T-1120
ISSUE 1

STROMBERG-CARLSON

S-C 1A2 KEY TELEPHONE SYSTEM DIAL SELECTIVE INTERCOM

Installation and Maintenance

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SECTION I DESCRIPTION

1. GENERAL

The dial-selective intercom portion of the S-C 1A2 Key Telephone System is suitable for both small and large installations. Three dial-selective intercoms are available: a selector-only system with a common talking path; a single-talking link system with one private talking path; and a two-talking link system with two private talking paths. Each system is designed to provide dial selection of any one of up to 36 stations. The basic system starts with an intercom service for nine stations with provisions for adding stations as required. The relays and circuits required to provide service for additional stations (beyond the basic nine stations) are added by installing S-C Key Telephone Units. The units are designed to add relays and circuits in increments that are economical. Features can be added as requirements change.

Although the selector-only arrangement can be used in large installations, it is best suited for small installations with a low calling rate. As the number of stations increase, or when privacy is desired, the single-talking link arrangement becomes desirable. When the calling rate is high, the calling capacity can be doubled by arranging the intercom for two-talking link operation.

2. FEATURES

Common Talking Path: The selector-only system uses a common talking path. Any station can listen or converse at any time. Modular construction permits you to equip the system for only present requirements. The basic system is a one-digit dialing, nine-station, dial-selector, common-talking-path intercom. The system is expandable to provide a two-digit dialing intercom for as many as 36 stations. Features include:

Audible station signaling.

System busy lamp signaling.

Signaling (dial or key) as many as six stations for a preset conference connection.

Up to six called and one calling party per conference group.

Establishing a conference between a central-office or PBX line and intercom station or a preset conference connection.

Extending facilities of intercom to an off-premise station.

One Private Talking Path: The single-talking link system permits dial selection of any one of up to 36 stations and uses a private talking path. The system can be arranged so that when the intercom is in use, all or any number of the associated intercom stations are automatically

cut off. Basic nine-station intercom is expandable to provide two-digit dialing for up to 36 stations. Features include:

Audible station signaling.

System busy lamp signaling.

Signaling (dial or key) as many as six stations for a preset conference connection.

Up to six called and one calling party per conference group.

Establishing a conference between a selected central-office or PBX line and an intercom station or a preset conference connection.

Extending facilities of intercom to an off-premise station.

Flashing lamp signal for incoming calls.

Flashing lamp signal while preset conference call is being established until all conference stations have been connected.

Providing camp-on feature to permit a station to dial and select a station while intercom is in use. When called station line is free, call is automatically connected.

Sending a busy signal to all stations trying to originate calls while intercom is busy.

Two Private Talking Paths: The two-talking link system permits dial selection of any one of up to 36 stations and uses two private talking paths. This arrangement permits two simultaneous and independent private two-way converations. Basic nine-station intercom is expandable to provide two-digit dialing for up to 36 stations. Features include:

Audible station signaling.

System busy lamp signaling.

Signaling (dial or key) as many as six stations for a preset conference connection. Up to six called and one calling party per conference group.

Establishing a conference between a selected central-office or PBX line and an intercom station or a preset conference connection.

Extending facilities of intercom to an off-premise station.

Flashing lamp signal for incoming calls.

Flashing lamp signal while preset conference call is being established until all conference stations have been connected.

Providing camp-on feature to permit a station to dial and select another station while intercom is in use. When called station line is free, call is automatically connected.

Sending a busy signal to calling station when called station is busy.

Sending a busy signal to calling station when called station has already been called for a conference.

3. DESCRIPTION OF KEY TELEPHONE UNITS

The S-C 19B KTU Flashing Circuit contains a double relay that provides the make-break timing functions for visual signals and for busy tone. This unit can be used at installations where the electromechanical interrupter is not used to supply these timing functions.

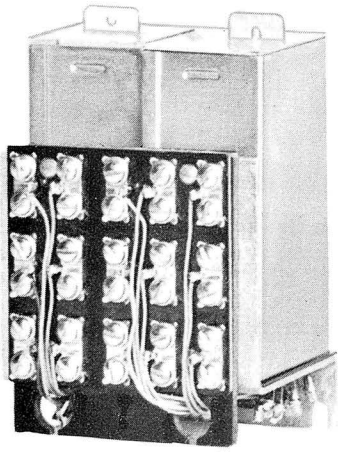

Figure 1. S-C 19B KTU Flashing Circuit.

The S-C 207C KTU Selector Circuit, which is the basic unit of the dial-selective intercom, is used with all three intercom arrangements. The unit provides a common talking path between all stations when used in the selector-only arrangement, and it contains a signaling circuit for nine codes. The signaling circuit provides the audible signal required to signal the called station. Optional strapping for busy lamp indications when the system is in use is provided. Dial selection for more than nine stations is obtained by using S-C 215A or 223A KTU Three-Station Signaling Circuits and S-C 216A KTU Transfer Circuits. Signaling of the stations is accomplished by dialing one digit or by dialing two digits, depending on the station code.

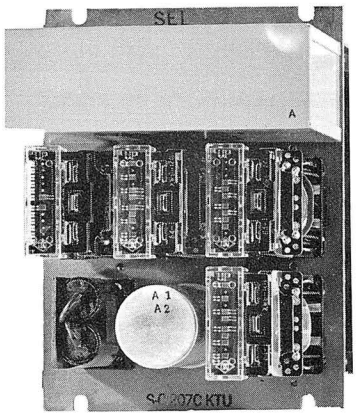

Figure 2. S-C 207C KTU Selector Circuit.

The S-C 214B KTU Single-Talking Link and Nine-Station Signaling Circuit is used to provide the single-talking link arrangement. The unit supplies talking battery to the intercom stations, and it contains signaling and talking-control circuits. The talking-control circuits are used to cut through a private talking path between the calling station and the called station. The signaling circuits control audible and visual signals for nine stations.

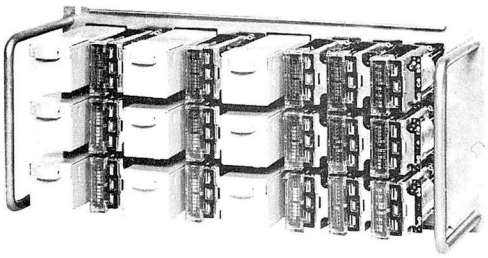

Figure 3. S-C 214B KTU Single-Talking Link and Nine-Station Signaling Circuit.

The S-C 215A KTU Three-Station Signaling Circuit is used to provide additional signaling circuits. The units are used when the single-talking link dial-selective intercom has been expanded beyond the original 9-station capacity by S-C 216A KTU Transfer Circuits. One S-C 215A KTU is required for every three stations beyond the original nine stations.

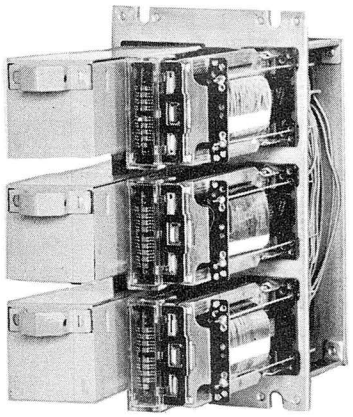

Figure 4. S-C 215A KTU Three-Station Signaling Circuit.

The S-C 216A KTU Transfer Circuit is used to expand the dial-selective intercom beyond the original 9-code capacity. Each unit expands the dialing capacity by nine codes, and units can be added until the capacity is increased to 36 codes. The S-C 207C Selector provides for nine 1-digit codes; the S-C 216A Transfer Circuit, when used, expands the intercom capacity by allowing 2-digit code dialing. Signaling is accomplished as follows: for the selector-only intercom by using the S-C 207C selector; for the single-talking link intercom by using S-C 215A Three-Station Signaling Circuits; and for the two-talking link intercom by using S-C 223A Three-Station Signaling Circuits.

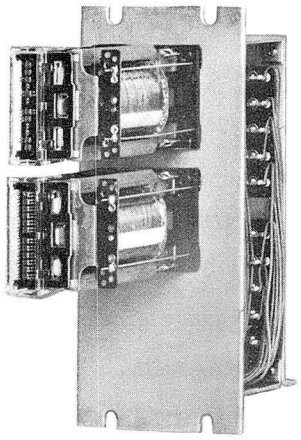

Figure 5. S-C 216A KTU Transfer Circuit.

The S-C 217A KTU Preset Conference Circuit will provide two preset conference connections. Each conference connection has a capacity of seven stations, including the calling station. This unit is normally used with single-talking link or two-talking link dial-selective intercom. The unit provides ringing voltage paths and flashing lamp paths to the conference stations. When the first conference party answers, the ringing stops at all conference stations. The lamp flashing, however, continues at each conference station until all

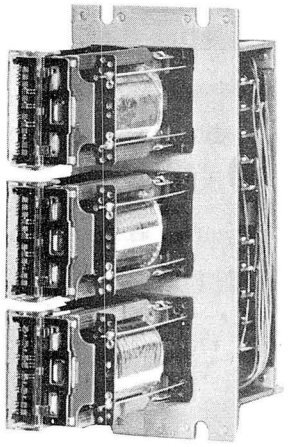

Figure 6. S-C 217A KTU Preset Conference Circuit.

all parties have answered. One preset conference unit is required for each two preset conference arrangement desired. Each conference arrangement used requires either one digit on the dial-selective intercom or a spare pushbutton on the telephone to signal for the conference.

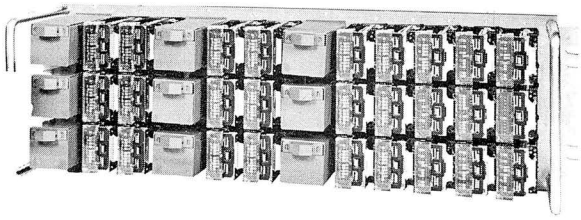

Figure 7. S-C 222A KTU Two-Talking Link and Nine-Station Signaling Circuit.

The S-C 222A KTU Two-Talking Link and Nine-Station Circuit is used to provide the two-talking link arrangement. The unit supplies talking battery to the intercom stations, and it contains signaling and talking-control circuits. The talking-control circuits are used to cut through two simultaneous and independent talking paths. The signaling circuits control audible and visual signals for nine stations.

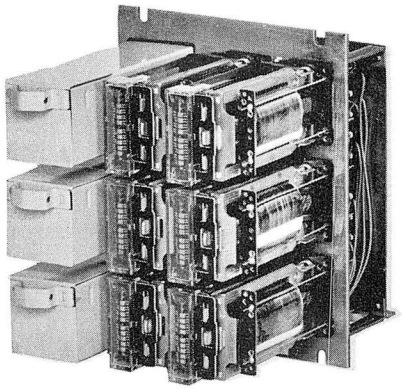

Figure 8. S-C 223A KTU Three-Station Signaling Circuit.

The S-C 223A KTU Three-Station Signaling Circuit is used to provide additional signaling circuits. The units are used when the two-talking link dial-selective intercom has been expanded beyond the original 9-station capacity by the S-C 216A KTU Transfer Circuits. One S-C 223A KTU is required for every three stations beyond the original nine stations.

The S-C 224A KTU Busy Signal and Camp-On Control Circuit is used to provide the busy tone circuits and the optional camp-on feature used with the single-talking link and two-talking link intercom. Camp-on is a feature that permits one station to dial and select another station when the intercom is is use. When the called station becomes free, ringing is applied, and the call is automatically cut through. This unit is required with the two-talking link intercom

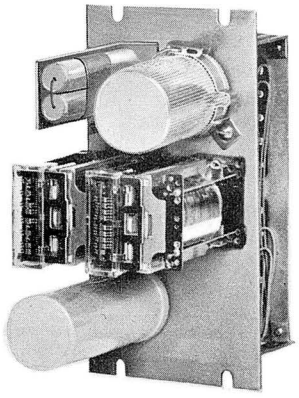

Figure 9. S-C 224A KTU Busy Signal and Camp-On Control Circuit.

The S-C 225A KTU Long Line Circuit is used to extend the facilities of the dial-selective intercom beyond the normal range to a remote or off-premise station. The normal range for the intercom is exceeded when the line loop resistance is more than 50 ohms. The unit supplies a ringing voltage circuit path and a talking-voltage circuit path to a remote or off-premise station. In addition, a circuit is provided for repeating dial pulses sent from the remote or off-premise station.

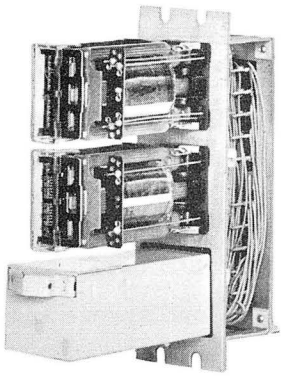

Figure 10. S-C 225A KTU Long Line Circuit.

The S-C 226B KTU Add-On Conference Control Circuit is used to enable connection of a central-office or PBX line to intercom stations that normally do not have access to outside trunks. The unit contains a single circuit that controls the transmission path between the dial-selective intercom and a previously held central-office or PBX line that is to be connected to a conference. When the S-C 226B KTU is used with the single-talking link or two-talking link, an S-C 229B KTU is required with each group of up to seven S-C 226B KTU Circuits to provide the add-on conference feature.

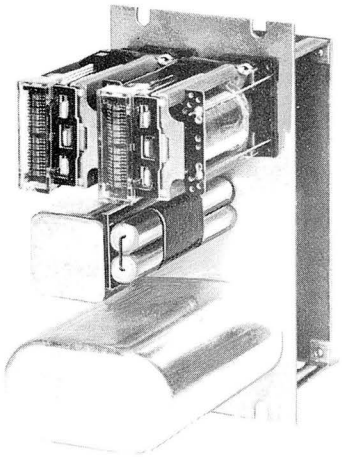

Figure 11. S-C 226B KTU Add-On Conference Control Circuit.

The S-C 227A KTU Auxiliary Control Circuit is used for one of several different auxiliary and control functions. The unit contains a circuit that can be used as: an auxiliary relay-lamp flashing circuit; an auxiliary relay-busy-lamp circuit; a ringing and tone control circuit; a multi-signal control circuit for various combinations of ringers, buzzers, and lamps; a common or station audible circuit; an auxiliary lamp relay circuit for use when more than 20 lamps per line are required; and a single add-on transfer circuit.

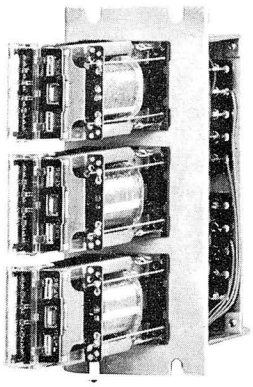

Figure 12. S-C 227A KTU Auxiliary Control Circuit.

The S-C 229B KTU Multiple Add-On Transfer Circuit provides the required circuits for operating up to seven S-C 226B KTU Add-On Conference Control Circuits. An S-C 229B KTU is required with each group of up to seven S-C 226B KTU's. This unit is not required for the add-on conference option with the selector-only intercom arrangement.

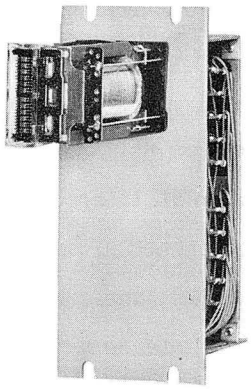

Figure 13. S-C 229B KTU Multiple Add-On Transfer Circuit.

The S-C 232B KTU Electromechanical Flash, Wink, Ring, and Time-Out Circuit is used to obtain basic timing intervals for visual and audible signals and for busy tone and is used to provide for a manual intercom line. This unit also provides an optional time-out feature for use when the dial-selective intercom is used with central-office or PBX line circuits of a 1A or 1A1 Key Telephone System. The unit contains a motor-driven interrupter which provides timing intervals required for interrupted audible signals, flashing lamps, winking lamps, and busy tone. Talking battery and a busy lamp provision are available for the addition of a manual intercom line. The optional time-out feature provides for the release of visual and audible signals.

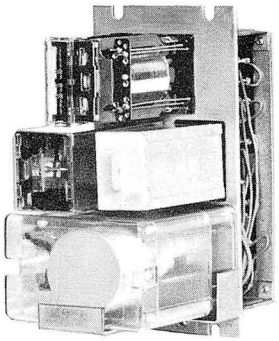

Figure 14. S-C 232B KTU Electromechanical Flash, Wink, Ring, and Time-Out Circuit.

4. INTERCOM ARRANGEMENT

a. General.

Three basic intercom systems are available: the selector-only intercom arrangement, the single-talking link intercom arrangement, and the two-talking link intercom arrangement. All three intercom arrangements can provide 36-station intercom service. There is a choice of dial or pushbutton access for various available optional services. The use of a dial code for access of an optional service reduces intercom station capacity by one. Each illustrated intercom arrangement is equipped for 36 codes, and one of each type of available optional service. Intercom systems can be rearranged to fit individual needs by addition or removal of the optional units.

b. Selector-Only Intercom.

The selector-only arrangement illustrated below is equipped for 36 codes. The basic selector-only arrangement is equipped for 9 codes and can be expanded (9 codes at a time) until a maximum of 36 codes is reached. This selector-only arrangement provides a common-talking path between all intercom stations. Options included with this arrangement are: Two 7-station preset conference arrangements (conferences are initiated either by pushing a button or by dialing a code), one add-on conference control circuit (one central-office or PBX line can be added to the intercom circuit by pushing a button or by dialing a code), and one long-line circuit (allows one station of the intercom line to be located at an area beyond the normal 50-ohm range of the intercom).

This intercom arrangement can be changed to a single-talking link or a two-talking link arrangement by adding equipment as indicated in the system arrangement drawings.

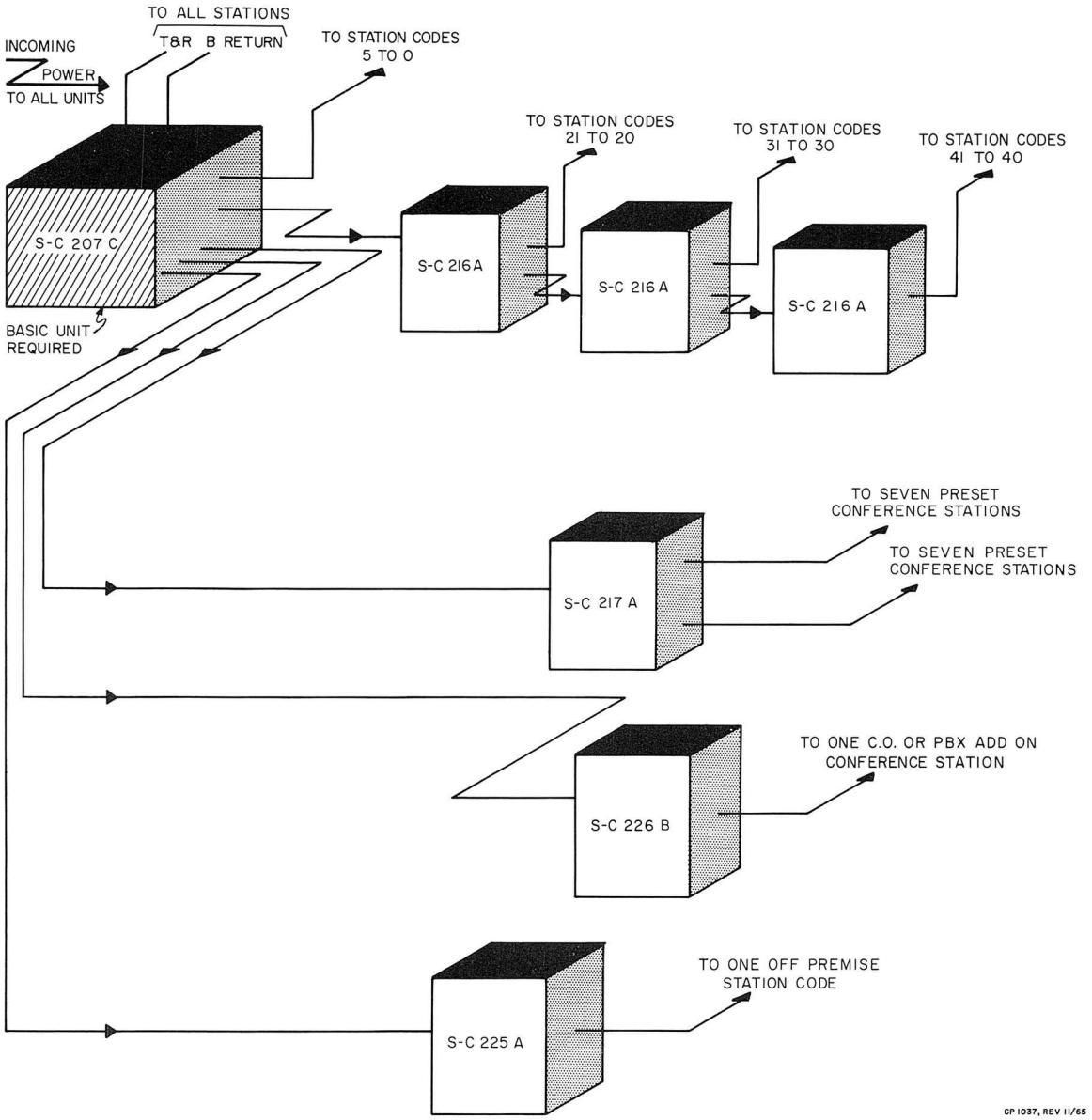

Figure 15. 36-Station Selector-Only Intercom Arrangement.

c. Single-Talking Link Intercom.

The single-talking link arrangement illustrated below is equipped for 36 codes. The basic single-talking link arrangement is equipped for 9 codes and can be expanded (9 codes at a time) until a maximum of 36 codes is reached. The single-talking link arrangement provides one private talking path between any two stations on the intercom line. Options included with this arrangement are: two 7-station preset conference arrangements (conferences are initiated either by pushing a button or by dialing a code), and one add-on conference control circuit (one central-office or PBX line can be added to the intercom circuit by pushing a button or by dialing a code), one long-line circuit (allows one station of the intercom line to be located at an area beyond the normal 50-ohm range of the intercom), and one busy signal and camp-on control circuit (provides busy tone and camp-on feature to all stations).

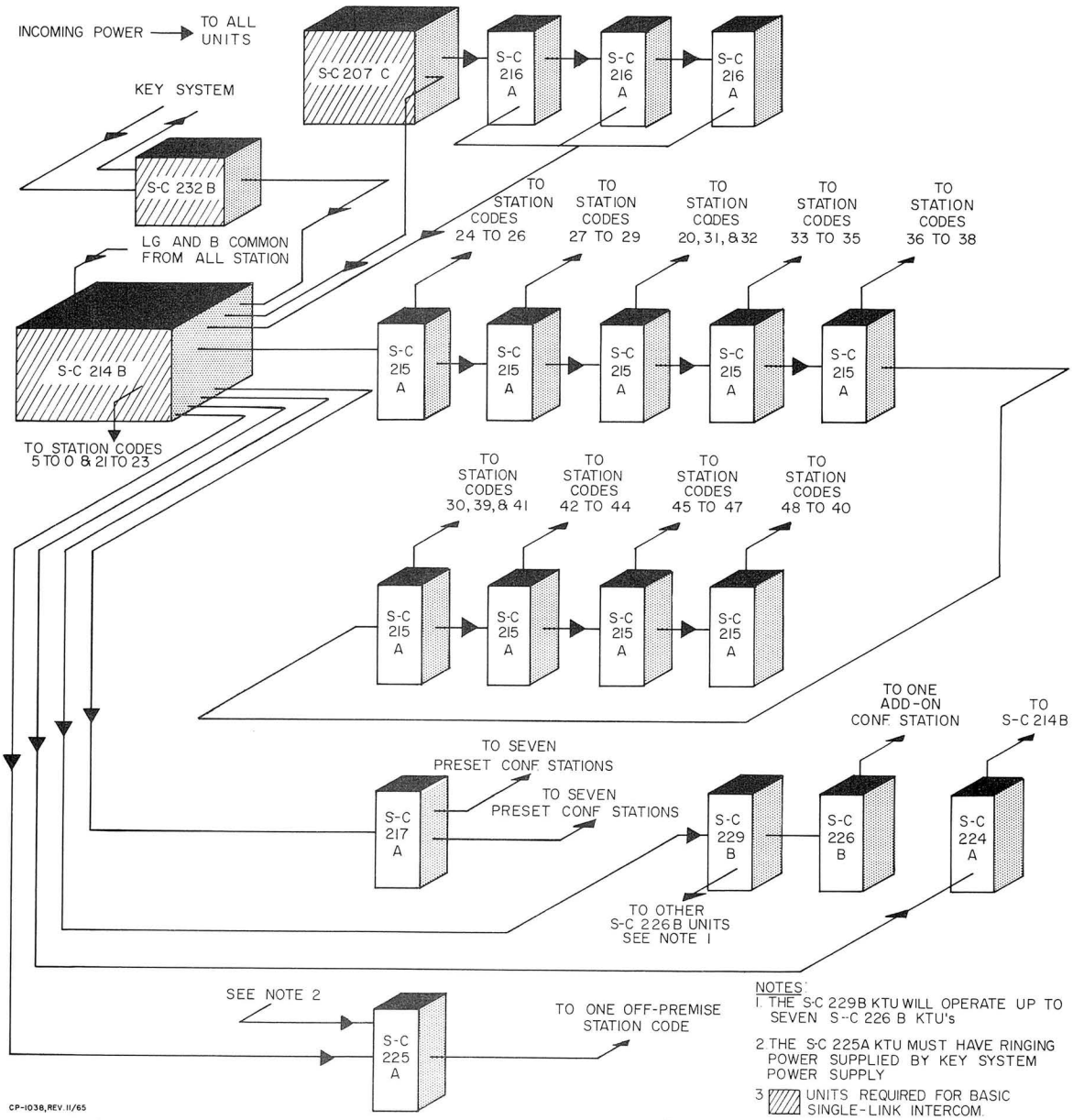

Figure 16. 36-Station Single-Talking Link Intercom Arrangement.

d. Two-Talking Link Intercom.

The two-talking link arrangement illustrated below is equipped for 36 codes. The basic two-talking link arrangement is equipped for 9 codes and can be expanded (9 codes at a time) until a maximum of 36 codes is reached. This two-talking link arrangement provides two private talking paths between any stations on the intercom line; two independent private conversations can take place at the same time. Busy tone and camp-on features are standard with this intercom. Options included with this arrangement are: two 7-station preset conference arrangements (conferences are initiated either by pushing a button or by dialing a code), one add-on conference control circuit (one central-office or PBX line can be added to the intercom line by pushing a button or by dialing a code), and one long line circuit (allows one station of the intercom line to be located at an area beyond the normal 50-ohm range of the intercom).

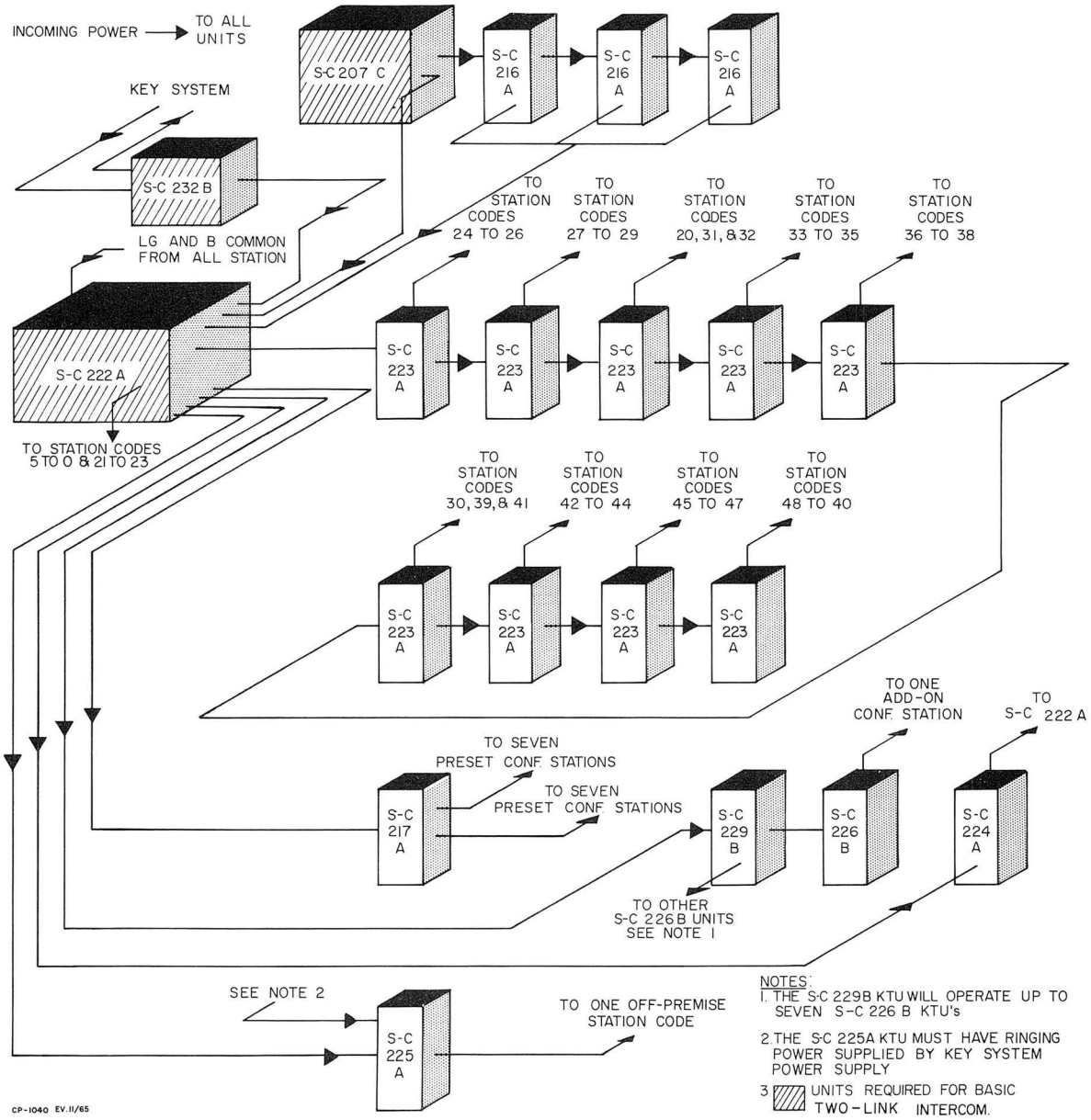

Figure 17. 36-Station Two-Talking Link Intercom Arrangement.

5. TELEPHONES

The 1700-Series multiline telephones and similar key telephones of other manufactures are compatable with the S-C 1A2 Key Telephone System. The 1700-Series multiline telephones are available in three basic types: 6-key executive-style desk telephones; 12-key executive-style desk telephones; and 12-key executive-style wall telephones.

The 6-key executive-style desk telephone is ideal where up to five central-office or PBX lines are required, or where up to four central-office or PBX lines and dial-selective intercom are required. The sixth key is used to provide the line-hold feature. Intercom using the hold key is available to expand the capacity by one line. Manual exclusion is available to provide a private line feature for one telephone on each line. Line cords are available with plug ends or spade ends to facilitate installation.

Figure 18. 6-Key Executive-Style Desk Telephone.

The 12-key executive-style desk telephone is ideal where up to 11 central-office or PBX lines are required, or where up to 10 central-office or PBX lines and dial-selective intercom are required. The twelfth key is used to provide line-hold feature. Intercom using the hold key is available to expand the telephone capacity by one line. This telephone is recommended when growth is anticipated because it can be initially equipped with six keys to provide for five lines and hold, and when required, a second set of six keys can be plugged in to provide eleven lines and hold. Manual Exclusion is available to provide a private line feature for one telephone on each line. Line cords are available with

Figure 19. 12-Key Executive-Style Desk Telephone.

plug ends or with spade ends to facilitate installation.

The 12-key executive-style wall telephone is ideal where desk space is at a premium. This telephone has the same-line capacity and growth capacity as the 12-key desk telephone.

Figure 20. 12-Key Executive-Style Wall Telephone.

6. BUSY-STATION NUMBER DISPLAY

The Busy-Station Number Display allows the receptionist to determine at a glance if a station is idle or busy. The unit provides displays that indicate the status of up to 36 stations. The displays are in the form of illuminated numerals. Each numeral on the face of the Busy-Station Number Display is associated with a station; when the handset of the station is off the cradle, a lamp behind the numeral lights. Initially, the Busy-Station Number Display is equipped with three lamp strips which can accommodate six lamps each to provide indications for 18 stations. When required, an add-on module, which contains three additional lamp strips, can be installed to provide for 18 more displays.

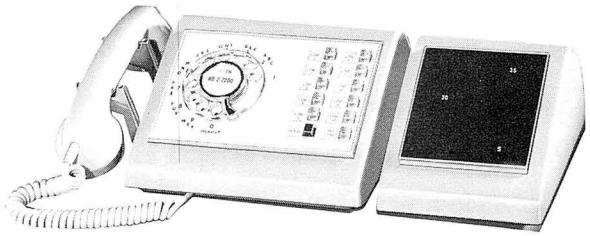

Figure 21. Busy-Station Number Display.

The design of the Busy-Station Number Display is similar to the design of the 1700-Series telephones, and the unit is available in the same color range as the telephone (black, beige, gray, or green). The combination of a 1700-Series telephone and matching Busy-Station Number Display compliments general business office decor.

7. TELEPHONE CONNECTING EQUIPMENT

The No. 44A terminal block contains 10 screw connections for termination of spade ended leads. Backboard and cover assemblies are available to mount one, three, or four No. 44A blocks. This terminal block is ideal when key telephone instruments with spade tipped line cords are used in the system.

The No. 66E-3 connecting block is a 25-pair block, which accepts one or two 25-pair cables and a plug ended instrument line cord. The 66E-3 connecting block includes 50 2-termination, quick-connect terminals wired to a single 50-terminal female connector. Two cut cables and a single key telephone set may be terminated on the block. The 714B tool is used to connect 20- to 26-gauge conductors to the terminals without stripping insulation and without soldering. If 18- or 19-gauge cable is used, conductors should first be stripped. This block is also available with a list 1 adapter, which includes five double screw connections on a removable insulated plate for providing auxiliary services (bells, buzzers, lights, etc.)

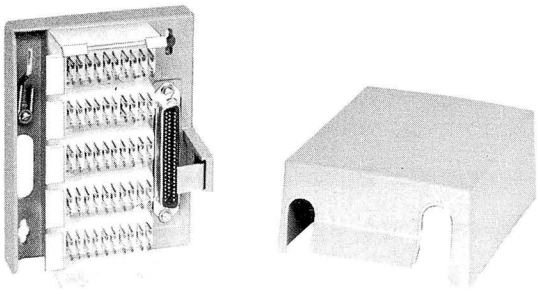

Figure 22. 66E-3 25-Pair Connecting Block.

The 66E-5 connecting block is a 50-pair block, which is equipped with two complete 25-pair terminal blocks and two 25-pair connectors. It accepts two single or one double plug-ended instrument line cord and up to four 25-pair cables, or two 50-pair cables. The cables may be cut and terminated, or they may be bridge connected and extended to another 66E-5 connecting block or other terminal without cutting the cable at the first location. The 66E-5 connecting block, like the 66E-3 connecting block, is factory prewired ready for cable installation by using the 714B tool. This terminal block is available with a list 1 adapter which includes eight double screw connections for taking off auxiliary services (bells, buzzers, lights, etc.).

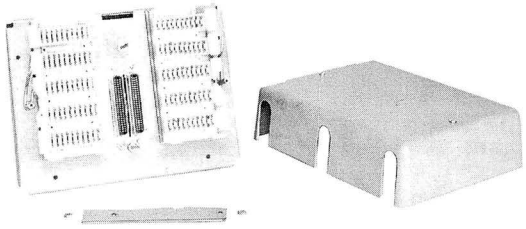

Figure 23. 66E-5 50-Pair Connecting Block.

8. DISTRIBUTION TERMINAL BOXES

The distribution terminal box, which consists of a housing and a 66-type quick-connect terminal block (s), provides for fast and efficient termination of cable pairs and facilitates maintenance. The 66-type quick-connect block provides clip-type metal terminal strips, six clips wide. A 714B tool is used to assist in rapidly terminating wires to these clips. The tool is also used to trim the wires. Plastic covered, 24 AWG wire is specified. Distribution terminal boxes with a 25-pair capacity and distribution terminal boxes with a 50-pair capacity are available.

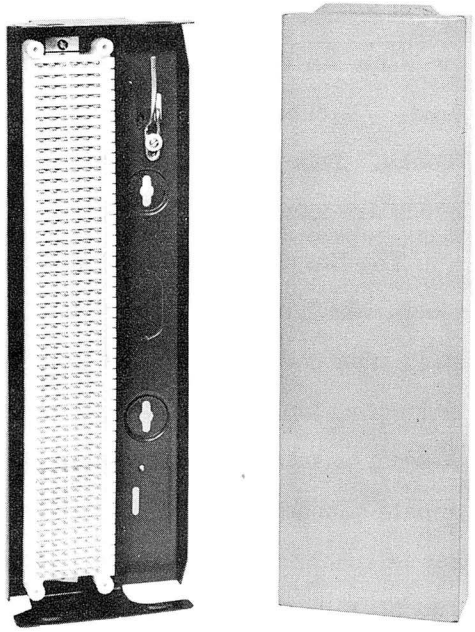

Figure 24. Distribution Terminal Box.

9. CONNECTION TOOL

The successful use of the clip terminals depends on the use of the 714B tool to properly insert the wires. The plastic handle contains a reversible rectangular hollow blade made of hardened steel. The blade is hollow so that it will fit over the connecting clip; the clearance on this fit is critical and controlled to within one thousandths of an inch.

One end of the blade has a cutting edge to trim off the excess conductor after the termination is made. The other end is blunt and is used when making bridging connections between two or more clip strips. The tool handle is color-coded yellow on the same side that the cutting edge of the blade is on.

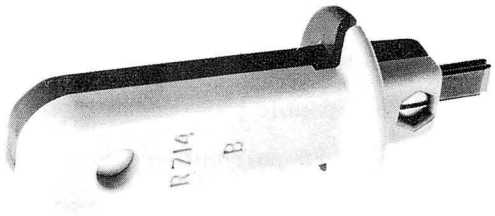

Figure 25. 714B Connection Tool.

10. INTERRUPTERS

The interrupters used to provide the timing intervals for the S-C 1A2 Key Telephone System are described in the following paragraphs.

S-C 202148-879 Interrupter.

The S-C 202148-879 Interrupter is provided as standard equipment with all S-C Key Service Units. The interrupter is a motor-driven plug-in unit, which is 2-3/16 inches wide, 3-3/4 inches high, and 2-3/16 inches deep. The following timing intervals are provided when the interrupter motor is energized (refer to S-428028 fig. 6): one 15-IPM interval, two 60-IPM intervals, and one 120-IPM interval. One additional interrupter contact is provided for a holding circuit of the motor, causing the interrupter to always stop in the same position.

S-C 202148-889 Interrupter.

The S-C 202148-889 Interrupter is provided as standard equipment with the S-C 232B KTU Electromechanical Flash, Wink, Ring, and Time-Out Circuit and with the S-C 584A KTU 13-Line Cell. The interrupter is a motor-driven plug-in unit, which is 2-1/4 inches wide, 3-5/16 inches high, and 4-15/32 inches deep. The following timing intervals are provided when the interrupter motor is energized (refer to S-428029 fig. 23): one 15-IPM interval, one 60-IPM interval, and one 120-IPM interval. One additional interrupter contact is provided for a holding circuit of the motor, causing the interrupter to always stop in the same position.

11. APPARATUS MOUNTING CABINETS

The S-C 16C Apparatus Mounting is a cabinet that provides mounting facilities for S-C Key Telephone Units and for 66-type quick-connect terminal blocks. This unit provides two rows for mounting, and each row is 43 mounting holes wide. (Refer to paragraph 15 for mounting information.) The 583A KTU 15-line cell can also be mounted in the cabinet. Each cabinet will accommodate up to four 66-type quick-connect terminal blocks. The dimensions of the cabinet are: 25-3/4 inches wide, 16-1/2 inches high, and 9-1/2 inches deep. An S-C 117A Cover is available for the S-C 16C Apparatus Mounting.

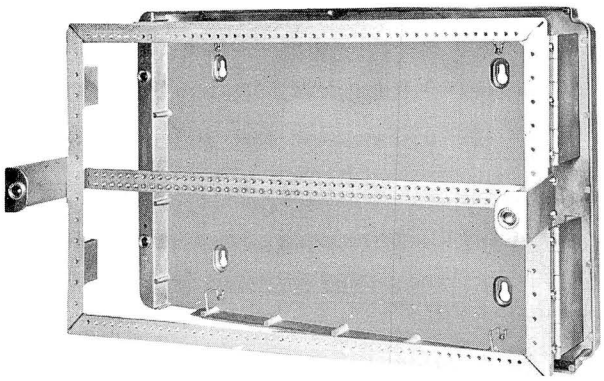

Figure 26. S-C 16C Apparatus Mounting Cabinet.

The 303722-986 Apparatus Mounting is a cabinet which provides mounting facilities for S-C Key Telephone Units and for 66-type quick-connect terminal blocks. This unit provides two rows for mounting, and each row is 23 mounting holes wide. (Refer to paragraph 15 for mounting information.) The dimensions of the cabinet are 13-1/4 inches wide, 16-5/8 inches high, and 9-3/8 inches deep.

12. POWER SUPPLIES

The power requirements for the S-C 1A2 Key Telephone System are affected directly by the system arrangement and station capacity. Power supplies recommended here are for average systems. When a system is equipped with more than the average mount of stations, power requirements for the system can be figured from the power requirement information contained in paragraph 16.

S-C 86731 Power Supply.

The S-C 86731 Power Supply is an internally mounted unit, which is recommended for use with the S-C 500 Series Key Service Units. The power supply is provided as standard equipment in the S-C 501A4, S-C 501A4D, and S-C 502A4D Key Service Units. Although the power supply is not provided as standard equipment with the S-C 501A1, the S-C 501A2, and the S-C 501A3 Key Service Units. It can be mounted in these units because they are furnished without the S-C 207C KTU Selector Circuit. The power supply is 9-1/8 inches wide, 7 inches high, and 4-1/16 inches deep. The power supply is equipped with a 12-foot power cord and has input taps making it workable from an ac source in the range of 105 to 130 volts, 60 cycles. The input power is 60 watts.

The power supply has the following outputs, each fused at 2 amperes:

(1) 0.9 ampere, 14-28 volts dc for talking.

(2) 0.6 ampere, 18-28 volts dc for relay signaling.

(3) 2.8 amperes, 8.75-11 volts, 60 cycles ac for lamp and buzzer signaling.

(4) 1.4 amperes, 16-20 volts, 60 cycles ac for buzzer signaling.

S-C 86738 Power Supply.

The S-C 86738 Power Supply is an internally mounted plug-in unit, which is provided as standard equipment in the S-C 551A Key Service Unit. The power supply is 6-1/10 inches wide, 4-1/2 inches high, and 3-3/5 inches deep.

Power cords for the power supply are available in 4-foot and 6-foot lengths and must be ordered separately.

The power supply has input taps making it workable from an ac source in the range of 105 to 129 volts, 60 cycles. The input power is 55 watts. The power supply has the following outputs:

(1) 90 milliamperes, 18-26 volts dc for talking - fused at 1/2 ampere.

(2) 200 milliamperes, 20-26 volts dc for relay signaling - fused at 1/2 ampere.

(3) 2.1 amperes, 8.75-11.25 volts, 60 cycles ac for lamp and buzzer signaling - fused at 5 amperes.

(4) 200 milliamperes, 20-22 volts, 60 cycles ac for buzzer signaling - fused at 1/2 ampere.

RT1B Power Supply.

The RT1B Power Supply is recommended for use with the selector-only arrangement. This power supply is normally externally mounted; the dimensions are 13-7/8 inches wide, 5-1/4 inches high, and 8-5/8 inches deep.

The power supply is equipped with a 6-foot power cord and operates from 117±5 volts ac. Additional taps provide for 111-volt or 123-volt input. The outputs of the power supply are as follows:

(1) 1.0 ampere, 21 volts dc for talking - fused at 2 amperes.

(2) 2.0 amperes, 23 volts dc for audible signaling and relay operation - fused at 2 amperes.

(3) 0.5 ampere, 20 volts, 60 cycles ac for audible signaling - fused at 2 amperes.

(4) 8.0 amperes, 10 volts, 60 cycles ac for lamp and audible signaling - fused at 2 amperes.

(5) 50 milliamperes, 10 volts, 60 cycles ac for lamp and audible signaling - fused at 2 amperes.

RT2B Power Supply.

The RT2B Power Supply is recommended for use with the single-talking link or two-talking link arrangement. The power supply is normally externally mounted; the dimensions are as follows: 17-7/8 inches wide, 5-1/4 inches high, and 8-5/8 inches deep.

The power supply is equipped with a 6-foot power cord and operates from 117±5 volts ac. Additional taps provide for 111-volt or 123-volt input. The outputs of the power supply are as follows:

(1) 4.0 amperes, 24 or 34 volts dc for talking, relay operation, and audible signaling - fused at 2 amperes.

(2) 0.5 ampere, 20 volts, 60 cycles ac for audible signaling - fused at 2 amperes.

(3) 10.0 amperes, 10 volts, 60 cycles ac for visual and audible signaling - fused at 2 amperes.

(4) 50 milliamperes, 90 volts, 20 cycles ac for local ringer and audible signaling.

RT3B Power Supply.

The RT3B Power Supply is recommended for use with the single-talking link or two-talking link arrangement when ringing power is required. The power supply is normally externally mounted; the dimensions are as follows: 8-5/8 inches wide, 12-1/2 inches high, and 5-1/4 inches deep.

The power supply is equipped with a 6-foot power cord and operates from 117±5 volts ac. Additional taps provide for 111-volt or 123-volt input. The outputs of the power supply are as follows:

(1) 1.0 ampere 14-28 volts dc for talking.

(2) 2.0 amperes 18-28 volts dc for signaling.

(3) 0.5 ampere 20 volts, 60 cycles ac for signaling.

(4) 8 amperes 10 volts, 60 cycles ac for signaling.

(5) 0.5 ampere 100 volts, 30 cycles ac for ringing.

RT3H Power Supply.

The RT3H Power Supply is an internally mounted unit which is recommended for use with the S-C 500 Series Key Service Units when system arrangements require that ringing voltage be supplied.

The RT3H Power Supply has the same physical dimensions as the S-C 86731 Power Supply, and is supplied with a 6-foot power cord. Input taps are provided for 111, 117, and 123 volts. At a nominal 117 volts, full load input current is rated at 1.1 amp. The power supply has the following outputs.

(1) 0.9 ampere, 18-28 volts dc for talking.

(2) 0.6 ampere, 20-28 volts dc for relay signaling.

(3) 3.0 amperes, 8.2-11 volts, 60 cycles ac for lamp and buzzer signaling.

(4) 0.05 ampere, 100-118 volts, 30 cycles ac for ringing.

Auxiliary Transformer.

The 486872 Auxiliary Transformer is used when auxiliary power is required to operate the system busy lamps. A toggle switch is provided for high-low input voltage. Dimensions of the transformer are as follows: 3-7/8 inches high, 3-1/4 inches wide, and 3-3/8 inches deep. The toggle switch protrudes 1 inch from the front of the transformer.

Output voltage is 10 volts ac, 4.8 amperes.

13. FUSE PANEL

The S-C 201B KTU Fuse Panel is a single-panel fuse mounting for seven fuses and six ground terminals. The fuse terminals are wired to an associated terminal panel. This unit can be used to: split the lamp load of 13- or 15-line cell systems; add protection for power supplies when a slave relay is used for lamp power circuit; add fuse protection at the equipment when main line fuses are inaccessible; or in any application requiring auxiliary fusing. The fuse panel can be mounted in the key system equipment or in an S-C 16C Apparatus Mounting Cabinet.

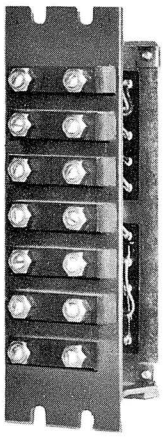

Figure 27. S-C 201B KTU Fuse Panel.

SECTION III INSTALLATION

14. GENERAL

This section contains suggestions and procedures that can be used as a guide for installing the dial-selective intercom portion of an S-C 1A2 Key Telephone System. Information concerning mounting of key telephone units and power supplies, determining power requirements, and interconnection wiring is included. Refer to T-246, S-C 1A2 Key Telephone System Description for information concerning installation planning, selection of key telephone units, and layout and physical arrangement of the units. To obtain copies of T-246, contact your Stromberg-Carlson Representative.

15. MOUNTING INFORMATION

The following chart is provided to aid in the arrangement of KTU's and to help in the selection of auxiliary apparatus mounting equipment needed to house the system.

The following illustrations show the number of mounting holes in the various equipment cabinets. KTU's are measured by the number of holes they cover when installed in the cabinets. (See the following chart.) KTU's can be mounted in any arrangement within the cabinets provided that the number of holes covered does not exceed the maximum number of holes provided in the cabinets. The Floor Stand Assembly is normally used to mount the system power supply.

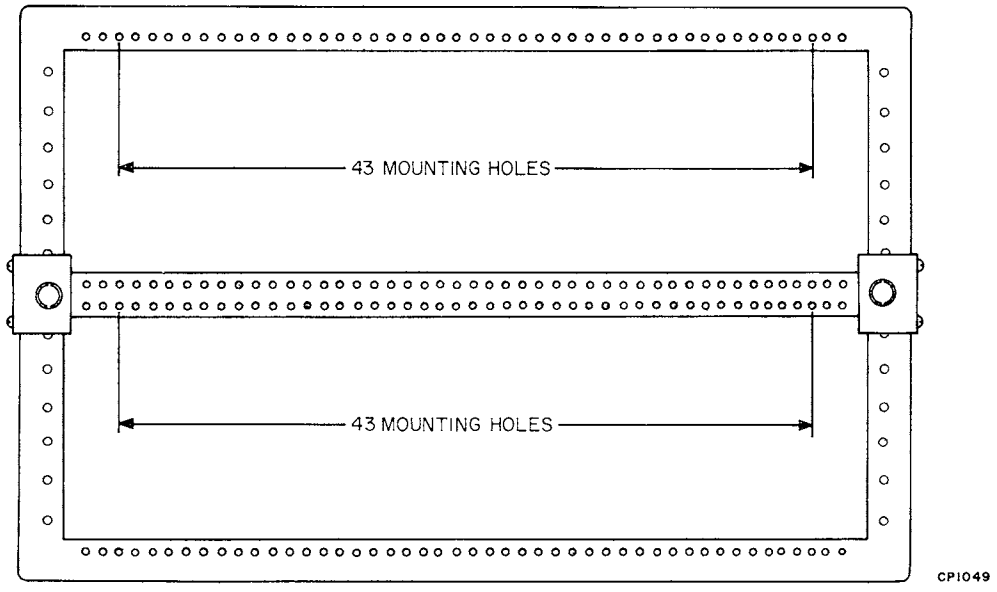

Figure 28. S-C 16C Apparatus Mounting Cabinet, Mounting Hole Arrangement.

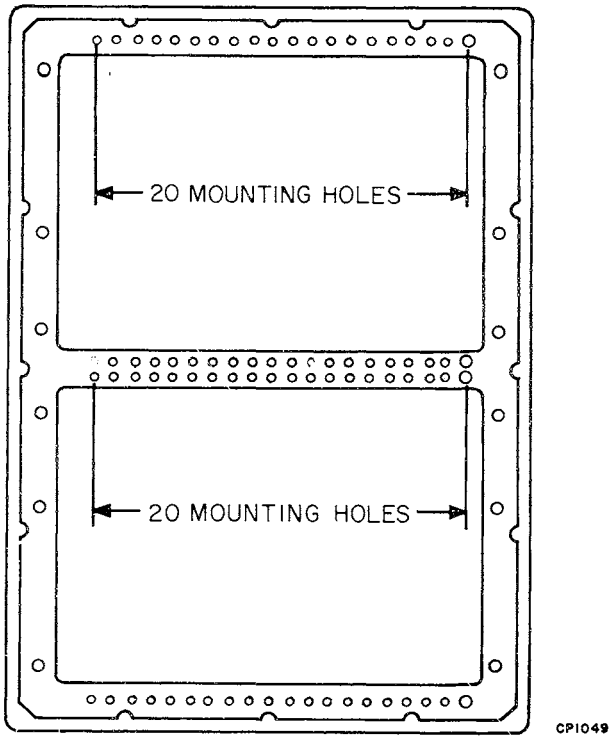

Figure 29. 6-Line Key System, Mounting Hole Arrangement.

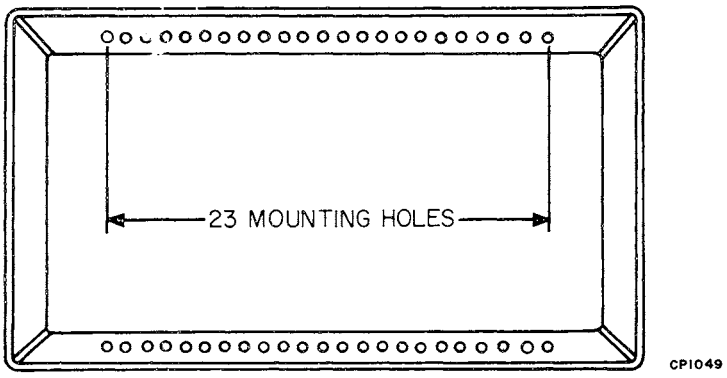

Figure 30. Floor Stand Assembly, Mounting Hole Arrangement.

KTU MOUNTING REQUIREMENTS				
		Mount In		
Description		KSU	S-C 16C or Rack	Holes Req
S-C 400B KTU	Line Card	×	×	na
S-C 401A KTU	Manual Intercom Card	×	×	na
S-C 19B KTU	Flashing Circuit		×	8
S-C 201B KTU	Fuse Panel	×	×	5
S-C 207C KTU	Selector Circuit	×	×	12
S-C 214B KTU	Single-Talking Link and Nine-Station Signaling Circuit		×	37
S-C 215A KTU	Three-Station Signaling Circuit		×	9
S-C 216A KTU	Transfer Circuit	×	×	7
S-C 217A KTU	Preset Conference Circuit	×	×	7
S-C 222A KTU	Two-Talking Link and Nine-Station Signaling Circuit		×	49
S-C 223A KTU	Three-Station Signaling Circuit		×	13
S-C 224A KTU	Busy Signal and Camp-On Control Circuit		×	8
S-C 225A KTU	Long Line Circuit	×	×	5
S-C 226B KTU	Add-On Conference Control Circuit		×	8
S-C 227A KTU	Auxiliary Control Circuit	×	×	7
S-C 229B KTU	Multiple Add-On Transfer Circuit	×	×	7
S-C 232B KTU	Electromechanical, Flash, Wink, Ring, and Time-Out Circuit		×	8
S-C 259A KTU	Two-Line Adapter	×	×	8
S-C 583A KTU	15-Line Cell Assembly		×	43
S-C 584A KTU	13-Line Cell Assembly		×	43

16. POWER REQUIREMENTS

a. Power Requirements.

The power requirements for the various S-C 1A2 Key Telephone Systems are affected by the following factors:

(1) Number of busy lamps.

Each busy lamp in the system requires a minimum 7.5 volts, 30 milliamperes for its operation.

(2) Number of CO or PBX lines.

Each line card in the system requires 70 milliamperes, during the talk condition, for its operation.

(3) Type of intercom.

Power requirements vary, depending on the number of stations and optional equipment. The following tables show power requirements for the basic 9-station selector only, single-talking link, and two-talking link intercoms.

Selector Only	Max drain in amps 20V & 24V				Normal drain in amps, talk condition, 24V	
	A BATT.		B BATT.		A BATT.	B BATT.
	20V	24V	20V	24V	24V	24V
Nine-station basic system	.138	.166	.591	.709	.165	.045
Transfer circuit			.081	.097		
Preset conference circuit	.018	.021			.005	
Long-line adapter circuit	.066	.079			.005	

Single-Talking Link	Max drain in amps 20V & 24V				Normal drain in amps, talk condition, 24V	
	A BATT.		B BATT.		A BATT.	B BATT.
	20V	24V	20V	24V	24V	24V
Nine-station basic system	.237	.344	.614	.737	.165	.080
Transfer circuit over 9 codes			.081	.097		
Preset conference circuit	.081	.021			.005	
Long-line adapter circuit	.066	.079			.005	
Camp-on circuit	.080	.096	.208	.249	.010	.010
Add-on conference circuit					.005	.010

Two-Talking Link	Max drain in amps 20V & 24V				Normal drain in amps, talk condition, 24V	
	A BATT.		B BATT.		A BATT.	B BATT.
	20V	24V	20V	24V	24V	24V
Nine-station basic system	.375	.450	.749	.899	.206	.201
Transfer circuit			.081	.097		
Preset conference circuit	.081	.021			.005	
Long-line adapter circuit	.066	.079			.005	
Camp-on circuit	.080	.096	.208	.249	.005	
Add-on conference circuit 1 per outside line					.005	.010

b. Loop Limits.

The loop limits represent the maximum distance allowed for each cable run. As these values are different at each installation, loop limits must be figured on an individual system basis. The factors listed here are used to determine the maximum loop limit for a cable run.

(1) Cable gauge and resistance per foot. (See below.)

(2) Minimum operating voltage and current of system busy lamps.

(3) Type of cable run installed.

(4) Source voltage and current.

When figuring loop limits for a Stromberg-Carlson system, remember that loops must be short enough to allow a minimum of 7.5 volts, 30 milliamps at each busy lamp. If values drop below this limit, double cable pairs (or use heavier gauge cable) to reduce line resistance. On long cable runs, when all instruments are at the end of the run, it is possible to use a higher value voltage source provided that voltages at the lamps fall within listed tolerances.

Copper Conductor: Cable Pair Resistance

Gauge	Feet Per Ohm
24	19.27
22	30.88
19	62.12

17. INSTALLATION WIRING

a. General.

Installation wiring is accomplished by connecting 24-gauge wire between the appropriate terminal strip punchings of the various units. Power supply connections are made in accordance with manufacturers recommendations. Wiring charts, showing all interconnections and listing options, are provided in this manual.

b. Wiring Example.

The installation drawing, figure 31, illustrates a selector-only intercom arrangement equipped for 34 stations and the following options: dial selection (with common talk path) for 34 stations, two preset conference arrangements accessed by dialing a code, and one add-on conference arrangement accessed by pushing a button, and one off-premise station accessed by dialing a code. The chart below, listing the connections required for the S-C 207C selector portion of this intercom arrangement, is provided to illustrate the use of the connection charts (c below).

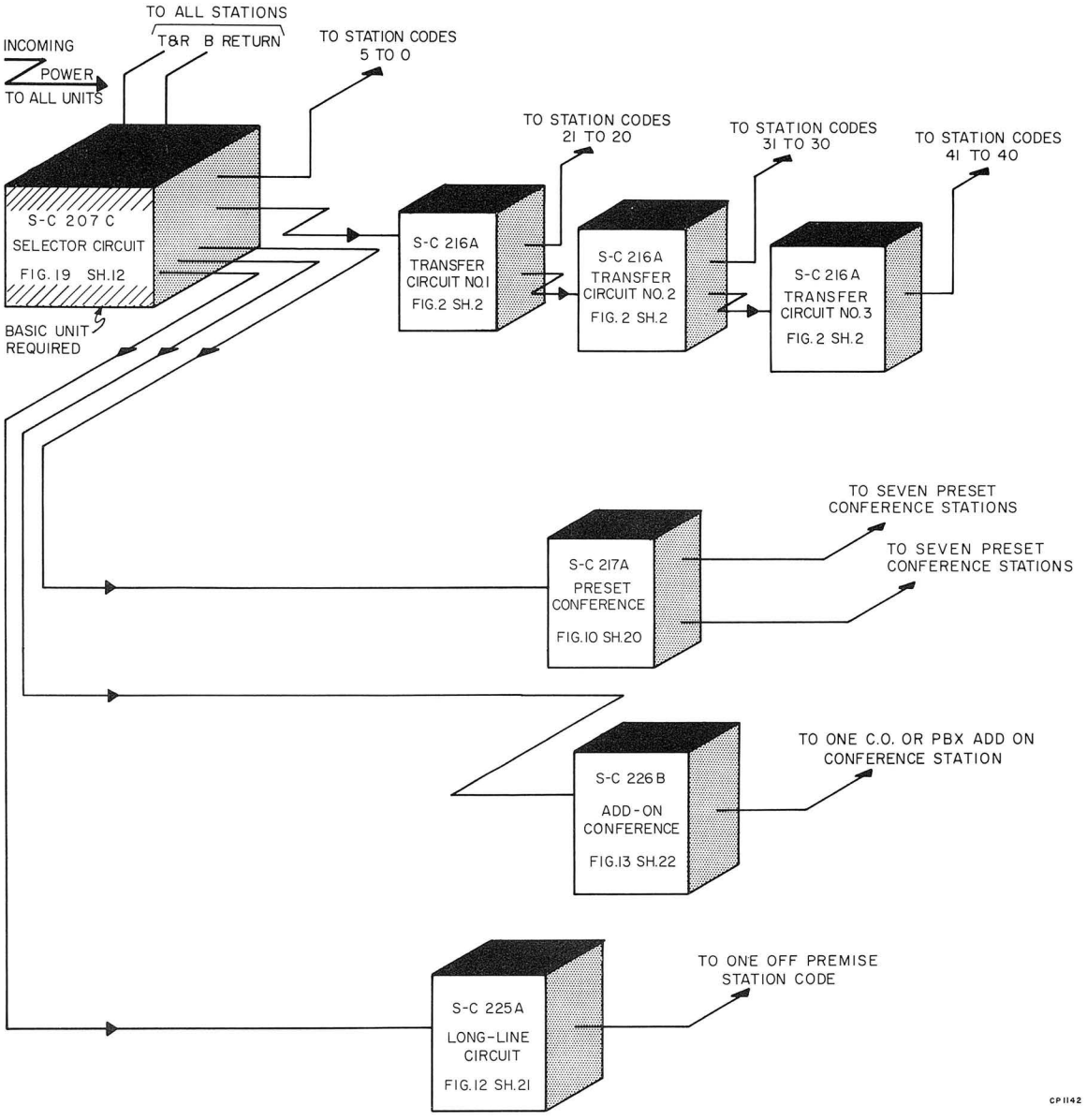

Figure 31. Installation Drawing

S-C 207C SELECTOR CIRCUIT FIGURE 19 SHEET 12				
From S-C 207C Terminal Strip Punching	Dial Code	Lead Designation	To	Remarks
2A	2	SW	First S-C 216A-33	Accesses second group of 10 stations. (Station codes 21 through 20 for stations 5 through 14.)
3A	3	SW	Second S-C 216A-33	Accesses third group of 10 stations. (Station codes 31 through 30 for stations 15 through 24.)
4A	4	SW	Third S-C 216A-33	Accesses fourth group of 10 stations. (Station codes 41 through 40 for stations 25 through 34.)
5A	5	C	S-C 217A-7	Code 5 accesses 1st preset conference.
6A	6	C	S-C 217A-17	Code 6 accesses 2nd preset conference.
7A	7	C	S-C 225A-7	Station code 7 accesses long line cct., station No. 1.
8A	8	-	-	Station code 8 accesses station No. 2.
9A	9	-	-	Station code 9 accesses station No. 3.
10A	0	-	-	Station code 0 accesses station No. 4.
11A	-	R	First S-C 216A-1	
12A	-	R	First S-C 216A-2	
13A	-	R	First S-C 216A-3	
14A	-	R	First S-C 216A-4	
15A	-	R	First S-C 216A-5	
16A	-	R	First S-C 216A-6	

S-C 207C SELECTOR CIRCUIT FIGURE 19 SHEET 12 (cont)

From S-C 207C Terminal Strip Punching	Dial Code	Lead Designation	To	Remarks
17A	-	R	First S-C 216A-7	
18A	-	R	First S-C 216A-8	
19A	-	R	First S-C 216A-9	
20A	-	R	First S-C 216A-10	
1B, 11B, 21B	-	Tip	Tip lead to all stations S-C 225A-3 and S-C 226B-3	Common tip lead
2B, 12B, 22B	-	Ring	Ring lead to all stations and to S-C 225A-4 and S-C 226B-4	Common ring lead
3B	-	L	Common telephone lamp lead	
5B	-	J	First S-C 216A-36 and S-C 226B-6	
9B	-		"A" battery	Talking voltage
10B	-		"A" ground	Talking voltage grd
13B	-	L	Common lamp lead	
15B	-	RL	First S-C 216A-31	
16B	-	ON	First S-C 216A-32	
17B	-	WI	Last 216A-34	
18B	-	W	First 216A-35	
19B	-		"B" battery	Relay signal voltage
20B	-		"B" ground	Relay signal voltage ground
23B	-			
26B	-		"B" ground	
27B	-		Lamp supply	
28B	-		"B" ground	
29B	-		Lamp supply	

S-C 207C SELECTOR CIRCUIT FIGURE 19 SHEET 12 (cont)				
From S-C 207C Terminal Strip Punching	Dial Code	Lead Designation	To	Remarks
39B	-		Audible signal power supply	
4B, 14B, 24B, 30B	-	LG	Lamp ground	
36B, 37B, 38B, 40B	-	B1	B1 lead from audible signal	

c. Connection Charts.

The connection charts (pages 131 through 139) supply all the information needed to efficiently install the intercom portion of the S-C 1A2 Key Telephone System.

Wiring of the individual KTU's is accomplished as follows:

(1) Select proper chart: Selector-Only Intercom Chart (CC-428029-100), Single-Talking Link Intercom Chart (CC-428029-200), or Two-Talking Link Intercom Chart (CC-428029).

(2) Make a list of all intercom options being used.

(3) Each block on the chart indicates the connections required for that unit. Wire only the options called for in the system plan.

(4) Wire from the TS PCHG (Terminal Strip Punching) listed in left hand column of the chart of the unit being wired to the TS PCHG or terminal called out in the right hand column of the chart.

(5) After intraunit wiring has been completed and after power connections have been completed, perform the checkout procedure contained in paragraph 22.

SECTION IV MAINTENANCE

18. GENERAL

These instructions are provided for the information and guidance of personnel responsible for the maintenance of the S-C 1A2 Key Telephone System.

The troubleshooting procedures described below provide a systematic means for sectionalizing an existing system malfunction to a major section of the system and for localizing a malfunction to a specific unit, card, or telephone instrument. When a malfunction has been localized to a line or manual intercom card, it is recommended that the defective card be returned to Stromberg-Carlson for immediate replacement. When a malfunction has been traced to the other major units, existing shop maintenance practices will prevail; that is, all units can be repaired by following normal shop maintenance procedures. In order to promote an efficient shop maintenance program, an adequate supply of component parts and key telephone units should be on hand to prevent service downtime.

The existance of a malfunction in a system will be indicated as a result of a routine maintenance check or a trouble report. Using the information derived as a result of a routine check or a trouble report, proceed with troubleshooting procedures as described below. Technical data pertinent to maintenance and repair, i.e., system checkout procedures and replacement parts lists, are supplied in subsequent paragraphs and section.

19. ROUTINE PREVENTIVE MAINTENANCE

Routine preventive maintenance is a systematic check of the system to locate equipment faults before service interruptions result. This is accomplished by periodic inspection. Although a minor defect may not have interfered with the performance of equipment, correcting the defect before it leads to a major breakdown saves valuable time and effort. The frequency of these checks is determined by local environmental conditions and the location of switching apparatus on the subscriber's premises. The following checks and corrective measures are offered as a guide for performing routine maintenance checks:

Inspect equipment to determine that wiring is properly dressed and that terminal screws have not loosened.

Inspect fuse panel and power supply fuses.

Remove any accumulated dust or dirt that may affect component operation. The use of a small portable vacuum cleaner should prove useful for dust removal. If area is dusty, make certain that apparatus cabinet cover is used and in place at all times.

20. TROUBLE REPORT

When a trouble report is received, be certain to obtain as much data pertaining to the existing malfunction as is possible. For example: the number of lines involved; whether the complaint involves the intercom circuit, the line circuit, or the entire system; the type of malfunction; the frequency of the malfunction; etc.

All these factors will facilitate analysis of the malfunction. When all of the information with respect to the malfunction has been received, proceed with troubleshooting as described below.

21. TROUBLESHOOTING

The instructions below include troubleshooting procedures required to sectionalize a malfunction to a major section of the system and to localize a malfunction to a specific unit, card, or telephone instrument. The utilization of plug-in type line and manual intercom cards and modular packaging of major circuit groups facilitates fast replacement and reduces system downtime to a minimum.

An analysis of the trouble report or a brief operational check will normally be enough to sectionalize the malfunction to the telephone instruments, system line circuits, system intercom circuits, or the central office/PBX. As an example, if a malfunction affects only a single telephone instrument, the cause of malfunction is probably within the instrument. If line operation for a number of phones is affected, the malfunction exists at the central office or the system line equipment. A further check by using a test telephone can ascertain whether the central-office or system line equipment is at fault. In a similar manner, a malfunction can be sectionalized to the intercom circuits of the system.

When a malfunction has been sectionalized to system line equipment, the most probable cause would be the line card associated with the affected line. Remove the defective line card and replace with a known good line card. Be certain that all strappings on the new card are the same as those on the defective card. Return the defective card to Stromberg-Carlson for immediate replacement.

When a malfunction has been sectionalized to a manual intercom card, remove and replace the card with a known good manual intercom card. Return the defective card to Stromberg-Carlson for immediate replacement.

When a malfunction has been sectionalized to the system dial-selective intercom circuit, refer to the system checkout chart below to isolate the malfunction to a specific key telephone unit.

22. SYSTEM CHECKOUT CHART FOR DIAL-SELECTIVE INTERCOM

The chart below outlines a systematic checkout procedure used to determine if the system is functioning properly after initial installation. The chart is also used to assist maintenance personnel in troubleshooting the dial-selective intercom portion of a system. (See TROUBLE-SHOOTING.)

SELECTOR-ONLY ARRANGEMENT				
Step	Test	Test Function	Normal Results	Probable Trouble
1	INTERCOM CALL, SINGLE DIGIT.	a. Access intercom from any station.	(1) S-C 207C KTU relays A and B operate. (2) Station lamps light steadily.	Power out. Blown Blown fuse. Wrong strapping. Defective lamp. Defective relay.
		b. Dial any single-digit station code.	(1) Relay A follows dial pulses. (2) Relay B remains operated (3) Relay C of S-C 207C KTU operates on first pulse. (4) Relay T of S-C 207C KTU operates. (5) Selector steps in unison with relay A. (6) Relay C releases after last pulse. (7) Ringer at called station operates for approx-imately 1-1/2 seconds. (8) Relay T releases. (9) Selector restores.	Wrong strapping. Defective relay. Defective ringer.
		c. Answer called station.	(1) Relays A and B operated. (2) Station lamps lighted. (3) Talking path established.	Defective telephone.
		d. Repeat steps 1a through 1c for all other single-digit station codes.		

SELECTOR-ONLY ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
2	INTERCOM CALL, TWO-DIGIT.	a. Access intercom from any station	(1) Same as in (1) and (2) of step 1a.	Same as in step 1a.
		b. Dial first digit (transfer code).	(1) Same as in (1) through (6) of step 1b. (2) Relays RL and TR of S-C 216A KTU operate and lock. (3) Relay T of S-C 207C KTU releases. (4) Selector restores.	Wrong strapping. Defective relay.
		c. Dial second digit (station code).	(1) Same as in (1) through (9) of step 1b.	Same as in step 1b.
		d. Answer called station.	(1) Same as in (1) through (3) of step 1c.	Same as in step 1c.
		e. Repeat steps 2a through 2d for all other two-digit station codes.		
3	PRESET CONF.	a. Access intercom from any station.	(1) Same as in (1) and (2) of step 1a.	Same as in step 1a.
		b. Dial single-digit code for first preset conference.	(1) Same as in (1) through (6) of step 1b. (2) Relay RO1 of S-C 217A KTU operates. Relay PC1 of S-C 217A KTU then operates, releasing relay RO1. (3) First preset conference station ringers operate for approximately 1-1/2 seconds. (4) Relay T of S-C 207C KTU and relay PC1 of S-C 217A KTU release. (5) Selector restores.	Wrong strapping. Defective relay. Defective ringers.
		c. Answer conference call at all stations associated with first preset conference.	(1) Conference talking path established.	Wrong strapping. Defective telephone.

SELECTOR-ONLY ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
3 (cont)		d. Repeat steps 3a through 3c for second preset conference.	(1) Same as in steps 3a through 3c except that relay PC2 operates instead of relay PC1.	
4	ADD-ON CONF.	a. Establish an outgoing CO or PBX call.	(1) A talking path is established.	Wrong strapping. Defective relay.
		b. Press HOLD key.	(1) A hold is placed on CO or PBX line. Local telephone is disconnected from CO or PBX line.	Defective relay A of S-C 400B KTU.
		c. Access intercom from same telephone and establish intercom call (step 1 or 2).	(1) Talking path established.	
		d. Operate conference key associated with the held CO or PBX line.	(1) Relay N of the S-C 226B KTU associated with the held CO or PBX line operates. (2) Relay A of S-C 400B KTU operates, and relay B of same KTU releases. (3) Conference path is established between the CO or PBX line and the local intercom conversation.	Wrong strapping. Defective relay. Defective telephone. Defective key.
5	CALL FROM OFF-PREMISE STATION.	a. Access intercom from off-premise station.	(1) Relays P and C of S-C 225A KTU operate. (2) Relays A and B of S-C 207C KTU operate. (3) Local station lamps light steadily. (Off-premise station has no station lamp because of loop range involved.)	Wrong strapping. Defective relay. Defective telephone.
		b. Dial any single-digit or two-digit station code.	(1) Relays P and C of the S-C 225A KTU follow dial pulses.	Same as in step 1b.

SELECTOR-ONLY ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
5 (cont)			(2) See step 1b when dialing a single-digit code. See steps 2b and 2c when dialing a two-digit code.	
		c. Answer called station.	(1) A talking path is established.	
6	CALL TO OFF-PREMISE STATION.	a. Access intercom from any station.	(1) See (1) and (2) of step 1a for results. No off-premise lamp.	Same as in step 1a.
		b. Dial single-digit code for off-premise station.	(1) See (1) and (6) of step 1b for results.	Wrong strapping. Defective relay. Defective ringer.
			(2) Relay R of S-C 225A KTU operates for approximately 1-1/2 seconds.	
			(3) Ringer at off-premise station operates for approximately 1-1/2 seconds.	
		c. Answer call at off-premise station.	(1) A talking path is established. (2) Relays P and C of S-C 225A KTU operate.	Defective telephone. Defective relay.

SINGLE-TALKING LINK ARRANGEMENT				
Step	Test	Test Function	Normal Results	Probable Trouble
1	INTERCOM CALL, SINGLE DIGIT.	a. Access intercom from any station.	(1) On S-C 214B, relay L for calling station operates, and relay B of S-C 207C KTU and relay B1 of S-C 214B KTU operate. (2) Station lamps light steadily. (3) Relay ST of S-C 232B KTU operates and starts interrupter.	Power out. Blown fuse. Wrong strapping. Defective lamp. Defective relay.

SINGLE-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
1 (cont)		b. Dial any single-digit station code.	(1) Relay A of S-C 207C KTU follows dial pulses. (2) Relay B of S-C 207C KTU remains operated. (3) Relay C of S-C 207C KTU operates on first pulse. (4) Relay T of S-C 207C KTU operates. (5) Selector steps in unison with relay A. (6) Relay C releases after last pulse. (7) On S-C 214B KTU, relays BC and BC1 and relay LS for the called station operate. (8) Relay LS locks in series with relay CH of S-C 214B KTU which may operate, and relays BC and BC1 release. (9) Relay RO of S-C 214B KTU operates for approximately 1-1/2 seconds. (10) Station or common audible ringer operates while relay RO is operated. (11) Lamp at called station flashes. (12) Relay T releases. (13) Selector restores.	Wrong strapping. Defective relay. Defective ringer.
		c. Answer called station.	(1) On S-C 214B KTU, relay TB1, relay L for the called station and relay LS for the calling station operate.	Wrong strapping. Defective relay. Defective telephone.

SINGLE-TALKING LINK ARRENGMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
1 (cont)			(2) Relays A and B of S-C 207C KTU, relays CH and B1 of S-C 214B KTU, and relay ST of S-C 232B KTU release. Interrupter stops. (3) All station lamps light steadily. (4) A talking path is established.	
		d. Repeat steps 1a through 1c for all other single-digit station codes.		
2	INTERCOM CALL, TWO-DIGIT.	a. Access intercom from any station.	(1) Same as in (1) through (3) of step 1a.	Same as in step 1a.
		b. Dial first digit (transfer code).	(1) Same as in (1) through (6) of step 1b. (2) Relays RL and TR of S-C 216A KTU operate and lock. (3) Relay T of S-C 207C KTU releases. (4) Selector restores.	Wrong strapping. Defective relay.
		c. Dial second digit (station code).	(1) Same as in (1) through (13) of step 1b.	Same as in step 1b.
		d. Answer called station.	(1) Same as in (1) through (4) of step 1c. (2) Relays RL and TR of S-C 216A KTU release.	Same as in step 1c.
		e. Repeat steps 2a through 2d for all other two-digit station codes.		
3	PRESET CONF.	a. Access intercom from any station.	(1) Same as in (1) through (3) of step 1a.	Same as in step 1a.

SINGLE-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
3 (cont)		b. Dial single-digit code for first preset conference.	(1) Same as in (1) through (6) of step 1b. (2) Relays RO1 and PC1 of S-C 217A KTU operate. (3) Relay RO1 releases. (4) Same as in (7) through (9) of step 1b. (5) Ringers at all stations called for conference operate while relay RO of S-C 214B KTU is operated. (6) Called station lamps flash. (7) Relay T of S-C 207C KTU and relay PC1 of S-C 217A KTU release. (8) Selector restores.	Wrong strapping. Defective relay. Defective ringers. Defective lamps.
		c. Answer one of called stations.	(1) Relay L for the called station and relay TB1 operate, causing relay LS for the calling station to operate. (2) Calling and all called station lamps flash. (3) Relays A and B of S-C 207C KTU release.	Defective lamp.
		d. Answer all remaining called stations.	(1) The called station answered last causes its relay L to operate, opening the circuit to relay CH of S-C 214B KTU. (2) Relays CH and B1 of S-C 214B KTU releases. (3) Calling and all called station lamps light steadily. (4) Conference talking path is established.	Wrong strapping. Defective relay. Defective telephone.

SINGLE-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
3 (cont)		e. Repeat steps 3a through 3d for second preset conference.	(1) Same as in steps 3a through 3d except that relay PC2 operates instead of PC1.	Same as in steps 3a through 3d.
4	ADD-ON CONF.	a. Establish an outgoing CO or PBX call.	(1) A talking path is established.	Wrong strapping. Defective relay. Defective telephone.
		b. Press HOLD key.	(1) A hold is placed on CO or PBX line. Local telephone is disconnected from CO or PBX line.	Defective relay A of S-C 400B KTU.
		c. Access intercom from the same telephone and establish intercom call.	(1) See step 1 when dialing a single-digit code. See step 2 when dialing a two-digit code. (2) Relay A of S-C 229B KTU operates.	Wrong strapping. Defective relay.
		d. Operate conference key associated with the held CO or PBX line.	(1) Relay M of the S-C 226B KTU associated with the held CO or PBX line operates. (2) Relay A of S-C 400B KTU operates, and relay B of same KTU releases. (3) Conference path is established between CO or PBX line and the local intercom conversation.	Wrong strapping Defective relay.
		e. Disconnect calling station from conference.	(1) Called intercom station and CO or PBX line remain in conference.	
5	CALL FROM OFF-PREMISE STATION	a. Access intercom from off-premise station.	(1) Relays P and C of S-C 225A KTU operate. (2) Relay L of S-C 214B KTU (off-premise station) operates. (3) Relays A and B of S-C 207C KTU operate.	Wrong strapping. Defective relay.

SINGLE-TALKING LINK ARRANGEMENT (cont)

Step	Test	Test Function	Normal Results	Probable Trouble
5 (cont)			(4) Relay B1 of S-C 214B KTU operates. (5) Local station lamps light steadily. (Off-premise station has no station lamp because of loop range involved.) (6) Relay ST of S-C 232B KTU operates and starts interrupter.	
		b. Dial any single-digit or two-digit station code.	(1) Relays P and C of S-C 225A KTU follow dial pulses. (2) See step 1b when dialing single-digit code. See steps 2b and 2c when dialing two-digit code.	Same as in step 1b.
		c. Answer called station.	(1) See step 1c if a single-digit station was called. See step 2d if a two-digit station was called.	Same as in step 1c.
6	CALL TO OFF-PREMISE STATION.	a. Access intercom from any station.	(1) See step 1a. (Off-premise station has no station lamp because of loop range involved.)	Same as in step 1a.
		b. Dial single-digit code for off-premise station.	(1) See (1) through (6) of step 1b. (2) Relay R of S-C 225A KTU operates for approximately 1-1/2 seconds. (3) Ringer at off-premise station operates for approximately 1-1/2 seconds. (4) On S-C 214B KTU, relays BC and BC1 and relay LS for the called station operate. (5) Relay LS locks in series with relay CH which may operate, and relays BC and BC1 release.	Wrong strapping. Defective relay.

SINGLE-TALKING LINK ARRANGEMENT (cont)

Step	Test	Test Function	Normal Results	Probable Trouble
6 (cont)			(6) Relay RO of S-C 214B KTU operates for approximately 1-1/2 seconds but serves no purpose at this time. (7) See (12) and (13) of step 1b.	
		c. Answer call at off-premise station.	(1) Relays P and C of S-C 225A KTU operate. (2) On S-C 214B KTU, relay TB1, relay L for the called station, and relay LS for the calling station operate. (3) Relays A and B of S-C 207C KTU, relays CH and B1 of S-C 214B KTU, and relay ST of S-C 232B KTU release. (4) Local station lamps light steadily. (5) A talking path is established.	Wrong strapping. Defective relay. Defective telephone.
7	CAMP-ON.	a. Access intercom and place call to simulate busy system condition.	(1) See step 1 when dialing a single-digit code. See step 2 when dialing two-digit code.	Wrong strapping. Defective relay.
		b. Access intercom from any idle station which has "auto. cutoff".	(1) On S-C 214B KTU, relay L for the calling station operates, and relays A and B of S-C 207C KTU operate.	
		c. Dial any single-digit or two-digit station code.	(1) See (1) through (6) of step 1b when dialing a single-digit code. See (1) through (4) of step 2b followed by (1) through (6) of step 1b when dialing a two-digit code. (2) Relays BY1 and BY of S-C 224A KTU operate.	

SINGLE-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
7 (cont)			(3) Relay BY1 releases, and relay BY locks. (4) Relay T of S-C 207C KTU is held operated. (5) Vibrator V of S-C 224A KTU operates. (6) Relay ST of S-C 232B KTU operates and starts interrupter. (7) Calling station receives interrupted busy signal.	
		d. Disconnect all busied stations except station which camps on.	(1) Relay TB1 of S-C 214B KTU releases. (2) Relay BY of S-C 224A KTU releases and stops Vibrator V. (3) Relay B1 of S-C 214B KTU operates. (4) On S-C 214B KTU, relays BC and BC1 and relay LS for the called station operate. (5) Called station's lamp flashes and ringer operates per (8) through (13) of step 1b.	Same as in step 1b.
		e. Answer called station.	(1) See step 1c if a single-digit station was called. See step 2d if a two-digit station was called.	Same as in step 1c.

TWO-TALKING LINK ARRANGEMENT				
Step	Test	Test Function	Normal Results	Probable Trouble
1	INTERCOM CALL, SINGLE-DIGIT, SECONDARY LINK FREE.	a. Access intercom from any station.	(1) On S-C 222A KTU, relay L for calling station operates, and relays A and B of S-C 207C KTU and relay B1 of S-C 222A KTU operate. (2) Station lamps light steadily.	Power out. Blown fuse. Wrong strapping. Defective lamp. Defective relay.

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
1 (cont)			(3) Relay ST of S-C 232B KTU operates and starts interrupter.	
		b. Dial any single-digit station code.	(1) Relay A of S-C 207C KTU follows dial pulses. (2) Relay B of S-C 207C KTU remains operated. (3) Relay C of S-C 207C KTU operates on first pulse. (4) Relay T of S-C 207C KTU operates. (5) Selector steps in unison with relay A. (6) Relay C releases after last pulse. (7) On S-C 222A KTU, relays BC and BC1, and relay LS for the called station operate. (8) Relay LS locks in series with relay CH of S-C 222A KTU, which may operate, and relays BC and BC1 release. (9) Relay RO of S-C 222A KTU operates for approximately 1-1/2 seconds. (10)Called station ringer or common audible signal operates while relay RO is operated. (11)Lamp at called station flashes. (12)Relay T releases. (13)Selector restores	Wrong strapping. Defective relay. Defective ringer.
		c. Answer called station.	(1) On S-C 222A KTU, relay L for the called station, relay TB1, and relay LS for the calling station operate. (2) Relays A and B of S-C 207C KTU and relay CH of S-C 222A KTU release.	Wrong strapping. Defective relay. Defective telephone.

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
1 (cont)			(3) On S-C 222A KTU, relay LTR, relay LT for the calling and called stations, and relay TB2 operate. (4) Relay TB1 of S-C 222A KTU releases. (5) Relay H of S-C 222A KTU operates. (6) Relays LTR and B1 of S-C 222A KTU release. (7) Relay ST of S-C 232B KTU releases. Interrupter stops. (8) Called and calling station lamps light steadily. All other station lamps extinguish. (9) A talking path is established via the secondary link.	
		d. Repeat steps a through c for all other single-digit station codes.		
2	INTERCOM CALLS, TWO-DIGIT, SECONDARY LINK FREE.	a. Access intercom from any station.	(1) Same as in step 1a.	Same as in step 1a.
		b. Dial first digit (transfer code).	(1) Same as in (1) through (6) of step 1b. (2) Relays RL and TR of S-C 216A KTU operate and lock. (3) Relay T of S-C 207C KTU releases. (4) Selector restores.	Wrong strapping. Defective relay.
		c. Dial second digit (station code).	(1) Same as in (1) through (13) of step 1b.	Same as in step 1b.
		d. Answer called station.	(1) Same as in (1) and (2) of step 1c. (2) Relays RL and TR of S-C 216A KTU release. (3) Same as in (3) through (9) of step 1c.	Same as in step 1c.

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
2 (cont)		e. Repeat steps a through d for all other two-digit station codes.		
3	INTERCOM CALL SECOND-ARY LINK BUSY.	a. Access intercom and establish call to simulate system condition with busy second-ary link.	Same as in step 1 or 2.	Same as in step 1 or 2.
		b. Access intercom from any idle station.	(1) Same as in step 1a.	Wrong strapping. Defective relay. Defective lamp.
		c. Dial single-digit or two-digit code of any idle station.	(1) See step 1b when dialing a single-digit code. See steps 2b and 2c when dialing a two-digit code.	Same as in step 1b.
		d. Answer called station.	(1) Same as in (1) and (2) of step 1c. (2) Relays RL and TR of S-C 216A KTU release if a two-digit station was called. (3) Relay B1 of S-C 222A KTU releases. (4) Relay ST of S-C 232B KTU releases. Interrupter stops. (5) Station lamps light steadily. (6) A talking path is established via the primary link.	Same as in step 1c.
4	PRESET CONF. SECOND-ARY LINK FREE.	a. Access intercom from any station.	(1) Same as in step 1a.	Same as in step 1a.
		b. Dial single-digit code for first preset confer-ence.	(1) Same as in (1) through (6) of step 1b. (2) Relays RO1 and PC1 of S-C 217A KTU operate.	Wrong strapping. Defective relay. Defective ringers. Defective lamps.

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
4 (cont)			(3) Relay RO1 releases. (4) Same as in (7) through (9) of step 1b. (5) Ringers at all stations called for conference operate while relay RO of S-C 222A KTU is operated. (6) Called station lamps flash. (7) Relay T of S-C 207C KTU and relay RC1 of S-C 217A KTU release. (8) Selector restores.	
		c. Answer one of the called stations.	(1) On S-C 222A KTU, relay L for the called station, relay TB1, and relay LS for the calling station operate. (2) Calling and all called station lamps flash. (3) Relays A and B of S-C 207C KTU release.	Wrong strapping. Defective lamp.
		d. Answer all remaining called stations.	(1) The called station answered last causes its relay L to operate, opening the circuit to relay CH of S-C 222A KTU. (2) Relay CH releases. (3) Same as in (3) through (9) of step 1c.	Wrong strapping. Defective relay. Defective telephone.
		e. Repeat steps 4a through 4d for second preset conference.	(1) Same as in steps 4a through 4d except that relay PC2 operates instead of PC1.	
5	ADD-ON CONF. SECONDARY LINK FREE.	a. Establish outgoing CO or PBX call.	(1) A talking path is established.	Wrong strapping. Defective relay. Defective telephone.
		b. Depress HOLD key.	(1) A hold is placed on CO or PBX line. Local telephone is disconnected from CO or PBX line.	Defective relay A of S-C 400B KTU.

TWO-TALKING ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
5 (cont)		c. Access intercom from the same station.	(1) Same as in step 1a.	Same as in step 1a.
		d. Dial any single-digit or two-digit code.	(1) See step 1b when dialing single-digit code. See steps 2b and 2c when dialing two-digit code.	Same as in step 1b.
		e. Answer intercom call.	(1) Same as in (1) and (2) of 1c. (2) Relays RL and TR of S-C 216A KTU release if a two-digit station was called. (3) Relay A of S-C 229B KTU operates. (4) Same as in (3) of step 1c. (5) Relay A of S-C 229B KTU releases. (6) Same as in (4) through (8) of step 1c. (7) An intercom talking path is established via the secondary link.	Wrong strapping. Defective relay.
		f. Depress conference key associated with the held CO or PBX line.	(1) Relay N of S-C 226B KTU associated with the held CO or PBX line operates. (2) Relay A of S-C 400B KTU operates. (3) Relay B of S-C 400B KTU releases. (4) Conference path is established between CO or PBX line and the local intercom conversation on the secondary link.	Wrong strapping. Defective relay. Defective key.
		g. Disconnect calling station from conference.	(1) CO or PBX line remains in conference with the called intercom station.	

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
6	ADD-ON CONF. SECONDARY LINK BUSY.	a. Establish outgoing CO or PBX call.	(1) A talking path is established.	Wrong strapping. Defective relay. Defective telephone.
		b. Depress HOLD key.	(1) A hold is placed on CO or PBX line. Local telephone is disconnected from CO or PBX line.	Defective relay A of S-C 400B KTU.
		c. Access intercom from another station and establish a call to simulate system condition with busy secondary link (step 1 or 2).		
		d. Access intercom from the same station from which the outgoing CO or PBX call was established.	(1) Same as in step 1a.	Wrong strapping. Defective relay. Defective lamp.
		e. Dial single-digit or two-digit code of any idle station.	(1) See step 1b when dialing a single-digit code. See steps 2b and 2c when dialing a two-digit code.	Same as in step 1b.
		f. Answer intercom call.	(1) Same as in (1) and (2) of step 1c. (2) Relays RL and TR of S-C 216A KTU release if a two-digit station was called. (3) Relay A of S-C 229B KTU operates. (4) Relay B1 of S-C 222A KTU releases. (5) Relay ST of S-C 232B KTU releases. Interrupter stops. (6) Station lamps light steadily. (7) An intercom talking path is established via the primary link.	Same as in step 1c.

TWO-TALKING LINK ARRANGEMENT (cont)

Step	Test	Test Function	Normal Results	Probable Trouble
6 (cont)		g. Depress conference key associated with the held CO or PBX line.	(1) Relay M of S-C 226B KTU associated with held CO or PBX line line operates. (2) Relay A of S-C 400B KTU operates. (3) Relay B of S-C 400B KTU releases. (4) Conference path is established between CO or PBX line and the local intercom conversation on the primary link.	Wrong strapping. Defective relay.
		h. Disconnect calling station from conference.	(1) CO or PBX line remains in conference with the called intercom station.	
7	CALL FROM OFF-PREMISE STATION SECONDARY LINK FREE.	a. Access intercom from off-premise station.	(1) Relays P and C of S-C 225A KTU operate. (2) Same as in step 1a. Off-premise station has no station lamp because of loop range involved.	Same as in step 1a.
		b. Dial any single-digit or two-digit station code.	(1) Relays P and C of S-C 225A KTU follow dial pulses. (2) See step 1b when dialing a single-digit code. See steps 2b and 2c when dialing a two-digit code.	Same as in step 1b.
		c. Answer called station.	(1) See (1) and (2) of step 1c. (2) Relays RL and TR of S-C 216A KTU release if a two-digit station was called. (3) Same as in (3) through (9) of step 1c.	Same as in step 1c.

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Result	Probable Trouble
8	CALL TO OFF-PREMISE STATION SECONDARY LINK FREE.	a. Access intercom from any station.	(1) Same as in step 1a. Off-premise station has no station lamp because of loop range involved.	Same as in step 1a.
		b. Dial single-digit or two-digit code for off-premise station.	(1) See (1) through (8) of step 1b when dialing a single-digit code. See (1) through (4) of step 2b followed by (1) through (8) of step 1b when dialing a two-digit code. (2) Relay R of S-C 225A KTU and relay RO of S-C 222A KTU operate for approximately 1-1/2 seconds. Operation of relay RO serves no purpose at this time. (3) Off-station ringer operates for approximately 1-1/2 seconds. (4) Relay T of S-C 207C KTU releases. (5) Selector restores.	Same as in step 1b.
		c. Answer call at off-premise station.	(1) Relays P and C of S-C 225A KTU operate. (2) Same as in (1) and (2) of step 1c. (3) Relays RL and TR of S-C 216A KTU release if a two-digit code was dialed to reach the off-premise station. (4) Same as in (3) through (9) of step 1c.	Same as in step 1c.

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
9	CAMP-ON SECONDARY LINK, PRIMARY LINK FREE.	a. Establish call to busy the secondary link (step 1 or 2).		
		b. Access intercom from any idle station and dial code of a busy station.	(1) Same as in step 1a. (2) See (1) through (6) of step 1b when dialing single-digit code. See (1) through (4) of step 2b followed by (1) through (6) of step 1b when dialing two-digit code. (3) Relay BY of S-C 224A KTU operates. (4) Relay T of S-C 207C KTU is held operated. (5) Vibrator V of S-C 224A KTU operates. (6) Calling station receives interrupted busy signal.	Wrong strapping. Defective relay. Defective lamp.
		c. Disconnect all busied station except station which camps on.	(1) All previously operated relays L, TB2, LS, H, and LT of S-C 222A KTU release. (2) Relay BY of S-C 224A KTU releases and stops vibrator V. (3) On S-C 222A KTU, relays BC and BC1 and relay LS for the called station operate. (4) Called station lamp flashes, and ringer operates per (8) through (13) of step 1b.	Same as in step 1b.
		d. Answer called station.	(1) See step 1c if a single-digit station was called. See step 2d if a two-digit station was called.	Same as in step 1c.
10	CAMP-ON BOTH LINKS BUSY.	a. Establish call to busy the secondary link (step 1 or 2).		

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
10 (cont)		b. Establish call to busy the primary link (step 3).		
		c. Access intercom from any idle station which has "auto. cutoff" option.	(1) On S-C 222A KTU, relay L for the calling station operates, and relays A and B of S-C 207C KTU operate.	Wrong strapping. Defective relay.
		d. Dial code of any busy station.	(1) See (1) through (6) of step 1b when dialing single-digit code. See (1) through (4) of step 2b followed by (1) through (6) of step 1b when dialing two-digit code. (2) Relays BY1 and BY of S-C 224A KTU operate. (3) Relay BY1 releases, and relay BY locks. (4) Relay T of S-C 207C KTU is held operated. (5) Relay ST of S-C 232B KTU operates and starts interrupter. (6) Vibrator V of S-C 224A KTU operates. (7) Calling station receives interrupter busy signal.	Wrong strapping. Defective relay.
		e. If called station is busy on secondary link, disconnect all stations on that link.	(1) On S-C 222A KTU, relays L, LS, and LT for secondary link stations release. (2) Relays TB2 and H of S-C 222A KTU release. (3) On S-C 222A KTU, relays LTR and LT for primary link stations and relay TB2 operate, transferring these stations to secondary link. (4) Relay TB1 of S-C 222A KTU and relay BY of S-C 224A KTU release.	Wrong Strapping. Defective relay.

TWO-TALKING LINK ARRANGEMENT (cont)				
Step	Test	Test Function	Normal Results	Probable Trouble
10 (cont)			(5) Vibrator V stops. Relays H and B1 of S-C 222A KTU operate. (6) Relay LTR of S-C 222A KTU releases. (7) Called station lamp flashes, and ringer operates via primary link per (8) through (13) of step 1b.	
		f. If called station is busy on primary link, disconnect all stations on secondary link.	(1) Primary link stations are transferred to secondary link per (1) through (3) of step 10e. (2) Relay TB1 of S-C 222A KTU and relay BY of S-C 224A KTU release. (3) Relays H and B1 of S-C 222A KTU operate. (4) Relay LTR of S-C 222A KTU releases. (5) Relay BY of S-C 224A KTU reoperates and locks. (6) Calling station continues to receive interrupted busy signal until all stations on secondary link are disconnected. (7) Same as in step 9c.	Wrong strapping. Defective relay.
		g. Answer called station.	(1) In case of step 10e, see step 3d. In case of step 10f, see step 1c.	Wrong strapping. Defective relay. Defective telephone.

SECTION V REPLACEMENT PARTS LIST

23. GENERAL

This section provides the necessary technical data and information required for ordering replacement parts for the dial-selective intercom. All major units or assemblies are stamped with unit identification and/or stock numbers and can be ordered by using this information. Components, such as: capacitors, resistors, etc., are not so identified ; when ordering these items, refer to the Replacement Parts List below to obtain the necessary ordering data.

24. REPLACEMENT PARTS LIST

The following table provides the information required when ordering parts for the dial-selective intercom. Be certain to include all the information provided on the chart to ensure that you will receive the correct replacement part in the fastest possible time.

Item	Stock Number	Related Information
S-C 1A2 POWER SUPPLIES		
S-C 86731 Power Supply	414096-029	
Cover	303723-268	
Cord (ac)	205036-119	
Cable clamp	540201-005	
Grommett	540479-630	
Wire nut	304168-159	
Terminal	26456-000	
Ground strap	303510-499	
Screw	503872-000	#6-32 × 3/8 P.H.I.M.S.
Screw	304037-371	#10 × 1/2 self taping hex hd (Z)
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
Nut	525142-000	#6-32 hex I nut
Power supply subassembly	414096-019	
Terminal panel assembly	301377-512	
Transformer	202899-192	
Inductor	202899-201	
Rectifier	202898-998	
Capacitor	202900-875	
Fuse	200110-319	2-ampere, cartridge

Item	Stock Number	Related Information
S-C 1A2 POWER SUPPLIES (cont)		
Fuse	200110-329	2-ampere, flat
Fuseholder	559996-099	
Bracket	303510-482	
Protector	303824-229	
Terminal	159054-000	
Spacer	303824-239	
Heat shield	303824-219	
S-C 86738 Power Supply	414099-029	
Enclosure	301377-582	
Protector	301377-562	
Fuse	555020-214	1/2-ampere, cartridge
Fuse	200110-349	1/2-ampere, flat
Fuse	200110-359	5-ampere, flat
Power supply subassembly	414099-019	
Power panel	301337-552	
Transformer	202903-052	
Bracket	301377-572	
Standoff	540023-404	
Fuseholder	559996-099	
Capacitor	202900-875	
Connector	555133-102	
Resistor	554531-119	
Diode	202903-018	
Receptacle	304147-152	
Boot	302864-839	
Cable	83258-070	
Cable clamp	540205-105	
Terminal	159054-000	
Anchor	303724-136	

Item	Stock Number	Related Information
S-C 232B KTU ELECTROMECHANICAL		
FLASH, WINK, RING, AND TIME-OUT	428029-109	
Relay (BF)	204799-679	
Relay (TO)	200521-223	
Relay (ST)	200521-223	
Thermal relay	204799-719	Timing relay
Interrupter	202148-889	9-10v 60-cycle ac
Bracket assembly	303824-679	Interrupter retainer
Terminal plate assembly	303824-459	
Mounting screw	509372-000	
Mounting plate assembly	303824-599	
Cover	217907-000	
Cover guide	217896-000	
Socket	152014-000	TD relay
Receptacle	555042-103	
Hex nut	525122-000	4-40 hex nut
S-C 229B KTU MULTIPLE ADD-ON		
TRANSFER CIRCUIT	428029-159	
Relay (A)	204799-669	
Terminal plate assembly	303824-449	
Mounting plate assembly	303824-589	
Mounting screw	509372-000	12-24 × 3/8 P.H.I.M.S.
S-C 227A KTU AUXILIARY CONTROL		
CIRCUIT	428029-089	
Relay (CA1) (CA2) (MS)	204799-609	
Rectifier (C1) (C2) (C3) (C4)	202874-778	Commercial 1N126A
Terminal plate assembly	303824-449	
Mounting screw	509372-000	
Mounting plate assembly	303824-539	
S-C 225A KTU LONG LINE CIRCUIT	428029-139	
Relay (C)	204799-689	
Relay (R)	204799-639	
Relay (P)	204799-849	

Item	Stock Number	Related Information
S-C 225A KTU LONG LINE CIRCUIT (cont)		
Capacitor	202905-348	2 × 2 uf (P1, D)
Rectifier	202874-758	Commercial diode 1N92(C)
Terminal plate assembly	303824-439	
Mounting plate assembly	303824-569	
Mounting screw	509372-000	12-24 × 3/8 P.H.I.M.S.
S-C 224A KTU BUSY SIGNAL AND		
CAMP-ON CONTROL CIRCUIT	428029-069	
Relay (BY)	204799-579	
Relay (BY1)	204799-569	
Capacitor	202901-025	(V) Electrolylic 500-uf 60v
Capacitor assembly	202463-000	(F1) (F)
Vibrator	204799-709	(V)
Tube clamp	540593-040	Vibrator
Socket	218154-000	Vibrator
Resistor (F)	554000-202	(R2) 2000-ohm ±5% 1/2-watt
Resistor (F1)	554000-512	(R1) 5100-ohm ±5% 1/2-watt
Resistor (V)	554004-100	(R3) 10-ohm ±10% 1-watt
Terminal plate assembly	303824-459	
Mounting screw	509372-000	12-24 × 3/8 P.H.I.M.S.
Mounting plate assembly	303824-559	
S-C 223A KTU THREE-STATION		
SIGNALING CIRCUIT	428029-059	For two-talking link arrangement
Relay (L1 through L3)	204799-699	
Relay (LS1 through LS3)	204799-569	
Relay (LT1 through LT3)	204799-569	
Resistor (L1 through L3)	554003-101	100-ohm ±5% 1-watt
Terminal plate assembly	303824-489	
Mounting screw	509372-000	12-24 × 3/8 P.H.I.M.S.
Mounting plate assembly	303824-549	

Item	Stock Number	Related Information
S-C 222A KTU TWO-TALKING LINK AND NINE-STATION SIGNALING CIRCUIT	428029-049	
Relay (L1 through L9)	204799-699	SS relay
Relay (LS1 through LS9)	204799-569	Wire spring relay
Relay (LT1 through LT9)	204799-569	Wire spring relay
Relay (RO)	204799-639	Wire spring relay
Relay (BC)	204799-649	Wire spring relay
Relay (BC1)	204799-579	Wire spring relay
Relay (TB1)	204799-659	Wire spring relay
Relay (CH)	204799-619	Wire spring relay
Relay (B1)	204799-589	Wire spring relay
Relay (H)	204799-579	Wire spring relay
Relay (LTR)	204799-579	Wire spring relay
Relay (TB2)	204799-659	Wire spring relay
Resistor (L1 through L9)	554003-101	100-ohm ±5% 1-watt
Resistor (J)	554000-622	6200-ohm ±5% 1/2-watt
Terminal plate assembly	303824-429	
Mounting plate assembly	303824-609	
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
S-C 217A KTU PRESET CONFERENCE CIRCUIT	428029-129	
Relay (PC1) (PC2)	204799-839	
Relay (RO1)	204799-579	
Terminal plate assembly	303824-449	
Mounting plate assembly	303824-539	
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
S-C 216A KTU TRANSFER CIRCUIT	428029-019	
Relay (RL)	204799-629	
Relay (TR)	204799-669	
Rectifier	202874-758	Commercial 1N92 diode (CR1)
Terminal plate assembly	303824-449	

Item	Stock Number	Related Information
S-C 216A KTU TRANSFER CIRCUIT (cont)		
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
Mounting plate assembly	303824-529	
S-C 215A KTU THREE-STATION		
SIGNALING CIRCUIT	428029-039	For single-talking link arrangement
Relay (L1 through L3)	204799-699	
Relay (LS1 through LS3)	204799-569	
Resistor (L1 through L3)	554003-101	100-ohm ±5% 1-watt
Terminal plate assembly	303824-469	
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
Mounting plate assembly	303824-519	
S-C 214B KTU SINGLE-TALKING LINK AND		
NINE-STATION SIGNALING CIRCUIT	428029-029	
Relay (L1 through L9)	204799-699	
Relay (LS1 through LS9)	204799-569	
Relay (BC)	204799-649	
Relay (BC1)	204799-579	
Relay (B1)	204799-589	
Relay (CH)	204799-619	
Relay (RO)	204799-639	
Relay (TB1)	204799-659	
Resistor (L1 through L9)	554003-101	100-ohm ±5% 1-watt
Mounting plate assembly	303824-939	
Terminal plate assembly	303824-929	
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
S-C 207C KTU SELECTOR CIRCUIT	428029-099	
Relay (A)	204799-689	
Relay (B)	204799-579	
Relay (C)	204799-599	
Relay (T)	204799-579	
Network	209323-000	

Item	Stock Number	Related Information
S-C 207C KTU SELECTOR CIRCUIT (cont)		
Resistor (A)(B)	554004-470	
Capacitor (A1) (A2)	202901-015	
Terminal plate assembly	303824-479	
Mounting screw	509372-000	
Mounting plate assembly	303824-509	
Cover assembly	303824-709	
Cover guide	303824-719	
Cable and switch assembly	202149-031	
S-C 201B KTU FUSE PANEL	428029-119	
Mounting plate assembly	303824-899	
Mounting plate assembly	303824-499	
Terminal plate assembly	303824-439	
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
S-C 19B KTU FLASHING CIRCUIT	428029-079	
Relay (A)	200402-971	
Relay (B)	200417-101	
Cover assembly	303824-799	
Cover guide	303824-809	
Mounting screw	509372-000	#12-24 × 3/8 P.H.I.M.S.
Plate assembly	303824-629	

FIG.1

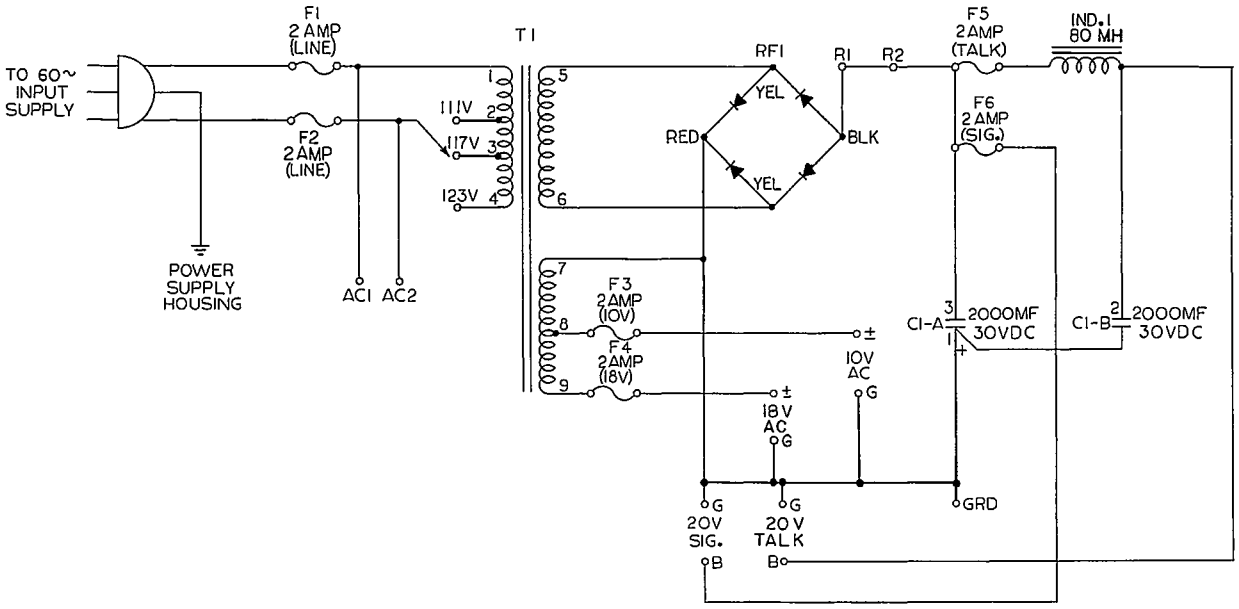

FIG. 1
POWER SUPPLY
S-C 86731

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NOTE INDEX: INFORMATION NOTES ARE NUMBERED 1 THROUGH 99.
CIRCUIT NOTES ARE NUMBERED 101 THROUGH 199.
EQUIPMENT NOTES ARE NUMBERED 201 THROUGH 299.

INFORMATION NOTES:

1. THE CURRENT VALUES ARE TABULATED ACCORDING TO SYSTEM ARRANGEMENT. IN EACH CASE AN INITIAL SYSTEM OF 9 CODES WITH NO OPTIONAL FEATURES IS ASSUMED. TO OBTAIN THE PROPER CURRENT VALUE FOR AN INSTALLATION, ADD TO THE INITIAL 9 CODE SYSTEM CURRENT VALUE THOSE CURRENTS ASSOCIATED WITH THE PARTICULAR OPTIONS USED. ONLY THOSE OPTIONAL FEATURES WHICH AFFECT THE CURRENT DRAINS ARE TABULATED.

SELECTOR ONLY ARRANGEMENT		MAX CURRENT DRAIN AT MIN (20 VOLT) VOLTAGE		CURRENT DRAINS DURING NORMAL (24 VOLTS) TALKING CONDITION	
		"A" BAT SUP	"B" BAT SUP	"A" BAT SUP	"B" BAT SUP
INITIAL 9 CODE INSTALLATION WITH NO FEATURES WHICH AFFECT CURRENT DRAINS		.138	.591	.165	.045
WHERE THESE FEATURES ARE USED, ADD THE ASSOC CURRENT VALUE TO THE INITIAL 9 CODE INSTALLATION CURRENT VALUE.	INSTALLATION OVER 9 CODES USING TRANS CCT (MAX 36 CODES)	0	.081	0	.140
	INSTALLATION WITH PRE-SET CONFERENCE CCT	.018	0	.005	0
	LONG LINE CCT	.066	0	.005	0

1. (CONT)

SINGLE TALKING LINK ARRANGEMENT		MAX CURRENT DRAIN AT MIN (20 VOLTS) VOLTAGE		CURRENT DRAINS DURING NORMAL (24 VOLTS) TALKING CONDITION	
		"A" BAT SUP	"B" BAT SUP	"A" BAT SUP	"B" BAT SUP
INITIAL 9 CODE INSTALLATION WITH NO FEATURES WHICH AFFECT CURRENT DRAINS		.237	.614	.165	.080
WHERE THESE FEATURES ARE USED ADD THE ASSOC CURRENT VALUE TO THE INITIAL 9 CODE INSTALLATION CURRENT VALUE	INSTALLATION OVER 9 CODES USING TRANS CCT (MAX 36 CODES)	0	.081	0	0
	INSTALLATION WITH PRESET CONFERENCE CCT	.018	0	.005	
	INSTALLATION WITH CAMP-ON CCT	.080	.208	.010	.010
	LONG LINE CCT	.066	0	.005	0
	ADD-ON CONFERENCE CCT	0	0	.005	.010

NOTES FOR CIRCUIT S-428029

S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

SN-428029

1 (CONT.)

TWO TALKING LINK ARRANGEMENT		MAX CURRENT DRAIN AT MIN (20 VOLTS) VOLTAGE		CURRENT DRAINS DURING NORMAL (24 VOLTS) TALKING CONDITION	
		"A" BAT SUP	"B" BAT SUP	"A" BAT SUP	"B" BAT SUP
INITIAL 9 CODE INSTALLATION WITH NO FEATURES WHICH AFFECT CURRENT DRAINS		.375	.749	.206	.201
WHERE THESE FEATURES ARE USED, ADD THE ASSOC CURRENT VALUE TO THE INITIAL 9 CODE INSTALLATION CURRENT VALUE.	INSTALLATION OVER 9 CODES 8 USING TRANS CCT (MAX. 36 CODES)	0	.081	0	0
	INSTALLATION WITH PRE-SET CONFERENCE CCT	.018		.005	
	INSTALLATION WITH CAMP-ON CCT	.080	.208	.010	.010
	LONG LINE CCT	.066	0	.005	0
	ADD-ON CONFERENCE CCT	0	0	.005	.010

NOTES FOR CIRCUIT S-428029

INFORMATION NOTES (CONT.):

2. WHEN MORE THAN ONE FIG. 2, 10 OR 13 ARE INSTALLED, THE STRAPPING ARRANGEMENT SHOWN BELOW SHOULD BE FOLLOWED.

FIG. 2 WIRING OPTION W

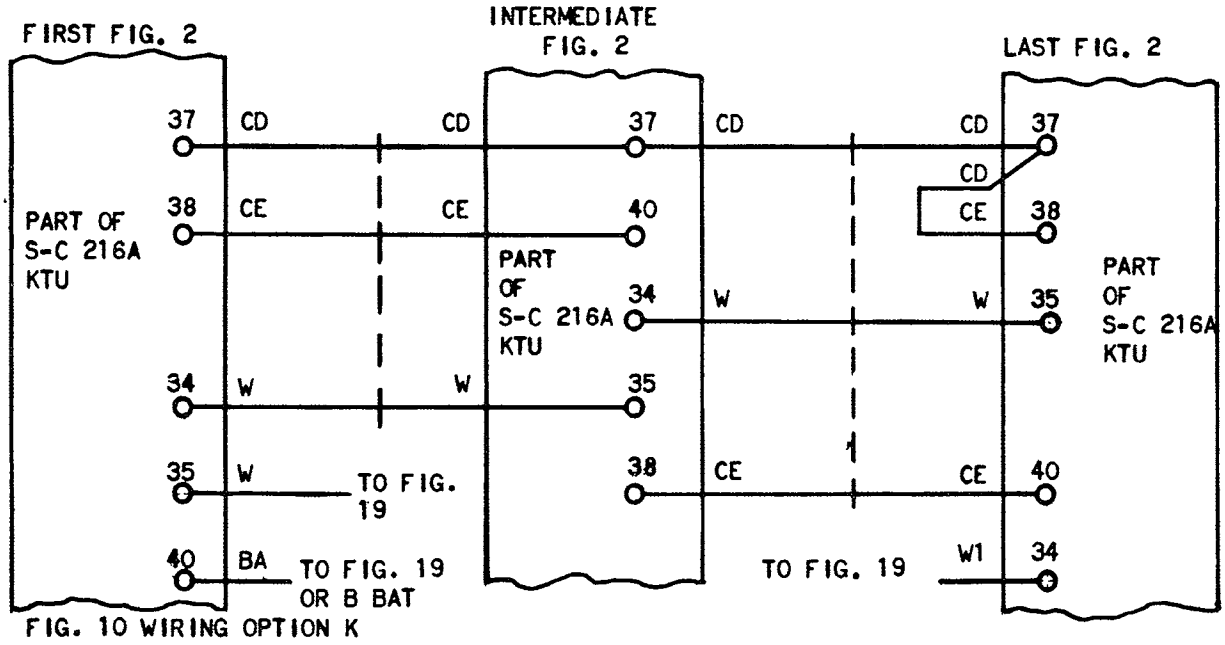
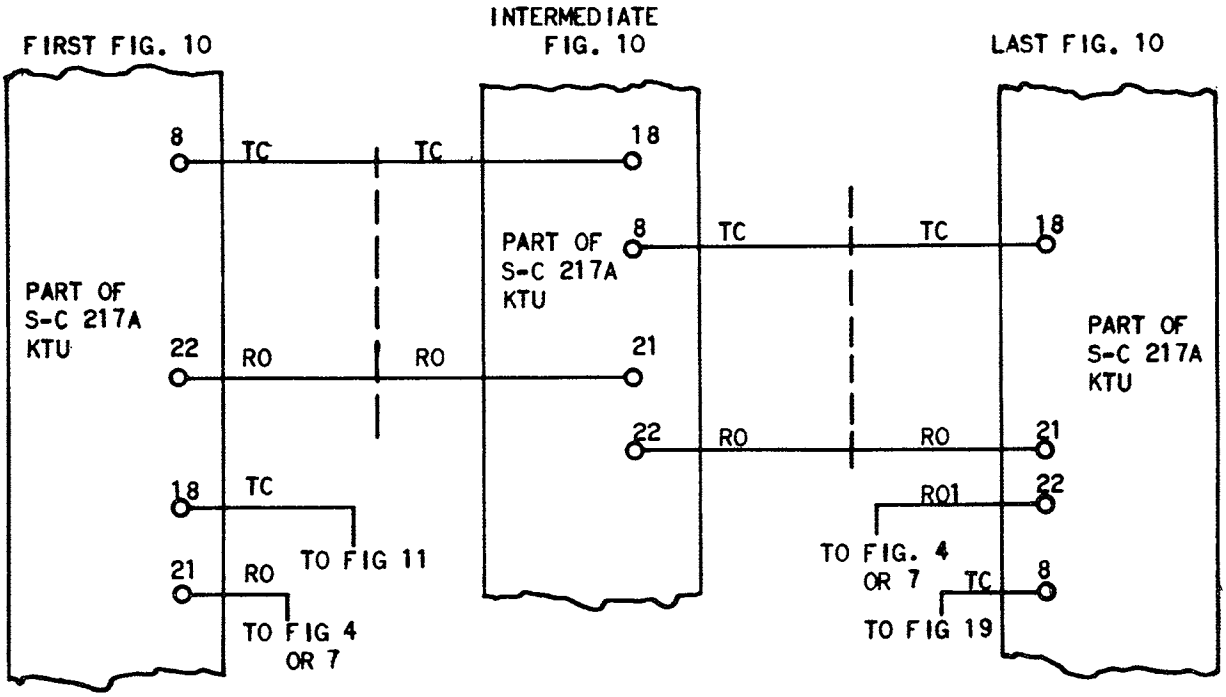


FIG. 10 WIRING OPTION K



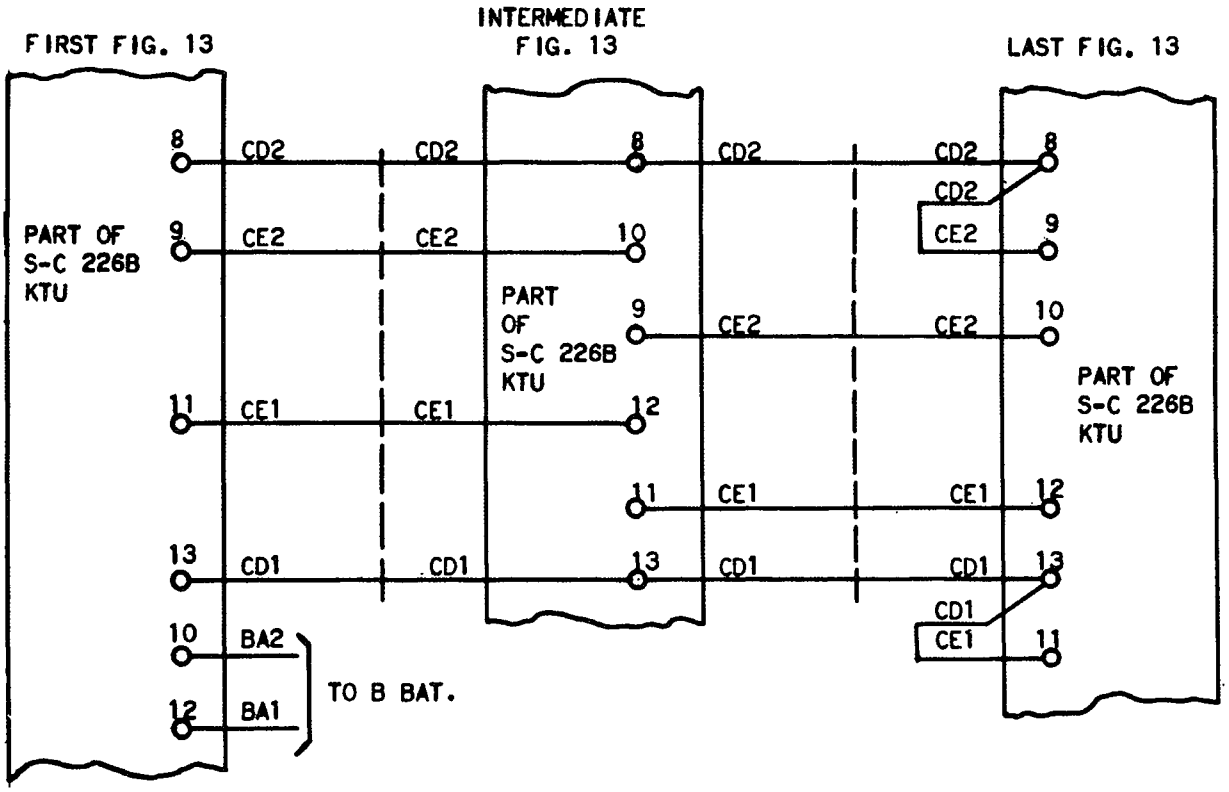
S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029

SN-428029

2 (CONT).

FIG. 13

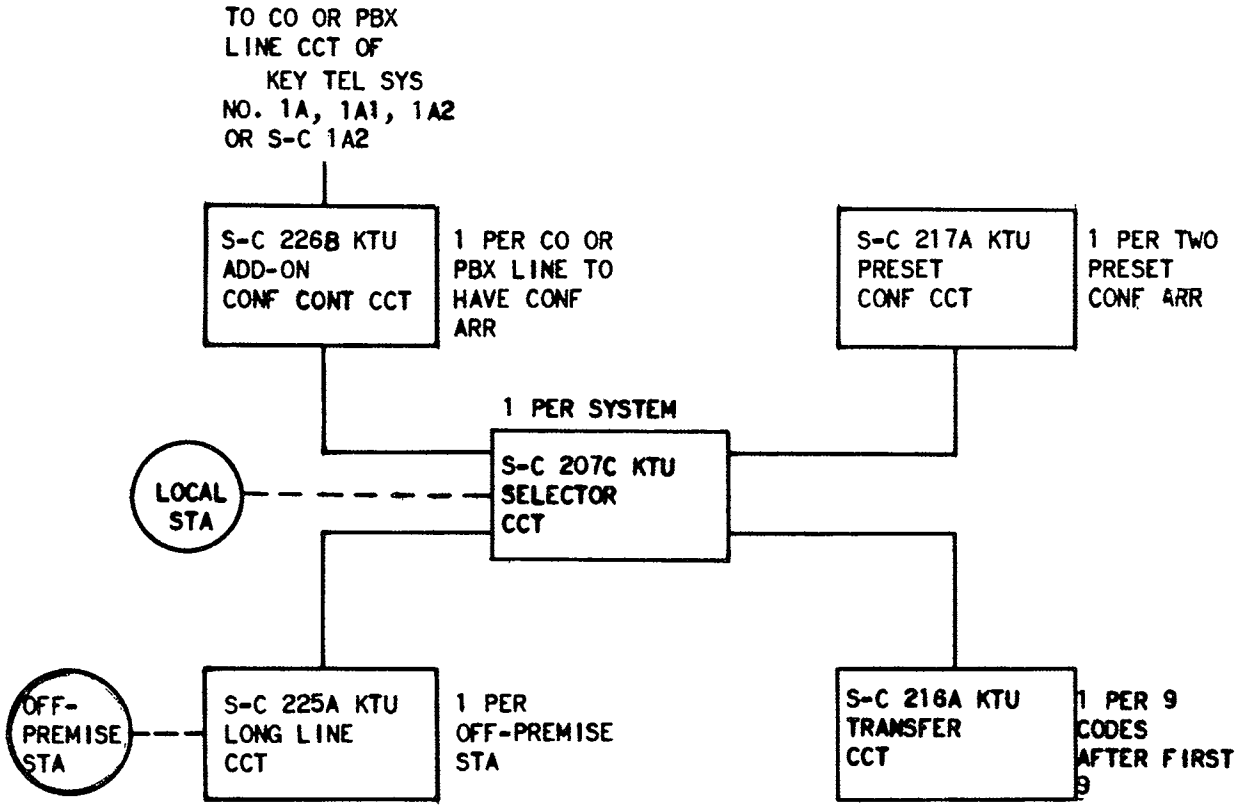


S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029 SN-428029

INFORMATION NOTES (CONT.):

3. BASIC BLOCK DIAGRAM FOR SELECTOR ONLY ARRANGEMENT



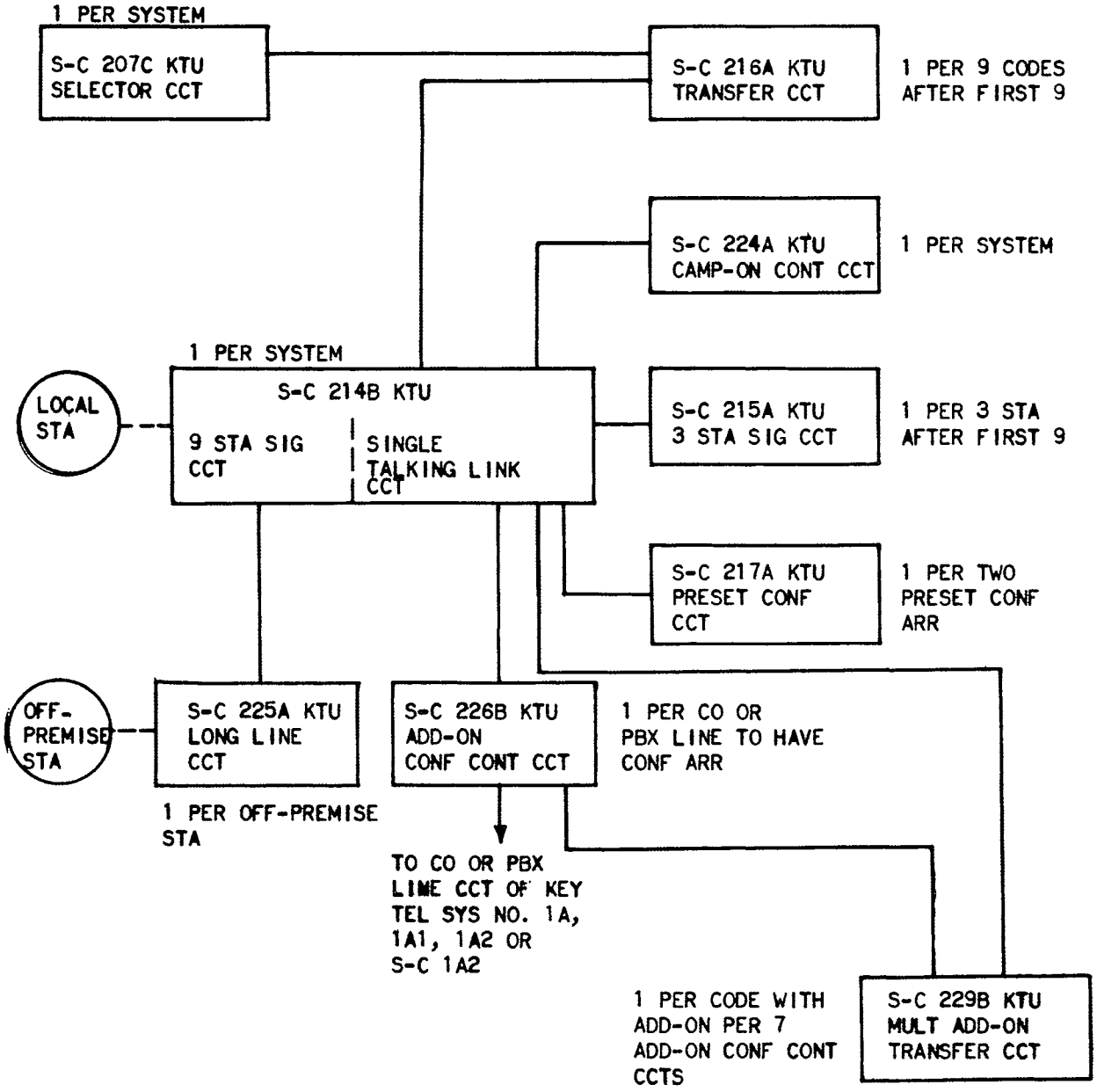
S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029

SN-428029

INFORMATION NOTES (CONT.):

4. BASIC BLOCK DIAGRAM FOR SINGLE TALKING LINK ARRANGEMENT



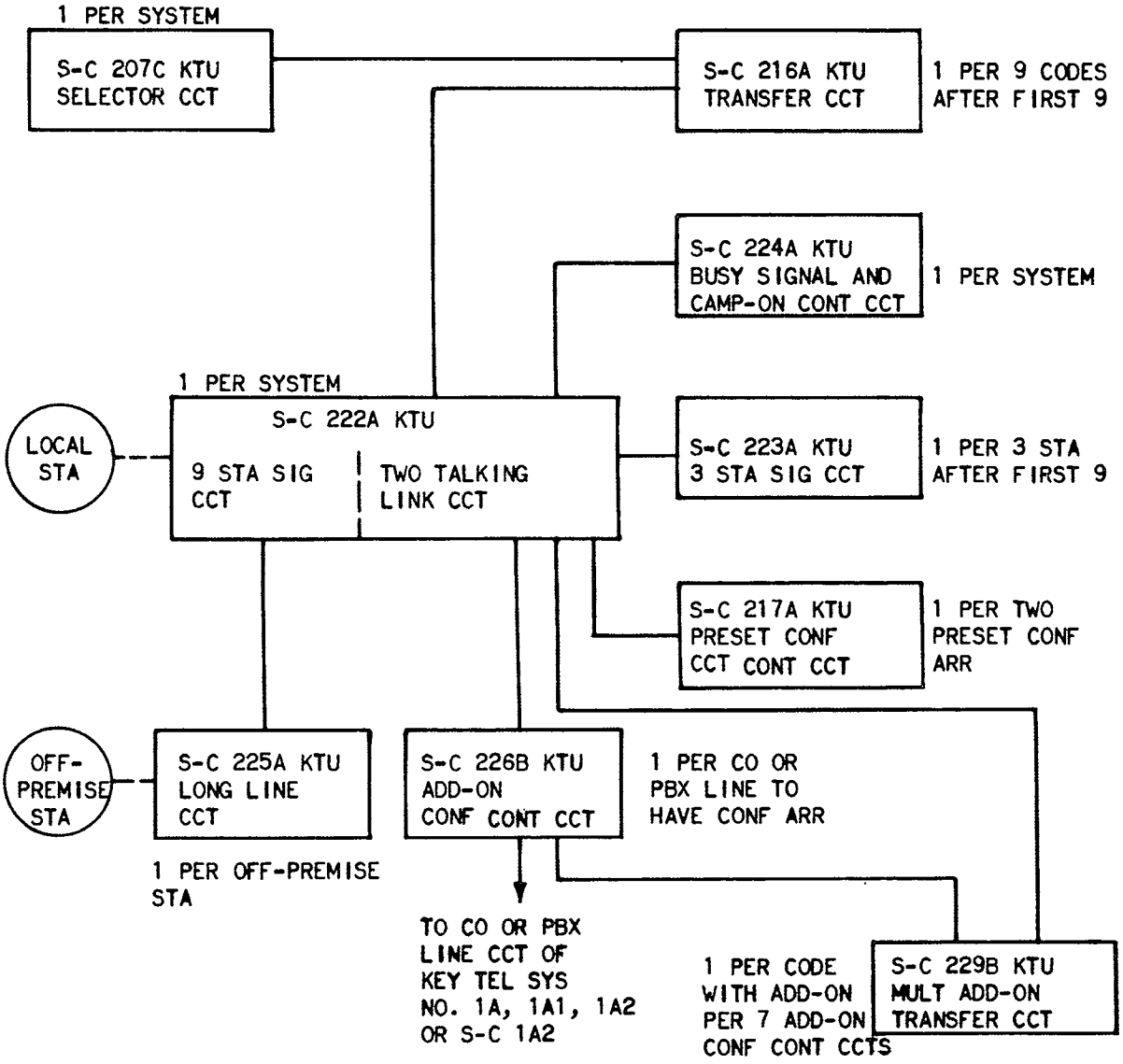
S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029

SN-428029

INFORMATION NOTES (CONT):

5. BASIC BLOCK DIAGRAM FOR TWO TALKING LINK ARRANGEMENT



S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029

SN-428029

CIRCUIT NOTES:

101. POWER SUPPLY FOR THIS SYSTEM MAY BE PROVIDED FROM A 20-26 VOLT DC SOURCE SUCH AS S-C 86731 POWER PLANT. DC MAY ALSO BE SUPPLIED FROM LOCAL OR BUILDING BATTERY. POWER SUPPLY FOR LAMPS MAY BE SUPPLIED FROM AN EXTERNAL TRANSFORMER, AND RINGING SUPPLY MAY BE OVER PAIR LEADS FROM CENTRAL OFFICE OR PBX.

102. THIS CIRCUIT WILL BE FUSED IN ACCORDANCE WITH THE FOLLOWING:

A. PROVIDE ONE 2 AMPERE FUSE FOR TALKING BATTERY DESIGNATED "A".
B. PROVIDE ONE 2 AMPERE FUSE FOR SIGNALING BATTERY DESIGNATED "B".
C. PROVIDE ONE 2 AMPERE FUSE PER MAXIMUM 36 SIGNAL LAMPS DESIGNATED "C".
D. PROVIDE ONE 2 AMPERE FUSE DESIGNATED "D" POWER SUPPLY FOR DC AUDIBLE SIGNALS.

103.

FEATURE OR OPTION			PROVIDE FIG	PROVIDE APP & WIR	PROVIDE QUANTITY
TRANS CCT (TO INCREASE SYS CAP. FROM 9 TO 36 CODES)			2		1 PER 9 CODES
STA SIG CCT	SINGLE TALKING LINK ARR	1ST 9 STAS	3		1 PER STA
		FOR STAS OVER 1ST 9	5		
	TWO TALKING LINK ARR	1ST 9 STAS	6		
		FOR STAS OVER 1ST 9	8		
SINGLE TALKING LINK CCT			4		1 PER SYS
TWO-TALKING LINK CCT			7		
SIG KEY (FOR PUSH-BUTTON STA SEL)			9		1 PER STA PER CALLED CODE
PRESET CONF CCT			10		1 PER TWO PRESET CONF ARR
BUSY SIG & CAMP-ON CONT CCT	SINGLE-TALKING LINK ARR WITH CAMP-ON		11		1 PER SYS
	TWO-TALKING LINK ARR				
LONG LINE CCT			12		1 PER OFF-PREMISE STA
ADD-ON CONF CONTROL CCT			13		1 PER CO OR PBX CONF LINE
FLASHING CCT (TWO FLASHING CONTACTS REQ'D MAY BE OBTAINED FROM ASSOC KEY TEL SYS NO. 1A OR 1A1) (SEE NOTE 106)			14		AS REQUIRED

S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029

103. (CONT)

FEATURE OR OPTION			PROVIDE FIG	APP & WIR	QUANTITY
AUX RELAY-BUSY LAMP CCT (TO PROVIDE CONTACTS TO CONTROL MORE THAN 40 LINE BUSY LAMPS			16		1 PER 80 LPS
AUX RELAY-LAMP FLASHING CCT (TO PROVIDE CONTACTS TO FLASH MORE THAN 20 LAMPS AT ONE TIME)			17		1 PER 80 LPS
RINGING AND TONE CONTROL CCT			18		1 PER SYS
SEL CCT			19		1 PER SYS
SINGLE ADD-ON TRANSFER CCT (NEEDED WITH ADD-ON CONF CONT CCT FOR SINGLE OR TWO TALKING LINK ARR)			20		1 PER CODE WITH ADD-ON PER FIG 13
ADD-ON KEY			21		1 PER STA PER ADD-ON LINE
ELECTRO-MECHANICAL FLASH, WINK, RING AND TIME-OUT CIRCUIT		USED WITH ONE SYSTEM	23	C	AS REQUIRED
		USED WITH MORE THAN ONE SYSTEM		D	
LAMP CCT FOR LAMPS IN INDICATORS			24		1 TO 20 PER LINE OR SIG CCT
COMMON AUDIBLE SIGNAL	BUZZERS OR BELLS	DC POWER SUPPLY	25	AY	AS REQUIRED
		AC POWER SUPPLY		AZ	
	RINGERS		26		
RINGING LAMP CCT USING KEY TEL UNIT			27		1 PER INSTALLATION
COMBINED USE OF SAME AUDIBLE SIGNAL AS BOTH LINE SIGNAL & COMMON SIGNAL	AUDIBLE SIGNALS	RINGERS	28		1 PER 3 AUDIBLE SIGNAL ARRANGEMENT
		BUZZERS OR BELLS	29		1 PER 8 AUDIBLE SIGNAL ARRANGEMENT
	AUDIBLE SIGNALS & COMBINED VISUAL & AUDIBLE SIGNALS	RINGERS	30		1 PER 2 COMBINED AUDIBLE SIGNALS & 1 COMBINED VISUAL & AUDIBLE SIGNAL
		BUZZERS OR BELLS — INDIRECT OPERATION OF BUZZER OF COMB. SIG.	31	L	1 PER 4 COMBINED AUDIBLE SIGNALS & 1 COMBINED VISUAL & AUDIBLE SIGNAL
		BUZZERS OR BELLS — DIRECT OPERATION OF BUZZER OF COMB. SIG.		P	

CONT. ON SHEET 11

103. (CONT.)

FEATURE OR OPTION		PROVIDE FIG	PROVIDE APP & WIR	PROVIDE QUANTITY
COMMON OR STATION AUDIBLE SIGNAL FOR S-C 1A2 KEY TELEPHONE SYSTEM		32		1 PER COMMON OR STATION AUDIBLE SIGNAL
AUXILIARY LAMP RELAY CCT TO PROVIDE FOR MORE THAN 20 LAMPS PER LINE & SIGNALING CCT		33		1 PER 3 GROUPS OF 40 LAMPS PER LINE
MULTIPLE ADD-ON TRANSFER CCT (NEEDED WITH ADD-ON CONF CONT CCTS FOR SINGLE OR TWO TALKING LINK ARR)		34		1 PER CODE WITH ADD-ON PER 7 ADD-ON CONF CONTROL CCTS.
USED WITH SEL ONLY ARR			B	
USED WITH SINGLE OR TWO TALKING LINK ARR			A	
MAX 9 CODES			X	
OVER 9 CODES			W	
STA IS AUTO CUTOFF			E	
STA IS NOT AUTO CUTOFF			F	
STA AUD SIG	OVER T & R LEADS		Y	
	OVER SEP SIG PAIR		Z	
	STA ASSOC WITH COM AUD ARR		AA	

S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029

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103. (CONT:)

FEATURE OR OPTION		PROVIDE FIG	PROVIDE APP & WIR	PROVIDE QUANTITY
SYS WITH PRESET CONF			K	
SYS WITHOUT PRESET CONF			J	
SYS WITH CAMP-ON			G	
SYS WITHOUT CAMP-ON			N	
TWO TALKING LINK ARR WITH CAMP-ON			T	
SIG KEY SELECTION OF STA	LOCAL STA		AE	
	OFF-PREMISE STA		AF	
LONG LINE CCT ASSOC WITH PRESET CONF USED WITH THE SELECTOR ONLY ARR			R	
WITHOUT AUX REL-BUSY LP CCT			H	
WITH AUX REL-BUSY LP CCT			M	
WITHOUT SINGLE OR MULTIPLE ADD-ON TRANSFER CCT			AG	
WITH SINGLE OR MULTIPLE ADD-ON TRANSFER CCT			Q	
DIAL, BUSY & AUDIBLE TONE			AJ	
INTERRUPTED RINGING			AK	
SINGLE SPURT RINGING			AL	
WITHOUT AUX REL-LP FLASH CCT			S	
WITH AUX REL-LP FLASH CCT			V	

S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029

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CIRCUIT NOTES (CONT):

104. ANY DIGIT EXCEPT 1 MAY BE ASSIGNED AS THE INITIAL DIGIT OF A TWO DIGIT CODE. THE NUMBER USED AS THE INITIAL DIGIT OF A TWO DIGIT CODE MAY NOT BE USED FOR A STATION CODE. ALSO SEE NOTE 114.

105. THE MS RELAY OF THE S-C 227A KEY TEL UNIT IS SHOWN AS AN AUXILIARY LAMP RELAY FOR FIGS. 16 & 17. OTHER UNITS MAY BE USED ON LOCALLY ENGINEERED BASIS. IT IS RECOMMENDED THAT A FIG 16 OR 17 (AS THE CASE MAY BE) BE ADDED TO AN INSTALLATION WHENEVER THE FIG 16 OR THE FIG 17 IS REQUIRED. THIS IS TO INSURE PROPER CURRENT LOADING OF RELAY CONTACTS AS THE INSTALLATION CHANGES AND GROWS.

106. THE CO LEAD CONNECTION IS REQUIRED WHEN THE ASSOCIATED NO. 1A OR 1A1 SYSTEM VIS & AUD SIG CCT IS USED AS PART OF THE S-C 1A2 SYSTEM INSTALLATION.

107. FIGS. 28 THROUGH 31 PROVIDE A FLEXIBLE ARRANGEMENT FOR THE COMBINED USE OF THE SAME AUDIBLE SIGNAL AS BOTH LINE SIGNAL AND COMMON SIGNAL.

A COMMON AUDIBLE SIGNAL MAY BE ASSOCIATED WITH ONE OR MORE GROUPS OF LINE OR SIGNAL CCTS AND ONE LINE OR SIGNAL CCT MAY OPERATE ONE OR MORE AUDIBLE SIGNALS.

THE CA OR CAI LEADS CONNECT TO THE LINE OR SIGNAL CCTS THROUGH CONTACTS ON THE RINGUP OR SIGNALING RELAY OR TO EXTERNALLY MOUNTED KEYS OR KEYS IN TEL SETS OR INTERCOMMUNICATING PICKUP KEYS AT KEY STATIONS ARRANGED WITH PRIVATE LINES.

IF ANY AUDIBLE SIGNAL IS COMMON TO MORE THAN ONE GROUP OF LINE OR SIGNAL CCTS, CONNECTIONS SHALL BE MADE THROUGH CAI LEADS (I.E. THROUGH DIODES C1, C2, C3 ETC.) INSTEAD OF CA LEADS TO AVOID FALSE OPERATION OF OTHER AUDIBLE SIGNALS NOT COMMON TO THE SAME GROUP OF LINE OR SIGNAL CCTS.

CA LEADS MULTIPLE TO OTHER CA LEADS (AND CAI LEADS MULTIPLE TO OTHER CAI LEADS) WHICH ARE COMMON TO THE SAME LINE OR SIGNAL CCT.

WHEN CAI LEADS ARE USED, THE NEGATIVE ENDS OF ALL DIODES (C1, C2, C3 ETC) ASSOCIATED WITH THE SAME COMMON AUDIBLE SIGNAL ARE STRAPPED TOGETHER TO THE OPERATING TERMINAL OF THE APPROPRIATE RELAY IN A MANNER SIMILAR TO THAT INDICATED IN NOTE 202. THE CAI LEADS IN NOTE 202 INDICATE THAT DIODES MOUNTED IN ONE KEY TEL UNIT MAY BE MULTIPLED TO APPROPRIATE RELAYS IN ANOTHER KEY TEL UNIT.

WHEN A DIODE IS MOUNTED BETWEEN TERMINALS 37 & 38, THERE SHALL BE NO CONNECTIONS TO TERMINAL 29; AND WHEN A DIODE IS MOUNTED BETWEEN TERMINALS 38 & 39, THERE SHALL BE NO CONNECTIONS TO TERMINAL 30.

FIGS 30 & 31 PROVIDE FOR THE COMBINATION OF AN AUDIBLE SIGNAL WITH A LOCKED-IN VISUAL SIGNAL. WHEN THESE FIGS. ARE USED, THE LOCKED-IN VISUAL SIGNAL MAY BE RELEASED BY THE MANUAL OPERATION OF A SIGNAL KEY AT THE POSITION SIGNALED.

CONT. ON SHEET 14

NOTES FOR CIRCUIT S-428029

CIRCUIT NOTES (CONT):

107. (CONT) WHEN FIG. 31 IS USED, THE BUZZER ASSOCIATED WITH THE COMBINED VISUAL AND AUDIBLE SIGNAL MAY BE OPERATED DIRECTLY BY THE SIGNAL KEY, OPTION P, OR INDIRECTLY THROUGH THE MS RELAY, OPTION L.

108. THE LOOP RESISTANCE OF THESE LEADS SHALL NOT EXCEED 6.5 OHMS.

109. WHEN AUXILIARY LAMP RELAY CIRCUIT FIG 33 IS USED, ALL LAMPS ASSOCIATED WITH THE LINE AND SIGNAL CIRCUIT SHALL BE CONNECTED TO FIG 33. TERMINATE RELAY GRD. ON THE PUNCHING DESIGNATED FOR LAMP BAT. OF THE LINE AND SIGNAL CIRCUIT. TERMINATE THE L LEAD OF THE AUXILIARY RELAY ON THE L LEAD PUNCHING OF THE LINE AND SIGNAL CIRCUIT.

110. WHEN FIG. 32 IS USED, THE CA1 CA2 OR MS RELAY MAY BE USED FOR EITHER COMMON AUDIBLE OR STATION AUDIBLE.

111. ALL RESISTORS ARE ± 10% 1/2 WATT UNLESS SHOWN OTHERWISE.

112. WHEN THE ADD-ON CONF FEATURE IS USED IN THE SINGLE OR TWO TALKING LINK ARR, OR 34 SHOWS THE CONNECTIONS REQUIRED FOR THIS FEATURE. FIG. 34 SHOWS THE CONNECTIONS USING A 229B KTU FOR MULTIPLE LINE ADD-ON. THIS FIG. HAS A MAXIMUM OF 7 ADD-ON LINES.

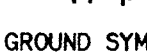
113. SIGNALING KEYS MAY BE PROVIDED BY KEY TEL SYSTEM NO. 1A OR 1A1 KEY AND TEL CCTS OR EQUIVALENT NON-LOCKING KEYS. IF GRD POTENTIALS PERMIT, THE SIG KEY NEED NOT CONNECT DIRECTLY TO B GRD.

114. THE OPERATE PATHS TO THE PRESET CONFERENCE CCT (C LEADS) AND TO THE OFF-PREMISE CCT (C LEADS) MUST CONNECT THROUGH THE FIRST BANK OF THE SELECTOR WHEN THE "SELECTOR ONLY" ARRANGEMENT IS USED. THESE PATHS CONNECT THROUGH THE SECOND BANK OF THE SELECTOR WHEN THE SINGLE OR TWO LINK ARRANGEMENT IS USED.

MAXIMUM 3 OFF-PREMISE STATIONS MAY BE INCLUDED IN PRESET CONFERENCE GROUPS WHEN THE "SELECTOR ONLY" ARRANGEMENT IS USED BY CONNECTING A GROUND SIGNAL ON THE M1, M2, AND M4 CONTACTS OF THE PC1 RELAY (R OPTION). ALSO SEE NOTE 104.

115.

DESIG.	BAT. SUPPLY
A	FILTERED (-24V TALK)
B	UNFILTERED (-24V SIG)

BATTERY SYMBOL 

VOLTAGE RANGE 20-26V

GROUND SYMBOL 

116. TWO L1 LEADS ARE SUPPLIED IN FIGS 4 & 7 TO PROVIDE A MEANS FOR LAMP LOAD DISTRIBUTION WHEN THE TOTAL NUMBER OF LAMPS DOES NOT EXCEED 40.

117. RESISTOR "A" IN FIG 13 IS USED TO DELAY RELEASE OF THE M RELAY TO INSURE OPERATION OF THE N RELAY ON LINK TRANSFER.

118. CAPACITORS "D" & "P1" IN FIG. 12 SHALL BE MATCHED IN CAPACITY WITHIN 1/2% OF EACH OTHER.

S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

NOTES FOR CIRCUIT S-428029 SN-428029

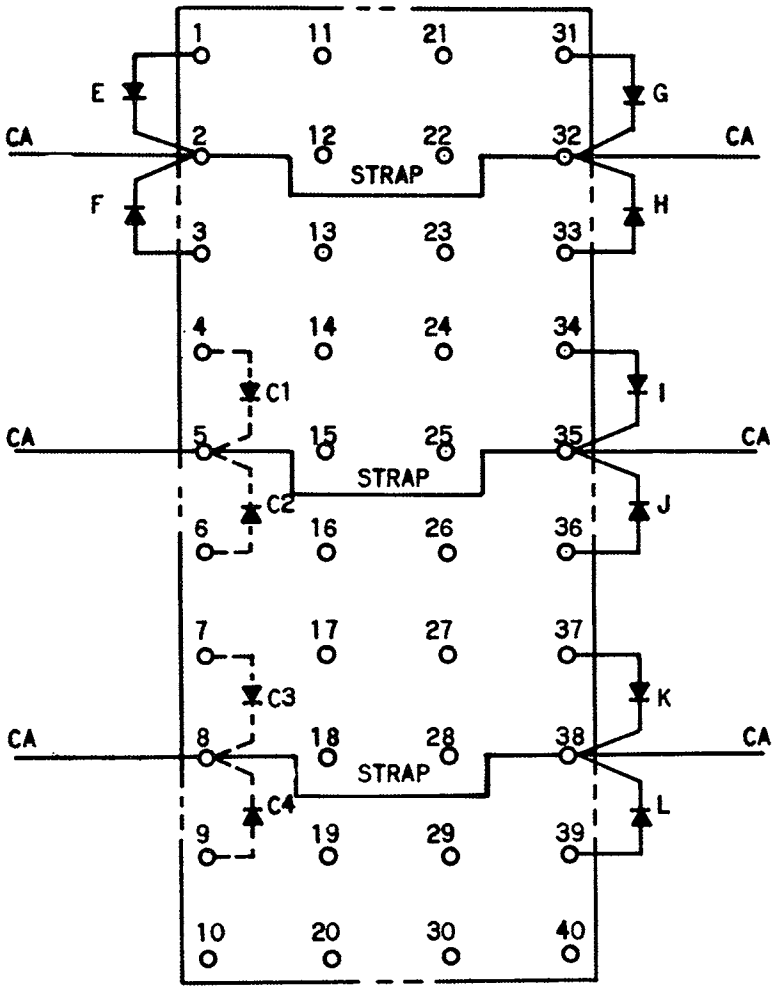
119. WITH CCT ISS 5 "AA" WIRING IS ADDED TO FIG. 19.
EQUIPMENT NOTES:

201. ALL G TERMS, ALL E TERMS, ALL L TERMS, ALL M TERMS, ALL N TERMS, ALL R TERMS, & ALL P TERMS ARE CROSS-CONNECTED ON THE INSTALLER'S SIDE DURING MANUFACTURE OF THE UNITS. CHANGES IN THESE WIRING ARRANGEMENTS SHOULD BE MADE LOCALLY AS REQUIRED.

202. DIODES C1 THROUGH C4 ARE SUPPLIED AS PART OF THE S-C 227A KEY TELEPHONE UNIT & MOUNTED BEHIND THE TERMINAL STRIP. ADDITIONAL DIODES "E" THROUGH "L" MOUNTED AS SHOWN BELOW MAY BE ADDED AS REQUIRED, USING SC808 OR EQUIVALENT DIODES.

ADDITIONAL DIODE CONNECTIONS
SEE NOTE 107

TERMINAL PLATE S-C 227A KEY TEL. UNIT



SHEET INDEX

FIG	CONTENTS	SHEET NO.	ISSUE NO. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
-	SHEET INDEX	1A	1	2	3	4	5	6	7								
-	SHEET INDEX	1B	1	2	3	4	5	6	7								
1	NOT USED	—															
2	TRANSFER CCT	2	1	2	2	2	2	2	2								
3	STA SIG CCT - SINGLE LINK (PART OF S-C 214B KTU)	3	1	2	3	3	3	4	4								
4	SINGLE TALKING LINK CCT (PART OF S-C 214B KTU)	4	1	2	3	3	3	4	4								
5	STA SIG CCT-SINGLE LINK (PART OF S-C 215A KTU)	5	1	2	3	3	3	4	4								
6	STA SIG CCT - TWO LINK (PART OF S-C 222A KTU)	6	1	2	3	3	3	4	4								
7	TWO TALKING LINK CCT (PART OF S-C 222A KTU)	7	1	2	3	3	3	4	5								
8	STA SIG CCT - TWO LINK (PART OF SC-223A KTU)	8	1	2	3	3	3	4	4								
9	SIG KEY	20	-	1	2	2	2	3	3								
10	PRESET CONFERENCE CCT																
11	BUSY SIG & CAMP-ON CONT CCT	9	1	2	3	3	3	4	4								
12	LONG LINE CCT	21	-	1	2	2	2	3	3								
13	ADD-ON CONF CONT CCT	22	-	1	2	2	2	3	3								
14	FLASHING CCT	10	1	2	3	3	3	3	3								
16	AUX REL - BUSY LP CCT (PART OF S-C 227A KTU)																
17	AUX REL - LP FLASH CCT (PART OF S-C 227A KTU)																
15	NOT USED	-															
18	RINGING & TONE CONTROL CCT	11	1	2	3	4	4	5	6								
19	SEL CCT	12	1	2	3	3	3	4	5								
20	SINGLE ADD-ON TRANSFER CCT	23	-	1	1	2	2	2	2								
21	ADD-ON KEY																
22	NOT USED	-															
23	ELECTRO-MECHANICAL FLASH, WINK, RING AND TIME-OUT CCT	13	1	2	3	3	3	4	4								

NOTE: FOR NOTES, SEE SN-428029

S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

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SHEET INDEX (CONT)

FIG	CONTENTS	SHEET NO.	ISSUE NO. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
24	LAMP CCT FOR LAMPS IN INDICATORS	- 24	-	1	1	1	1	1	1								
25	BUZZER CCT	-															
26	RINGER CCT	-															
27	RINGING LAMP CCT USING KTU	-															
28	MULTI-SIGNAL CONTROL CCT FOR RINGERS	14	1	2	3	4	4	4	4								
29	MULTI-SIGNAL CONTROL CCT FOR BUZZERS, BELLS, RINGERS	15	1	2	3	4	4	4	4								
30	MULTI-CONTROL CCT FOR RINGERS FOR COMB. AUD. & VISUAL SIG	16	1	2	3	4	4	4	4								
31	MULTI-CONTROL CCT FOR BUZZERS OR BELLS FOR COMB. AUD & VISUAL SIG	17	1	2	3	4	4	4	4								
32	COM AUD OR STA AUD CCT	18	1	2	3	4	4	4	4								
33	AUX LAMP RELAY CCT	19	1	2	3	4	4	4	4								
34	MULT ADD-ON TRANSFER CCT	25	-	1	2	2	3	3	3								

NOTE: FOR NOTES SEE SN-428029

S-C 1A2 KEY TELEPHONE SYSTEM
S-C 6A KEY TELEPHONE UNITS

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FIG. 2
TRANSFER CIRCUIT
S-C 216A K. T. U.

NOTE: FOR NOTES SEE SN-428029.

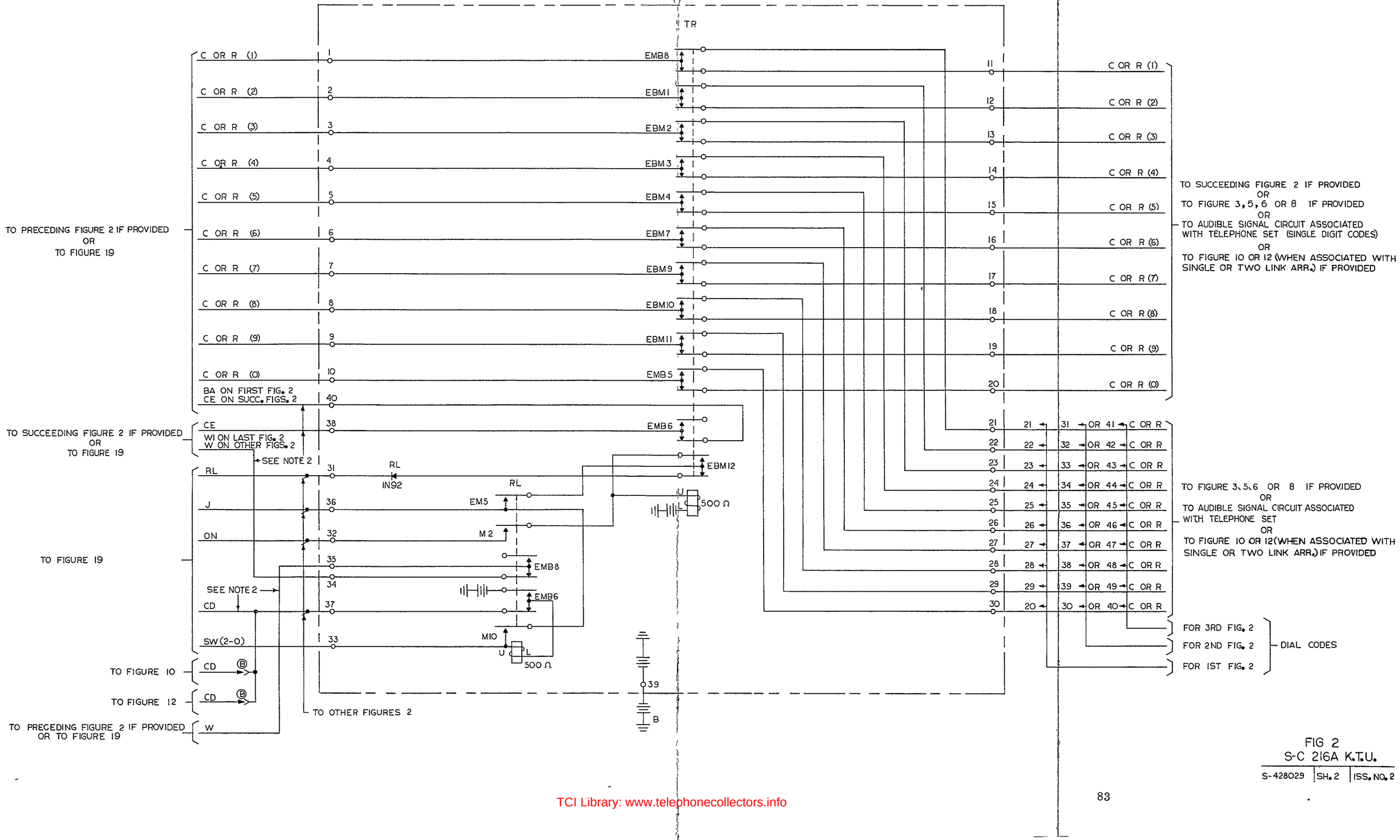


FIG 2
S-C 216A K.T.U.

S-428029 | SH. 2 | ISS. NO. 2

TABLE A FOR S-C 214B KEY TEL. UNIT

REFERENCE DESIGNATION	PUNCHING								
	CCT.1	CCT.2	CCT.3	CCT.4	CCT.5	CCT.6	CCT.7	CCT.8	CCT.9
A	1A	11A	21A	31A	1B	11B	21B	31B	1C
B	2A	12A	22A	32A	2B	12B	22B	32B	2C
C	3A	13A	23A	33A	3B	13B	23B	33B	3C
D	5A	15A	25A	35A	5B	15B	25B	35B	5C
E *	6A	16A	26A	36A	6B	16B	26B	36B	6C
F	7A	17A	27A	37A	7B	17B	27B	37B	7C
G *	11C	12C	13C	14C	15C	16C	17C	18C	19C
H	21C	22C	23C	24C	25C	26C	27	28C	29C
P *	1D	2D	3D	ID	2D	3D	3D	2D	1D
R *	4D	5D	6D	4D	5D	6D	6D	5D	4D

* SEE NOTE 201

FIG. 3
STATION SIGNALING CIRCUIT
FOR SINGLE LINK OPERATION
(PART OF S-C 214B KEY TEL. UNIT)
SEE TABLE A

NOTE: FOR NOTES SEE SN-428029.

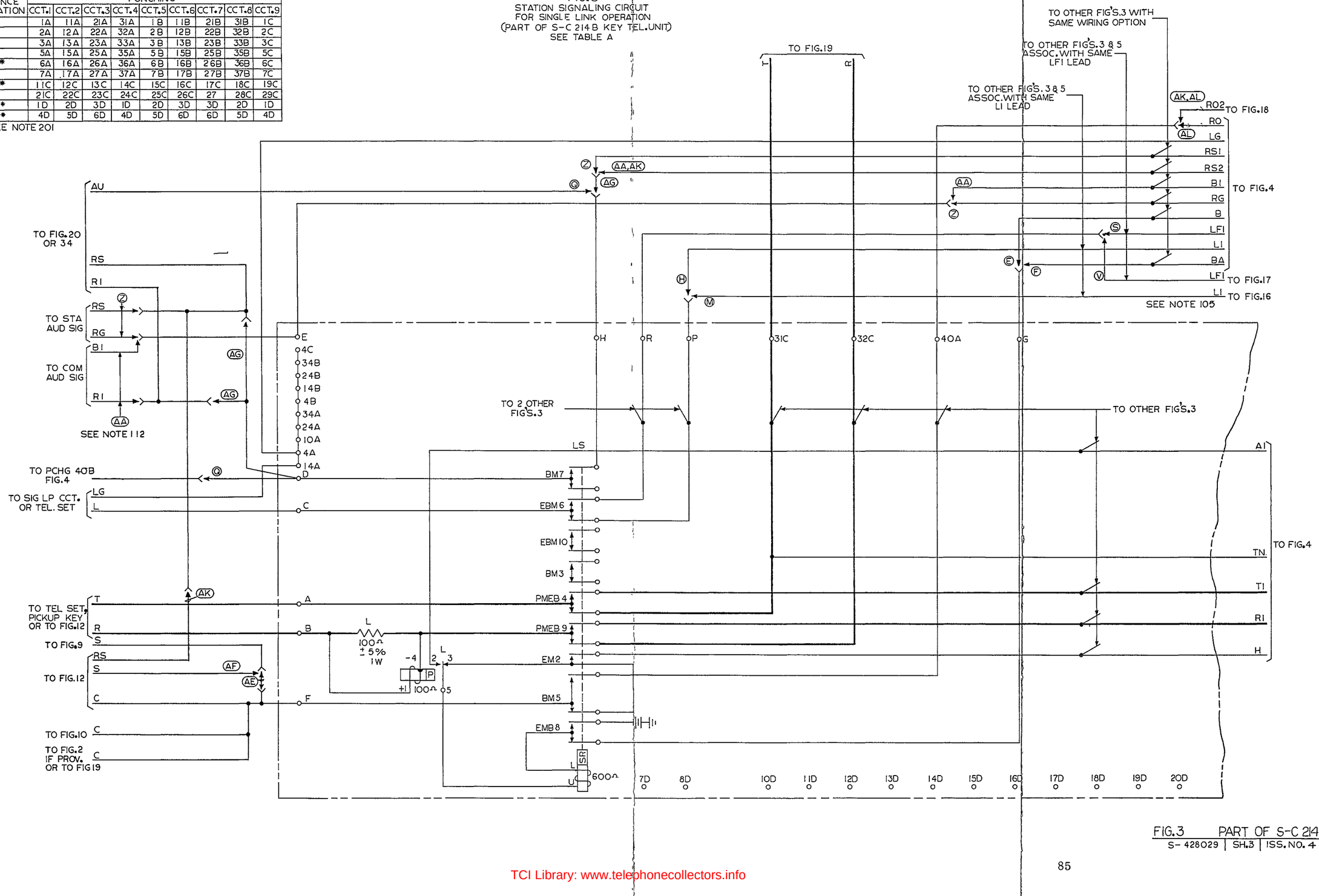


FIG. 3 PART OF S-C 214B K.T.U.
S-428029 | SH.3 | ISS. NO. 4

NOTE: FOR NOTES SEE SN-428029.

FIG. 4
SINGLE TALKING LINK CCT.
(PART OF S-C 214B K.T.U.)

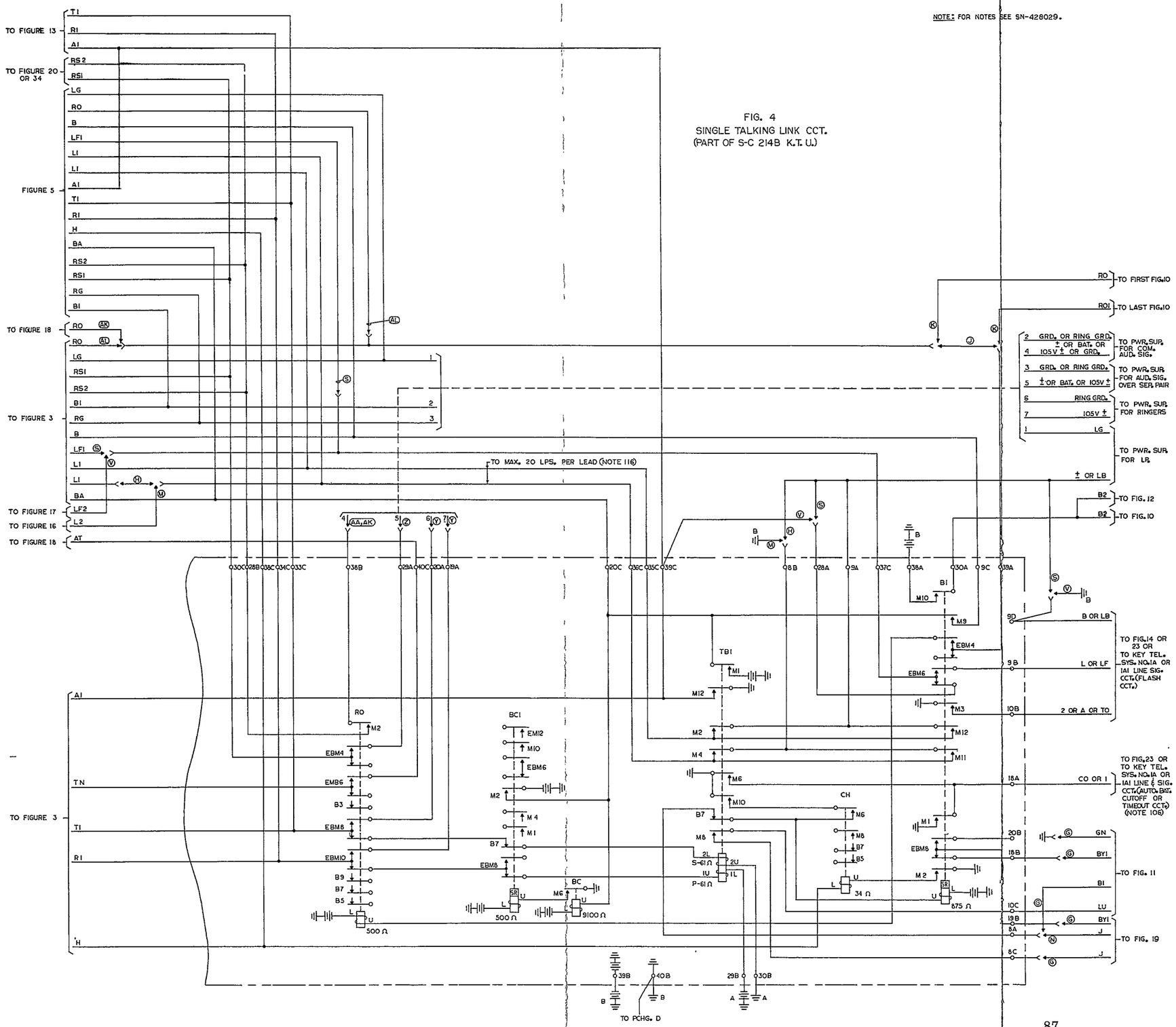


FIG. 4
PART OF S-C. 214B K.T.U.
S-428029 | SH. 4 | ISS. NO. 4

TABLE B FOR S C 215A K.T.U.			
REFERENCE DESIGNATION	PUNCHING CCT.1	CCT.2	CCT.3
A	1	11	21
B	2	12	22
C	3	13	23
D	5	15	25
E*	6	16	26
F	7	17	27
G*	18	19	20
H	28	29	30
P	35		
R	37		

* SEE NOTE 201

FIG. 5
STATION SIGNALING CIRCUIT
FOR SINGLE LINK OPERATION
(PART OF S-C 215A K.T.U.)
SEE TABLE B

NOTE: FOR NOTES SEE SN-428029.

TO OTHER FIGS. 3 & 5
ASSOC. WITH SAME LFI LEAD

TO OTHER FIGS. 3 & 5
ASSOC. WITH
SAME LI LEAD

TO SIG. LP. CCT. OR TEL. SET

TO FIG. 19

TO OTHER S-C 215A K.T.U.

TO 2 OTHER FIGS. 5

TO 2 OTHER FIGS. 5

TO OTHER S-C 215A K.T.U.

TO TEL. SET, PICKUP KEY OR TO FIG. 12

TO FIG. 10

TO FIG. 2 IF PROV. OR TO FIG. 19

TO FIG. 9

TO FIG. 12

TO COM. AUD. SIG.

TO STA. AUD. SIG.

TO FIG. 20 OR 34

SEE NOTE 112

TO OTHER FIGS. 5 WITH SAME WIRING OPTION

TO FIG. 4

TABLE C FOR S-C 222A KEY TEL. UNIT

REFERENCE DESIGNATION	PUNCHING								
	CCT1	CCT2	CCT3	CCT4	CCT5	CCT6	CCT7	CCT8	CCT9
A	1A	11A	21A	31A	1B	11B	21B	31B	1C
B	2A	12A	22A	32A	2B	12B	22B	32B	2C
C	3A	13A	23A	33A	3B	13B	23B	33B	3C
D	5A	15A	25A	35A	5B	15B	25B	35B	5C
E*	6A	16A	26A	36A	6B	16B	26B	36B	6C
F	7A	17A	27A	37A	7B	17B	27B	37B	7C
G*	11C	12C	13C	14C	15C	16C	17C	18C	19C
H	21C	22C	23C	24C	25C	26C	27C	28C	29C
J	11D	12D	13D	14D	15D	16D	17D	18D	19D
K	21D	22D	23D	24D	25D	26D	27D	28D	29D
L*	31D	32D	33D	31D	32D	33D	31D	32D	33D
M*	34D	35D	36D	34D	35D	36D	34D	35D	36D
N*	37D	38D	39D	37D	38D	39D	37D	38D	39D

*SEE NOTE 201

FIG. 6
STATION SIGNALING CIRCUIT
TWO LINK OPERATION
(PART OF S-C 222A KEY TEL. UNIT)
SEE TABLE C

NOTE: FOR NOTES SEE SN-428029.

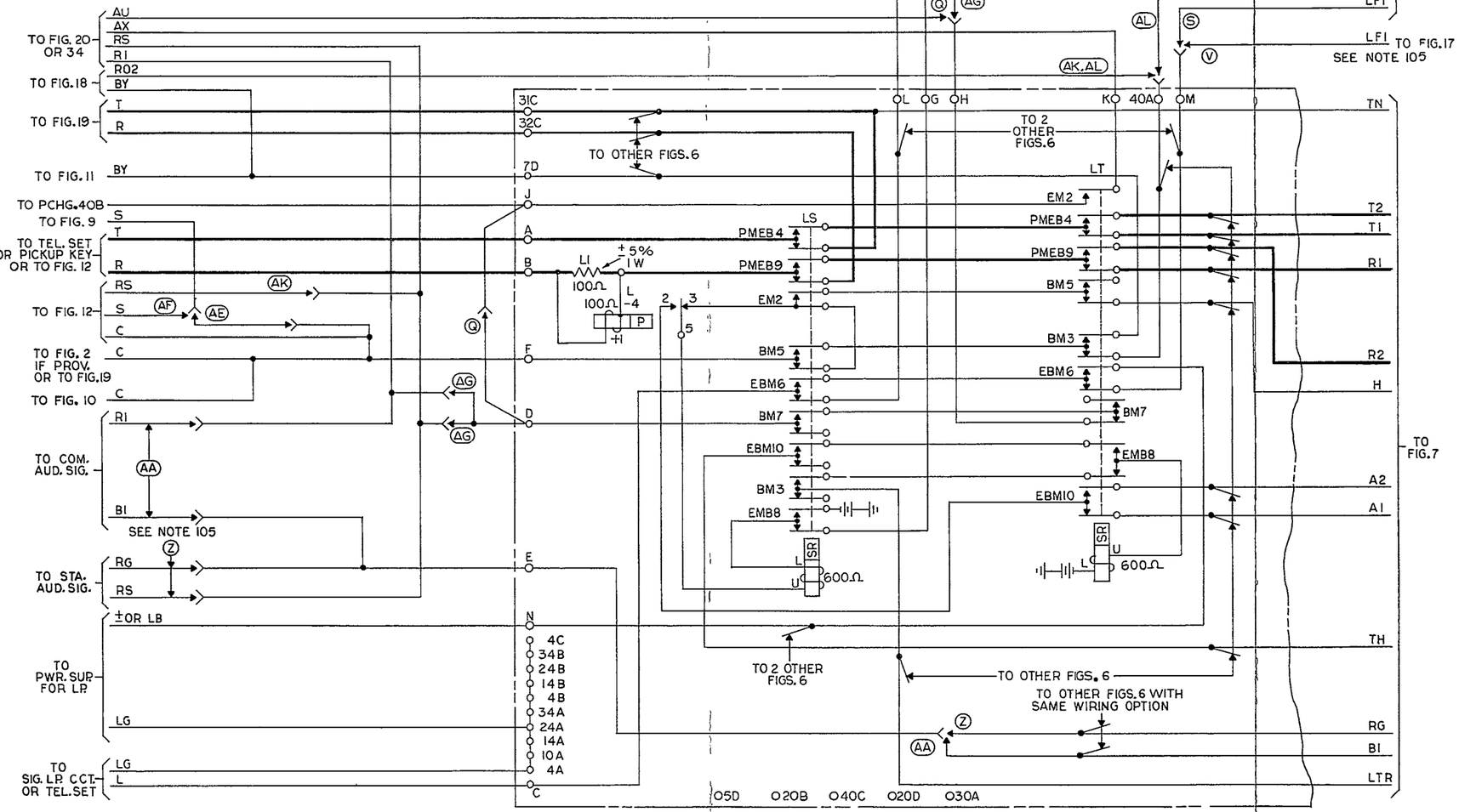


FIG. 6
PART OF S-C 222A K.T.U.
S-428029 | SH.6 | ISS. NO. 4

NOTE: FOR NOTES SEE SN-428029.

FIG. 7
TWO TALKING LINK CIRCUIT
(PART OF S-C 222A K.T.U.)

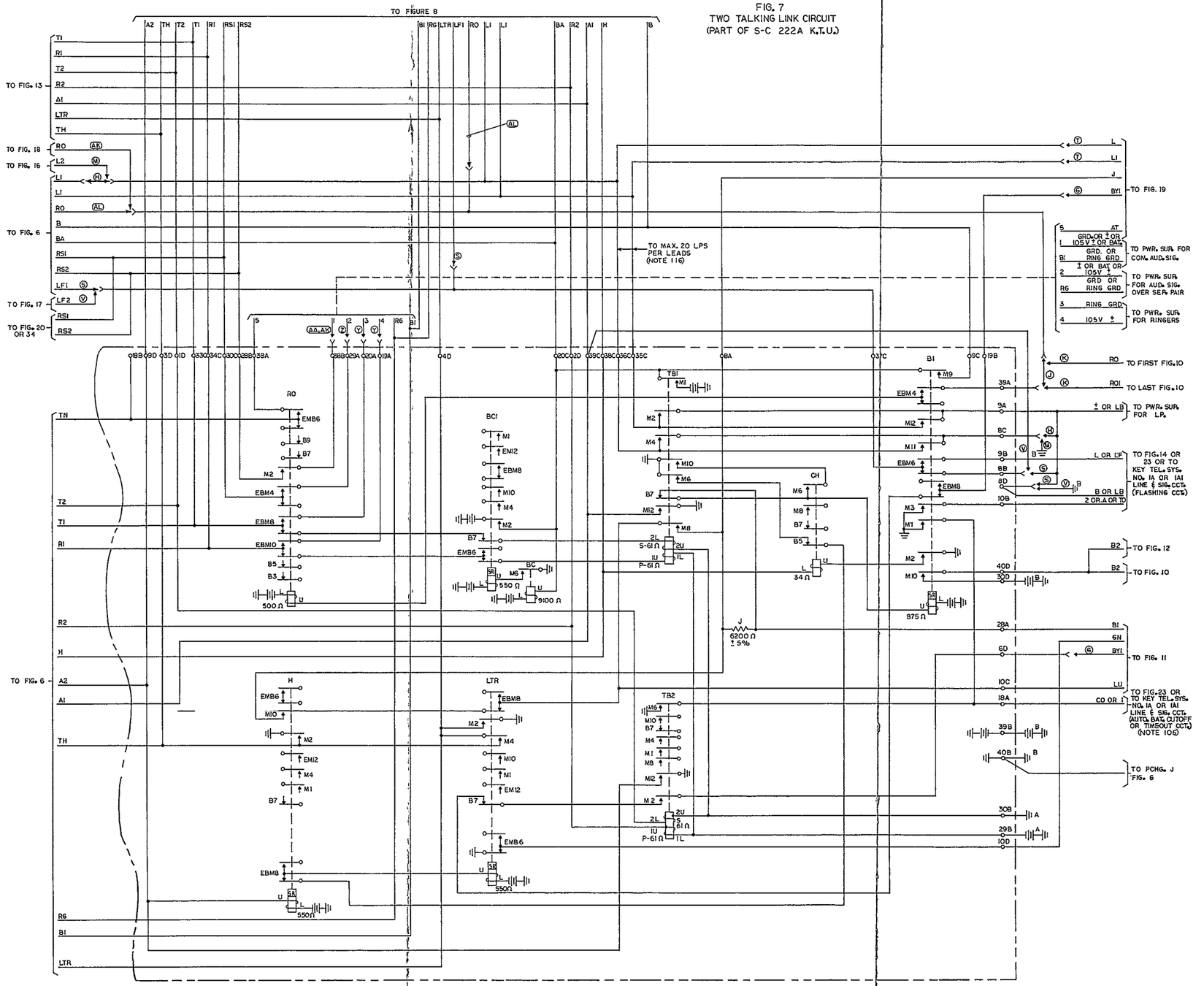


FIG. 7
PART OF S-C 222A K.T.U.
S-428029 | SH. 7 | ISS. NO. 5

FIG.8
STATION SIGNALING CIRCUIT
TWO LINK OPERATION
(PART OF S-C 223A KEY TEL.UNIT)
SEE TABLE D

NOTE: FOR NOTES SEE SN-428029.

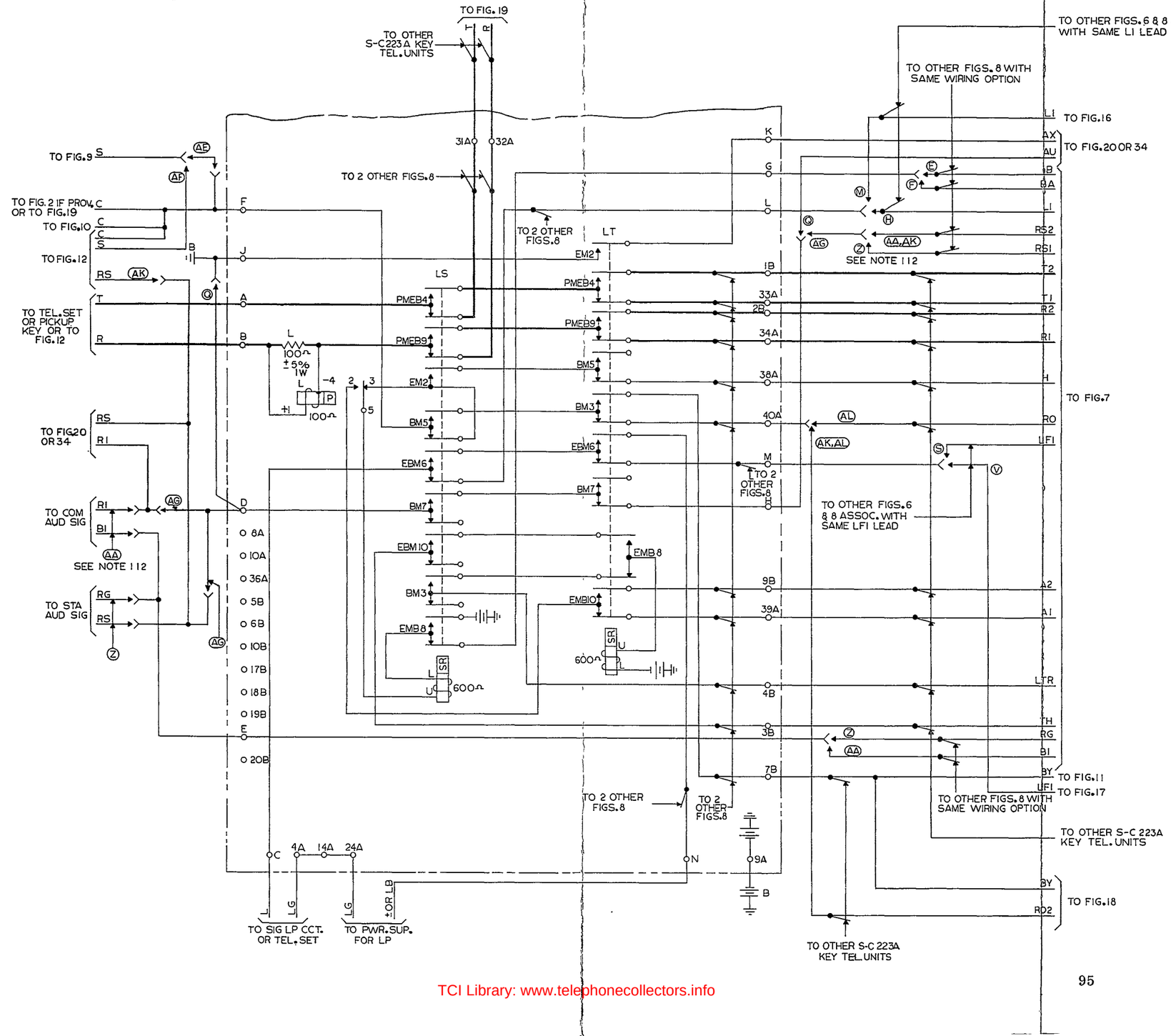


TABLE D
FOR S-C 223A KEY TEL.UNIT

REFERENCE DESIGNATION	PUNCHING		
	CCT.1	CCT.2	CCT.3
A	1A	11A	21A
B	2A	12A	22A
C	3A	13A	23A
D	5A	15A	25A
E *	6A	16A	26A
F	7A	17A	27A
G *	18A	19A	20A
H	28A	29A	30A
J	11B	13B	15B
K	12B	14B	16B
L	35A		
M	37A		
N	8B		

* SEE NOTE 201

FIG.8
PART OF S-C 223A K.T.U.
S-428029 | SH.8 | ISS.NO.4

NOTE: FOR NOTES SEE SN-428029.

FIG. 11

BUSY SIGNAL AND CAMP-ON CONTROL CIRCUIT
S-C 224A K.T.U.

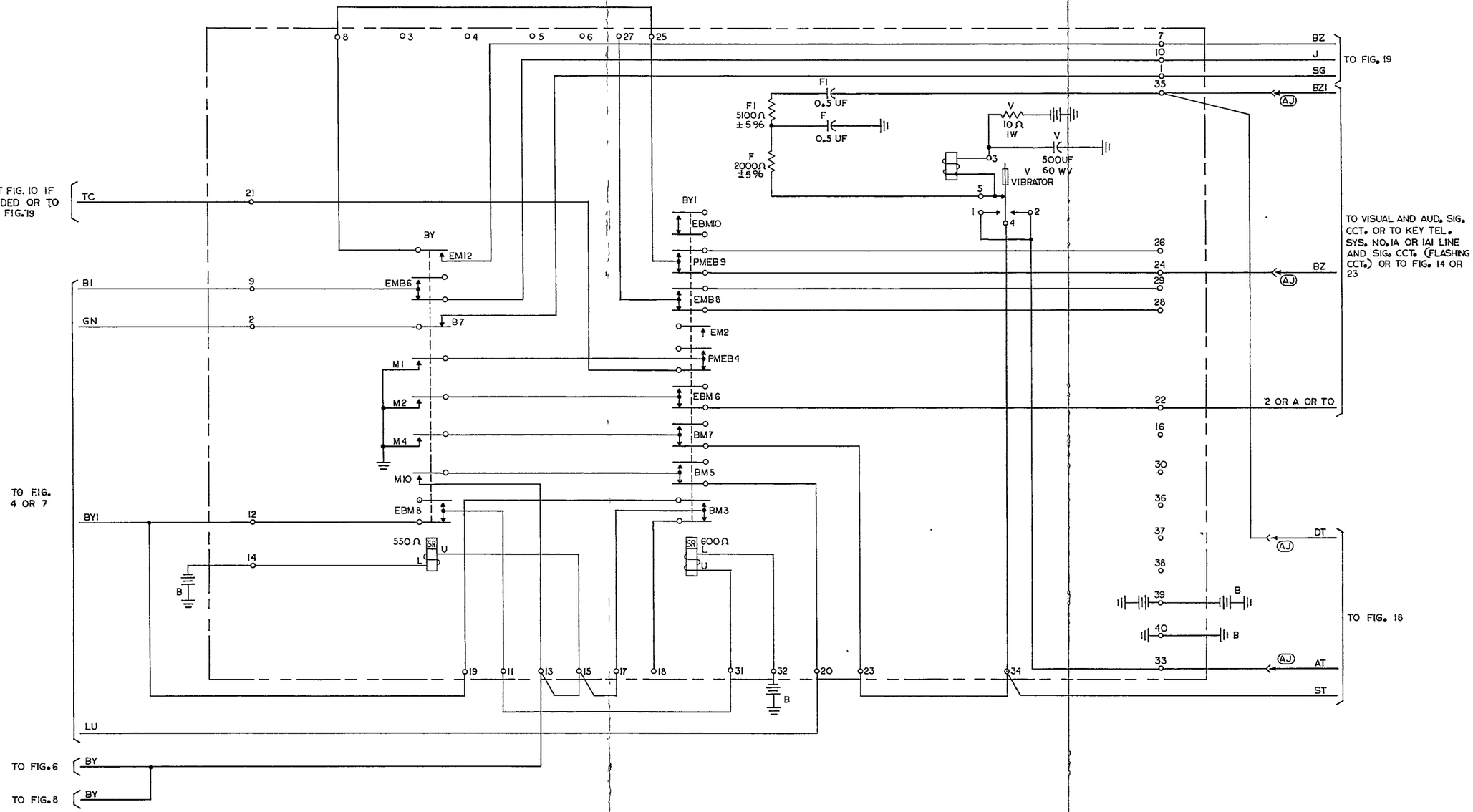


FIG. 11
S-C 224A K.T.U.
S-428029 | SH. 9 | ISS. NO. 4

FIG 14
FLASHING CIRCUIT
S-C 19B K.T.U.

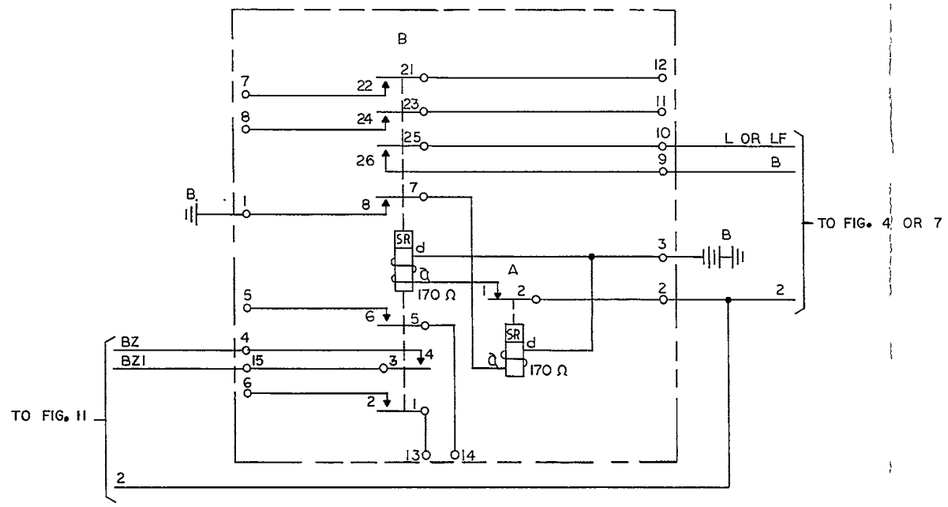
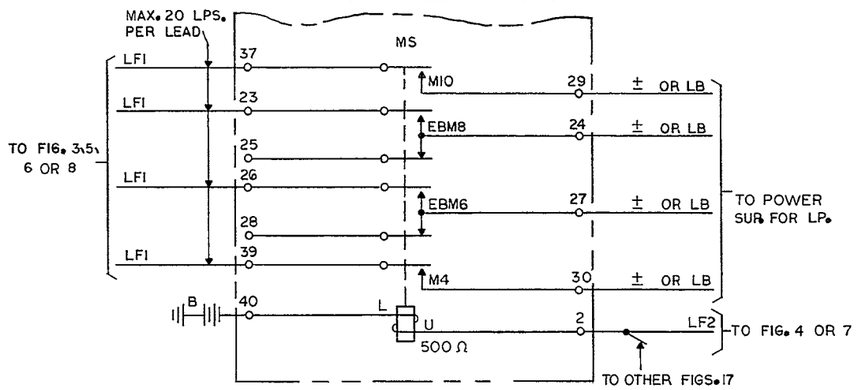


FIG 17
AUXILIARY RELAY-LAMP FLASH CCT
(NOTE 105)
(PART OF S-C 227A K.T.U.)



NOTE: FOR NOTES SEE 9N-428029.

FIG 16
AUXILIARY RELAY-BUSY LAMP CIRCUIT
(NOTE 105)
(PART OF S-C 227A K.T.U.)

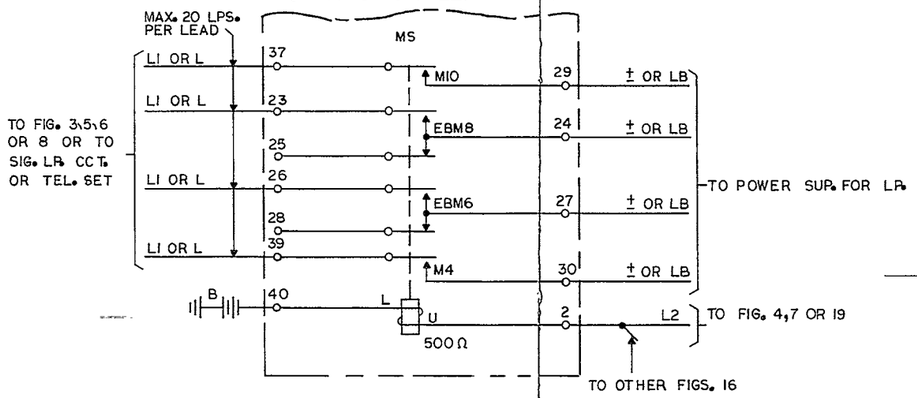


FIG. 14 S-C 19B K.T.U.
FIG. 16 & 17 PART OF S-C 227A K.T.U.

NOTE:
FOR NOTES SEE SN-428029.

FIG. 18
RINGING AND TONE CONTROL CIRCUIT

S-C 227A K.T.U.

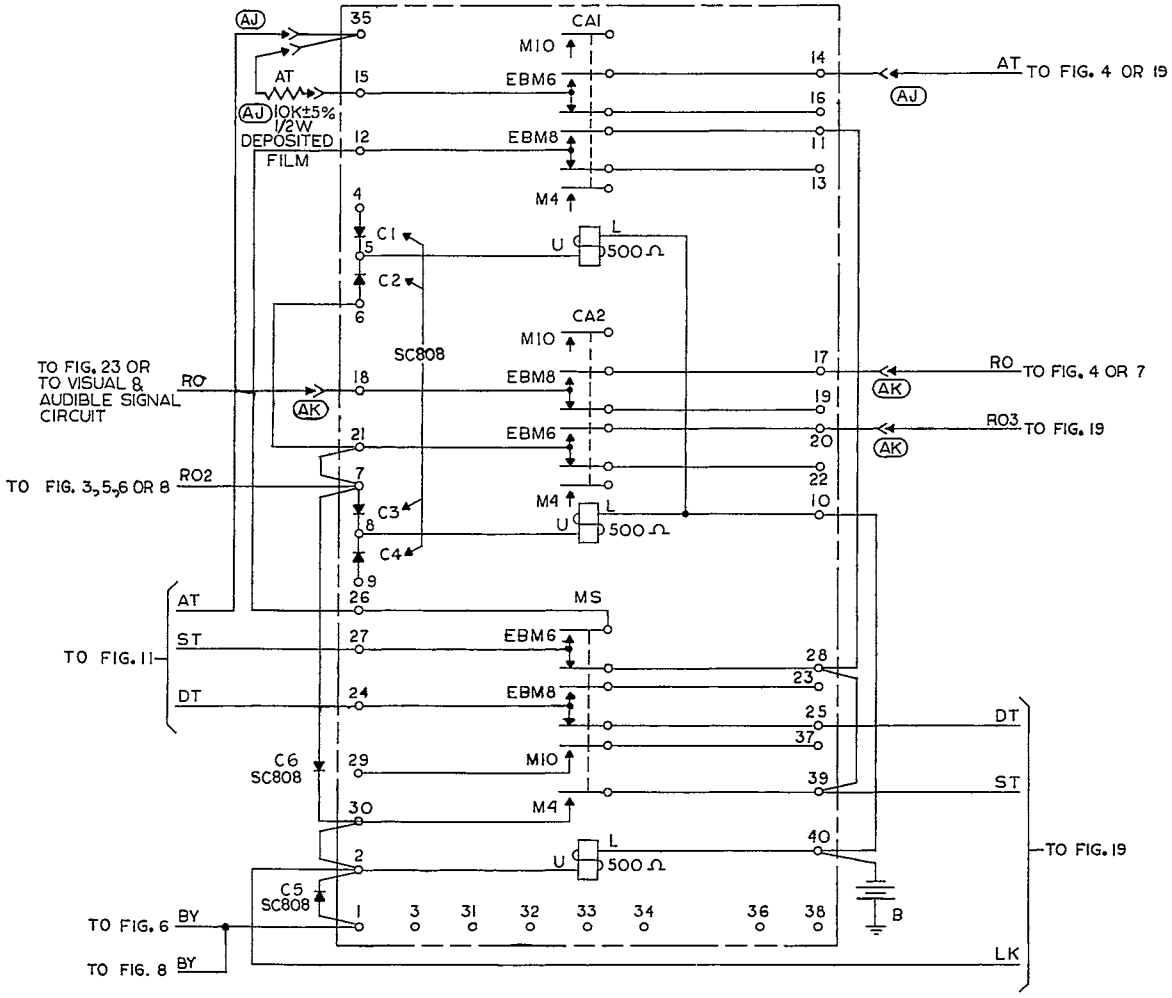
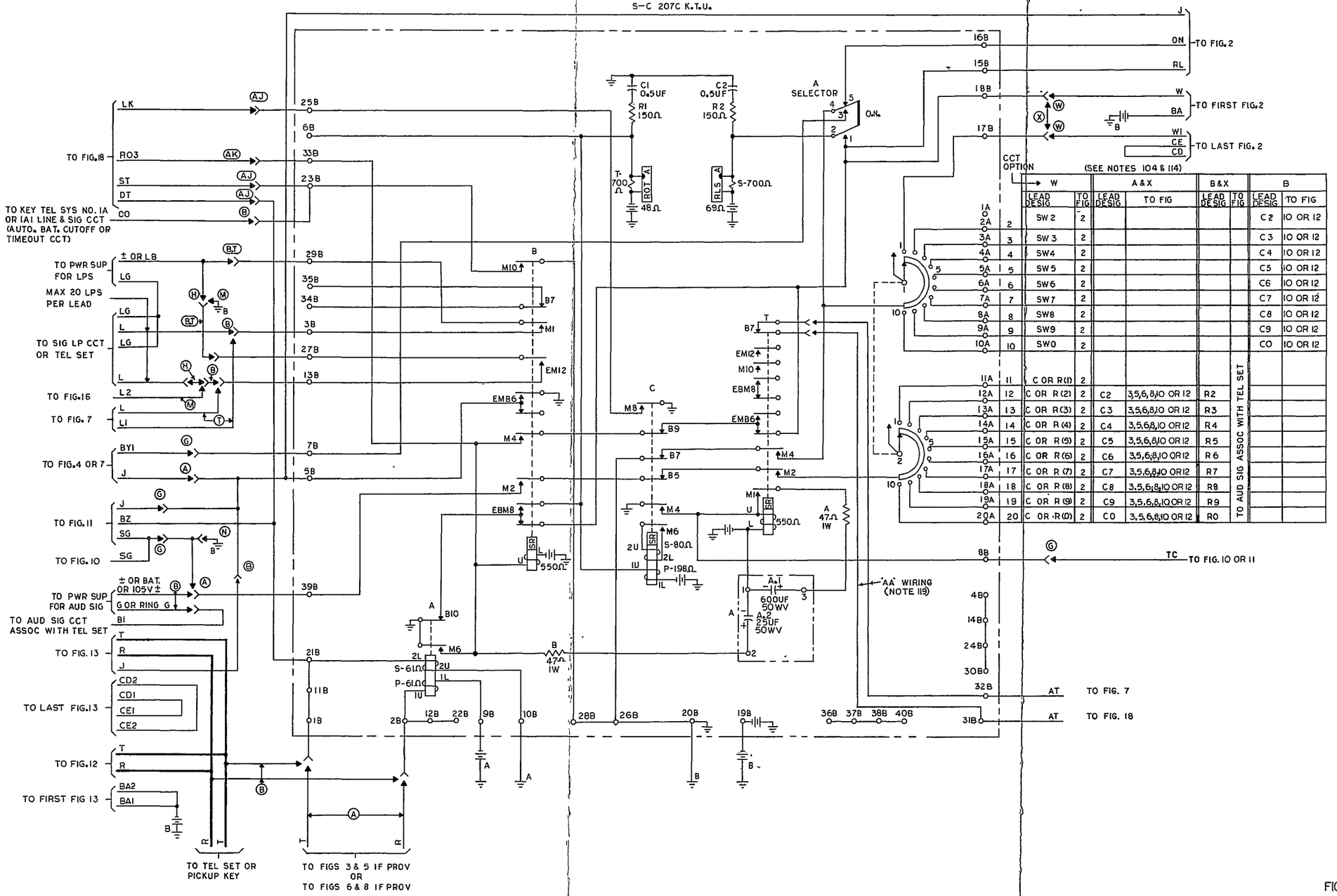


FIG. 18
S-C 227A K.T.U.

S-428029	SH. 11	ISS. NO. 6

FIG.19
SELECTOR CIRCUIT

S-C 207C K.T.U.



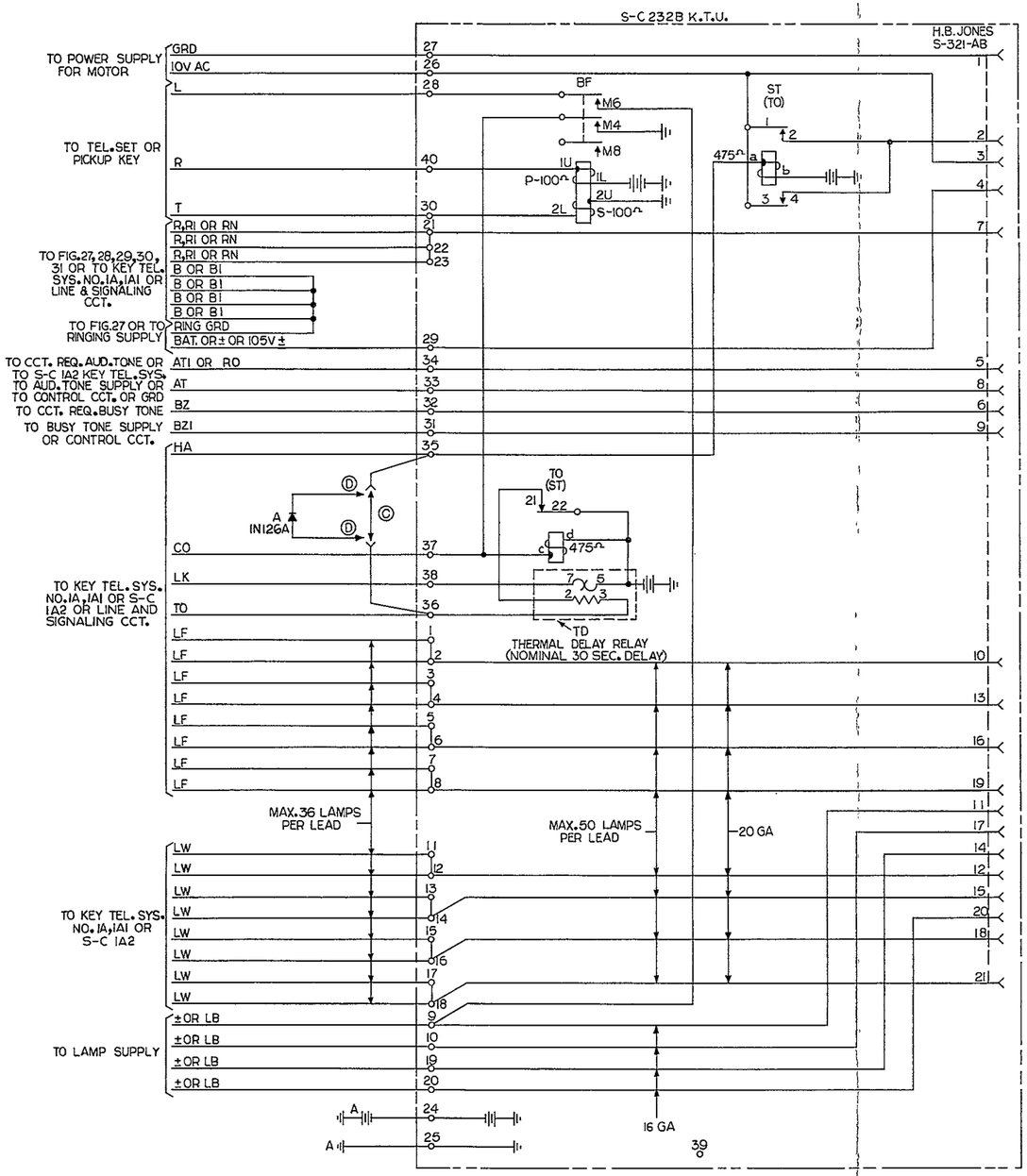
		W		A & X		B & X		B	
		LEAD DESIG	TO FIG	LEAD DESIG	TO FIG	LEAD DESIG	TO FIG	LEAD DESIG	TO FIG
1A									
2A	2	SW 2	2					C 2	10 OR 12
3A	3	SW 3	2					C 3	10 OR 12
4A	4	SW 4	2					C 4	10 OR 12
5A	5	SW 5	2					C 5	10 OR 12
6A	6	SW 6	2					C 6	10 OR 12
7A	7	SW 7	2					C 7	10 OR 12
8A	8	SW 8	2					C 8	10 OR 12
9A	9	SW 9	2					C 9	10 OR 12
10A	10	SW 0	2					C 0	10 OR 12
11A	11	C OR R (1)	2						
12A	12	C OR R (2)	2	C 2	3,5,6,8,10 OR 12	R 2			
13A	13	C OR R (3)	2	C 3	3,5,6,8,10 OR 12	R 3			
14A	14	C OR R (4)	2	C 4	3,5,6,8,10 OR 12	R 4			
15A	15	C OR R (5)	2	C 5	3,5,6,8,10 OR 12	R 5			
16A	16	C OR R (6)	2	C 6	3,5,6,8,10 OR 12	R 6			
17A	17	C OR R (7)	2	C 7	3,5,6,8,10 OR 12	R 7			
18A	18	C OR R (8)	2	C 8	3,5,6,8,10 OR 12	R 8			
19A	19	C OR R (9)	2	C 9	3,5,6,8,10 OR 12	R 9			
20A	20	C OR R (0)	2	C 0	3,5,6,8,10 OR 12	R 0			

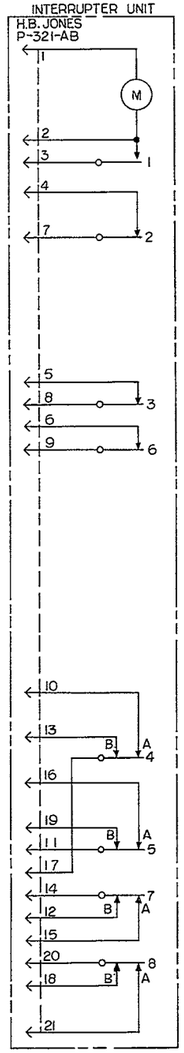
TO AUD SIG ASSOC WITH TEL SET

FIG.19
S-C 207C K.T.U.
S-428029 | SH.12 | ISS.NO.5

FIG. 23
ELECTRO-MECHANICAL FLASH, WINK, RING & TIMEOUT CIRCUIT

NOTE: FOR NOTES SEE SN-428029.





TIMING CHART FOR INTERRUPTER UNIT

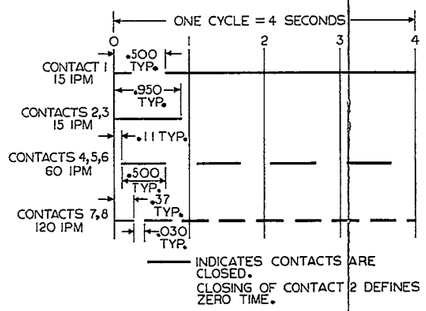


FIG. 23
S-C 2328 K.T.U.
S-428029 | SH. 13 | ISS. NO. 4

NOTE:
FOR NOTES SEE SN-428029

FIG. 28
MULTI-SIGNAL CONTROL CIRCUIT
FOR RINGERS
SEE NOTE 107

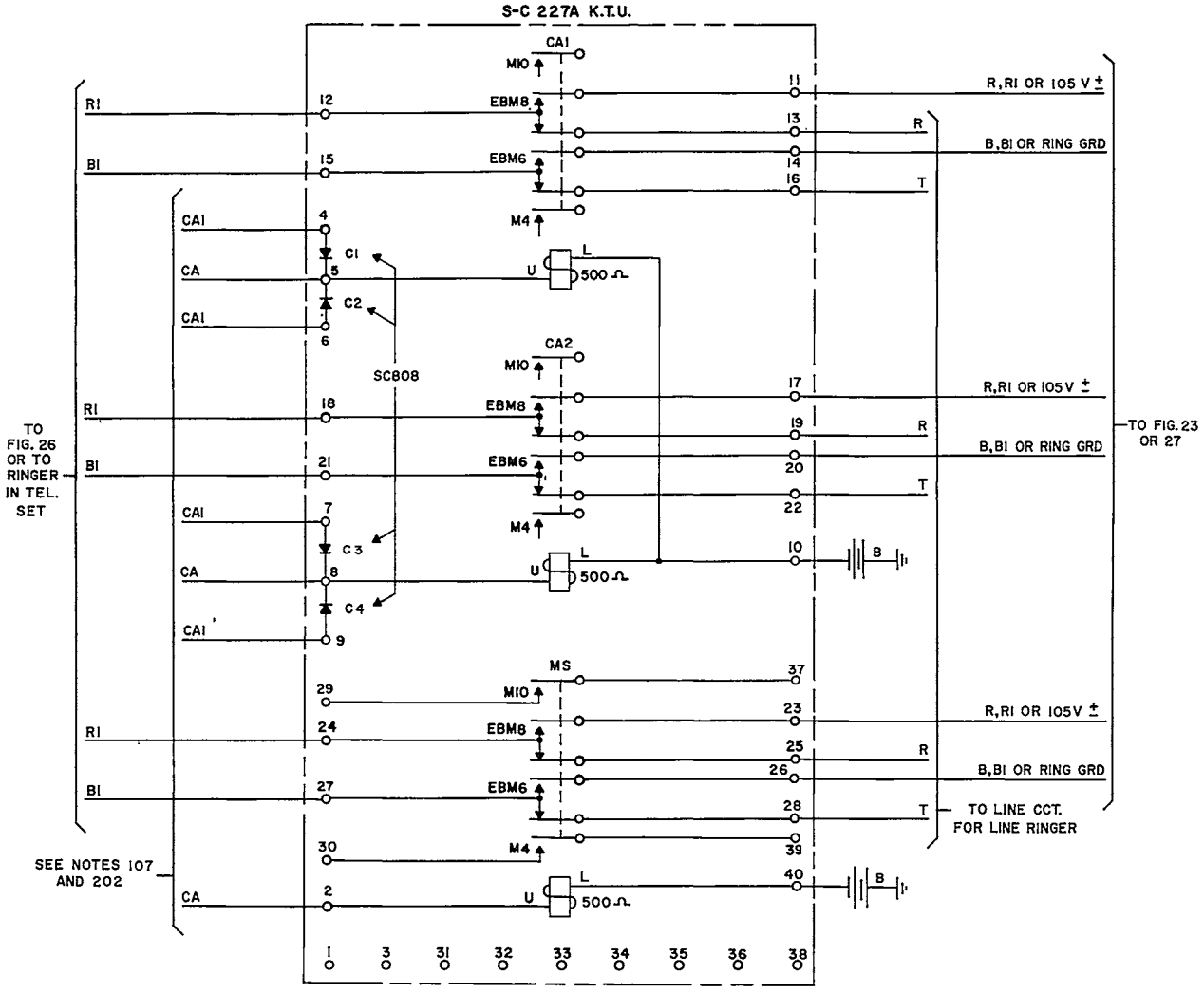


FIG. 28
S-C 227A K.T.U.

S-428029	SH. 14	ISS. NO. 4

NOTE:
FOR NOTES SEE SN-428029

FIG. 29
MULTI-SIGNAL CONTROL CIRCUIT
FOR BUZZERS, BELLS OR RINGERS
SEE NOTES 107 AND 202

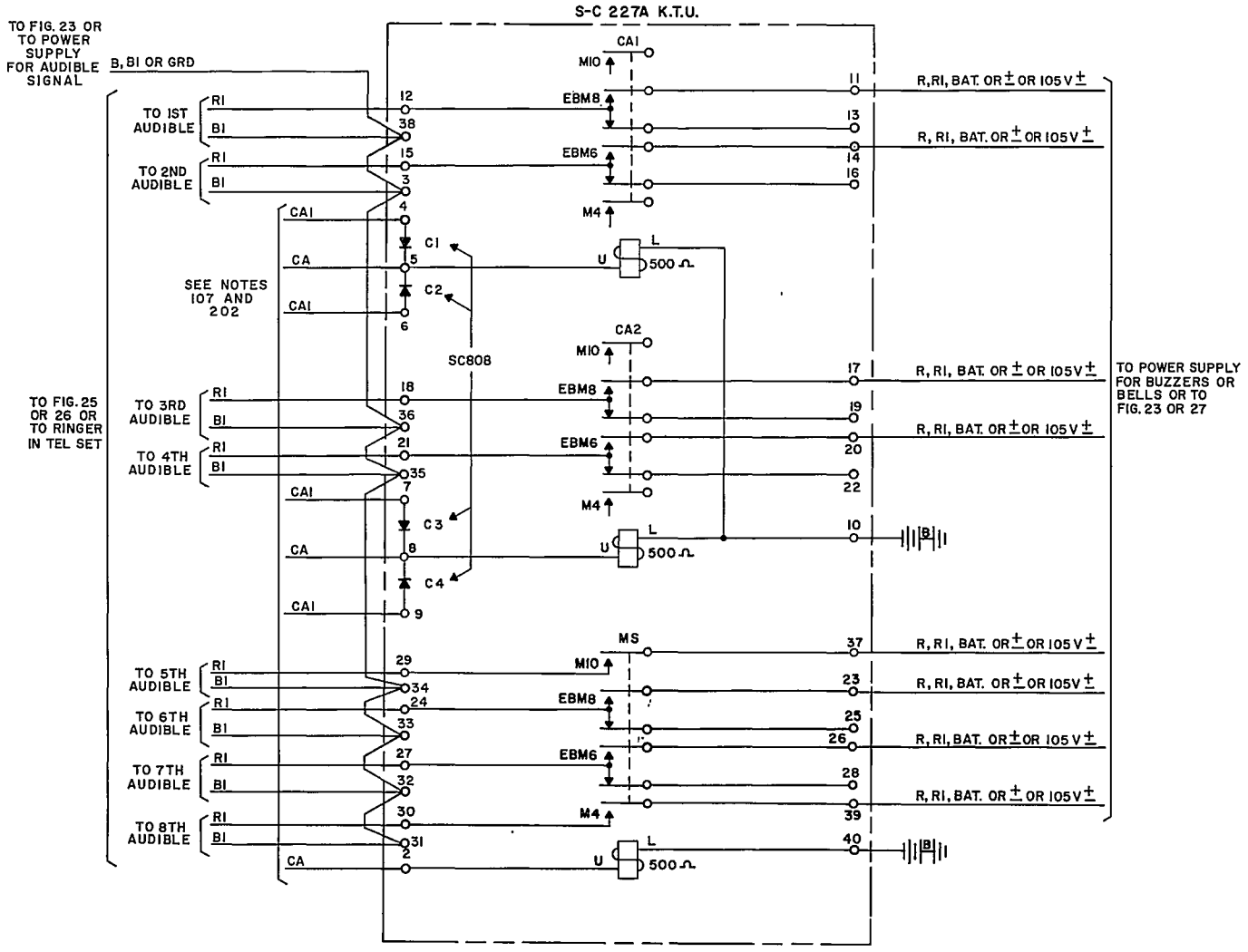


FIG. 29
S-C 227A K.T.U.

S-428029	SH. 15	ISS. NO. 4

NOTE:
FOR NOTES SEE SN-428029

FIG. 30
MULTI-CONTROL CIRCUIT FOR RINGERS
ARRANGED FOR COMBINATION
OF AUDIBLE SIGNAL AND
VISUAL SIGNAL
SEE NOTES 107 AND 202
S-C 227A K.T.U.

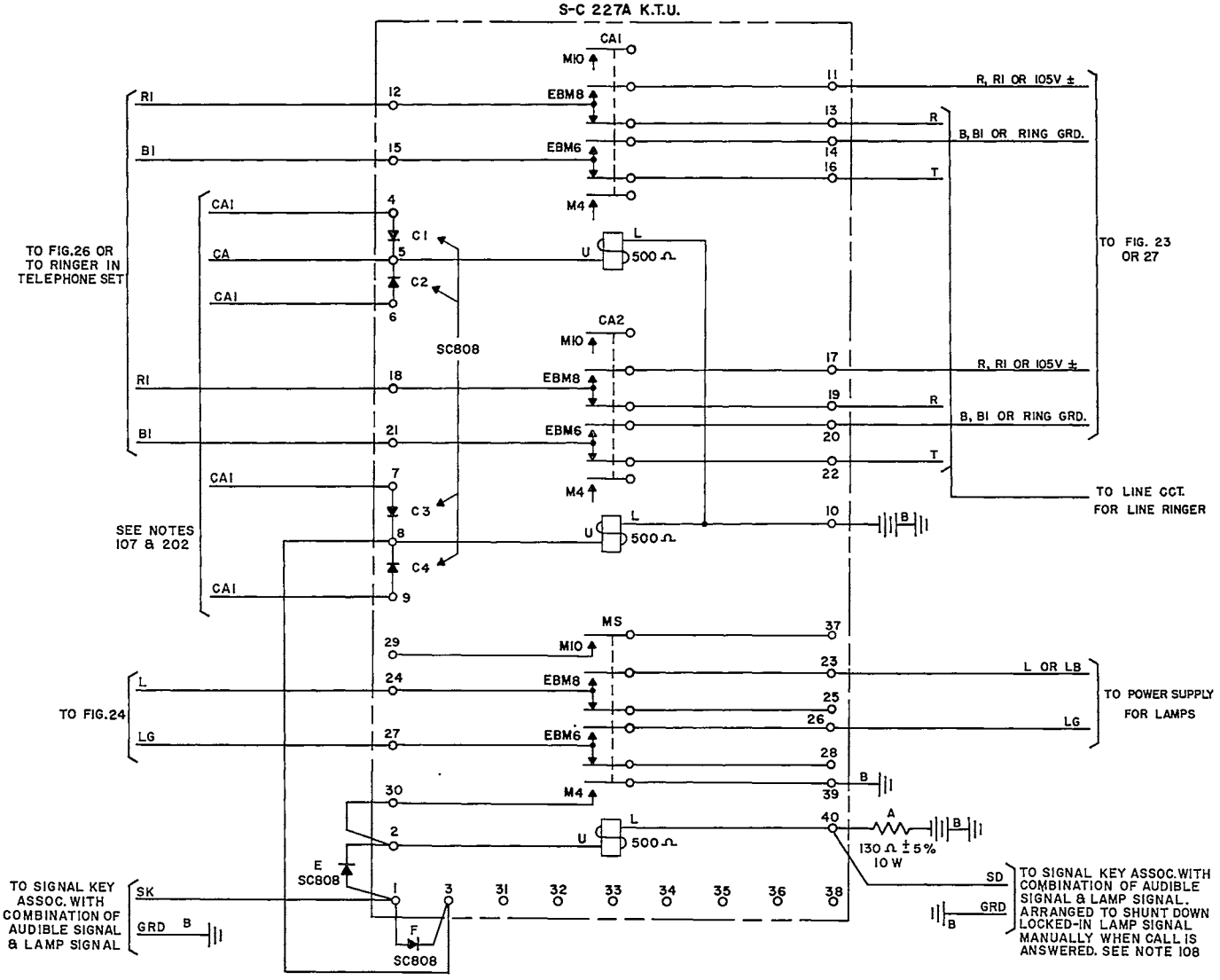


FIG. 30
S-C 227A K.T.U.

S-428029	SH. 16	ISS.NO. 4

FIG. 31
MULTI-CONTROL CIRCUIT
FOR BUZZERS OR BELLS ARRANGED
FOR COMBINATION OF AUDIBLE SIGNAL
WITH VISUAL SIGNAL
SEE NOTES 107 AND 202

NOTE:
FOR NOTES SEE SN-428029

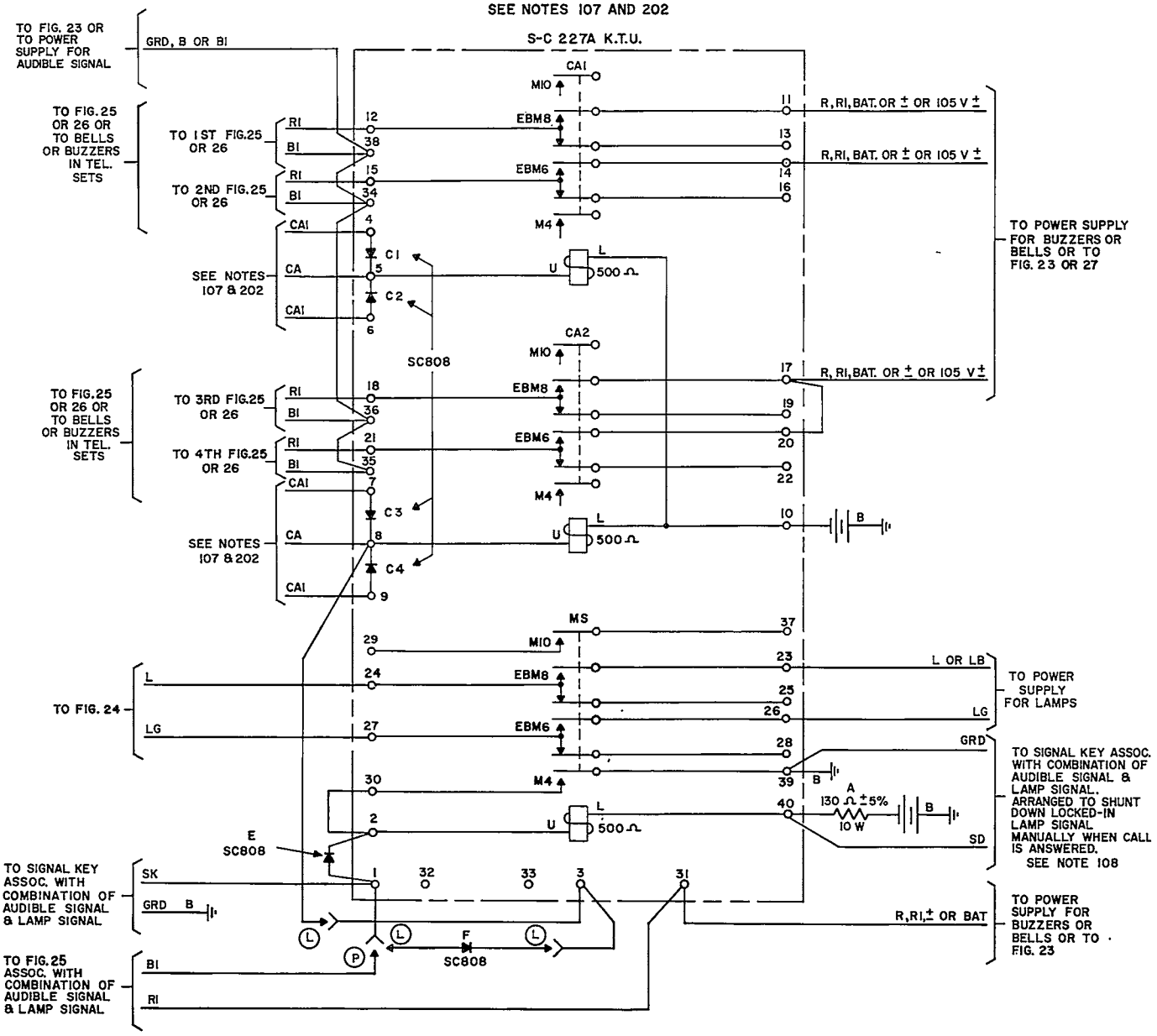


FIG. 31
S-C 227A K.T.U

S-428029	SH. 17	ISS. NO. 4

NOTE:
FOR NOTES SEE SN-428029

FIG. 32
COMMON AUDIBLE OR STATION
AUDIBLE CIRCUIT FOR S-C 1A2
KEY TELEPHONE SYSTEM
SEE NOTE 110

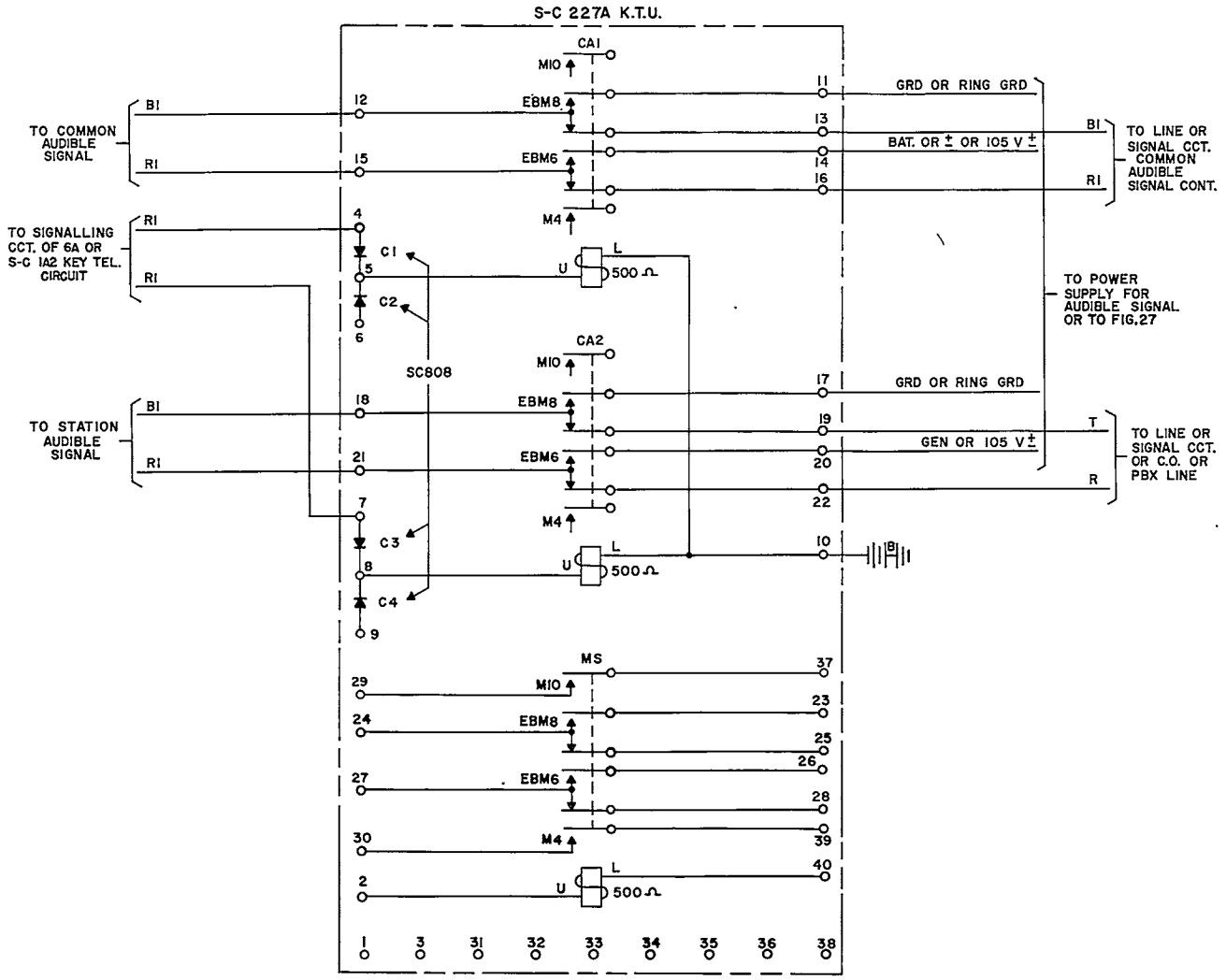


FIG. 32
S-C 227A K.T.U.

S-428029	SH.18	ISS.NO. 4

FIG. 33
AUXILIARY LAMP RELAY CIRCUIT
TO PROVIDE FOR MORE THAN
20 LAMPS PER LINE AND SIGNALING
CIRCUIT

NOTE:
FOR NOTES SEE SN-428029

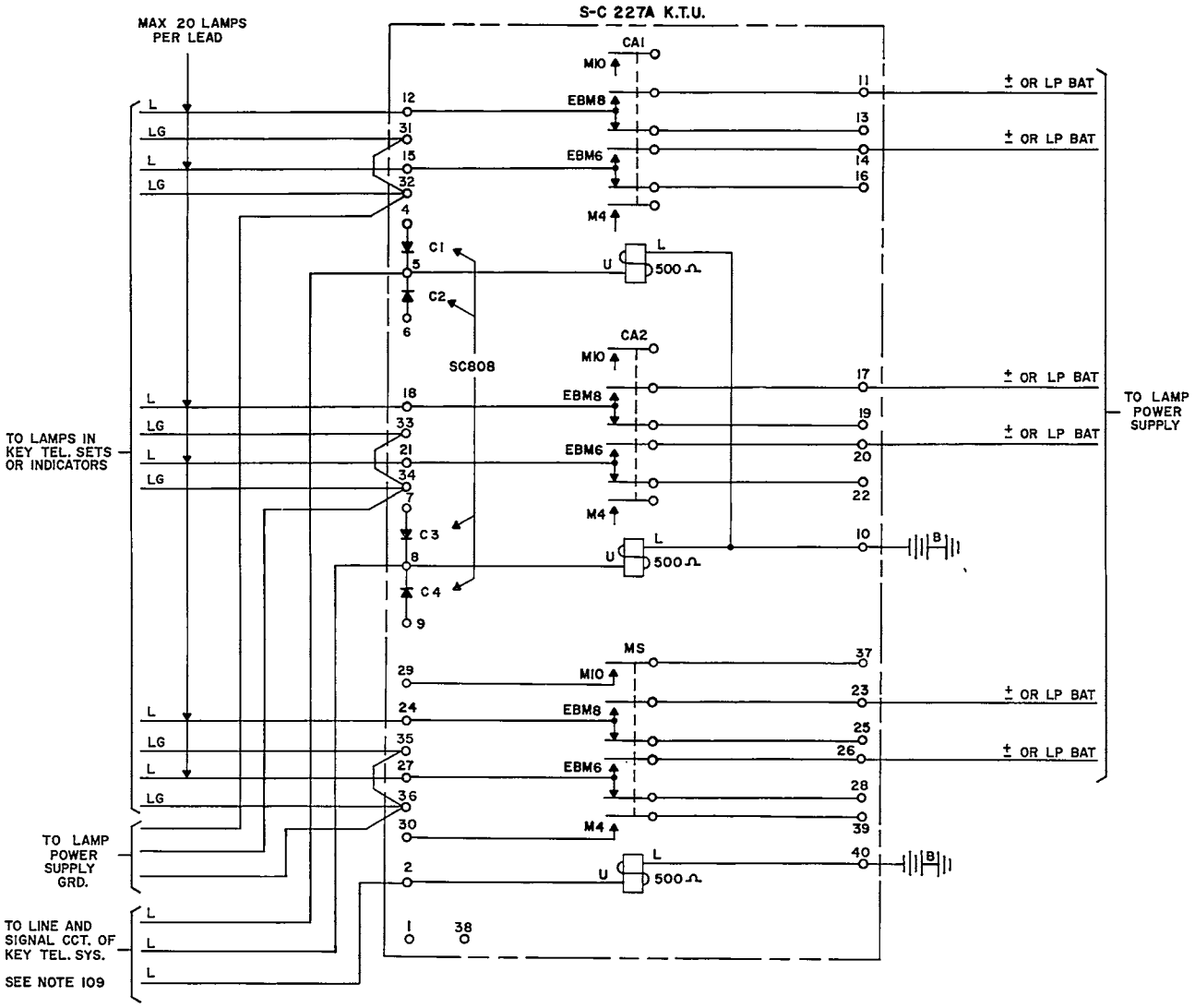


FIG. 33
S-C 227A K.T.U.

S-428029	SH. 19	ISS. NO. 4

NOTE :
FOR NOTES SEE SN-428029.

FIG. 10
PRESET CONFERENCE CCT.
S-C 217A K.T.U.

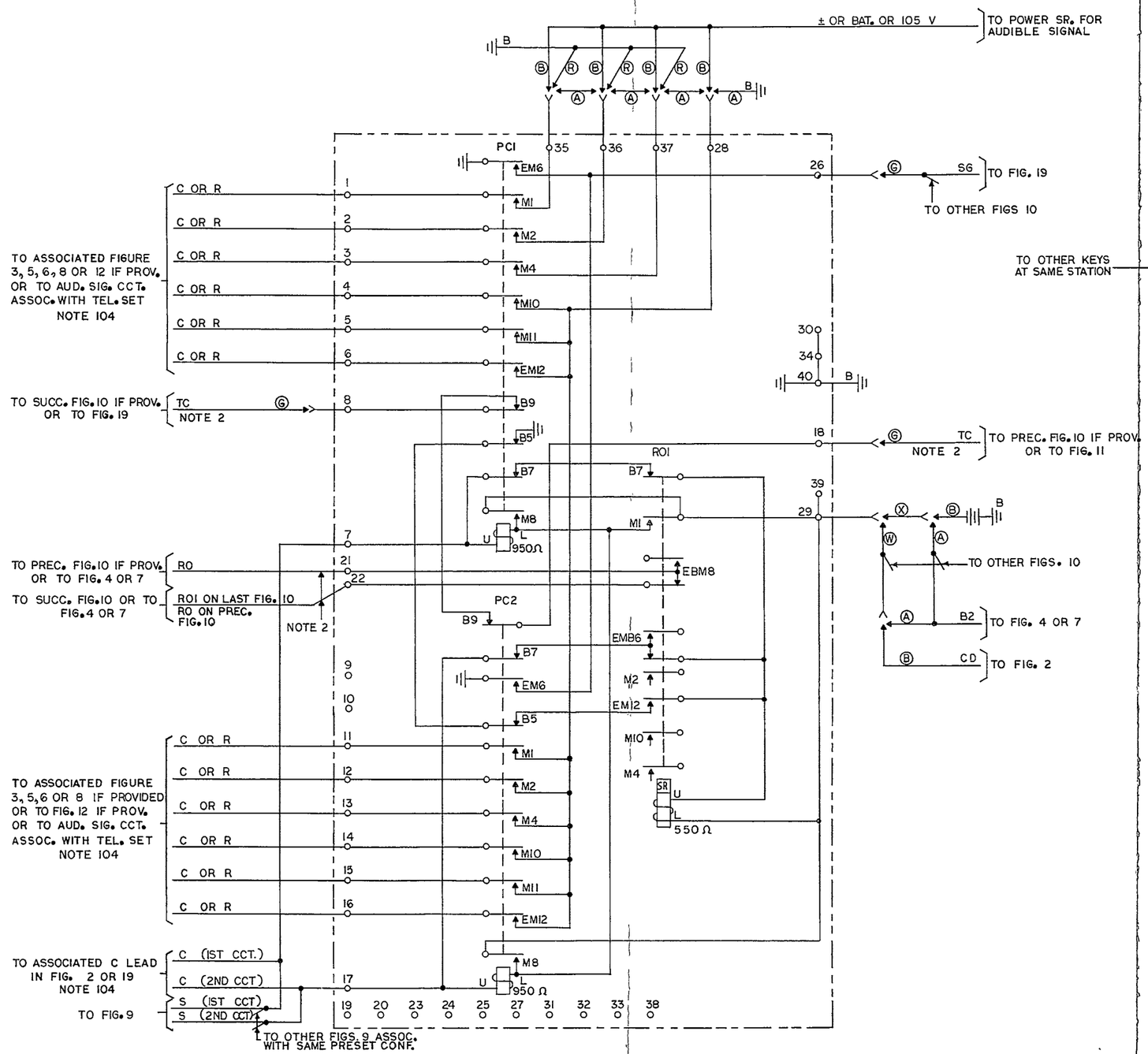


FIG. 9
SIGNAL KEY
NOTE 113

FIG. 9 SIGNAL KEY
FIG. 10 S-C 217A K.T.U.

S-428029 | SH. 20 | ISS. NO. 3

NOTE:
FOR NOTES SEE SN-428029.

FIG. 12

LONG LINE CIRCUIT
S-C 225A K.T.U.

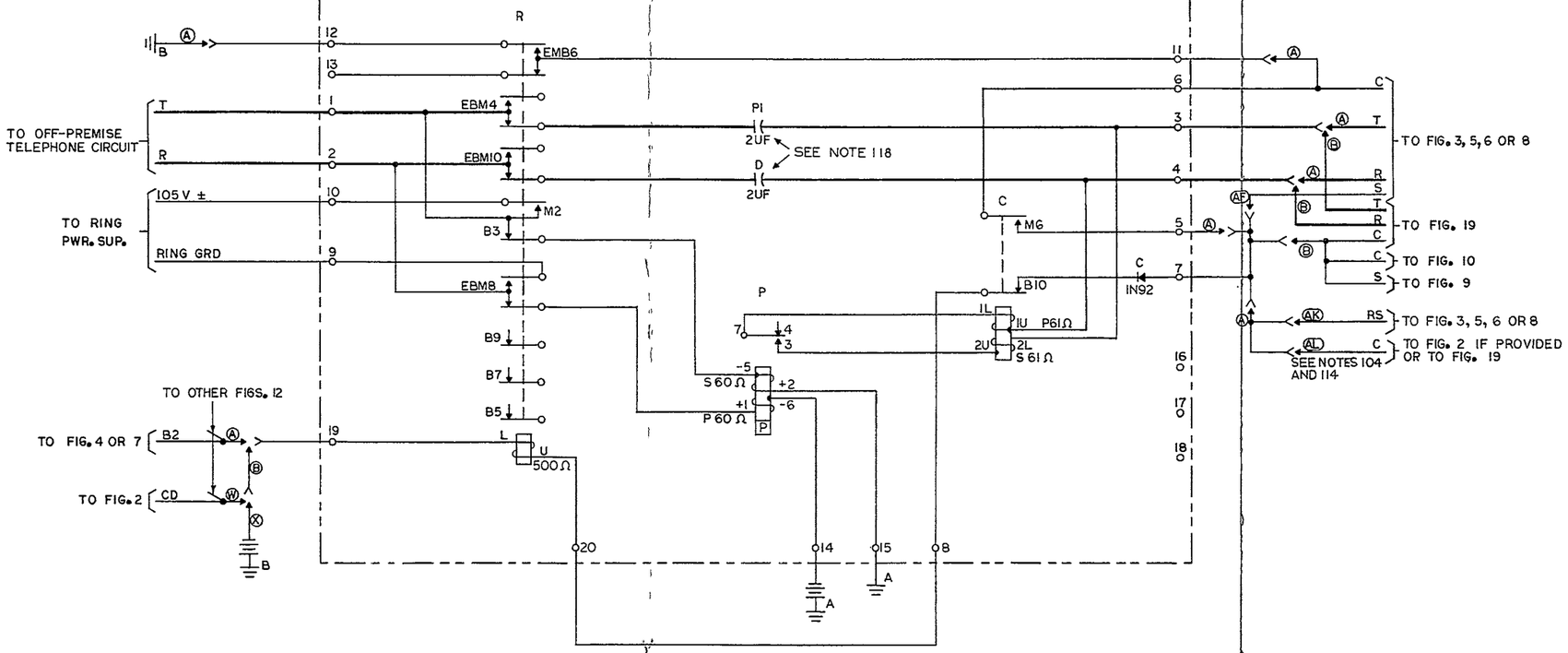


FIG. 12
S-C 225A K.T.U.
S-428029 | SH. 21 | ISS. NO. 3

NOTE: FOR NOTES SEE SN - 428029.

FIG. 13
ADD-ON CONFERENCE CONTROL CIRCUIT

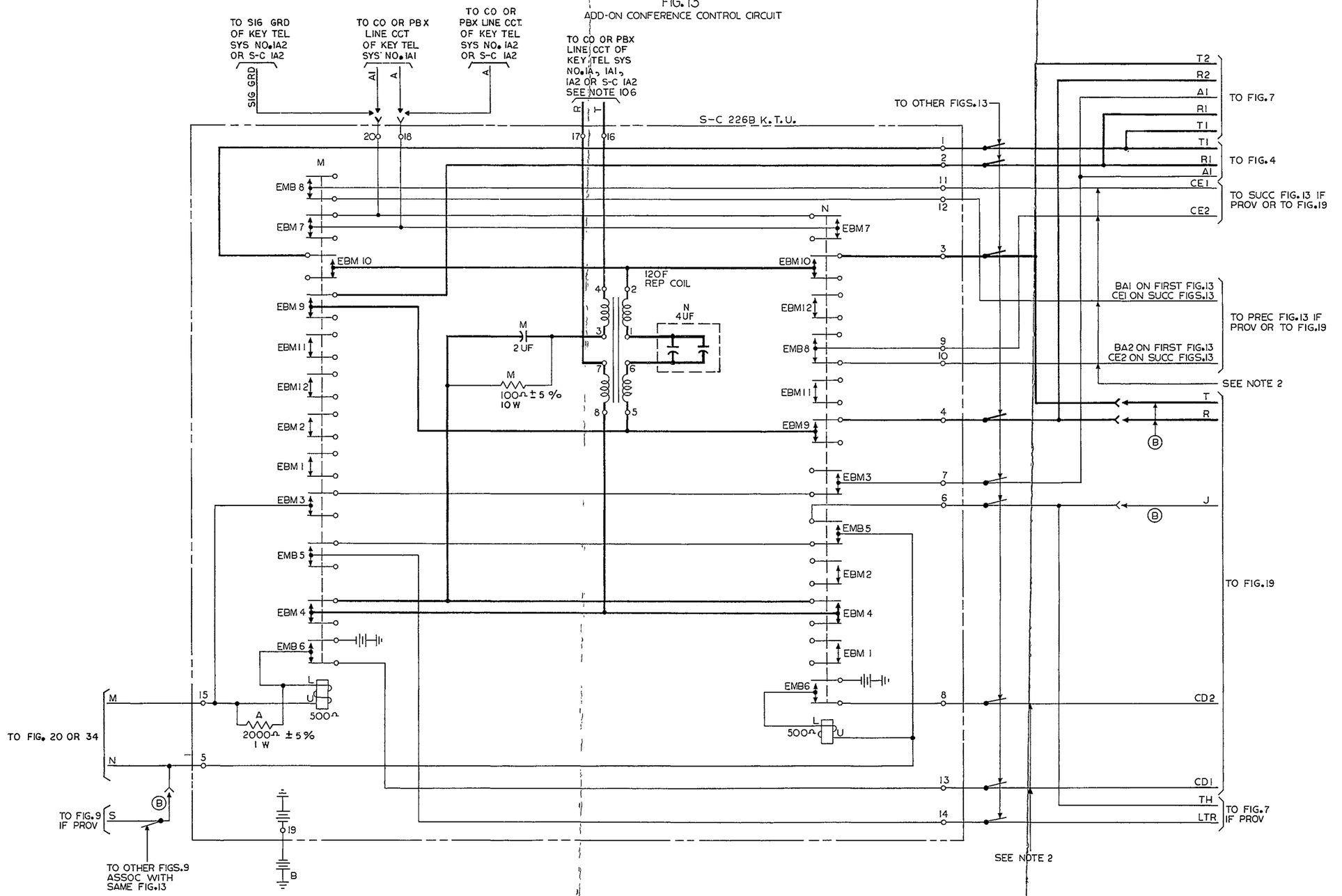


FIG. 13
S-C 226B K.T.U.
S-428029 | SH. 22 | ISS. NO. 3

FIG. 20

SINGLE ADD-ON TRANSFER CIRCUIT
NOTE 112
S-C 227A K.T.U.

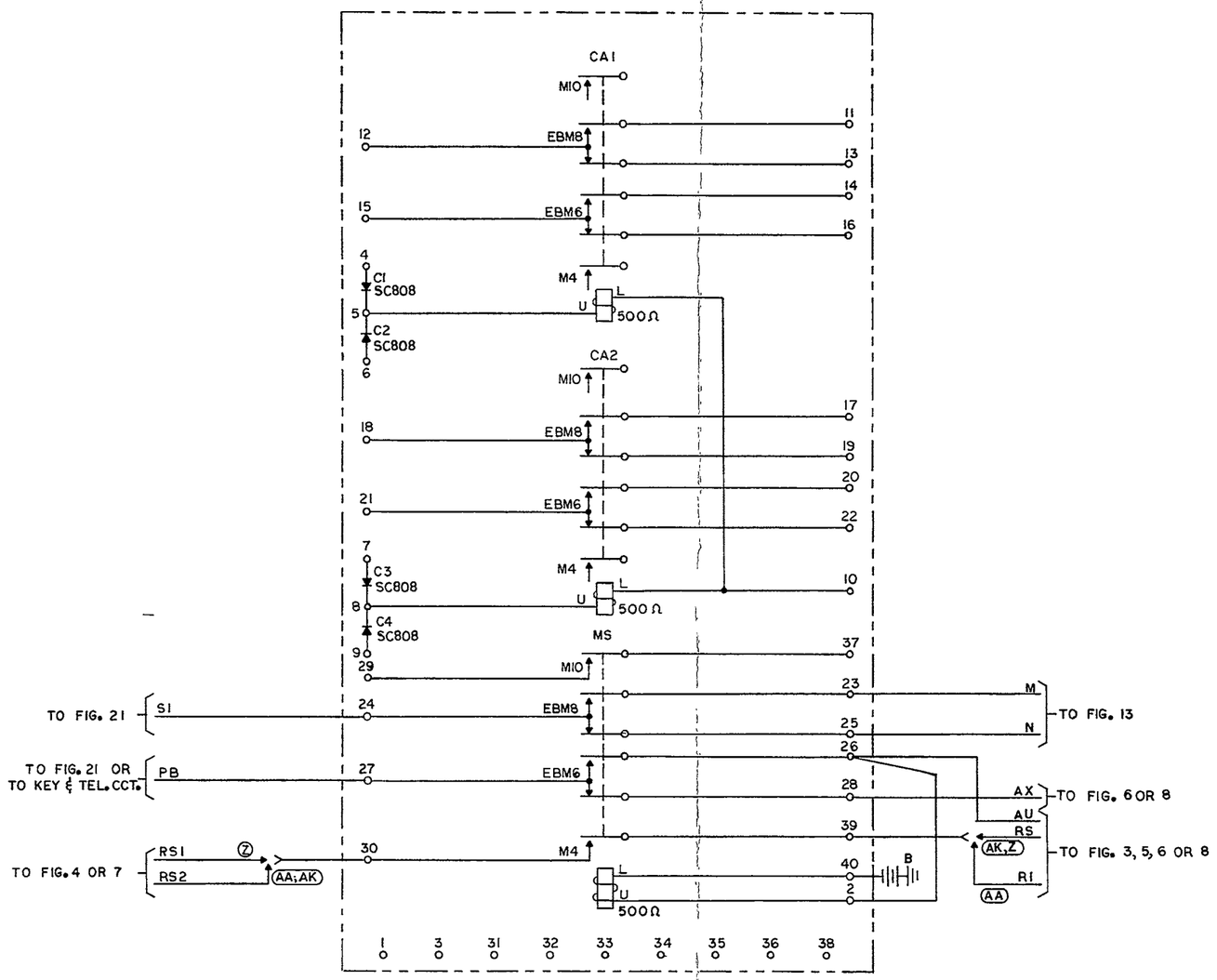
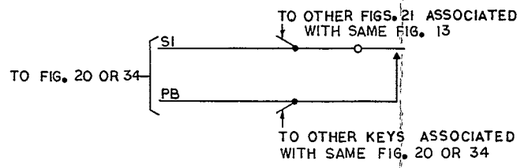


FIG. 21
ADD-ON KEY



NOTE:
FOR NOTES SEE SN-428029.

FIG. 20 S-C 227A K.T.U.
FIG. 21 ADD-ON KEY
S-428029 | SH. 23 | ISS. NO. 2

NOTE: FOR NOTES SEE SN-428029.

FIG.24
LAMP CIRCUIT
FOR LAMPS IN INDICATORS

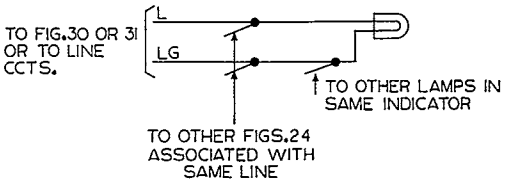


FIG.25
BUZZER CIRCUIT
COMMON AUDIBLE CODE
OR SELECTIVE SIGNALING

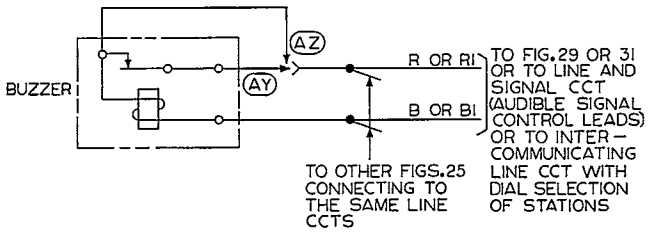


FIG.26
RINGER CIRCUIT
LINE RINGER OR COMMON RINGER

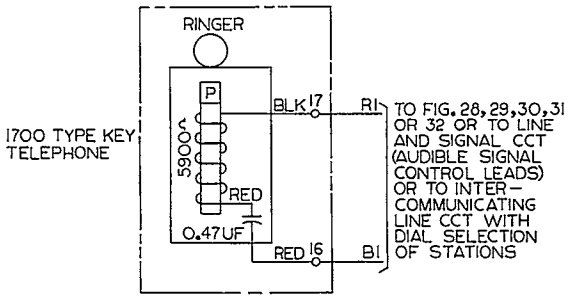


FIG.27
RINGING LAMP CIRCUIT
USING KEY TELEPHONE UNIT

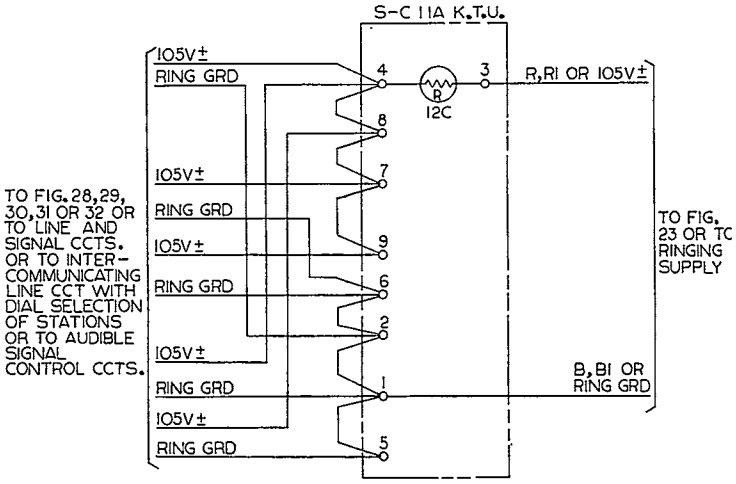


FIG.24	LAMP CIRCUIT
FIG.25	BUZZER CIRCUIT
FIG.26	RINGER CIRCUIT
FIG.27	S-C 11A K.T.U.

S-428029 | SH.24 | ISS.NO.1

NOTE: FOR NOTES SEE SN-428029.

FIG.34
MULTIPLE ADD-ON TRANSFER CIRCUIT
SEE NOTE 112
S-C 229B K.T.U.

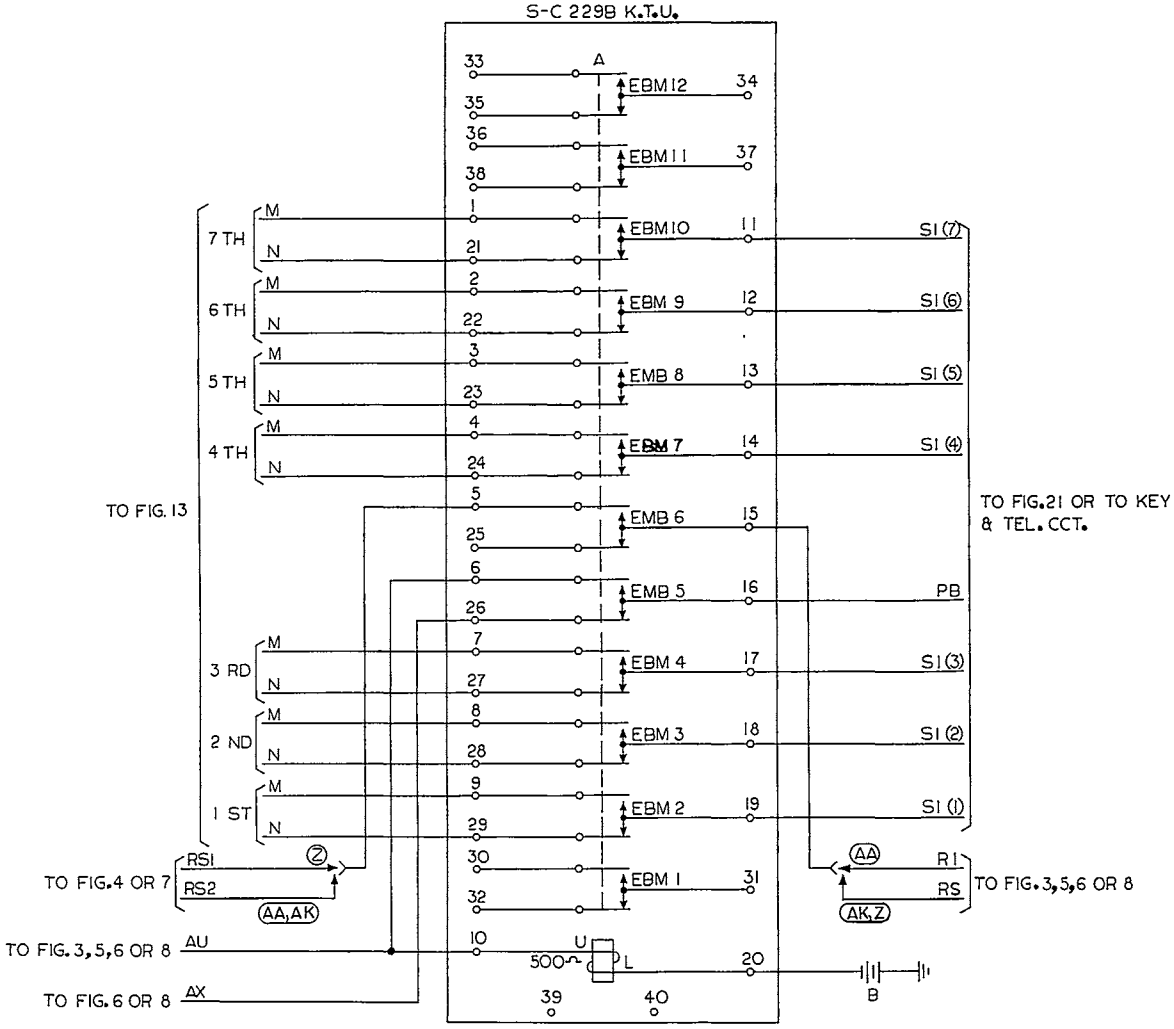
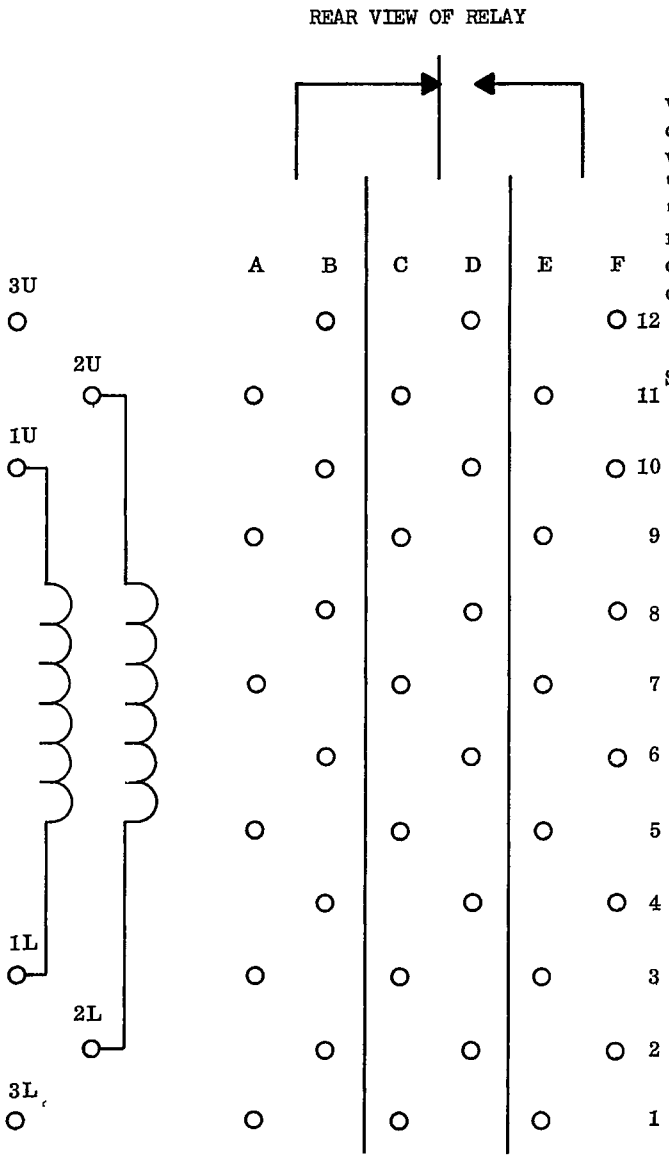
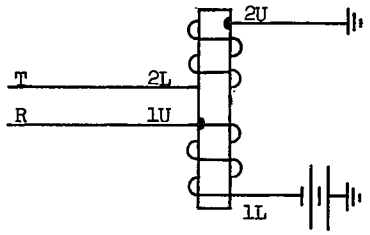


FIG.34
S-C 229B K.T.U.
S-428029 | SH.25 | ISS.NO.3



Those groups of contact pairs which make (or break) last are called "ordinary" contacts, those which make (or break) prior to "ordinary" contacts are called "early" contacts and those which make (or break) prior to "early" contacts are called "preliminary" contacts.

SPRING COMBINATION	CODE DESCRIPTION
M ----------	Make contact
B ----------	Break contact
BM ----------	Change-over contact which does not guarantee sequence
EM ----------	Early make contact
EB ----------	Early break contact
EMB ----------	Early make and late break contact
EBM ----------	Early break and late make contact
PM ----------	Preliminary make contact
PB ----------	Preliminary break contact
PMEB ----------	Preliminary make & early break contact
PBEM ---------	Preliminary break & early make contact



NOTE: When the relay has two windings, they must be connected in series aiding as shown above.

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Figure 32. Wire Spring Relay Numbering Scheme.

FIG. 19
S-C 207C KTU

SELECTOR CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
2A	SW OR C (2)	216A-33 FOR W OPTION WHEN USED AS SW LEADS (NOTE 1) OR 217A-7 FOR 1ST PRESET CONF CCT 217A-17 FOR 2ND PRESET CONF CCT FOR X OPTION OR 225A-7 FOR LONG-LINE CCT (NOTE 3)
3A	SW OR C (3)	
4A	SW OR C (4)	
5A	SW OR C (5)	
6A	SW OR C (6)	
7A	SW OR C (7)	
8A	SW OR C (8)	
9A	SW OR C (9)	
10A	SW OR C (0)	
11A	R	FIRST 216A-1 FOR W OPTION
12A	R	FIRST 216A-(2 THRU 10) WHEN USED AS R LEADS FOR W OPTION OR STATION AUDIBLE SIGNAL CIRCUIT WHEN USED AS R LEADS FOR X OPTION
13A	R	
14A	R	
15A	R	
16A	R	
17A	R	
18A	R	
19A	R	
20A	R	
1B,11B 21B	T	ALL ON-PREMISE TEL SETS; 225A-3; 226B-3
2B,12B 22B	R	ALL ON-PREMISE TEL SETS; 225A-4; 226B-4
3B	L	LAMP (SEE NOTE 2)
5B	J	FIRST 216A-36 FOR W OPTION AND 226B-6
9B		"A" BATTERY
10B		"A" GROUND
13B	L L2	LAMP FOR H OPTION 227A-2 FOR H OPTION (SEE NOTE 2)
15B	RL	FIRST 216A-31 FOR W OPTION
16B	ON	FIRST 216A-32 FOR W OPTION
17B	W1 STRAP	LAST 216A-34 FOR W OPTION OR 207C-18B FOR X OPTION
18B	W STRAP	FIRST 216A-35 FOR W OPTION OR 207C-17B FOR X OPTION
19B		"B" BATTERY
20B		"B" GROUND
23B	CO	KTS 1A OR 1A1 LINE AND SIGNAL CIRCUIT (AUTO. BAT. CUTOFF OR TIME-OUT CIRCUIT) OR 232B-37
26B		"B" GROUND
27B		LAMP SUPPLY FOR H OPTION OR "B" GROUND FOR H OPTION
28B		"B" GROUND
29B		LAMP SUPPLY
39B		AUD SIG POWER SUPPLY
4B,14B	LG	LAMP GRD H OPTION
24B,34B	LG	LAMP GRD FROM POWER SUPPLY
36B,37B	B1	B1 LEAD FROM AUD SIG
38B,40B		POWER SUPPLY GRD FOR AUD SIG

FIG. 2
S-C 216A KTU

TRANSFER CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
1	R	207C-11A OR PREC 216A-11
2	R	207C-12A OR PREC 216A-12
3	R	207C-13A OR PREC 216A-13
4	R	207C-14A OR PREC 216A-14
5	R	207C-15A OR PREC 216A-15
6	R	207C-16A OR PREC 216A-16
7	R	207C-17A OR PREC 216A-17
8	R	207C-18A OR PREC 216A-18
9	R	207C-19A OR PREC 216A-19
10	R	207C-20A OR PREC 216A-20
11	R	SUCC 216A-1
12	R	SUCC 216A-2
13	R	SUCC 216A-3
14	R	SUCC 216A-4
15	R	SUCC 216A-5
16	R	SUCC 216A-6
17	R	SUCC 216A-7
18	R	SUCC 216A-8
19	R	SUCC 216A-9
20	R	SUCC 216A-10
21	R	STATION AUDIBLE SIGNAL CIRCUIT
22	R	
23	R	
24	R	
25	R	
26	R	
27	R	
28	R	
29	R	
30	R	
31	RL STRAP	207C-15B SUCC 216A-31
32	ON STRAP	207C-16B SUCC 216A-32
33	SW (2-0)	207C-(2A-10A) (SEE NOTE 1)
34	W OR W1	SUCC 216A-35 (W LEAD) OR 207C-17B IF FROM LAST 216A (W1 LEAD)
35	W	PREC 216A-34 OR 207C-18B IF FROM FIRST 216A
36	J STRAP	207C-5B OTHER 216A-36
37	CD CD STRAP STRAP	225A-19 FOR W OPTION 217A-29 FOR W OPTION OTHER 216A-37 ON LAST 216A STRAP TO 38
38	CE	SUCC 216A-40 & ON LAST 216A STRAP TO 37
39		"B" BATTERY
40	BA OR CE	"B" BATTERY ON 1ST 216A (BA LEAD) OR PREC 216A-38 (CE LEAD)

FIG. 10
S-C 217A KTU

PRESET CONFERENCE CIRCUIT			
T S PCHG	LEAD DESIGNATION	TO	
1	C OR R	AUDIBLE SIGNAL CIRCUIT OR 225A-7 FOR R OPTION	1ST CCT
2	C OR R	AUDIBLE SIGNAL CIRCUIT OR 225A-7 FOR R OPTION	
3	C OR R	AUDIBLE SIGNAL CIRCUIT OR 225A-7 FOR R OPTION	
4	R	AUDIBLE SIGNAL CIRCUIT	
5	R		
6	R		
7	C S	207C SELECTED C LEAD SIGNAL KEY	
11	R	AUDIBLE SIGNAL CIRCUIT	2ND CCT
12	R		
13	R		
14	R		
15	R		
16	R		
17	C S	207C SELECTED C LEAD SIGNAL KEY	
28		AUD SIG POWER SUPPLY	
29	CD STRAP	"B" BATTERY FOR X OPTION 216A-37 FOR W OPTION OTHER 217A-29	
35		"B" GROUND FOR R OPTION OR AUD SIG POWER SUPPLY	
36			
37			
30,38 &0		"B" GROUND	

FIG. 13
S-C 226B KTU

ADD-ON CONFERENCE CONTROL CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
3	T STRAP	207C-1B OTHER 226B-3
4	R STRAP	207C-2B OTHER 226B-4
5	S	ALL SIGNALING KEYS ASSOCIATED WITH THE SAME 226B
6	J STRAP	207C-5B OTHER 226B-6
8	CD2	SUCC 226B-8 AND ON LAST 226B STRAP TO 9
9	CE2	SUCC 226B-10 OR ON LAST 226B STRAP TO 8
10	BA2 CE2	"B" BATTERY ON 1ST 226B OR PREC 226B-9
16	T	CO OR PBX LINE CCT OF KTS 1A, 1A1, 1A2 OR S-C 1A2
17	R	
18	A	CO OR PBX LINE CCT OF KTS 1A1, 1A2 S-C 1A2
19		"B" BATTERY
20	A1 SIG GRD	CO OR PBX LINE CCT OF KTS 1A1 (A1 LEAD) OR SIG GRD OF KTS 1A2 OR S-C 1A2 (SIG GRD LEAD)

FIG. 12
S-C 225A KTU

LONG-LINE CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
1	T	TO OFF-PREMISE TEL CCT
2	R	TO OFF-PREMISE TEL CCT
3	T	207C-1B
4	R	207C-2B
7	C C S	217A-1,2, OR 3 FOR R OPTION 207C SELECTED C LEAD (NOTE 3) SIGNALING KEY
8	STRAP	225A-20
9		RINGING POWER SUPPLY GROUND
10		RINGING POWER SUPPLY
14		"A" BATTERY
15		"A" GROUND
19	"B" BATTERY FOR X OPTION OR CD 216A-37 FOR W OPTION AND STRAP OTHER 225A-19	
20	STRAP	225A-8

FIG. 16
PART OF S-C 227A KTU

AUX RELAY - BUSY LAMP CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
2	L2 STRAP	207C-13B OTHER 227A-2
23	L	LAMP
24	LB	LAMP SUPPLY
26	L	LAMP
27	LB	LAMP SUPPLY
29	LB	LAMP SUPPLY
30	LB	LAMP SUPPLY
36	LG	LAMP GRD LAMP GRD FROM POWER SUPPLY
37	L	LAMP
39	L	LAMP
40		"B" BATTERY

WIRING OPTIONS

WIRING	OPTION
B	USED WITH SELECTOR - ONLY ARR.
X	MAX NINE CODES
W	OVER NINE CODES
K	SYSTEM WITH PRESET CONF
J	SYSTEM WITHOUT PRESET CONF
H	WITHOUT AUX RELAY BUSY LP CCT.
M	WITH AUX RELAY BUSY LP CCT
R	LONG LINE CCT ASSOCIATED WITH PRESET CONF

NOTE 1: SW leads are required only when W option, over nine codes, is used. The SW leads, 2 through 0, are connected to the required number of S-C 227A KTU, one lead per unit, The remaining SW leads may be used as C leads to operate preset conference circuits or long-line circuits. Leads not used in the above operations are left vacant. Any digit, other than 1, may be assigned as the initial digit of a 2-digit code. The number so assigned cannot be used as a station code.

NOTE 2: When more than 40 lamps are required for the system, provide the needed contacts through a common slave relay of the S-C 227A KTU. No more than 20 lamps should be served over one lamp lead.

NOTE 3: The operate paths to the preset conference circuit, C leads, and to the long-line circuit, C leads, must connect through the first bank of the selector when the selector only arrangement is used. Maximum of three off-premise stations may be included in preset conference groups when selector only arrangement is used by connecting a ground signal on punchings 35, 36 and 37 of the S-C 217A KTU.

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CONNECTION CHART
SELECTOR-ONLY ARRANGEMENT

CC-428029-100 | ISSUE NO. 1

FIG. 19
S-C 207C KTU

SELECTOR CIRCUIT			
TS PCHG	LEAD DESIGNATION	TO	
2A	SW2	W OPT 216A-33 (NOTES 1 AND 3)	
3A	SW3		
4A	SW4		
5A	SW5		
6A	SW6		
7A	SW7		
8A	SW8		
9A	SW9		
10A	SW0		
11A	C	W OPT 1ST 216A-1	OR X OPTION 214B-F OR 217A-7 FOR 1ST PRESET CONF CCT 217A-17 FOR 2ND PRESET CONF CCT OR 225A-7 FOR LONG-LINE CCT
12A	C	W OPT 1ST 216A-2	
13A	C	W OPT 1ST 216A-3	
14A	C	W OPT 1ST 216A-4	
15A	C	W OPT 1ST 216A-5	
16A	C	W OPT 1ST 216A-6	
17A	C	W OPT 1ST 216A-7	
18A	C	W OPT 1ST 216A-8	
19A	C	W OPT 1ST 216A-9	
20A	C	W OPT 1ST 216A-10	
19,11B	BZ	G OPT 228A-7	
21B	Y	214B-31C	
	DY	AJ OPT 227A-25	
20,12B	R	214B-32C	
22B			
5B	J	G OPT 214B-8C	
	J	N OPT 214B-8A	
	J	W OPT 1ST 216A-36	
	J	G OPT 228A-10	
7B	BY1	G OPT 214B-19B	
8B	TC	G OPT 228A-21 OR	
	TC	G & K OPT LAST 217A-B	
9B		*A* BATTERY	
10B		*A* GROUND	
15B	RL	W OPT 1ST 216A-31	
16B	OR	W OPT 1ST 216A-32	
17B	W1	W OPT LAST 216A-34	
	STRAP	X OPT 207C-16B	
18B	V	W OPT 1ST 216A-35	
	STRAP	X OPT 207C-17B	
19B		*B* BATTERY	
20B		*B* GROUND	
23B	ST	AJ OPT 227A-39	
25B	LK	AJ OPT 227A-2	
26B		*B* GROUND	
33B	RO3	AK OPT 227A-20	
39B	SG	G OPT 228A-1 &	
	SG	G & K OPT 1ST 217A-26	
		M OPT *B* GROUND	

FIG. 2
S-C 216A KTU

TRANSFER CIRCUIT			
TS PCHG	LEAD DESIGNATION	TO	
1	C	207C-11A OR PREC 216A-11	
2	C	207C-12A OR PREC 216A-12	
3	C	207C-13A OR PREC 216A-13	
4	C	207C-14A OR PREC 216A-14	
5	C	207C-15A OR PREC 216A-15	
6	C	207C-16A OR PREC 216A-16	
7	C	207C-17A OR PREC 216A-17	
8	C	207C-18A OR PREC 216A-18	
9	C	207C-19A OR PREC 216A-19	
10	C	207C-20A OR PREC 216A-20	
11	C	SUCC 216A-1	
12	C	SUCC 216A-2	OR 214B-F OR 217A-7 FOR 1ST PRESET CONF CCT 217A-17 FOR 2ND PRESET CONF CCT OR 225A-7 FOR LONG-LINE CCT
13	C	SUCC 216A-3	
14	C	SUCC 216A-4	
15	C	SUCC 216A-5	
16	C	SUCC 216A-6	
17	C	SUCC 216A-7	
18	C	SUCC 216A-8	
19	C	SUCC 216A-9	
20	C	SUCC 216A-10	
21	C		214B-F OR 215A-F OR 217A-7 FOR 1ST PRESET CONF CCT 217A-17 FOR 2ND PRESET CONF CCT OR 225A-7 FOR LONG-LINE CCT
22	C		
23	C		
24	C		
25	C		
26	C		
27	C		
28	C		
29	C		
30	C		
31	RL	207C-15B &	
	RL	SUCC 216A-31	
32	OR	207C-16B &	
	OR	ALL 216A-32	
33	SW(2-9)	207C-(2A-10A)	
34	W	SUCC 216A-35 OR	
	W1	207C-17B FROM LAST 216A-34	
35	W	PREC 216A-34 OR	
	W	207C-18B FROM 1ST 216A-35	
36	J	207C-5B &	
	J	ALL 216A-36	
37	CO	ALL 216A-37	
	STRAP	LAST 216A-38	
38	CE	SUCC 216A-40 OR	
	STRAP	LAST 216A-37	
39		*B* BATTERY	
40	BA	*B* BATTERY ON 1ST 216A KTU OR	
	CE	PREC 216A-38	

FIGS. 3&4
S-C 214B KTU

SINGLE-TALKING LINK AND NINE-STATION SIGNALING CIRCUITS			
TS PCHG	LEAD DESIGNATION	TO	
4A*	LG	LAMP PWR SUP GRD	
	LG	215A-R	
8A	J	N OPT 207C-5B	
	B1	G OPT 228A-9	
9A		LAMP SUP	
14A*	LG	LAMP	
18A	CO OR 1	KTS 1A, 1A1, AUTO, BAT. CUTOFF OR TIME-OUT CKT. OR 232B-37	
19A		Y OPT RING, PWR SUP	
20A		Y OPT RING, PWR SUP GRD	
28A	STRAP	S OPT LAMP BAT. SUP	
		V OPT 214B-39C	
29A		Z OPT AUD SIG PWR SUP	
30A	B2	217A-29	
	B2	225A-19	
38A		*B* BATTERY	
39A	RO	J & AK OPT 227A-17	
	RO	J & AL OPT 214B-40A	
	RO1	K OPT LAST 217A-22	
40A	RO	J & AL OPT 214B-39A	
	RO	K & AL OPT 1ST 217A-21	
	RO2	AK OR AL OPT 227A-7	
	STRAP	AL OPT 1ST 215A-40	
8B		M OPT *B* GROUND	
		K OPT LAMP SUP	
9B	L OR LF	19B-10	1A OR 1A1 KTS FLASH, CCT OR VIS & AUD SIG CCT (232B)
10B	Z OR A OR TO	19B-2	
18B	BY1	G OPT 228A-12	
19B	BY1	G OPT 207C-7B	
28B	RS2	AA OPT 227A-30 OR 229B-5	
	RS2	AA, AG & AK OPT 214B-H & ALL 215A-H	
29B		*A* BATTERY	
30B		*A* GROUND	
38B		AA & AK OPT AUD SIG PWR SUP	
39B		*B* BATTERY	
40B		*B* GROUND	
	STRAP	Q OPT 214B-D	
8C	J	G OPT 207C-5B	
9C	B	E OPT 214B-G &	
	STRAP	ALL 215A-G WITH SAME WIRING OPT	
10C	LU	224A-20	
20C	BA	F OPT 214B-G &	
	STRAP	ALL 215A-G WITH SAME WIRING OPT	
30C	RS1	Z & Q OPT 227A-30 OR 229B-5	
	RS1	Z & AG OPT 214B-H &	
	STRAP	ALL 215A-H WITH Z & AG OPT	
31C	T	207C-1B	
	T	1ST 215A-31	
32C	R	207C-2B	
	R	1ST 215A-32	
33C	Y1	1ST 226B-1	
	T1	1ST 215A-33	
34C	R1	1ST 226B-2	
	R1	1ST 215A-34	
35C	L1	H OPT 214B-P (NOTE 4) &	
	L1	ALL 215A-P WITH SAME WIRING OPT	

* 4A 10A 18A 24A 34A 4B 14B 24B 34B 4C

FIGS. 3&4
S-C 214B KTU (CONT)

SINGLE-TALKING LINK AND NINE-STATION SIGNALING CIRCUITS			
TS PCHG	LEAD DESIGNATION	TO	
36C	L1	H OPT 214B-P	
	L2	H OPT 227A-2 (NOTE	
	L1	ALL 215A-P WITH H OPT	
37C	LF1	S OPT 214B-R	
	LF1	ALL 215A-R WITH S OPT	
	LF2	V OPT 227A-2	
38C	H	1ST 215A-38	
39C	A1	1ST 226A-7	
	A1	1ST 215A-39	
	STRAP	V OPT 214B-28A	
40C	AT	227A-14	
9D		S OPT LAMP SUP	
		V OPT *B* GROUND	
	B OR LB	198-9 OR KTS 1A, 1A1 FLASH, CCT OR VIS & AUD SIG CCT (232B)	
AT	T	225A-3 OR KEY OR KEYLESS STA	
B†	R	225A-4 OR KEY OR KEYLESS STA	
CT	L	LAMP	
D†	RS	AG & AK OPT 225A-7	
	RS	Z & AG OPT STA AUD SIG	
	R1	AA & AG OPT COM AUD SIG	
	STRAP	Q OPT 214B-40D	
E†	B1	AA OPT COM AUD SIG	
	B1 OR RG	AA OR Z OPT AUD SIG SUP GRD	
	RG	ALL 215A-3 WITH SAME WIRING OPT-	
		Z OPT STA AUD SIG	
F†	C	X OPT 207C OR SELECTED C LEAD	
	C	W OPT 216A (NOTE 2)	
	C	217A	
	C	225A-6	
	S	AE OPT SIG KEY	
GT	B	E OPT 214B-9C	
	BA	F OPT 214B-20C	
HT	RS1	Z & AG OPT 214B-30C	
	RS2	AA, AG & AK OPT 214B-28B	
	AU	Q OPT 227A-26 OR 229B-6	
PT	L1	H OPT 214B-35C OR 36C	
	L1	H OPT 227A-23, 26, 37, OR 39	
RT	LF1	S OPT 214B-37C	
	LF1	V OPT 227A-23, 26,37, OR 39	

† SEE TABLE A

TABLE A

REFERENCE DESIGNATION	PUNCHING ON 214B KTU								
	CCT1	CCT 2	CCT3	CCT 4	CCT 5	CCT6	CCT 7	CCT 8	CCT 9
A	1A	11A	21A	31A	1B	11B	21B	31B	1C
B	2A	12A	22A	32A	2B	12B	22B	32B	2C
C	3A	13A	23A	33A	3B	13B	23B	33B	3C
D	5A	15A	25A	35A	5B	15B	25B	35B	5C
E (NOTE 5)	6A	16A	26A	36A	6B	16B	26B	36B	6C
F	7A	17A	27A	37A	7B	17B	27B	37B	7C
G (NOTE 5)	11C	12C	13C	14C	15C	16C	17C	18C	19C
H	21C	22C	23C	24C	25C	26C	27C	28C	29C
P (NOTE 5)	1D	2D	3D	1D	2D	3D	3D	2D	1D
R (NOTE 5)	4D	5D	6D	4D	5D	6D	6D	5D	4D

FIG. 5
S-C 215A KTU

THREE-STATION SIGNALING CIRCUIT			
TS PCHG	LEAD DESIGNATION	TO	
8*	LG	214B-4A &	
	LG	OTHER 215A-4	
9		*B* BATTERY	
1R*	LG	LAMP	
31	T	214B-31C &	
	T	OTHER 215A-31	
32	R	214B-32C &	
	R	OTHER 215A-32	
33	T1	214B-33C &	
	T1	OTHER 215A-33	
34	R1	214B-34C &	
	R1	OTHER 215A-34	
38	H	214B-38C &	
	H	OTHER 215A-38	
39	A1	214B-39C &	
	A1	OTHER 215A-39	
40	RO2	AK OR AL OPT 227A-7	
	RO	AL OPT 214B-40A	
	RO	OTHER 215A-40	
A†	T	KEY OR KEYLESS STA OF 225A-3	
B†	R	KEY OR KEYLESS STA OF 225A-4	
CT	L	LAMP	
DT	RS	AG & AK OPT 225A-7	
	RS	Z & AG OPT STA AUD SIG	
	R1	AA & AG OPT COM AUD SIG	
		Q OPT *B* GROUND	
ET	RG	Z OPT STA AUD SIG OR	
	B1	AA OPT COM AUD SIG	
	B1 OR RG	214B-E WITH SAME WIRING OPT	
FT	C	207C OR 216A	SELECTED C LEAD
	C	217A (NOTE 2)	
	C	225A-6 (NOTE 2)	
	S	AE OPT SIG KEY	
GT	B	E OPT 214B-9C	
	BA	F OPT 214B-20C	
	B OR BA	OTHER 215A-G WITH SAME WIRING OPT	
HT	AU	Q OPT 227A-26 OR 229B-6	
	RS2	AA AG & AK OPT 214B-28B	
	RS1	Z & AG OPT 214B-30C	
PT	L1	H OPT 214B-35C OR 36C	
	L1	H OPT 227A-23, 26, 37, OR 39	
RT	LF1	S OPT 214B-37C	
	LF1	V OPT 227A-23, 26, 37, OR 39	

* 4 14 24

† SEE TABLE B

TABLE B

REFERENCE DESIGNATION	PUNCHING ON 216A KTU		
	CCT 1	CCT2	CCT3
A	1	11	21
B	2	12	22
C	3	13	23
D	5	15	25
E (NOTE 5)	6	16	26
F	7	17	27
G (NOTE 5)	18	19	20
H	28	29	30
P		35	
R		37	

FIG. 10
S-C 217A KTU

PRESET CONFERENCE CIRCUIT			
TS PCHG	LEAD DESIGNATION	TO	
1	C		214B-F OR 215A-F
2	C		
3	C		
4	C		
5	C		
6	C		
7	C	X OPT 207C OR	SELECTED C LEAD (NOTE 2)
	C	W OPT 216A OR	
	S	SIG KEY	
8	TC	G OPT SUCC 217A-18	
	TC	G OPT FROM LAST 217A, 207C-8B	
11	C		214B-F OR 215A-F
12	C		
13	C		
14	C		
15	C		
16	C		
17	C	X OPT 207C OR	SELECTED C LEAD (NOTE 2)
	C	W OPT 216A OR	
	S	SIG KEY	
18	TC	G OPT FROM 1ST 217A, 224A-21 OR	
	TC	G OPT PREC 217A-B	
21	RO	PREC 217A-22	
	RO	AL OPT FROM 1ST 217A,214B-40A OR AK OPT	
	RO	FROM 1ST 217A, 227A-17	
22	RO	SUCC 217A-21	
	RO1	FROM LAST 217A, 214B-39A	
26	STRAP	G OPT OTHER 217A-26 &	
	SG	G OPT 207C-39B	
28		*B* GROUND	
29*	STRAP	OTHER 217A-29 &	
	B2	214B-30A	
35		*B* GROUND	
36		*B* GROUND	
37		*B* GROUND	
40*		*B* GROUND	

* 30 34 40 29 39

NOTE 1: Any digit, other than 1, may be assigned as the initial digit of a 2-digit code. The number used as the initial digit of the 2-digit code may not be used for a station code.

NOTE 2: The operate paths to the preset conference circuit, C leads, must connect through the second bank of the selector for single-link operation.

NOTE 3: Any three SW leads, 2 through 0, connect to a maximum of three 216A KTU (one lead per 216A unit). The remaining SW leads are left vacant.

NOTE 4: When more than 40 lamps are required for the system, provide the needed contacts by using a 227A KTU.

NOTE 5: Terminals are furnished cross-connected on the installer's side.

CONNECTION CHART
SINGLE-TALKING LINK ARRANGEMENT

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FIG. 11
S-C 224A KTU

BUSY SIGNAL AND CAMP-ON CONTROL CIRCUIT

TS PCHG	LEAD DESIGNATION	TO
1	SG	G OPT 207C-39B
2	GN	G OPT "B" GROUND
7	BZ	207C-21B
8	STRAP	224A-25
9	B1	G OPT 214B-8A
10	J	G OPT 207C-5B
11	STRAP	224A-31
12	BY1	G OPT 214B-18B
	STRAP	224A-19
13	STRAP	224A-15
14		"B" BATTERY
15	STRAP	224A-13
	STRAP	224A-17
17	STRAP	224A-15
19	STRAP	224A-12
20	LU	214B-10C
21	TC	G OPT 207C-8B OR
	TC	K OPT 1ST 217A-1B
22	Z OR	19B-2 OR KTS 1A, 1A1 FLASH. CCT OR
	A OR TO	VIS & AUD SIG CCT (232B-36)
23	STRAP	224A-34
24	BZ	19B-4 OR KTS 1A, 1A1 FLASH. CCT OR VIS & AUD SIG CCT (232B-32)
25	STRAP	224A-8
31	STRAP	224A-11
32		"B" BATTERY
33	AT	227A-35
34	ST	227A-27
	STRAP	229A-23
35	BZ1	19B-15 OR KTS 1A, 1A1 FLASH. CCT OR VIS & AUD SIG CCT (232B-31)
	DT	227A-24
39		"B" BATTERY
40		"B" GROUND

FIG. 12
S-C 225A KTU

LONG-LINE CIRCUIT

TS PCHG	LEAD DESIGNATION	TO
1	T	OFF-PREMISE KEY OR KEYLESS STA
2	R	
3	T	214B-A OR 215A-A
4	R	214B-B OR 215A-B
5	STRAP	225A-7
6	C	214B-FOR OR 215A-F
	STRAP	225A-11
7	C	AL & X OPT 207C OR SELECTED C LEAD (NOTE 2)
	C	AL & W OPT 216A
	RS	AK & Q OPT 227A-39 OR 229B-15
	RS	AK & AG OPT 214B-D OR 215A-D
	S	AF OPT SIG KEY
	STRAP	225A-5
8	STRAP	225A-20
9		RING, PWR SUP GRD
10		RING, PWR SUP
11	STRAP	225A-6
12		"B" GROUND
14		"A" BATTERY
15		"A" GROUND
19	BZ	214B-30A
	STRAP	OTHER 225A-19
20	STRAP	225A-8

FIG. 13
S-C 226B KTU

ADD-ON CONFERENCE CONTROL CIRCUIT

TS PCHG	LEAD DESIGNATION	TO
1	T1	214B-33C
	STRAP	OTHER 226B-1
2	R1	214B-34C
	STRAP	OTHER 226B-2
7	A1	214B-39C
	STRAP	OTHER 226B-7
11	CE1	SUCC 226B-12 OR
	STRAP	ON LAST 226B, 226B-13
12	BA1	ON 1ST 226B "B" BATTERY
	CE1	PREC 226B-11
13	CD1	ALL 226B-13 &
	STRAP	ON LAST 226B, 226B-11
15	M	227A-23 OR
	M	229B SELECTED M LEAD
16	T	CO OR PBX LINE CCT OF KTS 1A, 1A1,
17	R	1A2 OR S-C 1A2
18	A	CO OR PBX LINE CCT OF KTS 1A1,
20	A1	1A2 OR S-C 1A2
	SIG GRD	CO OR PBX LINE CCT OF KTS 1A1 (A1 LEAD) OR SIG GRD OF KTS 1A2 OR S-C 1A2 (SIG GRD LEAD)
19		"B" BATTERY

FIG. 18
S-C 227A KTU

RINGING AND TONE CONTROL CIRCUIT

TS PCHG	LEAD DESIGNATION	TO
2	LK	207C-25B
	STRAP	227A-30
6	STRAP	227A-21
7	STRAP	227A-21 ANODE OF DIODE C6*
	RO2	AK OR AL OPT 214B-40A OR 215A-40
10	STRAP	227A-40
11	STRAP	227A-28
12	STRAP	227A-26
14	AT	214B-40C
15		AT RES. (10K±5% ¼W)*
17	RO	AK & K OPT 1ST 217A-21
	RO	AK & J OPT 214B-39A
18	RO	AK OPT VIS & AUD SIG CCT (232B-34)
20	RO3	AK OPT 207C-33B
21	STRAP	227A-6
	STRAP	227A-7
24	DT	224A-35
25	DT	207C-21B
26	STRAP	227A-12
27	ST	224A-34
28	STRAP	227A-39
	STRAP	227A-11
30		CATHODE OF DIODE C6*
	STRAP	227A-2
35		AT RES. (10K±5% ¼W)**
	AT	224A-33
39	STRAP	227A-28
	ST	207C-23B
40	STRAP	227A-15
		"B" BATTERY

* INSTALLED LOCALLY

FIG. 14
S-C 19B KTU

FLASHING CIRCUIT

TS PCHG	LEAD DESIGNATION	TO
1		"B" GROUND
2	2	214B-10B
	2	224A-22
3		"B" BATTERY
4	BZ	224A-24
9	B	214B-9D
10	L OR LF	214B-9B
15	BZ1	224A-35

FIG. 16
PART OF S-C 227A KTU

AUXILIARY RELAY - BUSY LAMP CIRCUIT

TS PCHG	LEAD DESIGNATION	TO
2	L2	214B-36C
	STRAP	OTHER 227A-2
23	L1	
26	L1	214B-P OR 215A-P
37	L1	
39	L1	
24		
27		LAMP SUP
29		
30		
40		"B" BATTERY

FIG. 17
PART OF S-C 227A KTU

AUXILIARY RELAY - LAMP FLASHING CIRCUIT

TS PCHG	LEAD DESIGNATION	TO
2	LF2	214B-37C
	STRAP	OTHER 227A-2
23	LF1	
26	LF1	214B-P OR 215A-P
37	LF1	
39	LF1	
24		
27		LAMP SUP
29		
30		
40		"B" BATTERY

FIG. 20
PART OF S-C 227A KTU

SINGLE ADD-ON TRANSFER CIRCUIT
(ONE ADD-ON CIRCUIT ASSOCIATED WITH A STATION CODE)

TS PCHG	LEAD DESIGNATION	TO
2	STRAP	227A-26
23	M	226B-15
28	S1	ADD-ON KEY
26	AU	214B-M OR 215A-M
	STRAP	227A-2
27	PB	ADD-ON KEY
30	RS1	Z OPT 214B-30C
	RS2	AA OR AK OPT 214B-28B
39	RS	Z OPT STA AUD SIG OR AK OPT 225A-7
	R1	AA OPT COM AUD SIG
40		"B" BATTERY

FIG. 34
S-C 229B KTU

MULTIPLE ADD-ON TRANSFER CIRCUIT (MORE THAN ONE ADD-ON CIRCUIT ASSOCIATED WITH THE SAME STATION CODE)

TS PCHG	LEAD DESIGNATION	TO
1	M	7TH CCT 226B-15
2	M	6TH CCT 226B-15
3	M	5TH CCT 226B-15
4	M	4TH CCT 226B-15
5	RS1	Z OPT 214B-30C
	RS2	AA OR AK OPT 214B-28B
6	AU	214B-M OR 215A-M
	STRAP	229B-10
7	M	3RD CCT 226B-15
8	M	2ND CCT 226B-15
9	M	1ST CCT 226B-15
10	STRAP	229B-6
11	S1	7TH CCT ADD-ON KEY
12	S1	6TH CCT ADD-ON KEY
13	S1	5TH CCT ADD-ON KEY
14	S1	4TH CCT ADD-ON KEY
15	RS	Z OPT STA AUD SIG OR AK OPT 225A-7
	R1	AA OPT COM AUD SIG
16	PB	ADD-ON KEY (COM LEAD)
17	S1	3RD CCT ADD-ON KEY
18	S1	2ND CCT ADD-ON KEY
19	S1	1ST CCT ADD-ON KEY
20		"B" BATTERY

WIRING OPTIONS

WIRING	OPTION	
A	USED WITH SINGLE - OR TWO - TALKING LINK ARR.	
X	MAXIMUM 9 CODES	
W	OVER 9 CODES	
E	YES	AUTO CUTOFF
F	NO	
K	YES	PRESET CONF
J	NO	
G	YES	CAMP-ON
N	NO	
H	YES	AUX REL BUSY LAMP CCT
H	NO	
Q	YES	ADD-ON TRANS CCT
AG	NO	
V	YES	AUX REL LAMP FLASH CCT
S	NO	
Y	STATION	OVER T & R LEADS
Z	AUDIBLE	OVER SEPARATE SIG PAIR
AA	SIGNAL	STA ASSOC WITH COM AUD SIG
AE	SIGNAL KEY SELECTION OF STATION	LOCAL STA
AF		OFF-PREMISE STA
AK	INTERRUPTED RING.	
AL	SINGLE-SPURT RING.	
AJ	DIAL, BUSY & AUDIBLE TONE	

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FIG. 19
S-C 207C KTU

SELECTOR CIRCUIT			
T S PCHG	LEAD DESIGNATION		TO
2A	SW 2		W OPT 216A-33 (NOTE 4)
3A	SW 3		
4A	SW 4		
5A	SW 5		
6A	SW 6		
7A	SW 7		
8A	SW 8		
9A	SW 9		
10A	SW 0		
11A	C		W OPT 1ST 216A-1
12A	C		W OPT 1ST 216A-2
13A	C		W OPT 1ST 216A-3
14A	C		W OPT 1ST 216A-4
15A	C		W OPT 1ST 216A-5
16A	C		W OPT 1ST 216A-6
17A	C		W OPT 1ST 216A-7
18A	C		W OPT 1ST 216A-8
19A	C		W OPT 1ST 216A-9
20A	C		W OPT 1ST 216A-10
18,11B	DT		AJ OPT 227A-25
21B	T		222A-31C
	BZ		224A-7
28,12B	R		222A-32C
22B			
3B	L1		T OPT 222A-35C
5B	J		222A-8A
	J		W OPT 216A-36
	J		G OPT 224A-10
7B	BY1		G OPT 222A-19B
8B	TC		G OPT 224A-21 OR
	TC		G & K OPT LAST 217A-8
9B			*A* BATTERY
10B			*A* GROUND
13B	L		T OPT 222A-36C
15B	RL		W OPT 1ST 216A-31
16B	ON		W OPT 1ST 216A-32
17B	W1		W OPT LAST 216A-34
	STRAP		X OPT 207C-16B
18B	W		W OPT 1ST 216A-35
	STRAP		X OPT 207C-17B
19B			*B* BATTERY
20B			*B* GROUND
23B	ST		AJ OPT 227A-39
25B	LK		AJ OPT 227A-2
26B			*B* GROUND
27B			H & T OPT LAMP SUP
			M & T OPT *B* GROUND
28B			*B* GROUND
31B	AT		227A-1W
32B	AT		222A-38A
33B	RO3		AK OPT 227A-20
39B	SG		G OPT 224A-1 AND
	SG		G & K OPT 1ST 217A-26
			N OPT *B* GROUND

OR
X OPT
222A-F
OR
217A-7 FOR 1ST PRESET CONF CCT
217A-17 FOR 2ND PRESET CONF CCT
OR
225A-7 FOR LONG-LINE CCT

FIG. 2
S-C 216A KTU

TRANSFER CIRCUIT			
T S PCHG	LEAD DESIGNATION		TO
1	C		207C-11A OR PREC 216A-11
2	C		207C-12A OR PREC 216A-12
3	C		207C-13A OR PREC 216A-13
4	C		207C-14A OR PREC 216A-14
5	C		207C-15A OR PREC 216A-15
6	C		207C-16A OR PREC 216A-16
7	C		207C-17A OR PREC 216A-17
8	C		207C-18A OR PREC 216A-18
9	C		207C-19A OR PREC 216A-19
10	C		207C-20A OR PREC 216A-20
11	C		SUCC 216A-1
12	C		SUCC 216A-2
13	C		SUCC 216A-3
14	C		SUCC 216A-4
15	C		SUCC 216A-5
16	C		SUCC 216A-6
17	C		SUCC 216A-7
18	C		SUCC 216A-8
19	C		SUCC 216A-9
20	C		SUCC 216A-10
21	C		222A-F OR 223A-F OR 217A-7 FOR 1ST PRESET CONF CCT 217A-17 FOR 2ND PRESET CONF CCT OR 225A-7 FOR LONG-LINE CCT
22	C		
23	C		
24	C		
25	C		
26	C		
27	C		
28	C		
29	C		
30	C		
31	RL		207C-15B & SUCC 216A-31
	RL		
32	ON		207C-16B & SUCC 216A-32
	ON		
33	SW(2-0)		207C-(2A-10A) (NOTE 4)
34	W OR W1		SUCC 216A-35 (W LEAD) OR 207C-17B FROM LAST 216A-34 (W1 LEAD)
35	W		PREC 216A-34 OR 207C-18B FROM 1ST 216A-35
36	J		207C-5B & OTHER 216A-36
	J		
37	CO		ALL 216A-37 & 216A-38 ON LAST 216A
	STRAP		
38	CE		SUCC 216A-40 OR 216A-37 ON LAST 216A
	STRAP		
39			*B* BATTERY
40	BA OR CE		*B* BATTERY ON 1ST 216A (BA LEAD) OR PREC 216A-38 (CE LEAD)

OR
222A-F
OR
217A-7 FOR 1ST PRESET CONF CCT
217A-17 FOR 2ND PRESET CONF CCT
OR
225A-7 FOR LONG-LINE CCT

FIG. 6&7
S-C 222A KTU

TWO-TALKING LINK AND NINE-STATION SIGNALING CIRCUITS			
T S PCHG	LEAD DESIGNATION		TO
4A*	LG		LAMP
8A	J		207C-5B
9A			LAMP SUP
18A	CO OR 1		KTS 1A OR 1A1 AUTO BAT. CUTOFF OR TIME OUT CCT OR VIS & AUD SIG CCT (2328-37)
19A			Y OPT RINGING PWR SUP
20A			Y OPT RINGING PWR SUP GRD
28A	LG		LAMP PWR SUP GRD
28A	B1		224A-9
29A			Z OPT AUD SIG PWR SUP
38A	AT		207C-32B
39A	RO		J & AK OPT 227A-17
	RO		J & AL OPT 222A-40A
	RO1		K OPT LAST 217A-22
40A	RO		J & AL OPT 222A-39A
	RO		K & AL OPT 1ST 217A-21
	RO2		AK OR AL OPT 227A-7
	RO		AL OPT 1ST 223A-40A
8B	STRAP		V OPT 222A-39C
			S OPT LAMP SUP
9B	L OR LF		198-10 OR KTS 1A OR 1A1 FLASHING CCT OR VIS AND AUD SIG CCT (2328)
10B	2 OR A OR TO		198-2 OR KTS 1A OR 1A1 FLASHING CCT OR VIS AND AUD SIG CCT (2328-36)
19B	BY1		G OPT 207C-7B
28B	RS2		AA & Q OPT 227A-30 OR 229B-5
	RS2		AA, AG & AK OPT 222A-H AND
	RS2		ALL 223A-H WITH AA, AG & AK OPT
29B			*A* BATTERY
30B			*A* GROUND
38B			AA & AK OPT AUD SIG PWR SUP
39B			*B* BATTERY
40B			*B* GROUND
8C			M OPT *B* GROUND
			M OPT LAMP SUP
9C	B		E OPT 222A-G
	B		ALL 223A-G WITH SAME WIRING OPT
10C	LU		224A-20
20C	BA		F OPT 222A-G
	BA		ALL 223A-G WITH SAME WIRING OPT
30C	RS1		Z & Q OPT 227A-30 OR 229B-5
	RS1		Z & AG OPT 222A-H AND
	RS1		ALL 223A-H WITH Z & AG OPT.
31C	T		207C-1B
	T		1ST 223A-31A
32C	R		207C-2B
	R		1ST 223A-32A
33C	T1		1ST 226B-1
	T1		1ST 223A-33A

* 4A 10A 14A 24A 34A 4B 14B 24B 34B 4C

FIG. 6&7
S-C 222A KTU (CONT)

TWO-TALKING LINK AND NINE-STATION SIGNALING CIRCUITS			
T S PCHG	LEAD DESIGNATION		TO
34C	R1		1ST 226B-2
	R1		1ST 223A-34A
35C	L1		M OPT 222A-L AND ALL 223A-L WITH SAME WIRING OPT (NOTE 5)
	L1		T OPT 207C-3B
36C	L1		M OPT 222A-L AND ALL 223A-L WITH SAME WIRING OPT (NOTE 5)
	L		T OPT 207C-13B
	L2		M OPT 227A-2
37C	LF1		S OPT 222A-M
	LF1		S OPT 223A-M WITH S OPT
	LF2		V OPT 227A-2
38C	H		1ST 223A-38A
39C	A1		1ST 226B-7
	A1		1ST 223A-39A
	STRAP		V OPT 222A-8B
1D	T2		1ST 226B-3
	T2		1ST 223A-1B
2D	R2		1ST 226B-4
	R2		1ST 223A-2B
3D	TH		1ST 226B-6
	TH		1ST 223A-3B
4D	LTR		1ST 226B-1N
	LTR		1ST 223A-4B
6D	BY1		G OPT 224A-12
7D	BY		224A-13
	BY		227A-1
8D	S OR LB		V OPT *B* GROUND S OPT LAMP SUP 198-9 OR KTS 1A OR 1A1 FLASHING CCT OR VIS AND AUD SIG CCT (2328)
9D	A2		1ST 223A-9B
10D	GN		G OPT 224A-2
30D			*B* BATTERY
40D	B2		217A-29
	B2		225A-19
AT	T		TEL SET OR 225A-3
BT	R		TEL SET OR 225A-4
CT	L		LAMP
DT	R1		AA & AG OPT COM AUD SIG
	RS		AG & Z OPT STATION AUD SIG
	RS		AG & AK OPT 225A-7
	STRAP		Q OPT 222A-J
ET	B1		AA OPT COM AUD SIG
	B1 OR RG		AA OR Z OPT AUD SIG SUP GRD
	RG		Z OPT STA AUD SIG
	B1 OR RG		ALL 223A-E WITH SAME WIRING OPT
FT	C		X OPT 207C OR W OPT 216A (SELECTED C LEAD (NOTE 3))
	C		217A
	C		225A-6
	S		AE OPT SIG KEY
GT	B		E OPT 222A-9C
	BA		F OPT 222A-20C
HT	RS2		AA, AG & AK OPT 222A-28B
	RS1		AG & Z OPT 222A-30C
	AU		Q OPT 227A-26 OR 229B-6
JT	STRAP		222A-40B
	STRAP		Q OPT 222A-D
KT	AX		227A-28 OR 229B-26
LT	L1		H OPT 222A-35C OR 36C
	L1		M OPT 227A-23,26,37 OR 39
MT	LF1		S OPT 222A-37C
	LF1		V OPT 227A-23,26,37 OR 39
NT			LAMP SUP

† SEE TABLE C

FIG. 8
S-C 223A KTU

THREE-STATION SIGNALING CIRCUIT			
T S PCHG	LEAD DESIGNATION		TO
4A*	LG		LAMP
9A			*B* BATTERY
28A*	LG		LAMP PWR SUP GRD
31A	T		222A-31C
	T		OTHER 223A-31A
32A	R		222A-32C
	R		OTHER 223A-32A
33A	T1		222A-33C
	T1		OTHER 223A-33A
34A	R1		222A-34C
	R1		OTHER 223A-34A
38A	H		222A-38C
	H		OTHER 223A-38A
39A	A1		222A-39C
	A1		OTHER 223A-39A
40A	RO2		AK OR AL OPT 227A-7 & OTHER 223A-40A OR
	RO		AL OPT 222A-40A & OTHER 223A-40A
1B	T2		222A-1C
	T2		OTHER 223A-1B
2B	R2		222A-2C
	R2		OTHER 223A-2B
3B	TH		222A-3C
	TH		OTHER 223A-3B
4B	LTR		222A-4C
	LTR		OTHER 223A-4B
7B	BY		224A-13
	BY		227A-1
9B	A2		222A-9C
	A2		OTHER 223A-9B
AT	T		TEL SET OR 225A-3
BT	R		TEL SET OR 225A-4
CT	L		LAMP
DT	R1		AA & AG OPT COM AUD SIG
	RS		AG & Z OPT STA AUD SIG
	RS		AG & AK OPT 225A-7
	STRAP		Q OPT 223A-J
ET	B1		AA OPT COM AUD SIG
	B1 OR RG		222A-E WITH SAME WIRING OPT
	RG		Z OPT STA AUD SIG
FT	C		X OPT 207C OR W OPT 216A (SELECTED C LEAD (NOTE 3))
	C		217A
	C		225A-6
	S		AE OPT SIG KEY (NOTE 2)
GT	B OR BA		OTHER 223A-G WITH SAME WIRING OPT
	B		E OPT 222A-9C
	BA		F OPT 222A-20C
HT	RS2		AA, AG & AK OPT 222A-28B
	RS1		AG & Z OPT 222A-30C OR
	AU		Q OPT 227A-26 OR 229B-6
JT	STRAP		*B* GROUND
	STRAP		Q OPT 223A-D
KT	AX		227A-28 OR 229B-26
LT	L1		H OPT 222A-35C OR 36C
	L1		M OPT 227A-23,26,37, OR 39 (NOTE 5)
MT	LF1		S OPT 222A-37C
	LF1		Y OPT 227A-23,26,37 OR 39
NT			LAMP SUP

* 4A 16A 24A † SEE TABLE D

TABLE D

REFERENCE DESIGNATION	PUNCHING ON 223A		
	CCT 1	CCT 2	CCT 3
A	1A	11A	21A
B	2A	12A	22A
C	3A	13A	23A
D	5A	15A	25A
E (NOTE 6)	6A	16A	26A
F	7A	17A	27A
G (NOTE 6)	18A	19A	30A
H	28A	29A	30A
J	11B	13B	15B
K	12B	14B	16B
L		35A	
M		37A	
N		8B	

FIG. 11
S-C 224A KTU

BUSY SIGNAL AND CAMP-ON CONTROL CIRCUIT			
T S PCHG	LEAD DESIGNATION		TO
1	SG		G OPT 207C-39B
2	GN		G OPT 222A-10D
7	BZ		207C-21B
8	STRAP		224A-25
9	B1		222A-28A
10	J		207C-5B
11	STRAP		224A-31
12	BY1		G OPT 222A-6D
	STRAP		224A-19
13	BY		222A-7D
	BY		223A-7B
	STRAP		224A-15
14			*B* BATTERY
15	STRAP		224A-13
	STRAP		224A-17
17	STRAP		224A-15
19	STRAP		224A-12
20	LU		222A-10C
21	TC		G OPT 1ST 217A-18 OR 207C-8B
22	2 OR A OR TO		198-2 OR KTS 1A OR 1A1 FLASHING CCT OR VIS AND AUD SIG CCT (2328-36)
23	STRAP		224A-34
24	BZ		198-N OR KTS 1A OR 1A1 FLASHING CCT OR VIS AND AUD SIG CCT (2328-32)
25	STRAP		224A-8
31	STRAP		224A-11
32			*B* BATTERY
33	AT		227A-35
34	STRAP		224A-23
	ST		227A-27
35	DT		227A-24
	BZ1		198-15 OR KTS 1A OR 1A1 FLASHING CCT OR VIS AND AUD SIG CCT (2328-31)
39			*B* BATTERY
40			*B* GROUND

NOTE 1: Any digit, other than 1, may be assigned as the initial digit of a 2-digit code. The number used as the initial digit of the 2-digit code may not be used for a station code.

NOTE 2: Provide nonlocking type signaling keys as desired locally (externally mounted keys, or pickup keys of a key telephone set).

NOTE 3: The operate paths to the preset conference circuit, C leads, and to the off-premise circuit, C leads, must connect through the second bank of the selector for two-link operation.

NOTE 4: Any three SW leads, 2 through 0, connect to a maximum of three 216A key telephone units (one lead per 216A unit). The remaining SW leads are left vacant.

NOTE 5: When more than 40 lamps are required for the system, or when two or more of the following options are to be associated with the same station's signaling circuit, provide the needed contacts through a common slave relay of the 227A KTU.

- ADD-ON CONFERENCING.
- SIGNALING OVER SEPARATE SIGNAL PAIR.
- COMMON AUDIBLE ASSOCIATED WITH STATION.

NOTE 6: Terminals are furnished cross-connected on installer's side.

CONNECTION CHART
TWO-TALKING LINK ARRANGEMENT

CC-428029-300 | SHEET 1 | ISSUE NO. 2

CP 1110

FIG. 12
S-C 225A KTU

LONG-LINE CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
1	T	TO OFF-PREMISE TEL CCT
2	R	TO OFF-PREMISE TEL CCT
3	T	222A-A OR 223A-A
4	R	222A-B OR 223A-B
5	STRAP	225A-7
6	C STRAP	222A-F OR 223A-F 225A-11
7	C S RS STRAP RS	AL & X OPT 207C OR AL & W OPT 216A SEL. C LEAD AF OPT SIG KEY (NOTE 2) (NOTE 3) AK & Q OPT 227A-39 OR 229B-15 225A-5 AK & AG OPT 222A-D OR 223A-D
8	STRAP	225A-20
9		RINGING PWR SUP GRD
10		RINGING PWR SUP
11	STRAP	225A-6
12		*B* GROUND
13		*A* BATTERY
15		*A* GROUND
19	B2 STRAP	222A-80D OTHER 225A-19
20	STRAP	225A-8

WIRING OPTIONS

WIRING	OPTION	
A	USED WITH SINGLE - OR TWO-TALKING LINK ARR.	
X	MAXIMUM 9 CODES	
W	OVER 9 CODES	
E	STA IS AUTO. CUTOFF	
F	STA IS NOT AUTO. CUTOFF	
Y	STA	OVER T AND R LEADS
Z	AUD	OVER SEP SIG PAIR
AA	SIG	STA ASSOC WITH COM AUD SIG
K	SYS WITH PRESET CONF	
J	SYS WITHOUT PRESET CONF	
G	SYS WITH CAMP-ON	
N	SYS WITHOUT CAMP-ON	
H	WITHOUT AUX REL BUSY LP CCT	
M	WITH AUX REL BUSY LP CCT	
S	WITHOUT AUX REL LP FLASH CCT	
V	WITH AUX REL LP FLASH CCT	
AQ	WITHOUT ADD-ON TRANS CCT	
Q	WITH ADD-ON TRANS CCT	
T	TWO-TALKING LINK ARR. WITH CAMP-ON	
AE	SIG KEY SELECTION	LOCAL STATION
AF	OF STATION	OFF-PREMISE STATION
AK	INTERRUPTED RING.	
AL	SINGLE-SPURT RING.	
AJ	DIAL, BUSY & AUDIBLE TONE	

FIG. 13
S-C 226B KTU

ADD-ON CONFERENCE CONTROL CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
1	T1 STRAP	222A-33C OTHER 226B-1
2	R1 STRAP	222A-34C OTHER 226B-2
3	T2 STRAP	222A-1D OTHER 226B-3
4	R2 STRAP	222A-2D OTHER 226B-4
5	N	227A-25 OR 229B SELECTED N LEAD
6	TH STRAP	222A-3D OTHER 226B-6
7	A1 STRAP	222A-39C OTHER 226B-7
8	CD2 STRAP	ALL 226B-8 & 226B-9 ON LAST 226B
9	CE2 STRAP	SUCC 226B-10 OR 226B-8 ON LAST 226B
10	BA2 CE2	ON 1ST 226B, *B* BATTERY PREC 226B-9
11	CE1 STRAP	SUCC 226B-12 OR 226B-13 ON LAST 226B
12	BA1 CE1	ON 1ST 226B, *B* BATTERY PREC 226B-11
13	CD1 STRAP	ALL 226B-13 & 226B-11 ON LAST 226B
14	LTR LTR	222A-4D OTHER 226B-14
15	H	227A-23 OR 229B SELECTED H LEAD
16	T	CO OR PBX LINE CCT OF KTS 1A, 1A1, 1A2 OR SC 1A2
17	R	
18	A	CO OR PBX LINE CCT OF KTS 1A1, 1A2 OR SC 1A2
20	A1 SIG GRD	CO OR PBX LINE CCT OF KTS 1A1 (A1 LEAD) OR SIG GRDOF KTS 1A2 ORSC 1A2 (SIG GRD LEAD)
19		*B* BATTERY

TABLE C

REFERENCE DESIGNATION	PUNCHING ON 222A								
	CCT 1	CCT 2	CCT 3	CCT 4	CCT 5	CCT 6	CCT 7	CCT 8	CCT 9
A	1A	11A	21A	31A	1B	11B	21B	31B	1C
B	2A	12A	22A	32A	2B	12B	22B	32B	2C
C	3A	13A	23A	33A	3B	13B	23B	33B	3C
D	5A	15A	25A	35A	5B	15B	25B	35B	5C
E (NOTE 6)	6A	16A	26A	36A	6B	16B	26B	36B	6C
F	7A	17A	27A	37A	7B	17B	27B	37B	7C
G (NOTE 6)	11C	12C	13C	14C	15C	16C	17C	18C	19C
H	21C	22C	23C	24C	25C	26C	27C	28C	29C
J	11D	12D	13D	14D	15D	16D	17D	18D	19D
K	21D	22D	23D	24D	25D	26D	27D	28D	29D
L (NOTE 6)	31D	32D	33D	31D	32D	33D	31D	32D	33D
M (NOTE 6)	34D	35D	36D	34D	35D	36D	34D	35D	36D
N (NOTE 6)	37D	38D	39D	37D	38D	39D	37D	38D	39D

FIG. 10
S-C 217A KTU

PRESET CONFERENCE CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
1	C	222A-F OR 223A-F
2	C	
3	C	
4	C	
5	C	
6	C	
7	C S	X OPT 207C OR W OPT 216A SELECTED C LEAD (NOTE 3) OR SIG KEY (NOTE 2)
8	TC	G OPT SUCC 217A-18 OR FROM LAST 217A, 207C-BB
11	C	222A-F OR 223A-F
12	C	
13	C	
14	C	
15	C	
16	C	
17	C S	X OPT 207C OR W OPT 216A SELECTED C LEAD (NOTE 3) OR SIG KEY (NOTE 2)
18	TC	G OPT PREC 217A-8 FROM 1ST 217A, OR 226A-21
21	RO RO	PREC 217A-22, ALOPTFROM 1ST 217A, 222A-40AOR AK OPT FROM 1ST 217A, 227A-17
22	RO RO1	SUCC 217A-21 FROM LA ST 217A, 222A-39A
26	SG STRAP	G OPT 207C-39B G OPT OTHER 217A-26
28		*B* GROUND
29 *	B2 STRAP	222A-80D OTHER 217A-29
35		*B* GROUND
36		*B* GROUND
37		*B* GROUND
40 *		*B* GROUND

* 30 34 40 29 39

FIG. 20
PART OF S-C 227A KTU

SINGLE ADD/ON TRANSFER CIRCUIT (ONE ADD-ON CIRCUIT ASSOCIATED WITH A STATION CODE)		
T S PCHG	LEAD DESIGNATION	TO
2	STRAP	227A-26
23	H	226B-15
24	S1	ADD-ON KEY
25	H	226B-5
26	AU STRAP	222A-H OR 223A-H 227A-2
27	P8	ADD-ON KEY
28	AX	222A-K OR 223A-K
30	RS1 RS2	Z OPT 222A-30C AA OR AK OPT 222A-28B
39	RS R1	Z OPT STA AUD SIG OR AK OPT 225A-7 AA OPT COM AUD SIG
40		*B* BATTERY

FIG. 16
PART OF S-C 227A KTU

AUXILIARY RELAY - BUSY LAMP CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
2	L2 STRAP	222A-36C OTHER 227A-2
23	L1	222A-L OR 223A-L
26	L1	
37	L1	
39	L1	
24	L8	LAMP SUP
27	L8	
29	L8	
30	L8	
40		*B* BATTERY

FIG. 17
PART OF S-C 227A KTU

AUXILIARY RELAY - LAMP FLASHING CIRCUIT		
L S PCHG	LEAD DESIGNATION	TO
2	LF2 LF2	222A-37C OTHER 227A-2
23	LF1	222A-H OR 223A-H
26	LF1	
37	LF1	
39	LF1	
24	L8	LAMP SUP
27	L8	
29	L8	
30	L8	
40		*B* BATTERY

FIG. 14
19B KTU

FLASHING CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
1		*B* GROUND
2	2 2	224A-22 222A-108
3		*B* BATTERY
4	BZ	224A-24
9	B	222A-8D
10	L OR LF	222A-98
15	BZ1	224A-35

FIG. 34
S-C 229B KTU

MULTIPLE ADD-ON TRANSFER CIRCUIT (MORE THAN ONE ADD-ON CIRCUIT ASSOCIATED WITH THE SAME STATION CODE)		
T S PCHG	LEAD DESIGNATION	TO
1	H	7TH CCT 226B-15
2	H	6TH CCT 226B-15
3	H	5TH CCT 226B-15
4	H	4TH CCT 226B-15
5	RS1 RS2	Z OPT 223A-30C AA OR AK OPT 222A-28B
6	AU STRAP	222A-H OR 223A-H 229B-10
7	H	3RD CCT 226B-15
8	H	2ND CCT 226B-15
9	H	1ST CCT 226B-15
10	STRAP	229B-6
11	S1	7TH CCT ADD-ON KEY
12	S1	6TH CCT ADD-ON KEY
13	S1	5TH CCT ADD-ON KEY
14	S1	4TH CCT ADD-ON KEY
15	RS R1	Z OPT STA AUD SIG OR AK OPT 225A-7 AA OPT COM AUD SIG
16	PB	ADD-ON KEY (COM LEAD)
17	S1	3RD CCT ADD-ON KEY
18	S1	2ND CCT ADD-ON KEY
19	S1	1ST CCT ADD-ON KEY
20		*B* BATTERY
21	N	7TH CCT 226B-5
22	N	6TH CCT 226B-5
23	N	5TH CCT 226B-5
24	N	4TH CCT 226B-5
26	AX	222A-K OR 223A-K
27	N	3RD CCT 226B-5
28	N	2ND CCT 226B-5
29	N	1ST CCT 226B-5

FIG. 18
S-C 227A KTU

RINGING AND TONE CONTROL CIRCUIT		
T S PCHG	LEAD DESIGNATION	TO
1	BY BY	222A-7D 223A-7B ANODE OF DIODE C5*
2	LK STRAP	AJ OPT & 207C-23B 227A-30 CATHODE OF DIODE C5*
6	STRAP	227A-21
7	STRAP RO2	227A-21 AK OR AL OPT 222A-40A OR 223A-40A ANODE OF DIODE C6*
10	STRAP	227A-40
11	STRAP	227A-28
12	STRAP	227A-26
14	AT	207C-31B
15		AT RES. (10K ± 5% ½ W)*
17	RO RO	AK & K OPT 1ST 217A-21 AK & J OPT 222A-39A
18	RO	AK OPT VIS & AUD SIG CCT (232B-34)
20	RO3	AK OPT 207C-33B
21	STRAP STRAP	227A-6 227A-7
24	DT	224A-35
25	DT	AJ OPT 207C-21B
26	STRAP	227A-12
27	ST	224A-34
28	STRAP STRAP	227A-11 227A-39
30	STRAP	CATHODE OF DIODE C6* 227A-2
35	AT	AT RES. (10K ± 5% ½ W)* 224A-33
39	STRAP ST	227A-28 AJ OPT 207C-23B
40	STRAP	227A-10 *B* BATTERY

* INSTALLED LOCALLY

CONNECTION CHART
TWO-TALKING LINK ARRANGEMENT

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