



Ministry of Agriculture and Lands
Integrated Land Management Bureau

Crown Registry and
Geographic Base Branch

Specifications for Digital Aerial Photographic Images

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2	Gord Fish	5.7.1	Meta data requirements	Ron C. Johnson	PDF signed by Ron Johnson	10 March 2005
3	Gord Fish	5.8	Dynamic density capture, match adjacent flight line, histogram and colour balance approval, definition of AOI, pixel value requirements within AOI	Ron C. Johnson	PDF signed by Ron Johnson	10 March 2005
4	Gord Fish	7.1	Requirement to match samples approved by Branch	Ron C. Johnson	PDF signed by Ron Johnson	10 March 2005
5	Gord Fish	8.1	Onsite inspections for air film loan partners	Ron C. Johnson	PDF signed by Ron Johnson	10 March 2005
6	Gord Fish	Appendix B	Definition of AOI	Ron C. Johnson	PDF signed by Ron Johnson	10 March 2005
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10	Tim Brierley	5.6	Added specifications for required digital thumbnail deliverables	Andy Calarco	PDF signed by Andy Calarco	28 April 2008

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Specifications for
Digital Aerial Photographic Images

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SPECIFICATIONS FOR DIGITAL AERIAL PHOTOGRAPHIC IMAGES

1 PURPOSE

This specification prepared by the Crown Registry and Geographic Base Branch (CRGB), of the BC Ministry of Agriculture and Lands (MAL), describes the Provincial requirements for acquiring digital black and white and colour aerial data either through scanning previously acquired imagery or digital cameras. Previously acquired imagery includes negative black and white and colour air films, prints and diapositives. The intention is to define for contractors producing data the minimum requirements to meet provincial standards. The positive image files produced must represent the original imagery/scene as accurately as possible as they will become part of the digital archive.

This data may be used for many purposes such as digital orthophoto and data transfer; this does not negate the need to meet the specifications.

2 TECHNICAL AUTHORITY

The Branch shall be the technical authority for interpretation and/or clarification of this specification and for all matters related to production of digital reproductions of aerial photographic imagery. The Branch shall be the final authority on acceptance or rejection of submitted digital imagery.

3 DIGITAL ORTHOPHOTO

It is expected that digital orthophoto will be produced for the TRIM project, as well as other mapping projects, from the scanned data as specified in this document. Provincial standards for orthophoto are specified in 'Digital Orthophoto for the TRIM (1:20,000) program Release 1, May 1997. Last updated: June 2, 1998 (DO).

4 SCANNERS

4.1 Scanner acceptance test

Scanners to be used will be tested in accordance with the most recent revision of CRGB 'Scanner Acceptance Test Procedure for Scanners for Aerial Photography'. Those scanners that meet the geometric precision and accuracy and the radiometric precision acceptance levels as specified in the test procedure will be issued with a Certificate of Authorization.

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4.2 Certificate of Authorization

Scanning shall be carried out only on those scanners that have a Certificate of Authorization issued by CRGB. The Certificate shall be displayed in a location close to the scanner.

5 SCANNING

5.1 General requirements

The following requirements are made in order to maintain consistently high quality image scans and are based on normal scenes. **Before the commencement of scanning project, sample scan(s) must be submitted for approval from the Branch.**

- Scanner must be able to capture imagery with a density range of at least 1.3 without resulting in empty bins or gaps.
- Data loss to be kept to a minimum.
- Scanning of existing hard copy orthophoto is not acceptable. Scanning from paper prints (reflective images) is not acceptable for mapping purposes. Special Branch projects may require paper image scans. (See [section 5.3](#)).

5.2 Scan area

The scanned area must include all fiducial marks.

For scans from 'ten inch'" aerial negative films and diapositives the area of the image frame to be scanned shall be a rectangle defined on all four sides by the boundary lines which are located 3 mm outside the maximum exposed area of the image frame.

For scans from 'five inch archive' negative films the area of the image frame to be scanned shall be a rectangle defined on three sides by the boundary lines which are located 3 mm outside the maximum exposed area of the image frame. The fourth side shall include the instrumentation.

5.3 Scan pixel size

Scans of black and white imagery shall have a scan pixel size of between 10 to 14 microns inclusive. Scans of colour imagery shall have a scan pixel size of 10 to 16 microns inclusive. Scans of historical b/w five inch negatives shall be at 14 microns scan pixel size. Scans of historical b/w aerial photographic prints shall be at 36 microns resolution. Scans from equipment with different preset scan resolutions must be set to the nearest settings within the ranges noted above. See [Appendix A](#) for further information. CRGB may, from time to time, require scanning at a different scan pixel size and will advise in writing of this requirement.

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5.4 Scanning operating procedure

Contractors undertaking scanning shall submit annually to CRGB, a scanning Operating Procedure (OP) developed in accordance with the requirements of this specification. CRGB will review and if acceptable approve this operating procedure for a period of one year. All scanning for the project shall then be carried out in accordance with the approved OP. The OP shall address but not be limited to each of the following topics in this section.

5.4.1 Operator

Scanner operators shall be trained and experienced in the use of the scanner and its operating software as appropriate and in the selection of scanner operating parameters applicable to the relevant aerial photographic imagery.

5.4.2 Environmental

Temperature, relative humidity and fluctuations of temperature in the location in which the scanner is operated shall be maintained at values as required by the operating instructions provided by the scanner manufacturer and as required by good industrial practice in the handling of imagery. If no such operating instructions are provided, room temperature shall be maintained in the range 18 to 24 degree C, relative humidity in the range 50% to 70% RH. Temperature fluctuation shall not exceed 4 degrees C per hour.

5.4.3 Preparation of scanner and aerial imagery

The scanner stage shall be cleaned prior to scanning and shall be routinely checked for cleanliness during the scanning of a batch of imagery.

Prior to scanning, each frame shall be cleaned and inspected to ensure that it is free of damage, scratches, marks or flaws e.g., from photographic processing rollers or equipment, shipping, chemical stains or marks, finger prints, dust, dirt or other deleterious materials or temporary identification or coding marks. Any defects on the original imagery frame hindering scanning quality must be itemized and recorded on the [Scan Log](#). Repeated flaws must be reported to the Reproduction and Evaluation Lab as soon as possible.

The introduction of scratches or other marks to the original materials by the scanner or at any time during handling and processing will be unacceptable and cause for the rejection of the scans. Original materials must not come in contact with scanner while material is in motion.

5.4.4 Scanning parameters

The OP shall describe the scanner operating parameters that are to be selected by the scanner operator for each aerial image scan or for scanning of a batch of aerial images e.g., illumination,

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speed, aperture, pixel size or single parameter settings which embody some or all of these. It shall also identify if any intermediate inspections, or confirmation of, or change in scanner operating parameters are required during the batch scanning process.

5.5 Data re sampling

The scanner system output file (Appendix D, Glossary) may include image digitizing geometric and/or radiometric corrections that are inherent in the scanner design and which have been approved and certified for use by CRGB by virtue of the issue of the Certificate of Authorization (section 4.2).

- Post scanner system output resampling to a larger pixel size is not permitted.
- Post scanner system output resampling to a smaller pixel size is not permitted.

5.6 Output data format

A) Scan data files shall be recorded with 8 bit pixel values. Files shall be uncompressed, untiled, undodged TIFF 6x format.

Image files shall be located within a folder on the storage media. The naming convention shall be as follows:

Folder name\File name

bcb97001**bcb97001_008_14n.TIF**

Where: **bcb97001** is the air film roll identifier.

008 is the frame identifier.

14 is the scan resolution in microns.

n, d or p is the scan source.

n – Negative film

d – Diapositive

p – Paper print

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B) Digital Capture files shall be uncompressed, untiled, undodged TIFF 6x format.

Image files shall be located within a folder on the storage media. The naming convention shall be as follows:

Folder name\File name

BCD06001\BCD06001_008_PRGBN_28_8b.TIF

Where: **BCD06001** - is the roll identifier.

008 - is the frame identifier.

PRGBN -¹ is the captured sensor channels code.

28 -² is the nominal ground sample distance in centimetres.

8b - is the number of bits per pixel.

- ¹ Codes representing the image bands collected as listed below:
 - P = Panchromatic
 - R = Red
 - G = Green
 - B = Blue
 - N = Near Infrared (NIR)Only the codes for channels collected need to be reported.

² Ground Sample Distance will use a code based on the Ground Pixel size in centimetres.

Eg. 28 = 28 Centimetre GSD, 105 = 1.05 Metre GSD

C) Thumbnail files shall be 1/16 the size of the original image and be in jpeg format with a medium compression. For example, a 14 micron scan will have a reduced resolution of 224 microns and approximate file size of 200kb.

Image files shall be located within a thumbnail folder on the storage media (ie. Folder name\thumbnails\File name). The naming convention should be the same as the original scan or digital image with the resolution portion of the file name corrected for the reduced size.

CRGB may from time to time direct contractors, in writing, on a revision to this data format specification as a result of development, improvement and changes in data storage and recording techniques.

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5.7 Media

All files shall be delivered on storage media as prescribed by the Branch.

All storage media must have prior approval by the Branch.

CRGB may from time to time direct contractors, in writing, on a revision to this data storage and recording media specification as a result of development, improvement and changes in data storage and recording media.

5.7.1 Deliverables

- Media to be packaged, in original shipping containers where possible, suitable for safe courier transport.
- Each media shall have a digital directory of the contents in a “Readme” file/folder.
- Each media shall contain corresponding Metadata files in txt format for each image file.
- Each meta data file shall include all information in sample Metadata file up to and including “© Image Copyright Province of BC” in Appendix E.
- Each media shall have a label with the following information: BC air film number (folder name), frame numbers, operation number(s). (See [5.9](#) for media labelling.)
- Each media shall be delivered with the following hardcopy documentation:
 - packing slip clearly identifying all deliverables.
 - directory tree identifying complete contents of hard drive (including tif image and txt meta data files).
 - copy of ‘Scan Data Log’ (see [5.10](#)).

5.8 Operational inspections

See [Section 7 Original Imagery](#) for further information.

Contractor pre-submission inspections shall be made on the actual storage media which will be supplied to CRGB. I.e., after transfer and copying from the original data file onto deliverable media.

These inspections shall be completed with image viewing software and compared with the original photographic image. **It is the intent of CRGB to acquire digital imagery for inclusion in the DIM archive. As this data may be used in a variety of project types:**

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- The digital image file must represent the original dynamic density range of the original aerial imagery or scene, spanning the majority of the histogram.
- Every effort must be made match overall density and colour balance of imagery throughout the Operation.

Contractor pre-submission inspections of the digital image shall confirm that:

- The complete image of all fiducial marks is included.
- There are no artefacts produced by the digital capture process.
- There is no saturation of the image in a large area, for this purpose defined as an area greater than 200 by 200 pixels in which the pixel value is 255 or 0.
- B/w film image files are to be 8-bit grey scale images with a scanned resolution of between 10 and 14 microns inclusive.
- B/w paper print image files are to be 8-bit grey scale images scanned at 36 micron resolution.
- Colour image files shall be 24-bit images at 10 - 16 with a scanned resolution of between 10 and 16 microns inclusive.
- **Histogram and colour balance match sample approved by the Branch.**
- Histogram ranges for each colour band must be consistent with each other, with only minor shifting due to colour balance adjustments.

For each colour band, pixel histograms of images of normal scenes will typically display a Gaussian distribution of pixel values with the mean centered on pixel value 127. This value will vary relative to the original image mean density and colour balance.

‘Area of Interest’ (AOI) is the image area within the rebate excluding the fiducials cut outs and annotation block.

Pixel Values and ranges will vary, dependant on the density values and ranges of the original negative/scene. It is the intent of the data capture programs to obtain the greatest density range possible from each frame/scene. Digital image files with a narrow Pixel Value range, not representative of the original image/scene, will not be accepted.

Pixel Values within AOI:

- Other than defects on the original image (scratches, emulsion tears) there shall be no Pixel Values with the value of ‘0’.

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- Pixel Value for deep shadow area is expected to be 10-20.
- Pixel Values for highlight area is expected to be 235-245.

Pixel Values outside AOI:

- Pixel value of '0' shall be assigned to the base + fog (B+F) of the scanned negative.
- Useable deep shadow areas of the image/scene must be assigned a Pixel Value of greater than '0'.

Pixel Value of '255' must only be assigned to the area of greatest density in the negative image scan area. For Branch archive imagery this includes, but is not limited to: frame annotation, spectral reflection and ambient light fog. Pixel Value of 255 must not be assigned to natural landforms such as gravel or sand bars.

For "five inch archive scans", setting of the '255' Pixel Value must be such that the instrumentation is readable.

The Branch understands that these parameters may cause spikes in the histogram for the '0' and '255' Pixel Values but no other individual pixel bins shall contain unusual spikes or gaps of data.

All scanned image data must be compared with original scanned data using verification software to ensure no corruption or loss of data has occurred. Confirmation of this step shall be indicated on the Scan Data Log ([section 5.10](#)).

Confirmation that the image has been inspected shall also be recorded on the Scan data log ([section 5.10](#)).

5.9 Labelling

All storage media shall be identified with the Folder name ([Section 5.6](#)).

Folder name on media to be written with permanent water based marker.

The following data shall be provided on a label on the storage device (if submitted, a jewel case insert shall be supplied):

- Contractor name:
- BC roll number and photo numbers:
- File size:
- Scan resolution:

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- Date media produced:
- CRGB, Ministry of Agriculture and Lands.

5.10 Scan data log

The OP shall include a scan data log maintained by the contractor and available for inspection by CRGB. The scan data log shall include data typically as shown in [Appendix C](#) and shall be signed by the scanner operator. The contractor will provide a copy of the scan data log signed by a supervisor and for a period to be selected by CRGB e.g., four weeks, to CRGB for review.

A condensed version of the Scan Data Log shall be supplied with each scanned air film image set. This Scan Data Log will contain the following information:

- BC roll number:
- Calibration Date:
- Roll prepared by:
- Frame numbers:
- Scanner identification name:
- Pixel size:
- Date of Scan:
- Initial of operator (scan):
- Media writer identification name: (if applicable)
- Verification software identification:
- Date of media creation/verification:
- Notation of frame condition:
- Initial of operator (data storage)

A sample Scan/Production Log is available upon request from the Branch.

6 TEST SCAN

Test scans may be conducted on the contractors' scanners at the request of the Branch. These shall be conducted following the latest version of the 'Scanner Acceptance Test Procedure for

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Scanners for Aerial Photography’

If the scans fail to meet these acceptance levels CRGB shall be advised immediately and remedial action will be planned in consultation with the contractor.

7 Imagery Source

7.1 Air film negative

Special circumstances may require a limited number of negatives be loaned out for a short time.

Transportation, handling and safe storage of Branch air film negatives is the responsibility of the contractor when not in Branch storage/production facility. Project Sponsors and Contractors must agree - in writing - to the latest ‘Release of Provincial Air Photo Film Rolls’.

The minimum and maximum densities of the images shall be captured as positive data without clipping and without leaving excessive unused bins on the ends of the histogram.

Digital images produced from colour negative films shall be colour balanced to match digital sample(s) supplied by, or accepted by, the Branch, and all image scans must meet requirements as set down in section 5.8.

When scanning from an original aerial photographic negative the image shall be oriented on the scanner so that the annotation block of the final scanned image will be correct reading.

7.2 Diapositive

CRGB shall provide each contractor with a diapositive produced under identical processing conditions from the same master negative of a scene typical of that occurring in the TRIM project. This diapositive shall be scanned and the scan file provided to CRGB. CRGB will examine and compare the scan files from all contractors in a subjective manner and will report to the contractors on any lack of consistency. As appropriate, contractors will advise CRGB on recommended changes to their scanning OP to improve consistency between scans of the reference diapositive.

Scans from diapositive shall be oriented such that North is at the top of the scan.

7.3 Paper Print

The Branch is currently transferring the oldest air photography of the Province (1935 +) to a digital format. The original negatives are being used for this process but some images are unusable due to age and use. The Branch Air Photo Archive Collection prints will be used in place of these frames. Set up, procedures and parameters shall be as noted in [section 5.8](#). The objective is to produce a digital file representative of the original print, not an image suitable for mapping purposes.

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8 CRGB Inspection

As part of its Quality Assurance procedures, CRGB plans to conduct random inspections of the contractors' scanning operations to verify that they are being carried out in accordance with these specifications.

8.1 Inspection topics

CRGB inspections will include the following:

- A grid plate scan for geometric accuracy/precision, photographic step wedge and diapositive test scans as in the SATP ([section 4.1](#)).
- On site inspections to confirm that scanning is being carried out in accordance with the approved OP.
- On site inspections of the scan data log and other forms to confirm that scan record data is being collected and that specification requirements are being met.
- For contractors partnered in the Air Film Loan service, on site inspections of facility to ensure compliance with supplied "Agreement for Release of Provincial Aerial Photography Filmrolls" and "Air Film Handling" documents.

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APPENDIX A

Aerial photography scale, scan pixel size, ground pixel size, plot scale

CRGB has selected a scan pixel size in the range 10 micron to 14 micron for Branch projects, including the TRIM II project, recognizing the influence of three factors:

- object recognition, resolution
- map accuracy
- orthophoto resolution both in hard copy and in soft copy

The scan pixel size range of 10 micron to 14 micron for black and white scans was selected to enable contractors to select a scan pixel size appropriate to their specific scanning equipment without the need to post process the scan data to meet a single specified scan pixel size which may be unavailable as an original scan on any particular scanner.

The objective is to select a scan pixel size which will enable a given ground object size to be viewed, resolved or compiled at a known accuracy and precision.

Table 1 A shows the maximum recommended ground pixel size (GPS) for a range of orthophoto or map plot scales. Table 1 B lists values for the nominal aerial photography scale and the nominal image pixel size on the ground for various scan pixel sizes. Current industry practice recommends that the actual scan pixel size shall be not greater than 80% of the value required to achieve the maximum ground pixel size. For certain requirements of the TRIM project one of the above three factors may necessitate selection of a scan pixel size smaller than 15 micron as noted. CRGB will advise in writing if a change in scan pixel size is required.

It is expected that orthophoto will be reproduced from the scanned data. The 80% criterion is designed to allow for the production of high quality hard copies at the selected orthophoto or map plot scale. It is also intended to facilitate the viewing of images at up to twice the planned scale in soft copy format. This requirement is also made in order to ensure that an orthophoto pixel is created at a coarser resolution than the original scan. This will ensure that the desired pixel size is maintained even in areas of varying photo scales in the original photography caused by extreme relief.

As an example, from Table 1, a 1:5,000 scale mapping or orthophoto project would require a maximum ground pixel size of 0.6 metre. With the source photography scale of 1:40,000 this would require scanning at 15 micron ($0.6/40,000 \times 1,000,000 = 15$). The specification requires scanning at not more than 80% of this value or 12 micron ($.8 \times 15 = 12$). Scanning at an even finer resolution is also acceptable if approved in advance by CRGB.

The nominal ground image resolution on a plot and the object size of a 0.5 mm mark on a plot are shown in Table 1 C.

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A Criteria: Orthophoto, Map Plot		B Scan Pixel Size to Achieve Ground Pixel Criteria					C Plot	
Plot Scale PLS 1:	Ground Pixel Size Max. GPX metres	Nominal Photo Scale PHS 1:	Scan Pixel Size SP microns	Nominal Image Pixel Size (ground) (PHS x SP) metres	Scan Pixel Size (ground) SP X 80% microns	Nominal Image Pixel Size (ground) (SP X 80%) X PHS metres	Nominal Ground Image Resolution (SP X 80%) X 4 metres	0.5 mm Object Size (PLS X 0.5) metres
20000	2.5	40000	63	2.5	50	2.0	8	10
		40000	38	1.5	30	1.2		
10000	1.3	40000	32	1.3	26	1.0	4	5
		40000	27	1.1	22	0.9		
6000	0.8	40000	23	0.9	18	0.7	3	3
		40000	19	0.8	15	0.6		
5000	0.6	40000	15	0.6	12	0.5	2	3
		40000	13	0.5	10	0.4		
2500	0.3	20000	15	0.3	12	0.2	1	1
		20000	9	0.2	7	0.1		
1000	0.1	10000	14	0.1	11	0.1	0.4	1
		10000	9	0.1	7	0.1		

Table 1

Scan resolution vs. file size chart

Original	Resolution	File Size
B/W	21 micron	135 Mb
B/W	14 micron	300 Mb
B/W	7 micron	1.1 Gb
Colour	21 micron	400 Mb
Colour	14 micron	1 Gb
Colour	7 micron	3.5 Gb

Table 2

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APPENDIX B

SCANNING OPERATING PROCEDURE

TABLE OF CONTENTS (typical)

Operating procedure number: Date: Revision:			
Contractor name: Address: Prepared by: Date: Approved by: Date:			
Crown Registry and Geographic Base Branch Review by: Date: Approved by: Date:			
Item	Details	Sign off on operating procedure	Sign off on scan data report
Scanning Specification	Reference name and number	Y	
	Copy available to operators	Y	
	Copy read by operators	Y	
Scanner Calibration CRGB Certificate of Acceptance	Check calibration current	Y	Y
	Check current	Y	Y
Scanning General Test scans	Check need for	Y	Y
Scan mode	Density, check	Y	Y
Scan pixel size	Specification and/or advised by CRGB, check re: sampling to larger scan pixel size	Y	Y
Operator Approved operators	Names	Y	Y

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Environmental	Scanning room operation conditions, check	Y	
Preparation of scanner, images			
Scanner cleanliness	Procedure and check	Y	Y
Image cleanliness	Procedure and check	Y	Y
Image face on stage	Procedure and check	Y	Y
Image orientation on stage	Procedure and check	Y	Y
Scanning parameters images - inspection	Inspect for selection of scanning parameters	Y	Y
	Applicable batch size	Y	Y
	Individual as required	Y	Y
Computer hardware/software	Operational settings and check	Y	
Selection of scanning parameters			
Illumination	Procedure for selection, identify if for batch or individual	Y	Y
Speed		Y	Y
Aperture		Y	Y
Scan overview/confirm		Y	Y
Other		Y	Y
Operational Inspection			
On actual media/file supplied to CRGB	Details of inspection method and acceptance criteria	Y	Y
Meta data		Y	Y
Shift change over details		Y	
Scan data log		Y	Y

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Notes on content for operating procedure			
Item	Details	Sign off on operating procedure	Sign off on scan data report
Scanning Specification	Reference name and number Copy available to operators Copy read by operators	Y Y Y	
Scanner Calibration CRGB Certificate of Acceptance	Date of last calibration by manufacturer Date of last calibration by CRGB Exhibited on scanner	Y Y	Y Y
Scanning General Test scans	Report on number scans since last inspection and test scan	Y	Y
Scan mode	Density, check	Y	Y
Scan pixel size	Provide description of method and how re-sampled pixel size will be stated	Y	Y
Operator Approved operators	List of operators trained and experienced	Y	Y
Environmental	Room temperature and humidity conditions	Y	
Preparation of scanner, images Scanner cleanliness Image cleanliness Image face on stage Image orientation on stage	Inspect for cleanliness, absence of marks, removal of static Correct positioning of image emulsion and orientation on scanner stage	Y Y Y Y	Y Y Y Y
Scanning parameters images - inspection	Parameters applicable for total project? Identify parameters and how they will be selected if they are changed	Y Y Y	Y Y Y

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Computer hardware/software	Identify software/hardware conditions essential to ensure repeatable high quality scans e.g. limitations on network use, multitasking; ensure scanning parameters remained at selected settings	Y	
Selection of scanning parameters	Refer to scanner manufacturer/software vendor operation manual as appropriate		
Illumination		Y	Y
Speed		Y	Y
Aperture		Y	Y
Scan overview/confirm		Y	Y
Other			
Operational Inspection	Inspection against specified criteria: check histogram for compliance with specifications, compare digital image with analog All data recorded?		
On actual media/file supplied to CRGB		Y	Y
Meta data		Y	Y
Shift change over details		Y	
Scan data log		Y	Y

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APPENDIX C

SCAN DATA LOG

TABLE OF CONTENTS (typical)

Scanning specification reference number: CRGB approved operating procedure number: Date: Revision number:			
Contractor name: Address: Scanner operator: Date: Supervisor: Date:			
Crown Registry and Geographic Base Branch Reviewed by: Date: Approved by: Date:			
Item	Details	Check Off	notes
Project identification Scanner calibration current		y	
Scanning test scan required? scan mode – density Scan pixel size	scan #, total scan # check <u>record</u> <u>record</u>	y y y	Re: sampled to larger size? State original

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Preparation of scanner; image Scanner clean image clean image face on stage image orientation on stage	check check check check	y y y y	cleaned or as is cleaned or as is
Scanning parameters image – inspection image I.D. selected scanning parameters illumination Speed aperture scan overview/confirm other	characteristics describe batch size or individual <u>record</u> settings for	y y y y y y y y	quantitative description by reference to image #s unique image # for this file recent actual settings recent actual settings recent actual settings
Operational inspection final scan file quality inspection	meets acceptance criteria comments on original image condition <u>record file name</u>	y y	check off against each accept. criterion

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APPENDIX D

Glossary

Area of Interest (AOI)

Is the image area within the rebate excluding the fiducials cut outs and annotation block.

Bin

A pixel bin is a given pixel intensity. It is usually used to refer to the number of occurrences of a given intensity.

Density

The photographic density of the transparency as measured by a densitometer. Density is equivalent to:

$$D = 1/\log T$$

Where T = Transitivity of the media.

First Generation

Refers to a positive or negative transparency that has been produced from the original aerial negative or positive

Second Generation

This refers to a positive or negative produced by contact exposure from the first generation original

Pixel

A picture element, the digital representation of an image as an integer value. Normally within the range of 0 to 255 as stored in a single byte (8 bits).

Photographic Step Wedge

A standard photographic tool showing steps of increasing density. A typical wedge has steps at increments of 0.15 Density units within the range of 0 to 1.5 D.

Transitivity

Percent of light transmitted by a transparent media

Scanner system output file

The scanner system output file is defined as the first generation output file from the scanner which may include image digitizing geometric and/or radiometric corrections which are inherent to the scanner system design.

Sampling mode

A scanner operating mode in which every other or more pixels are skipped. For example, if the

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scanner optical resolution is 7.5 micron then sampling mode can produce an output file at 15 micron or 22.5 micron.

Re Sampling

An image post processing method in which the pixel values from the scanner system output file are re processed in software using for example, nearest neighbour, bilinear, bicubic or SinX resampling algorithms.

Scanning artefacts

Scanning artefacts in the digital reproduction of a photographic image are objects or structures which are introduced into the digital image as a result of the scanning process and which did not exist in the original photographic image.

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APPENDIX E

META DATA FILE

With each data file a separate ASCII file shall be supplied containing the following information:

The file name for the meta data file shall be identical to the associated image file with the exception of the file extension which shall be .txt.

- Meta Data for file : complete image file as per Section 5.6
- TRIM Map sheet : TRIM map sheet number, enter only one mapsheet
- Original Media : type of media scanned – negative, diapositive, paper print, digital
- Photo Roll Number : complete Province of BC air film identification number
- Photo Frame Number : three digit image frame number
- Focal Length : approx. focal length in millimetres
- Photo Date : date of photography in following format: yyyyymmdd
- Contractor Name : company name of contractor
- Scan Resolution : scan resolution in microns
- Photo Scale or GSD : only enter digits after the colon (see sample)
- Device Name and S/N: scanner or camera identification name and serial number
- Scan Date : data image digitized
- File Size (Bytes) : image file size in bytes
- Comments: : Comments relating to original image condition or digital data

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Two spaces shall follow the colon before data is entered. A sample Meta Data file follows.

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BCB99002_085_14d.txt

Meta data for file : BCB99002_085_14d.tif
TRIM Map sheet : 93E 088
Original Media : diapositive
Photo Roll Number : BCB99002
Photo Frame Number : 085
Focal Length : 150 mm
Photo Date : 19990815
Scan Contractor Name: CRGB
Scan Resolution : 14 microns
Photo Scale or GSD : 18000
Device Name and S/N: Zeiss PhotoScan S/N: 151234
Scan Date : 20010919
File Size (Bytes) : 301256775
Comments : histogram contains empty bins, scratch on original negative

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