

Digital Modular Radio AN/USC-61(V)



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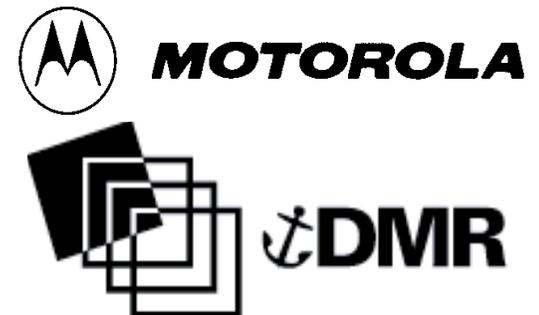
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Outline



- DMR Mission
- Why DMR?
- What is DMR?
- Program Status
- Developmental Testing
- Procurement Plan
- Fielding
- Conclusions



DMR Mission



“Acquire an Affordable, High-Capacity, Capable Tactical Radio to Provide Interoperable LOS/BLOS C4I Capabilities to the Fleet”

- ◆ **Built to Open Systems Architecture**
- ◆ **Maximizes COTS/NDI**
- ◆ **Able to Evolve As Commercial Technology Advances**
- ◆ **Not Tied to Original Manufacturer for Updates**
- ◆ **Supports Future Proofing**
- ◆ **Interoperable, Affordable, Scaleable, Flexible!**



Why DMR?

- ❑ **Plethora of Narrowband Stovepipe Radios are now 20+ years old—represents 60's, 70's technology that:**
 - ◆ **require extensive manpower to maintain & operate,**
 - difficult to find obsolete, replacement parts.
 - limited or non-existent production base.
 - ◆ **are a drain on limited fleet resources,**
 - ◆ **have limited capability, singular functionality, no automation & incapable of growth.**

System	IOC
ANWASC-5	1972
ANWASC-3	1976
AN/URT-23	1960s
AN/URC-109	1989
R-1051	1960s
R-2368	1980s
VRC-46	1960s

HF, VHF, UHF Radios and Ancillary Equipment
Too Many Stovepipe Radios in Service Today!

HF

- AN/URT-23 HF Transmitter
- AN/URT-24 HF Transmitter
- R-1051/URR Receiver
- SRA-49 Receive Multicoupler
- SRA-56/7/8 Multicoupler
- URA-38 RF Control & Coupling System
- R-2368 HF Receiver
- URC-131 HF Transmit Group
- AS-2537 Antenna
- AS-3772 Antenna
- OE-404V Antenna System
- OE-418 Antenna System
- AS-3771 Antenna
- IHFA Wire Antenna System
- OE-()V/SRC Antenna
- OA-9243 Tilt Whip Antenna System

VHF

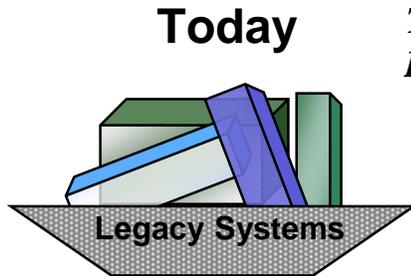
- VRC-46 Transceiver
- GRT-21 VHF Transmitter
- GRR-23 VHF Receiver
- GRC-211 VHF Trans
- AN/URC-80 VHF Trans
- AN/URC-139 Bridge to Bridge
- TD-1456 Multicoupler
- TD-1289 Multicoupler
- SRC-54B
- AS-3226 Antenna
- AS-2809 Antenna
- NT-66095 Antenna
- AS-4293 Antenna
- AN/VRC-49 Transceiver
- AN/URC-94 Transceiver
- GRC-171 Transceiver
- SRA-60

What is DMR?

Software Programmable Digital Radio



Information Superiority Requires New Capabilities



*Transmit, Receive, Bridge, and Gateway
Between Similar and Diverse Waveforms
Over Multiple Communications Media
and Networks*



**Software
Programmable
Digital
Radio**

- **Single Frequency**
- **Single Waveform**
- **Not Capable of Simultaneous Voice, Data, Video**
- **Low to Medium Data Rates**
- **Limited Routing, Networking, Network Management**
- **Can Not Automatically Adjust Performance**
- **Not Capable of Simultaneous Operation With Other Systems in Same or Other Domains**
- **Lacks Adequate Frequency Flexibility to Operate Globally**

- **Multi-band, Multi-mode, Secure, Non-secure (Voice, Video & Data)**
- **Operate across a wide frequency range (e.g. 2 MHz to 2 GHz)**
- **Dynamic Bandwidth Management**
- **Retransmit/Cross Band Between Frequency Bands and Waveforms**
- **Software Reprogrammable**
- **Network Between & Across Geographical & Organizational Boundaries**
- **Backwards Compatible With Legacy Systems**

Legacy Equipment Capable of Being Replaced by DMR



UHF

- ◆ AN/WSC-3
 - HAVEQUICK II
 - UHF SATCOM
 - UHF LOS
- ◆ AN/WSC-5
 - Shore UHF SATCOM
- ◆ TD-1271
 - 25 KHz DAMA Modem
- ◆ AN/USC-54 (VICS)
 - UHF SATCOM
 - 25 KHz DAMA
- ◆ AN/USC-42(V)1,2 (MINIDAMA)
 - 5/25 KHz SATCOM
 - UHF SATCOM
 - UHF LOS
- ◆ AN/URC-93
 - LINK 11
- ◆ MD-1324
 - 5/25 KHz DAMA Modem



VHF

- ◆ AN/GRC-211
 - AM/FM Voice
- ◆ AN/VRC-46
 - AM/FM Voice
- ◆ AN/SRC-54
 - SINGARS
 - SINGARS SIP

HF (planned for future) (Receivers & Exciters only)

- ◆ AN/URT-23
- ◆ AN/URC-109
- ◆ AN/URC-131 (HFSST)
- ◆ R-2368/URR
- ◆ R-1051/URR
- ◆ AN/FRT-96

Baseline	Options
ship, shore, sub	30-400 MHz 200W PA
0.1-2000 MHz, 4 Chs	HF 110A/ALE
5/25 kHz UHF SATCOM DAMA	MDR UHF SATCOM
AM/FM/HQII UHF LOS	HDR LOS (up to 4.6 Mbps)
SINGARS, VHF LOS	SINGARS SIP
Emedded TRANSEC/COMSEC	SATURN
Open System Architecture	Emedded Link 4A, Link 11
Software (re)Programmable	

DMR Size Comparison With Existing Systems



Dual DAMA

DDG

Transmitter Space

Radio Space

OK-326

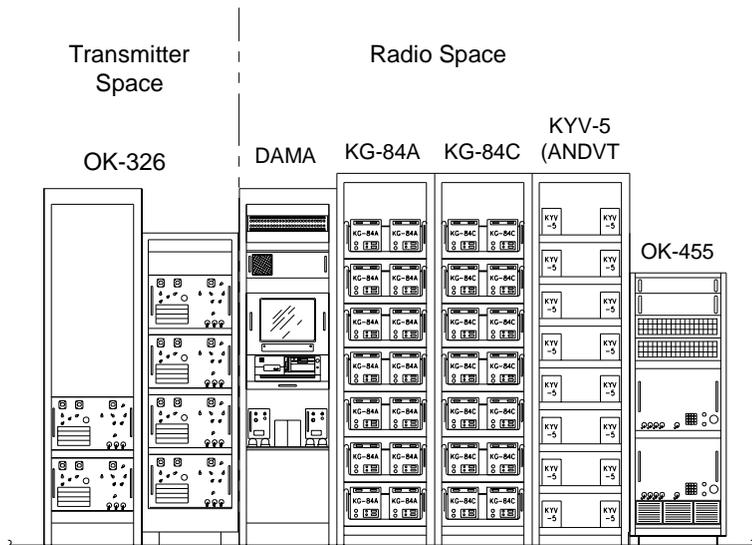
DAMA

KG-84A

KG-84C

KYV-5
(ANDVT)

OK-455



54 Boxes/Components, Single Function Radios, Multi-plexers and Cryptos (2194 lbs)

Mini-DAMA

DDG

Transmitter Space

Radio Space

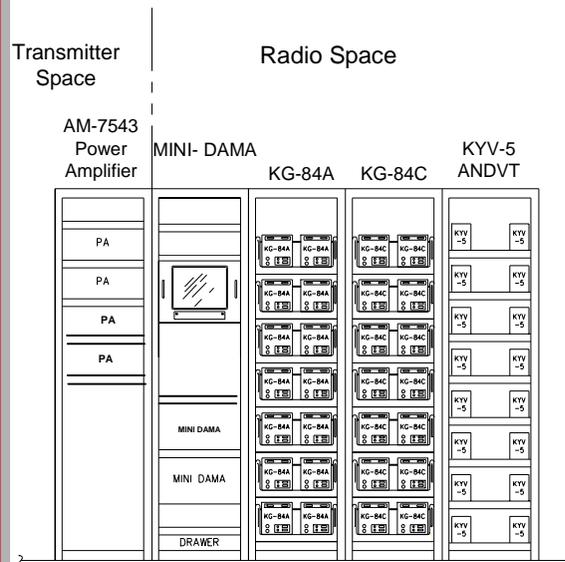
AM-7543
Power Amplifier

MINI-DAMA

KG-84A

KG-84C

KYV-5
ANDVT



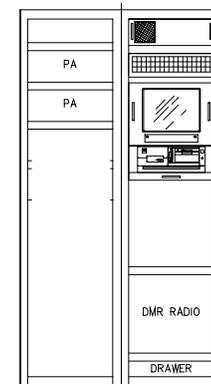
46 Single Band, Single Function Radios and Cryptos (1744 lbs)

DMR w/ Embedded TRANSEC/COMSEC

DDG

Transmitter Space

Radio Space



1 Multi-Band, Multi-Function Radio (550 lbs)

Where We've Been



- ❑ **Awarded 2 FFP/IDIQ Contracts—Sep '98 to Raytheon & Motorola**
 - ◆ **Architecture for UHF SATCOM, UHF LOS, MIL-188-181/182/183, SINCGARS which:**
 - ensures compliance with performance specs from JTRS ORD/ Maritime\Fixed Annex,
 - offers options for other advanced capabilities.

- ❑ **Conducted Extensive 8-Week Test on Initial Units**
 - ◆ **No Clear Technical Winner - both products showed weaknesses**
 - ◆ **Vendors afforded additional time to improve products**

- ❑ **Conducted Final Round of Testing—Ended Dec '99.**
 - ◆ **Winning vendor: Motorola - announced 2 Feb '00.**



Where We're At

- ❑ **Delivery of First LRIP Unit expected Nov '00**
 - ◆ **Version 2.0 hardware currently being produced by Motorola.**
 - ◆ **Balance of the LRIP 1 Units will be delivered to Version 3.0 configuration during May/Jun '01.**

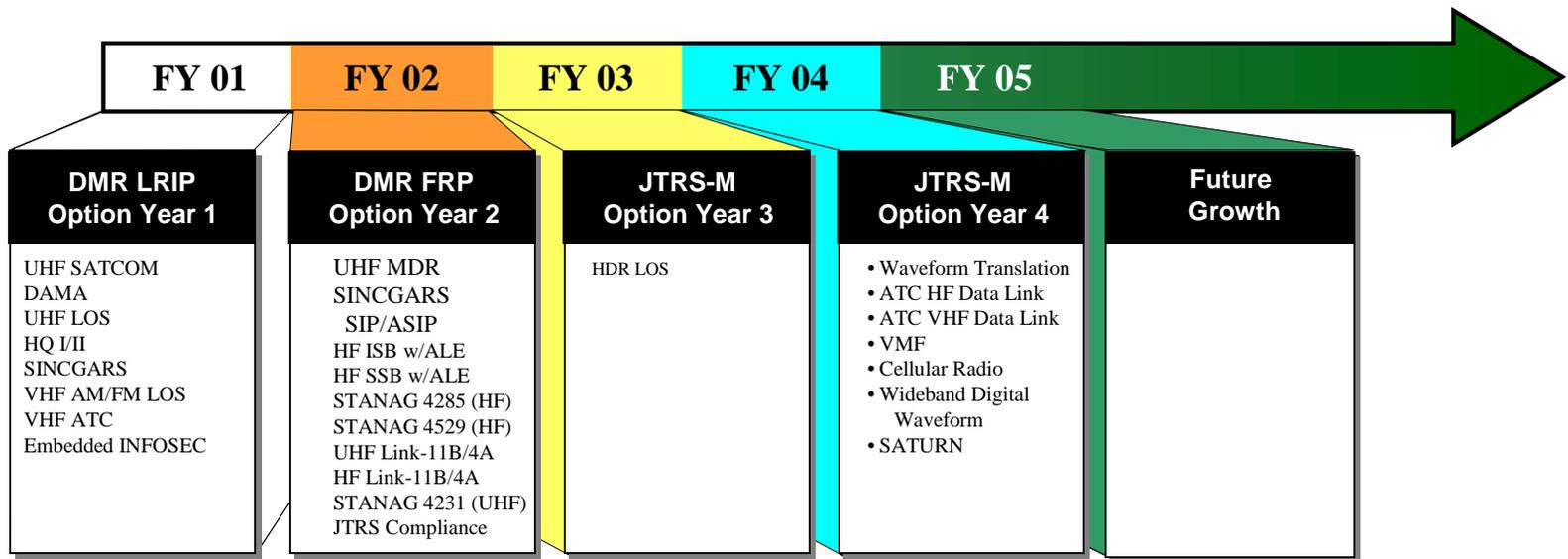
- ❑ **Testing Required Prior to LRIP 2 Award**
 - ◆ **Additional testing on Version 2.0 H/W to determine progress on identified deficiencies.**

- ❑ **OPEVAL**
 - ◆ **Scheduled Jun '01.**
 - ◆ **Install and Check-out of Motorola's S/W ver. 5.1, begins Jan '01.**

- ❑ **INFOSEC Certification**
 - ◆ **Working with NSA to further define the evaluation criteria for the NSA certification process and to pin specific "HARD" requirements.**



Where We're Going



DT-IIE

Purpose & Objectives



- ❑ **Purpose: Determine if DMR is ready to enter Operational Test and Evaluation (OPEVAL)**

- ❑ **Objectives:**
 - ◆ Evaluate DMR performance, effectiveness, and suitability.
 - ◆ Verify DMR interoperability with UHF SATCOM legacy systems.
 - ◆ Assess UHF Line-of-Sight (LOS) capabilities.
 - ◆ Exercise designated shipboard operators & maintainers

DT-IIE

Test Approach



Exercise DMR in a manner identical to the way COMOPTEVFOR will test. . .

- ◆ **Conduct TECHEVAL on Not-to-Interfere basis with normal shipboard operations.**
- ◆ **Record data as it occurs during ship's normal course of operations.**
- ◆ **Measure End-to-End performance using UHF SATCOM networks.**
- ◆ **Confirm compliance With JTRS ORD Annex B Maritime/Fixed:**
 - record data and voice statistics
 - test to a 97% confidence level
- ◆ **Verify Integrated Logistics Support (ILS):**
 - validate ILS certification
 - review documentation (i.e., Technical Manuals, etc.)
 - Assess training



DMR Procurement Plan

Platforms	FY99 Lrip One	FY00 LRIP TWO	FY01	FY02	FY03	FY04	FY05	FY06	FY07
OPN-DMR	15	26	0	22	49	9	2	7	13
OPN-JIMINI	59	12	0	16	8	0	2	0	0
HF-DMR		62			15	31	6	31	23
LPD 17-18		18							
CVN 69/76		4							
LPD 19-20			18						
DDG 93-95			21						
DDG 96-98				21					
LPD 21-22					18				
DDG 99-101				21					
LPD 23-24						18			
DDG 102-103					14				
LPD 25-26						18			
CVN 70					14				
LHD 8					12				
Total	74	122	39	80	130	76	10	38	36



SATCOM Fielding

□ Methodology:

- ◆ No units will be fielded until Milestone III.
- ◆ Installation priorities IAW IT-21 implementation matrix.
- ◆ Planned ship class DMR quantities:

SHIP CLASS	DMRs REQUIRED	SHIP CLASS	DMRs Required
CVN	3	DD	2
CV	3	FFG	1
AGF	3	MCS	3
LCC	3	MCM	1
LHA	3	MHC	1
LHD	3	AOE	1
LPD	2	AO	1
LSD	2	ARS	1
CG	2	AS	1



Conclusions

- ❑ **DMR – state-of-the-art system that will revolutionize RF communications in the fleet. . .**
 - ◆ **Consolidated capability**
 - ◆ **Automated**
 - ◆ **Flexible**
 - ◆ **Smaller**
 - ◆ **More powerful**
 - ◆ **Software Upgradeable**

- ❑ **Progressive acquisition strategy will provide “Best Value” product.**

- ❑ **The revolution that DMR/JTRS brings the user, will serve as the cornerstone in the overall radio room automation vision of PMW179.**

- ❑ **Need feedback from the user to best help us help you.**

- ❑ **Need you (user) to help us win support for greater expansion of DMR and future DMR capabilities with Navy leadership.**



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