

## **Organ Registration**

**with**

**Special Reference to  
the American Classic Organ**

**American Classic Organ  
for jOrgan 3.6.1  
(jOrgan is Java Virtual Organ)**

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# **Organ Registration with Special Reference to the American Classic Organ**

## **Introduction**

The American Classic Organ was designed to effectively play music from all eras and genres. Along with influence from English, German Baroque and French Romantic organs, there is also some influence from the orchestral theatre organs. The combination makes many interesting registrations and effects possible.

There are some basic rules for registration to make traditional organ sounds. There are other rules and principles for orchestral effects. Knowing these basic rules, you can then make the most of the sounds as you explore the American Classic Organ and experiment with many combinations.

While stop names and registrations will be in reference to the American Classic Organ for jOrgan, the principles, rules and registrations are good to know for playing any organ.

## **Families of Pipe Tone**

### *1. Principals*

The Principal is the basic organ tone. It is not imitative of any orchestral instrument. Principals are also called “Diapasons.” The harmonics of the Principal are full, especially heavy in the Octave. Principals are often voiced to be a bit breathy so they sound like they “sing”!

The Great division of an organ will usually have a full chorus of Principals. The Principals on the ACO’s Great are listed here:

Primary	Secondary
Chorus	Chorus

Montre 16’	
Principal 8’	Diapason 8’
Principal 4’	Octave 4’
Doublette 2’	Fifteenth 2’

The Erzähler 8’ is a relative of the Gemshorn, and can also function as a soft Principal.

### *1A. The Plenum*

Principals are used to construct a *Plenum*. Plenum is the Latin word for “Full.” A Plenum is a “Full Organ” registration. In a few of Bach’s organ works, he gives the registration “Organo Pleno” which means this full organ registration. While a Plenum has basic rules for its construction, there is still much variety available.

A Plenum is built from the bottom up. Principals 8' and 4' make a simple plenum and would make a fine medium-volume hymn accompaniment. The ACO's double Principal chorus makes more variety possible. Principal 8' and Octave 4' is a favorite of mine. Diapason 8' and Octave 4' works well. Diapason 8' and Principal 4' works, but the Principal 4' on the ACO is substantially louder, and really voiced to go better with the Principal 8'.

A Plenum can also have a Flute on the bottom, which can give a registration a clearer, lighter and cleaner sound. Try Hohlflöte 8 with Octave 4'. Or Flute Harmonique 8' with Octave 4' or Principal 4'.

Now add the Doublette 2' to any of the registrations described above. Substitute one of the 4' flutes for the 4' Principal or Octave.

Now try all of those registrations above but remove the 4' stop. Removing the 4' stop decreases the "fullness." Some people do not like "skipping pitches" in constructing a Plenum, but it can give a very clear and clean sound, especially if you substitute a flute for the 8' pitch.

#### *Plenums with mixtures*

A mixture should never be used alone. It is considered to be a "tonal crown." In many pieces, it may be very effective to save it, build up to it, and add it later in the piece or as an element for a triumphal conclusion.

All four mixtures on the ACO Great can serve the function of a tonal crown. The Plein Jeu III-VI may be the most useful. The Kleine Mixtur IV works well for a softer plenum with the Diapason and Octave. Grande Fourniture IV-VI is voiced louder, and for that reason it should be used with Principal 8' and 4' only. The Cymbel is high and bright and adds a "Neo-Baroque" element to a plenum.

#### *More than one mixture?*

You can use more than one mixture at a time, but you should ask yourself, "Will this really add anything?" The Great Plein Jeu will likely drown out the Kleine Mixtur. The Grande Fourniture will drown out almost anything. The Cymbel is higher pitched, so it may function as a "Crown on top of a crown"!

The Swell's Plein Jeu is a lower, full mixture. The Scharf is pitched higher and could be added to the Plein Jeu.

The same is also true of the Choir's Grave Mixture (Lower, more full) and the Zimbel which is pitched higher.

### *Reed Augmented Plenums.*

The “Full Organ” can become even fuller with the addition of the Trompet Harmonique 8’ and the Fagot 16’. Again, it may be best to build up and add the reeds for a triumphant conclusion.

### *16’ in a Plenum*

16’ in a Plenum is appropriate for some genres of music. It works in a Bach Prelude, but perhaps should be avoided in the Fugue. A 16’ in a Plenum can make it sound “muddy.”

I’ve been discussing Plenums chiefly using the stops of the Great. The ACO Swell also has a full Principal chorus with mixtures. Geigen Principal 8 and Praestant 4’ are the Swell Principals. The Octavin is actually a high pitched Flute Harmonique, but in the high range is close to a Principal tone and can be used as the top of a plenum.

The ACO Choir has one loud Principal, the Montre 4’. The Dolcan 8’ is a Principal, but voiced very soft—it is almost a string in the way it functions. On the choir you would build the plenum beginning with the Concert Flute 8’, add Montre 4’ and then the mixture.

### *Mutations in a Plenum*

Mutations can be used in a plenum for color. On the Great, Principal 8, 4, 2, with the Twelfth 2 2/3’ makes a nice plenum even without a mixture on top. Sesquialtera II uses the Twelfth 2 2/3 rank and adds a Tierce 1 3/5. A Sesquialtera can add color to any mixture, too. It brings to mind the sounds of the German Schnitgers and Silbermanns with their Cornets, Sesquialteras and Terzians used with a full plenum. A Quint 5 1/3’ is rare on most organs. It can give you the effect of a “ghost” 16’ stop. It adds fullness but not muddiness.

### *Doubling pitches*

The doubling of pitches, that is, using more than one 8’ stop or more than one 4’ stop at a time has a mixed history. In recent times, it is generally frowned upon. In construction of a Plenum, doubling of pitches should be avoided since the added stops of duplicated pitch don’t add that much. Better to simply choose the louder of the two. In virtual or other electronic organs where the sounds have been recorded and processed or synthesized and tuned electronically, doubling of pitches should be avoided since the perfectly tuned stops may cancel each other out if the wave crests and troughs combine just right. The Principal and Diapason on the ACO Great have different stereo arrangements so they can be used together for a solo principal sound. You may find that adding a Flute to a Principal or Diapason doesn’t really add much to the sound. A little history on doubling pitches. In the mid 1700s, German builder Gottfried Silbermann recommended the combination of a Principal and a Flute together for a nice, solid fundamental effect. His flutes were voiced closer in volume to the Principals, and so some harmonics and fullness were added.

## *2. Flutes*

Flutes are by nature less complex in their harmonics. Flutes come in all pitches. A flute can serve for the base of a plenum as mentioned above. Flute registrations can have solemn, light, even whimsical sounds. It all depends on the choice of flutes and pitches.

Different flutes have different characters. In a real pipe organ, the different character is determined by whether the pipe is open or closed on the top end, or by the material, wood or metal. The Hohlflöte is a stopped flute, the Flute Harmonique is an open flute. A Spitzflute has a cone shape (as does the Erzähler) and a Rohrflöte is partially stopped with a chimney on the top. A Quintaten is metal and is purposely overblown to bring out the fifth harmonic.

Try each of these flutes. Any one of them can serve as a solo stop if used with soft strings. Any one could be used to play chords or hymns. Try the flutes in different 8' and 4' combinations.

Also try the flutes of the Swell:

Bourdon 16'  
Gedeckt 8'  
Spitzflöte 8'  
Flauto Traverso 4'  
Octavin 2  
(We'll talk about the Flute Celeste later)

and those of the Choir:

Concert Flute 8'  
Nason Flute 8  
Koppel Flöte 4'  
Block Flöte 2'

The Great's Erzähler, as mentioned above, is a relative of the Gemshorn. E. M. Skinner is the one who first gave it the name Erzähler, which is German for "storyteller," or "speaker." (Although it sounds like a German name, the stop is entirely an American invention.) He voiced it so that it would have the characteristics of a flute, a principal and a string all combined. I like the combination of Erzähler with the Spitzflute 4'.

16' flutes can be used to give depth to a plenum, or for other effects with flute registrations. I've seen portions of d'Aquin Noels registered with a 16' and 4' flute.

## *3. Strings*

Just as principals are the heart of a classic organ, strings are the heart of an orchestral organ. The ACO has a variety of strings. Strings are called "strings" because of the similar character or

timbre to stringed instruments, particularly violins. Strings are very rich in their harmonic structure.

### *3A. Celestes.*

A string stop can be used alone. It can be used alone with a tremulant. It can also be used with a celeste. The celeste rank is tuned sharp so that it will give a beating or undulating effect when used with other normally tuned ranks. In classic registration, it may be rare to use a string with celeste *and* tremulant. In theater organ and orchestral style registrations this is quite common. A celeste stop should never be used alone, since there will be no undulating effect.

Most of the time, a string stop will have a corresponding celeste stop. On the choir, the Viola and its Celeste share one stop. The Dolcan, actually a soft principal, has its celeste. On the Great there is one string, the Viola, and there is the Erzähler and its celeste. The Viola and Erzähler Celeste can be used together for a nice string celeste effect. The Swell has two strings with their celestes. The Viole de Gambe is a bright, classical string, and Viole Celeste 8" is its corresponding celeste. The Salcional is more mellow (some count it as being a hybrid principal/string) and Voix Celeste is its counterpart. The Swell's Contra Gamba 16' can be used for depth, as can the Choir's Sanftbass.

### *3B. Strings, Orchestral Sounds, and Appropriate Solos.*

For a lush orchestral sound, use both Swell strings, with their celestes, couple them to the Choir with the Viola Celeste and the Dolcan and its Celeste. Experiment with 16' and 4' couplers. Experiment with tremulants. Experiment with additions of 4' flutes.

Try the stops of the Great as solos. Principal, Flute Harmonique, Hohlflöte, Trompet Harmonique, even a Rohrflöte 4', with and without tremulant.

Use Viola II on the Choir with an Oboe or Cor Anglais solo on the Swell, with or without Tremulant.

Using expression pedals, use Viola II on the Choir with the "box" closed or near closed as an accompaniment, and use the Viola and its Celeste on the Swell as a solo.

Use either pair of strings/celestes on the Swell with a Choir Cromorne or Clarinet as a solo.

Or, one of my favorites, use the strings and their celestes on either Swell or Choir with the "box" halfway open, and use the Great Rohrflöte 4' with tremulant as a solo.

### *3C. Strings and the Voix Humaine*

A string registration (especially on the Swell) can be enhanced with the Voix Humaine 8', which is a soft canister type reed that blends well with strings. On the ACO it sounds better with the Viola and its celeste.

### *3D. The Flute Celeste*

Unlike string celestes, the Flute Celeste is tuned flat. It can be used with the Spitzflöte or Gedackt for a soft, undulating accompaniment. It can also be used with the string celeste for some substance and some additional warmth.

### *4. Reeds*

Reeds can have two functions. They can function as chorus reeds and as solo reeds. Some stops (like the Imperial Trumpet and all of its alterable sounds) function chiefly as solo stops. Some serve equally well as solo or chorus reeds.

#### *4A. Chorus Reeds, Reeds with Plenum, French registrations*

Reeds can be used to supplement a plenum (as mentioned above). French organ music often uses (chorus) reeds to add brightness rather than adding mixtures for brightness. The Swell has a full French style reed chorus with the Trompette 8', Clarion 4', and Fagotto 16'.

#### *4B. Solo Reeds*

Solo reeds are sometimes imitative, especially if an organ is registered orchestrally. Use the strings of the Choir with the Swell Oboe, or the strings of the Swell with the Choir Clarinet. (The Clarinet is more in the genre of "orchestral" stops. The Cromorne is more useful for Baroque registrations.)

#### *4C. Voix Humaine as an Augment for the Strings or as a String*

The Voix Humaine (on some organs called the Vox Humana) can be used to augment strings (as above) or as an echo reed. Play the Voix Humaine with the expression on low ("box closed") for an echo passage in a song. Effective with or without Tremolo.

A registration borrowed from theater organs is to use a Voix Humaine with a 4' Flute with Tremolo as a solo.

### *4D. Trumpets*

The trumpets are a whole family by themselves. They can be more mellow, like the Swell "Trommet," which is really modeled after a Cornopean. They can be brighter like the Swell Trompette. They can be in between like the Great Trumpet Harmonique. The Swell Trumpets or the Trompet Harmonique on the Great can be used as solo reeds.

A solo trumpet can be used with a plenum (described above) as an accompaniment. The Trompet Imperiale (any of the selections under the Alterable) can be used with a full Great plenum, even augmented with the 8' and 16 reeds, and stand out as a solo.

Most of the Trompet Imperiale selections are bright solo reeds.

#### *4E. Orchestral Reeds*

The Flugelhorn (One of the Trompet Imperiale alterables) is an imitative orchestral reed. It may be more useful as an orchestral reed if the volume is set around 50 or 60.

The Choir French Horn 8' is also an imitative orchestral reed. It is especially effective in playing a low solo in the tenor range. (Accompany it with the Swell strings.)

The Choir Clarinet, The Swell Oboe and Cor Anglais are imitative orchestral reeds. The Swell Trommet can be effective as an orchestral solo voice.

#### *5. Mutations*

Mutations are stops that strengthen the upper harmonics. I wrote before about the use of mutations with a Plenum. Mutations are used for constructing nasard and cornet (pronounced 'cor-Nay') registrations.

##### *5A. Nazard and Quint Registrations*

A nazard or quint registration is simply an 8' flute with a 2 2/3' Nazard or Quint. It makes a very clear, hollow solo voice. Add a 4' flute and feel that hollow solo sound fill in a bit.

##### *5B. Cornet and Sesquialtera Registrations*

Add the Terz 1 3/5' and the nazard registration becomes a Cornet, so named because the harmonics make it sound almost like a horn. A Cornet can be constructed of 8' 4' 2 2/3' and a Terz 1 3/5' .., a 2' flute may also be added. Some organs have a Cornet stop with five ranks that sound the above pitches all together. On the ACO, the pitches can be selected separately on the Choir, or a combination Cornet can be drawn on the Swell. A Cornet can be used with or without Tremulant. A "Sesquialtera" registration is much like a Principal Cornet, and is a fitting solo voice for Baroque music. (Silbermann's Cornets were usually made with Principals)

#### *6. Pedal registrations*

The stops of the pedal division mirror the Great, only the stops are all pitched an octave lower. The pipes are voiced to be stronger and deeper than the equivalents on the manual. When registering a Great plenum, choose similar stops in the pedal an pitched an octave lower. If you use Principal 8 and 4 on the Great, choose Principal 16' and 8' in the pedal. If you use Principal 8, 4, and mixture on the great, use the Principal 16', 8' and Mixture on the pedal.



#### *6A. 16' Reeds*

An exception to this is the pedal reeds. The plenum registration described above can be given more power with the addition of a 16' reed. Try the Fagotto (mf), Posaune (f) or the Bombarde (ff). If more reeds are added on the manuals, add the 8' Trumpet or Bombarde in the Pedal.

#### *6B. The 32's*

The 32' stops should be used sparingly. The Grande Resultant is the 32' Principal which has three ranks. One is a Principal at 32' pitch which is barely audible. It is supplemented with Principals at 16' and 10 2/3' pitch the multiple pitches and the quint harmonic give it the characteristic rumble. The Open Bass 32' is a flute. The Violone 32 is really a soft voiced Principal, but works very well in orchestral registrations. The ACO's Violones are really all-purpose stops when something substantial but softer is needed. The Contre-Bombarde 32' is an extension of the 16' Bombarde, the lowest notes almost sounding like a beating drum.

#### *6C. Orchestral Registrations for Pedal.*

Orchestral registrations sound well with soft flutes (Open Bass) or Violones in the pedal. String or solo voices can be coupled to pedal.

#### *7. Couplers*

Couplers are useful. In classical music, they should be used sparingly. In Orchestral music they are used for combining similar or differing sounds. On an organ with many resources may not need to use many couplers since each division already has principals, flutes, reeds, strings.

## APPENDIX

### Examples of Registrations

Playlist from “Pipedreams, Some Latter Day Sounds” June 20, 2005, (On the Mormon Tabernacle Organ) <http://pipedreams.publicradio.org/listings/2005/0525/> with approximate equivalent registrations for the American Classic Organ 3.0.

**J. S. BACH:** Prelude & Fugue in b, S. 544 –**John Longhurst**, organ

Prelude

Great: Principal 8, Octave 4, Doublette 2, Plein Jeu III-VI (Section 1, 3, 5, conclusion)

Choir: Concert Flute 8, Block Flute 2, Sifflöte 1, Larigot 1 1/3 (Section 2, 4, 6)

Pedal: Principal 16, 8, Choral Bass 4, Mixtur IV, Contra Fagotto 16

Fugue

Great: Principal 8, Octave 4, Doublette 2, Plein Jeu III-VI (Trompet Harmonique 8 in conclusion)

Choir: Concert Flute 8, Sifflöte 1, Larigot 1 1/3

Pedal: Principal 16, 8, Choral Bass 4, Mixtur IV (Second section with Great to Pedal 8, Fagotto 16' in conclusion)

THOMAS ARNE: Flute Solo, Richard Elliot, organ (**1948 Aeolian-Skinner**/Mormon Tabernacle, Salt Lake City, UT)

Great: Rohrflöte 4 (Solo)

Choir: Nason Flute 8

Pedal: Violone 16, Spitzflöte 8

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**PETR EBEN:** *Moto ostinato*, from *Sunday Music*, [Clay Christiansen](#), organ (**1948 Aeolian-Skinner**/Mormon Tabernacle, Salt Lake City, UT) BWE Classics CD-0221

Swell, Cornet V (First and third high solo)

Great: Erzähler 8, Spitzflöte 4, Fifteenth 2

Choir: Cromorne 8 (Second low solo), Nason Flute 8 (Fourth low solo)

Violone 16, Spitzflöte 8

Later, the Great plays the soft plenum above, contrasted with Swell Gedeckt 8 and Flauto Traverso 4, with staccato from the Cromorne 8

In the next section, Great Diapason 8, Octave 4, and Kleine Mixtur IV, then add Trompet Harmonique 8 and Fagot 16 with Plein Jeu added later. Pedal Principal 16, 8, Choral Bass 4, Scharff IV and Posaune 16, perhaps Contra Bombarde 32 at the very end.

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**GEORGES BIZET** (trans. Longhurst): *Adagietto & Farandole*, from *L'Arlesienne* –Robert Cundick, **John Longhurst (1948 Aeolian-Skinner)**/Mormon Tabernacle) Argo CD-430.426 (nla)

First section

Swell: Salicional 8 and Voix Celeste 8, Viole de Gambe added later

Choir: Clarinet 8

Great: Hohlflöte 8

Pedal: Swell to Pedal 8, Violone 16

Second Section (“March of the Three Kings”)

Great: Diapason 8, Octave 4, Twelfth 2 2/3, Fifteenth 2, Fagott 16, Trompet Harmonique 8

Choir: Trompet Imperiale 8 (003 Divine Trumpet, Volume around 60)

Pedal: Principals 16, 8, Great to Pedal

Third Section: (Some of the registrations... Get’s pretty thick toward the end. Possibly using a Crescendo)

Swell: Gedeckt 8, Octavin 2, add Praestant 4 and Plein Jeux IV later.

Choir, Concert Flute 8, Koppeflöte 4, Later Nason Flute 8 alone.

Great: (March Theme) Trompet Harmonique

Trompet Imperiale 8 (003 Divine Trumpet, Volume around 60)

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**J. J. DAYNES** (arr. Cundick): *As the dew from heaven distilling* –**Richard Elliott (1948 Aeolian-Skinner)**/Mormon Tabernacle) **Pro Organo CD-7036 (Zarex Corporation)**

Swell: Salicional 8, Voix Celeste 8, Flute Celeste 8, Flauto Traverso 4, Swell 16 and 4, Tremulant.

Choir: Viola II, “box” partly closed.

Pedal, Violone 16, Spitzflöte 8