



# Advanced Turret System: 3 Technologies

**Inventors:**  
**Christopher Brown**  
**Matt Juhl**  
**John Schneider**



**Advanced Turret System (ATS)  
incorporates the following Crane  
developed technologies.**

- Marine Corps Transparent Armor  
Gunner's Shield-Counter Sniper  
(Current Marines Corps iteration of  
CSPS)**
- Advanced Turret Ring**
- Fatigue Reduction and Blast Effect  
Mitigation Turret Gunner's Seat and Foot  
Controls**

# ATS Concept



**MCTAGS-CS**  
Currently being jointly  
developed by NSWC  
Crane and BAE

**Advanced Turret  
Ring**

**Foot Controls**

**Fatigue Reduction and  
Blast Effect Mitigation  
Turret Gunner's Seat**



# Counter Sniper Protection System

**Inventors:**

**Christopher Brown**

**John Schneider**

**Robin Cromwell**

**Don Lowe**

**Patent Application # 11,998,977**

# What is it?

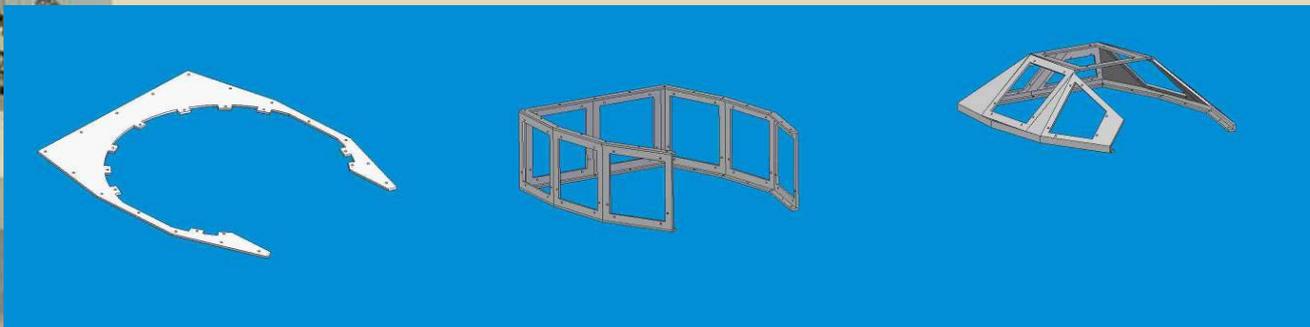


**Ballistic overhead protection of the turret gunner of combat vehicles.**

# Why did we make it?

- **Vehicle Turret Gunners in OIF and OEF are exposed to snipers and other kinetic events**
- **Current Gunner's Protection Kit only shields the gunner to chest level, and provides no transparency for gunner's situational awareness**
- **Status: prototyped with technical data package available**

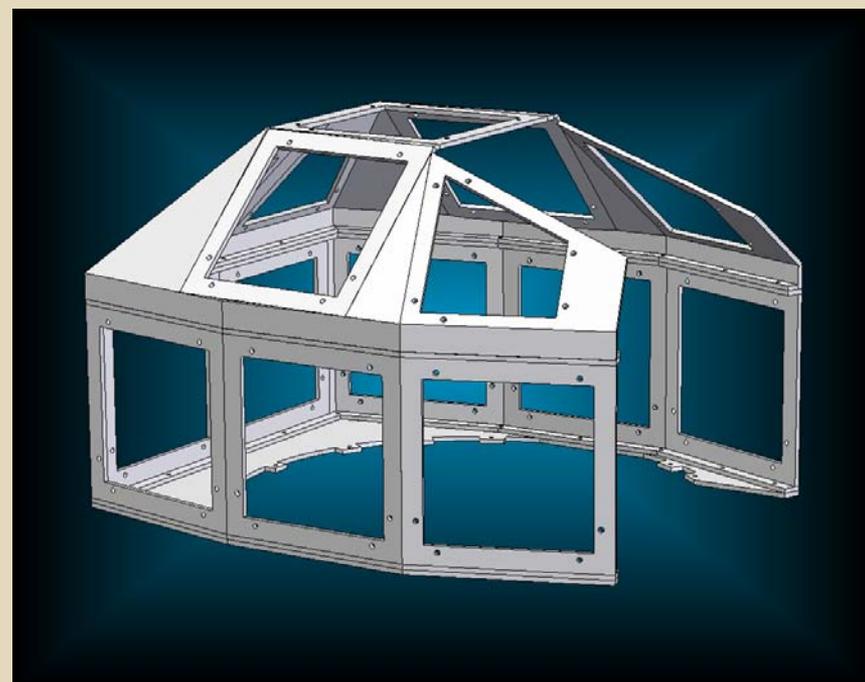
# What are its components?



**Can easily be reconfigured in the field – two personnel and a socket wrench**

## What are its main capabilities?

- Provides 7.62mm protection
- Steel provides Level 3 Ballistic protection
- Domed shape provides 95% coverage of the gunner vs. 42% coverage utilizing conventional Gunner Protection Kit



# What makes it special?

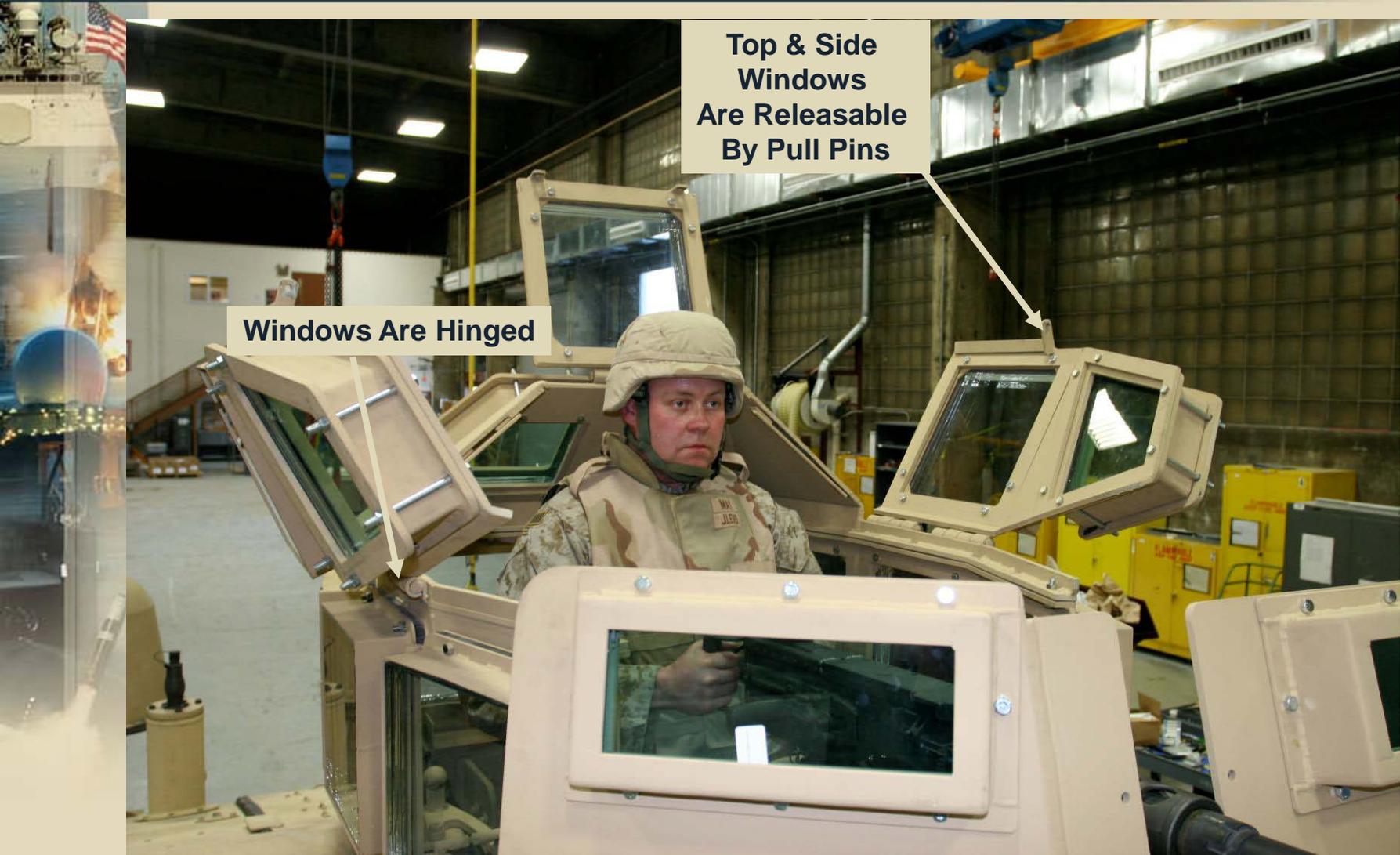


Hinged Side Windows  
for **Escalation of Force**



Top and sides of system can be swung open for **emergency egress**. Removal of two pins overhead of gunner allow for quick egress.

# What makes it special?



**Windows Are Hinged**

**Top & Side Windows Are Releasable By Pull Pins**

# Commercial Applications

- **Who would use it?**
  - Foreign Military Sales
  - Law Enforcement
- **Why would they want it?**
  - The CSPS is the only ballistic turret protection that provides this level of overall coverage.
- **How would it be used?**
  - On armored police vehicle for riot control or stand-off situations.





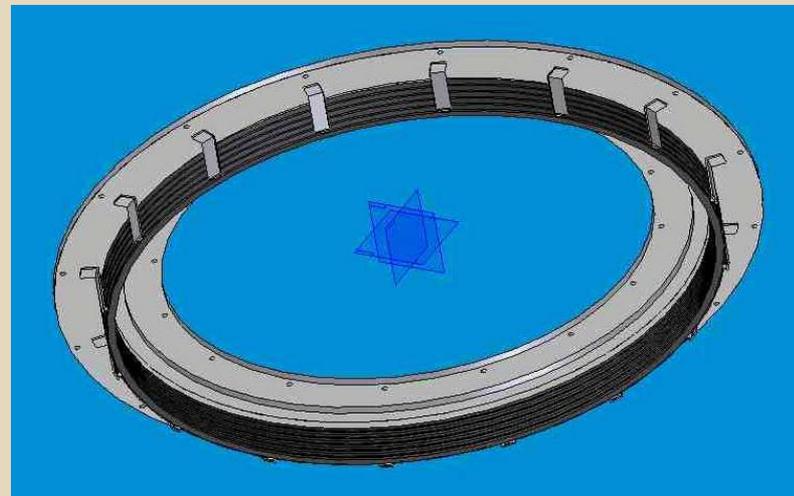
# Advanced Turret Ring

**Inventors:**  
**Christopher Brown**  
**John Schneider**

**Patent Application #s 12,334,070; 12,546,068**

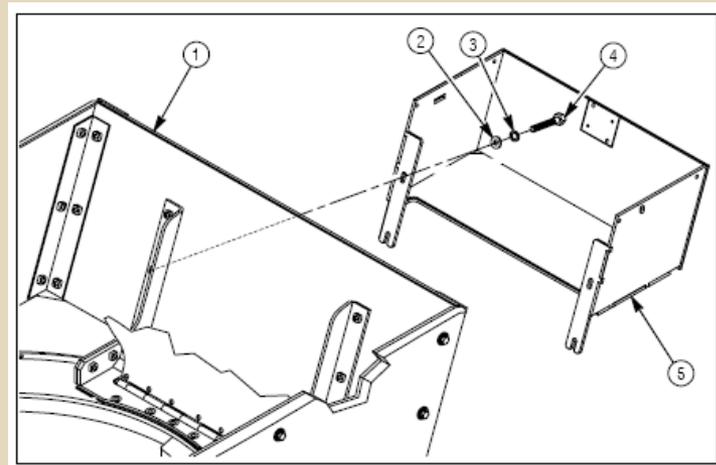
# What is it?

- **Allows the passing of communications signals, vehicle power, and other cable signals to the turret without the gunner becoming tangled in cords.**



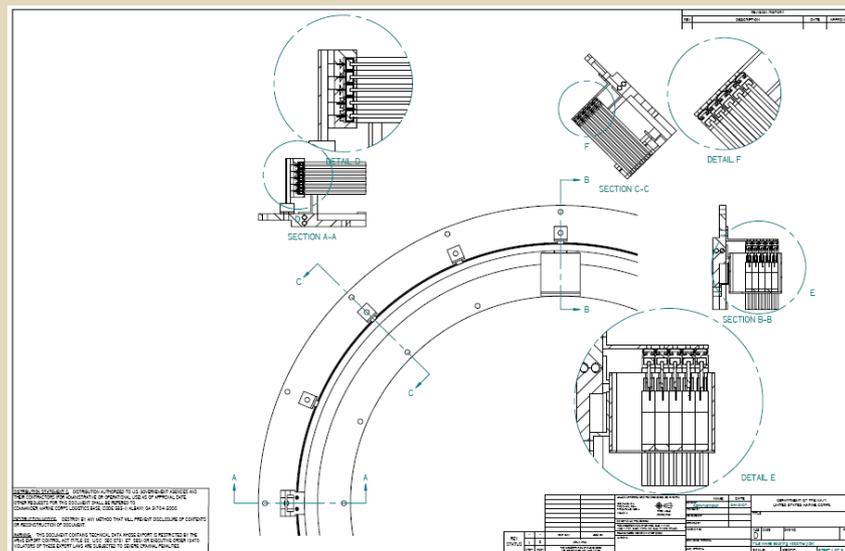
# Why did we make it?

- **Provide continuous communication and/or power while 360° traversing, vice:**
  - Cables
  - Batteries
- **Traditional slip rings:**
  - Would have required redesign and replacement of turret bearing
  - Are not typically designed for a large center opening.

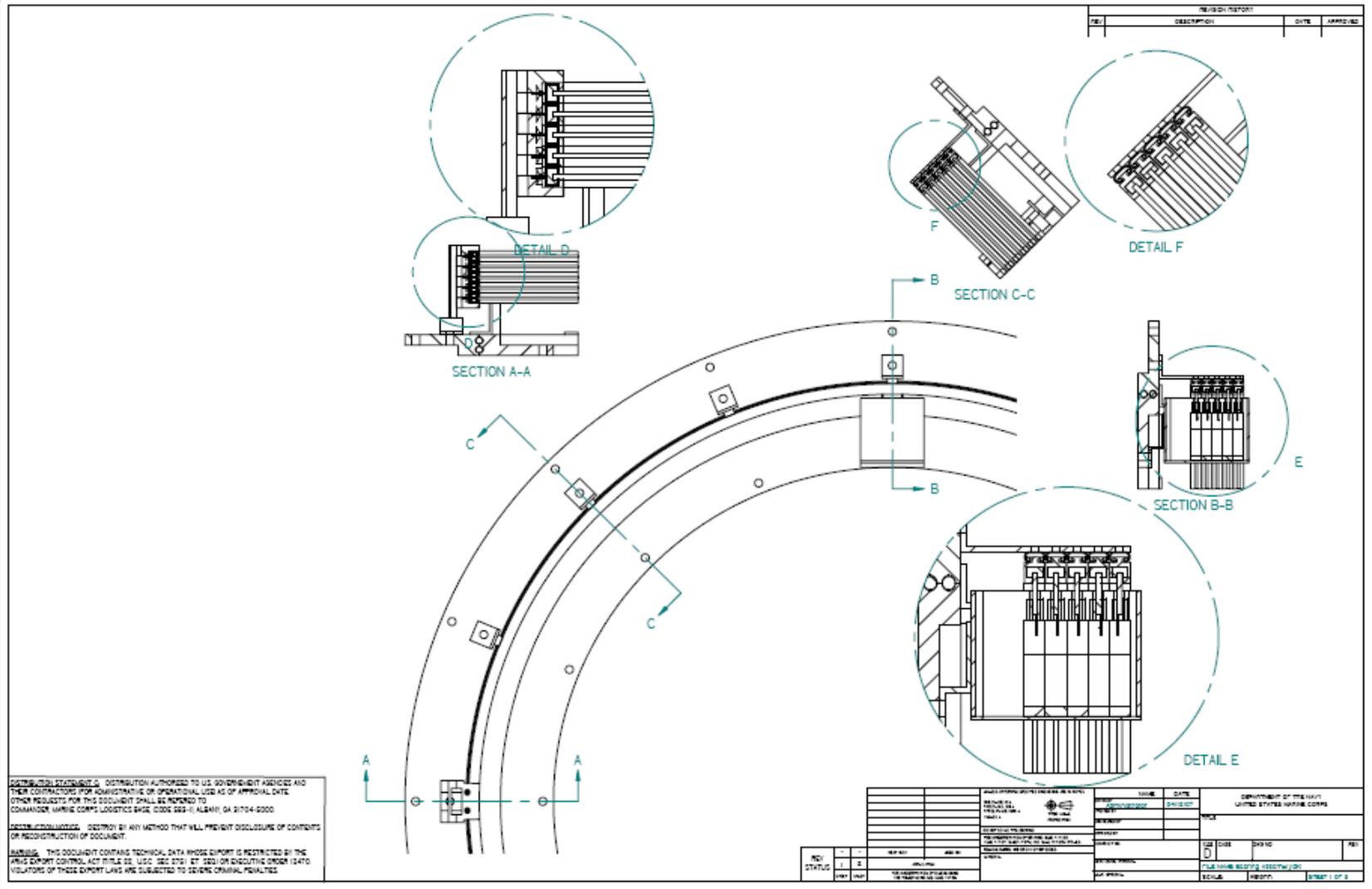


# What were the goals of the redesign?

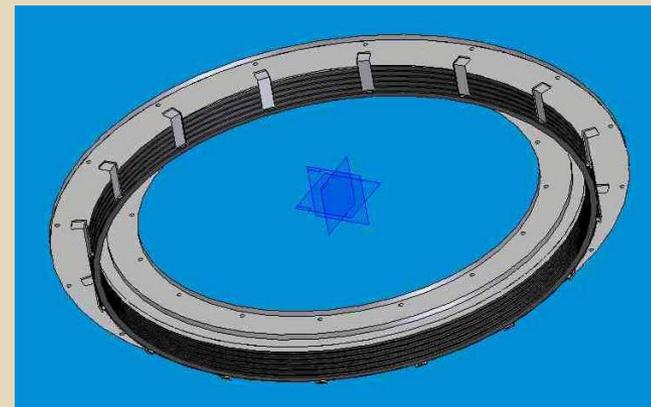
- A method of passing power signals between two conductors that can be formed into a large circle.
- Must be able to retrofit existing vehicle
- Must be easily resizable for various applications.



# What are its primary components?



- **Who would use it?**
  - Law Enforcement, i.e. armored police vehicle for riot control or stand-off situations.
  - Foreign Military Sales for turrets
  - Where ever large slip rings are employed, i.e. manufacturing robots with cables
- **Why would they want it?**
  - Upgrade existing slip ring capacity
  - Simple and inexpensive retrofit of existing large slip rings





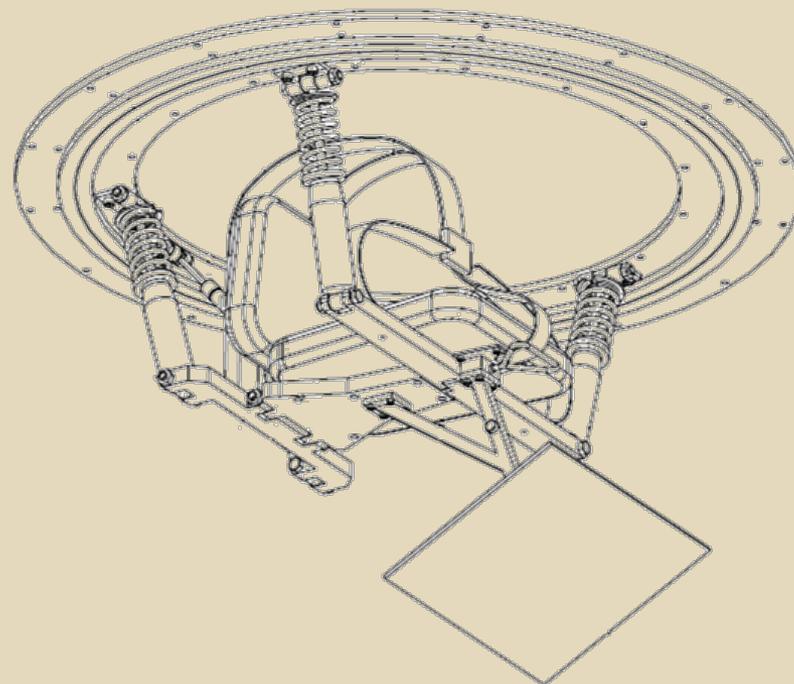
# Fatigue Reduction and Blast Effect Mitigation Turret Gunner's Seat

**Inventors:**  
**Christopher Brown**  
**Matt Juhl**

**Patent Application # 12,510,221**

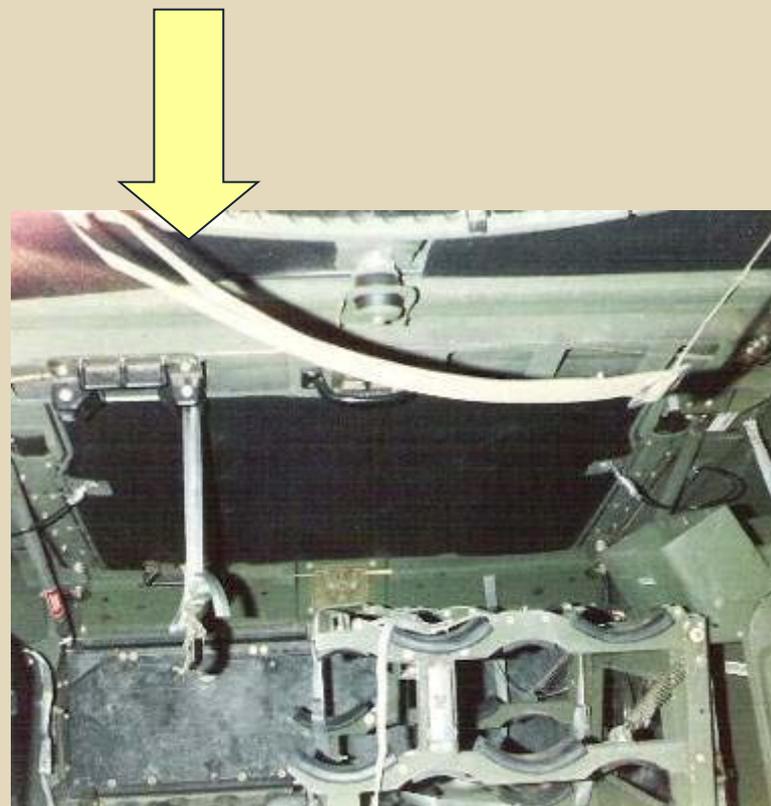
# What is it?

**A replacement seat for gunner's seat on tactical vehicles that provides shock absorption, fatigue mitigation, and blast effects reduction.**



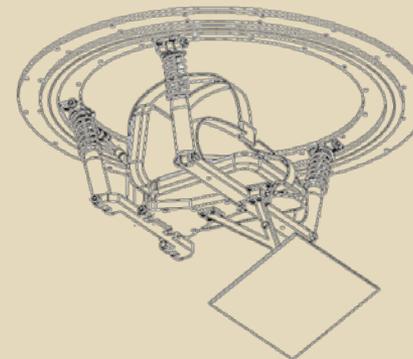
# Why did we make it?

- **Standard Strap seat causes the circulation in the gunner's legs to be cut off. Numbness and pain severely impact concentration and reaction.**
  - Can result in permanent nerve damage.
- **Provides no security in the event of an accident.**
- **Provides no protection from blast pressures or fragmentation due to blast events.**
- **Provides no cushioning from vibrations and impacts during normal vehicle operations.**

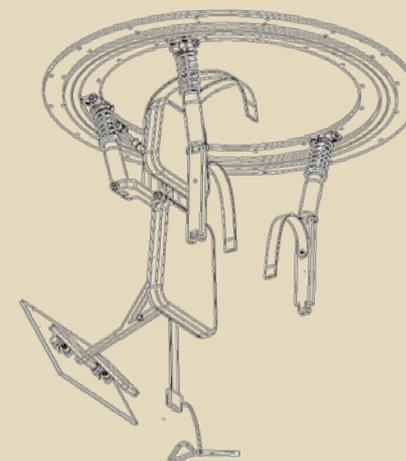


# What were the goals of the redesign?

- Design should prevent or significantly reduce numbness and pain when gunner is continuously seated for 8 to 10 hours.
- Design should provide protection from blast pressures and fragmentation due to blast events.
- Design should provide cushioning from vibrations and impacts during normal vehicle operations.
- Design should provide security in the event of an accident.
- Design should be adjustable to accommodate 95% of male users.



Side View

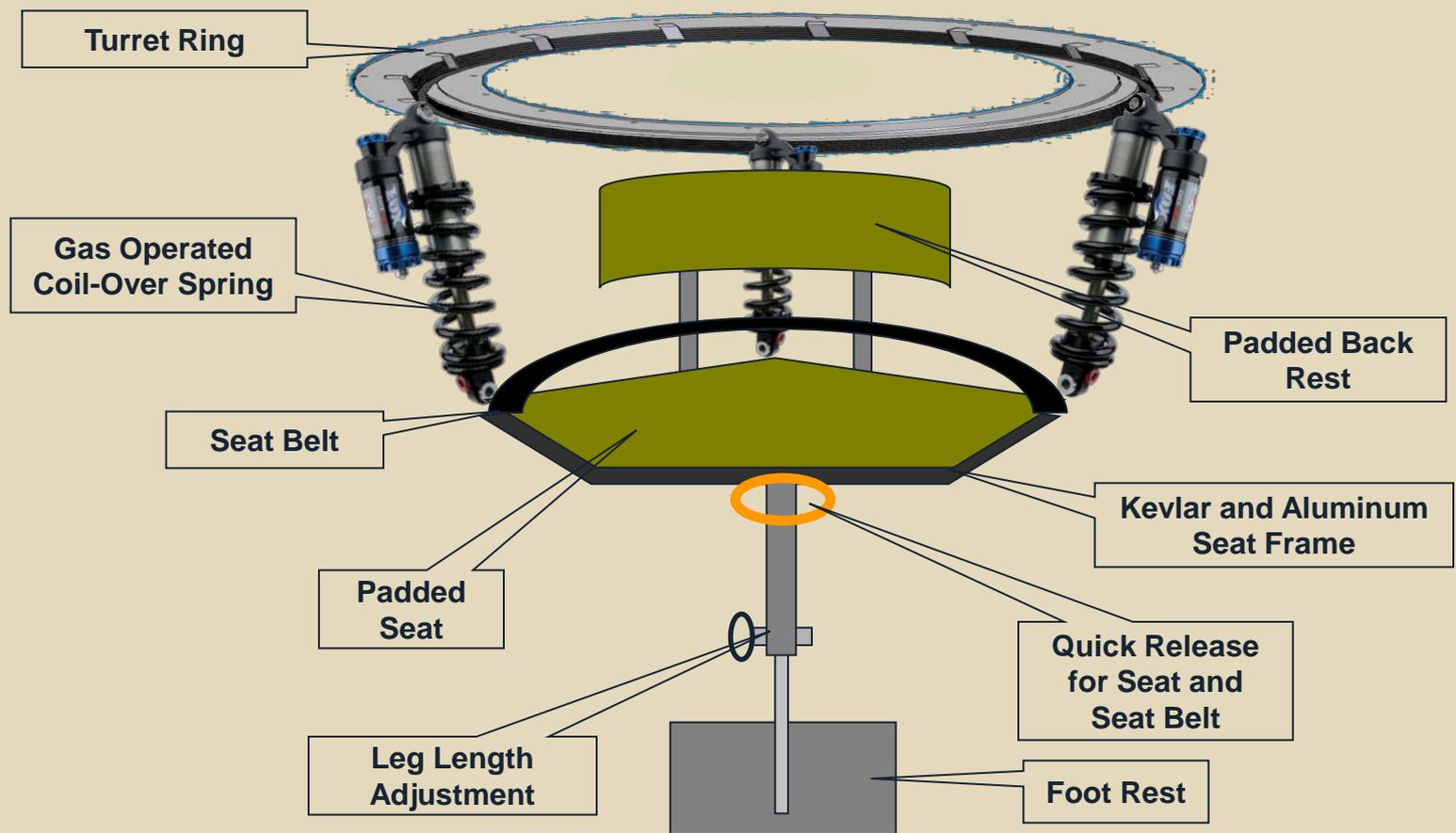


Emergency Release View

# What are its main components?



**Front View**



- **Who would use it?**
  - Law Enforcement
  - Heavy equipment operators
- **Why would they want it?**
  - Reduced costs and loss of time associated with injury due to improper seats
- **How would it be used?**
  - On armored police vehicle for riot control or stand-off situations.
  - Others???

