Miniature Verge Escapement Safety and Arming Device

Dime

OCSW

KAMAN DAYRON, Inc.
Prominent Features

- Miniature Size - .300 thick
- Operational capabilities far exceeds existing designs
  - 100,000 RPM
  - 100,000 G setback
  - No change in arm distance with temperature
  - No lubrication required
- Qualified
  - MIL-STD-1316 Compliant
  - Passes MIL-STD-331 safety tests
- Low cost
  - Plastic components
  - Spin lock – one piece design: a first
- High Reliability in a Variety of Guns
M549

OCSW thickness 1/3 of M549

OCSW Volume 1/10 of M549

M549

OCSW
M549

5 Lbs centrifugal force creates high friction

24,000 RPM

OCSW

No centrifugal Force

100,000 RPM
Conventional OCSW

- **Moment Arm of Resultant Force Vector Increased**
  - Eliminates need for Lubrication
  - Arming Time not effected by Temperature
Drive screw
Staked weight
Fits in Slot
Spin Lock - Simplified and Functionally Superior

- **M549**
  - Locks on gear tooth
  - Weight staked on
  - Drive screw to install
  - 3 parts

- **OCSW**
  - Locks in large rectangular slot
  - No separate weight required
  - Drops in slot at assembly
  - 1 part

KAMAN DAYRON, Inc.
**Rotor Starting Torque Increased to Reduce Starting Failures**

![Graph showing Rotor Starting Torque]

- **Torque generated by rotor**
- **Rotor rotation, degrees**
- **Gear Engagement**
- **Zip travel**

Comparison between **Modified** and **Original** gear engagement:

- **SAFE**
- **ARM**

KAMAN DAYRON, Inc.
Warhead
**OCSW Assembly**

- Forward housing
- Centrifugal spring
- Verge
- Starwheel & Pinion
- Aft plate
- Lead
- Rotor/Sector gear
- Aft housing
- Setback pin & Spring
- Aft plate
**XM307 (OCSW) Gun Firings**

<table>
<thead>
<tr>
<th></th>
<th>Fired</th>
<th>Functioned</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spotting Charge in Forward Warhead</td>
<td>345</td>
<td>329</td>
<td>95%</td>
</tr>
<tr>
<td>Dual Live Warhead</td>
<td>39</td>
<td>37</td>
<td>95%</td>
</tr>
<tr>
<td>Thermo baric Cartridge</td>
<td>32</td>
<td>32</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>416</strong></td>
<td><strong>398</strong></td>
<td><strong>96%</strong></td>
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</tbody>
</table>

*S & A is only one element of the fuze system*
## 30/S40mm Gun Firings

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<th>Functioned</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>30mm 88,000 RPM</strong></td>
<td>17</td>
<td>17</td>
<td>100%</td>
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<tr>
<td><strong>S40mm 48,000 RPM</strong></td>
<td>22</td>
<td>22</td>
<td>100%</td>
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<tr>
<td><strong>Total</strong></td>
<td>39</td>
<td>39</td>
<td>100%</td>
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