

ISR Support to Small Footprint CT Operations – Somalia / Yemen



ISR Task Force

Requirements and Analysis Division

February 2013

Overall classification of this document is
SECRET//SI//NOFORN



- ▶ **Introduction and Background**
- ▶ **Factors Impacting ISR Support to Operations**
- ▶ **Significant ISR Contributors**
- ▶ **Issues and Recommendations**



Study Overview

- ▶ (U) Previous studies* of Counterterrorism (CT) Kill / Capture operations in Iraq and Afghanistan have detailed the role and impact of Intelligence, Surveillance, and Reconnaissance (ISR) for those missions
- ▶ (U) This study extends that previous analysis and reports on ISR performance and requirements for CT operations in Somalia and Yemen and should inform ISR planning and investments for potential small footprint operations elsewhere
- ▶ (S/NF) From Jul – Oct 2012, the study team interviewed Task Force (TF) 48-4 personnel and collected extensive data on CT operations conducted from Jan 2011 – Jun 2012
- ▶ (U) Analytic results satisfy three linked objectives:
 - Highlight key factors in smaller-footprint operating environments that have the most significant impact on ISR employment / needs
 - Identify capabilities that are most effective / critical when operating in these environments
 - Describe issues and make recommendations for resourcing and longer term investment

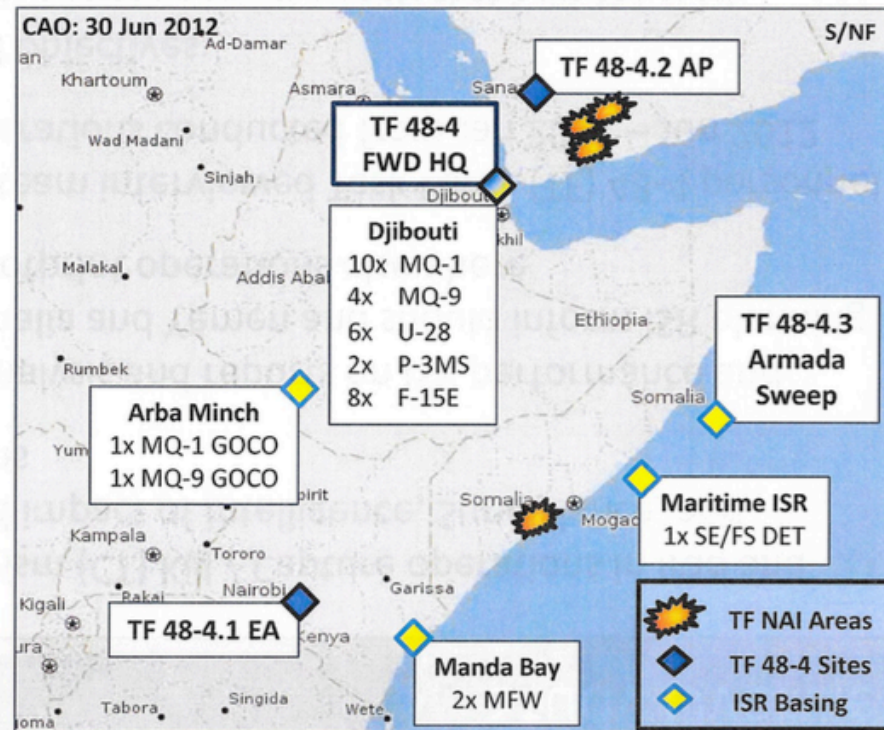
▶ **Purpose:** *Study ISR contributions to CT operations in the Horn of Africa (HOA) – East Africa and Arabian Peninsula – to inform ISR planning and investments for potential future small footprint operations*



TF 48-4 Focus and Organization

- ▶ (S/NF) TF 48-4 is organized into two main branches: East Africa (EA) in Nairobi, Kenya and Arabian Peninsula (AP) in Sana'a, Yemen
 - TF 48-4 EA and AP are further subdivided geographically into teams
 - TF 48-4 forward support element is at Camp Lemonier, Djibouti
- ▶ (S/NF) ISR is based at three regional airfields, supplemented with sea-based Scan Eagles or MQ-8 Fire Scouts
 - Djibouti (Camp Lemonier)*
 - Arba Minch
 - Manda Bay
- ▶ (S/NF) TF 48-4 counterterrorism operations are focused on violent extremist organizations (VEOs)
 - Al Qaida in the Arabian Peninsula
 - Al Qaida in East Africa/Al Shaabab
- ▶ (S/NF) TF 48-4 CT operations are only part of a broader whole-of-government approach to regional security / stability

TF 48-4 Theater Footprint



* Subsequent to data collection and interviews for this study, flight operations are being shifted from Camp Lemonier



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Summary of Factors Impacting ISR Support to Ops

- ▶ (S/NF) HVI operations in HOA highlight several key factors impacting ISR support to CT operations in a small-footprint environment
 - These factors differentiate CT in HOA from similar operations in Afghanistan or Iraq

Key Factors	Description / Implications	S/NF
Not an Active Warzone	<p>Operations are “Outside a Defined Theater of Active Armed Conflict” (ODTAAC)</p> <ul style="list-style-type: none"> – Limits footprint, allowable US activities, penetration of comms networks – Impacts operations and intel collection and exploitation activities 	
AUMF Process	<p>HVIs are approved for targeting by President of the United States under Authorization to Use Military Force (AUMF) provisions</p> <ul style="list-style-type: none"> – AUMF process requires significant intel / ISR to justify (and maintain) approvals – Relatively few, high-level terrorists meet criteria for targeting under the provisions – Approved HVIs are usually OPSEC and RoE savvy; limits intel and finishing chances 	
Strict Pre-strike Assurances	<p>A high level of assurance is required before a strike is approved</p> <ul style="list-style-type: none"> – Must establish Positive Identification (PID) of HVI with “near certainty” – Only finish in a confirmed low Collateral Damage Environment (CDE) – “Near certainty” increases ISR work factor, reduces targeting opportunities 	
Tyranny of Distance	<p>Long distances to operating areas complicate the “fixing” and “finishing” of HVIs</p> <ul style="list-style-type: none"> – Most objectives in Yemen are ~500km away, Somalia can be over 1000 km – Long transits consume ~50% of ISR flight time and complicate strike planning 	

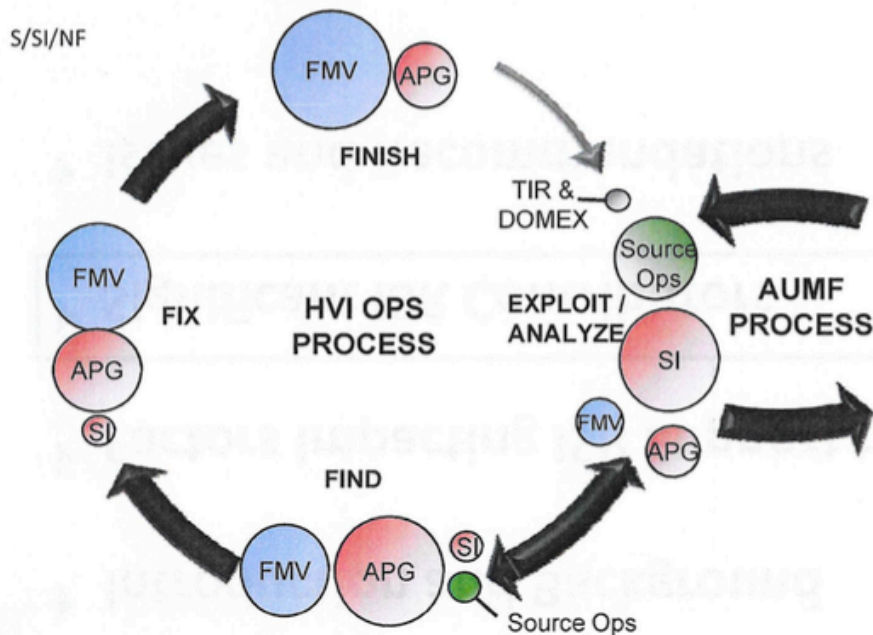


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ISR Contribution to Operations

- ▶ (S/SI/NF) FMV and Aerial Precision Geolocation (APG) dominate Find-Fix-Finish part of F3EA
 - APG tips narrow aperture FMV during Find
 - During Fix and Finish, FMV and APG are used together, to maintain HVI location and PID
 - SIGINT including Computer Network Operations (CNO) also contribute to Find and Fix



- = FMV
- = SIGINT APG/SI (Aerial Precision Geolocation, SIGINT internals/CNO)
- = HUMINT Source Operations
- = TIR/DOME (Tactical Interrogation Report, Document/Media Exploitation)

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- ▶ (S/NF) HOA kill / capture operations require input from other sources to drive the next “find”
 - ~75% of finishes in HOA are kinetic strikes
 - Very little “finish-based” intel (DOMEX or interrogation) to drive next “F3” cycle
- ▶ (S/NF) In HOA, analysis-intensive intelligence replaces tactical site exploitation, disrupting / slowing the “cycle”
- ▶ (S/NF) This intelligence also feeds the AUMF process which authorizes HVIs for kill / capture
 - AUMF approval usually requires several months of intel / ISR target development

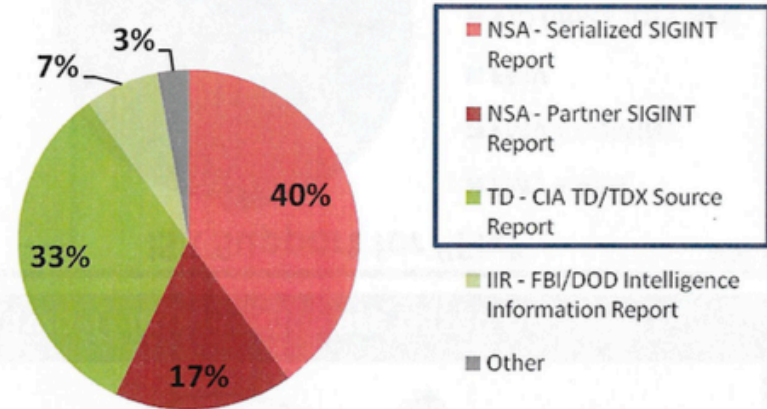


“Exploit/Analyze” Replaced by “All-Source Analysis”

- ▶ (S/NF) Analysts use other HUMINT and SIGINT sources to fill in for missing TIRs/DOMEX when building target packages (Baseball Cards (BBCs))
 - SIGINT, often from foreign partners, provides 57% of the BBC references
 - HUMINT, primarily CIA source reporting, provides almost all other references
- ▶ (S/NF) These sources are neither as timely nor as focused as tactical intelligence
 - Therefore not as immediately relevant to the next cycle of Find, Fix, Finish
- ▶ (S/NF) In Iraq and Afghanistan, DOMEX and interrogation from Finishing actions provided the bulk of phone numbers, locations and terrorist names
 - This intelligence fueled the next F3 cycle, with objectives often actioned within days

Target Package Sources - HOA 2012

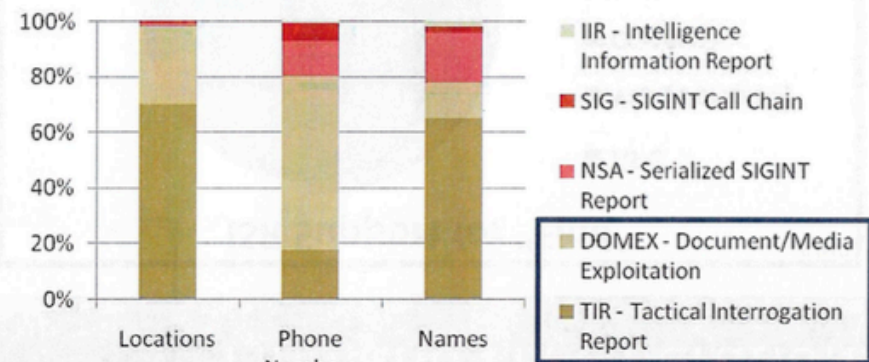
S/NF



SIGINT, HUMINT is gap-filler for absent TIR/DOMEX

Target Package Sources - Iraq 2007

S/NF

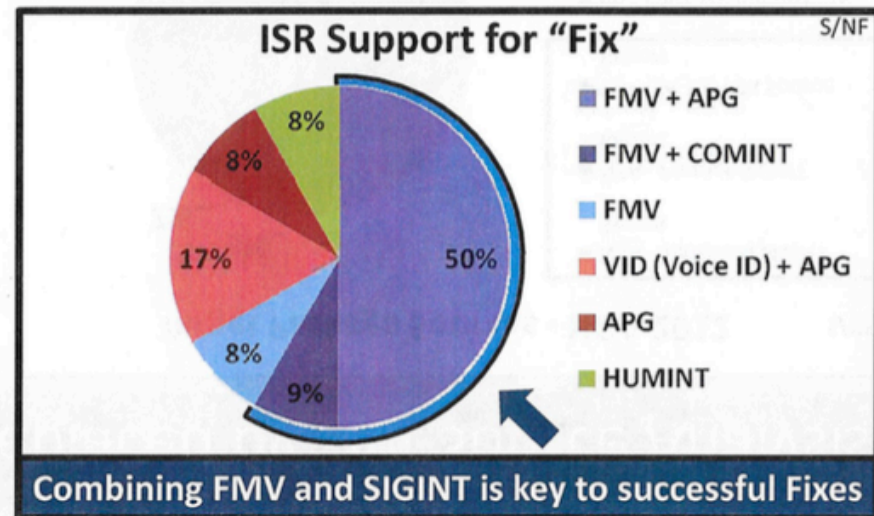
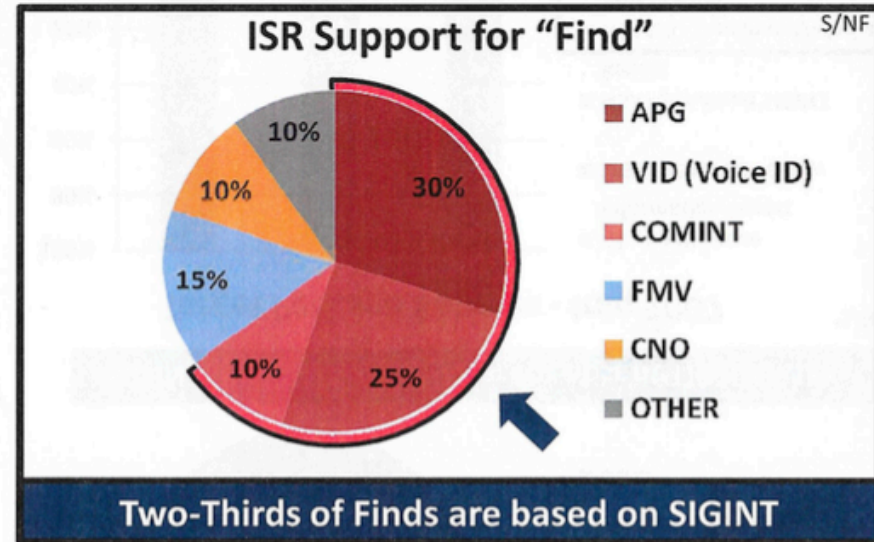


Finish-based intel immediately useful to next Find



Find and Fix Operations

- ▶ (S/NF) SIGINT provided two-thirds of the “hand-holds” used for HVI Finds
 - Overwhelmingly, single sources were used to successfully Find top HVIs
 - FMV and Computer Network Operations (CNO) also contributed to some Finds
- ▶ (S/NF) FMV support becomes more important in the Fix phase, typically in combination with SIGINT
 - Two-thirds of Fixes involved FMV
 - SIGINT, in various forms, continued to be a dominant contributor in Fix
 - FMV maintains Fix on initial Find location to enable the TF to keep eyes on the HVI while building up to “near certainty”
 - FMV, especially HD, is also used to build near certainty via identification of distinguishing physical characteristics
- ▶ (S/NF) Finishes are largely the same-- every Finish was supported by FMV





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Summary of Issues and Recommendations

Issue	Key Findings and Recommendations S/SI/NF
PID/CDE Requirements	<p><u>Finding:</u> Critical shortfall of capabilities providing PID and HVI location information</p> <p><u>Recommendation:</u> Continue to develop/field HD FMV and COMINT sensors</p>
Exploit/Analyze Alternatives	<p><u>Findings:</u> Advance Force Operations (AFO) enable “capture” vice “kill” finishes. National intelligence partners often have the best information and access. This can be completed remotely by COMINT and CNO</p> <p><u>Recommendations:</u> Leverage AFO to increase “capture” operations. Pre-plan for rapid sharing of IC information and increase COMINT and CNO collection ops</p>
Long Distances	<p><u>Findings:</u> Long distances in AO is a significant planning factor complicated by basing and over-flight planning issues</p> <p><u>Recommendations:</u> Increase mission range and endurance for all ISR platforms. Consider sea-based ISR as a necessary complement to land-based ISR</p>
HOA ISR Orbits	<p><u>Finding:</u> A key factor in Find/Fix failures is the frequent inability to maintain 24/7 persistent stare on active mission areas, especially when ISR is massed for Finishes</p> <p><u>Recommendation:</u> Support Combatant Command (CCMD) requirements for additional ISR orbits to help prevent “blinking” on HVIs during demand surges</p>

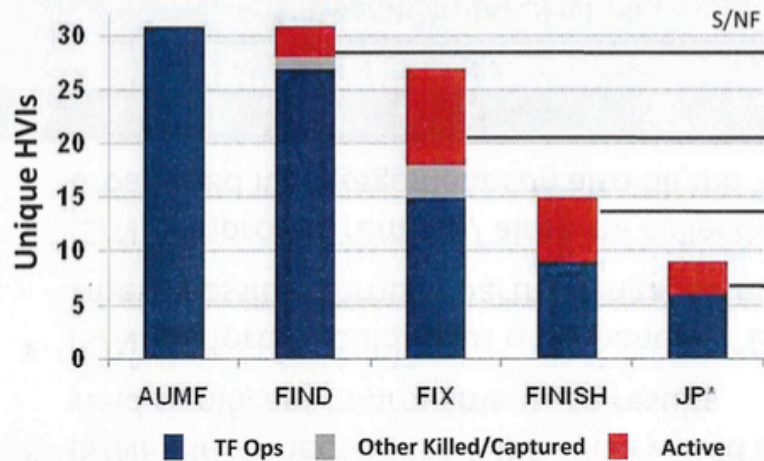
- ▶ (S/NF) **Also note:** Addressing ISR issues will improve rate of operations (and successes), but expectations should be calibrated for realities of HVI ops outside of active war zone
 - Constraining factors mean OPTEMPO will be significantly lower than previously seen in Iraq and Afghanistan



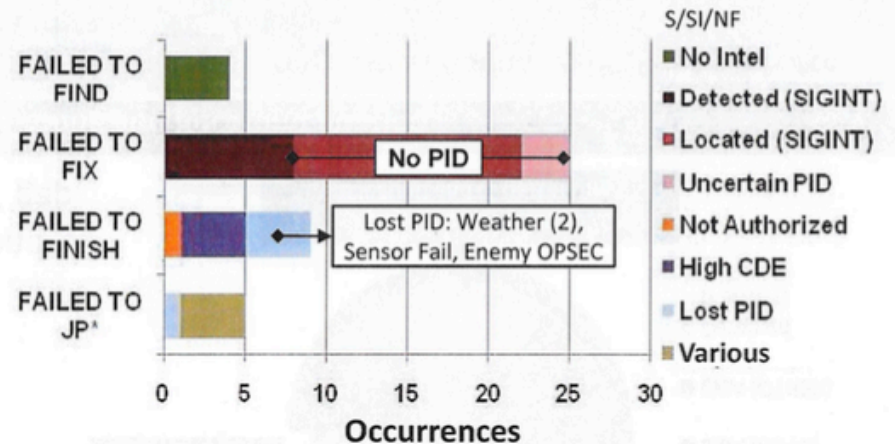
PID/CDE Requirements

- ▶ (S/NF) Unsuccessful Find-Fix-Finish sequences most often were due to issues with:
 - Transition from Find to Fix: Primarily due to inability to acquire positive identification (PID)
 - Transition from Fix to Finish: Combination of difficulty maintaining “near certainty” level PID and need to avoiding collateral damage areas

Prosecution of Top EAAP HVIs



Failure modes for ISR collections



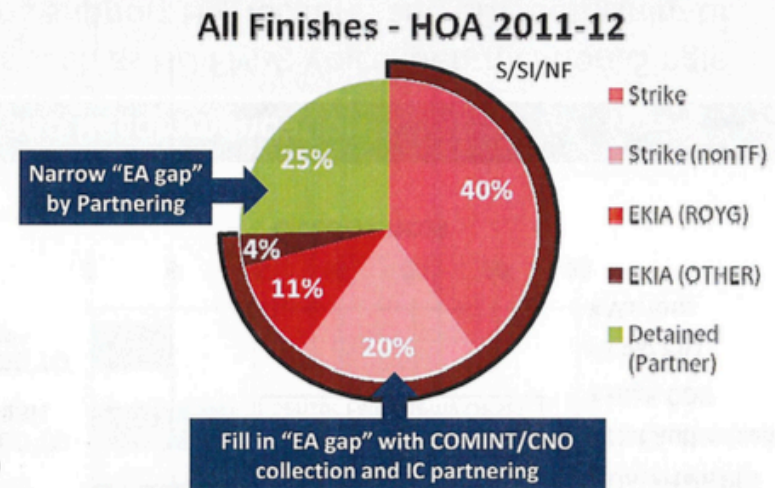
Issue	Key Finding and Recommendation	S/SI/NF
PID/CDE Requirements	Finding: Critical shortfall of capabilities such as HD FMV, Voice Identification, Single-Use Determination that provide PID and support HVI location and CDE determination	
	Recommendation: Continue to develop/field critical ISR sensors such as HD FMV and COMINT systems (Voice ID, Single-Use ID, Geolocation)	

* JP (Jackpot) = A confirmed Objective kill



Alternatives to Exploit/Analyze

- ▶ (S/NF) Lack of “Finish” intel to Exploit/Analyze and cue ISR is probably the most significant reason for the low rate of finishes
- ▶ (S/NF) Reconnecting the F3EA cycle would likely yield significant improvements to results
- ▶ (S/NF) Efforts should focus on expanding “EA” where possible through partner engagement
- ▶ (S/NF) Improved remote / airborne collection and broadened IC engagement can also fill the “EA” gap

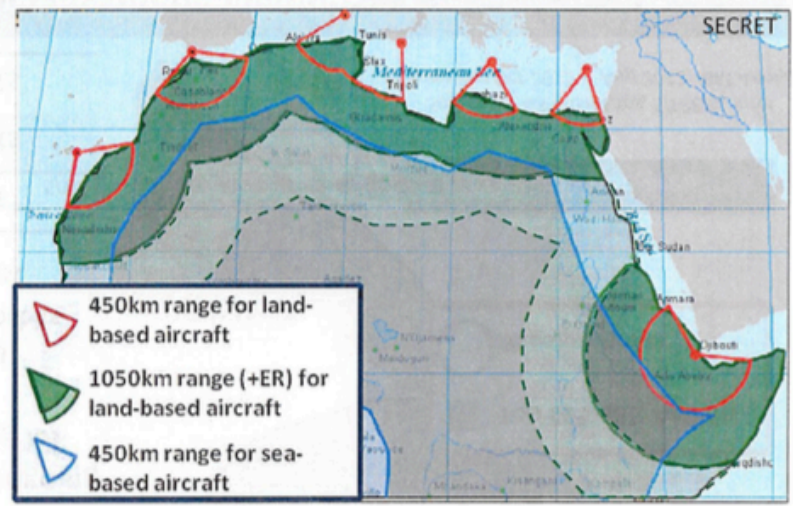


Issue	Key Finding and Recommendation	S/SI/NF
Host/Partner Engagement	Finding: Small teams of special force advisors can assist the partner nation under Advance Force Operations (AFO) which enables “capture” vice “kill” finishes	
	Recommendation: Whenever possible, leverage Advance Force Operations (AFO) to increase “capture” operations – tying previous finishes to future finds by generating more TIR & DOMEX	
IC Engagement	Finding: In the reduced access environment, national intelligence partners often have the best information and access	
	Recommendation: Pre-plan for rapid sharing of this information to minimize time delays	
COMINT/CNO	Finding: Identifying information can often be obtained remotely through COMINT and CNO	
	Recommendation: Increase airborne and remote COMINT and CNO collection and exploitation capabilities to make up for lack of access on the ground	



Long Distance Implications

- ▶ (S/NF) In Iraq 80% of finishing operations occurred within 150km of airfields
- ▶ (S/NF) The equivalent distance is 450km for Yemen and over 1000km for Somalia
 - ISR platforms spend half their mission flight time in transit--generating 38% fewer orbits per sortie than in other theaters
- ▶ (S/NF) The issue of distance is magnified when translated to all of northern Africa
 - MFW aircraft with a range of 450km will only reach about 5% of north Africa
 - The range of land-based RPA aircraft allows them to reach 25% of the area
 - Sea-basing allows short-range aircraft to reach 35% of the land mass



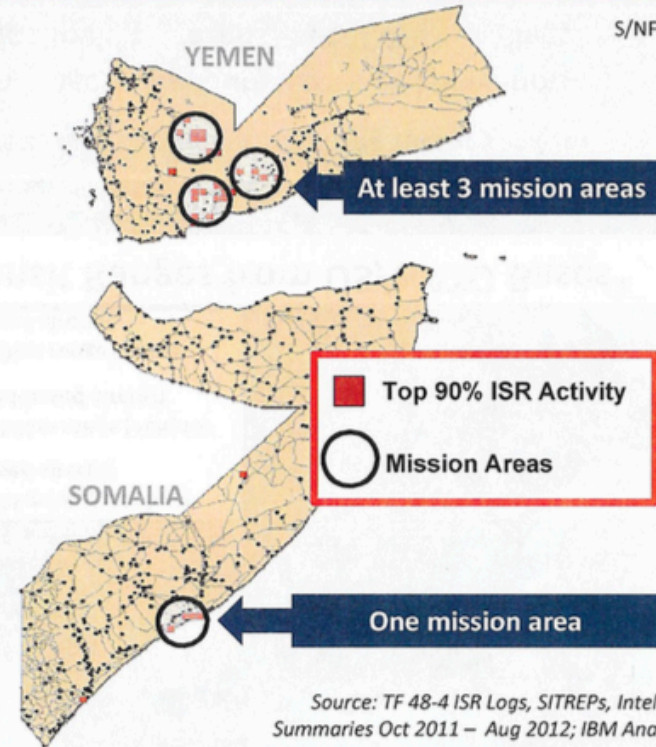
Transit Ranges from US/NATO Bases*

Issue	Key Finding and Recommendation	S/NF
LONG ENDURANCE	Finding: Long distances from airfields to operating areas is a significant planning factor	
	Recommendation: Consider ways to increase mission range and endurance for all ISR platforms; when satisfying airborne ISR requirements, key metric should be "orbits" not "CAPs" or "lines"	
SEA-BASING	Finding: Political and developmental issues complicate basing and over-flight planning	
	Recommendation: Even with shorter ranges, sea-based ISR may be a valuable complement to long endurance land-based ISR	



Additional ISR Will Prevent "Blinking"

- ▶ (S/NF) Shortfall in TF 48-4 ISR capacity is a contributor to "fail to find" and "fail to fix" in HOA
- ▶ (S/NF) To prevent "blinking" during F3, operations in Yemen require a minimum of 3 full orbits of ISR while Somalia operations require at least 1 full orbit
 - Per TF, one orbit is equal to 24/7 FMV/SI on-station coverage
- ▶ (S/NF) Additional capacity would be required to ensure ongoing development of one target is not sacrificed when massing ISR for Finish of another
 - Per TTPs, optimal ISR employment is three orbits per actioned objective, which would equate to 3 (Somalia) and 9 (Yemen) orbits
 - When ISR is massed in the Finish, coverage on other HVIs is lost



CAO: 30 Jun 2012	ISR Actual	ISR Min Req't	Per TTPs*	S/NF
Yemen	2.8 orbits	6.0 orbits	9.0 orbits	
Somalia	0.9 orbits	3.0 orbits	3.0 orbits	

Issue	Key Findings and Recommendations	S/NF
HOA ISR Orbits	<p>Finding: A key factor in Find/Fix failures is the frequent inability to maintain 24/7 persistent stare on active mission areas, especially when ISR is massed to support Finishing actions</p> <p>Recommendation: Support CCMD requirements for additional ISR orbits to help prevent "blinking" on HVIs during demand surges</p>	

* Approved requirements are now 8 (Yemen) and 5 (Somalia). Actual orbits delivered has also increased to 3.9 (Yemen) and 1.9 (Somalia)

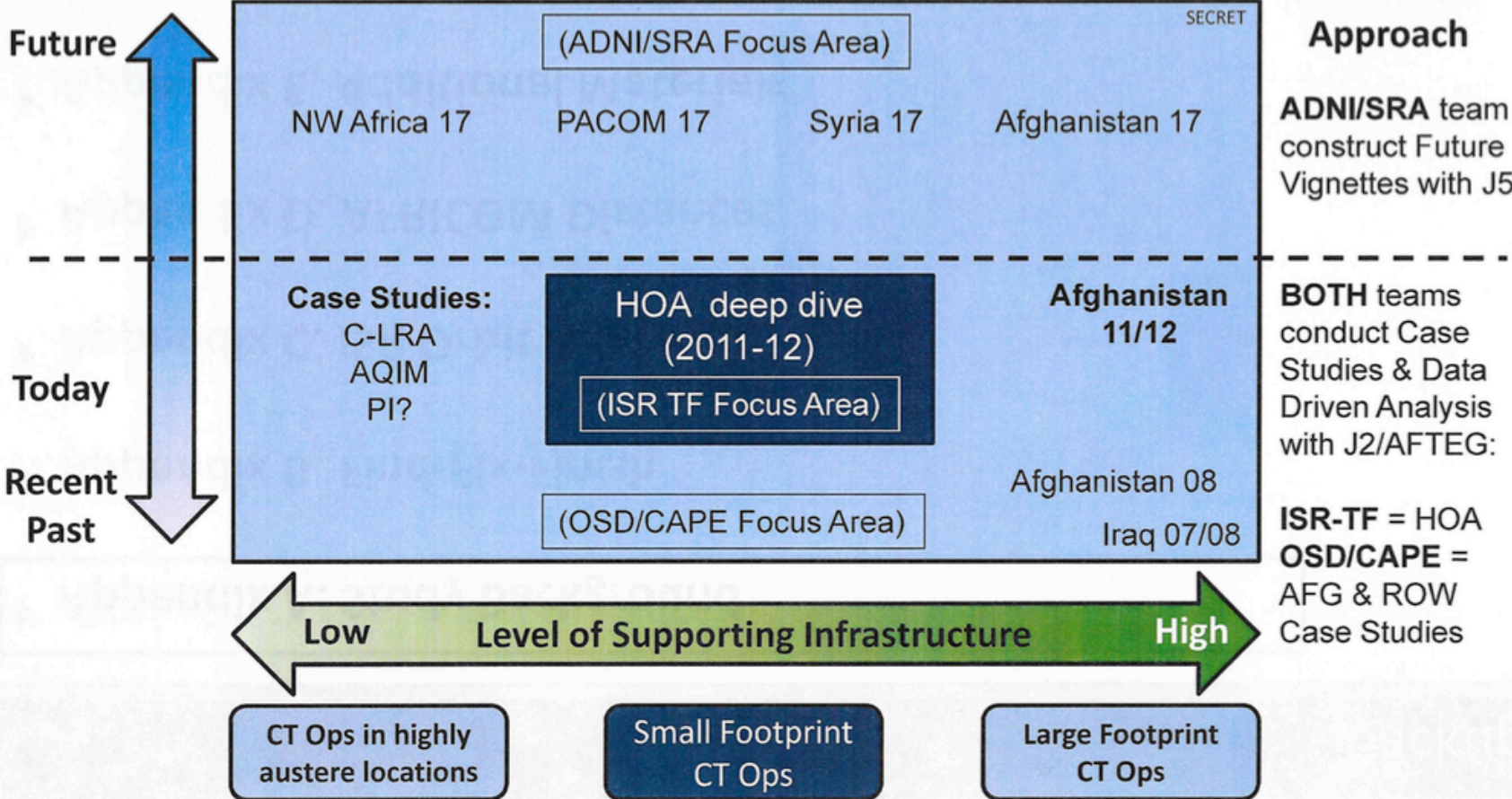


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Study Framework

OSD/CAPE and ISR-TF CT studies are shaped to complement each other. Study teams are coordinating with each other and mission owners to minimize impact on operations





Analytic Approach and Methodology

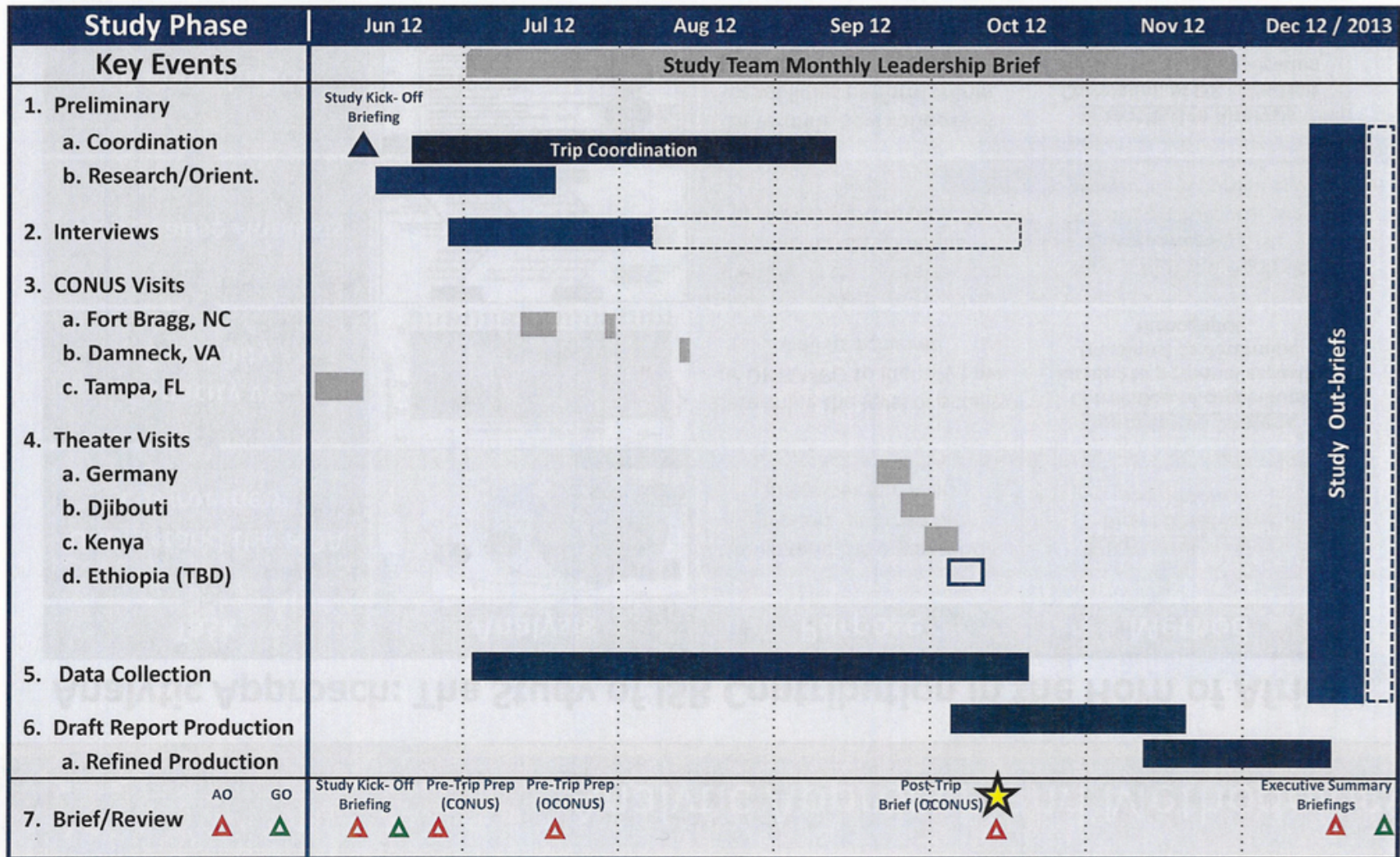
Analytic Approach: The Study of ISR Contribution in the Horn of Africa

Task	Analysis	Purpose	Method
Understand the HOA Environment		Understand the organization, mission, and map out processes and roles	<u>Qualitative Analysis</u> Direct Observation and Interviews
Capacity vs. Capability		Determine the level of activity or OPTEMPO to identify how well its achieved	<u>Quantitative Analysis</u> Correlation of capabilities (assets) to potential capacity (missions) to determine throughput
Root Cause Analysis		Identify all the causal factors that impacts or limits performance to define the "gap"	<u>Mixed Method Analysis</u> Quantitative Analysis, Qualitative Analysis, and Stakeholder Coordination
ISR Contribution		Determine how various ISR capabilities perform within the F3EA cycle and define effectiveness	<u>Quantitative Analysis</u> Correlation of ISR collection with operational application based on performance data
Final Synthesis		Compare and contrast results in HOA with those of AF and IZ to understand the bigger context of future operations	<u>Mixed Method Analysis</u> Compare HOA, IZ, AF results and discuss with SMEs





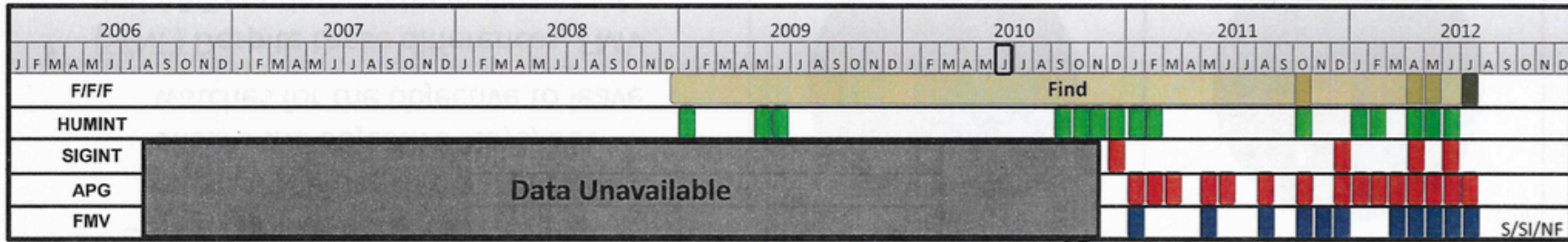
Study Schedule



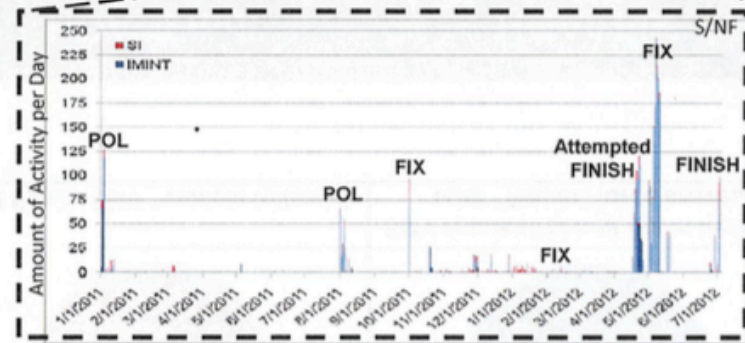


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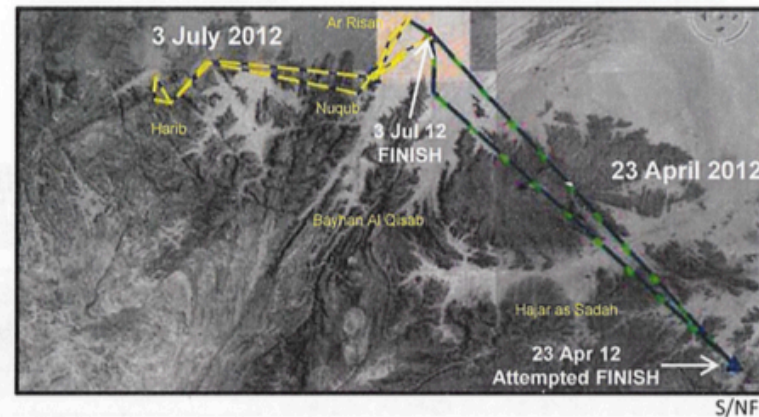
FFF Timeline: Objective Rhodes Case Study



Activity	Description Summary
FIND	Intelligence collection on target to establish pattern of life
	<ul style="list-style-type: none"> (S/NF) Jan 2009: Yemeni NSB assessed Anjaf as a trusted deputy to OBJ Canton and responsible for transporting extremists (S/NF) Mar 2009: Classified as one of eight main AQAP facilitators; Identified as #28 on ROYG's Most Wanted Terrorist List (S/NF) Sep 2010: ROYG assessed Anjaf and OBJ Canton preparing to use a VBIED against unspecified US interests (S/NF) 7 Jun 2010: Favorable AUMF ruling (□) by Office of General Counsel under Jupiter Garrett CONOP
FIX	Target has been located for kinetic/non-kinetic engagement
	<ul style="list-style-type: none"> (S/NF) 23 Apr 2012: Unsuccessful Strike <ul style="list-style-type: none"> 2 x Enemy Killed In Action 2 x Enemy Wounded In Action (Including OBJ Rhodes)
FINISH	Kill/Capture or neutralization of an enemy Target
	<ul style="list-style-type: none"> (S/NF) 3 Jul 2012: OBJ RHODES was eliminated via kinetic strike <ul style="list-style-type: none"> 0713: Multiple VID (RHODES) and Geo-located at NAI-064 0825: Vehicle follow begins 0908: OBJ Rhodes correlated to vehicle; Near Certainty established 1251: Strike 1301: Continue to monitor the scene 1500: OBJ buried near NAI-125



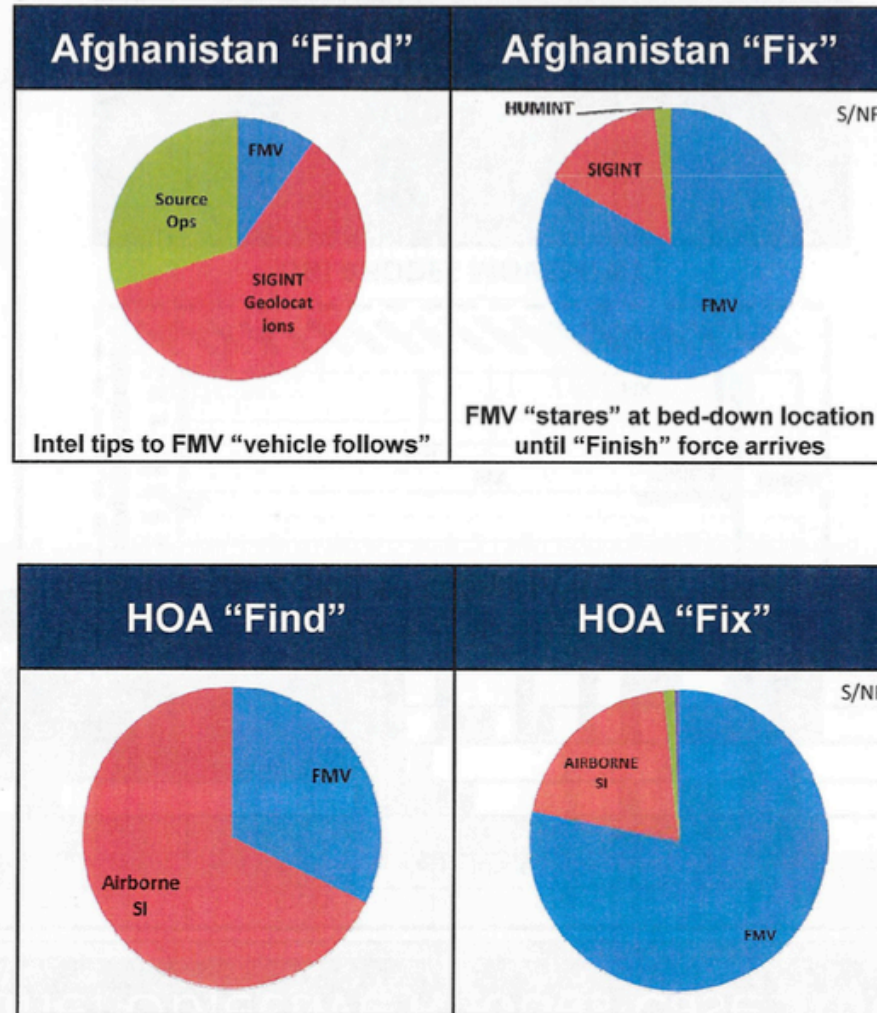
OBJ RHODES MOVEMENT





Find / Fix Comparison

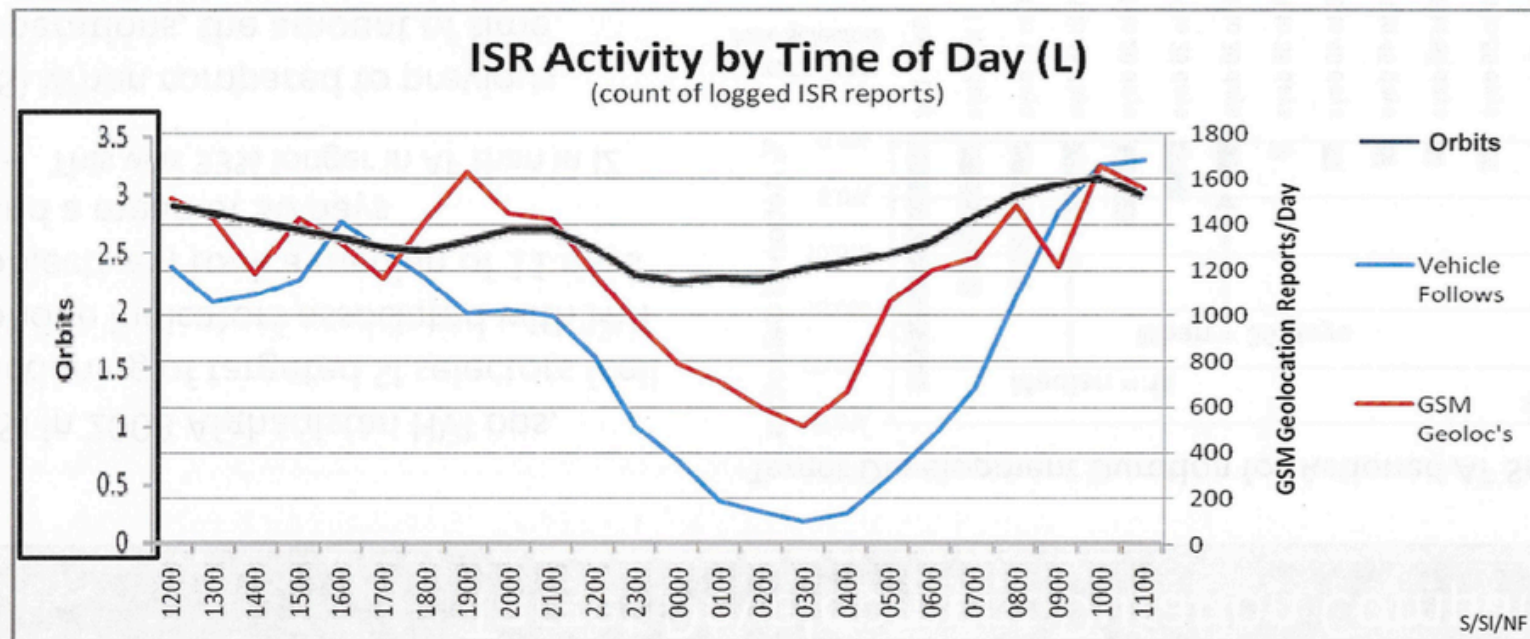
- ▶ (S/NF) Previous analyses show that the Find phase is typically characterized by a mix of APG, FMV vehicle follows, and HUMINT exploitation
- ▶ (S/NF) APG handholds from the Find phase then lead to many hours of HUMINT or FMV surveillance to maintain a fix on a bed-down location
- ▶ (S/NF) In HOA, Find and Fix work somewhat differently
 - Lack of HUMINT puts more demands on SIGINT to cue FMV in Find
 - High CDE at bed-down locations means FMV doesn't watch to ensure the objective stays, but watches for the objective to leave
- ▶ (S/NF) Despite these differences, FMV and APG continue to be mainstays of the Find and Fix steps





TF 48-4 SI Geolocation Comparison

- ▶ **(S//SI//NF) Unlike in Afghanistan in 2008, delays in target development cannot be attributed to a shortage of SI**
 - 2008 Afghanistan HVI operations were characterized by a significant drop in geolocations during the evening, which was attributed to ISR switching to FMV prime to support assaults
- ▶ **(S//SI//NF) On the contrary, analysis of SI geolocations and vehicle follows (FMV) in AP shows a high degree of correlation – and does not support the hypothesis that target development delays are due to a shortage of SI/APG**

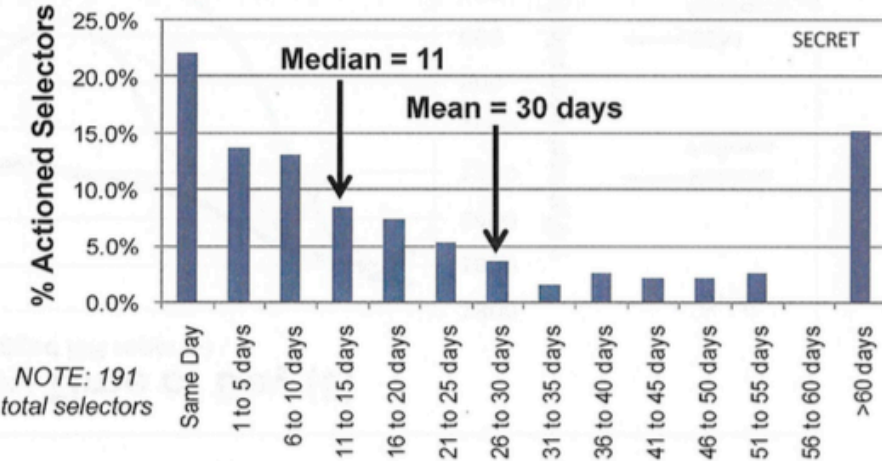




Target Development Duration Comparison

- ▶ (S) In 2008 Afghanistan HVI ops, actioning of targeted SI selectors (cell phone indicators associated with HVI objectives) took a median of 11 days and a mean of 30 days
 - This was 33% longer in AF than in IZ
- ▶ (S) When compared to previous operations, the amount of time required to action objectives is literally orders of magnitude higher
 - Eleven out of fourteen HVIs on the AUMF approved HVI list on January 1st, 2012 were still on the list at the end of the study period
- ▶ (S) Obviously, the requirement for FMV time increases substantially under these circumstances

Target Development Duration for Actioned AF Selectors



Median Time to Action Objectives

S/NF	IZ 2007	AF 2008	HOA 2012
Median # of days until actioned	7	11	N/A
Mean # of days until actioned	19	30	N/A
Over 60 days until actioned	7%	15%	93%
Over 180 days until actioned	UNK	UNK	79%



TF 48-4 Low "Finishing" Operations Tempo

- ▶ (S) Compared to Iraq and Afghanistan, the pace of finishing actions in HOA(EA) and Yemen(AP) is extremely low
 - In 07-08, Iraq averaged around 8 finishing actions per day, while Afghanistan averaged around 1.5
 - Currently, Afghanistan averages around 6 finishing actions per day
 - In AP the average (including mission partners) is around .2 per day (roughly 1 every two weeks)
 - In EA the pace is so low that it cannot be meaningfully measured (only three finishes in the past 18 months)



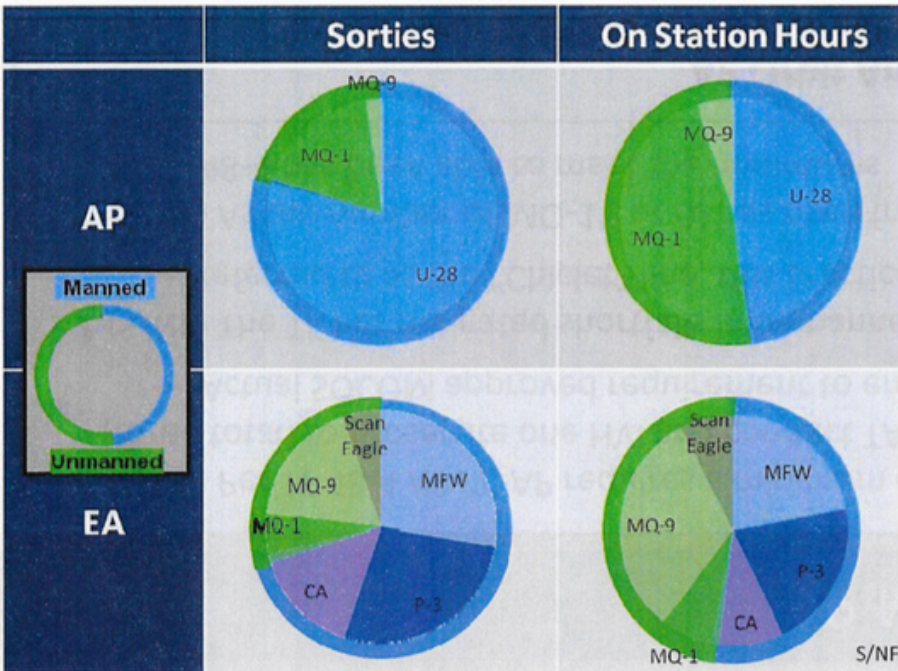
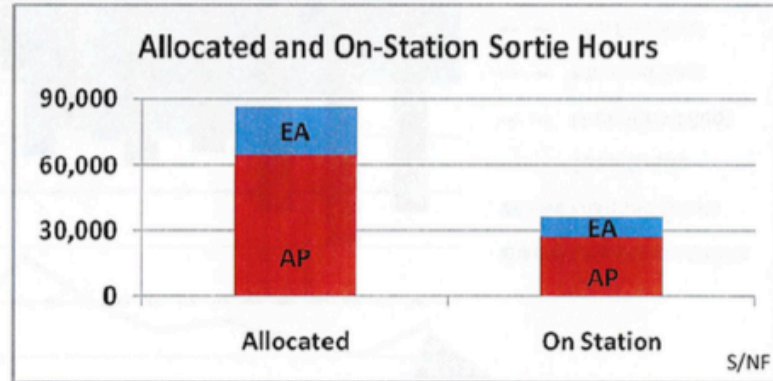
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ISR Allocation

- ▶ (S/NF) Over the study period, AP has averaged 15 sorties per day, while EA has averaged only four
- ▶ (S/NF) Those sorties have generated an average of 2.9 orbits of ISR for AP and .9 orbits for EA
- ▶ (S) AP has averaged three times the allocation and on station hours compared to EA
- ▶ (S) APs on-station time is larger than EAs allocation

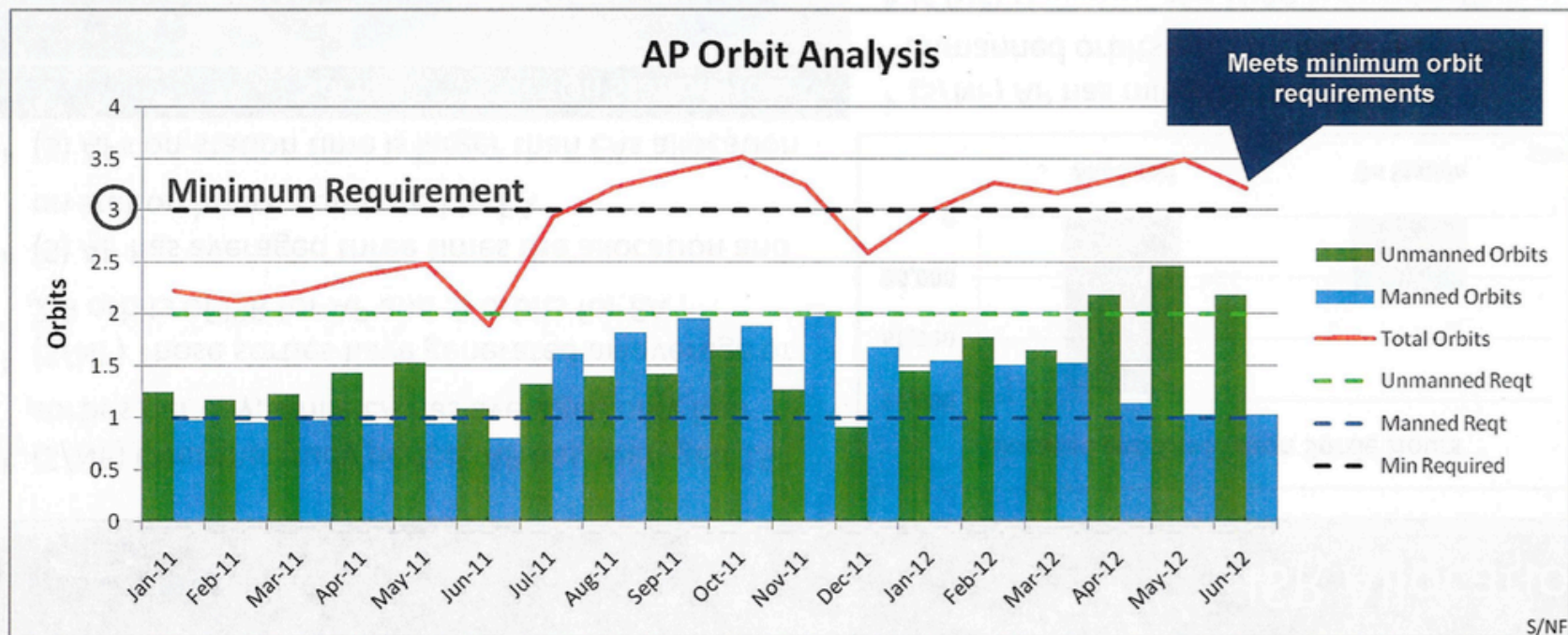


- ▶ (S/NF) AP has mitigated shortfalls in unmanned orbits with manned U-28 orbits
- ▶ (S/NF) However, the U-28 is very inefficient at generating an unmanned orbit – It requires over 4.5 times the number of MQ-1 sorties to create an orbit
- ▶ (S/NF) Although RPA still deliver more on-station time per sortie, EA shows a more even mix of manned and unmanned platforms
- ▶ (S/NF) This is plausibly due to basing short duration manned aircraft closer to operating areas than the longer legged MQs



AP Minimum Orbit Requirements

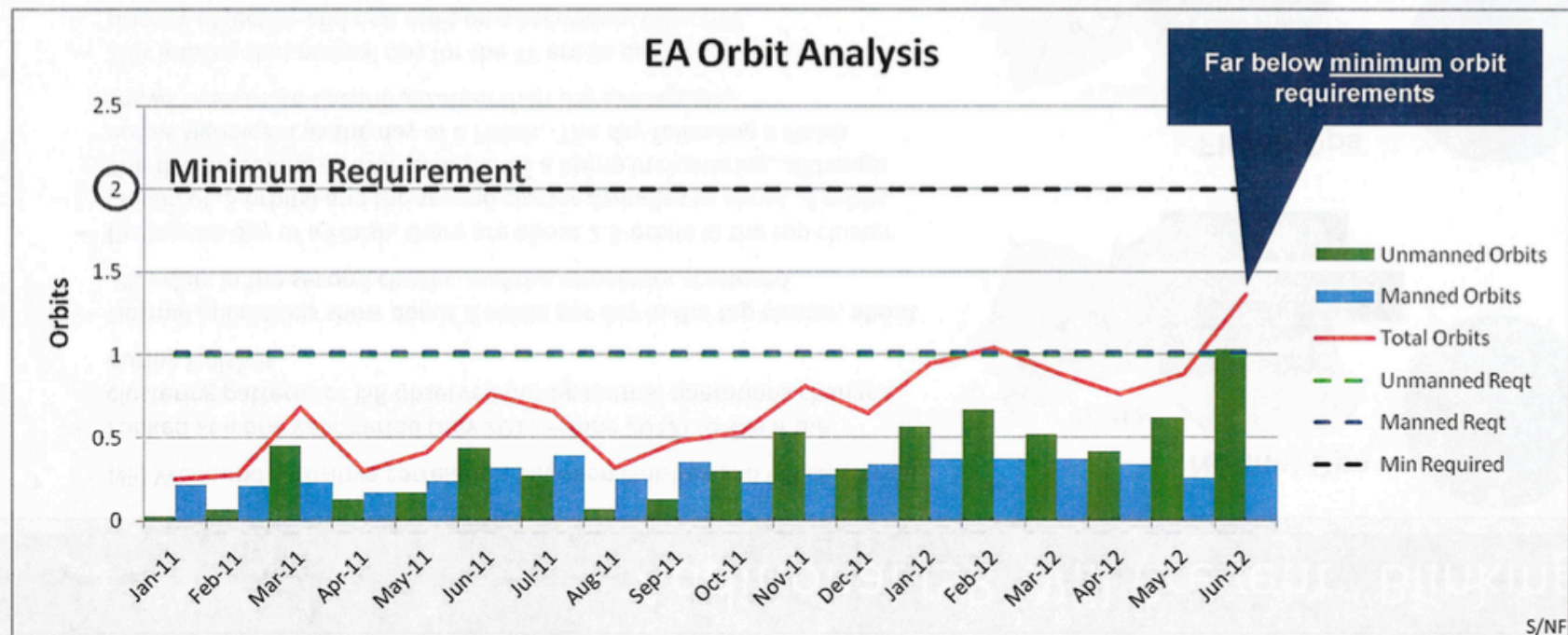
- ▶ (S/NF) Per TF 48-4 AP J2, AP requires a minimum of 1 manned and 2 unmanned ISR sortie (three total) to prosecute one HVI and conduct TADS related network development
 - Actual SOCOM approved requirement to enable multiple HVI missions is six orbits
- ▶ (S/NF) The TF has mitigated shortfalls in unmanned orbits with the manned U-28
 - Referred to as the “Chiclet” line, this practice compounded Djiboutian air control issues
- ▶ (S/NF) As the number of MQ-1’s at DJ has risen from 3 to 4 in Feb 2012, and finally to 6 in May 2012, 48-4 has been able to meet the minimums





EA Minimum Orbit Requirements

- ▶ (S/NF) Per TF 48-4 EA J2, EA requires a minimum of 1 manned and 1 unmanned ISR sortie (two total) to prosecute one HVI
 - Actual SOCOM approved requirement to enable mission is three orbits
- ▶ (S/NF) EA has never been allocated their minimum orbit requirements
 - EA has never consistently meet even half their minimum requirement
- ▶ (S/NF) EA did meet their unmanned requirements in July of 2012 with the addition of GOCO lines at Arba Minch and Fire Scout





Additional ISR Will Prevent "Blinking"

- ▶ (S/NF) We found a positive correlation between Finishes and ISR clustering
 - Looked at a one year period (July 2011 – June 2012) to see if the clustering patterns of ISR observed during normal operations changed during Finishes
 - Normal operations show about 2 orbits per day in the top cluster, about .85 orbits in the second cluster, and the remainder scattered
 - During the day of a Finish, there are about 2.5 orbits in the top cluster (a gain of .5 orbits) and the second cluster dwindles to about .4 orbits. The day preceding a Finish also shows a bump in clustering...although not as significant as the day of a Finish. The day following a Finish shows even more decentralization than the average day
 - This implies that normal ops for the TF are to put two orbits on the priority objective and one orbit on a secondary objective
 - As ops go from Find to Fix and then Finish, the TF starts to mass ISR. This massing peaks during the Finish and quickly dissipates
 - When taken in context of actual orbits we conclude that even during normal ops, the TF is "blinking" a bit on the secondary objective. When ISR is massed in a Finish, there would be a significant loss of SA on all other targets, hence the ISR post-Finish is scattered to try to pick up the loose threads



	Main Effort	Secondary Effort	Other Efforts
Normal	2.0 orbits	.85 orbits	.35 orbits
Finish	2.5 orbits	.40 orbits	.30 orbits
Post-Finish	1.9 orbits	.70 orbits	.60 orbits

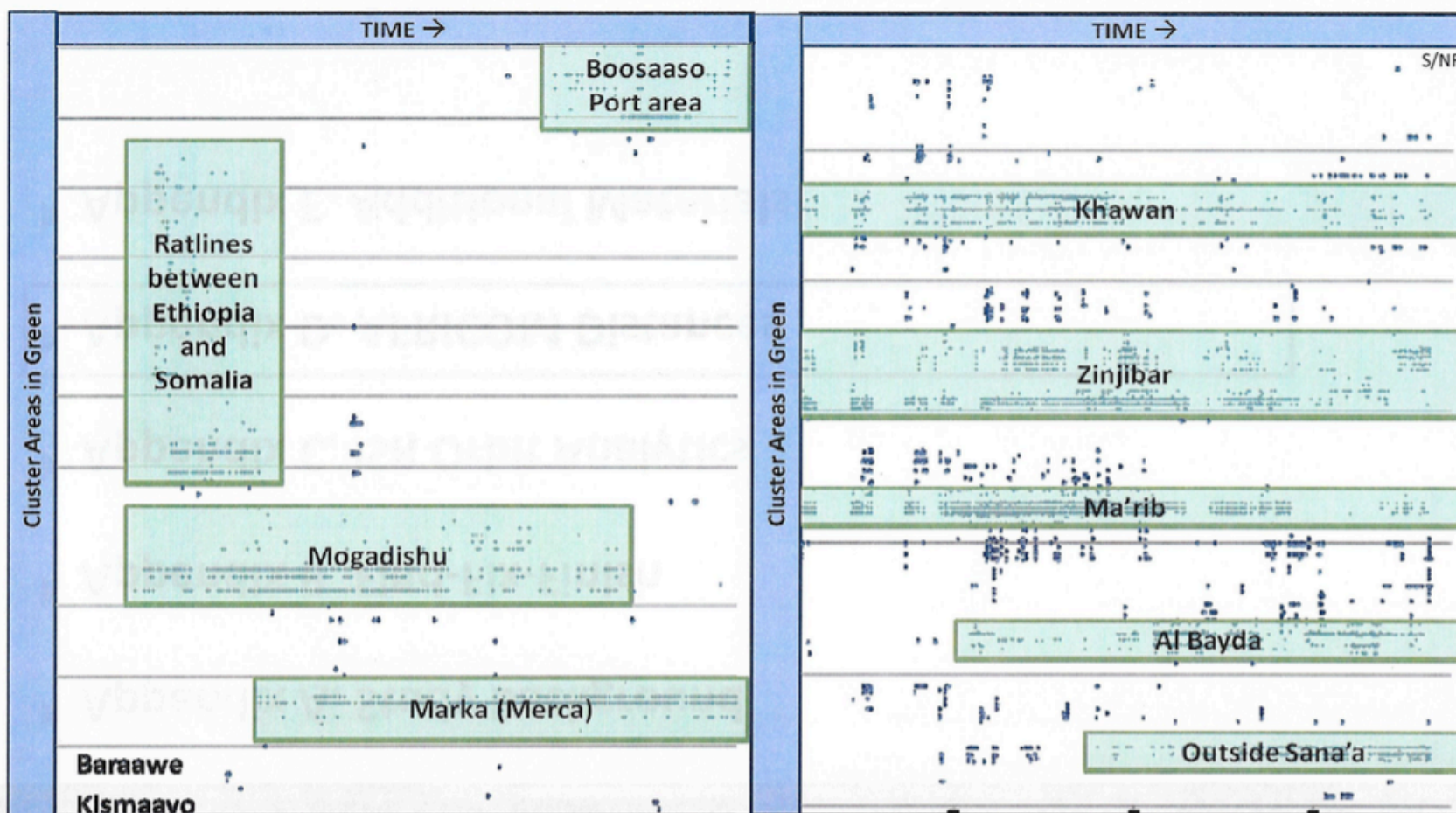
S/NF



Orbit Sufficiency

2012 ISR Activity by Day in Somalia

2012 ISR Activity by Day in Yemen



ISR activity clustering indicates Somalia operations are tightly clustered around one op area at a time, while Yemen operations are routinely dispersed across 3-5 op areas

- ▶ Appendix A. Study Background
- ▶ Appendix B. Find-Fix-Finish
- ▶ Appendix C. ISR Orbit Analytics
- ▶ **Appendix D. AFRICOM Distances**
- ▶ Appendix E. Additional Materials

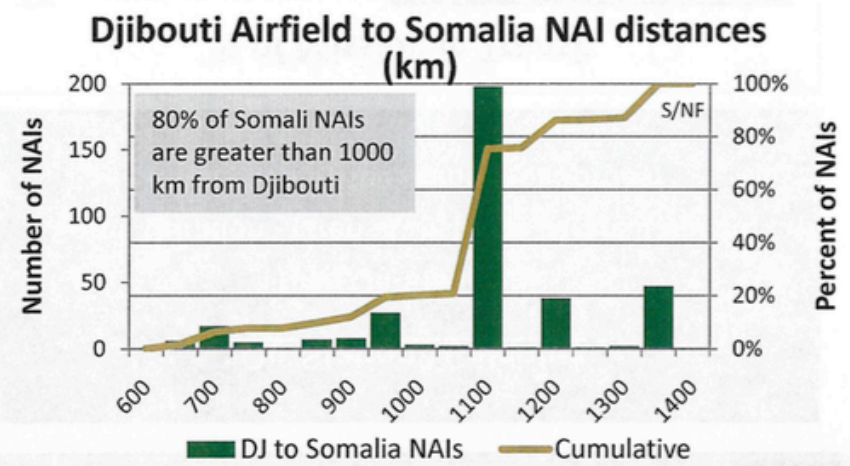
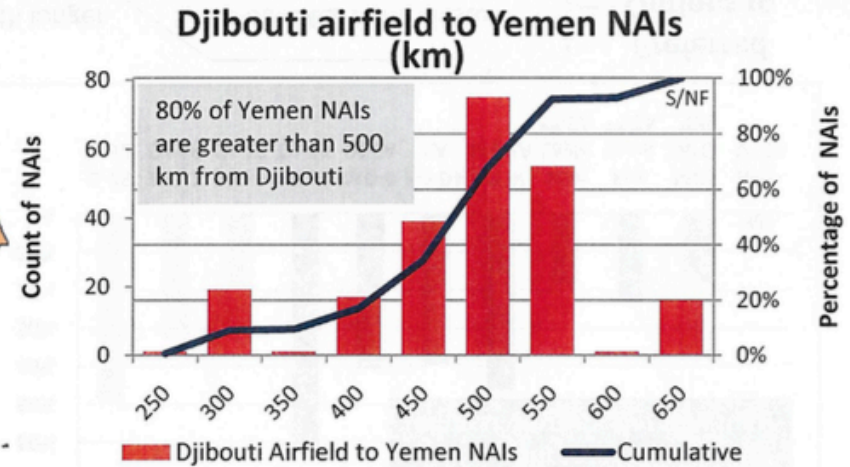
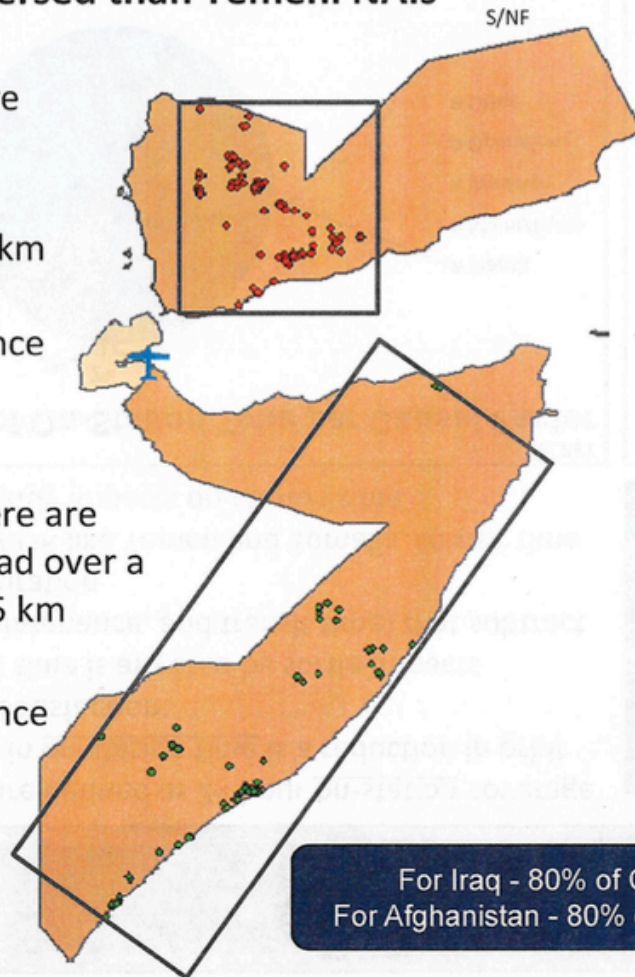


CLDJ Distances to HOA NAIs

▶ (S/NF) Somali NAIs are more distant and more dispersed than Yemeni NAIs

In Yemen there are 225 NAIs spread over a 515 km x 400 km space with an average distance of 471 km

In Somalia there are 362 NAIs spread over a 1550 km x 475 km space with an Average distance of 1065 km



For Iraq - 80% of OBJs are within 150 km (~2 hr round-trip transit for MQ-1)
 For Afghanistan - 80% of OBJs are within 400 km (~5-6 hr round-trip transit for MQ-1)



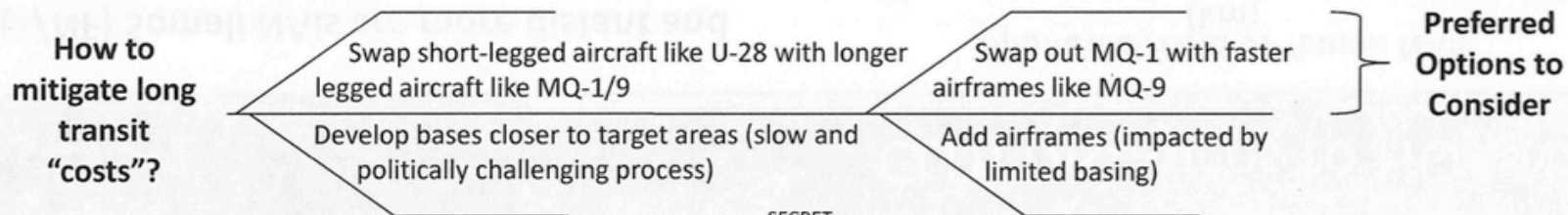
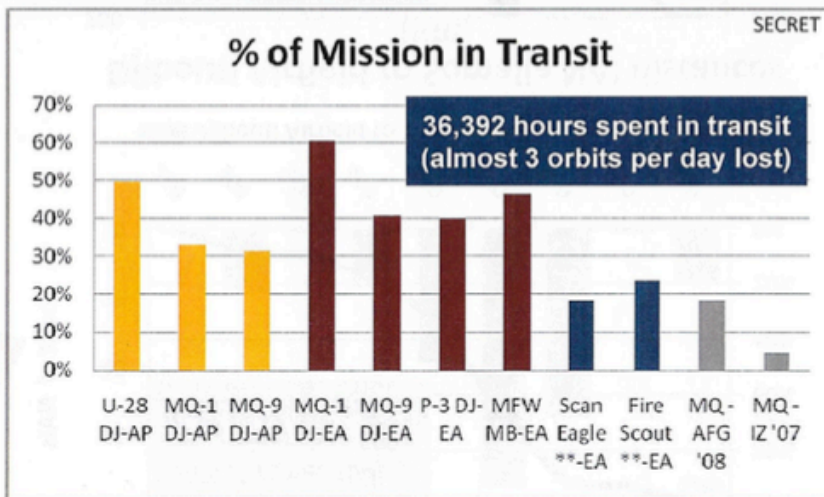
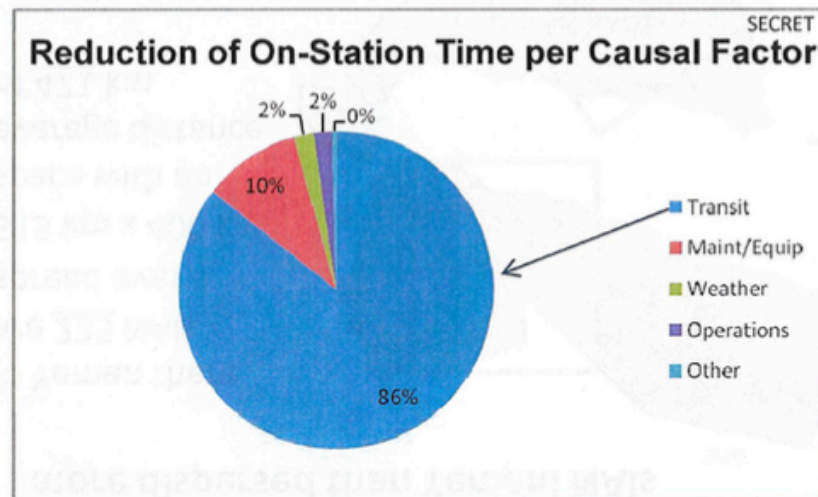
Factors affecting ISR Orbits

- ▶ (S) TF orbits are defined as 24 hour on-station coverage – a reduction in on-station time is a reduction in orbit requirement satisfaction
- ▶ (S) On station time is affected by sortie impacts (weather, maintenance, and transit time) that subtract from sortie duration
- ▶ (S) In a large AOR like Yemen and Somalia, transit time most significantly impacts on-station time

SECRET

“On-Station” Calculus

Time On-Station =
Sortie Duration - (Transit Distance / Transit Speed)
(multiplied by the number of sorties)



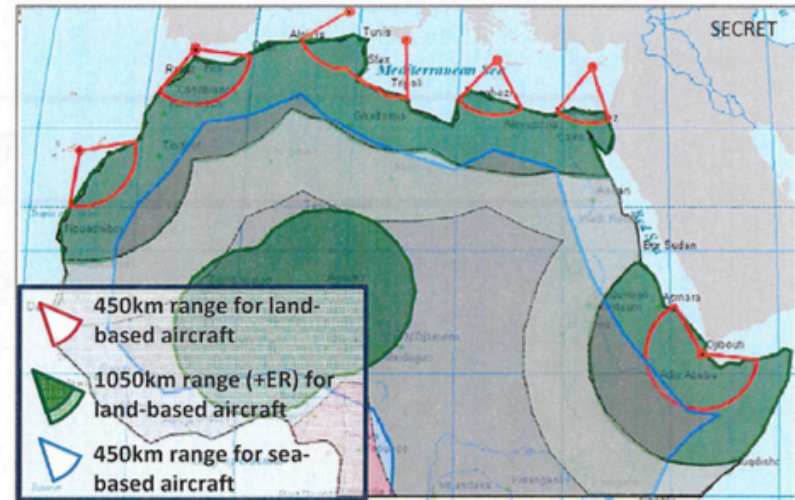
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Source: Predator Times Data V2.0; IBM Analysis



Long Distance Implications

- ▶ (S/NF) In Iraq 80% of finishing operations occurred within 150km of airfields
- ▶ (S/NF) The equivalent distance is 450km for Yemen and over 1000km for Somalia
 - ISR platforms spend half their mission flight time in transit--generating 38% fewer orbits per sortie than in other theaters
- ▶ (S/NF) The issue of distance is magnified when translated to all of northern Africa
 - MFW aircraft with a range of 450km will only reach about 5% of north Africa
 - The range of land-based RPA aircraft allows them to reach 25% of the area
 - Sea-basing allows short-range aircraft to reach 35% of the land mass



Transit Ranges from US/NATO Bases

Issue	Key Finding and Recommendation	S/NF
LONG ENDURANCE	Finding: Long distances from airfields to operating areas is a significant planning factor	
	Recommendation: Consider ways to increase mission range and endurance for all ISR platforms; when satisfying airborne ISR requirements, key metric should be “orbits” not “CAPs” or “lines”	
SEA-BASING	Finding: Political and developmental issues complicate basing and over-flight planning	
	Recommendation: Even with shorter ranges, sea-based ISR may be a valuable complement to long endurance land-based ISR	

- ▶ Appendix A. Study Background
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- ▶ **Appendix E. Additional Materials**



ISR Platforms and Capabilities

Current ISR Systems used in HOA Small-Footprint Operations

System	Sensor					Platform				# of Aircraft in theater (as of 30 June 2012)	Armed for Operations (X)	Manned (M) Or Unmanned (U)
	FMV	HD-FMV	PTT COMINT	DNR COMINT	APG	Time On Station (hours) - Mogadishu	Time On Station (hours) - Sana'a	Cruise Speed (KIAS)	Max Endurance (Hours)			
P-3 MS	2		X	X	X	4	5	228	12	2		M
Medium Fixed Wing (MFW)	X		X	X	X	4	n/a	unk	8	2	X	M
U-28	2		X		X	--	3	270	5	6	X	M
MQ-1 Predator	1		X		X	6	12	70-90	20	6	X	U
MQ-9 Reaper	1	X	X		X	9	10	175	14	4	X	U
Scan Eagle	X					13	n/a	55	15	1 USN Det		U
MC-12 Liberty (Ext'd Range)	1		X		X	2(4)	4 (6)	300	6 (8)			M

SECRET//SI//NOFORN

Red text denotes capabilities not in theater

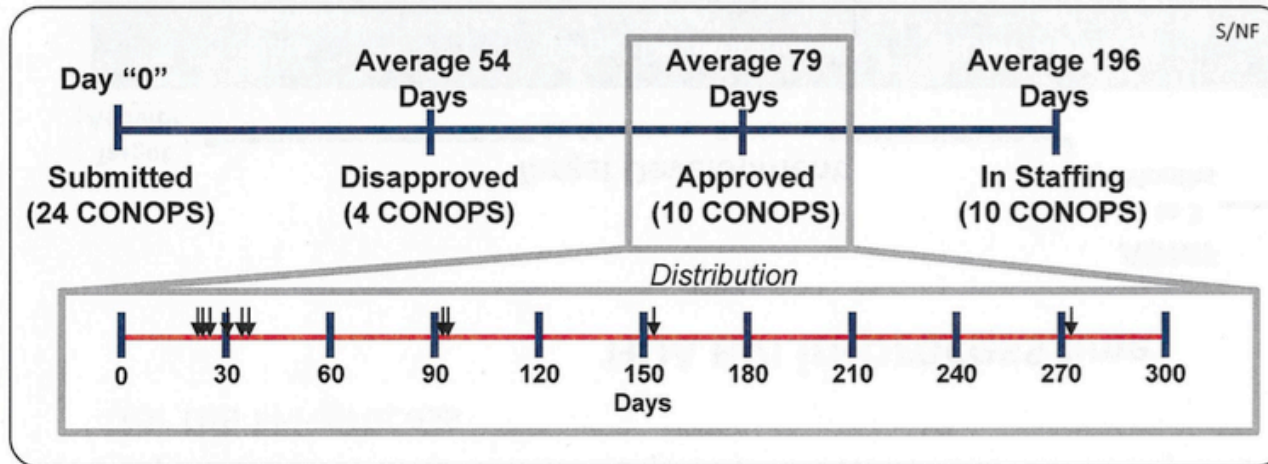
- ▶ (S/NF) The PID-providing phenomenologies, HD-FMV and DNR COMINT, are largely absent from ISR systems operating in HOA
 - Not all MQ-9s have HD-FMV
 - MFW platforms currently only fly in Somalia
 - P-3 MS is a low-density / high-demand platform currently not in Theater



AUMF CONOPS Approval Process Timeline

- ▶ (S) 24 AUMF CONOPS approval times could be fully measured
 - Other CONOPS were either not submitted (14) or were already approved/in staffing (21)

Submitted AUMF CONOPS Results



S/NF

Statistic Summary	CONOPS approval times
Max	274
Min	27
Median	35.5
Mean	79

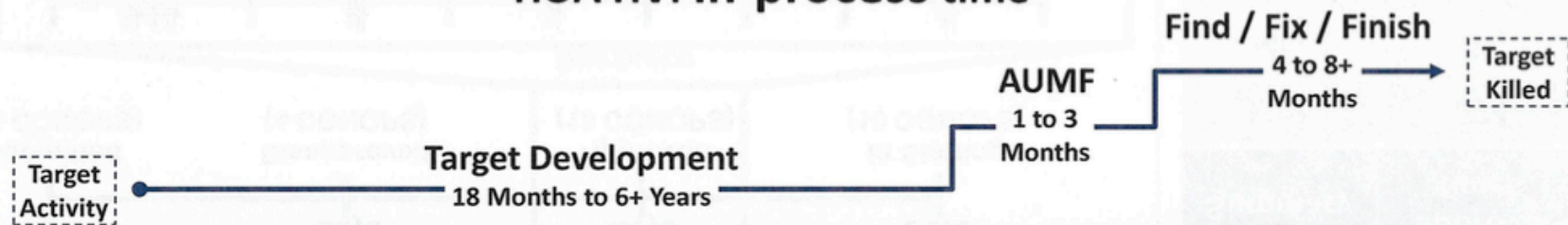
- ▶ (S) While it takes ~79 days to approve an AUMF CONOP, over half of the CONOPS were approved within 36 days
 - Removing the single highest data point would reduce the average approval time to 58 days
 - Adding in those CONOPS still in staffing would double or triple these times
- ▶ (S) These times do not account for the effort expended to collect and analyze intelligence to develop these CONOPS



HOA HVI Life Cycle

- ▶ (S) HOA HVIs require national intelligence resources and years of developmental work
- ▶ (S) Once identified as a target, HOA HVI's AUMF approval utilizes ISR (FMV/SI) intelligence to develop HVIs' POL and K/S CONOPS
- ▶ (S) Additional time is then required to attain near certainty and low CDE requirements for the FFF process

HOA HVI in-process time



Data Summary	Target Development (36)	AUMF Approval (10)	FFF process to kill Target (29)
Max	22.2 Years	9 Months	14.2 Months
Min	0.4 Year	0.9 Month	< 1 Month
Median	4.8 Years	1.2 Months	7.2 Months
Mean	6.0 Years	2.6 Months	8.3 Months
Conceptual Intel Contribution	1. National Intel	1. National Intel 2. FMV / SI	1. FMV / SI 2. HUMINT 3. COMINT/CNO



HD FMV Impact on Fix

Successful Fixes

Main ISR Contributor	Total	HD	Poss/Prob-HD	Non-HD
FMV	8	3	3	2
Other	3	2	0	1
Successful Fixes	11	5	3	3

S/NF

45% - 72% Involved HD-FMV

Unsuccessful Fixes

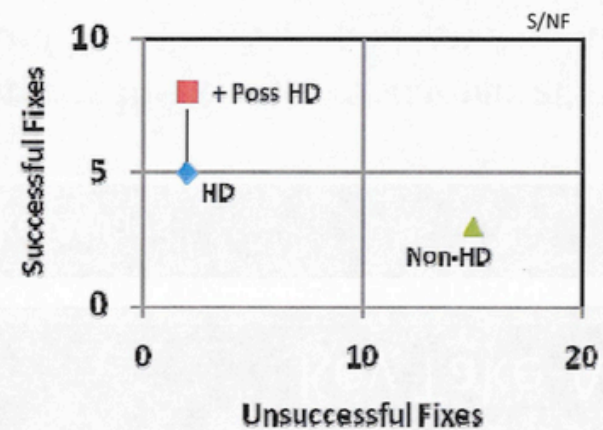
Type of Activity	Total	HD	Poss/Prob-HD	Non-HD
Detected SIGINT	8	N/A	N/A	N/A
Located SIGINT	14	1	0	13
PID N/A	3	1	0	2
Unsuccessful Fixes	17	2	0	15

S/NF

88% No HD FMV Involvement

- ▶ (S/NF) HD FMV is involved in many if not most successful fixes
 - 5 to 8 out of 11 successful fixes involved HD FMV
 - Possible/Probable -HD systems were MQ-9s highly likely to have HD
- ▶ (S/NF) Most of the unsuccessful fixes did not involve HD FMV
 - In the two failure cases involving HD FMV, cloud cover and bed-down location monitoring likely decreased its utility

FMV in "FIX"





Key Take-Aways

	Key Take-Aways	S/NF
Strategic	Operations in the small/medium footprint theater are fundamentally different from what we've experienced in Afghanistan and Iraq. Political constraints, long distances and ISR limitations make this a challenging future	
Operational	There is a critical shortfall of capabilities providing PID and HVI location information. We need to continue to develop/field HD FMV and COMINT sensors that provide this information	
Tactical	A key factor in Find/Fix failures is the frequent inability to maintain 24/7 persistent stare on active mission areas, especially when ISR is massed to support Finishing actions. Supporting CCMD requirements for additional ISR orbits will help prevent "blinking" on HVIs during demand surges	