

**L MULTIPLEX TERMINALS**  
**COMMON EQUIPMENT**  
**J68872A LINE PILOT MONITOR**

**TESTS**

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**1. GENERAL**

**1.01** This section covers the initial and routine tests that should be made on the J68872A line pilot monitor equipment. Most of these tests are required for initial installation checkout only and are not required on a routine basis. However, any of these tests may be used for troubleshooting, if required.

**1.02** This section is reissued to revise the procedure in Test A.

**1.03** Preparation of the recorder for operation is also included in this section. These procedures include chart installation; pen prep-

aration; and scale, pointer, and pen lineup. Information on the recommended frequency of these tests and adjustments and procedures for preparing the recorder for operation are listed in Table A.

**TABLE A**

RECORDER PREPARATION	INITIAL	ROUTINE
Chart Installation	X	Daily
Pen Preparation	X	Weekly
Scale, Pointer, and Pen Lineup	X	
TESTS AND ADJUSTMENTS		
Standardizer Circuit	X	Annually
Indicator-Recorder Amplifier Gain	X	Annually
Damping Adjustment	X	Annually
Pilot Pick-Off Hybrids	X	Annually
Individual Circuits	X	Annually
Automatic Advance Scan Mode	X	Annually
Automatic Repeat Scan Mode	X	Annually
Alarm Circuits	X	Quarterly

**2. APPARATUS**

**2.01** The following apparatus should be used in performing tests and adjustments in this section:

- 1 — J68827B (27B) Receiving Console or Siemens Selective Analyzer Rel 3D335 (Level Meter)

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1 — Siemens Oscillator Rel 3W518 (Level Oscillator) and Attenuator (preferred), or 17B Oscillator with 135:75-Ohm Matching Coil and Attenuator

2 — P2BJ Cords

1 — 368A Coaxial Termination (75 Ohms)

**3. RECORDER PREPARATION**

**A. Chart Installation**

**3.01** A Leeds and Northrup Company No. 620153 recorder chart is used. Minimum order is one box (100 charts per box). The recorder chart must be changed every 24 hours on a routine basis. To install this chart, grasp the pen bracket knob and pull the bracket forward a short distance. A spring-loaded stop is provided to hold the bracket in this position. Remove the used chart and fit the center hole of the new chart over the hub. Close the pen bracket and turn the knob until it snaps in to engage the main shaft. The chart is pressed against the knurled edge of the drive disk by the pressure roller. When the instrument is turned on, the chart drive motor causes the drive disk to slowly rotate the chart counterclockwise.

**B. Pen Preparation**

*Note 1:* Remove pen before swinging pen bracket down past the spring stop.

*Note 2:* Do not bend or otherwise damage the pen point.

*Note 3:* Do not invert pen after filling because ink will leak from the vent tube.

**3.02** To install the recorder pen, swing the pen bracket out to the spring stop and slide the pen onto its carriage.

**3.03** The pen should be filled with ink once each week. Use Leeds and Northrup Company No. 152059 recorder ink. Swing the pen bracket out to the spring stop and slide the reservoir down into the clip. Use the dropper to fill the reservoir to 1/8 inch from the top. Press the reservoir up into the clip so that it bears firmly against the gasket. If necessary, prime the pen. To do this, squeeze the empty ink dropper bulb, fit the spout of the dropper over the pen point, and slowly release the bulb until ink from the pen starts to run into the dropper.

**C. Scale, Pointer, and Pen Lineup**

**3.04** Turn the indicator-recorder off to line up the scale, pointer, and pen. (The ON-OFF switch is accessible when the indicator-recorder door is opened and the recording mechanism is swung out on its hinge. The switch is located on the upper left side of the amplifier chassis inside the indicator-recorder case.) Remove the measuring slide-wire cover and grasp the hub of the slide-wire contact arm. Turn the arm to bring the indicating pointer down scale until the mechanical stop is reached. The pointer should now be at the low-limit mark (dot) below the calibrated part of the scale, and the pen should be on the first line of the chart.

**4. TESTS AND ADJUSTMENTS**

**A. Standardizer Circuit**

STEP	PROCEDURE
1	<p><i>Note:</i> The stabilized 64-kHz supply of the spare stabilizer providing the calibration tone shall have been adjusted according to the performance requirements of Section 356-253-501 for 0 dBm into 135 ohms at the stabilized supply TST STBY jacks before proceeding with this test.</p> <p>Patch the receiving test equipment to the LINE jack on the rear of the monitor.</p>

STEP	PROCEDURE
2	<p>Depress the MEAS CAL key and measure the power.</p> <p><b>Requirement:</b> -34.3 dBm.</p>
3	<p>If the requirement of Step 2 is not met, adjust the CAL ADJ control on the rear of the monitor.</p>
4	<p>Remove the patch from the LINE jack.</p>
5	<p>Again depress the MEAS CAL key and note the reading on the indicator.</p> <p><b>Requirement:</b> 0.0 dBm <math>\pm</math>0.02 dB.</p>
6	<p>If the requirement of Step 5 is met, open the indicator-recorder door and proceed to Step 10. If the requirement of Step 5 is <i>not</i> met, proceed with Steps 7, 8, and 9.</p>
7	<p>Open the indicator-recorder door and locate the stabilizer lever which is found in the upper left corner of the indicator-recorder case.</p>
8	<p>Firmly press in the stabilizer lever of the indicator; hold the lever in until the pointer adjusts itself and stabilizes. Then, release the stabilizer lever and depress the MEAS CAL key and note the reading on the indicator.</p> <p><b>Requirement:</b> 0.0 dBm <math>\pm</math>0.02 dB.</p>
9	<p>If the requirement of Step 8 still is not met, repeat Step 8.</p>
10	<p>Swing out the recorder on its hinge and turn the cam (Fig. 1) counterclockwise until the outside cam follower is about to ride off its cam.</p>
11	<p>Allow the cam follower to ride off its cam automatically. When the MEAS CAL lamp is extinguished, depress the MEAS CAL key and note the reading on the indicator.</p> <p><b>Requirement:</b> 0.0 dBm <math>\pm</math>0.02 dB.</p>
12	<p>Return the recorder to its case and close the indicator-recorder door.</p>

#### B. Indicator-Recorder Amplifier Gain

STEP	PROCEDURE
1	<p><b>Note:</b> The optimum gain setting is that setting which gives maximum instrument sensitivity without causing hunting; i.e., pen or pointer oscillation.</p> <p>Hold the MEAS CAL key depressed and note the reading on the indicator-recorder meter.</p> <p><b>Requirement:</b> 0.0 dBm <math>\pm</math>0.02 dB.</p> <p><b>Note:</b> If this requirement is not met, perform Test A of this section.</p>

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STEP	PROCEDURE
2	Observe the pen and indicator.
3	If oversensitivity, characterized by hunting, or insensitivity is noted, turn the GAIN control knob on the indicator-recorder amplifier to its clockwise limit; then turn the knob counterclockwise until hunting disappears or shows only a slight variation of the balancing motor worm.

**C. Damping Adjustment**

STEP	PROCEDURE
	<i>Note:</i> Test B must be completed before performing this adjustment.
1	Remove the measuring slide-wire cover.
2	Manually rotate the slide-wire contact arm to move the pointer several inches from the balance point.
3	Release the contact arm and observe the pointer as the instrument balances.
4	Turn the damping adjustment (a screwdriver adjustment located inside the indicator-recorder case at the left rear corner) counterclockwise until the pointer overshoots the balance point when Steps 2 and 3 are repeated.
5	Turn the damping adjustment clockwise until the overshoot just disappears when Steps 2 and 3 are repeated.
6	Replace the slide-wire cover.

**D. Pilot Pick-Off Hybrids**

STEP	PROCEDURE
	<i>Note:</i> Steps 1 through 3 usually require 48 minutes without interference to perform this test. If a need for more than 48 minutes of uninterrupted time is anticipated for this test, omit Steps 1 through 3 and proceed to Step 4.
1	Open the indicator-recorder door and swing the recording mechanism out on its hinge.
2	Turn the cam and ratchet on the standardizer assembly until both cam followers ride off the cam.
	<i>Note:</i> Allow 48 minutes for testing without interference.

STEP	PROCEDURE
3	Return the recorder to its case, close the indicator-recorder door, and proceed to Step 6.
4	Open the indicator-recorder door and swing the recording mechanism out on its hinge.
5	<p>Insert a piece of paper or other insulating material between the center leaf and reference source contacts of the two standardizer switches (Fig. 1).</p> <p><i>Note:</i> Perform the following sequence of tests for each port served by the monitor (Fig. 2).</p>
6	Patch the 64-kHz 75-ohm unbalanced signal at $-24.0$ dBm from the sending test equipment to the REC TERM TRK IN jack of the receiving terminal trunk associated with the particular port to be tested.
7	Depress the MEAS key associated with the line to be checked and adjust the ADJ control for this line until the indicator-recorder meter indicates $0.0$ dB.
8	Patch the receiving test equipment to the REC TERM TRK OUT jack.
9	<p>Measure and record the power.</p> <p><i>Requirement:</i> <math>-32.0</math> dBm <math>\pm 0.5</math> dB.</p>
10	<p>Depress another MEAS key and again observe the power at the REC TERM TRK OUT jack.</p> <p><i>Requirement:</i> This reading shall not vary more than <math>\pm 0.05</math> dB from the power recorded in Step 9.</p>
11	If the procedure of Step 5 was used, remove the insulating material from standardizer switch contacts, return the recorder to its case, and close the indicator-recorder door.
12	Remove the plug from REC TERM TRK OUT and REC TERM TRK IN jacks.

#### E. Individual Circuits

STEP	PROCEDURE
1	<p>Depress the MEAS 1 key.</p> <p><i>Requirement:</i> The RPT SCAN lamp and MEAS 1 key lamp light.</p>
2	<p>Depress the MEAS 2 key.</p> <p><i>Requirement:</i> The RPT SCAN lamp remains lighted and the MEAS 2 key lamp lights.</p>

STEP	PROCEDURE
3	<p>Sequentially depress each of the remaining equipped MEAS keys.</p> <p><b>Requirement:</b> As each key is depressed, the previously lighted MEAS key lamp extinguishes, the depressed MEAS key lamp lights, and the RPT SCAN lamp remains lighted.</p>

## F. Automatic Advance Scan Mode

STEP	PROCEDURE
1	<p>Depress the ADV SCAN key and MEAS ( ) key for the last port equipped.</p> <p><b>Requirement:</b> The ADV SCAN and MEAS ( ) key lamps light. The MEAS ( ) key lamp remains lighted for <math>10 \pm 1</math> minutes. Then, the monitor automatically steps through all ports, spending approximately 6 to 10 seconds on each, and stops with the MEAS 1 key lamp lighted. The marker function shall now be checked by observing that the recorder was driven to its extreme limit of travel, and a marker pip was formed on the chart, just before the MEAS 1 key was lighted.</p> <p><b>Note:</b> If permitted to continue operating in this manner, the monitor remains on MEAS 1 for approximately 10 minutes, repeats the fast-scanning cycle, stops with the MEAS 2 key lamp lighted for 10 minutes, and continues this cycle for all keys which are being used on the monitor.</p>

## G. Automatic Repeat Scan Mode

STEP	PROCEDURE
1	<p>Depress the MEAS 1 key.</p> <p><b>Requirement:</b> The RPT SCAN lamp and MEAS 1 key lamp light. The MEAS 1 key lamp remains lighted for <math>10 \pm 1</math> minutes. Then, the monitor automatically steps through all ports, spending approximately 6 to 10 seconds on each, and stops with the MEAS 1 key lamp lighted.</p> <p><b>Note:</b> If permitted to continue operating in the repeat scan mode, the monitor shall, at the end of each 10-minute cycle, step through all ports and then stop on the same port from which it started.</p>

## H. Alarm Circuits

STEP	PROCEDURE
1	Insert a 75-ohm terminating plug into the REC TERM TRK OUT jack.
2	Patch a 64-kHz 75-ohm unbalanced signal at $-24$ dBm from the sending test equipment or from a spare tap on a 64-kHz carrier and pilot supply to the REC TERM TRK IN jack associated with port 1 of the monitor.
3	Depress the MEAS 1 key. <b>Requirement:</b> The MEAS 1 key lamp and RPT SCAN lamp light, and the meter indicates approximately 0.0 dB.
4	Reduce the applied signal power until the meter indicates $-0.5$ to $-0.6$ dB. <b>Requirement:</b> After a $0.6 \pm 0.5$ second delay, the ALM 1 and ALM RST key lamps light and the office alarms sound.
5	Depress the ALM RST key. <b>Requirement:</b> The ALM RST key lamp extinguishes and the office alarms stop.
6	Increase the input power level to approximately $-24$ dBm and return the alarm circuit to normal by depressing the ALM 1 key. <b>Requirement:</b> The ALM 1 key lamp extinguishes.
7	Increase the applied signal until the meter indicates $+0.5$ dB. <b>Requirement:</b> After a $0.6 \pm 0.5$ second delay, the ALM 1 and ALM RST key lamps light and the office alarms sound.
8	Reduce the input power level to approximately $-24$ dBm and return the alarm circuit to normal by depressing the ALM 1 and ALM RST keys. <b>Requirement:</b> The lamps in these keys extinguish and the office alarms stop. <b>Note:</b> The following steps should be performed for each equipped port.
9	Depress the MEAS key. <b>Requirement:</b> The MEAS key lamp lights.
10	Depress the ALM TST key. <b>Requirement:</b> The ALM key for the port selected in Step 9 and the ALM RST key lamps light and the office alarms sound.
11	Depress the ALM and ALM RST keys. <b>Requirement:</b> The ALM and ALM RST key lamps extinguish and the office alarms stop.
12	Remove the plugs from the REC TERM TRK IN jack and the REC TERM TRK OUT jack.

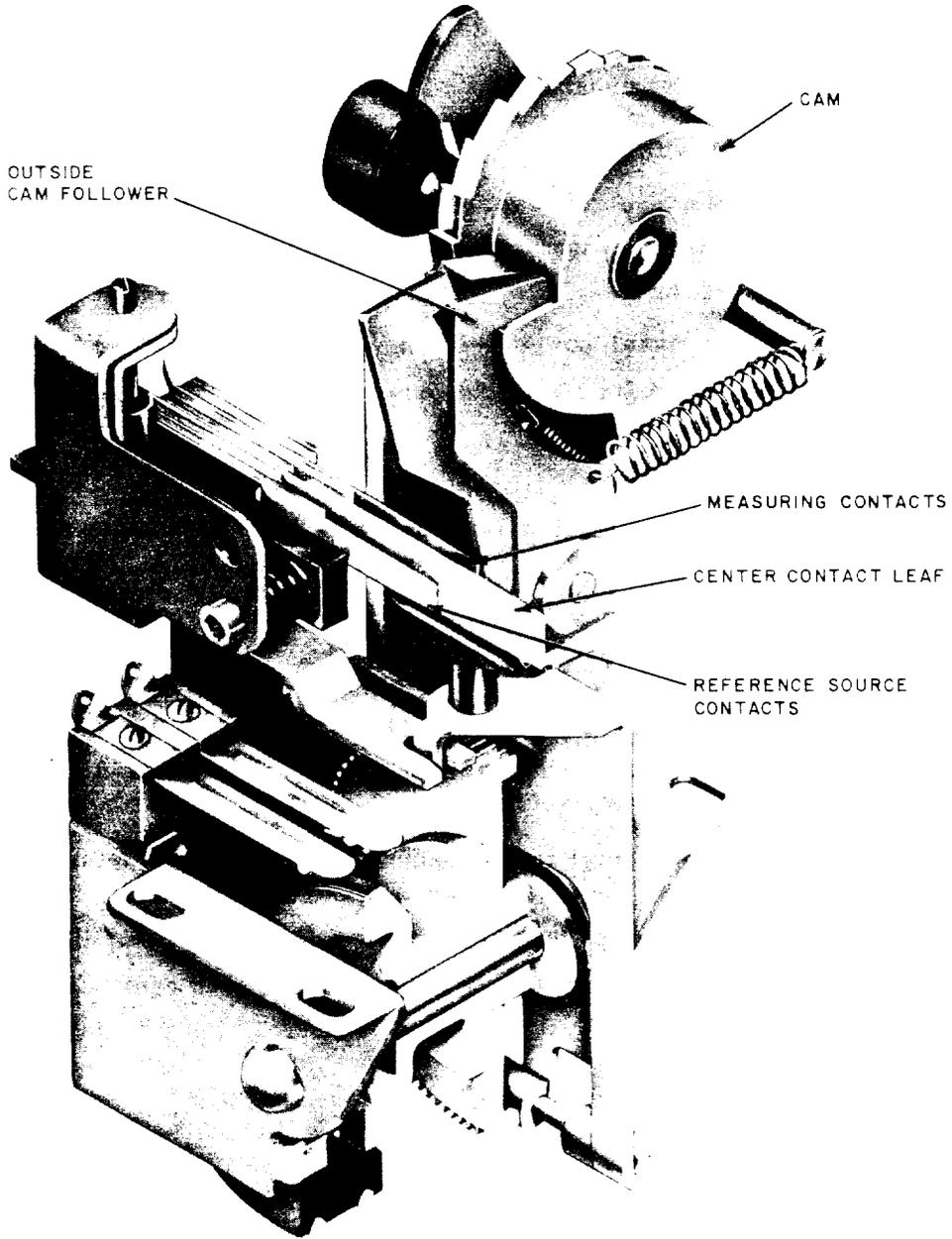


Fig. 1 — Indicator-Recorder Standardizer Assembly

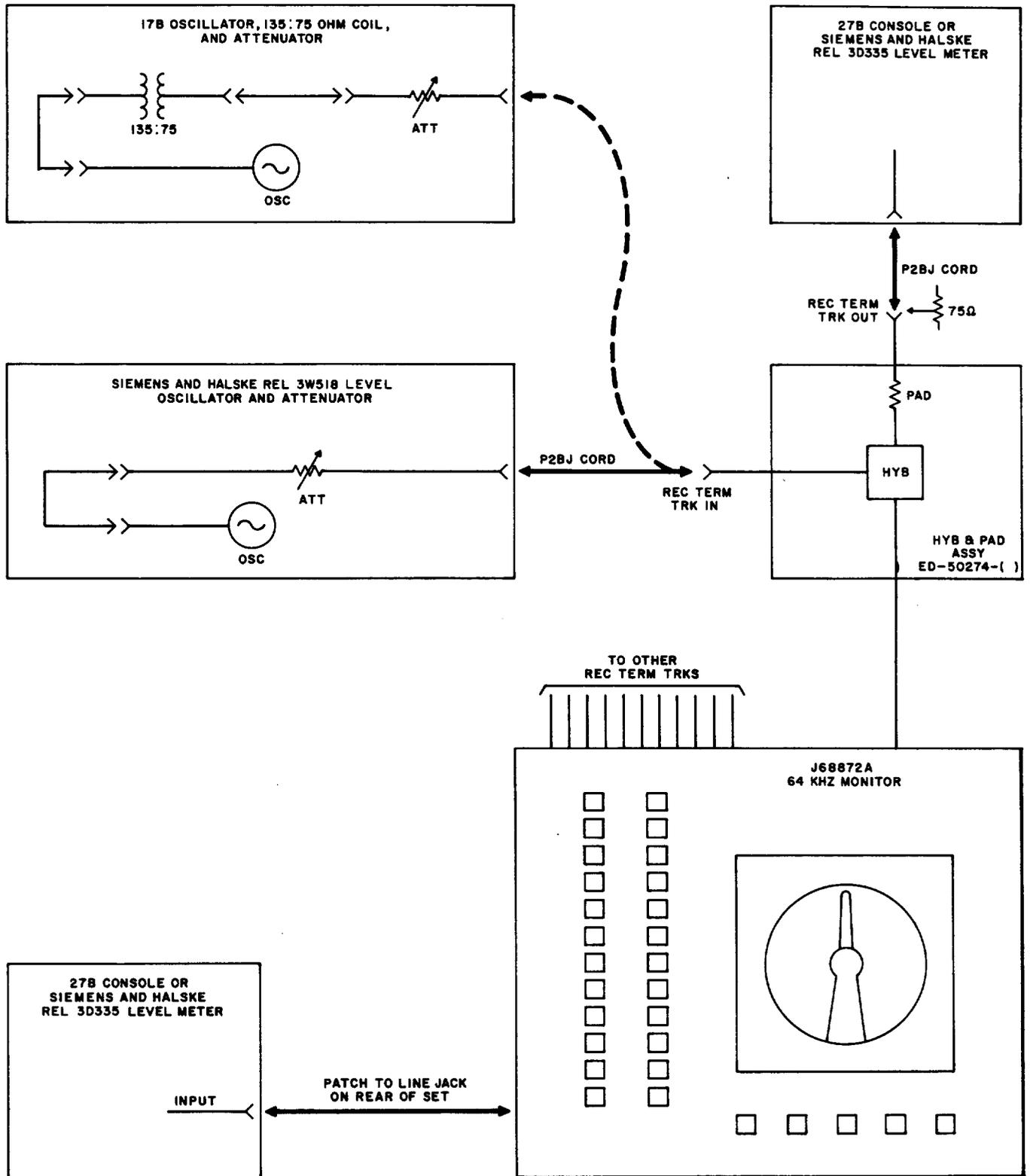


Fig. 2 — Check of Receiving Terminal Trunk for Through Transmission and Transmission to the J68872A Line Pilot Monitor Equipment