



# DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND  
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IN REPLY REFER TO

NAVSEAINST 4790.17B  
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## NAVSEA INSTRUCTION 4790.17B

From: Commander, Naval Sea Systems Command

Subj: MINIATURE/MICROMINIATURE MODULE TEST AND REPAIR (2M MTR) PROGRAM

Ref: (a) OPNAVINST 4700.7L  
(b) OPNAVINST 4790.13A  
(c) COMFLTFORCOMINST 4790.3  
(d) NAVSEA TE000-AA-MAN-010/2M, Certification Manual for Miniature/Microminiature (2M) Module Test and Repair (MTR) Program  
(e) NAVSUPINST 4423.29  
(f) NAVSEA SE004-AK-TRS-010/2M, Standard Maintenance Practices for Miniature/Microminiature (2M) Electronic Assembly Repair  
(g) NAVSEA ST821-AG-PRO-010, MTR Gold Disk Test Routine Development Requirements Manual  
(h) NAVSEA S8G50-AC-PRO-010, MTR Pinpoint Disk Test Routine Development Requirements Manual  
(i) NAVSUP P-485, Afloat and Ashore Supply Procedures

1. Purpose. To implement the NAVSEA Miniature/Microminiature Module Test and Repair (2M MTR) Program in accordance with the policy, responsibilities, and guidance in enclosure (5) of reference (a), reference (b), and Volume VI-Chapter 8 of reference (c). Also, to inform NAVSEA and Program Executive Office (PEO) personnel of the 2M MTR maintenance Program of Record for repairing circuit card assemblies (CCA) and electronic modules (EM) which reduces Total Ownership Costs (TOC) and improves system and equipment readiness.

2. Cancellation. NAVSEAINST 4790.17A

3. Scope and Applicability. This instruction applies to systems and equipment with electronic and electrical circuitry onboard U.S. Navy ships and at Navy shore activities supported with authorized 2M MTR capabilities, except as noted. The 2M MTR Program is a maintenance program used in support of all Naval Warfare Enterprises and the U.S. Marine Corps (USMC) Ground community. The NAVSEA 2M MTR Program and this instruction also serve as a guide for commands in the U.S. Army, U.S. Air Force (USAF), National Guard, U.S. Coast Guard (USCG), and allied

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country Military Departments that receive 2M MTR equipment and support from NAVSEA 2M MTR Program Engineering Agents.

a. This instruction does not apply to NAVSEA 08-cognizant nuclear propulsion plants and associated nuclear support facilities. The Director of the Naval Nuclear Propulsion Program has responsibility for all matters pertaining to the maintenance, repair, and modification of naval nuclear propulsion plants and associated nuclear support facilities. Nothing in this instruction supersedes or changes these responsibilities and authorities. Accordingly, the Naval Nuclear Propulsion Directorate shall be consulted in all matters pertaining to or affecting the maintenance, repair, or modification of naval nuclear propulsion plants or associated nuclear support facilities.

b. This instruction does not apply to Director, Strategic Systems Programs (DIRSSP)-cognizant ballistic missiles and associated strategic weapons systems and equipment.

c. 2M MTR support of Naval and USMC avionics and associated support equipment is addressed in COMNAVAIRFORINST 4790.2A.

d. Support of USMC Ground units with 2M MTR capabilities is addressed in USMC Technical Instruction TI 5895-45/11.

e. 2M MTR support of systems and equipment at Naval Computer and Telecommunications shore commands is addressed in NAVNETSPAOPSCOMINST 4790.1.

f. 2M MTR support of U.S. Coast Guard systems and equipment is addressed in Commandant Instruction 4790.2B.

g. 2M MTR support of U.S. Air Force and Air National Guard systems and equipment is addressed in Air Force Instruction 21-123 with Air Mobility Command Supplement 1.

4. Background. Since the 1970s the USN has relied on 2M Repair-trained and -certified technicians onboard ships and at shore commands to repair circuit card assemblies (CCAs) and electronic modules (EMs). These repairs have reduced system Total Ownership Costs (TOC) and enhanced ship readiness and sustainability. In FY 2008, Commander, U.S. Fleet Forces Command and Commander, Pacific Fleet N41/N43 approved a joint initiative called 2M Progressive Repair Enhancement Program (2M PREP), which has increased utilization of fleet 2M MTR capabilities.

a. The Navy's 2M repair capabilities have continuously evolved to support new technology and have expanded in scope to

include computer-aided test/diagnostic capabilities and piece parts used to support 2M repairs. The NAVSEA 2M MTR Program in its present form was established in 1992 as a result of organizational changes in NAVSEA and a Chief of Naval Operations (CNO)-directed consolidation of 2M repair responsibilities in NAVSEASYSKOM (NAVSEA) and NAVAIRSYSKOM (NAVAIR). A CNO-chartered Quality Management Board (QMB) action item in 1992 resulted in NAVSEA's assuming Navywide technical and Integrated Logistics Support (ILS) responsibilities for 2M repair equipment, associated tools, material, and 2M repair processes.

b. Initially the NAVSEA 2M MTR Program only supported outfitting of commands that performed Organizational (O)-level and Intermediate (I)-level maintenance. Currently the NAVSEA 2M MTR Program responsibility is to outfit and sustain approximately 240 ships and shore commands including some I-level shore maintenance activities that are now organizationally part of Naval Shipyards. Outfitting is performed by the program's two Engineering Agents--Naval Surface Warfare Center (NSWC) Crane Division and Naval Undersea Warfare Center (NUWC) Detachment Field Engineering Office (FEO) Norfolk--and includes 2M repair equipment, associated tools, microscopes, Electro Static Discharge (ESD) prevention material and equipment, special purpose test systems, Gold Disk test/diagnostic procedures, 2M repair procedures, repair piece parts and their Allowance Parts Lists, and 2M MTR equipment ILS.

c. The NAVSEA 2M MTR Engineering Agents have also been tasked and funded to outfit other SYSKOMs and supported commands of other Services. Since 1993, utilization of the NAVSEA-developed 2M MTR Program capabilities has expanded throughout the Department of Defense (DoD), U.S. Coast Guard, and numerous allied countries. This expansion was facilitated by shared tasking of the two NAVSEA 2M MTR Program Engineering Agents for development, selection, and acquisition of standard 2M MTR equipment and ILS, standard test/diagnostic software, 2M repair procedures, and 2M MTR certification and reporting procedures. Funding for outfitting of NAVAIR-cognizant Aviation Maintenance shops and work centers afloat and ashore with 2M MTR equipment is the responsibility of NAVAIR (PMA 260). Funding for outfitting of USMC Ground units with 2M MTR equipment is the responsibility of MARCORSYSKOM (CESS-TMDE). Likewise, the U.S. Air Force, U.S. Army, and U.S. Coast Guard have responsibility for funding outfitting of their commands using 2M MTR equipment provided by the NAVSEA 2M MTR Engineering Agents.

5. Responsibilities. References (a) and (b) designate NAVSEASYSKOM as the Program Manager for the 2M MTR Program.

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NAVSEASYSKOM has delegated the responsibility for program management, policy formulation, and executive oversight for the 2M MTR Program to the NAVSEA Deputy Commander, Logistics, Maintenance, and Industrial Operations (NAVSEA 04).

a. 2M MTR Program Manager (NAVSEA 04RM31)

(1) Provide technical direction; implement the 2M MTR Program by providing guidance, program policies, and procedures; and assign responsibilities to ensure optimal use of program resources. Enhance program capabilities to improve fleet readiness and sustainability and to reduce Total Ownership Costs (TOC) of ships, systems, and equipment.

(2) For ships and shore commands outfitted and supported by the NAVSEA 2M MTR Program, coordinate the requirements, development, acquisition, and distribution of 2M MTR equipment and related ILS, associated test/diagnostic/repair procedures, and piece-part allowances based on fleet requirements and priorities.

(3) Task and fund 2M MTR Program functions assigned to NAVSEA and Naval Supply Systems Command (NAVSUP) field activities.

(4) In accordance with responsibilities in references (a) and (c), establish and maintain 2M MTR instructor, inspector, technician, and facility certification procedures, as given in reference (d). Represent the SYSCOMs as the technical advisor for the 2M MTR Program Navy Enlisted Classification (NEC) Codes.

(5) Coordinate with ship and system acquisition and in-service support programs by reviewing and analyzing program maintenance, supportability, and logistics planning documents for the use of fleet 2M MTR capabilities at the lowest practical level. When feasible and cost-effective, assist NAVSEA and other Navy SYSCOM Program Managers and Program Executive Officers (PEOs) in developing and revising maintenance concepts and documentation to facilitate use of existing and planned O/I-level 2M MTR capabilities.

(6) Provide Acquisition and Life-Cycle Program Managers with information on current and planned 2M MTR equipment capabilities and assist new ship programs authorized to use onboard 2M MTR capabilities with space arrangement designs and lists of material requirements for 2M MTR shops and work centers.

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(7) Establish, collect, and validate 2M MTR performance measures including Module Test and Repair Tracking System (MTRTS) data. Disseminate pertinent MTRTS data to resource sponsors, the fleet, Type Commanders (TYCOMs), and other Immediate Superiors-In-Command.

(8) Coordinate proposed significant changes in O/I-level 2M MTR capabilities and workload with U.S. Fleet Forces Command N43, NAVSEA 04X, COMNRMCMC, and the NAVSEA 2M MTR Program Resource Sponsor (OPNAV N431).

(9) Coordinate the monthly Chief of Naval Operations (CNO) Gold Disk award responsibilities cited in reference (a).

b. Program Executive Officers; Ship Program Managers; and SYSCOM Ship, System, and Equipment Acquisition Managers, Product Support Managers and ILS Managers

(1) Per references (a) and (b), coordinate with the NAVSEA 2M MTR Program Manager to discuss supportability and maintenance planning for newly authorized ship classes and ship-board and shore-based systems and equipment containing electrical and electronic circuitry. To the maximum extent feasible, incorporate O/I-level 2M MTR capabilities into ILS planning and into system and ship class maintenance and supportability plans. Reference (a), paragraph 4.d(5), states that ships are to be "as self-sufficient in accomplishing maintenance as practical" and that maintenance programs shall utilize "reliable on-site or on-board technical decision-making support programs such as the Miniature/Microminiature (2M) Module Test and Repair (MTR) Program."

(2) Determine the need to have test and repair analyses done by 2M MTR Program In-Service Engineering Agents (ISEAs) on systems and equipment with CCA/EMs or other electronic circuitry. Ensure that level of repair and supportability analyses planned for new or modified systems do not include costs to outfit and train existing O/I-level 2M MTR capabilities and personnel.

(3) Ensure that effective depot planning is conducted on new systems/equipment and that the progressive maintenance concept addressed in reference (e) is applied to CCA/EMs that can be supported with fleet O/I-level 2M MTR capabilities. Supportability and repair analyses for new or modified systems shall address use of O/I-level 2M MTR capabilities. Operational Target (OPTAR) cost avoidance and other benefits from use of 2M MTR Program capabilities--including potential reductions in deployed and wholesale CCA/EM spares, reductions in Technical Assist

Visits, and mitigation of risks associated with Diminishing Manufacturing Sources and Material Shortages (DMSMS)--shall be factored into analyses. Ensure that Performance-Based Logistics (PBL) contracts and other support contracts being considered for interim support and depot support of CCA/EMs are structured to allow progressive repair and effective use of existing and future O/I-level 2M MTR capabilities. Access to contractor and organic depot piece parts by O/I-level 2M MTR work centers and shops should be addressed in PBL and other depot contracts for repair of CCA/EMs.

(4) When economically and technically feasible, include requirements in ship, system, and equipment acquisition contracts for CCA/EM schematics, assembly drawings, and piece-parts data, which are required for development of Gold Disk diagnostic procedures. Prior to designation of new CCA/EMs as consumables, request a test/reparability analysis by 2M MTR Program personnel. If feasible and cost effective, fund the 2M MTR Program for development of Gold Disk diagnostic procedures and designate the planned new consumables as fleet reparable. High-cost and/or high-failure consumable CCA/EMs installed in in-service systems and equipment should also be reviewed for Gold Disk development.

(5) Coordinate funding requirements with the 2M MTR Program Manager for Gold Disk procedure development and other test/diagnostic/repair procedures that will utilize O/I-level 2M MTR capabilities. Coordinate expected O/I-level 2M MTR workload impacts with the 2M MTR Program Manager, Type Commanders (TYCOMs), and other fleet Immediate Superiors-In-Command impacted by increased workload.

(6) Provide the 2M MTR Program Manager with information on planned Ship Alterations and ship space arrangement modifications that will impact existing 2M MTR work centers.

c. U. S. Fleet Forces Command (N43)

(1) Operationally administer the 2M MTR Program in accordance with policy and responsibilities of references (a), (b), and (c) and this instruction.

(2) Provide NAVSEA with pertinent information on reorganizations, establishment and disestablishment of subordinate shore maintenance sites, authorized 2M MTR capabilities, and proposed changes to the 2M MTR Chapter in Volume VI of reference (c).

(3) Provide policy and guidance to promote effective use of fleet and supporting shore command 2M MTR capabilities.

(4) Establish and resource Atlantic and Pacific Fleet 2M MTR Fleet Coordinators and 2M MTR Inspectors in Fleet concentration areas to inspect and certify NAVSEA-supported ship and shore activity 2M MTR work centers/shops and to certify technicians per reference (d). Ensure that 2M MTR Fleet Coordinators and Inspectors are either military personnel with NEC Code 9503 or civilian government employees who have completed all training requirements for NEC Code 9503.

(5) Provide direction and guidance to ensure that certified technicians, work centers/shops, and procedures are established for repairing CCAs and EMs, using reference (d) for certification and site review procedures and reference (f) for 2M repair procedures and workmanship standards.

d. Type Commanders (TYCOMs) and Immediate Superiors-In-Command (ISICs)

(1) Coordinate and manage the 2M MTR program at subordinate commands in accordance with Volume VI-Chapter 8 of reference (c).

(2) Monitor the effectiveness of the 2M MTR Program at subordinate commands and provide recommendations to the NAVSEA 2M MTR Program Manager concerning 2M MTR work center/shop equipment and its logistics support, outfitting requirements, and deployment priorities.

(3) Provide the MTR Engineering Agent (NUWC Detachment FEO Norfolk) with system and CCA/EM nominations for consideration as Gold Disk candidates. Assist in prioritization of Gold Disk Candidate Lists and, when feasible, support NUWC Detachment FEO with access to shipboard CCA/EMs required for Gold Disk development when assets are not available through the normal NAVSUPSYSCOM-supported Gold Disk development process.

(4) Ensure the return of 2M MTR equipment and piece parts from decommissioned ships and deactivated shore commands to 2M MTR Engineering Agents or Fleet Coordinators to facilitate refurbishment and upgrading for reutilization of these assets as required.

e. NSWC Crane [2M] and NUWC Detachment Field Engineering Office (NUWC Det FEO) Norfolk [MTR]

(1) Serve as Technical Direction Agents, Acquisition Engineering Agents, and In-Service Engineering Agents (ISEAs) for 2M MTR Program equipment, providing Integrated Logistics Support (ILS) and responsible for requirements determination to outfit ships and shore maintenance activities, 2M MTR training activities, and inspector recertification sites.

(2) Serve as 2M and MTR Certification Agents and as such, certify 2M MTR Fleet Coordinators, Inspectors, and Instructors per reference (d).

(3) Serve as Training Support Activities and as the Technical Data Managers for 2M MTR equipment and associated ILS.

(4) Assist PEOs and other Navy acquisition and life-cycle support programs with CCA/EM test and repair analyses and provide cost estimates for Gold Disks and other test/repair procedures not funded by the NAVSEA 2M MTR Program. Provide 2M MTR support to other DoD activities, U.S. Coast Guard, and Foreign Military Sales (FMS) requests when funded by the requesting activity. Provide assistance to Navy Technical Authority Warrant Holders in areas where the 2M MTR Engineering Agents are the recognized subject-matter experts.

(5) [NUWC Det FEO] Maintain the MTR Gold Disk Test Routine Development Requirements Manual, reference (g), and the MTR Pinpoint Disk Test Routine Development Requirements Manual, reference (h). Maintain a current, prioritized Gold Disk Candidate List. Coordinate prospective Gold Disk candidate approvals with the parent system/equipment ISEA or designated approval authority. Schedule, oversee, provide technical assistance, and verify Gold Disk development. Return all CCA/EMs utilized for Gold Disk development to their originating command in "A" condition. Distribute Gold Disks to all authorized MTR sites. Evaluate Silver Disks and convert to Gold Disks when feasible. Provide the monthly CNO Gold Disk award information to NAVSEA 04RM31 and OPNAV N431.

(6) [NUWC Det FEO] Concurrent with the release of new Gold Disks to the fleet, provide COMPACFLT N41 a listing of new Gold Disk National Stock Numbers (NSNs) to be incorporated into the 2M PREP trap process. Concurrently, provide these new Gold Disk NSNs to NAVSUP Weapon Systems Support (WSS) in order to have the Service Option Codes and Special Material Identification Code (SMIC) added.

(7) [NUWC Det FEO] Maintain Module Test and Repair Tracking System (MTRTS) software, validate reported MTRTS data,



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and disseminate quarterly MTRTS reports and other requested 2M repair metrics to the fleet, TYCOMs, ISICs, and other appropriate commands.

(8) [NUWC Det FEO] Develop and maintain 2M piece-part allowances (Allowance Parts Lists) for ship classes and shore activities with NAVSEA-supported 2M MTR capabilities. Provide 2M MTR work centers and shops with the capability to cross reference piece parts and track inventory.

(9) [NUWC Det FEO] Establish a Fleet Readiness Action Team (FRAT) to assist fleet 2M MTR technicians in identifying and obtaining 2M MTR piece parts not readily available. Determine interchangeability and source of supply of non-DOD stocked items. Attempt to find alternate sources for CASREP/work stoppages when required piece parts are not in stock or have a long lead-time for delivery. FRAT will make maximum use of 2M MTR piece parts obtained from decommissioned ships in this effort.

(10) [NSWC Crane] Maintain the Standard Maintenance Practices Miniature/Microminiature (2M) Electronic Assembly Repair Manual, reference (f).

(11) [NSWC Crane] Maintain the Certification Manual for the 2M MTR Program, reference (d), and coordinate revisions to the manual with NUWC Det FEO, 2M MTR Instructors and Inspectors, other SYSCOMs, and U.S. Coast Guard 2M MTR points of contact.

(12) [NSWC Crane] Maintain the 2M MTR Program Navy Training System Plan and coordinate revisions to the plan with NUWC Det FEO, 2M MTR Instructors and Inspectors, TYCOMs, other SYSCOMs, and U.S. Coast Guard 2M MTR points of contact.

f. Commander, Navy Regional Maintenance Centers (COMNRMC)

(1) Provide manning to effectively support Fleet CCA/EM workload in NAVSEA 04RM-supported 2M MTR Shops assigned to Navy Regional Maintenance Centers (RMCs).

(2) Ensure that personnel assigned to RMC 2M MTR Shops for CCA/EM repair are military technicians with NEC Code 1591 or government employees meeting certification requirements of reference (d).

g. Naval Supply Systems Command (NAVSUP 04) and Naval Supply Systems Command Weapon Systems Support (NAVSUP WSS)

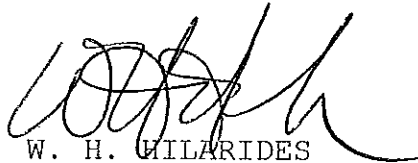
(1) [NAVSUP 04] Ensure that revisions to Afloat and Ashore Supply Procedures (NAVSUP P-485), reference (i), addressing existing 2M MTR policy and procedures are coordinated with the NAVSEA 2M MTR Program Manager.

(2) [NAVSUP 04] Ensure that any revisions to the Navy Uniform Source, Maintenance, and Recoverability (SM&R) Codes Instruction, reference (e), impacting the NAVSUP policy on progressive repair and the Gold Disk repair capability service option code are coordinated with the NAVSEA 2M MTR Program Manager.

(3) [NAVSUP WSS Mechanicsburg] Assist the NAVSEA 2M MTR Program with piece-part APL development for ship classes and shore commands with 2M MTR capabilities.

(4) [NAVSUP WSS Mechanicsburg] Assist the NAVSEA 2M MTR Program with selection of Gold Disk candidates and development of Gold Disks by providing CCA/EM requisition and CASREP data and by providing CCA/EMs for Gold Disk development when available.

(5) [NAVSUP WSS Mechanicsburg] Add R Codes to Service Option Codes and add Special Material Identification Code (SMIC) GL for CCA/EMs with Gold Disk procedures identified by NUWC Det FEO Norfolk.



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