J94024 (24B and 24C) LOOP CHECKER GENERATORS
DESCRIPTION

1. INTRODUCTION

1.01 This equipment compares the insertion loss of a subscriber loop with the insertion loss of a model subscriber loop. The comparison is made as a function of frequency in the voice band. The model or standard of comparison is the upper limit of the allowed loss versus frequency characteristic of a loop designed according to the loop layout rules. The equipment makes a direct above- or below-par evaluation of the transmission of the loop under test.

1.02 The equipment consists of two parts: (1) The loop checker generator (24B or C) to be installed in the central office and (2) the loop checker (24A) to be carried by the telephone craftsman and used at the customer's premises. In addition, a test line circuit SD-98100-01 is connected ahead of the loop checker generator circuit in the central office.

1.03 This section is reissued to change some of the electrical specifications.

2. DESIGN FEATURES (General)

A. Mechanical

2.01 Test outlets are provided at two jacks on the front panel of the loop checker generator and at a 55D connecting block located in the same bay used for calibrating the loop checker.

B. Electrical

2.02 The insertion loss of a loop depends upon three parameters: (a) frequency, (b) length, and (c) dc resistance. The comparison technique of the 24-type equipment is to so adjust signal amplitude and measuring sensitivity that if the loop under test were exactly like the model loop, the meter of the 24A would remain at midscale throughout the test. The output of the loop checker generator is shaped to have an amplitude versus frequency characteristic which is proportional to the loss versus frequency characteristic of the model subscriber loop (see Fig. 1).

2.03 The loop checker generator has the following electrical specifications:

(a) *Frequency Range:* 1000 to 3000 cps continuous.

(b) *Sweep:* From 1000 to 3000 cps in 4 to 18 seconds in an approximately linear fashion. Sweep from 3000 to 1000 cps very rapidly.

(c) *Output Level:* The output level is as shown in Fig. 1. The level will depend on the wiring loss of the particular office.

(d) *Accuracy:* ±0.2 db at all frequencies.

(e) *Output Impedance:* 900 ohms nominal.

(f) *Flat Output:* −8.4 dbm into 900 ohms with approximately 15-ma of direct current.

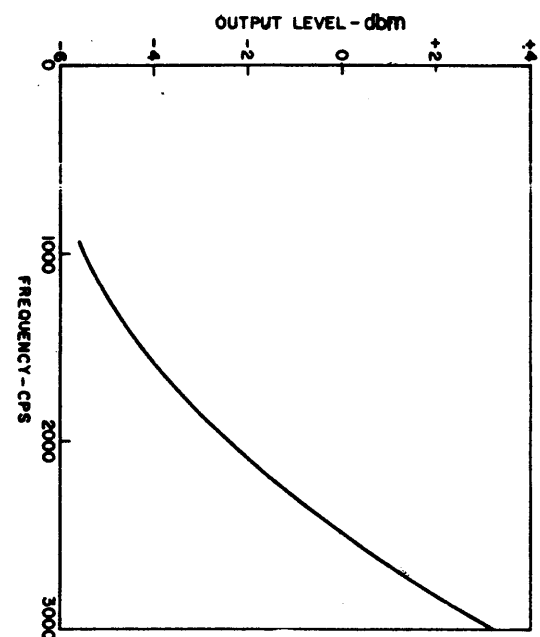Fig. 1 – Output Level Characteristics

(g) *Power:* 48 ±4 volts dc, approximately
→ 160-ma current drain for the 24B and ap-
→ proximately 500-ma for the 24C (to be sup-
plied by office battery).

2.04 The signal from a fixed 28-kc oscillator
is modulated by a swept frequency (25
to 27 kc). The filter selects the difference fre-
quency (1000 to 3000 cps) which is shaped,
amplified, and sent to the output network.

2.05 The output network provides one through
ten outlets balanced to ground.

2.06 The flat output amplifier provides an un-
shaped signal and direct current for test-
ing the 24A loop checker.

2.07 *Level Check*

(a) *24B* — A toggle switch marked LEV
CHK removes the shaping network and
replaces it with a fixed pad so that the output
level may be set.

(b) *24C* — When the switch is in the LEV
CHK position the shaping network is re-
placed by a fixed pad so that the output level
may be set.

2.08 *Frequency Check*

(a) *24B* — A FREQ CHK switch is provided
to stop the sweep at the end frequencies
(nominally 1000 and 3000 cps) so that these
frequencies may be checked.

(b) *24C* — With the switch in the FREQ CHK
position, the frequency may be manually
swept, by means of the FREQ CHK poten-
tiometer, to the end frequencies (nominally
1000 and 3000 cps) so that these frequencies
may be checked.

2.09 Two gain controls are provided; one ad-
justs the flat output (FLAT GAIN), the
other adjusts the shaped output (OUT GAIN).
For the 24B, the FLAT GAIN should always be
set first, since it affects the shaped output as
well. On the 24C the gain controls are inde-
pendent.

3. TEST LINE CIRCUIT

3.01 Test line circuit SD-98100-01 provides
ringing trip, on-hook or off-hook super-
vision, idle termination, and automatic time-out.