Schober Organ Notes No. 53

OVERTURE

We are gaining in membership! New members have heard about us through other members and our web site. So welcome to everyone new. We hope that we can help each other restore and maintain our Schober Organs. The new column that I added in ON 52, "Swap, Sell or Give Away Ads" (of non Schober related items) did fairly well. I did give away what I had advertised. However getting other ads from you so far has floated like a lead balloon. Hopefully we will get some ads for our next issue.

Bob Bainbridge And His Fabulous Robertone MK-8

When Bob was a boy, the Radio Age was at its infancy. His interest in that and music caused an involvement with electronic instruments. When he was nine years old, General Electric put WGY on the air. Bob built crystal radio sets and sold them to classmates in Scotia NY.

"When I was in the 6th grade, today they call it middle school, some company set up classes teaching wind instruments with parents paying a rental fee. I sold my folks on taking up the clarinet. After a lot of squeaks due to cracks and leaks on an old wooden Albert system horn, my dad bought me a pair (Bf and A) Beheom System horns made in France. Good wood and no more squeaks. Soon I played in the school orchestra and thought it was fun.

When in High School I continued the orchestra work and got involved playing an Ef saxophone which was loaned to me by a student. This was better than fun since we were paid for dance work and kept busy most every week end and sometimes on school nights."

"After graduating I entered Union College and got in their marching band so I could travel and see the games at no charge. They had a good supply of instruments, so I picked up a big Ef sax and used it to fill in the bass in our five piece jazz bit. I also learned to play the trumpet for 2nd fill in when needed. We played in frat houses in RPI and clubs in Troy and Albany. Next came the crash of 1929 and we were soon working for beer and sandwiches. My dad was also put on short schedule and I had to leave Union."

"I was lucky to find work with a Kelvinator distributor as a stock clerk and learned how to service domestic and commercial refrigeration. Soon I was installing the big stuff. I guess I learned my trade as the manager stopped me one day and made me Service Manager with a crew of eight men. Great, but now my day was 24 hours long and the phone was always ringing.

At 2AM I would be heading for Placid or the Catskills to fix units in commercial meat markets. Of course I continued playing the horns whenever possible. I made acquaintance with a young lady who was secretary to the CEO and we decided to get married as my salary was now fairly substantial, and I was also paid for playing in a couple of local jazz bands."

"Of course my family expanded with a daughter in 1935." Then booze restrictions were cancelled and presumably people spent more time in bars and spent less money on entertainment. "After a New Years date playing from 10 PM to 2 AM, I got home…looked in my wallet and had only $15 in it. I carried my horns up to the attic for the last time. This was Jan 1, 1936."

"In 1938 Kelvinator discontinued it's Albany outlet, so I got a service managers job in Glens Falls, NY with one of the better dealers of our products. My experiences there included working with Kelvinator and Westinghouse equipment and oil heating and coal stokers, both domestic and commercial installations and wiring and plumbing new houses and installing factory boilers."

"Along came WW2 and new products shrunk due to war shortages, so before the crash came, I applied for a job with GE at a new plant making turret controls for the new B-29 planes. This system replaced the hydraulic turret controls used on older bombers which would fail when the ack-ack hit the oil lines."

"I was hired as a production chaser but soon was given a promotion to foreman over 80 women aged 18 to 74, winding stators for Selsyns. When radar was first developed, we also wound the yokes for the monitors. This was fun and I got a lot of knowledge of electronics helping the EE's with turn counts and taps on these yokes."

Around this time, 1941-2, Bob was given a reed organ. A gift from a church in So. Glens Falls where it was replaced by a Hammond. "It had a high back bar and was too large for my family room. I saved the works (reed box, keyboard and stops), and built a console out of white pine boards". The bellows were shot, so Bob used an Electrolux vacuum cleaner instead, reducing its suction by putting a 200 watt bulb in series with it. "I made a spring loaded vacuum control [adjusted] so that I could play ten keys at once without losing the sound, a swell (volume) control was made from an old carburetor butterfly valve and I was in business … I had to move the vac into the cellar due to the noise it made and piped the vacuum to the console with a hose. To make more sound, a low priced mike was placed in back of the console and tied to what was then a deluxe home built tube power amplifier using a push pull output fed to a 12" speaker. Now I could play my one finger melodies plus three finger left had chords and mess around with the stops that played octave related notes. To hear what was possible I invited the organist from Christ Church to try it out. He thought it was pretty good and spent some two hours on the keyboard."

Due to the mike picking up all sorts of key and stop noise, a different pick up system was needed. I drilled and tapped a hole above the front end of each reed to take a #10 brass screw. Each screw was sanded smooth and flat on the shank end. A hole was drilled in the tail end of each reed and they were all connected to a ground bus. The screws were adjusted to just clear the maximum throw of each reed. Then a DC voltage was applied across the bus and the adjustable front screws. A two stage amplifier with high gain capacitance was connected into the circuit, and hooray the damn thing worked. On some notes the screws touched the vibrating reeds and wanted to tear the speaker apart, so I made a lead weight to hold down a key while I adjusted each pick up screw for the best sound and no banging. With time and improved tube amplifiers it did a pretty good job, but the tubes also heated the room! My next attempt to make a Hammond was with tube type oscillators using the keyboard with home made contacts and the pine wood console. My first try at electronic music."

At the end of the war the plant Bob was working in was converted to making capacitors. The equipment was moved from Pittsfield, MA and Bob was coordinator of the move, "and got my first taste of PCB's." After the move was completed Bob was made foreman, then general foreman and then Supervisor of Quality Control and transferred to a new plant in South Carolina."

Raising a family and putting two kids through college, prevented Bob from buying a Hammond Organ which cost $5000 in the 1930's, so Bob experimented building a Solovox, Theremin and seven more electric organs. "It was a program of keeping up with the inventions of the time, gleaning all the information available. My first attempt involved electronic tubes that now were fired up ;with AC instead of batteries. Making slave octaves was a problem so I tried an oscillator for each note. This resulted in "keep-in tune" problems and a multiplicity of tubes that

kept the house warm in winter and hot in the Summer." For every succeeding effort, Bob salvaged what parts could be had from the previous trials.

"My bungling around led me to make a Theremin. I sent away to the Patent Office and got a copy of the patent." Bob converted the old circuit diagrams and made up an oscillator, tied it to an antenna made from a handle of an old hair dryer, hooked it to a power amplifier and was able to play a tune by waving his hand.

"One of my fellow EE's was a good piano player, you name the tune and he could play it. We got together, me on the Theremin with one note melody, backed with his excellent piano. This worked out quite well and we soon played on a Columbia SC TV station. Requests for us came in from schools and hospitals. One of the hospitals was the local Mental Institution. We played for a group of inmates and several doctors. An inmate said he wanted to play so we asked him to play something on the piano. We then asked him if he would like to monkey with the Theremin. While I guided his hand, my friend followed the tune. After a few bars he got the idea and did a good job. The rest of the inmates clapped their hands and hollered his name. We were never invited back. Through the grape vine we heard that the doctors did not like the fact that we had an effect on their patients that they were not able to accomplish."

"Solovox information was available in service books so here was another avenue to explore. With a chunk of keyboard from a discarded reed organ and homemade contacts the instrument took shape. It was good enough for solo and fill in for five piece spot jobs at local parties. Through the circuitry of the Solovox I had built my set of top octave generators, however since commercial organ makers were quite tight lipped concerning their secrets, a divider system to provide the seven lower octaves was still in never-never land."

"In my travels I ran across a piano equipped with a rack of electric switches mounted over the keys, connected to a box that contained a loud speaker." This was an Organo. Bob could not get information from the manufacturer, but the owner of the night spot allowed him to unplug one of the circuit boards, and Bob drew a schematic of it. "Hurray! I struck pay dirt. Organo's simple type flip-flops did a nice job of frequency dividing, and a clever way of stair-casing the outputs made a sawtooth wave. Furthermore it could be translated into a home construction project."

"Slowly, as mad money and therefore parts were scarce, my first all electronic organ began to take shape. Filament power to light up sixty 12AX7 tubes took a 30 lb. transformer". Using parts from an old three manual keyboard that had been stored in the open belfry of a church, Bob constructed a two manual keyboard. The key-switches were made from gold-clad nickel wire as suggested by Richard Dorf of Schober Organ Co. The pine console was stripped and refitted with these keyboards, and 25 pedals cut from fir flooring. "Now I had a fairly respectable music maker even though it only played 8 foot fundamental notes since it only had single pole switches. This console was to see many more revisions, the 7 being the last."

In 1969-70, Bob was transferred to Singapore to build and manage a new plant manufacturing miniature electrolytic capacitors. He retired soon after his return. While there, however he had rented a Yamaha organ and this seems to have wet his appetite to construct a completely new organ, number 8, which he calls the Robertone MK-VIII.

"I had to make up my mind to either buy an organ or build one like the Schober ads showed. Knowing the time element of the latter I bought a Yamaha to enjoy while I did a bit of homework on the advantages of IC's. In 1974 I warmed up the old soldering iron and experimented with some computer based IC's that could be applied to organ circuits. Results of this trial and error procedure were so impressive I decided to build a new organ to end all organs as this would probably be my last attempt. I put all my woodworking equipment and electronic tools in the garage and went to work.

"I got to know a great guy at Schober. A VP by the name of Jim Ramsey. I collected

information and pictures of their products from him, Richard Dorf and Devtronix. It took a couple of years spare time to design and mock up the various sections of electronics required. Improvements in the
solid-state art threatened my sanity as new and better IC's showed up in the technical journals by the hour it seemed. Finally I made up my mind to stick with a design and stop reading about new stuff."

"I went to the lumber supplier and bought plywood, veneer and a gallon of contact cement and built my last console. It was built similar to Schober's Recital which was all straight line work. The electronics were constructed on perforated circuit boards. Twelve tone generators were built, each starting with a tunable oscillator and chips driven by this to give me 8 octaves of perfect square waves. Next the stop board panel was fitted to the console and GE mercury house type wall switches were machined to hold tabs. These switches are very positive, quiet and will last a long time. A rheostat over each stop controlled the volume of the output of the electronic keying system. I had learned in previous work to keep the tone signals out of the keying circuit, unlike Schober's design."

"Next came the tone filters. Using resistors and capacitors, by a cut and try system the wood winds, flute, horn and string filters were made. The woods were easy requiring only chopping off the sharp corners of the square waves, but the rest took a lot of time to perfect. Preamps for each
group of voices were made. Vibrato and sustain were built into the control panels. A swell pedal was built using a light controlled chip and a Reverbatape was purchased from Schober."

Two 61 note Pratt Read keyboards and a 13 note pedal board were bought from Devtronix and installed and wired into the console. I connected a couple of power amplifiers and speakers and after three years of building and revising, had the Robertone MK-VIII. I gave the Yamaha to my son in Tennessee. There was distortion on loud ranges on all the separate voicing outputs however. I had used Schober as an example, but now I thought that they did not use enough power amplifiers and speakers to get a good replica of a pipe installation."

"A little while later, due to the high humidity in SC, I moved back to NY State near Glens Falls . Not having a large family room, I put the console in the dining room next to an open stair well to the basement, copying Jim Ramsey, who cut a hole in his living room floor and put his speakers in the
room below. My open stairwell was the hole."

"I added several power amplifiers, one for each major voice group, mostly 30 and 50 watt with one 100 watt for the pedal tones. I built speaker housings which had one to four speakers in each. Nine of these are in the basement and two are fastened to the wall in the stairwell. The latter are connected to the oboe and high note string outputs as they are not strong sounding. Now I can shake the walls without distortion."

"Then I wanted chimes. I found that playing a four note chord plus the first note of the next chord plus a longer sustain sounded like a pretty good chime. I bought a toy organ with two octaves of keys, built contacts of phosphor bronze strips, made a box out of plywood covered with left over veneer from the console and attached it below the lower manual on the right. Once again DC keying proved it's worth. Each key was connected to it's source of five tones and it sounded good when played through it's own amp. and speakers. I always get a kick when guests look for a rack of pipe chimes in the basement after hearing the "chimes" played."

Bob sent me his notes, schematics and photos of the Robertone MK-VIII. The circuit boards look as though they were manufactured, so neat and orderly. The console is beautiful. Most importantly the sound is fabulous. I listen to and enjoy a tape of Bob playing the MK-VIII often. I am absolutely amazed that Bob designed and built everything (with the exception of the keyboards and Reverbatape) himself! Bob, thank you for sharing your story.

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MICROPHONE

A good microphone is expensive. Through the courtesy of Cornelius de Kam of ETONES, here is how to make a fine hi-fi microphone inexpensively. (Because of space limitations I will condense and paraphrase somewhat, combining two of his letters in the ETONES newsletter)

Someone wrote to say that the Radio Shack microphone at around the $90 level was good for recording. If you looked at the specifications of 50 -12,000 cps it wasn't that good. Realize that even the best microphones sometimes quit. Instead of getting a new one, you just replace the element. What this says is pick up the cheapest microphone you can find and replace the element with one of the top units.-From time to time Radio Shack sells a headset made by Koss. (Pro-25 $19.95 on sale in some kind of a promotion) The elements are dynamic units that have titanium diaphragms and samarium (sp) magnets. The response is 20 - 20,000 cps. I have checked these units out on my scope and they have a very smooth response curve. All that is required is to remove the elements, wire the two wires to a shielded cable, shield them with a small metal can or tube and place the unit with a foam powder puff into the cheap microphone.

If you don't like dynamic mikes, get the condenser replacement elements from Digi-Key #9925-ND, $2.69. The response is 20-20,000 cps and at only 3db down at the top and bottom. The $200 mikes on the market can't come close to these specs. (Digi-Key, 800 344-4539)

CAPACITOR CONTROVERSY!

As reported in ON 51, I had a very informative chat with Warren Boehling about the Schober Organ Co. their designs etc. One thing he told me was that the voltages at which the 5mf.electrolytic capacitors on the circuit boards worked was so low that it was better to use 25-30 volt units instead of 50 volt. That way they would not dry up as quickly.

Ray Devault wrote to Fred Henn "...Bob Avedon worked for Schober for quite a long time...I've known him and Richard Dorf since about 1966 so I called him Sunday evening to chat about Schober's history....The Concert model needed lots of help, so Bob Avedon came on board and with some assistance completely redesigned the organ and it became the original Recital model with the 12 separate tone generator modules. ...(When) Warren Boehling graduated as an engineer, Schober gave him a full time job and he and Bob worked in the lab together. They then designed the Recital Model into one using IC's in the tone generator...I asked Bob about the 5 mf. Capacitors that gave all the trouble by drying out. He said 'Oh, those damn capacitors. They were built by one company and not properly sealed so the electrolyte dried up and they lost capacity'. Voltage had nothing to do with it. It was a manufacturing problem."

SCHOBER RELATED ADS

Theatre Organ

Jean Probert has a Schober Theatre Organ she has no need for. Contact her at 7363 Buffham Rd., Seville, OH 44273, (330) 948-1847.

Parts Needed

Lester W. Schlumpf is looking for the Preamplifier-Vibrato board PTR-4 and Mixer-Compressor MTC-1 (or later models) for his Theatre. Contact him at 20 White Birch Dr., Dix

Hills, NY 11746-7721 (516) 423-6608. Email lesschlumpf@juno.com.

Bulletins Etc. Needed

For our library, could you please send me copies of any Schober INFORMATION BULLETINS you have? I already have #BN-046, SOC-11. The instructions and schematic for Recital Tone Generator 11171. (NOT 1117), anything on the IC Tone Generators and anything on any chimes.

Parts Needed

For myself, I am looking for a derelict TR-3 amplifier or a 11507 circuit board. One 1117 Tone Generator. Anything to do with any of the IC presets for any model Schober.

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Please send in your ads!

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Please note my new address. My location is the same, but for 911 purposes I needed a street address.

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