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Switchers' Quarterly

Seen in Captivity

Layout Editor Doug Alderdice has in his collection this J54701B PBX Test Set, acquired at the June 2012 Lancaster TCI show. According to CD-66073-01 it is for the No. 701A, 701B, 711A, 711B, 740A, 740B, 740C or 740E PBXs to test line finder, trunk finder, connector, selector and selector connector circuits. The test set is shown here on its side as the carrying handle and jack field for the test cords are on the bottom of the unit.

Switchers' Quarterly

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In This Issue

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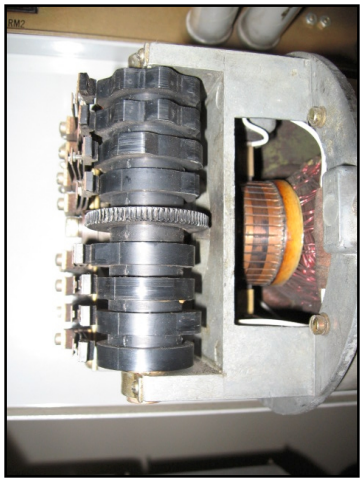
Want to see your story listed in "In This Issue"? Well then get busy and send it in! SQ is always looking for articles, stories, anecdotes and other material of interest to our readers. You don't have to be a 'writer' all you have to do is write. Handwritten, typewritten or word processed - we take 'em all. Pictures too. If you haven't got a scanner, send a copy print, not your irreplaceable originals or negatives please! I'll make every effort to return originals, but no guarantees! -CM

Fixed My Ringing Machine!

Michael Zaiontz

Photos by the author

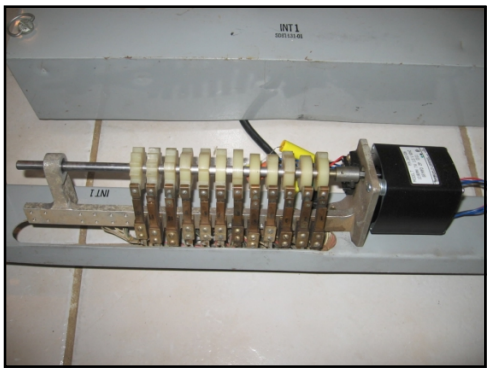
First, how it works. I have a rack mounted ringing machine. (Pictured at right) On one end of the tone/ring generator is a gear/cam assembly. (Below) The assembly has four cams on either side of the gear. The cams actuate contacts to provide the various tone and ringing voltage cadences. The assembly is all one piece made from plastic with a metal rod shaft running though it. It is held in place on either end by two brass bushings. The gear in the middle of the assembly is turned by a worm gear. The bushings, on either end, have the hole for the shaft of the cam/gear assembly offset so that as you rotate the bushing in its holder, you move the cam/gear assembly closer to or further away from the worm gear to accommodate wear of the plastic gear.



The Problem

The plastic gear on the cam/gear assembly has three 'dead' or worn spots that slip when they come into contact with the worm gear such that the gear/cam assembly stops turning. The brass bushings are at their limit and cannot move the gear any closer to the worm drive gear.

I had a plan 'B', an external motor/cam interrupter that I had rebuilt (picture below). The old motor was fried and a new one was available from Grainger. But using this assembly would involve either re-wiring the existing tone/ring generator to use the external interrupter, or abandoning the ring/tone generator all together and using an electronic tone/ring generator that I have with the external interrupter. I was not comfortable with either. So those were last resort options.



On the path to a solution.

I contacted some online gear manufacturing sites as well as a machine shop a few miles from my house. Either they did not want to work on the project or their price was in the thousands of dollars to make a new gear or resurface the existing gear.

After some thought, it came to me that maybe I could make new bushings with the hole for the shaft closer to the edge so that I could move the whole assembly closer to the worm gear. But how? I'm an amateur woodworker who knows how to weld, not machine small metal parts.

I'd have to get a brass rod of the correct diameter, ½ inch, and drill a hole parallel to the rod into the end of the rod, again of the correct diameter, ¼ inch.

Aligning all of this on my drill press would be impossible; I'd never get the new brass rod perfectly aligned with the drill bit. The hole in the rod would have to be parallel with the rod otherwise when the entire thing was reassembled, the shaft of the gear/cam assembly would bind and not turn.

Then it came to me: if I put a block of wood into my drill press and then drilled a ½ inch hole into the block of wood, which by default would be aligned with the drill bit. Then, I would insert the brass rod into the hole and clamp it in place. Moving the drill press table a little to one side, I could then drill a hole into the end of the rod, offset more than the old bushings. And this hole would be aligned by default with the rod.

I was lucky to get a scrap piece of wood from a big box home improvement store for free. It had a grove cut in one side that was perfect. (picture below) It would expose just enough of the rod so it could be easily clamped and prevent movement

of the rod.

The brass rod I bought from a seller on Amazon. (Pic #5)

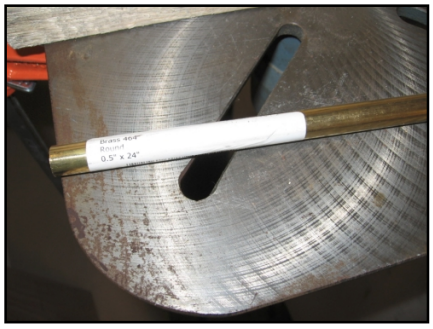
All went well. I clamped the block of wood down to the drill press table. Then I drilled a ½ inch hole completely through the block of wood. (Pic #4) I inserted the brass rod into the hole I drilled into the wood from below the drill press table. (Pic #6) Then I clamped the rod down. (Pic #7) Loosening the drill press table slightly, I moved it so as to offset the inner hole. The amount of offset was just 'eyeballed'. (Pic #8) After drilling the ¼ inch hole into the end of the rod with a lot of WD40 for lubrication, I then cut off pieces of the rod like doughnuts and filed the cut ends smooth. (Pic #9)

After assembling the bushings and gear/cam assembly back into the ringing machine, I found that I was able to move the assembly closer to the worm gear so that sufficient contact was made to turn the assembly even past the dead 'spots'. (Pic #10) I'm hoping that by pressing the two gears together, new threads will be cut deeper into the 'dead' areas.

So for the near future, my ringing machine and step switch can get back online after a long time being down. And if all else fails in the future, I do have plan 'B'. SQ

#9 New offset brass bushing shown next to an original one.

#6 Inserting rod into the hole.



#5 Brass rod.

#4 Drilling the wood block

#8 (Above) Drilling the quarter-inch hole.

#7 Preparing to drill quarter-inch hole.

#10 New bushing installed.

Editor's Note

Chris Mattingly

Greetings from the Springtime Winter Wonderland! Spring officially arrived several days ago then we get eight or more inches of snow (sorry, European readers, I don't know what that is in Euros). This should all melt by Spring, right?

I was going to e-mail Anders Järvenpää in Finland to see what the weather has been like in his area, but didn't get around to it. Up where he lives they get only about three hours of sunlight a day in the middle of winter and I have no idea how much snow. I will have to include that the next time around. How is it where you live, Doug? [*Seasonably cold ... I'm ready for spring! ... D.*]

Not much in the way of switching has been done in my house, as I've been tied up on the Scottish Rite organ project I may have mentioned before. That has been going on more than a year now. It's almost done, as far as the wiring is concerned. Our organ chapter is hosting a weekend regional convention. It is only ten days away as I write this, so I have deadlines to meet besides this edition of *SQ*. With the new computerized relay installed, the organ works much better, including the Antiphonal chamber on the other side of the auditorium, which hardly worked. The only thing left for me to is to wire the Echo chamber located above the ceiling which was not working at all. You would not believe the soot that has accumulated on this old stuff, left over from the days when the building was heated with coal. My hands turn jet black every time I touch the cabling. As my wiring of the new relay system to the old organ progressed, I was wiring on these horizontally mounted wooden terminal strips mounted on a panel and getting closer to the bottom, only inches off the floor. It was a tight squeeze, as they are close to the facing wall and there was a wooden trough that cables and a wind line were in. I had to lay on the floor to wire these bottom terminal strips and my head was only several inches away, making it difficult to focus on what I was doing.

It's a good thing our current telephone buildings were not heated with coal. Getting all that coal dust in the dial switching equipment would have been a disaster. That may be one of the reasons why around here anyway they put the new dial equipment in new buildings and sold the old manual exchange buildings during the dial conversions.

Make plans now to attend the Lancaster and Cincinnati shows, and be sure to bring your switching displays and artifacts. As always, your articles on switching equipment and experiences are welcome!

I spoke too soon department: Previously I wrote about the red phone booth/kiosks they still have in England. Recently there was an article posted on the TCI list-serv about efforts to remove the last remaining ones and selling them as antiques. I hope they don't get rid of all of them, especially by the London riverfront. Years ago I read that they were considered a national historic treasure and could not be exported. A few previously had been brought to the United States. Now they will have a surplus of them and I wonder if that rule is still in effect. These kiosks are made of cast iron and are unbelievably heavy, weighing about 2,000 pounds. That's about twice what my pick-up truck can handle. Now if I did get one, where could I put it? It certainly can't go inside the house. The floors would never support it! I don't think I would want it outside, either. The local Dr. Who fans might try to spray paint it blue.

In the next edition I hope to include an article about the Ericsson AGF system, with pictures of the one I saw in Finland last June. However that means I will have to (Gasp!) research how it works so I can write the article! SQ

Some photos of Phil McCarter's Collection (see article on page 5.)

Phil McCarter's test board.

Part of Phil McCarter's telephone display

Phil McCarter: My Story

I have collected phones, key systems and several switching systems. My plan was to create a mini Bell System type network. Over time the plan grew to include toll carrier equipment, switchboards and soon a two-ten pin cross arm pole line. I have amassed a large collection of Western Electric step-by-step and crossbar, Stromberg-Carlson XY, Automatic Electric, Itec, North Electric CX-100 and other types of switching equipment.

Phil's 3CL switchboard

At this time the WE SxS is about 90% wired. The Number 3 Crossbar is fully wired, and only needs the trunks completed and some internal repairs. The CX needs the CAMA trunks completed. The systems were planned to handle high traffic levels.

I have an Asterisk System set up to place up to 48 random calls, to make the switches sound like a real working office. The WE SxS has 60 working internal links and about 40 incoming or outgoing trunks. The Crossbar when finished will be able to handle 30+ calls. The CX-100 has seven local links and six incoming links. The AE and Itec has not been set up at this time. The XY can handle 25+ calls.

Plans are to be able to place calls to the 3CL Toll Switchboard and then back to the switching systems or to Asterisk. The toll switchboard has the ability to place calls by DC Key pulse or Multi-Frequency signaling. Special thanks goes to Steve Flocke for designing CAMA trunks from parts I had on hand for the MF part of the switchboard. The switchboard has two positions with a total of 16 cord circuits. I have a five circuit magneto to 3CL trunk as well. This will connect the 1800 Switchboard to the toll board. This switchboard has DC/ Keypulse keypads, with one DC to Dial Pulse Sender and ten trunks to access the SxS systems. The 3CL will have approximately 40 trunks connected to toll stations, incoming, outgoing and Asterisk TDM trunks.

All of the systems are interconnected on an Extended Area Service basis. Each of the systems has its own Automatic Number Identifier that is connected to the Asterisk Class 4 electronic switching system. When calling another C*Net user, they receive the number the call is originating from.

The estimated combined weight of the switching systems and switchboards is over 70,000 pounds, not including the cable.

The system has been designed to complete 1+ and operator CAMA trunk calls to any C*Net or DDD world number. In order to accomplish this, all 1+ calls are standard ten digit numbers. C*Net is 1+200+seven digits.

To use some of the lines, I have also a collection of approximately 300+ single line phones, a 20-line 1A1 key system and a 300-line 1A2 key system. I have over 300 key phones as well, and a lot of payphones. In the main display room there will be about 300 phones. When I started to collect phones and switching equipment, it was going to be a 200 line SxS system. Thanks to help from others it grew a lot. I was self employed at the time so I had more control of my time to run after the equipment as it was being removed.

I was blessed by God to be able to purchase the entire contents of a building. This was great, and all of the schematics were included. At the time I purchased three central office switches, about 2000 lines. The excess was shared with others and some later sold on Ebay (I wished that I knew that Ebay was going to exist 12 years later).

I started with the telecommunications industry just before the breakup of the Bell System on January 31st, 1984. I started with a 302 set and a 1A2 key system when I was in junior high school. For most of my career I was mostly self taught. I worked with a lot of ex-Bell System people throughout my career, and was always willing to learn from others. After I sold my business and ended my self employment, I went to work as a central office equipment installer. I learned the proper way to lace cables and build the superstructure for my central office.

As of 2010, I have made more than 30,000 hand wired connections. The project has been under way for more than 14 years. I still have about eight more to go. Then it will be time to rip it apart, because I'll be old, so in the future someone else will have equipment!

There is also 'O' Carrier with Single Frequency signalling units.

All of the switch aisles added together would be over 273 feet long, and made up of 500 WE SxS switches, 60 plus AE switches and 130 XY switches and relay plates. If I finish the entire project, I'll have 1700 working lines. I need more phones. Just kidding, as I've run out of room!

The long term plan will be to place a call from a 1899 magneto phone connected to a turn of the century cord switchboard over the proper trunk to a common battery switchboard to the 3CL Toll Switchboard to either the dial switching systems for to a 2013 cell phone. I'll call this my 100 year phone call. The entire call would be using the correct equipment for each part of the call.

Editor's Note: Phil McCarter is a long time telephone and switch collector who lives in the Portland, Oregon area. Also, see more photos of Phil's switches and telephone collection on page 4 and in the special e-Bonus section, available in the online members' area.

Background and History of the Evolution and Deployment of the Rotary Telephone Switching System

by Roger Conklin

Continued from the previous issue of *SQ*

When World War II ended in 1945, Automatic Electric's order books were full to overflowing. The pent-up demand for equipment was far beyond its capacity to produce it. Its order backlog was so large that many Independent companies had no hope of delivery of new automatic equipment for manual to dial conversions for several years. These telephone companies literally had their backs up against the wall. They had nursed their old manual switchboard equipment through the war years by replacing worn out switchboard keys, jacks, cords, plugs and relays. Much of it was so old and worn out that it was almost beyond hope. The dial telephone was here to stay and manual systems were destined to ultimate extinction, so the installation of new manual switchboard positions was mostly for the purpose of temporarily attending to demand until exchanges could be converted to dial. Into this vacuum stepped ITT with its 7-A2 Rotary system. Totally unknown in the US, its Federal Telephone and Radio Corporation plant in Clifton, NJ and Federal Telephone Laboratories in Nutley, NJ quickly went to work designing new Rotary circuits and modifications to meet the requirements of US Independent telephone companies. FTR was already tooled up to make the 7-A2 system, having done so in a limited way during World War II to meet emergency requirements of ITT's customers in South America, Puerto Rico, and New Zealand. Rotary production in Antwerp had been shut down by the war. The first two US Rotary customers for large exchanges were Rochester Tel. Co., Rochester, NY and Home Tel. Co., Lexington, KY. These were quickly followed by Central Telephone subsidiaries in Tallahassee, FL, La Crosse and Unalaska, WI, and Indiana Associated Telephone Co., a subsidiary of General Telephone, in Elkhart, IN. These cities required large exchanges, complete with manual long distance switchboards. Rochester, the location of Stromberg Carlson's factory, was in fact the largest city in the US still with a 100% manual telephone system when World War II ended. The new 7-A2 systems installed in the BAker and HAmilton exchanges with a total of 13,000 lines were placed in service on August 27, 1948. A few months later the EMpire and LOcust Rotary exchanges were placed in service. By 1950 a total of 44,000 telephones, all in the Rochester central business district, were served by these four Rotary exchanges.

None of the 7-A2 Rotary systems installed in the US remained in service for more than just a few years. There were two reasons for this short life: First, the Rotary system consisted of high-precision mechanical components, often compared in precision to those used in Swiss watches. The rapid start-up of mass manufacturing of this system in the US during the war, without the benefit original design drawings for all of the parts, required "backwards engineering, i.e. the preparation of drawings and tooling for manufacture from European-made samples obtained from customers outside of Europe. This resulted in less-than-perfect manufacturing drawings and tooling. Some of the mechanical parts produced from these tools lacked the necessary precision. These US-made systems experienced a significantly higher level of mechanical operating problems than was characteristic of European-produced Rotary equipment. This negatively affected service quality and resulted in higher than anticipated maintenance costs to the dissatisfaction of these US Independent telephone company customers. The second factor was that Rotary, being a revertive-pulse signaling system, could not be directly connected with dial pulse Step by Step networks common in the US Independent telephone companies. As long as Rotary systems interfaced with other kinds of exchanges via manual switchboard operators, there was no problem. But as extended area service (EAS for short) became a requirement in metropolitan areas to make possible no-charge dial-direct calling between adjacent urban Rotary and suburban Step by Step exchanges, it became necessary to directly interconnect these large Rotary offices to Step by Step exchanges in adjacent towns. In Europe and South America, Rotary had been deployed in automatic networks that were fully Rotary, always employing revertive pulses. In order to interface with direct pulsing SxS exchanges, revertive-dial pulse signaling conversion equipment was required. Designs for this equipment did not yet exist. By this time Automatic Electric was catching up with its backlog and Stromberg Carlson had entered the market with its new direct control XY system. This spelled the demise of the switching equipment shortage. Step by Step equipment soon replaced the Rotary equipment in some of these exchanges. In Rochester, after 5 years following the installation of the Rotary equipment during which the remainder of the system continued with manual operation, the decision was taken to turn a corner and make that city a #5 Crossbar network. Western Electric consented to becoming the supplier of this equipment to Rochester Telephone Corp. The BAker, HAmilton, EMpire and LOcust 7-A2 Rotary exchanges were subsequently removed and replaced by #5 Crossbar. Most, if not all, of the removed rotary equipment initially installed in the US was sold to and re-installed by Teléfonos de Mexico in Monterrey and other cities in Mexico where it operated Rotary networks.

Just a few years earlier, a similar signaling incompatibility situation existed in Mexico. ITT's Compañía Telefónica y Telegráfica Mexicana and L. M. Ericsson's Empresa de Teléfonos Ericsson, two competing Mexican Telephone companies with completely independent non-interconnected local and long distance networks within and between the major cities of Mexico, were merged into a single company in 1950. The new company was named Teléfonos de Mexico (Telmex for short). Legislation had been enacted in 1936 requiring the two companies to interconnect their networks, but because of technical incompatibil-

ity problems, the economic costs inherent in interconnecting different signaling systems, and World War II, the two companies paid the respective fines each year for failure to interconnect as mandated by law. The eventual merger of the two companies was only the first step in solving problem. The merged Telmex faced a signaling incompatibility problem of almost impossible proportions. The short-term solution was to install intermediate manual switchboards in the cities where both companies had operated, so customers connected to one system could dial an operator who would then connect them to subscribers served by the other system. The long-term solution so that all subscribers within the same cities could dial each other was to transfer and reinstall incompatible equipment. As an example of what happened through this process, Mexico City became a 100% Ericsson AGF (AGF being L. M. Ericsson's designation for their 500 point common control revertive-pulse system) city while Monterrey became a 100% ITT Rotary city. This massive removal, transfer and reinstallation was an expensive program which took several years to complete, but avoided the more expensive and complex alternative of developing, manufacturing, installing and maintaining massive amounts of signaling conversion equipment.

As a further footnote to the brief life of Rotary in the US, a few words may be appropriate on ITT's activities in supplying Step by Step equipment to US telephone companies. Taking advantage of Automatic Electric's tremendous order backlog after the end of the war, ITT's Federal Telephone and Radio Corporation (FTR) also tooled up and began the manufacture of Strowger-type Step by Step equipment in its Clifton, NJ factory. FTR supplied major SxS systems to General Telephone operating companies for several cities, including Erie, PA and Marion, OH, as well has making additions to existing Automatic Electric exchanges in several other locations across the country. FTR also became an important SxS supplier to Commonwealth Telephone Company in Pennsylvania and to REA borrowers. FTR's Step by Step equipment design was based on what was originally the International Western Electric version of this product. Like Western Electric, FTR employed rack-mounted flat type line and cutoff relays. Automatic Electric continued to use Strowger type relays for this purpose. ITT's Standard Telephones and Cables, Ltd., London, supplied the equipment design and tooling drawings to FTR. (STC was one of the major suppliers of Strowger (Step by Step) equipment to the British Post Office, and also to colonial government administrations and private companies in British colonies around the world.) The FTR switches were physically interchangeable with both Western Electric and Automatic Electric switches, so they could be used to fill vacant positions on existing switch shelves. This business got off to a great start and was going "gangbusters," but came to a screeching halt when General Telephone announced that it had acquired Automatic Electric. At that point sales to General Telephone (later known as GTE) came to a virtual halt. Around 1960, in the aftermath of a prolonged and bitter labor dispute, FTR closed its Clifton, NJ plant and transferred the manufacture of Step by Step, first to the ITT Kellogg plant on Cicero Avenue in Chicago, and later to Milan, TN when the Cicero Avenue plant was closed. Because of the FTR strike, Step by Step manual-to-dial conversion orders placed by United Telephone for Newton and Flemington, NJ and Carlisle, PA were converted to ITT Kellogg's K-60 Crossbar. Some telephone companies canceled their orders on FTR and replaced them with Automatic Electric or Stromberg Carslon. It was just before the Cicero Avenue plant was closed that this writer left ITT Kellogg and joined Cook Electric.

8. Characteristics of the Rotary System

The rotary system was a common control telephone switching system. With the Strowger step-by-step system, switches in the telephone exchange were directly controlled by impulses created from the subscriber's dial. The Rotary System, like its development twin the Panel System, was a common control system where pulses from subscriber dials were received and stored in registers (also called senders, register-senders and sender-translators). Pulses generated from subscriber dials, when stored were translated into commands that directed motor-driven switches to operate and make connections.

The procedures for making telephone calls were almost identical with those for subscribers connected to Step by Step exchanges. There were, however, some rather subtle but important differences between the way these two systems interfaced with the subscribers. These were:

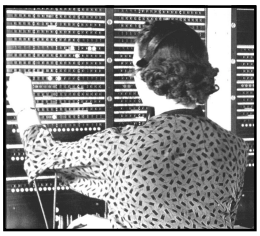
Continuous hunting vs. Blocking

In both the Step by Step and Panel systems (as well as later Crossbar systems), if a congestion (no-trunks available) condition is encountered at any stage of the switching, either within the exchange or the interexchange network during the process of setting up a call, the call is lost. This type of system is called a "blocking" or "loss" system. The subscriber receives an audible "busy" or" "no-trunks available" tone signal as an indication that the call cannot be completed. This tone advises the subscriber must hang up and try again later. ATB – All Trunks Busy conditions are rarely encountered in today's telephone systems, but were once quite common during periods of rapid growth, shifting traffic patterns or overloads causing unusually heavy spurts of telephone traffic, such as those resulting from natural disasters such as floods, snowstorms, earthquakes, tornadoes, fires, etc. which cause subscribers to make many more calls than normal.

The Rotary System is a continuous hunting, non-blocking system, also referred to as a "waiting" system. If congestion is encountered in a Rotary network within the originating exchange, an intermediate tandem or transit exchange, the distant local exchange or in the trunking network between exchanges, Rotary switches continue to rotate and hunt until a selector or trunk becomes available to switch the call to the next stage. The traffic is routed without loss to the trunks. Completion of the call may be delayed, but it is not blocked from being completed. When a trunk becomes available, the call will be completed. The subscriber does not receive an audible signal indicating that all trunks are busy. Rotary Systems were generally equipped with an optional time-out feature so that if no trunk became available within a predetermined period, typically about 30 seconds, then the hunting process would cease and the call would be "dropped." When a call was dropped because no trunk became available within the time-out period, the subscriber did not receive a "busy "or "all trunks busy" signal. Instead he received dial tone again, without ever hanging up. He could immediately redial the number. The "all trunks busy" indication was, in effect, a dial tone "notification" to try the call again.

To be continued

The Switch List



Have something to sell, swap or give away? Is there something you're looking for? Although email and eBay have made the Switch List and newsletter classified ads less important, don't forget that not everyone who reads *SQ* has a computer and internet access, In fact, more switchers seem NOT to have Internet than do!

FOR SALE: W.E. ivory 302, dial, clear plastic finger wheel, cloth cords, like new $345
Directory light, the kind used on the side of a phone booth, brand new $110
Manual round base desk phone, D-76869 stamped on short neck, 1927, rare, with E-1, brown cords 634-A subset w/ 101-A induction coil, straight line ringer $1150
(49) Public phone tokens or slugs, misc. brass, Goetz, Y.S. & S. $3 each or make offer for all
W.E. 554 black dial wall phone $45
Stromberg-Carlson 500 type desk sets, dial, frequency ringers $5 each
W.E. 202-C with F-1, #6-A(?) dial and 634-A subset $105
A.E. 40 HC type, dial, with silver bands on handset $95
W.E. telegraph selector switch in glass case $50
Leeds Wheatstone bridge with instruction book $40
(2) W.E. two position #6017-H key switch $10 each
A.E. 6026-D key switch with switchboard type head set jack $10
Three position #1017-E key switch $10
W.E. 30-B-1 power supply 110VAC input, 25 VDC output $40
Ringing generator 110VAC input, 30HZ ringing output $40
Loraine power supply 110VAC input, 120VDC output $40
N.E. extension ringers (loud, soft, ding-dong), new in box $40 each
A.E. large gong extension bell straight line ringer $35
Kellogg(?) large gong extension bell straight line ringer $35
Operator headset assembly on curved rod, no transmitter $5
(2) Teletype terminals, basket type moving bar style $90 ea. must be picked up.
Switchboard cord cutter for repairing cords $35
The following equipment from step-by-step systems--write or call and make offer:
Tone detector unit
(2) Operator chairs
Autovon(?) trunk circuit H-850695-A, H-887503 with 1200-K repeater coil
HCK small terminal boxes
Metal frame doors originally used to enclose PABX SXS dial equipment, 18 x 87 1/2, 22 x 87 1/2, fair condition, must be picked up

Fred Freebolin
3199 MC 6014
Yellville, AR 72687
(870) 449-5394

Looking for switching parts or information?
Place your ad in the next SQ*!*

FOR SALE: Rare opportunity! Complete 100 line Stromberg-Carlson XY (Step-By-Step) Dial Switching System. Consists of: One 100-Line line group frame, two selector groups frame, one connector group frame and steel mounting bays. Also includes dial tone generator, ringing generator & interrupter, but no power board or 48V power supply. Buyer will need to wire the frames together once mounted. Most documentation included. This system will be sold as a complete system only, no parts sales. Local pick-up OR buyer arranges shipping from a warehouse with loading dock.

Michael Carter
mcarter55@gmail.com
320-203-0155
CNET 1-377-5050
217 7th Ave S
Saint Cloud MN 56301

EQUIPMENT AVAILABLE from John Novack: I have an **Hitachi/GTE crossbar PBX** I would like to find a new home for. Not much is known about it, but now that I have all the known pieces from Chris M. I would like it to go to someone who will find the time to get it closer to working. I believe it is 100 lines, and some number of trunks. No console, of course!

The cabinet needs to be reassembled, but I THINK I have all the pieces, as well as all of the switch except for the power supply and tone plant.

This was originally recovered by Fred Freebolin, who failed to get the power and tone, and disassembled the cabinet for an easier move. Chris then obtained it from Fred, and had it in storage for some years, then it moved here.

It will require an enclosed trailer or truck with lift gate. It consists of 3 bays that are 30-36 inches wide by 6 feet tall, and each are HEAVY, so a couple of strong backs (weak minds are optional) will be needed to move it. The bays will either need to be laid on one side or well secured for a move.

Needless to say, local pickup in WV, very near Hagerstown, MD. The switch bays and parts are all at ground level, so no stairs or other gyrations would be needed to load it. Chris gave it to me, but had $150 into it, so I would like to either get something in trade, or at least that amount to send to Chris.

If you are interested or want more information, contact
John Novack
192 Ashton Drive
Falling Waters, WV 25419
301-728-6231
304-274-9079
jnovack@stromberg-carlson.org

AVAILABLE: for the cost of shipping are five more Adit 600 Channel Banks with 24 FXS ports. The controller card is not password protected and ready for programming. I also have one frame and power supply with controller card that is password protected with no channel cards if someone wants to play with it.
Contact Jerry Petrizze
Via Phone:
PSTN: 619-599-0535
C*Net 470-9000
via email: t2600@sbcglobal.net

Please send your name, address, city and zip code for shipping calcs. Also because I ship Fed-ex I will need a valid phone number.