Western Electric Co., Incorporated,
Engineering Dept.,
New York.

Appendix 1.
Issue 4 - BP-431752.
Replacing all previous issues.
February 2, 1922.

METHOD OF OPERATION
HOWLER CORD CIRCUIT
Sender Monitor Operator - Trouble Desk - Full Mechanical Power Driven System.

Change the Circuit Requirements to read as follows:

CIRCUIT REQUIREMENTS

THE READJUST REQUIREMENTS SHOWN BELOW ARE FOR MAINTENANCE USE ONLY

	OPERATE	NON-OPERATE	RELEASE
B4 (S)	When used with loops having a maximum resistance of 750 ohms After a soak of approximately .3 amp. Readj. .015 amp. Test .021 amp. W.C.C. .026 amp.		After a soak of approximately .3 amp. Readj. .005 amp. Test .0047 amp. W.C.C..0025 amp.
	When used with loops having a maximum resistance of 900 ohms. After a soak of approximately .3 amp. Readj. .015 amp. Test .019 amp. W.C.C. .022 amp.		After a soak of approximately .3 amp. Readj. .005 amp. Test .0047 amp. W.C.C. .0025 amp.
E3 (DT)	Readj. .010 amp. Test .025 amp. W.C.C. .040 amp.	Readj. .007 amp. Test .0066 amp.	
E226 (CI)	Readj. .015 amp. Test .027 amp. W.C.C. .038 amp.		Readj. .003 amp. Test .0015 amp.
E380 (SR)	Readj. .009 amp. Test .024 amp. W.C.C. .058 amp. Hold: W.C.C. .028 amp.		Readj. .001 amp. Test .0005 amp.
E467 (SLV)	Readj. .013 amp. Test .021 amp. W.C.C. .029 amp.		Readj. .0015 amp. Test .0014 amp.
E598 (S-1)	Readj. .017 amp. Test .019 amp. W.C.C. .020 amp.	Readj. .010 amp. Test .0095 amp.	

Western Electric Co., Incorporated,
Engineering Dept.,
New York.

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METHOD OF OPERATION
HOWLER CORD CIRCUIT
Sender Monitor Operator - Trouble Desk - Full Mechanical Power Driven System

GENERAL DESCRIPTION

1. This circuit is used at the trouble desk in a full mechanical power driven exchange to provide a means whereby the sender monitor operator may signal a subscriber who has left the receiver off the switchhook. It is used in connection with a holding line for permanent signals whose sleeve is grounded through a maximum resistance of 525 ohms.

2. When the plug of the howler cord is inserted in the jack of a holding line connected to a subscriber's station on which the receiver is off the switchhook, the supervisory lamp flashes and a 200F selector passes out four cycles of graduated tone over the line. The lamp is then extinguished and the operator may start the operation again by the momentary release of the howler key. If the subscriber replaces the receiver on the switchhook the tone is immediately disconnected from the line and the supervisory lamp burns steadily as a disconnect signal.

DETAILED DESCRIPTION

OPERATION

3. When the plug of this cord circuit is inserted in the jack of the holding line circuit, ground on the sleeve of the jack operates the SLV relay. A circuit is also closed from battery through the winding of the repeating coil, the S relay, over the subscriber's loop to ground through the other winding of the repeating coil, operating the S relay. The S relay operated prevents the howler signal lamp from lighting steadily and closes a circuit from battery on its armature through its make contact, winding of the S-1 relay, to a contact of the howler key. When the howler key is operated ground is connected through the winding of the S-1 relay, operating the relay. The S-1 relay operated closes a circuit from battery through the winding of the CI relay, make contact of the S-1 relay, normal terminal and contact of the C bridging brush, to ground through a contact of the howley key, operating the CI relay. The CI relay operated locks under control of the howler key, closes a circuit through the motor interrupter and the primary winding of the 49-A repeating coil, and closes in part a circuit to operate the DT relay. The operation of the S-1 relay also closes a circuit from battery through the 149 type interrupter, make contact of the S-1 relay, break contact of the SR-2 relay, make contact of the SLV relay to ground through the howler lamp, causing the lamp to flash. The S-1 relay operated also closes a circuit from ground through the contact of the 149-N interrupter, S brush and normal terminal of the 200-F selector, break contact of the SR-2 relay, make contact of the S-1 relay to battery through the winding of the STP magnet, energizing the magnet. The STP magnet energized operates. opening the energizing circuit and stepping the 200-F selector one step. At the next closure of the 149-N interrupter, the STP magnet is again energized, stepping the selector another step. As the selector steps around under control of the 149-N interrupter, graduated portions of the 49-A repeating coil are bridged across the secondary winding of the 1/2-25-A repeating coil through the C bridging brush, inducing a gruaded tone in the primary winding of the 1/2-25-A repeating coil, which is transmitted out over the subscriber's line.

4. When the 200-F selector is completing one revolution ground is connected through the SR brush and last terminal of the selector, break contact of the SR-1 relay to battery through the SR relay, operating the SR relay. The SR relay operated closes a circuit from battery through its winding, winding of the SR-1 relay, make contact of the SR relay, to ground through a contact of the howler key, operating the SR-1 relay. When the selector is completing its second revolution, a circuit is closed from battery through the winding of the SR-2 relay, make contact of the SR-1 relay, last terminal and SR brush of the selector to ground, operating the SR-2 relay. The SR-2 relay operated locks through a contact of the howler key. The operation of the SR-2 relay opens the tone circuit through the primary winding of the 49-A repeating coil and opens the energizing circuit through the STP magnet, preventing the selector from starting another revolution. The operation of the SR-2 relay also opens the lamp flashing circuit and the lamp is therefore extinguished. If the howler key is then restored to normal, the SR, SR-1 and SR-2 and C1 relays release. If the howler key is re-operated the former cycle of operation will recommence, connecting four more cycles of tone to the line. If, however, the plug of the cord is withdrawn from the line jack, the S and SLV relays release, restoring the circuit to normal.

5. If the receiver at the subscriber's station is restored to the switchhook while the selector is revolving the S relay releases, lighting the howler lamp steadily and opening the circuit through the S-1 relay which releases. The release of the S-1 relay closes a circuit from battery through the winding of the DT relay, make contact of the CI relay, break contact of the S-1 relay, make contact of the CI relay to ground through a contact of the howler key, operating the DT relay. The DT relay operated opens the howler tone circuit through the primary winding of the 49-A repeating coil, disconnecting the tone from the line. The DT relay locks under control of the CI relay and the howler key and therefore, will not be affected by operation of the switchhook. If the receiver is restored to the switchhook during the first revolution of the 200-F selector, the release of the S-1 relay opens the energizing circuit of the STP magnet, stopping the selector after its first revolution.

6. If the howler key is restored while the stepper is making a revolution, the selector is restored to normal through the RN bank of the selector. This circuit is traced from ground through the contacts of the restored howler key, RN brush and contacts of the bank, break contact of the STP magnet, winding of the STP magnet to battery.

CIRCUIT REQUIREMENTS

	OPERATE	NON-OPERATE	RELEASE
B4 (S)	After a soak of approximately .3 amp: Test .019 amp. Readj. .016 amp.		After a soak of approximately .3 amp: Test .005 amp. Readj. .0055 amp.
E3 (DT)	Test .024 amp. Readj. .010 amp.	Test .0067 amp. Readj. .007 amp.	
E226 CI	Test .016 amp. Readj. .015 amp.		Test .0028 amp. Readj. .003 amp.
E380 SR	Test .010 amp. Readj. .009 amp.		Test .0009 amp. Readj. .001 amp.
E467 SLV	Test .020 amp. Readj. .013 amp.		Test .0014 amp. Readj. .0015 amp.
E598 S-1	Test .018 amp. Readj. .017 amp.	Test .0095 amp. Readj. .010 amp.	
E760 SR-2	Test .025 amp. Readj. .023 amp.	Test .013 amp. Readj. .014 amp.	
E1037 SR-1	Test .021 amp. Readj. .016 amp.	Test .0095 amp. Readj. .010 amp.	

ENG.--TML-JO.
7/26/21.

CHK'D.--ELC.

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