

THE AUSTIN PREMIER QUADRUPLEX

... the story of the revival of the ultimate system of player organ roll manufacturer ...

Story and Photos by Ray Brubacher

In the first thirty years of the twentieth century, the musical interests of the country saw the development and perfection of a great many kinds of automatic musical devices running the gamut from the small nickelodeons to the automatic player violin. In the field of organ construction, nearly every major builder spent considerable time and financial interest in the developing and marketing of an automatic playing mechanism similar to that of the piano playing devices, which would operate his pipe organs; at that time these were enjoying a great deal of popularity in private residences of the ultra rich as well as in churches, theatres and mortuaries.

Some of the systems such as the Moller, Welte-Mignon, Link, Estey and Wurlitzer achieved a very high degree of perfection, that is, that the paper rolls controlled not only the notes that the organ would play, but also operated the swell shades, and the registration changes. However, these systems had one major shortcoming. The paper rolls for most players were about the same size as those of the conventional player piano rolls and therefore they were not capable of controlling the entire resources in terms of all the notes of all manuals and pedals, as well as the most subtle degrees of manual and pedal articulation which could only be realized through a live performance.

During this time, the Ampico and Aeolian Duo-art player piano systems were perfected, thus opening the door for further experimentation by organ builders. The Ampico and Duo-art systems both gave the pianists making the rolls a very complete control of attack, volume level and phrasing which could be very accurately reproduced on any piano having the proper playback mechanisms. Interested readers are here referred



The console of the Petty residence organ - An Austin Quadruplex organ.

to the monumental series of recordings being produced by Everest Records entitled *Archive of Piano Music* numbering some twenty discs on which are heard some of the greatest piano virtuosi of the past such as Paderewski, Saint-Saens, Hoffman and Gershwin. It is virtually impossible to determine that rolls are being played, so very realistic is the recorded sound.

By the middle of the 1920's the Austin Organ Company of Hartford, Connecticut, having experimented with various types of organ player mechanisms and each time being unsatisfied with the all too mechanical quality of reproduction, decided to start over with a clean sheet of paper, and virtually designed a completely new player system. The end result, through the efforts of F. B. Austin and a staff of devoted musician-minded engineers, came the Austin Premier Quadruplex Player.

The name *Quadruplex* was closely tied in with the system Austin felt most practical for an automatic player mechanism in that the roll gave complete and independent control over three manuals and full pedal, plus the control of registration and all swell pedals and crescendo pedal. Therefore, these rolls were designed for a three manual organ, and all

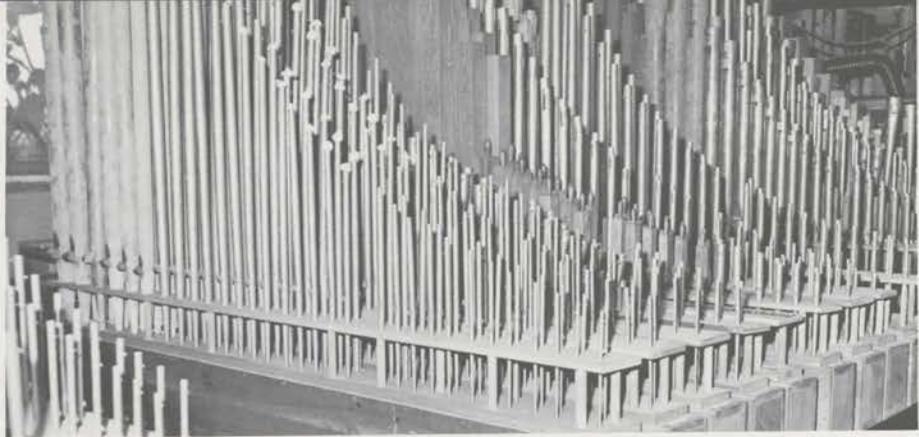
recordings were made on the special recording instrument in the factory studio. Many eminent organists of the day were put under contract to make recordings. Among the more prominent of these were Lynwood Farnum, Chandler Goldthwaite, Norman Coke-Jephcott, Charles R. Cronham, and William Fearnly. The first roll recorded by the company for sale in their catalogue was entitled *Ramona*.

It is indeed fortunate that these noted players left a legacy such as these splendid recordings in the days before high fidelity recording was even thought of. It is also unfortunate that the perfection of the Premier Quadruplex came so late in the twenties, in fact, just in time for the depression to spell an end to all activity in the field. All told, there were less than twenty player units constructed and of these, only one remains attached to its original instrument. This is in the auditorium of the Aetna Life Insurance Building in Hartford. It is of interest to note here that consumer prices for the rolls available in the catalog were determined by the weight of the roll. All recordings were weighed on a dial type kitchen scale and prices which ran from four dollars for a recording of Beethoven's *March from the Ruins of Athens* to eleven dollars for Debussy's *Afternoon of a Faun* were determined in this manner. All rolls were hand played and were not mechanically punched from an orchestral score, a method frequently resorted to by other roll producing companies.

After the depression, no more rolls were made, and the perforator mechanism was disassembled and stored. No one company was producing rolls because the development of the home electronic portable organ spelled a virtual end to residence pipe organ installations.

In the fall of 1963, William E. Petty, a manufacturing superintendent for Westinghouse and a resident of Fort Defiance, Virginia which is a small township five miles north of Staunton in the Shenendoah valley, and an organ buff of the first order, took delivery of a three manual twenty-two rank Estey organ which came from a Scarsdale, New York residence. The Estey had a player attachment and one of the unique luminous piston consoles in which all the stops are in the form of three-quarter inch diameter pushbuttons with the stop name engraved on translucent plastic. When the stop pistons are pushed, a light comes on behind each button indicating that the stop is drawn, and the light goes out when the button is depressed again. Petty, enthusiastic over the idea of having an organ that could play by itself, soon learned of the shortcomings of his existing system, and resolved to do something about it. Hearing of the Austin Quadruplex system and immediately recognizing its merits, he was able to track down a player unit which was installed on an Austin Organ in a Cincinnati, Ohio residence. Upon purchase of the unit with eighty rolls, and its connection to his instrument, Petty began to wonder if by chance the original roll perforating machine would still be in existence. Upon the basis of correspondence with the Austin Company, he was invited to come to the factory to see what was left of the original unit. A fire in the factory some years previous had destroyed all but the actual punch assembly with none of the controlling units in existence. There were no instruction manuals of any kind to direct the setting up of the instrument. However, Petty, being somewhat of a mechanical and electronic wizard, was not daunted and in the summer of 1965, obtained from Austin the punch assembly.

Upon its delivery to his home, Petty began the design of the perforator. Supporting frames, paper feed, paper takeup, time delay circuits, pulse and binary coding circuits



Some of the pipework in the Petty residence Austin Quadruplex Organ.

were also designed and constructed in his shop. Solid state electronics was to replace the electro-pneumatic action originally used by Austin. By summer of 1967, the perforator was complete, and Petty was able to locate William Fearnly who came to Fort Defiance to re-record that first Austin roll *Ramona* in honor of the historic occasion.

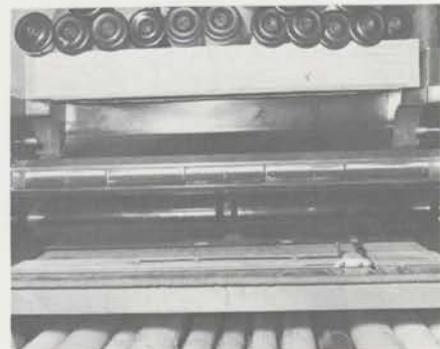
It was decided that another, more reliable console would soon be needed, and in the spring of 1968, a three manual Austin console was located, and its specifications were altered to comply as closely as possible with the original Austin studio recording instrument. Let us now examine the component parts of the Quadruplex player system in detail.

THE CONSOLE: The console is the standard Austin type with all electric action which plays the organ in the usual way. The console and Austin capture system combination action were completely reconstructed in Petty's shop. The essential additions to the console consist of hold and play indicating lights to let the organist know when he is actually recording the roll. The console controls the roll perforator unit in all ways, that is the playing, registration changes, crescendo pedal and swell pedal operation, tutti, and all couplers.

THE QUADRUPLEX PERFORATOR: The perforator mechanism consisting of the punching mechanism, paper feed, and takeup spools is driven by a one horsepower single phase motor. The perforating unit produces up to two hundred and forty holes across the width of the paper at the rate of thirty-one holes



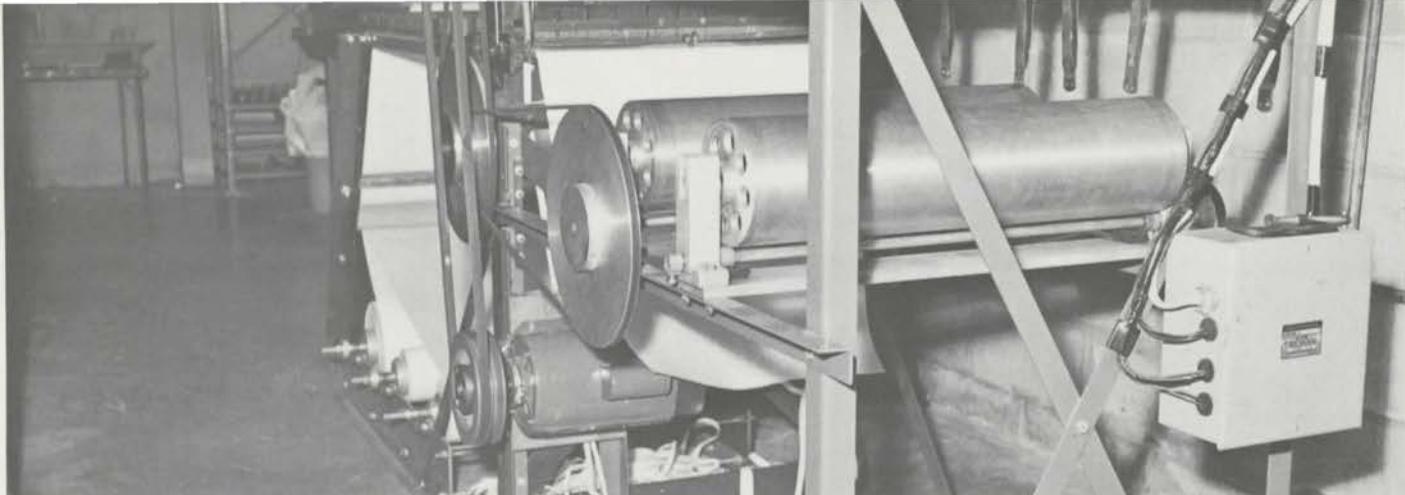
Bill Petty seen discussing the Austin combination action with veteran organ builder and inventor, Edwin Link (left).



The Quadruplex player showing the five section expansion tracker bar.



Close-up of Quadruplex perforator.



The perforator, showing the paper take-up cylinders.

per second allowing the fastest trills and runs to be faithfully recorded on the paper. The paper speed through the perforator is one hundred and thirteen inches or nine feet, five inches per minute. Diameter of each paper punch is .047 inches. Each punch is operated by a standard organ pneumatic operating on ten inches of vacuum, and is electrically parallel to the chest primaries. Besides having a separate hole for each note of the three manuals and pedal, there are three holes for the great-choir box, three holes for the swell box, and three holes for the crescendo pedal. These operate on the binary principle which will be explained later. There are a series of tracking holes in the center of the roll for keeping the roll centered, and another series of holes that runs continuously to operate the five section expanding tracker bar which automatically expands or contracts to compensate for moisture content of the paper. It is interesting to note here that unlike all other roll playing devices, the paper edges are not utilized in any way to control the tracking which results in longer life for the paper. In addition, the rolls do not have to be spooled tight in order to operate accurately.

The basic principle of operation of the perforator is a notched oscillating bar and a corresponding notch in a punchholder which engage when any given key is depressed on the console. The number of holes punched depends on how long the key is held. When a key is released,

a spring disengages the punchholder from the oscillating bar. Therefore, an exact reproduction of the manual and pedal technique of the organist recording the roll is possible.

ROLL PAPER: The paper used for the new Quadruplex rolls was determined from a chemical analysis of the original Austin roll paper. The paper for the new rolls is manufactured by the Minerva Paper Co. and is their type MG dry waxed machine glazed bleached kraft 30/35 pound stock, .0025 inch in thickness. The perforator will cut two master rolls plus one on a backing paper, the purpose of the backing paper being to insure a clean cut on all holes. Width of the paper as it goes into the perforator is $21\frac{3}{4}$ inches and it is automatically sheared to $21\frac{1}{8}$ inches as it emerges from the perforator. The roll is wound on a spool of which the ends are $2\frac{5}{8}$ inches in diameter. Maximum capacity of each roll is approximately ten minutes playing time. Each feed spool of blank paper will give a minimum of one hundred fifty to two hundred rolls and is ordered in three hundred pound lots.

EXPRESSION AND CRESCENDO: There are seven stages of expression on each of the two swell pedals and seven stages of crescendo that are available through binary coder systems. Since three holes are used for each expression pedal and three holes are used for the crescendo pedal, each pedal operates three sets of binary coders which through a series of plug in type relays trans-

lates the steps into three series of holes punched in the paper in any of the seven following combinations:

1
2
12
4
1 4
24
124

During the playback, another three sets of binary coders retranslates this information providing the seven steps of expression and crescendo.

REGISTRATION: When a stop is drawn or retired, or when any combination piston is used, a momentary pulse of electric current is generated by a pulse generator. This short pulse causes a series of solid state time relays to sequence; they first activate a thirty-six pole double throw switch which disconnects momentarily the top octave of the pedal and the bottom and top octaves of the choir manual, throwing these thirty-six circuits from notes and connecting them to whatever stops are on. This action which takes less than one-quarter of a second, punches two registration control holes in the paper and also whatever stops have been drawn. This action does not affect the playing in the normal manner and allows the player to play right through the stop changes.

In the playback, a similar procedure in reverse occurs. The two registration holes cause another thirty-six pole switch to change the key circuits to a latching relay circuit.

These two registration holes precede the stop holes by $\frac{1}{16}$ of a second which allows a break in the key circuit to cause the stop holes to operate the proper latching relay, after which the entire operation returns to normal play.

The question of whether there is a future for the Quadruplex system must remain unanswered at the present writing. There exists the possibility that a competitively priced portable player unit might be constructed to play the Quadruplex rolls and that the unit might be easily attached to any organ. It is hoped that such a possibility might soon become a reality, and that if so, today's generation of prominent organists might come to the Petty residence to record for posterity their talents on paper.

Mr. Petty wishes to thank Mr. F. B. Austin, president of Austin Organs, Hartford, Connecticut, for his advice and continuing interest, and to Mr. Al Miller, also of Austin Organs, for information and invaluable assistance in the redesigning of the complete Quadruplex player and recording system. A complete specification of the organ follows:

SPECIFICATION FOR THE WILLIAM PETTY RESIDENCE ORGAN WITH THE AUSTIN QUADRUPLEX PLAYER AND ROLL PERFORATOR.

Pedal

16' Open Diapason
16' Bourdon
16' Violone
8' Octave
8' Flute
8' Cello
4' Principal

Swell to Pedal 8'
Swell to Pedal 4'
Great to Pedal 8'
Great to Pedal 4'
Choir to Pedal 8'
Choir to Pedal 4'

Great (second manual)

8' Open Diapason
8' Grossflute
8' Concert Flute
8' Violincello
8' Salicional
4' Harmonic Flute
8' Trumpet
Three blank tablets

Great to Great 16'
Great to Great 4'
Swell to Great 16'
Swell to Great 8'
Swell to Great 4'
Choir to Great 16'
Choir to Great 8'
Choir to Great 4'
Chimes
Unison Off

Swell (third manual)

16' Bourdon
8' Gedeckt
8' Viola
8' Viol d' Orchestre
8' Viol Celeste
8' Muted Viol
4' Flute
2' Piccolo
8' Oboe
8' Vox Humana
three blank tablets
16' Swell to Swell
4' Swell to Swell
Unison Off
Tremulant

Choir (first manual)

8' Grossflute (Great)
8' Concert Flute (Great)
8' Unda Maris
8' Violincello (Great)
8' Salicional (Great)
4' Harmonic Flute
8' Trumpet (Great)
8' Clarinet
Harp
three blank tablets
Tremulant
Choir to Choir 16'
Choir to Choir 4'
Swell to Choir 16'
Swell to Choir 8'
Swell to Choir 4'
Unison Off

MECHANICALS

14 general pistons — 8 of which are above the swell manual and 6 are toe studs on the bottom left of the foot board. 5 pistons for Pedal, and 8 pistons for each manual which operate respective manual stops and the pedal division.

Tutti button and toe stud affecting the entire instrument. Great to Pedal, Choir to Pedal, and Swell to Pedal toe studs.

Blower — Orgoblo with 5 h.p. single phase motor.

Vacuum Blower for Player Unit — Orgoblo with 1 h.p. three phase motor.

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of the

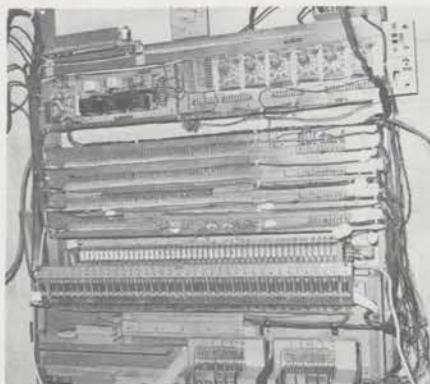


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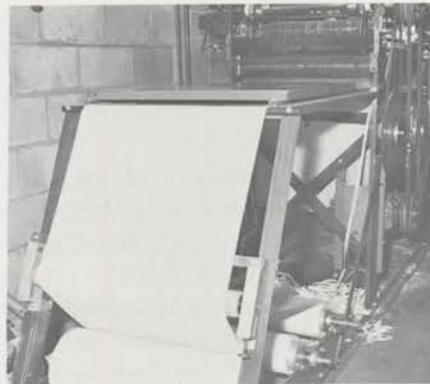
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and Wurlitzer Black Cap magnet coils.

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The Quadruplex player relays, pulse generator and binary coders.



The Quadruplex perforator showing the paper feed.