Schoenstein & Co., Benicia, California
Christ Church Episcopal, Cambridge, Massachusetts
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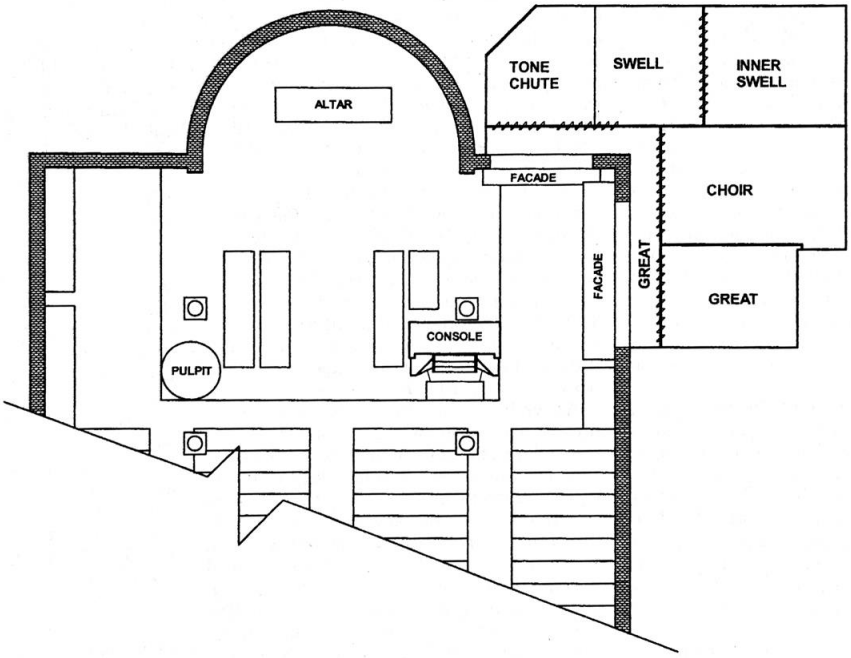

The Problems

Every organbuilder faces opportunities that, if accepted, pose potential dangers — shop overload, financial loss, or, worst of all, damage to reputation if acoustical or placement obstacles cannot be overcome. We were honored to be invited by one of the nation's oldest and most famous parishes to propose a new organ, but the situation gave us pause: a very dry acoustic; a convoluted, L-shaped, deep side chamber with poor tone openings; a historic church that could not be changed; and a hard act to follow — Æolian-Skinner.

The church building, completed in 1761, was enlarged in 1857 by cutting it in half and lengthening it by two bays, just as its architect, Peter Harrison, had intended. The large, clear windows contribute to the brightness of the space but unfortunately have a negative impact on the room's acoustics and the ability of the room to maintain a stable temperature. The reverberation period is nearly zero when the church is occupied. Although the room does not have an oppressive acoustical atmosphere; there is a certain liveliness, even though there is not much resonance.

The organ chamber is located in an addition off of the right side of the chancel with an extension tone chute over an entry hall as shown in the diagram. The chamber speaks not directly into the chancel, but into the side aisle. The tone openings are not only somewhat remote from the choir, but because of the height of the side aisle ceiling are several feet lower than they ideally should be. The chamber is excessively deep, but that's only the beginning of the story. A third of the area is fronted by the tone chute in which the sound must turn a corner and speak through a small opening and casework toward the west end of the church. After traveling all this way, it still does not have a direct shot at the choir. The other two thirds are partly blocked off by a heavy masonry L-shaped wall segment. On top of all this, the chamber

was not insulated and had thin, non-reflective, bass-absorbing walls. The floor was at two levels and there was not enough height to double-deck manual divisions. This was a tonal prison cell. Given the need for strict historical preservation of the building, there was no opportunity to create space for a large freestanding instrument or a new chamber. We had to make do with the present chamber that had given the Æolian-Skinner organ so much grief!

Replacing an Æolian-Skinner organ, especially one for which Ernest White was consultant, where E. Power Biggs was the organist, and which had been featured on Æolian-Skinner's recording, *Studies in Organ Tone*, opened the project to possible criticism. The 1941 Æolian-Skinner of three manuals, 45 ranks (Opus 1007) was a perfectly decent instrument in its style, but it was simply not up to coping with the terribly difficult chamber set-up. Under White's influence, this job was not typical of the G. Donald Harrison style. There was a strong emphasis on lightness and transparency of tone at the expense of fundamental and projecting qualities. Æolian-Skinner had installed one of its artificial electronic reverberation systems in 1959, but it was not successful enough to be worth maintaining. Also, this was surely not an appropriate site for anything artificial; the building is what it is and the acoustic is what the eye leads one to expect. The organ was revoiced in the 1970s, and later its Choir shades and front pipes were removed in an attempt to get more sound into the room. The organ was certainly changed, but not helped much. Finally, the Parish decided on replacement. The Æolian-Skinner is being renovated and relocated by Quimby Pipe Organs, Inc. to St. Theresa Catholic Church in Sugar Land, Texas. There it can speak freely and enjoy a more capacious mechanical layout as well. This project shows clearly that a normal organ, no matter how good, will not work in a difficult chamber.

When the list of obstacles becomes this great, every organbuilder faces the decision of whether or not to take on a job that may hurt his reputation if things don't go well. Was this an impossible situation?

Jack M. Bethards
President and Tonal Director

The Solutions

Successfully overcoming the challenges offered by an unfavorably placed organ chamber in a dry acoustic provided a hurdle matched only by the difficulty of navigating Cambridge's historic neighborhoods and streets! However, to work in one of our country's oldest and most historically important cities and within the shadow of Harvard University is to be inspired to overcome all challenges with enthusiasm.

If only the room were considered, a modest historically based tracker organ may have been a good solution, but the client's request was for an Anglo-American symphonic-style organ to lead and support their modern Anglican services. Obviously, the architecture and the nature of the parish called for a tone of nobility and refinement. Getting the sound out of the chamber, without it sounding harsh and forced, was the problem. An acoustically dry room reacts well to tone that is smooth, warm, and rich. It helps to make up for the lack of resonance. The

difficulty with an extremely deep, convoluted chamber is providing that kind of tone along with the power necessary to project it throughout the room. It requires a very specialized approach.

Certain design principles produce successful enchambered sounds. These include stoplists emphasizing bright, colorful diapason tones, strings, and open flutes, with the main power of the ensemble dominated by chorus reeds rather than high mixtures. High pitches do not travel well around corners! Adequate wind pressure to provide intensity and projection of tone—not loudness—is vital. Pipe scaling and voicing must be bold. Finally, the organ must be laid out so that the sound gets out of the chamber through a large, fully opening shade front. This means that the organ cannot be so large as to smother itself. The best enchambered organs are those where good sense has been used in leaving out stops that would compromise layouts.

To ensure the success of the new organ, major renovation work was accomplished in the existing organ chamber and blower room. The chamber walls and ceilings were provided with new insulation and completely refaced with extra-thick sheetrock. The blower room was cleaned and painted, with a filtration system added for the blower intake plus a humidification system for winter use. Finally, a return air system was designed and installed to draw room air through the organ chamber to stabilize its temperature. All of this work was ably accomplished by Charlie Allen Restorations, Inc., of Cambridge.

Having a chamber that had been redone to its highest potential, we turned to the layout of the organ in the given space. Beginning with the largest and most important division in the organ, the Swell was placed along the entire front section of the chamber, parallel to the front wall of the chancel. The total depth of this segment of the chamber is 24', but only 15' had the height necessary for the complete organ mechanisms. The rest was primarily usable only as a tone chute, which was much improved for this purpose with a newly-constructed angle wall to help direct the sound out into the room.

The main Swell windchests are placed in the full-height area of the chamber, with the double enclosed Inner Swell behind this. At the back of this division, one finds the chorus reeds and the 32' Fagotto pipes. It is not surprising to note that the further you move away from the swell shades, the higher the wind pressure, beginning at 5" for the main flue work, progressing upward to 10" for the Flauto Dolce, Celeste, and Mixture, then 15" for the chorus reeds, and finally 22" for the bass pipes of the 32' Fagotto. While having concerns about getting the sound of this division out into the room, it turned out to be one of the early tonal successes of the instrument. Using only the Swell, the organ, played for the first time for Lessons and Carols in December 2005, not only filled the room with sound but demonstrated how effective the expression boxes could be. The double expression system of the Swell, each with its own swell shoe for the outer and inner shades, makes available to the organist a very broad dynamic range without ever changing stops. In this case, the deep chamber enhances the ethereal quality of the Flauto Dolce and Celeste, serving as the whisper-like beginning to an effortless crescendo up through full swell.

The Great and Choir divisions are located at floor level parallel to the side aisle and partially below the case impost level. The Great experiences good tonal egress because of its placement closest to the congregation. All but two of the Great stops are enclosed, adding to the

versatility and dynamic range of the organ, especially for the Gambas, which serve as the solo strings of this organ. The Choir division required a few minor adjustments to compensate for its position at the bend of the organ chamber and partially behind a wall. The softest stop in the Choir, the delicate Lieblich Gedeckt, traded its rear chest position with the Fugara for a more prominent location on the front chest, achieving a natural presence in the room. The Choir Trumpet serves in the capacity of an enclosed Great chorus reed; color reeds include the expected Clarinet and the added luxury of an English Horn.

As we have done in several other instruments, the large wood pedal pipes are stacked horizontally on the roof of the organ. This permits a more spacious layout for the manual divisions, and puts the bass pipes in a favorable position for a direct line of sight projection into the church. At Christ Church, the Sub Bass and Open Wood were placed parallel to the side aisle with the pipes staggered to allow good speech. Upon installing and playing these pipes, we found that the low ceiling and close pipe placement in a relatively tight space defeated the otherwise noble sound of these massive pipes. The position of the pipes was then shifted 90 degrees to allow all of the pipe mouths to be near the tone opening, resulting in a much healthier, more robust foundation for the organ. This was critical, as one of the failings of the previous instrument was lack of a strong foundation tone.

All of the above are, of course, behind the scenes. Since the congregation tends to judge the instrument on its visual aspects as much as its tonal ones, a great deal of thought and planning went into the design of a new organ case, which must be considered a crowning glory of this instrument. Jonathan Austin, architect and church member, provided able leadership for this phase of the work. We enjoyed our time in Cambridge and being a part of the church community. Stuart Forster leads the excellent music program and ably demonstrates the resources and dynamic range of the organ every time he sits on the bench. His tireless attention to detail was appreciated throughout the project, particularly his work for the dedication service; for those of us who can never get enough of the music of Charles Stanford and friends, this day came remarkably close to the realization of this quest. The church, under the guidance of Senior Warden Dean Johnson, worked to make the new organ a success in every way possible. We thank everyone for their support and contributions and wish them well as they begin a new chapter in their long history under the leadership of their new rector, Joseph O. Robinson.

Louis E. Patterson
Vice President and Plant Superintendent

The Results

Schoenstein organs have become synonymous with unqualified success in challenging acoustics and for going the extra mile to maximize the expressive and colorful extremities of the instrument. Although colleagues had expressed apprehension about the complexity of mastering all the controls on an instrument capable of such detail, the logic and comfort of the console proved very quickly that many of the features that epitomize Schoenstein organs actually simplify countless techniques essential for making beautiful and inspiring music. For example, the double-enclosed Swell division reduces the number of steps required to craft a gradual change of color and volume, while simultaneously multiplying the extent to which those changes

are possible. Additionally, the double enclosure has made it possible to add just a touch of reed tone (so little that the youngest soloist would not be over-powered), to hush the Flute Celestes to less than a whisper, and to harness the 32' reed so that it may accompany even gentle string-toned stops; and yet its batteries enable the organist to achieve enormous power when necessary. Such tools for subtle beauty and minute control elevate the organ to become an invaluable partner in accompanying a service.

A major consideration for the parish, regarding its 245-year-old building, was to incorporate a visual design that would not detract from the building's simplicity, yet would not hide the instrument's liturgical significance. Our conclusion was to take inspiration from the work of John Snetzler, who had installed an organ at Christ Church in 1762, a year after the building was dedicated. Façade details mimic the adornment of the Peter Harrison building; both case and console are stained to match the wood trim throughout the Church.

The newly supported congregational singing responded with fresh energy from the first day the organ was played. Warm tone flooded the dry acoustic so that the second basses in the choir stalls, immediately in front of the organ façade, were not deafened as the organ brought to their feet those in the last pew in the far diagonal corner of the room. By the time of the dedication service, on April 30, the choir stalls and pews could no longer cope with the number of people participating in services. Concert audiences have responded equally well to the first three concerts, performed by Thomas Murray, Mary Preston, and Peter Richard Conte. The final inaugural concert, on February 9, will proffer another treasured opportunity to show off the capabilities with diverse repertoire, in both original and transcribed literature, of Boston's newest arrival in its sundry array of instruments.

Finally, it is necessary to document what a pleasure it is to play, and to listen to, this organ. The splendor of its individual voices (note the variety of flutes!), the cohesion and clarity of its choruses, the many effects and, of course, its colossal variety of expression in timbre and dynamics unite to create a musical instrument surpassing every hope of the committees, parishioners, donors, musicians, observers and visitors involved in this organ's creation and service.

Stuart Forster
Director of Music & Organist
Christ Church, Cambridge, MA

CHRIST CHURCH
CAMBRIDGE, MASSACHUSETTS
SCHOENSTEIN & CO.

GREAT (*II—Enclosed—5" Wind*)

16'	**Gamba**	12	Pipes
8'	**First Open Diapason**†	61	"
8'	**Second Open Diapason**	61	"
8'	**Harmonic Flute**†	61	"
8'	**Gamba**	61	"
8'	**Gamba Celeste** (TC)	49	"
8'	**Bourdon**	61	"
4'	**Principal**	61	"
4'	**Bourdon**	12	"
2⅔'	**Twelfth**	61	"
2'	**Fifteenth**	61	"
1⅗'	**Seventeenth**	54	"
1⅓'	**Mixture** III-IV	186	"
8'	**Trumpet** (*Choir*)		
8'	**Clarinet** (*Choir*)		
8'	**Tuba** (*Choir*)		
	Great Unison Off		
	Chimes (*Walker*)		
	Cymbelstern		
	†*Unenclosed (4¼" Wind)*		

SWELL (*III—Enclosed—5" Wind*)

16'	**Lieblich Bourdon**	12	Pipes
8'	**Open Diapason**	61	"
8'	**Stopped Diapason**	61	"
8'	**Echo Gamba**	61	"
8'	**Vox Angelica**	61	"
4'	**Gemshorn**	61	"
4'	**Harmonic Flute**	61	"
2'	**Flageolet**	61	"
8'	**Oboe**	61	"
	Tremulant		
	Stops Under Double Expression (10" Wind)		
8'	**Flauto Dolce**	61	"
8'	**Flute Celeste** (TC)	49	"
4'	**Flauto Dolce**	12	"
4'	**Flute Celeste**	12	"
2'	**Mixture** III-V	235	"
16'	**Contra Fagotto**†	61	"
8'	**Cornopean**†	61	"
4'	**Clarion**†	61	"
8'	**Vox Humana**††	61	"
	Swell 16'		
	Swell Unison Off		
	Swell 4'		
	†*15" Wind*		
	††5" Wind		

CHOIR (*I—Enclosed—5" Wind*)

16'	**Dulciana**	12	Pipes
8'	**Open Diapason** (*Great*)		
8'	**Concert Flute** (*Lieb. Gedeckt Bass*)	49	"
8'	**Lieblich Gedeckt**	61	"
8'	**Dulciana**	61	"
8'	**Unda-Maris** (TC)	49	"
4'	**Fugara**	61	"
4'	**Forest Flute**	61	"
2⅔'	**Nazard**	61	"
2'	**Harmonic Piccolo**	61	"
1⅗'	**Tierce** (TC)	42	"
8'	**Trumpet**	61	"
8'	**English Horn**	61	"
8'	**Clarinet**	61	"
	Tremulant		
	Tremulant — Variable		
8'	**Tuba**†	61	"
8'	**Tuben** (III)††		
	Choir 16'		
	Choir Unison Off		
	Choir 4'		
	Harp (*Walker*)		
	Celesta (*Walker*)		
	†15" Wind		
	††*Draws the three Swell chorus reeds at 8' pitch.*		

PEDAL (*7½" and 4¼" Wind*)

32'	**Sub Bass**†	12	Pipes
16'	**Open Wood**	32	"
16'	**Sub Bass**	32	"
16'	**Gamba** (*Great*)		
16'	**Dulciana** (*Choir*)		
16'	**Lieblich Gedeckt** (*Swell*)		
8'	**Principal**	32	"
8'	**Flute** (*Great*)		
8'	**Stopped Diapason** (*Swell*)		
8'	**Dulciana** (*Choir*)		
4'	**Fifteenth**	32	"
4'	**Flute** (*Great*)		
32'	**Contra Fagotto**†† (*Extend Swell*)	12	"
16'	**Ophicleide** (*Extend Choir Tuba)*	12	"
16'	**Contra Fagotto** (*Swell*)		
8'	**Tuba** (*Choir*)		
8'	**Trumpet** (*Choir*)		
4'	**Tuba** (*Choir*)		
4'	**Trumpet** (*Choir*)		
	†*Quint length pipes CCCC to FFFF#*		
	††*22" Wind*		

COUPLERS

Great	to	Pedal	
Swell	to	Pedal	
Swell	to	Pedal	4'
Choir	to	Pedal	
Choir	to	Pedal	4'
Swell	to	Great	16'
Swell	to	Great	
Swell	to	Great	4'
Choir	to	Great	16'
Choir	to	Great	
Choir	to	Great	4'
Swell	to	Choir	16'
Swell	to	Choir	
Swell	to	Choir	4'
Great	to	Choir	

MECHANICALS

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- 62 Pistons and toe studs.
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Four expression pedals.
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MIXTURE COMPOSITIONS

Great III-IV

C1	D15	A#35	G#45
	12		
19	15	12	
22	19	15	12
26	22	19	15

Swell III-V

C1	E17	B24	F#43	C#50
		8		
	8	12	8	
15	15	15	12	8
19	19	19	15	12
22	22	22	19	15

TONAL ANALYSIS OF MANUAL VOICES

TONAL FAMILIES

Diapasons	11	28%
Echo Diapasons	3	8%
Open Flutes	7	18%
Stopped Flutes	3	8%
Strings	4	10%
Hybrids	2	5%
Chorus Reeds	5	13%
Color Reeds	4	10%
	39	100%

PITCH SUMMARY

16'	4	10%
8'	20	51%
4'	6	16%
2⅔'	2	5%
2	4	10%
Above 2'	3	8%
	39	100%