

## TELEPHONE SETS

### 500 AND 501 TYPES

#### DESCRIPTION AND USE

#### 1. GENERAL

1.01 This section describes and indicates the uses for 500- and 501-type common battery telephone sets. It is re-issued to include the 500P telephone set, to make reference to colored sets, and to bring the practice up to date. Due to extensive revision, marginal arrows have been omitted.

1.02 Some of the 500- and 501-type telephone sets are available in color. All supply listings, including color of telephone sets and piece parts, are covered in Section C32.544, Telephone Sets, 500 Series, Supplies.

1.03 The maximum crosstalk volumes on 500- and 501-type telephone sets are about 5 db greater than the earlier telephone sets. Therefore, quad station wire and 2-pair service entrance cable, serving two circuits, may not exceed a total length of 100 feet if a 500- or 501-type telephone set is used.

#### 2. DESCRIPTION

2.01 **Appearance:** Fig. 1 shows a 500-type telephone set.



Fig. 1—500-type Telephone Set

2.02 **Mounting and Housing:** All parts enclosed by the housing, including the equalizer, network, line switch (switchhook), dial or apparatus blank, ringer, tube (501-type sets only), and cords, are mounted on the metal base. The plungers are part of the housing assembly. The housing is fastened to the base with two special, round head, captive machine screws and can easily be replaced. The equalizer, network, and line switch are **not to be replaced** in the field.

2.03 **Automatic Transmission Equalization:** Equalizers are required in 500-series telephone sets used near central offices or as "on premise" PBX stations. Zoning practices provide specific information on their use. Telephone sets are equipped for equalization as follows:

- (a) Sets coded 500A/B and 501A/B have 311A equalizers and 425A networks.
- (b) Sets coded 500J/K and 501J/K **do not** have equalizers.
- (c) All other 500-series sets have 425B networks which contain the necessary apparatus for equalization.

2.04 **Equalizer:** The 311A equalizer (Fig. 2) consists of a tungsten ballast filament, a silicon carbide varistor, a thermistor bead, and a resistor. These are wired to a terminal block which serves as a cover for the metal case that protects them. The filament, being in series with the transmitter, introduces a maximum transmission loss of 5 db on short loops but has a negligible effect on transmission over long loops. The varistor is bridged across the filament to protect it against abnormal voltages. The thermistor bead in series with the resistor is bridged across the receiver. The bead, being thermally coupled to the filament within a glass envelope, provides a graduated receiving loss corresponding to the loss in the transmitter circuit. The resistor limits the receiver circuit loss.

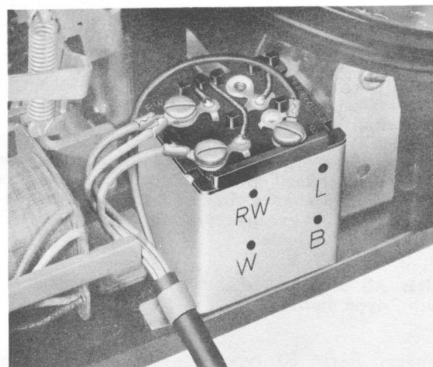


Fig. 2—311A Equalizer

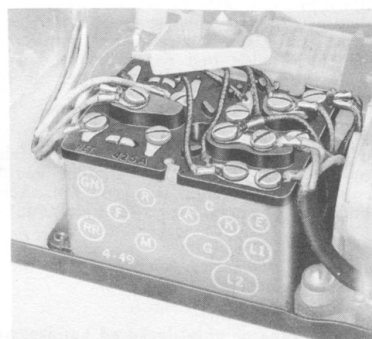


Fig. 3—425A Network

2.05 **Network:** The 425A network (Fig. 3) consists of a transformer, an autotransformer, two resistors, and four capacitors. The 425B network consists of a transformer, two silicon carbide varistors, three resistors, and four capacitors. The components of each network are wired to a terminal block, which also serves as the cover for the metal case con-

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taining them. A protective insulating compound surrounds the network components. The 425B network (Fig. 4) has substantially the same over-all transmission performance as that furnished by the 425A network plus the 311A equalizer. Both networks suppress dial pulsing interference with radio receiving sets and protect the pulsing contacts.



Fig. 4—425B Network

**2.06 Line Switch (Switchhook):** The card-operated line switch (switchhook) uses bifurcated springs which are protected by a plastic cover. G-type handsets are too light to operate the switch directly. Necessary force is furnished by a coil spring which is opposed by the contact springs. The handset weight, through lever arms, is required to overcome only the force differential between the coil spring and the contact springs. **No field maintenance** shall be performed on the switch contact spring assembly except replacement of the switch cover and cleaning of the contacts.

**2.07 Dial:** All 500-series dial telephone sets are equipped with 7-type dials.

**2.08 Ringer:** Early 500-type sets used C2A ringers and 501-type sets used C3A ringers. These ringers are not interchangeable. The C4A ringer can be used with all 500- and 501-type telephone sets. C-type ringers are high impedance and their sound output is several db higher than B-type ringers. Their lower pitch is more pleasing and effective and aids persons with high-frequency hearing loss. The subscriber may adjust the volume to one of four levels by rotating a notched wheel in the base of the set. This adjustment may be modified by the installer to provide bell cutoff when desired by the customer and authorized by a service order or other local instruction.

**2.09 Tube:** The ringing circuit of the 501-type telephone set employs a 3-element, cold cathode, gas-filled tube which is coded 426A. A 4-element tube coded 425A is available to care for conditions of excessive power induction.

**2.10 Handset:** All 500-series telephone sets are equipped with G-type handsets.

**2.11 Cords:** Neoprene or vinyl-jacketed handset and mounting cords are used with 500- and 501-type sets. The handset cords contain four conductors. The mounting cords have three conductors, except those for the 500H and 500P (six conductors) and those for the 500L/M (four conductors). All 3- and 4-conductor cords are available in the retractile type, which is only installed when authorized by a service order or other local instruction.

**2.12 Set Coding:** Basic codes for 500- and 501-type telephone sets are shown in Table A.

TABLE A

Manual	A		C	.	E			J		L		
Dial		B		D		F	H		K		M	P
500	.	.	.	.	.	.	.	.	.	.	.	.
501	.	.	.	.		.		.	.			

**2.13 Set Stamping:** A code and an assembly date are stamped on the base of each set approximately as shown in Fig. 5.

Code numbers such as 500C/D cover both manual and dial versions of a particular type set. Early A/B sets were stamped 500 and 501. Early J/K sets were stamped 500T and 501T.

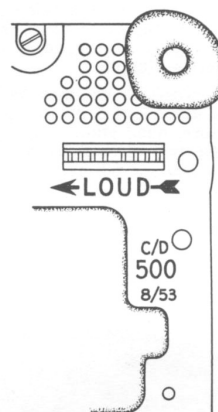


Fig. 5—Base of 500-type Set

### 3. GENERAL USE

**3.01 500A/B, 500C/D, 500J/K, 501A/B, 501C/D, 501J/K:** The use of these sets is covered in Section C63.121, Station Sets by Class of Service, Common Battery.

**3.02 501A/B, 501C/D, 501J/K:** In addition to their use referred to in 3.01, these sets may be used to reduce induction and to provide additional ringing bridges.

### 4. SPECIAL USE

**4.01 500E/F:** This set (Fig. 6) is used for party-line service with nonpolarized ringing. It should not be used as the tip party on a service which requires tip-party identification. The 500E/F is equipped with a plunger switch and wired to avoid interference with the dialing or talking of another customer on the party line when the handset is lifted to make a call. Only a low-loss receiver circuit is bridged across the line with normal operation of the line switch (switchhook) contacts. When it is found that the line is not busy, or when an incoming call is to be answered, pulling up the left plunger operates the plunger switch and closes through the talking and dialing circuits. Replacing the handset restores both switches. The 500E/F replaces the 302AA (manual) and the 302AC (dial) sets.

**4.02 501F:** This set has the same appearance and provides the same feature as the 500F set shown in Fig. 6. It is used for services which require polarized ringing. The 501F replaces the 306G telephone set. It may also be used to reduce induction and to provide additional ringing bridges.

**4.03 500H:** This set is equipped with a lucite finger wheel, a lamp which illuminates the dial, and a 6-conductor mounting cord. (See Fig. 7.) The lamp circuit is closed through the line switch (switchhook) contacts when the handset is lifted from its cradle. The light goes out when the handset is replaced. An auxiliary 6- to 8-volt ac or dc power source for the lamp

circuit is required. Due to its wiring arrangement, the 500H cannot be used as the tip party on message rate, automatic ticketing, automatic message accounting, or zone registration services. Its use otherwise is the same as the 500C/D.



Fig. 6—500F Telephone Set

4.04 **500P:** This set has the same appearance and provides the same feature as the 500H set shown in Fig. 7. It is used for the same services as the 500C/D set, including the tip party on message rate, automatic ticketing, automatic message accounting, and zone registration services.



Fig. 7—500H Telephone Set

4.05 **500L/M:** This set is used at installations which require that the ringer circuit be brought out separately through the mounting cord. Examples are: Telephone answering sets, 507-type PBX attendants' stations, certain 2B key telephone system stations, etc. A 4-conductor mounting cord and an additional terminal strip are provided. With the above exceptions, the 500L/M telephone sets are the same as the 500C/D. Manual sets (500L) are available only by conversion.