

Automatic Electric Type 80 Test and Adjustments

- 5.01 Performance of the telephone should be checked and final adjustments made after installation and electrical connections have been completed. The tests and adjustments described in the following paragraphs should be made by the installer.
- 5.02 Call the central office for a ringing test. If the telephone has a straight-line ringer with an adjusting wheel, adjust the volume of the ringer to a level suitable to the customer. To adjust the volume of a straight-line ringer equipped with an adjusting wheel, turn the plastic wheel which protrudes through the telephone baseplate (Figure 20). To increase the volume, turn the wheel in the direction indicated by the arrow.

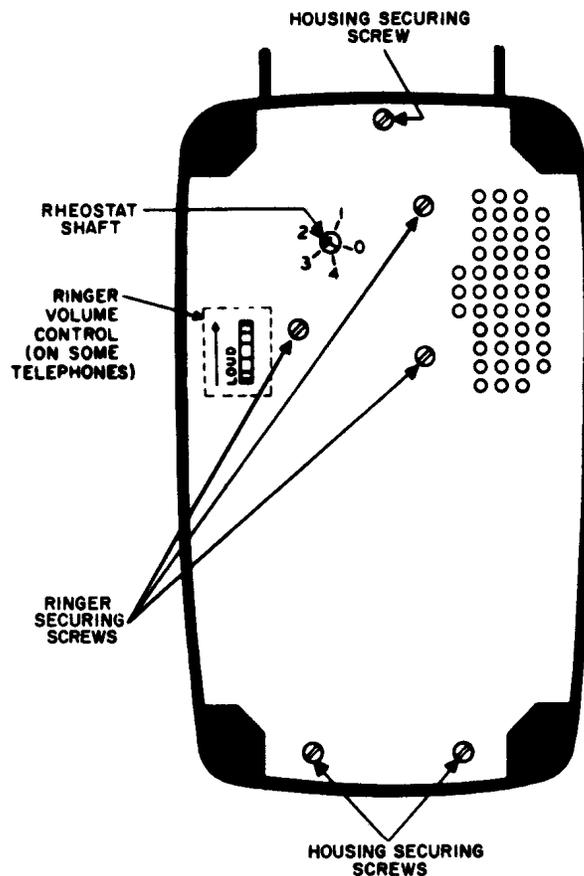


Figure 20. Baseplate.

- 5.03 Occasionally, when two or more straight-line ringers are connected to the same line, the ringer gongs may tap when another station dials. This is due to the charge and discharge of the ringer capacitor during dialing. To correct this, remove the housing of the tapping telephone and reverse the ringer leads at the transmission unit.

Transmitter Current Rheostat

- 5.04 Prior to the development of the automatic sidetone compensating feature, Automatic Electric Company telephones were equipped with a slotted shaft rheostat to limit the transmitter current on short loops: These telephones can be identified by codes beginning with the letter N, stamped on the baseplate.
- 5.05 The rheostat is mounted on the baseplate with its slotted shaft accessible through a hole in the underside of the baseplate (Figure 20). The shaft slot has an arrowhead shape to permit indexing with designations from 0 to 4 which appear in a circle surrounding the shaft hole. These index points correspond roughly to rheostat settings of zero through 400 ohms of series resistance inserted into the loop.
- 5.06 The installation of sets with the manually adjusted rheostat may be subject to restrictions imposed by transmission zoning. These restrictions may make unnecessary some or all of the rheostat adjustments specified in this part since the application of such telephones may be limited to loops requiring very little or no rheostat adjustment.
- 5.07 When adjustment of transmitter current is required, refer to the methods presented in the following paragraphs. These methods include rough and close approximation procedures in addition to an accurate means of adjustment. Exceptions are also explained.

Rough Approximation Method

- 5.08 When no portable milliammeter is available and installation is being made at a station served by a tributary central office with no direct testboard trunks, and the resistance of the loop (exclusive of the telephone instrument) is known only very approximately, set the rheostat according to the following rule of thumb:
- (a) If the loop does not exceed 200 ohms, set the rheostat at its 2 setting.
 - (b) If the loop is, greater than 2.00 ohms, set the rheostat at its 0 setting and note the limitation set forth in paragraph 5.16

Close Approximation Method

- 5.09 When no portable milliammeter is available and installation is being made at a station served by a tributary automatic central office with no direct testboard trunks, and the resistance of the loop (exclusive of the telephone instrument) is known fairly close, set the rheostat on the following basis:
- (a) If the loop is under 30 ohms, set the rheostat at its 4 setting.
 - (b) If the loop is over 30 ohms, set the rheostat at its 3 setting.
 - (c) If the loop is over 130 ohms, set the rheostat at its 2 setting.
 - (d) If the loop is over 230 ohms, set the rheostat at its 1 setting.
 - (e) If the loop is over 330 ohms, set the rheostat at its 0 setting, and note the limitation set forth in paragraph 5.16.

Accurate Methods

- 5.10 Paragraphs 5.08 and 5.09 set forth methods which give only approximate settings for the rheostat, based on an assumed central office battery potential of 50 volts and a battery feed coil resistance (to be added to the loop resistance in figuring current) of 200 ohms in each winding. The objective is to limit the current flowing in the loop and through the transmitter to a maximum of 60 milliamperes. This limits the transmitted speech to a maximum level which is not likely to cause crosstalk between circuits in the DDD network. It is much more desirable to adjust the rheostat, when required, on the basis of actual current measurements.
- 5.11 When installation is being made in an automatic or manual central office served by a testboard, call the testboard and ask for assistance in adjusting the rheostat. The testboardman will arrange to feed battery to the line in series with coils which are typical of those used in regular central office circuits, and in series with a milliammeter. Set the rheostat at its zero position and leave it there for a short time. If the testboardman finds that the loop current does not exceed 60 milliamperes, he will so notify you. In this case, no further adjustment is necessary, except to observe the limitation set forth in Paragraph 5.16.
- 5.12 If the testboardman does not advise that the loop current is already below 60 milliamperes, advance the rheostat slowly until advised by the testboardman that current is within limits.
- 5.13 Should the testboard for some reason not be equipped for current readings, the testboardman can connect his voltmeter across the line and determine the potential drop in the battery feed coil by subtracting the line reading from a reading taken directly across the office battery. If the resistance of the battery feed coil is known, the correct drop for a 60-milliampere drain can be calculated. For example, if the battery potential is 50 volts and the battery feed coil resistance is 200 ohms per winding, a current of 60 milliamperes produces a drop of $200 \times .060 = 12$ volts per winding in the coil, resulting in a line potential of $50 - 2(12) = 26$ volts.
- 5.14 When installation is being made at a station served by a tributary office with no direct testboard trunks, an accurate adjustment can still be made by connecting a portable milliammeter in series with one of the line conductors at the connecting block or at the transmission unit in the telephone.

Exceptions

- 5.15 Limitation of the transmitter current to 60 milliamperes applies only to installations in which all sets having access to the same line, whether installed at the same location or off the premises, are of the type with a manually adjusted series rheostat. If instruments of other circuit types are to be used on the same line with manually adjusted model, the rheostat must be set at its 0 setting, subject to the limitation listed in the next paragraph.
- 5.16 The simple induction coil used in conjunction with the manually adjusted series rheostat does not provide sidetone compensation for changes in line impedance with increasing loop length; that is, there is no element which can counteract each variation in impedance as it occurs. However, at the

setting of the rheostat an internal contact closes which connects a fixed resistance and capacitance across the sidetone balancing resistance in the receiver circuit. This change in the balancing impedance is intended to match the rather capacitive impedance of a long cable loop. It is not appropriate for a short cable loop (one which is only slightly higher in resistance than the value which reduces loop current to 60 milliamperes and thus requires the 0 setting of the rheostat), nor for a long open-wire loop, nor for a station on a loaded cable loop which lies less than one loading section from the nearest load coil. If a 0 setting is required in such cases, disconnect the violet rheostat wire from terminal 14 of the transmission unit and connect it to terminal 7. Do not attempt to open the rheostat contact by choosing a setting between 0 and 1, as this introduces unnecessary loop resistance.

- 5.17 Should any transmission complaint be received involving a set with the manually adjusted series rheostat, replace the instrument with one which provides automatic sidetone compensation.