LANDSAT RADIOMETRIC DATA

This is an extract from the ACRES Landsat Digital Data Format Document.

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LEADER FILE DESCRIPTOR VARIABLE SEGMENT - DEFINITION

NO.	BYTE NOS.		VALUE	DEFINITION
1	1-6	*	1	Number of header records
2	7-12		4320	Header record length
3	13-18		1	Number of map projection ancillary records
4	19-24		4320	Map projection ancillary record length
5	**25-30**	**	**2*n**	**Number of radiometric calibration ancillary records (where n = number of bands)**
6	31-36		4320	Radiometric Ancillary Record Length
7	37-52		000002000037016A	Scene Identification Field Locator
8	53-68		000002000165016A	WRS Identification Field Locator
9	69-84		000002000309016A	Mission Identification Field Locator
10	85-100		000002000325016A	Sensor Identification Field Locator
11	101-116		000002000117032A	Exposure date-time field locator
12	117-132		000002000213032A	Geographic Reference Field Locator
13	133-148		000002001477096A	Image Processing Performed Field Locator
14	149-164		000002001717016A	Imagery Format (Interleaving) Indicator Locator
15	165-180		000002001653064A	Band Indicator Locator
16	181-196		000002000208002A	Quadrant Indicator Locator
17	197-212		000003000365032N	Inter-pixel and inter-line scale locator
18	213-228		000002000277016N	Quadrant Product Vertical Overlap Indicator
19	229-244		000002000293016N	Quadrant Product Horizontal Overlap Indicator
20	245-4320			Blanks

* Byte 1 of the variable segment is byte 181 of the record.

** n is the number of spectral bands in the related imagery file.

RADIOMETRIC ANCILLARY RECORD - DEFINITION

FIELD TYPE	FIELD NUMBER	BYTE NUMBER	DESCRIPTION
B	1	1-4	Record Sequence Number
B	2	5	1st record sub-type code = 077(8)
B	3	6	Record type code = 044(8)
B	4	7	2nd record sub-type code = 022(8)
B	5	8	3rd record sub-type code = 011(8)
B	6	9-12	Record length = 4320
N	7	13-16	Band number = 1 to 7 -I4
N	**8**	**17-20**	**Lower reflectance limit - I4**
N	**9**	**21-24**	**Upper reflectance limit - I4**
N	10	25-28	Equalizing reference detector - I4
N	11	29-48	Offset coefficient (A0) - E20.10
N	12	49-68	Gain coefficient (A1) - E20.10

Note: fields 13 thru 28 consist of 256 1-byte binary elements

B	13	69-324	Detector 1 lookup table
B	14	325-580	Detector 2 lookup table
B	15	581-836	Detector 3 lookup table
B	16	837-1092	Detector 4 lookup table
B	17	1093-1348	Detector 5 lookup table
B	18	1349-1604	Detector 6 lookup table
B	19	1605-1860	Detector 7 lookup table
B	20	1861-2116	Detector 8 lookup table
B	21	2117-2372	Detector 9 lookup table
B	22	2373-2628	Detector 10 lookup table
B	23	2629-2884	Detector 11 lookup table
B	24	2885-3140	Detector 12 lookup table
B	25	3141-3396	Detector 13 lookup table
B	26	3397-3662	Detector 14 lookup table
B	27	3663-3908	Detector 15 lookup table
B	28	3909-4164	Detector 16 lookup table
B	29	4165-4320	Spare [LOCAL USE]

RADIOMETRIC ANCILLARY RECORD - EXPLANATION

FIELD	EXPLANATION
1-6	The contents of fields 1 to 6 are defined by the LGSOWG format, and field 5 takes the value (011)8 to indicate that it conforms to the LTWG recommendations.
8-9	Fields 8 and 9 indicate the lower and upper reflectance limits (percentages) respectively used in the contrast stretch, FORTRAN format I4, range 0 to 100.
10	In the radiometric calibration process, one detector in each band is defined as the equalizing reference detector, for which an absolute calibration is computed. The other detectors are matched to it using histogram analysis, to reduce the effects of radiometric striping.
11-12	The A0 and A1 coefficient may be used in conjunction with the expression R' = A0 + V'*A1 to convert linear digital values, V', in the current band to scene radiance, R' (in watts /m2sr). Each coefficient is stored in 20 bytes corresponding to the FORTRAN format E20.10.
13-28	Fields 13 to 28 each contain 256 data items for one of the 16 detectors within the band where each data item can take a value between 0 and 255, and is stored as a binary value in 1 byte. Since full scan lines of band 6 data are replicated four times, the transformation tables for each of the four band 6 detectors are replicated four times. If the transformation tables are changed within the product, fields 13 through 28 will be zero-filled. For Quadrant and Full-scene products, the gains and offsets used to correct the data on a line by line basis, can be extracted from the suffix area of the image data record.