

IIIB03-0007 – ATTACHMENT 3

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SUBJECT: The Capture and Transmission of Facial Images

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1. This is a highly technical operations bulletin to be used by Georgia Crime Information Center (GCIC) customers when dealing with vendors providing mugshot-imaging capability. To ensure compatibility with the Standards and Best Practices document, agencies should provide this information to any vendor chosen to provide mugshot-imaging capability.
2. The data format for the Interchange of Facial Images & Scars Marks and Tattoos (SMT) (titled “Data Format for the Interchange of Fingerprint, Facial, & SMT Information” (ANSI/NIST-ITL 1a-1997)) was approved by the American National Standard Institute (ANSI) on April 7, 1997.
3. The Information Technology Laboratory (ITL), previously the Computer Systems Laboratory of the National Institute of Standards and Technology (NIST), sponsored the development of the addendum to the Data format for the Interchange of Fingerprint Information (ANSI/NIST-CSL 1-1993). This addendum enhances the original standard by specifying the data elements required for the exchange of mugshot and SMT information.
4. To effectively exchange Facial Images or mugshots and (SMT) information across jurisdictional lines or between dissimilar systems, a standard is needed to specify the content and common format for the data exchange. The data may be images captured from digital cameras or the digital representation of scanned photographs or pictures.
5. Listed below are best practices, procedures and equipment specifications for law enforcement agencies considering the purchase of new systems or the upgrade of current systems.

a. POSE

The full-face or frontal pose is the most commonly used pose in photo lineups and shall always be captured. This pose is in addition to profiles or intermediate angled poses captured to acquire perspective and other information. For subjects who normally wear eyeglasses, a frontal

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mugshot image should be captured of the subject without glasses. This is required due to the glare from external illumination. An additional image can optionally be captured of the subject wearing eyeglasses.

b. DEPTH OF FIELD

The subject's captured facial images shall always be in focus from the nose to the ears. Although this may result in the background behind the subject being out of focus, it is not a problem. For optimum quality of the captured mugshot, the f-stop of the lens should be set at two f-stops below the maximum aperture opening when possible.

c. CENTERING

- (1) The facial image being captured (full-face pose) shall be in a position to satisfy all of the following conditions:
- (2) The approximate horizontal midpoints of the mouth and of the bridge of the nose shall lie on an imaginary vertical straight line positioned at the horizontal center of the image.
- (3) An imaginary horizontal line through the center of the subject's eyes shall be located at approximately the 55% point of the vertical distance up from the bottom edge of the captured image.
- (4) The width of the subject's head shall occupy approximately 50% of the width of the captured image. This width shall be the horizontal distance between the mid-points of two imaginary vertical lines. Each imaginary line shall be drawn between the upper and lower lobes of each ear and shall be positioned where the external ear connects to the head.

d. LIGHTING

Subject illumination shall be accomplished using a minimum of three-(3) point balanced illumination. Appropriate diffusion techniques shall also be employed and lights positioned to minimize shadows, and to eliminate hot spots on the facial image. These hot spots usually appear on reflective areas such as cheeks and foreheads. Proper lighting shall contribute to the uniformity of illumination of the background described in the exposure requirement.

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e. BACKGROUND

The subject whose image is being captured shall be positioned in front of a background which is 18% gray with a plain smooth flat surface. A kodak or other neutral gray card or densitometer shall be used to verify this 18% gray reflectance requirement. GCIC OPERATIONS BULLETIN 98-07

f. EXPOSURE

The exposure shall be keyed to the background. Several areas of the recorded 18% gray background shall be used to verify the proper exposure. The averages of 8-bit Red, Green and Blue (RGB) components within each area shall be calculated. Each of the RGB means shall fall between 105 and 125 with a standard deviation of plus or minus 10. Furthermore, for every area examined, the maximum difference between the means of any two of the RGB components shall not exceed 10.

g. ASPECT RATIO

The Width:Height aspect ratio of the captured image shall be 1:1.25.

h. MINIMUM NUMBER OF PIXELS

- (1) The minimum number of pixels in an electronic digital image shall be 480 pixels in the horizontal direction by 600 pixels in the vertical direction. It should be noted that the image quality of the captured mugshots and facial images will be improved as the number of pixels in both directions are increased. However, as images are captured with an increased number of pixels, the 1:1.25 (Width:Height) aspect ratio will be maintained.
- (2) Two considerations must be noted regarding this aspect of the recommendation. First, the normal orientation of many available cameras is the landscape format that specifies a greater number of pixels in the horizontal than in the vertical direction. Unless these cameras capture at least 600 pixels in the vertical direction, it may be necessary to rotate the camera 90 degrees. Second, the 480x600 capture format exceeds the VGA display format of 640x480. Therefore, at a minimum, an SVGA specification of 800x600 pixels will be required to display the facial image. The image will occupy less than the total number of available horizontal pixels.

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i. COLORSPACE

Captured electronic color facial images are required. Digital images shall be represented as 24-bit RGB pixels. For every pixel, eight (8) bits will be used to represent each of the Red, Green, and Blue components. The RGB colorspace is the basis for other colorspace including the Y, C_b, Y_r and YUV. Additional color management techniques are available from the International Color Consortium. Information regarding these techniques can be downloaded from the following Uniform Resource Locator (URL):

j. PIXEL ASPECT RATIO

Digital cameras and scanners used to capture facial images shall use square pixels with a pixel aspect ratio of 1:1.

k. COMPRESSION ALGORITHM

The algorithm used to compress mugshot and facial images shall conform to the JPEG Sequential Baseline mode of operation as described in the specification approved by the ANSI X3L3 Standards committee. The target size for a JPEG compressed color mugshot image file shall be 25,000 to 45,000 bytes.

l. FILE FORMAT

The JPEG File Interchange Format (JFIF) shall contain the JPEG compressed image data. The JFIF file shall be the part of the transaction file for interchange which conforms to the requirements as contained in ANSI/NIST-CSL 1-1993 and ANSI/NIST-ITL 1a1997.

6. APPROVED: _____
Paul C. Heppner, Deputy Director for GCIC

2-1-02
Date

Retention Schedule: To be retained as part of the SOP until updated.