

**E7 REPEATERS  
MAINTENANCE**

This section covers the maintenance tests on E7 repeaters.

The tests listed in Table I are made at regular intervals to detect troubles or near-troubles in the repeater or the cable pair.

**Note:** With the assistance of the office chief, each employee required to make these maintenance tests should learn how to recognize the following channel conditions by monitoring:

1. Idle channel
2. Dialing
3. Call-progress tones
4. Ringing
5. Channel in service, but neither terminal sending
6. Channel in service and sending
7. Channel singing
8. Channel noisy.

**TABLE I**

| TEST                      | TEST PERIOD |
|---------------------------|-------------|
| Check for Singing & Noise | 6 Months    |
| Return Loss               | 1 Year      |

These tests are made at the central office and unless line trouble is indicated a man is not required at the station.

**APPARATUS:**

- 1 — KS-14418 headset with 419A Plug. (singing check)
- 1 — E7 repeater (spare repeater)

Apparatus for measuring return loss as indicated in Table I, Section 332-207-301.

Reference network components as indicated in Table I, Section 332-207-301.

**Check for Singing and Noise**

| STEP | PROCEDURE  |
|------|--|
|      | <b>Caution:</b> Use only the specified type of headset for this test.  |
| 1    | Connect the KS-14418 headset to the MON jack of the E7 repeater and monitor the channel.   |
| 2a   | If the channel is idle and quiet, mark an "OK" in the record.  |
| 2b   | If the channel is in service, either wait until it is idle or keep returning to it until it becomes idle. (The channel is more likely to sing in the idle condition than in service). If it is quiet when idle, mark an "OK" in the record.  |
| 2c   | If the channel either sings or sounds noisy when idle, proceed to the repeater tests, regardless of the schedule for those tests. Singing or noise indicates a change in either the repeater or the cable pair subsequent to the channel lineup; the repeater should be checked first. |

**Repeater Tests**

The reference network obtained during the initial line-up tests described in 4.09-4.13 of Section 332-207-301 is used in place of the line for a maintenance test of the E7 repeater. The repeater must be taken out of service for testing.

| STEP | PROCEDURE   |
|------|---|
| 1    | <p>Set up a spare E7 repeater for temporary replacement of the unit to be checked. Simply duplicate, on the spare repeater, the following settings of the regular repeater:</p> <ul style="list-style-type: none"> <li>(a) Transformer tap</li> <li>(b) Network capacitance</li> <li>(c) Dial setting of adjustable resistor.</li> </ul>  |
| 2    | <p>Connect the apparatus for return-loss measurement as indicated in Fig. 12 of Section 332-207-301. Plug the adjusted spare repeater into the 54B test stand and make a return-loss measurement as follows:</p>  |
| 3    | <p>Set the oscillator frequency to 2600 cps <math>\pm</math> 100 cps. Operate 2AB set TEST FUNCTION switch to SEND 600 OHMS. Hold the SEND LEVEL key on the 54C set in the CAL position and adjust the oscillator output to obtain a reading of 10 db on the black scale.</p> <p>Release the SEND LEVEL key and measure the return loss of the spare repeater. Remember to <i>subtract</i> 10 db from the return-loss reading, since the oscillator output is adjusted to 10 db on the black scale. The return loss should be very nearly the same as the recorded return loss for the regular repeater. If the loss differs by more than 2.0 db, reset the adjustable resistor in the spare repeater to meet the recorded loss for the regular repeater. When this adjustment is completed, the spare repeater is ready for use as a temporary replacement for the regular repeater.</p> |
| 4    | <p>Using the KS-14418 headset, monitor on the regular repeater to determine whether the circuit is being used or is idle. When the channel is idle, remove the repeater from the shelf and replace it with the adjusted spare E7 repeater as quickly as practicable, in order to minimize the change of interfering with a call.</p>  |
| 5    | <p>Plug the regular repeater into the 54B test stand and make a return-loss measurement as outlined in Step 3.</p> <p><b>Requirement:</b> The measured return loss should be within <math>\pm</math> 3.0 db of the value obtained on the initial lineup. A deviation greater than <math>\pm</math> 3.0 db is an indication of trouble in the repeater, and the repeater unit should be replaced. Be sure to enter full information on the front cap of the replacing repeater.</p>  |
| 6    | <p>If the regular repeater meets the requirements, do not change any of the adjustments. Monitor the circuit and, when it is idle, replace the spare with the regular repeater as quickly as practicable.</p>   |
| 7    | <p>Do not leave the spare repeater as a replacement except in case of trouble in the regular repeater.</p>  |
| 8    | <p>If the check for singing and noise indicated trouble, but the repeater passed its test, report the cable pair for trouble check according to other sections of practices.</p>  |