

INTOXILYZER 5000

BREATH ANALYSIS INSTRUMENT

OPERATOR'S TRAINING

MANUAL

July 26, 1993

CONTENTS

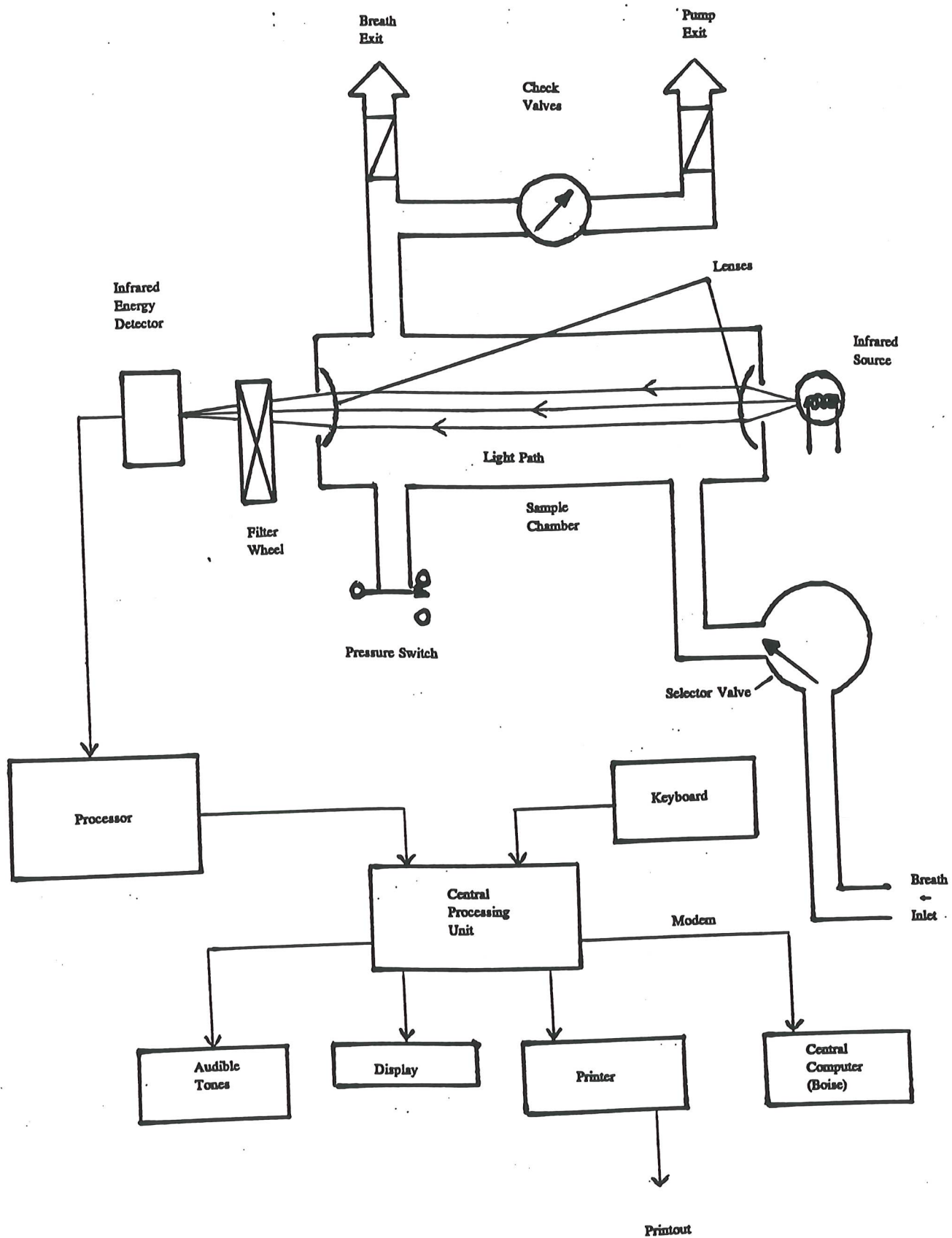
General Information (Operating Principle of Intoxilyzer 5000)	1
Functional Diagram	2
Front and Back Views of Intoxilyzer 5000	3
Parts, Controls, and Indicators	4
Fifteen Minute Waiting Period	5
Operating Procedure	5
Refusal Procedure.	6
Printed Output	7
Normal Printed Record	7
"INVALID TEST"	10
"DEFICIENT SAMPLE"	10
"INHIBITED RFI"	10
"INTERFERENT DETECTED"	10
"INVALID SAMPLE .XX"	10
Question Series Flow Chart (Idaho)	8
Explanation of User Questions	9
Display Messages and Commands (Meanings)	11
Tones	14
Displayed Error Messages	15
Diagnostic Checks	15
Time and Date Errors	15
Other Error Messages	16
Evidence Card Jammed in Printer	18
General Malfunctions	18
Preventive Maintenance	18

GENERAL INFORMATION

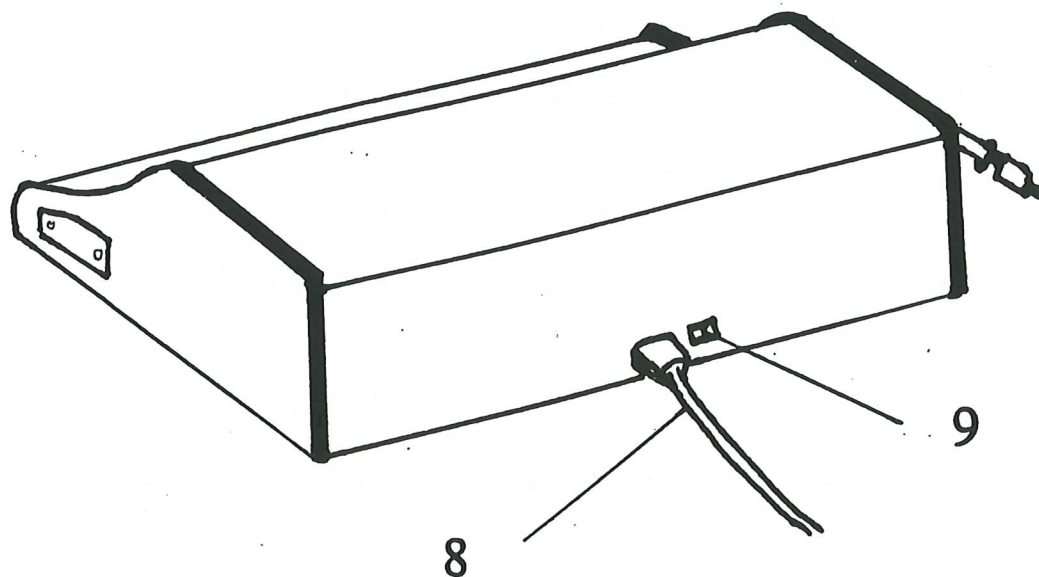
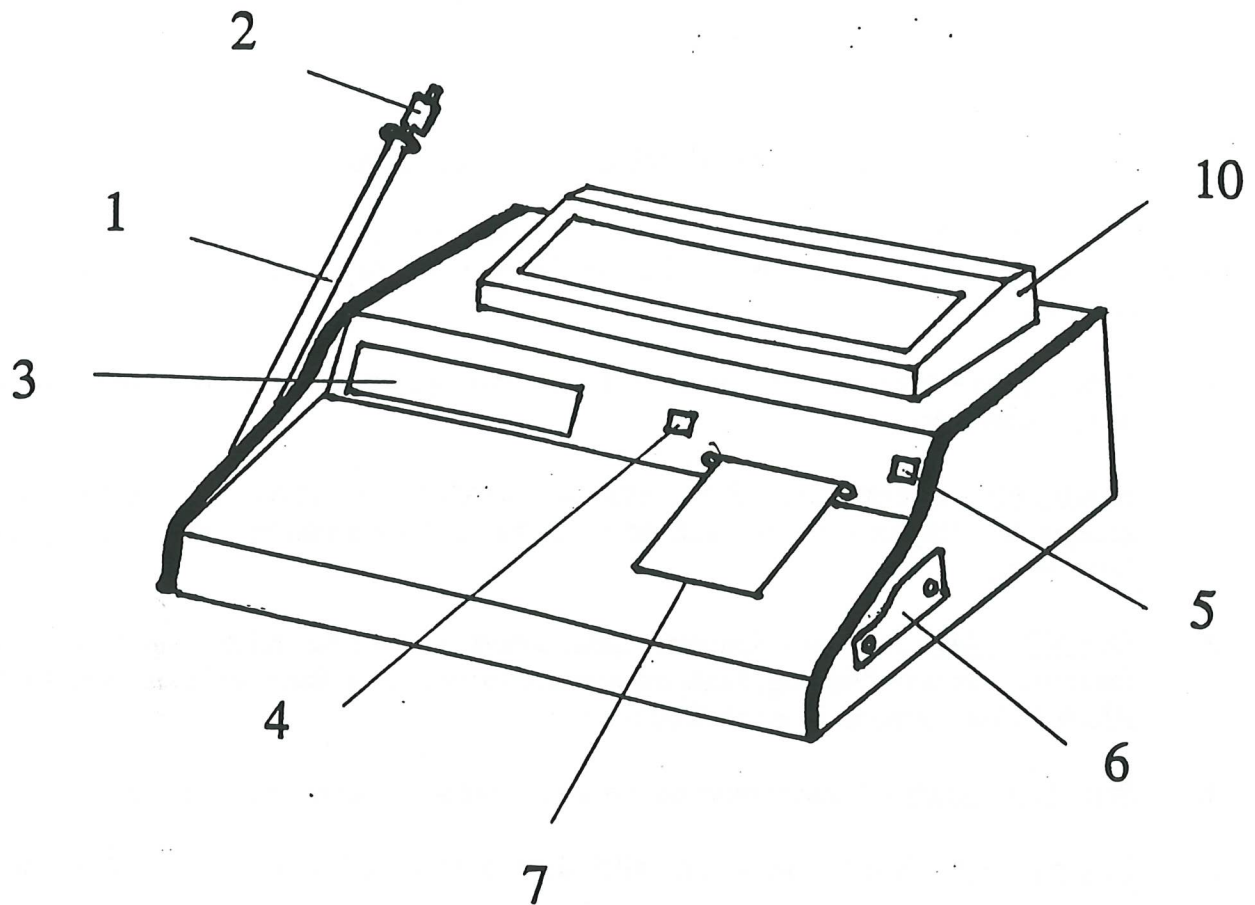
Depending on their physical size and structure, molecules absorb energy of specific frequencies. For example, alcohol molecules absorb certain frequencies of infrared energy. Accordingly, the Intoxilyzer 5000 breath analysis instrument uses an infrared energy absorption technique to find the alcohol concentration of a breath sample.

The heart of the Intoxilyzer 5000 instrument is its sample chamber. At one end of the chamber, a quartz iodide lamp emits infrared energy, which is directed through the chamber by a lens. At the opposite end of the chamber, a second lens focuses the energy leaving the chamber through three rotating filters and onto an infrared energy detector. The filters however, allow only certain wavelengths through.

Initially, the instrument establishes a zero reference point by measuring the amount of infrared energy striking the detector when the sample chamber is filled with room air. During a breath test, as the amount of alcohol vapor in the chamber rises, the amount of infrared energy reaching the detector falls. Therefore, by finding the difference between the zero reference point and the breath test measurement, the instrument determines breath alcohol concentration. The unit displays the result in grams of alcohol per 210 liters. To assure accurate test results, the Intoxilyzer 5000 breath analysis instrument also detects and compensates for acetone which absorbs the same infrared frequencies as alcohol absorbs.



FUNCTIONAL DIAGRAM



**INTOXILYZER Model 5000
Breath Analysis Instrument**

PARTS, CONTROLS, AND INDICATORS

To familiarize yourself with the parts, controls, and indicators of the Intoxilyzer 5000 breath analysis instrument, refer to the illustration on the previous page and the cross-referenced explanations below.

1. **Breath Tube** - A heated reinforced plastic tube through which the subject blows into the sample chamber.
2. **Mouthpiece** - A disposable, clear plastic part which fits in the end of the breath tube, accepts the subject's breath, and prevents unwanted substances from entering the instrument.
3. **Digital Display** - A sixteen character alpha-numeric readout that relates which operation the instrument is performing, alerts the operator to required actions, and expresses Breath Alcohol Concentration in grams/210 liters.
4. **Start Test Switch** - A green push button switch used to operate the instrument.
5. **Power Switch** - A red push button switch used to apply AC power to the instrument.
6. **Key Latch** - A hardened steel lock with a removable key used to unlock the hinged door on the side of the instrument to expose the Mode Selection switches.
7. **Evidence Card** - A formatted, multi-copy card that provides a printed record of the date, model and serial number of the instrument, test procedure, test results, time of test, and subject and operator information.
8. **Power Cord** - A cord that supplies power to the instrument.
9. **Computer Reset Switch** - A rocker switch activated only in isolated circumstances to cancel all operations and return the instrument to its initial "Not Ready" condition.
10. **Keyboard** - A standard computer keyboard which allows the operator to type answers to questions.
11. **Modem** - (Not shown) An electronic device allowing the Bureau of Forensic Services to communicate with the Intoxilyzer 5000 "on site". Call-ups of the instruments will typically be early Sunday mornings. Operators using the instrument will not be affected by the call-up. The modem can be used to diagnose instrument problems, or to recover test data if the printer fails.

FIFTEEN MINUTE WAITING PERIOD

The mucous lining of the mouth cavity and nasal passages stores alcohol for some time after a person consumes alcohol. Normal body processes eliminate residual mouth alcohol within 15 minutes.

Observe the subject for 15 minutes. During this time, the subject may not smoke, consume alcohol, belch, vomit, use chewing tobacco, or have any other substance in the mouth. If belching or vomiting does occur or something is found in the mouth, wait an additional 15 minutes.

OPERATING PROCEDURE FOR A BREATH TEST:

Observe subject for 15 minutes.

Insert a new mouthpiece in the end of the BREATH TUBE.

To conduct a breath test, push START TEST button and respond to the displayed messages and commands.

<u>DISPLAY READS</u>	<u>REQUIRED OPERATOR ACTION</u>
1. "INSERT CARD" (flashing)	Insert an evidence card into the card slot located on the front panel of the instrument.
2. SERIES OF QUESTIONS:	Answer each question and enter the information by pressing RETURN.
3. "AIR BLANK"	
4. "TIME ##HR ##MIN"	
5. "DATE MM/DD/YY"	
6. "AIR BLANK .##"	
7. "> > ..."	
8. "PLEASE BLOW INTO MOUTHPIECE UNTIL TONE STOPS"; "PLEASE BLOW/R" (flashing)	Request subject to blow into the mouthpiece until you tell him to stop.

* If the subject stops blowing before providing a sufficient sample, "PLEASE BLOW" flashes on the display and a beep sounds every 5 seconds. Request the subject to blow again until the tone stops. (The subject has 3 minutes to provide an adequate breath sample).

DISPLAY READS**REQUIRED OPERATOR ACTION**

- | | | |
|-----|--|--|
| 9. | "SUBJECT .##" | |
| 10. | "AIR BLANK .##" | |
| 11. | "> > ..." | |
| 12. | "PLEASE BLOW INTO MOUTHPIECE UNTIL TONE STOPS"; "PLEASE BLOW/R" (flashing) | Request subject to blow into the mouthpiece until you tell him to stop (See * at #8 on the previous page). |
| 13. | "SUBJECT .##" | * |
| 14. | "AIR BLANK .##" | |
| 15. | QUESTION | A question about drug testing will appear on DUI cases. |
| 16. | "TEST COMPLETE" | Remove the evidence card <u>after</u> it is released by the instrument. |
| 17. | "INTOXILYZER 5000, etc." (rolling across screen) | |

*If the second breath sample result differs from the first by more than .02, then a third sample will be automatically requested.

Enter all the data required in the logbook.

REFUSAL

If the subject refuses to give a sample, press the green **START TEST** button when the display shows **"PLEASE BLOW/R"**.

The print card will have **SUBJECT TEST REFUSED (TIME)**
SUBJECT REFUSED TO CONTINUE.

PRINTED OUTPUT

The Intoxilyzer 5000 breath analysis instrument gives a printed record of the date, name and serial number of the instrument, test procedure, test results, time of test, and subject and operator information.

THIS SIDE UP. THIS EDGE IN. FORM NUMBER 015010

IBFS
INTOXILYZER - ALCOHOL ANALYZER
MODEL 5000 SN 66-003023
08/03/1992

SUB NAME=SMITH,JOHN,Q
SUB DOB =02/28/65
O.L.N.=ID/89123329
OPER NAME=BENCHLEY,PETER,E
ARREST AGENCY=0006

TEST	BRAC	TIME
AIR BLANK	.00	14:03MDT
SUBJECT TEST	.10	14:04MDT
AIR BLANK	.00	14:04MDT
SUBJECT TEST	.09	14:04MDT
AIR BLANK	.00	14:05MDT

SUBJECT'S NAME

TIME FIRST OBSERVED INSTRUMENT LOCATION

OPERATOR

ADDITIONAL INFORMATION AND/OR REMARKS

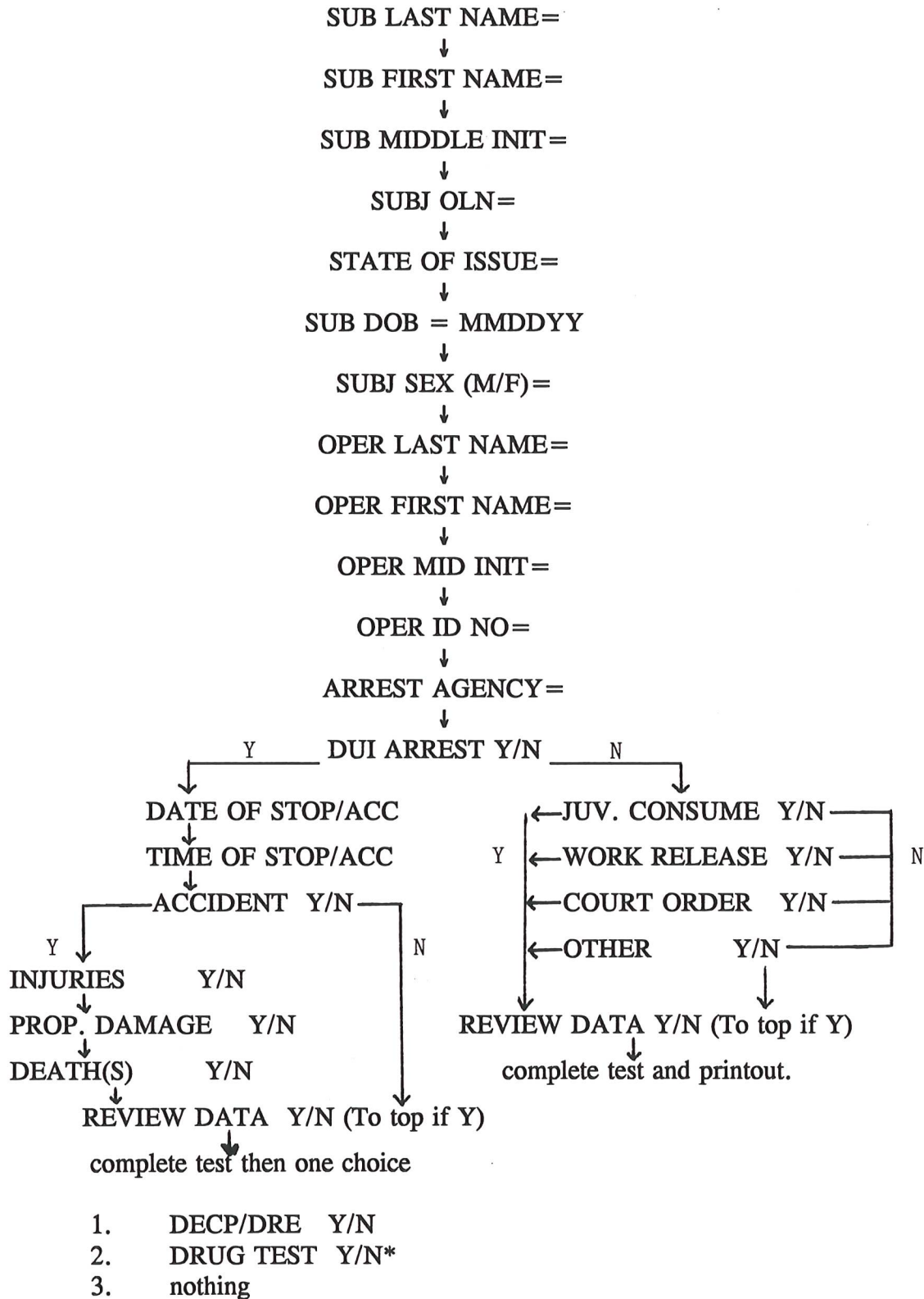
INTOXILYZER® INSTRUMENT PRINTER CARD

© 1986 by CMI INC.

CMI INC.

QUESTION SERIES FOR IDAHO TESTING PROGRAM

Press green START button and answer questions.



EXPLANATION OF USER QUESTIONS FOR IDAHO TESTING PROGRAM

QUESTION ON DISPLAY	CARD COPY	DATA BANK	COMMENTS
SUBJ LAST NAME=	X	X	Up to 20 letters for each, no -.: 'etc.
SUBJ FIRST NAME=	X	X	
SUBJ MIDDLE INIT=	X	X	Middle initial.
SUBJ OLN=	X	X	Entered as up to 20 numbers and/or letters.
STATE OF ISSUE=	X	X	Two letter postal code.
SUBJ DOB = MMDDYY	X	X	Entered as month, day, and year (e.g. 070552).
SUBJ SEX (M/F) =		X	
OPER LAST NAME =	X	X	Up to 20 letters for each, no _.: 'etc.
OPER FIRST NAME=	X	X	
OPER MID INIT =	X	X	Middle initial.
OPER ID NO=		X	Entered as a number w/o dashes.
ARREST AGENCY	X	X	Entered as 4 numbers; accident report code.
DUI ARREST Y/N		X	Answer yes if person arrested for DUI.
If answer is Y:			
DATE OF STOP/ACC		X	Date of stop or accident (eg. 062493).
TIME OF STOP/ACC		X	2400 hour military time.
ACCIDENT Y/N		X	Answer yes if person was in an accident.
If answer is Y: (N answer skips next questions only)			
INJURIES Y/N		X	Was anyone injured?
PROP. DAMAGE Y/N		X	Was there any property damage?
DEATH(S) Y/N		X	Was anyone killed?
REVIEW DATA Y/N			If you want to check answers, use Y.

Complete breath test conducted, but before printout is issued on DUI tests only (where the subject did not refuse any sample):

DECP/DRE Y/N	X	One question or the other activated; answer yes if you are going to ask the subject to give a blood sample and/or a urine sample for drug testing.
DRUG TEST Y/N	X	

Printout is issued and test is complete.

CARD DATA		COMMENTS
QUESTION ON DISPLAY	COPY BANK	

DUI ARREST Y/N if answer is N:

JUV. CONSUME Y/N	X	Illegal consumption.
WORK RELEASE Y/N	X	
COURT ORDER Y/N	X	Court ordered test.
OTHER Y/N	X	Any other reason not covered above.

REVIEW DATA Y/N If you want to check answers, check Y.

Complete breath test conducted and printout issued. End of test.

AN INCORRECT OPERATIONAL PROCEDURE OR CONDITION will cause the instrument to either cancel or complete a mode sequence and print one of the following messages on the evidence card:

1. "INVALID TEST" - Either the Start Test button was pushed at the wrong time or the evidence card was partially pulled from the printer.
2. "SAMPLE INTRODUCED AT IMPROPER TIME. INVALID TEST" - The subject blew into the mouthpiece at the wrong time.
3. "UNABLE TO OBTAIN STABLE REFERENCE"; "INVALID TEST" - The microprocessor was unable to obtain a stable reference signal from the processor.
4. "* DEFICIENT SAMPLE - VALUE PRINTED WAS HIGHEST OBTAINED" - The subject did not provide an adequate breath sample within three minutes. The instrument printed the highest obtainable BAC value indicated by the asterisk (*) printed before "SUBJECT TEST".
5. "INHIBITED RFI"; "INVALID TEST" - High level radio frequency interference is present.
6. "INTERFERENT DETECTED" - The subject's breath sample contained a substance, such as acetone, that absorbed the same infrared frequencies as alcohol. The instrument compensated for the amount of infrared energy absorbed by the substance. The message "INTERFERENT DETECTED HAVE BLOOD DRAWN" appears on the card.
7. "INVALID SAMPLE .XX" - The instrument detected residual mouth alcohol in the subject's breath sample and printed "INVALID SAMPLE .XX" in place of "SUBJECT TEST .##". The message "REPEAT OBSERVATION PERIOD BEFORE RETESTING SUBJECT" also appears on the card.

DISPLAY MESSAGES AND COMMANDS

The Intoxilyzer 5000 breath analysis instrument visually communicates by displaying the following messages and commands. Commands "flash" to indicate that the instrument expects a response. For operator response to error messages or "UNSTABLE REF", refer to "DISPLAYED ERROR MESSAGES" section.

<u>MESSAGE OR COMMAND</u>	<u>MEANING</u>
"NOT READY"	The instrument is purging the sample chamber and initializing the computer, processor, and printer.
"PROM CHECK ####"	The instrument is finding a checksum of all program bytes and is comparing it to an internal checksum.
"TEMP CHECK"	The instrument is checking the temperature of the sample chamber.
"RAM CHECK ##"	The instrument is checking each byte in RAM for possible failure.
"PROCESSOR CHECK"	The computer is testing the output of the processor, the stability of the signal, and the speed of the filter wheel.
"PRINTER CHECK"	The instrument is checking the movement of the printer head.
"DIAGNOSTIC OK"	The instrument did not find a malfunction while performing diagnostic checks on its components and operational standards.
"CLOCK ERROR"	The instrument is indicating where a malfunction exists. The number following "RAM ERROR" denotes the actual address location of error.
"PROM ERROR ####"	
"TEMP ERROR"	
"PRINTER ERROR"	
"RAM ERROR"	

<u>MESSAGE OR COMMAND</u>	<u>MEANING</u>
"PROCESSOR ERROR 1"	No sync pulse was found. A problem exists in the sync pulse chain.
"PROCESSOR ERROR 2"	The sync pulse rate is out of range.
"PROCESSOR ERROR 3"	An unacceptable negative processor drift was found.
"PROCESSOR ERROR 4"	An unacceptable positive processor drift was found.
"PROCESSOR ERROR 5"	The processor's reference value is out of range.
Rolling across the display - "INTOXILYZER MODEL 5000 --- PUSH BUTTON TO START TEST"; "PUSH BUTTON (flashing)"; "TIME ##HR ##MIN"	The instrument is ready for operation; you may begin a test by pushing the Start Test button.
"INSERT CARD (flashing)"	The instrument is requesting that an evidence card be inserted.
"AIR BLANK"	The instrument is purging the sample chamber and internal and external breath tubes.
"TIME ##HR ##MIN"	Local time.
"DATE MM/DD/YY"	Current date.
"> > ..."	The instrument is establishing a zero reference point.
"UNSTABLE REF"	The microprocessor was unable to obtain a stable reference signal from the processor. The instrument halts the test.

MESSAGE OR COMMAND

MEANING

"PLEASE BLOW INTO MOUTHPIECE UNTIL TONE STOPS"; "PLEASE BLOW/R (flashing)"

The instrument is requesting the subject to blow into the mouthpiece until the tone stops. The tone does not actually stop until the subject (with alcohol on the breath) stops blowing. Starting when this command appears on the display, the subject has three minutes to deliver an adequate breath sample. For a refusal, press START TEST button.

"PLEASE BLOW (flashing)"

The subject stopped blowing before providing a sufficient sample. "PLEASE BLOW" flashes and a beep sounds every five seconds until the subject begins blowing or three minutes have lapsed from the time the instrument initially requested the subject to blow into the mouthpiece.

"SUBJECT TEST .##"

The instrument is displaying the subject's breath alcohol concentration in grams per 210 liters.

"AIR BLANK .##"

The instrument is displaying the amount of alcohol remaining in the sample chamber while the sample chamber is being purged. Accordingly, during the purge operation, the number following "AIR BLANK" gradually decreases to .00.

"TEST COMPLETE"

The test and all printing are complete.

"INVALID TEST"

Either the Start Test button was pushed at the wrong time or the evidence card was pulled from the printer. The instrument cancels the test.

"INVALID SAMPLE"

The subject's breath sample contains residual mouth alcohol.

"INHIBITED - RFI"

High level radio frequency interference is present. The instrument cancels the test.

MESSAGE OR COMMAND

MEANING

"DEFICIENT SAMPLE"

The subject did not supply an adequate breath sample within three minutes.

"INTERFERENT"

The subject's breath sample contains a substance, such as acetone, that absorbs the same infrared frequencies as alcohol absorbs. The instrument compensates for the amount of infrared energy absorbed by the substance, completes the mode sequence, and prints "INTERFENT DETECTED HAVE BLOOD DRAWN" on the evidence card.

TONES

In addition to communicating through displayed messages and commands, the Intoxilyzer 5000 breath analysis instrument also communicates by sounding three distinct tones:

1. A beep sounds after the completion of each mode (operation).
2. A continuous tone sounds while a subject blows into the mouthpiece.
3. A low-high tone sounds intermittently for five seconds in the event of a malfunction, incorrect operational procedure, unfulfilled test requirement, or when START is pressed for a refusal.

Starting when the instrument displays the command "PLEASE BLOW INTO MOUTHPIECE UNTIL TONE STOPS"; "PLEASE BLOW/R (flashing)", the subject has three minutes to deliver an adequate breath sample. If the subject stops blowing before delivering an adequate breath sample and before the lapsing of three minutes, "PLEASE BLOW" flashes on the display and a beep sounds every five seconds. The beeping stops when the subject again begins to blow or the three minutes have lapsed.

DISPLAYED ERROR MESSAGES

Given below are the error messages that may appear on the display during the diagnostic checks and the actions you should take in response to a given error message:

<u>DISPLAYED ERROR MESSAGE</u>	<u>CORRECTIVE OPERATOR ACTIONS</u>
"PROM ERROR ###"	Call a Breath Testing Specialist for any of these error messages.
"TEMP ERROR"	
"PRINTER ERROR"	
"RAM ERROR ###"	
"PROCESSOR ERROR 3, 4, or 5"	

After completing the diagnostic checks without finding a malfunction, the instrument displays "DIAGNOSTIC OK". Next, the instrument reactivates the Start Test button and indicates that it is ready for operation by displaying the following message:

"INTOXILYZER MODEL 5000---PUSH BUTTON TO START TEST"; "PUSH BUTTON (flashing)"; "TIME ##HR ##MIN".

TIME AND DATE ERRORS:

<u>PROBLEMS</u>	<u>CORRECTIVE OPERATOR ACTIONS</u>
1. Date or time incorrect.	Call a Breath Testing Specialist to reprogram date or time.
2. Time or date or both are erratic <u>and</u> "CLOCK ERROR" appears periodically on the Display with a low-high warning tone.	Call a Breath Testing Specialist.

OTHER ERROR MESSAGES

Following are other error messages that may appear on the display. The error messages are accompanied by a low-high tone sounding intermittently for five seconds.

<u>DISPLAYED ERROR MESSAGE</u>	<u>CORRECTIVE OPERATOR ACTION</u>
"UNSTABLE REF"	When the display reads "INTOXILYZER MODEL 5000---PUSH BUTTON TO etc.", " begin another test by pushing the Start Test button. If "UNSTABLE REF" again appears on the display, <u>call a Breath Testing Specialist</u> .
"INVALID TEST"	Either the Start Test button was pushed at the wrong time or the evidence card was pulled from the printer. The instrument cancels the test, prints "INVALID TEST" (if the card was not pulled from the printer), and prepares itself to start another test. When the display reads "INTOXILYZER MODEL 5000---PUSH BUTTON TO etc.", you may begin another test by pushing the Start Test button. Make sure the Start Test button is pushed only at the proper time and the evidence card remains in the card slot until the instrument releases it.
"INVALID SAMPLE"	The instrument detected residual mouth alcohol in the subject's breath sample. The instrument completes the mode sequence, prints "INVALID SAMPLE.XX" in place of "SUBJECT TEST .##", and returns to the beginning of the mode sequence. Print card also shows "REPEAT OBSERVATION PERIOD BEFORE RETESTING SUBJECT". Observe the subject for at least 15 minutes before beginning another breath analysis.

DISPLAYED ERROR MESSAGE

CORRECTIVE OPERATOR ACTION

"INHIBITED - RFI"

High level radio frequency interference is present. The instrument halts the test, prints "INHIBITED RFI"; "INVALID TEST" and prepares itself to start another test.

Locate the RFI source and either remove the source from the instrument's operational environment or move the instrument to a new environment free from RFI.

"DEFICIENT SAMPLE"

The subject did not provide an adequate breath sample within three minutes. The instrument displays "SUBJECT TEST .###" (the highest value obtainable from the given breath samples) and completes the mode sequence. On the evidence card, the instrument indicates the highest obtainable value by printing an asterisk (*) before "SUBJECT TEST .###". The asterisk (*) is a cross reference to the message printed at the bottom of the evidence card: "*DEFICIENT SAMPLE - VALUE PRINTED WAS HIGHEST OBTAINED".

"INTERFERENT"

The subject's breath sample contains a non-alcohol substance that absorbs infrared energy. The instrument compensates for the amount of infrared energy absorbed by the substance and completes the test. Print card shows "INTERFERENT DETECTED HAVE BLOOD DRAWN".

Evidence Card Jammed in Printer

If an evidence card jams in the printer, push the Start Test button. The instrument will invalidate the test and try to return the evidence card. If the instrument does not return the evidence card, gently pull the card from the printer. In the event that a section of the card tears off and remains jammed in the printer, turn the instrument "off" and consult a Breath Testing Specialist.

General Malfunctions

In the event of a general malfunction (e.g., the display gives erratic information), take the following action(s):

1. Push the Start Test button.
2. If pushing "Start Test" fails to correct the malfunction, call a Breath Testing Specialist.

Preventative Maintenance

1. To assure adequate clearance and ventilation, locate the instrument at least one inch away from a back wall and on a hard surface (i.e., not on a surface covered with a rug-like material).
2. Keep the instrument away from extremes of temperature. The instrument's operational temperature range is 68°F to 86°F (20°C to 30°C); storage temperature range is -20°F to 140°F (-29°C to 60°C).
3. Keep the instrument clean and away from dust; any good glass cleaner can be used to clean the instrument's outer surface.
4. Do not place heavy objects on top of the instrument.