

L3 AND L4 CARRIER COMMON EQUIPMENT J68820 AUTOMATIC LINE SWITCHING TESTS SWITCHING SIGNAL LEVEL ADJUSTMENTS

The purpose of these tests is to adjust the level of the switching signals on L3 and L4 switching systems equipped with either ED-52102G() switch tone amplifiers or switch tone amplifier and J68820AD level compensation units. Systems equipped with the J68820AC level compensation unit are adjusted using procedures in Section 359-100-510. *Equipment Test Lists are affected.*

This section is reissued to correct levels in Chart 1. Arrows indicate significant changes. *Equipment Test Lists are not affected.*

L4 carrier system facilities may have unequalizable gain or loss at switching signal frequencies. New production LPSS-1 systems are provided with adjustable gain and loss, on an individual line basis, to compensate for the variations in switching signal level. The equipment consists of ED-52102G() switch tone amplifiers at the transmitting end of a switching section and J68820AD level compensation units (Fig. 1) at the receiving end. Existing L4 systems can be equipped with these units on an optional basis. The present J68820AC level compensation unit is rated MFR DISC. L3 systems do not require level compensation units, however, switch tone amplifiers are provided on the same basis as for newly manufactured L4 equipment.

In this section, the *transmitting end* of a switching section is designated the *far end* and the *receiving end* is designated the *near end*.

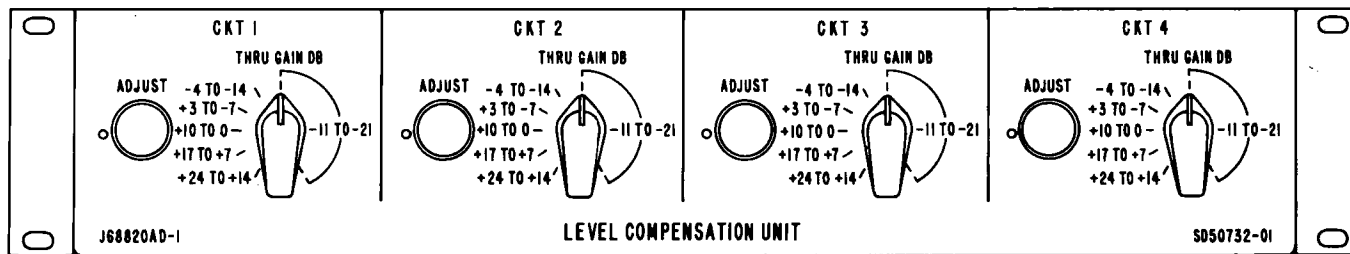


Fig. 1—J68820AD Level Compensation Unit

NOTICE

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APPARATUS

Transmission Test Equipment. Refer to Section 359-010-500 and select, from available equipment, a sending and a receiving unit having the following capabilities:

Sending Test Equipment (STE) capable of delivering into 75-ohm circuits, signals between 200 and 300 kHz at powers from zero to -90 dBm.

Receiving Test Equipment (RTE) capable of detecting from 75-ohm circuits, signals between 200 and 300 kHz at powers from zero to -120 dBm.

P2BJ Cords, as required

CHART 1

L4—INITIAL ADJUSTMENT OF J68820AD LEVEL COMPENSATION UNITS

STEP	PROCEDURE
Caution: Remove the associated line from service before performing the tests in this chart.	
1	◆At the near end (receive), prepare the RTE to make a terminated measurement of 290 kHz at -71.0 dBm.◆
2	◆Prepare the STE to send 290 kHz at -71.0 dBm.◆
3	Remove the plug connected to the LVL COMP OUT () jack on the level compensation panel to be adjusted.
4	Remove the plug connected to the LVL COMP IN () jack on the level compensation panel.
5	Connect the RTE to the LVL COMP OUT () jack [patch (2), Fig. 2] on the level compensation panel.
6	Connect the STE to the LVL COMP IN () jack [patch (1), Fig. 2] on the level compensation panel.

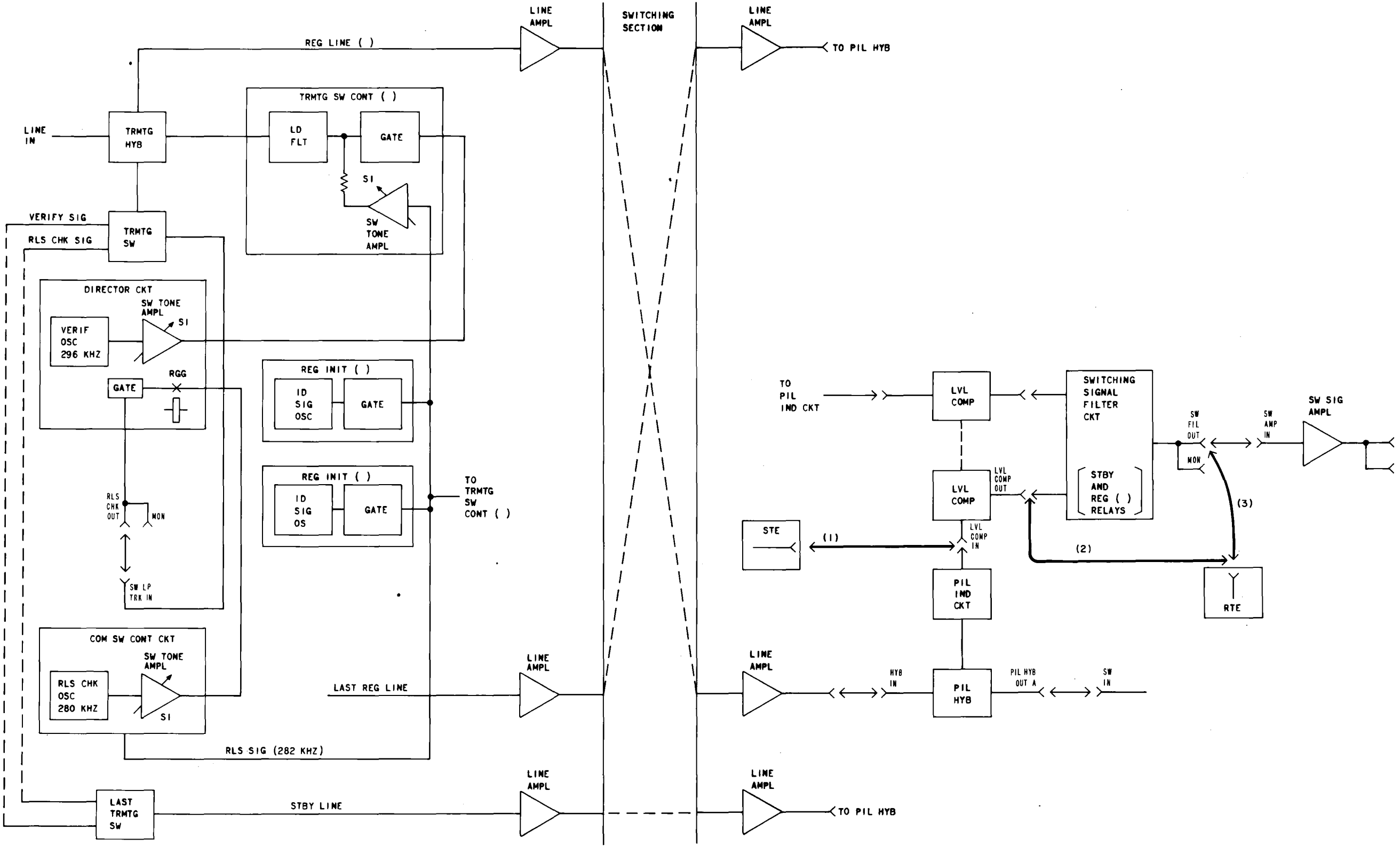


Fig. 2—L4—Switching Signal Level Adjustment

CHART 1 (Cont)

STEP	PROCEDURE
7	Set the THRU GAIN (dB) control on the level compensation panel to the +3 to -7 position.
8	◆Adjust the ADJUST control until the RTE indicates $-71.0 \text{ dBm} \pm 0.1 \text{ dB}$.◆
9	Remove patches (2), then (1) in Fig. 2.
10	Reconnect the plugs removed in Steps 3 and 4.
11	Repeat Steps 3 through 10 for each level compensation unit to be tested on the panel.

CHART 2
**L4—TERMINAL-TO-TERMINAL ADJUSTMENTS
OF SWITCHING SIGNAL LEVELS**

STEP	PROCEDURE
<i>Caution: These tests are performed after the transmission line is equalized and the tests of Section 359-100-505 are completed. Remove the associated line from service before performing the tests in this chart.</i>	
1	Establish a talking circuit between the terminals under test.
2	At the near end, prepare the RTE to make terminated measurements of the frequencies in Table A at approximately -71 dBm .
3	Remove the patch plug between the SW FIL OUT and SW AMP IN jacks, Fig. 2.
4	Connect the RTE to the SW FIL OUT jack [patch (3), Fig. 2].
5	At the switching signal filter unit, block operated all REG () relays and block the STBY relay in the unoperated condition.
6	Instruct the far end to send a 296-kHz signal over the standby line by the method described in Table A.
Note: Ensure that the far end is sending the correct level [$-54 \text{ dBm} \pm 0.2 \text{ dB}$ at the TRSG SW CONT () MON jack].	
7	At the near end, read the indication on the RTE.
Requirement: $-71 \text{ dBm} \pm 0.5 \text{ dB}$	

CHART 2 (Cont)

STEP	PROCEDURE
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TABLE A
TRANSMITTING SWITCHING SIGNALS

SWITCHING SIGNAL (kHz)	SIGNAL PURPOSE	SWITCHING SIGNAL ACTIVATION	SWITCHING SIGNAL RELEASE
296	Verification	Remove the TSH relay cover on the TRSG SW CONT () panel and manually operate the TSH relay.	Slowly operate the TRSG SW key on the TRSG SW CONT () panel and return the key to normal. (Replace TSH relay cover.)
280	Release check	Remove RCG relay cover. (RCG relay is on the director panel.) Block RCG relay in an operated condition.	Remove block from RCG relay. (Replace RCG relay cover.)
290	1st REG INIT Identification	Remove LO relay cover on the proper line initiator and operate the REC L SW key to DISC, operate INIT key to TST, block LO relay nonoperated, and operate TST SENS key.	Return keys REC L SW, INIT, and TST SENS to their normal positions. Remove block from LO relay and operate it momentarily. (Replace LO relay cover.)
288	2nd REG INIT Identification		
286	3rd REG INIT Identification		
284	4th REG INIT Identification		

- 8 If the requirement of Step 7 is **not** met, adjust the associated switch tone amplifier S1 switch (at the far end) and the level compensation unit ADJUST and THRU GAIN (dB) controls (at the near end) in accordance with Table B to correct any deviation (Δ dB) from -71 dBm.
- 9 Instruct the far end to remove the 296-kHz tone by the method described in Table A.
- 10 Instruct the far end to send a 280-kHz signal over the standby line at the proper level (-54 dBm ± 0.2 dB at the RLS CHK MON jack) by the method described in Table A.
- 11 At the near end, read the indication on the RTE.
Requirement: -71 dBm ± 0.05 dB
- 12 If the requirement of Step 11 is **not** met, adjust the associated switch tone amplifier S1 switch and the OG RLS CHK control (at the far end) and the level compensation unit

CHART 2 (Cont)

STEP	PROCEDURE
	ADJUST and THRU GAIN (dB) controls (at the near end) in accordance with Table B to correct any deviation (Δ dB) from -71 dBm.
13	Instruct the far end to remove the 280-kHz tone.
14	At the near end, remove the block from the REG 1 and STBY relay.
15	Instruct the far end to send a 290-kHz signal (see Table A) at the proper level (-54 dBm ± 0.2 dB).
16	At the near end, read the indication on the RTE.
	Requirement: -71 dBm ± 0.05 dB
17	If the requirement of Step 16 is not met, adjust the associated switch tone amplifier S1 switch (at the far end) and the level compensation unit ADJUST and THRU GAIN (dB) controls (at the near end) in accordance with Table B to correct any deviation (Δ dB) from -71 dBm.
18	Repeat Steps 14 through 17, releasing and blocking the REG relays in turn until the level of all regular lines (groups A, AA, and AB) are adjusted.
19	Disconnect the RTE from the SW FIL OUT jack [patch (3), Fig. 2].
20	Replace the patch plug between the SW FIL OUT and SW AMP IN jacks.

CHART 3

L3 OR L4—SWITCH TONE AMPLIFIER ADJUSTMENT

The purpose of this chart is to measure and adjust the amplitude of switching signals transmitted over L3 or L4 carrier system facilities. This chart is performed when the switching system is equipped with switch tone amplifiers only. Switch tone amplifiers may be used on existing L4 lines to adjust the switch tone levels that are within ± 10 dB of the nominal level (-71 dBm) at the SW FIL OUT jack.

TABLE B
LEVEL DEVIATION ADJUSTMENTS

Δ dB FROM -71 dBm	REGULAR LINE			STANDBY LINE				
	FAR END (TRANSMIT)	NEAR END (RECEIVING)		FAR END (TRANSMIT)	NEAR END (RECEIVING)	FAR END (TRANSMIT)		
	TRSW SW CONT UNIT	LEVEL COMPENSATION UNIT		DIRECTOR UNIT (296 kHz)	LEVEL COMPENSATION UNIT	COMMON SW CONTROL UNIT (280 kHz)		
	SET SWITCH *S1	SET THRU GAIN (dB)	SET ADJUST	SET SWITCH *S1	SET THRU GAIN (dB)	SET ADJUST	SET SWITCH *S1	ADJUST OG RLS CHK
+15 to +20	-10	-4 to -14	Δ dB = 0	-10	-4 to -14	Δ dB = 0	-10	Δ dB = 0
+10 to +15	-10	+3 to -7		-10	+3 to -7		-10	
+5 to +10	-5	+3 to -7		-5	+3 to -7		-5	
0 to +5	0	+3 to -7		0	+3 to -7		0	
-5 to 0	+5	+3 to -7		+5	+3 to -7		+5	
-11 to -5	+10	+3 to -7		+10	+3 to -7		+10	
-18 to -11	+10	+10 to 0		+10	+10 to 0		+10	
-20 to -18	+10	+17 to +7		+10	+17 to +7		+10	

* Located on switch tone amplifier

CHART 3 (Cont)

STEP**PROCEDURE**

Caution: Remove the associated line from service before performing the tests in this chart.

- 1 Establish a talking circuit between the terminals under test.
- 2 At the far end (transmit), check the switch tone amplifiers in the following equipment to be sure that the S1 switches are set to the 0 position.

Regular Lines—Transmitting switch control units

Standby Lines—Common switch control and director units.

- 3 At the near end (receive), prepare the RTE to make terminated measurements of the frequencies in Table A (Chart 2) at approximately -71 dbm.
- 4 Remove the patch plug as follows:

L3: Between SW FIL OUT and SW AMP IN jacks.

L4: Between SW FIL OUT and LVL COM IN jacks.

- 5 Make patch (1), Fig. 3.
- 6 At the switching signal filter unit, block operated all REG () relays.
- 7 Instruct the far end to send a 296-kHz signal over the standby line by the method described in Table A (Chart 2).

Note: Ensure that the far end is sending the correct level [-54 dBm ± 0.2 dB at the TRSG SW CONT () MON jack].

- 8 At the near end, read the indication on the RTE.

Requirement: -71 dBm ± 2.5 dB

- 9 If the requirement of Step 8 is **not** met, adjust the S1 switch of the switch tone amplifier in the director unit to meet the requirement.
- 10 Instruct the far end to remove the 296-kHz signal and to send a 280-kHz signal (Table A) at the correct level.
- 11 At the near end, read the indication on the RTE.

Requirement: -71 dBm ± 2.5 dB

CHART 3 (Cont)

STEP	PROCEDURE
12	If the requirement of Step 11 is not met, adjust the S1 switch of the switch tone amplifier in the common switch control unit to meet the requirement.
13	Instruct the far end to remove the 280-kHz signal and to send a 290-kHz signal (Table A) at the correct level.
14	At the near end, remove the block from the REG 1 relay and block the STBY relay operated.
15	Read the indication on the RTE. Requirement: $-71 \text{ dBm} \pm 2.5 \text{ dB}$
16	If the requirement of Step 15 is not met, adjust the S1 switch of the switch tone amplifier in the transmitting associated switch control unit to meet the requirement.
17	Repeat Steps 14 through 16, releasing and blocking the REG relays in turn until the level of all regular lines (groups A, AA, and AB) are measured and adjusted as necessary. Table A describes the method for sending the proper signal over each regular line.
18	Remove the block from the STBY relay.
19	Disconnect patch (1), Fig. 3.
20	Replace the patch plug as follows: L3: Between SW FIL OUT and SW AMP IN jacks. L4: Between SW FIL OUT and LVL COMP IN jacks.

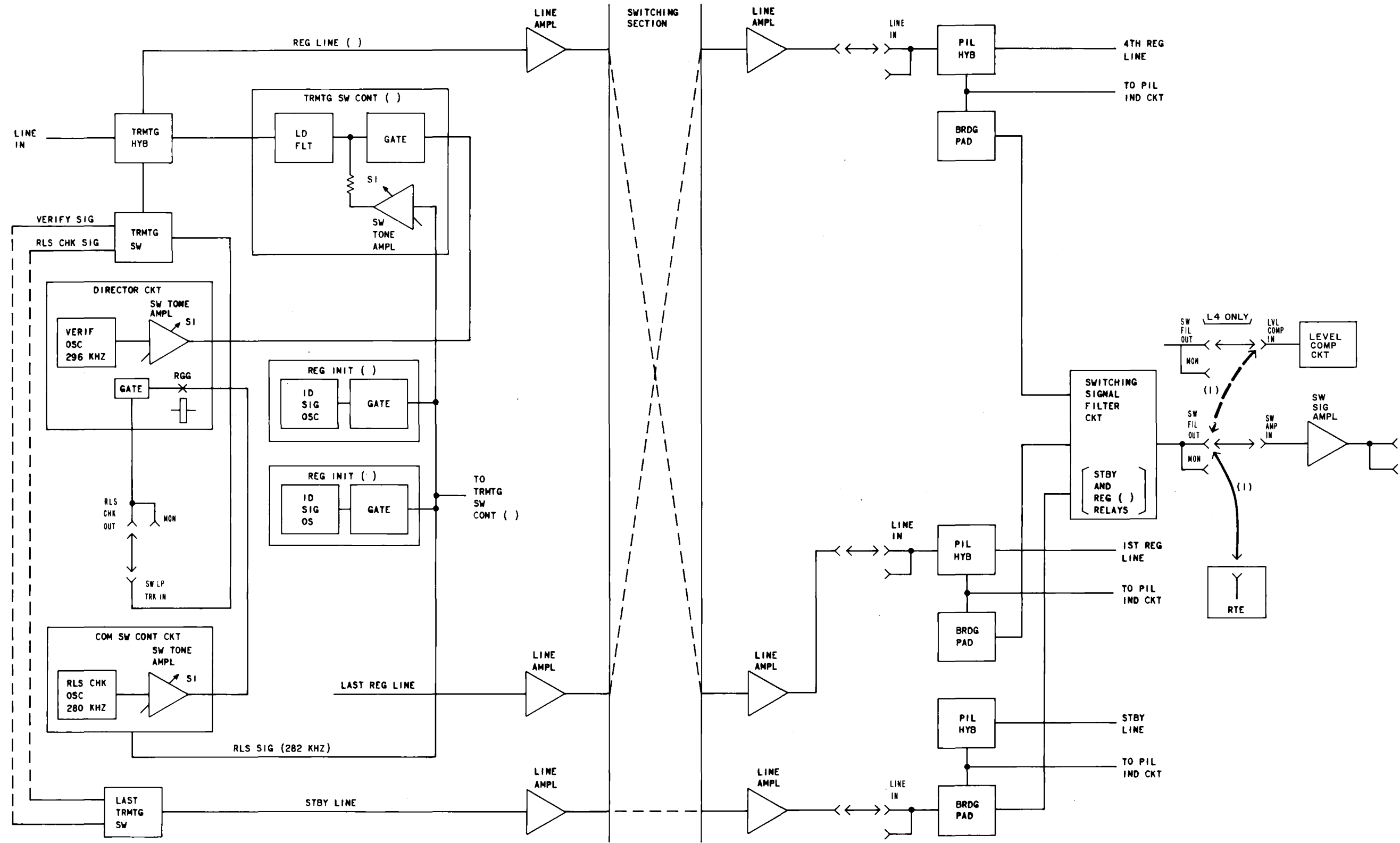


Fig. 3—L3 or L4—Switching Signal Level Measurement