COMMON SYSTEMS
HOLDING TIME RECORDER NO. 1C
RECORDER AND MISCELLANEOUS CIRCUITS
FOR OBTAINING TRAFFIC DATA
ON 48 VOLT CIRCUITS

CHANGES

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLYING TO ADDED OR REMOVED APPARATUS

C.1 Added test note "Adjacent relays shall not be energized. See B.S.P."

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350-RGWB-RGW

COMMON SYSTEMS
HOLDING TIME RECORDER NO. 1C
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CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 Fig. 15 was added for use with selectors. This arrangement delays the start of recording until the selector rotary magnet circuit is closed.

B. CHANGES IN APPARATUS

B.1

Removed	Replaced By	Added
J99211B - L16 Cord	1 1W2A Cord 1 263A Plug	1 (RS) E6149 Relay
J99211B - L15 Cord	1 1W1A Cord 1 110 Plug	
J99211A - L9 Cord	1 1P6A Cord 2 110 Plugs	

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Reference to Fig. 15 was added to circuit Notes 101B and 101C.

D.2 References to Fig. 15 terminals "D" and "E" and the (RS) relay were added to circuit note 103.

D.3 Fig. 15 was added.

D.4 The code of the cord of Fig. 9 formerly was J99211B-L16.

D.5 The code of the cord of Fig. 6 formerly was J99211B-L15.

D.6 The code of the cord of Fig. 7 formerly was J99211B-L9.

D.7 The "HT" lead of Fig. 1 designated "to Fig. 15" was added.

All other headings under "Changes", No Change.

1. PURPOSE OF CIRCUIT

1.1 This circuit is used for obtaining holding time data on various central office circuits.

2. WORKING LIMITS

2.1 The recorder may be used with any circuit that will satisfy the following conditions:-

2.11 The operating margins of the (T) and (RS) relays shall be met.

2.12 The operating margins of the circuit to which the recorder is connected shall not be disturbed.

2.2 (LP) Relay.
Maximum External Circuit from 20 to 28 volt battery 1445 ohms.
Minimum Insulation Resistance 30000 ohms.

3. FUNCTIONS

3.1 To obtain the number of times each circuit under observation is used during the interval of observation.

3.2 To obtain the aggregate time each circuit under observation is used during the interval of observation.

3.3 To obtain the number of times a group of circuits under observation have been used simultaneously during the interval of observation.

3.4 To obtain the aggregate time a group of circuits under observation have been used simultaneously during the interval of observation.

3.5 To obtain the total time of observation.

3.6 To give the observer control of the start of timing of circuits under observation by the recorder.

3.7 To start timing of calls under control of rotary magnet circuit of selectors.

4. CONNECTING CIRCUITS

4.1 Connections may be made to any circuit provided the circuit margins of the recorder circuit and the associated circuit are maintained.

4.2 Switchboard positions or secondary clock circuit.

DESCRIPTION OF OPERATION

5. PREPARATION FOR OBSERVATION

5.1 Furnish ground and 48 volt battery to the recorder cabinet as follows:

5.11 Connect the cord in Figure 12 to bus bars as shown and attach the associated connector body to the (Bat. Supply) plug base of Figure 3 direct or by means of the patching cord shown in Figure 14.

5.12 Where there is more than one recorder cabinet the power connections are extended to the next cabinet by means of the patching cord shown in Figure 13. One end of this cord is attached to the (BAT. EXT.) receptacle of the first cabinet and the other end to the (Bat. Supply) plug base of the next cabinet and so on.

5.2 Furnish clock pulses for timing by connecting the tip of the cord of Figure 6 to a source of clock pulses and the plug of the same cord to one of the clock pulse supply jacks of Figure 3. Where there is more than one recorder cabinet, clock pulses are extended to the next cabinet by means of the patching cord shown in Figure 7. One end of this cord is plugged in the multiple clock pulse supply jack of the first cabinet and the other end is plugged in one of the clock pulse supply jacks of the next cabinet, and so on.

5.3 Connections from the observed circuits are made direct to terminals A, B, C, D or E of the recorder shown in Figure 1 or 15 or by means of the cord attached to the connecting block shown in Figure 8. The circuits to be observed are connected to the individual terminals by means of cross-connecting wire, the cord shown in Figure 9 or the cord shown in Figure 10.

5.4 Typical connections to the A, B, C, D and E terminals are as follows:

5.41 Panel Systems - Selectors

The switch and cord in Figure 10 is used. The switch is clamped to the bearing plate of the selector frame and is located directly below the top multiple bank. One conductor of the cord is attached to an individual terminal of the connecting block Figure 8 and the other cord conductor is attached to the associated ground terminal. The individual terminal is then connected to terminal "C". When ready to start observations operate the battery key (B) per Figures A, B or C depending upon the circuit being used and the start key (ST) Figure 3.

5.42 Step-By-Step Systems Trunks to Selectors, Repeaters or Connectors.

If the trunks are provided with make-busy jacks use the cord and plug shown in Figure 9. Connect the cord tip to one of the individual terminals of the connecting block and connect the lead from this terminal to the "C" terminal Figure 1. The plug of the cord should be plugged in the make-busy jack. When ready to start observations operate the battery key (B) Figures A, B or C and the start key (ST) Figure 3. If any of the above trunks are not provided with a make-busy jack make the connection to the sleeve of the trunk. If Figure 15 of this circuit is used the E terminal is connected to the sleeve of the selector and the D terminal is connected to the rotary magnet lead. With this arrangement the (RS) relay is not operated until the rotary magnet is closed, thereby preventing the recording and timing of false starts.

5.43 Toll Systems

5.431 Toll Lines - Toll Switchboards Nos. 1, 1D, 2, 3 and 11 and Toll Tandem Switchboards Nos. 1 and 3

Connect the B terminal through the connecting block to the busy signal lead of the line to be observed. When ready to start observations operate the ground key (G) Figures A, B or C and the start key (ST) Figure 3.

5.432 Outgoing Trunks - Toll Switchboards Nos. 1, 1D and 2

Connect the B terminal through the connecting block to the sleeve of the trunk being observed. When ready to start observations operate the ground key (G) Figure A, B or C and the start key (ST) Figure 3.

5.44 Manual Systems

5.441 Outgoing Trunks

The preparation here is the same as described in paragraph 5.432.

5.45 Miscellaneous Applications

The recorder may be used, with other circuits provided it will satisfy the conditions outlined in paragraph 2.1 under Working Limits. Whenever it is so used connection should be made to some point in the circuit being observed so that the (T) relay in Figure 1 will remain operated throughout the holding time of the circuit. The (B) or (G) keys should always be operated before the (ST) key to avoid false operation of the (PB) and (PT) registers.

6. GENERAL OPERATION

When the (ST) key is operated the (P) relay operates in unison with the interruptions supplied by the clock interrupter. The (P) relay applies interrupted ground for the operation of the timing registers. With the (B) or (G) keys operated to connect battery or ground to the windings of the (T) relays and with the circuits to be observed connected to the A, B, C, D or E terminals the (T) relays and the (RS) relay, when used, operate when their associated circuit is in use. A (T) relay operated operates the (R) relay which in turn operates the (A) register once and also closes a path for the operation of the (B) register under control of the interruptions of the (P) relay. When the circuit under observation becomes idle the (T) and (R) relays the (RS) relay, when used, and the (A) and (B) registers are released.

7. CHECK REGISTER OPERATION

When the (CK) key, Figure 4, is operated the check register (CK) operates in unison with the (P) relay. The (CK) register is used to check the operation of the (B) registers and may be used to time the duration of observations.

8. GROUP REGISTER OPERATION

If a group of circuits is being observed a path is closed for the operation of the (PB) register, Figure 5, when all of the (R) relays are operated. If all the recorder circuits are not used the (PB) register control lead is closed through the unused circuits by the closed contacts of the (B) and (G) keys. The operation of the (PB) register closes a circuit for the (PT) register to operate in unison with the (P) relay.

9. CLOCK CIRCUIT

The clock interruptions are normally obtained from a distant office using Figure E. In this case the (LP) relay will follow the pulses of the distant office clock circuit and operate the (P) relay intermittently as described above. If there is no position clock circuit available in a distant office within the operating range of the (LP) relay then a clock as shown in Figure F is used. The time contacts of this clock operates the (CP) relay which in turn operates the (P) relay in unison with the interruptions of the clock.

10. USES OF THE VARIOUS REGISTERS

(A) Register - Operates once each time the circuit under observation is used.

(B) Register - Records the total time the circuit under observation is in use in units of 0.1 minute.

(CK) Register - Records the total time of the observation in units of 0.1 minute.

(PB) Register - Operates once each time all the circuits of a group under observation are in simultaneous use.

(PT) Register - Records the total time all the circuits of a group under observation are in simultaneous use in units of 0.1 minute.

11. CLOCK CONTACTS FIGURE F

The time contacts close every 6 seconds and remain closed approximately 0.4 second. The winding contacts close once every 90 minutes and remain closed from 6 to 7 minutes.

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