

PRELIMINARY

Bell System Voice And Data Communications

TECHNICAL REFERENCE

Standard Plugs And Jacks

September 1979

DIRECTOR – BUSINESS PREMISES ENGINEERING – DATA AND SPECIAL SYSTEMS



PRELIMINARY

NOTICE

This document is published by American Telephone and Telegraph Company for use by designers, manufacturers, and consultants of communications systems and equipment. The descriptions contained in this document are to be considered functionally equivalent to similar descriptions contained within Part 68, Chapter I of Title 47 of the Code of Federal Regulations or in the current issue of Documentation on file with the FCC entitled "Descriptions of Standard Registration Program Connection Configurations Supplementing Configurations described in subpart F of part 68 of the FCC Rules and Regulations". The limits of responsibility and liability of the Bell System with respect to the use of customer-provided systems and equipment are set forth in the appropriate tariff regulations.

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BELL SYSTEM VOICE AND DATA COMMUNICATIONS

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STANDARD PLUGS AND JACKS

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1. GENERAL

1.1 Introduction

This Technical Reference describes the standard jack arrangements to be provided by Bell Operating companies for the connection of telephone company-provided and customer-provided registered equipment to the public switched network. The FCC Registration Program contained in Part 68, Chapter I, of Title 47 of the Code of Federal Regulations permits the direct electrical connection of registered equipment, which complies with the standards incorporated into the FCC Rules, to the public switched network through standard plugs and Telephone Company - provided jacks, or equivalent, as described in or authorized by, Part 68. Supplemental Part 68 Jacks are also included in this reference and are provided under §68.104(c). The FCC Rules and Regulations allow these configurations to be described in nationwide tariffs as an alternative to specifying them directly in Part 68. Their use is intended for application with registered terminal equipment and systems in compliance with FCC, Part 68 requirements and is subject to effective tariff filings approved by the FCC.

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Part 68 of the FCC Rules also permits grandfathered terminal equipment and systems to be connected through standard jacks or other appropriate means of connection as defined under the FCC Registration Program. Under the Program, terminal equipment is grandfathered if it was directly connected to the telecommunications network without a telephone company-provided Protective Connecting Arrangement (PCA) or Data Access Arrangement (DAA) in accordance with Telephone Company tariffs as of October 17, 1977, the grandfather eligibility date for terminal equipment. Terminal equipment is also considered grandfathered if identical to the type described above, and is connected for the first time without a telephone company provided PCA/DAA, prior to July 1, 1979. The FCC provided this transition period of time to allow manufacturers to register their equipment, deplete existing inventories, and facilitate efficient use of equipment.

Systems are grandfathered if they were directly connected to the telecommunications network without a telephone company-provided PCA/DAA in accordance with Telephone Company tariffs as of June 1, 1978. A System is also considered grandfathered, if identical to the type described above and is connected for the first time, without a telephone company-provided PCA/DAA, prior to January 1, 1980*. Like the terminal equipment transition period, the FCC also provided a transition period for systems to allow manufacturers to register their equipment and to deplete existing inventories.

* January 1, 1980, Register Only date for Systems is currently under review of the FCC and may change as a result of their findings.

1.2 Hardware Specifications - Jacks & Plugs

This document does not contain detailed hardware specifications. Such information regarding Bell System jacks, plugs, and cords adopted by the FCC as standard is contained in Technical Description "Bell System Miniature Plugs and Jacks", dated August 1976. Information on FCC standard miniature ribbon plugs and jacks is contained in FCC Rules and Regulations, Part 68, Subpart F. (See Attachment A regarding ordering information covering these documents.)

1.3 Electrical Characteristics at Standard Jack Interfaces

The electrical characteristics at the interface between the Bell System Network and/or Bell System PBX/key systems and registered equipment is included in the following documents. (The Series 48000 References should be referred to for compatibility information pertaining to those classes of products for which they apply. If a Series 48000 Technical Reference is unavailable for the class of products concerned, generic information is contained in the 47000 Series of Technical References).

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<u>Title</u>	<u>Technical Reference</u>
. Functional Product Class Criteria -- Automatic Answering Devices	PUB 48001
. Functional Product Class Criteria -- PBX	PUB 48002
. Functional Product Class Criteria -- Alarm Dialing Systems	PUB 48003
. Functional Product Class Criteria -- Ancillary Repertory Dialers	PUB 48004
. Electrical Characteristics of Bell System Network Facilities at the Interface with Voiceband Ancillary and Data Equipment	PUB 47001
. Electrical Characteristics of Bell System PBX and Key Equipment at the Interface with Voiceband Ancillary and Data Equipment.	PUB 47002

These documents provide descriptive compatibility information with the public switched network (47001) and various Bell System PBX and key systems (47002) as required under Part 68, §68.110.

(Attachment A provides ordering information for these documents.)

1.4 Administrative/Technical Requirements and Conditions on the Use of Terminal Equipment

Part 68, Chapter I of Title 47, of the Code of Federal Regulations provides detailed information and procedures necessary for the proper connection of equipment to the Telecommunications Network. It is recommended that Licensed Professional Engineers, Designers, Manufacturers, Installation Supervisors, and Consultants of Communication Systems and Equipment refer to that document regarding all rules relative to the FCC Registration Program (See Attachment A for information on this document.)

2. TELEPHONE COMPANY JACKS

2.1 General

Telephone Company-provided jacks allow a ready means of connecting and disconnecting registered/grandfathered equipment to and from the network. These jacks are arranged to allow a mating plug connected thereto to be withdrawn without interfering with the operation of other customer premises equipment, if any, which remains connected to the telephone network.

2.2 Application

The Telephone Company-provided jacks described in this Technical Reference generally provide a bridged or series connection to the tip and ring conductors of a telephone line. In some configurations, key system A & A1 lead connections and Mode Indicative (MI & MIC) leads are also provided. The telephone line may be a central office line, a PBX station line, Centrex or key telephone system station line, or a PBX/Key System central office trunk/line. The jacks can be associated with either single line or multiline telephone service and shall be located on the customer's premises.

Two general types of jacks are described herein; one type is intended primarily for Voice equipment, and the other type is intended for Data equipment. However, registered data equipment which is arranged to transmit at a fixed level of no greater than -9 dB with respect to 1 milliwatt (permissive data) may use Voice or Data jacks. FCC Part 68 Rules and Regulations do not permit the installation of data jacks behind through transmission systems such as PBX and key systems. Data connections behind such systems must be made with voice jacks using the -9dBm type of equipment. (Data jacks are covered by USOCs RJ26X, RJ27X, RJ41S and RJ45S.

2.3 Physical

There are five types of Telephone Company-provided jacks used for the connection of registered equipment to the telecommunications network:

- 1) the miniature 6-position jack (miniature) (Fig. 1),
- 2) the weatherproof jack (Fig. 2),
- 3) the 50-position miniature ribbon jack (miniature ribbon) (Fig. 3),

- 4) the miniature 8-position series jack (series) (Fig. 4),
- 5) the miniature 8-position keyed jack (keyed) (Fig. 5).

The miniature 6-position, the miniature ribbon, and weatherproof jacks provide bridged connections to the tip and ring conductors of a telephone line. The miniature jack is used when registered equipment is connected to one, two, or three lines while the miniature ribbon jack is used for connecting several telephone lines. The miniature 8-position series jack provides series connections to the tip and ring conductors. The miniature 8-position keyed jack for data equipment provides bridged connections to the tip and ring conductor of a telephone line and mode indication leads for use with an exclusion key telephone set if required. The weatherproof jack is used to provide a bridged connection to the tip and ring conductors in environments exposed to moisture, i.e., docks and marinas. Each type, except for the weatherproof and 8-position keyed jacks, may be arranged to provide bridged connections of A and A1 conductors.

2.4 Identification and Ordering - Jacks & Adapters

Before connecting a registered device to telecommunications facilities the customer must inform the Telephone Company of their intent to do so, and supply the following information:

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- a. Provide the FCC Registration and Ringer Equivalence numbers appearing on the manufacturer's label.
- b. Order the desired number of jacks by appropriate USOC designation (see below).
- c. Specify the CO line(s), PBX trunk(s), and/or station(s) line(s) and designate the telephone number to be associated with each jack.
- d. Specify the position sequence in which each line should appear when miniature ribbon jacks are required. Lines should be wired consecutively in a standard manner without skipping positions.

Each jack arrangement described in this Technical Reference is identified by a specific Universal Service Order Code (USOC). Correlations between the various USOCs and their corresponding unique jack arrangements are given in Table A.

In instances where a Telephone Company-provided jack is already installed on premises, customers must inform the Telephone Company of their intention to connect a registered or grandfathered device prior to making the actual connection. If the in-place jack is a

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4- or 12-position non-standard jack and the registered device is equipped with a standard miniature plug, an adapter may be used to enable connection of the registered equipment. Adapters may be obtained from the Telephone Company by ordering (a) USOC RJA1X to adapt the miniature plug to the 4-position jack, or (b) USOC RJA3X to adapt a miniature plug to a 12-position jack. The customer can obtain comparable adapters from other than Telephone Company sources.

Where a miniature bridged jack is already installed and a customer wishes to connect two miniature bridged plugs to it, an RJA2X adapter, which consists of one miniature bridged plug and two miniature bridged jacks can be used. The adapter may be obtained from the Telephone Company by ordering USOC RJA2X. The customer can also obtain the adapter from other than Telephone Company sources.

The local Telephone Company business office or marketing representative will provide information regarding availability and rates for any of these Telephone Company-provided jacks.

3. DESIGN CONSIDERATIONS

3.1 General

Two general types of jacks are described herein; one type is intended primarily for Voice terminal equipment and the other type is intended for Data terminal equipment. However, registered data equipment which is arranged to transmit at a fixed level of no greater than -9 dB with respect to 1 milliwatt may use Voice or Data jacks.

When a registered ancillary device is intended to be used with a PBX or key telephone system, the registered equipment grantee should preferably provide a table to the user/vendor indicating compatibility of the registered device with appropriate types of PBXs and key telephone systems and specify the different USOCs that should be ordered to connect them to the respective Telephone Company facilities encountered. For example, a registered ancillary device may be designed to connect to the network via the tip, ring, A and A1 leads of a Key Telephone System. In a single line application the jack generally used would be either a RJ12 or RJ13. However, the design of the registered ancillary device may have an option that requires central office ringing to function properly. In such cases, the RJ12 should be requested to insure that central office ringing is provided. Thus, a table would define such facts.

3.2 Miniature 6-Position Jacks and 6-Position Adapters

The miniature 6-position jack provides a bridged connection to the tip and ring conductors of a telephone line. With the jack oriented as shown in Figure 1, contact numbering positions appear in increasing order, right to left. In most arrangements, the ring conductor appears in position 3; the tip conductor, in position 4. However, since this technical reference includes jacks also offered under nationwide tariff options, all lead assignments should be identified by specific jack configuration. The USOCs for different configurations and applications of this jack are: RJ11C, RJ11W, RJ12C, RJ12W, RJ13C, RJ13W, RJ14C, RJ14W, RJ16X, RJ17C, RJ18C, RJ19C, and RJ25C.

Adapters RJA1X, RJA2X and RJA3X adapt so as to provide a miniature 6-position jack.

3.201 RJ11C and RJ11W

Jacks RJ11C and RJ11W are normally associated with single line ancillary devices, telephone sets, or -9dBm (permissive) data equipment and provide bridged connections to the tip and ring of a telephone line (Fig. 6). RJ11C is surface or flush mounted for use with desk sets, while RJ11W is used for wall mounted sets.

3.202 RJ12C and RJ12W

Jacks RJ12C and RJ12W are normally associated with one line of a key telephone system. They provide a bridged connection to the tip and ring of the telephone line and to key system A and A1 leads (Fig 7). The tip and ring conductors in the jack are connected ahead of the key telephone system line circuit. The RJ12C is surface or flush mounted for use with desk sets; while the RJ12W is for wall mounted sets. Typically, these arrangements are used when registered ancillary equipment must respond to central office or PBX ringing.

3.203 RJ13C and RJ13W

Jacks RJ13C and RJ13W are normally associated with one line of a key telephone system. They provide a bridged connection electrically behind the key system line circuit to the tip and ring conductors and to the A and A1 leads (Fig. 8). The RJ13C is surface or flush mounted for use with desk sets, while RJ13W is for wall mounted sets. These arrangements are generally used when the registered ancillary equipment does not require central office or PBX ringing to function properly.

3.204 RJ14C and RJ14W

Jacks RJ14C and RJ14W provide for bridged connections to the tip and ring conductors of two separate telephone lines (Fig. 9). The RJ14C is surface or flush mounted for use with desk sets; while the RJ14W is for wall mounted sets.

3.205 RJ16X (Subject to effective tariffs and/or rulemaking)

Jack RJ16X provides a single line bridged tip and ring and is associated with -9dBm (Permissive) data arrangements that require mode indication for use with exclusion key telephone sets (Fig. 10). The exclusion key telephone set requires a series jack, RJ36X (described under 8 position jacks) as its normal means of connection. Attachment B describes the operation of an exclusion key telephone set that can be provided by Bell Operating Companies.

3.206 RJ17C (Subject to effective tariffs and/or rulemaking)

Jack RJ17C provides a single line bridged connection of tip and ring to special telephone sets or ancillary equipment (e.g., ECG machines) in hospital critical care areas (Fig. 11). Only registered equipment conforming to Article 517 of the 1978 National Electrical Code is permitted to connect to this jack arrangement. This jack differs from the RJ11C in that tip and ring appear on pins 1 & 6 rather than 3 & 4.

3.207 RJ18C (Subject to effective tariffs and/or rulemaking)

Jack RJ18C provides a bridged connection of single line tip and ring with make-busy leads MB/MB1 (Fig. 12). When the registered equipment provides a contact closure between the MB and MB1 leads, a make busy indication is transmitted to the network equipment busying out the line from further incoming calls. It is recommended that the busy indication (contact closure) be provided while the line is in the idle state in order to reduce the possibility of interfering with a call that is in the ringing or talking state. The RJ18C is surface or flush mounted for use with desk sets.

3.208 RJ19C (Subject to effective tariffs and/or rulemaking)

Jack RJ19C is normally associated with one line of a key telephone system. It provides a bridged connection of single line tip and ring behind a key system line circuit, with A and A1 lead control, and a direct connection for MB/MB1 make busy leads (Figure 13).

When the registered equipment provides a contact closure between the MB and MB1 leads, a make busy indication is transmitted to the network equipment busying out the line from further incoming calls. It is recommended that the busy indication (contact

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closure) be provided while the line is in the idle state in order to reduce the possibility of interfering with a call that is in the ringing or talking state. The RJ19C is surface or flush mounted for use with desk sets.

3.209 RJ25C (Subject to effective tariffs and/or rulemaking)

Jack RJ25C provides for bridged connection to the tip and ring conductors of three separate telephone lines. (Figure 14). The telephone company will wire the lines to the jack in the sequence designated by the customer. The RJ25C is surface or flush mounted for use with desk sets and ancillary devices.

3.210 RJA1X and RJA3X

RJA1X and RJA3X are adapters used to adapt 4-position and 12-position jacks, respectively, to a 6-position miniature bridged jack (Figure 15 and 16). They provide bridged connections to the tip and ring of the telephone line. If A and A1 leads are already terminated in the 4- or 12-pin jack, they will appear in positions 2 and 5 in the adapter. If A and A1 leads are not involved, positions 2 and 5 are reserved for Telephone Company use.

The customer may obtain these adapters from the Telephone Company, or provide their own equivalent adapters.

3.211 RJA2X

RJA2X is an adapter that converts a single miniature jack to two miniature jacks (Figure 17). It provides a bridged connection to the tip and ring conductors of the telephone line. If A and A1 leads are already terminated in an existing miniature bridged jack, they will appear in positions 2 and 5 in both miniature bridged jacks in the adapters. If A and A1 leads are not provided, positions 2 and 5 are reserved for Telephone Company use.

3.3 Weatherproof Jack

The weatherproof jack provides a single line bridged connection of tip and ring. These jacks are intended for use in areas normally exposed to moisture, ie. docks and/or marinas. See Figure 2.

3.301 RJ15C

Jack RJ15C is a weatherproof jack arranged to provide single line bridged connection of tip and ring (Figure 18). Jack RJ15C can be arranged for surface or flush mounting depending upon customer needs.

3.4 50-Position Miniature Ribbon Jack

The 50-position miniature ribbon jack provides bridged connections to the tip and ring and A and A1 conductors of several telephone lines. When used as data jacks, the 50 position miniature ribbon jack provides 8-six lead interfaces including bridged connections to the tip and ring conductors of up to 8 telephone lines, pads to attenuate the -4dBm output power of fixed loss loop data equipment and programming resistors for Programmed data equipment. With the jack oriented as shown in Figure 3, the pins are numbered in increasing order starting from the lower right hand corner and ending in the upper left hand corner. Pin assignments differ for each arrangement as explained in the following paragraphs.

A series tip and ring arrangement is provided via the 50-position miniature jack (see RJ71C). This arrangement utilizes a bridging plug to restore continuity of this circuit if the registered terminal equipment is removed. At this time automatic restoral is not available, however, a new 50-position miniature jack is under development and will eliminate the need for the bridging plug when it is available.

The jack is typically used when the registered equipment is bridged to several telephone lines. It is used to implement the RJ21X, RJ22X, RJ23X, RJ24X, RJ26X, RJ27X, and RJ71C arrangements as described in the following subsections.

The customer must specify the sequence that each line is to appear within the jack. The Telephone Company will wire the lines consecutively without skipping positions.

3.401 RJ21X

Jack RJ21X provides bridged connections to tip and ring conductors of up to twenty five telephone lines (fig. 19). Pin assignments for leads are given in Table B. RJ21X is typically used with Traffic Data Recording Equipment and Multiple Line Communication Systems. The customer must specify the connection sequence for each line appearing in the jack.

3.402 RJ22X

Jack RJ22X can be associated with a Telephone Company-provided key telephone system when connection is required to several lines. It provides bridged connections of up to twelve telephone lines and their associated A and A1 leads (Fig. 20). The tip and ring

conductors in the jack are wired ahead of the line circuit in the key telephone system. The pin assignments for the leads are given in Table C. This arrangement is used when the registered equipment must respond to central office or PBX ringing.

3.403 RJ23X

Jack RJ23X is normally associated with a Telephone Company-provided key telephone system when connection is required to several lines. It is wired to provide bridged connections of up to twelve key system line circuits and associated A and A1 leads (Fig. 21). It differs from and is preferred over the RJ22X, in that tip and ring conductors in the jack are wired behind the key system line circuits. Pin assignments, however, are the same as for RJ22X, and are given in Table C. This arrangement is typically used when the registered equipment does not require central office or PBX ringing to function properly.

3.404 RJ24X

Jack RJ24X is normally associated with a Telephone Company-provided key telephone system. It is typically used with registered ancillary devices such as conferencing devices, music on hold, etc. Pin assignments for leads are given in Table D. It is wired to provide the same tip, ring, A, and A1 appearances as a standard five line key telephone set (Fig. 22).

3.405 RJ26X

RJ26X is a multiple line universal data jack for up to 8 lines in a 50 position miniature ribbon connector and accommodates either fixed loss loop (FLL) or programmed (P) types of data equipment. Pin assignments for leads is given in table E. This jack is shown schematically in Figure 23. A switch, accessible to the customer, is provided on each line to select FLL or P type of operation. FLL equipment transmits at -4 ± 1 dB with respect to one milliwatt and a pad is included in the data jack so that pad loss plus loop loss is nominally 8 dB. Programmed type data equipment adjusts its output power in accordance with a programming resistor in the data jack. By these means, signals from either FLL or P types of registered data equipment will arrive at the local telephone company central office at a nominal -12 dB with respect to one milliwatt for optimum data transmission.

The Bell Operating Companies will implement the jack with RJ26X which is the common equipment containing the 50 position miniature ribbon jack itself plus up to 8 plug-in line circuit cards (USOC RJ26S), on a per-line basis, plus either a wall mounting, (USOC RJM3X), or a rack mounting, (RJM4X), for this equipment. Figures 24 and 25 show the equipment arrangements for RJ26X.

3.406 RJ27X

RJ27X is a multiple line programmable data jack for up to 8 lines in a 50 position miniature ribbon connector and accommodates programmed data equipment only. The pin assignment for leads is given in Table F. This jack is shown schematically in Figure 26. A multi-line data jack with only programmable capability is under development, but is not yet available. In the meantime, to meet customer requirements for RJ27X, Bell Operating Companies will make use of the multiple line universal data jack which works with programmable data equipment as described above. The USOCs RJ26X, RJ26S and RJM3X or RJM4X as discussed above will be provided. As soon as the programmable-only version is available, it will be employed to implement RJ27X.

3.407 RJ71C (Subject to effective tariffs and/or rulemaking)

Jack RJ71C provides a multiple series arrangement of tip and ring (Fig. 27). It is typically used with registered series devices such as toll restrictors, etc. Jack RJ71C can accommodate up to 12 circuits per jack (i.e. one tip and ring "in" and one tip and ring "out", 4 leads per circuit). This arrangement does not currently provide automatic restoral upon disconnection of registered equipment. Thus, a manual bridging plug is provided in order to

maintain circuit continuity upon withdrawal of a registered plug. Pin assignments for leads are given in Table G. Please note, Automatic Restoral hardware is under development using identical pin configuration as described in table G.

The customer must specify the sequence that each line is to appear within the jack. The Telephone Company will wire the lines consecutively without skipping positions.

3.5 Miniature 8-Position Series Jack

The miniature 8-position series jack provides series connections to the tip and ring conductors of a telephone line. With the jack oriented as shown in Figure 4, and the positions numbered in increasing order from left to right, the Network (R lead) ring conductor will appear in position 4; while the (R1 lead) ring conductor from the registered terminal equipment will appear in position 1. The Network (T lead) will appear in position 5 while the (T1 lead) tip conductor from the registered terminal equipment will appear in position 8. In those arrangements where connections are made to the A and A1 leads of a Telephone Company-provided key telephone system, the A lead appears in position 3; the A1 lead, in position 6. When a telephone set equipped with an exclusion key is associated with a registered data set, positions 3 and 6 are used as "mode indication" leads. The lead in position 3 is designated

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MI and the lead in position 6 is designated MIC. When the miniature series plug is inserted into the jack, shorting bars are removed and network continuity is established through the registered terminal equipment.

In early vintages of the series jack, insertion of either a 6- or 8-position plug would remove the shorting bars from contacts 1 & 4 and 5 & 8. In the current series jack, insertion of a 6-position plug provides a bridged connection i.e. the shorting bars are not removed from contacts 1 & 4 and 5 & 8. Insertion of an 8-position plug removes the shorting bars and, therefore, provides a series connection..

The USOCs are RJ31X, RJ32X, RJ33X, RJ34X, RJ35X, RJ36X, RJ37X, and RJ38X and are described below.

3.501 RJ31X

Jack RJ31X provides a series connection to the tip and ring conductors of a telephone line (Fig. 28). It is wired ahead of all station equipment electrically; and is typically used with registered alarm reporting devices. When there is an alarm condition, the registered device functions to cut off all station equipment wired behind it, via this jack. Conductors 2, 3, 6 and 7 are reserved for Telco use.

3.502 RJ32X

Jack RJ32X provides a series connection to the tip and ring conductors of a telephone line (Fig. 29). It differs from RJ31X in that it is wired ahead of a particular telephone set rather than ahead of all the station equipment. It is typically used with registered automatic dialers. Conductors 2, 3, 6 and 7 are reserved for Telco use.

3.503 RJ33X

Jack RJ33X is normally associated with a key telephone system. It provides a series connection to the tip and ring conductors of the telephone line and the key system line circuit A and A1 leads (Fig. 30). The tip and ring conductors are wired ahead of the key system line circuit. This arrangement is typically used when the registered equipment requires central office or PBX ringing. Conductors 2 and 7 are reserved for Telco use.

3.504 RJ34X

Jack RJ34X is normally associated with a key telephone system. It is wired to provide a series connection to the key system line circuit tip and ring conductors and its A and A1 leads (Fig. 31).

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It differs from RJ33X in that all conductors are wired behind the key system line circuit. This arrangement is typically used when the registered equipment is not critical as to type of ringing signal or does not require central office or PBX ringing. Conductors 2 and 7 are reserved for Telco use.

3.505 RJ35X

Jack RJ35X is normally associated with a key telephone set. It is wired to provide a series connection to the tip and ring conductors of the telephone line and a bridged connection to the A and A1 leads (Fig. 32). It differs from RJ33X and RJ34X in that the tip and ring leads are connected to the common wiring behind the pick-up keys of the station set but ahead of the switchhook. The jack is wired to the key telephone set so that the registered equipment functions on the line selected on the key set.

3.506 RJ36X (Subject to effective tariffs and/or rulemaking)

Jack RJ36X provides a connection for a registered telephone set equipped with an exclusion key when the telephone line is also to be used with a registered data set or registered protective circuitry (Fig. 33). It is wired to provide a series connection to the tip and ring conductors of the telephone line and mode indication leads MI and MIC. With this jack, the exclusion key can

be used to transfer the telephone line between the data set and the telephone set. As a customer option, the exclusion key may be wired so that either the telephone set or the data set controls the line. In the former case, the exclusion key must be operated to transfer the telephone line to the data set. In the latter case, the telephone line is normally associated with the data set. Operation of the exclusion key is required to transfer the line to the telephone set. In either case, a closure on the MI and MIC leads indicates the voice mode. (See Attachment B for further details.)

3.507 RJ37X

Jack RJ37X is used for providing two line service with exclusion. The jack is wired to provide a bridged connection to the tip and ring conductors of two telephone lines with exclusion on line 1 (Fig. 34).

3.508 RJ38X (Subject to effective tariffs and/or rulemaking)

Jack RJ38X provides a series connection to the tip and ring conductors of a telephone line identical to those described for RJ31X (Figure 35). However, the jack also provides a continuity circuit between pins 2 and 7 which is used as an indication that the plug of the registered equipment is engaged with the jack. The

jack is wired ahead of all station equipment electrically; and is typically used with registered alarm dialers. Conductors 3 and 6 are reserved for Telephone Company use.

3.6 Miniature 8-position keyed jack

The miniature 8-position keyed jack is intended for single line data applications. The miniature 8-position plug of data equipment has a convex key to prevent the inadvertent insertion of a data plug into a jack intended for voice equipment. This jack provides bridged connections to the tip and ring conductors of a telephone line. Except for the key, this jack is physically the same as the miniature 8-position jack described previously.

The positions are numbered as shown in Figure 5. Registered fixed loss loop (FLL) data equipment accesses the network via positions 1 and 2. Registered programmed (P) data equipment (or permissive -9dBm equipment) accesses the network via the network (R lead) ring conductor in position 4 and the network (T lead) tip conductor in position 5. The programming resistor for programmed data equipment appears across positions 7 and 8. The Mode Indication (MI) and Mode Indication Common (MIC) leads appear across positions 3 and 6. These leads are for use with an exclusion key telephone set as described in Attachment B.

3.601 RJ41S and RJ45S

RJ41S is a single line universal data jack normally associated with fixed loss loop (FLL) or programmed (P) data equipment. This jack is shown schematically with pin assignments in Figure 36. A switch, accessible to the customer, is provided to select FLL or P type of operation. (FLL equipment transmits at $-4 \pm 1\text{dB}$ with respect to one milliwatt and a pad is included in the data jack so that pad loss plus loop loss is nominally 8dB. Programmed data equipment adjusts its output power in accordance with a programming resistor in the data jack. By these means, signals from either FLL or P types of registered data equipment will arrive at the local telephone company central office at a nominal -12dB with respect to one milliwatt for optimum data transmission). Figure 37 shows physical appearance of the RJ41S. A sliding cover is provided to keep dirt and dust from entering the jack when it is not in use. The FLL - P switch to select the desired method of operation is shown. Two matte surfaces are provided on the housing of the jack for the telephone company installer to write in the loop loss (designated LP L) and the telephone line number, (designated T LN).

RJ45S is a single line data jack normally associated with programmed (P) data equipment. This jack is shown schematically with pin assignments in Figure 38. This jack is the same as the

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universal data jack RJ41S described above, except that the pad for fixed loss loop (FLL) equipment and the switch to select FLL or P type of operation are omitted. Its appearance is the same as RJ41S shown in Figure 37 except that RJ45S does not have the FLL - P switch.

Both jacks provide bridged connections to the tip and ring of a telephone line and provide mode indication leads for use with exclusion key telephone sets when required. The exclusion key telephone set requires a series jack RJ36X (described under 8 position jacks) as its normal means of connection. Attachment B describes the operation of a Multi-Function telephone set, USOC RTC, with an exclusion key, that can be provided by Bell Operating Companies and lists options to be specified by the customer.

3.602 RJ41M and RJ45M

A multiple mounting arrangement for mounting a number of RJ41S or RJ45S Single Line Universal or Programmed data jacks as shown in Figure 39 is available. The Telephone Companies will implement USOCs and RJ41M and RJ45M with RJM2X (which is the USOC for a mounting arrangement) and the appropriate number of RJ41S or RJ45S single line data jacks as required by the customer. The mounting arrangement will accommodate up to 16 single line data jacks. This arrangement in effect, provides the features of a patch panel. The user has complete flexibility in patching the cord and plug from any modem to any line. The arrangement can be mounted on a wall or on 19 or 23 inch relay racks.

ATTACHMENT A

Various references pertaining to the FCC Registration Program are listed below:

- *(a) Bell System Communications Technical Reference - PUB 47001 -
Electrical Characteristics of Bell System Network Facilities at
the Interface With Voiceband Ancillary and Data Equipment
- *(b) Bell System Communications Technical Reference - PUB 47002 -
Electrical Characteristics of Bell System PBX and Key Equipment
at the Interface With Voiceband Ancillary and Data Equipment
- *(c) Bell System Voice and Data Communications Technical Reference -
PUB 47101 - Standard Plugs and Jacks
- *(d) Bell System Communications Technical Reference - PUB 48001 -
Functional Product Class Criteria - Automatic Answering Devices.
- *(e) Bell System Communications Technical Reference - PUB 48002 -
Functional Product Class Criteria - PBX.
- *(f) Bell System Communications Technical References - PUB 48003 -
Functional Product class Criteria - Alarm Dialing Systems.
- *(g) Bell System Communications Technical Reference - PUB 48004 -
Functional Product Class Criteria - Ancillary Repertory Dialer.
- ***(h) Part 68 of Chapter I of Title 47 of the Code of Federal
Regulations
- *(i) Technical Description - Bell System Miniature Plugs and Jacks,
August, 1976

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*(j) Description of Standard Registration Program connection configurations supplementing configurations described in subpart F of Part 68 of the FCC Rules and Regulations.

*These references can be purchased by writing:

American Telephone and Telegraph Company
Information Distribution Center -
Technical References Room C190
P.O. Box 3513
New Brunswick, NJ 08903

**This publication can be obtained by writing to:

Superintendent of Documents
Government Printing Office
Washington, DC 20402

Telephone Set Associated with Registered Data Equipment

The FCC Registration Program contemplates that a data station arrangement will be registered as an entity with all its components. Thus, if a station arrangement is to include an item such as an associated telephone set, it would be included as part of the station package and registered in that configuration and the complete assembly equipped with the proper cord to interface with the telephone company provided jack. However, if requested, the telephone company will provide an exclusion key type telephone set connected through a series jack (USOC RJ36X) ahead of the jack for the data equipment. This set is called a multi-function telephone set, USOC RTC, and is described below. It provides an indication to the data equipment when the telephone set is in the voice mode or as an alternate arrangement, it provides an indication that the telephone set is off-hook only.

Multi-Function Telephone Set - USOC RTC

Upon customer request, the telephone company can provide the same multi-function exclusion key telephone set that was offered under USOC CBY with Automatic Data Access Arrangements CBS and CBT. For registered data equipment applications, this set is offered as USOC RTC. Both Rotary and TOUCH-TONE dial arrangements are available. The telephone

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set will be connected by means of a series jack (RJ36X) ahead of the data jack as shown in block diagrams in Figures 1 and 2 of this attachment. The telephone set can provide a mode indication to the data equipment through the MI (Mode Indicator) and MIC (Mode Indicator Common) pins of the data jack. This indication is accomplished by means of contacts on the exclusion key and switchhook which together provide a closure when the telephone set is conditioned for talking and the line is therefore unavailable for the data equipment. (As an alternate arrangement, the telephone set can be wired for "switchhook indication only." With this wiring option, the exclusion key contact mentioned is bypassed and a closure across MI and MIC means only that the telephone set is off-hook.)

The multi-function telephone set is capable of monitoring (on a high impedance basis) call progress tones as well as recorded voice answerback messages from the far end without the need for the switching from data to the voice mode. This feature, called Aural Monitoring, is accomplished by means of a high impedance bridging transformer while the telephone set is off-hook and in the data mode.

There are two control arrangements known as "data equipment controls line" and "telephone set controls line", which are customer options and are discussed in the following two paragraphs.

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When the multi-function telephone set is optioned for data equipment control of the line, calls are answered or originated with the telephone set by lifting the handset off-hook and operating the exclusion key. Calls may be answered or originated by the data equipment via the jack for the data equipment without removing the handset from its cradle. Lifting the handset off-hook (and not operating the exclusion key) will bridge the telephone receiver across the telephone line to provide the aural monitor feature. The bridging feature allows the telephone handset to be used for private listening of line signals while minimizing coupling to the line from the handset which might otherwise interfere with data transmission. Calls may be disconnected when the telephone set is in the talk mode by placing the handset in the cradle, but calls held up by the data equipment can be terminated only by the data equipment. When the exclusion key is operated on the telephone set, data transmission is interrupted. A diagram showing interconnection of the multi-function telephone set, data jack, and line is shown in Figure 1 of this Attachment for the data equipment control of the line option. The make contact on the exclusion key and a make contact on the switchhook are connected in series and then to the mode indication leads of the data jack. As discussed earlier, a closure on the mode indication leads indicates that the telephone set is conditioned for talking and that the line is unavailable for the data equipment. (When the switchhook indication only option is chosen, the exclusion key contact mentioned is bypassed and a closure across MI and MIC means only that the telephone set is off-hook).

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When the telephone set is optioned for telephone set control of the line, calls are answered or originated with the telephone by lifting the handset off-hook. Operating the exclusion key transfers the line to the data equipment via the jack for the data equipment and activates the aural monitor feature. For automatic answer operation, control of the line may be transferred to the data equipment by lifting the handset off-hook and lifting the exclusion key. Calls may then be answered, originated, and terminated by the data equipment through the data jack. To terminate a call with the exclusion key up, either the telephone handset is replaced on the cradle (automatically resetting the exclusion key and breaking the connection) or the data equipment disconnects and releases the line. With the exclusion key down, the telephone set is hung up in the usual manner. The break contact of the exclusion key and a make switchhook contact are connected in series and then to the mode indicator contacts of the data jack, and, as mentioned, a closure indicates that the line is unavailable for data transmission. This is termed the "Voice Mode Indication" option below. (With the "switchhook indication only" option, the exclusion key contact mentioned is bypassed and a closure across MI and MIC means only that the telephone set is off-hook.) The interconnection of the multi-function telephone set, the data jack, and the telephone line, are shown in Figure 2 of this Attachment for the telephone set control of the line option.

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The customer must specify whether the data set or the telephone is to control the line, whether the aural monitoring feature is desired and when the switchhook indication only option is desired. The USOC RTC has been assigned to the multi-function telephone set and customer options for this USOC are listed below:

- A1 - Telephone set controls line
- A2 - Data set controls line
- B3 - Aural monitoring not provided
- B4 - Aural monitoring provided
- C5 - TOUCH-TONE® Dial
- C6 - Rotary Dial
- D7 - Switchhook Indication Only
- D8 - Voice Mode Indication

Bridged Telephone Set

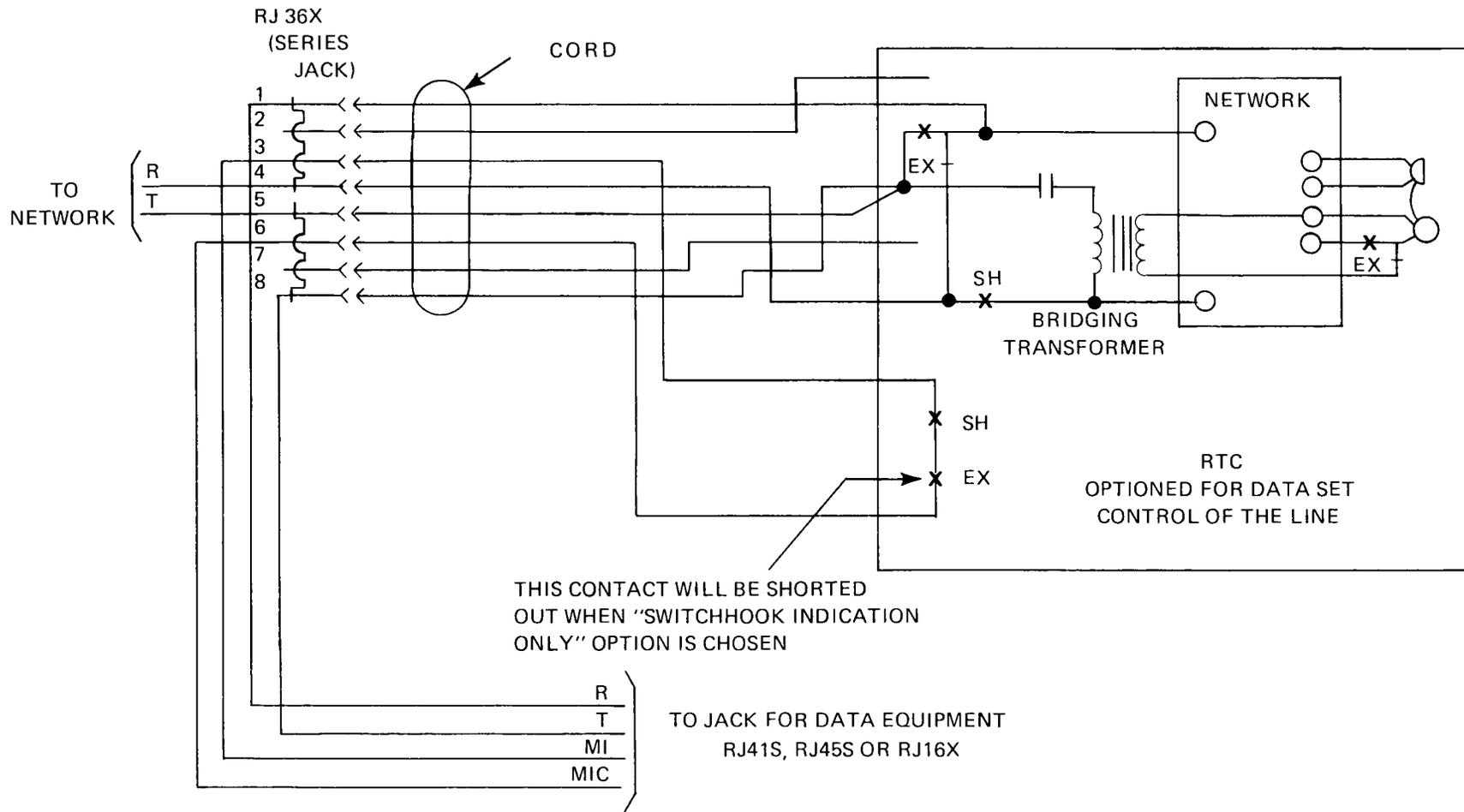
When the customers request a telephone set ahead of data equipment, an exclusion key telephone set as described in the preceding paragraphs is strongly recommended. This is because room noise and switchhook operation can cause data errors if an ordinary bridged telephone set is used. Also, calls can be dropped if the transfer between talk and data modes is not carefully coordinated. If a customer is aware of the possible problems and feels that by careful training of operators, a

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bridge telephone set will be used properly, the telephone companies will not deny such a request. However, to minimize the problem of persons picking up the phone while data is being transmitted, the bridged telephone will be located within sight of the data equipment and not more than about 6 feet from the data equipment.

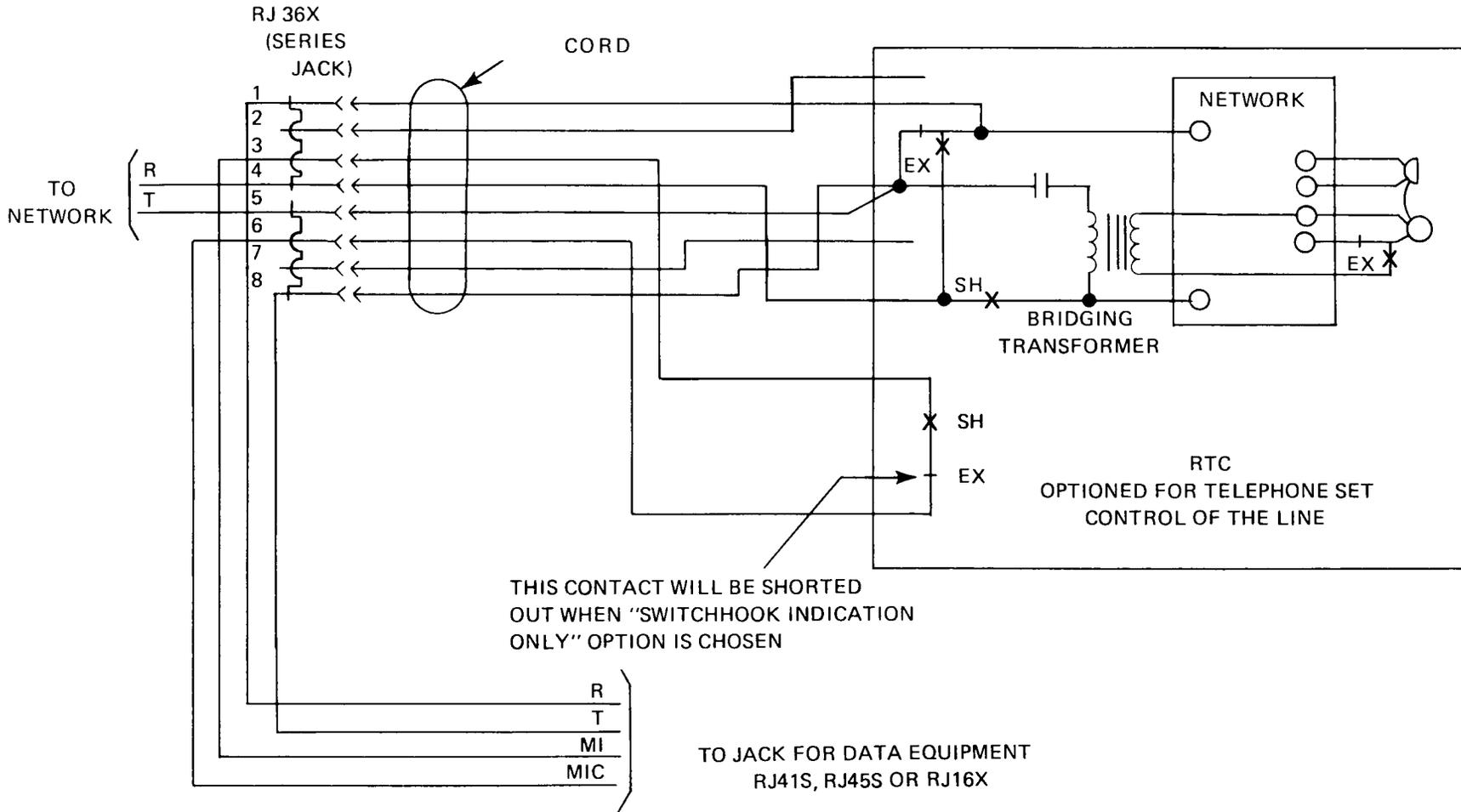
MULTI-FUNCTION TELEPHONE SET (RTC)



ATTACHMENT B

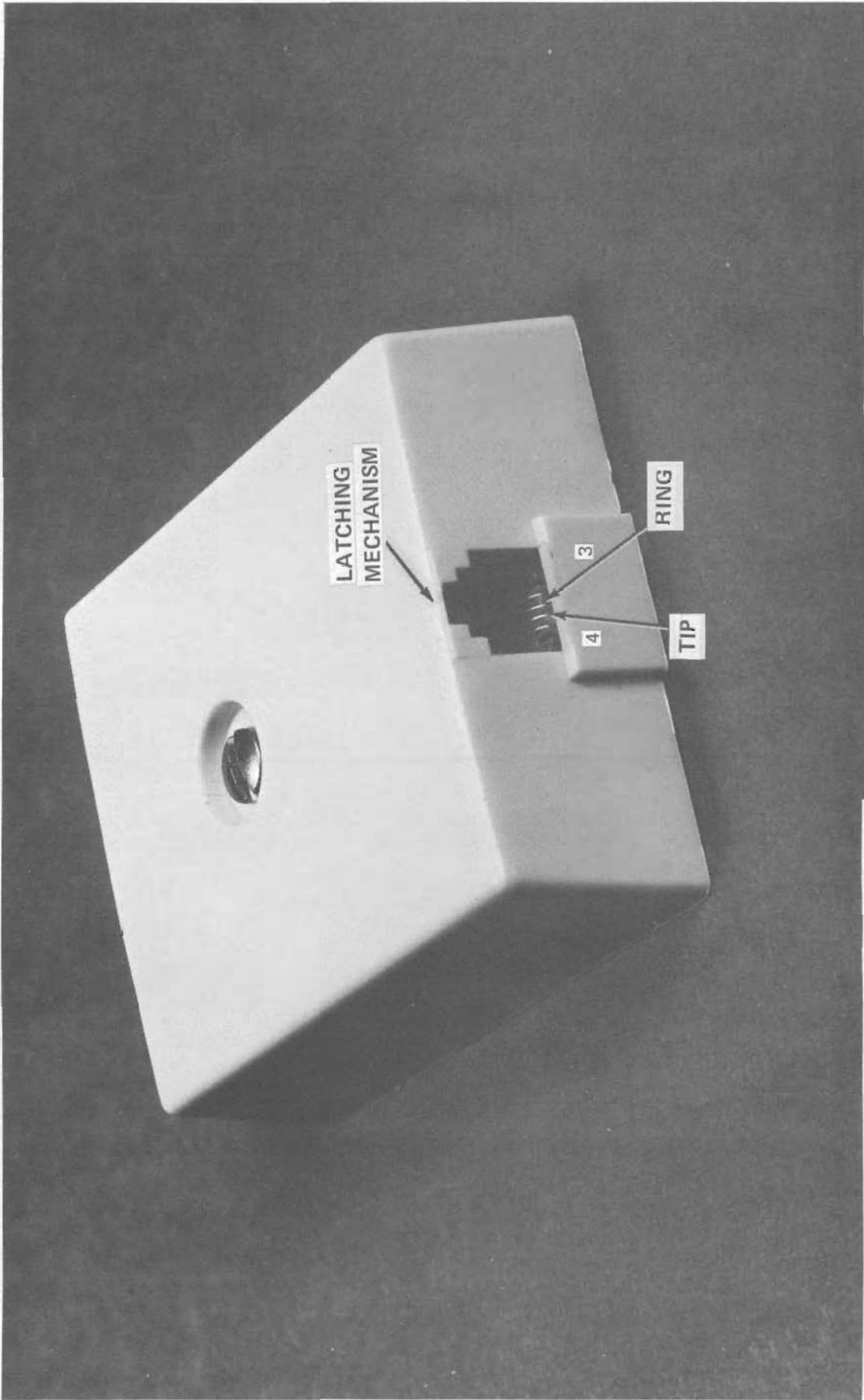
FIGURE 1

MULTI-FUNCTION TELEPHONE SET (RTC)



ATTACHMENT B

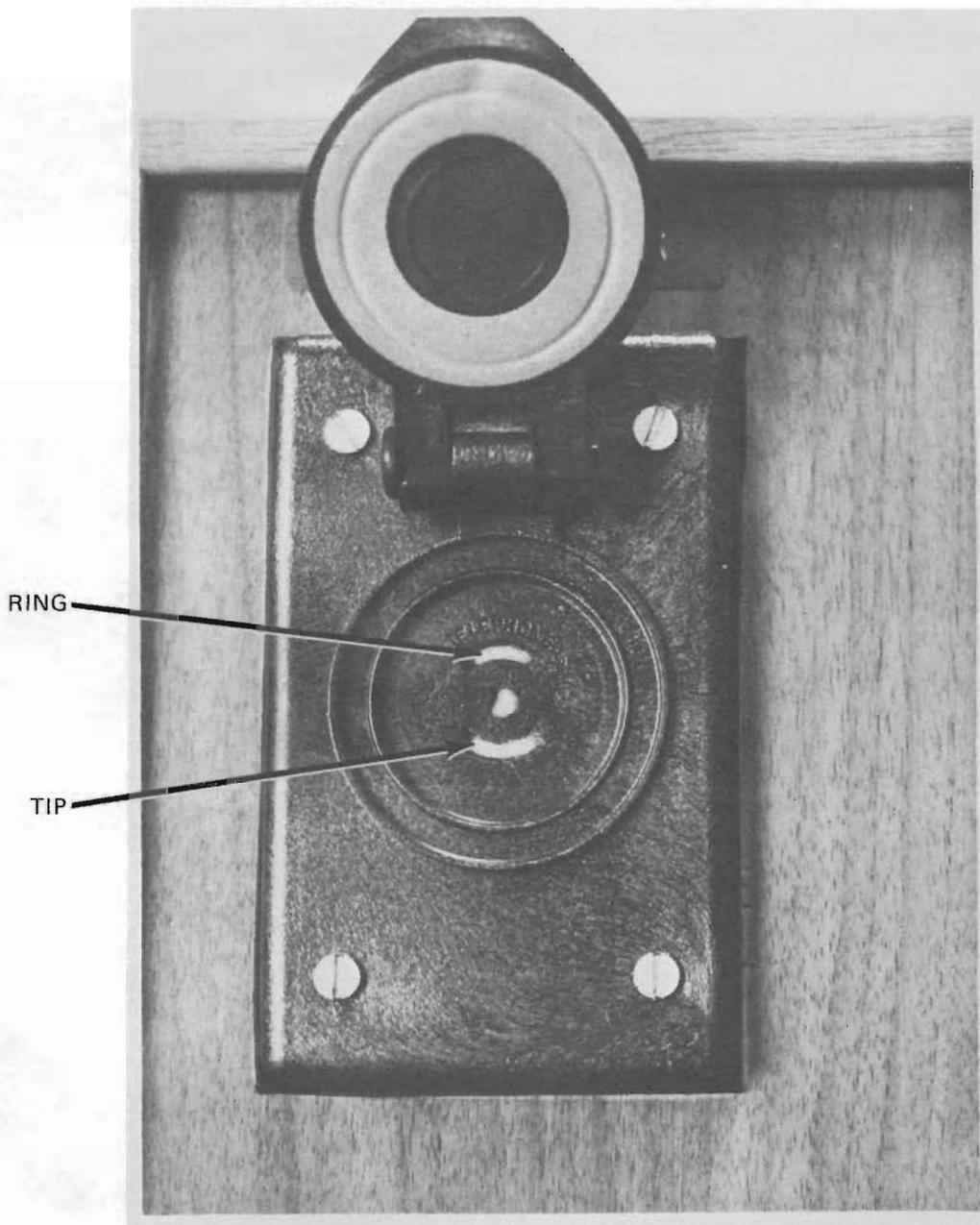
FIGURE 2



MINIATURE 6 - POSITION JACK

FIG. 1

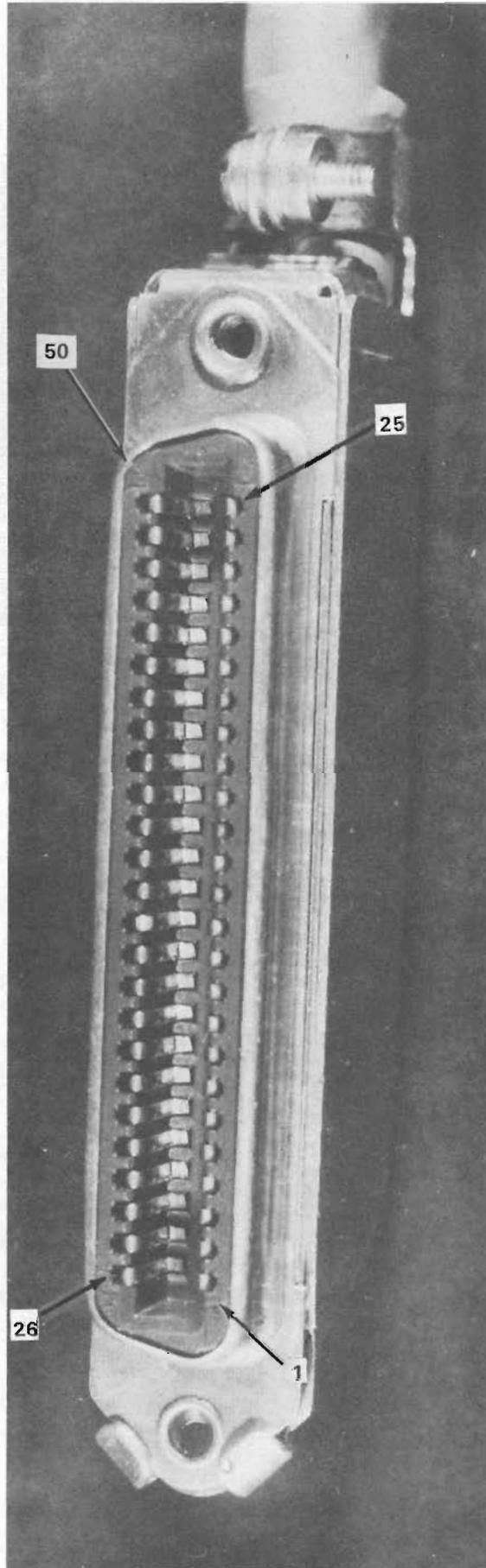
PRELIMINARY



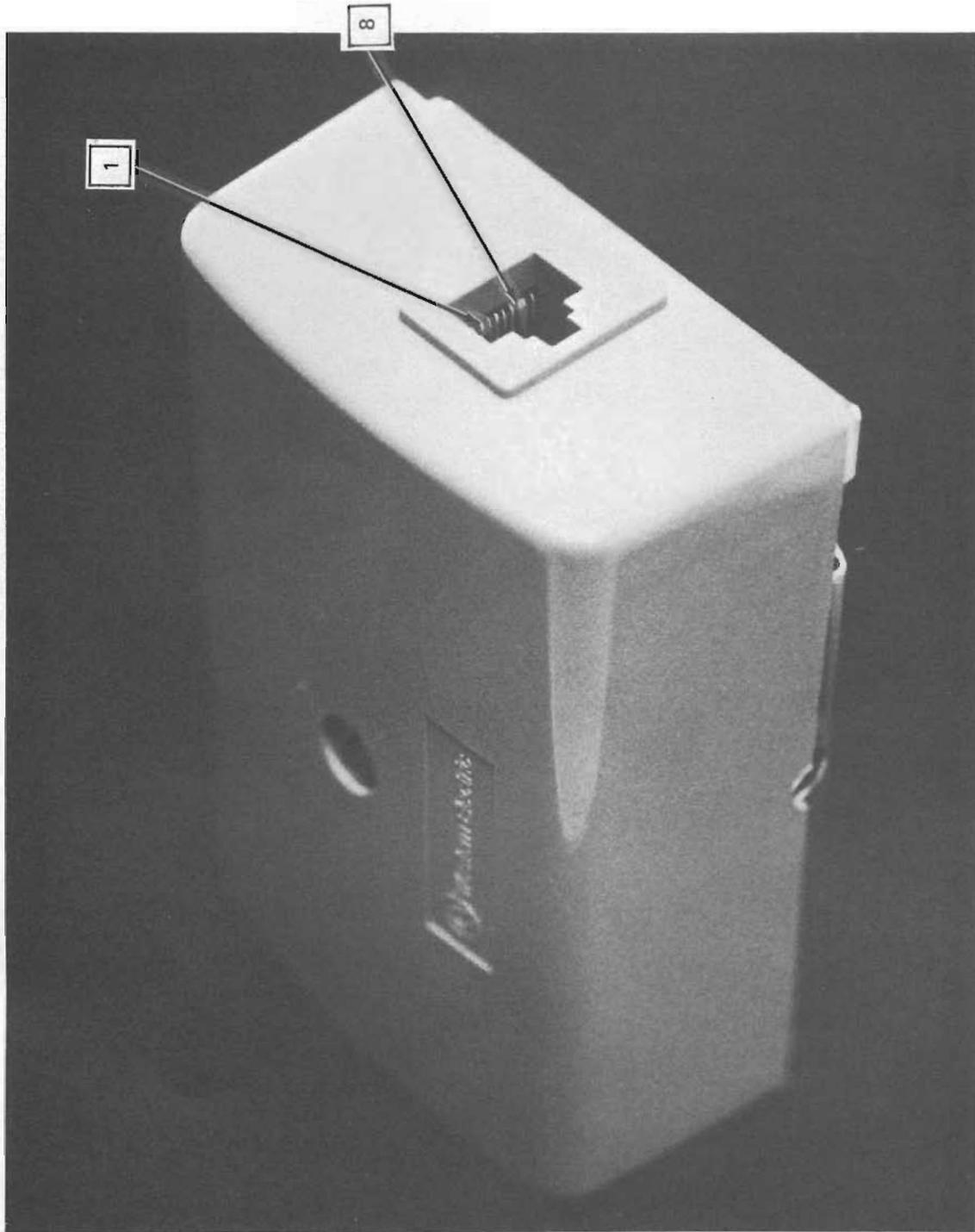
WEATHERPROOF JACK

FIGURE 2

PRELIMINARY

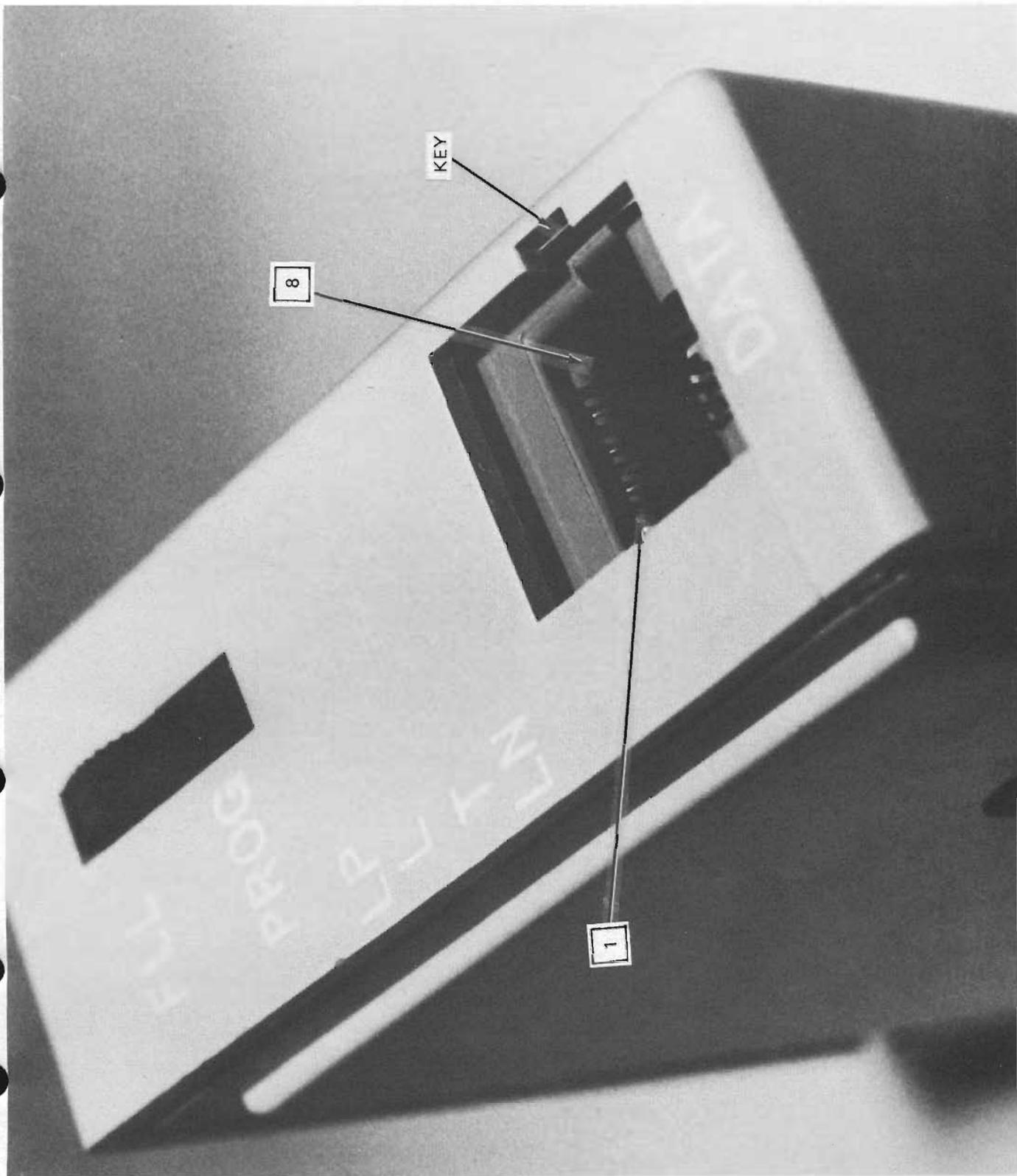


50- POSITION MINIATURE RIBBON JACK
FIGURE 3



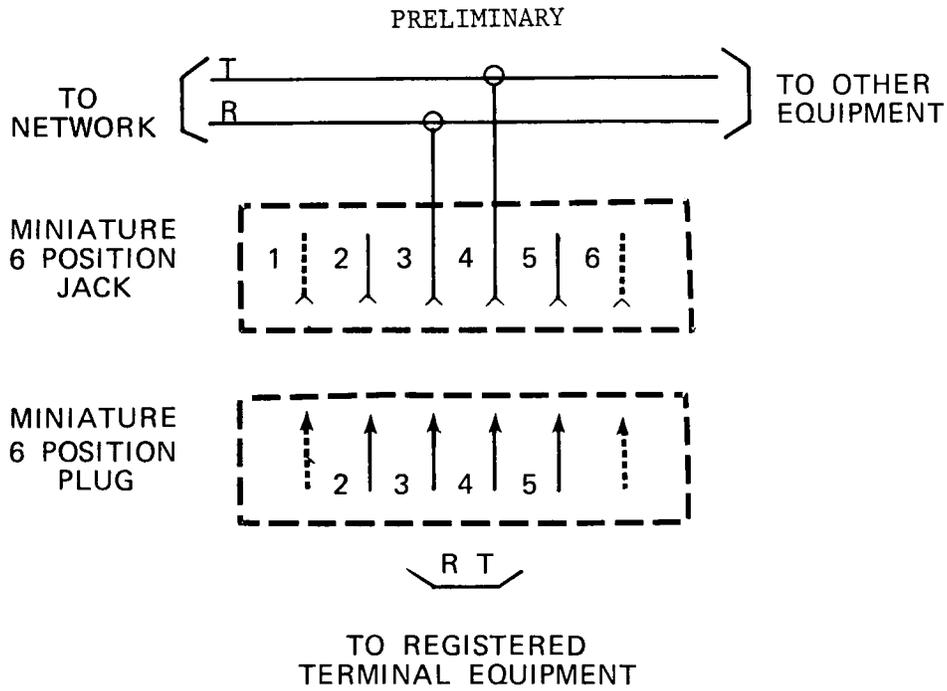
MINIATURE 8-POSITION SERIES JACK

FIGURE 4

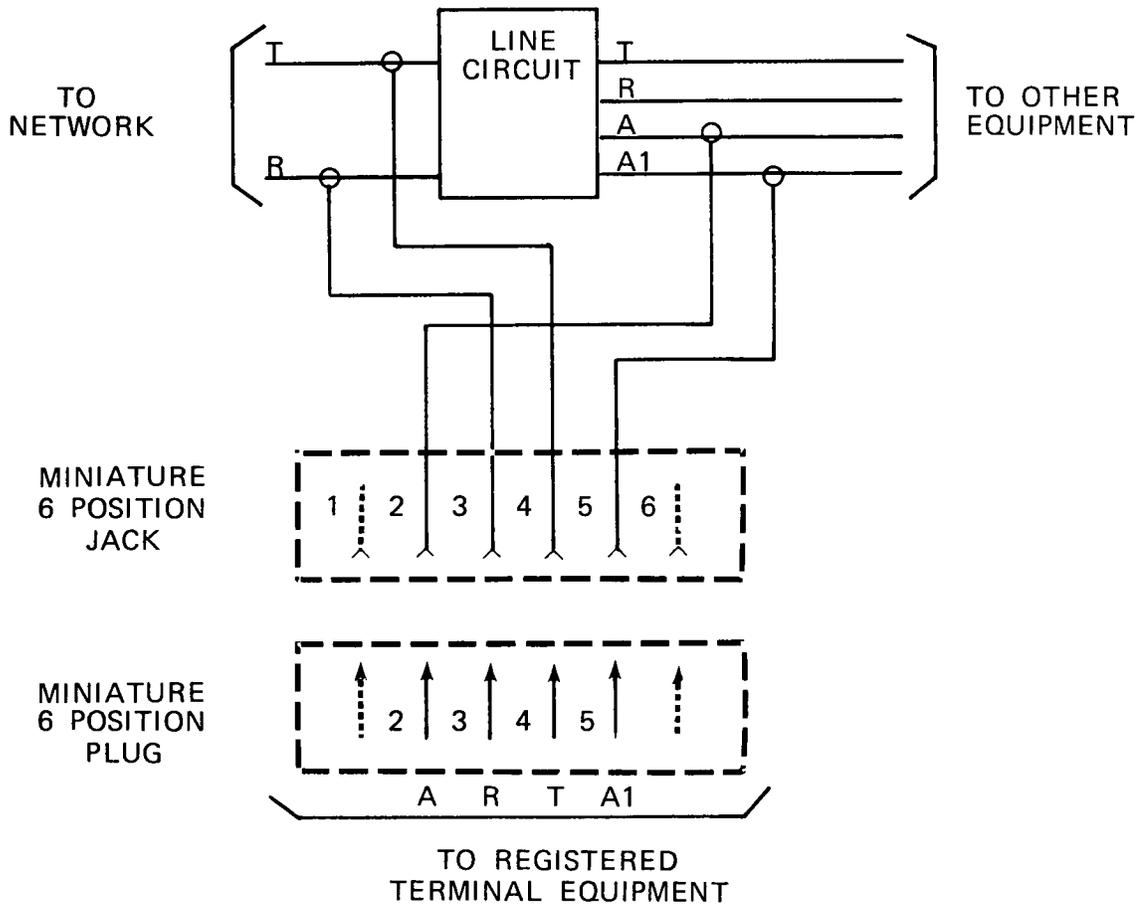


MINIATURE 8-POSITION KEYED JACK

FIGURE 5

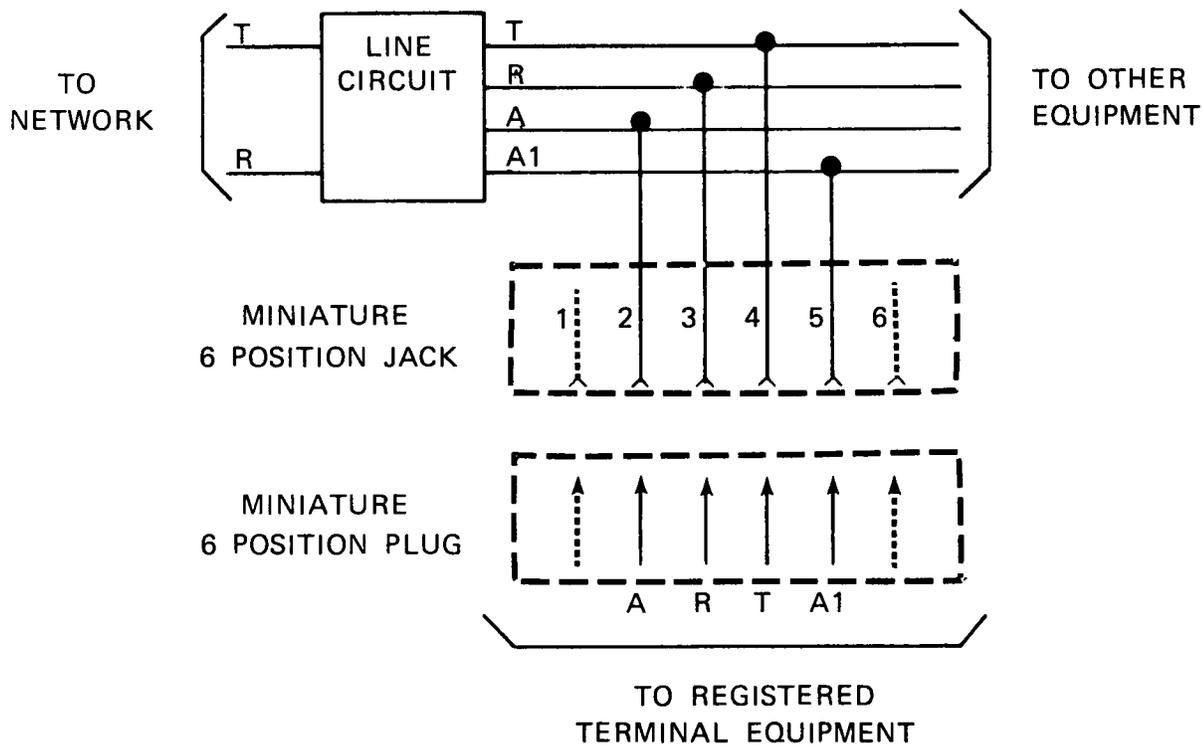


SIMPLIFIED SCHEMATIC – JACKS RJ11C AND RJ11W
FIGURE 6



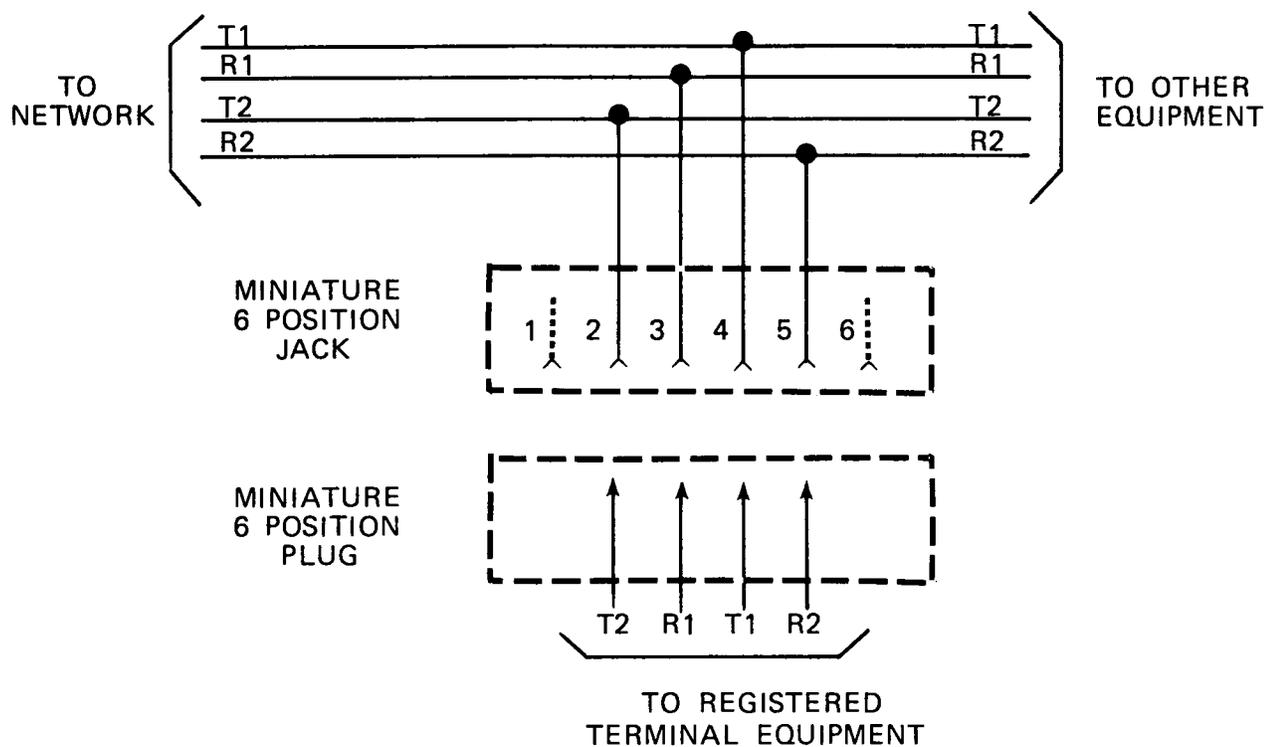
SIMPLIFIED SCHEMATIC – JACKS RJ12C AND RJ12W
FIGURE 7

PRELIMINARY



SIMPLIFIED SCHEMATIC — JACKS RJ13C AND RJ13W
FIGURE 8

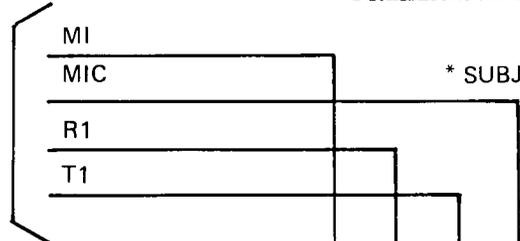
PRELIMINARY



SIMPLIFIED SCHEMATIC - JACKS RJ14C AND RJ14W
FIGURE 9

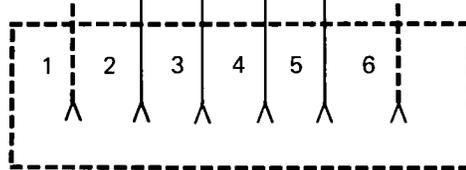
PRELIMINARY

TO SERIES JACK SUCH AS RJ36 (NOTE)



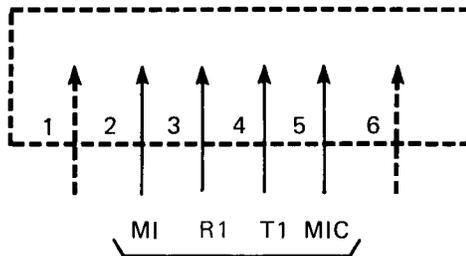
* SUBJECT TO EFFECTIVE TARIFF and/or FCC RULEMAKING

MINIATURE 6 POSITION JACK



MI = MODE INDICATION
MIC = MODE INDICATION COMMON

MINIATURE 6 POSITION PLUG

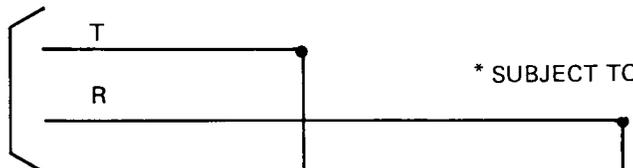


NOTE:
MI AND MIC LEADS ARE TYPICALLY WIRED TO AN RJ36X SERIES JACK WHICH CAN BE USED TO CONNECT AN EXCLUSION KEY TELEPHONE SET AHEAD OF THE DATA EQUIPMENT.

TO REGISTERED TERMINAL EQUIPMENT

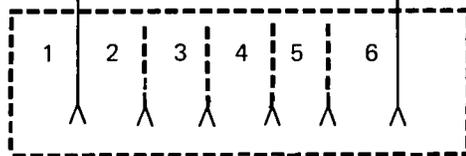
SIMPLIFIED SCHEMATIC - JACK RJ16X
Figure 10

TO NETWORK

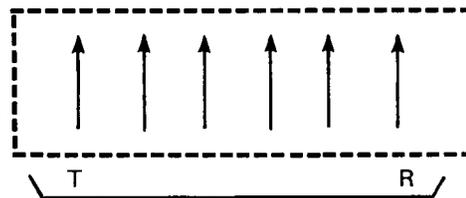


* SUBJECT TO EFFECTIVE TARIFF and/or FCC RULEMAKING

MINIATURE 6 POSITION JACK



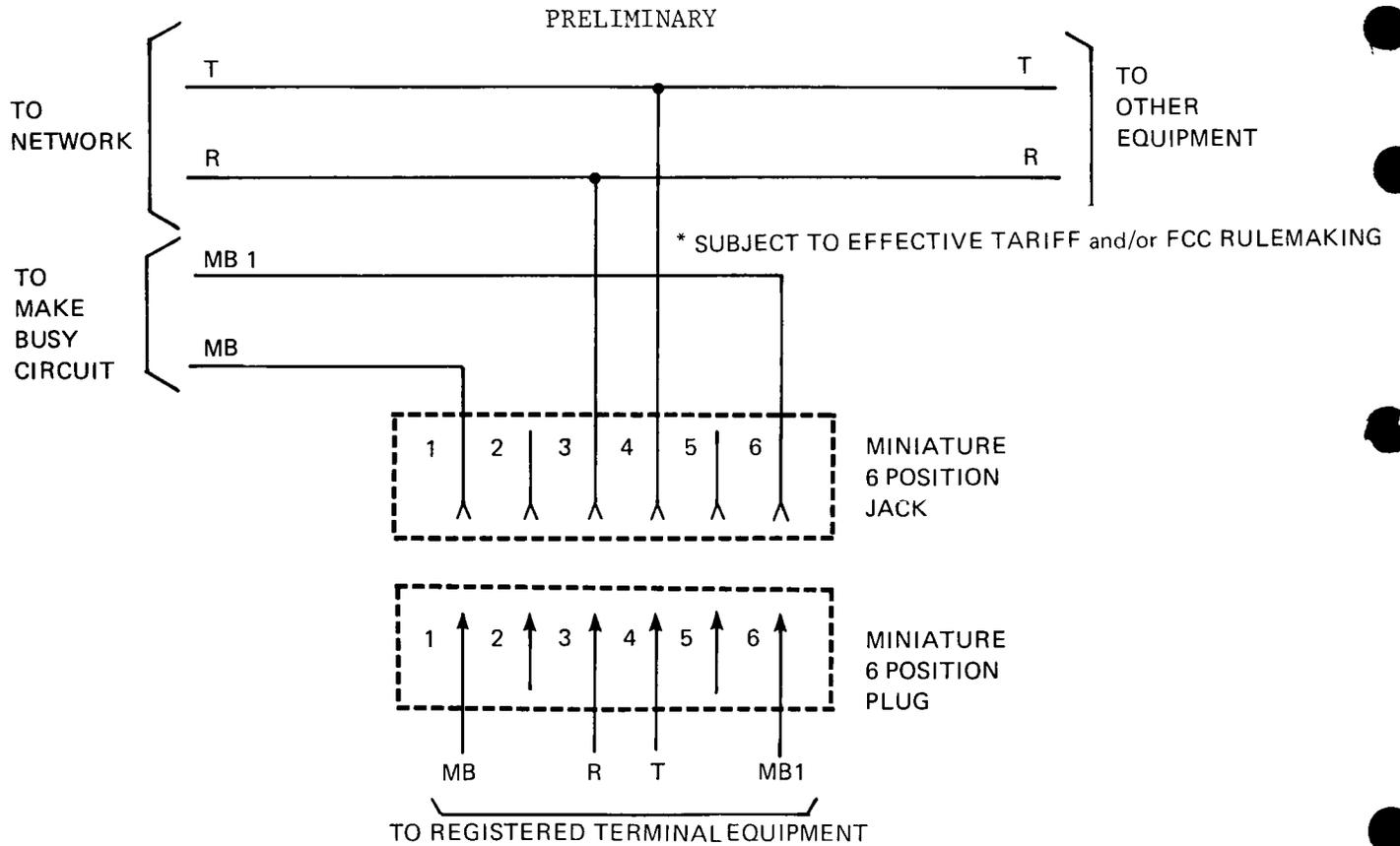
MINIATURE 6 POSITION PLUG



NOTE:
EQUIPMENT MUST COMPLY WITH ARTICLE 517 OF THE NATIONAL ELECTRIC CODE.

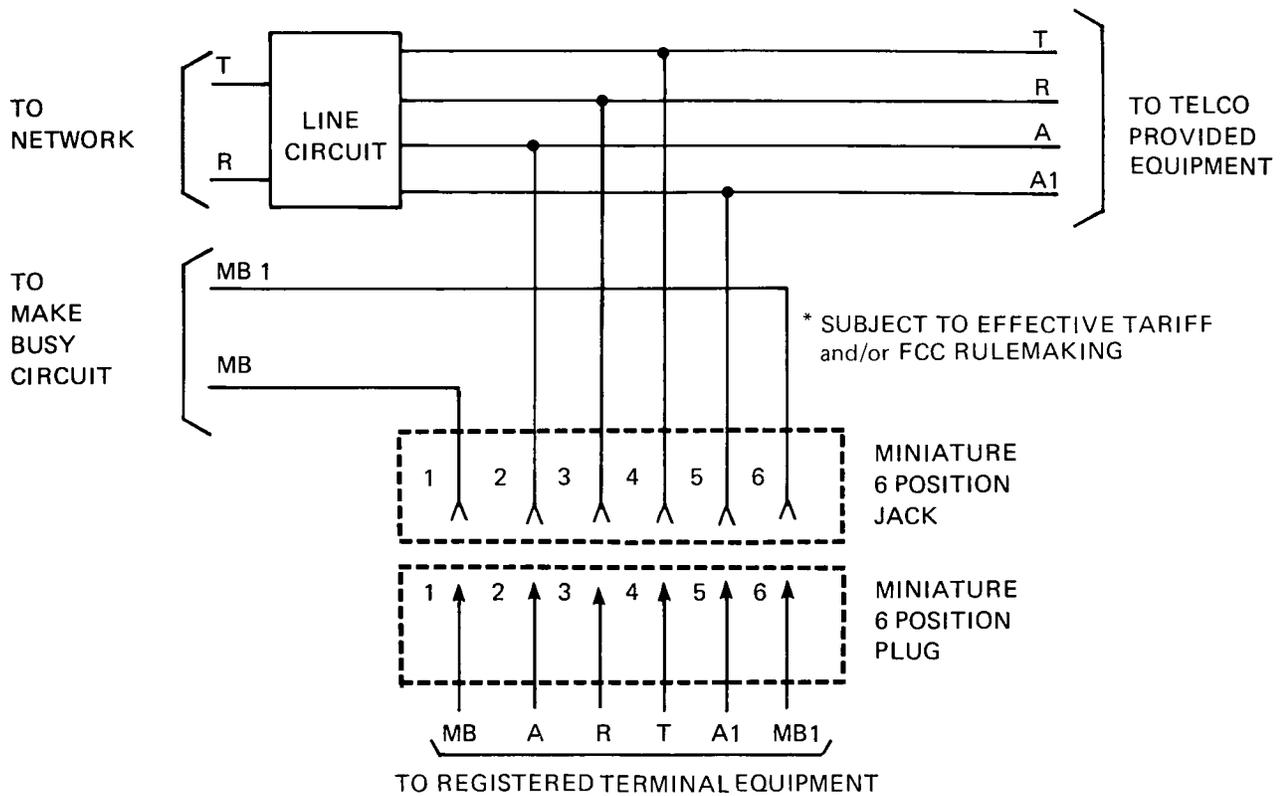
TO REGISTERED TERMINAL EQUIPMENT (NOTE)

SIMPLIFIED SCHEMATIC - JACK RJ17C
Figure 11



SIMPLIFIED SCHEMATIC – JACKS RJ18C

Figure 12

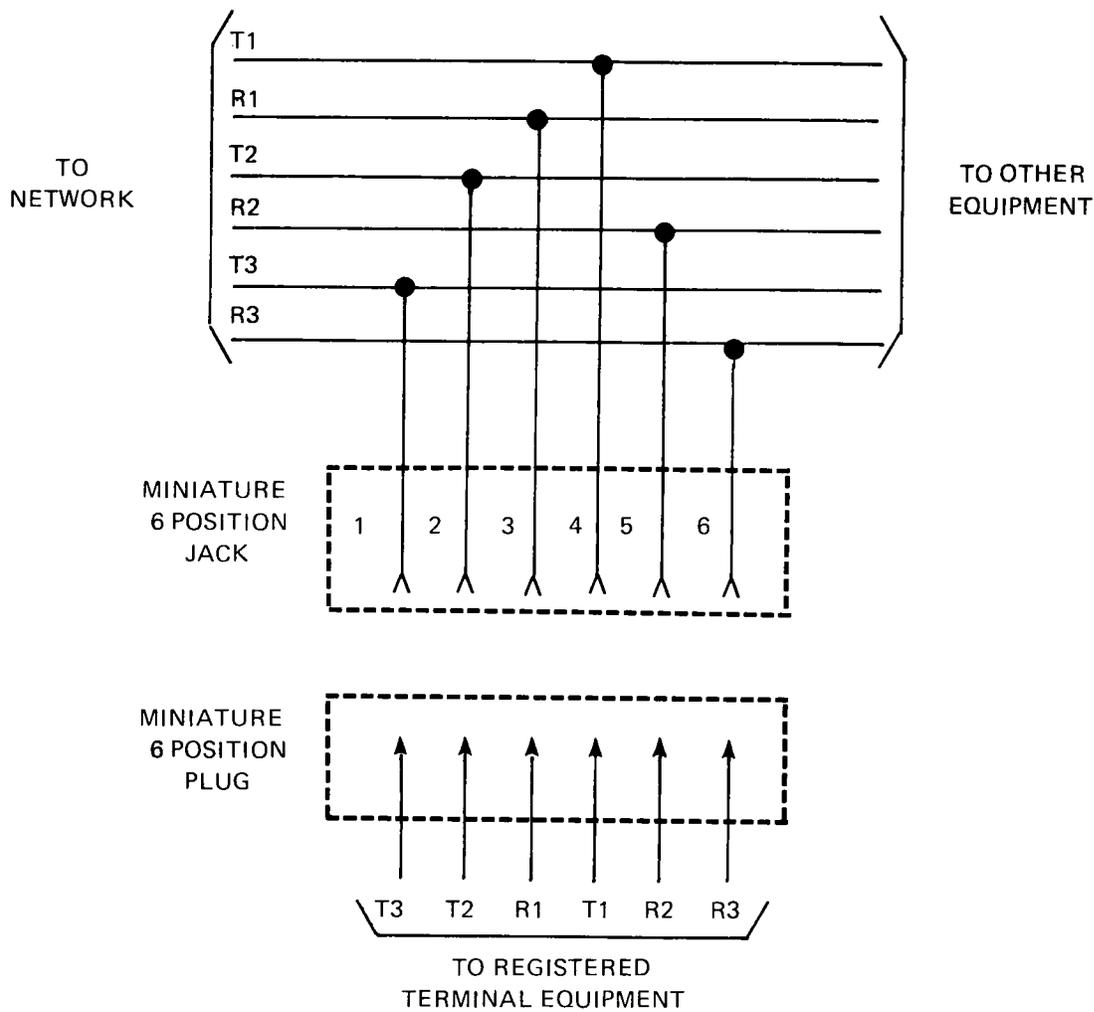


SIMPLIFIED SCHEMATICS – JACKS RJ19C

Figure 13

PRELIMINARY

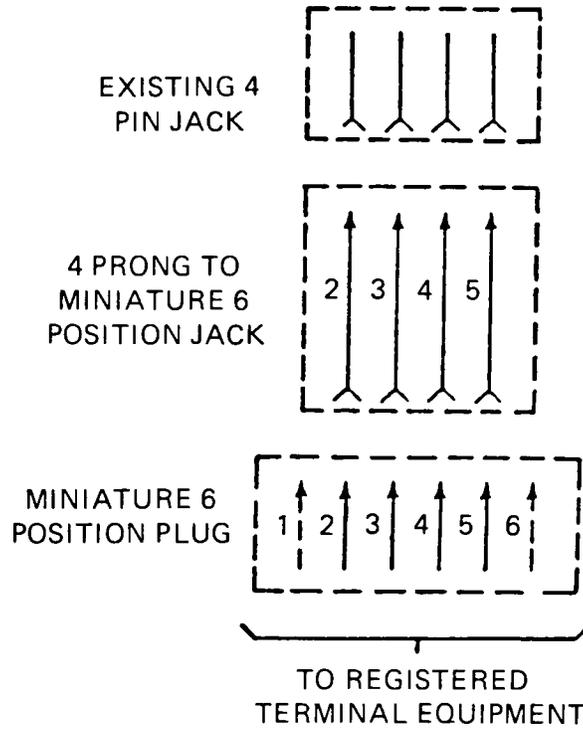
*SUBJECT TO EFFECTIVE TARIFF and / or FCC RULEMAKING



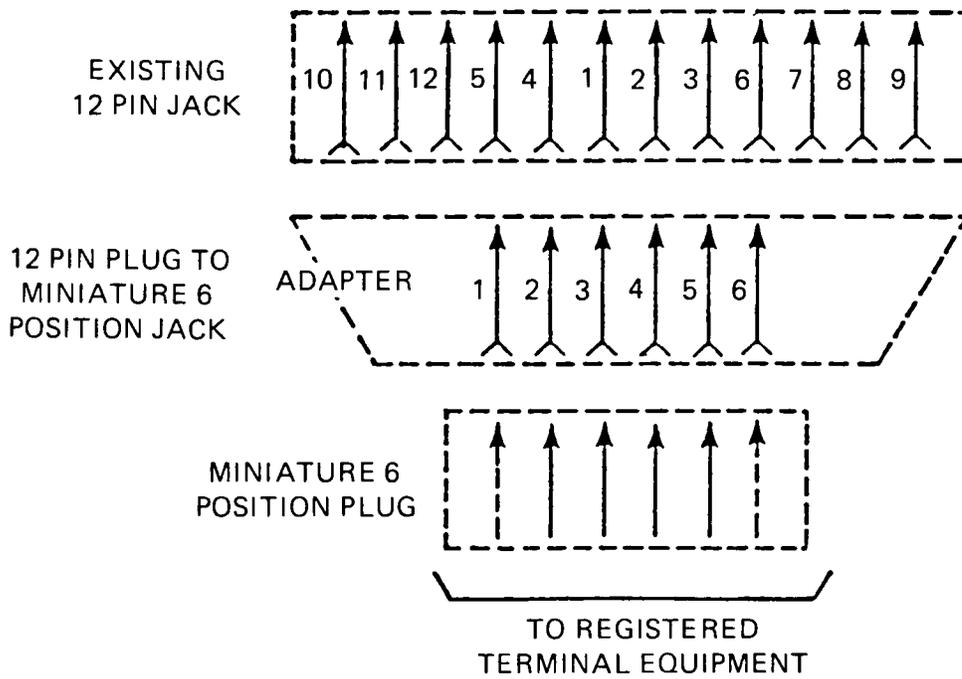
SIMPLIFIED SCHEMATIC – RJ25C

Figure 14

PRELIMINARY

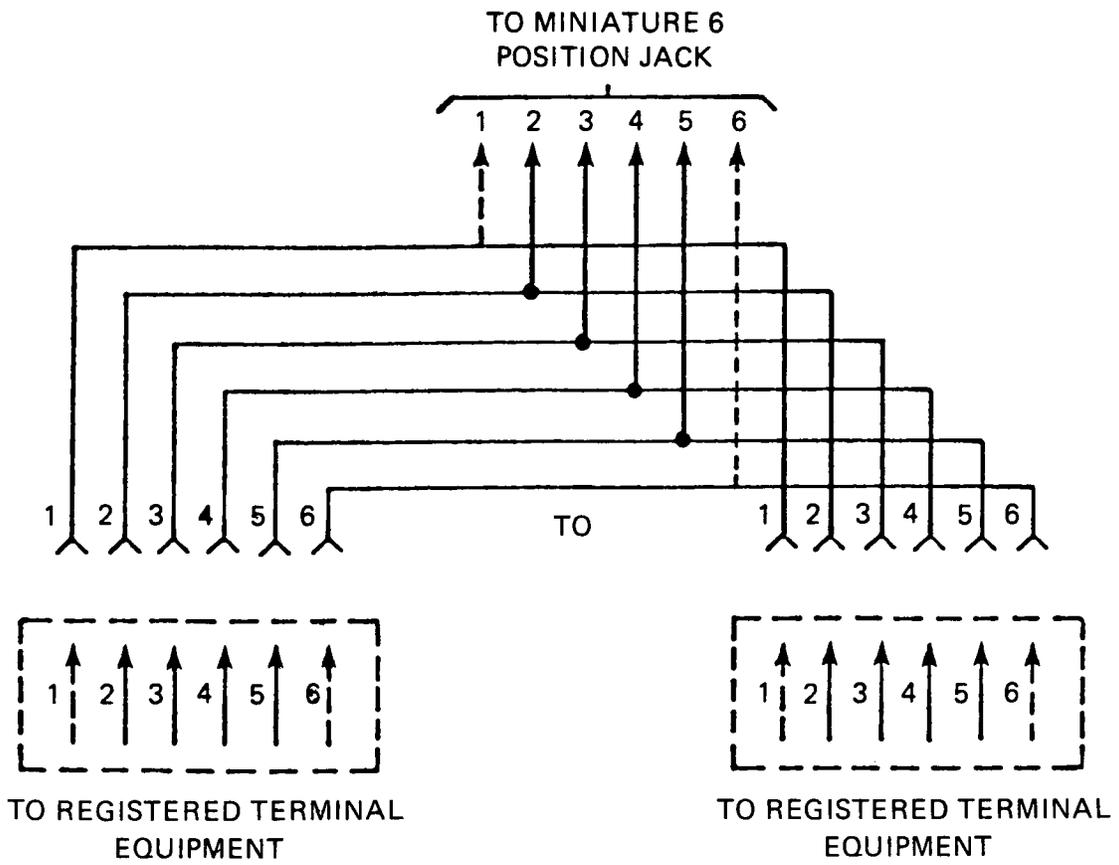


SIMPLIFIED SCHEMATIC – ADAPTER RJA1X
FIGURE 15



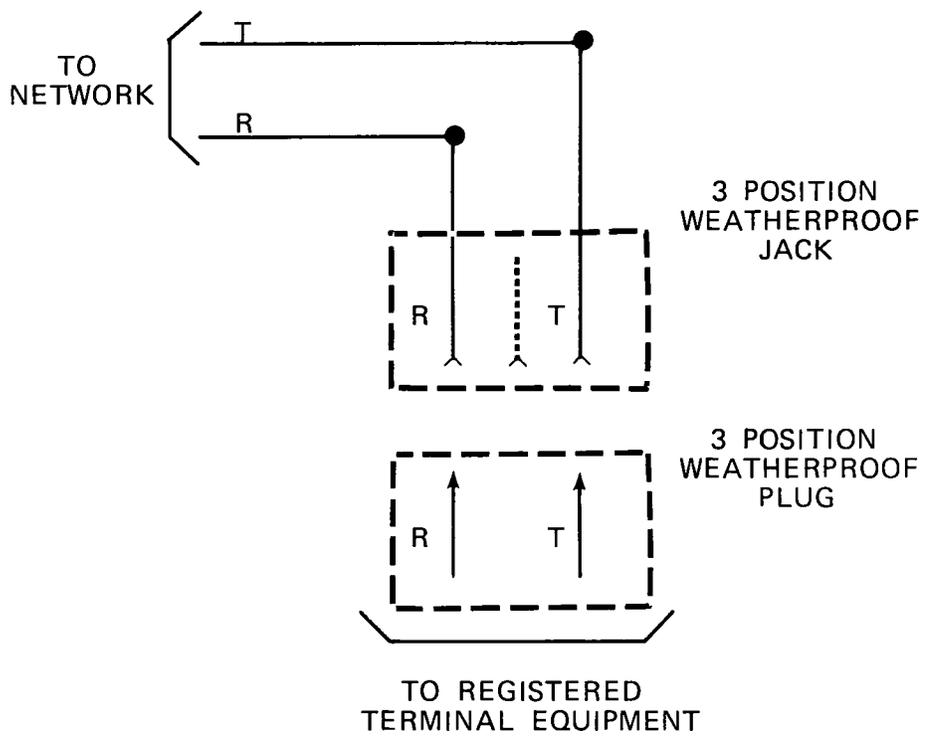
SIMPLIFIED SCHEMATIC – ADAPTER RJA3X
FIGURE 16

PRELIMINARY



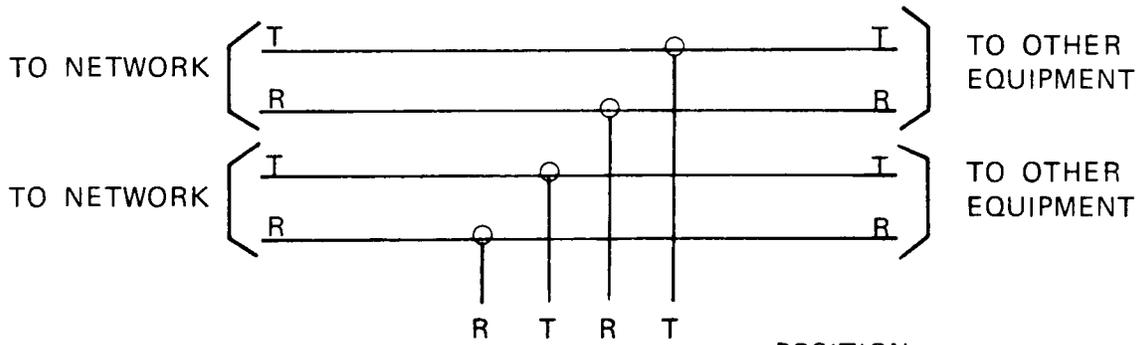
SIMPLIFIED SCHEMATIC – ADAPTER RJA2X
FIGURE 17

PRELIMINARY

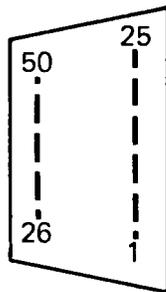


SIMPLIFIED SCHEMATIC - JACK RJ15C
FIGURE 18

PRELIMINARY

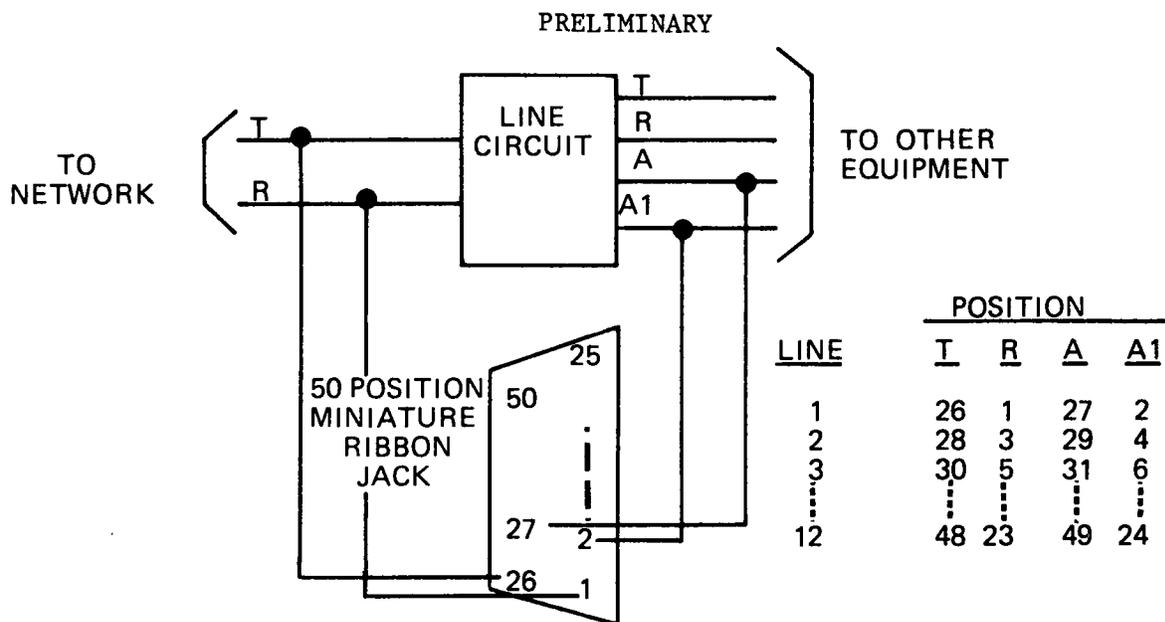


50 POSITION
MINIATURE
RIBBON
JACK

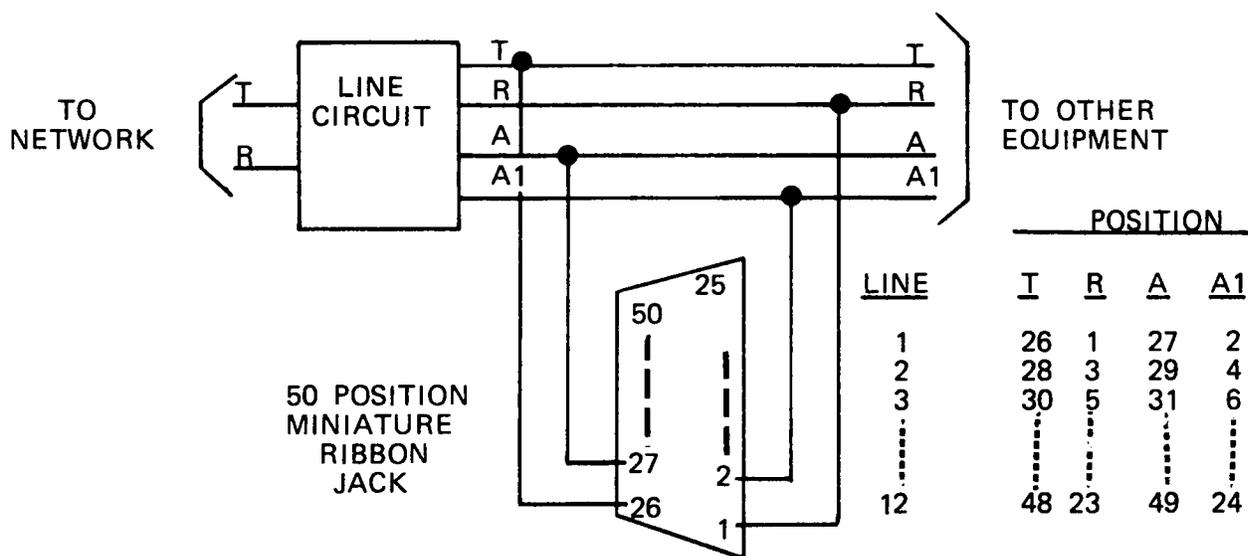


LINE	TIP	RING
1	26	1
2	27	2
3	28	3
25	50	25

SIMPLIFIED SCHEMATIC - JACK RJ21X
FIGURE 19

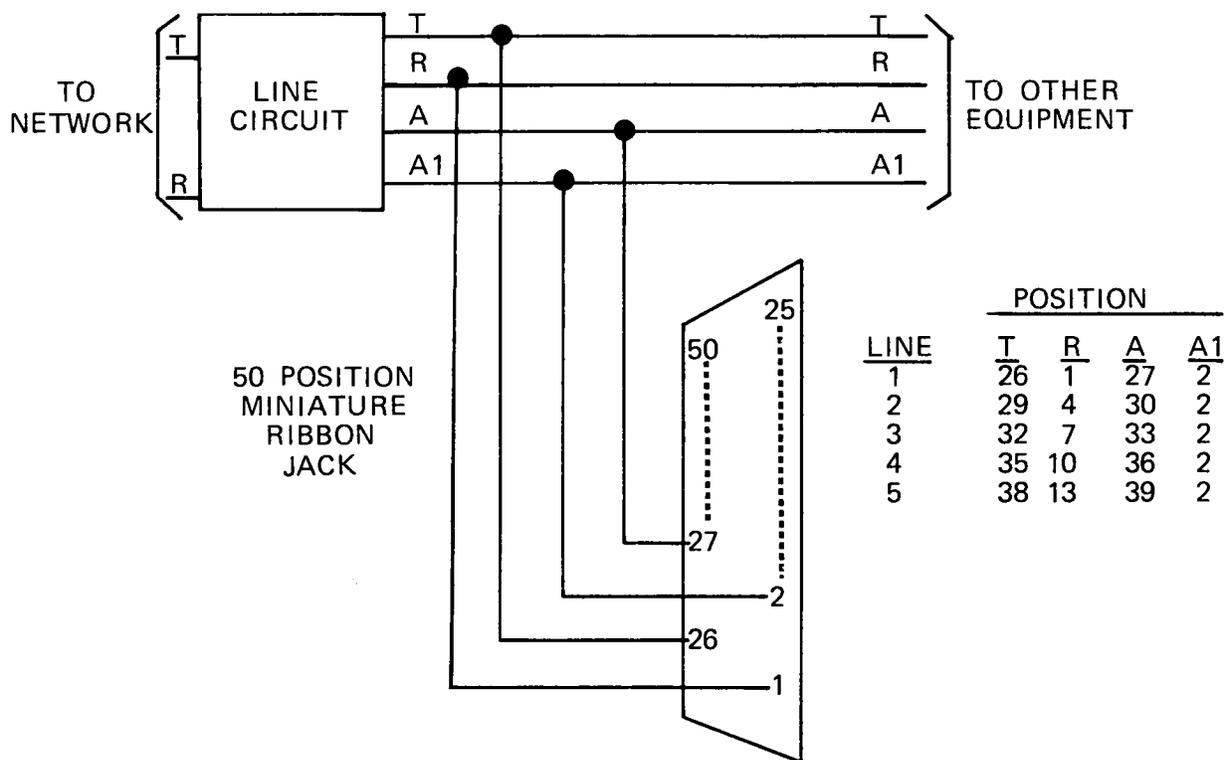


SIMPLIFIED SCHEMATIC – JACK RJ22X
FIGURE 20



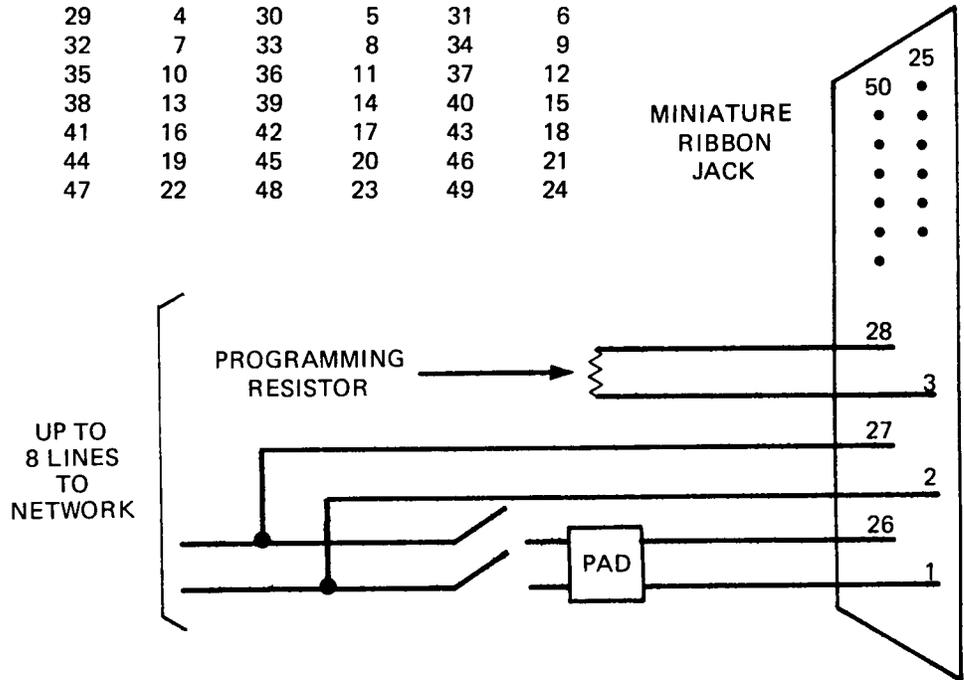
SIMPLIFIED SCHEMATIC – JACK RJ23X
FIGURE 21

PRELIMINARY



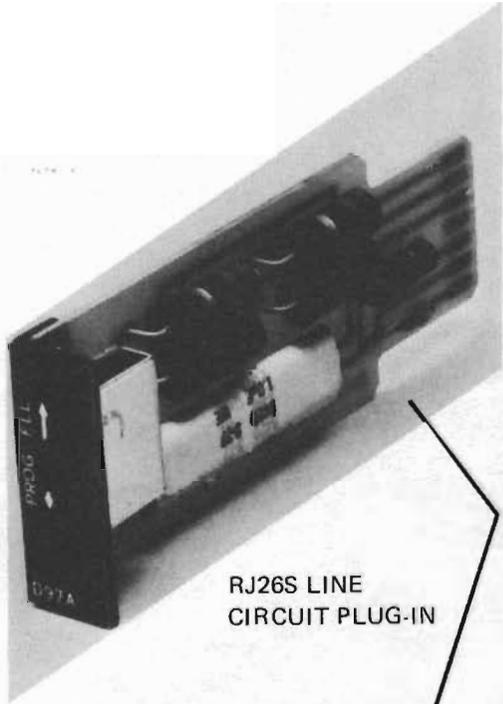
SIMPLIFIED SCHEMATIC - JACK RJ24X
FIGURE 22

LINE	POSITION					
	T (FLL)	R (FLL)	T (P)	R (P)	PR	PC
1	26	1	27	2	28	3
2	29	4	30	5	31	6
3	32	7	33	8	34	9
4	35	10	36	11	37	12
5	38	13	39	14	40	15
6	41	16	42	17	43	18
7	44	19	45	20	46	21
8	47	22	48	23	49	24

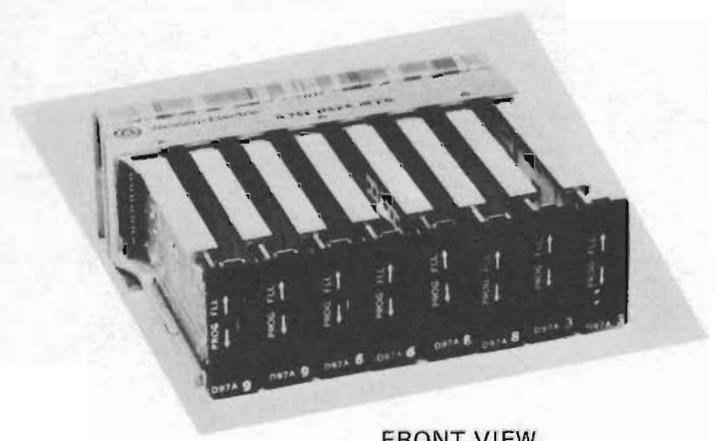


SIMPLIFIED SCHEMATIC – JACK RJ26X

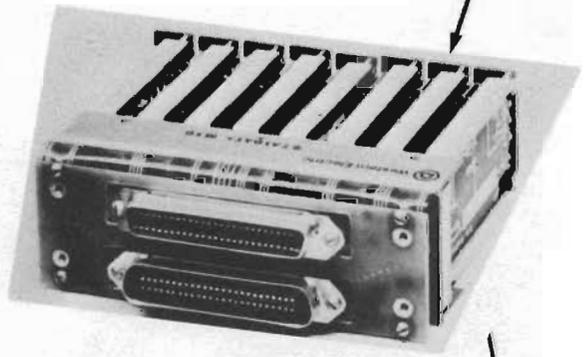
FIGURE 23



RJ26S LINE
CIRCUIT PLUG-IN

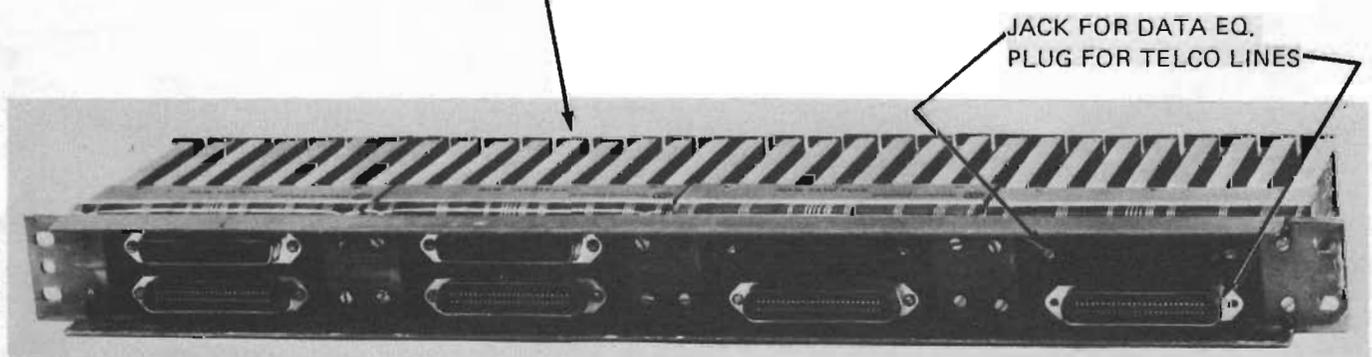


FRONT VIEW



REAR VIEW

RJ26X (COMMON EQUIPMENT)
EQUIPPED WITH EIGHT
RJ26Ss (LINE CIRCUITS)



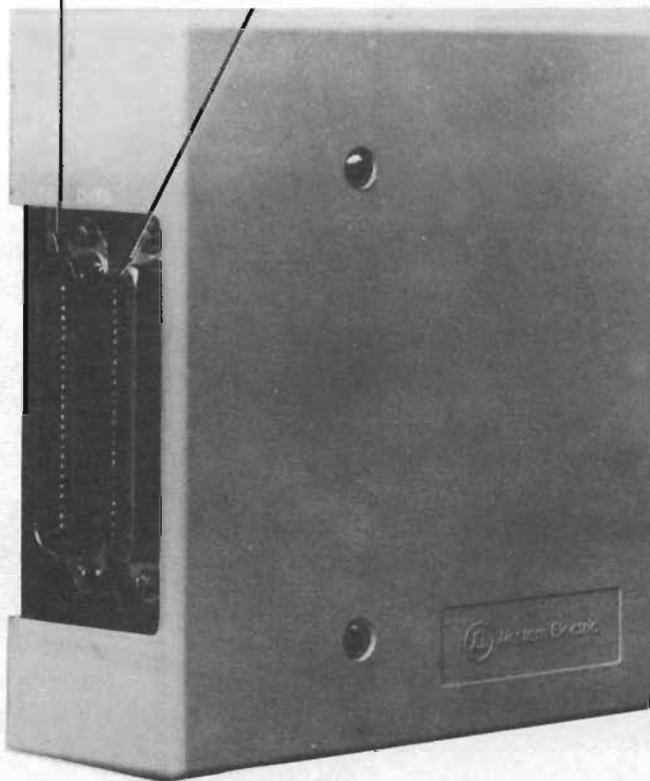
JACK FOR DATA EQ.
PLUG FOR TELCO LINES

FOUR RJ26Xs (COMMON EQUIPMENT) EACH EQUIPPED WITH EIGHT RJ26Ss (LINE CIRCUITS)
IN RJM4X (RACK MOUNTING)

FIGURE 24 MULTIPLE LINE DATA JACK

PLUG FOR TELEPHONE
LINE FACILITIES

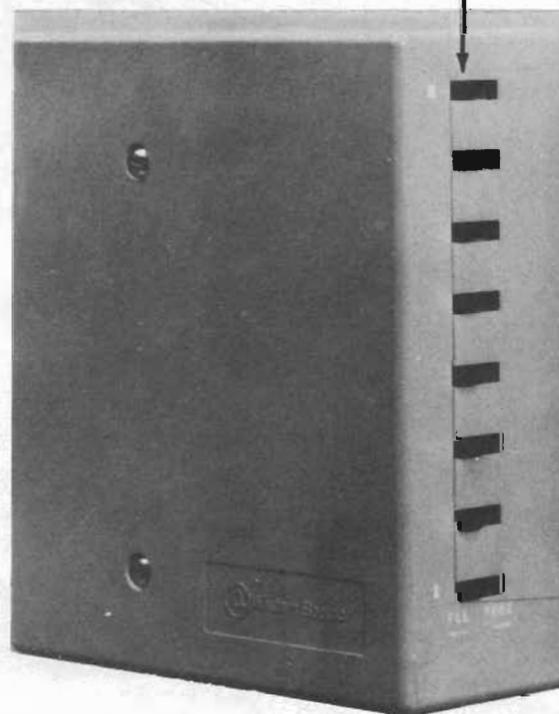
JACK FOR DATA EQUIPMENT



REAR VIEW

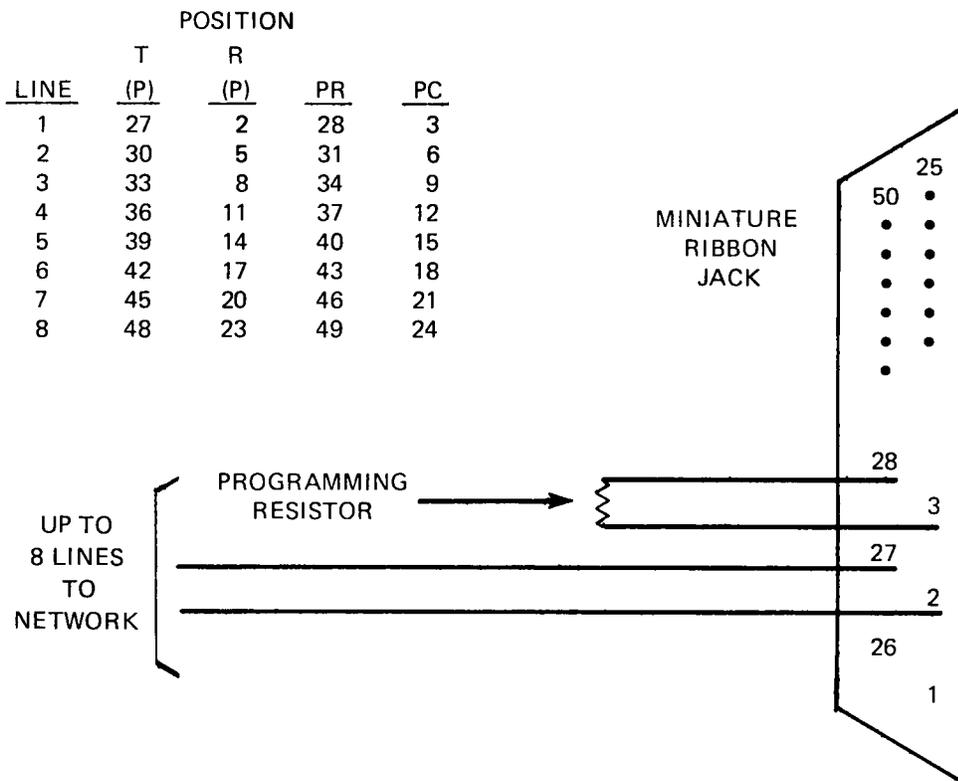
RJ26X (COMMON EQUIPMENT)
EQUIPPED WITH EIGHT
RJ26S's (LINE CIRCUITS)
IN RJM3X (WALL MOUNTING)

SWITCH PER LINE FOR
PROGRAMMED OR FIXED
LOSS LOOP OPERATION



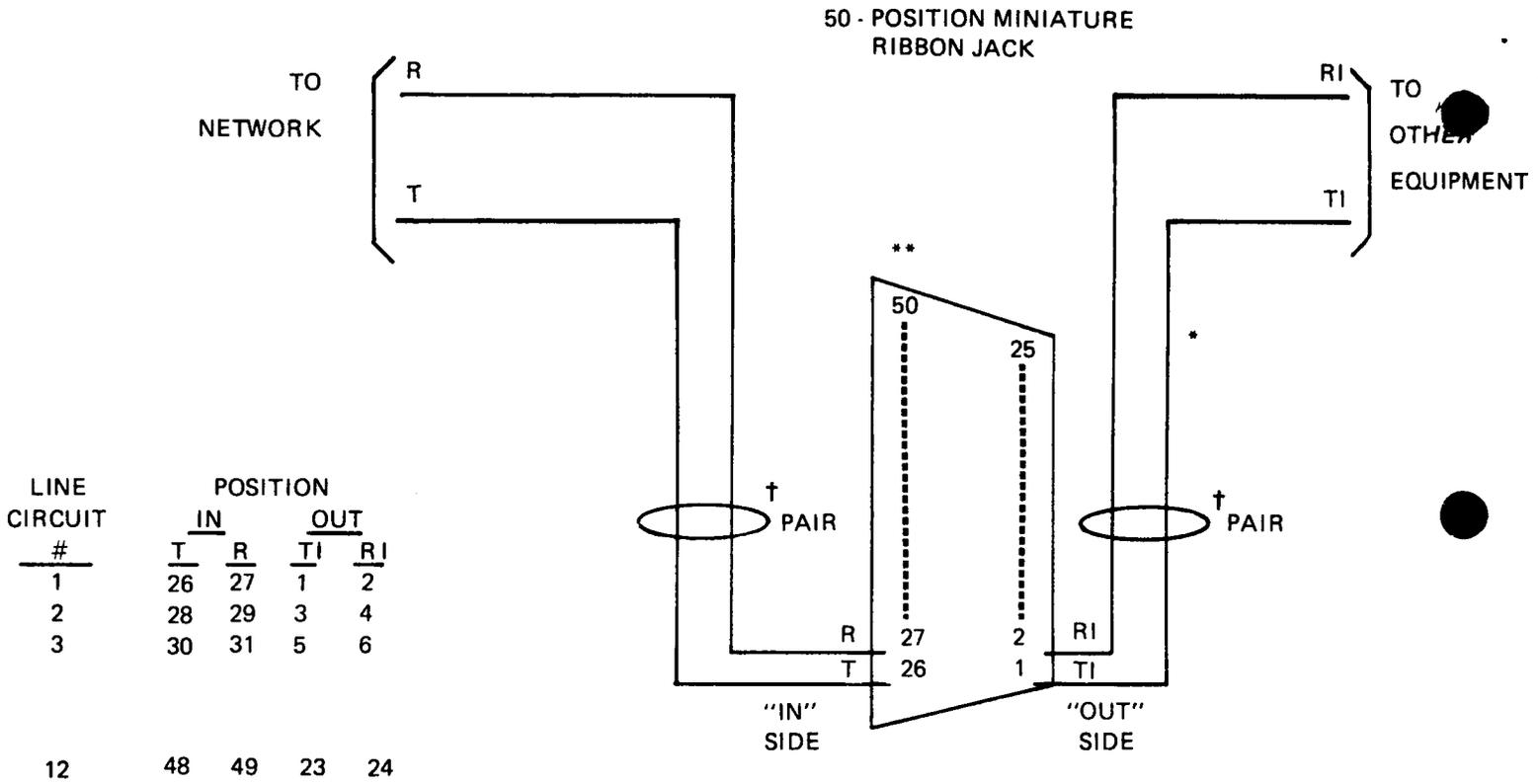
FRONT VIEW

FIGURE 25 MULTIPLE LINE DATA JACK



SIMPLIFIED SCHEMATIC – JACK RJ27X
 FIGURE 26

PRELIMINARY



SIMPLIFIED SCHEMATIC - JACK RJ71C

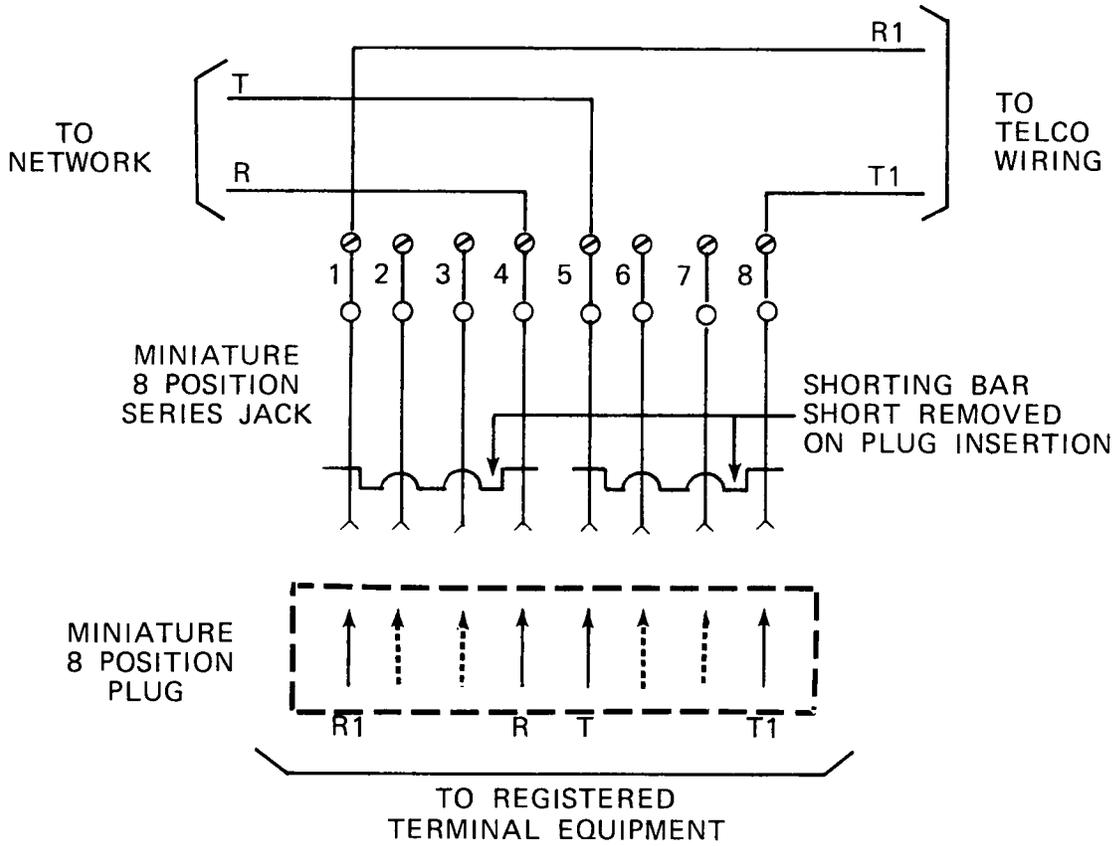
Figure 27

* SUBJECT TO EFFECTIVE TARIFF AND/OR FCC RULEMAKING.

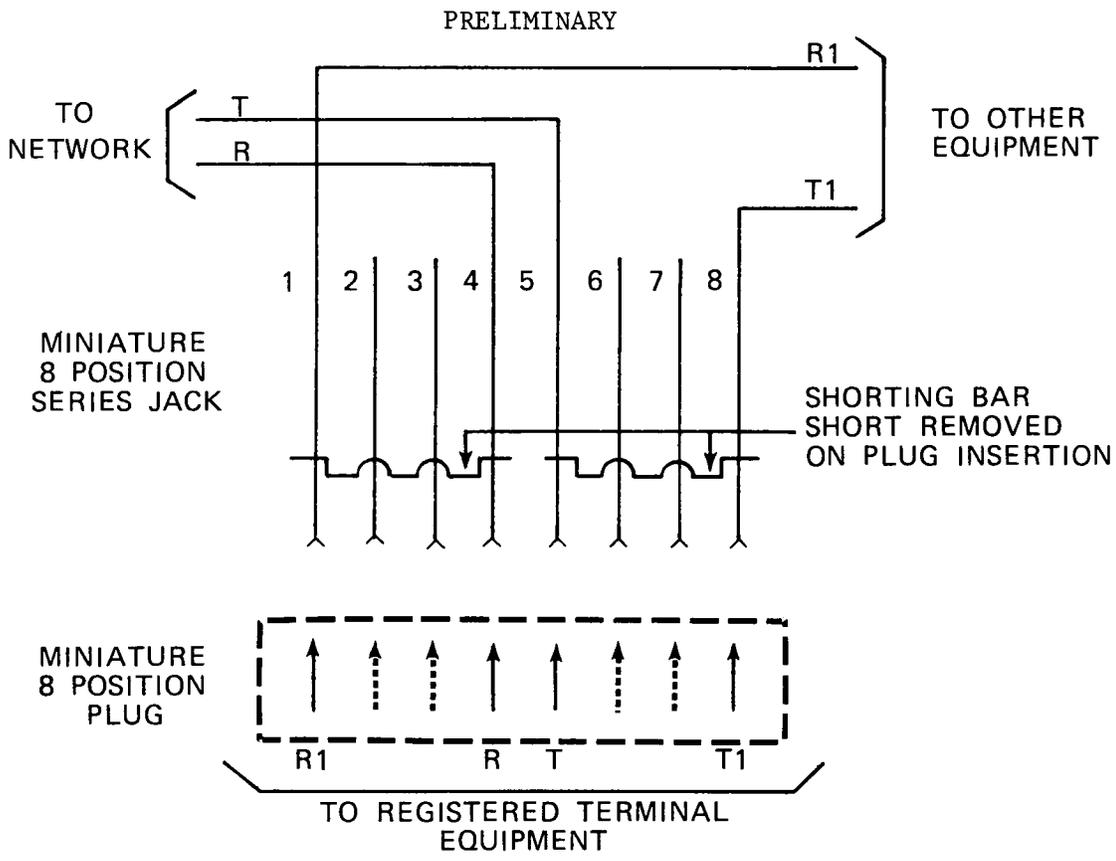
** A MANUAL BRIDGING PLUG IS ALSO PROVIDED BUT NOT SHOWN HERE. THE BRIDGING PLUG IS INSERTED BY THE CUSTOMER WHEN THE REGISTERED SERIES EQUIPMENT IS REMOVED. PLEASE NOTE THAT AN AUTOMATIC RESTORAL ARRANGEMENT IS UNDER DEVELOPMENT AND WILL ELIMINATE THE NEED FOR THE BRIDGING PLUG.

† THIS CABLE IS NOT TERMINATED IN THE CONVENTIONAL MANNER, (I.E. PAIR ON 26/1, ETC.) PAIR ONE "IN" IS 26 & 27 AND PAIR ONE "OUT" IS 1 & 2.

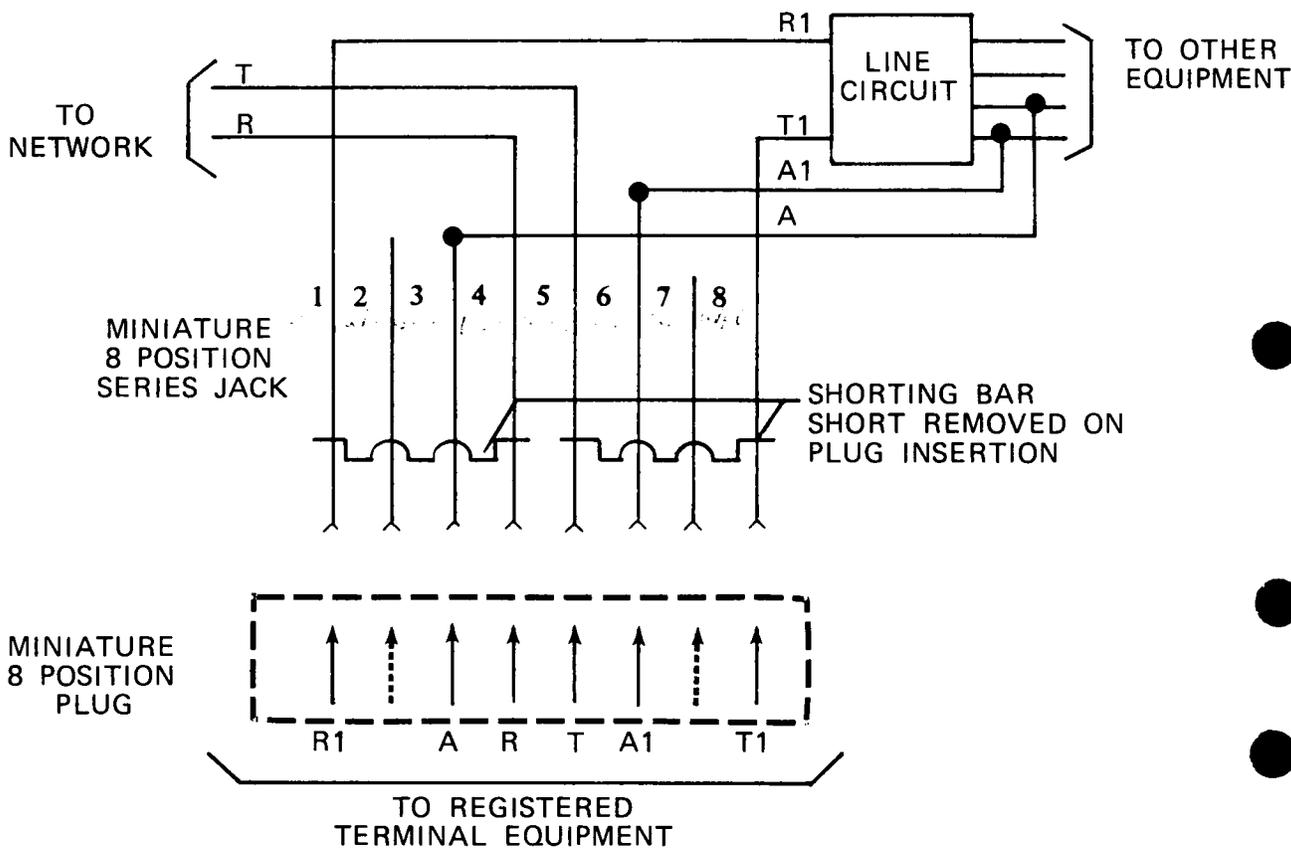
PRELIMINARY



SIMPLIFIED SCHEMATIC -- JACK RJ31X
FIGURE 28

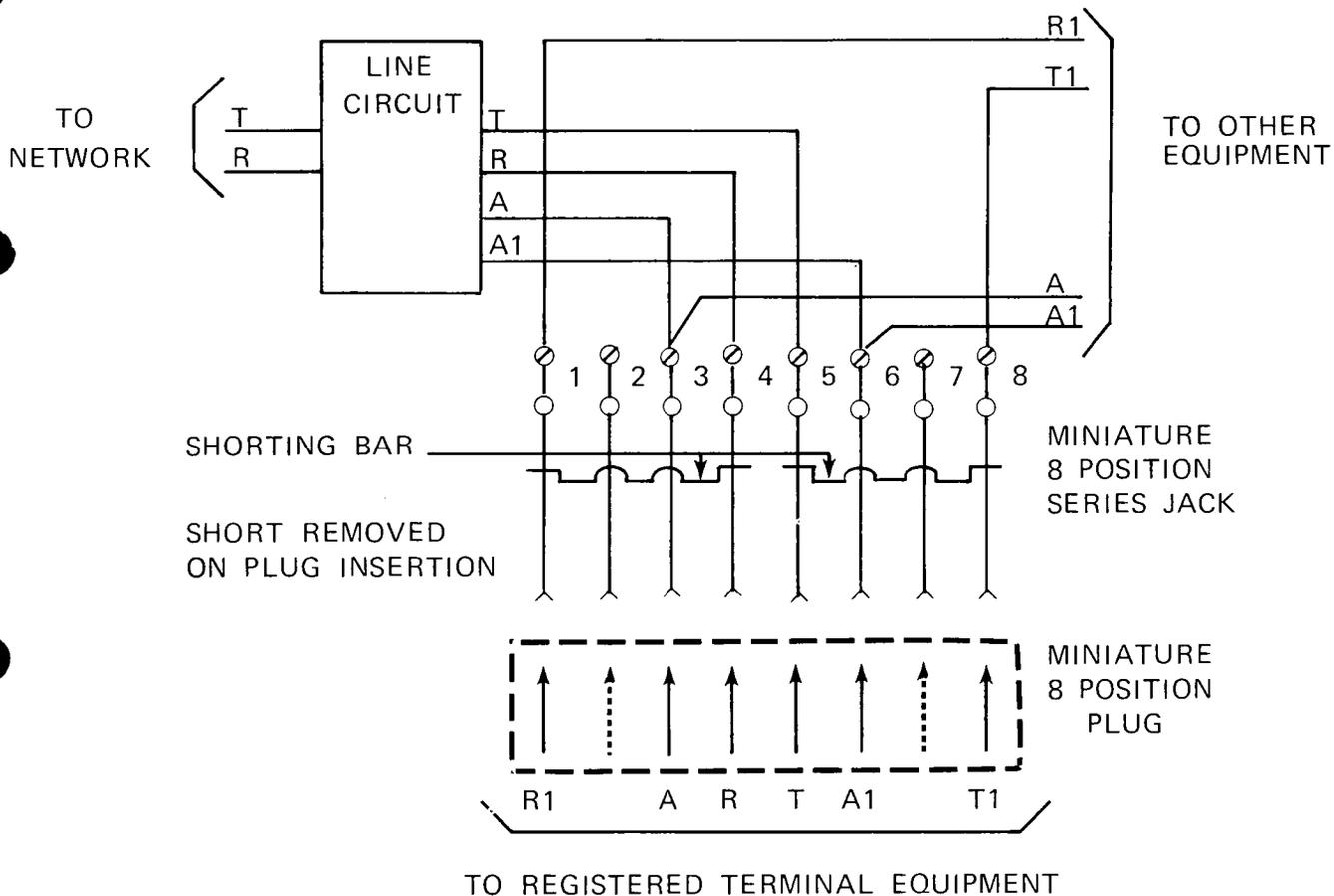


**SIMPLIFIED SCHEMATIC – JACK RJ32X
FIGURE 29**

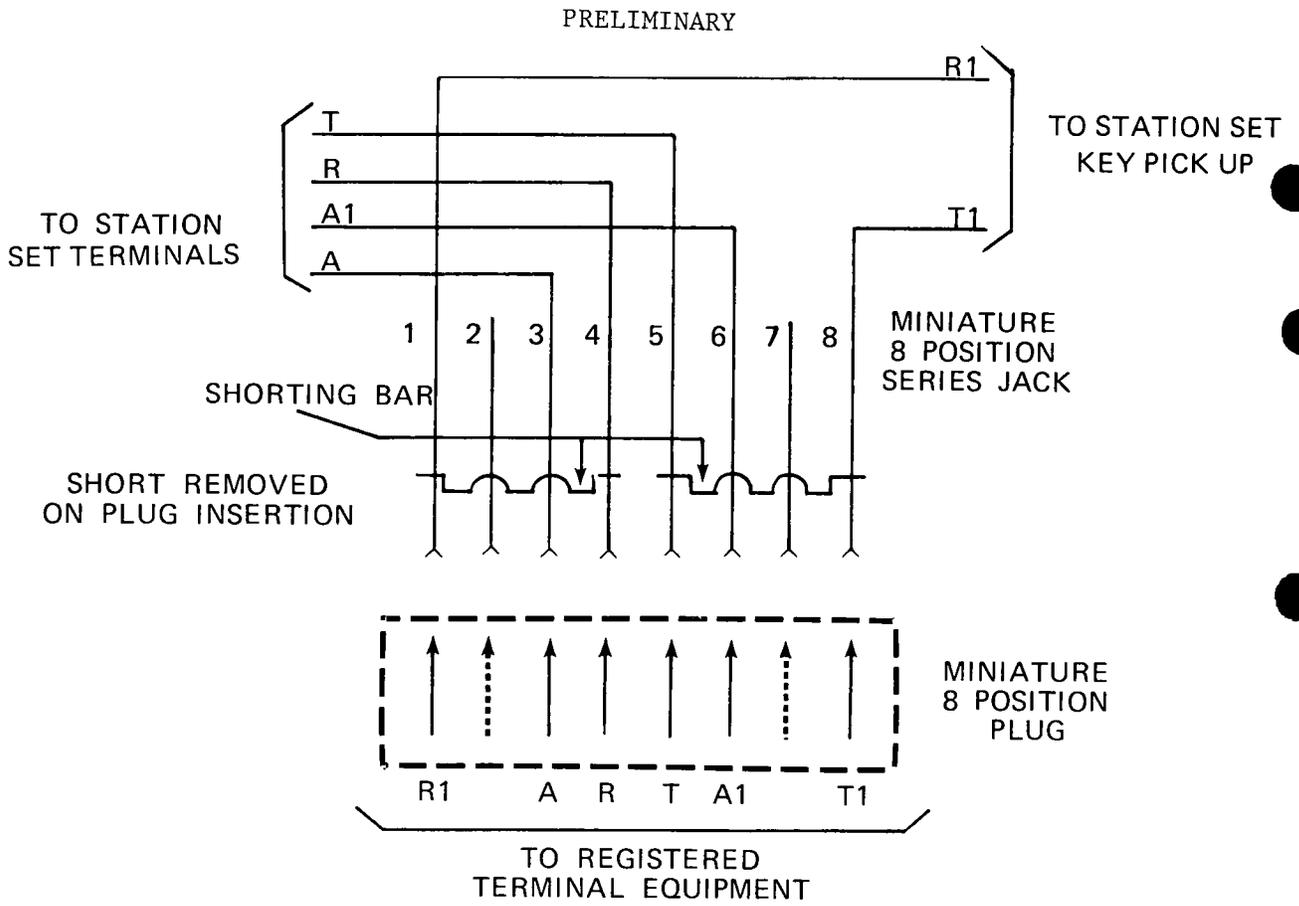


**SIMPLIFIED SCHEMATIC – JACK RJ33X
FIGURE 30**

PRELIMINARY



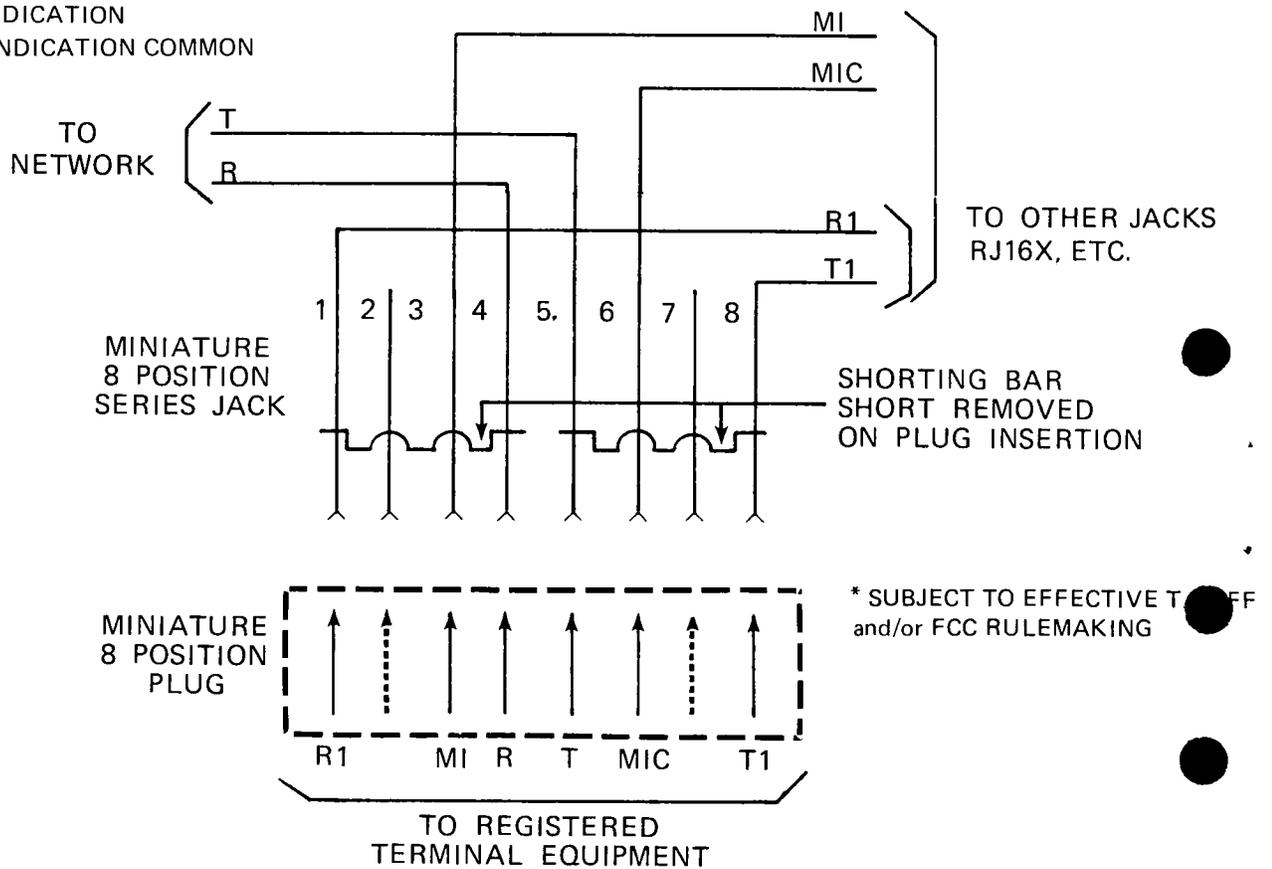
SIMPLIFIED SCHEMATIC – JACK RJ34X
FIGURE 31



**SIMPLIFIED SCHEMATIC – JACK RJ35X
FIGURE 32**

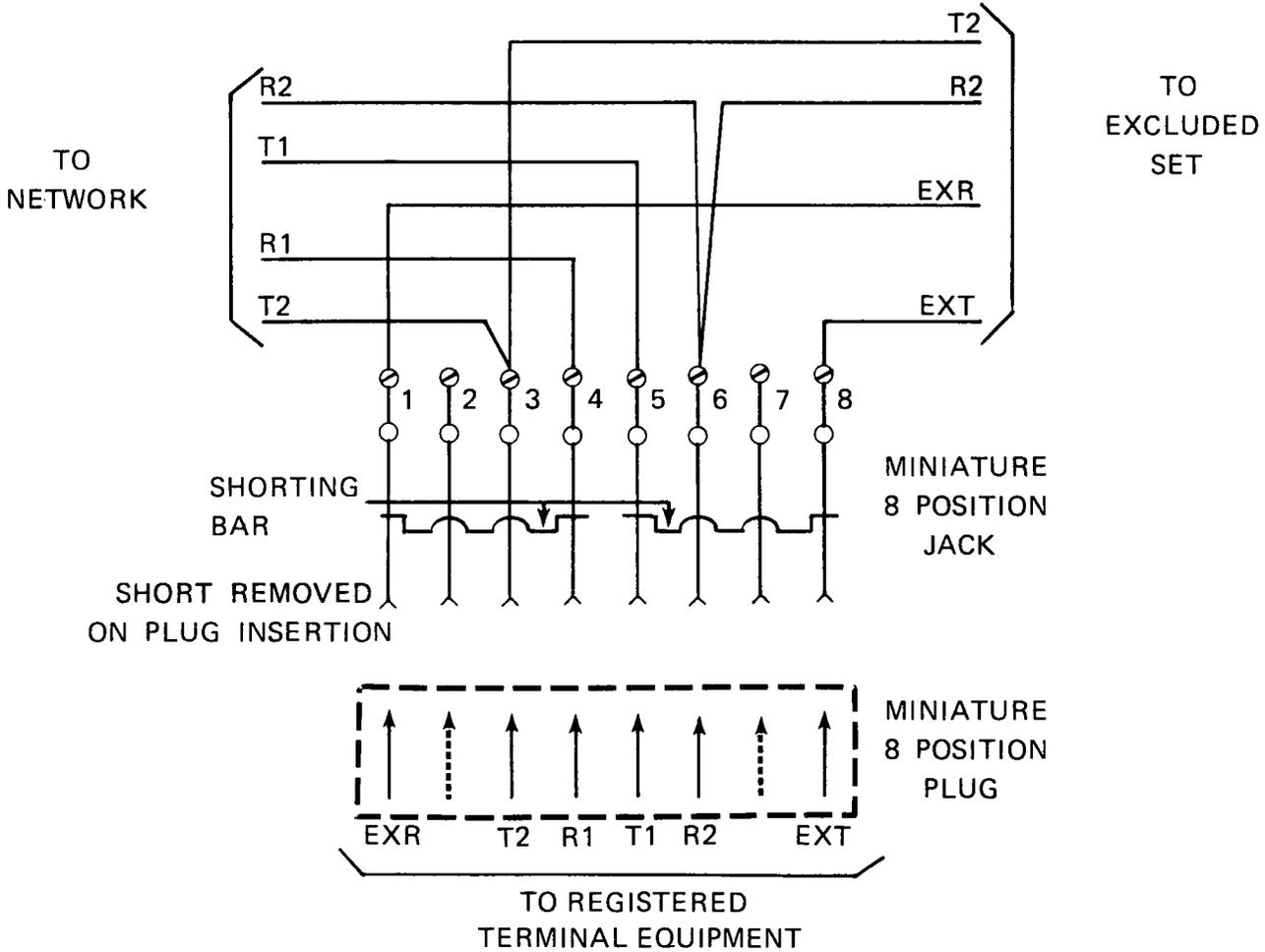
MI = MODE INDICATION

MIC = MODE INDICATION COMMON



**SIMPLIFIED SCHEMATIC – JACK RJ36X
FIGURE 33**

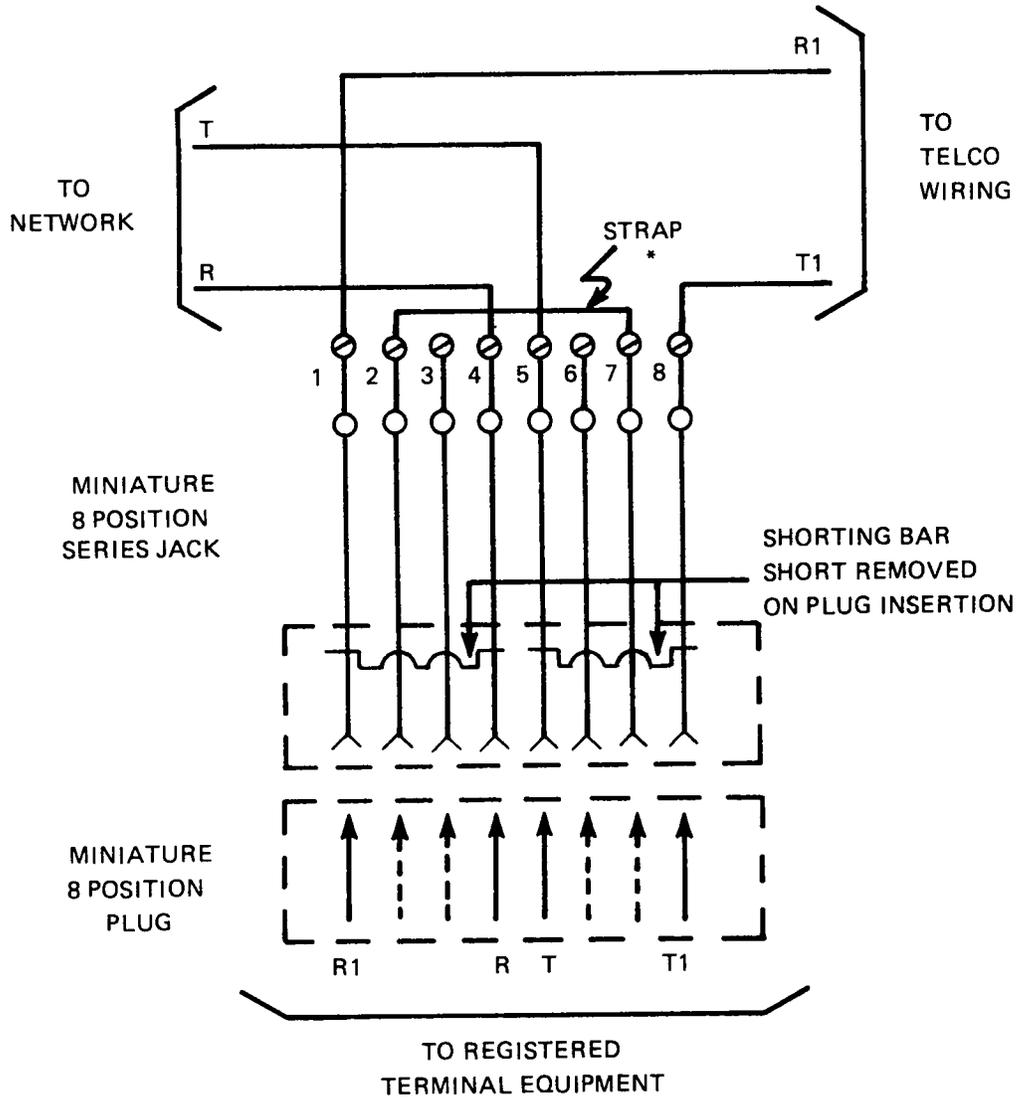
PRELIMINARY



SIMPLIFIED SCHEMATIC – JACK RJ37X
FIGURE 34

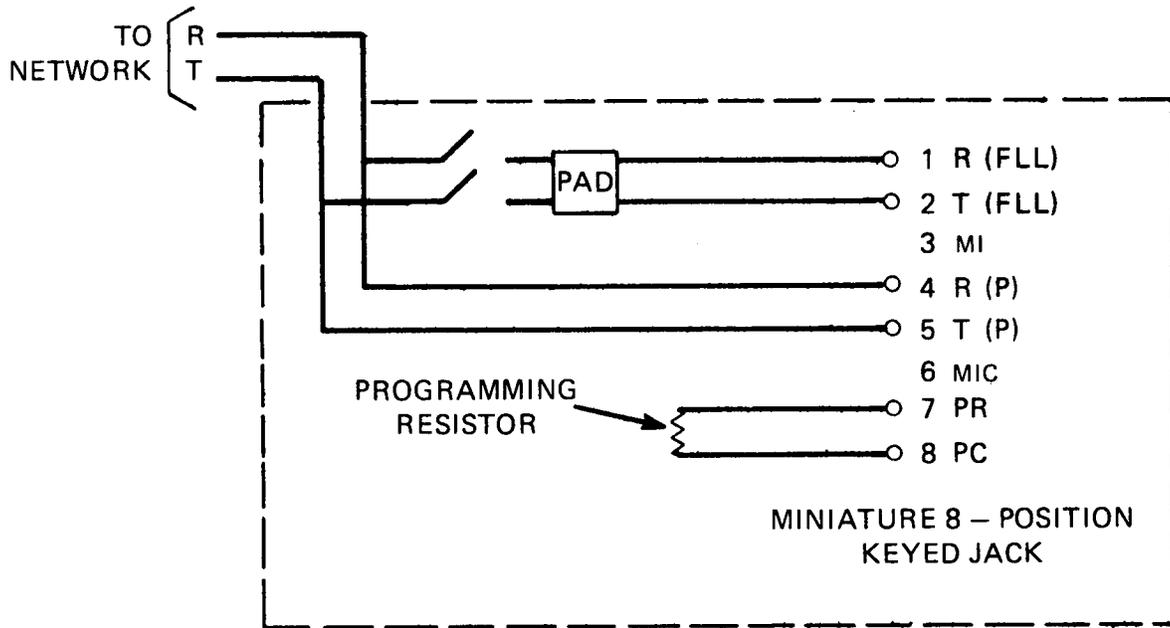
PRELIMINARY

* SUBJECT TO EFFECTIVE TARIFF and/or FCC RULEMAKING



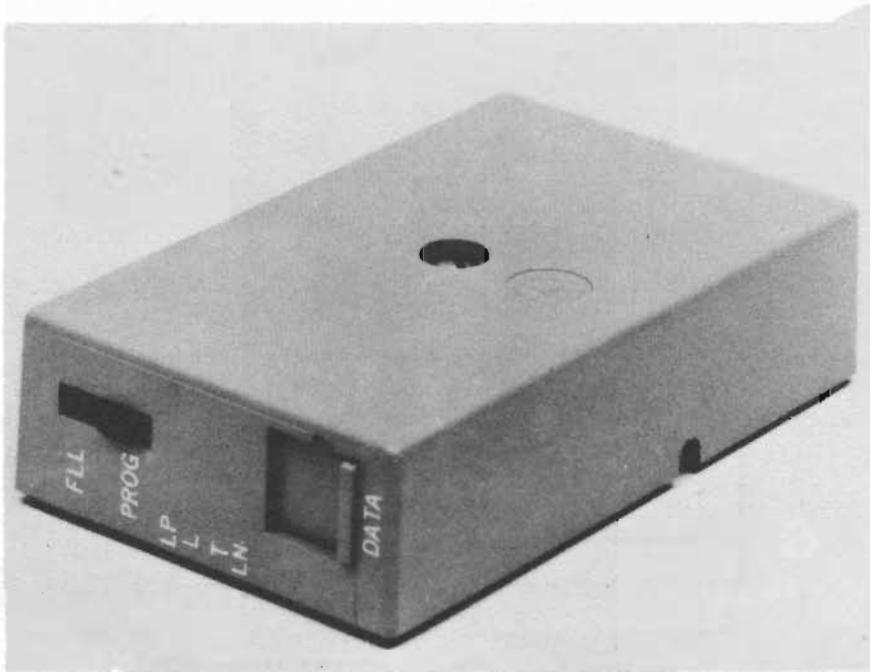
SIMPLIFIED SCHEMATIC — JACK RJ38X
FIGURE 35

* PROVIDED BY THE TELEPHONE COMPANY.

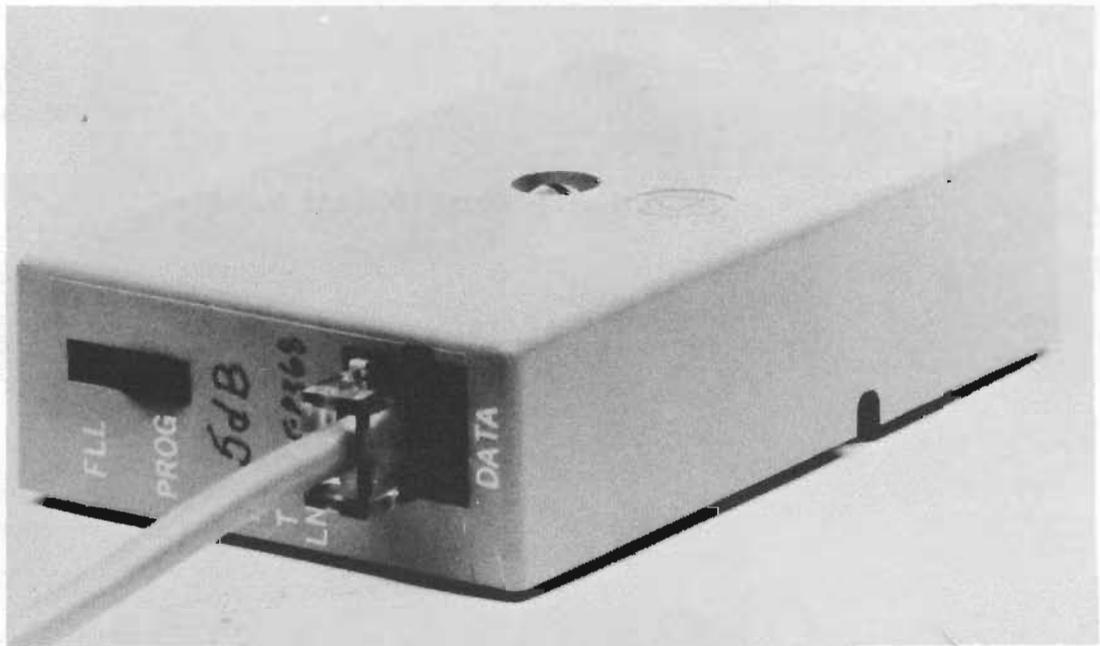


SIMPLIFIED SCHEMATIC JACK RJ41S

FIGURE 36

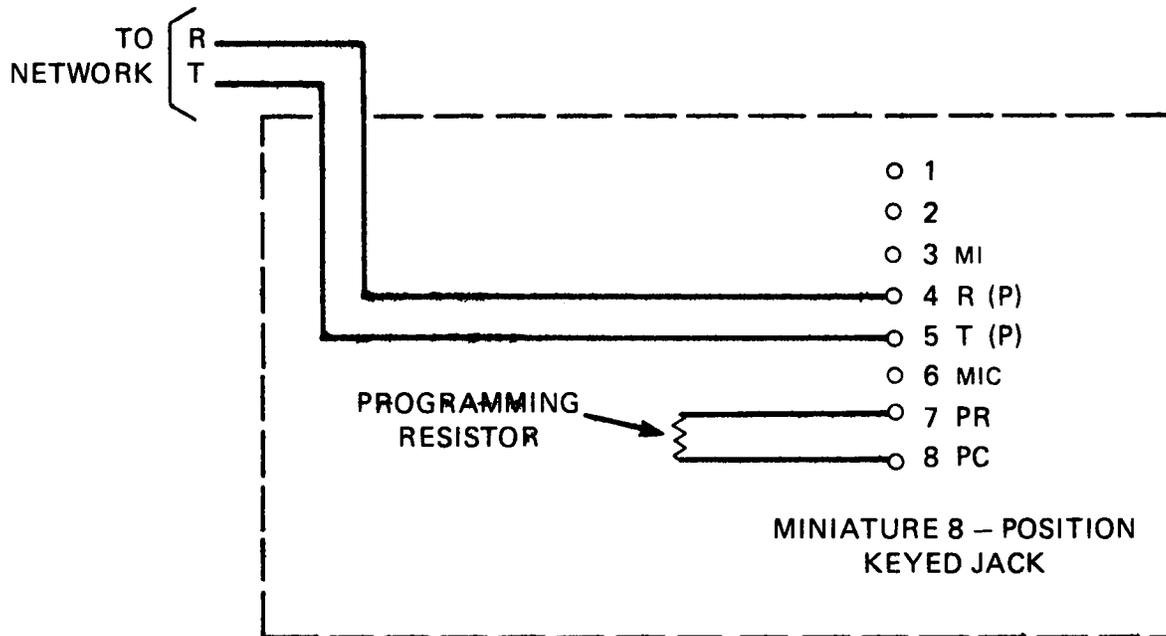


RJ41S (UNIVERSAL DATA JACK) SHOWN WITH SPRING LOADED DUST COVER CLOSED. RJ45S (PROGRAMMABLE DATA JACK) APPEARS THE SAME EXCEPT THAT SWITCH FOR PROGRAMMED OR FIXED LOSS LOOP OPERATION IS OMITTED.



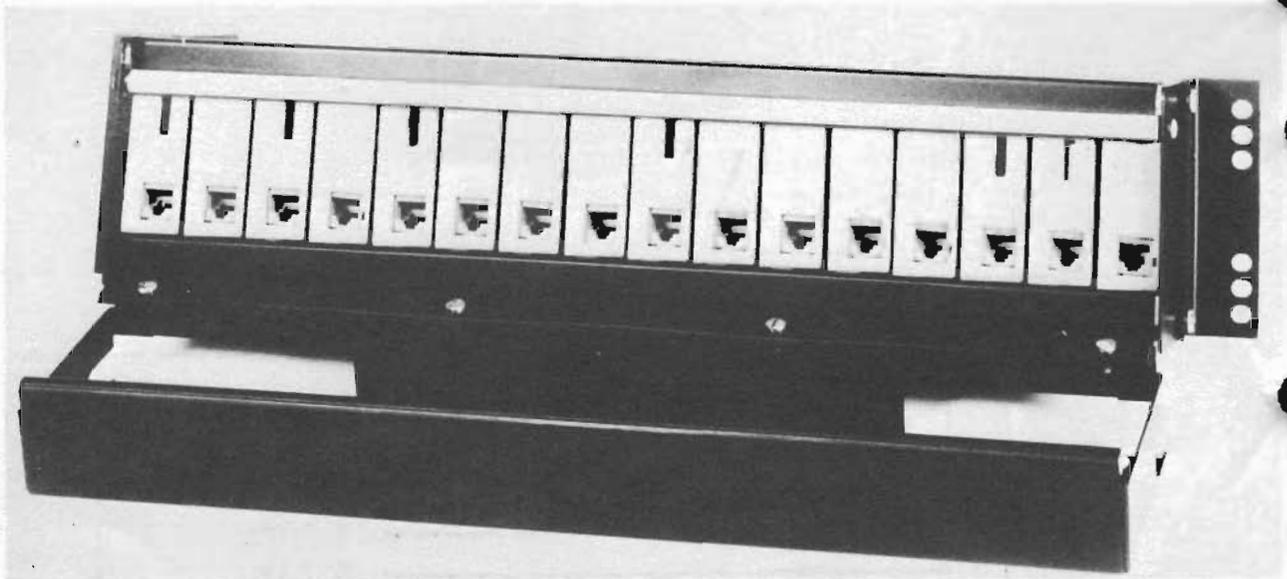
RJ41S SHOWN WITH PLUG INSERTED, KEYWAY FOR KEYED DATA PLUG CAN BE SEEN ON SIDE OF JACK OPENING

FIGURE 37 SINGLE LINE DATA JACKS

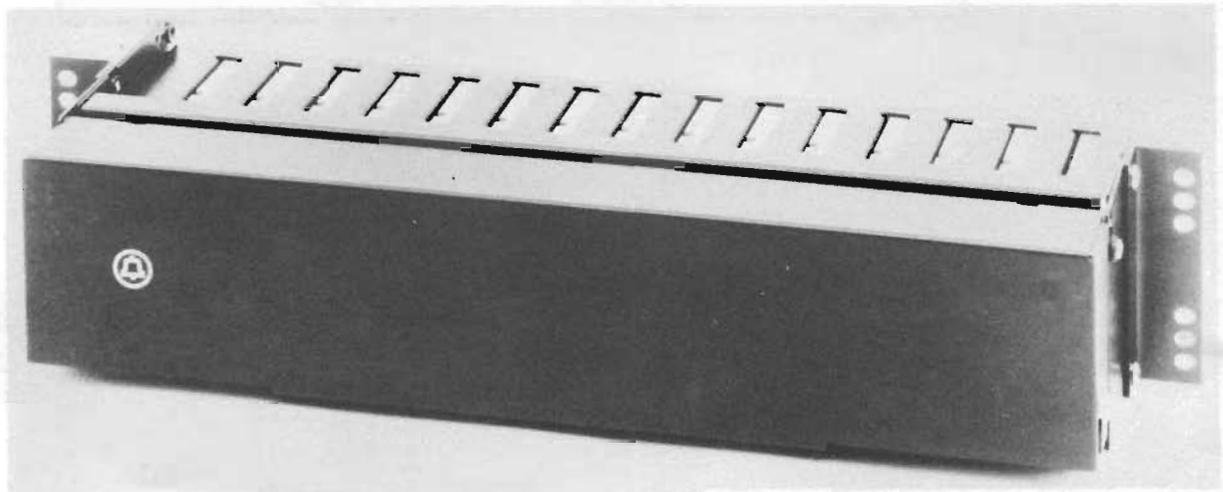


SIMPLIFIED SCHEMATIC JACK RJ45S

FIGURE 38



RJ41M OR RJ45M IS IMPLEMENTED WITH RJM2X (MULTIPLE MOUNTING) PLUS APPROPRIATE NUMBER OF RJ41Ss OR RJ45Ss (SINGLE LINE DATA JACKS). RJM2X HOLDS 16 DATA JACKS AS SHOWN ABOVE.



RJM2X (MULTIPLE MOUNTING) WITH COVER CLOSED. MOUNTS ON WALL OR 19" OR (WITH ADAPTER PLATE) ON 23" RELAY RACK.

FIGURE 39 MULTIPLE MOUNTING OF SINGLE LINE DATA JACKS

PRELIMINARY

TABLE A

Jacks — Connections

Type Of Jack	Type Of Connection	USOC	Note
Miniature 6-Position	Bridged Tip and Ring	RJ11C, RJ11W, RJ17C	1
	Bridged Tip and Ring Ahead of Key Telephone Line Circuit Plus A and A1	RJ12C, RJ12W	1
	Bridged Tip and Ring Behind Key Telephone Line Circuit Plus A and A1	RJ13C, RJ13W	1
	Bridged 2 Line Tip and Ring	RJ14C, RJ14W	1
	Bridged Tip and Ring With Mode Indication To A Series Connection Ahead of Bridged Connector	RJ16X	—
	Bridged Tip and Ring Ahead of All Equipment With Make Busy Control	RJ18C	1
	Bridged Tip and Ring Behind Key Telephone Line Circuit Plus A, A1, and Make Busy Control	RJ19C	1
	Bridged 3 Line Tip and Ring	RJ25C	1
Weatherproof	Bridged Tip and Ring	RJ15C	1
	Bridged Tip and Ring (Adapters)	RJA1X, RJA2X RJA3X	2,3,4 —
50-Position Miniature Ribbon Jack	Bridged Tip and Ring	RJ21X	—
	Bridged Tip and Ring Ahead of Key Telephone Line Circuit Plus A and A1	RJ22X	—
	Bridged Tip and Ring Behind Key Telephone Line Circuit Plus A and A1	RJ23X	—
	Bridged Tip and Ring Behind Key Telephone Line Circuit Plus A And Common A1	RJ24X	—
	Bridged Tip and Ring (DATA)	RJ26X, RJ27X	
	Series Tip and Ring	RJ71C	6

TABLE A (CONT'D)

Miniature 8-Position	Series Tip and Ring Ahead of All Station Equipment	RJ31X	—
	Series Tip and Ring Ahead of One Station	RJ32X	—
	Series Tip and Ring Ahead of Key Telephone Line Circuit Plus A and A1	RJ33X	—
	Series Tip and Ring Behind Key Telephone Line Circuit Plus A and A1	RJ34X	—
	Series Tip and Ring Plus A and A1 Wired To Station Set Terminals	RJ35X	—
	Series Tip and Ring Plus MI And MIC	RJ36X	—
	Bridged 2 Line Tip and Ring With Exclusion On Line 1	RJ37X	5
	Series Tip and Ring Ahead of All Station Equipment With Continuity Leads	RJ38X	—
	Bridged Tip and Ring Plus MI and MIC	RJ41S, RJ45S	

Notes

1. The Letter "C" In The USOC Indicates The Jack Is Baseboard Or Flush Mounted For A Desk Type Unit. "W" Indicates The Jack Is For A Wall Mounted Unit.
2. RJA1X Converts A 4-Hole Jack To A Miniature-Bridged Jack.
3. RJA2X Converts A Single Jack To A Duplex Jack.
4. RJA3X Converts A 12-Hole Jack To A Miniature-Bridged Jack.
5. Used With A Registered Telephone Set Equipped With An Exclusion Key For A Data Application.
6. Uses A Manual Bridging Plug To Provide Continuity When Registered Equipment Is Removed.

PRELIMINARY

TABLE B

Pin Assignments For Jack RJ21X

Line *	Pin No. For	
	Tip	Ring
1	26	1
2	27	2
3	28	3
.	.	.
.	.	.
.	.	.
24	49	24
25	50	25

* Customer Must Specify Lines To Be Designated 1, 2, etc.

PRELIMINARY

TABLE C

Pin Assignments For Jacks
RJ22X And RJ23X

Line *	Pin No. For			
	Tip	Ring	"A"	"A1"
1	26	1	27	2
2	28	3	29	4
3	30	5	31	6
4	32	7	33	8
5	34	9	35	10
6	36	11	37	12
7	38	13	39	14
8	40	15	41	16
9	42	17	43	18
10	44	19	45	20
11	46	21	47	22
12	48	23	49	24

* Customer Must Specify Lines To Be Designated 1, 2, etc.

PRELIMINARY

TABLE D

Pin Assignments For Jack RJ24X

Line *	Pin No. For			
	Tip	Ring	"A"	"A1"
1	26	1	27	2
2	29	4	30	2
3	32	7	33	2
4	35	10	36	2
5	38	13	39	2

* Customer Must Specify Lines To Be Designated 1, 2, etc.

TABLE E
PIN ASSIGNMENTS FOR JACKS
RJ 26X

LINE*	PIN NO. FOR					
	TIP (FLL)	RING (FLL)	TIP (P)	RING (P)	PR (PROG. RESISTOR)	PC (PROG. RESISTOR – COMMON)
1	26	1	27	2	28	3
2	29	4	30	5	31	6
3	32	7	33	8	34	9
4	35	10	36	11	37	12
5	38	13	39	14	40	15
6	41	16	42	17	43	18
7	44	19	45	20	46	21
8	47	22	48	23	49	24

*Customer Must Specify Lines To Be Designated 1, 2, Etc.

TABLE F
PIN ASSIGNMENTS FOR JACKS
RJ 27X

LINE*	PIN NO. FOR			
	TIP (P)	RING (P)	PR (PROG. RESISTOR)	PC (PROG. RESISTOR – COMMON)
1	27	2	28	3
2	30	5	31	6
3	33	8	34	9
4	36	11	37	12
5	39	14	40	15
6	42	17	43	18
7	45	20	46	21
8	48	23	49	24

*Customer Must Specify Lines To Be Designated 1, 2, Etc.

TABLE G
Pin Assignments For Jacks
RJ71C

PRELIMINARY

Line *	Pin No. For			
	"RI"	"TI"	"R"	"T"
1	2	1	27	28
2	4	3	29	28
3	6	5	31	30
4	8	7	33	32
5	10	9	35	34
6	12	11	37	36
7	14	13	39	38
8	16	15	41	40
9	18	17	43	42
10	20	19	45	44
11	22	21	47	46
12	24	23	49	48

* Customer Must Specify Lines To Be Designated 1, 2, etc.