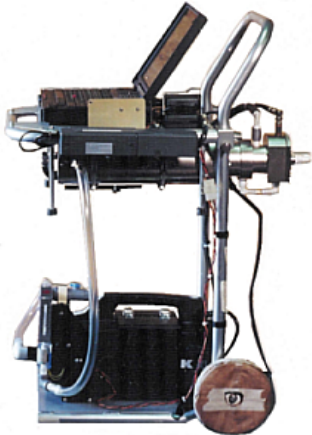
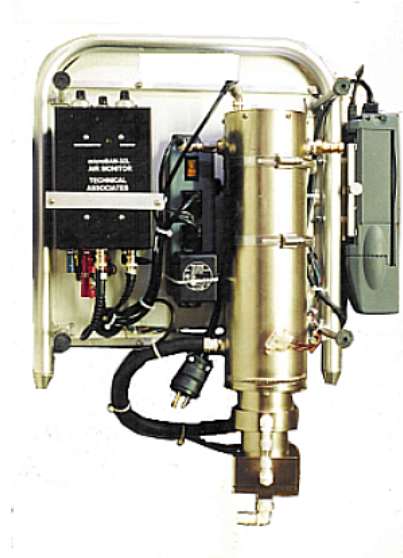


# PORTABLE AIR MONITOR

Model # MicroBAM-3ZL



MicroBAM-3ZL on Cart Mount.



MicroBAM-3ZL Hand Carry.

**TA** **TECHNICAL ASSOCIATES**  
7051 ETON AVENUE \* CANOGA PARK, CA 91303 TELEPHONE (818) 883-7043 \* FAX(818) 883-6103

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# PORTABLE AIR MONITOR

Model # MicroBAM-3ZL

- TOTAL SYSTEM WEIGHT ONLY 11 KG PLUS DETACHABLE CART AND PRINTER
- HIGH SENSITIVITY TO  $10^{-13}$   $\mu\text{Ci/cc}$
- SIMULTANEOUSLY MEASURES AND DISPLAYS 3 CHANNELS
- 600 Mhz PORTABLE PC (INCLUDED)
- REAL TIME ALARMS BASED ON CONCENTRATION NOT JUST ACCUMULATION
- READS DIRECTLY IN  $\mu\text{Ci/cc}$  AS WELL AS TOTAL DOSE (DAC or any units)
- ALL CALCULATIONS DONE AUTOMATICALLY
- PRINTS OUT GRAPHS OF ALL 3 CHANNELS
- ALL DATA STORES ON FLOPPY DISK OR HARD DRIVE (CD WRITER **OPTIONAL**)
- DYNAMIC BACKGROUND SUBTRACT
- SAMPLING HEADS ARE SEPARABLE AND REMOVABLE
- MEETS REG. GUIDE 8.25 AND REVISED 10 CFR 20

```

DATA.TXT
-----
SAVING TO FLOPPY
Time of Start Shift: Thur Jan 01 5:00:00
Current Time is 11:02
Health Physicist on Duty: not named
Shift Length: 8.00
Engineering Units: Bq/l
Engineering multiplier conversion units:
Channel      Total Exposure up to now
1             107
2             194
3             370
    
```

```

1      I-125      0.035
2      not used  0.000
3      not used  0.000
4      In-111    0.245
5      Ga-67     0.300
6      Mo-99     0.739

Enter Channel to change name and energy
Enter 'c' to continue
    
```

```

Name  Conc.  Tot. Exposure  Alarm1  Alarm2  Alarm3
Units Bq/l
I-125  0      95             13:45  13:45  13:45
not used  0      0              13:45  13:45  13:45
not used  0      0              13:45  13:45  13:45
In-111  0     129            13:45  13:45  13:45
Ga-67   0     101            13:45  13:45  13:45
Mo-99   0      64             13:45  13:45  13:45
Neon    0     224            13:45  13:45  13:45

Health Physicist on Shift: not named
Space remaining on floppy 62.00%
Low Flow Alarm: 13:45
Current Gross Channel Level: 3 13:45 NOT OKAY
One Second Concentration Alarm: Okay
Inactive Alarm: Okay

1) Modify Next Shift Length 2) Change Filter 3) Configure Energies
4) Set Alarms 5) Start Shift 6) Save onto Floppy 7) Exit
    
```

**GENERAL DESCRIPTION:** The MicroBAM-3ZL series are three channel air monitors for **SIMULTANEOUS** measuring of gross Beta-Gamma PARTICULATES, and GASEOUS radioactivity, and IODINE, like all of the MicroBAM-3 series, these are continuous duty, high capacity, rugged, portable systems. Electronics are microprocessor with portable PC display. Detector heads are self contained allowing change or addition of function as needed and allowing rapid repair by substitution in the field. The system is covered by TA's unique module exchange warranty, in addition to the full one year warranty covering all TA products.

Both filter paper and charcoal cartridge are easily changed via TA's unique quick-change, no-leak, o-ring/gasket sealed filter holders. All plumbing connectors and openings are sealed against air leaks. The air moving system is based on a dependable pump, capable of delivering 1CFM, or **optional** 4CFM, through clean filter paper and cartridge. A bypass valve and flow meter allow the user to adjust air flow through filters from 0 to maximum range. The entire system is extremely light and transportable, and comes complete with all hoses, cabling and connectors in place, fully tested and ready to operate. A cart is included to allow easy movement. System is 115V single phase; 220V **optional**, 50/60 Hz.

**SPECIFICATIONS:**

**Channels:** Three

**Activity Detected:** Gross Beta-gamma particulate, Iodine, Noble Gas.

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# PORTABLE AIR MONITOR

Model # MicroBAM-3ZL

## SPECIFICATIONS (Continued):

DETECTORS	Model MicroBAM-3ZL (Standard)	Optional Alternative Detectors
<b>Particulate: Beta-Gamma</b>	2" dia. GM 2mg/cm <sup>2</sup> Model T-1190 47-55mm dia filter paper	2" dia. sealed proportional detector
<b>Iodine: Gamma</b>	2" dia. Scintillation NaI(Tl) 2" dia. charcoal cartridge	2" dia. BGO Detector spectroscopic grade material Optimized signal to background ratio
<b>Noble Gas: Beta-Gamma</b>	2" dia. GM 2mg/cm <sup>2</sup> 300 cc sample chamber	Solid State or 2" Beta scintillator 2" sealed Proportional Detector

**Detector Selection:** TA offers a choice of solid state, gas filled and scintillation detectors. 2" diameter sealed GM has same or greater beta sensitivity in all energy ranges as proportional or beta scintillation or Solid State detectors. Threshold is set as low as possible while still rejecting any preamp noise. To make sure that you get the detectors you want; when an air monitor purchase order is placed with TA, we send you an acknowledgment which restates which detectors you have chosen, and asks for your confirmation or correction.

## CART VS. HAND CARRY:

The MicroBAM-3ZL system comes complete, operational, and cart mounted for easy transport. The MicroBAM-3ZL can also be hand carried to hard to reach locations. For this, the printer and the cart can be left behind.

System sensitivity: Sensitivity and weights given below are based on one week of operation, average background of 0.5mR/hour. GM detectors for particulate and noble gas channels and NaI(Tl) detector for iodine. Substitution of other detectors may increase system weight. Pump is 1 CFM. Please add 6 kg. to substitute 4 CFM pump.

	MicroBAM-3ZL	MicroBAM-3ZPb
<b>Shielding, full four pi:</b>	none	1/2 lead (Pb)
<b>Particulate: Beta-Gamma</b>	6 x 10 <sup>-11</sup> μCi/cc.	2 x 10 <sup>-13</sup> μCi/cc.
<b>Iodine: Gamma</b>	6 x 10 <sup>-11</sup> μCi/cc.	2 x 10 <sup>-13</sup> μCi/cc.
<b>Noble Gas: Beta-Gamma</b>	9 x 10 <sup>-7</sup> μCi/cc.	1 x 10 <sup>-7</sup> μCi/cc.
<b>3 Channel Printer</b>	0.5 or 2.1 kg	2 kg
<b>System Weight, TOTAL (Approx.)</b>	16 kg	45 kg
<b>Hand Carry Weight (Approx.)</b>	11 kg	39 kg
	includes computer, pump, detectors	
	excludes printer and cart	

This Air Monitor is more sensitive on all channels by factors of 5 to 500 than what is required by the USNRC and other regulatory agencies.

<b>High Voltage:</b>	Separately variable for scintillation or proportional detector from 0 to 1,500V (or 2,500V).
<b>Readout Screen:</b>	Showing both real-time concentration and accumulated doses for all channels simultaneously.
<b>Accuracy:</b>	±10% except for resolution loss and statistical variation.
<b>Alarms:</b>	All alarms are easily set by user to any value within BAM range. Low Level Alarm: Automatic Reset. High Level Alarm: High level alarm remains activated until RESET button is pushed.



## TECHNICAL ASSOCIATES

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\$Revision: 1.1 \$

# PORTABLE AIR MONITOR

Model # MicroBAM-3ZL

## SPECIFICATIONS (Continued):

**Alarm Indication:** PC Screen displays all alarms.  
**Optional:** MAL-Z Alarm module has lights for each channel: Red-High level and Amber-Low Level. Audio: 1000Hz, greater than 80db and fail-safe and alarm relays for customer use. See below. .

## AIR MOVING SYSTEM

**Air Pump:** Extremely rugged continuous duty.  
**Pump Drive Motor:** Continuous duty.  
**Flow Gauge:** 0 to 120 liters/minute.  
**Bypass Valve:** Adjustable bypass valve allows rate to be set to  $\pm 0.1$  CFM with clean filters, for 0 to maximum CFM. (Automatic Air flow regulation **Optional**)  
**Inlet + Outlet:** 15 Foot inlet and outlet hoses provided. May be extended.

**AUTO CALIBRATION:** Instrument calibrates itself when user inserts standard sources.

## ELECTRONIC SYSTEM DESCRIPTION: (Micro-processor based)

Electronics is Pentium-based, high quality portable PC including:

Serial Port	Parallel Port	PCMCIA Ports
Windows XP (TM)	Excel Spread Sheet (TM)	Keyboard
CPU with Data Acquisition	High Resolution, COLOR display	Audio
Touch Pad Pointer	Manuals	

3.5" Floppy disk drive - for DATA STORAGE - 30 days per disk.

30 Gigabyte hard drive. Stores programs and 20 YEAR'S DATA. Room for new software functions in the future.

Specialized TA air monitor software.

Graphics printer for hard copy. 3trace graphs at the push of two buttons.

**Printer Options:** Standard computer printer - full size (2.1kg)  
Miniature on-board printer - very small (0.5kg)

**Outputs:** Alarm condition outputs:  
1. Logic Level Signal - From PC  
2. Contact closure or opening - From **Optional** MAL-Z alarm module.  
Modem: Fast 56K BPS or faster, V-90 (plus **Optional** data compression)

**Standard Installation:** 2 wheel cart mounted for transporting long distances, single hand portability.

**Hand Carry:** System can be easily hand carried without cart.

**Special Safety Features:** Loss of air flow and loss of signal alarms, all circuits fused.  
Thermal protection on motor.

**Accessories:** System is shipped with all necessary accessories included and tested with system including all cables, hoses and manuals.

**Dimensions:** Per attached drawings.

**Shipping Weight:** 35 kg.

**Consumables:** System is shipped with starter kit containing consumables including filter paper, charcoal cartridges, printer paper and ink/toner.

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# PORTABLE AIR MONITOR

Model # MicroBAM-3ZL

## SPECIFICATIONS (Continued):

**Extra Cost Options:** Air monitor available with alternate air movers. Broader range to 12 decades.  
 Different detector types. Different cart size.  
 Iso-Kinetic operation. MAL-Z alarm/relay module.  
 Ethernet and Modem are included, other interfaces for 4-20mA, RS-485, etc... are optional.  
 Calibrated Radiation Standards (Cs-137, Ba-133, etc...)

## COMPARISON OF CERTAIN FEATURES

Technical Associates BAM-3 was perhaps the first CAM to correct for build-up of activity on the filters and to directly readout airborne radiation concentration in  $\mu\text{Ci/cc}$  (or Bq/liter, etc...) thus allowing Real Time Alarms plus better system sensitivity and accuracy. Recent enhancements include: Lighter system weight, Quieter Pump, Faster Computer with Massive Data Storage.

	<b>TYPICAL: (Not Technical Assoc.)</b>	<b>TECHNICAL ASSOCIATES: MicroBAM-3ZL</b>
<b>Corrects for Activity Build Up on Filters and Reads Directly in Concentration:</b>	Some Do, Some Do Not	Yes
<b>Display:</b>	40 Characters	14" Color LCD Monitor
<b>Dependable:</b>	No	Yes
<b>Simultaneous Collection and Measurement of Particulate, Iodine and Noble Gas:</b>	No	Yes
<b>Number of <u>Simultaneous</u> Measurement Channels:</b>	1	3
<b>Micro-Processor Speed:</b>	Not Pentium	1 GHz Pentium
<b>Data Storage Capacity:</b> Bytes: Years:	0.05 megabytes. 83 days	30 gigabyte 20 Year Data
<b>Precision: Data Storage Intervals:</b>	Every Hour	Every 2 Minutes
<b>Removable Data Storage (floppy disk) Bytes:</b>	No	1.44 megabytes*/disk
<b>Optional CD - Writer:</b>	No	Yes - 540 megabytes*/disk.
<b>Noble Gas Sensitivity Lowest Level:</b>	$2.7 \times 10^{-7}$ OPTIONAL	$1.0 \times 10^{-7}$ INCLUDED
<b>Numerical and Graph Print-Out:</b>		
Any Day This Year:	No	Yes
Any Month This Year:	No	Yes
This Year to Date:	No	Yes
Daily Average or Total:	No	Yes
Monthly Average or Total:	No	Yes
Full Year Average or Total:	No	Yes
<b>Choice of Pumps:</b>	No	Yes
<b>Quiet Pump Available:</b>	No	Yes 30 LPM (Almost no Sound)
<b>Ethernet Supplied (Standard):</b>	No	Yes
<b>Modem:</b>	No	Yes
<b>System Weight (Total):</b>	20 kg Typical	16 kg
<b>(Hand Carry):</b>	20 kg Typical	11 kg
<b>Wheels:</b>	2" dia	5 dia. Steel with Rubber Rims



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## ADDITIONAL INFORMATION ON OPTIONS AND CHOICES FOR TA's MicroBAM-3ZL:

### PUMPS:

MODEL #	VOLTAGE	FREE AIR	IN USE	WEIGHT	SOUND LEVEL
AP-1-115	115V 50/60Hz	1.3 CFM	1 CFM	1.6 kg	total quiet
AP-4-115	115V 50/60Hz	5.6 CFM	4 CFM	8 kg	regular
AP-1-220	220V 50/60Hz	1.3 CFM	1 CFM	1.6 kg	total quiet
AP-4-220	220V 50/60Hz	5.6 CFM	4 CFM	8 kg	regular

### PRINTERS:

MODEL #	WEIGHT	SUGGESTED USE
PR-PZ	0.5 kg	Can mount on cart for portable use.
PR-FL	2.1 kg	Use for printing graphs and data back at RSO Office.

### PORTABLE COMPUTER (LAP-TOP):

MODEL #	DESCRIPTION
PC-IBM	IBM THINK PAD™.
PC-WPRF	Water-Proof PC for worry proof decontamination or cleaning.

(Unit is available with alternative Detectors for different isotope detection. Please Call Technical Associates with your Specific Needs.)

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