

A subject that has come up in the past is why the Bell System included a transmitter by-pass condenser in early handsets. In the past, I submitted a passage from a BSP that did not seem to satisfy everyone.

Here is an explanation as extracted from The Bell System Technical Journal, April 1932:

Cohering

In common with a number of other materials, granular carbon is susceptible to cohering. When cohering occurs the resistance and sensitivity of the carbon are lowered and remain so until the transmitter is subjected to mechanical agitation. Experience has shown that cohering will greatly reduce the output of the handset transmitter and that fairly loud talking or a sharp mechanical shock is required to re-store it to its initial sensitivity.

Not infrequently cohering results from breaking the circuit connecting the transmitter to the battery, as for example, when the subscriber depresses the switch in the mounting in order to attract the attention of the operator.

A study of the electrical conditions responsible for cohering under these circumstances has shown that the distributed capacity and the inductance of the component parts of the station set are such that transient oscillations of a frequency of several thousand kilocycles per second are set up by the breaking of the circuit. Further investigation has shown that the transmitter can be protected from the cohering effect of these oscillations, without introducing a transmission loss at voice frequencies, by connecting a condenser of a few thousandths of a microfarad capacity across the transmitter to by-pass these transient currents.

In the case of the deskstand transmitter, these cohering effects have not been important for several reasons.

Probably the principal one is that the mechanical impact incident to switchhook operation is carried directly to the transmitter and prevents appreciable cohering.

BELL SYSTEM PRACTICES SECTION C30.002
Station installation and Maintenance
Issue 3, 14 August, 1940
AT&T COMPANY STANDARD

TRANSMISSION ZONING OF STATION APPARATUS

1.12 F1-type Handsets and some E-type hand sets are not equipped with an anti-packing condenser bridged across the transmitter as this is not required at anti-sidetone stations except in the case of radio interference from adjacent broadcasting stations. In this case a 129F condenser should be mounted under the transmitter contact springs of F type hand set or E type hand set equipped with a 625A transmitter having 129F condenser. All F2 and F3 type handsets come equipped with this condenser.

1.13 Handsets if used at common battery side-tone stations must be equipped with a 129F condenser.

Since the transmission improvement of the F type handset is not fully realized unless it is used with the anti-sidetone circuit, the F type handsets should not be used with sidetone sets unless necessary because of supply conditions.

(Transmission Zone Chart)

(snip) Note 4: The E1E and the F1A type hand sets employ F1 transmitter units. The type of receiver is the factor which differentiates between them in zoning.

The E1E hand set is usually provided with a 129 type condenser, bridged across the transmitter. The F1A hand set does not require such a bridging condenser except when necessitated because of interference from radio broadcast stations and when the set is used with the sidetone circuit. In such cases the installer should place a No. 129F condenser under the transmitter contact springs in the handle of the F1A handset. The use of F1A handsets at sidetone stations is not shown on Chart 2 and should be avoided unless required by supply conditions.

BELL SYSTEM PRACTICES SECTION C32.203
Station installation and Maintenance
Issue 5, 20 JANUARY, 1944

HANDSETS - DESCRIPTION

4.03 - F type handsets used at sidetone stations should be equipped with a 129F condenser to prevent packing. This condenser is bridged across the transmitter unit and mounted beneath the transmitter contact springs. The 129F condenser may be required at anti-sidetone stations adjacent to radio broadcasting stations to prevent interference from the radio transmitter. F1A handsets used with 332 and 334 type telephone sets also require the 129F condenser.

BELL SYSTEM PRACTICES SECTION C32.275
Station installation and Maintenance
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HANDSETS - MAINTENANCE

1.03 - E and F type handsets if used at sidetone stations or at stations subject to interference from radio broadcasting stations, shall be equipped with a 129 type condenser bridged across the transmitter.

2.60 - When it is found necessary to equip an F type handset with the 129F condenser, the outer terminal of the 129F condenser (with eyelet) should be assembled under the center contact springs. The inner terminal of the condenser should be assembled under the other contact spring.

BELL SYSTEM PRACTICES SECTION C32.275
Station installation and Maintenance
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AT&T Co Standard

HANDSETS - MAINTENANCE

1.04 The E- and F-type handset used at stations subject to radio interference shall be equipped with a 129-type condenser bridged across the transmitter as shown in Figs 1. To equip an F-type handset with the 129F condenser the outer terminal of the condenser (with eyelet) is assembled under mounting screw of the center contact spring. The inner terminal is placed... (snip)