

## CODE CALLING SYSTEMS 1A AND 1B TESTS AND ADJUSTMENTS

### 1. GENERAL

1.01 This section covers the tests and adjustments to be made on the apparatus associated with the 1A and 1B Code Calling Systems including the signals which are also used in conjunction with the 2A and 2B Code Calling Systems covered in the P.B.X. Installation and Maintenance Practices.

1.02 This section is reissued to convert it to letter size and to incorporate material from the addendum in its proper location. In the process of this conversion, marginal arrows have been omitted.

1.03 The commercial power supply should be disconnected from the apparatus before disconnecting the signals or attempting any repairs. Disconnection of the power supply will not usually be necessary when making tests and adjustments.

1.04 If any operating or key unit or apparatus part becomes defective and cannot be adjusted by the methods described in this section a new unit or part shall be installed and the defective unit or part shall be returned for repair.

### 2. CODE SENDING STATION

2.01 A method of disassembling and reassembling the code sending station is shown in Fig. 1.

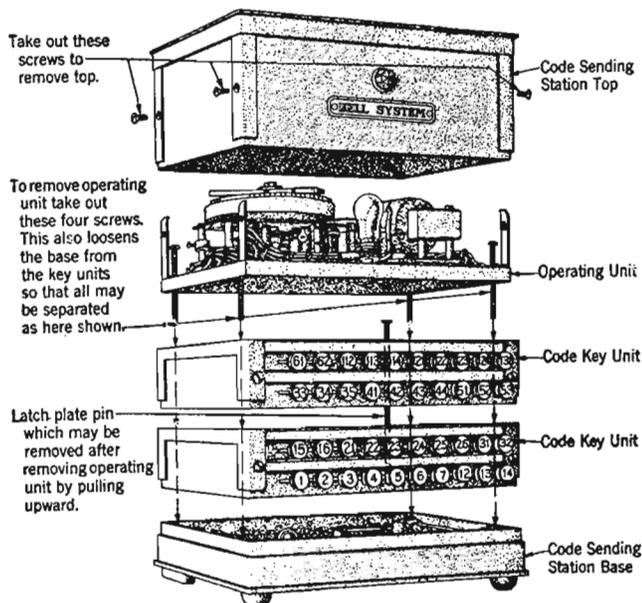


Fig. 1—40-Code Sending Station for 1A System

2.02 **Cleaning:** Dust and metallic particles shall be removed from the commutator of the operating unit by wiping with KS-2423 Cloth. Do not use ordinary rags or cheesecloth, as lint may get into the operating unit mechanism.

2.03 **Lubrication:** On the List 1 units there are two bearings at the end of the cam shaft opposite the motor, one supporting the main cam shaft and the other the cam which controls the motor circuit. List 2 units have, in addition, a bearing at each end of the upper cam shaft. All bearings are equipped with oil-saturated felt washers. When lubrication becomes necessary, these bearings should be lubricated with KS-7470 oil applied to the felt washers or by touching the washers with a piece of bare wire which has been dipped into the oil. The bearings of the List 1 units may be reached by removing the back of the set. However, it will be necessary to remove the List 2 unit from the case for lubrication by removing the screws from the bottom of the case. The two bearings for the upper cam shaft then may be reached from the top of the unit. The bearing for the lower cam shaft and for the motor control cam may be reached from the bottom of the unit. Oil should be applied sparingly to the teeth of the gears connecting the upper and lower cam shafts.

**Note:** The motor is a sealed unit and needs no lubrication.

2.04 **Armature Spring:** The retractile spring referred to in Fig. 2 is for the purpose of pulling the armature away from the pole face and ordinarily requires no adjustment in the field.

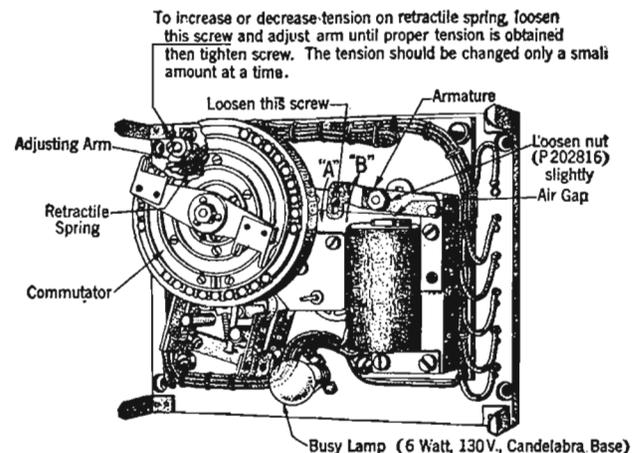


Fig. 2—Operating Unit of Code Sending Station

2.05 **Speed:** The code sending station should complete one cycle (3 complete codes) for signal 26 in approximately 30 seconds. Replace the code sender, if necessary, as there is no adjustment for speed of the synchronous motor.

2.06 **Busy Lamp:** Note that the busy lamp flashes the selected code as the signals sound. Replacement lamp, NE45-1/4 watt, 110 to 125 volt, candelabra base.

2.07 **Key Units** require no adjustments or lubrication. Replace any units that become defective.

2.08 **Cords and Plugs** shall be replaced if found badly frayed or defective.

**3. RELAY SETS**

3.01 The KS-8230-L1 and L2 relay sets have carbon contacts to take the arcing that occurs due to signal lines being equipped with a large number of signals. These carbon contacts, when badly worn, may be replaced with new carbon contacts.

3.02 The relays and other parts of transformer relay sets used on 1B Code Calling Systems do not normally require any adjustments. If any of these units become defective, replace with a new or repaired unit.

3.03 The relays in the KS-7340 and KS-7357 relay sets and the KS-8233-L2 transformer relay set have a two-position armature air gap. The close air gap should be used for manual ringing telephone lines and the wide air gap should be used for machine ringing telephone lines, especially in dial areas.

**4. SIGNALS**

4.01 **Bells and Chime Signals** require no adjustment or lubrication except the chime signals which have an adjusting screw at the bottom of the plunger guide for adjusting the volume of the signal. The volume should be adjusted to meet the subscriber's requirements. If plunger should stick in its guide, remove guide and plunger if practicable and clean with carbon tetrachloride. If it is impracticable to remove these parts or cleaning does not correct difficulty in those cases where the plunger and guide can be removed, replace the entire signal.

4.02 **Horns:** Foreign substances may collect between the diaphragm and the front plate. In these cases remove front plate and brush out the dirt (horn plate position should be noted at the time of removal, so it may be replaced in its identical position). The volume of sound emitted by horns may be adjusted by means of a screw and lock nut which is provided for this purpose. As in the case of bells, the volume should meet the subscriber's requirements. Defective horns shall be replaced.

4.03 **Signals having relays which operate on telephone ringing voltage** have a two-position armature air gap. The close air gap should be used for manual ringing telephone lines and the wide air gap should be used for machine ringing telephone lines, especially in dial areas.

**5. TESTS**

5.01 If the code calling system becomes inoperative, check the 312002 Littelfuse inside the code sender and those in the power supply circuits.

5.02 After making any adjustments or replacements in the code calling apparatus, test the system by sending one of the codes, preferably a code that is unassigned by the subscriber.

5.03 See that all signals are operative and that their volume is satisfactory to the subscriber.

5.04 Note whether the speed of the operating unit in the code sending station is within the specified limits and that the busy lamp in the top of the code sending station is operative.

5.05 If night connection arrangements are provided connect the code calling system for night connections and have the attendant ring the extension station with which the code calling system is associated. Note that the signals sound once each time ringing current is applied to the extension station.

5.06 If any particular signal or group of signals become inoperative inspect the signal control relay set or transformer relay set associated with the signals and the relays in the signals, if the signals are equipped with relays. Replace any defective apparatus. Difficulty might also be present in the telephone wiring and connections and if so, should be corrected. Defective power wiring, appliance outlets, etc., should be brought to the attention of the subscriber who should arrange to have the defects corrected by an electrician.

5.07 Check the starting, running, and pulsing contacts in the code sender for failure to operate properly, or for dirt.

**Notes:** Power should be disconnected from the set before cleaning or adjusting any contacts.

The pair code contacts on the List 1 sender may be burnished by removing the back of the set. The two pairs of contacts on the List 2 sender are accessible for burnishing only when the unit has been removed from the housing. Contact pressure may be established at the code contacts for the burnishing operation by pressing on the contact operating bar. In order to burnish the starting or motor control contacts of either List 1 or List 2 it will be necessary to remove the unit from the housing. Contact pressure at the starting contacts may be established by fully depressing any key. The motor control contacts can be burnished if the motor is stopped before the cam reaches the end of the cycle, i.e. contacts are closed.

5.08 When the selector switch is in the "N" position check that the code is repeated only three times before stopping. When the selector switch is in the "C" position check that the code is repeated continuously or until the switch is restored to the "N" position after which the sender will complete its cycle and stop.

**6. RADIO INTERFERENCE**

6.01 When trouble is encountered with radio interference and the source has been determined to be either the code sending station or signals, refer this condition to your supervisor or to the engineering department.