

Organ Registration:

The Organist's Palette—An Orchestra at Your Fingertips

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I. Basic Review of Organ Tone (see www.organstops.org for reference)

- A. Two types of tone—flue & reed
 1. Flue
 - a. Principals (“Principal, Diapason, Montre, Octave, Super Octave, Fifteenth”) & Mixtures
 - b. Flutes (any name containing “flute” or “flöte” or “flauto” as well as “Bourdon, Gedeckt, Nachthorn, Quintaton”)
 - c. Strings (“Viole de Gambe, Viole Celeste, Voix Celeste, Violone, Gamba”)
 2. Reed (“Trompette, Hautbois [Oboe], Clarion, Fagotto [Basson], Bombarde, Posaune [Trombone], English Horn, Krummhorn, Clarinet”, etc.)
 - a. Conical reeds
 - i. “Chorus” reeds—Trompette, Bombarde, Clarion, Hautbois
 - ii. Orchestral, “imitative” reeds—English Horn, French Horn
 - b. Cylindrical reeds (very prominent even-numbered overtones)
 - i. Baroque, “color” reeds—Cromorne, Dulzian, some ex. of Schalmei (can also be conical)
 - ii. Orchestral, “imitative” reeds—Clarinet (or Cor di Bassetto or Basset Horn)
*Listen to pipes in the bottom range and try to hear harmonic development.
Begin by hearing the prominent 2nd overtone of the Cromorne 8' (overtone at 2 2/3' pitch);
then hear 4th overtone (at 1 3/5').*
- B. Pitch name on stop indicates “speaking” length of the pipe played by low C on that rank

II. Scaling

- A. Differences in scale among families of organ tone
 1. Flutes are broadest scale (similar to “oo” or “oh” vowel)
 2. Principals are in the middle—narrower than flutes (similar to “ah” vowel)
 3. Strings are narrowest scale (similar to “ee” vowel)
- B. Differences in scale according to era of organ construction
 1. *In general*, organs built in early 20th century (1920s-1940s):
principals and flutes are broad in scale (darker, fuller sound), and strings tend to be very thin, keen. (Higher wind pressures as well!)
 2. *In general*, organs built in mid-20th century (1950s-1970s):
principals and flutes are narrow in scale (brighter, thinner sound), and strings tend to be just slightly narrower scale than principals.
(Lower wind pressures as well!)

III. Mutations (e.g., 2 2/3', 1 3/5', 1 1/3', 1 1/7', 8/9', 10 2/3', 5 1/3', 3 1/5', etc.)

- A. Principal-scale—Quinte (or Twelfth) 2 2/3', Terz (or Seventeenth) 1 3/5'
 - Best used with the principal chorus to add “tang” (w/ or w/out mixtures)
 - These principal-scale mutations are often found in the Great division, but sometimes the mutations on a subsidiary division (Swell or Positive/Choir) are principal scale
- B. Flute-scale—Nazard 2 2/3', Tierce 1 3/5', Larigot 1 1/3', Septieme 1 1/7', None 8/9'
 - Best used with other flutes to create different colors (because scale of flute family will be similar)
 - Often *not* effective with principals (scale of flute mutations is too broad)

- Can be effective with reeds in French *Grand jeu* to reinforce harmonics

Test mutations by playing notes low in range to discern whether they are flute- or principal-scale.

IV. Mixtures (principal-scale)

- Composition: most are made up of unisons and quints (5ths); some include 3rds, 7ths, 9ths (rare)
- Pitch-level indication (length of the bottom note of the lowest rank of pipes)
- Use judiciously—non-organists often find too much mixture tone to be annoying
- Beware very high-pitched mixtures; consider them more for special effects than for chorus use.
- Breaking back: rising through the compass of the stop, the bottom pitch “resets” to a lower pitch—usually to the unison or quint below the previous lowest pitch
- Since most mixtures already contain the 2’ pitch in the mid-range of the manual compass, consider whether the 2’ contributes to the chorus or exacerbates tuning problems.
- When coupling manuals in *ff* passages, consider using one or two powerful mixtures rather than all (some softer mixtures may not be contributing)—tiny pipes of mixtures can fight with one another in tuning

V. Doubling 8’ stops

- For some music where more richness of tone is desired, piling up 8’ tone (principals, flutes, and maybe strings [w/out celestes unless truly desired] as well) can be effective
- On especially thin-sounding instruments (esp. ones built in mid-20th century), piling up 8’ tone can help greatly.
- However*, beware on instruments with insufficient wind supply as using flutes (which use a lot of wind) with principals can cause wind to shake and/or sag; in these cases, find a compromise where you use enough tone for the sound you desire while ensuring sufficient wind (i.e., not too “shaky”)
- Doubling at 4’ pitch level (principals and flutes) may or may not be effective—listen to sound
- Doubling 2’ principals and flutes causes tuning problems and thickness too high in range of sound—using *only* 2’ principal is usually best

VI. Coupling

- Listen to discern if divisions are in tune with one another; if not, often a little less sound is better than a big, out-of-tune sound
- For very fast-moving passages (Liszt, Bach), consider playing on an uncoupled manual (full unenclosed Great if it is full enough)—this often gives better clarity since all pipes are speaking together and from the same area of the instrument
- If uncoupling is not practical in middle of busy passage, simply close boxes—unenclosed division will be heard clearly; open boxes again when motion slows, chordal passages, etc.
- Super-couplers are often most useful when:
 - combining masses of strings & celestes [w/ or w/out flutes] (8’ tone);
 - adding power or brilliance when playing low in the range of the manuals;
 - adding power or brilliance on a small—medium-sized early 20th century organ without much upperwork or brilliance
 - adding power and definition during a climactic solo Pedal line
- Sub-couplers are often most useful when:
 - playing high in range of manuals
 - desiring French *Octaves graves* effect at climaxes
 - “cheating” on Messiaen’s *Transports de joie* (by playing only the right hand part divided between both hands)
 - adding gravity to an instrument without sufficient 16’ manual tone
 - adding 32’ tone on manual (16’ stop coupled through 16’ coupler=32’ tone)

(best when playing climaxes in mid- to high-range of manuals)

- F. Beware of “abusing” sub- or super-couplers: subs can rob wind or be too heavy & “growly”; supers can cause “screaminess” when used with upperwork

VII. Flute constructions

- A. Stopped (“Bourdon, Gedeckt, Koppelflöte, Quintadena”)
1. hollow sound; even-numbered overtones ($2\frac{2}{3}$, $1\frac{3}{5}$ pitches, etc.) are very prominent; odd-numbered overtones (4', 2' pitches) are eliminated from harmonic development; *Listen to pipes in the bottom range and try to hear harmonic development. Begin by hearing the prominent 2nd overtone of the Quintadena 8' (overtone at $2\frac{2}{3}$ ' pitch).*
 2. pipe is half-length (i.e., low C of a Gedeckt 8' is only 4' in actual length); stopper effectively doubles “speaking length” of the pipe
 3. chimney flutes (“Rohrflötes”) have a characteristic sound produced by the open “chimney” on the cap/stopper of the pipe
 4. listen for chuff—characteristic “coughing” attack of un-nicked mouths—good for special effect; avoid if not desired in solos or ensembles
- B. Open (“Open Flute, Flute Ouvrete, Spitzflöte, Nachthorn”)
1. somewhat fuller sound with more brilliance
 2. better pitch definition in low range than stopped flutes
 3. all overtones are present
- C. Harmonic (“Flûte Harmonique, Flûte Traversière, Flûte Octaviane”)
1. most realistic flute tone: most like the orchestral flute—very brilliant
 2. low range of the stop (bottom 1 or $1\frac{1}{2}$ octaves) is usually composed of open pipes [not harmonic]
 3. clear pitch definition
 4. harmonic pipes are open (unstopped) double-length with a hole punched half-way up the resonator (i.e., middle C pipe of a Harmonic Flute 8' rank is 4' [rather than 2' as with an open flute])
 5. harmonic flutes can cause an unwanted thickening/blurring of the ensemble if used with a principal chorus; however, they can also be useful in thickening/enriching a very thin chorus
 6. on Harmonic Flute 8', the bottom two octaves or so are often open pipes but *not* harmonic; the harmonic pipes generally begin around middle (“2”) C (which would actually be 4' in length if harmonic) or the F above middle C
- Listen for distinctions between different flute constructions; try identifying them by ear as others perform.*
- D. These different constructions are likely available throughout the instrument at different pitch levels (some at 8', others are 4', 2', 16', or even 1', $2\frac{2}{3}$ ', or $1\frac{3}{5}$ '); *Choose the color you like best for a particular passage by playing the 4' 8vb; play the 2' 16vb; play the 16' 8va; play the 1' 24vb; or use sub/super-couplers with Unison Off to bring the passage into the range where you would like to play it.*

VIII. Optimal ranges for various families of tone

- A. Flutes—tend to be strongest in **high** range of manual, weak in low range
- B. Strings—tend to be strong in **low** range
- C. Reeds—tend to be strongest in **middle** range
- D. Principals—voiced to be strong throughout **all** ranges

IX. Unity/combinations of tone

- A. Sometimes using only stops of one family of sound creates an effective **unity** of color
1. Strings & celestes alone (w/ super-couplers?) w/out flutes

2. Reed chorus alone (16'-8'-4'?)
3. Flutes alone (8'-4'-2'; 8'-2'; 8'-4'-1 1/3'; etc.)
4. Principals alone (no flutes)—for plenum (if principals are full enough...)

B. Sometimes various combinations of tone are most effective

1. Strings & celestes with flutes, light principals, Vox Humana w/ or w/out tremulant
2. Reeds and cornets (flutes at 8', 4', 2 2/3', 2', and 1 3/5' pitches)—*Grand jeu*
3. Principals with 8' flutes and string stops added for richness (no celestes)
4. Adding a 4' open (or harmonic) flute to an Hautbois 8' can make oboe tone more realistic

X. Plethora of flute combinations (using standard 2 2/3', 1 3/5', and 1 1/3' mutations)

8', 4'	8', 4', 2'	8', 4', 2', 1'	8', 4', 1'	8', 2', 1'
8', 2'	8', 1'	16', 1' (played <i>8va</i> = 8', 1/2')		
8', 2 2/3'	8', 1 3/5'	8', 1 1/3'		
8', 4', 2 2/3'	8', 4', 1 3/5'	8', 4', 1 1/3'	8', 4', 2 2/3', 2'	8', 4', 2', 1 3/5'
8', 4', 2', 1 1/3'	8', 4', 1 3/5', 1 1/3'	8', 4', 1 3/5', 1'	8', 4', 1 1/3', 1'	
8', 2 2/3', 2'	8', 2 2/3', 1 3/5'	8', 2 2/3', 1 1/3'	8', 2 2/3', 1'	
8', 2', 1 3/5'	8', 2', 1 1/3'	8', 1 3/5', 1 1/3'		
8', 1 1/3', 1'	(availability of 1 1/7' & 8/9' mutations increases possible choices)			

XI. Cornet (options)

- A. Cornet is composed of the first five pitch levels of the harmonic series: 8', 4', 2 2/3', 2, & 1 3/5'
- B. All 5 of these are most often flutes & flute-scale mutations
- C. May be "*decomposé*" (each rank or pitch level must be drawn separately) OR part or all may be available on one or two stop knobs ("Mounted Cornet V" or "Cornet IV" [requires 8' flute to be drawn with it], etc.)
- D. Try substituting a 4' principal for the 4' flute—may yield a brighter, more pungent sonority
- E. Try substituting a 2' principal for the 2' flute—may yield a brighter, sparklier sonority
- F. Larigot 1 1/3' (the sixth pitch level of the harmonic series) may be added if desired
- G. Try adding Tremulant for solo effects—trem. must be vocal (not too fast or wide)
- H. Cornet is most powerful in soprano range; can be sumptuous in tenor range (*Tierce en taille*); be careful when going below G2—mutations are heard more distinctly—OK if desiring effect

XII. "Auditioning the string basses"

- A. When choosing registration for rapid passages—especially in Pedal, listen to each stop individually to discern:
 1. if it contributed significantly to the sound (or just eats wind)
 2. if the speech is quick (pipe must speak before moving to next sixteenth-note...)
 3. if the pitch is clear and definite
- B. Combine stops that have the fastest speech, clearest pitch, and that contribute most to the sound; leave the rest out of the ensemble
- C. Heavy Open Wood 16' and 32' stops are usually best left out of rapid passages work and brought on as motion slows (and pipes have time to speak)
- D. Stopped flute pipes in the Pedal (e.g., Subbass 16') may be "thuddy," "tubby," and unclear (*or*, they may be fine)
- E. Because a Pedal Subbass 16' may be too opaque, and because a Principal 16' may be too slow-speaking (since 16' of air has to be set into motion to produce a pitch that may only last 1/2-second), it may be that a solid, quick-speaking 16' reed with plenty of fundamental (in Pedal division or maybe coupled/borrowed from Swell) alone would be sufficient to provide the necessary 16' tone

XIII. Piston setup

- A. Setting Swell, Great, and Pedal divisional pistons in a buildup can be very helpful:
1. makes *crescendo* & *diminuendo* quick and easy
 2. you know exactly what stops are on & how to get more or get rid of some at will
 3. makes quick volume/balance adjustments easy
- B. Begin with softest stop(s) on divisional 1, add progressively to each successive one
1. An example for the Swell:
Swell 1—Gambe 8', Gambe Celeste 8' (w/ or w/out Flauto Dolce & Flute Celeste 8')
Swell 2—Gedeckt 8', Gambe 8'
Swell 3—(add Principal 8' to Swell 2)
Swell 4—(add Octave 4' to Swell 3)
Swell 5—(add Hautbois 8' to Swell 4)
Swell 6—(add Trompette 8' to Swell 5)
Swell 7—(add Clarion 4' to Swell 6)
Swell 8—(add 16' flue[s], reed[s], and mixture)
 2. For the Great:
Great 1—Röhrflote 8'
Great 2—(add Salicional 8' to Great 1)
Great 3—(add Principal 8 to Great 2)
Great 4—(add Octave 4' to Great 3)
Great 5—(add Octave 2' to Great 4)
Great 6—(add Trompette 8' to Great 5)
Great 7—(add Clarion 4' to Great 6)
Great 8—(add 16' flue[s], reed[s], and [low-pitched] mixture)
 3. Follow similar pattern with Pedal—begin with softest enclosed borrowed stops on 1; build to FULL
- C. Decision to add reeds before mixtures (or *vice versa*) is subjective and has to be discerned differently on each different instrument
- D. “Masking”
1. When attempting a smooth *crescendo* while adding stops mid-phrase, add a higher pitched stop (4', then 2', then Mixture) when melody (or texture) leaps/steps **downwards** in range. Add lower pitched 16' stops at the point when texture leaps upwards.
 2. When removing stops mid-phrase for a smooth *diminuendo*, remove a higher pitched stop (Mixture, then 2', then 4') when melody (or texture) leaps/steps **upwards**. Remove lower pitched 16' stops when texture moves downwards.
- E. Set celestes of division on divisional piston 1
- F. Set a Solo Flute (Flauto Mirabilis 8') w/ Trem. on highest divisional; w/out Trem. on next-highest; enables adding and subtracting Tremulant for effect

XIV. Solo colors

- A. Try many different possibilities for solo colors
1. Solo reeds (Hautbois, English Horn, Clarinet)
 2. Individual “chorus” reed (Trompette 8' [w/ Trem.?]; Clarion 4' *8vb* [w/ Trem.?], etc.)
 3. Solo flutes (try stops of different pitch levels [4', 2'] in correct range for different colors)
 4. Two flutes in different divisions in different locations coupled together (especially antiphonally—a 4' in front of church combined with a 4' in rear of church) if tuning is not too far off..
 5. Bold strings can be used as solo voice
 6. Principal/diapason stops (w/ Trem.?) can be used as solo voice (try 4' *8vb*)

(also try adding flute [at same pitch level] to principal to broaden tone)

B. Tremulant doubles the number of possible expressive sonorities

XV. Tremulants

- A. Listen to how speed and depth of Tremulant affects different stops in different ranges in different ways: reeds will be affected differently than flutes
- B. Use Tremulants that are not too fast or too deep for the most vocal effect (unless you want a special, “theater” effect!); but if tremulant is barely noticeable, ask technician to adjust it
- C. Adding Tremulants to long, sustained notes can bring interest (“Barbara Streisand effect”)
- D. To accomplish this, it is often helpful to set the solo voice on two divisional pistons *near* the note you will be holding. Set one divisional *without* tremulant, and one *with* tremulant (e.g., Solo 7—Flauto Mirabilis 8’; Solo 8—Flauto Mirabilis 8’, Tremulant) in order to bring on or take of the tremulant as desired (in conjunction with dynamic shaping with the swell box!)

XVI. *fff* solo reeds

- A. Be judicious in use of *fff* solo reeds—they ARE *fff* after all!
- B. Use sound appropriate for music—Tuba Mirabilis 8’ is English, dark, broad, majestic, stately; Trompette en Chamade 8’ (or State Trumpet, etc.) is Spanish in origin, brighter, direct, pungent; Using the Tuba in English music sounds right; Tuba in French music sounds out of place (although occasionally a Tuba *may* be all that is available to create the impact desired...)
- C. Beware of big chords on truly *fff* solo reeds in rooms not large enough to contain the sound
- D. Beware that a solo reed at the opposite end of the church/room from where you are seated at the console will be *much* (!) louder to the people near it than it sounds to you
- E. In very large rooms—Notre Dame Cathedral, Paris; Broadway Baptist Church, Fort Worth, TX; St. Paul’s Cathedral, London—solo reeds may be necessary and even quite exciting when used as chorus reeds in the *fff* tutti sections and/or at climaxes

XVII. Unification/borrowing

- A. It is often helpful to know what ranks are used in multiple locations/ways on instrument (e.g., a Swell Rohrflöte 16’ may also be extended as a 8’ in the Swell *and* as borrows in the Pedal)
- B. This will show you what sonorities are duplicated across stops and which ones are independent and will yield different colors (e.g., a unified Great Bourdon 16’ and Holz Gedeckt 8’ [taken from the same rank] will give the same sound; but that will be different from the Rohr Gedeckt 4’ and Waldflöte 2’ which are independent ranks in the same division)
- C. Resultant effects are often produced on smaller instruments by having a 16’ stop play at unison pitch with the quint (5th) above at 10 2/3’ pitch. Thus, drawing the “Resultant 32” will automatically draw the 16’ from which the unison pitch is taken.

XVIII. Subtraction of tones

- A. Resultant effects are produced by the law of acoustics often referred to as “subtraction of tones:” for example, if a pitch of ≈ 32 Hertz/cycles per second (low 16’ C) is played with a pitch of ≈ 48 Hertz (the G above), the *resulting* suggested pitch is 16 Hertz ($48-32=16$)—otherwise known as low 32’ C
- B. If the 32’ (or available resultant OR playing 5ths in the pedal) is too loud, try playing the 5th at the bottom of the manual compass (i.e., in F Major with 16’ in the pedal, play a low C on a manual registered with some 8’ sound) (...and possibly add the A as well)

XIX. Balancing for audience/location of pipes

- A. As you register, work to find sounds that will achieve the sonority you desire for the person sitting

in the audience. Antiphonal divisions will be louder to them; the Brustwerk screaming in your face may be quite mild to the congregation.

B. Be aware of the location of the different divisions of pipes

1. Tuning issues:

a. If Great and Swell are on the same side of the chancel chambers and the Choir and Solo are on the opposite, the divisions located nearest one another may be best in tune with one another (i.e., coupling Great and Swell together may be more successful than coupling Great and Choir)

b. Divisions may be located on different levels: higher divisions will likely be warmer (sharp)—especially in summer; lower divisions will likely be cooler (flat)—especially in summer; be aware as you couple

2. Divisions at front of instrument (usually Great; sometimes Ruckpositiv) usually speak with the most directness—best for Bach, clarity, distinctiveness; for this reason, the *uncoupled Great* (or uncoupled *Positiv*) is likely to be the clearest

XX. Pedal mixtures

A. Pedal mixtures are best used when the pedal is uncoupled from the manuals and when an independent, clear, and clean sound is desired—best in pedal solos in Baroque music

B. Beware of using pedal mixtures when playing on the manuals: the fact that Pedal mixtures do not break back causes some of the pitches in the middle to upper range of the pedalboard to get quite high—they can begin “tangling” with the manual texture and the manual mixtures

C. Often times, a manual to pedal coupler is better (than using Pedal mixtures) during passages in which manuals and pedal play together (for the reason above)

XXI. Swell boxes

A. “Work the box” (closing or opening) on long notes of a solo melody or sustained chords for most impact

B. Shape phrases as would an orchestral musician playing a solo

C. Remember that more than ½ of the sound is let out in the first ¼ of opening the box

D. Each instrument’s swell box action, responsiveness (sluggishness?), and effectiveness (dynamic range) is different

E. Plant foot firmly on swell shoe (toe *and* heel) for greatest, most smooth control of dynamic shading

F. When shaping phrase with dynamics, leave some swell box “in reserve” at the end of the phrase so that the box can be closed on the final long notes.

XXII. Special considerations for electronic organs

A. Electronic organs may combine tone in a different manner than on pipe organs

(e.g., combining multiple 8’ stops may not add body but instead “cloud” or distort the tone)

B. Dynamic range of volume pedals on electronic organ may be much wider than what a swell box can do on a pipe organ