

## INDUCTIVE NOISE

### 1. GENERAL

**1.01** This section contains information on causes and effects of inductive noise at subscriber station.

**1.02** This section is reissued to:

- Delete all connection information. (This information has been incorporated into Division 501.)
- Incorporate information formerly contained in Section 500-112-400.

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.03** Inductive noise, as used in this section, occurs when telephone stations are within 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 and low frequency hum.



***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** The balance-to-ground of the customer station sets is often the controlling factor in the susceptibility to inductive noise.

**Note:** The unbalance between the two sides of a line which has only the capacitance afforded by the air dielectric between the tip and ring shall not exceed three volts on the meter at the local test desk.

**2.03** The unbalances due to nongrounded ringers are small and noise resulting from the action of induced voltages on these unbalances is usually negligible.

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

- (a) Balance line.
- (b) Isolate ringer.
- (c) Install D-180489 Kit of Parts, if Automatic Number Identification (ANI) is provided.

#### ***Line Balance***

**2.05** Whatever other corrective measures may be taken to eliminate an inductive noise problem, it is essential that the line be balanced in order to be effective. Even the type of ringer being used affects the situation.

**2.06** B-type ringers, which were manufactured with magnetic iron core ringer coils, have red-striped markings on both coil covers. These

#### **NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

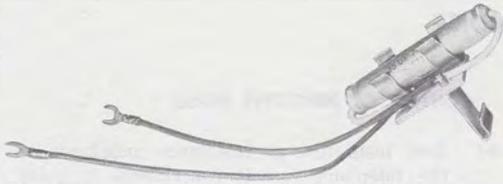


Fig. 1—D-180327 Kit of Parts

red-striped ringers are lower in impedance and increase the susceptibility to inductive noise when used for grounded ringing.

**2.07** All low-impedance ringers on grounded ringing lines troubled with inductive noise should be replaced by high-impedance capacitor-type ringing bridges i.e. C4-type or equivalent.

#### *Devices To Minimize Inductive Noise*

**2.08** Different electrical devices may be used to minimize the effect of inductive noise where encountered.

**2.09** When the inductive noise is excessive on lines with high-impedance capacitor-type grounded ringing bridges, ringer isolators may be utilized to minimize the effects of the induced voltage.

**2.10** From the standpoint of susceptibility to inductive noise, a grounded station ringer equipped with a ringer isolator is equivalent to a nongrounded ringer (if the induced voltage between the line and ground is not high enough to exceed the limits of the ringer isolator, and that tip party identification is not provided).

**2.11** Refer to Section 500-114-100 for selection of coupling devices.

### 3. MULTISLOT COIN STATIONS

**3.01** Multislot prepay coin collectors are susceptible to inductive noise in exposed areas. Older types of prepay coin collectors have a large shunt unbalance caused by the connection of the coin relay from one side of the line to ground. Later types correct this unbalance by use of center-tapped 101B induction coils or 425- or 4010-type networks with the coin relay connected from the center tap (balance point) to ground.

**3.02** Where noise problems arise with older type coin collectors, it will be necessary to replace the coin collector with one employing a 425- or 4010-type network.



*The single slot coin telephone sets are much less susceptible to inductive noise and should be used in place of multislot coin collectors since they use a ground-lifting relay (in DTF systems) to effectively reduce inductive interference.*

**3.03** The electromagnet associated with coin operation is connected in series with the line. In order to minimize the effect of the electromagnet on transmission, a 452A or 452B 4-uf capacitor is connected in parallel with it. In areas of low-frequency inductive interference it may be necessary to increase the size of this capacitor to keep the noise pickup within acceptable limits. A D-180327 Kit of Parts (Fig. 1) is available for this purpose and is intended for use in all 200-type coin collectors using a 425- or 4010-type network. It replaces the 452A or 452B capacitor.

**3.04** The D-180327 Kit of Parts will not fit in the 3-slot panel, 235- and 1235-type coin collectors.