Telephony 101 –Wiring of Standard Local Battery Circuit February 1, 2013

Hello All,

As always, please send any questions about the reading assignment directly to me at oldtimetelephones@goeaston.net. I will bundle questions if necessary, repeat the questions, and give answers in an e-mail to the TCI List Server before moving on to the next reading assignment. This way everyone will benefit from these questions and answers. By sending questions directly to me, we will avoid unnecessary clutter on the List Server. Previous reading assignments, notes, questions, and answers are available in the TCI Library at http://www.telephonecollectors.info/telephony-101/.

Please finish Chapter 15, starting on the bottom of page 102 and going through page 110. In this part of the chapter we will see how the basic circuit was applied along with some of the circuit variations. Notice that I called the diagrams in the first part of this chapter "circuit diagrams" whereas I call the rest of them "wiring diagrams." Although wire colors are not shown, I distinguish between solder terminals and screw terminals with the symbols, and I label the terminals when they are labeled in the phones. These wiring diagrams should be sufficient to correctly hook up almost any of the old LB phones. Yet the wiring diagrams retain the same general shape of the circuit diagrams so you don't loose sight of the operating principles. You might want to look again at the definition of symbols in Fig. A-1 on page 217. By the way, we drew each of the symbols from scratch to develop a symbol library in the autocad program used for the diagrams throughout the book.

In Fig. 15-4 and all later figures, the switches are shown in the off-hook (talking) position. So when there is a gap between two switch contacts, the circuit is open. Similarly, lightning arresters are shown with a gap and they have no effect on ac or dc operation of the phones. They simply provide a convenient spark pathway for a high-voltage lightning strike to find a path to ground without frying the rest of the phone.

In Fig. 15-5, you're going to see what I call a harmless point of contact between two circuits. By creating this common point between two circuits, designers were able to reduce the number of spring contacts in a switch pile-up from 4 to 3 (there were even 5 springs in the early S-C phone in Fig. 15-4).

If you own one of these old phones, you may have noticed that you have to leave the receiver on-hook when cranking the magneto or the ringer won't work. This behavior is explained on p. 104, and a way to avoid this problem with a "sure-ring" condenser is also described there. It's cute.

On a typical rural line with these phones, there could be from a handful to as many as 40 parties on the line. To reduce the amount of ringing one had to listen to, it was possible to arrange things so any party could ring the operator without being heard on the line. This was done by switching one side of the magneto to ground to ring the operator's ringer that was connected between that side of the line and ground. There are various ways to do this, and several examples are shown in the book.

There's a brief paragraph in this chapter about using local-battery talking on common-battery lines to take advantage of the large signal produced by the local-battery circuit. This was, of course, useful on very long common-battery lines (common-battery operation is described in the next chapter).

Finally, there's a section on changing the line polarity when dc current goes through a receiver to maximize the receiver's performance. This section explains the mysterious letter "Z" stamped on some receiver terminals.

If there are any questions about the current reading assignment, we will deal with the questions before moving on to the next reading assignment.

Ralph

Telephony 101 –Wiring of Standard Local Battery Circuit February 4, 2013

Hello Again,

A reader asked why some switch hooks were shown upside down. He also asked what does "makes first" mean.

Regarding the upside-down switch hook symbol, go way back to Figs. 4-1 and 4-2 on pages 30 and 31. Throughout the book, I want to retain this circular circuit appearance because it helps me understand how the circuit works. You see this same appearance in the circuit diagram in Fig. 15-1, and when I draw wiring diagrams I want to keep this appearance to the extent possible. I think you can recognize the circuit of Fig. 15-1 in all of the wiring diagrams (Figs. 15-4 through 15-10). To retain this simple circuit appearance and represent the switch accurately, I sometimes have to draw the switches upside down.

The term "makes first" is shorthand for "makes contact first." Look for example at the hook switch in Fig. 15-5. Switches will always be drawn in the talking position (off hook), so when the receiver is on the hook (not shown, so just imagine it) there would be a gap between all three contacts. The hook part of the switch is the part that moves when the receiver is lifted off the hook. As this part moves towards the other two contact springs, the one it touches first (i.e., makes first) completes the circuit in the transmitter loop. Therefore, transmitter current is already flowing when the hook part touches the other contact spring ("makes last") and brings the receiver into the circuit. In this way a loud receiver popping noise associated with turning on the dc current is avoided. Thus you can see that the order of making contact in switches can be important.

I plan to post the next reading assignment tomorrow.

Ralph