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**Condition Report on the Organ**
**+ Christ King Catholic Parish +**

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**October 2014**

## Report Purpose

The purpose of this report is to:

- Describe the current status, disposition and condition of the Christ King Catholic Church organ
- Provide a general recommendation regarding the comparative viability and advisability of repairing or replacing the instrument

## The Christ King Catholic Church Organ; A Brief Description

The organ at Christ King Church was built by the Wicks Organ Company of Highland, Illinois in 1954. It has been modified only slightly from its original design and installation (original Quintaton, Nason Flutes, and Fagotto have been altered). Many repairs have been conducted over time and technical and tonal failures and thus repair needs continue.

The "organ" consists of *pipes* (which produce the musical organ tone), *wind-chests* (on which pipes sit, and that contain the valve mechanisms to let wind into pipes), *the "winding" and "actions"* (the methodology of getting pressurized air to the wind-chests, and the methodologies of opening valves within the wind-chests, to allow pipes to sound), and the *console* (where keys, pedals, and stops allow the organist to control the organ).

Organ *pipes* are crafted of either various metal alloys (zinc, tin, copper, lead, etc.) or wood species (poplar, pine, etc.). Their shapes (square, round, conical) produce varieties of tone, akin to the wealth of tonal colors in a symphonic orchestra. Taller pipes produce low pitches, and shorter pipes produce higher musical pitches. Just as an orchestra has multiple tonal families (strings, brasses, woodwinds, percussion) at various pitch levels (low tubas to high piccolos), a pipe organ has a variety of colorful voices in a range of dynamic levels, produced by the many ranks of pipes.

These sonorities are intended to *lead* the singing of an entire congregation or assembly, to *accompany* choirs and soloists, and to *perform* sacred organ repertoire (preludes, postludes, processions, etc.). To accomplish these various musical tasks, the organ has four "tone families", designed for multiple primary and secondary musical uses.

These tone families and their prime functions are the *Principals* - for leading the singing of the full assembly, and full solo/ensemble playing); the *Flutes* - for quieter hymns, accompaniments, and softer passages; the *Strings* - for quiet & expressive playing; and, the *Reeds* - for solo melodic and ensemble playing. The tonal families also produce sounds at a wide range of pitch. (Bass for musical depth and accompanying singing in the men's range – and Treble for melodies, brilliance, and accompanying singing in the women's range.) The Christ King Church organ has pipes in all of the tone families.

The organ operates by a unique Wicks invented "direct-electric" *wind-chest* valve action. Direct-electric actions employ low voltage DC current powered electro-magnets with felt and leather circular seals/pads mounted under every pipe. Whenever the DC electro-magnet receives current (by a key played at the console) an internal magnet armature moves. This armature motion pulls open the felt and leather seal/valve atop the armature and thus allows pressurized air to enter the chosen pipe….whenever pressurized air ("wind") enters the pipe, that pipe sounds (just as blowing air into a flute or clarinet causes those instruments to sound). When the key is released, the electro-magnet armature returns to its "off" position, placing the felt and leather pad/valve in its "off" position, thereby closes off wind to the pipe, stopping pipe speech.

The *console* is the "control panel" of the organ, and contains keyboards, stops, and pedals, for the organist to play the instrument. No tone emanates from the console. The console cabinet also contains its associated stop, key, and pedal electrical contacts and switches, and is located at the center of the balcony. The console is connected to the pipes via under-floor cables and conduits.

The pressurized air/"wind" in the organ is generated by an electric fan "blower"; the wind's pressure and flow/amount is controlled by a series of wind "regulators" (similar to bellows). The electric fan blower is located in the church basement. The multiple wind regulators (bellows) are located within the blower room and in each of the pipe chambers, usually below the wind-chests and pipes. The blower, regulators, and wind-chests are connected by air ducts.

The majority of pipes, wind-chests, valves, wind lines, and electrical switches are located within the twin chambers at the back of the rear balcony. More electrical switches and critical operating equipment are located within the console. Multiple sets of metal pipes are also mounted forward of the chambers, on a cantilevered wind chest platform. The wooden "shutters" or "louvers" backing the platform can be opened and closed via pedals at the console. Opening the shutters allows the sound of chambered pipes within to become louder, and closing the shutters limits or quiets the sound from chambered pipes.

**An Overview of current Organ Defects and Problems**

The problems inherent in the Christ King organ fall into three primary categories:

1. Inherent flaws in the initial technical design, selection of materials, and workmanship applied when the organ was first built.
2. The negative effect of time, decay, and wear-and-tear over the years of usage since the organ was built in 1954.
3. Inherent flaws in the musical and acoustic design and execution of the organ installation, and tonal flaws relative to the acoustic environment of the church's worship space.

Problem Category #1: Inherent flaws in the instrument's design, materials, and workmanship

As with many commodities, different organs are produced from different manufacturers with various levels of quality….similar to automobiles, or clothing, or many other articles that can be mentioned. Automobiles, for example, can range from low quality products such as the "Yugo" up to the Lexus and Cadillac level.

The Christ King organ falls into the lower range of organ material, design, and workman like qualities. Examples of design features and material selections that have less reliability and durability than their counter-parts in the industry include:

a. Soft wood material construction: screws strip out easily, construction is not dimensionally stable; plywood delaminates and leaves debris particles in the valve system

b. Electrical system: Phosphor bronze contacts corrode and burn easily. There is no spark suppression methodology to protect contacts.

c. Single/exterior layer only of Bellows leather gussets

d. The direct electric valve system can only operate on lower wind pressure; higher pressures are needed for stable tuning and reed pipe speech

e. Lesser quality pipe metals and metal thicknesses prevent stable pipe tone and tuning
f. Multiple duplexed/unit stops prevent tonal blend, balance, and accurate tuning
g. Pipe design and scaling is "off the shelf"; pipes were not custom built for the unique and challenging acoustic setting of this church building
h. Access us difficult, unsafe, or impossible to some components within the pipe chambers
i. There is inadequate service lighting within the organ chambers/mechanisms
j. Blower air intake is unfiltered; dirt and dust are brought into the organ's wind system

<u>Problem Category #2: Negative effects of time, decay, and wear-and-tear</u>

While many organs need some form of repair or updating over time, for most organs, the long term repair needs are quite minimal. The inherently lower grade technical design, material selections, and level of workmanship used in this particular organ have resulted in significant problems and defects, happening in a shorter time-frame than most instruments.

Current and recent defects and repair needs include:

a. Electrical system fire hazard


b. Burnt key, pedal, and switch contacts
c. Broken expression shoe contacts
d. Loose pedal tension, and no means of increasing tension
e. Too stiff keyboard tension
f. Rotting and decayed bellows gusset leathers

g. Debris particles from decaying plywood clogging valves
h. Sticking armature axels and hinge pins
i. Corroded relay and switch contact rails
j. Warped soft wood rails in switches that hold contact pins
k. Broken down DC current generator
l. Dead divisional cancel piston contacts

m. Torn reed pipe metal scrolls for critical volume and tuning
n. Dead notes (resulting from magnet hinge and/or electrical contact and switch defects)

o. Ciphers (note that will not stop sounding…resulting from valve hinge, electrical contact, and debris particle problems)

p. Lack of adequate humidity over the years, resulting in dried and cracked bellows leather, damaged wood components, and cork gaskets
q. Stripped wood at screws
r. Decayed and leaking expression motor rubber-cloth pneumatics
s. Pipes that cannot be tuned, or that do not remain in tune durably
t. Decaying wood pipe tuning gaskets
u. Decaying and leaking leather and cork wind-chest air tight gaskets
v. Aging and worn springs
w. Aging and worn felts
x. Zymbelstern (bells) do not operate (wiring & electrical switch failure)

Problem Category #3: Inherent flaws in musical and acoustic factors

While there are many credible artistic approaches and philosophies' regarding what constitutes "good" organ tone, certain fundamentals govern. These include adequate and stable wind supply, appropriate volume levels for a given context, the consistent and even supply of wind to pipes, and even tone and volume between like pipes within a single set. Independent sets of pipes in an organ with dedicated functional and musical duties are also important.

The Christ King organ has significant acoustic and musical defects and challenges. These include:

a. Poor tonal and speech regulation for many pipes
b. Unstable or impossible tuning due to pipe construction and poor initial regulation
c. Un-responsive and inadequate wind regulators
d. Valves that do not open to supply even and stable wind to pipes
e. All sets of pipes are "duplexed/unified", such that they do not have dedicated, stable tonal functions
f. The completely sound absorbing ceiling in the Nave of the church does not allow proper sound reflection, reinforcement or reverberation. Organ tone is severely diminished and tone projection is decimated by the existing room acoustic situation.

g. Too low wind-pressure in the organ hinders balanced pipe speech and stable reed pipe tone/tuning
h. Unstable pipe metal that will not hold proper shape/adjustment

**An overview of repair or replacement Solution Options**

A reasonable question to ask when encountering a defective piece of mechanical equipment is, "Can it be repaired?", followed by the next logical question, "What is the cost of repair vs. replacement?"

It is indeed possible to repair the numerous defects inherent in this organ and bring it back to "nearly new" condition. The key problem with attempting a repair to "like new" is that the inherent design, materials and workmanship of this organ are poor, such that it has decayed to its current poor condition largely because of these inherent poor qualities, and not because of outside influences. Simply put, to repair this organ back to "like new" will only cause it to embark on its path of decay to its current condition once again. Repairs to this organ will not be durable, and will need re-repairing in future years. Even if all defects are repaired, the fundamental soft wood construction, poor valve design, inappropriate metal types, too-low wind pressures, and unreliable electrical contact and switching system will remain, and will remain to be problematic.

The only durable and reliable method of avoiding the aforementioned defects (and to avoid repeating them) is to replace poor design and materials with good. Examples and goals include:

a. Appropriately selected, seasoned, sealed, and treated woods
b. Durable and time tested electrical components and materials
c. Use of properly tanned and installed leather parts, and/or use of leather-less features
d. Use of an organ wind-chest valve system that has long term reliability, and that delivers appropriate air pressure to pipes evenly and consistently
e. Use of compatible and appropriate pipe metals
f. Reduced use of duplex/unit actions
g. Custom made pipes to sound well in the (improved) acoustic of the church room
h. Full, safe, and lighted maintenance and tuning access to all pipes and components
i. A clean, quiet, climate controlled air intake and blower situation

The accomplishment of these goals requires replacement of most, if not all, of the organ's features. To continue the analogy, a Yugo cannot be turned into a Chevrolet or Buick or Cadillac by "repairing" it.

The cost of properly and fully repairing a defective pipe organ, built of less than excellent initial materials, design, and workmanship, is typically 80% or greater than replacement cost. Further, repairs of this type of organ are short-lived, and require re-repair again.

Replacing this organ with a well designed, durable, and custom-made musical instrument is recommended. A properly conceived replacement instrument can serve the church for decades,

and will be the least expensive option in the long term, particularly because of lowered and eliminated maintenance, repair, or replacement costs.

The recommended next step in the process of addressing this organ is to develop a replacement organ design specification, and to submit that specification for pricing to pre-selected and pre-qualified organ manufacturers. Our existing Organ Consultation contract agreement will allow us to move into the organ design, specification, and bidding phase whenever the church desires.

**Technical Description of the Existing Instrument**

General Specifications of the Wicks Organ

"Direct Electric" Action

30 Registers, 33 Ranks, 60 Stop Controls

Summary:

In Left Chamber (expressive):

Soubbasse 16'
Open Flute 8'
Nason Flute 8'
Spitz Flute 8'
Flute Celeste 8'
Salicional 8'
Salicional Celeste 8'
Chimney Flute 4'
Twelfth 2-2/3'
Trombone/Trompette 16' & 8'
Menschenstimme 8'
Maas-Rowe Electro-Harp

In Right Chamber (expressive):

Contrebasse 16'
Choral Bass 4'
Quintaton 16'
Gamba 16'
Gedeckt 16'
Singend Gedeckt 8'
Gemshorn 8'
Gemshorn Celeste 8'
Keppelflote 8'
Cornet III
Krummhorn 8'
Hautbois 4'
Tuba Major 8'

Exposed (Façade):
Principal 8’
Octave 4’
Nachthorn 4’
Quint 2-2/3’
Octavin 2’
II Scharf 1-1/3’
Chimes

Combination Action
- 10 General Pistons
- 10 General Toe Studs
- 5 Divisional Pistons
- General Cancel
- Divisional Cancels
- Reversibles: Great to Pedal (toe stud)
  Sfzorando (toe stud and piston)
- Setter
- All Swells toggle switch
- Pedal on Manual Combinations toggle switches (3)

Crescendo Pedal
Swell Expression Pedal
Choir Expression Pedal
Three Manual and Pedal Draw-knob Console
Blower
Rectifier

**Maintenance Service Provider/Tuner’s Inner-Office Technical Report**
**ORGAN STOPLIST AND CONDITION SURVEY** REPORT:
Wicks Organ Co. and the United Organ Co./installers; tonal design by James Keeley
**Christ King Parish Church**, Wauwatosa, Wisconsin
Survey conducted February 23, 2005 by David Beyer, Organ Technician, V-Pres. SRR&A, Ltd.
Updated, October 31, 2014 by David Beyer and Scott Riedel
**Totals**: 30 registers, 60 speaking stops, 33 ranks, 1881 pipes
**NOTE: specific defects in this report are listed Underlined and Bold**
**Overview**: This is a duplexed unit organ, in which a modest number of enclosed ranks are used at multiple pitch levels and on multiple keyboards, combined with several exposed ranks duplexed between the Great and Pedal divisions. The organ’s tonal scheme is typical for the time of its construction (ca.1954?); the mechanisms of the console (keyboards, draw stops, pistons and controls) and the chambered actions (wind systems, chest actions, remote controls) all exhibit significant wear and some intermittent failures. Tonal changes include a switching of the

Quintaton & Nason Flutes; the former is now a Lieblich Gedeckt, and the latter is a Quintaton (tonally) and removal of a Fagotto in the SW chamber for replacement by a Vox Humana (Menschemstimme.)

**SPECIFICATIONS**

| Division/stop | | material | location | notes | |
|---|---|---|---|---|---|
| **PEDAL** [compass C1-g32] | | | | | |
| 1 | Contrebasse 16’ | open metal | rt chamber | **C1 over blows** | 32 pipes |
| 2 | Soubasse 16’ | stopt wood | lt chamber | **windy basses** | 32 pipes |
| 3 | Quintaton 16’ [GT] | stopt wood | rt chamber | duplex/**action noise** C1~B12 | |
| 4 | Gamba 16’ [CH] | open metal | rt chamber | duplex/**C1 over blows** | |
| 5 | Gedeckt 16’ [CH] | stopt wood | rt chamber | duplex/ | |
| 6 | Quint Bass 10 2/3’ | open metal | rt chamber | unit of #1 **[tone too loud]** | |
| 7 | Open Diapason 8’ | open metal | rt chamber | unit of #1 | 12 pipes |
| 8 | Gedeckt 8’ [CH] | stopt metal | rt chamber | unit of #5 | |
| 9 | Quintaton 8’ [GT] | stopt wood | rt chamber | unit of #3 | |
| 10 | Spitzflote 8’ [SW] | open metal | lt chamber | duplex of SW voice | |
| 11 | Gross Quint 5-1/3’ | open wood | lt chamber | unit SW Op Fl 8’; **poor switch** | |
| 12 | Choral Bass 4’ | open metal | rt chamber | upper chest/ rear rt corner | 32 pipes |
| 13 | Nason FL 4’ [SW] | stopt wood | lt chamber | duplex/tone is “Quintaton” | |
| 14 | Nachthorn 4’ [GT] | stopt metal | rt façade | duplex/exposed | |
| 15 | Gross Terz 3-1/5’ | stopt wood | rt chamber | unit of #5 | |
| 16 | Septieme 2-2/7’ | open metal | lt chamber | unit of #10 | |
| 17 | Quint 2-2/3’ [GT] | open metal | lt façade | duplex GT voice/exposed | |
| 18 | Octavin 2’ [GT] | open metal | lt façade | duplex GT voice/exposed | |
| 19 | Trombone 16’ [SW] | taper metal | lt chamber | extension duplex/slow | 12 pipes |
| 20 | Tuba Major 8’ [GT] | taper metal | rt chamber | duplex/harmonic trebles | |
| 21 | Trompette 8’ [SW] | taper metal | lt chamber | duplex | |
| 22 | Krummhorn 4’ [CH] | cylindrical | rt chamber | duplex/clarinet scale & tone | |
| 23 | Chimes [GT] | | | **inoperable** | |

Couplers: SW/PD 8’, 4’ GT/PD 8’, 4’ CH/PD 8’ 4’

| **SWELL** [compass C1-C61] | | located in left chamber | | |
|---|---|---|---|---|
| 1 | Open Flute 8’ | stopt bass/open wood | C25 **magnet noise** | 61pipes |
| 2 | Nason Flute 8’ | stopt wood/narrow, low cut-up, no nicking (Quintaton?) | | 61 pipes |
| 3 | Spitz Flute 8’ | taper metal/very narrow | Erzähler form | 61 pipes |
| 4 | Flute Celeste 8’ (tc) | taper metal | works well w/ all unisons | 49 pipes? |
| 5 | Salicional 8’ | open metal/very narrow, keen | **lacks treble ascent** | 61 pipes |
| 6 | Sal. Celeste 8’ (tc) | open metal/less keen | with super extension | 61 pipes |
| 7 | Chimney Flute 4’ | half stopt metal | uneven speech | 61 pipes |
| 8 | Salicional 4’ | open metal | unit #5 | 12 pipes |
| 9 | Twelfth 2-2/3’ | open metal | mild blending | 61 pipes |
| 10 | Chimney Flute 2’ | open metal | unit #7 | 12 pipes |

| | | | | | |
|---|---|---|---|---|---|
| 11 | Cymbal III (derived) | | | duplex of 12th | |
| 12 | Trompette 8’ | conical metal | | harmonic trebles | 61 pipes |
| 13 | Menschenstimme 8’ | capped metal on Fagotto rack | | board, **poor regulation** | 61 pipes |
| 14 | Trompette 4’ | open metal (flues) | | unit of #12 | 12 pipes |
| 15 | Tremolo | | | | |

Couplers: SW 16’, Unison Off, 4’

**GREAT** [compass C1-C61] located in right chamber & exposed “shelf chest”

| | | | | | |
|---|---|---|---|---|---|
| 1 | Quintaton 16’ | stopt wood | rt chamber | moved from Nason? | 61 pipes |
| 2 | Principal 8’ | open metal | rt façade | “horn” tone & scaling | 61 pipes |
| 3 | Singend Gedeckt 8’ | stopt metal | rt chamber | gentle | 61 pipes |
| 4 | Octave 4’ | open metal | lt façade | smaller than #2 | 61 pipes |
| 5 | Nachthorn 4’ | stopt metal | rt façade | speech F18, Fs19 | 61 pipes |
| 6 | Quint 2-2/3’ | open metal | lt façade | big principal tone | 61 pipes |
| 7 | Octavin 2’ | open metal | lt façade | as big as #2! | 61 pipes |
| 8 | II Scharf 1-1/3’ | open metal | rt façade | regulation! | 122 pipes |
| 9 | Tuba Major 8’ | conical metal | rt chamber | regulation, C25, Cs26 | 61 pipes |
| 10 | Cymbelstern | | rt façade | | 6 or 8 bells |
| 11 | Tremolo (chamber stops only) | | | | |
| 12 | Chimes | open metal | split façade | A22~F42 | 21 tubes |

Couplers: GT 16’, Unison Off, 4’ SW/GT 16’, 8’, 4’ CH/GT 16’, 8’, 4’

**CHOIR** [compass C1-C61] located in right chamber/shared with GT

| | | | | |
|---|---|---|---|---|
| 1 | Gamba 16’ | open metal | unit extension of #3/**poor regulation** | 12 pipes |
| 2 | Gedeckt 16’ | stopt wood | unit extension of #4 | 12 pipes |
| 3 | Gamba 8’ | open metal | slow speech (rosin-y?) warm | 61 pipes |
| 4 | Gedeckt 8’ | stopt wood | unit/**weak tone, trebles weak** | 61 pipes |
| 5 | Gemshorn 8’ | taper metal | neutral tone ok | 61 pipes |
| 6 | Gemshorn Cel 8’ (tc) | taper metal | flutey-ok | 49 pipes |
| 7 | Koppelflote 8’ | taper metal | full, singing trebles | 61 pipes |
| 8 | Oct. Gedeckt 4’ | open metal | unit extension of #4 | 12 pipes |
| 9 | Gamba 4’ | open metal | unit extension of #3 | 12 pipes |

(Continued)

| | | | | |
|---|---|---|---|---|
| 10 | Nazard 2-2/3’ | open metal | unit of #4 | |
| 11 | Flautino 2’ | open metal | unit of #7 | 24 pipes |
| 12 | Tierce 1-3/5’ | open metal | unit of #7 | |
| 13 | Larigot 1-1/3’ | open metal | unit of #7 | |
| 14 | Septieme 1-1/7’ | open metal | unit of #7 | |
| 15 | Sifflote 1’ | open metal | unit of #7 | |
| 16 | Cornet III | open metal | string dolce form, breaks at every C | 183 pipes |
| 17 | Krummhorn 8’ | cylindrical | big tone, medium clarinet scale | 61 pipes |
| 18 | Krummhorn 4’ | open metal | unit of #17 | 12 pipes |
| 19 | Hautbois 4’ | capped metal | **poor regulation** | 61 pipes |
| 20 | Reeds Tremolo | | | |

21 Tremolo **inoperable**

Couplers: CH 16', Unison Off, 4' SW/CH 16', 8', 4' (**intermittent failure CH U. Off**)

**ACCESSORIES**

| | | |
|---|---|---|
| General thumb pistons | 1~10 with duplicate toe studs | **(#4 toe not working**) |
| Divisional thumb pistons | 1~5 plus cancel (O) for each | SW, GT, CH, PD |
| Reversibles | GT/PD toe stud | |
| | SFZ toe stud & duplicate piston | |
| Setter | Combination toe stud--upper right | |
| General cancel | thumb piston--lower right | |
| Toggle switches | Expression to Swells (inoperable) | Rt keycheek of GT |
| | Pedal on Manual combinations | each of three lt keycheeks |
| Maas-Rowe Electro-Harp | On/Off switch upper right on music desk | |
| | 9-voice detente switch under left stopjamb | |
| | rotary pitch dial on box under jamb | |

Swell shoes SW & GT/CH each controlling 4 banks of 6 shades for chambers
(**miscellaneous failures—differing with each motion of the shoes**)

**OBSERVATIONS**

1 Wind system in jeopardy due to failing leather gussets at all corners of the wind regulator reservoirs and cracking hinge leathers for same.

2 Plaster spots evidence water damage on chamber ceilings and above critical chests and pipes. 3 Electrical faults in console controls, chamber controls, and wind chest pipe actions.

4 Insufficient lighting and ladder access for safe maintenance of all upper and lower chamber components.

5 Tonal regulation needed across the board for all reed ranks, and offset 16' pipes.

6 Insofar as the organ is only as successful as the tonal environment in which it speaks, improving the room sound will improve the organ tone and its effect in the room.

7 Expanded combination levels will require a new "brain" for the console.

8 Aging felts, springs, contacts, switches, and wooden components holding them in the console require refurbishment/replacement to ensure reliable actions and accurate usage of organ controls.

# # #