0,0
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0,0
0,25004
0,29584
0,32776
0,32305
0,30953
0,31352
0,31394
0,32050
0,31246
0,29976
0,29298
0,29502
0,29955
0,29914
0,29114
0,28001
0,28122
0,28142
0,28464
0,27821
0,26868
0,25890
0,23980
0,23513
0,14228
0,0

sec.	lpm	1	2	3	4	5	6	7	ave.	s.d.
1.0 liter										
8	7.5									
6	10									
4	15									
3	20									
2	30									
1.5 liters										
11	8.2									
8	11.25									
6	15									
4	22.5									
3	30									
2.0 liters										
16	7.5									
12	10									
8	15									
6	20									
5	24									
4	30									

2.5 liters		
	16	8.3
	14	10.7
	10	15
	7	21.4
	6	25
	5	30
3.0 liters		
	22	8.2
	15	10.55
	12	15
	9	20
	7	25.7
	6	30
3.5 liters		
	21	10
	14	15
	11	19.1
	8	26.5
	7	30

Operator	Date	Voume	DMT Result		3306		
ALB	10/17/2007	1.1	DNAS		1.1	DNAS	
		1.2	DNAS		1.2	DNAS	
		1.3	DNAS		1.3	DNAS	
		1.4	DNAS		1.4	DNAS	
		1.5	DNAS		1.5	1.5	0
		1.5	DNAS		1.6	1.6	0
		1.6	DNAS		1.7	1.7	0
		1.7	DNAS		1.8	1.6	-0.2
		1.8	DNAS		1.9	1.6	-0.3
		1.9	DNAS		1.1	DNAS	
		2	DNAS		1.2	1.5	0.3
		2	DNAS		1.3	1.6	0.3
ALB	10/18/2007	1.1	DNAS		1.4	1.6	0.2
		1.2	DNAS		1.5	1.8	0.3
		1.3	DNAS		1.6	2	0.4
		1.4	DNAS		1.7	1.9	0.2
		1.5	DNAS		1.8	2	0.2
		1.6	DNAS		1.9	2.2	0.3
		1.6	DNAS		2	2.2	0.2
		1.7	DNAS		1.1	DNAS	
		1.7	DNAS		1.2	DNAS	
		1.8	DNAS		1.3	1.5	0.2
		1.8	DNAS		1.4	1.5	0.1
		1.8	DNAS		1.5	1.8	0.3
		1.9	DNAS		1.6	1.7	0.1
		2	DNAS		1.7	1.8	0.1
		2	DNAS		1.8	2	0.2
		2	DNAS		1.9	2.1	0.2
ALB	10/18/2007	1.1	DNAS		2	2.1	0.1
		1.2	DNAS		1.1	DNAS	
		1.3	DNAS		1.2	1.5	0.3
		1.4	DNAS		1.3	1.6	0.3
		1.5	DNAS		1.4	1.6	0.2
		1.5	DNAS		1.5	1.8	0.3
		1.6	1.6	0	1.6	2	0.4
		1.5	1.6	0.1	1.7	1.9	0.2
		1.7	1.6	-0.1	1.8	2.1	0.3
		1.8	1.7	-0.1	1.9	2.1	0.2
		DROP	1.6		2	2.3	0.3
RJD	10/23/2007	1.1	DNAS				
		1.2	DNAS			ave. diff.	0.2
		1.3	DNAS				
		1.4	DNAS				
		1.5	1.5	0			
		1.6	1.6	0			
		1.7	1.6	-0.1			
		1.8	1.9	0.1			
		1.9	2	0.1			
		2	2	0			
		1.5	1.5	0			
		1.45	1.5	0.05			
				0.05			

Operator	Date	Volume	DMT Result		3006		
ALB	10/17/2007	1.1	DNAS	#VALUE!			
		1.2	DNAS	#VALUE!			
		1.3	DNAS	#VALUE!			
		1.4	DNAS	#VALUE!			
		1.5	DNAS	#VALUE!			
		1.5	DNAS	#VALUE!			
		1.6	DNAS	#VALUE!			
		1.7	DNAS	#VALUE!			
		1.8	DNAS	#VALUE!			
		1.9	DNAS	#VALUE!			
		2	DNAS	#VALUE!			
		2	DNAS	#VALUE!			
ALB	10/18/2007	1.1	DNAS	#VALUE!			
		1.2	DNAS	#VALUE!			
		1.3	DNAS	#VALUE!			
		1.4	DNAS	#VALUE!			
		1.5	DNAS	#VALUE!			
		1.6	DNAS	#VALUE!			
		1.6	DNAS	#VALUE!			
		1.7	DNAS	#VALUE!			
		1.7	DNAS	#VALUE!			
		1.8	DNAS	#VALUE!			
		1.8	DNAS	#VALUE!			
		1.8	DNAS	#VALUE!			
		1.9	DNAS	#VALUE!			
		2	DNAS	#VALUE!			
		2	DNAS	#VALUE!			
		2	DNAS	#VALUE!			
ALB	10/18/2007	1.1	DNAS	#VALUE!			
		1.2	DNAS	#VALUE!			
		1.3	DNAS	#VALUE!			
		1.4	DNAS	#VALUE!			
		1.5	DNAS	#VALUE!			
		1.5	DNAS	#VALUE!			
		1.6	1.6	0			
		1.5	1.6	0.1			
		1.7	1.6	-0.1			
		1.8	1.7	-0.1			
		DROP	1.6	#VALUE!			
RJD	10/23/2007	1.1	DNAS	#VALUE!			
		1.2	DNAS	#VALUE!			
		1.3	DNAS	#VALUE!			
		1.4	DNAS	#VALUE!			
		1.5	1.5	0			
		1.6	1.6	0			
		1.7	1.6	-0.1			
		1.8	1.9	0.1			
		1.9	2	0.1			
		2	2	0			
		1.5	1.5	0			
		1.45	1.5	0.05			

Operator	Date	Volume	DMT Result	3406	
ALB	10/17/2007	1.1	DNAS		
		1.2	DNAS		
		1.3	DNAS		
		1.4	DNAS		
		1.5	DNAS		
		1.5	DNAS		
		1.6	DNAS		
		1.7	1.7	0	
		1.8	1.7	-0.1	
		1.9	1.7	-0.2	
		2	1.7	-0.3	
RJD	10/24/2007	1.1	DNAS		
		1.2	DNAS		
		1.3	DNAS		
		1.4	1.5	0.1	
		1.5	1.6	0.1	
		1.6	1.7	0.1	
		1.7	1.7	0	
		1.8	2	0.2	
		1.9	1.7	-0.2	
		2	1.9	-0.1	
					-0.03636

National Patent
Analytical Systems, Inc.

Mr. Robert Drawbaugh
Vermont Dept of Health
Box 70
Burlington, Vt. 05402-0700

July 27, 2009

Via Email

Dear Mr. Drawbaugh:

Regarding your request for pricing on 12 to 15 additional DMT Instruments I am pleased to quote you as follows:

Our part no. 71700VT, DataMaster DMT Vermont Configuration $6,690.00 each.

This configuration currently includes a Laser Printer, One reconditioned and tested Guth 34CNP Simulator and software as approved and in effect on the date of shipment. All performance and maintenance specifications are to our standard testing protocol. Fob Vermont Department of Health.

The price is slightly higher than my email of March owing to the quantity being a maximum of 15 pcs. rather than our original discussion based on 24 pcs.

I will need to expedite this since you indicated you would require shipment by the middle of September, so the sooner I know, the more realistic the shipping date becomes.

Thanks for your consideration and if I can be of further help, please let me know.

Sincerely,

John Fusco,
President

2090 Harrington Memorial Road, Mansfield, Ohio 44901 Ph 419-526-6727 Fax 419-526-9446
jd@NPAS.com

Vermont Department of Health Laboratory
Toxicology Program
Memorandum

To: Mary Celotti, Laboratory Director
Bill Apao, Director, Health Surveillance

CC: Steven Smith, State Purchasing Agent, Dept. of BGS

From: Robert Drawbaugh, Toxicology Program Chief

Date: April 14, 2011

Re : DataMaster DMT Purchase

This is a request for a sole-source purchase of DataMaster DMT breath alcohol teting instruments. These instruments are replacement for the obsolete BAC DataMaster instruments now in use in several law enforcement agencies throughout the state. DataMaster is the only instrument approved by the state for evidential breath testing in support of prosecution of dui – alcohol cases . The instruments specified in this requisition are for the completion of the DataMaster replacement program begun in 2008. They are the same model as the instruments being successfully used in Franklin, Grand Isle, Chittenden, Washington and Windham counties. National Patent Analytical Systems is the manufacturer and only source for these instruments. It is to the State's advantage to continue purchase of this model from this manufacturer from the Department of Health, law enforcement agency and State's Attorneys' points of view. Funding for this purchase is provided through grants by the National Highway Traffic Safety Administration through the Governor's Highway Safety Program. In order to be able to receive, test the units and train law enforcement officers within the grant time frame it is necessary to have the purchase order in the hands of the vendor by mid-February. Thank you in advance for everyone's attention to this important purchase.

Vermont Department of Health Laboratory
Toxicology Program
Memorandum

To: Mary Celotti, Laboratory Director
Bill Apao, Director, Health Surveillance

From: Robert Drawbaugh, Toxicology Program Chief

Date: April 14, 2011

Re : DataMaster DMT Purchase

This is a request for a sole-source purchase of DataMaster DMT breath alcohol teting instruments. These instruments are replacement for the obsolete BAC DataMaster instruments now in use in several law enforcement agencies throughout the state. DataMaster is the only instrument approved by the state for evidential breath testing in support of dui – alcohol prosecution. The instruments specified in this requisition are for the expansion of the replacement program and will match the model being used in Franklin, Grand isle and Chittenden counties. National Patent Analytical Systems is the manufacturer and only source for these instruments. It is to the State's advantage to continue purchase of this model from this manufacturer from the Department of Health, law enforcement agency and State's Attorneys points of view. Funding for this purchase is provided by the National Highway Traffic Safety Administration through the Governor's Highway Safety Program. Due to the funding source this order must be in the hands of the manufacturer by Aug 15 and the purchase paid by September 30. Thanks in advance for everyone's attention to this important purchase.

Memorandum

TO: Steve Smith, Purchasing Agent, BGS Financial Operations Division

FROM: Mary Celotti, VDH Laboratory Director

DATE: August 24, 2009

RE: Request for Waiver of Proof of Product Liability Insurance for Purchase of Additional National Patent Analytical Systems (NPAS) DataMaster Instruments

This is a request for a waiver of the Proof of Product Liability Insurance coverage for the purchase of additional National Patent Analytical Systems (NPAS) DataMaster alcohol breath testing instruments. These instruments are replacement for obsolete NPAS DataMaster breath alcohol concentration testing instruments currently in use in several law enforcement agencies throughout the state. DataMaster instruments are the only instrument approved by the State for evidential breath testing in support of DUI-Alcohol prosecution, and National Patent Analytical Systems is the only manufacturer and only source for these instruments. The instruments being purchased are identical to the instruments recently replaced in Franklin, Grand Isle and Chittenden counties, and it is advantageous to the State (i.e. Vermont Department of Health, law enforcement and State's Attorneys) in terms of resources and time needed to validate the instruments, distribute validation data and other documentation, learn maintenance and repair, train numerous (> 400) law enforcement and state's attorney staff, and prepare for legal DUI proceedings to purchase this same make and model of instrument. Funding for this purchase is provided through a federal grant and the Department of Public Safety's Governor's Highway Safety Program. Due to funding deadlines of September 30, 2009, it is imperative that this order be expedited, so that the vendor can provide the instruments and the purchase be paid by this date. Otherwise, we are risking the loss of $125,000 of federal funding that has been specifically identified for this purchase. Thank you for your assistance.

- Three IR Filters @ 3.44μ, 3.37μ, and 3.50μ
- Internal Quartz standard
- Solid (not flexible) keyboard
- Ethernet connectivity
- Modem connectivity
- (4) USB ports
- RS-232 port
- Breath tube (heated with RFI antenna)
- Touch screen
- Software – Windows CE5.+ current Vermont revision
- HP Inkjet color printer (equivalent to units previously supplied, HP 5940)
- Refurbished Guth 34C-NP type simulators
    - Please ensure that the simulators will properly align with the simulator tower. To accomplish this, the openings on the tower for the breath and BNC connectors must be fully adjustable. This can be done by either making ovals for all three openings, or by making one slot in which all three connections are located. A suggested template will be provided on request. If further clarification is necessary, please contact VDHL.

- Three IR Filters @ 3.44μ, 3.37μ, and 3.50μ
- Internal Quartz standard
- Solid (not flexible) keyboard
- Ethernet connectivity
- Modem connectivity
- (4) USB ports
- RS-232 port
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2090 Harrington Memorial Drive
Mansfield, OH 44903
Tel:(419) 526-6727
Toll Free: 1-800-800-8143
Fax: (419) 526-9446
E-mail: salesteam@npas.com
Web: http://www.npas.com

National Patent Analytical Systems, Inc.

December 24, 2009

Mr. Bob Drawbaugh

Vermont Department of Health
195 Colchester Avenue
Burlington, VT 05402-1125
Main: (802) 863-7622
Fax: (802) 863-7632
bdrawba@vdh.state.vt.us

RE: DataMaster DMT Quotation

Bob,

Thank you for your continued interest in the DataMaster DMT evidential BAC instrument. As requested in your e-mail, we are pleased to quote as follows:

(40) DataMaster DMT complete with;

- Three (3) IR Filters @ 3.44μ, 3.37μ and 3.50μ
- Internal quartz standard
- Keyboard
- Ethernet
- (4) USB ports
- RS-232 port
- Breath hose (heated)
- Touch screen
- Software - Windows CE5.+
- Laser jet printer (similar to original units supplied)
- Refurbished Guth 34C-NP type

Price per unit: .....$6,150.00 FOB destination.

Options:

1. Internal Dry Gas feature – eliminates the need for wet bath simulator process. Additional cost per unit is **$498.00** (less cylinder). Refer to model DMT-G literature for details.

2. Magnetic card reader - **$430.00** each.

3. Bar code reader - **$402.00** each.

4. Mouthpieces – Guth:
   100 pieces - $0.38/each
   200-399 pieces - $0.31/each
   400-999 pieces - $0.28/each

Technical Notes:

- Training:
  a) One (1) technician to Burlington, VT at no daily rate charge, travel & living expenses to be paid by Vermont Department of Health.
  b) Free training at NPAS, Inc. in Mansfield, Ohio. Travel and living expenses for attendees to be paid by Vermont Department of Health.
- Availability of replacement parts for the life of the unit.
- Wet bath external simulator ready.
- Our after sales service team is available by phone or e-mail 8:00 am – 5:00 EST, Monday through Friday.

We thank you for the opportunity to work with the Vermont Department of Health on this project. If you have any questions or need clarification please do not hesitate to contact us.

Best regards

Glen L. Campbell
Director of Sales & Marketing
NPAS
419-526-9446
800-800-8143
gcampbell@npas.com

Department of Health Requisition

From: A Bolduc Date: 12/30/09

Shipped To: 195 Colchester Avenue
Burlington VT 05401

Date Required: 20 units to be delivered by 3/19/10

20 units to be delivered between
5/1/10 and 5/28/10

Date: _____

Requisition # _____

Department ID #: _____

Program Code # _____

Fund Code # _____

Approved by Director _____

Item	Quantity	Unit	Description: Give complete description	Catalog #	Object Code	Total
	40	Ea.	DataMaster DMT complete with: HP Inkjet color printer (equivalent to previous units supplied) and USB cable Solid (not flexible) keyboard Refurbished Guth 34C-NP simulators See attached for further specifications and current quote			$246,000.00

Vendor Name NPAS

DEPT/PROGRAM CODES DataMaster 3420030840 39461 PERCENTAGE 100%

DEPT/PROGRAM CODES Administration 3420030810 39434 PERCENTAGE 0%

DEPT/PROGRAM CODES Administration 3420030810 39434 PERCENTAGE 0%

DEPT/PROGRAM CODES Administration 3420030810 39434 PERCENTAGE 0%

Approved by RJD Date: 1/20/10

(If over $1,000)
Authorized by Laboratory Director

Date:

DMT VOLUME MEASUREMENT PERFORMANCE PROFILE

Instrument ID._____

Time	3sec.	5sec.	10sec.	15 sec.	20 sec.	30 sec.
Flow	.05 min.	.083 min.	.167 min.	.25 min	.33 min.	.50 min.
2						**1.0**
3					**1.0**	**1.5**
4				**1.0**	**1.33**	**2.0**
5				**1.25**	**1.67**	**2.5**
10			**1.67**	**2.5**	**3.3**	**5.0**
20	**1.0**	**1.67**	**3.34**	**5.0**	**6.6**	
30	**1.5**	**2.5**	**5.0**	**7.5**	**9.9**	
40	**2.0**	**3.3**	**6.7**	**10**		

All results in L/M

Tests in order of when generated	range of results	
28	10	
10	10	21.1
12	12	
24	12	
12	12	
10	14	
32	14	
26	16	
26	16	
24	16	
> 40	16	
40	16	
> 40	16	
20	16	
16	16	
24	16	
16	18	
16	20	
20	20	
16	20	
16	20	
20	20	
16	22	
24	22	
14	22	
14	22	
12	22	
16	22	
16	24	
24	24	
20	24	
16	24	
22	24	
33	24	
24	24	
28	24	
24	24	
32	24	
40	24	
> 40	24	
> 40	24	
24	25	
28	26	
24	26	
22	28	
24	28	
18	28	
22	28	
20	32	

22		32	
22		33	
22		40	
28		40	
24		40	These results
25		40	were >40 but
24		40	DMT does not
24		40	report that high
	Average	23.1	

National Patent
Analytical Systems, Inc.

Service Memo

To: All Concerned July 10, 2009

Subject: 5 Way Valve Update

We believe we have found a very simple solution to the issue of sticking 5 way valves that has surfaced intermittantly and has been very pesky to completely resolve. The reason this has been so difficult is that we were never able to fully identify the cause. Based on our recent engineering work it appears that the primary cause is residual magnetism in the structure of the solenoid that drives the 5 way valve. While the force of the return spring is over 125 grams pressure, the residual opposing magnetism can be as high as 30 or more grams pressure in a few solenoids. This combined with the other normal sources of friction can be sufficient, in some cases, to cause sticking. This varies from batch to batch depending on the composition of the steel used for the solenoid frame and core. This is not within our control.

I should note that the issue of a sticking 5 way does not present a problem with a test because there can never be a test if this conditions is present since the breath sample is vented to the outside and the reading will typically be .000. It can also result in a "pump error" in which case there is no test.

The solution is to provide for an air gap between the core and the guide structure of the solenoid which can be easily done with a very thin washer. We are suggesting a .006 thick Kapton washer that we will provide on request (at no charge) to any and all DataMaster users. It is our part no 34582 and we life tested this concept to 5000 cycles. We are suggesting that it be placed on all 5 way valve solenoid core stems regardless of wether or not that valve has stuck. It is a simple, fast and convenient fix that can be done on the next visit to the instrument. We do not suggest that a special effort be made to do this update unless there is an immediate issue with this problem on any given instrument. I should have these available the first part of next week.

In order to install simply remove the 5 way from the base (use caution as the lamp transistor that is mounted to the block will be warm), unscrew the nylon acorn nut from the front of the core stem and then pull out the core. Slide the washer over the core stem to the base of the stem and reassemble all. There should be no need to readjust anything although we suggest that a simulator be run after reassembly to insure that all is well. The time required should be less than 5 minutes.

John Fusco

2090 Harrington Memorial Road, Mansfield, Ohio 44901 Ph 419-526-6727 Fax 419-526-9446
jd@npas.com

Vermont Department of Health Laboratory Requisition

From: A. Bolduc Date: 1/28/10

Shipped To: 195 Colchester Avenue
Burlington VT 05401

Date Required:

Date: _____

Requisition # _____

Department ID #: _____

Program Code # _____

Fund Code # _____

Approved by HS Administrator _____

Item	Quantity	Unit	Description: Give complete description	Catalog #	Object Code	Total
	20	ea.	DataMaster Refurbishment Replace CPU (Pn 43602 with current SI Controller			$19,800.00
	20	ea.	Replace controller boards (Pn 41602) to current revision level quote from manufacturer includes freight in both directions and all labor to replace the above and bring the instruments to operational condition			$6,000.00

Vendor Name National Patent Analytical Sys

DEPT/PROGRAM CODES DataMaster 3420021211 39461 PERCENTAGE 100%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 00%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 00%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 0%

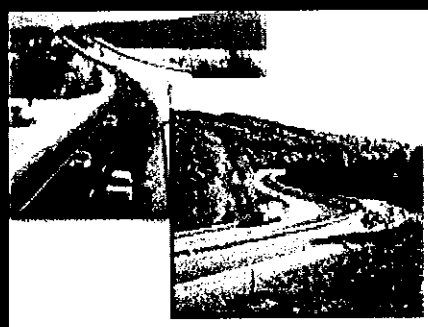
Approved by Date:

(If over $1,000)
Authorized by Laboratory Director

Date:

Thank You!

- Thank you to the Vermont Governor's Highway Safety Program for the funding to purchase the DataMaster DMT's.

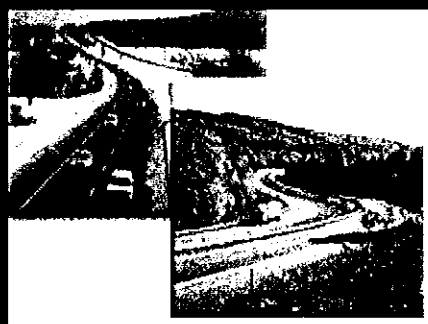


State of Vermont
Department of Public Safety
Governor's Highway Safety Program
5 Park Row, Waterbury, VT 05676
1.802.241.5509

March. 2010

Thank You!

- Thank you to the Vermont Governor's Highway Safety Program for the funding to purchase the DataMaster DMT's.



State of Vermont
Department of Public Safety
Governor's Highway Safety Program
5 Park Row, Waterbury, VT 05676
1.802.241.5509

March. 2010

Target BAC DataMaster Replacement / DataMaster DMT Deployment Schedule [4/14/11]

Testing/Calibration/Certification		Officer Training	S.A. Training	Deployment	
# inst.	**Date range**	**Date range**	**Date range**	**Dates**	**Counties [#]**
15	9/30 – 10/30	Nov.30-Dec.16 Jan. 6- 15	Dec.14 – Jan.16	12/16-12/18 1/18-20	Washington – 6 Windham – 7
20	3/1 – 3/31	3/22 – 4/17	4/27-5/14	4/14-16	Lamoille – 3 Orleans – 2 Addison – 4 Windsor – 5 Bennington-5 (VPA - 4)
20	6/14 – 7/31	7/19 – 8/20	8/26 – 9/24	8/24-26	Rutland – 4 Caledonia – 3 Orange – 4 Essex – 3 (VPA – 1)
10				July '08	Franklin/Grand Isle - 5
10				Nov. '08	Chittenden - 11
					(67)

From: John Fusco [jd@npas.com]
Sent: Friday, February 27, 2009 8:41 AM
To: Drawbaugh, Bob
Subject: Re: ?????
OK

This will get a little lengthy.

Bar code is where things are headed. It is very standardized and any OL with a bar code will be the same. However, not all states have bar code on their OLs. Mag Swipe is not well standardized between states and OLs from other states may not be readable. Bar Code is probably the way things will go since it holds so much more information and is fairly well standardized. But Mag swipes will be around for the indefinite future also.

We go both directions and both are developed. SC went with Bar Code. the card is inserted into the left side of the unit. The mag swipe is developed but we haven't placed any except maybe in Iowa, I'm not sure.

When I say developed I mean the we have the core done and working and the only development necessary would be to put it into the VT software. You can have either or both together although both together would get a little messy from the development standpoint - but not all that bad. It would be another question to determine if one was going to be used and if so, which one. There would be some database work if the questions and data are not the same or in the identical formats. Again, this should not be all that extensive.

The easiest, most economical and cleanest way to go with the mag swipe is to use one that is already in the keyboard. This option would add about $250.00 to the price. Since the software is basically done and adaptation should not be a big issue, there would be no development cost.

The bar code reader is a much less simple proposition as the technology is very different. The cost of this would

be $670.00 a copy but, again, the development should be minimal so there would be no separate cost for that part.

There are no common parts so putting both into the same unit would simply mean the price of both parts but since the development becomes more significant I would be inclined to simply add another $50 per unit and spread it out over the purchase. So combining both into one unit would total about $970.00 each. Still not all that bad.

Delivery currently is 10 to 14 weeks. It is a little hard to predict next year, especially with all the economy bad news going on. It could be a week to 10 days if things slow down but my guess would be it will not change a whole lot.

Jf

On Feb 27, 2009, at 8:03 AM, Drawbaugh, Bob wrote:

> Being a 'progressive state - we have both. but we were thinking the mag reader and hadn't considered the 2d barcode - perhaps out of ignorance of the possibility.
>
> -----Original Message-----
> **From:** John Fusco [mailto:jd@npas.com]
> **Sent:** Friday, February 27, 2009 8:01 AM
> **To:** Drawbaugh, Bob
> **Subject:** Re: ?????
>
> When you say card swipe. Are you talking about magnetic card swipe like a credit card or are you referring to bar code readers like what is on many Operator Permits? The Bar codes are the strange looking patterns. What does Vt actually use?
>
> On Feb 27, 2009, at 7:49 AM, Drawbaugh, Bob

wrote:

> John, When we spoke recently re: budget prep and est. cost of DMTs I did not ask all the questions that have come up. One inquiry was about the additional cost of adding a card swipe device and the other is the projected, as best you can, delivery time from purchase to delivery currently and a year from now. Thanks for any help you can give.

John Fusco
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Phone 419+526-6727 Fax 419+526-9446

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Breath Alcohol Testing Instrument Performance Reviews

Amanda Bolduc, MFS

I participated in the task of reviewing the performance of four new and different breath alcohol testing instruments; the NPAS DataMaster DMT™, the CMI Intoxilyzer® 8000, the Drager Alcotest® 7110 MKIII-C and the Intoximeter EC/IR-II. The instruments were analyzed for precision, accuracy, linearity, interference detection capabilities and mouth alcohol detection capabilities, ease of use, durability and overall performance.

The instruments were analyzed as provided by the manufacturer. No calibrations, certifications or other adjustments were made. The simulators used were Guth 2100 and Guth 34CNP.

Method:

- **Precision:**
  - Aqueous ethanol solutions of 0.08g/210L and 0.16g/210L were analyzed with n=10
  - The standard deviations were calculated
- **Accuracy**
  - Aqueous ethanol solutions with nominal concentrations of 0.02g/210L, 0.04g/210L, 0.08g/210L, 0.16g/210L and 0.40g/210L were analyzed as calibration checks.
  - All solutions were verified by Headspace gas chromatography with flame ionization detection. Actual concentrations are listed with results data.
- **Linearity**
  - The five aqueous ethanol solutions were prepared over a concentration range that will provide vapor concentrations from 0.02 through 0.40g/210L.
  - The ensuing results from the breath alcohol testing instruments were plotted against the known concentrations generated from the Headspace GC/FID.
  - The results formed a straight line with Correlation Coefficients (R^2 values) of at least 0.99.
- **Interference**
  - Compounds were prepared and tested in the instruments to evaluate the interference detection systems (N=5)
    - 0.02% Acetone in 0.08% EtOH
    - 0.05% Acetone in 0.08% EtOH
    - 0.10% Acetone in 0.08% EtOH
    - 0.04% Methanol
    - 0.04% Isopropanol
    - 0.04% Methanol in 0.08% EtOH
    - 0.04% Isopropanol in 0.08% EtOH
  - The mouth alcohol detection system was tested. Each test was taken at 3-5 minute intervals subsequent to the use of mouthwash until such time as no mouth alcohol was detectable.

Results:

- **Table 1: Standard Deviations (Precision)**

		DMT		INTox 8000		DRA-IR		INTOX EC/IR-II		
		N	Std Dev	N	Std Dev	N	Std Dev	N	Std Dev	
0.02		10	0.0003	10	0.0007	10	0.0024	10	0.0003	
0.04		10	0.0004	10	0.0005	10	0.001	10	0.0003	
0.08		10	0.0004	10	0.0008	10	0.0013	10	0.0025	
				10	0.0058	10	0.0043			
				10	0.0022	10	0.0005			
				10	0.0037	10	0.0045			
				10	0.0036	10	0.0026			
					0.0032		0.0026			Mean Std Dev
0.16		10	0.0008	10	0.0064	10	0.0017	10	0.0005	
				10	0.0067	10	0.0011			
				10	0.0056	10	0.0229			
				10	0.0096	10	0.0011			
				10	0.0067	10	0.0051			
						10	0.004			
					0.007		0.006			Mean Std Dev
0.4		10	0.0008	10	0.0156	10	0.009	10	0.0023	
					(.366-.317)					
			0.0005		0.0054		0.0042		0.0012	Grand Mean Std Dev

- **Table 2: Accuracy for Intoxilyzer Instrument**

Date	Operator	Instrument	Sim Lot	Sim [X]	N=	Avg	Std Dev
12/15/2005	SH	INT	06-01-020	0.0203	10	0.0175	0.0007
12/16/2005	SH	INT	06-06-040	0.0376	10	0.031	0.0005
12/14/2005	SH	INT	06-05-080	0.0815	10	0.0728	0.0008
12/15/2005	SH	INT	06-05-080	0.0815	10	0.0841	0.0058
12/15/2005	ALB	INT	06-05-080	0.0815	10	0.0765	0.0022
12/16/2005	SH	INT	06-05-080	0.0815	10	0.0756	0.0037
12/19/2005	ALB	INT	06-05-080	0.0815	10	0.0777	0.0036
12/15/2005	SH	INT	06-07-160	0.1582	10	0.1523	0.0064
12/15/2005	ALB	INT	06-07-160	0.1582	10	0.1542	0.0067
12/19/2005	RD	INT	06-07-160	0.1582	10	0.1609	0.0056
12/20/2005	RD	INT	06-07-160	0.1582	10	0.1491	0.0096
12/21/2005	TM	INT	06-07-160	0.1582	10	0.1526	0.0067
12/19/2005	ALB	INT	06-03-400	0.3807	10	0.3543	0.0156

- **Table 3: Accuracy for Drager Instrument**

Date	Operator	Instrument	Sim Lot	Sim [X]	N=	Avg	Std Dev
12/15/2005	SH	DRA-IR	06-01-020	0.0203	10	0.0207	0.0024
		DRA-EC				0.02	0
		IR & EC				0.0204	0.002
12/15/2005	ALB	DRA-IR	06-06-040	0.0376	10	0.0356	0.001
		DRA-EC				0.0364	0.0007
		IR&EC				0.036	0.0009
12/14/2005	SH	DRA-IR	06-05-080	0.0815	10	0.0784	0.0013
		DRA-EC				0.0787	0.0016
		IR&EC				0.0786	0.0014
12/16/2005	SH	DRA-IR	06-05-080	0.0815	10	0.0831	0.0043
		DRA-EC				0.0835	0.0041
		IR&EC				0.0833	0.0041
12/16/2005	ALB	DRA-IR	06-05-080	0.0815	10	0.0794	0.0005
		DRA-EC				0.0802	0.0006
		IR&EC				0.0798	0.0007
12/16/2005	RD	DRA-IR	06-05-080	0.0815	10	0.0822	0.0045
		DRA-EC				0.0829	0.0044
		IR&EC				0.0826	0.0043
12/20/2005	ALB	DRA-IR	06-05-080	0.0815	10	0.0825	0.0026
		DRA-EC				0.0827	0.0028
		IR & EC				0.0826	0.0026
12/16/2005	SH	DRA-IR	06-07-160	0.1582	10	0.1561	0.0017
		DRA-EC				0.1555	0.001
		IR&EC				0.1558	0.0014
12/19/2005	SH	DRA-IR	06-07-160	0.1582	10	0.1528	0.0011
		DRA-EC				0.1518	0.0012
		IR&EC				0.1523	0.0013
12/19/2005	ALB	DRA-IR	06-07-160	0.1582	10	0.1802*	0.0229
		DRA-EC				0.1831*	0.0238
		IR & EC				0.1817*	0.0228
12/19/2005	ALB	DRA-IR	06-07-160	0.1582	10	0.1584	0.0011
		DRA-EC				0.1611	0.0023
		IR & EC				0.1598	0.0022
12/20/2005	RD	DRA-IR	06-07-160	0.1582	10	0.1534	0.004
		DRA-EC				0.1527	0.003
		IR & EC				0.1531	0.0032
12/21/2005	TM	DRA-IR	06-07-160	0.1582	10	0.1491	0.0051
		DRA-EC				0.1483	0.0051
		IR & EC				0.1487	0.005
12/19/2005	ALB	DRA-IR	06-03-400	0.3807	10	0.3792	0.009
		DRA-EC				0.3831	0.0079
		IR & EC				0.3812	0.0085

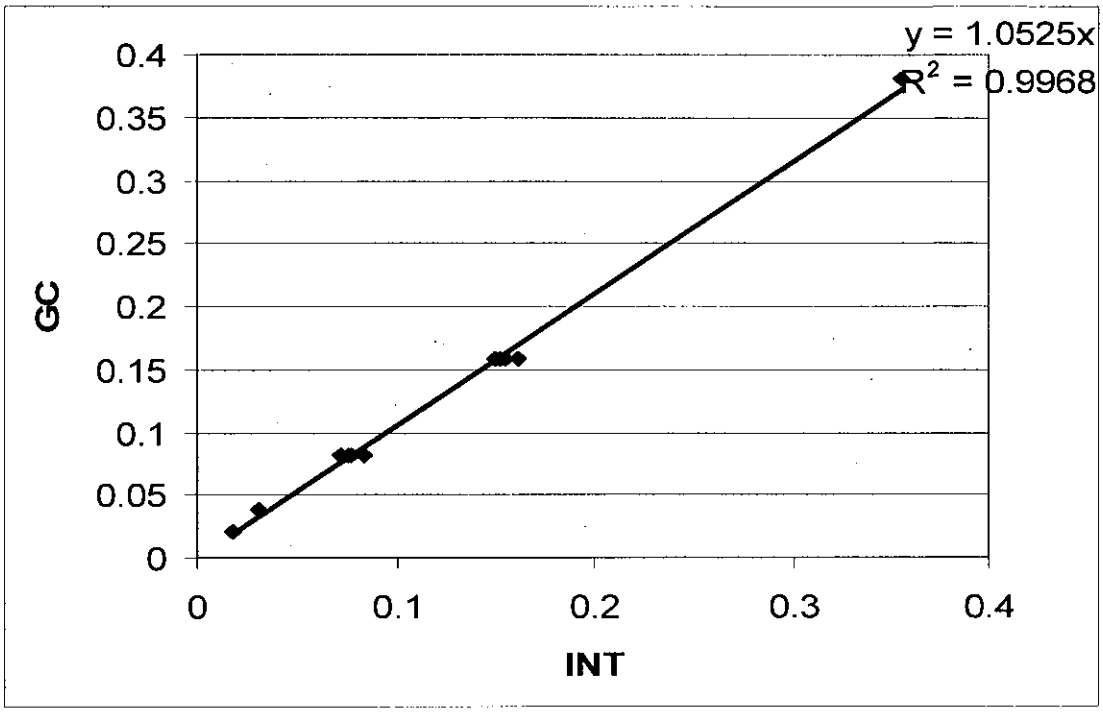
- **Table 4: Accuracy for DataMaster Instrument**

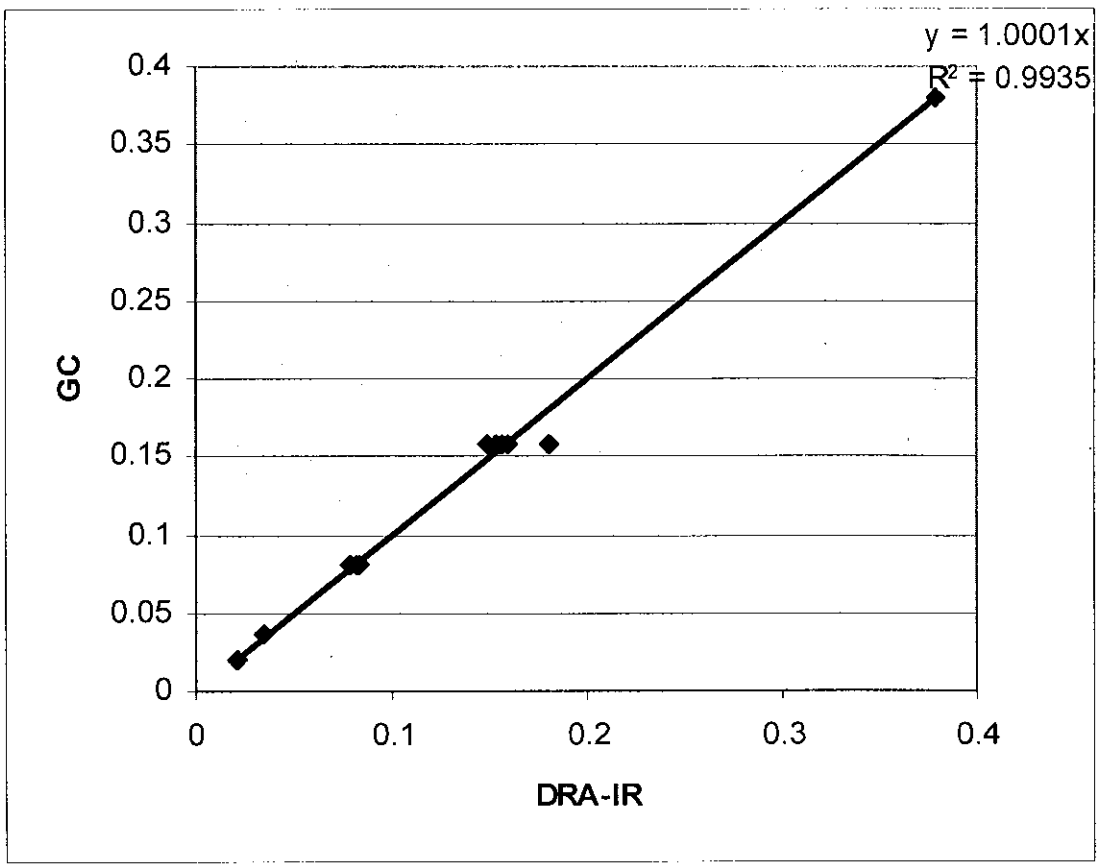
Date	Operator	Instrument	Sim Lot	Sim [X]	N=	Avg	Std Dev
3/8/2006	SH	DMT	06-01-020	0.0203	10	0.0214	0.0003
3/9/2006	ALB	DMT	06-06-040	0.0376	10	0.0375	0.0004
3/10/2006	DMR	DMT	06-05-080	0.0815	10	0.0791	0.0004
3/9/2006	DMR	DMT	06-07-160	0.1582	10	0.1602	0.0008
3/10/2006	DMR	DMT	06-03-400	0.3807	10	0.389	0.0008

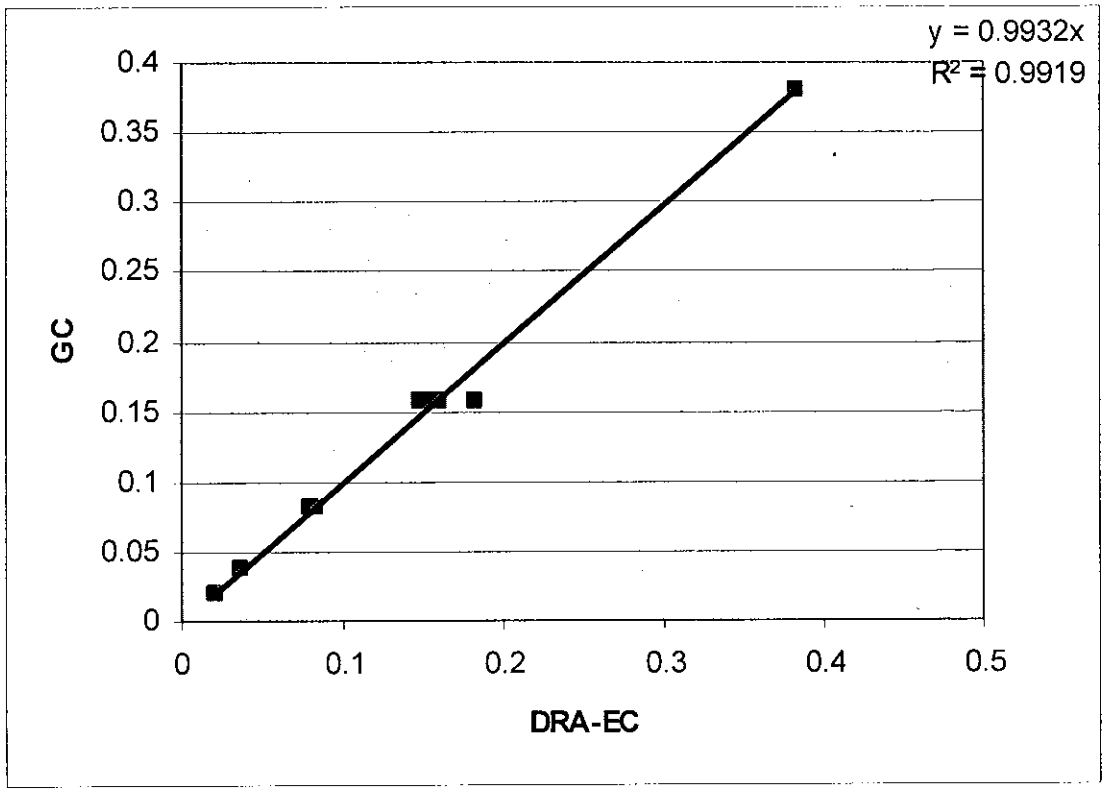
- **Table 5: Accuracy for Intoximeter Instrument**

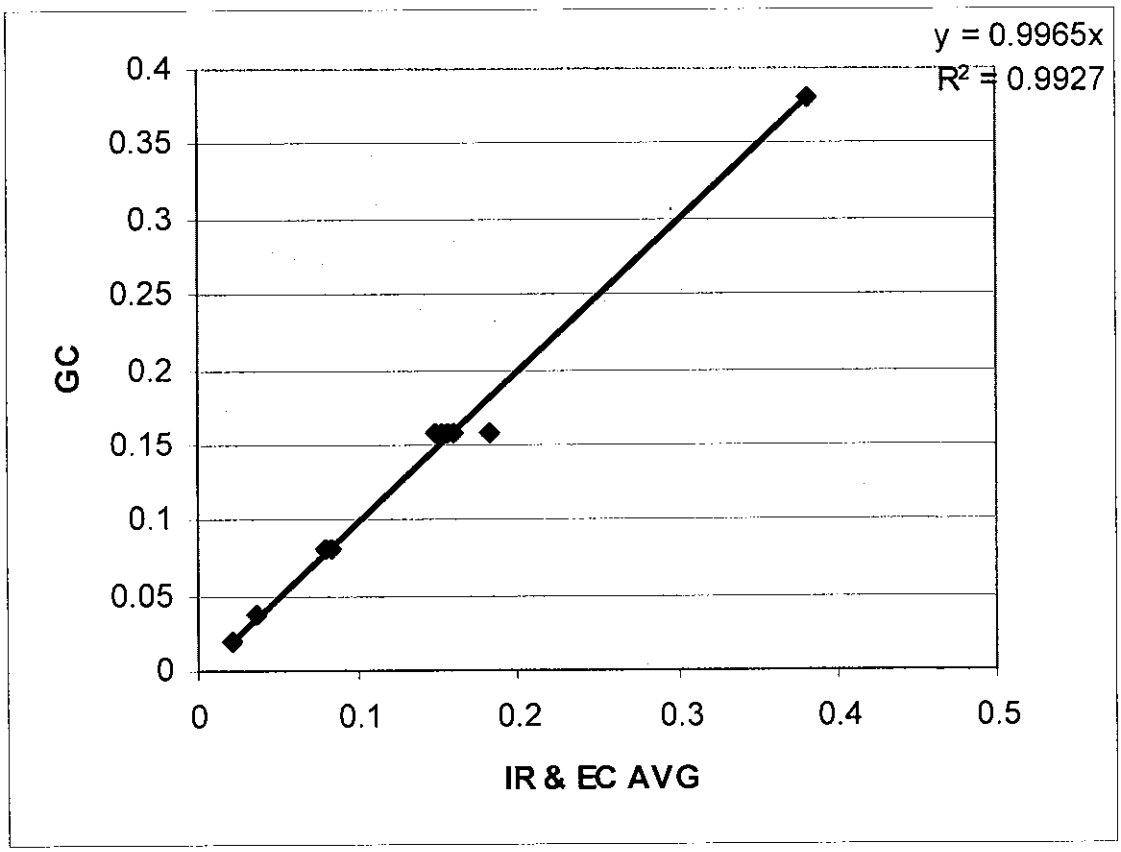
Date	Operator	Instrument	Sim Lot	Sim [X]	N=	Avg	Std Dev
3/8/2006	SH	INTox II	06-01-020	0.0203	10	0.0219	0.0003
3/9/2006	ALB	INTox II	06-06-040	0.0376	10	0.0389	0.0004
3/9/2006	DMR	INTox II	06-05-080	0.0815	10	0.078	0.0025
3/10/2006	DMR	INTox II	06-07-160	0.1582	10	0.16	0.0005
3/13/2006	ALB	INTox II	06-03-400	0.3807	10	0.379	0.0023

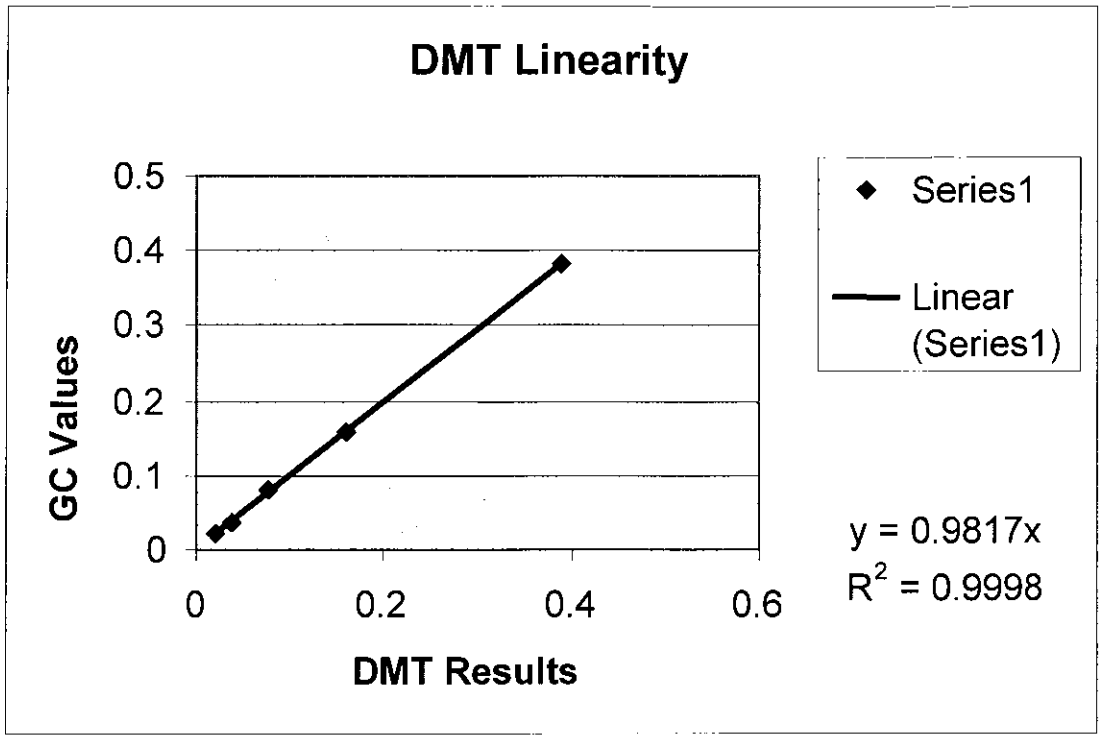
- **Linearity**

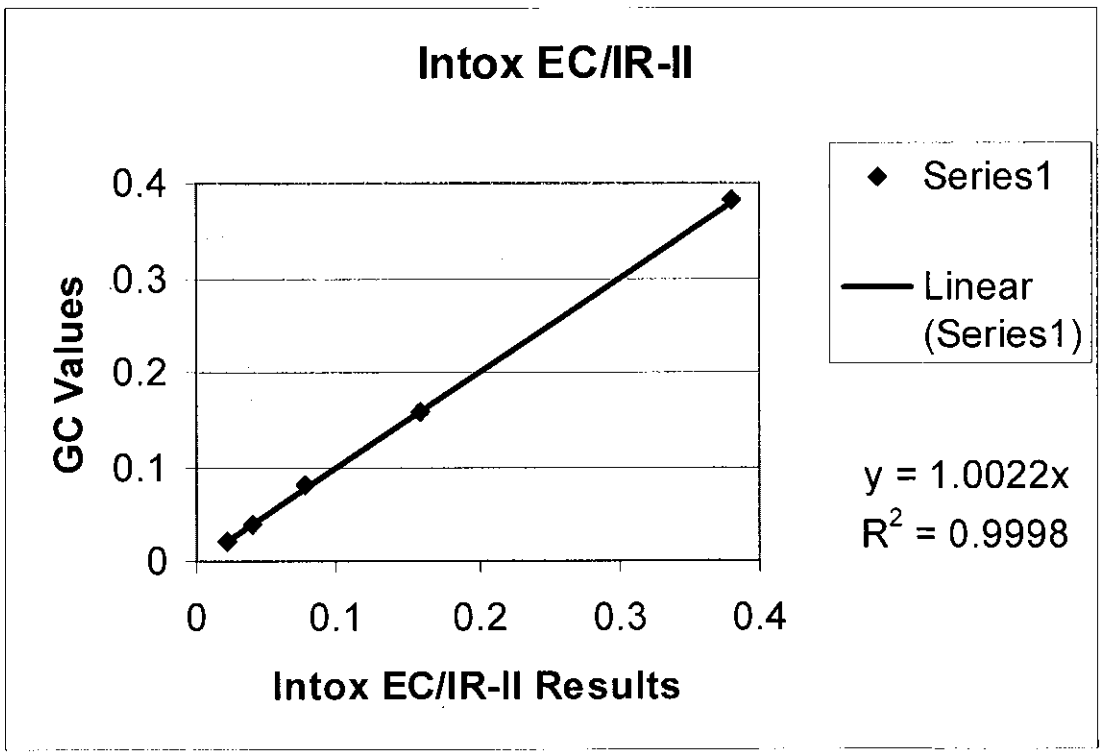





y = 0.9932x
R² = 0.9919
GC
DRA-EC
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5


y = 0.9965x
R² = 0.9927
GC
IR & EC AVG
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.1
0.2
0.3
0.4
0.5


DMT Linearity
0.5
0.4
0.3
0.2
0.1
0
GC Values
0
0.2
0.4
0.6
DMT Results
Series1
Linear (Series1)
y = 0.9817x
R2 = 0.9998


Intox EC/IR-II
0.4
0.3
0.2
0.1
0
GC Values
0
0.1
0.2
0.3
0.4
Intox EC/IR-II Results
Series1
Linear (Series1)
y = 1.0022x
R2 = 0.9998

- **Table 5: Interference**

Positive Interference Message Given

N=5 X/N

Interferent	Date	DMT	Intox EC/IR	Date	INTOX 8000	DRA
.02% Acetone in 0.1% EtOH	2/28/06	6 for 6	0 for 5	12/21/05	1 for 5	0 for 5
Error Message reported		X.XXX	None (0.90- 0.97)		Invalid Sample	None (.071-.074)
.05% Acetone in 0.1% EtOH	3/1/06	6 for 6	0 for 5	12/22/05	5 for 5	0 for 5
Error Message reported		X.XXX	Mouth Alc, Sample over range, 0.95- 0.96		Invalid Spl(2); Interferent Detect(3)	None (.072-.077)
0.1% Acetone in 0.1% EtOH	3/1/06	6 for 6	0 fo 5	12/22/05	5 for 5	0 for 5
Error Message reported		X.XXX	EtOH Baseline err, Spl over rng, Mouth Alc, 0.98		Interferent Detect (4); Improper Spl (1)	None (.07-.079)
.04% Methanol	2/27/06	6 for 6	0 for 5	12/22/05	1 for 5	5 for 5
Error Message reported		X.XXX	None (0.36- 0.40)		Improper Spl (1); None(4) (.022g/210L)	Interference
.04% Isopropanol	3/3/06	6 for 6	0 for 5	12/23/05	5 for 5	5 for 5
Error Message reported		X.XXX	None (0.018- 0.020)		Interferent Detect	Interference
.04% MeOH in .08% EtOH	3/3/06	3 for 9	0 for 5	12/23/05	2 for 5	5 for 5
Error Message reported		X.XXX, None (0.096-0.097)	None (0.090-0.097)		Improper Spl (2), None (3) (.097-.099)	Interference
.04% Iso in .08% EtOH	3/8/06	6 for 6	0 for 5	12/23/05	5 for 5	5 for 5
Error Message reported		X.XXX	None (0.092 - 0.093)		Interferent Detect	Interference

- **Table 6: Mouth Alcohol Detection**

DMT

Elapsed Time (min)	Detected Y/N	BrAC
0:00	Mouthwash 1st used	
1:00	Y	INVALID
6:00	Y	INVALID
11:00	N	0.000

INTox 8000

Elapsed Time (min)	Detected Y/N	BrAC
0:00	Mouthwash 1st used	
5:00	Y	XXX*
9:00	Y	XXX*
12:00	Y	XXX*
16:00	N	0.000

*Invalid Sample

DRA

Elapsed Time (min)	Detected Y/N	BrAC
0:00	Mouthwash 1st used	
1:00	y	-.---
5:00	Y	-.---
10:00	N	0.057g/210L
		0.030
14:00	N	g/210L
16:00	N	0.000

INTOX EC/IR-II

Elapsed Time (min)	Detected Y/N	BrAC
0:00	Mouthwash 1st used	
5:00	N	0.029
9:00	N	0.008
15:00	N	0

Discussion:

- **NPAS DataMaster DMT™**
  - **Features**

The DataMaster DMT™ uses the judicially accepted method of infrared spectroscopy to determine breath alcohol levels. The detector is a thermo-electrically-cooled PbSe detector regulated to operate at 0°C. Regulating the operating temperature of the detector allows for greater sensitivity while maintaining a stable detector output. This enhances the precision, repeatability and low-level performance of the DMT. A stepper motor precisely controls all the optical filters (including the quartz internal standard). The use of narrow bandpass (10 nanometer) optical filters at 3.44, 3.37 and 3.50 micron allows the passage of a limited frequency range of infrared energy. This makes the DMT highly specific to ethanol to the exclusion of other alcohols and interfering compounds. The long life gray body infrared source generated very little visible light. This maximizes power usage and reduces instrument temperatures giving the DMT a high level of stability.

A powerful 32 bit, 206 Mhz processor administers signal processing. This facilitates the use of a short sample path (57cm) and a small sample chamber volume (23cc). This allows for an accurate measurement of the deep lung sample across a wide range of blowing patterns and subject vital lung capacities. The processor permits the use of an advanced breath sampling system. This new system accurately measures the breath flow rate and volume, including negative flow rates, eliminating any questions about sample acceptance.

The DMT software is built on the Microsoft .NET framework. This platform provides for a familiar graphical user interface making the DMT operator friendly.

  - **Precision**

The DMT had produced an average standard deviation of 0.0005 with a range of 0.0003-0.0008.

  - **Accuracy**

The DataMaster performed to +/- 5% of the true value at each concentration with one exception. At 0.0203g/210L at N=10, the DMT had an average result of 0.0214g/210L and standard deviation of 0.0003. This gives a of 105.4% recovery.

  - **Linearity**

The results were plotted against the GC value for each concentration and a line was generated. The formula for the line is $y=0.9817x$. $R^2=0.9998$.

  - **Interference**

The DMT reports an error message of X.XXX instead of an ethanol concentration when an interfering agent is detected. At concentrations of .02%, .05% and 0.1% acetone in 0.10% ethanol, the DMT reported an interference message 100% of the time. At a concentration of 0.04% methanol in

0.08% ethanol, the DMT only reported an interference message 3 out of 9 tries. On 6 of 9 tries it reported the concentration at an average of 0.097g/210L EtOH.

Mouthwash was used by a subject who subsequently provided breath samples until such time as no mouth alcohol was detected. At an elapsed time since use of mouthwash of one minute, the DMT reported an invalid sample. Invalid was also reported at an elapsed time of six minutes. At an elapsed time of eleven minutes, no mouth alcohol was detected and the BrAC was reported at 0.000g/210L.

- **Ease of use, durability and overall performance**

The DMT is equipped with a full graphics touch screen which is extremely operator friendly. The windows-based operating system provides a very familiar platform for data entry. The processor permits the use of an advanced breath sampling system. The new system accurately measures the breath flow rate and volume, including negative flow rates, eliminating any questions about sample acceptance. The screen also displays a subject's breath flow curve in real time along with the alcohol absorption curve. This greatly enhances the operators ability to determine the subject's level of cooperation during a test. This information can also be part of the test ticket. The utilization of an external printer eliminates the need for special tickets.

The DataMaster Operation Guide is very clear, understandable and helpful. It had detailed instructions and explanations and photos to aid in instrument set up and software navigation. When additional support was necessary, it was easy to contact National Patent's customer service department, who were knowledgeable and extremely helpful.

The DMT's overall performance would be classified "excellent".

- **CMI Intoxilyzer® 8000**
  - **Features**

The Intoxilyzer is an infrared-based device designed for both mobile and stationary evidential breath alcohol testing. It utilizes an internal printer unit of either the impact or thermal type onto a paper roll. The Intoxilyzer has been designed in such a way that it will allow for prolonged use without the requirement for recalibration. The reason for this is there are no moving parts within the device. The infrared light is pulsed in order that the dual pyroelectric detectors may accurately quantify as well as qualify the alcohol concentration present within the analytical cell. The Intoxilyzer was also designed to operate using infrared light at two wavelengths, 3 and 9 microns. The absorption ratio that is generated when alcohol alone is supplied in the path of the infrared light creates what may be termed as a fingerprint and that allows the device to discriminate between those samples, which are contaminated by breath interferents, and those that are not.

- **Precision**

At a concentration of .08g/210L EtOH, the Intoxilyzer had a standard deviation range of 0.0008-0.0058 at N=10. At a concentration of 0.16g.210L EtOH, the Intoxilyzer had a standard deviation range of 0.0056-0.0096 at N=10.

- **Accuracy**

The Intoxilyzer did not perform to +/- 5% of the true value during almost every test. It has been approximately two years since the instrument was last calibrated. Although; the inter-day and intra-day results were also inconsistent.

- **Linearity**

The Intoxilyzer results were plotted against the GC value for each concentration and a line was generated. The formula for the line is $y=1.0525x$. $R^2=0.9968$.

- **Interference**

The Intoxilyzer gave three different error messages during the testing of interferents; "Invalid Sample", "Improper Sample" and "Interferent Detect". The operators manual did not define these error messages and calls to the CMT customer service center were not returned, therefore we cannot conclude if the error messages were due to interference or another problem. Assuming that "Invalid" and "Improper" samples were due to interference, the Intoxilyzer detected acetone 20% of the time at .02%, and 100% of the time at .05% and 0.1% concentrations. Methanol was detected 20% of the time at .04%

MeOH in water and 40% of the time at .04% MeOH in .08% EtOH. Isopropanol was detected 100% of the time at both concentrations.

Mouthwash was used by a subject who subsequently provided breath samples until such time as no mouth alcohol was detected. Mouthwash was used at 15:08. Mouth alcohol was detected at 15:13, 15:17, and 15:20. No mouth alcohol was detected at 15:24 and the BrAC was 0.000.

- **Ease of use, durability and overall performance**

The CMI Intoxilyzer® 8000 is a compact unit which takes up far less workspace than other instruments. It is also designed for both mobile and stationary evidential breath alcohol testing. When the calibration of the device is verified during periodic checks, security tabs can be attached to the device in such a way that prevents any unauthorized opening of the casing. Provided they remain unbroken, the tabs confirm that the device has remained in a fully operational condition between the periodic verification checks. The Intoxilyzer has also been designed in such a way that it will allow for prolonged use without the requirement for recalibration. This is because there are no moving parts within the device.

The Intoxilyzer instrument provides quick calibrations and results. It has a fairly simple data input system when conducting a suspect test. The supervisor menu for maintenance, settings adjustments and routine performance checks is cryptic at best. It is confusing to navigate and the manual provides little support or explanations. The customer service department was impossible to reach despite repeated attempts and messages.

The instrument does not utilize heated simulator solution hoses. Heated simulator hoses would prevent condensation which causes external calibration failures. The unit displayed frequent RAM failure messages causing the machine to become inoperable for periods of time. We were unable to diagnose, nor fix the RAM failure because the manual fails to address failure messages. We were also unable to determine the difference between sample failure messages "Invalid" and "Improper" for the same reason. We had hoped to contact customer support for assistance, but have so far been unable to reach anyone.

The Intoxilyzer's overall performance would be classified "unsatisfactory".

- **Draeger Alcotest® 7110 MKIII-C**
  - **Features**

The Drager utilizes two independent alcohol measuring technologies. The first is infrared which detects alcohol in the 9.5um region of the IR spectrum. It utilizes an absorption chamber (cuvette) with 70 mL chamber volume, gold-coated parabolic mirrors, an electronically modulated infrared transmitter, and a pyroinfrared detector with an integrated IR filter. The second method is an electrochemical sensor. This measures small samples from inside the cuvette. Once ethanol reaches the sensor, a chemical reaction is triggered. The resulting current is used to determine the amount of alcohol in the sample. By combining two distinct analytical systems to analyze a subject's breath, the DRA is able to provide two precise, accurate, and independent test results. The dual system also allows for a greater degree of sensitivity to any possible existence of interfering substances. Because the fuel cell is alcohol specific, and the IR sensor operates at 9.5um in the IR spectrum, the possibility of an interfering substance influencing a subject's ethanol reading is "virtually" impossible.

  - **Precision**

At a concentration of 0.08g/210L EtOH, the DRA had a standard deviation range of 0.0005-0.0045 at N=10. At a concentration of 0.16g.210L EtOH, the DRA had a standard deviation range of 0.0011-0.0229 at N=10.

  - **Accuracy**

The DRA performed to +/- 5% of the true value at each concentration with three exceptions. At concentration 0.0376g/210L the result was 0.0356g/210L with a standard deviation of 0.001 and a recovery of 94.7%. At concentration .1582g/210L one resulting average was .1802g/210L with a standard deviation of .0229 and a recovery of 113.9%. Also at this concentration there was an average of .1491g/210L with a standard deviation of .0051 and a recovery of 94.2%.

- **Linearity**

The DRA results were plotted against the GC value for each concentration and a line was generated. The formula for the line for the infrared (IR) result is y=1.0001x R^2=0.9935. The formula for the line for the electrochemical (EC) result is y=0.9932x R^2=.09919. The formula for the line for the average of both results is y=0.9965x R^2=0.9927.

- **Interference**

The DRA's infrared sensor operates in the 9.5um range of the infrared spectrum. Because of this range, the DRA is free from the influence of acetone, toluene and acetaldehyde as they relate to a human submitting a breath sample. The DRA also employs an alcohol specific electrochemical (fuel cell) sensor which is not influenced by acetone, toluene or acetaldehyde. When tested for acetone in ethanol, the DRA reported only ethanol in the appropriate concentration which was neither influenced, nor interfered by the acetone. The DRA reported error messages for both the presence of methanol and isopropanol 100% of the time.

The DRA's mouth alcohol detection capabilities are not satisfactory. At one and five minutes after mouthwash use, the DRA detected mouth alcohol and reported an interference message. At ten minutes after mouthwash use, the DRA did not report mouth alcohol, but reported at BrAC of 0.057g/210L. At fifteen minutes after use it reported a BrAC of 0.030g/210L. At twenty minutes the BrAC was 0.000g/210L and no mouth alcohol was detected.

- **Ease of use, durability and overall performance**

The Drager Alcotest® 7110 MKIII-C is a dual detection, compact, portable breath alcohol analyzer capable of providing two precise, accurate, and independent test results. The DRA is powered by either AC or DC power which is convenient for portable use. The DRA is capable of using either an onboard or external printer. The onboard printer paper was difficult to replace. The externally generated evidence reports are neat and understandable. The onboard generated supervisor reports do not include averages or standard deviations. We were unable to find a way to include this in the generated report. Ticket reprint are possible only when the given test number is known. This may cause difficulties should tickets become lost.

The instrument employs a mandatory fifteen minute wait period after data is entered and before the breath is given. It is not possible to terminate the wait period once started. This means that should there be a need to restart the test period in the middle of the observation, it is not possible. We were also unable to override the wait period for testing purposes which was quite inconvenient. When problems such as this one arose, customer service at Drager was difficult to reach. We had to wait three business days for a response to our message.

The instruction manual is thorough, although difficult to understand. The layout of functions and explanation is confusing. The menu of options on the instrument is also difficult to navigate, and not intuitive. When attempting to use the manual to navigate the menu, it is difficult at best.

The overall performance of the instrument would be classified as "satisfactory".

- **Intoximeter EC/IR-II**
  - **Features**

The Intoximeter EC/IR-II utilizes both an electrochemical sensor and an infrared detector. The infrared system is capable of simultaneously analyzing carbon dioxide concentrations and alcohol concentrations in the breath. This capability allows the instrument to determine a deep lung breath sample on both alcohol rich and alcohol free samples. It employs an easy to read 256 x 32 pixel graphic vacuum fluorescent display.

- **Precision**

The Intoximeter had an overall average standard deviation of 0.0012. At a concentration of 0.08g/210L EtOH, the Intoximeter had a standard deviation of 0.0025; n=10. At 0.4g/210L EtOH the standard deviation was 0.0023; n=10. All other concentrations had standard deviations < 0.0005.

- **Accuracy**

The Intoximeter performed to +/- 5% the true value with one exception. At 0.0203g/210L the Intoximeter reported the concentration as 0.0219g/210L with a standard deviation of 0.0003 and a 107.89% recovery.

- **Linearity**

The Intoximeter results were plotted against the GC value for each concentration and a line was generated. The formula for the line is $y=1.0022x$ $R^2=0.9998$.

- **Interference**

The Intoximeter failed to detect any of the introduced interferents. Customer support was contacted and the software was updated three times to correct the units ability to detect and report interfering compounds. The unit continued to fail to detect interferents.

- **Ease of use, durability and overall performance**

The Intoximeter EC/IR-II is a compact, easy to operate breath alcohol testing instrument. It utilizes dual technology, however only the electrochemical fuel cell is used to calculate the results of the suspect sample. The infrared result is used to rule out mouth alcohol and compound interference.

The instrument employs and onboard printer, however it is capable of printing to an external unit. The display was easy to read. For a basic test, the instrument was very straight forward and easy to use. To do more complicated or higher level functions on the instrument, the software was not intuitive and very difficult to navigate. The operators manual was minimally helpful. None of the reported error messages were explained in the operators manual.

The customer service at Intoximeter was sub-standard. Reported problems were not rectified. Additional equipment and support (including heated simulator hoses, and interferent detecting software) were promised by the company, however was never received.

The overall performance of the instrument would be classified "unsatisfactory".

Vermont Department of Health Laboratory Requisition

From: A. Bolduc Date: 3/22/10

Shipped To: 195 Colchester Avenue
Burlington VT 05401

Date Required: 9/1/10

Date: _____

Requisition # _____

Department ID #: _____

Program Code # _____

Fund Code # _____

Approved by HS Administrator _____

Item	Quantity	Unit	Description: Give complete description	Catalog #	Object Code	Total
	80	ea	External USB Card Reader	E-SEEK 250		$52,000.00

Vendor Name NPAS, Inc

DEPT/PROGRAM CODES DataMaster 3420021211 39461 PERCENTAGE 100%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 0%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 0%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 0%

Approved by Date:

(If over $1,000)
Authorized by Laboratory Director

Date:

From: John Fusco [jd@npas.com]
Sent: Friday, May 02, 2008 11:14 AM
To: Drawbaugh, Bob
Subject: Conversation
Bob

Scott is somewhat ahead of us on a method of making better use of the data without the need to revamp your Host Database.

You are presently able to off load the data into a thumb drive and reload it into a pc. The difficulty is in coming up with a friendly format so that you can import this into an excell spreadsheet or something similar. He is working on a routine that will allow this data to be put into a format that will allow this transition and will be assigning the project to the engineer that we are bringing on. Hopefully he will be starting within the next week or so and this project will be the first he will tackle after all the familiarity needs are done. This will take a month or two, but we should have it resolved at that point. I'll have it sped up as much as possible, but I can't detail Scott or Steve to it with all the other projects they have going on. There will be no cost associated with this as we need it for everyone, regardless.

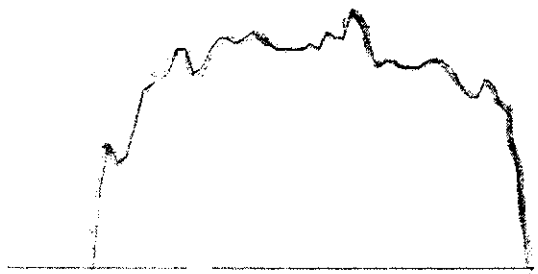
I have asked him to modify the DataMaster code to make data collection default to the off position. This will happen soon and we can talk next week about how to get these installed. I may need a listing of the instruments you wish to update. Your only cost will be the tech time to burn the proms. That shouldn't take much more than 3 or 4 hours and we can simply swap the EPROMs since they are reusable.

I thank you for your usual patience and cooperation and your continued patronage.

John Fusco
National Patent Analytical Systems, Inc.
jd@npas.com
Phone 419+526-6727 Fax 419+526-9446

From: John Fusco [jd@npas.com]
Sent: Friday, September 07, 2007 3:27 PM
To: Drawbaugh, Bob

DataMaster
DMT ®
NPAS -- Mansfield, OH



DataMaster
DMT ®
NPAS -- Mansfield, OH

SUBJECT TEST - 11/14

Version [illegible]
DATAMASTER code: [illegible]

Date: 12-02-2005
Time: 15:48:12

SUBJECT NAME: [illegible]
LICENSE #:
STATE ISSUED:
DOB: [illegible]

OPERATOR NAME: [illegible]
CERTIFICATE #:

OFFICER NAME:
ARREST LOCATION:
ARREST DATE: [illegible]

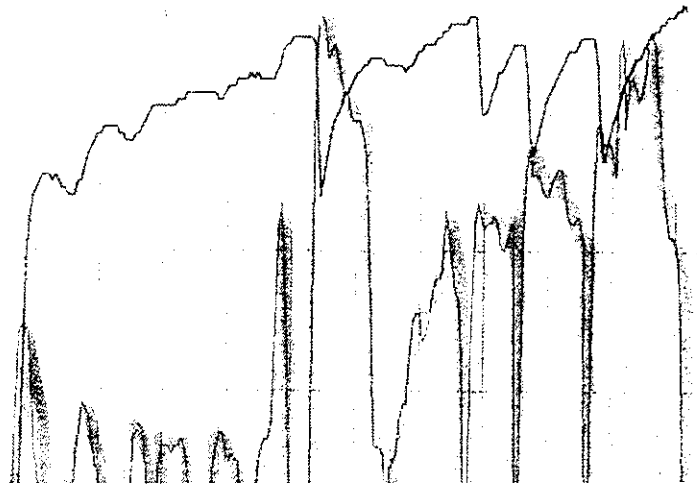
Normal = 0.000 g/210L

BLANK TEST	[illegible]	[illegible]
EXTERNAL STANDARD	[illegible]	[illegible]
EXTERNAL STANDARD	[illegible]	[illegible]
BLANK TEST	[illegible]	[illegible]
SUBJECT SAMPLE	[illegible]	[illegible]
BLANK TEST	[illegible]	[illegible]

Intoxicated Subject RC

Air Flow —

Alcohol Concentration

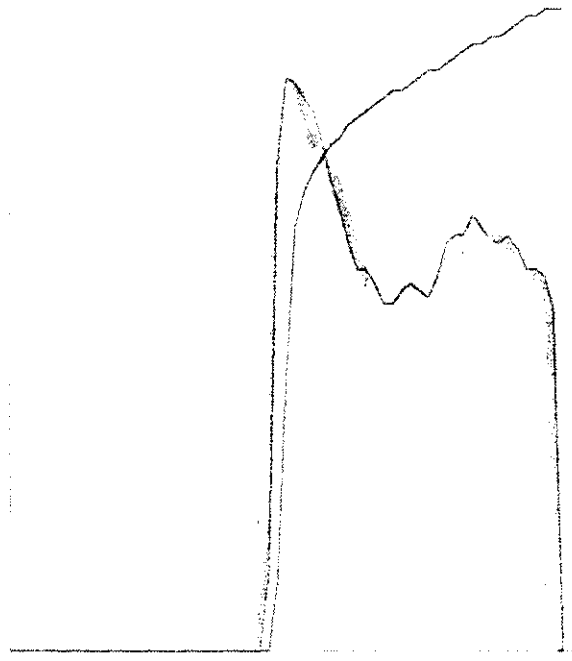


DataMaster
DMT ®
NPAS -- Mansfield, OH

DMT®

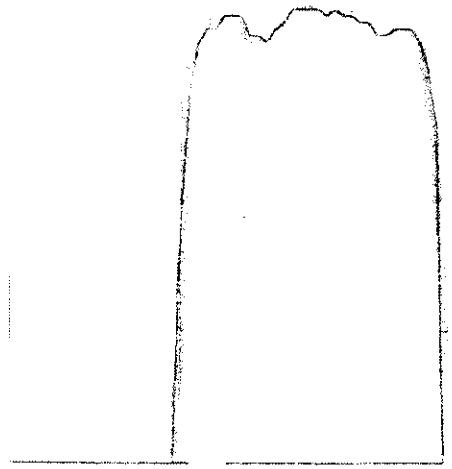
NPAS -- Mansfield, OH

PUMPOUT TEST #9



DataMaster
DMT ®
NPAS -- Mansfield, OH

SUBJECT TEST #3



DataMaster

DMT®

HPAS -- Mansfield, OH

SUBJECT TEST #4

[illegible]

BLANK TEST [illegible]

INTERNAL STANDARD [illegible]

EXTERNAL STANDARD [illegible]

BLANK TEST [illegible]

SUBJECT SAMPLE [illegible]

BLANK TEST [illegible]

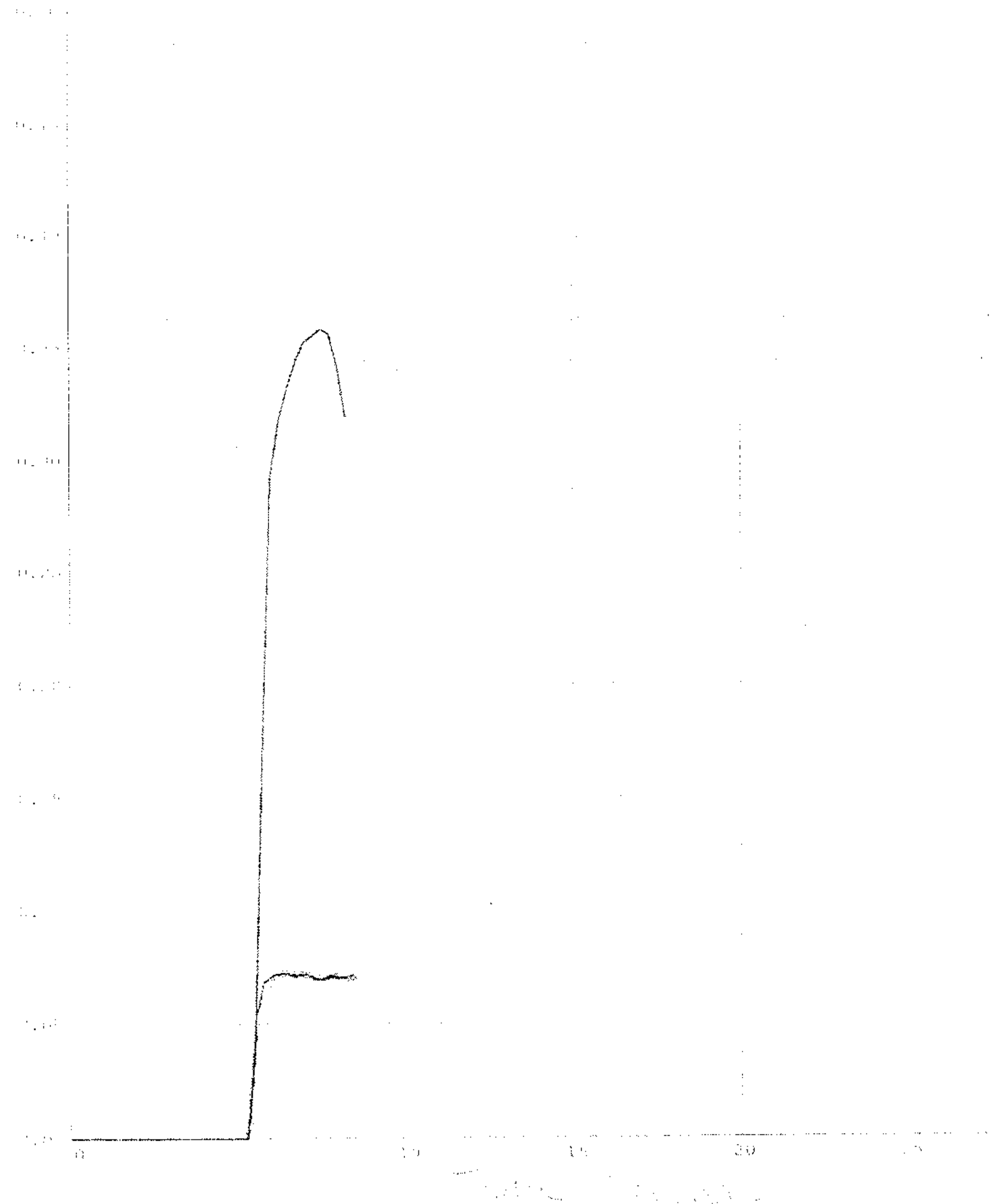
Air flow [redacted]

Concentration [illegible]

"Invalid Sample"

Test fail due to [illegible]

[illegible]



DataMaster
DMT ®
NPAS -- Mansfield, OH

DMT Data Collection Options

OPTION	Positive Impact	Negative Impact
1. Collect/ save no data [basic function to generate a test report requires data to be saved for a short period of time but can be erased shortly after a report is printed.]	By not collecting any data we will probably maintain the level of discovery requests that we have now, maybe a slight increase in the beginning. We will not need resources to sort or maintain individual breath test and instrument error data. Agencies will not have extra responsibilities in terms of discovery requests	*Disadvantages* are obviously a lack of information on how the instruments are performing in the field re: individual breath tests.. We will be asked in testimony regarding the field performance of the instruments and will have no direct knowledge. Paper copies of certification, installation, AnnualPreventiveMaintenance and Routine PerformanceChecks will need to be maintained. Statistical evaluation of these data will have to be performed on the data following data entry into an appropriate software package requiring data entry resources.
2. Collect/save only certification parameters and test data	Certification test information will be available for DM agencies to provide as discovery if needed.(We currently provide these documents) Saving theses processes will allow us to use the certification protocol already outlined by this program which would automate our testing processes assuring consistency in the manner in which the process is performed, generate performance criteria pass/fail information and generate a report. Would allow certification information to be printed on the ticket reducing the number of issues requested in discovery requests.	The time savings on having DM agency provide this type of discovery is minimal. Still no information regarding field performance of the instruments creating need for more extensive testimony to support the validity of a test result.
3. Collect/save certification, installation test data	Certification and installation test information will be available for DM agencies to provide as discovery if needed.(We currently provide these documents) This information can be immediately available to the DM supervisor in cases of trouble shooting. Saving theses processes will allow us to use the protocols already outlined by this program which would automate our testing processes, generate	The time savings on having DM agency provide this type of discovery is minimal. Still no information regarding field performance of the instruments creating need for more extensive testimony to support the validity of a test result.

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	pass/fail information and generate a report. Would allow certification and installation information to be printed on the ticket reducing the number of issues requested in discovery requests.	
4. #3 + Routine Performance Check [RPC] test data	Certification, installation and RPC test information will all be available for DM agencies to provide as discovery if needed.(We currently provide these documents) This information can be immediately available to the DM supervisor in cases of trouble shooting. Saving theses processes will allow us to use the protocols already outlined by this program which would automate our testing processes, generate pass/fail information and generate a report. Mandatory criteria will be setup for RPC as to when they need to be performed including reminders and an automatic "Out of Service" if not performed. This itself will reduce the amount of follow-up reminders to law enforcement agencies and make the process more consistent. It would also reduce the defense challenge re: untimely performance checks as related to validity of test results.	The time savings on having DM agency provide this type of discovery is minimal. Still no information regarding field performance of the instruments
5. #4 + status/error codes or descriptions	As for above. Information regarding error messages and maintenance will be available at DM agency as well as at VDHL. DM agency could provide more complete response to discovery requests. We will have some information as to how the instruments are performing in the field.	The discovery request volume will be the same for these two scenarios as if we were saving all of the data but the information available for us to review will be limited. We will be unable to generate lost tickets.
6. #5 + any other maintenance test data	; Information regarding error messages and maintenance will be available at DM agency as well as at VDHL. DM agency could provide discovery. We will have some information as to how the instruments are performing in the field .	The discovery request volume will be the same for these two scenarios as if we were saving all of the data but the information available for us to review will be limited. We will be unable to generate lost tickets.

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7. #6 + selected breath test data – not identifying subject	Field performance of the instruments will be available for review. Information regarding breath volume and test graphs will be available. We may be able to compile data regarding DUI statistics in Vermont that was previously unavailable. We will be able to support testimony which is currently somewhat speculative with hard data. Discovery requests can be pushed to the DM agency. DMT can provide cumulative test record reports directly or by exporting to another software package.	Discovery request will be the same as if we were collecting all of the information but finding the correct tests may become difficult without case information. Lost tickets will not be able to be regenerated. All tests generated over past 6months or more may be requested. Would not be able to sort test records by case
8. #6 + all breath test data	Field performance of the instruments will be available for review. We may be able to compile data regarding DUI statistics in Vermont that was previously unavailable. We will be able to support theories that we currently testify about with hard data. Discovery requests can be pushed to the DM agency. Lost tickets will be able to be generated.	Discovery load will return to the days prior to turning off the memory function of the current DataMaster although this may be offset with the DM agencies providing the discovery responses.
DMT Data Handling Options		
1. store all collected data on each instrument only	The advantage would be that the health department would not have to generate discovery requests at all. Reprint info directly from DMT.	The information is of no real use to the DM agencies (with the exception of reprinting tickets) and so would only be provided to attorneys at which point we would be asked to interpret. We would be unable to maintain any information regarding field performance of the instrument without having the agencies print reports from the DMT and mail them to us. That makes organization very difficult. Copious

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		amounts of data to be stored on DMT computer.
2. upload data to on-site computer	Allows the DM agency to organize and sort data including sending electronic copies to us. Discovery can be provided by the DM agency. This also allows the DM agency to maintain a separate database pertaining to their own statistics regarding DUI. This could be combined with other agencies in collaboration, for example the Burlington Metro Area. Allows for archiving, saving space on DM.	Requires an additional duty for the DM supervisors or others at DM sites.
3. upload data to storage device, e.g. external hard disk; CD/data DVD; memory stick	DM agency can provide discovery requests. Allows for archiving, saving space on DM.	Sending information to the health department will take more effort on both the agency and the health department parts. Information cannot be easily sorted by the agency.
4. manually upload data to central computer data base located within VDoH	The health lab will have all of the information fromthe field which can be sorted and analyzed.	The health department will have to provide all discovery requests. DM agencies will not have immediate access to data once uploaded. VDH will be responsible for regenerating missing tickets. Requires backup/ archive of data.
5. automatically upload data to a central computer and publish to a web site.	All information regarding DMT performance and individual test data are available to all parties; minimizes paper files; minimizes request for discovery reports/documents.	Requires website development and ongoing maintenance

Contributor 1.

In my opinion, not turning on the memory would be a mistake. The DMT can collect much more information than the current DataMaster. This additional information not previously available to us would be beneficial to have as well as the visual representation of breath alcohol content and breath flow. It would enable us to support theories that we already testify about currently with hard data.

Once memory is used to the point of scenario #5, discovery frequency will be the same as if we were collecting all of the information. If we are willing to go as far as scenario #5 then we will only be hurting ourselves by not collecting all of the available information.

Contributor 2.My recommendation for the DMT is to collect all information available and to handle it via Data Handling Option #2.

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Simulator vapor result (for one or two tests) and status messages, if existing.

Other Documents: these documents include in-house procedures and training materials. They are available for review by appointment at the VDHL during regular business hours. Training manuals have been provided to the State's Attorney's Office.

- Infrared Breath Testing Device DataMaster Student Manual [12/07]
- Infrared Breath Testing Device DataMaster Student Manual; DataMaster DMT Addendum [5/08]
- DataMaster DMT Instrument Supervisor and Record Administrator Manual [D-Alc-011] [8/08]
- VDHL DataMaster DMT technical reference notebook
- DataMaster power-up procedure [performed on receipt of instrument] [P-Alc-116]
- DataMaster DMT Annual Preventive Maintenance procedure [P-Alc- 120]
- Simulator Solution Preparation procedure [P-Alc-204]
- Pre-Deployment Testing Information - This is a binder of all information and test data generated for each individual instrument previous to calibration and certification for evidential use.
  The raw data are available electronically but conversion and interpretation are required. A spiral-bound book containing this information has been provided to the State's Attorney's Office for each instrument deployed in the county.

From: Bolduc, Amanda
Sent: Friday, July 31, 2009 9:06 AM
To: 'dmr@npas.com'
Cc: Lab_Alc
Subject: DMT Error Codes

Dave, here are our comments regarding the error code explanations. I have made notations in red. Are you sure this list is complete? I think there may be a few missing. I made notes at the end of a few others I believe we have generated in the past. Maybe these are no longer used? Please advise.

/T DMT Explanation of Status C...

ABolduc

Amanda Bolduc
Vermont Department of Health Laboratory
195 Colchester Ave
PO Box 1125
Burlington, VT 05402-1125
(802) 863-7413
(802) 863-7632 (fax)

The "Filter Agreement" concept as it pertains to analytical principles incorporated in the DataMaster DMT breath test instrument.

Calibrating a DMT involves introducing known standards of water vapor and either wet or dry ethanol vapor. The purpose is twofold. First, the error in quantifying the ethanol, pre-calibration, as evidenced in the discrepancy between the known ethanol concentration (Ca) and that analyzed and displayed by the instrument upon introduction of that standard, is normalized to the known (Ca) by dividing the known value (Ca) into the reported (resulting in CAL). Second, by knowing that a true ethanol standard, free of any potential interfering substances, is introduced during the calibration procedure, the instrument determines the relative measurement of the ethanol sample when analyzing the vapor at each of the three narrow bandpass filter wavelengths (ref: a21, a31), thereby allowing subsequent analyses to be qualified as either containing or being free of interfering substance(s).

Water vapor is introduced so as to allow the amount evident at each of the filter wavelengths to be subtracted from all analyses thereafter. This water vapor concentration will be constant regardless of the ethanol concentration of the sample so a straight subtraction will suffice (ref: b1, b2, b3).

For discussion of the basic concept, we will discuss using 2 of the three filters (3.44 and 3.37 microns) and calibrating with water and ethanol. As stated above, water is introduced to determine the amount to be subtracted at 3.44μ and 3.37μ. These will not be the same value as water absorbs IR energy to a greater degree at 3.37μ than at 3.44μ. With the water content accounted for, the relative absorption by ethanol between 3.37μ and 3.44μ is determined. Since ethanol absorbs approximately 20% more IR energy at 3.37μ than that at 3.44μ, we would expect a21 to be in the neighborhood of 1.2 as a21 is defined as the value of ethanol measured at 3.37μ with respect to that at 3.44μ. As each IR filter has slightly different transmittance characteristics (center wavelength and half peak bandwidth), albeit within the published filter specifications, each instrument must be calibrated to determine the specific calibration factors for the use of those filters in a specific instrument. Those calibration factors are the characteristic values for that particular instrument. The a21 value is used on subsequent analyses do determine the presence (or absence) of an interfering substance.

This is done by first determining the concentration of the sample as analyzed at the 3.44μ filter. The 3.37μ filter is then inserted into the optical path and the sample is analyzed at that wavelength. The result analyzed at 3.44μ is multiplied by a21. The result at 3.37μ is subtracted from this product of the value at 3.44μ x a21. If the difference is ≤ the filter agreement threshold (default 0.005) then the sample is said to be free from an interfering substance. This is because the relative absorption seen between 3.37μ and 3.44μ for this sample is the same as that for the ethanol standard used to calibrate the instrument. When a substance other than ethanol, but still absorbing IR energy in the 3.4μ region, is added to

the sample, a disagreement becomes evident in the value at 3.37μ with the result from 3.44μ x a21. The greater the concentration of the interference, or the less like ethanol (a21), the greater the discrepancy becomes.

As some allowance for variation between the values (3.44μ x a21 and 3.37μ) is necessary due to expected variability in any measurement (+/-0.002 for each measurement) the question arises as to at what level the discrepancy becomes significant and scientifically and legally of importance. The limit for the filter agreement threshold is 0.005. What this means is that once the discrepancy between the value at 3.37μ and the value at 3.44μ x a21 ≥ 0.005, the sample is said to contain an interfering substance.

The following is an explanation of what might happen if the sample were to contain acetone in addition to ethanol. Lets assume the ethanol concentration of the sample as measured at 3.44μ was 0.160. Knowing that ethanol absorbs approximately 20% more energy at 3.37μ, we would anticipate the result at 3.37μ to be 0.160 X 1.2 = 0.192. If acetone is also a component of the sample, it would be useful to know the characteristics of acetone at 3.44μ and 3.37μ. Test data has shown that acetone absorbs 2 to 3 times the amount of IR energy at 3.37μ than it does at 3.44μ (again, independent of the concentration). For this discussion we will use a 2:1 ratio. Assume a contribution of 0.010 at 3.44μ. Since we expect in this example 2X that concentration at 3.37μ, the value would be 0.020. If we add these concentrations of acetone to the ethanol portion we would see:

Reading at 3.44μ = 0.100 (etoh) + 0.010 (ace) = 0.110 total concentration

Reading at 3.37μ = 0.120 (etoh) + 0.020 (ace) = 0.140 total concentration

When multiplying the result at 3.44μ by a21 we see:

0.110 x 1.2 = 0.132

Comparing this to the result at 3.37μ we see:

0.132 – 0.140 = -0.008

This exceeds the "filter agreement threshold", (preset at 0.005) by 0.03. This test would result in the message of "interference detected" if the software were designed to handle the discrepancy in this manner.

If the contribution by acetone were 0.005 at 3.44μ in the above example, the amount at 3.37μ would be expected to be 2X or 0.010. This, added to our base ethanol concentration would yield:

Reading at 3.44 = 0.100 (etoh) + 0.005 (ace) = 0.105 total concentration

Reading at 3.37 = 0.120 (etoh) + 0.010 (ace) = 0.130 total concentration

When multiplying the result at 3.44μ by a21 we see:

0.105 x 1.2 = 0.126

Comparing this to the result at 3.37μ we see:

0.126 – 0.130 = -0.004

This would be below the set filter agreement threshold (0.005) an in this instance, the final result would be a reported ethanol concentration of 0.105.

The explanation above is repeated except filter 2 (3.37μ) is replaced with filter 3 (3.50μ) and a21 is replaced with a31.

The filter agreement threshold will be adjustable. This settable level (2-10) implying, when referring to g/210l units of measurement, an adjustable threshold of between 0.002 g/210L and 0.010 g/210L will pertain to the difference in the calculated concentration at filter 1 (3.44μ) and filter 2 (3.37μ) or the difference in the calculated concentration at filter 1 and filter 3 (3.50μ). The selected filter agreement threshold will be the absolute value for sample concentrations measured at filter 1 of up to 0.100 g/210L. For values at or greater than 0.100 g/210L the threshold will be a percentage of the analyzed concentration at 3.44μ:

Filter Agreement if 3.44μ ≥ 0.100 g/210L = (Int x 0.001) x (value at filter 1 / 0.100)
Where Int is the set filter agreement threshold value from 2 to 10

If the difference when comparing the results of 3.44μ and 3.37μ OR when comparing the results of 3.44μ and 3.37μ exceeds the threshold, a non-specific to ethanol sample is said to have occurred.

An additional filter agreement threshold calculation will also be employed where the threshold outlined above is not exceeded but the difference in the 2 calculated differences (filter 1-2 and filter 1-3) when combined reaches a level defined as:

For filter 1 measured concentrations of up to 0.100 g/210L
Diff filter 1-2 plus Diff filter 1-3 ≥ (Int x 0.001) x (7/5)
For concentrations measured at filter 1 of 0.100 g/210L or greater,
(Int x 0.001) x (value at filter 1 / 0.100) x (7/5)

See table below for example of thresholds with INT set to 5

Value @ Filt 1	Filter I1-2I Diff	Filter I1-3I Diff	Combined Diff I1-2I/I1-3I
0.025	0.0050	0.0050	0.0070
0.050	0.0050	0.0050	0.0070
0.075	0.0050	0.0050	0.0070
0.100	0.0050	0.0050	0.0070
0.150	0.0075	0.0075	0.0105
0.200	0.0100	0.0100	0.0140
0.250	0.0125	0.0125	0.0175
0.300	0.0150	0.0150	0.0210
0.350	0.0175	0.0175	0.0245
0.400	0.0200	0.0200	0.0280
0.450	0.0225	0.0225	0.0315
0.500	0.0250	0.0250	0.0350
0.550	0.0275	0.0275	0.0385
0.600	0.0300	0.0300	0.0420

Enter Int Thrshld (2-10)
5

Separate worksheet allows changing Threshold setting to see limits.

National Patent Analytical Systems, Inc.

Explanation of the INVALID SAMPLE message and the DataMaster DMT

12/14/07

Measurements of the alcohol concentration during breath sample delivery are taken every 250 milliseconds (4x per second).

A "positive slope" is defined as a comparison of a 2 consecutive point average to the previous where the trend is not in the negative direction. Both conditions of a positive change and no change are considered a positive slope.

The message "INVALID SAMPLE" will be produced while the instrument detects at least the minimum rate of airflow during sample delivery if:

There are three consecutive comparisons of two point averages where the trend is in the negative direction (values are decreasing) after seeing first a minimum of six positive comparisons of two point averages.

Or

Any final result $\geq$ 0.060 g/210 l is less than 95% of any previous high reading during that successfully delivered sample.

Or

Any final result $\geq$ 0.003 g/210 l but $<$ 0.060 g/210 l is lower than any previous high reading during that successfully delivered sample by at least 0.003 g/210 l.

DMT Memory Options

#1. *Advantages:* By not collecting any data we will probably maintain the level of discovery requests that we have now, maybe a slight increase in the beginning. We will not need resources to sort or maintain data. Agencies will not have extra responsibilities in terms of discovery requests. *Disadvantages* are obviously a lack of information on how the instruments are performing in the field. We will be asked in testimony regarding the field performance of the instruments and will have no direct knowledge.

#2, #3, #4: To me all three of these scenarios provide the same advantages and disadvantages.

Advantages: Certification, installation and RPC test information will all be available for DM agencies to provide as discovery if needed.(We currently provide these documents) This information can be immediately available to the DM supervisor in cases of trouble shooting. Saving theses processes will allow us to use the protocols already outlined by this program which would automate our testing processes, generate pass/fail information and generate a report. Mandatory guidelines will be setup for RPC as to when they need to be performed including reminders and an automatic "Out of Service" if not performed.

Disadvantages: The time savings on having DM agency provide this type of discovery is minimal. Still no information regarding field performance of the instruments.

#5 and #6: To me, both of these scenarios provide the same advantages and disadvantages.

Advantages: Information regarding error messages and maintenance will be available at DM agency as well as at VDHL. DM agency could provide discovery. We will have some information as to how the instruments are performing in the field.

Disadvantages: The discovery request volume will be the same for these two scenarios as if we were saving all of the data but the information available for us to review will be limited. We will be unable to generate lost tickets.

#7: *Advantages:* Field performance of the instruments will be available for review. Information regarding breath volume and test graphs will be available although we will not be able to sort by case. We may be able to compile data regarding DUI statistics in Vermont that was previously unavailable. We will be able to support theories that we currently testify about with hard data. Discovery requests can be pushed to the DM agency.

Disadvantages: Discovery request will be the same as if we were collecting all of the information but finding the correct tests may become difficult without case information. Lost tickets will not be able to be generated.

#8: *Advantages*: Field performance of the instruments will be available for review. We may be able to compile data regarding DUI statistics in Vermont that was previously unavailable. We will be able to support theories that we currently testify about with hard

data. Discovery requests can be pushed to the DM agency. Lost tickets will be able to be generated.

Disadvantages: Discovery load will return to the days prior to turning off the memory function of the current DataMaster although this may be offset with the DM agencies providing the discovery.

In my opinion, not turning on the memory would be a mistake. The DMT can collect much more information than the current DataMaster. This information has never been available to us and it would be beneficial to have as well as the visual representation of alcohol and breath flow. It would enable us to support theories that we already testify about currently with hard data.

Once memory is used to the point of scenario #5, discovery frequency will be the same as if we were collecting all of the information. If we are willing to go as far as scenario #5 then we will only be hurting ourselves by not collecting all of the available information.

Data Handling Options:

1. The advantage would be that the health department would not have to generate discovery requests at all, however, the information is of no real use to the DM agencies (with the exception of reprinting tickets) and so would only be provided to attorneys at which point we would be asked to interpret. We would be unable to maintain any information regarding field performance of the instrument without having the agencies print reports from the DMT and mail them to us. That makes organization very difficult.

2. Allows the DM agency to organize and sort data including sending electronic copies to us. Discovery can be provided by the DM agency. This also allows the DM agency to maintain a separate database pertaining to their own statistics regarding DUI. This could be combined with other agencies in collaboration, for example the Burlington Metro Area.

3. DM agency can provide discovery requests. Sending information to the health department will take more effort on both the agency and the health department parts. Information cannot be easily sorted by the agency.

4. The health lab will have all of the information in the field to be sorted and analyzed. DM agencies will not be responsible for Discovery requests however, the health department will have to provide all discovery requests.

My recommendation for the DMT is to collect all information available and to handle it via Data Handling Option #2.

Evaluation of Breath Testing Instruments

This study will evaluate the performance of the NPAS DataMaster DMT®, the CMI Intoxilyzer® 8000, and the Drager Alcotest® 7110 MKIII-C instruments at various alcohol concentrations, with emphasis on 0.08g/210L and 0.16g/210L. In addition, the responses to mouth alcohol and potentially interfering compounds will be tested.

The Vermont Department of Health Laboratory of the Agency of Human Services oversees blood and breath alcohol testing activities in Vermont. Currently the National Patent Analytical Systems, Inc. BAC DataMaster® is the only breath alcohol analyzer approved by the VDHL.

Criteria that will be used in the evaluation of the instruments include accuracy, precision, linearity, response to mouth alcohol, and response to various potentially interfering agents. Emphasis will be placed on alcohol concentrations of 0.08g/210L and 0.16g/210L. Other issues that will be taken into consideration are ease of use, durability, and overall performance during experimental data collection .

Method:

- Precision:
  - Ethanol solutions of 0.08g/210L and 0.16g/210L will be analyzed (n=10), using the supervisor mode.
- Accuracy
  - Solutions at levels of 0.02, 0.04, 0.08, 0.16 and 0.40 g/210L will be analyzed (n=10) as calibration checks
  - All solutions will be verified by gas chromatography with flame ionization detection.
- Linearity
  - The five aqueous ethanol solutions are prepared over a concentration range that will provide vapor concentrations from 0.02 through 0.4g/210L. The ensuing results should form a straight line with all observed values within +/- 5% of the known value and with a Correlation Coefficient of at least 0.99
- Interference
  - The mouth alcohol detection system will be tested (n=10) Each test will be taken at 3-5min intervals until such time as no mouth alcohol is detected
  - 0.04% Methanol in water
  - 0.04% Isopropanol in water
  - 0.05% Acetone in water
  - 0.02% Acetone in 0.08% Ethanol
  - 0.05% Acetone in 0.08% Ethanol
  - 0.1% Acetone in 0.08% Ethanol
  - 0.04% Methanol in 0.08% Ethanol
  - 0.04% Isopropanol in 0.08% Ethanol

DMT Volume Measure Testing

S/N_____

Pressure: _____

Target Volume	Flow (lpm)	Time (sec.)	1	2	3	4	5	6	7	Ave.	% s.d.
1.5 L	8.2	11									
	15	6									
	22.5	4									
2.0 L	10	12									
	15	8									
	24	5									

Flow rate +/- _____ time +/- _____

DataMaster DMT

Human Subject Testing Data

Bob Drawbaugh, Chief
Toxicology Program
VT Department of Health

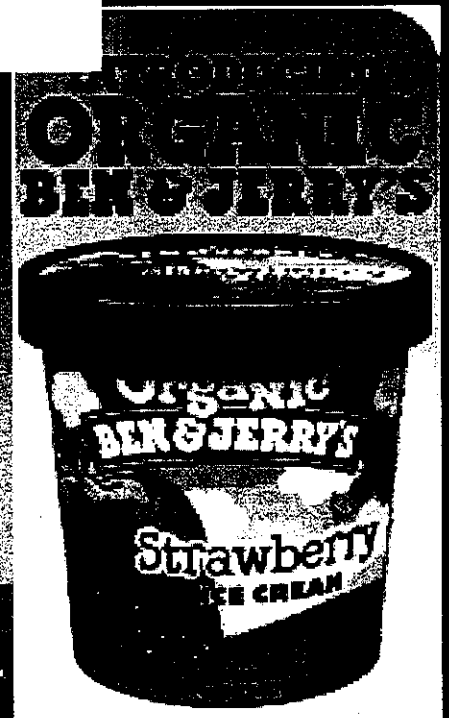
VERMONT
DEPARTMENT OF HEALTH

Alcohol Section

- blood alcohol [and other volatiles]
- breath alcohol
  - Instrument certification, maintenance, repair
  - officer training – operators and DM Supervisors
- consultation and testimony

Alcohol Section

The staff:



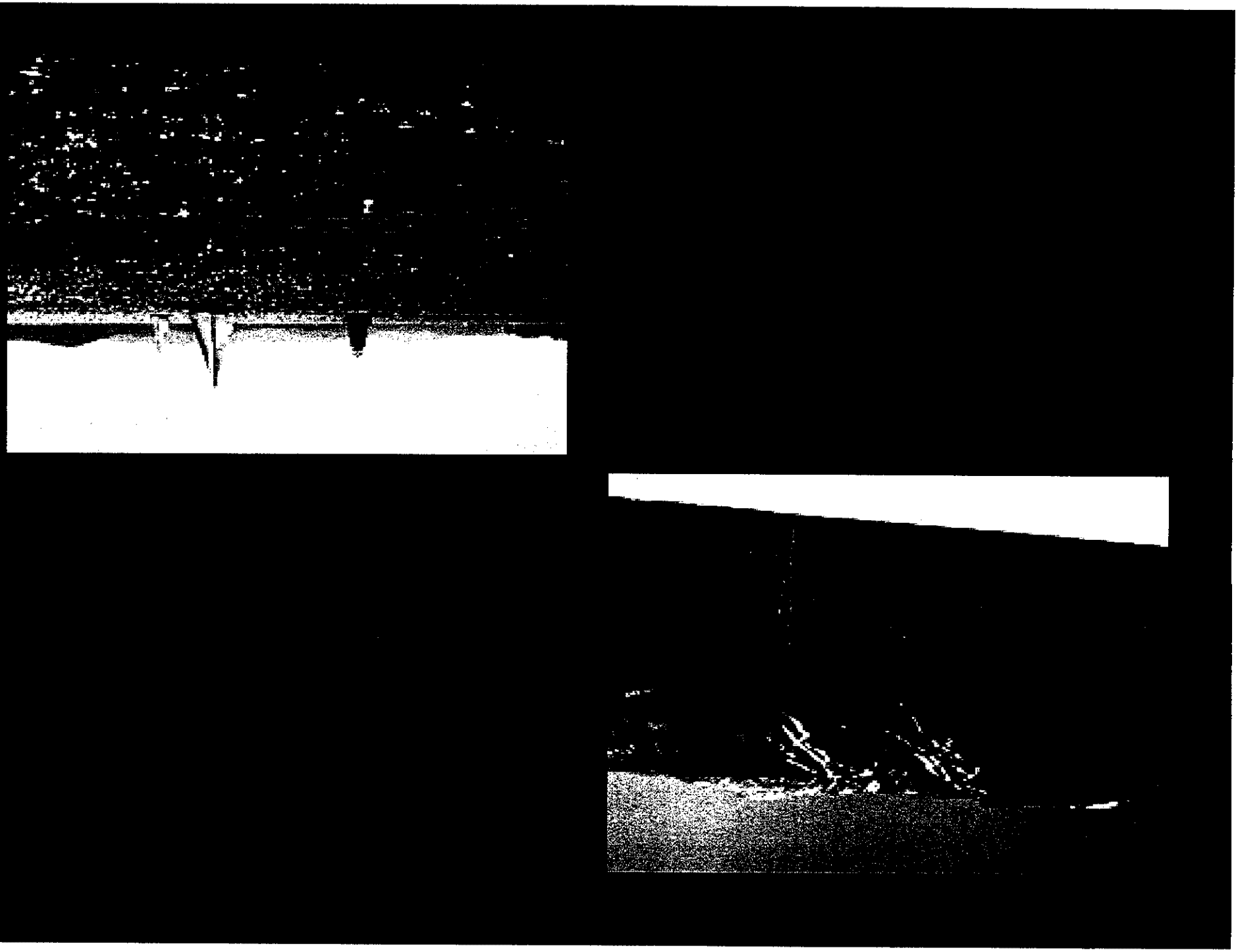
The Earth will thank you.

Your body will thank you.

Your belly will thank you and send love letters.

DMT Testing

- Initial check-out upon receipt [power up]
- Accuracy, precision, linearity
- Interference sensitivity
- Sample acceptance, RFI, breath volume check
- heated zone monitoring
- software protocol check

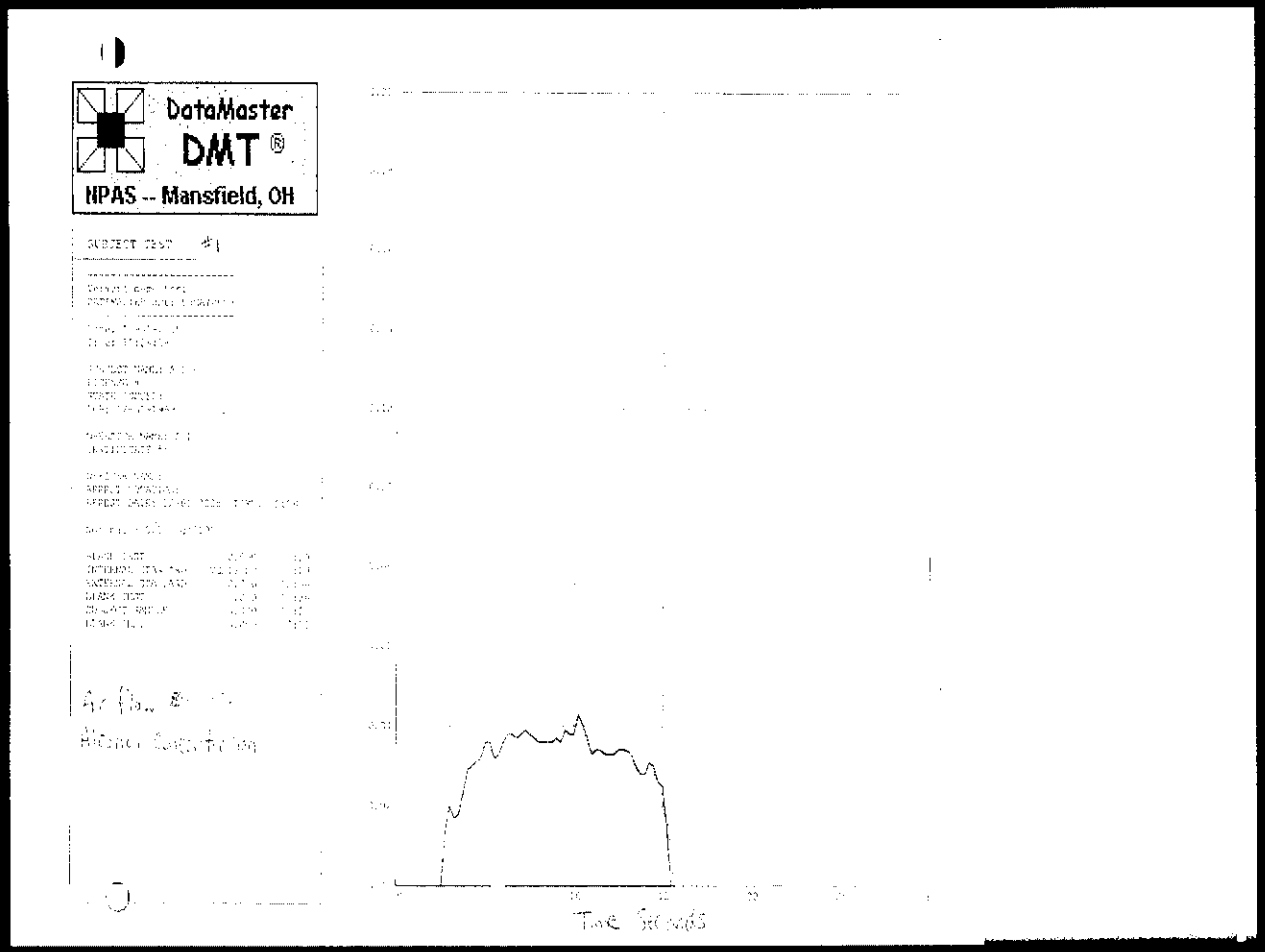


DMT Testing

Human Subject Testing

- volunteer subjects, target conc. 0.10 or lower
- includes non-drinkers, mouth alcohol, non-routine provision of breath
- Some time profile testing

DMT Testing – 12/05



DataMaster DMT

Human Subject Testing Data

Bob Drawbaugh, Chief
Toxicology Program
VT Department of Health

Alcohol Section

- blood alcohol [and other volatiles]
- breath alcohol
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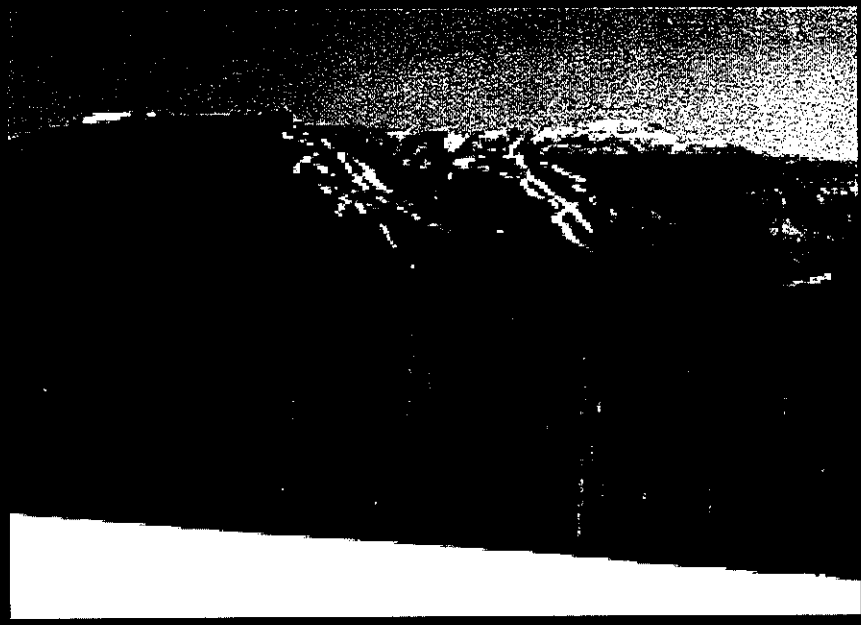
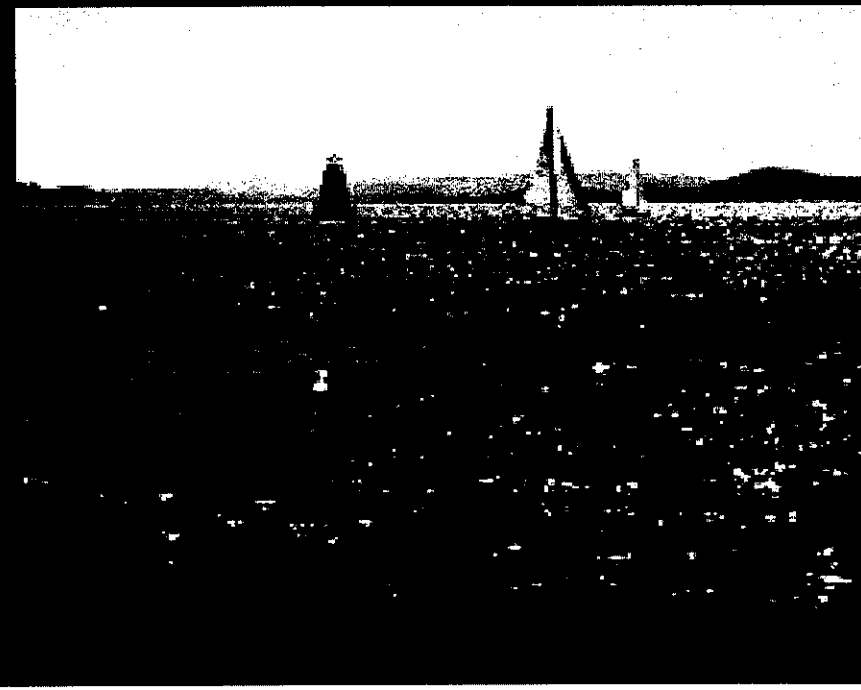
- Accuracy, precision, linearity
- Interference sensitivity
- Sample acceptance, RFI, breath volume check
- heated zone monitoring
- software protocol check





DMT Testing

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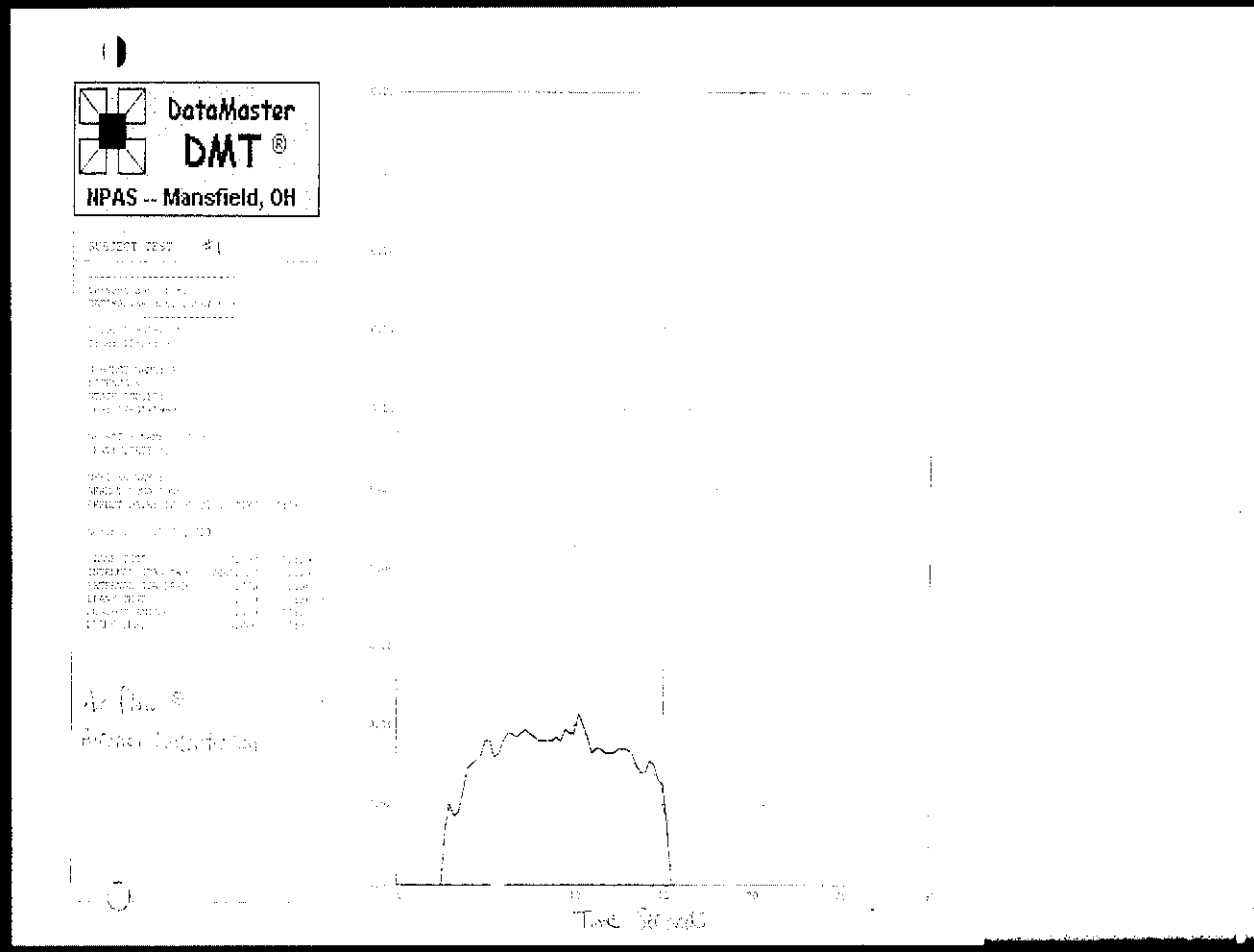
- includes non-drinkers, mouth alcohol, non-routine provision of breath
- Some time profile testing

DMT Testing – 12/05



National Patent Analytical Systems, Inc 10/31/07

Voltage Settings / Adjustments on the DataMaster DMT

Since the early days of the Verifier and the DataMaster, a primary objective was to maximize optical efficiency in the system so as to obtain maximum detector signal without overdriving the IR source or the detector's thermo-electric cooler. If either or both required substantial electric current to operate within acceptable parameters, excessive heat and undue wear and tear on circuit components would be the result. Systemic optical efficiency was the result of a number of variables.

First and foremost is the narrow bandwidth of the IR filters which is something that will not be compromised as it affords us the specificity to ethanol that the DataMaster is known for.

The sensitivity of a given PbSe detector to the amount of incident IR energy is also a big consideration. Many improvements have been made by the various manufacturers of the detectors to improve this sensitivity.

The efficiency of converting electrical energy (current/power) into IR energy by the source is another variable. For years, a simple kanthal coil has been used in the DataMaster with good reliability and decent efficiency. Very recently, a source has been specified for use, primarily in the DMT that incorporates a parabolic back reflector which greatly increases the amount of IR energy out with a given amount of power applied.

The remaining variables deal primarily with alignment, cleanliness and other related issues. System noise is kept to a minimum if ample signal can be obtained reducing the amount of gain (electronic) needed to produce the required signal levels. If gain must be increased due to low signal, this would also increase the amount of system noise.

Voltage settings in DataMasters up to this point have involved, among other things, setting the detector bias voltage to 120 Vdc, setting the cooler to the voltage level stated on the tag attached to the detector cable and then adjusting the IR source intensity to the needed level such that the output detector voltage (MTR) was somewhere around 0.000. The 120 Vdc bias is required with a 3mm x 3mm detector element. The cooler voltage was the level required in order to operate the detector at a temperature around zero degrees C. The IR source voltage would be a level that varied from a low level of around 1.5 Vdc in a very efficient system to something around 3.5 Vdc or more in a system with low efficiency. If the source voltage would approach 4 Vdc, this would be considered high.

Voltage settings in the DMT have been changed slightly due to a noticeable increase in efficiency across the board. Additionally, a change to a 2 mm x 2 mm PbSe detector was made due to the fact that the 2 mm x 2 mm detector is more readily available and there is no measurable difference in the sensitivity or performance in the two detectors. The 2 mm x 2 mm detector requires only a bias voltage of 80 Vdc.

In the DMT, aside from the RFI sensitivity adjustment, there are only three voltage settings that can be made and this is done using digital potentiometers via the Technician Mode screen. These are settings for the detector bias, TE cooler and IR source (lamp) intensity. The procedure for setting these voltages is as follows:

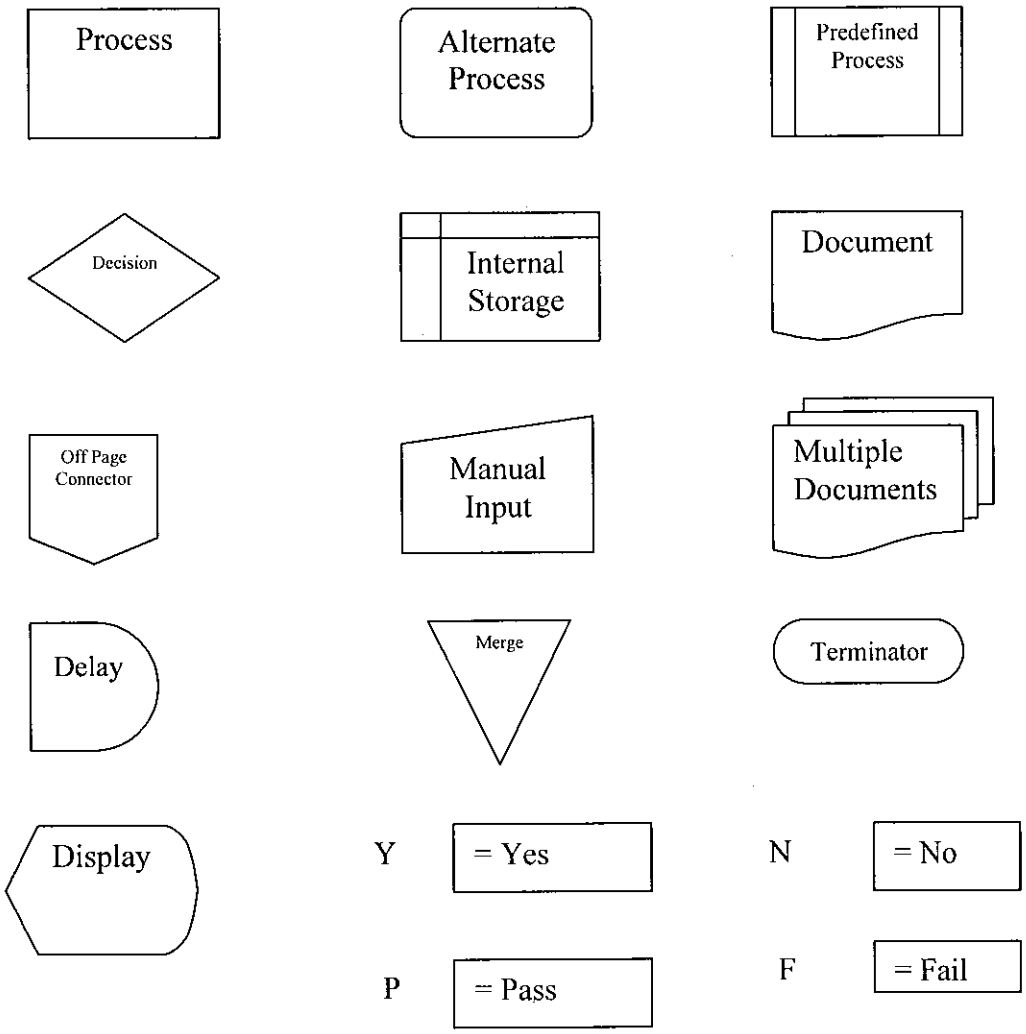
Set the bias to 80 Vdc for a 2 mm x 2 mm detector or 120 Vdc if 3 mm x 3 mm. This information should appear on the tag attached to the detector cable. The tolerance on this setting is ±5 Vdc.

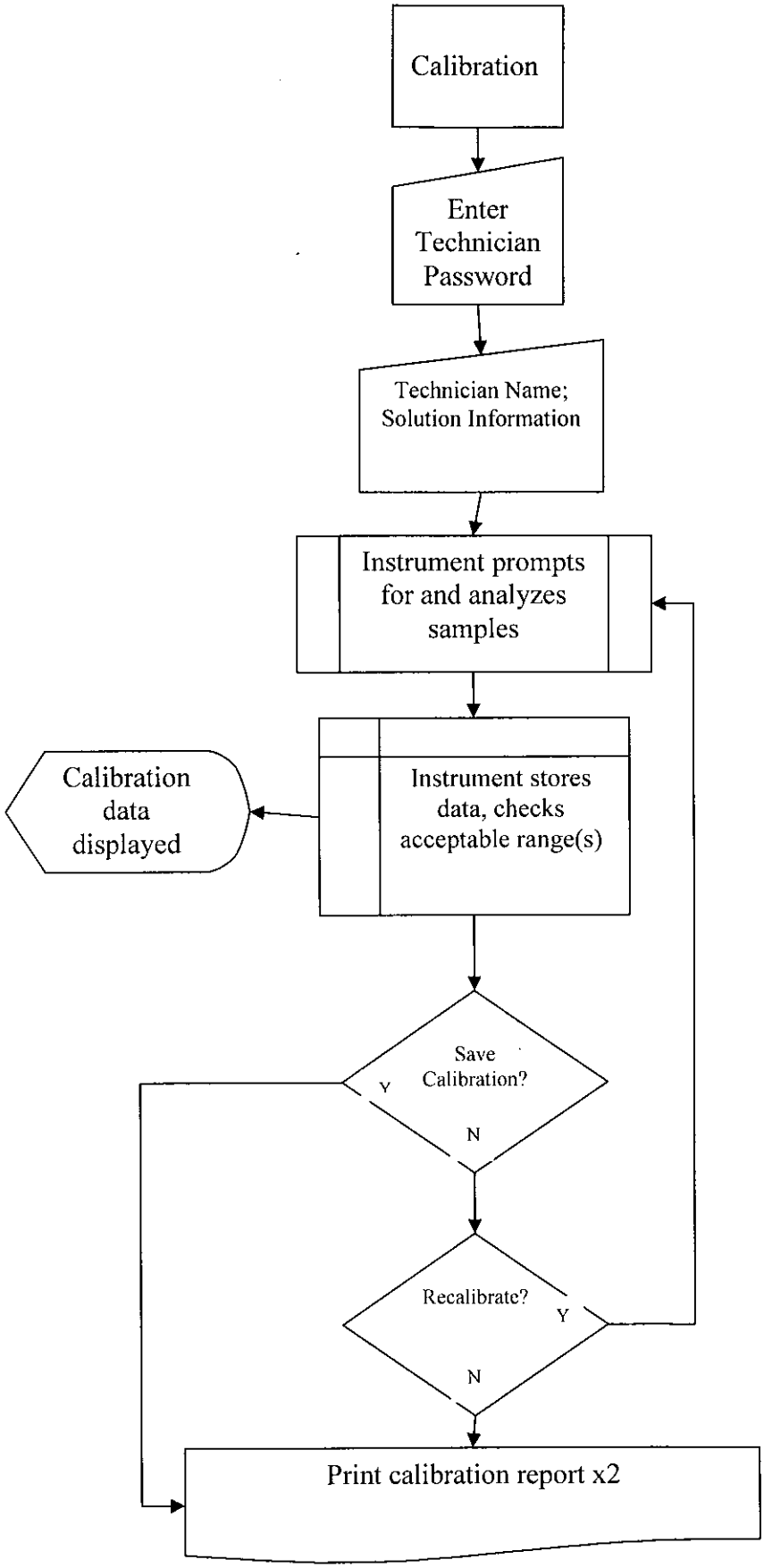
Start with a cooler voltage of 1.5 Vdc and a lamp voltage of 1.5 Vdc. See what the detector voltage is at these settings. If the detector voltage is more negative negative than -.100, contact NPAS. If it is between -0.100 and +0.100, leave these settings as is. If the detector voltage is > 0.100, increase the cooler voltage no more than 0.1 Vdc. If this is enough to bring the detector voltage down to the acceptable range, save these settings. If not, increase the Lamp voltage no more than 0.1 Vdc. If this is enough to bring detector voltage within range, save these settings. If not, go back to the cooler and increase it no more than, 0.1 Vdc. Continue this alternating the increase of no more than 0.1 V dc of the cooler and lamp voltages until the detector voltage is within range. Remember to save these settings.

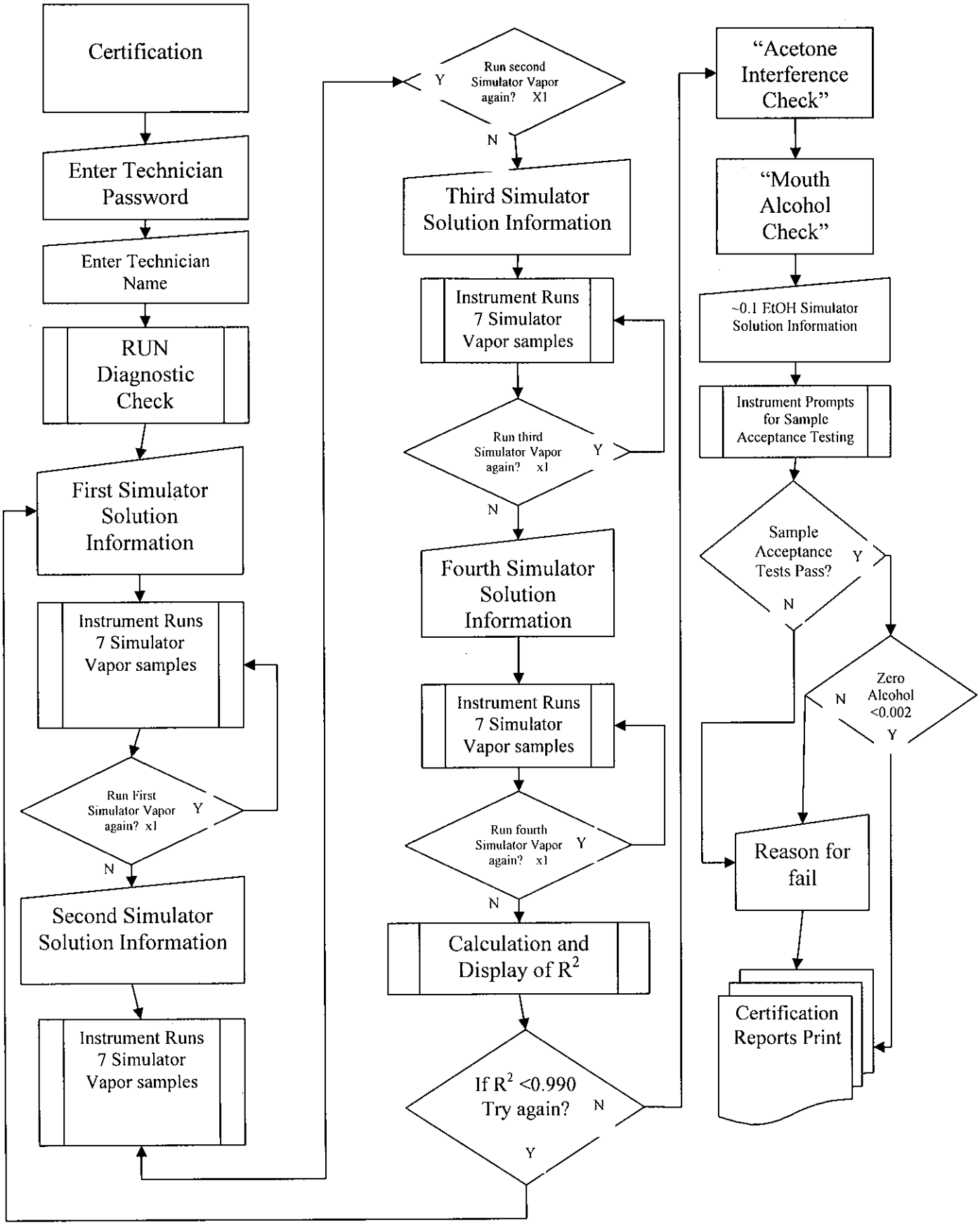
If you get to the point that both the lamp and cooler are around 2.0 V dc and the detector voltage is still not down to around zero, increase the lamp only. The maximum allowable lamp voltage for the IR source is 3.0 Vdc. If it is required to set the lamp above 2.6 Vdc to get the detector voltage within range, the unit more than likely requires service.

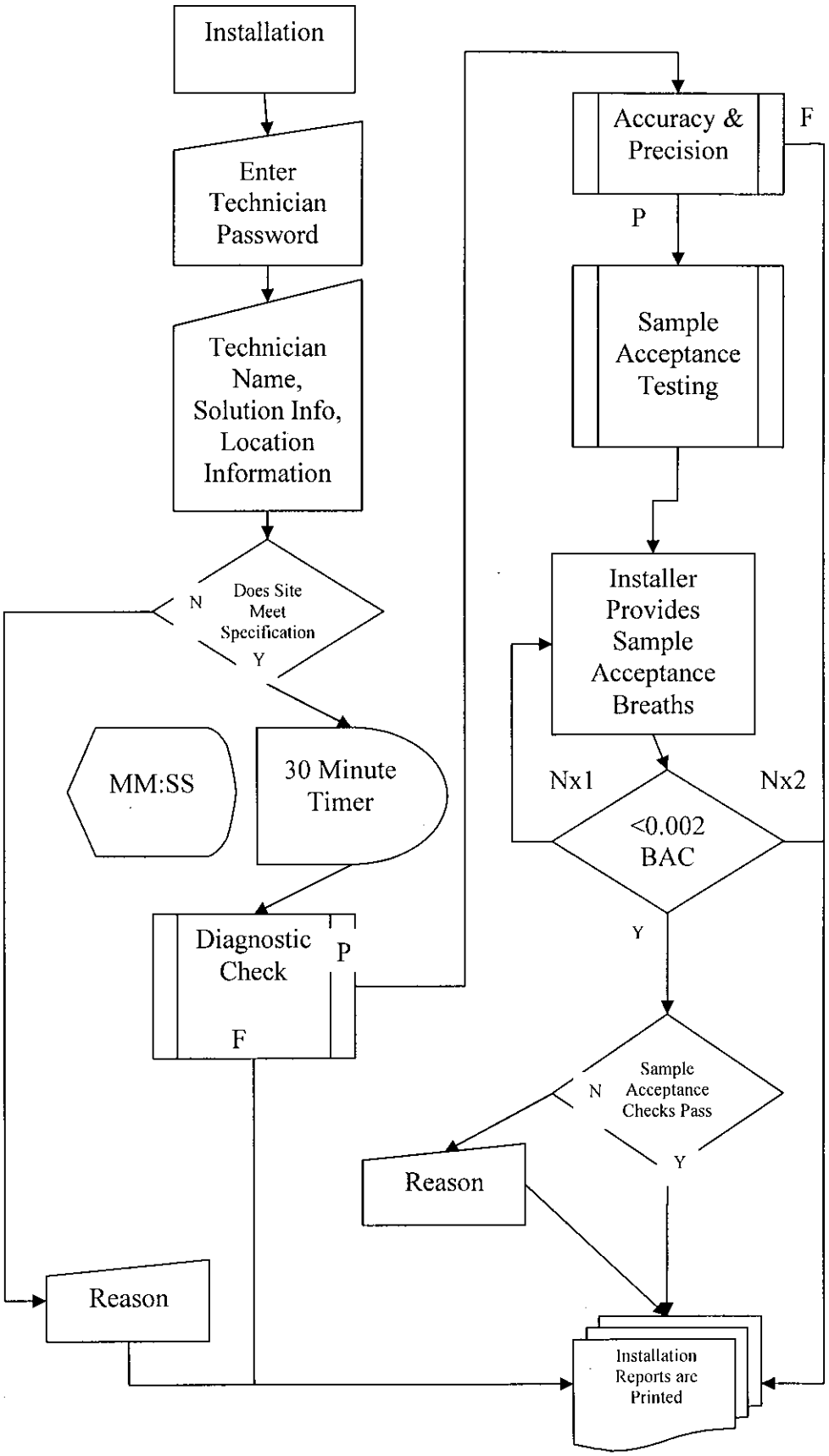
Any questions regarding these instructions can be directed to NPAS at 800-800-8143.

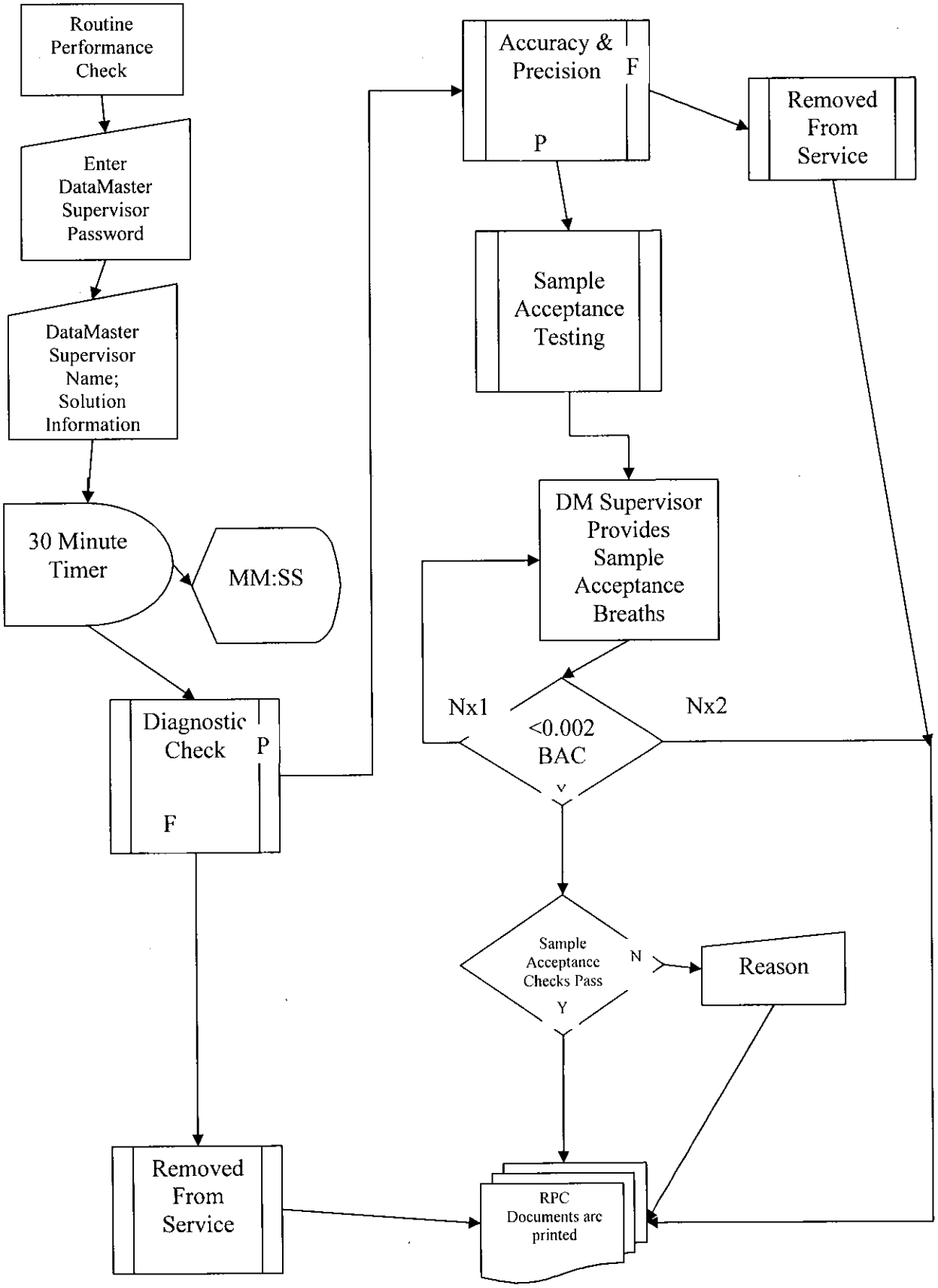
Flow Chart Key

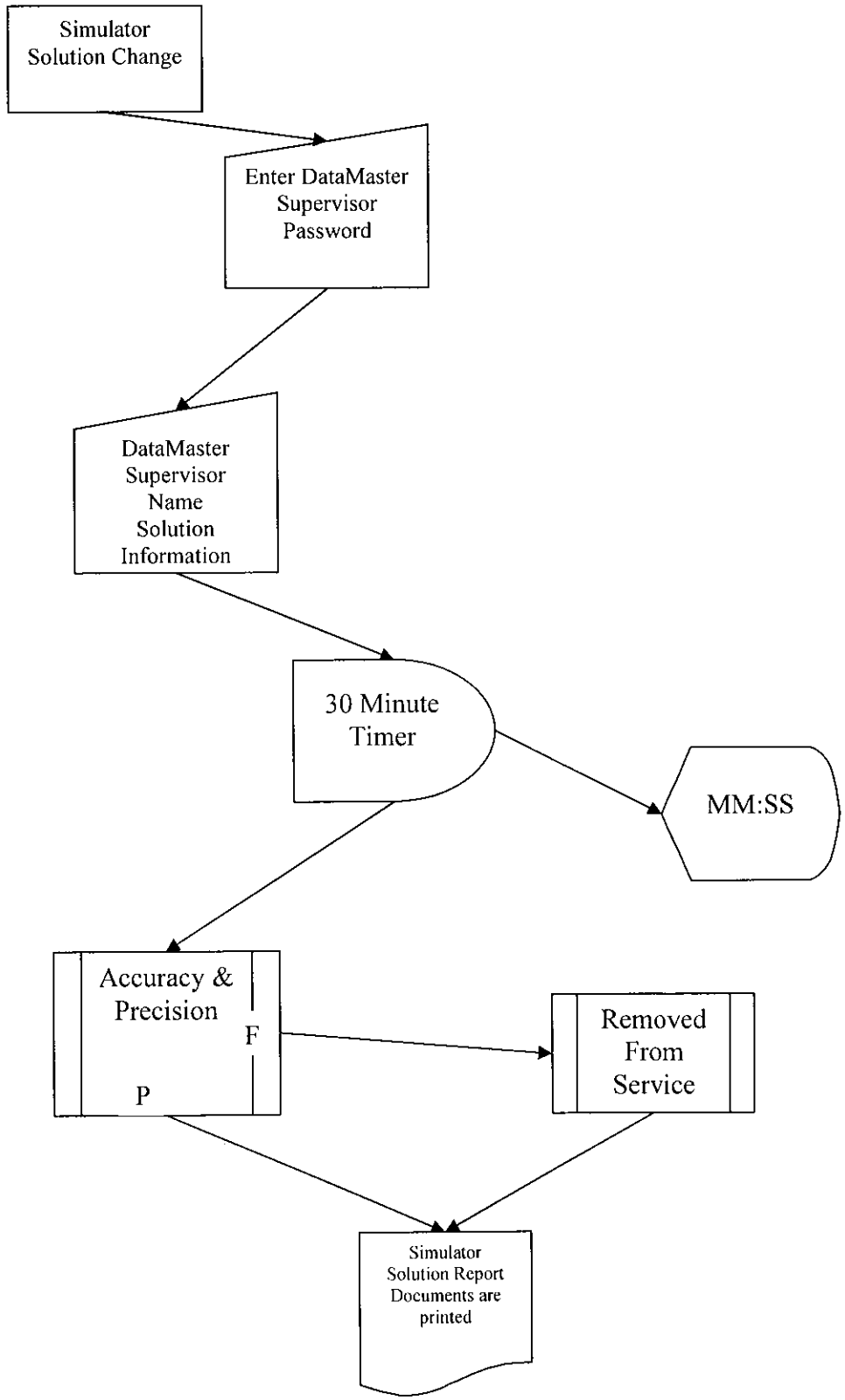


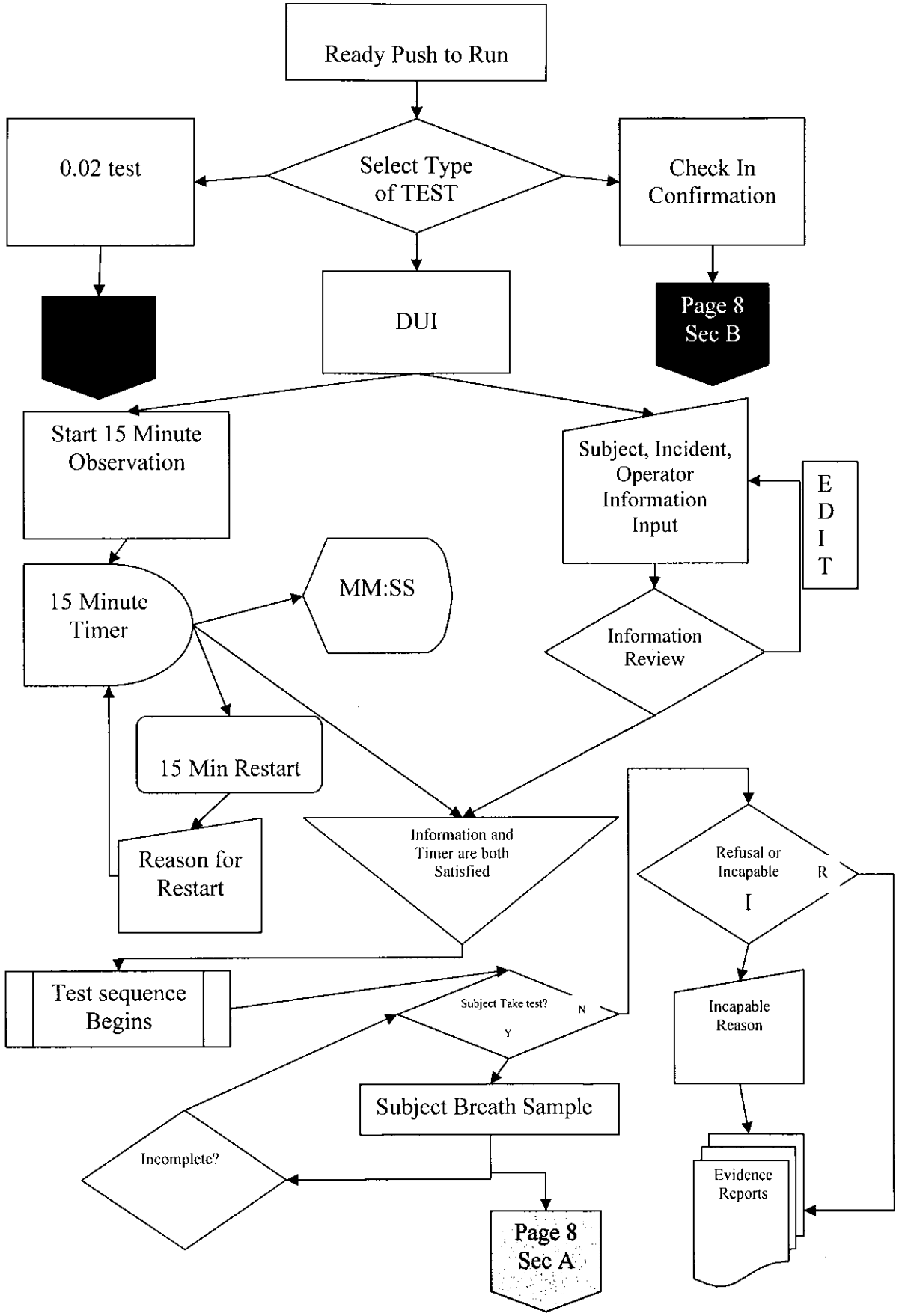

Calibration
Enter Technician Password
Technician Name; Solution Information
Instrument prompts for and analyzes samples
Instrument stores data, checks acceptable range(s)
Calibration data displayed
Save Calibration?
Y
N
Recalibrate?
Y
N
Print calibration report x2

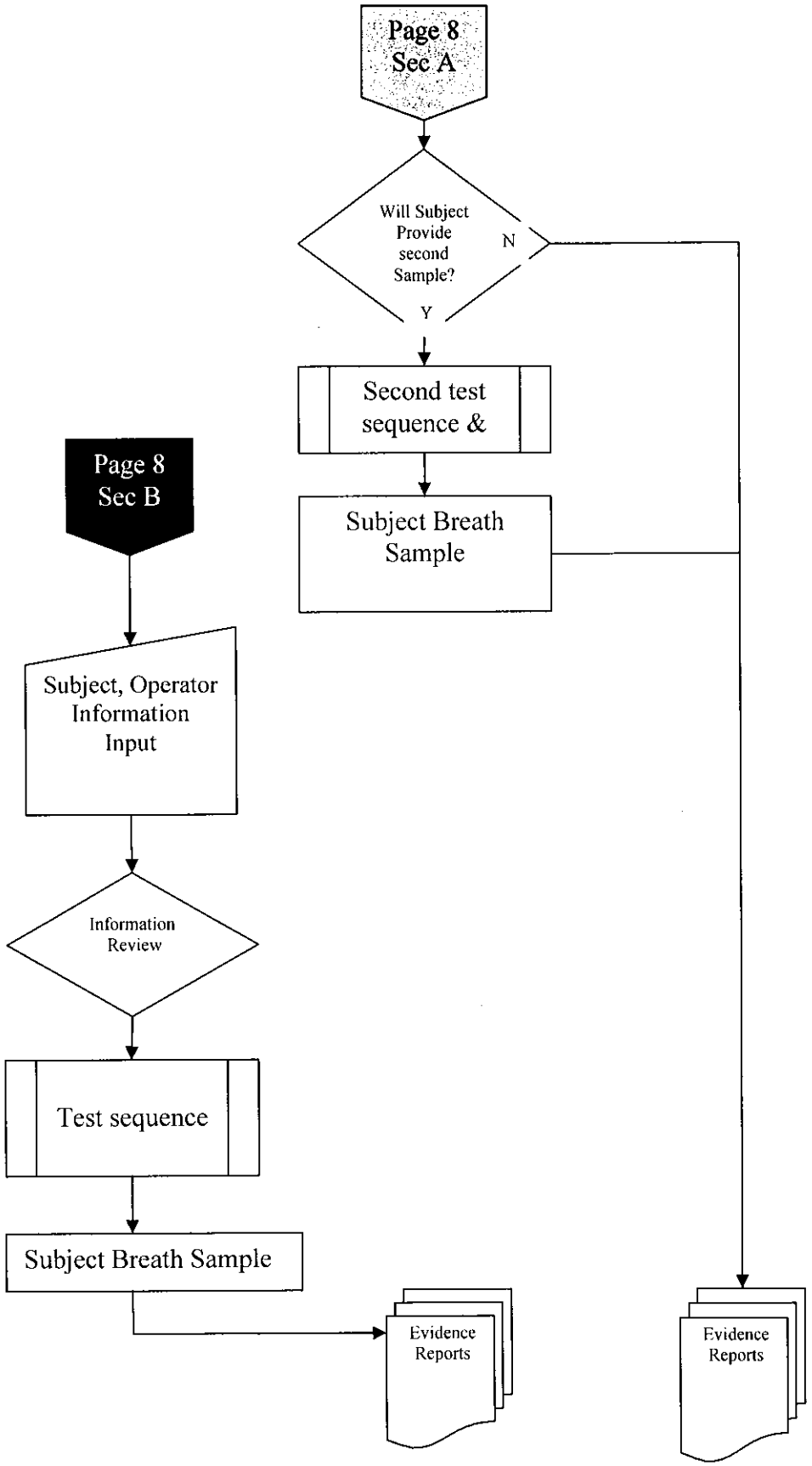

Certification
Enter Technician Password
Enter Technician Name
RUN Diagnostic Check
First Simulator Solution Information
Instrument Runs 7 Simulator Vapor samples
Run First Simulator Vapor again? x1
Y
N
Second Simulator Solution Information
Instrument Runs 7 Simulator Vapor samples
Run second Simulator Vapor again? X1
Y
N
Third Simulator Solution Information
Instrument Runs 7 Simulator Vapor samples
Run third Simulator Vapor again? x1
Y
N
Fourth Simulator Solution Information
Instrument Runs 7 Simulator Vapor samples
Run fourth Simulator Vapor again? x1
Y
N
Calculation and Display of R^2
If R^2 <0.990 Try again?
N
Y
"Acetone Interference Check"
"Mouth Alcohol Check"
~0.1 EtOH Simulator Solution Information
Instrument Prompts for Sample Acceptance Testing
Sample Acceptance Tests Pass?
Y
N
Zero Alcohol <0.002
N
Y
Reason for fail
Certification Reports Print

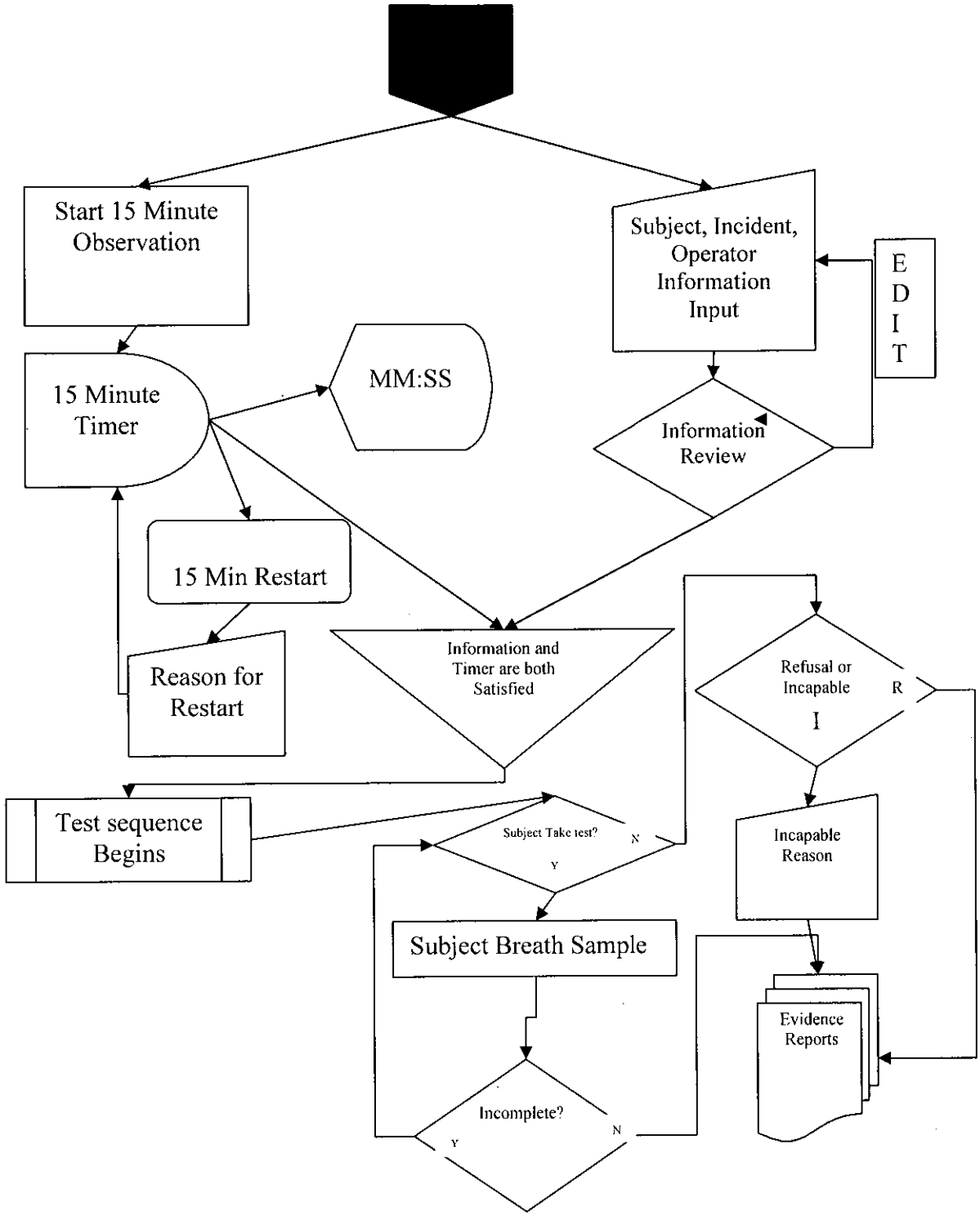

Installation
Enter Technician Password
Technician Name, Solution Info, Location Information
Does Site Meet Specification
N
Y
MM:SS
30 Minute Timer
Diagnostic Check
P
F
Reason
Accuracy & Precision
F
P
Sample Acceptance Testing
Installer Provides Sample Acceptance Breaths
Nx1
Nx2
<0.002 BAC
Y
Sample Acceptance Checks Pass
N
Y
Reason
Installation Reports are Printed

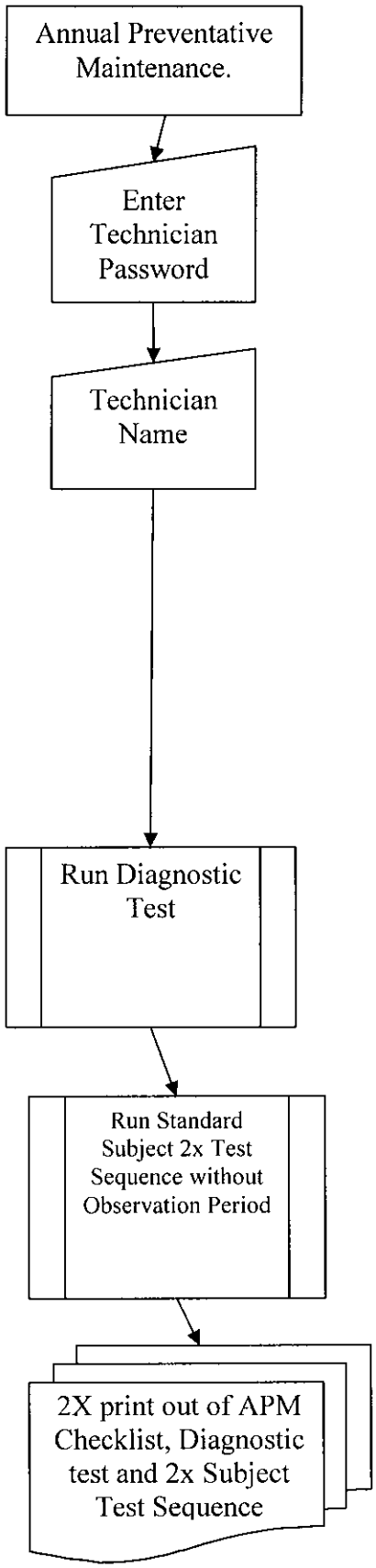

Routine Performance Check
Enter DataMaster Supervisor Password
DataMaster Supervisor Name; Solution Information
30 Minute Timer
MM:SS
Diagnostic Check
P
F
Accuracy & Precision
F
P
Removed From Service
Sample Acceptance Testing
DM Supervisor Provides Sample Acceptance Breaths
Nx1
<0.002 BAC
Nx2
Sample Acceptance Checks Pass
N
Y
Reason
Removed From Service
RPC Documents are printed


Simulator Solution Change
Enter DataMaster Supervisor Password
DataMaster Supervisor Name Solution Information
30 Minute Timer
MM:SS
Accuracy & Precision
F
P
Removed From Service
Simulator Solution Report Documents are printed

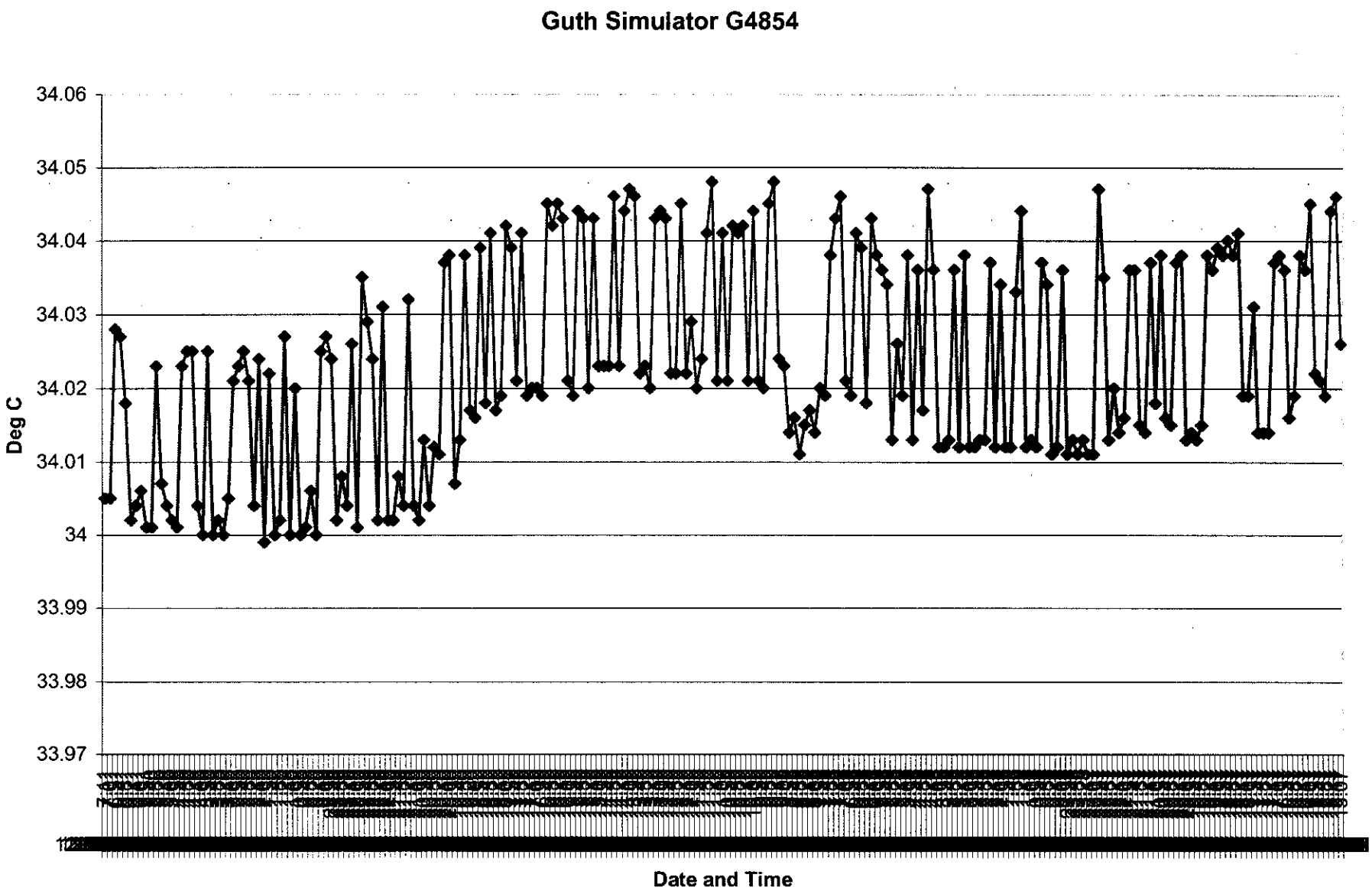

Ready Push to Run
Select Type of TEST
0.02 test
Check In Confirmation
DUI
Page 8 Sec B
Start 15 Minute Observation
Subject, Incident, Operator Information Input
E D I T
15 Minute Timer
MM:SS
Information Review
15 Min Restart
Reason for Restart
Information and Timer are both Satisfied
Refusal or Incapable
R
I
Test sequence Begins
Subject Take test?
N
Y
Incapable Reason
Subject Breath Sample
Incomplete?
Evidence Reports
Page 8 Sec A

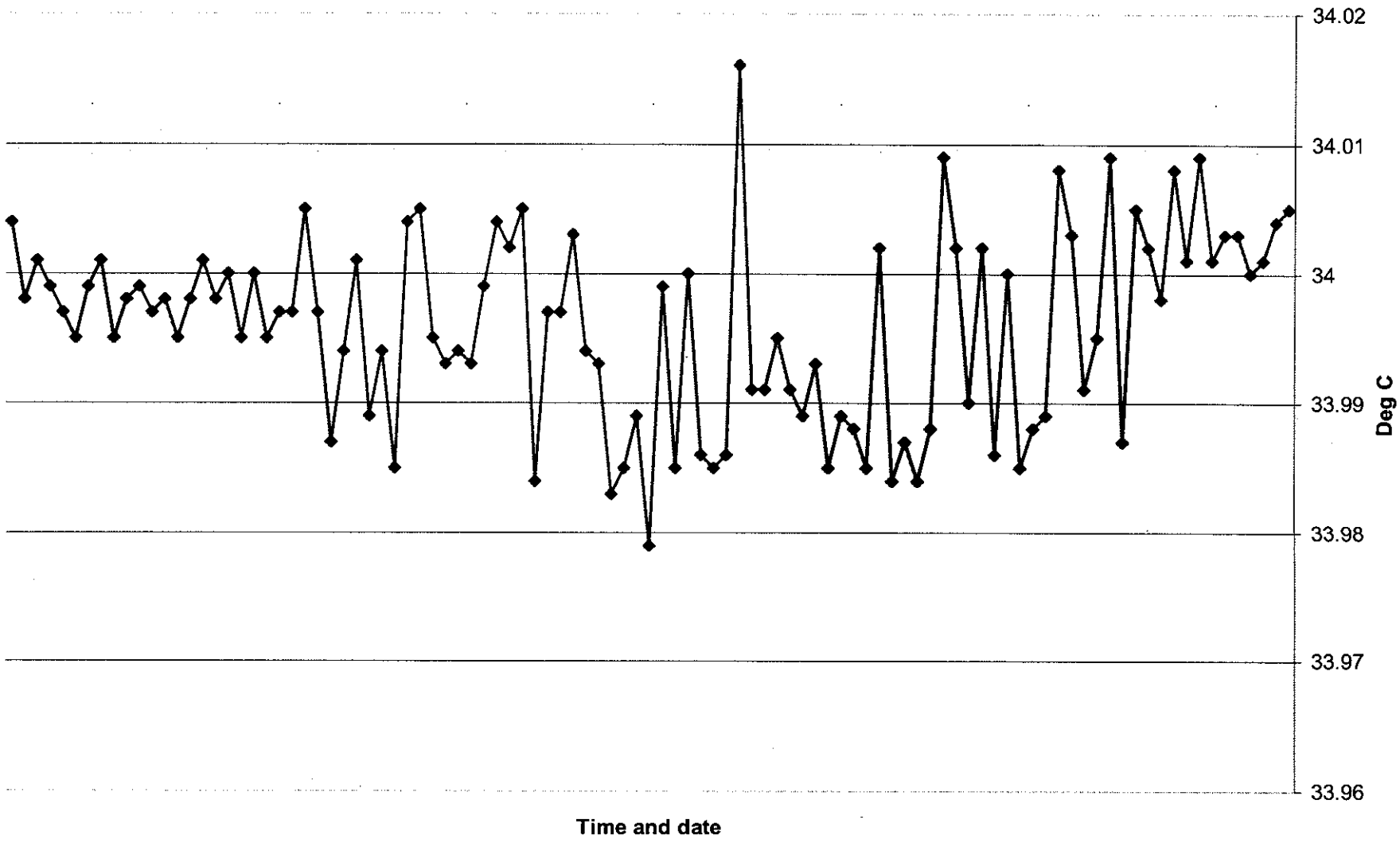

Page 8
Sec A
Will Subject
Provide
second
Sample?
N
Y
Second test
sequence &
Subject Breath
Sample
Page 8
Sec B
Subject, Operator
Information
Input
Information
Review
Test sequence
Subject Breath Sample
Evidence
Reports
Evidence
Reports


Start 15 Minute Observation
Subject, Incident, Operator Information Input
E D I T
15 Minute Timer
MM:SS
Information Review
15 Min Restart
Reason for Restart
Information and Timer are both Satisfied
Refusal or Incapable
R
I
Test sequence Begins
Subject Take test?
N
Y
Incapable Reason
Subject Breath Sample
Evidence Reports
Incomplete?
Y
N


Annual Preventative Maintenance.
Enter Technician Password
Technician Name
Run Diagnostic Test
Run Standard Subject 2x Test Sequence without Observation Period
2X print out of APM Checklist, Diagnostic test and 2x Subject Test Sequence

L/min	seconds	inlet pressure	volume reported	
10	24	20	4.97	
10	24	20	5.01	
10	24	20	5.04	
10	24	20	5	
10	24	20	4.98	
10	24	20	4.97	4.995
10	24	30	5.14	
10	24	30	5.03	
10	24	30	4.93	
10	24	30	5.07	
10	24	30	4.97	
10	24	30	4.95	5.015
10	24	50	4.98	
10	24	50	4.91	
10	24	50	4.96	
10	24	50	5.09	
10	24	50	4.97	
10	24	50	5.09	5


Guth Simulator G4854
34.06
34.05
34.04
34.03
34.02
34.01
34
33.99
33.98
33.97
Deg C
Date and Time


Simulator G10929
34.02
34.01
34
33.99
33.98
33.97
33.96
Deg C
Time and date

From: John Fusco [jd@npas.com]
Sent: Friday, April 24, 2009 2:18 PM
To: Customers
Subject: Huff n' Puff

From: Scott Marhefka [eng@npas.com]
Sent: Friday, June 22, 2007 3:45 PM
To: Bolduc, Amanda
Cc: Drawbaugh, Bob; Richardson, Darcy
Subject: latest updates

Bob,

I am resending this from Wednesday night. I only sent it to Amanda and I received a baby photo today.

Hello Amanda,

The contents of the attached zip file need put onto the DMT. Please call if you need help.

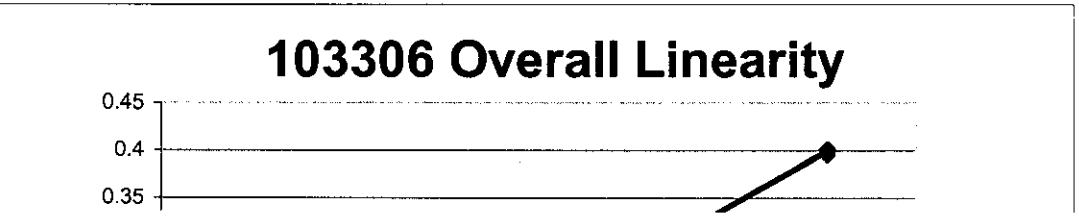
These updates include the addition of ranges to the solution change and beeping when the RFI test starts. I have also included a screen saver that you may or may not want. To see the screen saver, in Setup - Advanced change Idle Time to something other than 0. After Idle Time minutes have passed the screen saver will appear until you press the screen or a key.

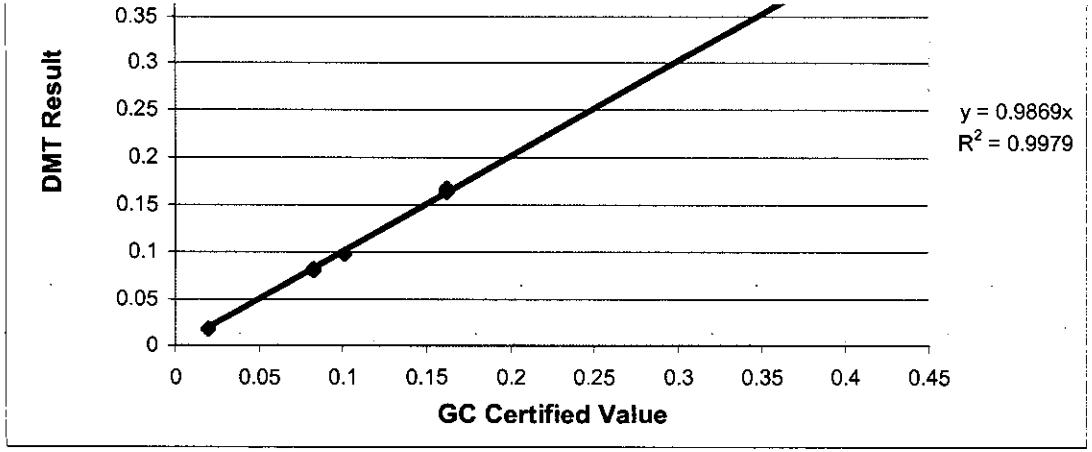
--

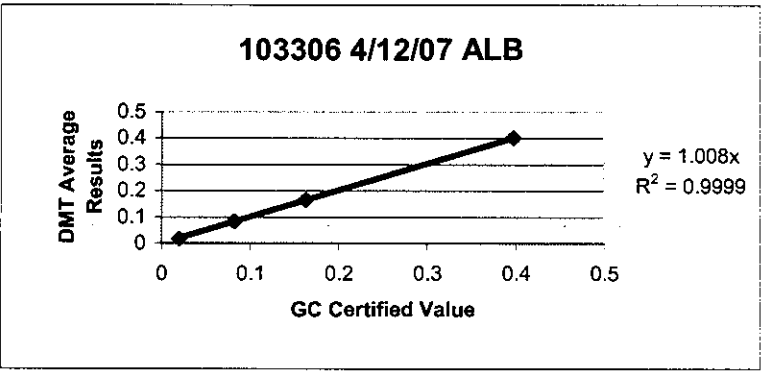
Scott Marhefka
National Patent Analytical Systems
2090 Harrington Memorial Road
Mansfield, OH 44903

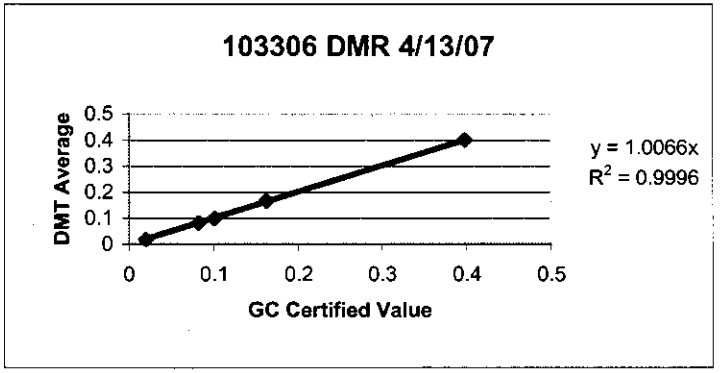
email: eng@npas.com
phone: (419) 526-6727

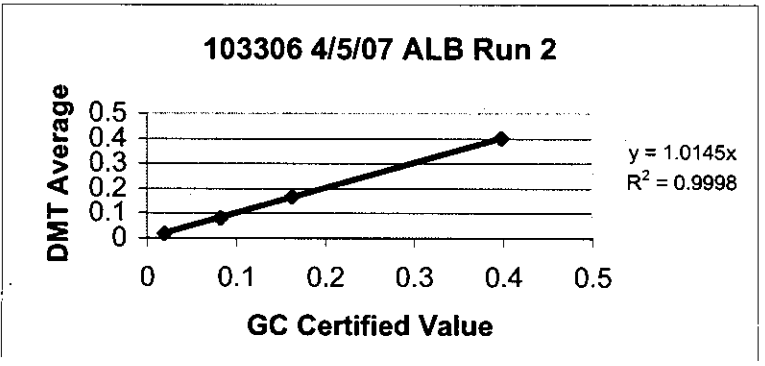
Date	Time	Lot #	GC Value	DMT Avg	Std Dev	Analyst	N=10 for each test
4/4/2007	12:27	07-01-020	0.0196	0.0175	0.0007	ALB	
4/4/2007	12:39	07-01-020	0.0196	0.0172	0.0004	ALB	
4/5/2007	10:11	07-09-080	0.0821	0.0812	0.0004	ALB	
4/5/2007	9:37	07-09-080	0.0821	0.0818	0.0004	ALB	
4/5/2007	11:19	07-08-160	0.162	0.1668	0.0004	ALB	
4/5/2007	11:37	07-08-160	0.162	0.1663	0.0005	ALB	
4/5/2007	12:49	07-03-400	0.3969	0.4024	0.0005	ALB	
4/5/2007	13:19	07-03-400	0.3969	0.4023	0.0008	ALB	
4/12/2007	8:40	07-03-400	0.3969	0.3999	0.0007	ALB	
4/12/2007	9:20	07-08-160	0.162	0.1649	0.0003	ALB	Ran High
4/12/2007	11:07	07-09-080	0.0821	0.0811	0.0006	ALB	--> Low
4/12/2007	12:41	07-01-020	0.0196	0.0172	0.0004	ALB	
4/13/2007	11:03	07-01-020	0.0196	0.0171	0.0003	DMR	
4/13/2007	13:03	07-09-080	0.0821	0.081	0	DMR	
4/13/2007	14:25	07-08-160	0.162	0.1651	0.0003	DMR	
4/13/2007	15:16	07-03-400	0.3969	0.4003	0.0005	DMR	
4/13/2007	16:41	07-04-100	0.1008	0.0969	0.001	DMR	
4/16/2007	9:47	07-03-400	0.3969	0.399	0.001	ALB	N=3
4/16/2007	11:09	07-08-160	0.162	0.1646	0.0006	ALB	Blown
4/16/2007	11:16	07-09-080	0.0821	0.0803	0.0006	ALB	through
4/16/2007	11:24	07-01-020	0.0196	0.017	0	ALB	breath tube
4/16/2007	15:26	07-08-160	0.162	0.1632	0.0004	RJD	
4/16/2007	15:43	07-01-020	0.0196	0.017	0.0005	RJD	
4/16/2007	15:57	07-03-400	0.3969	0.3972	0.0008	RJD	
4/16/2007	16:12	07-09-080	0.0821	0.0806	0.001	RJD	
4/18/2007	7:24	07-01-020	0.0196	0.0169	0.0006	SH	
4/18/2007	7:43	07-09-080	0.0821	0.0791	0.0006	SH	
4/18/2007	8:35	07-08-160	0.162	0.1626	0.0007	SH	
4/18/2007	14:04	07-03-400	0.3969	0.3958	0.0008	SH	

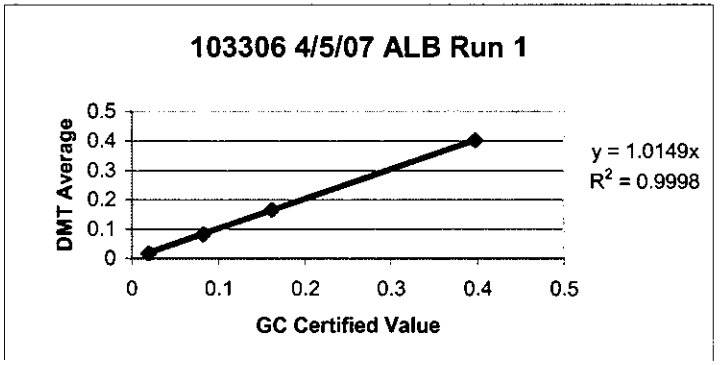


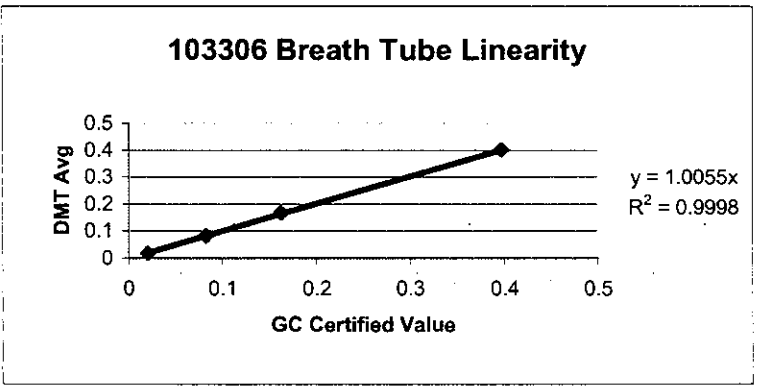

DMT Result
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45
GC Certified Value
y = 0.9869x
R2 = 0.9979

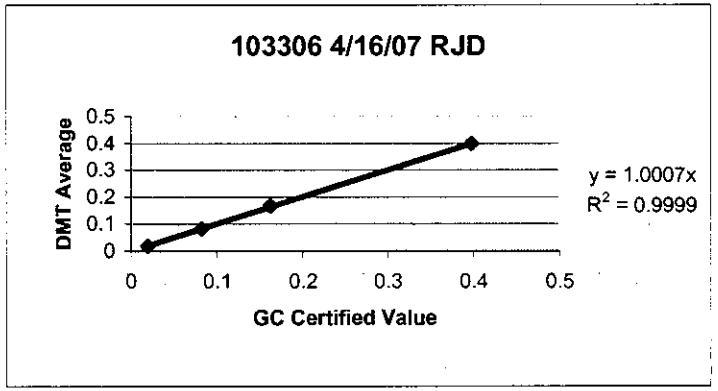

103306 4/12/07 ALB
DMT Average Results
0.5
0.4
0.3
0.2
0.1
0
0 0.1 0.2 0.3 0.4 0.5
GC Certified Value
y = 1.008x
R2 = 0.9999

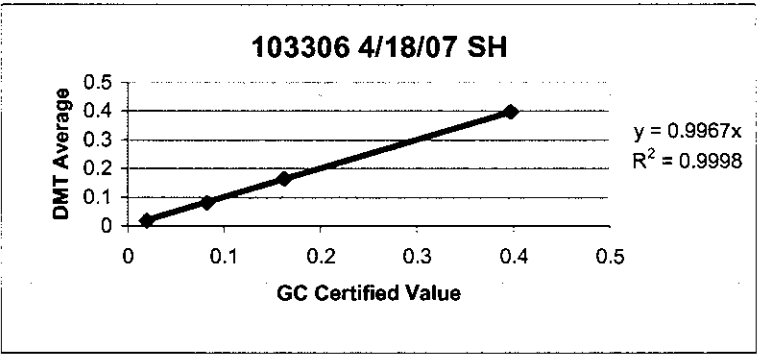

103306 DMR 4/13/07
DMT Average
0.5
0.4
0.3
0.2
0.1
0
0 0.1 0.2 0.3 0.4 0.5
GC Certified Value
y = 1.0066x
R2 = 0.9996


103306 4/5/07 ALB Run 2
DMT Average
0.5
0.4
0.3
0.2
0.1
0
0 0.1 0.2 0.3 0.4 0.5
GC Certified Value
y = 1.0145x
R2 = 0.9998

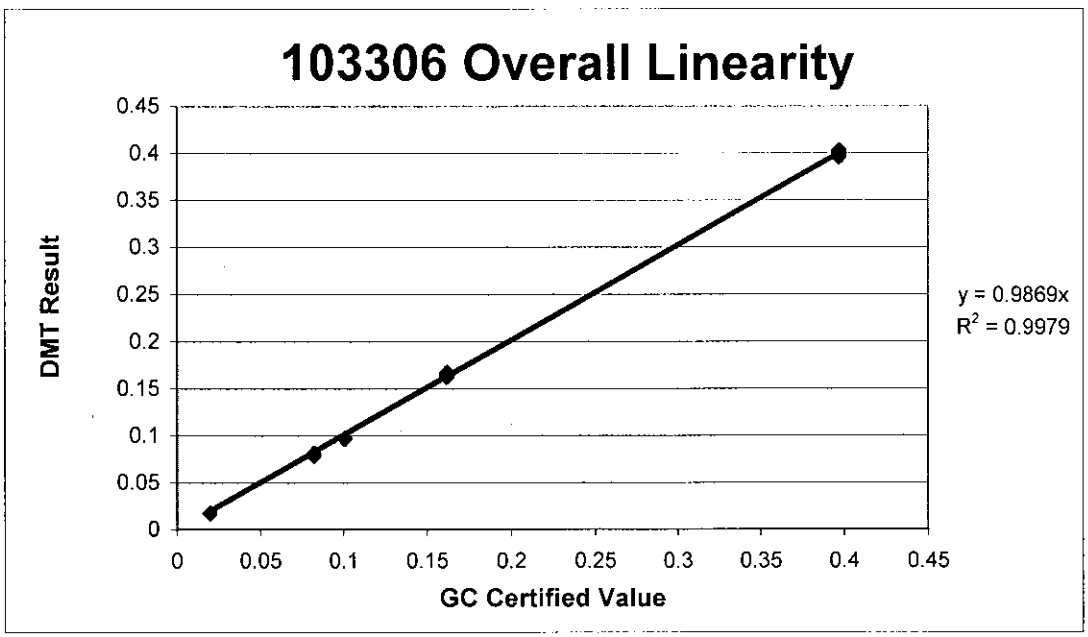

103306 4/5/07 ALB Run 1
DMT Average
0.5
0.4
0.3
0.2
0.1
0
0 0.1 0.2 0.3 0.4 0.5
GC Certified Value
y = 1.0149x
R2 = 0.9998


103306 Breath Tube Linearity
DMT Avg
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
GC Certified Value
y = 1.0055x
R2 = 0.9998

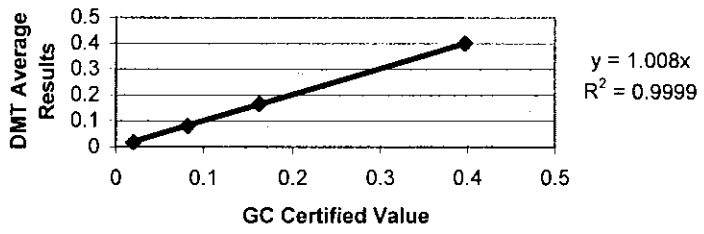

103306 4/16/07 RJD
DMT Average
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
GC Certified Value
y = 1.0007x
R2 = 0.9999


103306 4/18/07 SH
DMT Average
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
GC Certified Value
y = 0.9967x
R2 = 0.9998

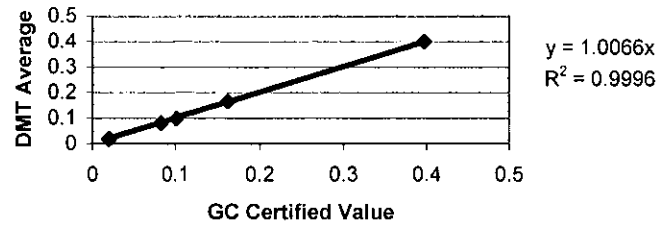
Date	Time	Lot #	GC Value	DMT Avg	Std Dev	Analyst	N=10 for each test
4/4/2007	12:27	07-01-020	0.0196	0.0175	0.0007	ALB	
4/4/2007	12:39	07-01-020	0.0196	0.0172	0.0004	ALB	
4/5/2007	10:11	07-09-080	0.0821	0.0812	0.0004	ALB	
4/5/2007	9:37	07-09-080	0.0821	0.0818	0.0004	ALB	
4/5/2007	11:19	07-08-160	0.162	0.1668	0.0004	ALB	
4/5/2007	11:37	07-08-160	0.162	0.1663	0.0005	ALB	
4/5/2007	12:49	07-03-400	0.3969	0.4024	0.0005	ALB	
4/5/2007	13:19	07-03-400	0.3969	0.4023	0.0008	ALB	
4/12/2007	8:40	07-03-400	0.3969	0.3999	0.0007	ALB	
4/12/2007	9:20	07-08-160	0.162	0.1649	0.0003	ALB	Ran High
4/12/2007	11:07	07-09-080	0.0821	0.0811	0.0006	ALB	--> Low
4/12/2007	12:41	07-01-020	0.0196	0.0172	0.0004	ALB	
4/13/2007	11:03	07-01-020	0.0196	0.0171	0.0003	DMR	
4/13/2007	13:03	07-09-080	0.0821	0.081	0	DMR	
4/13/2007	14:25	07-08-160	0.162	0.1651	0.0003	DMR	
4/13/2007	15:16	07-03-400	0.3969	0.4003	0.0005	DMR	
4/13/2007	16:41	07-04-100	0.1008	0.0969	0.001	DMR	
4/16/2007	9:47	07-03-400	0.3969	0.399	0.001	ALB	N=3
4/16/2007	11:09	07-08-160	0.162	0.1646	0.0006	ALB	Blown
4/16/2007	11:16	07-09-080	0.0821	0.0803	0.0006	ALB	through
4/16/2007	11:24	07-01-020	0.0196	0.017	0	ALB	breath tube
4/16/2007	15:26	07-08-160	0.162	0.1632	0.0004	RJD	
4/16/2007	15:43	07-01-020	0.0196	0.017	0.0005	RJD	
4/16/2007	15:57	07-03-400	0.3969	0.3972	0.0008	RJD	
4/16/2007	16:12	07-09-080	0.0821	0.0806	0.001	RJD	
4/18/2007	7:24	07-01-020	0.0196	0.0169	0.0006	SH	
4/18/2007	7:43	07-09-080	0.0821	0.0791	0.0006	SH	
4/18/2007	8:35	07-08-160	0.162	0.1626	0.0007	SH	
4/18/2007	14:04	07-03-400	0.3969	0.3958	0.0008	SH	



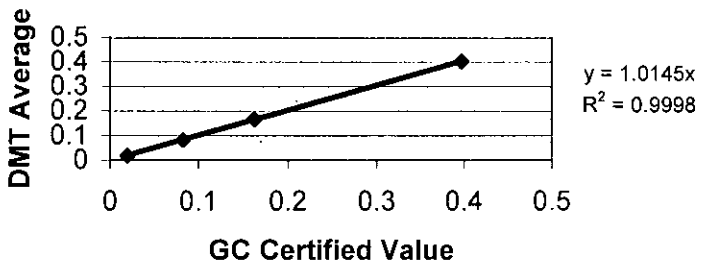
103306 4/12/07 ALB



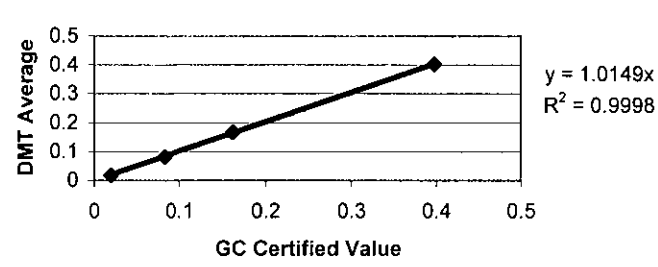
103306 DMR 4/13/07



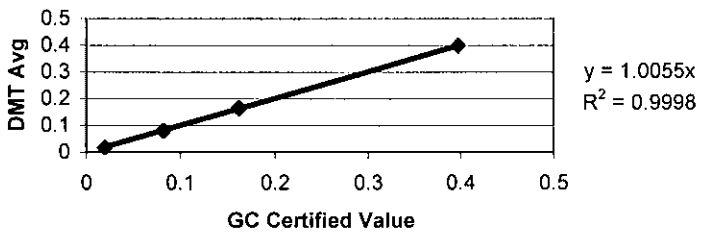
103306 4/5/07 ALB Run 2



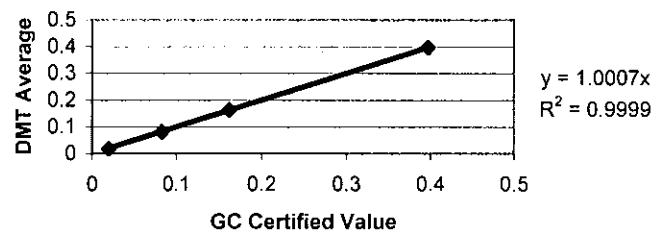
103306 4/5/07 ALB Run 1



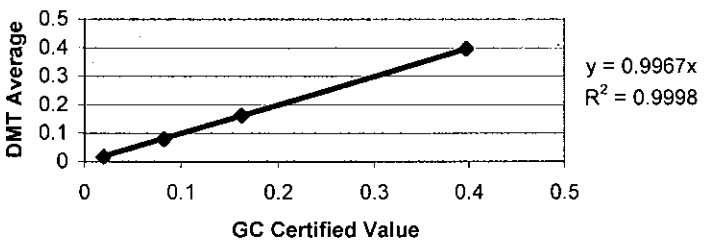
103306 Breath Tube Linearity



103306 4/16/07 RJD



103306 4/18/07 SH



From: John Fusco [jd@npas.com]
Sent: Wednesday, April 30, 2008 4:52 PM
To: Drawbaugh; Drawbaugh, Bob

Bob

I had a call from Lisa Lee in New York last week that was a little strange. She asked me why one of your people would have called her to inquire about all the invalid sample problems New York was having. We haven't generally shared the data with anyone although a few knew we had it and were looking at it. The strange part was that the data is absolutely beautiful. It is almost perfect with less than 2% invalid samples in over 1700 tests.

The 2% that were called invalid did not fit the expected significant downward profile and qualified only by reason of a very slight downward movement of less than .004 as the subject stopped blowing. We are continuing to investigate these as there may well be a physical reason.

Regardless, Lisa was very surprised that anyone would call it a problem and asked me to check around and see where that may have come from since false information like that could hurt her program.

I was very disappointed that the Washington people came away from their visit with Vermont with a bad impression of us. Maybe it is deserved, but it appears that we are no longer in consideration in Washington.

John Fusco
National Patent Analytical Systems, Inc.
jd@npas.com
Phone 419+526-6727 Fax 419+526-9446

National Patent
Analytical Systems, Inc.

NPAS Customer Memo

March 14, 2008

With no distractions like last weekend's 18-inch snowfall (I got to use the snow blower!), I think this is a good time to update everyone on some good things happening at NPAS.

First, as most of you are aware, there is an addition to our executive staff in the person of my son, Daniel J. Fusco. Daniel started last September and has been working quietly in the background and generally annoying the rest of the staff (like father, like son). He received his undergraduate degree in finance and accounting from Ashland University, and his law degree from Capital University, Columbus, Ohio. Daniel practiced law for the past eight or so years in Columbus for a small law firm. Before practicing law, Dan was an investment and trust advisor with JP Morgan Chase. With his business and legal background Dan will be working into a number of areas over the coming months before we finally decide how to divvy up the golf outings. I thought it was important to get him out of the legal field before he went into defense work.

Second, Cliff Broeder has sort of retired, which means that he is not around quite as much but still phoning and visiting customers and lending his opinions and expertise to us on a continual basis. Cliff can still be reached at our offices in Mansfield. This year at IACT, when I announce Cliff's retirement, it will be for real, although don't look for him to go away soon. Plans are that he will continue consulting and working with us for an indefinite period.

I wrote to you last fall regarding the work we had done to insure that our software for the DMT was in a very strong position to withstand any potential scrutiny. We actually went somewhat further with our advances. As this project progressed, engineering decided that, if we were going to do any work on the overall organization of the code, we should advance the system from C++ to C Sharp. Although it is the same basic coding language, it is considerably more advanced in terms of organizational structure than C++. This DMT advancement is being completed and should be finalized by June 1.

I realize that the entire software issue is very complex. Therefore, we have begun a program to assist everyone who is connected with this issue in any way to understand the capabilities of the DMT software system in ways that are easier to conceptualize. Among the various software we have developed for Vermont, South Carolina and New York, there is now a sizeable pool of applications that now must be put together into a cohesive format that everyone can understand so that these can be used to implement future programs. The investment in engineering hours over the past two years is approaching 10,000, and this does not include the time expended to develop the original operating software. This, I believe, is as much an investment in our own company future as it is a work for these valued customers and future customers.

The bigger software issue in terms of the defense community is not presenting any new issues for us. We continue to make it available under a protective order or non-disclosure agreement.

In terms of hardware I am very pleased to tell you that our work on the tolerances of the detector block assembly is now complete, and any blocks in the field of the original configuration have been or are being replaced with current production blocks. The design is identical; only the manufacturing tolerances and assembly procedures have changed. Each assembly now passes a production operation test with a minimum of 300 cycles before installation. This is prior to any QA testing during final operational work.

We have further refined the tolerances on the valve assembly with respect to the Teflon coating and have improved the reliability of this device to an expected 10,000 cycles. We have not seen the first failure in production in many months.

We have also finalized the three-filter software that is used for dry gas testing, as the initial versions were incomplete with respect to some very slight temperature compensation routines. Some of these were marginally apparent in evaluation instruments but were never an issue with field instruments.

The first three prototype DMTs with the enclosed dry gas housing are now complete. The housing profile is the same as the basic DMT and all wiring and tubing are completely enclosed in the instrument with easy access to the gas cylinder from a locked rear door. Production parts are being readied and should be available within twelve weeks. The name of this version of the DMT is DMT-G and it will be forwarded to DOT shortly.

We are presently working on 10 prototype DMT-P instruments and are optimistic that we will be able to show this concept at IACT. The basic design is 12 volt Portable with built in Gas, a standard ticket printer and bar code reader. It will operate with most of the same capabilities of the standard DMT but in a smaller package that will lend itself better to vehicle use.

As you can see, the past eighteen months or so have been very hectic with multiple, related projects going at the same time. In our efforts to give you the best possible products and services, we have also seen our number of employees grow from about 22 to 32 people. As I look back, we have made substantial progress in all areas and are looking forward to continuing to work with all of you.

John Fusco

National Patent
Analytical Systems, Inc.

NPAS Customer Memo

May 14, 2008

We are hoping to see many of you at IACT in a few days. Prior to this I thought I would briefly update everyone on the progress we have made in a few areas that I spoke of several months ago.

The work on the conversion to C Sharp coding is continuing to progress and will be substantially completed in June although the real benefit continues to be in the ability to do multi language support. This is not meaningful to most users except that as a side benefit the organizational structure of the code is much more advanced and will be incorporated into current coding. We continue to believe that the better organized structure will be much more defensible and presentable should the code be subjected to court issues.

I'm hoping to get Bob Drawbaugh to talk a little at the users meeting regarding the reporting work that we have done in the Vermont Software. It is, without a doubt, the most extensive and complex that has ever been attempted in any breath analysis software. Vermont will be placing the units into service in June. One (among many) of the unique features of this software is the ability to do graphs of the linearity checks.

New to the DMT software is the Volume Bar Graph recently implemented in the Bermuda code. It is easily added to existing software and presents an indication to the testing officer of the status of the blow with respect to volume requirements.

We will begin work shortly (June 1) on some software routines that will allow the XML formatted data (the form of the raw data from the DMT) to be converted to a format that can be easily imported into Excel. This will be convenient for anyone who wishes to do some statistical work without the necessity of implementing a full data base structure.

In the very near future we will begin work on the Iowa code and the attendant conversion of the TRACS system so that it will be compatible with the Iowa code. The goal in Iowa is a seamless transistion from the cdm into the DMT with full TRACS capabilities.

We are adding a third engineeer for at least the summer months to help complete a number of ongoing projects. He will be starting June 1.

Dave will be updating everyone with respect to progress and implementation of DMT hardware although it has generally settled in very well in terms of production consistency.

Again, we are looking forward to seeing all of you.

John Fusco

National Patent
Analytical Systems, Inc.

NPAS Customer Memo

August 22, 2008

We are continuing to move forward very quickly in any number of areas of product development.

The conversion of the DMT operating system to "C Sharp" is essentially complete and work is progressing on the Iowa code which has a number of unique features. The Iowa DMT software will incorporate the TRACS system, as did their DataMasters. As part of this feature, the DMT will be communicating on the ethernet rather than using a modem. The attendant savings in phone lines that are dedicated to communication will be significant. This work is, of course, transferable to all code that will be using the "C Sharp" language. This is the first work of its' kind in the industry. We are looking to complete the Iowa code to a customer testing stage by the middle of this Fall, if not earlier.

It is our intention, by making this very significant investment in software development at this time, to avoid costly charges for our customers in the future. This applies both to development during the initial sale and to any rewrites that may be necessary during the life of the program. Note that we are not changing the DMT code. We are dramatically altering the vehicle by which it is written and implemented. The cost savings to our customers in the future will be very significant. The time to execute changes will be significantly reduced.

It is still our plan to make the updated "C Sharp" vehicle backwards compatible with older codes that were written in C++. The will be done on a time permitting basis and will bring the benefits of the newer system to everyone.

Iowa will be the first state to put the DMT-G into service. This instrument incorporates all the dry gas components seamlessly into a housing at the right side of the instrument. Nothing is exposed, including the tubing, electrical fittings and the gas control components. All the metal work is in process and this new model will be available for demonstrations of a production instrument in late September although many of you saw the pre-production prototypes. Production units will look identical. Our thanks go to Iowa's Jim Bleskacek for his innovative ideas in a number of areas of this new model.

The routine that allows direct exporting of the XML data from the DMT is complete and it can now be imported with ease into an Excel spreadsheet.

Vermont is complete and in service. The feed back we have had so far has been good and without any court issues that we are aware of.

Speaking of court issues, we have had virtually no requests for the software lately although we continue to receive inquiries by email and phone from time to time – mostly from Washington State. We simply do not hear from them once they figure out they really can get it. The issue is by no means dead and I am told by several sources that new initiatives are planned in a number of states. We will continue to make the software available under a protective order. I believe that part of the reason we have no issues with this subject is our efforts to maintain a credible and open relationship with the defense community.

South Carolina is progressing into the operator and supervisor training stage with some minor work still remaining on the code. They are planning on placing instruments late this fall. New York is continuing to place instruments and is now approaching some 200 in service.

The Pennsylvania State Police are continuing to place DMTs.

I'm not sure any of you have noticed, but we are now using a different detector manufacturer. The quality of these detectors has been absolutely superb. There have been virtually no failures in over 500 pieces and the stability, at times, is such that you might think the insrument is stuck on .000! This is primarily due to the detectors themselves but there is a little help from the latest revision of the Controller Board which routes several traces in slightly different paths making it slightly less susceptible to cross noises.

We now have a second source for the microcontrollers and are no longer at the mercy of a single source for that device or for the graphics display. Our patent application continues to be in the hands of the USPTO but we are hoping for an answer soon. It has been almost 4 years. Essentially, it covers the use of a touch screen graphics display on a breath alcohol analyzer.

Work is continuing to progress on the fully portable DMP. We are waiting on final metal work and are hoping to have the first demonstrators ready by late October. All the features of the DMT are present in the DMP.

We are not a "glitzy" company. We simply do whatever we need to do to get our customers to wherever it is they need to go.

We all are hoping you are having a good Summer.

John Fusco

National Patent
Analytical Systems, Inc.

Mr. Robert Drawbaugh
Vermont Dept of Health
Box 70
Burlington, Vt. 05402-0700

March 15, 2010

Dear Mr. Drawbaugh:

Regarding your request for clarification of our warranty policy: We do have a stated 2 year warranty on DataMaster Products, including the DMT. However, we have always considered the warranty to start upon actual deployment of the instruments to the field rather than the shipping date when multi instrument state orders are involved. Further, since the placement of the instruments is often staggered in time, we usually pick a mutually agreeable date that reflects, more or less, an average placement date. This is easier and more convienent for all concerned. This is not a policy that was ever reduced to written form and probably never will be but it certainly is helpful to our customers. The only caveat is that the warranty maintenance, repairs and recalibrations be done by a technician who has been certified by us as a maintenance technician.

Regarding the issue of your technician using parts from one of our demonstrator or loaner instruments to repair an instrument from your inventory. If it is helpful to your program we certainly support this remedy. We can send you a replacement part for the loaner instrument and your technician can install it.

Our records currently indicate that your employee Steve Harnois is certified by us to perform maintenance and recalibrations on the DataMasters and DMT instruments. Given his experience and level of expertise, it is my opinion that he should perform the maintenance on the new DMT instruments.

Sincerely,

John Fusco,
President

2090 Harrington Memorial Road, Mansfield, Ohio 44901 Ph 419-526-6727 Fax 419-526-9446
jd@NPAS.com

Fax: 419-526-9446

NPAS Consolidated Price list
Box 1435, 2090 Harrington Mem. Rd.
Mansfield, Ohio 44901

Phone : 800-800-8143

Effective Date

Print Date 3/24/09

Notes: u/m are units and are in increments of Each, if not specified. Wire and tubing are in increments of Feet. Prices expressed as 0.00 are not priced.

Part No	Description	List Price	State Single	2 to 6 pieces	over 6 pieces
10003	REGULATOR, LPM 1.5	283.50	255.15	240.97	218.30
10008	REGULATOR ASSY, 2.5 lpm GAS W/ VALVE,	303.19	272.87	257.71	233.45
10009	REGULATOR ASSY, 3.5 lpm GAS, W/ VALVE	303.19	272.87	257.71	233.45
10015	TRANSDUCER, 7-35V, 1/8 NPT MALE, 1.5K I	211.05	189.95	179.39	162.51
21074	RECEP, AC EMI FILTER FUSE COMBO	58.56	52.70	49.77	45.09
21075	RECEPT, AC EMI, 3A, PNL MT, R/A	17.53	15.78	14.90	13.50
21080	POWER SUPPLY, SWITCHER, 12V, 120W	139.42	125.48	118.51	107.35
22081	SOLENOID, 22V ROTARY CALIBRATION AR	104.55	94.09	88.87	80.50
22082	SOLENOID, 22V ROTARY FILTERS ARM 24	104.55	94.09	88.87	80.50
24102	LED, LAMP GREEN DISPLAY READY	3.82	3.44	3.25	2.94
24112	DISPLAY, LCD LARGE	80.89	72.80	68.76	62.29
25258	RECEP, AC 3 PRONG BLK PANEL MT	2.26	2.04	1.92	1.74
25260	RECEPT, AC 3 PRONG BLK PANEL MNT	1.67	1.50	1.42	1.28
25311	CONN MODULAR JACK, 6 POS RJ11	6.76	6.09	5.75	5.21
26002	FITTING, CPC PANEL MNT, MALE	8.11	7.30	6.89	6.24
26003	FITTING, "L" (DM BREATH TUBE) CPC	5.21	4.69	4.43	4.01
27022	DETECTOR, INFRARED 2MM ELEMENT	293.08	263.77	249.12	225.67
27033	SOLENOID, 12VDC COIL, MODIFIED PLUNGI	36.53	32.88	31.05	28.13
27034	SOLENOID, 24V 5 WAY VALVE W/ PLUNGER	34.43	30.99	29.27	26.51
27036	TRANSDUCER 6V	1.05	0.95	0.89	0.81
27037	THERMISTOR, 4.7K SAMPLE CHAMBER	10.03	9.03	8.53	7.73
27041	SENSOR, MASS AIRFLOW, MICROBRIDGE	91.35	82.22	77.65	70.34
27044	SWITCH, SLOTTED OPTICAL	5.25	4.73	4.46	4.04
27045	PHOTO INTERRUPTER	6.13	5.52	5.21	4.72
27048	PROBE TEMPERATURE 4"X3/16"OD S	116.55	104.90	99.07	89.74
27050	FITTING NUT & FERRULE (GUTH)	7.68	6.91	6.53	5.91
27051	PROBE TEMPERATURE GUTH 34C	126.58	113.92	107.60	97.47
27081	SENSOR, FUEL CELL A318 TYPE 4	217.35	195.62	184.75	167.36
27082	PUMP, SAMPLER .2 mL	217.35	195.62	184.75	167.36
28117	SWITCH, CDM PAPER FEED	9.89	8.90	8.40	7.61
28411	SCREW, .312 - 18 X .25 SET, HEX, CUP POIN	1.05	0.95	0.89	0.81
29520	KIT, SCREW, DB CONN MTG	1.05	0.95	0.89	0.81
29592	FITTING, RETAINER, LED LIGHT BAR	2.14	1.93	1.82	1.65
29606	O RING, DET PLATE 3 3/4 ID, 3 7/8 OD	1.05	0.95	0.89	0.81
29715	O RING, BUNA N, .45 OD X .175 ID X .14 TH	1.05	0.95	0.89	0.81
29736	VALVE CHECK, FLAPPER	3.81	3.43	3.24	2.94
29744	VALVE GAS 1/8 NPT 12VDC, 2 way 2.5mm o	58.90	53.01	50.07	45.36
29803	STANDOFF, #4-40 X 3.25 IN. CARD SUPPOR	4.45	4.01	3.78	3.43
29832	FITTING, STUD AJ4-50	4.08	3.67	3.47	3.14
29834	RECEP, DRUSZ FASTNER 3/8" SQ HOLE	6.34	5.71	5.39	4.88
29849	O RING, 7/16 ID, 9/16 OD AFLAS	1.27	1.14	1.08	0.98
29850	O RING, BUNA N, 5/8"OD X 1/2"ID DASH 01	1.05	0.95	0.89	0.81
29851	O RING, 3/16"ID, 5/16"OD, VITON	20.84	18.75	17.71	16.04
29854	STANDOFF, #4-40 X .50 AL M/F .18 HEX (DE	1.30	1.17	1.11	1.00
29858	STANDOFF, #4-40 PRINTER HOLDDOWN	2.10	1.89	1.78	1.62
29860	STANDOFF, 2.312", SHORT HOLDDOWN	7.10	6.39	6.03	5.47
29873	O RING, 3/4 OD X 5/8 ID X 1/16"	1.05	0.95	0.89	0.81
29891	SCREW, #8-32 SLOTTED SET, MACHINED	6.09	5.48	5.18	4.69
29895	THERMOSTAT, MERCURY IN COLUMN	108.77	97.89	92.45	83.75
29968	THERMOMETER, GUTH DIAL	97.74	87.97	83.08	75.26
29970	THERMOMETER, NIST CALB ASSY W/NUT	97.65	87.89	83.00	75.19
29980	GASKET, SIMULATOR, REPCO JAR	3.36	3.02	2.86	2.59
29981	O RING, BIG, SIMULATOR MOTOR	1.05	0.95	0.89	0.81
29982	GASKET, SIMULATOR JAR	1.05	0.95	0.89	0.81
29985	MOTOR, SYNCHRON SIMULATOR	80.33	72.29	68.28	61.85
29986	HEATER, MKII, MKIIA, 10-4 & EARLY 34C	61.20	55.08	52.02	47.13
29988	LAMP, INDICATOR, 34C	8.19	7.37	6.96	6.31
29989	LAMP, INDICATOR, RED 34C	8.19	7.37	6.96	6.31
29992	FUSE SIMULATOR 34C	5.25	4.73	4.46	4.04
30125	FITTING, AL NIPPLE .312 O.D...218 I.D..5 IL	1.12	1.01	0.95	0.86
30277	FITTING, CPC PANEL MNT FEMALE	18.04	16.24	15.34	13.89
30280	ADAPTER, CALIBRATION	6.30	5.67	5.36	4.85
30293	KEY, TOOL HEAD	7.56	6.80	6.43	5.82
30301	COVER, K STD DM (POWDER COATED)	257.23	231.51	218.64	198.07
30310	ELBOW, 90 DEG 1/8 NPT F/ M BRASS,1200	4.83	4.35	4.11	3.72
30346	ACORN NUT, NYLON 4-40 .25 WIDE X .28 HI	1.05	0.95	0.89	0.81
30367	FITTING, CPC PANEL MNT MODIFIED (r302'	21.72	19.55	18.46	16.72
30368	FITTING, THREADED CAP, THERM RECEPT	7.72	6.95	6.56	5.94
30396J	PANEL, REAR, PLATED REV J (BLK ZINC)	49.01	44.11	41.66	37.74
30401B	COVER, DM STD, BLACK	243.84	219.46	207.27	187.76
30407	BUSHING, FILTER ARM	4.83	4.35	4.11	3.72
30409	RING, WINDOW RETAINING	5.70	5.13	4.85	4.39
30410	RING, QUARTZ ARM RETAINING	8.40	7.56	7.14	6.47
30411	RING, DETECTOR BLOCK RETAINING	13.45	12.11	11.43	10.36
30414	DOOR, DM SUPERVISOR (BLACK POWDER (	18.38	16.54	15.62	14.15
30417	DOOR, DM SUPERVISOR (POWDER COATEI	10.84	9.76	9.22	8.35
30419	DOOR, SIMULATOR EXT K COVER	26.28	23.65	22.33	20.23
30422A	BLOCK, DM SC OUTLET REV.F (Cleaned)	27.08	24.37	23.01	20.85
30451	COVER, EXTENDED K (POWDERCOATED)	342.46	308.21	291.09	263.69
30454	COVER, cdm, METAL Without 30498 / 30499	116.27	104.64	98.83	89.53
30455	PRINTER BRACKET, DP834-12, MAIN	37.99	34.19	32.29	29.25
30456	PRINTER BRACKET, DP834-12, LOWER TOP	9.22	8.30	7.84	7.10
30457	PRINTER BRACKET, DP834-12, UPPER BOTT	25.65	23.09	21.80	19.75
30458	PRINTER BRACKET, DP834-12, UPPER TOP	16.79	15.12	14.28	12.93
30466	DOOR, SIMULATOR STD EXT COVER	18.19	16.37	15.46	14.01
30499	DOOR, cdm PRINTER WELL	13.77	12.40	11.71	10.61

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Part No	Description	List Price	State Single	2 to 6 pieces	over 6 pieces
30504	FUSE, 10A 250V 3AG DMT REAR PANEL	1.09	0.98	0.93	0.84
30525	SCREEN FILTER INSERT THERM BLOCK 11/	2.23	2.00	1.89	1.71
30526	SCREEN, MOUTHPIECE INSERT .625 DIA	1.05	0.95	0.89	0.81
31360	BUMPER, RUBBER W/ WASHER #6	1.05	0.95	0.89	0.81
31366	BUMPER, RUBBER SHORT	1.34	1.21	1.14	1.03
31367	BUMPER, SQUARE RUBBER .23 H X .50 SQ	1.05	0.95	0.89	0.81
31450	TUBE, INLET 34C	25.73	23.15	21.87	19.81
31487	STANDOFF, DETECTOR PLATE,ROUND STO(	1.81	1.63	1.54	1.39
31502	FITTING, NIPPLE 10-32 X .17 ID TUBING	1.43	1.29	1.21	1.10
31588	SWITCH, 20A, ON-OFF-ON, SPDT, ROCKER	2.35	2.12	2.00	1.81
31877	SCREW, #6-32 X .375 HEX WASHER HEAD	1.05	0.95	0.89	0.81
32101	INSERT, MOUTHPIECE VALVE	10.93	9.84	9.29	8.42
32102	WASHER, MOUTHPIECE VALVE-NEO FLAT	1.05	0.95	0.89	0.81
32103	Screen,Mouthpc.Valve, 6' x 48", 30 Mesh .00	32.54	29.29	27.66	25.06
32104	O RING, 5/16 X 7/16 X .065 THK, BUNA-N	1.05	0.95	0.89	0.81
32402-1	PCB ASSY, cdm PRINTER DRIVER MOD.	211.05	189.95	179.39	162.51
32404	PCB ASSY, 34C SIMULATOR	165.38	148.84	140.57	127.34
32660	PLATE, BASE ADAPTER FOR SI PROCESSOR	28.81	25.93	24.49	22.19
34065	FUSE 3.15A 250V SLO-BLO 5 X 20MM	1.05	0.95	0.89	0.81
34545	BRACKET, DMT PRINT SUPPORT	18.15	16.34	15.43	13.98
34546	BRACKET, DMT STND RIGHT SUPPORT	35.61	32.05	30.27	27.42
34569	KEYBOARD, CHERRY USB W/ 3TRK MSR	363.82	327.44	309.25	280.15
34574	BRACKET, PRINTER LEFT SIDE	48.64	43.78	41.34	37.45
34589	GASKET, SYCHRON SIMULATOR MOTOR	5.71	5.14	4.86	4.40
34590	CABLE ASSY, DC ADAPTER PLUG	24.81	22.33	21.09	19.10
35624	SCREW, #6-32 X .375 FLTHD TORX/6LOBE S	1.05	0.95	0.89	0.81
35626	SCREW, #6-32 X .500 FLTHD PIN/TORX SS M	1.05	0.95	0.89	0.81
35666	TOOL, SYRINGE, 2 LITRE	157.50	141.75	133.88	121.28
35667	TOOL, SYRINGE, 3.5 LITRE	236.25	212.62	200.81	181.91
36018	TUBING SILICON (MILKY) 1/4 ID X 3/8 OD	2.35	2.12	2.00	1.81
36347	CORD, POWER LINE 6' 7" BLACK	7.61	6.85	6.47	5.86
36379	TUBING CLEAR TYGON 3/16 X 5/16	1.89	1.70	1.61	1.46
36500	CABLE ASSY, TELPAR PR DRIVER	11.04	9.93	9.38	8.50
36509	CABLE ASSY, KEYBOARD 4 COND	7.52	6.77	6.39	5.79
36521	CABLE ASSY, USB 2.0 A-B MALE 2 METER L	8.40	7.56	7.14	6.47
36566	TUBING 1/4 X 3/8 TYGON	4.11	3.70	3.50	3.17
36567	TUBING 1/4 X 7/16 VINYL BLACK (SIM. HO(	1.05	0.95	0.89	0.81
36568	TUBING 1/4 X 7/16 VINYL CLEAR (SIM. HO(	1.05	0.95	0.89	0.81
37019	MIRROR, SAMPLE CHAMBER (.090")	13.41	12.07	11.40	10.33
37020	FITTING, PANEL BRASS 3/8 X 3/8 BARBS	18.38	16.54	15.62	14.15
37032	LENS, QUARTZ 20MM BI-CONVEX	47.25	42.52	40.16	36.38
37033	WINDOW, QUARTZ STANDARD 16.5MM	11.39	10.25	9.68	8.77
37035	WINDOW, QUARTZ 12.7MM	10.84	9.76	9.22	8.35
37037	FUSE 3 AMP SLO BLO	1.05	0.95	0.89	0.81
37039	FUSE 7A SLO BLO, 2AG	1.05	0.95	0.89	0.81
37040	KEYPAD, ELASTOMER (WITH GRAY KEYS)	360.94	324.84	306.80	277.92
37058	CLIP, NYLON CABLE .625 DIA (BT HOLDER)	1.05	0.95	0.89	0.81
37060	WINDOW, 9.5mm DIA X 1mm THICK IR QUAI	10.99	9.89	9.34	8.46
37062	ANTENNA 1/4-32 X .180 L.	16.08	14.47	13.67	12.38
37072	FITTING, "Y" 1/4" TUBING	2.53	2.28	2.15	1.95
37073	FITTING, "Y" 3/16	1.76	1.59	1.50	1.36
37077	HEAD, PRINTER, FOR DP834-12	121.28	109.15	103.08	93.38
37079	HEAD, PRINTER 7 PIN	97.65	87.89	83.00	75.19
37088	FITTING, CPC MOUTHPIECE RECEPTICLE	2.90	2.61	2.46	2.23
37090	FITTING, CPC SHURLOCK FEM 1/4ID	9.30	8.37	7.90	7.16
37092	TUBING BREATH 1/4 ID X 7/16 OD.	6.00	5.40	5.10	4.62
37110	CONTROLLER, WINDOWS CE	877.80	790.02	746.13	675.91
37112	JAR, SIMULATOR	31.70	28.53	26.94	24.41
37113	JAR, SIMULATOR (REPCO)	0.00	0.00	0.00	0.00
37150	FITTING, "T" PLASTIC 5/16	2.44	2.19	2.07	1.88
37188	LOCK, CAM LOCK ASSY (KEY 1101)	13.82	12.44	11.75	10.64
37194	MOTOR, 12 X 20.6 MM, 8 MM SHAFT Stand:	83.48	75.13	70.95	64.28
37196	MOTOR, CHOPPER 12VDC 16 X 16 MM-DM	0.00	0.00	0.00	0.00
37197	KEY, DATAMASTER SUPERVISOR DOOR 1(	5.25	4.73	4.46	4.04
37200	RFI SHIELDING STRIP, BERYLLIUM COPPEI	13.74	12.37	11.68	10.58
37204	GASKET, EMI NEOPRENE "D" .375 X .25	7.57	6.81	6.43	5.83
37206	FITTING, BLACK THRU 1/4 ID X 1/8-27NPT	1.47	1.32	1.25	1.13
37207	GASKET, PORON ADHESIVE, REAR MIRROR	1.18	1.06	1.00	0.91
37240	POWER SUPPLY, LCD DISPLAY MTNG BOAI	27.34	24.61	23.24	21.05
37400	KEYBOARD ASSY, PC, PURCHASED	37.64	33.88	32.00	28.98
37401	KEYBOARD, CHERRY	176.72	159.04	150.21	136.07
37402	KEYBOARD, USB STANDARD BLACK	34.47	31.02	29.30	26.54
37404	KEYBOARD, FLEXIBLE PC BLACK	47.22	42.50	40.14	36.36
37444	PUMP ASSY, DIAPHRAGM UNIT	47.25	42.52	40.16	36.38
37459	CABLE ASSY, MODULAR KEYBOARD	11.91	10.72	10.12	9.17
37553	MEMBRANE,8.4 IN TOUCH REPLACEMENT	84.83	76.35	72.11	65.32
37560	COVER, STD KEYBOARD (POWDER COATEI	80.33	72.29	68.28	61.85
38001	FITTING, RETAINER, DISPLAY CABLES	1.05	0.95	0.89	0.81
39140	PUMP, DUAL DIAPHRAM 120 VAC	165.38	148.84	140.57	127.34
39144	PUMP, 12V DC	204.75	184.28	174.04	157.66
39210	PRINTER, EPSON M-192	157.50	141.75	133.88	121.28
39217	MODEM, APPROTEK 7524-1 SP1, 2400 BAU	169.41	152.47	144.00	130.44
39217-1	MODEM, MODIFIED, APROTEK 7524	195.35	175.82	166.05	150.42
39218	PRINTER, DOT MATRIX 40 COL DP834-12	289.79	260.81	246.32	223.14
39239	LAMP, INFRARED LIGHT SOURCE	54.18	48.76	46.05	41.72
39240	RECEPTICAL, 4 POSITION SURGE PROTECT(	32.19	28.97	27.36	24.79

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39241	LAMP, IR SOURCE TO-8 PACKAGE	122.85	110.57	104.42	94.59
39245	SURGE PROT, TRIPP LITE LS-604	291.38	262.24	247.67	224.36
39262	PRINTER BRACKET ASSY REV A	97.87	88.08	83.19	75.36
39262-1	PRINTER BRACKET ASSY FOR 39218	118.28	106.45	100.54	91.08
39302	GAS, DRY STANDARD 105 L .08 G/210L ETC	252.00	226.80	214.20	194.04
39303	GAS, DRY STANDARD 105L .08 G/210L ETOI	217.35	195.62	184.75	167.36
39526	REGULATOR, WALL 110 AC TO 7.5 DC	44.10	39.69	37.48	33.96
40223	PCB ASSY, DM DET PRELIM	100.07	90.07	85.06	77.06
40400	STAND, cdm INSTRUMENT, BASE	389.81	350.83	331.34	300.16
40401	STAND, DM INSTRUMENT, BASE, PA	247.28	222.55	210.18	190.40
41132	SAMPLE CHAMBER ASSY, STD DATAMASTI	430.58	387.52	365.99	331.54
41133	TRANSFORMER, 110V 60HZ MID-DM	151.89	136.70	129.11	116.96
41134	SAMPLE CHAMBER ASSY, SHORT	415.86	374.28	353.48	320.22
41137	TAPE ASSY, HEATER (DM) (SERIES)	35.92	32.33	30.53	27.66
41139	SAMPLE CHAMBER ASS'Y, FLAT CAP	355.51	319.96	302.18	273.74
41140	TEMPERATURE CNTRL ASSY, FLAT CAP	64.65	58.18	54.95	49.78
41145	CABLE ASSY, FET SOURCE/COOLER CONTR	6.78	6.10	5.76	5.22
41147	CABLE ASSY, OPTICAL BENCH GROUND ST	1.31	1.18	1.11	1.01
41151	CABLE ASSY, dmt SIM RECEPTICAL	14.17	12.75	12.04	10.91
41167	CABLE ASSY, SHORT MODEM, 1 FT.	2.02	1.81	1.71	1.55
41168	CABLE ASSY, 6 FOOT MODEM	4.69	4.22	3.99	3.61
41203	CABLE ASSY, LCD RIBBON	10.46	9.41	8.89	8.05
41206	DISPLAY ASSY, DM FRONT PANEL LARGE L	247.59	222.83	210.45	190.64
41210	KEYBOARD ASSY, W/ CABLE ASSY	514.18	462.76	437.05	395.92
41216	BLOCK ASSY, DM THERMISTOR, SINGLE	71.37	64.23	60.66	54.96
41216-1	BLOCK ASSY, DM THERM, SINGLE W/O SCR	69.70	62.73	59.25	53.67
41217	CABLE ASSY, PC KB, DIN	9.70	8.73	8.25	7.47
41218	PCB ASSY, POWER SUPPLY, 9/97	187.14	168.43	159.07	144.10
41223	PCB ASSY, DET BD,W/TERM BLK	104.62	94.16	88.93	80.56
41223-1	PCB ASSY, DET BD. W/ R/A HDR	97.40	87.66	82.79	75.00
41224	PCB ASSY, PRINTER DRIVER (OBS)	110.53	99.48	93.95	85.11
41226	PCB ASSY, RF BOARD	49.71	44.74	42.25	38.27
41227	CABLE ASSY, DM SAMPLE CONTROL	7.47	6.73	6.35	5.76
41229	CABLE ASSY, DM PRINT DRIVER 4POS PWR	10.45	9.41	8.88	8.05
41230	CABLE ASSY, COOLER TRANS.	9.64	8.68	8.20	7.43
41231	CABLE ASSY, DM STD LAMP TRANS.	10.67	9.60	9.07	8.21
41232	CABLE ASSY, BT HEATER POWER TRANS	15.98	14.38	13.59	12.31
41233	CABLE ASSY, DM PUMP DRIVER	8.51	7.66	7.24	6.56
41237	CABLE ASSY, DM CPU/PWR RIBBON	6.88	6.19	5.85	5.30
41240	PUMP ASSY, SIMULATOR , DM	221.92	199.73	188.64	170.88
41242	CABLE ASSY, DM PRINTER/CPU RIBBON	7.93	7.13	6.74	6.10
41243-1	BRACKET ASSY, DP834-12 PRINTER, FINAL	508.87	457.98	432.54	391.83
41244	CABLE ASSY, DM DET/CPU RIBBON	5.79	5.21	4.92	4.46
41245	BENCH ASSY, DM OPTICAL	1,637.2	1,473.5	1,391.6	1,260.6
41247	CABLE ASSY, DM MEMORY EXPANSION	18.38	16.54	15.62	14.15
41248	PUMP ASSY, 12VDC	209.89	188.90	178.41	161.62
41249	PUMP ASSY, W/O SNUBBER	183.58	165.22	156.04	141.36
41253	UPGRADE KIT, DP834-12 PRINTER	586.71	528.04	498.70	451.77
41254	CABLE ASSY, DM PHOTO INT (PRINTER)	13.54	12.19	11.51	10.43
41255	BENCH ASSY, OPT 3.445/3.373/3.500	1,791.1	1,612.0	1,522.4	1,379.1
41256	BENCH ASSY, OPT, 3.37/3.44/3.50 MID	1,634.0	1,470.6	1,388.9	1,258.2
41260	PCB ASSY, DM MEMORY EXPANSION	194.04	174.63	164.93	149.41
41265	BENCH ASSY, OPTICAL, CHANNEL DMT	1,986.0	1,787.4	1,688.1	1,529.2
41266	DISPLAY ASSY, LARGE LCD, BACKLIT	165.36	148.82	140.56	127.33
41267	VALVE ASSY, BLOCK & SLIDE	70.62	63.55	60.02	54.37
41270	PCB ASSY, cdm PRINTER DRIVER	95.06	85.55	80.80	73.20
41275	FLOW SENSE MODULE ASS'Y	108.09	97.28	91.88	83.23
41276	CABLE ASSY, SERIAL I/O, DB-9 TO 2X5, RIB	22.76	20.48	19.34	17.52
41277	CABLE ASSY, DMT SIM TEMP RIBBON	16.84	15.15	14.31	12.96
41278	CABLE ASSY, DB9F TO 2X5 RLC-CNTRL	15.99	14.39	13.60	12.32
41279	CABLE ASSY, DB9F TO 2X5 DMT MODEM	15.77	14.19	13.41	12.14
41280	CABLE ASSY, MODIFIED MODEM 39217-1 P	5.00	4.50	4.25	3.85
41284	CABLE ASSY, DMT MODEM POWER	4.06	3.66	3.45	3.13
41285	DISPLAY ASSY, LG LCD, DM & cdm	87.79	79.01	74.62	67.60
41286	DISPLAY ASSY, DM LARGE LCD	90.23	81.21	76.70	69.48
41297-1	COVER ASSY, CDM, METAL	1,014.9	913.43	862.68	781.49
41301	SNUBBER ASSY, RADOMSKI	37.80	34.02	32.13	29.11
41303	SNUBBER ASSY, 2 HOLER	24.99	22.49	21.24	19.24
41307	CABLE ASSY, DM RFI PCB	19.45	17.50	16.53	14.98
41310	MOTOR ASS'Y, 12X20.6MM	88.73	79.86	75.42	68.32
41311	MOTOR ASS'Y, STEPPER	153.78	138.40	130.72	118.41
41320	ISOLATED SOURCE DMT INLET ASS'Y	72.26	65.03	61.42	55.64
41329	BLOCK ASSY, SC INLET	146.61	131.95	124.62	112.89
41330	LAMP ASSY, DM INFRARED SOURCE	147.40	132.66	125.29	113.50
41331	PCB ASSY, DM BAROMETER BOARD, COMP	176.40	158.76	149.94	135.83
41344	SOLENOID ASS'Y, FILTER WHEEL LOCKING	20.21	18.19	17.18	15.56
41356	BLOCK SUB ASSY, MID 3.37/3.44/3.50	737.54	663.78	626.91	567.90
41357	BLOCK SUB ASSY, DET, 3.445/3.373/3.500	710.66	639.60	604.06	547.21
41359	BLOCK SUB ASSY, DM DETECTOR	600.83	540.75	510.71	462.64
41361	ARM ASSY, DM DETECTOR FILTER	200.68	180.61	170.57	154.52
41362	ARM ASSY, 3 FILT, 3.445/3.373/3.500	303.31	272.98	257.82	233.55
41365	CABLE ASSY, DM SUPERVISOR PANEL 20 C	18.52	16.67	15.74	14.26
41367	ARM ASSY, QTZ STD, NOTCHED	22.96	20.66	19.52	17.68
41368	DOOR ASSY, DM SUPERVISOR	58.28	52.45	49.53	44.87
41370	PCB ASSY, DM PUMP DRIVER, FULL	44.66	40.20	37.96	34.39
41371	PCB ASSY, DM PUMP DRIVER, BASIC	23.56	21.20	20.02	18.14

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Part No	Description	List Price	State Single	2 to 6 pieces	over 6 pieces
41374	MIRROR MOUNT ASS'Y, FLAT CAP	31.78	28.61	27.02	24.47
41375	WINDOW HOLDER ASS'Y, FLAT CAP	33.67	30.31	28.62	25.93
41376	BLOCK ASSY, SC OUTLET	50.66	45.59	43.06	39.00
41378	BLOCK ASSY, SC INLET/OUTLET, SHORT	42.60	38.34	36.21	32.80
41383	RECEP ASSY, AC EMI STD BACK PANEL	69.74	62.77	59.28	53.70
41384	RECEP ASSY, CONVENIENCE	15.80	14.22	13.43	12.17
41390	DETECTOR ASSY, MOUNTING BARE LEADS	343.30	308.97	291.81	264.34
41391	DETECTOR ASSY, MOUNTING	340.20	306.18	289.17	261.95
41392	BLOCK FIN ASSY, DM DETECTOR REV A	986.25	887.63	838.32	759.42
41393	BLOCK FIN ASSY, DET., 3.445/3.373/3.500	1,094.5	985.12	930.39	842.82
41394	PCB ASSY, THERMOMETER DIGITAL	143.48	129.13	121.96	110.48
41398	BLOCK FIN ASSY, MID 3.37/3.44/3.50	1,100.1	990.17	935.16	847.15
41400	BLOCK FIN ASSY, STEP/DET	985.54	886.99	837.71	758.87
41408	SIMULATOR HOLDER ASS'Y, DMT-34CNP	289.28	260.35	245.89	222.74
41409	SIMULATOR HOLDER HEAD ASS'Y, DMT-RE	170.97	153.87	145.32	131.64
41418	RECEPT ASSY, BAR CARD	25.35	22.81	21.54	19.52
41424	CABLE ASSY, DM J12 SAMPLE CONTROL	7.43	6.69	6.32	5.72
41428	PCB ASSY, TEMPERATURE XMITTER	49.49	44.54	42.06	38.10
41430	DOOR ASSY, DM SIMULATOR STD EXT	92.17	82.95	78.34	70.97
41431	CABLE ASSY, DMT DC POWER HARNES SLE	13.84	12.46	11.76	10.66
41432	CABLE ASSY, EXTERNAL GAS CONTROL	16.88	15.19	14.34	12.99
41433	CABLE ASSY, DM TEMP TRANS COAX	16.59	14.93	14.10	12.78
41434	CABLE ASSY, DMT PORTABLE 12V POWER	51.66	46.49	43.91	39.78
41435	CABLE ASSY, dmt, AC RECEPT	9.47	8.52	8.05	7.29
41436	CABLE ASSY, dmt, EMBEDDED POWER	6.34	5.71	5.39	4.88
41437	CABLE ASSY, dmt AC/DC POWER HARNESS	26.17	23.56	22.25	20.15
41439	CABLE ASSY, dmt AC POWER HARNESS (Sir	32.72	29.45	27.81	25.20
41456	PCB ASSY, DMT PIGGYBACK	21.68	19.51	18.43	16.70
41460	FITTING, BEATH TUBE SCREEN-CHECK ASS	26.63	23.97	22.64	20.50
41461	PROBE ASSY, TEMPERATURE	34.92	31.42	29.68	26.89
41463	PROBE (REPCO) 3402C SIMULATOR	58.28	52.45	49.53	44.87
41466	OPTICAL SENSOR, QTZ ASS'Y	25.95	23.35	22.05	19.98
41467	OPTICAL SENSOR, FILT ASS'Y	18.60	16.74	15.81	14.32
41474	PANEL ASSY, DMT FACE 8.4" LCD	1,082.4	974.22	920.10	833.50
41476	PANEL ASSY, DMT FACE 8.4 SLED CONFIG	1,388.5	1,249.7	1,180.3	1,069.2
41502	VALVE ASSY, 5 WAY, 24VDC	137.74	123.96	117.08	106.06
41503	VALVE ASSY, CHECK PURCHASED ASSY.	9.44	8.49	8.02	7.27
41504	VALVE ASSY, DUAL CHECK	7.82	7.04	6.65	6.02
41505	VALVE ASSY, 5-WAY, 12VDC	137.40	123.66	116.79	105.79
41509	CABLE ASSY, DET MTNG, BARE LEADS	5.67	5.10	4.82	4.37
41510	CABLE ASSY, DETECTOR MOUNTING	8.16	7.35	6.94	6.28
41513	WIRE ASS'Y, dmt VALVE SOLENOID	3.00	2.70	2.55	2.31
41523	CABLE ASSY, LAMP, 2 POS..156 CTR	3.46	3.12	2.94	2.67
41524	CABLE ASSY, INTERNAL KEYBOARD	9.14	8.23	7.77	7.04
41525	CABLE ASSY, MOUNTED MODEM-CPU	15.28	13.76	12.99	11.77
41527	CABLE ASSY, RS232 (DTE) 25M	4.41	3.97	3.74	3.39
41540	CABLE ASSY, CAT.5E 12" RJ45 CROSSOVEI	1.97	1.78	1.68	1.52
41542	CABLE ASSY, RS232 (DTE) 25M X 2X5	9.32	8.38	7.92	7.17
41544	WIRE ASS'Y, FERRITE CHOKE, 22μH	7.27	6.55	6.18	5.60
41560	CABLE ASSY, DB9MF, ST THRU SERIAL, MI	13.96	12.57	11.87	10.75
41561	CABLE ASSY, DB9MF, ST THRU SERIAL, MI	20.32	18.29	17.27	15.65
41601	PCB ASSY, DMT DETECTOR MTG	312.03	280.83	265.23	240.26
41602	PCB ASSY, DMT CONTROLLER	432.35	389.12	367.50	332.91
41603	PCB ASSY, DMT CONNECTOR	267.36	240.62	227.26	205.87
41603A	PCB ASSY, DMT CONNECTOR NO MODEM	109.87	98.88	93.39	84.60
41607	PCB ASSY, DMT CONNECT. W/ BAR CODE U	275.86	248.28	234.48	212.41
41608	PCB ASSY, SI DMT SERIAL ADAPTER	31.35	28.21	26.65	24.14
41610	PCB ASSY, LCD 8.4 IN DISPLAY MOUNTING	101.47	91.32	86.25	78.13
41614	CABLE ASSY, TANK PRESS. TRANSDUCER	16.71	15.04	14.21	12.87
41620-C	PCB ASSY, MOUNTED MODEM,7524	233.21	209.89	198.23	179.57
41625	PCB ASSY, SAMPLE CONTROL	73.88	66.49	62.80	56.89
41630	LAMP ASSY, IR PACKAGE TO-8	136.46	122.81	115.99	105.07
41671	KIT, OPTIONAL MICHIGAN PENTAX PRINTE	885.30	796.77	752.51	681.68
41910	TUBING KIT ASSY, SIMULATOR, QUICK DIS	18.39	16.55	15.63	14.16
41911	TUBING KIT ASSY, HEATED SIM TUBING	71.66	64.49	60.91	55.18
41912	TUBING KIT ASS'Y, DMT HEATED SIM	131.45	118.31	111.74	101.22
41915	TUBE ASSY, SIMULATOR AC POWER	144.95	130.46	123.21	111.61
41940	CABLE ASSY, EXT PRINTER, SERIAL	31.78	28.60	27.01	24.47
42300	SAMPLE CHAMBER, BARE ASSY	271.51	244.36	230.78	209.06
42301	SAMPLE CHAMBER INLET BARE ASSY	63.86	57.48	54.28	49.18
42302	VALVE ASSY, 5 WAY BARE	93.58	84.22	79.54	72.06
42303	PUMP ASSY, EXTERNAL SIMULATOR, SVC.	177.01	159.31	150.46	136.30
42305	SAMPLE CHAMBER EXTRUSION ASSY	140.40	126.36	119.34	108.10
42521	BLOCK ASSY, MIRROR MOUNTING (SELL P/	42.13	37.92	35.81	32.44
43206	DISPLAY ASSY, DM FRONT PNL, LG LCD, B/	309.03	278.13	262.68	237.96
43208	COVER ASSY, DM - K	919.79	827.81	781.82	708.24
43229	CABLE ASSY, CDM PRINTER POWER	6.35	5.71	5.39	4.89
43291	VALVE ASSY, GAS, 1/8" TUBE	96.20	86.58	81.77	74.07
43336	CABLE ASSY, CDM PRINTER TO PCB	15.24	13.72	12.96	11.74
43339	CABLE ASSY, DMT TRACS	3.16	2.85	2.69	2.44
43341	CABLE ASSY, SI TO CONTROLLER	8.05	7.24	6.84	6.20
43344	CABLE ASSY, SI POWER	3.60	3.24	3.06	2.77
43345	CABLE ASSY, SI TO MODEM	7.86	7.07	6.68	6.05
43360	DISPLAY ASSY, LCD DMT 8.4 INCH	936.59	842.93	796.10	721.17
43368	DOOR ASSY, DM SUPERVISOR, BLACK	36.38	32.74	30.93	28.01
43433	CABLE ASSY, DP834-12 PRINTER 10 POSITI	11.96	10.77	10.17	9.21

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43434	CABLE ASSY, DP834-12 PRINT HEAD 12 POS	18.24	16.42	15.50	14.04
44024	REFILL,15 CuFt, Etoh Cylinder	450.45	405.41	382.88	346.85
44308	COVER ASSY, DM K, CANADIAN	1,420.5	1,278.4	1,207.4	1,093.8
45105	KEYBOARD ASSY, NPAS NEW WITHOUT CAI	704.51	634.06	598.83	542.47
45107-2	PCB ASSY, KB DRIVER, PIC OP	76.38	68.74	64.92	58.81
45119	PCB ASSY, MULTI - I/O	154.44	138.99	131.27	118.91
45120	PCB ASSY, CPU BOARD,UNIVERSAL	389.06	350.15	330.70	299.57
45120-1	PCB ASSY, CPU / DATA 10/91 BASIC BOARI	416.77	375.10	354.26	320.92
45125	PCB ASSY, PARALLEL PORT ADAPTER	67.54	60.79	57.41	52.01
45130	PCB ASSY, PARALLEL PRINTER DRIVER	111.87	100.68	95.09	86.14
45678	KIT, DRY GAS OPT INTERNAL VALVE	217.48	195.73	184.86	167.46
45679	KIT, GAS OPT. EXT TANK PES. MONT. AND S	158.61	142.75	134.82	122.13
60053	SIMULATOR, MODEL 34C 220 VOLTS	1,207.7	1,087.0	1,026.6	929.99
60202	INSULATOR, SIM JAR, REPCO	2.39	2.15	2.03	1.84
99999	Shipping and Handling Charges	0.00	0.00	0.00	0.00

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30346	ACORN NUT, NYLON 4-40 .25 WIDE X .28 HI	1.05	0.95	0.89	0.81
30280	ADAPTER, CALIBRATION	6.30	5.67	5.36	4.85
37062	ANTENNA 1/4-32 X .180 L.	16.08	14.47	13.67	12.38
41362	ARM ASSY, 3 FILT, 3.445/3.373/3.500	303.31	272.98	257.82	233.55
41361	ARM ASSY, DM DETECTOR FILTER	200.68	180.61	170.57	154.52
41367	ARM ASSY, QTZ STD, NOTCHED	22.96	20.66	19.52	17.68
41245	BENCH ASSY, DM OPTICAL	1,637.2	1,473.5	1,391.6	1,260.6
41255	BENCH ASSY, OPT 3.445/3.373/3.500	1,791.1	1,612.0	1,522.4	1,379.1
41256	BENCH ASSY, OPT, 3.37/3.44/3.50 MID	1,634.0	1,470.6	1,388.9	1,258.2
41265	BENCH ASSY, OPTICAL, CHANNEL DMT	1,986.0	1,787.4	1,688.1	1,529.2
41216-1	BLOCK ASSY, DM THERM, SINGLE W/O SCR	69.70	62.73	59.25	53.67
41216	BLOCK ASSY, DM THERMISTOR, SINGLE	71.37	64.23	60.66	54.96
42521	BLOCK ASSY, MIRROR MOUNTING (SELL P/	42.13	37.92	35.81	32.44
41329	BLOCK ASSY, SC INLET	146.61	131.95	124.62	112.89
41378	BLOCK ASSY, SC INLET/OUTLET, SHORT	42.60	38.34	36.21	32.80
41376	BLOCK ASSY, SC OUTLET	50.66	45.59	43.06	39.00
41393	BLOCK FIN ASSY, DET., 3.445/3.373/3.500	1,094.5	985.12	930.39	842.82
41392	BLOCK FIN ASSY, DM DETECTOR REV A	986.25	887.63	838.32	759.42
41398	BLOCK FIN ASSY, MID 3.37/3.44/3.50	1,100.1	990.17	935.16	847.15
41400	BLOCK FIN ASSY, STEP/DET	985.54	886.99	837.71	758.87
41357	BLOCK SUB ASSY, DET, 3.445/3.373/3.500	710.66	639.60	604.06	547.21
41359	BLOCK SUB ASSY, DM DETECTOR	600.83	540.75	510.71	462.64
41356	BLOCK SUB ASSY, MID 3.37/3.44/3.50	737.54	663.78	626.91	567.90
30422A	BLOCK, DM SC OUTLET REV.F (Cleaned)	27.08	24.37	23.01	20.85
41243-1	BRACKET ASSY, DP834-12 PRINTER, FINAL	508.87	457.98	432.54	391.83
34574	BRACKET, PRINTER LEFT SIDE	48.64	43.78	41.34	37.45
34546	BRACKET, DMT STND RIGHT SUPPORT	35.61	32.05	30.27	27.42
34545	BRACKET, DMT PRINT SUPPORT	18.15	16.34	15.43	13.98
31366	BUMPER, RUBBER SHORT	1.34	1.21	1.14	1.03
31360	BUMPER, RUBBER W/ WASHER #6	1.05	0.95	0.89	0.81
31367	BUMPER, SQUARE RUBBER .23 H X .50 SQ	1.05	0.95	0.89	0.81
30407	BUSHING, FILTER ARM	4.83	4.35	4.11	3.72
41168	CABLE ASSY, 6 FOOT MODEM	4.69	4.22	3.99	3.61
41232	CABLE ASSY, BT HEATER POWER TRANS	15.98	14.38	13.59	12.31
41540	CABLE ASSY, CAT.5E 12" RJ45 CROSSOVEI	1.97	1.78	1.68	1.52
43229	CABLE ASSY, CDM PRINTER POWER	6.35	5.71	5.39	4.89
43336	CABLE ASSY, CDM PRINTER TO PCB	15.24	13.72	12.96	11.74
41230	CABLE ASSY, COOLER TRANS.	9.64	8.68	8.20	7.43
41279	CABLE ASSY, DB9F TO 2X5 DMT MODEM	15.77	14.19	13.41	12.14
41278	CABLE ASSY, DB9F TO 2X5 RLC-CNTRL	15.99	14.39	13.60	12.32
41560	CABLE ASSY, DB9MF, ST THRU SERIAL, MI	13.96	12.57	11.87	10.75
41561	CABLE ASSY, DB9MF, ST THRU SERIAL, MI	20.32	18.29	17.27	15.65
34590	CABLE ASSY, DC ADAPTER PLUG	24.81	22.33	21.09	19.10

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41509	CABLE ASSY, DET MTNG, BARE LEADS	5.67	5.10	4.82	4.37
41510	CABLE ASSY, DETECTOR MOUNTING	8.16	7.35	6.94	6.28
41424	CABLE ASSY, DM J12 SAMPLE CONTROL	7.43	6.69	6.32	5.72
41237	CABLE ASSY, DM CPU/PWR RIBBON	6.88	6.19	5.85	5.30
41244	CABLE ASSY, DM DET/CPU RIBBON	5.79	5.21	4.92	4.46
41247	CABLE ASSY, DM MEMORY EXPANSION	18.38	16.54	15.62	14.15
41254	CABLE ASSY, DM PHOTO INT (PRINTER)	13.54	12.19	11.51	10.43
41229	CABLE ASSY, DM PRINT DRIVER 4POS PWR	10.45	9.41	8.88	8.05
41242	CABLE ASSY, DM PRINTER/CPU RIBBON	7.93	7.13	6.74	6.10
41233	CABLE ASSY, DM PUMP DRIVER	8.51	7.66	7.24	6.56
41307	CABLE ASSY, DM RFI PCB	19.45	17.50	16.53	14.98
41227	CABLE ASSY, DM SAMPLE CONTROL	7.47	6.73	6.35	5.76
41231	CABLE ASSY, DM STD LAMP TRANS.	10.67	9.60	9.07	8.21
41365	CABLE ASSY, DM SUPERVISOR PANEL 20 C	18.52	16.67	15.74	14.26
41433	CABLE ASSY, DM TEMP TRANS COAX	16.59	14.93	14.10	12.78
41439	CABLE ASSY, dmt AC POWER HARNESS (Sir	32.72	29.45	27.81	25.20
41437	CABLE ASSY, dmt AC/DC POWER HARNESS	26.17	23.56	22.25	20.15
41431	CABLE ASSY, DMT DC POWER HARNES SLE	13.84	12.46	11.76	10.66
41284	CABLE ASSY, DMT MODEM POWER	4.06	3.66	3.45	3.13
41434	CABLE ASSY, DMT PORTABLE 12V POWER	51.66	46.49	43.91	39.78
41151	CABLE ASSY, dmt SIM RECEPTICAL	14.17	12.75	12.04	10.91
41277	CABLE ASSY, DMT SIM TEMP RIBBON	16.84	15.15	14.31	12.96
43339	CABLE ASSY, DMT TRACS	3.16	2.85	2.69	2.44
41435	CABLE ASSY, dmt, AC RECEPT	9.47	8.52	8.05	7.29
41436	CABLE ASSY, dmt, EMBEDDED POWER	6.34	5.71	5.39	4.88
43434	CABLE ASSY, DP834-12 PRINT HEAD 12 POS	18.24	16.42	15.50	14.04
43433	CABLE ASSY, DP834-12 PRINTER 10 POSITI	11.96	10.77	10.17	9.21
41940	CABLE ASSY, EXT PRINTER, SERIAL	31.78	28.60	27.01	24.47
41432	CABLE ASSY, EXTERNAL GAS CONTROL	16.88	15.19	14.34	12.99
41145	CABLE ASSY, FET SOURCE/COOLER CONTR	6.78	6.10	5.76	5.22
41524	CABLE ASSY, INTERNAL KEYBOARD	9.14	8.23	7.77	7.04
36509	CABLE ASSY, KEYBOARD 4 COND	7.52	6.77	6.39	5.79
41523	CABLE ASSY, LAMP, 2 POS,.156 CTR	3.46	3.12	2.94	2.67
41203	CABLE ASSY, LCD RIBBON	10.46	9.41	8.89	8.05
41280	CABLE ASSY, MODIFIED MODEM 39217-1 P	5.00	4.50	4.25	3.85
37459	CABLE ASSY, MODULAR KEYBOARD	11.91	10.72	10.12	9.17
41525	CABLE ASSY, MOUNTED MODEM-CPU	15.28	13.76	12.99	11.77
41147	CABLE ASSY, OPTICAL BENCH GROUND ST	1.31	1.18	1.11	1.01
41217	CABLE ASSY, PC KB, DIN	9.70	8.73	8.25	7.47
41527	CABLE ASSY, RS232 (DTE) 25M	4.41	3.97	3.74	3.39
41542	CABLE ASSY, RS232 (DTE) 25M X 2X5	9.32	8.38	7.92	7.17
41276	CABLE ASSY, SERIAL I/O, DB-9 TO 2X5, RIB	22.76	20.48	19.34	17.52
41167	CABLE ASSY, SHORT MODEM, 1 FT.	2.02	1.81	1.71	1.55

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Part No	Description	List Price	State Single	2 to 6 pieces	over 6 pieces
43344	CABLE ASSY, SI POWER	3.60	3.24	3.06	2.77
43341	CABLE ASSY, SI TO CONTROLLER	8.05	7.24	6.84	6.20
43345	CABLE ASSY, SI TO MODEM	7.86	7.07	6.68	6.05
41614	CABLE ASSY, TANK PRESS. TRANSDUCER	16.71	15.04	14.21	12.87
36500	CABLE ASSY, TELPAR PR DRIVER	11.04	9.93	9.38	8.50
36521	CABLE ASSY, USB 2.0 A-B MALE 2 METER L	8.40	7.56	7.14	6.47
37058	CLIP, NYLON CABLE .625 DIA (BT HOLDER)	1.05	0.95	0.89	0.81
25311	CONN MODULAR JACK, 6 POS RJ11	6.76	6.09	5.75	5.21
37110	CONTROLLER, WINDOWS CE	877.80	790.02	746.13	675.91
36347	CORD, POWER LINE 6' 7" BLACK	7.61	6.85	6.47	5.86
44308	COVER ASSY, DM K, CANADIAN	1,420.5	1,278.4	1,207.4	1,093.8
41297-1	COVER ASSY, CDM, METAL	1,014.9	913.43	862.68	781.49
43208	COVER ASSY, DM - K	919.79	827.81	781.82	708.24
30454	COVER, cdm, METAL Without 30498 / 30499	116.27	104.64	98.83	89.53
30401B	COVER, DM STD, BLACK	243.84	219.46	207.27	187.76
30451	COVER, EXTENDED K (POWDERCOATED)	342.46	308.21	291.09	263.69
30301	COVER, K STD DM (POWDER COATED)	257.23	231.51	218.64	198.07
37560	COVER, STD KEYBOARD (POWDER COATEI	80.33	72.29	68.28	61.85
41391	DETECTOR ASSY, MOUNTING	340.20	306.18	289.17	261.95
41390	DETECTOR ASSY, MOUNTING BARE LEADS	343.30	308.97	291.81	264.34
27022	DETECTOR, INFRARED 2MM ELEMENT	293.08	263.77	249.12	225.67
41206	DISPLAY ASSY, DM FRONT PANEL LARGE L	247.59	222.83	210.45	190.64
43206	DISPLAY ASSY, DM FRONT PNL, LG LCD, BA	309.03	278.13	262.68	237.96
41286	DISPLAY ASSY, DM LARGE LCD	90.23	81.21	76.70	69.48
41266	DISPLAY ASSY, LARGE LCD, BACKLIT	165.36	148.82	140.56	127.33
43360	DISPLAY ASSY, LCD DMT 8.4 INCH	936.59	842.93	796.10	721.17
41285	DISPLAY ASSY, LG LCD, DM & cdm	87.79	79.01	74.62	67.60
24112	DISPLAY, LCD LARGE	80.89	72.80	68.76	62.29
41430	DOOR ASSY, DM SIMULATOR STD EXT	92.17	82.95	78.34	70.97
41368	DOOR ASSY, DM SUPERVISOR	58.28	52.45	49.53	44.87
43368	DOOR ASSY, DM SUPERVISOR, BLACK	36.38	32.74	30.93	28.01
30466	DOOR, SIMULATOR STD EXT COVER	18.19	16.37	15.46	14.01
30499	DOOR, cdm PRINTER WELL	13.77	12.40	11.71	10.61
30417	DOOR, DM SUPERVISOR (POWDER COATEI	10.84	9.76	9.22	8.35
30414	DOOR, DM SUPERVISOR (BLACK POWDER (	18.38	16.54	15.62	14.15
30419	DOOR, SIMULATOR EXT K COVER	26.28	23.65	22.33	20.23
30310	ELBOW, 90 DEG 1/8 NPT F/ M BRASS,1200	4.83	4.35	4.11	3.72
27050	FITTING NUT & FERRULE (GUTH)	7.68	6.91	6.53	5.91
26003	FITTING, "L" (DM BREATH TUBE) CPC	5.21	4.69	4.43	4.01
37150	FITTING, "T" PLASTIC 5/16	2.44	2.19	2.07	1.88
37072	FITTING, "Y" 1/4" TUBING	2.53	2.28	2.15	1.95
37073	FITTING, "Y" 3/16	1.76	1.59	1.50	1.36
30125	FITTING, AL NIPPLE .312 O.D.,.218 I.D..5 IL	1.12	1.01	0.95	0.86
41460	FITTING, BEATH TUBE SCREEN-CHECK ASS	26.63	23.97	22.64	20.50
37206	FITTING, BLACK THRU 1/4 ID X 1/8-27NPT	1.47	1.32	1.25	1.13
37090	FITTING, CPC SHURLOCK FEM 1/4ID	9.30	8.37	7.90	7.16
37088	FITTING, CPC MOUTHPIECE RECEPTICLE	2.90	2.61	2.46	2.23
30277	FITTING, CPC PANEL MNT FEMALE	18.04	16.24	15.34	13.89
30367	FITTING, CPC PANEL MNT MODIFIED (r302'	21.72	19.55	18.46	16.72
26002	FITTING, CPC PANEL MNT, MALE	8.11	7.30	6.89	6.24
31502	FITTING, NIPPLE 10-32 X .17 ID TUBING	1.43	1.29	1.21	1.10
37020	FITTING, PANEL BRASS 3/8 X 3/8 BARBS	18.38	16.54	15.62	14.15
38001	FITTING, RETAINER, DISPLAY CABLES	1.05	0.95	0.89	0.81
29592	FITTING, RETAINER, LED LIGHT BAR	2.14	1.93	1.82	1.65
29832	FITTING, STUD AJ4-50	4.08	3.67	3.47	3.14
30368	FITTING, THREADED CAP, THERM RECEPT	7.72	6.95	6.56	5.94
41275	FLOW SENSE MODULE ASS'Y	108.09	97.28	91.88	83.23
37037	FUSE 3 AMP SLO BLO	1.05	0.95	0.89	0.81
34065	FUSE 3.15A 250V SLO-BLO 5 X 20MM	1.05	0.95	0.89	0.81
37039	FUSE 7A SLO BLO, 2AG	1.05	0.95	0.89	0.81
29992	FUSE SIMULATOR 34C	5.25	4.73	4.46	4.04
30504	FUSE, 10A 250V 3AG DMT REAR PANEL	1.09	0.98	0.93	0.84
39302	GAS, DRY STANDARD 105 L .08 G/210L ETC	252.00	226.80	214.20	194.04
39303	GAS, DRY STANDARD 105L .08 G/210L ETOI	217.35	195.62	184.75	167.36
37204	GASKET, EMI NEOPRENE "D" .375 X .25	7.57	6.81	6.43	5.83
37207	GASKET, PORON ADHESIVE, REAR MIRROR	1.18	1.06	1.00	0.91
29982	GASKET, SIMULATOR JAR	1.05	0.95	0.89	0.81
29980	GASKET, SIMULATOR, REPCO JAR	3.36	3.02	2.86	2.59
34589	GASKET, SYCHRON SIMULATOR MOTOR	5.71	5.14	4.86	4.40
37079	HEAD, PRINTER 7 PIN	97.65	87.89	83.00	75.19
37077	HEAD, PRINTER, FOR DP834-12	121.28	109.15	103.08	93.38
29986	HEATER, MKII, MKIIA, 10-4 & EARLY 34C	61.20	55.08	52.02	47.13
32101	INSERT, MOUTHPIECE VALVE	10.93	9.84	9.29	8.42
60202	INSULATOR, SIM JAR, REPCO	2.39	2.15	2.03	1.84
41320	ISOLATED SOURCE DMT INLET ASS'Y	72.26	65.03	61.42	55.64
37112	JAR, SIMULATOR	31.70	28.53	26.94	24.41
37113	JAR, SIMULATOR (REPCO)	0.00	0.00	0.00	0.00
37197	KEY, DATAMASTER SUPERVISOR DOOR 1(	5.25	4.73	4.46	4.04
30293	KEY, TOOL HEAD	7.56	6.80	6.43	5.82
45105	KEYBOARD ASSY, NPAS NEW WITHOUT CA'	704.51	634.06	598.83	542.47
37400	KEYBOARD ASSY, PC, PURCHASED	37.64	33.88	32.00	28.98
41210	KEYBOARD ASSY, W/ CABLE ASSY	514.18	462.76	437.05	395.92
37401	KEYBOARD, CHERRY	176.72	159.04	150.21	136.07
34569	KEYBOARD, CHERRY USB W/ 3TRK MSR	363.82	327.44	309.25	280.15
37404	KEYBOARD, FLEXIBLE PC BLACK	47.22	42.50	40.14	36.36
37402	KEYBOARD, USB STANDARD BLACK	34.47	31.02	29.30	26.54

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37040	KEYPAD, ELASTOMER (WITH GRAY KEYS)	360.94	324.84	306.80	277.92
45678	KIT, DRY GAS OPT INTERNAL VALVE	217.48	195.73	184.86	167.46
45679	KIT, GAS OPT. EXT TANK PES. MONT. AND S	158.61	142.75	134.82	122.13
41671	KIT, OPTIONAL MICHIGAN PENTAX PRINTE	885.30	796.77	752.51	681.68
29520	KIT, SCREW, DB CONN MTG	1.05	0.95	0.89	0.81
41330	LAMP ASSY, DM INFRARED SOURCE	147.40	132.66	125.29	113.50
41630	LAMP ASSY, IR PACKAGE TO-8	136.46	122.81	115.99	105.07
29988	LAMP, INDICATOR, 34C	8.19	7.37	6.96	6.31
29989	LAMP, INDICATOR, RED 34C	8.19	7.37	6.96	6.31
39239	LAMP, INFRARED LIGHT SOURCE	54.18	48.76	46.05	41.72
39241	LAMP, IR SOURCE TO-8 PACKAGE	122.85	110.57	104.42	94.59
24102	LED, LAMP GREEN DISPLAY READY	3.82	3.44	3.25	2.94
37032	LENS, QUARTZ 20MM BI-CONVEX	47.25	42.52	40.16	36.38
37188	LOCK, CAM LOCK ASSY (KEY 1101)	13.82	12.44	11.75	10.64
37553	MEMBRANE,8.4 IN TOUCH REPLACEMENT	84.83	76.35	72.11	65.32
41374	MIRROR MOUNT ASS'Y, FLAT CAP	31.78	28.61	27.02	24.47
37019	MIRROR, SAMPLE CHAMBER (.090")	13.41	12.07	11.40	10.33
39217	MODEM, APPROTEK 7524-1 SP1, 2400 BAUI	169.41	152.47	144.00	130.44
39217-1	MODEM, MODIFIED, APROTEK 7524	195.35	175.82	166.05	150.42
41310	MOTOR ASS'Y, 12X20.6MM	88.73	79.86	75.42	68.32
41311	MOTOR ASS'Y, STEPPER	153.78	138.40	130.72	118.41
37194	MOTOR, 12 X 20.6 MM, 8 MM SHAFT Stand	83.48	75.13	70.95	64.28
37196	MOTOR, CHOPPER 12VDC 16 X 16 MM-DM	0.00	0.00	0.00	0.00
29985	MOTOR, SYNCHRON SIMULATOR	80.33	72.29	68.28	61.85
29851	O RING, 3/16"ID, 5/16"OD, VITON	20.84	18.75	17.71	16.04
29873	O RING, 3/4 OD X 5/8 ID X 1/16"	1.05	0.95	0.89	0.81
32104	O RING, 5/16 X 7/16 X .065 THK, BUNA-N	1.05	0.95	0.89	0.81
29849	O RING, 7/16 ID, 9/16 OD AFLAS	1.27	1.14	1.08	0.98
29981	O RING, BIG, SIMULATOR MOTOR	1.05	0.95	0.89	0.81
29715	O RING, BUNA N, .45 OD X .175 ID X .14 TH	1.05	0.95	0.89	0.81
29850	O RING, BUNA N, 5/8"OD X 1/2"ID DASH 01	1.05	0.95	0.89	0.81
29606	O RING, DET PLATE 3 3/4 ID, 3 7/8 OD	1.05	0.95	0.89	0.81
41467	OPTICAL SENSOR, FILT ASS'Y	18.60	16.74	15.81	14.32
41466	OPTICAL SENSOR, QTZ ASS'Y	25.95	23.35	22.05	19.98
41476	PANEL ASSY, DMT FACE 8.4 SLED CONFIG	1,388.5	1,249.7	1,180.3	1,069.2
41474	PANEL ASSY, DMT FACE 8.4" LCD	1,082.4	974.22	920.10	833.50
30396J	PANEL, REAR, PLATED REV J (BLK ZINC)	49.01	44.11	41.66	37.74
32404	PCB ASSY, 34C SIMULATOR	165.38	148.84	140.57	127.34
41270	PCB ASSY, cdm PRINTER DRIVER	95.06	85.55	80.80	73.20
32402-1	PCB ASSY, cdm PRINTER DRIVER MOD.	211.05	189.95	179.39	162.51
45120-1	PCB ASSY, CPU / DATA 10/91 BASIC BOARI	416.77	375.10	354.26	320.92
45120	PCB ASSY, CPU BOARD,UNIVERSAL	389.06	350.15	330.70	299.57
41223	PCB ASSY, DET BD,W/TERM BLK	104.62	94.16	88.93	80.56
41223-1	PCB ASSY, DET BD. W/ R/A HDR	97.40	87.66	82.79	75.00
41331	PCB ASSY, DM BAROMETER BOARD, COMP	176.40	158.76	149.94	135.83
40223	PCB ASSY, DM DET PRELIM	100.07	90.07	85.06	77.06
41260	PCB ASSY, DM MEMORY EXPANSION	194.04	174.63	164.93	149.41
41371	PCB ASSY, DM PUMP DRIVER, BASIC	23.56	21.20	20.02	18.14
41370	PCB ASSY, DM PUMP DRIVER, FULL	44.66	40.20	37.96	34.39
41607	PCB ASSY, DMT CONNECT. W/ BAR CODE U	275.86	248.28	234.48	212.41
41603	PCB ASSY, DMT CONNECTOR	267.36	240.62	227.26	205.87
41603A	PCB ASSY, DMT CONNECTOR NO MODEM	109.87	98.88	93.39	84.60
41602	PCB ASSY, DMT CONTROLLER	432.35	389.12	367.50	332.91
41601	PCB ASSY, DMT DETECTOR MTG	312.03	280.83	265.23	240.26
41456	PCB ASSY, DMT PIGGYBACK	21.68	19.51	18.43	16.70
45107-2	PCB ASSY, KB DRIVER, PIC OP	76.38	68.74	64.92	58.81
41610	PCB ASSY, LCD 8.4 IN DISPLAY MOUNTING	101.47	91.32	86.25	78.13
41620-C	PCB ASSY, MOUNTED MODEM,7524	233.21	209.89	198.23	179.57
45119	PCB ASSY, MULTI - I/O	154.44	138.99	131.27	118.91
45125	PCB ASSY, PARALLEL PORT ADAPTER	67.54	60.79	57.41	52.01
45130	PCB ASSY, PARALLEL PRINTER DRIVER	111.87	100.68	95.09	86.14
41218	PCB ASSY, POWER SUPPLY, 9/97	187.14	168.43	159.07	144.10
41224	PCB ASSY, PRINTER DRIVER (OBS)	110.53	99.48	93.95	85.11
41226	PCB ASSY, RF BOARD	49.71	44.74	42.25	38.27
41625	PCB ASSY, SAMPLE CONTROL	73.88	66.49	62.80	56.89
41608	PCB ASSY, SI DMT SERIAL ADAPTER	31.35	28.21	26.65	24.14
41428	PCB ASSY, TEMPERATURE XMITTER	49.49	44.54	42.06	38.10
41394	PCB ASSY, THERMOMETER DIGITAL	143.48	129.13	121.96	110.48
27045	PHOTO INTERRUPTER	6.13	5.52	5.21	4.72
32660	PLATE, BASE ADAPTER FOR SI PROCESSOR	28.81	25.93	24.49	22.19
37240	POWER SUPPLY, LCD DISPLAY MTNG BOAR	27.34	24.61	23.24	21.05
21080	POWER SUPPLY, SWITCHER, 12V, 120W	139.42	125.48	118.51	107.35
39262-1	PRINTER BRACKET ASSY FOR 39218	118.28	106.45	100.54	91.08
39262	PRINTER BRACKET ASSY REV A	97.87	88.08	83.19	75.36
30456	PRINTER BRACKET, DP834-12, LOWER TOP	9.22	8.30	7.84	7.10
30455	PRINTER BRACKET, DP834-12, MAIN	37.99	34.19	32.29	29.25
30457	PRINTER BRACKET, DP834-12, UPPER BOTT	25.65	23.09	21.80	19.75
30458	PRINTER BRACKET, DP834-12, UPPER TOP	16.79	15.12	14.28	12.93
39218	PRINTER, DOT MATRIX 40 COL DP834-12	289.79	260.81	246.32	223.14
39210	PRINTER, EPSON M-192	157.50	141.75	133.88	121.28
41463	PROBE (REPCO) 3402C SIMULATOR	58.28	52.45	49.53	44.87
41461	PROBE ASSY, TEMPERATURE	34.92	31.42	29.68	26.89
27048	PROBE TEMPERATURE 4"X3/16"OD S	116.55	104.90	99.07	89.74
27051	PROBE TEMPERATURE GUTH 34C	126.58	113.92	107.60	97.47
41248	PUMP ASSY, 12VDC	209.89	188.90	178.41	161.62
37444	PUMP ASSY, DIAPHRAGM UNIT	47.25	42.52	40.16	36.38

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42303	PUMP ASSY, EXTERNAL SIMULATOR, SVC.	177.01	159.31	150.46	136.30
41240	PUMP ASSY, SIMULATOR , DM	221.92	199.73	188.64	170.88
41249	PUMP ASSY, W/O SNUBBER	183.58	165.22	156.04	141.36
39144	PUMP, 12V DC	204.75	184.28	174.04	157.66
39140	PUMP, DUAL DIAPHRAM 120 VAC	165.38	148.84	140.57	127.34
27082	PUMP, SAMPLER .2 mL	217.35	195.62	184.75	167.36
41383	RECEP ASSY, AC EMI STD BACK PANEL	69.74	62.77	59.28	53.70
41384	RECEP ASSY, CONVENIENCE	15.80	14.22	13.43	12.17
25258	RECEP, AC 3 PRONG BLK PANEL MT	2.26	2.04	1.92	1.74
21074	RECEP, AC EMI FILTER FUSE COMBO	58.56	52.70	49.77	45.09
29834	RECEP, DRUSZ FASTNER 3/8" SQ HOLE	6.34	5.71	5.39	4.88
41418	RECEPT ASSY, BAR CARD	25.35	22.81	21.54	19.52
25260	RECEPT, AC 3 PRONG BLK PANEL MNT	1.67	1.50	1.42	1.28
21075	RECEPT, AC EMI, 3A, PNL MT, R/A	17.53	15.78	14.90	13.50
39240	RECEPTICAL, 4 POSITION SURGE PROTECT(	32.19	28.97	27.36	24.79
44024	REFILL,15 CuFt, Etoh Cylinder	450.45	405.41	382.88	346.85
10008	REGULATOR ASSY, 2.5 lpm GAS W/ VALVE,	303.19	272.87	257.71	233.45
10009	REGULATOR ASSY, 3.5 lpm GAS, W/ VALVE	303.19	272.87	257.71	233.45
10003	REGULATOR, LPM 1.5	283.50	255.15	240.97	218.30
39526	REGULATOR, WALL 110 AC TO 7.5 DC	44.10	39.69	37.48	33.96
37200	RFI SHIELDING STRIP, BERYLLIUM COPPER	13.74	12.37	11.68	10.58
30411	RING, DETECTOR BLOCK RETAINING	13.45	12.11	11.43	10.36
30410	RING, QUARTZ ARM RETAINING	8.40	7.56	7.14	6.47
30409	RING, WINDOW RETAINING	5.70	5.13	4.85	4.39
41139	SAMPLE CHAMBER ASS'Y, FLAT CAP	355.51	319.96	302.18	273.74
41134	SAMPLE CHAMBER ASSY, SHORT	415.86	374.28	353.48	320.22
41132	SAMPLE CHAMBER ASSY, STD DATAMASTI	430.58	387.52	365.99	331.54
42305	SAMPLE CHAMBER EXTRUSION ASSY	140.40	126.36	119.34	108.10
42301	SAMPLE CHAMBER INLET BARE ASSY	63.86	57.48	54.28	49.18
42300	SAMPLE CHAMBER, BARE ASSY	271.51	244.36	230.78	209.06
30525	SCREEN FILTER INSERT THERM BLOCK 11/	2.23	2.00	1.89	1.71
30526	SCREEN, MOUTHPIECE INSERT .625 DIA	1.05	0.95	0.89	0.81
32103	Screen,Mouthpc.Valve, 6' x 48", 30 Mesh .00	32.54	29.29	27.66	25.06
35624	SCREW, #6-32 X .375 FLTHD TORX/6LOBE S	1.05	0.95	0.89	0.81
31877	SCREW, #6-32 X .375 HEX WASHER HEAD	1.05	0.95	0.89	0.81
35626	SCREW, #6-32 X .500 FLTHD PIN/TORX SS M	1.05	0.95	0.89	0.81
29891	SCREW, #8-32 SLOTTED SET, MACHINED	6.09	5.48	5.18	4.69
28411	SCREW, .312 - 18 X .25 SET, HEX, CUP POIN	1.05	0.95	0.89	0.81
27081	SENSOR, FUEL CELL A318 TYPE 4	217.35	195.62	184.75	167.36
27041	SENSOR, MASS AIRFLOW, MICROBRIDGE	91.35	82.22	77.65	70.34
99999	Shipping and Handling Charges	0.00	0.00	0.00	0.00
41408	SIMULATOR HOLDER ASS'Y, DMT-34CNP	289.28	260.35	245.89	222.74
41409	SIMULATOR HOLDER HEAD ASS'Y, DMT-RE	170.97	153.87	145.32	131.64

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60053	SIMULATOR, MODEL 34C 220 VOLTS	1,207.7	1,087.0	1,026.6	929.99
41303	SNUBBER ASSY, 2 HOLER	24.99	22.49	21.24	19.24
41301	SNUBBER ASSY, RADOMSKI	37.80	34.02	32.13	29.11
41344	SOLENOID ASS'Y, FILTER WHEEL LOCKING	20.21	18.19	17.18	15.56
27033	SOLENOID, 12VDC COIL, MODIFIED PLUNGI	36.53	32.88	31.05	28.13
22082	SOLENOID, 22V ROTARY FILTERS ARM 24	104.55	94.09	88.87	80.50
22081	SOLENOID, 22V ROTARY CALIBRATION AR	104.55	94.09	88.87	80.50
27034	SOLENOID, 24V 5 WAY VALVE W/ PLUNGER	34.43	30.99	29.27	26.51
40400	STAND, cdm INSTRUMENT, BASE	389.81	350.83	331.34	300.16
40401	STAND, DM INSTRUMENT, BASE, PA	247.28	222.55	210.18	190.40
29858	STANDOFF, #4-40 PRINTER HOLDDOWN	2.10	1.89	1.78	1.62
29854	STANDOFF, #4-40 X .50 AL M/F .18 HEX (DE	1.30	1.17	1.11	1.00
29803	STANDOFF, #4-40 X 3.25 IN. CARD SUPPOR	4.45	4.01	3.78	3.43
29860	STANDOFF, 2.312", SHORT HOLDDOWN	7.10	6.39	6.03	5.47
31487	STANDOFF, DETECTOR PLATE,ROUND STO(	1.81	1.63	1.54	1.39
39245	SURGE PROT, TRIPP LITE LS-604	291.38	262.24	247.67	224.36
31588	SWITCH, 20A, ON-OFF-ON, SPDT, ROCKER	2.35	2.12	2.00	1.81
28117	SWITCH, CDM PAPER FEED	9.89	8.90	8.40	7.61
27044	SWITCH, SLOTTED OPTICAL	5.25	4.73	4.46	4.04
41137	TAPE ASSY, HEATER (DM) (SERIES)	35.92	32.33	30.53	27.66
41140	TEMPERATURE CNTRL ASSY, FLAT CAP	64.65	58.18	54.95	49.78
27037	THERMISTOR, 4.7K SAMPLE CHAMBER	10.03	9.03	8.53	7.73
29968	THERMOMETER, GUTH DIAL	97.74	87.97	83.08	75.26
29970	THERMOMETER, NIST CALB ASSY W/NUT	97.65	87.89	83.00	75.19
29895	THERMOSTAT, MERCURY IN COLUMN	108.77	97.89	92.45	83.75
35666	TOOL, SYRINGE, 2 LITRE	157.50	141.75	133.88	121.28
35667	TOOL, SYRINGE, 3.5 LITRE	236.25	212.62	200.81	181.91
27036	TRANSDUCER 6V	1.05	0.95	0.89	0.81
10015	TRANSDUCER, 7-35V, 1/8 NPT MALE, 1.5K I	211.05	189.95	179.39	162.51
41133	TRANSFORMER, 110V 60HZ MID-DM	151.89	136.70	129.11	116.96
41915	TUBE ASSY, SIMULATOR AC POWER	144.95	130.46	123.21	111.61
31450	TUBE, INLET 34C	25.73	23.15	21.87	19.81
36566	TUBING 1/4 X 3/8 TYGON	4.11	3.70	3.50	3.17
36567	TUBING 1/4 X 7/16 VINYL BLACK (SIM. HO(	1.05	0.95	0.89	0.81
36568	TUBING 1/4 X 7/16 VINYL CLEAR (SIM. HO(	1.05	0.95	0.89	0.81
37092	TUBING BREATH 1/4 ID X 7/16 OD.	6.00	5.40	5.10	4.62
36379	TUBING CLEAR TYGON 3/16 X 5/16	1.89	1.70	1.61	1.46
41912	TUBING KIT ASS'Y, DMT HEATED SIM	131.45	118.31	111.74	101.22
41911	TUBING KIT ASSY, HEATED SIM TUBING	71.66	64.49	60.91	55.18
41910	TUBING KIT ASSY, SIMULATOR, QUICK DIS	18.39	16.55	15.63	14.16
36018	TUBING SILICON (MILKY) 1/4 ID X 3/8 OD	2.35	2.12	2.00	1.81
41253	UPGRADE KIT, DP834-12 PRINTER	586.71	528.04	498.70	451.77
42302	VALVE ASSY, 5 WAY BARE	93.58	84.22	79.54	72.06

Fax: 419-526-9446

NPAS Consolidated Price list
Box 1435, 2090 Harrington Mem. Rd.
Mansfield, Ohio 44901

Phone : 800-800-8143

Effective Date

Print Date 3/24/09

Notes: u/m are units and are in increments of Each, if not specified. Wire and tubing are in increments of Feet. Prices expressed as 0.00 are not priced.

Part No	Description	List Price	State Single	2 to 6 pieces	over 6 pieces
41502	VALVE ASSY, 5 WAY, 24VDC	137.74	123.96	117.08	106.06
41505	VALVE ASSY, 5-WAY, 12VDC	137.40	123.66	116.79	105.79
41267	VALVE ASSY, BLOCK & SLIDE	70.62	63.55	60.02	54.37
41503	VALVE ASSY, CHECK PURCHASED ASSY.	9.44	8.49	8.02	7.27
41504	VALVE ASSY, DUAL CHECK	7.82	7.04	6.65	6.02
43291	VALVE ASSY, GAS, 1/8" TUBE	96.20	86.58	81.77	74.07
29736	VALVE CHECK, FLAPPER	3.81	3.43	3.24	2.94
29744	VALVE GAS 1/8 NPT 12VDC, 2 way 2.5mm o	58.90	53.01	50.07	45.36
32102	WASHER, MOUTHPIECE VALVE-NEO FLAT	1.05	0.95	0.89	0.81
41375	WINDOW HOLDER ASS'Y, FLAT CAP	33.67	30.31	28.62	25.93
37060	WINDOW, 9.5mm DIA X 1mm THICK IR QUAI	10.99	9.89	9.34	8.46
37035	WINDOW, QUARTZ 12.7MM	10.84	9.76	9.22	8.35
37033	WINDOW, QUARTZ STANDARD 16.5MM	11.39	10.25	9.68	8.77
41513	WIRE ASS'Y, dmt VALVE SOLENOID	3.00	2.70	2.55	2.31
41544	WIRE ASS'Y, FERRITE CHOKE, 22μH	7.27	6.55	6.18	5.60

Part No	Description	List Price	Single Unit	2 to 6 pieces	Over 6 Pieces

From: John Fusco [jd@npas.com]
Sent: Tuesday, May 06, 2008 3:28 PM
To: Customers
OK. They say once you pass 65 everything goes. Here's the attachment.

National Patent Analytical Systems, Inc.
Report on Data Obtained from the State of New York on
Evidential Breath Alcohol Tests using the DataMaster DMT

Invalid Sample data was recently evaluated from DMT instruments in service in New York State. The New York Division of Criminal Justice Services began installing these instruments in September 2007. This data was purged of all personal information prior to leaving New York State. A preliminary observation of this data was made by the staff at National Patent Analytical Systems Inc. ("NPAS") and the following is being offered for informational purposes. NPAS intends only to make this information available in summary form to existing customers and other interested parties. This is an informational report only and is not being offered as a scientific study.

Background and supporting Information

A. Explanation of the INVALID SAMPLE message criteria as it is employed in the DataMaster DMT

1. Measurements of the alcohol concentration during breath sample delivery are taken every 250 milliseconds (4x per second). This measurement is taken in real time and the result of an average of the 500+ Hz signal resulting from the chopping of the detector signal. There is no electronic delay in the processing of this signal since only 2 measurements are required for a single average.

2. A "positive going slope" is defined as a comparison of a 2 consecutive point average to the previous where the trend is not in the negative direction. Both conditions of a positive change and no change are considered a positive going slope.

3. The message "INVALID SAMPLE" will be produced while the instrument detects at least the minimum rate of airflow during sample delivery if:

a. There are three consecutive comparisons of two point averages where the trend is in the negative direction (values are decreasing) after seeing first a minimum of six positive comparisons of two point averages, or

b. If any final result $\geq$ 0.060 g/210 l is less than 95% of any previous high reading during that successfully delivered sample, or

c. If any final result $\geq$ 0.003 g/210 l but $<$ 0.060 g/210 l is lower than any previous high reading during that successfully delivered sample by at least 0.003 g/210 l.

Note: The traditional BAC DataMaster and cdm do not utilize criteria 3b and 3c. Criteria 3a is similar except that a slightly longer positive going reading is required by the DMT prior to averaging for the negative going reading.

B. Background of Data Evaluated

Actual subject test data was recently evaluated from DMT instruments in the field in New York State. The State of New York, through the Division of Criminal Justice Services began installing instruments in September 2007. At the time of the gathering of the data, 88 units were in evidential field service for varying lengths of time and a total of 1713 evidential tests were performed. Minimum initial deprivation periods were observed and a 20 minute additional waiting period is observed after any test that terminates with an "invalid sample" per New York testing procedures. There were a total of 71 (4% of total) "invalid samples" and 34 of these DMTs produced at least one invalid sample. The average # of tests per these 34 units was 33.1. The remaining 54 units that had no invalid samples averaged 10.9 tests per unit and it is probable that these 54 DMTs are either in low usage locations or have been in the field the shortest time.

C. Summary of Test Data

1. There were 35 tests (2% of the total) that were terminated with an invalid sample message because they met the criteria in either 3b or 3c above. These were all as a result of multiple blows during a single test attempt on the part of the subject that fit the citeria of these conditions. These tests could have also been terminated as incomplete as they met both the criteria for either 3b or 3c above in addition to the criteria for an incomplete test. These tests are somewhat unremarkable as starting and stopping blows during a single test typically results in an unpredictable outcome. A determination as to the exact reason cannot be made unless a graph of the alcohol and breath curves is available. Since multiple blows that terminate in an unsucessful test are generally more correctly considered as "incomplete" future versions of the software will accommodate this change.

2. There were 36 instances of invalid samples (2% of the total) triggered by a negative slope to the alcohol concentration curve. In these instances of invalid samples due to negative slope, there were 6 subjects who accounted for a total of 15 invalid sample tests.* Of interest here is that the negative slopes, as evaluated from the graphs produced, were in no way typical of what is traditionally percieved as a significant downward trend that could be as a result of mouth alcohol. Rather, the indication was that, as the subject was about to "run out of breath" and as the sample was near completion the alcohol concentration dropped off very slightly (.001 to a max .004) at the tail end of the breath delivery. This decline is sufficient to trigger the "invalid sample" message.

Comments

1. The ability to capture and evaluate this data in precise detail is possible because of the very fast response of the DMT system coupled to the graphic depiction of the breath and alcohol profile in real time, allowing a resolution in the data points to .0001. (see patent note below)

2. Since not a single test of the 1713 evaluated exhibited the anticipated significant rise and/or fall that would be expected if the sample were contaminated with mouth alcohol, the question then arises as to the cause of this minimal downward trend at the very end of the test as the subjects ceased blowing.

A study by J. C. Russel and R. L. Jones, Biochemistry Laboratory, Department of Surgery and Pulmonary Division, Department of Medicine, University of Alberta, Edmonton, Alberta titled "Breath Ethyl Alcohol Concentration and Analysis in the Presence of Chronic Obstructive Pulmonary Disease" (circa 1983?) may shed some light on this question. Among other things in this study, one thing that was seen was that, in patients with COPD, there was a characteristic of the breath alcohol curve almost identical to that which was observed on the invalid tests performed on the DMT. Normal subjects in this study did not exhibit this drop-off in the alcohol concentration at the end of exhalation.

3. The absence of any indications of invalid samples as a result of mouth alcohol in the total of 1713 tests may be significant. Future data will be used to validate this information.

*Removing the multiple tests per subject to get a clearer indication of the percentage of subjects producing invalid samples due to negative slopes, the 2.1% is reduced to 1.47%. This represents the total percentage of invalid sample tests produced on all instruments if only a single test was performed.

Note: Patents are pending on certain applications used to record, analyze and present this data. These applications are employed in the DMTs used in the New York testing and in all DMTs in service.

Prepared by:

David Radomski
John Fusco
May 1, 2008

From: John Fusco [jd@npas.com]
Sent: Tuesday, October 09, 2007 11:31 AM
To: Drawbaugh, Bob
Cc: Radomski Dave; Scott Marhefka
Subject: Re: DMT order
Bob:

Dave was notified on the 26th that 4 additional instruments were needed. These were on the shelf, but ready to go is very relative. They were ready from a hardware and electronic testing standpoint, but not from a software testing standpoint. Scott spent a considerable amount of time last week being certain that all the current and most recent software work was done and passed it to service late last week. Essentially, because of the time that had elapsed since the last shipment, he did a complete review again before he gave it to service for installation in the the new instruments. He worked on it last week, working it in with some visitors which took some time away. Service began testing protocols at that time and will finish today. This testing takes about 1 day for each instrument. In this case, I have two techs on the four instruments for 2 days since they can run them concurrently.

This is our normal procedure since software is never loaded until we are as certain as we can be that it is current. Essentially these four were treated as new instruments again from that perspective, and each time we ship, they are each run through the same procedures. This will be shortened somewhat when the software is considered final, but until then, they will go through the same routine, and if there are changes, the testing will be more extensive again.

I'm not sure there is any good way around this that will still insure that we are doing the best that we can. Your requirements, particularly from a software perspective have been very extensive and in many ways have allowed us to do some unique development work that I think we can both be proud of and hopefully, we can use elsewhere. The price of this is time and as long as we are in the evaluation phase,

it will continue to be an important factor. Hopefully, all will go well with these four, but if there are issues that your people find, we will address them and test it all again.

Now get your boat in dry dock and go back to work.

JF

On Oct 9, 2007, at 10:20 AM, Drawbaugh, Bob wrote:

> John, Just a note to let you know that it appears that either there is a lack of communication within NPAS or incorrect information coming to us regarding our DMT order. We recently requested an additional 4 instruments to be sent to us from the batch that , we have been told, is on the shelf to supply our order. The instruments were not shipped as had been promised which has held up our testing schedule. The reason for the delay is unclear to us as one entity has cited another as the reason while that person claims no responsibility for that decision. The delay in itself is not a particularly big issue if they are shipped as per reply to our inquiry yesterday, however, in review of the total experience there are concerns regarding NPAS ability to provide the products in a timely manner and which perform as specified in the purchase performance specifications. What is concern for all of us in the field as users is the apparent lack of abiltiy of the industry manufacturers to provide equipment meeting the perceived or specified need. You may want to articulate this concern to the next meeting of the manufacturers. I hope that we can move forward together and get resounding approval and appreciation of the new DataMaster model in the very near future.
>
> Cordially,
>
> Bob
>
> **********
>
> Robert Drawbaugh, Chief
> Toxicology Program
> VT Department of Health Laboratory
> 195 Colchester Ave.
> Burlington, VT 05402-1125
> (802) 863-7622

John Fusco
National Patent Analytical Systems, Inc.
jd@npas.com
Phone 419+526-6727 Fax 419+526-9446

Vermont Department of Health Laboratory
Toxicology Program
Memorandum

To: Steven Smith
Deborah LaRose

From: Robert Drawbaugh, Toxicology Program Chief

Date: April 14, 2011

Re : DataMaster DMT Refurbish Project

In support of our request for approval and processing of our requisition for refurbishing of DataMaster DMT breath alcohol testing instruments by the original manufacturer, National Patent Analytical Systems, Inc., I offer the following:

1. to maintain the operating and performance integrity of instrumentation having already been in use for collecting evidence for dui prosecutions it is important that only the original manufacturer and author of the operating software have access to the instruments for refurbishing;
2. The parts used in this refurbish process are unique to the DataMaster and and the interfacing with the rest of the system is only available from the original manufacturer;
3. In continuing coordination with the manufacturer of the instruments to be refurbished and who is providing the new instruments to be installed around the state for dui evidence collection we will be able to schedule the project so that it is the least disruptive to resources for law enforcement as possible.

These factors alone should support the requirement for the work requested to be provided as a sole source by the original manufacturer of the instrumentation.

Vermont Department of Health Laboratory Requisition

From: Date:

Shipped To: 195 Colchester Avenue
Burlington VT 05401

Date Required:

Date: _____

Requisition # _____

Department ID #: _____

Program Code # _____

Fund Code # _____

Approved by HS Administrator _____

Item	Quantity	Unit	Description: Give complete description	Catalog #	Object Code	Total
	15	ea	DataMaster DMT breath alcohol testing instruments with: refurbished Guth 34C-NP simulators[operating head; jar and bnc temperature monitoring cable].; with current Vermont hardware and software configuration; meeting current Vermont performance criteria as specified in previous purchase.			$98,625.00

Vendor Name NPAS

DEPT/PROGRAM CODES DataMaster 3420021211 39461 PERCENTAGE 100%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 00%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 00%

DEPT/PROGRAM CODES Administration 3420021208 39434 PERCENTAGE 0%

Approved by RJD Date: 7/30/09

(If over $1,000)
Authorized by Laboratory Director

Date:

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MNam		
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Gender	M	
License		
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f2	-6.315
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Val	0
Time	11:27:26
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Time	11:27:43
Volume	2.84
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Attempts	1
Duration	5.25
alc	0
f1	0

f2		-3.655
f3		0
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Txt		
/Txt		
Blank		
Val		0.67
Time		11:28:31
/Blank		
Xq		
Val		344.69
Time		11:28:37
Off		0.75%
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/Xq		
Stand		
Temp		33.9
Time		11:28:56
Target		268.31
alc		286.23
f1		286.232
f2		1.809
f3		12.349
/Stand		
Blank		
Val		1.58
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