

OPERATOR TRAINING HANDOUTS  
NATIONAL DRAEGER INC., ALCOTEST 7410 PLUS

1. NATIONAL DRAEGER INC., ALCOTEST 7410 PLUS.

The 7410 Plus is a hand-held breath alcohol testing device that measures the concentration of alcohol in a person's breath. The 7410 Plus assures that alveolar breath samples are consistently obtained and uses a chemical fuel cell for alcohol detection and quantification. Tests are initiated by using the National Draeger Inc., Alcotest 7410 Plus Software and a handheld computer running under the Windows CE operating system. Graphical, written and audio instructions indicate the current status of the test cycle and prompt the operator through the programmed test procedure. The test results with officer/subject information, date, time, and instrument serial number are printed at the completion of each test.

2. NATIONAL DRAEGER INC., ALCOTEST 7410 PLUS OPERATING PROCEDURES:

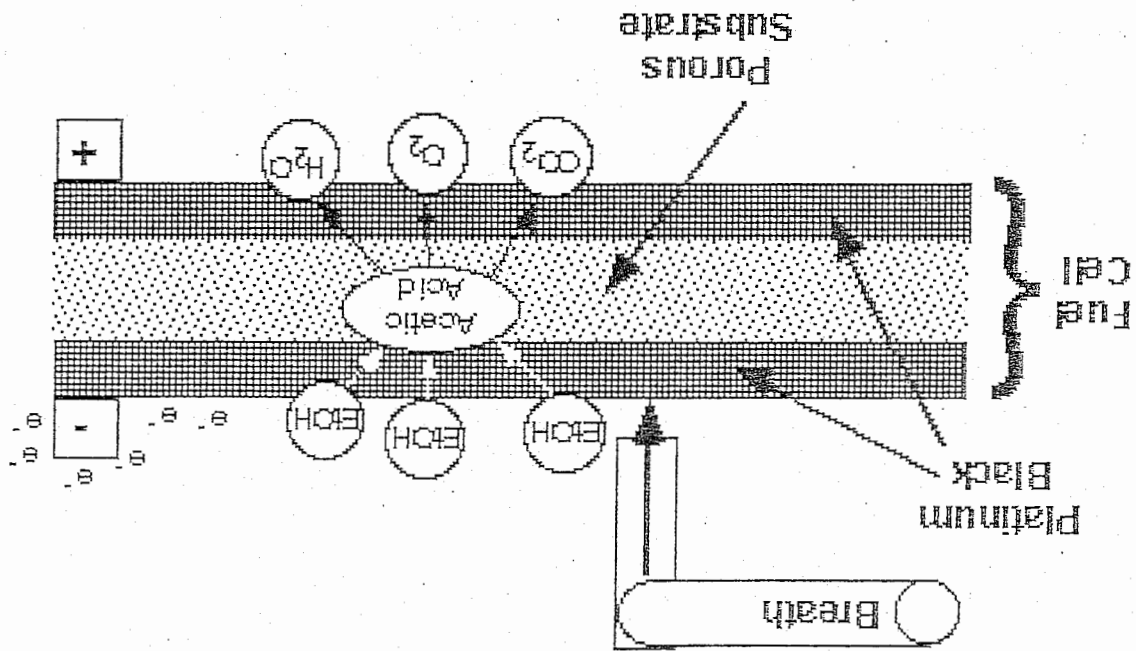
The precautionary checklist (example attached) to be used by operators of the instrument shall be kept at the location of each instrument.

3. PERIODIC DETERMINATION OF ACCURACY (PDA):

- a. The PDA is performed at least every 10 days or following the testing of 150 subjects, whichever occurs sooner, by the operator on the 7410 Plus with the use of a Dry Gas Calibration Device. The determination of accuracy is performed using the Precautionary Checklist for the BBT (Appendix C). The accuracy test results are stored in the BBT instrument until transferred to a central computer. This transfer shall be performed at least every ten days. The transfer will be reviewed, initialed, and dated by an FAS or FAA.
- b. If the PDA results are outside the limits ( $\pm 0.010\%$  of the known dry gas reference concentration) the instrument will automatically disable itself. The FAS or FAA shall disallow further subject tests until the cause is determined and corrective action taken.
- c. The 7410 Plus is inhibited from performing breath tests if the PDA varies by more than  $\pm 0.010\%$  from the known concentration of the reference material. This limit is set by the laboratory and is used to ensure that the instrument meets the accuracy requirements. If the 7410 Plus is out of calibration, the Forensic Alcohol Supervisor or Forensic Alcohol Analyst must determine the cause and take corrective action before placing the unit back into service.

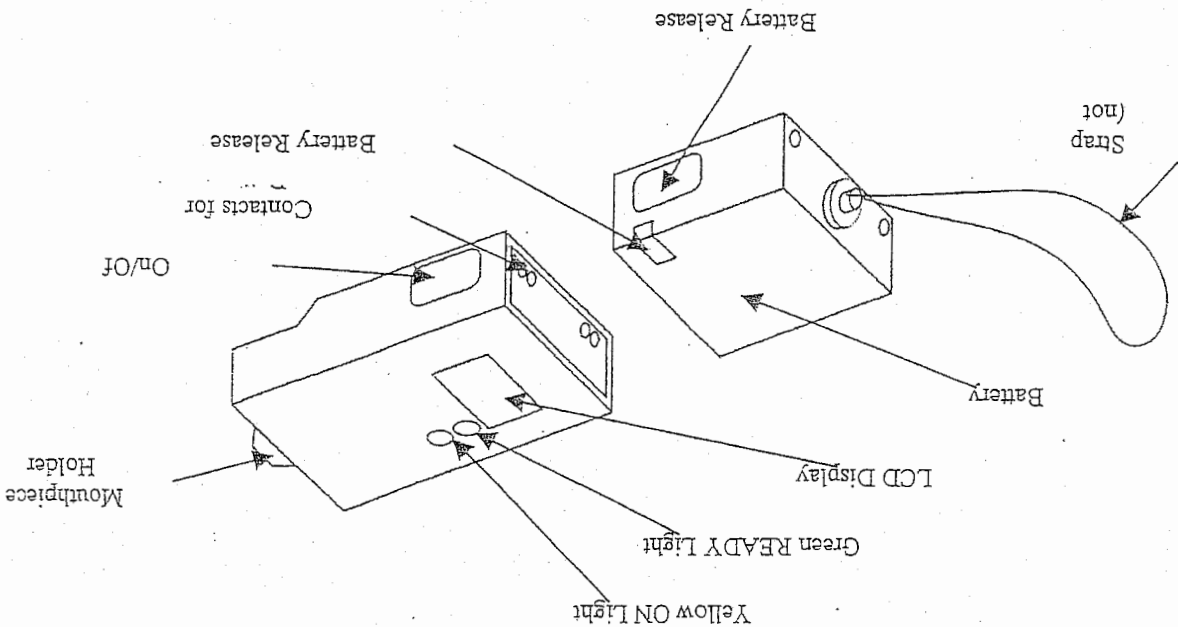
4. PRINCIPLES OF FUEL CELL TECHNOLOGY:

FUEL CELL DIAGRAM



- a. Alcohol fuel cells were first developed in Austria in the early 1960s. A fuel cell consists of a porous plastic disc coated on both sides with platinum black impregnated with an electrolyte (Diagram). The disc is suspended in a housing enclosed on the bottom side and connected on the upper side to a sample chamber. When a 1 ml sample of deep lung breath is presented to the upper surface of the cell, the alcohol in the sample is captured by the fuel cell and oxidized in a short period of time.
- b. The surface chemical reaction is:
- $$\text{Breath Alcohol} + \text{Fuel Cell} \rightarrow \text{Acetic Acid} + \text{Electrons}$$
- $$\text{Acetic Acid} \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{O}_2$$
- c. The release of electrons are ultimately translated into a breath alcohol reading.

5. BASIC OPERATING FEATURES:



6. OPERATION:

The Draeger Alcotest 7410 Plus Software in association with the handheld computer running Windows CB initiates the subject test sequence. Graphical, written and audio instructions indicate the current status of the test cycle and prompt the operator through the programmed test procedure (See the Precautionary Checklist in this Appendix). The breath tests are administered by removing the 7410 Plus from the cradle after entering the subject and officer information. Test results with date and time and subject/officer information can be printed at the end of the test.

7. PROGRAMMED TEST SEQUENCES:

The standard subject test sequence is AIR BLANK, BREATH, BREATH.

8. MICROPROCESSOR CONTROLLED:

A microprocessor in the National Draeger Inc., Alcotest 7410 Plus along with the handheld computer software controls all functions electronically.

9. DIGITAL READOUT:

The visual display and indicator lights on the 7410 Plus aid the operator in performing an evidential test.

1. KEYBOARD AND MAGNETIC CARD READER ENTRY:

The subject information may be entered using a driver's license and magnetic card reader. The Operator's information may be entered using an issued Operators card and magnetic card reader. Subject and Operator information may also be entered through the virtual keyboard of the handheld computer.

11. SAMPLING RELIABILITY AND ACCURACY:

Alveolar (deep lung) air samples are assured by requiring that a minimum of 1500 ml of continuous breath pass through the instrument before the sample is taken. Tests containing mouth alcohol are prevented by the required 15 minute continuous observation period prior to having the subject blow and having the subject give two breath samples that must agree within 0.02% of each other.

USER-LEVEL MAINTENANCE1. BATTERY RECHARGING

The Evidential Portable Alcohol System (EPAS) battery is recharged with either the 110 VAC power supply or the vehicle DC adaptor attached to the exterior of the EPAS kit and connected to the appropriate outlet. Good practice is to charge the EPAS kit once a week for 12 to 24 hours depending on usage.

2. PRINTER-PAPER REPLACEMENT

- a. When a colored stripe appears on the printed output, the paper roll must be replaced.
- b. Lift the printer out of the cradle by the black pull tabs, and disconnect the power supply cable.
- c. Remove the printer cover by grasping and squeezing the area beneath the oval-shaped holes on the sides of the printer.
- d. Remove the printer ribbon (see "Printer-Ribbon Replacement"). Remove the rest of the old paper by gently pulling the roll.
- e. Place paper roll into the curved depression within the case bottom, making sure the paper projects from the top of the roll.
- f. Insert the paper into the tractor slot of the printer. Push the black rubber roller towards the back of the printer until the paper is drawn in and fed out the top. If the paper does not feed easily, fold over about 1/2" of paper to create a sharper edge. Re-insert the printer ribbon.

3. PRINTER-RIBBON REPLACEMENT

- a. The ribbon cartridge should be replaced when printouts begin to appear faint.
- b. Press down the end of the cartridge marked "PUSH", and the ribbon will dislodge at the other end of the printer. The cartridge can then be removed.
- c. Insert a new cartridge with the ribbon positioned in the slot between the two metal tongues of the printing mechanism. Be sure to thread the paper roll between the ribbon and the plastic edge of the cartridge.
- d. Press the cartridge onto the driver pin.
- e. Replace printer cover and test by connecting the power supply cable.

PRECAUTIONARY CHECKLIST -  
PERIODIC DETERMINATIONS OF ACCURACY

The Periodic Determination of Accuracy (PDA) is performed at least once every ten days or 150 subjects, which ever occurs sooner. If a PDA is not performed within the 10 days or before 150 subjects are tested, the instrument will lock until a successful PDA is performed. PDAs will be performed every ten days. The steps for performing a PDA are as follows:

1. If the 7410 Plus is off, press the ON/OFF button once to bring the instrument to data mode. It is now ready to receive data for a PDA Test.
2. Start by pressing the "Rocket" button on the Windows CE (WinCE) computer - this starts the data input program on the computer and allows communication with the Draeger 7410 Plus. Select "ACC. Test" from the Choose An Option screen. The next screen will prompt "Do You Have An Operator ID Card to Swipe?" Press [Yes] or [No].
3. Enter the operator data by swiping the operator's ID card, or by manual input through the virtual keyboard. A review screen allows you to check this data. Select [Initiate 7410 for Accuracy Check] to send operator data to the 7410 Plus.
4. The 7410 Plus will start the Accuracy check mode. When ready to accept a reference sample, "ACC" will be displayed with a green ready light.

5. Remove the 7410 Plus from the case and attach to the regulator's gas outlet ensuring that the mouthpiece holder and regulator adapter are aligned properly and seated completely.
6. Start the gas flow by pressing the regulator button continuously until the horn stops sounding (approximately 2-3 seconds).
7. If the result is within  $\pm 0.010$  of the known value for the dry gas ethanol calibrating device, the 7410 Plus will store the result and the instrument can be used for another 10 days or 150 subjects, which ever occurs sooner.
8. If the result is not within the  $\pm 0.010\%$  of the known value for the dry gas ethanol calibrating device, the 7410 Plus will store the result and display "ACC" followed by "Err" followed by the result. The instrument will then disable itself and not allow further subject tests until corrective action is taken by the FAA or FAS.
9. The accuracy test results are stored in the EBT instrument until transferred to a central computer. This transfer shall be performed at least every ten days. The transfer will be reviewed, initialed, and dated by a FAS or FAA.

CALIFORNIA DOJ
ALCOHOL TEST 7410
PLUS
SERIAL NUMBER:
ARNH-0236
MM.DD.YY HH:MM
10.12.99 11:07
EDT
SEQUENTIAL TEST
#:00002
*****
ACCURACY TEST:
OPERATOR:
LAST:
"TESTER"
FIRST:
"DUCE"
ID-NUMBER:
12345
AGENCY:
PD
NICETOWNE

PRECAUTIONARY CHECKLIST FOR SUBJECT TESTS

Breath samples shall be collected only after the subject has been under continuous observation for at least fifteen minutes prior to collection of the breath sample, during which time the subject must not have ingested alcoholic beverages or other fluids, regurgitated, vomited, eaten, or smoked. The officer who performs the observation must initial the printed test record.

1. When the system case is opened, the 7410 Plus is automatically turned on in data mode. Press the ON/OFF switch once if the 7410 Plus has powered down. The screen will display "dat". It is now ready for an evidential breath test.
2. Start the test by pressing the "Rocket" button on the Windows CE (WinCE) computer - this starts the data input program on the computer and allows communication with the Draeger 7410 Plus. Press the ON/OFF switch once if the 7410 Plus has powered down. The screen will display "dat". Select [Evidential Test] from the "Choose An Option" screen. The next screen will ask whether or not a subject's driver's license is available. Press [YES] if a license is available, or [No] if one is not available.
3. Swipe the Subject's Driver's License to enter the subject data. If no license is available, go to step 4.
4. If the license cannot be swiped because it is damaged or no license is available, the subject data, at least first and last names and date of birth, shall be entered manually using the virtual keyboard that appears on the WinCE computer's display. Use the stylus, attached to the system case, to enter data. Move from field to field using the <<Next>> button.
5. Violation defaults to 23152cvc but 23153cvc or Other may be selected. If Other is selected, you must type in the violation code using the virtual keyboard.
6. Enter the Operator data by swiping the Operators ID card or by using the virtual key board.
7. Once the Operator data has been entered, the "Verify Data" screen will appear. Data may be edited as needed by either selecting the "Edit Sub." or "Edit OP." or by touching the line of data that needs to be edited.

CALIFORNIA DOJ  
ALCOTEST 7410 PLUS  
SERIAL NUMBER: ARNH-0250  
MM.DD.YY HH:MM  
06.28.00 08:15 DST  
SEQUENTIAL TEST #: 00070  
\*\*\*\*\*  
SUBJECT:  
LAST: RUSS  
FIRST: JOHN GORDON  
LICENSE: A076XXX  
DOB: 05-31-1953  
OPERATOR: TESTER  
LAST: TESTER  
FIRST: DUCE  
ID-NUMBER: 12345  
AGENCY: PD NICETOWNE  
LOC: Fairfield, SOLANO  
VIOLATION: 23152 cvc  
\*\*\*\*\*  
AIR BLANK 0.000 08:15  
BREATHTEST 1 0.08 08:15  
BASELINE = 0.000  
BREATHTEST 2 0.09 08:18  
BREATHTEST 3 ----  
ALL RESULTS IN GM/210L  
\*\*\*\*\*  
COMMENTS:  
15 MINUTE OBSERVE  
OPERATOR SIGNATURE: \_\_\_\_\_  
\*\*\*\*\*

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8. Once the data is correct, ensure that the 7410 Plus is in the "dat" mode and select <Data OK>> on the "Verify Data" screen. The 7410 Plus beeps once to indicate it is communicating. The 7410 Plus then beeps three times at the successful completion of data transferring. The computer screen will display "You May Remove the 7410 From the Cradle".
9. The 7410 Plus will flash the date and time as follows: "dd" and display the day (01-31); "mm" and display the month (01-12); "yy" and display the year (00-99); "hh" and display the hour; and "mn" and display the minutes. If the date is incorrect, discontinue the test and return the instrument to the laboratory for servicing.
10. Next, the instrument will display "Abt" on the LCD screen indicating an Air Blank is being performed.
11. The test sequence will continue at the completion of the blank if the displayed result is 0.000g/210L of Breath.
12. The instrument will display "br1". It will beep and then the Ready light will come on, indicating that it is ready to accept the first breath sample.
13. Attach a new mouthpiece to the 7410 Plus.
14. Have the subject blow with one long continuous breath with sufficient force to keep the instrument's "horn" sounding until it stops. (The horn actually does not stop sounding until the subject stops blowing.)
15. If the subject's breath sample was insufficient, the display will indicate error code "Ins" and the Ready light will cycle on again for another attempt to collect the breath sample.
16. After the subject stops blowing, the instrument will collect and analyze the sample and display the results. The instrument will count down from 120 seconds then will display "br2". It will beep and then the Ready light will come on, indicating that it is ready to accept the second breath sample.
17. Have the subject blow again when the ready light is on. The second test result will be displayed. If the first and second tests are within 0.02g/210L, the test is complete. Make sure the printed test records are signed by the operator, and initialed by the observer.
18. If the first and second test do not agree within 0.02g/210L, the instrument will count down from 120 seconds then will display "br3". It will beep and then the Ready light will come on, indicating that it is ready to accept the third breath sample.
19. Ending tests. If the subject does not deliver an adequate breath sample within 45 seconds after "br1" or "br2" is displayed, then "End" (end test) will be displayed along with a series of short beeps. The operator can select End by pressing the ON/OFF button once while the beeping continues. This sequence will continue until either a breath sample is delivered or End is selected. If the ON/OFF button is not pressed, the test can continue. A test can be

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ended in the case of a refusal or for any other reason the operator deems necessary. The results of the ended test can be printed as described below.

20. To print the test results align the LHD's on the 7410 Plus with the window on the printer. The test record will be printed automatically.

21. The officer who performed the continuous observation period (minimum of 15 minutes) will initial the test record in the space provided.

22. The operator must also sign the card in the space provided.

23. If two of the three results do not agree within 0.02 g/210L then the operator can start another test. The first test results are retained as electronic records in the instrument as well as a printout, which should be handled like a normal test record.

24. Safely discard the mouthpiece.

25. Replace the 7410 Plus in its cradle within the system case. The instrument will power-off after a few moments. To use the 7410 Plus immediately, press the on/off button for 2-3 seconds, until the display recycles to dat.

**Error Codes:** Operators can resolve the following Error Codes by applying the indicated remedy. Contact the Forensic Alcohol Laboratory for all other error conditions.

Error Code	Cause	Remedy
INS	Test subject is not blowing hard enough or steadily enough.	Instruct subject to give one long continuous breath, keeping the horn sounding as long as possible
RFI	RFI (radio frequency interference present)	Change location to move away from source, or stop transmissions.
ACC	Warning on the day before maximum allowed for Accuracy	Perform Determination of Accuracy on instrument.
ACC	Instrument disabled. Accuracy Check needed	Perform Determination of Accuracy on instrument.