APD 2000 Training

Introduction
Operation
Maintenance

Kevin Good
Smiths Detection

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Introduction to the APD2000®

- Portable hand-held chemical agent monitor with gamma radiation detection capabilities
- Introduced in 1998
- Over 4000 on the streets
- Designed for First Response community

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APD2000® Specifications

Agents Detected:

GA, GB, GD, VX, HD, HN, Lewisite (L), Pepper Spray, Mace

Sensitivity	Response Time
V – 4 ppb	30 seconds
G – 15 ppb	30 seconds
H – 300 ppb	15 seconds
L – 200 ppb	15 seconds

For high concentrations of these agents, detection time is 10 seconds

Temperature:

Operation-22° to 126°F
Storage: -80° to 160°F

Weight

6 pounds (<3 kg) including batteries

Size:

4" x 3 ½" x 11" (10 x 9 x 28 cm) (Excluding handle)

Power

6 standard or rechargeable "C" batteries,

Self test:

BIT for electronic, pneumatic, and power conditions

Operator Service:

5 minutes per 24 hours of operation

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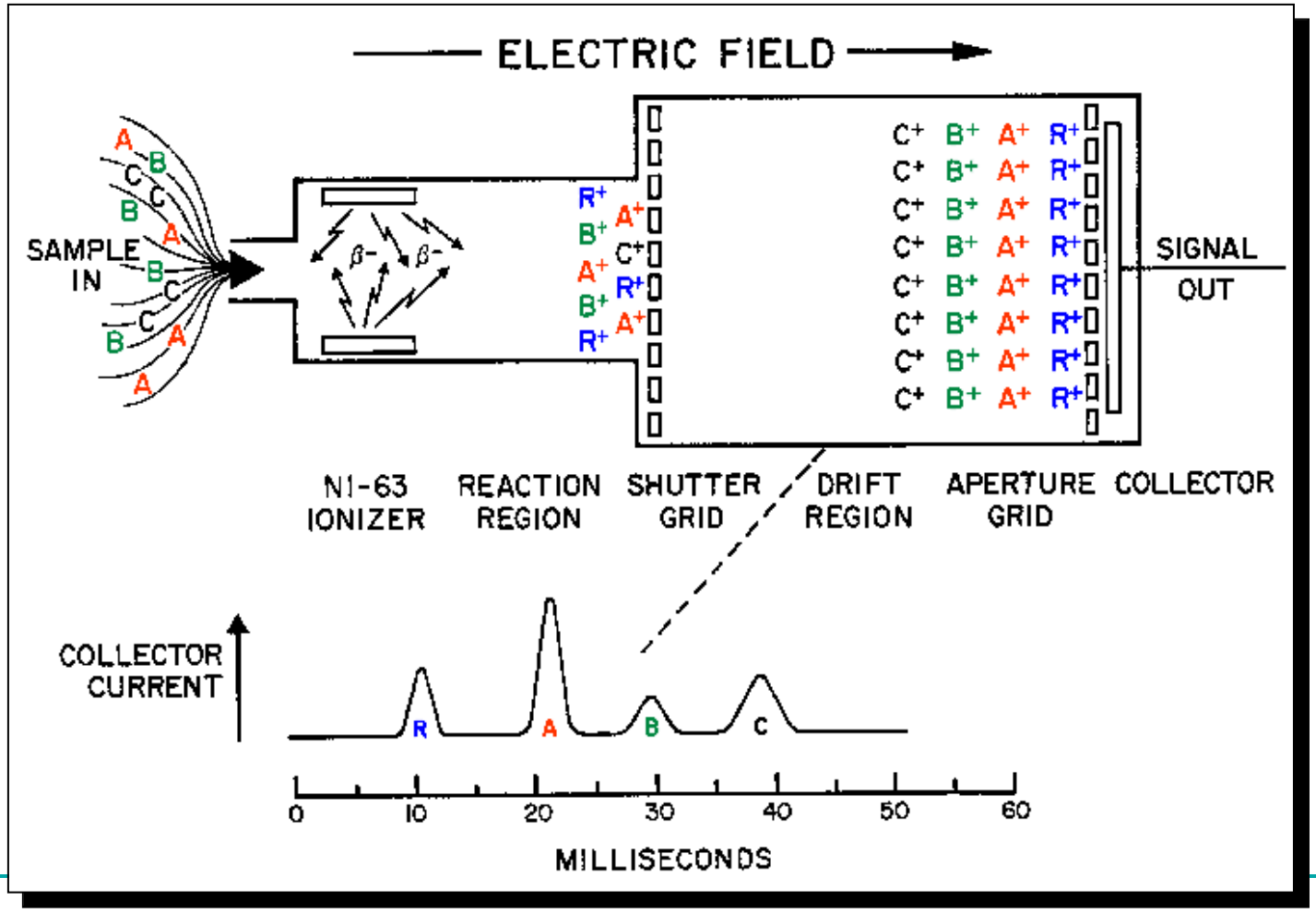
Principles of Operation



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Operating the APD2000 ®

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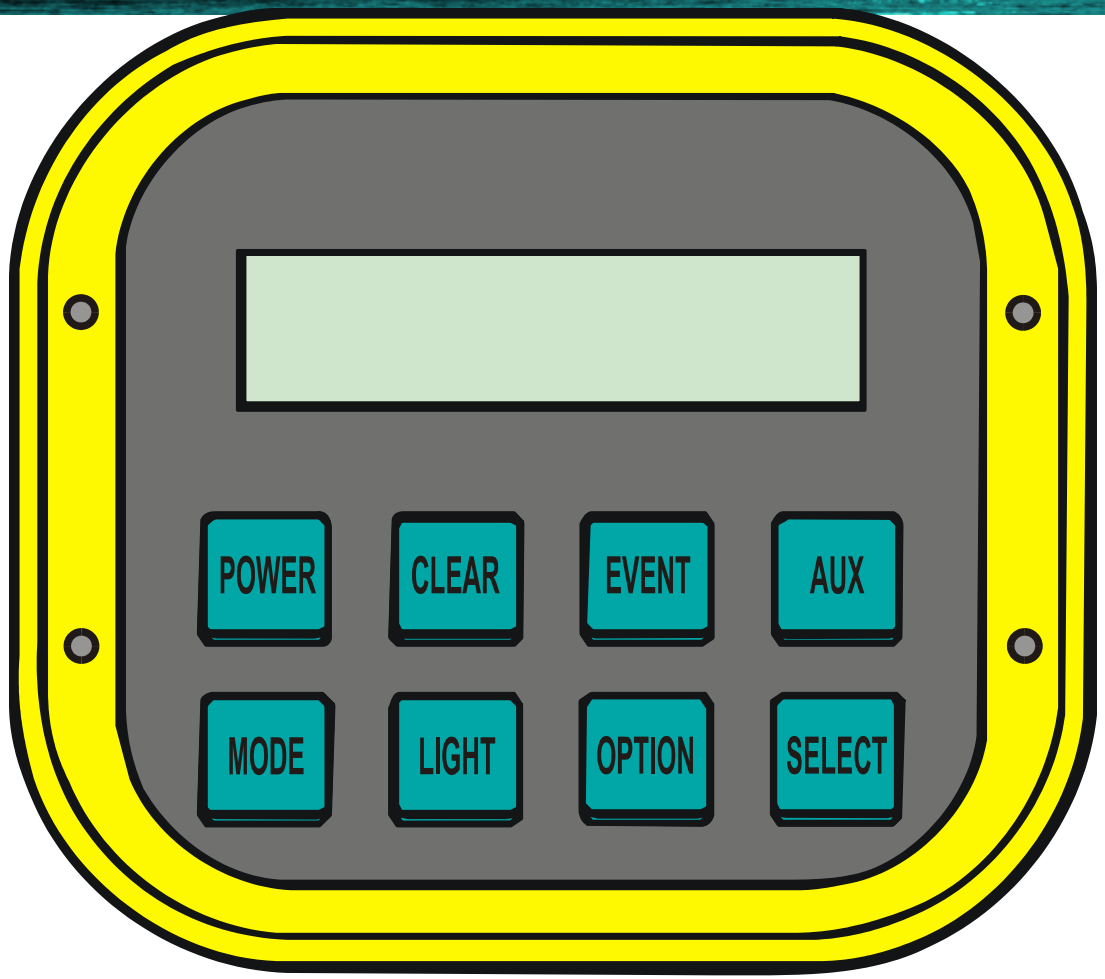
APD2000 Keypad ®



POWER - Turns unit on/off

CLEAR - Activates back flush manually

MODE - Switches agent mode between CW, CWVX, IRRT, and TEST

LIGHT - Toggles display backlight on/off

EVENT - Enables data logging

AUX - Enables auxiliary capabilities

OPTION - Activates menus and cycles through options

SELECT - Silences horn during alarm. When menus are activated, selects currently displayed option

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General Use

- Point Detector
- Measures what is at the nozzle
- Only samples vapors
- Low ppb ranges
- Startup and clear down
- Fresh batteries
- Fresh filter standoff nozzle

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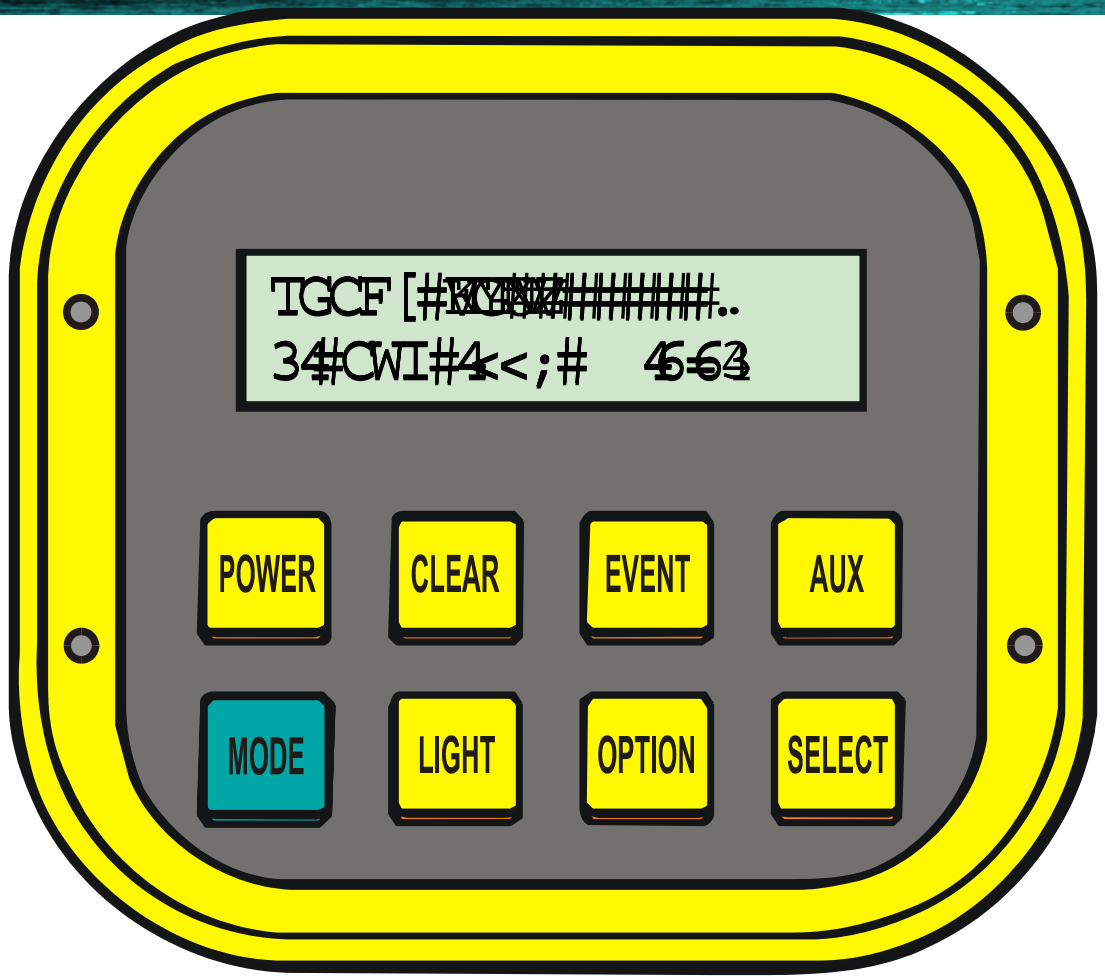
Changing Agent Modes



Press MODE key to change agents

- CW (chemical warfare)
- CWVX (agent VX)
- IRRT (irritant)
- Test

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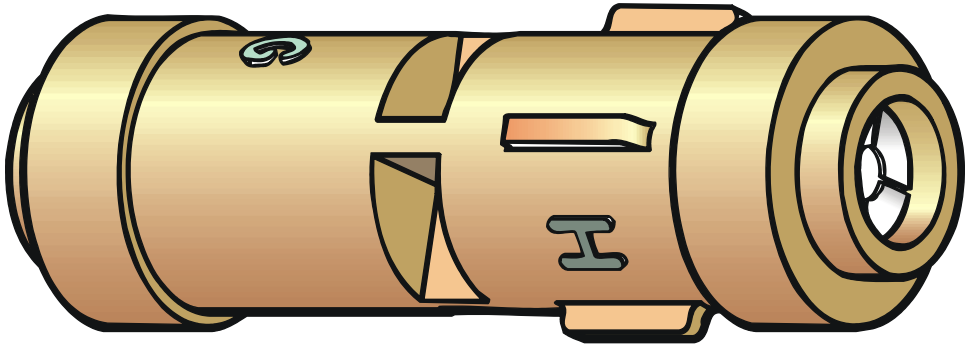
Confidence Sample

- G simulant tests for nerve agents
- H simulant tests for blister agents
- If you can smell the vapors, it is OK
- Small amount needed to alarm- usually less than one second exposure



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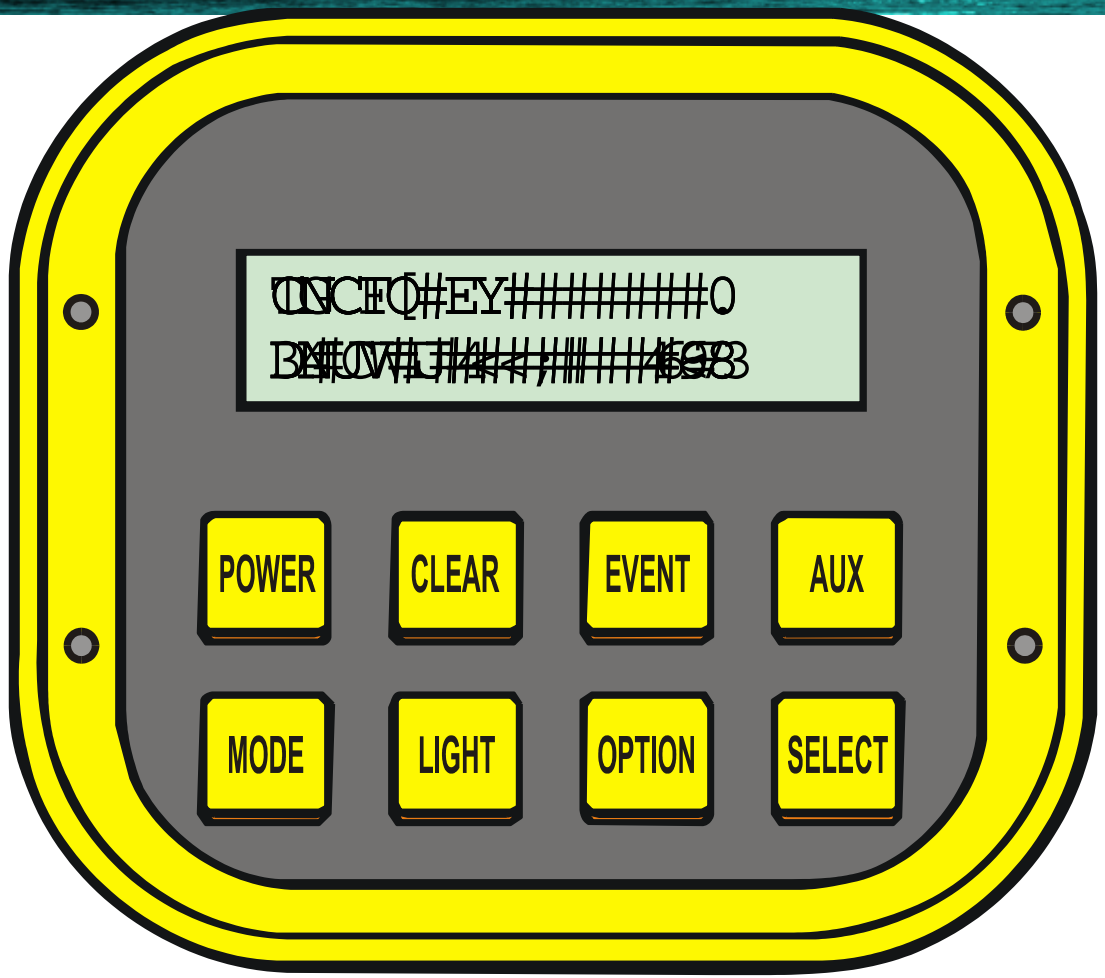
Relative Concentration



76 - 100 High

51 - 75 Medium

25 - 50 Low

0 - 25 Below alarm threshold

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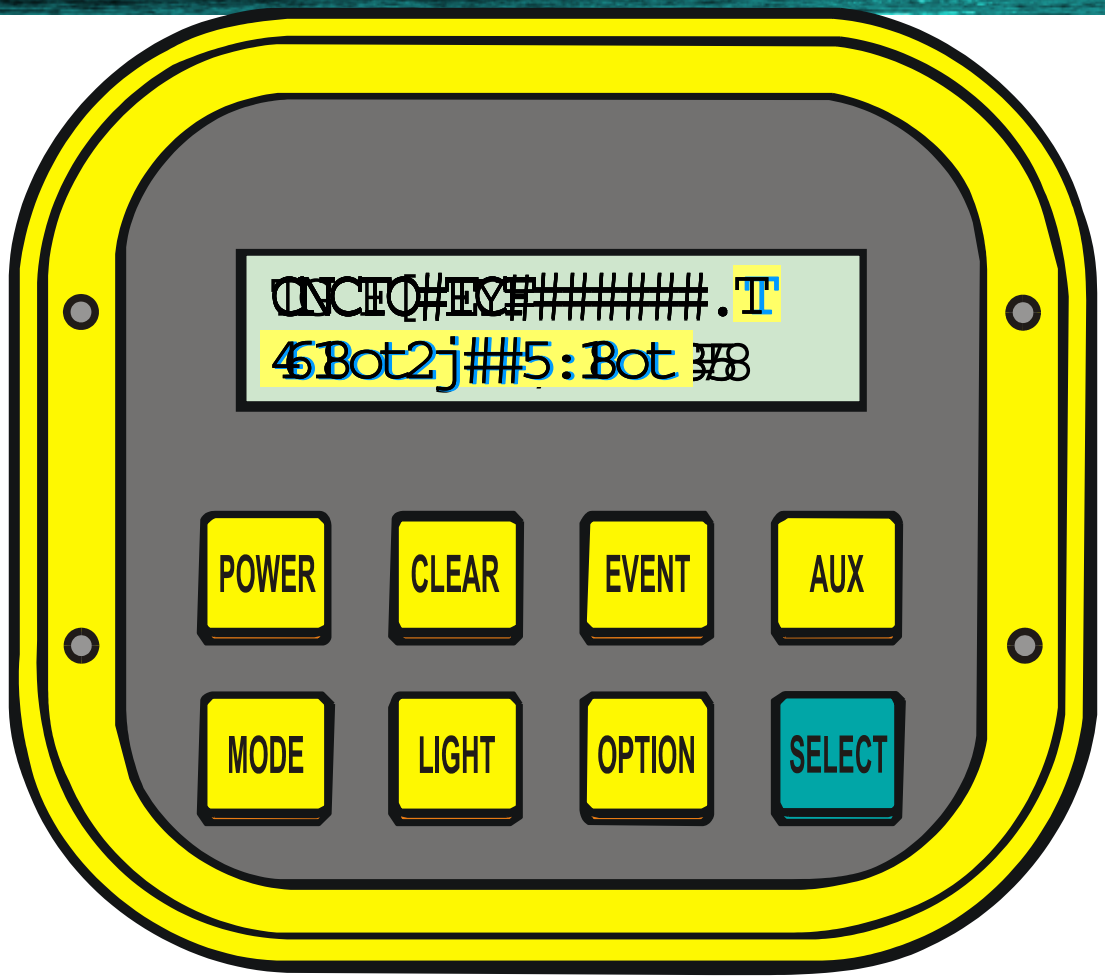
Gamma Radiation Detection



Ready state

Alarm state

Silence alarm by pressing SELECT key

Radiation level

Cycle between CW and Rad alarms

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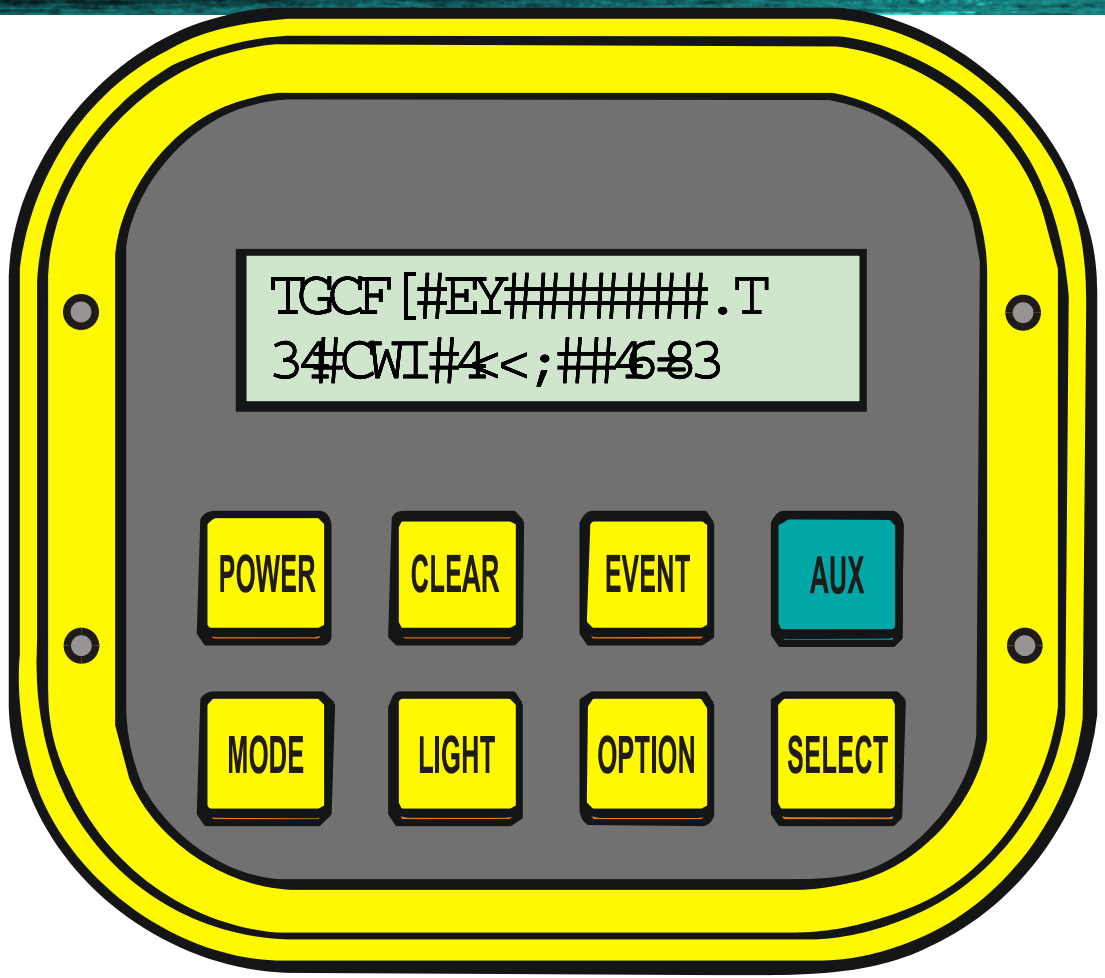
Radiation Detection (Continued)



AUX key toggles RAD capability on and off

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Shutdown

Radiation Detection

- Gamma only
- Need a check source to test
- Cesium 137 at about 10 Millicuries
- Gives response in about 20 seconds at direct contact with case

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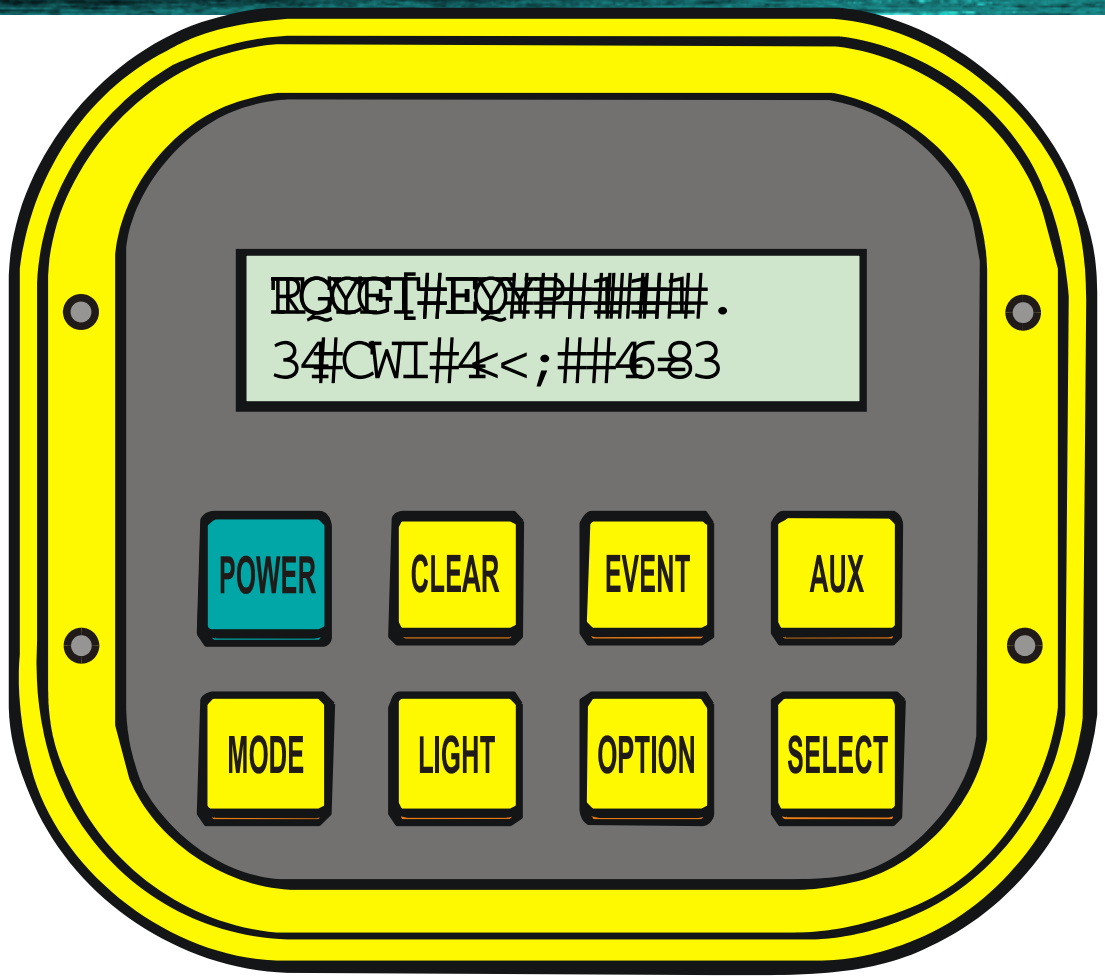
Shutdown (Continued)



Press POWER key to shut down

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Operational Issues

- Auto Cal
- Low Power
- Low Flow
- Alarms Immediately after going Ready
- Slow response to simulant
- No response to G simulant
- No response to H simulant

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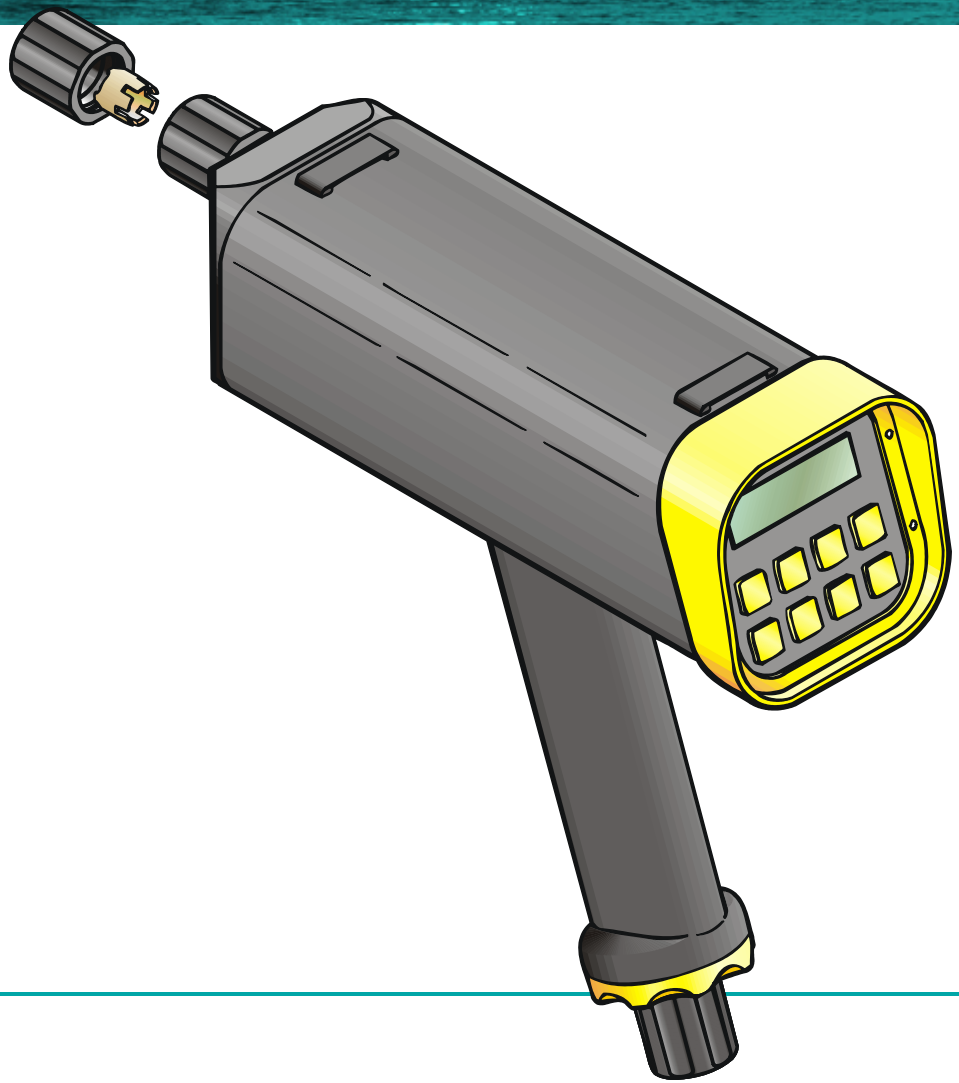
Shutdown (Continued)



Remove filter

Replace nozzle cap

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Decontamination

- Water
- Soap and Water
- Bleach and Water
- Use Soft Brush

- All caps must be tight
- Do not dunk the unit- low pressure water flow OK
- Dry the unit, check for agent
- If OK- proceed with Shutdown

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Frequently Asked Questions

- Does agent need to pure to detect it?
  - Doesn't matter is it is 100% pure agent or 1%, as long as there is sufficient agent to generate the minimum detectable limits of the instrument (low ppb)
- False Alarms
  - All units WILL false alarm to something (like the simulants)
  - Real false alarms versus forced alarms
  - APD tested at Secret Service with 180 interferents from White House
  - Less than 10 % false alarmed the unit
  - Floor wax, furniture polish are issues and have the same components as simulant

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FAQ's

- How far from the source will it detect?
  - Detects concentrations at the nozzle, not across the room
  - Low ppb detection levels provide early warning
- Service and Calibration (APD)
  - No calibration
  - Factory service every 12 months
  - Cost $315 for sieve, filter replacement
  - Wipe test every 6 months
- Do I need a radiation license?
  - No, they are covered by a general license. Users only need to do a wipe test twice per year and keep records.
  - Exceptions
    - DoD
    - NYC

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FAQs

- How does the alarm display relate to concentrations of agent?

APD2000 Display Readout vs. Agent Concentration

The following figures for the APD2000 are approximate, and should be used for guidance only. The data represents results from laboratory tests using pure agents under controlled conditions. Please be aware that the true concentration of agents varies in accordance with the purity of agent, temperature, humidity, and other environmental conditions.

APD2000 Display	Nerve G. Agent (ppb)	Nerve V Agent (ppb)	Blister H/L Agent (ppb)
26	15	4	15
30	25	15	25
40	50	25	50
50	75	50	100
60	100	75	150
70	150	100	200
80	200	200	300
90	300	300	500
100	500	500	700

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FAQs

- What Pepper Sprays can we detect?

Known pepper sprays that will alarm		
Type		Manufacturer
Pepper type I	Peppergard 10% 5.5% Peppermace MK-IVB Pepper Foam Triple Action Pepper/Tear Gas Fox Serious Business MK-4 Wildfire 15%	MSI MSI MSI MSI Fox Defense Tech Little Guy
Pepper type II	911 Self Defense Pepper Bloc Sabre M-120 Police	Guardian DMA Security Equip
Pepper type III	Fox Five point Three Security Plus Pepper Shot 10% Guardian Magnum 15%	Fox Security Plus Pepper Shot Filipo
Mace	Mace CN Mace CS	
Known pepper sprays that will **NOT** alarm:		
	Punch II M3 Body Guard LE-10 Alaska's Best Defense Chem Armor Defense	Aerko Guardian Security Equip Chem Armor

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FAQs

- Why is it so hard to detect pepper spray?
  - The pepper sprays all are heavy with generally oily components that settle out as solids very quickly.

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Urban Myths

- The APD false alarms too much
- We must start the unit every week
- The APD doesn’t work in humid environments
- The APD is just like the CAM
- We cannot detect any pepper spray
- Never needs service
- No training needed
- The Yahoo Haz Mat chat group is the best source for APD2000 information

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Points to Remember

- When ***not*** in use keep all caps on tight
- When ***in*** use make sure a filtered standoff nozzle is in place
- Use ***fresh*** batteries
- ***Run*** the unit about once a month to assure readiness
- Give the unit ***time*** to alarm and clear down
- Don't declare a ***False Alarm*** based on head space sampling
- If something doesn't look right, ***call*** us.

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Customer Service

410 510 9141

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Used By The Best!
(and he ain't looking for speeders)

- **See how easy this is to use?**
- **We bought this one to check the Clinton bedroom for bad stuff.**
- **I heard Saddam was found by using this APD2000- alarmed on his significant body odor.**
- **If we had one of these in '73 I would have attended more Alabama Air National Guard meetings.**

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Questions?

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