

Raytheon

Customer Success Is Our Mission



GRIFFIN[®]

Air Launch Applications

**Briefer
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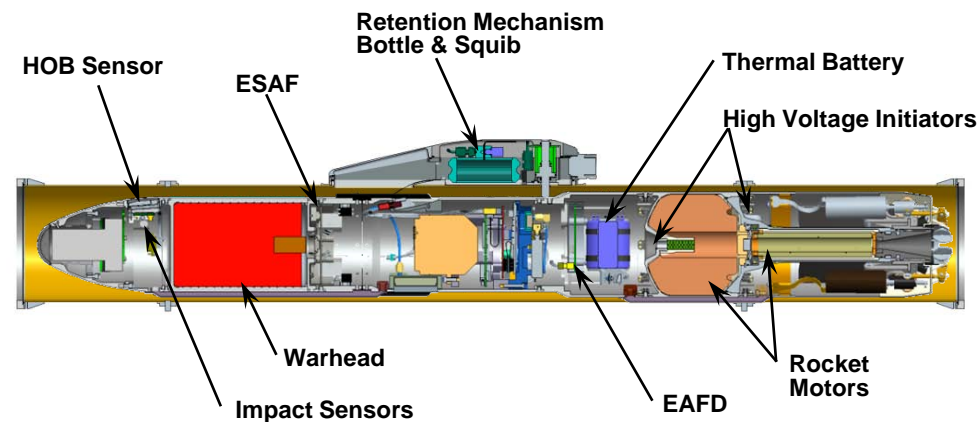
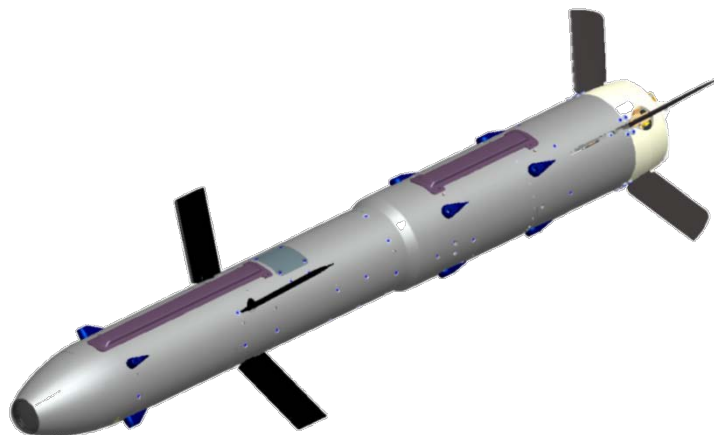
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Agenda

- Griffin[®] overview
 - Missile overview
 - Griffin[®] capabilities
 - Advantages
 - Aircraft integration
 - Griffin[®] Smart Launcher
 - Production
- Conclusion



Griffin[®] B Block II missile



- Small and light:
 - 43 inches
 - 33 lbs
- Precise:
 - SASSM GPS/INS
 - Semi-active laser (SAL)
- Reliable:
 - Tube carriage/launch
 - Proven component heritage
- Lethal with low collateral damage:
 - 13 lb blast fragmentation warhead
 - Warhead fuzing options:
 - Height of Burst (HOB)
 - Point Detonate (PD)
 - Delay
 - Confined lethality
- Cockpit selectable options provide real-time flexibility / assessment
 - Fuze settings: PD, HOB, Delay
 - Laser PRF codes
 - Built In Test (BIT)

Target set

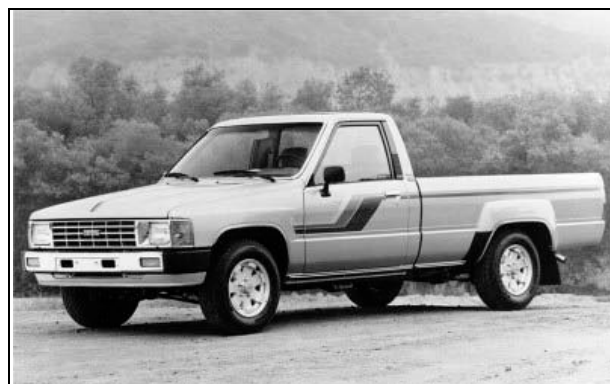
Personnel in the open



Personnel in urban environments



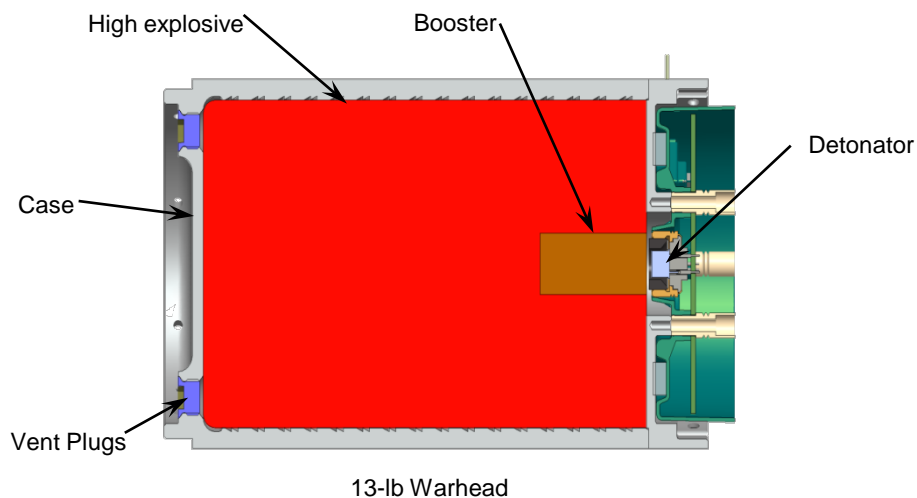
Light trucks



Heavy trucks



Current Griffin[®] warhead



- 13 lbs total weight
- 4.9 lbs PBXN-110
- Steel case internally scored



Integration approach

- Phase I – Integration
 - ICD / SIL / Ground test / Captive flight test
 - Lab hardware, CATMs, launcher(s)
- Phase II – Employment
 - Live fire at range
 - Telemetry, AUR, launcher(s)



Griffin[®] Missile Supporting Multiple Navy & Marine Platforms

Operational

- USMC Harvest Hawk
 - Operational Now



Potential Near-Term

- Fire Scout



Potential Additional Applications

- MH-60
- USMC F-35B



Fire Scout Integration



Load out with Smart Launcher
- Demonstration configuration

Load out with Common Launcher
- Field configuration



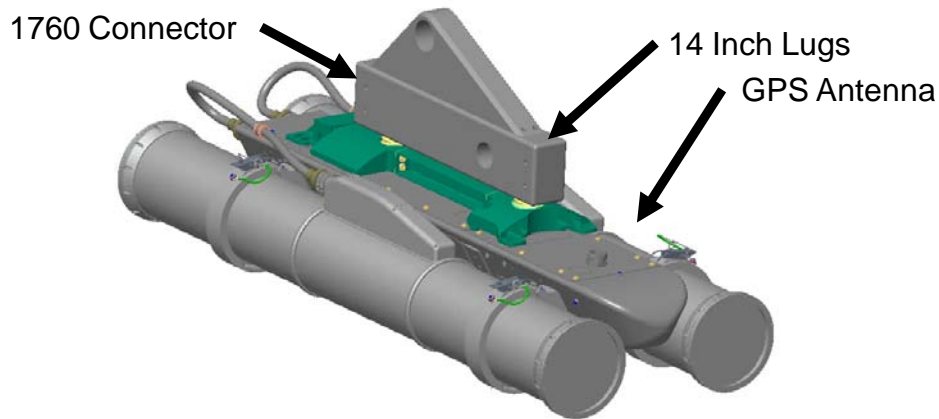
Platform agnostic



110 lbs per pylon

Smart Launcher

- 26 lbs (47 lbs with strong back and rings)
- UAI 1760 compatible
- Provides known-store emulation to platform
 - Enables integration w/o changing aircraft s/w
- Calculates targeting data with minimal input
- Responds and reports status to host platform
- Adaptable mounting
 - 14" lugs or custom brackets



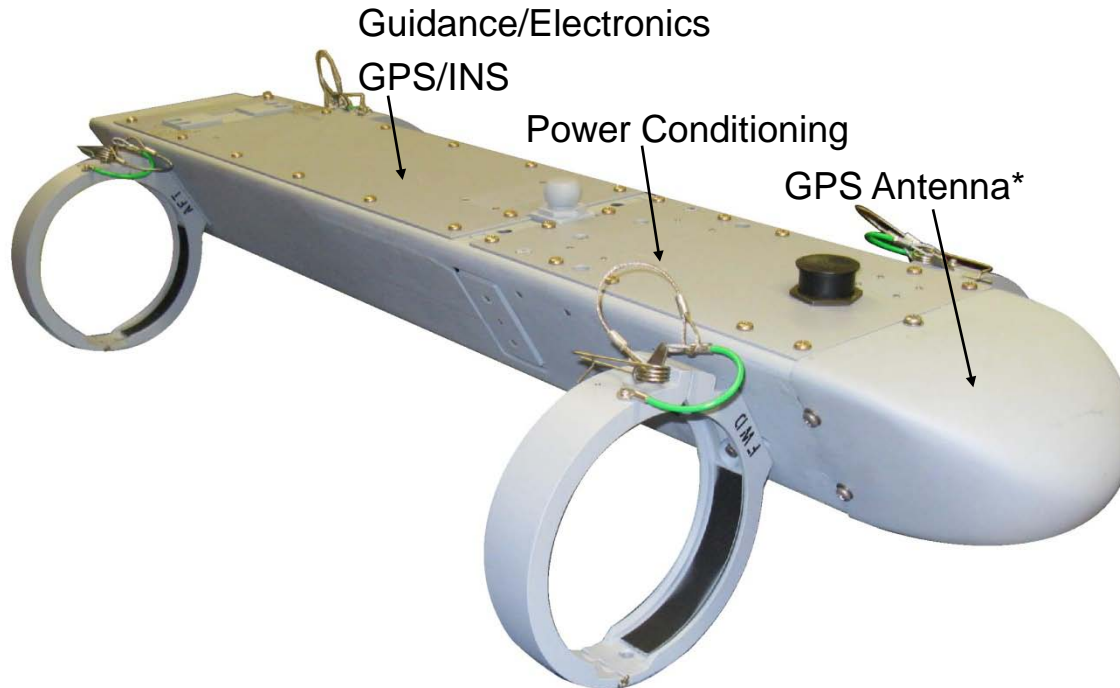
Two Missile
Load out

Griffin[®] advantages

- Two-for-one weight advantage over alternative
- More lethal against soft targets than alternative
- Easily integrated using Smart Launcher
- Dual Mode (GPS/INS and SAL)
- Moving target capability to 70 mph
- Accurate GPS only performance
- GPS only mode allows “fire-and-forget” capability for improved force protection
- GPS only enables for multiple rounds simultaneous impact
- Capability increase - four stowed kills and 401 lbs lighter than alternative



Griffin[®] Smart Launcher Rotary-wing applications



- 1553 compatible
- Provides known-store emulation to platform
 - Enables platform integration without changing aircraft s/w
- Calculates targeting data with minimal input
- Controls and launches two Griffin[™] B Block II-missiles
- Responds and reports status to host platform
- Adaptable mounting
 - 14” lugs or custom brackets
- High structural load margins



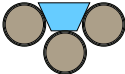


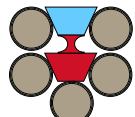
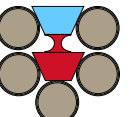
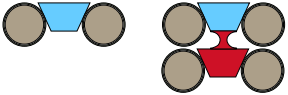
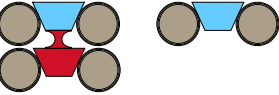
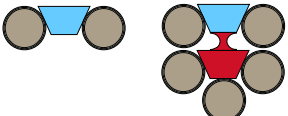
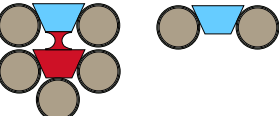
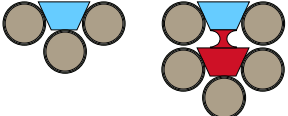
* Alternatively, can accept platform GPS input



Griffin[®] Smart Launcher enables flexible / rapid platform integration

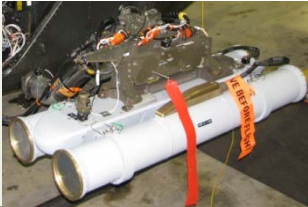


Modular Smart Launcher (MSL) Load Out

Griffin™ Load Out

		2 Per Wing / 4 Total
		3 Per Wing / 6 Total
		4 Per Wing / 8 Total
		5 Per Wing / 10 Total
		6 Per Wing / 12 Total
		7 Per Wing / 14 Total
		8 Per Wing / 16 Total

Modular Smart Launcher offers commonality and maximum flexibility

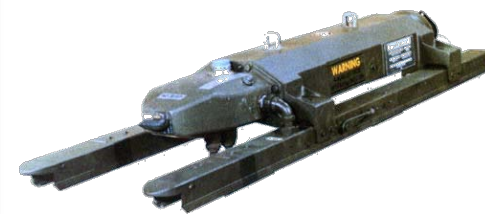
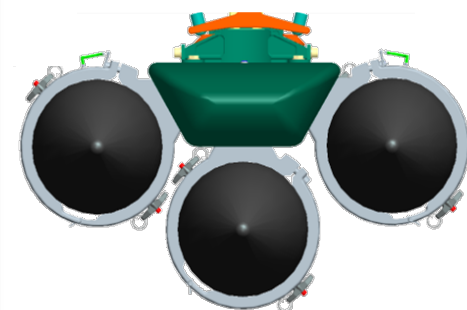
Griffin[®] weight advantage

Stowed Kills Per Pylon:	Two Stowed Kills	Four Stowed Kills	Five Stowed Kills
			
Griffin solution <small>*47 lbs includes strongback</small>	1 Smart Launcher (47lbs*) + 2 Griffin AURs (42 lbs ea)	2 Smart Launcher Stack with Adapter + 4 AURs	2 Smart Launcher Stack with Adapter and Rings + 5 AURs
Weight of Griffin solution	131 lbs	281 lbs	326 lbs
Alternative solution	1 M299 Launcher (143 lbs) + 2 alts. (99 lbs ea)	2 M299 Launchers + 4 alts	Configuration not supported
Weight of alternative solution	341 lbs	682 lbs	Not supported
Weight savings	210 lbs	401 lbs	No comparison

Carry four Griffin[™] missiles and 60 lbs of fuel for the same weight of two alts



Griffin Smart Launcher



M299 Launcher – 2 Rail

Same number of stowed kills and more than 30 minutes of station time for OH-58D

Missile Production Assembly Line - Rita Road



Griffin[®] Missile Production – over 1,200 produced

- Production initiated 2008
- Production floor area upgraded in 2009 for improved flow and capacity

Conclusion

- Small, light and extremely precise
 - Ideally suited for scout helicopters and light-weight rotary wing applications
- Target attack shaping – flexible
 - GPS/INS/SAL guidance options
 - Cockpit selectable options: Point detonate, height of burst and fuze- delay, ripple launch
 - Multiple round simultaneous impact (MRSI)
- Proven moving-target capabilities
 - Capability to 70 mph
- Made for irregular and hybrid warfare ops
 - Confined lethal effects
 - 13 lb warhead; 25-foot lethality radius on point detonate
- Rapid integration – under 6 months
 - Smart Launcher integrates quickly onto virtually any platform interface
 - Successful and experienced QRC team
- Missile and launcher are in production



Expanded capability with rapid integration