

TELEPHONE SETS
MODIFICATION FOR SECOND PARTY SATT DETECTION
RESISTIVE GROUND METHOD

1. GENERAL

1.01 This section provides instructions for the resistive ground method of modifying telephone sets so that they can be identified by SATT equipment as the tip (second) party in 2-party ANI service. This section is reissued to change the title and to provide a reference to information on other second party SATT detection methods. Conversion information for the following telephone sets is provided:

- (a) AEC Co Types 40, 80, 85, 86, 87, 90M, 182, 183, and 880.
- (b) Kellogg 1000.
- (c) Leich 100 and 700.
- (d) North Electric 6 and 7H.
- (e) Stromberg Carlson 1243, 1443, 1543W, and 1600W.
- (f) WEC Co 302, 500-series, and 701B.

1.02 Certain SATT systems such as Types 59 and 62 provide for 2-party service with ANI without the need for spotter dials. Party 1, the first station on the line, is wired as a 1-party line. A standard telephone set is used. Signaling can be bridged (straight-line or harmonic) or divided (straight-line or harmonic). Party 2, the second station on the line, requires a ground connection to the telephone set as well as the addition of a resistor and a wiring modification. Signaling can be bridged (straight-line or harmonic) or divided (straight-line or harmonic). Second party detection is accomplished by placing a high resistance ground (mark) on the tip (+) side of the line when the telephone set is off-hook. Absence of ground identifies party 1 when in the off-hook condition.

1.03 Although primarily intended for 2-party service, 4-party service can be provided by using telephones equipped with SATT B (spotter) dials for the third (position 0 spot) and fourth (position 9 spot) parties. Detection for party 1 and

party 2 would be the same as described in paragraph 1.02.

2. MODIFICATION PROCEDURES

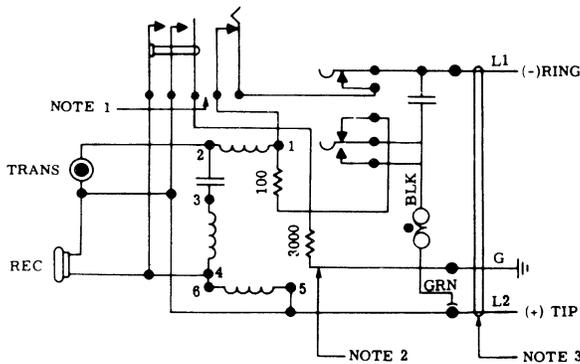
2.01 Modification procedures for the various telephones are provided in Figures 1 through 16. Only the second station on the line is to be modified. The primary change for each type of telephone set is the addition of a 3000-ohm resistor. There are a few exceptions where a dial change is required to obtain the identification ground during the open period of the dial impulse springs. Where a telephone set requires changes beyond the addition of the resistor, it is suggested that that telephone set be applied to party 1 or on an individual line to avoid added expense.

2.02 The resistor required is a standard radio type, 3000-ohm, 1-watt, $\pm 5\%$, carbon resistor. The AEC Co part number is D-284327-A. This resistor is furnished with spade leads attached (see Figure 17). Other apparatus which may be required is specified in the instructions in Figures 1 through 16. To modify the telephone with the resistor mentioned in the notes of Figures 1 through 17, proceed as follows (refer to Figure 18):

- (1) Cut the shunt strap wire as close as possible to the impulse spring terminal.
- (2) Clip one spade terminal from resistor assembly (D-284327-A) and skin the lead approximately 3/16 inch.
- (3) Splice the shunt strap to the resistor lead just skinned with a compression splicing sleeve (API 321026, or equal). Precaution should be taken when squeezing the splicing sleeve to avoid breaking the lead.
- (4) Connect the opposite end of the resistor assembly to the appropriate ground terminal as specified in Figures 1 through 17. When replacing the dial, be certain that the lead does not short out against the dial base.

2.03 Most AECo Types 95, 182A, 192A, and dial-in-handset telephone sets equipped with a Type 46 ringer can be arranged for second party SATT detection by connecting a ringer coil tap to a transmission unit terminal. These sets when not equipped with a ringer, and the NB- and NC-series Types 80, 90M, and 183 sets, can be modified by adding an inductor to the set. These modifications do not require any dial changes and all wire

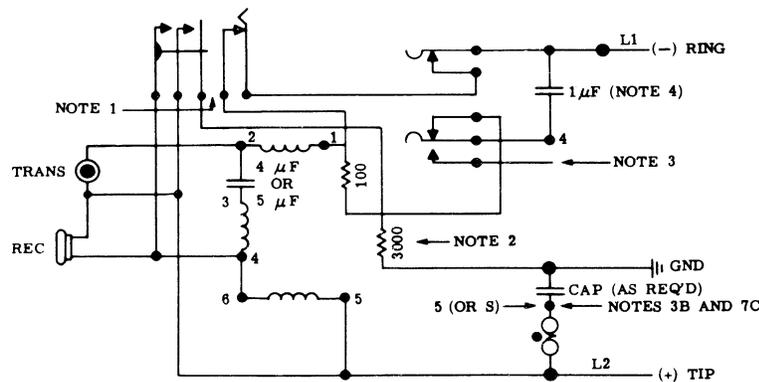
terminations are made on transmission unit terminals. Both the ringer coil tap and inductor methods for AECo telephone sets are covered in the applicable section of this series of General System Practices. The resistive ground method covered in this section cannot be applied to Touch Calling unit sets. Touch Calling unit sets must be modified by either the ringer coil tap or inductor method.



NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 6) AND WIRING BETWEEN FIRST DIAL SHUNT SPRING AND TERMINAL G (GROUND).
3. THREE CONDUCTOR LINE CORD REQUIRED TO BRING IN GROUND CONNECTION (TELEPHONE MAY BE SO EQUIPPED).
4. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR SECOND PARTY IDENTIFICATION, L2 (+) TIP.
5. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL. FOR DIVIDED RINGING [L2 (+) RING TO GROUND] SEE FIG. 2.
6. MATERIAL REQUIRED:
A. RESISTOR, 3000-OHM, 1-WATT, $\pm 5\%$, CARBON, AECO D-284327-A OR EQUIVALENT.

Figure 1. AECo Type 40--Bridged or (-) Ground Ringing.



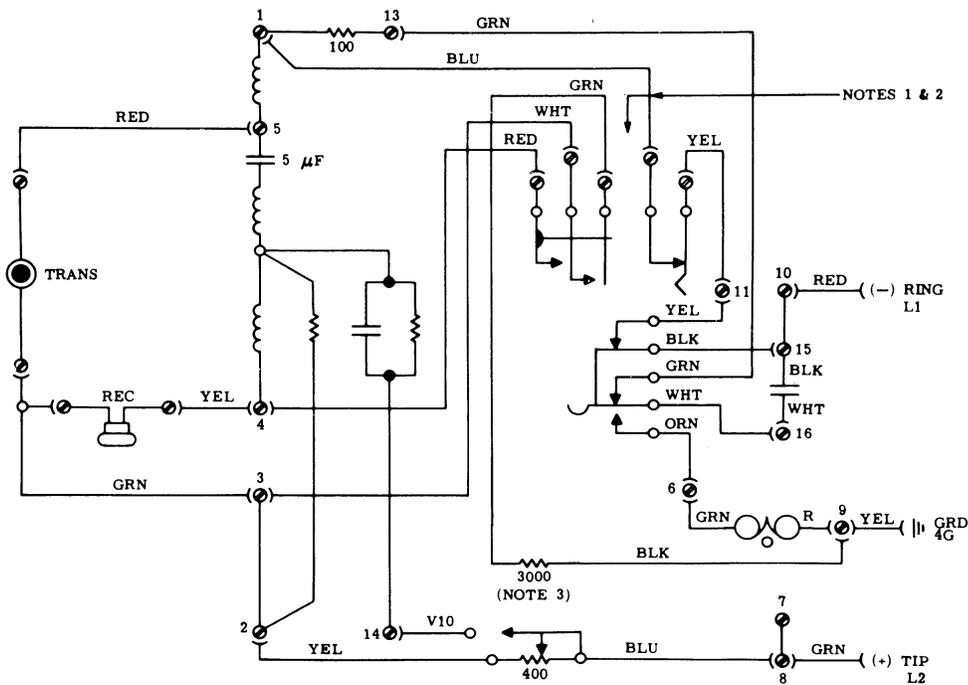
NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 7A) AND WIRING BETWEEN FIRST DIAL SPRING AND TERMINAL G (GROUND).
3. CHANGE WIRING AS FOLLOWS:
A. REMOVE BLK-WHT (OR WHT) LEAD CONNECTED FROM SWITCH HOOK TO TERMINAL 5 (OR TO RINGER).
B. MOVE GRN RINGING CAPACITOR LEAD FROM TERMINAL 4 TO TERMINAL 5.
C. MOVE BRN RINGING CAPACITOR LEAD FROM TERMINAL L1 TO TERMINAL G.
D. MOVE GRN-WHT RINGER LEAD FROM TERMINAL G TO TERMINAL L2.
4. ADD $1 \mu\text{F}$ CAPACITOR (SEE NOTE 7, B AND C) BETWEEN TERMINALS 4 AND L1.
5. FOR BRIDGED RINGING OR DIVIDED RINGING [L1 (-) RING TO GROUND] SEE FIG. 1.
6. ADDITION OF $1 \mu\text{F}$ CAPACITOR IS REQUIRED TO MAINTAIN RC FILTER FOR SPARK SUPPRESSION AND TO PREVENT DIAL PULSE DISTORTION ON LONG OR HEAVILY LOADED LINES.

7. MATERIAL REQUIRED:

- A. RESISTOR, 3000-OHM, 1-WATT, $\pm 5\%$, CARBON, AECO D-284327-A OR EQUIVALENT.
- B. CAPACITOR, $1 \mu\text{F}$, D-68247-B; 6-32 x 3/16 RHIMS; MOUNT IN INSERT ADJACENT TO SWITCH HOOK. THIS CAPACITOR IS FOR USE IN TELEPHONES HAVING TWO-SECTION CAPACITOR MOUNTED ON BASEPLATE; CIRCUIT LABEL D-53940-A.
- C. CAPACITOR, $4 \mu\text{F}/0.7 \mu\text{F}$, D-68640-AR. THIS CAPACITOR IS FOR USE IN TELEPHONES HAVING TWO SEPARATE CAPACITORS, CIRCUIT LABEL D-53688-A. REPLACE $5 \mu\text{F}$ CAPACITOR D-68258-A MOUNTED ON BASEPLATE AND WIRE AS SHOWN IN WIRING DIAGRAM ABOVE. DISREGARD NOTES 3B, 3C, 3D, AND 4. USE BUMPER INSERT (TERMINAL 5) TO TERMINATE RINGER AND CAPACITOR LEADS IN PLACE OF TERMINAL 5. EXISTING $1 \mu\text{F}$ CAPACITOR REMAINS WIRED AS IS.

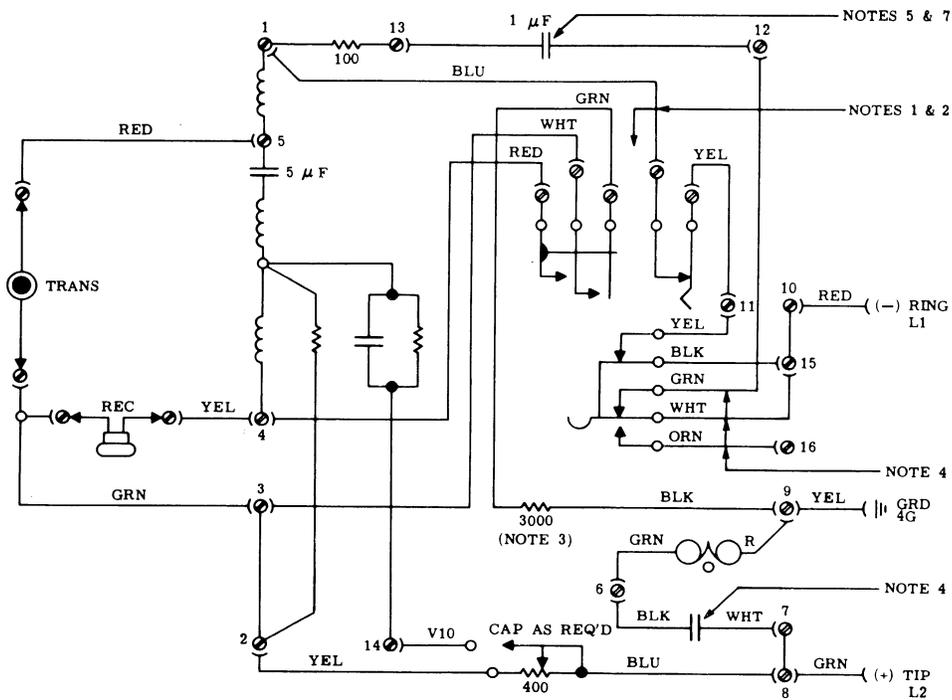
Figure 2. AECo Type 40--Divided Ringing L2 (+) Tip to Ground.



NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. MOVE BLUE DIAL LEAD FROM NO. 1 SHUNT SPRING TO NO. 1 IMPULSE SPRING.
3. ADD RESISTOR (SEE NOTE 6) AND WIRING BETWEEN NO. 1 SHUNT SPRING AND TERMINAL 9 (GROUND).
4. RINGER WIRING IS SHOWN FOR DIVIDED RINGING, L1 (+) TIP TO GROUND. FOR BRIDGED RINGING MOVE RED RINGER LEAD FROM TERMINAL 9 TO TERMINAL 7. FOR DIVIDED RINGING [L2 (+) TIP TO GROUND] SEE FIG. 4.
5. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L2 (+) TIP.
6. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, $\pm 5\%$, CARBON, AECO D-284327-A OR EQUIVALENT.

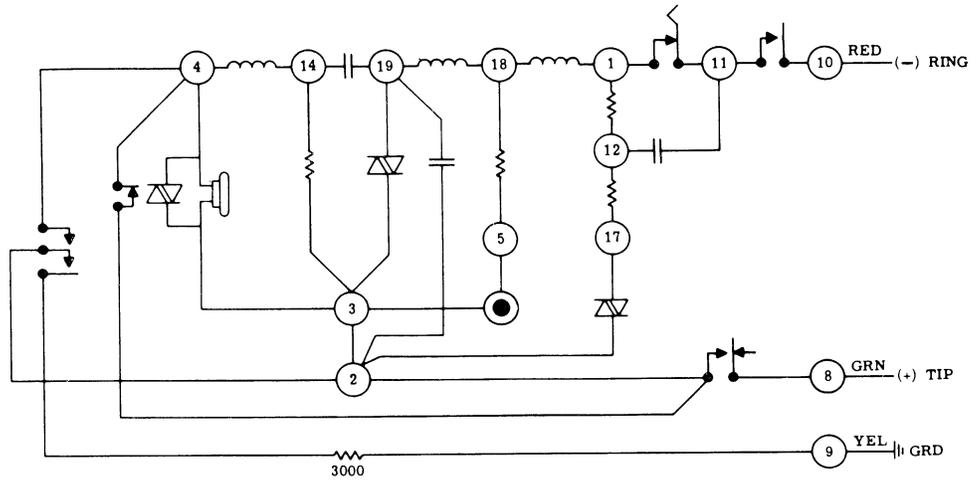
Figure 3. AEC0 Types 80 and 90M—Manually Adjusted, Bridged or (-) Grounded Ringing.



NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. MOVE BLUE DIAL LEAD FROM NO. 1 SHUNT SPRING TO NO. 1 IMPULSE SPRING.
3. ADD RESISTOR (SEE NOTE 8A) AND WIRING BETWEEN NO. 1 SHUNT SPRING AND TERMINAL 9 (GROUND).
4. CHANGE WIRING AS FOLLOWS:
 - A. MOVE BLK AND WHT RINGING CAPACITOR LEADS FROM TERMINALS 15 AND 16 TO TERMINALS 6 AND 7.
 - B. REMOVE ORN SWITCH HOOK LEAD FROM TERMINAL 6 AND DEAD END AT TERMINAL 16.
 - C. MOVE WHT SWITCH HOOK LEAD FROM TERMINAL 16 TO TERMINAL 15.
 - D. MOVE GRN SWITCH HOOK LEAD FROM TERMINAL 13 TO TERMINAL 12.
5. REMOVE FLAT BRACKET AT RIGHT REAR OF TRANSMISSION UNIT AND REPLACE WITH $1 \mu\text{F}$ CAPACITOR AND ASSOCIATED MOUNTING BRACKET (SEE NOTE 8B). CONNECT CAPACITOR LEADS TO TERMINALS 12 AND 13.
6. FOR BRIDGED RINGING OR DIVIDED RINGING [L1 (-) RING TO GROUND] SEE FIG. 3.
7. ADDITION OF $1 \mu\text{F}$ CAPACITOR IS REQUIRED TO MAINTAIN RC FILTER FOR SPARK SUPPRESSION AND TO PREVENT DIAL PULSE DISTORTION ON LONG OR HEAVILY LOADED LINES. IN THE STANDARD CIRCUIT, THE RINGING CAPACITOR PERFORMS THIS FUNCTION.
8. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, $\pm 5\%$, CARBON, AECO D-284327-A OR EQUIVALENT.
 - B. CAPACITOR, $1 \mu\text{F}$, D-68563-A; NUT, D-7700-A; MOUNTING BRACKET, D-731517-A.

Figure 4. AEC0 Types 80 and 90M—Manually Adjusted, Divided Ringing (+) Tip to Ground.

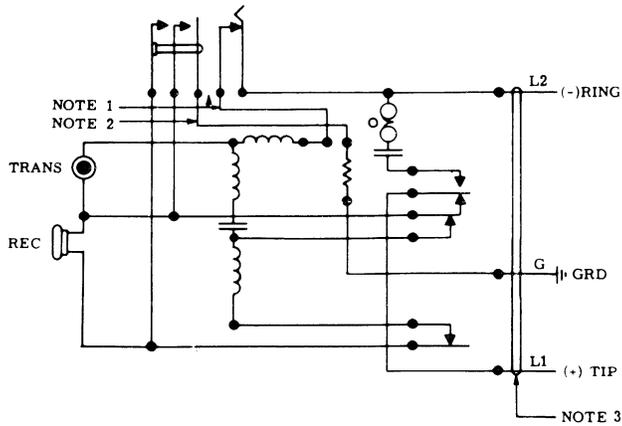


NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 7) BETWEEN NO. 1 DIAL SHUNT SPRING AND TERMINAL 9 OF TRANSMISSION UNIT (OR OTHER APPROPRIATE GROUND TERMINAL).
3. MOVE BLU DIAL LEAD FROM NO. 1 SHUNT SPRING TO NO. 1 IMPULSE SPRING.
4. PROVIDE GROUND LEAD TO TERMINAL BLOCK AND CONNECT WITH YEL LINE CORD LEAD.

5. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L2 (+) TIP.
6. RINGER, IF USED, MUST BE WIRED ACCORDING TO THE SECTION IN THE 473 DIVISION WHICH APPLIES TO THE TELEPHONE BEING MODIFIED.
7. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

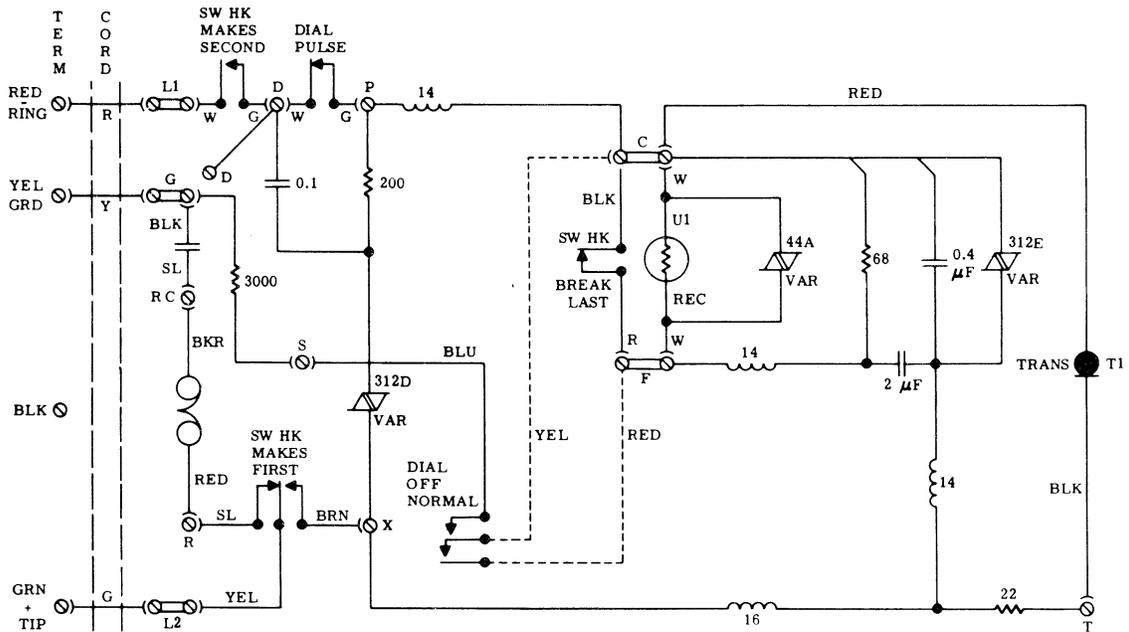
Figure 5. AECO Types 80, 85, 86, 87, 90M, 182, 183 and 880—Self Compensating.



NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 6) AND WIRING BETWEEN FIRST DIAL SHUNT SPRING AND TERMINAL G (GROUND).
3. THREE CONDUCTOR LINE CORD REQUIRED TO BRING IN GROUND CONNECTION (TELEPHONE MAY BE SO EQUIPPED).
4. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR SECOND PARTY IDENTIFICATION, L2 (+) TIP.
5. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
6. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

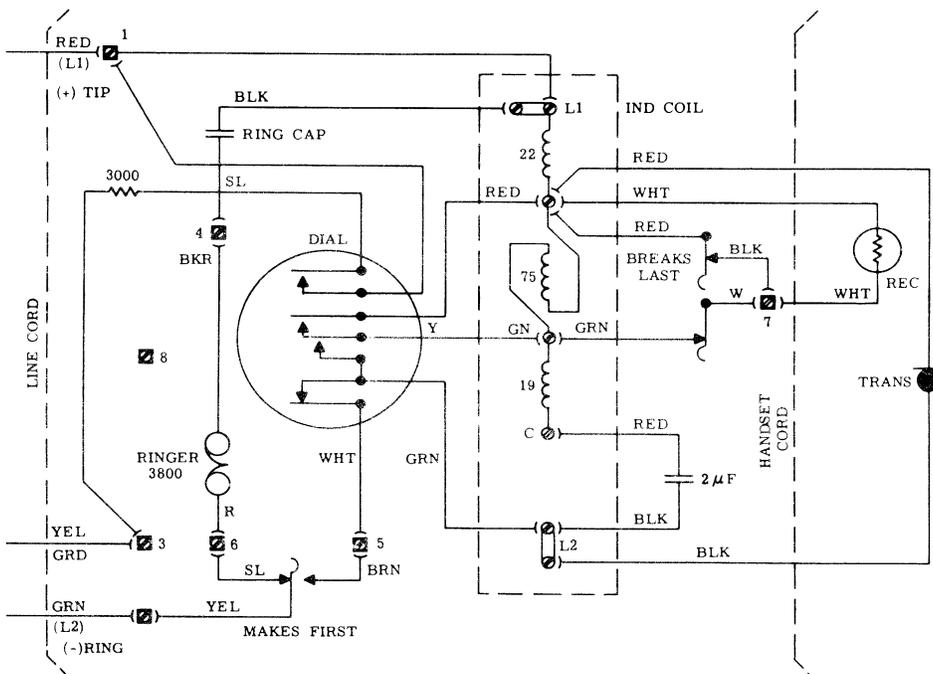
Figure 6. Kellogg 1000.



NOTES:

1. MOVE BLUE DIAL LEAD FROM TERMINAL X TO TERMINAL S.
2. ADD RESISTOR (SEE NOTE 5) AND WIRING BETWEEN TERMINAL G AND TERMINAL S.
3. POLARITY MUST BE MAINTAINED FOR TIP PARTY IDENTIFICATION, L2 (+) TIP.
4. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
5. MATERIAL REQUIRED:
A. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

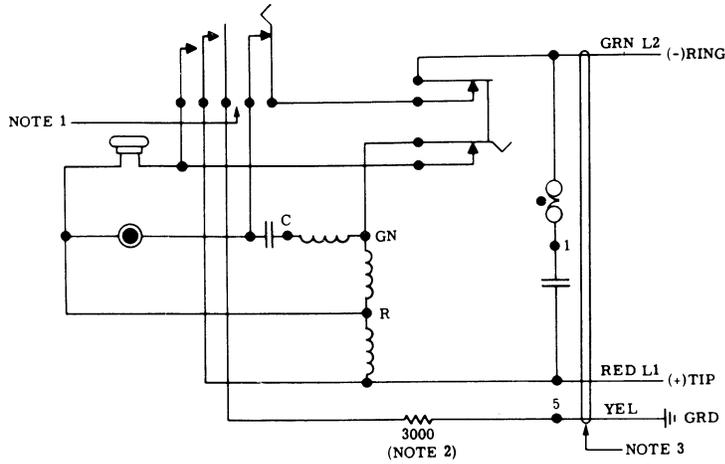
Figure 7. Leich 100.



NOTES:

1. CHANGE DIAL TO AECO D-84864-C (TYPE 51A; CONTAINS AN EXTRA PAIR OF SHUNT "MAKE" SPRINGS).
2. ADD RESISTOR (SEE NOTE 5) AND WIRING BETWEEN FIRST DIAL SHUNT SPRING AND TERMINAL 3 (GROUND).
3. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR TIP PARTY IDENTIFICATION, L1 (+) TIP.
4. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
5. MATERIAL REQUIRED:
A. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

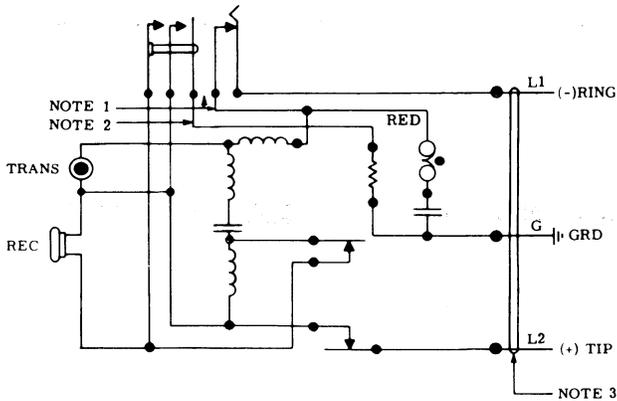
Figure 8. Leich 700.



NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 6) AND WIRING BETWEEN FIRST DIAL SHUNT SPRING AND TERMINAL 5 (GROUND).
3. THREE CONDUCTOR LINE CORD REQUIRED TO BRING IN GROUND CONNECTION (TELEPHONE MAY BE SO EQUIPPED).
4. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L1 (+) TIP.
5. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
6. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

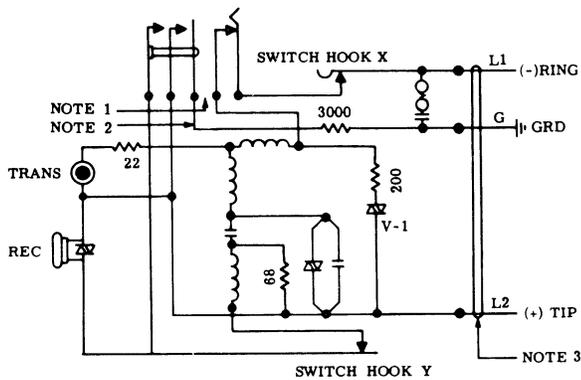
Figure 9. North Electric 6 and 7H.



NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 6) AND WIRING BETWEEN FIRST DIAL SHUNT SPRING AND TERMINAL G (GROUND).
3. THREE CONDUCTOR LINE CORD REQUIRED TO BRING IN GROUND CONNECTION (TELEPHONE MAY BE SO EQUIPPED).
4. POLARITY OF LINE MUST BE MAINTAINED FOR PARTY IDENTIFICATION, L2 (+) TIP.
5. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
6. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

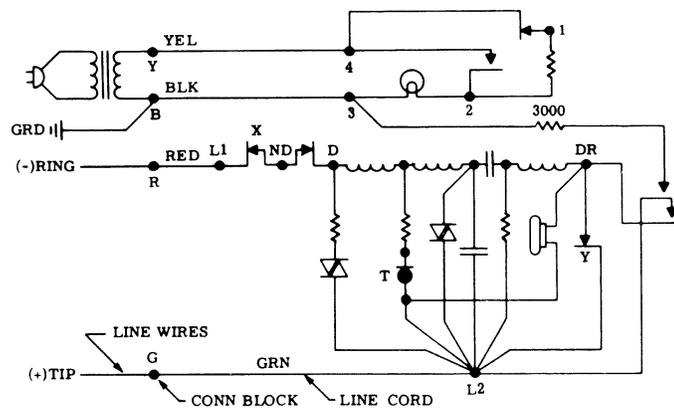
Figure 10. Stromberg Carlson 1243 and 1443.



NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 6) AND WIRING BETWEEN FIRST DIAL PULSE SPRING AND TERMINAL G (GROUND).
3. THREE CONDUCTOR LINE CORD REQUIRED TO BRING IN GROUND CONNECTION (TELEPHONE MAY BE SO EQUIPPED).
4. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L2 (+) TIP.
5. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
6. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, $\pm 5\%$, CARBON, AECO D-284327-A OR EQUIVALENT.

Figure 11. Stromberg Carlson 1543W.

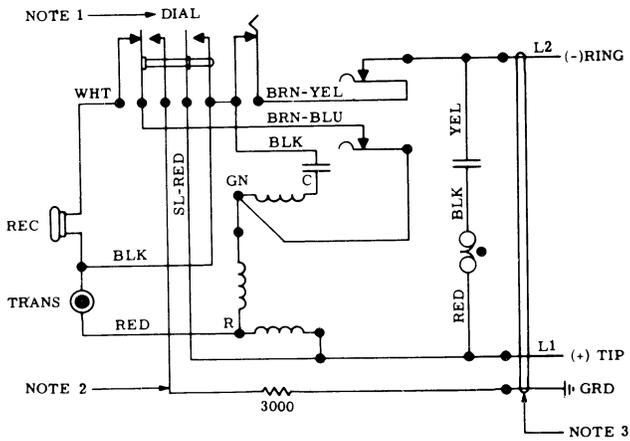


NOTES:

1. REMOVE TERMINAL LINK FROM DIAL.
2. ADD RESISTOR (SEE NOTE 5) BETWEEN FIRST DIAL SHUNT SPRING AND TERMINAL 3.
3. IF TRANSFORMER IS NOT GROUNDED, ADD GROUND LEAD AND CONNECT TO TERMINAL B AT TERMINAL BLOCK.
4. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L2 (+) TIP.
5. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, $\pm 5\%$, CARBON, AECO D-284327-A OR EQUIVALENT.

Figure 12. Stromberg Carlson 1600W.

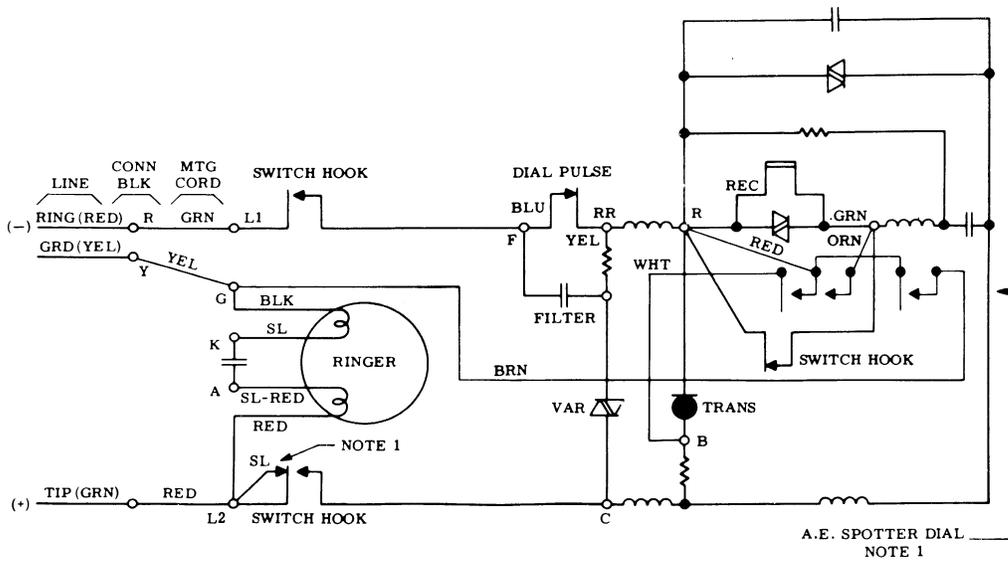
SECTION 473-002-800
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NOTES:

1. DIAL MUST HAVE 5-SPRING SHUNT (BREAK-MAKE AND A BREAK). REMOVE EXISTING DIAL AND INSTALL REPLACEMENT DIAL (SEE NOTE 6A). TERMINATE EXISTING DIAL LEADS AS SHOWN ABOVE.
2. ADD RESISTOR (SEE NOTE 6B) AND WIRING BETWEEN THIRD DIAL SHUNT SPRING AND GND (GROUND) TERMINAL.
3. THREE CONDUCTOR LINE CORD REQUIRED TO BRING IN GROUND CONNECTION (TELEPHONE MAY BE SO EQUIPPED).
4. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L1 (+) TIP.
5. MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
6. MATERIAL REQUIRED:
 - A. DIAL, TYPE 52, AECO Z-24613-1 OR EQUIVALENT.
 - B. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

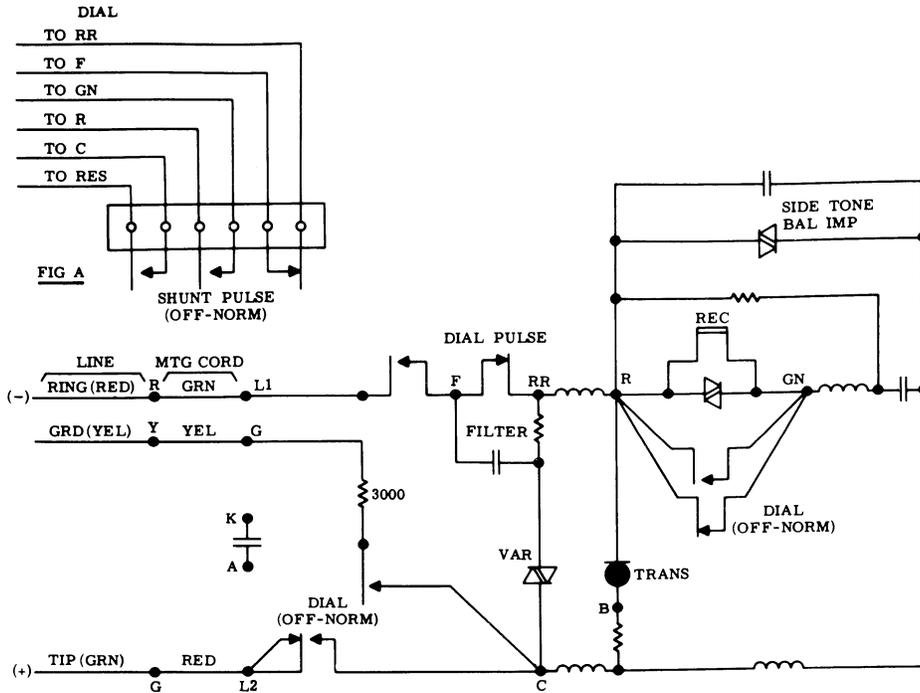
Figure 13. WECO 302.



NOTES:

1. REMOVE EXISTING DIAL. FOR PARTY 3, INSTALL SATT B DIAL LOBE POSITION O (SEE NOTE 4A). FOR PARTY 4, INSTALL SATT B DIAL LOBE POSITION 9 (SEE NOTE 4B). NECESSARY MOUNTING MATERIAL IS INCLUDED WITH DIAL.
2. FOR OTHER THAN TIP RINGING, MAKE RINGER CONNECTIONS ACCORDING TO WIRING LABEL.
3. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY 3 AND PARTY 4 IDENTIFICATION, L2 (+) TIP.
4. MATERIAL REQUIRED:
 - A. AECO SATT B DIAL ASSEMBLY, Z-26090-3 (BLACK).
 - B. AECO SATT B DIAL ASSEMBLY, Z-26090-1 (BLACK).

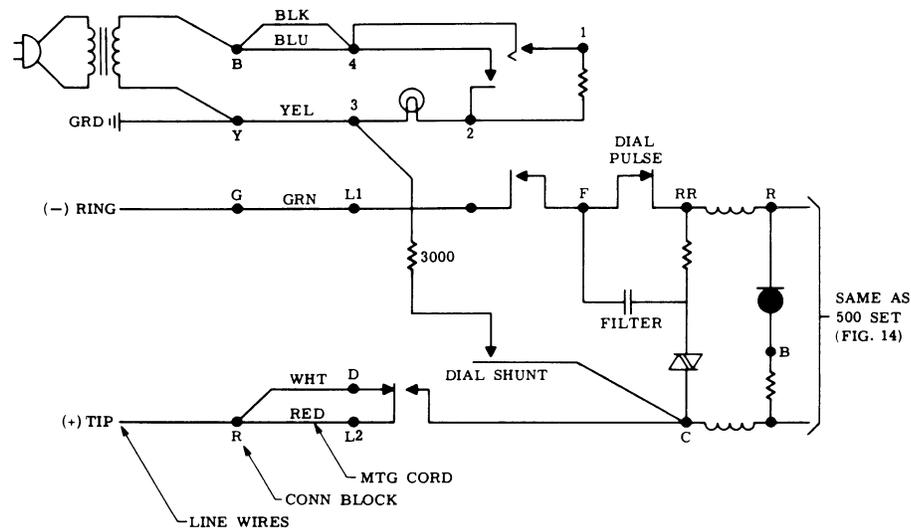
Figure 14. WECO 500 with SATT Dial (for Parties 3 and 4).



NOTES:

1. DIAL MUST HAVE 4-SPRING SHUNT (2 MAKE SETS). REMOVE EXISTING DIAL AND INSTALL REPLACEMENT DIAL (SEE NOTE 5, A THROUGH E). TERMINATE IMPULSE AND FIRST PAIR OF SHUNT SPRINGS AS SHOWN IN FIG. A.
2. ADD RESISTOR (SEE NOTE 5F) BETWEEN ONE TERMINAL OF ADDITIONAL DIAL SHUNT SPRING AND TERMINAL G (GROUND).
3. ADD LEAD BETWEEN TERMINAL OF OTHER ADDITIONAL DIAL SHUNT SPRING AND TERMINAL C.
4. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L2 (+) TIP.
5. MATERIAL REQUIRED:
 - A. DIAL, TYPE 52, AECO Z-24613-2 (OR WECO TYPE 7G-3).
 - B. ADAPTER, DIAL MOUNTING, D-780685-A.
 - C. BRACKET, ADAPTER, D-731923-A.
 - D. 4-36 SCREWS (3 REQUIRED), D-760730-A.
 - E. 6-32 x 3/8 BGG, SHIMS (3 REQUIRED).
 - F. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.

Figure 15. WECo 591.



NOTES:

1. REMOVE WECO TYPE 8A DIAL AND INSTALL WECO TYPE 8B DIAL WHICH HAS TWO MAKES ON SHUNT.
2. ADD RESISTOR (SEE NOTE 6) BETWEEN ONE SPRING OF ADDITIONAL SHUNT AND TERMINAL 3 OF TB-1.
3. CONNECT SECOND SPRING OF ADDITIONAL SHUNT TO TERMINAL C.
4. CONNECT (-) RING WIRE TO TERMINAL G OF CONNECTING BLOCK. CONNECT (+) TIP WIRE TO TERMINAL R OF CONNECTING BLOCK.
5. POLARITY OF LINE MUST BE MAINTAINED AS SHOWN FOR PARTY IDENTIFICATION, L2 (+) TIP.
6. MATERIAL REQUIRED:
 - A. RESISTOR, 3000-OHM, 1-WATT, ±5%, CARBON, AECO D-284327-A OR EQUIVALENT.
 - B. WECO TYPE 8B DIAL.
7. IF EITHER WECO E1A RINGER OR WECO 1610A INDUCTOR IS USED, CONNECT PER WECO INSTRUCTIONS AND DISREGARD ABOVE.

Figure 16. WECo 701B.

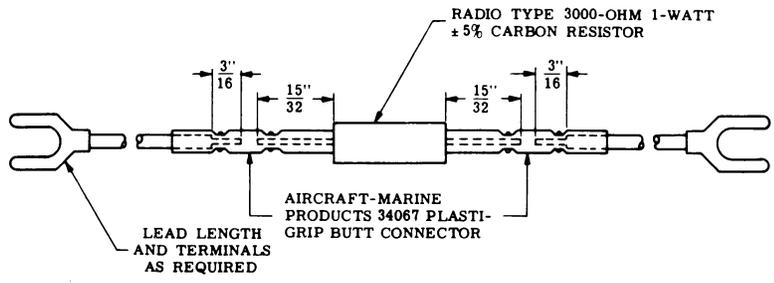


Figure 17. AECo Resistor Assembly D-284327-A.

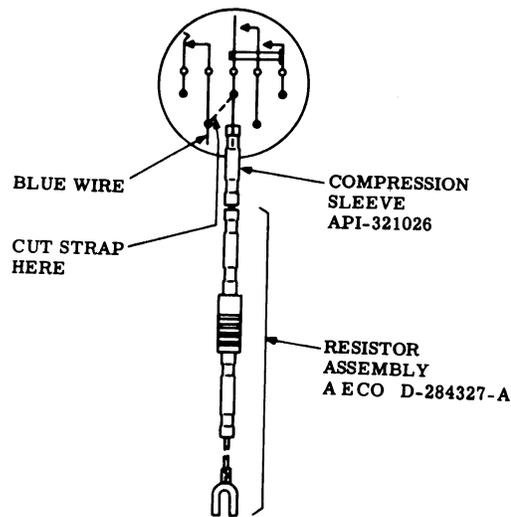


Figure 18. AECo Dial Modified for Second Party SATT Detection.