Procedure for BSD600-Duet Semi-Automated Dried Sample Punch Instrument

Version 1

Effective Date: 09/17/2012

- **1.0 Purpose** The purpose of this document is to instruct users in the operation of the BSD600-Duet Semi-Automated Dried Sample Punch Instrument for use in punching database samples to be extracted by the Qiagen BioRobot®.
- Scope The procedures in this document apply to the DNA Database Unit of the Forensic Biology Section at the State Crime Laboratory. Qualified DNA Database Forensic Scientists/DNA Database Analysts who have completed the Qiagen BioRobot® Universal Training portion of the DNA Database Training Program shall complete the sections of this procedure. DNA Database Forensic Scientists/DNA Database Analysts currently in Qiagen BioRobot® training may operate the robot as outlined in the Qiagen BioRobot® Universal Training portion of the DNA Database Training Program. However, DNA Database Forensic Scientists/DNA Database Analysts currently in Qiagen BioRobot® training may not run samples that are to be uploaded into CODIS.
- **3.0 Definitions** See Forensic Biology Section Procedure for DNA Database for definitions applicable to this procedure.

4.0 Equipment

- BSD600-Duet Semi-Automated Dried Sample Punch Instrument
- BSD Duet Software, Qiagen BioRobot® Universal System and disposable plastic ware
- Qiagen QIAsoft Software
- Cleaning solutions/materials including 100 % isopropyl alcohol, deionized water, compressed air;
- Various laboratory equipment involved in DNA analysis (including gloves, biohazard waste containers, etc.)

5.0 Procedure

5.1 Operator Instructions

- **5.1.1** Follow "Sample ID Scan and Process Sheets" protocol on the BioRobot® software (QIAsoft) using the Forensic Biology Section Procedure for Qiagen BioRobot® Universal to generate a pre-extraction worksheet.
- **5.1.2** Turn on the BSD600-Duet Puncher and the attached computer. The order in which they are turned on does not affect functionality. Plug in the attached Pressure Pump. Leave the password field of the Windows login screen blank.
- **5.1.3** Open the BSD600-Duet Software. Enter username and password.
- **5.1.4** Select "Distribute Spots."
- **5.1.5** Allow the puncher to initialize and click "Continue."
- **5.1.6** Select "All Available Tests" and click "Continue."
- **5.1.7** Select the appropriate test group for your plate (for a Qiagen BioRobot® plate, select "96Well-QiagenBioRobot" and leave default boxes checked on the right) and click "Continue."

- **5.1.8** When prompted to scan the plate barcode, type in the appropriate plate name.
- **5.1.9** Load the tray as indicated by the screen prompt, close the cover, and click "Continue."

Version 1

Effective Date: 09/17/2012

- **5.1.10** Using the BSD600-Duet Puncher, punch samples and positive extraction controls (if used) to fill the plate to be used as outlined by the pre-extraction worksheet. The BSD600-Duet takes 1/8" punches of the samples. This process shall be witnessed by a DNA Database Forensic Scientist or DNA Database Analyst.
- **5.1.11** For each sample, first scan the sample barcode by lining up the barcode with the red laser. If there is no usable barcode, the barcode may also be manually typed. The witness shall confirm that the appropriate barcode appears on the screen.
- **5.1.12** Once the sample barcode has been scanned, punch the sample by sliding it under the Card Clamps and aligning it with the red dot emitted from the reader.
 - **5.1.12.1** The rate at which the sample is punched may be adjusted using the knob on the left side of the Auto-Trigger, or the sample may be punched using the Foot Switch. Automatic punching may be disabled by pushing the button on the right side of the Auto-Trigger, but the Foot Switch may be used with or without the Auto-Trigger disabled.
 - **5.1.12.2** An option to inspect the tray is available after a bar code is scanned but before a sample is punched.
 - 5.1.12.3 If at any time the disk detector detects that a punch has not passed through the Chute and been placed in the plate, the BSD600-Duet attempts to punch the same place up to three times. If the disk detector still detects no punch passing through the Chute, the following options are displayed: "Card Not Punched," "Inspect Trays," "Spot Discarded," "Spot Placed in Cell," "Spot in Cell," and "Spot Not Found." Select the appropriate response or action and re-punch the sample if required. (Selecting "Card Not Punched," "Spot Discarded," or "Spot Not Found" results in re-punching the sample. Selecting "Spot Placed in Cell" or "Spot in Cell" allows the next sample to be punched. Selecting "Inspect Trays" brings the tray to the front.)
 - **5.1.12.4** If at any time the disk detector fails to detect that no punch is taken, the disk detector fails to detect that only a partial punch is taken, or it is desired to have multiple punches in a well, double click on the corresponding well on the screen. Scan the barcode for the desired sample and re-punch the sample. Continue punching the remainder of the plate.

Note: If the filter paper containing the sample cannot be maneuvered so that a punch can be taken by the BSD600-Duet, a manual punch may be obtained for the sample. See "Punching of Database Samples for Robotic Processing" in the Forensic Biology Section Procedure for Qiagen BioRobot® Universal for instructions regarding manual punching.

Note for Bloodstains: If the paper is not saturated, a double punch may be used to ensure adequate sample for processing. Wells that receive double punches shall be documented on the pre-extraction worksheet.

Version 1

Effective Date: 09/17/2012

5.1.13 When all samples have been punched, check the plate to ensure that the appropriate number of punches is in each well. If a partial plate is being punched, manually end the run by using menu command "Action -> End Run." When prompted, select the appropriate option from "All Spots Present," "Repunching Required" (references entire plate - re-punching of individual samples shall occur as instructed in **5.1.12.3** or **5.1.12.4**), and "Plate Not Checked."

Note: If manual punching of any samples is needed, ensure that this occurs before the "All Spots Present" option is selected. There should be a punch in each well for which a barcode has been scanned.

- **5.1.14** Once the plate has been punched and all spots are present, select "Print Plate Maps."
- **5.1.15** Cover the plate with parafilm and store appropriately until ready for use.
- **5.1.16** Once the plate has been removed from the BSD600-Duet, end the run. Retain plate map sheet for subsequent processing on the Qiagen BioRobot® following the Forensic Biology Section Procedure for Qiagen BioRobot® Universal.

Note: The DNA Database Manager shall be notified in the event of a technical issue and informed of any issues with puncher function. The Technical Leader shall be notified in the event of a technical issue and shall investigate causes and perform any actions needed to place instrument back in service.

5.2 Maintenance

- **5.2.1** Document performed maintenance on the BSD600-Duet Semi-Automated Dried Sample Punch Instrument Maintenance Log.
- **5.2.2** Chute and Punch Mechanism
 - **5.2.2.1** The chute and punch mechanism shall be cleaned by the operator at the end of each BSD600-Duet Puncher use.
 - **5.2.2.2** Turn the instrument off and lift the card platform. Lift the front panel and lift and rotate the upper console to the left to expose the underside. Unscrew the inner Chute. Do not unplug outer chute.
 - **5.2.2.3** Clean the inner chute as follows: 1) clean inner and outer surfaces with alcohol and 2) blow compressed air through chute.
 - **5.2.2.4** Clean the outer chute by blowing compressed air through chute.
 - **5.2.2.5** Blow compressed air into the underside of the manifold to remove lint build-up.

5.2.2.6 Reassemble chutes and refit to unit. Return upper console to horizontal position. Blow compressed air between punch guide and die (punch mechanism). Lower card platform and return front panel to operating position.

Version 1

Effective Date: 09/17/2012

5.2.3 General Cleaning

- **5.2.3.1** The top surfaces and external surfaces of the BSD600-Duet Puncher shall be cleaned at the end of each BSD600-Duet Puncher use.
- **5.2.3.2** Dust the outer surfaces of the instrument using a soft, damp cloth. Ensure water does not come into contact with electrical components.
- **5.2.3.3** Dust countertop surfaces around the instrument to remove any dust accumulated as a result of the punching process.

5.2.4 Humidifier

- **5.2.4.1** The manufacturer recommends that the humidifier attachment be used when the humidity in the room is below 45 %. The humidity in the room may be determined with a digital humidity meter.
- **5.2.4.2** The operator shall empty the humidifier attachment if the log indicates it has not been used for two weeks.

6.0 Limitations - N/A

7.0 Safety

- **7.1** Exposure to blood borne pathogens may occur in performing the procedures in this document. Personal protective equipment including lab coats and gloves shall be worn when performing the responsibilities outlined herein.
- **7.2** This instrument contains moving parts and their movement is not always indicated. Use caution during operation.
- 7.3 Use caution when operating the attached bar code reader as the beam can cause serious eye damage.

8.0 References

State Crime Laboratory Safety Manual

Forensic Biology Section Administrative Policy and Procedure

Forensic Biology Section Administrative Procedure for Safety and Hazardous Waste Disposal

Forensic Biology Section Procedure for DNA Database

Forensic Biology Section Procedure for DNA Database Training

Forensic Biology Section Procedure for Qiagen BioRobot® Universal

Forensic Biology Section Procedure for DNA Reagent Preparation and Quality Control

Forensic Biology Section Procedure for Performance Check and Equipment Maintenance

Version 1

Effective Date: 09/17/2012

BSD600-Duet Operator Guidelines, BSD Robotics

9.0 Records

• BSD600 Duet Punch Maintenance Log

10.0 Attachments - N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document