

## STATION TRANSFORMERS

### 1 GENERAL

1.01 This section contains identification information on station transformers. See Table A.

1.02 This section is reissued to:

- Add B cord clip
- Add safety information on 2012-type transformers
- Add 2012C and 2012D transformers
- Show 2012A and 2012B transformers MD
- Add 85B1 power unit
- Add 95B1 power unit
- Add KS-21239L6 transformer
- Revise information on KS-16940L1 (voltage regulating) transformer

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

***Danger: When providing power for illuminated station sets, two or more transformers should never feed the same inside wiring pair. If one transformer is unplugged while the secondary terminals of that transformer are being energized through the inside wiring, by another transformer, the exposed terminal blades of the unplugged transformer would be energized with 110 to 125 volts ac. Installations of multiple transformers connected to the same inside wiring pair should be avoided and corrected if encountered in the field.***

***Warning: Care should be taken to trim and dress leads connecting to low voltage output terminals of transformers and power units to assure that inadvertent connection to conducting surfaces or other power source does not occur. If more than one transformer or power unit is plugged into a multiple receptacle power strip, there must be at least one inch separation between them. Only UL listed receptacle power strips with adequate power rating shall be used. Use of a continuous terminal power strip that allows the secondary output terminals of the transformer or power unit to be in close proximity to the ac line source is not recommended.***

1.03 Locate transformers where they will be accessible for inspection and maintenance.

1.04 Transformers discussed in this section require a 110- to 125-volt ac power service outlet.



***Make sure that the 110- to 125-volt power service outlet is not under control of a switch.***

1.05 To prevent accidental removal, power cords may be fastened to the ac outlet with a power-cord plug-retainer assembly (Section 167-400-210) and plug-in transformers may be secured with a clamp. A clamp is furnished with some of the KS-20426L3 transformers, others have a molded mounting tab. A retaining clamp is also furnished with the 85B1 and 95B1 power units. The 2012-type transformer may be secured with a 2A clamp.

1.06 The B cord clip (size 1) provides a means of attaching D station wire to station transformers to prevent the wire being accidentally pulled from the transformer screw terminals.

### NOTICE

Not for use or disclosure outside the  
Bell System except under written agreement

- 1.07 The B cord clips come 10 to a package and should be ordered as follows:

1 package (10 clips per package)—Clip, Cord, B1-61.

- 1.08 Remove protective paper from adhesive of B cord clip and stick clip to bottom of station transformers as shown in Fig. 3. Terminate D station wire on screw terminals of 2012-type transformer and hook station wire through B cord clip as shown in Fig. 3.

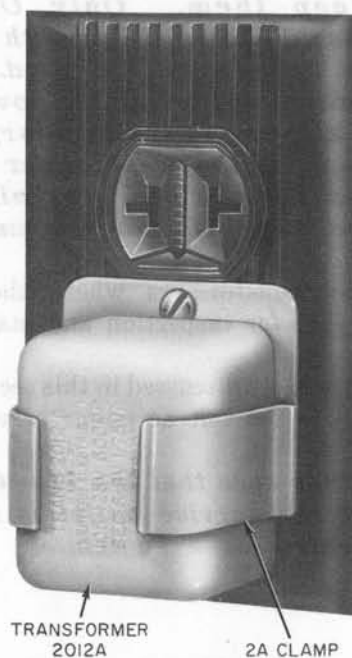


Fig. 1—2A Clamp

## 2. 2012-TYPE TRANSFORMER

**Danger:** For safety, securely attach retaining clamp to ac outlet using outlet cover screw **BEFORE** attempting to install 2012-type transformer. See Fig. 1. When removing 2012-type transformer always unplug unit completely from outlet **BEFORE** attempting to remove the retaining clamp. This will prevent the possibility of a loosened retainer clamp or metallic outlet cover making contact with the ac prongs of the 2012-type transformer when partially withdrawn from outlet. Do not use 2A

**clamp or similar retaining clamp on outlets where cover mounting screw holds the duplex outlet in the box.**

- 2.01 A 2A clamp may be used to secure the 2012-type transformer to a standard electrical service outlet (Fig. 1) in those locations where the transformer is subject to being accidentally dislodged from the receptacle.



The 2012-type transformers manufactured after April 1969 have folded blade-type prongs (Fig. 2), which have improved retaining characteristics. Use of the 2A clamp with 2012-type transformers having folded blade type prongs will normally not be necessary.

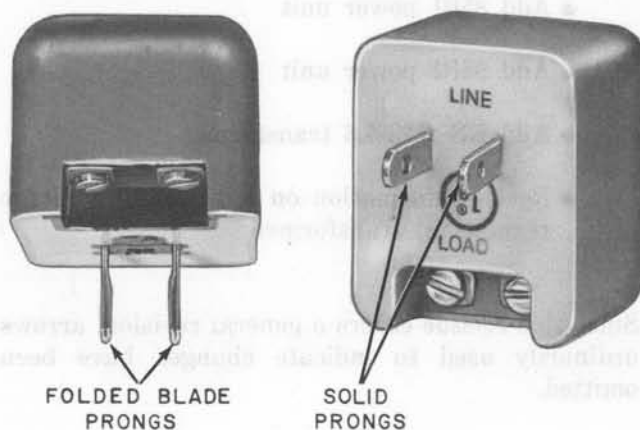


Fig. 2—2012-Type Transformer, Prongs

- 2.02 The 2A clamp is available in Light Olive Gray (-49) and Ivory (-50).

2012A (MD) or 2012C Transformer



Any number of TRIMLINE® telephone sets per residence along with one PRINCESS® telephone set may be powered from one 2012A or 2012C transformer. However, only one

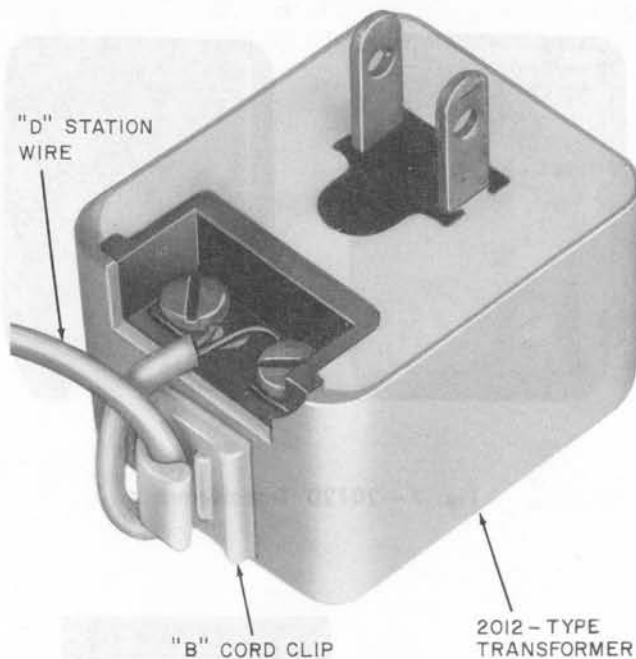


Fig. 3—Cord Clip Used to Secure Station Wire to Transformer

**PRINCESS telephone set can be connected to a 2012A or 2012C transformer. When installing multiple PRINCESS sets use KS-20426L3 transformer or provide an additional 2012A or 2012C transformer for each telephone set.**

- 2.03 The 2012C is equivalent to and a direct replacement for the 2012A (MD) transformer.
- 2.04 The 2012A or 2012C (Fig. 4 or 6) transformer supplies power for telephone sets with dial night light feature and is available in light olive gray (-49) or ivory (-50).



**Do not use 2012A or 2012C transformer to power 3-type (MD) speakerphone systems or TOUCH-MATIC® 16 telephone sets.**

- 2.05 Prongs for the primary terminals are provided so that the transformer can be mounted in a standard parallel-blade convenience receptacle. Screw terminals are provided for secondary winding



Fig. 4—2012A Transformer

in a recess on the same side of apparatus as the prongs.

- 2.06 With 115-volts, 60 Hz applied to the primary winding, the secondary winding delivers approximately 7 volts at 0.250 amp.
- 2.07 A 25-foot telephone set mounting cord is not recommended because the added resistance of this cord results in decreased illumination.

#### 2012B (MD) or 2012D Transformer

- 2.08 The 2012D is equivalent to and a direct replacement for the 2012B transformer.
- 2.09 The 2012B or 2012D transformer (Fig. 5 or 7) is intended to supply power to TOUCH-A-MATIC 16 telephone sets, and the 55A or 55B control unit in 3-type speakerphone systems and is available in Light Olive Gray (-49) or Ivory (-50). The length of wire between the transformer and the control unit should not exceed 100 feet of standard inside wire.



**Do not use 2012B or 2012D transformer in place of a 2012A or 2012C transformer.**

- 2.10 Prongs for the primary terminals are provided so that the transformer can be mounted in a standard parallel-blade convenience receptacle. Screw terminals are provided for secondary winding in a recess on the same side of apparatus as the prongs.

- 2.11 With 115 volts, 60 Hz applied to the primary winding, the secondary delivers approximately 17 volts at 0.132 amp.

**2.12** A sustained short circuit across the secondary of the 2012D for 10 to 15 minutes will cause the transformer to go open and remain that way. This is a self-protecting fail safe feature to prevent transformer overheating.

**2.13** The 2012D transformer will be manufactured with back plates in a contrasting color from the case. The visual difference is provided to aid in preventing mixing and misuse with 2012A and 2012C transformers.

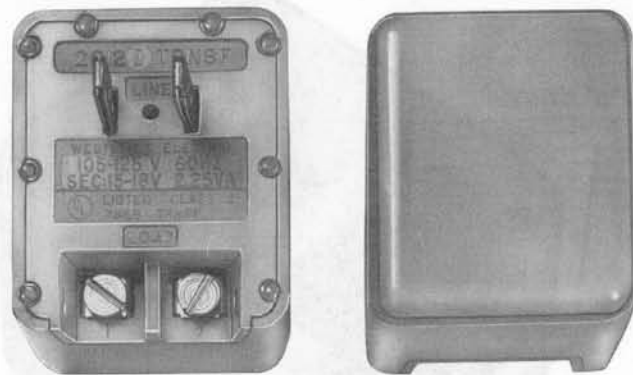


Fig. 7—2012D Transformer



Fig. 5—2012B Transformer

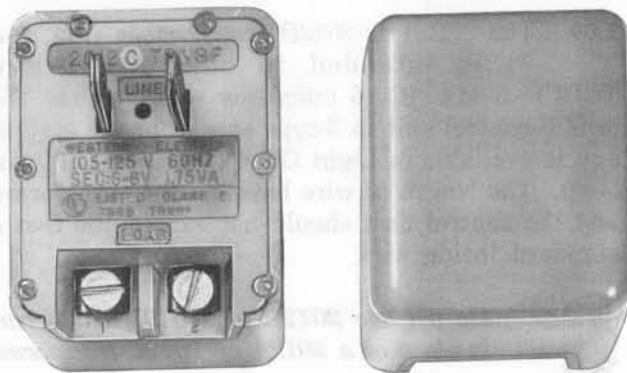


Fig. 6—2012C Transformer

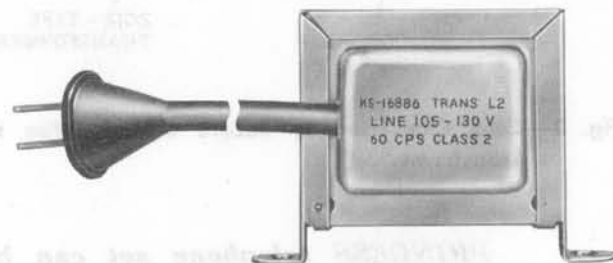


Fig. 8—KS-16886L2 Transformer

### 3. KS-16886L2 TRANSFORMER

**3.01** The KS-16886L2 transformer (Fig. 8) is primarily intended as the centralized power supply for multiphone dial light installations and home interphone systems requiring approximately 6 volts. It is capable of handling up to ten dial

light stations. Additional taps at 10.5, 24.0, and 25.5 volts are also provided for other possible uses. This transformer is self-protecting with an automatic reset thermo switch.



TABLE A

## TRANSFORMER APPLICATION (NOTE)

TRANSFORMER	APPLICATION	PARAGRAPH NO.
2012A (MD) or 2012C	For dial light in the TRIMLINE telephone set. For dial-night light in the PRINCESS telephone set.	2.03 thru 2.07
2012B (MD) or 2012D	Power supply for TOUCH-A-MATIC 16 telephone set, and for 55A or 55B control unit in 3-type (MD) speakerphone system	2.08 thru 2.13
KS-16886L2	For centralized power supply for multiphone dial light installations and home interphone systems requiring approximately 6 volts, capable of handling up to ten dial light stations	3.01 thru 3.03
KS-16940L1	For centralized regulated power supply for up to 30 dial and night lights in telephone sets	4.01 thru 4.07
KS-20426L3	For centralized power supply mounted in a 2-wire receptacle, will power five dial light telephone sets	5.01 thru 5.04
2075A	Supplies power (15 to 18 volts) for the 41A dial in 660-, 662-, 663-, and 664-type telephone sets	8.01 thru 8.03
2186A (MD) or 2189A	Supplies power for the 700A and 700B subscriber sets	9.01 thru 9.06
KS-5714 (MD)	To operate bells, buzzers, and lamps on station systems when the circuits are arranged to supply this load separately	10.01 thru 10.03
KS-21239L6	To furnish power for the 24A-type line status indicator	11.01 thru 11.03
85B1 Power unit	To furnish ac power for the 4A speakerphone system	12.01 thru 12.03
95B1 Power unit	To furnish power for the TOUCH-A-MATIC 32 telephone set	13.01 thru 13.03

*Note:* These transformers are to be used only for the application indicated in this table. Do not substitute one transformer for another.

**3.02** Over-all dimensions of the transformer are 2-3/4 by 3-3/4 by 2-3/4 inches. Power cord is 18 inches long and terminates in a 2-pronged plug. Weight is approximately 1-1/2 pounds.

**3.03** Keyhole slots provide easy installation. Use a suitable backboard when mounting on surfaces requiring backboards.



*The exposed low-voltage terminals are not hazardous and short circuits across these terminals will not damage the KS-16886L2 transformer. However in instances where frequent customer contact may result in short circuits that will affect service, the transformer may be mounted in a 105C (plastic) apparatus box.*

#### 4. KS-16940L1 VOLTAGE REGULATING (V.R.) TRANSFORMER

**4.01** KS-16940L1 V.R. transformer (Fig. 9) is primarily for use as centralized dial light power source to provide regulated power for dial lights and night lights on telephones. It will power 30 dial light telephone sets.

**4.02** Input is provided with a 2-foot 3-conductor power cord and plug. The ground prong of the plug is connected internally to the transformer case. The output is isolated from the input and the case and is terminated in two low voltage terminals on the case.

**4.03** Output taps of 6.3 and 8.0 volts are located on back of cover as shown in Fig. 10. The transformer is shipped with movable lead connected to 6.3-volt tap.

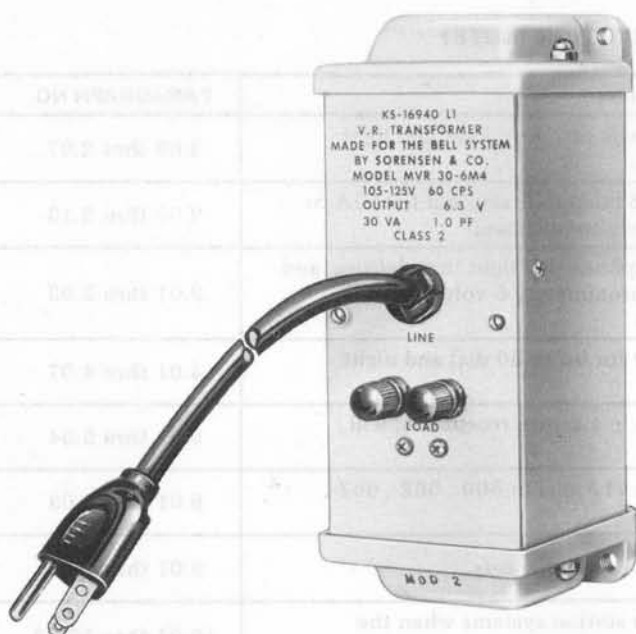


Fig. 9—KS-16940L1 V.R. Transformer

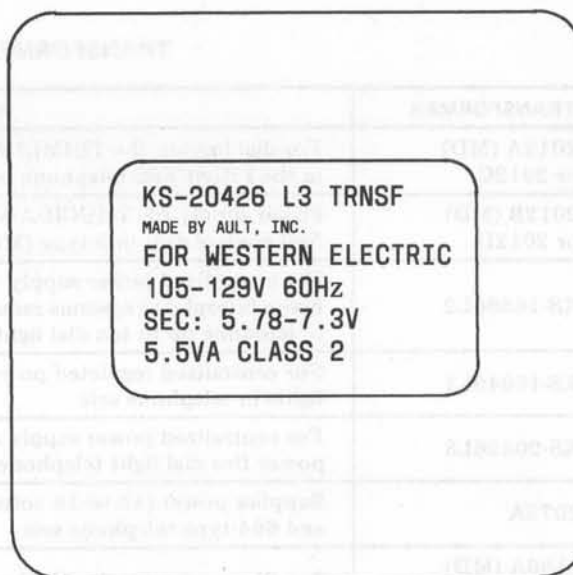


Fig. 11—KS-20426L3 Transformer Manufactured by AULT, INC.



Fig. 10—Movable Lead Connected to 8-Volt Tap, KS-16940L1 V.R. Transformer With Cover Open

4.04 The 8-volt tap should be used to provide illumination for PRINCESS telephone sets.

4.05 To change connection to 8.0-volt tap.

- (1) Remove plug from power outlet, if connected.
- (2) Remove two screws holding cover to case.
- (3) Remove cover.
- (4) Change movable lead from 6.3-volt tap to 8.0-volt tap.

4.06 Over-all dimensions of the transformer are 7-5/8 by 2-15/16 by 3-5/8 inches. The weight is approximately 5-1/2 pounds.

4.07 Four 1/4-inch holes are provided on the case for mounting. Use a suitable backboard for mounting on surfaces requiring backboards.



*An adapter is needed to plug power cord in a standard parallel-blade ac outlet.*

## 5. KS-20426L3 TRANSFORMER

**Danger:** All KS-20426L3 transformers manufactured by AULT, INC., are being recovered from the field. The transformers should be located and recovered on any customer premises visit (installation, repair, modular conversion activity, etc.) and returned without delay to the local Western Electric Service Center. When removing and replacing the KS-20426L3 (AULT) transformer, the unit **SHOULD NOT** be unplugged and then plugged back into the associated ac power outlet, since the stability of the transformer could be affected by such action. See Fig. 11 for the manufacturer's identification marking on the transformer. This recovery plan does not apply to AULT, INC., KS-20426L1 transformer.

5.01 The KS-20426L3 transformer (Fig. 12) is intended for use in light systems and is mounted in a 2-wire receptacle. It will power 5 dial light telephone sets.

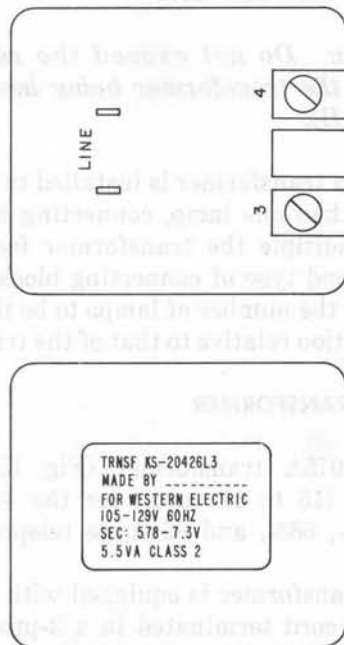


Fig. 12—KS-20426L3 Transformer (Current Version)

5.02 The transformer is self-protecting with an automatic thermo switch and is provided with primary terminals in the form of parallel blades which serve as the mounting device. If furnished, the clamp (Fig. 13) must be used to hold the transformer securely in the receptacle.

**Danger:** For safety, securely attach retaining clamp to ac outlet using outlet cover screw **BEFORE** attempting to install KS-20426L3 transformer. See Fig. 13. When removing KS-20426L3 transformer, always unplug the power unit completely from the outlet **BEFORE** attempting to remove the retaining clamp. This will prevent the possibility of a loosened retainer clamp or metallic outlet cover making contact with the ac prongs of the KS-20426L3 transformer when partially withdrawn from outlet. Do not use KS-20426L3 transformer retaining clamps on outlets where the cover mounting screw holds the duplex outlet in the box.

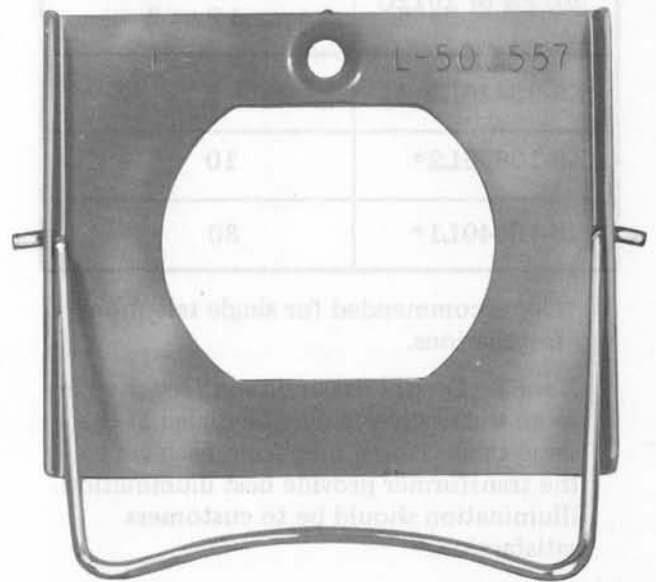


Fig. 13—Clamp for Mounting Early Version KS-20426L3 Transformer Not Equipped With Molded Mounting Tab

**5.03** Some transformers are provided with a mounting tab which is used to hold the transformer securely in the receptacle by using the outlet cover screw. See Fig. 14.

**Danger:** Do not use a KS-20426L3 transformer equipped with a mounting tab if ac outlet has a metal cover or if center cover mounting screw holds the duplex outlet in the box.

**5.04** Recessed screw-type secondary terminals are provided on the same side of the apparatus as the primary terminals. With 115 volts, 60 Hz applied to the primary winding, the secondary winding delivers approximately 6.38 volts at 750 milliamperes.

TABLE B  
DIAL LIGHT  
TRANSFORMER LIMITATION

TRANSFORMERS (NOTE 1)	MAXIMUM NUMBER OF DIAL LIGHT TEL SETS
2012A or 2012C	See Note 2 and Part 2
KS-20426L3	5
KS-16886L2*	10
KS-16940L1*	30

\*Not recommended for single telephone installations.

**Note 1:** Do not use common feeder where more than two sets may be dialed at the same time. Home runs from each set to the transformer provide best illumination. Illumination should be to customers satisfaction.

**Note 2:** Any number of TRIMLINE telephone sets per residence along with one PRINCESS telephone set may be powered from one 2012A or 2012C transformer. However, only one PRINCESS telephone set can be connected to a 2012A or 2012C transformer.

## 6. LENGTHS OF FEEDER PAIRS

**6.01** Table B is to be used as a guide only. After the installation of equipment is made, if illumination is reported as inadequate, then it must be assumed that the lengths of feeder pairs have been exceeded, or too many stations have been off-hook at one time. To remedy this situation do one of the following:

- Double up on the transformer feeder pairs.
- Split the lamp load by adding a second transformer.

**Danger:** When providing power for illuminated station sets, two or more transformers should never feed the same inside wiring pair. Installations of multiple transformers connected to the same inside wiring pair should be avoided and corrected if encountered in the field.

Illumination should be to the customer's satisfaction.

## 7. MULTIPLE INSTALLATIONS

**Caution:** Do not exceed the rated lamp load of the transformer being installed (see Table B).

**7.01** When a transformer is installed to illuminate more than one lamp, connecting blocks may be used to multiple the transformer feeder pairs. The number and type of connecting blocks required depends upon the number of lamps to be illuminated and their location relative to that of the transformer.

## 8. 2075A TRANSFORMER

**8.01** The 2075A transformer (Fig. 15) supplies power (15 to 18 volts) for the 41A dial in the 660-, 662-, 663-, and 664-type telephone sets.

**8.02** The transformer is equipped with an 18-inch power cord terminated in a 2-pronged plug. This plug fits a standard parallel-blade convenience receptacle.

**8.03** Keyhole slots are provided at the rear of the transformer for each installation. Use a suitable backboard when mounting on surfaces requiring backboards.



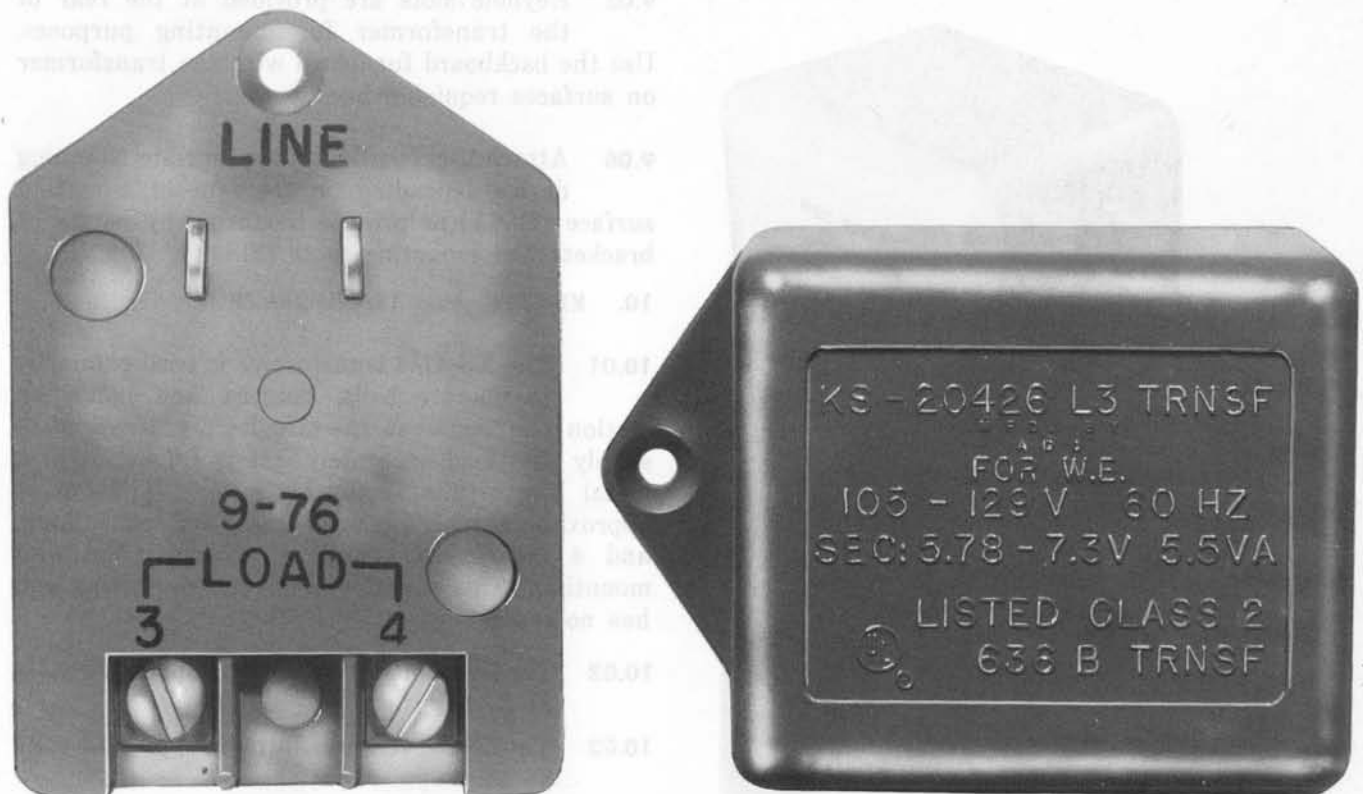


Fig. 14—KS-20426 Transformer Equipped With Molded Mounting Tab

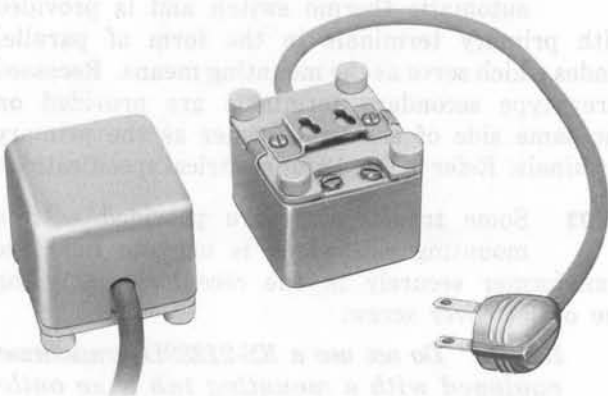


Fig. 15—2075A Transformer

## 9. 2186A (MD) OR 2189A TRANSFORMER

**9.01** The 2189A is a recommended replacement for the 2186A transformer.

**9.02** These transformers (Fig. 16 and 17) supply power for the 700A and 700B subscriber sets.

**9.03** These transformers are protected by an internal thermal overload safety switch which restores automatically. They are equipped with a 12-inch (2186A) or 11-inch (2189A) power cord connected to the primary winding. The secondary winding is terminated in screw terminals on the rear of the transformer.

**9.04** With 117 volts, 60 Hz applied to the primary winding, the secondary delivers approximately 20 volts at 0.345 amp.

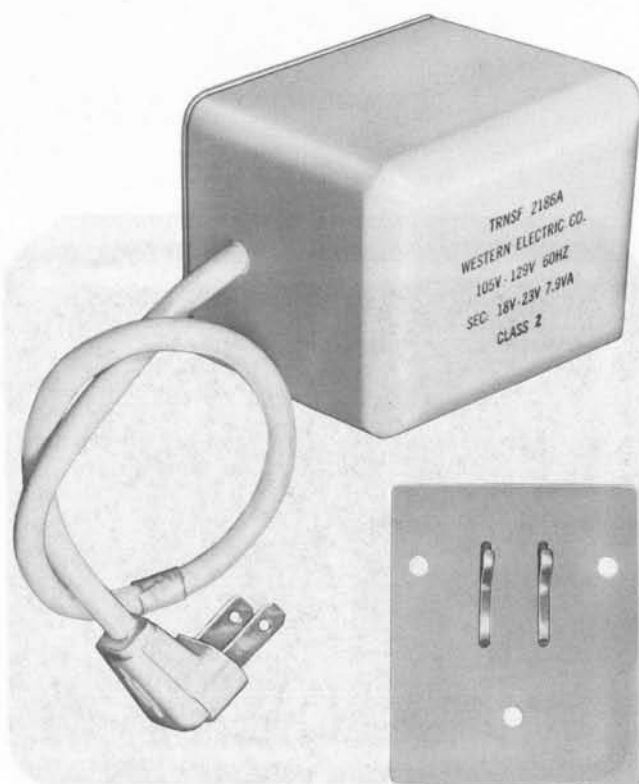


Fig. 16—2186A (MD) Transformer



Fig. 17—2189A Transformer

**9.05** Keyhole slots are provided at the rear of the transformer for mounting purposes. Use the backboard furnished with the transformer on surfaces requiring backboards.

**9.06** Attach backboard with appropriate fastening device depending on the type of mounting surface (2186A) or provide mounting by means of brackets and mounting plate (2189A).

## 10. KS-5714 (MD) TRANSFORMER

**10.01** The KS-5714 transformer is used primarily to operate bells, buzzers, and lamps on station systems when the circuits are arranged to supply this load separately. It is furnished in a metal box with a removable cover. The box is approximately 8-3/4 inches long, 4-3/8 inches high, and 4 inches deep, and is arranged for wall mounting. This transformer is self-protecting and has no fuses.

**10.02** The KS-5714L4 transformer supplies 15-volts at 2.2 amps.

**10.03** The KS-5714L5 transformer supplies 15-volts at 1.1 amps.

## 11. KS-21239L6 TRANSFORMER

**11.01** The KS-21239L6 transformer (Fig. 18) is used to furnish power for the 24A-type line status indicator.

**11.02** The transformer is self-protecting with an automatic thermo switch and is provided with primary terminals in the form of parallel blades which serve as the mounting means. Recessed screw-type secondary terminals are provided on the same side of the transformer as the primary terminals. Refer to Fig. 18 for electrical specifications.

**11.03** Some transformers are provided with a mounting tab which is used to hold the transformer securely in the receptacle by using the outlet cover screw.

**Danger:** Do not use a KS-21239L6 transformer equipped with a mounting tab if ac outlet has a metal cover or if center cover mounting screw holds the duplex outlet in the box.

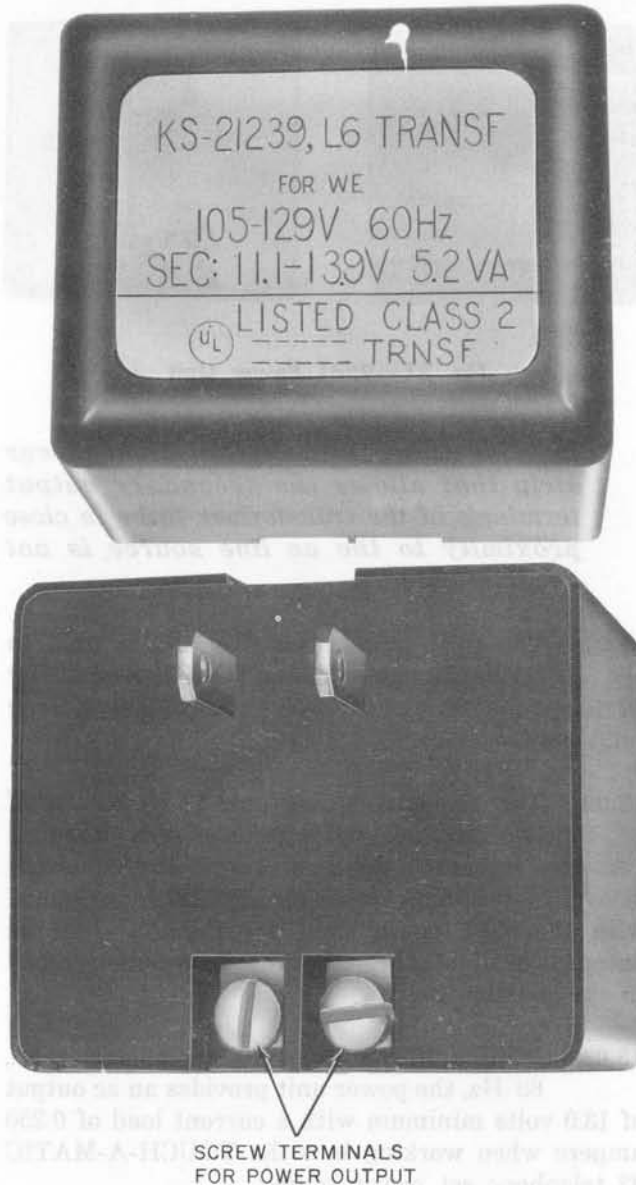


Fig. 18—KS-21239L6 Transformer

## 12. 85B1 POWER UNIT

**Warning:** Care should be taken to trim and dress leads connecting to low voltage output of 85B1 power unit to assure that inadvertent connections to conducting surfaces or other power source does not occur.

**Warning:** If more than one 85B1 and/or 95B1 power unit is plugged into a multiple receptacle power strip there must be at least one inch separation between the power units. Be sure the receptacle power strip is UL listed and rated sufficiently for the number of power units plugged in. Use of a continuous terminal power strip that allows the secondary output terminals of the transformer to be in close proximity to the ac line source is not recommended.

12.01 The 85B1 power unit (Fig. 19) is used to furnish ac power for the 4A speakerphone system. Available in Light Olive Gray (-49) only.

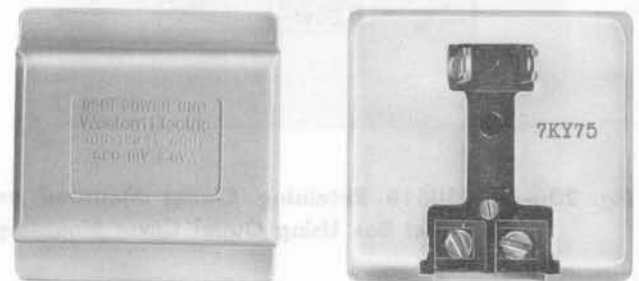


Fig. 19—85B1 Power Unit

12.02 The ac input to the unit is by means of two parallel blades for use in a standard two wire receptacle which serves as the mounting device. A retaining clamp (841050818) is furnished with the 85B1 power unit, see Fig. 20. The ac output is available through screw terminals recessed in the plastic case.

12.03 With a line voltage of 105 to 129 volts, 60 Hz, the power unit provides an ac output of 17.5 volts minimum with a current load of 0.200 ampere when working into the 4A speakerphone system.

**Danger:** For safety, securely attach retaining clamp to ac outlet using outlet cover screw **BEFORE** attempting to install 85B1 power unit. See Fig. 20. When removing 85B1 power unit, always unplug the power unit completely from the outlet

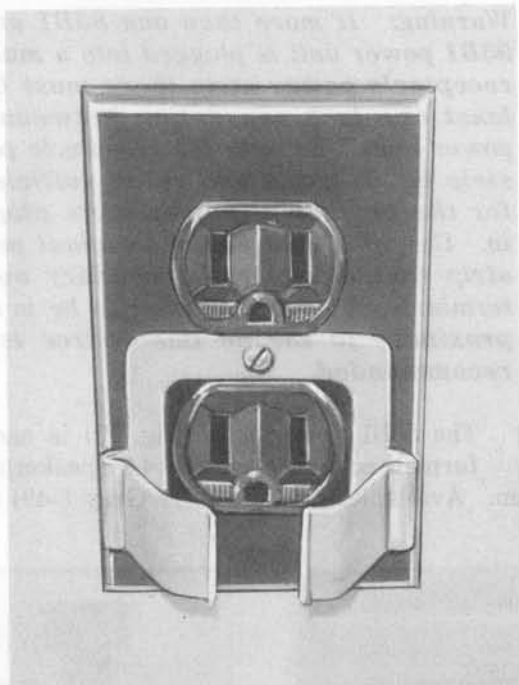


Fig. 20—841050818 Retaining Clamp Mounted on AC Outlet Box Using Outlet Cover Mounting Screw

**BEFORE** attempting to remove the retaining clamp. This will prevent the possibility of a loosened retainer clamp or metallic outlet cover making contact with the ac prongs of the 95B1 power unit when partially withdrawn from outlet. Do not use an 841050818 or similar retaining clamps on outlets where the cover mounting screw holds the duplex outlet in the box.

### 13. 95B1 POWER UNIT

**Warning:** Care should be taken to trim and dress leads connecting to low voltage output of 95B1 power unit to assure that inadvertent connections to conducting surfaces or other power source does not occur.

**Warning:** If more than one 95B1 and/or 85B1 power unit is plugged into a multiple receptacle power strip there must be at least one inch separation between the power units. Be sure the receptacle power strip is UL listed and rated sufficiently for the number of power units plugged

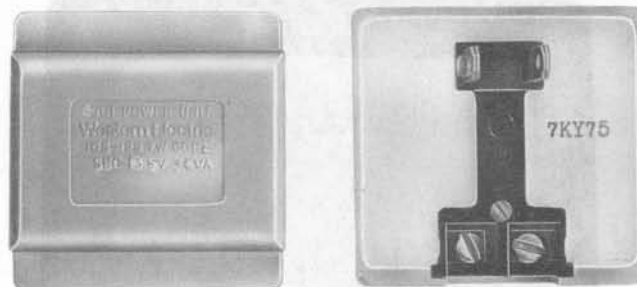


Fig. 21—95B1 Power Unit

*in. Use of a continuous terminal power strip that allows the secondary output terminals of the transformer to be in close proximity to the ac line source is not recommended.*

**13.01** The 95B1 power unit (Fig. 21) is used to furnish ac power for the TOUCH-A-MATIC® 32 telephone set. Available in Light Olive Gray (-49) only.

**13.02** The ac input to the unit is by means of two parallel blades for use in a standard two wire receptacle which serves as the mounting device. A retaining clamp (841050818) is furnished with the 95B1 power unit, see Fig. 20. The ac output is available through screw terminals recessed in the plastic case.

**13.03** With a line voltage of 105 to 129 volts, 60 Hz, the power unit provides an ac output of 13.0 volts minimum with a current load of 0.250 ampere when working into the TOUCH-A-MATIC 32 telephone set power supply.

**Danger:** For safety, securely attach retaining clamp to ac outlet using outlet cover screw **BEFORE** attempting to install 95B1 power unit. See Fig. 20. When removing 95B1 power unit, always unplug the power unit completely from the outlet **BEFORE** attempting to remove the retaining clamp. This will prevent the possibility of a loosened retainer clamp or metallic outlet cover making contact with the ac prongs of the 95B1 power unit when partially withdrawn from outlet. Do not use an 841050818 or similar retaining clamps on outlets where the cover mounting screw holds the duplex outlet in the box.