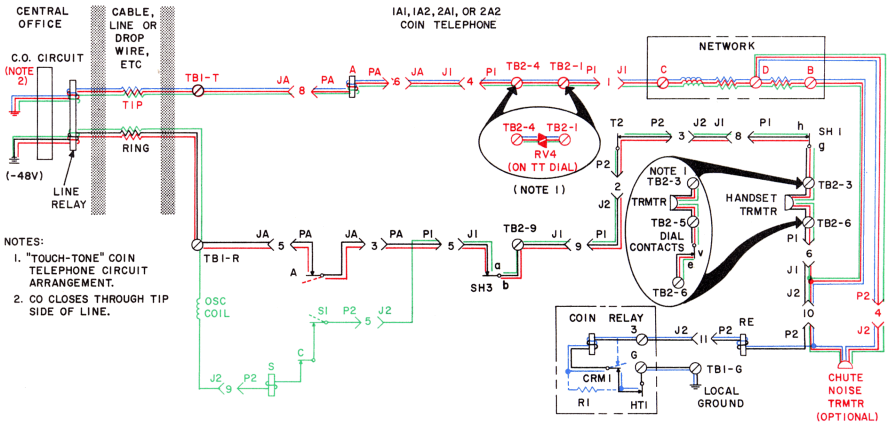
COLOR FUNCTIONAL SCHEMATICS

1A/2A/1C/2C-TYPE COIN TELEPHONE SETS



LEGEND

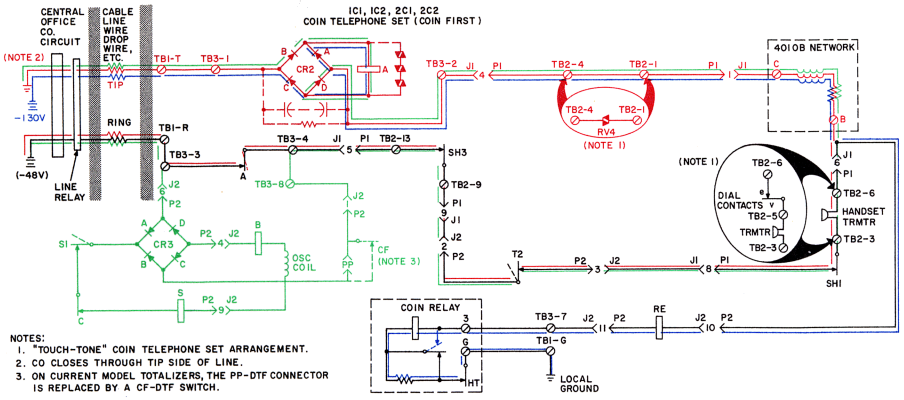
CIRCUIT CONDITION:

- Handset on switchhook
- T2 operated (coin deposited)
- HT1 (hopper trigger) operated

CIRCUIT ACTION:

1. **Black** — This circuit causes the tip side of line to be closed through to ground in the CO. Dial tone is placed on line but is ineffective. Current in this circuit (48V) is not sufficient to operate RE or coin relay.
2. **Red** — A relay operates, causing its normal contacts to open removing the short across the **S** (stepper) relay.
3. **Green** — (a) Operation of **S** relay causes its normally closed **S1** contact to open. The **S1** contact in opening causes the **S** relay to release, thus closing the **S1** contact. This operating and releasing action of the **S** relay steps the totalizer 10 degrees back to normal each time it operates. (Each $.05 amount deposited causes the totalizer to rotate 10 degrees.)
   (b) When the totalizer has been stepped back to normal, **T2** contact restores (opens its make contact, which in turn, opens the telephone circuit.)
4. **Blue** — (a) The CO, detecting the open telephone circuit, sends out negative 100 to 130 volts return battery to return the deposit.
   (b) The **RE** relay in operating would normally restore the **T1** contact. Since the initial rate was not deposited, the **T1** was normal and the operated **RE** relay has no effect.
   (c) The operated coin relay, closes its make contact causing the current to bypass the relay and flow through the resistor which was previously shorted. The short across the relay winding causes the relay to be slow release. The resistor, having approximately the same resistance as the coin relay winding, is placed in the circuit to protect contact **HT** when it restores, and to protect the resistance lamp in the central office circuit.
   (d) As the coin relay releases, the **HT** contact opens placing the coin telephone set in its idle state.

Fig. 1—Call Abandoned With Less Than Initial Rate Deposited (Deposit Refunded)—1A/2A-Type



LEGEND

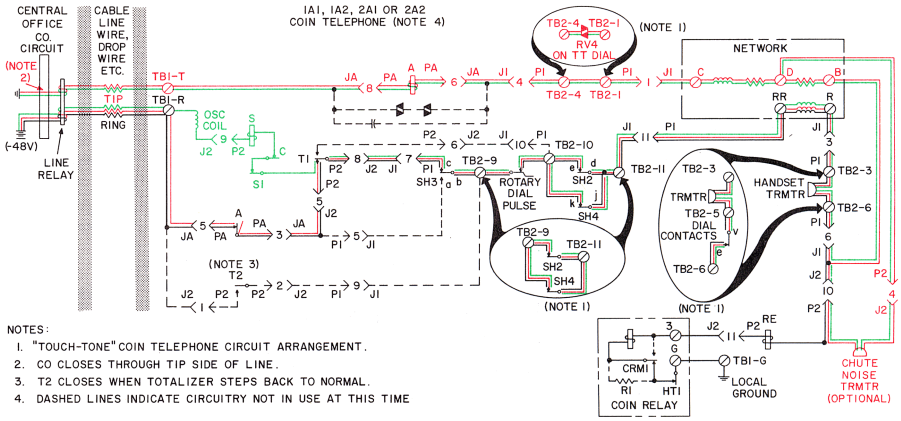
CIRCUIT CONDITION:

- Handset on switchhook
- T2 operated (coin deposited)
- HT1 (hopper trigger) operated

CIRCUIT ACTION:

1. **Black** — This circuit causes the tip side of line to be closed through to ground in the CO. Dial tone is placed on line but is ineffective. Current in this circuit (48V) is not sufficient to operate **RE** or coin relay.
2. **Red** — **A** relay operates, causing its normal contacts to open removing the short across the **S** (stepper) relay
3. **Green** — (a) Operation of **S** relay causes its normally closed **S1** contact to open. The **S1** contact in opening causes the **S** relay to release, thus closing **S1** contact. This operating and releasing action of the **S** relay steps the totalizer 10 degrees back to normal each time it operates. (Each $.05 amount deposited causes the totalizer to rotate 10 degrees.)
   (b) When the totalizer has been stepped back to normal, **T2** contact restores, (opens its make contact, which in turn, opens the telephone circuit.)
4. **Blue** — (a) The CO, detecting the open telephone circuit, sends out negative 100 to 130 volts return battery to return the deposit.
   (b) The **RE** relay in operating would normally restore the **T1** contact. Since the initial rate was not deposited, the **T1** was normal and the operated **RE** relay has no effect.
   (c) The operated coin relay, closes its make contact causing the current to bypass the relay and flow through the resistor which was previously shorted. The short across the relay winding causes the relay to be slow release. The resistor, having approximately the same resistance as the coin relay winding, is placed in the circuit to protect contact **HT** when it restores, and to protect the resistance lamp in the central office circuit.
   (d) As the coin relay releases, the **HT** contact opens, placing the coin telephone set in its idle state.

Fig. 2—Call Abandoned With Less Than Initial Rate Deposited (Deposit Refunded)—1C/2C-Type (CF)



NOTES:

1. "TOUCH-TONE" COIN TELEPHONE CIRCUIT ARRANGEMENT.
2. CO CLOSES THROUGH TIP SIDE OF LINE.
3. T2 CLOSES WHEN TOTALIZER STEPS BACK TO NORMAL.
4. DASHED LINES INDICATE CIRCUITRY NOT IN USE AT THIS TIME

LEGEND

CIRCUIT CONDITION:

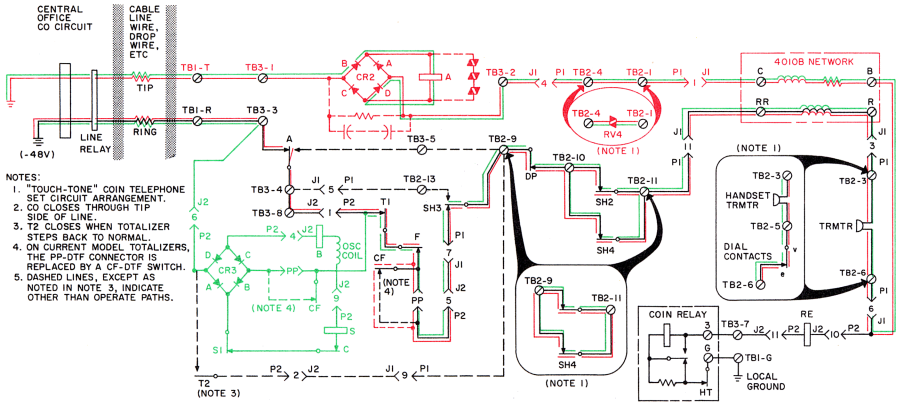
- Outgoing call
- Handset off-hook (SH1, SH2, SH3, SH4 operated)
- T2 operated (coin deposited)
- T1 operated (initial rate deposited)
- **HT** (hopper trigger) operated

CIRCUIT ACTION:

1. **Black** — This circuit causes the tip side of line to be closed through to ground in the CO. Dial tone is placed on line. Current in this circuit (48V) is not sufficient to operate **RE** or coin relay.
2. **Red** — **A** relay operates causing its normal contact to open which removes the short across the **S** (stepper) relay.
3. **Green** — (a) Operation of **S** relay causes its normally closed **S1** contact to open. The **S1** contact in opening causes the **S** relay to release thus closing the **S1** contact. This operating and releasing action of the **S** relay steps the totalizer 10 degrees back each time it operates.

   (b) When the totalizer has stepped back to normal the **T2** contact restores and places the telephone circuit in its dialing and talking state.

Fig. 3—Initial Rate Deposited—Origination State—1A/2A-Type



LEGEND

CIRCUIT CONDITION:

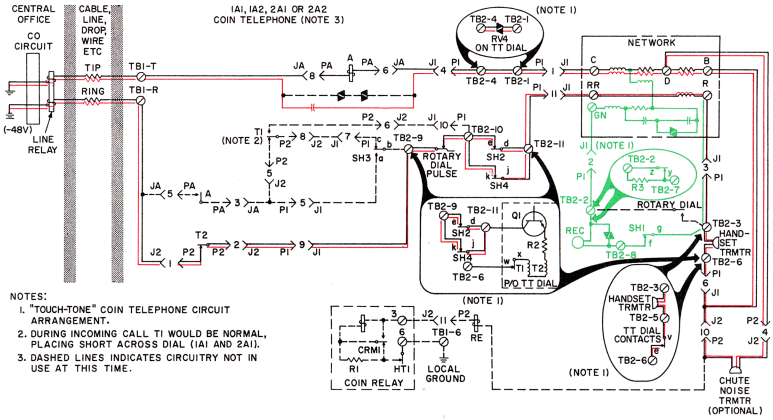
- Outgoing call
- Handset off-hook (SH1, SH2, SH3, SH4 operated)
- T2 operated (coin deposited)
- T1 operated (initial rate deposited)
- HT (hopper trigger) operated

CIRCUIT ACTION:

1. **Black** — This circuit causes the tip side of line to be closed through to ground in the **CO**. Dial tone is placed on line. Current in this circuit (48V) is not sufficient to operate **RE** or coin relay.
2. **Red** — **A** relay operates causing its normal contact to open which removes the short across the **S** (stepper) relay.
3. **Green** — (a) Operation of **S** relay causes its normally closed **S1** contact to open. The **S1** contact in opening causes the **S** relay to release thus closing the **S1** contact. This operating and releasing action of the **S** relay steps the totalizer 10 degrees back each time it operates.

   (b) When the totalizer has stepped back to normal the **T2** contact restores and places the telephone circuit in its dialing and talking state.

Fig. 4—Initial Rate Deposited—Origination State—1C/2C-Type (CF)



LEGEND

CIRCUIT CONDITION:

- Outgoing call
- Handset off-hook
- Dial tone present
- T1 operated
- T2 returned to normal

CIRCUIT ACTION:

1. **Black — Dialing —**

   Dialing path of rotary dial coin telephone set differs from TOUCH-TONE set (see Note 1 and insets). TOUCH-TONE dial contacts **V, E** open and disconnect transmitter from network during dialing; contacts **W, X** close and connect the dial oscillator to the network in place of the transmitter.

2. **Red — Talking —**

   TOUCH-TONE dial contacts **V, E** close, and **W, X** open during the talking state (see insets). The coin signal transmitter detects the sound of coins dropping through the chute.

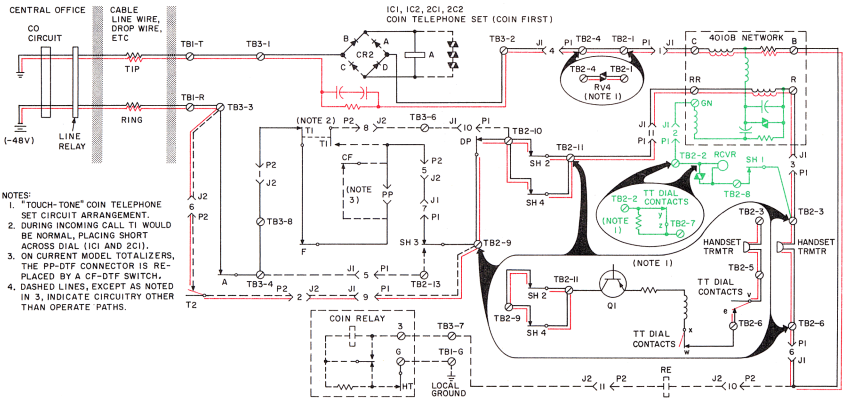
3. **Green — Listening —**

   (a) The listening (secondary) circuit receives its energy through inductive coupling from the primary induction coil windings.

   (b) Rotary dial off-normal contacts short out the receiver during dialing.

   (c) TOUCH-TONE dial contacts **Y, Z** remove the shunt across level limiting resistor **R3** to reduce oscillator sidetone during dialing.

Fig. 5—Dialing, Talking, and Listening Circuits—1A/2A-Type



LEGEND

CIRCUIT CONDITION:

- Outgoing call
- Handset off-hook
- Dial tone present
- T1 operated
- T2 returned to normal

CIRCUIT ACTION:

1. **Black — Dialing —**

   Dialing path of rotary dial coin telephone set differs from TOUCH-TONE set (see Note 1 and insets). TOUCH-TONE dial contacts **V, E** open and disconnect transmitter from network during dialing; contacts **W, X** close and connect the dial oscillator to the network in place of the transmitter.

2. **Red — Talking —**

   TOUCH-TONE dial contacts **V, E,** close, and **W, X** open during the talking state (see insets).

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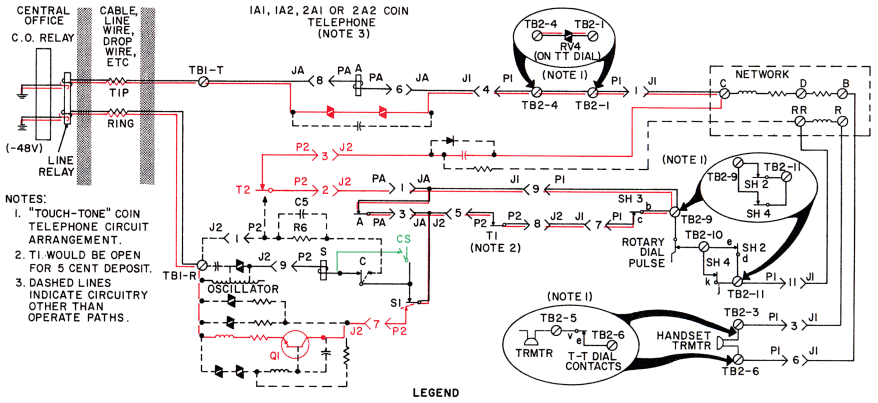
   (c) TOUCH-TONE dial contacts **Y, Z** remove the shunt across level limiting resistor **R3** to reduce oscillator sidetone during dialing.

Fig. 6—Dialing, Talking, and Listening Circuits—1C/2C-Type (CF)



LEGEND

CIRCUIT CONDITION:

- **Nickel, Dime,** or **Quarter** deposit requested by operator
- **T2** operated as result of deposited coin
- **C** and **CS** contacts normal for nickel or dime deposit
- **C** and **CS** contacts operated for quarter deposit

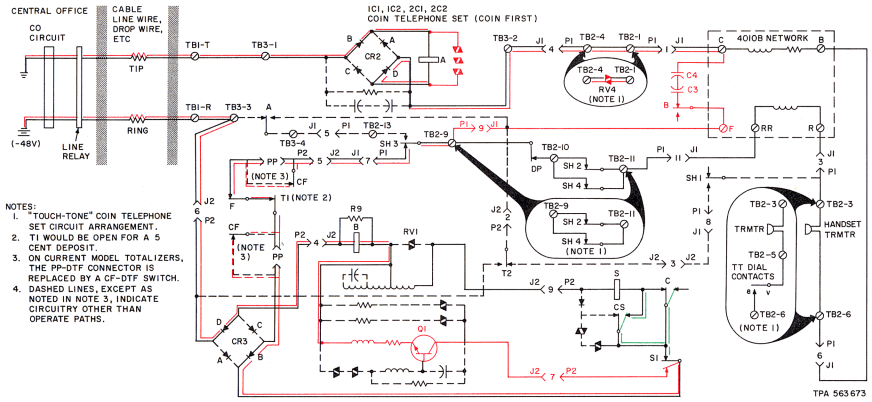
CIRCUIT ACTION:

1. **Black** — Oscillator charging circuit and **S** relay operating path for nickel or dime deposit. The circuit is shown for dime deposit. Nickel deposit circuit would be the same, except **T1** contact would be normal (open) instead of closed as shown.

2. **Black and Green** — Oscillator charging circuit and **S** relay operating path for quarter deposit. **CS** contact operates when totalizer rotates 45°, enabling charging of the **S** relay before **C** contact restores. This enables a faster readout of the oscillator circuit.

3. **Red** — Oscillator readout (tone signal) path. Contact **S1** transfers the current flow from the totalizer to the transistor. Current flow is increased and decreased due to the changing polarity on the emitter and base of the transistor caused by the transformer action of the tank circuit. This produces tone signal heard by operator during operate and release stepping of **S** relay. The signal bypasses the network through the **T2** contacts and the **AC** shorting capacitor.

Fig. 7—Coin Signal Tone Circuit—1A/2A-Type



LEGEND

CIRCUIT CONDITION:

- **Nickel, Dime,** or **Quarter** deposit requested by operator
- **T2** oprated as result of deposited coin
- **C** and **CS** contacts normal for **nickel** or **dime** deposit
- **C** and **CS** contacts operated for **quarter** deposit

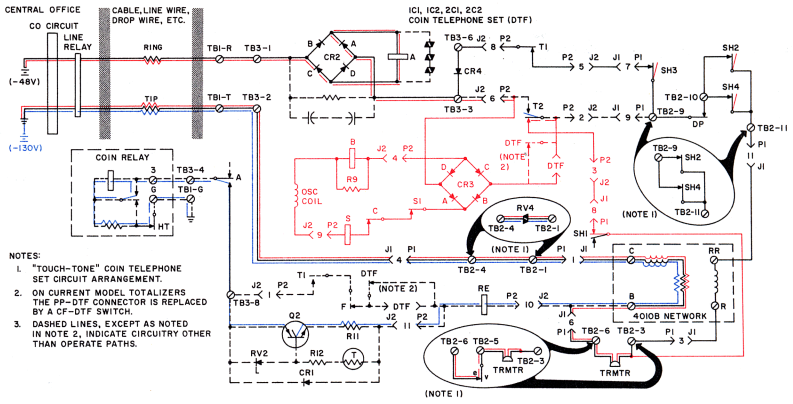
CIRCUIT ACTION:

1. **Black** — Oscillator charging circuit and **S** relay operating path for nickel or dime deposit. The circuit is shown for dime deposit. Nickel deposit circuit would be the same, except **T1** contact would be normal (open) instead of closed as shown.

2. **Black** and **Green** — Oscillator charging circuit and **S** relay operating path for quarter deposit. **CS** contact operates when totalizer rotates 45°, enabling charging of the **S** relay before **C** contact restores. This enables a faster readout of the oscillator circuit.

3. **Red** — Oscillator readout (tone signal) path. Contact **S1** transfers the current flow from the totalizer to the transistor. Current flow is increased and decreased due to the changing polarity on the emitter and base of the transistor caused by the transformer action of the tank circuit. This produces tone signal heard by operator during operate and release stepping of **S** relay. The signal bypasses the network through the **B** relay contacts and the **AC** shorting capacitors.

Fig. 8—Coin Signal Tone Circuit—1C/2C-Type (CF)



LEGEND

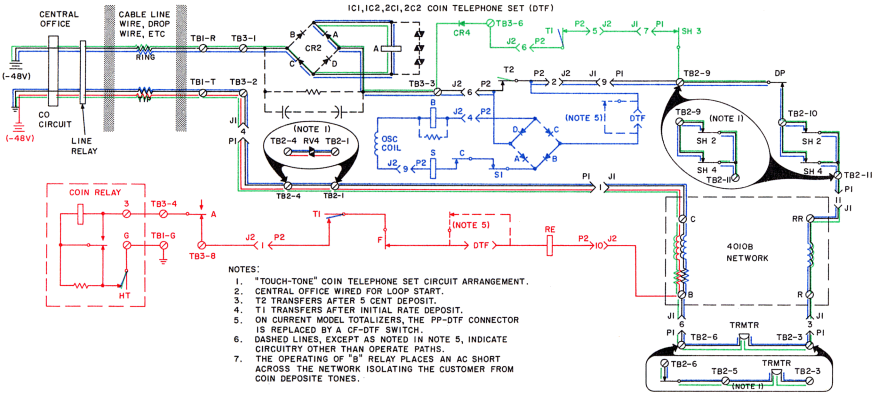
CIRCUIT CONDITION:

- Handset off-hook
- Less than initial rate deposited — handset on-hook
- **T2** opened (coin deposited)
- **HT** (hopper trigger) closed

CIRCUIT ACTION:

1. **Black** — For a deposit less than initial rate, a path exists from Ring to Tip through **A** relay, normally closed **T1** contacts, operated **SH3, SH2** and **SH4**, network, and transmitter, which causes CO to send dial tone.
2. **Red** — Handset is restored; all switchhook contacts restored to normal. When **SH3** opens, the short is removed around totalizer and current flows through **A** relay, polarity guard, **S** (stepper) relay normally opened (but now closed) **T2**, normally closed **SH1** and network to Tip. Operation of the **S** relay causes the totalizer to operate and step back to home position.
3. **Blue** — (a) When the totalizer has been stepped back to normal, **T2** contact restores (opens its make path) which in turn, opens the telephone circuit.
   (b) The CO, detecting the open telephone circuit, sends out negative 100 to 130 volts return battery over tip side of line to return the deposit.
   (c) The operated coin relay closes its make contact causing the current to bypass the relay and flow through the resistor which was previously shorted. The short across the relay winding causes the relay to be slow release. The resistor, having approximately the same resistance as the coin relay winding, is placed in the circuit to protect contact **HT** when it restores, and to protect the resistance lamp in the CO circuit.
   (d) As the coin relay releases, the **HT** contact opens, placing the coin telephone set in its idle state.

Fig. 9—Call Abandoned With Less Than Initial Rate Deposited (Deposit Refunded)—1C/2C-Type (DTF)



LEGEND

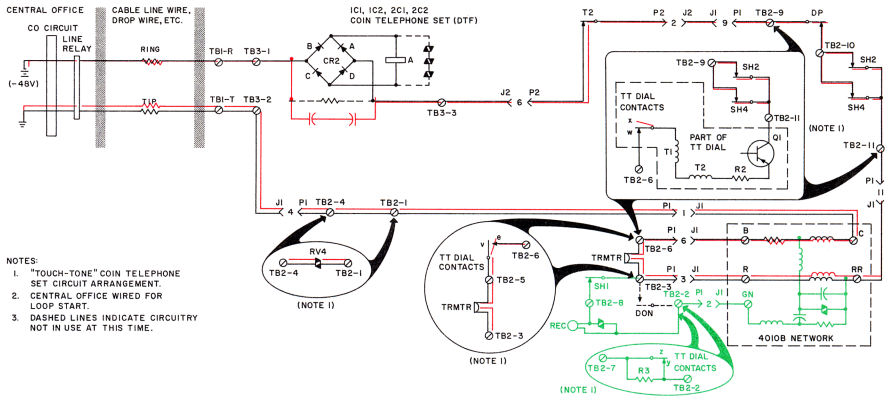
CIRCUIT CONDITION:

- Handset off-hook
- **HT** and **T2** operated with 5-cent deposit
- **T1** operated with initial rate deposit

CIRCUIT ACTION:

1. **Black — Standby**
   Central office wired for loop start — Ring is negative while tip is grounded. When handset is lifted, **SH1, SH2** and **SH4,** and **SH3** transfer. Loop current flows through **A** relay and dial tone is placed on the line.
2. **Red — Ground Test For Initial Rate Deposit**
   After a sufficient number of digits have been dialed, the CO removes battery from the ring and connects it to the tip; opens the ring releasing the **A** relay. This action permits the CO to look for coin station ground. If ground is not found (**HT** and **T1** open) and this should be a charge call, customer will hear a recording requesting an initial rate deposit.
3. **Green — 5-Cent Deposit**
   With a deposit less than initial rate, coin relay **HT** contacts close and totalizer contacts **T2** open. A path exists from Ring to Tip through normally closed **T1,** operated **SH3, SH2** and **SH4,** and network.
4. **Blue — Initial Rate Deposit**
   Normally closed **T1** contacts open applying current to oscillator and totalizer. Totalizer "reads out" and steps back to home position.

Fig. 10—Standby, Ground Test for Initial Rate Deposit, 5-Cent Deposit, and Initial Rate Deposit—1C/2C-Type (DTF)



LEGEND

CIRCUIT CONDITION:

- Outgoing call
- Handset off-hook
- Dial tone present
- **T1** operated
- **T2** returned to normal

CIRCUIT ACTION:

1. **Black — Dialing —**

   Dialing path of rotary dial coin telephone set differs from TOUCH-TONE set (see Note 1 and insets). TOUCH-TONE dial contacts **V, E** open and disconnect transmitter from network during dialing; contacts **W, X** close and connect the dial oscillator to the network in place of the transmitter.

2. **Red — Talking —**

   TOUCH-TONE dial contacts **V, E** close, and **W, X** open during the talking state (see insets).

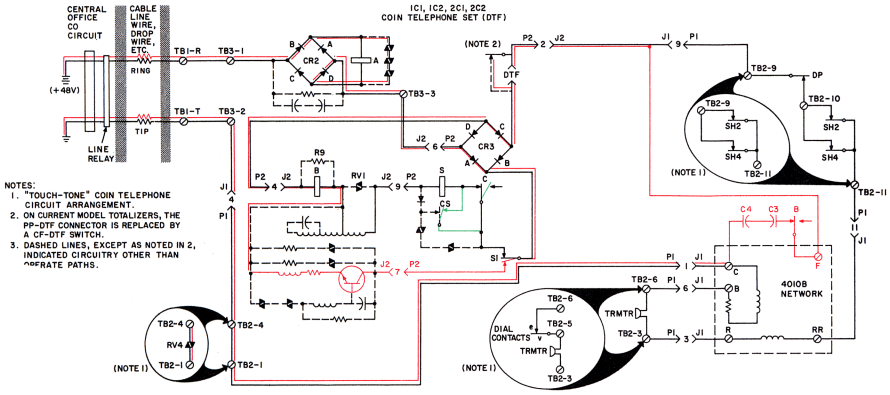
3. **Green — Listening —**

   (a) The listening (secondary) circuit receives its energy through inductive coupling from the primary induction coil windings.

   (b) Rotary dial off-normal contacts short out the receiver during dialing.

   (c) TOUCH-TONE dial contacts **Y, Z** remove the shunt across level limiting resistor **R3** to reduce oscillator sidetone during dialing.

Fig. 11—Dialing, Talking, and Listening Circuits—1C/2C-Type (DTF)



LEGEND

CIRCUIT CONDITION:

- **Nickel, Dime,** or **Quarter** deposit requested by operator
- **C** and **CS** contacts normal for nickel or dime deposit
- **C** and **CS** contacts operated for quarter deposit

CIRCUIT ACTION:

1. **Black** — Oscillator charging circuit and **S** relay operating path for nickel or dime deposit.
2. **Black** and **Green** — Oscillator charging circuit and **S** relay operating path for **quarter** deposit. **CS** contact operates when totalizer rotates 45°, enabling charging of the **S** relay before **C** contact restores. This enables a faster readout of the oscillator circuit.
3. **Red** — Oscillator readout (tone signal) path. Contact **S1** transfers the current flow from the totalizer to the transistor. Current flow is increased and decreased due to the changing polarity on the emitter and base of the transistor caused by the transformer action of the tank circuit. This produces tone signal heard by operator during operate and release stepping of **S** relay. The signal bypasses the network through the **B** relay contacts and the **AC** shorting capacitors.

Fig. 12—Coin Signal Tone Circuit—1C/2C-Type (DTF)