the groups allowing the other to come in more or less unopposed. In such cases, one group is usually larger than the other; the large group serving as a lure.

c. Multiple - where the group or groups divide into their component individual strength, making as many separate attacks as there are planes attacking. Since attacks of this form take advantage of all varying degrees of altitude, dive angle and direction, they are the most dangerous and complicated attacks of all. Simultaneous attacks with two or more planes bearing on the same target from different altitudes have proved highly effective.

3. Ruses

The Japanese have been quick to take advantage of carrier problems to permit sneak approaches. They include the following:

a. Using a form of IFF in an attempt to pose as a "friendly".

b. Following "friendlies" back to their parent carrier in the hope of being taken for a straggler.

c. Following a returning strike to take advantage of the radar null point behind its IFF.

d. Excellent use of weather, neighboring land masses or clouds. The use of clouds has been particularly outstanding.

e. Knowledge of a carrier's schedule so that the attack can be made when the carrier is launching or landing planes and is thus pointing into the wind.

B. Attack.

At the moment when the approach is completed and the attack begins, deception appears to be of paramount importance. Courses are taken that appear to lead to nearby ships or to pass safely by the formation. At short range these are changed suddenly and a ship which a split second before had the role of observer suddenly finds itself playing the lead. On occasions a plane has flown past or over a ship only to bank sharply and hit the same ship from the other direction.

Excellent use of the sun has been made by attacking planes.

In addition to the deception in the early stages of the attack, the suicide plane once committed to a particular ship is apt to weave or jerk violently to throw off gun solutions.
Once over or near the formation, the attack is made as speedily as possible to allow a minimum of time for A/A tracking.

C. Point of Aim.

In attacking aircraft carriers suicide pilots aim for planes spotted on the flight deck, seeking thereby to increase the size and intensity of the fire resulting from the fuel carried by their own and the carriers' planes.

When there are no planes on the flight deck the enemy attempts to crash into the island superstructure, or possibly the elevators.

The bridge, and superstructure aft, are favorite points of aim in attacks against small and lightly-armored ships. Radar installations and fire control centers have been frequent targets on large and small ships.

Because of damage by A/A and because of ship's speed and maneuvers, however, suicide planes have not always been able to hit the more vulnerable parts of their targets. Ships have been hit on their catwalks, gun tubs, hulls and on the side and stern, and at various points topside.

D. Equipment.

Suicide planes without a bomb load have been noted but these would seem to be in the minority. A bomb or two is usually carried, the 250 kilogram being the most common. Instances have been noted however where the crash of a plane was followed by a tremendous burst indicating a far greater amount of explosive carried. The comparatively low fuel requirements would make this possible.

There is substantial evidence to believe that some suicide planes attempt to score a double killing by dropping their bomb on one ship and crashing into another a short distance away. In most cases however, the bombs are carried into the target ship, having been previously fused to explode on impact.

Evidence of improved armor has been found on recently crashed suicide planes, offering part of the explanation as to why they are proving difficult to shoot down. Captured documents confirm this use of armor on suicide planes.

E. Future Employment.

Since suicide attacks in the past have been made from all angles, all altitudes and by many different types of enemy aircraft, it is difficult to foresee what new tactic can be added to their repertoire. No simultaneous mass attacks on several ships have been noted (i.e., each ship in a formation undergoing a simultaneous attack by four or five planes at different angles for a total of 50 or more planes diving at the same time) but this may well be a future development.

The key to the future, however, seems to depend a great part on the use of BAKA (the pilot-guided aircraft bomb). Although some BAKA have already been shot down or have been evaded by surface craft and other destroyed by aircraft which have also destroyed BAKA-carrying planes, enough evidence has not been amassed to portray its tactical use with any assurance.

It is thought apropos, however, to give here a brief description of BAKA as its capabilities become immediately evident.

BAKA is a small rocket-propelled glider aircraft designed to be carried aloft and released by a parent-bomber. The nose of this glider is a 2645-pound warhead loaded with 1135 pounds of trinitro-anisol. A pilot sits behind this nose, goes on oxygen as his parent-bomber carries him as high as 27,000 feet and then, when the glider is released, guides it, at least in
theory, into an enemy warship far below. Three rockets in the after fuselage section enable the pilot to increase the glider's range or to build up speed for a final impact. Two additional rockets may be fitted into the wings.

This new weapon appears to have a maximum range of 55 miles and a maximum speed of 618 miles per hour.

BAKA is a low winged monoplane with a narrow round fuselage and a flat, rectangular tail plane which terminates in twin square fins and rudders. The wing span is 16 feet 5 inches and the over all length is 19 feet 10 inches. The entire craft is sturdily constructed, the fuselage of aluminum alloy and the wings of fabric-covered stressed skin plywood.

Communications between the BAKA pilot and the parent-aircraft is possible only before it is launched. A walk-around oxygen bottle is good for 25 minutes at 26,000 feet.

The theoretical maximum horizontal range of BAKA when released at 27,000 feet is 55 miles. Fifty-two of these miles would be traveled at a glide speed of 229 miles per hour and at a glide angle of 5 degrees 25 minutes. During the remaining three miles, the use of rockets would accelerate the speed to 535 miles per hour in level flight with a corresponding increase in speed as the diving angle was increased.

At a 50 degree or greater diving angle, maximum speed would be 618 miles per hour. Whether rockets were used at the beginning or end of the run, or whether they were used to climb, would not appreciably affect the maximum range.

In attacking ships protected by heavy deck armor, it is presumed the rockets would be used at the end of the run in a torpedo approach in order to score a close to the water line hit. If launched from a distance, however, BAKA would be vulnerable to attack by fighters before reaching a position to effectively complete its own attack. Lacking maneuverability, BAKA could take but little evasive action in its unpowered glide and its only method of escape would be to fire one or more of its rockets. In this event, and also in the case of BAKA using its rockets at the start of its glide, the increased velocity secured from the rocket would dissipate before BAKA could reach its target and its final terminal velocity would be substantially decreased.

The following aircraft are believed to be suitable for launching BAKA or could be made satisfactory without major modifications: Betty 22, Helen 2, Peggy 1, Liz 11, Sally 2, Taizan, and Rita 11.

Since the simple and economical construction of BAKA should permit mass production, the only limiting factor would appear to be the number of parent-aircraft available. For this reason, the destruction of the parent aircraft would appear to be of extreme importance inasmuch as special fuselage modifications are undoubtedly necessary and a drastic cut in the available supply of BAKA carriers would render BAKA inoperative.

An attack on the parent-aircraft before BAKA could be launched within range would also nullify the use of this suicide weapon.

BAKA has already been employed in several attacks on U.S. Naval vessels but has proven vulnerable both to defending aircraft and anti-aircraft fire. In the absence, however, of information as to its use in multiple attack (i.e. several BAKA simultaneously attacking a single ship from different angles of approach or altitude) it is not possible at this time to evaluate the effectiveness of the weapon.
It is pointed out in reference (a) that the suicide air attack "represents by far the most difficult antiaircraft problem yet met by the Fleet. The psychological value of AA, which in the past has driven away a large percentage of potential attackers, is inoperative against the suicide plane." However, "at the present time ships are destroying more than 50% of all attacking suicide planes, as compared with 33.6% success against dive and torpedo attacks during the first half of 1944." The overall comment is made that "there is no reason to believe that Fleet AA will not make this type of attack, as it has others, unprofitable to the enemy." (p. 1-2).

**TABLE I.**

Summary of AA Action Reports

<table>
<thead>
<tr>
<th></th>
<th>1944</th>
<th></th>
<th></th>
<th>1945</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O.CT.</td>
<td>N.OV.</td>
<td>D.EC.</td>
<td>J.AN.</td>
<td>TOTA.</td>
</tr>
<tr>
<td>Enemy A/C taken under fire</td>
<td>510</td>
<td>282</td>
<td>320</td>
<td>332</td>
<td>1444</td>
</tr>
<tr>
<td>Suicide A/C taken under fire*</td>
<td>54 (11%)</td>
<td>79 (28%)</td>
<td>109 (34%)</td>
<td>110 (33%)</td>
<td>352 (24%)</td>
</tr>
<tr>
<td>Suicide A/C shot down clear before committed to crash</td>
<td>29 (53%)</td>
<td>40 (50%)</td>
<td>63 (58%)</td>
<td>46 (42%)</td>
<td>178 (50%)</td>
</tr>
<tr>
<td>Suicide A/C shot down clear after &quot; &quot; &quot; &quot;</td>
<td>11 (20%)</td>
<td>6 (8%)</td>
<td>12 (11%)</td>
<td>11 (10%)</td>
<td>40 (11%)</td>
</tr>
<tr>
<td>Suicide hits</td>
<td>18 (33%)</td>
<td>34 (42%)</td>
<td>51 (47%)</td>
<td>35 (32%)</td>
<td>138 (39%)</td>
</tr>
<tr>
<td>Damaging Near Misses</td>
<td>7 (13%)</td>
<td>11 (15%)</td>
<td>13 (12%)</td>
<td>22 (20%)</td>
<td>53 (15%)</td>
</tr>
<tr>
<td>Non-suicide A/C taken under fire</td>
<td>456 (89%)</td>
<td>203 (72%)</td>
<td>211 (66%)</td>
<td>222 (67%)</td>
<td>1092 (76%)</td>
</tr>
<tr>
<td>Non-Suicide A/C shot down clear</td>
<td>95 (21%)</td>
<td>16 (8%)</td>
<td>23 (11%)</td>
<td>22 (10%)</td>
<td>156 (14%)</td>
</tr>
<tr>
<td>Non-Suicide Hits</td>
<td>10 (2.2%)</td>
<td>1 (0.5%)</td>
<td>3 (1.4%)</td>
<td>9 (4%)</td>
<td>23 (2.1%)</td>
</tr>
</tbody>
</table>

Table I is tabulated from data furnished in Reference (a), pp 2-1, 2-2, and 2-4. Of particular interest are the differences between the percentages of suicide and non-suicide planes shot down clear of the target, and between the percentages of suicide and non-suicide planes scoring hits.

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The phrase 'suicide aircraft taken under fire' is broader than 'suicide attempts' as used in this study. The latter refers only to those aircraft known to have committed themselves to a crash attempt. The former phrase includes in addition a percentage of the aircraft shot down before their intent could be discovered corresponding to the percentage of aircraft of known intent which undertook a suicide crash. The number of suicide attempts in the narrow sense occurs in this table as the sum of suicide hits, damaging near misses and suicide aircraft shot down clear after committed to a crash.
The following comments are made in reference (a) on the data of Table II; "Battleships have been more successful in protecting themselves from suicide attacks than any other type of ship. ... This is unquestionably due to the greater fire power of these ships, better distribution of guns and less distraction from the AA problem. ... The very low success of merchant ships indicates that defense in the late stages of a suicide attack must be borne primarily by the target ships. ... Carriers, especially CV's have been more susceptible to damage than any other type of naval vessel. Always the primary target of suicide planes, CV's present a target so large that an attacking plane is almost certain to hit unless it suffers severe structural damage. CVE's, comparatively slow and lacking the fire power of their larger sisters, have nevertheless given a creditable performance." Table II covers the period October 1944 through January 1945.

TABLE III
(From Tables V & VI of Reference (a))

A. Suicide Actions*

<table>
<thead>
<tr>
<th>Ammunition Performance in AA Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planes Destroyed - By Ammunition Types</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td>October</td>
</tr>
<tr>
<td>November</td>
</tr>
<tr>
<td>December</td>
</tr>
<tr>
<td>January</td>
</tr>
<tr>
<td>TOTALS</td>
</tr>
</tbody>
</table>

Rounds Per Bird - By Ammunition Types

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-------------------------------------</td>
<td>----------</td>
<td>-------</td>
<td>-------</td>
<td>----------</td>
<td>------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>October</td>
<td>1,479</td>
<td>242</td>
<td>59</td>
<td>2,201</td>
<td>-</td>
<td>9,983</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>1,213</td>
<td>324</td>
<td>392</td>
<td>2,408</td>
<td>-</td>
<td>8,755</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>493</td>
<td>218</td>
<td>-</td>
<td>1,007</td>
<td>-</td>
<td>3,933</td>
<td>24,942</td>
</tr>
<tr>
<td>January</td>
<td>2,675</td>
<td>402</td>
<td>986</td>
<td>3,576</td>
<td>2,170</td>
<td>16,313</td>
<td>17,402</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>1,162</td>
<td>310</td>
<td>710</td>
<td>2,272</td>
<td>2,231</td>
<td>8,972</td>
<td>28,069</td>
</tr>
</tbody>
</table>

* This table provides data for actions in which at least one suicide crash was attempted, but some kills were planes not definitely identified as having suicidal intentions.
B. Non-Suicide Action

Planes Destroyed - By Ammunition Types

<table>
<thead>
<tr>
<th></th>
<th>5&quot; Com.</th>
<th>5&quot; VT</th>
<th>3&quot;/50</th>
<th>40mm.</th>
<th>1&quot;/1</th>
<th>20mm.</th>
<th>.50 Cal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>23.0</td>
<td>9.5</td>
<td>4.0</td>
<td>23.0</td>
<td>-</td>
<td>27.0</td>
<td>.5</td>
</tr>
<tr>
<td>November</td>
<td>1.5</td>
<td>1.0</td>
<td>-</td>
<td>6.5</td>
<td>-</td>
<td>5.5</td>
<td>1.0</td>
</tr>
<tr>
<td>December</td>
<td>5.0</td>
<td>6.5</td>
<td>9.5</td>
<td>-</td>
<td>-</td>
<td>8.0</td>
<td>-</td>
</tr>
<tr>
<td>January</td>
<td>4.0</td>
<td>3.0</td>
<td>-</td>
<td>7.5</td>
<td>-</td>
<td>10.0</td>
<td>1.5</td>
</tr>
<tr>
<td>TOTALS</td>
<td>33.5(21%)</td>
<td>20.0(13%)</td>
<td>4.0(3%)</td>
<td>46.0(29%)</td>
<td>-</td>
<td>50.5(32%)</td>
<td>3.0(2%)</td>
</tr>
</tbody>
</table>

Rounds Per Bird - By Ammunition Types

<table>
<thead>
<tr>
<th></th>
<th>5&quot; Com.</th>
<th>5&quot; VT</th>
<th>3&quot;/50</th>
<th>40mm.</th>
<th>1&quot;/1</th>
<th>20mm.</th>
<th>.50 Cal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>748</td>
<td>65</td>
<td>294</td>
<td>3,672</td>
<td>-</td>
<td>7,802</td>
<td>39,986</td>
</tr>
<tr>
<td>November</td>
<td>2,601</td>
<td>788</td>
<td>-</td>
<td>1,249</td>
<td>-</td>
<td>3,156</td>
<td>875</td>
</tr>
<tr>
<td>December</td>
<td>795</td>
<td>179</td>
<td>2,151</td>
<td>-</td>
<td>-</td>
<td>6,729</td>
<td>-</td>
</tr>
<tr>
<td>January</td>
<td>1,765</td>
<td>1,068</td>
<td>-</td>
<td>5,635</td>
<td>-</td>
<td>7,935</td>
<td>9,929</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>960</td>
<td>624</td>
<td>752</td>
<td>3,361</td>
<td>-</td>
<td>7,152</td>
<td>15,139</td>
</tr>
</tbody>
</table>

The following comments on this table are abstracted from reference (a): "Credit for approximately 80% of all plane kills in suicide actions goes to the automatic weapons (50% to 40mm. and 27% to 20mm.) leaving 20% to 5-inch batteries. ... Against planes in non-suicide actions, the 5-inch weapons were more successful, getting credit for 34% of the kills. ... Because the suicide attack presents a close-in AA problem, the preponderance of automatic weapon successes was to be expected. ... The poor performance of 5-inch batteries, exclusive of fire control considerations, may be credited to: (1) small 5-inch expenditures, especially during suicide attacks, a result of failure to open fire at maximum range. (2) Failure to use a sufficient proportion of VT fuzes." The report urges the importance of destroying the highest possible percentage of suicide aircraft by 5-inch fire since only in this way can the aircraft be caused to crash at a safe distance from the target ship.


The disposition of the carrier task force Combat Air Patrol in defense against enemy air attack is largely determined by the enemy's tactics, for it is the function of the CAP to intercept and turn back whatever thrusts may be made by groups of enemy planes. Formerly, the Japanese were likely to strike with large formations, in which dive and torpedo bombers would be convoyed by fighters. On interception, the destruction or scattering of the bombers alone would often be sufficient to turn back the raid. However, since the evident adoption of the crash dive as the standard form of enemy attack, all hostile aircraft - bombers and fighters - have become potential suicide divers. If any of these planes can penetrate the fighter defense to execute dives on our ships, the raid may be a success. The Japanese have, accordingly, modified their approach tactics in order to afford a better chance that some planes may get in to the force. Instead of single groups of raiders, several smaller groups, separated in bearing, altitude, and range, have on many occasions been sent out to attack. Whatever success the enemy has achieved in damaging carrier strike forces has been associated with the use of these tactics.

* This table provides data for actions in which no suicide dives were made and no planes shot down were identified as bent upon crashing ships.
The first suicide attacks on a large scale were made on 25 October, 1944. In the following months a number of attacks with skillfully coordinated split approaches were executed but the old blundering raids by single groups continued to appear — on several occasions as "fat, dumb, and happy" as in the past. It is a striking fact that in the period 25 October through 21 January only the coordinated raids achieved any success, as expressed in the following statements:

(a) No raid by a single group of enemy planes succeeded in putting any aircraft over a carrier strike group in position to make suicide dives.

(b) Almost all raids consisting of two or more separated groups succeeded in putting some planes over a carrier strike group in position to make suicide dives.

Data supporting these statements are presented in Table I. All raids of three or more aircraft directed at carrier strike groups in the period 25 October, 1944, through 21 January, 1945, are listed. Raids of single groups of enemy aircraft are entered in the first section of the table, and raids of two or more groups are entered in the second section, where the labeling of the groups — A, B, or C — indicates the chronological order of their approach to the force. The number of planes comprising each group is given, and their fate is shown in the columns giving the number tallyhoed by the CAP, the number shot down by CAP, the number penetrating to the force in position to make suicide dives, and the number which did in fact score suicide hits.

### TABLE I

**JAPANESE RAIDS AGAINST CARRIER STRIKE GROUPS**

*25 October, 1944 - 21 January, 1945*

<table>
<thead>
<tr>
<th>Date</th>
<th>Group</th>
<th>Number Enemy Aircraft</th>
<th>In Raid</th>
<th>Tallyhoed by CAP</th>
<th>Destroyed</th>
<th>Penetrated to Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 Oct. TU77.4.2 (CVE)</td>
<td>30</td>
<td>30</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>25 Oct. TU77.4.3 (CVE)</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5 Nov. TG 38.3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6 Nov. TG 38.3</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>13 Nov. TG 38.1</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>19 Nov. TG 38.2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>25 Nov. TG 38.3</td>
<td>12</td>
<td>12</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>16 Dec. TG 38.2</td>
<td>8</td>
<td>8**</td>
<td>8**</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>16 Jan. TG 38.3</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>21 Jan. TG 38.1</td>
<td>18</td>
<td>18</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>101</strong></td>
<td><strong>101</strong></td>
<td><strong>62</strong></td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Summary:** 100% of raiders tallyhoed
51% of raiders destroyed
0% of raiders penetrated to force

*Figures excluded from totals because CAP was impromptu or totally lacking because of engagement with Jap Fleet.**

** by outgoing strike planes at 120 miles from ship.
### Raids of Two or More Groups of Aircraft

<table>
<thead>
<tr>
<th>Date</th>
<th>Group</th>
<th>In Group</th>
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<th>Destroyed</th>
<th>Penetrated to Force</th>
<th>Suicide Hits***</th>
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**Summary:**
- 79% of raiders tallyhoed
- 51% of raiders destroyed
- 65% of raiders which were tallyhoed destroyed
- 39% of raiders penetrated to force

*figures excluded from totals since CAP was impromptu or totally lacking because of engagement with Jap Fleet.*

** Bettys and Franceses. Probably not a suicide raid.

***The numbers shot down by AA are outside the scope of this analysis.
The salient feature of Table 1 is the success achieved by the enemy with raids of several coordinated groups — 59% of the raiders penetrated to the force, where they did attack, or might have attacked if they had not turned back or been shot down by AA. Further analysis of the raids shows:

(a) 54% of the planes that penetrated to the force, i.e., 27 out of 50, had not been tallyhoed at all.

(b) 72% of the planes that penetrated to the force either had not been tallyhoed at all, or had not been tallyhoed till within 15 miles of the formation.

These results are evidently associated with the coordination of the raids, for once a tallyho was made, the CAP shot down about the same portion of planes sighted — 65% — as in the case of the single raids (61%). Jap planes got in primarily because they were not sighted by CAP fighters.

The problem of defense against these attacks is then concerned primarily with the chain of operations — detection, tracking, evaluation, fighter direction — whose end is the placing of CAP fighters in position to tallyho all of the enemy planes. Further analysis and description of the attacks listed in Table I B are presented in order to point out those characteristics which are typical of the successful suicide raids.

A. The Typical Suicide Raid on Fast Carrier Forces (Oct. 1944 - Jan. 1945)*

During the period 25 October 1944 through 21 January 1945 the typical suicide raid against a carrier strike force operating at sea showed careful planning and fair to skillful execution. The relatively small number of such attacks which have appeared may have reflected the amount of organization and planning necessary for these attempts. Some characteristic features are listed below with a further discussion of the more important points. The analysis is based on the raids against Carrier Task Forces through January 1945, but as shown in the appendix, the principal raid in February follows the same plan.

(a) The enemy planes proceeded directly along their courses without meandering, as if the location of the target ships was known and tactics were planned accordingly.

(b) The approach to the target fleet was made from the general direction of the nearest land.

(c) A single large group split at 80 to 100 miles from the target into a smaller group of 3 to 6 planes and a larger group of 6 to 15 planes. Then:

1. Both groups maneuvered to produce a separation in bearing, altitude and range.

2. The smaller group proceeded first, flying at medium altitude.

3. The larger group followed 10 to 20 minutes behind, flying at medium to high altitude on a somewhat different bearing.

(d) Both groups flew at relatively high speed.

* For a comprehensive survey of Japanese Suicide Air Tactics against all naval units for the extended period through April 1945 See Paragraph 3, Page 5.
(e) Both groups attained altitude beyond 60 miles range and through the major portion of their course approached in level flight or in a shallow glide. About 20 miles from the target the raiders pushed over into a steeper glide calculated to bring them over the force at an altitude of about 10,000 feet.

(f) One or both groups might fly in through clouds if they covered at least 5-6/10 of the sky and extend at least 4,000 feet in altitude.

(g) On reaching the target enemy planes attacked without hesitation. In carrier groups, carriers alone were attacked.

(h) On interception enemy planes refused combat, and immediately took evasive action. The favorite evasive maneuver was diving to the water or into clouds if any were nearby.

(i) The vast majority of the enemy aircraft were single engine planes, and of these most were fighters carrying wing bombs. The few twin engine planes seen were probably pathfinders or observers and not potential suicide divers.

B. Direction of Attack.

In the period October 1944 through January 1945, carrier groups at the time of approach of a suicide raid were, on the average, operating 75 miles from the nearest land. Most of the suicide attacks originated from the general direction of that land. For 8 of 10 attacks the bearing of approach lay within a sector 40° on either side of the bearing line of the nearest land. In no case did an attack come from a direction opposite to the direction of the nearest land.

C. Altitudes of Approach.

The following figure shows how the range of altitudes of approach varied with the
distance of the raid from the force during the period October 1944 through January 1945. For most of the attacks, the altitudes of both the larger and the smaller groups lay between the solid lines.

The dotted line in the figure represents the variation in altitude along the approach course of a typical raid. Altitude was usually attained early, though groups might delay climbing till within 70 miles of the force. No further climb was made. Instead, the raid either continued at the same altitude or entered a shallow glide. About 20 miles from the target a steeper letdown might be made. Variation in tactics was considerable here and fortuitous cloud cover over the force played an important part. One generalization which can be made is; groups of 4 or more raiders did not drop down to the water to make their final approaches at minimum altitude. The few single planes intercepted at low altitude by the Jack patrols were probably raiders diving away from a tallyho by the CAP.

D. Speed.

The ground speed of most of the raids was 170-210 knots. In most of the attacks the enemy had to fly against winds averaging 12-15 knots at sea level, so the air speeds were probably considerably greater than the ground speeds.

E. Deception.

Beyond the straightforward tactics outlined above, no particular deceptive measures seem to have been taken by the Japanese on these planned attacks, with the possible exception of the counterfeiting of our IFF. In many cases bogey indications were not distinguished from those of returning strikes, but it appears that much of this confusion was coincidental, since both friendly and enemy planes were both approaching from the nearest enemy land. The generally high altitudes chosen by the raiders precluded their trailing returning strikes, and their rather high speeds — usually considerably greater than those of returning friendlies — apparently indicates that they did not generally attempt to fly along over returning strikes in order to show as a merged plot on our search radar. Furthermore, every group of enemy planes which was tallyhoed or had penetrated to the force could be identified with a definite bogey plot obtained by some ship. It must be stressed again that these conclusions concern the period under analysis, and that data from later periods may reveal further changes in suicide tactics.
This incident is an early example of how the close coordination of two groups caused confusion which helped to get the first group in to the force. The plot and following account have been reconstructed from a study of all information given in ships' action reports and from the CAP ACA-1 form:

Single group splits at 105 miles. Group A proceeds at about 180 knots at 22,000 ft. altitude, Group B at about 140 knots at lower altitude.

At 1403 CAP Div. 1 vectored out toward A and B, then on same bearing, 260° T. Groups scissor, and CAP is sent after later group (B), at 1414 is about to intercept. But at 1414 A is slipping in, begins letdown from 20,000 ft., and is detected by FD ship. CAP is turned to chase A, almost catches up at 1423, but A gets in. Six planes appear in two elements, all make suicide dives, score 2 hits.

Meanwhile B slowly proceeds, CAP Div. 1 is sent out again, tallyhoes 5 Zeke at 13,000 ft. at 1431, shoots down 3. CAP Div. 2 vectored out, shoots down fourth. Fifth Zeke flees.

There was little or no cloud cover, and visibility aloft was unlimited.

Raid on TF 38, Midday 21 January, 1945

The raids on TF 38 around midday, 21 January, 1945, illustrate an attempt at coordination of attacks originating in different areas. On this date a large single raid approached the fleet from the direction of the Babuyan Islands and Luzon to the south while another raid of two loosely coordinated groups — a small one followed by a large one — approached directly from Formosa to the northwest. If neither of the two large groups had been intercepted they would have reached...
the fleet center simultaneously. However, with the division of the force into task groups, the CAP of TG 38.1 was free to stop the southern raid at a time when TG 38.3 was much occupied with the raid from Formosa. Because of the division of defensive concern, the two raids can be considered independently.
Eighteen fighter bombers — Tojos, Oscars, Zekes — stacked up from 5,000 to 8,000 feet approached on a straight course at a ground speed of 170 knots. The raid was easily intercepted by two divisions of CAP with a result typical for such an obvious approach. Fourteen of the bandits were destroyed, and three more were probably destroyed. None penetrated to the Task Group.

A single enemy plane, probably an observer, followed 30 miles behind the large group at a higher altitude. Its indication faded at about 45 miles, and the plane was never tallyhoed.

Cloud cover in the neighborhood of the interception was 4-8/10 from 2500 ft. to 3500 ft. An interesting feature of this raid is the direction of approach. The land nearest to TG 38.1 was Formosa, 112 miles to the northwest, but the Babuyan Islands, 120 miles to the south, were nearly as close, and it was evidently from this direction that the raid came.

**Raid on TG 38.3**

Group A Four fighters at high altitude were tracked in to the force. Because of nearby friendly indications this bogey was evaluated as friendly by many ships with the result that a division of CAP was sent out as a precautionary measure when the bogey was only 30 miles away. A tallyho was made at 12 miles, but the enemy group at 20,000 ft. was well above the CAP and penetrated to the formation. Two Zekes attacked at once (1209), one scoring a bomb hit, the other a suicide hit. The other two planes delayed their final approach until about 1235, when one dove to attack and the other flew overhead to observe.

The group almost flew over the strike picket to the west but was not detected by that ship’s radar, probably because of high altitude.

The ground speed of A increased from 190 knots at the beginning of its track to 210 knots near the end.

Group B Fifteen planes — Zekes, Hamps, Judys, Oscar, Tojo — sortied from Formosa at an altitude below 10,000 feet and at a speed of about 140 knots. Some 65 miles from their target they climbed to an estimated altitude of 16,000 feet and then came on in to the force in a long glide at a uniform ground speed of 210 knots. Seventeen miles from the force, at about 8,000 feet altitude, this raid was first tallyhoed by one of two divisions of CAP vectored out. In the ensuing mêlée, both divisions accounted for a total of 9 planes destroyed, but the remainder reached the force, where one more successful suicide hit resulted. It was apparently one of the planes tallyhoed that trailed friendlies to a picket destroyer to the northwest and there scored another suicide hit.

Cloud cover was 4/10, from 2,500 ft. to 3,500 ft.

The coordination of Groups A and B on this raid would have been very poor had not the second pair of planes in A delayed their final approaches until B was well on the way in. In other respects the approach tactics of A and B are typical.
Complete information covering this incident has not yet become available, but the excellent action report of the SARATOGA, CV-5, makes possible a consideration of some tactical aspects in the light of the previous analyses.

As the plot shows, a single group of bogeys was picked up at 1628 about 70 miles from TU 52.2.4 (SARATOGA plus 3 DD's). The speed of this group was about 140 knots. At a range of about 65 miles the raid split into groups A and B. A increased speed to 170 knots, turned, and headed directly for the Task Unit; B slowed to 90 knots, crossed the trail of A, and then flew on a crossing course at 120 knots.

During this time the SARATOGA had only two sections of airborne fighters - 4 VF - available for defense. One section was vectored out to A and at about 30 miles tallyhoed some or all of a group of about 8 planes flying at about 4,000' (quilt). Two bandits were shot down, but the remaining 6 continued on in and at 1703 made suicide attacks on the SARATOGA. The other section of CAP was vectored out to B, and a merged plot was obtained, but because of the heavy cloud cover no tallyho was made. The planes which attacked TU 52.2.4 at 1846 may have come from Group B.
Some individual points of interest are:

(a) Direction of Approach - On 21 February Iwo Jima could not have been the point of origin of a raid of this sort. The nearest likely land was Chichi Jima, 120 miles from the SARATOGA, and it was from the direction of Chichi Jima that the raid was first plotted.

(b) Altitudes and Clouds - Cloud cover was nearly 10/10 with mattress at 2-3,000 ft., quilt at 4-5,000 ft. Since both groups, A and B, used this dense cover, it is probable that the initial choice of approach — probably low on the water — was determined accordingly.

(c) Speed - The rather low speeds used may be associated with the use of cloud cover.

Finally, it is interesting to compare the tracks of this raid on 21 of February with those of the raid of 30 October on TG 38.4. The splitting, scissoring, direct approach of the faster group, and crossing approach of the slower group amount to the same general maneuver in both cases.
Observed Suicide Attacks by Jap Aircraft Against Allied Ships as Reported in Dispatches.

MAY, 1945

Suicide Attempts Reported: 108
Ships Hit: 60
Hits on Ships: 80
Damaging Near Misses: 23
Ships Sunk: 10

* Attempts which do not result in a hit or damaging near miss are often not reported by dispatch. A study of AA Action Reports, October 1944 through March 1945 reveals that 56% of all suicide attempts resulted in a hit or damaging near miss. Applying this percentage to the 105 hits and damaging near misses reported for May, it appears possible that between 180 and 190 attempts were actually made.

Results of Suicide Attempts by Type of Ship Attacked

MAY, 1945

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<th>Type of Ship</th>
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<th>Ships Hit</th>
<th>Ships Damaged by Near Misses Only</th>
<th>Ships Sunk</th>
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NOTE: Only planes actually committed to a suicide attack on a ship are counted as "suicide attempts."

Jap aircraft destroyed by CAP before their intentions could become known are not included.
Observed Suicide Attacks by Jap Aircraft Against Allied Ships as Reported in Dispatches.

JUNE, 1945

Suicide Attempts Reported - - - - - 20*
Ships Hit - - - - - - - - - - - - - - - - 13
Hits on Ships - - - - - - - - - - - - - - - - 13
Damaging Near Misses - - - - - - - - - - - - - - - - 5
Ships Sunk - - - - - - - - - - - - - - - - 3

* Attempts which do not result in a hit or damaging near miss are often not reported by dispatch. A study of AA Action Reports, October 1944 through March 1945 reveals that 56% of all suicide attempts resulted in a hit or damaging near miss. Applying this percentage to the 18 hits and damaging near misses reported for June, it appears possible that between 30 and 35 attempts were actually made.

Results of Suicide Attempts by Type of Ship Attacked

JUNE, 1945

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<th>Type of Ship</th>
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NOTE: Only planes actually committed to a suicide attack on a ship are counted as "suicide attempts."

Jap aircraft destroyed by CAP before their intentions could become known are not included.
RECAPITULATION

Observed Suicide Attacks by Jap Aircraft
Against Allied Ships

OCTOBER 1944 - JUNE 1945

Suicide Attempts Reported by
AA Action Reports (October-March) - - - 356
Suicide Attempts Reported by
Dispatch (April-June) - - - - - 301
Total Suicide Attempts Reported - - - - - 657**
Ships Hit - - - - - - - - - - - - - - - - - - 281
Hits on Ships - - - - - - - - - - - - - - - - - - 351
Damaging Near Misses - - - - - - - - - - - - - - - - - 104
Ships Sunk - - - - - - - - - - - - - - - - - - - - - - 49

** The contribution of the period October 1944 through March 1945 to this figure (356) is based on
Antiaircraft Action Reports, and is considered reliable. For the period April through June 1945
this source is not available, and information concerning the Japanese suicide effort has been compiled from dispatches, in which attempts not resulting in a hit or damaging near miss are often not reported. A study of Antiaircraft Action Reports for the period for which they are available reveals that 56% of all suicide attempts resulted in a hit or damaging near miss. Applying this percentage to the 257 hits and damaging near misses reported by dispatches for the period April through June, it appears possible that between 150-170 attempts were made in addition to those reported in dispatches, thus raising the total for the period October through June to a possible 807-827 attempts.

Results of Suicide Attempts by Type of Ship Attacked

OCTOBER 1944 - JUNE 1945

<table>
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<th>Type Ship</th>
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* Data for October through March were tabulated from Antiaircraft Action Reports. Data for later months have been compiled from dispatches.

NOTE: Only planes actually committed to a suicide attack on a ship are counted as "suicide attempts."

Jap aircraft destroyed by CAP before their intentions could become known are not included.