



Joint Program Executive Office Joint Tactical Radio System

JTRS Family of Programs Spectrum Overview

Statement A - Approved for public release, distribution is unlimited (1 December, 2011).



14 December, 2011

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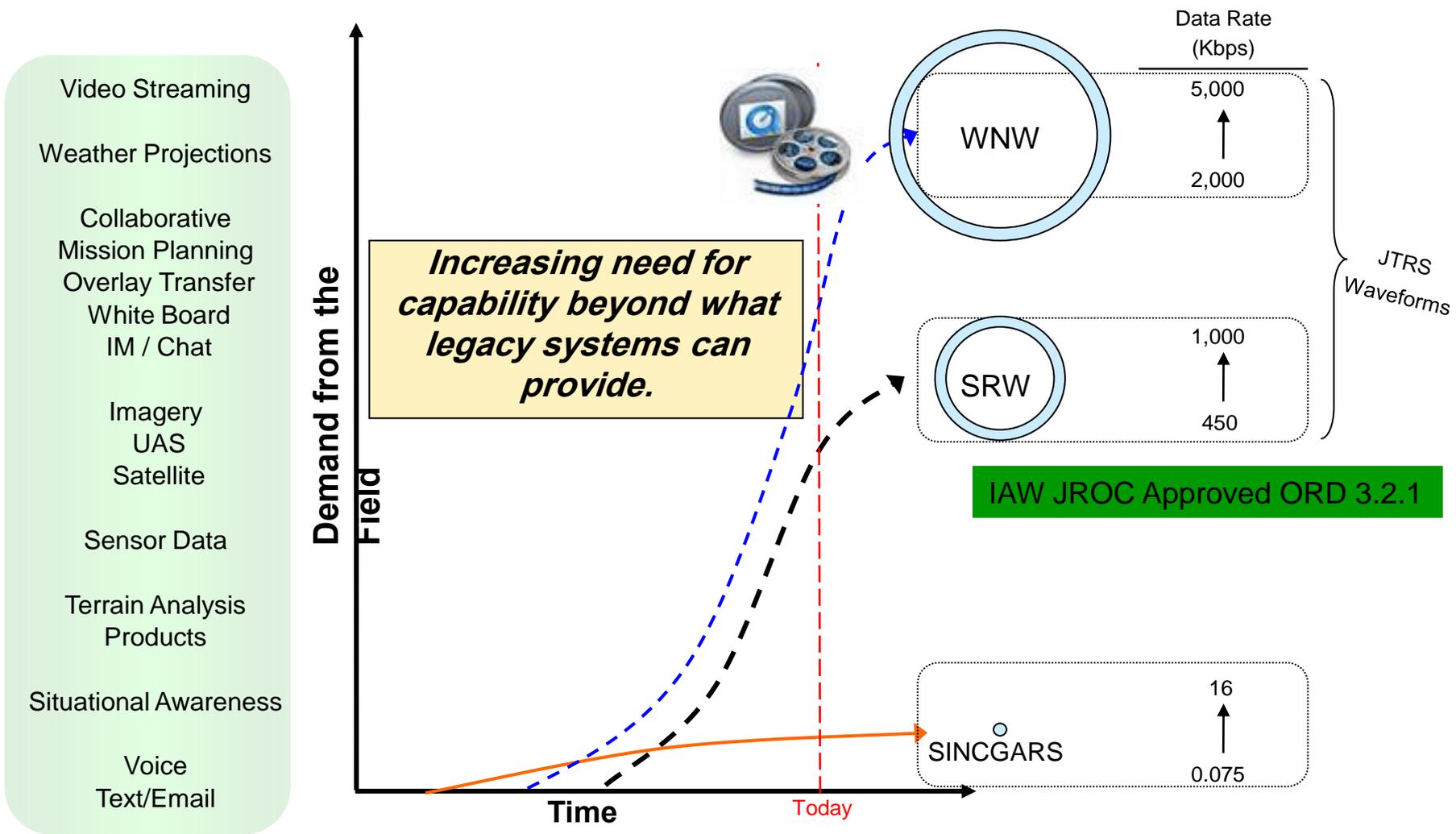
Directorate

JPEO JTRS

V3.0

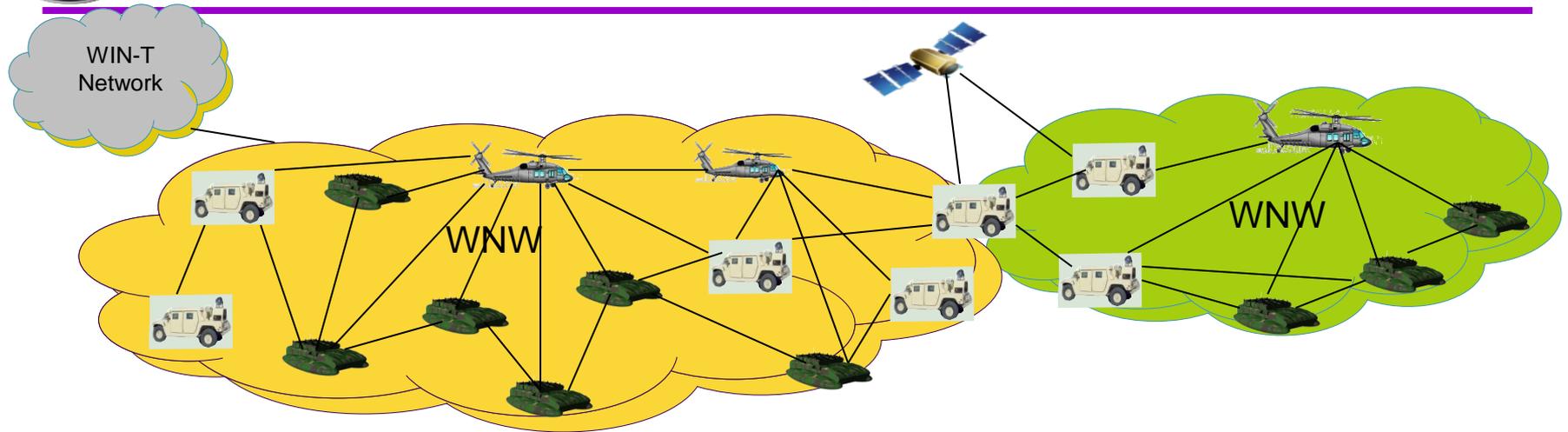


Increasing Demands of the Net-Centric Battlespace





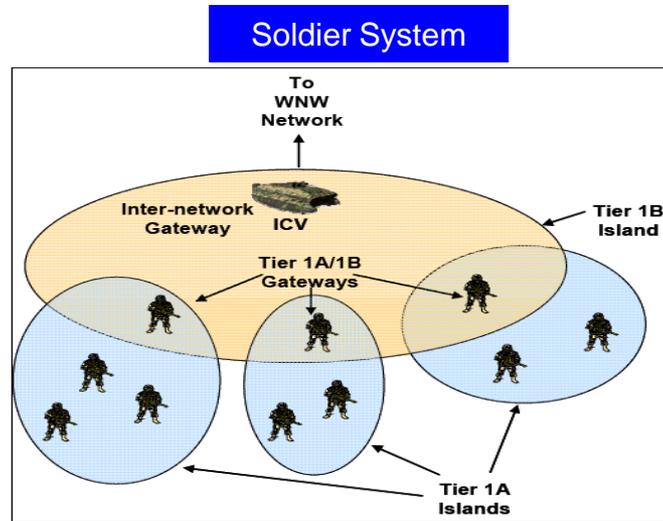
Wideband Networking Waveform (WNW)



- ▶ High data-rate Mobile Ad Hoc Network (MANET) Backbone = 2 Mbps network throughput
- ▶ Design prioritizes performance over system Size, Weight and Power (SWAP) constraints
 - Supports multiple gateways between subnets
 - Distributed Time Division Multiple Access (TDMA) with dynamic slot allocation
- ▶ Reduces overhead and response time in large networks, efficiently using capacity
 - Scalable network architecture supporting flat and hierarchical network topology
 - High assurance (HA/PE) network security architecture for Global Information Grid (GIG) interoperability
 - Priority-based MANET Quality of Service (QoS) features enable GIG Interoperability



Soldier Radio Waveform (SRW)



- ▶ Provides MANET Voice and Data for Dismounted Soldiers and Small Form Factors
- ▶ Designed to meet requirements of SWAP-constrained systems
 - Stub network architecture
 - Centralized TDMA resource management within each island
 - Link encryption without HAIPE
 - Priority based MANET QoS mechanism insufficient for direct GIG interoperability



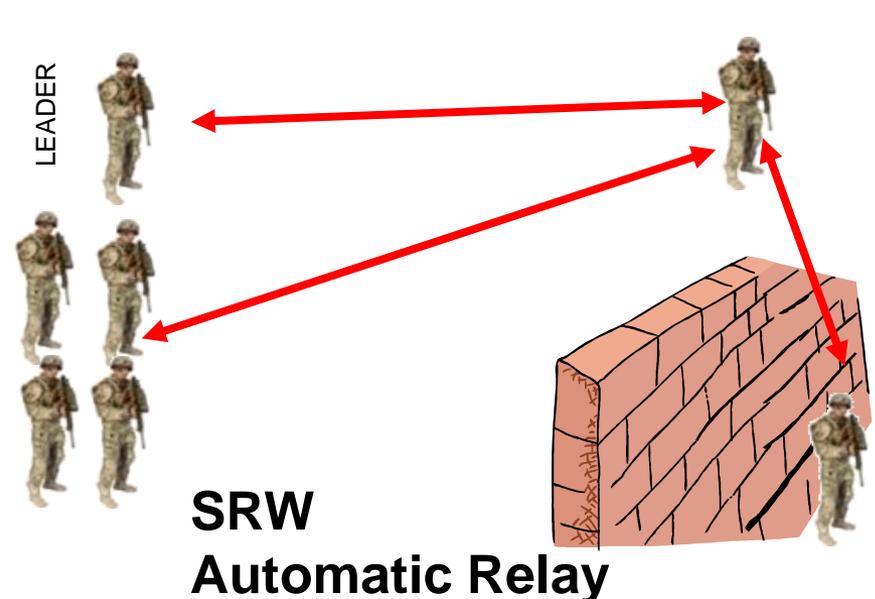
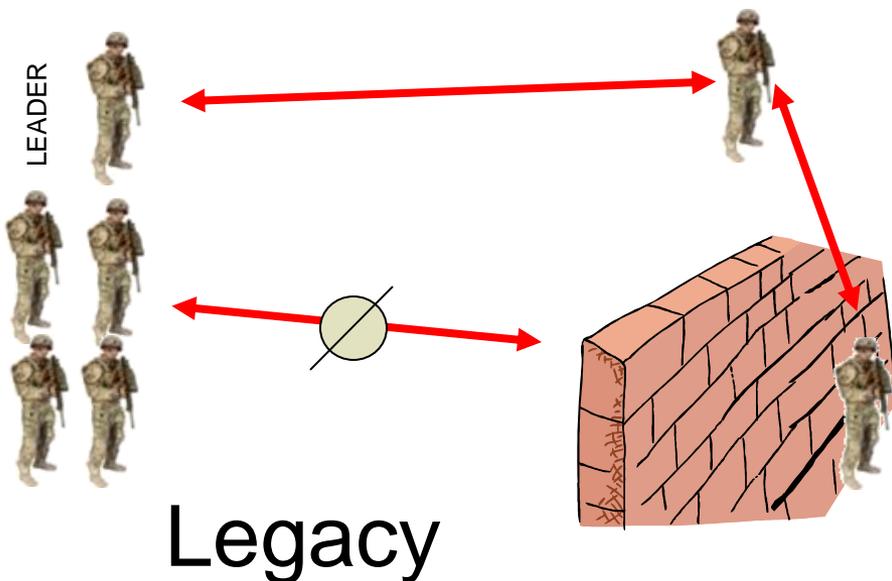
MUOS Capability Overview

- ▶ Worldwide services. On-the-move terminals.
- ▶ Group Communications (a.k.a. Push To Talk / Netted Comms)
 - Voice & Data Services: (Data: 9.6 – 384 kbps)
- ▶ Point-to-Point (P2P) Communications
 - Full-duplex communication
 - Supports voice and data communications
 - 2.4 Kbps (voice only) to 384 kbps
 - Terminal to Terminal *and* Terminal to DSN
- ▶ Point-to-Network (P2N) Communications
 - Provides an Internet Protocol (IP) network connection
 - Full-duplex communication
 - Supports IP data services from 9.6 kbps to 384 kbps



Networking Capabilities

- Networking waveforms go beyond point-to-point legacy systems
 - Provides warfighters with multi-cast, simultaneous access for battlespace flexibility
 - Networking waveforms “route” around obstacles with automatic relay capability
 - Portable, single channel for voice, Position Location Information (PLI) and data





JENM Network Planning



JENM Network Planner



#2
Mission Planning begins, frequency requests submitted using SXXI, and SFAF output

#1
Mission Data sent from HQ!
Includes:

1. Task Organization
2. Equipment
3. JTRS Waveforms
4. Network planning
5. Joint Restricted Frequency List (JRFL)



Spectrum Manager SXXI

#3
Frequency Assignments received from Frequency Manager

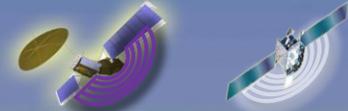
#4
Create Radio Configuration File (RCF) & Radio Mission Data Set (RMDS) with Authorized frequency assignments granted by Host Nation



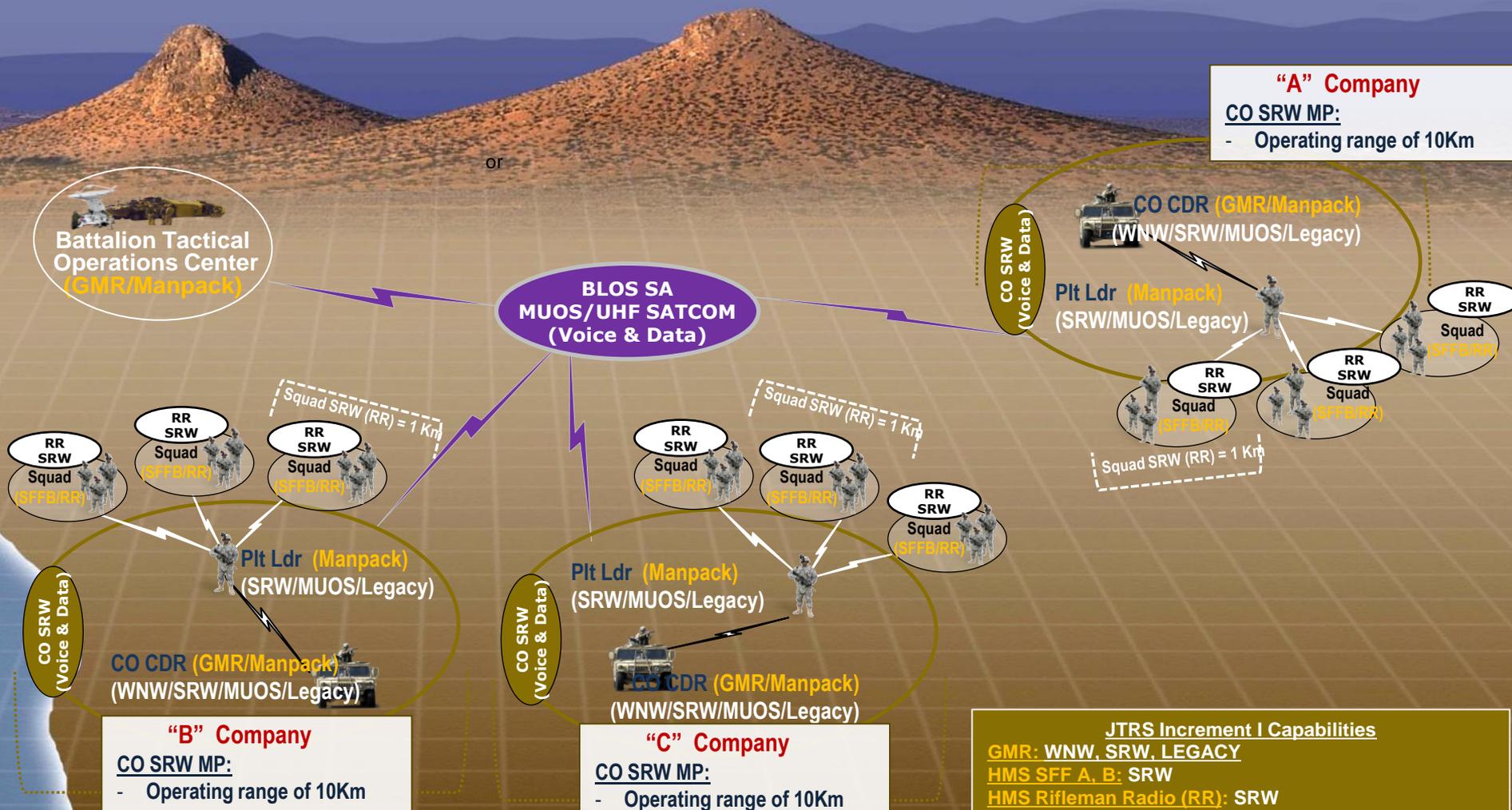
#5 ✓
Load GMR with RMDS & Manpack with RCF

Joint Enterprise Network Manager (JENM)

Estimated Battalion level Training Scenario “Army Battalion Training Operations”



BLOS via MUOS & UHF SATCOM



JTRS Increment I Capabilities

GMR: WNW, SRW, LEGACY
HMS SFF A, B: SRW
HMS Rifleman Radio (RR): SRW
HMS Manpack (MP): SRW, MUOS, Legacy

Estimated Battalion spectrum training requirements

- GMR: (WNW) 1 x 3MHz
- MUOS: 1 x 5Mhz Chnl
- RR: (SRW) 1 x 1.2MHz Chnl
- Manpack: (SRW) 4 x 1.2MHz Chnl



JTRS Increment 1 Capabilities Matrix

JTRS ORD 3.2/3.2.1 Increment 1 Threshold Capabilities with POM-10, PR-11, POM-12 Additions & JROCM & ADM Documentation (26 September 2011 v25) TopVue No. 9879		JTRS Threshold Capabilities										
		CSCHR		HMS				GMR	MIDS JTRS	AMF		
		JEM*	Falcon III*	Type 2 Encryption				Type 1 Encryption	AN/VRC-107(3)	AN/USQ-190(V): 1 to 4 (C)	AMF-SA	
Joint Capability JTRS Radios are capable of additional waveforms beyond Increment 1		Handheld & Vehicle AN/PRC-148(V)4	Handheld & Vehicle AN/PRC-152(V)1	Rifleman Radio AN/PRC-154(V)1	SFF-A RT-1935/G	SFF-D RT-1948/D	SFF-B RT-1953(C)/T	Manpack AN/PRC-155(V)1				
Channels per Radio		1	1	1	1	1	2	2	4	4	2	
Transformational	Joint Networking (WNW, SRW and JAN-TE are reserved for U.S. only.)		-	-	-	-	-	-	WNW	-	WNW	
	Enterprise Manager		-	-	SRW(3)	SRW(3)	SRW(3)	SRW(4)	SRW(4)	SRW(4)	-	SRW(4)
	Enterprise Svcs (R&R)		-	-	-	-	-	-	-	-	JAN-TE(5)	-
	-		-	-	-	-	-	-	-	-	-	MUOS
	-		-	-	JENM	JENM	JENM	JENM	JENM(2)	JENM	-	JENM(2)
Legacy	Ground/Air/Maritime LOS/BLOS	LOS Voice & Data	SINC	SINC	-	-	-	SINC	SINC	SINC	-	SINC(6)
		LOS Voice VHF	VHF FM	VHF FM	-	-	-	-	VHF FM	-	-	VHF FM
		LOS Voice UHF	UHF AM/FM	UHF AM/FM	-	-	-	-	UHF AM/FM	-	-	UHF AM/FM
		BLOS SATCOM	IW Ph 1	DAMA/IW Ph 1	-	-	-	-	DAMA	DAMA	-	-
	Tactical Data Link (TDL)		-	-	-	-	-	-	-	-	-	-
	Tactical Voice (e.g. CAS)		HQ II	HQ II	-	-	-	-	HQ II	-	Link-16(1)	Link-16(1)
	Air Traffic Control		-	-	-	-	-	-	ATC	-	-	ATC
	Coalition Interoperability		-	-	-	-	-	-	Bowman VHF	-	-	Bowman VHF(6)
Homeland Defense (Low-Band P-25)		P25(P2P)	P25(P2P)	-	-	-	-	-	-	-	-	

NDI Solution

NDI procurement process ongoing, draft RFP released

- Notes:**
1. Link-16 Information Assurance Upgrade and Frequency Remap.
 2. An updated JENM is implemented to provision MUOS Waveform.
 3. Using Type 2 Encryption.
 4. Capable of using Type 1 & 2 Encryption.
 5. Unfunded JROC Validated Requirement.
 6. Delayed requirement.

Legend
Transformational
Ground/Air/Maritime LOS/BLOS
Tactical/Specialty
Coalition
Other

*In Production.



Spectrum Approval Status

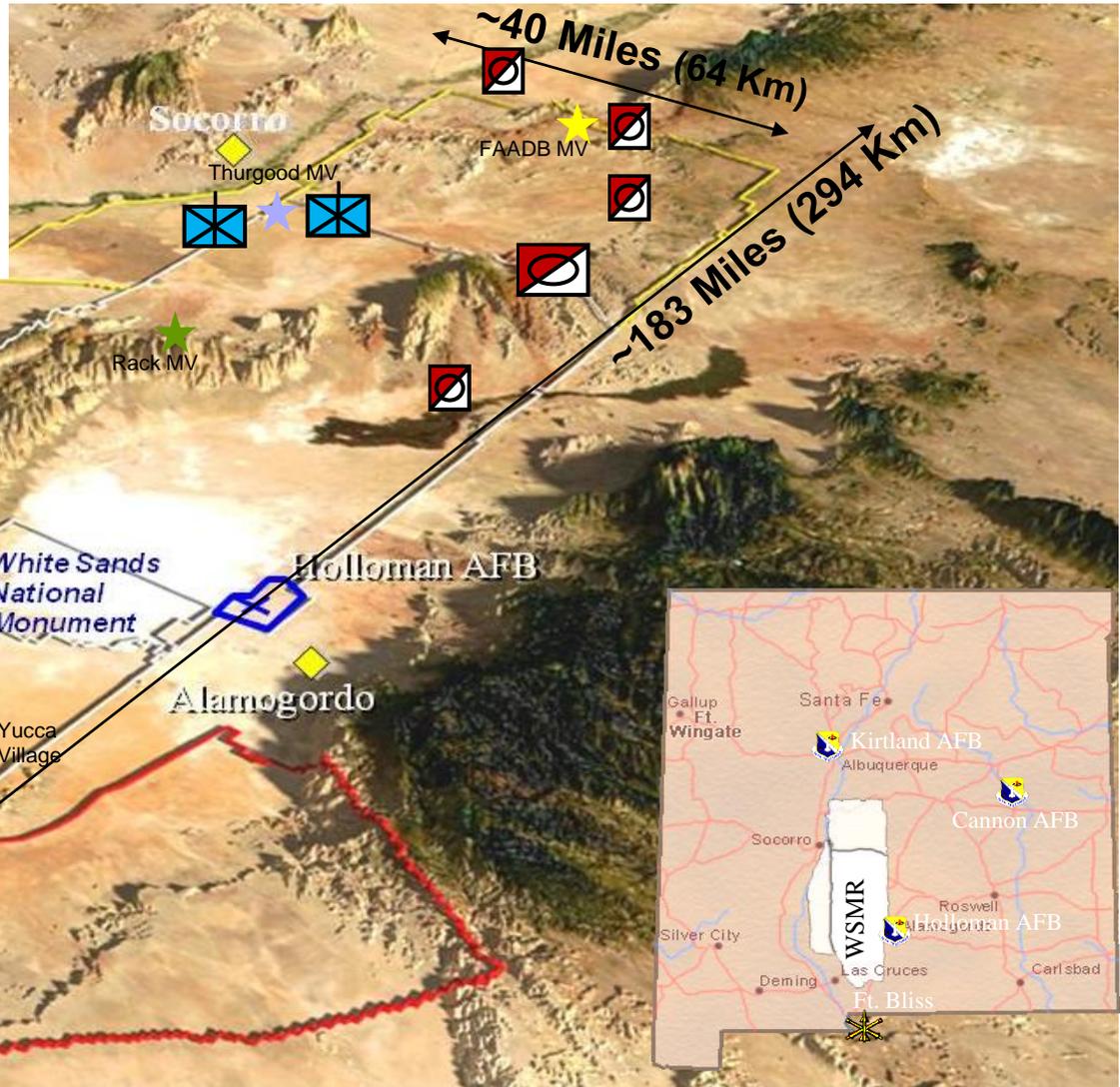
Spectrum Allocation DD1494 ID/JF-12 Serial No. Status Matrix (1 December 2011v18)		JTRS Form Factors					GMR	MIDS JTRS	AMF
		HMS							
									
Spectrum Requirements		Type 2 Encryption			Type 1 Encryption		AN/VRC-107(3)	AN/USQ-190(V): 1 to 4 (C)	AMF-SA
		Rifleman Radio AN/PRC-154(V)1	SFF-A RT-1935/G	SFF-D RT-1948/D	SFF-B RT-1953(C)/T	Manpack AN/PRC-155(V)1			AN/ZRC-2()
No. Channels		1	1	1	2	2	4	4	2
DD1494 ID/ JF-12 Serial No.		9678			9726		9042	7064	9181
U.S. DD1494 Approval Status		Stage-4 Approved Awaiting NTIA Signature			Stage-3 Approved Awaiting NTIA Signature		Stage-2 Approved Stage-3 Awaiting NTIA comments	Stage-3 Approved Stage-4 Awaiting NTIA Comments	Stage-3 Awaiting NTIA Comments
Host Nation Supportability	CENTCOM	Stage-4 Supportable Comments received			Stage-3 Supportable Comments received		Stage-3 Supportable Comments received	Stage-4 Pending Submission to COCOMs	Stage-3 Pending Submission to COCOMs
	EUCOM	Stage-4 Released for Comments			Stage-3 Released for Comments		Stage-3 Spectrum Supportability Comments in progress	Stage-4 Pending Submission to COCOMs	Stage-3 Pending Submission to COCOMs
	PACOM	Stage-4 Supportable Comments received			Stage-3 Released for Comments		Stage-3 Supportable Comments received	Stage-4 Pending Submission to COCOMs	Stage-3 Pending Submission to COCOMs
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Recent JTRS Testing Success: Army Network Integration Event at White Sands Missile Range"

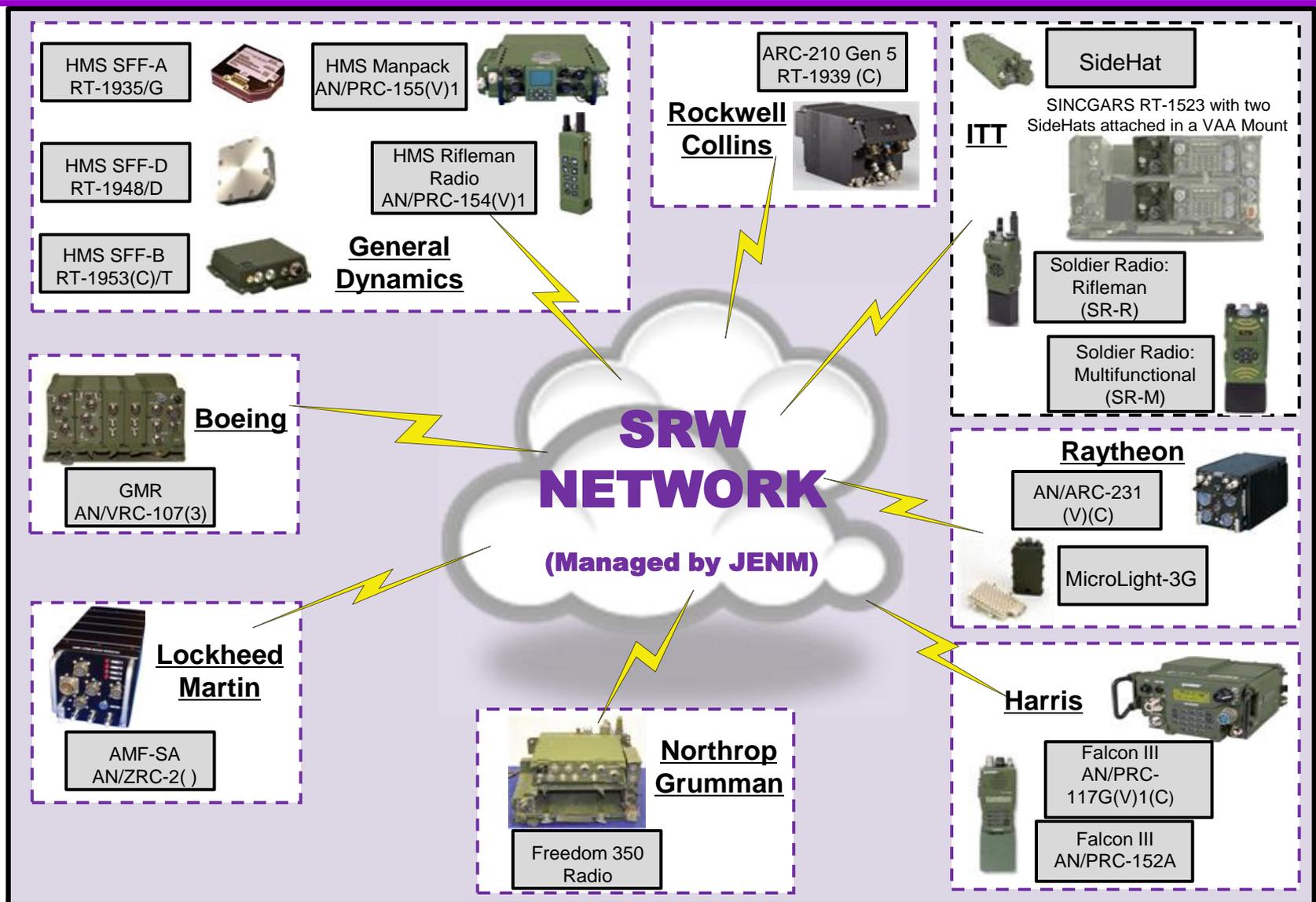
JTRS Success at NIE 12.1:

- RR IOT&E
- SRW delivered on several platforms
- SRW Net Manager





Emerging Soldier Radio Waveform (SRW) – Capable Radios





Spectrum Certification Process for Software Defined Radios

- ▶ Background – SDR's have flexibility to add waveforms as the demand and requirements grow / change
- ▶ Current Spectrum Certification Process
 - “Updated Stage 4” submissions with each WF addition

Is there another Spectrum Certification Approach?



Summary

JTRS is achieving Spectrum Supportability and is making progress with your support

Thank you!