

Report Date: 25 Apr 2014

**Summary Report for Individual Task
441-096-2006
Organize Emplacement of a Sentinel Sensor and Sensor Node
Status: Approved**

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

DESTRUCTION NOTICE: None

Condition: In a tactical environment, you are the team leader and have just arrived at the selected Sentinel site. You direct your soldiers to emplace the Sentinel sensor, and prepare for action. Assistance from other crew members is available. Some iterations of this task should be performed in MOPP 4.

Standard: Supervise emplacement of the Sentinel sensor to ensure it is initialized and operating, and report the status to platoon leader, per TM 9-1430-741-10, without causing injury to self or other personnel, with no damage to the equipment, with minimal damage to the environment, and within the time prescribed by local command directives.

Special Condition: None

Safety Level: Low

MOPP: Sometimes

Task Statements

Cue: You have been directed to Organize Emplacement of a Sentinel Sensor and Sensor Node

DANGER
None

WARNING
Extremely hot or cold metal surface can cause personnel injury. If surfaces are hot to the touch or temperature is below 32 degrees F, use gloves to protect hands when handling equipment. Failure to comply could result in injury to personnel.

CAUTION
None

Remarks: None

Notes: All required Air Defense specific references and technical manuals will be provided by the local Air Defense Command.

Performance Steps

1. Supervise positioning of ATG trailer
 - a. Drive HMMWV with sensor trailer over survey marker.
 - b. Stop sensor trailer over survey marker.
Note: When trailer is in position take the following actions.
 - c. Set HMMWV transmission to neutral.
 - d. Set parking brake.
 - e. Turn off HMMWV engine.
 - f. Chock ATC trailer wheels.
 - g. Set trailer brakes handles to down (horizontal) position.
2. Supervise uncoupling of ATG trailer from HMMWV.
 - a. Remove stow pins holding jack pads.
 - b. Remove each rear jack pad.
 - c. Place jack pads on ground.
3. Ensure stabilizing of ATG trailer.
 - a. Grasp jack handcrank.
 - b. Remove handcrank quick-release pin.
 - c. Turn handcrank as required to set jack pad on ground.
 - d. Install quick-release pin to secure handcrank.
 - e. Unscrew and remove covers from three circular levels.
Note: From behind trailer identify high side (side which the ground is highest)
 - f. Grasp high side jack handcrank.
 - g. remove quick-release pin.
 - h. Turn handcrank of trailer jack until tire is off ground.
 - i. Turn handcrank three more turns.
 - j. install quick-release pin to secure jack handcrank.
 - k. Grasp low side jack handcrank.

l. remove quick-release pin.

Note: While observing low side circular level turn jack handcrank until bubble is directly in line with inner circle of level from side to side.

m. Turn jack handcrank until bubble is centered.

n. Install quick-release pin.

o. Grasp front end jack handcrank.

p. Remove quick-release pin.

q. Turn jack handcrank until bubble is centered.

r. install quick-release pin.

Note: readjust all leveling jacks as required, until all level bubbles are within required circle.

WARNING

High winds can create a hazard with antenna raised. Do not operate radar when wind velocity is in excess of 62 miles per hour. Failure to comply could result in injury to personnel or damage to equipment.

WARNING: Unexpected antenna rotation can present a hazard to personnel. Ensure AZIMUTH DRIVE circuit breaker is set to OFF and azimuth handcrank is engaged for manual rotation when climbing or working on top of ATG. Failure to comply may result in serious injury to personnel.

WARNING: ATG trailer can tip over. Do not climb on ATG trailer or raise or lower antenna unless jacks are extended and secured. Failure to comply may result in serious injury to personnel and equipment.

CAUTION: Antenna of BSU can be damaged if antenna rotates while being raised or lowered. Ensure antenna array is facing trailer tongue and azimuth handcrank is engaged when raising or lowering antenna.

s. Install cover on circular levels.

4. Ensure proper erecting of the radar antenna.

a. Verify azimuth drive circuit breaker is set to off.

b. Press down azimuth handcrank engagement lever to engage azimuth handcrank.

c. Release two antenna hold-down latches.

d. Secure antenna to densor trailer.

e. Press down elevation handcrank lock to release elevation handcrank.

f. turn elevation handcrank counterclockwise.

g. Raise antenna until it is fully erected.

- h. Life up elevation handcrank lock to lock elevation handcrank.
 - i. Raise azimuth handcrank engagement lever to disengage azimuth handcrank.
5. Ensure proper positioning of HMMWV.
- a. Drive HMMWV to designated site with in 40 meters of ATG trailer.
 - b. Orient HMMWV with rear toward ATG trailer.
 - c. Place HMMWV transmission to neutral.
 - d. Set hand brake.
 - e. Turn off engine.

WARNING

Potentially hazardous voltages are present at radar set connections when generator is running. Do not apply generator power to system until radar set is properly grounded and all system cable connections have been made. death to serious injury can occur if power is present when making connections or radar set is ungrounded. Generator must be turned off before disconnecting radar set grounding equipment.

- f. Chock HMMWV wheels.
6. Ensure proper grounding of the Sentinel.
- a. Remove ground rod, ground cable and slide hammer form stowage.
 - b. Attach threaded couplings of slide hammer to ground rod.
 - c. Drive ground rod into ground near generator ground terminal.
 - d. Remove slide hammer from ground rod.
 - e. Stow slide hammer.
 - f. Unwrap W15 ground cable from ground cable bracket.
 - g. Attach W15P1 ground cable clip to ground rod.

CAUTION

Cables can be damaged from flexing in adverse conditions. Do not flex cable rapidly if temperature is at or below 32' F! install protective covers on open cable ends when not in use.

CAUTION: Cable and connectors can be damaged from snagging or scraping. Do not permit cable to snag on obstacles or to be chafed while being pulled. install protective covers on open cable ends when not in use.

CAUTION: Cables can be damaged by being driven over. Ensure that cables are located in a traffic free area or are protected from damage caused by vehicle driving over them.

Note: For SINCGARS or EPLRS data communications, perform the following steps. For FAAD data link communications.

h. Verify ground cable connections between generator and ground rod are secure.

7. Direct laying and connecting of system cables

a. Verify generator is turned off.

b. Remove quick-release securing cable reel arm to bracket.

c. Rotate cable reel arm to operating position.

d. Secure by installing quick release pin through hole on cable reel arm.

e. Unfasten straps on system power reel.

f. turn cable reel locking nut counterclockwise until cable reel rotates freely.

g. Unspool system power cable and pull towards rear of ATG.

h. Verify azimuth drive circuit breaker is set to off.

i. Verify all other circuit breakers are set to on and EMER STOP switch is reset.

j. Remove protective caps from cable connector and prime power connector J1.

k. Install system power cable to prime power connector J1.

l. Remove protective caps from cable connector and radios connector J6.

m. Lay between HMMWV and rear of ATG the data link cable.

n. Install data link cable connector to radios connector J6.

o. Remove protective caps from HMMWV connector W1J1 and from system power cable connector W1P1.

p. Install system power cable connector to HMMWV cable connector W1J1.

- q. Remove protective caps from connectors J4 on power interface unit and from cable connector.
 - r. Install data link cable connector to power interface init radio connector.
8. Direct laying and connecting data link cables.
- a. Unfasten straps on cable reel.
 - b. Turn cable reel locking nut counterclockwise until cable reel rotates freely.
 - c. Unspool data link cable and pull towards connection a FAAD C21 site.
 - d. Remove protective caps from data link cable connector and FAAD C21 site connector.
 - e. Install data link cable connector at designated FAAD C21 site connector.
 - f. Pull cable ends to SIU connector panel.
 - g. Remove protective cap from FDL connector J5 and data link cable connector.

CAUTION

Prolonged operation of radios from battery power will discharge HMMWV battery. Do not operate EPLRS or SINCGARS radios from battery power more than 12 minutes if HMMWV motor or generator is not running.

CAUTION: Power surges occurring during system power turn-on or turn-off can damage SINCGARS radios. Ensure DC power ON/OFF switch on power interface unit is set to off position until generator output is stabilized and radar system power is turned on or off.

Note: If DC power ON/OFF switch on the power interface unit is positioned to OFF or if HMMWV generator is not running, radio power is supplied by the HMMWV battery.

- h. Install data link cable connector to FDL connector J5.
9. Ensure proper preparation of radio set for operation.
- a. Deploy two SINCGARS antenna from tethers holdings.
 - b. Turn on SINCGARS radio per operator's manual.
- Note:** The PLGR must be loaded with current crypto codes. If it does not have current codes, errors of up to 150 meters may occur in target position reports.
- Note:** After connection, PLGR remains on top of Atg until completion of initialization procedure. PLGR is then disconnected from AGLay between HMMWV and rear of ATG and reinstalled in mount in HMMWV.
10. Ensure proper connection of PLGR to ATG.
- a. Remove PLGR from mount in HMMWV, while leaving on with battery power.

- b. Remove power cable connector from PLGR connector J4.
 - c. Remove external antenna cable connector from PLGR connector J3.
 - d. Install protective caps on PLGR connectors J4 and J3.
 - e. Relocate PLGR from HMMWV to sensor.
 - f. Remove PLGR adapter cable from shelf under RCT in RCT compartment.
 - g. Remove protective caps from adapter cable and from PLGR connector J9 on SIV connector panel.
 - h. Install PLGR adapter cable connector P2 to PLGR connector J9 on SIV connector panel.
 - i. Install PLGR adapter cable connector P1 to PLGR connector J2.
 - j. Rotate flip-up swivel antenna on PLGR to raised position.
 - k. Position PLGR on top of ATG.
11. Ensure proper installation of IFF interrogator.
- a. Position IFF interrogator to mounting base and secure with latches.
 - b. install cable connector W3P2 to IFF interrogator connector J2.
 - c. Install cable connector W4P2 to IFF interrogator connector J1.
 - d. Install cable connector W7P2 to IFF interrogator connector J5.
 - e. Install cable connector W6P1 to IFF interrogator J4.
 - f. Install IFF cover and secure with six latches.
 - g. Perform IFF code loading procedures per operator manual.

CAUTION

KIV-16 is classified as cryptographic controlled item. When KIV-16 is installed, the IFF interrogator is classified COMSEC. Do not leave KIV-16 unattended. Refer to AR 380-40 for handling of controlled communication material. Failure to comply may result in compromise to equipment security.

- h. Perform system checkout procedure to verify system operation.

12. Ensure proper installation of KIV-16

- a. Set IFF circuit breaker to off at sensor power distribution panel.
- b. Set azimuth handcrank engagement lever to engaged position on antenna pedestal.

- c. Remove IFF cover six release latches.
- d. Install mode-4 module to IFF interrogator.
- e. Secure with two captive screws.
- f. Install IFF cover with six latches.
- g. Set IFF circuit breaker to on at sensor power distribution panel.

WARNING

High voltage is produced when generator set is in operation. Improper operation could result in personal injury or death by electrocution.

WARNING: Exhaust discharge contains deadly gases. Do not operate the generator set in enclosed areas unless exhaust discharge is properly vented to outside. Failure to comply may result in injury or death to personnel due to carbon monoxide poisoning.

WARNING: Never attempt to start the generator set if it has not been properly grounded. Insure that the generator is properly grounded prior to starting generator. Failure to comply could result in injury or death to personnel.

WARNING: Electrical hazard is present. Ensure that system power cable is properly connected. Failure to comply could result in injury to personnel and/or equipment.

WARNING: Fire Hazard exists with generator fuel. Do not perform fuel servicing while smoking. Do not expose fuel to heat to electrical spark. Ensure generator is turned off and completely cooled before refueling. Failure to comply may result in serious injury to personnel and equipment.

WARNING: With any access door open the noise level of the generator set when operating could cause hearing damage. Hearing protection must be worn when working within 20 feet of an operating generator.

- h. Perform IFF code loading procedures.

13. Ensure power is applied from generator.

- a. Preliminary setup.

(1) Ensure following settings on sensor power distribution panel.

(a) Azimuth drive circuit breaker set to off.

(b) All other circuit breakers set to on.

(2) Position RCT in RCT compartment as required to access RCT connections.

(3) Ensure RCT cable assembly is installed between connector J1 of RCT and RCT data-power connector J2 of SIU connector panel.

(4) Verify RCT power switch is set to on at bottom of RCT.

b. Procedure

(1) Verify the azimuth drive circuit breaker is set to off.

(2) Verify all ground cable connections are made.

(3) Visually inspect generator for fuel, oil coolant leaks.

(4) ensure generator fluid level checks have been performed per generator (before) PMCS in TM.

(5) Position dead crank switch to normal.

(6) Release latch and raise generator control panel cover to the full open position.

(7) Release two turnlock fasteners and lower generator control panel.

(8) Push DC control power circuit break CB1 in.

(9) Verify AC voltage reconnection switch is positioned to 120/208 V 3 PH.

(10) Close generator control panel and secure with two turnlock fasteners.

(11) Position AM-VM transfer switch to L1-L2 3 PHASE.

(12) VERIFY EMERGENCY STOP PUSH TO STOP pushbutton switch has been reset by pulling out on switch.

(13) Place MASTER SWITCH to PRIME AND RUN position.

(14) push PRESS TO TEST pushbutton and ensure all indicator lights are on.

(15) Release PRESS TO TEST pushbutton and ensure all indicator lights go off.

(16) Press and hold BATTLE SHORT press to test light and ensure light goes on.

(17) Release BATTLE SHORT press to test light and ensure light goes off.

(18) Press and hold AC CIRCUIT INTERRUPTER press to test light and ensure light goes on.

CAUTION

Do not crank engine in excess of 15 seconds. Allow starter to cool at least 15 seconds between attempted starts. Failure to observe could result in damage to the starter.

Note: If ambient temperature is below 40 degrees F, position MASTER SWITCH at PREHEAT position for 30 seconds before positioning MASTER SWITCH to START position.

(19) Release AC CIRCUIT INTERRUPTER press to test light and ensure light goes off.

(20) Position MASTER SWITCH to START.

Note: Hold MASTER SWITCH in START position until OIL PRESSURE gauge reaches at least 25 psi, AC VOLTS has increased to its approximate rated value, and engine has reached stable operating speed.

(21) Set MASTER SWITCH to PRIME & RUN AUX FUEL position.

Note: Let engine run until water temperature reaches at least 170 degrees F, as indicated on COOLANT TEMP gauge before proceeding.

(22) Verify OIL PRESSURE gauge is reading 25-60 psi.

(23) Observe AC VOLT meter and verify meter indicates 205-220 Vac.

Note: Adjust AC output as required using VOLTAGE adjust knob.

(24) Observe HZ meter and verify meter indicates 400 +/- 12 Hz.

Note: Adjust frequency output as required using FREQUENCY adjust knob

(25) Position AC CIRCUIT INTERRUPTER switch to CLOSED position.

(26) Observe green AC CIRCUIT INTERRUPTER indicator is on.

(27) Verify voltage and frequency are still at required values.

Note: Adjust if necessary.

(28) Rotate AM-VM transfer switch thru positions while observing PERCENT RATED CURRENT meter.

(29) Verify each phase indication is not over max.

Note: If phase indication is over max load rating on any phase, place the AC CIRCUIT INTERRUPTER switch to the OPEN position and notify Organizational Maintenance.

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WARNING: Unexpected antenna rotation can present a hazard to personnel. Ensure AZIMUTH DRIVE circuit breaker is set to OFF and azimuth handcrank is engaged for manual rotation when climbing or working on top of ATG. Failure to comply may result in serious injury to personnel.

CAUTION: Incorrect phase sequence of primary power can damage equipment. Do not continue if phase detector correct indicator is not on or if phase detector incorrect indicator is on.

14. Supervise powering up of the shelter.

a. Verify that PHASE DETECTOR correct (green) indicator is on and incorrect (red) indicator is off, at sensor POWER DISTRIBUTION panel.

b. Set AC voltage meter rotary switch to each position and verify AC voltage meter indicates 115 +/- 11.5 Vac or 200 +/- 20 Vac volts, as indicated by respective switch position.

- c. Set rotary switch to OFF.
- d. Verify personnel are clear of antenna.
- e. Verify azimuth handcrank engagement lever is set to disengaged position.
- f. Set AZIMUTH DRIVE circuit breaker to ON.

g. Verify the following indications at RSC panel. POWER OFF indicator on. CB OPEN indicator off.

Note: If POWER OFF indicator is on proceed to next step. If POWER indicator is off, refer to RSC fault indications to troubleshoot fault.

Note: Perform the following steps if CB OPEN indicator is on.

h. Open transmitter low voltage compartment access panel.

Note: At transmitter control panel, ensure the following are set to ON. If any circuit breaker is tripped or OFF, reset or set to ON as required.

i. Verify TX 28VDC circuit breaker, PAM 1/BLOWER1 circuit breaker, PAM 2/BLOWER 2 circuit breaker to ON.

j. Secure transmitter low voltage compartment panel/

k. Open receiver/exciter access panel.

l. Verify receiver/exciter circuit breaker (CB 1) is set to ON.

m. Secure receiver/exciter access panel.

Note: If CB OPEN indicator is still on, see RSC Fault Indications to troubleshoot fault. If CB OPEN indicator is OFF, proceed to next step.

n. Press and release POWER ON switchlamp at RSC panel.

o. Press and hold COMPTR RESET switchlamp for 2 seconds.

p. Release switchlamp.

q. Verify the following indications on the RSC panel are correct.

(1) POWER ON indicator is ON.

(2) RAD OFF indicator is ON.

(3) HV OFF indicator is ON.

(4) XMTR WARNING indicator is ON.

(5) ANT ROT OFF indicator is ON.

(6) CW or CCW indicator is ON

(7) All other indicators are OFF.

Note: If indications are incorrect , refer to RSC Fault Indications to troubleshoot fault.

(Asterisks indicates a leader performance step.)

Evaluation Guidance: Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

Evaluation Preparation: Setup: Ensure that all information, references, and equipment required to perform the task are available. Use the performance measures and the references to score the Soldier's performance. Brief the Soldier. Tell the Soldier what he is required to do IAW the task conditions and standards.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Positioned ATG over site survey marker as directed by the section chief or team leader.			
2. Uncoupled ATG trailer from HMMWV.			
3. Stabilized ATG trailer.			
4. Erected ATG antenna.			
5. Positioned HMMWV.			
6. Grounded Sentinel.			
7. Laid and connected system cables.			
8. laid and connected data link cables.			
9. Ensured proper preparation of radio set for operation.			
10. Ensured proper connection of PLGR to ATG.			
11. Ensured proper installation of IFF interrogator.			
12. Ensured proper installation of KIV-16			
13. Ensured power is applied from generator.			
14. Supervised powering up of the shelter.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	AR 200-1	ENVIRONMENTAL PROTECTION AND ENHANCEMENT	No	No
	TM 9-1430-741-10	OPERATORS MANUAL FOR SENTINEL, AN/MPQ-64, (NSN 1430-01-420-8077)	No	No

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT. Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects.

Safety: In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination. Everyone is responsible for safety. A thorough risk assessment must be completed prior to every mission or operation.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks : None

ICTL Data :

ICTL Title	Personnel Type	MOS Data
MOS 14G - Air Defense (AD) Battle Management System Operator - SL2	Enlisted	MOS: 14G, Skill Level: SL2, Duty Pos: DQG