

Party Lines in the U.S.A.

- a blast from the past!

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Courtesy of CLAUDE STERLING

WHY PARTY LINES

In the early days of the telephone in the US, telephone circuits consisted of one wire with a ground return. Circuits were few and there was little interference from electric power distribution. As demand for telephone service increased in urban areas, it was necessary to migrate to "full metallic" i.e. two wire lines. Multi-pair telephone cable had not been developed, hence each line required crossarm space for two pins and insulators. In high density urban areas there was a limit to the number of crossarms that could be placed on a given pole.

In rural areas, great distances between farms became a barrier to economic pole line "open wire" construction. Many rural or "farmer" lines were constructed by the farmers themselves. Sometimes the lines consisted of a single wire attached by a porcelain knob to a two by four nailed to a fence post.

Given the above economic and physical barriers, party lines became a feasible solution to providing service to all who needed it.

CODED RINGING

In the early days of party line service, the ringers on all telephones were "bridged" across the telephone line or in the case of one wire service connected line to ground. Whenever there was ringing current presented either by the operator or by a subscriber turning the magneto on his telephone, all telephones on the line would ring. In order to differentiate what party the call was for, a system of coded rings was developed, usually a combination of long and short rings.

Example: Telephone number 46F31, in this case, the "F" indicates "Farmer Line", the 46 is Farmer Line 46 and the 31 is the ring code - three long rings and one short ring.

Other schemes were used where the last digit of the phone number denoted the ring code, last digit 1 denoted one long ring, 2 denoted 2 rings - - - up to five and then 6 would be one long and one short, 7 one long and two shorts etc.

Rural lines frequently had as many as 20 parties and the telephone was ringing all of the time. A

means of reducing the number of rings heard by a party was desirable. In those days the concept of everyone having a one party line was unthinkable!

RINGING SCHEMES

Several methods were developed both by the Bell System and the Independent Companies to reduce the number of rings heard by a given subscriber. At this point we probably need to take a look at some definitions. Going back to basics, the telephone circuit in its simplest form consists of two wires, i.e. "tip" and "ring". This terminology originates from the plug on the operators cord which has a tip contact and a ring contact.

TIP - Usually the green lead in the line cord.

RING - Usually the red lead in the line cord.

GROUND - The yellow lead in the line cord which is/or was connected to the ground point at the protector where the telephone line comes in to the building. In the central office, this lead may be referred to as the "sleeve lead" again from the sleeve of the operators cord.

BRIDGED RINGING - All ringers on the line are "bridged" or connected across the tip and ring leads of the line, hence they all ring at the same time and every party hears all rings.

Since there was usually some form of lightning protection at the premises, usually carbon blocks with an air gap to the ground rod, a ground connection was readily available at the customer premise. Since ringing current is not readily affected by stray noise sometimes present on a ground return, the ground (or earthing electrode for you good folks in the UK) can be utilized as a return path to the central office.

SELECTIVE RINGING - By utilizing the ground return, several methods are available for reducing the number of rings heard by any given subscriber.

FULL-SELECTIVE RINGING - Regardless of the number of parties on a given line, an individual subscriber hears only his own ring.

SEMI-SELECTIVE RINGING - Each party hears only half of the rings on a given line.

DIVIDED RINGING - Half of the ringers on the line are connected tip to ground and half ring to ground. In this manner, any given party only hears half of the rings on the line. In the case of a two party line, each party hears only his own ring (Full selective ringing). In the case of four or

eight (or more) parties, a subscriber hears half of the rings on the line (semi-selective ringing).

Up to this point, things are pretty simple, a single telephone set can be used for any application. From here on, the stocking of sets becomes a bit more complicated.

SUPERIMPOSED RINGING - Here, 20 Cycle ringing current is superimposed over a DC bias, either negative or positive. With this arrangement, four party service can be Full Selective and eight party service Semi-Selective. This arrangement requires either a relay or gas tube in each telephone to detect the DC bias and respond appropriately. It is necessary to use a special set with the gas tube and each set must be configured on site for the particular party code. Superimposed ringing was widely used in the Bell System.

(+) Bias, Tip to ground

(-) Bias, Tip to ground

(+) Bias, Ring to ground

(-) Bias, Ring to ground

FREQUENCY RINGING - (See Ralph Myers book page 48) Uses five different ringing frequencies hence five types of ringers. This makes stocking of sets a little more complicated. With Bridged Ringing, 5 parties can be Full Selective, with bridged ringing, 10 parties can be Full Selective and with Superimposed Ringing, 20 party Full Selective Service can be achieved. Stromberg Carlson in the XY switch did indeed accommodate 20 party full selective service. Frequency ringing was rarely used by the Bell System but it was widely used by the Independents phone companies.

HARMONIC RINGING - the most common form of Frequency Ringing where the ringers were tuned to $16 \frac{2}{3}$, $33 \frac{1}{3}$, 50, and $66 \frac{2}{3}$ cycles per second. Since these are true harmonic frequencies, false ringing became a problem in some cases. AE solved this by using "non-harmonic" frequencies of 16, 30, 42, 54 and 66 cycles per second. I think Gary Goff mentioned having an AE40 with a 54 cycle ringer in Southern California. Another variant was "Decimonic Ringing" utilizing 20, 30, 40 50 and 60 cycle ringers. With the advent of more sophisticated electronics, these frequencies could easily be derived from the commercial 60 cycle commercial power.

This may be like asking for the time and getting a response of how the clock works but in essence this is why most WE sets have straight line ringers and many AE, SC, North and Kellogg sets have "tuned" ringers.