

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

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METHOD OF OPERATION
TELEPHONE CIRCUIT

Trunk Supervisor - For Use With Long Distance Cordless Trunk Positions - Arranged
For Audible And Visual Signal -

FULL MECHANICAL POWER DRIVEN SYSTEM.

GENERAL DESCRIPTION:

1. This circuit is used as a long distance cordless supervisor's circuit, and is selected by a final selector. It is equipped with jacks whereby the wire chief and desk operator may communicate with the supervisor. Two final frame numbers are assigned to this circuit, one for the long distance cordless operator and the other for local cordless operators, when calling the supervisor.

DETAILED DESCRIPTION:

CALL FROM LOCAL CORDLESS OPERATOR:

2. When a final selector connects to the tip, ring and sleeve of this circuit, a circuit is closed from battery on the sleeve brush of the final selector, to ground through the windings of the CO relay, which operates. The CO relay operated, closes a circuit from ground on its armature, break contact of the RI relay the 2-G lamp (RED) to battery, through the winding of the C relay, lighting the lamp and operating the C relay. The CO relay operated, also closes a circuit from ground on its armature, through the break contact of the P relay, winding of the R relay, to battery on the armature of the M relay, operating the R relay. The C relay operated, connects ringing current through its make contact, break contact of the OB relay, to ground through the 127-A subscriber's set, ringing the bell. The R relay operated, locks to ground through the break contact of the D relay, and connects battery to the winding of the RI relay. The CO relay operated, also closes a circuit from ground, through the break contact of the D relay, make contact of the CO relay, winding of the TR relay, to battery on the armature of the FM relay, operating the TR relay. When the plug of the operator's telephone set is inserted in the telephone jacks of this circuit, a circuit is closed from battery through the winding of the P relay, transmitter of the telephone set, 16 ohm windings of the induction coil to ground, operating the P relay. The P relay operated, completes the circuit through the winding of the RI relay from ground on the armature of the CO relay to battery through the make contact of the R relay, operating the RI relay, which locks to ground on the armature of the CO relay. The RI relay operated, extinguishes the 2-G (RED) lamp and releases the C relay. The release of the C relay opens the circuit through the 127-A subscriber's set, silencing the bell. The RI relay operated, also closes a circuit from ground on the armature of the D relay through the winding of the FM relay, which operates. The FM relay operated, closes a circuit from battery on its armature, through the 18-U resistance, make contact of the TR relay, ring side of trunk through the associated final selector and local cordless operator's circuit to ground through the tripping relay in the cordless circuit, thereby tripping the ringing current. The TR relay, being of the slow acting type, does not release immediately upon its operating circuit being opened by the operation of the FM relay, thus insuring

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the operation of the tripping relay. The operation of the FM relay and the release of the TR relay closes the talking circuit through to the associated final selector,

3. When the plug of the telephone set is withdrawn from the telephone jacks, the P relay releases. When the associated final selector returns to normal, all operated relays release, restoring the circuit to normal.

CALLS FROM LONG DISTANCE CORDLESS OPERATOR.

4. When a final selector connects to the L.D. tip, ring and sleeve terminals of this circuit, a circuit is closed from battery on the final selector sleeve brush to ground through the windings of the L.D. and CO relays in series, which operate. The CO relay operated, closes a circuit from ground on its armature, break contact of the RI relay, 2-G lamp (RED) to battery through the winding of the C relay, lighting the lamp and operating the C relay. The C relay operated, connects ringing current through its make contact, to ground through the break contact of the CB relay and the 127-A subscriber's set, thereby ringing the bell. The CO relay operated, also closes a circuit from ground on its armature, break contact of the P relay, winding of the R relay, to battery through the break contact of the R relay, which operates. The R relay operated, locks to ground through the make contact of the CO relay and break contact of the D relay. The CO relay operated, also closes a circuit from ground through the break contact of the D relay, make contact of the CO relay, winding of the TR relay, to battery on the armature of the FM relay, thereby operating the TR relay. When the plug of the telephone set is inserted in the telephone jacks of this circuit, a circuit is closed from battery through the winding of the P relay, transmitter of the telephone set, to ground through the 16 ohm windings of the induction coil, operating the P relay. The P relay operated, completes a circuit from ground on the armature of the CO relay, to battery through winding of the RI relay and make contact of the R relay, operating the RI relay. The RI relay operated, locks to ground on the armature of the CO relay, and opens the circuit through the 2-G (RED) lamp and C relay, extinguishing the lamp and releasing the C relay. The release of the C relay opens the circuit through the 127-A subscriber's set, silencing the bell. The RI relay operated, closes a circuit from ground on the armature of the D relay, to battery through the winding of the FM relay, which operates. The FM relay operated trips machine ringing from the L.D. cordless circuit and releases the TR relay as described under paragraph 4; and also closes a circuit from ground on its armature, through the make contact of the L.D. relay, to battery through the winding of the S relay, which operates. The S relay operated, bridges the 46-A or 47-A retardation coil across the tip and ring of the circuit, thereby extinguishing the L.D. operator's supervisory lamp. The operation of the F key closes a circuit through the FL relay, which operates and opens the circuit through the 46-A or 47-A retardation coil, thereby causing the L.D. operator's supervisory lamp to flash as a recall signal. When the F key is restored to normal, the FL relay releases. When the plug of the telephone set is withdrawn from the jacks the P relay releases. When the associated final selector returns to normal, all operated relays release and the circuit is restored to normal.

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CALLS FROM WIRE CHIEF AT TEST DESK

5. On calls originating at the wire chief's desk, ground is connected over the lead L, break contact of the M1 relay, 2-G (GREEN) lamp, to battery through the C relay, lighting the lamp and operating the relay. The C relay operated, rings the bell of the 127-A subscriber's set. When the plug of the operator's set is inserted in the telephone jacks, the P relay operates. When the WC key is operated, a circuit is closed from battery through inner winding of the M relay, contacts of the WC key, to ground on the contacts of the telephone jacks, operating the M relay. The M relay operated, locks over a circuit from battery through its make contact and outer winding, 110 ohm winding of the M1 relay, to ground on the armature of the P relay, operating the M1 relay, and closes the talking circuit through to the wire chief. The M1 relay operated locks over the L lead and remains locked until the plug of the wire chief's telephone circuit is withdrawn from the trunk jack. The M1 relay operated, opens the circuit through the 2-G (GREEN) lamp and C relay, extinguishing the lamp and releasing the relay. The C relay released, opens the circuit through the 127-A subscriber's set, silencing the bell. When the plug of the operator's set is withdrawn from the telephone jacks, the P, M and M1 relays release, restoring the circuit to normal.

CALLS FROM THE DESK.

6. When the plug of a cord is inserted in the desk jack, a circuit is closed from battery through the sleeve of the cord windings of the D relay, to ground on the armature of the FM relay, operating the D relay. The D relay operated closes a circuit from ground on its armature, break contact of the R1 relay, 2-G (RED) lamp, to battery through the winding of the C relay, lighting the lamp and operating the relay. The C relay operated, rings the bell of the 127-A sub-set. The D relay operated, also operates the TR and R relays. The TR relay operated, performs no useful function on calls of this nature. The R relay operated, locks under control of the D relay. When the plug of the telephone set is inserted in the jack of the circuit, the P relay operates. The P relay operated, operates the R1 relay, which locks under control of the D relay. The R1 relay operated, releases the C relay and extinguishes the red lamp. The operation of the OPERATE key, closes a circuit from ground on the contacts of the telephone jack, to battery through the winding of the AJ relay, which operates. The AJ relay operated, operates the S relay which bridges the 46-A or 47-A retardation coil across the tip and ring of the circuit, flashing the supervisory lamp in the desk operator's cord circuit. When the plug of the cord is withdrawn from the desk jack of this circuit, the D relay releases, in turn releasing the TR, R1, and R relays. When the plug of the telephone set is withdrawn from the telephone jacks, the P relay releases, in turn releasing the AJ and S relays restoring the circuit to normal.

OUTGOING CALLS:

7. When the plug associated with the telephone set is inserted in the telephone jacks, the P relay operates. When the OPERATE key is operated, a circuit is closed from ground on the telephone jacks, to battery through the winding of the

1. *Journal of Management Studies*, 1990, 27, 1, 1-14.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion. The number of people aged 65 and over is expected to increase from 250 million to 450 million. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion. The number of people aged 15 and over is expected to increase from 3.5 billion to 4.5 billion.

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AJ relay which operates and locks to ground on the make contact of the P relay. The AJ relay operated, connects the talking circuit through to the "A" switchboard, and operates the S relay. The S relay operated, bridges the 46-A or 47-A retardation coil across the circuit, lighting the line lamp at the "A" switchboard. When the plug of the "A" operator's cord is inserted in the jack at the "A" board, the retardation coil being bridged across the circuit, prevents the A operator's supervisory lamp from lighting. The "A" switchboard operator may be flashed by momentarily operating and restoring the F key. The F key while operated, closes a circuit from ground on the telephone jack, contacts of the F key to battery, through the winding of the FL relay, operating the FL relay. The FL relay operated, opens the circuit through the 46-A or 47-A retardation coil, causing the supervisory lamp in the associated cord circuit to be extinguished. When the plug of the telephone set is withdrawn from the telephone jacks of this circuit, the P, AJ, and S relays release, and the circuit is restored to normal.

OPERATOR CALLS SUPERVISOR.

8. To call the supervisor the SR key is operated, closing a circuit through the winding of the O, OB and SUP relays, which operate. The O relay operated, locks to ground on the armature of the P relay. The OB relay operated, connects ringing current to the 127-A subscriber's set, ringing the bell. The SUP relay operated, locks to ground through the make contact and winding of the O relay, and lights the 2-G (WHITE) lamp at the position. The release of the SR key releases the OB relays, silencing the bell. When the plug of the telephone set is inserted in the jacks, the P relay operates and the O relay releases thereby releasing the SUP relay and extinguishing the WHITE lamp. When the plug of the supervisor's telephone set is withdrawn from the jacks, the P relay is released, restoring the circuit to normal.

CIRCUIT REQUIREMENTS

THE READJUST REQUIREMENTS SHOWN BELOW ARE FOR MAINTENANCE USE ONLY.

| | <u>OPERATE</u> | <u>NON OPERATE</u> | <u>RELEASE</u> |
|--|--|-------------------------------------|--|
| 162-R (TR) | Special requirements to insure slow release. Readj. .021 amp. Test .023 amp. W.C.C. .063 amp. | Readj. .017 amp. Test .016 amp. | |
| B9 (C) | After a soak of approximately .3 amp. Readj. .054 amp. Test .064 amp. W.C.C. .073 amp. | | After a soak of approximately .3 amp. Readj. .006 amp. Test .0057 amp. |
| B10 (LD) | Requirements are without soak. Readj. .025 amp. Test .037 amp. W.C.C. .048 amp. | | Readj. .004 amp. Test .002 amp. |
| E24 (S) & (FL) | Readj. .012 amp. Test .026 amp. W.C.C. .040 amp. | Readj. .009 amp. Test .0085 amp. | |
| E65 (R) & (R1) | Readj. .013 amp. Test .017 amp. W.C.C. .020 amp. | Readj. .009 amp. Test .0085 amp. | |
| E403 (M1) Inner winding (110 ohms) | Readj. .027 amp. Test .030 amp. W.C.C. .033 amp. | Readj. .018 amp. Test .017 amp. | |
| Outer winding (1000 ohms) | Hold: Test .020 amp. W.C.C. (Hold) .020 amp. | | |
| E467 (O) | Readj. .013 amp. Test .022 amp. W.C.C. .030 amp. | | Readj. .0015 amp. Test .0008 amp. |

CIRCUIT REQUIREMENTS

THE READJUST REQUIREMENTS SHOWN BELOW ARE FOR MAINTENANCE USE ONLY.

| | <u>OPERATE</u> | <u>NON-OPERATE</u> | <u>RELEASE</u> |
|---|--|------------------------------------|-------------------------------------|
| E468 (M) Inner winding (500 ohms) | Readj. .035 amp. Test .038 amp. W.C.C. .040 amp. | Readj. .018 amp. Test .017 amp. | |
| Outer Wdg. (500 ohms) | Hold: Test .032 amp. (HOLD) W.C.C. .033 amp. | | |
| E515 (OB) | Readj. .018 amp. Test .024 amp. W.C.C. .030 amp. | Readj. .012 amp. Test .011 amp. | |
| E525 (SUP) | Special requirements to meet hold condition. Readj. .020 amp. Test .021 amp. W. C. C. (Operate) .030 amp. W. C. C. (HOLD) .021 amp. | | Readj. .003 amp. Test .0015 amp. |
| E590 (D) (Wdgs.in Series Aiding | Readj. .020 amp. Test .022 amp. W.C.C. .023 amp. | Readj. .012 amp. Test .011 amp. | |
| E590 (CO) (Wdgs.in Series Aiding) | Readj. .020 amp. Test .034 amp. W.C.C. .048 amp. | Readj. .012 amp. Test .011 amp. | |
| E592 (AJ) & (FM) | Readj. .024 amp. Test .026 amp. W.C.C. .027 amp. | Readj. .013 amp. Test .012 amp. | |

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TELEPHONE COLLECTORS' GUIDE

ALPHABETICALLY BY AREA AND EXCHANGE

AREA

EXCHANGE

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| | <u>OPERATE</u> | <u>NON-OPERATE</u> | <u>RELEASE</u> |
|-----|------------------|--------------------|----------------|
| H14 | Readj. .047 amp. | Readj. .030 amp. | |
| (P) | Test .081 amp. | Test .028 amp. | |
| | W.C.C. .114 amp. | | |

ENG.--PAF-JO.
10/29/21

CHK'D.--WJT-CWP.

APPROVED - C.L.SLUYTER, G.M.L.

ALL INFORMATION CONTAINED
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STUDY DESIGN

1. The first group of people who are interested in the study of the history of the United States are the people who are interested in the history of the United States.