CONNECTING ARRANGEMENT C25
118A INTERCONNECTING UNIT

1. GENERAL

1.01 This section provides identification, installation, operation, maintenance, and connecting information for Connecting Arrangement C25. Connecting Arrangement C25 provides a connection, over a voice-grade private line, between the customer-provided (CP) automatic number identification (ANI) equipment of a CP communications system (typically a PBX) and the station identification frame (SIF) in a Bell System central office (CO). This arrangement provides automatic identified outward dial (AIOD) capabilities to the CP equipment.

1.02 Connecting Arrangement C25 consists of a 118A interconnecting unit (IU), Fig. 1, 2, and 3. Strapping options are provided for SF signaling when required. One Connecting Arrangement C25 and its associated voice-grade private line has the capacity to handle the identification for up to 250 outgoing trunks depending upon the call attempts and traffic load on the CO. If two or more groups of trunks are terminated on different serving COs, a separate Connecting Arrangement C25 must be ordered for each trunk group.

1.03 This issue of the section is based on the following drawings:

CD-1E239-01, Issue 1

SD-1E239-01, Issue 1

If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing(s), reference should be made to the SDs and CDs to determine the extent of the changes and the manner in which the section may be affected.

2. IDENTIFICATION

PURPOSE

- To provide access from CP equipment to a Telephone Company CO associated with automatic message accounting equipment for automatic calling station identification.
- To convert Electronic Industries Association (EIA) serial binary signals from CP equipment to frequency-shift-keying (FSK) signals of the proper level for transmission over the voice-grade private line to the CO.
- To provide protection for personnel against hazardous voltages.

APPLICATION

- Used with Voice Connecting Arrangement(s) CD7, CD8, or CDH (loop- or ground-start trunks) which provide outgoing service for CP PBX.

ORDERING GUIDE

- Unit, Interconnecting, 118A (consists of a 614A panel equipped with an HJ1 circuit pack).

Associated Apparatus (Order Separately)

- Bracket, 99B
- Cabling, Wiring, "D" Inside or equivalent (for cabling the supervisory leads from the connecting arrangement to the interface connecting block)
- Wire, DL-1, P-46F616 or equivalent (for cabling the clock and data leads from the connecting arrangement to the interface connecting block)
- Block, Connecting, 66M1-50 (Fig. 4)

Note: Spare terminals on interface connecting blocks associated with Voice Connecting Arrangement(s) CD7, CD8, or CDH may be used when available; other types of blocks may be used where specified by local engineering.

- Clip, Bridging, B (25 per pkg.)

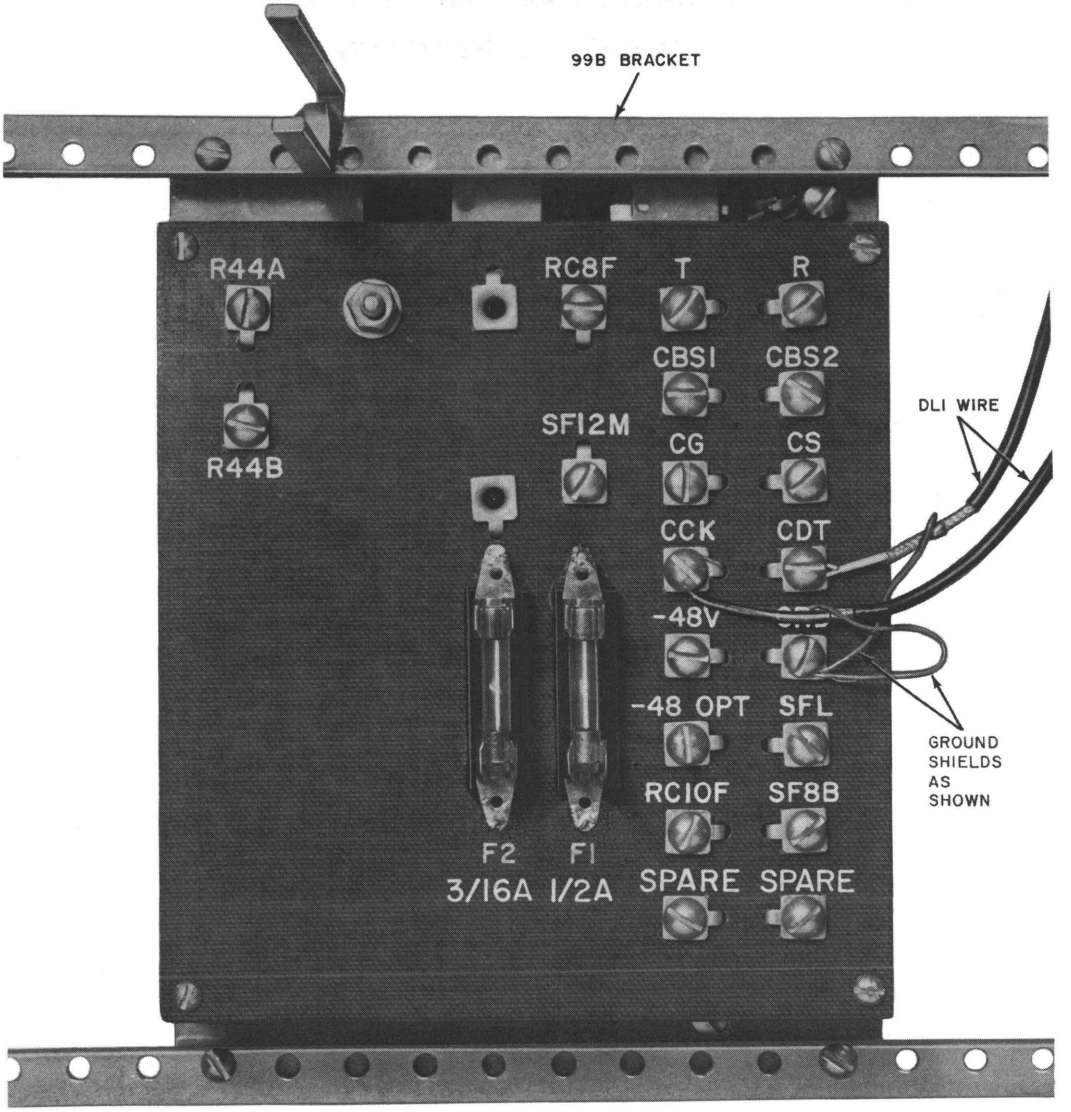


Fig. 1—118A Interconnecting Unit—Clock and Data Leads Connected

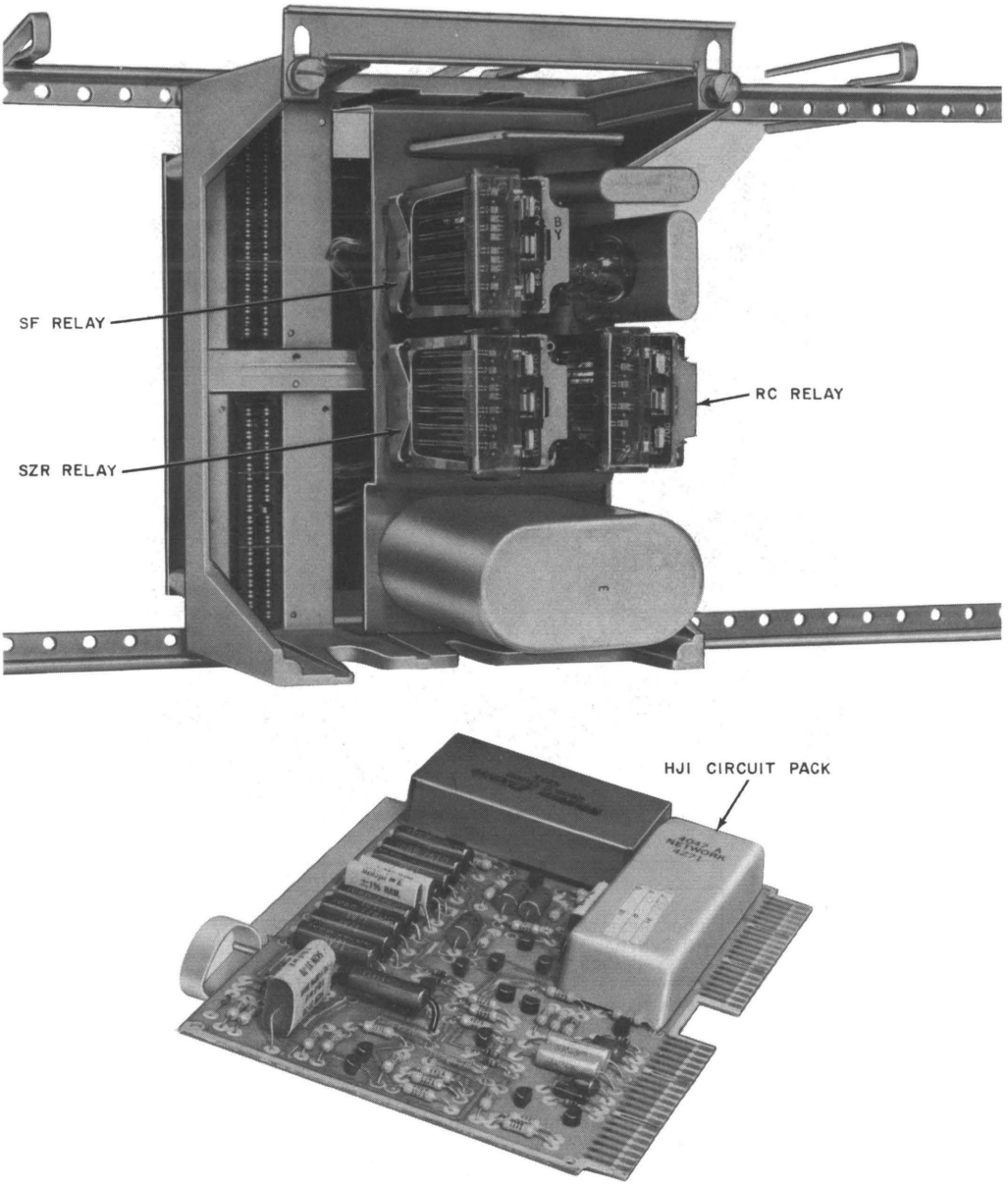
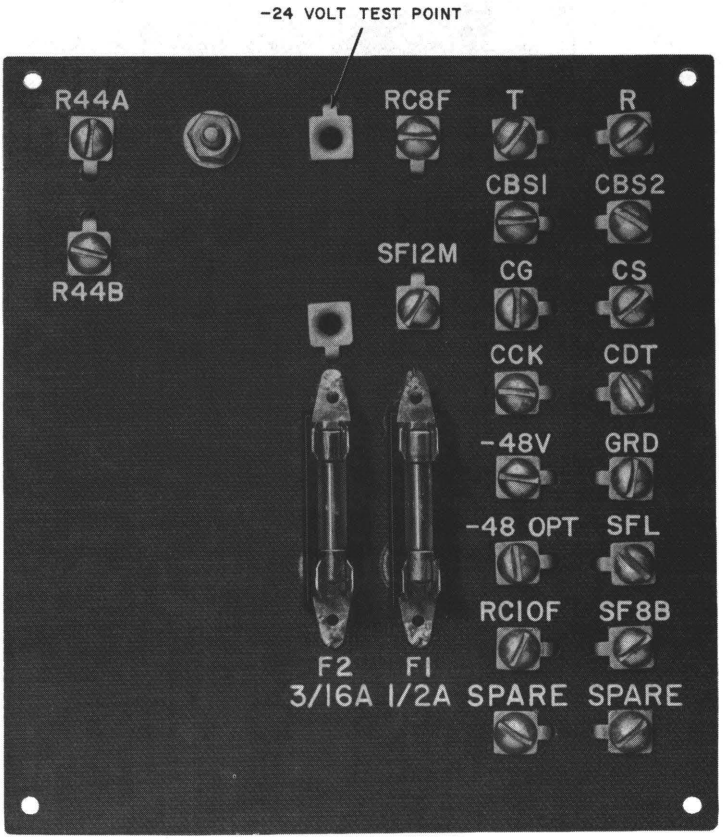


Fig. 2—118A Interconnecting Unit—Front View With HJ1 Circuit Pack Removed



FOR	PROVIDE STRAPS	
	FROM	TO
LOOP RESISTANCE TO CENTRAL OFFICE 500 OHMS OR LESS	R44A	R44B
SF SIGNALING NOT PROVIDED BETWEEN PBX AND CENTRAL OFFICE (OPTION Z)	CBSI	RC8F
	-48 OPT	RCIOF
SF SIGNALING PROVIDED BETWEEN PBX AND CENTRAL OFFICE (OPTION Y)	CBSI	SFI2M
	-48 OPT	SF8B
	-48 OPT	SFL

Fig. 3—118A Interconnecting Unit—Rear View

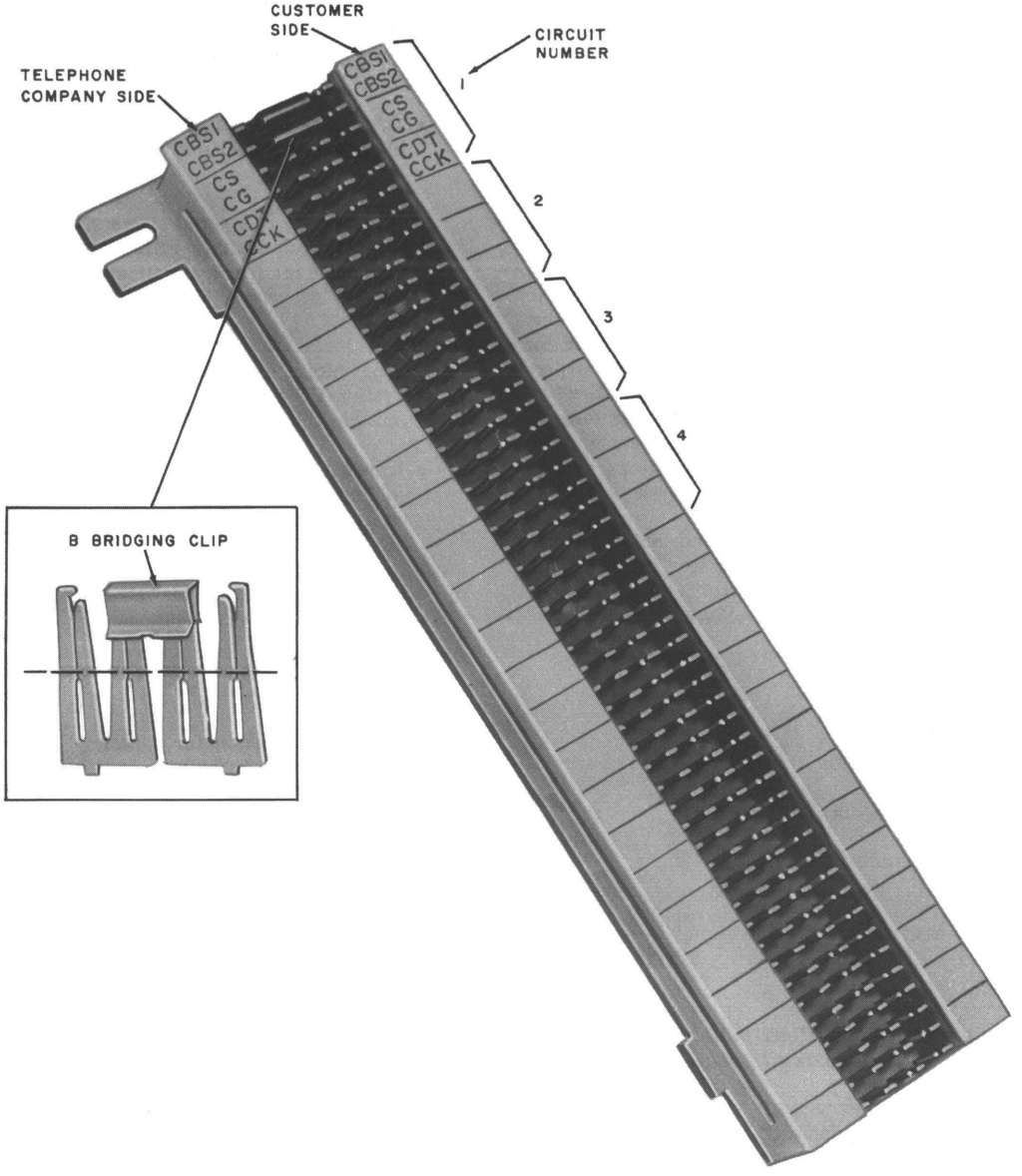


Fig. 4—Typical Interface Connecting Block

- KS-20944, List 2 Protector (Optional—***must*** be provided when CP power supply is used)—see Fig. 8

- Block, Connecting, 66C1-16 or equivalent (for providing distribution of power when KS-20944 protector is used between CP power supply and ***more than one*** connecting arrangement of any type—see Fig. 9)

Note: The cumulative current drain of the connecting arrangements connected to a KS-20944 protector must not exceed the maximum current rating of the protector. For instance, the maximum current drain for one Connecting Arrangement C25 is 0.5 ampere and the maximum current rating of a KS-20944, List 2 protector is 15 amperes; therefore, no more than 30 Connecting Arrangements C25 may be connected to the protector (this example is for illustrative purposes only).

- Wire, AM, 14 gauge, paired, red and black, P-384614 or equivalent (for cabling from the KS-20944 protector to the 66C1-16 connecting block—see Fig. 9).

Replaceable Components

- Fuse, AGC#1/2 (1/2 amp-F1)

- Fuse, AGC#3/16 (3/16 amp-F2)

- Pack, Circuit, HJ1

- Panel, 614A.

DESIGN FEATURES

118A Interconnecting Unit

- Consists of a ***614A panel*** equipped with a plug-in ***HJ1 circuit pack***

- Detects loop closure on leads CS, CG from CP ANI equipment

- Signals the Bell System CO AIOD equipment over leads T, R that a trunk number and a station number have been identified

- Recognizes a transmit data command signal over leads T, R from the Bell System CO

- Signals CP ANI equipment with a contact closure on leads CBS1, CBS2 that a transmit data command signal has been received from the Bell System CO

- Provides a terminator as specified in EIA Standard RS-232C for CP clock and data leads

- Converts the EIA serial binary signals from the CP equipment to FSK signals of the proper level for transmission over the voice-grade private line to the Bell System CO

- Transmits a disconnect signal to the Bell System CO when the CP ANI equipment removes the closure on leads CS, CG

- Transmits a disconnect signal to the CP ANI equipment by removing the contact closure on leads CBS1, CBS2, when the Bell System CO disconnects first

- Provides dc isolation between Bell System facilities and CP ANI equipment

- Provides strapping options for loop and SF signaling

- Provides protection for personnel against hazardous voltages.

614A Panel—See Fig. 2

- Mounts on a standard 23-inch relay rack or in a 16C apparatus mounting, using a 99B bracket

- Size—approximately 8 by 6 by 8 inches

- Weight—approximately seven and one-half pounds (without circuit pack)

- Equipped with two 914A 40-pin connectors arranged to mount one HJ1 circuit pack

- Provides supervisory circuit, power circuit, and fuses for 118A IU

- Provides screw terminals for option straps and connections to the CP equipment and the Bell System CO.

HJ1 Circuit Pack—See Fig. 2

- Components are mounted on a 40-pin printed wiring board.
- Plugs into connector on 614A panel.
- Size—approximately 5-1/2 by 7-1/2 inches.
- Weight—approximately one pound.
- Provides EIA interface, output flip-flop, and data transmitter circuits for 118A IU.

KS-20944, List 2 Protector (Fig. 8 and 9)

- Components are mounted in a 5-1/2 by 4-1/2 by 3-1/2 inch box with hinged cover, designed to mount on a wall or any flat surface.
- Provides screw terminals inside of box for connection to Bell System equipment.
- Provides two external 14-gauge color-coded leads for connection to CP power source ([R] GRD, [BK] −V).
- Provides current and voltage limiting between Bell System equipment and CP power source.
- Protector circuit breakers trip in 25 milliseconds on overvoltage, current overload, reversed voltage polarity, improper grounding, or ac voltage from CP power source as follows:
  - (a) Overvoltage of 68 volts dc
  - (b) Current overload of 18 amperes
  - (c) Reversed dc polarity
  - (d) Improper ground
  - (e) AC voltage greater than 18 volts.
- Protector circuit breaker switch provides a means for removing CP power from Bell System interconnecting equipment.

CAUTION: The circuit breaker switch removes voltage from the load (Bell System) side of the protector only; voltage will still be present on terminals and components inside the protector box.

- Provides hazardous voltage protection between CP power source and Bell System equipment.

3. INSTALLATION

118A INTERCONNECTING UNIT

3.01 Locate the connecting arrangement in an area free of dampness and excessive dust or dirt, with adequate room for access to front and rear of equipment and connecting blocks. The connecting arrangement should be mounted as close as possible to the CP ANI equipment; maximum distance between the connecting arrangement and the CP ANI equipment, including the customer-provided and installed wiring, must not exceed 50 feet. Mount the 118A IU on a 23-inch relay rack or 16C apparatus mounting using 99B brackets. (Provide a separate GRD to rack or mounting.)

To protect transistors and other electrical components of the interconnecting unit, remove fuses before installing or replacing a circuit pack or interconnecting unit.

3.02 Use the "D" inside wiring cable or equivalent to terminate the supervisory leads (CBS1, CBS2, CS and CG) associated with the CP equipment on the interface connecting block. Use the DL-1 shielded wire or equivalent to terminate the clock and data leads (CCK and CDT) associated with the CP equipment on the interface connecting block. ***The shields on leads CCK and CDT must be grounded at the 118A IU only; do not ground the shields at the interface connecting block.*** Stencil circuit number and lead designations on interface connecting block designation strip (see Fig. 4).

3.03 Provide straps on the 118A IU for loop and signaling options as shown in Fig. 3, 6, and 7.

KS-20944 PROTECTOR

3.04 When CP power source is used to power the connecting arrangement, a KS-20944 protector must be provided between the CP power source and the connecting arrangement. Mount

the KS-20944 protector on a wall or suitable flat surface near the interface connecting block. Use the AM-type, 14-gauge wire or equivalent to make connections from the protector to the 66C1-16 connecting block. Terminate one end of the wiring to the screw terminals (term. – and +) of the load terminal strip provided on the protector (see Fig. 8). Solder the other end of the wiring to terminals in column D of the connecting block as shown in Fig. 9; using the 14-gauge wire, solder the multiple straps to the terminals in column D of the connecting block as shown in Fig. 9, depending on the number of connecting arrangements provided. Use "D" inside wire cable or equivalent to make connections from the quick-connect terminals in columns A, B, and C of the connecting block to the screw terminals on the connecting arrangements.

4. OPERATION

4.01 ***Idle Condition—Connecting Arrangement C25 (Fig. 6 and 7):*** When the connecting arrangement is in the idle condition, leads CS, CG and CBS1, CBS2 from the CP equipment are open; a –48 volt battery signal is maintained through resistance lamp A, contact 8B of relay SZR, and the primary winding of relay RC, to leads T, R of the data channel toward the CO. The CP ANI equipment provides a positive EIA voltage signal (binary 0) over lead CDT and standard clock pulses over lead CCK to the connecting arrangement. The EIA interface and output flip-flop circuit detects the CP signal and in turn causes the data transmitter circuit to transmit a 1150-Hz signal over leads T, R of the data channel (voice-grade private line) toward the CO.

4.02 ***Seizure—Connecting Arrangement C25—SF Signaling Not Provided (Fig. 6):*** When the seizure of a trunk for an outgoing dialed call is recognized by the CP ANI equipment, the trunk and associated station number is identified and stored; the CP ANI equipment provides a bid signal to the connecting arrangement for access to the CO by placing a contact closure across leads CS, CG. This closure operates relay SZR through contact 10B of relay RC. Relay SZR operated prepares a closure path across leads CBS1, CBS2 and transfers the supervisory signal (through relay RC to leads T, R) from battery to ground. This ground activates the supervisory relay in the associated CO signaling circuit. The trunk scanner in the digit register connector circuit of the CO SIF recognizes this service request and assigns it a preference. When an idle digit register is connected to the line and conditioned to accept PBX identification information, a transmit data signal in the form of simplex battery is returned to the connecting arrangement over leads T, R. This battery operates relay RC through contact 8M of relay SZR. Relay RC operated completes the closure path across leads CBS1, CBS2 toward the CP ANI circuit as a transmit data command signal.

4.03 ***Seizure—Connecting Arrangement C25—SF Signaling Provided (Fig. 7):*** Seizure of the connecting arrangement when SF signaling is provided is accomplished in the same manner as described in 4.02 with the exception that the operation of the RC relay provides an operate path for the SF relay through contact 4M of the RC relay. Relay SF operated completes the closure path across leads CBS1, CBS2 toward the CP ANI circuit as a transmit data command signal. This extends the time between customer bid for data channel access (CS, CG closed) and connecting arrangement transmit data command (CBS1, CBS2 closed) by approximately 35 milliseconds. This 35-millisecond delay is required to allow the SF signaling equipment to clear the signaling transmission path to the CO.

4.04 ***Information Transmission—Connecting Arrangement C25 (Fig. 6 and 7):*** Within a timed interval (greater than 10 milliseconds but less than 20 milliseconds—see 4.07 and Fig. 10) after the CP equipment receives the transmit data command signal (contact closure across leads CBS1, CBS2), it must transmit the trunk and station number to the connecting arrangement over lead CDT. Each complete message from the CP equipment to the connecting arrangement consists of 41 binary bits, one premessage bit followed by a 40-bit word (8 digits, 5 bits per digit); 4 digits (20 bits) identify the trunk, the other 4 (20 bits) identify the station. Each 5-bit digit consists of two "1" bits and three "0" bits (2/5 code, see Table A). The premessage bit level is always a "1" bit.

> ***Note:*** As a trouble-locating aid, the CO equipment is normally conditioned to interpret an all "1" bit transmission (beginning with the first detected error digit and lasting for the remainder of the message) as admission of the CP equipment that it has detected an error or failed to identify the station making the call (see 4.06).

TABLE A

2/5 DIGIT CODE

DIGIT NUMBER	CHRONOLOGICAL POSITIONS OF 1 BITS	SEQUENTIAL APPEARANCE OF SERIAL BINARY DIGITS				
		0	1	2	4	7
0	4,7	○	○	○	●	●
1	0,1	●	●	○	○	○
2	0,2	●	○	●	○	○
3	1,2	○	●	●	○	○
4	0,4	●	○	○	●	○
5	1,4	○	●	○	●	○
6	2,4	○	○	●	●	○
7	0,7	●	○	○	○	●
8	1,7	○	●	○	○	●
9	2,7	○	○	●	○	●

These pulses are negative-going, standard EIA serial binary pulses synchronized with the repetition rate of the CP clock pulses on lead CCK (see Fig. 11). The rise time and duration of the data pulse is not critical; however, it must have reached peak amplitude at the leading edge of the clock pulse. The data pulse does not change until after the clock pulse is no longer present; consequently, the leading edge of the data pulse must precede the clock pulse by at least 3 microseconds and the trailing edge must lag the clock pulse by at least 3 microseconds. The CP clock pulses on lead CCK are accurate negative-going pulses with a repetition rate of 735.5 pps $\pm$0.1 percent, rise time of 2 microseconds, and a duration of 30 microseconds. Clock pulses need not be provided continually, just during signal transmission only. If the clock pulses are stopped for any reason, they must be resumed before a bid signal is initiated by the CP equipment. At least three clock pulses must be transmitted to the connecting arrangement following the end of the data message. The EIA interface and output flip-flop circuit in the connecting arrangement detects the data pulses from the CP ANI circuit and in turn causes the data transmitter to shift from the space or zero bit frequency (1150 Hz) to the mark or "1" bit frequency (1850 Hz) of a level suitable for transmission to the CO over leads T, R of the data channel (voice-grade private line).

4.05 ***Disconnection—Connecting Arrangement C25 (Fig. 6 and 7):*** The CP ANI equipment must maintain uninterrupted contact closure across leads CS, CG from seizure of the connecting arrangement until completion of transmission of trunk and station number data (see 4.07 and Fig. 10). When the CP equipment disconnects first, the CP ANI circuit removes the contact closure across leads CS, CG. An open on leads CS, CG causes SZR relay to release; SZR relay released opens leads CBS1, CBS2 toward the CP equipment, causes relay RC to release, transfers the supervisory signal (through relay RC to leads T, R toward the CO) from ground to battery as a disconnect signal, and returns the connecting arrangement to the idle condition (the RC relay released causes the SF relay to release when provided). When the CO disconnects first, the supervisory relay in the CO signaling circuit removes battery from leads T, R of the connecting arrangement causing relay RC to release. Relay RC released removes the closure across leads CBS1, CBS2 toward the CP equipment (see Fig. 6); when SF signaling is provided (see Fig. 7), relay RC released causes the SF relay to

release which in turn removes the closure across leads CBS1, CBS2 toward the CP equipment. The CP ANI circuit recognizes the open on leads CBS1, CBS2 as a disconnect signal and subsequently removes the closure across leads CS, CG toward the connecting arrangement. An open on leads CS, CG causes SZR relay to release and returns the connecting arrangement to the idle condition.

4.06 ***Call Billing:*** The CO receives the identification information and stores the station number in a memory slot associated with the trunk number for all outgoing calls using the trunk lines whether or not the information is required for call billing. When the AMA equipment requires the station number for call billing, the number is read out of storage. If the equipment determines that the number is invalid either because of digits in error or an incomplete number, the call is either billed to the listed PBX number or billed by operator number identification or billed by an alternate method.

4.07 ***Functional Sequence of Operation (Fig. 10):*** The CP ANI equipment initiates a bid for data channel access to the CO with a contact closure across leads CS, CG. Following a minimum interval of 45 milliseconds, the connecting arrangement provides a closure across leads CBS1, CBS2 as a transmit data command signal to the CP ANI equipment (a delay of 3 seconds between the CS, CG closure and the CBS1, CBS2 closure usually indicates trouble on the data channel or temporary traffic overload in CO data processing equipment). Following the CBS1, CBS2 closure the CP equipment begins data transmission; the interval between the CBS1, CBS2 closure and data transmission must be greater than 10 milliseconds but less than 20 milliseconds. Data transmission time is approximately equal to 55.76 milliseconds. Following the last bit of data, the CP equipment shall remove the closure across leads CS, CG to release connection to the CO. The interval between the last bit of data and removal of the closure across leads CS, CG must be less than or equal to 10 milliseconds. Following the release of the CO connection by the CP equipment (open on leads CS, CG) there must be a minimum interval of 45 milliseconds before the CP equipment initiates another bid for data channel access (closure across leads CS, CG).

5. MAINTENANCE

5.01 Precautions should be taken when performing tests to avoid adversely affecting service to the customer. Local instructions should be followed with reference to notifying the customer and CO personnel before performing the tests.

5.02 When there is an indication of trouble in the connecting arrangement(s), the circuit at fault must be opened at the interface connecting block to verify in which direction the trouble exists. The circuit can be opened at the interface connecting block by removing the B bridging clip associated with each lead.

5.03 ***Tests—Connecting Arrangement C25 (Fig. 6 and 7):***

(a) Check for blown fuses (F1 and F2) on 118A IU.

(b) Check for presence of battery and ground and proper polarity on −48V and GRD terminals.

(c) Check for presence of −48 volts between −48 OPT terminal and GRD terminal (see Fig. 3, 6, and 7); if voltage is not present check fuse F1.

(d) Check for presence of −24 volts between −24 volt test point and GRD terminal (see Fig. 3, 6, and 7); if voltage is not present check fuse F2, resistor R48, and zener diode CR18.

5.04 ***Tests—Connecting Arrangement C25—SF Signaling Not Provided (Fig. 6):***

Note: Notify CO before proceeding with this test.

(a) Open all the leads of the circuit under test at the interface connecting block. Block the RC relay non-operated. Disconnect leads T and R (data channel) from terminals T and R on the 118A IU.

(b) Connect lead CS to lead CG; observe that relay SZR operates. If relay SZR does not operate, check fuse F1, check for faulty RC relay contact 10B, and check for open on leads CS, CG, or the strap between terminals −48 OPT and RC10F.

(c) With relay SZR operated, block operated relay RC; check for closure across leads CBS1, CBS2. If closure is not present across lead CBS1, CBS2 check for faulty RC relay

contact 8M, faulty SZR relay contact 10M, or open on leads CBS1, CBS2, or the strap between terminals RC8F and CBS1.

(d) If trouble is indicated in the data channel see 5.06.

(e) On completion of tests, reconnect leads T and R to terminals T and R on the 118A IU, replace the B bridging clips at the interface connecting block associated with the circuit under test, and remove the block from relay RC.

5.05 ***Tests—Connecting Arrangement C25—SF Signaling Provided (Fig. 7):***

Note: Notify CO before proceeding with this test.

(a) Open all the leads of the circuit under test at the interface connecting block. Block the RC relay non-operated. Disconnect leads T and R (data channel) from terminals T and R on the 118A IU.

(b) Connect lead CS to lead CG; observe that relay SZR operates. If relay SZR does not operate, check fuse F1, check for faulty SF relay contact 8B, and check for open on leads CS, CG, or the strap between terminals −48 OPT and SF8B.

(c) With relay SZR operated, block operated relay RC; observe that relay SF operates and check for closure across leads CBS1, CBS2. If relay SF does not operate, check for faulty RC relay contact 4M or open on the strap between terminals −48 OPT and SFL. If closure is not present across leads CBS1, CBS2, check for faulty SF relay contact 12M, faulty SZR relay contact 10M, or open on leads CBS1, CBS2, or the strap between terminals SF12M and CBS1.

(d) If trouble is indicated in the data channel, see 5.06.

(e) On completion of tests, reconnect leads T and R to terminals T and R on the 118A IU, replace the B bridging clips at the interface connecting block associated with the circuit under test, and remove the block from relay RC.

5.06 ***Tests—Data Channel (Fig. 6 and 7):*** When trouble is indicated in the data channel, replace the HJ1 circuit pack. If trouble is still present, check for open or short on leads CDT and CCK. Perform normal circuit order transmission tests over leads T and R toward the CO. Using a 716C receiver, check for presence of 1150-Hz tone across leads T and R from the connecting arrangement when the connecting arrangement is in the idle condition.

5.07 ***Tests—KS-20944 Protector (Fig. 8):*** If circuit breaker switches are tripped (in the ***off*** position) return them to the ***on*** position; if circuit breaker switches cannot be operated to the ***on*** position perform tests as follows:

(a) Disconnect Telephone Company provided wiring from terminals 1 and 2 (− and +) of the load terminal strip on the protector under test. If the circuit breaker switches remain in the ***on*** position when operated, the trouble is in the Telephone Company provided equipment. Check for proper polarity of the Telephone Company provided leads at terminals 1 and 2 (− and +) of the load terminal strip on the protector; ascertain that the circuits connected to the protector do not exceed the current rating of the protector.

(b) If the trouble is not in the Telephone Company side, check the type, amount, and polarity of the CP voltage present on the leads provided for customer termination at the protector; this voltage should meet the specifications shown in Fig. 8.

Do not attempt any tests or repairs to the CP equipment.

6. CONNECTIONS

6.01 For connecting information refer to Fig. 3, 5,6, 7, and 9.

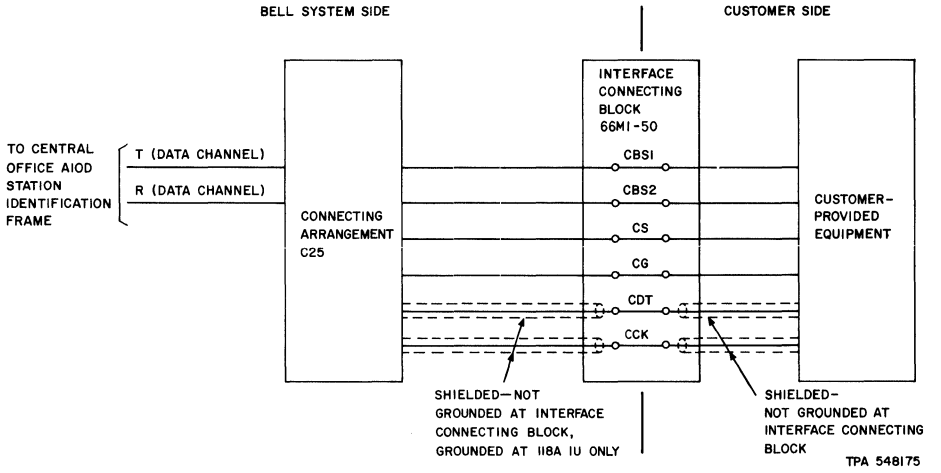
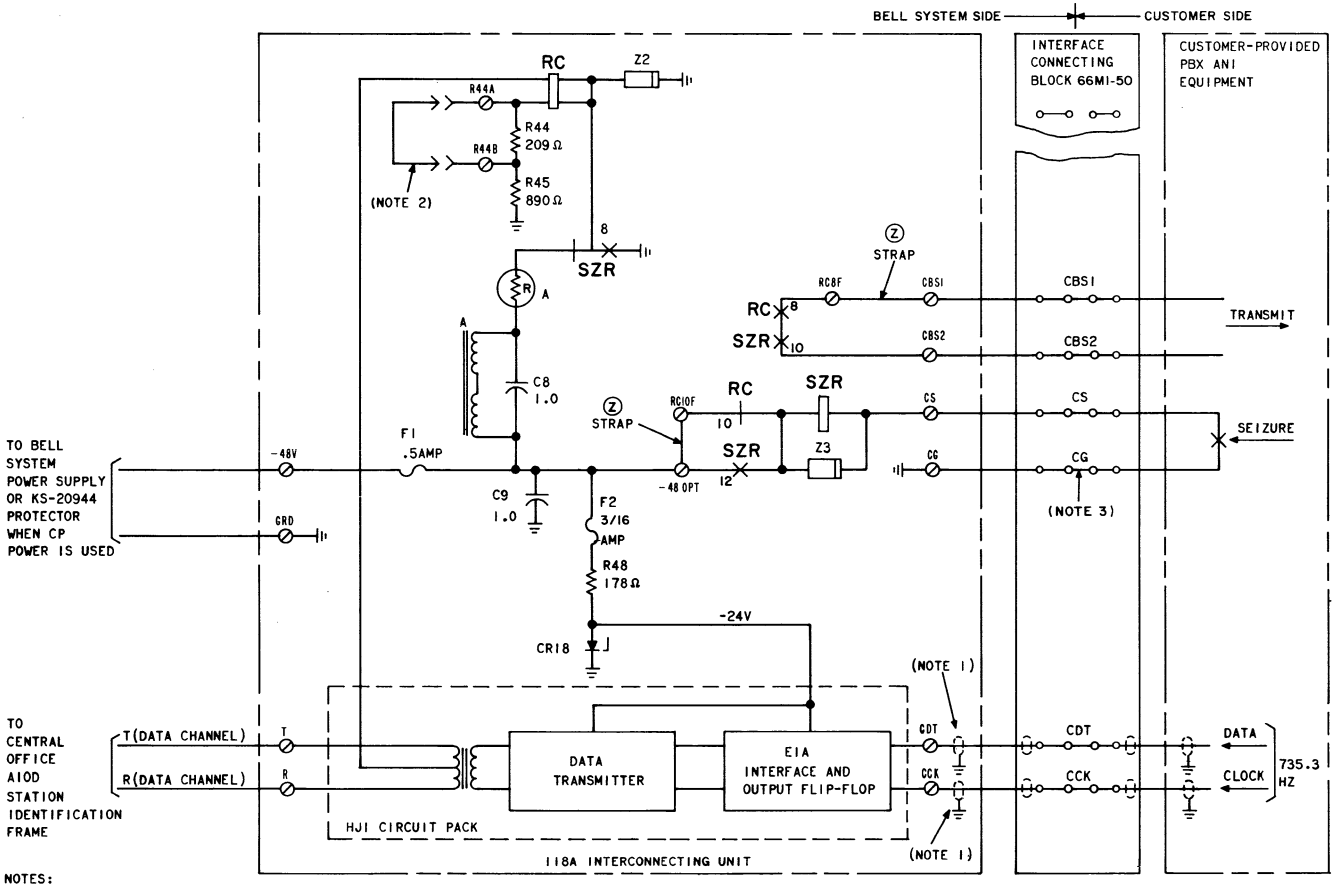
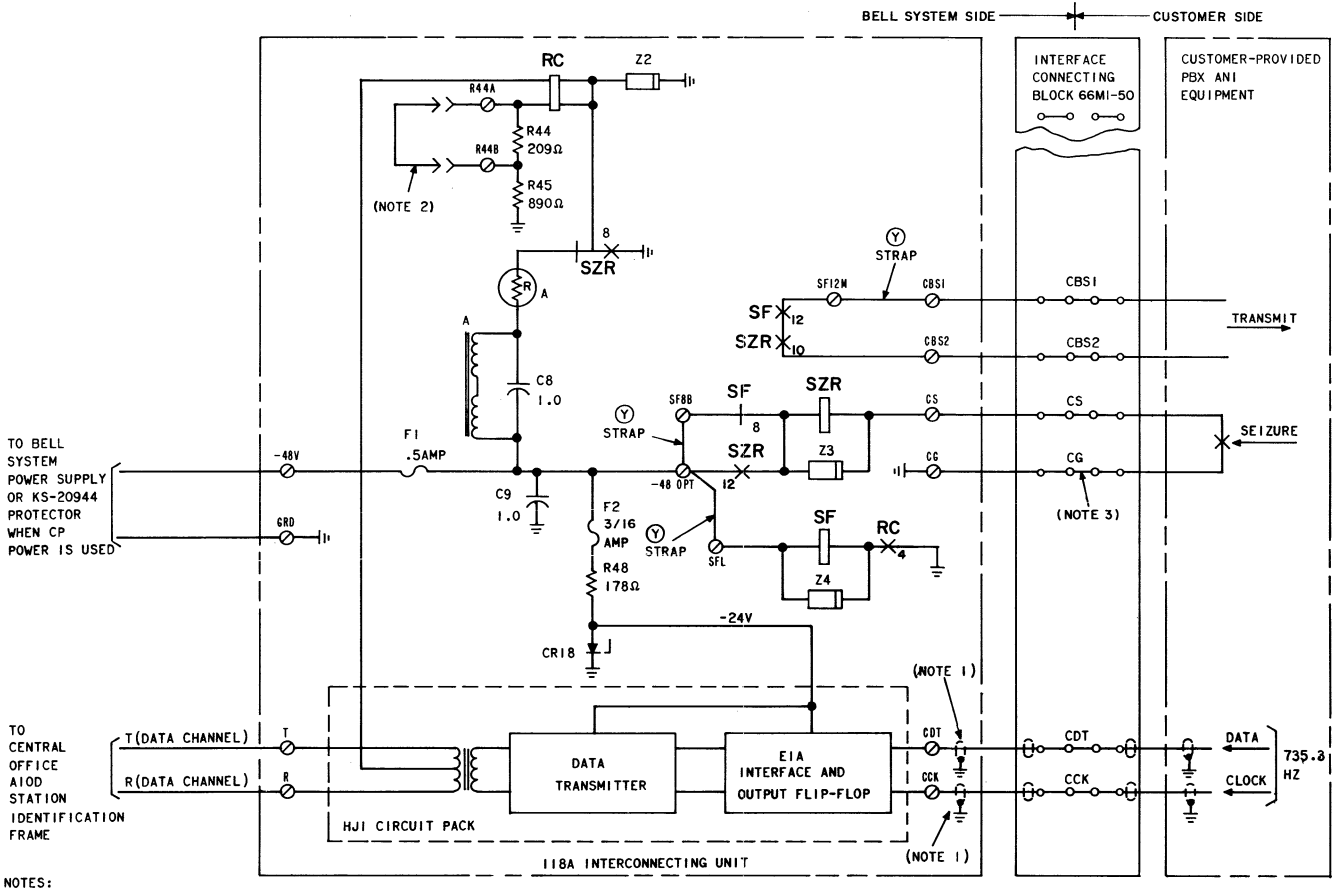


Fig. 5—Block Diagram—Voice Connecting Arrangement C25



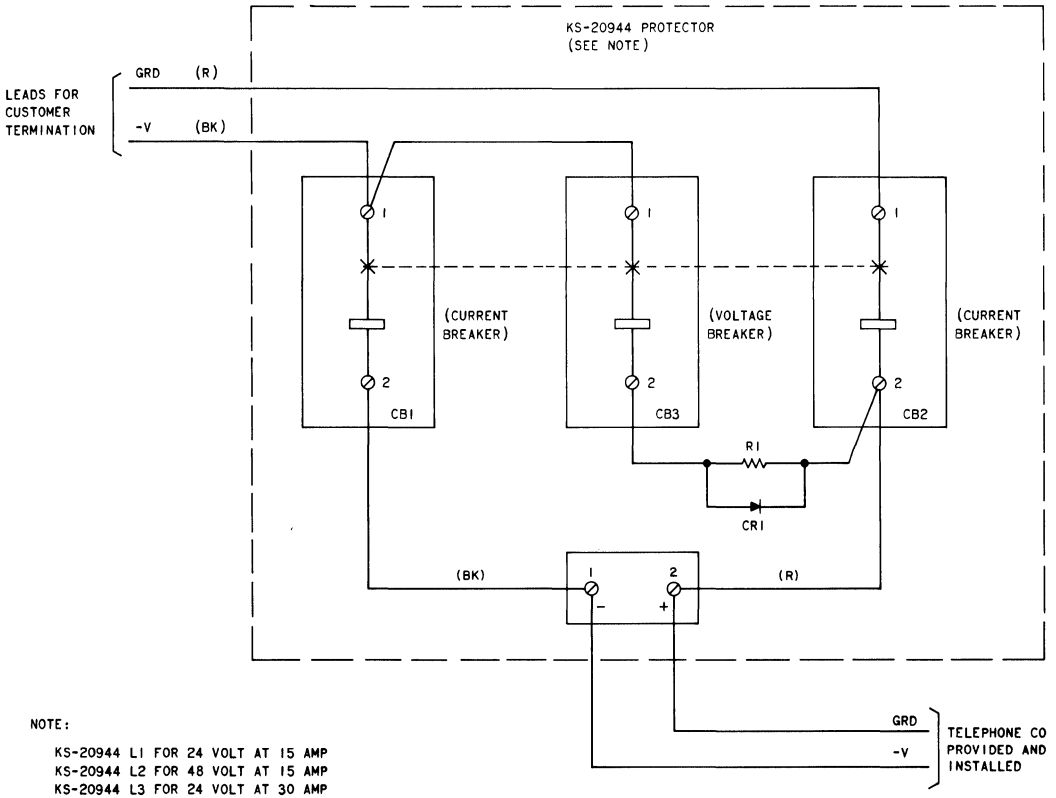
NOTES:
1. CONNECT SHIELDS OF CDT AND CCK LEADS TO GRD TERMINAL ON 118A IU, DO NOT GROUND AT INTERFACE CONNECTING BLOCK.
2. PROVIDE STRAP FROM TERMINAL R44A TO R44B WHEN LOOP TO CENTRAL OFFICE IS 500 OHMS OR LESS.
3. B BRIDGING CLIP.

Fig. 6—Simplified Schematic and Connections, Connecting Arrangement C25, SF Signaling Not Provided Between PBX and Central Office Station Identification Frame (Option Z)



NOTES:
1. CONNECT SHIELDS OF CDT AND CCK LEADS TO GRD TERMINAL ON 118A IU, DO NOT GROUND AT INTERFACE CONNECTING BLOCK.
2. PROVIDE STRAP FROM TERMINAL R44A TO R44B WHEN LOOP TO CENTRAL OFFICE IS 500 OHMS OR LESS.
3. B BRIDGING CLIP.

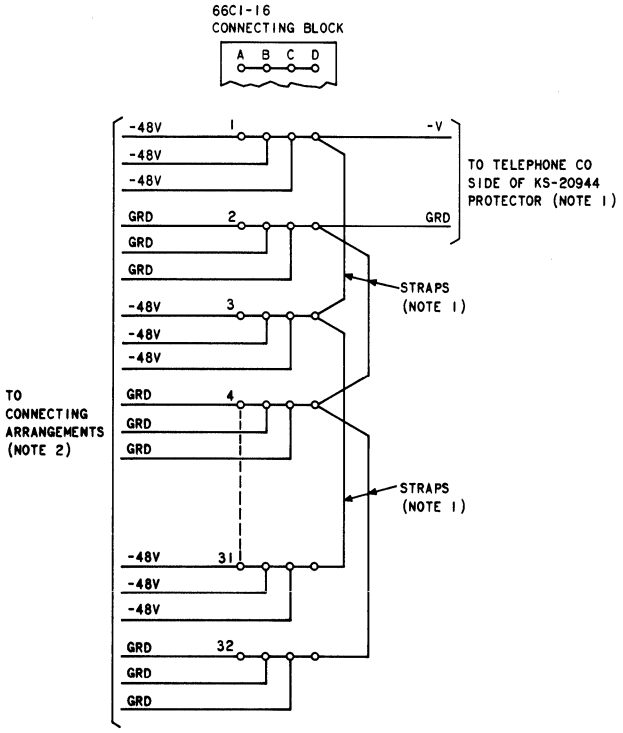
Fig. 7—Simplified Schematic and Connections, Connecting Arrangement C25, SF Signaling Provided Between PBX and Central Office Station Identification Frame (Option Y)



NOTE:

KS-20944 L1 FOR 24 VOLT AT 15 AMP
KS-20944 L2 FOR 48 VOLT AT 15 AMP
KS-20944 L3 FOR 24 VOLT AT 30 AMP
K2-20944 L4 FOR 48 VOLT AT 30 AMP
PROTECTORS WILL TRIP IN 25 MILLISECS (MAXIMUM):
ON OVERVOLTAGE OF 38 VOLTS (24 VOLT UNIT) AND 68 VOLTS
(48 VOLT UNIT), ON OVERLOAD OF 18 AMPERES (15 AMP UNIT)
AND 36 AMPERES (30 AMP UNIT), ON REVERSED POLARITY, OR AC
VOLTAGE GREATER THAN 18 VOLTS, OR INCORRECT GRD.

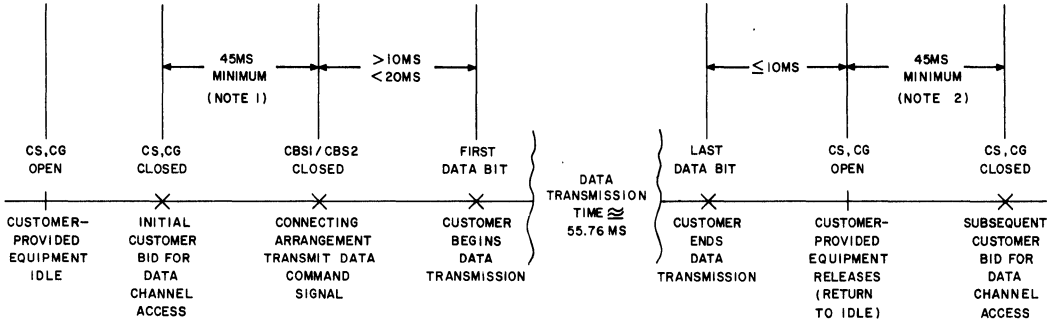
Fig. 8—Schematic—KS-20944 Protector



NOTES:

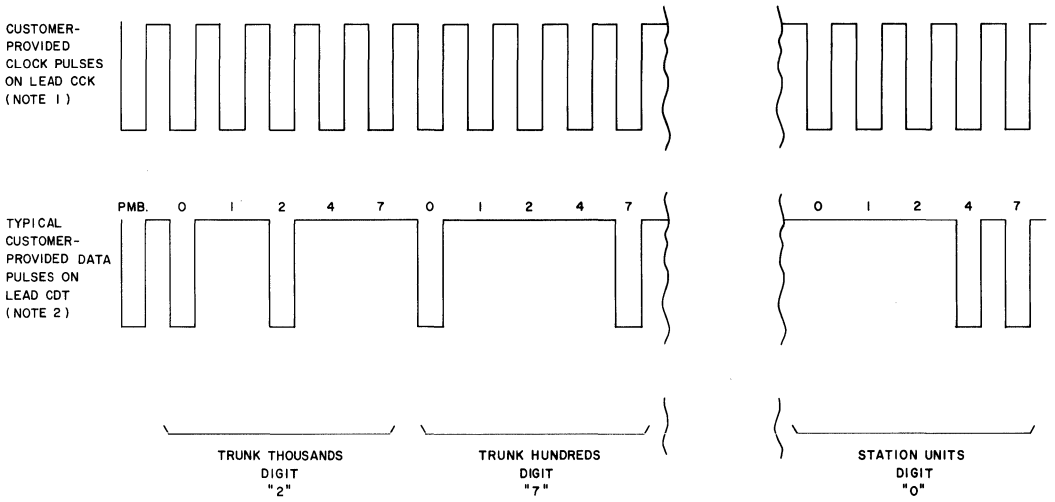
1. USE 14-GAUGE WIRE TO CONNECT FROM KS-20944 PROTECTOR TO CONNECTING BLOCK; PROVIDE MULTIPLE STRAPS AS DETERMINED BY NUMBER OF CONNECTING ARRANGEMENTS TO BE CONNECTED TO. USE SOLDER TO MAKE THE CONNECTION OF THE 14-GAUGE WIRE AND STRAPS TO THE CONNECTING BLOCK.
2. USE "D" INSIDE WIRE OR EQUIVALENT TO MAKE CONNECTIONS FROM CONNECTING BLOCK TO CONNECTING ARRANGEMENTS. EACH CONNECTING BLOCK PROVIDES MEANS FOR CONNECTING TO 48 CIRCUITS, HOWEVER, DO NOT EXCEED THE MAXIMUM CURRENT RATING OF THE KS-20944 PROTECTOR.

Fig. 9—Typical Power Distribution Connections Between KS-20944 Protector and Connecting Arrangements



NOTES:
1. A DELAY OF 3 SECONDS BETWEEN CUSTOMER BID AND RETURN OF TRANSMIT DATA COMMAND SIGNAL USUALLY INDICATES TROUBLE ON THE DATA LINE OR TEMPORARY TRAFFIC OVERLOAD IN CENTRAL OFFICE DATA PROCESSING EQUIPMENT.
2. THERE MUST BE A MINIMUM INTERVAL OF 45 MILLISECONDS BETWEEN CUSTOMER RELEASE OF CONNECTING ARRANGEMENT (RETURN TO IDLE CONDITION) AND SUBSEQUENT CUSTOMER BID FOR DATA CHANNEL ACCESS.

Fig. 10—Functional Sequence Diagram



NOTES:

1. CUSTOMER-PROVIDED CLOCK PULSES MUST BE CONTINUOUS NEGATIVE GOING PULSES WITH A REPETITION RATE OF 735.3 PPS ± 0.1 PERCENT, RISE TIME 2 MICROSECONDS, DURATION 30 MICROSECONDS.
2. CUSTOMER-PROVIDED DATA PULSES MUST BE NEGATIVE-GOING PULSES SYNCHRONIZED WITH REP RATE OF CLOCK PULSES; DATA PULSE MUST LEAD CLOCK PULSE BY A MINIMUM OF 3 MICROSECONDS AND LAG CLOCK PULSES BY A MINIMUM OF 3 MICROSECONDS.

Fig. 11—Typical Customer Clock and Data Pulses on Leads CCK and CDT