Understanding and Mastering Pipe (and Electric) Organs:
Technology and Technique for LDS Organists

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Preface

The pipe organ is the fundamental musical instrument of the Church. No other instrument can even begin to match its utility and power for accompanying the Hymns of the Restoration. A well-played organ enables and assists the Spirit in touching the hearts of the Saints.

There is a shortage of qualified, trained organists in the Church, and this scarcity appears to be growing. Nearly all LDS chapels have organs, many of which are of reasonably good quality, and a precious few of which are real pipe organs. However, in many wards, there are few or no qualified organists who have been trained to get the most out of these marvelous instruments. It is a tragic waste when a very expensive pipe organ is underutilized simply because the organist doesn't know what the buttons, levers, and knobs do, and how to get a good sound for a particular hymn. Similarly, the electric organ, which is a fine instrument in its own right, is often underutilized for the same reason.

This manuscript is written for pianists who want to learn the organ. Without information and training, even excellent pianists are sometimes poor organists. This is not due to a lack of talent, but simply because of the following three factors:

1. Some pianists are intimidated by all the complicated knobs, switches, expression pedals, foreign words, etc. and as a result, they play the right notes but fail to make the organ sound good.
2. Others are discouraged by the idea of using their feet to play the bass pedals. Because they don't know proper organ technique, they occasionally stab at a bass note or two with one foot, or worse, they give up and play only with their hands, resulting in the organ sounding weak and tinny because there is no bass foundation in the sound.
3. Others are uncomfortable playing without a sustain pedal because they have never been taught proper organ fingering technique, resulting in missing notes and a failure to achieve a smooth, legato sound.

This manuscript is primarily designed to address the first of these three issues. It also provides a short introduction to the second and third (other resources are readily available that address the

second and third, which are referenced in Appendix III). The purpose of this particular manuscript is to de-mystify the organ. After reading this short book and spending a few of hours using it as a reference while experimenting on the organ, any good pianist can learn to get a good sound out of an organ. When you have completed this book, you will:

1. understand the meaning and function of every button, knob, switch and word on the organ;
2. understand how to get a nice variety of sounds for various kinds of hymns; and
3. have a rudimentary understanding of proper organ technique.

After you have read this book, I encourage you to then go through the resources listed in Appendix III and spend some quality time over a period of months practicing. If you do so, any good pianist can become a competent organist. As with any musical instrument, the acquisition of organ-playing skills requires more than reading a book; it only comes with many hours of practice. But a little instruction can make your time spent practicing many times more effective, and this manuscript will give a few introductory pointers that can help in that regard.

Although this manuscript is geared toward pipe organs, nearly everything in it also applies to electronic organs. This is because most of the electronic organs purchased by the LDS Church in the last 50 years have been designed to imitate pipe organs as closely as possible, not only in sound, but also in look and feel. So if you are familiar with the buttons, knobs, switches, and pedals of a pipe organ, you can transfer that knowledge to any electronic organ with no problems. Remember, an electronic organ in the hands of someone with organ knowledge sounds better than a real pipe organ played by someone who doesn't know what he or she is doing. This little book is intended to help every ward organist get the most out of whatever instrument is in your chapel.

Let's get started!

Chapter 1

What Is A Pipe Organ?

The **pipe organ** is a keyboard musical instrument which derives its source of tone generation from pushing compressed air through pipes of various shapes and lengths. It is the ultimate keyboard instrument. Long before synthesizers, samplers, and Clavinovas, the beautiful sound of the pipe organ graced church and concert halls. Its majesty and tone are unparalleled by any other single instrument.

Originally, pipe organs were operated mechanically. The air pressure was produced by a manual or pedal pump (there was a Deacon in the basement, pumping away!), and the pipes were opened by a series of mechanical linkages from the keyboard that made the keyboard stiff and hard to play. In the 20th Century, however, with the advent of electricity, the pipe organ became a wonderful instrument, with a light touch… playable by ordinary people with ordinary fingers.

The modern pipe organ is a very complex mechanism; even small pipe organs have many hundreds of individual pipes, with thousands of electrical switches, wires, relays, and electro-magnetic pneumatic valves. Unlike any other keyboard instrument, including the piano, pipe organs are not and cannot be mass produced. Each organ is custom designed and manufactured by hand. Each pipe is made by hand by a skilled craftsman. No two organs sound the same.

Because of the complexity and labor-intensiveness of the manufacturing process, pipe organs are extremely expensive. With the advent of **electronic organs** in the middle of the 20th Century, the Church mostly stopped buying real pipe organs, because of the cost difference. From about 1950 to 2000, most new chapels were fitted with one of these less expensive -- but terrible sounding -- organs. Only a few stake centers (usually in areas with wealthy members who donated the difference in cost) received real pipe organs. The rest got bland, boring, sterile electronic organs. During those years, comparing a pipe organ to an electronic organ was like comparing a nine-foot Steinway grand to a Wurlitzer spinet: both are pianos, but the sound of one is infinitely superior to that of the other.

Recent advances in digital sampling and loudspeaker technology have made electronic organs far better sounding than in the past. In fact, many people cannot hear the difference between a state-of-the-art electronic organ versus a real pipe organ. However, to a purist's ears, the shrill beauty of a true pipe organ cannot be duplicated electronically by even the most advanced digital sampling technologies. As a result, pipe organs continue to be prized instruments, and there are a number of manufacturers still in business in the United States. Although the Church still purchases a few pipe organs for its universities and major buildings, pipe organs are almost never installed in new LDS meetinghouses. One Church employee expressed it this way: "For the price of one pipe organ in Utah, we can build a dozen chapels in Africa." With the price difference so large, and the sound difference so slight, the policy makes sense.

Although this manuscript is written for pipe organs, nearly everything in it also applies to electronic organs. The terminology and technique are virtually identical for both. Whether you are fortunate enough to be playing a real pipe organ or a modern digitally sampled electronic

organ, or whether you are stuck with one of the old style electronic organs, they all work the same way.

Glossary for Chapter 1

Pipe Organ: a keyboard-operated musical instrument which generates sound by pushing compressed air through pipes of various shapes and lengths

Electronic Organ: a less-expensive imitation of a pipe organ which generates sound through semi-conductor tone generation and/or computerized sampling; amplification; and loudspeakers

Chapter 2

How A Pipe Organ Works

A modern pipe organ consists of:

1. A **console**, where the organist sits;
1. A **blower**, which supplies compressed air at a certain pressure; and
2. A **loft**, which houses the pipes themselves.

In the vast majority of pipe organs, the console is connected to the loft by many hundreds of low-voltage electric wires that control the opening and closing of electromagnetic air valves at the bottom of the pipes.

Within the console are the keys. Although they look like piano keys, there are some important differences. First, while a piano has 88 keys, an organ keyboard has only 61 keys: five octaves from C to C. Second, while a piano key is connected to a mechanical linkage that causes a felt-tipped wooden hammer to strike a string, an organ key is nothing more than an electrical switch.[1] When you press the key, it closes the switch, just like turning on a light switch. There is a spring under the key that causes it to bounce back up after you press it, shutting off the switch. For this reason, organ keys have a different and lighter "feel" than do piano keys. It doesn't matter how hard you strike the key - the volume will be the same no matter how hard the key is pressed.

Each keyboard in an organ is called a **manual**. Most small organs have two manuals plus the **bass pedals**, for a total of three keyboards. Larger organs have three, four or even five manuals plus the bass pedals.

In medium- and large-sized instruments, each manual operates a separate, complete organ, each with its own sets of pipes, its own part of the loft, and sometimes even its own blower. Thus, what we think of as one organ may actually be three or more complete instruments. If there are two manuals and pedals, there are a total of three "organs". Through the use of **couplers**, these several organs may be combined and played together, but it should be kept in mind that they are really separate organs, each with its own unique sound and characteristics.

The length of a pipe controls its pitch. The shape of a pipe determines the kind of sound it makes. Every pipe organ has sets of pipes, called **ranks**. A rank consists of a group of pipes of

[1] The exception would be "tracker" pipe organs, in which the key is mechanically connected to the air valve, and pressing the key actually opens the valve. Although this old-fashioned design is fairly rare, there are some tracker organs in LDS meetinghouses. You can tell a tracker organ by the fact that there is no separate console; the keyboard is built into the loft, with the organist sitting right next to the front wall of the chapel, facing the wall (there are usually mirrors on the sides so the organist can look at the conductor without turning around.) You can also tell a tracker organ by the action of the keyboard, which is heavier, stiffer, and slower than other organs. In this design, no electrical switches are used; electricity is used to power the air pump, but other than that, the entire organ is mechanical.

similar shapes but different lengths, each of which produces a certain pitch (there is one for each note). Because all the pipes in a rank have a similar shape, a rank may be thought of as a "family" of pipes that produce a consistent sounding tone. When you play a scale with one rank of pipes, you will hear a series of notes, one at a time, that have a similar "flavor" or tone. In real pipe organs, each pipe is unique, and sometimes you can hear subtle differences in tone from one note to another. However, pipes from different ranks sound very different from each other.

During manufacturing, each rank is **scaled** to the size of the hall in which the organ is to be installed. Scaling is accomplished by adjusting the diameter of the pipes and the air pressure blown through them, which determines the volume of the sound. For example, the Salt Lake Tabernacle organ is scaled much larger than the organ in a typical chapel, because the sound of each pipe must be heard in such a large hall. (Incidentally, the Conference Center is so large that there was no practical way to scale the organ large enough to fill it with sound; consequently, although it is scaled very largely, that particular organ is also reinforced electronically with microphones in the lofts which send a signal to the PA system.)

Each rank has a name that describes its sound. For example, most organs have a rank called "Principal 8". A Principal rank consists of a set of round, metal pipes that have a loud, bright tone.

If we say an organ has "nine ranks," we mean that there are nine different-sounding sets of pipes. Be combining these ranks in different ways, we can obtain many different possible sounds. In a large instrument with several organs, there are hundreds of possible combinations.

There are two basic types of **pipes**: flues and reeds. **Flues** generate their tone in the same way as a recorder played by a grade-school child: by forcing air through an orifice in a pipe. In contrast, **reeds** work on the same basic principle as the harmonica and accordion; the air rushes over a metal reed and makes it vibrate. Some reeds have a brassy, trumpet-like sound and are very loud, while others are softer and sound more like an oboe or English horn.

Flues are made of two kinds of materials: wood and metal. Wooden flues are usually rectangular in shape and have a mellow tone with comparatively few overtones. Most deep bass ranks are also made of wood. Metal flues are usually made of tin. Metal flues are the most numerous on the organ, and are used in the brighter ranks.

By varying the shape of the flue pipe and the opening of its mouth, a wide variety of sounds can be obtained. A Koppel Flöte rank, for example, looks like a bunch of little tin hats, or upside-down funnels. A Gemshorn rank looks like someone took a can opener twist-key and went to work on the pipes. A Gedeckt rank (German for "covered" pipe) consists of wooden flues which have the ends plugged off at the top. A typical small organ will have one rank of wooden flues, one rank of reeds, and the rest will be tin flues of various kinds.

On the console, there are many switches with funny-sounding names and numbers. These switches are called **stops**. In large instruments, such as the famous organs in the Salt Lake Tabernacle and Conference Center, each rank of pipes is operated by one stop. In smaller

instruments found in most chapels, several different stops (switches) may operate a single rank of pipes, but play them at different pitches.

A particular pipe will sound when two things happen: first, the stop which turns on the rank (family) of which the pipe is a member must be turned on; and second, the key on the manual which represents the pitch of that particular pipe must be pressed. In a large organ, each manual rank has 61 pipes and each pedal rank has 32 pipes – one for each key.

Each stop is labeled with a number. This number represents the length of the very largest pipe in the rank, measured in feet. Normally, the lowest rank in the pedal organ is labeled 16', meaning that the longest pipe (played by the bottom C on the pedal keyboard) is sixteen feet long. The note produced by a 16 foot long pipe is the same pitch as the lowest C on a piano. Some very large organs have 32' ranks, meaning the largest pipe is 32 feet long! This note would be an octave below the lowest C on a piano - a pitch so low it is as much felt as heard. Remember, the pitch of a pipe is controlled by its length; the longer the pipe, the lower the pitch.

Going up one octave on the keyboard cuts the length of the pipe in half. Thus, on a 16' manual rank, the bottom C plays a pipe that is 16' long, the next C plays an 8' pipe, the middle C plays a 4' pipe, the next C is 2', and the top C opens a pipe that is 1' long.

On most smaller organs, the highest pitched rank is 2', but in larger organs, the highest pitched ranks are 1'. A 1' rank means the longest pipe (played by the bottom C on the manual keyboard) is 12" long. The next C is 6", the middle C is 3", the next C is 1 ½", and the top key on a 1' rank opens a pipe that is only 3/4" long. The pitch of the note produced by this pipe is an octave higher than the highest C on a piano.

Most ranks are 16', 8', 4', or 2'. An 8' rank is one octave higher in pitch than a 16', and so on. There are also 5 1/3', 2 2/3' and 1 1/3' ranks, which play fifths. In other words, if you play a C, one of these ranks will actually sound a G. Sometimes, there are strange ranks like 1 3/5, which play thirds, but these are rare. The purpose of these ranks is to add harmonics to the sound when combined with base-pitch ranks.

Most organs have one or more stops called **mixture**s. These operate two or more ranks at the same time, with at least one on a fifth and one on the basic pitch. Usually, these ranks are 2 2/3', 2', 1 3/5', 1 1/3', and 1' ranks. Mixture II means there are two ranks, Mixture III means there are three, and Mixture IV means there are four ranks attached to that stop.

As stated previously, pipe organ ranks are very expensive. The more ranks an organ has, the more it originally cost to purchase and the more it costs to maintain. Thus, to cut down on cost, most small organs double up and make each rank perform two or more jobs. Instead of having an 8' rank of 61 pipes and a separate 4' rank of 61 pipes, they will use one rank of 73 pipes which operates at both 8' and 4' pitches. In other words, there will be two stops (switches) that operate the same rank (set of pipes), one at an 8' pitch and one at a 4' pitch. Thus, on most small organs, there are far fewer ranks than there are stops. Although there are fewer ranks, each rank is larger; usually, 73, 85, or sometimes even 97 pipes each.

A **celeste** rank is a very soft rank of pipes which are tuned slightly sharp. The purpose of a celeste rank is to create a celeste effect by combining the sharp tone with a correctly tuned tone. This slightly out of tune combination creates a very pretty, chorusing sound. Typically, a celeste rank will have only about 49 pipes and will play at an 8' pitch. Most celeste ranks do not operate at the bottom octave of the keyboard. Therefore, because its longest pipe is actually only 4' long, it is technically a 4' rank even though its stop is labeled 8' and it is played at an 8' pitch.

Pipes are tuned by adjusting their length. Most tin pipes have a sleeve on the top end that fits around the pipe by friction. By twisting and tapping on this sleeve, it may be moved up or down on the pipe, varying the effective length of the pipe, and thus adjusting the pitch.

Because each pipe must be tuned by hand, tuning a pipe organ is a very time consuming and expensive process. For this reason, it is important to keep the organ loft at a constant temperature and humidity to avoid the shrinking and expanding of metal and wood that comes with temperature and humidity changes, which can quickly make an organ out of tune. This is problematic in most chapels, because the loft is located against an outside wall. For this reason, some organ lofts have their own heating and air conditioning systems. Others automatically open the loft to expose the pipes to the chapel air when the organ is off.

Glossary for Chapter 2

Console: the part of the organ where the organist sits, consisting of a wooden box containing the manuals, the stops, the pedals, and a bench.
Blower: air compressor that supplies air to the pipes.
Loft: where the pipes are. Sometimes exposed, sometimes enclosed in a box or room, sometimes both.
Manual: a keyboard with 61 keys played with the hands
Bass Pedals: a keyboard with 32 keys played with the feet
Coupler: a switch that combines two organs together to be played with one manual, or which adds the settings selected from one organ to that same organ an octave higher or lower
Rank: a set of pipes with a similar tone, one pipe for each note
Scaling: designing of the pipes to provide the correct volume for the size of the hall
Pipes: flues and reeds
Flue: a wooden or metal tube which produces a tone when air is blown through it.
Reed: a metal pipe which generates its tone from a vibrating reed
Stop: a switch that operates a certain rank of pipes at a certain pitch
Mixture: a stop that controls two or more ranks instead of only one rank
Celeste: a rank of pipes tuned slightly sharp

Assignment for Chapter 2

Ask for permission to borrow a key to the organ loft door, and take a peek inside. If you have an electronic organ, you'll see a few large loudspeakers. If you have a pipe organ, you'll be amazed at what you see! Try to identify some of each category of pipes: wood flues, tin flues, and reeds.

Chapter 3
Rank Names and Sounds

Now, let us examine each organ one at a time and discuss the types of ranks and stops we can expect to find on each. As we do so, keep in mind that pipe organs were invented in Europe, and the most popular manufacturers were in Germany. Even in the United States, most of the organ manufacturers are descendants of German immigrants. As a result, much of organ "language" uses German words. Don't let this scare you off.

On a two-manual instrument, the **Great** organ is played by the bottom keyboard and the **Swell** organ is played by the upper keyboard. If there are three manuals, the bottom is called the Choir organ (or Positiv organ), the middle is the Great, and the top is the Swell.

There are two locations for the stops (switches). Consoles of larger organs usually have pull-knob type switches located out on the sides of the console (think of the Tabernacle organ). The Pedal stops are usually on the far left side, the Swell stops are on the inner left, the Great stops are on the inner right, and the Choir stops are on the far right.

Smaller organs usually have either lever or rocker switches located above the swell manual, arranged from left to right in the following order: pedal organ, swell organ, and great organ.

Within each organ, the stops are usually arranged in an order like this:
1. Flue pipes on the left, reeds next, and couplers on the right.
2. Within these divisions, the lowest sounding ranks are on the left, moving upward in pitch toward the right; and
3. Within stops of the same category and pitch, the loudest ranks are on the left, getting to softer ranks moving towards the right.

Thus, if you are asked to play an organ you have never played before, even if you know nothing about it, if you know these rules, you can guess the setting you want.

<u>The Great Organ</u>

The Great organ may be considered the "main" organ. Congregational hymns are typically played on the Great. It is the loudest of the organs. In instruments with exposed pipes, all the exposed pipes belong to the Great. In such organs, there is no volume control for the Great. Every pipe plays at full volume every time it is activated. You can only control the volume by playing more or fewer pipes.

Let us examine a typical Great organ. Since no two organs are alike, your organ will not have exactly these same ranks, but this will give you a feel for the kinds of ranks typically found in the Great organ.

Principal 8' (also called **Diapason 8'**). This is the main rank. It is loud, clear, and bright. It is almost always used on opening and closing hymns.

Gedeckt 8' (also spelled **Gedekt 8'**, and sometimes called **Bourdon 8'**). A darker, medium-loud rank, often made of wood, which is usually used in conjunction with the Principal to add volume and richness. Sometimes has a noticeable **chiff** (attack) sound.

Dulciana 8' (or **Gemshorn 8'**). A quiet, sweet, bright rank.

Octave 4' (also spelled **Octav 4'**, and also called **Principal 4'** or **Prestant 4'**). This is a similar-sounding rank to the Principal 8', but one octave higher. (On many smaller organs, it is actually the same rank as Principal 8', but sounded one octave higher.)

Gedeckt 4' (also called **Flute D'Amour 4'**, **Flute Harmonic 4'**, **Spillflöte 4'**, or just plain **Flute 4'**.) A gedeckt type rank one octave higher. (On smaller organs, it is often the same rank as Gedeckt 8' but sounded one octave higher.)

Nachthorn 4' If your organ has one of these, you're lucky! This is a very beautiful, soft, warm rank. The name means "night horn" in German. (If you don't have a nachthorn, you might have a **Violin 4'** or **Viola 4'**, which are also soft and warm, but more nasal-sounding).

Super Octave 2' (also called **Blockflöte 2'**). Quite loud, it is similar to the Principal rank two octaves higher. (On smaller organs with multi-use ranks, it is actually the same rank as the Principal 8' and/or the Octave 4'.)

Flute 2' (also called **Fifteenth 2'** or **Flautino 2'**). A softer 2' rank. (In smaller organs it is actually the Gedeckt rank sounded two octaves higher.)

Mixture III Three ranks of pipes; usually 2', 1 1/3', and 1'. Very loud, to be used only when the rest of the organ is on full blast. (A few organs have a Mixture IV with four ranks).

Swell-to-Great 8 This coupler takes whatever setting you have for the Swell organ and adds it to the Great manual, such that both organs are played with the same keyboard.

Swell-to-Great 4 Same as above, but adds the Swell organ settings to the Great manual at a pitch one octave higher than the stops selected on the Swell.

Great-to-Great 4 This coupler takes everything you have selected on the Great organ, and Also plays it one octave higher. Can be used to increase the brightness and volume on energetic hymns, particularly with large congregations.

<u>The Swell Organ</u>

The Swell is the organ that provides variety of tone and the ability to use expression by varying the volume. The pipes of the swell organ are enclosed in a wooden box with shutters on the front, the opening of which is controlled by the pedal in the console, which serves as a volume control. In fact, the name "swell" comes from the fact that the organist can increase and decrease the volume of this organ to heighten musical expression.

Even with the shutters opened all the way, the Swell organ is not as loud as is the Great organ. Prelude and postlude are typically played on the Swell. Through the Swell to Great coupler, its sounds can also be added to those of the Great organ so that both organs are played on the Great manual, to give more richness, variety, and volume on various hymns.

Let us now examine a typical Swell organ:

Bourdon 16' This rank produces a very "muddy" sound, and should never be used except during a one-note-at-a-time solo (with accompaniment on another manual.) In general, this stop is a complete waste that should be avoided.

Rohrflöte 8' (or **Spitzflöte 8'** or **Hohlflöte 8'**). A mellow sounding rank, somewhere between gedekt and gemshorn in both tone and volume.

Salicional 8' (or **Viola 8'**, **Gamba 8'** or **Gemshorn 8'**). The softest rank of all - very quiet and stringlike.

Voix Celeste 8' (or **Viola Celeste 8'** or **Gemshorn Celeste 8'**). Another soft rank, tuned slightly slightly sharp. Never used alone. Designed to be used in conjunction with the Salicional 8' rank, to produce a beautiful chorusing effect.

Spitz Principal 4' (also called **Spitz Octave 4'** or **Spitzflöte 4'**). Not as loud as the Octave 4' on the Great organ, but brighter.

Koppelflöte 4' (also called **Conical Flute 4'**). A really weird sounding rank. Not too loud, with lots of overtones. If you don't have one of these, you might instead have a **Rohrflöte 4'** or **Flute D'Amour 4'**.

Nasat 2 2/3' (also called **Nazard 2 2/3'**). Played on a fifth, the purpose of this rank is to add harmonics. If you don't have one of these, you might have a **Larigot 1 1/3'** or **Tierce 1 1/3'** rank instead.

Spitz Principal 2' (also called **Blockflöte 2'**). Similar to Spitz Principal 4', an octave higher.

Piccolo 2' (also called **Flautino 2'**). A softer 2' rank.

Contre Trompette 16' (also called **Contra Fagotto 16'**). A complete waste of space. Never any good to be used at any time for anything on the manuals.

Trompette 8' (or **Oboe 8'**). A reed rank. The tone and volume vary from instrument to instrument, but usually has a sound somewhere between a trumpet and an English horn.

Clairon 4' (also called **Trompette 4'**). A reed rank that is an octave higher. In smaller organs with multi-use ranks, it is the same rank as the Trompette 8', sounded an octave higher.

Tremolo (or **Tremulant**). This is neither a rank nor a coupler. It is a switch that engages a bellows which forces the pumped air back and forth, varying the air pressure, making the organ tone wobble in a vibrato-like manner. *Never to be used on hymns*, but sometimes useful for prelude/ postlude. This rule bears repeating and emphasis: NEVER USE TREMOLO ON HYMNS!

Swell-to-Swell 4' This coupler takes whatever registration you have selected on the Swell organ and adds it again an octave higher.

The Pedal Organ

The pedal organ is the most overlooked and underutilized of the organs by inexperienced and untrained organists, which is understandable but extremely unfortunate. Because many organists are really pianists who have been recruited - or "drafted" (with varying degrees of enthusiasm) - into playing the organ, they have been trained to play with their fingers... but not with their feet! However, the pedal organ IS NOT OPTIONAL. It is every bit as important as are the Great and

Swell organs to creating a satisfactory sound for prelude, postlude, and congregational hymns. The pedal organ typically has the fewest stops of all the organs. A medium-sized instrument might include the following:

Sub Bass 16' (also called **Open Wood 16'** or **Principal 16'**) This rank provides the loud bass foundation on loud hymns.

Bourdon 16' A medium-volume bass foundation rank, used on softer hymns. In small organs, it is usually an extension of a Bourdon or Gedeckt rank.

Lieblich Gedeckt 16' A soft bass foundation rank, used on prelude and postlude. It is usually located inside the swell loft, so that its volume can be varied in conjunction with the Swell organ.

Principal 8' (also called **Octave 8'**). Add this rank to the Sub Bass and Bourdon for loud hymns. On smaller organs, this is exactly same as the Principal rank from the Great organ, but played on the pedal keyboard.

Gedeckt 8' (or **Rohrflöte 8'** or **Cello 8'**) In smaller organs, this is the same rank as the respective stops in the Great or Swell organs.

Choral Bass 4' Usually, the same as the Octave 4 rank on the Great organ.

Contre Trompette 16' (or **Bombarde 16'**). If you have one of these, you're lucky. It's an awesome, though seldom-used, rank. Sometimes, it is an extension of the Trompette 8' rank in the Swell organ. It is a loud, deep, rumbling reed that makes the whole room shake. Best used on the last chorus of rousing congregational hymns, when the organ is being played very loudly.

Contre Bassoon 16' A softer bass reed rank, usually an extension of the Oboe 8' rank.

Trompette 8' The same as the Trompette rank in the swell organ.

Great to Pedal This coupler is often used to bring whatever the settings are on the Great organ down to the Pedals.

Swell to Pedal Similar to the Great to Pedal coupler, this one brings the Swell settings to the pedals.

Other Couplers

Some organs have Swell-to-Swell 16, Swell-to-Great 16, and/or Great-to-Great 16 couplers. These are a waste of space and should NEVER be used on hymns. They make the organ sound horribly muddy.[2] Some organs also have Swell Unison Off or Great Unison Off couplers, which should also NEVER be used on hymns. They are used in conjunction with the Swell-to-Swell 16 or 4 to make everything an octave lower or higher, while shutting off the basic pitch. Again, this bears repeating: No 16' couplers nor Unison Off couplers should ever be used for congregational hymns.

Other Switches and Controls

[2] There is a little trick one can use, however, that would be an exception to this rule. If you have the organ as loud and full as it will go but still want more (like on the last chorus of The Spirit of God), try switching on the STG 16 and GTG 16 couplers, and playing an octave higher on the Great keyboard. On some organs, it's like adding a bunch of 2' and 1' ranks!

On most small pipe organs, there are two "volume" pedals. The one on the left is the **Swell Pedal** or **Expression Pedal**, which controls the opening and closing of the swell shutters. The one on the right is called the **Crescendo Pedal**. It is very important to understand exactly how these pedals operate, so you'll know what they can -- and cannot -- do.

First of all, there is no "volume control" on a true pipe organ, in the same sense as the volume control on an electronic organ. When air is pushed through a pipe, it produces one sound at one volume level. There are only three ways to control volume on a pipe organ:

1. use more or fewer stops;
2. use louder or softer stops; and
3. control the opening of the swell shutters.

On an exposed Great organ, because there are no shutters, only the first two of the above methods work. In contrast, the volume of the swell organ can be controlled to a limited extent by the degree of the opening of the swell shutters. (In some small organs with no exposed pipes, the Great organ pipes are also enclosed in shutters. In such cases, occasionally, there is a separate shutter control for the Great organ, but in most small organs all the pipes are in the same Swell box, with only one swell pedal/shutter control.) In some instruments, the swell loft is in plain view and you can actually see the shutters open and close, although this is rare. Because the opening and closing of the shutters can be distracting to the congregation, most swell boxes are covered with a grille cloth to hide the shutters. Either way, the movement of the shutters is controlled by how far the Swell Pedal is depressed. THIS IS THE ONLY PEDAL THAT CHANGES VOLUME WITHOUT CHANGING THE SOUND![3]

In contrast, the Crescendo Pedal (the one on the right) increases volume by turning on more and more stops as it is depressed. In doing so, it overrides the settings selected by the stop switches. It cannot decrease volume, but may increase it depending on how many stops you already have on. It does not increase volume smoothly; rather, as it is depressed, it causes jumps in volume as each stop is added. An organist has more control by manually adding and subtracting stops using the switches than by using the crescendo pedal. THIS PEDAL DOES NOT WORK LIKE AN ELECTRIC ORGAN. IT WORKS AS IF YOU WERE ADDING MORE STOPS! Please note that *the normal position for the Crescendo Pedal is all the way off.* In most organs, there is a little light that turns on when the Crescendo Pedal is on, even a little bit, to warn you that it's not off. IF YOU FEEL LIKE YOU HAVE NO CONTROL OVER THE ORGAN AND CAN'T FIGURE OUT WHAT'S GOING ON, CHECK THE CRESCENDO PEDAL!

Some organs have a **Sforzando Switch** (usually labeled "Sfz" or "Tutti"), which is usually a foot-operated switch located to the right of the Swell and Crescendo pedals. It turns on ALL the stops (without physically moving the stop switches). It usually turns on a red light so you'll

[3] To help keep the organ in tune, it is important to minimize temperature swings. Unless the organ loft has its own heating/cooling system, the best rule is to leave the swell shutters fully open when the organ is not in use. Before switching the organ off, always press the swell pedal to open the shutters all the way. In contrast, if the loft does have its own heating/ cooling system, the opposite is true: before switching the organ off, always close the swell shutters.

know it's on. It is even louder than pressing the Crescendo pedal all the way down, because the Crescendo pedal usually leaves out the reeds, while the Sforzando switch includes them. (Watch out for this switch... don't accidentally hit it while you're playing a soft hymn... somebody might hurt their head when bouncing off the ceiling after jumping out of the pew!)

The **Preset Switches** are typically located immediately below the manuals. These are usually round white pushbuttons underneath the keys. They are labeled with numbers. On larger organs, there may also be foot-operated preset switches above the bass pedals, to the left of the crescendo and swell pedals. Pressing a preset switch sets the stops to a prearranged setting by physically moving the stop switches.[4] On some organs, all the preset switches set all the manuals. On other organs, each manual has its own preset switches that only affect the stops of that particular organ. The only way to find out is through experimentation.

Presets are intended to help you change stop settings very quickly. For example, in the middle of a musical number, there isn't time to flip a whole bunch of stop switches to change the sound. That's when a preset switch can come in really handy. Unfortunately, however, presets are often misused as a crutch by inexperienced organists, who use the same sounds for every hymn, every week. They just press their "favorite" preset and leave it there. Don't fall into this trap!!!

Presets are usually programmable and changeable. The procedure for setting a preset is usually to depress a particular preset button and while holding it in, flip the stops you want to the on position and the stops you don't want to the off position, then letting go of the preset button. Watch out, though. It is a good idea to write down the settings before changing them, and returning them back to the way they were after you are finished playing, so you don't give someone else who is improperly using them as a crutch a heart attack the next time they press the button and it doesn't do what they expected it to do.

Glossary for Chapter 3

Great: the main, loudest organ, operated by the Great manual, which is the lower keyboard
Swell: the organ with more tonal variety and volume control, operated by the Swell manual, which is the upper keyboard
Swell Pedal (Expression Pedal): operates the swell shutters, controlling volume of enclosed pipes
Crescendo Pedal: gradually increases the number of ranks engaged as it is depressed, overriding the stops
Sforzando (Tutti): turns on all the stops, making the organ play its loudest possible volume
Preset: programmable switches that select certain stops selected in advance by the organist
Chiff: a very short, percussive, harmonic sound when a pipe is first opened (at the beginning of a note) - most noticeable on Gedeckt ranks - the amount of chiff is determined by the shape of the pipe's orifice (opening)

Assignment for Chapter 3

[4]NOTE: See Appendix I for a discussion of preset switches on electronic organs.

1. Turn on the organ, shut off all the stops, press the Swell to Great 8 coupler, open the Swell shutters all the way, press middle C, and while holding that note down, toggle on and off each Swell and Great stop, one at a time. Listen carefully to the tonal, volume, and pitch differences between the ranks.
2. Through experimentation, see if the following is true for the organization of the stops within each organ grouping:
    1. Wood and tin flue pipes on the left, reeds next, and couplers on the right.
    2. Within these divisions, the lowest sounding ranks on the left, moving upward in pitch toward the right; and
    3. Within stops of the same category and pitch, the loudest ranks on the left, moving softer towards the right.
    4. Memorize the above organizational scheme.
    5. Change a preset on your organ to a setting of your own invention, then change it back to the way it was.

Chapter 4
Organ Registration

One of the common mistakes beginning organists make is to rely on the crutch of finding a favorite preset and using it all the time. Various hymns should sound different from each other. Don't wimp out and use the presets. Instead, create a unique sound tailored for each hymn.

Setting the organ registration for a particular hymn is every bit as much an art as is playing the notes. Proper registration requires the use of both sides of the brain. Imagining what you want the sound to be like involves the right (creative) side, while manipulating the technical aspects to create that sound call on the left (logic) side.

The first step is to imagine what kind of a sound would be good for this particular hymn. Should it be loud or soft? Dark or bright? Is a constant volume OK or would expression be helpful?

Start with the basics. 8' is the pitch people sing at and it is also the pitch of a piano. Always use an 8' foundation. On soft hymns, start with one or two soft 8' ranks (not the principal rank) and also add a soft 4' rank.

On medium hymns, add a louder 8' rank (probably the principal rank), a medium 4' rank and a soft 2' rank. On loud hymns, start with all the 8' ranks plus loud 4' and 2' ranks for the first few verses, then add a mixture and more bass on the last verse.

As a general rule, for soft hymns, it is usually better to use quieter ranks with the swell shutters open than to use loud ranks with them closed. The shutters do not simply diminish the volume, they also rob the sound of beautiful harmonics. (Think of listening to a loud trumpet in an adjoining room with the door closed versus a soft flute played in the room you are in - they may be the same volume, but which will sound better?) LET THE PIPES SING.

A celeste rank should never be used alone, but should be used only in conjunction with another rank of soft pipes. Alone, they are off pitch. Used together with another rank, they make a very pretty "moving" (chorusing) sound - much more heavenly than tremolo. Don't use a celeste rank on loud hymns. Their use on soft hymns if optional.

Tremolo is ONLY for prelude and postlude. NEVER use tremolo on congregational hymns (I keep emphasizing this because it is one of the most common mistakes LDS organists make. You will never, ever hear the tremolo on during a hymn in General Conference. Tremolo is ONLY for occasional use in prelude, postlude, and organ solos).

NEVER use a 16' rank in the manual keyboards with congregational hymns. All it does is muddy up the sound.

ALWAYS use a 16' rank on the pedal keyboard. Also use a GTP or STP, depending on which manual you're playing with your hands. (If your organ has only one 16' rank and it is too loud

for a soft hymn, one trick is to use GTP or STP and play the pedals an octave lower.)

STG 8 effectively doubles the number of sound combinations from which you can choose for hymns, increasing the flexibility of the organ. STG enables you to select stops from both the swell and great organs, playing them all on the Great manual keyboard.

STG 4 and GTG 4 take whatever stops you already have on and have those same ranks also play one octave higher. These couplers increase volume and brightness considerably, similar to adding 4' and 2' ranks. They are excellent for loud hymns.

Mixtures add a very brilliant sound. They should never be used alone or with soft settings. The same rule also applies to reeds. NEVER USE MIXTURES OR REEDS ON SACRAMENT HYMNS! They will ruin the intent of the hymn, which is to induce a sweet, soft, contemplative, reverent spirit and invite the congregation to focus on the Savior. Conversely, adding mixtures and/or reeds on loud opening or closing hymns is good when added on top of a solid 8, 4 and 2 foot foundation sound.

On medium and loud hymns, it is sometimes nice to add a rank or two for the last verse or last chorus. For example, one could add the reeds on the last chorus of The Spirit of God to add a little extra "oomph." If you have one, you can add the 16' pedal Contre Trompette on the last note of a loud hymn and, if possible, play that last note an octave lower than written.

One common mistake organists make is failing to play louder for Stake Conference than they do for Sacrament Meeting. If the curtains to the gym are opened and there are seats all the way back, you need to play louder. Don't wimp out on big hymns during Stake Conference. Crank it up. The louder you play, the louder they'll sing. The louder they sing, the stronger the Spirit will be.

If you have any say in the matter, encourage the Stake Presidency to select loud hymns for Stake Conference (i.e., How Firm a Foundation, We Thank Thee O God For A Prophet, Now Let Us Rejoice, The Spirit of God, The Morning Breaks, High On A Mountain Top, Redeemer of Israel, Praise To The Man, etc.) The bigger the congregation, the "bigger" the hymns ought to be. Soft hymns do not work well for Stake Conference, except as choir numbers. Sometimes, Stake Presidencies are overly concerned with selecting hymns that fit a particular theme and do not understand the constraints involved with congregational singing in a large hall (time delay between sight of conductor and sound of organ at rear of hall, time delay between sound at front of hall and back of hall, time delay of echo from back of hall to front, volume loss of organ between front and rear of hall, etc.) The importance of selecting hymns appropriate for large congregations cannot be overemphasized. Softer hymns that work well in a Sacrament Meeting are far less effective in Stake Conference because the people in the back of the hall cannot hear and cannot stay on the beat, causing them to feel conspicuous and sing softly or not at all. This does not help them to feel the Spirit. (Note that the General Authorities ALWAYS follow this rule for the congregational "rest hymn" in each General Conference session!)

In contrast to hymns, prelude is usually best on the Swell organ. Select a soft, sweet registration.

Use very few ranks. Do not play prelude too loudly. Generally (but not always), the softer you play the prelude, the more reverent the congregation will be. Always start prelude very softly then increase volume slightly as the noise in the chapel increases. Never use 2' ranks, nor loud 8' and 4' ranks. Use the celeste, and/or feel free to use the vibrato if you wish. Vary the volume expressively with the swell shutters. If the congregation starts getting too loud, one "trick" is to gradually open the shutters more to stay above the noise level, then suddenly close them and drop the volume. People who have been speaking loudly will suddenly feel conspicuous and drop their volume, as well. Sometimes, it is nice to play an accompaniment in the left hand on the Swell, with the melody played by the right hand on the Great (or vice versa).

The most important rule in this chapter is, EXPERIMENT. Take the time to go to the chapel during the week and tinker. Find various kinds of combinations that sound nice. The more you play around with the stops, the better you'll get at anticipating what will sound good. In my observation, that is the single biggest problem with LDS organists: they haven't spent enough time on the organ, alone, with nobody else in the chapel, just playing around and experimenting. That's how I learned nearly everything I've written in this manuscript, just fiddling with switches to see what they do. Just like learning a software program, the best way to learn is usually to just play with it and see what it does.

Summary of Chapter 4

- Don't rely on presets
- Don't use loud ranks on soft hymns
- Do use loud ranks on loud hymns, especially for large congregations
- Open the swell shutters to let the pipes "sing"
- Never use a 16' pitch on the manuals
- Always use a 16' pitch on the pedals
- No tremolo on hymns
- Never use mixtures or reeds on soft or Sacrament hymns
- Add mixtures and/or reeds on the last verse or chorus of loud hymns
- Experiment to find good combinations

Assignment for Chapter 4

Experiment, find, and write down your favorite registration for each of the following hymns:

1. While of These Emblems We Partake (174)
2. Abide With Me (166)
3. Sweet Hour of Prayer (142)
4. How Firm A Foundation (85)
5. The Spirit of God (2)

Chapter 5
Introduction to Organ Technique

There are two primary differences between proper piano versus organ technique. First, because there is no sustain pedal, the organ must be played in a legato style. Also, because there is no hammer action, the force with which the key is pressed is irrelevant. These two factors combine to require – and to allow – creative fingering methods, including finger substitution. Finger substitution means originally playing a note with one finger, then while keeping the key depressed, switching to another finger. This is done to free up the original finger to get ready to play the next note.

If a certain note carries from one chord to another, try leaving that note pressed and only change the notes that move. On some hymns, this sounds nice. If an entire chord is repeated, try leaving the bass (pedal) note pressed while the hands break between notes. Generally, if a note is repeated, it is held for only one-half to three-quarters of its value.

Many organists who have home organs learn some bad habits, one of which is playing the right hand on one keyboard and the left on the other. This is incorrect technique for congregational hymns. Do not put one hand on the swell and the other on the great, like on home organs. When playing congregational hymns, both hands should always play on the same manual - and that manual should almost always be the Great. The right hand should play the soprano and alto parts, the left hand the tenor part, and the feet the bass notes. *Note that the bass notes are not played by the left hand but rather by the feet on the pedals.*[5]

Another incorrect assumption learned from home organs is that the upper keyboard is louder than the lower one. In pipe organs, the opposite is true: the Great (lower) is louder than the Swell (upper). Remember, hymns are almost always played on the Great. Even softer hymns should usually be played with both hands on the Great (soft ranks can be brought down to the Great manual using the Swell-to-Great coupler).

A third incorrect technique learned from home organs is to use only the toe of the left foot for the pedals. This error arises because most home organs have only one octave of very short pedals. In contrast, church organs have several octaves of long pedals designed to be played with the heels and toes of both feet. Thus, there are four possible ways to play a pedal key (just as there are ten fingers with which to play a manual key): left toe (symbolized with **^** underneath the note under the bass clef staff), left heel (symbolized with **o** underneath the note under the bass clef staff), right toe (symbolized with **^** above the note above the bass clef staff) and right heel (**o** above the note). Resist the temptation to use only one of these four ways of playing bass notes.

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[5] Organ purists will argue that this rule is inviolable, but the truth of the matter is, if you are playing the bass note on the bass pedal, there is no harm in also playing it with the left hand. (If the GTP coupler is on, there will be NO difference in the sound.) Some organists (I am one of them, by the way) find it's easier and requires less brain power to just play all the notes with their hands and also add the bass note with their feet. Although there is no harm in this, it is not officially "proper technique."

Doing so is as limiting and foolish as playing with only the index finger of one hand instead of using all ten fingers. One-footed, toe-only pedal playing is neither smooth nor precise. Learning proper pedal technique is not difficult, but it does take some time and practice.

Proper shoes are essential. The shoes must have a short heel (not flat like running shoes, and not high-heeled like a woman's dress shoe). The soles (both heel AND toe) should be 100% leather. Unfortunately, such shoes are becoming increasingly difficult to find, especially in climates with snowy winters, where dress shoes almost always have rubber heels. Rubber-soled or rubber-heeled shoes shorten the life of the finish on the pedals. Worse, they do not slide properly on the pedals, making it difficult to play correctly.

Also, I strongly encourage you to not learn to play in your stocking feet; it is impossible to use correct heel and toe technique without shoes. Special organ shoes may be purchased, but an old-fashioned men's dress shoe or men's ballroom dance shoe is also excellent. (The author bought a pair of used shoes at Deseret Industries then had a shoe repair shop install new leather soles and heels - the total cost was only $25.) Because such shoes are not ideal fashion statements for women, many organists bring a separate pair of shoes in a handbag for playing the organ, and change shoes when they sit to play.

(NOTE: Only a very basic introduction and a few tips are given here. For additional information on technique, along with exercises and repertoire, see the resources listed in the Appendix III.)

Assignment for Chapter 5

1. Purchase a pair of leather-soled and leather-heeled shoes.
2. Read the Introduction to *Basic Organ Techniques & Repertoire* (pp. i-vii).
3. Work on exercises 1-18 and 72-96 in *Basic Organ Techniques & Repertoire* (pp. 1-7, 28-34).
4. Learn Prelude and Fugue in G Major by Bach (*Basic Organ Techniques & Repertoire* pp. 95-99). Be sure to follow the heel and toe markings for pedals exactly as printed on the music.

Appendix I
Electronic Organs

Because electronic organs are designed to imitate pipe organs, most of the information in this book applies to them, as well. However, there are several important differences, the most common of which are listed below:

1. On most electronic organs, the presets do not physically move the stops. Rather, they simply cancel out and override the stop switches. If this is the case, the preset switches usually have lights in them to indicate which ones are on. These switches are much softer to the touch (and easier to accidentally switch on while playing) than are the presets on pipe organs.
2. The swell pedal is actually a volume control that varies the volume of the amplified sound that is sent to the speakers, as opposed to a shutter control. In most electronic organs, this volume control affects both the Swell AND the Great.
3. Some electronic organs do not have a crescendo pedal (although most do).
4. There may be a "chiff" control. This adds a harmonic at the beginning of a note when a key is pressed, particularly for the gedeckt ranks. (The gedeckt ranks in some pipe organs have a significant amount of chiff, while others do not.) The chiff is determined by the shape of the opening of the pipe and is not controllable after the organ is installed. On some electronic organs, this attack sound may be added or eliminated with a switch.
5. There may be a "transpose" control. This control shifts the pitch of the organ up or down in ½ step increments. Thus, a transposition setting of +1 will play the sound ½ step higher than the organist is playing. Watch out for this control to make sure it is not inadvertently on; it can really mess up a congregational hymn.
6. There is sometimes a bass coupler that automatically "plays the pedals" for you. It takes the lowest note you play on the great manual and plays that note for you on the bass register without pressing the bass pedals. This enables the organist to play all four parts of hymns with the hands, like on a piano, and not use the pedals at all. The author strongly encourages you to not use this as a crutch. It is best to learn to play the pedals rather than relying on this switch; however, <u>using such a coupler is far better than having no bass at all.</u>

Appendix II
Foreign Words Commonly Used in Pipe Organs

German Translations

Doppel	Double
Flote	Flute
Gedeckt	Covered
Gems	Harmony
Koppel	Couple
Krumm	Bent
Lieblich	Lovely
Spitz	Pointed

Italian Translations

Dolce	Sweet

French Translations

Bourdon	Bumblebee
D'Amour	Of Love
Diapason	Tuning Fork
Voix	Voice

Appendix III
Organ Resources

The following technique books are highly recommended:

Basic Organ Techniques & Repertoire by J.J. Keeler and E. Donnell Blackham, Deseret Book, 1971.

Organ Studies for the Beginner by D. Wolford, Shawnee Press.

A good web site with resources for organists:

http://www.geocities.com/ddstone48/