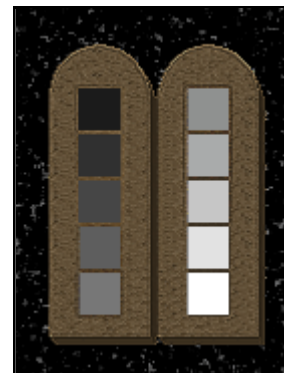


Beyond the Digital Zone System

*Then God said, "Let there be light"; and there was light.
And God divided the light into ten zones*

Zone system myths

I am going to start by discussing some zone system myths, because until they are swept away, it may be hard to wrap one's mind around the idea of using the zone system with anything other than black-and-white negatives. So, here goes

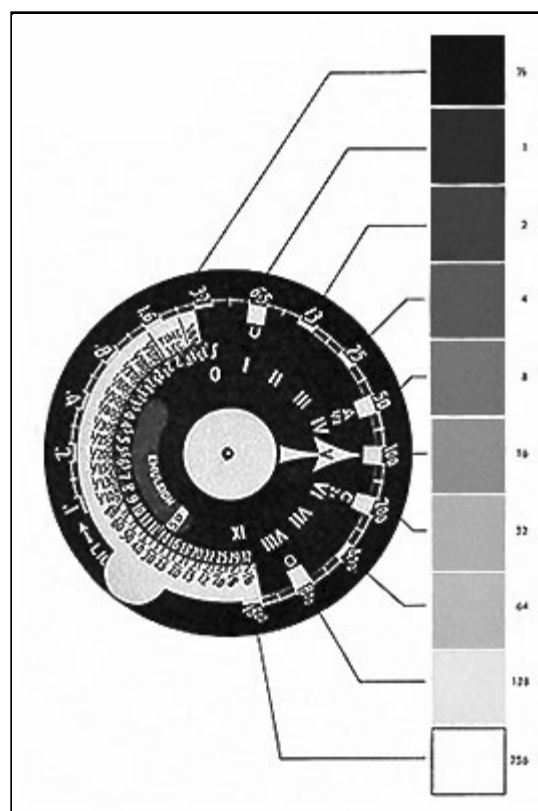


Myth #1: The zone system divides the image scale into ten zones.

The reality is that it is the exposure scale of the subject that has zones, not the image; and that the zone system itself does not specify any number of zones, because the range of zones represented in the image depends on the photographic medium in use.

This myth is very deeply embedded in the collective photographic consciousness, and it is not hard to see why. In the 1948 edition of *The Negative*, Ansel started his discussion of the zone system with an illustration of a ten-step gray scale of print values next to a Weston meter dial that was marked off in Roman zone numerals, and back then he called those values Print Zones. It would have been natural to conclude that a specific scale of print values is the basis of the zone system. But the system was still in development in 1948; and by 1981, he had more logically defined the relationship between zones and values:

Note that we use the term *zone* to refer only to the exposure scale, and *value* for the other concepts, specifically luminance values, negative density values, and print values. It is essential to remember the basic relationship: *if we take a reading from a single-luminance surface and use the indicated exposure settings, we are giving Zone V exposure for that surface, and*



The Gray Scale and the Weston Meter Dial.

— Ansel Adams, *The Negative* (1948, 14)

anticipate a negative density Value V and a print Value V (middle gray) representing that surface To determine the remainder of the scale, then, we define a one-stop exposure change as a change of one zone on the exposure scale, and the resulting gray in the print is considered one value higher or lower on the print scale.

— Ansel Adams, *The Negative* (1981, 48-49)

So zones come first, and print values follow. As you can see from the description above, zones are actually exposure values, assigned Roman numerals centered on V for the exposure indicated by a light meter.¹

But even the 1981 edition of *The Negative* contains a number of illustrations of gray scales, and they all have the legendary ten (actually eleven, from O to X inclusive) zones. Why ten zones? In 1948, Ansel's explanation was a little mundane:

A gray scale of 10 steps seems to me most convenient Moreover, the 8 intermediate steps of tone can be related to the 8 indications on the calculator dial on the Weston Master Exposure Meter

— Ansel Adams, *The Negative* (1948, 16)

A more realistic basis for ten zones is found in the 1981 edition. Speaking of a film's characteristic curve:

Ultimately the straight-line response tapers off at the *shoulder* of the curve (Zone IX and above with modern films). This occurs at high exposure levels and shows graphically the compression of detail in subject areas that are overexposed, frequently called "blocking" of highlights.

— Ansel Adams, *The Negative* (1981, 87)

In other words, black-and-white negatives tend to have about a ten-stop range from threshold shadow exposure to loss of highlight detail. But black-and-white negatives are not the only photographic medium. How did Ansel apply the zone system to reversal materials (transparencies and Polaroid images)?

Just which zone we use for the placement decision will depend on the scale of the specific material, and the subject at hand. Both Polaroid films and transparencies have a considerably shorter scale than conventional negative films, however. Few reversal materials will record detail above Zone VII, and even this may be beyond the scale of some. A series of tests should be conducted to determine the practical scale of the film used before deciding where to place important high values which must retain texture and detail.

Once you have placed the important high values on the appropriate zones, you must consider where the low values fall. With the relatively short scale of positive materials, Zone II is usually the "threshold" of useful exposure, and Zone III should reveal some substance and texture.

— Ansel Adams, *The Negative* (1981, 97)

Minor White illustrates this in his book, *The New Zone System Manual*; his example of a "zone ruler" constructed from Polaroid prints extends from zones

II to VIII (seven zones, not ten):

II	III	IV	V	VI	VII	VIII
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— adapted from Minor White *et al.*, *The New Zone System Manual* (1976, 20)

So, ten zones are logical when working with black-and-white negatives, but not necessarily any other medium. And trying to arbitrarily fit other media into the ten-zone mold is not likely to be successful. For example, to preview what is to come, placing what is intended to be a textured highlight onto zone VIII when using a digital camera will probably result in disappointment, because many digital cameras saturate to pure white by zone VIII.

One last note: the development of black-and-white films can be altered to produce negatives with expanded or contracted range; under these conditions, the number of zones recorded in the image may vary from perhaps 8 to 12.

So, to correctly restate the myth above (emphasis on the corrections):

The zone system, *when applied to conventional black-and-white negatives*, divides the *exposure scale of the subject* into *about ten zones*.

Myth #2: This (referring to the table on the right, or a derivative thereof) is the zone system, and these are definitions of the zones.

First, note that these are *descriptions* of zones, not definitions. And, not to belabor the point, this table was published in a book called *The Negative*.

Anyone who professes to understand the zone system should first, in my humble opinion, read chapter 9 of Ansel's book, *Polaroid Land Photography*. Even if one has no interest in this (hopefully not dying) art, the book should be considered the fourth one in the photography series for a number of reasons. In chapter 9, "Exposure and the Zone System," Ansel applies the latter specifically to Polaroid materials,

Table 2 gives the approximate values for various types of subjects rendered "realistically."

Table 2. *Description of Zones.*

Value Range	Zone	Description
Low Values	Zone 0	Total black in print. No useful density in the negative other than filmbase-plus-fog.
	Zone I	Effective threshold. First step above complete black in print, with slight tonality but no texture.
	Zone II	First suggestion of texture. Deep tonalities, representing the darkest part of the image in which some detail is required.
Middle Values	Zone III	Average dark materials and low values showing adequate texture.
	Zone IV	Average dark foliage, dark stone, or landscape shadow. Normal shadow value for Caucasian skin portraits in sunlight.
	Zone V	Middle gray (18% reflectance). Clear north sky as rendered by panchromatic film, dark skin, gray stone, average weathered wood.
High Values	Zone VI	Average Caucasian skin value in sunlight, diffuse skylight or artificial light. Light stone, shadows on snow in sunlit landscapes, clear north sky on panchromatic film with light blue filter.
	Zone VII	Very light skin, light gray objects; average snow with acute side lighting.
	Zone VIII	Whites with texture and delicate values; textured snow; highlights on Caucasian skin.

step-by-step, and compares the results with the familiar ones known from black-and-white negatives. This is an invaluable source of information from which to glean the basic principles of the zone system, independent of the photographic medium in use. Figure 9-7 below should be an eye-opening experience to anyone who has so far only understood the zone system as applied to black-and-white negatives.

Zone IX	White without texture approaching pure white, thus comparable to Zone I in its slight tonality without true texture. Snow in flat sunlight. With small-format negatives printed with condenser enlarger, Zone IX may print as pure white not distinguishable from Zone X.
Zone X	Pure white of the printing paper base; specular glare or light sources in the picture area.

— Ansel Adams, *The Negative* (1981, 59-60)

Ansel then points out that many Polaroid materials actually have a much smaller dynamic range than that illustrated in the figure.

Along the same lines, from *The New Zone System Manual* by Minor White:

To find the contrast scale of the Polaroid material, we count the number of textured zones (prints) between darkest and lightest, then add two (for the darkest and lightest). If, for example, six textured prints appear, we assume the material has an 8-zone capacity or range Type 52 Polaroid materials have a total of only about seven zones. As we begin to realize these differences, we begin to understand that the zone is an elastic unit. We will see later that Zone III in Polaroid is darker than Zone III in conventional materials.

Comparison of Polaroid and Conventional zone rulers

When we generate both rulers from Zone V, we definitely see that the Zone III in Polaroid is darker than the Zone III in conventional B&W. For visualization this means that we have to adjust our mental idea of, say, Zone III, according to our experience of the film in the camera.

— Minor White *et al.*, *The New Zone System Manual* (1976, 17-20)

So, to correct myth #2: the table on the right is not the zone system; it is the *result* of applying the zone system to conventional black-and-white negatives.

The full black-to-white Polaroid scales usually span an exposure range of 1:16 to 1:48, Zones II-III to VII-VIII½. With conventional negatives the effective exposure range is 1:128 or 1:256, Zones I through VIII or IX. *Only Value V remains constant throughout*, and we visualize the other values in reference to the exposure scale of the film in use. Print Values IV, V, and VI will be quite similar with Polaroid or conventional materials, but Value III in a Polaroid print is *not* the same gray value as in a conventional print. In visualizing the values of the Polaroid print you must adjust to its restricted range, which is comparable to that of color transparency materials. Through experience you can learn what Zone III represents in a conventional film and in Polaroid print films, and visualize results appropriately in reference to the material (see Figure 9-7).

*Relative
luminance*

*Conventional Black-and-White
Film*

*Polaroid Black-and-White
Prints (Approximate)*

<i>units</i>	<i>Exposure zone</i>	<i>Print value</i>	<i>Description</i>	<i>Print value</i>	<i>Description</i>
½	0	0	Solid black	0	Solid black
1	I	I	First step above solid black	I	Solid black
2	II	II	First “texture”	II	First step above solid black
4	III	III	Textural significance	III	First “texture”
8	IV	IV	Average shadow value	IV	Average shadow value
16	V	V	Middle gray—18% gray card value	V	Middle gray—18% gray card value
32	VI	VI	Average skin reflectance (36%)	VI	Average skin reflectance (36%)
				VI½	High skin value
64	VII	VII	High skin value, full texture	VII	Quite high value—reduced texture
				VII½	Usual texture limit
128	VIII	VIII	Highest textural value	VIII	Just below pure white
				VIII½	Pure white
256	IX	IX	Untextured white	IX	Pure white

Figure 9-7. Relationship of Exposure Zones and Print Values

— Ansel Adams, *Polaroid Land Photography* (1978, 129-130); highlight colors added

Myth #3: The zone system requires variable processing of the negative, and therefore cannot be applied to other media.

We have pretty much exploded this one already. Some more quotes:

Full control using the Zone System requires individual processing of each negative, obviously not practical with roll films. It is a mistake, however, to assume that the Zone System therefore “does not work” with roll-film cameras; since it is a practical expression of sensitometric principles, the Zone System remains valid, even though its use is somewhat different While the Zone System allows considerable freedom to control the process to achieve our visualized objectives, we also learn to visualize images within the limits *imposed by the process*, regardless of format.

— Ansel Adams, *The Negative* (1981, 93)

The Zone System procedures described apply to the use of conventional black-and-white negative films, and with modification of scale, to color negative films. Reversal films (that is, those which produce a positive image directly rather than a negative) call for a somewhat different approach. Such films include transparency materials and Polaroid Land prints.

— Ansel Adams, *The Negative* (1981, 95)

I have found that the Zone System is invaluable in color photography, primarily in relation to exposure, but of course its application poses very subtle considerations.

— Ansel Adams, *Examples: The Making of 40 Photographs* (1983, 143)

The two exercises above [Polaroid exposures] are fairly simple and, if repeated several times, generally give the student a taste of the consciousness-expanding power of previzualization. He may also soon learn that previzualization is the ultimate benefit of the Zone System, not contrast control, as is popularly thought.

If the positive film is developed automatically, contrast control through the alteration of film development is gone. So we previzualize with what control is left—changing exposure. If even that control is taken away, as in fully automated cameras, we previzualize according to the inherent contrast of the film We can flatly say that *no combination of film, camera, and processing denies photographers the choice of visualization.*

— Minor White, “Learning with Polaroid Photography,” in *Polaroid Land Photography* by Ansel Adams (1978, 232)

Myth #4: The zone system cannot be applied to advanced imaging techniques such as High Dynamic Range (HDR) imaging.

See the [More Examples](#) page for two HDR images captured using the zone system.

Next: [a working definition](#)

[introduction](#) | **myths** | [definitions](#) | [the zone system](#) | [approach](#)
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