

SERVICE

INDUCTIVE NOISE

1. GENERAL

1.01 This section covers the corrective measures which are used to minimize inductive noise.

1.02 This section is reissued to:

- Revise Part 5
- Revise Table A
- Change Fig. 5

1.03 Inductive noise is caused by the electromagnetic field of:

- Power circuits
- Transformers
- Neon lights
- Fluorescent lights
- Office machines

Such fields create foreign voltages on the telephone circuit. Unbalance of the telephone circuit will result in noise.



Station apparatus and associated wiring should not be located closer to possible sources of inductive noise than the separations specified in Division 461 sections covering wiring and clearances.

2. CONTROL OF INDUCTIVE NOISE

2.01 Poor insulation or resistance unbalance of the telephone circuit contributes to noise resulting from inductive interference. Locating and eliminating the cause of high leakage or resistance unbalance may adequately solve the problem.

2.02 When noise is encountered, the steps required for the control of inductive noise (in order of practical application) are:

- (1) Balance line/replace low impedance ringers
- (2) Install 3-element tube
- (3) Install 4-element tube
- (4) Install solid state ringer isolator
- (5) Install 11A extender
- (6) Install D-180489 Kit of Parts.

3. TUBES AND RINGER ISOLATOR

3.01 Typical connections of tubes and ringer isolator are shown in Fig. 3 through 6.



The limitations on the number of tube equipped ringing bridges and the permissible loop resistance are more restricted than for regular capacitor-type ringing bridges. The reduction in limitations is different for various central office ringing arrangements. For the limitations, refer to Section 500-114-100.

3-Element Tube 426-Type

- All party services except with tip party identification

Note: At negative stations using 96-volt long line circuits, (R) tube lead must be connected to ground.

4-Element Tube 425-Type

- All party services except with tip party identification

Note: When a station set is equipped with a 425A tube and used with 96-volt dial long

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line circuit install a 542K, 5 μ f capacitor (furnished locally) in series with the (G) tube lead using any spare terminal or D-161488 connector.

Ringer Isolator D-180036

- 2-party service
- 2-party service with tip party identification
- 4-party service semiselective ringing.

Ringer Isolator (D-180036 Kit of Parts)

3.02 The ringer isolator may be used in cases where the central office is not equipped to provide superimposed ringing, or in grounded ringing arrangements with 96-volt long line circuits where a tube is not required.

3.03 The ringer isolator is intended for use with all grounded ringers where there is a noise problem except those ringers used in 4-party full selective and 8-party semiselective ringing service. The ringer isolator may be used at subscriber stations requiring tip party identification. Identification connections are made in the normal manner, but only the 2650-ohm identification circuit should be used. The 1000-ohm identification circuit should not be used because excessive noise may be induced on the line. One ringer isolator is required for each grounded ringer.

3.04 Refer to Table A for modifications of the AC1 or AD1 TRIMLINE® base when used in conjunction with a ringer isolator.



Lines equipped with ringer isolators or extenders may be tested for continuity by conventional test desk procedures, if test desk has been modified for this test. The circuit allows operation of the ringer isolator or extender without ringing the telephone set.

4. 11A EXTENDER

4.01 The 11A extender can be used in place of the 425A or 426A electron tube to provide additional ringing range and ringer isolation on 4-party full selective and 8-party semiselective ringing. It can also be used in place of the D-180036 ringer isolator to provide ringer isolation on one and two party lines as well as on multiparty divided code lines. Refer to Section 501-322-101 for connection information.

5. D-180489 KIT OF PARTS

5.01 The D-180489 Kit of Parts is used to eliminate noise in subscriber lines associated with automatic number identification by providing a balanced ground path when tip party identification is provided in 500-, 554-, ♦702-, ♦2500-, 2554-, and ♦2702-type♦ telephone sets. Refer to Section 501-376-100 for connection information.

TABLE A

**MODIFICATION AND CONNECTIONS OF AC1 AD1 TRIMLINE®
BASE FOR RINGER ISOLATOR (FIG. 5)**

WIRE OR LEAD		COLOR	REMOVE FROM		CONNECT TO TERM. BOARD	CONNECT TO 74-TYPE CONN BLK	
			AC1	AD1			
Line Wire	Ring	R				4	
	Tip	G				5	
	Grd	Y				1	
	BATT	BK				3	
Mtg Cord AD1 Base (Note 4)		R				4	
		G				5	
		[Y] (W)					2
		BK					3
		[W] (Y)					1
Inside Wire AC1 Base (Note 4)		R			L2	4	
		G			L1	5	
		Y			A	2	
		BK			1	3	
		R†			3	1	
Ringer Isolator		R				5	
		G				4	
		Y				1	
		BK				2	
Ringer		BK	L1	G	3		
		S	B	B	Note 3		
Strap		Y		G	A		
Line Switch		S	A	A	*		

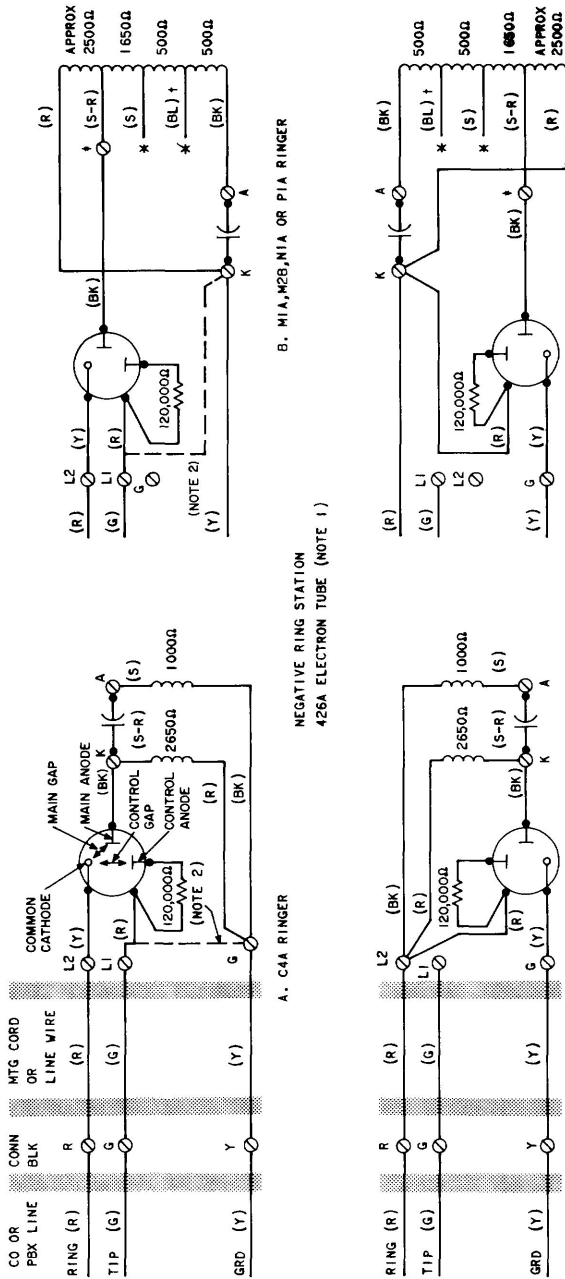
* Insulate and store.

† First conductor of second inside wire (quad).

[] Early model manufactured prior to 10-1-72.

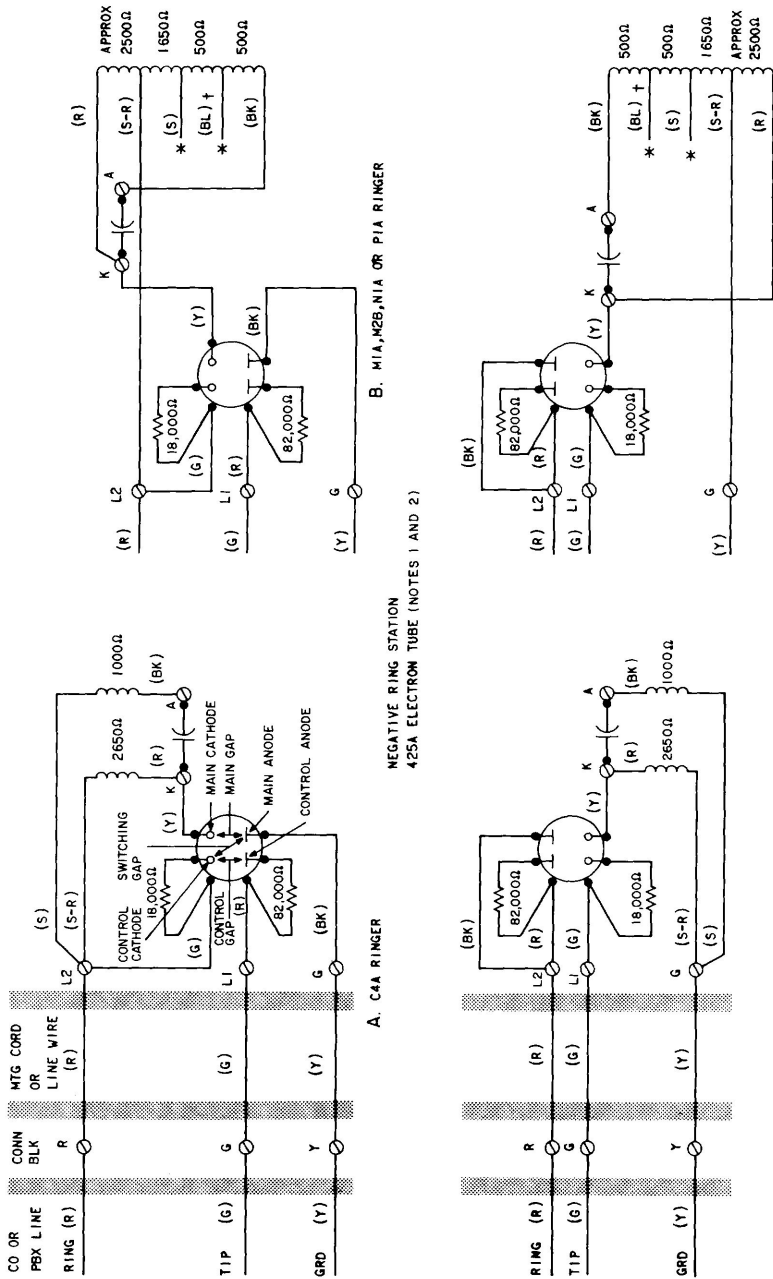
() Current production model.

- Notes:*
1. Connections are for ring party, reverse tip and ring line wire leads for tip party.
 2. Use 74-type connecting block for housing ringer isolator and terminating mounting cord or inside wire, disconnect and store 425A electron tube leads.
 3. Connect to terminal B for tip party identification.
 4. Disconnect (BK) strap at terminal L2, insulate and store.



- NOTES:**
1. FOR TIP STATION, REVERSE TIP AND RING LEADS AT CONNECTING BLK (OR EQUIVALENT).
 2. WHERE RINGER OPERATION IS MARGINAL AT STATIONS WITHOUT ANI, (R) TUBE LEAD MAY BE CONNECTED TO GROUND. AT STATIONS USING 96V LONG LINE CIRCUITS, (R) LEAD MUST BE CONNECTED TO GROUND.
- * INSULATE AND STORE
 - † (BL) LEAD REMOVED FROM LATER MODEL P1A RINGERS
 - ‡ D-161488 CONNECTOR OR SPARE TERMINAL

Fig. 1—3-Element Tube, Typical Ringing Bridge Connections



B. M1A, M2B, N1A OR P1A RINGER

B. M1A, M2B, N1A OR P1A RINGER

A. C4A RINGER

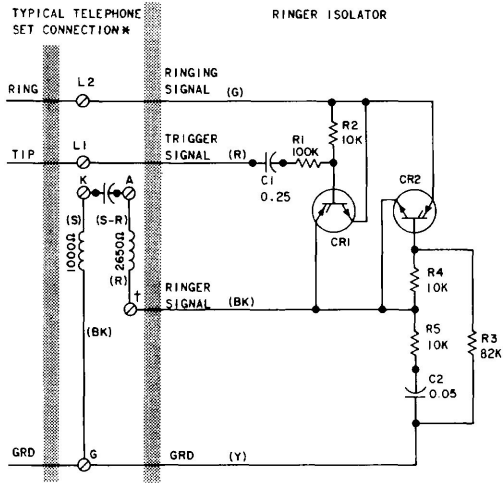
A. C4A RINGER

NEGATIVE RING STATION
425A ELECTRON TUBE (NOTES 1 AND 2)

POSITIVE RING STATION
425A ELECTRON TUBE (NOTES 1 AND 2)

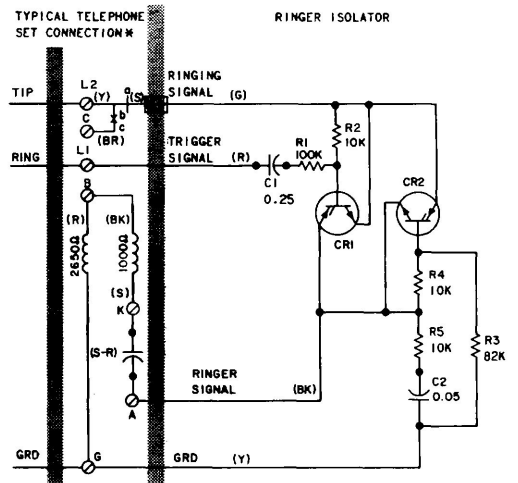
- NOTES:
1. WHEN A STATION SET IS EQUIPPED WITH A 4-ELEMENT 425A ELECTRON TUBE AND USED WITH 96 VOLT DIAL LONG LINE CIRCUIT, INSTALL A .542K CAPACITOR .50F (FURNISHED LOCALLY) IN SERIES WITH THE (G) TUBE LEAD USING ANY SPARE TERMINAL OR D-151488 CONNECTOR.
 2. FOR TIP STATION, REVERSE TIP AND RING LEADS AT CONNECTING BLK (OR EQUIVALENT) * INSULATE AND STORE † (BL) LEAD REMOVED FROM LATER MODEL P1A RINGERS

Fig. 2—4-Element Tube, Typical Ringing Bridge Connections



* RING STATION. FOR TIP STATION REVERSE TIP AND RING LEADS AT CONNECTING BLOCK (OR EQUIVALENT).
 † USE SPARE TELEPHONE SET TERMINAL OR D-161488 CONNECTOR.

Fig. 3—Ringer Isolator, Typical Connections Using C4A Ringer Without Identifying Ground



* TIP STATION WITH IDENTIFYING GROUND
 † USE SPARE TELEPHONE SET TERMINAL OR D-161488 CONNECTOR

Fig. 4—Ringer Isolator, Typical Connections Using C4A Ringer With Identifying Ground

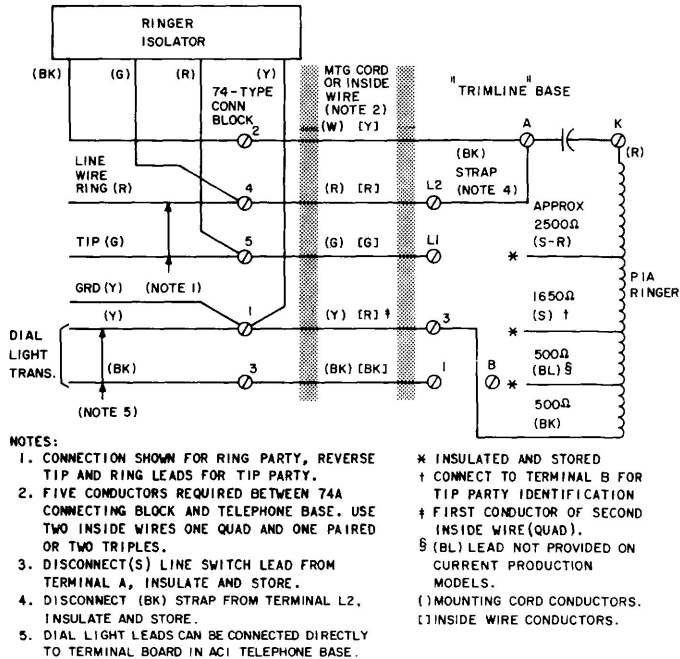
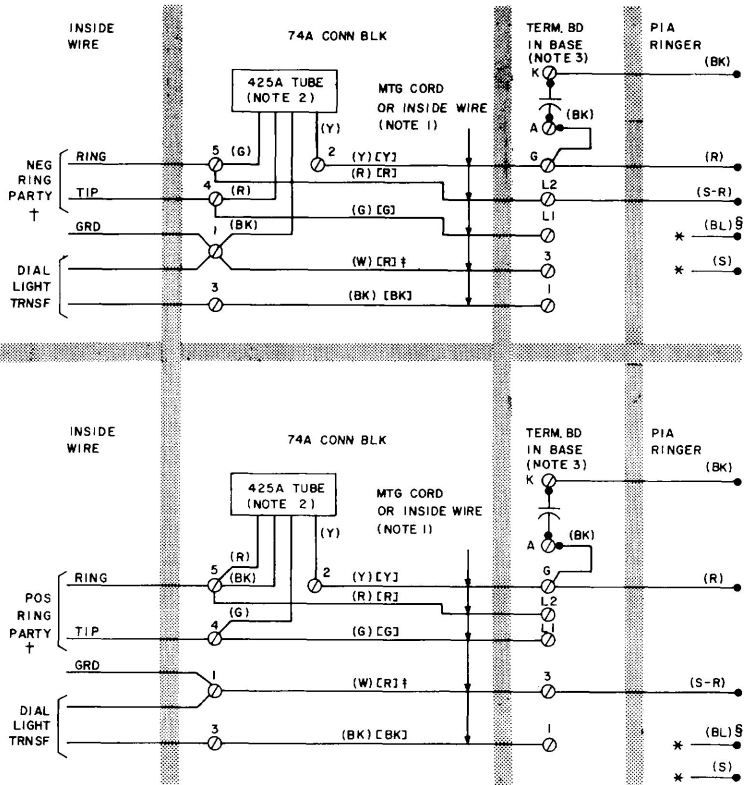


Fig. 5—Ringer Isolator, TRIMLINE® Set Connections for AC1 and AD1 Telephone Bases



NOTES:

1. TWO INSIDE WIRES ARE REQUIRED WITH ACI BASE ; ONE QUAD AND ONE PAIRED OR TWO TRIPLES.
 - () MOUNTING CORD CONDUCTORS
 - [] INSIDE WIRE CONDUCTORS
 - * INSULATE AND STORE.
 - † FOR TIP STATION REVERSE RING AND TIP LEADS AT CONNECTING BLOCK OR EQUIVALENT.
 - ‡ FIRST CONDUCTOR OF SECOND INSIDE WIRE (QUAD).
 - § (BL) LEAD NOT PROVIDED ON CURRENT PRODUCTION MODELS.
2. WHEN A STATION SET IS EQUIPPED WITH A 4-ELEMENT 425A ELECTRON TUBE AND WITH 96 VOLT DIAL LONG LINE CIRCUIT, INSTALL A 542K CAPACITOR .5UF (FURNISHED LOCALLY) IN SERIES WITH THE (G) TUBE LEAD USING ANY SPARE TERMINAL OR D-161488 CONNECTOR.
 3. JISCONNECT (S) LINE SWITCH LEAD FROM A ON TERMINAL BOARD, INSULATE AND STORE.

Fig. 6—4-Element Tube, TRIMLINE Set Connections