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Principles and Principals

*Learn the basics of organ tone and how to combine organ stops
to build functional and effective registrations.*

ALL YOU REALLY NEED TO KNOW ABOUT ORGAN STOPS

Families of tone

Principal (also commonly called *Diapason*) is the most basic tone of the classic pipe organ, and it is unique to the organ. Unlike stops in the other families of tone (flutes, strings, reeds), its tone neither imitates nor even remotely resembles that of any other instrument.

Flutes are generally softer than principals. Flutes come in a wide variety of colors, but generally their overtones are less prominent than those of principals.

Strings are generally softer than principals, but, unlike flutes, they are rich in overtones and relatively weak in fundamental.

In a pipe organ, the above three types of tone are produced by *flue* pipes (whistles, basically) of various shapes and sizes. The fourth family of tone comes from *reed* pipes, which have vibrating metal reeds inside.

Reeds can be used as loud (Trumpet) or distinctive (Krummhorn) solo stops, and they can add “fire” to the ensemble.

Overtones and the physics of loud and soft

Every musical tone consists of *fundamental* and *overtones*. Playing an acoustical instrument or singing louder generates overtones at a greater proportion to the fundamental pitch. Organ pipes cannot be played louder, so additional sets of pipes are added to reinforce the overtones of the first set. *Hint: To make your (fake) electronic organ sound as natural as possible, don't just “turn up the volume,” reinforce natural overtones by adding higher pitches. Conversely, don't use a full registration and just “turn down the volume” to make the organ softer (e.g. for a sacrament hymn).*

Pitches

8' is unison pitch. (Eight feet is the length of the longest pipe – the lowest note – in a set of principal pipes playing at unison pitch). Middle C of an 8' stop is the same middle C that you sing or play on the piano.

4' is one octave higher. (A pipe half as long as another sounds the first overtone of the longer pipe, which is one octave). 2' is another octave higher. Conversely, 16' sounds one octave lower.

Non-octave overtones are represented by organ stops classified as *mutations*. They are easily identified by fractions in their pitch: 2 2/3' is the most common (8 divided by 3), and 1 3/5' and 1 1/3' are quite common as well. Somewhat like reeds, *mutations* can be used to create distinctive solo colors or to add “bite” to a chorus.

How to classify stops by sight – and some names to remember

<u>Principals</u>	<u>Flutes</u>	<u>Strings</u>	<u>Reeds</u>
Principal	Gedackt	<i>Besides anything</i>	<i>Besides anything</i>
Diapason	Bourdon	<i>with the root “viol,”</i>	<i>recognizable as a reed or</i>
Open Diapason	Nachthorn	Salicional	<i>brass instrument, some</i>
Prestant	<i>and just about</i>	Voix Celeste	<i>fairly common ones are:</i>
Montre	<i>anything with the</i>	Salicet (4')	Fagot (<i>emphasis on the second</i>
<i>just about any</i>	<i>word “flute” or</i>	Fugara (4')	<i>syllable, please!)</i>
<i>musical interval,</i>	<i>“flöte” or “floete”</i>	Gemshorn	Krummhorn
<i>such as:</i>	<i>(German) in it.</i>	<i>(pronounced GEMZ-</i>	Cromorne
Octave	<i>Not so common</i>	<i>horn, with a hard G),</i>	Posaune
Twelfth	<i>these days:</i>	<i>technically a flute-string</i>	Clarion
Fifteenth	Melodia	<i>hybrid but usually more</i>	Bombarde
	Clarabella	<i>like a string than a flute.</i>	<i>(Those are all reed or brass</i>
			<i>instruments too, just archaic</i>
			<i>ones or in a foreign language).</i>

FINDING YOUR WAY AT THE ORGAN CONSOLE

Standard arrangement of stop tabs on a two manual organ, left to right:(1) **Divisions:** Pedal | Swell | Great (lower manual)Within each division: (2) **Pipe type:** Flues | Reeds | then couplers and other thingsWithin each pipe type: (3) **Pitches:** 16' | 8' | 4' etc. Higher pitches may be combined as *mixtures*, indicated by roman numerals.Within each pitch group: (4) **Tone family:** Principals, then flutes and strings, generally loud to soft.

USING THE STOPS EFFECTIVELY AND APPROPRIATELY

Basic hymn registration – *Providing effective support for congregational singing is not about making the organ sound pretty!*

1. Start with a chorus of principals of 8' and 4' pitches on the Great manual.
2. Select one 16' pedal flue stop of appropriate loudness and the Great to Pedal coupler.
3. Adjust the expression pedal (not the *Crescendo* pedal!) for a natural sound.
- 4a. Need louder? Add higher pitches: 2', then 2 2/3' and/or Mixture (multiple higher pitches); possibly add more 16' tone in the Pedal to balance.
- 4b. Need softer? Substitute a combination of flutes and strings for principals, still including 4'. Possibly combine stops from both manuals, using the Swell to Great coupler, and, if so, the Swell to Pedal coupler. Omit Great to Pedal when playing only on the Swell.

Always remember! The principal chorus is the backbone of classic organ sound. Over a period of at least 300 years, this characteristic sound has proven to be the most effective sound to support

congregational singing. That noble sound – not the organ’s ability to imitate other instruments – is the reason we still have organs in churches today. Every church organist should recognize and respect that fact – as a matter of principle (pun intended).

Standard hymn playing **includes 16'** pitch for the bass line only, and that is what the pedals are for. Many electronic organs provide a **bass coupler** as a “poor man’s” substitute for playing with both of your feet. However, “for best results,” learn to play the pedals correctly! It’s hard at first, but, once you learn, it’s the easiest part of playing the organ. (Promise! I didn’t believe it either).

16' stops on the manuals should be reserved for the grandest effects. The same applies to **32'** pedal stops.

Some things that DO NOT go together well:

Celeste stops and choruses of other stops. *Celeste* is short for *Voix celeste* – French for “heavenly voice” – which sounds appealing and appropriate, and it is a lovely effect when used as intended – and that is with JUST ONE OTHER STOP! That stop will always be just to the left of the celeste stop. (If the celeste stop includes a roman numeral II it means that the companion stop is included with the celeste on a single stop tab). The celeste effect is achieved when two similar ranks of pipes, one deliberately out of tune with the other, sound together. Including a celeste stop in a chorus of other stops introduces an out-of-tune element, which spoils the clean and pure, solid-sounding chorus. Therefore, as a rule: NEVER USE A CELESTE FOR CONGREGATIONAL SINGING! Treat it as a special effect – the less you use it the more effective it will be.

Highly colorful reeds, such as *Krummhorn* and *English Horn*, are intended as solo stops and should not be included in chorus registrations. Some “safe” chorus reeds: Trumpet, Oboe, Fagot, Posaune,

Tremulant or **Tremolo**. Again, a special effect. Use it sparingly, and NEVER for accompanying the congregation!

What about expression pedals? How loud should it be?

For hymn playing on a pipe organ, open the swell pedal all the way and adjust “volume” by selecting the right stops. Then, if necessary, partially close the swell pedal to “fine tune” – and then LEAVE IT ALONE! (Congregational hymns are not the place for dramatic dynamic changes). Ideally, your digital electronic organ will simulate a pipe organ so accurately that you can register and use the expression pedal(s) the same way, but this is rarely the case. Therefore, some general rules of thumb:

1. If the organ seems too loud to you when you practice in your empty chapel, it may be just fine or even too soft when it’s full of people. Human bodies are pretty good sound absorbers.
2. If your bishop tells you the organ is too loud, it probably isn’t. He’s sitting in the wrong place to judge fairly. Get a musically savvy person in the middle of the congregation to give you feedback. (Of course, be very tactful with your bishop!)
3. If you can’t hear anyone singing, something is wrong. (Way too loud? Too soft? Transposer on?)
4. During prelude and postlude, don’t try to compete with noisy people, but don’t play “temple-soft” either (unless you have found that that really works).