

STANDARD HANDSETS
DESCRIPTION AND FIELD MAINTENANCE

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1. GENERAL

1.01 This section describes the GTE AE Type 81, 810, and 811 handsets, and provides additional information on ordering, assembly variations, and field maintenance.

1.02 This section is reissued to include information on the redesigned transmitter spring, redesigned receiver cap, the new resizing tool, ordering the handsets and replacement parts, and to include miscellaneous changes to the text, figures, and tables. Due to the extensive changes involved, marginal arrows are omitted. Remove the previous issue of this section from the binder or microfiche file and replace it with this issue.

2. DESCRIPTION

Type 81 Handset

2.01 The Type 81 handset (Figure 1) was previously used on early model GTE AE telephones that have L, N, or NA production codes and a manually adjusted rheostat in series with the line.

2.02 The Type 81 handset was furnished with a three-conductor handset cord. The transmitter and receiver units were connected into the circuit by means of contact springs

that fit into grooves molded into cavities of the handset handle (shell). The receiver unit had an external rectangular magnet, bridged by a bar contact.

2.03 The molded components of the Type 81 handset (Figure 2) were originally available only in black, and were compression molded of phenolic. The receiver cap of this material for the Type 81 handset, was furnished without a gasket, and does not require one. Similar components, redesigned for injection molding, were later furnished in colored butyrate and propionate compounds. The receiver cap of these materials has an annular recess on the inner surface to maintain the required uniformity of wall thickness. This recess was originally filled with a neoprene gasket, but a flat gasket was later substituted. The latter has a self-adhesive backing, and is used to cover the top of the recess rather than to fill it. The original version of this gasket for the Type 81 handset, has an inner diameter of 1-7/32 inches.

Type 810 Handset

2.04 The Type 810 handset (Figure 1) was used on later model GTE AE telephones that have NB production codes, a varistor-regulator (self-compensating) transmission network, and a four-conductor handset cord.

2.05 The Type 810 handset receiver unit lacks the external magnet of the Type 81 handset and is connected into the circuit by means of screw terminals (for early version receiver units) or quick connect terminals (for current version receiver units) on its back to which the cord conductors are terminated directly.



Figure 1. Standard Handsets.

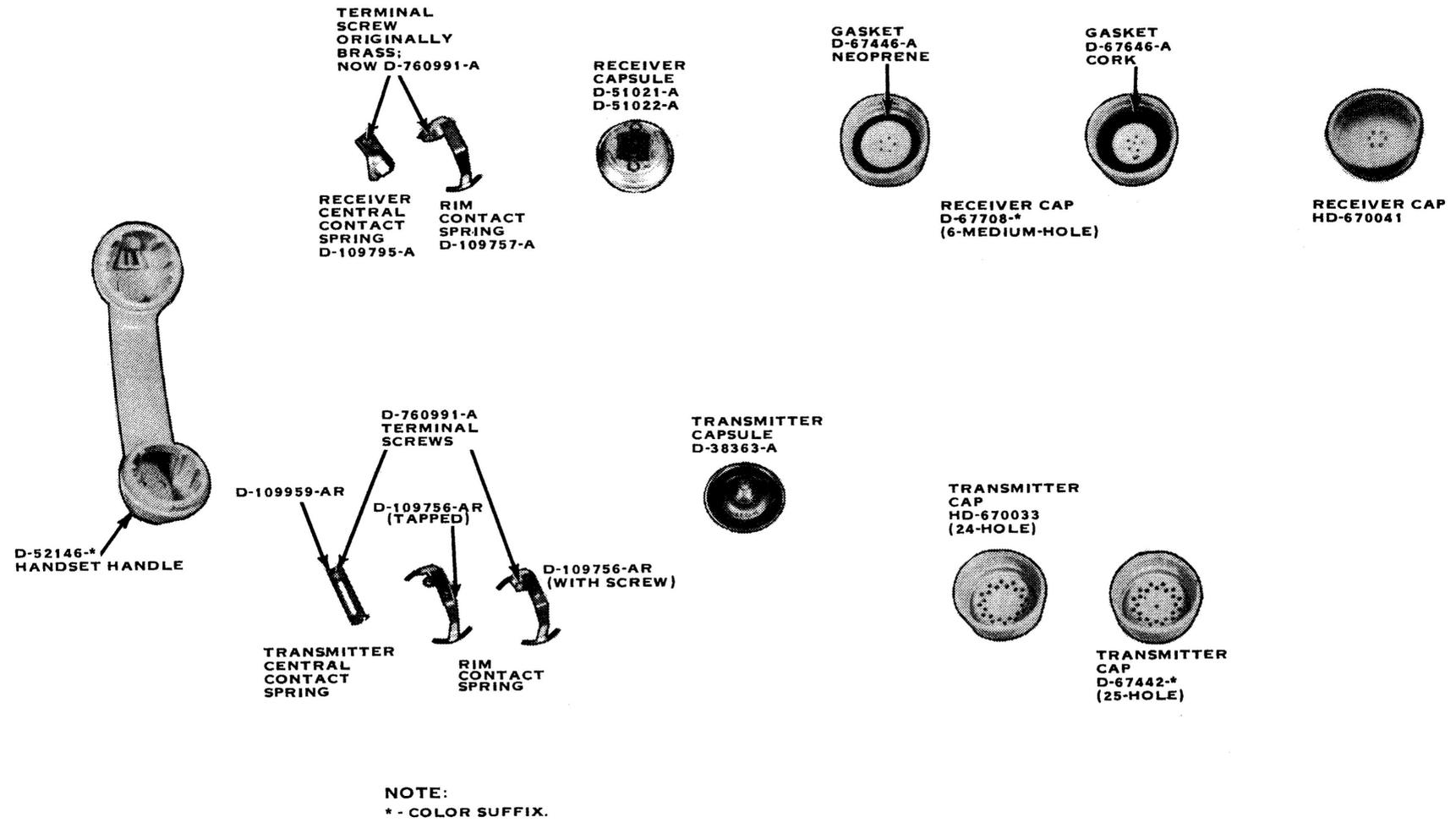


Figure 2. Type 81 Handset Components.

2.06 The molded components of the Type 810 handset (shown in Figure 3) were originally manufactured in black phenolic and either colored butyrate or propionate. In both versions, the transmitter cap and handset handle (shell) were duplicates of the Type 81 handset. The receiver cap, however, was provided with larger holes and a cork gasket with a larger inner diameter of 1-9/32 inches that was used on the black receiver cap as well as colored receiver caps.

2.07 The material used for colored parts (handle, receiver cap and transmitter cap) of the Type 810 handset was later changed to Acrylonitrile Butadiene Styrene (ABS) or similar styrene, without any change in the design. The caps were subsequently modified to permit the holes to be molded rather than punched. The later version caps have an additional hole in the center of the cap, for a total of 6 holes on the receiver cap and 25 holes on the transmitter cap. The current HD-67708 receiver cap has a molded seat and acoustical seal that eliminates the need for the cork gasket for both Type 810 and 811 handsets (with the exception of coin telephone handsets). The center hole of the new HD-670041 receiver cap has also been eliminated.

2.08 A redesigned HD-110036-A transmitter spring is used in place of the previous D-109756-AR transmitter spring and is used for both Type 810 and 811 handsets. The transmitter spring includes the appropriate forming of two transmitter-rim contact springs to ensure that a reliable contact is achieved when the transmitter cap is fully seated.

Type 811 Handset

2.09 The Type 811 handset (Figure 1) is used on the current version GTE AE telephones that have HC, ND, and NF production codes and incorporate an improved version of the varistor-regulator (self-compensating) transmission network, and a four-conductor handset cord.

2.10 The molded components of the Type 811 handset (shown in Figure 3), are the same as those of the final version of the Type 810 handset except for the receiver unit. The receiver unit of the Type 810 handset incorporates a silicon varistor, and the sound opening is covered by a cloth baffle in addition to an outer membrane of clear polyester film. The Type 811 handset receiver unit is externally the same as the Type 810 handset receiver unit except the perforated metal grid is clearly visible because the cloth baffle is eliminated.

Hearing Aid Coupler Handset

2.11 The hearing aid coupler handset is a Type 811 handset and is identified with ordering numbers L-9080 and L-9081.

2.12 The L-9080 hearing aid coupler handset (Figure 4) is used on single-slot coin telephones and on replacement armored cord assemblies for three-slot coin telephones. A large grommet, colored in shades of blue or green and located at the armored cord exit of the handset, identifies the L-9080 hearing aid coupler handset on a coin telephone. The grommet works in conjunction with a special bushing to fix the armored cable in place and protect it from vandalism. Further vandalism protection is extended to the L-9080 hearing aid coupler handset, due to the receiver and transmitter caps being cemented to the handle (shell).

2.13 The L-9081 hearing aid coupler handset (Figure 4) is intended for hearing aid use, and is available for replacement of residential telephones, where required.

2.14 The purpose of hearing aid coupler handsets, in addition to their normal functions, is to provide a magnetic field for pickup by hearing aid couplers with characteristics corresponding to the usual acoustical output of the receiver. This is more direct input to hearing aid devices and improves hearing. The normal acoustical output of the receiver will not be greatly affected by adding this feature.

2.15 The hearing aid coupler handset is equipped with a coil of wire wound around a bobbin that is placed around the receiver capsule of the handset. The coil of wire is connected in parallel with the receiver and, because of its high impedance, it does not affect normal receiver output. The coil is energized by the voice-generated current fluctuations that drive the receiver

2.16 The D-51030-B receiver capsule used in the hearing aid coupler handsets is special because a nickel silver clamping plate is used instead of an aluminum clamping plate. The aluminum material tends to absorb the energy of the magnetic field by eddy current loss. This is particularly true at higher telephone voice frequencies.

2.17 A neoprene cushion washer replaces the previous steel spring washer to push the coil bobbin and receiver capsule toward the ear cap.

3. ORDERING AND REPLACEMENT PART INFORMATION

3.01 There are several different ordering numbers that make up each Type 81, 810, and 811 handset, depending upon the desired features, or the telephone on which it is equipped.

3.02 Table 1 contains a list of ordering numbers for the Type 81 handset. It lists the replacement handset cord ordering numbers, and the color (if black, grey, or beige) each handset (by ordering number) is available in.

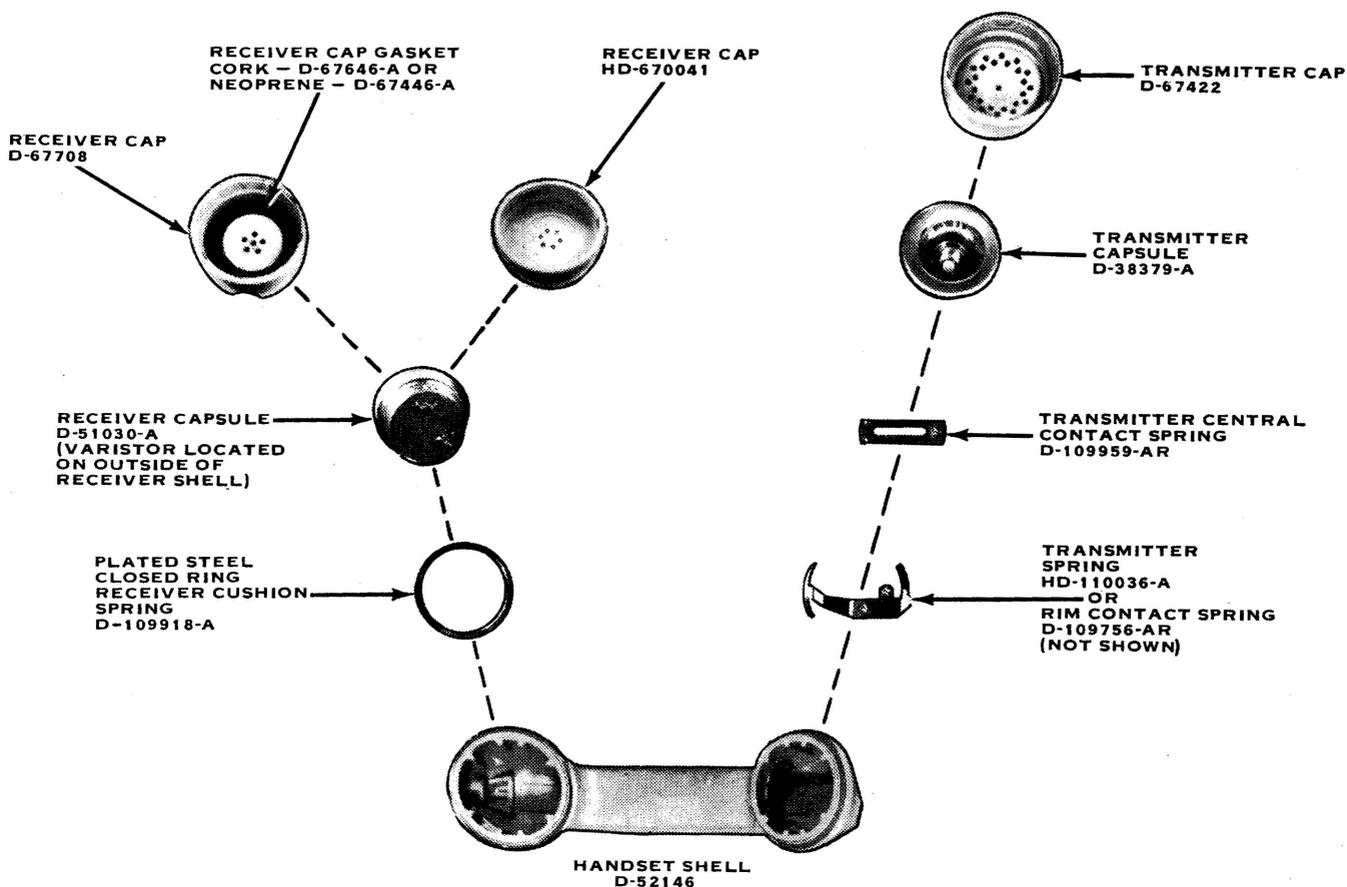


Figure 3. Type 810 and 811 Handset Components.

NOTE: Each handset is equipped with a handset cord. Ordering numbers for replacement handset cords are given for reference only.

3.03 Table 2 contains a list of ordering numbers for the Type 810 and 811 handsets. It lists the replacement handset cord ordering numbers, and the color (if black, gray, or beige) each handset (by ordering number) is available in.

3.04 The 997 division of GTE Practices is made up of the shop procedures for each telephone. The replacement parts list (if available) in the shop procedure has the handset ordering number, colors available, and color suffixes for that telephone. To order a handset, refer to the shop procedure for the specific telephone.

3.05 To order replacement parts for the Type 81 handset, refer to Figure 2. Refer to Figure 3 for the Type 810 and 811 handsets. To order replacement parts for the L-9080 and L-9081 handsets, refer to Figure 4.

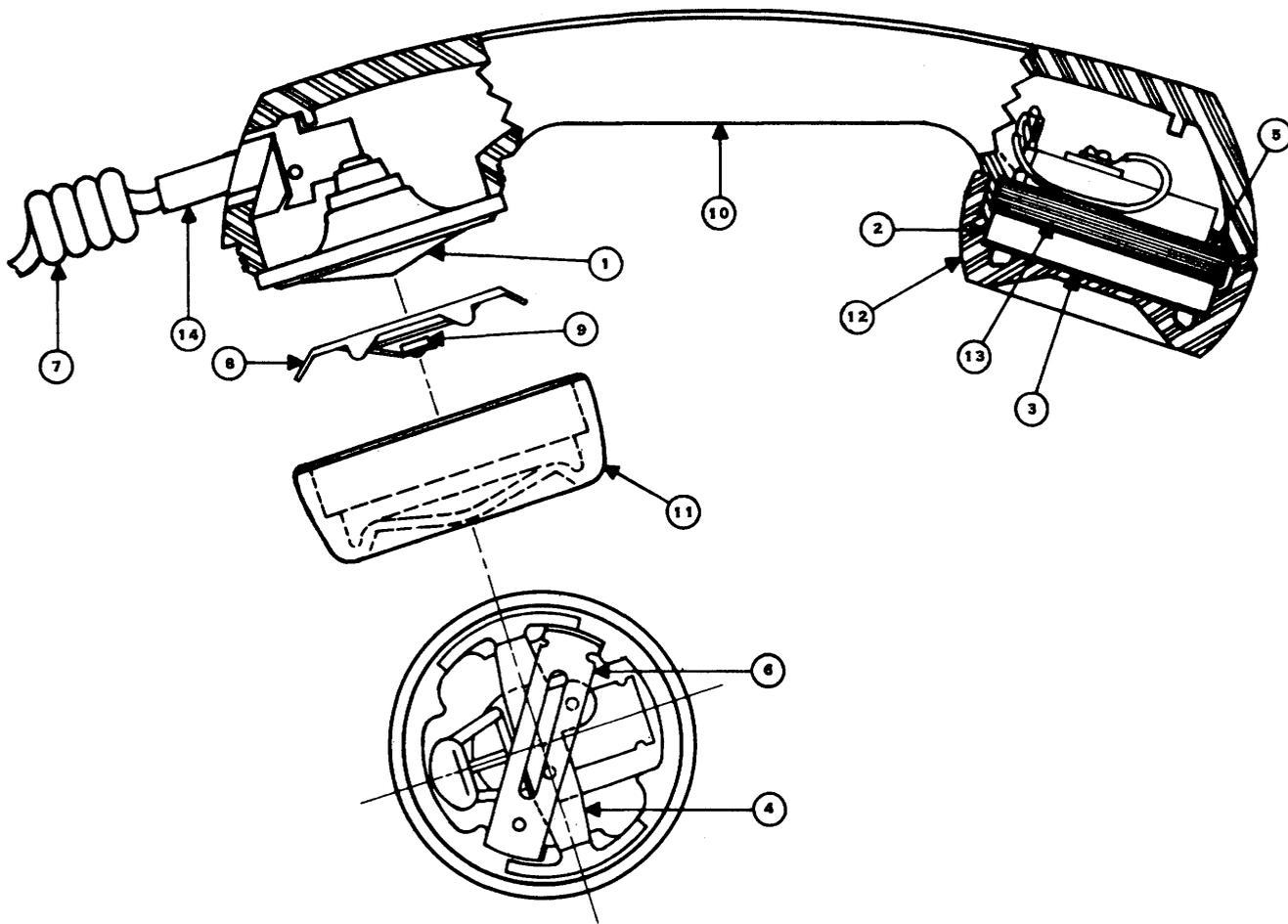
3.06 A list of replacement parts that are manufacture discontinued is given in Table 3. The manufacture dis-

continued replacement parts are given for reference only and are not available for ordering.

4. ASSEMBLY VARIATIONS

4.01 Interchangeability of molded components should be governed by the following principles:

- (a) Threaded engagement between surfaces of dissimilar properties should be avoided. Black phenolic caps should be used only on a black phenolic handle, and vice versa. If practical, mating of thermoplastic parts should be confined to like materials, using styrene with styrene, butyrate with butyrate, etc.
- (b) Small-hole receiver caps should be used only on Type 81 handsets.
- (c) Transmitter and receiver caps for converted North Electric Company handsets should be used only on those conversion handsets. The dimensions of the electrical components are such that only these caps may be used; therefore, receiver caps for the Type 81, 810, and 811 handset cannot be substituted. Distinguishing features among the various types are shown in Figure 5.



COMMON PARTS LIST				
ITEM	DESCRIPTION	PART NO. L-9080	PART NO. L-9081	QTY
1	TRANSMITTER CAPSULE	D-38379-B	D-38379-A	1
2	RECEIVER CAPSULE	D-51030-B		1
3	CORK GASKET	D-67646-A		1
4	TRANSMITTER SPRING	D-109756-B	HD-110036-A	1
5	CUSHION WASHER	HD-670024-A		1
6	TRANSMITTER SPRING	D-109959-A		1
7	HANDSET CORD	HD-540137	D-543534-D	1
8	TRANSMITTER SHIELD	HD-180003-A		1
9	INSULATOR DISK	HD-440012-A	OMIT	1
10	HANDSET SHELL	HD-520012	HD-520012	1
11	TRANSMITTER CAP	HD-670033		1
12	RECEIVER CAP	D-67708		1
13	COIL ASSEMBLY	HD-280020-A		1
14	GROMMET	HD-670025-A	OMIT	1

Figure 4. L-9080 and L-9081 Handset Components.

Table 1. Ordering Information for the Type 81 Handset and Replacement Handset Cords.

HANDSET NO.	REPLACEMENT HANDSET CORD NO. (SEE NOTE 1)	COLORS AVAILABLE
L-9024-CO	3HA6	Black
L-9024-DO	3PC1 (note 3)	Black
L-9027 (note 2)	3HA6 (note 3)	(note 2)
L-9031-CO	3HA6	Black
L-9036 (note 2)		(note 2)
L-9040 (note 2)		(note 2)
L-9044-CO	3HA15	Black
L-9045	3HA15	Black
L-9049		Gray
L-9052 (note 2)		(note 2)

NOTES:

1. All handsets are factory equipped with a handset cord.
2. Refer to the shop procedure (997 division of GTE Practices) for each specific telephone, which gives the handset number, colors available, and color suffix required.
3. An armored handset cord (4PA3) can be installed when the handset is used on a coin telephone. (Refer to the 476 division of GTE Practices for installation of security devices.)

(d) Handsets with Type 811 receiver units used on NC-series telephones should be equipped only with receiver caps having six medium-sized holes. This is the only combination of receiver and cap that constitutes a Type 811 handset.

4.02 Other substitutions are sanctioned either as superseding factory assemblies or as field expedients when stocks of the original part are not available. These include use of the 25-hole transmitter cap on a Type 81 handset, or on a Type 810 handset originally equipped with a 24-hole cap. When the small-hole receiver cap is not available, the Type 81 handset may be fitted with either a medium-hole Type 811 cap (preferable), a five-large-hole Type 810 cap (next choice), or a six-large-hole Type 810 cap. A Type 810 handset may be equipped with a five-large-hole receiver cap, a six-large-hole version, or a medium-hole Type 811 cap. Even though equipped with a Type 811 receiver, a handset does not require a Type 811 cap if it is used only on NB-series telephones. In such cases, it remains classified as a Type 810 handset.

4.03 Field replacement of receiver caps may occasionally require transfer of the gasket from the old cap to the new. The neoprene gasket is readily removable, fits all versions of thermoplastic cap, and may be used in any such application. It is not necessary, however, on a converted North Electric Company handset. The cork gasket can generally be removed and reapplied without damage. To avoid later confusion, however, it is advisable to use a Type 810/811 large-diameter gasket on any Type 810 or 811 receiver cap, even if it is to be installed on a Type 81 handset. In such cases it is preferable to discard the narrow-diameter gasket with the damaged Type 81 receiver cap being replaced and use a fresh gasket on the replacement cap.

NOTE: Receiver cap HD-670041 does not require a gasket.

Electrical Parts

4.04 In all types of handsets, connections to the transmitter network are made by contact springs inserted into

Table 2. Ordering Information for the Type 810 and 811 Handsets and Replacement Handset Cords.

HANDSET NO.	REPLACEMENT HANDSET CORD NO. (NOTE 1)	COLORS AVAILABLE
L-9047 (note 2)	4HA11	(note 2)
L-9050 (note 2)	4HA4	(note 2)
L-9054 (note 2)	D-543534 (4HA6)	(note 2)
L-9055		Black
L-9058		Black
L-9059 (note 2)		(note 2)
L-9060-CA	4HA12	Black
L-9061 (note 2)	4HA12	(note 2)
L-9062		Black
L-9064		Grey
L-9067 (note 2)		(note 2)
L-9069 (note 2)		(note 2)
L-9071 (note 2)		(note 2)
L-9072 (note 2)		(note 2)
L-9073 (note 2)		(note 2)
L-9076 (note 2)		(note 2)
L-9079 (note 2)	D-543492 (4PA3) (note 3)	Black or beige
L-9080 (note 2)	HD-540137 (4PA5) (note 3)	Black or beige
L-9081 (note 2)	D-543534 (4HA6)	(note 2)
NL-19585 (note 2)	NL-19584 (plug-ended)	(note 2)

NOTES:

1. All handsets except the NL-19585, are factory equipped with a handset cord.
2. Refer to the shop procedure (997 division of GTE Practices) for each specific telephone, which gives the handset number, colors available, and color suffix required.
3. An armored handset cord (4PA3 or 4PA5) can be installed when the handset is used on a coin telephone. (Refer to the 476 division of GTE Practices for installation of security devices.)

the cavity of the handle. As initially manufactured, these springs had tapped holes fitted with brass or with nickle-plated iron machine screws. On the central contact spring, the hole was tapped in a brass stud staked to the spring. As a cost reduction measure, the stud and the tapping operation were eliminated in favor of a helical punching operation. Specially hardened, thread-forming (tap) screws are used in the punched holes. While the newer screws are also a proper fit in the tapped holes of the older springs, the soft brass or iron screws from those springs must not be used in the newer springs with punched holes because the screw threads will strip. Receiver contact springs, (Figure 2) are used only on the Type 81 handset. Their design has not been changed, although recent units are equipped with tap screws in their tapped holes for uniformity. The receiver cushion spring on the Type 810 handset has been redesigned to eliminate the split in the ring that caused tangling in bulk storage. This requires the spring to be placed on the unit before cord connections are made.

4.05 The transmitter used on Type 810 and 811 handsets has exactly the same dimensions and general appearance as that used on the Type 81 handset, except for the ink-stamped type and part number markings. The electrical properties of the two units are quite different, however, and they should not be interchanged.

4.06 On the Type 81 handset, a three-conductor cord was original equipment. The more sensitive receiver and shunt varistor used on Type 810 and 811 handsets require a four-conductor cord. The additional conductor provides a separate path for the receiver, free of direct-current flow, in order to prevent detrimental biasing of the varistor and receiver clicks as the dial is turned off-normal and returns to normal. For several years, factory-assembled Type 81 handsets were manufactured with a Type 810 handset cord on which the black conductor had been cut off at each end. In such cases, a green tie lead was furnished to connect the common terminal of the receiver with the transmitter central contact spring. The standard 3HA6 replacement cord duplicates the original construction, with two spade terminals on the green conductor at the handset end. If this cord is unavailable or inconvenient to stock, a Type 810/811 cord may be substituted, using the same connections as for a Type 810 or 811 handset at both the instrument and handset ends. This arrangement is now standard on factory-assembled Type 81 handsets. Do not use a three-conductor cord on any Type 810 or 811 handset.

5. FIELD MAINTENANCE

Caps and Capsules

5.01 If a cap or capsule is defective, it should be removed from the handset shell and a replacement cap or capsule

Table 3. Manufacture Discontinued Handset Component Replacement Parts.

HANDSET COMPONENT	PART NUMBER	TYPE HANDSET USED WITH		
		TYPE 81 HANDSET	TYPE 810 HANDSET	TYPE 811 HANDSET
Receiver caps	D-67645	X	X	X
	D-67423-A	X		
	D-67647-A		X	
	D-67441	X		
	NL-15702-A		X	
Handset handle	D-52143-A	X	X	X
	D-52154		X	X
Transmitter cap	D-67422-A	X	X	X
Transmitter central contact spring	D-109794-A	X	X	X
Rim contact spring	D-109756-A	X	X	X
Receiver cap cord gasket	D-67457-A	X		
Receiver capsule	D-51024-A		X	

NOTE: Manufacture discontinued replacement parts are given for reference only and are not available for ordering.

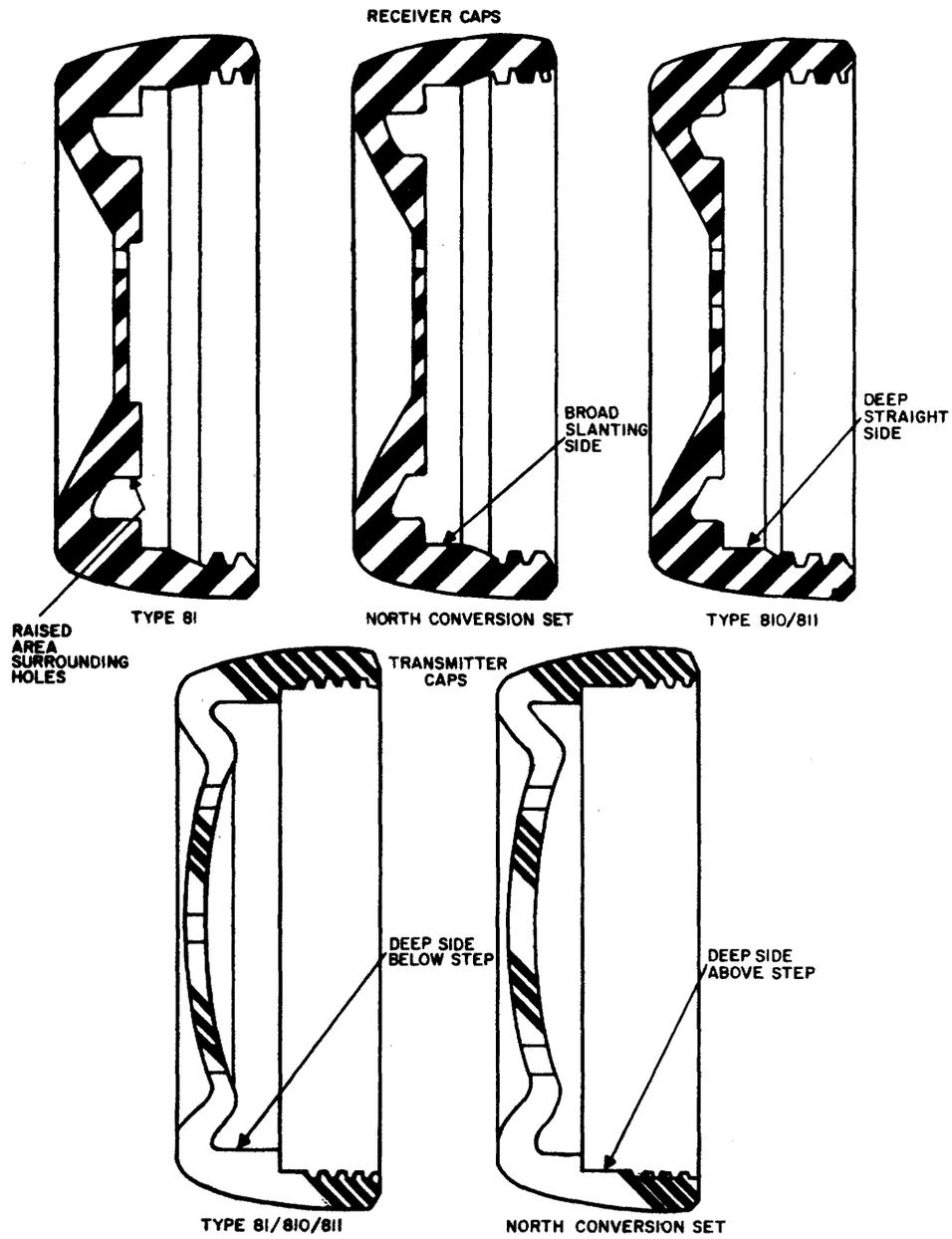


Figure 5. Cross Section of Transmitter and Receiver Caps.

installed. Caps can be removed by holding the handset with the face of the caps up and then unscrewing the caps. After a cap has been removed, a capsule can be lifted directly from the cavity. (The black and yellow handset cord leads connect directly to the receiver capsule on a Type 810 or 811 handset. Those leads must be disconnected and reconnected when replacing a receiver capsule.) Numbers for replacement parts are given in Figures 2 and 3.

Cords

5.02 Cords can be replaced as follows (see Tables 1 and 2 for order numbers of replacement cords):

- (a) Remove the telephone housing and disconnect the handset cord.
- (b) Remove the caps and capsules from the handset.
- (c) Lift out and remove the transmitter central contact spring.
- (d) Loosen the terminal screw on the central contact spring and rim contact spring and disconnect the green and red leads (Figures 6, 7, and 8).
- (e) Loosen the strain relief clamp screw and free the clamp.
- (f) Loosen the terminal screws at the receiver end (Figures 6, 7, and 8) and remove the cord lead.
- (g) Pull out the old cord and feed the leads of the new cord through the entrance hole in the transmitter end of the handset. Feed the leads that must be connected at the receiver end through the handset handle and into the receiver cavity.

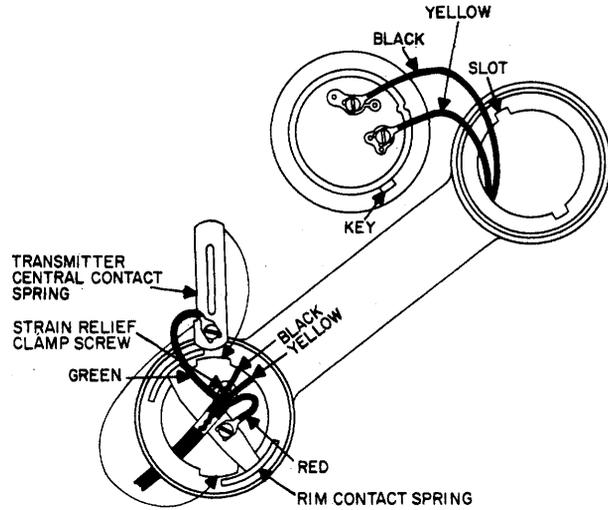


Figure 7. Internal Wiring for Type 810 and 811 Handsets.

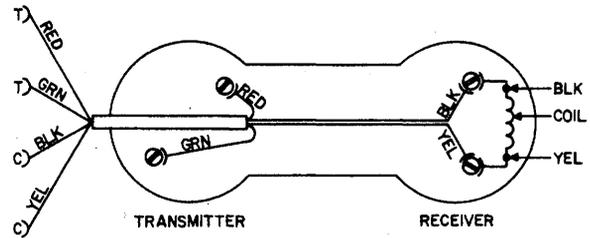


Figure 8. Internal Wiring for L-9080 and L-9081 Handset.

NOTE: Some Type 81 handsets have a separate spade-tipped green wire connected to the transmitter central contact spring and receiver central contact spring (Figure 6). This wire must be removed. Others are equipped with a Type 810/811 handset cord, with a separate black conductor connected to the receiver central contact spring. The green lead of the replacement handset cord (3HA6) is of sufficient length to reach the receiver cavity and has two spade terminals so that it can be connected at both the transmitter central contact spring and receiver central contact spring.

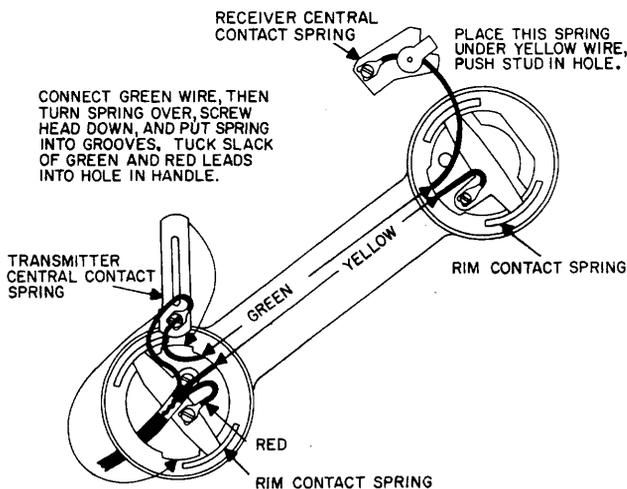


Figure 6. Internal Wiring for Type 81 Handset.

- (h) Connect the handset cord leads, fasten the strain relief clamp, and replace the springs, capsules and caps.
- (i) Connect the cord at the telephone and make a test call. Refer to the section in the 473 division of GTE Practices covering that type of telephone for proper cord connections at the instrument.

Resizing a Quick-Connect Terminal

5.03 Occasionally, a quick-connect terminal will open up, and will be oversized, but can be returned to its original size by use of a Material Code (MC) 578901 resizing tool. To resize a quick connect terminal, perform the following steps:

- (a) Insert the bottom point (fingers) of the tool into the terminal until the fingers contact the network card.
- (b) Squeeze the edges (handles) of the terminal firmly together.

NOTE: Do not twist the tool, it may loosen the terminal on the card.

- (c) Release the handles of the terminal, and remove the tool.

Type 810 or 811 Handset Equipped with Handset Weight

5.04 When the Type 810 or 811 handset is equipped with an armored cord for use with coin telephones, it is neces-

sary to install the PP4Z handset weight. The handset weight is made of zinc and weighs 4 ounces. It prevents the spring action of the armored cord from holding the handset in an off-hook position.

5.05 Refer to Figure 9 and install the handset weight as follows:

- (a) Remove the transmitter cap from the handset and lift out the transmitter.
- (b) Disconnect and remove terminal leads from the upper and lower transmitter contact assemblies.
- (c) Remove the upper and lower transmitter contact assemblies.
- (d) Attach the adhesive insulator on the handset weight.
- (e) Insert the weight into the handset cavity via the transmitter opening. Keep the black and yellow receiver leads to the lower left side of the cavity.
- (f) Insert the lower transmitter contact assembly and connect the red lead.
- (g) Insert the upper transmitter contact assembly and connect the green lead.
- (h) Replace the transmitter and transmitter cap.

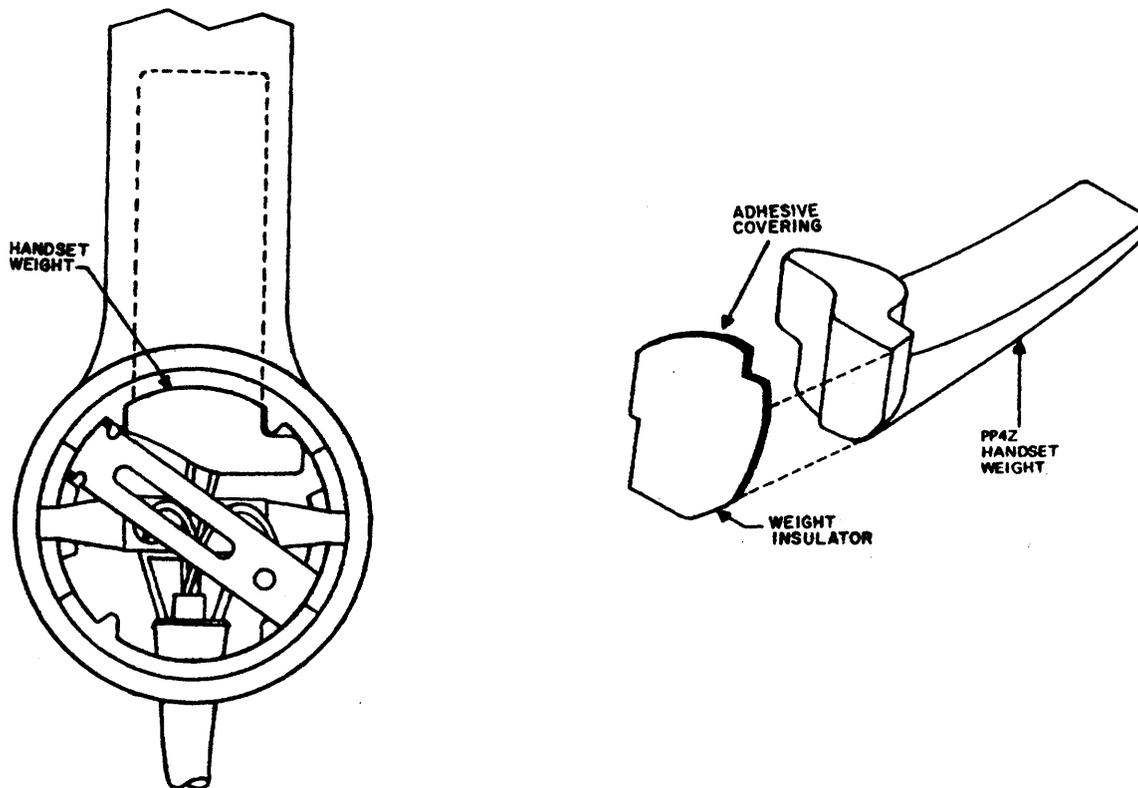


Figure 9. Installing Handset Weight.