

## BANDS - Multispectral / Hyperspectral Band Parameters

The BANDS extension is defined to supplement information in the NSIF image subheader where additional parametric data is required for multiband sensor data. This data extension is placed in each image subheader as required. Each band must be identified either by the wavelength of peak response (BANDPEAK), or the wavelengths of its edges (BANDLBOUNDn, BANDUBOUNDn). [Editor's Note: A proposal has been submitted to revise the BANDS TRE to preclude the need to define the spectral response. This may be desirable for security purposes.] The format and descriptions of the user-defined fields of this extension are detailed in Table 1.

**TABLE 1 BANDSA – MULTISPECTRAL / HYPERSPECTRAL BAND PARAMETERS EXTENSION FORMAT**

R = REQUIRED, C = CONDITIONAL, < > = BCS SPACES ALLOWED FOR ENTIRE FIELD					
Field	Name	Size	Value Range	Units	Type
CETAG	Unique Extension Identifier.	6	BANDSA	N/A	R
CEL	Length of Entire Tagged Record.	5	00072 to 45980	bytes	R
<i>The Following Fields Define BANDSA</i>					
ROW_SPACING	<u>Row Spacing</u> measured at the center of the image. Distance in the image plane between corresponding pixels of adjacent rows measured in feet or meters; or Angular center-to-center distance (pitch) between corresponding pixels of adjacent rows measured in micro-radians If the actual spacing (or associated units) is unknown, the default value of "0000000" will be entered.	7	00.0000 to 99.9999  0000.00 to 9999.99  0000000	feet or meters  μ-radians	R
ROW_SPACING_UNITS	<u>Unit of Row Spacing.</u> f = feet m = meters r = μ-radians	1	f, m or r		R

COL_SPACING	<p><u>Column Spacing</u> measured at the center of the image.</p> <p>Distance in the image plane between adjacent pixels within a row measured in feet or meters; or</p> <p>Angular center-to-center distance (pitch) between adjacent pixels within a row measured in micro-radians.</p> <p>If the actual spacing (or associated units) is unknown, the default value of "0000000" will be entered.</p>	7	<p>00.0000 to 99.9999</p> <p>0000.00 to 9999.99</p> <p>0000000</p>	<p>feet or meters</p> <p>μ-radians</p>	R
COL_SPACING_UNITS	<p><u>Unit of Column Spacing.</u></p> <p>f = feet</p> <p>m = meters</p> <p>r = μ-radians</p>	1	f, m or r		R
FOCAL_LENGTH	<p><u>Sensor Focal Length.</u> Effective distance from optical lens to sensor element(s), used when either ROW_SPACING_UNITS or COL_SPACING_UNITS indicates μ-radians. 999.99 indicates focal length is not available or not applicable to this sensor.</p>	6	000.01 to 899.99, 999.99	cm	C
BANDCOUNT	<p><u>Number of Bands</u> comprising the image. Fields BANDPEAKn through BANDGSDn will be repeated for each band.</p>	4	0001 to 9999	N/A	R
BANDPEAKn	<p><u>Band n Peak Response Wavelength.</u> Must be specified unless BANDLBOUNDn and BANDUBOUNDn are specified.</p>	5	00.01 to 19.99	μm	<C>
BANDLBOUNDn	<p><u>Band n Lower Wavelength Bound.</u> The wavelength for the nth band at the lower 50% (-3db) point of the sensor spectral response.</p>	5	00.01 to 19.99	μm	<C>
BANDUBOUNDn	<p><u>Band n Upper Wavelength Bound.</u> The wavelength for the nth band at the higher 50% (-3db) point of the sensor spectral response.</p>	5	00.01 to 19.99	μm	<C>
BANDWIDTHn	<p><u>Band n Width.</u> The wavelength difference between the upper and lower bounds at the 50% (-3db) points of the sensor spectral response.</p>	5	00.01 to 19.99	μm	<C>

BANDCALDRKn	<u>Band n Calibration (Dark)</u> . The calibrated receive power level for the nth band that corresponds to a pixel value of 0.	6	0000.1 to 9999.9	$\mu\text{w} / (\text{cm}^2\text{-sr-}\mu\text{m})$	<C>
BANDCALINCn	<u>Band n Calibration (Increment)</u> . The mean change in power level for the nth band that corresponds to an increase of 1 in pixel value.	5	00.01 to 99.99	$\mu\text{w} / (\text{cm}^2\text{-sr-}\mu\text{m})$	<C>
BANDRESPn	<u>Band n Spatial Response</u> . Nominal pixel size, expressed in microradians	5	000.1 to 999.9	$\mu\text{radians}$	<C>
BANDASDn	<u>Band n Angular Sample Distance</u> . The pixel center-to-center distance, expressed in microradians.	5	000.1 to 999.9	$\mu\text{radians}$	<C>
BANDGSDn	<u>Band n Ground Sample Distance</u> . The average distance between adjacent pixels for the nth band.	5	00.01 to 99.99	m	<C>