

DATA SETS MODELS 3 AND 3A TRANSMITTER-RECEIVER INSTALLATION AND CONNECTIONS

1. GENERAL

1.01 This section covers data sets models 3 and 3A (Fig. 1). It does not contain operating information concerning the business machine equipment associated with the data set. Model 3 to model 3A modification information is also included.

1.02 This section is reissued to:

- Delete all but installation and connection information. Deleted information is now covered in Sections 592-010-100, -300, and -500, Issue 1.
- Revise the text.
- Delete drawings T-700274, T-700275, and T-700276.

- Delete drawings SD-1D000-011, -012, -013, and -014.

- Add Fig. 1, 2, and 3.

1.03 Due to extensive changes, marginal arrows have been omitted.

2. INSTALLATION

2.01 It is recommended *all* model 3 sets or early model 3A sets be modified to include the features listed below. Several features incorporated in late model 3A sets were not included in early model 3A or any model 3 sets. ***Before installation***, verify that these features exist. If not, modify as outlined in 2.02.

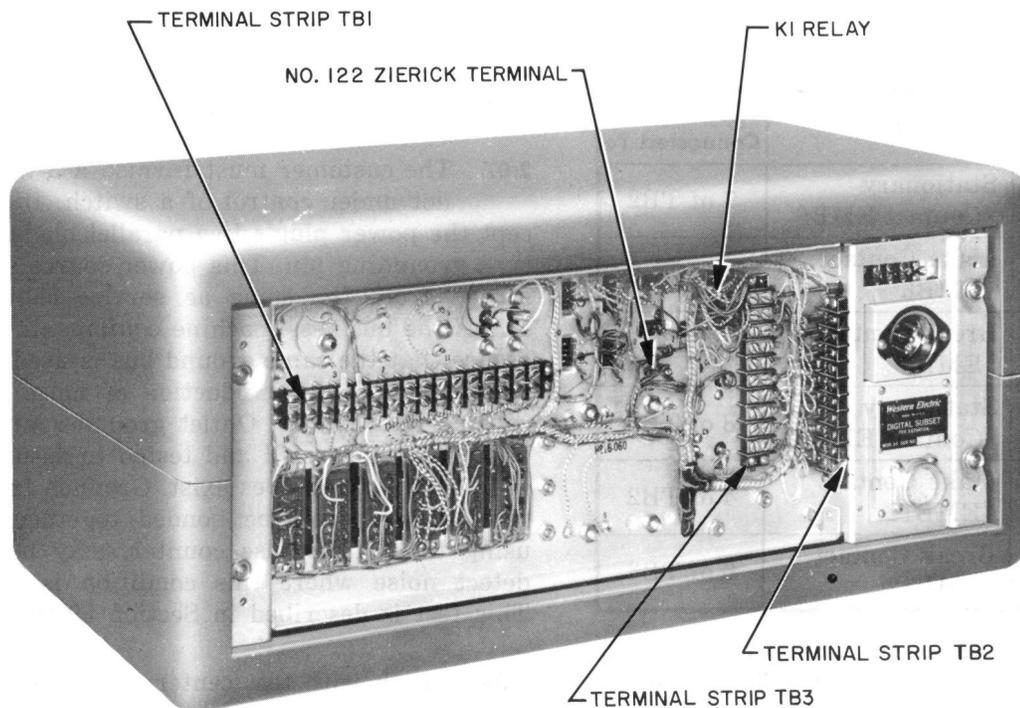


Fig. 1 — Data Set 3A, Rear View, Cover Removed

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2.02 All sets should be equipped with the following wiring boards:

- Attenuation Equalization Board ED-1D048-30 (with X option) *or* No Attenuation — No Equalization Board ED-1D054-30 (with Y option)
- Line and Control Board ED-1D053-30
- Modulator Board ED-1D049-30
- Demodulator A Board ED-1D052-30
- Demodulator B Board ED-1D051-30

Some older type B or F numbered boards were modified as indicated by a stenciled red star on top of the frame. *All* boards without ED numbers or a red star should be replaced. B or F numbered boards without a red star *are not compatible* with ED or red star boards.

- Early sets were equipped with a diode (1N100) across the winding of relay *K1*. This diode should be removed. If *B* option is specified, a WECO 420B diode should be installed as shown in Fig. 2.
- To avoid a momentary open in the line when transferring from talk to data or data to talk, the following changes should be made on relay *K1*.

Move Wire From	To	Other End Connected To
Stationary Contact BM3	Stationary Contact EMB6	7 of TB2
Make Contact BM3	Make Contact EMB6	3 of TB2
Break Contact BM3	Break Contact EMB6	7 of TB3
Stationary Contact EBM4	Stationary Contact EMB12	8 of TB2
Make Contact EBM4	Make Contact EMB12	4 of TB2
Break Contact EBM4	Break Contact EMB12	6 of TB3

- Lead from pin D of Cannon connector is sewn back in the cable form. The loose end should be terminated on GRD1 of No. 122 Zierick terminal located directly below RP1 at the rear of the data set.

2.03 The data set model 3A shall be installed in conformance with existing practices covering the installation of station sets.

2.04 The set must be located within range of the customer-supplied interface cord connecting the data set with the business machine (not over 50 feet).

2.05 To avoid interference during data transmission, the following restrictions apply to the data line where practicable.

- Use only on individual lines.
- Do not connect extension telephones.



Data line must not appear on key telephone systems having A lead control such as 1A1 key telephone systems.

2.06 To minimize inductive interference to 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's 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.

2.07 The customer must furnish a 3-wire outlet not under control of a switch. It must accept the power plug's two parallel blades and U-type grounding pin. This power source should be served from the same ac service cabinet that serves the business machine equipment. This will assure that the same ground bus is used for both and prevent any introduction of noise potential causing data errors. Outlet ground sources must be visually inspected and tested to assure that a good solid ground does exist. Grounds from separate sources must be bonded together. A test, using the 6A impulse counter, may be used to detect noise where this condition is suspected. This test is described in Section 592-010-500.

2.08 Check with test center that telephone loop facilities assigned have been tested to verify that they meet design requirements. If not, the loop must be tested to see that it meets these

requirements before proceeding with the installation. These requirements are covered in Section 314-205-500.

3. CONNECTIONS AND OPTIONS

3.01 Five groups of options are shown in Fig.

2. Note that only one option from each group may be specified for any particular installation. These options must be specified on the service order.

Group 1

- Options *A* and *C* are connected when a telephone set is used and the customer does not desire remote control of the talk and data modes of operation.
- Options *B* and *C* are connected if the customer wishes to control the talk and data modes from his own equipment. With these options, it is possible to have a telephone set which shares control of the talk and data modes with the remote control. Two situations are possible:
 - Remote control *only*, or
 - Remote control *and* telephone push-button control.
- When only remote control is desired, terminals *B* and *C* of *J7* are not connected in the customer's equipment. Data mode is obtained by customer connection of leads *A* to *D* of *J7*; opening of connection between *A* and *D* returns data set to talk mode.
- When remote control and telephone set push-button control are desired, terminals *B* and *C* of *J7* must be connected together through a contact in the customer's equipment. The data mode may be obtained by depressing the data key on the telephone set or by the customer connecting terminal *A* to *D* on *J7*. Return to the talk mode can be accomplished by depressing the talk key on the telephone set or momentarily opening the closure between terminals *B* and *C* of *J7* in the business machine equipment.
- Option *D* is connected when the modulator and demodulator of the data set are connect-

ed directly to the line. Neither a telephone set nor remote control is used with this option. The *K1* relay is not used as part of the control circuitry.

Group 2

- *U* option is used for operating on 4-wire circuits. Data is transmitted over one pair and received over another. If a telephone set is desired, a locally engineered arrangement is required.
- *V* option is used for 2-wire operation. This strapping connects the demodulator to the modulator and provides for keeping a local copy of transmitted information. Since only one pair of wires is used, transmission of data can be in one direction only at any given time. This option is always used on switched network applications.

Group 3

- Option *R* provides an internal request to send (RS) voltage, thus keeping the carrier turned on at all times and giving a continuous start-to-send (SS) voltage to the customer. This allows transmission by the customer at any time, making it unnecessary for him to request to send before making a transmission.
- Option *S* gives the customer control of the start-to-send signal. With this option, it is necessary for the customer to request to send over the interface circuit. After a short delay, the data set delivers a start-to-send signal and transmission can begin.

Group 4

- Option *X* is used when delay and attenuation equalization is required. Delay equalization is normally specified when the business machine operates above 600 bits per second. It will be used primarily on switched telephone network. On private line facilities, its use will depend on whether the facilities are already equalized for delay. To install this option it is necessary to order

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separately three 200C and three 200AE equalizers and wire according to Fig. 2. Note that the connections are soldered. With this option ED-1D048-30 attenuation equalizer board is used.

- Option Y is wired at the factory. The no attenuation — no equalization board ED-1D054-30 is also factory placed. This option is used when no delay or attenuation equalization is required. This option consists of soldered connections which must be removed if X option is installed, in addition to the wiring board change.

Group 5

- Options K, L, and M connect the proper

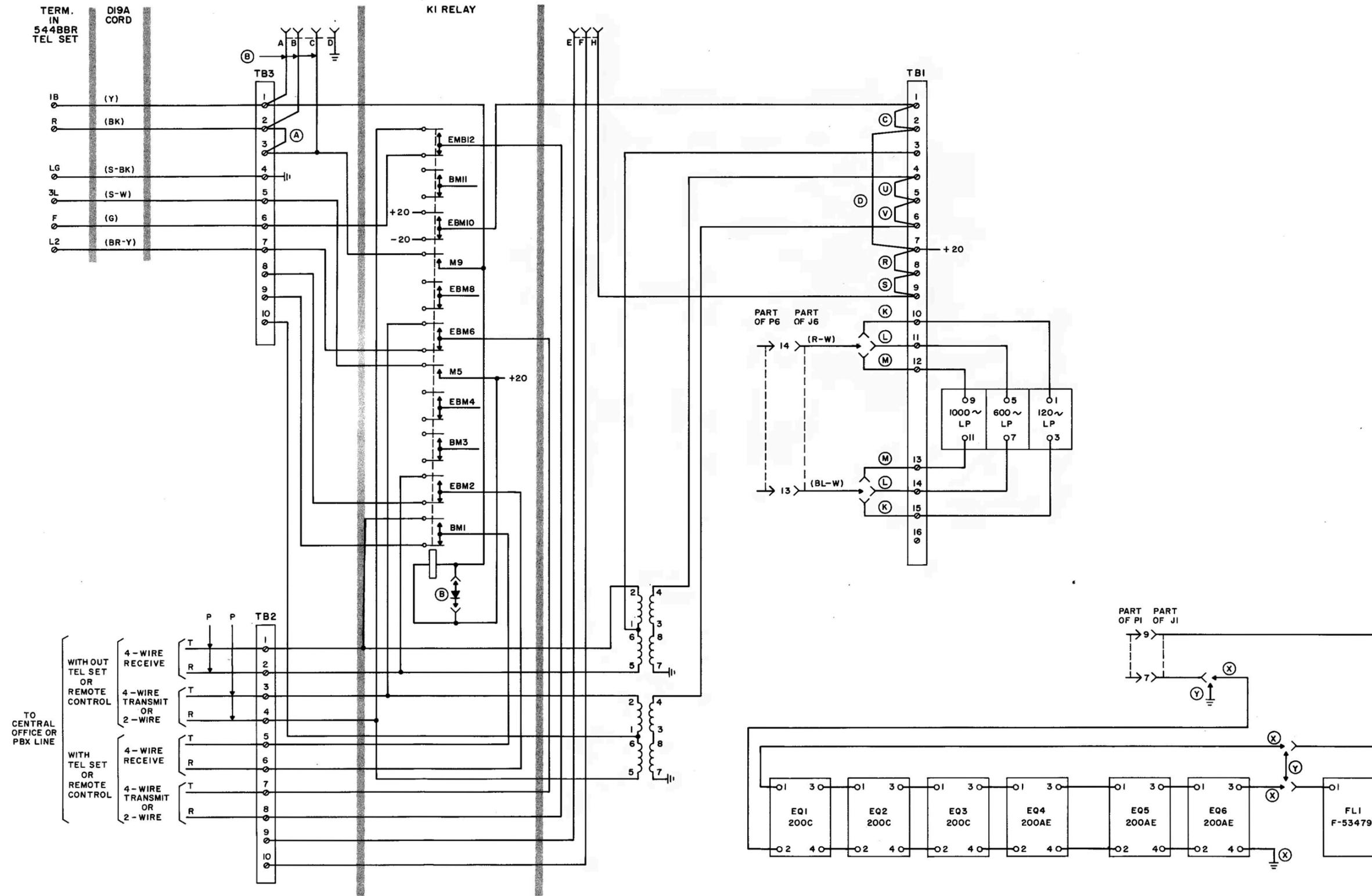
portion of filter FL3 into the demodulator. The option used is dependent on the bit rate of the business machine. (See Fig. 2.)

3.02 Note that there is no OFF-ON power switch. This means it is necessary to unplug the data set when work is to be done inside the cabinet.

3.03 Connect the data set and *specified* wiring options as shown in Fig. 2.

3.04 Modify and connect the telephone set as shown in Fig. 3.

3.05 Test and adjust as outlined in Section 592-010-500.



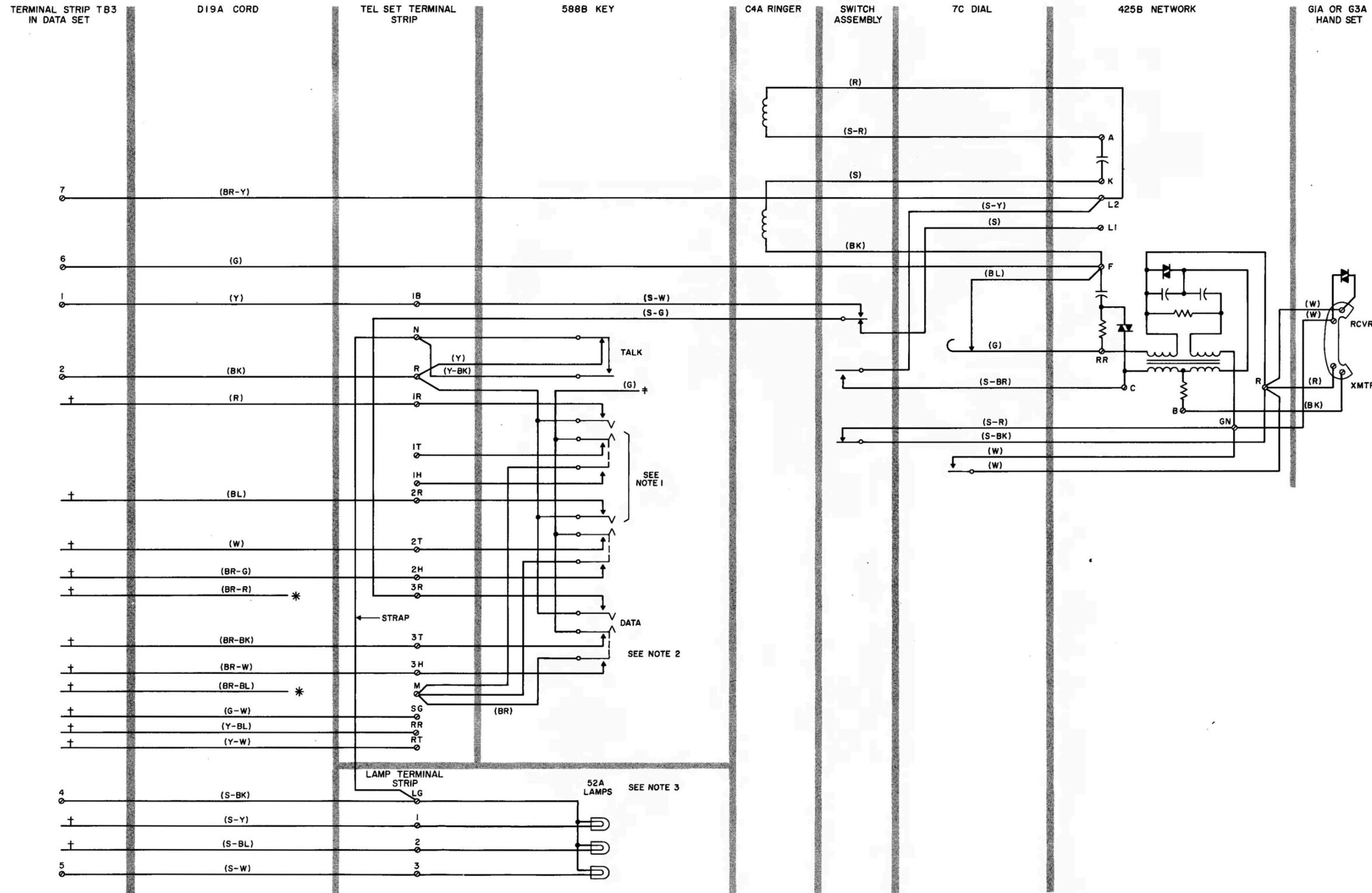
Note: Data set is supplied wired per Y option.

WIRING OPTIONS

Select one and only one option from each group as applicable.

Group	Wiring	Option
1	A & C	With tel set — no remote control of data and talk modes.
	B & C	Remote control of data and talk modes—with terminals B and C on J7 connected together. A momentary closure between terminals A and D on J7 puts data set into data mode. A momentary break between terminals B and C on J7 returns data set to talk mode. With terminals B and C on J7 not connected together, a closure between terminals A and D on J7 puts data set into data mode. Breaking connection between terminals A and D on J7 returns data set to talk mode.
	D	Neither tel set nor remote control used. (Interlock not controlled by relay.)
2	U	4-wire operation.
	V	2-wire operation.
3	R	Line carrier permanently on, permanent start/send signal.
	S	Customer control of start/send signal and line carrier by means of request to send.
4	X	With delay equalizers.
	Y	Without delay equalizers.
5	K	For bit rates 0 to 200/sec.
	L	For bit rates 200 to 900/sec.
	M	For bit rates 900 to 1200/sec.

Fig. 2 — Data Set 3A, Schematic



WIRING CHANGES FOR 544BBR TELEPHONE SET FOR USE WITH DATA SET 3A

Cord	Lead			Off	On
	Ringer	Switchhook	Key		
BR-Y				3R	L2
BK				1H	R
G				1T	F
	R			1R	L2
	BK			1T	F
		S-Y		R	L2
		S-G		N	3R
			Y	M	R
			G	F	‡

Strap LG to N on telephone set terminal strip.

- * Taped and stored.
- † Tape and store in data set.
- ‡ Disconnect, tape, and store.

- Note 1:** Block center two pushbuttons with LP-12A858 blocking rings.
- Note 2:** Remove screw from data button to make nonlocking.
- Note 3:** 51A lamps supplied with the set must be changed to 52A lamps.

Fig. 3 — Telephone Set 544BBR Modified for Use with Data Set 3A