See new revised page 1 in front of this sect.

DATA SET 201A

TRANSMITTER-RECEIVER

INSTALLATION - CONNECTIONS

1. INTRODUCTION

1.01 This section covers data set 201A. It does not contain any operating information concerning the business machine equipment associated with the data set.

1.02 This section is reissued to show interface pin 24 connected for external timing. Fig. 7 reflects this change.

2. INSTALLATION

2.01 Data set 201A shall be installed in conformance with existing practices covering installation of telephone sets.

2.02 The set must be located within range of the customer-supplied interface cord. This cord must not exceed 50 feet.

2.03 The data set cord is terminated on three 44A connecting blocks. The telephone set cord, if used, terminates in an A25B connector cable. The connector cable should be terminated on five 44A connecting blocks located reasonably close to the data set connecting blocks. Connections between blocks can be made with 6-pair IW-cable or equivalent.

2.04 To avoid possible interruption during data transmission, it is preferable to avoid connecting extension stations or multiple appearances on the data line.

2.05 When quad JKT wire is used on 4-wire systems, use the red and green conductors as one pair and the yellow and black conductors as the second pair.

2.06 A 3-wire power cord is supplied with the data set for connection to a 117-volt ac receptacle. The customer must furnish a 3-wire outlet, not under control of a switch. This power source must be served from the same ac service cabinet that serves the business machine so that the same ground bus is used for both. This measure is necessary to prevent introduction of noise potentials which might otherwise develop and cause data errors. Visually inspect and test that a good solid ground does exist in outlet ground sources. Grounds from separate sources should be bonded together. A test using the 6A impulse counter may be used to detect noise where this condition is suspected. These tests are described in Section 592-011-500.

2.07 The power source must be 117 volts $\pm$10 per cent and 60 cycles $\pm$0.5 cycle per second.

2.08 To minimize inductive interference to the data signal on the telephone (data) line, the line should not be carried in the same run as cable between the data set and the customer business machine or lines carrying teletypewriter services. If this condition cannot be met, it will be necessary to run the telephone (data) line in SK (shielded) station wire between the data set and the cable distribution terminal or building entrance.

3. CONNECTIONS

3.01 Type-of-operation options and strapping information shown in the following tables must be specified on the service order.

3.02 Data set 201A is factory-strapped in the following manner:

Table B - 600 ohms

Table C - 7, 15 strapped

Table D - 4-wire

Table E - -50 to -20

Table F - -8

Table G - 4-wire continuous carrier.

Sets used on service orders specifying conditions other than above must be re-strapped in accordance with Tables B through G, removing or rearranging factory straps where necessary.

TABLE A

AUTOMATIC ANSWERING

Feature or Option		Provide	
		Wiring	Quantity
With 2-Wire Key Telephone Set	Selective Automatic Answering	W	One Per Circuit
	Permanent Automatic Answering	X	

3.03 The following tables give strapping information for terminal strip L1 (see Fig. 1).

TABLE B

TERMINAL IMPEDANCE

Impedance ohms	Connect Terminals
600	(6, 10); (3, 8)
900	(2, 10); (3, 4)

TABLE C

NEW SYNC

When New Sync Is Not Used by Customer	Connect Terminals
	(7, 15)

TABLE D

ECHO DELAY

Lines	Connect Terminals
2 Wire	(1, 5); (11, 12)
4 Wire	(11, 16)

3.04 The following tables give strapping information for terminal strip L2 (see Fig. 1).

TABLE E

RECEIVE SIGNAL LEVEL

Received Signal	Maximum Line Noise		Connect Terminals
dbm	dbm	dbrn*	
Compromise Equalizer Not Connected			
-50 to -20	-60	+30	(5, 7)
-44 to -14	-54	+36	(1, 7); (3, 5)
-38 to -8	-48	+42	(6, 7); (4, 5)
Compromise Equalizer Connected			
-42 to -12	-52	+38	(2, 7); (5, 8)
-36 to -6	-46	+44	(1, 7); (2, 3); (5, 8)

* C Message Weighting

TABLE F

TRANSMITTER LINE SIGNAL

Line Signal dbm	Connect Terminals
0	(26, 30)
-2	(27, 30)
-4	(28, 30)
-6	(29, 30)
-8	None

TABLE A

FEATURE		OPTION	TYPE OF OPERATION		CONNECTIONS	
					TERMINAL STRIP	STRAP TERMINALS
AUTOMATIC ANSWER (WITH TWO-WIRE KEY TELEPHONE SET)		W	Selective Automatic Answering			See Connection Diagram.
		X	Permanent Automatic Answering			See Connection Diagram.
TERMINAL IMPEDANCE			IMPEDANCE (OHMS)			
		G*	600		L1	(6, 10) (3, 8)
		F	900		L1	(2, 10) (3, 4)
NEW SYNC		A*	New Sync Not Used		L1	(7, 15)
			New Sync Used		L1	None
ECHO DELAY (See Note 1.)		E	2-Wire		L1	(1, 5) (11, 12)
		B*	4-Wire		L1	(11, 16)
TRANSMITTER OUTPUT LEVEL			LINE SIGNAL (DBM)			
		ZI	0		L2	(26, 30)
		ZJ	−2		L2	(27, 30)
		ZK	−4		L2	(28, 30)
		ZL	−6		L2	(29, 30)
		ZM*	−8		L2	None
TYPE OF OPERATION			TYPE OF OPERATION			
	4-WIRE PRIVATE LINE	ZN*	Continuous Carrier		L2	(22, 24, 25) (20, 21, 23) (13, 16) (11, 12)
		ZO	Carrier Controlled By Request to Send		L2	(18, 22) (19, 20) (24, 25) (14, 17) (21, 23) (13, 16) (11, 12)
	2-WIRE PRIVATE LINE OR DDD	ZP	Carrier Controlled By Request to Send		L2	(22, 24) (20, 23) (15, 25) (10, 21) (9, 14, 17)
RECEIVE SIGNAL LEVEL (See Note 2, Note 3, and Note 4.)			RECEIVER SIGNAL (DBM)	MAXIMUM LINE NOISE (DBRNC)		
			COMPROMISE EQUALIZER OUT			
		ZA	−50 to −20	−36	L2	(5, 7)
		ZB	−44 to −14	−42	L2	(1, 7) (3, 5)
		ZC	−38 to −8	−48	L2	(6, 7) (4, 5)
		ZD*	−32 to −2	−54	L2	(1, 7) (3, 6) (4, 5)
			COMPROMISE EQUALIZER IN			
		ZE	−42 to −12	−40	L2	(2, 7) (5, 8)
		ZF	−36 to −6	−46	L2	(1, 7) (2, 3) (5, 8)
		ZG	−30 to 0	−52	L2	(6, 7) (2, 4) (5, 8)
		ZH	−24 to +6	−58	L2	(1, 7) (3, 6) (2, 4) (5, 8)

*Indicates factory-wired option.

Note 1: Four-wire installations use option B. Most 2-wire installations use option E; however, short-haul circuits may use option B if requested by customer.

Note 2: Usually, the equalizer is not used on private lines.

Note 3: Option ZG should be used when the data set is on a loop with loss of 4 dB or less.

Note 4: Option ZF should be used when the loop loss is between 4 and 10 dB. If line noise causes faulty operation on the data terminal when using option ZF, then option ZG should be used.

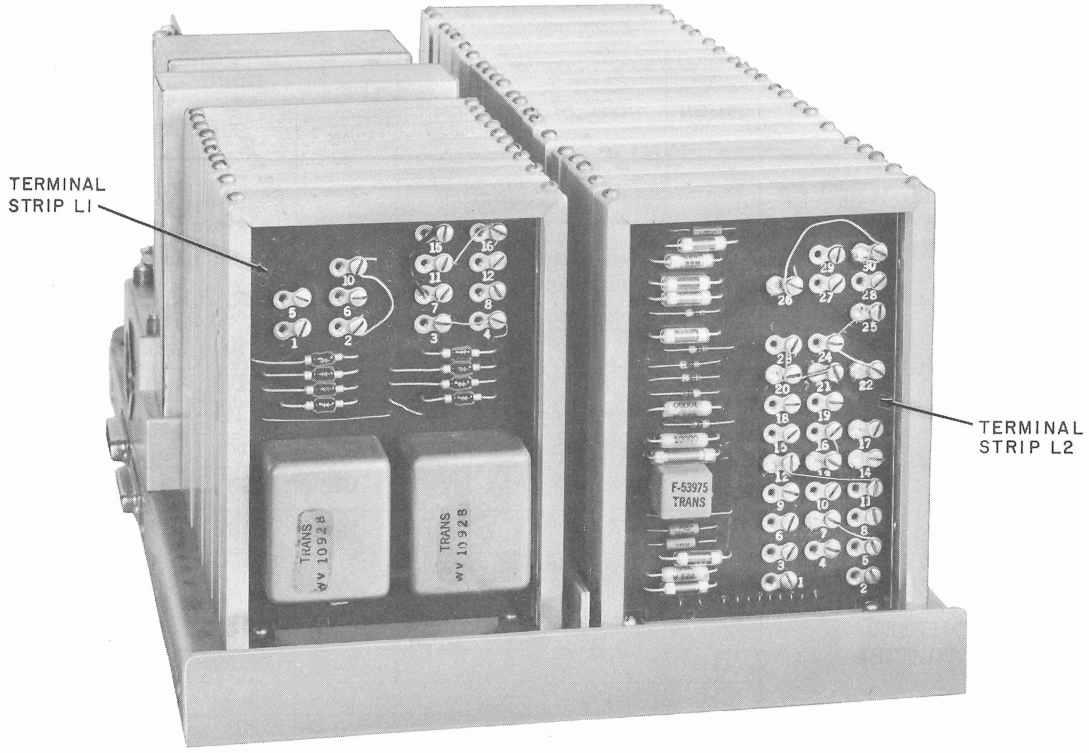


Fig. 1—Data Set 201-Type, Cover Removed

Fig. 3 and 3A—Two-Wire Data Service Without a Telephone Set

Fig. 4 and 4A—Two-Wire Data Service With a Telephone Set but Without a Key Telephone System

Fig. 5 and 5A—Two-Wire Data Service With a Telephone Set and a 1A1 or 1A Key Telephone System

Fig. 6—569NB Telephone Set, Internal Connections

Fig. 7—Data Sets 201A and 201B, Automatic Answering Circuit

Fig. 8—Line and Test Key Circuit.

3.04 Figure 8 shows an external line and test key circuit which may be specified for 4-wire circuits. In the normal position, this key does not affect the operation of the data set. When in the test position, this key connects the output of the transmitter to the input of the receiver and grounds the interface (IT) lead. This permits the business machine to send data to itself through the local data set.

4. REFERENCES

4.01 The following Bell System Practices contain information which may be helpful in installing and connecting Data Sets 201A1, A2 and 201B1, B2:

SECTION	TITLE
502-533-100	Telephone Sets—569NB
590-010-200	Data Sets, General Installation and Connection Information
592-011-100	Data Sets 201A1, A2 and 201B1, B2, Transmitter-Receiver, Description and Operation

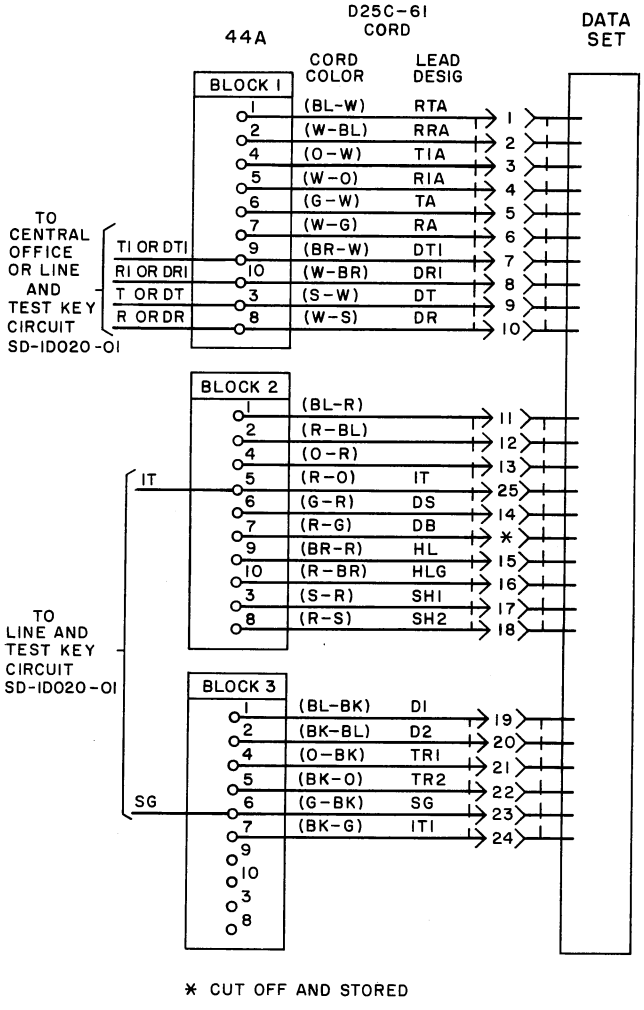


Fig. 2 - External Connections for 4-Wire Data Service Without a Telephone Set

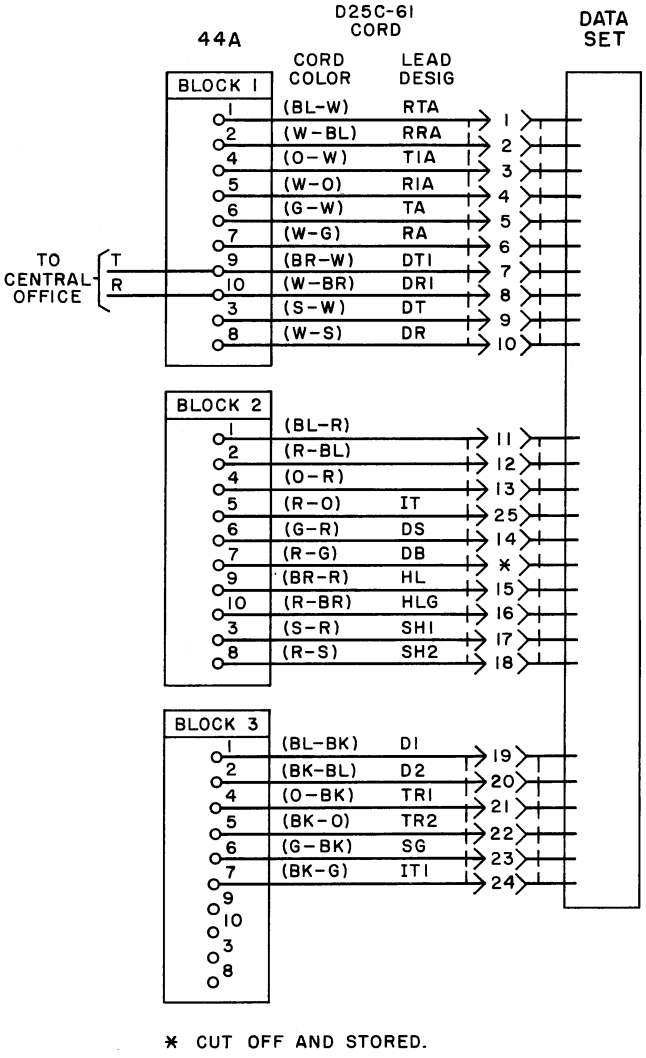


Fig. 3 - External Connections for 2-Wire Data Service Without a Telephone Set

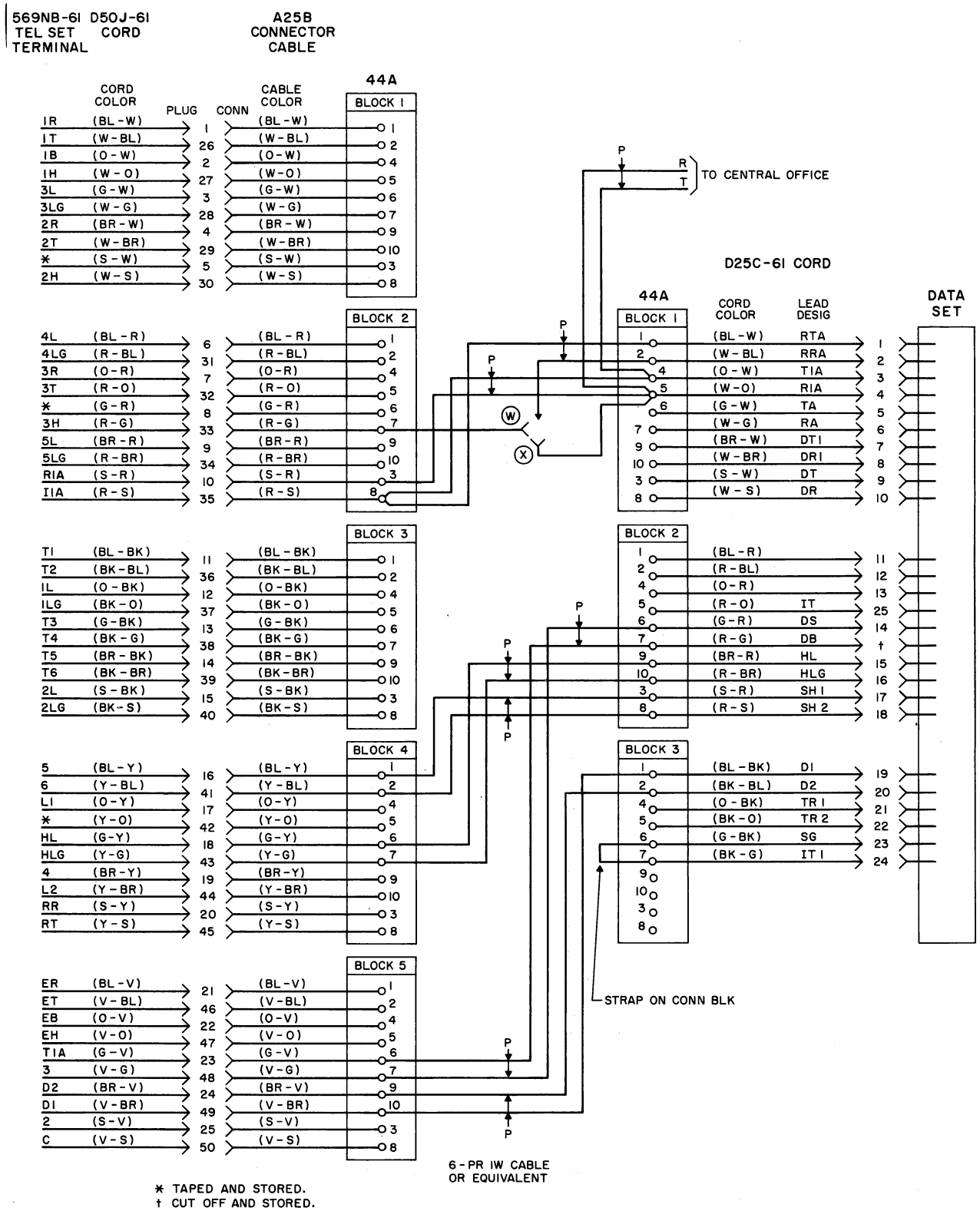


Fig. 4 - External Connections for 2-Wire Data Service With a Telephone Set but Without a Key Telephone System

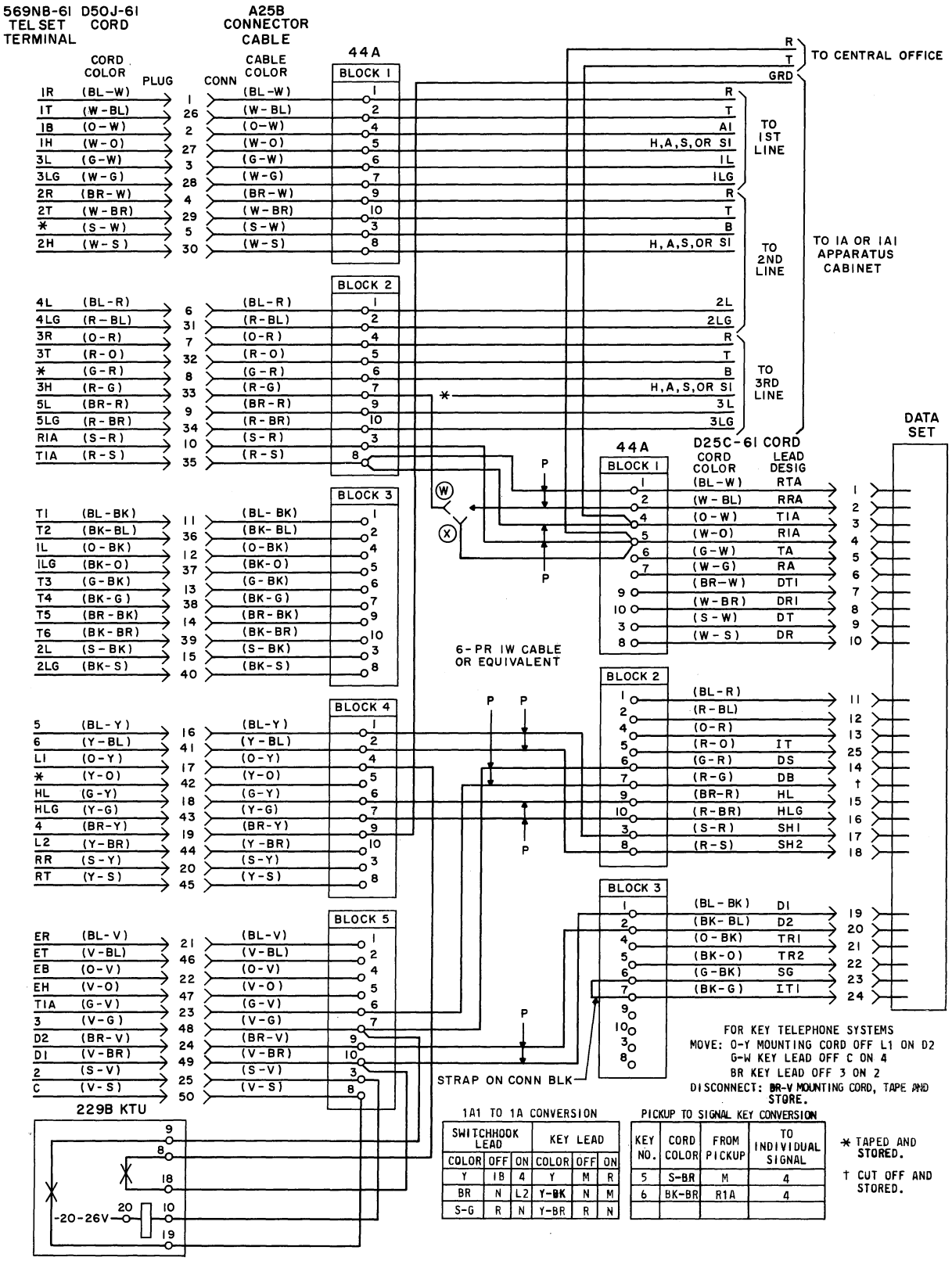
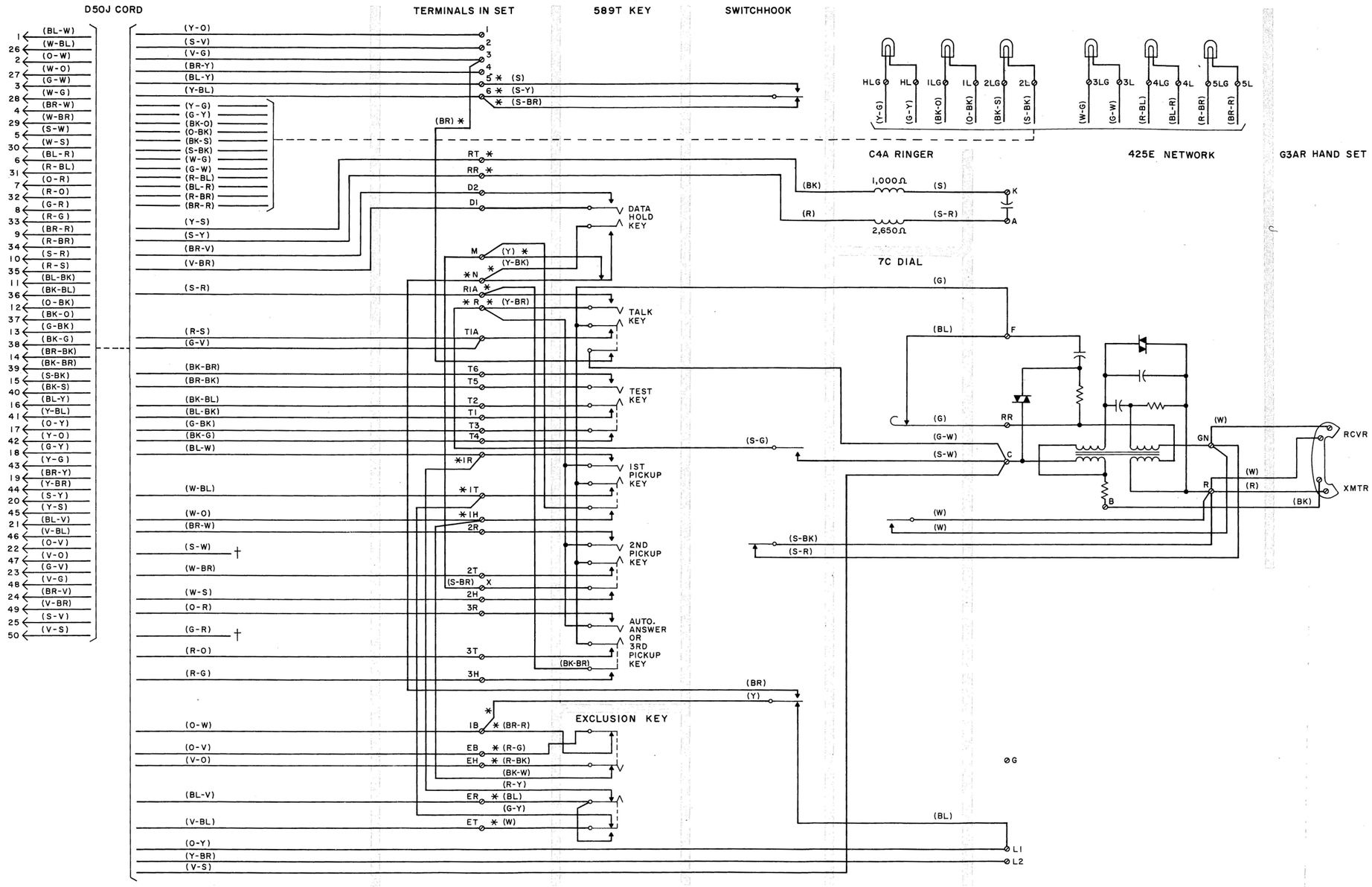


Fig. 5 - External Connections for 2-Wire Data Service With a Telephone Set and With a 1A1 or 1A Key Telephone System



* Spade-tipped lead

† Tape and Store

FOR KEY TELEPHONE SYSTEMS

Move O-Y mounting cord off L1 on D2. G-W key lead off C on 4. BR key lead off 3 on 2.

Disconnect BR-V mounting cord, tape, and store.

1A1 TO 1A CONVERSION

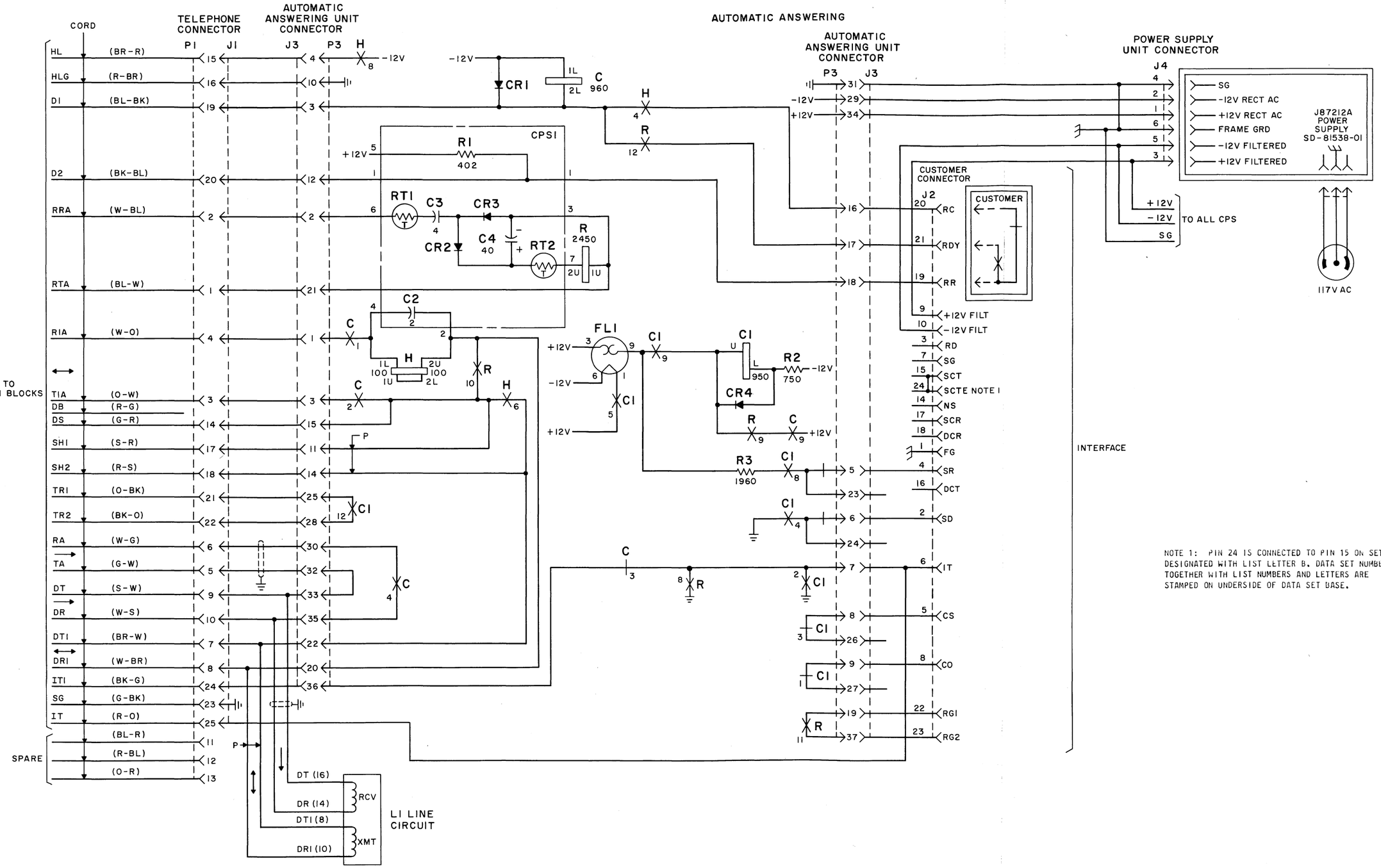
Switchhook Lead			Key Lead		
Color	Off	On	Color	Off	On
Y	1B	4	Y	M	R
BR	N	L2	Y-BK	N	M
S-G	R	N	Y-BR	R	N

PICKUP TO SIGNAL KEY CONVERSION

Key No.	Cord Color	From Pickup	To Individual Signal
5	S-BR	M	4
6	BK-BR	R1A	4

Note: To connect C4A ringer to date line, move red ringer lead from RR to R1A and BK ringer lead from RT to T1A.

Fig. 6 - 569 NB Telephone Set Internal Connections



NOTE 1: PIN 24 IS CONNECTED TO PIN 15 ON SETS DESIGNATED WITH LIST LETTER B. DATA SET NUMBER TOGETHER WITH LIST NUMBERS AND LETTERS ARE STAMPED ON UNDERSIDE OF DATA SET BASE.

Fig. 7 - Data Set 201A Automatic Answering Circuit

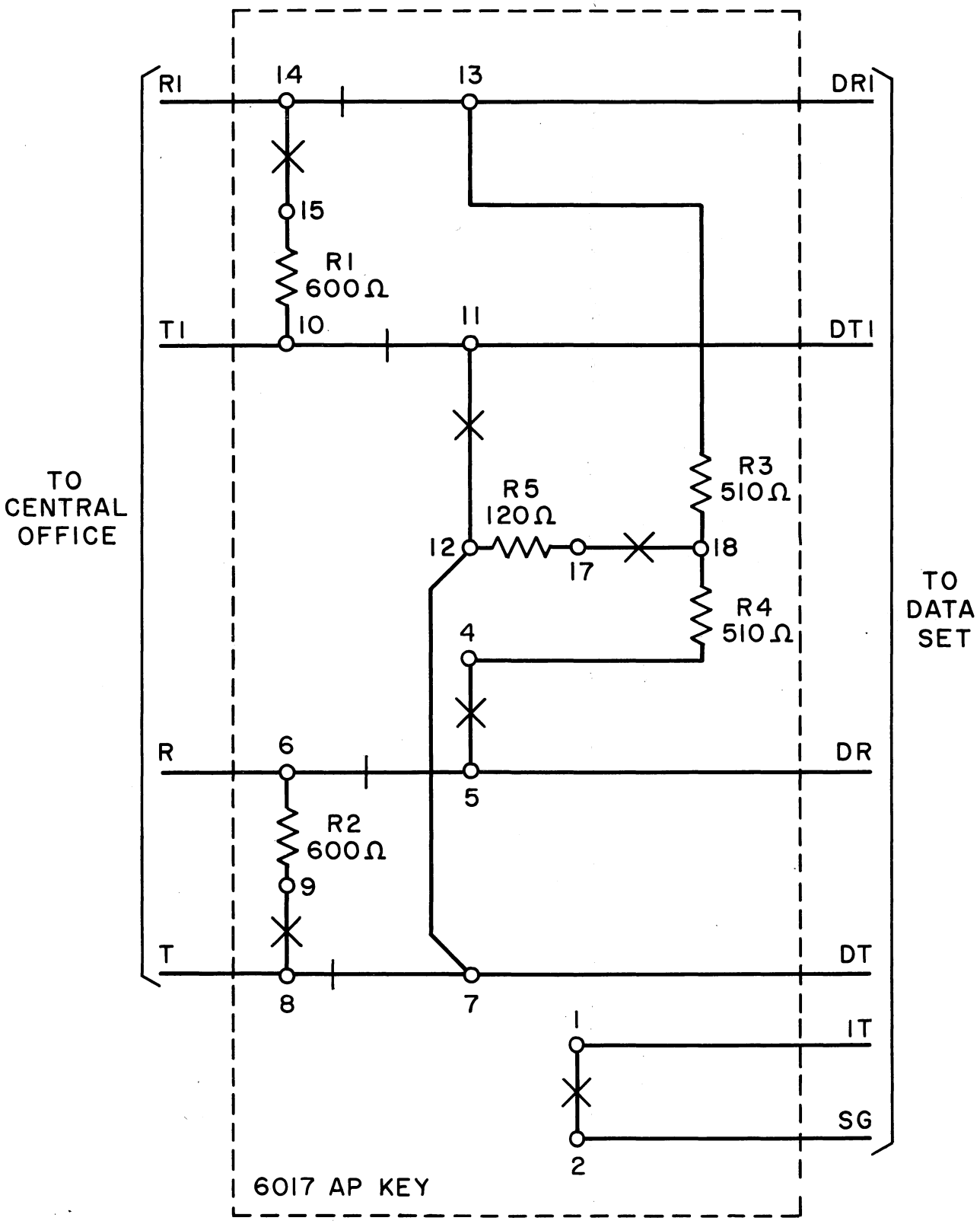


Fig. 8 - Line and Test Key Circuit (SD-1D020-01)