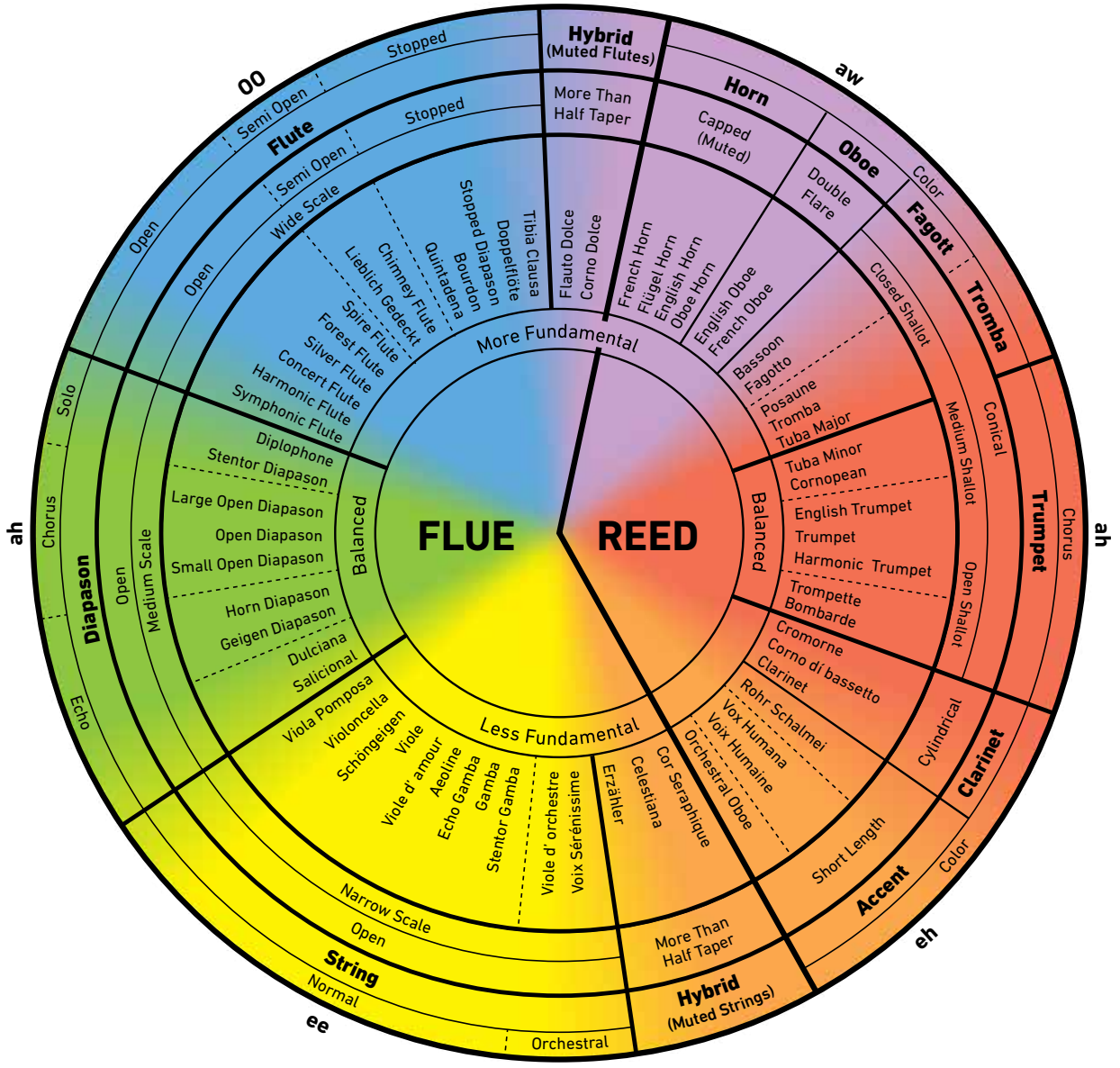
SCHOENSTEIN
Pipe Organ Tonal Color Wheel

by Jack Bethards | Schoenstein & Company



READING THE COLOR WHEEL

The color wheel is divided into four main rings, as delineated by the five bold circles. The four rings are most clearly seen just to the right of the twelve o'clock position on the wheel. In other areas of the wheel, the outer two rings are often subdivided. The following text describes the content of the wheel, starting at its perimeter and working inward toward the core.

VOWEL SOUNDS

Describing organ tone in words is difficult and often misleading. Bright, dark, rich, warm, brilliant, wooly and sweet are just a few of the common attempts to picture organ tone. Saying that a stop sounds like an oboe, for example, doesn't help much either. Is it an oboe in a French band or in an English orchestra? Six of the most basic vowel tones are shown at the outer edge of the wheel to introduce a more accurate system of description. There are dozens, if not hundreds, of minute variations in vowel sound, any of which might be employed to illustrate the kind of organ tone one is either hearing or wishes to hear. Consonants may be used as well to describe the percussive onset of some tones.

Schoenstein Pipe Organ Tonal Color Wheel
continued

FIRST (OUTER) RING

The outer ring of the wheel indicates twelve major categories of organ tone. The number of categories could be decreased to six by reducing the reed family to chorus reeds and color reeds and by combining the two hybrid groups into one. Conversely the number of categories could be increased to seventeen, thus revealing more detail, by dividing the flute family into open, semi-open and stopped flutes; the diapason family into chorus, solo and echo diapasons; the string family into normal and orchestral strings.

SECOND RING

The second ring describes the elements of pipe construction that contribute most to the distinctive character of each group. Among flues, the most important determinant is the scale — a pipe's diameter relative to speaking length. Next in importance are the treatment of the top end of the pipe (open, semi-open, stopped) and the shape of the pipe body (parallel or tapered). Among flutes, tone quality is so greatly affected by the opening at the top that they are divided into three distinct tonal groups based on this characteristic alone. The strongly tapered (muted) flue pipes are called hybrids because they have an unusual tone that is difficult to place squarely in the flute or string category. This elusive quality is part of their charm. (Mildly tapered construction also affects tone, but this and myriad other more subtle construction features cannot be shown with clarity on the color wheel.)

In the reed family, the shape and length of the resonator, as well as the shape and opening of the shallot (the organ's equivalent of a mouthpiece) are the most important among many variables. Scale, of course, also plays an important role; however, there are great variations in scale within each reed group— not a continuum as found in flues (string to diapason to flute.)

THIRD RING

The third ring gives specific examples of 8-foot stops of various dynamic levels in each tonal category, using nomenclature found in Schoenstein organs. Dozens, if not hundreds, of other names would serve just as well. One example is the term "principal," which is synonymous with "diapason." Some names are unique to Schoenstein organs, but in those cases, stops with more common names, which are in the same category, are also included for clarity—for example Viole d'orchestre, which is in the same class asVoix Sérénissime.

FOURTH RING

The essence of tone color is harmonic structure—the relative strength of a tone's harmonic components. The most elementary description of tone color derives from the balance between a tone's first harmonic or fundamental frequency, and all its upper harmonics or overtones, considered as a group. Tones with what we may consider a "normal" balance (between the fundamental and all upper harmonics) are capable of producing what is called "chorus tone" in the organ. These are the trumpets and diapasons at the right and left sides of the ring respectively. At the bottom of the ring are stops with less fundamental in relation to upper harmonics, with a tone often described as "bright." At the top are stops with more fundamental in comparison to upper harmonics, sometimes called "dark." Although it is not possible to include in this highly simplified presentation, a detailed analysis of each stop would reveal widely varying proportions between the fundamental and the various upper harmonics from one stop to the next around the wheel. Thus, some stops can be described and recognized by the prominence of certain harmonics. A keen ear can detect if a stop has, for example, a prominent third harmonic (an octave plus a perfect fifth above the fundamental). Two groups of stops— the clarinet and stopped flute families—emphasize all the odd-numbered harmonics. Note that these are roughly opposite one another on the color wheel. The two hybrid groups emphasize the fifth, sixth and seventh harmonics, giving them their mysterious quality.

FLUE AND REED

The inner core of the wheel divides all organ tone into two categories based on the method of tone production—flue or reed. Flue pipes generate tone by wind blowing across the lip of the pipe, which causes the column of air inside the pipe to vibrate. A flue pipe generates its tone very much like a simple whistle or the flute of the orchestra. Reed pipes generate tone with a thin, brass tongue (reed) vibrating against a small, open-faced, hollow tube (shallot). The resulting tone is then amplified and modified by a resonator (often conical in shape), which comprises the top portion of the pipe. A reed pipe generates its tone much like the clarinet of the orchestra.

LOUDNESS AND PITCH

Loudness and pitch affect our perception of tonal color. Extremes of either can obscure tonal color or create what appear to be variations. For example, a diapason voiced loudly can become stringy and the same pipe voiced softly can seem fluty. Many tone colors when voiced softly can take on a "gray" or nearly neutral tone, which can be very valuable, especially for accompaniment. Around the tonal color wheel, stops that are normally loudly voiced may appear next to ones that are usually soft. Relationships are based entirely on tone quality, irrespective of loudness.

Many stops lose their distinctive color as they approach the top of their pitch range; the same is true of some stops toward the bottom of the compass. The color wheel considers stops as they sound in the mid-range of the manual keyboard.