KODAK Digital LAD Test Image

User's Guide and Digital Recorder Calibration and Aims

TECHNICAL DATA / REFERENCE

October 2026 H-387

The KODAK Digital LAD Test Image is a digital image that can be used as an aid in setting up digital film recorders to produce properly exposed digital negatives and in obtaining pleasing prints from those negatives.

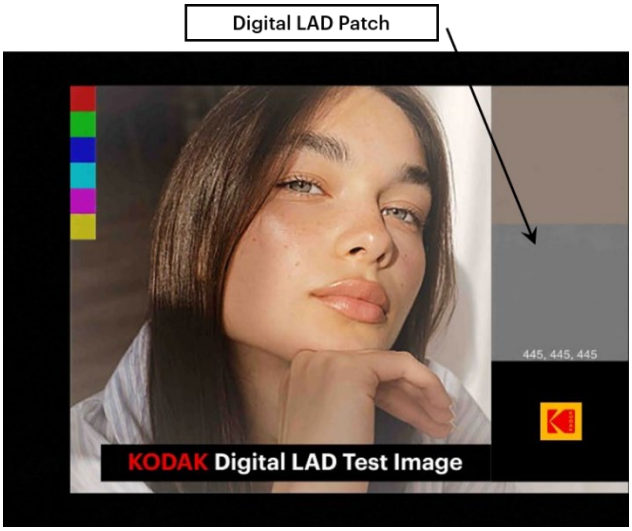
The recommended procedure is as follows:

- Record one or more frames of the KODAK Digital LAD Test Image at the head end of every job
- After the digital negative is processed, measure the density of the digital LAD patch and compare with aims.

Summary of Digital Recording LAD Aims

Film Type	Mode	Status M Density Above D-min		
		Red	Green	Blue
KODAK VISION Color Intermediate Film 5/2242	Neg	0.828	0.86	0.943
KODAK VISION Color Intermediate Film 5/2242	IP	0.967	1.005	1.102
KODAK VISION3 Digital Color Intermediate Film 2254	Neg	0.828	0.86	0.943
KODAK VISION3 Digital Color Intermediate Film 2254	IP	0.967	1.005	1.102
KODAK VISION3 50D Color Negative Film 5203	Neg	0.653	0.687	0.725

- Note that the table gives Status M density aims with D-min density subtracted. Measure the D-min density for the given film stock through your laboratory and add it to the densities given in Table I to determine the total Status M aim density.
- When the negative is sent for printing, a satisfactory print can be obtained if the printing lab is instructed to adjust the printing color timing so that the digital LAD patch prints to the recommended LAD densities for the print film being used. (e.g. 1.09/1.06/1.03 Status A density for KODAK VISION Color Print Film 2383).



Digital Film Recorder Calibration

The following is a summary of recommended practices for calibration of digital film recorders when recording DPX format images. It is based on practices that were developed by Eastman Kodak Company and is often referred to as the CINEON calibration aim.
References are listed at the end of the document.

Step 1: Calibrate the Recorder to the CINEON Calibration Aim

The calibration aim is the relationship between the code values of the image (the input) and the density on the film (the output). It is calculated by the following equation:

Printing Density = 0.002 * CV

Where	CV = code value (10 bit, 0 to 1023)
And	Printing Density = the density above D-min of the negative as "seen" by the combination of print film and the illumination of a standard motion picture printer.

Note that the densities are not Status M densities, but rather printing densities. The printing densities defined reflect the current motion picture film system. Tables II & III give the corresponding Printing Density for selected code values. It also gives equivalent Status M densities as well as Status M density above D-min for the films commonly used for laser film recorders, KODAK VISION Color Intermediate Film 5/2242 and KODAK VISION3 Digital Color Intermediate Film 5/2254. Note that the Status M densities above D-min are the same for both of these intermediate films.

Table II: Calibration Aims for Digital Original Negative Recorded onto KODAK VISION Color Intermediate Film 5/2242

	Printing Density Code Value			Printing Density (Above D-min)			Status M (Above D-min)			Status M (See Note 1)		
	R	G	B	R	G	B	R	G	B	R	G	B
	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.071	0.550	0.603
	22	22	22	0.044	0.044	0.044	0.041	0.043	0.047	0.112	0.593	0.650
	95	95	95	0.190	0.190	0.190	0.177	0.184	0.201	0.248	0.734	0.804
	200	200	200	0.400	0.400	0.400	0.372	0.387	0.424	0.443	0.937	1.027
	445	445	445	0.890	0.890	0.890	0.828	0.860	0.943	0.899	1.410	1.546
Digital	520	520	520	1.040	1.040	1.040	0.967	1.005	1.102	1.038	1.555	1.705
LAD	685	685	685	1.370	1.370	1.370	1.274	1.324	1.452	1.345	1.874	2.055
	800	800	800	1.600	1.600	1.600	1.488	1.546	1.695	1.559	2.096	2.298
	900	900	900	1.800	1.800	1.800	1.674	1.740	1.907	1.745	2.290	2.510
	968	968	968	1.936	1.936	1.936	1.801	1.871	2.051	1.872	2.241	2.654
	1000	1000	1000	2.000	2.000	2.000	1.860	1.933	2.119	1.931	2.483	2.722
	1023	1023	1023	2.046	2.046	2.046	1.903	1.978	2.168	1.974	2.528	2.771

D-min	0.071	0.550	0.603

Table III: Calibration Aims for Digital Original Negative Recorded onto KODAK VISION3 Digital Color Intermediate Film 2254

	Printing Density Code Value			Printing Density (Above D-min)			Status M (Above D-min)			Status M (See Note 1)		
	R	G	B	R	G	B	R	G	B	R	G	B
	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.067	0.710	0.687
	22	22	22	0.044	0.044	0.044	0.041	0.043	0.047	0.108	0.753	0.734
	95	95	95	0.190	0.190	0.190	0.177	0.184	0.201	0.244	0.894	0.888
	200	200	200	0.400	0.400	0.400	0.372	0.387	0.424	0.439	1.097	1.111
	445	445	445	0.890	0.890	0.890	0.828	0.860	0.943	0.895	1.570	1.630
Digital	520	520	520	1.040	1.040	1.040	0.967	1.005	1.102	1.034	1.715	1.789
LAD	685	685	685	1.370	1.370	1.370	1.274	1.324	1.452	1.341	2.034	2.139
	800	800	800	1.600	1.600	1.600	1.488	1.546	1.695	1.555	2.256	2.382
	900	900	900	1.800	1.800	1.800	1.674	1.740	1.907	1.741	2.450	2.594
	968	968	968	1.936	1.936	1.936	1.801	1.871	2.051	1.868	2.581	2.738
	1000	1000	1000	2.000	2.000	2.000	1.860	1.933	2.119	1.927	2.643	2.806
	1023	1023	1023	2.046	2.046	2.046	1.903	1.978	2.168	1.970	2.688	2.855

D-min	0.067	0.710	0.687

Recorders from different manufacturers will likely have some means to utilize these aims as part of their calibration procedure. Please refer to your recorder's specific instructions regarding how to use this type of data for calibrating the recorder.

When creating an interpositive or master positive, a simple inversion of the density to code value relationship would produce a LAD density that is too high. An offset of -0.116 printing density is included to get to a more acceptable LAD density. This forces some high code values to produce a negative density, so these are clipped to a density of zero in the following tables.

Table IV: Calibration Aims for Interpositive Digital Recording onto KODAK VISION Color Intermediate Film 5/2242

	Printing Density Code Value			Printing Density (Above D-min)			Status M (Above D-min)			Status M (See Note 1)		
	R	G	B	R	G	B	R	G	B	R	G	B
	0	0	0	1.930	1.930	1.930	1.795	1.865	2.045	1.866	2.415	2.648
	22	22	22	1.886	1.886	1.886	1.754	1.823	1.998	1.825	2.373	2.601
	95	95	95	1.740	1.740	1.740	1.619	1.682	1.844	1.690	2.232	2.447
	200	200	200	1.530	1.530	1.530	1.423	1.479	1.621	1.494	2.029	2.224
	445	445	45	1.040	1.040	1.040	0.967	1.005	1.102	1.038	1.555	1.705
Digital	520	520	520	0.890	0.890	0.890	0.828	0.860	0.943	0.899	1.410	1.546
LAD	685	685	685	0.560	0.560	0.560	0.521	0.541	0.593	0.592	1.091	1.196
	800	800	800	0.330	0.330	0.330	0.307	0.319	0.350	0.378	0.869	0.953
	900	900	900	0.130	0.130	0.130	0.121	0.126	0.138	0.192	0.676	0.741
	965	965	965	0.000	0.000	0.000	0.000	0.000	0.000	0.071	0.550	0.603
	1023	1023	1023	-0.116	-0.116	-0.116	0.000	0.000	0.000	0.071	0.550	0.603

D-min	0.071	0.550	0.603

Table V: Calibration Aims for Interpositive Digital Recording onto KODAK VISION3 Digital Color Intermediate Film 2254

	Printing Density Code Value			Printing Density (Above D-min)			Status M (Above D-min)			Status M (See Note 1)		
	R	G	B	R	G	B	R	G	B	R	G	B
	0	0	0	1.930	1.930	1.930	1.795	1.865	2.045	1.862	2.575	2.732
	22	22	22	1.886	1.886	1.886	1.754	1.823	1.998	1.821	2.533	2.685
	95	95	95	1.740	1.740	1.740	1.619	1.682	1.844	1.686	2.392	2.531
	200	200	200	1.530	1.530	1.530	1.423	1.479	1.621	1.490	2.189	2.308
	445	445	45	1.040	1.040	1.040	0.967	1.005	1.102	1.034	1.715	1.789
Digital	520	520	520	0.890	0.890	0.890	0.828	0.860	0.943	0.895	1.570	1.630
LAD	685	685	685	0.560	0.560	0.560	0.521	0.541	0.593	0.588	1.251	1.280
	800	800	800	0.330	0.330	0.330	0.307	0.319	0.350	0.374	1.029	1.037
	900	900	900	0.130	0.130	0.130	0.121	0.126	0.138	0.188	0.836	0.825
	965	965	965	0.000	0.000	0.000	0.000	0.000	0.000	0.067	0.710	0.687
	1023	1023	1023	-0.116	-0.116	-0.116	0.000	0.000	0.000	0.067	0.710	0.687

D-min	0.067	0.710	0.687

The relationship between Status M and printing density changes from film to film. Table VI gives Status M code values for KODAK VISION3 50 Color Negative Film 5203. These films are commonly used in CRT film recorders. In certain situations, it may be sufficient to limit the maximum code values to less than 1023, thus requiring lower densities and possibly improving throughput without sacrificing final image quality. The table shown goes to a code value of 800 before clipping.

Table VI: Calibration Aims for Digital Recording onto KODAK VISION3 50D Color Negative Film 5203

	Printing Density Code Value			Printing Density (Above D-min)			Status M (Above D-min)			Status M (See Note 1)		
	R	G	B	R	G	B	R	G	B	R	G	B
	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.152	0.582	0.845
	95	95	95	0.000	0.000	0.000	0.000	0.000	0.000	0.152	0.582	0.845
	200	200	200	0.210	0.210	0.210	0.196	0.206	0.217	0.348	0.788	1.062
	400	400	400	0.610	0.610	0.610	0.569	0.569	0.568	0.721	1.151	1.413
	445	445	445	0.700	0.700	0.700	0.653	0.687	0.725	0.805	1.269	1.570
Digital	600	600	600	1.010	1.010	1.010	0.942	0.991	1.046	1.094	1.573	1.891
LAD	685	685	685	1.180	1.180	1.180	1.100	1.157	1.222	1.252	1.739	2.067
	800	800	800	1.410	1.410	1.410	1.315	1.383	1.460	1.467	1.965	2.305
	900	900	900	1.610	1.610	1.610	1.315	1.383	1.460	1.467	1.965	2.305
	1000	1000	1000	1.81	1.81	1.81	1.315	1.383	1.460	1.467	1.965	2.305

D-min	0.152	0.582	0.845

KODAK Digital LAD Test Image

Record a Digital LAD Image

Once the recorder is calibrated, it is recommended that a Digital LAD image be recorded along with each production job. This digital LAD image will consist of or contain a patch recorded at a set of LAD code values. This patch may be printed to standard LAD densities on the print to obtain a reasonable starting print balance. Suitable print densities for the LAD patch are 1.09/1.06/1.03. Status A for KODAK VISION Color Print Film 2383.

The recommended code values for a digital LAD patch are:

Red	Green	Blue
445	445	445

Note that these code values do not result in densities that are exactly the same as those recommended in the KODAK Publication H-61, Laboratory Aim Density (See Table VII, next page). However, the densities are close and still result in an image well placed on the straight-line portion of the film's characteristic curve.

Table VII also gives the recommended aim densities for digital recorders when used to make interpositives. The LAD aims for negative are different than for interpositive, even though they're printed from the same code values.

Finally note that some facilities may choose to use a digital LAD with code values other than 445, 445, 445. We chose these values to be consistent with a large body of industry practice.

However, other values could be chosen, such as a set of code values that give densities closer to the publication H-61 densities.

Table VII: Summary of Digital Recording LAD Aims

Mode	Red	Green	Blue
Negative Mode 5/2242			
Code values for Digital LAD	445	445	445
Printing density for Digital LAD	0.890	0.890	0.890
Status M density above D-min for Digital LAD	0.828	0.860	0.943
Status M density for Digital LAD	0.899	1.410	1.546
Normal LAD aims (per KODAK Publication H-61)	1.00	1.45	1.55
Negative Mode 2254			
Code values for Digital LAD	445	445	445
Printing density for Digital LAD	0.890	0.890	0.890
Status M density above D-min for Digital LAD	0.828	0.860	0.943
Status M density for Digital LAD	0.895	1.570	1.630
IP Mode 2242			
Code values for Digital LAD	445	445	445
Printing density for Digital LAD	1.040	1.040	1.040
Status M density above D-min for Digital LAD	0.967	1.005	1.102
Status M density for Digital LAD	1.038	1.555	1.705
Normal LAD aims (per KODAK Publication H-61)	1.15	1.60	1.70
IP Mode 2254			
Code values for Digital LAD	445	445	445
Printing density for Digital LAD	1.040	1.040	1.040
Status M density above D-min for Digital LAD	0.967	1.005	1.102
Status M density for Digital LAD	1.038	1.555	1.705

References

1. G. Kennel, "Digital Film Scanning and Recording: The Technology and Practice," SMPTE Journal, March, 1994.
2. "Laboratory Aim Density, Using LAD to Set Up an Electronic Color Analyzer and Printing Control," KODAK publication H-61.

©KODAK, 2026.
KODAK, EASTMAN, VISION, VISION3 and the KODAK logo are trademarks of KODAK.