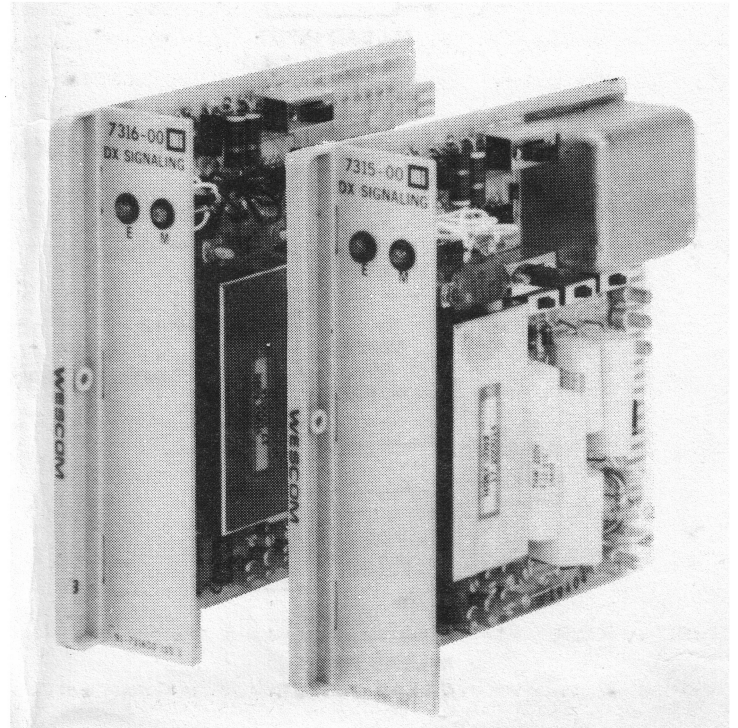




7315-00 And 7316-00 DX Signaling Modules

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1. GENERAL

1.01 This Section provides a circuit description, installation procedures, and basic testing information for the Wescom® 7315-00 and 7316-00 DX Signaling Modules shown in Figure 1.

1.02 The 7315-00 and 7316-00 DX Signaling Modules are plug-in printed circuit modules used to derive E&M lead signaling from the line side of the associated repeat coil. The E&M signals are received over a metallic voice path to a maximum loop distance of 5000 ohms via duplex leads. The 7315-00 is a DX signaling module complete with built-in repeat coil and impedance matching capabilities. The 7316-00 performs the same DX signaling functions, but without the repeat coil and impedance matching capabilities of the 7315-00.

1.03 Issue 3 changes include the addition of front-panel-mounted LEDs to monitor E&M signaling, and added circuitry to allow

Figure 1. 7315-00/7316-00 DX Signaling Modules

compatibility with Type I and Type II interfaces. Second-printing changes include lead and switch designation corrections and a general editorial update. Significant changes are indicated by a change bar (█) in the margin adjacent to the affected copy.

1.04 When conditioned for DX1 operation, these units accept M-lead signals and deliver E-lead signals, as shown in Figures 2 and 3. A DX1 is usually associated with a trunk or station circuit.

1.05 When conditioned for DX2 operation, these units accept E-lead signals and deliver M-lead signals. A DX2 is usually associated with an intermediate circuit location and is generally connected to the E&M leads of SF or carrier equipment.

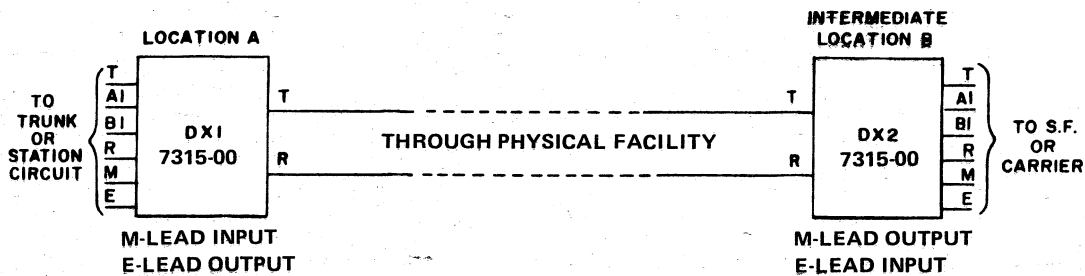


Figure 2. 7315-00 DX1/DX2 Applications Diagram

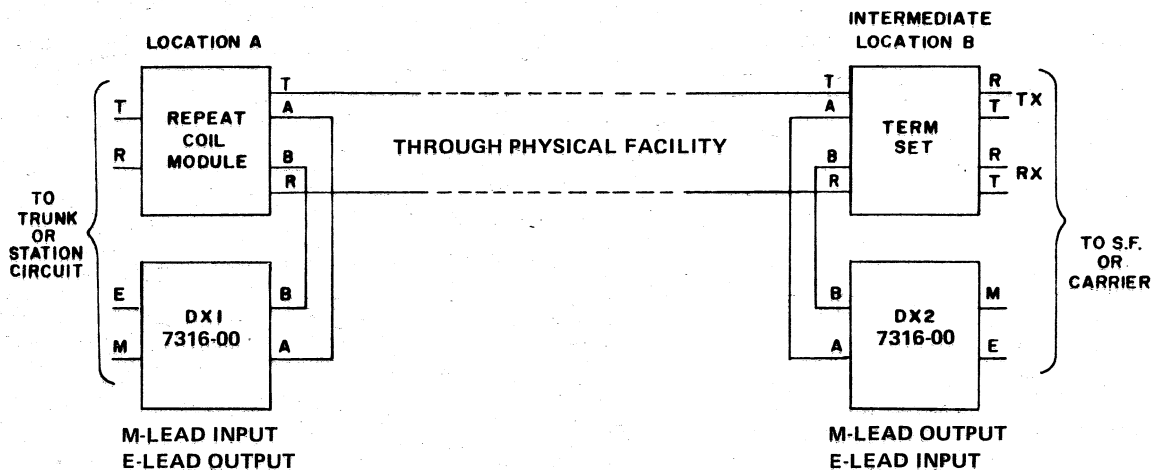


Figure 3. 7316-00 DX1/DX2 Applications Diagram

1.06 The 7315-00 or 7316-00 mounts in one module mounting position of a Wescom Type 440X Mounting Assembly. Electrical connection to the system is made through one of the 56-pin, wire-wrapped, card-edge connectors provided as part of the Type 440X Mounting Assembly.

2. CIRCUIT DESCRIPTION

Type I Nonlooped Signaling

2.01 The following description is applicable to both the 7315-00 and 7316-00. It considers a call being completed through a PBX location and an intermediate location, with similar units being provided at both locations. The unit situated at location A is conditioned as a DX1, with its A and B leads in the normal configuration. The unit situated at intermediate location B is conditioned as a DX2, with its A and B

leads in the normal configuration. Refer to the schematic diagrams (Figures 6 and 7) and Figure 4 during the following circuit description.

Idle Condition

2.02 During idle, the M/MA leads (pin 3 or 21) at the DX1 and DX2 locations are at a ground potential, and the E/EA leads (pin 23) are open. Also during idle, a -48V potential is applied to the voltage divider, made up of R8 and R9; this causes current to flow from the -48V source through R8, winding 1, DX balancing resistance, winding 3, and R7 to ground. This current keeps relay A in both DXs in the deenergized condition. False relay operation of the A relay (K1) due to differences in battery, and/or due to ground potential differences between the two DX signaling locations, are prevented by currents through windings 4 and 2 of relay A (K1); these currents equally aide and oppose the operation of the A relay (K1), keeping it deenergized.

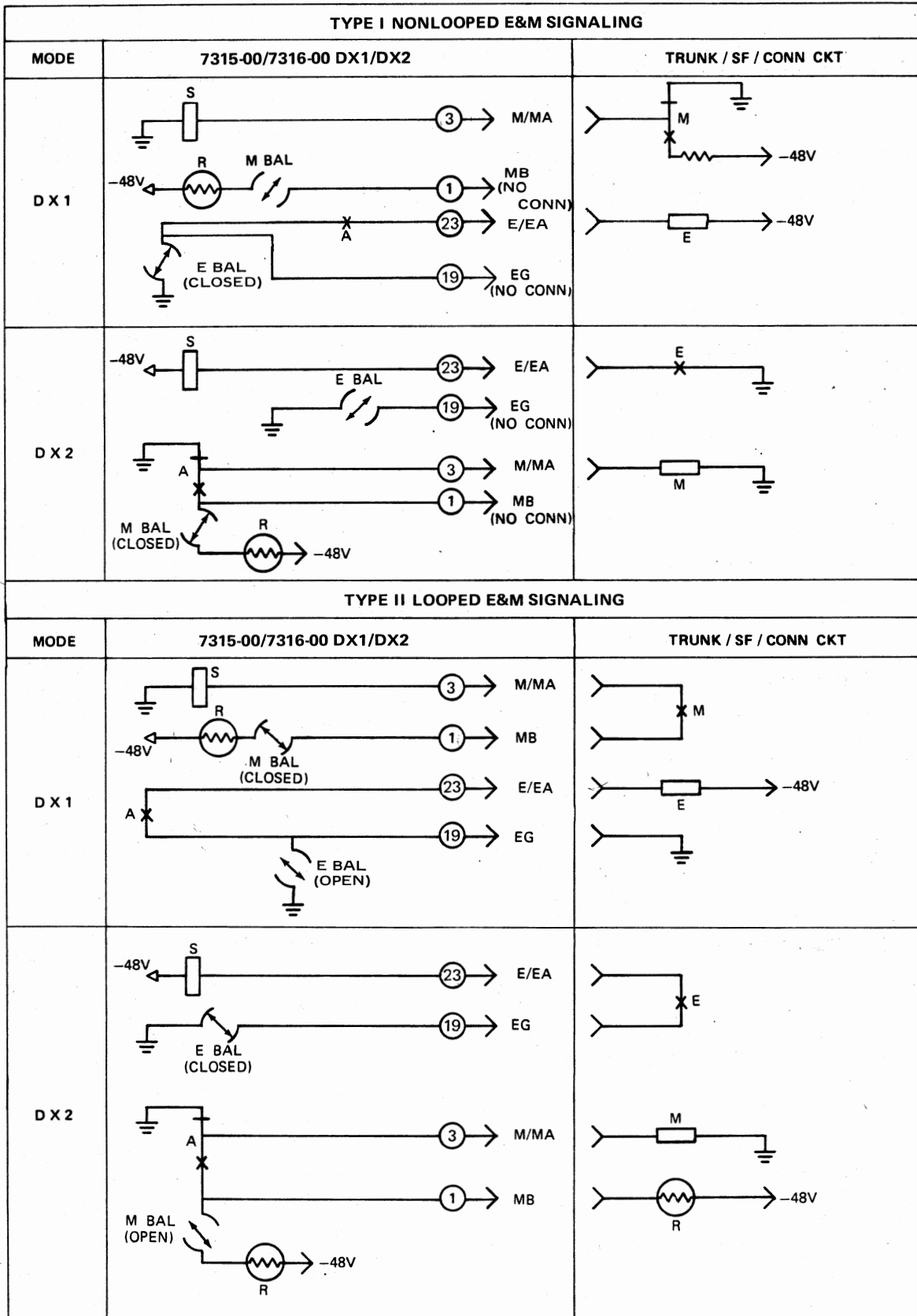


Figure 4. 7315-00 And 7316-00 Resultant DX1/DX2 Connecting Circuits With Looped (Type I) And Nonlooped (Type II) E&M Signaling

DX1 Location Initiates Call

2.03 A call initiated at the DX1 location causes a -48V potential to be applied to the M/MA lead of the DX1, turning on the front-panel-mounted M LED and operating the S relay (K2). Relay S, operated, closes its contacts to a -48V source, which causes current to flow from the source through R6, through winding 4 of relay A, and through the NORM position of switch S4, to the A lead.

2.04 The current in the 7315-00 DX1 passes through its impedance matching switch (S3) and the repeat coil of T1 to the tip lead (pin 41). It then passes to the distant-end 7315-00 DX2 via the cable facility. The distant-end tip lead (pin 41) receives the current signal and passes it through its T1 repeat coil, and impedance matching switch (S3) to the A lead (pin 53). The remainder of the circuit action is the same as that of the 7316-00 and is described in Paragraph 2.06.

2.05 The current applied to the 7316-00 A lead (pin 53) passes directly to its associated repeat coil module (location A of Figure 3). It is then sent, via the tip lead of the cable facility, to the distant end. The current then passes through the distant-end repeat coil module to the A lead of the DX2.

2.06 The current applied to the A lead (pin 53) of the DX2 passes through the NORM position of switch S4, winding 4 of the A relay (K1), and R7 to ground. The direction of current through winding 4 of the DX2 opposes the idle condition current through windings 1 and 3, operating relay A (K1). Relay A, operated, turns on the front-panel-mounted M LED and changes the M/MA lead (pin 3 or 21) from a ground to battery condition, which is applied to the associated signaling or trunk equipment.

2.07 Relay A (K1) in the DX1 remains in an idle condition because of the direction and magnitude of current through winding 4, which overrides the current through windings 1 and 3 that tend to activate the A relay (K1).

Dialing From DX1 To DX2

2.08 Dial pulsing from location A (see Figures 2 and 3) appears as M-lead battery/ground transitions to the DX1. These pulses are passed over the signaling link to the DX2, where they are reconverted into M-lead battery/ground transitions from the location B DX2 to the connecting circuit, as described in Paragraphs 2.02 through 2.06.

Answer Supervision At The DX1

2.09 When the called party answers, the connecting circuit grounds the E/EA lead (pin 23) to the location B DX2, causing its front-panel-mounted E LED to turn on and the S relay to operate. The S relay, operated, places a -48V at the junction of windings 3 and 4 of the DX2's A relay (K1), providing battery to winding 4 and the tip lead (A lead of the 7316-00) connection. The voltage potential between the DX sets is now the same, resulting in the line current becoming essentially zero. With zero current through winding 4 of the DX1, the current through windings 1 and 3 now causes the A relay in the DX1 to operate. The A relay, operated, turns on the DX1 front-panel-mounted E LED and places ground on the E/EA lead to the connecting circuit.

Disconnect

2.10 Disconnect may be initiated from either direction. Disconnect is initiated from location A when the connecting circuit switches the M/MA lead (pin 3 or 21) of the DX1 from battery to ground. This causes the front-panel-mounted M LED to turn off and the S relay in the DX1 to release. At location B, the A relay in the DX2 will release, turning off its front-panel-mounted M LED and grounding the M/MA lead to the connecting circuit. When disconnect occurs from location B, the connecting circuit opens the E/EA lead to the DX1. This operation causes the S relay of the DX2 to release, turning off its front-panel-mounted E LED, and also causes the A relay at location A to release, thus opening the E/EA lead to its connecting circuit and turning off the front-panel-mounted E LED.

DX2 Location Initiates Call

2.11 A call is initiated from the DX2 and is a result of a ground being applied to its E/EA lead. The DX2, receiving a ground on the

E/EA lead, operates its S relay and turns on its front-panel-mounted E LED. This causes the A relay (K1) in the DX1 to operate, which provides an E/EA-lead ground output and turns on its front-panel-mounted E LED.

2.12 Dialing and answer supervision at the DX2 is the same as described in Paragraphs 2.08 and 2.09.

Type II Looped Signaling

2.13 The 7315-00 and 7316-00 modules are also designed for Type II looped E&M signaling. For an explanation of this type of operation, refer to Figure 4 and the following paragraphs. (Note that Figure 4 shows nonlooped Type I as well as looped Type II signaling configurations for DX1/DX2 modes of operation.)

2.14 In the DX1 mode of looped Type II operation, the electronic switching system provides a normally open contact set which controls the M-lead signaling. This contact set is connected between the -48V source supplied by the MB lead (pin 1) of the DX1, and the M/MA lead (pin 3 or 21) of the DX1, which is connected to the S relay (K2). Seizure from the electronic switching equipment is initiated by closing its M/MA-MB loop, thus operating the S relay. The E-lead signaling from the DX1 to the electronic switching equipment is controlled by a normally open contact set of the A relay. This contact set is in the DX1 and across the E/EA-EG leads (pins 23 and 19, respectively). When the DX1 initiates a seizure to the electronic switching equipment, it closes the loop between the E/EA-EG leads, thus operating the external E relay or other indicating medium in the electronic switching equipment.

2.15 The signaling concept is similar to DX2 operation, with two exceptions: The electronic equipment provides a loop closure across the E/EA-EG leads upon outgoing seizure, and the DX2 provides a loop closure across the M/MA-MB leads (pins 3 and 1, respectively) upon incoming seizure.

3. INSPECTION

3.01 Inspect the equipment thoroughly as soon as possible after delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

3.02 Wescom equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by one number on any following models that are manufactured. Therefore, be sure to include the issue number along with the model number when making inquiries about the equipment.

4. MOUNTING

4.01 The 7315-00 and 7316-00 are plug-in printed circuit modules designed to mount in one module mounting position of a Type 440X Mounting Assembly. Type 440X Mounting Assemblies are available in capacities of 1 to 13 modules, and may be equipped or pre-wired for any combination of modules from the Wescom product line.

5. INSTALLER CONNECTIONS

5.01 When the 7315-00 or 7316-00 is installed in a Type 440X Mounting Assembly, it makes electrical connection to the associated equipment through a 56-pin, wire-wrapped, card-edge connector provided as part of the mounting assembly. Make all connections to this assembly in accordance with Table 1.

NOTE

These units contain mercury-wetted-contact relays. During shipping and handling, surplus mercury may collect on the relay contacts, causing a short. To correct this condition, hold the unit upright, tap it gently on a hard surface, and install.

Table 1. 7315-00 And 7316-00 Installer Connections

MODULE	LEAD DESIGNATION	PIN	
7315-00	T	To line	41
	R		49
	A		53
	B		51
	D		9
	T1	To drop	55
	R1		47
	A1		45
	B1		43
	D1		27
	E/EA		23
	M/MA		3, 21
	EG		19
	MB		1
-48V	35		
GRD	17		
7316-00	A	To line	53
	B		51
	D		9
	E/EA	To drop	23
	M/MA		3, 21
	EG		19
	MB		1
	-48V		35
GRD	17		

6. OPTIONS

7315-00

6.01 The 7315-00 includes switch options which permit either DX1 or DX2 operation, and 600- or 900-ohm repeat coil impedance. It also has screw options which provide proper balance of the windings on the bistable relay, the capacitive matching network, and the midpoint capacitors. See Figure 5 for the option locations.

7316-00

6.02 The 7316-00 provides for all the same options as the 7315-00, except for the 600- or 900-ohm options (switches S3 and S5) and the A1- and B1-lead midpoint capacitors. Refer to Figure 5 for the option locations.

CAUTION

When opening a screw option, rotate the screw counterclockwise two full turns to ensure that the connection is open. When closing a screw option, rotate the screw clockwise. Overtightening screw options may damage the printed circuit board.

DX1/DX2 Conditioning (7315-00 And 7316-00)

6.03 Condition the 7315-00 or 7316-00 for DX1 operation by placing switches S1 and S2 in the DX1 position. DX2 operation is provided by placing switches S1 and S2 in the DX2 position.

Resistive Matching Network (7315-00 And 7316-00)

6.04 Screw options R3K, R2K, R1K, R500, and R250 are provided on the module for proper balancing of the windings on the bistable relay. Condition the resistive network of the module in accordance with Table 2 and the following:

- (1) Calculate loop resistance of the trunk facility.

NOTE

To determine 4-wire loop resistance, measure the resistance of either the transmit or the receive pair and divide the quantity by two.

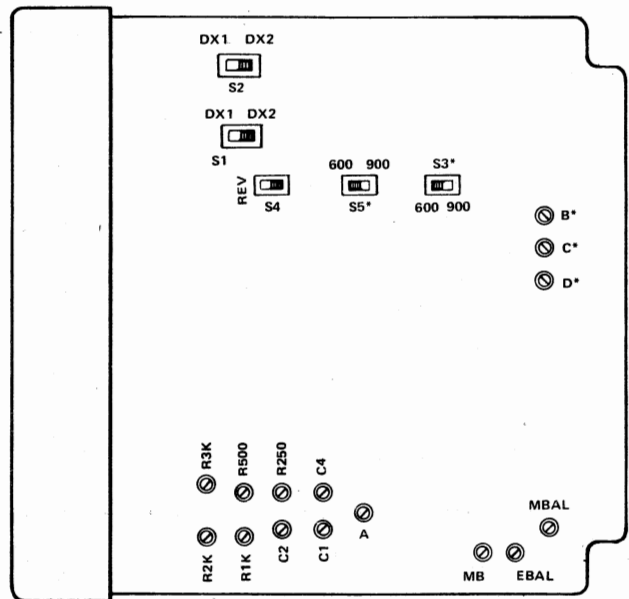


Figure 5. 7315-00 And 7316-00 Option Locations (* On 7315-00 Only)

Table 2. Resistance Screw Options

SCREW OPTION CLOSED	REMOVES
R3K	3 kilohms
R2K	2 kilohms
R1K	1 kilohm
R500	500 ohms
R250	250 ohms

- (2) Add 1250 ohms to this value.
- (3) Select resistors whose values total the calculated value ± 125 ohms by opening their respective screw options, and short those resistors not required by closing their respective screw options.

EXAMPLE

Calculated Loop Resistance: 1500 ohms
 Add 1250: +1250 ohms
 Total Resistance Required: 2750 ± 125 ohms

- (4) To obtain the desired result of 2750 ohms, open R2K, R500, and R250, and close options R3K and R1K.

Midpoint Capacitor

6.05 The 7315-00 and 7316-00 provide a 4.22uF midpoint capacitor across the A and B leads when option A is closed. If the capacitor provided in an associated repeat coil or term set is 2uF or less, close option A. If the associated capacitor is greater than 2uF, open option A.

7315-00

6.06 Two 1uF midpoint capacitors between the A1 and B1 leads may be connected by closing screw options C, D, and B. For 2uF operation, close all three options; for 1uF operation, close either C or D, and close B.

Capacitive Matching Network (7315-00 And 7316-00)

6.07 In order to obtain minimum pulse distortion, three screw options (C1, C2, and C4) are provided to match the total capacitance of the trunk facility and the midpoint capacitance determined in Paragraph 6.05 above. Refer to

Table 3 for total capacitance values and their associated option positions.

6.08 Calculate the required value of the DX balance capacitance by using the following formula:

$$\text{BAL CAP} = \text{XMPC} + \text{A/B CAP (if req'd)} + 1\text{uF}$$

... where BAL CAP is the total DX balancing capacity, XMPC is the capacity of the transmission unit midpoint capacitor, and A/B CAP is the midpoint capacitor in the 7315-00 or 7316-00.

EXAMPLE

When the 7315-00 is used in the 2W mode with internal 2W repeat coil, there is no transmission unit midpoint capacitor. Therefore, close option A (Paragraph 6.05). BAL CAP = 4.22uF (A/B CAP) + 1uF = 5.22uF. Screw down DX balance capacitor options C1 and C4.

Repeat Coil Termination (7315-00 Only)

6.09 Switches S3 and S5 provide for 600- or 900-ohm impedance matching on either the line or drop side of transformer T1. Determine the impedance of the line and the drop side and place switches S3 and S5 in the corresponding positions. For example, if the line side requires a 600-ohm match, place S3 in the 600 position.

Polarity (7315-00 And 7316-00)

6.10 Switch S4 provides a means of reversing the A- and B-lead connections. This reversal may be necessary at one end of a 4-wire DX

Table 3. Capacitive Screw Options

CAPACITIVE MATCHING	CLOSE OPTIONS	OPEN OPTIONS
7.22uF	C1, C2, C4	—
6.22uF	C4, C2	C1
5.22uF	C4, C1	C2
4.22uF	C4	C1, C2
3uF	C2, C1	C4
2uF	C2	C1, C4
1uF	C1	C2, C4

signaling link to maintain proper A- and B-lead signaling continuity between the DX units. If the A and B leads are reversed, place switch S4 in the REV position. This reversal routes the A and B leads to their proper terminations.

Looped E&M Signaling

6.11 Options E BAL and M BAL provide the means for the 7315-00 and 7316-00 to be used with electronic switching equipment requiring looped E&M signaling. When looped E&M signaling is required and the unit is conditioned as a DX1, close M BAL and open E BAL. When looped E&M signaling is required and the unit is conditioned as a DX2, close E BAL and open M BAL. For nonlooped E&M signaling in the DX1 mode, close the E BAL option and open the M BAL option. In the DX2 mode of E&M signaling, close the M BAL and open the E BAL option. Option MB should be opened for DX2, Type II signaling, and closed for all other types.

6.12 When strapping and all installer connections have been completed, insert the module into the mounting assembly.

CAUTION

Removal and installation of modules should be done with care. Do not force a module into place. If excessive resistance is encountered, remove the module and check the card guides and connector to verify proper alignment and the absence of foreign material.

7. TESTING

7.01 If trouble is encountered with the operation of the module, verify that all installer connections have been properly made and that all options have been conditioned as required. With power removed, make certain that the module is making proper connection with the mounting assembly card connector; remove and reinsert the module. If trouble persists, perform the test procedure described in Table 4 to determine whether the fault is internal or external to the module.

Test Equipment

7.02 The test equipment necessary to test the signaling portion of the 7315-00 and 7316-00 is as follows:

- (a) Pulsing test set (Northeast Electronics TTS 26B, or equivalent).
- (b) Test cords.

7.03 The signaling test procedure used on a 7315-00 or 7316-00 is determined by the application of the module and the configuration of the local circuit arrangement. If a local E&M lead jackfield is provided, the signaling portion of the 7315-00 or 7316-00 can be operationally checked with a standard pulsing set. If E&M lead access is not provided, the overall circuit may have to be checked at a different point, i.e., on a loop dial basis (tie trunk) or an SF tone basis (E&M SF signaling unit). The test procedure in Table 4 assumes that an E&M-lead jackfield is available, that the unit is configured as a DX1, and that nonlooped E&M signaling is employed. Other circuit arrangements require modification of the test procedure. To obtain technical assistance, contact the Wescom Technical Services Department by calling:

Charles INDUSTRIES
408 - 775-1400 *3/1/93*
708 - 960-8000
806 - 6300
(312) 971-2010,
TWX 910-695-4735, or
DATA-PHONE® (312) 971-1698
708

Canadian Customers:
(416) 877-0191 or
TWX 610-492-2646

8. WARRANTY

8.01 STANDARD WARRANTY: Wescom products are warranted to be free from defects in material, workmanship, and design, given proper installation and regular maintenance. Wescom's obligations under this warranty are limited to correction and replacement, at Wescom's production facility, of any defective items received by Wescom, transportation prepaid, for a period of 60 months from the date of original shipment. Warranty and remedies on

Table 4. 7315-00 And 7316-00 Test Procedure

STEP	ACTION	VERIFICATION
1	Option the unit for DX1 operation. Connect 310 Test Cord between the pulsing test set and the 7315-00 or 7316-00's E&M leads. Condition the pulsing test set to send M-lead signaling and to receive E-lead signaling.	
2	Determine that the circuit is in the idle condition in both directions.	
3	Key the M/MA lead to the 7315-00 or 7316-00 for an off-hook condition.	Verify that the circuit is seized at the distant location.
4	Pulse the M/MA lead to the 7315-00 or 7316-00 at 12pps at 58 percent break.	Verify pulsing and pulse distortion at distant terminal. Pulse distortion should not exceed 4 percent. Verify that the E/EA lead at the local terminal remains in the idle condition.
5	Place the M/MA lead at the local terminal in an on-hook condition and request the distant terminal to seize the circuit toward the local terminal.	Verify that the local E/EA lead goes off-hook.
6	Request the distant terminal to pulse the circuit at 12pps and 58 percent break.	Verify pulsing and pulse distortion at the local end. Pulse distortion should not exceed 4 percent.
7	Remove all test cords and condition the unit for the type of DX operation required.	

products not manufactured by Wescom are in accordance with the warranty of the respective manufacturer. WESCOM MAKES NO OTHER WARRANTY OF ANY KIND WHATEVER, EXPRESSED OR IMPLIED; AND ALL IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS THE AFORESAID OBLIGATIONS IS HEREBY DISCLAIMED BY WESCOM.

8.02 Field repairs involving the replacement of components within a unit are not recommended. If an item is found to be defective, contact Wescom, Inc., by telephone or TWX, for instructions regarding replacement or repair.

8.03 If a replacement unit is required, it will be shipped in the fastest manner consistent with the urgency of the situation. Upon receipt of a replacement unit, return the defective unit in the carton in which the replacement was shipped, using the shipping label provided, to:

Wescom, Inc.
8245 Lemont Road
Downers Grove, Illinois 60515

Canadian Customers:
Wescom Canada, Ltd.
45 Sinclair Ave.
Georgetown, Ontario
L7G 4X4

Repair Or Exchange Services

8.04 In addition to the standard Wescom Warranty Service, Wescom offers a repair or exchange service for those items out of warranty. Under this arrangement, faulty units may be shipped to Wescom and either completely repaired and quality tested or exchanged for a replacement unit. To obtain details of this service and a schedule of prices, contact your local Wescom Sales Representative.

9. SPECIFICATIONS

9.01 Specifications describing the electrical and physical characteristics of the 7315-00 and 7316-00 are as follows:

Electrical

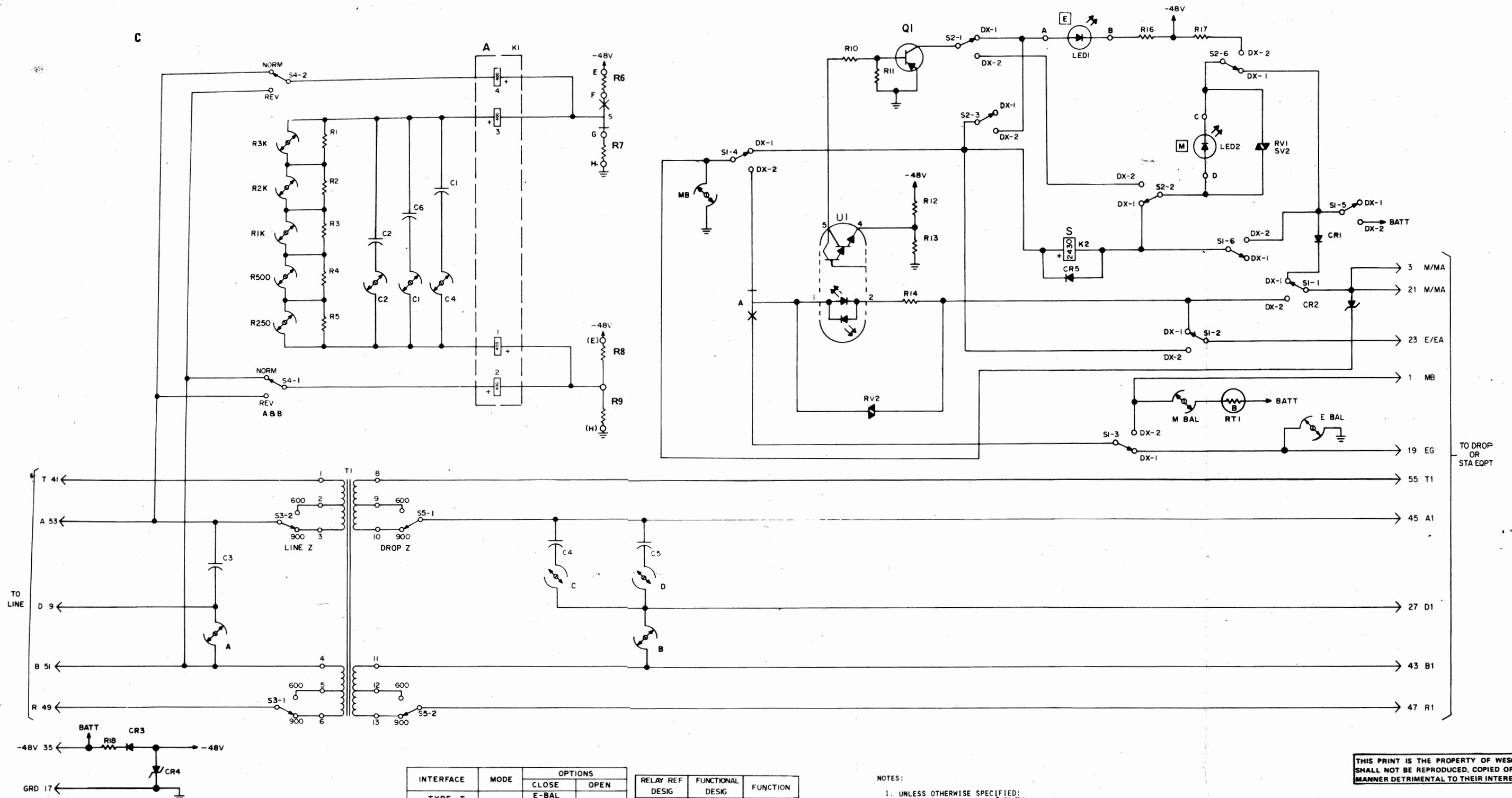
- (a) **POWER REQUIREMENTS:** -44Vdc to -56Vdc, 100mA maximum, plus M-lead current.
- (b) **DX1 SIGNALING STATES:**
 - (1) Input (M lead): On-hook, ground; off-hook, resistance battery.
 - (2) Output (E lead): On-hook, open; off-hook, ground.
- (c) **DX2 SIGNALING STATES:**
 - (1) Input (E lead): On-hook, open; off-hook, ground.

- (2) Output (M lead): On-hook, ground; off-hook, resistance battery.

- (d) **PULSING RANGE:** 8 to 14pps.
- (e) **DISTORTION:** Less than 4 percent maximum at 12pps and 58 percent break.
- (f) **LOOP RESISTANCE:** 5000 ohms maximum.
- (g) **MINIMUM CABLE PAIR INSULATION RESISTANCE:** 100,000 ohms.

Physical

- (a) **OPERATING ENVIRONMENT:** Temperature, 32^o to 120^oF (0^o to 49^oC); humidity to 95 percent (no condensation).
- (b) **WEIGHT:** 7315-00, 1.32 lb (598.90g); 7316-00, 12.0 oz (340.2g).
- (c) **DIMENSIONS:** 5.6 inches (14.2cm); width, 1.5 inches (3.8cm); depth, 6.0 inches (15.2cm).
- (d) **MOUNTING:** Each module occupies one module mounting position of Type 400 or 440-211-202 through 440-723-202 Mounting Assemblies, which provides for either KTU apparatus-case or relay-rack mounting.



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DX LINE BALANCE	CLOSE	OPEN
RESISTOR INCREASE VALUE (OHMS)		
250		R250
500		R500
1K		R1K
2K		R2K
3K		R3K
CAP TOTAL VALUE (MFD)		
1	C1	C2, C4
2	C2	C1, C4
3	C1, C2	C4
4.22	C4	C1, C2
5.22	C4, C1	C2
6.22	C4, C2	C1
7.22	C4, C2, C1	

INTERFACE	MODE	OPTIONS		
		CLOSE	OPEN	
TYPE I (NON LOOPED)	DX1 / DX2	E-BAL		
		M-BAL		
		MB		
TYPE II (LOOPED)	DX1	M-BAL, MB	E-BAL	
		DX2	E-BAL	M-BAL, MB

RELAY REF	FUNCTIONAL DESIG	FUNCTION
K1	A	PULSING
K2	S	SUPERVISION

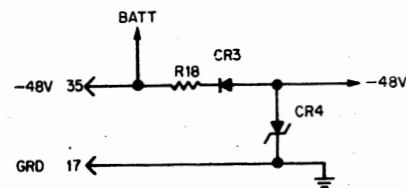
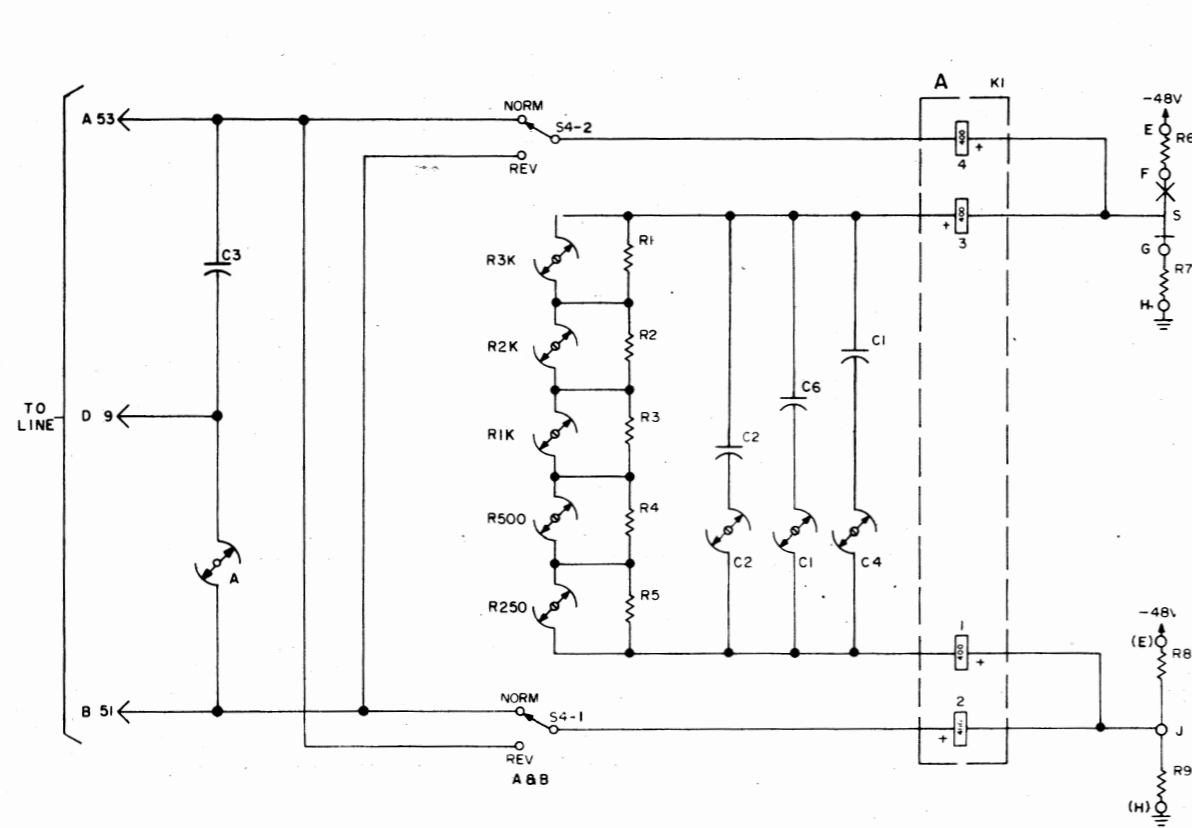
OPERATION	OPERATE SWITCH
DX1 / DX2	S1, S2
A B B LEADS	S4, A & B
NORM / REV	S4, A & B
LINE IMPEDANCE 600 / 900	S3, LINE Z
DROP IMPEDANCE 600 / 900	S5, DROP Z

OPERATION	CLOSE	OPEN
A, B CAP IN 4.22	A	
A, B CAP OUT OR D LEAD CONTROL		A
A1, B1 CAP IN 1 MFD	C, B	D
A1, B1 CAP IN 2 MFD	C, B, D	
A1, B1 CAP OUT OR D1 LEAD CONTROL	C, D	B

- NOTES:
- UNLESS OTHERWISE SPECIFIED: RESISTORS ARE IN OHMS 1/4W CAPACITORS ARE IN MICROFARADS.
 - PC BOARD CONNECTOR
 - XXX FRONT PANEL MARKING.
 - N.O., N.C. RELAY CONTACTS
 - OPEN, CLOSED SCREW OPTIONS

Figure 6. 7315-00 DX Signaling Module (Issue 3) Schematic Diagram

D



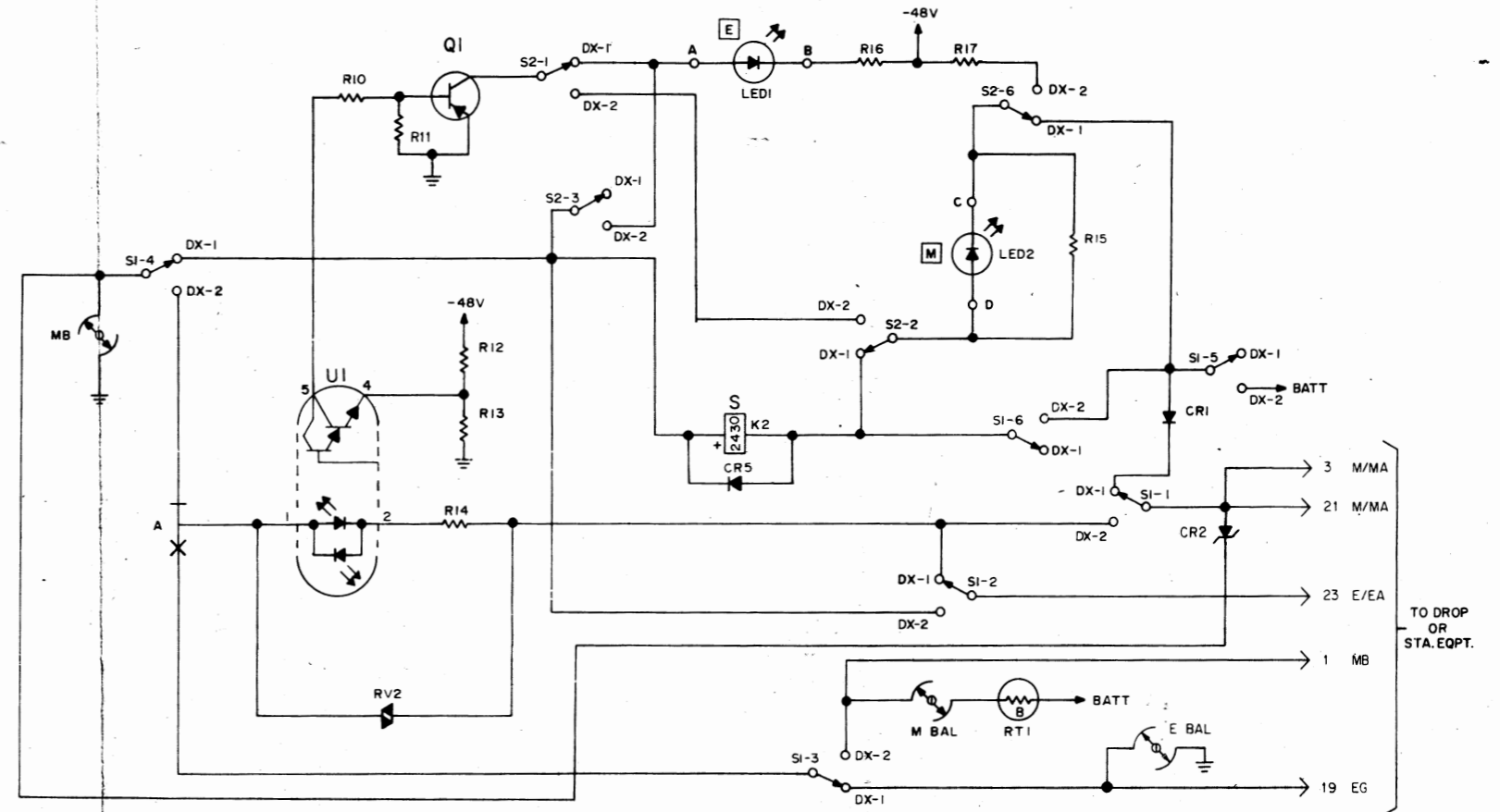
DX LINE BALANCE	CLOSE	OPEN
RESISTOR INCREASE VALUE (OHMS)		
250	R250	R250
500	R500	R500
1K	R1K	R1K
2K	R2K	R2K
3K	R3K	R3K
CAP TOTAL VALUE (MFD)		
1	C1, C2, C4	C2, C4
2	C2	C1, C4
3	C1, C2	C4
4.22	C4	C1, C2
5.22	C4, C1	C2
6.22	C4, C2	C1
7.22	C4, C2, C1	

INTERFACE	MODE	OPTIONS	
		CLOSE	OPEN
TYPE I (NON LOOPED)	DX1/DX2	E-BAL	
		M-BAL	
TYPE II (LOOPED)	DX1	M-BAL, MB	E-BAL
		DX2	E-BAL

OPERATION	OPERATE SWITCH
DX1 / DX2	S1 + S2
A B B LEADS	
NORM / REV	S4 A B B

RELAY REF DESIG	FUNCTIONAL DESIG	FUNCTION
K1	A	PULSING
K2	S	SUPERVISION

OPERATION	CLOSE	OPEN
A, B CAP IN 4.22	A	
A, B CAP OUT OR D LEAD CONTROL		A



NOTES:

- UNLESS OTHERWISE SPECIFIED: RESISTORS ARE IN OHMS 1% 3W CAPACITORS ARE IN MICROFARADS.
- PC BOARD CONNECTOR
- XXX FRONT PANEL MARKING.
- N.O., N.C. RELAY CONTACTS.
- UPEN, CLOSED SCREW OPTIONS

Figure 7. 7316-00 DX Signaling Module (Issue 3) Schematic Diagram