

2800 GROUND T&R MANUAL

CHAPTER 8

MOS 2834 INDIVIDUAL EVENTS

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2800 GROUND T&R MANUAL

CHAPTER 8

MOS 2834 INDIVIDUAL EVENTS

**8000. PURPOSE.** This chapter contains individual training events for MOS 2834, Satellite Communications (SATCOM) Technician.

**8001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**8002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

8003. INDEX OF 2000-LEVEL EVENTS

Event	Event Title	Page
2834-ACT-2301	Perform advanced corrective maintenance on digital wideband transmission systems to the piece-part component level	8-5
2834-ACT-2302	Perform corrective maintenance on satellite communication antennas	8-6
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**8004. 2000-LEVEL EVENTS**

**2834-ACT-2301:** Perform advanced corrective maintenance on digital wideband transmission systems to the piece-part component level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2834

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, designated faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Read schematic diagrams.
4. Ensure proper handling of static sensitive components/printed circuit cards.
5. Measure system performance.
6. Perform alignments.
7. Trace signal paths (signal flow).
8. Trace current/voltage paths.
9. Isolate faulty components
10. Requisition repair parts, as required.
11. Remove/replace faulty components.
12. Apply authorized modification and technical instructions.
13. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 60-12120-01 Fireberd 6000 Reference Manual
2. Applicable technical manuals/publications
3. FEDLOG Federal Logistic Data
4. MCO 3500.27B Operational Risk Management (ORM) (MAY 2004)
5. MCO P4790.1 Marine Corps Integrated Maintenance Management System (MIMMS) Manual
6. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
7. PX 20055 Ground Mobile Forces AS-3036 Antenna Upgrade Kit
8. PX19671, REV. A (L3) X-Band Upconverter Model 6166-03 (CV-4352):  
Operations Manual
9. PX19672, REV. A (L3) X-Band Downconverter Model 6167-03 (CV-4353):  
Operations Manual
10. PX19674 - REV. B (L3) Model 3501-01 IBS/IDR Universal Satellite Modem (MD-1340): Installation & Operation Manual
11. SL 1-2/3 Index of Authorized Publications in Stock
12. SL-4 Repair, Maintenance, and Management Lists

13. TM 08347B-12/1 Satellite Communications Terminals AN/TSC-85B (V)1 w/ch 1&2: Operator & Organizational Maintenance Manual
14. M 08347B-34/3 Satellite Communications Terminals AN/TSC-85B (V)1 w/ch 1&2: Direct & General Support Maintenance Manual
15. TM 08348B-12/1 Satellite Communications Terminals AN/TSC-93D (V)1 w/ch 1&2: Operator & Organizational Maintenance Manual
16. TM 08348B-34/3 Satellite Communications Terminals AN/TSC-93B (V)1 w/ch 1&2: Direct & General Support Maintenance Manual
17. TM 10510-OD/IF General Purpose Test Measurement Diagnostic Equipment Listing
18. TM 10877A/10878A-10/2 Operation and Maintenance Quick Reference Guide for AN/USC-65 (V)1 and AN/USC-65 (V)2
19. TM 10877A/10878A-12/1 Operation and Maintenance Instructions for AN/USC-65 (V)1 and AN/USC-65 (V)2
20. TM 11-5895-1041-34 LNA Control/Translator (Single and Dual Control): Direct and General Support Maintenance Manual
21. TM 11-5895-1093-34 Control, Antenna C-10273/TSC: Direct & General Support Maintenance Manual
22. TM 11-5895-1612-12 Secure Mobile Anti-Jam Reliable Tactical Terminal
23. TM 11-5895-1612-30 Secure Mobile Anti-Jam Reliable Tactical Terminal
24. TM 11-5895-1780-13&P Replacement Frequency Modulation Orderwire Technical Manual
25. TM 11-6130-492-13&P Replacement High Voltage Power Supply Technical Manual
26. TM 11-7025-356-12&P Enhanced Tactical Satellite Signal Processor Technical Manual
27. TM 5895-1038-30 Antenna, AS-3036/TSC and Antenna Mounted Electronics: Direct Support Maintenance Manual
28. TM 9999-15/1 ESD Awareness Electro-Static Discharge
29. UM 4790-5 MIMMS AIS, Field Maintenance Procedures
30. User's Guide Spectrum Analyzer

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. AN/TSC-85D GMF satellite terminal
2. AN/TSC-93D GMF satellite terminal
3. AN/TSC-154 SMART-T satellite terminal
4. AN/TSC-156B satellite terminal
5. AN/USC-65 LMST satellite terminal
6. Oscilloscope
7. Data communications analyzer
8. Multimeter
9. Dummy load
10. Watt Meter
11. Spectrum analyzer

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2834-ACT-2302:** Perform corrective maintenance on satellite communication antennas

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2834

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, designated faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Read schematic diagrams.
4. Ensure proper handling of static sensitive components/printed circuit cards.
5. Measure antenna performance.
6. Perform antenna alignments.
7. Trace signal paths (signal flow).
8. Trace current/voltage paths where applicable.
9. Isolate faulty components.
10. Evacuate LRU/SRU to higher echelon of maintenance, as required.
11. Requisition repair parts, as required.
12. Remove/replace faulty components.
13. Apply authorized modifications and technical instructions.
14. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. MCO P4790.1 Marine Corps Integrated Maintenance Management System (MIMMS) Manual
4. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
5. SL 1-2/3 Index of Authorized Publications in Stock
6. SL-4 Repair, Maintenance, and Management Lists
7. TM 9999-15/1 ESD Awareness Electro-Static Discharge
8. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Digital multimeter
2. Wattmeter
3. Dummy Load
4. AN/TSC-85D GMF satellite terminal
5. AN/TSC-93D GMF satellite terminal
6. AN/TSC-154 SMART-T satellite terminal

7. AN/TSC-156B Phoenix satellite terminal
8. AN/USC-65 LMST satellite terminal
9. AS-3036 2.4 Meter X-Band Antenna
10. AS-4429 4.9 Meter Lightweight High Gain X-Band Antenna (LHGXA)
11. AS-4429 4.9 Meter Large Aperture Multi-Band Antenna (LAMDA)
12. Radiation meter
13. Quad band satellite emulator

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2834-OPS-2401:** Provide technical assistance during the installation of satellite communication systems

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2834

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, satellite communications equipment and a mission.

**STANDARD:** To ensure satellite communication systems are installed and operate in accordance with the appropriate system technical manual.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to cryptographic security requirements.
3. Verify equipment is properly grounded.
4. Verify power source, proper phase, and voltage levels.
5. Verify antenna installation, as required.
6. Verify remote capabilities, as required.
7. Verify COMSEC connection, as required.
8. Verify equipment operation to include equipment configuration and programming.
9. Perform electromagnetic interference troubleshooting.
10. Provide guidance to correct discrepancies noted.

**REFERENCES:**

1. Applicable technical manuals/publications
2. CMS-5 COMSEC Material System Policy & Procedures Manual
3. EKMS-1\_ CMS Policy and Procedures for Navy EKMS Tiers 2 & 3
4. MCO 3500.27B Operational Risk Management (ORM) (MAY 2004)
5. Operational Order
6. PX 20055 Ground Mobile Forces AS-3036 Antenna Upgrade Kit

7. PX19671, REV. A (L3) X-Band Upconverter Model 6166-03 (CV-4352):  
Operations Manual
8. PX19672, REV. A (L3) X-Band Downconverter Model 6167-03 (CV-4353):  
Operations Manual
9. PX19674 - REV. B (L3) Model 3501-01 IBS/IDR Universal Satellite Modem (MD-1340): Installation & Operation Manual
10. TM 08347B-12/1 Satellite Communications Terminals AN/TSC-85B (V)1 w/ch 1&2:  
Operator & Organizational Maintenance Manual
11. TM 08347B-34/3 Satellite Communications Terminals AN/TSC-85B (V)1 w/ch 1&2:  
Direct & General Support Maintenance Manual
12. TM 08348B-12/1 Satellite Communications Terminals AN/TSC-93D (V)1 w/ch 1&2:  
Operator & Organizational Maintenance Manual
13. TM 08348B-34/3 Satellite Communications Terminals AN/TSC-93B (V)1 w/ch 1&2:  
Direct & General Support Maintenance Manual
14. TM 10877A/10878A-10/2 Operation and Maintenance Quick Reference Guide for  
AN/USC-65 (V)1 and AN/USC-65 (V)2
15. TM 10877A/10878A-12/1 Operation and Maintenance Instructions for AN/USC-65  
(V)1 and AN/USC-65 (V)2
16. TM 11-5895-1041-34 LNA Control/Translator (Single and Dual Control):  
Direct and General Support Maintenance Manual
17. TM 11-5895-1093-34 Control, Antenna C-10273/TSC: Direct & General Support  
Maintenance Manual
18. TM 11-5895-1780-13&P Replacement Frequency Modulation Orderwire Technical  
Manual
19. TM 11-6130-492-13&P Replacement High Voltage Power Supply Technical Manual
20. TM 11-7025-356-12&P Enhanced Tactical Satellite Signal Processor Technical  
Manual
21. TM 5895-1038-30 Antenna, AS-3036/TSC and Antenna Mounted Electronics:  
Direct Support Maintenance Manual
22. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control  
and Safety (Aug 91)
23. TM 9999-15/1 ESD Awareness Electro-Static Discharge

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Multimeter
  2. Wattmeter
  3. Dummy Load
  4. AN/TSC-85D GMF satellite terminal
  5. AN/TSC-93D GMF satellite terminal
  6. AN/TSC-154 SMART-T satellite terminal
  7. AN/TSC-156B Phoenix satellite terminal
  8. AN/USC-65 LMST satellite terminal
  9. AS-3036 2.4 Meter X-Band Antenna
  10. AS-4429 4.9 Meter Lightweight High Gain X-Band Antenna (LHGXA)
  11. AS-4429 4.9 Meter Large Aperture Multi-Band Antenna (LAMDA)
  12. Digital oscilloscope
  13. AN/GSC-54 fiber optic converter
  14. Power supply
  15. Signal generator
  16. Data communications analyzer
-

**2834-OPS-2402:** Provide technical assistance during the restoration of satellite communication systems

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2834

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, satellite communications equipment and a mission.

**STANDARD:** To ensure satellite communication systems are installed and operate in accordance with the appropriate system technical manual.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Verify equipment is properly grounded.
3. Verify power source, proper phase and voltage levels.
4. Verify antenna installation, as required.
5. Verify remote capabilities, as required.
6. Verify COMSEC connection, as required.
7. Verify equipment operation to include equipment configuration and programming.
8. Verify equipment operating procedures to include COMSEC.
9. Perform electromagnetic interference troubleshooting.
10. Provide guidance to correct discrepancies noted.

**REFERENCES:**

1. Applicable technical manuals/publications
2. CMS-5 COMSEC Material System Policy & Procedures Manual
3. EKMS-1\_CMS Policy and Procedures for Navy EKMS Tiers 2 & 3
4. Operational Order
5. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety (Aug 91)
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. AN/TSC-85D GMF satellite terminal
2. AN/TSC-93D GMF satellite terminal
3. AN/TSC-154 SMART-T satellite terminal
4. AN/TSC-156B Phoenix satellite terminal
5. AN/USC-65 LMST satellite terminal
6. AS-3036 2.4 Meter X-Band Antenna
7. AS-4429 4.9 Meter Lightweight High Gain X-Band Antenna (LHGXA)
8. AS-4429 4.9 Meter Large Aperture Multi-Band Antenna (LAMDA)
9. Digital oscilloscope
10. Data communications analyzer
11. Multimeter
12. Dummy load
13. Wattmeter

NAVMC 3500.6A  
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14. AN/GSC-54 fiber optic converter
  15. Power supply
  16. Signal generator
  17. Spectrum analyzer
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CHAPTER 9

MOS 2844 INDIVIDUAL EVENTS

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CHAPTER 9

MOS 2844 INDIVIDUAL EVENTS

**9000. PURPOSE.** This chapter contains individual training events for MOS 2844, Ground Communications Organizational Repairer.

**9001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**9002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

9003. INDEX OF 1000-LEVEL EVENTS

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9004. 1000-LEVEL EVENTS

2844-ACT-1301: Perform ground common transmission systems restoration

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2844

GRADES: PVT, PFC, LCPL, CPL, SGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, designated faulty equipment, TMDE and tools.

STANDARD: To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

PERFORMANCE STEPS:

1. Adhere to safety requirements.
2. Adhere to cryptographic security regulations.
3. Research applicable technical data pertaining to faulty equipment.
4. Read basic systems diagrams.
5. Measure basic circuit performance.
6. Perform alignments, as required.
7. Isolate faulty systems component.
8. Requisition part, as required.
9. Remove/replace faulty components, as required.
10. Apply authorized modification and technical instructions.
11. Perform maintenance closeout procedures to include quality assurance checks.

REFERENCES:

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. Operational Order
5. SL 1-2/3 Index of Authorized Publications in Stock

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment:

1. Wattmeter
  2. Digital transfer device
  3. Multimeter
  4. Ground common transmission system
  5. HYP-57/TSEC vehicular power adapter
  6. Mobile intercom system
  7. Organizational test set
  8. Organizational tool box
  9. Distribution box
  10. AN/TSEC KY-57
-

**2844-ACT-1302:** Perform corrective maintenance on ground common transmission systems to the shop replaceable unit (SRU) level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2844

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, designated faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Research applicable technical data pertaining to faulty equipment
4. Read basic schematic diagrams.
5. Measure basic circuit performance.
6. Perform alignments, as required.
7. Verify firmware/software, as required.
8. Isolate faulty line replaceable unit (LRU).
9. Requisition parts, as required.
10. Remove/replace faulty LRU, as required.
11. Apply authorized modifications and technical instructions.
12. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. SL 1-2/3 Index of Authorized Publications in Stock

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Wattmeter
2. Power supply
3. Multimeter
4. Ground common transmission system
5. DAGR
6. Organizational toolkit
7. Organizational test set

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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2844-OPS-1401: Verify the installation of ground common transmission systems

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2844

GRADES: PVT, PFC, LCPL, CPL, SGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, equipment and a mission.

STANDARD: To ensure equipment is properly installed and operates in accordance with the appropriate system technical manual.

PERFORMANCE STEPS:

1. Adhere to cryptographic security regulations.
2. Adhere to safety requirements.
3. Verify power source.
4. Verify antenna installation, as required.
5. Perform electromagnetic interference troubleshooting to include checking for proper grounding, cable connection, and perform corrective action when applicable.
6. Provide guidance to correct discrepancies.
7. Verify communications security (COMSEC) connection, as required.
8. Verify equipment operation.
9. Verify remote capabilities, as required.

REFERENCES:

1. Applicable technical manuals/publications
2. MCRP 6-22A Multi-Service Communications Procedures for the Single-Channel Ground Radio
3. TI-5820-25/22 Electromagnetic Environmental Effects (E3) Procedures
4. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety (Aug 91)
5. TM 9999-15/1 ESD Awareness Electro-Static Discharge

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment:

1. Remote radio control system
  2. Ground radio transmission system
  3. TSEC/KY-57 Speech Security Equipment (VINSON)
  4. Ground tester
  5. Organizational toolkit
  6. Organizational test set
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CHAPTER 10

MOS 2846 INDIVIDUAL EVENTS

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CHAPTER 10

MOS 2846 INDIVIDUAL EVENTS

**10000. PURPOSE.** This chapter contains individual training events for MOS 2846, Ground Radio Intermediate Repairman.

**10001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**10002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

10003. INDEX OF 1000-LEVEL EVENTS

Event	Event Title	Page
2846-ACT-1301	Perform corrective maintenance on ground common transmission systems to the shop replaceable unit (SRU) level	10-5

10004. 1000-LEVEL EVENTS

**2846-ACT-1301:** Perform corrective maintenance on ground common transmission systems to the shop replaceable unit (SRU) level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2846

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, designated faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to cryptographic security regulations.
3. Research applicable technical data pertaining to faulty equipment.
4. Ensure proper handling of static sensitive components/printed circuit cards.
5. Verify firmware/software, as required.
6. Upgrade/reinstall firmware/software, as required.
7. Read schematic diagrams.
8. Calculate circuit parameters.
9. Measure circuit performance.
10. Perform alignments, as required.
11. Trace signal paths.
12. Trace current/voltage paths.
13. Identify faulty secondary replaceable unit/chassis mounted components.
14. Replace faulty components, as required.
15. Apply authorized modifications and technical instructions.
16. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. CMS-5 COMSEC Material System Policy & Procedures Manual
3. EKMS-1\_CMS Policy and Procedures for Navy EKMS Tiers 2 & 3
4. FEDLOG Federal Logistic Data
5. MCO P4790.1 Marine Corps Integrated Maintenance Management System (MIMMS) Manual
6. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
7. Maintenance Float Catalog Maintenance Float Catalog
8. SL 1-2/3 Index of Authorized Publications in Stock
9. SL-4 Repair, Maintenance, and Management Lists
10. TM 9999-15/1 ESD Awareness Electro-Static Discharge
11. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Wattmeter
2. Digital transfer device
3. Power supply
4. ON-373A/GRC Interconnecting Group
5. Ground common transmission system
6. ATE
7. Multimeter
8. Signal generator
9. Function generator
10. Oscilloscope
11. Toolkit
12. Laptop computer

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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CHAPTER 11

MOS 2847 INDIVIDUAL EVENTS

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2800 GROUND T&R MANUAL

CHAPTER 11

MOS 2847 INDIVIDUAL EVENTS

**11000. PURPOSE.** This chapter contains individual training events for MOS 2847, Telephone Systems/Personal Computer Repairer.

**11001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**11002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

11003. INDEX OF 1000-LEVEL EVENTS

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2847-ACT-1301	Perform corrective maintenance on ground common telephony systems to the shop replaceable unit (SRU) level	11-5
2847-ACT-1302	Perform corrective maintenance on ground common data networking systems to the shop replaceable unit (SRU) level	11-6
2847-ACT-1303	Perform corrective maintenance on a fiber optic cable	11-7

11004. 1000-LEVEL EVENTS

**2847-ACT-1301:** Perform corrective maintenance on ground common telephony systems to the shop replaceable unit (SRU) level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2847

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, designated faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Verify firmware/software, as required.
4. Upgrade/reinstall firmware/software, as required.
5. Verify system configuration, as required.
6. Read schematic diagrams.
7. Calculate circuit parameters.
8. Ensure proper handling of static sensitive components/printed circuit cards.
9. Measure circuit performance.
10. Perform alignments, as required.
11. Identify faulty secondary replaceable unit/chassis mounted components.
12. Remove/replace faulty components, as required.
13. Apply authorized modifications and technical instructions.
14. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. Maintenance Float Catalog Maintenance Float Catalog
4. SL 1-2/3 Index of Authorized Publications in Stock
5. TM 9999-15/1 ESD Awareness Electro-Static Discharge

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. GPETE
2. Data transfer device
3. Laptop computer
4. Power supply
5. Ground common telephony system

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2847-ACT-1302:** Perform corrective maintenance on ground common data networking systems to the shop replaceable unit (SRU) level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2847

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, designated faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to Information Assurance (IA) regulations.
3. Research applicable technical data pertaining to faulty equipment.
4. Read schematic diagram.
5. Calculate circuit parameters.
6. Measure circuit performance.
7. Ensure proper handling of static sensitive components/printed circuit cards.
8. Identify faulty components.
9. Evacuate to higher echelon, as required.
10. Remove/replace faulty components, as required.
11. Apply authorized modifications and technical instructions.
12. Research upgrades and drivers.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. SL 1-2/3 Index of Authorized Publications in Stock
4. SL-4 Repair, Maintenance, and Management Lists
5. TM 9999-15/1 ESD Awareness Electro-Static Discharge

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. GPETE
2. Data networking systems
3. Maintenance kit
4. Peripheral devices

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2847-ACT-1303:** Perform corrective maintenance on fiber optic cable

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2847

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, faulty cable, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety regulations.
2. Research appropriate technical data.
3. Measure cable performance.
4. Isolate faulty components/areas.
5. Requisition repair part, as required.
6. Replace faulty connectors, as required.
7. Apply authorized modifications and technical instructions.
8. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Optical communications test set
  2. Visual fiber optic fault finder
  3. Optical Time Domain Reflector (OTDR)
  4. Termination kit
-

11003. INDEX OF 2000-LEVEL EVENTS

Event	Event Title	Page
2847-ACT-2301	Perform corrective maintenance on ground common laser printers	11-9

11003. 2000-LEVEL EVENTS

2847-ACT-2301: Perform corrective maintenance on ground common laser printers

EVALUATION-CODED: YES

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2847

GRADES: PVT, PFC, LCPL, CPL, SGT

INITIAL TRAINING SETTING: MOJT

CONDITION: With the aid of references, an assigned maintenance area, designated faulty equipment, TMDE and tools.

STANDARD: To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

PERFORMANCE STEPS:

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Read schematic diagram.
4. Calculate circuit parameters.
5. Measure circuit performance.
6. Ensure proper handling of static sensitive components/printed circuit cards.
7. Identify faulty components.
8. Evacuate to higher echelon, as required.
9. Requisition repair parts, as required.
10. Remove/replace faulty components, as required.
11. Apply authorized modifications and technical instructions.
12. Research upgrades and drivers.

REFERENCES:

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. SL 1-2/3 Index of Authorized Publications in Stock
4. SL-4 Repair, Maintenance, and Management Lists
5. TM 09999-15/1 ESD Awareness

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment:

1. GPETE
  2. Printer
  3. Maintenance kit
-

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CHAPTER 12

MOS 2848 INDIVIDUAL EVENTS

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CHAPTER 12

MOS 2848 INDIVIDUAL EVENTS

**12000. PURPOSE.** This chapter contains individual training events for MOS 2848, Tactical Remote Sensor System (TRSS) Maintainer.

**12001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**12002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

12003. INDEX OF 2000-LEVEL EVENTS

Event	Event Title	Page
2848-ACT-2301	Perform corrective maintenance on the Tactical Remote Sensor System	12-5

12004. 2000-LEVEL EVENTS

2848-ACT-2301: Perform corrective maintenance on the Tactical Remote Sensor System

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

DESCRIPTION: Necessary MOS 2848 is assigned to qualified Marines in PMOS of 2846 or 2862.

MOS PERFORMING: 2848

GRADES: LCPL, CPL, SGT, SSGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, an assigned maintenance area, designated faulty equipment, TMDE and tools.

STANDARD: To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

PERFORMANCE STEPS:

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Read schematic diagrams.
4. Calculate circuit parameters.
5. Ensure proper handling of static sensitive components/printed circuit cards.
6. Measure basic circuit performance.
7. Perform alignments, as required.
8. Trace signal paths.
9. Trace current/voltage paths.
10. Isolate faulty component(s).
11. Requisition repair parts, as required.
12. Remove/replace faulty component(s), as required.
13. Research authorized modification and technical instructions.
14. Perform maintenance closeout procedures to include quality assurance checks.

REFERENCES:

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. Maintenance Float Catalog Maintenance Float Catalog
5. SL 1-2/3 Index of Authorized Publications in Stock
6. SL-4 Repair, Maintenance, and Management Lists
7. TM 9999-15/1 ESD Awareness Electro-Static Discharge
8. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment:

1. Semiconductor device test set

2. Oscilloscope
3. Function generator
4. Digital multimeter
5. Wattmeter
6. Signal Generator
7. AN/GSQ-261 Tactical Remote Sensor System (TRSS)
8. AN/USM-657(V2) Third Echelon Test System (TETS)
9. Spectrum analyzer
10. J-4843A/GRM test adapter
11. TS-4317/GRM Radio Test Set

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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CHAPTER 13

MOS 2862 INDIVIDUAL EVENTS

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2800 GROUND T&R MANUAL

CHAPTER 13

MOS 2862 INDIVIDUAL EVENTS

**13000. PURPOSE.** This chapter contains individual training events for MOS 2862, Electronics Maintenance Technician.

**13001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**13002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

13003. INDEX OF 2000-LEVEL EVENTS

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2862-ACT-2302	Perform advanced corrective maintenance on ground common telephony switching systems to the piece-part component level	13-6
2862-ACT-2303	Perform advanced corrective maintenance on data networking systems to the piece-part component level	13-7

13004. 2000-LEVEL EVENTS

**2862-ACT-2301:** Perform advanced corrective maintenance on ground common transmission systems to the piece-part component level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2862

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to cryptographic security regulations.
3. Ensure proper handling of static sensitive components/printed circuit cards.
4. Conduct system fault analysis.
5. Research applicable technical data pertaining to faulty equipment.
6. Interpret complex schematic diagrams.
7. Calculate complex electronic circuit parameters.
8. Measure complex electronic circuit performance.
9. Trace signal paths, e.g., current/voltage.
10. Develop troubleshooting tools utilizing ATE as required.
11. Isolate faulty components.
12. Determine acquisition method for repair parts.
13. Remove/replace faulty components, as required.
14. Apply authorized modifications and technical instructions.
15. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. Applicable technical manuals/publications
3. CMS-5 COMSEC Material System Policy & Procedures Manual
4. EKMS-1\_ CMS Policy and Procedures for Navy EKMS Tiers 2 & 3
5. FEDLOG Federal Logistic Data
6. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
7. SL 1-2/3 Index of Authorized Publications in Stock
8. SL-4 Repair, Maintenance, and Management Lists
9. TM 9999-15/1 ESD Awareness Electro-Static Discharge
10. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Oscilloscope

2. Multimeter
3. Wattmeter
4. Dummy Load
5. Function generator
6. Tool Kit
7. DAGR
8. Power Supply
9. Frequency counter
10. Spectrum analyzer
11. Digital transfer device
12. Ground common transmission system
13. Data communications analyzer
14. ATE

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2862-ACT-2302:** Perform advanced corrective maintenance on ground common telephony switching systems to the piece-part component level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2862

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to cryptographic security regulations.
3. Ensure proper handling of static sensitive components/printed circuit cards.
4. Conduct system fault analysis.
5. Research applicable technical data pertaining to faulty equipment.
6. Validate firmware/software, as required.
7. Reinstall firmware/software, as required.
8. Upgrade firmware/software, as required.
9. Interpret complex schematic diagrams.
10. Calculate complex electronic circuit parameters.
11. Measure complex electronic circuit performance.
12. Trace signal paths, e.g., current/voltage.
13. Develop trouble shooting tools utilizing ATE as required.

14. Isolate faulty components.
15. Determine acquisition method for repair parts.
16. Remove/replace faulty components, as required.
17. Apply authorized modifications and technical instructions.
18. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. Applicable technical manuals/publications
3. CMS-5 COMSEC Material System Policy & Procedures Manual
4. EKMS-1\_CMS Policy and Procedures for Navy EKMS Tiers 2 & 3
5. FEDLOG Federal Logistic Data
6. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
7. SL 1-2/3 Index of Authorized Publications in Stock
8. SL-4 Repair, Maintenance, and Management Lists
9. TM 9999-15/1 ESD Awareness Electro-Static Discharge
10. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Oscilloscope
2. Multimeter
3. Function generator
4. Power supply
5. Ground common telephony switching system
6. Data transfer device
7. TA-977/PT Tone Signaling Adapter
8. TD-1234 Multiplexer Combiner
9. ATE
10. DAGR
11. Data analyzer
12. Power meter
13. Tool kit

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2862-ACT-2303:** Perform advanced corrective maintenance on data networking systems to the piece-part component level.

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2862

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to cryptographic security regulations.
3. Ensure proper handling of static sensitive components/printed circuit cards.
4. Conduct system fault analysis.
5. Research applicable technical data pertaining to faulty equipment.
6. Validate firmware/software, as required.
7. Upgrade firmware/software, as required.
8. Reinstall firmware/software, as required.
9. Measure electronic circuit performance.
10. Troubleshoot using PC diagnostic tools, as required.
11. Isolate faulty components.
12. Determine acquisition method for repair parts.
13. Remove/replace faulty components, as required.
14. Apply authorized modifications and technical instructions.
15. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. Applicable technical manuals/publications
3. CMS-5 COMSEC Material System Policy & Procedures Manual
4. EKMS-1\_ CMS Policy and Procedures for Navy EKMS Tiers 2 & 3
5. FEDLOG Federal Logistic Data
6. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
7. SL 1-2/3 Index of Authorized Publications in Stock
8. SL-4 Repair, Maintenance, and Management Lists
9. TM 9999-15/1 ESD Awareness Electro-Static Discharge
10. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Tool Kit
2. Desktop computer
3. Laptop computer
4. Network router
5. Network hub
6. Network server
7. Tactical Data Network (TDN)
8. DDS

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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CHAPTER 14

MOS 2871 INDIVIDUAL EVENTS

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CHAPTER 14

MOS 2871 INDIVIDUAL EVENTS

**14000. PURPOSE.** This chapter contains individual training events for MOS 2871, Calibration Technician.

**14001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**14002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

14003. INDEX OF 1000-LEVEL EVENTS

Event	Event Title	Page
2871-ADMN-1201	Complete calibration maintenance documents and forms	14-5
2871-ACT-1301	Perform corrective maintenance on Test Measurement and Diagnostic Equipment	14-5
2871-ACT-1302	Calibrate Test Measurement and Diagnostic Equipment	14-7

14004. 1000-LEVEL EVENTS

2871-ADMN-1201: Complete calibration maintenance documents and forms

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2871

GRADES: PVT, PFC, LCPL, CPL, SGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, documents, equipment, applicable maintenance management forms and software.

STANDARD: In accordance with TI 4733-OD/1.

PERFORMANCE STEPS:

1. Input information into the automated calibration information system.
2. Reconcile calibration information.
3. Produce induction label(s).
4. Perform maintenance closeout procedures to include quality assurance checks.

REFERENCES:

1. 17-35MTL-1 Electronic Version of METRL (METPRO)
2. TM 10811A-3/5 Visual Labmate User's Manual
3. Technical Instruction Series 4733 Marine Corps Calibration and Maintenance Programs
4. UM 4400-124 Sassy Using Unit Procedures
5. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment

1. Data acquisition control group
- 

2871-ACT-1301: Perform corrective maintenance on Test Measurement and Diagnostic Equipment

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2871

GRADES: PVT, PFC, LCPL, CPL, SGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, an assigned maintenance area, faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to equipment.
3. Read schematic diagrams.
4. Verify configurations, as required.
5. Calculate basic electronic circuit performance.
6. Ensure proper handling of static sensitive components/printed circuit cards.
7. Measure circuit performance.
8. Trace signal paths in basic electronic circuits.
9. Trace current/voltage paths in basic electronic circuits.
10. Perform alignments, as required.
11. Isolate faulty components, as required.
12. Requisition repair parts.
13. Replace faulty components.
14. Apply authorized modifications and technical instructions.
15. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. ISBN 0-02-800762-X GROB Basic Electronics 7th Edition
4. ISBN 0-02-801845-1 Electronics Principles and Applications 4th Edition
5. ISBN 0-13-250704-8 Electronics with Digital and Analog
6. ISBN 0-13-889585-6 Electricity One-Seven 2nd Edition
7. ISBN 0-675-21217-0 Digital Fundamentals 4th Edition
8. ISBN 0-8359-4283-X Mathematics Applied to Electronics 2nd Edition
9. TM 10510-14/1 Electronic Test Equipment Listing
10. TM 9999-15/1 ESD Awareness Electro-Static Discharge

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Function generator
2. Digital multimeter
3. Digital oscilloscope
4. Signal generator
5. Universal counter
6. Automated test equipment
7. Communication test set
8. Power supply
9. Data acquisition control group
10. Low frequency repair station
11. Communication repair station
12. Computer assisted basic electronics training system
13. Power supply load
14. Variable isolation transformer and safety analyzer
15. Tool kit

**MATERIAL:** Distance Learning Products Available:

1. MCI 2820, Electronics Mathematics for Marines

2. MCI 286G, Fundamentals of Digital Logic
  3. MCI 287A, Introduction to Test Measurement and Diagnostic Equipment
- 

**2871-ACT-1302:** Calibrate Test Measurement and Diagnostic Equipment

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2871

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, equipment to be calibrated, materials and tools.

**STANDARD:** In accordance with TI 4733-35/23 and MCSC PM-TMDE approved instrument calibration procedures.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to connector care requirements.
3. Adhere to quality requirements.
4. Perform operational check.
5. Verify accuracy of Test Measurement and Diagnostic Equipment utilizing appropriate calibration procedure.
6. Ensure proper handling of static sensitive components/printed circuit cards.
7. Verify authorized modification and technical instructions.
8. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 17-35FR-06 Facilities Requirements
2. 17-35MTL-1 Electronic Version of METRL (METPRO)
3. Applicable technical manuals/publications
4. FEDLOG Federal Logistic Data
5. TI 4733-35/24 Quality Manual
6. TM 10510-14/1 Electronic Test Equipment Listing
7. TM 9999-15/1 ESD Awareness Electro-Static Discharge
8. Technical Instruction Series 4733 Marine Corps Calibration and Maintenance Programs

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Function generator
2. Digital multimeter
3. Digital oscilloscope
4. Signal generator
5. Universal counter
6. Automated test equipment
7. Communication test set

8. Torque wrench
9. Torque multiplier
10. Tachometer
11. Tensiometer
12. Spring Scale
13. Platform Scale
14. Pressure Gauge
15. Vacuum Gauge
16. Compound Gauge
17. Torque Screwdrivers
18. Wheel Scales
19. Thermometer
20. Force/Mass standard station
21. Torque standard station
22. Oscilloscope station
23. Temperature standard station
24. Pressure standard station
25. Automotive standard station
26. Multimeter station
27. Data acquisition control group
28. Signal generator standard station
29. Low frequency station
30. On site station
31. Communication standard station
32. High frequency shared station
33. Mechanical shared station

**MATERIAL:** Distance Learning Products Available:

1. MCI 2820, Electronics Mathematics for Marines
  2. MCI 286G, Fundamentals of Digital Logic
  3. MCI 287A, Introduction to Test Measurement and Diagnostic Equipment
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2800 GROUND T&R MANUAL

CHAPTER 15

MOS 2874 INDIVIDUAL EVENTS

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2800 GROUND T&R MANUAL

CHAPTER 15

MOS 2874 INDIVIDUAL EVENTS

**15000. PURPOSE.** This chapter contains individual training events for MOS 2874, Metrology Technician.

**15001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**15002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

15003. INDEX OF 2000-LEVEL EVENTS

Event	Event Title	Page
2874-PLAN-2101	Plan Test Measurement and Diagnostic Equipment maintenance support	15-5
2874-PLAN-2102	Manage laboratory standards traceability	15-5
2874-PLAN-2103	Manage laboratory quality program	15-6
2874-PLAN-2104	Manage calibration automated information system	15-7
2874-PLAN-2105	Perform the duties of Senior Calibration Chief, TMDE	15-7
2874-PLAN-2106	Perform the duties as SNCOIC, TMDE School	15-9
2874-ACT-2301	Calibrate laboratory standards	15-9
2874-ACT-2302	Calibrate microwave measurement equipment	15-10
2874-ACT-2303	Calibrate electro-optic equipment	15-11
2874-ACT-2304	Calibrate dimensional equipment	15-12
2874-OPS-2401	Deploy a calibration maintenance facility	15-13

15004. 2000-LEVEL EVENTS

2874-PLAN-2101: Plan Test Measurement and Diagnostic Equipment maintenance support

EVALUATION-CODED: NO SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2874

GRADES: SGT, SSGT, GYSGT, MSGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, Commander's guidance, equipment, a mission and personnel.

STANDARD: In accordance with MCO P4733.1B and MCO P4790.2\_, Appendix E.

PERFORMANCE STEPS:

1. Determine unit capabilities.
2. Determine supported unit requirements.
3. Determine locations of supported equipment.
4. Determine supply support.
5. Determine logistical support.
6. Determine personnel requirements.
7. Determine facility requirements (consider environmental considerations).
8. Determine security requirements.
9. Determine fiscal requirements.

REFERENCES:

1. Applicable technical manuals/publications
2. CMR Consolidated Memorandum Report
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. MCO P5090.2A Environmental Compliance and Protection Manual (Jul 98)
5. MCWP 5-1 Marine Corps Planning Process
6. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety (Aug 91)
7. UNIT SOP Unit's Standing Operating Procedures
8. Unit TO/E Table of Organization/Equipment

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2874-PLAN-2102: Manage laboratory standards traceability

EVALUATION-CODED: NO SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2874

GRADES: SGT, SSGT, GYSGT, MSGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, equipment, materials and tools.

**STANDARD:** In accordance with TI 4733-35/24.

**PERFORMANCE STEPS:**

1. Coordinate receipt of standards.
2. Schedule laboratory standards for calibration.
3. Schedule personnel to perform maintenance action.
4. Coordinate shipment of standards.
5. Maintain laboratory standards.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
  2. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP) (Jun 99)
  3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
  4. MSDS Material Safety Data Sheets
  5. TM 10510-14/1 Electronic Test Equipment Listing
  6. UM 4790-5 MIMMS AIS, Field Maintenance Procedures
- 

**2874-PLAN-2103:** Manage laboratory quality program

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2874

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, equipment, a mission and personnel.

**STANDARD:** In accordance with TI 4733-35/24.

**PERFORMANCE STEPS:**

1. Prepare for evaluations.
2. Perform evaluation.
3. Correct deficiencies.
4. Maintain laboratory documents.
5. Maintain laboratory records.

**REFERENCES:**

1. Applicable technical manuals/publications
2. CMR Consolidated Memorandum Report
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. MCO P5090.2A Environmental Compliance and Protection Manual (Jul 98)
5. MCWP 5-1 Marine Corps Planning Process
6. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety (Aug 91)
7. UNIT SOP Unit's Standing Operating Procedures
8. Unit TO/E Table of Organization/Equipment

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment: Calibration Facility

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**2874-PLAN-2104:** Manage calibration automated information system

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2874

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, equipment, a mission and personnel.

**STANDARD:** In accordance with TM 10811A-OD&P/1\_.

**PERFORMANCE STEPS:**

1. Maintain automated information system database.
2. Maintain automated information system software.
3. Maintain automated information system hardware.
4. Perform automated information system recovery plan.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
  2. Applicable technical manuals/publications
  3. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP) (Jun 99)
  4. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
  5. TM 10510-14/1 Electronic Test Equipment Listing
  6. UM 4790-5 MIMMS AIS, Field Maintenance Procedures
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**2874-PLAN-2105:** Perform the duties of Senior Calibration Chief, TMDE

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2874

**GRADES:** MGYSGT

**INITIAL TRAINING SETTING:** MOJT

**CONDITION:** With the aid of references and when assigned to the billet.

**STANDARD:** To accomplish program objectives for development, production and sustainment to meet the user's operational needs as described in DOD Directives 5000.01 and 5000.02.

**PERFORMANCE STEPS:**

1. Analyze mission, directives, policy, guidance, and references.

2. Advise the Program Manager, TMDE on Marine Corps TMDE Calibration and Maintenance Program (CAMP) and Calibration/Metrology policy.
3. Provide quantitative data for the reporting cost, schedule and performance data for the AN/TSM-214A Expeditionary TMDE Maintenance System (ETMS).
4. Coordinate with the Calibration TMDE Management Systems (CTMS) Team Leader pertaining to TMDE calibration, acquisitions, services, research and development supporting the operating forces to sustain combat essential and mission critical equipment.
5. Coordinate and provide direction for the oversight of the Marine Corps Calibration Quality Assurance Program.
6. Review quality audits and participate in surveillance visits to Marine Forces Calibration Facilities.
7. Represent the Program Manager, TMDE during Navy Calibration/Metrology Standing Committee (AIS Standing Committee), Test and Measurement Systems Executive Board (TAMS EB), and the Engineering Steering Committee (ESC) meetings.
8. Assist the Program Officer CTMS to manage fiscal requirements in the acquisition and support of Calibration Equipment.
9. Brief required personnel on TMDE and Calibration Equipment maintenance issues/challenges.
10. Assist the CTMS Project Officer to plan life-cycle sustainment strategy for TMDE, Calibration Equipment, and the AN/TSM-214A Expeditionary TMDE Maintenance System (ETMS).

**REFERENCES:**

1. Applicable technical manuals/publications
  2. Higher Headquarters Directives
  3. MCO 4105.2 Marine Corps Warranty Program
  4. Contracting Officer Representative (COR) ICE2 Handbook
  5. DoDD 5000.01 Defense Acquisition System
  6. DoDD 5000.02 Defense Acquisition Regulations
  7. MCO 4081.2 Performance Based Logistics (PBL)
  8. MCO 5000.19 Marine Corps Systems Command
  9. TM 4420-15/1 Lifecycle Logistics and the Material Fielding Process
  10. MCO 4000.57 Total Life Cycle Management
  11. MCO 4000.58 Marine Corps Logistics Command
  12. CJCSI 3170.01 Joint Capabilities Integration Development System
  13. CJCSM 3170.01 Operation of the Joint Capabilities Integration Development System
  14. MCO 3900.15 Expeditionary Force Development System
  15. Title 10 USC
  16. MCO 5000.19 Marine Corps Systems Command
  17. SECNAVINST 5000.2 Implementation and Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System
  18. SECNAVINST 4105.1 INDEPENDENT LOGISTICS ASSESSMENT (ILA) AND CERTIFICATION REQUIREMENTS
  19. SECNAVINST 5420.188 ACQUISITION CATEGORY (ACAT) PROGRAM DECISION PROCESS
  20. Federal Acquisition Regulation (FAR) Vol 1&2
  21. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP)
-

**2874-PLAN-2106:** Perform the duties as SNCOIC, TMDE School

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2874

**GRADES:** MGYSGT

**INITIAL TRAINING SETTING:** MOJT

**CONDITION:** With the aid of references, Instructors, Students, Commander's guidance and a table of organization and equipment.

**STANDARD:** To provide entry and career level training for Marines in the intermediate maintenance of ground Test Measurement and Diagnostic Equipment (TMDE) and to provide qualified maintainers and maintenance supervisors to the Operating Forces in accordance with MCO 1553.1\_; MCO 1553.2\_; and MCO 1553.5\_.

**PERFORMANCE STEPS:**

1. Review present TO/E and policies/procedures.
2. Coordinate with CMC (MMEA and T&E) on matters relating to entry level training for assigned regular and reserve Marines.
3. Supervise and mentor all Instructors of the Calibrations Technicians Course (CTC) and Metrology Technicians Course (MTC).
4. Chair all Academic Review Boards (ARB) for all students.
5. Review and make changes and recommendations to: after instruction reports (AIRs), POIs, Quota Memorandum (TQM) and TECOM Integrated Management System (TIMS) for students assigned to future classes.
6. Monitor external evaluations to identify trends noted by the Operating Forces, and make recommendations as appropriate.
7. Conduct course content review boards (CCRBs) to identify and implement current/future requirements of the OpFor.
8. Review present TO/E and policies/procedures.
9. Develop/revise policies and procedures, as required.
10. Direct the establishment/revision of formal courses, as required.
11. Manage formal student training.

**REFERENCES:**

1. Applicable Unit Policies and Procedures
2. MCO 1553.1B The Marine Corps Training and Education System
3. MCO 1553.2\_ Management of Marine Corps Formal Schools and Training Detachments (Nov 03)
4. MCO 1553.5\_ Marine Corps Training and Education Evaluation
5. NAVMC 3500.6 Ground Electronics Maintenance Training and Readiness Manual
6. SAT MANUAL Systems Approach to Training Manual
7. Unit TO/E Table of Organization/Equipment
8. Higher Headquarters Directives

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**2874-ACT-2301:** Calibrate laboratory standards

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

MOS PERFORMING: 2874

GRADES: SGT, SSGT, GYSGT, MSGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, an assigned maintenance area, equipment, materials and tools.

STANDARD: In accordance with TI 4733-35/23 and MCSC PM-TMDE approved instrument calibration procedures.

PERFORMANCE STEPS:

1. Adhere to safety requirements.
2. Adhere to connector care requirements.
3. Adhere to quality requirements.
4. Verify accuracy of electronic standards utilizing appropriate calibration procedures, as required.
5. Verify accuracy of mechanical standards utilizing appropriate calibration procedures, as required.
6. Verify accuracy of physical standards utilizing appropriate calibration procedures, as required.
7. Verify accuracy of dimensional standards utilizing appropriate calibration procedures, as required.
8. Apply authorized modifications and technical instructions.
9. Perform maintenance closeout procedures to include quality assurance checks.

REFERENCES:

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP) (Jun 99)
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. TM 10510-14/1 Electronic Test Equipment Listing
5. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

MISCELLANEOUS:

ADMINISTRATIVE INSTRUCTIONS: This task applies to the equipment noted in the most recent edition of TI-4733-35/8.

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2874-ACT-2302: Calibrate microwave measurement equipment

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2874

GRADES: SGT, SSGT, GYSGT, MSGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, an assigned maintenance area, equipment, materials and tools.

**STANDARD:** In accordance with TI 4733-35/23 and MCSC PM-TMDE approved instrument calibration procedures.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to connector care requirements.
3. Adhere to quality requirements.
4. Verify accuracy of microwave measurement equipment utilizing appropriate calibration procedures.
5. Apply authorized modifications and technical instructions.
6. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP) (Jun 99)
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. TM 10510-14/1 Electronic Test Equipment Listing
5. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** This task applies to the equipment noted in the most recent edition of TI-4733-35/8.

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**2874-ACT-2303:** Calibrate electro-optic equipment

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2874

**GRADES:** SGT, SSGT, GYSGT, MSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, equipment, materials and tools.

**STANDARD:** In accordance with TI 4733-35/23 and MCSC PM-TMDE approved instrument calibration procedures.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to connector care requirements.
3. Adhere to quality requirements.
4. Verify accuracy of electro-optic equipment utilizing appropriate calibration procedures.
5. Apply authorized modifications and technical instructions.
6. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP) (Jun 99)
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. TM 10510-14/1 Electronic Test Equipment Listing
5. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** This task applies to the equipment noted in the most recent edition of TI-4733-35/8.

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**2874-ACT-2304:** Calibrate dimensional equipment

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2874

**GRADES:** SGT, SSGT, GYSGT, MSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, equipment, materials and tools.

**STANDARD:** In accordance with TI 4733-35/23 and MCSC PM-TMDE approved instrument calibration procedures.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Adhere to quality requirements.
3. Verify accuracy of dimensional equipment utilizing appropriate calibration procedures.
4. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP) (Jun 99)
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. TM 10510-14/1 Electronic Test Equipment Listing
5. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** This task applies to the equipment noted in the most recent edition of TI-4733-35/8.

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**2874-OPS-2401:** Deploy a calibration maintenance facility

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2874

**GRADES:** SSGT, GYSGT, MSGT,

**INITIAL TRAINING SETTING:** MOJT

**CONDITION:** With the aid of references, Commander's guidance, equipment, materials and tools.

**STANDARD:** In accordance with the MCO P4790.2\_, Appendix E.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure personnel are prepared for deployment, as required.
3. Establish load plans for equipment and personnel.
4. Arrange for special material handling and transportation equipment.
5. Select site location after considering: space requirements, terrain features, access routes, proximity to supported units and logistic support.
6. Determine power requirements, as required.
7. Install the maintenance facility.
8. Verify environmental conditions inside shelter.
9. Determine logistics/support procedures.
10. Maintain logistics/support procedures.
11. Maintain security.

**REFERENCES:**

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
  2. Applicable technical manuals/publications
  3. MCO 4733.1B Marine Corps Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP) (Jun 99)
  4. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
  5. MCWP 3-40.3 Communications and Information Systems
  6. TM 10510-14/1 Electronic Test Equipment Listing
  7. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety (Aug 91)
  8. UM 4790-5 MIMMS AIS, Field Maintenance Procedures
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CHAPTER 16

MOS 2887 INDIVIDUAL EVENTS

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CHAPTER 16

MOS 2887 INDIVIDUAL EVENTS

**16000. PURPOSE.** This chapter contains individual training events for MOS 2887, Artillery Electronics Technician.

**16001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**16002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

16003. INDEX OF 1000-LEVEL EVENTS

Event	Event Title	Page
2887-ACT-1301	Perform corrective maintenance on artillery ground-based sensors to the piece-part component level	16-5
2887-ACT-1302	Perform corrective maintenance on the Meteorological Measuring Station to the piece-part component level	16-6
2887-ACT-1303	Perform corrective maintenance on artillery fire control electronic systems to the piece-part component level	16-7
2887-OPS-1401	Provide technical assistance during the installation of artillery electronic equipment	16-9

16004. 1000-LEVEL EVENTS

2887-ACT-1301: Perform corrective maintenance on artillery ground-based sensors to the piece-part component level

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2887

GRADES: PVT, PFC, LCPL, CPL, SGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, an assigned maintenance area, faulty equipment, TMDE and tools.

STANDARD: To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

PERFORMANCE STEPS:

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Read schematic diagrams.
4. Calculate circuit parameters.
5. Ensure proper handling of static sensitive components/printed circuit cards.
6. Measure basic circuit performance.
7. Perform alignments, as required.
8. Trace signal paths.
9. Trace current/voltage paths.
10. Isolate faulty component.
11. Requisition repair parts, as required.
12. Remove/repair faulty components, as required.
13. Apply authorized modifications and technical instructions.
14. Perform preventative maintenance checks and services.
15. Perform maintenance closeout procedures to include quality assurance checks.

REFERENCES:

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. Maintenance Float Catalog
5. SL 1-2/3 Index of Authorized Publications in Stock
6. SL-4 Repair, Maintenance, and Management Lists
7. TM 9999-15/1 ESD Awareness Electro-Static Discharge
8. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment:

1. Oscilloscope
2. Firefinder radar set
3. Power supply

4. Signal generator
5. Spectrum analyzer
6. Direct maintenance tool kit
7. General maintenance tool kit and adaptors
8. Power meter
9. Digital multimeter
10. Test adapter kit
11. Comm-Elect common tool kit
12. ATE
13. Lightweight counter mortar radar
14. Ground counter fire sensor

**MATERIAL:** Distance Learning Products Available:

1. MCI 2820, Electronics Mathematics for Marines
2. MCI 286G, Fundamentals of Digital Logic
3. MCI 287A, Introduction to Test Measurement and Diagnostic Equipment
4. MCI 1142B, Solid State Devices

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2887-ACT-1302:** Perform corrective maintenance on the Meteorological Measuring Station to the piece-part component level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2887

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, and assigned maintenance area, faulty equipment, TMDE and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Read schematic diagrams.
4. Calculate circuit parameters.
5. Ensure proper handling of static sensitive components/printed circuit cards.
6. Measure basic circuit performance.
7. Perform alignments, as required.
8. Trace signal paths.
9. Trace current/voltage paths.

10. Isolate faulty component.
11. Requisition repair parts, as required.
12. Remove/replace faulty component, as required.
13. Apply authorized modifications and technical instructions.
14. Perform preventative maintenance checks and services.
15. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. SL 1-2/3 Index of Authorized Publications in Stock
5. SL-4 Repair, Maintenance, and Management Lists
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Power Supply
2. Oscilloscope
3. AN/TMQ-41A MMS
4. 28V power supply
5. Signal generator
6. Comm-Elect common tool kit
7. Spectrum analyzer
8. Direct maintenance tool kit
9. General maintenance tool kit and adaptors
10. Power meter
11. Digital multimeter
12. Test adapter kit
13. ATE

**MATERIAL:** Distance Learning Products Available:

1. MCI 2820, Electronics Mathematics for Marines
2. MCI 286G, Fundamentals of Digital Logic
3. MCI 287A, Introduction to Test Measurement and Diagnostic Equipment
4. MCI 1142B, Solid State Devices

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2887-ACT-1303:** Perform corrective maintenance on artillery fire control electronic systems to the piece-part component level

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2887

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, faulty equipment, materials and tools.

**STANDARD:** To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Research applicable technical data pertaining to faulty equipment.
3. Read schematic diagrams.
4. Calculate circuit parameters.
5. Ensure proper handling of static sensitive components/printed circuit cards.
6. Measure basic circuit performance.
7. Perform alignments, as required.
8. Trace signal paths.
9. Trace current/voltage paths.
10. Isolate faulty component.
11. Remove/repair faulty component, as required.
12. Requisition repair parts, as required.
13. Apply authorized modifications and technical instructions.
14. Perform preventative maintenance checks and services.
15. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. Applicable technical manuals/publications
2. FEDLOG Federal Logistic Data
3. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
4. SL 1-2/3 Index of Authorized Publications in Stock
5. SL-4 Repair, Maintenance, and Management Lists
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Digital fire control system
2. Oscilloscope
3. M-94 MVS
4. 28V power supply
5. Signal generator
6. Function generator
7. Digital multimeter
8. OD-144 Gun Direction Unit
9. Spectrum analyzer
10. Direct maintenance tool kit
11. General maintenance tool kit and adaptors
12. Power meter
13. Test adapter kit
14. Comm-Elect common tool kit

15. Automated Test Equipment
16. DFCS Test Set

**MATERIAL:** Distance Learning Products Available:

1. MCI 2820, Electronics Mathematics for Marines
2. MCI 286G, Fundamentals of Digital Logic
3. MCI 287A, Introduction to Test Measurement and Diagnostic Equipment
4. MCI 1142B, Solid State Devices

**MISCELLANEOUS:**

**ADMINISTRATIVE INSTRUCTIONS:** Utilizing the common sense approach to maintenance, component level repair can be accomplished by this MOS if the technician possesses the required facilities, publications, skills, TMDE and tools. Training for this skill is normally provided by the 2M/ATE course.

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**2887-OPS-1401:** Provide technical assistance during the installation of artillery electronic equipment

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2887

**GRADES:** PVT, PFC, LCPL, CPL, SGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, equipment and a mission.

**STANDARD:** To ensure equipment is properly installed and operates in accordance with the appropriate system technical manual.

**PERFORMANCE STEPS:**

1. Verify equipment is properly grounded.
2. Verify power source.
3. Verify antenna installation, as required.
4. Verify remote capabilities, as required.
5. Verify software applications.
6. Verify equipment operation.
7. Perform electromagnetic interference troubleshooting, as required.
8. Provide guidance to correct discrepancies as noted.

**REFERENCES:**

1. Applicable technical manuals/publications
2. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety (Aug 91)
3. TM 9999-15/1 ESD Awareness Electro-Static Discharge

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. AN/TMQ-41A MMS
2. Ground tester

3. AN/TPQ-46A Firefinder Radar Set
4. M-94 MVS
5. OD-144 Gun Directional Unit

**MATERIAL:** Distance Learning Products Available:

1. MCI 2820, Electronics Mathematics for Marines
  2. MCI 286, Fundamentals of Digital Logic
  3. MCI 287, Introduction to Test Equipment
  4. MCI 1142, Solid State Devices
-

16005. INDEX OF 2000-LEVEL EVENTS

Event	Event Title	Page
2887-ACT-2301	Manage artillery electronics maintenance	16-12
2887-ACT-2302	Determine low density maintenance support requirements for artillery electronic equipment	16-12
2887-OPS-2401	Provide advanced technical assistance during the installation of artillery electronic equipment	16-13

16006. 2000-LEVEL EVENTS

2887-ACT-2301: Manage artillery electronics maintenance

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2887

GRADES: SGT, SSGT, GYSGT

INITIAL TRAINING SETTING: MOJT

CONDITION: With the aid of references, equipment and personnel

STANDARD: To return equipment to condition code A as defined in UM 4400-124, paragraph 4, page 4-22.

PERFORMANCE STEPS:

1. Interpret and disseminate detailed schematic diagrams.
2. Analyze failure data to ensure appropriate parts support.
3. Develop modifications instructions.
4. Adjust alignment procedures to account for environmental changes.
5. Evaluate contractor logistics support requirements.
6. Inspect software upgrades.

REFERENCES:

1. 29 CFR1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
2. Applicable technical manuals/publications
3. FEDLOG Federal Logistic Data
4. MCO P4790.2C MIMMS Field Procedures Manual (JUL 94)
5. SL 1-2/3 Index of Authorized Publications in Stock
6. SL-4 Repair, Maintenance, and Management Lists
7. TM 9999-15/1 ESD Awareness Electro-Static Discharge
8. UM 4790-5 MIMMS AIS, Field Maintenance Procedures

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment:

1. AN/TPQ-46 Firefinder Radar Set
2. Ground counter fire sensor
3. AN/TMQ-41A MMS
4. M-94 MVS
5. Digital fire control system
6. Lightweight counter mortar radar

MATERIAL: Distance Learning Products Available:

1. MCI 2820, Electronics Mathematics for Marines
  2. MCI 286G, Fundamentals of Digital Logic
  3. MCI 287A, Introduction to Test Measurement and Diagnostic Equipment
  4. MCI 1142B, Solid State Devices
-

**2887-ACT-2302:** Determine low density maintenance support requirements for artillery electronic equipment

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2887

**GRADES:** SSGT, GYSGT

**INITIAL TRAINING SETTING:** MOJT

**CONDITION:** With the aid of references, appropriate equipment, a mission, and personnel.

**STANDARD:** To ensure specific pre-determined quantities of artillery electronic equipment are stocked in accordance with MCO P4400.150\_, page A-7.

**PERFORMANCE STEPS:**

1. Evaluate the unit's support requirements.
2. Define supply support requirements.
3. Define float support requirements.
4. Submit support requirements.

**REFERENCES:**

1. Applicable technical manuals/publications
  2. CAL and LUBF Consolidated Account Listing and Loaded Unit Balance File
  3. Operational Order Operational Order
  4. Higher Headquarters Directives
- 

**2887-OPS-2401:** Provide advanced technical assistance during the installation of artillery electronic equipment

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2887

**GRADES:** SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** MOJT

**CONDITION:** With the aid of references, provided equipment and a mission.

**STANDARD:** To ensure equipment is properly installed and operates in accordance with the appropriate system technical manual.

**PERFORMANCE STEPS:**

1. Provide technical assistance during system embarkation.
2. Provide technical expertise in site selection.
3. Provide technical assistance during system emplacement.
4. Report updates regarding system readiness.

**REFERENCES:**

1. Applicable technical manuals/publications

2. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety (Aug 91)

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. AN/TPQ-46\_ Firefinder Radar Set
  2. Ground counter fire sensor
  3. AN/TMQ-41A MMS
  4. M-94 MVS
  5. Digital fire control system
-

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CHAPTER 17

MOS 2891 INDIVIDUAL EVENTS

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CHAPTER 17

MOS 2891 INDIVIDUAL EVENTS

**17000. PURPOSE.** This chapter contains individual training events for MOS 2891, Electronics Maintenance Chief.

**17001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**17002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

17003. INDEX OF 2000-LEVEL EVENTS

Event	Event Title	Page
2891-PLAN-2101	Draft ground electronics maintenance SOP	17-5
2891-ACT-2301	Supervise ground electronics maintenance	17-6
2891-OPS-2401	Execute the plan for deployed maintenance	17-8

17004. 2000-LEVEL EVENTS

2891-PLAN-2101: Draft ground electronics maintenance SOP

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

MOS PERFORMING: 2891

GRADES: MSGT, MGYSGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: Provided with Commander's guidance, a mission and a table of organization/equipment.

STANDARD: To ensure subordinate units can perform their maintenance mission in accordance with MCO P4790.2, page 1-20 and MCO P4790.2\_, Appendix A.

PERFORMANCE STEPS:

1. Analyze mission, directives, policy, guidance, and references.
2. Identify policies not adequately covered by existing references.
3. Identify maintenance procedures requiring amplification.
4. Identify maintenance procedures requiring deviation from existing references.
5. Identify Commander's additional policy guidance.
6. Detail local policy required to be addressed within local SOP.
7. Staff SOP within unit for review.
8. Submit for approval.

REFERENCES:

1. Unit's Standing Operating Procedures (SOP)
2. Unit TO/E Table of Organization/Equipment
3. MCWP 4-24 Commander's Guide to Maintenance
4. MCWP 4-24 Maintenance Operations
5. MCO P4790.1 MIMMS Introduction Manual
6. MCO P4790.2 MIMMS Field Procedures Manual (Jul 94)
7. MCBul 3000 Marine Corps Automated Readiness Evaluation System (MARES) Equipment
8. MCO 3000.11 Marine Corps Automated Readiness Evaluation System
9. MCO 4105.2 Marine Corps Warranty Program
10. MCO 4200.33 Contractor Logistics Support (CLS) for Ground Equipment, Ground Weapons Systems, Munitions, and Information Systems
11. MCO 4400.16 Uniform Material Movement and Issue Priority System
12. MCO 4855.10 Product Quality Deficiency Reporting (PQDR)
13. MCO P4400.82F Regulated/Controlled Items Management Manual
14. MCO P4400.150 Consumer Level Supply Policy Manual
15. MCO P4400.151 Intermediate-Level Supply Management Policy Manual
16. MCO P5215.17 Marine Corps Technical Publications System
17. TM 4700-15/1 Ground Equipment Record Procedures
18. UM 4400-124 FMF SASSY Using Unit Procedures
19. UM 4400-60 Material Returns Program User's Manual
20. UM 4400-123 FMF SASSY Management Unit Procedures
21. UM 4790-5 MIMMS AIS, Field Maintenance Procedures
22. UM PLMS Publication Library Management System



18. MCO P4400.151 Intermediate-Level Supply Management Policy Manual
19. MCO P4400.82F Regulated/Controlled Items Management Manual
20. MCO P4790.1 MIMMS Introduction Manual
21. MCO P4790.2 MIMMS Field Procedures Manual
22. TM 4700-15/1 Ground Equipment Record Procedures
23. DLA Customer Assistance Handbook
24. UM 4400-124 FMF SASSY Using Unit Procedures
25. UM 4400-60 Material Returns Program User's Manual
26. UM 4400-123 FMF SASSY Management Unit Procedures
27. UM 4790-5 MIMMS AIS, Field Maintenance Procedures
28. MCO 4855.10 Product Quality Deficiency Reporting (PQDR)
29. MCO 4105.2 Marine Corps Warranty Program
30. ICE2 Statement of Requirements Document
31. Contracting Officer Representative (COR) ICE2 Handbook
32. DoDD 4151.18 Maintenance of Military Material
33. MCO 4733.1 Marine Corps Test, Measurement, Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP)
34. TM 10510-OD/1 General Purpose Test Measurement and Diagnostic Equipment (TMDE) Listing (Including Ancillary Electronic Support Items and Tool Kits)
35. TM 10209-10/1 Use and Care of Hand Tools and Measuring Tools
36. TI 4733-15/1 Calibration Requirements Marine Corps Test, Measurement and Diagnostic Equipment Calibration and Maintenance
37. TI 4733-15/6 Test, Measurement and Diagnostic Equipment Calibration and Maintenance Support
38. TI 4733-15/7 Procedural Publication Index for Test, Measurement and Diagnostic Equipment Calibration and Maintenance Program
39. TI 4733-15/9 Radiac Instrument Calibration Requirements
40. TI 4733-15/10 Special Calibration of Torque Wrenches
41. TI 4733-15/11 Infantry Weapons Gauge Calibrations Program
42. 4733-15/12 Calibration Requirements for Thermistor Mounts/Power Sensors Marine Corps Calibration Program
43. TI 4733-15/21 Survey Instrument Calibration
44. TI 4733-35/5 Calibration Equipment Recommendations for the Marine Corps Calibration Program
45. TI 4733-35/8 Marine Corps Transfer Standards Program
46. TI 4733-35/23 Naval and Marine Corps Calibration Laboratory Audit/Certification Manual
47. TI 5820-25/22 Electromagnetic Environmental Effects Procedures for Installation of Communication Equipment on United States Marine Corps Platforms
48. MCO 2410.2 Electromagnetic Environmental Effects Control Program
49. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety
50. TM 9999-15/1 Electrostatic Discharge Awareness
51. TM 9999-15/2 Electrostatic Discharge Awareness
52. SI-4400-15/5 Packaging/Handling/Storage and Transportation of ESD Sensitive Items
53. TI-4400-15/1A Packaging, Handling, and Transportation of ESD Items
54. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
55. TM 2000.15/1 Brief Description of US Marine Corps Communication-Electronic Equipment
56. TM 2000.OD/2 Principle Technical Characteristics of U.S. Marine Corps Communication-Electronics Equipment

57. TM 4795-12/1 Corrosion Prevention and Control
  58. TM 4795-34/2 Corrosion Prevention and Control
  59. TM-5410-14/1 Intermediate Maintenance Instructions Electronics Maintenance Complex
  60. TM 5411-14/1 Marine Corps Expeditionary Shelter System (MCESS) (Small Shelter Family) Operation and Maintenance Instructions
  61. TM-5411-14/P&2 EMI Shelter (Marine Corps Expeditionary Shelter System (MCESS) (Small Shelter Family) 10-Foot Rigid General Purpose Shelter Operation and Maintenance (Instructions with Repair Parts List)
  62. CNSS 4000 Communication Security (COMSEC) Maintenance and Maintenance Training
  63. DODI 8523.01 Communications Security
  64. DODI 8570.01-M Information Assurance Workforce Improvement Program
  65. CMS-5 Communication Security Material System (CMS) Cryptographic Equipment Information/Guidance manual
  66. Electronic Key Management System (EKMS 1)
- 

**2891-OPS-2401:** Execute the plan for deployed maintenance

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**MOS PERFORMING:** 2891

**GRADES:** MSGT, MGYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, Commander's guidance, equipment, a mission and personnel.

**STANDARD:** To implement task organized maintenance in support of MAGTF Operations in accordance with MCO P4790.2\_, Appendix E.

**PERFORMANCE STEPS:**

1. Review warning order.
2. Review Commander's guidance.
3. Review supported equipment density list.
4. Identify support requirements.
5. Establish deployed contracted logistic support (CLS) procedures.
6. Validate class IX requirements.
7. Supervise equipment embarkation.
8. Determine shop layout.
9. Organize maintenance area.
10. Establish contact team maintenance.
11. Establish security/defense.
12. Draft deployed maintenance plans.

**REFERENCES:**

1. MCO 1200.17 Military Occupational Specialties Manual
2. 29 CFR 1910.1200 Title 29 Code of Federal Regulations, Hazard Communication
3. Applicable technical manuals/publications
4. MCWP 3-40.3 Communications and Information Systems

5. MCWP 5-1 Marine Corps Planning Process
6. MPS Load Plan
7. Operational Order
8. UNIT SOP Unit's Standing Operating Procedures
9. Unit TO/E Table of Organization/Equipment
10. MCWP 4-24 Maintenance Operations
11. MCRP 4-11.3 Unit Embarkation Handbook
12. UM PLMS Publication Library Management System
13. MCO P5215.17 Marine Corps Technical Publications System
14. MCBul 3000 Marine Corps Automated Readiness Evaluation System (MARES) Equipment
15. MCO 3000.11 Marine Corps Automated Readiness Evaluation System
16. MCO 4400.16 Uniform Material Movement and Issue Priority System
17. MCO P4400.150 Consumer Level Supply Policy Manual
18. MCO P4400.151 Intermediate-Level Supply Management Policy Manual
19. MCO P4400.82F Regulated/Controlled Items Management Manual
20. MCO P4790.1 MIMMS Introduction Manual
21. MCO P4790.2 MIMMS Field Procedures Manual
22. TM 4700-15/1 Ground Equipment Record Procedures
23. DLA Customer Assistance Handbook
24. UM 4400-124 FMF SASSY Using Unit Procedures
25. UM 4400-60 Material Returns Program User's Manual
26. UM 4400-123 FMF SASSY Management Unit Procedures
27. UM 4790-5 MIMMS AIS, Field Maintenance Procedures
28. MCO 4855.10 Product Quality Deficiency Reporting (PQDR)
29. MCO 4105.2 Marine Corps Warranty Program
30. ICE2 Statement of Requirements Document
31. Contracting Officer Representative (COR) ICE2 Handbook
32. DoDD 4151.18 Maintenance of Military Material
33. MCO 4733.1 Marine Corps Test, Measurement, Diagnostic Equipment (TMDE) Calibration and Maintenance Program (CAMP)
34. TM 10510-OD/1 General Purpose Test Measurement and Diagnostic Equipment (TMDE) Listing (Including Ancillary Electronic Support Items and Tool Kits)
35. TM 10209-10/1 Use and Care of Hand Tools and Measuring Tools
36. TI 4733-15/1 Calibration Requirements Marine Corps Test, Measurement and Diagnostic Equipment Calibration and Maintenance
37. TI 4733-15/6 Test, Measurement and Diagnostic Equipment Calibration and Maintenance Support
38. TI 4733-15/7 Procedural Publication Index for Test, Measurement and Diagnostic Equipment Calibration and Maintenance Program
39. TI 4733-15/9 Radiac Instrument Calibration Requirements
40. TI 4733-15/10 Special Calibration of Torque Wrenches
41. TI 4733-15/11 Infantry Weapons Gauge Calibrations Program
42. 4733-15/12 Calibration Requirements for Thermistor Mounts/Power Sensors Marine Corps Calibration Program
43. TI 4733-15/21 Survey Instrument Calibration
44. TI 4733-35/5 Calibration Equipment Recommendations for the Marine Corps Calibration Program
45. TI 4733-35/8 Marine Corps Transfer Standards Program
46. TI 4733-35/23 Naval and Marine Corps Calibration Laboratory Audit/Certification Manual
47. TI 5820-25/22 Electromagnetic Environmental Effects Procedures for Installation of Communication Equipment on United States Marine Corps Platforms

48. MCO 2410.2 Electromagnetic Environmental Effects Control Program
49. TM 9406-15 Grounding Procedures for Electromagnetic Interference Control and Safety
50. TM 9999-15/1 Electrostatic Discharge Awareness
51. TM 9999-15/2 Electrostatic Discharge Awareness
52. SI-4400-15/5 Packaging/Handling/Storage and Transportation of ESD Sensitive Items
53. TI-4400-15/1A Packaging, Handling, and Transportation of ESD Items
54. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
55. TM 2000.15/1 Brief Description of US Marine Corps Communication-Electronic Equipment
56. TM 2000.OD/2 Principle Technical Characteristics of U.S. Marine Corps Communication-Electronics Equipment
57. TM 4795-12/1 Corrosion Prevention and Control
58. TM 4795-34/2 Corrosion Prevention and Control
59. TM-5410-14/1 Intermediate Maintenance Instructions Electronics Maintenance Complex
60. TM 5411-14/1 Marine Corps Expeditionary Shelter System (MCESS) (Small Shelter Family) Operation and Maintenance Instructions
61. TM-5411-14/P&2 EMI Shelter (Marine Corps Expeditionary Shelter System (MCESS) (Small Shelter Family) 10-Foot Rigid General Purpose Shelter Operation and Maintenance (Instructions with Repair Parts List)
62. CNSS 4000 Communication Security (COMSEC) Maintenance and Maintenance Training
63. DODI 8523.01 Communications Security
64. DODI 8570.01-M Information Assurance Workforce Improvement Program
65. CMS-5 Communication Security Material System (CMS) Cryptographic Equipment Information/Guidance manual
66. Electronic Key Management System (EKMS 1)

**SUPPORT REQUIREMENTS:**

**MATERIAL:** Distance Learning Products Available:

1. MCI 0414B, Ground Maintenance Management Procedures for Supervisors
-

2800 GROUND T&R MANUAL

CHAPTER 18

MOS 8641 INDIVIDUAL EVENTS

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2800 GROUND T&R MANUAL

CHAPTER 18

MOS 8641 INDIVIDUAL EVENTS

**18000. PURPOSE.** This chapter contains individual training events for MOS 8641, Microminiature Repairer.

**18001. INDIVIDUAL SKILLS**

1. Core skills are basic individual skills that make a Marine and qualify them for an MOS. They are the 1000 level skills introduced in the entry level training in the formal schools and refined in operational units.

2. Core Plus Skills are advanced individual skills that are environment, mission, rank or billet specific. They are the 2000 level skills introduced in the entry level managed on the job training in operational units and advanced formal schools training.

**18002. EVENT CODING.** Events in the T&R Manual are depicted with an 11 or 12 digit alphanumeric system, i.e. XXXX-XXXX-XXXX, utilizing the following methodology:

a. Field one - Each event starts with 28XX. 2800 indicates that the event is a core capability for all Marines within the occupational field. 2844 indicates the event is for 2844, Ground Communications Organizational Repairer, etc.

b. Field two - This field is alpha characters indicating a functional area. The functional areas for this chapter are listed below:

Functional Area	Field Name	Example
Maintenance Planning	PLAN	2844-PLAN-XXXX
Maintenance Administration	ADMN	2844-ADMN-XXXX
Maintenance Actions	ACT	2844-ACT-XXXX
Maintenance Operations	OPS	2844-OPS-XXXX
Maintenance Training	TRNG	2844-TRNG-XXXX

c. Field three - All individual events within T&R Manuals are either 1000-level events that are taught at MOS-producing formal schools or 2000-level events that are taught at advanced-level schools or are MOJT. The first digit indicates whether it is a core (1) or core plus (2) event.

The second digit indicates the associated field and the last two digits indicate the task number. 2303 indicates that it is a core plus task and it is the third task within the Maintenance Actions functional area for that MOS. This chapter contains both level events.

MOS	Field Name	Associated Field Number	Core/ Core Plus	Task	Example
2800	PLAN	101-199	2	1	2800-PLAN-2101
2871	ADMN	201-299	1	4	2871-ADMN-1201
2846	ACT	301-399	2	3	2846-ACT-2303
2821	OPS	401-499	1	2	2821-OPS-1401
2805	TRNG	501-599	2	1	2805-TRNG-2501

18003. INDEX OF 2000-LEVEL EVENTS

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8641-ACT-2302	Repair circuit card assembly conductors	18-5
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8641-ACT-2304	Repair stranded wire	18-7
8641-ACT-2305	Repair flexible flat conductors	18-8
8641-ACT-2306	Remove components from circuit card assemblies	18-9
8641-ACT-2307	Install components on circuit card assemblies	18-10
8641-ACT-2308	Remove surface mounted technology devices	18-11
8641-ACT-2309	Install surface mount technology devices	18-12
8641-ACT-2310	Prepare automated test equipment for operation	18-13
8641-ACT-2311	Perform troubleshooting on circuit card assemblies	18-14
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18004. 2000-LEVEL EVENTS

8641-ACT-2301: Repair circuit card assembly laminates

EVALUATION-CODED: NO

SUSTAINMENT INTERVAL: 12 months

DESCRIPTION: This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

MOS PERFORMING: 8641

GRADES: PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

INITIAL TRAINING SETTING: FORMAL

CONDITION: With the aid of references, an assigned maintenance area, damaged circuit card assemblies and a circuit card repair station.

STANDARD: To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 011, page 25, paragraph 11.4.

PERFORMANCE STEPS:

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Identify types of laminate damage.
4. Identify the repair methods.
5. Repair the damaged laminate.
6. Perform maintenance closeout procedures to include quality assurance checks.

REFERENCES:

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. MSDS Material Safety Data Sheets
3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
5. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. TM 9999-15/2 ESD Electro-static Discharge Management

SUPPORT REQUIREMENTS:

EQUIPMENT: Support Equipment:

1. Automated test equipment
  2. MK-2663/U electronic equipment maintenance kit
-

**8641-ACT-2302:** Repair circuit card assembly conductors

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, damaged circuit card assemblies and a circuit card repair station.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1, WP 012, page 35, paragraph 12.4.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure the proper handling of static sensitive components/printed circuit cards.
3. Identify types of conductor damage.
4. Identify the repair methods.
5. Repair the damaged conductor(s).
6. Perform quality assurance checks.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. MSDS Material Safety Data Sheets
3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
5. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. TM 9999-15/2 ESD Electro-static Discharge Management

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
2. MK-2663/U electronic equipment maintenance kit

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**8641-ACT-2303:** Repair internal conductors of multilayer circuit card assemblies

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, a circuit card repair station and damaged multilayer circuit card assemblies.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 015, page 14, paragraph 15.4 and TI 2005-35/7.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Identify the types of internal conductor damage.
4. Identify the repair methods.
5. Repair the damaged internal conductor(s).
6. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. MSDS Material Safety Data Sheets
3. TI 2005-35/7 Repair open subsurface circuit runs in multilayer circuit card assemblies utilizing jumper wires
4. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
5. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
6. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
7. TM 9999-15/1 ESD Awareness Electro-Static Discharge
8. TM 9999-15/2 ESD Electro-static Discharge Management

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
2. MK-2663/U electronic equipment maintenance kit

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**8641-ACT-2304:** Repair stranded wire

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, a circuit card repair station and damaged stranded wire.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 010, page 11, paragraph 10.4.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Identify stranded wire damage.
4. Identify the repair method.
5. Repair the damaged stranded wire.
6. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. MSDS Material Safety Data Sheets
2. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
3. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
2. MK-2663/U electronic equipment maintenance kit

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**8641-ACT-2305:** Repair flexible flat conductors

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, a circuit card repair station and damaged flexible flat conductors.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 013, page 12, paragraph 13.4.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Identify types of flexible flat conductor damage.
4. Repair the damaged flexible flat conductor.
5. Perform quality assurance checks.

**REFERENCES:**

1. MCMTRTS USER'S GUIDE USMC MTR Tracking System Installation and User's Guide
2. MCO P5090.2A Environmental Compliance and Protection Manual (Jul 98)
3. MM/ATE SHO MM/ATE Student Handout
4. MSDS Material Safety Data Sheets
5. TI 2005-35/7 Repair open subsurface circuit runs in multilayer circuit card assemblies utilizing jumper wires
6. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
7. TM 09458A-14/1A PRC-2000-2M System Electronic Rework Power Unit
8. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
2. MK-2663/U electronic equipment maintenance kit

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**8641-ACT-2306:** Remove components from circuit card assemblies

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, a circuit card repair station and damaged circuit card assemblies with faulty components.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 005, page 18, paragraph 5.13; TM 5895-45/1\_, WP 006, page 24, paragraph 6.4; and TM 5895-45/1\_, WP 007, page 29, paragraph 7.4.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Identify faulty component(s) on a circuit card assembly.
4. Remove conformal coating, as required.
5. Remove component(s).
6. Perform quality assurance checks.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. MSDS Material Safety Data Sheets
3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
5. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. TM 9999-15/2 ESD Electro-static Discharge Management

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Supporting Equipment:

1. Automated test equipment
2. MK-2663/U electronic equipment maintenance kit

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**8641-ACT-2307:** Install components on circuit card assemblies

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, circuit card assemblies with faulty components and a circuit card repair station.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 005, page 18, paragraph 5.13; TM 5895-45/1\_, WP 006, page 24, paragraph 6.4; and TM 5895-45/1\_, WP 007, page 29, paragraph 7.4.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Install components.

4. Replace conformal coating, as required.
5. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. MSDS Material Safety Data Sheets
3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
5. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. TM 9999-15/2 ESD Electro-static Discharge Management

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
2. MK-2663/U electronic equipment maintenance kit

---

**8641-ACT-2308:** Remove surface mounted technology devices

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, circuit card assemblies with surface mounted devices and a circuit card repair station.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 005, page 18, paragraph 5.13; TM 5895-45/1\_, WP 006, page 24, paragraph 6.4; TM 5895-45/1\_, WP 007, page 29, paragraph 7.4; and TM 5895-45/1\_, WP 018, page 50, paragraph 18.2.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Identify the surface mounted component(s) to be removed.
4. Remove the surface mounted component(s).
5. Perform quality assurance checks.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. MSDS Material Safety Data Sheets
3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
5. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. TM 9999-15/2 ESD Electro-static Discharge Management

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
2. MK-2663/U electronic equipment maintenance kit

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**8641-ACT-2309:** Install surface mount technology devices

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, and assigned maintenance area, circuit card assemblies with surface mounted devices and a circuit card repair station.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 005, page 18, paragraph 5.13; TM 5895-45/1\_, WP 006, page 24, paragraph 6.4; TM 5895-45/1\_, WP 007, page 29, paragraph 7.4; and TM 5895-45/1\_, WP 018, page 50, paragraph 18.2.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Identify the installation method.
4. Install the surface mounted component(s).
5. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. MSDS Material Safety Data Sheets

3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
5. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair
6. TM 9999-15/1 ESD Awareness Electro-Static Discharge
7. TM 9999-15/2 ESD Electro-static Discharge Management

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
  2. MK-2663/U electronic equipment maintenance kit
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**8641-ACT-2310:** Prepare Automated Test Equipment for operation

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, an Automated Test Equipment station, circuit card assemblies and software.

**STANDARD:** In accordance with TM 10793A-10/1, Chapters 3 and 4.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Perform equipment inspections/inventories.
3. Perform preventive maintenance on ATE, as required.
4. Perform preventive maintenance on a circuit card repair station.
5. Identify equipment malfunctions, as required.
6. Replace damaged or missing equipment/tools, as required.
7. Verify equipment operation.
8. Load appropriate programs.
9. Verify software operation.

**REFERENCES:**

1. Marine Corps Module Test Repair Tracking System User's Manual Marine Corps Module Test Repair Tracking System User's Manual
2. SL-3-10793 AN/USM-674
3. ST-90 Shortrak 90 User's Manual
4. ST900-HN-GPT-020 Protrack I Model 20A Technical and Operations Manual
5. TM-09810A-40/6 Gold and Silver Disk User's Manual
6. TM-09810A-50/4 ATR Tutorial

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
  2. AN/USM-657 (V2) Third Echelon Test Set (TETS)
- 

**8641-ACT-2311:** Perform troubleshooting on circuit card assemblies

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, an Automated Test Equipment station and circuit card assemblies.

**STANDARD:** In accordance with TM 10793A-10/1, Chapter 6.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Ensure proper handling of static sensitive components/printed circuit cards.
3. Locate test routine.
4. Execute test routine according to instructions.
5. Isolate faulty component(s).
6. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. ST-90 Shortrak 90 User's Manual
3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TM 9999-15/1 ESD Awareness Electro-Static Discharge
5. TM 9999-15/2 ESD Electro-static Discharge Management
6. TM-09810A-40/6 Gold and Silver Disk User's Manual
7. TM-09810A-50/4 ATR Tutorial
8. TM-10793A-10/1 MTR User's Manual

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
  2. AN/USM-657 (V2) Third Echelon Test Set (TETS)
-

**8641-ACT-2312:** Create a test routine

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, Automated Test Equipment, an Application Program Set and known good circuit card assemblies.

**STANDARD:** In accordance with TM 10793A-10/1, Chapter 5 and TM 09810A-50/5 Chapters 4 and 5.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Develop test routine instructions.
3. Store component signatures.
4. Develop test routine illustrations.
5. Develop test routine database.
6. Verify test routine.

**REFERENCES:**

1. MCO 2410.2\_ Electromagnetic Environmental Control Program
2. ST-90 Shortrak 90 User's Manual
3. TI 4400-15/5 Packaging, Handling, Storage, and Transportation of Electrostatic Discharge Sensitive Items
4. TM 09810A-50/5 Department of Defense AN/USM-646 Gold/Silver disk; Test Station Electrical/Electronic; Development Procedure Manual
5. TM 9999-15/1 ESD Awareness Electro-Static Discharge
6. TM 9999-15/2 ESD Electro-static Discharge Management

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
2. Applicable APS
3. AN/USM-657 (V2) Third Echelon Test Set (TETS)

---

**8641-ACT-2313:** Install wires on connectors/terminals

**EVALUATION-CODED:** NO

**SUSTAINMENT INTERVAL:** 12 months

**DESCRIPTION:** This is a necessary MOS only, assigned to eligible Marines who have completed the Microminiature/Automated Test Equipment Technician Course at MCCES, 29 Palms, CA.

**MOS PERFORMING:** 8641

**GRADES:** PVT, PFC, LCPL, CPL, SGT, SSGT, GYSGT

**INITIAL TRAINING SETTING:** FORMAL

**CONDITION:** With the aid of references, an assigned maintenance area, a circuit card repair station, connectors, terminals and wire.

**STANDARD:** To minimum workmanship standards of acceptance as described in TM 5895-45/1\_, WP 005, page 18, paragraph 5.13; TM 5895-45/1\_, WP 006, page 24, paragraph 6.4; TM 5895-45/1\_, WP 007, page 29, paragraph 7.4; TM 5895-45/1\_, WP 008, page 21, paragraph 8.4; and TM 5895-45/1\_, WP 009, page 13, paragraph 9.4.

**PERFORMANCE STEPS:**

1. Adhere to safety requirements.
2. Prepare a wire lead.
3. Install a wire lead.
4. Replace conformal coating, as required.
5. Perform maintenance closeout procedures to include quality assurance checks.

**REFERENCES:**

1. MSDS Material Safety Data Sheets
2. TI 5895-45/1 AN/USM and AN/USM-674 Test Station Gold Disk and Silver Disk Program
3. TM 5895-45/1 Standard Miniature/2M Maintenance Practices for Electronic Assembly Repair

**SUPPORT REQUIREMENTS:**

**EQUIPMENT:** Support Equipment:

1. Automated test equipment
  2. MK-2663/U electronic equipment maintenance kit
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APPENDIX A

ACRONYMS AND ABBREVIATIONS

ATE.	Automated Test Equipment
BDA.	battle damage assessment
C2.	command and control
C2W.	command and control warfare
C4.	command, control, communications, and computers
C4I.	command, control, communications, computers and intelligence
C4ISR.	command, control, communications, computers, intelligence, surveillance and reconnaissance
CA.	civil affairs
CAG.	civil affairs group
CCIR.	commander's critical information requirements
CE.	command element
CI.	counterintelligence
CJCS.	Chairman of the Joint Chiefs of Staff
CJCSI.	Chairman of the Joint Chiefs of Staff instruction
CJCSM.	Chairman of the Joint Chiefs of Staff manual
CLS.	Contractor Logistical Support
COA.	course of action
COG.	centers of gravity
COMSEC.	communications security
CONOPS.	contingency operations
CP.	counter-propaganda
DCID.	Director of Center Intelligence Directive
DISA.	Defense Information Systems Agency
DLR.	Depot Level Repairables
DITS.	Deployable Integrated Transport Suite
DoD.	Department of Defense
DTC.	Digital Technical Control Facility
E3.	electromagnetic environmental effects
EA.	electronic attack
ELMACO.	Electronics Maintenance Company
EMI.	electromagnetic interference
EMO.	Electronics Maintenance Officer
EPLRS.	Enhanced Position Reporting System
ERO.	equipment repair order
ES.	electronic support
ESD.	electrostatic discharge
FFR.	Firefinder Radar
FM.	field manual (army)
GDU.	Gun Direction Unit
GIG.	Global Information Grid
GMF.	Ground Mobile Forces
GPTE.	General Purpose Test Equipment
INFOSEC.	information security
JCMA.	joint COMSEC monitoring activity
JCS.	Joint Chiefs of Staff
JCSE.	joint communications support element

JEECS . . . . . Joint Enhanced Core Communication System  
LD . . . . . low density  
LRU . . . . . line replaceable unit  
LTI . . . . . limited technical inspection  
MAGTF . . . . . Marine air-ground task force  
MEE . . . . . Mission Essential Equipment  
MEF . . . . . Marine Expeditionary Force  
MEU . . . . . Marine Expeditionary Unit  
MIMMS . . . . . Marine Corps Integrated Maintenance Management System  
MI . . . . . modification instruction  
MIS . . . . . maintenance information systems  
MMS . . . . . Meteorological Measuring Station  
MSC . . . . . Major Subordinate Command  
MVS . . . . . Muzzle Velocity System  
NCS . . . . . Net Control Station  
OPLAN . . . . . operation plan  
OPORD . . . . . operation order  
OPSEC . . . . . operations security  
PADS . . . . . Position Azimuth Determining System  
PAO . . . . . public affairs officer  
PEB . . . . . pre-extend bin  
PQDR . . . . . Product Quality Deficiency Report  
RadBn . . . . . radio battalion  
RMC . . . . . Repairables Maintenance Company  
SATCOM . . . . . satellite communications  
SCR . . . . . single channel radio  
SECREP . . . . . secondary reparable  
SOP . . . . . standing operating procedures  
SRU . . . . . shop reparable unit  
T/E . . . . . Table of Equipment  
TERPES . . . . . Tactical Electronic Reconnaissance Processing Evaluation System  
TETS . . . . . Third Echelon Test Set  
TI . . . . . technical instruction  
TMDE . . . . . test measurement and diagnostic equipment  
T/O . . . . . Table of Organization  
T/O&E . . . . . Table of Organization and Equipment  
TRSS . . . . . Tactical Remote Sensor System  
TSM . . . . . Transition Switch Module  
UUT . . . . . Unit Under Test  
WIR . . . . . Recoverable Items Report

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APPENDIX B

TERMS AND DEFINITIONS

Terms in this glossary are subject to change as applicable orders and directives are revised. Terms established by Marine Corps orders or directives take precedence after definitions found in Joint Pub 1-02, DOD Dictionary of Military and Associated Terms.

A

**After Action Review (AAR).** A professional discussion of training events conducted after all training to promote learning among training participants. The formality and scope increase with the command level and size of the training evolution. For longer exercises, they should be planned for at predetermined times during an exercise. The results of the AAR shall be recorded on an after action report and forwarded to higher headquarters. The commander and higher headquarters use the results of an AAR to reallocate resources, reprioritize their training plan, and plan for future training.

**Assessment.** An informal judgment of the unit's proficiency and resources made by a commander or trainer to gain insight into the unit's overall condition. It serves as the basis for the midrange plan. Commanders make frequent use of these determinations during the course of the combat readiness cycle in order to adjust, prioritize or modify training events and plans.

C

**Chaining.** A process that enables unit leaders to effectively identify subordinate collective events and individual events that support a specific collective event. For example, collective training events at the 4000-level are directly supported by collective events at the 3000-level. Utilizing the building block approach to progressive training, these collective events are further supported by individual training events at the 1000 and 2000-levels. When a higher-level event by its nature requires the completion of lower level events, they are "chained"; sustainment credit is given for all lower level events chained to a higher event.

**Civil Affairs.** Designated Active and Reserve component forces and units organized, trained, and equipped specifically to conduct civil affairs activities and to support civil-military operations. See also civil affairs activities; civil-military operations. Also called CA. (JP 1-02)

**Civil Military Operations.** The activities of a commander that establish, maintain, influence, or exploit relations between military forces, governmental and nongovernmental civilian organizations and authorities, and the civilian populace in a friendly, neutral, or hostile operational area in order to facilitate military operations, to consolidate and achieve operational US objectives. Civil Military Operations may include performance by military forces of activities and functions normally the responsibility of

the local, regional, or national government. These activities may occur prior to, during, or subsequent to other military actions. They may also occur, if directed, in the absence of other military operations. Civil military operations may be performed by designated civil affairs, by other military forces, or by a combination of civil affairs and other forces. Also called CMO. (JP 1-02)

**Collective Event.** A clearly defined, discrete, and measurable activity, action, or event (i.e., task) that requires organized team or unit performance and leads to accomplishment of a mission or function. A collective task is derived from unit missions or higher-level collective tasks. Task accomplishment requires performance of procedures composed of supporting collective or individual tasks. A collective task describes the exact performance a group must perform in the field under actual operational conditions. The term "collective" does not necessarily infer that a unit accomplishes the event. A unit, such as a squad or platoon conducting an attack may accomplish a collective event or, it may be accomplished by an individual to accomplish a unit mission, such as a battalion supply officer completing a reconciliation of the battalion's CMR. Thus, many collective events will have titles that are the same as individual events; however, the standard and condition will be different because the scope of the collective event is broader.

**Collective Training Standards (CTS).** Criteria that specify mission and functional area unit proficiency standards for combat, combat support, and combat service support units. They include tasks, conditions, standards, evaluator instruction, and key indicators. CTS are found within collective training events in T&R manuals.

**Combat Readiness Cycle.** The combat readiness cycle depicts the relationships within the building block approach to training. The combat readiness cycle progresses from T&R Manual individual core skills training, to the accomplishment of collective training events, and finally, to a unit's participation in a contingency or actual combat. The combat readiness cycle demonstrates the relationship of core capabilities to unit combat readiness. Individual core skills training and the training of collective events lead to unit proficiency and the ability to accomplish the unit's stated mission.

**Combat Readiness Percentage (CRP).** The CRP is a quantitative numerical value used in calculating collective training readiness based on the E-coded events that support the unit METL. CRP is a concise measure of unit training accomplishments. This numerical value is only a snapshot of training readiness at a specific time. As training is conducted, unit CRP will continuously change.

**Component Events.** Component events are the major tasks involved in accomplishing a collective event. Listing these tasks guide Marines toward the accomplishment of the event and help evaluators determine if the task has been done to standard. These events may be lower-level collective or individual events that must be accomplished.

**Computer Network Attack.** Operations to disrupt, deny, degrade, or destroy information resident in computers and computer networks, or the computers and networks themselves. Electronic attack (EA) can be used against a computer, but it is not computer network attack (CNA). CNA relies on the data stream

to execute the attack while EA relies on the electromagnetic spectrum. An example of the two operations is the following: sending a code or instruction to a central processing unit that causes the computer to short out the power supply is CNA. Using an electromagnetic pulse device to destroy a computer's electronics and causing the same result is EA. Also called CNA. (JP 1-02)

**Computer Network Defense.** Defensive measures to protect and defend information, computers, and networks from disruption, denial, degradation, or destruction. Also called CND. (JP 1-02).

**Computer Network Exploitation.** Enabling operations and intelligence collection to gather data from target or adversary automated information systems or networks. (DoDI 3600.1)

**Computer Network Operations.** Comprised of CNA, CND, and related CNE enabling operations. (DoDI 3600.1)

**Condition.** The condition describes the training situation or environment under which the training event or task will take place. Expands on the information in the title by identifying when, where, and why the event or task will occur and what materials, personnel, equipment, environmental provisions, and safety constraints must be present to perform the event or task in a real-world environment. Commanders can modify the conditions of the event to best prepare their Marines to accomplish the assigned mission (e.g.: in a desert environment; in a mountain environment; etc.).

**Core Competency.** Core competency is the comprehensive measure of a unit's ability to accomplish its assigned MET. It serves as the foundation of the T&R Program. Core competencies are those unit core capabilities and individual core skills that support the commander's METL and T/O mission statement. Individual competency is exhibited through demonstration of proficiency in specified core tasks and core plus tasks. Unit proficiency is measured through collective tasks.

**Core Capabilities.** Core capabilities are the essential functions a unit must be capable of performing during extended contingency/combat operations. Core unit capabilities are based upon mission essential tasks derived from operational plans; doctrine and established tactics; techniques and procedures.

**Core Plus Capabilities.** Core plus capabilities are advanced capabilities that are environment, mission, or theater specific. Core plus capabilities may entail high-risk, high-cost training for missions that are less likely to be assigned in combat.

**Core Plus Skills.** Core plus skills are those advanced skills that are environment, mission, rank, or billet specific. 2000-level training is designed to make Marines proficient in core skills in a specific billet or at a specified rank at the Combat Ready level. 3000-8000-level training produces combat leaders and fully qualified section members at the Combat Qualified level. Marines trained at the Combat Qualified level are those the commanding officer feels are capable of accomplishing unit-level missions and of directing the actions of subordinates. Many core plus tasks are learned

via MOJT, while others form the base for curriculum in career level MOS courses taught by the formal school.

**Core Skills.** Core skills are those essential basic skills that "make" a Marine and qualify that Marine for an MOS. They are the 1000-level skills introduced in entry-level training at formal schools and refined in operational units.

**Counter-Intelligence.** Information gathered and activities conducted to protect against espionage, other intelligence activities, sabotage, or assassinations conducted by or on behalf of foreign governments or elements thereof, foreign organizations, or foreign persons, or international terrorist activities. Also called CI. (JP 1-02)

#### D

**Deception.** Those measures designed to mislead the enemy by manipulation, distortion, or falsification of evidence to induce the enemy to react in a manner prejudicial to the enemy's interests. (JP 1-02)

**Defense Readiness Reporting System (DRRS).** A comprehensive readiness reporting system that evaluates readiness on the basis of the actual missions and capabilities assigned to the forces. It is a capabilities-based, adaptive, near real-time reporting system for the entire Department of Defense.

**Deferred Event.** A T&R event that a commanding officer may postpone when in his or her judgment, a lack of logistic support, ammo, ranges, or other training assets requires a temporary exemption. CRP cannot be accrued for deferred "E-coded" events.

**Delinquent Event.** An event becomes delinquent when a Marine or unit exceeds the sustainment interval for that particular event. The individual or unit must update the delinquent event by first performing all prerequisite events. When the unit commander deems that performing all prerequisite is unattainable, then the delinquent event will be re-demonstrated under the supervision of the appropriate evaluation authority.

#### E

**E-Coded Event.** An "E-Coded" event is a collective T&R event that is a noted indicator of capability or, a noted Collective skill that contributes to the unit's ability to perform the supported MET. As such, only "E-Coded" events are assigned a CRP value and used to calculate a unit's CRP.

**Electronic Warfare.** Any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. Also called EW. The three major subdivisions within electronic warfare are: electronic attack, electronic protection, and electronic warfare support. (a) electronic attack. That division of electronic warfare involving the use of electromagnetic energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability and is considered a form of fires. Also called EA. EA includes: (1) actions taken to prevent or reduce an enemy's effective use of the electromagnetic

spectrum, such as jamming and electromagnetic deception, and (2) employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (lasers, radio frequency weapons, particle beams). (b) electronic protection. That division of electronic warfare involving passive and active means taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of electronic warfare that degrade, neutralize, or destroy friendly combat capability. Also called EP. (c) electronic warfare support. That division of electronic warfare involving actions tasked by, or under direct control of, an operational commander to search for, intercept, identify, and locate or localize sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition, targeting, planning and conduct of future operations. Thus, electronic warfare support provides information required for decisions involving electronic warfare operations and other tactical actions such as threat avoidance, targeting, and homing. Also called ES. Electronic warfare support data can be used to produce signals intelligence, provide targeting for electronic or destructive attack, and produce measurement and signature intelligence. (JP 1-02)

**Entry-level Training.** Pipeline training that equips students for service with the Marine operating forces.

**Evaluation.** Evaluation is a continuous process that occurs at all echelons, during every phase of training and can be both formal and informal. Evaluations ensure that Marines and units are capable of conducting their combat mission. Evaluation results are used to reallocate resources, reprioritize the training plan, and plan for future training.

**Event (Training).** An event is a significant training occurrence that is identified, expanded and used as a building block and potential milestone for a unit's training. An event may include formal evaluations. An event within the T&R Program can be an individual training evolution, a collective training evolution or both. Through T&R events, the unit commander ensures that individual Marines and the unit progress from a combat capable status to a Fully Combat Qualified (FCQ) status.

**Event Component.** The major procedures (i.e., actions) that must occur to perform a collective event to standard.

**Exercise Commander (EC).** The Commanding General, Marine Expeditionary Force or his appointee will fill this role, unless authority is delegated to the respective commander of the Division, Wing, or FSSG. Responsibilities and functions of the EC include: (1) designate unit(s) to be evaluated, (2) may designate an exercise director, (3) prescribe exercise objectives and T&R events to be evaluated, (4) coordinate with commands or agencies external to the Marine Corps and adjacent Marine Corps commands, when required.

**Exercise Director (ED).** Designated by the EC to prepare, conduct, and report all evaluation results. Responsibilities and functions of the ED include: (1) Publish a letter of instruction (LOI) that: delineates the T&R events to be evaluated, establishes timeframe of the exercise, lists responsibilities of various elements participating in the exercise, establishes safety requirements/guidelines, and lists coordinating instructions. (2) Designate the TEC and TECG to operate as the central control agency for the exercise. (3) Assign evaluators, to include the senior evaluator, and ensure that those

evaluators are properly trained. (4) Develop the general exercise scenario taking into account any objectives/ events prescribed by the EC. (5) Arrange for all resources to include: training areas, airspace, aggressor forces, and other required support.

## I

**Individual Readiness.** The individual training readiness of each Marine is measured by the number of individual events required and completed for the rank or billet currently held.

**Individual Training.** Training that applies to individual Marines. Examples include rifle qualifications and HMMWV driver licensing.

**Individual Training Standards (ITS).** Specifies training tasks and standards for each MOS or specialty within the Marine Corps. In most cases, once an MOS or community develops a T&R, the ITS order will be cancelled. However, most communities will probably fold a large portion of their ITS into their new T&R manual.

**Information Assurance.** Information operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and nonrepudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities. Also called IA. (JP 1-02)

## L

**Line Replaceable Unit (LRU).** An essential support item removed and replaced to restore an end item or communication network to an operationally ready condition. This term is normally used to describe removal and replacement of secondary reparable items or other subassemblies while the end item is on the line or operational as opposed to maintenance actions conducted in the repair shop.

**Example:** Restoration of a HF Radio network may involve replacing the Receiver/Transmitter or a radio frequency cable assembly. The definition may also extend to the replacement of a chassis-mounted component such as a switch or circuit breaker if the repair was conducted outside of the repair shop by a technician possessing the skills and tools necessary to safely and effectively conduct the repair.

## M

**Marine Corps Combat Readiness and Evaluation System (MCCRES).** An evaluation system designed to provide commanders with a comprehensive set of mission performance standards from which training programs can be developed; and through which the efficiency and effectiveness of training can be evaluated. The Ground T&R Program will eventually replace MCCRES.

**Marine Corps Ground Training and Readiness (T&R) Program.** The T&R Program is the Marine Corps' primary tool for planning and conducting training, for planning and conducting training evaluation, and for assessing training readiness. The program will provide the commander with standardized programs of instruction for units within the ground combat, combat support, and combat service support communities. It consolidates the ITS, CTS, METL and other

individual and unit training management tools. T&R is a program of standards that systematizes commonly accepted skills, is open to innovative change, and above all, tailors the training effort to the unit's mission. Further, T&R serves as a training guide and provides commanders an immediate assessment of unit combat readiness by assigning a CRP to key training events. In short, the T&R Program is a building block approach to training that maximizes flexibility and produces the best-trained Marines possible.

**Mission Essential Task(s) MET(s).** A MET is a collective task in which an organization must be proficient in order to accomplish an appropriate portion of its wartime mission(s). MET listings are the foundation for the T&R manual; all events in the T&R manual support a MET.

**Mission Essential Task List (METL).** Descriptive training document that provides units a clear, war fighting focused description of collective actions necessary to achieve wartime mission proficiency. The service-level METL, that which is used as the foundation of the T&R manual, is developed using Marine Corps doctrine, Operational Plans, T/Os, UJTL, UNTL, and MCTL. For community based T&R Manuals, an occupational field METL is developed to focus the community's collective training standards. Commanders develop their unit METL from the service-level METL, operational plans, contingency plans, and SOPs.

**Mission Performance Standards (MPS).** Criteria that specify mission and functional area unit proficiency standards for combat, combat support and combat service support units. They include tasks, conditions, standards, evaluator instruction, and key indicators. MPS are contained within the MCCRES volumes. The MCCRES volumes are being replaced by T&R Manuals. Collective events will replace MPS.

O

**Operational Readiness (OR).** (DoD or NATO) OR is the capability of a unit/formation, ship, weapon system, or equipment to perform the missions or functions for which it is organized or designed. May be used in a general sense or to express a level or degree of readiness.

**Operations Security.** A process of identifying critical information and subsequently analyzing friendly actions attendant to military operations and other activities to: a. identify those actions that can be observed by adversary intelligence systems; b. determine indicators that hostile intelligence systems might obtain that could be interpreted or pieced together to derive critical information in time to be useful to adversaries; and c. select and execute measures that eliminate or reduce to an acceptable level the vulnerabilities of friendly actions to adversary exploitation. (JP 1-02)

P

**Performance Step.** Performance steps are included in the components of an Individual T&R Event. They are the major procedures (i.e., actions) a Marine unit must accomplish to perform an individual event to standard. They describe the procedure the task performer must take to perform the task under operational conditions and provide sufficient information for a task performer to perform the procedure (may necessitate identification of

supporting steps, procedures, or actions in outline form). Performance steps follow a logical progression and should be followed sequentially, unless otherwise stated. Normally, performance steps are listed only for 1000-level individual events (those that are taught in the entry-level MOS school). Listing performance steps is optional if the steps are already specified in a published reference.

**Physical Security.** (DoD, NATO) That part of security concerned with physical measures designed to safeguard personnel; to prevent unauthorized access to equipment, installations, material, and documents; and to safeguard them against espionage, sabotage, damage, and theft. (JP 1-02)

**Prerequisite Event.** Prerequisites are the academic training and/or T&R events that must be completed prior to attempting the event.

**Psychological Operations.** Planned operations to convey selected information and indicators to foreign audiences to influence their emotions, motives, objective reasoning, and ultimately the behavior of foreign governments, organizations, groups, and individuals. The purpose of psychological operations is to induce or reinforce foreign attitudes and behavior favorable to the originator's objectives. Also called PSYOP. (JP 1-02)

**Public Affairs.** The use of command information, community relations activities and public information directed to various national and international publics, in support of combatant commander public information needs at all operational levels. Also called PA.

## R

**Readiness.** (DoD) Readiness is the ability of U.S. military forces to fight and meet the demands of the national military strategy. Readiness is the synthesis of two distinct but interrelated levels: (a) Unit readiness - The ability to provide capabilities required by combatant commanders to execute assigned missions. This is derived from the ability of each unit to deliver the outputs for which it was designed. (b) Joint readiness--The combatant commander's ability to integrate and synchronize ready combat and support forces to execute assigned missions.

## S

**Secondary Reparable (SECREP).** Certain specified items which are not functional by themselves but are components of other items and repairable as indicated by their Source, Maintenance and Recoverability Code (SMRC). These items are defined in detail and managed in accordance with the current edition of MCO P4400.82.

**Section Skill Tasks.** Section skills are those competencies directly related to unit functioning. They are group rather than individual in nature, and require participation by a section (S-1, S-2, S-3, etc).

**Shop Replaceable Unit (SRU).** An essential support item removed and replaced to restore a line replaceable unit (LRU) to an operationally ready condition. This term is normally used to describe removal and replacement of secondary reparable items or chassis-mounted components from the next higher assembly and/or Line Replaceable Unit while in the repair shop.

**Example:** Performing corrective maintenance on an HF Radio end item may involve inducting the Receiver/Transmitter (an LRU) into the repair shop. Under the terms of this definition, the secondary reparables or components mounted within the chassis of the RT would be considered SRUs as this type of repair would not normally be conducted on the line.

**Simulation Training.** Simulators provide the additional capability to develop and hone core and core plus skills. Accordingly, the development of simulator training events for appropriate T&R syllabi can help maintain valuable combat resources while reducing training time and cost. Therefore, in cases where simulator fidelity and capabilities are such that simulator training closely matches that of actual training events, T&R Manual developers may include the option of using simulators to accomplish the training. CRP credit will be earned for E-Coded simulator events based on assessment of relative training event performance.

**Standard.** A standard is a statement that establishes criteria for how well a task or learning objective must be performed. The standard specifies how well, completely, or accurately a process must be performed or product produced. For higher-level collective events, it describes why the event is being done and the desired end-state of the event. Standards become more specific for lower-level events and outline the accuracy, time limits, sequencing, quality, product, process, restrictions, etc., that indicate the minimum acceptable level of performance required of the event. At a minimum, both collective and individual training standards consist of a task, the condition under which the task is to be performed, and the evaluation criteria that will be used to verify that the task has been performed to a satisfactory level.

**Sustainment Training.** Periodic retraining or demonstration of an event required maintaining the minimum acceptable level of proficiency or capability required to accomplish a training objective. Sustainment training goes beyond the entry-level and is designed to maintain or further develop proficiency in a given set of skills.

**Systems Approach to Training (SAT).** An orderly process for analyzing, designing, developing, implementing, and evaluating a unit's training program to ensure the unit, and the Marines of that unit acquire the knowledge and skills essential for the successful conduct of the unit's wartime missions.

## T

**Training Task.** This describes a direct training activity that pertains to an individual Marine. A task is composed of 3 major components: a description of what is to be done, a condition, and a standard.

**Technical Exercise Controller (TEC).** The TEC is appointed by the ED, and usually comes from his staff or a subordinate command. The TEC is the senior evaluator within the TEGC and should be of equal or higher grade than the commander(s) of the unit(s) being evaluated. The TEC is responsible for ensuring that the evaluation is conducted following the instructions contained in this directive and MCO 1553.3A. Specific T&R Manuals are used as the source for evaluation criteria.

**Tactical Exercise Control Group (TECG).** A TECG is formed to provide subject matter experts in the functional areas being evaluated. The benefit of establishing a permanent TECG is to have resident, dedicated evaluation authority experience, and knowledgeable in evaluation technique. The responsibilities and functions of the TECG include: (1) developing a detailed exercise scenario to include the objectives and events prescribed by the EC/ED in the exercise LOI; (2) conducting detailed evaluator training prior to the exercise; (3) coordinating and controlling role players and aggressors; (4) compiling the evaluation data submitted by the evaluators and submitting required results to the ED; (5) preparing and conducting a detailed exercise debrief for the evaluated unit(s).

**Training Plan.** A document that outlines the general plan for the conduct of individual and collective training in an organization for specified periods of time.

**U**

**Unit CRP.** Unit CRP is a percentage of the E-coded collective events that support the unit METL accomplished by the unit. Unit CRP is the average of all MET CRP.

**Unit Evaluation.** All units in the Marine Corps must be evaluated, either formally or informally, to ensure they are capable of conducting their combat mission. Informal evaluations should take place during all training events. The timing of formal evaluations is critical and should, when appropriate, be directly related to the units' operational deployment cycle. Formal evaluations should take place after the unit has been staffed with the majority of its personnel, has had sufficient time to train to individual and collective standards, and early enough in the training cycle so there is sufficient time to correctly identified weaknesses prior to deployment. All combat units, and units task organized for combat require formal evaluations prior to operational deployments.

**Unit Training Management (UTM).** Unit training management is the use of the SAT and Marine Corps training principles in a manner that maximizes training results and focuses the training priorities of the unit on its wartime mission. UTM governs the major peacetime training activity of the Marine Corps and applies to all echelons of the Total Force.

**W**

**Waived Event.** An event that is waived by a commanding officer when in his or her judgment, previous experience or related performance satisfies the requirement of a particular event.