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MCO 3311.1
C2T
3 Apr 92

MARINE CORPS ORDER 3311.1

From: Commandant of the Marine Corps
To: Distribution List

Subj: MATERIEL FIELDING PLAN FOR THE TACTICAL AIR OPERATIONS
MODULE (TAOM), AN/TYQ-23(V)1

Ref: (a) MCO P5000.10
(b) MCO P4105.3

Encl: (1) Materiel Fielding Plan for the Tactical Air
Operations Module (TAOM), AN/TYQ-23(V)1

1. Purpose. The purpose of this Order is to provide field commanders with information and instructions concerning the fielding of the Tactical Air Operations Module (TAOM), AN/TYQ-23(V)1. The format and content of the Materiel Fielding Plan (MFP) are per references (a) and (b).

2. Information. This MFP provides an overview of the TAOM's operating capabilities; an equipment description; a schedule for deliveries; and a description of how it will be sustained throughout the life cycle. In addition, information is provided to facilitate planning and budgeting for the TAOM's impact on Operations and Maintenance Marine Corps (O&MMC) budget submissions. The TAOM's will be assigned to the Marine Air Control Squadrons (MACS), and, with personnel, support equipment, communications and radar equipment, will function as the Tactical Air Operations Center (TAOC) for Marine Air-Ground Task Forces (MAGTF). The TAOM will replace the Tactical Air Operations Central, AN/TYQ-2, and the Tactical Data Communications Central (TDCC), AN/TYQ-3A, within the MACS.

3. Action. Action required by major commands and receiving units is listed in the enclosure.

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4. Reserve Applicability. This Order is applicable to the
Marine Corps Reserve.

R.A.T.I.E.

R. A. TIEBOUT
By direction

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MATERIEL FIELDING PLAN
FOR THE TACTICAL AIR OPERATIONS MODULE (TAOM), AN/TYQ-23(V)1

1. Introduction

a. Source of Requirement. The statement of requirement for the TAOM is described in Required Operational Capability (ROC) CCC 1.28C of 9 February 1987. The TAOM is being fielded to enable effective command and control of tactical air operations for a Marine Air-Ground Task Force (MAGTF) during the 1990-2005 time period. The avalanche of technological advancements in airborne weapon systems, and the potential threats ensuing from hostile forces in possession of such systems during that time-frame, have mandated changes to tactical system concepts and evolving equipment within the Marine Corps. An operational need of the tactical commander to conduct command and control of tactical air operations in a specific timeframe requires a system capable of operating in an environment significantly more complex than that which existed in past conflicts.

b. Points of Contact

<u>Position</u>	<u>Name</u>	<u>CODE/ TELEPHONE</u>
Deputy Program Manager (DPM)	Col R. F. Gibson	COMMARCORSYSCOM (C2T) (703) 602-8987-9 DSN 332-8987-9
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c. Fielding Methodology

(1) General Fielding Plan. The TAOM will be fielded horizontally within the Marine Aircraft Wings and designated supporting organizations within the Marine Corps. The specific fielding schedule is provided in appendix A.

(2) Method of Fielding. The TAOM will be automatically distributed to field units (see appendix B). Selected support items will also be automatically distributed on an in-stores basis, while technical manuals and initial operating spares (IOS) will be shipped out of stores with the TAOM's prior to establishing the initial issue provisioning

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list. New Table of Equipment (T/E) items for which the unit is responsible will be requisitioned by the using units.

(3) Logistics Assistance During Fielding. The Commander, Marine Corps Systems Command (COMMARCORSSYSCOM (C2T)) will prepare an AN/TYQ-23(V)1 Phase-in Plan. The Commander, Marine Corps Logistics Bases (COMMARCORLOGBASES) will prepare an AN/TYQ-2 and AN/TYQ-3A Phase-out Plan. The plans will specify tasks to be performed, when they are to be completed, responsibilities, time periods for removal and retrograde of the replaced systems, and emplacement of the TAOM's being fielded at the Marine Air Control Squadron (MACS).

d. Replaced Systems Equipment. The TAOM will replace the Tactical Air Operations Central (TAOC), AN/TYQ-2, in its entirety; that portion of the Tactical Data Communications Central, AN/TYQ-3A assets allocated to equip the TAOC; and other related equipment. The following is a listing of items being replaced, which includes Table of Authorized Materiel Control Numbers (TAMCN) and National Stock Numbers (NSN):

(1) AN/TYQ-2 (by major component) and AN/TYQ-3A

<u>TAMCN</u>	<u>Nomenclature/Model No.</u>	<u>NSN</u>
A0235	Central Computer Group, AN/TYA-5	5840-00-884-1776
A0293	Communications Group, AN/TYA-12	5895-00-900-7892
A0552	Distribution Box, J-2573/TYQ-2	5895-00-884-2244
A0880	Interrogator Processor Evaluator, CP-1186/TYQ-2	5895-01-014-3052
A0888	Maintenance Group, AN/TYQ-TYA-27	5895-00-884-1179
A1117	Operations Group, AN/TYA-9A	5895-00-900-7893
A1375	Radar Processor Group (3-D), AN/TYA-18	5895-00-999-6956
A2382	Signal Data Converter, CV-1927/TYA	5895-00-999-6958
A2472	Supervisory Operator Group, AN/TYA-9B	5895-01-050-7965
A2530	Tactical Air Operations Central, AN/TYQ-2	5895-00-860-3535
A3243	Unit Test Group, AN/TYA-23	4940-00-884-1773
A2540	Tactical Data Communications Central, AN/TYQ-3A	5895-01-073-2434

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(2) Other Related Equipment to be Replaced

<u>TAMCN</u>	<u>Nomenclature/Model No.</u>	<u>NSN</u>
A0280	Communications Control Group, AN/TYA-11	5995-00-789-0676
A0886	Maintenance Transport Group, AN/TYA-24	4940-00-999-6952
A0902	Maintenance Kit, MK-2580/TYQ-3A	5895-01-262-2815
A1275	Program Entry Device, MV-848/PSC-2	5895-01-146-6738
A1380	Radar Relay Set, AN/TXQ-3	5840-00-124-9321
A0625	Data Link Emulator Unit, SM-822/GYQ	5895-01-164-6640

2. System Description

a. General. The TAOM is an integrated grouping of equipment mounted in an International Organization for Standardization (ISO) standard 8-foot by 8-foot by 20-foot shelter which, along with associated communications and radar equipment, provides five basic functions: communications; data processing; video display and controls; recording; and radar. These functions provide the capability of performing data exchange and processing, real-time display, automated target tracking, and automated air defense and air control.

b. TAOC Sybsystems. The TAOC system may be divided into six subsystems:

Required Subsystems: Prime Power
Tactical Air Operations Module
Radar

Operational Subsystems: Transportation Vehicle
External Communications
Antenna

(1) Prime Power Subsystem. The TAOC's prime power subsystems supplies each TAOM with the AC power necessary to perform its mission. AC prime power is provided from a mobile electric power generating system (MEPGS), commercial sources, or shipboard sources. The MEPGS is a tactical generator which accompanies the TAOM in the field. The TAOM will accept 120/208 VAC ($\pm 12\%$), 50-60 Hz ($\pm 10\%$) 4-wire Wye connected 3-phase. Shipboard power is converted from 440 VAC ($\pm 12\%$), 50-60 Hz ($\pm 10\%$) Delta connected 3-phase into 120/208 VAC, 3-phase, Wye power required by the TAOM. This conversion is accomplished through the Delta-Wye step-down transformer external to the TAOM shelter.

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(2) Tactical Air Operations Module Subsystem. All TAOM's are functionally and physically identical, with a stand-alone capability of performing all TAOC functions. As additional TAOM's are connected and manned, functional capacities except for simulation (SIM) and computer-aided instruction (CAI), will increase. Each TAOM (not including environmental control units (ECU) and chemical, biological, and radiological (CBR) components) weighs 17,500 pounds maximum, has external dimensions of 8-feet by 8-feet by 20-feet, and requires less than 30K watts of electrical power. The TAOM is housed in a standard, rigid electromagnetic interference (EMI) -protected shelter with a flush external surface to facilitate transport configuration. The shelter is equipped with lifting devices that conform with ISO specification. The major units within the TAOM subsystem are as follows:

(a) Computer Unit (CU). Two identical CU's are contained in each TAOM. The CU is the main data processing element used in the TAOM system. Each CU consists of a modified AN/AYK-14 computer and a Bus Interface Controller (BIC). Each AN/AYK-14 has 1024K words (16 bits per word) of volatile or nonvolatile local memory. Two CU's per TAOM are minimally required. When operating in the single TAOM configuration, the TAOM is capable of operating with a third CU installed in the space normally occupied by one of the high frequency (HF) radios. Loss of the third CU will not affect operations.

(b) Mass Memory Unit (MMU). The MMU provides the storage of all application programs, data bases, and other data not practical to be stored in the CU. The MMU consists of a Bus Protocol Controller (BPC) for Digital Data Base (DDB) interface, control and management electronics, and a capacity for up to 6 megabytes of random access semiconductor memory. A "keep-alive" universal power source battery is used to sustain the MMU memory [minimum 75hrs] when power is lost or turned off.

(c) Operator Console Unit (OCU). The OCU provides operator personnel with the interface to the TAOM system. Four OCU's are contained in each TAOM and are identical in size and functions. The OCU consists of graphic displays, auxiliary displays, system access controls, and display access controls. Each OCU contains the analog and digital circuitry, power supplies, controls, and display devices required by the operators to perform their tasks.

(d) Printer Unit (PRU). The PRU is a small, lightweight, high speed, thermal printer. There is one PRU per TAOM comprised of two separate, collocated assemblies: a printer and a BIC for interface to the DDB. The PRU BIC receives data to be printed from the DDB in serial form,

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converts the data to parallel form, and transfers it to the printer. The printer provides hard copy information of any desired data directed by the operator at the OCU.

(e) Radar Interface Unit (RIU). The RIU provides interfaces for access to four local radar sets, two of which can be radio remote radars via the Digital Communications Unit (DCU) of the TAOM. The RIU receives digitized radar video (local radars only) and digital data from the radars. The digitized radar video is extracted by the RIU and routed to the OCU's for display along with sweep and timing data. The RIU receives, converts, and distributes digital data for up to three radar sets to the CU via the DDB. The RIU sends CU command messages to the radar sets for status requests, Mode IV requests, and emission control (EMCON). Upon CU control, the RIU also provides simulated video to the OCU's within its TAOM as part of the TAOC training requirements.

(f) Digital Communications Unit (DCU). The DCU provides the necessary buffering, formatting, modems, and cryptographic device interfaces required to communicate between various external tactical data links and the CU.

(g) Voice Communications Access Unit (VCAU). The VCAU provides OCU operators with access to all voice (internal and external) elements of the communications system. Connections for two headset assemblies and a manual foot-switch assembly are provided. The unit can be operated in one of three modes (internal, external, or both), where "hot mike" is available for internal operations.

(h) Power Distribution Control Unit (PDCU). The PDCU converts input AC power into sources of voltage needed within the TAOM.

(i) Communications Interface Unit (CIU). The CIU provides the switching required to connect the various TAOM communications units (VCAU, DCU, internal radio equipment (IRE), and cryptographic devices) in the proper combination and with communications units external to the TAOM (data links, radios, multichannel radios, and wire lines). The use of digitized audio and time-division multiplexing of external audio channels enables a straightforward interface to the serial bus interface between TAOM's, providing total distribution of audio channels to each TAOM of the TAOC.

(j) Internal Radio Equipment (IRE). The IRE provides the TAOM with radio equipment for both voice and data communications. Each radio is connected to voice and/or

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data channels via the CIU. The radio equipment consists of Ultra High Frequency (UHF), Very High Frequency (VHF), and HF radio groups.

(k) Radar Data Bus (RDB). Radar data and a radar voice channel between a local radar and an assigned TAOM, and radar data between TAOM's, are transmitted over an RDB which uses fiber optic cable as a transmission medium. An individual RDB is provided for each local radar. The RDB interfaces with the TAOM through the radar Fiber Optics Interface Panel (FOIP) which is located in the TAOM shelter wall. The radar FOIP consists of external connectors, distribution couplers, and an electro-optical converter which contains internal cable connections and controls and indicators.

(l) Digital Data Bus (DDB)/Voice Control Bus (VCB). Digital data are transmitted within and between TAOM's over one of two independent and redundant DDB's. Digitized voice signals are transmitted between the CIU's of the TAOM's over one of two independent and redundant VCB's. These buses use fiber optic cable for this transmission between TAOM's and metallic conductor cable within the TAOM. The DDB/VCB's interface with the TAOM through the DDB/VCB FOIP which is located in the shelter wall. The DDB/VCB FOIP consists of external connectors and controls, distribution couplers, and an electro-optical converter which contains internal cable connections and controls and indicators. An exchange assembly provides DDB/VCB interface between internal TAOM elements.

(m) Cryptographic Devices. Each TAOM includes provisions for the electrical and mechanical installation of cryptographic devices.

(n) Recorder/Reproducer Unit (R/RU). The R/RU provides the capability to record audio signals from any VCAU within the TAOM as selected by the operator at the CIU. The R/RU allows the simultaneous recording of four channels for 24 hours without changing tapes. The R/RU also provides a fifth channel that records time and permits correlation of recorded events with the time they occurred.

(o) Environmental Control Unit (ECU). Cooling and heating are provided by two 5-ton, Government furnished, standard air conditioning and heating devices. The ECU's are external to the TAOM with controls and thermostats installed inside the TAOM. One ECU is used to heat or cool the air internal to the TAOM to a desired predetermined range and circulate the conditioned air to provide personnel with a stable environment. The second ECU is used under extreme temperature conditions or when CBR equipment is operating.

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(p) Disk Memory Unit (DMU). A DMU, including power and MMU interfaces, is provided to allow for loading the operational program into the MMU.

(q) Cable Set. The TAOM cabling consists of three cable sets which provide all wire and fiber optic cabling required to interconnect the TAOM. Cables used externally to the TAOM are TAOM to prime power - 50 meters (two 25 meter cables); TAOM to TAOM fiber optic cables - 500 meters; and TAOM to local Radar/IFF set - 2 kilometers.

(3) Radar Subsystem. The radar subsystem for the TAOC consists of one AN/TPS-59 and two AN/TPS-63 radars. All radars are unit T/E items modified to interface with the TAOM. This modification consists of the installation of a TAOM Interface Group (TIG) within each radar set. The TIG's for each specific radar set differ mechanically but are functionally identical. Each TIG consists of a TAOM Interface Unit (TIU), a VCAU, and a Radar Electro-Optical Converter (REOC) and has provisions for cryptographic devices.

(4) Transportation Vehicle Subsystem. TAOM's and accompanying pallets are capable of being transported by helicopter, fixed-wing aircraft, truck, mobilizer, trailer, railroad, landing craft, barge or ship. No transportation assets are dedicated to the TAOM, however then following equipment is organic to the Marine Corps.

- (a) CH-53E aircraft
- (b) C-130 aircraft
- (c) MK48/14 "Dragon Wagon"
- (d) Lightweight Amphibious Container Handler (LACH)
- (e) 25-ton Rough Terrain Cargo Handler (RTCH)
- (f) Mobilizer, XM1022 NSN 2330-01-167-7262

(5) External Communications Subsystem. The external communications subsystem provides each TAOM with the capability to connect up to 12 radios, telephone lines, and/or wire lines externally. The external communications consist of, but are not limited to, switchboards, multichannel radios, individual tactical radios, and point-to-point wire lines. The external connections are provided at the Communications Demarcation Panel (CDP) of the CIU. These connections consist of three 26-pair hermaphrodite connectors.

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(6) Antenna Subsystem. The antennas are capable of being mounted on the TAOM roof (except for the HF sloping dipole antennas) or ground-mounted remotely from the TAOM. Except for full HF operations, special siting of antennas is not required. For full HF operations, antennas shall be separated by 390 feet (+/- 10 feet) using the 200 foot cables provided. These antenna subsystems are a functional part of the IRE.

c. Administrative Information

- (1) Nomenclature: Tactical Air Operations Module
- (2) TAMCN: A2525
- (3) ID NO: 08565A
- (4) NSN: 5895-01-127-8134
- (5) JETDS Nomenclature: AN/TYQ-23(V)1
- (6) Manufacturer: Litton Data Systems Division
- (7) Manufacturer's CAGE Code: 13973
- (8) Stores Account Code (SAC): 3
- (9) Management Echelon Code: 43
- (10) Controlled Item: yes
- (11) Recoverability: fifth echelon
- (12) Unit of Issue: ea
- (13) Unit Standard Package: 1 ea (Module)
- (14) Unit Cost: \$6.1 million
- (15) Standardization: yes
- (16) Combat/Mission Essential: yes
- (17) Combat Active Replacement Factor: N/A
- (18) Support Cost: To be provided later.
- (19) Petroleum, Oil, and Lubricants: N/A
- (20) Equipment Density: Critical Low Density

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(21) Readiness Reporting: yes

d. Physical Characteristics

(1) Shelter

- (a) Height: 96 in
- (b) Width: 96 in
- (c) Length: 240 in
- (d) Square: 160 sq ft
- (e) Cube: 1280 cu ft
- (f) Weight: 16,500 lbs in transport
configuration
- (g) Stowage: (square only)

(2) Pallet

- (a) Height: 72 in
- (b) Width: 84 in
- (c) Length: 144 in
- (d) Square: 84 sq ft
- (e) Cube: 504 cu ft
- (f) Weight: 6,800 lbs in transport
configuration
- (g) Stowage: (square only)

(3) Power Requirements (including ECU)

- (a) Volts: 120/208 VAC " 12%
- (b) Frequency: 50-60 Hz
- (c) Phase: 3
- (d) Watts: 60 kW

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(4) Environmental Requirements: Two vertical 5-ton ECU's for each shelter (TAMCN B0007).

e. Operational Characteristics. The TAOM's assigned to MACS's, when configured with radar, communications, and support equipment, and provided with personnel, will function as a TAOC for MAGTF's up to Marine Expeditionary Force (MEF) size. The TAOC may vary from one to four TAOM's; however, five TAOM's may be interconnected should the additional capacity be required. All TAOM's are identical physically and functionally, thus enabling the center to function while TAOM's are being displaced. It is designed for ease of emplacement and emphasizes reliability, maintainability, and simplicity. It is capable of operating throughout the range of climatic conditions (temperature, humidity, moisture, wind and dust) associated with amphibious operations. Moreover, it is designed for movement to and within the amphibious objective area via ship, fixed- and rotary-wing aircraft, amphibious landing craft/vehicles, and ground vehicles. Its physical integrity guards against the shocks associated with handling aboard ship, movement ashore, and displacement.

f. Associated Systems/Equipment

<u>Item</u>	<u>TAMCN</u>
Environmental Control Unit	B0007
Mobile Electric Power Generating System	(60 kW required)

3. Logistics Support

a. Maintenance Support

(1) Maintenance Concept. The maintenance concept for the TAOM was formulated with emphasis upon two key elements of the Marine Corps' maintenance policy:

(a) Maintenance will be accomplished at the lowest level and as far forward in the battle area as possible.

(b) The TAOM system will employ standardization and modular design to simplify and enhance maintenance efficiency and operational readiness.

(2) Maintenance Policy Implementation. To implement this maintenance policy, the TAOM is designed with built-in test (BIT) routines and visual indications to enable the operator to locate, remove and replace faulty Lowest Replaceable Items (LRI). The need for repairers or technicians at the organizational level of maintenance is reduced since the operator is classified as an operator/maintainer. The use of

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multiple identical units with built-in redundancy, and the elimination of organizational maintenance technicians, also results in the reduction of repairers and technicians for the TAOM.

(3) Organizational Level Maintenance. Organizational level maintenance will be performed by the system operators using the skills that are associated with their duties as operators. They will locate, remove, and replace faulty LRI's as indicated by the BIT routines incorporated in the operating software, the visual indicators on faulty LRI's, and the degradation in the operating performance of the TAOM. Upon occurrence of a failure, operators will restore a TAOM to its operating condition in less than 15 minutes mean time to repair (MTTR) and not exceeding a maximum time to repair (Max) of 30 minutes at the 95th percentile. This includes recognition and verification of a failure (including loading of diagnostics); isolation to the faulty LRI; removal/replacement of the faulty item from on-site spares; verification of proper operation; and unit reinitialization/software reconfiguration to achieve full operability. Operator personnel will not be required to use special tools or test equipment to perform organizational maintenance, nor will operators perform equipment critical alignments and adjustments.

(4) Intermediate Level Maintenance. Intermediate level maintenance procedures are based on a maintenance concept that fault isolation to the Lowest Replaceable Item (LRI) will be accomplished at the organizational or Intermediate level and repair of that LRI would be accomplished at a depot facility. The COMMARCORLOGBASES (Code 843) will coordinate shipment of LRIs to and from the depot facilities. Depot repair of the LRIs will occur at the US Air Force SN/ACL facility, Sacramento, CA. Therefore, Intermediate Level Maintenance will consist of those procedures that are identified in the appropriate Technical Manuals as performable at the intermediate level with the use of the Built in Test (BIT)/Performance Monitor (PERM) Test and a Volt/Ohm Meter. No other Test Measurement and Diagnostic Equipment (TMDE) is required. Marine Corps Automated Test Equipment System (MCATES) will be available in the Marine Air Control Squadron (MACS) when the MCATES System is fielded. When fielded, MCATES will permit some intermediate level TAOM module repair by the maintenance section at the MACS.

(5) Depot Level Maintenance. The depth of maintenance includes all repair, major overhaul, and rebuild of items that are economical to repair or rebuild. Automatic digital and analog test equipments will be utilized in fault detection, isolation, and verification of repair. Depot level hardware maintenance on all TAOM's will be performed by the Air Force,

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except for those Government furnished materiel (GFM) components for which depot facilities have already been assigned. The COMMARCORLOGBASES will evaluate Quality Deficiency Reports (QDR) originating from field activities and will provide a recommended correction as appropriate.

b. Contractor Support Requirements

(1) Contractor Engineering Services. Engineering Services will be performed by personnel of the prime contractor or subcontractors per MCO P12306.1. Contractor engineering and technical services (CETS) may include advice, instruction, and training of Marine Corps personnel in the installation, operation, and maintenance of the TAOM's and TIG's. CETS personnel will be provided (one person) for a period of 1 year after Government acceptance of the system at each MACS and the Marine Corps Communication-Electronics School (MCCES). At Marine Corps Tactical System Support Activity (MCTSSA), the CETS will consist of two individuals, one experienced with the system hardware (HW) and one experienced with system software (SW) and firmware (FW). Need for additional CETS for out years will be identified by using units per current policy and procedures.

c. Manpower, Personnel, and Training

(1) Personnel Requirements.

(a) General. Since the MACS is authorized to perform both organizational and intermediate levels of maintenance on the TAOM, all operator and maintenance personnel for the TAOM will be assigned to the squadron. There is a net increase of 7 officers (all in operations) and a net decrease of 26 enlisted (increase of 2 in operations and decrease of 28 in maintenance) associated with the TAOM at each MACS. Table 1 shows new personnel figures by grade and Military Occupational Specialty (MOS) of personnel relating directly to the operation and maintenance of the TAOM's. The operator MOS's will increase in scope to accommodate the expansion of organizational maintenance responsibilities.

(b) Support Personnel. It is anticipated that the introduction of the TAOM will not have significant effect on the numbers and qualifications of other support personnel. There will be a gradual decrease in Marine Corps depot workload as the TAOM is phased in and the AN/TYQ-2, AN/TYQ-3A, and related equipment are phased out due to assumption of depot maintenance by the Air Force. The operational and field test personnel are expected to be provided by MACS-1, which participated in operational testing of the engineering and manufacturing development (E&MD) TAOM.

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(2) Training Requirements

(a) Contractor Training Courses. Factory training will consist of two operator/on-equipment courses and two maintenance courses. The first of each will be conducted at the contractor's manufacturing facility, and the second will be conducted at MCCES, Twentynine Palms, CA. Each operator course will have an estimated length of 10 weeks and will accommodate 20 students. Each maintenance course will have an estimated length of 12 weeks and accommodate 15 students. Instructors from MCCES will attend the first factory training course along with personnel from the unit scheduled to receive the first TAOM's. In addition, the contractor will conduct an Operational Familiarization course at each receiving unit site. This course will be 2 weeks long and will cover System Configuration, Data Base Build, System Emplacement and Scenario training. This course will be taught during system delivery/acceptance and attendees will be designated by the owning unit Commander.

Table 1. Number of Personnel By MOS and Rank/Grade

	<u>Operations MOS</u>			<u>Maintenance MOS</u>					<u>Total</u>
	7210	7234	7236	5970	5963	5964	5978	5979	
Maj	1								1
Capt	5								5
Lt	13								13
WO	-			1					1
Total Off.	19			1					20
Change	+7			-					+7
MGySgt			1						1
MSgt		-	3				-	1	4
GySgt		3	3				-	1	7
SSgt		3	6				-	2	11
Sgt		3	9		1	-			13
Cpl		6			2	-			8
L/Cpl		12			3	-			15
PFC		-							-
Total Enl		27	22		6	-	-	4	59
Change		-6	+8		-11	-6	-3	-4	-22

NOTE: The table excludes non-operator and non-maintenance personnel.

MOS Legend:

7210 Air Defense Control Officer
 7234 Air Command and Control Electronics Operator
 7236 Tactical Air Defense Controller
 5970 Data Systems Maintenance Officer

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5963 Tactical Air Operations Central Repairer
5964 Tactical Data Communications Central Repairer
5978 Tactical Data Communications Central Technician
5979 Tactical Air Operations Central Technician

(b) Marine Corps Formal Schools Training. Marine Corps Formal Schools Training will be conducted at MCCES. Formal School Training will include both entry level and Fleet Marine Force (FMF) conversion training for both operators/maintainers and repairers/technicians. Courses will be taught using operational TAOM's and operator, repair, and technician courses. The instructors for the courses will have been trained during the factory training courses and will have the training materials and training equipment available for use. In addition, the capability for limited scenario generation is resident within the TAOM, and may be used to stimulate external message generation and rudimentary instructor controlled, tactical situations. The TAOM will replace both the AN/TYQ-2 and AN/TYQ-3A within each MACS. The AN/TYQ-2 will be phased out of the Marine Corps; however, the AN/TYQ-3A will continue to be used in the Tactical Air Command Center (TACC). This will result in an overall reduction for AN/TYQ-3A training requirements. Since the TAOM maintenance concept requires the operator to assume significantly greater maintenance responsibilities, it is expected that TAOM operator courses will increase in course length. In contrast, due to the expected decrease in the number of maintenance personnel required to support the TAOM, a decrease is expected in class size or the number of annual classes.

(c) Unit Training. Unit training will include conversion training, the on-site familiarization course, and regular squadron training exercises. Conversion training for squadron operator and maintenance personnel will be conducted at MCCES as per the timeline contained in appendix C. This will be an 8 week course of instruction. Funding will be provided by MARCORSYSCOM, Code C2T. Reserve personnel may receive training at either the regular conversion courses or via Mobile Training Course conducted by MCCES training teams. Quota control for conversion course will be handled by HQMC, Code APC.

(d) Software Support Training. Training requirements for software support are identified as follows:

1 Training. The Software Support Activity (SSA), in conjunction with the Developing Activity, will determine the specific amount and type of training required for the SSA to assume responsibility for TAOM. Training topics should include operation of equipment, operation of software, software support issues, configuration control issues, etc.

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During the transition phase, the following technical and programming courses will be required:

- a System Overview and Module Assignments
- b Executive Program Interface
- c Overview of Application Program
- d Configuration Control
- e Compiler Overview
- f In-Plant Simulator Program Structure

and Capabilities

The SSA will be responsible for requesting and participating in the necessary training. If the SSA is also the independent verification and validation agent, substantial training will be realized during the Verification and Validation (V&V) process.

2 Identification of SSA Software Support

Personnel Training. SSA TAOM software support personnel will require appropriate levels of training in the following system interfaces:

- a CMS-2 Computer Programming Language
- b ULTRA-16 Computer Programming Language
- c Assembly Programming Language for TAOM
- d Share/43 Operating System
- e SDEX-M Operating System.
- f Microprocessor Development Systems (MDS)
- g TAOM Console Operations
- h TAOM Computer Unit Training
- i Military Tactical Data Message Format
- j Other training as required

and Processing

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3 Provide TAOM Software Support Training.

Specific tasks associated with providing TAOM user training are the following:

a Conduct training classes

b Create and maintain training lesson plans

(3) Training Support Items. There are no new training support items required.

d. Supply Support

(1) Objective. The objective of supply support is to attain and maintain combat readiness. All spares, repair parts, support and test equipment, and supply support technical assistance to support the TAOM must be available at the appropriate echelons of supply and maintenance when the TAOM becomes operational. Additional stocks must be available through routine replenishment.

(2) Provisioning. Provisioning is the identification, selection, and acquisition of spares and repair parts required for operation during a defined initial period of service. These items are stocked in the supply system and at appropriate maintenance echelons at the beginning of the operational phase of the system life cycle.

(a) Currently, provisioning is being accomplished to the LRI level. Provisioning lists delineated to the piece part level have not been finalized.

(b) IOS and Electronic Warfare (EW) spares identified to the LRI level are to be delivered concurrent with the delivery of each suite of equipment. This ensures that the spares are in place when the system becomes operational. The spares for IIP will be identified on the DD 250 accompanying each suite.

(3) Replenishment. Replenishment is the follow-on support provided to replace and maintain the stocks of spares, repair parts, and consumables required to sustain operations of the system during the operational phase of the TAOM's life cycle. The information obtained from the Logistics Support Analysis (LSA) data base, the provisioning process, and the usage data obtained during development and production testing, provide a basis for replenishment planning. This planning allows for a smooth transition of support from the provisioned stocks to the regular supply system.

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(4) Operational Supply Considerations. The stockage of spares and repair parts is dependent upon the expected failure rate of the LRI or higher assembly; the ability of maintenance personnel (operators or repairers) to fault locate, remove, replace, and verify the repair of the faulty LRI; the ability of units performing these maintenance actions to stock replacement supplies; and the turnaround time between the operational unit and higher level maintenance organizations.

(a) Stockage for the organizational level will be minimized to that considered essential for a 30-day operation for each TAOM. Storage space is provided in the TAOM shelter for only 1.5 cubic feet of consumables, spares, and manuals.

(b) A stockage of Marine Corps-managed spares, repair parts, and secondary reparables for Marine Corps-unique components of the TAOM will be maintained at the depot level with the range and depth necessary to provide support to meet depot repair requirements. Supply support requests for non-Marine Corps managed items will be placed with the appropriate integrated managers for those items.

(c) When planning stockage quantities, considerations must be given to the fact that each MACS is authorized four TAOM's, which are capable of being deployed in one, two, three, and four TAOM configurations.

(5) Transition of Supply Support Responsibility. The contractor is responsible for all supply support for each TAOM until acceptance by the Government. The responsibility for supply support is then assumed by the Government. The provisioned spares will be procured as an option line item under the production contract, but the Government will perform the supply support function. The Air Force will function as the primary inventory control activity (PICA) for all TAOM-unique items which are common to both Marine Corps and Air Force systems. The Marine Corps will function as secondary inventory control activity (SICA). Each service will manage its own TAOM, service-unique items.

e. Support Equipment. Support equipment includes those equipments/systems that are not integral parts of the system but are required and utilized in the deployment, installation, operation, and maintenance of the TAOM. Included are items used to provide power and environmental control and conduct testing, maintenance, movement, and training.

(1) Special Tools. Organizational level maintenance (first and second echelons) will consist of preventive and corrective maintenance actions which will not require the use

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of test equipment but may require the use of special tools (i.e., card extractors). Intermediate level maintenance (third and fourth echelons) will be performed by repairers/technicians and may require common test equipment or special tools. A special tool list will be provided later.

(2) Common Tools. Common tools are required by the operator/maintainers to perform organizational level maintenance. Organizational level tools will be assembled as a set and provided to the using unit as a SAC 3 item with the TAOM. Responsibility for maintaining the tool sets will be with the using unit. Organizational tool sets will contain the following common tools:

<u>Item</u>	<u>NSN</u>	<u>P/N</u>	<u>Qty</u>
Adpt, 3/8" to 1/4"	5120-00-224-9219	EX372B	1
Alignment Tool	5120-00-060-6423	547-2796-002	1
Bit, #2 PHH, 3/8" Dr.	5120-00-293-0318	FP22	1
Card Extractor	4935-01-129-8359	11329300-02	1
Cndct Bag, Velostat	8105-01-119-8109	2100 18x18	1
Nutdriver, 1/4"	5120-00-241-3188	ND16	1
Nutdriver, 7/16"	5120-00-222-1499	GGG-W-657-7/16	1
Pliers, Conn Shell	5120-00-624-8065	AT508K	1
Rachet, 3/8" dr	5120-00-240-5364	B51	1
Scdr, #1 Phillips	5120-00-240-8716	SSDP31	1
Scdr, #2 Phillips	5120-00-234-8913	MS15224-5	1
Scdr, #3 Phillips	5120-00-234-8912	SSDP63	1
Scdr, Flattip, 1/2"	5120-00-227-7338	D339	1
Scdr, Flattip, 1/4"	5120-00-278-1282	41S1102	1
Scdr, Flattip, 1/8"	5120-00-542-2281	GGG-S-121-1/8	1
Scdr, Flattip, 3/16"	5120-00-278-1270	41S1056-10	1
Scdr, Flattip, 3/8"	5120-00-905-6729	GGG-S-121-3/8	1
Scdr, Flattip, 5/16"	5120-00-234-8910	FT1-1	1
Skt Hd Scw Key 1/8"	5120-00-892-6000	GGG-K-275	1
Skt Hd Scw Key 3/32"	5120-00-832-6215	H332	1
Skt Hd Scw Key 5/32"	5120-00-832-6216	H532	1
Socket, 3/4" 3/8" dr.	5120-00-237-0977	B1216	1
Socket, 7/16" 3/8" dr.	5120-00-277-1464	3D-1214	1
Socket, 9/16" 3/8" dr.	5120-00-227-6704	1218	1
Tote Box, Velostat	5975-01-141-6886	4428	1
Wrench, Adj 6"	5120-00-264-3795	B107.8	1
Wrench, Combn 1/2"	5120-00-228-9506	1306	1
Wrench, Combn 1/4"	5120-00-288-9997	A-A-1358	1
Wrench, Combn 3/8"	5120-00-228-9504	G243079-4	1
Wrench, Combn 5/8"	5120-00-228-9508	1164	1
Wrench, Combn 7/16"	5120-00-228-9505	G243079-5	1
Wrench, Conn, Adj.	5120-01-160-1310	JR700	1

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Wrench, Trq 0-10" lbs	5120-00-618-4433	F10-1	1
Wrench, Trq 0-60" lbs	5120-00-221-7971	A-A-1274	1
Wrist Strap, Velostat	4240-01-075-9170	2060	2

(3) Test Equipment. Test equipment consists of a Volt/Ohm meter organic to the using unit. The performance monitoring and fault isolation/detection capabilities that are integrated into the TAOM provide a BIT capability that is not considered to be TMDE and is not managed as TMDE. However, the capabilities of the integrated performance monitoring and fault detection/isolation functions impact on the types and quantities of TMDE required.

(a) Special-Purpose Test Equipment.

Special-purpose test equipment will be supplied in the form of application program sets (APS). TAOM peculiar APS's to support the TAOM will be provided for use with the MCATES when the MCATES is fielded.

(b) General Purpose Test Equipment. The TMDE

planned for intermediate level maintenance of the TAOM is comprised of general-purpose test equipment and includes MCATES. MCATES consists of the Digital Card Tester, AN/USM-465B, and the Automatic Hybrid Test Station, AN/USM-631. The AN/USM-465B will provide automatic testing of low and medium complexity digital printed circuit boards (PCB) and fault isolation to the node level utilizing a guided probe algorithm. It is portable and weighs about 40 pounds. The AN/USM-631, also referred to as the MCATES Hybrid Test Station (MHTS), provides automatic testing of complex analog, digital, and hybrid PCB's with guided probe/clip fault isolation capabilities. It weighs about 1,500 pounds.

(c) Support Equipment. Access to the following

minimum equipment is required for the TAOM life cycle support:

	<u>Equipment</u>	<u>Qty</u>
<u>1</u>	TAOM Operation Modules (OM's) AN/TYQ-23	4
<u>2</u>	AN/TPS-63 Radar	1
<u>3</u>	AN/TPS-59 Radar	1
<u>4</u>	AN/TYQ-1 Tactical Air Command Central (TACC)	1
<u>5</u>	Simulator	1
<u>6</u>	Data Reduction and Recorder	1
<u>7</u>	AN/UYK-43 (Share/43) computer with peripherals (or updated equivalent)	1

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- | | | |
|----|--|---|
| 8 | Programmable Read-only Memory (PROM) burner | 1 |
| 9 | Microprocessor Development System (MNS) | 1 |
| 10 | Others as required, including periodic access with agencies on the joint Tactical Air Operations (JTAO) interface network and HAWK Missile Firing Batteries. | 1 |

The SSA will be responsible for acquiring the equipment during the transition period.

(4) Other Support Equipment

(a) Electrical Power Support. The TAOM has an operating electrical power requirement of 120/208 VAC ($\pm 12\%$), 50-60 Hz, 60 kW, 3-phase, 4-wire Wye, 0.85 power factor, and a utility grade at 110 amperes. The TAOM can be connected to a tactical or commercial electrical power distribution system, or to shipboard electrical power with a Delta-to-Wye transformer.

(b) Tactical Transportability Support. The TAOM shelter has external dimensions of 8-foot by 8-foot by 20-foot (160 ft(2), 1280 ft(3)). It weights a maximum of 17,500 pounds when configured for transport with external ancillary equipment such as antennas stowed in the shelter. The shelter is designed to be transported by truck, fixed-wing aircraft, rotary-wing aircraft, rail, and ship. Each TAOM shelter is accompanied by a 7-feet by 6-feet by 12-feet equipment pallet which may weigh up to 10,000 pounds in the transport configuration. The pallet will be loaded with two ECU's, CBR defense equipment, and two 2-kilometer fiber optic cables on reels. Because of their size and weight, and only after a certification, it is planned that the TAOM's and pallets may be air transported during deployment by either CH-53E helicopter or C-130 aircraft. Overland transportation will be primarily by mobilizer or non-dedicated Logistic Vehicle System (LVS) container haulers (MK48/14 "Dragon Wagon"). The TAOM may be unloaded from landing craft with the LACH. The 30-ton Rough Terrain Rubber Tired Crane may be used to lift the TAOM to move it for minor relocation. The RTCH is designed specifically to handle containers such as the TAOM. The RTCH may be used to unload TAOM's that have been prepositioned perpendicular to the long axis of causeway sections. The RTCH is especially useful for loading TAOM's aboard the LVS or moving them short distances.

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(c) Environmental Control Support. The TAOM environmental control system consists of the shelter air distribution system, two vertical 5-ton ECU's to air-condition and heat the shelter, and CBR equipment to provide protection for the crew and equipment.

f. Technical Publications

(1) Manuals. Table 2 contains a listing of technical manuals (TM) developed for the TAOM. All manuals will be listed on the SL 1-2 and can be requested through CG MCLB (Code 876), Albany. The preliminary TM's listed in table 2 will be overpacked for delivery with the TAOM. Publication control numbers (PCN's) will be assigned when camera-ready copies are received.

Table 2. TAOM Technical Manuals

<u>Title</u>	<u>Publication Number</u>
Tactical Air Operations Module AN/TYQ-23(V)1 Operation Instruction Manual	TM 08565A-10/1
Tactical Air Operations Module AN/TYQ-23(V)1 and (V)2 System Level Equipment Maintenance Instructions	TM 08565A-24/2
Tactical Air Operations Module AN/TYQ-23(V)1 and (V)2 Digital Communications Equipment Maintenance Instructions	TM 08565A-24/3
Tactical Air Operations Module AN/TYQ-23(V)1 and (V)2 Voice Communications Equipment Maintenance Instructions	TM 08565A-24/4
Tactical Air Operations Module AN/TYQ-23(V)1 and (V)2 Radar Interface Equipment Maintenance Instructions	TM 08565A-24/5
Tactical Air Operations Module AN/TYQ-23(V)1 and (V)2 Data Processing Equipment Maintenance Instructions	TM 08565A-24/6

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Table 2. TAOM Technical Manuals (contd.)

<u>Title</u>	<u>Publication Number</u>
Tactical Air Operations Module AN/TYQ-23(V)1 and (V)2	TM 08565A-24/7
Internal Radio Equipment Maintenance Instructions	
Tactical Air Operations Module AN/TYQ-23(V)1 and (V)2 Operator Interface Equipment Maintenance Instructions	TM 08565A-24/8
Tactical Air Operations Module AN/TYQ-23 (V)1 and (V)2 Technical Manual IPB	TM 08565A-24P/9
Portable Recording System (PRS) 11 Volumes (10-1 thru 10-11)	TM 08565A-14/10
Tactical Air Operations Module AN/TYQ-23(V)1 System Employment Planning	TM 08565A-14/11
Tactical Air Operation Module AN/TYQ-23(V)1 TAOM Interface Group (TIG)	TM 08565A-14/12
Tactical Air Operations Interface Group Part Numbers 246006-100, 246007-100, 246008-100 Illustrated Parts Breakdown	TM 08565A-24P/13
Tactical Air Operation Module AN/TYQ-23(V)1 In-Plant Simulator (IPS) Commercial Manual	TM 08565A-14/14
Tactical Air Operations Module AN/TYQ-23(V)1 Operator's Reference Manual	TM 08565A-12/15
Tactical Air Operations Module AN/TYQ-23(V)1	TM 08565A-14/16
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Table 2. TAOM Technical Manuals (contd.)

<u>Title</u>	<u>Publication Number</u>
RF-112A Power Supply Used with HF Radio	
RF-596A-02/RF-1317A Preselector/Postselector Module Option (A19 Assembly) Used with HF Radio	TM 08565A-14/17
RF-595A-01 ISB Option RF-595A-02, TM-08565A-14/18 Delay-Compensated ISB Option Used with HF Radio	TM 08565A-14/18
RF-601A Antenna Coupler Group Used with HF Radio	TM 08565A-14/19
RF-110A Radio Frequency Amplifier Used with HF Radio	TM 08565A-14/20
RF-155DR Data Radio Set Used with HF Radio	TM 08565A-14/21
RF-130-01/02 1 KW HF Transmitter Used with HF Radio	TM 08565A-14/22
RF-1310 Series Exciter Used with HF Radio	TM 08565A-14/23
RF-590A Receiver Used with HF Radio	TM 08565A-14/24
MX-512P Link-11 Data Terminal Set Part Number 29200-501	TM 08565A-14/26
Computer Unit Digital Data Computer CP-1931/TYQ-23(V)	TM 08565A-14/25
Tactical Air Operations Module AN/TYQ-23 Operation and	TM 08565A-14/27
Maintenance Instructions TAOC/MCE Disk Memory Unit	
Tactical Air Operations Module Operating and Servicing	TM 08565A-14/28

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Table 2. TAOM Technical Manuals (contd.)

<u>Title</u>	<u>Publication Number</u>
Instructions for P3000 Thermal Printer, with Addendum	
Tactical Air Operations Module Data Radio Set Instruction Manual	TM 08565A-12/29
Tactical Air Operations Module 1KW HF Transmitter Instruction Manual	TM 08565A-12/30
Tactical Air Operations Module Receiver Instruction Manual	TM 08565A-12/31
Tactical Air Operations Module Exciter Instruction Manual	TM 08565A-12/32
Tactical Air Operations Module Power Amplifier Instruction Manual	TM 08565A-12/33
Tactical Air Operations Module Power Supply Instruction Manual	TM 08565A-12/34
Tactical Air Operations Module Antenna Coupler Instruction Manual	TM 08565A-12/35
Tactical Air Operations Module Recorder Reproducer 246169 Operating Manual	TM 08565A-12/36
Tactical Air Operations Module Recorder Reproducer 246169 Maintenance Manual	TM 08565A-14/37
Tactical Air Operations Module TAOM 2920 Tape Subsystem Maintenance Manual	TM 08565A-12/38
Tactical Air Operations Module Instruction, Operation and Maintenance Manual, UHF Frequency Hopping Bandpass Filter	TM 08565A-14/39
TAOM List of Applicable Publications	TM 08565A-14/40

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Table 2. TAOM Technical Manuals (contd.)

<u>Title</u>	<u>Publication Number</u>
TAOM Inspection Manual	TM 08565A-14/41
TAOM Work Cards	TM 08565A-14/42

(2) TAOM-Related Technical Manuals. Table 3 contains a listing of TM's with the assigned PCN for Government furnished equipment (GFE) and contractor manuals to be used in and with the TAOM. All manuals will be listed on the SL 1-2 and can be requested through COMMARCORLOGBASES, (Code 876), Albany, GA 31704-5000.

Table 3. TAOM-Related Technical Manuals

<u>Title</u>	<u>PCN</u>	<u>Publication Number</u>
KG-40 and	N/A	KAM-270B/TSEC
KGX-40 Manuals	N/A	KAM-279A/TSEC
KG-84A Manual	N/A	KAO-184A/TSEC
	35158566100	TM 5810-309-10
KY-58 Manuals	N/A	KAO-168B/TSEC
	N/A	KAM-336A/TSEC
	N/A	KAM-337A/TSEC
	N/A	KAM-338A/TSEC
	N/A	KAM-339B/TSEC
	N/A	KAM-340A/TSEC
	35158543100	TM 11-5810-262-OP
	35158543500	TM 11-5810-262-20
KY-68 Manuals	N/A	KAO-162A/TSEC
	N/A	KAO-175A/TSEC
	N/A	MAMM-343A/TSEC
	35158582100	TM 11-5810-329-10
KY-75 Manuals	N/A	KAM-334A/TSEC
	N/A	KAO-154A/TSEC
	35158553000	TM 11-5810-281-OP
	35158553400	TM 11-5810-281-20
SB-3865 (ULCS) Manuals	18408439100	TM 08439A-10/1
	18408439200	TM 08439A-12/2-1
	18408439300	TM 08439A-12/2-2
	18408439400	TM 08439A-34/3

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Table 3. TAOM-Related Technical Manuals (contd.)

<u>Title</u>	<u>PCN</u>	<u>Publication Number</u>
	18407751100	TM 07751A-14/1
	18407752000	TM 07751A-14/2
AN/TPS-59 Manuals	18407753000	TM 07751A-14/3
	18407754000	TM 07751A-14/4
	18407755100	TM 07751A-14/5
	18407756000	TM 07751A-14/6
	18407757100	TM 07751A-14/7
	18407758000	TM 07751A-14/8
	18407759000	TM 07751A-14/9
	18407760000	TM 07751A-14/10
	18407761000	TM 07751A-14/11
	18407761500	TM 07751A-14/12
	18407762000	TM 07751A-14/13
	18407763000	TM 07751A-14/14
	18407763500	TM 07751A-14/15
	18407542700	TM 07751A-14/16
	18407525300	TM 07751A-14/17
	18407765000	TM 07751A-14/18
	18407524700	TM 07751A-14/19
	15707775100	LI-07751A-12
AN/TPS-63 Manuals	18407736000	TM 07736C-14/1
	18407736200	TM 07736C-14/2
	18407736400	TM 07736C-14/3
	18407736500	TM 07736C-14/4
	18407736600	TM 07736C-14/5
	18407735700	TM 07736C-14/6
R-442/VRC Manuals	35159381100	TM 11-5820-401-20
	35159381800	TM 11-5820-401-34-3
	35159390000	TM 11-5820-409-35
AN/VRC-47 Manual	35159381100	TM 11-5820-401-20-1
RT-524A/VRC Manuals	35159381700	TM 11-5820-401-34P-2-1
	3515938100	TM 11-5820-401-34P-2-2
AN/GRC-171A(V)2 Manuals	18407954700	TM 08180A-35/1
	17007084600	RS 08180A-50/3
AN/GRC-171A(V)2 Manuals	18407981100	TM 08446A-14/1 W/C
	18407981203	TM 08446A-50/2 W/C
AN/GRC-171A(V)4	18409097000	TM 19097A-14

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Table 3. TAOM-Related Technical Manuals (contd.)

<u>Title</u>	<u>PCN</u>	<u>Publication Number</u>
Motor Generator (60 kW) Manuals	34603300000	TM 5-6115-545-12-1 TM 5-6115-545-34 TM 11-6115-545-24P
Handset H-189/GR Manual	35161470000	TM 11-5965-280-15

g. Computer Resources Support

(1) General. The TAOM utilizes digital computers with associated SW and FW to collect and process digital information used in acquiring, processing, displaying, and communicating data pertaining to the control of air defense operations and air traffic control. This provides responsive, real-time, command and control of all air-to-air and surface-to-air missile (SAM) assets in its sector of responsibility. The digital data processing system is capable of exchanging information with other systems of the Marine Corps Tactical Command and Control System (MTACCS) and with U.S. and NATO command and control systems. The TAOM SW consists of support SW (compilers, assemblers, emulators, simulators, builders, linkage-editors, loaders, and task drivers as well as diagnostic and debugging programs); a real-time operating system (RTOS); a data management system (DMS); and applications programs (AP). All AP's are of modular design and operate under the control of the RTOS and the DMS in interfacing with HW units. Each SW module is functionally independent thus facilitating alteration or augmentation without modification of any other program or subprogram.

(2) Computer Unit (CU). Two identical CU's are located in each TAOM. Each CU consists of a Digital Data Computer Set AN/AYK-14(V) and a Digital Data Bus Controller C-11293(V2)/TYQ-23 (DDB). The AN/AYK-14(V) is the principal memory, arithmetic, logic, and control element of the TAOM. The DDB provides the interface between the CU and the other TAOM units. The DDB also provides the means to load the operational program from the MMU MU-776/TYQ-23. The MMU provides the volatile (Battery back-up 72hrs) storage of all application programs, data bases, and other data not practical to be stored in the CU internal memory. A DMU is used to load the operational program into the MMU.

(3) Software/Firmware (SW/FW)

(a) General. The operational SW is controlled and documented as a single program containing subprograms which are

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allocated among the CU's depending upon the number of interconnected TAOM's and operational CU's in each TAOM. Essentially, fixed routines in the units of the TAOM are contained in the unit as FW. These routines can be changed only by physically changing the chip or module containing the routine.

(b) Maintenance. CETS for hardware will be provided at MCTSSA for 1 year after Government acceptance of the first TAOM. Thereafter, it is planned to exercise options in the production contract to obtain post development engineering software support services at MCTSSA until the Marine Corps Software Support Center (SSC) is completely operational. This capability is expected to be fully attained as the TAOM approaches full operational capability (FOC), which is scheduled for 3d quarter FY93. The SSC used by the contractor to develop production SW will be transferred to MCTSSA's custody for inclusion into their SSC.

(c) Firmware Changes. In each instance when firmware is changed, MCTSSA will submit a proposed Modification Instruction (MI) to CG MCLB (Code 843-2), Albany. This proposed MI will contain the procedures to be used to install and test TAOM firmware. Firmware changes will also be made to PCB's and distribution made as described in the Software Configuration Management Plan, appendix E. MCTSSA will prepare a program tape or a master programmable read only memory (PROM) chip which will then be used by the Automatic Test Services Unit (ATSU) at COMMARCORLOGBASES to burn the new program onto blank PROM chips. These PROM's subsequently will be forwarded to the depot repair activity for incorporation into the affected PCB's.

(d) Configuration Management (CM). Each service (Marine Corps and Air Force) assumes CM for its service-peculiar portions of SW subprograms and for FW. The Marine Corps will provide coordination and control to ensure that its service-peculiar portions are compatible with the overall SW program. The Marine Corps ADPM will serve as chairman of the Software Configuration Control Board (SCCB). MCTSSA will administer Configuration Management of TAOM SW and FW per appendix E of that document. COMMARLOGBASES will administer Configuration Status Accounting of the TAOM. TAOM software and firmware Configuration Status Accounting Records will be submitted to CG MCLB (Code 843-2), Albany by MCTSSA.

h. Facilities

(1) General. Facilities required for the TAOM and TAOM-related equipment will be utilized for operation, training,

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maintenance, and storage. No new construction requirements are anticipated and no special environmental conditions are required. Communications Security (COMSEC) equipment facility requirements will be handled per current COMSEC directives.

(2) Test and Evaluation Sites

(a) The in-plant portion of the first article test was conducted at the contractor's plant. The field portion of the test will be conducted at MACS-1.

(b) Follow-on operational test and evaluation (FOT&E) will be conducted as directed by the COMMARCORSYSCOM and is presently planned to be conducted at MACS-1.

(3) Operational Sites

(a) Ashore. No new construction requirements are anticipated for operational sites. The TAOM can be operated on hard level ground, but a blacktop or concrete pad is desirable for a semipermanent operational site.

(b) Afloat. Landing force TAOM's are capable of being operated aboard ship for training and data base maintenance. The TAOM can utilize shipboard electric power by using a Delta-to-Wye power transformer.

(c) Airborne. The TAOM will not be operated while being transported by air.

(4) Training Sites. During production and delivery, the contractor will provide the initial operator and maintenance training courses at the contractor's facility. Thereafter, MCCES will assume the training responsibility.

(5) Maintenance Sites

(a) Organizational Level. No TAOM-related maintenance areas or facilities are required.

(b) Intermediate Level. Deletion of the maintenance shelters in the equipment being replaced by the TAOM will require that additional intermediate maintenance facilities be provided to using organizations. It is planned to provide two 8-foot by 8-foot by 8-foot by 10-foot standard ISO shelters for each four-TAOM system. Some of these shelters may be utilized for storage or maintenance. These shelters will be provided as separate allowances for each unit and will neither be part of, nor dedicated entirely to, the TAOM's.

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(c) Depot Level. Depot level maintenance will be provided by the Air Force. The Marine Corps' software support facility is located at MCTSSA, Camp Pendleton, California.

(6) Storage Sites. The TAOM requires no additional protection other than that provided by its own shelter. For long-term, undisturbed storage, a method of humidity control will assist in retarding moisture and corrosion damage. It is estimated that storage space in the amount of 1,200 cubic feet will be required at each MACS for the intermediate level spares and repair parts. The amount of storage space for secondary reparables, spares, and repair parts will be established after provisioning and replenishment requirements have been determined.

i. Packaging, Handling, Storage, and Transportation

(1) General. The TAOM is designed to be deployed, operated and maintained in any area of the world. Extremes of altitude, temperature, and humidity; blowing sand or dust; saltwater spray will not adversely affect the movement or operation of the equipment. The TAOM is capable of being operated aboard ship for system checkout and training, or from locations ashore for operations.

(2) Packaging. The TAOM is self-contained within a standard ISO 8-foot by 8-foot by 20-foot shelter when in the transport or storage mode except for two ECU's, two fiber optic cables on reels, and CBR equipment, which are loaded on a 7-foot by 6-foot by 12-foot equipment pallet. Antennas and all cables (except for the two fiber optic cables) are stored in the shelter. The power generator is not stored in the shelter.

(3) Handling. The TAOM shelter corners are joined with corner fittings which have lifting/towing eyes for use in handling and transportation. The shelter floor is mounted on three parallel skid assemblies that run the full length of the shelter. The skids absorb impact shock and permit the towing of the shelter over rough terrain for short distances. The skids contain two sets of forklift pockets on each side so that two forklift trucks can be used to lift and move the TAOM.

(4) Storage. The TAOM is designed to withstand storage in all climates and within a temperature range of -62o C (-80o F) to +71o C (+160o F). For long-term undisturbed storage, a method of humidity control will assist in retarding possible moisture and corrosion damage. The batteries used for emergency lighting, the R/RU battery and tapes, the first aid kit, and the fire extinguisher are removed during storage periods.

ENCLOSURE (1)

3 Apr 92

(5) Transportation. The TAOM is designed and certified to be transportable by fixed-wing aircraft, helicopter external lift, rail, sea, and land. It is planned that all TAOM's will be delivered from the contractor's plant to the using unit for field acceptance testing. Shipment of the TAOM will be per Department of Defense (DoD) Regulation 4500.32-R, MCO P4600.14A, and MCO P4600.7C.

j. Warranties

(1) Warranty Provisions. The TAOM has a 2-year warranty which covers system design, workmanship and material, and performance as specified and limited in contract N00039-87-C-1330. Warranty Administration Plan is being provided by MCLB Alb upon delivery of end item.

(2) System Workmanship and Material Warranty. The contractor warrants that for a period of 2 years after acceptance, all supplies furnished under the contract will be free from all failures and defects in material and workmanship and will conform to all requirements of the contract. However, with respect to Government furnished property, the contractor's warranty extends only to its proper installation, unless the contractor performs some modification or other work on the property. The warranty periods for the "wear items" listed below are as follows:

<u>Equipment Nomenclature</u>	<u>First Article System</u>	<u>Production System</u>
CRT 17"	2,000 Hours*	4,000 Hours*
CRT 25"	2,000 Hours*	4,000 Hours*
FOG 17"	6 Months	14 Months
FOG 25"	6 Months	14 Months
CU Fan	1,200 Hours*	2,400 Hours*
Shelter Fan & Invertor	6,000 Hours*	12,000 Hours*
OCU Chimney Fan	4,000 Hours*	12,000 Hours*
REC/REP (Mech)	4,000 Hours*	8,000 Hours*
Disk (Mech)	4,000 Hours*	8,000 Hours*

* or 2 years, whichever comes first

NOTE: Hours as listed above are system operating hours; months are in calendar time.

ENCLOSURE (1)

(3) Performance Warranty. The TAOM computer programs that reside in the AN/AYK-14 computer, and the SW/FW embedded in the various unit processors listed below under TAOM unit processors, are to be free of performance defects during a 2-year period commencing with the acceptance of first article. A performance defect is defined as a failure of the computer program or embedded processor SW/FW which prevents or precludes the successful performance of, or accomplishment of, a function or subfunction for those units listed below:

TAOM Unit Processors

DCU	RIU
BIC	OCU
CIU	BPC
MMU	VCAU
TIG	

The equipment must have been operated per applicable operating manuals for the failure to be covered under the warranty. The SW and FW problems must be identified and documented in software trouble reports (STR). Changes made to the SW or FW by anyone other than the contractor will cause the warranty to be null and void.

(4) Warranty Claims. All warranty claims will be processed through the unit's respective Force Service Support Group maintenance channels to the CG MCLB (Code 856), Albany, GA 31704-5000. To the maximum extent possible, a single point of contract (Warranty Coordinator) should be designated for an installation or geographical area. The Warranty Administrator at CG MCLB (Code 843-2), Albany can be reached by calling DSN 567-6550/1 or commercial (912) 439-6552.

(a) Equipment failures determined to be under warranty are to be reported within 5 working days by message in QDR (SF 368) format to the Warranty Administrator, CG MCLB (Code 843-2), Albany. In addition to the information provided in blocks 1 through 19 of the QDR, the "Remarks" section (Block 22) must contain sufficient data to support the warranty claim. Also, in the "Remarks" section, include whether use of Marine Corps labor and parts is recommended to accomplish repair or if the contractor should be directed to make the repairs. The Warranty Administrator at COMMARCORLOGBASES will report the claim to the contractor and advise the reporting unit of action to be taken. The Warranty Administrator at COMMARCORLOGBASES will submit warranty claims to the respective contracting officer for

ENCLOSURE (1)

3 Apr 92

reimbursement of costs due to the Government for parts and labor expenses incurred by the Marine Corps.

(b) Repair parts determined to be under warranty will be held at the owning unit/repair facility for 60 days after submittal of the warranty QDR, or until disposition has been provided by the contracting officer or the Warranty Administrator at COMMARCORLOGBASES. If the defective item is to be returned, the item is tagged with the Inspection and Repair Tag (NAVMC 1018), by Marine Corps Serial Number, packaged to prevent further damage, and shipped to the address provided by COMMARCORLOGBASES; otherwise, dispose per Marine Corps directives after the 60-day period. Costs incurred as a result of the Marine Corps repairing supplies under warranty must be documented and submitted to the Warranty Administrator, COMMARCORLOGBASES in order to process claims for reimbursement. A followup QDR must be submitted, with completed Equipment Repair Order (ERO) (NAVMC 10245) attached, citing the warranted repair parts used and the computed labor charges involved. In the "Remarks" section of the QDR, the message date time group of the original QDR is cited.

(5) Procedures. Questions pertaining to warranty coverage should be addressed to the COMMARCORLOGBASES, (Code 865), Albany, GA 31704-5000.

4. Actions Required To Place Equipment In Service

a. COMMARCORSYSCOM. The COMMARCORSYSCOM (C2T) will be responsible for the following duties:

(1) Preparation of an AN/TYQ-23(V)1 Phase-in Plan for the using units and the contractor, which covers timing, training, support equipment and spare parts.

(2) Initiation of action to convert TAOM planned allowances to actual allowances. The results of this action will be reflected on the gaining unit's Equipment Allowance File (EAF).

(3) Providing guidance to appropriate activities to initiate the fielding process or notify activities of any problems or issues that will delay fielding beyond the projected in-service date.

b. COMMARCORLOGBASES. A Phase-out Plan for the AN/TYQ-2, AN/TYQ-3A (removing it from the MACS), supporting equipment, and spare parts will be prepared to include instructions on retrograde and disposition of the equipment (see appendix D).

ENCLOSURE (1)

c. Gaining Command

(1) Using units will perform an acceptance inspection upon receipt of TAOM assets. Particular attention should be given to inventory contained on the DD 250, physical integrity, technical manual special instructions. If discrepancies or problems are discovered during the acceptance test and prior to official Government acceptance, a Report of Discrepancy is submitted per MCO 4430.3J. The COMMARCORLOGBASES will assist in inventory of spares for retrograde equipment and the spares out of stores for the TAOM equipment.

(2) Retrograde and disposition of the AN/TYQ-2, AN/TYQ-3A, associated support equipment, and spare parts will be per the COMMARCORLOGBASES applicable Phase-out Plans.

(3) The gaining command is required to budget for and requisition supporting consumables as required to support the TAOM starting with initial delivery of the equipment.

(4) The gaining command will account for the new assets per MCO P4400.152 and MCO P4400.82.

(5) Authorization to place the TAOM in service must be requested in accordance with existing FMF orders. The TAOM will be Marine Corps Automated Readiness Evaluations System reportable once the item has been placed in service.

ENCLOSURE (1)

3 Apr 92

LIST OF ALLOWANCES AND DELIVERY SCHEDULES (PLANNED)

<u>T/E NO</u>	<u>UNIT TITLE</u>	PLANNED	DISTRIBUTION	
		TOTAL	QUANTITY	DATE
		<u>ALLOWANCE</u>		
7720	MCCES, MCAGCC, 29 PALMS, CA	9	4	Jul 91
7442	MCTSSA, CAMP PENDLETON, CA	4	3	Nov 91
7720	MCCES, MCAGCC, 29 PALMS, CA	9	7	Nov 91
N8633	MACS-1, MACG, 3D MAW	4	4	Feb 92
N8633	MACS-7, MACG, 3D MAW	4	4	Jun 92
N8631	MACS-4, MACG, 1st MAW	4	4	Sep 92
N8632	MACS-5, MACG, 2D MAW	4	4	Nov 92
N8632	MACS-6, MACG, 2D MAW	4	4	Jan 93
7442	MCTSSA, CAMP PENDLETON, CA	4	1	Mar 93
N8634	MACS-24, MACG, 4TH MAW	4	4	Apr 93
7011	MARCORLOGBASE, Barstow, CA	1	1	Dec 93

Appendix A to
ENCLOSURE (1)

SCHEDULE OF EVENTS

All factory training for operations and maintenance has been completed.

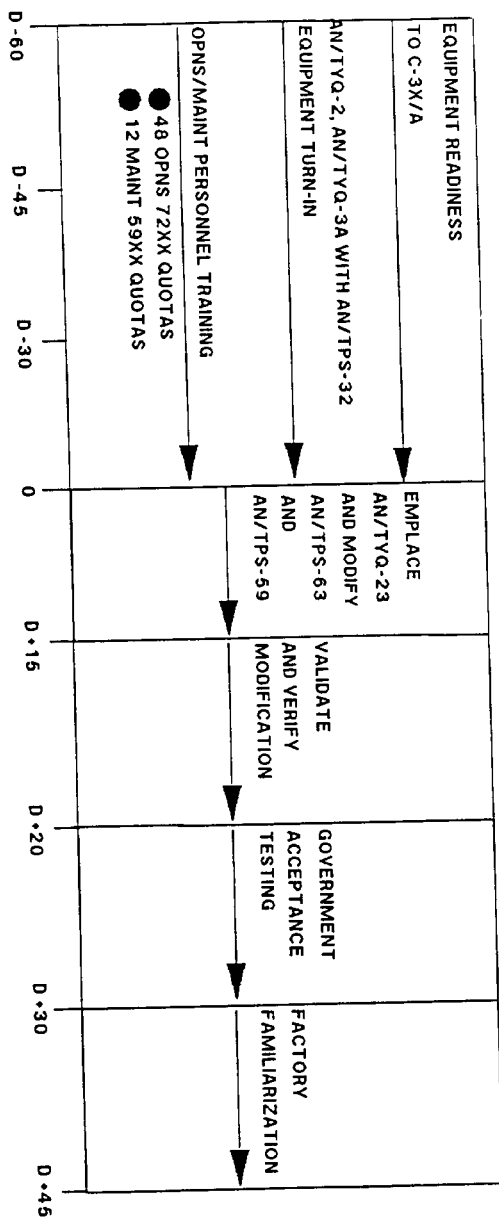
<u>Event</u>	<u>Date</u>
Initial Operational Capability	3rd Qtr FY92
MCTSSA Assumes Post-Development Software Support Activity	4th Qtr FY93
Full Operational Capability	4th Qtr FY93

Appendix B to
ENCLOSURE (1)

3 APR 1992

TAOM PHASE-IN AND PERSONNEL TRAINING PLAN

- - Training at MCCES for conversion (8-weeks)
- - Minimized operational "stand-down" time



MCO 3311.1
3 Apr 92

AN/TYQ-2 AND AN/TYQ-3A PHASE-OUT PLANNING DATA

Supplied for information is annex I to appendix D, the COMMARCORLOGBASES letter of 2 April 1990. Enclosure (2) to the letter has been removed due to the scheduled dates being overtaken by events and incorrect. A formal Phase-out Plan has been drafted by COMMARCORLOGBASES and will be distributed under separate cover.

Appendix D to
ENCLOSURE (1)

D-1



DEPARTMENT OF THE NAVY
MARINE CORPS LOGISTICS BASE
ALBANY, GEORGIA 31704-5000

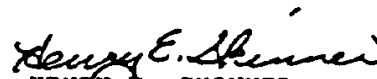
4400
Code 843-2
APR 02 1990

From: Commander, Marine Corps Logistics Bases, Albany

Subj: PLANNING DATA FOR REMOVAL OF THE TACTICAL AIR OPERATIONS
CENTRAL AN/TYQ-2. TACTICAL DATA COMMUNICATIONS CENTRAL
AN/TYQ-3A AND INSTALLATION OF THE TACTICAL AIR
OPERATIONS MODULE AN/TYQ-23

Encl: (1) Schedule of Planned Events
(2) Planning Calendar
(3) Chart of Planned Events

1. The subject planning data is to be used as an aid in establishing milestones during the transition of the old and new systems.
2. Enclosure (1) establishes time frames for events, actions and action offices.
3. Enclosure (2) establishes planned calendar dates for the using units. Enclosure (3) is provided for information.
4. Marine Corps Logistics Base, Albany welcomes any recommendations which may add to a smooth transition.
5. Point of contact at Marine Corps Logistics Base. Albany, Georgia, is S. Byrd/H. Skinner. Communication-Electronic/Missile Division Code 843-2. AUTOVON 567-6551/52.


HENRY E. SKINNER
By direction

DISTRIBUTION:

Commanding General, Fleet Marine Force Pacific
Commanding General, Fleet Marine Force Atlantic
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Commanding General, Third Marine Air Wing
Commanding General, Fourth Marine Air Wing
Commanding Officer, Marine Air Control Squadron One
Commanding Officer, Marine Air Control Squadron Two
Commanding Officer, Marine Air Control Squadron Four
Commanding Officer, Marine Air Control Squadron Five
Commanding Officer, Marine Air Control Squadron Six
Commanding Officer, Marine Air Control Squadron Seven
Commanding Officer, Marine Air Control Squadron Two Three
Commanding Officer, Marine Air Control Squadron Two Four

Annex I to
Appendix D to
ENCLOSURE (1)

SCHEDULE OF PLANNED EVENTS FOR THE PHASE OUT OF THE AN/TYQ-2
AND AN/TYQ-3A AND THE PHASE IN OF THE AN/TYQ-23

<u>EVENT</u>	<u>ACTION</u>	<u>ACTION OFFICE</u>
1	<u>150 DAYS PRIOR TO EST. DELIVERY DATE (EDD)</u> SUBMIT MESSAGE TO EACH USER OF THE AN/TYQ-23 TO BEGIN PHASE OUT PLAN	MCLBA (843-2)
2	<u>120 DAYS PRIOR TO EDD</u> SUBMIT RECOVERABLE ITEM REPORTS (WIRs) ON SECONDARY DEPOT REPAIRABLE (SDRs) ON THE AN/TYQ-2 AND AN/TYQ-3A	USING UNITS *SEE NOTE 1
3	115 DAYS PRIOR TO EDD PROVIDE DISPOSITION ON WIRs SUBMITTED DURING EVENT TWO (2)	MCLBA (843-2)
4	<u>115 DAYS PRIOR TO EDD</u> ESTABLISH INVENTORY OF SHELTERS AND SL-3 ITEMS	USING UNITS
5	<u>110 DAYS PRIOR TO EDD</u> SUBMIT WIRs ON SHELTERS/SL-3 ITEMS	USING UNITS *SEE NOTE 1
6	<u>105 DAYS PRIOR TO EDD</u> PROVIDE DISPOSITION INSTRUCTIONS ON WIRs SUBMITTED DURING EVENT FIVE (5)	MCLBA (843-2)
7	<u>80 DAYS PRIOR TO EDD</u> FINAL SUBMITTAL OF WIRs ON SDRs TO MCLBA. CODE 843-2	USING UNITS
8	<u>75 DAYS PRIOR TO EDD</u> PROVIDE DISPOSITION INSTRUCTIONS ON WIRs SUBMITTED DURING EVENT SEVEN (7)	MCLBA (843-2)

Annex I to
Appendix D to
ENCLOSURE (1)

SCHEDULE OF PLANNED EVENTS CONTINUED

<u>EVENTS</u>	<u>ACTION</u>	<u>ACTION OFFICE</u>
9	<u>70 DAYS PRIOR TO EDD</u> SUBMIT FINAL WIRs ON SHELTERS TO MCLBA. CODE 843-2	USING UNITS
10	<u>65 DAYS PRIOR TO EDD</u> PROVIDE DISPOSITION INSTRUCTIONS ON WIRs SUBMITTED DURING EVENT NINE (9)	MCLBA (843-2)
11	<u>35 DAYS PRIOR TO EDD</u> PROVIDED LIST OF INITIAL OPERATING SPARES (IOS) FOR THE AN/TYQ-23	MCLBA (843-2)
12	<u>25 DAYS PRIOR TO EDD</u> LOAD DUES FOR AN/TYQ-23 IOS	USING UNITS
13	<u>DELIVERY OF AN/TYQ-23 ANDK IOS</u>	LITTON DATA SYS
14	<u>5 DAYS AFTER EDD</u> COMPLETE INVENTORY OF AN/TYQ-23 IOS	USING UNITS
15	<u>10 DAYS AFTER EDD</u> IDENTIFY IOS DISCREPANCIES TO MCLBA. CODE 843-2	USING UNITS
16	<u>25 DAYS AFTER EDD</u> RESOLVE IOS DISCREPANCIES	USING UNITS

Annex I to
Appendix D to
ENCLOSURE (1)

SCHEDULE OF PLANNED EVENTS CONTINUED

<u>EVENT</u>	<u>ACTION</u>	<u>ACTION OFFICE</u>
17	<u>45 DAYS AFTER EDD</u> ACCEPTANCE OF IOS	USING UNITS
18	<u>90 DAYS AFTER EDD</u> RECEIPT OF AN/TYQ-2 AND AN/TYQ-3A ASSETS	MCLB ALBANY MCLB BARSTOW

NOTE 1 - MCCES WILL SUBMIT WIRs ON ALL AN/TYQ-2 ASSETS AND THOSE AN/TYQ-3A ASSETS NOT REQUIRED FOR CONTINUATION OF MISSION REQUIREMENTS. MCCES WILL CONTINUE USING THE AN/TYQ-3A AS REQUIRED UNTIL THE ADVANCED TACTICAL AIR COMMAND CENTRAL IS FIELDDED.

MCTSSA WILL SUBMIT WIRs ON AN/TYQ-2 AND AN/TYQ-3A ASSETS NOT REQUIRED FOR CONTINUATION OF MISSION REQUIREMENTS. MCTSSA WILL CONTINUE USING THE AN/TYQ-2 AND AN/TYQ-3A AS REQUIRED UNTIL THE AN/TYQ-23 AND ATACC ARE FIELDDED RESPECTIVELY.

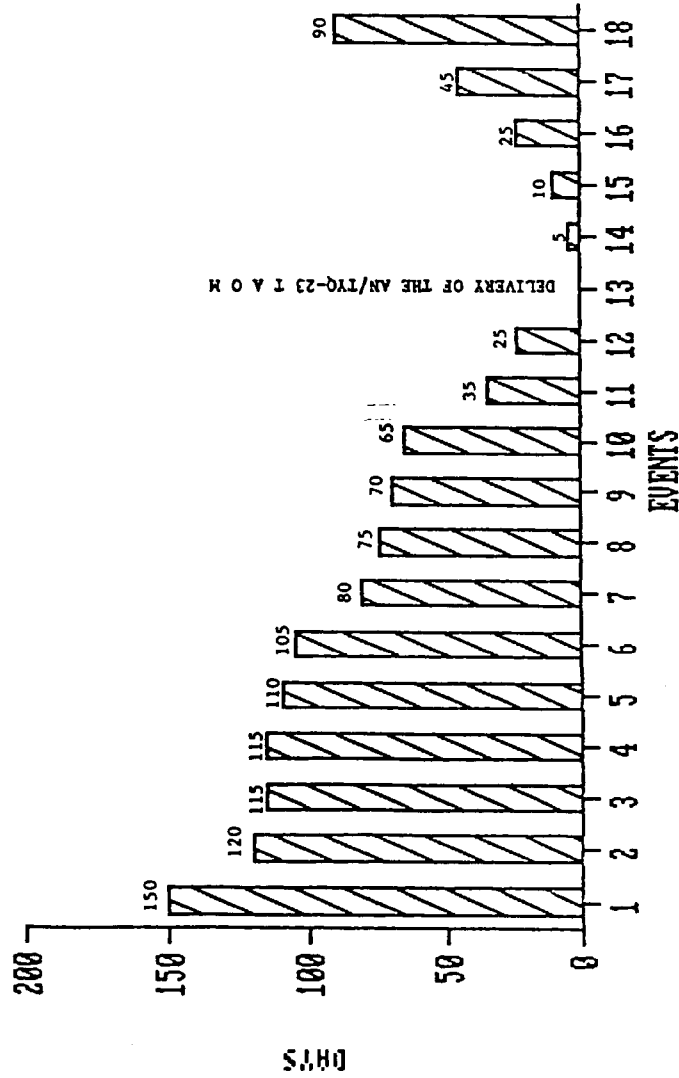
MACS UNITS WILL SUBMIT WIRs ON ALL ASSETS OF THE AN/TYQ-2 AND AN/TYQ-3A SYSTEMS.

SPECIAL NOTE: MACS-1 WILL RECEIVE DISPOSITION INSTRUCTIONS OF CURRENT ASSETS FROM MARINE CORPS RESEARCH. DEVELOPMENT AND ACQUISITION COMMAND (MCRDAC).

Annex I to
Appendix D to
ENCLOSURE (1)

3 APR 1992

PHASE OUT OF AN/TYQ-2 AND AN/TYQ-3A
-- PHASE IN OF AN/TYQ-23 --



*ACTIONS OF 1 - 18 ARE IDENTIFIED ON SCHEDULE OF EVENTS.

*DATES FOR EVENTS 1 - 18 ARE IDENTIFIED ON CALENDAR OF EVENTS.

Annex I to
Appendix d to
ENCLOSURE (1)

SOFTWARE CONFIGURATION MANAGEMENT
PLAN

Authenticated by:

S. Wilson
Head, Software Control Section
Air Systems Branch
ACCSD, MCTSSA

Date:

14 May 91

Approved:

D. O'Neal
Director
ACCSD, MCTSSA

Date:

15 May 91

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Appendix E to
ENCLOSURE (1)

C.1 INTRODUCTION

This Configuration Management Plan (CMP) is an element of the Computer Resources Life Cycle Management Plan for the AN/TYQ-23 (V)1 Tactical Air Operations Module (TAOM), document number TAOM-CRLCMP-00345. The CMP defines the responsibilities, procedures, and practices specific to each of three separate and distinct phases. Phase 1 consists of activities and responsibilities prior to Government acceptance of the TAOM. Phase 2 consists of activities and responsibilities during the warranty period. Phase 3 consists of activities and responsibilities during Government maintenance (i.e., post warranty period) of TAOM software and firmware.

C.2 CONFIGURATION IDENTIFICATION

TAOM acquisition is now in the production phase (Phase 1), during which product baseline specifications, that provide the basis for control of future changes, are being established. These specifications provide TAOM Functional, Allocated, and Product baseline descriptions. Tables C-1 through C-4 list TAOM specifications which are to be under Configuration Management (CM). Configuration Management will also provide control of support software (i.e., test software, simulation software, and software development tools). Baseline documentation has been numbered in accordance with Litton Data Systems' Configuration Management Plan, Document No. 191137-900C, Section 4. Once assigned, these document numbers remain in effect throughout the document's life cycle.

C.2.1 Functional Baseline

The Functional Baseline was established upon publication of the AN/TYQ-23(V)1 ELEX-T-316 Specification.

C.2.2 Allocated Baseline

The Allocated Baseline was initially established during development and test of the AN/TYQ-23(V)1 Engineering Development Model and has been continually updated during production system development. This baseline specifies requirements for nine firmware module computer programs, each of which has been designated as a Computer Software Configuration Item (CSCI) and a single operational program (CSCI) which has been divided into thirteen subprograms. The Allocated Baseline CSCIs are listed in Table C-2.¹

¹CSCI supersedes Computer Program Configuration Item (CPCI).

Table C-1 TAOM Functional Baseline Specifications

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
Contract Specification, Production of TAOM AN/TYQ-23(V)1 for the Marine Corps	ELEX-T-316J	System Spec

Table C-2 TAOM Allocated Baseline Specifications

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
Switch Action Catalog	191100-620-01	B1/B5
TAOM Interface Group (TIG)	246949-640-01	PPS
Firmware CSCIs		
Mass Memory Unit (MMU)	191112-640-01	PPS
Digital Comm Unit (DCU)	191113-640-01	PPS
Radar Interface Unit (RIU)	191114-640-01	PPS
Comm Interface Unit (CIU)	191115-640-01	PPS
Voice Comm Access Unit (VCAU)	191116-640-01	PPS
Operator Console Unit (OCU)	191117-640-01	PPS
Computer Aided Instr (CAI)/OCU	191117-640-02	PPS
Bus Interface Controller (BIC)/ Bus Protocol Controller (BPC)	191192-640-01	PPS
TAOM Interface Unit (TIU)	194283-640-01	PPS
Software CSCI		
System Software	191153-640	PPS
Real-Time Operating System (RTOS)	191153-640-01	PPS
Data Management System (DMS)	191153-640-02	PPS
System Initialization (SI)	191153-640-03	PPS
Surveillance (SURV)	191153-640-04	PPS
Weapons Control (WC)	191153-640-05	PPS
Air Traffic Controller (ATC)	191153-640-06	PPS
Electronic Warfare (EW)	191153-640-07	PPS
Simulation (SIM) (classified)	191153-640-08	PPS
Data Recording Reduction (DRR)	191153-640-09	PPS
System Initialization Control (SIC)	191153-640-10	PPS
Display (DISP)	191153-640-11	PPS
Performance Monitoring (PERM)	191153-640-12	PPS
Communications (COMM) (classified)	191153-640-13	PPS

Appendix E to
ENCLOSURE (1)

Table C-3 TAOM Product Baseline Specifications/Documents

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
Firmware CSCIs		
Mass Memory Unit (MMU)	191112-667-1	PDS
Digital Comm Unit (DCU)	191113-667-1	PDS
Radar Interface Unit (RIU)	191114-667-1	PDS
Comm Interface Unit (CIU)	191115-667-1	PDS
Voice Comm Access Unit (VCAU)	191116-667-1	PDS
Operator Console Unit (OCU)	191117-667-1	PDS
Computer Aided Instruction (CAI)/ Operation Control Unit (OCU)	191117-667-2	PDS
Bus Interface Controller (BIC)/ Bus Protocol Controller (BPC)	191192-662-1	PDS
TAOM Interface Unit (TIU)	194283-667-1	PDS
Software CSCI		
Program Design Spec - Basic	191153-660	PDS
Real-Time Operating System (RTOS)	191153-660-01	PDS
Data Management System (DMS)	191153-660-02	PDS
System Initialization (SI)	191153-660-03	PDS
Surveillance (SURV)	191153-660-04	PDS
Weapons Control (WC)	191153-660-05	PDS
Air Traffic Controller (ATC)	191153-660-06	PDS
Electronic War (EW)	191153-660-07	PDS
Simulation (SIM) (classified)	191153-660-08	PDS
Data Recording Reduction (DRR)	191153-660-09	PDS
System Initialization Control (SIC)	191153-660-10	PDS
Display (DISP)	191153-660-11	PDS
Performance Monitoring (PERM)	191153-660-12	PDS
Communications (COMM)	191153-660-13	PDS
Database Design Doc	191100-280	DBDD
Source Code	N/A	N/A

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Table C-4 TAOM Product Baseline Test Documents

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
Mass Memory Unit (MMU)	191112-745	FQT
Digital Communications Unit (DCU)	191113-745	FQT
Radar Interface Unit (RIU)	191114-745	FQT
Radar Interface Unit (RIU)	191114-745	FQT
Communications Interface Unit (CIU)	191115-745	FQT
Voice Comm Access Unit (VCAU)	191116-745	FQT
Operator Console Unit (OCU)	191117-745	FQT
Internal Radio Unit (IRU)	191120-745	FQT
Power Distribution Ctl Unit (PDCU)	191129-745	FQT
Fiber Optic Interface Panel (FOIP)	191131-745	FQT
Bus Interface Controller (BIC)	191192-745	FQT
TAOC Interface Unit (TIU)	194283-745	FQT
Computer Unit (CU)	TBD	FQT
Printer Unit (PRU)	TBD	FQT
Recorder/Reproducer Unit (R/RU)	TBD	FQT
Disk Memory Unit (DMU)	TBD	FQT
System test procedures		
TAOM Non-Operating/Oper Test Procedures	194403-745	N/A
TAOM Environmental Test Procedures	194407-745	N/A
TAOC TAOM FAT Procedures	246908-740	N/A
TAOC STST Procedures	246909-740	N/A
TAOC MTST Procedures	246910-740	N/A
TAOC System Field Test Procedures	246911-740	N/A
TAOC and TIC Reliability Test Procedures	246912-740	N/A
Operational Conf Test (OCT) Procedures	246921-740	N/A

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C.2.3 Product Baseline

The Product Baseline will be the approved "as-built" product configuration identification established upon Government acceptance of the system. The Product Baseline consists of specifications that define the Functional Baseline, the Allocated Baseline, and specifications/documents listed in Tables C-3 and C-4.

C.3 CONFIGURATION CONTROL

Configuration Control of the TAOM will be performed throughout the TAOM life cycle. The following paragraphs incorporate the three-phased approach when describing configuration control plans and procedures during development and life cycle support.

C.3.1 Responsibilities

C.3.1.1 Phase 1 Responsibilities

Space and Naval Warfare Systems Command (SPAWAR) will administer the contract and provide independent verification and validation (IV&V) support. IV&V representatives reside in-plant at Litton Data Systems facilities, Van Nuys to monitor development of TAOM software. SPAWAR will have configuration control of the Functional Baseline (i.e., ELEX-T-316J). Marine Corps Research and Development Acquisition Command (MCRDAC) (Code PSE) has responsibility for TAOM First Article acceptance (signing of the DD250). Litton Data Systems will maintain configuration control of specifications and documentation that make up the Allocated and Product baselines in accordance with Litton Data Systems' Configuration Management Plan, Document No. 191137-900C.

C.3.1.2 Phase 2 Responsibilities

SPAWAR will administer the contract and provide contract support through the Naval Electronics Technical Representative (NETR) throughout this phase (warranty phase). MCRDAC (Code PSE) will be responsible for approval of changes to TAOM baseline specifications. The TAOM Warranty Administration Plan provides guidance concerning warranty issues.

C.3.1.3 Phase 3 Responsibilities

Responsibility for Class I Engineering Changes Proposals (ECPs) will reside with the Configuration Control Board (CCB) Chairperson, MCRDAC (Code PSE). Responsibility for Class II ECPs will reside with the CCB Chairperson, Air Systems Support

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Division (ACCSO), Marine Corps Tactical Systems Support Activity (MCTSSA). Marine Corps Logistic Base, Albany (MCLBA) has responsibility for updating firmware documentation (drawings). MCTSSA (ACCSO) will be responsible for control and maintenance of software and firmware Configuration Items (CIs).

C.3.2 Flow of Configuration Control

Configuration control will change as the TAOM project progresses through the three CM phases. The following paragraphs define the process for recommending, approving, and processing changes to the TAOM during each phase.

C.3.2.1 Phase 1 Configuration Control

During Phase 1, configuration control for the TAOM will be in accordance with Litton Data Systems' Configuration Management Plan, Document No. 191137-900C. Engineering Change Proposals (ECPs) and Request for Deviation/Waivers (RFD/RFWs) will be sent to SPAWAR. SPAWAR will distribute a copy to each CCB member.

C.3.2.2 Phase 2 Configuration Control

During Phase 2 (warranty period), Product Quality Deficiency Reports (QDRs) will be used to identify deficiencies in TAOM software and firmware. MCLBA will screen all QDRs to identify the appropriate Action Point as described in MCO 4855.10. MCTSSA will review software/firmware QDRs and return their recommendations to MCLBA. Warranty QDRs will be sent to SPAWAR and processed as specified in the Warranty Administration Plan. MCTSSA will prepare ECPs for valid non-warranty QDRs when a change is requested and submit them to MCRDAC for CCB approval. The flow of configuration control during the warranty period is illustrated in Figure C-1.

C.3.2.3 Phase 3 Configuration Control

During Phase 3 (maintenance phase), MCLBA will screen all QDRs to identify the appropriate Action Point. Software or firmware QDRs will be analyzed by MCTSSA to verify the validity of the problem being identified. ECPs will be submitted to MCRDAC. Approved software/firmware ECPs will be returned to MCTSSA for implementation. MCTSSA will submit a copy of their Configuration Status Accounting Report (CSAR) to MCLBA for inclusion in the Marine Corps CSAR in accordance with MCO P4130.8. The flow of configuration control during the maintenance phase is illustrated in Figure C-2.

C.3.3 Reporting Documents

The following paragraphs identify documents that will be used to describe problems and report configuration changes to software and firmware during TAOM development and support.
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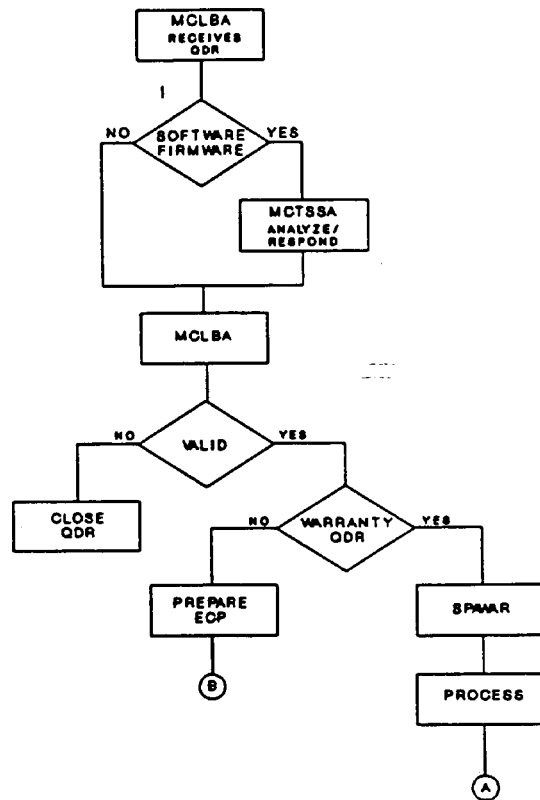


Figure C-1. Phase 2 configuration control (Page 1 of 2).

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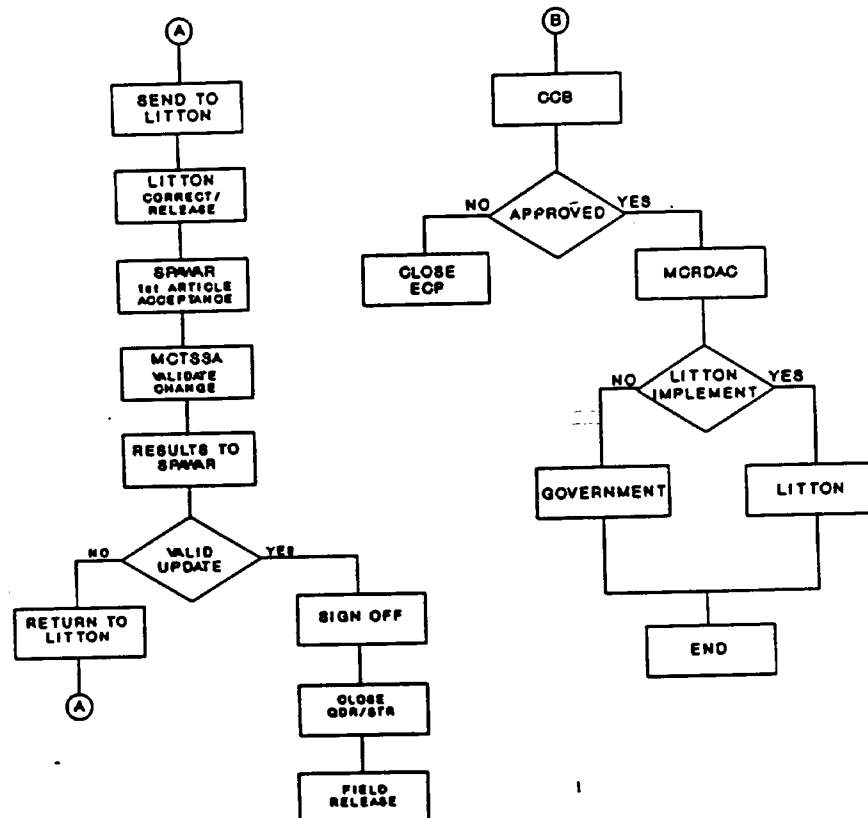


Figure C-1. Phase 2 configuration control (Page 2 of 2).

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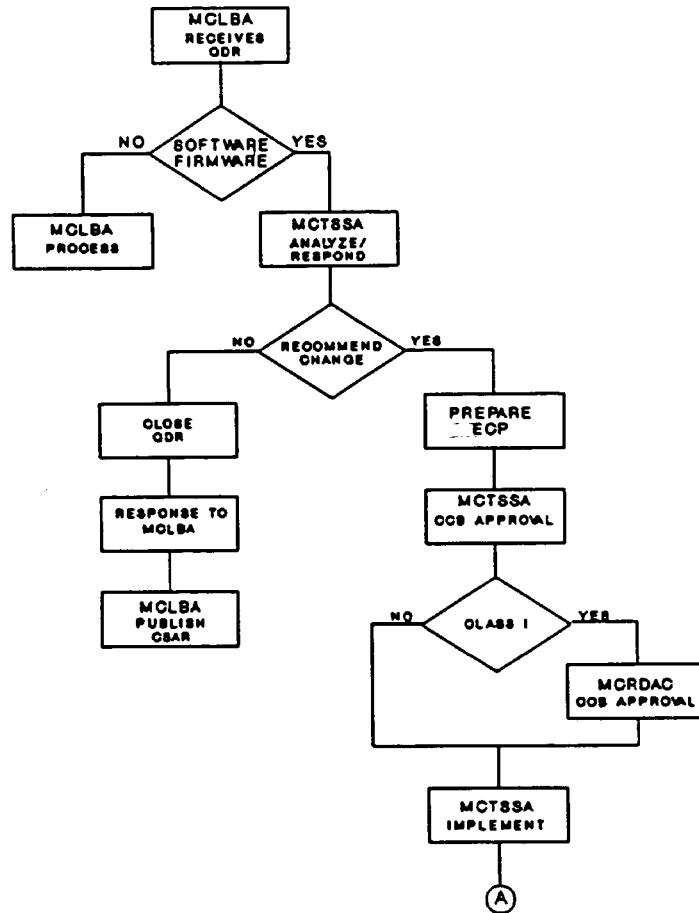


Figure C-1. Phase 3 configuration control (Page 1 of 2).

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MCO 3311.1

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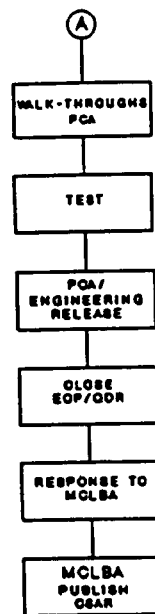


Figure C-1. Phase 3 configuration control (Page 2 of 2).

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C.3.3.1 Phase 1 Reporting Documents

During Phase 1 (production phase), Litton Data Systems will use documents as specified in their Configuration Management Plan, Document No. 191137-900C.

C.3.3.2 Phase 2 Reporting Documents

During Phase 2 (warranty phase), Litton Data Systems will use documents as specified in their Configuration Management Plan, Document No. 191137-900C. The Government will use documents identified in the following paragraphs to control TAOM software/firmware changes.

C.3.3.2.1 Product Quality Deficiency Report. A Product Quality Deficiency Report (QDR), Standard Form 368, will be generated for each software/firmware deficiency. QDs will be processed in accordance with the current release release of MCO 4855.10.

C.3.3.2.2 Software Trouble Report. A Software Trouble Report (STR), DI-E-2178A, will be generated by Litton Data Systems and SPAWAR. Deficiencies identified during acceptance testing, not corrected prior to Marine Corps acceptance of the system, will be recorded by Litton Data Systems using the STR. Problems identified by these STRs will be transitioned from Phase 1 for correction during Phase 2. Latent defects, identified by QDRs, will be submitted to Litton Data System by SPAWAR, utilizing the STR.

C.3.3.2.3 Engineering Change Proposal. An Engineering Change Proposal (ECP), DD Form 1692, will be prepared as a result of valid QDRs or for any change to baseline specification documents. Preparation of ECPs will be in accordance with the current release of MIL-STD-480.

C.3.3.2.4 Specification Change Notice. A Specification Change Notice (SCN), DD form 1696, will be prepared and submitted as an ECP enclosure to propose, transmit, and record changes to a specification. When SCNs are submitted with an ECP they will be issued and incorporated only after approval of the ECP. An SCN will also be used to update specification changes not associated with an ECP. Preparation of SCNs will be in accordance with the current release of MIL-STD-480.

C.3.3.2.5 Request for Deviation/Waiver. A Request for Deviation/Waiver (RFD/RFW), DD Form 1694, will be used to request a deviation or a waiver. A request for deviation may be used prior to development of an item when it is necessary to depart from mandatory specification requirements or drawings. A request for waiver may be used during or after development of an item, or when an item, after having been submitted for test,

is found to depart from specified requirements, but is considered suitable for use "as built." Preparation of RFD/RFWs will be in accordance with the current release of MIL-STD-480.

C.3.3.3 Phase 3 Reporting Documents

During Phase 3 (maintenance phase), documents specified in the following paragraphs will be used to identify and control TAOM software/firmware changes.

C.3.3.3.1 Product Quality Deficiency Report. A Product Quality Deficiency Report (QDR), Standard Form 368, will be generated as described in paragraph C.3.3.2.1.

C.3.3.3.2 Engineering Change Proposal. An Engineering Change Proposal (ECP), DD Form 1692, will be prepared as described in paragraph C.3.3.2.3.

C.3.3.3.3 Specification Change Notice. A Specification Change Notice (SCN) DD form 1696, will be prepared as described in paragraph C.3.3.2.4.

C.3.3.3.4 Request for Deviation/Waiver. A Request for Deviation/Waiver (RFD/RFW), DD Form 1694, will be prepared as described in paragraph C.3.3.2.5.

C.3.4 Review Boards

Configuration Control Boards (CCBs) are established to participate in the review process and act as the approving agent for software/firmware changes. Technical Review Boards (TRBs) are established to provide the CCB with technical evaluation of recommended changes. The following paragraphs define review boards for each phase.

C.3.4.1 Phase 1 Review Boards

Litton Data Systems has established various review boards as identified in Litton Data Systems' Configuration Management Plan, Document No. 191137-900C. SPAWAR will serve as Chairman of the Government CCB and will review all TAOM ECPs. The Government CCB will consists of members from the following Activities.

- a. Chairperson, SPAWAR
- b. United States Air Force, Electronic Systems Division (ESD)
- c. United States Air Force, Tactical Air Command (TAC)
- d. Marine Corps Research and Development Acquisition Command

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- e. Marine Corps Tactical Systems Support Activity
- f. Marine Corps Logistic Base, Albany (Code 843)
- g. Additional membership may be appointed by the Chairperson if deemed appropriate on a case-by-case basis

C.3.4.2 Phase 2 Review Boards

During Phase 2 (warranty phase), the Government CCB reviews all TAOM SCNs, and Request for Deviation/Waivers. When the CCB meets to review acceptance test or warranty issues, the purpose will be to establish priorities, not to approve or disapprove warranty corrections. The CCB will consist of members from the following Activities.

- a. Chairperson, Marine Corps Research, Development and Acquisition Command (MCRDAC)
- b. Space and Naval Warfare Systems Command (SPAWAR)
- c. United States Air Force, Electronic Systems Division (ESD)
- d. United States Air Force, Tactical Air Command (TAC)
- e. Marine Corps Tactical Systems Support Activity (MCTSSA)
- f. Marine Corps Logistic Base, Albany (Code 843)
- g. Additional membership may be appointed by the Chairperson, if deemed appropriate, on a case-by-case basis

C.3.4.3 Phase 3 Review Boards

During Phase 3 (maintenance phase), software/firmware maintenance of the TAOM shifts from Litton Data Systems to MCTSSA. The following paragraphs describe review boards established by the Government to review changes during this phase.

C.3.4.3.1 MCRDAC Review Board. MCRDAC will review all ECPs, SCNs, and Request for Deviation/Waivers. The CCB will consist of members from the following Activities.

- a. Chairperson, Marine Corps Research, Development and Acquisition Command (MCRDAC)
- b. Marine Corps Combat Development Command (MCCDC)

- c. Marine Corps Logistic Base, Albany (Code 843)
- d. Marine Corps Logistic Base, Albany (Code 856)
- e. Marine Corps Tactical Systems Support Activity, Air Command and Control Systems Division (ACCSA)
- f. United States Air Force, Electronic Systems Division (ESD)
- g. United States Air Force, Tactical Air Command (TAC)
- h. Additional membership may be appointed by the Chairperson if deemed appropriate on a case-by-case basis

C.3.4.3.2 MCTSSA Review Boards. MCTSSA (ACCSA) will support MCLBA (Code 843) as the Marine Corps Logistic Element Manager (LEM) for tactical software and firmware. MCTSSA will establish a CCB to perform: 1) technical evaluation of all software/firmware QDRs, 2) technical evaluation of software/firmware ECPs, and 3) approve preparation of ECPs prior to MCRDAC submittal. MCTSSA will establish a Technical Review Board (TRB) to determine the validity, impact, and class of the change. Results of the TRB will be submitted to the CCB. The following paragraphs identify CCB and TRB members.

C.3.4.3.2.1 Configuration Control Board. The Configuration Control Board (CCB) will assess the impact of software/firmware changes in terms of technical requirements, cost, and schedule. The CCB will consist of the following members.

- a. Chairperson, Director (ACCSA)
- b. Recording Secretary, Configuration Management
- c. Project Representative, TAOM Project Officer
- d. TAOM Lead Engineer
- e. Quality Assurance, (ACCSA)
- f. Interoperability (ACCSA)
- g. Additional membership may be appointed by the Chairperson if deemed appropriate on a case-by-case basis

C.3.4.3.2.2 Technical Review Board. The Technical Review Board (TRB) will be convened, prior to a CCB being convened, to ensure that QDRs and ECPs intended for CCB review are complete. This includes insuring all software/firmware issues and project impacts are identified and resolved prior to CCB action. The TRB will consist of the following members.

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- a. Chairperson, TAOM Project Officer
- b. Recording Secretary, Configuration Management
- c. Software/Firmware Engineer
- d. Programmer/Analyst
- e. Test Engineer
- f. Additional membership may be appointed by the Chairperson if deemed appropriate on a case-by-case basis

C.3.5 Storage, Handling, Release of Project Media

Responsibilities and procedures for storage, handling, and releases of project media will change as the TAOM project progresses through the three CM phases. The following paragraphs identify procedures during each phase.

C.3.5.1 Phase 1 Storage/Handling/Release

During Phase 1, Litton Data Systems will follow the procedures for storage, handling, and release of project media in accordance with Litton Data Systems' Configuration Management Plan, Document No. 1191137-900C.

C.3.5.2 Phase 2 Storage/Handling/Release

During Phase 2, MCTSSA will maintain a Configuration Control Media Library (CCML). The CCML will contain TAOM CSCI magnetic media, support software tools, and specifications and test plans listed in Tables C-1 through C-4. An off-site location will be used to store CCML backup copies. All classified media will be handled in accordance with Department of the Navy Information and Personnel Security Program Regulation, OPNAVINST 5510.1. Litton Data Systems will follow the procedures for storage, handling, and release of project media in accordance with Litton Data Systems' Configuration Management Plan, Document No. 1191137-900C.

C.3.5.3 Phase 3 Storage/Handling/Release

During Phase 3, the CCML will contain magnetic media of each TAOM CSCI, support software tools, and the specifications listed in Tables C-1 through C-4. The media library will be controlled by CM. An off-site location will be used to store CCML backup copies. All classified media will be handled in accordance with Department of the Navy Information and Personnel Security Program Regulation, OPNAVINST 5510.1. For version releases involving modified software programs, MCTSSA

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may perform one of two things: 1) deliver and install the new release using contact teams, or 2) send the new release to the Fleet Marine Force (FMF). For version releases involving modified firmware programs, MCTSSA may perform one of two things: 1) submit to MCLBA (Code 843) magnetic media, new PROMs, a Modification Instruction (MI) or Technical Instruction (TI), or 2) deliver and install the new release using contact teams. MCTSSA will record the following version release information.

- a. Location - Marine Corps Activity receiving software or firmware update
- b. Serial Number - The serial number of the TAOM
- c. Version - Identify version of software or firmware delivered
- d. Media - Identify if delivered media was software or firmware
- e. Date - Date software or firmware delivered
- f. Transported - Method used to transport new version
- g. Installed by - Name of person performing the installation (used only when new version is hand delivered)

C.3.6 Additional Control

The United States Air Force is procuring a modified version of the TAOM identified as the AN/TYQ-23(V)2 Modular Control Equipment (MCE). There is commonality in the MCE/TAOM software and firmware, therefore close coordination with the Air Force is required. During Phase 3, MCTSSA will evaluate MCE software/firmware Trouble Reports (TRs) and ECPs. If the problem or change affects software/firmware common to MCE/TAOM, MCTSSA may fix the problem or add an enhancement via an ECP. Tables C-5 through C-8 list MCE baseline specifications.

C.4 CONFIGURATION STATUS ACCOUNTING

Configuration Status Accounting (CSA) will be performed during all three phases of TAOM configuration management. CSA databases will be developed to track all software/firmware QDRs, ECPs and SCNs, and provide their priority, status, and effectivity. The following paragraphs define CSA procedures as they pertain to each phase.

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Table C-5. MCE Functional Baseline Specifications.

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
Contract Specification, Production of TAOM AN/TYQ-23(V)2 for the U.S. Air Force	ELEX-T-316J/AF	System Spec

Table C-6 MCE Allocated Baseline Specifications

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
Switch Action Catalog	224100-620-01	B1/B5
MCE Interface Group (MIG)	225006-642	PPS
Firmware CSCIs		
Mass Memory Unit (MMU)	191112-640-01	PPS
Digital Comm Unit (DCU)	191113-640-01	PPS
Radar Interface Unit (RIU)	224114-640-01	PPS
Comm Interface Unit (CIU)	224115-640-01	PPS
Voice Comm Access Unit (VCAU)	224116-640-01	PPS
Operator Console Unit (OCU)	224117-640-01	PPS
Computer Aided Inst (CAI)/OCU	191117-640-02	PPS
Bus Interface Controller (BIC)	224192-640-01	PPS
Bus Protocol Controller (BPC)	224194-640-01	PPS
MCE Interface Unit (MIU)	225006-640-01	PPS
Software CSCI		
Introduction	221453-640	PPS
Real-Time Operating System (RTOS)	221453-640-01	PPS
Data Management System (DMS)	221453-640-02	PPS
System Initialization (SI)	221453-640-03	PPS
Surveillance (SURV)	221453-640-04	PPS
Weapons Control (WC)	221453-640-05	PPS
Air Traffic Controller (ATC)	221453-640-06	PPS
Electronic Warfare (EW)	221453-640-07	PPS
Simulation (SIM)	221453-640-08	PPS
Data Recording Reduction (DRR)	221453-640-09	PPS
System Initialization Control (SIC)	221453-640-10	PPS
Display (DISP)	221453-640-11	PPS
Performance Monitoring (PERM)	221453-640-12	PPS
Communications (COMM)	221453-640-13	PPS

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Table C-7. MCE Product Baseline Specifications.

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
MCE Interface Group (MIG)	225006-662	PDS
Firmware CSCIs		
Mass Memory Unit (MMU)	191112-662-1	PDS
Digital Comm Unit (DCU)	191113-667-1	PDS
Radar Interface Unit (RIU)	224114-667-1	PDS
Comm Interface Unit (CIU)	224115-667-1	PDS
Voice Comm Access Unit (VCAU)	224116-667-1	PDS
Operator Console Unit (OCU)	224117-667-1	PDS
Computer Aided Instr (CAI)/OCU	191117-667-2	PDS
Bus Interface Controller (BIC)	224192-667-1	PDS
Bus Protocol Controller (BPC)	224194-667-1	PDS
MCE Interface Unit (MIU)	225006-667-1	PDS
Software CSCI		
Introduction	224153-660	PDS
Real-Time Operating System (RTOS)	224153-660-01	PDS
Data Management System (DMS)	224153-660-02	PDS
System Initialization (SI)	224153-660-03	PDS
Surveillance (SURV)	224153-660-04	PDS
Weapons Control (WC)	224153-660-05	PDS
Air Traffic Controller (ATC)	224153-660-06	PDS
Electronic War (EW) (Classified)	224153-660-07	PDS
Simulation (SIM)	224153-660-08	PDS
Data Recording Reduction (DRR)	224153-660-09	PDS
System Initialization Control (SIC)	224153-660-10	PDS
Display (DISP)	224153-660-11	PDS
Performance Monitoring (PERM)	224153-660-12	PDS
Communications (COMM)	224153-660-13	PDS
Database Design Doc	224100-280	DBDD
Source Code	N/A	N/A

Table C-8 MCE Product Baseline Test Documents

<u>TITLE</u>	<u>DOCUMENT NUMBER</u>	<u>DOC TYPE</u>
MCE Interface Group (MIG)	225006-745	FQT
System Test procedures		
TAOM Non-Operating/Oper Test Pro	194403-745	N/A
TAOM Environmental Test Procedures	194407-745	N/A
TAOC TAOM FAT Procedures	246908-740	N/A
TAOC STST Procedures	246909-740	N/A
TAOC MTST Procedures	246910-740	N/A
TAOC System Field Test Procedures	246911-740	N/A
TAOC and TIC Reliability Test Pro	246912-740	N/A
Operational Conf Test (OCT) Pro	246921-740	N/A

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C.4.1 Phase 1 Configuration Status Accounting

Litton Data Systems will provide the Government with Configuration Status Accounting Reports (CSARs) in accordance with Contract N00039-87-C-0330.

C.4.2 Phase 2 Configuration Status Accounting

During Phase 2, the NETR will provide a monthly CSAR to MCTSSA.

C.4.3. Phase 3 Configuration Status Accounting

During Phase 3, MCLBA (Code 856) will be responsible for maintaining the Marine Corps CSA database in accordance with MCO P4130.8. MCTSSA will maintain a CSA database and provide monthly CSAR updates to MCLBA. Periodically, MCLBA will forward their CSAR to MCTSSA to insure information contained in their respective CSA databases accurately reflect each other. The MCTSSA CSA database will identify each baseline and all documents, document changes and revisions that define current and past approved configurations. As a minimum, CM will maintain the following information.

- a. Status of each element of a CSCI
- b. Status of each specification and document that comprises each CSCI
- c. Status of all ECPs, including the number, type, and priority
- d. Status of all QDRs, including the number, type and action taken
- e. Status of all SCNs, including the number and reason for specification changes
- f. Status of all open action items from formal reviews and audits

C.5 FORMAL REVIEWS AND AUDITS

Formal reviews and audits will be conducted during development and life cycle support of TAOM. The following paragraphs identify the scope, participating organizations, and responsibilities associated with each review or audit.

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C.5.1 Phase 1 Formal Reviews and Audits

During Phase 1, the Government will conduct a Functional Configuration Audit (FCA) and a Physical Configuration Audit (PCA) in accordance with MIL-STD-1521B.

C.5.2 Phase 2 Formal Reviews and Audits

The government will conduct reviews of the documentation to ensure each new version is ready to proceed to the next milestone. The TAOM Warranty Administration Plan provides guidance concerning warranty issues.

C.5.3 Phase 3 Formal Reviews and Audits

During Phase 3, MCTSSA will conduct the following reviews and audits to ensure each new version is ready to proceed to the next project milestone.

C.5.3.1 Design Walk-through

A design walk-through will be held prior to code generation. The purpose is to look for flaws, weaknesses, errors, and omissions in the design architecture prior to code generation. The author (designer) will present the design approach being used to satisfy specification requirements, e.g., Software Requirements Specification (SRS). Presentation of the program design language (PDL) will also be included in a design walk-through if the use of PDL is a project requirement.

C.5.3.2 Code Walk-through

Code walk-throughs will be conducted after the first error-free compilation and prior to code testing. Program listings will be examined by a small group to include the originator/author of the code. The walk-through must: (1) verify that the code satisfies design requirements, (2) verify proper external interface design, (3) identify flaws, weaknesses, errors, and omissions in the code, to include structure, and (4) verify compliance with the published ACCSD policy for programming conventions.

C.5.3.3 Physical Configuration Audit

Physical Configuration Audits of TAOM software/firmware will be conducted under the direction of the Head, Software Control Section, ACCSD. These audits, conducted in accordance with MIL-STD-1521, will take place prior to system testing and again prior to version release.