CMPD Crime Laboratory
Blood Alcohol Analysis Training Manual
Stage 2: Gas Chromatography FID and Headspace Sampling

1 Gas Chromatography

1.1 Training Goals

1) The trainee must understand the theory of Gas Chromatography / Headspace Sampling.

Training Objectives

The trainee will demonstrate a knowledge of the theory and function of the following parts of the gas chromatography system;

- Split/Splitless and sample valve loop injection.
- Temperature programming vs. isothermal oven temperatures.
- Mechanics, operation and theory of Flame Ionization Detectors and describe their operation.
- The trainee should be capable of performing routine maintenance on the gas chromatograph.
- The trainee will understand the capabilities and limitations of these instruments.
- Column type (polarity) and length and how they affect the separation of alcohol.
- The trainee will be able to use PLIMS and GC/Headspace software control and data acquisition.

2 Sampling.

2.1 Training Goals

The trainee must understand:

- Evidence Analysis Requests sent via PLIMS unless an outside agency is involved. Outside agencies will continue to use the older printed Laboratory Request Form. The service request will be handled via PLIMS as described in QM 4.4 and PM 4.1.

- The theory of Headspace Sampling.

2.2 Training Objectives

2.2.1 The trainee must understand and apply the following:

- The trainee will understand the basic design of the instruments, i.e. Autodiluter, pipettes, Headspace Sampler and Gas chromatograph.
- Maintenance, programming and use of Hamilton Pipettor

- Temperature and pressure effects on BAC systems sampling,
- Mechanics and operation of the Headspace System,
- The software controlling the Headspace System,
- Routine maintenance on the Headspace System.

3 Assessment

3.1 The trainee may be given a written exam.

4 Readings

4.1 Agilent, GC/Headspace tutorial

4.2 Software documentation and Instrument documentation for the currently available assets in the lab and BAC SOP

4.3 An Introduction to Forensic Science, Saferstein 8th edition

4.4 Disposition of Toxic Drugs In Man; chapter on Ethanol pp. 299-303