Specifications

Christoph Paccard Digital Carillon Instrument

By Christoph Paccard Bellfoundries
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General Description:

The Christoph Paccard Digital Carillon Instrument is a fully automatic instrument that provides the traditional bell rings of the Church or college campus including virtually unlimited choices for standard or custom recorded clock chime melodies, hour strike bells, peals, the traditional call-to-worship, Angelus, Sanctus, De Profundis, funeral tolls, and music for all seasons. A musician can record custom songs, melodies, and other bell rings. In addition the instrument serves as a controller for tower clocks or cast bells. This is a very high quality proprietarily built system manufactured for high reliability service in harsh environments; what it is not is also important to note: it is not a cheap electronic product modified and altered to be marketed as a carillon instrument. Being specifically and custom designed for this unique niche market by Campanalogists from the ground up, the instrument is rigorously designed to be very hardy; the beauty of its sound, its reliability, serviceability and ease-of-use are its primary attributes. The standard warranty on the carillon instrument is 5 years with professional Christoph Paccard installation; this warranty can be extended up to 10 years.

The sounds of the carillon are certainly one of its greatest attributes; the sound is the very authentic, beautiful clean and clear sounds of real cast bronze, musically tuned bells digitally sampled. The sound of the bells is projected through high quality outdoor speakers using solid-state amplification.

The instrument is played fully automatically from the digital program clock, which is interfaced through an LCD backlighted display screen with simple instructions for easy operation.

Description of the Bells:

All of the Christoph Paccard bells in our Digital Carillon Instrument are digitally sampled real cast bronze bells. The sounds of the bell rings are authentic including the true sound of swinging bells; e.g., the call-to-worship, and celebration or wedding peals; including the actual sound of swinging bell motions. Each of the bell sounds are individual samples which means that you can make any combination for your bell peals, clock chime melodies, tolls, etc., as may desired. While the instrument has an automatic, live, and recordable 5 octave range, the actual range is from C2, (a 40,000 lb. bell), to C8, (a 20 lb. bell); … the 5 octave range can be adjusted from C2 to C7, or C3 to C8 per your desire. The individual sounds are sampled at 16 bit resolution at 32KHz sampling rate. The instrument has 32 note polyphony, which provides authentic reproduction of carillon music without notes dropping early or unrealistically.

Following is a condensed listing of the bell rings available with the instrument:

Call-to-worship, or Class bell: a single swinging bell which starts with the bell swinging and striking on only one side to full swing in which the bell is swinging and striking the clapper on both sides of the swinging motion. This bell ring, like all others, is controlled by both the automatic program and by manual operation. The length of the peal is easily adjustable in one second increments. The user can choose which bell provides the swinging bell sound.

Peal: the celebration or wedding peal is a combination of swinging bells. The user can select the peal notes, the number of bells within a peal, the length of the peal ring, etc..

Toll: the tolling bell is a stationary bell that is struck by a bellstriker, the timing between strikes and the length of the toll period is easily adjustable by the user. The user can easily set the toll to ring a certain number of times, a persons age, the number of souls lost in 911, etc.. The user can choose which bell provides the toll bell sound.

Angelus: Just as the other bell rings, the Angelus can be configured per your needs and desires, and at days and times and lengths, completely customized as desired. The user can choose which bells compose the Angelus ring and peal.

Clock Chime Melodies: There is virtually no limit to the number and variety of clock chime melodies that may be sounded; again, the user may select the specific notes within each clock chime melody. The clock chime can play on the hour, half hour, or quarter hours as may be desired, on any hours as may be desired. The instrument is delivered with standard clock chimes ready to chime.

Hour Strike: The hour strike may be programmed to play on any hour as desired, either after a clock chime melody or as a stand alone hour strike.

Manual swing / strike button panel: the user can assign up to 10 bells on the face of the carillon panel for a single swing or strike or any combination up to 10 bells. User chooses that particular bell to swing or be struck.

Carillon: The carillon may be initiated fully automatically, manually, or live via MIDI keyboard. The duration of the carillon play is easily user set, and may be stopped at any time. The carillon music can be preloaded by Christoph Paccard or easily recorded by your musician. The carillon may automatically change seasonal songs that play based upon programmed dates that can be set by the user. The song memory is virtually unlimited; will store songs in various user nameable catagories for all seasons. The memory is not limited by complex music with many notes; it has a 32 note polyphony. The instrument gives priority to the resonance of heavier bells because they resonate longer. As a consequence, the resonance of these heavy bells will not be "shut down" when playing tremolo with smaller bells. The instrument can generate bell sound with 128 steps of loudness which allows artistic expression in the music. The instrument is not only capable of generating the natural sounds of bells, but also of digitalizing sounds other than bells, (train sounds, whistles, bugle calls, etc..)

Select a Melody: this feature allows a user to scroll through lists of songs and select an individual melody to play; it is easily accessed by a user.

Warning Siren / Voice Alert System: these features can be a part of the carillon and customized as required for your location. Normally, a wireless remote control will also be a part of this feature that will allow activation by personnel from remote distances and locations.

Description of the Program Control Clock

The program control clock is the system that operates all timed events including automatic programmed, timed, events and durations of manual functions. This control system provides program operation to any schedule, to any minute, hour or day, allowing complete flexibility in program scheduling. The precision of the control system is +/- 2 seconds per year; for those who require closer accuracy, a GPS interface is optional. Seasonal time changes are handled automatically; the system allows adjustment of seasonal time change dates should Congress change their minds again. The system has a backup battery to retain the correct time and save the program in the event of a power outage; the backup battery has an expected lifetime of 10 years.

The display: The carillon features a 4 line, 80 character alpha-numeric backlit LCD display. Programming of all carillon functions is accomplished using only 4 touch buttons. The program set up and operation is in plain English text on the display; it is designed to be intuitive and simple to use.

The Program Memory: The user program is stored in non-volatile memory which is not dependent upon the clock battery for maintenance during a power outage. The program memory provides a virtually unlimited number of events for all bell rings and carillon music. In addition, each and every day of the year can have special programming. In practical usage, a special day, July 4th, for example, the special day programming will override the standard programming that may be set up.

Custom outputs: The system has four custom outputs that can control cast bells, clocks, tower louvers, lights, etc..

The bell sampler: The Digital Carillon Instrument system contains the finest bell ring sampler available. The samples are permanently stored and the circuitry in the system does not impose inherent length limitations on the sampled sounds, including on the

complex swinging bell sounds. The Digital Carillon Instrument includes commands to start and stop samples, with sensing of the starts and stops to make possible the absolute accuracy of even very complex bellringing sounds such as peals. The system can even provide for the playing of custom recordable digital sound clips, such as train whistles, etc.. The sampler operates at 16 bit resolution at 32 KHz sampling rate.

Power Sources: All the DC voltages required by the carillon instrument are generated within itself. In addition, sensing of the power line is done constantly to determine if a power failure has occurred. If so, program memory and the current conditions of the system are safely stored before the line voltage disappears. When line voltage is restored, the program will run exactly as it left off.

Interface lock out: The carillon instrument provides for the primary user to lock out unauthorized users with a pin code. A master code is stored at Christoph Paccard facilities.

Custom Record Capability: The carillon is MIDI controlled and has a midi input. An optional keyboard or organ midi-interface may be included to provide actual playing from the sampled carillon. Custom recording of songs with titles can be played into permanent memory for automatic playback at any time.

Amplification System

A 300 watt RMS digital power amplifier has been especially designed for reproducing the sound of bells. Quality and long term reliability is at the top of our selection process for components of the carillon. The system amplifier has extensive fault protection designed into it so that the amplifier will operate safely and continuously into any load impedance without damage, overtemp, or shutdown. The amplifier develops very little heat, and along with it input and output line transient protection, user resetable circuit breaker, insures long term reliability and quality of sound.

The exclusive features of this custom carillon digital amplifier include:

***SAT-SENSE Current Delimiter:** Continuously monitors current on output lines and proportionately decreases drive level if an overcurrent, (due to speaker overdrive or distribution transformer saturation), begins to occur. This is all done very subtly with no discernible overshoot or breathing effects. Rear access control easily sets the maximum current, (power), desired. Advantages are: 1.) Carillon installer matches the maximum amplifier output power to the specific system. 2.) Allows amplifier to drive lower power rated speaker or distribution systems without fear of overdrive distortion or speaker damage. 3.) Makes input level setting less critical when operating the system at or near its rated power.

***High Speed Dynamic Scaler, (HSDS**): Allows the amplifier to operate safely and continuously into any load impedance including impedance mismatches, reactive loads, and dead shorts without overheating or shutdown. HSDS automatically senses the load impedance present on the speaker lines and scales the amplifier output to its maximum safe level. The amplifier will never fully shut down from adverse load conditions, but instead will continue to put out the maximum safe amount or power without overheating or failure. Output is completely stable into any type of loading situation

***Input Transformer Isolation**: Full isolated, true balanced, differential, 10kOhm or 600Ohm, transformer input is standard with 100db+ CM rejection and 1,000 volts SM range. This combination gives clean, no hum, input performance from virtually any drive source or wire length. In addition, an Input Line Hum Balance adjustment is furnished to greatly decrease hum resulting from any drive line impedance imbalances that might occur. Inputs can be referenced to any ground or left floating, completely eliminating any possibility of ground loops.

***Input Filters:** Subsonic and ultrasonic filers give better system performance and reduce installation headaches that commonly occur from distribution transformer saturation or spurious high frequency oscillations.

***Power Supply:** Fully regulated, soft start, phase controlled, DC power supply allows the amplifier to deliver 100% rated program output power, even under 95VAC power line brown-out conditions or 50% rated program output power down to 80VAC input line. The soft-start feature totally eliminates the large turn-on line surges that typically trip circuit breakers in large multi-amp installations. Reliability is greatly increased by eliminating the severe high current stresses to which the power supply components are normally subjected.

***PWM Digital Amplifier**: The 85% to 90% power transfer efficiency across the full output range of the patented carillon amplifier results in small size and weight, low power consumption, low heat generation and no noisy fans. In comparison, a conventional linear amplifier with lackluster efficiencies of 5% to 50% are large, heavy, have high power consumption, high heat generation and generally require troublesome fans or huge and expensive convection heat sinks. Another important advantage of the CP amplifier is that reactive power is recirculated and stored in the internal DC power supply instead of being wasted in the form of heat as in a conventional linear amplifier. This fact is especially important in the commercial sound market where the normal distributed line installation generally looks highly inductive reactive, due to the long connecting wires and numerous distribution transformers and speakers connected. In short, the conventional linear amp grunts and groans, runs hotter, wastes reactive power and prematurely load-line current limits; while the CP digital amplifier cruises along, running cooler, reusing reactive power while still delivering full-rated current into any reactive load. The many advantages of the CP amp are clear.

Monitor Amplification System: A separate 5 watt internal amplification monitor with speaker and volume control is part of the instrument.

<u>Weather-Proof Speakers Designed for the CP Digital Carillon Instrument:</u>

The system normally comes with four weatherproof speakers, each with 60 watt drivers. Each horn is made of weatherproof fiberglass horn section and one common driver. A heavy duty, weatherproof compression driver unit complements the speaker horn. The horn has a 4.5’ air column length for high quality sound reproduction, worthy of the carillon bell sounds and amplification system. Each horn provides dispersion of 120 degrees. Using a complement of four horns assures complete sound coverage. The horn is a non-resonant exponential reflex type projector horn with a weatherproof fiberglass bell and heavy duty positive lock mounting bracket.

	CJ-46	**Optional DR-72**
Dispersion:	120 degrees	65 degrees

Air Column Length	4.5’	6.5’
Bell Size	23” X 13”	31” round
Horn Length	17”	28”
Weight:	15.5 lbs.	25 lbs.

Specs for the 60 watt driver:

Power Rating:	60 watts continuous
Frequency Response	70Hz – 12kHz
Impedance (OHMs):	70 volt line with transformer to 16 ohm coil
Sound Level:	120 dB

Cabinetry:

There is a choice of cabinets; either a wall mount or table top black metal locking cabinet, or a custom wooden console or keyboard console. The black metal cabinet is 15 7/8” height, 21” width, 18 ½” deep.

Transient Power Surge Protector:

CP includes a surge protection system. This component provides protection against power surges and provides clean power for the instrument.

Options:

Four function Wireless Remote Control
Ten function Wireless Remote Control
Wired remote control
Simple 5 octave MIDI keyboard
Custom keyboard console
Playing the carillon directly from the organ console
Interior sound
Additional power amplification / Additional speakers
Speaker mounting towers
Speaker Cupolas
Cast bell control
Tower Clock Control
Tower Louver Control
Bell shaped bronze commemorative plaques

Warranty:

CPB warrants the carillon instrument when installed by Christoph Paccard for a period of 5 years. With Christoph Paccard installation and regular maintenance with our Preventive Maintenance Agreement, PMA, your warranty is extended to 10 years. The liability of CP will be to correct any defect. The warranty is void if the system is not properly grounded; and does not include damage due to acts of God or any misuse. Safe access to all equipment locations is the responsibility of the purchaser. Christoph Paccard offers a 3 year manufacturers warranty for all customer installs.

Power Requirements:	110 volt AC, or 220 VAC, 60 HZ
Shipping Weight:	65 pounds