

NO. 1 TRUNK CONCENTRATOR BALANCE REQUIREMENTS AND VERIFICATION TESTS

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	1. GENERAL	1	No. 1 Trunk Concentrator 2-wire and 4-wire incoming trunks. These requirements cover the incoming trunk circuits from the class 5 end office or from the switchboards. To provide the customer with an acceptable grade of service, balance requirements must be met to control echo return loss (ERL) and singing return loss (SRL).
	2. BALANCE REQUIREMENTS	2	
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	4. PREPARATION	3	1.02 When this section is reissued, the reason for reissue will be given in this paragraph.
	5. VERIFICATION TESTS AND PROCEDURES	4	1.03 Balance measurements results are to be recorded on the standard E-6006 record test form covered in Section 660-461-101. General information on balance testing is covered in Section 660-461-100. The NBOC verification in large class 5 offices is covered in the applicable switching system Section 660-47Y-520.
FIGURES			
	1. Jack, Key, and Lamp Panel for J99375A (using RLMS)	11	1.04 All 2-wire incoming trunks with loaded cable pair facilities should be equipped either with impedance compensators (837-type) or precision networks (4066-type). The description of the various types of impedance compensators and precision networks is given in Section 332-205-500.
	2. Balance Test—Standard Terminations From Class 5 End Office	13	1.05 The No. 1 Trunk Concentrator is a 4-wire switcher and therefore does not require through balance. The network build-out capacitor (NBOC) located in the No. 1 Trunk Concentrator (1M Terminating Set or equivalent) may be used with a 4066-type network to build out the cable end section.
	3. 2-Wire Circuit With Impedance Compensator and Compromise Network	15	<i>Note:</i> Do not use the compromise network with 4066 type network.
	4. 2-Wire Circuit With 4066-Type Network	17	1.06 The No. 1 Trunk Concentrator system has requirements for office cabling lengths and trunk equipment. The optional 2-dB pad may be required on short connecting intrabuilding trunks. The 2-dB pad is provided to improve ERL and SRL performance, so that noise and crosstalk reaching the subscriber will be tolerable. However,
	5. 2-Wire Circuit With Compromise Network and Optional 2 dB Pad	19	
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1. GENERAL			
1.01	This section provides terminal balance requirements and verification tests for the		

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most of the intercepting trunks are not equipped with a switchable 2-dB pad, and office facilities may not always be furnished with 2-dB pads for insertion into short toll connecting trunks. To meet balance requirements of a 2-wire facility with less than 2-dB loss, adjustable pads of the 1M or equivalent terminating set in the No. 1 Trunk Concentrator trunks are used to accommodate the 2 dB loss, in addition to the normal functions.

1.07 Class 5 end office definition—The central office trunking where telephone subscribers are terminated for purposes of switching calls from telephone to telephone. It must home on a class 4 or higher office for Message Telecommunication System (MTS) network to complete on long distance calls.

2. BALANCE REQUIREMENTS

2.01 Balance requirements are such that all trunks must have ERL and SRL measurements equal to or greater than the requirements given in Fig. 3 through 7. Trunks whose measurements are below the requirements should be referred to the transmission engineer. The trunk should be removed from service until corrective action is taken. The transmission engineer will determine if the trunks should be turned up for service. The initial certification and recertification requirements are covered in Section 853-500-110. If all trunks requiring balance meet the requirements given in this section, certification can be obtained from the transmission engineer.

2.02 The maintenance personnel will record results on standard form E-6006 and summarize the measurements of balance testing. The transmission engineer will review the results to determine that the overall balance objectives have been met for the No. 1 Trunk Concentrator.

3. TEST APPARATUS

3.01 The following test apparatus will be required to perform terminal balance measurements at the No. 1 Trunk Concentrator.

QUANTITY	TEST SET OR APPARATUS	REFERENCE
1	Return Loss Measuring Set (RLMS) Wiltron Model (9041 or 9031), KS-20501 or equivalent KS-20501 (RLMS)	103-106-115
1	900-ohm resistor plus 2.16 μF capacitor in series test termination with 274J holding coil	Local arrangement (see Fig. 2)
1	Spare 4182 network with transmit 7.0 dB pad and receive 16.0 dB pad	
1	349A-type plug or 310-type plug (place a short across tip & ring)	
2	Patching cord, P3E cord, 6 feet long, equipped with 310 plugs on each end (cord 3P7A)	
1	Cord 1W13A (two KS-6278 clips with 108 cord tip rubber insulators) or equivalent	

3.02 At the Class 5 end office location:

QUANTITY	TEST SET OR APPARATUS	REFERENCE
1	2AB Auxiliary Transmission Test Set	103-102-100
	or	
1	900-ohm resistor plus 2.16 μ F capacitor in series test termination with 274J holding coil	Local arrangement (see Fig. 2)

4. PREPARATION

4.01 Before beginning verification test, assemble associated test set and apparatus equipment as listed in Part 3. (Refer to Fig. 1 for actual test connections.)

4.02 At the No. 1 Trunk Concentrator location:

The following apparatus is required as applicable when NBOC buildout is required.

- | | |
|---|--|
| 1 | Capacitance Decade Box - 7A or Equivalent (Capacitance Range 0.000 to 0.110 μ F in .001 μ F step accuracy) |
| 1 | Return Loss Measuring Set (RLMS) |

STEP	PROCEDURE
1	Remove cover from RLMS.
2	Connect AC cord to AC outlet (110 VAC).
3	Turn power switch - ON.
4	Wait 10 minutes before testing.
5	Establish a talking circuit between the No. 1 Trunk Concentrator and the class 5 end office. Request the class 5 office personnel to help make balance test.
6	From the list of intercept or direct assistance trunks in one trunk class, select one trunk for test. Notify the class 5 office the selected trunk to be measured.
7	Make busy the trunk to be tested. Operate the associated make-busy (MB) key at the Jack, Key and Lamp Panel of the ANI Incoming Trunk Frame (see Fig. 1). Check for MB lamp lighted.

STEP	PROCEDURE
<i>Caution: Balance tests must be made on an out-of-service basis. The proper out-of-service procedures should be applied to working lines or trunks prior to performing any balance effort.</i>	

4.03 At the Class 5 end office location:

STEP	PROCEDURE
1	Make busy the trunk to be tested according to local central office procedure.
2	Verify the trunk to be tested for idle condition.
3	Prepare to select the trunk under test depending on the type of class 5 end office. [Some trunk connections to the Automatic Intercept System (AIS) are established with a test frame, test circuit control, maintenance test center or test set (see Fig. 2)].
4	Prepare to establish the outgoing test connection for trunk under test. The operation of the class 5 office originating test equipment is described in the applicable test section.

5. VERIFICATION TESTS AND PROCEDURES

5.01 The following procedures are used to verify that the trunks serving the No. 1 Trunk Concentrator will meet the balance requirements specified in this section.

5.02 Before the procedures of this section are performed, the trunks being tested must meet the 1004-Hz loss, gain-slope, and circuit noise requirements.

5.03 Balance requirement verification tests are made on all incoming trunks from a class 5 end office as shown in applicable Fig. 3 through 7.

5.04 The RLMS (Wiltron Model, KS-20501 or equivalent) must be calibrated to compensate

for transhybrid loss (THL). This provides correction for the internal loss of hybrid under test when making 4-wire measurements.

5.05 The balance verification tests and procedures are listed below:

TEST "A" 2-Wire Incoming Trunks—Fig. 3, 4, 5, and 7.

TEST "B" 4-Wire Incoming Trunks—Fig. 6 and 7.

TEST "A"—VERIFICATION TEST AND PROCEDURES FOR 2-WIRE INCOMING TRUNKS AT THE NO. 1 TRUNK CONCENTRATOR LOCATION, USING FIG. 3, 4, 5, AND 7

STEP	PROCEDURE														
1	Connect the RLMS as indicated in Fig. 1, using the cords 3P7A with 310 plugs on each end.														
2	Verify 4-wire terminating set (4WTS) under test: (a) S-1 screw - Down (b) Comp net screw - Down (c) All other screws - Up														
3	WILTRON (RLMS) - Go to Step 4. KS-20501 (RLMS) - Go to Step 5.														
4	WILTRON (RLMS) - Set the controls as follows: <table style="margin-left: 40px; border: none;"> <tr> <td style="padding-right: 20px;">POWER switch</td> <td>ON</td> </tr> <tr> <td>NETWORK</td> <td>INT</td> </tr> <tr> <td>ADD dB</td> <td>0 dB</td> </tr> <tr> <td>RL TEST TYPE</td> <td>ERL</td> </tr> <tr> <td>TEST MODE</td> <td>4-W RL (0 dB)</td> </tr> <tr> <td>THL dB</td> <td>0.0</td> </tr> <tr> <td>TALK/DIAL, HOLD, OPEN</td> <td>OPEN</td> </tr> </table>	POWER switch	ON	NETWORK	INT	ADD dB	0 dB	RL TEST TYPE	ERL	TEST MODE	4-W RL (0 dB)	THL dB	0.0	TALK/DIAL, HOLD, OPEN	OPEN
POWER switch	ON														
NETWORK	INT														
ADD dB	0 dB														
RL TEST TYPE	ERL														
TEST MODE	4-W RL (0 dB)														
THL dB	0.0														
TALK/DIAL, HOLD, OPEN	OPEN														
	Note: Adjust the RLMS for transhybrid loss of the 4WTS under test.														
	(a) Method 1 or 2 can be used to short the 2-wire side of the 4WTS. <ol style="list-style-type: none"> (1) Insert a 349A type plug or 310 type plug (with a short across tip and ring) into the associated TST jack located on Jack, Key, and Lamp Panel (see Fig. 1). (2) Place a short across the tip and ring leads on terminals 12 and 13 on the wiring side of the 4WTS, with cord 1W13A (two KS-6278 clips with 108 cord tip rubber insulators) or equivalent. (b) Set the ADD dB switch to 0 dB position and adjust THL dB switch for a 0 dB indication on the meter. If a 0 dB reading cannot be obtained, change the TEST MODE switch to +10 dB or +20 dB as required. (c) The transhybrid loss should equal the loss of the two hybrid legs (about 8 dB), plus the transmit and receive pad values. (d) Remove the short from 2-wire side of the 4WTS.														

STEP	PROCEDURE
(e) ERL, SRL, and SRL HI measurements will equal the direct meter reading, plus the ADD dB switch setting. No correction factor is required for this measurement. (Computing sample is shown at the end of this procedure.)	
(f) Proceed to Step 6.	
5 KS-20501 (RLMS) - Set the controls as follows:	
	POWER switch ON
	NETWORK INT
	ADD dB 0 dB
	TEST TYPE ERL
	TEST LOCATION +0 dB
	THL or ADD 0.0
	Note: Adjust the RLMS for transhybrid loss of the 4WTS under test.
	(a) Method 1 or 2 can be used to short the 2-wire side of the 4WTS.
	(1) Insert a 349A type plug or 310 type plug (with a short across tip and ring) into the associated TST jack located on Jack, Key, and Lamp Panel (see Fig. 1).
	(2) Place a short across the tip and ring leads on terminals 12 and 13 on the wiring side of the 4WTS, with cord 1W13A (two KS-6278 clips with 108 cord tip rubber insulators) or equivalent.
	(b) Set the ADD dB switch to 0 dB position and adjust THL or ADD switch for a 0 dB indication on the meter. If a 0 dB reading cannot be obtained, change the ADD dB switch to the -10 position and readjust the THL or ADD switch until 0 dB reading is obtained.
	Note: If the THL equals to the loss greater than 10.8 dB, then to overcome this additional gain that was used to compensate for the transhybrid loss, a correction factor of 10 dB must be added to the calculated value. (See computing sample at the end of this procedure.)
	(c) The transhybrid loss should equal the loss of the two hybrid legs (about 8 dB), plus the transmit and receive pad values.
	(d) Remove the short from 2-wire side of the 4WTS.
	(e) Proceed to Step 6.
6 Request the class 5 end office to originate a test call over the intercept or direct assistance trunk under test.	

STEP	PROCEDURE
7	Request the class 5 end office to terminate with standard termination as shown on Fig. 2.
8	Adjust the ADD dB switch to have the meter read on scale. Read the ERL by adding the setting on ADD dB to the meter reading. (Computing Sample is shown at the end of this procedure.)
9	Record ERL results on form E-6006.
	Note: The measurement results must meet the requirements given in this section.
10	Set the RLMS - TEST TYPE switch to SRL.
11	Repeat Steps 8 and 9 for SRL measurements.
12	Set the RLMS - TEST TYPE switch to SRL-HI.
13	Repeat Steps 8 and 9 for SRL-HI measurements.
14	Stop! Have you recorded ERL, SRL and SRL-HI measurements on form E-6006?
15	Remove RLMS from trunk under test.
16	Remove standard termination (Step 7).
17	Remove make-busy and restore trunk to service.
18	Repeat Steps 1 through 17 on all other trunks to be tested in one trunk class incoming from class 5 end office.
	Note: After you have tested three trunks from one trunk class and the requirements are not met - stop! Recheck items listed below.
	(a) Verify that the class 5 end office has the proper termination as shown in Fig. 2. Make ERL measurement with termination and record this reading (see Steps 1 through 8). At the class 5 end office main distributing frame, place a short on the cable pair of the trunk under test and read the ERL again. If this second reading is the same (or very close to the same) value, the termination is not on the trunk or it could be of improper value.
	(b) Verify the 4WTS compromise network screw is down.
	(c) Verify the impedance compensator settings (see Section 332-205-500).
	(d) Verify the 4066-type network requirements (see Section 332-205-500).
	(e) Figure 9 contains possible causes for poor balance. If these items check satisfactorily, refer trouble to your Supervisor.

STEP	PROCEDURE
	SAMPLE - Computing ERL, SRL and SRL-HI (RLMS) WILTRON MODEL or equivalent
	ADD dB switch ON +20 dB
	METER reads <u>6 dB</u>
	Calculated value = 26 dB RL
	(RLMS) KS-20501
	ADD dB switch ON +10 dB
	METER reads <u>6 dB</u>
	Calculated value = 16 dB
(If-used)	Correction factor <u>+10 dB</u>
	Corrected value = 26 dB RL
	Note: (RLMS) WILTRON, KS-20501 or equivalent. If ADD dB switch is on +30 and the meter reads off scale 10 dB or higher, this would equal to 40 dB plus. Should this occur, the reading is an incorrect indication of a return loss measurement. (Check for open circuit.)

**TEST "B"—VERIFICATION TEST AND PROCEDURES
FOR 4-WIRE INCOMING TRUNKS AT THE NO. 1
TRUNK CONCENTRATOR LOCATION USING FIG. 6
AND 7.**

STEP	PROCEDURE
1	Make busy the trunk to be tested. (See 4.02, Step 7; and 4.03, Steps 1 and 2.)
2	Connect the RLMS as indicated in Fig. 1, using the cords 3P7A equipped with 310 plugs on each end.
3	Remove the 4182 network under test from plug-in mounting.
4	Insert the spare test 4182 network into the plug-in mounting (Step 3). Verify for the correct 89-type pads with transmit 7.0 dB and receive 16.0 dB.
	Note: Verify that there are no pads wired between 4182 network and the line facilities before making test.
5	(RLMS) WILTRON - Go to Step 6. (RLMS) KS-20501 - Go to Step 7.

STEP	PROCEDURE
6	(RLMS) WILTRON POWER switch ON NETWORK INT THL dB 0.0 TEST MODE 4-W RL (0 dB) TEST TYPE ERL ADD dB As required for on-scale reading
7	(RLMS) KS-20501 POWER switch ON NETWORK INT THL or ADD 0.0 TEST LOCATION 0 dB TEST TYPE ERL ADD dB As required for on-scale reading
8	Request the class 5 end office to originate a test call over the intercept or direct assistance trunk under test.
9	Request the class 5 end office to terminate with standard termination as shown in Fig. 2.
10	Adjust the ADD dB switch to have the meter read on scale. Read the ERL by adding the setting on ADD dB to the meter reading.
11	Record ERL results on form E-6006.
	Note: The measurement results must meet the requirements given in this section.
12	Set the RLMS - TEST TYPE switch to SRL.
13	Repeat Steps 10 and 11.
14	Set the RLMS - TEST TYPE switch to SRL-HI.
15	Repeat Steps 10 and 11.
16	Stop! Have you recorded ERL, SRL and SRL-HI measurements on form E-6006?

STEP	PROCEDURE
17	Remove RLMS from trunk under test.
18	Remove standard termination (see Step 9).
19	Remove the spare test 4182 network (Step 4). Insert the original 4182 network (Step 3) into the plug-in mounting. (Make overall talking or transmission test on each trunk from the class 5 end office before turn up.)
20	Remove make-busy and restore trunk to service.
21	Repeat Steps 1 through 20 on all other trunks to be tested in one trunk class incoming from class 5 end office.
<p>Note: After you have tested three trunks from one trunk class and the requirements are not met - Stop! refer to paragraph 5.06.</p>	

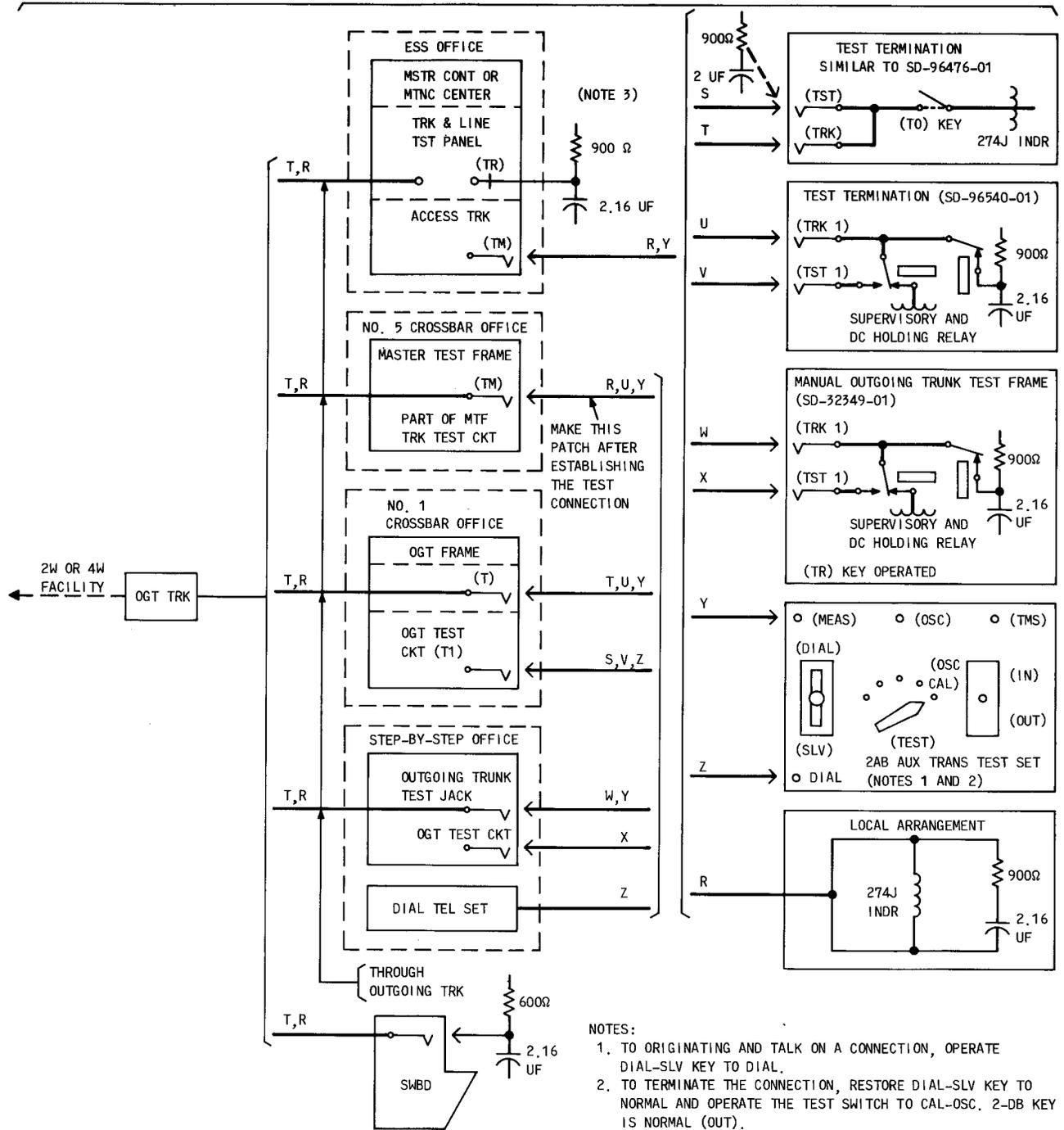
5.06 If the requirements are not met for the Intercept and Directory Assistance (DA) trunks going to the No. 1 Trunk Concentrator, the following questions will have to be decided for the class 5 office:

1. Do all of the 4WTS at the class 5 office have their COMP NET screws down for the Intercept and DA trunks?
2. Do the other toll connecting trunks to this class 5 office have a NBOC office value?
3. If there is a NBOC value of the 4WTS, has this value been set in the toll connecting, intercept, and DA trunks?
4. If the 4WTS in the toll connecting, intercept or DA trunk appears to need an NBOC value,

refer to the appropriate section (660-47Y-520) for the selection of office NBO in a large class 5 office.

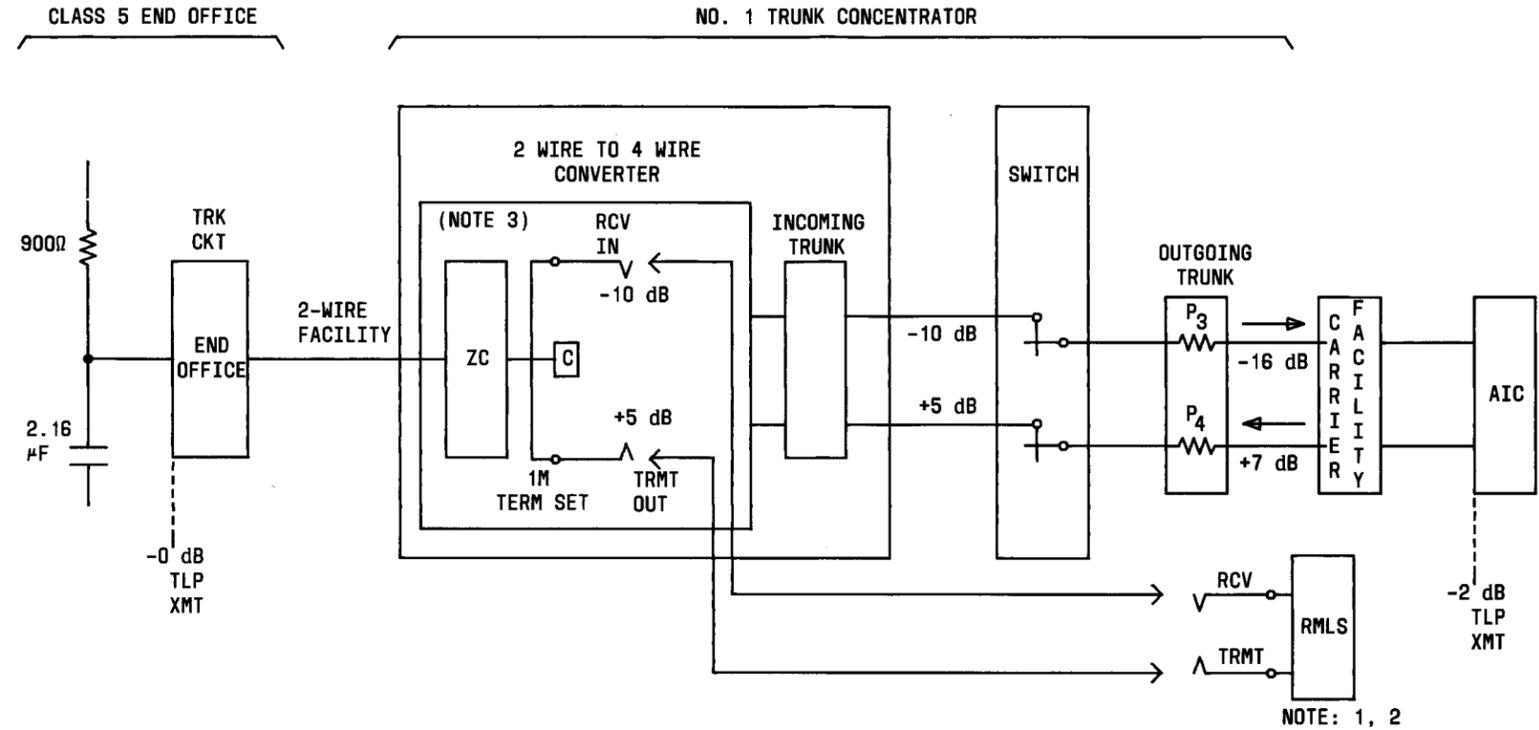
5.07 In order to meet balance requirements for the 4-wire trunks at the class 5 end office and intercept and DA trunks (only) to the No. 1 Trunk Concentrator, connect the RLMS as indicated in Fig. 8, originate a test call, and terminate. The NBOC will be for the highest capacitance value (turn screws down as required) that appears to optimize ERL, SRL, and SRL-HI. Record all readings and recheck ERL, SRL, and SRL-HI to assure the values have been optimized for a maximum indication. Readjust the NBOC value for small corrections when necessary. This NBOC highest capacitance value will be used in all of the 4WTS for Intercept and DA trunks (only).

CLASS 5 END OFFICE



- NOTES:
1. TO ORIGINATING AND TALK ON A CONNECTION, OPERATE DIAL-SLV KEY TO DIAL.
 2. TO TERMINATE THE CONNECTION, RESTORE DIAL-SLV KEY TO NORMAL AND OPERATE THE TEST SWITCH TO CAL-OSC. 2-DB KEY IS NORMAL (OUT).
 3. IN NO. 1 ESS OFFICES THE 7-DIGIT DIRECTORY NUMBER TERMINATION OR TERMINATIONS FURNISHED BY OPERATION OF TR KEY IN THE TRK AND LINE TST PNL SHOULD BE THE SD-1A310 COMBINED MW AND BAL TERM. (DO NOT USE THE SD-1A227 900 OHM TERMINATION WITH LOOP COMPENSATION FOR TERMINAL BALANCE MEASUREMENTS.) IN NO. 2 ESS OFFICES THIS TYPE OF TERMINATION IS FURNISHED BY SD-2H136-02.

Fig. 2—Balance Test—Standard Terminations From Class 5 End Office

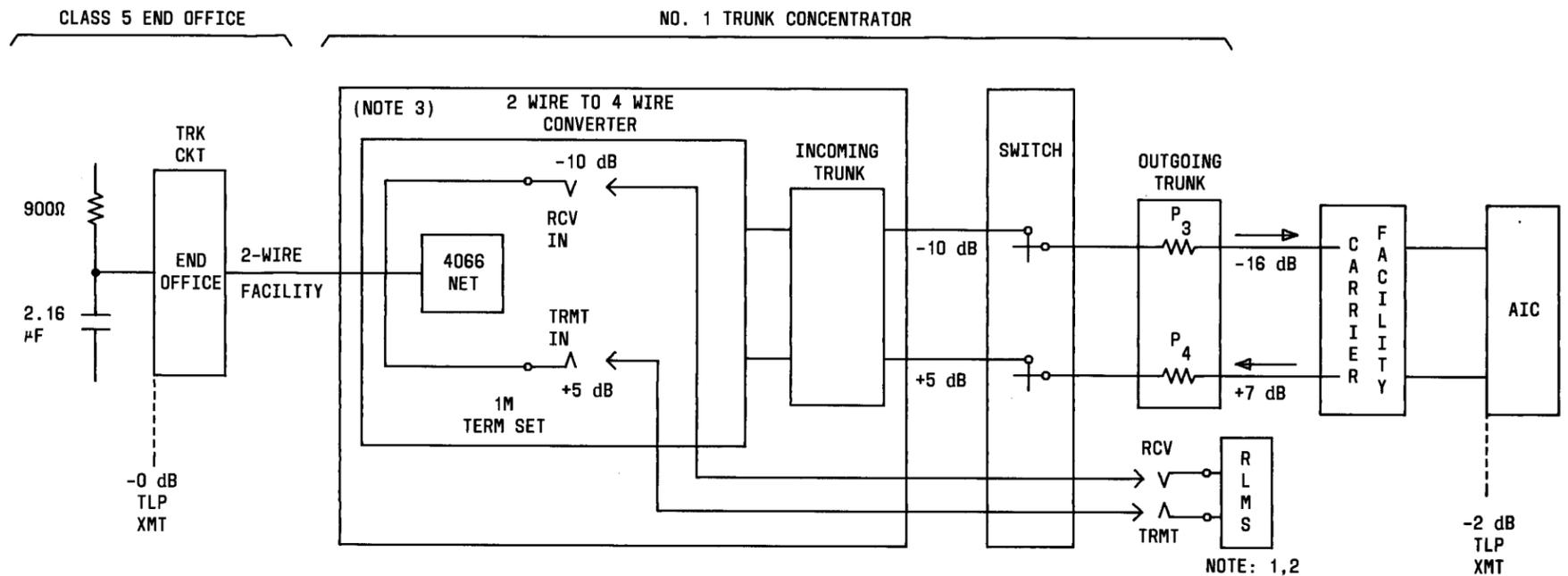


NOTES:

1. WILTRON MODEL (RLMS)
 - POWER - ON
 - NETWORK - INT
 - THL DB - AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 4)
 - TEST MODE - 4-W RL AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 4)
 - RL TEST TYPE - ERL, SRL, & SRL HI
 - ADD DB - AS REQUIRED FOR ON SCALE READING (SEE VERIFICATION TEST "A")
 2. REQUIREMENTS: ERL 18 dB
SRL 10 dB
SRL HI 10 dB
 3. SEE FIG. 1 FOR JACK ARRANGEMENT
- LEGEND: ZC = IMPEDANCE COMPENSATOR
C = COMPROMISE NETWORK
AIC = AUTOMATIC INTERCEPT CENTER
RMLS = RETURN LOSS MEASURING SET

- KS-20501 (RLMS)
- POWER - ON
 - NETWORK - INT
 - THL OR ADD - AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 5)
 - TEST LOCATION - +0 dB
 - TEST TYPE - ERL, SRL, & SRL HI
 - ADD DB - AS REQUIRED FOR ON SCALE READING (SEE VERIFICATION TEST "A")

Fig. 3—2-Wire Circuit—With Impedance Compensator and Compromise Network



NOTES: 1. WILTRON MODEL (RLMS)

- POWER - ON
- NETWORK - INT
- THL dB - AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 4)
- TEST MODE - 4-W RL AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 4)
- RL TEST TYPE - ERL, SRL, & SRL HI
- ADD dB - AS REQUIRED FOR ON SCALE READING

(SEE VERIFICATION TEST "A")

- 2. REQUIREMENTS: ERL 18 dB
- SRL 10 dB
- SRL HI 10 dB

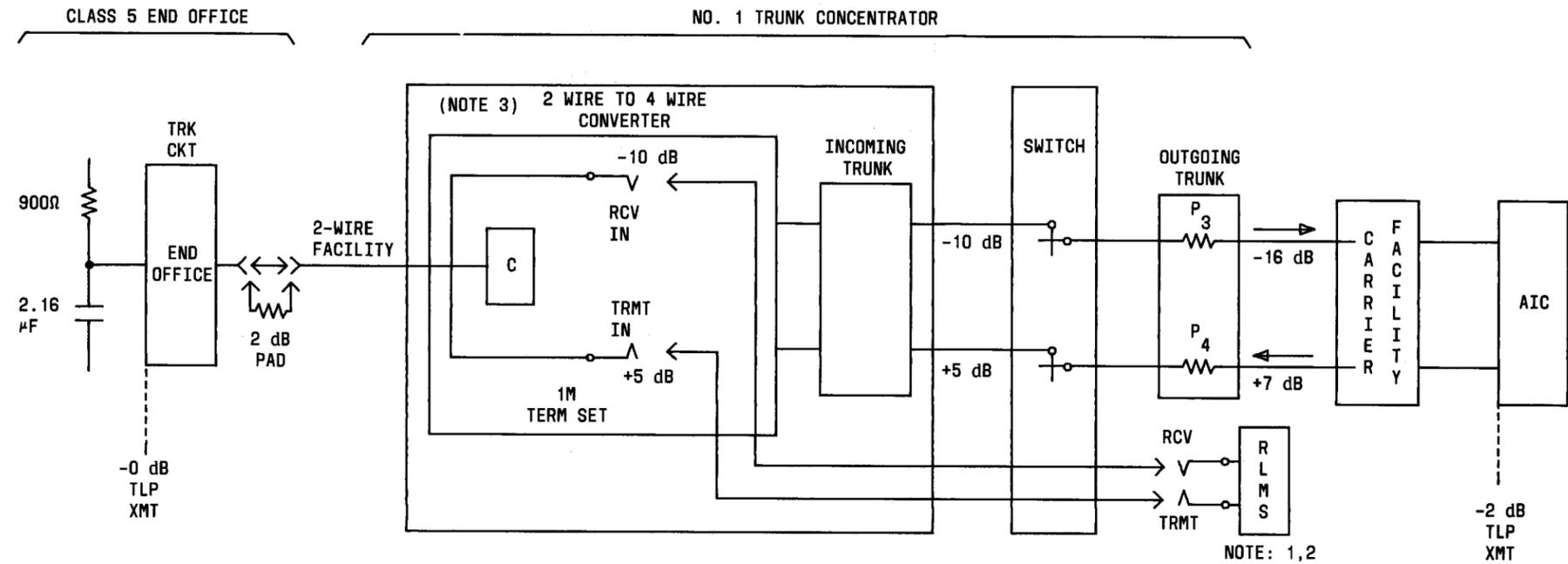
3. SEE FIG. 1 FOR JACK ARRANGEMENT

KS-20501 (RLMS)

- POWER - ON
- NETWORK - INT
- THL OR ADD - AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 5)
- TEST LOCATION - +0 dB
- TEST TYPE - ERL, SRL, & SRL HI
- ADD dB - AS REQUIRED FOR ON SCALE READING

(SEE VERIFICATION TEST "A")

Fig. 4—2-Wire Circuit—With 4066 Type Network



NOTES: 1. WILTRON MODEL (RLMS)

- POWER - ON
 - NETWORK - INT
 - THL dB - AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 4)
 - TEST MODE - 4-W RL AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 4)
 - RL TEST TYPE - ERL, SRL, & SRL HI
 - ADD dB - AS REQUIRED FOR ON SCALE READING
- (SEE VERIFICATION TEST "A")

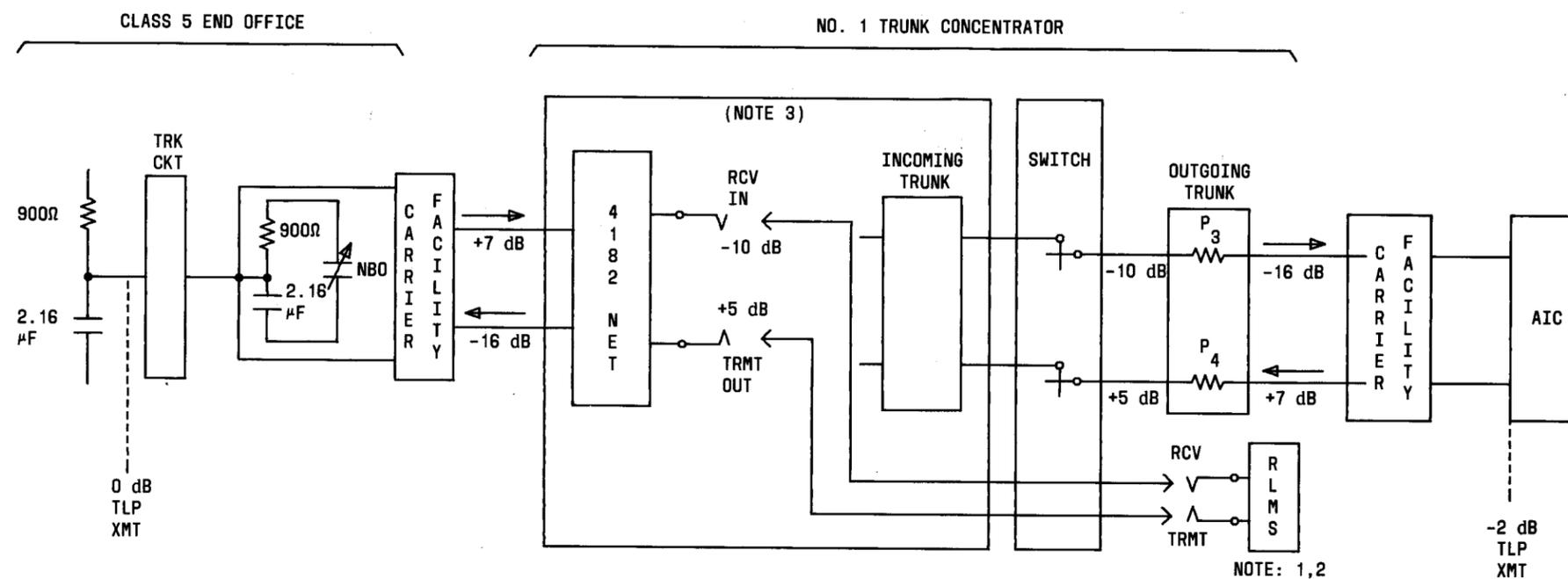
2. REQUIREMENTS:
- | | |
|--------------|--------------|
| 2 dB PAD OUT | 2 dB PAD IN |
| ERL 18 dB | ERL 22 dB |
| SRL 10 dB | SRL 14 dB |
| SRL HI 10 dB | SRL HI 14 dB |

3. SEE FIG. 1 FOR JACK ARRANGEMENT

KS-20501 (RLMS)

- POWER - ON
 - NETWORK - INT
 - THL OR ADD - AS REQUIRED FOR THE TRANSYBRID LOSS (STEP 5)
 - TEST LOCATION - +0 dB
 - TEST TYPE - ERL, SRL, & SRL HI
 - ADD dB - AS REQUIRED FOR ON SCALE READING
- (SEE VERIFICATION TEST "A")

Fig. 5—2-Wire Circuit—With Compromise Network and Optional 2 dB Pad



NOTES: 1. WILTRON MODEL (RLMS)

- POWER - ON
- NETWORK - INT
- THL dB - 0 dB
- TEST MODE - 4-W RL 0 dB
- TEST TYPE - ERL, SRL & SRL HI
- ADD dB - AS REQUIRED FOR ON SCALE READING

(SEE VERIFICATION TEST "B")

- 2. REQUIREMENTS: ERL 22 dB
- SRL 15 dB
- SRL HI 15 dB

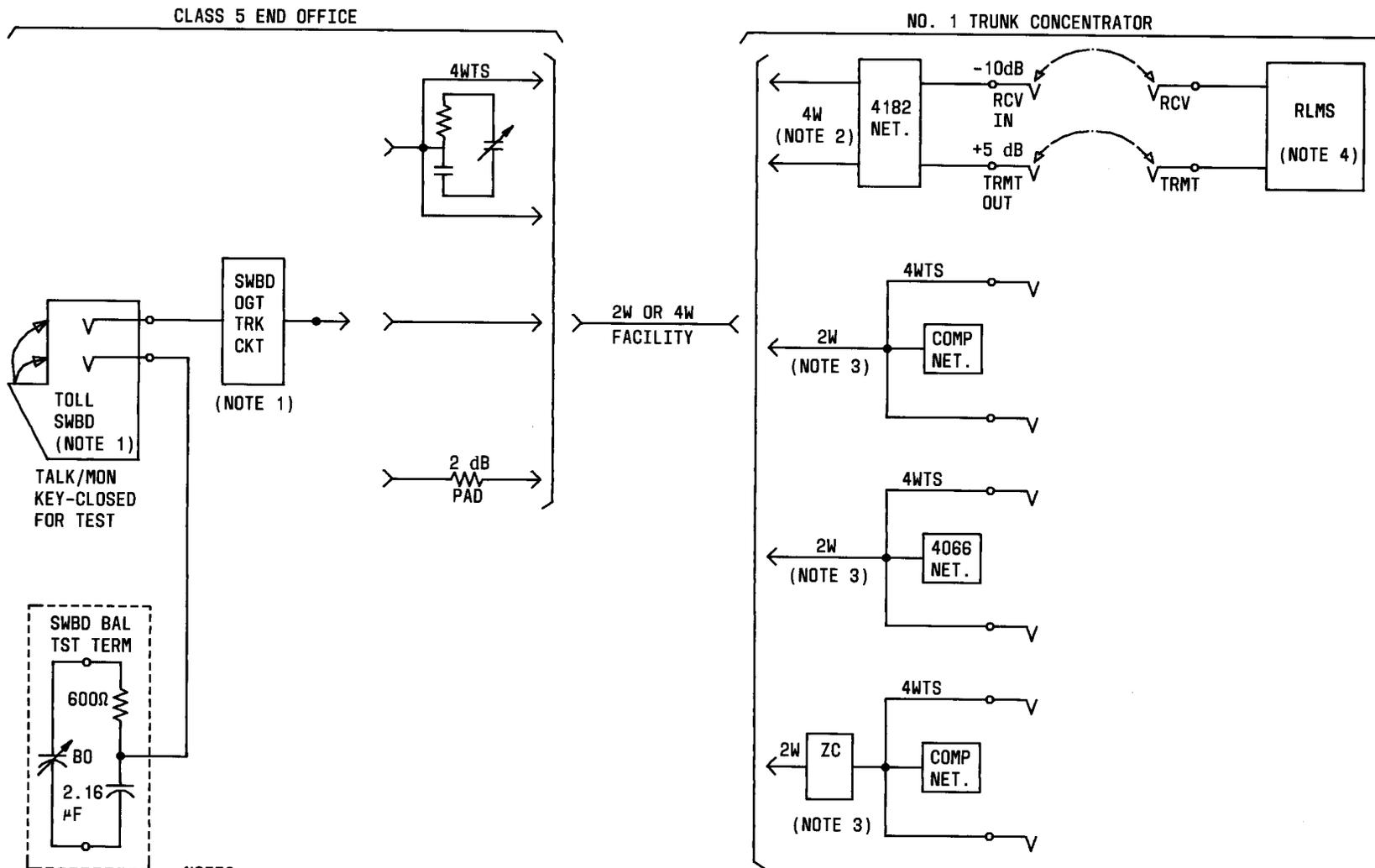
- 3. SEE FIG. 1 FOR JACK ARRANGEMENT

KS-20501 (RLMS)

- POWER - ON
- NETWORK - INT
- THL & ADD - 0 dB
- TEST LOCATION - 0 dB
- TEST TYPE - ERL, SRL & SRL HI
- ADD dB - AS REQUIRED FOR ON SCALE READING

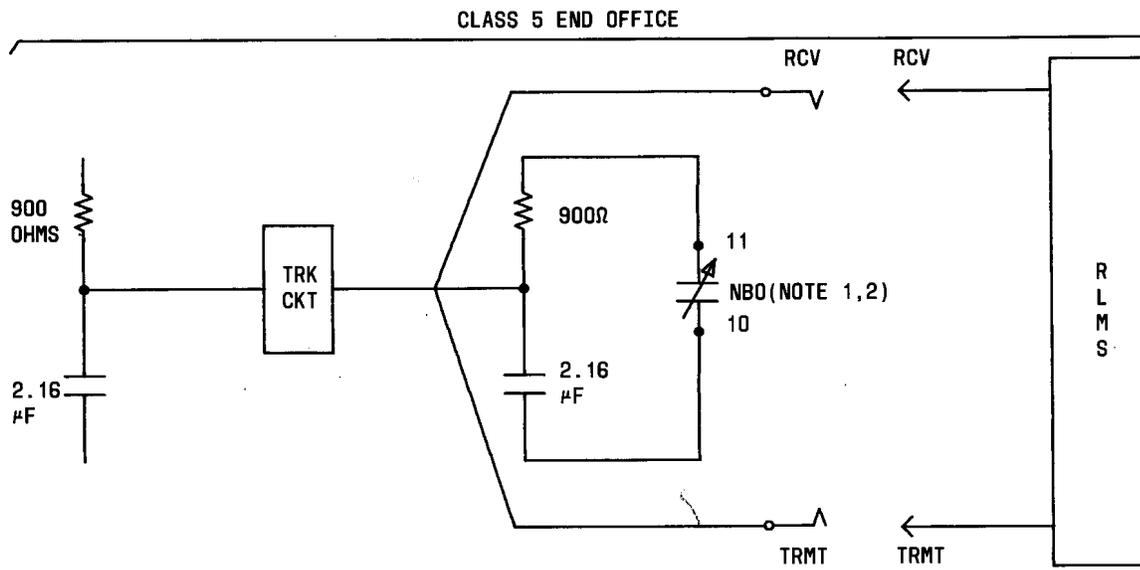
(SEE VERIFICATION TEST "B")

Fig. 6—4-Wire Circuit—With 4182 Network



- NOTES:
1. TERMINATE AT SWBD OGT ACCESS TRUNK CIRCUIT (SEE FIG. 2) OR IF SWBD 600Ω TERMINATION (NBOC) HAS BEEN OPTIMISED FOR PROPER BUILD-OUT.
 2. SEE VERIFICATION TEST "B" FOR 4-WIRE.
 3. SEE VERIFICATION TEST "A" FOR 2-WIRE.
 4. REQUIREMENTS: ERL 22dB
SRL 14dB
SRL HI 14dB

Fig. 7—Toll Switchboard Trunk—Balance to No. 1 Trunk Concentrator



NOTES:

1. NBOC WILL BE OPTIMIZED FOR THE MAXIMUM ERL, SRL-LO AND SRL-HI READING. CONNECT CAPACITANCE DECADE BOX ACROSS TERMINALS 10 AND 11.
2. THIS METHOD OF NBOC BALANCING IS NOT INTENDED TO BE COMPLETE (REFER TO PARAGRAPH 5.06 STEP 4).

Fig. 8—Class 5 End Office—With 4WTS Balancing Network

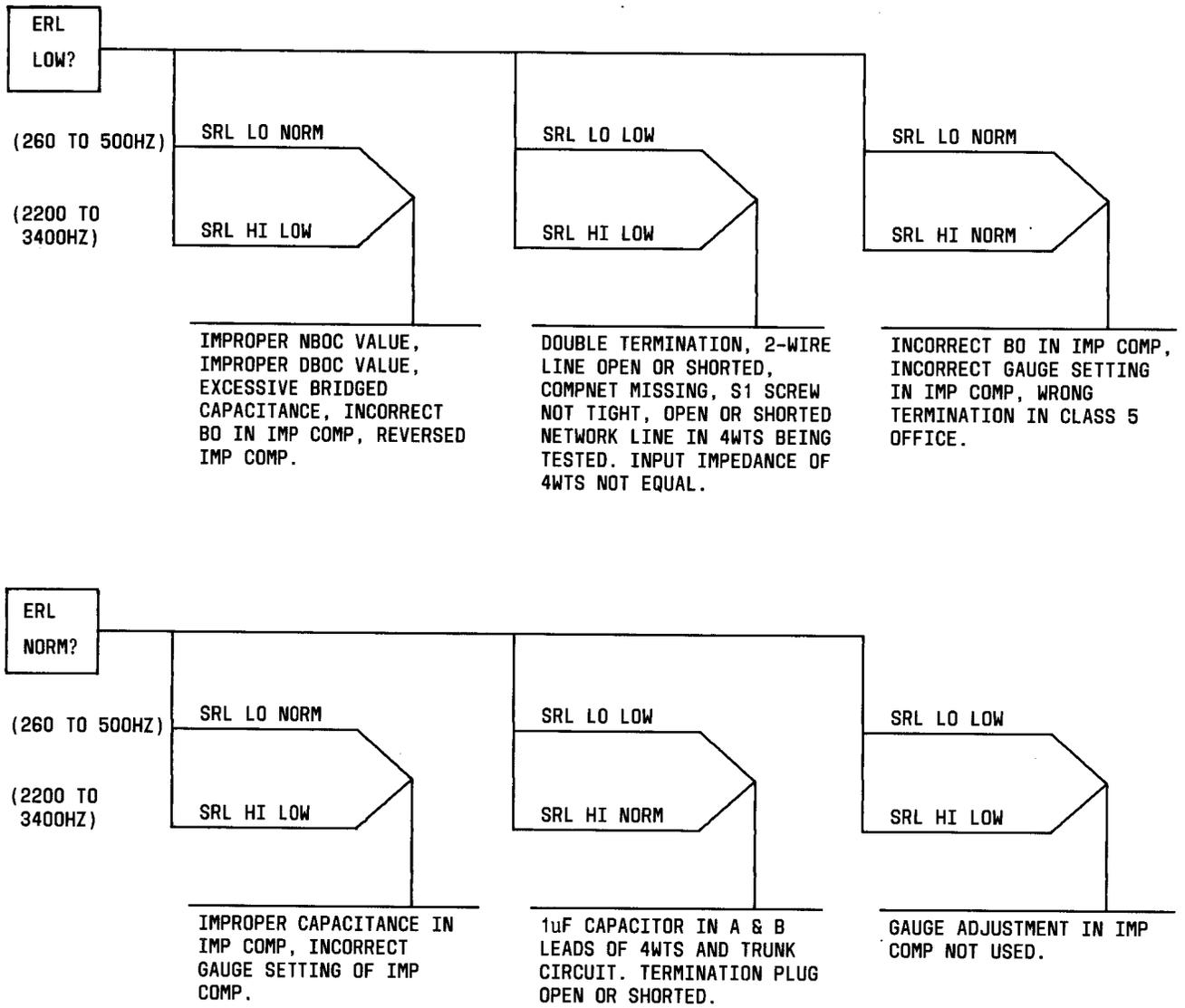


Fig. 9—Typical Terminal Balance Irregularities