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AIRCRAWF AUTOMATED ESCAPE SYSTEMS

LEVEL DATA ANALYSIS PROGRAM SYMPOSIUM

VOL. II

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PREVIOUS EDITION MAY BE USED UNLESS STOCK IS EXHAUSTED.
AIRCREW AUTOMATED ESCAPE SYSTEMS
(AAES)

DATA ANALYSIS PROGRAM
SYMPOSIUM

VOL II

(COPIES OF VISUAL PRESENTATION AIDS & ADDITIONAL INFORMATION)

Presented by:

NAVAL AIR SYSTEMS COMMAND
NAVAL SAFETY CENTER
NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY

APPROVED FOR PUBLIC RELEASE:
DISTRIBUTION UNLIMITED

6,7,8 OCTOBER, 1981
NAVAL SAFETY CENTER
NORFOLK, VIRGINIA
Assumption:

The cause of death for recovered fatalities is from the same distribution as those which are lost.

Thus, given X out of 17 deaths are caused by the canopy (for lost category) the probability of observing 0 out of 41 (recovered category) which were caused by the canopy is:

\[(1 - \frac{X}{17})^{41}\]

Let \(p = \frac{X}{17}\)

\( (1 - p)^{41} \) is displayed below.

e.g. \( (1 - \frac{1}{17})^{41} = .083 \)

\( (1 - \frac{2}{17})^{41} = .0059 \)

... etc...

\( (1 - \frac{16}{17})^{41} = 0.35 \times 10^{-51} \)

\( (1 - \frac{17}{17})^{41} = 0 \)
AIRCREW AUTOMATED ESCAPE SYSTEMS
(AAES)

DATA ANALYSIS PROGRAM
SYMPOSIUM

VOL II

(COPIES OF VISUAL PRESENTATION AIDS & ADDITIONAL INFORMATION)

Presented by:

NAVAL AIR SYSTEMS COMMAND
NAVAL SAFETY CENTER
NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY

6,7,8 OCTOBER, 1981
NAVAL SAFETY CENTER
NORFOLK, VIRGINIA
Prom: Commander, Naval Safety Center
To: Distribution

Subj: Automated Airborne Escape Systems (AAES) Symposium

Encl: (1) Agenda for subject symposium

1. At the request of the Chief of Naval Operations and with the cooperation and support of Commander, Naval Air Systems Command, Commander, Naval Safety Center, will co-host a two-day symposium to review selected topics associated with Automated Airborne Escape Systems (AAES).

2. The symposium will be held at the Naval Air Station, Norfolk, Virginia, on 6, 7 and 8 October 1981. The symposium's format will consist of informative presentations, 30-40 minutes in length, followed by open question-and-answer periods. Representatives of the Naval Air Systems Command (Aircrew Systems Division), Naval Weapons Engineering Support Activity (Systems Analysis), and the Naval Safety Center (Aviation Directorate) will present results of selected studies conducted for the purpose of evaluating or monitoring AAES usage, performance and/or maintenance trends. Source data has been derived from historical mishap data files maintained by the Naval Safety Center.

3. The identification, assessment and effective resolution of problem areas related to the effective use, maintainability and operation of AAES has been and will continue to be a major objective of the Navy. Systematic analysis of long-term mishap data is one approach to identifying reliability and maintainability degradation trends, as well as potential system deficiencies. The utility of such analyses in escape system design, acquisition and modification processes is considered to have significant value to both industry and DOD organizations having a direct interest in AAES and their subsystems.

4. The proposed agenda, enclosure (1), is provided for your interest and review. If your organization desires representation at the AAES symposium, please provide names, grade/rate (as appropriate), social security numbers, job title, and security clearance to this Command no later than 15 September 1981. Additional information on approved agenda, time schedule, conference location and travel directions will be forwarded. Due to space limitations, each organization/command will be limited to no more than three representatives.
5. Naval Safety Center points of contact are: CDR V. Voge (Code 14, Autovon 690-7341) and LCDR R. Moe (Code 122, Autovon 690-3494). COMMNAVSYSCOM/NAVWESA points of contact are: Mr. F. Guill/Mr. C. Stokes (Autovon 288-3621 or Commercial 202 433-3621).

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USAAVCOM ST LOUIS
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PERSONS SYSTEMS INTEGRATION
ADVANCED LOGISTICS MANAGEMENT INC
DR. RON HUSTON, UNIV. OF CINCINNATI
DR. ALBERT KING, WAYNE STATE UNIV.
UNIV. OF SOUTHERN CA
NAVTRADEPCEN
UNIVERSAL PROPULSION CO
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INSTITUTE OF AVIATION MEDICINE, RN
MINISTRY OF DEFENSE, UK
NAVPRO BETHPAGE NY
NAVPRO BURBANK CA
NAVPRO DALLAS TX
NAVPRO LONG BEACH CA
NAVPRO COLUMBUS OH
HAWKER SIDDELEY, UK
APPRO ST LOUIS MO
APPRO SEATTLE WA
APPRO FT WORTH TX
APPRO PARSINGDALE, NY
GENERAL DYNAMICS
APPLIED COMBUSTION TECHNOLOGY
MANTECH INTERNATIONAL CORP

-4-
AGENDA DAY 1

0800-0850  Registration
0900-0915  Opening Remarks - Welcome
           RADM T. C. Steele
0915-0945  Introduction of Host Reps
           Area Orientation
0945-1000  Break
1000-1050  AAES Data System Program Introduction
1100-1150  Review of AAES Use and Non-use
1200-1330  Lunch Break
1330-1420  Through vs Jettison Canopy Injuries
1430-1520  Helmet Retention/Loss Factors

AGENDA DAY 2

0900-0950  Flail/Tumbling Factors
1000-1150  In-Service System Reliability
1200-1330  Lunch Break
1330-1420  Overwater Survivability
1430-1520  Aircrew Size/Anthropometry
1530-1620  Expected Impact of AAES Data System Usage

AGENDA DAY 3

To be used as necessary based on progress during days 1 and 2

Enclosure (1)
1. Introduction to AAES Data System Program  NAVAIR/NAWESA
   Objectives
   Interface NAVSAFECEN/NAVAIR
   Present Status – Future Plans
   Constraints

2. Review of historical use and non-use of AAES  NAVSAFECEN/NAVAIR
   Results: Survivability
   Trends in Usage Rates
   Non-survived Ejection Cause Factors
   Usage Conditions
   AAES non-use trends
   Success Criteria

3. Through-canopy vs Jettisoned-canopy Injuries  NAVAIR/NAVSAFECEN
   Vertebral
   Upper-lower limbs
   Head/neck

4. Helmet Retention/Loss Factors  NAVAIR/NAVSAFECEN
   Vertebral Injury
   Varying levels of consciousness
   Head/Neck Injury

5. Ejection Flail-tumbling Factors  NAVWESA/NAVAIR
   As a function of airspeed
   As a function of system design
   As a function of Escape initiation method
6. In-service Reliability  NAVWEA/NAVAIR

Ejections attempted but not accomplished

Other failure/malfunction modes

7. Ejection Survivability in Low Altitude Overwater Environment  NAVSAFECEN/NAVAIR

· Land vs Water Survival

· Overwater Fatalities

· Parachute/RSSK Divestment and LPA Inflation Variables

8. Aircrew Restraint Factors  NAVSAFECEN/NAVAIR

· Negative "G" Environment

· Research on "G" Restraint Systems

9. Expected Impact of AAES Data System Program  NAVAIR/NAWESA

· Short Range

· Long Range
PROPOSED ATTENDEES

U. S. NAVY: Representation from:

OPNAV - 05F, 506N
CHINAVMATT
COMNAVAIRSYSCOM
NAVAIRDEVCEN
NAWPNCEN CHINA LAKE
BUMED
MONTEREY
CNET
ONR
NAVAIRTESTCEN
NAVORDSTA
NAMRL PNCLA
NAMI PNCLA
NAVAL BIODYNAMICS LAB
NAVAIRWORKFACS (6)
TYCOM - Safety; Flight Surgeons; Physiologists
OPTEVROR

USAF; Representation from:

NORTON AFB
WRIGHT PATTERSON AFB
BROOKS AFB
ANDREWS AFB
KELLEY AFB

ARMY; Representation from:

FORT RUCKER
ST LOUIS

NASA

LANGLEY AFB
MANNED SPACE CENTER

CONTRACTORS

PRIME AIRFRAME
Grumman; Boeing; Vought; Douglas; McDonnell; Republic; Fairchild-Miller; Lockheed; Convair; Martin-Baker LTD, U.K.

OTHERS
Teldyne Ryan; Stencel Aero Engineering Corp.; Pacific Scientific; Talley; Biotechnology; Humanoid Systems; Dayton T. Brown; East-West Industries; Explosive Technology; Space Ordnance Systems; Person-System Integration; Advanced Logistics Management Inc.; University of Cincinnati; Wayne State University; University of Southern California
FOREIGN GOVERNMENTS (having similar AAES)

CANADA

GREAT BRITAIN

FEDERAL REPUBLIC OF GERMANY
The AIRTASK WORK UNIT ASSIGNMENT described below is assigned in accordance with the indicated effort level and schedule. Funding authorization for the work unit will be provided in separate correspondence. If this AIRTASK WORK UNIT ASSIGNMENT cannot be accomplished as assigned, advise the NAVAIR HQ cognizant code. No work beyond the planning phase will be accomplished unless the addressee has funds in hand or written assurance thereof.

2. Cancellation, References and/or Enclosures.

Cancellation: Work Unit A5312B-04 dated 13 Dec 1979 and subsequent amendments under AIRTASK A512-512C/184-0/0512-000-055 amend. 1.

Encl: (1) NAVAIR Consolidated Priority List - Aircraft Systems Fleet Support Projects 10 October 1980
(2) Schedule

3. Technical Instructions.

a. Title. IDENTIFICATION AND REVIEW OF AIRCREW AUTOMATED ESCAPE SYSTEM (AAES), IN-SERVICE RELIABILITY AND MAINTAINABILITY PROBLEMS

b. Purpose. To establish a systematic investigation of in-service AAES data, such as that contained in the 3-M System, Unsatisfactory Reports, Medical Officer Reports of Aircraft Accidents, and Naval Air Rework Facility Data Systems, to identify for potential corrective action the many daily low-grade problems which contribute to the general lowering of AAES in-service reliability and cause the general worsening of AAES in-service maintainability.

c. Background. At present there exist special arrangements for investigating and correcting spectacular AAES in-service problems, particularly those which may cause fatalities. This effort is intended for reviewing the pervasive non-spectacular low-grade AAES in-service reliability and/or a general degradation of AAES in-service maintainability. These problems, vastly overshadowed by the spectacular ones, nonetheless are important, and if left unmonitored and uncorrected, occasionally manifest themselves in fatalities, serious injuries and/or very great difficulties experienced by the ejectee, which under slightly different conditions could have caused serious injuries. Some problems also manifest themselves in increased
maintenance efforts and costs and/or increased hazards to maintenance personnel. Since there at present is no systematic review of in-service AAES data, there is no valid method of identifying AAES in-service problems deserving management attention short of awaiting death, serious injury or major complaints. Thus NAVAIR is forced into a "squeaky wheel" reaction mode of operation versus the more desirable mode of allocating resources based on a continuous analysis of the total AAES in-service experience.

d. Detailed Requirements/Cost Estimates. $90.0 K for FY-81 in support of applicable projects listed on enclosure (1) Priority List, to be obligated quarterly as follows: first quarter $30.0 K, second quarter $30.0 K, third quarter $30.0 K. Program element - 78012N (O & MN).

Continue establishment of a system for the systematic review of such sources of AAES in-service data as 3-M Systems, Unsatisfactory Reports, Medical Officer Reports of Aircraft Accidents, and Naval Air Rework Facility data systems, in a manner designed to identify and assess the significance of the many commonly occurring in-service problems affecting AAES in-service reliability and maintainability. The system outputs shall be structured to provide data of assistance to NAV AIR Headquarters in the management of the scarce AAES resources; e.g., problems experienced, frequency of occurrence, experience severity, potential severity, and range of activities and/or AAES experiencing the problems. Once established and documented the system(s) can be integrated into regular reporting systems to assure regular, early notification to NAV AIR Headquarters concerning in-service problems being experienced and should assist considerably in the identification of causes and development of remedial actions. In addition, perform specific analytical tasks of high priority as assigned.

e. Detailed Program Plan. Not applicable.

f. Field Activity Contact. Mr. G. Opresko, NAVWESA (ESA-31).

g. Headquarters Technical Support. None.

4. Schedule. See Enclosure (2).

5. Reports and Documentation.

a. Reports.

(1) Upon completion of each task, present data and findings in letter-type reports to NAV AIR Headquarters (AIR-531).

(2) A semi-annual program review shall be held at NAV AIR in February and August with NAV AIR publishing a report of findings in March and September.
(3) NAVWESA shall report to the Commander, Naval Air Systems Command (AIR-512C) the man years and associated cost, cost of materials, travel and cost of contracts awarded by NAVWESA for this project. This report shall be submitted 1 May 1981 and 1 November 1981 for final status.

b. Requirements for Future Planning Information. Prepare and submit to NAVAIRHQ (AIR-531) for approval, a letter-type project plan. The primary effort shall be for establishment of baseline data to aid in subsequent identification of trends and specific problems. Subsequent tasks shall be for extending previous analytical techniques and data sources investigating efforts to identify specific AAES in-service reliability and maintainability problems.

6. Contractual Authority. Contracts to perform all or portions of the Work Unit are hereby authorized within the funding indicated by the Work Unit cost estimate.

7. Source and Disposition of Equipment. Not applicable.

8. Aircraft Requirements. None.

9. Status of Applicable Funds. Funds for this Work Unit will be provided separately.

10. Security Classification. All prescribed work under this Work Unit is unclassified. In performing the prescribed work, access to information which is classified and/or to areas containing classified equipment may be required. Any reference to such classified material shall be in accordance with the applicable materials security classification. Particularly, reference to information concerning survivability/vulnerability shall be classified in accordance with OPNAVINST. C5513.2A, Encl. (63); OPNAVINST. S5513.8, Encl. (7).

Copy to:
Addressee (3)
NAVMATDATASYSGRU, Morgantown, W.Va. 26505
NAVAIRDEV (CSD), Warminster
NAVAIRTESTCEN (SY-70), PAXRIV
NAVOROSTA (Code 5123), Indian Head
NAVOROSTA (Code 515), Indian Head
NAVWPNCEN, China Lake (Code 64)
NAVSafeCEN, Norfolk
COMNAVAIRPAC, North Island
CGFMFLANT
CGFMFPAC
NAVPLANTREPO, Bethpage
NAVPLANTREPO, Dallas
NAVPLANTREPO, Burbank
NAVPLANTREPO, Long Beach
AFPRO, St. Louis
DCASMA (DCRA-GACB), Marietta
NAVY EJECTIONS BY SEAT TYPE,
SEAT FAMILIES & SEAT GROUPS

1 JANUARY 1969 THROUGH 31 DECEMBER 1979
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979
DATA DISPLAY FORMAT

TYPE SEAT
TYPE EJECTION
(i.e. J.C. or T.C.)

TOTAL

SURVIVORS
TOTAL
B – MAJOR (QTY, %)
F – MINOR (QTY, %)
G – NONE/MINIMAL (QTY, %)

TOTAL

FATALITIES
TOTAL
A – FATAL (QTY)
L – LOST (QTY)
U – UNKN/MISSING (QTY)

OVERWATER
TOTAL
B – MAJOR (QTY, %)
F – MINOR (QTY, %)
G – NONE/MINIMAL (QTY, %)

TOTAL

OVERLAND
TOTAL
B – MAJOR (QTY, %)
F – MINOR (QTY, %)
G – NONE/MINIMAL (QTY, %)

TOTAL

OVERWATER
TOTAL
A – FATAL (QTY)
L – LOST (QTY)
U – UNKN/MISSING (QTY)

TOTAL

OVERLAND
TOTAL
A – FATAL (QTY)
L – LOST (QTY)
U – UNKN/MISSING (QTY)
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

<table>
<thead>
<tr>
<th>ESCAPAC 1</th>
<th>JETTISONED-CANOPY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
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<table>
<thead>
<tr>
<th>SURVIVORS</th>
<th>7 (100%)</th>
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<tbody>
<tr>
<td>B - 0</td>
<td>(0%)</td>
</tr>
<tr>
<td>F - 4</td>
<td>(57.1%)</td>
</tr>
<tr>
<td>G - 3</td>
<td>(42.9%)</td>
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<table>
<thead>
<tr>
<th>FATALITIES</th>
<th>0 (0%)</th>
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<tbody>
<tr>
<td>A</td>
<td></td>
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<td>L</td>
<td></td>
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<td>U</td>
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<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>2 (100%)</th>
</tr>
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<tbody>
<tr>
<td>B - 0</td>
<td>(0%)</td>
</tr>
<tr>
<td>F - 2</td>
<td>(100%)</td>
</tr>
<tr>
<td>G - 0</td>
<td>(0%)</td>
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<table>
<thead>
<tr>
<th>OVERLAND</th>
<th>5 (100%)</th>
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<tbody>
<tr>
<td>B - 0</td>
<td>(0%)</td>
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<tr>
<td>F - 2</td>
<td>(40.0%)</td>
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<tr>
<td>G - 3</td>
<td>(60.0%)</td>
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<thead>
<tr>
<th>OVERWATER</th>
<th>0 (0%)</th>
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<td>A -</td>
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<tr>
<th>OVERLAND</th>
<th>0 (0%)</th>
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<td>A -</td>
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<td>L -</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1A-1
JETTISONED-CANOPY
89

SURVIVORS
76 (85.4%)
B - 12 (15.8%)
F - 26 (34.2%)
G - 38 (50.0%)

FATALITIES
13 (14.1%)
A - 11
L - 2
U - 0

OVERWATER
30 (88.2%)
B - 5 (16.7%)
F - 12 (40.0%)
G - 13 (43.3%)

OVERLAND
46 (83.6%)
B - 7 (15.2%)
F - 14 (30.4%)
G - 25 (54.3%)

OVERWATER
4 (11.8%)
A - 3
L - 1
U - 0

OVERLAND
9 (16.4%)
A - 8
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1C-2
JETTISONED-CANOPY

157

SURVIVORS
138 (87.9%)
B - 20 (14.5%)
F - 32 (23.2%)
G - 86 (62.3%)

FATALITIES
19 (12.1%)
A - 13
L - 5
U - 1

OVERWATER
74 (89.2%)
B - 6 (8.1%)
F - 13 (17.6%)
G - 55 (74.3%)

OVERLAND
64 (86.5%)
B - 14 (21.9%)
F - 19 (29.7%)
G - 31 (48.4%)

OVERWATER
9 (10.8%)
A - 4
L - 5
U - 0

OVERLAND
10 (13.5%)
A - 9
L - 0
U - 1
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1C-2 THROUGH-THE-CANOPY

FATALITIES
0
A - - -
L - - -
U - - -

OVERLAND
0
A - - -
L - - -
U - - -

OVERWATER
0
A - - -
L - - -
U - - -

SURVIVORS
1 (100%)
B - 1 (100%)
F - 0
G - 0

OVERLAND (100%)
B - -
F - -
G - -

OVERWATER (100%)
B - 1
F - 0
G - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1C-3

JETTISONED-CANOPY

124

FATALITIES
14 (11.3%)

A - 10
L - 4
U - 0

OVERLAND
9 (10.0%)

A - 9
L - 0
U - 0

OVERWATER
5 (14.7%)

A - 1
L - 4
U - 0

SURVIVORS
110 (88.7%)

B - 19 (17.3%)
F - 28 (25.5%)
G - 63 (57.3%)

OVERLAND
81 (90.5%)

B - 16 (19.8%)
F - 16 (19.8%)
G - 49 (50.5%)

OVERWATER
29 (85.3%)

B - 3 (10.3%)
F - 12 (41.4%)
G - 14 (48.3%)
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ESCAPAC I, IA-1, IC-2, IC-3 JETTISONED-CANOPY

FATALITIES
46

A - 34
L - 11
U - 1

OVERLAND
28

A - 26
L - 1
U - 1

OVERWATER
18

A - 8
L - 10
U - 0

SURVIVORS
322

B - 52 (15.7%)
F - 90 (27.1%)
G - 190 (57.2%)

OVERLAND
196

B - 37 (18.5%)
F - 51 (26.0%)
G - 108 (55.1%)

OVERWATER
136

B - 15 (11.0%)
F - 39 (28.7%)
G - 82 (60.3%)
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1E-1
JETTISONED-CANOPY

SURVIVORS
0 (0%)
B -
F -
G -

FATALITIES
1 (100%)
A - 1
L - 0
U - 0

OVERWATER
B -
F -
G -

OVERLAND

OVERWATER
A -
L -
U -

OVERLAND
A - 1
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1E-1
THROUGH-THE-CANOPY

7

SURVIVORS
3 (42.9%)

B - 0 (0%)
F - 0 (0%)
G - 3 (100%)

FATALITIES
4 (57.1%)

A - 2
L - 2
U - 0

OVERWATER
0 (0%)

B -
F -
G -

OVERLAND
3 (60.0%)

B - 0 (0%)
F - 0 (0%)
G - 3 (100%)

OVERWATER
2 (100%)

A - 0
L - 2
U - 0

OVERLAND
2 (40.0%)

A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1F-3
JETTISONED-CANOPY

SURVIVORS

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<tbody>
<tr>
<td>16</td>
<td>(84.2%)</td>
</tr>
<tr>
<td>B</td>
<td>4 (25.0%)</td>
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<tr>
<td>F</td>
<td>4 (25.0%)</td>
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<tr>
<td>G</td>
<td>8 (50.0%)</td>
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FATALITIES

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<tr>
<td>3</td>
<td>(15.8%)</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>L</td>
<td>0</td>
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<tr>
<td>U</td>
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OVERWATER

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>9</td>
<td>(66.7%)</td>
</tr>
<tr>
<td>B</td>
<td>2 (22.2%)</td>
</tr>
<tr>
<td>F</td>
<td>3 (33.3%)</td>
</tr>
<tr>
<td>G</td>
<td>4 (44.4%)</td>
</tr>
</tbody>
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OVERLAND

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>7</td>
<td>(87.5%)</td>
</tr>
<tr>
<td>B</td>
<td>2 (28.6%)</td>
</tr>
<tr>
<td>F</td>
<td>1 (14.3%)</td>
</tr>
<tr>
<td>G</td>
<td>4 (57.1%)</td>
</tr>
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OVERWATER

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<tr>
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<tbody>
<tr>
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<td>(33.3%)</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
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<tr>
<td>L</td>
<td>0</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
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OVERLAND

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<tr>
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<td>(12.5%)</td>
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<tr>
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<tr>
<td>L</td>
<td>0</td>
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<tr>
<td>U</td>
<td>0</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1G-2
THROUGH-THE-CANOPY

40

SURVIVORS
30 (75.0%)
B - 7 (23.3%)
F - 7 (23.3%)
G - 16 (53.3%)

FATALITIES
10 (25.0%)
A - 7
L - 3
U - 0

OVERWATER
16 (69.6%)
B - 2 (12.5%)
F - 5 (31.3%)
G - 9 (56.3%)

OVERLAND
14 (82.4%)
B - 5 (35.7%)
F - 2 (14.3%)
G - 7 (50.0%)

OVERWATER
7 (30.4%)
A - 4
L - 3
U - 0

OVERLAND
3 (17.6%)
A - 3
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1G-3
JETTISONED-CANOPY

SURVIVORS
40 (93.0%)
- S - 9 (22.5%)
- F - 7 (17.5%)
- G - 24 (60.0%)

FATALITIES
3 (7.0%)
- A - 2
- L - 1
- U - 0

OVERWATER
5 (62.5%)
- B - 0 (0%)
- F - 1 (20.0%)
- G - 4 (80.0%)

OVERLAND
35 (100%)
- B - 9 (25.7%)
- F - 6 (17.1%)
- G - 20 (57.1%)

OVERWATER
3 (37.5%)
- A - 2
- L - 1
- U - 0

OVERLAND
0
- A -
- L -
- U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ESCAPAC IF-3, IG-2 & IG-3
JETTISONED-CANOPY

63

SURVIVORS
57 (90.5%)
B - 13 (22.8%)
F - 12 (21.1%)
G - 32 (56.1%)

FATALITIES
6 (9.5%)
A - 5
L - 1
U - 0

OVERWATER
15 (75.0%)
B - 2 (13.3%)
F - 5 (33.3%)
G - 8 (53.3%)

OVERLAND
42 (97.7%)
B - 11 (26.2%)
F - 7 (16.7%)
G - 24 (57.1%)

OVERWATER
5 (25.0%)
A - 4
L - 1
U - 0

OVERLAND
1 (2.3%)
A - 1
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ESCAPAC IG-2 & IG-4
THROUGH-THE-CANOPY

SURVIVORS
31 (75.6%)
B - 7 (22.6%)
F - 7 (22.6%)
G - 17 (54.8%)

FATALITIES
10 (24.4%)
A - 7
L - 3
U - 0

OVERWATER
16 (69.6%)
B - 2 (12.5%)
F - 5 (31.3%)
G - 9 (56.3%)

OVERLAND
15 (83.3%)
B - 5 (33.3%)
F - 2 (13.3%)
G - 8 (53.3%)

OVERWATER
7 (30.1%)
A - 4
L - 3
U - 0

OVERLAND
3 (16.7%)
A - 3
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ESCAPAC
IF-3, IG-2, IG-3, & IG-4

104

SURVIVORS
88 (84.6%)
B - 20 (22.7%)
F - 19 (21.6%)
G - 49 (55.7%)

FATALITIES
16 (15.4%)
A - 12
L - 4
U - 0

OVERWATER
31 (72.1%)
B - 4 (12.9%)
F - 10 (32.3%)
G - 17 (54.8%)

OVERLAND
57 (93.4%)
B - 16 (28.1%)
F - 9 (15.8%)
G - 32 (56.1%)

OVERWATER
12 (27.9%)
A - 8
L - 4
U - 0

OVERLAND
4 (6.6%)
A - 4
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ALL ESCAPAC

FATALITIES
62 (12.9%)
A - 46
L - 15
U - 1

OVERLAND
32 (11.2%)
A - 30
L - 1
U - 1

OVERWATER
30 (15.2%)
A - 16
L - 14
U - 0

SURVIVORS
420 (87.1%)
B - 72 (17.1%)
F - 109 (26.0%)
G - 239 (56.9%)

OVERWATER
167 (84.4%)
B - 19 (11.4%)
F - 49 (29.3%)
G - 99 (59.3%)

OVERLAND
53 (20.9%)
F - 60 (23.7%)
G - 140 (55.3%)
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK A5 JETTISONED-CANOPY

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<thead>
<tr>
<th>FATALITIES</th>
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<table>
<thead>
<tr>
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<th>(0%)</th>
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<tbody>
<tr>
<td>A</td>
<td>L</td>
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</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
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</tr>
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<tbody>
<tr>
<td>A</td>
<td>L</td>
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</table>

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<thead>
<tr>
<th>SURVIVORS</th>
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<td>B</td>
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<table>
<thead>
<tr>
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<th>(100%)</th>
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<tbody>
<tr>
<td>B</td>
<td>F</td>
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</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
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</thead>
<tbody>
<tr>
<td>B</td>
<td>F</td>
</tr>
</tbody>
</table>

-32-
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK A5
THROUGH-THE-CANOPY

18

SURVIVORS
13 (72.2%)
B - 8 (61.5%)
F - 2 (15.4%)
G - 3 (23.1%)

FATALITIES
5 (27.8%)
A - 4
L - 1
U - 0

OVERWATER
1 (50.0%)
B - 1 (100%)
F - 0 (0%)
G - 0 (0%)

OVERLAND
12 (75.0%)
B - 7 (58.3%)
F - 2 (16.7%)
G - 3 (25.0%)

OVERWATER
1 (50.0%)
A - 0
L - 1
U - 0

OVERLAND
4 (25.0%)
A - 4
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK F5
JETTISONED-CANOPY

17

SURVIVORS
13 (76.5%)
B - 1 (10.0%)
F - 5 (50.0%)
G - 7 (53.8%)

FATALITIES
4 (24.5%)
A - 2
L - 2
U - 0

OVERLAND
2 (16.7%)
A - 2
L - 0
U - 0

OVERWATER
2 (40.0%)
A - 0
L - 2
U - 0

OVERWATER
10 (83.3%)
B - 1 (10.0%)
F - 5 (50.0%)
G - 4 (40.0%)

OVERWATER
3 (60.0%)
B - 0 (0%)
F - 0 (0%)
G - 3 (100%)
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU5
JETTISONED-CANOPY

12

SURVIVORS
12 (100%)
B - 3 (25.0%)
F - 3 (25.0%)
G - 6 (50.0%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
4 (100%)
B - 0 (0%)
F - 2 (50.0%)
G - 2 (50.0%)

OVERLAND
8 (100%)
B - 3 (37.5%)
F - 1 (12.5%)
G - 4 (50.0%)

OVERWATER

OVERLAND
A -
L -
U -
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU5
THROUGH-THE-CANOPY
72

SURVIVORS
56 (77.8%)
B - 17 (30.4%)
F - 28 (50.0%)
G - 11 (19.6%)

FATALITIES
16 (22.2%)
A - 12
L - 4
U - 0

OVERWATER
35 (81.4%)
B - 7 (20.0%)
F - 20 (57.1%)
G - 8 (22.9%)

OVERLAND
21 (72.4%)
B - 10 (47.6%)
F - 8 (38.1%)
G - 3 (14.3%)

OVERWATER
8
A - 5
L - 3
U - 0

OVERLAND
8
A - 7
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRUEA5
JETTISONED-CANOPY

SURVIVORS
4 (100%)
B - 2 (50.0%)
F - 1 (25.5%)
G - 1 (25.5%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
0
B -
F -
G -

OVERLAND
4 (100%)
B - 2 (50.0%)
F - 1 (25.5%)
G - 1 (25.5%)

OVERWATER

OVERLAND

A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRUEAS
THROUGH-THE-CANOPY

SURVIVORS

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<tr>
<th>Letter</th>
<th>Count</th>
<th>Percentage</th>
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</tr>
<tr>
<td>F</td>
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<td>0%</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
<td>0%</td>
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FATALITIES

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>L</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
<td>0%</td>
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OVERWATER

<table>
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<th>Count</th>
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<tbody>
<tr>
<td>B</td>
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<tr>
<td>F</td>
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<td>G</td>
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OVERLAND

<table>
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<tr>
<th>Letter</th>
<th>Count</th>
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<tbody>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
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<tr>
<td>G</td>
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OVERWATER

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>L</td>
<td>-</td>
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OVERLAND

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>L</td>
<td>-</td>
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<tr>
<td>U</td>
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</table>
# NRO EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

<table>
<thead>
<tr>
<th>MK H-5</th>
<th>JETTISONED-CANOPY</th>
</tr>
</thead>
<tbody>
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## Survivors

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>13</td>
<td>(92.9%)</td>
</tr>
<tr>
<td>B - 4</td>
<td>(30.8%)</td>
</tr>
<tr>
<td>F - 5</td>
<td>(38.5%)</td>
</tr>
<tr>
<td>G - 4</td>
<td>(30.8%)</td>
</tr>
</tbody>
</table>

## Fatalities

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<tr>
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<td>(7.1%)</td>
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<tr>
<td>A - 0</td>
<td></td>
</tr>
<tr>
<td>L - 1</td>
<td></td>
</tr>
<tr>
<td>U - 0</td>
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## Overwater

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>3</td>
<td>(75.0%)</td>
</tr>
<tr>
<td>B - 0</td>
<td>(0%)</td>
</tr>
<tr>
<td>F - 2</td>
<td>(66.7%)</td>
</tr>
<tr>
<td>G - 1</td>
<td>(33.3%)</td>
</tr>
</tbody>
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## Overland

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<table>
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<tbody>
<tr>
<td>1</td>
<td>(100%)</td>
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## Overwater

<p>| | |</p>
<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>(25.0%)</td>
</tr>
<tr>
<td>A - 0</td>
<td></td>
</tr>
<tr>
<td>L - 1</td>
<td></td>
</tr>
<tr>
<td>U - 0</td>
<td></td>
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</tbody>
</table>

## Overland

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>A -</td>
<td></td>
</tr>
<tr>
<td>L -</td>
<td></td>
</tr>
<tr>
<td>U -</td>
<td></td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK L5
THROUGH-THE-CANOPY

6

SURVIVORS
4 (66.7%)
B - 2 (50.0%)
F - 1 (25.0%)
G - 1 (25.0%)

FATALITIES
2 (33.3%)
A - 2
L - 0
U - 0

OVERWATER
0
B -
F -
G -

OVERLAND
4 (66.7%)
B - 2 (50.0%)
F - 1 (25.0%)
G - 1 (25.0%)

OVERWATER
0
A -
L -
U -

OVERLAND
2 (33.3%)
A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK Z5
THROUGH-THE-CANOPY
6

SURVIVORS
6 (100%)
B - 1 (16.7%)
F - 0 (0%)
G - 5 (83.3%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
0
B -
F -
G -

OVERLAND
6 (100%)
B - 1 (16.7%)
F - 0 (0%)
G - 5 (83.3%)

OVERWATER

OVERLAND

A -
L -
U -
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK5 SERIES
JETTISONED-CANOPY

49

SURVIVORS

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<th>Count</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>B</td>
<td>10</td>
<td>22.7%</td>
</tr>
<tr>
<td>F</td>
<td>15</td>
<td>34.1%</td>
</tr>
<tr>
<td>G</td>
<td>19</td>
<td>43.2%</td>
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FATALITIES

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<th>Count</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>10.2%</td>
</tr>
<tr>
<td>L</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>U</td>
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OVERWATER

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<tr>
<th>Code</th>
<th>Count</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>B</td>
<td>0</td>
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<tr>
<td>F</td>
<td>4</td>
<td>40.0%</td>
</tr>
<tr>
<td>G</td>
<td>6</td>
<td>60.0%</td>
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OVERLAND

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<tbody>
<tr>
<td>B</td>
<td>10</td>
<td>29.4%</td>
</tr>
<tr>
<td>F</td>
<td>11</td>
<td>32.4%</td>
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<tr>
<td>G</td>
<td>13</td>
<td>38.2%</td>
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OVERWATER

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<th>Code</th>
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<tbody>
<tr>
<td>A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>3</td>
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<tr>
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OVERLAND

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<th>Count</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
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<td>5.6%</td>
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<tr>
<td>L</td>
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<td>U</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

NON A-6/EA-6B MK5 SERIES THROUGH-THE-CANOPY

SURVIVORS
23 (76.7%)
B - 11 (47.8%)
F - 3 (13.0%)
G - 9 (39.1%)

FATALITIES
7 (23.3%)
A - 6
L - 1
U - 0

OVERWATER
1 (50.0%)
B - 1 (100%)
F - 0
G - 0

OVERLAND
22 (78.6%)
B - 10 (45.5%)
F - 3 (13.6%)
G - 9 (40.9%)

OVERWATER
1 (50.0%)
A - 0
L - 1
U - 0

OVERLAND
6 (21.4%)
A - 6
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU5 & MK GRUEA5
THROUGH-THE-CANOPY

73

SURVIVORS
57 (78.1%)
B - 18 (31.6%)
F - 28 (49.1%)
G - 11 (19.3%)

FATALITIES
16 (21.9%)
A - 12
L - 4
U - 0

OVERWATER
35 (81.4%)
B - 7 (20.0%)
F - 20 (57.1%)
G - 8 (22.9%)

OVERLAND
22 (73.3%)
B - 11 (50.0%)
F - 8 (36.4%)
G - 3 (13.6%)

OVERWATER
8 (18.6%)
A - 5
L - 3
U - 0

OVERLAND
8 (26.7%)
A - 7
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK5 SERIES
THROUGH-THE-CANOPY

103

SURVIVORS
80 (77.7%)
B - 29 (36.3%)
F - 31 (38.8%)
G - 20 (25.0%)

FATALITIES
23 (22.3%)
A - 18
L - 5
U - 0

OVERWATER
36 (80.0%)
B - 8 (22.2%)
F - 20 (55.6%)
G - 8 (22.2%)

OVERLAND
44 (75.9%)
B - 21 (47.7%)
F - 11 (25.0%)
G - 12 (27.3%)

OVERWATER
9 (20.0%)
A - 5
L - 4
U - 0

OVERLAND
14 (24.1%)
A - 13
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ALL MK5 SERIES

152

SURVIVORS

124 (81.6%)
B - 39 (31.5%)
F - 46 (37.1%)
G - 39 (31.4%)

FATALITIES

28 (18.4%)
A - 20
L - 8
U - 0

OVERWATER

46 (79.3%)
B - 8 (17.4%)
F - 24 (52.2%)
G - 14 (30.4%)

OVERLAND

78 (83.0%)
B - 31 (39.7%)
F - 22 (28.2%)
G - 25 (32.1%)

OVERWATER

12 (20.7%)
A - 5
L - 7
U - 0

OVERLAND

16 (17.0%)
A - 15
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK A7A
THROUGH-THE-CANOPY

SURVIVORS

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<tr>
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<td>5 (71.4%)</td>
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<tr>
<td>F</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>G</td>
<td>2 (28.6%)</td>
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FATALITIES

<p>| | |</p>
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<tbody>
<tr>
<td>A</td>
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<td>U</td>
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OVERWATER

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>B</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>F</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>G</td>
<td>0 (0%)</td>
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OVERLAND

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<tr>
<td>B</td>
<td>4 (66.7%)</td>
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<tr>
<td>F</td>
<td>0 (0%)</td>
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<tr>
<td>G</td>
<td>2 (33.3%)</td>
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OVERWATER

<p>| | |</p>
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<td>A</td>
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OVERLAND

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<td>L</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK 75
JETTISONED-CANOPY

SURVIVORS

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<tr>
<td>F</td>
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<td>0%</td>
</tr>
<tr>
<td>G</td>
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<td>100%</td>
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FATALITIES

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<th>Value</th>
<th>Percentage</th>
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<td>0%</td>
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<tr>
<td>L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
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OVERWATER

<table>
<thead>
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<th>Value</th>
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<tbody>
<tr>
<td>B</td>
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<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>G</td>
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OVERLAND

<table>
<thead>
<tr>
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<th>Value</th>
<th>Percentage</th>
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</tr>
<tr>
<td>F</td>
<td>0</td>
<td>0%</td>
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<tr>
<td>G</td>
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<td>100%</td>
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OVERWATER

<table>
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<th>Value</th>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>L</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td></td>
</tr>
</tbody>
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OVERLAND
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK F7A
JETTISONED CANOPY

87

SURVIVORS
82 (94.3%)
B - 5 (6.1%)
F - 16 (19.5%)
G - 61 (74.4%)

FATALITIES
5 (5.7%)
A - 3
L - 2
U - 0

OVERWATER
42 (95.5%)
B - 2 (4.8%)
F - 5 (11.9%)
G - 35 (83.3%)

OVERLAND
40 (93.0%)
B - 3 (7.5%)
F - 11 (27.5%)
G - 26 (65.0%)

OVERWATER
2 (4.5%)
A - 0
L - 2
U - 0

OVERLAND
3 (7.0%)
A - 3
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK F7A
THROUGH-THE-CANOPY

SURVIVORS
1 (100%)
B - 1 (100%)
F - 0 (0%)
G - 0 (0%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
0

OVERLAND
1 (100%)
B - 1 (100%)
F - 0 (0%)
G - 0 (0%)

OVERWATER

OVERLAND
A -
L -
U -

A -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU7
THROUGH-THE-CANOPY
38

SURVIVORS
26 (68.4%)
B - 7 (26.9%)
F - 10 (38.5%)
G - 4 (34.6%)

FATALITIES
12 (31.6%)
A - 7
L - 5
U - 0

OVERWATER
12 (66.7%)
B - 2 (16.7%)
F - 6 (50.0%)
G - 4 (33.3%)

OVERLAND
14 (70.0%)
B - 5 (35.7%)
F - 4 (28.6%)
G - 5 (35.7%)

OVERWATER
6 (33.3%)
A - 1
L - 5
U - 0

OVERLAND
6 (30.0%)
A - 6
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU7A
JETTISONED-CANOPY

SURVIVORS
56 (83.6%)
B - 9 (16.1%)
F - 12 (21.4%)
G - 35 (62.5%)

FATALITIES
11 (16.4%)
A - 9
L - 2
U - 0

OVERWATER
42 (91.3%)
B - 4 (9.5%)
F - 9 (21.4%)
G - 29 (69.0%)

OVERLAND
14 (66.7%)
B - 5 (35.7%)
F - 3 (21.4%)
G - 6 (42.9%)

OVERWATER
4 (8.7%)
A - 2
L - 2
U - 0

OVERLAND
7 (33.3%)
A - 7
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRUEA7
THROUGH-THE-CANOPY

17

SURVIVORS
15 (88.2%)

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<th>Category</th>
<th>Count</th>
<th>(%)</th>
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<tr>
<td>F</td>
<td>7</td>
<td>46.7</td>
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<tr>
<td>G</td>
<td>5</td>
<td>33.3</td>
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FATALITIES
2 (11.8%)

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<th>Count</th>
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</thead>
<tbody>
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<tr>
<td>L</td>
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<td></td>
</tr>
<tr>
<td>U</td>
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OVERWATER
12 (85.7%)

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<th>Count</th>
<th>(%)</th>
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<td>3</td>
<td>25.0</td>
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<td>F</td>
<td>7</td>
<td>58.3</td>
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<tr>
<td>G</td>
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OVERLAND
3 (100%)

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<th>(%)</th>
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<td>0</td>
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<tr>
<td>F</td>
<td>0</td>
<td>0</td>
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<tr>
<td>G</td>
<td>3</td>
<td>100.0</td>
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OVERWATER
2 (14.3%)

<table>
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<tbody>
<tr>
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<tr>
<td>L</td>
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<tr>
<td>U</td>
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OVERLAND
0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK H7A
JETTISONED-CANOPY

348

SURVIVORS

296 (85.1%)
B - 32 (10.8%)
F - 76 (25.7%)
G - 188 (63.5%)

FATALITIES

52 (14.9%)
A - 29
L - 23
U - 0

OVERWATER

190 (87.2%)
B - 13 (6.8%)
F - 49 (25.8%)
G - 28 (67.4%)

OVERLAND

106 (81.5%)
B - 19 (17.9%)
F - 27 (25.5%)
G - 60 (56.6%)

OVERWATER

28 (12.8%)
A - 6
L - 22
U - 0

OVERLAND

24 (18.5%)
A - 23
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK7 SERIES
JETTISONED-CANOPY
503

SURVIVORS
435 (86.5%)
B - 46 (10.6%)
F - 105 (24.1%)
G - 284 (65.3%)

FATALITIES
68 (13.5%)
A - 41
L - 27
U - 0

OVERWATER
274 (89.0%)
B - 19 (6.9%)
F - 63 (23.0%)
G - 192 (70.1%)

OVERLAND
161 (82.6%)
B - 27 (16.8%)
F - 42 (26.1%)
G - 92 (57.1%)

OVERWATER
34 (11.0%)
A - 8
L - 26
U - 0

OVERLAND
34 (17.4%)
A - 33
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

NON A-6/EA-6B
MK7 SERIES
THROUGH-THE-CANOPY

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<tr>
<th>SURVIVORS</th>
<th>FATALITIES</th>
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<tbody>
<tr>
<td><strong>8</strong> (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>B - 6 (75.0%)</td>
<td>A -</td>
</tr>
<tr>
<td>F - 0 (0%)</td>
<td>L -</td>
</tr>
<tr>
<td>G - 2 (25.0%)</td>
<td>U -</td>
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<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> (100%)</td>
<td><strong>7</strong> (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
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<tr>
<td>B - 1 (100%)</td>
<td>B - 5 (71.4%)</td>
<td>A -</td>
<td>A -</td>
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<tr>
<td>F - 0</td>
<td>F - 0 (0%)</td>
<td>L -</td>
<td>L -</td>
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<tr>
<td>G - 0</td>
<td>G - 2 (28.6%)</td>
<td>U -</td>
<td>U -</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU7 & MK GRUEA7 THROUGH-THE-CANOPY

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<td>B</td>
<td>10</td>
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<tr>
<td>F</td>
<td>17</td>
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<td>G</td>
<td>14</td>
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<tr>
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<th>14 (25.5%)</th>
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<td>L</td>
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<tr>
<th>OVERLAND</th>
<th>6 (26.1%)</th>
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<td>L</td>
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<thead>
<tr>
<th>OVERWATER</th>
<th>24 (75.0%)</th>
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<td>5</td>
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<tr>
<td>F</td>
<td>13</td>
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<tr>
<th>OVERLAND</th>
<th>17 (73.9%)</th>
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<td>F</td>
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55
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK7 SERIES
THROUGH-THE-CANOPY

63

SURVIVORS
49 (77.8%)
B – 16
F – 17
G – 16

FATALITIES
14 (22.2%)
A – 7
L – 7
U – 0

OVERWATER
25 (75.8%)
B – 6 (24.0%)
F – 13 (52.0%)
G – 6 (24.0%)

OVERLAND
24 (80.0%)
B – 10 (41.7%)
F – 4 (6.6%)
G – 10 (41.7%)

OVERWATER
8 (24.2%)
A – 1
L – 7
U – 0

OVERLAND
6 (20.0%)
A – 6
L – 0
U – 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ALL MK7 SERIES
566

SURVIVORS
484 (85.5%)
B - 62 (12.8%)
F - 122 (25.2%)
G - 300 (62.0%)

FATALITIES
82 (14.5%)
A - 48
L - 34
U - 0

OVERWATER
299 (87.7%)
B - 25 (8.4%)
F - 76 (25.4%)
G - 198 (66.2%)

OVERLAND
185 (82.2%)
B - 37 (20.0%)
F - 46 (24.9%)
G - 102 (55.1%)

OVERWATER
42 (12.3%)
A - 9
L - 33
U - 0

OVERLAND
40 (17.8%)
A - 39
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ALL MK5 & MK7 SERIES
JETTISONED-CANOPY

552

SURVIVORS
479 (86.8%)
B - 56 (11.7%)
F - 120 (25.1%)
G - 303 (63.3%)

FATALITIES
73 (13.2%)
A - 43
L - 30
U - 0

OVERWATER
284 (88.5%)
B - 19 (6.7%)
F - 67 (23.6%)
G - 198 (69.7%)

OVERLAND
195 (84.4%)
B - 37 (19.0%)
F - 53 (27.2%)
G - 105 (53.8%)

OVERWATER
37 (11.5%)
A - 8
L - 29
U - 0

OVERLAND
36 (15.6%)
A - 35
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

NON A-6/EA-6B
MK5 & MK7 SERIES
THROUGH-THE-CANOPY

<table>
<thead>
<tr>
<th>SURVIVORS</th>
<th>31 (81.6%)</th>
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<tr>
<td>B - 17</td>
<td>(54.8%)</td>
</tr>
<tr>
<td>F - 3</td>
<td>(9.7%)</td>
</tr>
<tr>
<td>G - 11</td>
<td>(35.5%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FATALITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 (18.4%)</td>
</tr>
<tr>
<td>A - 6</td>
</tr>
<tr>
<td>L - 1</td>
</tr>
<tr>
<td>U - 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (66.7%)</td>
</tr>
<tr>
<td>B - 2</td>
</tr>
<tr>
<td>F - 0</td>
</tr>
<tr>
<td>G - 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 (82.9%)</td>
</tr>
<tr>
<td>B - 15</td>
</tr>
<tr>
<td>F - 3</td>
</tr>
<tr>
<td>G - 11</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (33.3%)</td>
</tr>
<tr>
<td>A - 0</td>
</tr>
<tr>
<td>L - 1</td>
</tr>
<tr>
<td>U - 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 (17.1%)</td>
</tr>
<tr>
<td>A - 6</td>
</tr>
<tr>
<td>L - 0</td>
</tr>
<tr>
<td>U - 0</td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

A-6/EA-6B
MK5 & MK7 SERIES
THROUGH-THE-CANOPY

128

SURVIVORS
98 (76.6%)
B - 28 (28.6%)
F - 45 (45.9%)
G - 25 (25.5%)

FATALITIES
30 (25.4%)
A - 19
L - 11
U - 0

OVERWATER
59 (78.7%)
B - 12 (20.3%)
F - 33 (55.9%)
G - 14 (23.7%)

OVERLAND
39 (73.6%)
B - 16 (41.0%)
F - 12 (30.8%)
G - 11 (28.2%)

OVERWATER
16 (21.3%)
A - 6
L - 10
U - 0

OVERLAND
14 (26.4%)
A - 13
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK5 & MK7 SERIES THROUGH-THE-CANOPY

166

SURVIVORS

129 (77.7%)

B – 45 (34.9%)
F – 48 (37.2%)
G – 36 (27.9%)

FATALITIES

37 (22.3%)

A – 25
L – 12
U – 0

OVERWATER

61 (78.2%)

B – 14 (23.0%)
F – 33 (54.0%)
G – 14 (23.0%)

OVERLAND

68 (77.3%)

B – 31 (45.6%)
F – 15 (22.1%)
G – 22 (32.4%)

OVERWATER

17 (21.8%)

A – 6
L – 11
U – 0

OVERLAND

20 (22.7%)

A – 19
L – 1
U – 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ALL MK5 & MK7 SERIES

718

SURVIVORS

608 (84.7%)

B - 101 (16.6%)
F - 168 (27.6%)
G - 339 (55.8%)

FATALITIES

110 (15.3%)

A - 68
L - 42
U - 0

OVERWATER

345 (86.5%)

B - 33 (9.6%)
F - 100 (29.0%)
G - 212 (61.4%)

OVERLAND

263 (82.4%)

B - 68 (25.9%)
F - 68 (25.9%)
G - 127 (48.3%)

OVERWATER

54 (13.5%)

A - 14
L - 40
U - 0

OVERLAND

56 (17.6%)

A - 54
L - 2
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

TYPE 9
CANOPY FRAGMENTATION
(TOTAL)

SURVIVORS
7 (87.5%)
B - 3 (42.9%)
F - 2 (28.6%)
G - 2 (28.6%)

FATALITIES
1 (12.5%)
A - 1
L - 0
U - 0

OVERWATER
1 (100%)
B - 0 (0%)
F - 1 (100%)
G - 0 (0%)

OVERLAND
6 (85.7%)
B - 3 (50.0%)
F - 1 (16.7%)
G - 2 (33.3%)

OVERWATER
0 (0%)
A -
L -
U -

OVERLAND
1 (14.3%)
A - 1
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)  
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

-67-
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

<table>
<thead>
<tr>
<th>Category</th>
<th>Survivors</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45 (81.8%)</td>
<td>10 (18.2%)</td>
</tr>
<tr>
<td>B</td>
<td>10 (22.2%)</td>
<td>A - 9</td>
</tr>
<tr>
<td>F</td>
<td>7 (15.6%)</td>
<td>L - 1</td>
</tr>
<tr>
<td>G</td>
<td>28 (62.2%)</td>
<td>U - 0</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Location</th>
<th>Survivors</th>
<th>FATALITIES</th>
</tr>
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<tbody>
<tr>
<td>OVERWATER</td>
<td>9 (90.0%)</td>
<td>A - 9</td>
</tr>
<tr>
<td>B</td>
<td>2 (22.2%)</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>0 (0%)</td>
<td>L - 1</td>
</tr>
<tr>
<td>G</td>
<td>7 (77.8%)</td>
<td>U - 0</td>
</tr>
<tr>
<td>OVERLAND</td>
<td>36 (80.0%)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>8 (22.2%)</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>7 (19.4%)</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>21 (58.3%)</td>
<td></td>
</tr>
<tr>
<td>OVERWATER</td>
<td>1 (10.0%)</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>OVERLAND</td>
<td>9 (20.0%)</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

LS-1/LS-1A THROUGH-THE-CANOPY

2

SURVIVORS
1 (50.0%)
- B - 0 (0%)
- F - 0 (0%)
- G - 1 (100%)

FATALITIES
1 (50.0%)
- A - 1
- L - 0
- U - 0

OVERWATER
0
- B -
- F -
- G -

OVERLAND
1 (50.0%)
- B - 0 (0%)
- F - 0 (0%)
- G - 1 (100%)

OVERWATER
0
- A -
- L -
- U -

OVERLAND
1 (50.0%)
- A - 1
- L - 0
- U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

HS-1
JETTISONED-CANOPY

SURVIVORS
20 (80.0%)
B - 4 (20.0%)
F - 10 (50.0%)
G - 6 (30.0%)

FATALITIES
5 (20.0%)
A - 2
L - 3
U - 0

OVERWATER
8 (72.7%)
B - 0 (0%)
F - 4 (50.0%)
G - 4 (50.0%)

OVERLAND
12 (85.7%)
B - 4 (33.3%)
F - 6 (50.0%)
G - 2 (16.7%)

OVERWATER
3 (27.3%)
A - 0
L - 3
U - 0

OVERLAND
2 (14.3%)
A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

HS-1A
JETTISONED-CANOPY

<table>
<thead>
<tr>
<th>SURVIVORS</th>
<th>FATALITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 (77.8%)</td>
<td>2 (22.2%)</td>
</tr>
</tbody>
</table>

| B - 2 (14.3%) | A - 2 |
| F - 3 (42.9%) | L - 0 |
| G - 3 (42.9%) | U - 0 |

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 (77.8%)</td>
<td>B - (A)</td>
</tr>
<tr>
<td>B - 2 (14.3%)</td>
<td>A - 2</td>
</tr>
<tr>
<td>F - 3 (42.9%)</td>
<td>L - 0</td>
</tr>
<tr>
<td>G - 3 (42.9%)</td>
<td>U - 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (22.2%)</td>
<td>A - 0</td>
</tr>
<tr>
<td>A - 2</td>
<td>A -</td>
</tr>
<tr>
<td>L - 0</td>
<td>L -</td>
</tr>
<tr>
<td>U - 0</td>
<td>U -</td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

LW-3B
JETTISONED-CANOPY

<table>
<thead>
<tr>
<th>SURVIVORS</th>
<th>FATALITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>L</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>L</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

LW-3B
THROUGH-THE-CANOPY

SURVIVORS
15 (70%)
B - 4 (26.7%)
F - 9 (60.0%)
G - 2 (13.3%)

FATALITIES
6 (30%)
A - 6
L - 0
U - 0

OVERWATER
4 (80.0%)
B - 2 (50.0%)
F - 0 (0%)
G - 2 (50.0%)

OVERLAND
11 (73.3%)
B - 2 (18.2%)
F - 9 (81.8%)
G - 0 (0%)

OVERWATER
1
A - 1
L - 0
U - 0

OVERLAND
4
A - 4
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

SIIIS-3AV8
CANOPY FRAGMENTATION
(TOTAL)

SURVIVORS
7 (100%)

- B -
- F -
- G -

FATALITIES
0 (0%)

- A -
- L -
- U -

OVERWATER
2 (100%)

- B - 0 (0%)
- F - 0 (0%)
- G - 2 (100%)

OVERLAND
5 (100%)

- B - 1 (20.0%)
- F - 1 (20.0%)
- G - 3 (60.0%)

OVERWATER
0

OVERLAND
0

- A -
- L -
- U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

NAMC II (T-33B)

SURVIVORS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>B</td>
<td>0</td>
</tr>
<tr>
<td>F</td>
<td>1</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
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</table>

FATALITIES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td></td>
</tr>
</tbody>
</table>

OVERWATER

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>G</td>
</tr>
</tbody>
</table>

OVERLAND

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>0</td>
</tr>
<tr>
<td>F</td>
<td>1</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
</tr>
</tbody>
</table>

OVERWATER

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>U</td>
</tr>
</tbody>
</table>

OVERLAND

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>U</td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

F-5E
JETTISONED-CANOPY

SURVIVORS
1 (100%)
B - 0 (0%)
F - 0 (0%)
G - 1 (100%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
0
B -
F -
G -

OVERLAND
1 (100%)
B - 0 (0%)
F - 0 (0%)
G - 1 (100%)

OVERWATER
0
A -
L -
U -

OVERLAND
0
A -
L -
U -
THROUGH-THE-CANOPY EJECTIONS

VS.

JETTISONED-CANOPY EJECTIONS,

CANOPY FRAGMENTATION(TOTAL) EJECTIONS,

CANOPY CUTTING(PARTIAL) EJECTIONS
# U.S. Navy Fatalities

Ejections Accomplished Clear of Aircraft and Inadvertent Ejections

(1 Jan 1969 - 31 Dec 1979)

<table>
<thead>
<tr>
<th>TYPE EJECTION</th>
<th>OVERWATER</th>
<th></th>
<th></th>
<th>OVERLAND</th>
<th></th>
<th></th>
<th>ALL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EJECTES</td>
<td>FATALITIES</td>
<td>RATE</td>
<td>EJECTES</td>
<td>FATALITIES</td>
<td>RATE</td>
<td>EJECTES</td>
<td>FATALITIES</td>
</tr>
<tr>
<td>JETTISONED CANOPY</td>
<td>524</td>
<td>22/44</td>
<td>12.6%</td>
<td>560</td>
<td>74/3</td>
<td>13.8%</td>
<td>1084</td>
<td>96/47</td>
</tr>
<tr>
<td>THROUGH THE CANOPY</td>
<td>109</td>
<td>11/16</td>
<td>24.8%</td>
<td>128</td>
<td>30/1</td>
<td>24.2%</td>
<td>237</td>
<td>41/17</td>
</tr>
<tr>
<td>CANOPY FRAGMENTATION (TOTAL)</td>
<td>3</td>
<td>0/0</td>
<td>0%</td>
<td>12</td>
<td>1/0</td>
<td>8.3%</td>
<td>15</td>
<td>1/0</td>
</tr>
<tr>
<td>CANOPY CUTTING (PARTIAL)</td>
<td>0</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>0/0</td>
<td>0%</td>
<td>1</td>
<td>0/0</td>
</tr>
<tr>
<td>TOTALS</td>
<td>636</td>
<td>33/60</td>
<td>14.6%</td>
<td>701</td>
<td>105/4</td>
<td>15.5%</td>
<td>1,337</td>
<td>138/64</td>
</tr>
</tbody>
</table>
U.S. NAVY MAJOR INJURIES
EJECTIONS ACCOMPLISHED CLEAR OF AIRCRAFT
AND
INADVERTENT EJECTIONS
(1 JAN 1969 - 31 DEC 1979)

<table>
<thead>
<tr>
<th>TYPE EJECTION</th>
<th>OVERWATER</th>
<th></th>
<th>OVERLAND</th>
<th></th>
<th>ALL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EJECTES</td>
<td>MAJOR INJURIES (RATE)</td>
<td>EJECTES</td>
<td>MAJOR INJURIES (RATE)</td>
<td>EJECTES</td>
<td>MAJOR INJURIES (RATE)</td>
</tr>
<tr>
<td>Jettisoned Canopy</td>
<td>524</td>
<td>39 (7.4%)</td>
<td>560</td>
<td>97 (17.3%)</td>
<td>1084</td>
<td>136 (12.5%)</td>
</tr>
<tr>
<td>Through-The Canopy</td>
<td>109</td>
<td>19 (17.4%)</td>
<td>128</td>
<td>28 (21.9%)</td>
<td>237</td>
<td>47 (19.8%)</td>
</tr>
<tr>
<td>Canopy Fragmentation (Total)</td>
<td>3</td>
<td>0 (0%)</td>
<td>12</td>
<td>4 (25.0%)</td>
<td>15</td>
<td>4 (26.7%)</td>
</tr>
<tr>
<td>Canopy Cutting (Partial)</td>
<td>0</td>
<td>-</td>
<td>1</td>
<td>0 (0%)</td>
<td>1</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Totals</td>
<td>637</td>
<td>58 (9.1%)</td>
<td>701</td>
<td>129 (18.4%)</td>
<td>1,337</td>
<td>187 (14.0%)</td>
</tr>
</tbody>
</table>
U.S. NAVY
EJECTIONS ACCOMPLISHED CLEAR OF AIRCRAFT
AND
INADVERTENT EJECTIONS
(1 JAN 1969 - 31 DEC 1979)

JETTISONED CANOPY EJECTIONS
# JETISONED CANOPY EJECTIONS

**1 JAN 69 - 31 DEC 79**

<table>
<thead>
<tr>
<th>TYPE EJECTION SEAT</th>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL EJECTEE</td>
<td>FATAL (A/L,U)</td>
</tr>
<tr>
<td>ESCAPAC 1</td>
<td>2</td>
<td>0/0</td>
</tr>
<tr>
<td>ESCAPAC 1A-1</td>
<td>34</td>
<td>3/1</td>
</tr>
<tr>
<td>ESCAPAC 1C-2</td>
<td>83</td>
<td>4/5</td>
</tr>
<tr>
<td>ESCAPAC 1C-3</td>
<td>34</td>
<td>1/4</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ESCAPAC 1
JETTISONED-CANOPY

7

SURVIVORS
7 (100%)
B - 0 (0%)
F - 4 (57.1%)
G - 3 (42.9%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
2 (100%)
B - 0 (0%)
F - 2 (100%)
G - 0 (0%)

OVERLAND
5 (100%)
B - 0 (0%)
F - 2 (40.0%)
G - 3 (60.0%)

OVERWATER
0 (0%)
A -
L -
U -

OVERLAND
0 (0%)
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1A-1
JETTISONED-CANOPY

89

SURVIVORS

<table>
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<th>Letter</th>
<th>Number</th>
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<tbody>
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<td>B</td>
<td>12</td>
<td>15.8%</td>
</tr>
<tr>
<td>F</td>
<td>26</td>
<td>34.2%</td>
</tr>
<tr>
<td>G</td>
<td>38</td>
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FATALITIES

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<td>14.1%</td>
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<tr>
<td>L</td>
<td>2</td>
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OVERWATER

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<th>Number</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>B</td>
<td>5</td>
<td>16.7%</td>
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<tr>
<td>F</td>
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<td>G</td>
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<td>43.3%</td>
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OVERLAND

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<td>7</td>
<td>15.2%</td>
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<td>F</td>
<td>14</td>
<td>30.4%</td>
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<td>G</td>
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<td>54.3%</td>
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OVERWATER

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<tr>
<td>U</td>
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OVERLAND

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<tr>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1C-2
JETTISONED-CANOPY
157

SURVIVORS
138 (87.9%)
B - 20 (14.5%)
F - 32 (23.2%)
G - 86 (62.3%)

FATALITIES
19 (12.1%)
A - 13
L - 5
U - 1

OVERWATER
74 (89.2%)
B - 6 (8.1%)
F - 13 (17.6%)
G - 55 (74.3%)

OVERLAND
64 (86.5%)
B - 14 (21.9%)
F - 19 (29.7%)
G - 31 (48.4%)

OVERWATER
9 (10.8%)
A - 4
L - 5
U - 0

OVERLAND
10 (13.5%)
A - 9
L - 0
U - 1
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1C-3
JETTISONED-CANOPY

124

SURVIVORS
110 (88.7%)
B - 19 (17.3%)
F - 28 (25.5%)
G - 63 (57.3%)

FATALITIES
14 (11.3%)
A - 10
L - 4
U - 0

OVERWATER
29 (85.3%)
B - 3 (10.3%)
F - 12 (41.4%)
G - 14 (48.3%)

OVERLAND
81 (90.0%)
B - 16 (19.8%)
F - 16 (19.8%)
G - 49 (60.5%)

OVERWATER
5 (14.7%)
A - 1
L - 4
U - 0

OVERLAND
9 (10.0%)
A - 9
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ESCAPAC I, IA-1, IC-2, IC-3
JETTISONED-CANOPY

378

SURVIVORS
332 (87.8%)
B - 52 (15.7%)
F - 90 (27.1%)
G - 190 (57.2%)

FATALITIES
46 (12.2%)
A - 34
L - 11
U - 1

OVERWATER
136 (88.3%)
B - 15 (11.0%)
F - 39 (28.7%)
G - 82 (60.3%)

OVERLAND
196 (87.5%)
B - 37 (18.9%)
F - 51 (26.0%)
G - 108 (55.1%)

OVERWATER
18 (11.7%)
A - 8
L - 10
U - 0

OVERLAND
28 (12.5%)
A - 26
L - 1
U - 1
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1E-1
JETTISONED-CANOPY

SURVIVORS
0 (0%)
B -
F -
G -

FATALITIES
1 (100%)
A - 1
L - 0
U - 0

OVERWATER
B -
F -
G -

OVERLAND
B -
F -
G -

OVERWATER
A -
L -
U -

OVERLAND
A - 1
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1F-3
JETTISONED-CANOPY

19

SURVIVORS
16 (84.2%)
B - 4 (25.0%)
F - 4 (25.0%)
G - 8 (50.0%)

FATALITIES
3 (15.8%)
A - 3
L - 0
U - 0

OVERWATER
9 (66.7%)
B - 2 (22.2%)
F - 3 (33.3%)
G - 4 (44.4%)

OVERLAND
7 (87.5%)
B - 2 (28.6%)
F - 1 (14.3%)
G - 4 (57.1%)

OVERWATER
2 (33.3%)
A - 2
L - 0
U - 0

OVERLAND
1 (12.5%)
A - 1
L - 0
U - 0
### NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

**1 JANUARY 1969 THROUGH 31 DECEMBER 1979**

#### 1G-2
**JETTISONED-CANOPY**

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<th>FATALITIES</th>
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<td><strong>1 (100%)</strong></td>
<td><strong>0 (0%)</strong></td>
</tr>
<tr>
<td>B - 0 (0%)</td>
<td>A -</td>
</tr>
<tr>
<td>F - 1 (100%)</td>
<td>L -</td>
</tr>
<tr>
<td>G - 0 (0%)</td>
<td>U -</td>
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</tbody>
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**OVERWATER**

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
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<tbody>
<tr>
<td><strong>1 (100%)</strong></td>
<td><strong>0</strong></td>
</tr>
<tr>
<td>B - 0 (0%)</td>
<td>A -</td>
</tr>
<tr>
<td>F - 1 (100%)</td>
<td>L -</td>
</tr>
<tr>
<td>G - 0 (0%)</td>
<td>U -</td>
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**OVERLAND**

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<th>OVERLAND</th>
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<tr>
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<tr>
<td>L -</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

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<td>6 (9.5%)</td>
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<td>B</td>
<td>13 (22.8%)</td>
<td>5</td>
</tr>
<tr>
<td>F</td>
<td>12 (21.1%)</td>
<td>1</td>
</tr>
<tr>
<td>G</td>
<td>32 (56.1%)</td>
<td>0</td>
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<thead>
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<th>OVERWATER</th>
<th>15 (75.0%)</th>
<th>OVERLAND</th>
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<td>B</td>
<td>2 (13.3%)</td>
<td>A - 4</td>
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<tr>
<td>F</td>
<td>5 (33.3%)</td>
<td>L - 1</td>
</tr>
<tr>
<td>G</td>
<td>8 (53.3%)</td>
<td>U - 0</td>
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<thead>
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<th>OVERWATER</th>
<th>5 (25.0%)</th>
<th>OVERLAND</th>
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<tr>
<td>B</td>
<td>11 (26.2%)</td>
<td>A - 1</td>
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<tr>
<td>F</td>
<td>7 (16.7%)</td>
<td>L - 0</td>
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<tr>
<td>G</td>
<td>24 (57.1%)</td>
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<tr>
<td>L</td>
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<td>L - 0</td>
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<tr>
<td>U</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK 15
JETTISONED-CANOPY

SURVIVORS
1 (100%)

B - 0 (0%)
F - 1 (100%)
G - 0 (0%)

FATALITIES
0 (0%)

A - 0
L - 0
U - 0

OVERWATER
0

B - 0
F - 0
G - 0

OVERLAND
1 (100%)

B - 0 (0%)
F - 1 (100%)
G - 0 (0%)

OVERWATER
0

A - 0
L - 0
U - 0

OVERLAND
0 (0%)

A - 0
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK F5
JETTISONED-CANOPY

SURVIVORS
13 (76.5%)
B - 1 (7.7%)
F - 5 (38.5%)
G - 7 (53.8%)

FATALITIES
4 (24.5%)
A - 2
L - 2
U - 0

OVERWATER
3 (60.0%)
B - 0 (0%)
F - 0 (0%)
G - 3 (100%)

OVERLAND
10 (83.3%)
B - 1 (10.0%)
F - 5 (50.0%)
G - 4 (40.0%)

OVERWATER
2 (40.0%)
A - 0
L - 2
U - 0

OVERLAND
2 (16.7%)
A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU5
JETTISONED-CANOPY

12

SURVIVORS

12 (100%)

B - 3 (25.0%)
F - 3 (25.0%)
G - 6 (50.0%)

FATALITIES

0 (0%)

A -
L -
U -

OVERWATER

4 (100%)

B - 0 (0%)
F - 2 (50.0%)
G - 2 (50.0%)

OVERLAND

8 (100%)

B - 3 (37.5%)
F - 1 (12.5%)
G - 4 (50.0%)

OVERWATER

A -
L -
U -

OVERLAND

A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRUEA5
JETTISONED-CANOPY

SURVIVORS
4 (100%)
B - 2 (50.0%)
F - 1 (25.5%)
G - 1 (25.5%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
0
B -
F -
G -

OVERLAND
4 (100%)
B - 2 (50.0%)
F - 1 (25.5%)
G - 1 (25.5%)

OVERWATER

OVERLAND
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK H-5
JETTISONED-CANOPY
14

SURVIVORS
13 (92.9%)
B - 4 (30.8%)
F - 5 (38.5%)
G - 4 (30.8%)

FATALITIES
1 (7.1%)
A - 0
L - 1
U - 0

OVERWATER
3 (75.0%)
B - 0 (0%)
F - 2 (66.7%)
G - 1 (33.3%)

OVERLAND
10 (100%)
B - 4 (40%)
F - 3 (30%)
G - 3 (30%)

OVERWATER
1 (25.0%)
A - 0
L - 1
U - 0

OVERLAND
0
A - 
L - 
U - 
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK5 SERIES
JETTISONED-CANOPY

49

SURVIVORS
44 (89.8%)
B - 10 (22.7%)
F - 15 (34.1%)
G - 19 (43.2%)

FATALITIES
5 (10.2%)
A - 2
L - 3
U - 0

OVERWATER
10 (76.9%)
B - 0 (0.0%)
F - 4 (40.0%)
G - 6 (60.0%)

OVERLAND
34 (94.4%)
B - 10 (29.4%)
F - 11 (32.4%)
G - 13 (38.2%)

OVERWATER
3 (23.1%)
A - 0
L - 3
U - 0

OVERLAND
2 (5.6%)
A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK A7A
JETTISONED-CANOPY

SURVIVORS

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</tr>
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<td>B</td>
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<tr>
<td>F</td>
<td>1</td>
<td>(100%)</td>
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<tr>
<td>G</td>
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FATALITIES

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OVERWATER

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<tr>
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</tr>
<tr>
<td>B</td>
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<tr>
<td>F</td>
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OVERLAND

<p>| | |</p>
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<tr>
<td>B</td>
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<tr>
<td>F</td>
<td>(100%)</td>
</tr>
<tr>
<td>G</td>
<td>(0%)</td>
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OVERWATER

<p>| | |</p>
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<td>L</td>
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OVERLAND

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<tr>
<td>L</td>
<td></td>
</tr>
<tr>
<td>U</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK Z5
JETTISONED-CANOPY

<table>
<thead>
<tr>
<th>SURVIVORS</th>
<th>FATALITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>B - 0 (0%)</td>
<td>A -</td>
</tr>
<tr>
<td>F - 0 (0%)</td>
<td>L -</td>
</tr>
<tr>
<td>G - 1 (100%)</td>
<td>U -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>B -</td>
<td>B - 0 (0%)</td>
</tr>
<tr>
<td>F -</td>
<td>F - 0 (0%)</td>
</tr>
<tr>
<td>G -</td>
<td>G - 1 (100%)</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU 7A
JETTISONED-CANOPY

67

SURVIVORS

56 (83.6%)
B - 9 (16.1%)
F - 12 (21.4%)
G - 35 (62.5%)

FATALITIES

11 (16.4%)
A - 9
L - 2
U - 0

OVERWATER

42 (91.3%)
B - 4 (9.5%)
F - 9 (21.4%)
G - 29 (69.0%)

OVERLAND

14 (66.7%)
B - 5 (35.7%)
F - 3 (21.4%)
G - 6 (42.9%)

OVERWATER

4 (8.7%)
A - 2
L - 2
U - 0

OVERLAND

7 (33.3%)
A - 7
L - 0
U - 0
NAVY EJECTIONS (ACCOMPILISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK H7A
JETTISONED-CANOPY
348

SURVIVORS
296 (85.1%)
B - 32 (10.8%)
F - 76 (25.7%)
G - 188 (63.5%)

FATALITIES
52 (14.9%)
A - 29
L - 23
U - 0

OVERWATER
190 (87.2%)
B - 13 (6.8%)
F - 49 (25.8%)
G - 28 (67.4%)

OVERLAND
106 (81.5%)
B - 19 (17.9%)
F - 27 (25.5%)
G - 60 (56.6%)

OVERWATER
28 (12.8%)
A - 6
L - 22
U - 0

OVERLAND
24 (18.5%)
A - 23
L - 1
U - 0
NAVY EJECTIONS (ACCOMPANIED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

<table>
<thead>
<tr>
<th>MK7 SERIES</th>
<th>JETTISSONED-CANOPY</th>
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<table>
<thead>
<tr>
<th>SURVIVORS</th>
<th>(86.5%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>46 (10.6%)</td>
</tr>
<tr>
<td>F</td>
<td>105 (24.1%)</td>
</tr>
<tr>
<td>G</td>
<td>284 (65.3%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>(89.0%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>19 (6.9%)</td>
</tr>
<tr>
<td>F</td>
<td>63 (23.0%)</td>
</tr>
<tr>
<td>G</td>
<td>192 (70.1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERLAND</th>
<th>(57.1%)</th>
</tr>
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<tbody>
<tr>
<td>B</td>
<td>27 (16.8%)</td>
</tr>
<tr>
<td>F</td>
<td>42 (26.1%)</td>
</tr>
<tr>
<td>G</td>
<td>92 (57.1%)</td>
</tr>
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<table>
<thead>
<tr>
<th>FATILITIES</th>
<th>(13.5%)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>41</td>
</tr>
<tr>
<td>L</td>
<td>27</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
</tr>
</tbody>
</table>

34 (17.4%)
34 (11.0%)
161 (82.6%)
274 (89.0%)
34 (17.4%)
A - 33
L - 1
U - 0
A - 8
L - 26
U - 0
B - 27
F - 42
G - 92
B - 19
F - 63
G - 192

-105-
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

ALL MK5 & MK7 SERIES
JETTISONED-CANOPY

552

SURVIVORS
479 (86.8%)
B - 56 (11.7%)
F - 120 (25.1%)
G - 303 (63.3%)

FATALITIES
73 (13.2%)
A - 43
L - 30
U - 0

OVERWATER
284 (88.5%)
B - 19 (6.7%)
F - 67 (23.6%)
G - 198 (69.7%)

OVERLAND
195 (84.4%)
B - 37 (19.0%)
F - 53 (27.2%)
G - 105 (53.8%)

OVERWATER
37 (11.5%)
A - 8
L - 29
U - 0

OVERLAND
36 (15.6%)
A - 35
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

LS-1/LS-1A
JETTISONED
55

SURVIVORS
45 (81.8%)
B - 10 (22.2%)
F - 7 (15.6%)
G - 28 (62.2%)

FATALITIES
10 (18.2%)
A - 9
L - 1
U - 0

OVERWATER
9 (90.0%)
B - 2 (22.2%)
F - 0 (0%)
G - 7 (77.8%)

OVERLAND
36 (80.0%)
B - 8 (22.2%)
F - 7 (19.4%)
G - 21 (58.3%)

OVERWATER
1 (10.0%)
A - 0
L - 1
U - 0

OVERLAND
9 (20.0%)
A - 9
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

HS-1
JETTISONED-CANOPY

25

SURVIVORS
20 (80.0%)
B - 4 (20.0%)
F - 10 (50.0%)
G - 6 (30.0%)

FATALITIES
5 (20.0%)
A - 2
L - 3
U - 0

OVERWATER
8 (72.7%)
B - 0 (0%)
F - 4 (50.0%)
G - 4 (50.0%)

OVERLAND
12 (85.7%)
B - 4 (33.3%)
F - 6 (50.0%)
G - 2 (16.7%)

OVERWATER
3 (27.3%)
A - 0
L - 3
U - 0

OVERLAND
2 (14.3%)
A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

LW-3B
JETTISONED-CANOPY

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<thead>
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<th>FATALITIES</th>
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<tr>
<td>0 (0%)</td>
<td>1 (100%)</td>
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</tbody>
</table>

| B -   | A - 1 |
| F -   | L - 0 |
| G -   | U - 0 |

<table>
<thead>
<tr>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
<thead>
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<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>A -</td>
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</tr>
<tr>
<td>L -</td>
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</tr>
<tr>
<td>U -</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

NAMC II (T-33B)

SURVIVORS

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<th>Count</th>
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</tr>
<tr>
<td>F</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>G</td>
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FATALITIES

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<th>Percentage</th>
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<tr>
<td>A</td>
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<td>0%</td>
</tr>
<tr>
<td>L</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
<td>0%</td>
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</tbody>
</table>

OVERWATER

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
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<tr>
<td>F</td>
<td>1</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
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</table>

OVERLAND

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>F</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>G</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

OVERWATER

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<tr>
<td>L</td>
<td>0</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
</tr>
</tbody>
</table>

OVERLAND

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td>L</td>
<td>0</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

F-5E
JETTISONED-CANOPY

1

SURVIVORS

1 (100%)

B - 0 (0%)
F - 0 (0%)
G - 1 (100%)

FATALITIES

0 (0%)

A -
L -
U -

OVERWATER

0

B -
F -
G -

OVERLAND

1 (100%)

B - 0 (0%)
F - 0 (0%)
G - 1 (100%)

OVERWATER

0

A -
L -
U -

OVERLAND

0

A -
L -
U -
U.S. NAVY
EJECTIONS ACCOMPLISHED CLEAR OF AIRCRAFT
AND
INADVERTENT EJECTIONS
(1 JAN 1969 - 31 DEC 1979)

THROUGH-THE-CANOPY EJECTIONS
## Through-the-Canopy Ejections

### 1 Jan 69 - 31 Dec 79

<table>
<thead>
<tr>
<th>Type Ejection Seat</th>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Ejectees</td>
<td>Fatal (A/L,U)</td>
</tr>
<tr>
<td>ESCAPAC 1C-2</td>
<td>1</td>
<td>0/0</td>
</tr>
<tr>
<td>ESCAPAC 1E-1</td>
<td>2</td>
<td>0/2</td>
</tr>
<tr>
<td>ESCAPAC 1G-2</td>
<td>23</td>
<td>4/3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>26</td>
<td>4/5</td>
</tr>
<tr>
<td>MK A5</td>
<td>2</td>
<td>0/1</td>
</tr>
<tr>
<td>MK GRU5</td>
<td>43</td>
<td>5/3</td>
</tr>
<tr>
<td>MK GRUEA5</td>
<td>0</td>
<td>–</td>
</tr>
<tr>
<td>MK L5</td>
<td>0</td>
<td>–</td>
</tr>
<tr>
<td>MK Z5</td>
<td>0</td>
<td>–</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>45</td>
<td>5/4</td>
</tr>
<tr>
<td>MK A7</td>
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<td>0/0</td>
</tr>
<tr>
<td>MK F7</td>
<td>0</td>
<td>–</td>
</tr>
<tr>
<td>MK GRU7</td>
<td>18</td>
<td>1/5</td>
</tr>
<tr>
<td>MK GRUEA7</td>
<td>14</td>
<td>0/2</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>33</td>
<td>1/7</td>
</tr>
<tr>
<td>LS-1/LS-1A</td>
<td>0</td>
<td>–</td>
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<tr>
<td>LW-3B</td>
<td>5</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td>5</td>
<td>1/0</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>109</td>
<td>11/16</td>
</tr>
<tr>
<td><strong>OVERALL TOTALS</strong></td>
<td>237</td>
<td>41/17</td>
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# Through-the-Canopy Ejections

1 Jan 69 - 31 Dec 79

<table>
<thead>
<tr>
<th>Type Ejection Seat</th>
<th>Total Ejectees</th>
<th>Major Injuries</th>
<th>Rate</th>
<th>Total Ejectees</th>
<th>Major Injuries</th>
<th>Rate</th>
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<tbody>
<tr>
<td>Through-the-Canopy Total</td>
<td>109</td>
<td>19</td>
<td>17.4%</td>
<td>128</td>
<td>39</td>
<td>30.5%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>237</td>
<td>51</td>
<td>21.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overwater</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESCAPAC 1C-2</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td>0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>ESCAPAC 1E-1</td>
<td>2</td>
<td>0</td>
<td>0%</td>
<td>5</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>ESCAPAC 1G-2</td>
<td>23</td>
<td>2</td>
<td>8.7%</td>
<td>17</td>
<td>5</td>
<td>29.4%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>26</td>
<td>3</td>
<td>11.5%</td>
<td>22</td>
<td>5</td>
<td>22.7%</td>
</tr>
<tr>
<td>MK A5</td>
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<td>1</td>
<td>50.0%</td>
<td>16</td>
<td>7</td>
<td>43.8%</td>
</tr>
<tr>
<td>MK GRU5</td>
<td>43</td>
<td>7</td>
<td>16.3%</td>
<td>29</td>
<td>10</td>
<td>34.5%</td>
</tr>
<tr>
<td>MK GRUEA5</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>7</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>MK L5</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>6</td>
<td>2</td>
<td>33.3%</td>
</tr>
<tr>
<td>MK Z5</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>6</td>
<td>1</td>
<td>16.7%</td>
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<tr>
<td>Subtotal</td>
<td>45</td>
<td>8</td>
<td>17.8%</td>
<td>58</td>
<td>21</td>
<td>36.2%</td>
</tr>
<tr>
<td>MK A7</td>
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<td>1</td>
<td>100%</td>
<td>6</td>
<td>4</td>
<td>66.7%</td>
</tr>
<tr>
<td>MK F7</td>
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<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>MK GRU7</td>
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<td>2</td>
<td>11.1%</td>
<td>20</td>
<td>5</td>
<td>25.0%</td>
</tr>
<tr>
<td>MK GRUEA7</td>
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<td>3</td>
<td>21.4%</td>
<td>3</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>33</td>
<td>6</td>
<td>18.2%</td>
<td>30</td>
<td>10</td>
<td>33.3%</td>
</tr>
<tr>
<td>LS-1/LS-1A</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>1</td>
<td>50.0%</td>
</tr>
<tr>
<td>LW-3B</td>
<td>5</td>
<td>2</td>
<td>40.0%</td>
<td>16</td>
<td>2</td>
<td>12.5%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>5</td>
<td>2</td>
<td>40.0%</td>
<td>18</td>
<td>3</td>
<td>16.7%</td>
</tr>
<tr>
<td>Totals</td>
<td>109</td>
<td>19</td>
<td>17.4%</td>
<td>128</td>
<td>39</td>
<td>30.5%</td>
</tr>
<tr>
<td>Overall Totals</td>
<td>237</td>
<td>51</td>
<td>21.5%</td>
<td></td>
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## THROUGH-THE-CANOPY EJECTIONS

1 JAN 69 - 31 DEC 79

<table>
<thead>
<tr>
<th>TYPE EJECTION SEAT</th>
<th>OVERWATER</th>
<th></th>
<th>OVERLAND</th>
<th></th>
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<tbody>
<tr>
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<td>TOTAL EJECTES</td>
<td>MINOR INJURIES</td>
<td>RATE</td>
<td>TOTAL EJECTES</td>
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<td>ESCAPAC 1C-2</td>
<td>1</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>ESCAPAC 1E-1</td>
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<td>0</td>
<td>0%</td>
<td>5</td>
</tr>
<tr>
<td>ESCAPAC 1G-2</td>
<td>23</td>
<td>5</td>
<td>21.7%</td>
<td>17</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>26</td>
<td>5</td>
<td>19.2%</td>
<td>22</td>
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<td>MK A5</td>
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<td>0</td>
<td>0%</td>
<td>16</td>
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<td>46.5%</td>
<td>29</td>
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<tr>
<td>MK GRUEA5</td>
<td>0</td>
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<td>—</td>
<td>1</td>
</tr>
<tr>
<td>MK L5</td>
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<td>—</td>
<td>6</td>
</tr>
<tr>
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<td>20</td>
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<td>237</td>
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# Through-the-Canopy Ejections

## Jan 69 - 31 Dec 79

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<th>Rate %</th>
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<td>22.3</td>
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<td><strong>33</strong></td>
<td><strong>24.2</strong></td>
<td><strong>18.2</strong></td>
<td><strong>39.4</strong></td>
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<td><strong>17.4</strong></td>
<td><strong>34.9</strong></td>
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<td><strong>237</strong></td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1C-2
THROUGH-THE-CANOPY

1

SURVIVORS
1 (100%)
B - 1 (100%)
F - 0
G - 0

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
1 (100%)
B - 1 (100%)
F - 0
G - 0

OVERLAND
0
B -
F -
G -

OVERWATER
0
A -
L -
U -

OVERLAND
0
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1E-1
THROUGH-THE-CANOPY

SURVIVORS
3 (42.9%)
B - 0 (0%)
F - 0 (0%)
G - 3 (100%)

FATALITIES
4 (57.1%)
A - 2
L - 2
U - 0

OVERWATER
0 (0%)
B -
F -
G -

OVERLAND
3 (60.0%)
B - 0 (0%)
F - 0 (0%)
G - 3 (100%)

OVERWATER
2 (100%)
A - 0
L - 2
U - 0

OVERLAND
2 (40.0%)
A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1G-2
THROUGH-THE-CANOPY
40

SURVIVORS
30 (75.0%)
- B - 7 (23.3%)
- F - 7 (23.3%)
- G - 16 (53.3%)

FATALITIES
10 (25.0%)
- A - 7
- L - 3
- U - 0

OVERWATER
16 (69.6%)
- B - 2 (12.5%)
- F - 5 (31.3%)
- G - 9 (56.3%)

OVERLAND
14 (82.4%)
- B - 5 (35.7%)
- F - 2 (14.3%)
- G - 7 (50.0%)

OVERWATER
7 (30.4%)
- A - 4
- L - 3
- U - 0

OVERLAND
3 (17.6%)
- A - 3
- L - 0
- U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1G-3
JETTISONED-CANOPY

43

SURVIVORS

40 (93.0%)
B - 9 (22.5%)
F - 7 (17.5%)
G - 24 (60.0%)

FATALITIES

3 (7.0%)
A - 2
L - 1
U - 0

OVERWATER

5 (62.5%)
B - 0 (0%)
F - 1 (20.0%)
G - 4 (80.0%)

OVERLAND

35 (100%)
B - 9 (25.7%)
F - 6 (17.1%)
G - 20 (57.1%)

OVERWATER

3 (37.5%)
A - 2
L - 1
U - 0

OVERLAND

0
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK A5
THROUGH-THE-CANOPY

18

SURVIVORS

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<tr>
<th>B</th>
<th>F</th>
<th>G</th>
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<tbody>
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<tr>
<td>61.5%</td>
<td>15.4%</td>
<td>23.1%</td>
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13 (72.2%)

FATALITIES

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<tbody>
<tr>
<td>4</td>
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5 (27.8%)

OVERWATER

<table>
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<tbody>
<tr>
<td>1</td>
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<td>0</td>
</tr>
<tr>
<td>100%</td>
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</table>

1 (50.0%)

OVERLAND

<table>
<thead>
<tr>
<th>B</th>
<th>F</th>
<th>G</th>
</tr>
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<tbody>
<tr>
<td>7</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>58.3%</td>
<td>16.7%</td>
<td>25.0%</td>
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12 (75.0%)

OVERWATER

<table>
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<tr>
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<th>L</th>
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</thead>
<tbody>
<tr>
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<td>1</td>
<td>0</td>
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</table>

1 (50.0%)

OVERLAND

<table>
<thead>
<tr>
<th>A</th>
<th>L</th>
<th>U</th>
</tr>
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<tbody>
<tr>
<td>4</td>
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</table>

4 (25.0%)
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU5
THROUGH-THE-CANOPY
72

SURVIVORS
56 (77.8%)
B - 17 (30.4%)
F - 28 (50.0%)
G - 11 (19.6%)

FATALITIES
16 (22.2%)
A - 12
L - 4
U - 0

OVERWATER
35 (81.4%)
B - 7 (20.0%)
F - 20 (57.1%)
G - 8 (22.9%)

OVERLAND
21 (72.4%)
B - 10 (47.6%)
F - 8 (38.1%)
G - 3 (14.3%)

OVERWATER
8
A - 5
L - 3
U - 0

OVERLAND
8
A - 7
L - 1
U - 0
### NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

#### MK GRUEA5
- THROUGH-THE-CANOPY
- **1**

#### SURVIVORS
- **1** (100%)
  - B - 1 (100%)
  - F - 0 (0%)
  - G - 0 (0%)

#### FATALITIES
- **0** (0%)
  - A -
  - L -
  - U -

#### OVERWATER
- **0**
  - B -
  - F -
  - G -

#### OVERLAND
- **1** (100%)
  - B - 1 (100%)
  - F - 0 (0%)
  - G - 0 (0%)

#### OVERWATER
- **A -
  - L -
  - U -

#### OVERLAND
- **A -
  - L -
  - U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK L5
THROUGH-THE-CANOPY

SURVIVORS
4 (66.7%)

B - 2 (50.0%)
F - 1 (25.0%)
G - 1 (25.0%)

FATALITIES
2 (33.3%)

A - 2
L - 0
U - 0

OVERWATER
0

OVERLAND
4 (66.7%)

B - 2 (50.0%)
F - 1 (25.0%)
G - 1 (25.0%)

OVERWATER
0

OVERLAND
2 (33.3%)

A - 2
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK Z5
THROUGH-THE-CANOPY

SURVIVORS
6 (100%)
B - 1 (16.7%)
F - 0 (0%)
G - 5 (83.3%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
0
B -
F -
G -

OVERLAND
6 (100%)
B - 1 (16.7%)
F - 0 (0%)
G - 5 (83.3%)

OVERWATER
A -
L -
U -

OVERLAND
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

NON A-6/EA-6B MK5 SERIES THROUGH-THE-CANOPY

30

SURVIVORS

23 (76.7%)
B - 11 (47.8%)
F - 3 (13.0%)
G - 9 (39.1%)

FATALITIES

7 (23.3%)
A - 6
L - 1
U - 0

OVERWATER

1 (50.0%)
B - 1 (100%)
F - 0
G - 0

OVERLAND

22 (78.6%)
B - 10 (~5.5%)
F - 3 (13.6%)
G - 9 (40.9%)

OVERWATER

1 (50.0%)
A - 0
L - 1
U - 0

OVERLAND

6 (21.4%)
A - 6
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU5 & MK GRUEA5 THROUGH-THE-CANOPY

73

SURVIVORS
57 (78.1%)
B - 18 (31.6%)
F - 28 (49.1%)
G - 11 (19.3%)

FATALITIES
16 (21.9%)
A - 12
L - 4
U - 0

OVERWATER
35 (81.4%)
B - 7 (20.0%)
F - 20 (57.1%)
G - 8 (22.9%)

OVERLAND
22 (73.3%)
B - 11 (50.0%)
F - 8 (36.4%)
G - 3 (13.6%)

OVERWATER
8 (18.6%)
A - 5
L - 3
U - 0

OVERLAND
8 (26.7%)
A - 7
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK5 SERIES
THROUGH-THE-CANOPY

SURVIVORS
80 (77.7%)
B – 29 (36.3%)
F – 31 (38.8%)
G – 20 (25.0%)

FATALITIES
23 (22.3%)
A – 18
L – 5
U – 0

OVERWATER
36 (80.0%)
B – 8 (22.2%)
F – 20 (55.6%)
G – 8 (22.2%)

OVERLAND
44 (75.9%)
B – 21 (47.7%)
F – 11 (25.0%)
G – 12 (27.3%)

OVERWATER
9 (20.0%)
A – 5
L – 4
U – 0

OVERLAND
14 (24.1%)
A – 13
L – 1
U – 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK A7A
THROUGH-THE-CANOPY

7

SURVIVORS

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<td>F</td>
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FATALITIES

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<td>L</td>
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OVERWATER

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<td>F</td>
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OVERLAND

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<tr>
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<td>F</td>
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<td>G</td>
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OVERWATER

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<tr>
<td>A</td>
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<td>L</td>
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OVERLAND

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<tr>
<td>A</td>
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<td>L</td>
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<tr>
<td>U</td>
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NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK F7A
THROUGH-THE-CANOPY

1

SURVIVORS
1 (100%)

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<td>1 (100%)</td>
</tr>
<tr>
<td>F</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>G</td>
<td>0 (0%)</td>
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</table>

FATALITIES
0 (0%)

<p>| | |</p>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>L</td>
<td></td>
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<tr>
<td>U</td>
<td></td>
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</table>

OVERWATER
0

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
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<tr>
<td>F</td>
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</tr>
<tr>
<td>G</td>
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</tbody>
</table>

OVERLAND
1 (100%)

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>B</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>F</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>G</td>
<td>0 (0%)</td>
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OVERWATER

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
</tr>
<tr>
<td>U</td>
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</tr>
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</table>

OVERLAND

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td></td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU7
THROUGH-THE-CANOPY
38

SURVIVORS
26 (68.4%)
B - 7 (26.9%)
F - 10 (38.5%)
G - 4 (34.6%)

FATALITIES
12 (31.6%)
A - 7
L - 5
U - 0

OVERWATER
12 (66.7%)
B - 2 (16.7%)
F - 6 (50.0%)
G - 4 (33.3%)

OVERLAND
14 (70.0%)
B - 5 (35.7%)
F - 4 (28.6%)
G - 5 (35.7%)

OVERWATER
6 (33.3%)
A - 1
L - 5
U - 0

OVERLAND
6 (30.0%)
A - 6
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRUEA7
THROUGH-THE-CANOPY

17

SURVIVORS
15 (88.2%)
B - 3 (20.0%)
F - 7 (46.7%)
G - 5 (33.3%)

FATALITIES
2 (11.8%)
A - 0
L - 2
U - 0

OVERWATER
12 (85.7%)
B - 3 (25.0%)
F - 7 (58.3%)
G - 2 (16.7%)

OVERLAND
3 (100%)
B - 0 (0%)
F - 0 (0%)
G - 3 (100%)

OVERWATER
2 (14.3%)
A - 0
L - 2
U - 0

OVERLAND
0
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

NON A-6/EA-6B
MK7 SERIES
THROUGH-THE-CANOPY

8

SURVIVORS
8 (100%)
B - 6 (75.0%)
F - 0 (0%)
G - 2 (25.0%)

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
1 (100%)
B - 1 (100%)
F - 0
G - 0

OVERLAND
7 (100%)
B - 5 (71.4%)
F - 0 (0%)
G - 2 (28.6%)

OVERWATER
0 (0%)
A -
L -
U -

OVERLAND
0 (0%)
A -
L -
U -
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT) 
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK GRU7 & MK GRUEA7 THROUGH-THE-CANOPY

55

SURVIVORS

41 (74.5%)

B - 10 (24.4%)
F - 17 (41.5%)
G - 14 (34.2%)

FATALITIES

14 (25.5%)

A - 7
L - 7
U - 0

OVERWATER

24 (75.0%)

B - 5 (20.8%)
F - 13 (54.2%)
G - 6 (25.0%)

OVERLAND

17 (73.9%)

B - 5 (29.4%)
F - 4 (23.5%)
G - 8 (47.1%)

OVERWATER

8 (25.0%)

A - 1
L - 7
U - 0

OVERLAND

6 (26.1%)

A - 6
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK7 SERIES
THROUGH-THE-CANOPY
63

SURVIVORS
49 (77.8%)
B - 16
F - 17
G - 16

FATALITIES
14 (22.2%)
A - 7
L - 7
U - 0

OVERWATER
25 (75.8%)
B - 6 (24.0%)
F - 13 (52.0%)
G - 6 (24.0%)

OVERLAND
24 (80.0%)
B - 10 (41.7%)
F - 4 (6.6%)
G - 10 (41.7%)

OVERWATER
8 (24.2%)
A - 1
L - 7
U - 0

OVERLAND
6 (20.0%)
A - 6
L - 0
U - 0
# Navy Ejections (Accomplished Clear of Aircraft and Inadvertent)

1 January 1969 Through 31 December 1979

<table>
<thead>
<tr>
<th>Non A-6/EA-6B MK5 &amp; MK7 Series Through-the-Canopy</th>
<th>38</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survivors</strong></td>
<td></td>
</tr>
<tr>
<td>31 (81.6%)</td>
<td></td>
</tr>
<tr>
<td>B - 17 (54.8%)</td>
<td></td>
</tr>
<tr>
<td>F - 3 (9.7%)</td>
<td></td>
</tr>
<tr>
<td>G - 11 (35.5%)</td>
<td></td>
</tr>
<tr>
<td><strong>Fatalities</strong></td>
<td></td>
</tr>
<tr>
<td>7 (18.4%)</td>
<td></td>
</tr>
<tr>
<td>A - 6</td>
<td></td>
</tr>
<tr>
<td>L - 1</td>
<td></td>
</tr>
<tr>
<td>U - 0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overwater</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (66.7%)</td>
<td></td>
</tr>
<tr>
<td>B - 2 (100%)</td>
<td></td>
</tr>
<tr>
<td>F - 0</td>
<td></td>
</tr>
<tr>
<td>G - 0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overland</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>29 (82.9%)</td>
<td></td>
</tr>
<tr>
<td>B - 15 (51.7%)</td>
<td></td>
</tr>
<tr>
<td>F - 3 (10.3%)</td>
<td></td>
</tr>
<tr>
<td>G - 11 (37.9%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overwater</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (33.3%)</td>
<td></td>
</tr>
<tr>
<td>A - 0</td>
<td></td>
</tr>
<tr>
<td>L - 1</td>
<td></td>
</tr>
<tr>
<td>U - 0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overland</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6 (17.1%)</td>
<td></td>
</tr>
<tr>
<td>A - 6</td>
<td></td>
</tr>
<tr>
<td>L - 0</td>
<td></td>
</tr>
<tr>
<td>U - 0</td>
<td></td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

A-6/EA-6B
MK5 & MK7 SERIES
THROUGH-THE-CANOPY

SURVIVORS
98 (76.6%)
B - 28 (28.6%)
F - 45 (45.9%)
G - 25 (25.5%)

FATALITIES
30 (25.4%)
A - 19
L - 11
U - 0

OVERWATER
59 (78.7%)
B - 12 (20.3%)
F - 33 (55.9%)
G - 14 (23.7%)

OVERLAND
39 (73.6%)
B - 16 (41.0%)
F - 12 (30.8%)
G - 11 (28.2%)

OVERWATER
16 (21.3%)
A - 6
L - 10
U - 0

OVERLAND
14 (26.4%)
A - 13
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

MK5 & MK7 SERIES THROUGH-THE-CANOPY
166

SURVIVORS
129 (77.7%)
B - 45 (34.9%)
F - 48 (37.2%)
G - 36 (27.9%)

FATALITIES
37 (22.3%)
A - 25
L - 12
U - 0

OVERWATER
61 (78.2%)
B - 14 (23.0%)
F - 33 (54.0%)
G - 14 (23.0%)

OVERLAND
68 (77.3%)
B - 31 (45.6%)
F - 15 (22.1%)
G - 22 (32.4%)

OVERWATER
17 (21.8%)
A - 6
L - 11
U - 0

OVERLAND
20 (22.7%)
A - 19
L - 1
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

LS-1/LS-1A
THROUGH-THE-CANOPY
2

SURVIVORS
1 (50.0%)
B - 0 (0%)
F - 0 (0%)
G - 1 (100%)

FATALITIES
1 (50.0%)
A - 1
L - 0
U - 0

OVERWATER
0
B -
F -
G -

OVERLAND
1 (50.0%)
B - 0 (0%)
F - 0 (0%)
G - 1 (100%)

OVERWATER
0
A -
L -
U -

OVERLAND
1 (50.0%)
A - 1
L - 0
U - 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

LW-3B
THROUGH-THE-CANOPY

21

SURVIVORS
15 (70%)

B - 4 (26.7%)
F - 9 (60.0%)
G - 2 (13.3%)

FATALITIES
6 (30%)

A - 6
L - 0
U - 0

OVERWATER
4 (80.0%)

B - 2 (50.0%)
F - 0 (0%)
G - 2 (50.0%)

OVERLAND
11 (73.3%)

B - 2 (18.2%)
F - 9 (81.8%)
G - 0 (0%)

OVERWATER
1

A - 1
L - 0
U - 0

OVERLAND
4

A - 4
L - 0
U - 0
U.S. NAVY
EJECTIONS ACCOMPLISHED CLEAR OF AIRCRAFT
AND INADVERTENT EJECTIONS
(1 JAN 1969 - 31 DEC 1979)
CANOPY FRAGMENTATION (TOTAL) EJECTIONS
## CANOPY FRAGMENTATION (TOTAL) EJECTIONS
### 1 JAN 1969 - 31 DEC 1979

<table>
<thead>
<tr>
<th>EJECTION SEAT</th>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL EJECTEES</td>
<td>FATAL (A/L,U)</td>
</tr>
<tr>
<td>TYPE 9</td>
<td>1</td>
<td>0/0</td>
</tr>
<tr>
<td>S111S-3AV8</td>
<td>2</td>
<td>0/0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0/0</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
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<table>
<thead>
<tr>
<th>EJECTION SEAT</th>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL EJECTEES</td>
<td>MAJ INJ</td>
</tr>
<tr>
<td>TYPE 9</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>S111S-3AV8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>EJECTION SEAT</th>
<th>MINOR INJ</th>
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</thead>
<tbody>
<tr>
<td>TYPE 9</td>
<td>1</td>
</tr>
<tr>
<td>S111S-3AV8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
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<tr>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

TYPE 9
CANOPY FRAGMENTATION
(TOTAL)

8

SURVIVORS
7 (87.5%)
B – 3 (42.9%)
F – 2 (28.6%)
G – 2 (28.6%)

FATALITIES
1 (12.5%)
A – 1
L – 0
U – 0

OVERWATER
1 (100%)
B – 0 (0%)
F – 1 (100%)
G – 0 (0%)

OVERLAND
6 (85.7%)
B – 3 (50.0%)
F – 1 (16.7%)
G – 2 (33.3%)

OVERWATER
0 (0%)
A –
L –
U –

OVERLAND
1 (14.3%)
A – 1
L – 0
U – 0
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

SIII-3AV8
CANOPY FRAGMENTATION
(TOTAL)
7

SURVIVORS
7 (100%)
B -
F -
G -

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
2 (100%)
B - 0 (0%)
F -- 0 (0%)
G - 2 (100%)

OVERLAND
5 (100%)
B - 1 (20.0%)
F - 1 (20.0%)
G - 3 (60.0%)

OVERWATER
0
A -
L -
U -

OVERLAND
0
A -
L -
U -
U.S. NAVY
EJECTIONS ACCOMPLISHED CLEAR OF AIRCRAFT
AND
INADVERTENT EJECTIONS
(1 JAN 1969 - 31 DEC 1979)

CANOPY CUTTING (PARTIAL) EJECTIONS
## CANOPY CUTTING (PARTIAL) EJECTIONS

1 JAN 1969 - 31 DEC 1979

<table>
<thead>
<tr>
<th>EJECTION SEAT</th>
<th>OVERWATER</th>
<th>OVERLAND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL EJECTEES</td>
<td>FATAL (A/L,U)</td>
</tr>
<tr>
<td>ESCAPAC 1G-4</td>
<td>1</td>
<td>0/0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>0/0</td>
</tr>
</tbody>
</table>

NO MAJOR INJURIES
NO MINOR INJURIES
NAVY EJECTIONS (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

1G-4
CANOPY CUTTING
(PARTIAL)

SURVIVORS
1 (100%)
B - 0
F - 0
G - 1

FATALITIES
0 (0%)
A -
L -
U -

OVERWATER
0
B -
F -
G -

OVERLAND
1
B - 0 (0%)
F - 0 (0%)
G - 1 (100%)

OVERWATER
A -
L -
U -

OVERLAND
A -
L -
U -
# U.S. Navy Fatalities
## Types 2,3&6 Ejections

<table>
<thead>
<tr>
<th>Type Ejection</th>
<th>Overwater</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Ejectees</td>
<td>Fatal (A/L, U)</td>
<td>Rate</td>
<td>Ejectees</td>
<td>Fatal (A/L, U)</td>
<td>Rate</td>
<td>Ejectees</td>
</tr>
<tr>
<td>Jettisoned Canopy</td>
<td>17</td>
<td>13</td>
<td>76.5%</td>
<td>33</td>
<td>19</td>
<td>57.6%</td>
<td>50</td>
</tr>
<tr>
<td>Through - The - Canopy</td>
<td>4</td>
<td>2</td>
<td>50.0%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Canopy Fragmentation (Total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canopy Cutting (Partial)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>21</td>
<td>15</td>
<td>71.4%</td>
<td>33</td>
<td>19</td>
<td>57.6%</td>
<td>54</td>
</tr>
</tbody>
</table>
# U.S. Navy Fatalities

## Types 1, 2, 3, 5 & 6 Ejections

<table>
<thead>
<tr>
<th>Type Ejection</th>
<th>Overwater Ejectees</th>
<th>Overwater Fatal (A/L, U)</th>
<th>Overwater Rate (%)</th>
<th>Overland Ejectees</th>
<th>Overland Fatal (A/L, U)</th>
<th>Overland Rate (%)</th>
<th>All Ejectees</th>
<th>All Fatal (A/L, U)</th>
<th>All Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jettisoned Canopy</td>
<td>542</td>
<td>79</td>
<td>14.6%</td>
<td>592</td>
<td>96</td>
<td>16.2%</td>
<td>1134</td>
<td>175</td>
<td>15.4%</td>
</tr>
<tr>
<td>Through - The - Canopy</td>
<td>113</td>
<td>29</td>
<td>25.7%</td>
<td>128</td>
<td>31</td>
<td>24.2%</td>
<td>241</td>
<td>60</td>
<td>24.9%</td>
</tr>
<tr>
<td>Canopy Fragmentation (Total)</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>12</td>
<td>2</td>
<td>16.7%</td>
<td>15</td>
<td>1</td>
<td>6.7%</td>
</tr>
<tr>
<td>Canopy Cutting (Partial)</td>
<td>1</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>658</strong></td>
<td><strong>108</strong></td>
<td><strong>16.4%</strong></td>
<td><strong>733</strong></td>
<td><strong>128</strong></td>
<td><strong>17.5%</strong></td>
<td><strong>1391</strong></td>
<td><strong>236</strong></td>
<td><strong>17.0%</strong></td>
</tr>
</tbody>
</table>
# Ejection Envelope

## Accomplished and Inadvertent Ejections

( By Canopy Removal System )

<table>
<thead>
<tr>
<th></th>
<th>Overwater</th>
<th></th>
<th>Overland</th>
<th></th>
<th>All</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Fatal</td>
<td>%</td>
<td>Total</td>
<td>Fatal</td>
<td>%</td>
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<tr>
<td>Jettisoned – Canopy Envelope</td>
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<td></td>
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</tr>
<tr>
<td>– In</td>
<td>486</td>
<td>32</td>
<td>6.6</td>
<td>493</td>
<td>24</td>
<td>4.9</td>
</tr>
<tr>
<td>– Out</td>
<td>31</td>
<td>28</td>
<td>90.3</td>
<td>58</td>
<td>53</td>
<td>91.4</td>
</tr>
<tr>
<td>– Pos</td>
<td>8</td>
<td>6</td>
<td>75.0</td>
<td>8</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Through – the Canopy Envelope</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>– In</td>
<td>91</td>
<td>11</td>
<td>21.1</td>
<td>103</td>
<td>9</td>
<td>8.7</td>
</tr>
<tr>
<td>– Out</td>
<td>16</td>
<td>15</td>
<td>93.8</td>
<td>24</td>
<td>22</td>
<td>91.7</td>
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<tr>
<td>– Pos</td>
<td>2</td>
<td>1</td>
<td>50.0</td>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Canopy Fragmentation</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– In</td>
<td>3</td>
<td>0</td>
<td>0.0</td>
<td>11</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>– Out</td>
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<td>–</td>
<td>0.0</td>
<td>1</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>– Pos</td>
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<td>–</td>
<td>0.0</td>
<td>0</td>
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<td>0.0</td>
</tr>
<tr>
<td>Canopy Cut</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>– In</td>
<td>–</td>
<td></td>
<td></td>
<td>1</td>
<td>–</td>
<td>0.0</td>
</tr>
<tr>
<td>– Out</td>
<td>–</td>
<td></td>
<td></td>
<td>0</td>
<td>–</td>
<td>0.0</td>
</tr>
<tr>
<td>– Pos</td>
<td>–</td>
<td></td>
<td></td>
<td>0</td>
<td>–</td>
<td>0.0</td>
</tr>
<tr>
<td>Totals</td>
<td>637</td>
<td>93</td>
<td></td>
<td>700</td>
<td>109</td>
<td></td>
</tr>
</tbody>
</table>
### U.S. NAVY FATALITIES TYPES 4, 7, 8, 0 & BLANK EJECTIONS

<table>
<thead>
<tr>
<th>Type Ejection</th>
<th>OVERLAND</th>
<th>OVERWATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jettisoned Canopy</td>
<td>137  100%</td>
<td>29  98.6%</td>
</tr>
<tr>
<td>Through – the – Canopy</td>
<td>28  96.6%</td>
<td>51</td>
</tr>
<tr>
<td>Canopy Fragmentation</td>
<td>6   83.3%</td>
<td>9   86.7%</td>
</tr>
<tr>
<td>Canopy Cutting (Partial)</td>
<td>-</td>
<td>2   200%</td>
</tr>
<tr>
<td>Totals</td>
<td>172</td>
<td>170</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate (Rate)</th>
<th>FATAL Ejectees</th>
<th>FATAL Ejectees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>82.3%</td>
<td>78.8%</td>
</tr>
<tr>
<td>OVERLAND</td>
<td>63%</td>
<td>11%</td>
</tr>
<tr>
<td>OVERWATER</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>

-152-
DETAILED DISCUSSION

CONCERNING VERTEBRAL COMPRESSION

FRAC TURES ASSOCIATED WITH EJECTION
EJECTION ASSOCIATED VERTEBRAL INJURIES

- VERTEBRAL COMPRESSION FRACTURES
- PARAVertebral MUSCULAR STRAINS/SPRAINS
EJECTION FORCES

\[ F_{\text{CATAPULT}} = p \cdot A(\text{CATAPULT PISTON}) = m(\text{SEAT + EJECTEE}) \cdot a(\text{SEAT + EJECTEE}) \]

\[ = \frac{W(\text{SEAT + EJECTEE})}{g} \cdot a(\text{SEAT + EJECTEE}) \]

\[ a(\text{SEAT + EJECTEE}) = p \cdot \frac{A(\text{CATAPULT PISTON}) \cdot g}{W(\text{SEAT + EJECTEE})} \]

WHERE

- \( p \) IS PRESSURE INSIDE CATAPULT (PSF)
- \( g \) IS GRAVITY CONSTANT (32.2 FT/SEC^2)
- \( A \) IS CATAPULT PISTON AREA (FT^2)
- \( m \) IS EJECTED MASS (LBS-SEC^2/FT)
- \( W \) IS EJECTED WEIGHT (LBS)
- \( a \) IS ACCELERATION (FT/SEC^2)
VERTEBRAL COMPRESSION FRACTURE MECHANISMS

- IMMEDIATE CAUSE OF MATERIAL COMPRESSIVE FAILURE IS OVERSTRESS. THIS MAY BE GENERAL, I.E.:

  ![Diagram of compressive failure zone](image)

  OR IT MAY BE LOCALIZED (CONCENTRATED IN SMALL AREA) EITHER BY ALIGNMENT OR FORCE CONCENTRATION

  ![Diagram of alignment and force concentration](image)

  WHICH INDUCE LOCALIZED EXCESSIVE STRESS
• USE OF MARTIN-BAKER MK 5 SERIES EJECTION SEATS WAS ACCOMPANIED BY EXTRAORDINARY INCREASE IN VERTEBRAL COMPRESSION FRACTURE AND PARAVERTEBRAL MUSCLE STRAIN/SPRAIN INCIDENCE RATES.

• ANALYSES REVEALED PREDOMINANT CAUSE FOR INCREASED INCIDENCE RATES WAS CONCURRENT CHANGE TO EJECTING THROUGH THE CANOPY FROM EJECTING FOLLOWING CANOPY JETTISONING.

• SUBSEQUENT ANALYSES HAVE DEMONSTRATED THAT INTRODUCTION OF POWERED HAUL BACK INERTIA REELS SIGNIFICANTLY REDUCES VERTEBRAL INJURY INCIDENCE RATES BOTH FOR JETTISONED CANOPY AND FOR THROUGH-THE-CANOPY EJECTIONS.
APPENDIX D
SEATS INCLUDED BY

A. NAVY STANDARD WITH NAMC TYPE II CATAPULT

1. F4D-1
2. FJ-3, -3D, -3M, -4, -4B
3. F3H-2, -2M, -2N
4. F9F-5, -6, -8, -8B, -8P, -8T
5. F11F-1
6. F2H-4
7. A4D-1

(F8U EXCLUDED)

B. MARTIN–BAKER MK 5 SERIES

1. F9F-8T MK A5
2. F8U SERIES MK F5
3. F4H MK H5
4. F3H-2 MK M5
5. FJ-4B MK N5
6. F4D-1 MK P5
7. F11F-1 MK X5
8. F9F-8B MK Z5
RATE OF VERTEBRAL INJURIES SUSTAINED DURING
THROUGH-THE-CANOPY EJECTIONS
(BASED ON SURVIVORS DURING THE PERIOD
1 SEPTEMBER 1958 THROUGH 31 DECEMBER 1961)

MARTIN—BAKER EJECTION SEATS
(18 VERTEBRAL INJURIES/
56 THROUGH-THE-CANOPY
EJECTIONS)

33.9%

NAVY STANDARD EJECTION SEATS
(NAMC II)
(6 VERTEBRAL INJURIES/
17 THROUGH-THE-CANOPY
EJECTIONS)

35.3%
VERTEBRAL INJURIES SUSTAINED DURING CANOPY JETTISONED EJECTIONS
(BASED ON SURVIVORS DURING THE PERIOD 1 SEPTEMBER 1958 THROUGH 31 DECEMBER 1961)

MARTIN—BAKER EJECTION SEATS
(2 VERTEBRAL INJURIES DURING 39 EJECTIONS)

NAVY STANDARD EJECTION SEATS
(NAMC II)
(4 VERTEBRAL INJURIES DURING 117 EJECTIONS)
THROUGH-THE-CANOPY EJECTION RATES

(BASED ON TOTAL EJECTIONS DURING THE PERIOD
1 SEPTEMBER 1958 THROUGH 31 DECEMBER 1961)

MARTIN-BAKER EJECTION SEAT
(65 THROUGH-THE-CANOPY EJECTIONS OUT OF 114 EJECTIONS TOTAL)

57.0%

NAVY STANDARD EJECTION SEATS
(NAMC II)
(22 THROUGH-THE-CANOPY EJECTIONS OUT OF 148 EJECTIONS TOTAL)

15.0%
U.S. NAVY MARTIN-BAKER SEAT USAGE
VERTEBRAL INJURIES & THROUGH-THE-CANOPY EJECTIONS VS. EJECTION ALTITUDE

DATA COVERS PERIOD
9/1/58 – 3/31/63

TOTAL THROUGH-THE-CANOPY EJECTIONS
PORTION SUSTAINING VERTEBRAL INJURIES

FREQUENCY

GROUND LEVEL
MAXIMUM ALTITUDE
10,000 ft.
5,000 ft.
2,000 ft.

11
10
10
39
1
6
30
4

GROUN LEVEL
MAXIMUM ALTITUDE
10,000 ft.
5,000 ft.
2,000 ft.

63.4%
20.0%
13.3%

PERCENTAGE EJECTEES SUSTAINING VERTEBRAL INJURY BY EJECTION ALTITUDE

GROUND LEVEL
MAXIMUM ALTITUDE
10,000 ft.
5,000 ft.
2,000 ft.

55.7%
15.7%
14.3%

DISTRIBUTION OF EJECTEES BY EJECTION ALTITUDE
U.S. NAVY MARTIN-BAKER SEAT USAGE COMPARISON
OF EJECTION METHODS USED BY SURVIVING EJECTEES
(DATA FOR THE PERIOD 9/1/58 - 3/31/63)
REPORTED CONTRIBUTORY CAUSES OF VERTEBRAL INJURIES SUSTAINED DURING EJECTION WITH MARTIN-BAKER EJECTION SEATS

(BASED ON VERTEBRAL INJURIES DURING THE PERIOD 1 SEPTEMBER 1958 THROUGH 13 APRIL 1962)

LOOSE RESTRAINT HARNESS
3.9%

POOR POSITION
11.5%

THESE INJURIES WERE SUSTAINED DURING THROUGH-THE-CANOPY EJECTIONS
U.S. NAVY MARTIN-BAKER SEAT USAGE COMPARISON OF VERTEBRAL INJURY RATES BY EJECTION METHOD

(DATA COVERS PERIOD 9/1/58 - 3/31/63 SURVIVORS ONLY)

VERTEBRAL INJURY RATE REPRESENTED BY CROSS-HATCHED AREAS

JETTISONED CANOPY

THROUGH-THE-CANOPY

6.7%

36.6%
DISTRIBUTION OF ALL EJECTION-ASSOCIATED VERTEBRAL FRACTURES

U.S. NAVY MARTIN-BAKER SEAT USAGE

DATA COVERS PERIOD 9/1/58-3/31/63
SURVIVORS ONLY

DATA ABSTRACTED FROM EJECTEES' MEDICAL RECORDS

FRACTURE FREQUENCY

Vertebrae:
- C1
- C2
- C3
- C4
- C5
- C6
- C7
- T1
- T2
- T3
- T4
- T5
- T6
- T7
- T8
- T9
- T10
- T11
- T12
- L1
- L2
- L3
- L4
- L5

Fracture Frequency:
- C1: 1
- C2: 1
- C3: 0
- C4: 1
- C5: 1
- C6: 1
- C7: 1
- T1: 1
- T2: 1
- T3: 1
- T4: 1
- T5: 1
- T6: 4
- T7: 2
- T8: 8
- T9: 11
- T10: 11
- T11: 6
- T12: 8
- L1: 5
- L2: 2
- L3: 2
- L4: 1
- L5: 0
DISTRIBUTION OF VERTEBRAL FRACTURES ASSOCIATED WITH THROUGH-THE-CANOPY EJECTIONS

U.S. NAVY MARTIN–BAKER SEAT USAGE

VERTEBRAE

C1  C2  C3  C4  C5  C6  C7  T1  T2  T3  T4  T5  T6  T7  T8  T9  T10 T11 T12 L1  L2  L3  L4  L5

DATA COVERS PERIOD 9/1/58–3/31/63
SURVIVORS ONLY

DATA ABSTRACTED FROM EJECTEES' MEDICAL RECORDS

FRACTURE FREQUENCY

-168-
CUMULATIVE DISTRIBUTION OF PERCENTAGE EJECTEES UNINJURED VS AIRSPEED RANGE

JAN 1969 THROUGH JUL 1974

CUMULATIVE PERCENTAGE (%)

SPEED RANGES

I 0-99KTS
II 100-199KTS
III 200-299KTS
IV 300-399KTS
V 400-499KTS
VI 500-599KTS

ESCAPAC (NB-9/NB-10) (A-4)
ESCAPAC (NB-10) (A-7)
ESCAPAC (NB-11/NES-12/ NES-16) (A-4)
TYPE NECK INJURY VS TYPE INERTIA REEL
BY TYPE ESCAPAC SEAT A-4/A-7

JAN 1969 THROUGH JUL 1974

<table>
<thead>
<tr>
<th>CATEGORY OF INJURIES</th>
<th>A. ALL NECK &amp; VERTEBRAL</th>
<th>B. ALL NECK LESS TRANSECTIONS</th>
<th>C. VERTEBRAL</th>
<th>D. NECK SPRAIN/STRAIN</th>
</tr>
</thead>
</table>

- A-7 W/O PIR
- COMPOSITE W/O PIR
- A-4 W/O PIR
- A-4 W/ PIR
A-4 AIRCRAFT
ESCAPAC SERIES EJECTION SEATS
EJECTION DISTRIBUTION BY PARACHUTE TYPE AND INERTIA REEL TYPE

- Unmodified seats (NB-9/NB-10)
  - W/O PIR 5.70%
- Upgraded seats (NB-11/ NES-12/NES-16)
  - W/O PIR 36.27%
  - W/PIR 5.18%
DISTRIBUTION OF MAJOR NECK AND VERTEBRAL INJURIES AS PERCENTAGE OF TOTAL NUMBER OF EJECTEES

1 JANUARY 1969 THROUGH 31 AUGUST 1974

<table>
<thead>
<tr>
<th>AIRCRAFT MODEL A-5</th>
<th>AIRCRAFT MODEL A-4</th>
<th>AIRCRAFT MODEL A-7</th>
<th>AIRCRAFT MODELS A-4/A-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARACHUTE TYPE: NES 16A</td>
<td>PARACHUTE TYPE: NB 11/12/13/16</td>
<td>PARACHUTE TYPE: NB 10</td>
<td>PARACHUTE TYPES: NB 9/10</td>
</tr>
<tr>
<td>TRANSECTIONS 12.3%</td>
<td>CERVICAL FRACTURES 12.3%</td>
<td>NECK STRAIN/SRAIN 11.1%</td>
<td>CERVICAL FRACTURES 11.1%</td>
</tr>
<tr>
<td>OTHER VERTEBRAL FRACTURES 24.7%</td>
<td>NECK FRACTURES 2.08%</td>
<td>OTHER VERTEBRAL FRACTURES 6.99%</td>
<td>OTHER VERTEBRAL FRACTURES 6.79%</td>
</tr>
<tr>
<td>NECK STRAIN/SRAIN 11.54%</td>
<td>NECK STRAIN/SRAIN 12.5%</td>
<td>NECK STRAIN/SRAIN 7.42%</td>
<td>NECK STRAIN/SRAIN 7.42%</td>
</tr>
<tr>
<td>TOTAL INJURIES 5/10</td>
<td>TOTAL INJURIES 13/81</td>
<td>TOTAL INJURIES 30/144</td>
<td>TOTAL INJURIES 43/58</td>
</tr>
</tbody>
</table>
INJURY DISTRIBUTIONS OF TYPES OF MAJOR NECK AND VERTEBRAL INJURIES
AS PERCENT OF TOTAL MAJOR INJURIES

1 JANUARY 1969 THROUGH 31 AUGUST 1974

<table>
<thead>
<tr>
<th>AIRCRAFT MODEL A 5</th>
<th>AIRCRAFT MODEL A 4</th>
<th>AIRCRAFT MODEL A 7</th>
<th>AIRCRAFT MODEL A 4/A 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARACHUTE TYPE A5</td>
<td>PARACHUTE TYPE A4</td>
<td>PARACHUTE TYPE A7</td>
<td>PARACHUTE TYPE A4/A7</td>
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<tr>
<td>ALL VERTERbral</td>
<td>ALL VERTERbral</td>
<td>ALL VERTERbral</td>
<td>ALL VERTERbral</td>
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<tr>
<td>TRANCTIONS 40</td>
<td>TRANCTIONS 40</td>
<td>TRANCTIONS 40</td>
<td>TRANCTIONS 40</td>
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<tr>
<td>NECK STRAIN/SRAIN 60%</td>
<td>NECK STRAIN/SRAIN 60%</td>
<td>NECK STRAIN/SRAIN 60%</td>
<td>NECK STRAIN/SRAIN 60%</td>
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<tr>
<td>TOTAL INJURIES 6</td>
<td>TOTAL INJURIES 12</td>
<td>TOTAL INJURIES 12</td>
<td>TOTAL INJURIES 12</td>
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<td>TOTAL EJECTIONS 10</td>
<td>TOTAL EJECTIONS 10</td>
<td>TOTAL EJECTIONS 10</td>
<td>TOTAL EJECTIONS 10</td>
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<tr>
<td>OTHER VERTERbral FRACTURES 20%</td>
<td>OTHER VERTERbral FRACTURES 20%</td>
<td>OTHER VERTERbral FRACTURES 20%</td>
<td>OTHER VERTERbral FRACTURES 20%</td>
</tr>
<tr>
<td>TOTAL EJECTIONS 4</td>
<td>TOTAL EJECTIONS 12</td>
<td>TOTAL EJECTIONS 12</td>
<td>TOTAL EJECTIONS 12</td>
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<tr>
<td>OTHER VERTERbral FRACTURES 20%</td>
<td>OTHER VERTERbral FRACTURES 20%</td>
<td>OTHER VERTERbral FRACTURES 20%</td>
<td>OTHER VERTERbral FRACTURES 20%</td>
</tr>
<tr>
<td>NECK STRAIN/SRAIN 75%</td>
<td>NECK STRAIN/SRAIN 75%</td>
<td>NECK STRAIN/SRAIN 75%</td>
<td>NECK STRAIN/SRAIN 75%</td>
</tr>
<tr>
<td>TOTAL INJURIES 4</td>
<td>TOTAL INJURIES 4</td>
<td>TOTAL INJURIES 8</td>
<td>TOTAL INJURIES 8</td>
</tr>
<tr>
<td>CERVICAL FRACTURES 15%</td>
<td>CERVICAL FRACTURES 15%</td>
<td>CERVICAL FRACTURES 15%</td>
<td>CERVICAL FRACTURES 15%</td>
</tr>
<tr>
<td>TOTAL EJECTIONS 20</td>
<td>TOTAL EJECTIONS 20</td>
<td>TOTAL EJECTIONS 20</td>
<td>TOTAL EJECTIONS 20</td>
</tr>
<tr>
<td>NECK STRAIN/SRAIN 55.8%</td>
<td>NECK STRAIN/SRAIN 55.8%</td>
<td>NECK STRAIN/SRAIN 55.8%</td>
<td>NECK STRAIN/SRAIN 55.8%</td>
</tr>
<tr>
<td>TOTAL INJURIES 8</td>
<td>TOTAL INJURIES 8</td>
<td>TOTAL INJURIES 8</td>
<td>TOTAL INJURIES 8</td>
</tr>
<tr>
<td>OTHER VERTERbral FRACTURES 40%</td>
<td>OTHER VERTERbral FRACTURES 40%</td>
<td>OTHER VERTERbral FRACTURES 40%</td>
<td>OTHER VERTERbral FRACTURES 40%</td>
</tr>
<tr>
<td>TOTAL EJECTIONS 20</td>
<td>TOTAL EJECTIONS 20</td>
<td>TOTAL EJECTIONS 20</td>
<td>TOTAL EJECTIONS 20</td>
</tr>
</tbody>
</table>
MAJOR NECK AND VERTEBRAL INJURY RATES
ASCRIbable TO EJECTION FORCES
AND/OR PARACHUTE OPENING FORCES
VS USE OF POWERED INERTIA REELS

1 JANUARY 1969 THROUGH 31 AUGUST 1974

TOTAL: 225
ESCAPAC SERIES EJECTION SEATS
NOT EQUIPPED WITH POWERED INERTIA REELS

TOTAL: 34
TRANSECTIONS 0%
VERTEBRAL FRACTURES 4.89%
NECK-SPRAIN/STRAIN 10.22%

TOTAL: 112
ESCAPAC SERIES EJECTION SEATS
EQUIPPED WITH POWERED INERTIA REELS

TOTAL: 6
TRANSECTIONS 0.89%
VERTEBRAL FRACTURES 2.68%
NECK SPRAIN/STRAIN 1.79%
# TABLE IX
GROSS REPORTED MAJOR NECK AND VERTEBRAL INJURIES VS USE OF POWERED INERTIA REEL ESCAPAC SERIES EJECTION SEATS

**1 JANUARY 1969 THROUGH 31 AUGUST 1974**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EJECTIONS</td>
<td>81</td>
<td>144</td>
<td>225</td>
<td>112</td>
</tr>
<tr>
<td>INJURIES</td>
<td>13</td>
<td>31</td>
<td>44</td>
<td>6</td>
</tr>
<tr>
<td>TRANSECTIONS</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>VERTEBRAL FRACTURES</td>
<td>11</td>
<td>31</td>
<td>42</td>
<td>5</td>
</tr>
<tr>
<td>NECK SPRAIN/STRAIN</td>
<td>4</td>
<td>15</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>VERTEBRAL FRACTURES</td>
<td>7</td>
<td>16</td>
<td>23</td>
<td>2</td>
</tr>
<tr>
<td>NECK SPRAIN/STRAIN</td>
<td>7</td>
<td>16</td>
<td>23</td>
<td>2</td>
</tr>
</tbody>
</table>

**NOTE:**
(1) PIR = POWERED INERTIA REEL
(2) A-4 W/PIR ARE A-4F, A-4M, TA-4F, AND TA-4J
<table>
<thead>
<tr>
<th>INJURY RATES (A)</th>
<th>A-4 W/O PIR</th>
<th>A-7 W/O PIR</th>
<th>A-4 &amp; A-7 W/O PIR</th>
<th>A-4 W/PIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.05%</td>
<td>21.53%</td>
<td>19.56%</td>
<td>5.36%</td>
<td></td>
</tr>
<tr>
<td>TRANSECTION RATES</td>
<td>2.47%</td>
<td>0%</td>
<td>0.89%</td>
<td>0.89%</td>
</tr>
<tr>
<td>VERTEBRAL FRACTURE AND NECK SPRAIN/STRAIN RATES (B)</td>
<td>13.58%</td>
<td>21.53%</td>
<td>18.67%</td>
<td>4.46%</td>
</tr>
<tr>
<td>VERTEBRAL FRACTURE RATES (C)</td>
<td>4.94%</td>
<td>10.42%</td>
<td>8.44%</td>
<td>2.68%</td>
</tr>
<tr>
<td>NECK SPRAIN/STRAIN RATES (D)</td>
<td>8.64%</td>
<td>11.11%</td>
<td>10.22%</td>
<td>1.79%</td>
</tr>
</tbody>
</table>

**NOTE:**
(1) PIR = POWERED INERTIA REEL
(2) A-4 W/PIR ARE A-4F, A-4M, TA-4F, AND TA-4J
(3) PARENTHEtical LETTERS (A), (B), (C), AND (D) ARE FOR ASSISTANCE IN REFERRING TO THE FOLLOWING GRAPHICAL PRESENTATION (FIGURE 10)
### TABLE XI

**MAJOR NECK AND VERTEBRAL INJURIES**

**ASCRIBABLE TO EJECTION AND/OR PARACHUTE OPENING FORCES VS USE OF POWERED INERTIA REEL**

1 JANUARY 1969 THROUGH 31 AUGUST 1974

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EJECTION</strong></td>
<td>81</td>
<td>144</td>
<td>225</td>
<td>112</td>
</tr>
<tr>
<td><strong>INJURIES</strong></td>
<td>10</td>
<td>25</td>
<td>35</td>
<td>6</td>
</tr>
<tr>
<td><strong>TRANSECTIONS</strong></td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>VERTEBRAL FRACTURES</strong></td>
<td>9</td>
<td>25</td>
<td>34</td>
<td>5</td>
</tr>
<tr>
<td><strong>NECK SPRAIN/STRAIN</strong></td>
<td>2</td>
<td>9</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td><strong>VERTEBRAL FRACTURES</strong></td>
<td>7</td>
<td>16</td>
<td>23</td>
<td>2</td>
</tr>
</tbody>
</table>

**NOTE:**
1. PIR = POWERED INERTIA REEL
3. FIGURES HAVE BEEN CORRECTED TO REMOVE ALL GROUND IMPACT VERTEBRAL FRACTURES, MAN-SEAT COLLISION INJURIES, AND EPC ENTANGLEMENT TRANSECTION
### TABLE XII
MAJOR NECK AND VERTEBRAL INJURY RATES ASCRIbable TO EJECTION AND/OR PARACHUTE OPENING FORCES VS USE OF POWERED INERTIA REEL

1 JANUARY 1969 THROUGH 31 AUGUST 1974

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries</td>
<td>12.35%</td>
<td>17.36%</td>
<td>15.56%</td>
<td>5.38%</td>
</tr>
<tr>
<td>Transections</td>
<td>1.23%</td>
<td>0%</td>
<td>0.44%</td>
<td>0%</td>
</tr>
<tr>
<td>Verterbral Fractures</td>
<td>11.11%</td>
<td>17.36%</td>
<td>15.11%</td>
<td>4.64%</td>
</tr>
<tr>
<td>Neck Sprain/Strain</td>
<td>11.11%</td>
<td>17.36%</td>
<td>15.11%</td>
<td>4.64%</td>
</tr>
<tr>
<td>Verterbral Fractures</td>
<td>2.47%</td>
<td>6.25%</td>
<td>4.89%</td>
<td>2.68%</td>
</tr>
<tr>
<td>Neck Sprain/Strain</td>
<td>8.64%</td>
<td>11.11%</td>
<td>10.22%</td>
<td>1.79%</td>
</tr>
</tbody>
</table>

**NOTE:**
1. PIR = POWERED INERTIA REEL
3. FIGURES HAVE BEEN CORRECTED TO REMOVE ALL GROUND IMPACT VERTEBRAL FRACTURES, MAN-SEAT COLLISION INJURIES, AND EPC ENTANGLEMENT TRANSECTION
ESCAPAC SERIES EJECTION SEATS
(A-4 AND A-7 AIRCRAFT)
VERTEBRAL COMPRESSION FRACTURE DISTRIBUTION

JANUARY 1969 THROUGH AUGUST 1974

WITH NB-9/NB-10 (NO SPREADER GUN)

WITH NB-11/NES-12/NES-16 (SPREADER GUN)

FRACURE FREQUENCY

CERVICALS

THORACICS

LUMBARS
<table>
<thead>
<tr>
<th></th>
<th>NB-11/NES-12/NES-16 (UPGRADED SEATS)</th>
<th>NB-9/NB-10 (UNMODIFIED SEATS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/O PIR</td>
<td>70</td>
<td>11</td>
</tr>
<tr>
<td>W/PIR</td>
<td>10</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>NB-11/NES-12/NES-16 (UPGRADED SEATS)</td>
<td>NB-9/NB-10 (UNMODIFIED SEATS)</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>W/O PIR</td>
<td>TRACTIONS: 2</td>
<td>TRANSECTIONS: 0</td>
</tr>
<tr>
<td></td>
<td>CERVICAL FX.: 1</td>
<td>CERVICAL FX.: 0</td>
</tr>
<tr>
<td></td>
<td>CERVICAL &amp; OTHER: 0</td>
<td>CERVICAL &amp; OTHER: 0</td>
</tr>
<tr>
<td></td>
<td>THORACIC &amp; LUMBAR: 3</td>
<td>THORACIC &amp; LUMBAR: 0</td>
</tr>
<tr>
<td></td>
<td>STRAIN/SPRAIN: 7</td>
<td>STRAIN/SPRAIN: 1</td>
</tr>
<tr>
<td></td>
<td>TOTAL EJECTEES: 70</td>
<td>TOTAL EJECTEES: 11</td>
</tr>
<tr>
<td>W/PIR</td>
<td>TRACTIONS: 0</td>
<td>TRANSECTIONS: 1</td>
</tr>
<tr>
<td></td>
<td>CERVICAL FX.: 0</td>
<td>CERVICAL FX.: 0</td>
</tr>
<tr>
<td></td>
<td>CERVICAL &amp; OTHER: 0</td>
<td>CERVICAL &amp; OTHER: 0</td>
</tr>
<tr>
<td></td>
<td>THORACIC &amp; LUMBAR: 0</td>
<td>THORACIC &amp; LUMBAR: 3</td>
</tr>
<tr>
<td></td>
<td>STRAIN/SPRAIN: 2</td>
<td>STRAIN/SPRAIN: 0</td>
</tr>
<tr>
<td></td>
<td>TOTAL EJECTEES: 10</td>
<td>TOTAL EJECTEES: 102</td>
</tr>
<tr>
<td>NB-11/NES-12/NES-16 (UPGRADED SEATS)</td>
<td>NB-9/NB-10 (UNMODIFIED SEATS)</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>W/O PIR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRANSECTIONS: 2.86%</td>
<td>TRANSECTIONS: 0%</td>
<td></td>
</tr>
<tr>
<td>CERVICAL FX.: 1.43%</td>
<td>CERVICAL FX.: 1.29%</td>
<td></td>
</tr>
<tr>
<td>CERVICAL &amp; OTHER: 0%</td>
<td>CERVICAL &amp; OTHER: 0.65%</td>
<td></td>
</tr>
<tr>
<td>THORACIC &amp; LUMBAR: 4.29%</td>
<td>THORACIC &amp; LUMBAR: 6.45%</td>
<td></td>
</tr>
<tr>
<td>STRAIN/SPRAIN: 10.00%</td>
<td>STRAIN/SPRAIN: 9.68%</td>
<td></td>
</tr>
<tr>
<td>TOTAL EJECTIONS: 70</td>
<td>TOTAL EJECTIONS: 11</td>
<td></td>
</tr>
<tr>
<td><strong>W/PIR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRANSECTIONS: 0%</td>
<td>TRANSECTIONS: 0.98%</td>
<td></td>
</tr>
<tr>
<td>CERVICAL FX.: 0%</td>
<td>CERVICAL FX.: 0%</td>
<td></td>
</tr>
<tr>
<td>CERVICAL &amp; OTHER: 0%</td>
<td>CERVICAL &amp; OTHER: 0%</td>
<td></td>
</tr>
<tr>
<td>THORACIC &amp; LUMBAR: 0%</td>
<td>THORACIC &amp; LUMBAR: 2.94%</td>
<td></td>
</tr>
<tr>
<td>STRAIN/SPRAIN: 20.00%</td>
<td>STRAIN/SPRAIN: 0%</td>
<td></td>
</tr>
<tr>
<td>TOTAL EJECTIONS: 10</td>
<td>TOTAL EJECTIONS: 102</td>
<td></td>
</tr>
</tbody>
</table>
TABLE XVI
A-4 AIRCRAFT TYPES OF ESCAPAC SERIES EJECTION SEATS VS PARACHUTE TYPE AND INERTIA REEL TYPE

<table>
<thead>
<tr>
<th></th>
<th>NB-11/NES-12/NES-16 (UPGRADED SEATS)</th>
<th>NB-9/NB-10 (UNMODIFIED SEATS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/O PIR</td>
<td>ESCAPAC IA-1*</td>
<td>ESCAPAC I*</td>
</tr>
<tr>
<td>W/PIR</td>
<td>( ESCAPAC IF-3 )</td>
<td>ESCAPAC IC-3*</td>
</tr>
<tr>
<td></td>
<td>( ESCAPAC IG-3 )</td>
<td></td>
</tr>
</tbody>
</table>

NOTE:

COMPARATIVE INFORMATION FOR THESE EJECTION SEATS IS PROVIDED IN APPENDIX G (1)

* COMPARISON OF THE MAJOR ASPECTS OF THESE EJECTION SEATS ALSO IS PROVIDED IN APPENDIX G (2) AND (3)
<table>
<thead>
<tr>
<th></th>
<th>A-4 AIRCRAFT</th>
<th>A-7 AIRCRAFT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NB-11/NES-12/NES-16 (UPGRADED SEATS)</td>
<td>NB-9/NB-10 (UNMODIFIED SEATS)</td>
</tr>
<tr>
<td>W/O PIR</td>
<td>ESCAPAC IA-1*</td>
<td>ESCAPAC I*</td>
</tr>
<tr>
<td>W/PIR</td>
<td>ESCAPAC IF-3</td>
<td>ESCAPAC IC-3*</td>
</tr>
<tr>
<td></td>
<td>ESCAPAC IG-3</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

COMPARATIVE INFORMATION FOR THESE EJECTION SEATS IS PROVIDED IN APPENDIX G (1)

* COMPARISON OF THE MAJOR ASPECTS OF THESE EJECTION SEATS ALSO IS PROVIDED IN APPENDIX G (2) AND (3)
# COMPARISON OF ESCAPAC I, ESCAPAC IA–1 (A–4A/B/C/E/L AIRCRAFT), ESCAPAC IC–3 (A–4F/M, TA–4F/J AIRCRAFT) AND ESCAPAC IC–2 (A–7 AIRCRAFT)

<table>
<thead>
<tr>
<th>DESIGN ASPECT</th>
<th>ESCAPAC IA–1</th>
<th>A–4 ESCAPAC I</th>
<th>ESCAPAC IC–3</th>
<th>A–7 ESCAPAC IC–2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARACHUTE TYPE</td>
<td>NB–11/NES–12 (BALLISTIC SPREADER GUN) W/Mk5 &amp; ZDL</td>
<td>NB–9 W/Mk5 &amp; ZDL</td>
<td>NB–10/NB–10–2(^1/)</td>
<td>NB–10/NB–10–2(^1/)</td>
</tr>
<tr>
<td>SURVIVAL KIT</td>
<td>PK–2</td>
<td>PK–2</td>
<td>RSSK–8A</td>
<td>RSSK–8A</td>
</tr>
<tr>
<td>INERTIA REEL TYPE</td>
<td>NON–PIR</td>
<td>NON–PIR</td>
<td>PIR</td>
<td>NON–PIR</td>
</tr>
<tr>
<td>ROCKET CATAPULT</td>
<td>RAPEC I</td>
<td>RAPEC I</td>
<td>P/N 2174–522</td>
<td>P/N 2174–520</td>
</tr>
<tr>
<td>SYSTEM STABILIZATION</td>
<td>SNUBBER/DART</td>
<td>(NONE)</td>
<td>DART</td>
<td>DART</td>
</tr>
<tr>
<td>MAN–SEAT SEPARATION</td>
<td>BLADDERS</td>
<td>BLADDERS</td>
<td>BLADDERS</td>
<td>BLADDERS</td>
</tr>
</tbody>
</table>

\(^1/\) SEE ESCAPAC IC PARACHUTE SUBSYSTEM TIMING, APPENDIX G

\(^2/\) ABBREVIATIONS:
- ZDL = ZERO DELAY LANYARD
- Mk5 = 2.0 SEC. DELAY CARTRIDGE
- PIR = BALLISTIC POWERED INERTIA REEL
# Table XVIII
ESCAPAC Series Ejection Seats
Ejection Distribution by Parachute Type and Inertia Reel Type and Aircraft

<table>
<thead>
<tr>
<th></th>
<th>A-4 Aircraft</th>
<th>A-7 Aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NB-11/NES-12/NES-16 (Upgraded Seats)</td>
<td>NB-9/NB-10 (Unmodified Seats)</td>
</tr>
<tr>
<td>W/O PIR</td>
<td>70</td>
<td>11</td>
</tr>
<tr>
<td>W/PIR</td>
<td>10</td>
<td>102</td>
</tr>
</tbody>
</table>
### Table XIX

**Escapac Series Ejection Seats**

**Ejectee Injury Type Distribution**

**By Parachute Type and Inertia Reel Type and Aircraft**

<table>
<thead>
<tr>
<th></th>
<th>A-4 Aircraft</th>
<th></th>
<th>A-7 Aircraft</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NB-11/NES-12/NES-16</td>
<td>NB-9/NB-10</td>
<td>NB-10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UPGRADED SEATS</td>
<td>UNMODIFIED SEATS</td>
<td>UNMODIFIED SEATS</td>
<td></td>
</tr>
<tr>
<td>W/O PIR</td>
<td>TRANSECTIONS: 2</td>
<td>TRANSECTIONS: 0</td>
<td>TRANSECTIONS: 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CERVICAL FX.: 1</td>
<td>CERVICAL FX.: 0</td>
<td>CERVICAL FX.: 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CERVICAL &amp; OTHER: 0</td>
<td>CERVICAL &amp; OTHER: 0</td>
<td>CERVICAL &amp; OTHER: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>THORACIC &amp; LUMBAR: 3</td>
<td>THORACIC &amp; LUMBAR: 0</td>
<td>THORACIC &amp; LUMBAR: 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STRAIN/SPRAIN: 7</td>
<td>STRAIN/SPRAIN: 1</td>
<td>STRAIN/SPRAIN: 14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL EJECTIONS: 70</td>
<td>TOTAL EJECTIONS: 11</td>
<td>TOTAL EJECTIONS: 144</td>
<td></td>
</tr>
<tr>
<td>W/PIR</td>
<td>TRANSECTIONS: 0</td>
<td>TRANSECTIONS: 1</td>
<td>(NO PIR IN A-7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CERVICAL FX.: 0</td>
<td>CERVICAL FX.: 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CERVICAL &amp; OTHER: 0</td>
<td>CERVICAL &amp; OTHER: 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>THORACIC &amp; LUMBAR: 0</td>
<td>THORACIC &amp; LUMBAR: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>STRAIN/SPRAIN: 2</td>
<td>STRAIN/SPRAIN: 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL EJECTIONS: 10</td>
<td>TOTAL EJECTIONS: 102</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE XX
**ESCAPAC SERIES EJECTION SEATS**
**EJECTEE INJURY TYPE RATES BY PARACHUTE TYPE**
**AND INERTIA REEL TYPE AND AIRCRAFT**

<table>
<thead>
<tr>
<th>W/C PIR</th>
<th>A-4 AIRCRAFT</th>
<th>A-7 AIRCRAFT</th>
<th>W/PIR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NB-11/NES-12/NES-16 UPGRADED SEATS</strong></td>
<td><strong>NB-9/NB-10 UNMODIFIED SEATS</strong></td>
<td><strong>NB-10</strong></td>
<td></td>
</tr>
<tr>
<td>TRANSECTIONS:</td>
<td>2.86%</td>
<td>TRANSECTIONS:</td>
<td>0</td>
</tr>
<tr>
<td>CERVICAL FX.:</td>
<td>1.43%</td>
<td>CERVICAL FX.:</td>
<td>0</td>
</tr>
<tr>
<td>CERVICAL &amp; OTHER:</td>
<td>0</td>
<td>CERVICAL &amp; OTHER:</td>
<td>0</td>
</tr>
<tr>
<td>THORACIC &amp; LUMBAR:</td>
<td>4.29%</td>
<td>THORACIC &amp; LUMBAR:</td>
<td>0</td>
</tr>
<tr>
<td>STRAIN/SPRAIN:</td>
<td>10.00%</td>
<td>STRAIN/SPRAIN:</td>
<td>9.09%</td>
</tr>
<tr>
<td>TOTAL EJECTIONS:</td>
<td>70</td>
<td>TOTAL EJECTIONS:</td>
<td>11</td>
</tr>
</tbody>
</table>

| **NB-11/NES-12/NES-16 UPGRADED SEATS** | **NB-9/NB-10 UNMODIFIED SEATS** | **NB-10** |
| TRANSECTIONS: | 0 | TRANSECTIONS: | 0.98% |
| CERVICAL FX.: | 0 | CERVICAL FX.: | 0 |
| CERVICAL & OTHER: | 0 | CERVICAL & OTHER: | 0 |
| THORACIC & LUMBAR: | 0 | THORACIC & LUMBAR: | 2.94% |
| STRAIN/SPRAIN: | 20.00% | STRAIN/SPRAIN: | 0 |
| TOTAL EJECTIONS: | 10 | TOTAL EJECTIONS: | 102 |

TOTAL EJECTIONS: 144

(NONE)
(NO EJECTIONS)
# Table XXI

**Effect Upon Injury Rates of Incorporating Ballistic Powered Inertia Reel in Escapac IC Configuration Ejection Seats**

<table>
<thead>
<tr>
<th>Injury Types</th>
<th>EXCAPAC IC-2</th>
<th>ESCAPAC IS-3</th>
<th>Effect of Adding PIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL EJECTIONS</td>
<td>144</td>
<td>102</td>
<td>N/A</td>
</tr>
<tr>
<td>INJURY TYPES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transections:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cervical FX.:</td>
<td>0</td>
<td>0.98%</td>
<td>+0.98%</td>
</tr>
<tr>
<td>Cervical &amp; Other FX.:</td>
<td>1.39%</td>
<td>0</td>
<td>-1.39%</td>
</tr>
<tr>
<td>Thoracic &amp; Lumbar FX.:</td>
<td>0.69%</td>
<td>0</td>
<td>-0.69%</td>
</tr>
<tr>
<td>Neck Strain/Sprain:</td>
<td>6.94%</td>
<td>2.94%</td>
<td>-4.00%</td>
</tr>
<tr>
<td>ALL Cervical FX.:</td>
<td>9.72%</td>
<td>0</td>
<td>-9.72%</td>
</tr>
<tr>
<td>ALL Vertebral FX.:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.08%</td>
<td>0</td>
<td>-2.08%</td>
</tr>
<tr>
<td></td>
<td>9.02%</td>
<td>2.94%</td>
<td>-6.08%</td>
</tr>
</tbody>
</table>
### TABLE XXII

**EFFECT UPON INJURY RATES OF INTRODUCING NON-INERTIA REEL VARIATIONS IN ESCAPAC EJECTION SEAT CONFIGURATIONS**

<table>
<thead>
<tr>
<th>INJURY TYPES</th>
<th>A-7 ESCAPAC IC-2</th>
<th>A-4 ESCAPAC IA-1</th>
<th>EFFECT OF DIFFERENCES BETWEEN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL EJECTIONS</strong></td>
<td>144</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td><strong>INJURY TYPES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRANSECTIONS:</td>
<td>0</td>
<td>2.86%</td>
<td>+2.86%</td>
</tr>
<tr>
<td>CERVICAL FX.:</td>
<td>1.39%</td>
<td>1.43%</td>
<td>+0.04%</td>
</tr>
<tr>
<td>CERVICAL &amp; OTHER FX.:</td>
<td>0.69%</td>
<td>0</td>
<td>-0.69%</td>
</tr>
<tr>
<td>THORACIC &amp; LUMBAR FX.:</td>
<td>6.94%</td>
<td>4.29%</td>
<td>-2.65%</td>
</tr>
<tr>
<td>NECK STRAIN/SPRAIN:</td>
<td>9.72%</td>
<td>10.00%</td>
<td>+0.28%</td>
</tr>
<tr>
<td><strong>ALL CERVICAL FX.:</strong></td>
<td>2.08%</td>
<td>1.43%</td>
<td>-0.65%</td>
</tr>
<tr>
<td><strong>ALL VERTEBRAL FX.:</strong></td>
<td>9.02%</td>
<td>5.72%</td>
<td>-3.30%</td>
</tr>
</tbody>
</table>
CONTINGENCY ANALYSIS OF A-4 ESCAPE DATA

IN AN INDEPENDENT REVIEW OF THE A-4 EJECTION DATA, THE SYSTEMS ANALYSIS DEPARTMENT, NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY, WASHINGTON, D. C., SUBJECTED THE DATA TO A 2 X 2 CONTINGENCY TEST.

AS REPORTED IN THE FOLLOWING PAGES, THIS ANALYSIS FOUND THE FOLLOWING:

- NO INFERENCE CAN BE DRAWN FROM A-4 EJECTION DATA ALONE CONCERNING THE ROLE OF SPREADER GUN OR BALLISTIC POWERED INERTIA REEL IN THE PRODUCTION OR PREVENTION OF NECK INJURIES.

- THE A-7 EJECTION DATA APPEARS TO BE FROM THE SAME POPULATION AS THE EJECTION DATA FOR A-4 WITH THE SPREADER GUN BUT WITHOUT THE POWERED INERTIA REEL.

- THE CONTINGENCY TEST INDICATES THAT THE SPREADER GUN HAS NO EFFECT UPON NECK INJURIES.

- THE A-7 EJECTION DATA APPEARS NOT TO BE FROM THE SAME POPULATION AS THE EJECTION DATA FOR A-4 WITHOUT THE SPREADER GUN BUT WITH THE POWERED INERTIA REEL.

- THE CONTINGENCY TEST INDICATES THAT THE POWERED INERTIA REEL HAS AN EFFECT UPON NECK INJURIES.

- THE SPREADER GUN IS NOT CAUSING NECK INJURIES.

- THE POWERED INTERTIA REEL AIDS IN PREVENTING NECK INJURIES.
A-4 CONTINGENCY TEST

2 X 2 CONTINGENCY TEST

USED FOR TESTING SAMPLES CLASSIFIED AS TO TWO ATTRIBUTES, I. E., INJURIES VS. NO INJURIES

\[ x^2 = \sum \frac{(f - F)^2}{F} \]

WHERE:

\[ f = \text{OBSERVED FREQUENCY} \]
\[ F = \text{CALCULATED OR EXPECTED FREQUENCY} \]

SO THAT:

THE DEVIATION FROM THE EXPECTED IS MEASURED

NULL HYPOTHESIS: SAMPLES TESTED ARE FROM THE SAME POPULATION:

ACCEPT IF \[ x^2 < 3.84 \] \hspace{1cm} (p < .05)
REJECT IF \[ x^2 \geq 3.84 \]
## A-4 Contingency Test

### A-4 Data (Neck Injury Only)
(Data points are the same as used for correlation analysis)

<table>
<thead>
<tr>
<th></th>
<th>Spreader Gun</th>
<th>No Spreader Gun</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Inertial Reel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Injury</td>
<td>6</td>
<td>101</td>
<td>107</td>
</tr>
<tr>
<td>Injury</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7</td>
<td>102</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No Power Inertial Reel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Injury</td>
<td>59</td>
<td>10</td>
<td>69</td>
</tr>
<tr>
<td>Injury</td>
<td>8</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>67</td>
<td>11</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Injury</td>
<td>65</td>
<td>111</td>
<td>176</td>
</tr>
<tr>
<td>Injury</td>
<td>9</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>74</td>
<td>113</td>
<td>187</td>
</tr>
</tbody>
</table>
# A-4 Contingency Test

## X² Results

<table>
<thead>
<tr>
<th>SPREADER VS NO SPREADER</th>
<th>NECK INJURIES</th>
<th>ALL INJURIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-4 TOTAL</td>
<td>6.95*</td>
<td>8.85*</td>
</tr>
<tr>
<td>A-4 NO PIR</td>
<td>0.10</td>
<td>0.80</td>
</tr>
<tr>
<td>A-4 PIR</td>
<td>1.17</td>
<td>2.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PIR VS NO PIR</th>
<th>NECK INJURIES</th>
<th>ALL INJURIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-4 TOTAL</td>
<td>6.08*</td>
<td>5.97*</td>
</tr>
<tr>
<td>A-4 SPREADER</td>
<td>0.18</td>
<td>1.05</td>
</tr>
<tr>
<td>A-4 NO SPREADER</td>
<td>0.54</td>
<td>0.0004</td>
</tr>
</tbody>
</table>

**Null Hypothesis:** Samples are from same population

*(*) Indicates rejection; all others accepted

**PIR = Power Inertial Reel**
## A–4 Contingency Test

### \( X^2 \) Results

<table>
<thead>
<tr>
<th></th>
<th>Neck Injuries</th>
<th>All Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spreader vs No Spreader</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-4 Total</td>
<td>6.95*</td>
<td>8.86*</td>
</tr>
<tr>
<td>A-4 No PIR</td>
<td>0.10</td>
<td>0.80</td>
</tr>
<tr>
<td>A-4 PIR</td>
<td>1.17</td>
<td>2.01</td>
</tr>
<tr>
<td><strong>PIR vs No PIR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-4 Total</td>
<td>6.08*</td>
<td>5.97*</td>
</tr>
<tr>
<td>A-4 Spreader</td>
<td>0.18</td>
<td>1.05</td>
</tr>
<tr>
<td>A-4 No Spreader</td>
<td>0.54</td>
<td>0.0004</td>
</tr>
<tr>
<td><strong>A-7 (No Spreader, No PIR) vs A-4 (Spreader, No PIR)</strong></td>
<td>2.21</td>
<td>0.0025</td>
</tr>
<tr>
<td><strong>A-7 (No Spreader, No PIR) vs A-4 (No Spreader, PIR)</strong></td>
<td>12.86*</td>
<td>10.51*</td>
</tr>
</tbody>
</table>

**Null Hypothesis:** Samples are from same population

(*) Indicates rejection; all others accepted

PIR = Power Inertial Reel
## A-4 Contingency Test

**A-7 Data (Neck Injury Only)**  
(Data same as that used for correlation analysis)

<table>
<thead>
<tr>
<th></th>
<th>Spreader Gun</th>
<th>No Spreader Gun</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Inertial Reel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Injury</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Injury</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>No Power Inertial Reel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Injury</td>
<td>-</td>
<td>115</td>
</tr>
<tr>
<td>Injury</td>
<td>-</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>136</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>136</td>
</tr>
</tbody>
</table>
A–4 CONTINGENCY TEST

CONCLUSIONS:

(1) NO INFERENCE CAN BE DRAWN FROM A-4 DATA ALONE, I. E.:

(A) SPREADER GUN MAY BE CAUSING INJURIES

(B) PIR MAY BE PREVENTING INJURIES

(2) A-7 DATA APPEARS TO BE FROM THE SAME POPULATION AS A-4 (WITH SPREADER BUT NO PIR). THE CONTINGENCY TEST INDICATES THAT THE SPREADER HAS NO EFFECT.

(3) A-7 DATA APPEARS NOT TO BE FROM THE SAME POPULATION AS A-4 (WITH NO SPREADER, BUT WITH PIR). THE CONTINGENCY TEST INDICATES THAT THE PIR HAS AN EFFECT.

(4) ANALYSIS INDICATES THAT THE SPREADER GUN IS NOT CAUSING INJURIES, BUT THE PIR IS PREVENTING GUN INJURIES.
VERTEBRAL COMPRESSION FRACTURE MECHANISMS

- GIVEN GEOMETRY AND YIELD STRESS OF VERTEBRAE AND CURRENT CATAPULT BOOST ACCELERATIONS, MOST CURRENT EJECTION ASSOCIATED VERTEBRAL COMPRESSION FRACTURES, WITH THE POSSIBLE SIGNIFICANT EXCEPTION OF THOSE ASSOCIATED WITH THROUGH-THE-CANOPY EJECTIONS, ARE BELIEVED TO RESULT FROM POOR VERTEBRAL ALIGNMENT.

- CAUSES SUGGESTED FOR VERTEBRAL MISALIGNMENT INCLUDE:
  - PERSONAL EQUIPMENT INFLUENCES
  - NONSTABLE EJECTION PLATFORM
  - INADEQUATE THIGH SUPPORT
  - POOR TORSO RESTRAINT
  - CATAPULT BOOST ACCELERATION VECTOR INDUCED FORWARD TORSO ROTATION
  - POOR SEAT BACK SUPPORT

AS WELL AS MANY OTHER CAUSES FOR UPPER TORSO MOVEMENT
VERTEBRAL COMPRESSION FRACTURE MECHANISMS
THROUGH-THE-CANOPY EJECTION

PRODUCES MULTIPHASIC ABRUPT CHANGES IN EJECTEE ACCELERATIONS AND RESULTING FORCES IMPOSED UPON VERTEBRAE:

- INITIAL BOOST PHASE
  - INITIAL BODY LOADING, BODY ELEMENTS SHIFT DOWNWARD
  - DUE TO BODY'S "MASS-SPRING-DAMPER SYSTEM" CHARACTERISTICS
    - BODY SEGMENT VELOCITIES ARE NONUNIFORM
    - BODY SEGMENT VELOCITIES LOWER THAN SEAT VELOCITY

- SEAT-CANOPY IMPACT PHASE
  - SEAT DECELERATES RAPIDLY
  - BODY SEGMENTS TEND TO CONTINUE AT UNCHANGING VELOCITY

- CANOPY YIELDING PHASE
  - SEAT MOVEMENT SMALL
    - SEAT VELOCITY DECREASING RAPIDLY
    - CATAPULT INTERNAL PRESSURES RISING RAPIDLY
  - BODY SHIFTS UPWARD WITHIN SEAT AND VELOCITIES DECREASE
    - REDUCES BUTTOCK AND VERTEBRAL LOADING
    - BODY LOADS SHOULDER HARNESS/SHOULDER GIRDLE
      - POSSIBLY REVERSING VERTEBRAL LOADING
      - HEAD CONTACTS CANOPY
        - POSSIBLY REVERSING VERTEBRAL LOADING
        - POSSIBLY INDUCING VERTEBRAL MISALIGNMENT

(CONTINUED NEXT CHART)
VERTEBRAL COMPRESSION FRACTURE MECHANISMS
THROUGH-THE-CANOPY EJECTION (CONT’D)

• CANOPY PENETRATION PHASE

  – SEAT ACCELERATES RAPIDLY DUE TO:
    • HIGHER CATAPULT INTERNAL PRESSURES
    • EFFECTIVE REDUCED EJECTED WEIGHT (TEMPORARY MAN-SEAT SEPARATION DURING CANOPY YIELDING PHASE)
  – SEAT MOVES UPWARD RELATIVE TO BODY
    • SEAT MOVEMENT MAY INDUCE "OVERSHOOT" ACCELERATION IN BODY
    • BODY MOVEMENT MAY BE TEMPORARILY RETARDED BY CANOPY CONTACT WITH HEAD
      • EXACERBATING VERTEBRAL LOADINGS
      • EXACERBATING VERTEBRAL MISALIGNMENT

• SEAT CLEAR PHASE
GENERALIZED CONCEPTUALIZATION OF BODY MOTIONS AND FORCES ASSOCIATED WITH THROUGH-THE-CANOPY EJECTION (GOOD RESTRAINT/POSTURE)
GENERALIZED CONCEPTUALIZATION OF BODY MOTIONS
AND FORCES ASSOCIATED WITH THROUGH-THE-CANOPY EJECTION
(Poor Restraint/Posture)
GENERALIZED CONCEPTUALIZATION OF MAN-SEAT INTERACTIONS AND EXTERNAL FORCES OPERATING ON COMBINATION

BOOST PHASE

CANOPY PENETRATION PHASE

F EJECTEE CANOPY PENETRATION (HEAD)

F EJECTEE CANOPY PENETRATION (HEAD)

F EJECTEE CANOPY PENETRATION (KNEE/THIGH)

UNGUIDED POWERED FLIGHT PHASE

Fq

FPROPULSION

FSEAT CANOPY PENETRATION

FPROPULSION

FSEAT CANOPY PENETRATION

FPROPULSION

FSEAT CANOPY PENETRATION

FPROPULSION

FSEAT SIDE CANOPY

FPROPULSION

FPROPULSION

FPROPULSION
GENERALIZED CONCEPTUALIZATION OF MAN-SEAT INTERACTIONS AND EXTERNAL FORCES OPERATING ON COMBINATION INITIAL SEAT TRAVEL PHASE

SHOULDER HARNESS
HORIZONTAL MAN-SEAT REACTIONS
LAP BELT
VERTICAL MAN-SEAT REACTIONS

F_CATAPULT
GENERALIZED CONCEPTUALIZATION OF MAN-SEAT
INTERACTIONS AND EXTERNAL FORCES
OPERATING ON COMBINATION

SEAT CANOPY PENTRATION PHASE

F\textsubscript{CANOPY}

F\textsubscript{CATAPULT}

SHOULDER HARNESS

HORIZONTAL MAN-SEAT REACTIONS

LAP BELT
GENERALIZED CONCEPTUALIZATION OF MAN-SEAT INTERACTIONS AND EXTERNAL FORCES OPERATING ON COMBINATION

EJECTTEE CANOPY PENETRATION PHASE (HEAD)
GENERALIZED CONCEPTUALIZATION OF MAN-SEAT INTERACTIONS AND EXTERNAL FORCES OPERATING ON COMBINATION

EJECTEE CANOPY PENETRATION PHASE (KNEES)
VERTEBRAL COMPRESSION FRACTURES MECHANISMS

INADEQUATE THIGH SUPPORT
THE VERTEBRAE
SHOWING NORMAL CURVATURE

INTERVERTEBRAL DISC

SACRUM

COCCYX
A TYPICAL THORACIC VERTEBRA, VIEWED FROM ABOVE

- Front
- Rear

- Costal Fovea
- Pedicle or Root of Vertebral Arch
- Lamina
- Superior Articular Process
THE VERTEBRAE
SHOWING NORMAL CURVATURE

FACES OF
ADJACENT
VERTEBRAE
NEARLY
PARALLEL
OPTIMIZING
LOAD TRANSFER
CAPABILITY
ACROSS
INTERVERTEBRAL
DISCS AND
ELIMINATING
POTENTIAL FOR
LOCALIZED HIGH
STRESS CONCENTRATIONS

SACRUM
COCCYX
EFFECTS OF FEMUR LEVERAGING PELVIS

PELVIC ROTATION OF SACRUM
EFFECTS OF FEMUR LEVERAGING PELVIS

ANTERIOR LIPS OF VERTEBRAE PINCHED TOGETHER CREATING POTENTIAL FOR LOCALIZED HIGH STRESS CONCENTRATIONS

POSTERIOR LIPS OF VERTEBRAE SEPARATED REDUCING LOAD TRANSFER CAPABILITY ACROSS INTERVERTEBRAL DISCS

PELVIC ROTATION OF SACRUM
GENERALIZED CONCEPTUALIZATION OF MAN-SEAT
INTERACTIONS AND EXTERNAL FORCES
OPERATING ON COMBINATION
UNGUIDED POWERED FLIGHT PHASE

\( F_q \)

\( F_{\text{ROCKET}} \)

SEAT-MAN GAP

SHOULDER HARNESS

HORIZONTAL MAN-SEAT REACTIONS

LAP BELT

VERTICAL MAN-SEAT REACTIONS

\( F_{\text{ROCKET}} \)
NUMBERS OF COMPRESSIONS
FRACTURES REPORTED
COMPARISON OF COMPRESSION FRACTURE FREQUENCY
AMONG VERTEBRAE FOR JETTISONED-CANOPY AND
THROUGH-THE-CANOPY USN EJECTEES FOR PERIOD
1/1/69 THROUGH 12/1/79

JETTISONED - CANOPY
EJECTEE

THROUGH - THE - CANOPY
EJECTEE
3RD PERCENTILE EVENT TIME LINE

CANOPY PENETRATION
A7, RUN 1, TEST T-1301
TEST DATE 22 OCTOBER 1980

HEAD LOAD - POUNDS
DUMMY Z ACCELERATION - G'S
MANIFOLDS OPEN
HELMET CONTACTS CANOPY
IGNITION
SEAT-CANOPY CONTACT: SEAT STOPS PUSHING DUMMY
CANOPY BREAKTHROUGH COMPLETED
HELMET CONTACTS CANOPY
HELMET CONTACTING LOOSE CANOPY GLASS
SEAT CATCHES UP WITH DUMMY
SIDE PANEL/KNEE CANOPY BREAKTHROUGH COMPLETED
PEAK LIMIT OF ACCELEROMETER
HEAD LOAD (LBS)
CATAPULT PRESSURE (PSI)
TIME
0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000
VERTEBRAL COMPRESSION FRACTURE MECHANISMS
PERSONAL EQUIPMENT INFLUENCES

• TYPES OF INFLUENCES

  – DISTRIBUTION OF WEIGHT
    • INCREASE LOAD SUPPORTED BY VERTEBRAL COLUMN
    • MOVE EFFECTIVE C.G. FORWARD – INCREASING TENDENCY FOR VERTEBRAL MISALIGNMENT

  – PLACEMENT OF STRAPS, ATTACHMENTS, PHYSICAL BULK
    • PRODUCE LOCALIZED, VARIABLE FROM PERSON-TO-PERSON VERTEBRAL MISALIGNMENT
VERTEBRAL COMPRESSION FRACTURE MECHANISMS

NON-STABLE EJECTION PLATFORM

- CAUSES BUTTOCK AND LOWER TORSO MOVEMENT UNDER CATAPULT BOOST ACCELERATION FORCES RESULTING IN VERTEBRAL MISALIGNMENT.
VERTEBRAL COMPRESSION FRACTURE MECHANISMS
INADEQUATE THIGH SUPPORT

- ACCELERATION FORCE OF LOWER LEG PULLS THIGH DOWN AGAINST FORWARD EDGE OF THIGH SUPPORT STRUCTURE
  - ROTATES PELVIS
    - INDUCING VERTEBRAL MISALIGNMENT
  - CAUSES “SUBMARINING” OF LOWER TORSO UNDER LOWER RESTRAINTS (LAPBELT)
    - INDUCING VERTEBRAL MISALIGNMENT
VERTEBRAL COMPRESSION FRACTURE MECHANISMS
POOR TORSO RESTRAINT

- BODY SLUMP DURING CATAPULT BOOST PHASE ACCOMPANIED BY FORWARD MOTION OF TORSO WITHIN RESTRAINTS
  - INDUCING VERTEBRAL MISALIGNMENT
  - MAY BE EXACERBATED BY FIRING CONTROL REACH/ACTUATION PROBLEMS INDUCING EJECTEE TO MOVE UPPER TORSO FORWARD AND DOWN.
  - ALSO MAY BE EXACERBATED BY DIVERGENCE BETWEEN CATAPULT/RAIL BOOST ANGLE AND SEAT BACK ANGLE.

- BODY "SUBMARINES" UNDER LOWER RESTRAINTS (LAPBELT)
  - INDUCING VERTEBRAL MISALIGNMENT
VERTEBRAL COMPRESSION FRACTURE MECHANISMS

CATAPULT BOOST ACCELERATION VECTOR
INDUCED FORWARD TORSO ROTATION

• DIVERGENCY BETWEEN CATAPULT/RAIL BOOST ANGLE
AND SEAT BACK ANGLE CAUSES SEAT TO PULL AWAY
FROM EJECTEE’S BACK

  • EJECTEE TORSO ROTATES ABOUT LOWER
  RESTRAINTS (LAPBELT) INTO SHOULDERS
  HARNESS
    • INDUCING VERTEBRAL MISALIGNMENT

  • LOWER TORSO "SUBMARINES" UNDER LOWER
  RESTRAINTS (LAPBELT)
    • INDUCING VERTEBRAL MISALIGNMENT
VERTEBRAL COMPRESSION FRACTURE MECHANISMS
CATAPULT BOOST ACCELERATION VECTOR
INDUCED FORWARD TORSO ROTATION

INDUCED FORWARD ROTATION
FPULL AWAY
FINERTIA
FSPINAL
FCATAPULT
VERTEBRAL COMPRESSION FRACTURES MECHANISMS

POOR SEAT BACK SUPPORT

- PRODUCES AREAS OF NON-SUPPORT
  CAUSING VERTEBRAL MISALIGNMENT
  DURING CATAPULT BOOST
  ACCELERATION.
GENERATION OF HEAD LOADS DURING THROUGH-THE-CANOPY EJECTION

- REQUIRES HELMET CONTACT WITH CANOPY SEGMENT RESISTING PENETRATION
  - HELMET STRIKES CANOPY BEFORE SEAT DOES
  - HELMET STRIKES CANOPY WHEN SEAT DOES
  - SEAT STRIKES CANOPY AND STOPS. BODY INERTIAL FORCES AND RESTRAINT SUBSYSTEM SLACK PERMIT BODY TO RISE UNTIL HELMET STRIKES CANOPY
  - HELMET STRIKES CANOPY AFTER SEAT PENETRATES CANOPY
DEFICIENCIES IN HEAD LOAD DATA MEASUREMENTS

- Nonrepresentative compression of dummy under acceleration
- Nonrepresentative restraint system constraint of dummy under deceleration
- Geometric misalignments between helmet-canopy force and transducer:
  - Contact force vector vs transducer axis
  - Contact point offset from transducer
  - Helmet shift during canopy contact
EFFECTS OF LANDING TERRAIN UPON TYPES AND FREQUENCY OF INJURIES

HYPOTHETICAL POPULATION

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over land</td>
<td>40</td>
</tr>
<tr>
<td>Over water</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
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</table>
EFFECTS OF LANDING TERRAIN UPON TYPES AND FREQUENCY OF INJURIES
EFFECTS OF LANDING TERRAIN UPON FREQUENCY OF LANDING INJURIES

HYPOTHETICAL POPULATION

OVER LAND 40
OVER WATER 60
TOTAL 100

LANDING INJURIES 4
(ALL OVER LAND)

LANDING INJURY RATES:

- \frac{\text{LAND. INJ.}}{\text{TOTAL}} = 4\%
- \frac{\text{LAND. INJ.}}{\text{OVER LAND}} = 10\%

NOTE: VERY FEW LANDING INJURIES ARE ASSOCIATED WITH WATER LANDINGS. THUS LANDING INJURY RATE AS PERCENTAGE OF TOTAL EJECTIONS MASKS CRITICAL RATE BY INCLUDING LOW RISK OF LANDING INJURY OVER WATER POPULATION. SHOULD PERCENTAGE EJECTING OVER LAND CHANGE, A CORRESPONDING INCREASE OR DECREASE IN THE TOTAL EJECTEE PERCENTAGE WOULD OCCUR UNLESS THE HIGH RISK OVER LAND INJURY RATE WERE TO CHANGE.
EFFECTS OF LANDING TERRAIN UPON FREQUENCY OF DROWNING

HYPOTHETICAL POPULATION

<table>
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<th>Condition</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Over Land</td>
<td>40</td>
</tr>
<tr>
<td>Over Water</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>Drownings (All Over Water)</td>
<td>15</td>
</tr>
</tbody>
</table>

DROWNING RATES:

- \( \frac{\text{Drowning}}{\text{Total}} = 15\% \)
- \( \frac{\text{Drowning}}{\text{Over Water}} = 25\% \)

NOTE: Very few drownings, although a few, occur over land, thus the low risk of drowning population ejecting over land can obscure a critical rate preventing recognition of a problem. If percent ejecting over water were to change then, without a change in drownings among over water ejectee rate, the rate among total ejectees would climb.
### ESCAPAC DROWNINGS AMONG ALL EJECTIONS

<table>
<thead>
<tr>
<th></th>
<th>IA-1</th>
<th>IC-3</th>
<th>IF-3</th>
<th>IG-3</th>
</tr>
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<tbody>
<tr>
<td>A-4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>1%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>DATES: 69-78</td>
<td>DATES: 69-77</td>
<td>DATES: 72-77</td>
<td>DATES: 74-78</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>IC-2</th>
<th>IG-2</th>
<th>IE-1</th>
</tr>
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<tbody>
<tr>
<td>A-7</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>DATES: 69-76</td>
<td>DATES: 75-78</td>
<td>DATES: 73-78</td>
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</table>

1/1/69 - 12/31/78
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<th>Location</th>
<th>Dates</th>
<th>Count</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>IG-3</td>
<td>74-78</td>
<td>25</td>
<td>71%</td>
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<tr>
<td>IF-3</td>
<td>72-77</td>
<td>8</td>
<td>40%</td>
</tr>
<tr>
<td>IC-3</td>
<td>69-77</td>
<td>93</td>
<td>72%</td>
</tr>
<tr>
<td>IC-2</td>
<td>69-76</td>
<td>73</td>
<td>46%</td>
</tr>
<tr>
<td>IE-1</td>
<td>73-78</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>IA-1</td>
<td>69-78</td>
<td>53</td>
<td>60%</td>
</tr>
</tbody>
</table>

ESCAPAC OVER LAND EJECTIONS

A-4
A-7
S-3
### ESCAPAC OVER WATER EJECTIONS

<table>
<thead>
<tr>
<th></th>
<th>IA-1</th>
<th>IC-3</th>
<th>IF-3</th>
<th>IG-3</th>
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ESCAPAC DROWNINGS OVER WATER

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A-4
A-7
S-3
DROWNINGS AND LOST(WATER) AMONG OVERWATER, WITHIN ENVELOPE TYPE 1 AND 5 EJECTEES (ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT EJECTIONS)

1 JANUARY 1969 THROUGH 31 DECEMBER 1979

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1 JANUARY 1969 THROUGH 31 DECEMBER 1979

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**ACCOMPLISHED CLEAR OF**

1 JANUARY

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OF TYPE 1 AND 5 EJECTIONS, DROWNINGS AND LOST WATER BY SEAT TYPE AND EJECTION ENVELOPE.

ACCOMPLISHED CLEAR OF AIRCRAFT AND INADVERTENT EJECTIONS)

1 JANUARY 1969 – 31 DECEMBER 1979

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OVERWATER EJECTIONS ACCOMPLISHED CLEAR OF AIRCRAFT
(INCLUDING INADVERTENT) - DROWNINGS AND LOST AT SEA FATALITIES
(1 JANUARY 1969 THROUGH 31 DECEMBER 1979)

<table>
<thead>
<tr>
<th>MONTH</th>
<th>OVERWATER</th>
<th>CUM % OVERWAT</th>
<th>DROWNING</th>
<th>CUM % DROWN</th>
<th>LOST @ SEA</th>
<th>CUM % LOST</th>
<th>LOST @ SEA &amp; DROWNING</th>
<th>CUM % LOST &amp; DROWN</th>
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</thead>
<tbody>
<tr>
<td>OCT</td>
<td>46</td>
<td>46</td>
<td>1</td>
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<td>5</td>
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<td>4</td>
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<td>4</td>
<td>8</td>
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<td>44</td>
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<td>3</td>
<td>11</td>
<td>61</td>
<td>61</td>
<td>7</td>
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<tr>
<td>MAR</td>
<td>51</td>
<td>305</td>
<td>1</td>
<td>12</td>
<td>66</td>
<td>66</td>
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<td>419</td>
<td>0</td>
<td>13</td>
<td>72</td>
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<tr>
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<td>476</td>
<td>3</td>
<td>16</td>
<td>88</td>
<td>88</td>
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<tr>
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<td>530</td>
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<td>16</td>
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<td>17</td>
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<td>18</td>
<td>100</td>
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</table>

The table shows the cumulative data for overwater ejections, drownings, and lost at sea fatalities from January 1969 to December 1979.
ROLE OF LOST & DROWNING IN EJECTION FATALITIES AMONG TYPE 1 AND 5 EJECTIONS (INADVERTENT AND ACCOMPLISHED CLEAR OF AIRCRAFT EJECTIONS)
1 JANUARY 1969 THROUGH 31 DECEMBER 1979

(121) ALL OTHER CAUSES

LOST 40.1%
DROWNING 8.9%
ALL OTHER CAUSES 59.9%
MONTHLY COMPARISONS OF OVERWATER EJECTION, DROWNING, LOST AT SEA, & DROWNING AND LOST AT SEA QUANTITIES AND RATES, 1 JANUARY 1969 THROUGH 31 DECEMBER 1979
MONTHLY COMPARISONS OF DROWNINGS, LOST AT SEA, COMBINED DROWNINGS & LOST AT SEA EJECTIONS AGAINST OVERWATER EJECTIONS
BY MONTHLY CUMULATIVE PERCENTAGES
(1 JANUARY 1969 THROUGH 31 DECEMBER 1979)
## ESCAPAC EJECTIONS

DATA PERIOD BEGINNING 1 JANUARY 1969
ENDING 31 DECEMBER 1979 (EXCEPT AS NOTED)

<p>| | | | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>A-4</td>
<td>IA-1</td>
<td>88</td>
<td></td>
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<tr>
<td></td>
<td>IC-3</td>
<td>128</td>
<td>IF-3</td>
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<td></td>
<td>20</td>
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<tr>
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<td>IG-3</td>
<td></td>
<td>63</td>
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<td>THROUGH DEC. 1980</td>
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<tr>
<td>A-7</td>
<td>IC-2</td>
<td>159</td>
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<td>THROUGH AUG. 1981</td>
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</table>
ESCAPAC FATALITIES
DATA PERIOD BEGINNING 1 JANUARY 1969
ENDING 31 DECEMBER 1979 (EXCEPT AS NOTED)

A-4

IA-1 14 15.9%
IC-3 17 13.3%
IF-3 4 20.0%

IG-3 13 (7 OVER WATER) 20.6%

THROUGH DEC. 1980

A-7

IC-2 19 11.9%

IG-2 12 19.0%

THROUGH AUG. 1981
ESCAPAC OVERLAND EJECTIONS
DATA PERIOD BEGINNING 1 JANUARY 1969
ENDING 31 DECEMBER 1979 (EXCEPT AS NOTED)

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<tr>
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<td>IG-3</td>
<td>50</td>
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THROUGH DEC. 1980
THROUGH AUG. 1981
ESCAPAC OVERWATER EJECTIONS
DATA PERIOD BEGINNING 1 JANUARY 1969
ENDING 31 DECEMBER 1979 (EXCEPT AS NOTED)

A-4
IA-1 35
IC-3 36
IF-3 12
IG-3 13
THROUGH DEC. 1980

A-7
IC-2 86
IG-2 38
THROUGH AUG. 1981
## ESCAPAC EJECTEE DROWNINGS

DATA PERIOD BEGINNING 1 JANUARY 1969
ENDING 31 DECEMBER 1979 (EXCEPT AS NOTED)

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**A-4**

**A-7**

**THROUGH DEC. 1980**

**THROUGH AUG. 1981**
END
11-86
DTIC