TRAFFIC SERVICE POSITION SYSTEM NO. 1 WITH REMOTE TRUNK ARRANGEMENT, POSITION SUBSYSTEM NO. 2, AND AUTOMATIC COIN TOLL SERVICE

BALANCE

BASE UNIT

CONTENTS PAGE

1. GENERAL

1.01 This section provides the procedures required to determine and verify network and drop build-out capacitor values. This is necessary to meet echo return loss (ERL) and singing return loss (SRL) balance requirements for base Traffic Service Position System (TSPS) installations equipped with the Remote Trunk Arrangement (RTA) ▶and Automatic Coin Toll Service (ACTS).◀ These

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procedures are required to establish initial office balance and to verify that balance requirements are met when new trunk circuits are added to balanced systems.

1.02 This section is reissued to include balance procedures and verification tests of circuits used in the ACTS feature of a TSPS No. 1 base unit. Change arrows are used to indicate addition in Parts 1 through 7. Parts 8 through 12 are new. This section does not affect the equipment test list.

1.03 All measurement results should be recorded and retained. Section 660-463-010 describes the forms required and the suggested method of record retention.

1.04 The transmission engineer should participate in the measurement and selection of network build-out capacitor (NBOC) and drop build-out capacitor (DBOC) values.

1.05 The procedures to determine and verify NBOC and DBOC values necessary to impedance balance a base TSPS office can be summarized as follows:

(a) For a sample of 2-wire toll connecting (TC) trunks, determine the compromise NBOC value necessary to build out the network in the 1P 4-wire terminating set (4WTS), or equivalent, of the operator trunk circuits. Adjust all NBOCs of the 1P 4WTS associated with all operator position trunks ▶and coin detection and announcement (CDA) circuits◀ to this value.

(b) For all 2-wire TC trunks, verify the previously determined compromise NBOC value.

(c) For all 4-wire TC trunks ▶and CDA circuits◀ containing TSPS 4-wire bridging repeaters and other base TSPS trunks containing 24V4-type repeaters, determine the DBOC values necessary to build out the 2-wire port on the repeater.

(d) For all trunks in (c) above, determine NBOC values necessary to build out the balancing networks associated with the terminating set in the TSPS 4-wire bridging repeater and 24V4 repeaters.

(e) ▶For all CDA type II circuits, determine NBOC value for the HYB 2 network.

(f) For all CDA type II circuits, determine the DBOC value of the idle circuit termination and the value for the switchable DBOC in the 2-wire port of HYB 2.◀

A general discussion on office balance of the TSPS is contained in Section 660-463-100.

1.06 If the TSPS base unit serves TC trunks that provide ***only TSPS 4-wire bridging access*** with TSPS 4-wire bridging repeaters, the same procedure will be followed on samples of 4-wire TC trunks.

> ***Note:*** If, at a later date, 2-wire TSPS bridging access is added to the TSPS base unit serving only 4-wire TC trunks, the TSPS base unit will have to be rebalanced completely.

1.07 Before the procedures in this section are performed, all TC trunks between the toll office and the class 5 offices must meet or exceed the noise, transmission, and balance requirements. The toll office ***must*** be certified balanced.

> ***Caution: Balance testing must be performed on an out-of-service basis. The proper out-of-service procedures should be made on any working trunk prior to performing any balance tests.***

1.08 If during procedures at the control, display, and test (CDT) panel the indicators are not normal, reestablish the test connection. If the condition persists, reinitialize the CDT by entering into the TTY the following: TKT 00 CDT.

1.09 Tables A through H are condensed versions of the balance procedures given in succeeding parts of this section. They can be used when the operating company personnel who is doing balance work is experienced in balance work, TSPS test procedures, and the CDT. The tables can also be used as a checklist to ensure that complete balance testing is done on each type of trunk. There is a separate table for each type of trunk. Cross references are made to the part and figures containing the detail procedures.

TABLE A

DETERMINE NBOC VALUE OF 1P 4WTS

TEST	RLMS CONNECTIONS	TERMINATIONS	CIRCUIT	FIGURE	PART	REMARKS
Capacitance Measurements	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK. Rec: T AMPL OUT JK	Local Office: 900Ω+ 2.16 μF Toll Office: BAL TEST TERM	2-Wire TC Trunks	1	2	
			4-Wire TC Trunks	2	2	Performed in base units with 4-wire TC trunks only

TABLE B

2-WIRE TOLL CONNECTING TRUNK BALANCE TEST

TEST	RLMS CONNECTIONS	TERMINATION	CIRCUIT	FIGURE	PART	REMARKS
Balance Verification	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	Local Office: 900Ω + 2.16 μF Toll Office; BAL TST TERM		3	4	Subpart A

TABLE C

4-WIRE TOLL CONNECTING TRUNKS, INWARD TRUNKS, AND DELAYED CALL TRUNKS BALANCE TESTS

TESTS	RLMS CONNECTIONS	TERMINATIONS	CIRCUIT	FIGURE	PART	REMARKS
Port 3 DBOC Selection and Verification	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	CUT: 600Ω in TOLL AMPL OUT, BRDG IN LOCAL OR TOLL AMPL OUT BRDG IN	SD-7C022-01	5	5	Steps 1-14
		Bridging Repeater Test Extender: 600Ω Port 1 AMPL IN & OUT Port 2 AMPL IN & OUT	3-Way 4-Wire Bridging Repeater	6	5	Steps 1-14
Port 3, 4WTS NBOC Selection and Verification	CUT Jacks Send: TOLL BRDG IN Rec: TOLL AMPL OUT 600Ω: LOCAL OR TOLL BRDG IN & AMPL OUT	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK	SD-7C022-01	7	5	Steps 15-25
	Bridging Repeater Test Extender Jacks Send: Port 2 AMPL IN Rec: Port 2 AMPL OUT 600Ω: Port 1 AMPL IN & AMPL OUT		3-Way 4-Wire Bridging Repeater	8	5	Steps 15-25
Toll Office 4WTS Verification	CUT Jacks Send: TOLL IN Rec: TOLL OUT	Toll Office: BAL TEST TERM	SD-7C022-01	9	5	Performed on TC trunks only Steps 26-33
	Bridging Repeater Test Extender Jacks Send: Port 2 LINE IN Rec: Port 2 LINE OUT		3-Way 4-Wire Bridging Repeater	10	5	Performed on TC trunks only Steps 26-33

TABLE D

OPERATOR POSITION TRUNK BALANCE TEST

TEST	RLMS CONNECTIONS	TERMINATIONS	CIRCUIT	FIGURE	PART	REMARKS
Verification	24V4 Associated with Operator Position Trunk Send: R AMPL IN JK Rec: T AMPL OUT JK	450Ω + 4.32 μF in Test Access Port 1 of CDT		4	4	Subpart 8

TABLE E

BASE-REMOTE TRUNKS, OPERATOR SERVICE TRUNKS, AND CAMA TRANSFER TRUNKS BALANCE TESTS

TEST	RLMS CONNECTION	TERMINATIONS	CIRCUIT	FIGURE	PART	REMARKS
DBOC Selection and Verification	24V4 Associated with CDT Test Access CRT Send: R AMPL IN JK Rec: T AMPL OUT JK	24V4 Associated with CUT 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK		11	6	
NBOC Selection and Verification	24V4 Associated with CUT Send: R AMPL IN JK Rec: T AMPL OUT JK	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK		12	7	

TABLE F

SERVICE OBSERVING TRUNK BALANCE TESTS

TEST	RLMS CONNECTIONS	TERMINATIONS	CIRCUIT	FIGURE	PART	REMARKS
1P 4WTS Verification	24V4 Associated with CUT Send: R AMPL IN JK Rec: T AMPL OUT JK	450Ω + 4.32 μF in Test Access Port 1 of CDT		4	4	Subpart B
DBOC Selection and Verification	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	Bridging Repeater Test Extender: 600Ω Port 1 AMPL IN & OUT Port 2 AMPL IN & OUT		6	5	Steps 1-14
NBOC Selection and Verification	Bridging Repeater Test Extender Jacks Send: Port 2 AMPL IN Rec: Port 2 AMPL OUT 600Ω: Port 1 AMPL IN & AMPL OUT	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK		8	5	Steps 15-25

TABLE G

COIN DETECTION AND ANNOUNCEMENT CIRCUIT TYPE I BALANCE TESTS

TEST	RLMS CONNECTIONS	TERMINATIONS	CIRCUIT	FIGURE	PART	REMARKS
1P 4WTS Verification	CDA Under Test Send: AMP 2 IN JK Rec: AMP 1 OUT JK	450Ω + 4.32 μF in Test Access Port 1 of CDT		4	4	Place Shorting Plug in HYB 1 IN JK for THL Subpart C
HYB 2 Port DBOC Selection and Verification	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	CDA Under Test 600Ω: AMP 3 OUT JK AMP 3 MON JK AMP 2 IN JK AMP 2 MON JK		11	6	
HYB 2 Port 4WTS NBOC Selection and Verification	CDA Under Test Send: AMP 3 MON JK Rec: AMP 2 MON JK 600Ω: AMP 3 OUT JK 600Ω: AMP 2 OUT JK	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK		12	7	Place Shorting Plug in SCM JK for THL
Verification	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	450Ω + 4.32 μF in Test Access Port 1 of CDT		16	11	
	900Ω Test 4WTS Patch to AT1 JK of CDT	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK		16	11	

TABLE H

COIN DETECTION AND ANNOUNCEMENT CIRCUIT TYPE II BALANCE TESTS

TEST	RLMS CONNECTIONS	TERMINATIONS	CIRCUIT	FIGURE	PART	REMARKS
1P 4WTS Verification	CDA Under Test Send: AMP 2 IN JK Rec: AMP 1 OUT JK	450Ω + 4.32 μF in Test Access Port 1 of CDT		4	4	Place Shorting Plug in HYB 1 IN JK for THL
Port 3 DBOC Selection and Verification	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	Bridging Repeater Test Extender: 600Ω Port 1 AMPL IN & OUT Port 2 AMPL IN & OUT		6	5	Steps 1-14
Port 3 NBOC Selection and Verification	Bridging Repeater Test Extender Jacks Send: Port 2 AMPL IN Rec: Port 2 AMPL OUT 600Ω: Port 1 AMPL IN & AMPL OUT	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK		8	5	Steps 15-25
HYB 2 NBOC Verification	Bridging Repeater Test Extender Jacks Send: Port 2 LINE IN Rec: Port 2 LINE OUT	900Ω + 2.16 μF Term with DBOC Patched in AT1 JK of CDT		13	8	
HYB 2 2-Wire Port ICT DBOC Selection and Verification	Bridging Repeater Test Extender Jacks Send: Port 2 LINE IN Rec: Port 2 LINE OUT	Idle Circuit Termination of Circuit Under Test		14	9	CUT In Idle State
Switchable DBOC Selection And Verification	Bridging Repeater Test Extender Jacks Send: Port 2 LINE IN Rec: Port 2 LINE OUT	900Ω Test 4WTS Patched to AT1 JK of CDT with 600Ω in 4-Wire Legs		15	10	
Verification	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	450Ω + 4.32 μF in Test Access Port 1 of CDT	T1-P1	17	12	
	900Ω Test 4WTS Patch to AT1 JK of CDT with Term and DBOC	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK	P1-T1	17	12	
	24V4 Associated with CDT Test Access Circuit Send: R AMPL IN JK Rec: T AMPL OUT JK	900Ω + 2.16 μF and DBOC Patch to AT1 JK of CDT	T1-P2	18	12	
	900Ω Test 4WTS Patch to AT1 JK of CDT with DBOC	24V4 Associated with CDT Test Access Circuit 600Ω: R AMPL IN JK 600Ω: T AMPL OUT JK	P2-T1	18	12	
	900Ω Test 4WTS Patch to AT0 JK of CDT	450Ω + 4.32 μF In Test Access Port 1 of CDT	P2-P1	19	12	
	900Ω Test 4WTS Patch to AT1 JK of CDT with Term and DBOC	900Ω Test 4WTS Patch to AT0 JK of CDT with 600Ω in 4-Wire Legs	P1-P2	19	12	

2. CAPACITANCE MEASUREMENTS FOR DETERMINATION OF NBOC VALUE FOR BASE TSPS 1P 4WTS BALANCING NETWORKS

2.01 Measurements should be performed on a sample of 2-wire TC trunks from each of the class 5 offices served by the toll offices with which the TSPS is associated. Each selected sample, one for each class 5 office, should include the TC trunk expected to have the greatest cable capacitance and the TC trunk expected to have the least cable capacitance. It should also include a sufficient number of TC trunks randomly selected from the total group of TC trunks from that class 5 office. The size of each sample should be determined according to the following table.

Total Number of TC Trunks	Number of TC Trunks in Sample
5 or less	all
6-10	5
11-15	6
16-25	7
26-50	8
50 or greater	approximately 18 percent of total

2.02 In selecting TC trunks for the sample which are expected to have the least and greatest cable capacitance, consideration should be given to the following:

(a) Cable length between the TC trunk appearance on the main distributing frame (MDF), or equivalent, of the toll office

(1) The 4WTS of the TC trunk facilities when carrier or 4-wire metallic facilites are used.

(2) The 837-type network (ie, impedance compensator on E-repeater TC trunks).

(3) The MDF, or equivalent, of the class 5 office on intrabuilding TC trunks and short nonrepeatered interbuilding TC trunks.

(b) Different facilities and/or routines used in the design of the TC trunks from a given class 5 office.

(c) In-bay location of the associated trunk circuits in the toll office with respect to its MDF location and its switching network location.

(d) Toll office switching multiples and service observing bridges.

2.03 This procedure is performed using a properly built-out code 970 BAL TEST CIRCUIT at the toll office. At the base TSPS CDT, the balance test circuit which has been properly tested according to Section 660-463-504 is used.

APPARATUS:

1—KS-20501 return loss measuring set (RLMS) with appropriate test cords

1—5A attenuator or equivalent

1—7A capacitor box or equivalent

1—J99338CB 3-way, 4-wire bridging repeater test extender

1—ED-1C336-30 extender cable

10—262B 600-ohm terminating plugs

1—6-foot 2-conductor test cord with 354C plug at one end and 310 plug at other end

APPARATUS:

1—3P15A patching test cord assembly consisting of P3K cord 6 feet long equipped with two 310 plugs

1—2-conductor test cord with suitable insulated alligator clip at one end

1—310-type 450 ohm plus 4.32 μF terminating plug

1—349 shorting plug

1—388-type plug with 450 ohm plus 4.32 μF termination and DBOC

1—388-type plug with 900 ohm plus 2.16 μF termination and DBOC

1—spare 24V4-type repeater mounting with a 1M 4WTS.

STEP	PROCEDURE
1	At the TSPS office, connect a 7A capacitor box across the balance network of the 1P 4WTS associated with the CDT balance test circuit. (See Section 660-463-504 for modification of the 1P 4WTS.)
2	Adjust the capacitance value of the 7A capacitor box to zero (0.000 μF).
3	Connect an RLMS to the 24V4-type repeater associated with the CDT balance test circuit (see Fig. 1 and 2).
4	At the class 5 office, using the equipment in that office, seize and key pulse (dial) 959-1210 (the directory number assigned to the TSPS jack ended test line) into the trunk selected.
5	At the TSPS office, when the MASTER TEST LINE-MTL lamp flashes and buzzer sounds indicating an incoming test call, depress MASTER TEST LINE-TEST key and establish voice communication with the class 5 office.
6	Transfer call to CDT access line 0 by depressing MASTER TEST LINE—TRFR key. Depress TRUNK TRANSMISSION TEST-XMSN and TALK keys to establish voice communication with the class 5 office. After voice communication is established, release the TALK key before proceeding.
7	At the class 5 office, place appropriate test termination (900 ohms + 2.16 μF) across the transmission path of the selected trunk.
8	At the TSPS office, outpulse code 970 to establish a switched connection to a balance test circuit at the toll office: (a) Operate MASTER TEST LINE key sequence, TEST-KP-CODE-0970-ST. (b) Operate TRUNK TRANSMISSION TEST-TOLL BRDG key.

STEP	PROCEDURE
	(c) Operate MASTER TEST LINE-OP key. The MASTER TEST LINE-EQPT ST lamp will flash and the MASTER TEST LINE-OP lamp will light. When outpulsing is complete, a bridge connection with the local and toll offices has been established.
9	At the toll office, terminate the transmit and receive legs of the balance test hybrid associated with the code 970 circuit.
10	Set the TEST TYPE switch of the RLMS to SRL-HI.
11	Adjust the capacitor box to a value giving the greatest return loss and record the capacitance value and the return loss measurement. ***Note:*** A value of capacitance less than 0.004 μF indicates that the 2-wire TC trunk is not in its "cut-through" state.
12	Set the TEST TYPE switch of the RLMS to SRL-LO and record the measurement.
13	Set the TEST TYPE switch of the RLMS to ERL and record the measurement.
14	Repeat Steps 10, 12, and 13 for each value of capacitance set in the capacitor box as follows: Value obtained in Step 11 minus .012 Value obtained in Step 11 minus .010 Value obtained in Step 11 minus .008 Value obtained in Step 11 minus .006 Value obtained in Step 11 minus .004 Value obtained in Step 11 minus .002 Value obtained in Step 11 plus .002 Value obtained in Step 11 plus .004 Value obtained in Step 11 plus .006 Value obtained in Step 11 plus .008 Value obtained in Step 11 plus .010 Value obtained in Step 11 plus .012.
15	At the class 5 office, remove the test termination established in Step 7.
16	At the TSPS, release TRUNK TRANSMISSION TEST-TOLL BRDG key and depress TRUNK TEST-RLS key to release connection.
17	Repeat Steps 4 through 16 for each trunk in the sample.
18	Remove test connections after all trunks have been tested.

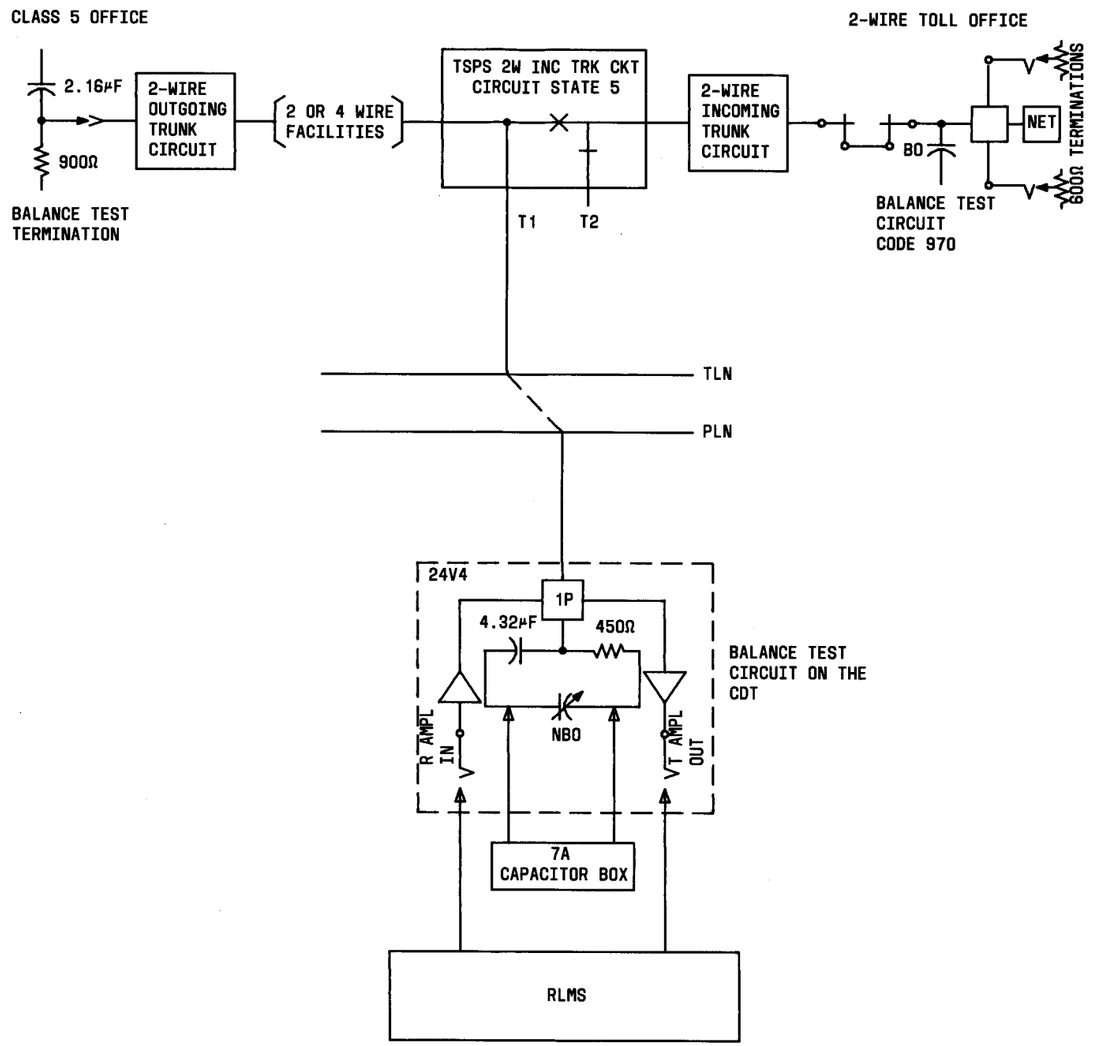

Fig. 1—Test Connections for NBOC Value Selection in 1P 4WTS

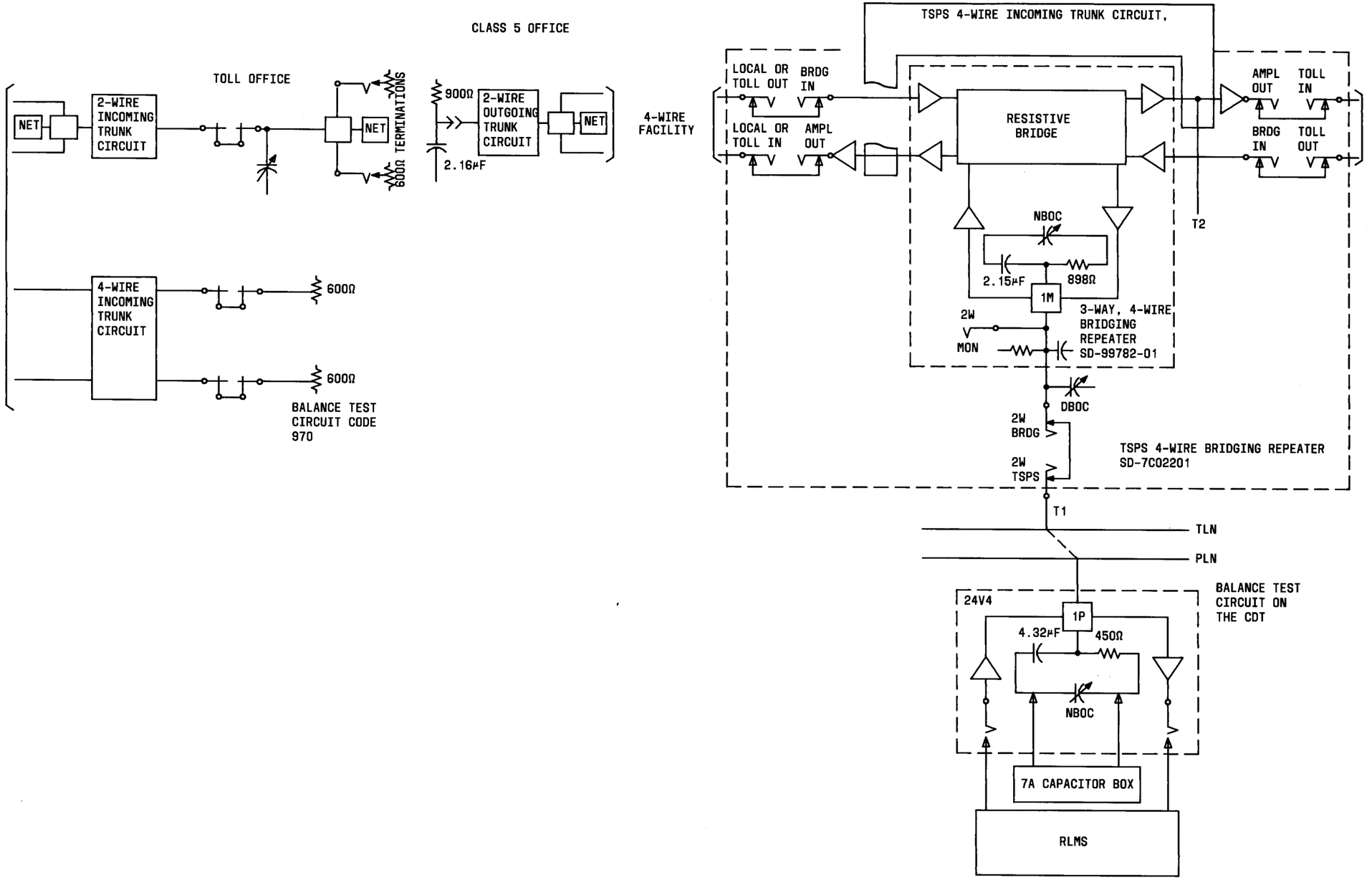

Fig. 2—Test Connections for NBOC Value Selection in 1P 4WTS in TSPS Offices With 4-Wire Trunks Only

3. DETERMINING NBOC VALUE OF THE 1P 4WTS

3.01 The optimum value of NBOC of the 1P 4WTS or equivalent used in all applications shall be determined by the transmission engineer based on the measurements made in the preceding procedures. The optimum value of the NBOC is that which will allow the 2-wire TC trunks to meet balance requirements when tested from the balance test circuit of the CDT.

3.02 Strap or screw down the NBOC adjustments on all 1P 4WTSs, or equivalent, associated with operator position trunk, ▶CDA type I and II circuits,◀ service observing access circuit, and balance test circuit on the CDT.

4. VERIFICATION TESTS OF THE NBOC VALUE OF THE 1P 4WTS

A. 2-Wire Toll Connecting Trunks

4.01 This procedure is used to verify the NBOC value determined in Part 3 or to certify office balance requirements for groups of 2-wire TC trunks added after initial office balancing. This procedure is performed on all 2-wire TC trunks in each trunk group as described in paragraphs 2.01 and 2.02. The toll office code 970 balance test circuit and the base TSPS CDT balance test circuit, both properly built-out, are used in this procedure.

STEP	PROCEDURE
1	At the TSPS office, connect the RLMS to the 24V4-type repeater associated with the CDT balance test circuit as shown in Fig. 3.
2	At the class 5 office, seize and keypulse (dial) 959-1210 (the directory number assigned to the TSPS JACK ENDED TEST line) into the trunk selected.
3	At the TSPS office, when the MASTER TEST LINE-MTL lamp flashes and buzzer sounds indicating an incoming test call, depress MASTER TEST LINE-TEST key and establish voice communication with the class 5 office.
4	Transfer the call to CDT access line 0 by depressing MASTER TEST LINE-TRFR key. Depress TRUNK TRANSMISSION TEST-TMSN and TALK keys to establish voice communication with the class 5 office. After voice communication has been established, release the TALK key before proceeding.
5	At the class 5 office, place the appropriate test termination (900 ohm + 2.16 μF) across the transmission path of the selected trunk.
6	At the TSPS office, outpulse code 970 to establish a switched connection to a balance test circuit at the toll office: (a) Operate MASTER TEST LINE key sequence, TEST-KP-CODE-0970-ST. (b) Operate TRUNK TRANSMISSION TEST-TOLL BRDG key. (c) Operate MASTER TEST LINE-OP key. The MASTER TEST LINE-EQPT ST lamp will flash and the MASTER TEST LINE-OP lamp will light. When outpulsing is complete, a bridge connection with the local and toll offices has been established.

STEP	PROCEDURE
7	At the toll office, terminate with 600 ohms the transmit and receive legs of the balance test hybrid associated with the code 970 circuit.
8	Set up the test equipment to perform ERL or SRL as described in Section 660-463-504.
9	Measure the ERL, SRL-LO, and SRL-HI. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
10	Record the measurement results.
11	At the class 5 office, remove the test termination established in Step 5.
12	At the TSPS office, release the TRUNK TRANSMISSION-TOLL BRDG key and depress TRUNK TEST-RLS key to release connection.
13	Repeat Steps 2 through 12 for all 2-wire TC trunks included in the samples in paragraph 2.03. ***Note:*** The measurement must meet the requirements in Section 660-463-301. If the requirements are not met, the NBOC selection process may have to be repeated.
14	Repeat Steps 2 through 12 for ***all*** 2-wire TC trunks if the requirements in Step 13 are met.
15	Remove all test equipment after all trunks have been tested.

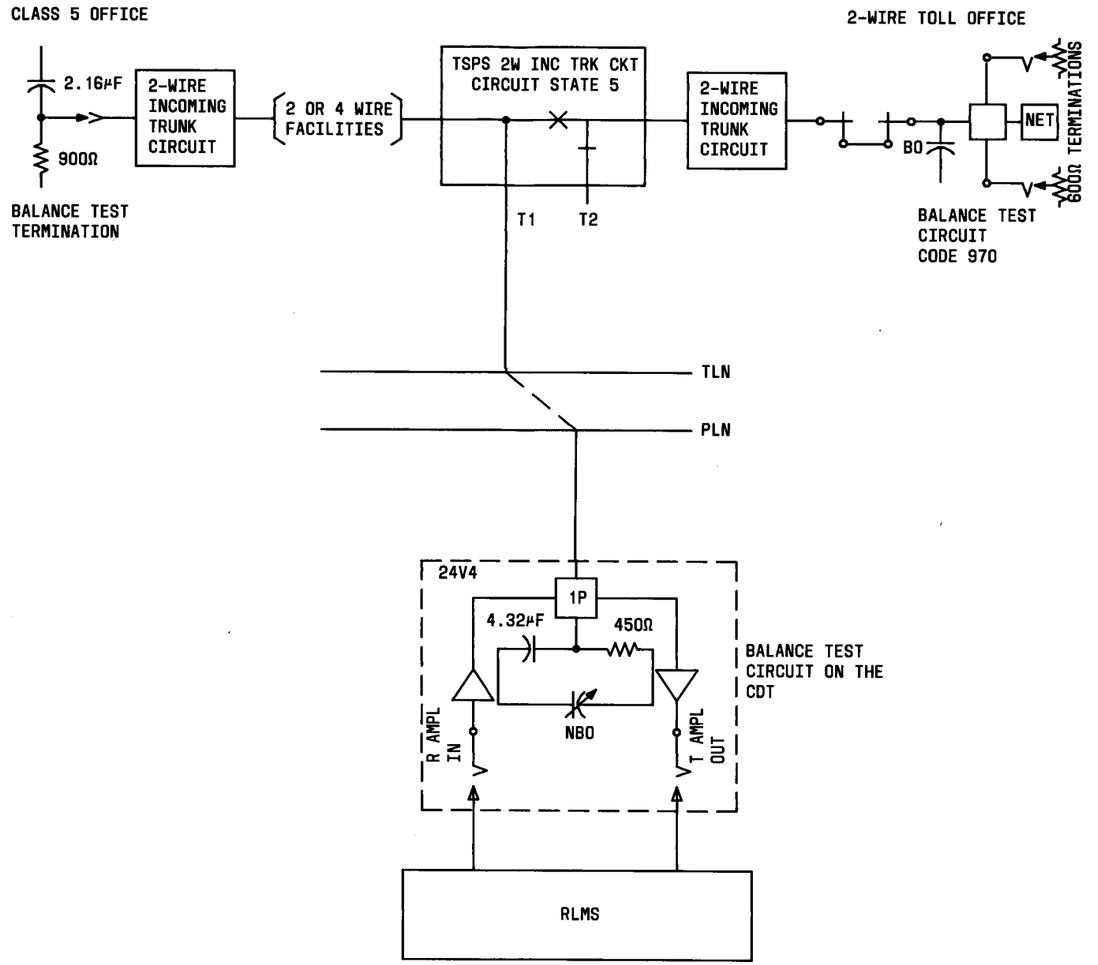

Fig. 3—Test Connections for 1P 4WTS NBOC Verification Tests on 2-Wire TC Trunks

B. Operator Position and Service Observing Trunks

4.02 This procedure is used to verify the compromise NBOC value on all the 1P 4WTSs associated with the operator position trunks and service observing trunk. The base TSPS CDT access line 1 must be properly built-out before this procedure can be used. See Section 660-463-504.

STEP	PROCEDURE
1	At the CDT, connect the selected position circuit to access line 1 by depressing the SERVICE AND POSITION TEST-XMSN key and using the MASTER TEST LINE keying sequence TEST-KP-tgn-c-mem-ST. tgn = trunk group number c = 0 (no camp on) or 1 (camp on) mem = member number.
2	At the 100C or retrofitted 100B position, operate the MAKE BUSY key.
3	At the CDT, operate the TST CONT-TEST 4 key.
4	Connect an RLMS to the 24V4-type repeater associated with the selected position circuit as shown in Fig. 4.
5	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
6	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
7	Record the measurement results.
8	Release the connection.
9	Repeat Steps 1 through 8 for all position circuits to be tested.
10	Remove all test connections after all trunks have been tested.

C. Coin Detection and Announcement Circuits, Types I and II

4.03 This procedure is used to verify the NBOC value on all the 1P 4WTSs associated with the CDA types I and II circuits. The base TSPS CDT access line 1 must be properly built-out before this procedure can be used. See Section 660-463-504.

STEP	PROCEDURE
1	At the CDT, place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the CDT balance test circuit.
2	At the CDT, connect the selected CDA circuit to access line 1 by operating the SERVICE AND POSITION TEST-XMSN and TRUNK TRANSMISSION TEST-XMSN keys and using the MASTER TEST LINE keying sequence TEST-KP-tgn-c-mem-CODE-44-ST tgn = trunk group number (025 for CDA type I or 026 for CDA type II) c = 0 (no camp on) or 1 (camp on) mem = member number.
3	At the CDT, operate the TST CONT-TEST 4 key.
4	Connect an RLMS to the CDA to be tested as shown in Fig. 4.
5	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
6	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
7	Record the measurement results.
8	Release the connection by releasing the TST CONT-TEST 4, SERVICE AND POSITION TEST-XMSN, and TRUNK TRANSMISSION TEST-XMSN keys and operating the SERVICE AND POSITION TEST-RLS key.
9	Repeat Steps 1 through 8 for all CDA circuits to be tested.
10	Remove all test connections after all trunks have been tested.

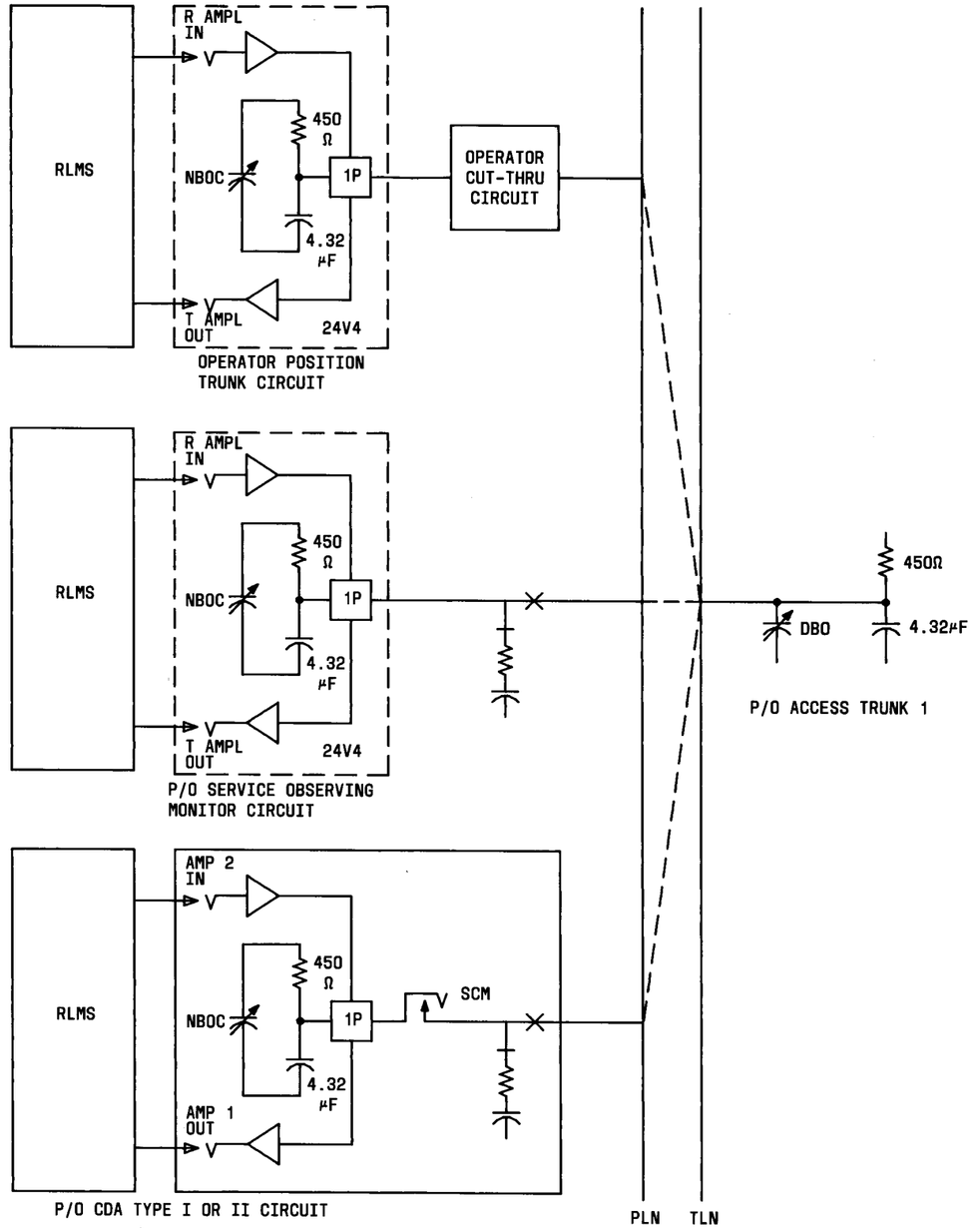

Fig. 4—Test Connections for Verification Tests on Operator Position Trunks, Service Observing Trunks, and CDA Type I or II Circuits

5. SELECTION AND VERIFICATION OF DBOC AND NBOC VALUES ASSOCIATED WITH 2-WIRE PORTS OF 4WTS CONTAINED IN TSPS 4-WIRE BRIDGING REPEATER (SD-7C022-01) OF TSPS BASE UNITS

5.01 This procedure is performed on all 3-way, 4-wire bridging repeaters associated with base TSPS 4-wire TC trunks, inward trunks, 4-wire delay call trunks, ▶CDA type II circuits,◀ and service observing trunks. The base TSPS CDT balance test circuit, with its NBOC properly built-out, is used in this procedure.

5.02 Steps 5 through 10 of this procedure can be omitted for a trunk connection if the DBOC value is determined by prescription. However, if the ERL and SRL requirements given in Section 660-463-301 are not met, Steps 5 through 10 of this procedure should be performed to determine the optimum DBOC value.

5.03 Steps 17 through 22 of this procedure can be omitted for a trunk connection if the NBOC value is determined by prescription. However, if the ERL and SRL requirements given in Section 660-463-301 are not met, Steps 17 through 22 of this procedure should be performed to determine the optimum value.

5.04 Steps 3 and 26 through 29 should be performed for all base TSPS 4-wire TC trunks containing a 4WTS in the transmission path between the TSPS and the toll office.

STEP	PROCEDURE
1	At the TSPS office, connect an RLMS to the 24V4-type repeater associated with the base TSPS CDT balance test circuit as shown in Fig. 5 or 6.
2	Connect the selected trunk to be tested to the CDT access line 0 by depressing the TRUNK TRANSMISSION TEST-XMSN key and using the MASTER TEST LINE keying sequence TEST-KP-tgn-c-mem-ST. tgn = trunk group number c = 0 (no camp on) or 1 (camp on) mem = member number. ***Note:*** Proceed to Step 4 if the selected 4-wire trunk does not contain a 4WTS in the transmission path between the TSPS and the toll office.
3	Outpulse 970 to establish a switched connection to a code 970 BAL TST CIRCUIT at the toll office by using the MASTER TEST LINE keying sequence TEST-KP-CODE-0970-ST followed by operation of TRUNK TRANSMISSION TEST-TOLL BRDG and MASTER TEST LINE-OP keys. The MASTER TEST LINE-EQPT ST lamp will flash and OP lamp will light steadily when outpulsing is complete.
4	Terminate the 4-wire ports (1 and 2) of the TSPS 4-wire bridging repeater (SD-7C022-01) as in Fig. 5. If the 3-way, 4-wire bridging repeater is a separately mounted item ▶or a part of a CDA type II circuit,◀ remove the plug-in from its mounting and insert it into the J99338CB test extender. Install terminating plugs and connect the test cable as in Fig. 6. ***Note:*** If the DBOC value is determined by prescription, set the DBOC associated with the 2-wire port to the prescription value and skip to Step 11. The DBOC is an integral part of SD-7C022-01 but is a separately mounted item when SD-99782-01 is used.

STEP	PROCEDURE
5	Connect a 7A capacitor box (or equivalent) to the MON 2W-4W pin jacks on the face of the 3-way, 4-wire bridging repeater plug-in or at the DBOC mounting.
6	Set the TEST TYPE switch of the RLMS to SRL-HI, SRL-LO, or ERL.
7	Adjust the capacitor decade box in small increments of capacitance and record ERL, SRL-LO, and SRL-HI. Keep repeating until ERL and SRL-HI reach maximum and then start to drop. A trade-off pattern will be found to exist between ERL and SRL-HI. Record the capacitance and measurement values.
8	Remove the 7A capacitor box from the MON 2W-4W jack.
9	Set the DBOC of the bridging repeater to the value recorded in Step 7 above.
10	Verify that the return loss measured by the RLMS is approximately the same as that recorded in Step 7. If it is not, the DBOC must be readjusted. When large changes in the DBOC are required to obtain the same measurement as that obtained in Step 7, investigate for trouble.
11	Set up the test equipment to perform ERL or SRL measurement as described in Section 660-463-504.
12	Measure the ERL, SRL-LO, and SRL-HI. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
13	Record the measurement results.
14	Remove the RLMS from the CDT balance test circuit.
15	Terminate with 262B plugs the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the CDT balance test circuit.
16	Connect the RLMS to the TSPS 4-wire bridging repeater as in Fig. 7 or 8. ***Note:*** If the value of the NBOC is determined by prescription, set the NBOC of the bridging repeater 4WTS to that value by turning down or tightening the appropriate screw switches and skip to Step 23.
17	Connect a 7A capacitor box across the NBOC of the bridging repeater. Check that all NBOC switches are open.
18	Set the TEST TYPE switch of the RLMS to SRL-HI.
19	Adjust the capacitor decade box in small increments of capacitance and record ERL, SRL-LO and SRL-HI. Keep repeating until ERL and SRL-HI reach maximum and then start to drop. A trade-off pattern will be found to exist between ERL and SRL-HI. Record the capacitance and measurement values.

STEP	PROCEDURE
20	Set the NBOC of the bridging repeater to the capacitance value recorded in Step 19 by turning down or tightening the appropriate NBOC screw switches.
21	Remove the 7A capacitor box from the NBOC of the bridging repeater.
22	Verify that the return loss measured by the RLMS is approximately the same as that observed in Step 19. If not, the NBOC of the bridging repeater must be readjusted.
23	Set up the test equipment to perform ERL or SRL measurements as described in Section 660-463-504.
24	Measure the ERL, SRL-LO and SRL-HI. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
25	Record the measurement results. ***Note:*** Proceed to Step 30 if the 4-wire trunk does not contain a 4WTS as described in paragraph 5.04.
26	Reconnect the RLMS and terminating plugs as shown in Fig. 9 or 10.
27	Set up the test equipment to perform ERL or SRL measurements as described in Section 660-463-504.
28	Measure the ERL, SRL-LO, and SRL-HI. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
29	Record the measurement results.
30	Remove all test connections from the TSPS 4-wire bridging repeater or from the test extender and return the 3-way, 4-wire bridging repeater to its proper mounting.
31	Depress the CDT TRUNK TEST-RLS key to release the connection.
32	Repeat Steps 2 through 31 for all circuits containing 3-way, 4-wire bridging repeaters.
33	Remove the test plugs from 24V4-type repeater associated with the CDT balance test circuit after all trunks have been tested.

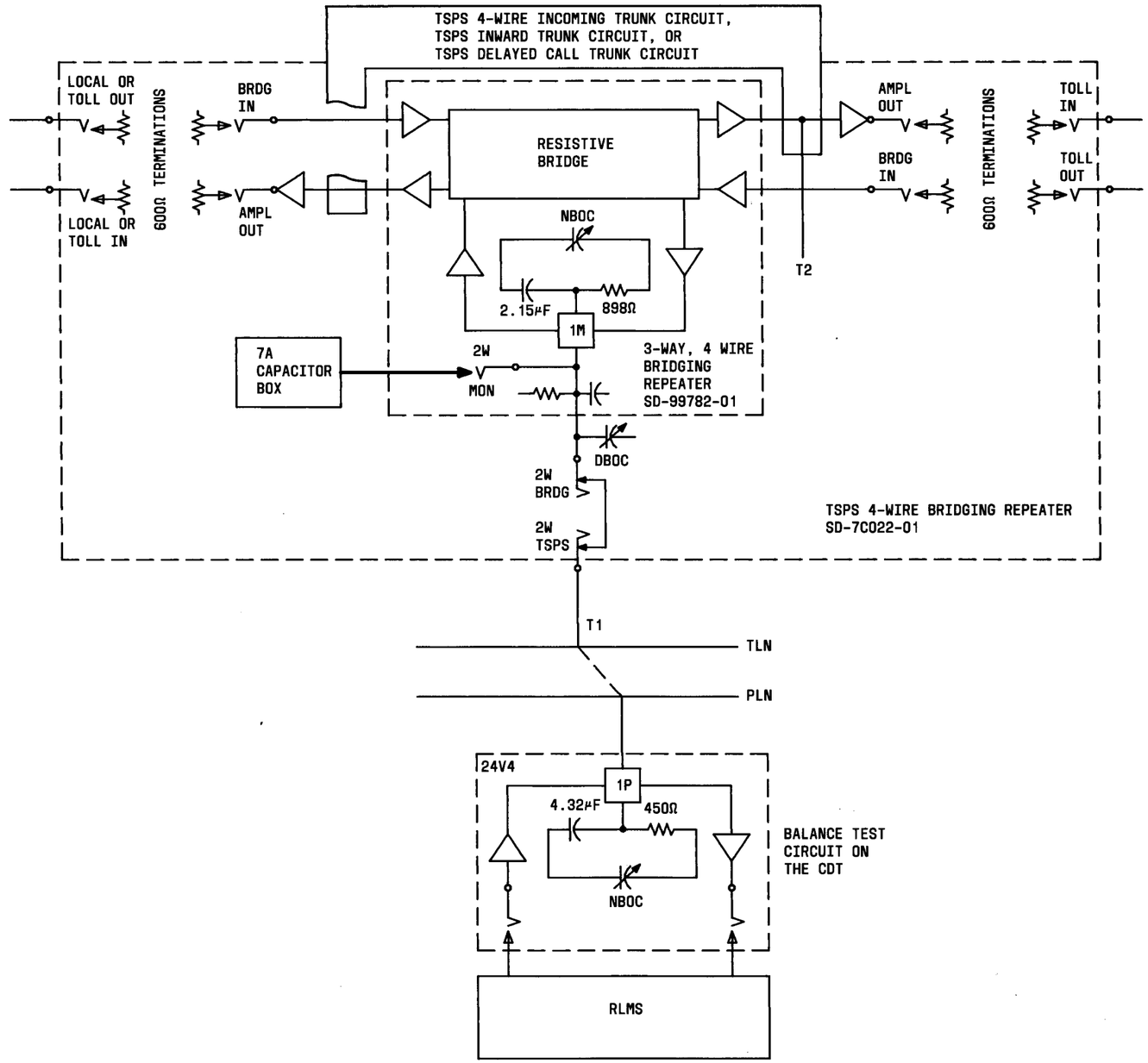

Fig. 5—Test Connections for DBOC Value Selection on TSPS 4-Wire Bridging Repeater

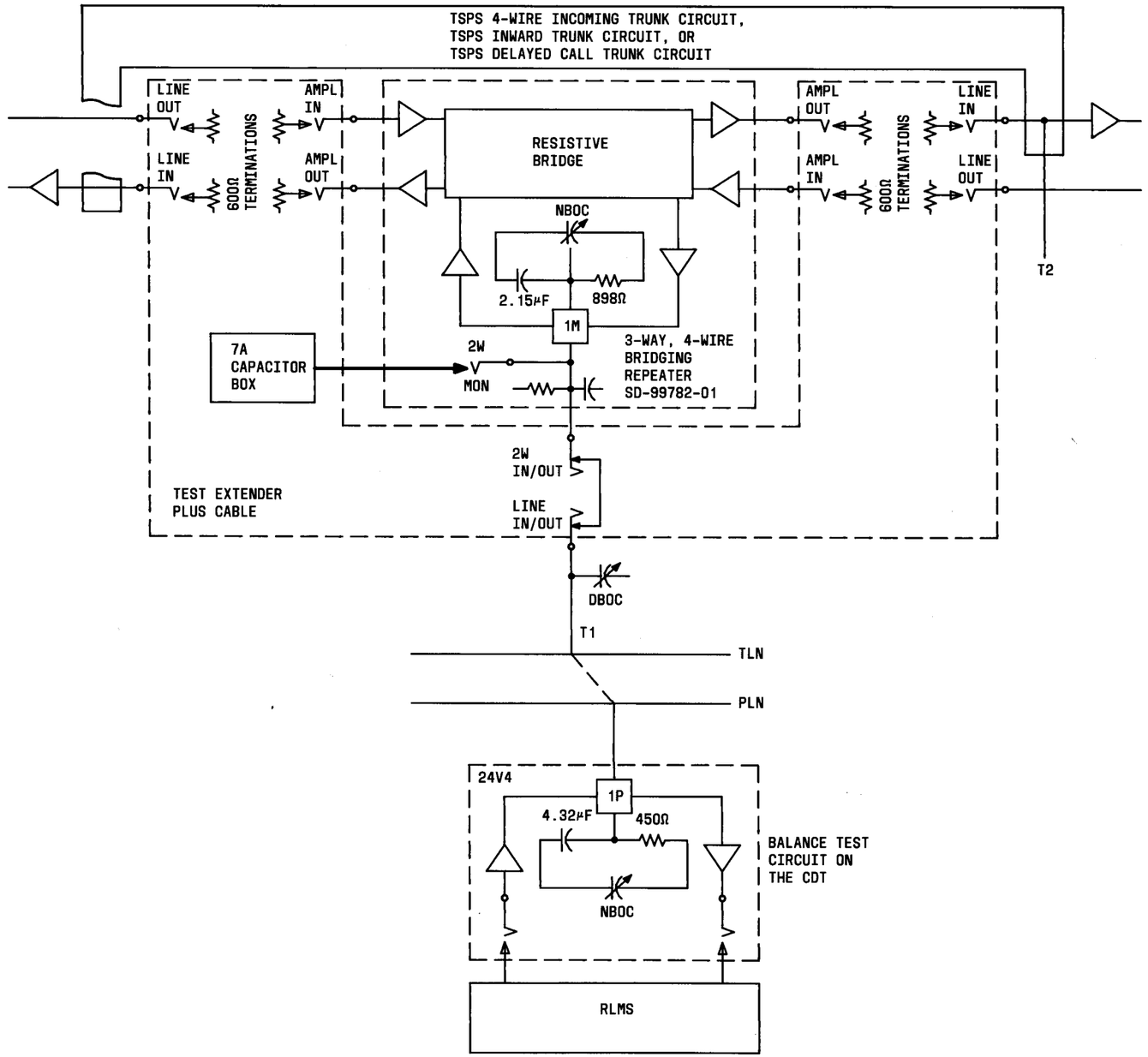

Fig. 6—Test Connections for DBOC Value Selection on 3-Way, 4-Wire Bridging Repeater Using Test Extender

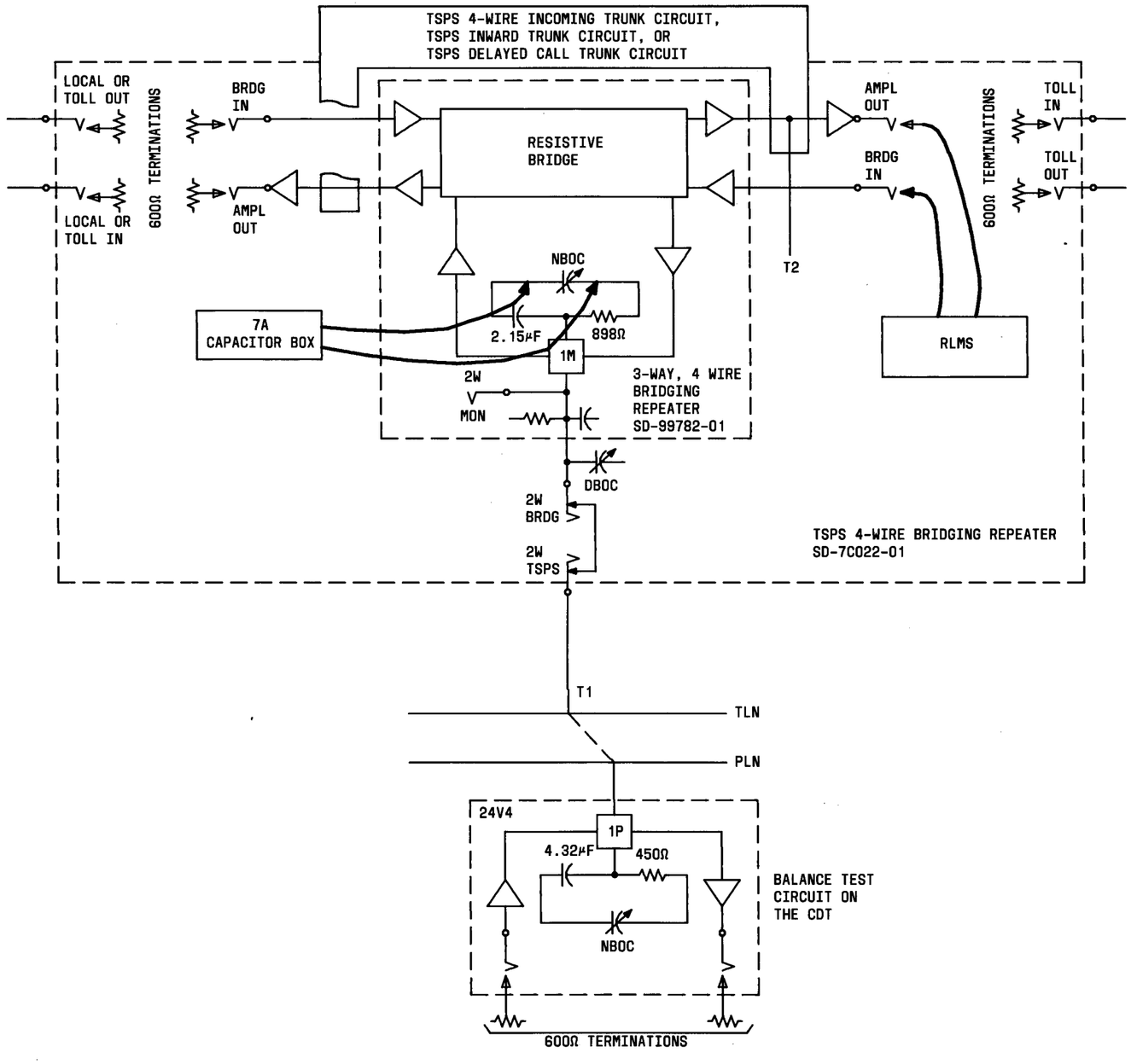

Fig. 7—Test Connections for NBOC Value Selection on TSPS 4-Wire Bridging Repeater

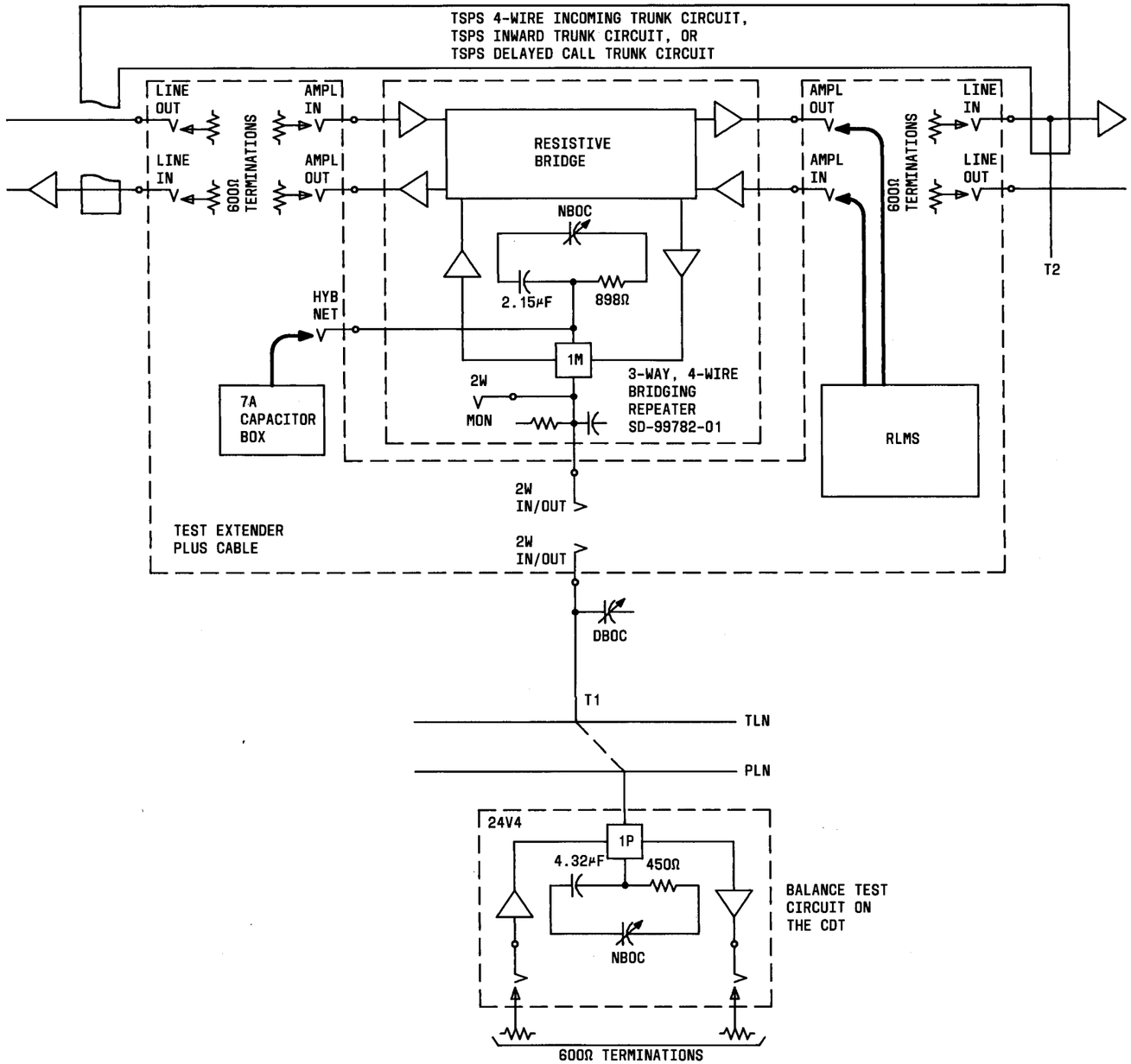

Fig. 8—Test Connections for NBOC Value Selection on 3-way, 4-Wire Bridging Repeater Using Text Extender

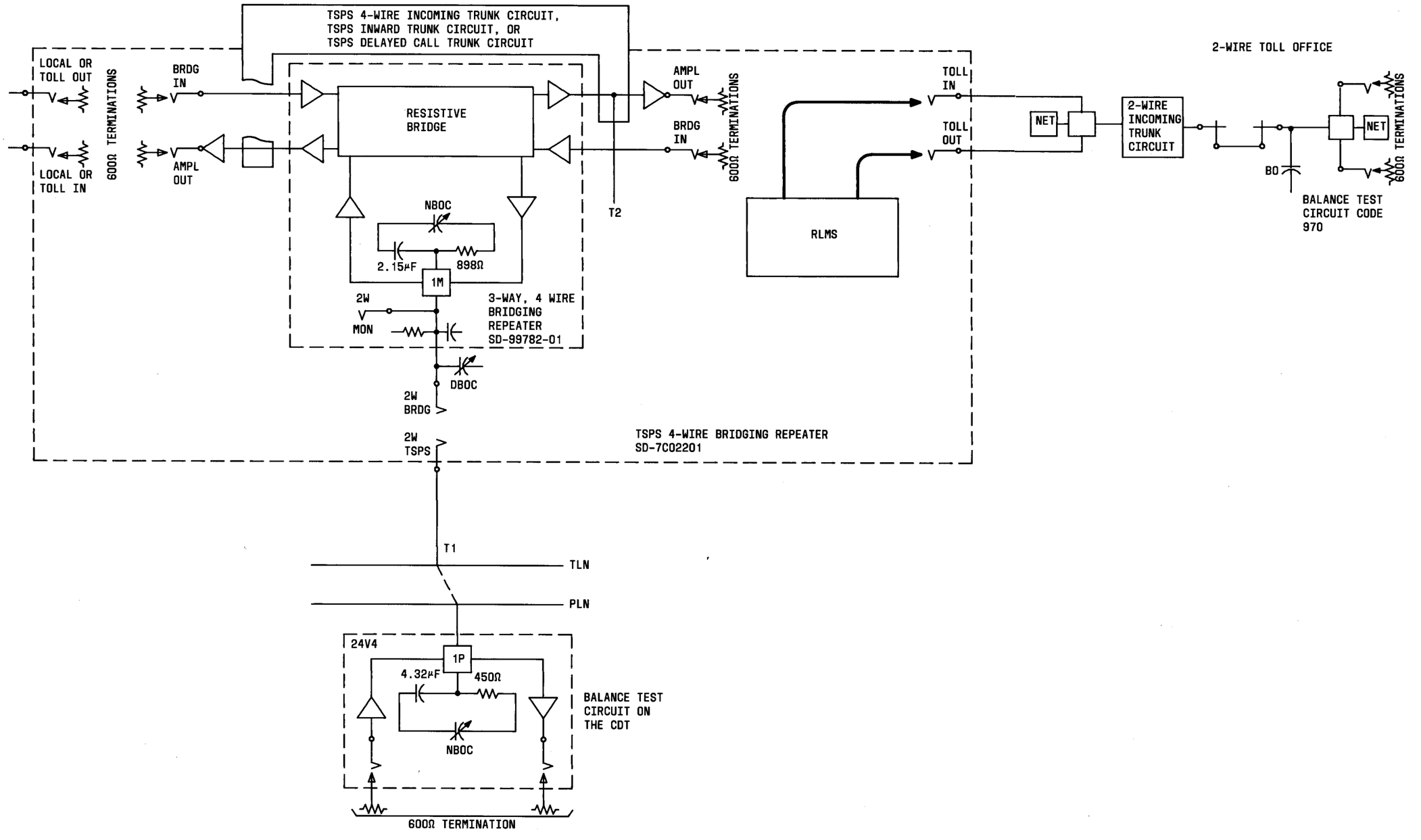

Fig. 9—Test Connections for Verification Test of 4WTS in Toll Office

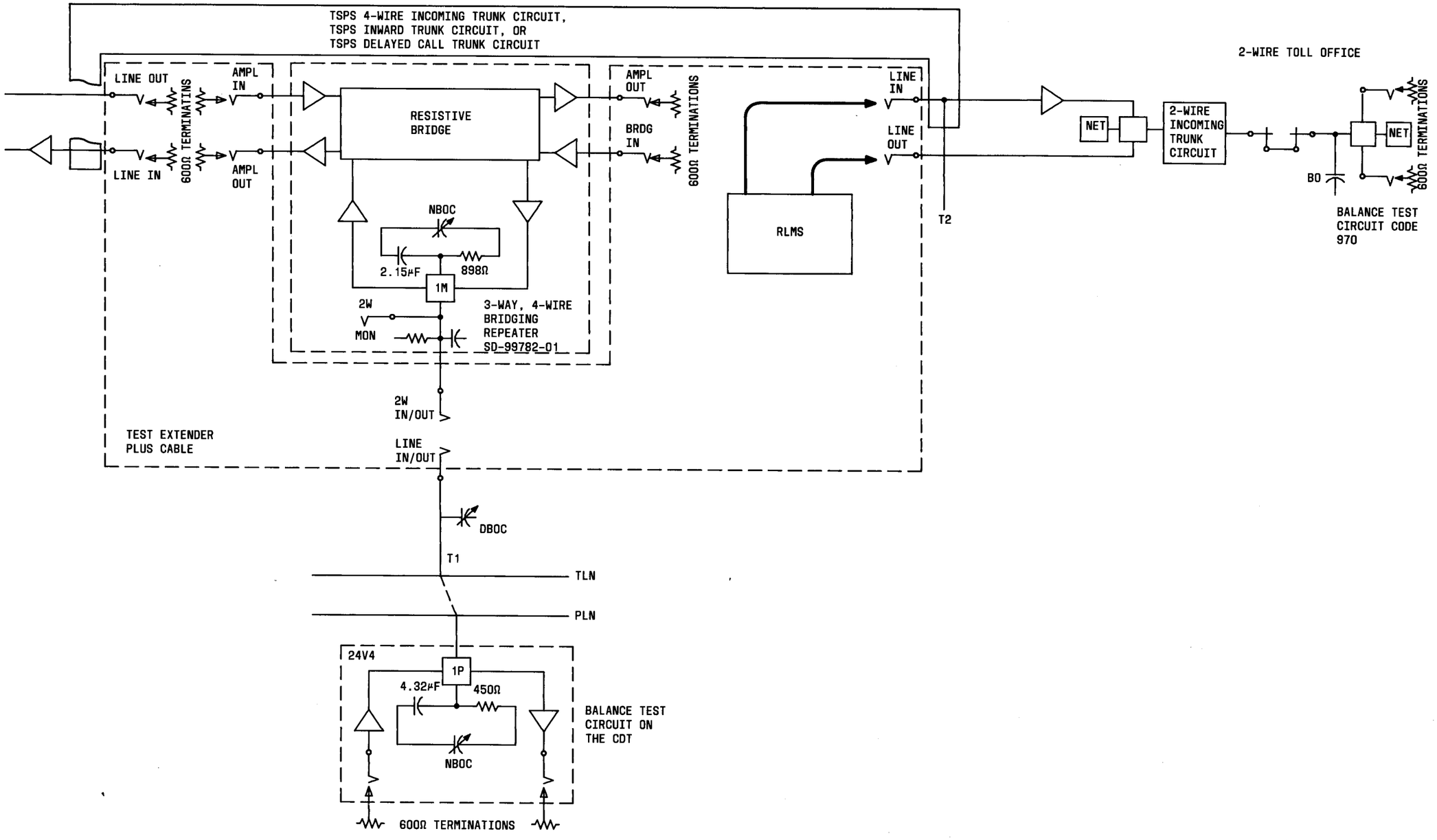

Fig. 10—Test Connections for Verification Test of 4WTS in Toll Office Using Test Extender

6. SELECTION AND VERIFICATION OF DBOC VALUES ASSOCIATED WITH 2-WIRE PORT OF BASE TSPS TRUNKS CONTAINING 24V4-TYPE REPEATERS

6.01 This procedure is performed on all base TSPS base-remote (BR) trunk circuits, 4-wire operator service (OS) trunk circuits, 4-wire incoming CAMA transfer (CAMA-XFER) trunk circuits, ▶and CDA type I circuits.◀ The base TSPS CDT balance test circuit properly built-out is used in this procedure.

STEP	PROCEDURE
1	Connect an RLMS to the 24V4-type repeater associated with the CDT balance test circuit as shown in Fig. 11.
2	Depress TRUNK TRANSMISSION TEST-XMSN key and connect the selected trunk to CDT access line 0 using the MASTER TEST LINE keying sequence TEST-KP-tgn-c-mem-ST. tgn = trunk group number c = 0 (no camp on) or 1 (camp on) mem = member number
3	Terminate the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the trunk with 262B plugs.
4	Set the DBOC associated with the trunk circuit to the prescription value. ***Note:*** If trimming adjustment of the DBOC value to obtain the optimum setting is not desired, skip to Step 7 of the procedure. However, if the ERL and SRL requirements given in Section 660-463-301 are not met, the following steps should be followed to determine the optimum value for the DBOC.
5	Set the TEST TYPE switch of the RLMS to SRL-HI.
6	Adjust the DBOC in small increments of capacitance and record ERL, SRL-LO, and SRL-HI. Keep repeating until ERL and SRL-HI reach maximum and then start to drop. A trade-off pattern will be found to exist between ERL and SRL-HI. Record the capacitance and measurement values.
7	Set up the test equipment to perform ERL or SRL measurement as described in Section 660-463-504.
8	Measure the ERL, SRL, and SRL-HI. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
9	Record the measurement results.
10	Remove plugs from 24V4-type repeater associated with trunk.
11	Depress TRUNK TEST-RLS key at CDT to release connection.
12	Repeat Steps 2 through 11 for all BR, 4-wire CAMA-XFER, and 4-wire OS trunks and ▶CDA type I circuits.◀
13	Remove all test connections after all trunks have been tested.

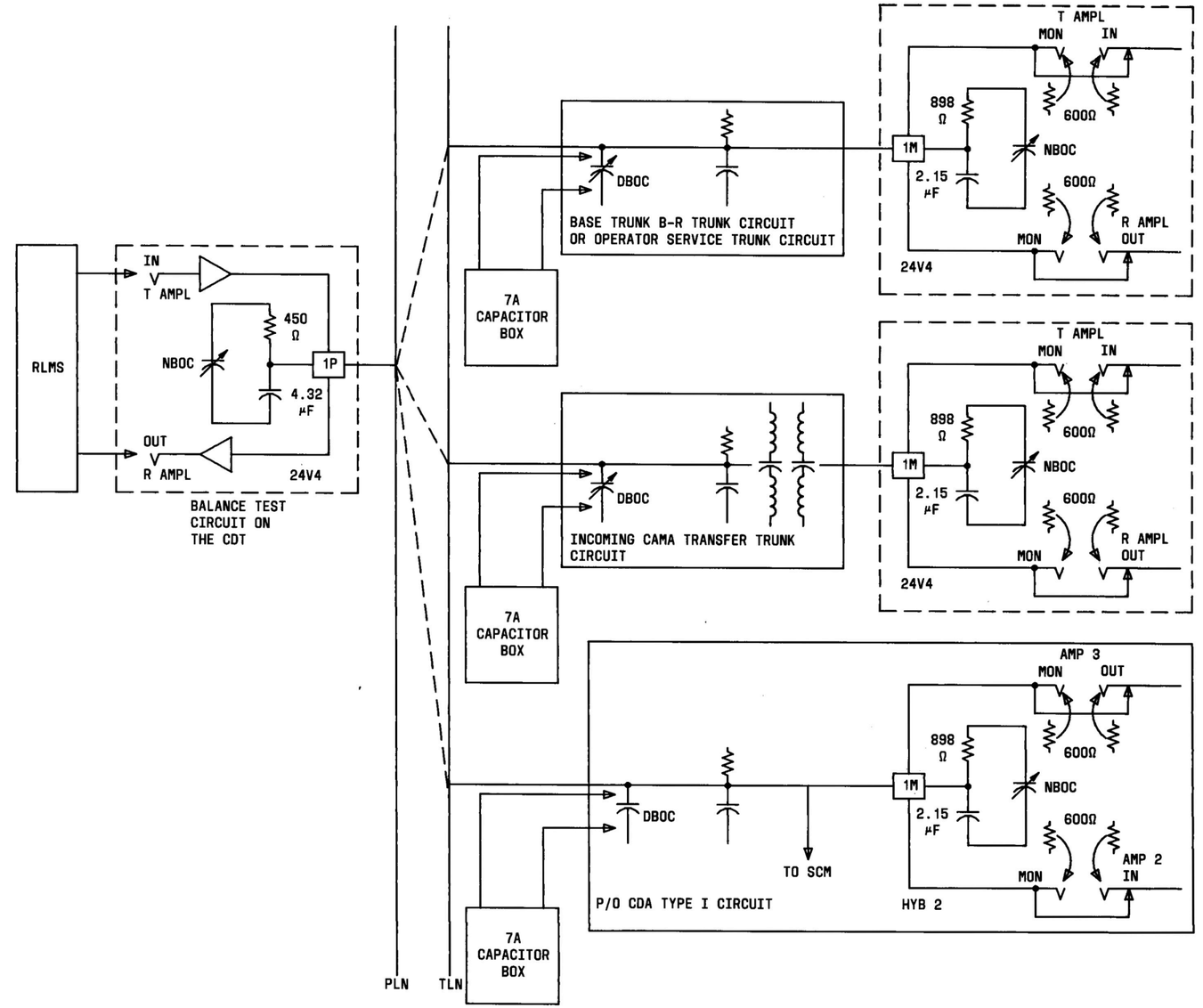

Fig. 11—Test Connections for DBOC Selection on BR Trunks, Operator Service Trunks, CAMA Transfer Trunks, and CDA Type I Circuits

7. SELECTION AND VERIFICATION OF NBOC VALUES FOR THE 4WTS ASSOCIATED WITH BASE TSPS 24V4-TYPE REPEATERS

7.01 This procedure is performed on all base TSPS BR trunks, 4-wire operator service trunks, 4-wire incoming CAMA transfer trunks, ▶and CDA type I circuits.◀ Before adjusting NBOC values, the 2-wire port of the 4WTS should be properly built-out as described in Part 6. The base TSPS CDT balance test circuit properly built-out is used in this procedure.

STEP	PROCEDURE
1	Terminate with 262B plugs the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the CDT balance test circuit.
2	Depress TRUNK TRANSMISSION TEST-XMSN key and connect the selected trunk to CDT access line 0 using the MASTER TEST LINE keying sequence TEST-KP-tgn-c-mem-ST. tgn = trunk group number c = 0 (no camp on) or 1 (camp on) mem = member number
3	Connect RLMS to 24V4-type repeater associated with trunk as shown in Fig. 12.
4	Set capacitance value for NBOC to prescription value. ***Note:*** If trimming of the capacitance value of this NBOC to obtain the optimum setting is not desired, skip to Step 7 of this procedure. However, if the ERL and SRL requirements given in Section 660-463-301 are not met, the following steps should be followed to determine the optimum value for this NBOC.
5	Set the TEST TYPE switch of RLMS to SRL-HI.
6	Adjust the NBOC in small increments of capacitance and record ERL, SRL-LO, and SRL-HI. Keep repeating until ERL and SRL-HI reach maximum and then start to drop. A trade-off pattern will be found to exist between ERL and SRL-HI. Record the capacitance and measurement values.
7	Set up test equipment to perform ERL or SRL measurements as described in Section 660-463-504.
8	Measure the ERL, SRL-LO, and SRL-HI. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
9	Record the measurement results.
10	Remove all test connections from the 24V4-type repeater associated with the trunk.
11	Depress TRUNK TEST-RLS key at the CDT to release the connection.
12	Repeat Steps 2 through 11 for all BR trunks, 4-wire operator service trunks, CAMA transfer trunks, ▶and CDA type I circuits.◀
13	Remove test plug from 24V4-type repeater associated with the CDT balance test circuit after all trunks have been tested.

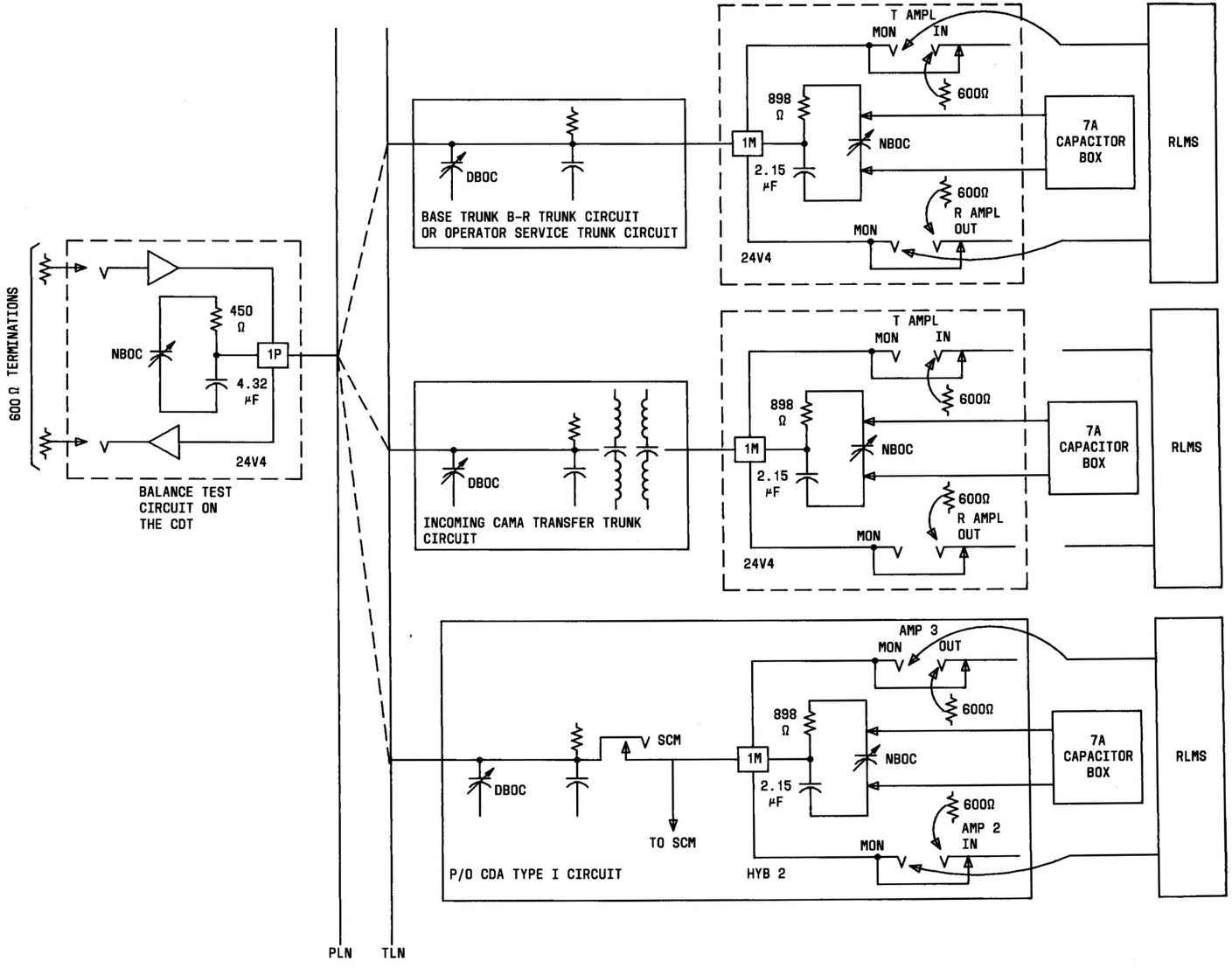

Fig. 12—Test Connections for NBOC Selection on BR Trunks, Operator Service Trunks, CAMA Transfer Trunks, and CDA Type I Circuits

8. ▶SELECTION AND VERIFICATION OF NBOC VALUES FOR HYB 2 OF THE CDA TYPE II CIRCUIT

8.01 This procedure is performed on all CDA type II circuits. The NBOC of HYB 2 is set to the value used in the 1P 4WTS determined in paragraph 3.01. This test is made to a termination on access line 1 of the CDT.

STEP	PROCEDURE
1	At the CDT, connect the CDA type II circuit to be tested to access line 1 by operating the SERVICE AND POSITION TEST-XMSN and TRUNK TRANSMISSION TEST-XMSN keys and using the MASTER TEST LINE keying sequence TEST-KP-026-c-mem-CODE-45-ST. c = 0 (no cap on) or 1 (camp on) mem = member number.
2	At the CDT, operate the TST CONT-TEST 4 key.
3	Set the value of the adjustable DBOC of the 900 ohm plus 2.16 μF test termination plug to the same value as that of the NBOC of HYB 2.
4	At the CDT, place the test termination plug in the AT1 jack.
5	At the CDT, release the SERVICE AND POSITION TEST-XMSN key.
6	At the CDA type II circuit to be tested, remove the 3-way, 4-wire bridging repeater from its mounting. ***Note:*** Do not tamper with existing slide switch or amplifier gain potentiometer settings.
7	Using the extender cable, connect test extender to the repeater mounting from which the repeater was removed.
8	Insert the 3-way, 4-wire bridging repeater into test extender.
9	Terminate the following jacks on test extender with 262B plugs: J1 LINE ON and AMP IN J3 AMP OUT J4 AMP IN J5 LINE IN and AMP OUT.
10	Verify that option Z is ***not*** connected.
11	Connect an RLMS to the CDA to be tested as shown in Fig. 13.
12	Set up test equipment to perform ERL and SRL measurements as described in Section 660-463-504. ***Note:*** A shorting plug is placed into the HYB 2 jack, the A relay operated, and the B and C relays nonoperated to obtain the THL of the HYB 2 4WTS.

STEP	PROCEDURE
13	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
14	Record the measurement results.
15	Return the 3-way, 4-wire bridging repeater to its proper mounting.
16	Release the connection by releasing the TST CONT-TEST 4 and TRUNK TRANSMISSION TEST-XMSN keys and operating the SERVICE AND POSITION TEST-RLS key.
17	Repeat Steps 1 through 16 for all CDA type II circuits to be tested.
18	Remove test connection after all circuits have been tested.

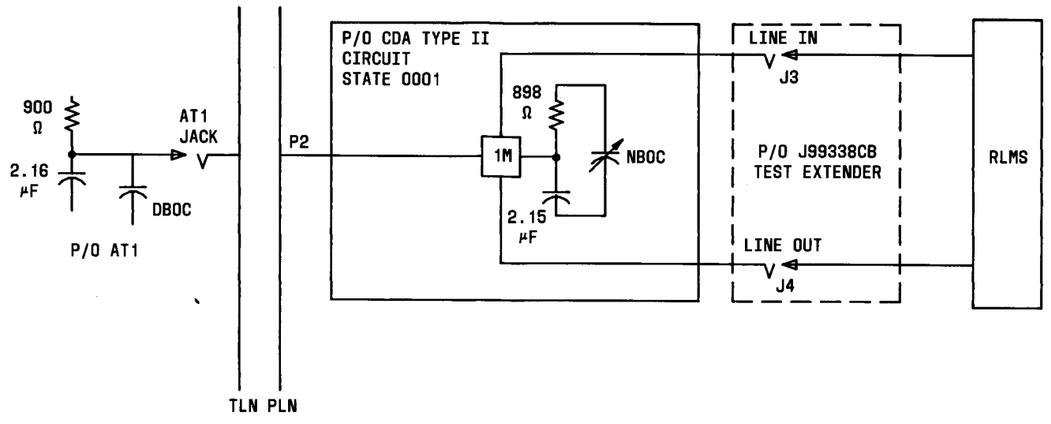

Fig. 13—Test Connections for Selection and Verification of NBOC Values for HYB 2 of CDA Type II Circuits

9. SELECTION AND VERIFICATION OF DBOC VALUES ON IDLE CIRCUIT TERMINATION OF HYB 2 4WTS IN CDA TYPE II CIRCUITS

9.01 This procedure is performed on all CDA type II circuits after the procedure in Part 8 is complete.

STEP	PROCEDURE
1	At the CDA type II circuit to be tested, remove the 3-way, 4-wire bridging repeater from its mounting.
	Note: Do not tamper with existing slide switch or amplifier gain potentiometer settings.
2	Using the extender cable, connect test extender to repeater mounting from which repeater was removed.
3	Insert the 3-way, 4-wire bridging repeater into test extender.
4	Terminate the following jacks on test extender with 262B plugs: J1 LINE ON and AMP IN J3 AMP OUT J4 AMP IN J5 LINE IN and AMP OUT.
5	Verify that option Z is ***not*** connected.
6	Connect a 7A capacitor box or equivalent across the DBOC of the idle circuit termination on the 2-wire port of HYB 2. Verify that the DBOC is set to zero.
7	Connect an RLMS to the CDA to be tested as shown in Fig. 14.
8	Set the TEST TYPE switch of the RLMS to SRL-HI, SRL, or ERL.
9	Adjust the capacitor box in small increments of capacitance and record SRL-HI, SRL, and ERL. Keep repeating until ERL and SRL-HI reach maximum and then start to drop. A trade-off pattern will be found to exist between ERL and SRL-HI. Record the capacitance and measurement values.
10	Remove the 7A capacitor box from the DBOC of the CDA.
11	Set the DBOC to the value recorded in Step 9 above.
12	Verify that the return loss measured by the RLMS is approximately the same as that recorded in Step 9. If it is not, the DBOC must be readjusted. When large changes in the DBOC are required to obtain the same measurement as that obtained in Step 9, investigate for trouble.

STEP	PROCEDURE
13	Set up test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
14	Measure the ERL and SRL.
	Note: The measurement results must meet the requirements in Section 660-463-301.
15	Record the measurement results.
16	Return the 3-way, 4-wire bridging repeater to its proper mounting.
17	Repeat Steps 1 through 15 for all CDA type II circuits to be tested.
18	Remove test connections after all circuits have been tested.

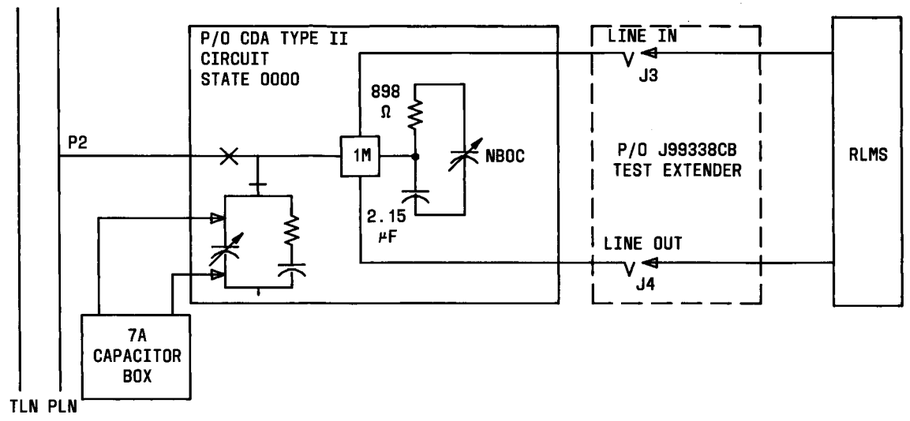

Fig. 14—Test Connections for Selection and Verification of DBOC Values on Idle Circuit Termination of HYB 2 4WTS of CDA Type II Circuits

10. SELECTION AND VERIFICATION OF THE SWITCHED DBOC ON THE 2-WIRE PORT OF HYB 2 OF CDA TYPE II CIRCUITS

10.1 This procedure is performed on all CDA type II circuits. The procedures in Part 8 must be performed before this procedure can be started. This test is made to a 900-ohm 4WTS which is patched into the AT1 jack associated with access line 1 of the CDT. The prescription setting of the switched DBOC is equal to the average of the largest and the smallest values for the DBOCs associated with the base trunk of all base-remote trunks in the TSPS base unit.

STEP	PROCEDURE
1	At the CDT, connect the CDA type II circuit to be tested to access line 1 by operating the SERVICE AND POSITION TEST-XMSN and TRUNK TRANSMISSION TEST-XMSN keys and using the MASTER TEST LINE keying sequence TEST-KP-026-c-mem-CODE-XX-ST. c = 0 (no camp on) or 1 (camp on) mem = member number.
2	At the CDT, operate the TST CONT-TEST 4 key.
3	Set the value of the NBOC of a 900-ohm 4WTS (ie, type 1M) to the average of the largest and smallest values for the NBOC of the 4WTS associated with the base trunk, base-remote trunk circuits of all BR trunks in that TSPS base unit.
4	At the CDT, patch the 2-wire port of the 900-ohm 4WTS to the AT1 jack.
5	At the CDT, release the SERVICE AND POSITION TEST-XMSN key.
6	At the CDA type II circuit to be tested, remove the 3-way, 4-wire bridging repeater from its mounting. ***Note:*** Do not tamper with existing slide switch or amplifier gain potentiometer settings.
7	Using the extender cable, connect the test extender to the repeater mounting from which the repeater was removed.
8	Insert the 3-way, 4-wire bridging repeater into the test extender.
9	Terminate the following jacks on the test extender with 262B plugs: J1 LINE ON and AMP IN J3 AMP OUT J4 AMP IN J5 LINE IN and AMP OUT.
10	Verify that option Z is ***not*** connected.
11	Connect an RLMS to the CDA to be tested as shown in Fig. 15.
12	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.

STEP	PROCEDURE
13	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
14	Record the measurement results.
15	Return the 3-way, 4-wire bridging repeater to its proper mounting.
16	Release the connection by releasing the TST CONT-TEST 4 and TRUNK TRANSMISSION TEST-XMSN keys and operating the SERVICE AND POSITION TEST-RLS key.
17	Repeat Steps 1 through 16 for all CDA type II circuits to be tested.
18	Remove test connection after all circuits have been tested.

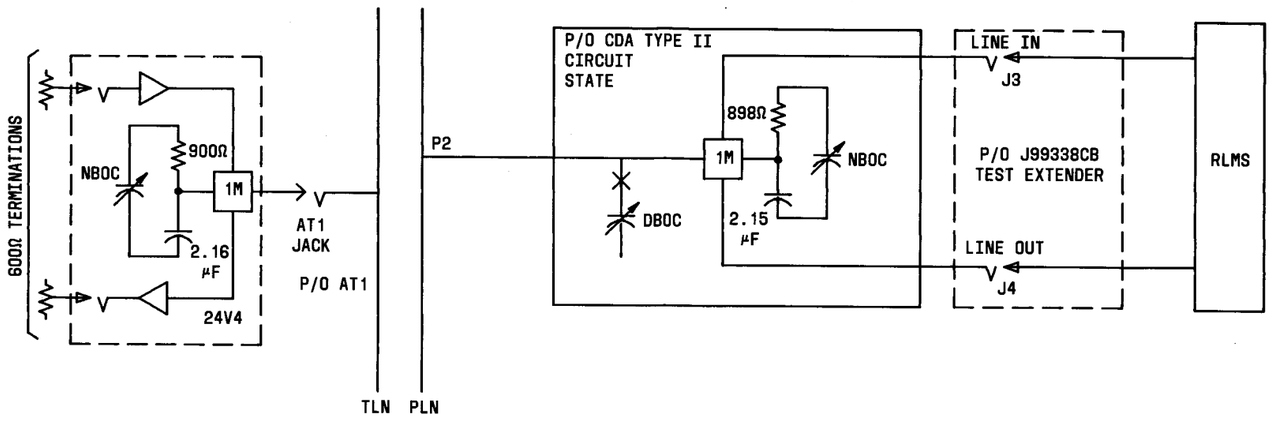

Fig. 15—Test Connections for Selecton and Verification of the Switched DBOC Value on the 2-Wire Port of HYB 2 of CDA Type II Circuits

11. VERIFICATION TEST OF CDA TYPE I CIRCUITS

11.01 This procedure is performed on all CDA type I circuits. The procedures in Parts 4C, 6, and 7 need to be completed on these circuits before this procedure is started. This test is made between test terminations on access lines 0 and 1 of the CDT.

STEP	PROCEDURE
1	At the CDT, connect the selected CDA circuit to access line 0 and 1 by operating the SERVICE AND POSITION TEST-XMSN key and the TRUNK TRANSMISSION TEST-XMSN key and using the MASTER TEST LINE keying sequence TEST-KP-025-c-mem-CODE-44-ST. c = 0 (no camp on) or 1 (camp on) mem = member number.
2	At the CDT, operate the TST CONT-TEST 4 key.
3	Connect an RLMS to the balance test circuit of the CDT as shown in Fig. 16.
4	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
5	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
6	Record the measurement results.
7	Patch a 900-ohm 4WTS that has been set up according to Section 660-463-504 to the AT1 jack at the CDT.
8	Release the SERVICE AND POSITION TEST-XMSN key.
9	Place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the 900-ohm 4WTS that is patched to the AT1 jack.
10	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
11	Record the measurement results.
12	Remove the RLMS from the balance test circuit of the CDT.
13	At the CDT place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the CDT balance test circuit.
14	Remove 262B termination plugs from the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.
15	Connect an RLMS to the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.

STEP	PROCEDURE
16	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
17	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
18	Record the measurement results.
19	Remove the test connections.
20	Release the connection by releasing the TST CONT-TEST 4 and TRUNK TRANSMISSION TEST-XMSN keys and operating the SERVICE AND POSITION TEST-RLS key.
21	Repeat Steps 1 through 20 for all CDA type I circuits to be tested.
22	Remove test connection after all circuits have been tested.

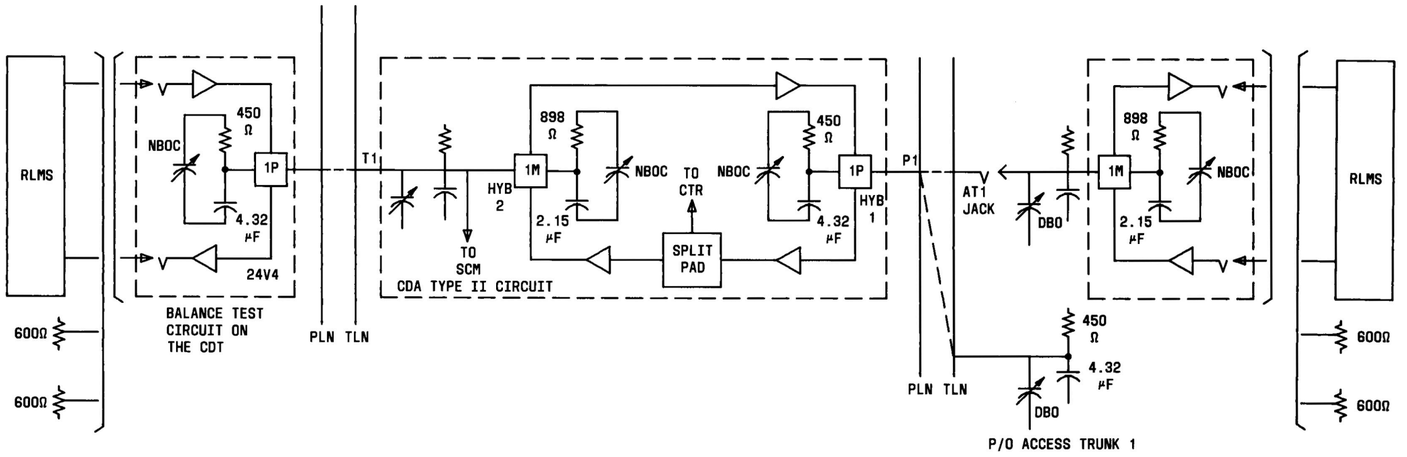

Fig. 16—Test Connections for Verification Test of CDA Type I Circuits

12. VERIFICATION TESTS OF CDA TYPE II CIRCUITS

12.01 This procedure is performed on all CDA type II circuits. The procedures in Parts 4C, 5, 8, 9, and 10 need to be completed on these circuits before this procedure is started. These tests are made between test terminations on access lines 0 and 1 of the CDT.

A. T1 to P1 Test

STEP	PROCEDURE
1	At the CDT, connect the selected CDA circuit to access lines 0 and 1 by operating the SERVICE AND POSITION TEST-XMSN and TRUNK TRANSMISSION TEST-XMSN keys and using the MASTER TEST LINE keying sequence TEST-KP-026-c-mem-CODE-44-ST. c = 0 (no camp on) or 1 (camp on) mem = member number.
2	At the CDT, operate the TST CONT-TEST 4 key.
3	Connect an RLMS to the balance test circuit of the CDT as shown in Fig. 17.
4	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
5	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
6	Record the measurement results.
7	Patch a 900-ohm 4WTS that has been set up according to Section 660-463-504 to the AT1 jack at the CDT.
8	Release the SERVICE AND POSITION TEST-XMSN key.
9	Place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the 900-ohm 4WTS that is patched to the AT1 jack.
10	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
11	Record the measurement results.
12	Remove the RLMS from the balance test circuit of the CDT.
13	At the CDT, place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the CDT balance test circuit.
14	Remove 262B termination plugs from the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.
15	Connect an RLMS to the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.

STEP	PROCEDURE
16	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
17	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
18	Record the measurement results.
19	Remove the test connections.
20	Release the connection by releasing the TST CONT-TEST 4 and TRUNK TRANSMISSION TEST-XMSN keys and operating the SERVICE AND POSITION TEST-RLS key.
21	Repeat Steps 1 through 20 for all CDA type II circuits to be tested.
22	Remove test connections after all circuits have been tested.

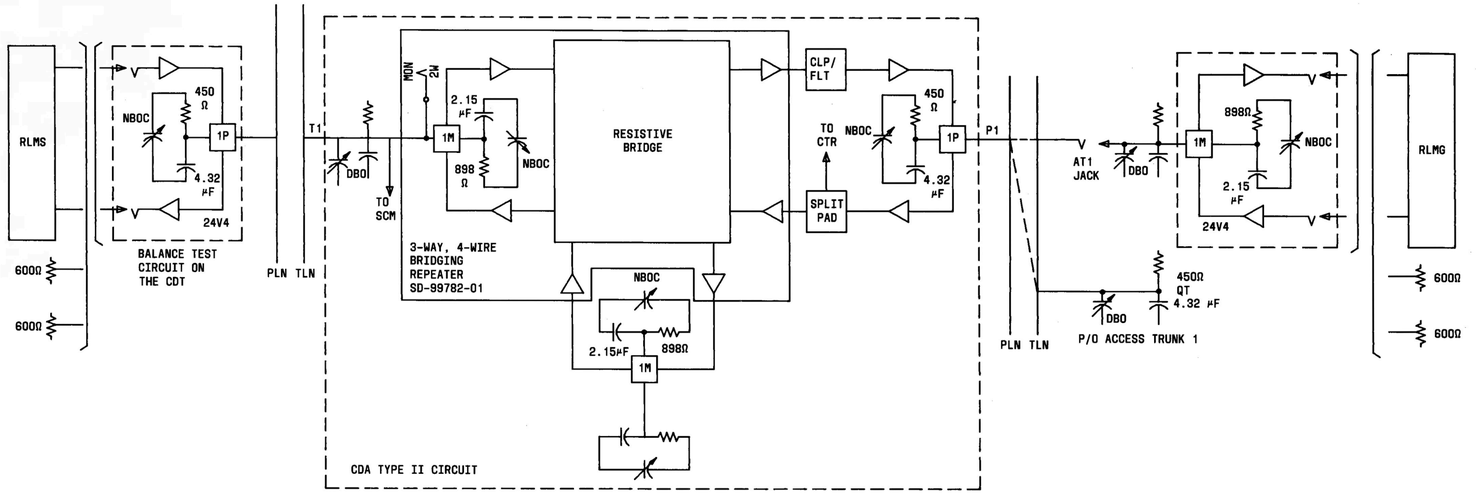

Fig. 17—Test Connections for Verification Test of CDA Type II Circuits, T1 to P1 Ports

B. T1 to P2 Test

STEP	PROCEDURE
1	At the CDT, connect the selected CDA circuit to access lines 0 and 1 by operating the SERVICE AND POSITION TEST-XMSN and TRUNK TRANSMISSION TEST-XMSN keys and using the MASTER TEST LINE keying sequence TEST-KP-026-c-mem-CODE 45-ST. c = 0 (no camp on) or 1 (camp on) mem = member number.
2	At the CDT, operate the TST CONT-TEST 4 key.
3	Connect an RLMS to the balance test circuit of the CDT as shown in Fig. 18.
4	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
5	Patch a 900-ohm 4WTS that has been set up according to Section 660-463-504 to the AT1 jack at the CDT.
6	Release the SERVICE AND POSITION TEST-XMSN key.
7	Place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the 900-ohm 4WTS that is patched to the AT1 jack.
8	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
9	Record the measurement results.
10	Remove the RLMS from the balance test circuit of the CDT.
11	At the CDT, place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the CDT balance test circuit.
12	Remove 262B termination plugs from the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.
13	Connect an RLMS to the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.
14	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
15	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
16	Record the measurement results.

STEP	PROCEDURE
17	Remove the test connections.
18	Release the connection by releasing the TST CONT-TEST 4 and TRUNK TRANSMISSION TEST-XMSN keys and operating the SERVICE AND POSITION TEST-RLS key.
19	Repeat Steps 1 through 18 for all CDA type II circuits to be tested.
20	Remove test connections after all circuits have been tested.

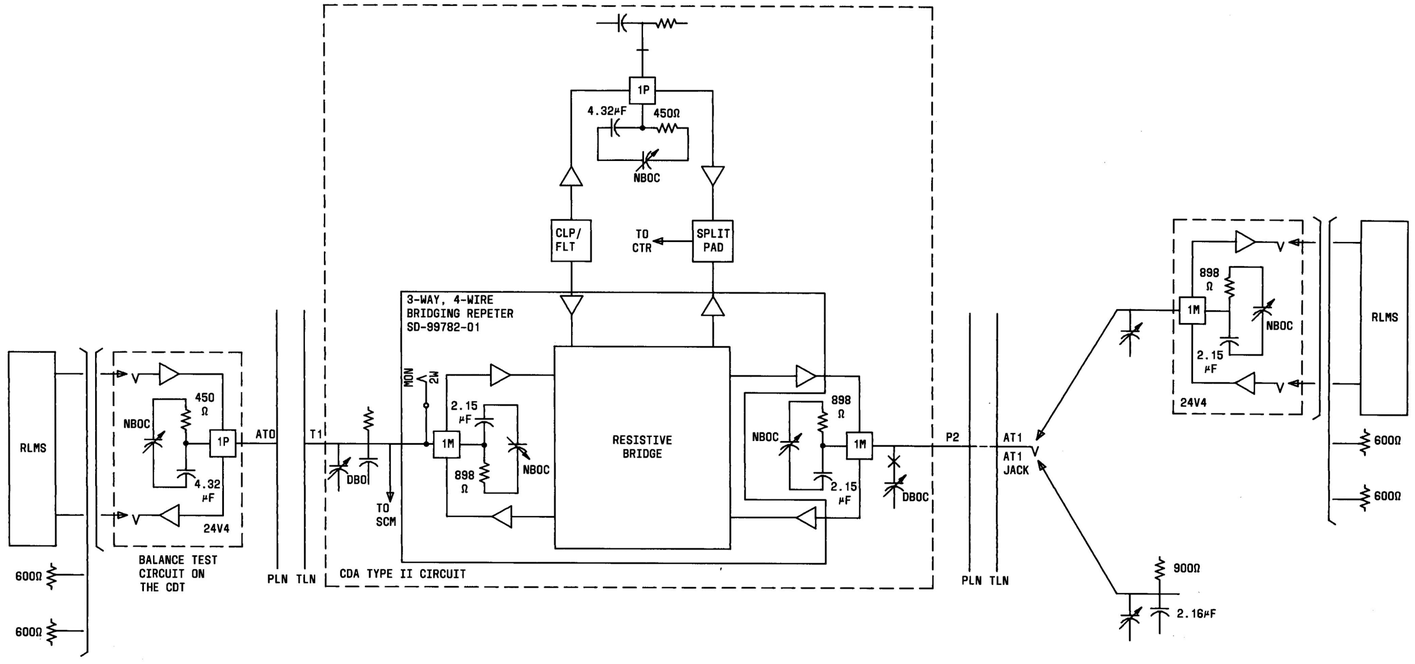

Fig. 18—Test Connections for Verification Test of CDA Type II Circuits, T1 to P2 Ports

C. P1 to P2 Test

STEP	PROCEDURE
1	At the CDT, connect the selected CDA circuit to access lines 0 and 1 by operating the SERVICE AND POSITION TEST-XMSN and TRUNK TRANSMISSION TEST-XMSN keys and using the MASTER TEST LINE keying sequence TEST-Kp-026-c-mem-CODE-46-St. c = 0 (no camp on) or 1 (camp on) mem = member number.
2	At the CDT, operate the TST CONT-TEST 4 key.
3	At the CDT, replace the 1P 4WTS with a 900-ohm 4WTS in the 24V4-type repeater associated with the balance test circuit of the CDT.
4	Connect an RLMS to the balance test circuit of the CDT as shown in Fig. 19.
5	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
6	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
7	Record the measurement results.
8	Patch a 900-ohm 4WTS that has been set up according to Section 660-463-504 to the AT1 jack at the CDT.
9	Release the SERVICE AND POSITION TEST-XMSN key.
10	Place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the 900-ohm 4WTS that is patched to the AT1 jack.
11	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
12	Record the measurement results.
13	Remove the RLMS from the balance test circuit of the CDT.
14	At the CDT, place 262B plugs in the R AMPL IN and T AMPL OUT jacks in the test jack field of the 24V4-type repeater associated with the CDT balance test circuit.
15	Remove 262B termination plugs from the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.
16	Connect an RLMS to the 900-ohm 4WTS that is patched to the AT1 jack of the CDT.

STEP	PROCEDURE
17	Set up the test equipment to perform ERL and SRL measurements as described in Section 660-463-504.
18	Measure the ERL and SRL. ***Note:*** The measurement results must meet the requirements in Section 660-463-301.
19	Record the measurement results.
20	Remove the test connections.
21	Release the connection by releasing the TST CONT-TEST 4 and TRUNK TRANSMISSION TEST-XMSN keys and operating the SERVICE AND POSITION TEST-RLS key.
22	Repeat Steps 1 through 21 for all CDA type II circuits to be tested.
23	Remove test connections after all circuits have been tested.◆

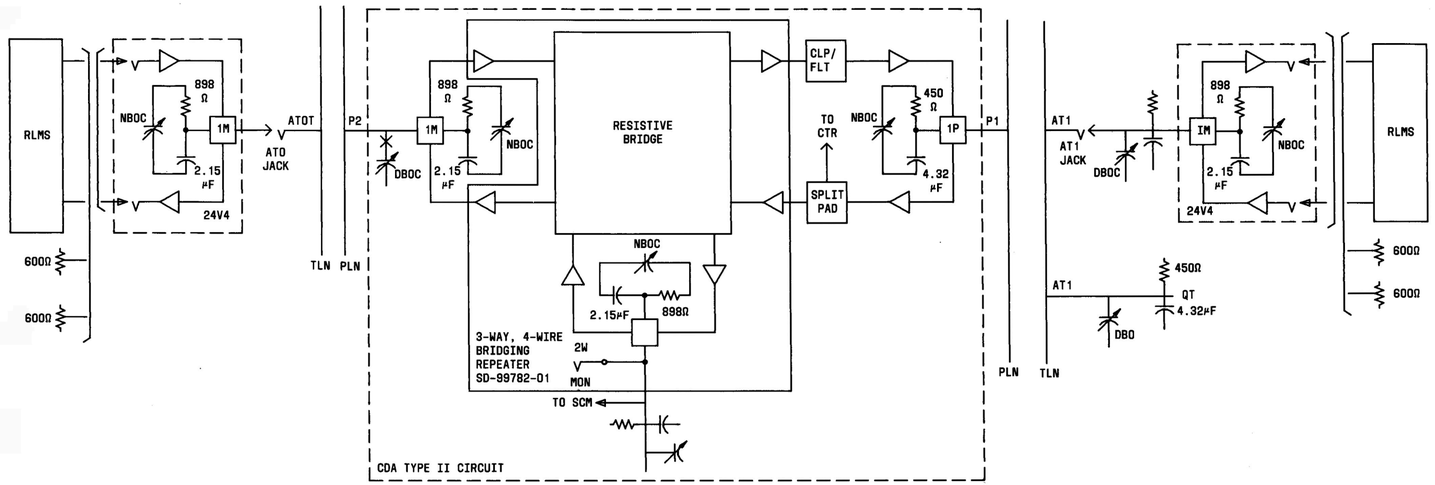

Fig. 19—Test Connections for Verification Test of CDA Type II Circuits, P1 to P2 Ports