31-A TELEGRAPH RELAYS
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.1 This section covers the installation and maintenance requirements for the 31-A polar telegraph relay. Unless otherwise specified herein or in the "Circuit Requirements Tables" on circuit drawings, the requirements covered by this section apply to all 31-A telegraph relays.

1.2 Part 2 of this section covers the requirements for the inspection of mechanical adjustments which shall be used to determine whether the relay is in proper condition for delivery to the customer and for service. These are called "Requirements".

1.3 Part 3 of this section covers the mechanical requirements which must be met in readjusting a relay which fails to meet the test requirements. These are called "Readjusting Procedures".

1.4 The facilities for meeting the requirements are provided in the form of standard tools and gauges. However, if it is found by experience that adjustments for meeting certain requirements can be made satisfactorily by "feel" or by "eye", these methods may be employed. It is suggested that checking with tools and gauges be made often enough to insure that proper test and adjustment requirements are being met.

1.5 ***Marking Position*** When in use this relay is always under control of either positive or negative current. When the armature is making contact with the contact stud, it is said to be in the marking position.

1.6 ***Spacing Position*** When the armature is resting against the insulating or stop screw it is said to be in the spacing position.

1.7 The following is a list of the tools and gauges specified in Parts 2 and 3 for use in inspecting and readjusting the relay.

CODE NO.	DESCRIPTION
TOOLS	
35	3-1/2" Screwdriver
—	Long nose pliers
GAUGES	
74-C or	Gauge
(the replaced 74-A)	Gauge

2. REQUIREMENTS

2.001 Unless otherwise specified any relay covered by this section shall meet the following requirements.

2.002 Requirements are given in the order in which adjustments should be made by the Telephone Company.

2.003 Unless otherwise specified the requirements given on this sheet are both test and readjust requirements.

2.1 ***Contact Alignment*** The contacts shall line up with the armature in the position it normally assumes, so that their centers are not out of alignment more than 25% of the diameter of the contact points. This shall be judged by eye.

2.2 ***Contact Cleaning*** (Readjust Only) Clean the contacts only when necessary and in accordance with approved procedures.

2.3 ***Contact Separation*** The contact separation; that is, the separation between the armature contact and the contact on the marking screw, when the armature is resting against the spacing or stop screw, shall be minimum .004", maximum .006".

2.4 ***Magnet Yokes*** The magnet shunt blocks shall not bind when slid along the brass guide rods.

2.5 ***Contact Pillars*** The Marking and Spacing pillars shall be firmly mounted so that they do not tend to rotate.

2.6 ***Magnets*** The magnets shall be firmly fixed to the base of the relay, and have the coils mounted rigid.

2.7 ***Lock Nuts*** The lock nuts on the stop screw and contact screw shall be sufficiently tight to hold any adjusted position.

2.8 ***Electrical Requirements*** When adjusted in accordance with the above, the relay should follow fastest hand speed signals with current reversals of positive and negative of .002 amps. (See circuit requirements tables.)

3. READJUSTING PROCEDURES

3.1 ***General***

3.011 In readjusting the requirements which specify only one limit (either a minimum or a maximum limit) it is advisable, if possible, to provide some margin inside the limit for deterioration.

3.012 A relay should be readjusted in accordance with the following methods to meet the readjust requirements.

3.2 ***Contact Alignment*** (Reqt 2.1)

To line up the contacts in a vertical plane the right-hand brass pillar carrying the contact should be loosened and rotated sufficiently to secure the desired adjustment. To line up the contacts in a horizontal plane the flat brass extension of the armature should be bent.

3.3 ***Contact Cleaning*** (Reqt 2.2)

Clean the contacts in accordance with approved procedures.

3.4 ***Contact Separation and Magnetic Air-Gaps*** (Reqt 2.3)

The two magnet yokes should be slid as far from the coils as possible. The stop screw and the contact screw should then be screwed in until the armature is held, midway between the brass pillars supporting the screws. This may be judged by eye.

Each coil should then be freed from the permanent magnet by loosening the screw in the magnet adjacent to the coil. Insert together the .020" and the .012" blades of the No. 74-C gauge between one pole piece and the armature, then tighten the coil in this position. Repeat operation on other side. This will give an air-gap separation of .032" on either side. The stop screw and the contact screw should then be withdrawn until the armature is free to move about 1/8", and will remain in position, resting against the contact screw or the stop screw. Move the armature against the contact screw and advance the screw till the armature leaves it and strikes the stop screw. Withdraw the contact screw about 1/4 turn and lock it in this position. Insert the .004" gauge between the contacts and then advance the stop screw till the gauge is just free to slide. Lock the stop screw in this position.

3.5 ***Magnet Yokes*** (Reqt 2.4)

To determine if the yokes are free from mechanical friction draw up the guide rod, against the tension of the springs, thus freeing the yokes from magnetic attraction.

3.6 ***Contact Pillars*** (Reqt 2.5)

These pillars can be made firm by tightening the screws in the base.

3.7 ***Magnets*** (Reqt 2.6)

To meet this requirement, it is necessary only to tighten four screws in the base.

3.8 ***Lock Nuts*** (Reqt 2.7)

Securely tighten the lock nuts on the contact and stop screws, exercising care not to change any adjustments.

3.9 ***Electrical Requirements*** (Reqt 2.8)

After the above adjustments have been completed the relay should meet its readjust electrical requirements. It is permissible to move the position of one or both of the magnet yokes to insure operation.