

## Re: Repairing a telephone

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**Date:** 03/01/05

Date: Tue, 1 Mar 2005 10:44:51 -0330

"NSM" <[nowrite@to.me](mailto:nowrite@to.me)> wrote in message news:%POUd.19435\$TB.6528@edtnps84...

>

> *"Franc Zabkar" <[fzabkar@optussnet.com.au](mailto:fzabkar@optussnet.com.au)> wrote in message*

> *news:ifp621p4ad7g3dqv3ikqbcq4cdpaqdd4j9@4ax.com...*

>

>> *In Australia the OC voltage at the socket with phone disconnected or*

>> *on-hook is usually around 52VDC. Taking the phone off-hook drops this*

>> *to around 20V or less, and the loop current should be about 20mA.*

>> *Polarity does not matter for most (all?) phones. Ringing voltage is*

>> *around 90VAC.*

>

I agree those voltages sound typical of many 'dial' telephone systems around the world.

Rotary 'dials' are much less common in many places today, where 'Touch-Tone' signalling using tones is now common. But the term 'dial telephone system' still used to denote automatic exchanges as compared to manually operated switchboards.

The following comments do not apply to operator provided or manual switchboard telephone service.

With those you may get anything from 18 volts to dry cells inside the phones themselves; with a hand crank used for signalling!

Many public telephone exchanges are DC operated by large rechargeable batteries that are 'floated' (maintained in a very slight state of charge) at around 52 volts.

Typically there are 24 cells nominally 2.0 volts each. So many people will say "48 volts". In practice these are provided with a closely controlled 'float' voltage of about 2.15 to 2.17 volts per cell; thus  $24 \times 2.17 = 52.08$  volts.

So typically the 'maximum DC' voltage that can come over the telephone line towards your phone is around 52 volts.

Some small private branch telephone exchanges serving a small area such as one factory or a small mine site did use 24 volt battery systems. Or occasionally an AC operated Power Supply that provided smooth DC without back up batteries.

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The absolute maximum current that you might draw through the telephone line if you are right next door to a 52 volt telephone building is probably about 80 to 100 milliamps, when the phone is off hook/talking.

If you are many miles away (the maximum cable wire loop resistance is probably about 1200 to 1500 ohms which is dependent on the gauge of wire, signalling and transmission requirements) the telephone loop current typically might be 20 to 30 milliamps. All depending on the circuitry, the resistance of the telephone it self and so on.

When ringing is applied at the telephone building, to call the phone it is typically around 100 volts 'AC' often at frequency of 20 Hertz. By the time that ringing reaches the phone through the resistance/impedance of the telephone line etc. it typically could be 80 to 90 AC volts or less.

There are other ringing schemes.

On a personal (individual/private line) all these DC and AC voltages are balanced to avoid crosstalk/overhearing etc.

But on some party/shared service lines the AC ringing voltage may be sent out on one side of the line (only during the ringing cycle) so that only the party or parties phone/s on that side of the telephone cable pair line will hear ringing; party line phones are connected with one side of only their ringing circuit to ground.

Upon answering a party line, people pick up the phone and talk on the telephone which is now connected to the line on a balanced or loop basis same as any other phone.

Some party line ringing systems did/do use ringing voltage of different frequencies for each party on the line. One such typical system used to use 16.6, 25, 33.3 and 50 hertz for a four party line. Various telephone systems of many different manufacturers are installed in various parts of the world. There was/is no one absolute standard for the local loop part of the telephone system; although international signalling and transmission standards are becoming more universal.