

# **BELL SYSTEM PRACTICES**

Station Installation and  
Maintenance

## **ADDENDUM C55.162**

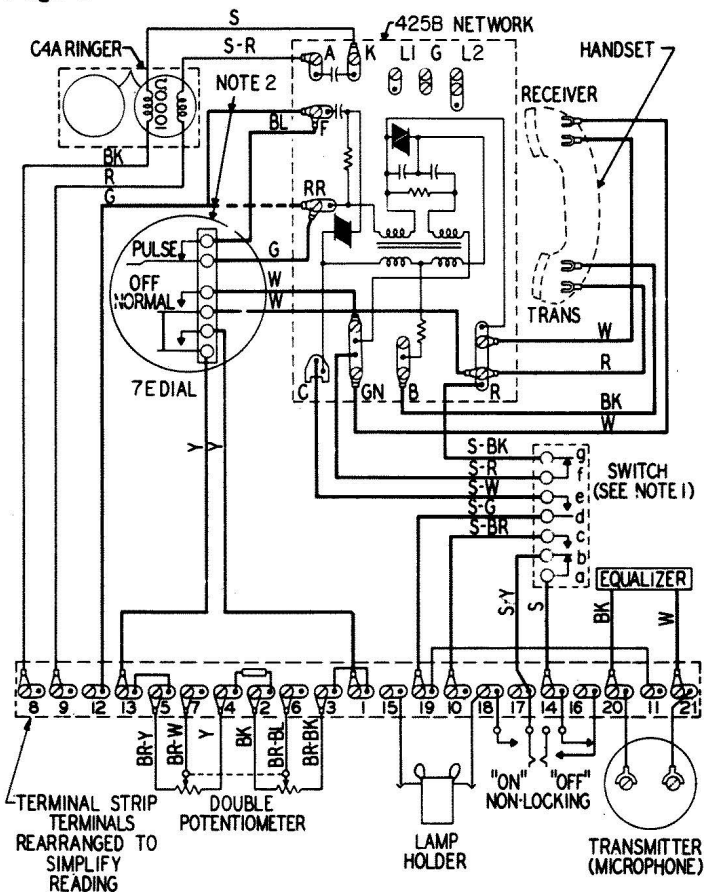
Issue A, 2-1-55-N  
T. P. T. & T. Co.  
Provisional

### **TELEPHONE SET 595 TYPE (DISTANT TALKING SET)**

#### **1. GENERAL**

1.01 This provisional addendum is issued to provide information for the field forces pending the receipt of a more detailed practice from the American Company. This addendum should be retained with subsequent issues of the section until notice is given covering its cancellation or reissuance.

1.02 All sets manufactured after November 1954 are wired in accordance with the drawings in this provisional addendum.



**NOTE 1: Contact Sequence**

**Removing Handset**

1. cb closes before de
2. fg opens

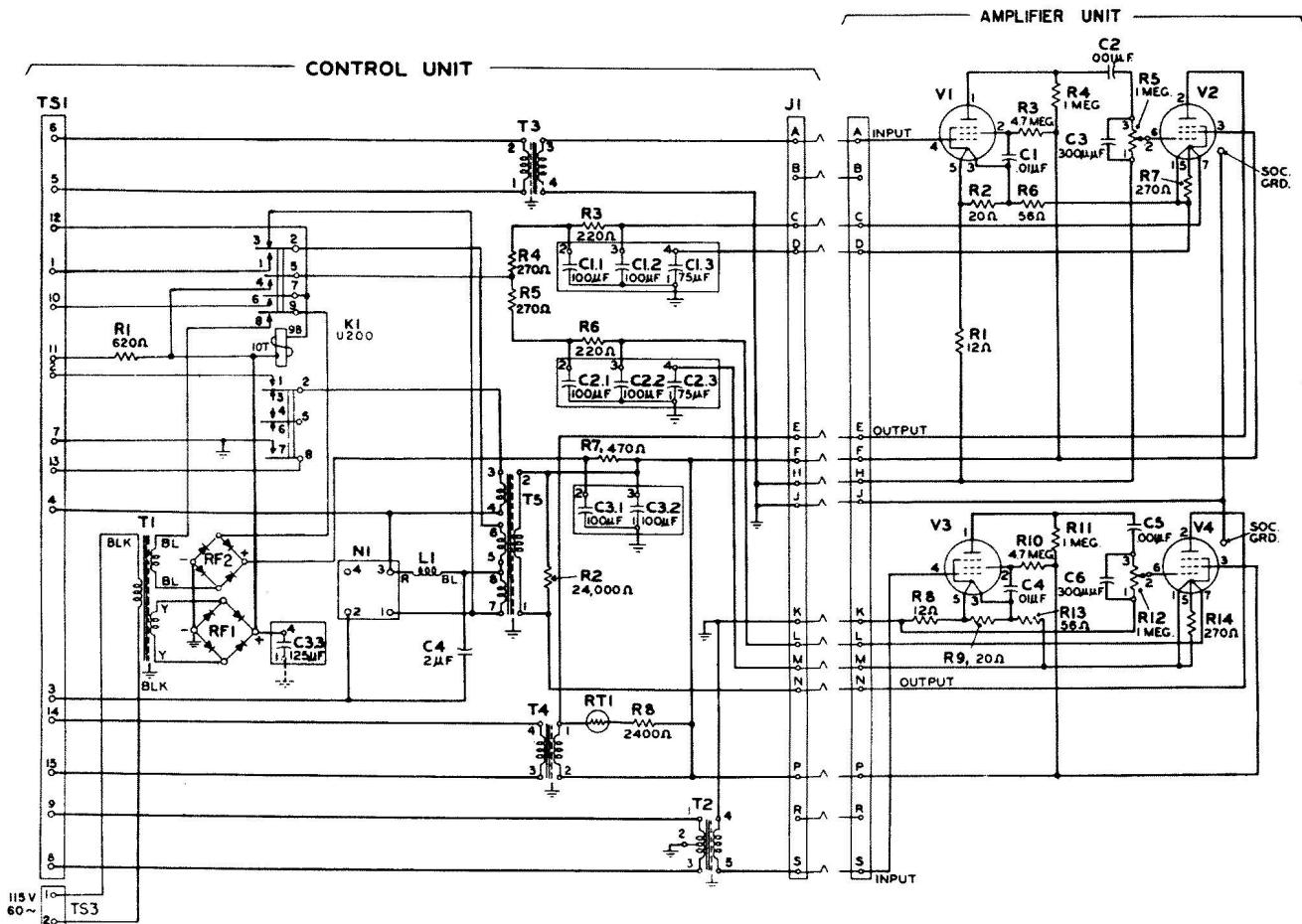
**Restoring Handset**

1. fg closes
2. de opens before cb

**NOTE 2: Manual Service**

1. Replace dial with 95B-3 apparatus blank.
2. Move green lead from "F" to "RR" on the network.

**592 A/B-3  
Telephone Set Connections**



KS-14964

Control Unit with KS-14990 Amplifier Schematic

ADDENDUM

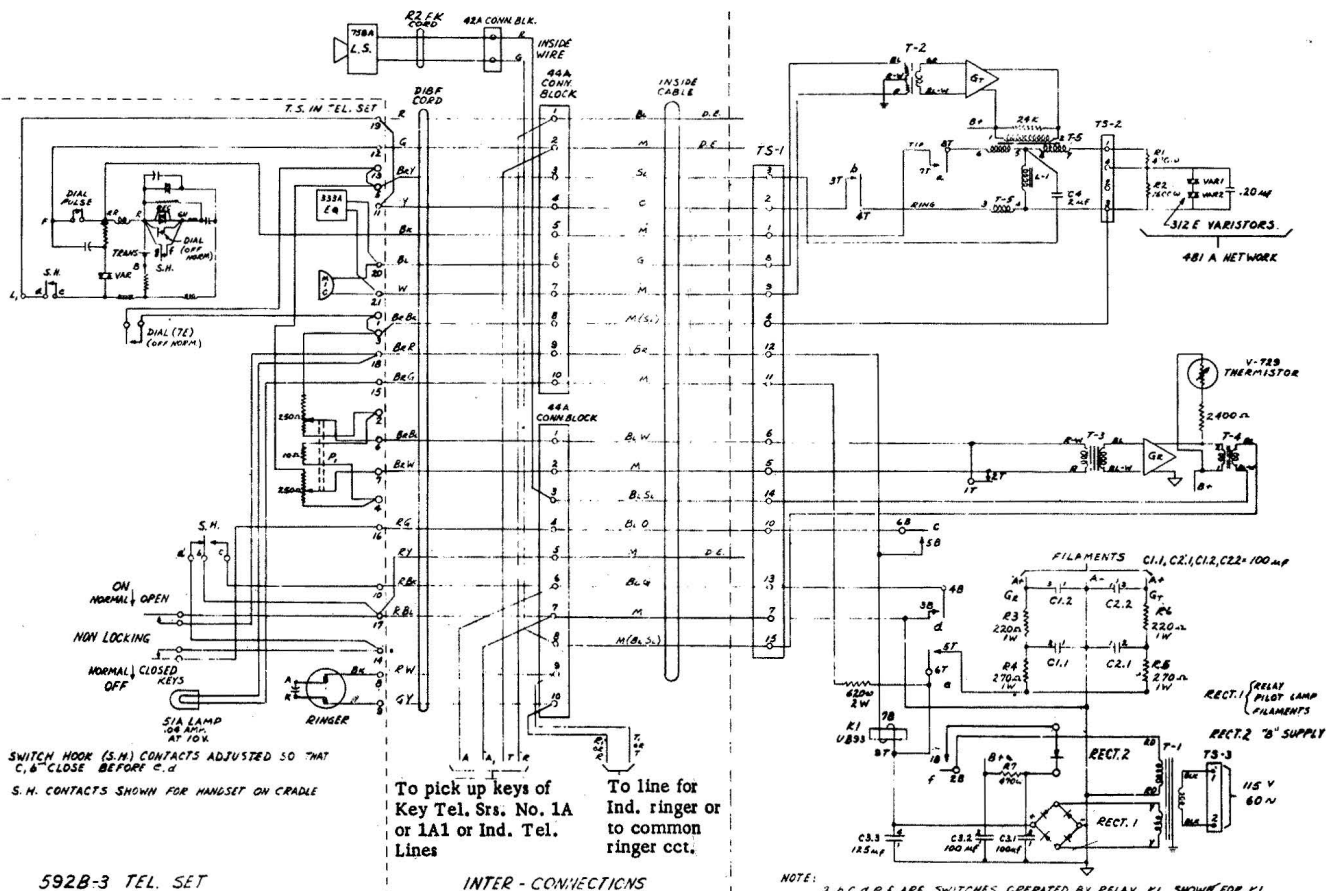
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TELEPHONE SET

595 TYPE

(DISTANT TALKING SET)



**ADDENDUM**  
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**TELEPHONE SET**  
**595 TYPE**  
**(DISTANT TALKING SET)**

**BELL SYSTEM PRACTICES**  
**Station Installation and Maintenance**

**SECTION C55.162**  
**Issue 1, July, 1954**  
**AT&T Co Provisional**

**TELEPHONE SET**  
**595 TYPE**  
**(DISTANT TALKING SET)**

**1. GENERAL**

1.01 This section covers the description, use and operation, installation and connections, maintenance, and supplies information pertaining to the 595A-3 (manual) and 595B-3 (dial) distant talking telephone set.

1.02 This set incorporates distant talking and loudspeaker features and may be used on dial or manual individual central office lines, PBX extension stations, and 1A or 1A1 key telephone systems. It is arranged for switching to either the distant talk feature and loudspeaker or to the regular telephone set for normal use, as required.

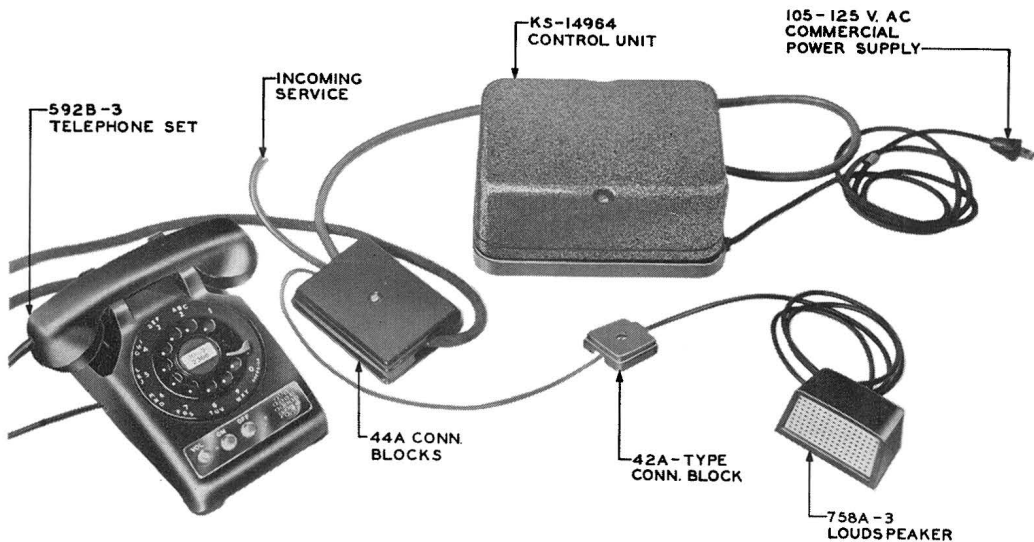
1.03 This telephone equipment is installed only upon issuance of a service order or other proper authorization.

**2. DESCRIPTION**

2.01 The 595B-3 (distant talking) telephone set, as shown in Fig. 1, consists of three units: The 592B-3 telephone set, the 758A-3 loudspeaker, and the KS-14964 control unit.

**592-Type Telephone Set**

2.02 The 592B-3 telephone set shown in Fig. 2 contains the regular telephone set features as well as the control and switching arrangements for use when the distant talking feature is required. The telephone set has the general appearance of a 500-type key telephone set with an assembly consisting of a loudspeaker volume control, pilot lamp, control keys, and microphone mounted in the base.



**Fig. 1—Complete 595B-3 Telephone Set**



**Fig. 2—592B-3 Telephone Set**

2.03 The loudspeaker volume control (VOL) enables the subscriber to control the incoming loudspeaker level **only**. The transmitting level is controlled by the amplifier gain control in the KS-14964 control unit and is preset at the factory.

2.04 The pilot lamp lights in the ON button when the button is pressed to operate the telephone set as a distant talking facility. The OFF button is used to disconnect the telephone set from the distant talking feature and to restore it for normal use.

2.05 The transmitter (microphone) consists of a modified U1 receiver unit mounted in a soft neoprene cushion assembly.

2.06 For additional information pertaining to components of this telephone set that are common to all 500-type telephone sets, consult the sections in the 500-series group.

### **758A-3 Loudspeaker**

2.07 The 758A-3 loudspeaker is provided to furnish loudspeaker facilities for the distant talking set. This loudspeaker, as shown in Fig. 1, consists of a small speaker unit mounted on a metal chassis which is provided with screw terminals inside for mounting cord connections. These are enclosed in a rectangular thermoplastic housing and metal grill. The 5-1/2-foot mounting cord is equipped with a wing-type band for fastening to a 42A-type connecting block. The base of the speaker is provided with an adhesive-type friction pad.

### **KS-14964 Control Unit**

2.08 The KS-14964 control unit, as shown in Figs. 3 and 4, consists of an assembly of electronic apparatus mounted on a base approximately 9-5/8 inches by 7-1/8 inches. It is



**Fig. 3—KS-14964 Control Unit**

equipped with a removable cover, which is approximately 4 inches in depth and fastens with two captive screws. This cover has a crinkle finish and is beige grey in color. The base is arranged for wall or desk mounting. Entrance holes for the inside wiring cable and power cord are located at the bottom of the unit, and a terminal strip with screw-type terminals is provided inside for connecting the inside wiring cable conductors. A clamp is provided for fastening the cable to the unit.

2.09 Included in the KS-14964 control unit are the transmitting and receiving amplifiers (KS-14990 amplifier), power supply, and associated circuits. The power supply furnishes the plate supply for the amplifiers of both receiving and transmitting circuits, power for the pilot lamp in the telephone set, and power to operate the U200 relay. This control unit is equipped with a 6-foot cord for connecting it to a 60-cycle, 105- to 125-volt commercial power supply. **This unit will not operate on direct current.**

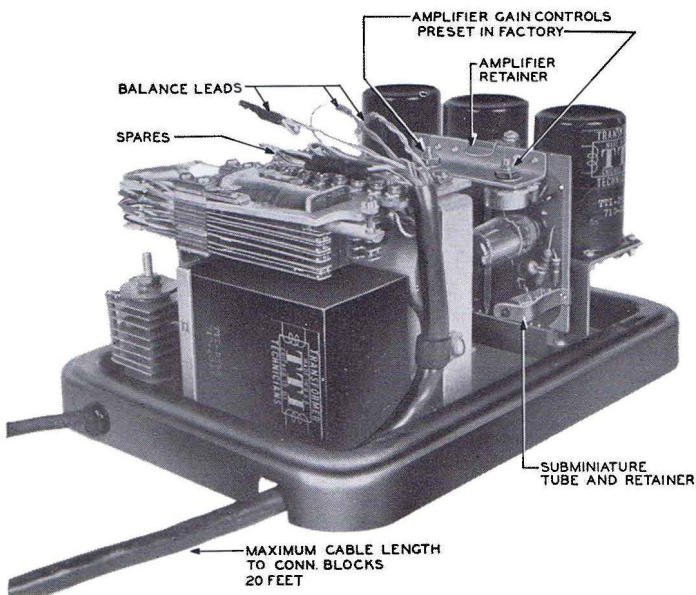
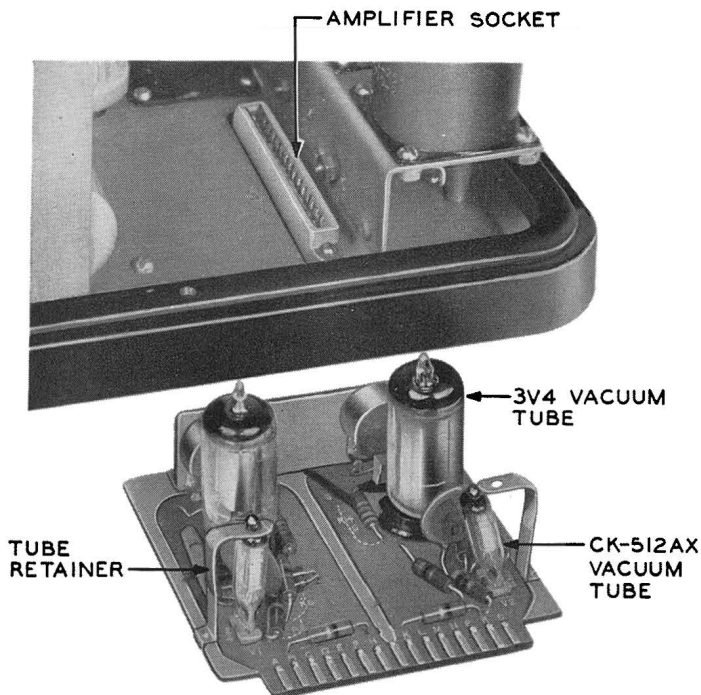


Fig. 4—KS-14964 Control Unit (Open View)

2.10 The KS-14990 amplifier employed in the KS-14964 control unit furnishes both the receive and transmit amplification for the distant talking set. Both amplifier circuits are mounted on a single plug-in type, plastic card which fits into an elongated socket in the base of the control unit, see Figs. 4 and 5.

### 3. USE AND OPERATION

3.01 The 595-type (distant talking) telephone set is designed for use on individual line service or with separately mounted, 6000-series keys of 1A or 1A1 key telephone equipments.



**Fig. 5—KS-14900 Amplifier**

3.02 When it is desired to initiate or to answer calls with the 592-type telephone set and not use the distant talking features, follow the normal telephone procedures established for handset-type telephones. When this set is so operated the pilot lamp does not light.

3.03 **To Initiate Call on the Distant Talking Set:** Let handset remain in cradle and press the ON button in the telephone set. This button is nonlocking; however, the relay in the control unit will lock in, the pilot lamp will light the ON button, and dial tone should be heard from the loudspeaker. This operation is equivalent to normal switchhook action. When dial tone is heard, proceed to dial the number without lifting the handset. As the called party answers, adjust the volume control (VOL) for satisfactory receiving volume.

3.04 Microphone or transmitting volume cannot be controlled manually by the subscriber. However, best results can be attained by limiting the distance between the microphone and the mouth to approximately 2 feet. All other standards of good telephone usage such as a well modulated voice and facing the telephone microphone apply to the distant talking set. Noisy locations and those with poor acoustics will also affect the quality of transmission.

3.05 To hang up or have the equivalent of switchhook operation at the completion of a distant talking conversation, the OFF button must be pressed which returns the telephone set to a normal condition. The pilot lamp will go out when the OFF button is pressed.

3.06 **To Answer Call, Using the Distant Talking Features:** Press the ON button in the telephone set. Since warmup time is negligible, the pilot lamp lights and the conversation may commence immediately. Adjust the volume control for satisfactory receiving volume, then follow the steps outlined in 3.04 and 3.05.

3.07 **To Transfer Call From Distant Talking Set To Handset:** If during the course of a distant talking conversation it is desired to transfer to normal handset use of the 592-type telephone set, it is simply necessary to lift the handset. The relay in the control unit will automatically transfer the system to normal telephone operation and the pilot lamp in the ON button will go out. The volume control does not control the level to the receiver in the handset but operates on the loudspeaker **only** when the telephone set is being used as a distant talking facility.

### **3.08 To Transfer From Handset To Distant Talking Set:**

If during the course of a normal handset conversation it is desired to transfer to distant talking operation, it is necessary to press the nonlocking ON button before the handset is replaced on the cradle and to keep the ON button depressed until the handset is replaced. Then follow the steps outlined in 3.04 and 3.05. Failure to keep the ON button depressed during the replacement of the handset to the cradle may result in disconnects and lost calls.

## **4. INSTALLATION AND CONNECTIONS**

4.01 Before starting installation, check that the commercial power is ac. If dc is encountered, refer the matter through regular organization channels to the Engineering Department for advice before proceeding with the work.

4.02 To connect the components of the distant talking set use two 44A connecting blocks mounted on a 168B-type backboard with a 101C-type cover. Connect the telephone set cord, the control unit wiring cable, incoming service extension, or common ringer to the connecting block terminals, as shown in Fig. 6.

### **Telephone Set**

4.03 The 592-type telephone set should be located and mounted as described in Section C53.153, 1A Key Telephone System Installation. The D18F cord is equipped with a stay hook which fits 44A connecting blocks. Make cord connections on the connecting block terminals as shown in Fig. 6. Connections for the 592-type telephone set are shown in Fig. 7.

4.04 The telephone set cord should not be exposed to moisture. If necessary, fasten cord near the connecting block with a cable clamp to keep it off the floor.

4.05 When indicated on the service order or on other proper authorization, retractile-type cords for the G-type handset may be substituted for the standard handset cord.

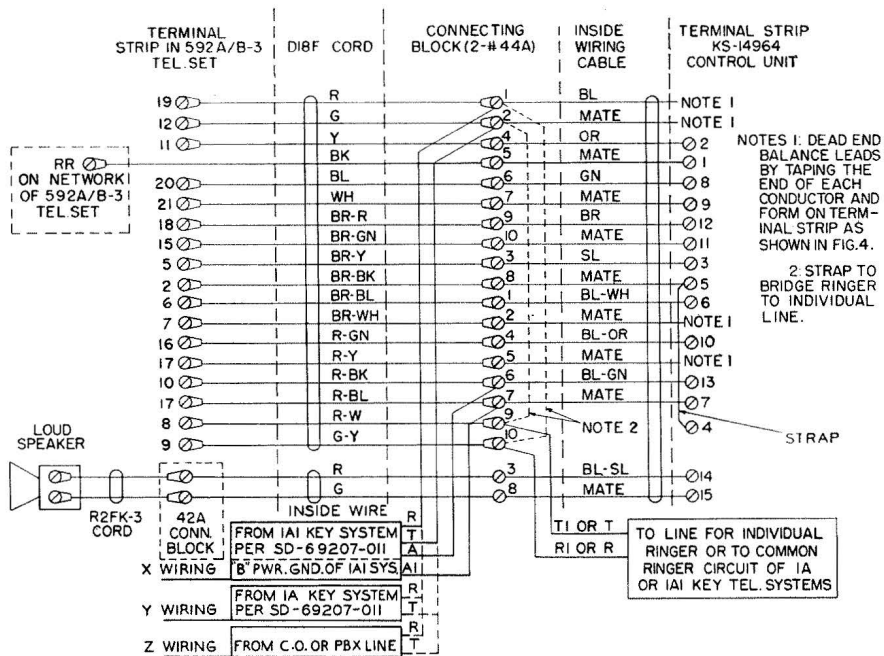
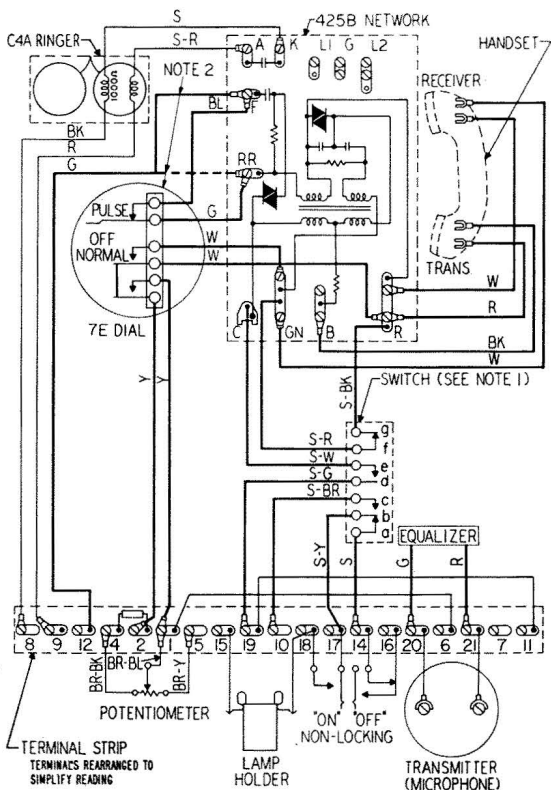


Fig. 6—The 595-Type Telephone Set Control Unit



**Note 1:** Contact sequence

(a) **Removing Handset**

- (1) cb closes before de
- (2) fg opens

(b) **Restoring Handset**

- (1) fg closes
- (2) de opens before cb

**Note 2:** Manual service

(a) Replace dial with 95A-3 apparatus blank

(b) Move green lead from "F" to "RR" on the network

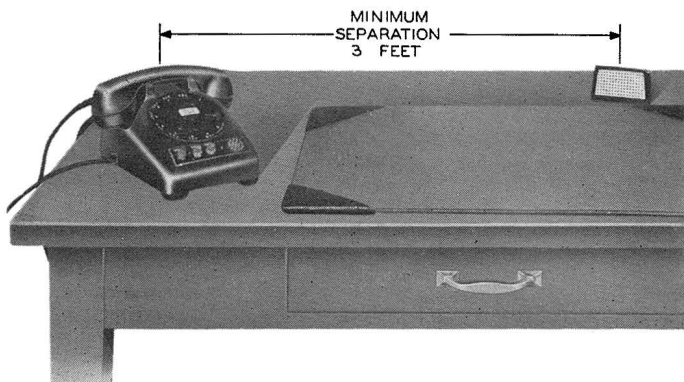
**Fig. 7—The 592-Type Telephone Set—Wiring Diagram**

## Loudspeaker

4.06 The 758A-3 loudspeaker must be installed so that it is at least 3 feet away from the telephone set. This distance is necessary to minimize singing or howling in the loudspeaker when the volume is turned up too high. Attach the cord from the loudspeaker to a 42A-type connecting block located a sufficient distance from the 44A connecting blocks to facilitate separation of the telephone set and loudspeaker.

4.07 Noisy locations will greatly cut down the effectiveness of the loudspeaker and should be avoided. Also, caution the subscriber against placing objects in front of the speaker and against attempting to move the speaker too close to the telephone set which contains the microphone.

4.08 Have the subscriber make a talking test to find the best location for the loudspeaker. In most cases the subscriber may be most comfortable with the speaker on one side of his desk and the telephone on the other, as shown in Fig. 8.



**Fig. 8—General Location for Distant Talking Set**

## Control Unit

4.09 Do not plug the power cord into the commercial power supply outlet until all of the connections of the system are completed.

4.10 In locating the KS-14964 control unit be guided by the subscriber's wishes and the considerations outlined below :

- (a) Avoid locations where the cord to the control unit may be stretched across an aisle or passageway, or near a window or other places where the unit may be exposed to the elements.
- (b) Locate the control unit near the location of the 592-type telephone set. **The maximum allowable cable distance between the two is 20 feet.** In many cases, where the cable length is extended beyond the 20-foot maximum, objectionable dial clicks may be heard in the loudspeaker.
- (c) Locate so that workman will not be exposed to injury when working on the unit and where the equipment will not be exposed to damage.
- (d) Locate the control unit near a commercial 60-cycle, 105- to 125-volt power supply. The power cord is 6 feet long. **This set will not operate on dc power.**
- (e) When the control unit is to be attached to desks or wall surfaces, be guided by considerations covered in Section C31.145, Subscriber and Telephone Sets, for Indoor Locations, Installation.

4.11 When a backboard is required the 147A, 165A, or other suitable backboard may be used and attached in the same manner as subscriber set backboards. When attaching the control unit to the 165A backboard, center the unit on the backboard.

4.12 Make connections on the terminal strips in the control unit as covered in Fig. 6. Leave sufficient slack to enable movement of cable conductors to different terminals. Fig. 4 shows a method of disposing of balance leads, spare conductors, and the forming of cable conductors on the terminal strips.

4.13 Check that the KS-14990 amplifier is snug in place. Do not attempt to adjust the gain control on the amplifiers. These are set in the factory and should be readjusted only by properly qualified and equipped maintenance or transmission engineering forces.

4.14 Upon completion of the installation work on all of the units of the distant talking set, plug the cord into the 60-cycle, 105- to 125-volt power outlet and make operation tests. Test for proper operation of the ON and OFF switches, pilot lamp, and volume control.

4.15 Make sure that the subscriber or a competent representative understands the functions and use of the system before leaving the subscriber's premises.

## **5. MAINTENANCE**

5.01 When the telephone set, loudspeaker, or control unit are dirty, clean the external surfaces and remove loose dust from the interior in accordance with instruction included in Section C30.012, Station Sets, Cleaning.

5.02 Make a visual inspection of the interior and exterior of the telephone set, loudspeaker, and control unit for obvious defects, such as loose, displaced, or broken parts, obstruction of moving parts, or the presence of foreign matter that could interfere with the proper operation of the equipment.

### **Telephone Set**

5.03 The window strip assembly is mounted to the housing by means of snaps and may be removed by lifting it out at each end with the point of a screwdriver or other similar tool inserted under the end of the strip. The spring prong fasteners of the snap remain captive in holes in the strip.

5.04 If trouble is encountered in the transmitter (microphone), the complete assembly should be replaced. This would include the neoprene gasket that cushions the unit.

5.05 In order to insure maximum illumination of the pilot lamp, any accumulation of dirt or film on the end of the lamp should be removed by wiping with a damp cloth.

5.06 The 51A lamp may be lifted out from between the spring contact members of the 55A lamp holder by inserting a small object into one end and forcing the lamp into the open. When replacing the lamp, press the lamp into place between the contact members with fingers and slip it forward toward the ON button to insure maximum illumination.

5.07 Key buttons and switchhook plungers shall move freely without binding or squeaking throughout their entire travel. If they bind, remove set cover and determine cause of binding. Clean the following parts with a cloth moistened with KS-7860 petroleum spirits: key buttons and key button holes, plungers and plunger holes, and the switchboard operating bracket arm shaft. Do not allow petroleum spirits to get on contacts of contact springs. If binding continues after cleaning, replace the key buttons or plungers.

5.08 If SWITCH ARMS squeak, lubricate the bearing surfaces on each end of the operating bracket arm shaft with a No. 2, or softer, graphite pencil.

5.09 No field maintenance shall be performed on the switch assembly except the replacement of the switch assembly dust cover.

5.10 Feet, or friction pads if present, shall not be cut, worn, or have foreign matter imbedded in them to an extent which might scratch the surfaces on which the set is placed. If necessary, the feet may be cleaned by brushing with a stiff bristle brush.

5.11 Feet that cannot meet the requirements in 5.10 shall be equipped with triangular friction pad KS-8035. If the telephone set is already equipped with friction pads and they do not meet requirements, replace with new pads. If a foot is missing, replace the set.

5.12 For adjustments, requirements, and general maintenance information pertaining to C4A ringers, see Section C31.207, Ringers—C Type, Maintenance.

5.13 For information pertaining to procedures for the replacement and cleaning of parts of the G1A handset see Section C32.275, Handsets, Maintenance.

### **Loudspeaker**

5.14 Inspect and clean the 758A-3 loudspeaker in accordance with 5.01 and 5.02. Replace any loudspeaker housings found chipped or cracked.

5.15 The loudspeaker base is equipped with an adhesive-type friction pad. If the adhesive is found to have lost its effectiveness, and if the friction pad cannot meet the requirements in 5.10 or is missing, replace.

## Control Unit

5.16 The following work is all that is recommended for field maintenance of the KS-14964 control unit. Make tests and trouble analyses in the following steps:

- (1) Check to see whether the control unit is connected by cord to the power supply outlet. The distant talking set derives its power from the subscriber's ac power supply and, therefore, will not operate during power failures. However, regular telephone service is not so affected and the telephone set may be used in the normal manner.
- (2) Press the ON button in the 592-type telephone set. If the pilot lamp fails to light, test the power supply outlet with a neon voltage tester or equivalent.
- (3) Take appropriate steps to have the subscriber arrange for power restoration in the event of a power off condition.
- (4) When commercial power is entering the control unit and amplification seems to be deficient in either or both receiver and transmitter circuits, the complete KS-14990 amplifier should be replaced with a serviceable one to give a quick indication that the trouble is in the amplifier.
- (5) **Disconnect the power supply to the control unit each time the amplifier or its tubes are pulled out of the sockets.** The amplifier is held in place by a retainer as shown in Fig. 4, which must be removed to free the amplifier. **Extreme care must be exercised in removing the KS-14990 amplifier from its socket in the base of the control unit.** Since the amplifier is mounted on a plastic card, it should not be bent in its socket because bending may injure the terminal end of the card or the socket. It is recommended that the amplifier be grasped by fingers of both hands, and, if necessary, rocked slightly from side to side while exerting upward pull.
- (6) If changing the amplifier clears the trouble, tubes from the changed amplifier should be replaced, one by one, with those of the serviceable amplifier to determine which are bad, if any. Each CK512AX subminiature tube is held in place by a retainer which must be lifted to clear the top of the tubes and bent back slightly to facilitate the removal of tubes, see Fig. 5.

(7) Another procedure could follow along these lines: If amplification seems to be low in one circuit only, either the receiving or the transmitting, tubes can be replaced in the suspected circuit to determine which is bad.

(8) In reinserting the CK512AX subminiature tubes, orient them so that the red mark on the tube base faces the top of the card and the dot near the top end of the socket.

5.17 If any of the above steps do not clear trouble that originates in the control unit, replace it with a serviceable one.

## 6. SUPPLIES

6.01 This section contains replacement parts that are peculiar to the 595-type (distant talking) telephone set.

<u>Index</u>	<u>Ordering Information and Description</u>
Amplifier	<b>Amplifier, KS-14990.</b> Plastic card with printed circuit and tubes to amplify receiving and transmitting circuits.
Apparatus Blank	<b>Blank, Apparatus, 95A-3.</b> Covers dial opening when telephone set is used for manual service.
Collar	<b>P-19B533, Collar.</b> Sleeve for ON or OFF button.
Control Unit	<b>Unit, Control, KS-14964.</b> Complete unit that furnishes power to the distant talking set.
Cords	<b>Cord, R2FK-3.</b> Loudspeaker mounting cord.  <b>Cord, D18F-3.</b> Vinyl jacketed telephone mounting cord.
Dial	<b>Dial, 7E-3.</b> Special dial for 592B-3 telephone set.
Equalizer	<b>Equalizer, 333A.</b> Transmitter (microphone) equalizer.

<u>Index</u>	<u>Ordering Information and Description</u>
Friction Pads	<p><b>P-14A220, Friction Pad.</b> Adhesive-type friction pad for base of loudspeaker.</p> <p><b>Pad, Friction, KS-8035.</b> Adhesive-type friction pad for feet of the telephone set.</p>
Grid	<p><b>P-14A222, Grid.</b> Fits front of loudspeaker.</p>
Housings	<p><b>P-14A217, Housing Assembly.</b> Plastic housing for loudspeaker.</p> <p><b>P-14A260, Housing Assembly.</b> Housing for 592-type telephone set including plungers and handhold cover.</p>
Key Button	<p><b>P-12A856, Button.</b> Clear plastic ON or OFF button.</p>
Knob	<p><b>P-14A253, Knob.</b> Plastic knob for potentiometer.</p>
Lamp	<p><b>Lamp, 51A.</b> Pilot lamp that lights the ON button.</p>
Lamp Holder	<p><b>Holder, Lamp, 55A.</b> Socket for 51A lamp.</p>
Loudspeaker	<p><b>Loudspeaker, 758A-3.</b> Complete loudspeaker with cord.</p>
Microphone and Control Unit	<p><b>P-14A241, Microphone and Control Unit Assembly.</b> Complete control assembly including microphone, potentiometer, keys, lamp holder, terminal strip, and mounting.</p>
Petroleum Spirits	<p><b>Spirits, Petroleum, KS-7860.</b> For cleaning metal parts (pt. or qt. cans).</p>
Plunger	<p><b>P-14A246, Plunger.</b> Mounts the ON or OFF button.</p>

<u>Index</u>	<u>Ordering Information and Description</u>
Screws	<b>P-210799, Screw.</b> Flat head machine screw for the base of loudspeaker.  <b>P-210800, Screw.</b> Fit studs of the microphone.
Sets	<b>Set, Telephone, 592A-3.</b> Manual telephone for the distant talking set.  <b>Set, Telephone, 592B-3.</b> Dial telephone for distant talking set.  <b>Set, Telephone, 595A-3.</b> Complete manual distant talking set. Includes 592A-3 telephone set, control unit, and loudspeaker.  <b>Set, Telephone, 595B-3.</b> Same as 595A-3 equipped with dial.
Spring	<b>P-12A888, Coil Spring.</b> Returns ON or OFF button.
Transmitter (microphone)	<b>Transmitter (Microphone) 655A.</b> Complete microphone with neoprene gasket.
Tubes	<b>Tubes, Vacuum, CK512AX.</b> Subminiature tubes for KS-14990 amplifier (2 required).  <b>Tubes, Vacuum, 3V4.</b> Miniature tubes for KS-14990 amplifier (2 required).
Washers	<b>P-284184, Washer.</b> Small washer for stud of microphone.  <b>P-181055, Washer.</b> Large washer for stud of microphone.
Window Strip	<b>P-14A243, Window Strip Assembly.</b> Plastic strip fits over control buttons and microphone.