The American Institute of Organbuilders

2024 Annual Convention

Salt Lake City, Utah

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THE FIFTIETH NATIONAL CONVENTION
of
THE AMERICAN INSTITUTE OF ORGANBUILDERS

SALT LAKE CITY, UTAH
August 17–22, 2024

The Organbuilder's Companion

for the cities of

Salt Lake City, American Fork, Provo *and* Environs

Scot L. Huntington
Editor and Compiler

Mark Hotsenpiller
Program Editor

The American Institute of Organbuilders
Grass Valley, California
2024

THIS BOOK IS DEDICATED TO

Joseph Ridges
(1827–1914)

An immigrant and frontier pioneer,
practicing organbuilding with
discernment on the edge of civilization,
with a scarcity of materials.

NOMENCLATURE: The European standard for note and key compass nomenclature is used throughout this book. When citing harmonic numbers, the Pedal pitch basis is 16′ and the manual is 8′, for pitch No. 1.

CCC (32′), CC (16′), C (8′), c^0 (4′), c^1 (2′), c^2 (1′), c^3 (½′), c^4 (¼′), etc.

ORGAN NUMBERING: Every effort has been made to use the numbering nomenclature specific to each firm's usage, and to avoid the ubiquitous and often incorrect use of "Opus" where not specifically appropriate. The various companies involving Ernest Skinner used "Organ No." or "No." on contracts and engineering documents, and Aeolian-Skinner continued the same usage from Skinner. Internally, both companies would often refer to an instrument only by its three-digit number, using the word "Opus" occasionally in correspondence and on the later signature plates. Since the various incarnations of the company used "No." in technical documents and "Opus" in various ancillary documents, either term is correct, and they can be used interchangeably.

THE PRIMARY TYPEFACES USED IN THIS PUBLICATION ARE GARAMOND PREMIER PRO AND FUTURA.

Garamond Premier Pro was designed by Robert Slimbach on the model of the roman types of Claude Garamond and the *italic* types of Robert Granjon.

Futura is a geometric sans-serif typeface designed by Paul Renner and released in 1927.

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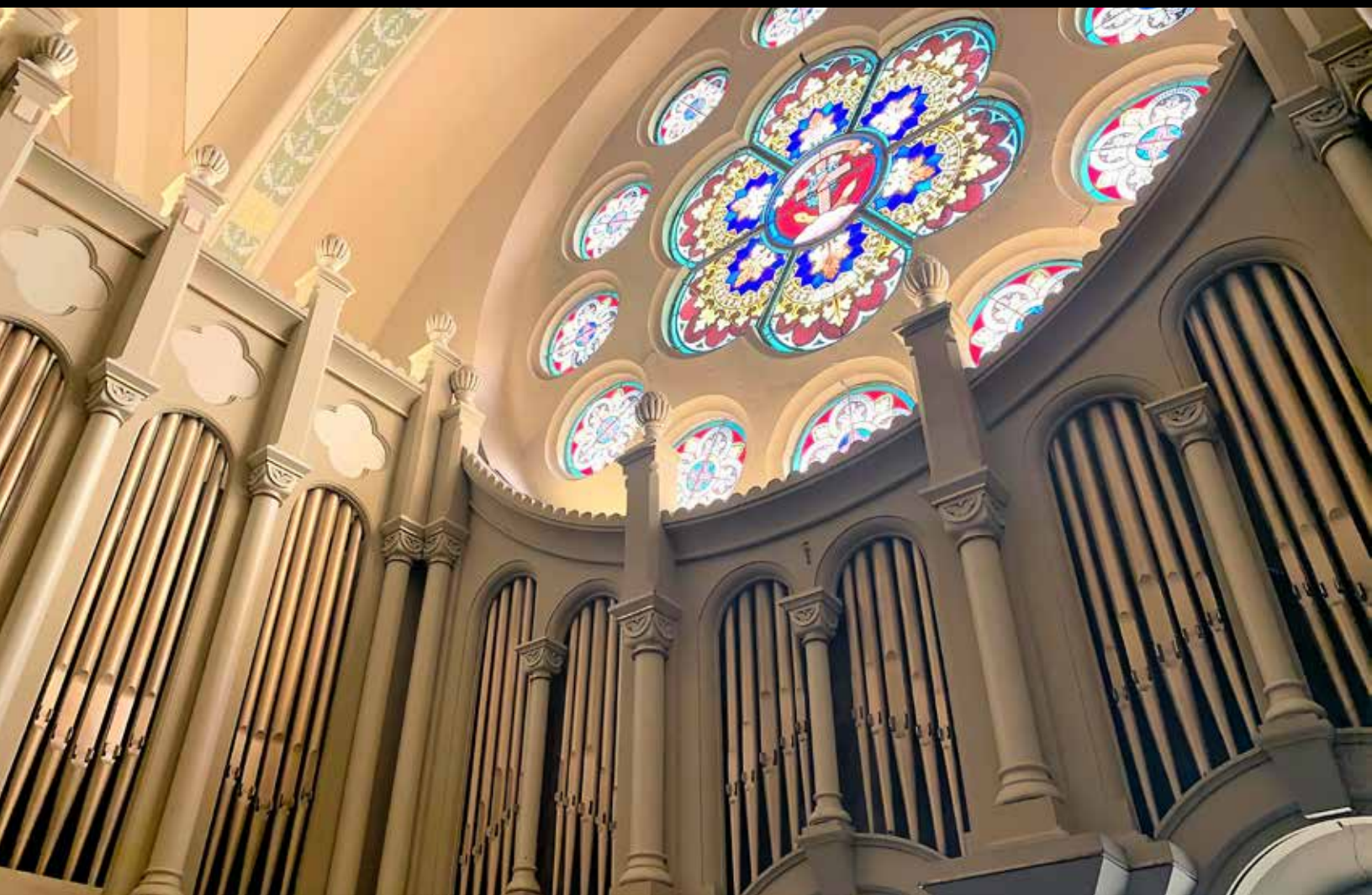

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CONVENTION PARTICULARS

ORGAN DOCUMENTATION: SALT LAKE CITY AND ENVIRONS

ADVERTISER DIRECTORY

AIO STRUCTURE

- Board members are responsible for communicating with the first committee in their columns.
- Committees are chaired by the first person listed.
- Board and some committee terms expire following the annual convention in the year listed.

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RESOLUTIONS
Review by-laws, minutes of board and annual meetings. Review proposed amendments to the Bylaws

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EDUCATION
Administer training programs, plan educational content of conventions and mid-year seminars

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CARL HERSOM
SCOT HUNTINGTON
MATT PARSONS

CONVENTION OVERVIEW
Hold annual review session to evaluate previous convention. Help new convention committees with organization and hotel negotiations

LUKE TEGTMEIER COORDINATOR
MARK HOTSENPILLER
CHARLES KEGG
MANUEL ROSALES

WEBSITE RESOURCES
Develop a comprehensive online website resource for pipe organ service information

MARK HOTSENPILLER
RYAN BOYLE
DEREK VERVEER
BENJAMIN YOUNG

NOMINATING
Select candidates for the annual election

2024
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RYAN LUCKEY
RIC PARSONS
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ABOUT THE AIO

THE INSTITUTE

THE AMERICAN INSTITUTE OF ORGANBUILDERS IS AN EDUCATIONAL organization dedicated to advancing the art of organbuilding "by discussion, inquiry, research, experiment, and other means." AIO members are professional organbuilders, service technicians, and suppliers who subscribe to the Institute's objectives and its Code of Ethics.

In 1973, a group of organbuilders met in Washington, D.C. to explore the possibility of forming a professional association. A provisional board was established, and a constitution committee was appointed. In September 1974, a convention was held in Dayton, Ohio, which adopted a constitution and bylaws, signed charter members, and elected a Board of Directors. Since that time, conventions have been held each year in cities throughout the United States and Canada. These meetings are structured around a full schedule of technical lectures, visits to local organ shops and instruments, product exhibits, and business meetings. The opportunity to meet other builders, technicians, and suppliers to share ideas and information is another important benefit of each convention.

AIO midyear seminars provide further opportunities for professional growth. These weekend seminars are held in shops throughout the country and are structured to provide hands-on training in a variety of small group settings.

JOURNAL OF AMERICAN ORGANBUILDING

THE INSTITUTE PUBLISHES A QUARTERLY JOURNAL FEATURING technical articles, product and book reviews, and a forum for the exchange of building and service information and techniques. Subscriptions are provided free to AIO members and are available to non-members through the main office at $50 per year, U.S. addresses only.

MEMBERSHIP

AIO MEMBERSHIP IS OPEN TO THOSE CURRENTLY ENGAGED IN full-time organbuilding or organ maintenance work. Affiliate membership is open to those who are not full-time builders or technicians, as well as non-North American builders and those in allied professions supporting the pipe organ industry. Prospective members must obtain the nominating signature of a current AIO member and provide a brief summary of their work history on the nomination form. Further details about membership categories and annual dues are provided on the form.

WEBSITE

THERE ARE SEVERAL AIO RESOURCES AVAILABLE ONLINE AT www.pipeorgan.org. The membership roster includes links to the websites of companies employing individual AIO members. Members can change personal contact information at any time, as well as search for information of AIO colleagues, by signing into their individual accounts. Past and present convention information, seminar descriptions, past copies of the AIO *Journal*, and a copy of the membership application can also be found here. Enquiries may be made of the Executive Secretary:

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WWW.PIPEORGAN.ORG

ON THE COVER

The Salt Lake Temple, begun in 1853 and dedicated 1893.

Truman Angell, architect.

IMAGE RORY WALLWORK

WELCOME

AIO 2024 CONVENTION

Salt Lake City, Utah

HEADQUARTERED AT

Hilton Salt Lake City Center Hotel

255 SOUTH WEST TEMPLE
SALT LAKE CITY, UTAH 84101

(801) 328-2000

David Chamberlin CONVENTION CHAIR

WELCOME TO SALT LAKE CITY

THE FIRST MORMON PIONEERS ARRIVED IN THE VALLEY OF THE Great Salt Lake in 1847. Twenty years later the famous tabernacle, an engineering marvel in its day, and its remarkable organ were complete, at least enough for the Church of Jesus Christ of Latter-day Saints to hold its semi-annual General Conference in October, 1867. With the completion of the first transcontinental railroad in 1869, Salt Lake City began to become less of a refuge for Latter-day Saints and more of a cosmopolitan city. Within the next two years its first Roman Catholic parish was founded, St. Mark's Episcopal Cathedral was built, and Methodist and Presbyterian churches were organized, followed by Lutherans and others.

Still, as late as 1948, G. Donald Harrison complained that it was hard to get a good cup of coffee anywhere in Salt Lake City! Rest assured, that is no longer the case. (Latter-day Saints are taught to abstain from alcohol, tobacco, coffee, and non-herbal tea). Much has changed in the last quarter century. The 2002 Winter Olympics provided the impetus for major infrastructure improvements, such as the new airport and a great light-rail system. Salt Lake City has become a vibrant, dynamic city. It is once again hosting the Winter Olympics in 2034. Utah advertises that the mountains near Salt Lake offer the best powder on the planet. However, don't bring your skis to Salt Lake in August!

CONVENTION HOTEL

THE HILTON SALT LAKE CITY CENTER HOTEL IS THE HOST HOtel for this year's convention. The Hilton is located just a couple blocks south of Temple Square, allowing conventioneers to visit on foot if they choose. Many of the amenities to which we are accustomed are included: Wi-Fi is complimentary throughout the hotel. Parking, normally $29/day, has been discounted to $10/day. Guest rooms are comfortable and offer the usual accoutrements. Spencer's Steaks and Chops, one of Salt Lake's finest dining establishments, is located off the hotel lobby and offers exquisite lunch and dinner fare. Trofi Bistro features a breakfast buffet.

WEATHER

SALT LAKE CITY IS LOCATED IN A HIGH-ELEVATION DESERT valley at 4300 feet above sea level. High temperatures in August can exceed 90 degrees, but it's a dry heat! Nighttime temperatures commonly cool into the 60s. Very little rain occurs in the summer except for a rare afternoon thunderstorm.

GETTING THERE

THE SALT LAKE CITY AIRPORT (SLC) IS SERVED BY ALL MAJOR airlines. It is an important hub for Delta Airlines with about 70% of total air traffic. The airport is located 8 miles northwest of the city.

Getting from the airport to the Hilton is easy and inexpensive if you use the light rail system, TRAX. Trains depart every 15 minutes during the day. One-way fares are $2.50, or $1.25 for seniors. To find the station at the airport, follow the signs for Ground Transportation. Once outside, turn left and go to position "1A". Fare machines are located there which accept credit cards and cash; payments are not accepted on the trains. Once in the city, exit at Gallivan Plaza station. Walk left to the corner, turn right on 300 South and proceed to the next intersection. Turn right on West Temple where you will find the Hilton. Of course, taxis and ride shares are also available.

WELCOME

I would like to extend my sincere appreciation to the following for their invaluable assistance and contributions to this book: Curt Hawkes and the Austin Organ Co., Michael Fazio, President; Michael Bigelow and David Chamberlin, M.L. Bigelow & Co.; Mark Lively and the Lively-Fulcher Organ Co.; Jack Bethards and the Schoenstein Organ Co., Anne Walkenhorst and Sean Cureton, The American Organ Archives of the OHS; Nick Bergin, editor, *The American Organist;* St. Mark's Cathedral; Richard Elliot and John Longhurst of the LDS Tabernacle; Bill Hesterman, Mark Hotsenpiller, Len Levasseur, Gabrielle Terrone, Kenneth Udy, James Wallmann, and the AIO Publication Committee.

— Scot Huntington, EDITOR

The convention committee, Bill Hesterman and David Chamberlin.
ABSENT: *Tyler Anderson*

Amtrak serves Salt Lake City (SLC) via the California Zephyr. The train station is intermodal. Catch the TRAX Blue Line, which begins its route at the Amtrak station. Exit at Gallivan Plaza as above.

TRAX features a "free fare zone" in the central portion of the city. This will allow you to easily access Temple Square and its visitor's centers and Family History Library, the Clark Planetarium, and City Creek Shopping Center among other venues.

The street naming convention in Salt Lake City, Utah, is based on a grid system that uses a numerical coordinate system. The streets are named in relation to their distance from the city's center, the intersection of Main Street and Temple Square. The city is divided into blocks, with each block representing 100 units. For example, 200 East is two blocks east of Main Street, and 300 South is three blocks south of Temple Square. This grid system makes navigation and addressing easier for residents and visitors.

TOURS

THE SCHEDULE FOR THIS YEAR'S CONVENTION DEVIATES FROM our normal routine. Each day will feature lectures during a portion of the day followed or preceded by an excursion away from the hotel. Since this is the case, there will not be an official "Spouse Tour". The pre-convention tour on Saturday will visit the Golden Spike National Historic Park in Promontory where we will see the beautifully replicated locomotives, the *Jupiter* and *No. 119,* emerge from their engine houses under their own steam. We will then visit Union Station in Ogden and the various museums there in addition to an optional side trip to the Hill Aerospace Museum. The post-convention tour will focus on five organs in Salt Lake City.

WWW.PIPEORGAN.ORG

SCHEDULE

SATURDAY, AUGUST 17
PRE-CONVENTION TOUR

7:30 AM **Registration Desk open**
8:00 AM **Buses depart for Golden Spike National Historic Park**
9:30 AM **Tour of Golden Spike NHP, *Arrival of CPRR Jupiter & UPRR No. 119***
11:30 AM **Buses depart for Ogden**
12:30 PM **Arrive at historic Ogden Union Station. Lunch on one's own**
Railroad, classic car, and firearms museums
1:30 PM **One bus departs for Hill Aerospace Museum, *optional***
4:00 PM **Buses depart for Hilton**
6:00 PM **Dinner on one's own**

SATURDAY, AUGUST 17
HOTEL ACTIVITIES

7:30 AM **Registration Desk open**
8:00 AM **Exam Review Session I**
12:00 PM **Lunch on one's own**
1:00 PM **Exam Review Session II and Examination**
5:00 PM **Free Time**
6:00 PM **Dinner on one's own**
7:30 PM **Board of Director's Meeting I**

SUNDAY, AUGUST 18

8:00 AM **Exhibitor Setup**
9:00 AM **Board of Director's Meeting II, *if necessary***
9:15 AM **Music and the Spoken Word, *Live Broadcast from Conference Center, on your own***
11:00 AM **Registration Desk open**
11:00 AM **Lunch on one's own**
12:00 PM **LECTURE James Wallmann**

Salt Lake Tabernacle Organ History, 1867–1948

Joseph Ridges, a carpenter-cum-organbuilder from England who came to the Utah Territory via Australia, built the first Salt Lake Tabernacle organ in 1867 with metal pipes and other parts purchased from Wm. B.D. Simmons of Boston. The pioneer organ was enlarged in 1885, then rebuilt by W.W. Kimball Company in 1901 and rebuilt again by Austin Organ Company in 1916. Using sources not previously consulted by organ historians, this lecture will review the history of the Tabernacle organ before 1948.

1:30 PM **Walk or bus to Tabernacle at Temple Square**
2:00 PM **DAILY ORGAN RECITAL Tabernacle**
3:30 PM **Walk or bus to Cathedral of St. Mark, Episcopal**
4:15 PM **EVENSONG at Cathedral of St. Mark, Episcopal**
5:15 PM **Walk or bus to Hilton**
6:00 PM **Dinner and Exhibitors Night**
6:00 PM **40 and Under Dinner**
11:00 PM **Exhibits close**

MONDAY, AUGUST 19

7:30 AM **Registration Desk open**
8:00 AM **Annual Business Meeting**
9:00 AM **LECTURE John Bishop**

Preservation and Relocation of Pipe Organs

10:30 AM **Coffee Break**
10:45 AM **PANEL DISCUSSION**

Control Systems for Complicated Pipe Organs

12:30 PM **Lunch at Hotel. Exhibits open**
1:30 PM **Walk or bus to Tabernacle**
2:00 PM **LECTURE Jonathan Ambrosino**

Summation of Style: G. Donald Harrison and the Tabernacle

Perhaps the most mythologized yet misunderstood 20th-century U.S. organ builder, G. Donald Harrison came from London to Boston in 1927 to impart to Skinner organs the tonal ideals of his former employer, Henry Willis III. In reality, Harrison adopted just as many patterns of his namesake Harrison & Harrison before striking out on his own highly personal path. In this he was influenced partly by older English and French organs, and partly by the ideas of those around him, but principally from his own fascinations, convictions, trials, and errors. The slow Depression economy, financial reserves, collaborative customers, and the talented Aeolian-Skinner workforce all allowed Harrison a rare opportunity to evolve a new style, which found its apotheosis at Salt Lake City. Jonathan Ambrosino traces that style, showing how Opus 1075, meant to sum up, still offered a platform for experimentation.

3:00 PM **LECTURE Bill Hesterman**

Overview of changes made to the Tabernacle organ since 1948

3:30 PM **DEMONSTRATION Aeolian-Skinner Op. 1075, 1945-48 (V/206) — Richard Elliott**
4:15 PM **Chamber Tour**

5:30 PM **Walk or bus to Hilton**
6:00 PM **Dinner at Hotel and Exhibits open**
6:00 PM **APOBA Dinner**
10:00 PM **Exhibits close**

TUESDAY, AUGUST 20

7:30 AM **Registration Desk open**
8:00 AM **Buses depart for American Fork. Divided into two groups by bus**
8:45 AM **GROUP A Bigelow Shop Tour, Op. 44 (III/39) under construction**
TABLE TALKS
8:45 AM **GROUP B Alpine Tabernacle, Austin Op. 1130, 1923.**
PRESENTATION Victor Hoyt
What the Heck is a Punjab?
An informal discussion and Q&A concerning the mysteries and unique language of Austin Organs maintenance and repair.
10:00 AM **Groups change places. Walk or bus.**
10:15 AM **GROUP A Alpine Tabernacle**
GROUP B Bigelow Shop
11:30 AM **All buses depart for Provo Central Stake Center**
12:15 AM **Box Lunch at Provo Central Stake Center**
1:00 PM **LECTURE/DEMONSTRATION David Chamberlin**
Bigelow's "Either/Or" Stop Action
2:30 PM **Buses return to Hilton Hotel**
3:30 PM **LECTURE Craig Hilton and Chris Boone**
Protecting Your Craft
Insurance and Risk Management for Organbuilders
4:45 PM **LECTURE John-Paul Buzard**
Demystifying the Exam
6:00 PM **Dinner on one's own**

WEDNESDAY, AUGUST 21

7:30 AM **Registration Desk open**
8:00 AM **LECTURE Lynn Dobson**
Designing The Organ of the Future
9:15 AM **LECTURE John Seest**
Structural Basics for Organbuilders
This presentation will review the basics of how structures behave and misbehave.
10:15 AM **Coffee Break, Exhibits open**
10:45 AM **LECTURE Joe Nielsen**
Voicing Repairs in the Field
12:00 Noon **Lunch at hotel, Exhibits open – Last Chance**
12:00 PM **Board of Directors Meeting III with new Board**
1:15 PM **Walk or bus to Conference Center at Temple Square**
2:00 PM **DAILY ORGAN RECITAL Conference Center**
2:30 PM **LECTURE Jack Bethards, Louis Patterson**
The Conference Center Organ: From Concept to Realization
3:15 PM **DEMONSTRATION Schoenstein Op. 139, 2004 (V/130)**
3:45 PM **Chamber Tour**
5:00 PM **Walk or bus to Hilton**
6:00 PM **Cash Bar**
7:00 PM **Banquet and Awards**

THURSDAY, AUGUST 22
POST-CONVENTION TOUR

8:30 AM **Registration Desk open**
8:45 AM **Walk or bus to Cathedral of St. Mark, Episcopal**
9:00 AM **DEMONSTRATION Bigelow Op. 35 (III/40)**
10:15 AM **Walk to Cathedral of the Madeleine**
10:30 AM **DEMONSTRATION Kenneth Jones (IV/80)**
11:45 AM **Board buses for St. Ambrose Catholic Church**
12:15 PM **Box lunch at St. Ambrose**
1:00 PM **DEMONSTRATION Bigelow Op. 36 (III/50, rebuild of Holtkamp No. 1820)**
2:00 PM **Board buses for University of Utah, Libby Gardner Concert Hall**
2:15 PM **DEMONSTRATION Lively-Fulcher (III/67)**
3:30 PM **Board buses for First United Methodist Church**
4:00 PM **DEMONSTRATION Bigelow Op. 38 (III/42, rebuild of 1906 Kilgen)**
5:15 PM **Walk or bus to Hilton**
Dinner on one's own
Optional, on one's own:
7:30 PM **Tabernacle Choir rehearsal — Conference Center, open to the public**

PRESENTERS

JONATHAN AMBROSINO

JONATHAN AMBROSINO IS A TUNER-technician, consultant, journalist, and tonal finisher. Together with Joe Sloane he looks after distinguished Boston-area instruments (Trinity Church, Old South Church, Church of the Advent, Groton School), many of which he has shepherded through some form of tonal restoration or reconstruction. As an advisor, he has consulted to more than 100 churches, universities and private schools, nationally and abroad, on projects for new and restored organs, including Saint Thomas, New York City and Harvard University. Current consultation includes the three new organs for Trinity Church Wall Street, Schantz's restoration of Möller Op. 8000 at Central Presbyterian Church, Park Avenue, and Foley-Baker's relocation of Skinner 819 to Episcopal High School, Houston. Over the past 35 years, he has written widely on organ matters in the U.S. and U.K., lectured at numerous AIO conventions, written, and served twice as editor of the AIO *Journal*. As a tonal finisher, he has been involved in numerous new and restoration projects (Longwood Gardens, St. John's Cathedral, Denver), often also involved in the pipe restoration. His most recent such effort, in collaboration with Alden Organ Service, the late Richard Houghten, Joe Sloane, and Ortloff Organ Co., is the relocated 3/38 1927 Skinner, Op. 563, from New York City to Southern Methodist University in Dallas, completed this past January. He is currently working with Spencer Organ Co. on the tonal end of Aeolian-Skinner Op. 932, Calvary Church in Memphis, which is reconstructed largely to its 1935 state.

JACK BETHARDS

JACK BETHARDS, CHAIRMAN AND Tonal Advisor of Schoenstein & Co., became an "organ nut" at the age of eight when Schoenstein electrified the organ in his church. In school and college, he worked for the San Francisco Möller installation and maintenance firm. Following his father's advice, he pursued a career in business management and consulting before purchasing the Schoenstein firm in 1977. Jack's musical training comes from decades of orchestral playing and conducting.

JOHN BISHOP

SINCE BECOMING DIRECTOR OF THE Organ Clearing House in 2000, John Bishop has managed the sale of around one hundred fifty organs. As the company had dismantled hundreds of instruments since its founding in 1962, John expanded the services by recognizing that screws can be turned in two directions, and as OCH merged with the Bishop Organ Company, started offering comprehensive relocation projects, renovating and installing select instruments. This led to offering the services of the OCH crew to assist colleague organ companies installing their new organs. In the past ten years, the OCH, under the leadership of OCH President Amory Atkins, has helped with the installation of over twenty new pipe organs.

John has a degree in organ performance from Oberlin. As a student, he worked part-time for John Leek in Oberlin, becoming full-time after graduation. He worked for Angerstein & Associates in Stoughton, Mass. from 1984–1987, and founded the Bishop Organ Company in 1987, restoring, renovating, and maintaining organs in the Boston area and throughout New England.

John has written the monthly column, *"In the wind..."* for *The Diapason* since 2004. He has served on the board of directors of the Friends of the Kotzschmar Organ in Portland, Me. for twenty years. He lives in Newcastle, Me. and Stockbridge, Mass. with his wife Wendy and Farley the Goldendoodle.

CHRIS BOONE

CHRIS IS BUCKNER INSURANCE'S VICE President of Producer Development and manages Buckner's Utah County Office, located in Pleasant Grove. Chris has been in the insurance industry since he joined Buckner in 2018. He has industry specialties in construction, manufacturing, and professional services. Before joining Buckner, Chris worked in the construction industry for eight years. His background and licenses provide him with industry-specific knowledge and expertise that are extremely valuable to his clients.

Chris earned his bachelor's degree in finance from Utah Valley University and later went back to complete his MBA, with a Finance Emphasis as well. He is a Certified Insurance Counselor (CIC) and is actively involved in several Home Builder and Contractor Associations. Chris loves to spend time with his wife, Shelby, and their three children. He enjoys working with his hands and isn't afraid of

hard work. He enjoys hunting, riding horses, fishing, playing sports, and anything that gets him in the outdoors with family and friends.

JOHN-PAUL BUZARD

JOHN-PAUL BUZARD IS THE ARTISTIC Director of Buzard Pipe Organ Builders, LLC of Champaign, Illinois. He received his Master of Music degree in Organ and Church Music from Northwestern University in 1980, and his Master Organbuilder Certificate (now Fellow) from the American Institute of Organbuilders in 1985. Prior to founding the firm, Buzard was Curator of Organs and Harpsichords at the University of Illinois at Urbana-Champaign.

John-Paul is a member of the American Guild of Organists and the Organ Historical Society; the Buzard firm is a member of the International Society of Organbuilders and APOBA. He is also a member of the Worshipful Company of Musicians of the City of London, having been sponsored by organbuilder Henry Willis 4 as the only non-English resident allowed into this ancient musicians' craft guild. (This distinction entitles him to drive a herd of sheep across London Bridge and legally whistle a tune while doing so!)

J-P has a long-standing passion for welcoming new people into our profession and marking their professional achievements in meaningful ways. This inspired him to develop an Apprenticeship Program for Organ Builders, which has been approved by the U. S. Department of Labor. The program's academic aspect mirrors the AIO's examination process, adding practical hands-on experience requirements to the curriculum, allowing successful participants to achieve Journeyworker and Master certifications. This program is being made available at no charge to any established organ builder who might like to formally train an apprentice.

DAVID CHAMBERLIN

DAVID CHAMBERLIN IS VICE-PRESIdent and tonal director of M. L. Bigelow & Co., Inc., Organ Builders, but most of his time at the shop is spent in mechanical design. He caught the "organ bug" early in life (age four) by "helping" his father remove a pipe organ (Murray Harris, he thinks) from a local church that had been condemned and slated for demolition. His father was a devoted amateur organist, and David spent most of his church time on the organ bench next to his father as an eager page turner and stop puller. At age fifteen he took his father's place. After graduating from high school he chose to major in music (against his father's better judgment), feeling neither qualified nor interested in a more sensible (!) pursuit. He graduated with honors from Brigham Young University and a few years later completed a master's degree at the Eastman School of Music, a student of David Craighead. Between degrees, while his newlywed wife finished her music degree at BYU, he stumbled into a temporary job at Bigelow's. After their two and a half years in Rochester, realizing he would not be the world's greatest organist after all (!), he telephoned Mike Bigelow who responded with "Sure, we'll find something for you to do." That was 39 years ago. Still there.

David has been the organist at Zion Evangelical Lutheran Church, Salt Lake City since 1987. Besides regular duties, he voluntarily prepares musical psalm settings for every Sunday. In 1996 he was commissioned to compose a new setting of the liturgy, which is still in use, rotating seasonally with other settings known more widely. Besides organ benches, his other favorite uncomfortable place to sit is on his mountain bike.

David has served the AIO as a member of the Board of Directors, currently as a member of the Ethics Committee, and (oh, yeah) chair of the 2024 Convention Committee.

LYNN DOBSON

LYNN DOBSON IS WELL KNOWN FOR lectures at several previous AIO conventions. He began building organs under his own name in 1974. To date the company has built 98 new organs and restored or rebuilt many existing instruments. New organs may be either mechanical or electric action; projects involving existing organs range from the restoration of nineteenth-century instruments to the enlargement of the Schlicker organ in the Chapel of the Resurrection at Valparaiso University. The company he founded employs 20 people; notable projects include large organs for the Cathedral of Our Lady of the Angels in Los Angeles, the Kimmel Center for the Performing Arts in Philadelphia, and Saint Thomas Church, New York City International projects include an organ for Merton College at Oxford University and an organ for St. James Church, King Street, Sydney, Australia, currently nearing completion. Lynn is a member of AIO, AGO, OHS; and Dobson Pipe Organ Builders, Ltd. is a member of APOBA and ISO. In 2020 Lynn sold the business and retired from full-time work but still continues to do design work part-time for the company.

PRESENTERS

WILLIAM HESTERMAN

BILL STARTED TAKING PIANO LESsons at the age of 9, and organ lessons at age 12. At the age of 14, lessons were started with Tabernacle Organist Roy M. Darley. Bill's first Temple Square performance in 1968 was playing for the Sunday morning session of Stake Conference in the Assembly Hall. Bill has been playing for events and meetings on Temple Square ever since. Bill has performed inaugural concerts on organs in Utah, California, New Mexico, and Texas.

At the age of fifteen, Bill expressed interest in learning how a pipe organ "works." Wayne Devereaux, then head technician of the Tabernacle instrument, agreed to teach him about the workings of the organ. This early technical training led to what would become a lifetime career for Bill. In 2005, Bill's company, Rocky Mountain Organ Company, Inc. was contracted to protect the Tabernacle Organ during the seismic remodeling of the Tabernacle. Bill is also the National Sales Director for Austin Organs, Inc. of Hartford, Conn.

In August of 2013, Bill became a volunteer member of the Tabernacle Choir administrative staff serving as an assistant to the Tabernacle Organists.

CRAIG HILTON

CRAIG HAS BEEN IN THE INSURANCE industry since 1989 and has been with Buckner Insurance since 2003. He has industry specialties of construction, financial institutions, hospitals, restaurants, manufacturing and professional services. Craig is on the 2020 Insurance Business America's Top 100 Producers.

Craig's favorite place to be, outside of work, is on the river fly fishing or hunting and his favorite place to be is at his cabin near Clear Creek, Utah. His favorite movie is *The Hobbit* and he loves eating sushi. As a child, Craig enjoyed baseball, football, basketball, and fishing or hunting with his father. He considers marrying his wife, Sharon, as his greatest accomplishment.

VICTOR HOYT

VICTOR BEGAN HIS CAREER AS AN APprentice in a small tracker restoration shop in Florence, Massachusetts. After two years, he moved on to Austin Organs, Inc. and fell in love with all the machines. He worked at Austin, both as an employee and a contractor, for the next thirty-eight years. He is currently the Associate Curator of Pipe Organs at West Point USMA.

JOSEPH NIELSEN

JOSEPH NIELSEN BEGAN HIS CAREER in organ building with Quimby Pipe Organs. Combining a master's degree in organ performance with years of carpentry experience, Joseph's career in the industry has spanned nearly 24 years. He has worked all over the United States with various firms who recognize his expertise in designing, building, voicing, and maintaining pipe organs. In 2023, he began working for The Church of Jesus Christ of Latter-day Saints as the curator of pipe organs on Temple Square. He has the privilege of stewardship over G. Donald Harrison and Aeolian-Skinner's epic Op. 1075, as well as Schoenstein's *magnum opus*. The creation of majestic sound, cohesion of tone, a variety of color and proper speech are at the core of his tonal philosophy.

LOUIS PATTERSON

LOUIS PATTERSON, PRESIDENT OF Schoenstein & Co., oversees all aspects of the company. He has over fifty years of organ building experience. Prior to joining Schoenstein in 1999, Louis served ten years as a full-time church musician. He has also maintained a dual career in organ building and church music, specializing in service work, tuning, and managing organ projects.

JOHN SEEST

JOHN SEEST IS A PRINCIPAL AT ARSEE Engineers in Indianapolis. He has worked in various capacities at Goulding & Wood and periodically assists other organbuilders with structural engineering issues.

JAMES WALLMANN

JAMES L. WALLMANN GREW UP PLAYing Austin Op. 2008 (1938) in Berkeley, California. After studying music at Brigham Young University in Provo, Utah, Jim obtained a law degree from Georgetown University and recently retired after many years as a corporate attorney for an international building materials company in Irving, Texas. Since 1984, he has reviewed over 650 books, most in foreign languages, for *The American Organist*. His other writings have appeared in that publication and in *The Organ Yearbook, The Tracker, Het Orgel, Twentieth-century Organ Music* (2012), and *Journal of the Fellowship of American Bibliophilic Societies*.

Old St. Patrick's Basilica, New York, NY.
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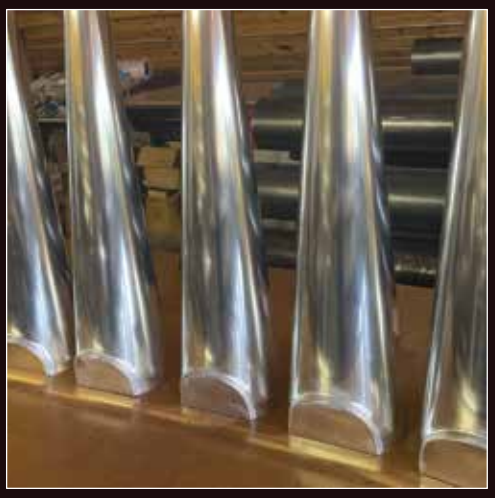

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ALPINE STAKE TABERNACLE
AMERICAN FORK, UTAH

Austin Organ Co., Opus 1130, 1923
New Austin console, 1976
SOURCE: Transcribed from the console.

Compasses: 61/32

II. GREAT
16 Bourdon [Ped]
8 Open Diapason
8 Gross Flute
4 Principal
4 Flute Harmonic
8 Tuba
Chimes
Great to Great 16, 4
Great Unison Off
Swell to Great 16, 8, 4
Choir to Great 16, 8, 4

I. CHOIR
8 Geigen Diapason
8 Hohl Flute
8 Dulciana
8 Unda Maris
4 Flute d'Amour
8 Clarinet
Tremolo
Choir to Choir 16, 4
Choir Unison Off
Swell to Choir 16, 8, 4

III. SWELL
16 Lieblich Gedeckt
8 Gedeckt
8 Gamba
8 Gamba Celeste
8 II Echo Celeste
4 Flauto Traverso
2 Flautino
8 Oboe
8 Vox Humana
Tremolo
Swell to Swell 16, 4
Swell Unison Off

PEDAL
16 Diapason
16 Bourdon
16 Lieblich Gedeckt [Sw]
8 Bourdon [ext]
Great to Pedal 8, 4
Swell to Pedal 8, 4
Choir to Pedal 8, 4

ACCESSORIES
Manual divisional pistons: 1-8
Pedal divisional toe studs: 1-8
Divisional cancel bars
General pistons: 1-8
General toe studs: 9-16
Setter
Tutti toe stud
Crescendo pedal
Swell and Choir expression pedals
Reversible pistons: Gt-Ped; Sw-Ped; Ch-Ped; Sw-Gt
Maas-Rowe chime volume roto-selector: Off, 1-6
Touch screen portal for digital combination system

Bigelow & Co., Opus 16 (1987)
Two Manuals and Pedal
18 ranks: 13 voices (+2 transmissions = 15 stops)

MANUALS and PEDAL	Manual I	OR Manual II	OR Pedal		Pipe count
1. Subbass			16		30
2. Quintadena	16		16		58
3. Praestant	8		8		58
4. Chimney Flute	8	8			58
5. Quintadena			8	from 16′	
6. Gamba	8	8			58
7. Celeste	8	8		from tenor-c	46
8. Octave	4	4			58
9. Conical Flute	4	4			58
10. Octave	2	2			58
11. Nazard/	2⅔				58
Cornet		III		2′ + 1⅗′ from tenor-c	92
12. Mixture/	IV				232
Quint		1⅓			
13. Dulcian		16	16		58
14. Trumpet	8	8			58
15. Trumpet			8	from man.	
				Total pipes	980

GENERAL

Manual I to Pedal
Manual II to Pedal
Manual II to Manual I
Flexible Wind/Tremulant
Cymbelstern
Vogelgesang
58/30 notes. Flat pedalboard. Keys of bone and ebony.
Self-regulating, suspended mechanical key action.
Mechanical stop action. Stops with pitches listed under two divisions are registered on one OR the other division by means of sliding stop levers, e.g.: I - Off - II.
Mechanically operated swell shades enclose all pipes except Praestant and Subbass.

PROVO CENTRAL STAKE

FLUE PIPE SCALES

		C	c^0	c^1	c^2	c^3
Subbass 16′	*Diameter:*	170x235	101x152	64x105	—	—
	Cut-up:	76.5	44.0	21.0	—	—
Quintadena 16′	*Diameter:*	130.0	82.0	51.0	33.0	22.0
¼ mouth	*Cut-up:*	35.4	21.1	11.9	8.4	6.3
Pracstant 8′	*Diameter:*	140.0	76.5	48.0	28.0	17.0
¼ mouth	*Cut-up:*	34.5	18.8	10.5	7.5	4.4
Gamba 8′	*Diameter:*	91.5	56.5	34.5	21	13.5
1/11 mouth	*Cut-up:*	19.4	12.3	7.4	5.0	2.6
Celeste 8′	*Diameter:*	---	54.0	33.0	20.0	13.0
1/17 mouth						
Chimney Flute 8′	*Diameter:*	111x120	70x77	51.5	32.0	20.5
1/11 mouth	*Cut-up:*	---	---	16.8	9.8	5.8
Octave 4′	*Diameter:*	86.0	50.0	29.0	17.0	10.0
¼ mouth	*Cut-up:*	19.5	10.5	7.3	4.1	2.6
Conical Flute 4′	*Diameter:*	86/34.5	58/25.0	38/17.5	24.5/13.5	15.6/9.2
⅔ mouth	*Cut-up:*	20.0	11.8	7.5	4.8	3.0
Nazard 2⅔′	*Diameter:*	73/44	42/34	24.0	15.5	10
(Cornet III)	*Cut-up:*	13.3	8.0	6.0	3.5	2.5
⅕ mouth						
Open Flute 2′	*Diameter:*	—	33.5	20.5	13.0	9.0
(Cornet III)	*Cut-up:*	—	6.5	4.6	2.9	2.0
⅕ mouth						
Tierce 1⅗′	*Diameter:*	—	28/22	17.0	11.0	8.0
(Cornet III)	*Cut-up:*	—	5.8	4.0	2.5	1.8
⅕ mouth						
Octave 2′	*Diameter:*	43.5	26.0	15.0	9.0	5.5
1/17 mouth	*Cut-up:*	10.9	7.0	4.3	2.6	1.6
Mixture (2′)	*Diameter:*	40.0	24.0	13.5	8.5	5.5
Unisons 1/17 mouth	*Cut-up:*	10.0	6.0	3.8	2.5	1.4
Quints ⅔ mouth						

REED PIPE SCALES

		C	c^0	c^1	c^2	c^3
Trumpet 8′						
	Resonators:	*Hammered lead, thickness C = 1.5 mm. Voicing slots approx. one diameter from pipe tops. Double-length (harmonic) from f#².*				
	Diameter:	107.0	73.0	55.0	49.0	48.0
	Length:	2220	1150	560	256	256
	Shallots:	*C: Tapered with lead face* *c¹: Parallel, domed with lead face* *c²: Parallel, domed, open*				
	Diameter:	14/16	10/13	8.0	6.5	6.0
	Length:	*Normal length, determined by pipemaker*				
	Tongues:	*Medium-hard brass*				
	Thickness:	0.44	0.31	0.22	0.12	0.10
	Boots:	*Metal. French double-block construction from f#°, i.e. boot extends upwards to meet and support the resonator.*				
Dulcian 16′	*Resonators:*	*Cylindrical; C-B zinc, remainder hammered lead. Short voicing slots, approx. ⅓ diameter, at the top of the pipe.*				
	Diameter:	65.0	49.0	38.5	32.0	26.0
	Cyl. length:	2385	1080	552	245	104
	Cone length:	450	315	200	130	68
	Shallots:	*C: Tapered with lead face* *c¹: Parallel, domed with lead face* *c²: Parallel, domed, open*				
	Diameter I.D.	18.0/23.0	13.0/16.7	11.6	8.7	6.6
	Length:	*Normal, as determined by pipemaker*				
	Tongues:	*Medium-hard brass*				
	Thickness:	0.82	0.53	0.37	0.28	0.24
	Boots:	*Metal. French double-block construction from c¹*				

FIRST UNITED METHODIST CHURCH

FIRST UNITED METHODIST CHURCH | SALT LAKE CITY, UTAH

Bigelow & Co., Inc. | American Fork, Utah

ESSAY BY **DAVID CHAMBERLIN**

BIGELOW & CO., INC. WAS FOUNDED IN 1978 BY MICHAEL BIGElow after serving an apprenticeship with John Brombaugh in Middletown, Ohio. The company specializes in mechanical-action instruments that are both historically informed and innovative. It was, therefore, a bit surprising for this firm to be asked to tackle the rebuilding of what had once been a tubular-pneumatic instrument. Let's just say we have learned a lot in the process.

First United Methodist Church, Salt Lake City, dedicated their new building on May 22, 1906, with the organ's dedication following about six months later on December 7th (quoting from the church's website). The oldest document in the church's archives pertaining to the organ is a contract with the firm of "Geo. Kilgen and Son," dated January 29, 1924, in which the first item reads: "To electrify the organ now located in their church using the most modern type action with silver contacts, brass encased magnets and paraffine [*sic*] cables." The 1924 contract included several "modernizing" tonal changes as well, such as replacing the Great Mixture with a Flute Celeste, replacing the Dolce Cornet with a Vox Humana, etc.

Using the 1924 contract stop list and other physical clues as a point of departure, it is possible to reverse engineer the 1906 stop list:

GREAT

16′ Dbl. Open Diapason*
8′ Open Diapason*
8′ Viol d'Gamba*
8′ Dulciana
8′ Melodia
8′ Dopple Flute [*sic*]*
4′ Octave*
4′ Flute d'Amour*
2⅔′ Twelfth
2′ Fifteenth*
Mixture III
8′ Trumpet*

SWELL

16′ Bourdon (t.c.)*
8′ Open Diapason*
8′ Salicional
8′ Aeoline
8′ Stop Diapason*
8′ Quintadena
4′ Fugara*
4′ Flute Harmonic*
2′ Flageolet*
Dolce Cornet III
8′ Cornopean*
8′ Oboe*

PEDAL

16′ Open Diapason*
16′ Bourdon*
8′ Violincello [*sic*]*

*Historic ranks extant with most or all of their pipework intact, although several may date from 1924

A photograph from 1915 reveals a handsome case and stenciled façade pipes covering an opening sixteen feet wide and twenty feet high. In conjunction with a 1960 "Sanctuary and Chancel Beautification Project," the beautiful oak casework was discarded and the stenciled façade pipes (all speaking and previously painted gold) were hidden from view. The organ was thoroughly overhauled and further modified at that time. By the 1980s the old chests and actions were failing again, and an electronic imitation provided a temporary solution. After the current organist, Scott Mills, was hired ca. 2009, an effort was made to resurrect a portion of the pipe work, including a low-cost approximation of the original façade. Hearing real pipes again inspired the congregation to pursue a more comprehensive restoration of their historic instrument, including a faithful reconstruction of the oak casework and stenciled facade.

Realizing that many of the original pipes had been discarded or seriously altered, the church purchased nearly forty ranks of vintage Kimball and Austin pipework, including the harp and chimes, from the nearby Masonic temple (Austin, 1915), whose organ had been sitting unused for over twenty years. After examining what was left of the original Kilgen material and its later additions, listening to whatever was playable, reviewing the inventory acquired from the Masonic temple, and perusing old photographs, we contracted with the church to "restore" and enlarge their legacy organ. Adding just two new stops (four ranks of upperwork) we developed the three-manual specification found on page 26.

Most pipes of the Great, Swell, and Pedal divisions stand on either their original ventil or unit chests, releathered and re-electrified by us. It is interesting that the ventil chests are in the style of Roosevelt, which may have come from an earlier Farrand & Votey instrument. That firm had been active in Utah in the 1890s, when they had recently acquired Roosevelt's patents. Did the previous Methodist church, about a block away from the 1906 structure, have a Farrand & Votey organ that Kilgen adapted to the new space? Modifications to those chests and to the swell box make such a scenario plausible.

The main Choir chest is a new Blackinton-style slider chest by Organ Supply Industries. That firm also supplied electro-pneumatic unit and offset chests used variously throughout the organ, and several single-rise regulators.

We purchased a vintage "Style A" stoptab console from the Austin factory and had the keys recovered in unbleached bone by Nelson Woodworking of Little Compton, Rhode Island. Stop action magnets and the control system are from Syndyne.

With the completion of this instrument, Bigelow is pleased and proud to claim responsibility for all three of Salt Lake City's most recent three-manual organs, all very different from each other, and each one uniquely beautiful.

SALT LAKE CITY, UTAH

FIRST UNITED METHODIST CHURCH

PRESENT STOPLIST

First United Methodist Church
Salt Lake City, Utah
Bigelow & Co., Opus 38 (2016)
3 manuals, 42 ranks

Renovation/enlargement of
1906/1924 Geo. Kilgen & Son

LEGEND:

A = Austin Opus 609, 1915, recycled from Salt Lake Masonic Temple
K = Kilgen and/or predecessor(s)
N = new pipework by Toni Käs for Bigelow
V = vintage pipework from various sources

I. CHOIR (enclosed)

8′	Geigen Principal	61	A
8′	Dulciana	61	A
8′	Melodia	61	A
8′	Quintadena	61	A
4′	Gemshorn	61	A
4′	Flute d'Amour	61	K
2′	Flageolet	61	K
1⅓′	Nineteenth	61	N
8′	Trumpet	61	K
8′	Clarinet	61	V
	Tremulant		
	Harp*	49	A
	Celesta*	12	A
	Choir to Choir 16		
	Unison Off		
	Choir to Choir 4		
	Swell to Choir 8		
	Swell to Choir 4		
16′	Tuba, T.C.* (Gt)		
8′	Tuba* (Gt)		
4′	Tuba* (Gt)		

II. GREAT

16′	Double Open Diapason	61	K, 1-7 A
8′	Open Diapason	61	K
8′	Doppel Flute	55	K
8′	Dulciana (Ch)		
4′	Octave	61	K
4′	Hohl Flute	61	K or later
2⅔′	Octave Quint	61	V
2′	Super Octave	61	K
III	Mixture (1⅗-1⅓-1)	183	V
8′	Trumpet (Ch)		
8′	Tuba*	61	K
	Choir to Great 16		
	Choir to Great 8		
	Choir to Great 4		
	Swell to Great 8		
	Swell to Great 4		
	Chimes*		

III. SWELL (enclosed)

16′	Lieblich Gedackt	61	K
8′	Open Diapason	61	K
8′	Salicional	61	K
8′	Voix céleste	49	A
8′	Stopped Diapason	61	K
4′	Fugara	61	K
4′	Flute Harmonic	61	K (1-12 V)
2′	Flautino	61	V
III	Cornet	183	A
III	Mixture (2-1⅓-1)	183	N
16′	Contra Bassoon	61	A
8′	Cornopean	61	A
8′	Oboe	61	K
8′	Vox Humana	61	V (Kimball**)
	Tremulant		
	Unison Off		
	Swell to Swell 4		
16′	Tuba, T.C.* (Gt)		
8′	Tuba* (Gt)		
4′	Tuba* (Gt)		

PEDAL

32′	Open Resultant		
32′	Stopped Resultant		
16′	Open Diapason (wood)	32	K
16′	Principal (Gr 16 Diap)		
16′	Sub Bass	32	K
16′	Lieblich Gedackt (Sw)		
8′	Principal (Gr 16 Diap)		
8′	Cello	32	K
8′	Bourdon	32	V
4′	Principal (Gr 16 Diap)		
4′	Bourdon (ext.)	12	
16′	Tuba (ext.)	12	V (Murray-Harris***)
16′	Contra-Bassoon (Sw)		
8′	Tuba (Gr)		
8′	Trumpet (Ch)		
8′	Bassoon (Sw ext.)		
	Great to Pedal 8		
	Choir to Pedal 8		
	Choir to Pedal 4		
	Swell to Pedal 8		
	Swell to Pedal 4		
	Chimes		

*Does not couple
**from 1913 Kimball in Assembly Hall on Temple Square, courtesy of Bill Hesterman
***16 pipes (C-d♯⁰) and 16-note chest, which still had this handwritten shipping label:

FROM: Burbank, California
TO: ATT. MR GILBERT
(local technician responsible for "improvements" done in the 1960s)

PREVIOUS STOPLIST

First Methodist Church
Salt Lake City, Utah
Geo. Kilgen & Son

1906 stop list, reconstructed from penciled labels on toeboards and available documents.
Boldface indicates extant stops, with all or most pipes, in their original divisions.
SOURCE: Bigelow & Co.

GREAT

16′	**Double Open Diapason**	G(?) – f⁰ in facade
8′	**Open Diapason**	C – B in facade
8′	Viol d'Gamba	
8′	Dulciana	
8′	**Dopple Flute** [sic]	Not on original toeboard. No room for C-F (discarded?)
8′	Melodia	
4′	**Octave**	
4′	Flute d'Amour	Moved to Choir
2⅔′	Octave Quinte	
2′	**Super Octave**	
III	Mixture	
8′	Trumpet	From 1924 (?), moved to Choir

SWELL

16′	**Bourdon**	Renamed "Lieblich Gedackt"
8′	**Open Diapason**	
8′	**Salicional**	
8′	Aeoline	
8′	**Stop Diapason** [*sic*]	
8′	Quintadena	
4′	**Fugara**	
4′	**Flute Harmonic**	Reconstructed bass octave
2′	Flageolet	Moved to Choir
III	Dolce Cornet	
8′	Cornopean	From 1924 (?), repurposed as Tuba
8′	**Oboe & Bassoon**	

PEDAL

16′	**Double Open Diapason**	
16′	**Sub Bass**	
16′	Lieblich Gedackt (Sw)	Added in 1924 (?) (No existing trace of duplex action)
8′	**Cello**	

CONFERENCE CENTER

SALT LAKE CITY, UTAH

COVER FEATURE
CONFERENCE CENTER
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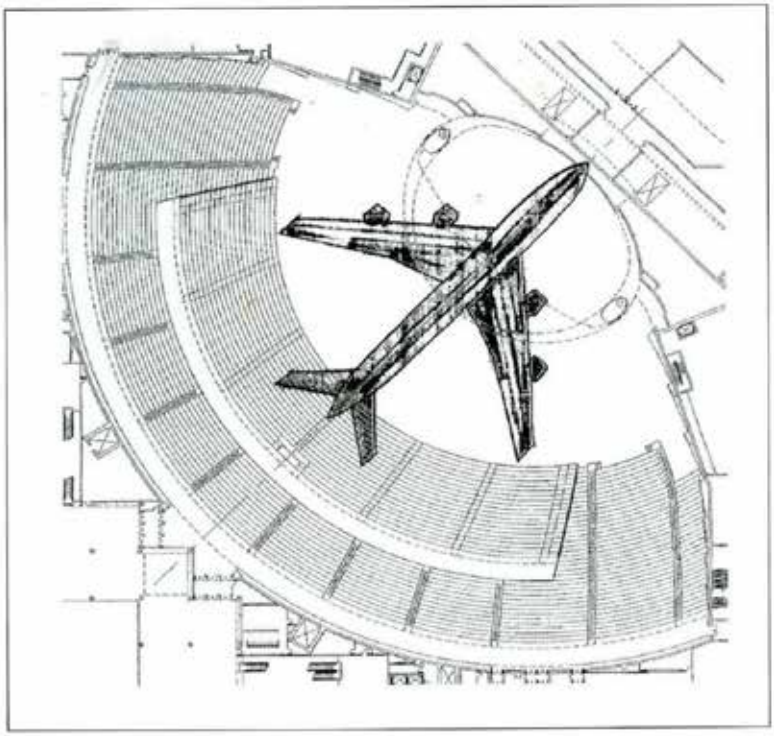
SALT LAKE CITY, UTAH

A SYMPHONIC ORGAN FOR THE WORLD'S LARGEST THEATER AUDITORIUM

SCHOENSTEIN & CO. ORGAN BUILDERS



The Builders' Perspective

It's downright confounding to think of a five-manual organ with 130 ranks, seven 32' stops—two of them extended into the 64' range—and wind pressures up to 25" as a *Multum in Parvo* job (that's what the British call a small organ that sounds big). Yet, when we realize that this substantial instrument is in a 21,333-seat auditorium—fully carpeted with upholstered seats, acoustically treated walls and ceiling—into which a Boeing 747 would comfortably fit, the reality of that description sinks in. This is the largest theater-style auditorium ever built. The next largest is the Auditorio Nacional in Mexico at about 11,000 seats. For comparison, remember that Radio City Music Hall has about 6,000 seats, and a typical symphony hall about 2,000. Organs have been built for majestic spaces with reverberant resonance, but never before has one been designed for an 8.5 million cubic foot space with an acoustic planned primarily for the spoken word. The prospect of doing this was daunting to say the least. Very few concert organs in theater acoustics have been successful, even in buildings a tenth the size. There were no examples of buildings—let alone organs—to study. We had to start installation before the building was completed, so there was no opportunity for tonal testing or even a hand clap in the finished space. We had a theory, but that was all!

Before outlining the nerve-racking, but exhilarating process of designing and building this organ, let me answer the questions we are most often asked.

Is an auditorium this large really necessary? The original plan was for one even larger, but this was the largest that could be built on the site with today's technology. The members of the Church of Jesus Christ of Latter-day Saints gather together twice each year for their General Conference. In the last few decades requests from members to attend have flooded in by the tens of thousands. The Tabernacle and all the other Temple Square overflow facilities could barely hold the church leadership, let alone all the members who wished to attend. Church president Gordon B. Hinckley decided that the problem must be solved and ordained the building of the Conference Center.

What is General Conference? Like most people, when I heard the term I thought of a convention business meeting. Nothing could be further from the truth. General Conference, held on the first weekend of April and October each year, is a series of five religious services with messages of instruction and inspiration from the General Authorities of the church and sacred music usually led by the Tabernacle Choir. The organ provides accompaniment for the choir and support for the robust singing of over 21,000 congregants, but there are no organ solos except for soft prelude and postlude selections.

Why is the building shaped and furnished like a theater? It was important to have a semicircular (pie-shaped) design to bring the people as close as possible to the speakers on the rostrum, because the spoken word is the central aspect of General Conference. Perfect sight lines and clear sound were equally important. This shape, combined with acoustically absorptive materials, is the opposite of what is traditionally desired for choral and organ music.

Does a modern auditorium of such vast proportions have the proper atmosphere for religious services? General Conference is a deeply meaningful religious experience and a kind of homecoming or family gathering for members of the church. The Tabernacle has been its home since the early days. Moving into a new site is a bit like asking the Vatican to abandon St. Peter's. Therefore, it was of primary importance to create an atmosphere in the new building reminiscent of the traditions of past conferences and, indeed, of the church's history. A warmly welcoming, familiar and comfortable place of religious purpose was the program set before the architects. All of us in the organ profession must be very gratified that the church authorities found the organ to be the most perfect means to make the members feel at home in the new building. The organ's physical design would be a gentle reminder of the Tabernacle's pioneer case; the sound of a real pipe organ, containing sonic elements of the Tabernacle instrument, would be an equally strong reminder of the building's purpose.

Does the Auditorium have other uses? We found out just how many when we attempted to schedule tonal-finishing work! As soon as the building opened, its usage multiplied. It plays host to regional conferences of the church, special musical events such as Pioneer Day in July and Christmas programs plus pageants, meetings, and special events such as the program the church put on for the 2002 Winter Olympics. The stage platform area is designed for flexibility. It can be converted from the choir and rostrum setup (shown on the front cover) to a setting for orchestra and choir only, or to a completely clear stage—from first row of orchestra seats to the organ case. Ultra-modern rigging, lighting, and audio equipment make varied uses possible. The building is completely climate-controlled 24 hours a day—a great advantage for the organ.

Given the size of the building, why isn't the organ larger? Our charge was to make an instrument large enough to get the job done but no larger. Because of the stage requirements, there were space limitations. The budget was to be reasonable and the organ had to be practical to maintain. Also, we were convinced that the number of ranks was not the answer to filling the room with sound. Overly large designs can be counterproductive, smothering themselves in cramped layouts.

I heard that the organ was to be amplified. Is that so? It was never intended to amplify the organ independently by placing microphones in or near the organ. However, we knew that the choir's sound would have to be reinforced and that the organ would be picked up along with it. We also thought that this system would be needed to help project the sound of the organ to the far reaches of the balconies. Much to our surprise and relief, the organ required no amplification at all to be heard clearly throughout the building. The acoustic surpassed even our highest expectations, thanks to the brilliant engineering of acoustical consultants Jaffe Holden Scarbrough of Norwalk, Connecticut.

Six sets of expression shades, variable tremulants, and crescendo functions are assigned to five balanced pedals by these miniature drawknobs, which in turn are controlled by six independent combination thumb pistons.

MUSICAL OBJECTIVES

Our first objective was to create a tone of beauty and nobility without the coarse, shrill loudness that could so easily result from an effort to fill such a large space with sheer force. Certainly, room-filling power is important, but not nearly as important as balancing with the choir. The Tabernacle Choir is used to singing with the full resources of the Tabernacle organ and they were not enamored with the idea of full organ having to issue from closed expression boxes! Another point, the full significance of which was not obvious until the building was in operation, is that it is primarily a recording and broadcasting facility from the point of view of the worldwide church membership. Every significant event is broadcast and translated into 50 languages over the church satellite network. The Sunday radio and television program, *Music and the Spoken Word*, originates from the Conference Center on many occasions. The organ, therefore, had to have a character of tone that was appropriate for broadcasting and recording where subtlety and control are more important than loudness.

Our second objective was to provide all the tonal resources necessary for choir accompaniment. An organ of 130 ranks should be able to handle the bulk of the organ solo repertoire, but this was our last concern. The Tabernacle Choir has an unusually wide-ranging repertoire, as they say, "from Bach to Broadway." They are used to being accompanied by one of the largest and most elegant organs in the world. Our charge was to provide every sound at every dynamic that a choral conductor could ask for. The recently formed Orchestra at Temple Square, a first-rate symphony orchestra, performs often at the Conference Center, and the organ has to acquit itself well in the orchestral repertoire.

There are three features of the divisional layout that are designed specifically to enhance accompaniment capabilities. In working with the Tabernacle Choir over the years, the organists all wished that they could have more solo tone colors available for countermelodies and melody reinforcement at contrasting dynamic levels. In other words, two Solo divisions. The Conference Center has three—the Solo, Grand Solo, and Orchestral. The Symphonic Flute and French Horn of the Solo, the Tuba and Tuben of the Grand Solo, and all the stops of the Orchestral fill this need. The Orchestral division is especially interesting because it includes several voices borrowed directly from the theater organ. The Conference Center organ is truly an eclectic one designed to cover the greatest possible repertoire. Borrowing sounds from the theater organ is no different than borrowing sounds from the French Romantic or English Romantic traditions. Any tone that is attractive and useful and that does not detract from the overall ensemble can be included. We picked several distinctive Wurlitzer voices not found on the typical concert organ. It is very important to note, however, that we were not attempting to insert a small theater organ into the instrument, just as we would not graft onto it a neo-Baroque positive. It turned out that these theater-inspired voices have been extremely useful in all kinds of musical contexts that have nothing to do with theater music. They are simply beautiful sounds that work well.

The Choir division is also geared toward maximum accompanimental flexibility. It has a complete selection of strings of different scales from Viole d'orchestre to Viola Pomposa, flutes of different types at all pitches of the cornet, and a chorus of small diapasons with pitches individually controllable. This arrangement provides a nearly limitless array of combinations in both tone color and pitch to create new and interesting effects. The Swell division, which is always the workhorse in choir accompaniment, is especially well developed, with several variations in diapason and flute tone, as well as both French- and English-style reed choruses.

Our third objective was to include some of the more important musical effects of the Tabernacle organ, while at the same time providing overall contrast to it and the other organs on Temple Square. The Aeolian-Skinner is noted for its clarity, and that was a quality the Tabernacle Choir could not live without. The scintillating string ensemble of the Tabernacle organ and its exceptional wealth of *mezzo-forte* voices were effects we wanted to capture in the new instrument. A direct imitation would not only have been impossible but inappropriate in the Conference Center acoustic; the objective was to create equally pleasing sounds with a different accent. In the simplest terms, both organs are eclectic. The Aeolian-Skinner is an American Classic instrument, whereas the Schoenstein organ is an American Romantic one. Other organs on Temple Square lean toward the French and German, so we leaned slightly in the English direction.

Our fourth objective was to duplicate the Tabernacle console arrangements as far as reasonable to make transferring from one instrument to the other as easy as possible considering the pressure of constant performances and broadcasts with limited rehearsal schedules that face the organists.

Finally, we limited ourselves to the smallest stoplist that could achieve the four goals above. We avoided any specialty stops that would be seldom used. For example, there was no need in this instrument for whisper-soft stops that would be lost in this acoustic. There were practical benefits to the *Multum in Parvo* approach, too: tuning stability through logical layout, keeping primary flues and primary reeds each on one level; more economical maintenance.

The following table compares various halls showing the sonic work the Conference Center organ must do:

Hall	Seats	Cu. Vol.	Ranks	Seats/Rank	Cu. Ft./Rank
Conference Center	21,333	8,500,000	130	164	65,385
Atlantic City Convention Hall	40,000	14,700,000	449	89	32,739
London Royal Albert Hall	6,080	3,060,000	172	35	17,790
Mormon Tabernacle	6,500	1,495,000	206	32	7,257
Dallas Myerson Hall	2,179	845,000	84	26	10,059
Cleveland Severance Hall	1,890	554,000	94	20	5,894

The Great reeds and Solo Millennial Trumpet viewed from above

If we apply to other halls with similar acoustics the Conference Center's ratio of seats to ranks (164 seats per rank), we can see just how small the Conference Center organ is in proportion to the hall:

Hall	Seats	Ranks
Conference Center	21,333	130
Royal Albert Hall	6,080	37
Myerson Hall	2,179	13
Severance Hall	1,890	12
Average large church	1,000	6
Average medium church	500	3

DESIGN THEORY

Every organ design should be based on a solid foundation of musical/acoustical theory, just as every composition should be based on a thorough understanding of harmony and form. For this organ we had a definite theory and a strong conviction that it would work—but no proof! Our system has worked well in moderate-sized buildings with dry acoustics, but would the same principles apply here? Since we had nothing else to go on, we decided to take a deep breath and bet our reputation that they would.

Our first principle in dealing with a dry acoustic is to "fight fire with fire." It seems logical to think that a thin, bright tone will pierce through a dry acoustic, but the exact opposite is true. A dry acoustic requires exceptionally warm, rich, and mellow tones with the center of gravity at 8' pitch. Acoustical resonance is what smooths out and adds beauty to tones that otherwise would be brittle. Without such resonance, the tone must fend for itself and be beautiful up close without the halo of reverberation. Fifty percent of the Conference Center manual voices are at 8' pitch. There are nine 8' diapasons as well as numerous flutes, smooth-toned reeds, and strings. These, along with the softer, smoother 16' and 4' voices, produce a broad tonal foundation.

The second principle is to dominate the stoplist with tones of a naturally projecting character, such as highly energized diapasons, keen strings, open and harmonic flutes, and English-style chorus reeds. These stops, which have a good balance of fundamental and overtones within themselves, can impart power without harsh loudness.

The third principle in dealing with a dry acoustic is that dramatic power must come from reed choruses rather than mixture choruses. The brilliance from the overtones in high-pressure chorus reeds is much more satisfying than the piercing shrillness that results from over-driven mixtures. Mixtures are vitally important in any large organ, but in our concept they provide tonal color—not power.

Perhaps the most thrilling characteristic of the pipe organ is its room-shaking bass. To produce the proper gravity in a room of over eight million cubic feet requires moving a lot of air. Therefore, we included 16' and 32' stops representing each family of tonal color and several dynamic levels. Given the size of the room, it seemed not inappropriate to extend two of the stops into the 64' range. The most interesting bass stop is the Diaphone. In this country diaphones have been associated almost exclusively with theater organs; in England, they were more widely used. The diaphone is a valvular reed developed by Robert Hope-Jones. It yields a magnificent, fast speaking, fundamental bass unequaled by any other class of stop. We were fortunate to acquire a fine example made by Kimball originally for the Forum Theatre in Los Angeles.

The proper and judicious application of high wind pressure is critical to the success of all these concepts. High wind pressure is not employed to produce loudness. The virtue of high wind pressure is twofold. First, it provides a kind of tonal quality that projects sound very efficiently. You have probably experienced the amazing projection achieved by great singers and instrumentalists. Their tone is not loud, but is infused with an intensity that projects. The Wurlitzer organ is another good example. Wurlitzer organs are capable of filling large, acoustically dead motion picture theaters with rich and full tone. The same Wurlitzer organ voiced in the same way can be placed in a small broadcasting studio with an equally fine result. You can stand next to a Wurlitzer organ with no sonic discomfort; its sound projects without extreme loudness. The second virtue of high pressure is the production of sonorous quality in solo stops. High pressure is particularly helpful in reeds, as it also promotes stability. In the Conference Center organ we applied high pressure liberally, but not throughout the instrument, because there is no doubt whatsoever that certain classes of tone fare much better on moderate pressure. This includes, of course, the traditional diapason choruses. In summary, there are certain tonal characteristics that are best achieved with different wind pressures, and to create an instrument of broad tonal scope that can work in a dry acoustic, both approaches should be employed.

Finally, although we consider unenclosed voices a luxury on small organs, there is no doubt of their value in large schemes. We designed a large Great, which is capable of a smooth crescendo buildup by itself. All of the tonal families are well represented and enhanced by the freshness of unenclosed placement directly behind the facade. This is where the application of moderate wind pressure is most valuable. The largest enclosed division, the Swell, has a very complete diapason chorus, as does the Solo. Therefore, we have the luxury of unenclosed Great and Pedal choruses in contrast to expressive choruses in both Swell and Solo. A choir can be backed by all manner of plenum effects at many dynamic levels.

TONAL FINISHING

In scaling and designing the pipes we used the acoustical projections of Jaffe Holden Scarbrough. A theory, which fortunately worked out in practice, is that in order to have good bass in such a huge building, we would have to use extra-large scales. Treble scales would also have to be large, because there were no nearby reflective surfaces to aid in treble projection. It was almost as though the organ were located outdoors!

Our approach to tonal finishing followed the same pattern as our tonal renovation of the Tabernacle Aeolian-Skinner organ, which was completed in 1989. As at the Tabernacle, hall scheduling made it impossible to conduct long periods of tonal regulation. We never had one longer than ten days. Even then, the complete silence that we are used to in churches didn't happen except on Sundays and holidays. But this turned out to be an artistic advantage in both projects. We would do some work, evaluate it, and make refinements before moving on. The breaks between tonal finishing sessions allowed us to think through the balancing and detailed polishing of the instrument while it was being used and tested in a variety of applications. Because of the hall's varied bookings, we were able to test the organ with the Tabernacle Choir and various visiting organizations, as well as orchestra. Tonal finishing was a 32-month process.

We started this job realizing that we might have to make some major changes after hearing the organ in its final acoustical setting. Building an organ based entirely on theoretical concepts and mathematical projections is a dangerous business. We were prepared for the worst. Much to our great surprise and relief, the projections turned out to be right on the money, and the instrument performed generally as we had hoped it would. The acoustic turned out to be much like a good symphony hall of the less resonant type. We faced a huge job of tonal regulation, but no more than what we expected in any instrument of this size. We did make some tonal

The console is made of cherry, kerulian birch burl veneer, and ebony with polished bone and ebony manual key coverings, polished ebony and cherry drawknobs on brass shanks, and cast brass expression shoes.

changes, but we were gratified that none of these contradicted our design theories. To the contrary, changes were necessary only where we were not quite bold enough in following our original concepts! These were: emphasis on 8' foundation tone, adequate wind pressure, and emphasis on open rather than stopped flutes.

Even with fairly large scales specified for the diapasons, we increased the scales slightly on the Great Large Open Diapason and the Great Principal. The instrument had commanding reeds and a powerful solo flute, but no diapason of similar character. Therefore, we extended the Pedal Open Wood into a Stentor Diapason on the Solo (scale 38 on 25" wind pressure). We raised the wind pressure of the Solo from 10" to 11½" and of the Grand Solo from 15" to 17½". We knew at the outset that normal stopped flutes were not terribly effective in large buildings so we included only a few. The results proved the point and caused us to eliminate two more and replace them with diapasons! The straight 8' Stopped Diapason in the Swell was replaced with the 8' Small Open Diapason. The 8' Chimney Flute in the Great gave way to an 8' tapered principal (Gemshorn). These aided greatly the dynamic buildup in these divisions.

We also discovered that our system of double expression, which is very effective in smaller buildings, did not mean much in a building of this immense size. With the long distances between the pipes and the listeners, a single swell box is quite adequate to reduce volume to *ppp*. We modified the double expressive box and shades of the Grand Solo to make it an entirely separate subdivision of the Solo. Being separately couplable, the Grand Solo Tuba chorus topped by a Tierce Mixture serves as the capstone of other divisions.

FACADE

That the facade turned out so well is another one of the miracles of this job. It could have been a real disaster, because it was truly a design by committee. Emphasis was placed on the facade because it is the main design feature of the entire auditorium. Our first instinct was to do something completely different than the Tabernacle. We tried Modern, Greek revival, and many other concepts. Soon it was made clear that we must arrive at something that would be a reminder of the Tabernacle, but an imitation of that case would be doomed to failure on the grounds of both appropriateness and accuracy. Four groups were involved in the design: Bill Williams, project architect of ZGF, Seattle, Washington; the church architects and design experts under the direction of Leland Gray; Paul Fetzer of Fetzers' Inc., Salt Lake City, the architectural millwork firm engaged to build the facade along with the other woodwork of the building; and Steuart Goodwin from our firm. Steuart suggested that by employing two large towers, a group of smaller towers and flats, and gold-finished front pipes we would echo the feeling of the Tabernacle no matter how far afield we went with other elements. He developed the initial design. Scott Bleak of the church's Architecture and Engineering Division suggested the unique idea of bridging all of the towers with one sweeping connective element at the top. We wanted the facade to be as acoustically transparent as possible and to include reflective elements to help project sound forward. Paul Fetzer worked out all these details, as well as the decorative elements and structure of the woodwork. The design team worked tirelessly to achieve a result that was acceptable to each party and one that appears to have been happily embraced by the leadership and membership of the church.

COLLABORATION

The time schedule, which was shorter than we would expect, even for a modest-sized church organ, combined with the size of the instrument made it impossible for us to accomplish this project without a lot of extra help from our many trusted suppliers and colleagues. A.R. Schopp's Sons Inc. of Alliance, Ohio, made almost all of the pipes and, in addition, all of the windchests and most of the wind regulators. Peterson Electro-Musical Products of Alsip, Illinois, made the combination action and relay equipment. Walker Technical Company of Zionsville, Pennsylvania, furnished the digital percussion effects. Fetzers' Inc. of Salt Lake City manufactured and installed all of the facade woodwork. The gold finish of the front pipes was executed in Bountiful, Utah, by New Image Body Works. M.L. Bigelow & Company Inc. of American Fork, Utah, was very helpful to us throughout the project, particularly in restorative work of the Diaphone pipes. We could not have done this project without the help of the skilled and diligent organ technicians of the Tabernacle, Robert Poll and his associate, Lamont Anderson.

Our longtime colleague Steuart Goodwin collaborated on this project as he did on the Tabernacle renovation, helping with design work, voicing, and supervising massive amounts of the tonal finishing. Our project manager for the first portion of the work was Robert Rhoads, who was succeeded after his retirement by Louis Patterson.

All of us at Schoenstein wish to thank the Conference Center team under the direction of Tom Hanson for their generous cooperation and support, and especially the Tabernacle Choir staff: Tabernacle organists John Longhurst, Clay Christiansen, and Richard Elliott; Temple Square organists Bonnie Goodliffe and Linda Margetts; music director Craig Jessop and associate director Mack Wilberg; choir president Mac Christensen and past president Wendell Smoot. Working on Temple Square, serving the Mormon Tabernacle Choir, is a once-in-a-lifetime experience that we have been blessed to enjoy twice.

Finally, we must recognize perhaps the most important collaborators of all, the great builders of the past who handed down knowledge and inspiration. Three of them even provided pipes—Wurlitzer, Kimball, and Aeolian—three giants of American organbuilding.

JACK M. BETHARDS
On behalf of all the organbuilders:

Wendell Ballantyne	Joe Lambarena
David Beck	Luis-Alonzo Lopez
Ann Bharoocha	Fernando Martinez
Filiberto Borbon	George Morten
Peter Botto	Mike Ohman
Jim Cullen	Louis Patterson
Mary Dunwell	Sharon Powers
Manuela Esteva	Chuck Primich
Steuart Goodwin	Bill Ramsay
Vicente Guerrero	Robert Rhoads
Chris Hansford	Tom Roberts
Nathan Hansford	Don Siler
Mark Hotsenpiller	Cindy Smith
Eldon Ives	Chet Spencer

The Orchestral Tuba Mirabilis on 20" wind located on the roof of the Swell box

The Musicians' Perspective

July 2004 marks the 75th anniversary of the Mormon Tabernacle Choir's weekly radio broadcast, *Music and the Spoken Word* (which also has been televised since 1962). For the last 55 years the Tabernacle's magnificent Aeolian-Skinner organ has provided colorful and appropriate accompaniments for the choir, and will continue to do so for the foreseeable future. (To find the broadcast in your area go to <www.musicandthespokenword.com> or phone 800-247-6655.)

With growth, however, comes change. The demand for seating for a number of ecclesiastical and concert events now far exceeds the 6,500-seat capacity of the Tabernacle. In 1996, the Church of Jesus Christ of Latter-day Saints announced plans to build a larger structure to help meet that demand. The result is the 21,000-seat Conference Center, which occupies the entire block immediately north of Temple Square. The building was finished and dedicated in 2000. The installation of the organ by Schoenstein & Co. began in January 2000. The instrument was first heard publicly during the church's General Conference in October of that year with only the Swell and Solo divisions installed, and tonally unfinished. The organ was used for numerous events throughout the erection and finishing process, with organists employing whatever tonal resources happened to be available at the time. While frustrating in some ways to use the organ in this rather piecemeal manner, in the long run it was most advantageous. It provided the opportunity to evaluate the instrument in actual use on virtually a rank-by-rank basis, and resulted in some tonal changes as the work progressed. Tonal finishing was completed just in time for the ACO Regions VIII and IX Conventions held in Salt Lake City in June 2003. In addition to four recitals presented by staff organists, a gala inaugural concert for the organ took place during the convention, attracting an audience in excess of 15,000. That program featured Todd Wilson performing Joseph Jongen's *Symphonie concertante* with the Orchestra at Temple Square, plus the Tabernacle Choir singing Leonard Bernstein's *Chichester Psalms* and several other works, accompanied by the organ and a small instrumental ensemble.

The musical demands placed upon the Schoenstein organ are anything but typical. A recent Mormon Tabernacle Choir concert included a chorus from Bach's cantata, *Jesu, der du meine Seele*; the "Hallelujah" chorus from Beethoven's *Christ on the Mount of Olives*; Rimsky-Korsakov's *Slava*; *Call of the Champions* by John Williams (written for the opening ceremonies of the 2002 Winter Olympics); "Climb Every Mountain" from *The Sound of Music*; a medley of George M. Cohan favorites; plus an assortment of hymn arrangements and folk songs. Like many of the choir's programs, this one concluded with the ever-popular Wilhousky arrangement of "The Battle Hymn of the Republic." Talk about eclectic!

The Mormon Tabernacle Choir is adept at performing music written in diverse styles. The accompanying organ must be equally flexible. For this particular concert we were joined by a couple of dozen instrumentalists (brass, woodwind, harp, and percussion). At many performances, however, the organ alone provides the accompaniment.

The Beethoven chorus poses a particular challenge. The bass line of the keyboard reduction is largely unplayable on the pedals of the organ. Rather than resorting to compromising the bass line or to thinning out the accompaniment even more, we do not hesitate to put two organists at the console, utilizing the "Pedal Tutti to Manual" couplers. In this way we can play all the written notes and judiciously flesh out the reduction to more closely approach the effect of the full orchestra against the massive choir. There are many orchestral reductions that benefit from this approach. Furthermore, knowing that we are not uncomfortable sharing the bench, associate conductor Mack Wilberg, who creates so many fine settings for the Mormon Tabernacle Choir, occasionally writes original organ accompaniments for two players. Our approach in working with the choir is to do whatever it takes to provide the most satisfying musical result.

With a staff of five organists constantly preparing for different events at Temple Square, it is essential that we work efficiently and cooperatively. Consider, for example, the registration of choir accompaniments for broadcasts. A new anthem will typically be read for the first time at the Thursday rehearsal ten days before the broadcast on which it is programmed. The organist will have a registration "roughed out" for that first reading. As he or she observes the conductor's interpretation and hears the organ with the choir the registrations are refined. At the subsequent Thursday rehearsal all the program repertoire is recorded, both for timing purposes and to provide a study tape for the conductor, organist, and production personnel. The need for further registration adjustments may become evident upon hearing the tape. Normally a second organist is present at rehearsals and performances. His or her observations from the perspective of either the broadcast audio booth or the audience are always welcome and helpful. Finally, following the performance, the registrations are written down to serve as a reference for the next organist who will perform that accompaniment.

That same need for efficiency dictated certain decisions relative to the Conference Center organ. In order to facilitate moving between the Tabernacle and Conference Center instruments, console and key dimensions were duplicated, insofar as practical. Also the location of pistons, reversibles, couplers, stopknobs, and other controls corresponds closely between the two consoles.

Church authorities desired that the Conference Center have something of a "familiar" feel for the public. To that end the arrangement of the entire rostrum area is similar to that of the Tabernacle. The pipe display of the new organ was designed to be subtly reminiscent of the Tabernacle organ. The desire for familiarity also influenced certain tonal aspects of the Schoenstein organ. It was important, for instance, to include a wide array of elegant string stops, along with the resources necessary to render the signature sound of our broadcast's closing theme ("As the Dew from Heaven Distilling") "authentically."

However, some important departures from the resources of the Tabernacle organ are evident as well. For example, in lieu of an antiphonal division we opted for a second solo division. Years of experience at the Tabernacle convinced us of the potential usefulness of two solo departments, particularly when rendering reductions of orchestral accompaniments. Usage has confirmed the viability of that decision.

There is an unrelenting schedule of broadcasts, services, concerts, and daily organ recitals held in the various facilities at Temple Square. We move frequently and easily among its four performance organs, enjoying the strengths of each. We find the new Conference Center organ to have a colorful, warm, and noble sound. It has already proven its adaptability to a wide variety of musical styles. Particularly noteworthy is its ability to complement and soar above a full symphony orchestra when required. The old axiom that in matters of design form follows function certainly applies to this instrument.

The Conference Center organ is the result of a lengthy and productive collaboration among organbuilder, organists, architects, and acoustical consultants. The challenges were numerous. The result is gratifying beyond all expectation.

JOHN LONGHURST, Senior Organist
Mormon Tabernacle Choir

Conference Center Organ

The Church of Jesus Christ of Latter-day Saints
Salt Lake City, Utah, USA
Schoenstein & Co., Opus 139 — 2000-2003
Five-manual and pedal movable console
103 voices, 130 ranks, 7,708 pipes

The organ in the Conference Center was built in 2000-2003 by Schoenstein & Co. of San Francisco. This organ of the American Romantic style employs a symphonic tonal approach with the richness and warmth characteristic of English instruments. Although designed primarily to provide colorful and varied accompaniment, the organ also renders the solo repertoire beautifully. A five-manual console controls the 7,708 pipes of its 130 ranks, which are spread across seven divisions (including the Grand Solo, which is housed in the Solo chamber but is controlled by independent swell shades).

Great Manual II
23 voices, 32 ranks, 1,905 pipes
Wind pressure 5½" (140 mm.)

32' Dulciana ..... 61 pipes
16' Double Open Diapason .. 61 pipes
16' Bourdon (Wood) ..... 61 pipes
8' Stentor Diapason (Solo)
8' Large Open Diapason..... 61 pipes
(7½"/190 mm. wind)
8' Open Diapason ..... 61 pipes
8' Horn Diapason ..... 61 pipes
8' Gamba ..... 61 pipes
8' Gemshorn ..... 61 pipes
8' Harmonic Flute ..... 61 pipes
8' Doppelflöte (Wood) ..... 61 pipes
4' Principal ..... 61 pipes
(7½"/190 mm. wind)
4' Octave ..... 61 pipes
4' Octave Gemshorn..... 61 pipes
4' Forest Flute ..... 61 pipes
2⅔' Twelfth ..... 61 pipes
2' Fifteenth ..... 61 pipes
1⅗' Seventeenth ..... 61 pipes
2' Full Mixture IV-V..... 266 pipes
(7½"/190 mm. wind)
2' Mixture IV..... 215 pipes
1⅓' Sharp Mixture ..... 175 pipes
16' Bass Trumpet ..... 61 pipes
(7½"/190 mm. wind)
8' Trumpet..... 61 pipes
(7½"/190 mm. wind)
4' Clarion..... 61 pipes
(7½"/190 mm. wind)
8' Tuba Mirabilis (Orchestral)
8' Millennial Trumpet (Solo)
Les cloches de Hinckley. 32 notes
Cymbelstern
Tremulant
I/II Manual Transfer (settable)*

Swell (enclosed) Manual III
22 voices, 28 ranks, 1,817 pipes
Wind pressure 5½" (140 mm.)

16' Double Open Diapason ..68 pipes
16' Bourdon (Wood) .....68 pipes
8' Open Diapason .....68 pipes
8' Small Open Diapason.....68 pipes
8' Silver Flute .....68 pipes
8' Bourdon.....12 pipes
8' Viole de gambe.....68 pipes
8' Viole céleste .....68 pipes
8' Flauto Dolce .....68 pipes
8' Flute Celeste (TC) .....56 pipes
4' Principal .....68 pipes
4' Harmonic Flute.....68 pipes
2' Fifteenth .....61 pipes
2⅔' Cornet III .....183 pipes
2' Plein Jeu V .....276 pipes
32' Contra Fagotto.....68 pipes
(10"/254 mm. wind)
16' Bombarde .....68 pipes
16' Fagotto 12 pipes
(10"/254 mm. wind)
8' Trompette .....68 pipes
8' Cornopean .....68 pipes
(10"/254 mm. wind)
8' Oboe .....68 pipes
8' Voix humaine .....61 pipes
Separate tremulant draws
with Voix humaine stop knob
4' Clairon harmonique.....68 pipes
4' Clarion.....68 pipes
(10"/254 mm. wind)
Tremulant
Swell to Swell 16'
Swell Unison Off
Swell to Swell 4'

Choir (enclosed) Manual I
23 voices, 23 ranks, 1,539 pipes
Wind pressure 5½" (140 mm.)

16' Bass Viol .....68 pipes
8' Viola Pomposa .....68 pipes
8' Viola Celeste .....68 pipes
8' Echo Gamba .....68 pipes
8' Gamba Celeste.....68 pipes
8' Viol d'orchestre.....68 pipes
8' Viol céleste.....68 pipes
16' Lieblich Bourdon (Metal)68 pipes
8' Lieblich Bourdon.....12 pipes
8' Concert Flute (Wood).....68 pipes
4' Nachthorn .....68 pipes
2⅔' Nazard .....61 pipes
2' Harmonic Piccolo .....61 pipes
1⅗' Tierce.....61 pipes
8' Echo Diapason.....68 pipes
4' Fugara.....68 pipes
2⅔' Twelfth .....61 pipes
2' Fifteenth.....61 pipes
1⅓' Nineteenth .....61 pipes
1' Twentysecond.....61 pipes
16' Flügel Horn.....12 pipes
8' Trumpet .....68 pipes
8' Flügel Horn.....68 pipes
8' Cromorne.....68 pipes
4' Rohr Schalmei .....68 pipes
8' Tuba Mirabilis (Orchestral)
8' Millennial Trumpet (Solo)
Harp .....61 notes
Celesta .....61 notes
Orchestral Bells .....37 notes
Tremulant
Choir to Choir 16'
Choir Unison Off
Choir to Choir 4

Note: Choir stops are grouped by tonal family on specification and on stop jamb

*Added in 2021

Solo (enclosed) Manual IV
10 voices, 19 ranks, 1,085 pipes
Wind pressure 11½" (292 mm.)

8' Open Diapason ..... 61 pipes
8' Phonon Diapason (Orchestral)
8' Symphonic Flute ..... 61 pipes
4' Principal ..... 61 pipes
4' Octave (Orchestral)
2⅔' Quint Mixture V ..... 288 pipes
8' French Horn ..... 61 pipes
8' Cor Anglais (Orchestral)
8' Clarinet (Orchestral)
Celestial Chimes ..... 32 notes
Orchestral Harp ..... 61 notes
Tremulant
Variable Tremulant

Separate Shades -- Grand Solo –
Wind pressure 17½" (444 mm.)
16' Bass Tuba ..... 61 pipes
8' Tuba ..... 61 pipes
4' Tuba Clarion ..... 61 pipes
8' Tuben (III Ranks)
Draws Bass Tuba, Tuba, and Tuba Clarion at 8' pitch
2' Tierce Mixture IV-VI ... 309 pipes

Unenclosed Solo stops
8' Stentor Diapason ..... 29 pipes
Extends Pedal Open Wood
(25"/635 mm. wind)
8' Millennial Trumpet ..... 61 pipes
(15"/381 mm. wind)
Solo to Solo 16'
Solo Unison Off
Solo to Solo 4'

Orchestral (enclosed) Manual V
10 voices, 10 ranks, 670 pipes
Wind pressure 10" (254 mm.)

16' Tibia Clausa (Wood) ..... 12 pipes
8' Phonon Diapason ..... 61 pipes
8' Tibia Clausa ..... 61 pipes
8' Stentor Gamba ..... 61 pipes
8' Celeste ..... 61 pipes
4' Octave ..... 12 pipes
4' Tibia Clausa ..... 12 pipes
2⅔' Tibia Twelfth
2' Tibia Piccolo ..... 12 pipes
1⅗' Tibia Tierce
16' Clarinet ..... 61 pipes
8' Tuba Horn ..... 61 pipes
(15"/381 mm. wind)
8' Clarinet ..... 12 pipes
8' Cromorne (Choir)
8' Cor Anglais ..... 61 pipes
8' Orchestral Oboe ..... 61 pipes
8' Vox Humana ..... 61 pipes
(5½"/140 mm. wind)
Separate tremulant draws with Vox Humana stop knob
Tremulant
Also draws Tuba Horn tremulant
Variable Tremulant
8' Tuba Mirabilis ..... 61 pipes
(20"/508 mm. wind)
Orchestral to Orchestral 16'
Orchestral Unison Off
Orchestral to Orchestral 4'

Pedal
15 voices, 18 ranks, 692 pipes
Wind pressure 5½" (140 mm.)

64' Gamba ..... 4 pipes
(GGGGG#)
(10"/254 mm. wind)
32' Diaphone (Wood) ..... 12 pipes
(25"/635 mm. wind)
32' Diapason ..... 12 pipes
(10"/254 mm. wind)
32' Gamba ..... 12 pipes
32' Dulciana (Great)
32' Sub Bass (Wood) ..... 12 pipes
(10"/254 mm. wind)
16' Diaphone (Wood) ..... 32 pipes
16' Open Wood ..... 32 pipes
(10"/254 mm. wind)
16' Diapason ..... 32 pipes
16' Great Diapason (Great)
16' Swell Diapason (Swell)
16' Violone (Wood) ..... 32 pipes
(7½"/190 mm. wind)
16' Gamba ..... 32 pipes
16' Bass Viol (Choir)
16' Dulciana (Great)
16' Sub Bass ..... 32 pipes
16' Tibia Clausa (Orchestral)
16' Bourdon (Swell)
16' Lieblich Bourdon (Choir)
10⅔' Quint ..... 32 pipes
8' Open Wood ..... 12 pipes
8' Principal ..... 32 pipes
8' Gamba ..... 12 pipes
8' Flute ..... 32 pipes
8' Bass Viol (Choir)
8' Sub Bass ..... 12 pipes
8' Bourdon (Swell)
8' Lieblich Bourdon (Choir)
4' Choral Bass ..... 32 pipes
4' Octave Flute (Flute) ..... 32 pipes
4' Bass Viol (Choir)
2⅔' Rauschquinte II ..... 64 pipes
1⅓' Mixture III ..... 96 pipes
64' Trombone ..... 4 pipes
(GGGGG#)
(20"/508 mm. wind)
32' Trombone ..... 12 pipes
32' Contra Fagotto (Swell)
16' Trombone ..... 32 pipes
16' Bass Tuba (Solo)
16' Bombarde (Swell)
16' Bass Trumpet (Great)
16' Fagotto (Swell)
16' Flügel Horn (Choir)
16' Clarinet (Orchestral)
8' Tromba ..... 32 pipes
(15"/381 mm. wind)
8' Bass Tuba (Solo)
8' Bass Trumpet (Great)
8' Bombarde (Swell)
8' Fagotto (Swell)
8' Clarinet (Orchestral)
8' Flügel Horn (Choir)
4' Tromba ..... 12 pipes
4' Bass Trumpet (Great)
4' Cromorne (Choir)
Pizzicato Bass
Plays 16 Open Wood at 8' pitch through pizzicato relay
Tower Chimes ..... 32 notes

Intermanual Couplers
Swell to Great 16'
Swell to Great 8'
Swell to Great 4'
Choir to Great 16'
Choir to Great 8'
Choir to Great 4'
Solo to Great 16'
Solo to Great 8'
Solo to Great 4'
Orchestral to Great 16'
Orchestral to Great 8'
Orchestral to Great 4'
Swell to Choir 16'
Swell to Choir 8'
Swell to Choir 4'
Solo to Choir 8'
Orchestral to Choir 8'
Orchestral to Solo 8'
Solo to Orchestral 8'
Great Tutti to Solo
Pedal Tutti to Swell

*Added in 2021

Pedal Couplers
Great to Pedal 8'
Swell to Pedal 8'
Swell to Pedal 4'
Choir to Pedal 8'
Choir to Pedal 4'
Solo to Pedal 8'
Solo to Pedal 4'
Orchestral to Pedal 8'
Orchestral to Pedal 4'

Special Couplers

Pedal Tutti to Swell
Pedal Tutti to Choir
Great Tutti to Solo
Pedal Divide 12/13
Pedal Divide 17/18
Pedal Divide 20/21
Pedal Divide deactivates pedal coupler notes 1-12 and pedal stop notes 13-32, etc.
Swell to Great Sforzando
Solo to Great Sforzando
Sforzando couplers activated by toe lever
Grand Solo off Solo
Grand Solo on Great
Grand Solo on Swell
Grand Solo on Choir
MIDI to Great
MIDI to Swell
MIDI to Choir
MIDI to Solo
MIDI to Orchestral
MIDI to Pedal

Combinations (each User folder holds 50 memory levels)
General.....0, 1-24
1-4 and 13-16 duplicated by toe studs
Great.....1-8
Swell.....1-8
Choir.....1-8
Solo.....1-8
Orchestral.....1-8
Pedal.....1-8
Pedal pistons 1-8 duplicated on thumb pistons under Manual I

Reversibles
Great to Pedal (thumb and toe)
Swell to Pedal (thumb and toe)
Choir to Pedal (thumb)
Solo to Pedal (thumb)
Orchestral to Pedal (thumb)
Solo to Great (toe)
64 Trombone (toe)
64 Gamba (toe)
32 Trombone (toe)
32 Diaphone (toe)
32 Fagotto (toe)
32 Sub Bass (toe)
Cymbelstern (thumb and toe)
Manual I/II (thumb)
with indicator light
Full Organ (thumb and toe)
with indicator light.
(Separate settings for each user)
Note: Coupler reversibles affect sub and super couplers in off mode.

Mechanicals
Swell expression pedal
Choir expression pedal
Solo expression pedal
Orchestral expression pedal
Expression shoe selector
Crescendo pedal
(4 sequences per user, all adjustable from console)
30-segment LED Crescendo
Pedal indicator
"Next" piston sequencer controls*
(8 thumb pistons; 2 toe studs)
"Previous" piston sequencer controls*
(2 thumb pistons; 1 toe stud)
Swell Voix Humaine Tremulant Off*

Accessories
IOTI Virtuoso control system (2021)
Console power on
Blower power on
Combination set
Range set*
Memory selector
MIDI In/Out/Thru jacks
Digital clock
Clock mode selector
Stop/Start, Reset buttons
Clock synchronized to WWVB
Broadcast timer
Console fan on/off

Case
Builders: Fetzers, Inc. (Salt Lake City); Louchard Yacht Restoration (Port Townsend, WA)
Materials: walnut; cherry

Tuning
Equal temperament; A=440 Hz at 74° F

Blowers
Six electric blowers
(Total of 33 h.p.)

*added in 2021 as part of control system replacement

General Bibliography

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The Tabernacle Choir at Temple Square is an ambassador for The Church of Jesus Christ of Latter-day Saints.

LDS Conference Center
Schoenstein & Co., Inc. 2003

GREAT | 61 notes, w.p. 5½", except * 7½"

Stop	C	c°	c¹	c²	c³	c⁴	MW	Remarks
Dulciana 32′	261.5	155.5	98.0	61.7	38.9	24.5	2/9	36 zinc
Double Open Diapason 16′	250.4	148.9	88.5	52.0	32.6	20.2	2/9	24 zinc
Bourdon 16′	149x190							Wood; pierced stoppers @ c²
Large Open Diapason 8′*	162.7	105.3	65.3	40.5	24.1	14.3	1/5	17 zinc; C-F# 2/9 MW
Open Diapason 8′	162.7	96.5	57.4	34.1	21.1	13.1	1/4	17 zinc
Small Open Diapason 8′	148.9	88.5	53.9	33.0	20.3	12.4	2/9	17 zinc; Victorian slots
Gamba 8′	87.3	55.0	34.6	21.8	13.7	8.7	1/4	12 zinc; tin; French slots
Harmonic Flute 8′	136.5	84.0	64.0	47.0	33.0	22.0	2/9 <	12 zinc; C-f¹ Victorian slots; harm. @ f#¹
Doppelflöte 8′	96.8x117.5		44.5x69.9 (c°)					Wood
Gemshorn 8′	148.0	88.6	52.7	31.3	18.6	11.1	2/9	12 zinc; ½ taper
Principal 4′*	96.5	62.6	38.8	23.1	13.7	8.5	1/4	5 zinc
Octave 4′	92.4	54.9	32.6	20.2	12.6	8.1	1/4	5 zinc
Octave Gemshorn 4′	84.4	51.7	31.7	19.4	11.9	7.3	2/9	Tin; ⅔ taper
Forest Flute 4′	68.0	52.5	37.7	26.3	17.8	12.1	2/9	C-e°=Victorian slots; harm. @ f°
Twelfth 2⅔″	59.9	37.2	23.1	14.3	9.3	5.7	2/9	
Fifteenth 2′	50.4	31.3	19.3	12.0	7.8	5.0	1/4	
Seventeenth 1⅗′	38.8	24.1	14.9	9.3	6.0	——	1/5 <	
Full Mixture 2′ IV-V *ff**	**2′**	**1′**	**½′**	**¼′**	**⅛′**			
	50.4	31.3	19.3	12.6	8.1	——	unisons 2/9; quints 1/5	
C	*2*	*1 ⅓*	*1*	*⅔*				
c#°	*2 ⅔*	*2*	*1 ⅓*	*1*	*⅔*			
a°	*4*	*2 ⅔*	*2*	*1 ⅓*	*1*			
b¹	*4*	*2 ⅔*	*2*	*1 ⅓*				
a#²	*5 ⅓*	*4*	*2 ⅔*	*2*				
Mixture 2′ IV *f*	**2′**	**1′**	**½′**	**¼′**	**⅛′**			
	50.4	31.3	18.6	12.0	7.8	——	1/4	
C	*2*	*1 ⅓*	*1*	*⅔*				
d°	*2 ⅔*	*2*	*1 ⅓*	*1*				
g#²	*2 ⅔*	*2*	*1 ⅓*					
c#³	*2 ⅔*	*2*						
Sharp Mixture 1⅓′ III *mf*	**2′**	**1′**	**½′**	**¼′**	**⅛′**			
	45.4	28.7	17.8	11.0	6.8	4.6	1/4	
C	*1 ⅓*	*1*	*⅔*					
c²	*2*	*1 ⅓*	*1*					
c³	*2 ⅔*	*2*	*1 ⅓*					
f³	*2 ⅔*	*2*						
Bass Trumpet 16′*	6″	3¾″						Tapered shallots; harm. @ g#³
Trumpet 8′*	4″							Tapered shallots; harm. @ g#², 5 flues
Clarion 4′*	3¼″							Tapered shallots; harm. @ g#¹, 17 flues

N.B. Unless indicated, metal content is 45% tin; "Victorian" slots are 1/3 Ø wide, 1/3 Ø margin at top; "French" slots are 1/4 Ø wide, 1 Ø margin; "<" indicates mouth width progresses wider toward top.

SWELL | 68 notes, w.p. 5½", except * 10"

Stop	C	c⁰	c¹	c²	c³	c⁴	MW	Remarks
Double Open Diapason 16′	229.6	136.5	81.1	50.4	31.3	20.2	2/9	24 zinc
Bourdon 16′/8′	170x216		62.5 (g#¹)	54.0	34.8	22.5	1/4	32 wood; 36 stopped metal
Open Diapason 8′	162.3	96.5	57.4	35.3	21.1	13.5	1/5	17 zinc
Small Open Diapason 8′	136.5	81.2	49.6	30.4	18.7	11.5	1/4	12 zinc
Silver Flute 8'	120.9	78.5	60.3	43.0	29.8	14.9	1/5	12 zinc, Victorian slots
Viole de Gambe 8'	87.9	53.9	33.0	20.3	12.4	7.6	2/9 <	12 zinc
Viole céleste 8′	65.4	46.2	33.0	20.3	12.4	7.6	2/9 <	12 zinc
Flauto Dolce 8′	87.0	65.0	45.0	24.0	10.0	7.0	1/5 <	12 zinc; ⅔ taper, slotted
Flute Celeste 8′ t.c.	*same scale as Flauto Dolce*							
Principal 4′	92.4	54.9	32.6	19.3	12.6	8.1	2/9	5 zinc
Harmonic Flute 4′	71.0	55.0	40.0	28.0	19.0	13.0	2/9	Tin; C-e⁰ Victorian slots, harm. @ f⁰
Fifteenth 2′	50.4	31.3	19.3	12.0	7.8	5.0	2/9 <	
Cornet 2⅔′ III *mf*	**2⅔′**	**2′**	**1′**	**½′**	**¼′**	**⅛′**		
4′, 2⅔′, 2′=	59.9	48.2	28.7	17.8	11.0	7.1	2/9	
	1⅗′	**⅘′**	**⅖′**	**⅕′**				
1⅗′ =	38.8	23.1	13.7	8.5	——	——	1/5	
C	*2 ⅔*	*2*	*1 ⅗*					
e³	*4*	*2 ⅔*	*2*					
Plein Jeu 2′ V *f*	**2′**	**1′**	**½′**	**¼′**	**⅛′**			
	52.6	31.3	19.3	12.0	8.1	——	2/9	
C	*2*	*1 ⅓*	*1*	*⅔*	*½*			
a#⁰	*2 ⅔*	*2*	*1 ⅓*	*1*	*⅔*			
d#¹	*4*	*2 ⅔*	*2*	*1 ⅓*	*1*			
g#¹	*4*	*2 ⅔*	*2*	*1 ⅓*				
b²	*5 ⅓*	*4*	*2 ⅔*	*2*				
Contra Fagotto 32′/16′*	10″	5½″	3¼″					Tapered shallots; harm. @ g#³
Bombarde 16′	145.0	100.0	80.0	66.0	55.0	——		Parallel shallots; harm. @ c⁴
Trompette 8′	108.0							Parallel shallots; harm. @ c³, 12 flues
Cornopean 8′*	3½″							Tapered shallots; harm. @ g#¹, 12 flues
Oboe 8′	3¾″							Tapered shallots; no caps, 12 flues
Voix humaine 8′	40.0							Parallel shallots; 12 flues to c⁴
Clairon harmonique 4′	96.0							Parallel shallots; harm. @ c²; 24 flues
Clarion 4′*	2⅞″							Tapered shallots; harm. @ g#⁰; 24 flues

CONFERENCE CENTER

CHOIR | 68 notes, w.p. 5½″

Stop *(listed by tonal family)*	C	c⁰	c¹	c²	c³	c⁴	MW	Remarks
Bass Viol 16′	142.6	84.8	50.4	30.0	17.8	10.6	2/9	24 zinc
Viola Pomposa 8′	119.9	71.3	42.4	25.2	15.0	8.9	1/4	12 zinc; c⁰-c³ flared 2 scales
Viola Celeste 8′	87.3	61.7	42.4	25.2	15.0	8.9	1/5 <	12 zinc; g⁰-c³ flared 2 scales
Echo Gamba 8′	77.7	46.2	27.5	19.4	13.7	9.7	1/6 <	12 zinc
Gamba Celeste 8′	*same scale as Echo Gamba*							
Viol d'Orchestre 8′	40.1	27.9	19.4	13.5	9.4	––	1/5	12 zinc, bellied 3 scales
Viol céleste 8′	*same scale as Viol d'Orchestre*							
Lieblich Bourdon 16′/8′	229.7	129.6	83.7	54.0	34.8	22.5	1/4	20 zinc; f¹-f⁴=chimneys; f#⁴ ⅔ taper
Concert Flute 8′	105x129	66x81	–	26.3 (g#²)	23.1	15.7	1/5	44 wood
Nachthorn 4'	80.0	56.6	40.0	28.3	20.0	14.2	1/5	Victorian slots to c#³
Nazard 2⅔′	56.0	35.0	22.7	15.5	10.4	6.1	2/9	C-f²=chimneys; @ f#² open tapered
Harmonic Piccolo 2′	48.2	36.6	24.2	14.7	8.4	6.0	2/9	c⁰-c³ harmonic
Tierce 1⅗′	64.2	39.6	23.9	14.9	9.7	––	2/9	⅔ taper
Echo Diapason 8′	143.3	87.9	53.9	33.0	20.3	12.4	2/9	12 zinc; tin
Fugara 4'	84.4	51.7	31.7	19.4	11.9	7.3	2/9	Tin
Twelfth 2⅔′	60.9	37.3	22.9	14.0	8.6	5.3	1/5	Tin
Fifteenth 2′	49.7	30.4	18.7	11.4	7.0	4.3	2/9 <	Tin
Nineteenth 1⅓′	35.8	22.0	13.5	8.3	5.1	––	1/5 <	Tin
Twenty-Second 1′	29.2	17.9	11.0	6.7	4.1	––	2/9 <	Tin
Flügel Horn 16′/8′	4″	2⅞″						Tapered shallots, 14 flues
Trumpet 8'	4″							Tapered shallots, 14 flues
Cromorne 8′	40.0	34.0	29.0	27.0	23.5	––		Parallel shallots, 14 flues
Rohr Schalmei 4′	1¼″							Tapered shallots, 29 flues

ORCHESTRAL | 61 notes, w.p. 10″

Stop	C	c⁰	c¹	c²	c³	c⁴	MW	Remarks
Tibia Clausa 16′/2′	200x257	117.5x136.5						Wood, 12 Kimball; Wurlitzer @ c⁰
Phonon Diapason 8′/4'	153.0							Wurlitzer
Stentor Gamba 8′	73.5	45.0	26.7	16.9	11.2	7.6	1/5 <	12 zinc; Victorian slots; flared c⁰-f#³
Gamba Celeste 8′	*same scale as Stentor Gamba*							
Clarinet 16′/8′	3¼″							Tapered shallots, 12 new; Wurlitzer @ c⁰
Tuba Horn 8′ (15″ w.p.)	4⅞″							Wurlitzer
English Horn 8′	3″							Tapered shallots; EMS single bell; 12 flues
Orchestral Oboe 8′	1½″							Wurlitzer; zinc and Hoyt metal
Vox Humana 8′ (5½″ w.p.)	1⅝″							Wurlitzer; Hoyt metal
Tuba Mirabilis 8′ (20″ w.p.)	5½″							Tapered shallots, harm. @ c¹; 3 flues

SOLO | 61 notes, w.p. 11½", except * 17½"

Stop	C	c⁰	c¹	c²	c³	c⁴	MW	Remarks
Open Diapason 8′	170.0	101.0	63.0	39.0	24.0	14.5	2/11	17 zinc, heavy metal
Symphonic Flute 8′	84.0	Special scale		Harmonic a#¹-d³; double mouths f#²-c⁴; double harmonic d#³-c⁴				
Principal 4′	97.0	57.0	36.0	22.0	14.0	8.8	1/5	5 zinc
Quint Mixture 2⅔′ V	**4′**	**2′**	**1′**	**½′**	**¼′**	**⅛′**		
	92.5	55.0	33.0	20.0	13.0	8.8	2′ is 2/9; other ranks are 1/5	
C	*2⅔*	*2*	*1⅓*	*1*	*⅔*			
b⁰	*4*	*2⅔*	*2*	*1⅓*	*1*			
a#¹	*4*	*2⅔*	*2*	*1⅓*				
f#²	*8*	*4*	*2⅔*	*2*				
d#³	*8*	*5⅓*	*4*	*2⅔*	*2*			
French Horn 8′	6″							Tapered shallots, 24 flues
Bass Tuba 16′*	7″	4″						Tapered shallots, harmonic @ c²
Tuba 8′*	5″							Tapered shallots, harmonic @ c¹; 3 flues
Tuba Clarion 4′*	4⅛″							Tapered shallots, harmonic @ c⁰; 15 flues
Tierce Mixture 2′ IV-VI*	**4′**	**2′**	**1′**	**½′**	**¼′**	**⅛′**		
unisons=	100.8	59.9	35.6	22.1	13.7	8.8	1/5	
quints=	96.5	57.4	34.1	21.1	13.1	8.8	1/5	
tierce=		54.9	32.6	20.6	12.6	8.5	1/5	
C	*2*	*1⅗*	*1⅓*	*1*				
d#⁰	*2⅔*	*2*	*1⅗*	*1⅓*	*1*			
g#⁰	*4*	*2⅔*	*2*	*1⅗*	*1⅓*	*1*		
a²	*5⅓*	*4*	*2⅔*	*2*	*1⅗*	*1⅓*		
d³	*5⅓*	*4*	*2⅔*	*2*				
Millenial Trumpet 8′ (15″ w.p.)	4″							Parallel shallots, harmonic @ g#¹, 5 flues
Stentor Diapason 8′ (25″ w.p.)			71.0 @2′C				1/4	Extension of Pedal Open Wood

PEDAL | 32 notes, w.p. 5½", except * 10"

Stop	C	c⁰	c¹	c²	c³	c⁴	MW	Remarks
Gamba 64′/8′ (GGGGG#)*	369.9	311.0	184.9	109.9	65.3	38.8	2/9	40 zinc
Diaphone 32′/16′ (25″ w.p.)	660.4x660.4 (26x26″)							Kimball, 12 flues
Diapason 32′/16′*	459.0	273.1	162.3	96.5	57.4	—	1/4	Victorian slots
Subbass 32′/8′*	528.6x609.6							16 new, Kimball e⁰ – g#²
Open Wood 16′/8′*	350.8x411.2							12 Aeolian; 18 Kimball, extend to Solo
Violone 16′ (7½″ w.p.)	157.2x200.0							18 wood, 6 zinc
Quint 10⅔′	201.6	119.9	71.3	42.4	—	—	2/9	22 zinc
Principal 8′	169.5	100.8	60.6	35.6	—	—	2/9	18 zinc; Victorian slots
Flute 8′	148.9	88.5	52.7	31.3	—	—	2/9	12 zinc
Choral Bass 4′	92.0	56.1	34.4	21.1	—	—	2/9	
Octave Flute 4′	76.0	58.0	43.0	30.0	—	—	2/9 <	Harmonic @ f⁰
Rauschquinte 2⅔′ II	**2⅔′**	**2′**	**1′**	**½′**	**¼′**	**⅛′**	2/9	*C-g¹ 2⅔′ 2′*
	65.3	52.6	32.6	19.3	12.6	8.1		
Mixture 1⅓′ III	*Same scale as Rauschquinte, except ⅔′ pitch one note smaller*							*C-g¹ 1⅓′ 1′ ⅔′*
Trombone 64′/16′ (20″ w.p.)	22″ @ G#	18″	11½″	6½″	4¾″	—		From GGGGG#, tapered shallots
Tromba 8′/4′ (15″ w.p.)	5½″	4″						Tapered shallots

A TIMELINE OF ORGANS IN THE SALT LAKE TABERNACLE TO 1948

ESSAY BY JAMES L. WALLMANN

INTRODUCTION

The history of organs in the Salt Lake Tabernacle to 1948 is reasonably well documented. This is not to say that there are no gaps or uncertainties—because there are—or that further research would not disclose new information from letters, journals, account books, and other sources not reviewed by organ historians, but the basic history of the instruments is fairly well established. Citations for information in this timeline found in Orth 1989 or Owen 1990 are not repeated. Where new information has been developed or more precise citations are available (particularly because so many sources in the Church History Library[1] are now available digitally), references are given in footnotes. Because what has been written and published about the Tabernacle organs is integral to how organists and organbuilders have related to these instruments, the major publications on the Tabernacle organs are included within this timeline.

PIONEER ORGAN BY JOSEPH RIDGES AND NIELS JOHNSON

25 April 1827 – Joseph Harris Ridges is born in Eling, Hampshire, England. The family must have moved to London when Ridges was young. He describes "a pair of massive, tall iron fretwork gates" behind which was an unnamed organ factory, probably that of William Hill. With a friend who was most likely an apprentice, Ridges visited the factory and, with the examination of organs in the area, learned something of organbuilding. Ridges, however, became a carpenter and in 1852 traveled to Australia to seek gold. A year later, he and his wife were living in Sydney where they converted to The Church of Jesus Christ of Latter-day Saints. Sydney is also where Ridges built one of the first organs in Australia, an instrument he packed up and brought with him when he and his family gathered to the Intermountain West in 1856.

11 October 1857 – The organ built in Australia by Ridges was first heard in the Old Tabernacle, an adobe structure on the location where the Assembly Hall now stands on Temple Square. No stoplist survives, but the instrument probably had five speaking stops and "perhaps 295 pipes." This is an unusual number (assuming Ridges' memory is correct), but corresponds to five stops with a GG–f[3] (59-note) compass. Given that Ridges learned about organbuilding in the 1840s, it is not surprising that he may have used a somewhat archaic compass. Parts of this organ were used to build a new organ for the Assembly Hall in 1883, but no original Ridges pipes are believed to have survived to the present day.

ca. 1862 – Church President Brigham Young asks Ridges if a large organ could be built for the new Salt Lake Tabernacle. Ridges says it could be done.

April 1863 – Construction begins on the new Salt Lake Tabernacle.[2]

26 June 1863 – Ridges writes a letter from Boston to Brigham Young.[3]

> During the past two days I have been busily engaged in getting my object underway. I am happy to say it is favourably progressing. The making [of] the metal pipes will detain me here five weeks unavoidably. The price of metal is a little higher than I expected, though not much, making perhaps in all my bills $100 more than the sum named by you to Bro. Eldridge. This class of goods has raised on account of the war and it is thought by the builders will raise much more. Mr. B.D. Simmonds [*sic*] is considered to be the best organ builder here; with him I am dealing. He says the price of your organ, if built at his factory, would be forty-five thousand dollars.

It is clear that the metal pipes for the original Tabernacle organ came from Wm. B.D. Simmons (1823–1876), one of Boston's leading organbuilders. Ridges and workers in Salt Lake City constructed the organ case, wooden pipes, and probably other parts, but the exact situation is unclear. It is possible that Simmons "supplied a complete internal chassis for the organ—frame, windchests, key and stop action, and metal pipes—leaving the Pedal pipes and chests, the bellows, the case, and probably the manual wood pipes for Ridges and his crew to construct."[4] The amount spent with Simmons in Boston (see next entry) implies that Ridges ordered more than just metal pipes from Simmons. The $45,000 figure cited by Ridges suggests that he was describing to Simmons a large three- or four-manual organ, perhaps one with a carved, hardwood case and metal 32′ display pipes, rather than the two-manual instrument he purchased.[5] Of course, Ridges and Niels Johnson did eventually build a large three-manual organ, but the case was made of pine grained to resemble oak and the largest façade pipes were cylindrical wood pipes constructed with staves like a barrel and painted gold. (The $45,000 amount may be exaggerated, but it would not be the last time facts about the Tabernacle organ were embellished.) The high-quality pine for the largest pipes and the organ case came from Pine Valley, about 325 miles south of Salt Lake City.

29 June 1863 – Horace S. Eldredge, Brigham Young's purchasing agent, writes check no. 45 for $1100.00 with the annotation "a/c of Joseph H Ridges for Organ."[6]

5 September 1863 – "A large organ in Utah," *Dwight's Journal of Music* 23/12: 95, col. 2.

> A large organ, one of the largest in this country, has recently been built by Simmons & Co., to be placed in the Mormon Tabernacle at Salt Lake City, which is a building large enough to seat 15,000 [!] people. The case of the organ and the large diapasons, are to be made in the temple [i.e., Tabernacle], and a skilful [*sic*] workman has started for this purpose to Salt Lake City.

This was among the first of many Eastern notices on the Tabernacle organ to appear

over the years, most of which originated from interested parties such as organbuilders, railroad companies (to promote travel to the West), and the Church, to say nothing of a press hungry for copy (good or bad) on the "Mormons."

January 1866 – Construction of the Tabernacle organ begins.

24 May 1866 – The organ is in the workshop and is described as having two manuals and a 27-note pedal with 35 stops, five of which are mechanical, and "something like 2000 pipes." Later, the manuals were described as having a 56-note compass with the pedal only 25 notes.

6 October 1867 – Although incomplete, the organ is first heard in public at General Conference; only 700 of the projected 2000 pipes are available. Brigham Young "also spoke of the labors of Elder Ridges on the large Organ, and of the difficulties he had labored under in his work."[7]

30 November 1867 – "The organ," *Latter-day Saints' Millennial Star* 29/48: 759. Publication of the stoplist of the Ridges organ. The *Millennial Star,* as it was commonly called, was published in Liverpool and London for members of the Church in that country. While the *Millennial Star* reprinted many articles from the *Deseret News,* it is interesting that the 1867 stoplist did not appear in a Salt Lake City publication. The keydesk, as one would expect with a large mechanical action instrument, was built into the base of the organ case.

January 1868 to August 1874 – The Public Works account books[8] record payments made to the builders of the Tabernacle organ. The two "New Organ Time Books," as they are now called, cover the periods January 1868 to December 1869 and January 1870 to August 1874. Work on the Tabernacle organ started before and continued after the dates of the account books, but it is not known if or how this work was recorded by the Church. "The pay for the workmen varied according to their skill with the millwrights being the highest paid at $5.00 a day, and the mason tenders and apprentices, the lowest paid, receiving the least at $1.50 or $2.00 a day."[9] Workers did not receive a salary; instead, their pay was in the form of a credit they could use at the tithing store, a sort of general store operated by the Church where cash was not needed. (Hard currency was for many years in short supply in the Utah Territory.) In January 1868, ten men are listed, with Ridges receiving $8.00 per day for 26 days of work in that month and Shure Olsen (1818–1901; his name is almost always given as "Sure Olson") receiving $5.00 per day for 12¾ days. One worked at $3.50 per day while the remaining seven worked from 11¼ to 25 days that month at $4.50 per day. February was similar to January, except we see that "Glue Boy" Moroni Pratt, then 14 years old,[10] received $1.50 per day for 14 days of work. (A week was counted as having six work days.) Ridges almost always worked 24 to 27 days per month and was the highest paid. When Ridges was away, Olsen was in charge because he approved the number of days the workforce had labored. The six years and eight months covered by the New Organ Time Books show thirty-three different workers, including Ridges, Olsen, and Niels Johnson (1837–1886), who first appears in June 1868 as "Nils Johnson" at $4.50 per day. From January 1868 to July 1869 there were no fewer than nine workers per month with as many as 20 in March 1869. This is also the month in which painters are first mentioned. The number of workers per month tapered off, with three to five per month from May 1872 to August 1874. While Johnson receives credit for the enlarged organ in the 1880s, it is interesting that Olsen had more responsibility and was higher paid than Johnson during the period of the New Organ Time Books. Further analysis of this original source material is beyond the scope of this timeline.

27 October 1869 – Ridges writes a letter from Boston to Brigham Young.[11]

> I have been successful in my undertaking and have accomplished mainly the object I had in view. [¶] I have obtained admittance inside the the [*sic*] organs I desired to see and think I have seen none so grand as our own. With the third manual or keyboard and solo stops for concert and religious use, it will compare with any. The exterior pipes in the great Boston organ are not so large as those in ours and altogether it is less grand and majestic than I had anticipated. As I write I am surrounded by seven fine church organs in the factory of W.B.D. Simmons who undertook my order lower than others so I dealt with him. [¶] The pipes will be finished and on the way by the time you receive this. [...] [¶] Please tell Thomas to send me the money to come home and buy what little spring wire and brass sheet I need, as when I have settled with Mr. Simmons I shall be out of funds. [...] [¶] I have only bought what I am obliged to have in order to make a fair finish of the organ. I want two more stops—metal—to go with my wood stops, but I feared you would not approve.

12 November 1869 – T[homas] W. Ellerbeck, clerk to Brigham Young, writes a letter to Ridges in care of Wm. B.D. Simmons, Esq., 190 Charles St., Boston, Mass. "By direction of Pres[iden]t B Young," a check for $600 "is sent to you to cover balance of purchases and expenses home." Ellerbeck adds: "We are hard up for funds, and you are to be as economical as possible."[12]

April 1870 – The gallery is completed in the Tabernacle.[13] The gallery not only provided additional seating, but improved the acoustics, which previously had been inconsistent and echoey. Those sitting under the gallery, however, could have their view of the rostrum partially obstructed by the pillars supporting the gallery.

4 May 1872 – Brigham Young writes that the instrument took almost ten years to build and cost an estimated $70,000.[14] This amount must include the cost of labor of Ridges and the local workforce. While an equivalent organ could have been ordered from a builder in Boston or New York for much less than $70,000 (if the Church even had this much money to spend), this would have frustrated Brother Brigham's desire for his people to be self-sufficient.

2 December 1874 – Ridges writes a letter from the Tabernacle to Church leaders.[15]

> Being requested to report to you relative to the organ, I submit the following items. [¶] The organ is nearly completed,

but is at present partly dismembered in order to complete the connection of the large front pipes, which cannot be done to advantage while the instrument is in use. [¶] The number of men working on it is three, including myself. [¶] I have here some 400 pipes, some in part, some complete, the voicing of which must be done by myself. [¶] On the completion of the work on which the men I have are mainly engaged (an item which the President on his departure requested me to have done) which will take about four weeks—'tis intended to reduce the number of men to two in all. [¶] In building a grand organ on so great scale as ours, other builders have ranks of workmen acquainted with its complicated action and vast breathing reservoirs—better perhaps than themselves. With us, it has not been so. I have had no such efficient aid, the more profound of the work devolving upon myself. And when its three thousand tongues are all under control, each must receive its final equipoise of voice and tone—the most important and the last of the work, and is called in organ phraseology regulating. This I have yet to do. [¶] I am therefore thankful to say that a short time will successfully complete the work. [¶] The cost from now to its completion will be from two to three thousand dollars.

9 October 1875 – John Taylor, a senior Church leader, dedicates the Tabernacle and its organ.[16] A year later, a visitor reports that the organ "requires four men to blow the bellows."[17]

1878 – The organ is described as being in an "unfinished state." Two or three years later, a writer from Boston visiting the "City of the Saints" attended a service in the Tabernacle "but, unhappily, the great organ was undergoing repairs, and not in use on that particular Sunday."[18] One wonders how frequently the pioneer instrument was not playable due to repairs or work on additions.

1883 – The choir stand in the Tabernacle is remodeled as risers ascending from the floor, thereby obscuring most of the lower part of the organ case below the impost but increasing seating capacity from 75 to 200 singers.[19]

August 1883 – Ten crates labeled "Organ Ware" arrive by train from Steere and Turner of Springfield, Massachusetts.[20] With freight, the cost was $2,049. Included were: almost 1,200 pipes, of which 336 would have been for the new six-stop Solo division, meaning that stops for other divisions were added or their pipes replaced; a pneumatic lever to assist the key action; and probably two hydraulic motors to power the bellows. Niels Johnson, trained by Ridges, carried out the work.

3 October 1885 – An article in the *Deseret News,* copied to the Journal History,[21] describes the organ as enlarged by Johnson without giving the stoplist: "The organ has now four manuels [*sic*] and a pedal, the number of stops being 57. The total number of pipes is 2,648." The stoplist appeared three and a half years later (see next two entries).

2 March 1889 – "The grand organ. A detailed description of the magnificent instrument," *Deseret Evening News* 22/84: [3], col. 6.[22] Stoplist of the organ as enlarged by Johnson, who was assisted by Shure Olsen. The organ is described as having four manuals, although there is no Solo to Pedale coupler and there is a Solo to Choir coupler.

16 March 1889 – "The grand organ," *Deseret Weekly* 38/12: 359, cols. 2–3. The stoplist corresponds to that published two weeks earlier, except that the organ is described as having three manuals. Photos from the period seem to show a three-manual instrument.

Late 1890s – The pioneer organ is starting to show its tonal and mechanical shortcomings. One anonymous observer wrote in 1899 that a thorough overhaul of the Tabernacle organ was needed "and would include the addition of the latest stops, combinations and valued mechanical accessories, also the introduction of pneumatic-electric action and the removal of the console ... to a distance from the instrument proper. This last might be done, if nothing else is, as the performer cannot hear sufficiently from where he now sits to judge of effects, and at times he cannot hear some of his work at all."[23]

2 January 1901 – "Utah's old organ builder, who wrought a wonderful miracle half a century ago, applauded by 10,000 people : stirring scene witnessed at Tabernacle yesterday. Elder Joseph Ridges receives an ovation : how he built America's greatest organ in wilderness," *Salt Lake Herald,* no. 209, p. 8, cols. 1–3. Reprinted in Longhurst 2013. With the pioneer instrument about to be replaced, there was one last chance to honor Joseph Ridges as the original builder. Ridges was interviewed for the occasion. This and the interview given in the following month are the source of much of our information on Ridges' background as an organbuilder, although his recollections are sometimes inconsistent. Ridges died on 7 March 1914.

16 February 1901 – "Pioneer organ builder's story : Joseph H. Ridges, who planned and constructed the Tabernacle organ, tells the 'News' something of difficulties overcome in the great work," *Deseret Evening News* 52/75: 9, cols. 1–3. Reprinted in Longhurst 2013. Another interview with Ridges.

KIMBALL ORGAN

31 October 1900 – John J. McClellan (1874–1925), "a musician of considerable training and stature,"[24] is appointed Tabernacle organist.

31 December 1900 – Contract is signed with the W.W. Kimball Company of Chicago to build a new organ for the Tabernacle. That the Church wanted an organbuilder with a national reputation to rebuild the Tabernacle organ rather than a local builder is evidence that the Church was becoming less insular and aimed to participate more fully in American life.[25] The instrument was to be completed by April 1 1901. One-third of the old pipes were retained for the rebuilt instrument. The contract does not survive and the stoplist is taken from the extant Kimball console (although a few stop knobs or labels are missing) and notes from the Austin Organ Company. As noted in the stoplist, it is possible that some changes to the disposition were made during the Kimball organ's short life. Although documentation is lacking, the tubular-pneumatic action was apparently at some point partially electrified. The console was placed at the front of the choir seats, in the center, with the organist's back to the instrument. The pedalboard was flat.

4 May 1901 – Dr. George W. Walter, a prominent organist close to the Kimball company, presents the completed instrument in recital. Walter later wrote: "The Great Tabernacle Organ is an event in organ building. It is the end of all organ building knowledge there is, and we shall have to wait for a new inspiration before we can add anything to it."[26]

1 November 1902 – "Der Mormonentempel und das Tabernakel mit seiner grossen Orgel in Salt Lake City, Utah, Nord-Amerika," *Zeitschrift für Instrumentenbau* 23/4: 81–84. The *Zeitschrift* für *Instrumentenbau* was probably the leading organ and musical instrument periodical of the time, and this article shows that the fame of the Tabernacle organ had reached Europe.

1909 – Richard H. Little, *Hearing the organ : sketch* (Chicago: W.W. Kimball Company, [1909]). Originally appeared in the *Chicago Record-Herald,* 23 August 1908 (title page). Containing effusive praise for the sounds of the Kimball organ, this booklet describes the author's experience at an organ recital by McClellan. The pamphlet was produced by the organbuilding company and not only "mailed all over the United States" by Kimball,[27] but available "Compliments of Bureau of Information [at] Temple Block" (as Temple Square in Salt Lake City was then known).[28] It is now a rare piece of Tabernacle organ ephemera.

September 1910 – The first recording of a pipe organ in the United States is made at the Tabernacle, with McClellan playing Bach's *Toccata and Fugue in D minor* and the *Toccata* from Widor's Fifth Symphony.[29]

27 August 1914 – Tabernacle organists McClellan and Tracy Y. Cannon and organ technician J.J. Toronto inform Church leaders that the organ's condition had deteriorated and recommend that the Austin Organ Company reconstruct the instrument.[30] The matter was referred to a committee and it took several months before the decision was actually made to replace the Kimball organ. Remarkably, the Kimball console was saved. For many years it was on display at a Visitor's Center on Temple Square. It is now part of the collection of the Church History Museum.[31]

AUSTIN ORGAN

18 March 1915 – A contract is signed with the Austin Organ Company of Hartford, Connecticut for a new four-manual organ to be completed by 15 February 1916. The Kimball organ was made playable (in time for the summer recital series!) by installing a new Austin console and bypassing most of the old action.

14 November 1915 – To accommodate the enlarged instrument, the casework is extended on both sides of the original organ case by Cannon and Fetzer of Salt Lake City. [Ed. the same firm constructed the casework for the 2002 Schoenstein instrument in the new Conference Center.] This is the "Tabernacle organ" familiar to millions today.

12 May 1916 – The first public recital on the completed instrument is given.

19 July 1916 – Church officials formally accept the Tabernacle organ, Austin's Opus 573. The large Austin Universal Air Chest system was used. The windchests were large enough to enter and, in fact, visitors were given tours inside the windchests.[32] The console was moved to its current position: at the front of the choir seats, perpendicular to the organ but slightly to one side, with the organist facing the choir director in the center.

1916/17 – *The great organ of Salt Lake City* (Hartford, Conn.: Austin Organ Company, [1916 or 1917]). Publicity booklet from the organbuilder.

1917 – Levi Edgar Young, *The great Mormon Tabernacle with its world-famed organ and choir* (Salt Lake City: Bureau of Information). Cover title: *The Salt Lake Tabernacle and world-famed organ*. A later issue was published in 1924 or later, but retained the original 1917 copyright date.

8 April 1924 – Alexander Schreiner (1901–1987) is appointed Tabernacle organist. Schreiner would later be a moving force in replacing the Austin organ with the Aeolian-Skinner instrument.

1925/26 – *The great organ of Salt Lake City* (Hartford, Conn.: Austin Organ Company, [1925 or 1926]). Publicity booklet from the organbuilder, slightly revised from the earlier version. The stoplist does not show the 1926 changes.

10 September 1926 – Austin adds 24 stops containing more than 1,500 new pipes. Among other changes, the Great 4′ Principal and 2′ Fifteenth are moved to the open section, a 5-rank Mixture (with a 17th) is added to the Great, and a IV Plein Jeu replaces the III Cornet Mixture on the Swell.

1930 – Levi Edgar Young, *The Mormon Tabernacle with its world-famed organ and choir* (Salt Lake City: Bureau of Information). Cover title: *The Salt Lake Tabernacle and world famed organ*. Two later issues were published between 1935 and 1938, and in 1939 or later, but both retained the original 1930 copyright date.

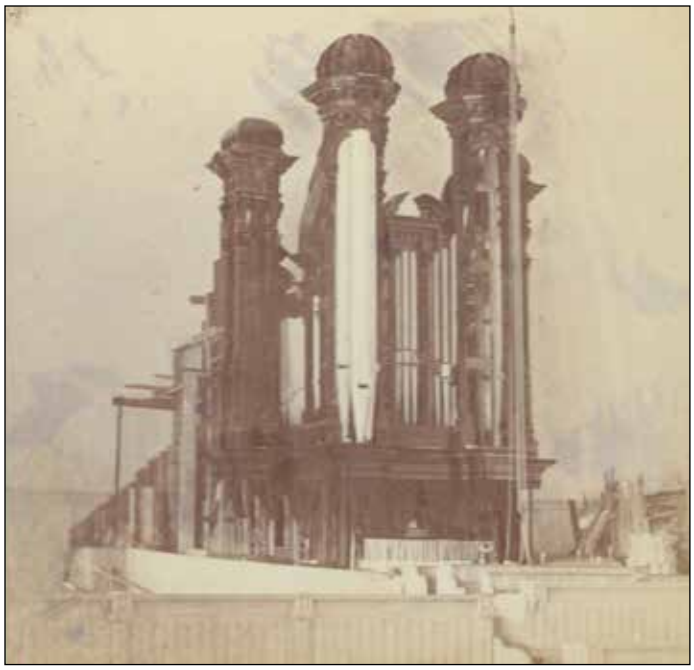
February 1937 – Austin installs a new console. The old console was retained and is in the collection of the Church History Museum.[33]

1937/40 – *The great organ of Salt Lake City* (Hartford, Conn.: Austin Organs, Inc., [between 1937 and 1940]. Publicity booklet from the organbuilder. The text is similar but the format differs from the two previous publications. The stoplist does not show the 1940 changes.

1940 – Austin adds these stops to the organ: Great – 4′ Second Octave, 2⅔′ Twelfth, V Fourniture; Swell – IV Sesquialtera, 8′ Trompette; Orchestral – 4′ Fugara, 2⅔′ Nazard, 1⅗′ Tierce; Pedal – 4′ Octave, 2′ Super Octave, IV Mixture. One rank is removed from the Great V Mixture and the 8′ Melophone (added in 1926) is removed from the Orchestral division. James B. Jamison, an early proponent of "American Classic" organ design, was responsible for the scaling of the new stops and mixture compositions. The existing reed stops were revoiced by James H. Nuttall, a freelance organbuilder trained in England who was a long-time associate of Robert Hope-Jones and noted as a voicer and inventor.[34]

1948 – To make way for the new Aeolian-Skinner instrument, the Austin organ is

TABERNACLE ORGAN



Organ in New Tabernacle, ca. 1869. Note the gessoed and ungilded facade pipes. Author's collection.

Organ in Tabernacle, ca. 1870. Courtesy of the Church History Library, The Church of Jesus Christ of Latter-day Saints (PH 1932).

Organ in Tabernacle, Salt Lake, ca. 1882. Courtesy The American Organ Archives of the OHS.

Keydesk, ca. 1882, detail. Courtesy The American Organ Archives of the OHS.

Stereoview photographs by Charles R. Savage.

Ca. 1904 after the installation of the Kimball.

moved to the auditorium of the Joseph Smith Memorial Building at Brigham Young University (BYU), Provo, Utah, by the Schoenstein firm of San Francisco. The Celestial, String, and enclosed Great divisions were not kept and at least "four full-compass stops and two wood basses were removed from the various manual divisions" for use in the Aeolian-Skinner organ. "Internal arrangement was altered from 'single-storey' to 'two-storey' to fit the chamber in the auditorium."[35] The auditorium did not share the Salt Lake Tabernacle's excellent acoustics. By the 1970s, the organ was in poor condition, other instruments on campus having taken its place. Before the Joseph Smith Memorial Building was razed in 1990 to make way for a new structure, all attempts to sell the organ were unsuccessful. With only two weeks left, Michael Ohman, an organist and long-time member of the BYU School of Music (as well as a part-time organ technician), salvaged the pipes of the organ, console, blower, percussion instruments, unit chests, and the Austin tremulant for the Vox Humana by putting them in storage. The windchests and "associated mechanical materials all went down with the building." While no records remain, Ohman reports the BYU pipework contained "ranks from the Ridges to Austin organs." Over the years, the salvaged pipes and parts were sold to various parties. The second Austin console was donated by Ohman to the Church History Museum.[36]

ADDITIONAL REFERENCES

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April 1967 – Jay M. Todd, "Tabernacle organ," *Improvement Era* 70/4: 14–20.

1989 – Edgar V. Orth, *The Tabernacle organ : a chronological compendium history : creator and transmogrifiers* ([Eugene, Or.: Edgar V. Orth, 1989]). Available at Church History Library, M282.21 O77t 1989.

1990 – Barbara Owen, *The Mormon Tabernacle organ : an American classic : the American Classic Organ Symposium : Temple Square : Salt Lake City, Utah* ([Salt Lake City:] The Church of Jesus Christ of Latter-day Saints, 1990).

2007 – James L. Wallmann, "Tabernacle renewed: Third American Classic Organ Symposium in Salt Lake City," *The Tracker* 51/4: 10–16. Available from the Organ Historical Society at https://organhistoricalsociety.org/publications/tracker/ (accessed 8 March 2024).

2013 – John Longhurst, "Joseph H. Ridges : London to Sydney to Zion : 1827 to 1857," n.p., [ca. 2013]. Available from the Church History Library at https://tinyurl.com/slc-11 (accessed 30 January 2024).

ENDNOTES

1. See https://history.churchofjesuschrist.org/landing/church-history-library?lang=eng (accessed 10 February 2024).

2. Stewart L. Grow, "A historical study of the construction of the Salt Lake Tabernacle," in *The Tabernacle : "An Old and Wonderful Friend,"* ed. Scott C. Esplin (Provo, Utah: Religious Studies Center, Brigham Young University, 2007), p. 149. Grow's essay originally appeared in 1947 as his master's thesis in history at Brigham Young University.

3. J.H. Ridges to President Brigham Young, 26 June [1863]. Church History Library, Salt Lake City, CR 1234/1, box 29, folder 11. Available at https://tinyurl.com/slh-03 (accessed 2 February 2024). In this and other letters quoted, punctuation, spelling, and capitalization are standardized.

4. Owen 1990, p. 6. The recollection of George S. Hutchings (as related to William B. Goodwin) that the Boston firm did the voicing, implying that someone from the Simmons company travelled to Salt Lake City (see Christine Merrick Ayars, *Contributions to the art of music in America by the music industries of Boston : 1640 to 1936* (New York: The H.W. Wilson Company, 1937), p. 160), must be discounted and is not supported by written evidence.

5. I thank Scot Huntington for his insights on how much pipes and organs cost in 1863 Boston. Email to the author dated 19 February 2024.

6. Horace S. Eldredge papers, 1833–1886; Financial Papers; Riggs & Co. check books, 1863; Church History Library, MS 1210. Available at https://tinyurl.com/slc-04 (accessed 11 February 2024). It is possible a small portion of the $1100 was for transportation expenses for Ridges to return to Utah.

7. "Thirty-seventh Semi-Annual Conference," *Deseret News* 16/40 (9 October 1867): 313, cols. 1–2.

8. Public Works account books, 1848–1908. Church History Library, CR 5/7. Available at https://tinyurl.com/slc-05 (accessed 25 February 2024). The account books reflecting payments for the organ are in box 9, folders 3 and 4. These original source documents do not seem to have been consulted in previous studies of the Tabernacle organ.

9. Ronald G. Watt, *Public Works accounts books index* ([Salt Lake City:] Historical Department, 1997), p. 2. Available at https://tinyurl.com/slc-06 (accessed February 25, 2024).

10. https://tinyurl.com/slc-07 (accessed 8 March 2024).

11. J.H. Ridges to President Young, 27 October [18]69. Church History Library, CR 1234/1, box 33, folder 9. Available at https://tinyurl.com/slc-01 (accessed 2 February 2024).

12. Brigham Young office files transcriptions, 1974–1978; Letterbooks; Letterbook Volume 11, 1869 September 15–1870 February 9; Church History Library, MS 2736. Available at https://tinyurl.com/slc-02 (accessed 10 February 2024).

13. Scott C. Esplin, "Time line," in *The Tabernacle* (2007), p. 4.

14. Letter to Frank Low, as cited in Ronald W. Walker, "The Salt Lake Tabernacle in the nineteenth century: A glimpse of early Mormonism," *Journal of Mormon History* 31/3 (Fall 2005): 228, n. 113.

15. J.H. Ridges to Gentlemen, 2 December [18]74. Church History Library CR 1234/1, box 35, folder 10. Available at https://tinyurl.com/slc-08 (accessed 2 February 2024).

16. Scott C. Esplin, "Time line," in *The Tabernacle* (2007), p. 4; *Deseret News* 24/38 (20 October 1875): 594, cols. 2–5 to 595, col. 1 ("We also dedicate the platform upon which the organ stands and all the component parts thereof, together with the organ which we have constructed to assist the sweet singers of Israel in making melody to the Lord our God; the woods and the metals, the bone, the ivory and the leather; the keys, the stops, and the treadles; the levers, the valves and the bellows; and all the other appurtenances and appliances, together with the gilding, the painting, the varnish and the polish thereof; and all the other ornamentation whatsoever, and every particle and fibre thereof—we dedicate and consecrate it unto thee and set it apart as an instrument for praise and thanksgiving to the Lord God of Israel.").

17. Fanny L. Rains, *By land and ocean : or the journal and letters of a young girl who went to South Australia with a lady friend, then alone to Victoria, New Zealand, Sydney, Singapore, China, Japan, and across the continent of America home* (London: Sampson Low, Marston, Searle, & Rivington, 1878), p. 227 ("The organ is the second largest in the United States [!], was built in the Tabernacle by their own men, has three thousand pipes, fifty-two stops, and requires four men to blow the bellows."). It is unclear whether all four calcants were needed at the same time, or if the team consisted of four men, only two or three were needed at any one time to supply the wind.

18. L[uther] L. H[olden], "Salt Lake City, Utah," *Musical Herald* [Boston] 2/7 (July 1881): 167, col. 1.

19. Scott C. Esplin, "Time line," in *The Tabernacle* (2007), p. 5.

20. While the Organ Historical Society Library and Archives holds the Steere & Turner Collection (MS-02), the collection begins in 1884 and focuses on instruments built under that company's name; nothing is found in the collection about the pipes and parts supplied for the Tabernacle organ. Information courtesy of Sean Cureton, Assistant Archivist and Librarian, emails to the author dated 9 February 2024.

21. Historical Department journal history of the Church, 1830–2008 ("Journal History"), Church History Library CR 100 142. Available at https://tinyurl.com/slc-09 (accessed February 3, 2024). The Journal History was a scrapbook maintained by historians arranged in chronological, day-by-day format. Most of the Journal History "consists of clippings from newspapers and magazines or typed transcriptions of published materials."

22. Copied to the Journal History of the same date, f. 2.

23. "There has been some talk ... ," *Latter Day Saints Southern Star* [Chattanooga] 1/25 (20 May 1899): 197, col. 2. Even today, with the console in its current location, the sound of the instrument projects over the head of the organist.

24. Owen 1990, p. 14.

25. It was, after all, only in 1890 that the Manifesto prohibiting plural marriage in the Church was issued. Utah became a state in 1896.

26. *Kimball pipe organs* (Chicago and New York: W.W. Kimball Company, [1913]), p. 17, col. 2. Walter also wrote *The Temple organ : Washington, D.C.* (Chicago: W.W. Kimball Co., 1900) about the four-manual Kimball organ in Temple Beth Elohim, Washington, D.C.

27. "'Hearing the Organ' is the title ... ," *Deseret Evening News* 58 (27 March 1909): 17, col. 2. See also "'Hearing the organ'," *Inter-Mountain Republican* [Salt Lake City] 13/7 (18 February 1909): 4, col. 2 ("copies are sent out by the hundred thousand, and to every part of the world") in which the anonymous writer notes with some annoyance that the Kimball company "simply rebuilt" an instrument originally constructed by Joseph Ridges from 1866 to 1870—the organbuilder who, the writer felt, deserved the credit.

28. Little 1909, back cover.

29. Rollin Smith, "Early American organ recordings," in *Litterae organi: Essays in honor of Barbara Owen,* ed. John Ogasapian *et al.* (Richmond, Va.: OHS Press, 2005), p. 234.

30. The source cited by Owens and Orth, the Journal History of 27 August 1914, f. 11, refers to a communication from McClellan, Cannon, and Toronto "recommending the re-construction of our tabernacle organ, at a cost of $53,000," but does not mention Austin.

31. See "New exhibit celebrates 150th anniversary of Salt Lake Tabernacle organ" at https://tinyurl.com/slc-10 (accessed 20 February 2024).

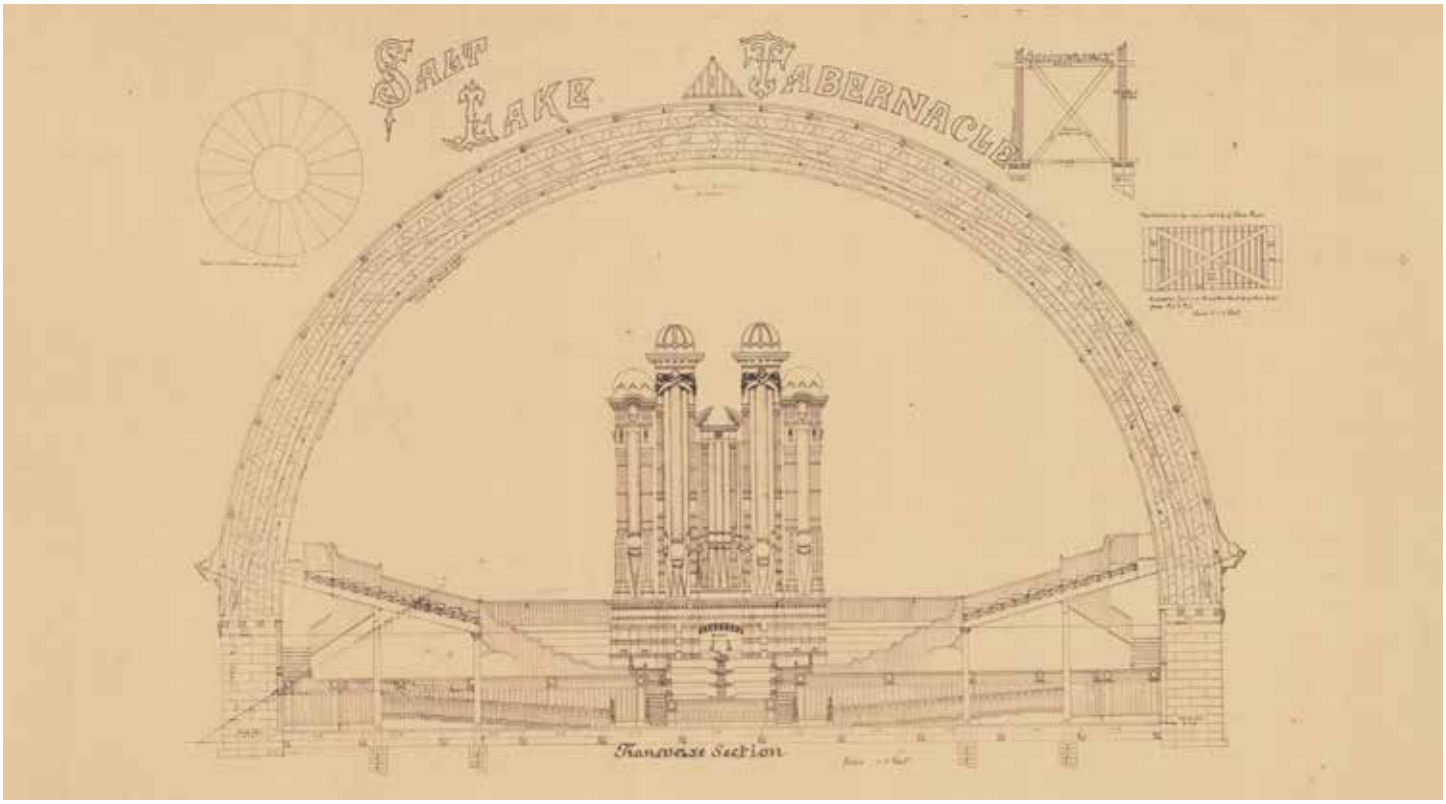
32. Personal communication from Roy M. Darley. Darley found it amusing that guests who had visited the insides of the Austin organ would ask for a similar tour after the Aeolian-Skinner instrument was installed.

33. Information courtesy of John Longhurst, email to the author dated 21 February 2024.

34. David H. Fox, *Robt. Hope-Jones* (Richmond, Va.: Organ Historical Society, 1992), p. 274.

35. Owen 1990, p. 34.

36. Information on the fate of the Austin organ courtesy of John Longhurst, email to the author dated 21 February 2024, and Michael Ohman, emails to the author dated 22 February 2024 and 18 March 2024 (quotations). Ohman recalls that the "walk-in Austin chests that had been installed at BYU had been dramatically cut down to accommodate space. To do any service to the mechanics of the chests, an under-car four-wheeled dolly was used to scoot around. I laid on my back and used the heels of my shoes to navigate. It was an adventure."



Salt Lake Tabernacle, Transverse Section, ca. 1900. Courtesy of the Church History Library, The Church of Jesus Christ of Latter-day Saints (MS 14066).

TABERNACLE ORGAN

THE ORGAN.

From brother J. H. Ridges, the builder of this magnificent instrument, we are furnished a few items that will interest not only many of our readers, but the musical world abroad. When finished, the instrument will be twenty-three feet wide, thirty feet deep, forty feet high, and will contain over 25,000 feet of lumber. It was commenced in January, 1866, and every effort will be made to complete it by the Conference on the 6th of April next. It is being built on the large scale, and will contain the following stops and pipes :—

Great Organ—Principal, fifteenth, open diapason, stopped diapason, mixture-three ranks, flute harmonic, hohl flute, flute a cheminee, dulciana, twelfth, trumpet, bourdon.

Swell Organ—Claribella, principal, clari flute, stopped flute, cromorne, hautboy, open diapason, stopped diapason, mixture-two ranks, bassoon, bourdon, piccolo.

Pedal Organ—Open bass, 16 feet; dulc bass, 16 feet; principal bass, 8 feet; stopped bass, 16 feet; great open bass, 32 feet.

Mechanical Stops—Great and swell, pedal and great, pedal and swell, tremblant, bellows signal.

The organ has two manuals—the Great and Swell, both heavily filled and the pipes on Large scale. The pipes will number two thousand or upward.

Source: "The organ," *Latter-day Saints' Millennial Star* 29/48 (30 November 1867): 759.

THE GRAND ORGAN.

By courtesy of Conductor Beesley, of the Tabernacle choir, we are enabled to publish the following, which has never before appeared in any journal:

Description of the Grand Organ in the Tabernacle, Salt Lake City, Utah, as reconstructed by Mr. N. Johnson.

SPECIFICATION.

Three Manuals, Compass CC to G, 56 notes.
Pedal Compass, CCC to F..... 30 "
Fifty-seven stops.

No. 1.

GREAT ORGAN.

1.	Open Diapason,	16 feet,	metal,	56 pipes.
2.	Open Diapason,	8 "	"	56 "
3.	Viol D Gamber,	8 "	"	56 "
4.	Hohl Flute.....	8 "	wood,	56 "
5.	Stpt Diapason..	8 "	"	56 "
6.	Flute aChimmee	8 "	metal,	56 "
7.	Harmonic Flute	4 "	"	56 "
8.	Octave.....	4 "	"	56 "
9.	Twelfth.....	2⅔ "	"	56 "
10.	Fifteenth.....	2 "	"	56 "
11.	Mixture,4 ranks.....		"	224 "
12.	Trumpet.....	8 feet,	"	56 "

Total..... 840 pipes.

No. 2.

SWELL ORGAN.

13.	Bourdon	16 feet,	wood,	56 pipes.
14.	Open Diapason,	8 "	metal,	56 "
15.	Salicional.....	8 "	"	56 "
16.	Clarabella.....	8 "	wood,	56 "
17.	Stpt Diapason..	8 "	"	56 "
18.	FlautoTraverso	4 "	"	56 "
19.	Octave.....	4 "	metal.	56 "
20.	Flutino.....	2 "	"	5 "
21.	Dolce Cornet...	2 Ranks,	"	116 "
22.	Cornopean.....	8 feet,	"	56 "
23.	Oboe & Bassoon	8 "	"	56 "
24.	Vox Humana...	8 "	"	56 "

Total..... 728 pipes.

Source: "The grand organ," *Deseret Weekly* 38/12 (16 March 1889): 359, cols. 2–3.

No. 3.

CHOIR ORGAN.

25.	Bell, Gamba....	8 feet,	metal,	56 pipes.
26.	Gemshorn.....	8 "	"	56 "
27.	Dulciana.....	8 "	"	56 "
28.	Melodia.....	8 "	wood,	56 "
29.	Lieblich Gedact.	8 "	"	56 "
30.	Fugara.....	4 "	metal,	56 "
31.	Piccolo.....	2 "	"	56 "
32.	Clarionet.....	8 "	"	56 "
33.	Fagotto.....	8 "	"	56 "

Total..... .....504 pipes.

No. 4.

SOLO ORGAN.

34.	Stentorphon....	8 feet,	metal,	56 pipes.
35.	Keraulophon....	8 "	"	56 "
36.	Stpt. Diapason..	8 "	wood,	56 "
37.	Harmonic Flute	4 "	metal,	56 "
38.	Piccolo.....	2 "	"	56 "
39.	Tuba Mirabilis..	8 "	"	56 "

Total..... 336 pipes.

No. 5.

PEDALE ORGAN.

40.	Dbl. Op. Diap.	32 feet,	wood,	30 pipes.
41.	Open Diapson	16 "	"	30 "
42.	Violone...	16 "	"	30 "
43.	Bourdon.....	16 "	"	30 "
44.	Violoncelle....	8 "	metal,	30 "
45.	Flute.....	8 "	wood,	30 "
46.	Trombone.....	16 "	metal,	30 "
47.	Trumpet.....	8 "	"	30 "

Total..... 240 pipes.

Total Number of pipes..... 2648 pipes.

No. 6.

48. Great to Pneumatic Coupler.
49. Swell to " "
50. Choir to " "
51. Solo to Choir "
52. Choir to Swell "
53. Great to Pedale "
54. Swell to " "
55. Choir to " "

MECHANICAL ACCESSORIES.

56. Swell Tremolo.
57. Pedal Check.
58. Wind Indicator.
59. Hydraulic Engine Starter.
60. Automatic Engine Regulator.

No. 7.

PEDAL MOVEMENTS.

1. Great Forte.
2. Great Mezzo, double acting.
3. Great Piano, double acting.
4. Swell Forte.
5. Swell Piano, double acting.
6. Pedal Forte.
7. Pedal Piano, double acting.
8. Balance Swell Pedale.

Mormon Tabernacle Organ
Salt Lake City, Utah

W.W. Kimball, 1901

Tubular-Pneumatic Action
Compasses: 61/30
Console preserved at the Museum of Church History and Art
Stoplist reconstructed verbatim from the extant console, and Austin Organ Co. files, [annotations in brackets].[1]

II. GREAT
16′ Double Open Diapason
8′ Bell Diapason
8′ Open Diapason
8′ Second Open Diapason
8′ Gamba [tin]
8′ Doppel Flute [wood]
8′ Dulciana
8′ Claribell Flute [wood]
4′ Principal
4′ Wald Flute [wood]
2⅔′ Twelfth
2′ Fifteenth [Octave 4′ console]
8′ Trumpet [Austin list only]

III. SWELL [Enclosed]
16′ Bourdon
8′ Horn Diapason
8′ Violin Diapason
8′ Stopped Diapason
8′ Spitz Flute
8′ Salicional
8′ Viole Celeste
8′ Aeoline
4′ Violina
4′ Flute Harmonic
2′ Flautino
Cornet III
16′ Contra Fagotto
8′ Cornopean
8′ Oboe d'Amour
8′ Vox Humana

1. Barbara Owen, *The Mormon Tabernacle Organ, An American Classic;* The Church of Jesus Christ of Latter-day Saints, Salt Lake City, 1990, 20-21.

I. CHOIR [Enclosed]
16′ Gross Gedeckt
8′ Geigen Principal
8′ Violoncello
8′ Quintadena
8′ Melodia
8′ Dolce
4′ Flauto Traverso
4′ Fugara
2′ Harmonic Piccolo
8′ Clarinet
8′ Orchestral Oboe

IV. SOLO
16′ Violone
8′ Stentorphone
8′ Viole da Gamba [tin]
8′ Melophone [wood]
4′ Orchestral Flute [wood]
8′ Waldhorn [Austin: 4′]
8′ Trumpet [console only]
8′ Tuba Mirabilis
8′ Saxophone
4′ Clarion

PEDAL
32′ Double Open Diapason
16′ Open Diapason
16′ Bourdon
16′ Lieblich Gedeckt
16′ Violone
10⅔′ Quinte
8′ Violoncello
8′ Flute [wood]
16′ Trombone
8′ Trumpet

PEDAL COUPLERS
Pedal Fifths
Pedal Octaves
Great to Pedal
Swell to Pedal
Choir to Pedal
Solo to Pedal
Pedal to Solo

SWELL COUPLERS
Swell Octaves
Swell to Great
Sw. to Gt. Sub Octave
Swell to Great Super Octave
Swell to Choir
Swell to Solo

CHOIR COUPLERS
Choir to Great
Ch. to Gt. Sub Octave
Choir Sub Octave

SOLO COUPLERS
Solo Octaves
Solo to Great
So. to Gr. Super Octave

ACCESSORIES
Tremolos to Swell, Choir, and Solo
Reversible Gt. to Ped.
Crescendo, Full Organ
Wind and Crescendo indicator dials

ADJUSTABLE COMBINATIONS
3 Great
3 Choir
3 Swell
2 Solo

10 h.p. fan blower, Austin listed pressures as: Great and Solo 4¼″. Swell and Choir 3½″, Pedal not noted.

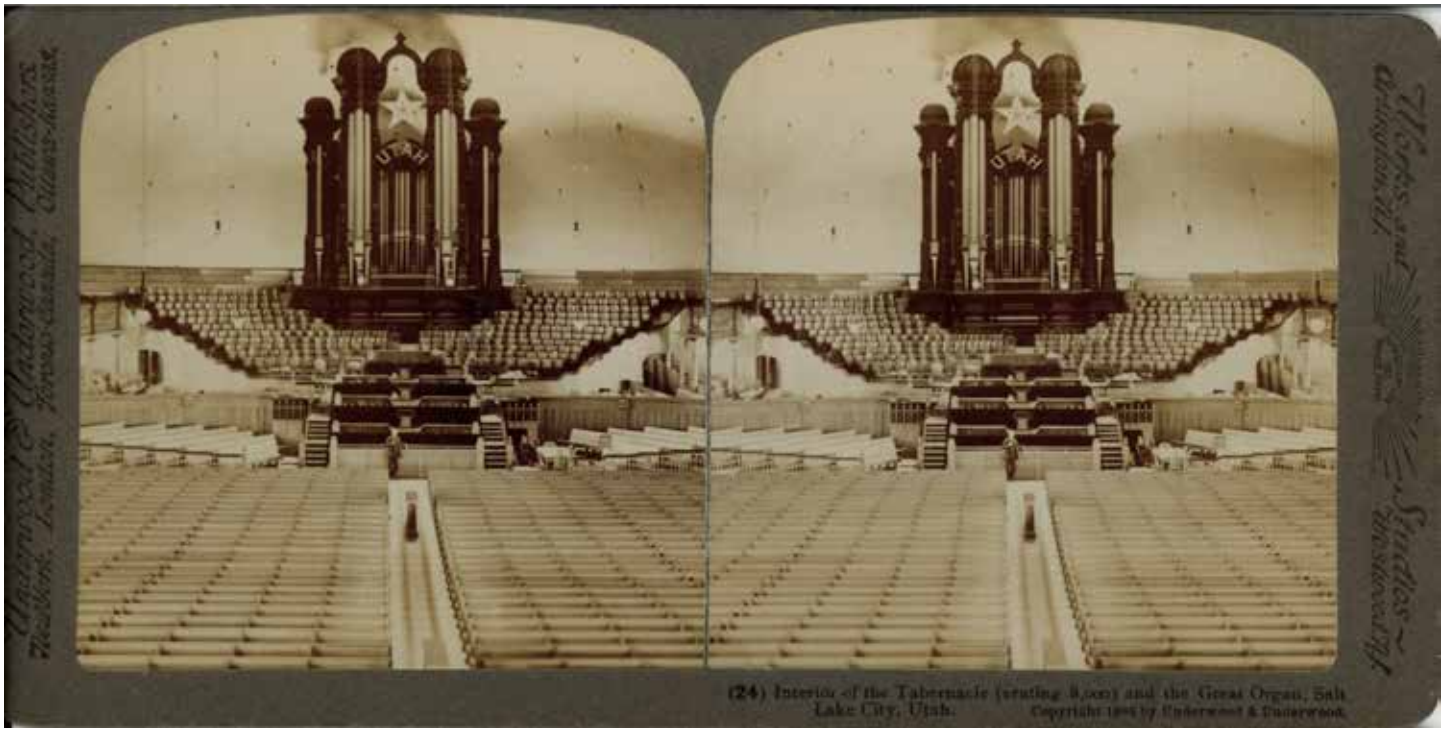
ABOUT THE KIMBALL

Frederick W. Hedgeland, son of a prominent English organbuilding family was at this time the head of Kimball's pipe organ division. He had obtained patents on various devices for tubular-pneumatic action in 1892, 1896, and 1897, including a design for pneumatic coupler stacks that permitted a large number of couplers at various pitches, not solely at the unison. Note the unusual Pedal to Solo, and the Pedal Fifths coupler which would have turned the division into a giant resultant. While no record exists of the exact number of ranks Kimball reused from the old Ridges/Johnson organ, Barbara Owen quotes both Hedgeland and local newspapers monitoring the progress of the new Kimball organ, stating in one article that "approximately one third of the original pipes were reused," and directly quoting Hedgeland in another that "only the pedal and a few stops" were repurposed from the old organ.[2] Comparing the new Kimball pedal with that of the 1888 Johnson rebuild, it would appear the old pedal was reused in its entirety, with an expanded compass and two additional stops. While Hedgeland was quoted in the press as being very dismissive of the pipework of the old organ which had been imported from the East,[3] the former organ's pipework which had been obtained from the shops of W.B.D. Simmons in Boston and Steere & Turner in Westfield, Mass. would have been of first-rate quality, and both firms were noted for the tonal excellence of their bold voicing styles. Hedgeland further opined that the old pipework had simply been dropped in place without further voicing refinement onsite.[4] While one stated goal of the new organ was both increased volume and a change in taste from classically-inspired voicing toward the orchestral, it would be a fair criticism to opine in hindsight that what was gained in power was also the loss in harmonic richness and clarity which characterized the old Ridges/Johnson instrument—and the diapason work in particular.

2. *IBID*, 21

3. *IBID*, 18,19

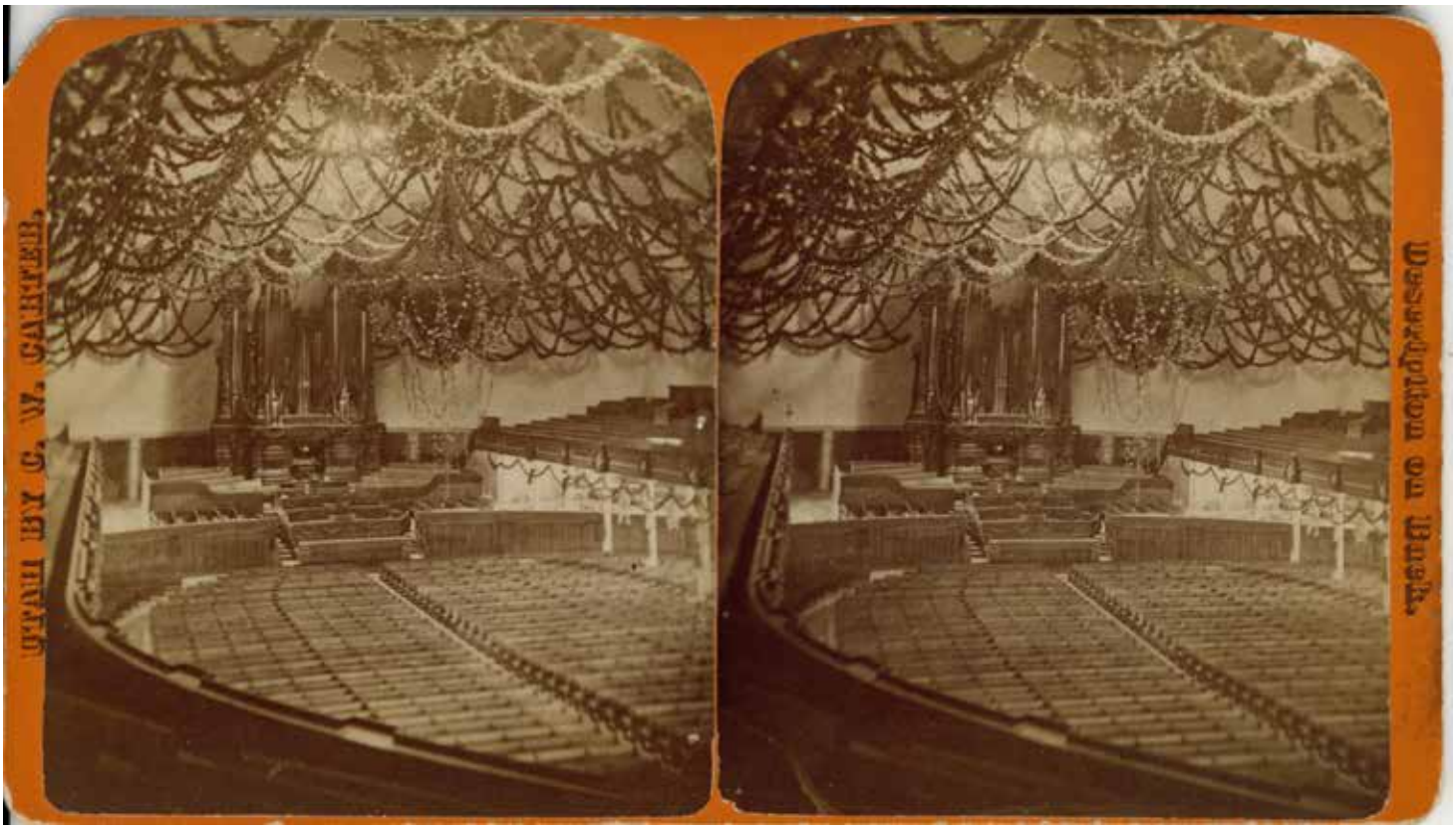
4. *IBID,* 19



The interior of the Tabernacle taken in 1904 shortly after the installation of Kimball organ. Compare the interior with that of the 1877 image on the facing page, with raked choir seating in opera chairs instead of pews. Underwood & Underwood publisher, from the Huntington collection.

Tabernacle organist John J. McClellan (1874–1925) at the console of the Kimball organ he designed, ca. 1910.

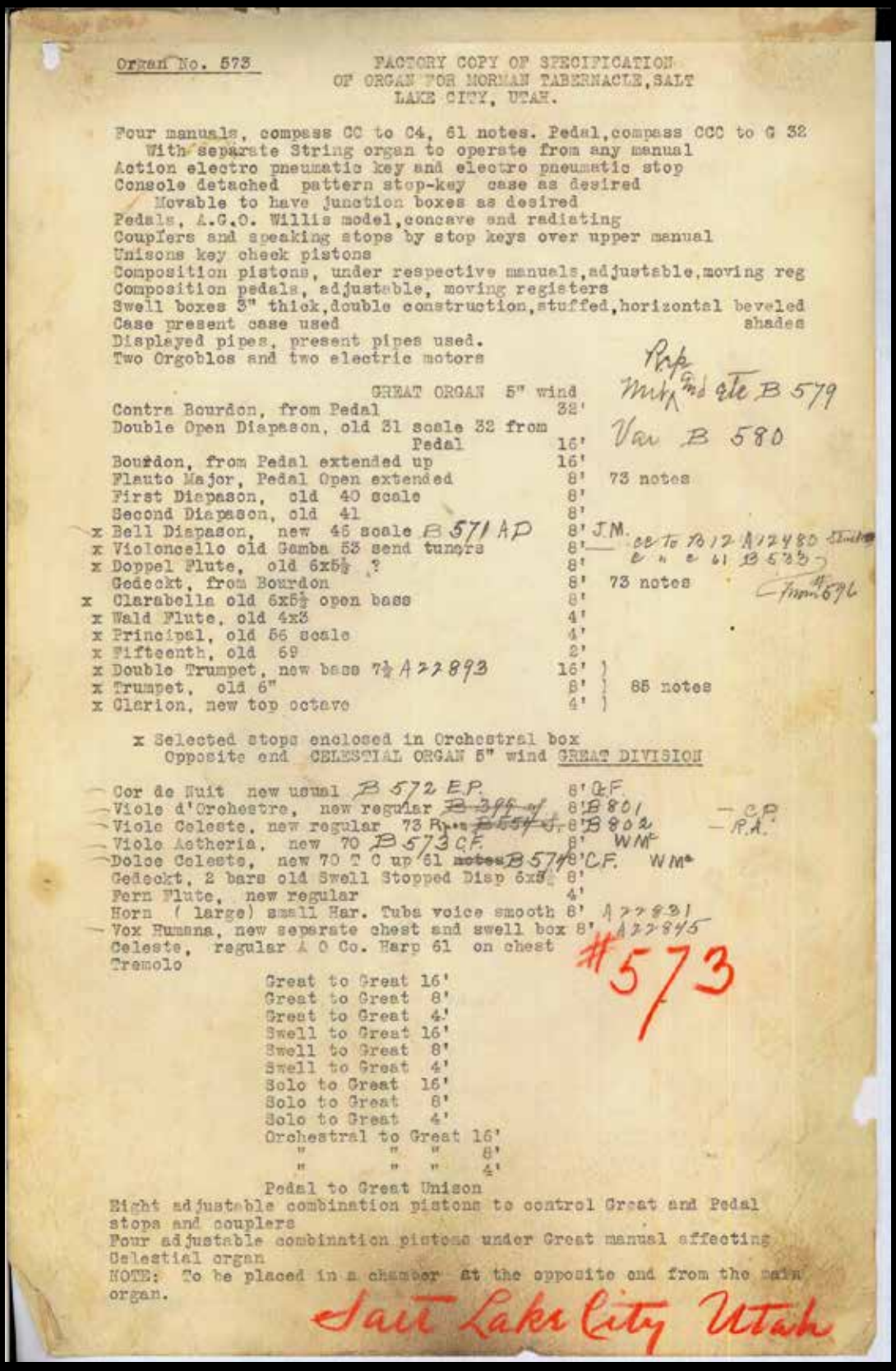
Chief Organist Edward P. Kimball at the Kimball console, ca. 1910. Courtesy of the Church History Library, The Church of Jesus Christ of Latter-day Saints (PH 7782).



The Tabernacle decorated and organ is garbed in funereal drapes in preparation for the lying in state and funeral for President Brigham Young (†Aug. 29, 1877). From the Huntington collection.

TABERNACLE ORGAN

Voicing room copy of factory specifications, courtesy Austin Organs, Inc.



Organ No. 573

FACTORY COPY OF SPECIFICATION
OF ORGAN FOR MORMAN TABERNACLE, SALT
LAKE CITY, UTAH.

Four manuals, compass CC to C4, 61 notes. Pedal, compass CCC to G 32
With separate String organ to operate from any manual
Action electro pneumatic key and electro pneumatic stop
Console detached pattern stop-key case as desired
Movable to have junction boxes as desired
Pedals, A.G.O. Willis model, concave and radiating
Couplers and speaking stops by stop keys over upper manual
Unisons key cheek pistons
Composition pistons, under respective manuals, adjustable, moving reg
Composition pedals, adjustable, moving registers
Swell boxes 3" thick, double construction, stuffed, horizontal beveled
Case present case used shades
Displayed pipes, present pipes used.
Two Orgoblos and two electric motors

Rep Mtr and etc B 579

GREAT ORGAN 5" wind

Contra Bourdon, from Pedal	32'	
Double Open Diapason, old 31 scale 32 from Pedal	16'	Van B 580
Bourdon, from Pedal extended up	16'	
Flauto Major, Pedal Open extended	8'	73 notes
First Diapason, old 40 scale	8'	
Second Diapason, old 41	8'	
x Bell Diapason, new 46 scale B 571 AP	8'	J.M.
x Violoncello old Gamba 53 send tuners	8'	
x Doppel Flute, old 6x5½ ?	8'	
Gedeckt, from Bourdon	8'	73 notes
x Clarabella old 6x5½ open bass	8'	
x Wald Flute, old 4x3	4'	
x Principal, old 56 scale	4'	
x Fifteenth, old 69	2'	
x Double Trumpet, new bass 7½ A 22893	16'	85 notes
x Trumpet, old 6"	8'	
x Clarion, new top octave	4'	

x Selected stops enclosed in Orchestral box
Opposite end CELESTIAL ORGAN 5" wind GREAT DIVISION

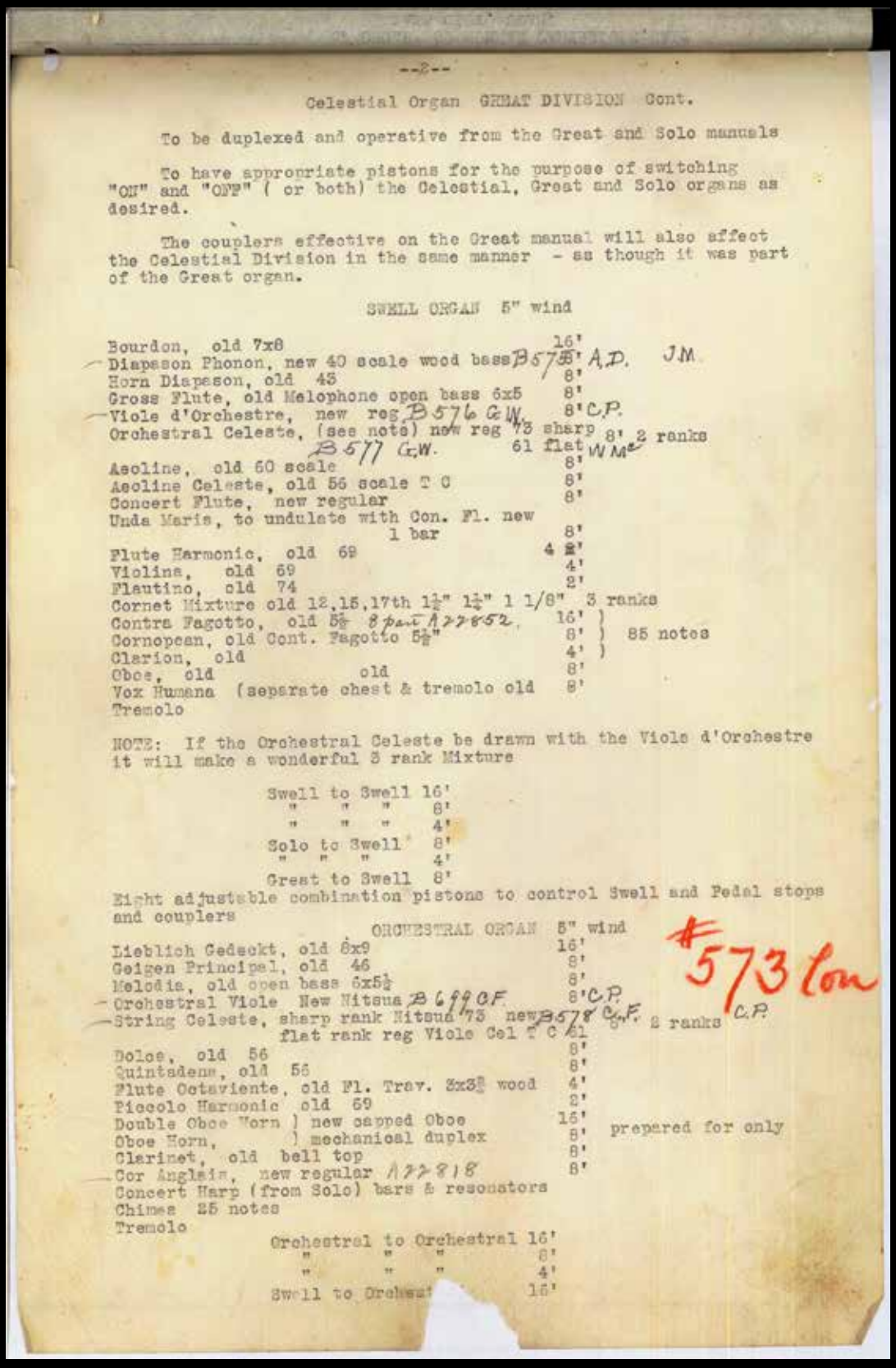
Cor de Nuit new usual B 572 EP	8'	CF
Viole d'Orchestre, new regular B 395 of	8'	B 801 — CP
Viole Celeste, new regular 73 R... B 554 J	8'	B 802 — R.A.
Viole Aetheria, new 70 B 573 CF	8'	WM
Dolce Celeste, new 70 C up 61 notes B 574	8'	CF. WM
Gedeckt, 2 bars old Swell Stopped Diap 6x5½	8'	
Fern Flute, new regular	4'	
Horn (large) small Har. Tuba voice smooth	8'	A 22831
Vox Humana, new separate chest and swell box	8'	A 22845
Celeste, regular A G Co. Harp 61 on chest		
Tremolo		

#573

Great to Great 16'
Great to Great 8'
Great to Great 4'
Swell to Great 16'
Swell to Great 8'
Swell to Great 4'
Solo to Great 16'
Solo to Great 8'
Solo to Great 4'
Orchestral to Great 16'
" " " 8'
" " " 4'
Pedal to Great Unison

Eight adjustable combination pistons to control Great and Pedal stops and couplers
Four adjustable combination pistons under Great manual effecting Celestial organ
NOTE: To be placed in a chamber at the opposite end from the main organ.

Salt Lake City Utah



--2--

Celestial Organ GREAT DIVISION Cont.

To be duplexed and operative from the Great and Solo manuals

To have appropriate pistons for the purpose of switching "ON" and "OFF" (or both) the Celestial, Great and Solo organs as desired.

The couplers effective on the Great manual will also affect the Celestial Division in the same manner - as though it was part of the Great organ.

SWELL ORGAN 5" wind

Bourdon, old 7x8	16'	
Diapason Phonon, new 40 scale wood bass B578 A.D. JM	8'	
Horn Diapason, old 43	8'	
Gross Flute, old Melophone open bass 6x5	8'	
Viole d'Orchestre, new reg B576 G.W.	8' C.P.	
Orchestral Celeste, (see note) new reg 73 sharp B577 G.W. 61 flat WMc	8'	2 ranks
Aeoline, old 60 scale	8'	
Aeoline Celeste, old 56 scale T C	8'	
Concert Flute, new regular	8'	
Unda Maris, to undulate with Con. Fl. new 1 bar	8'	
Flute Harmonic, old 69	4'	
Violina, old 69	4'	
Flautino, old 74	2'	
Cornet Mixture old 12,15,17th 1⅓" 1⅓" 1 1/8"		3 ranks
Contra Fagotto, old 5⅓" 8 part A22852	16')	
Cornopean, old Cont. Fagotto 5⅓"	8')	85 notes
Clarion, old	4')	
Oboe, old old	8'	
Vox Humana (separate chest & tremolo old	8'	
Tremolo		

NOTE: If the Orchestral Celeste be drawn with the Viole d'Orchestre it will make a wonderful 3 rank Mixture

Swell to Swell 16'
" " " 8'
" " " 4'
Solo to Swell 8'
" " " 4'
Great to Swell 8'

Eight adjustable combination pistons to control Swell and Pedal stops and couplers

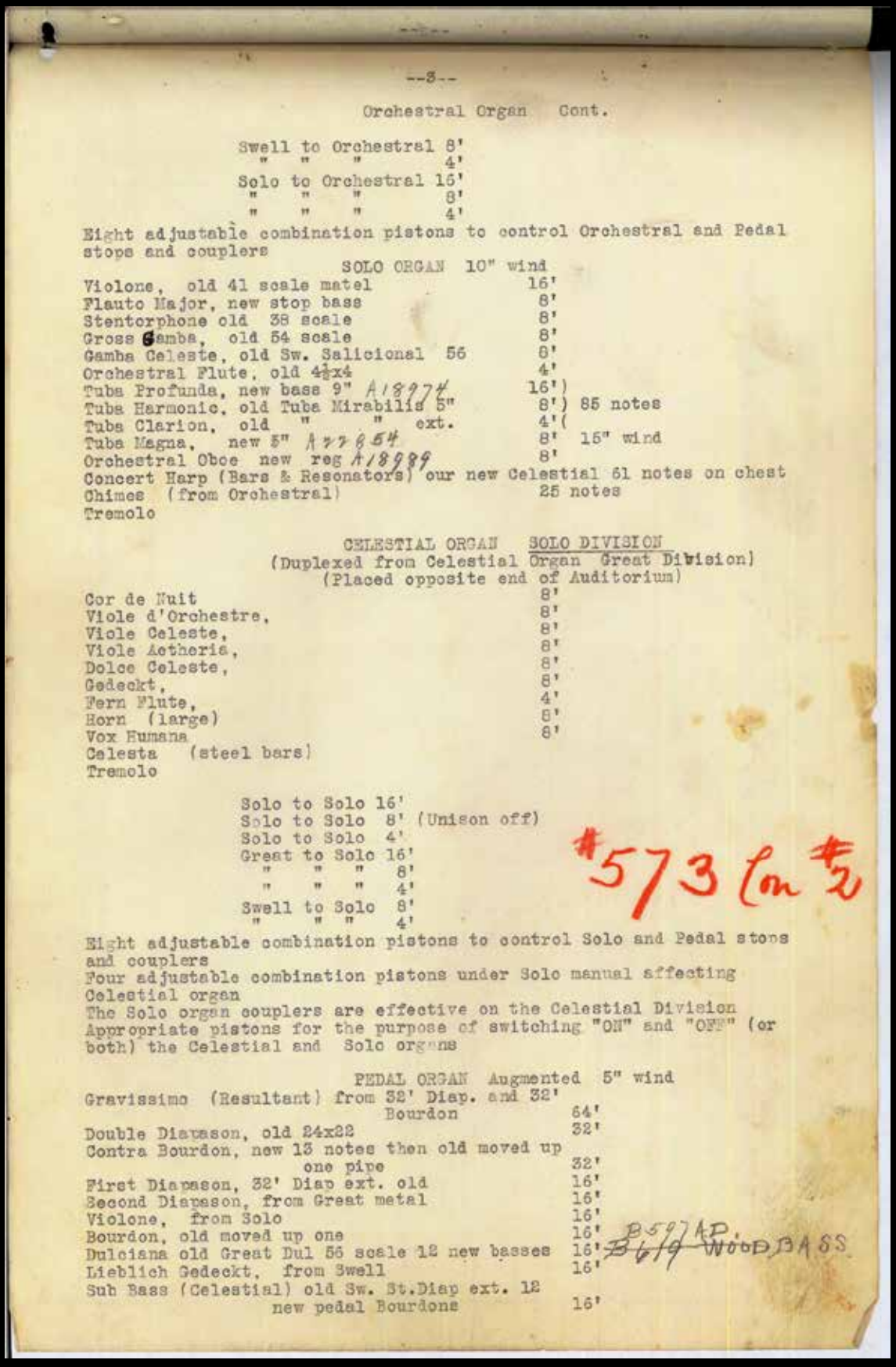
ORCHESTRAL ORGAN 5" wind

#573 low C.P.

Lieblich Gedeckt, old 6x9	16'	
Geigen Principal, old 46	8'	
Melodia, old open bass 6x5½	8'	
Orchestral Viole New Nitsua B699 C.F.	8' C.P.	
String Celeste, sharp rank Nitsua 73 new B578 C.F. flat rank reg Viole Cel T C 61	8'	2 ranks
Dolce, old 56	8'	
Quintadena, old 56	8'	
Flute Octaviente, old Fl. Trav. 6x3½ wood	4'	
Piccolo Harmonic old 69	2'	
Double Oboe Horn) new capped Oboe	16'	
Oboe Horn,) mechanical duplex	8'	prepared for only
Clarinet, old bell top	8'	
Cor Anglais, new regular A22818	8'	
Concert Harp (from Solo) bars & resonators		
Chimes 25 notes		
Tremolo		

Orchestral to Orchestral 16'
" " " 8'
" " " 4'
Swell to Orchest 16'

TABERNACLE ORGAN



--3--

Orchestral Organ Cont.

Swell to Orchestral 8'
" " " 4'
Solo to Orchestral 16'
" " " 8'
" " " 4'

Eight adjustable combination pistons to control Orchestral and Pedal stops and couplers

SOLO ORGAN 10" wind

Violone, old 41 scale matel	16'	
Flauto Major, new stop bass	8'	
Stentorphone old 38 scale	8'	
Gross Gamba, old 54 scale	8'	
Gamba Celeste, old Sw. Salicional 56	8'	
Orchestral Flute, old 4½x4	4'	
Tuba Profunda, new bass 9" A18974	16')	
Tuba Harmonic, old Tuba Mirabilis 5"	8')	85 notes
Tuba Clarion, old " " ext.	4'(	
Tuba Magna, new 5" A17854	8'	15" wind
Orchestral Oboe new reg A18989	8'	
Concert Harp (Bars & Resonators) our new Celestial 61 notes on chest		
Chimes (from Orchestral)	25 notes	
Tremolo		

CELESTIAL ORGAN SOLO DIVISION
(Duplexed from Celestial Organ Great Division)
(Placed opposite end of Auditorium)

Cor de Nuit	8'
Viole d'Orchestre,	8'
Viole Celeste,	8'
Viole Aetheria,	8'
Dolce Celeste,	8'
Gedeckt,	8'
Fern Flute,	4'
Horn (large)	8'
Vox Humana	8'
Celesta (steel bars)	
Tremolo	

Solo to Solo 16'
Solo to Solo 8' (Unison off)
Solo to Solo 4'
Great to Solo 16'
" " " 8'
" " " 4'
Swell to Solo 8'
" " " 4'

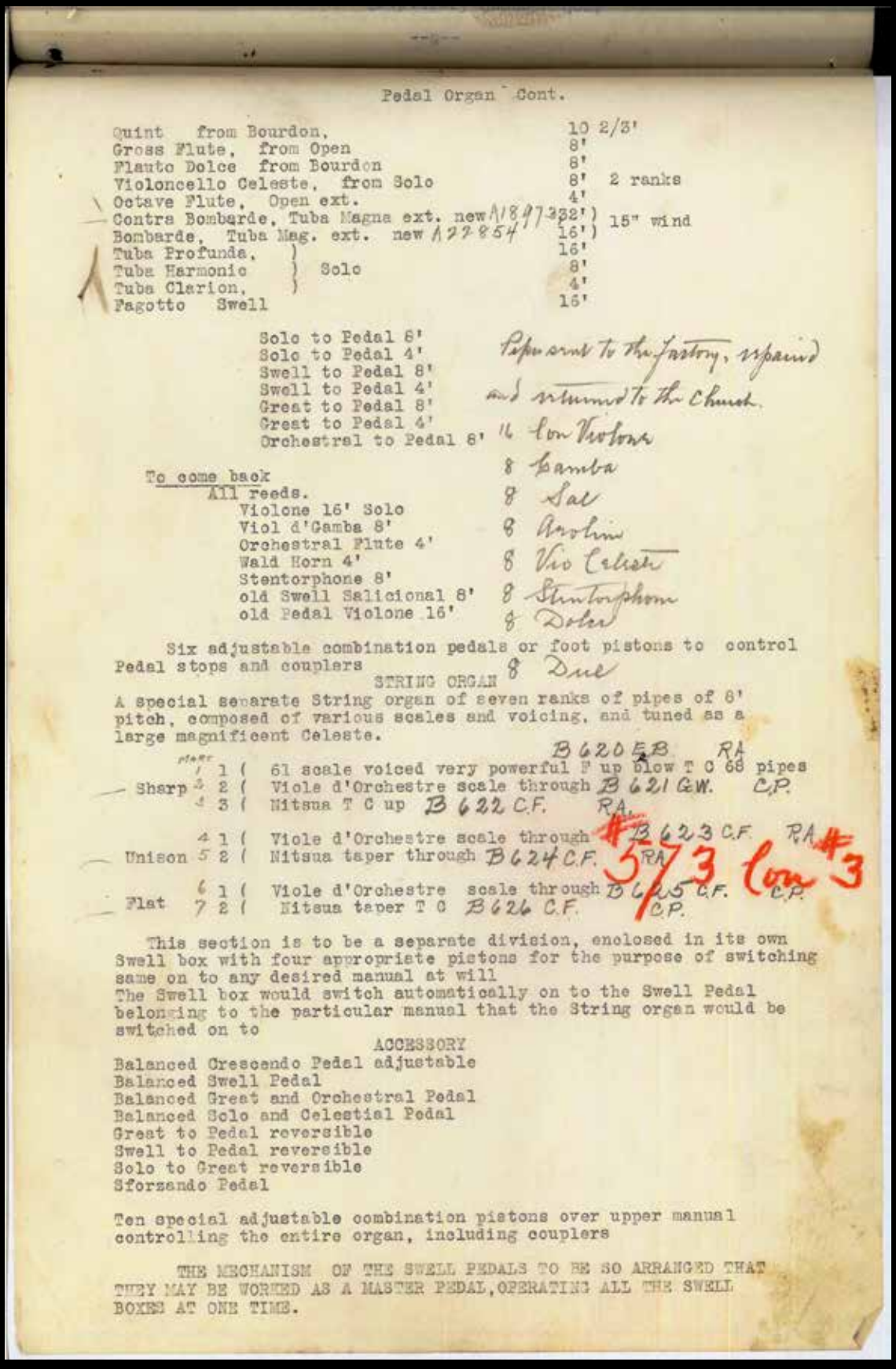
#573 (on #2)

Eight adjustable combination pistons to control Solo and Pedal stops and couplers
Four adjustable combination pistons under Solo manual affecting Celestial organ
The Solo organ couplers are effective on the Celestial Division
Appropriate pistons for the purpose of switching "ON" and "OFF" (or both) the Celestial and Solo organs

PEDAL ORGAN Augmented 5" wind

Gravissimo (Resultant) from 32' Diap. and 32' Bourdon	64'
Double Diapason, old 24x22	32'
Contra Bourdon, new 13 notes then old moved up one pipe	32'
First Diapason, 32' Diap ext. old	16'
Second Diapason, from Great metal	16'
Violone, from Solo	16'
Bourdon, old moved up one	16'
Dulciana old Great Dul 56 scale 12 new basses	16'
Lieblich Gedeckt, from Swell	16'
Sub Bass (Celestial) old Sw. St.Diap ext. 12 new pedal Bourdons	16'

B597AP
~~B619~~ WOOD BASS



Pedal Organ Cont.

Quint from Bourdon,	10 2/3'	
Gross Flute, from Open	8'	
Flauto Dolce from Bourdon	8'	
Violoncello Celeste, from Solo	8'	2 ranks
Octave Flute, Open ext.	4'	
Contra Bombarde, Tuba Magna ext. new A18973	32')	15" wind
Bombarde, Tuba Mag. ext. new A22854	16')	
Tuba Profunda,)	16'	
Tuba Harmonic) Solo	8'	
Tuba Clarion,)	4'	
Fagotto Swell	16'	

Solo to Pedal 8'
Solo to Pedal 4'
Swell to Pedal 8'
Swell to Pedal 4'
Great to Pedal 8'
Great to Pedal 4'
Orchestral to Pedal 8'

Pipes sent to the factory, repaired and returned to the Church.

16 Low Violone
8 Gamba
8 Sal
8 Aeoline
8 Vio Celeste
8 Stentorphone
8 Dolce
8 Due

To come back
All reeds.
Violone 16' Solo
Viol d'Gamba 8'
Orchestral Flute 4'
Wald Horn 4'
Stentorphone 8'
old Swell Salicional 8'
old Pedal Violone 16'

Six adjustable combination pedals or foot pistons to control Pedal stops and couplers

STRING ORGAN

A special separate String organ of seven ranks of pipes of 8' pitch, composed of various scales and voicing, and tuned as a large magnificent Celeste.

B 620 SB RA

Sharp
1 (61 scale voiced very powerful F up blow T C 68 pipes
2 (Viole d'Orchestre scale through B 621 G.W. C.P.
3 (Nitsua T C up B 622 C.F. RA

Unison
1 (Viole d'Orchestre scale through B 623 C.F. RA #3
2 (Nitsua taper through B 624 C.F. RA 3 low #3

Flat
1 (Viole d'Orchestre scale through B 625 C.F. C.P.
2 (Nitsua taper T C B 626 C.F. C.P.

This section is to be a separate division, enclosed in its own Swell box with four appropriate pistons for the purpose of switching same on to any desired manual at will
The Swell box would switch automatically on to the Swell Pedal belonging to the particular manual that the String organ would be switched on to

ACCESSORY

Balanced Crescendo Pedal adjustable
Balanced Swell Pedal
Balanced Great and Orchestral Pedal
Balanced Solo and Celestial Pedal
Great to Pedal reversible
Swell to Pedal reversible
Solo to Great reversible
Sforzando Pedal

Ten special adjustable combination pistons over upper manual controlling the entire organ, including couplers

THE MECHANISM OF THE SWELL PEDALS TO BE SO ARRANGED THAT THEY MAY BE WORKED AS A MASTER PEDAL, OPERATING ALL THE SWELL BOXES AT ONE TIME.

--5--

COMBINATION PEDALS OR FOOT PISTONS TO BE SET IN THE TOE PANEL AND AS MANY AS THE SPACE WILL CONVENIENTLY PERMIT. These pedals to be adjustable and may be used for any department of the organ as may be hereafter decided upon.

All manual stops of 16' 8' and 4' pitch, to have 73 pipes with the exception of the soft Celestes.

The good pipes of the present old organ are to be used, revoiced and re-constructed where necessary, but in any case, guaranteed absolutely perfect.

No case work is to be furnished by the AUSTIN ORGAN CO.

The Austin Organ Co. to provide all manual and pedal chests, swell boxes and console for the future additional registers (4) (four on each)

Two junction boxes provided in floor (at any position desired) so that the console may be moved to said position, thus avoiding loose exposed cable

Any desired length of flexible cable will be provided, so that the console can still be moved a reasonable distance from the junction boxes.

The purchaser will furnish the wiring for the motors, the lights in the interior of the organ and the galvanized iron ducts from blowers to organ

16 Fagotto lengthened out to pitch with new blocks & eschallotes {8' c up new

8 Oboe repaired

8 Clarinet lower 5 made new

8 Tuba Mirabilis old from #441

8 Vox Humana repaired

#573 Con #4

ARCHIVAL RECORDINGS OF THE TABERNACLE ORGANS ARE AVAILABLE ON YOUTUBE

The Lost Chord, Sir Arthur Sullivan
Edward P. Kimball, organist
RECORDED APRIL 23, 1927

Great is Jehovah, Schubert
The Mormon Tabernacle Choir
Edward P. Kimball, organist
RECORDED JUNE 10, 1927

https://youtu.be/6HfsLBjSxg4

War March of the Priests, Wagner
Edward P. Kimball, organist
RECORDED JUNE 8, 1927

A poor, close-miked, non-reverberant recording.

https://youtu.be/7vObCrp0AEk

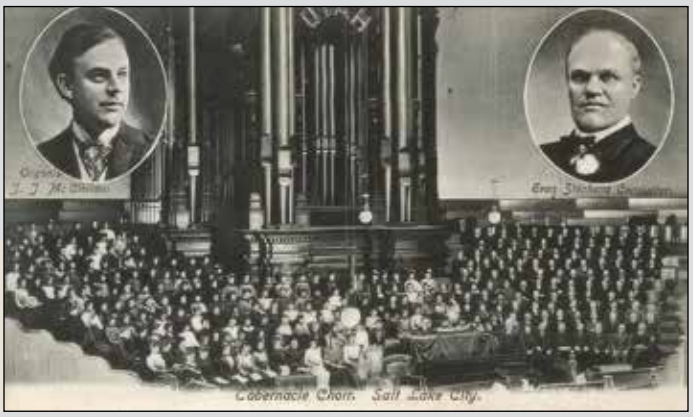
The Gondoliers, Ethelbert Nevin
John J. McClellan, organist
RECORDED IN 1910 ON THE KIMBALL

The best they could do in the day, generally sounding like a harmonium.

https://youtu.be/aSZU2GGdukc

John J. McClellan
ORGANIST

Edward P. Kimball
ORGANIST



THE TABERNACLE CHOIR—SALT LAKE CITY, UTAH
The inset portraits show Organist John J. McClellan (1874–1925, organist between 1900 and 1925) and Choir Conductor and Director Evan Stephens (1854–1930, Choir Director between 1890 and 1916). Date: ca. 1901

Salt Lake Tabernacle Organ

The Church of Jesus Christ of Latter-day Saints
Salt Lake City, Utah, USA
Aeolian-Skinner, Opus 1075 — 1948
Five-manual and pedal detached console; Electro-pneumatic key and stop action
147 voices, 206 ranks, 11,623 pipes

The original organ in the Salt Lake Tabernacle was built by Joseph Ridges in 1867 with 2 manuals. It was rebuilt and enlarged by Niels Johnson (1889), Kimball Organ Company (1901), and Austin Organ Company (1916, 1926, 1937). A contract for a new organ was signed with the Aeolian-Skinner Organ Company of Boston in 1945. At the time, G. Donald Harrison was company president and tonal director. Some pipework from earlier organs was retained, but the organ installed was essentially new. Further additions were made during renovations in 1979 and 1984-88. These were mostly stops which Harrison intended to install but which were omitted for various reasons. The instrument is recognized by many as a quintessential example of the American Classic style of organ building, an eclectic approach championed and brought to its zenith by G. Donald Harrison.

Great Manual II

29 voices, 44 ranks, 2,564 pipes
Wind pressures 3½", 3⅞", 4⁹⁄₁₆", 4⅞"
(89, 98, 116, 124 mm.)

16' Subprincipal ..... 61 pipes
16' Quintaten ..... 61 pipes
8' Principal ..... 61 pipes
8' Diapason ..... 61 pipes
8' Montre* ..... 61 pipes
8' Bourdon ..... 61 pipes
8' Spitzflöte ..... 61 pipes
8' Flûte Harmonique* ..... 61 pipes
8' Bell Gamba ..... 61 pipes
5⅓' Grosse Quinte ..... 61 pipes
4' Principal ..... 61 pipes
4' Octave ..... 61 pipes
4' Koppelflöte ..... 61 pipes
4' Flûte Octaviante* ..... 61 pipes
4' Gemshorn ..... 61 pipes
3⅕' Grosse Tierce ..... 61 pipes
2⅔' Quinte ..... 61 pipes
2' Super Octave ..... 61 pipes
2' Blockflöte ..... 61 pipes
1⅗' Tierce ..... 61 pipes
1¹⁄₇' Septième ..... 61 pipes
2⅔' Full Mixture IV ..... 244 pipes
2' Fourniture IV ..... 244 pipes
1⅓' Kleine Mixtur IV ..... 244 pipes
1' Acuta III ..... 183 pipes
8' Cornet V* (f-f³) ..... 185 pipes
16' Double Trumpet* ..... 61 pipes
8' Trumpet* ..... 61 pipes
4' Clarion* ..... 61 pipes
I/II Manual Transfer (settable)++

† Celeste stops marked with a dagger draw the celeste rank as well as the straight rank, and include a "II" on the stopknob

Swell (enclosed) Manual III

29 voices, 40 ranks, 2,561 pipes
Wind pressures 4¼", 4⅞"
(108, 124 mm.)

16' Lieblich Gedeckt** ..... 68 pipes
16' Gemshorn ..... 68 pipes
8' Geigen Principal ..... 68 pipes
8' Gedeckt ..... 68 pipes
8' Claribel Flute** ..... 68 pipes
8' Flauto Dolce ..... 68 pipes
8' Flute Celeste (TC) † ..... 56 pipes
8' Viole de Gambe ..... 68 pipes
8' Viole Céleste † ..... 68 pipes
8' Orchestral Strings II ..... 136 pipes
8' Salicional ..... 68 pipes
8' Voix Céleste † ..... 68 pipes
4' Prestant ..... 68 pipes
4' Fugara ..... 68 pipes
4' Flauto Traverso ..... 61 pipes
2⅔' Nazard ..... 61 pipes
2' Octavin ..... 61 pipes
2' Hohlflöte* ..... 68 pipes
2⅔' Cornet III ..... 183 pipes
2⅔' Plein Jeu VI ..... 366 pipes
1⅓' Plein Jeu IV*
(from Plein Jeu VI)
⅔' Cymbale IV ..... 244 pipes
32' Contra Fagot ..... 61 pipes
16' Contre Trompette ..... 61 pipes
8' 1ère Trompette* ..... 68 pipes
8' 2ème Trompette ..... 61 pipes
8' Hautbois ..... 68 pipes
8' Voix Humaine ..... 68 pipes
(5"/127 mm. wind)
5⅓' Quinte Trompette ..... 61 pipes
4' Clairon ..... 61 pipes
Tremulant
Swell to Swell 16'
Swell to Swell 4' (only affects stops with top octave extensions)

Positiv Manual I

16 voices, 21 ranks, 1,257 pipes
Wind pressure 2⅝" (67 mm.)

8' Principal* ..... 61 pipes
8' Cor de Nuit ..... 61 pipes
8' Quintade ..... 61 pipes
4' Principal ..... 61 pipes
4' Nachthorn ..... 61 pipes
2⅔' Nazard ..... 61 pipes
2' Principal ..... 61 pipes
2' Spillflöte ..... 61 pipes
1⅗' Tierce ..... 61 pipes
1⅓' Larigot ..... 61 pipes
1' Sifflöte ..... 61 pipes
1¹⁄₇' Septerz II ..... 98 pipes
1' Scharf III ..... 183 pipes
½' Zimbel III ..... 183 pipes
16' Rankett ..... 61 pipes
8' Cromorne* ..... 61 pipes
Tremulant

Choir (enclosed) Manual I

18 voices, 24 ranks, 1,536 pipes
Wind pressure 4¾" (121 mm.)

16' Gamba ..... 68 pipes
8' Principal ..... 68 pipes
8' Concert Flute ..... 68 pipes
8' Viola ..... 68 pipes
8' Viola Celeste † ..... 68 pipes
8' Dulcet II ..... 136 pipes
8' Kleine Erzähler II ..... 124 pipes
4' Prestant ..... 68 pipes
4' Zauberflöte ..... 68 pipes
4' Gambette ..... 68 pipes
2' Piccolo Harmonique ..... 61 pipes
2⅔' Carillon III ..... 183 pipes
2⅔' Sesquialtera II* (from Carillon)
1' Fife* (from Carillon)
2' Rauschpfeife III ..... 183 pipes

*Added as part of renovation project, 1986-88
**Retained from earlier Tabernacle organs
***Added in 1979 ++Added in 2021

16' Dulzian ..... 61 pipes
8' Trompette ..... 61 pipes
8' Krummhorn ..... 61 pipes
8' Orchestral Oboe ..... 61 pipes
4' Rohr Schalmei ..... 61 pipes
8' Trompette Harmonique* (Bombarde)
Tremulant
Positiv off Choir*
Choir to Choir 16'
Choir to Choir 4' (only affects stops with top octave extensions)

Bombarde Manual IV
8 voices, 18 ranks, 1,038 pipes
Wind pressure 6⅛" (156 mm.)

8' Diapason ..... 61 pipes
4' Octave ..... 61 pipes
2⅔' Grosse Cornet IV-VI .... 306 pipes
2⅔' Grande Fourniture VI ... 366 pipes
16' Bombarde ..... 61 pipes
8' Trompette Harmonique* 61 pipes (12"/305 mm. wind)
8' Trompette ..... 61 pipes
4' Clairon ..... 61 pipes

Solo (enclosed) Manual IV
11 voices, 11 ranks, 727 pipes
Wind pressure 9$\frac{5}{16}$" (237 mm.)

8' Flauto Mirabilis ..... 68 pipes
8' Gamba ..... 68 pipes
8' Gamba Céleste † ..... 68 pipes
4' Concert Flute ..... 68 pipes
2⅔' Nazard*** ..... 61 pipes
2' Piccolo*** ..... 61 pipes
1⅗' Tierce*** ..... 61 pipes
8' French Horn ..... 68 pipes
8' English Horn ..... 68 pipes
8' Corno di Bassetto ..... 68 pipes
8' Tuba ..... 68 pipes (11½"/92 mm. wind)
8' Cornet V (Great)
Chimes (c-g^2 amplified) . 32 tubes
8' Harp (c-c^4 amplified) ..... 49 bars
4' Celesta (from harp) ..... 61 notes
Tremulant
Positiv on Solo*
Solo-Bombarde to Solo-Bombarde 16'
Solo-Bombarde Unison Off++
Solo-Bombarde to Solo-Bombarde 4' (affects all stops)

Antiphonal (enclosed) Manual V
9 voices, 11 ranks, 720 pipes
Wind pressure 4⅜" (111 mm.)

8' Diapason ..... 68 pipes
8' Gedeckt** ..... 68 pipes
8' Salicional ..... 68 pipes
8' Voix Céleste † ..... 68 pipes
4' Principal ..... 68 pipes
2' Kleine Mixtur III ..... 183 pipes
8' Trompette ..... 68 pipes
8' Vox Humana ..... 68 pipes
8' Tuba Mirabilis* ..... 61 pipes (Front case; 15"/381 mm. wind)
8' Cornet V* (Great)
Tremulant
Antiphonal to Antiphonal 16'*
Antiphonal to Antiphonal 4' (affects all stops)

Pedal
27 voices, 37 ranks, 1,220 pipes
Wind pressures 3⅜", 4$\frac{5}{16}$", 4½", 4⅝", 6$\frac{3}{16}$", 7"
(86, 110, 114, 117, 157, 178 mm.)

32' Montre** ..... 12 pipes (ext. of Great Subprincipal)
32' Flûte Ouverte** ..... 12 pipes
32' Contre Bourdon** ..... 12 pipes
16' Contre Basse ..... 32 pipes
16' Principal ..... 32 pipes
16' Flûte Ouverte ..... 32 pipes
16' Violone ..... 32 pipes
16' Bourdon ..... 32 pipes
16' Gemshorn (Swell)
16' Gamba (Choir)
16' Lieblich Gedeckt (Swell)
10⅔' Grosse Quinte ..... 32 pipes
8' Principal ..... 32 pipes
8' Violoncello ..... 32 pipes
8' Spitzprincipal ..... 32 pipes
8' Flûte Ouverte ..... 32 pipes
8' Flauto Dolce ..... 32 pipes
8' Gamba (Choir)
8' Lieblich Gedeckt (Swell)
5⅓' Quinte ..... 32 pipes
4' Choral Bass ..... 32 pipes
4' Nachthorn ..... 32 pipes
4' Gamba (Choir)
4' Lieblich Gedeckt (Swell)
2' Principal ..... 32 pipes
2' Blockflöte ..... 32 pipes
10⅔' Grand Harmonics V ..... 160 pipes
4' Full Mixture IV ..... 128 pipes
1' Cymbale IV ..... 128 pipes
32' Bombarde ..... 32 pipes
32' Contra Fagot (Swell)
16' Ophicleide ..... 32 pipes
16' Trombone ..... 32 pipes
16' Double Trumpet* (Great)
16' Contre Trompette* (Swell)
16' Dulzian (Choir)
8' Posaune ..... 32 pipes
8' Trumpet ..... 32 pipes
8' Double Trumpet* (Great)
8' Contre Trompette* (Swell)
8' Krummhorn (Choir)
4' Clairon ..... 32 pipes
4' Chalumeau ..... 32 pipes
2' Kornett ..... 32 pipes

Percussion
Chimes on Great
Chimes on Pedal
Tower Chimes on Pedal++
Harp on Choir
Celesta on Choir

Pedal Couplers
Great to Pedal 8'
Swell to Pedal 8'
Swell to Pedal 4' (affects all stops)
Choir to Pedal 8'
Positiv to Pedal 8'
Solo-Bombarde to Pedal 8'
Solo-Bombarde to Pedal 4' (affects all stops)
Antiphonal to Pedal 8'

Intermanual Couplers
Swell to Great 16'++
Swell to Great 8'
Swell to Great 4' (only affects stops with top octave extensions)
Choir to Great 8'
Choir to Great 4' (only affects stops with top octave extensions)
Positiv to Great 8'++
Solo-Bombarde to Great 16'
Solo-Bombarde to Great 8'
Solo-Bombarde to Great 4'
Antiphonal to Great 8'
Swell to Choir 16'++
Swell to Choir 8'
Swell to Choir 4' (only affects stops with top octave extensions)
Solo-Bombarde to Choir 8'
Antiphonal to Choir 8'*
Positiv to Solo 8'++
Antiphonal to Solo 8'*
Great Tutti to Solo
Pedal Tutti to Swell

*Added as part of renovation project, 1986-88
**Retained from earlier Tabernacle organs
***Added in 1979 ++Added in 2021

Combinations (256 memories - 2007)
General.....0, 1-24
1-4, 13-16 duplicated by toe studs
Great.....1-8
Swell 1-8
Choir 1-8
Positiv* 1-6
Solo-Bombarde 1-8
Antiphonal.....1-4
Pedal 1-8
6-8 duplicated on thumb pistons under Manual I*

Reversibles
Each manual to Pedal 8' coupler (thumb)
Great to Pedal (toe)
Swell to Pedal (toe)
Solo-Bombarde to Great (toe)
32' Bombarde (toe)
32' Flûte Ouverte (toe)*
32' Contra Fagot (toe)*
32' Contre Bourdon (toe)
Choir shades to
Swell expression pedal (thumb)
Manual I/II (thumb)
with indicator lights*
Sforzando (thumb* & toe) with
indicator lights (sforzando may be set independently for each user)

Mechanicals
Swell expression pedal
Choir expression pedal
Solo expression pedal
Antiphonal expression pedal
Crescendo pedal
(4 sequences per user, all adjustable from console)++
30-segment LED Crescendo
Pedal indicator*
Tremulants, celestes, and percussion may be programmed to cancel with crescendo pedal*
Harp dampers on/off
"Next" piston sequencer controls
(8 thumb pistons; 2 toe studs)++
"Previous" piston sequencer controls
(2 thumb pistons; 1 toe stud)++
Swell Voix Humaine Tremulant
Off++

Accessories
Combination set
Memory lock*
Memory selector*
Range set++
IOTI Virtuoso control system
with USB port (2021)
MIDI In/Out/Thru jacks (2007)
Digital clock*
Clock mode selector
Stop/Start, Reset buttons
Clock synchronized to WWVB
Broadcast timer*
Console fan on/off *

Case
Builders:
Joseph Ridges (1867)
Cannon and Fetzer (1916)
Materials: Pine

Relay
Solid state*

Tuning
Equal temperament; A=440 Hz at 74° F

Blowers
Main: 30 h.p.
Auxiliary Pedal: 3 h.p.*
Antiphonal: ¾ h.p.

General Bibliography

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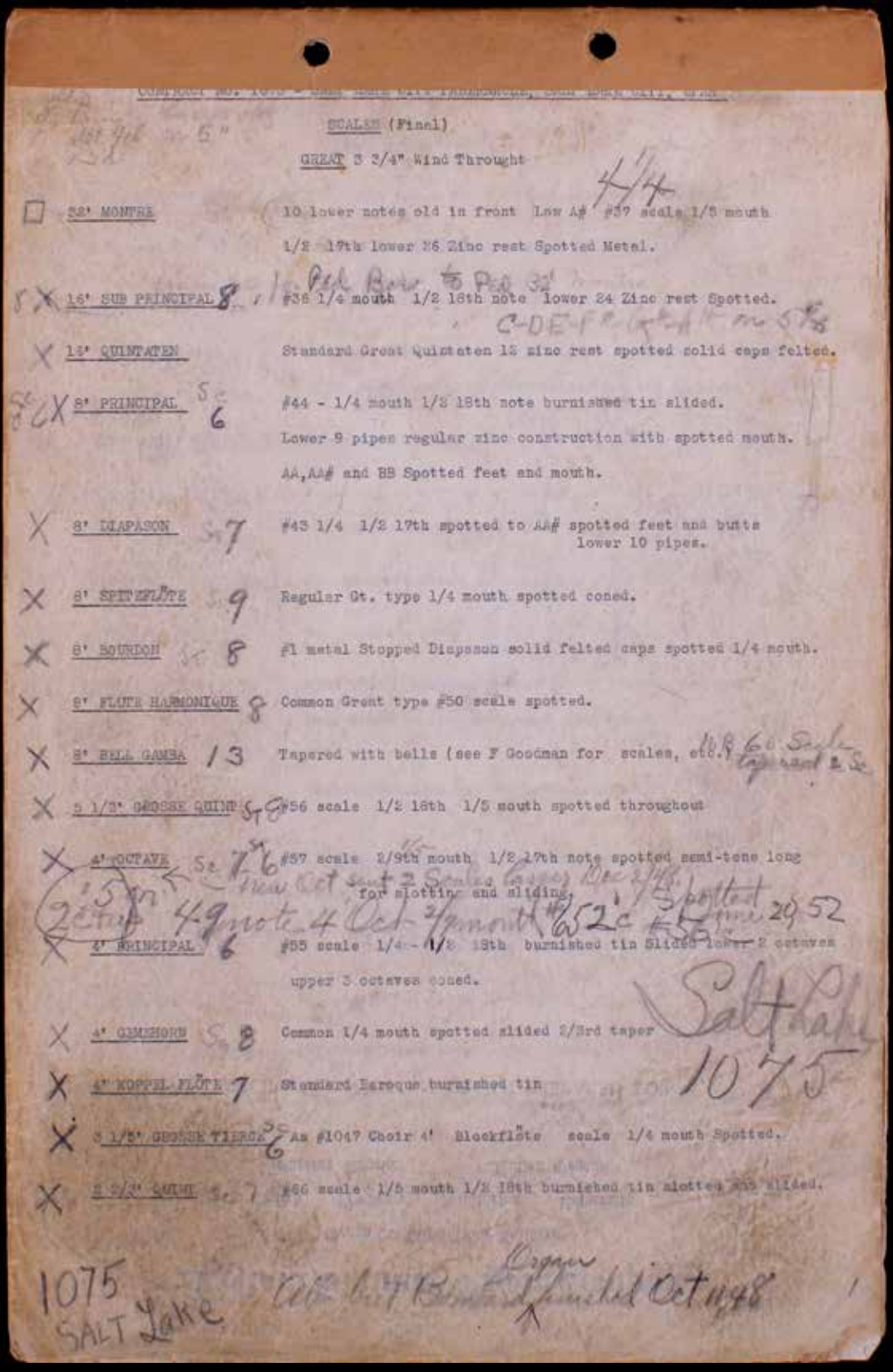
The Tabernacle Choir at Temple Square is an ambassador for The Church of Jesus Christ of Latter-day Saints.

*Added as part of renovation project, 1986-88
**Retained from earlier Tabernacle organs
***Added in 1979 ++Added in 2021

SALT LAKE CITY, UTAH

TABERNACLE ORGAN

Voicing room copy of the factory spec, courtesy the OHS Library and Archives.



SCALES (Final)

GREAT 3 3/4" Wind Throught

32' MONTRE — 10 lower notes old in front Low A# #37 scale 1/5 mouth 1/2 17th lower 36 Zinc rest Spotted Metal.

16' SUB PRINCIPAL — #38 1/4 mouth 1/2 18th note lower 24 Zinc rest Spotted.

16' QUINTATEN — Standard Great Quintaten 12 zinc rest spotted solid caps felted.

8' PRINCIPAL — #44 - 1/4 mouth 1/2 18th note burnished tin slided. Lower 9 pipes regular zinc construction with spotted mouth. AA,AA# and BB Spotted feet and mouth.

8' DIAPASON — #43 1/4 1/2 17th spotted to AA# spotted feet and butts lower 10 pipes.

8' SPITZFLÖTE — Regular Gt. type 1/4 mouth spotted coned.

8' BOURDON — #1 metal Stopped Diapason solid felted caps spotted 1/4 mouth.

8' FLUTE HARMONIQUE — Common Great type #50 scale spotted.

8' BELL GAMBA — Tapered with bells (see F Goodman for scales, etc.

5 1/3' GROSSE QUINT — #56 scale 1/2 18th 1/5 mouth spotted throughout

4' OCTAVE — #57 scale 2/9th mouth 1/2 17th note spotted semi-tone long for slotting and sliding.

4' PRINCIPAL — #55 scale 1/4 - 1/5 18th burnished tin Slided lower 2 octaves upper 3 octaves coned.

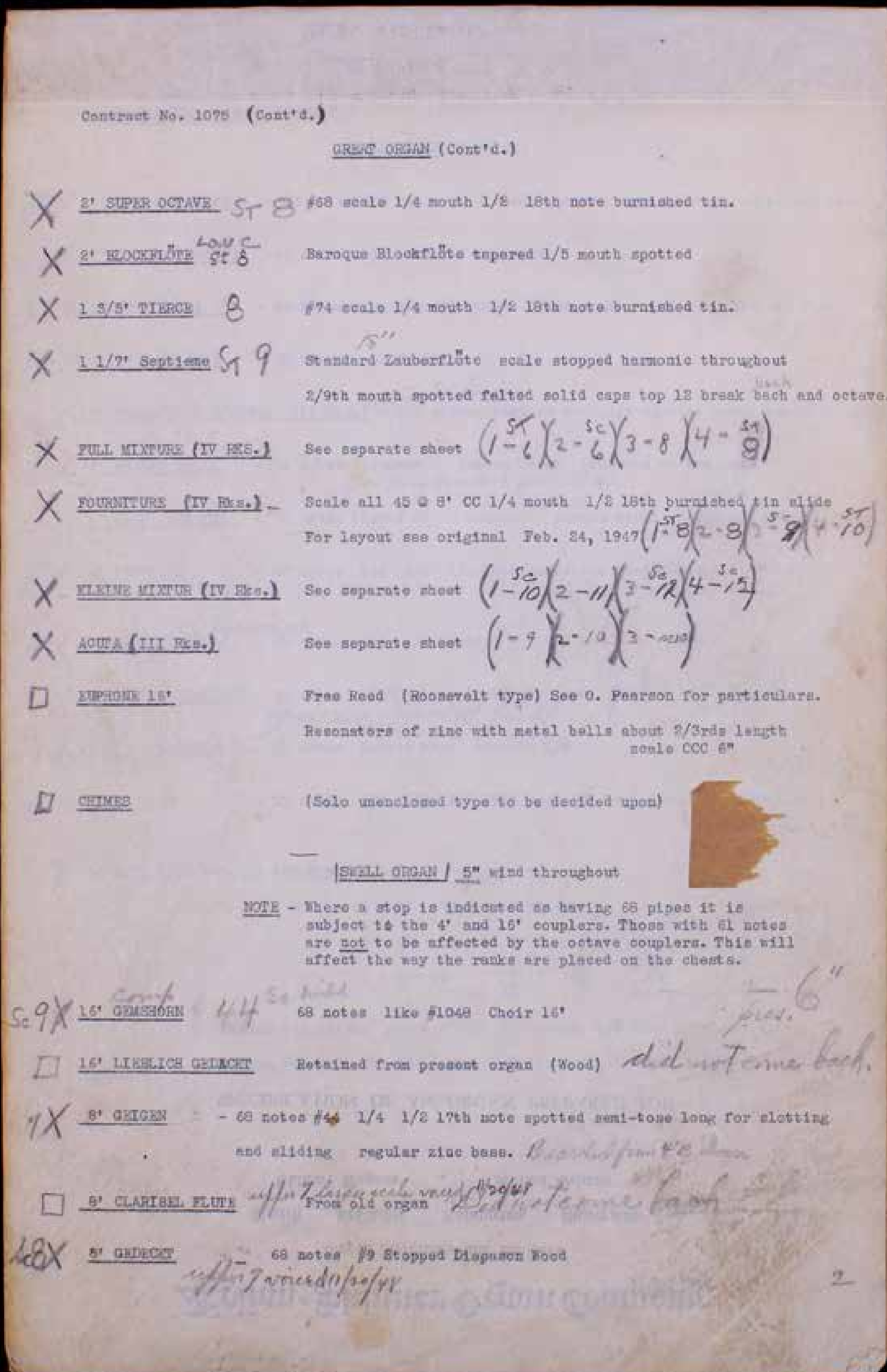
4' GEMSHORN — Common 1/4 mouth spotted slided 2/3rd taper

4' KOPPEL FLÖTE — Standard Baroque burnished tin

2 1/3' GROSSE TIERCE — As #1047 Choir 4' Blockflöte scale 1/4 mouth Spotted.

2 2/3' QUINTE — #66 scale 1/5 mouth 1/2 18th burnished tin slotted and slided.

1075 SALT LAKE



Contract No. 1075 (Cont'd.)

GREAT ORGAN (Cont'd.)

2' SUPER OCTAVE	#68 scale 1/4 mouth 1/2 18th note burnished tin.
2' BLOCKFLÖTE	Baroque Blockflöte tapered 1/5 mouth spotted
1 3/5' TIERCE	#74 scale 1/4 mouth 1/2 18th note burnished tin.
1 1/7' Septieme	Standard Zauberflöte scale stopped harmonic throughout 2/9th mouth spotted felted solid caps top 12 break bach and octave.
FULL MIXTURE (IV Rks.)	See separate sheet
FOURNITURE (IV Rks.)	Scale all 45 @ 8' CC 1/4 mouth 1/2 18th burnished tin slide For layout see original Feb. 24, 1947
KLEINE MIXTUR (IV Rks.)	See separate sheet
ACUTA (III Rks.)	See separate sheet
EUPHONE 16'	Free Reed (Roosevelt type) See O. Pearson for particulars. Resonators of zinc with metal bells about 2/3rds length scale CCC 6"
CHIMES	(Solo unenclosed type to be decided upon)

SWELL ORGAN / 5" wind throughout

NOTE - Where a stop is indicated as having 68 pipes it is subject to the 4' and 16' couplers. Those with 61 notes are not to be affected by the octave couplers. This will affect the way the ranks are placed on the chests.

16' GEMSHORN	68 notes like #1048 Choir 16'
16' LIEBLICH GEDACKT	Retained from present organ (Wood)
8' GEIGEN	- 68 notes #44 1/4 1/2 17th note spotted semi-tone long for slotting and sliding regular zinc bass.
8' CLARIBEL FLUTE	From old organ
8' GEDECKT	68 notes #9 Stopped Diapason Wood

2

Contract No. 1075 (Cont'd.)

SWELL ORGAN (Cont'd.)

8' VIOLE-DE-GAMBE - 68 notes #56 scale 1/4 mouth spotted bass spotted butts and feet

8' VIOLE- CELESTE -68 notes all as Viole-de-gambe

8' SALICIONAL - 68 notes regular #60 scale 1/5th mouth spotted butts and feet

8' VOIX CELESTE - 68 notes as Salicional

8' ORCHESTRAL STRINGS (II Rks.) [made louder] - 136 pipes regular #64 1/6 spotted metal butts in bass.

8' FLAUTO DOLCE - 68 notes common common metal (instead of Aeoline)

8' FLUTE CELESTE - 56 notes (tenor C) common common metal (instead of Unda Maris)

4' PRESTANT - 68 notes #56 1/4 1/2 18th semi-tone long for slotting and Sliding.

4' FUGARA [Sc 7 voiced] - 68 notes #64 1/4 spotted

4' FLAUTO TRAVERSO - 61 notes #50 at 8' CC Great type spotted [Spotted.]

2 2/3' NAZARD - 61 notes Koppel type spotted 1/4

2' OCTAVIN - 61 notes #70 1/4 1/2 18th spotted semi-tone long for slotting and sliding.

CORNET, (III Rks.), - 183 Pipes

12 - 15 - 17	49 notes
8 - 12 - 15	5 "
1 - 8 - 12	7 "
	61

[(1-5T 7)(2-5T 8)(3-9)]

Unison and Quints #46 @ 8' CC 1/4 mouth 1/2 18th note

Tierce #48 @ 8' CC 1/4 mouth 1/2 18th slotted and slided

Contract No. 1075 (Cont'd.)

SWELL ORGAN (Cont'd.)

X PLEIN JEU (VI Rks.) - 366 Pipes

(1-6)(2-36)(3-58)
(4-9)(5-11)(6-12)
increased pipes
to for Clarinet

12 - 15 - 19 - 22 - 26 - 29	12 notes	
8 - 12 - 15 - 19 - 22 - 26	12	"
1 - 8 - 12 - 15 - 19 - 22	12	"
1 - 8 - 8 - 12 - 15 -- 19	12	"
1 - 5 - 8 - 8 - 12 - 15	6	"
1 - 1 - 5 - 8 - 8 - 12	7	"
	61	

Unison and Quints - all #44 scale @ 8' CC 1/2 17th [illegible] slided

X CYMBALE (IV Rks.) - 244 Pipes → Revised 12

(1-11)(2-12)(3-13)(4-13)(4-14)

26 - 29 - 33 - 36	18 Notes	12
22 - 26 - 29 - 33	6 "	6
19 - 22 - 26 - 29	6 "	6
15 - 19 - 22 - 26	6 "	6
12 - 15 - 19 - 22	6 "	6
12 - 15 - 15 - 19	6 "	19
8 - 12 - 15 - 15	13 "	
	61	

Revised 5" pipes

26-29-33-36 — 12
22-26-29-33 — 12
19-22-26-29 — 6
15-19-22-26 — 6
12-15-19-22 — 6
8-12-15-19 — 6
1-8-12-15 — 13
61

New Change 7/31/57
Changed Sept 30 1957 Abe.

Unison and Quint - all #48 @ 8' CC 1/4 mouth 1/2 18th [illegible] and slided. Where the 15th repeats the 2nd 15th to be two scales smaller.

☐ 32' FAGOT - 61 notes Regular Swell 16' Fagotto type lower 12 as #1047 graduated to meet scale of Fagotto at 16' CCC softly voiced spotted tips and bells lower 36 pipes above that all spotted Mitred and hooded (see G.D.H.)

☐ 16' CONTRE TROMPETTE - 61 notes - #2 French shallots lower octave regular tapered shallots with slant head. Resonators all spotted to 8' C Bass spotted tips and bells mitred and hooded. Lower 12 shallots new construction as O. Pearson worked out for Methuen

☐ 8' TROMPETTE - 61 notes - #2 French shallots wide openings resonators all spotted to CC mitred and hooded

4

Contract No. 1075 (Cont'c.)

SWELL ORGAN (Cont'd.)

☐ 8' HARMONIC TRUMPET - 61 Notes - #2 English Harmonique tenor F# (as sample)
CC 3 3/4" spotted throughout

☐ 5 1/3' QUINT TROMPETTE - 61 Notes - #3 French shallots spotted resonators throughout

☐ 4' CLAIRON - 61 Notes as 8' Trompette

☐ 8' HAUTBOIS - 61 Notes Regular with French shallots spotted bells

☐ 8' VOX HUMANA - 68 Notes regular lift cap spotted (Vox Humana)
on separate chest with its own Tremulant

TREMULANT

Swell to Swell 4' }
} on selected stops
Swell to Swell 16' }

CHOIR ORGAN (Enclosed) 5" wind

NOTE - Stops with 68 notes affected by 4' and 16' couplers
Those with 61 notes not to be affected
Arrange planting of pipes on chests accordingly

X 11 16' GAMBA - 68 notes - #46 1/5 mouth slided lower 24 zinc rest spotted.

X 8 8' PRINCIPAL - 68 notes #48 1/4 1/2 17th semi-tone long for slotting and
sliding zinc lower 12 rest spotted.

X 10 8' VIOLA - 68 notes - Christ ch., Cambridge Swell Viole-de-Gambe (tapered) Slotted 58 Sc

X 10 8' VIOLA CELESTE - 68 notes Same as Viola except lower 12 to be regular #60 scale Gamba.

9 XX 8' DULCET (II Rks.) - 135 pipes - Two #75 scale Violes 1/5 mouth slided
136 "
tin burnished lower octaves tin butts and feet.

X 11 8' KLEINE ERZAHLER - 124 Pipes (one rank below tenor C) Common spotted

X 9 8' CONCERT FLUTE 9 Hol notes common Wood with har. metal treble 30%

9 X 4' PRESTANT - 68 notes - as 8' Montre as to scale, etc.

X 4' GAMBETTE - 68 notes #72 1/4 spotted.

5

Contract No. 1075 (Cont'd.)

CHOIR ORGAN (Cont'd.)

X 8 4' ZAUBER FLÖTE - 88 notes common Std. harmonic through to top C spotted.
1c Har
upper 7 large scale revised 11/20/48

X 9 2' PICCOLO HARMONIQUE - 61 notes common Ct. type Har. Flute spotted
upper 24 large scale 11/20/48

X RAUSCHPFEIFE (III Rks.) - 183 Pipes (1 – 9c9 X 2 – 10 X 3 – 11)
Marked IV
15 - 19 - 22 - 18 notes
12 - 15 - 19 - 15 "
8 - 12 - 15 - 51 "
61 "

Scales all based #995 Principal scale 1/4 mouth spotted

X CARILLON (III Rks.) - 183 Pipes (1 – 10 X 2 – 11 X 3 – 12)
MARKED V
5c
18 - 17 - 22 - 49 notes
~~12 - 12 - 19 - 6 "~~
8 - 12 - 15 - 12 "
61 "

All Baroque Sifflöte scale 1/6 mouth spotted and slided

☐ 16' DULCIAN - 61 notes 1/2 length 16' Fagot all as #1080 spotted tubes mitred and hooded

☐ 8' TROMPETTE French shallots #3 scale spotted throughout mitred and hooded.

☐ 8' ORCHESTRAL OBOE Common (voiced loudly)

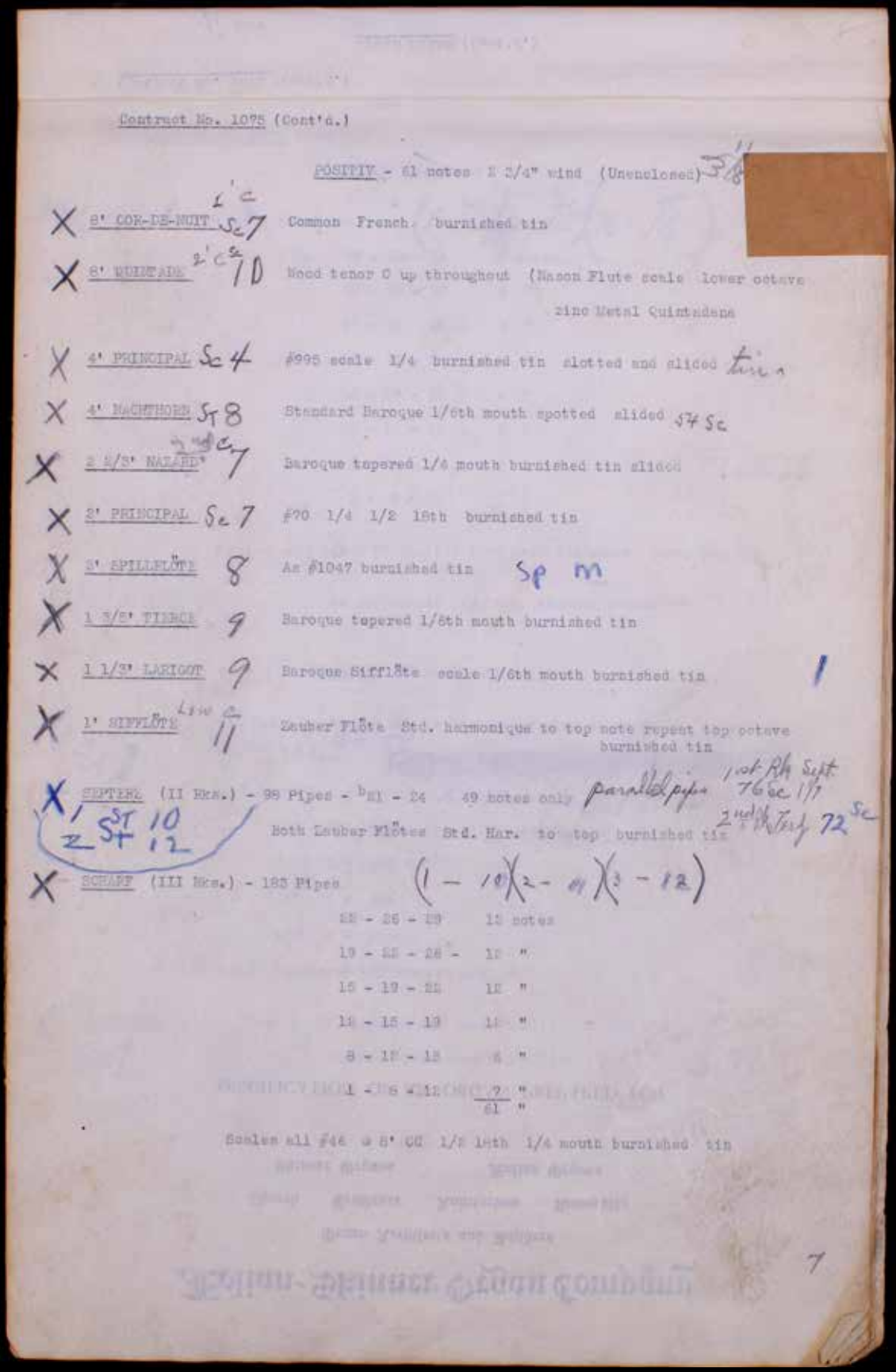
☐ 8' CROMORNE Common Baroque (hooded)

☐ 4' KOHR SCHALMEI Common Baroque

X HARP) CELESTA) 61 notes Skinner Harp

6

TABERNACLE ORGAN



Contract No. 1075 (Cont'd.)

POSITIV - 61 notes 2 3/4" wind (Unenclosed)

X 8' COR-DE-NUIT — Common French burnished tin

X 8' BOURDON — Wood tenor C up throughout (Mason Flute scale lower octave zinc Metal Quintadena

X 4' PRINCIPAL — #995 scale 1/4 burnished tin slotted and sliced

X 4' NACHTHORN — Standard Baroque 1/6th mouth spotted sliced

X 2 2/3' NAZARD — Baroque tapered 1/6 mouth burnished tin sliced

X 2' PRINCIPAL — #70 1/4 1/2 18th burnished tin

X 2' SPILLFLÖTE — As #1047 burnished tin

X 1 3/5' TIERCE — Baroque tapered 1/6th mouth burnished tin

X 1 1/3' LARIGOT — Baroque Stifflöte scale 1/6th mouth burnished tin

X 1' SIFFLÖTE — Zauber Flöte Std. harmonique to top note repeat top octave burnished tin

X SEPTIEME (II Rks.) - 98 Pipes - ^{b}21 - 24 49 notes only parallel pipes

Both Zauber Flötes Std. Har. to top burnished tin

X SCHARF (III Rks.) - 183 Pipes (1 - 10)(2 -)(3 - 12)

22 - 26 - 29 13 notes

19 - 23 - 26 - 18 "

15 - 19 - 22 18 "

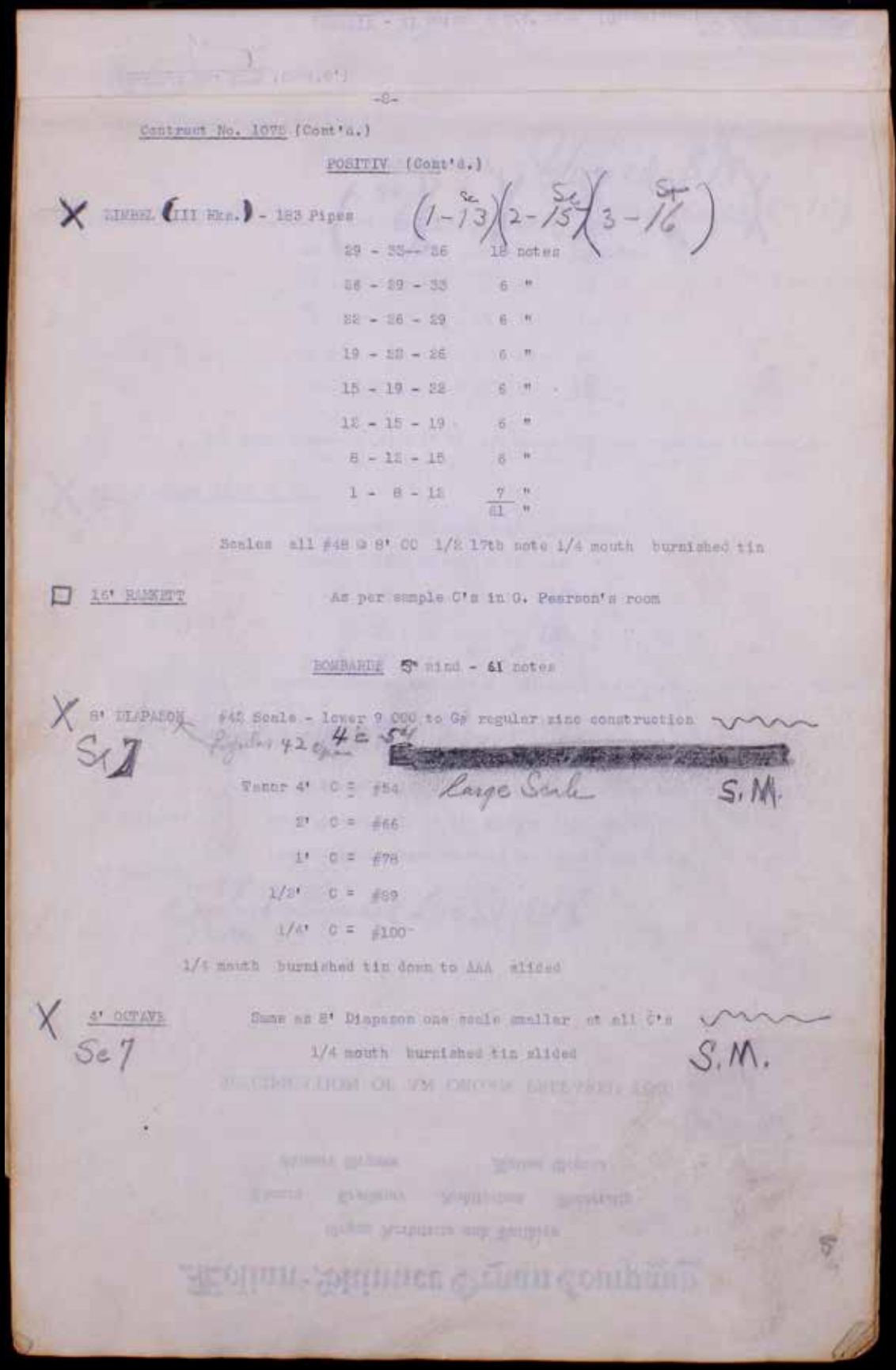
11 - 15 - 18 11 "

8 - 12 - 15 6 "

1 - 5 - 8 - 11 2 "

61 "

Scales all #46 @ 8' CC 1/2 18th 1/4 mouth burnished tin



-6-

Contract No. 1078 (Cont'd.)

POSITIV (Cont'd.)

X DIAPASON (III Rks.) - 183 Pipes (1-Sc 13)(2-Sc 15)(3-Sc 16)

29 - 33-- 36 18 notes
26 - 29 - 33 6 "
22 - 26 - 29 6 "
19 - 22 - 26 6 "
15 - 19 - 22 6 "
12 - 15 - 19 6 "
8 - 12 - 15 6 "
1 - 8 - 12 7 "
61 "

Scales all #48 @ 8' CC 1/2 17th note 1/4 mouth burnished tin

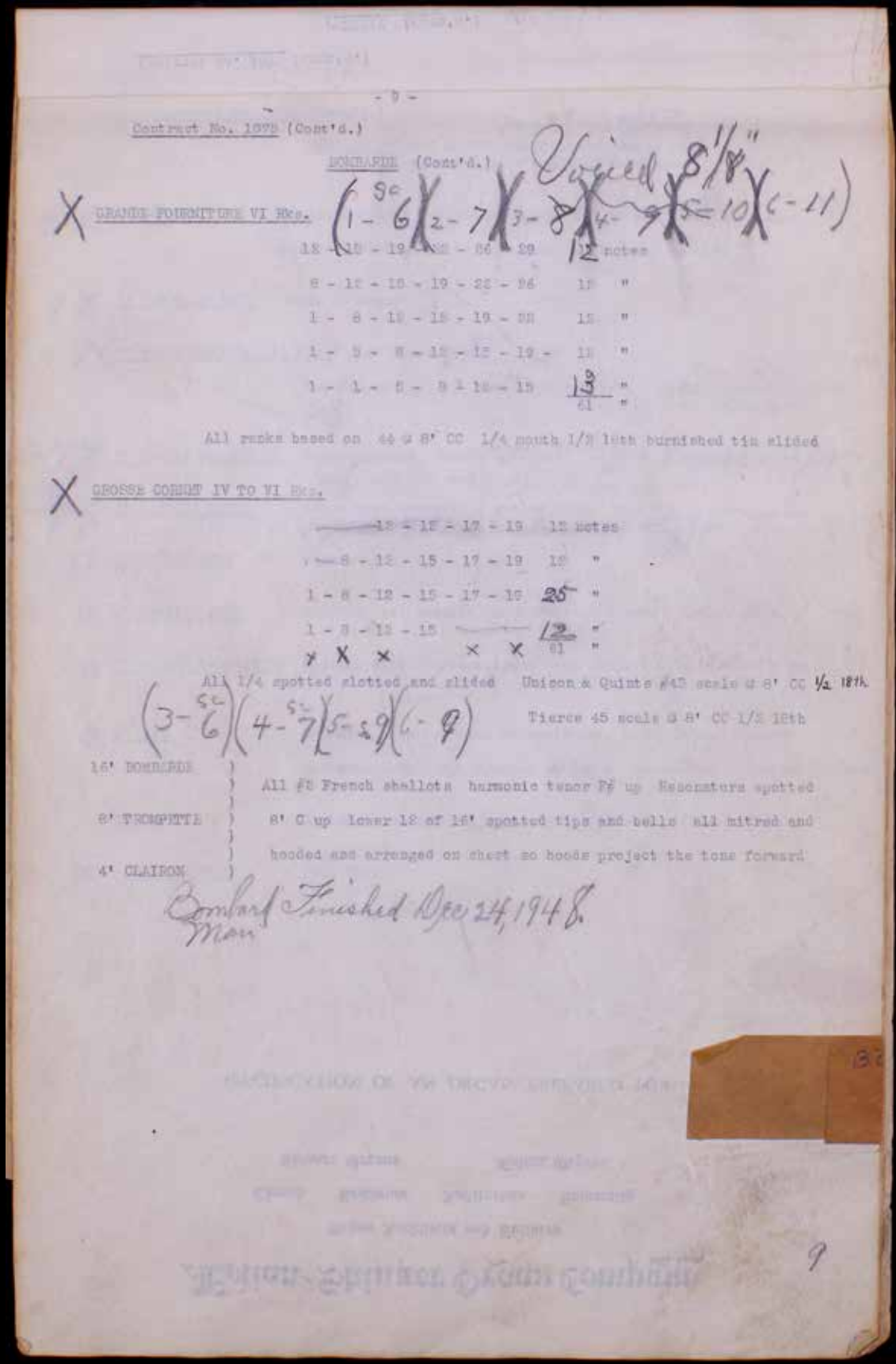
☐ 16' BASSETT As per sample C's in G. Pearson's room

BOMBARDE 5th wind - 61 notes

X 8' DIAPASON #42 Scale - lower 9 CCC to G# regular zinc construction
Sc 7 Regular 42 Sc 4 Sc 5
Tenor 4' C = #54 Large Scale S.M.
2' C = #66
1' C = #78
1/2' C = #89
1/4' C = #100
1/4 mouth burnished tin down to AAA slided

X 4' OCTAVE Same as 8' Diapason one scale smaller at all C's
Sc 7 1/4 mouth burnished tin slided S.M.

TABERNACLE ORGAN



- 9 -

Contract No. 1078 (Cont'd.)

BOMBARDE (Cont'd.)

Voiced 8 1/8"

X GRANDE FOURNITURE VI Rks.

(1 - 6 Sc)(2 - 7)(3 - 8)(4 - 9)(5 - 10)(6 - 11)

12 notes

8 - 12 - 15 - 19 - 22 - 26 15 "

1 - 8 - 12 - 15 - 19 - 22 15 "

1 - 5 - 8 - 12 - 15 - 19 - 15 "

1 - 1 - 5 - 8 - 12 - 15 13 "

61 "

All ranks based on 44 @ 8' CC 1/4 mouth 1/3 18th burnished tin slided

X GROSSE CORNET IV TO VI Rks.

12 - 15 - 17 - 19 12 notes

8 - 12 - 15 - 17 - 19 12 "

1 - 8 - 12 - 15 - 17 - 19 25 "

1 - 8 - 12 - 15 12 "

61 "

X X X X X

All 1/4 spotted slotted and slided Unison & Quinte 42 scale @ 8' CC 1/2 18th

(3 - 6 Sc)(4 - 7 Sc)(5 - 9)(6 - 9)

Tierce 45 scale @ 8' CC 1/2 18th

16' BOMBARDE)

) All #8 French shallots harmonic tenor F# up Resonators spotted

8' TROMPETTE) 8' C up lower 12 of 16' spotted tips and bells all mitred and

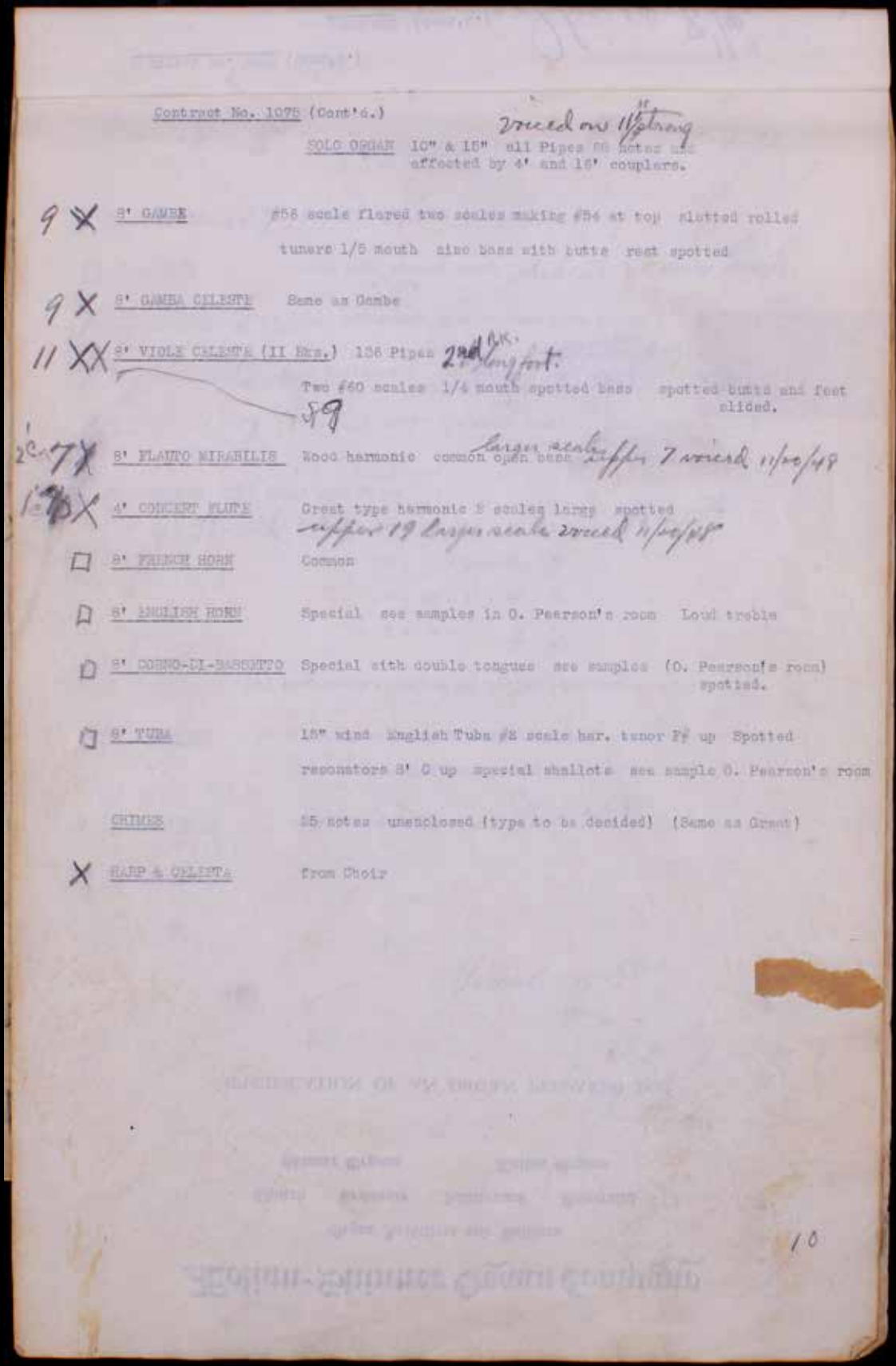
) hooded and arranged on chest so hoods project the tone forward

4' CLAIRON)

Bombard Finished Dec 24, 1948.

Mon

9



Contract No. 1075 (Cont'd.)

SOLO ORGAN 10" & 15" all Pipes 68 notes unless affected by 4' and 16' couplers.

9 X 8' GAMBE #56 scale flared two scales making #54 at top slotted rolled tuners 1/5 mouth zinc bass with tuttz rest spotted

9 X 8' GAMBA CELESTE Same as Gambe

11 XX 8' VIOLE CELESTE (II Rks.) 136 Pipes Two #60 scales 1/4 mouth spotted bass spotted bunts and feet slided.

7 X 8' FLAUTO MIRABILIS Wood harmonic common open bass

4' CONCERT FLUTE Great type harmonic 2 scales large spotted

8' FRENCH HORN Common

8' ENGLISH HORN Special see samples in O. Pearson's room Loud treble

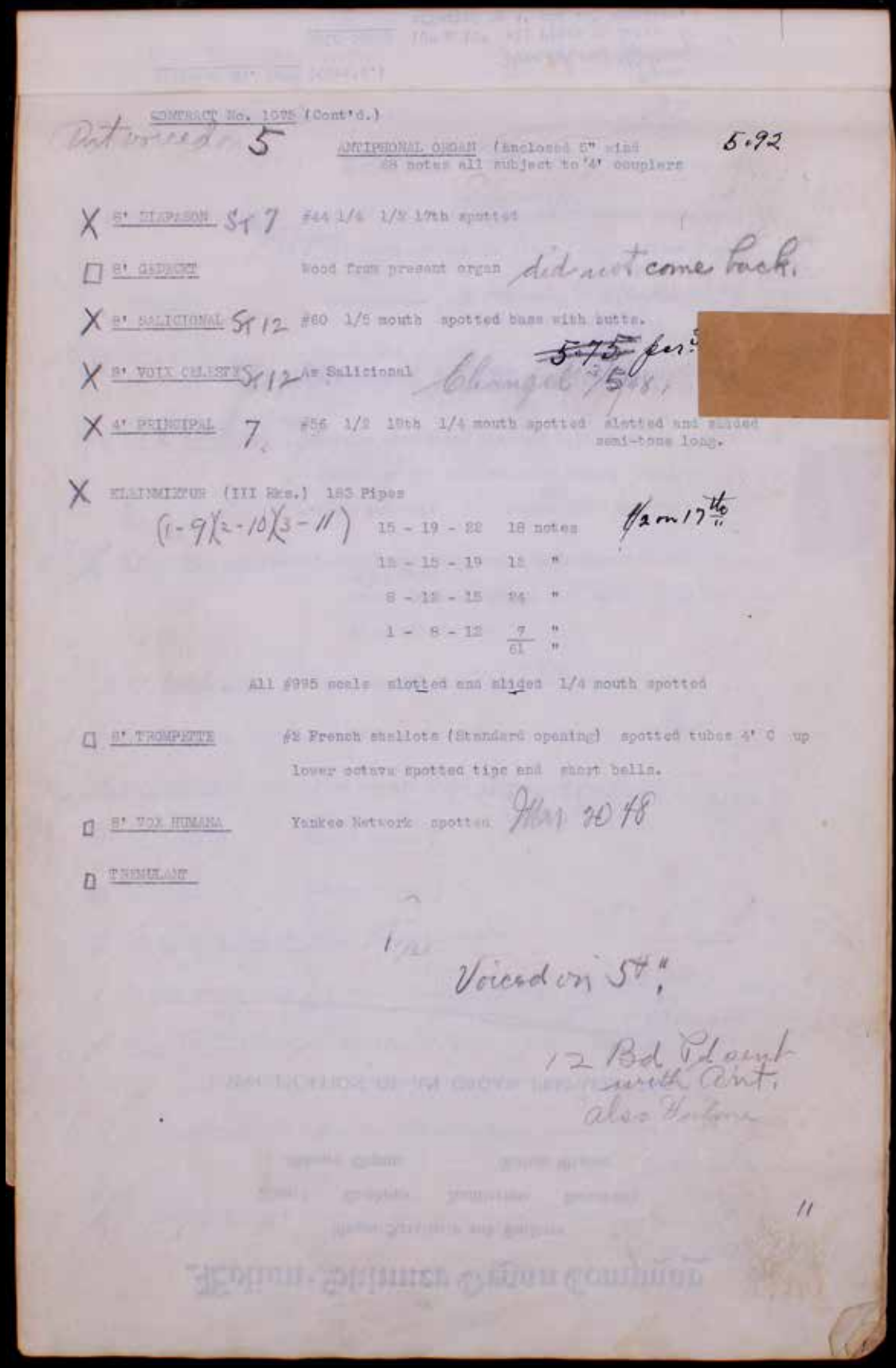
8' CORNO-DI-BASSETTO Special with double tongues see samples (O. Pearson's room) spotted.

8' TUBA 15" wind English Tuba #2 scale bar. tenor F# up Spotted resonators 8' C up special shallots see sample O. Pearson's room

CHIMES 25 notes unenclosed (type to be decided) (Same as Great)

X HARP & CELESTA from Choir

TABERNACLE ORGAN



CONTRACT No. 1095 (Cont'd.)

Returned 5

ANTIPHONAL ORGAN (enclosed 6" wind 68 notes all subject to '4' couplers

5.92

X 8' DIAPASON St 7 #44 1/4 1/2 17th spotted

☐ 8' GEDECKT Wood from present organ did not come back.

X 8' SALICIONAL St 12 #60 1/5 mouth spotted bass with butts.

X 8' VOIX CELESTE St 12 As Salicional ~~5.75 per~~ Charged 5.00,

X 4' PRINCIPAL 7 #56 1/2 18th 1/4 mouth spotted slotted and scaled semi-tone long.

X FLAUTAMIXTUR (III Rks.) 183 Pipes

(1-9 X 2-10 X 3-11) 15 - 19 - 22 18 notes Harm 17th "

12 - 15 - 19 12 "

8 - 12 - 15 24 "

1 - 8 - 12 7/61 "

All #995 scale slotted and slided 1/4 mouth spotted

☐ 8' TROMPETTE #2 French shallots (Standard opening) spotted tubes 4' C up lower octave spotted tips and short bells.

☐ 8' VOX HUMANA Yankee Network spotted Mar 30 18

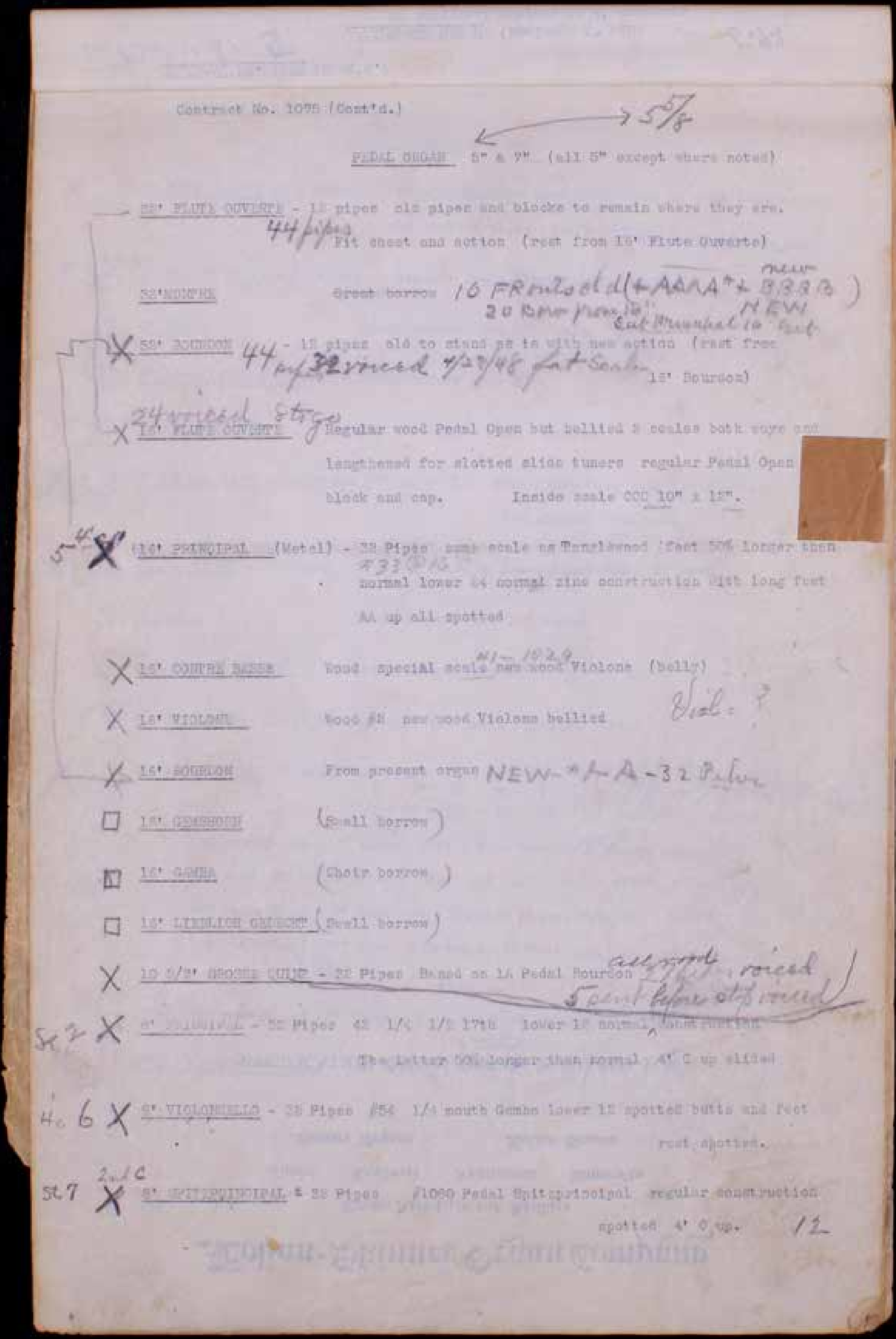
☐ TYMPANI

1/2

Voiced on 5".

12 Bd Diapt with Ant. also Tenors

11



Contract No. 1075 (Cont'd.)

PEDAL ORGAN 5" & 7" (all 5" except where noted)

32' FLUTE OUVERTE - 12 pipes old pipes and blocks to remain where they are. Fit chest and action (rest from 16' Flute Ouverte)

32' BOMBARDE Great borrow

32' BOURDON - 12 pipes old to stand as is with new action (rest from 16' Bourdon)

16' FLUTE OUVERTE Regular wood Pedal Open but bellied 2 scales both ways and lengthened for slotted slide tuners regular Pedal Open block and cap. Inside scale CCC 10" x 12".

16' PRINCIPAL (Metal) - 32 Pipes same scale as Tanglewood feet 50% longer than normal lower 24 normal zinc construction with long feet AA up all spotted

16' CONTRE BASSE Wood special scale new wood Violone (belly)

16' VIOLONE Wood #8 new wood Violone bellied

16' BOURDON From present organ

16' GEMSHORN (Swell borrow)

16' GAMBA (Choir borrow)

16' LIEBLICH GEDECKT (Swell borrow)

10 2/3' GROSSE QUINT - 32 Pipes Based on 16 Pedal Bourdon

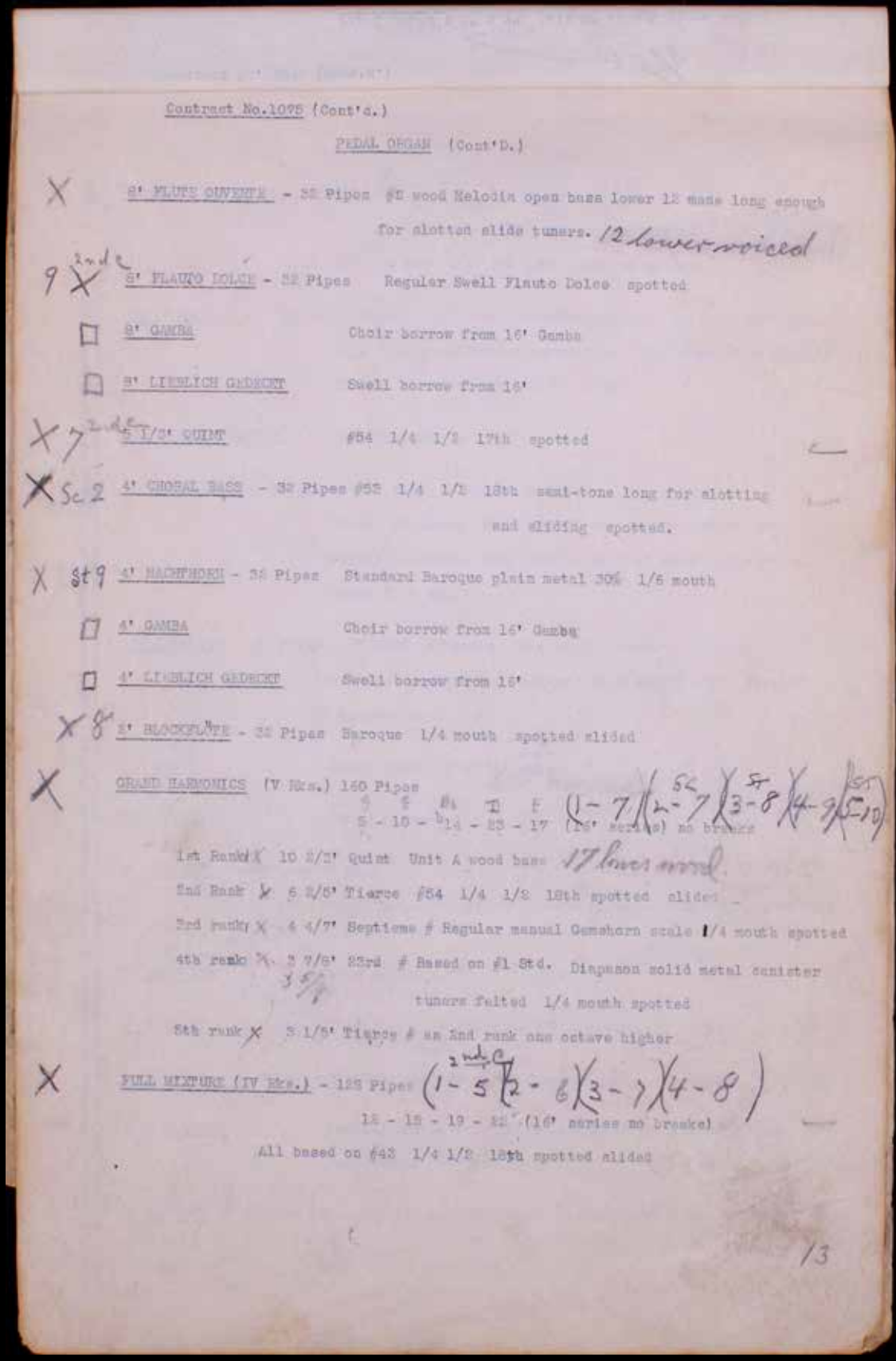
8' PRINCIPAL - 32 Pipes 42 1/4 1/5 17th lower 12 normal construction. The latter 50% longer than normal. 4' C up slided

8' VIOLONCELLO - 32 Pipes #54 1/4 mouth Gamba lower 12 spotted butts and feet rest spotted.

8' SPITZPRINCIPAL - 32 Pipes #1060 Pedal Spitzprincipal regular construction spotted 4' C up.

12

TABERNACLE ORGAN



Contract No.1095 (Cont'd.)

PEDAL ORGAN (Cont'D.)

X 8' FLUTE OUVERTE - 32 Pipes #32 wood Melodia open bass lower 12 made long enough for slotted slide tuners. 12 lower voiced

9 X 2nd c 8' FLAUTO DOLCE - 32 Pipes Regular Swell Flauto Dolce spotted

□ 8' GAMBA Choir borrow from 16' Gamba

□ 8' LIEBLICH GEDECKT Swell borrow from 16'

X 7 2nd c 5 1/3' QUINT #54 1/4 1/2 17th spotted

X Sc 2 4' CHORAL BASS - 32 Pipes #32 1/4 1/2 18th semi-tone long for slotting and sliding spotted.

X St 9 4' HACKPHORN - 32 Pipes Standard Baroque plain metal 30% 1/6 mouth

□ 4' GAMBA Choir borrow from 16' Gamba

□ 4' LIEBLICH GEDECKT Swell borrow from 16'

X 8 2' BLOCKFLÖTE - 32 Pipes Baroque 1/4 mouth spotted slided

X GRAND HARMONICS (V Rks.) 160 Pipes (1 - 7 Sc)(2 - 7 Sc)(3 - 8 St)(4 - 9 St)(5 - 10 St)
C - E♭ - B♭ - D - F
5 - 10 - 14 - 22 - 17 (16' series) no breaks

1st Rank X 10 2/3' Quint Unit A wood bass 17 lower mtl.

2nd Rank X 8 2/5' Tierce #54 1/4 1/2 18th spotted slided

3rd rank X 4 4/7' Septieme # Regular manual Gemshorn scale 1/4 mouth spotted

4th rank X 3 9/5' 22nd # Based on #1 Std. Diapason solid metal canister tuners felted 1/4 mouth spotted

5th rank X 3 1/5' Tierce # as 2nd rank one octave higher

X FULL MIXTURE (IV Rks.) - 128 Pipes (1 - 5 2nd c)(2 - 6)(3 - 7)(4 - 8)
15 - 15 - 19 - 22 (16' series no breaks)

All based on #43 1/4 1/2 18th spotted slided

13

Contract No. 1078 (Cont'd.)

PEDAL ORGAN (Cont'd.)

X CYMBEL (IV Rks.) 128 Pipes (1 - 9/2 - 5 5/10 (3 - 11 (4 - 12)

26 - 29 - 33 - 36 (16' series no breaks)

All based on #44 1/4 1/2 17th spotted slided.

32' BOMBARDE 5" wind - 32 Pipes 12" scale French shallots unweighted tongues Pipes new construction metal tips 1/4 length then zinc with 4' bell of metal spotted 8' C up

32' CONTRA FAGOTTO Swell borrow

16' OPHICLEIDE - 32 Pipes - 7" wind 7" scale at CCC French shallots small weight on tongues tubes metal tips 1/4 length zinc then 2' bell of metal all spotted metal 8' C up.

16' TROMBONE - 32 Pipes - 9" wind 6" scale Eng. light pressure shallots screwed on weights for tongues pipe construction similar to Ophicleide

16' FAGOT Swell borrow from 32' Fagot

16' DOLCIAN Choir borrow

8' POSAUNE - 32 Pipes 7" wind 4 1/2" scale French shallots with small weights spotted tubes throughout.

8' CROMORNE Choir borrow

8' TRUMPET - 32 Pipes - 7" wind Similar to 16' Trombone.

4' CLAIRON - 32 Pipes - 7" wind similar to 8' Posaune

4' CHALUMEAU Special new Baroque (to be developed) top board space required as Clarinet

2' KORNETT 5" wind Standard #2 English Trumpet light pressure shallots

CHIMES (Great)

14

SALT LAKE CITY TABERNACLE, SALT LAKE CITY, UTAH

GREAT MIXTURE LAYOUT AND SCALES

FULL MIXTURE (IV Rks.) - 244 Pipes

12 - 15 - 19 - 22	12 notes
8 - 12 - 15 - 19	12 "
1 - 8 - 12 - 15	31 "
	61 "

Material — Spotted Metal

Scales — #45 @ 8' CC all ranks.

Ratio — 1/2 18th note

Mouth — 1/4 unison ranks 1/5 Quint ranks Semi-tone long for slotting and sliding.

FOURNITURE (IV Rks.) - 244 Pipes

15 - 19 - 22 - 26	12 notes
12 - 15 - 19 - 22	12 "
8 - 12 - 15 - 19	12 "
1 - 8 - 12 - 15	12 "
1 - 5 - 8 - 12	7 "
	61 "

Material — Burnished tin slided

Scales — #1075 Fourniture to be determined #46@8'CC 1/2 on 18

Ratio — " " " " "

Mouth — 1/4 all ranks

ACUTA (III Rks.) - 183 Pipes

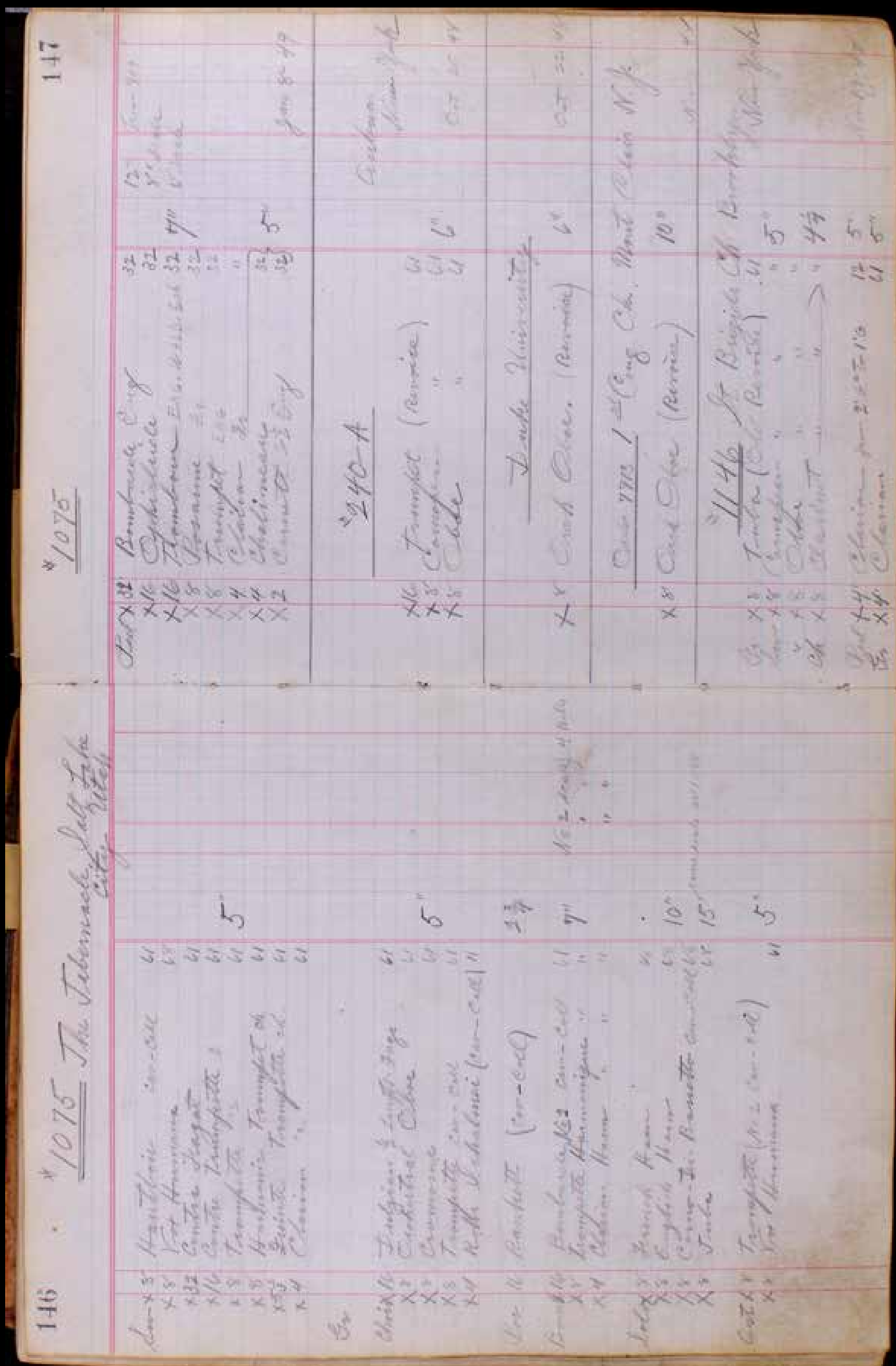
22 - 26 - 29	12 notes 12 notes
19 - 22 - 26	12 "
15 - 19 - 22	12 "
12 - 15 - 19	12 "
8 - 12 - 15	7 " for 13 notes
	61 "

Material — Burnished tin

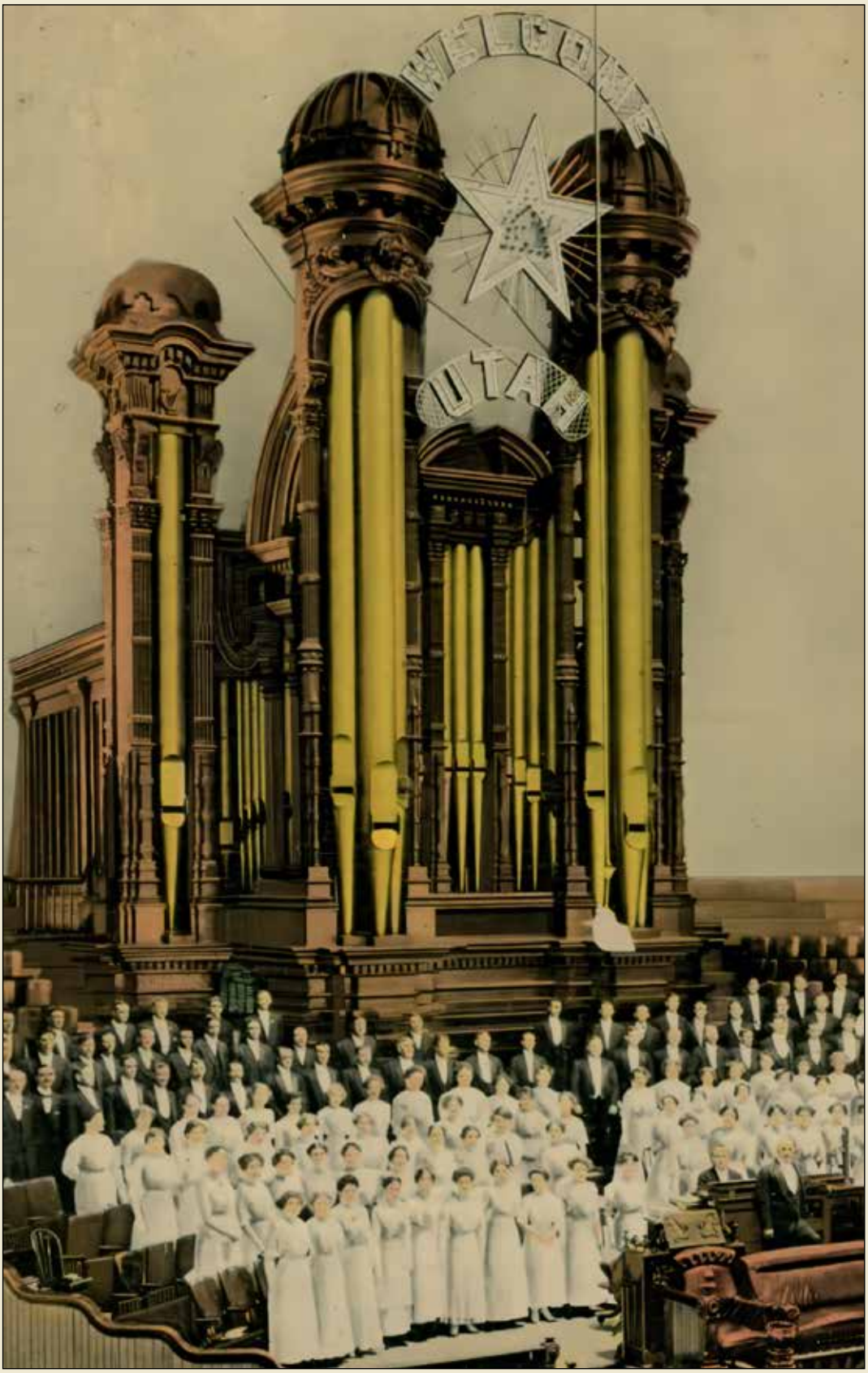
Scales — All #47 @ 8' CC

Ratio — 1/2 18th

Mouth — 1/4 mouth burnished tin


146
#1075 The Tabernacle Salt Lake City Utah
147
#1075
#240-A
Duke University
Op. 7713 1st Cong. Ch. Mont Clair N.J.
#1146 St Briggs Ch Brooklyn N. York

TABERNACLE ORGAN



An early 20th-century hand-colored postcard of the Tabernacle choir and Kimball organ.

A comparison of the Herter Bros. walnut case for the 1863 E.F. Walcker in Boston Music Hall on the left and the Ridges 1873 faux-grained pine Tabernacle case on the right. Other than builders occasionally borrowing the concept of single-pipe flats, this is the only known instance of such a well-proportioned and slavish imitation of the famous case known to have been made. The Walcker facade 32′ only went to F while the Ridges facade went to low-C, the only facade in America to do so until the 1950s.

REVIEW OF THE 1948 INSTALLATION

Both G. Donald Harrison and Alexander Schreiner were prolific and gifted correspondents. Hundreds of pages of colorful prose about the Tabernacle organ have been collected from Schoenstein & Co. files, Aeolian-Skinner factory records, the archives of the Church of Jesus Christ of Latter-day Saints and the massive collection of letters unearthed by Charles Callahan, soon to be published by the Organ Historical Society under the title *The American Classic Organ: Collected Letters*. A digest of some of this material will be the subject of a later article, but a few notes are critical to the understanding of our approach to the 1988 renovation project. Physical evidence in the instrument, anecdotes and, most important, material revealed in these written records proves that the Mormon Tabernacle installation, like so many huge jobs, was fraught with pressures. On January 16, 1949, when the instrument was finished, G. Donald Harrison must have experienced great relief along with his oft-quoted satisfaction with the instrument.

THE IDEA GERMINATES

Dr. Schreiner had been thinking of major changes to the Tabernacle organ for several years. He knew, of course, about G. Donald Harrison's work, but was not yet on a first-name basis when they corresponded late in 1944. Harrison visited Salt Lake City in 1945 at Schreiner's request and gave a consulting report on the organ in March. The two men began plans for a "rebuild" which turned out to be a new Aeolian-Skinner organ with a few stops and casework from previous instruments. The contract for $90,000 was signed in November 1945 with a completion date of March 15, 1948. In a December 11, 1945, letter to William King Covell, Harrison said, "With the location of the organ and the superb acoustics there is a real chance to build the most distinguished instrument in the country, and that is what I intend to try to do."

The contract was executed at the start of the postwar inflation and there was no escalation clause. Two years made a huge difference in cost of production. Reportedly, the company lost some $50,000 (remember, those were 1948 dollars!) on the instrument. In early 1948 Harrison requested an adjustment in price or a reduction in the number of stops. Although not fully documented, it is believed that the Church sent an auditor to Boston, who determined that some adjustment was justified. The stoplist reductions, fortunately, did not occur. In fact, several stops that were prepared for (primarily the Bombarde division) were added during construction. This, according to Harrison, helped the financial picture somewhat.

Design work began in earnest in March 1947. Schreiner put much effort into the design, but diplomatically deferred to Harrison in most matters except console appointment and nomenclature. Harrison was equally skilled in diplomacy and the two seemed to get along famously. Tabernacle organists Frank Asper and Roy Darley were involved in the design as well, but from some distance.

There were some significant changes in the layout from Harrison's first conception detailed to Alexander Schreiner in a letter of March 25, 1947. The Swell and Choir were to be double-decked with the chorus work and reeds on the top level. As built, the divisions were double-decked, but the chorus work and reeds were placed on the bottom levels. The preliminary plan placed the four Great chests at the upper level, the two Positiv chests below with the Pedal in front but lowered still farther to promote egress for the Positiv. As built, the upper level contains two chests of the Great and the Positiv. The lower level contains two chests of the Great (including the mixtures) with the Pedal in the originally planned position. There is no discussion in the records about the change; however, it seems obvious to assume that there was great concern about featuring the Positiv division. It was, therefore, given what was thought to be the most prominent position. As it turns out, the upper level is, indeed, the more favorable position within the enclosed divisions; however, there is little difference between the upper and lower level in the exposed divisions. In retrospect, it seems a shame that

the tuning stability of the Great was compromised in favor of a Positiv division which would have spoken favorably from its originally planned position.

WORK STARTS

Construction began around June of 1947. The Aeolian-Skinner factory was immensely busy with postwar work. From 1947 through 1950, approximately 125 projects went through the shop. Over a hundred of these were three- and four-manual jobs. More than likely all of these instruments were in process at one time or another during the construction and installation of the Tabernacle organ. The building of one organ is a complex venture. When several organs are in process, deadlines to be met, scarce postwar materials to be procured, the problems of running a vast enterprise, particularly one with the attention to quality that was the hallmark of Aeolian-Skinner, multiply geometrically. There is no doubt that this pressure affected the Mormon Tabernacle organ, both in changes to the tonal design specifications (this, alone, could be the subject of a major article) and in the amount of time spent in tonal finishing.

Work in the Tabernacle started in April 1948. Obviously the contracted completion date had slipped! The plan for installation required continuous availability of an organ for daily recitals and weekly broadcasts. The Antiphonal organ was to be installed first in a temporary location and connected to the old console. Then the old organ was to be removed by the Schoensteins to Brigham Young University minus blower and console. While the Antiphonal served as the Tabernacle's only organ, the new main organ was to be installed using the old blower for testing. At the last minute, the console and blower were to be exchanged and the new main organ finished before the October 1, 1948, Church Conference. Then the Antiphonal was to be moved to its permanent position.

The crew was headed by Henry Sieberg and included Martin Carlson, Carmelo Fabrizio, Herbert Pratt and the Tabernacle technician, Leland Van Wagoner. Possibly one or two others helped, but there is no solid record. Mr. Pratt was in charge of tuning and regulating and Mr. Carlson concentrated on wiring, etc. Stanley Williams, Aeolian-Skinner's western representative, was involved from time to time and the Schoenstein company provided some extra help.

The quick console changes were accomplished without missing a note, according to Lawrence Schoenstein who was on the scene, but the rest of the schedule did not work out exactly as planned! On September 25, 1948, Alexander Schreiner, who seemed to serve as an informal project manager, sent a status report to Boston at Harrison's request. The new blower was scheduled to be running by the 27th. The new console was on hand and was to be exchanged with the old one before October 1. The Swell was ready to play except for seven sets of reeds. The Great was only partly complete. The Positiv and Choir were not operating and had no pipes. The Pedal had only a few pipes. The Bombarde and Solo had yet to be wired and winded. Work lights in the expression boxes had not been hooked up! The October 1 conferees heard six ranks of the Great and most of the Swell while work continued on the rest. References in other correspondence indicate that several mechanical parts and a large bulk of pipework, particularly reeds, had not been completed and shipped from the factory at that point. (Factory notes show all pipes completed in the shop on October 11, 1948, except the Bombarde, which was ready on December 24.)

Another indication of the personal involvement of Alexander Schreiner is that he worked out a formula for adjusting the wind pressure used in the Boston voicing rooms to compensate for the high Salt Lake altitude. Evidently no compensation was made in the first pipes shipped. Pressures had to be reduced at the Tabernacle. (For example, the Antiphonal was specified at 5" but set on the job at 4³/₈".) Other pressures were altered, but one assumes this was the choice of the finishers, as altitude adjustments were made for later shipments of pipes from Boston.)

TONAL FINISHING

Perhaps of most importance to the finished product was the amount of time spent on tonal finishing. It is, of course, naive to assume that G. Donald Harrison supervised all of the tonal finishing. The important fact is how much time was available for tonal work in total and, secondarily, how much of this period was devoted to final polishing under Harrison's personal supervision? Plotting out the work remaining after September 25, including unpacking, planting and rough tuning the flue pipes, it would be safe to assume that the organ would not be ready for any kind of serious tonal work until around the second week of November. This would allow about 50 working days (assuming six-day weeks) until January 16. Subtracting the time needed to get reeds ready for finishing and for final tuning of the finished organ, about 30 days were available for finishing the entire organ. We know from experience that the activities in the Tabernacle make uninterrupted work impossible. The same was true then. Correspondence from both Harrison and Schreiner indicate the difficulties under which the crew operated. Also, keep in mind that during this process there must have been numerous interruptions for discussions and time spent on special tonal adjustments, mechanical work and so on. For example, we know that during the finishing eight sets of trebles of larger scale were ordered to solve balance problems. It is possible that other stops, including the Swell Clairon and Harmonic Trumpet, were altered. Some of the numerous deviations from the scale list may have happened on the job.

The correspondence backs this up. Harrison wrote a letter on December 21, 1948, to Henry Willis from Boston. He stated that he

Closeup of carving detail on 32' pedal tower, showing simulated oak graining of the pine

had just returned after "a couple of weeks" on the job in Salt Lake City and was planning to return after Christmas to finish up the work. Assuming a couple of weeks before Christmas and the full time between Christmas and January 16, taking away a reasonable amount for travel, would have allowed Harrison approximately 25 days for supervision of tonal finishing. This means either (1) some ranks were brushed over lightly or (2) each rank got less than two hours work including muting for mixtures, etc.!

All this calculation after the fact cannot be taken too literally; we do not know exactly what went on. The point is to show that time was limited. What must have happened, based on inspection of the organ, was serious work on critical areas with little or no attention to others.

This picture, while not unusual for large projects, is something that should be kept in mind when listening to an organ in minute detail. When an instrument is new—especially in a fine setting—and "the bloom is on the rose," the tonal picture can seem marvelously complete even if it was painted with a "broad brush." As time goes on and organists get more deeply immersed in the instrument and start exploring vast quantities of repertoire, the discrepancies in tonal finishing can begin to show.

THE RESULT IS UNVEILED

What was the result of this marathon effort? Some of the circumstances were, indeed, difficult; however, the most important elements for success—a good client, a good builder and a good room—were there. This positive "partnership" resulted in an instrument with a "signature sound." By this, I mean an organ that is instantly recognizable—one with individual character. Creating a unique sound while staying well within the bounds of good taste and tradition is the work of genius. Achieving these things in an eclectic instrument is a miracle.

Discussing the "American Classic" philosophy is not within the purpose or scope of this article. It must be pointed out, however, that building an eclectic instrument is a dangerous business. Admittedly, it is easier to do with a large specification than in a limited one, but the same pitfall of misunderstanding eclecticism can stand in the way. The term "eclectic" as applied to organ design has been terribly misused. Eclectic organ design does not mean including everything from all past styles. It does mean adopting, selectively, ideas of various traditions to create a musical instrument of integrity. Such eclecticism may result in an instrument capable of rendering musically, if not authentically, literature of many periods. The idea of separate divisions or subdivisions based on different traditions all captured together in one console cannot possibly work. The G. Donald Harrison and Aeolian-Skinner concept of the eclectic organ was far more subtle.

Harrison was aiming for a modern instrument based in tradition but not bound by it. His interest, as expressed over and over again in letters to his colleagues, was in the music. Any study of the past was to rediscover the great literature. He carefully culled formulas of others and freely modified them in the service of musical refinement. He believed that there were basic laws of musically correct design, but that it was the calling of an artist-builder to interpret these in his own way. And, contrary to popular belief, Harrison greatly admired many of the beautiful E.M. Skinner voices and combined them with his material skillfully.

The keynote, to me, of the Mormon Tabernacle organ is its avoidance of extremes. Harrison created an instrument of widely varied tonal color, but he left no gaps in the picture. All the sounds relate to one another in a smoothly changing panorama. There are no extremes in dynamic level. Most stops are placed on one plateau so that they may be easily mixed and blended.

Although easily recognizable, the tonal character of the Mormon Tabernacle organ is hard to describe. After working with it for a long time, the words that come to mind are smoothness, refinement and elegance. In thinking of great organs, one often thinks of the comparisons made among the great orchestras—the New York Philharmonic with its brilliant soloists, the Philadelphia Orchestra with its rich and shimmering ensembles, the Chicago Orchestra with its robust power and deep sonority. The Mormon Tabernacle organ is perhaps most like the Philadelphia Orchestra. In fact, many people over the years have commented on the similarity in fusion of tonal elements into an elegant whole.

What did Schreiner himself feel distinguished the Tabernacle organ from others? In the church files is the first draft of an article Schreiner composed for the spring 1957 issue of the *Organ Institute Quarterly*. "The new Aeolian-Skinner organ in the Tabernacle is a gem of the organbuilder's art. The general tonal scheme is in the classic tradition whereby each manual is an independent ensemble of contrasting tone and mixture, complete with flue structure and chorus reeds as well as orchestral voices." Independence of divisions and complete harmonic structure were the points of which he seemed to be most proud. He noted that couplers—particularly to the Pedal—were rendered less important due to the great lengths that were taken to create independence. A special system was provided for super couplers (see stoplist) wherein chorus work was not affected. "Also, the two most powerful stops . . . are not overpowering when heard alone and thus do not overshadow the remainder of the organ." A blended ensemble was of critical importance to Schreiner. He goes on to coin a phrase that makes it crystal clear: ". . . the backbone of the organ—foundation stops, mixtures, reeds—are so well balanced as to contribute to a 'democratic' ensemble of sound." In detail he was especially proud of the Swell Plein Jeu which was "capable of being played by itself with musically satisfying results . . ." He was also pleased with the number of pitches represented in each division, particularly the Pedal which had "16 pitches from the bottom 32′ to the top of the Cymbale . . ." It is clear that Schreiner had both a musical and scientific perspective relative to the organ, as he was very interested not only in matters of sonority, but in acoustics and mechanical matters as well.

As a work of art, there is no doubt the Mormon Tabernacle organ was eminently successful when it was unveiled in 1949. But it also accomplished its practical, everyday work in the Tabernacle to perfection. The organ has three roles. Standing above all else is accompanying the famous Mormon Tabernacle Choir of 325 voices. Many people comment that when hearing the Tabernacle organ and choir together, there is such a perfect blend that these powerful and sublime musical forces become one great instrument. Accompanying such a large choir requires an instrument with a subtle kind of power—power that is under control and power that does not compete for attention. This quality is what the Tabernacle organ has, perhaps more so than any other in the world—a vast variety of tone colors very subtly differentiated one from another, allowing a nearly "seamless" crescendo and diminuendo from the lightest registrations to full organ and back.

The organ's second function is the playing of solo literature. It is heard in a solo capacity each week during the choir's worldwide radio and television broadcast. It is played every day of the week throughout the year, sometimes twice a day, in formal recitals. The audience for these recitals is diverse, being mostly composed of tourists with a good number of foreign visitors—many of them attending an organ recital for the first time. The repertoire is, therefore, decidedly eclectic with music of nearly all periods and styles represented. There is absolutely no question that the Mormon Tabernacle organ must be able to play this demanding repertoire convincingly. There is no possibility of fulfilling this mission with an instrument specializing in any one tonal style.

The third aspect of the Tabernacle organ's role is its use in broadcasting. Although heard live by hundreds of thousands every year, it is heard by millions over radio and television and in recordings. In designing and working with the instrument, great thought has always been given to how it sounds "over the air."

It comes as a surprise to many that the Tabernacle is not used for regular Sunday services. Although it is used on occasion for funerals and twice each year for church conferences, it is not, in the strict sense, a church or chapel. The Tabernacle organ would be a marvelous service playing organ—the envy of many a cathedral organist—but it was not designed with that particular requirement in mind.

The Mormon Tabernacle organ is not a church organ, a concert hall organ or a studio organ. To some degree it is all three. In all work with the organ we have kept in mind these three jobs: accompaniment of a large choir, eclectic recital repertoire and affinity with broadcasting. What this meant in practical terms was that nothing could be changed or introduced which would rob the organ of its characteristic elegance in accompaniment and its eminent suitability for radio pickup. It is, perhaps, easy enough to add variety and flexibility to an instrument if it is purely a recital organ; however, the challenge becomes much greater when one is dealing with an instrument that has often been compared to the Philadelphia Orchestra and one that has a "signature sound."

POST-HARRISON WORK

What happened to the organ between 1949 and 1984? We know that some things about the organ bothered Alexander Schreiner from the outset. Schreiner seemed to have felt uncomfortable asking Harrison to return. Perhaps a concern over Aeolian-Skinner's financial loss on the project had something to do with this. Perhaps he wanted to make some adjustments of which he felt Harrison might not approve. Within a short time after the installation was completed, he engaged the Schoenstein company to do some remedial regulation in the Swell and Positiv. His concern was in the effect of the Swell reeds and Cymbale and the Positiv Rankett, which exhibited serious instability. He also spent a lot of time directing fine adjustment of tremulants.

In 1953 the Great Kleine Mixtur was refinished by Aeolian-Skinner, evidently softening it considerably. The Swell Cymbale was recomposed and revoiced by the firm in 1957 for a reduction in volume, which Dr. Schreiner later regretted, according to his colleagues. In 1958 the Melos Anthrophon was added (see details in the accompanying article). In 1969 the Bombarde Grosse Cornet was revoiced by Aeolian-Skinner to "brighten and increase dynamic level as much as pipes will allow." In 1970–71 the Aeolian-Skinner firm did some general regulation and tuning and recommended an extensive redesign of the instrument. Other firms proposed drastic redesigns in later years, but these were never considered seriously.

In the late 1970s, the Bombarde Trompette 8′ and 4′ and the Swell Clairon 4′ (actually 16′ Contre Trompette treble) were revoiced by the Trivo Company. In 1979 three Casavant stops were added to the Solo.

A Pedal to Great coupler had been provided originally (but not included on the printed stoplist) as a convenience for the tuners. In the late 1970s, Robert Cundick suggested that it be changed to a Pedal Tutti to Swell coupler to make it useful for the performers as well. He also recommended that a tremulant be added to the Positiv. Schreiner agreed on the condition that the tremulant be wired to a blank Positiv drawknob and the coupler drawknob not be relabeled. Dr. Schreiner ordered the tutti reversible action disconnected during his tenure, but it was reconnected thereafter.

Of far more consequence than the above were the many changes in regulation which seemed to have been made over the years. It is quite possible that these were done to accommodate broadcasting requirements with equipment of somewhat more limited capacity as compared with today's. These include several attempts to improve the Swell Harmonic Trumpet and the Positiv Rankett as well as other stops. Many more subtle but still telling changes seem to have been made in the balance of enough stops to have made a clear difference in the overall effect of the organ. Unfortunately, no consistent records were kept of work on the organ throughout that period.

On the mechanical side, the relay started showing problems in 1959 and was later replaced. This was because of problems with the power supply which had been changed previously. The Aeolian-Skinner company furnished replacement keyboards in the 1960s. Shortly after the organ was completed, the roll top was removed from the console and the case was cut down to provide better sight lines between organist and conductor. At the same time, the pedalboard and key desk were modified to provide more leg room. In the 1960s, a smaller bench was made for better television viewing of pedal work. All these jobs were done beautifully by local Salt Lake City craftsmen. Mechanical maintenance of the organ has been continuous through all of the years with regular attention by in-house organ technicians.

JACK M. BETHARDS

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THE 1988 RENOVATION—A BUILDER'S PERSPECTIVE

Through the history of the Mormon Tabernacle, the objective has been the finest instrument America could produce. It should be noted and appreciated by American organbuilders that the Church of Jesus Christ of Latter-day Saints has not looked to Europe, but has sought an instrument that expressed the American eclectic spirit. In reviewing the history of the Tabernacle organs, it seems clear that each new project was reaching toward the goal that G. Donald Harrison was able to realize in 1948—producing a distinguished American organ. When we met in 1984, the church authorities and organists were clear in their conviction that Harrison's 1948 instrument was their ideal and ultimate instrument. Their desire was simply to complete and perfect it. They felt that after nearly 40 years of use, any minor inadequacies should have been discovered and that their goal was a logical and practical one. By 1988, the organ's 40th anniversary, they intended it to be established as a musical landmark on Temple Square not open to further change. They felt a responsibility as stewards of a national artistic treasure.

We consider the work completed in 1988 not another step in the organ's evolution, but, rather, a conclusion of Harrison's 1948 project. The word "renovation" was selected carefully to reflect the spirit of renewal rather than rebuilding. This, of course, was an important distinction in designing our work. One clear indication of the seriousness with which we undertook this approach is that no name other than G. Donald Harrison and Aeolian-Skinner will be found on the console. We are strongly convinced that this instrument has remained true to the Aeolian-Skinner tradition and that the work can stand on the original nameplates.

1984—RETRACING HARRISON'S STEPS

The Tabernacle Aeolian-Skinner is probably the most famous organ in the world. It has been heard by more people than any other. Over 2,000 editions of the Tabernacle Choir broadcast, "Music and the Spoken Word," have been carried throughout the United States and in many other parts of the world since 1948. The organ has been featured on numerous recordings and, of course, heard by visitors to Temple Square in Salt Lake City daily since its dedication. The number who have heard this instrument reaches into the hundreds of millions. For many, this is the sound by which all organs are measured. There is no doubt that it is one of the greatest expressions of the American Classic style. It is also one of the largest organs in the world and plays in one of the most favorable settings. For all of these reasons, we approached the Mormon Tabernacle organ with deep respect when, in 1984, we were asked to look into various concerns of the organists, including console problems and tonal matters. The Schoenstein firm has had a three generation association with Skinner. It was always the practice of the Schoenstein family to encourage the younger generations to gain experience from the prominent Eastern builders. Louis Schoenstein worked for E.M. Skinner, his son Lawrence was hired by G. Donald Harrison and stayed with Aeolian-Skinner for nearly 20 years. Lawrence's son Terrence was hired by Joseph Whiteford and worked with the firm for several years. The Schoenstein family has also worked at the Mormon Tabernacle going back to the days of the Austin organ. Considering the Schoenstein family's three generation experience with both Skinner and the Tabernacle, we felt very comfortable contemplating the 1988 renovation project.

As I approached Salt Lake City in November 1984 to survey the organ, I wondered what could be wrong with this magnificent instrument—masterwork of G. Donald Harrison. On the other hand, I knew as an organbuilder that no real artist could ever consider an instrument perfect. The results of placement and acoustics, for example, can never be completely anticipated. Harrison himself certainly had these feelings, as it is well known how often he returned to instruments, making changes—not always minor ones. Organbuilding is simply too complicated an enterprise to be thoroughly predictable.

Jack M. Bethards

I listened to the Tabernacle organists demonstrate the problems they were encountering, and went through the organ with a fine-tooth comb to discover the myriad details that made up this ensemble that I had listened to, with millions of others all over the world, for nearly 40 years. The concerns of the Tabernacle organists—all highly skilled players—could fit under the umbrella of minor but frustrating limitations. How could an organ that had such a grand overall effect be limited in variety of individual registrations? For example, the Great organ of 34 ranks was usable mainly in combinations employing large numbers of stops. The 2′ Super Octave was almost half the power of the 2⅔′ Quinte. A light principal chorus without mixture was not possible. There was no clear relationship in timbre or volume between the primary and secondary 8′ and 4′ principal stops. Within ranks, there were severe note-to-note regulation problems. Speech was inconsistent. Mixtures tended to be drawn in groups, as the individual mixtures evidenced balance problems. In short, the Great, which sounded fine in the hall with massive combinations, did not live up to what a 34-rank Great promised.

Division by division, the organ evidenced the same kinds of limitations. The speech of individual pipes was so irregular that when combined in ensembles, crispness and definition was lost. This was particularly noticeable in the Pedal organ. Some solo stops, including the Swell Hautbois and the Great Flûte Harmonique, were not useful due to regulation or balance problems.

At the end of my lengthy study of the instrument, I became convinced that the organists had legitimate concerns about the tonal properties of the organ. I was equally sure, however, that 95% of the problems could be corrected through simple but meticulous tonal regulation. There was clear evidence (later confirmed by research and further inspection) that some adjustments had been made in the instrument's finishing over the years and that it did not receive quite the kind of thoroughness in tonal finishing that was considered normal for Aeolian-Skinner. The result of all this was an instrument somewhat showing its age.

Other problems, including the wind system, exacerbated the tonal picture. The

blower was not quite adequate to sustain the Tutti. This was so marginal that it was hard to pinpoint why the organ seemed to lack excitement when played "full out." Many divisions and subdivisions had terribly unsteady wind which resulted in poor attack. The Bombarde reeds and Solo Tuba, for example, shook like jelly, robbing them of impact. There is probably not a large instrument in the world that does not suffer from some internal placement problems. The Tabernacle is no exception. Very careful attention to balances in tonal finishing is required to alleviate these. In many cases either this was not taken into account originally or subsequent refinishing had upset some critical relationships.

The world-famed acoustics of the Mormon Tabernacle have some interesting and unexpected characteristics vis-a-vis organ tone. First, the building is so vast (seating 8,000) that sound energy is somewhat reduced in immediate impact although it carries at that reduced level beautifully throughout the building. Second, the room has a tendency to blend the sound so that almost anything sounds attractive at a distance, but may not work as well close up or over the air. Third, sounds from approximately 4′ F down diminish in intensity. The shell of the building is plaster on wood frame. Bass frequencies are partially absorbed.

One major point that soon became evident was that the instrument tended to have a center of gravity around the 4′ pitch rather than at 8′. Throughout the work in regulation and additions, great effort has been spent on trying to add resources that would allow the lowering of this musical center of gravity as needed. Although great pains were taken in the original design to gain divisional independence and balance, some of the plans did not work out in actual practice. This was particularly evident in the Great and Positiv and somewhat in the Pedal. The Swell reed chorus was not in balance with itself or vis-a-vis the ensemble. Some additional solo stops, including a commanding reed, seemed appropriate for an organ of this scope. Some couplers and registration aids especially helpful for the varied and demanding repertoires of the music program were missing.

Finally, the console was beginning to show significant wear. No console in the world gets more heavy and regular use than that of the Mormon Tabernacle: seven days a week for recitals, practice, lessons, rehearsals, broadcasts, recordings and tuning. It was already on its second set of Aeolian-Skinner manual keys. The relay was causing unnerving lapses in performance. The combination action was beginning to give trouble, but more important was the need for multiple memories, given the increasing demands on the Tabernacle schedule for limited rehearsal time and the increased participation of associate and guest organists.

PLANNING

The musicians were clearly not able to live with the status quo. They had been working with the instrument for many years and had formed their opinions slowly and thoughtfully. They had reached a consensus that work was needed. On the other hand, they loved the organ and respected the men—Alexander Schreiner and G. Donald Harrison—who had planned and built it.

Our first job was to set an overall philosophy to guide us in forming recommendations. It was obvious: make changes only where there is a serious need; make additions only if they do not compromise the integrity of the original work.

RESEARCH

We felt that it was impossible to proceed with any work on the Mormon Tabernacle organ without first learning everything we could about why things were done as they were by Harrison and others. Although the organ had been in use for nearly four decades and one might assume that all of its secrets had been learned simply by testing its musical utility, we were of the firm belief that no changes could be considered until we were convinced we knew everything we could about the intent of the original builder. We started by collecting every piece of written information about the instrument we could locate. We obtained, through former Skinner employees and through the courtesy of the Rodgers Organ Company, which now owns many of the Skinner records, volumes of correspondence, shop notes, work orders, etc. Next, we went through the Church of Jesus Christ of Latter-day Saints' historical archives and obtained the lengthy and detailed files of Alexander Schreiner which covered the history of the organ from his first conversations with Harrison. Allen Kinzey of the Nicholas-Bradford Organ Company and formerly of Aeolian-Skinner was of great help in providing information from his extensive files. He is a dedicated Aeolian-Skinner specialist. We interviewed or corresponded with everyone we could find who was connected with the original project, including former Tabernacle organists Alexander Schreiner and Roy Darley. Finally, we visited Aeolian-Skinner organs that either had an influence on the Tabernacle organ or were contemporary with it. This, coupled with the working files of the maintenance staff and our own extensive in-house Skinner and Aeolian-Skinner records, gave us a resource of inestimable value in all the critical decisions made about the instrument. As the project continued, people who shared our interest in the organ and in Aeolian-Skinner contributed material to our rapidly growing files. We have accumulated a mass of historical and technical information that is fascinating.

Early in the process, two internationally-known artists who are especially conversant with Skinner and Aeolian-Skinner organs, Robert Glasgow of the University of Michigan and Thomas Murray of Yale University, both spent time with the instrument and offered their comments. These ranged from details of console appointment through tonal matters.

METHODOLOGY

At the outset of this work, we established several guidelines which were followed meticulously throughout:

1. DOCUMENTATION—A day-by-day, hour-by-hour log was kept of everything done to the organ. This includes notations of all regulation in every stop no matter how minor. It includes careful descriptions of the status prior to the start of work, inspection notes, experimental procedures, work done and final results.

2. ARCHIVAL RETENTION—Every pipe removed from the instrument, in those few cases where changes were made, was labeled, packed and placed in permanent storage near the Tabernacle. Changes were made in such a way that they could be reversed should future generations wish to return any portion of the instrument to its original state. For example, in repitching the Pedal mixtures the 5⅓′ rank was removed to storage. We removed with it its original toe board and rack rather than adapting them to the new pipes. Although an entirely new toe board and rack had to be made matching the original in finish, etc., we felt this investment was well worthwhile to assure that the change could be reversed with absolute accuracy. This system was followed throughout the project in all changes whether mechanical or tonal.

3. DIFFERENTIATION OF ADDITIONS—There are two approaches to the mechanical side of making additions to an existing instrument. One is to make the additions appear as though they were part of the original and another is to make them clearly different. The former approach gives the instrument a uniform appearance and the impression that the additions could have been part of the original. The latter shows future generations clearly what was original and what was added. Although the instinct of the craftsman is to challenge his skill in making the final product a perfectly finished whole, the historian's approach won out. We decided to make all additions in style of construction and finish to our normal standards. This was also true of the Casavant additions made in 1979 and so future historians studying this organ will benefit from a clear picture.

4. EXPERIMENTATION—From the outset, it was agreed that this work would be under no time pressure except for a general goal of completing it on or about the organ's 40th anniversary in 1988. The Church encouraged a process of deliberate, step-by-step experimentation for making each decision on tonal changes. This was true of what would seem to be even rather minor points. Our normal procedure was to start with a written rationale for any tonal change or addition. We then made and tried sample pipes. For example, in connection with the Swell reed chorus, eleven different trials were made. Experimental solutions were evaluated by the organists along with us, sometimes over a long period of time, to dilute first impressions. After completing work, we all agreed to keep an open mind and study the results for a reasonable amount of time before considering it a permanent part of the organ. We had the opportunity of hearing the organ in recital each day. Organists would often arrange to play repertoire that would demonstrate our work in various musical contexts. This immediate feedback was of great value. What a wonderful and unusual situation to have a client with only one objective—perfection!

There is an interesting parallel in the timing of the 1948 and 1988 projects. Harrison began his discussions with Schreiner in 1944. Our work was started in 1984. Harrison's work was finally completed on January 16, 1949, and the celebration of the completion of renovation will begin on January 19, 1989, with the start of the American Classic Organ Symposium. The thorough and deliberate approach to the renovation project can be noted in the fact that tonal regulation, addition of 17 ranks of pipes, console and electrical system renovation, etc., was spread over the same amount of time it took to design and build the entire instrument. We hope that the result reveals this meticulous approach.

5. TEAM APPROACH—Members of the Schoenstein & Co. staff were all honored to be involved in this work. Tonal design, scaling of additions and console layout were by the writer who also supervised all tonal work. Steuart Goodwin, Southern California representative of Schoenstein & Co. and a respected builder and restorer, did most of the flue pipe regulation and planned all rescaling of existing pipework. He worked in close partnership with me and the organists on every artistic decision. His sure musical judgment and consummate skill were critical to the success of this undertaking. Other flue regulation was by Terrence Schoenstein and Robert Rhoads. Reed regulation was by Robert Rhoads. Reed renovation was by John Hupalo with voicing by Robert Rhoads. Metal pipes were made by Thomas Anderson, who formerly supervised the Aeolian-Skinner pipe shop for 18 years, and by John Hupalo. Voicing was by Fred Lake. Engi-

neering for all additions was by Glen Brasel. Components, including chests and reservoirs, were made under the supervision of Robert Rhoads, Schoenstein factory manager, who also directed the console renovation and all installation in Salt Lake City. Other key Schoenstein staff members were: Philip Browning, David Fortin, Renato Guerrero, Gayle Holmlund, Eldon Ives, Elmer Ives, George Morten, Dolores Rhoads, Scott Rosencrans, Bert Schoenstein, Don Siler, Leonard Warren, Ronald Warren and Daniel Yonts. Lawrence Schoenstein served as general consultant.

We considered ourselves the overseers of the project but felt open to engaging other firms and individuals to make up the best expert team we could muster for this extremely critical assignment. For example, David A.J. Broome, vice president and tonal director of Austin Organs Inc., is one of the world's leading experts in high-pressure reed work. We commissioned Austin Organs Inc. to build the pipes and chests for the two high-pressure reeds. High-pressure reservoirs were made by the Crome Organ Company of Los Angeles. A.R. Schopp & Sons of Alliance, Ohio, who had supplied many reeds to the Aeolian-Skinner Company, made the chorus reed stops. Roland Dumas, formerly of Aeolian-Skinner and C.B. Fisk Inc., made the 8′ Cromorne for the Positiv. New manual keyboards were made by P & S Organ Supply of Brandon, Suffolk, England. The Salt Lake City firm of H. Ronald Poll & Associates accomplished the technical design and installation of solid-state equipment furnished by Solid State Logic Ltd. and the temporary console built by R.A. Colby Inc.

An indispensable element in this team approach was the contribution of the in-house Tabernacle organ maintenance staff headed by Robert Poll. With the assistance at varying times of Melvin Dunn, Greg Mortimer and Lamont Anderson, Robert carried out many aspects of the renovation program in addition to the regular duties of tuning and maintaining all of the instruments on Temple Square. This was not only efficient, but provided an interchange of ideas that produced a practical, serviceable end result. It is safe to say that this project could not have been accomplished or the results preserved without the dedication of these fine technicians.

A final indication of teamwork was the smooth-working relationship with the three Tabernacle organists and the Church administration. Organbuilders shudder at the thought of coordinating the ideas of several artists and managers, but in this case the process couldn't have been smoother. The musicians always considered decisions as a group and reached a clearly voiced consensus. We wish to also acknowledge the invaluable assistance of Ronald John who served as the vital liaison between us and the Church authorities to insure their complete understanding and support during the entire project.

TONAL WORK

As soon as the renovation project was announced, people who admired the instrument became worried that it would be "revoiced" or, even worse, "rescaled." Yet another historic organ would be lost. It was inspiring to know how much the instrument meant to so many. It was also humorous to hear "authoritative" accounts of the work from people with no first (or even second or third) hand contact with it. Comments ranged from "they are turning it into a screaming neo-Baroque monstrosity" to "they are overrefining it—reducing it to a romantic gray blob." Such is the organ world. Thank goodness, people are concerned! However, it is important to set the record straight now that the work is complete and a written description can be backed up with a finished result that stands on its own merits.

The following tonal philosophy was enthusiastically embraced by all parties: Reverse changes subsequent to Harrison's 1948 design that had proven inappropriate, correct any faults of aging, carry out the kind of meticulous tonal regulation that Aeolian-Skinner would have done with the proper time and budget, make changes or additions only either (a) to carry out preparations already made or (b) to solve some long-standing, clearly recognizable musical problem.

Any historian could subscribe to most of that statement; the question becomes who decides what is a "major" musical problem, and how to correct it? Our feeling was that any builder would relish the opportunity to come back to an instrument after it has had a nearly 40-year trial period, reevaluate it, and set about solving any problems that have emerged in all those years of intense use. None of us connected with the project will presume to say that we could or would try to second-guess G. Donald Harrison. However, we did try to make all of our decisions fortified with every bit of information we could gain about his approach. We spent well over a year before we formalized any plans for tonal additions. During that time, we worked with the instrument doing tonal regulation, listening to innumerable tests, studying the organ in recital and weekly broadcasts, meeting with the organists and generally getting immersed in its musical riches.

This is, I suppose, an ideal way to complete an instrument. What a luxury it would be to install an organ and "rough it out" and then live with it for a year, hearing it in recital daily played by first-rate musicians, trying various solutions and not being under pressure to finish until things seemed to fit into place. We hope that the final result of all the tonal work will not be noticed. This may seem a surprising goal, but we believe that someone who has not heard the organ for a few years and had not memorized the stoplist could return now and assume that the instrument was original.

Before describing the work, let's start with some definitions of terms often misunderstood:

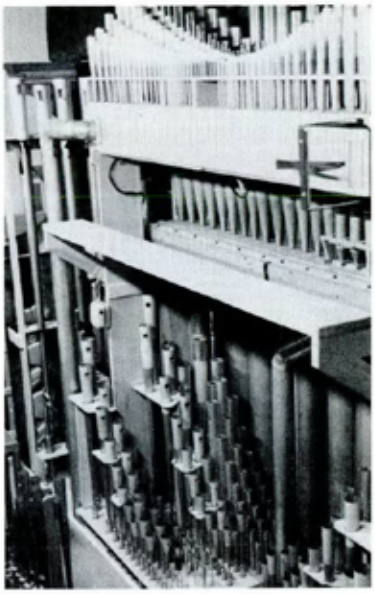
1. SCALING. Scaling involves all aspects of the physical design of pipes. Although the major part of this function is determining the diameters of each pipe throughout the compass of the rank, there is much more involved. Determining mouth width, languid bevel, materials and their thickness, shape, etc., are all part of the process. For reeds, details of shallot construction and size, etc., are also critical. Rescaling means changing one or more of these basic design factors in an existing set of pipes by cutting a pipe apart and remaking it, or, perhaps, moving it to a different position in the compass and making a new pipe to fill its place. For example, the relative diameter of a rank of pipes can be reduced by removing low C, moving C♯ through top C down, lengthening them and then adding a new C at the top of the compass.

2. VOICING. A pipe fresh from the pipe shop usually does not speak at all. The process of voicing is bringing the pipe to speech and then giving it the character and volume that the designer of the organ had in mind when he scaled it. Voicing involves major adjustments to the pipe's structure and dimensions such as determining height of mouth, toe opening, flue opening, treatment and position of languid, etc. Reed voicing is especially complex, involving determination of relative length of tongue and resonator, size, thickness, weight and shape of tongue and, most important, its curve. When a pipe is revoiced it involves a major change in the pipe's character and may even involve cutting a pipe apart to lower its mouth or change its languid. For reeds, it often involves new tongues of different thickness, weight and curve.

3. FINISHING. The term "finishing" is quite appropriate as it is simply putting the polishing touches on the voicer's work. (Whether the process of voicing is accomplished in a voicing room or in the church, this process of further refinement is still necessary.) Finishing involves the same techniques as voicing with these differences: (1) It usually employs two people—a voicer and the tonal director who designed the organ, scaled the pipes and directed the voicing. (2) Individual ranks are judged *in ensemble*. It is at the stage of finishing, when most pipes are in place, that the organ can be heard in its entirety and *in its environment* for the first time. (3) The work is more detailed.

Perhaps 80% of voicing work is done in the voicing room, but the last 20% in the church is often the making or breaking of an organ. The finisher judges the organ at the console and/or in the room and directs the voicer from the overall musical point of view. It is much the same as the role of a conductor. Establishing balances within ranks, within subdivisions and divisions, and among all the elements of the full ensemble is the tonal finisher's job. Refinishing is often required when the acoustical environment is changed.

4. REGULATING. Regulation is the minor adjustment to an already voiced and finished pipe to alter volume and speech (and to some extent timbre). This involves cleaning, minor adjustments to toe and flue openings and occasionally adjustments in languid and lip positions. For reeds it usually involves adjustment of relative length of resonator and tongue and it can include recurving or replacing tongues which have become damaged or fatigued. The emphasis here is on the word "minor." Tonal regulation cannot change the underlying work of the voicer or finisher. Why, then, is regulation needed? Time takes a toll on organ pipes—particularly those that are voiced on



Positiv additions, Great reeds and Flûte Harmonique below new Cornet V

the low-cut, slow-side style. Languids change position (large ones can sag, small ones can pop up), upper and lower lips can shift position or be damaged, dust and dirt can fill flues, and so on. Reed tongues and shallots can be damaged or fatigued. Shallots and tuning wires can become loose. Tuning scrolls can fatigue. Dust and dirt can upset tongues. Chest or action characteristics can change slightly. A first-class tuner is always listening to the speech, timbre and balance of pipes as well as their pitch. When one falls out of line with its neighbors, it should be regulated. If this is not done (or done badly), an organ will gradually change character—sometimes drastically. If this goes too far, it is sometimes difficult to find enough uniform pipes to establish a "base line."

Now, what did "they" really do to the Tabernacle organ? Regulation (in its strict definition) formed over 95% of all tone work on the Aeolian-Skinner pipework. What little rescaling, revoicing or refinishing that was done is detailed in notes to the stoplist.

TONAL OBJECTIVES

The architect of an organ must have a thorough understanding of his client's musical requirements. No less is required of a builder attempting restoration or enlargement of an existing organ. Quickly shifting fads must be separated clearly from long-term goals or else an instrument can become nothing more than a pastiche reflecting a maze of unrelated tonal ideas. We set out six general tonal objectives. The following chart shows how the tonal work satisfied each one:

—Restore the original speech, timbre and balance of each stop.
Tonal regulation throughout.

—Improve divisional independence/completeness.
Great Montre
Great Flûte Octaviante
Great Reeds 16′, 8′, 4′
Swell Hohlflöte
Positiv Principal
Positiv Cromorne
Choir Sesquialtera
Choir Fife
Pedal Principal 2′
Pedal Mixtures

—Add 8′ tone.
Tonal regulation.
Great Montre
Great Flûte Harmonique
Positiv Principal
Great, Positiv Swell, Bombarde and Antiphonal reeds

—Provide solo colors to broaden tonal palette.
Great Flûte Harmonique
Great Cornet V
Great Trumpet
Positiv Cromorne

—Provide solo reed tone also capable of adding to the climactic character of the full organ.
Bombarde Trompette Harmonique
Antiphonal Tuba Mirabilis

—Move or rescale, refinish or revoice stops only where absolutely necessary and to solve problems such as tuning stability or egress.
Great Fourniture
Swell Plein Jeu
Swell Cymbale
Swell Chorus Reeds (16′, 8′, 4′)
Swell Voix Humaine
Choir Rauschpfeife
Positiv Rankett
Bombarde Grande Fourniture
Solo Upper Work
Pedal Kornett

The tonal elements listed above will be discussed under each type of work from regulation through additions.

TONAL REGULATION, REFINISHING, REVOICING AND RESCALING

Our first step was to determine the extent to which problems could be solved by simple regulation. To find out whether this more conservative approach would be satisfactory, we carried out some preliminary tests. Steuart Goodwin and I asked the organists to point out the stop that seemed to them the most useless. They universally nominated the 8′ Diapason of the Bombarde (in effect, the First Diapason of the Great in Harrison's concept). We carefully regulated the stop for proper speech and consistency of timbre. I emphasize that this process involved absolutely no "revoicing" whatsoever. What was a dull and lifeless stop with gulpy speech and irregular loudness through the compass became the rich and vibrant stop that Harrison must have had in mind. The experiment was so successful that Robert Cundick changed his plans for the following Sunday choir broadcast using the once shunned stop not only in many combinations but as a solo voice. We carried this experimental process through several more stops until it became absolutely clear that the rich material of Harrison's original plan was all there to be rediscovered. Certainly, there would be no need for any massive changes.

We wanted hands-on experience tuning this huge organ in order to know it well. There is no other way. Working in double shifts with two assistants, Robert and Dolores Rhoads of our firm tuned the organ from top to bottom in five days. The resulting detailed information on problems of tuning and regulation proved invaluable in all our future regulation work.

On subsequent visits, we went through the entire organ regulating division by division. Stops that were thought to be hopeless came alive through simple reregulation. Detailed regulation of the mixture work was fascinating and revealing. In the process, each rank is heard individually as others are muted off. We immediately discovered what we had supposed—much of the mixture work had not been regulated in detail and some had been regulated initially but upset through changes over the years. Most of the mixture pipes were out of speech. Breaks were rough and quint/unison balance changed radically through the compass. Some (as many as 30% of some ranks!) were entirely silent. Many pipes had been muted purposely due to poor speech or drawing. In a few cases, chest actions were not functioning for individual notes as the borings were plugged with original shellac sizing. It was a gruelingly difficult but rewarding process to regulate these mixtures one by one. It is especially true in mixture work that pipes must be precisely on speech and in balance to work as an ensemble. Often, a mixture which seems lifeless has simply fallen out of regulation. This was proven over and over again at the Tabernacle as pipes were simply put into good speech and the effect was more power and brightness without any revoicing or change in general volume level. This must have been what the mixtures were like when the organ was new, or what they were intended to be.

The Great Kleine Mixtur had been softened to the point of flutiness. Many pipes had been muted. It was unsteady and difficult to tune. Refinishing to a more normal level, where the pipes spoke comfortably, restored the elegance of this stop. The Swell Cymbale worked far better, also, when it was brought back to its former dynamic level and scale. A slight scale change was made in the Choir Rauschpfeife, but this was purely for tuning stability. The Bombarde mixture benefited from simple muting of doubles and 5⅓′ pitches, as well as normal regulation. The Great 2′ Fourniture was recomposed slightly for similar reasons. Harrison, himself, changed his ideas in these matters in instruments made after the Tabernacle. The Pedal 10⅔′ Harmonics was another revelation. It appeared never to have been finished and, being out of balance, it did not produce the proper effect of a soft 32′ when combined with a 16′ voice. After regulation, the stop, which is composed of stopped, open and tapered pipes, became a most useful addition to the wide variety of Pedal 32′ options and a grand augmentation of them. All of this work is detailed in the footnotes to the stoplist.

The Pedal mixtures were rarely used except in the fullest of combinations. The lower Pedal mixture with its prominent 5⅓′ pitch was too strong to serve in medium combinations and the upper Pedal mixture could not be used without support of the lower. It was all or nothing and all was too much. We repitched the mixture series by one level starting at 4′. No changes were made other than simple regulation, the removal to storage of the 5⅓′ rank and the addition of a ⅓′ rank. This greatly increased the range of usefulness of the Pedal mixtures. Although the upper mixture is still best used with the foundation of the lower, the lower mixture can now be used alone. This revision and the addition of the 2′ Pedal Principal have made the Pedal organ truly independent.

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Details of pipe racking can alter regulation and stability. The Tabernacle technicians went through the entire instrument, enlarging rack borings where they were too tight to accommodate seasonal changes in humidity and tightening, retaping and felting tie racks, etc. They also felted tuning scrolls as needed on both reeds and large flues.

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In the annotated stoplist, the reader will find a description of every tonal change made. The only stops in the 1948 instrument which do not remain are:

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Trompette. It was specified to have English shallots. We found it fitted with standard Aeolian-Skinner French shallots and from all indications this was the case from the time the organ was finished. There was a good deal of speculation about this change. It is quite possible that a stop with English shallots was tried and found to be ineffective considering wind pressure and placement. In an effort to test this assumption we had sample pipes made and tried them. We even tried a hooded sample, as Harrison had once thought of hooding many reeds in the enclosed divisions. The results were quite disappointing. This system of providing two contrasting style reed choruses with common 16′ and sometimes 4′ registers works brilliantly on many Skinner organs, but it did not work well under these circumstances. Whether Harrison discovered this as we did through trial and error or made a last-minute change in the specifications after tone finishing of other divisions, we don't know. The Harmonic Trumpet with French shallots, although having more power and brilliance than the English Trumpet would have, did not add much to the ensemble because it was only slightly more fundamental and powerful than the Trompette. Two attempts were made over the life of the organ to further differentiate this stop from the Trompette. Both had proved ineffective. We decided to replace it with a new Trompette of larger scale which could add weight and power to the Swell reed chorus.

The 4′ Clairon had also been a problem stop. The upper end of the 16′ Contre Trompette had been traded with it many years ago, perhaps at the time of original finishing. The 4′ line lacked power. When we switched the pipes back, the situation was worse. We tried the treble of the 8′ Harmonic Trumpet in the Clairon chest and it was a more successful solution. We, therefore, put into storage the 4′ Clairon and the bass of the 8′ Harmonic Trumpet. The treble of the 16′ Contre Trompette which had been revoiced several years before (as the Clairon) was quite successful and we decided not to reverse this work. The new 8′ Trompette serves well as a larger solo stop and to add fundamental power to the original Harrison chorus. Since it is affected by the sub and super couplers, it can serve as an alternate chorus effect. The Swell Cymbale has been reregulated back to original volume.

When the Casavant additions were made in 1979 to the Solo division, the two-rank String was sacrificed to provide chest and space for the Casavant Nazard stop. Serious thought was given to returning these to the instrument; however, considering the great utility of the upper work in the Solo, particularly after revoicing, and the fact that the original stops were close in scale and effect to other strings in the organ, it was decided to leave the 1979 additions in place. The obvious musical utility of the 1979 additions is corroborated by this interesting historical note. Alexander Schreiner asked G. Donald Harrison in a letter dated June 22, 1946, to consider including a 2′ flute in the Solo: "... Something that will go with the present 8′ and 4′ flutes for Solo purposes."

It should be noted that one stop was added to the organ subsequent to 1948 and then removed in 1987. This is a stop with an unusual history and name coined by Alexander Schreiner—the Melos Anthropon. Dr. Schreiner admired the Vox Humana from the old Kimball Assembly Hall organ. He requested the Tabernacle organ technicians to add it to the Aeolian-Skinner organ. A chest and box with adjustable expression opening was obtained from Aeolian-Skinner and the "Melos Anthropon" was placed in the Swell on the main Swell wind system. Unfortunately, the stop was never successful because it lacked a proper tremulant. Since the stop was not original to the 1948 instrument and had not proven useful over the years, the pipes were removed. However, the windchest proved to be extremely valuable to the project. The original Aeolian-Skinner Voix Humaine was installed on the main windchest fed by a special regulator with its own tremulant. Since this system was on slightly higher pressure than the main system, it would sometimes upset the functioning of the pitman chest. In 1988, the special wind system was rechanneled to the former Melos Anthropon chest and the Aeolian-Skinner Voix Humaine installed on it. The original Voix Humaine chest was then available for the much needed addition of a 2′ flute in the Swell. This migration might have been destined to happen. On June 22, 1946, Schreiner said to Harrison: "... I am wondering if you might consider putting the Vox on a separate tremolo and perhaps in a separate box as we now have it." Schreiner's later addition of the Melos Anthropon seems to have been an attempt to gain the perfect Vox effect. The original Skinner Voix Humaine which was quite lovely has been improved in effect by this change and is now one of the most perfect stops of its type to be found. We think that Dr. Schreiner would be pleased.

In many cases when we found a solution for one tonal problem, it opened the way for solution of another. One good example is the Pedal Kornett 2′. This stop all through the years was unstable in tuning and constantly slipped out of regulation. It was placed with the upper Pedal flues rather than with the reed chorus. Thinking of this stop in the classical sense as only a solo voice, one can see the rationale; however, in the Tabernacle it was more commonly desired as a chorus stop. Because of its regulation problems, it was seldom used in either context. There was a blank section exactly the right size for a 2′ Pedal reed in the reed chorus chest. One wonders if the builders did not plan for this stop to be in the chorus originally and then changed their minds. We further wonder if word of the change never got to the voicers because it was obvious the minute we experimented with the wind pressure that the pipes were happier and worked much more perfectly on the Pedal chorus pressure of 6⅜₁₆" rather than the flue pressure of 4⅜₁₆". The stop was moved permanently and after careful repair and regulation works beautifully in the chorus and every bit as well as a solo stop be-

Temple Square, with Temple in foreground, domed Tabernacle in rear and Assembly Hall in upper center

cause placement of the reed chest is no less advantageous than the flue chest. The opportunity opened by the move of the Kornett was the addition of a 2′ Principal in the Pedal on the old Kornett chest. This seemingly insignificant stop has proven to be of immense value. Formerly there was nothing between the 2′ Pedal flute and the huge battery of mixture tone. The 2′ stop has bridged the gap.

Some tonal augmentation was possible through the very simple means of separating ranks within compound stops. In several cases throughout the Tabernacle organ, mixtures and other compound stops are located on two or more windchests where one would not be large enough to supply all the pipes. For tuning convenience, most of these were provided with switches located in the organ. In two cases, the versatility of the instrument was enhanced greatly by providing these controls on the console. The Swell Plein Jeu of six ranks is a powerful stop containing such a full breath of the harmonic series in most of its range that Alexander Schreiner was often quoted as saying that it could be played alone, creating a convincing Swell principal chorus. The gravity of the lower pitches, however, made it somewhat less useful than a normal Swell mixture. By simply making the upper four ranks available independently as a 1⅓′ Plein Jeu, several more registrational possibilities were introduced.

The Choir Carillon, composed of the pitch series 2⅔′, 1⅗′ and 1′, was repositioned on its toe boards to provide, in addition to the original composition, a Sesquialtera of two ranks and a Fife of one rank. The 1′ stop was particularly useful in adding a subtle measure of brilliance in certain combinations.

The original 8′ Flûte Harmonique on the Great was disappointing. It did not have the "bloom" of ascending power in the treble which is so critically important for the interpretation of French Romantic literature. Harrison specified a stop of "Cavaillé-Coll scale." The stop does indeed follow fairly closely a typical Cavaillé-Coll scale progression; however, it is the one used most commonly in either small choir organs or as the 4′ Flûte Octaviante of a larger instrument. Surely a vast building such as the Tabernacle requires something larger! We decided to provide new Flûte Harmonique pipes from tenor C up based on Cavaillé-Coll's largest progression. We located it on a new chest directly behind the center front pipes of the main case. It now fulfills what we think Harrison might have envisioned when he specified a Cavaillé-Coll style Flûte Harmonique. The original Aeolian-Skinner stop was moved to 4′ pitch and extended by one octave and renamed Flûte Octaviante. Thus, it serves without alteration, in the proper role its scale dictates. Furthermore, it provides open flute tone at 4′ pitch on the Great—something that should not be absent from an instrument of this proportion.

TONAL ADDITIONS

Several entirely new stops were added. I must emphasize that no changes in the balance of the original instrument were made to accommodate them. They are, strictly speaking, additive. That is, should a player choose to ignore the new stops, the organ can be used as it was originally specified (with the exception of the few tonal changes noted above).

The addition of a 2′ flute in the Swell and a 2′ Principal in the Pedal on existing windchests was discussed above in connection with tonal changes on the existing instrument. The other additions will be discussed below.

Oftentimes organbuilding solutions that are ideal on paper can fail in reality. One such principle is clearly evident in this organ. Harrison obviously thought of the Positiv as being connected with the Choir and the Great with the Bombarde. The Choir was to provide substance and fundamental for the Positiv and the Bombarde was to provide the first principal chorus and the reed chorus for the Great. Unfortunately, in both cases placement and acoustics defeated the plan. Additionally, it seemed difficult in actual practice to treat separate divisions as a unit through coupling. Therefore, it was necessary to provide both the Great and Positiv with some additional resources to make them independent.

The first addition, and the most controversial to some, is chorus reeds on the Great. Harrison had planned for Great reeds initially. A March 1945 stoplist specifies Great reeds as follows: 16′ Double Trumpet, 8′ Trumpet, 4′ Clarion. But Harrison writes to Schreiner on December 5, 1945: ". . . I have from time to time looked with somewhat of a critical eye on the 16′, 8′ and 4′ Trumpets which are included at the present time." At another point he states: "In studying old specifications of the classic period, I have often noted a 16′ Baroque reed placed on the Great organ, and have tried to imitate this in certain instances." He explains having been very pleased with a 16′ free reed Euphone at St. Mary the Virgin in New York City and then suggests: "Why wouldn't it be a good idea to eliminate [the Trumpets], and use the money thus saved to help pay for a 16′ Euphone on the Great organ, making that a single reed on that department, and expanding our Bombarde section . . ." Throughout the correspondence, the Bombarde section looms important in Harrison's mind. He is constantly pushing for it and one wonders if he would have been most pleased to have the Great as originally specified *and* the Bombarde. On July 1, 1948, Harrison again writes to Schreiner: "There is one thing troubles me and that is the 16′ Great Euphone. The one in St. Mary's has proved itself to be unreliable. . . . Perhaps a 16′ Fagotto or fairly free-toned English-type Trumpet. . . ."

Many Aeolian-Skinners had 16′ reeds on the Great and some had reed choruses. Still, his ideal, at least at the time of the Tabernacle organ, was to depend on a massive flue chorus. It must be noted, of course, that the Bombarde division, which contained a flue chorus and reed chorus, was intended to be supplementary to the Great. Unfortunately, due partly to placement problems and partly to the style and dynamic level of the reeds, the Bombarde serves the organ better standing alone than with the Great. This is a case of an idea which looks very useful and flexible on paper but did not work in reality.

Many people think that the addition of reeds to a G. Donald Harrison Great is the ruination of his concept. All of us on the project felt that the addition of reeds, as long as it did not hamper in any way the existing Great, could not possibly do any harm to the organ for, after all, they simply need not be used if one is uncomfortable with them. Since the inclusion of a substantial reed chorus on organs of nearly all traditions and nearly all periods is normal, we felt that it did the Tabernacle organ an injustice not to have this capability in service of the great organ literature.

The big question became, "What kind of reeds should these be?" Our concept was to provide what many organbuilders call "normal trumpet tone." We wanted to avoid all extremes, as the musical purpose was to provide trumpet tone in between, in both timbre and volume, the Swell and Bombarde. We started by providing a 16′ much like Harrison provided on other instruments. The 8′ and 4′ registers had progressively increasing scales. All of the shallots are slightly tapered and slightly closed. The bells are made of tin with zinc in the stems of the bases. The boots are of thick common metal. This reed chorus has been one of the most useful additions to the instrument. It adds another dimension in both character and dynamic to the instrument and allows the Great, for the first time, to fully stand on its own. The new reeds have added many solo possibilities and the 16′ stop has been borrowed into the Pedal at both 16′ and 8′ to provide another dynamic terrace in the Pedal reed department. (Borrows from the Swell Contre Trompette at 16′ and 8′ were also added to provide still another level under expression.)

An 8′ Montre was added to the Great organ. This stop had two purposes. First, it does what the Bombarde 8′ Diapason was intended to do—serve as the number one principal tone of a three-level Great. Second, it is scaled in the bass to add power in the range below tenor F.

One tone character entirely missing from the Tabernacle instrument was a wide-scale 8′ Cornet. We provided a five-rank Cornet on the Great and made it available as a borrow on the Antiphonal and Solo. No claim is made that the addition of such a stop will make the Mormon Tabernacle organ capable of rendering authentic performances of French classical repertoire; however, the addition of this distinct color is a remarkable enhancement and further broadens the scope of this eclectic instrument.

There is no doubt that the Positiv organ lacked foundation. Like the reedless Great, the foundationless Positiv is a concept of the mid-20th century which worked much better on paper than in reality. However, the concept of a weak third manual division is not solely the province of the organ reform movement. American organbuilding has suffered from weak Choirs as well as weak Positivs for generations. We felt that as long as future generations could hear the original G. Donald Harrison Positiv as it was conceived, it would be quite proper to add some elements to give the Positiv a proper balance within the ensemble. The organists had to depend on coupling from the Choir to provide 8′ principal and reed tone. We added an 8′ Principal scaled and voiced strictly in the Aeolian-Skinner tradition to blend with the existing principal chorus. The Choir Cromorne, particularly, was constantly coupled, but due to placement was never in balance and seldom in tune. The only Positiv reed originally was a quarter-length Rankett. We thought this stop could work very well as a sub to a dominant unison, but the unison was missing! Harrison's precontract stoplist called for a Cromorne on the Positiv and a Clarinet on the Choir. Later he dropped the Clarinet, moved the Cromorne to the Choir, and substituted the Rankett on the Positiv. The obvious solution was a return to the original plan for the Positiv. We provided a large-scale, powerful French-style Cromorne. The stop is as powerful as a light trumpet. It works beautifully with the Rankett to give a reed chorus to the Positiv. The Rankett had been softened over the years to work better as the lone reed in the division. With addition of the Cromorne, we were able to bring it back to its normal, comfortable volume level. The Rankett also had a inveterately unstable range. The pipes had been worked on so much over the years that they were in poor condition. After some additional work, we found that the chest holes were too small. These were enlarged and the damaged pipes remade. The stop is now quite successful in its whole range. This corroborates the story that the Rankett scale was changed during manufacturing of the organ. Evidently, a special Baroque-style reed had been developed by Oscar Pearson and the chest was made for it. The stop did not prove successful and a more normal quarter-length fagott-style reed was substituted and called Rankett. The bass chest had very large racks which were adapted and the

treble range, obviously, was intended for smaller pipes.

The final additions were a pair of new reed stops on high wind pressure. Many who have played and heard the Tabernacle organ over the years have felt that it lacked a final crowning glory of reed power. The first thought, naturally, was a Trompette en chamade. Another appealing thought was a smooth but glowing Willis-style Tuba that could carry a solo line over full Swell. After much effort in making a choice, the obvious answer became, "include them both." Since stops of this nature can often do more harm than good to a fine instrument, tremendous study was put into not only the style, but placement of these prominent stops. Sample pipes were made along with a special high-pressure test wind system and chest. Both Trompette and Tuba samples were tried in all possible locations in the organ and in various trajectories from horizontal to vertical. We immediately eliminated the idea of mounting "en chamade." In the Tabernacle the best effect is achieved by using the domed shape of the ceiling to distribute the sound. We finally settled on a Tuba Mirabilis scaled after the original Aeolian-Skinner Solo Tuba but played on 15" wind pressure and located in the lower left front of the case and a Trompette Harmonique scaled to complement the Bombarde trompettes and on 12" wind pressure located in the lower right front of the case in front of the Bombarde.

The Aeolian-Skinner Bombarde Trompettes 8′ and 4′ were originally slated to be mounted horizontally (en chamade). The 8′ and 4′ along with the added 16′ were installed hooded. (The records do not indicate reasons for this change, but it seems safe to assume that it could have been financial or layout limitations or both.) In any event, the final result was somewhat unfortunate, but has been corrected by the Trompette Harmonique which, when drawn with the Bombarde reed chorus, adds a remarkable amount of fundamental and solidity.

It is a real luxury to have two marvelous tubas, one under expression and one open. In volume level, both of the new reeds are just slightly above the Bombarde and are telling but not in the slightest overwhelming over the full organ ensemble and other large combinations. These stops do not violate the Harrison-Schreiner ideal of restraint in dynamic levels.

WIND SYSTEM

The wind system of this instrument is unusual among Aeolian-Skinner organs. Most manual chests are fed by double-rise, weighted reservoirs rather than the normal spring-loaded, single-fold type. Harrison was obviously calling on his experience in England as we see from this quote in a letter to Aubrey Thompson Allen dated February 1, 1949: "The Salt Lake City organ is now all finished, accepted and paid for, and it is really a grand job of its kind. Probably coming from England an instrument of this type will be quite a shock to you as it is a far cry from anything one years [sic] in England or on the Continent for that matter. When you have an opportunity to look it over there are many features that will seem like old friends, such as the double-rise reservoirs which I used for all manual departments, together with the time-honored concussion valves."

As an aside, Harrison must have felt that this instrument should stand above even other Aeolian-Skinners. We speculate that he took the very finest English cathedral organs as a model. Another example was his specification that nearly all reeds should be hooded—a common practice in first-class English instruments.

The weighted, double-rise reservoirs also helped us in a very important part of our research. Establishing proper wind pressures

Members of the Schoenstein staff celebrate completion of the console

in a restoration provides a vexing quandary for the restorer. Many factors can change over the years, but springs add to the confusion as they not only can become weak but easily be mixed up from reservoir to reservoir or mounted with differing degrees of tension. Careful inspection indicated that the weights of the reservoirs had remained in place over the years and so we felt quite confident in retaining the pressures as we found them in all cases, except the Solo Tuba.

Unfortunately, the "time-honored concussion valves" were not applied very liberally, resulting in the unsteady wind mentioned above. Some of the winkers in place were not properly positioned nor of a design that allowed enough flexibility to absorb shocks in the system. Additional units were added throughout the instrument especially in the Bombarde and Solo and resulted in an excellent improvement—probably what Harrison had hoped for.

To solve the minor deficiency in wind which caused flatting on full organ, the primary bass pedal wind system was separated and fed by an added 3 hp Spencer turbine blower. The separation also aided in steadiness of the other divisions. Evidently there was always a bit of worry on Schreiner's part about the capacity of the blower. On December 5, 1945, Harrison wrote to Schreiner, "We will, of course, check up on the horsepower of the blower before it is ordered, although I feel certain that it is still plenty large enough."

ELECTRICAL SYSTEM

Unfortunately, the original electric-pneumatic key relays had been changed to telephone-type units. The equipment was not up to professional organbuilding standards and was beginning to fail. What was left of the original Aeolian-Skinner equipment (switches, etc.) was ready for rebuilding. Since most of the original system was gone, it was decided to replace the entire relay and switching system with solid-state equipment. The system was designed and installed by H. Ronald Poll and Associates of Salt Lake City working closely with the in-house maintenance staff. The equipment and engineering were provided by Solid State Logic Ltd. of England. Provisions for all added stops were incorporated as specified by us. Now the entire system, which is a most complicated one, including myriad couplers, chest cut-outs, offset chest switches, etc., is contained in a space about 10% of the original. The system is easily accessible for service and contains no moving parts.

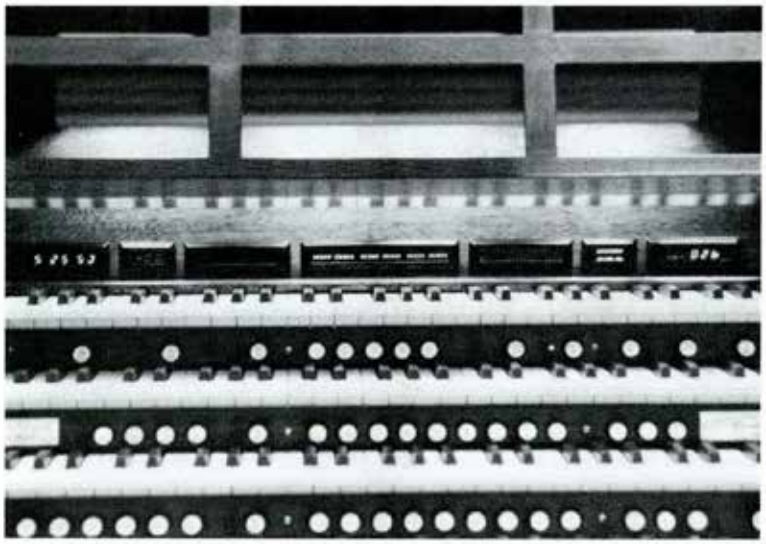
CONSOLE

It was decided to do a complete top-to-bottom rebuild, renewing everything, even those components such as combination action leather which had several years of operating life left. The console had to be removed to our factory for this work and it seemed practical to do everything in one step. Since the Tabernacle organ had to be kept in use at all times, a temporary four-manual console was built by R.A. Colby Inc. of Johnson City, Tennessee, under the direction of H. Ronald Poll and Associates of Salt Lake City, who installed it. This temporary console also facilitated the installation and switch over to the new electrical system without missing a single daily recital or weekly choir broadcast and performed excellent service for 18 months while the original console was refurbished. The day the Aeolian-Skinner console was removed, the new console was already operating. Through the use of connectors, this same rapid-fire exchange took place when the original console was reinstalled.

The Aeolian-Skinner console was sent to San Francisco in November 1985 and stripped down to bare wood. Every component was rebuilt and the case and both benches were refinished. Over the years the case had been damaged in thousands of stage setups. Missing parts of delicate carvings and moldings, broken corners, etc., were remade along with a new name board. The original two-tone finish was duplicated.

Several new features were added to the console including an adjustment device for the music rack, built-in communications equipment for organ service and rehearsal, timers, signals and other equipment necessary for production of the weekly broadcast, and all of the controls for solid-state equipment, etc. Since the Tabernacle is not air-conditioned, the organists can suffer under the television lights. We built a fan into the console with adjustable ducts. Thus this may be the only "air-conditioned" console in the world! Many of these conveniences had been added over the years as extra items attached externally to the console, somewhat marring its stately appearance. Everything was built-in and hidden as much as possible in the 1988 renovation.

We also added some console controls for more flexibility. For example, duplicate general pistons were provided on the right-



Indicator panels above Antiphonal keys: clock, radio broadcast timer, "stand-by" sign, crescendo bar-graph, "on-the-air" sign, sforzando, memory level

hand side of the key slips, duplicate pedal thumb pistons were added. Some toe studs and toe levers were added as space permitted. A reverser to exchange Manual I and Manual II was provided to accommodate the French system of divisional relationships.

In all of these modifications to the console, we had one guiding principle: to maintain the elegant simplicity of which both Harrison and Schreiner were so proud when the organ was designed. It should be noted that the couplers are on knobs in the jambs, and that the console does not bristle with countless toe studs and controls. We added only those items which we felt were absolutely necessary and took special pains to conceal all "space-age" controls which were not of the original Aeolian-Skinner style. For example, we made Skinner-style bezels for all of the new solid-state indicators, broadcast signals, timers, etc., and spread them discretely across the nameboard. We made a sliding drawer under the key desk to contain all of the auxiliary solid-state controls and a duplicate sliding drawer on the opposite side of the console to store pencils, papers and other paraphernalia which always clutter most consoles. The memory selector and crescendo selector, etc., were located on thumb pistons on the key slips. One especially interesting task was creating a special illuminated "on-the-air" indicator using a type style for the logo that was in use by the Columbia Broadcasting System in 1948! We also replaced fluorescent lights with incandescent ones on dimmers and took special care to make every detail of the console in keeping with the Aeolian-Skinner tradition. New stop-knob assemblies were exact copies of the originals with many parts, including the knob heads, furnished by the same suppliers used by Aeolian-Skinner. The knob stems were hand-turned in ebony. The knobs were engraved by Hesco in the original style. Balanced pedals, toe studs, toe levers and other controls were rebuilt or replaced using duplicates made by Harris Precision Products. The pedalboard was completely rebuilt with new natural covers and sharps.

Careful study was made of the manual keyboard situation and we decided to replace rather than rebuild. The second set of Aeolian-Skinner keyboards were not of the same high quality as the originals. We thought it best, rather than attempting to rebuild these, to start afresh. We engaged P & S Organ Supply of Brandon, Suffolk, England, to make the keys with thumb pistons as exact replicas. We started by purchasing a two-manual set to try in the Tabernacle environment. These test keys went through the change of seasons with flying colors. We then sent all five Aeolian-Skinner manuals to England and the painstaking job of measuring and tooling up began. The new keys were custom-made to the original models. The original nameplates were retained. The finished keys look and feel like the Skinner originals but have many design improvements which make them easy to regulate and rebuild in the future. They are elegant, to say the least, and are of the very highest standards of workmanship. The Aeolian-Skinner keyboards have been retained and fitted by Tabernacle organ technicians as spares to be used in the future whenever the keyboards need to be refurbished. The console was returned home in time for the 3,000th broadcast of "Music and the Spoken Word" on February 15, 1987.

COMBINATION ACTION

Replacing the remote Aeolian-Skinner combination action with a solid-state unit was a difficult decision. Whereas the original Aeolian-Skinner relay was gone, the combination action was still in place and functioning well, given its age. The arguments of originality and reliance on time-proven technology are strong ones for preservation of this equipment. On the other hand, the reduced maintenance cost, flexibility and multiple memory capability of solid-state combination action are appealing. In the case of the Tabernacle organ, the decision was weighted by the use the instrument receives. It is played in recital every day of the year, sometimes twice. It is used for Tabernacle Choir rehearsals and a weekly worldwide, live radio broadcast. There are three full-time staff organists and two associate organists plus numerous guest organists throughout the year. Practice time is limited by other activities in the Tabernacle including regular tours. It seemed to us that if any organ could benefit from a multiple memory combination action, it was this one. Furthermore, and of great importance to admirers of Aeolian-Skinner consoles, including ourselves, the combination action was remote and, therefore, there would be no difference in "feel" of the console. The original pneumatically operated knobs could be retained. Therefore, it was decided to substitute a Solid State Logic 64 memory level combination action with the potential of expansion to 256 memory levels. Many other features possible with a solid-state combination action were also incorporated into the console. The equipment, made by Solid State Logic Ltd., was designed and installed by H. Ronald Poll and Associates.

MECHANICAL REBUILDING

We will not dwell in this article on the subject of normal mechanical rebuilding—primarily releathering. Since the organ was installed, the Tabernacle has maintained a staff of in-house organ technicians who, in addition to regular tuning, take care of all mechanical maintenance problems as they arise. Despite the immense size and complexity of this instrument, it is safe to say that every note and every action is working at all performances. Whenever a problem is found, it is usually corrected within a few hours. It is a tribute, indeed, to the craftsmanship and materials employed in the organ's original construction that it has had very few problems over the years. Most have occurred in the relay, combination action and console. These have been the subjects of recent work. Nearly all of the reservoirs have been releathered over the last few years. Most of the windchests, including note pouches, key primaries and stop actions, are operating on original leather which is projected to serve for many more years. Chests will be releathered as needed by the Tabernacle organ shop. Swell engines, tremulants, concussion bellows and other devices are in the process of rebuilding as needed.

REGULAR TUNING AND ADJUSTMENT

We have worked closely with the Tabernacle maintenance crew on procedures for continuing care of the instrument. Particular attention has been placed on proper routines for care of reed pipes. Robert Poll and his associate Lamont Anderson follow a meticulous tuning schedule throughout the year which is aimed at minimizing major shifts in pitch. This is accomplished through careful monitoring of temperature, etc. Since the Tabernacle is not air-conditioned, temperature and humidity maintenance is a difficult proposition. Humidity variations are particularly hard on the Tabernacle instrument. Every effort is made by the Tabernacle staff to maintain good conditions for the organ. The process of servicing and tuning any organ is aided greatly by having the proper facilities. All of the lighting in the organ has been changed from incandescent to fluorescent to provide for cooler and more evenly distributed work light. An advanced, hands-free intercommunication system has been perfected so that there is relaxed, easy communication. Anyone who has struggled with tuning and tone regulation, as well as mechanical adjustments, on a large instrument can attest to the value of such seemingly unimportant items.

CONCLUSION

We trust that this complete resume of the 1988 renovation will be of help to future historians. Working with this instrument was a constant source of inspiration and gratification. We hope that the results of the cooperative efforts of so many artisans would be appreciated by the original creators of this great work of art, including Alexander Schreiner and G. Donald Harrison.

JACK M. BETHARDS

THE 1988 RENOVATION—AN ORGANIST'S PERSPECTIVE

Although a quality pipe organ is a musical instrument of remarkable longevity, it is subject to wear. The Tabernacle organ is no exception. A thorough renovation was inevitable. Not only were mechanical repairs needed (i.e., replacement of keyboards and other worn components), but new technology developed during this period could now be incorporated (i.e., solid-state relays and multiple combination memories, etc.). In 1948, 20 general combination pistons were a luxury, even for a large organ. Yet, as the work load grew in the succeeding years, we organists were increasingly hard pressed to make do with only 20 generals. Each day invariably involved setting and resetting pistons. I'll never forget the 1985 ACDA (American Choral Directors Association) national convention at the Tabernacle. Several different choirs with organists had preceded the Tabernacle Choir concert in earlier performances that day. We were to start after a brief "standing intermission" following the previous concert just concluded. John Longhurst and I were frantically resetting pistons for our performance. Jerold Ottley, our conductor, mounted the podium, bowed and gave an immediate downbeat. At that instant, John captured the last combination as my fingers and feet descended to play the first chord of the accompaniment. Several gray hairs were simultaneously added to my poor head! Shortly thereafter the "64X" option became available through the new solid-state multiple-combination action. With 1,280 general combination pistons potentially at my command, I thought that I had died and gone to heaven.

As comprehensive as the 1948 instrument was, subsequent day-to-day experience over many years suggested discreet modifications that would further enhance its flexibility and impact. Thus, careful additions were considered, either based on items suggested by Harrison himself but never finalized, or clearly indicated by a consensus of qualified performers and builders. The reader, at this point, must not misunderstand. The organ did many things magnificently and had justly earned its place among the important organs of the world. Furthermore, 40 years of extensive experience convinced us that the American Classic aesthetic, so successfully brought to fruition in this instrument, is and will continue to be artistically valid. Yet, there were areas where problems were evident.

The Great division, as substantial as it was, for the most part could not function satisfactorily on its own. It was nearly always used with the Swell, Choir or Bombarde coupled to it to provide reed tone and additional strength in the upperwork. The Pedal likewise had some problems; the mixtures were not entirely satisfactory, and the independent pedal reeds tended to be too strong, while the borrowed reeds were often not strong enough. The Positiv was not an adequate foil to the Great. There were no solo stops that could project a line over the top of the Tabernacle Choir singing in full voice, not to mention a congregation of 6,000! The absence of a 2' flute in the otherwise complete Swell division was often noted, and conversely, something was needed in the Pedal to help bridge the dynamic gap between the 4' Choral Bass and the mixtures. Some stops were rarely used, either because they lacked the refinement typical of the organ as a whole or because they did not fit properly with other stops. The challenge, of course, was to solve the foregoing in a manner that would be completely in harmony with the aesthetic of this American Classic masterpiece. This meant entrusting the work to a firm whose enthusiasm for the work of G. Donald Harrison matched our own.

Schoenstein & Co., under the direction of Jack M. Bethards, was awarded the contract to oversee the entire project. We were especially pleased with Mr. Bethards's philosophy of using the most qualified specialists and best sources of material for this critical assignment regardless of their association with the Schoenstein firm, and his commitment to supervise personally all tonal work. The results have been most gratifying. Visiting organists are hard pressed to differentiate between old and new. More importantly, each new rank makes a vital addition to the previous specification. "How did we ever get along without this particular rank?" typifies our inevitable reaction to the now complete stoplist. The Tabernacle organ of 1988 is a fitting tribute to the Aeolian-Skinner Organ Company and a living reaffirmation of the validity of the American Classic concept. We are confident that the spirit of G. Donald Harrison is smiling in approval. Certainly this project typifies the same forward-looking, ever-perfecting attitude that was his hallmark.

The Tabernacle organ is one of the most visible instruments in the world. With its daily recital series, weekly broadcasts and telecasts, rehearsals, services and recordings, plus the necessary maintenance needed to keep the organ in top form, the scheduling of this organ in a building through which millions (over four million Temple Square visitors in 1988) of eager tourists pass in never-ending succession is a continuing challenge. To fit the extensive renovation project into this hectic schedule without undue disruption was nothing short of a miracle.

Many of the ideas for customizing the console occurred during the organists' informal meetings at lunch. "Wouldn't it be great if . . ." is a magical phrase. So often "if" can be transformed into fact if one "puts his shoulder to the wheel." The rotating disk upon which the organ console now rests is an example of such a phenomenon.

The need to send the Skinner console to San Francisco plus the conversion to solid-state relays coupled with the need for the organ to remain operative during the entire period could result in a once-in-a-lifetime opportunity. For a short period the temporary Colby console wired to the new solid-state relay system would stand alongside the Skinner console prior to disconnecting and shipping the latter to the Schoenstein factory. I can still remember that wonderful

Tabernacle organists (from left) Clay Christiansen, John Longhurst and Robert Cundick

moment when John Longhurst said, "I've been thinking—*wouldn't it be great if* we could install a rotating disk under the console for optimal audience viewing of a recitalist plus other times when a different position of the console would be advantageous?" "Sounds fantastic!" Clay Christiansen and I exclaimed in unison. It was Ronald John, supervisor of operations for Temple Square, who was able to make the dream a reality. Ron had extensive experience as a journeyman machinist and steel industry manager. He was enthusiastic about the idea and, after seeing the impracticality of an initial design attempt, proceeded to supervise the design and installation of a 7'9" circular steel disk faced with hardwood flooring to match the existing floor. Resting on a circular track containing 285 ball bearings, the disk was precisely engineered to take the weight of the organ console yet permit the organist to easily turn the entire unit. The Skinner console was shipped, the disk was installed, and finally the Colby console was lifted into place by a crew of strong-shouldered men with flashbulbs and television cameras making another "media event." All this had happened without interrupting the regular use of the organ, and all because someone had said, "Wouldn't it be great if . . ."

ROBERT CUNDICK

Robert Cundick received his PhD degree in composition from the University of Utah in 1955. A holder of the FAGO certificate, he has been a Tabernacle organist since 1965.

SALT LAKE TABERNACLE ORGAN
AEOLIAN-SKINNER, OPUS 1075 (G. DONALD HARRISON), 1948
147 Voices—206 Ranks—11,623 Pipes

GREAT (unenclosed) Manual II
29 Voices—44 Ranks—2,564 Pipes
Wind Pressures 3½", 3⅞", 4⅜", 4⅞"

		Pipes
16	Subprincipal	61
16	Quintaten	61
8	Principal	61
8	Diapason	61
8	Montre	61*
8	Bourdon	61
8	Spitzflöte	61
8	Flûte Harmonique	61*
8	Bell Gamba	61
5⅓	Grosse Quinte	61
4	Principal	61
4	Octave	61
4	Koppelflöte	61
4	Flûte Octaviante	61*
4	Gemshorn	61
3⅕	Grosse Tierce	61
2⅔	Quinte	61
2	Super Octave	61
2	Blockflöte	61
1⅗	Tierce	61
1⅐	Septième	61
2⅔	Full Mixture IV	244
2	Fourniture IV	244
1⅓	Kleine Mixtur IV	244
1	Acuta III	183
8	Cornet V (f–f⁴)	185*
16	Double Trumpet	61*
8	Trumpet	61*
4	Clarion	61*
	Positiv on Great	

SWELL (enclosed) Manual III
29 Voices—40 Ranks—2,561 Pipes
Wind Pressures 4¼", 4⅞"

16	Lieblich Gedeckt	68**
16	Gemshorn	68
8	Geigen Principal	68
8	Gedeckt	68
8	Claribel Flute	68**
8	Flauto Dolce	68
8	Flute Celeste TC	56
8	Viole de Gambe	68
8	Viole Celeste	68
8	Orchestral Strings II	136
8	Salicional	68
8	Voix Celeste	68
4	Prestant	68
4	Fugara	68
4	Flauto Traverso	61
2⅔	Nazard	61
2	Octavin	61
2	Hohlflöte	68*
2⅔	Cornet III	183
2⅔	Plein Jeu VI	366
1⅓	Plein Jeu IV (from Plein Jeu VI)*	
⅔	Cymbale IV	244
32	Contra Fagot	61
16	Contre Trompette	61
8	1ère Trompette	68*
8	2ème Trompette	61
5⅓	Quinte Trompette	61
4	Clairon	61
8	Hautbois	68
8	Voix Humaine (W.P. 5")	68
	Tremulant	
	Swell to Swell 4 (only affects stops with top octave extensions)	
	Swell to Swell 16	

POSITIV (unenclosed) Manual I
16 Voices—21 Ranks—1,257 Pipes
Wind Pressure 2⅜"

8	Principal	61*
8	Cor de Nuit	61
8	Quintade	61
4	Principal	61
4	Nachthorn	61
2⅔	Nazard	61
2	Principal	61
2	Spillflöte	61
1⅗	Tierce	61
1⅓	Larigot	61
1	Sifflöte	61
1⅐	Septerz II	98
1	Scharf III	183
½	Zimbel III	183
16	Rankett	61
8	Cromorne	61*
	Tremulant	

CHOIR (enclosed) Manual I
18 Voices—24 Ranks—1,536 Pipes
Wind Pressure 4¾"

16	Gamba	68
8	Principal	68
8	Concert Flute	68
8	Viola	68
8	Viola Celeste	68
8	Dulcet II	136
8	Kleine Erzähler II	124
4	Prestant	68
4	Zauberflöte	68
4	Gambette	68
2	Piccolo Harmonique	61
2⅔	Carillon III	183
2⅔	Sesquialtera II (from Carillon)*	
1	Fife (from Carillon)*	
2	Rauschpfeife III	183
16	Dulzian	61
8	Trompette	61
8	Krummhorn	61
8	Orchestral Oboe	61
4	Rohr Schalmei	61
8	Trompette Harmonique (Bombarde)*	
	Positiv off Choir*	
	Tremulant	
	Choir to Choir 4 (only affects stops with top octave extensions)	
	Choir to Choir 16	

BOMBARDE (unenclosed) Manual IV
8 Voices—18 Ranks—1,038 Pipes
Wind Pressure 6¼"

8	Diapason	61
4	Octave	61
2⅔	Grosse Cornet IV–VI	306
2⅔	Grande Fourniture VI	366
16	Bombarde	61
8	Trompette Harmonique (W.P. 12")	61*
8	Trompette	61
4	Clairon	61

SOLO (enclosed) Manual IV
11 Voices—11 Ranks—727 Pipes
Wind Pressure 9⅝"

8	Flauto Mirabilis	68
8	Gamba	68
8	Gamba Celeste	68
4	Concert Flute	68
2⅔	Nazard	61***
2	Piccolo	61***
1⅗	Tierce	61***
8	French Horn	68
8	English Horn	68
8	Corno di Bassetto	68
8	Tuba (W.P. 11½")	68
8	Cornet V (Great)*	
	Positiv on Solo*	
	Tremulant	
	Chimes (32 tubas, c–g², amplified)	
8	Harp (49 bars, c–c⁴, amplified)	
4	Celesta (from Harp, 61 notes)	
	Solo–Bombarde to Solo–Bombarde 4 (affects all stops)	
	Solo–Bombarde to Solo–Bombarde 16	

ANTIPHONAL (enclosed) Manual V
9 Voices—11 Ranks—720 Pipes
Wind Pressure 4¾"

8	Diapason	68
8	Gedeckt	68**
8	Salicional	68
8	Voix Celeste	68
4	Principal	68
2	Kleine Mixtur III	183
8	Trompette	68
8	Vox Humana	68
8	Tuba Mirabilis (Front Case) (W.P. 15")	61*
8	Cornet V (Great)	
	Tremulant	
	Antiphonal to Antiphonal 4 (affects all stops)	
	Antiphonal to Antiphonal 16*	

PERCUSSION
Chimes on Great
Chimes on Pedal
Harp on Choir
Celesta on Choir

PEDAL (unenclosed)
27 Voices—37 Ranks—1,220 Pipes
Wind Pressures
3⅜", 4⅜", 4½", 4⅝", 6⅜", 7"

32	Montre (ext. of Great Subprincipal)	12**
32	Flûte Ouverte	12**
32	Contre Bourdon	12**
16	Principal	32
16	Flûte Ouverte	32
16	Contre Basse	32
16	Violone	32
16	Bourdon	32
16	Gemshorn (Swell)	
16	Gamba (Choir)	
16	Lieblich Gedeckt (Swell)	
10⅔	Grosse Quinte	32
8	Principal	32
8	Violoncello	32
8	Spitzprincipal	32
8	Flûte Ouverte	32
8	Flauto Dolce	32
8	Gamba (Choir)	
8	Lieblich Gedeckt (Swell)	
5⅓	Quinte	32
4	Choral Bass	32
4	Nachthorn	32
4	Gamba (Choir)	
4	Lieblich Gedeckt (Swell)	
2	Principal	32*
2	Blockflöte	32
10⅔	Grand Harmonics V	160
4	Full Mixture IV	128
1	Cymbale IV	128
32	Bombarde	32
32	Contra Fagot (Swell)	
16	Ophicleide	32
16	Trombone	32
16	Double Trumpet (Great)*	
16	Contre Trompette (Swell)*	
16	Dulzian (Choir)	
8	Posaune	32
8	Trumpet	32
8	Double Trumpet (Great)*	
8	Contre Trompette (Swell)*	
8	Krummhorn (Choir)	
4	Clairon	32
4	Chalumeau	32
2	Kornett	32

COUPLERS
Great to Pedal
Swell to Pedal
Choir to Pedal
Positiv to Pedal
Solo–Bombarde to Pedal
Antiphonal to Pedal
Swell to Pedal 4 (affects all stops)
Solo–Bombarde to Pedal 4 (affects all stops)
Swell to Great
Choir to Great
Solo–Bombarde to Great
Antiphonal to Great
Swell to Choir
Solo–Bombarde to Choir
Antiphonal to Choir*
Antiphonal to Solo*
Great Tutti to Solo
Pedal Tutti to Swell
Swell to Great 4 (only affects stops with top octave extensions)
Choir to Great 4 (only affects stops with top octave extensions)
Solo–Bombarde to Great 16
Solo–Bombarde to Great 4 (affects all stops)

Swell to Choir 4 (only affects stops with top octave extensions)

COMBINATIONS (64 Memory Levels*)
General 0, 1–20
1–5 and 11–15 duplicated by toe studs
1–3, 5–7 and 13–15 duplicated on right side of keyboards*

Great	0, 1–8
Swell	0, 1–8
Choir	0, 1–8
Positiv	0, 1–6 *
Solo–Bombarde	0, 1–8
Antiphonal	0, 1–4
Pedal	0, 1–8

6–8 duplicated on thumb pistons under Manual I*

REVERSIBLES
Each manual to pedal unison coupler (thumb)
Great to Pedal (toe)
Swell to Pedal (toe)
Solo–Bombarde to Great (toe)
32 Bombarde (toe)
32 Flûte Ouverte (toe)*
32 Contra Fagot (toe)*
32 Contre Bourdon (toe)
Choir shades to Swell expression pedal (thumb)
Manual I/II (thumb) with indicator lights*
Sforzando (thumb* and toe) with indicator lights (sforzando may be set independently for each memory level)

MECHANICALS
Swell expression
Choir expression
Solo expression
Antiphonal expression
Crescendo (four crescendo sequences, Standard A, B and C. A, B and C are adjustable from the console*)
Thirty segment L.E.D. Crescendo Pedal indicator*
Tremulants, celestes and percussion may be programmed to cancel with crescendo pedal*
Crescendo and Sforzando blind check*
Chime volume control
Chimes forte/piano
Chime dampers on/off
Harp dampers on/off

ACCESSORIES
Combination setter button
Memory lock*
Memory level selector (64 levels)*
Memory level "clear"*
Digital clock with mode selector, stop/start, reset, fast set, slow set and hold controls*
"Stand by" and "On the Air" signals*
Broadcast timer*
Console fan on/off*
Technician call button
Intercom push to talk and volume controls*
Monitor on/off and volume controls*
Nauvoo Bell button (historic bell located outside the Tabernacle)

RELAY
Solid state*

BLOWERS
Main: 30 hp
Auxiliary pedal: 3 hp*
Antiphonal: ¾ hp

TUNING
Equal temperament; A=440 at 74°F.

*Added as part of renovation project, 1986–88
**Retained from earlier Tabernacle organs
***Added in 1979

NOTES TO THE STOPLIST

The following notes detail all changes or other items of interest in connection with each speaking stop of the Mormon Tabernacle organ. If a stop is not footnoted, it is, to the best of our knowledge, exactly as it was left by Harrison in 1949 with the exception of the effects of normal aging and the resulting normal maintenance. Such normal maintenance included cleaning and tonal regulation. Every pipe in the organ was tested for proper speech, uniformity of timbre and volume balance. Where necessary (see text of article), regulation was carried out. Work of this nature has not been individually footnoted. In the case of reed stops, repair work due to the effects of age and tuning was somewhat more extensive. The stops listed below were sent to the Schoenstein factory where the following work was accomplished: cleaning, new tuning springs, new tuning scrolls, and new tongues and wedges only where originals were damaged:

Positiv	16	Rankett
Choir	8	Trompette
Swell	16	Contre Trompette
Swell	8	Trompette
Swell	4	Clairon (old 8′ Harmonic Trumpet treble)
Bombarde	8	Trompette
Bombarde	4	Clairon
Pedal	2	Kornett

Changes in borrows, couplers, combinations, reversibles, mechanicals, accessories, etc., are self-explanatory.

GREAT
8′ Montre. New pipes on actions prepared originally for Great 32′ Montre (notes 1 through 6 and 29 through 61) and new Schoenstein actions (notes 7 through 28).

8′ Flûte Harmonique. Original pipes (notes 1–12). New pipes (notes 13–61). All on new Schoenstein actions. (Orginal pipes 13–61 to 4′ Flûte Octaviante.)

8′ Bell Gamba. Originally intended to be a copy of a Roosevelt Bell Gamba. Delivered as a standard Salicional.

4′ Flûte Octaviante. Original 8′ Flûte Harmonique (notes 1–49). New pipes (notes 50–61). All on original 8′ Flûte Harmonique actions.

2⅔′ Full Mixture.

12–15–19–22:	18 Notes
8–12–15–19:	12 Notes
1– 8–12–15:	31 Notes

2′ Fourniture.

Original

15–19–22–26:	18 Notes
12–15–19–22:	12 Notes
8–12–15–19:	12 Notes
1– 8–12–15:	12 Notes
1– 5– 8–12:	7 Notes

Revised 1988

15–19–22–26:	18 Notes
12–15–19–22:	24 Notes
8–12–15–19:	12 Notes
1– 8–12–15:	7 Notes

Composition change only—no rescaling. Thirty-one new pipes made following original scales. Old pipes placed in storage.

1⅓′ Kleine Mixtur.

19–22–26–29:	12 Notes
15–19–22–26:	12 Notes
12–15–19–22:	12 Notes
8–12–15–19:	12 Notes
8– 8–12–15:	13 Notes

Refinished (softened) by Aeolian-Skinner in 1953. Returned to normal balance in 1988.

1′ Acuta.

22–26–29:	12 Notes
19–22–26:	12 Notes
15–19–22:	12 Notes
12–15–19:	12 Notes
8–12–15:	13 Notes

8′ Cornet V Ranks. New pipes on new Schoenstein actions.

16′ Double Trumpet. New pipes on new Schoenstein actions.

8′ Trumpet. New pipes on new Schoenstein actions (notes 1–12) and actions originally prepared for treble of 16′ Great reed (notes 13–61).

4′ Clarion. New pipes on new Schoenstein actions.

SWELL
Lieblich Gedeckt. From Pioneer organ.

Claribel Flute. Former Kimball Melophone. Bass octave former Austin Clarabella.

2′ Hohlflöte. New pipes on original Voix Humaine action on Swell manual chest. Originally these actions were supplied by a special reservoir. They are now supplied by the main reservoir and the original wind supply has been rerouted to the former Melos Anthropon (now Voix Humaine) windchest.

2⅔′ Cornet.

12–15–17:	49 Notes
8–12–15:	5 Notes
1– 8–12:	7 Notes

2⅔′ Plein Jeu.

12–15–19–22–26–29:	12 Notes
8–12–15–19–22–26:	12 Notes
1– 8–12–15–19–22:	12 Notes
1– 8– 8–12–15–19:	12 Notes
1– 5– 8– 8–12–15:	6 Notes
1– 1– 5– 8– 8–12:	7 Notes

1⅓′ Plein Jeu. Six-rank Plein Jeu is planted on two chests with two separate stop actions but originally controlled by one knob. An additional knob was provided on the console to control the upper four ranks separately.

⅔′ Cymbale.

Original

26–29–33–36:	12 Notes
22–26–29–33:	6 Notes
19–22–26–29:	6 Notes
15–19–22–26:	6 Notes
12–15–19–22:	6 Notes
12–15–15–19:	6 Notes
8–12–15–15:	19 Notes

Revised 1957

26–29–33–36:	12 Notes
22–26–29–33:	12 Notes
19–22–26–29:	6 Notes
15–19–22–26:	6 Notes
12–15–19–22:	6 Notes
8–12–15–19:	6 Notes
1– 8–12–15:	13 Notes

Some rescaling (reduction) was done, possibly in connection with the 1957 recomposition. In 1988, scales were returned to original as far as could be determined.

16′ Contre Trompette. Treble (4′ up) revoiced in the late 1970s.

8′ First Trompette. New pipes on actions originally used for 8′ Harmonic Trumpet. 8′ Harmonic Trumpet treble substituted for 4′ Clairon. Bass placed in storage.

8′ Second Trompette. Stop originally named 8′ Trompette. No change other than nomenclature.

8′ Hautbois. Five additional reed pipes (notes G♯57 through C61) made to replace five flue pipes placed in storage. This was done to carry the reed tone to the highest possible point in the compass.

8′ Voix Humaine. In 1958, an Aeolian-Skinner unit chest was added to accommodate a Vox Humana from the old Kimball Assembly Hall organ. This was called Melos Anthropon. These pipes were removed in the 1988 project. The original Aeolian-Skinner Voix Humaine was moved from the main chest to this chest. The wind system originally feeding the Voix Humaine on the main chest was rerouted to these actions.

4′ Clairon. Treble of former Harmonic Trumpet on Clairon actions. Bass of Harmonic Trumpet and original Clairon to storage. (An attempt was made to revoice the original Clairon in the 1988 renovation, but little improvement resulted.)

POSITIV
8′ Principal. New pipes on new Schoenstein actions (notes 7–61) and on actions originally prepared for Great 32′ Montre (notes 1–6).

1⅓′ Septerz

Flat 21st:	49 Notes
24th:	49 Notes

1′ Scharf

22–26–29:	12 Notes
19–22–26:	12 Notes
15–19–22:	12 Notes
12–15–19:	12 Notes
8–12–15:	6 Notes
1– 8–12:	7 Notes

⅓′ Zimbel

29–33–36:	18 Notes
26–29–33:	6 Notes
22–26–29:	6 Notes
19–23–26:	6 Notes
15–19–22:	6 Notes
12–15–19:	6 Notes
8–12–15:	6 Notes
1– 8–12:	7 Notes

16′ Rankett. This stop evidenced serious speech problems evidently from its inception, as pipes were badly damaged in efforts to correct the situation. We discovered that chest holes (notes A34 through F42) were inadequate. Pipes that had been damaged were repaired and the chest holes were enlarged. It is also interesting to note that the bass offset chest for this stop was designed for pipes of a larger scale. Whether this was an error or whether the pipes were changed prior to shipment or during finishing is unknown.

8′ Cromorne. New pipes on new Schoenstein actions.

CHOIR
2⅔′ Carillon.

12–17–22:	49 Notes
8–12–15:	12 Notes

2⅔′ Sesquialtera. Pipes were reracked and an extra knob provided on console to control this section of the Carillon.

1′ Fife. Pipers were reracked and an extra knob provided on console to control this section of the Carillon.

TABERNACLE ORGAN

2′ Rauschpfeife

15–19–22:	18 Notes
12–15–19:	12 Notes
8–12–15:	31 Notes

This stop was based on a special scale developed for the 4′ Principal of Ernest White's studio organ (opus 995, 1939). It resulted in a bulge of approximately nine steps at 1/4′ (3″) C. The pipes in this range were very unstable. In the 1988 renovation, 13 new pipes were provided and the scale bulge was reduced by three steps.

8′ Krummhorn. Original pipes. Name changed to avoid confusion with new Cromorne added to Positiv. (Name of Pedal borrow also changed.)

BOMBARDE

2⅔′ Grosse Cornet.

12–15–17–19:	12 Notes
8–12–15–17–19:	12 Notes
1–8–12–15–17–19:	25 Notes
1– 8–12–15:	12 Notes

Revoiced by Aeolian-Skinner in 1969.

2⅔′ Grande Fourniture.

Original

12–15–19–22–26–29:	12 Notes
8–12–15–19–22–26:	12 Notes
1– 8–12–15–19–22:	12 Notes
1– 5– 8–12–15–19:	12 Notes
1– 1– 5– 8–12–15:	13 Notes

Revised 1988

12–15–19–22–26–29:	12 Notes
8–12–15–19–22–26:	12 Notes
1– 8–12–15–19–22:	12 Notes
1– 8–12–15–19:	12 Notes
1– 8–12–15:	13 Notes

Pipes left in place but muted.

8′ Trompette Harmonique. New Austin pipes on Austin actions fed by three-valve regulator.

8′ Trompette. Revoiced in late 1970s.

4′ Clairon. Revoiced in late 1970s.

SOLO

8′ Flauto Mirabilis. The harmonic length pipes (wood) were cut down to normal length during, to the best of our knowledge, the original tonal finishing process. These were left as is and carefully regulated.

2⅔′ Nazard. Casavant pipes on actions originally used for the two-rank Viole Celeste. Revoiced in 1988. Original pipes are now the property of Brigham Young University and are intended for use in the Austin organ which was removed in 1948 from the Salt Lake Tabernacle.

2′ Piccolo. Casavant pipes (originally named Blockflöte) on Casavant action. Revoiced in 1988.

1⅗′ Tierce. Casavant pipes on Casavant action. Revoiced in 1988.

8′ Tuba. Wind pressure originally specified at 15″. Wind pressure noted at start of restoration 14″. After much experimentation, the pressure was reduced to 11½″.

Chimes. Slated for possible replacement in the future with large-scale orchestral chimes on electric action.

8′ Harp. Slated for possible replacement with normal Skinner Harp.

ANTIPHONAL

8′ Gedeckt. From Pioneer organ.

8′ Tuba Mirabilis. New Austin pipes on Austin action fed by three-valve regulator. Pipes are located in the main organ case.

PEDAL

32′ Montre. 10 pipes from Pioneer organ. Austin actions retained.

32′ Flûte Ouverte. 12 pipes from Pioneer organ.

32′ Contre Bourdon. 12 pipes from Austin organ.

2′ Principal. New pipes on chest originally provided for 2′ Kornett. Kornett pipes moved to actions on chorus reed chest.

10⅔′ Grand Harmonics.

5–10–Flat 14–16–17:	32 Notes

4′ Full Mixture. Originally 5⅓′ Full Mixture. 5⅓′ rank removed to storage. Low rank from Cymbale transferred as upper rank of Full Mixture.

Original

12–15–19–22:	32 Notes

Revised 1988

15–19–22–26:	32 Notes

1′ Cymbale. Originally 1⅓′ Cymbale. Low rank moved to top rank of Full Mixture. New ⅓′ pitch rank made as top rank of Cymbale.

Original

26–29–33–36:	32 Notes

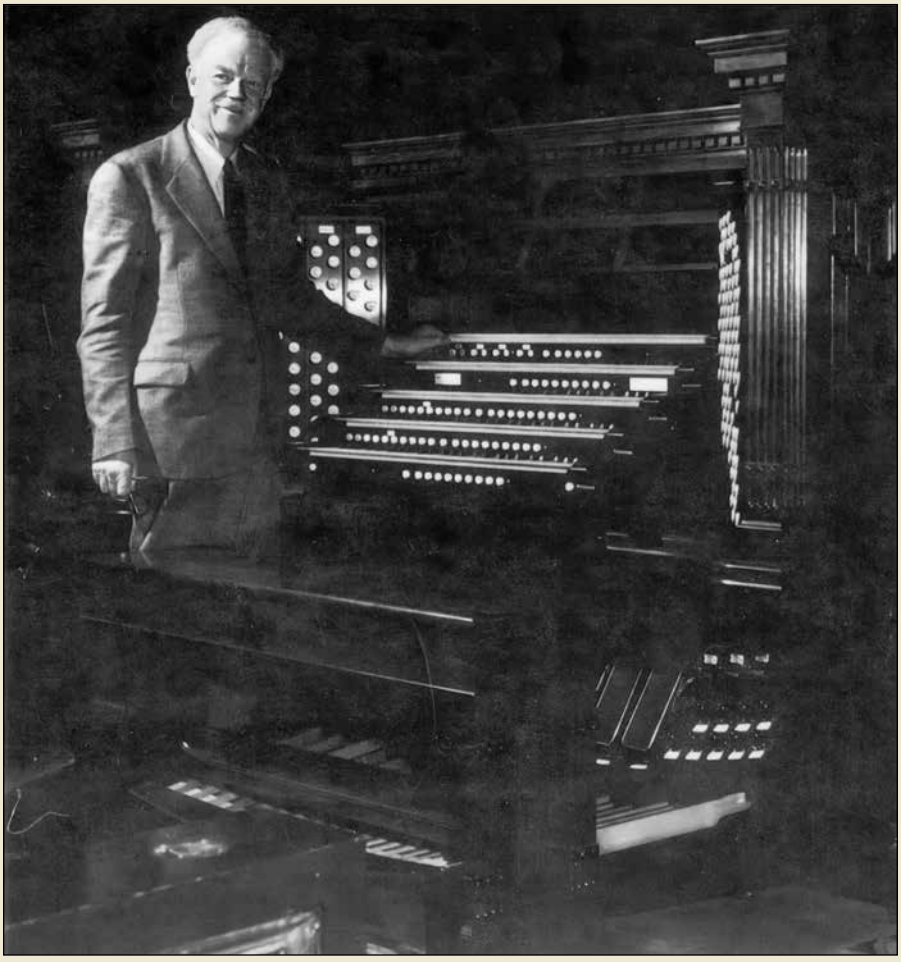
Revised 1988

29–33–36–40:	32 Notes

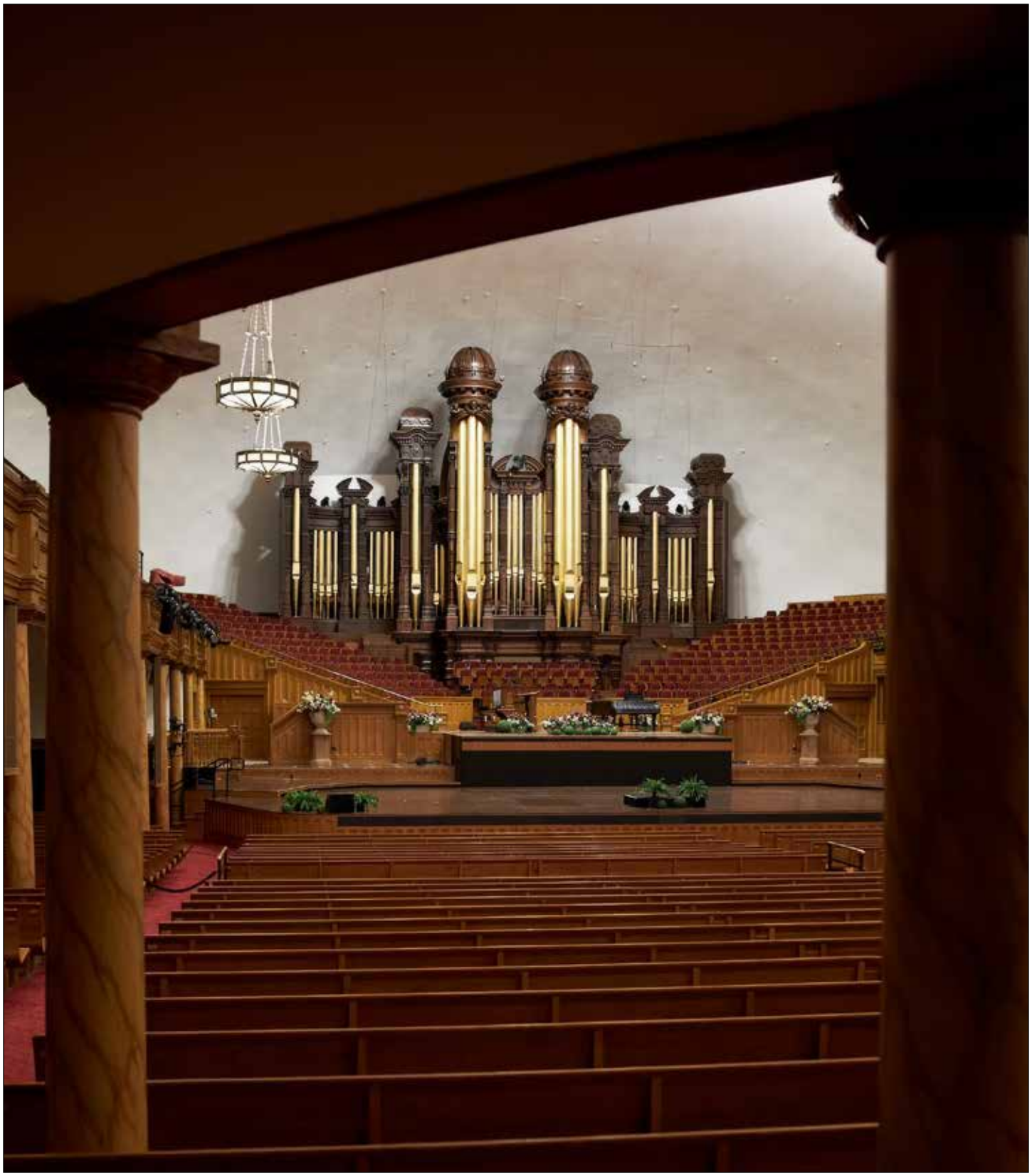
2′ Kornett. Original pipes moved from flue chest to chorus reed chest on actions provided in 1948 for stop of unknown designation.

PERCUSSION

These knobs removed from their original locations within the Great, Pedal and Choir divisions to provide room for other stops.



G. Donald Harrison beside the new console seen in its original form, before the top cornice was modified in 1954 with a lower, less massive profile to give the organist a better view of the conductor.



A relatively recent photo of the Tabernacle organ following the 2007 enlargement of the stage extension and structural reinforcement. The spotlights which mar the clean lines of the case were installed decades ago when the choir regularly broadcast on television.

ST. AMBROSE CATHOLIC CHURCH

ST. AMBROSE CATHOLIC CHURCH | SALT LAKE CITY, UTAH

Bigelow & Co., Inc. | American Fork, Utah

ESSAY BY **DAVID CHAMBERLIN**

ST. AMBROSE PARISH IN SALT LAKE CITY HAS BEEN BLESSED with a beautiful, large, and acoustically gracious worship space, a talented and ambitious director of music (Christopher Huntzinger), excellent choirs, and supportive clergy. However, prior to 2012, the church was being served by a unit organ of only seven ranks with no reeds. When the 44-rank Holtkamp organ from St. Mark's Episcopal Cathedral downtown became available (replaced by a new Bigelow instrument), the musicians and clergy of St. Ambrose wasted no time to procure it for their parish. Having maintained the Holtkamp instrument for many years, and having dismantled and removed it to make way for the new organ, Bigelow & Co. was the obvious choice to reconstruct it as a new instrument for St. Ambrose.

Bigelow Opus 36 includes the console, chests, and forty-two ranks of pipes from the Holtkamp, all seven ranks from the parish's previous Wicks organ, and one new reed rank, for a total of fifty ranks. Only four ranks were substantially revoiced, otherwise revoicing was limited to minor adjustments required by changes in wind pressure and different acoustics.

A handsome new oak case, including a Rückpositiv, harmonizes with the interior of the church and presents the organ as a new instrument.

The inaugural recital was played by Dr. Clay Christiansen of the LDS Tabernacle on January 25, 2013. Dr. Christiansen, who had served St. Mark's Cathedral for ten years when the Holtkamp was new, commented afterward that the new instrument "far eclipses either previous instrument," and called it a "very satisfying eclectic instrument, wonderfully well-suited to its environment."

St. Ambrose Catholic Church
Wicks Organ Co., Opus 4501, 1965

GREAT		PIPES	RANK
8	Principal	61	1
8	Rohr Gedeckt (Sw)		4
8	Dolce	61	2
4	Octave	61	3
4	Harmonic Flute (Sw)		7
2⅔	Twelfth (Sw)		5
2	Principal	12	3
	Swell to Great 16′		
	Swell to Great 8′		
	Swell to Great 4′		

SWELL			
8	Gedeckt	61	4
8	Echo Salicional	61	5
8	Voix Celeste	49	6
4	Harmonic Flute	61	7
4	Salicet	12	5
2⅔	Nazard		4
2	Piccolo	12	7
	Tremolo		
	Swell to Swell 16′		
	Swell to Swell 4′		

PEDAL			
16	Sub Bass	12	4
16	Lieblich Gedeckt		4
8	Principal (Gt)		1
8	Bass Flute (Sw)		4
4	Octave (Gt)		3
4	Harmonic Flute (Sw)		7
	Great to Pedal 8′		
	Great to Pedal 4′		
	Swell to Pedal 8′		
	Swell to Pedal 4′		

Cathedral of St. Mark, Episcopal
Salt Lake City, Utah
Holtkamp Organ Co., Job No. 1820, 1967
Relocated and rebuilt for St. Ambrose R.C. in 2012 by Bigelow & Co.
Compasses: 61/32

II. GREAT

16	Quintadena	61
8	Principal	61
8	Gedackt	61
4	Octave	61
4	Spitzflöte	61
2	Doublette	61
	Mixture IV	244
8	Trumpet	61

I. POSITIV

8	Copula	61
4	Rohrflöte	61
2	Principal	61
2	Blockflöte	61
1	Octave	61
	Sesquialtera II	122
	Scharff III	183
8	Cromorne	61

III. SWELL (enclosed)

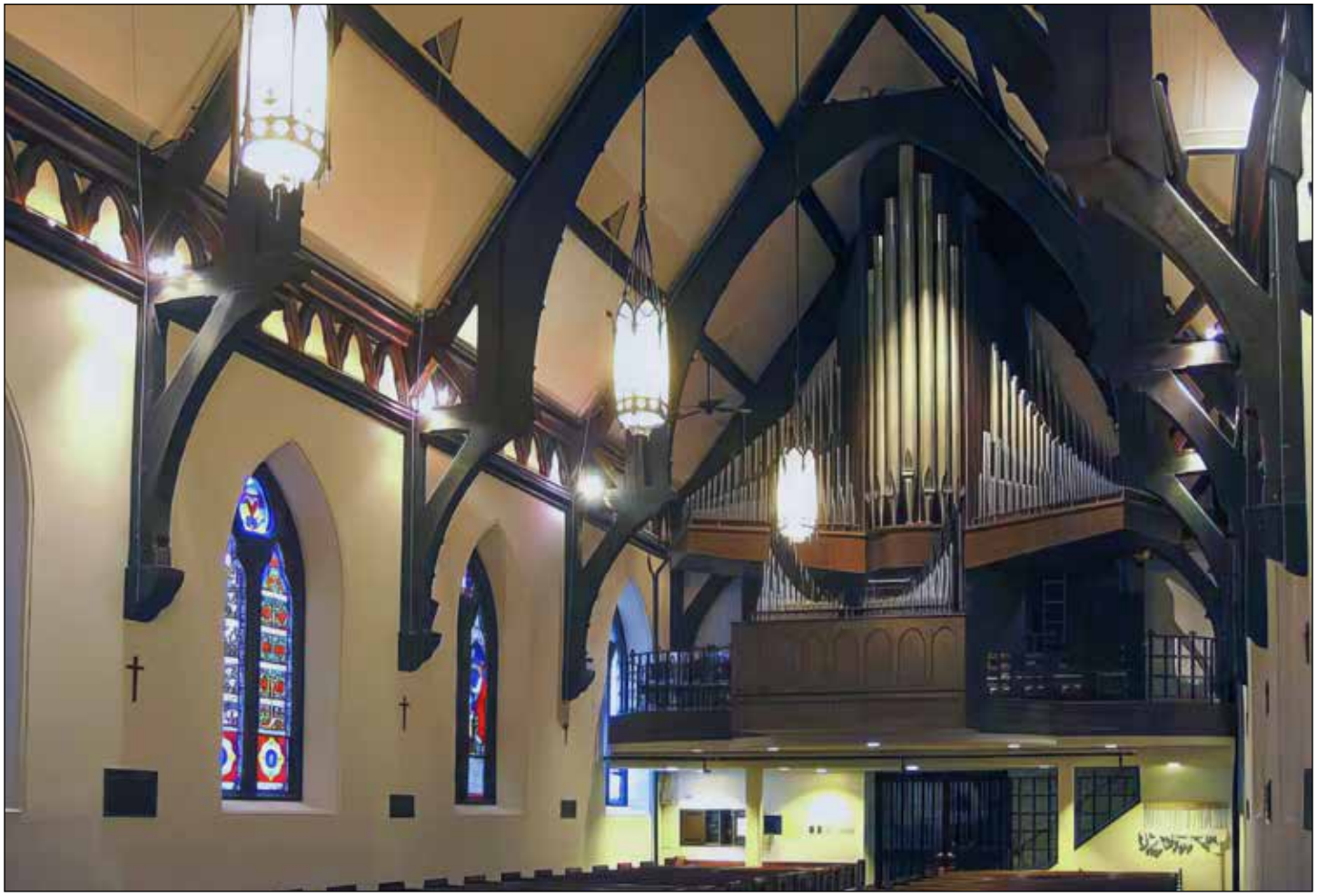
8	Bourdon	61
8	Gamba	61
8	Celeste [F]	56
4	Principal	61
4	Fullflöte	61
2	Nachthorn	61
1⅓	Quinte	61
	Fourniture III	183
16	Fagott	61
8	Oboe	61

PEDAL

16	Principal	32
16	Subbass	32
8	Octave	32
8	Flauto	32
4	Choralbass	32
	Rauschbass III	96
16	Posaune	12
8	Trumpet	32
4	Schalmey	32

COUPLERS

Swell to Great
Positiv to Great
Swell to Positiv
Great to Pedal
Swell to Pedal
Positiv to Pedal



The 1967 Holtkamp in its original configuration at St. Mark's Cathedral, Salt Lake City.

ST. AMBROSE CATHOLIC CHURCH

St. Ambrose Catholic Church
Salt Lake City, Utah
Bigelow & Co., Opus 36 (2013)
3 manuals, 50 ranks

Rebuild/enlargement of Holtkamp Job No. 1820
Utilizing all seven ranks of Wicks Op. 4501, the church's previous organ
One completely new stop: Swell Cornopean
Minor revoicing (slightly higher cut-ups), except as noted
Original Holtkamp console with expanded stop rail

I. POSITIV

		PIPES	
8	Prestant	7	New A.R. Schopp; 1-6 from Copula, then ext. Prestant 4′
8	Copula	61	
8	Dolce (Gt)		
4	Prestant	61	Wicks Octave, revoiced (reduced toe holes)
4	Rohrflöte	61	
	Dolce (Gt)		
2	Principal	61	
2	Blockflöte	61	
1	Octave	61	
II	Sesquialtera	122	
III	Scharf	183	
8	Cornopean (Sw)		
8	Cromorne	61	
	Swell to Positiv		

II. GREAT

16	Bourdon (Sw*)		
16	Quintadena	61	
8	Open Diapason	61	Wicks
8	Principal	61	
8	Gedeckt	61	
8	Dolce	61	Wicks
4	Octave	61	
4	Spitzflöte	61	
2	Doublette	61	
IV	Mixture	244	
8	Trumpet	61	Reworked by Fred Oyster
	Positiv to Great		
	Swell to Great		

III. SWELL

8	Viol-Principal	61	Holtkamp Gamba, revoiced (higher cut-ups, larger toes)
8	Bourdon	61	Wicks
8	Flute	61	Holtkamp Bourdon (wood/metal)
8	Salicional	61	Wicks
8	Celeste (FF)	56	Wicks, 6-12 Holtkamp
4	Principal	61	
4	Harmonic Flute	61	Wicks
2⅔	Nasat	61	Holtkamp Füllflöte 4′ (+5 from stock)
2	Nachthorn	61	
III	Fourniture	183	22 new, rest repurposed from 1⅓′ Larigot and Fourniture (C was ⅔′-½′-⅓′, now 2′-1′-⅔′)
16	Fagott	61	
8	Cornopean	61	New from A.R. Schopp
8	Oboe	61	
4	Fagott (ext. 16′)	24	New from A.R. Schopp

PEDAL

32	Principal Resultant		
32	Resultant (Bourdon)		
16	Principal	32	
16	Bourdon (Sw*)	12	Wicks
16	Bourdon doux (Sw*)		
16	Quintadena (Gr)		
8	Octave	32	
8	Flauto	32	
4	Choralbass	32	
4	Bourdon (Sw 8′)		
III	Rauschpfeife	96	
16	Posaune	32	
16	Fagott (Sw)		
8	Trumpet	32	Reworked by Fred Oyster
4	Schalmey	32	
	Great to Pedal		
	Positiv to Pedal		
	Swell to Pedal		

*The 16′ octave of the Bourdon rank is extended from the Swell Flute but is unenclosed. On the Great, and on the Pedal as "Bourdon doux," the 16′ octave plays on reduced wind pressure.

THE CATHEDRAL OF THE MADELEINE

The Cathedral of the Madeleine
Salt Lake City, Utah
Kenneth Jones and Associates, 1992

I. POSITIVE (58 notes)
8′ Principal
8′ Hohlflute 8′
8′* Quintadena
4′ Octave
4′ Coppelflute
2⅔′ Nazard
2′ Octave
2′ Nachthorn
1⅗′ Tierce
1⅓′ Larigot
1⅓′ Scharf V-VI
16′ Rankett
8′ Cromhorne
Tremulant
8′ Fanfare Trumpet

II. GREAT (58 notes)
16′ Principal
8′ Octave
8′ Rohrflute
8′ Gamba
4′ Octave
4′ Spitzflute
2⅔′ Quint
2′ Octave
2′ Mixture IV
½′ Cymbal III
8′ Trumpet

III. SWELL (enclosed, 58 notes)
16′* Bourdon
8′* Open Diapason
8′ Gedeckt
8′* Salicional
8′* Celeste
4′ Principal
4′ Harmonic Flute
2⅔′ Nazard
2′ Gemshorn
1⅗′ Tierce
2′ Mixture V
16′ Double Trumpet
8′ Cornopean
8′ Oboe
8′* Vox Humana
4′ Clarion
Tremulant

IV. BOMBARDE (58 notes)
8′* Open Flute
8′* Dulciana
Cornet V (mounted)
16′ Bombarde
8′ Trompette
4′ Clairon
8′* Clarinet

PEDAL (30 notes)
32′ Open Bass
16′* Open Wood
16′* Principal
16′* Bourdon
8′* Octave
8′* Bass Flute
4′ Choral Bass
4′* Flute
2⅔′ Mixture IV
32′ Contra Bombarde
16′ Trombone
8′ Bass Trumpet
4′ Schalmey

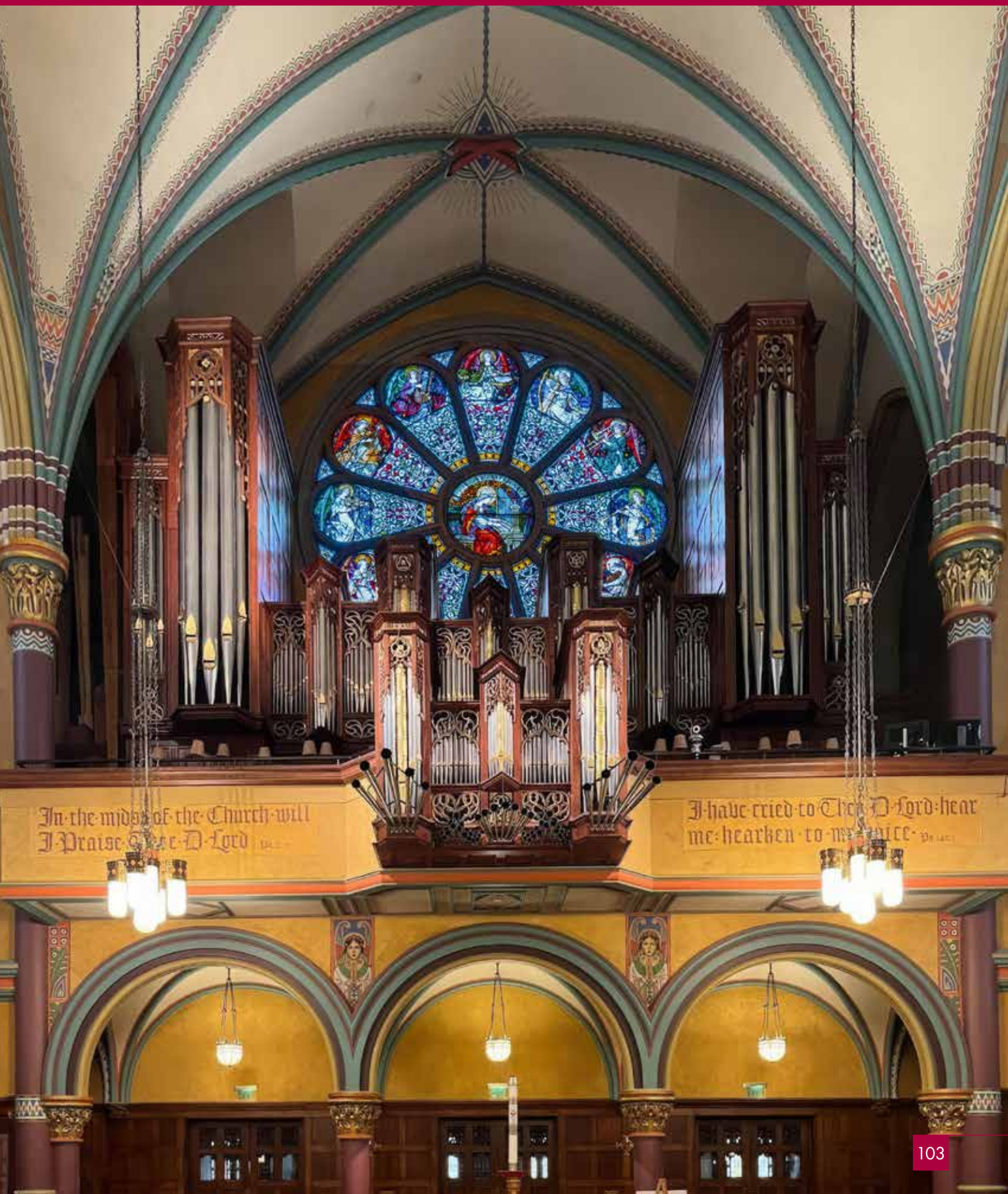
COUPLERS
Great to Pedal
Positive to Pedal
Swell to Pedal
Bombarde to Pedal
Positive to Great
Swell to Great
Bombarde to Great
Swell to Positive

*Restored Kimball ranks
8 x 128 levels of memory.
Sequencer
Mechanical key action
Electric Stop Action
IV/79 ranks. 58/30

THE ECCLES MEMORIAL ORGAN

In 1909, a 27-rank electro-pneumatic organ was built by the W.W. Kimball Company of Chicago. It was rebuilt by Schoenstein & Co. of San Francisco in 1953. By the mid-1980s, this organ had come to the end of its natural life and was replaced in 1992 by a new IV/79-rank mechanical action English-style organ built by Kenneth Jones and Associates of Bray, Ireland. The organ, which has 4,066 pipes, stands in a gothic case designed to match the woodwork installed in 1918, when the cathedral's interior was remodeled by Pittsburgh architect John T. Comès.

SALT LAKE CITY, UTAH



THE CATHEDRAL OF THE MADELEINE

SALT LAKE CITY, UTAH

Kenneth Jones and Associates, 1992

SOURCE: Factory pipe-order sheets

GREAT | 85mm w.p.		**C**	**c⁰**	**c¹**	**c²**	**c³**	**Remarks**
Principal 16′	Ø	250.0	142.0	84.0	48.0	27.0	1-44 façade, tin, interior 50% tin
	Cut-up	48.0	27.3	15.5	8.8	5.0	MW 2/9, 67° languid
	Toe hole	25	17	10.5	8.0	5.5	
Octave 8′	Ø	155.0	89.0	53.0	31.5	18.5	1-31 tin façade, interior 50% tin
	MW	0.25	0.26	0.27	0.28	0.28	Graduated mouth width, 70° languid
	Cut-up	32.0	18.5	11.0	6.4	3.8	
	Toe	18.0	11.0	9.0	6.0	3.5	
Gamba 8′	Ø	117.0	68.0	39.0	23.0	13.0	1-12 copper, then 50%. Slotted, rollers 1-20
	Cut-up	19.5	11.0	6.5	3.7	2.0	
	Toe	8.0	5.5	3.3	2.3	1.7	
Rohrflute 8′	Ø	134.0	84.0	53.0	34.2	22.0	20% tin, 50° languid, MW ¼. Gemshorn 53-58
	Cut-up	33.5	20.0	12.0	7.0	4.0	
	Toe	11.5	8.0	5.6	4.0	2.8	
	Rohr L/Ø	550/23	280/18	140/14	70/11	35/11	
Octave 4′	Ø	89.0	51.0	30.3	18.0	10.3	1-20 façade, tin, interior 50%: 70° languid, MW ¼
	Cut-up	18.0	11.0	6.5	3.9	2.2	
	Toe	11.0	8.5	5.0	3.2	2.5	
Spitzflute 4′	Ø	101/33.5	60/20.0	37.5/12.5	22.5/7.5	13.5/6.8	50% tin, 55° languid, MW 2/9
	Cut-up	19.5	12.0	7.0	4.0	2.4	
	Toe	6.5	5.2	4.4	2.5	1.5	
Quint 2⅔′	Ø	54.0	33.0	20.0	12.0	7.0	50% tin, 70° languid, MW 2/9
	Cut-up	9.8	5.9	3.5	2.0	1.2	
	Toe	6.5	4.3	2.4	1.5	1.0	
Octave 2′	Ø	49.0	29.0	16.7	9.5	5.5	50% tin, 70° languid, MW ¼
	Cut-up	9.2	5.1	2.9	1.6	0.9	
	Toe	7.0	4.5	2.5	1.5	1.0	
Mixture IV 2′	C	2′	1⅓′	1′	⅔′		50% tin, 70° languid
	d⁰	2⅔′	2′	1⅓′	1′		
	e¹	4′	2⅔′	2′	1⅓′		
	f² ♯	8′	4′	2⅔′	2′		

8′	Ø	—	—	—	—	18.5	MW ¼
	Cut-up	—	—	—	—	3.5	
	Toe	—	—	—	—	3.2	
4′		—	—	—	18.0	10.0	MW ¼
		—	—	—	3.4	2.0	
		—	—	—	3.0	2.2	
2⅔′		—	—	20.5	12.2	7.2	MW ⅔
		—	—	3.7	2.3	1.4	
		—	—	3.6	2.1	1.1	
2′		48.0	28.0	17.0	10.0	6.0	MW ¼
		9.0	5.1	2.8	1.6	1.0	
		6.8	4.2	2.6	1.6	1.0	
1⅓′		34.0	20.0	12.0	7.0	—	MW ⅔
		6.0	3.5	2.1	1.2	—	
		5.0	3.0	1.7	1.0	—	
1′		27.0	16.0	9.2	—	—	MW ⅔
		4.9	2.7	1.5	—	—	
		4.0	2.5	1.5	—	—	
⅔′		19.0	11.3	—	—	—	MW ⅔
		3.3	2.0	—	—	—	
		2.7	1.5	—	—	—	
Cymbal II-III ½′	C		½′	⅓′			50% tin, 70° languid
	d^0		⅔′	½’			
	e^1	2′	1′	⅔′			
	$f^{\sharp 2}$	2′	1⅓′	1′			
	$a^{\sharp 2}$	4′	2′	1⅓′			
	d^3	4′	2⅔′	2′			
4′	Ø	—	—	—	—	10.0	MW ¼
	Cut-up	—	—	—	—	1.8	
	Toe	—	—	—	—	1.8	
2⅔′		—	—	—	—	7.2	MW ¼
		—	—	—	—	1.4	
		—	—	—	—	1.1	
2′		—	—	—	10.0	6.0	MW ¼
		—	—	—	1.7	1.0	
		—	—	—	1.6	1.0	

THE CATHEDRAL OF THE MADELEINE

SALT LAKE CITY, UTAH

1⅓′		—	—	—	—	4.2	MW ⅔
		—	—	—	—	0.8	
		—	—	—	—	0.8	
1′		—	—	—	5.5	—	MW ⅔
		—	—	—	1.0	—	
		—	—	—	0.9	—	
⅔′		—	—	6.7	4.0	—	MW ⅔
		—	—	1.2	0.8	—	
		—	—	1.1	0.7	—	
½′		15.5	9.0	5.0	—	—	MW ⅔
		2.7	1.6	0.9	—	—	
		1.5	1.0	0.8	—	—	
⅓′		11.0	—	—	—	—	MW ⅔
		1.9	—	—	—	—	
		1.4	—	—	—	—	
Trumpet 8′	Ø top/tip	110/13.8	86/11.0	69/9.5	58/8.5	50/7.5	50% tin, slotted 1-24, flues 51-58
	Length	2300	1125	540	260	120	
Shallot	Length	110	75	52	40	27	Open, tapered, flat bottom
	Ø end/top	15/12	11/9	9/7.6	8/7	7.3/6.6	
	Wall thick	1.2	1.0	4.0/2.0	3.7/1.7		
	Opening	6.5/3.0	5.0/2.5	4.0/2.0	3.7/1.7	3.5/1.5	
Tongue	Thickness	0.65	0.40	0.25	0.16	0.10	
POSITIVE | 75mm w.p.		**C**	**c^0**	**c^1**	**c^2**	**c^3**	**Remarks**
Principal 8′	Ø	107.0	85.0	49.0	29.0	16.7	8-24 façade, tin, interior 50%.
	Cut-up	21	17.0	9.7	5.7	3.4	70° languid, MW ¼
	Toe	11.0	9.5	6.7	4.8	3.2	
Hohlflute 8′	Ø	135.0	78.0	49.0	31.0	20.0	20% tin, Gedackt with Gemshorn trebles 53-58
	Cut-up	30.0	19.5	11.5	7.0	4.0	MW ⅔
	Toe	10.0	6.5	5.1	4.3	2.5	
Quintadena 8′	Ø	92.0	55.0	33.0	20.0	14.0	*Restored pipes*

Octave 4′	Ø	82.0	48.0	28.0	16.5	9.6	13-22 façade, 70%, remainder 50%.
	Cut-up	17.0	9.6	5.6	3.2	1.9	70° languid , MW ¼
	Toe	9.5	6.5	4.5	3.0	2.6	
Coppelflute 4′	Ø	88.0	56.0	35.0	22.0	f² 19.0	20% tin. Stopped cone canisters 1-12; open canisters 13-42; then open Gemshorns
	Cut-up	18.0	11.0	6.8	4.0	3.2	
	Toe	9.0	5.3	4.0	3.0	2.5	50° languid , MW ⅔ graded to ⅓ @ 49
	Cone L	160.0	160.0	95.0	56.0	40.0	
	Top Ø	26.0	26.0	16.0	11.0	9.0	
Nazard 2⅔′	Ø	66.0	36.9	24.0	15.0	9.2	25% tin. Cylindrical; 50° languid, MW ⅔
	Cut-up	122	7.5	4.3	2.5	1.5	
	Toe	4.5	3.5	2.5	1.8	1.0	
Octave 2′	Ø	46.0	27.4	15.7	9.3	5.5	50% tin, 70° languid , MW ¼ graded to ⅔ @ 49
	Cut-up	9.0	5.4	3.0	1.8	1.0	
	Toe	4.5	3.0	2.0	1.2	0.9	
Nachthorn 2′	Ø	50/37	31/25	19/16	12/11	7/7	25% tin. Tapered; 50° languid, MW ⅔
	Cut-up	10.0	5.5	3.1	1.7	1.2	
	Toe	5.2	3.3	2.2	1.8	1.0	
Tierce 1⅗′	Ø	46.0	29.0	18.5	12.0	7.0	25% tin. Cylindrical; 50° languid, MW ⅕
	Cut-up	8.2	4.7	2.7	1.5	0.9	
	Toe	3.0	2.5	1.9	1.4	1.0	
Larigot 1⅓′	Ø	40.0	24.0	14.0	58.4	5.9	25% tin. Cylindrical; 50° languid, MW ⅕
	Cut-up	7.0	4.3	2.6	1.6	1.0	Breaks back to 2′ @ 52
	Toe	2.5	2.0	1.6	1.3	1.0	
Scharff IV-V 1⅓′	C		1⅓′	1′	⅔′	½′	50% tin, 70° languid
	g♯⁰		2′	1⅓′	1′	⅔′	
	f♯¹		2⅔′	2′	1⅓′	1′	
	e²	8′	4′	2⅔′	2′	1⅓	
	d³	8′	4′	2⅔′	2⅔′	2′	
8′	Ø	—	—	—	—	16.5	MW ¼
	Cut-up	—	—	—	—	3.2	
	Toe hole	—	—	—	—	3.2	
4′		—	—	—	—	9.6	MW ¼
		—	—	—	—	1.9	
		—	—	—	—	2.6	
2⅔′		—	—	—	11.5	7.0	MW ⅔
		—	—	—	2.3	1.4	
		—	—	—	2.0	1.5	

THE CATHEDRAL OF THE MADELEINE

SALT LAKE CITY, UTAH

2′	—	—	15.7	9.3	5.5	MW ¼
	—	—	3.0	1.8	1.0	
	—	—	2.2	1.3	1.0	
1⅓′	32.0	19.0	11.0	6.5	3.8	MW ⅔
	5.9	3.6	2.2	1.2	0.8	
	3.5	2.3	1.5	1.0	0.6	
1′	25.0	14.8	8.7	5.0	—	MW ⅔
	4.8	2.9	1.7	1.0	—	
	3.0	2.0	1.2	0.6	—	
⅔′	18.5	10.5	6.0	—	—	MW ⅔
	3.5	2.2	1.2	—	—	
	2.2	1.4	0.9	—	—	
½′	14.2	8.2	—	—	—	MW ⅔
	2.7	1.6	—	—	—	
	1.9	1.0	—	—	—	
2⅔′ (2nd)	—	—	—	—	7.0	MW ¼
	—	—	—	—	1.3	
	—	—	—	—	1.5	

		C	**c⁰**	**g⁰ / g♯⁰**	**c¹**	**c²**	**c³**	**Remarks**
Rankett 16′	Ø	34.0	29.0	26.6/26.3	25.0	22.0	19.0	75% tin. Narrow-scale trumpet
	Tip	15.0	12.5	11.3/11.1	10.5	9.0	7.5	
	L	1250	575	380/725	540	250	110	
Shallot	L	195.0	120.0	—	60.0	35.0	23.0	Open, parallel, bottom 45°
	O.D.	14.0	11.0	—	9.0	7.5	6.5	
	Wall thick	1.75	1.5	—	1.0	0.75	0.75	
	Opening	6.0	4.8	—	4.0	3.0	2.8	
	Tongue	0.8	0.55	0.38		0.26	0.18	
Cromorne 8′	Ø	47.0	38.0	—	32.0	28.0	25.0	50% tin. Flues 51-48
	Cylinder L	1300	640	—	315	145	65	
	Cone L	110	75	—	52	40	28	
	Tip Ø	13.0	10.0	—	8.5	7.5	7.0	

Shallot	L	110	75	—	52	40	28	Clicquot French shallots
	O.D.	11.0	8.5	—	7.0	6.0	5.5	
	Wall thick	1.2	1.0	—	0.8	0.7	0.6	
	Opening	8.0	5.5	—	4.5	3.6	3.3	
	Tongue	0.5	0.35	—	0.22	0.14	0.09	
Fanfare Trumpet	Ø	100.0	78.0	—	64.0	56.0	52.0	90% tin, en chamade,
110 mm pressure	Tip	13.5	10.5	—	8.5	7.5	6.5	resonators flared during voicing,
	L	2275	1115	—	530	250	120	flue trebles 51-58
Shallot	L	110	75	—	52	40	27	Open, tapered with flat bottoms
	O.D.	14/12	11/9.6	—	9/8	7.8/7	7/6.5	
	Opening	6/3	4.5/2.7	—	3.7/2.4	3.6/2.2	3.5/2.0	
	Tongue	0.65	0.40	—	0.25	0.16	0.10	

SWELL | 85mm w.p.		**C**	**c^0**	**c^1**	**c^2**	**c^3**	**Remarks**
Lieblich Bourdon 16′		*Restored pipes of wood*					
Open Diapason 8′	Ø	150	88	53	32	19	*Restored pipes*
Salicional 8′	Ø	105	65	35	21	13	*Restored pipes*
Voix Celeste 8′	Ø	—	60	34	20	12	*Restored pipes;* from 13
Gedeckt 8′	Ø	130.0	76.0	48.0	31.0	20.0	20% tin, canisters and chimneys from 49 75% tin
	Cut-up	30.0	19.0	11.0	7.0	4.2	50° languid. MW ¼, large tuning ears
	Toe hole	9.5	6.0	5.0	4.0	2.8	
	Rohr L/Ø	—	—	75/10	35/8	19/4	
Principal 4′	Ø	86.0	49.0	29.0	17.5	10.0	50% tin. 70° languid , MW ¼
	Cut-up	17.0	9.7	5.7	3.3	1.9	
	Toe	410.0	6.5	4.7	3.3	2.5	
Harmonic Flute 4′	Ø	100.0	65.0	40.0	24.0	13.5	50% tin. Harmonic from c^1, MW ¼
	Cut-up	17.0	10.0	8.0	4.6	2.6	
	Toe	8.0	6.0	5.0	4.0	3.0	
	Body L	1230	610	600	300	150	
Nazard 2⅔′	Ø	61.0	36.0	21.5	12.7	7.3	50% tin. 55° languid, MW ⅔, cylindrical
	Cut-up	13.0	7.5	4.2	2.5	1.6	
	Toe	4.0	3.5	2.5	2.0	1.0	
Gemshorn 2′	Ø	50.25	30/20	17/13	9.5/9.5	5.7/5.7	50% tin. 65° languid, MW ⅔, tapered
	Cut-up	8.5	4.9	2.8	1.5	0.9	
	Toe	4.0	3.0	1.7	1.0	0.8	

THE CATHEDRAL OF THE MADELEINE

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Tierce 1⅗′	Ø	42.0	26.5	16.2	9.6	5.7	50% tin, 55° languid, MW ⅖, cylindrical
	Cut-up	8.0	4.4	2.5	1.5	0.9	
	Toe	3.0	2.4	1.8	1.3	0.8	
Plein Jeu V 2′	C	2	1⅓	1	⅔	½	50% tin, 70° languid
	c^0	2⅔	2	1⅓	1	⅔	
	c^1	4	2⅔	2	1⅓	1	
	c^2	8	4	2⅔	2	1⅓	
	c^3	8	4	2⅔	2⅔	2	
8′	Ø	—	—	—	28.0	16.5	MW ¼
	Cut-up	—	—	—	6.0	3.5	
	Toe	—	—	—	5.0	3.6	
4′		—	—	28.0	16.5	10.0	MW ¼
		—	—	5.8	3.4	1.9	
		—	—	4.8	3.4	2.6	
2⅔′		—	32.0	19.0	11.3	6.7	MW ⅖
		—	6.5	3.8	2.2	1.4	
		—	3.5	2.7	1.9	1.1	
2⅔′ (doubled)		—	—	—	—	6.7	MW ¼
		—	—	—	—	1.4	
		—	—	—	—	1.4	
1⅓′		34.0	20.0	12.0	7.0	—	MW ⅖
		5.7	3.5	2.0	1.0	—	
		3.5	2.7	1.8	1.0	—	
1′		26.0	15.5	9.2	—	—	MW ⅖
		4.6	2.8	1.6	—	—	
		2.6	1.4	0.9	—	—	
⅔′		19.0	11.0	—	—	—	MW ⅖
		3.5	2.2	—	—	—	
		2.2	1.3	—	—	—	

Double Trumpet 16′	Ø	120	90	68	55	46	50% tin; 1-12 ½L with wood boots
	Tip	15.0	12.0	10.0	9.5	7.5	
	L	2300	2280	1110	530	255	
Shallot	L	175	110	75	52	40	Open, tapered, flat bottoms
	O.D.	16/13	12/10	9.5/8.2	7.9/7.0	7.1/6.4	
	Wall	1.7	1.2	1.0	0.8	0.7	
	Opening	5.5/3.0	4.0/2.5	3.3/2.3	2.9/2.2	2.7/2.1	
	Tongue	0.85	0.6	0.4	0.28	0.2	
Trompette 8′	Ø	110	85	67	57	50	50% tin; 53-58 8+4 flue trebles
	Tip	14.5	11.5	9.7	8.5	7.0	
	L	2290	1120	540	260	120	
Shallot	L	120	80	58	40	28	Open, parallel, flat bottoms
	O.D.	13.0	10.0	8.2	7.1	6.5	
	Wall	1.2	1.0	0.8	0.7	0.6	
	Opening	5.5	4.2	3.5	3.2	3.0	
	Tongue	0.65	0.4	0.25	0.16	0.09	
Hautbois 8′	Bell Ø	92	70	55	43	35	50% tin, bell and stem throughout; half-soldered caps; flues 53-58
	Joint Ø	45	33	24	19	17	
	Tip Ø	11.5	9.0	7.5	6.5	6.0	
	Bell L	405	245	145	85	40	
	L	1660	768	342	140	57	
Shallot	L	102	70	50	35	25	English tapered, flat bottoms
	O.D.	14.0/10.0	10.5/7.5	8.0/6.0	6.4/5.0	5.5/4.5	
	Wall	1.2	1.0	0.8	0.7	0.6	
	Opening	5x35	3.6x24	2.9x15	2.5x12	2.3x10	
	Tongue	0.6	0.4	0.25	0.16	0.09	
Voix Humaine 8′	Ø	36	33	31	30	30	*Restored Kimball pipes,* cylindrical ⅛L
Clarion 4′	Ø	72	55	48	43	flue	50% tin; flues 2 rks. 4+2 53-58
	Tip	11.0	9.0	8.0	7.5	—	
	L	1100	530	255	120	—	
Shallot	L	80	58	40	28	—	French Bertounèche shallots
	O.D.	9.0	7.5	6.8	6.4	—	
	Wall	1.0	0.8	0.7	0.6	—	
	Opening	4.0	3.5	3.2	2.9	—	
	Tongue	0.38	0.24	0.15	0.09	—	

BOMBARDE | 110 mm w.p.

Open Flute 8′	Ø	168	96	58	37	30	*Restored Kimball pipes*
Dulciana 8′	Ø	91	52	32	19	12.5	*Restored Kimball pipes*

THE CATHEDRAL OF THE MADELEINE

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Cornet V	g^0	8	4	2⅔	2	1⅗	20% tin; open cylindrical; languid 55°, MW ¼
	d^3	8	4	3⅕	2⅔	2	
	e^3	8	4	4	3⅕	2⅔	
			g^0	c^1	c^2	c^3	
8′	Ø		84.0	67.0	40.0	24.5	
	Cut-up		16.0	13.0	7.9	4.8	
	Toe hole		8.5	7.7	5.5	4.0	
4′	Ø		49.0	39.0	23.0	13.0	
	Cut-up		7.6	9.6	4.5	1.8	
	Toe hole		6.3	5.5	4.0	3.0	
2⅔′	Ø		35.0	28.0	16.1	9.2	
	Cut-up		6.8	5.5	3.2	1.8	
	Toe hole		5.3	4.8	3.3	2.5	
2′	Ø		28.0	22.0	13.0	7.5	breaks to 4′ @ 53 Ø 9.5
	Cut-up		5.5	4.3	2.5	1.5	
	Toe hole		4.2	3.9	2.4	1.8	
1⅗′	Ø		23.0	18.0	10.3	6.0	breaks to 3⅕′ 51 Ø 8.0
	Cut-up		4.5	3.5	2.0	1.2	
	Toe hole		3.6	3.0	2.0	1.5	
Bombarde 16′	Ø	130	98	77	62	52	50% tin; 1-6 ½L with wood boots
	Tip	19.5	14.5	11.0	9.3	8.5	
	L	2350	2320	1110	540	260	
Shallot	L	200	120	80	58	40	Bertounèche shallots
	O.D.	17.5	12.5	9.3	7.7	7.0	
	Wall	1.8	1.3	1.0	0.8	0.7	
	Opening	8.0	5.5	4.2	3.5	3.2	
	Tongue	0.95	0.65	0.40	0.26	0.18	
Trompette 8′	Ø	115	88	71	60	52	50% tin; 8+4 flue trebles 53-58
	Tip	15.0	12.0	10.0	8.5	7.5	
	L	2290	1125	540	260	120	
Shallot	L	120	80	58	40	28	Bertounèche shallots
	O.D.	13.0	10.0	8.2	7.1	6.5	
	Wall	1.2	1.0	0.8	0.7	0.6	
	Opening	6.5	4.8	4.0	3.6	3.2	
	Tongue	0.65	0.40	0.25	0.16	0.10	

Clarion 4′	Ø	80	64	52	46	flues	50% tin; 4+2 flue trebles 53-58
	Tip	11.5	9.5	8.5	7.5	—	
	L	1115	530	255	120	—	
Shallot	L	80	58	40	28	—	Bertounèche shallots
	O.D.	9.4	7.8	7.0	6.5	—	
	Wall	1.0	0.8	0.7	0.6	—	
	Opening	4.6	3.7	3.5	3.2	—	
	Tongue	0.40	0.25	0.16	0.10	—	
Clarinet 8′	Ø	48	37	26	21	18	*Restored pipes*

PEDAL | 110 w.p.

Open Bass 32′	Extension Open Wood 16′, 7 new pipes; C-E resultant					
Open Wood 16′	*Restored pipes*					
Principal 16′	*Restored pipes*					
Bourdon 16′	*Restored pipes*					
Octave 8′	*Restored pipes*					
Bass Flute 8′	*Restored pipes*					
Choral Bass 4′	Ø	95.0	55.0	31.5		50% tin. 50° languid, MW ¼
	Cut-up	18.0	10.5	6.5		
	Toe hole	10.0	7.0	5.0		
Mixture IV 2⅔′		2⅔′	2′	1⅓′	1′	50% tin. 65° languid
2⅔′	Ø	67.0	37.0	21.5		MW ⅔
	Cut-up	11.5	6.5	3.5		
	Toe hole	6.0	4.0	2.6		
2′	Ø	53.0	30.0	17.2		MW ¼
	Cut-up	9.5	5.5	3.5		
	Toe hole	5.0	3.0	2.2		
1⅓′	Ø	37.0	22.0	13.0		MW ⅔
	Cut-up	6.5	3.6	2.2		
	Toe hole	4.0	2.7	2.0		
1′	Ø	28.0	16.5	10.0		MW ¼
	Cut-up	5.3	3.2	1.9		
	Toe hole	3.0	2.0	1.5		

THE CATHEDRAL OF THE MADELEINE

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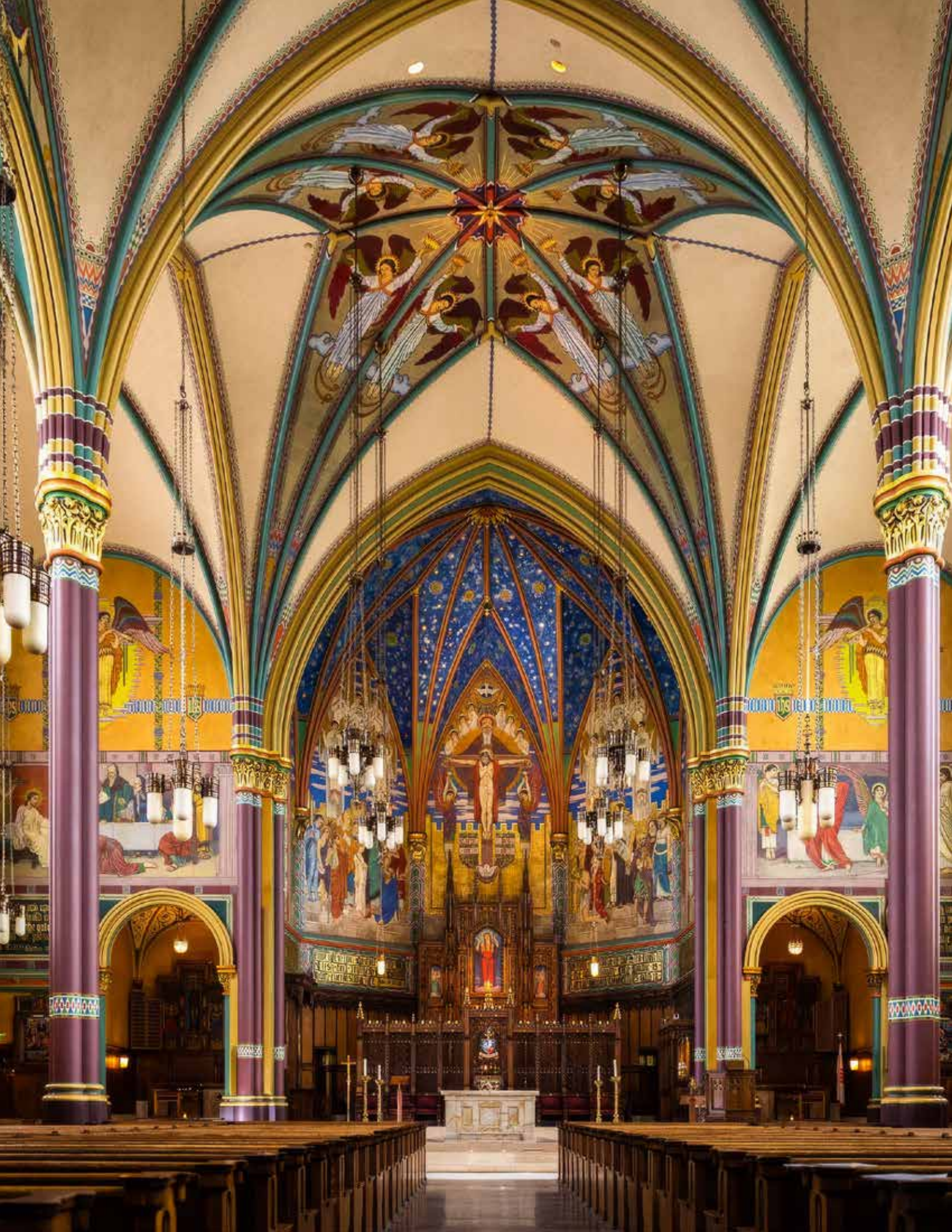
Trombone 16′	Ø	175	125	95	1-12 copper, remainder 50%; wood boots
	Tip	20.0	14.0	11.0	
	L	4450	2300	1130	
Shallot	L	200	120	80	Lead-faced shallots, flat bottom
	O.D.	160	95	60	
	Wall	2.0	1.5	1.2	
	Opening	11/6	7/4	5.5/3.0	
	Tongue	0.95	0.65	0.40	
Bass Trumpet 8′	Ø	120	90	77	50% tin
	Tip	15.0	12.5	11.0	
	L	2290	1125	540	
Shallot	L	115	80	55	Open, tapered, flat bottoms
	O.D.	15/13	12/10.6	10/9	
	Wall	1.2	1.0	0.8	
	Opening	7/3.5	5.5/2.7	4.5/2.0	
	Tongue	0.65	0.40	0.25	
Schalmey 4′	Ø	65	53	43	Trumpet form
	Tip	11.0	9.0	8.0	
	L	1100	530	260	
Shallot	L	80	58	40	Bertounèche shallots
	O.D.	9.0	7.5	6.8	
	Wall	1.0	0.8	0.7	
	Opening	5.0	4.0	3.5	
	Tongue	0.40	0.25	0.16	



THE CATHEDRAL CHURCH OF ST. MARK

THE CATHEDRAL CHURCH OF ST. MARK | SALT LAKE CITY, UTAH

Bigelow & Co., Inc. | American Fork, Utah

ESSAY BY **DAVID CHAMBERLIN**

ALL OF US AT BIGELOW & CO. WERE THRILLED AND HONORED to be commissioned to build a new tracker organ for the beautiful, historic Cathedral Church of St. Mark, Salt Lake City. The three-manual, forty-rank instrument is the firm's Opus 35, our fourth-largest when it was completed in February 2012. The Very Reverend Frederick Q. Lawson, former dean of the cathedral, initiated the project and supported it throughout. Dr. Andrew Unsworth, one of the Tabernacle organists, served as consultant

Founded in 1871, less than thirty years after the first Latter-day Saints arrived in the Salt Lake Valley, and only two years after the completion of the first transcontinental railroad, St. Mark's is the oldest non-LDS church in Utah in continuous use. It was designed by noted architect, Richard Upjohn (Trinity Church, New York City), in the Gothic Revival style, and is now listed on the National Register of Historic Places. The interior is graced by beautiful stained glass windows, including several by the famous Tiffany firm.

The highest priority in the visual design of the new organ was to reveal the rose window that had been walled over behind the previous organ for forty years. That requirement was met, and the south-facing rose window once again adds light and life to the Sunday morning worship experience. The gothic architecture of the organ case fits the church interior perfectly and is a joy to behold.

Tonal objectives of the new organ included a generally warmer sound than had been in vogue at the time of the previous organ and more resources for choir accompaniment in the Anglican tradition. Because the Positive division, placed on the gallery rail, would be the least useful in terms of choir accompaniment, it was conceived as a quasi-solo division (Cornet, Processional Trumpet, Great to Positive coupler). Placing the Great division under expression, except Præstant 8 and Octave 4, increases its usefulness in choir accompaniment and adds considerably to the flexibility of the instrument.

Manual key action and all coupling is mechanical, except that the Processional Trumpet (mounted horizontally in the main case), the Swell Fagotto 16, and the lower two octaves of the Great Bourdon (borrowed from the Pedal) play from electro-pneumatic chests, as do all Pedal stops. Giving up tracker action on this limited basis solved several problems associated with fitting a sizeable organ into a restricted space, and it made some valuable unification and duplexing practical.

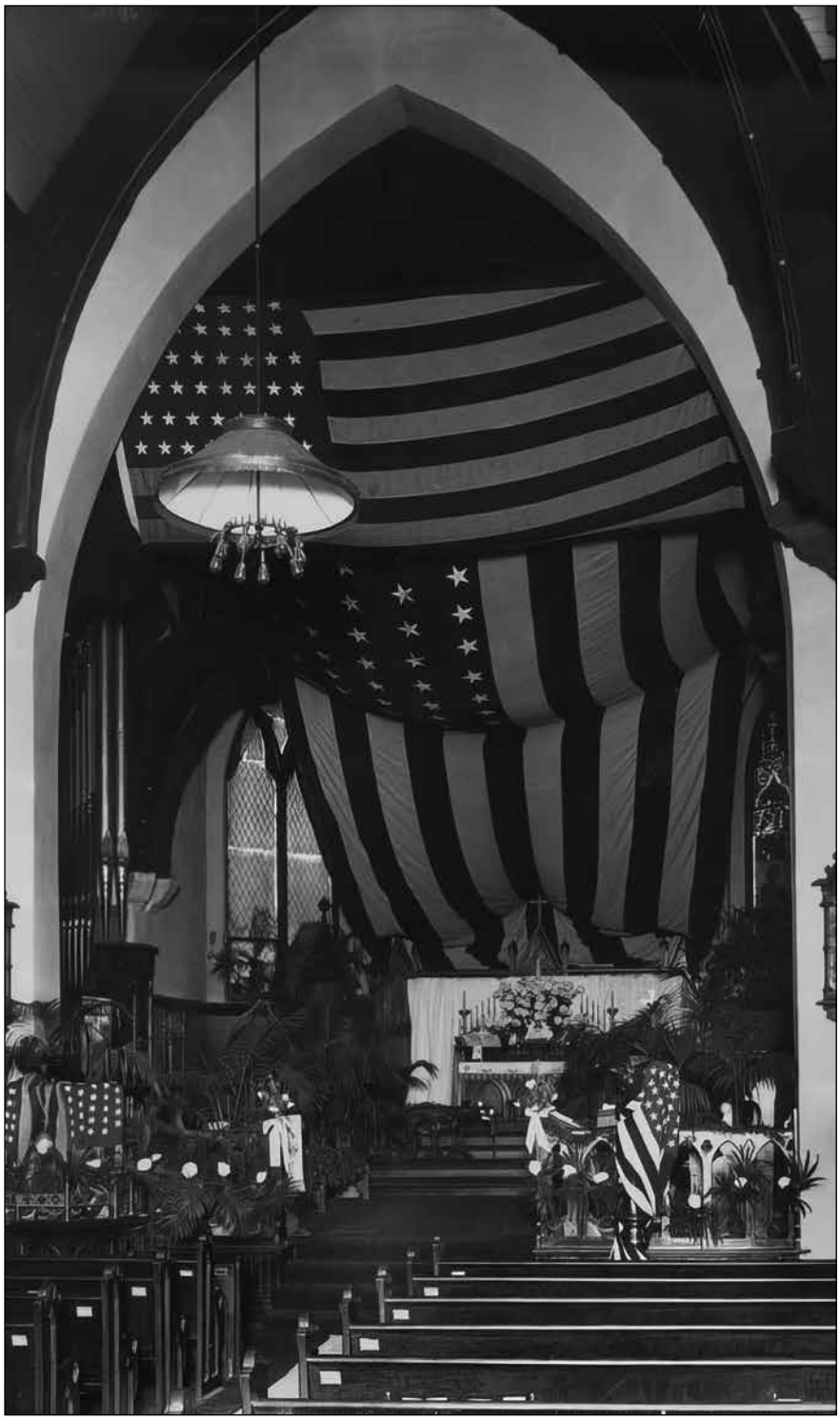
Dedicatory and inaugural recitals spanned several months and were played by cathedral organists George Henry and Christopher Wootton, other area organists, including those of the Tabernacle on Temple Square (one of whom is a former organist of St. Mark's), and Dr. Julia Brown.

A HISTORY OF THE ORGANS IN SAINT MARK'S CATHEDRAL

ESSAY BY S.L. HUNTINGTON

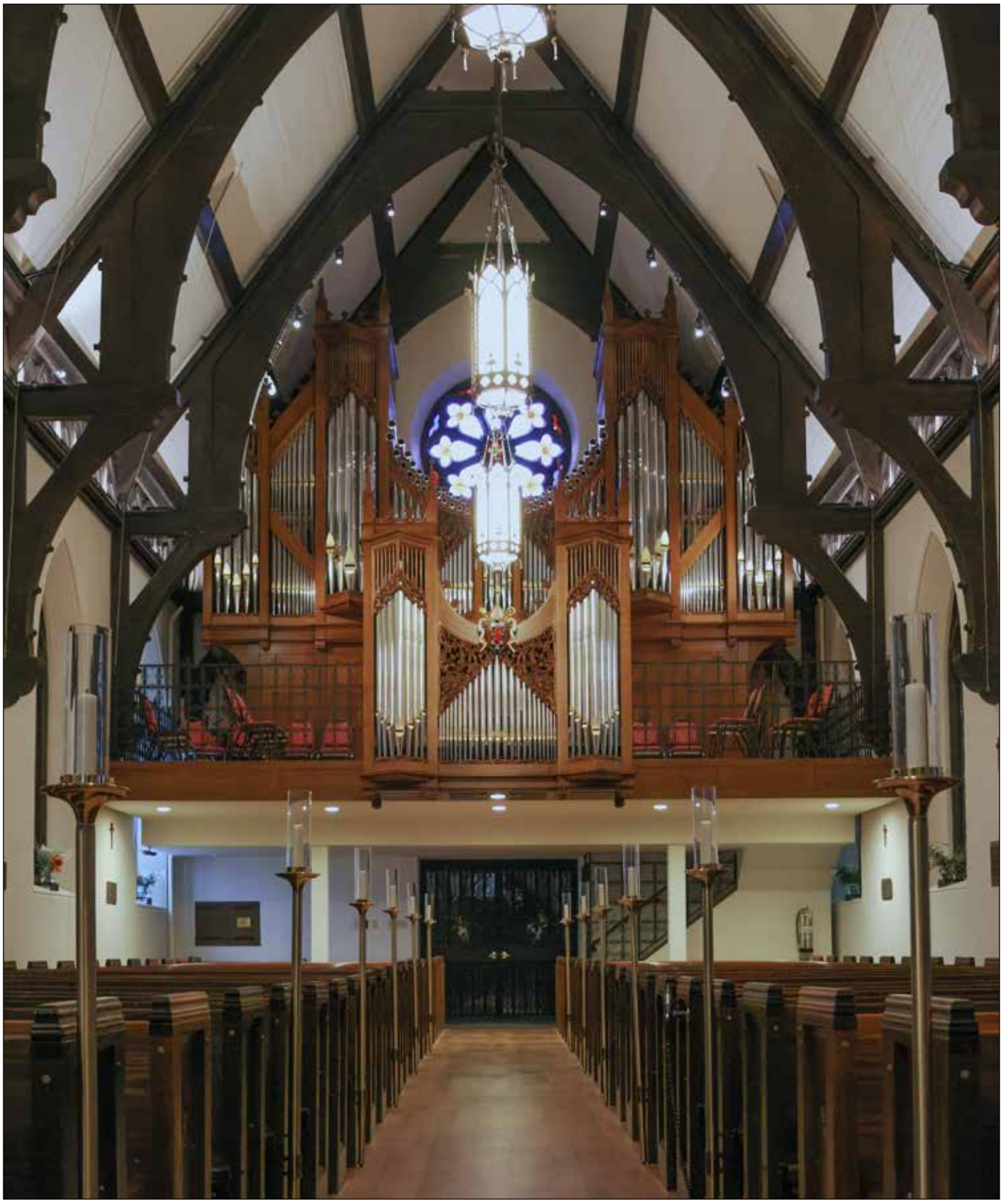
THE FIRST RECORDED INSTRUMENT AT ST. Mark's was a Mason & Hamlin reed organ, although the instrument used at the opening service on Sept. 5, 1871 was "a gift from a Sunday school" in New Haven, Connecticut. It is not known if the original organ and the Mason and Hamlin were the same or separate instruments. In 1882, Johnson & Son installed a two-manual instrument costing $6,000, Op. 589, in the right-side transept with the choir, although the price might suggest a three-manual instrument. When the building was enlarged in 1903 with a deep chancel, constructed according to plans developed in 1870, the choir was moved into the chancel and the organ into a left-side chancel chamber. An article in the October 6, 1913 issue of the Salt Lake Telegram announced the organ mechanism was worn out and it was being enlarged to three-manuals with a modern action (M.P. Möller Op. 1621). This is at odds with the Moller ledger book, which implies an existing Choir division was being enlarged and gives details of the divisional enlargement as follows: Great 9 ranks-9 stops enlarged with 1 rank; the Swell with 16 rks.-14 stops gained 6 new ranks; and the 7 rks.-7 stop Choir received 5 new ranks. The three-rank Pedal was augmented with octave extensions. The action is not specified but was presumably electro-pneumatic, and the rebuild cost $5,400. This organ burned with the church on March 31, 1935.

A repurposed organ, a Wurlitzer Hope-Jones Unit Orchestra originally built for the Victory Theatre, Salt Lake City (Op. 802, 1924), was placed in the rebuilt church. This was a standard two-manual, 8-rank Style F with divided expression. The Wurlitzer remained in use until 1967 when it was sold to a private individual in Salt Lake City. As part of the Diocesan Sesquicentennial celebration in 1967, the choir was moved to a new purpose-built rear gallery, and a new custom-built three-manual instrument was commissioned from the Holtkamp Organ Co., Job No. 1820. This organ in turn, was replaced by Bigelow & Co. as their Opus 35 in 2011, a new three-manual electric-action instrument, the gift of a generous donor. The Holtkamp was reconfigured and enlarged slightly for St. Ambrose Catholic Church, Salt Lake City, by Bigelow & Co., as its Opus 36, in 2013.



St. Mark's Cathedral decorated with American flags on December 12, 1912. Utah became increasingly patriotic as World War I approached. Bishop Franklin Spencer Spalding, 1904–1914, spoke against the war, as did his successor, Paul Jones, 1915–1918, a socialist and pacifist. J. Walcott Thompson, son of the commandant of Fort Douglas, a local attorney, and a cathedral vestry member for forty-seven years, led opposition to Jones, which resulted in the latter's resignation as bishop. A portion of the rebuilt Johnson & Son organ is visible in the left chancel.

THE CATHEDRAL CHURCH OF ST. MARK



The Cathedral of St. Mark, Episcopal
Bigelow & Co., Op. 35, 2012
Salt Lake City, Utah

II. GREAT (unenclosed)

16′	Bourdon	C-b^0 from Ped.
8′	Præstant	facade
4′	Octave	C-b^0 facade

Enclosed Great

8′	Conical Flute	
8′	Harmonic Flute	C-d♯^{0} from Conical Flute
4′	Lieblich Flute	small-scale chimney flute
2⅔′	Twelfth	
2′	Fifteenth	
IV	Mixture	
8′	Trumpet	
	Flexible Wind	affects all manuals
	Positive to Great	
	Swell to Great	

III. SWELL (enclosed)

8′	Stopped Diapason	C-B wood
8′	Viole de Gambe	C-F♯ zinc
8′	Voix Céleste	begins on bass G
4′	Viol-Principal	
4′	Traverse Flute	
2⅔′	Nasard	
2′	Blockflöte	
1⅗′	Tierce	
III	Plein Jeu	
16′	Fagotto	EP action
8′	Oboe	
	Tremulant	affects all manuals when Flexible Wind is on

I. POSITIVE (on gallery rail)

8′	Præstant	facade, C-F from Ch. Fl.
8′	Chimney Flute	C-B wood
4′	Octave	
4′	Open Flute	
2′	Octave	
III	Cornet	A - d^3
8′	Cromorne	
16′	Processional Trumpet, t. c.	ext. 8′
8′	Processional Trumpet	horizontal, from c^0 in main facade. EP action.
	Great to Positive	
	Swell to Positive	

PEDAL

32′	Resultant	(Bourdon)
16′	Contrebasse	wood
16′	Bourdon	wood
8′	Octave	facade
8′	Bourdon	ext.
4′	Octave	ext.
16′	Trombone	C-B wood
16′	Fagotto	(Sw)
8′	Trombone	ext.
8′	Fagotto	(Sw)
4′	Fagotto	(Sw)
	Great to Pedal	
	Positive to Pedal	
	Swell to Pedal	

GENERAL

61/32 Compass. AGO Pedalboard.
Detached console. Keys of bone/ebony.
Self-regulating mechanical key action for manuals.
Electro-pneumatic action for all Pedal stops, as well as
Gr. Bourdon 16 (C-b^0), Sw. Fagotto, and Processional Trumpet.
Electric stop action.
Multi-level combination action with piston sequencer.
Flexible Wind

The Cathedral of St. Mark, Episcopal
Bigelow & Co., Flue Scales

POSITIVE

Præstant 8′	F	c^0	c^1	c^2	c^3
Diameter	106	80.3	46.2	27.5	17
MW	4/17				
Octave 4′	C	c^0	c^1	c^2	c^3
Diameter	80.3	46.2	27.5	17	10.6
MW	4/17	¼			
Octave 2′	C	c^0	c^1	c^2	c^3
Diameter	44.2	25.1	14.7	9.2	5.78
MW	¼				
Chimney Flute 8′	C	c^0	c^1	c^2	c^3
Diameter	71.3	71.3	44.2	28	18.6
MW	4/17				
Chimney diameter	—	—	11.05	7	4.65
Chimney length	—	—	60.25	27.175	11.3
Open Flute 4′	C	c^0	c^1	c^2	c^3
Diameter	77.4	52.5	35.7	22.9	14.6
MW	⅕				
Cornet III (2⅔′)*	A	c^0	c^1	c^2	c^3
Diameter	46.2	41.9	27.5	17.6	10.9
MW	⅕				

**all three ranks same scale*

GREAT

Præstant 8′	C	c^0	c^1	c^2	c^3
Diameter	162.4	92.4	52.6	32.7	20.3
MW	4/15				
Octave 4′	C	c^0	c^1	c^2	c^3
Diameter	88.6	50.9	29.2	18.0	11.1
MW	¼				
Twelfth 2⅔′	C	c^0	c^1	c^2	c^3
Diameter	61.1	35.1	21.1	13.0	8.0
MW	0.235	0.242	0.248	0.254	0.260
Fifteenth 2′	C	c^0	c^1	c^2	c^3
Diameter	50.9	29.2	18.0	11.1	6.9
MW	¼				

Mixture IV (1⅓′)	C	c^0	c^1	c^2	c^3
Diameter	31.5	18.6	11.1	6.7	4.3
MW	⅔				
breaks at c^0, c^1, c^2, $c^{\sharp 3}$ (5⅓′), $f^{\sharp 3}$					
Bourdon 16′	C	c^0	c^1	c^2	c^3
Diameter	—	—	77.7	51.5	34.1
MW	—	—	⅔		
Conical Flute 8′	C	c^0	c^1	c^2	c^3
Diameter	142.2	90.4	57.5	37.3	24.2
top diameter	42.7	33.8	25.8	19.5	14.4
MW	⅔				
Harmonic Flute 8′	C	c^0	c^1	c^2	c^3
Diameter	—	77.9	62.8	48.0	32.7
MW	—	⅔			
harmonic pipes begin at a^1					
Lieblich Flute 4′	C	c^0	c^1	c^2	c^3
Diameter	71.1	43.8	27.5	17.7	12.5
MW	⅔	graduated to	⅕		
chimneys begin at $G^{\sharp}$, becomes conical open at $f^{\sharp 2}$					
Chimney diameter	—	7.7	5.7	4.2	—
Chimney length	—	80.6	36.6	15.7	—
SWELL					
Stopped Diapason 8′	C	c^0	c^1	c^2	c^3
Diameter	95x119	77.8	48.3	30.6	19.4
MW		⅔			
Viole de Gambe 8′	C	c^0	c^1	c^2	c^3
Diameter	105.3	62.6	37.2	22.1	13.2
MW	⅔				
1-12 stopped poplar, cylindrical open at $f^{\sharp 3}$					
Voix Céleste 8′	G	c^0	c^1	c^2	c^3
Diameter	84.8	68.3	40.6	24.1	14.3
MW	¼				
Viol-Principal 4′	C	c^0	c^1	c^2	c^3
Diameter	77.7	44.3	25.2	15.0	9.3
MW	¼				
Traverse Flute 4′	C	c^0	c^1	c^2	c^3
Diameter	77.7	53.9	40.6	26.3	17.1
MW	⅕				
harmonic pipes begin at c^1					

Nasard 2⅔′	C	c^0	c^1	c^2	c^3
Diameter	61.4	41.8	27.5	17.6	11.1
top diameter	30.7	20.9	13.8	8.8	5.6
MW	⅕				

cylindrical at f^3 and gradually increase mouth width thereafter

Blockflöte 2′	C	c^0	c^1	c^2	c^3
Diameter	52.3	35.1	22.8	14.5	8.3
top diameter	26.2	17.6	11.4	7.3	8.3
MW	⅕				

cylindrical at c^3 and gradually increase mouth width thereafter

Tierce 1⅗′	C	c^0	c^1	c^2	c^3
Diameter	46.0	30.5	19.7	12.4	7.2
top diameter	23.0	15.3	9.9	6.2	7.2
MW	⅕				

cylindrical at $g^{\sharp 2}$ and gradually increase mouth width to ¼ thereafter break back to 3⅕′ at $g^{\sharp 3}$

Plein Jeu III (2′)	C	c^0	c^1	c^2	c^3
Diameter	38.9	23.1	13.7	8.2	5.2
MW	⅔				
Composition:					
	C	2 - 1 - ⅔			
	e^0	2 - 1⅓ - 1			
	$g^{\sharp 1}$	2⅔ - 2 - 1⅓			
	$g^{\sharp 2}$	4 - 2⅔ - 2			
	e^3	8 - 4 - 2⅔			

PEDAL

Contrebasse 16′	C	c^0	c^1
Width/Depth	238/285	132/164	83/102
Equivalent diameter	294	166	104

rescaled from Kimball Violone acquired from Charles Ruggles

Bourdon 16-8′	C	c^0	c^1	c^2
Width/Depth	174/218	104/130	62/77	38/47.5
Equivalent diameter	220.0	130.8	77.8	47.9

Octave 8′	C	c^0	c^1	c^2
Diameter	162.4	92.5	55.0	34.1
MW	¼			

mouth width gradually increases from ¼ at c^1 to 4/15 at g^2

Historic American Buildings Survey
P. Kent Fairbanks, Photographer September, 1967
St. Mark's Episcopal Cathedral
231 East First South Street, Salt Lake City, Salt Lake County, Utah

LIBBY GARDNER CONCERT HALL

THE GARDNER CONCERT HALL ORGAN

THE LIVELY-FULCHER PIPE ORGAN BUILT FOR the Gardner Concert Hall on the University of Utah campus in Salt Lake City was installed and completed by May 2000. The tonal inspiration of the 58-stop instrument is modeled after the great organs of 19th-century France, with mutation stops borrowed from the classic tradition and reed tonalites based on both the classic Clicquot and romantic Cavaillé-Coll schools of construction. As a teaching and concert instrument, it possesses the musical flexibility to perform the gamut of standard literature, while in the larger musical life of an active university, the organ is capable of balancing a full orchestra as both a soloist and as a member of the symphony, and with two of its three manual divisions under expression, possesses a wide dynamic range for the accompaniment of soloists, choruses, and chamber groups.

The free-standing case takes inspiration from various design elements throughout the recital hall, and is constructed of highly-figured cherry. The bass pipes of the Grand Orgue and Pedale Montre stops are placed in the façade and are of 72% tin. The pipe shades are formed of a two-layered geometric design with the front layer in gold and the back in a contrasting green. The prominent feature of the Positif pipe shades is the Utah State Flower, the Sego Lily, forging a personal connection between the organ's public face, the state of Utah, and its University home. The organ is positioned front and center in the hall, in its own gallery above the orchestra stage and behind the choir seating. The Hall is designed to provide a flexible reverberation period ranging from a luxurious 4.5 seconds to a more intimate 1.5 seconds.

The new organ has mechanical key action with electric stop action and a solid-state combination system offering 256 memory levels. Externally, the case façade suggests the disposition of the divisions within: the Positif Expressif is front and center at impost level, with the Grand Orgue above and the Récit behind. The Bombarde division is divided on either side of the Grand Orgue and the Pedale is divided on either side of the manual divisions behind the massive sixteen-foot pedal towers. The wind system utilizes traditional-style reservoirs with wooden wind trunks. The keyboards feature bone-covered naturals and ebony sharps.

University of Utah, Libby Gardner Concert Hall
Salt Lake City, Utah
Lively-Fulcher Pipe Organ Builders, 2000

3 manuals, 67 ranks

I. GRAND ORGUE		PIPES
16′	Montre	61
8′	Montre	61
8′	Flûte à cheminée	61
8′	Flûte harmonique	61
8′	Salicional	61
4′	Prestant	61
4′	Flûte ouverte	61
2′	Doublette	61
	Fourniture V	305
	Cymbal IV	244
8′	Cornet V [t.g.]	210
8′	Trompette	61
4′	Clairon	61

II. POSITIF EXPRESSIF		
8′	Montre	61
8′	Bourdon	61
4′	Prestant	61
4′	Flûte	61
2⅔′	Nazard	61
2′	Doublette	61
2′	Quarte de nasard	61
1⅗′	Tierce	61
1⅓′	Larigot	61
	Fourniture IV	244
8′	Trompette	61
8′	Cromorne	61

BOMBARDE (Floating)		
16′	Tuba magna	12
8′	Tuba mirabilis	61
4′	Cor harmonique	12

III. RÉCIT EXPRESSIF		
16′	Bourdon	61
8′	Diapason	61
8′	Viole de gambe	61
8′	Voix céleste	61
8′	Flûte traversière	49
8′	Cor de nuit	61
4′	Prestant	61
4′	Flûte octaviante	61
2′	Octavin	61
	Plein jeu IV	244
16′	Basson	61
8′	Trompette harmonique	61
8′	Basson-hautbois	61
8′	Voix humaine	61
4′	Clairon harmonique	61

PEDALE		
32′	Contre-basse (digital)	32
32′	Soubasse	12
16′	Montre [G.O.]	
16′	Flûte (open wood)	32
16′	Soubasse	32
8′	Montre	32
8′	Flûte	12
8′	Bourdon	12
4′	Prestant	12
4′	Flûte ouverte	12
32′	Contre bombarde	32
16′	Bombarde	12
16′	Basson	32
8′	Trompette	32
4′	Clairon	12

Mechanical key action
Electric stop action
Optional assisted coupling

SALT LAKE CITY, UTAH

LIBBY GARDNER CONCERT HALL

SALT LAKE CITY, UTAH

Lively-Fulcher Pipe Organ Builders

Wood and metal pipe scaling

SOURCE: Lively-Fulcher scale sheets posted on the Libby Gardner Concert Hall website.

STOP NAME	PITCH	COMPASS	NO. OF PIPES	Ø OF C1 (MM)	MATERIAL	COMMENTS
G.O. Montre	16′	C1 – b24	24	260	70%	Polished fronts with inserted french mouths
G.O. Montre	16′	c25 – c61	37	86	50%	Inside pipes
G.O. Montre	8′	C1 – f18	18	164	70%	Polished fronts with inserted french mouths
G.O. Montre	8′	f♯19 – c61	43	71	50%	Inside pipes
G.O. Salicional	8′	C1 – B12	12	123	50%	Slotted
G.O. Salicional	8′	c13 – c61	49	75	50%	Slotted
G.O. Flûte harmonique	8′	c13 – c61	49	101	30%	f30 – c61 harmonic 1-12 Flûte á cheminèe
G.O. Flûte á cheminèe	8′	C1 – B12	12	107 x130	wood	
G.O. Flûte á cheminèe	8′	c13 – c61	49	82	30%	Chimneys f♯19 – f 54
G.O. Prestant	4′	C1 – c61	61	90	50%	
G.O. Flûte ouverte	4′	C1 – c61	61	95	30%	
G.O. Doublette	2′	C1 – c61	61	52	50%	
G.O. Fourniture V	2′	C1 – c61	305	48	50%	
G.O. Cymbal IV	1′	C1 – c61	244	29	50%	
G.O. Cornet V	8′	g20 – c61	42	56	30%	Chimneys g20 – f 54
G.O. Cornet V	4′	g20 – c61	42	52	30%	
G.O. Cornet V	2⅔′	g20 – c61	42	39	30%	
G.O. Cornet V	2′	g20 – c61	42	32	30%	
G.O. Cornet V	1⅗′	g20 – f54	35	27	30%	
G.O. Trompette	8′	C1 – c61	61	125	50%	Harmonic a♯47 – f 54, flues f♯55 – c61: double block 13-54
G.O. Clairon	4′	C1 – c61	61	102	50%	Harmonic a335 – f42, flues f♯43 – c61, double block 1-42

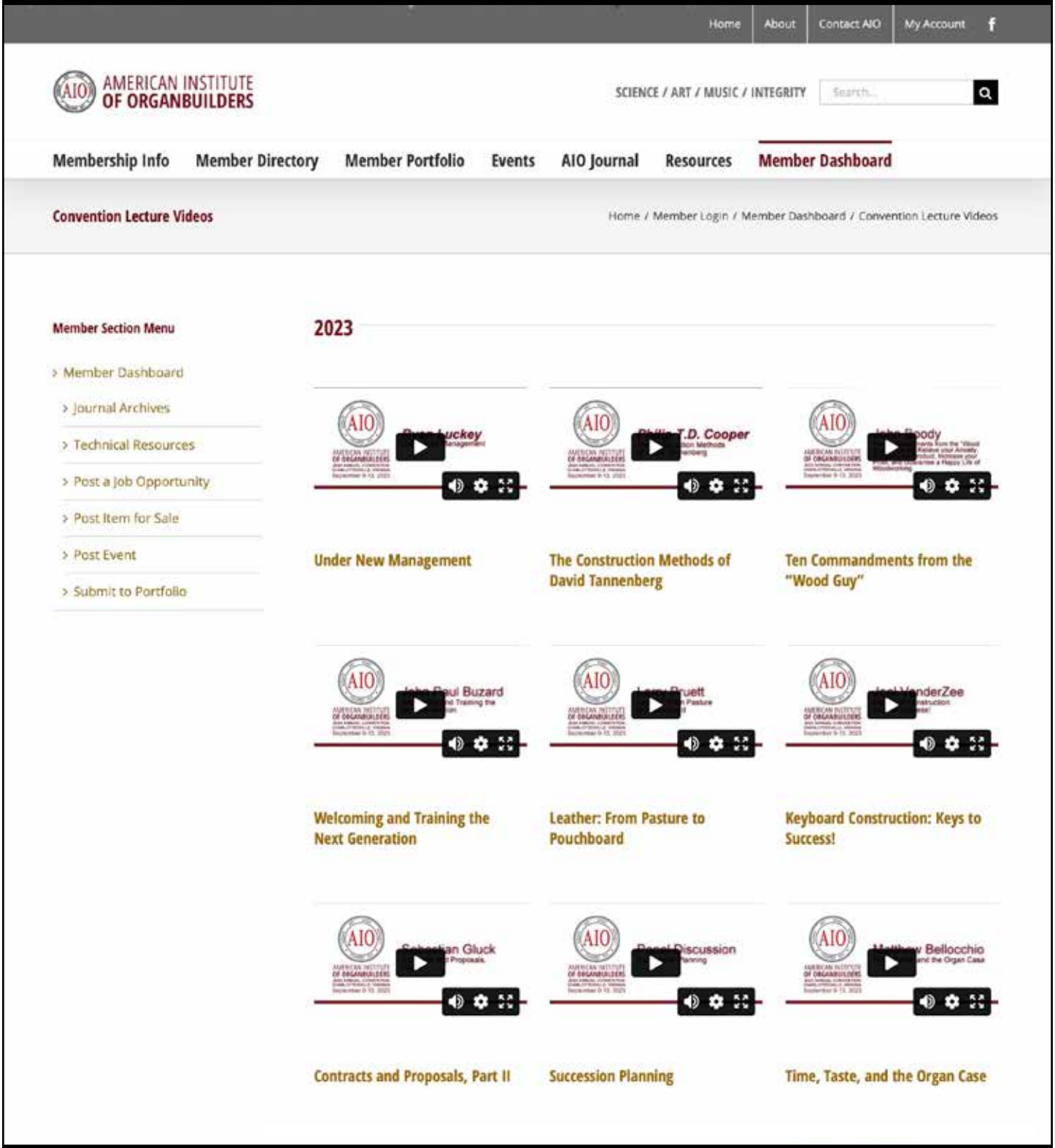
STOP NAME	PITCH	COMPASS	NO. OF PIPES	Ø OF C1 (MM)	MATERIAL	COMMENTS
Récit Bourdon	16′	C1 – c24	24	152 x184	wood	
Récit Bourdon	16′	c25 – c61	37	73	30%	
Récit Diapason	8′	C1 – B12	12	160	zinc	
Récit Diapason	8′	c13 – c61	49	92	50%	
Récit Flûte traversière	8′	c13 – c61	49	91	30%	f30 – c61 harmonic; 1-12 Cor de nuit
Récit Cor de nuit	8′	C1 – B12	12	103 x 125	wood	
Récit Cor de nuit	8′	c13 – c61	49	79	30%	
Récit Viole de gambe	8′	C1 – B12	12	107	zinc	Slotted
Récit Viole de gambe	8′	c13 – c61	49	65	50%	Slotted
Récit Voix céleste	8′	C1 – B12	12	98	zinc	Slotted
Récit Voix céleste	8′	c13 – c61	49	60	50%	Slotted
Récit Prestant	4′	C1 – c61	61	90	50%	
Récit Flûte octaviante	4′	C1 – c61	61	88	30%	f18-c61 harmonic
Récit Octavin	2′	C1 – c61	61	55	30%	c13-c49 harmonic

Récit Plein jeu IV	2′	C1 – c61	244	50	50%	
Récit Basson	16′	C1 – c61	61	125	zinc /50%	Zinc 1-12 (full length), double block 25-61
Récit Trompette harmonique	8′	C1 – c61	61	110	50%	Harmonic c37– f54, flues f♯55 – c61, double block 13-54
Récit Basson-hautbois	8′	C1 – c61	61	75	50%	Domed resonators 25-54, flues 55-61, double block 13-54
Récit Voix humaine	8′	C1 – c61	61	45	50%	Flues c♯54-c61, double block 13-54
Récit Clairon harmonique	4′	C1 – c61	61	90	50%	Harmonic c25 – f42, flues f♯43 – c61, double block 1-42

STOP NAME	PITCH	COMPASS	NO. OF PIPES	Ø OF C1 (MM)	MATERIAL	COMMENTS
Positif Montre	8′	C1 – B12	12	156	zinc	
Positif Montre	8′	c13 – c61	49	90	50%	
Positif Bourdon	8′	C1 – B12	12	100 x 121	wood	
Positif Bourdon	8′	c13 – c61	49	76	30%	
Positif Prestant	4′	C1 – c61	61	86	50%	
Positif Flûte conique	4′	C1 – c61	61	96>64	30%	
Positif Nazard	2⅔′	C1 – c61	61	77	30%	
Positif Quarte de nazard	2′	C1 – c61	61	61	30%	
Positif Doublette	2′	C1 – c61	61	50	50%	
Positif Tierce	1⅗′	C1 – c61	61	52	30%	
Positif Larigot	1⅓′	C1 – c61	61	46	30%	
Positif Fourniture IV	1′	C1 – c61	244	28	50%	
Positif Trompette	8′	C1 – c61	61	102	50%	Harmonic a♯47 – f 54, flues f♯55 – c6, double block 13-54
Positif Cromorne	8′	C1 – c61	61	42	50%	Flues f♯55 – c61, double block 13-54

STOP NAME	PITCH	COMPASS	NO. OF PIPES	Ø OF C1 (MM)	MATERIAL	COMMENTS
Bombarde Tuba mirabilis	16/8/4′	C1 – c85	85	144	zinc /50%	Zinc 1-12 (full length), harmonic 49-66, flues 67-85
Pedale Soubasse	32/16/8′	C1 – g56	56	315 x 380	wood	
Pedale Flute	16/8/4′	C1 – g56	56	290 x 368	wood	
Pedale Montre	8/4′	C1 – f18	18	171	70%	Polished fronts with inserted french mouths
Pedale Montre	8/4′	f♯19 – g44	26		50%	Inside pipes
Pedale Bombarde	32/16′	C1 – g44	44	300	zinc /50%	Zinc 1-24 (full length), double block 37-44
Pedale Trompette	8/4′	C1 – g44	44	142	50%	Double block 13-44

AIO CONVENTION LECTURE VIDEOS



LECTURE VIDEOS FROM 2022 AND 2023 ARE NOW AVAILABLE FOR VIEWING

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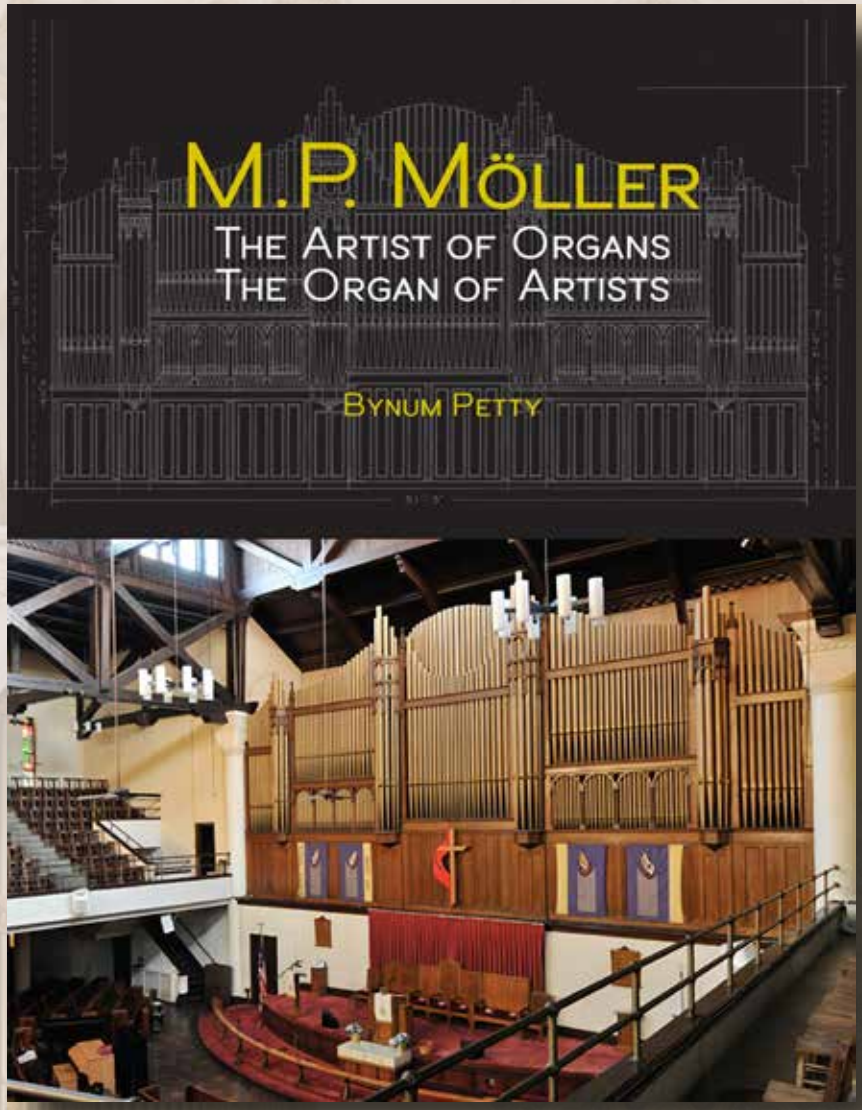

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OHS PRESS, 2023; 402 PGS. HARDCOVER

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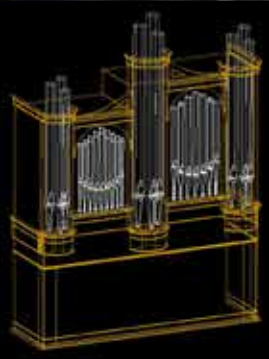

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