Smile for the Grenade!
“Camera go BANG!”



Vlad Gostomelsky

Joshua A. Marpet

Who are we?

- **Vlad Gostom @recompiler** - Years of model rocketry and high power model rocketry
- DARPA researcher – including future warrior combat system
- Penetration Testing – Web Apps, networks, physical security (including banks)
- Air Force Auxiliary – Ground Search and Rescue
- CERT Team

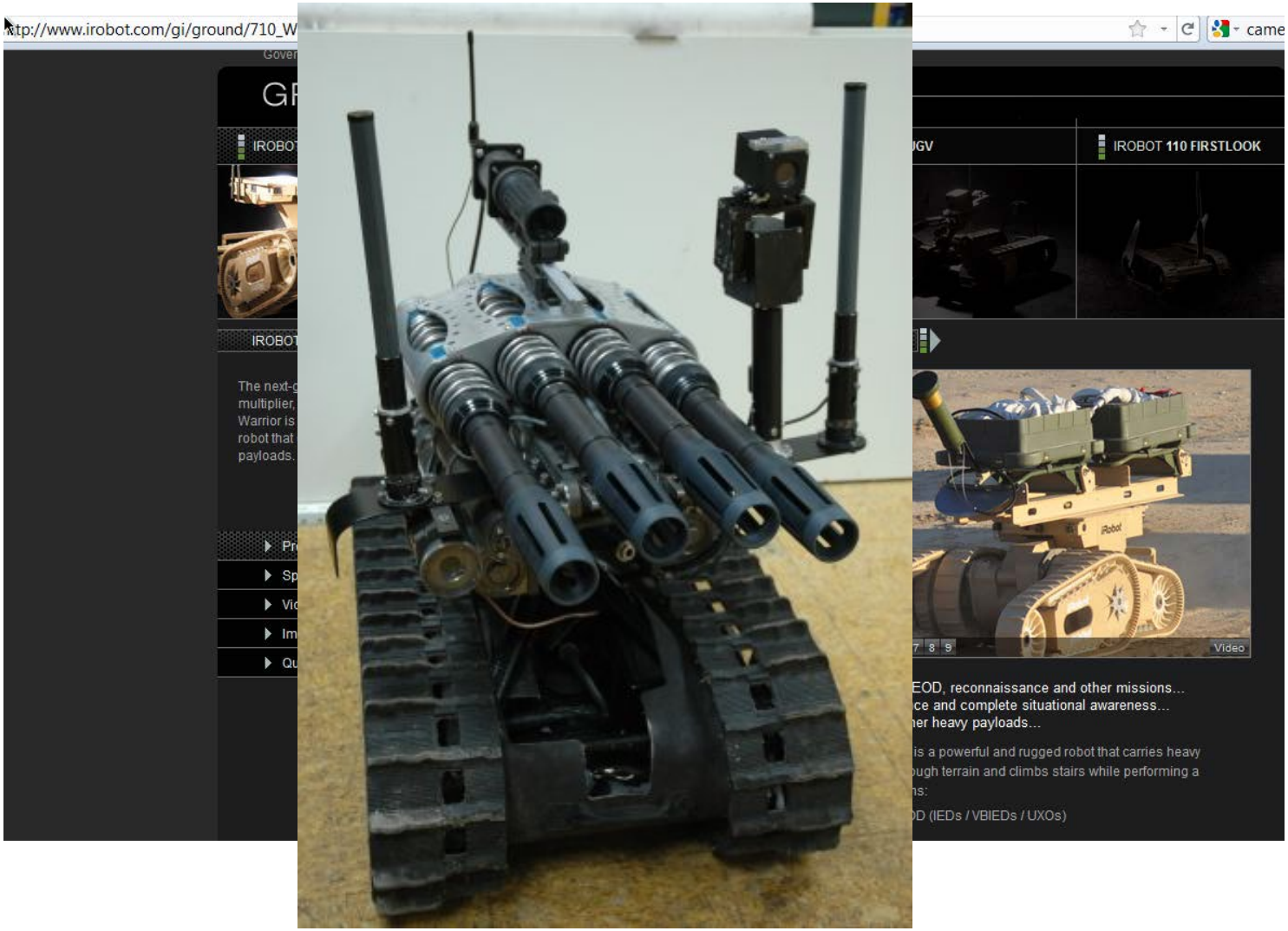
- **Joshua Marpet @quadling**
- Joshua Marpet speaks all over, from Black Hat to Pumpcon.
- His presentations range from Video Security to the progress of the Information Security Industry, and everywhere in between.
- He's held every one of his childhood fantasy jobs except for astronaut, and currently teaches Infosec at Wilmington University, an NSA/DHS Center of Academic Excellence.
- Josh gets the job done.

Camera Timeline

1950's 1960's 1970's 1980's 1990's 2000's



History
Remote Video Surveillance



UAV Surveillance



UMV – Unmanned Marine Vehicle



Inspection Cameras

http://www.ridgid.com/Tools/SeeSnake-micro

SeeSnake® micro™ Inspection Camera

The new RIDGID® SeeSnake® micro™ Inspection Camera allows you to perform detailed visual inspection in hard to reach areas. Its comfortable pistol grip design and forward facing controls make it easy to detect and diagnose the unreachable. Available with a 17mm camera head for general use or a 9.5mm camera head for up-close visual inspections in tight spaces, the SeeSnake micro Inspection Camera provides solutions whenever and wherever you need them.

Click here for an overview of the complete RIDGID handheld inspection product offering.



FULL LIFETIME WARRANTY

Specifications

Display:	2.4" Color LCD (234 X 160 Resolution)
Camera Head:	Aluminum 17mm Or Aluminum 9.5mm
Lighting:	1 or 2 Adjustable LEDs
Cable Reach:	3' (Expandable to 30' w/optional extensions)
Video Output:	3' RCA Cable (included)
Waterproof:	Camera & Cable to 10' (when properly assembled)
Power Source:	4 AA Batteries (6 hrs. of continuous run-time)
Attachments:	Mirror, Hook & Magnet
Weight:	1.2 lbs (0.5 kg)



Watch Video!

Plant Engineering PRODUCT of the YEAR 2007

2008 DEALER DESIGN AWARDS
NEWS GOLD

Fiber Optic Cameras

Push Cameras for (pipe inspection, pipeline inspection)

Push cameras (snake type) are used for pipeline, duct, drain and pipes inspection in plumber, repair of inspection work. This inspection cameras consist of long insertion probe with a flexible "goose-neck" for getting around corners. LED lights give adequate illumination and cctv type camera on the tip capture clear images and allow image and video saving. Often push or pipe inspection cameras are called SEWER cameras or drain video camera and used in sewer inspection. Push video cameras could be portable or more advance with motorized wheel to push long probe for 60 and more meters down the tubes, pipes, drain, sewer.

Have a Question?
Ask Us

"Hydra" Push Camera for Pipe inspections, 25.4mm(1") diameter (20M(65.6') or 30M(98.4') Length)



Medit's new Hydra Push cameras are designed to offer you great color images of your inspections contained in a convenient portable design which allows you to carry this onto any jobsite.

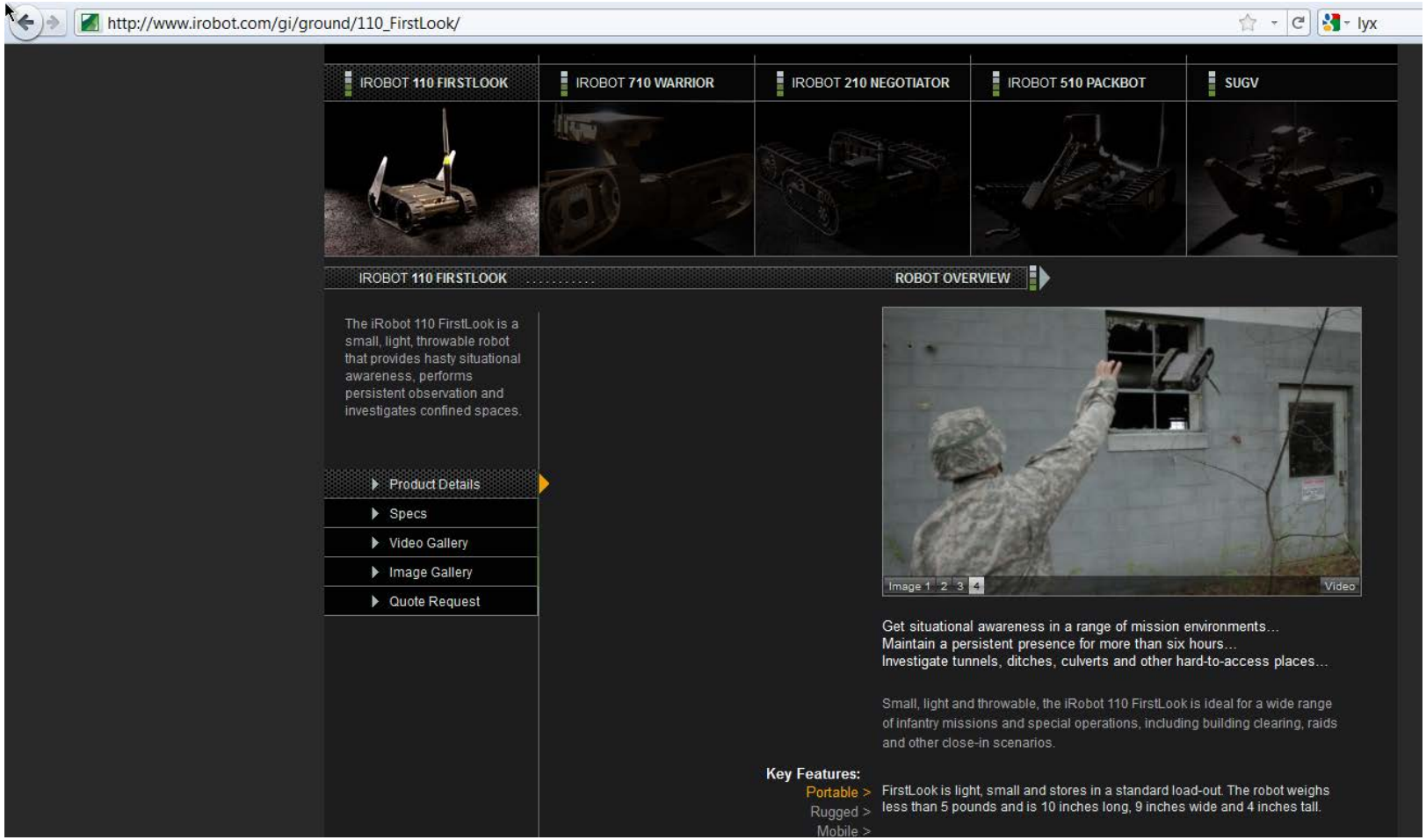
PRICE: $2,350.00 USD
ADD TO CART
MORE INFO

SKU: HPVBS

Product Features:

- High pixel resolution of 625 lines on the 4.3" LCD Monitor
- Highly portable design with an integrated rechargeable battery
- ¼ CCD Video camera chip producing 800 x 480 Resolution

Throwable Robots



iRobot is Hackable!

- Easily reprogrammable
- Encouraged by manufacturer
- Expansion modules sold by manufacturer and other distributors
- Can be controlled by Wii controllers
- iRobot frogger



Camera Balls

http://www.defensereview.com/eye-ball-r1-throwable-camera-system-for-high-risk-mille-tactical-ops/

LPS Teams with Major U.S. Defense Contractor to Develop DREAD Centrifuge Weapon
Royal Canadian Mounted Police Team to Compete in 2005 5.11 Challenge

Eye Ball R1 Throwable Camera System for High-Risk Mil/LE Tactical Ops

On May 15, 2005, in Special Operations, by David Crane

by David Crane
david@defensereview.com

All digital photos included with this article are courtesy of Remington Technologies.

Criminals, insurgents, and terrorists beware. The Eye Ball R1 remote-controlled 360-degree spherical camera system, or "mobile display system", originally designed and developed by O.D.F. Optronics, Ltd., out of Tel-Aviv, Israel, will now be manufactured and marketed in the U.S. by Remington Technologies, a division of Remington Arms Company, Ltd., through a licensing agreement.

Compact, lightweight, and ruggedized, the EyeBall R1 was designed and developed to be deployed/employed for...
military Special Operations (SPECOPS), law enforcement SWAT/SRT operations, anti-terrorism/counterterrorism operations, hostage rescue operations, and just about any and all other types of tactical operations for which a small, rugged, lightweight wireless audio device/video camera can come in handy. According to the company, potential applications for the technology include (but are not limited to) Dynamic Entry/High-Risk Entry Operations (including room clearing and stairwell clearing), ceiling and attic Investigation, surveillance operations, and search and rescue operations.



Due to its ruggedized construction, the Remington Technologies Eye Ball R1 can be rolled, tossed, or thrown wherever necessary. Once deployed, the system can capture video out to 25 yards away and audio up to a distance of 5 yards, and then broadcast both up to 200 yards wirelessly back to a large remote control device called

Ballistic Cameras

OH GIZMO!

Ads by Google CCTV Camera Security Camera Spy Camera Sa

Tuesday, August 2, 2005

The Firefly, Disposable Ballistic Camera

By David Ponce



You know something? The Israelis really seem to be into this concept: take a camera, toss it in the action, see what happens.

First, they came out with a rugged ball shaped spycam. Now this! It's called the Firefly, and it's made by Rafael Land Systems. It can be launched up to 600m from an M16's underslung grenade launcher, by any non specially-trained soldiers. The "ballistic camera" will then lob in the air, all the while taking video and transmitting back to ground operators' PDAs.

Once it reaches the ground, it, well it smashes up.

Useful, if you're into that war stuff.

Story VIA Defensetech VIA The Raw Feed.

Ballistic Camera DIY

- Easy access for Civilians
- Price tag
- DIY/MAKE spirit
- Search and Rescue
- Killer Airsoft
- Just Because!



Safety

DIY Destructive Devices can go wrong.

VERY WRONG!

If you ever hear someone with a grenade launcher go,

“Hey, y’all, someone hold my beer! Now watch this!!”

RUN!



Safety 2

- **WARNING! DO NOT DO THIS AT HOME! DO NOT MAKE THESE SHELLS OR BUILD THIS SYSTEM**
- Do NOT disassemble 37mm or 40mm shells!
- We are experts. No, really.
- Please do not do this.
- If you want, call/email us. We will happily discuss it with you, including the possible dangers.

Safety 3

Hand Orientation

Right hand on pistol grip

Left hand BEHIND the shell

Not on ‘hand guard’

Fragmentation Vest

Flash Suit

Gloves

Helmet

Eye Protection

Ear Protection

No Such thing as overkill when its your fingers and eyeballs





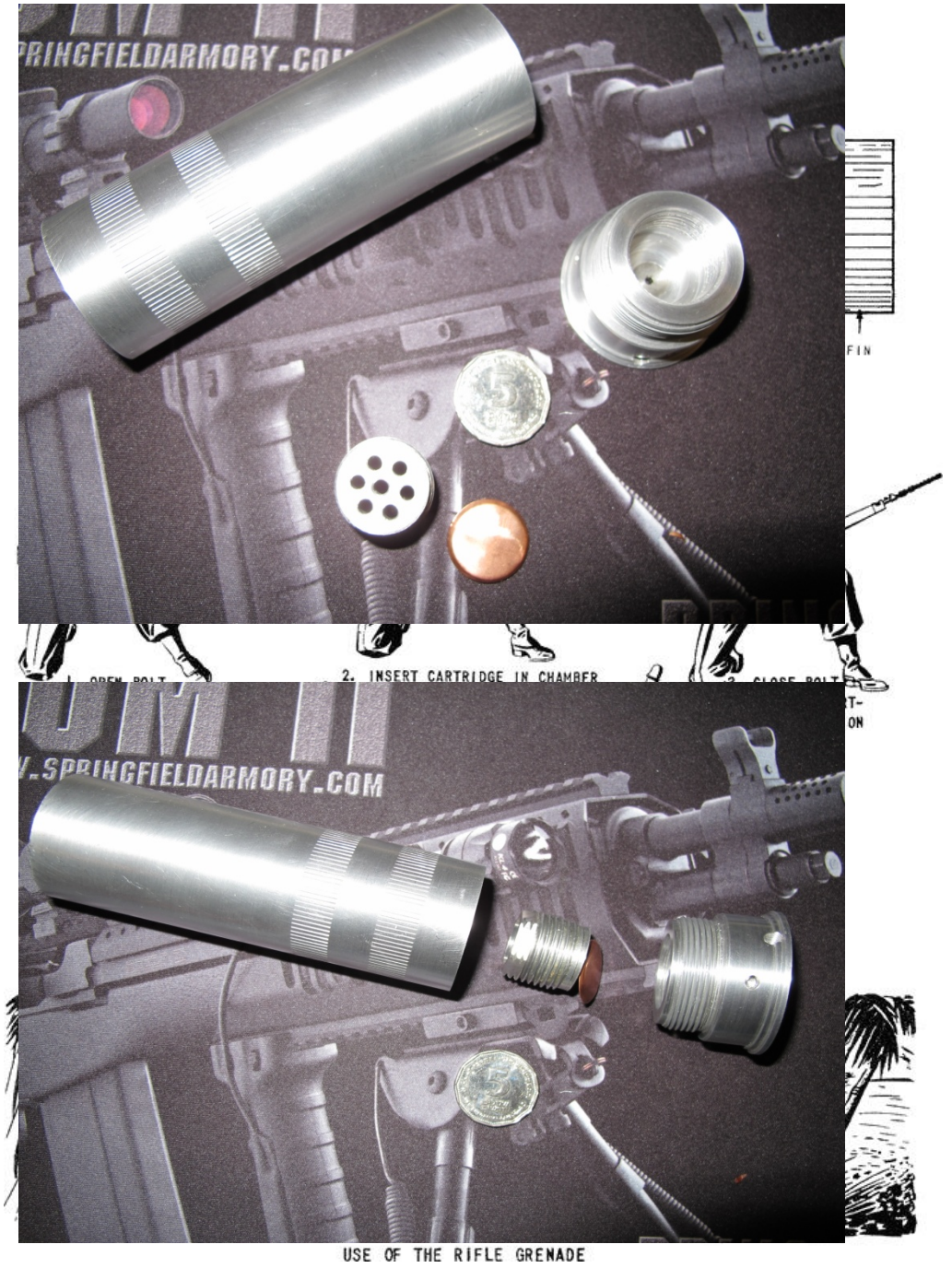
Legality

- 37mm vs. 40mm
- Non-DD vs Destructive Device
- NFA 1934
- ¼ Ounce of Explosive/Propellant/Lift Charge
- PC 120301(a)(4) – “Penal Code” ($200,000 fine + Jail time)



Capability 37mm non-DD

- 1/2lb projectile 400 meters range
- 1/4lb 400 feet vertically
- 25000 PSI in high pressure chamber



Why our system is not DD

- Total weight of lift charge/payload
- Intent – Signal, Search and Rescue
- Non-antipersonnel
- 37mm
- Never ever aim at individuals.



System Configuration

Launcher Variants

Low Pressure Device (only 25000 PSI)

26.5mm

37mm

40mm

Modular

Blank Round

Standalone

Under-barrel

6 shot/8 shot

Automatic

Corner Shot



Design

Trial and Error
Individual Component testing
Camera
Command Center Recorder
Field Recorder
Power Source
Payload Capsule/Recovery System
Launcher shell

Metal Film Canister
Nalgene micro bottle
Plastic Film Canister



System Capabilities

- 600 meter vertical shot
- Fire over 5 story building for urban S&R
- 400 meter horizontal range
- 22 seconds of video from 140 meters altitude
- 30min of on-station time if tangled in trees via chute or tangle lines
- Punch through ¼ plywood – remain on-station
- Punch through plate glass – remain on-station



Challenges - Electronics

- Documentation in Engrish
- Range issues
- Repeatability
- DOA Equipment
- Locating proper cameras



Challenges – Shell Design and Propulsion

- Safety!!
- Legality (rectal opening safety)
- Camera-system arming
- Temperature during ignition
- G forces during the boost phase
- Space
- Camera orientation
- Timing

Camera-System Arming

- Spin-Arm
- Ripcord
- Magnetic reed switch
- Pushbutton

Challenges
Launch, Stabilization, Recovery

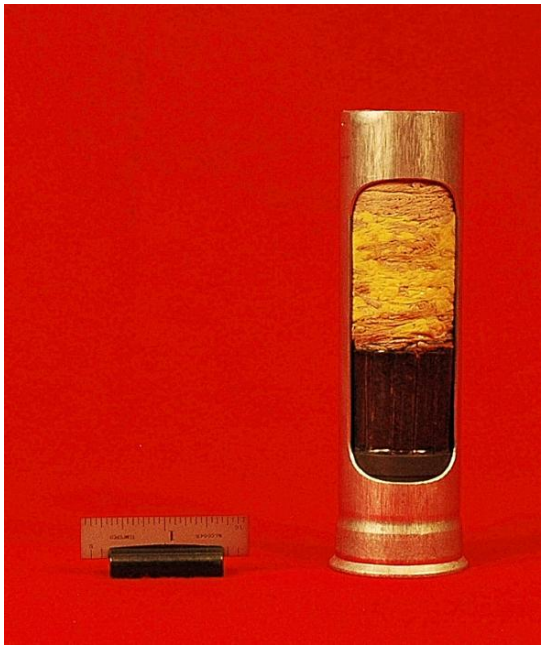
- Stabilizing fin deployment
- Camera orientation
- Powder burns
- Parachute deployment
- ‘helicopter’ recovery
- Tangle lines

Failure is always an option.

- Chute/Streamer deployment
- Camera stabilization
- Failure to fire
- Delayed ignition
- Explosion
- Electronics failure
- Trees and buildings jump in the way

Shell Diagram





Shell Loading – Safety and “Issues”

- Safety! Do you *want* to see the hand again?
- Weight
- Fine Particles
- Crushed primers
- Packing propellant



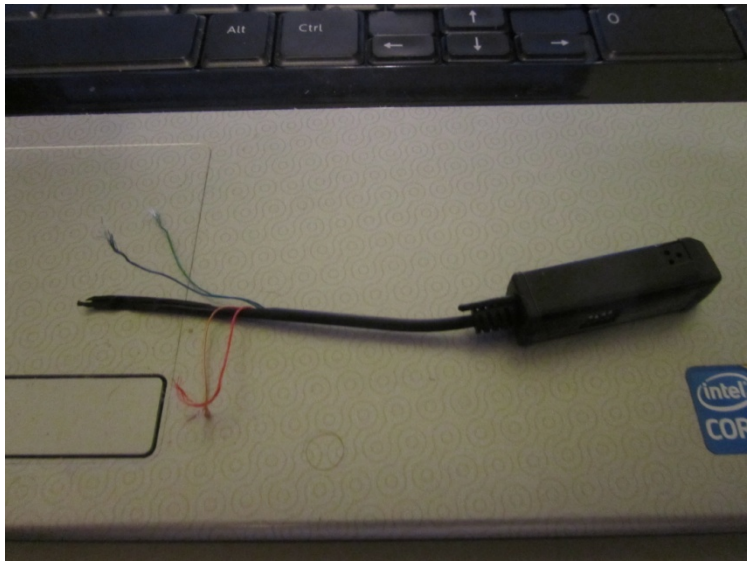


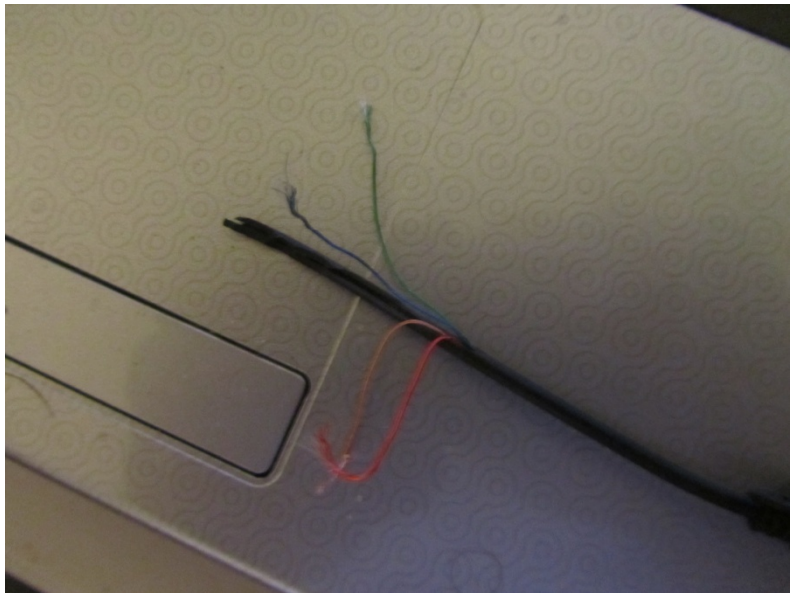
Shell Loading – Procedures and demo

- Primer
- Propellant in high-pressure chamber
- Blast-disk
- Cardboard lug
- Fireproof wadding
- Camera/Parachute package
- Insert battery pin
- Cover cap

Electronics “Issues”

- Wiring
- Battery pack issues
  - 6 volts?
  - Lithium vs. Alkaline?
  - Button Cells?
- Eyesight





Testing Issues

- Safety! Talk to the ***HAND***!!!!!!
- Location – Just where do you test a grenade launcher? Hmmm?
- Data logging

System



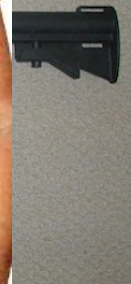












System Diagram









Eye in the Sky features

- 37mm Launcher - Available to Civilians!
- 5.8 Ghz Cameras
- Hand Loaded Shells
- Parachute for hang time
- 100-400 Meter range
- Designed for Urban Search and Rescue teams, Disaster Assessment Teams, SWAT teams or Airsoft Lunatics
- Short Range DVR for viewing by Stacked Tactical Team
- Longer Range Receiver for use at command center.
- 8 channels for multiple camera usage.
- 5 Volt Power supply replaced by Lithium Cells.
- Deployment time is good, mere seconds.
- Equipment is readily available for civilians and law enforcement, and is already carried by many law enforcement units for CS gas deployment.

Prices

- Firefly 2k per shot
- DD Launcher (+$200)
- DD Shells (+$200 per)
- Good luck getting non-military sale.
- Launcher - $1500 minimum

- Eye in the Sky DIY
- $200 per shell
- Non-DD (No $200 tax)
- Non-DD Launcher (Save another $200)
- Thriving DIY community
- Launcher - $400-$700

Videos

- To Be Added for Preso

Check the fingers

Want to keep all of yours?

Ask some questions now!

Avoid the hospital later!

<Applause!!!>

