LESSON PLAN

PART I
COVER SHEET

LESSON TITLE: M256A1 Chemical Agent Detector Kit

TRAINING METHOD: Demonstration - Performance

ORGANIZATIONAL PATTERN: Topical

REFERENCES: T.O. 11H2-21-1, Chemical Agent Detector Kit: M256/M256A1 (September 1985)
T.O. 11H2-21-11, Chemical Agent Detector Simulator Kit M256A1

AIDS AND HANDOUTS: Attachment 1, Illustration of sampler-detector, front view
Attachment 2, Illustration of sampler-detector, back view
M256A1 Simulator, Detector (NSN 6665-01-293-2149)
Gloves and Protective Mask for Personnel Operating M256A1 Training Kit
PIN 33298-DF, Use of Chemical Agent Detector Kit M256A1. 17 min.
PIN 606042DF, DPTV F Block (Chemical Decontamination and Detection Equipment - F2)
Clock or Stop Watch for Timing Test

LESSON OBJECTIVE: Given an explanation and a demonstration on the M256A1 Chemical Agent Detector Kit (using the M256A1 Training Kit), the student must properly perform all of the task steps listed. During the final course of instruction test, the student must demonstrate mastery of at least three samples of behavior listed below.

TASK STEPS:

1. Inspect and determine serviceability of the M256A1 detector kit.

2. Operate a M256A1 detector kit using operational instructions. (Use an M256A1 training kit to perform this step).

3. Properly report test results from an M256A1 detector kit.

SAMPLES OF BEHAVIOR:

1. State the purpose and detection/identification capabilities of the M256A1 Detector Kit.

2. Explain the theory of operation for using the M256A1 Detector Kit.

3. Identify the components of the M256A1 Detector Kit.

4. Explain operational limitations of the M256A1 Detector Kit.

SUGGESTED COURSE(S) OF INSTRUCTION: (Chemical Threat Area)

Shelter Management Team
Contamination Control Team
Disaster Preparedness Support Team

STRATEGY: Show the M256A1 Detector Kit and explain how it should be used in wartime or an exercise. Devise opportunities for as much hands-on training as possible. Demonstrate how to operate the M256A1 Detector Kit and point out limitations of the Detector Kit. M256A1 Training Kits should be used during student demonstration, stress safety. The M256A1 Training Kit contains an assortment of 36 sampler-detectors to simulate positive nerve, blister, and blood agents. The training kit sampler detectors are identical in appearance, except they are colored blue and numerically coded. Gloves must be worn when crushing heater ampoules. Masks are worn to avoid any possible vapor hazard associated with breaking the ampoules.

LESSON OUTLINE:

MAIN POINT 1. PURPOSE AND CAPABILITIES OF THE M256A1 DETECTOR KIT

MAIN POINT 2. THEORY OF OPERATION

MAIN POINT 3. M256A1 DETECTOR KIT COMPONENTS
- a. Sample Detector
- b. M8 Paper
- c. Instruction Cards
- d. Carrying Case

MAIN POINT 4. OPERATE THE M256A1 DETECTOR KIT
- a. Lewisite Results
- b. Blister Results
- c. Blood Results
- d. Nerve Results

MAIN POINT 5. UNUSUAL CONDITIONS

a. Between 32° and 50°F
b. Below 32° F
c. Desert Conditions
d. Tropic Conditions
e. Rain/Snow

MAIN POINT 6. INSPECTION AND SERVICEABILITY

PART II
TEACHING PLAN
INTRODUCTION

ATTENTION: When the air is contaminated with chemical warfare agents, one breath could make you a casualty.

MOTIVATION: If you can determine the presence of chemical contamination, you'll know the protection needed to survive, or whether protection is even necessary.

OVERVIEW: The M256A1 Detector Kit will help you make the determination. We'll cover:

1. Purpose and capabilities
2. Theory of operations
3. Components
4. Operation and reading results
5. Use during unusual conditions
6. Inspection and serviceability

TRANSITION: Let's take a look at the purpose and capabilities of the M256A1 Detector Kit.

BODY

MAIN POINT 1. PURPOSE AND CAPABILITIES OF THE M256A1 DETECTOR KIT

The M256A1 Detector Kit provides a simple method to confirm the presence of chemical warfare agents (nerve, blister, blood and lewisite) in liquid or vapor form. It can NOT detect choking agents.

The M256A1 sampler-detectors are capable of detecting and identifying vapors only. The M8 paper provided is to identify liquid agents.

MAIN POINT 2. THEORY OF OPERATION

The M256A1 kit is intended for chemical reconnaissance during post-attack procedures. Prior to using the kit assume the proper MOPP level.

TESTING TAKES ABOUT 20 MINUTES

Testing with the M256A1 takes about 20 minutes and is just one of a number of sources used to determine the presence and extent of chemical contamination.

Once you conduct reconnaissance, pass the results to the Survival Recovery Center through the established channels as quickly as possible.

REPORT ALL RESULTS, POSITIVE AND NEGATIVE

When you conduct testing, it is just as important to provide negative as well as positive results. However, when checking for blood agents, a re-check is necessary if the first results are positive.

This is due to mercuric cyanide used in the blister agent testing which could possibly be mistaken for hydrogen cyanide, a type of blood agent. If the blood agent test is positive both times, call in a positive result.

CONCENTRATE THE VAPORS WITH A BOX OR CAN

When performing chemical testing, one ideal place to monitor is around or above suspected areas of liquid agents. By using a box or can, you can trap the vapors above the liquid for a better concentration.

MAIN POINT 3. COMPONENTS

The M256A1 components are:

a. Carrying Case

The carrying case is constructed of a olive drab plastic with adjustable carrying straps.

b. Instruction Cards

Three instruction cards with a color comparison chart are attached to the carrying case.

c. M8 Paper

One pack of M8 Chemical Detector Paper with a color comparison chart and instructions inside the cover.

INSTRUCTOR'S NOTE:
Instructions for the M8 Paper are in RTP F1.

d. sample detector

Each kit contains 12 individually wrapped sampler-detectors. The detectors consist of:

⇒ Blood and Nerve agent detector spots and ampoules with a protective strip.

⇒ Blister agent detector spots, ampoules, and a heating assembly used in the testing process.

⇒ Lewisite detecting tablet and rubbing tabs.

MAIN POINT 4. OPERATE THE M256A1 DETECTOR KIT

Breaking the ampoules spreads the liquid contained in them over the separate testing spots. When in contact with a chemical agent vapor, the liquid will react and change colors on the test spot. This color change indicates a positive or negative result.

The lewisite tab works the same except it uses a tablet instead of liquid. An initial rub mark is made on the tab for a color comparison, against a second rub mark.

The following indications summarize the test results:

a. Lewisite Results (after ten minutes of exposure time)

Lewisite test (rubbing tab): Remember, your first rub mark was a tan color.

⇒ Positive if the mark is olive drab after rerub.

⇒ Negative if mark is tan after rerub.

b. Blister Results (immediately after all ampoules are broken)

Blister agent (square test spot):

⇒ Positive for H agent if purple or blue.

⇒ Positive for CX agent if red or purple.

⇒ Negative if colorless (if temperature is high it may be faint blue).

c. Blood Results (after ten minutes of exposure time)	Blood agent (round test spot): ⇒ Positive if pink or blue. ⇒ Negative if yellow, orange, tan, or colorless.
d. Nerve Results (wait about three minutes after exposure)	Nerve agent (star test spot): ⇒ Positive if colorless or peach. ⇒ Negative if blue.
MAIN POINT 5. UNUSUAL CONDITIONS	There are some special considerations based on weather conditions. The procedures vary when using the kit in cold weather as well as using the kit in a tropical climate.
a. Between 32° and 50° F	Extend the wait times for the test spot by six minutes when temperatures are between 32° and 50° degrees Fahrenheit or 0° and 10° degrees Celsius.
b. Below 32° F	Below 32 degree Fahrenheit (0°C) the reagent solution may freeze. You must thaw it prior to use.

c. Desert Conditions	Retain a small amount of reagent after crushing ampoule marked "3" in desert conditions, defined as high temperature and low humidity. Rewet the nerve agent test spot after five minutes by squeezing the remaining reagent from the ampoule "3" onto the nerve agent test spot.
d. Tropic Conditions	For tropic conditions, a faint blue color may appear in ABSENCE of blister agents H and HD. Otherwise, operation of the kit is the same as it is for usual conditions. When judging the results, special care must be taken with the Lewisite rub marks. Since changes in color may be vary slight, check the results with a second rub mark before making a decision.
e. Rain/Snow	Protect the sampler-detector from rain or snow as much as possible. Cover the detector with your body or use it under a roof or cover. You could also use the same can or box that you used to trap vapors.

MAIN POINT 6. INSPECTION AND SERVICEABILITY

The M256A1 kit should be inspected prior to use. Inspection basically includes looking for physical damage, broken ampoules, or cracked channels. Do not open the sealed protective bags for inspection until you are actually ready to use them.

Check discard date on protective bag. If discard date has passed, replace with another kit.

Before you operate the kit, follow all caution and warnings during Preventive Maintenance Checks and Services (PMCS) and during operations.

TRANSITION:

Now it's time to demonstrate what we have learned thus far.

INSTRUCTOR'S NOTE: Use T.O. 11H2-21-1 for specific procedures relating to operations and preventive maintenance checks.

CONCLUSION

SUMMARY: We have just covered the main points of the M256A1 Detection Kit including:

1. The purpose and capabilities
2. The theory of operations
3. Components
4. Operation and reading results
5. Unusual conditions dependent
6. Inspection and serviceability

REMOTIVATION: Determining the presence of chemical warfare agents is essential for knowing the type of protection necessary to survive.

CLOSURE: This completes this lesson on the M256A1 Chemical Agent Detector Kit.

TRANSITION: (Develop locally to transition to the next topic.)

PART III
EVALUATION

STUDENT PERFORMANCE STANDARDS

1. Inspect and determine serviceability of the M256A1 detector kit.

2. Operate a M256A1 detector kit using operational instructions. (Use an M256A1 training kit to perform this step).

3. Properly report test results from an M256A1 detector kit.

TEST ITEMS

---

1. LESSON OBJECTIVE: State the purpose and detection/identification capabilities of the M256A1 Detector Kit.

QUESTION: (TRUE or FALSE)

The purpose of the M256A1 Detector Kit is to provide a method to detect nerve, blister, choking, and blood agents in liquid and vapor form.

a. True
b. False

Key: b

REFERENCE: Main Point 1

---

2. LESSON OBJECTIVE: Explain the theory of operation for using the M256A1 Detector Kit.

QUESTION: (MULTIPLE CHOICE)

Which of the following is **NOT** a consideration when using the M256A1 Detector Kit?

a. Re-test for blood agents if the first result is positive.
b. Pass the positive and negative results to the joint information center.
c. Assume the appropriate MOPP level when using the M256A1 Detector Kit.
d. Concentrate the suspected chemical agents by covering a liquid area with a box or can.

Key: b

REFERENCE: Main Point 2

3. LESSON OBJECTIVE: Identify the components of the M256A1 Detector Kit.

QUESTION: (MULTIPLE CHOICE)

Which of the following are considered components of the M256A1 Detector Kit?

a. Carrying case, sampler-detectors, M8 paper, and instruction cards.
b. Carrying case, sampler-detectors, and instruction cards.
c. Sampler-detectors, M8 paper, M9 tape, and checklist.
d. M8 paper, M9 tape, carrying case, and checklist.

Key: a

REFERENCE: Main Point 3

---

4. LESSON OBJECTIVE: Explain operational limitations of the M256A1 Detector Kit.

QUESTION: (MULTIPLE CHOICE)

Retain a small amount of reagent in order to rewet the nerve agent test spot during

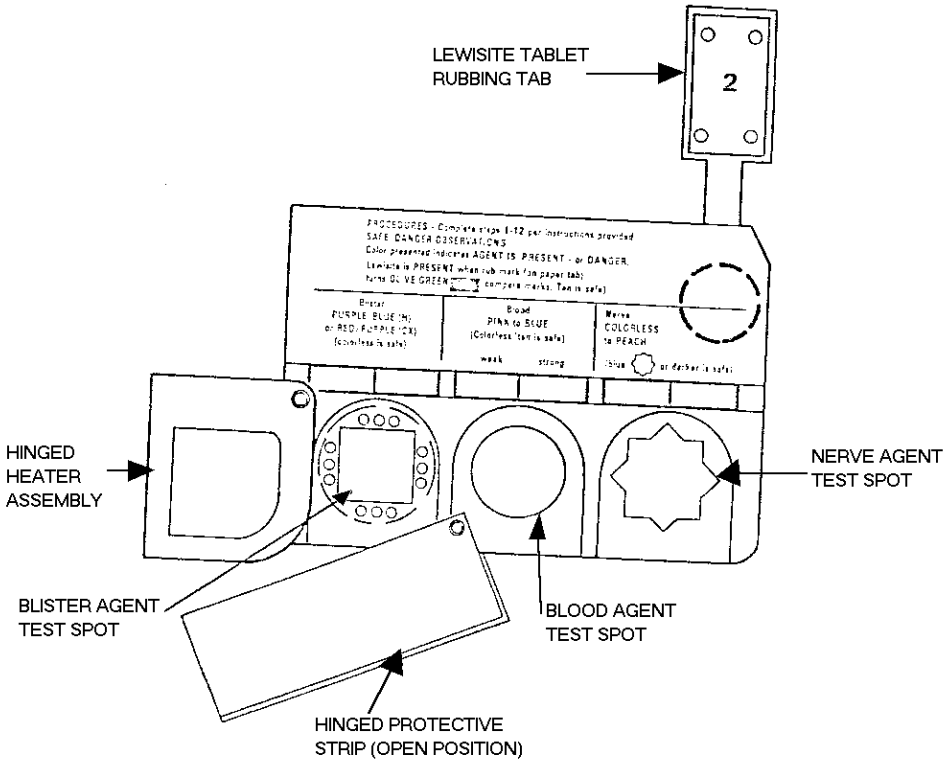
a. Desert Conditions
b. Tropical Conditions
c. Temperatures below 32° F.
d. Temperatures between 32° and 50° F.

Key: a

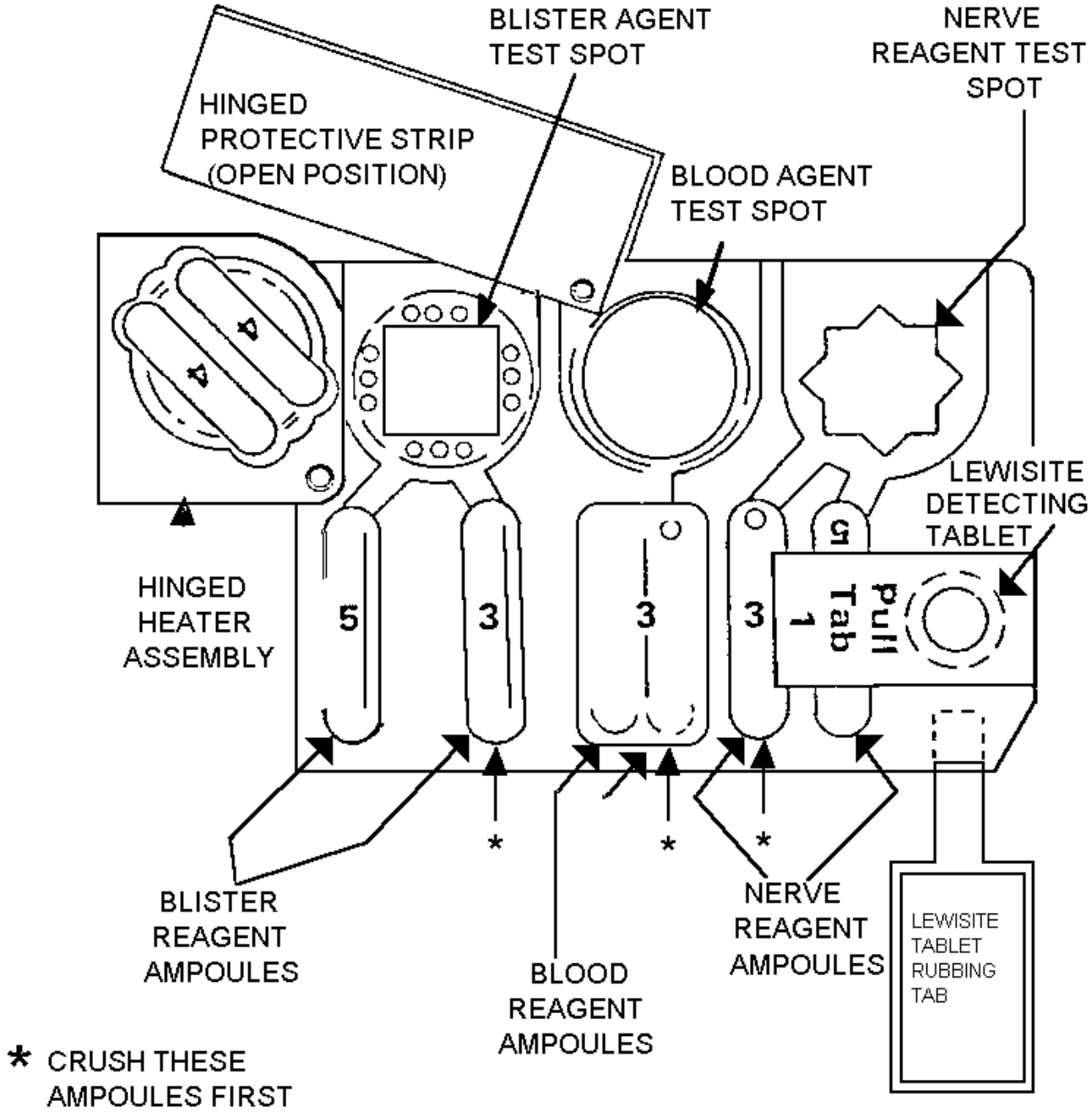
REFERENCE: Main Point 5

PART IV
RELATED MATERIALS

Attachment 1. Illustration of sampler-detector, front view.
Attachment 2. Illustration of sampler-detector, back view.
RTP F1 M8 and M9 Paper



M256A1 CHEMICAL DETECTION KIT
(FRONT VIEW)



M256A1 CHEMICAL DETECTION KIT (BACK VIEW)

ATTACHMENT 2

TRAINING PACKAGE COMMENT REPORT

RTP # _____ RTP DATE _____

To get an *immediate response* to your questions concerning subject matter in this Readiness Training Package (RTP), call the author (listed on the front cover) or the Contingency Training Section at DSN 523-6458 between 0700-1600 (CT), Monday through Friday. Otherwise, write, fax, or E-mail the author to make comments, suggestions or point out technical errors in the area of: References, Body Information, Performance Standards, Test Questions, and Attachments.

NOTE: Do not use the Suggestion Program to submit corrections for printing or typographical errors.

Comments:_____

_____

_____

_____

_____

AFCESA/CEX FAX #: DSN 523-6383
Internet: childsr@afcesa.af.mil

----------FOLD HERE----------

OFFICIAL BUSINESS

HQ AFCESA/CEXR
ATTN: TSGT CHILDS
139 BARNES DR. SUITE 1
TYNDALL AFB, FL 32403-5319