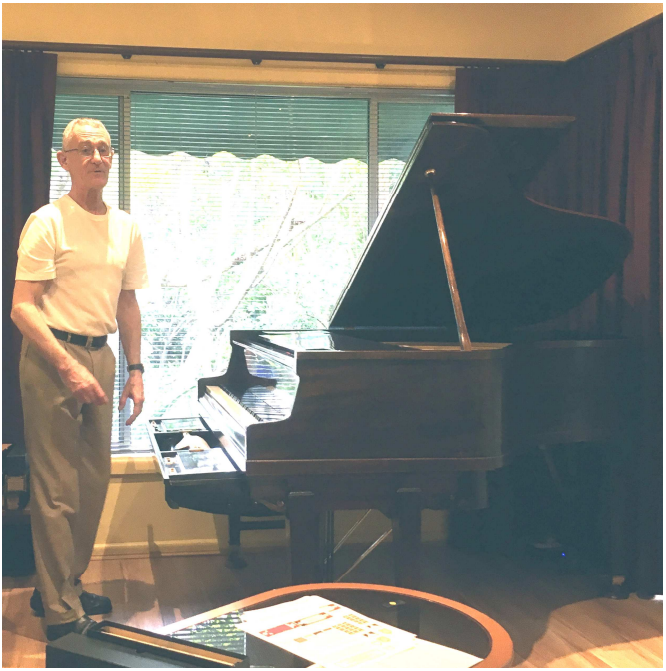
Australian Collectors of Mechanical Musical Instruments

Established 1971

Bulletin 203 December 2017

October meeting 2017 hosted by Peter and Warwick (photos by Bill Lloyd)



Left: *Peter announcing a roll about to be played on his newly restored Ampico (an impossible photo to take due to the back lighting, well done Bill)*

Below: *Peter Coggins inspecting Peter's Weber Duo-Art.*

(Apologies that there are only two photos of the meeting, as apart from these two, no other photos were taken at the time.)

Next meeting

Saturday 9th December at 2:00 pm

The Christmas meeting is being hosted by Bill and Patsy Lloyd (assisted by their friend Drew) at 5 Pindari Place, Bayview (phone 0428 743 218). This wonderful venue now holds Bill's newly restored Duo-Art (please bring your favourite Duo-Art roll or two). Bill also has a lovely model B Steinway on which the pianists among us are invited to play. Please bring your usual food or drink, although there will be copious offerings available. Less ambulant members are welcome to park at the house, otherwise please park on the street since space at the house is limited. Note the earlier time, as this is our Christmas party. Also, if you have not already paid the $40 dues, please do so at the meeting or by contacting John Steain.

Upcoming meeting dates 2018

(1) Saturday – February 24th to be hosted by John and Glenda Steain, Kenthurst.
(2) Saturday – April 28th venue to be decided.
(3) Saturday – June 30th venue to be decided.
(4) Saturday – August 25th venue to be decided.
(5) Saturday – October 27th to be hosted by Peter and Warwick, Padstow.
(6) Saturday – December 8th venue to be decided.

In this issue

Front cover

Bill Lloyd's 1929 Steinway Duo-Art, now newly restored, see article in this issue.

Wanted: A friend seeks Mastertouch Piano Roll D1656 "O! Sydney I Love You" played by Laurel Pardy and Edith Murn. Please contact me if you can help. *Peter*.

President's report

Tony Hilton

October 28th was a lovely sunny day, and for me it started with Peter Coggins visiting to service my Steinway PEDA, after which we headed to the meeting being hosted by Peter and Warwick. As you may have read in the previous Bulletin, Peter had just restored his 97 year old Ampico. It looked and sounded magnificent. Polishing the casework has made Peter rather svelte!

After the huge spread of food, drinks and coffee, whilst admiring Warwick's newly landscaped garden we assembled for the meeting. Apologies were received from Glenn Amer, Ron and Margaret Sharp, Horrie Davis, Ian Williamson and John Shaw. There was discussion about the website in which the hope is that it will encourage new members. Peter informed us that it was now getting easier to find the site through Google, and the more we use it the better the access. The benefits from the site are that we now have an up-to-date site with links to all the allied instruments and interests within the group.

Bruce Welch showed us the new boxes, leaders, tag ends and self-adhesive roll labels he has produced, and very fine they are too. You should have received a flyer in the last Bulletin about this, as Bruce hopes to make these available to all members at the lowest possible cost. Please let Bruce know of your interest.

Richard Beeston had travelled from Wyong and informed us he is doing a Masters degree concerning how recorded music in all its various forms has affected the social aspects of Australian life from 1900-2000. This includes cylinder music in all its various forms, piano rolls, shellac and vinyl discs, wire and tape recordings, both reel to reel and cassette, CDs, MP3 and any other forms he can get information about. If you can assist please contact Peter.

Peter then gave us a demonstration of the Knabe, both on subdued and the brilliant settings. Certainly some volume there! After that he moved to the Yamaha C5 Disklavier and demonstrated some wonderful pieces, including the beautiful Chopin Nocturne Op. 27 No. 2 played by Theodor Leschetizky. June 29th or 30th, 2018 is a date to put in your calendar as the Sydney Symphony Orchestra will be performing Gershwin's *Rhapsody in Blue* from Gershwin's piano roll recordings via Peter's MIDI files of the rolls. Should be quite an occasion.

A Duo-Art and Doble Steam Cars

Bill Lloyd

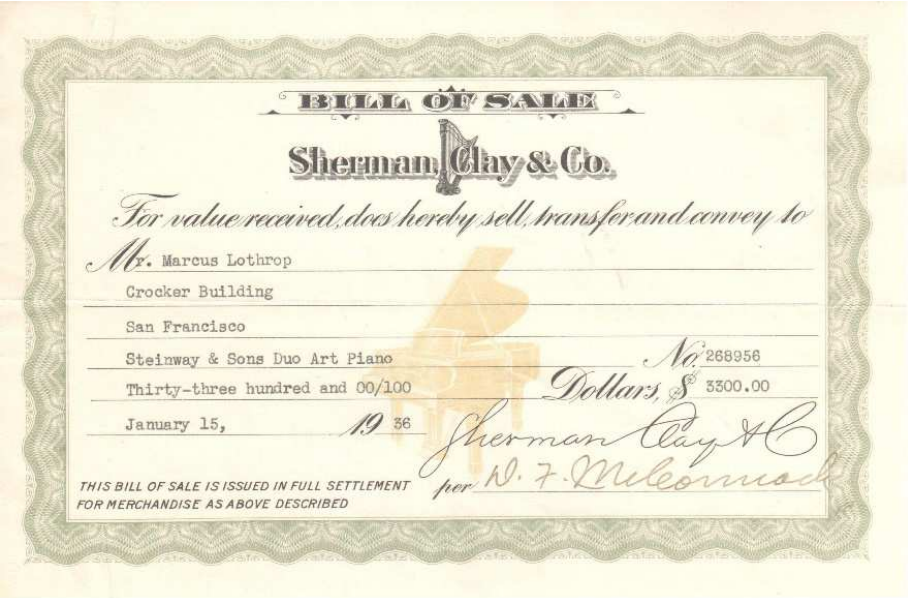
The story of Bill Lloyd's Steinway Duo-Art Sn. 268956

If I hadn't been a mechanical engineer patent attorney with a particular interest in steam cars, I would never have met my 1929 Duo-Art Steinway. Back in 1981 one of my professional colleagues, Charlie Cole, was a U.S. patent attorney. While looking at a photo of my 1922 Stanley Steamer hanging on my office wall, he casually remarked, "A friend of mine in San Francisco used to own a Doble steam car". Almost everyone has heard of the legendary Stanley Steamer but almost no one knows anything about the extremely rare Doble steam cars. These were acknowledged as the "Rolls Royce" of steam cars but only about 30 were ever built. I couldn't believe what I had just heard but it was true.

Charlie had been a life-long friend of Marcus Lothrop, who like me was a mechanical engineer patent attorney. Marc was then 78 and still practicing in San Francisco. Back in the 1920s he had been the patent attorney for the Doble Steam Motors company and had bought one of their last cars about 1929. Only a few weeks later I was pleased to visit Marc and his wife Derelle in their beautiful Spanish Mission style home, high up in Berkeley, looking over San Francisco Bay.

Mark and Derelle Lothrop with the Duo-Art piano, photo taken in 1981

Marc had cleverly picked the right parents and the house had been a wedding present to the young couple about 1928. They lived there happily for the rest of their lives. A frequent visitor was Marc's good friend Warren Doble, brother of Abner Doble, who together were responsible for the Doble steam cars. Mark had shared a flat with Warren in their student days. The Steinway piano was bought from Sherman Clay & Co in San Francisco on January 15, 1936 for $3,300.00.



BILL OF SALE

Sherman, Clay & Co.

For value received, does hereby sell, transfer and convey to

Mr. Marcus Lothrop

Crocker Building

San Francisco

Steinway & Sons Duo Art Piano No. 268956

Thirty-three hundred and 00/100 Dollars, $ 3300.00

January 15, 19 36

Sherman Clay & Co

per W. F. McCormack

THIS BILL OF SALE IS ISSUED IN FULL SETTLEMENT FOR MERCHANDISE AS ABOVE DESCRIBED

Original Duo-Art Bill of Sale – 1936

This was an extraordinary amount of money to spend on a luxury item in the middle of the Depression. The Lothrops probably thought the distinctive Spanish Mission style piano case fitted particularly well with their beautiful house. (According to www.saving.org, $3,300 in 1936 is $58,000 in today's money.)

Marc and I became good friends and regular correspondents on steam and patent matters. He was very pleased when I was finally lucky enough to acquire a Doble of my own in 1992. This is Doble number E-11, shown on the following page. By another coincidence, Marc had once been offered this very same car in San Francisco prior to having another one (Doble F-30) specially built for him.

Bill's 1924 Doble steam car

I visited Marc again in 1984 and played the piano on both occasions. I knew nothing of the Duo-Art system but was fascinated by the piano and said that if they ever wanted to sell it, I would be pleased to give it a good home. Sadly, Marc passed away in 1994 and when Derelle followed some years later, their daughter Evelyn sold me the piano on 27 November, 2001. I had no idea what it was worth and asked Evelyn to have it valued. The price she nominated was US$7,000.

I assumed that much work would be needed to recondition the piano and on the advice of Denis Condon, it was delivered in its crate to Bruce Campbell early in 2002. The first time I saw the piano in Australia was also the first time I met Bruce on 12 September, 2002. According to my diary, I found him to be "a very happy soul, who likes music and company". He had only just opened the crate and had not had a good look at the piano, only enough to say "That's a very handsome piano." I had always assumed it was a 1936 model because that's the date of Marc Lothrop's original bill of sale. However, he showed me the serial number (268956) and his catalogue which revealed that the piano was actually made in 1929.

The next discovery was even more intriguing. Bruce had been giving me a rough idea of all the things that generally need to be done to get one of these pianos playing again. He then got underneath and pulled off the cover for the first time. He couldn't believe what he saw. "This piano has been beautifully reconditioned!" He thought it must have been done sometime in the past 30 years. He pointed out all the things that were not original but had been expertly replaced. This was all extraordinarily good news. All it needed was a 240/110 volt transformer and some general adjustments. This was duly done and the piano arrived at Bayview on 28 September 2002, where it has lived ever since.

I asked Evelyn about the surprise restoration and she replied that "Dad did indeed have the piano taken down and put together again but I have not come across any paper work. I hesitate to even hazard a guess as to when the work was done."

By an extraordinary but vitally linked set of coincidences, this particular Duo-Art Steinway was purchased in 1936 by a mechanical engineer patent attorney in San Francisco who at that time owned a Doble steam car. This Duo-Art now lives on the other side of the Pacific Ocean with another mechanical engineer patent attorney who also has a Doble steam car! Mechanics, music and steam have many points of common interest and often feature together in various collections. However, I doubt they would ever have had the unique personal and historic relationship I have been privileged to enjoy with Marc Lothrop and his Steinway.

The piano performed well for many years in its new home but gradually began to give signs of failing health. Peter Coggins visited on a couple of occasions and explained that the blue synthetic fabric that had been so popular at the time, had not proved to be long lasting. It would need to be done again in the near future.

On 25 February, 2017 I hosted an ACMMI meeting at Bayview for the first time. I knew the piano needed attention and was interested to learn what more experienced people thought should be done. The answer was given very succinctly by Bruce Campbell himself. I have always enjoyed the companion 1960 Model B Steinway but felt that the 1929 one was rather dead and difficult to play in comparison. Bruce gave me some precise details as to what was wrong and confidently assured me, "This piano can be made to play and sound as well as the Model B. You can shoot me if I'm wrong!"

He subsequently recommended Peter Coggins, whom I already knew, and put me in touch with Emanuel Rey, a highly skilled, Swiss born and trained piano restoration expert. Emanuel pointed out what needed to be done to the piano action immediately and what could be left until later. We decided that the easiest answer was “the lot”. This included new strings, new hammers and a complete restoration of the action. The yellow ivory keys could also be bleached white again, while keeping their characteristic grain and feel. Emanuel and Peter arrived together on May 1st, 2017 and made a joint attack on the problem.

Peter Coggins (behind) and Emanuel Rey under the Steinway

Emanuel carried off the action and Peter removed the pneumatics. I asked them to take plenty of photos and to keep all of the old materials for “historical” records. With my own photos and theirs, I now have about 1,500 photos documenting the work. I greatly enjoyed watching them work and visiting their homes to see more of their highly skilled craftsmanship.

The first delight was playing the newly restored piano. Emanuel had worked a miracle in turning the previously dead and lifeless action into something of warmth and brilliance. The new tone and key touch was as seductive as I find the Model B. There was no comparison between the old piano and the newly “reincarnated” one.

Then Peter returned with the equally miraculous pneumatics. It was a delight to hear the first roll played. Peter had showed me that the 4-beat pump was only producing a wheezing 2. Now the piano played like a demon, but with the full expression that I had never appreciated before. I was very pleased to call Bruce Campbell to tell him that he was entirely correct. The piano had been made to play and sound as satisfying as the Model B and I could reassure him that he had no fear of being “shot”. I was most grateful for his encouragement to get the work done.

Stewart Handley has been tuning the piano and Emanuel explained that it would take about four tunings before the new strings would settle in. Emanuel tuned it once when he installed the strings. Stewart has since tuned it twice and will give it another tune on the day before our Bayview meeting in December, so it should be in fine voice on the day. Stewart will also be tuning the Model B Steinway, which had fallen behind and has also needed more than one tuning.

Emanuel has recently regulated the Kawai piano I have at Denistone and I’ve been amazed at how much better that one is after being tuned twice in quick succession after being neglected for about five years. Not only is the piano easier to play after being properly regulated but I didn’t realise just how important the tuning is to the actual ease of playing. The notes just seem to be in their right places. God and Bach are in their musical heaven and all is well with the world. (*Photo shows Peter and Emanuel with the piano action from Bill’s Duo-Art.*)

MIDI-valve system for an Ampico

Peter Phillips

The concept of making a pneumatic player piano operate via electric valves goes back to the 1920s. For example, the Sanfilippo collection in the US has a concert grand Knabe Ampico that operates from an original remote spool box. Pipe organs of all kinds, especially theatre organs, have electric valves that allow air flow to pipes when keys are pressed. So, in the late 1970s there were existing examples when I first set out to devise an electric valve system for my Ampico, but as it turned out, none that met my criteria. This article is about my latest iteration of a MIDI-valve system.

Criteria to meet

The two most important aspects to consider in a valve system fitted to a reproducing piano are valve throw and the time constant of the coil. Let me explain. All electric valves, regardless of how they are constructed, have a coil of wire. Typically the coil is wound around an iron core, or in the case of a solenoid, around a hollow core so an iron plunger can move inside the coil. Another design might be like a relay, such as those used in the Bob Hunt VirtualRoll system, which incorporates small automotive relays.

That is, the valve must have a coil and a moving part that opens a hole when the coil is energised. The travel distance of the moving part (the valve) is the valve throw. As anyone who works on pneumatic players will know, valve throw is a critical setting. In the first place, it must trigger the pneumatic device it is controlling (eg a note pneumatic), which means it must allow enough air flow and therefore open far enough to achieve this. But it must also quickly switch off, which requires the smallest travel distance that is consistent with reliable operation. Achieving best operation is therefore a compromise between these two factors.

The term ‘time constant’ may not be familiar to all readers. This is a property exhibited by all types of coils, and refers to the time taken for the current flowing through the coil to reach a certain value. You might think the current would instantly reach its final value, but not so.

All coils have an electrical property called inductance, which is described as opposition to a *change* in the value of current flowing through the coil. So, when a coil is first energised, it takes time for the current to rise to a value that will cause enough magnetism to attract the metal valve. Furthermore, when power to the coil is switched off, it takes time for the current to fall to a point that allows the valve to fall back into place. In the case of a reproducing piano, some expression notes are quite short, such as the snakebites on a Duo-Art roll. If the time constant of an electric valve is too great, it may not respond at all, because the time duration of the signal to the valve is shorter than the time constant of the coil.

Another important aspect is that the valve should, ideally, provide a perfect seal when closed. Otherwise, because these valves are connected to the tubes from the tracker bar, any leakage through the valve will tend to overcome the effect of the bleed in a pneumatic valve. This might cause the pneumatic valve to operate prematurely, and remain on after the end of a roll perforation. But, a perfect seal can also mean the coil attracting the valve element needs considerable power to open the valve. The forces associated with a vacuum are quite surprising, and if a lot of electrical energy is needed to open a valve, that energy, after the current is switched off, will tend to hold the valve open until the energy is dissipated. There are quite a number of conflicting issues with valves operating a pneumatic piano.

The physical construction of a valve system has to support the 98 valves (for an Ampico), and provide a means of connecting to the tracker bar tubing. The size of the valve blocks is determined by the physics of many things, such as the size of each valve, the available space in the piano, and the limit imposed by the spacing between tubing connections. All valve systems I have observed have typically 16 valves per block, although a system I saw in New Zealand in the 1980s that was being built by a collector had individual Wurlitzer organ valves. I am not sure how they were attached, but they appeared to be individual valves and not in sets. I did not hear the piano play, which would be from a remote spool box.

The electronics to drive a set of MIDI-controlled valves is the least of our worries. Commercial MIDI products are available from various sources, and in its simplest form, the electronics is housed in a box, and each valve block is connected to the electronics with ribbon cable. Depending on the electronics, there is often no need for any electronic components to be mounted on the valve blocks

The first system

I am not sure of exact dates, but I am certain I demonstrated my Ampico playing from magnetic tape in 1979. At the time it was greeted with great enthusiasm, and over following years I retrofitted my so-called PA system to at least 12 Ampicos. While probably not the first of its type, it was among the first. In the 1970s, I had few resources and even less money, so my system was built in accordance with two sets of criteria: performance and a design I could build in my workshop. It was not possible to source the specialised parts, as the only outlets were disposal stores, and despite searching high and low, I could find nothing that would suit my needs. So, I needed a design that I could construct from the ground up.

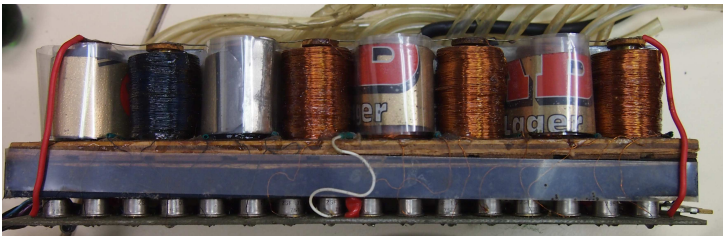
The first and most important aspect was the design of a suitable valve. The conflicts of low time constant, enough power, minimal size and construction simplicity all needed to be satisfied. Today, I would do it differently, but back then the answer was to wind a coil around a piece of iron rod, and to position the assembly so it could attract a disc of metal that would uncover a hole. At the time I was very keen on a product called closed-cell neoprene, the material used in wet suits. So, my valve was simply a metal disc covering a hole punched in closed-cell neoprene. The hole was connected via tubing to the tracker bar tubing.

To establish the valve throw, I connected a prototype valve to the Ampico and applied a signal to make the valve operate at a repetitive rate consistent with a trill. In hindsight, this was not the most scientific way to do this, and the valve throw I came up with was actually greater than it needed to be. But it worked, and I then set up an arrangement involving a multi-tube manometer that connected to each of the 16 valves per block. Pulsing each valve with an electrical signal, and applying suction to the open end of each of the 16 manometers meant I could adjust the throw of each valve by observing the position of the water level in each manometer. If the throw was too high the water level would fall below my reference line, too low and it would rise above the line.

The coil design by now had been determined, in which 5000 turns of thin wire were wound on a 3/8 inch diameter, one inch long piece of soft iron. I found a coil winding machine (ex Sunbeam) at a disposal store, and after I had adapted it to my needs, it went on to wind at least 1200 coils (that’s six million turns!).

Each coil was one inch in diameter, but it was also necessary to space the coils so there would be minimal interaction between a coil and an adjacent valve. This was to prove an ongoing problem, indicating my design had its limitations. Fortunately, there was enough space in my Ampico to place all but one of the valve blocks behind the stack, which meant I could space the coils to minimise the interaction. That is, I ended up with 80 valves located right near the stack and therefore near the tubing from the tracker bar. The other 18 valves needed in an Ampico were built as a block and mounted near the expression units.

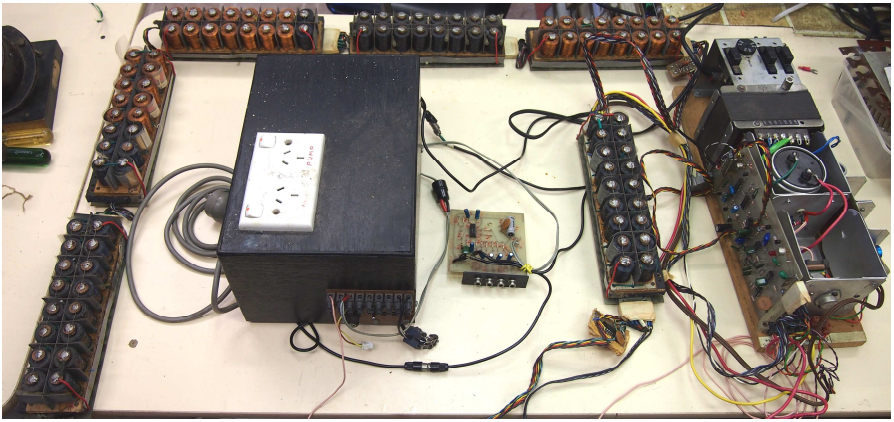
When I first began testing the valve interface, it had quite a few problems, mainly to do with the electronics. But there was also the issue of interaction between valves. At the time (1978), my father-in-law was staying with us, a man in his 80s who loved his beer. Grandad was upstairs that day enjoying a beer, when I began encountering valves opening when an adjacent valve was operated. In frustration, it seemed a beer would be a good idea, so I joined Grandad. Then I wondered if the problem might be solved by shielding the coils with metal. There in my hand was the very metal, a steel beer can. It worked, and while I resorted to other materials in later systems, my original valve system has metal shields branded Tooheys!



One of the original valve units with beer can metal shields

Because the coils were designed to have a low time constant, it was necessary to power them with 40 volts DC. Briefly, the time constant of a coil equals its inductance divided by its resistance. A low time constant is therefore achieved if the inductance is low, or the resistance is high. A high resistance is obtained by many turns of thin copper wire, but causing enough current to flow requires a high voltage. As well, because the valves were giving a very good seal, a high voltage was needed to overcome suction levels above 25" WG. Solenoids in the Disklavier and PianoDisc operate from voltages of 100V DC and 40V DC respectively, I suspect due to the coil design having a low time constant.

A concept not found on the commercial valve systems I have seen is a manifold tubing connector. This is in lieu of connecting tubes directly to a valve block, as in the VirtualRoll system, which meant the tubing in my system could be located behind each valve unit, up against the back of the stack, giving a neater installation and shorter tube length.



The prototype PA e-valve system, circa 1978. On the right is the power supply, the black box at centre-left switched power to the pump and electronics when a signal was received.

The revised system

It had long been my plan to update the valve system in my Ampico so it could play MIDI files. The previous system was developed before MIDI came into being, and I devised an audio-based data format that would suit a tape recorder. This later morphed into audio tracks on a CD, and there are still a few of my systems in operation playing from a CD or computer. I had decided to build a whole new system, as I wanted to remove the old version and put it away in case of interest in its historical value. It now resides in boxes in my workshop.

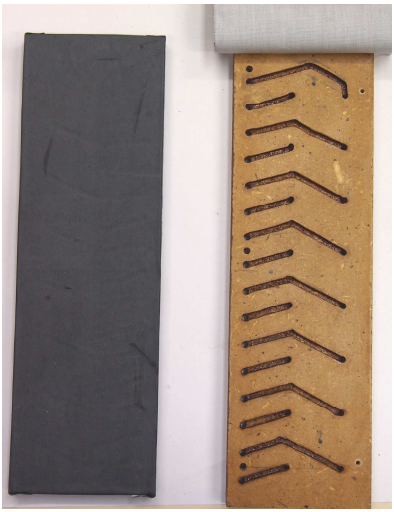
Initially I figured that all I needed to do was to build another set of valves based on the old design, and to drive these from a commercially available MIDI decoder board. I still had quite a few old parts, but not a complete set to make up a full system. Several options arose concerning obtaining the necessary parts, but these did not eventuate. In one case, the owner of one of my old systems wanted a great deal of money, another had parts he would give me, but I didn’t follow it up.

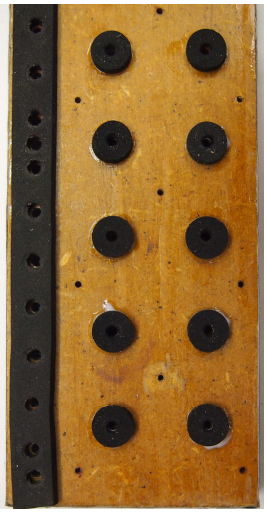
During a recent trip to Melbourne, I visited Harold Ball. Back in the 1980s, Harold and his three sons set themselves up to manufacture my valve system, and they built several units. The point is that Harold still had quite a few parts that were intended for a system that did not eventuate. After examining all these parts, I agreed that Harold's asking price was very fair, and so I returned to Sydney with pretty much everything I needed. Among the parts was a complete set of coils, wound sometime in 1986 and looking almost brand new. And so began a journey that was take me over three months. In the first place, I had decided that although it had stood the test of time, the old construction could do with some refining.

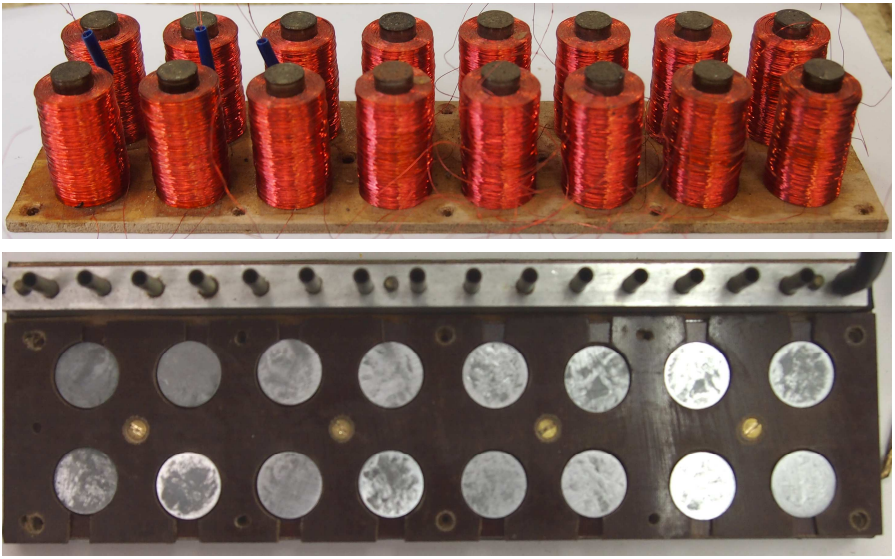
In particular, I wanted to establish the correct valve throw and to make this part of the construction, avoiding the need to make adjustments afterwards. In the previous system, adjustment was made by tightening screws that compressed the closed-cell neoprene rubber gasket. This time, rather that use my Ampico to establish the valve travel I used a one-finger vorsetzer I had previously built for other reasons. This arrangement has a wooden finger that would normally play a piano key, but in this setup it was arranged to hit a spring that needed the same pressure as needed to push a piano key. The pneumatic was controlled by an Amphion primary and secondary valve. Once I had determined the ideal valve throw (about 0.8 mm), the next step was to modify the design to suit. A few photos will help explain, shown below and next page.

Left shows underside of timber valve block, routed to connect valve holes to manifold holes. This side is covered with air-tight cloth.

Right shows the other side of the block, with closed-cell neoprene rubber valve seats and manifold connection





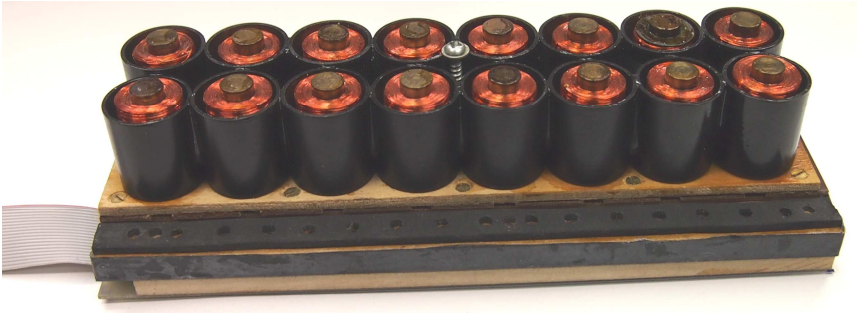


Top shows a set of 16 coils on a plywood board. The coil board sits on top of the valve block shown under, in which metal discs cover the valve seats. An aluminium manifold is shown

The difference now is the separate neoprene rubber valve seats. In the old design, the entire surface of the block was covered with rubber, and the valve throw was adjusted by screwing the coil board to the valve block and as a result, compressing the rubber and reducing the valve throw. Now, the throw is entirely determined by the height of the spacer surrounding each disc. The correct height was obtained by using various suitably-punched materials of differing thickness. It took a while to get this right, but it is so important.

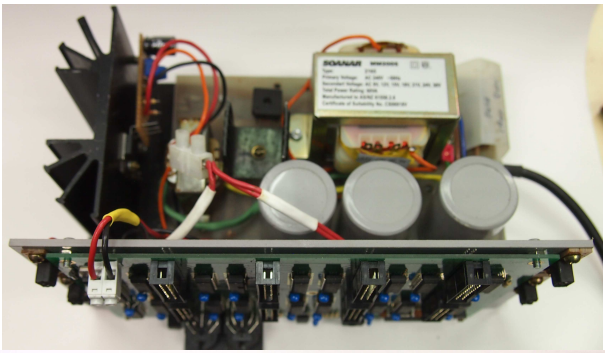
Because the valve throw was now less than that of the previous system, the voltage operating the coils could be reduced. But the problem of interaction between valves was now more prominent than before My solution then was to shield the coils with what looked like an ice-cube separator. That arrangement did not work in the new design, instead it required shielding each coil with a length of thin metal tube, as first used by Harold Ball and sons. Terminating the common wire of each coil was originally done by soldering it to a small piece of circuit board glued to the top of the iron core of each coil. A common wire then connected to each piece of circuit board, making it impossible to remove coil shields.

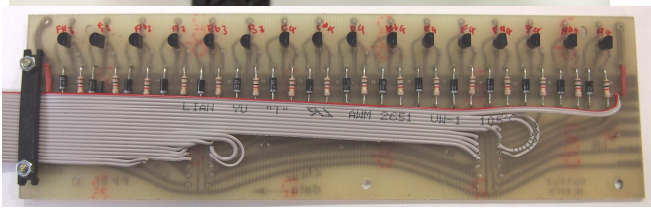
To avoid this, in the new design I connected the common wires to a length of wire laying along the surface of the coil board. This allowed coil shields to be fitted last, which meant a valve board could now be disassembled more easily, a procedure that needed to happen a few times!



A completed valve unit. A circuit board sits under the unit with transistors to drive the coils.

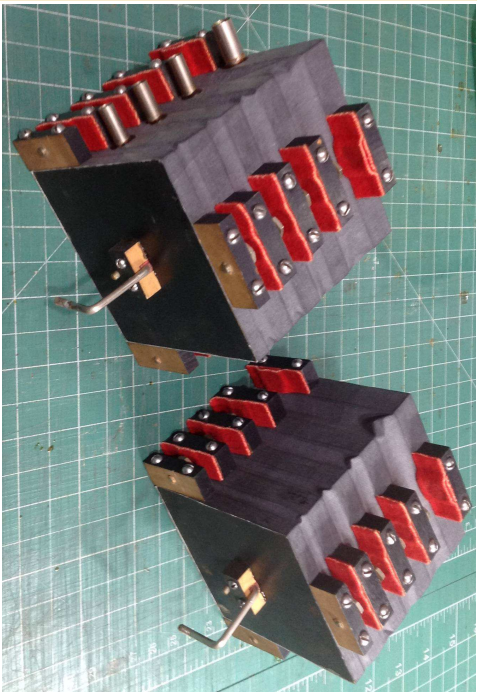
I should point out that I do not claim this design to be state-of-the-art or ideal. It is simply a revision of a design that has worked well over the last 40 years. A better design would most likely incorporate small solenoids, as these require less power and voltage and would give a more compact arrangement. But these would need to be purchased, an option I did not have all those years ago.

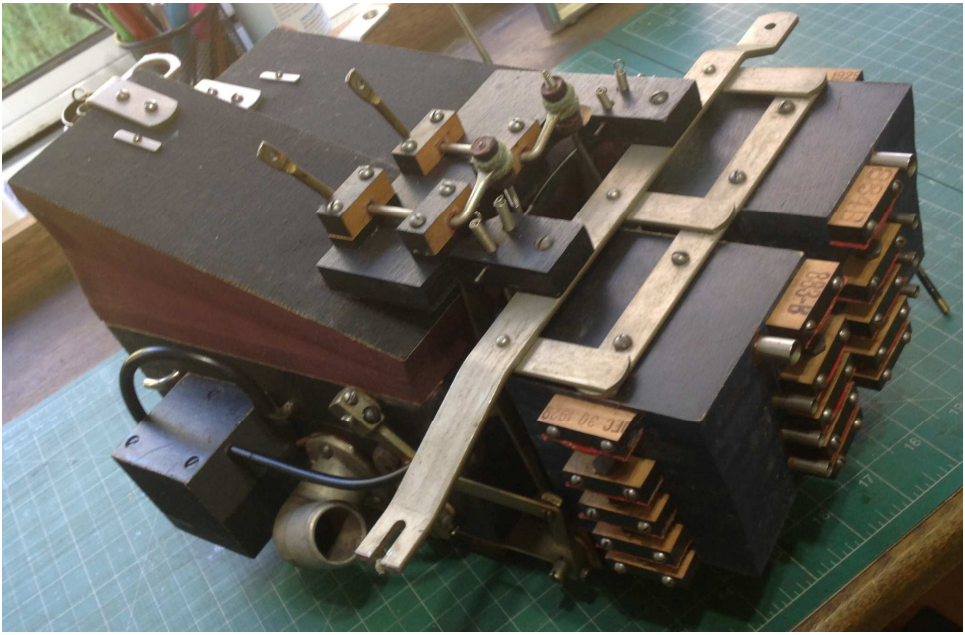




The electronics. Top shows the power supply and MIDI decoder board (commercial product). Below is a circuit board that sits under a valve unit. The ribbon cable plugs into its relevant socket on the MIDI decoder board attached to the power supply. There are six valve units.

Bill’s Duo-Art expression box under restoration (photos Peter Coggins)





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