MICROWAVE ANTENNAS
KS-5759 DELAY LENS ANTENNA
REHABILITATING LENS ELEMENTS

1. GENERAL

1.01 This section explains the methods which should be followed to satisfactorily rehabilitate lens elements of the KS-5759 delay lens antenna.

1.02 Those elements which are known to reduce the antenna gain because of an excess moisture content and which are considered salvable shall be banded with AT-7209, B Polyethylene Tape in accordance with the procedure outlined herein, then stored in a dry place. Elements shall be stored in such a manner as to permit air to circulate over their surfaces. At the discretion of the operating company, these elements may be replaced in an antenna which is equipped with a KS-16784 blower-heater assembly.

1.03 Those elements that are dry but physically damaged to an extent where repair is warranted shall be banded as above, then packed as described in Part 6. Arrangements shall then be made with the Western Electric Company, Department 1534, 200 Central Avenue, Kearny, New Jersey as to where these elements are to be shipped for repair.

1.04 Those elements that are not damaged and meet the transmission requirements shall be banded and bagged in accordance with the procedures outlined herein and then either replaced in the antenna lens housing or stored for future use.

1.05 To perform the banding and bagging operations listed herein, it will be necessary to supply, locally, four sealing angles and three tension retainers (illustrated respectively in Fig. 1 and 2 of Section 402-420-500).

1.06 All work done on lens elements shall be performed, wherever possible, in an area protected by an overhead shelter. If a sheltered area is unavailable, the work shall be performed during fair weather only, with precautions being taken to keep the elements off the ground at all times and protected from wetness during off-hours by means of a waterproof covering.

2. INSPECTING ELEMENTS

2.01 Remove the polyethylene covering enclosing each lens element. The tape used for identifying each element (refer to 3.06, Section 402-420-502) shall be removed from the bag and replaced on the element in the position corresponding to the location from which it was removed.

2.02 All lens element assemblies which have been removed from the antenna for the purpose of rehabilitation shall be inspected for signs of protruding aluminum strips.

2.03 As a result of the above inspection, all aluminum strips found protruding shall be repositioned to their normal location, ie, so that they are flush with the end of the element. Repositioning shall be done with the use of KS-6015 pliers.

3. BANDING OF ELEMENTS

3.01 Each lens element assembly shall be banded with AT-7209, B Polyethylene Tape. There shall be three tapes around both the longitudinal and transverse axes, positioned as shown in Fig. 1. The longitudinal tapes shall be applied first.

3.02 Each tape shall be tensioned and heat-sealed in the manner illustrated in Fig. 2 and 3. Prior to tensioning, clean the surfaces of each tape in the immediate vicinity of the seal with trichloroethylene or its equivalent.

Note: Masking tape shall be applied between the dowel and the polyethylene tape to prevent the latter from slipping off the dowel during tensioning.

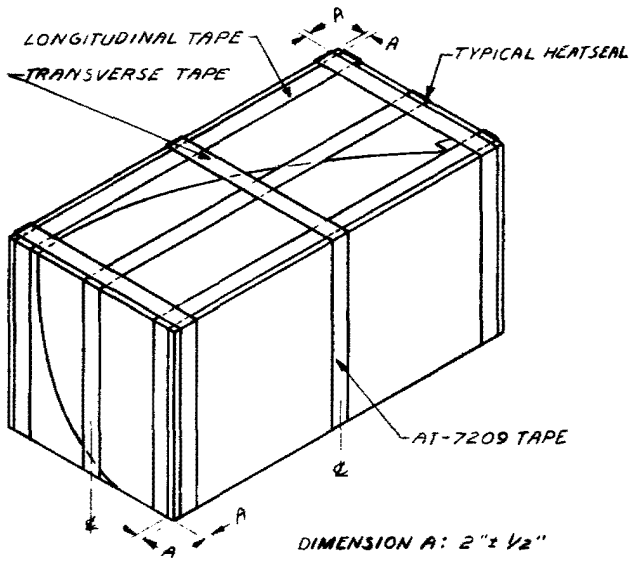


Fig. 1 – Banded Lens Element

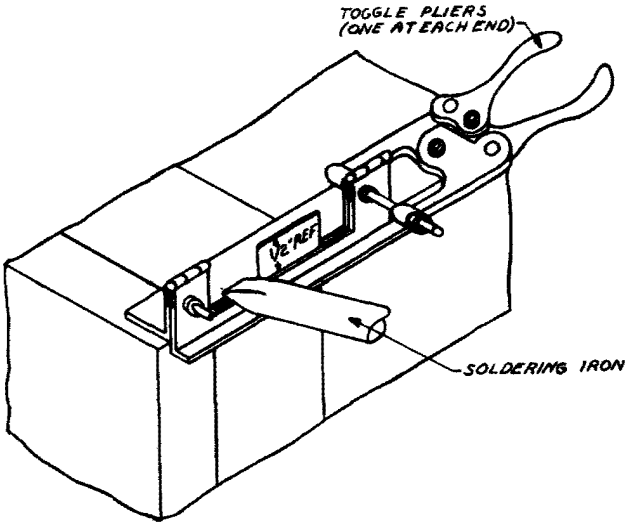


Fig. 3 – Sealing of Tape

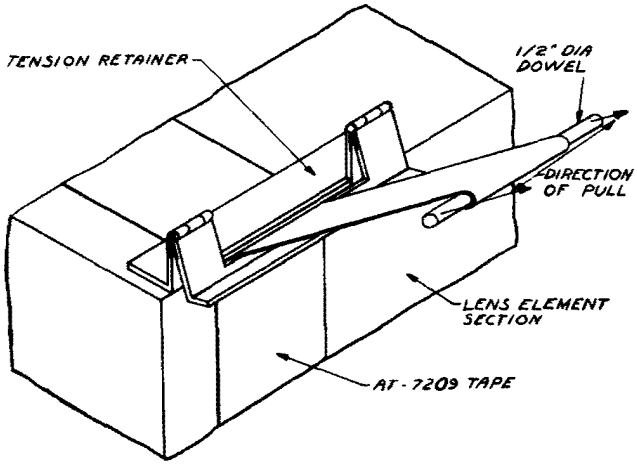


Fig. 2 – Tensioning Tape

Caution 1: Safety glasses shall be worn by personnel working with a soldering iron.

Caution 2: The cleaning solvent shall be used in a well ventilated area. Inhalation of its vapors and prolonged or repeated contact with the skin shall be avoided.

Caution 3: Care shall be exercised to prevent the cleaning solvent from contacting the foamed-polystyrene lens element.

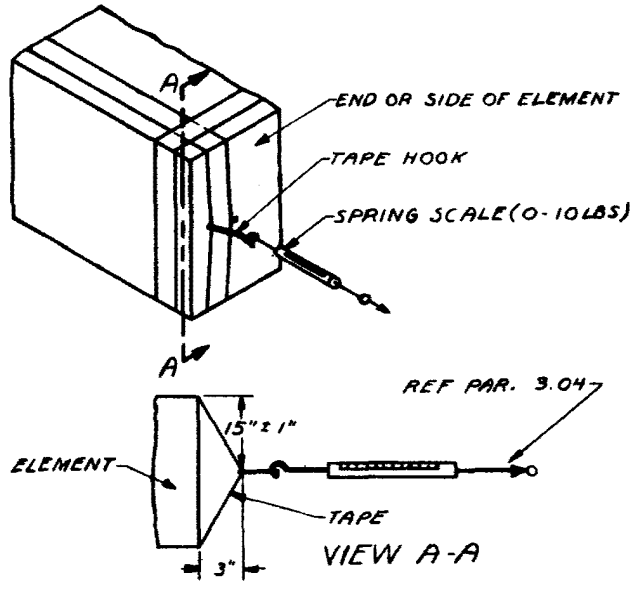
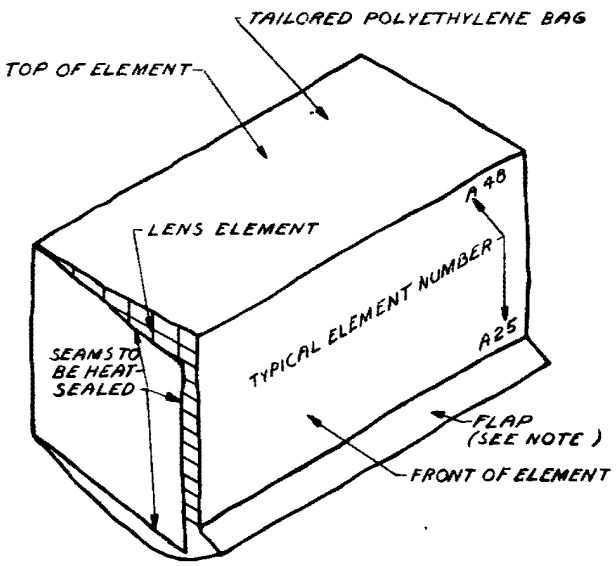


Fig. 4 – Checking Tape Tension

3.03 After sealing, remove the tension retainers and check each tape for minimum tension as shown in Fig. 4. Two measurements shall be made on each tape, one at each end or front and back of the element.



Note: All bags, except those intended for elements A1-A24 and B1-B24, are fabricated with a 6-inch flap.

Fig. 5 – Placing Element in Bag

3.04 Each tape shall be considered properly tensioned when the force required to raise the tape 3 inches from the element surface is not less than 6 lbs per reading at the ambient temperature at which banding is done. If the tension is checked at a temperature higher than that at which banding was done, then there will be allowed a decrease in scale reading of 16 ounces for the first 10-degree F rise in temperature and an 8-ounce decrease for the next 10-degree F rise.

4. BAGGING ELEMENTS

4.01 Elements which have been banded and which meet the transmission requirements shall be enclosed in a tailored bag made of two thicknesses of 0.004-inch black polyethylene sheet.

4.02 Prior to placing the bag about the element, the tape bearing the element number shall be removed from the element. The bag to be used for enclosing an element shall have markings corresponding to the number of the element.

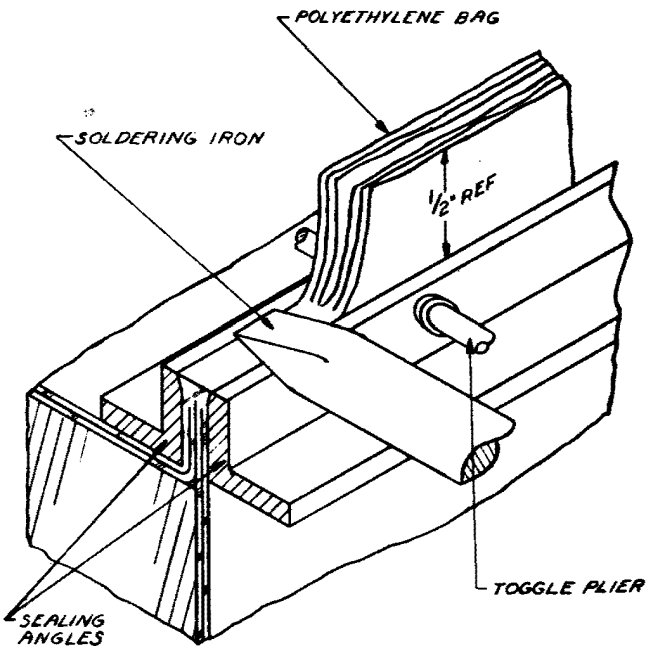


Fig. 6 – Heat Sealing of Bag

4.03 The element shall be placed in the polyethylene bag so that the number on the bag is in the position corresponding to the location of the number on the element. The flap on the bag will be located at the bottom front of the element as shown in Fig. 5.

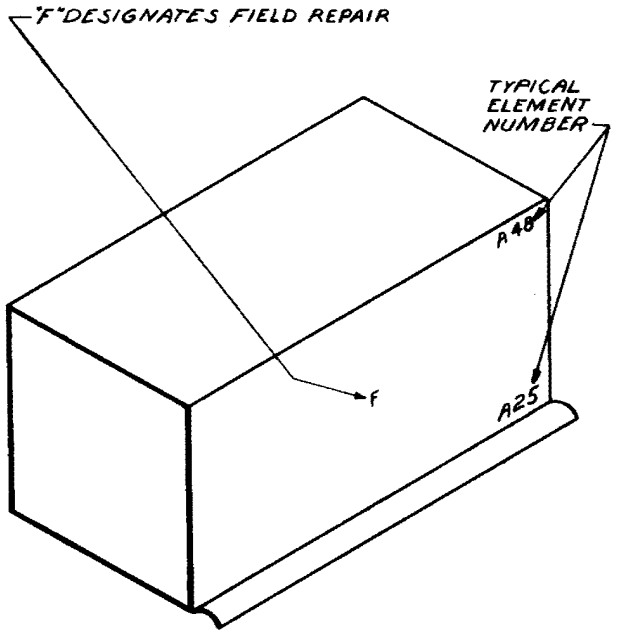


Fig. 7 – Bagged and Marked Element

4.04 All seams of the bag shall be heat-sealed. A suggested heat-sealing technique is shown in Fig. 6.

Caution: Care should be exercised to prevent molten polyethylene or a hot soldering iron from contacting those surfaces of the polyethylene material which will form the enclosing bag.

5. MARKING

5.01 All bagged elements shall be marked with the designation F on the front center of the element as shown in Fig. 7. Marking shall be done with 3/4-inch characters using type A-1007-White-Kel-F plastic printing ink or equivalent.

6. PACKING

6.01 Those elements which require repair and are to be shipped as mentioned in 1.03 shall be enclosed in a snug-fitting box of cleated plywood, minimum 3/20, using a liner of 200 test corrugated board. A snug-fitting container having requirements equivalent to or better than those outlined is also acceptable.

6.02 Each container shall be marked indelibly in characters, not less than 3/4 inch high as follows:

Antenna KS-5759

Lens Element Assembly (No.) .....

Box.....of.....