

## KS-14582 L1 AND L2 SOLDERING COPPERS AND KS-14768 HEAT UNITS HANDLING AND MAINTENANCE

### I. GENERAL

**1.01** This section covers the handling and maintenance of the KS-14582 L1 and L2 soldering coppers. It also covers the KS-14768 heat units used to provide the heat for the soldering operations. This soldering copper is intended for use where power for heating an electric soldering copper is not available or where the use of an open flame-heated copper is not practicable as in the case of certain carrier repeater maintenance operations.

**1.02** This section is reissued to incorporate the information contained in Addendum 075-190-811, Issue 1, and to revise 6.01.

**1.03** Two sizes of tips are provided for the KS-14582 L1 and L2 soldering coppers. The larger tip, designated L4, is used for heavier soldering operations such as splicing and maintaining cables. The smaller tip, L5, is used for lighter work such as soldering conductors on terminal lugs.

**1.04** Before attempting to use the KS-14582 L1 or L2 soldering copper, prepare all connections in advance of the soldering operation. The KS-14582 L1 and L2 soldering coppers reach operating temperature in approximately 20 seconds after the heat unit is fired. The soldering coppers may then be used for soldering for a period of 4 to 6 minutes with the L4 tip, and 6 to 8 minutes with the L5 tip. To continue soldering for a longer period of time, the expended heat unit must be extracted and a fresh one substituted.

#### **1.05 *Precautions To Be Observed With the Soldering Coppers:***

- (a) To avoid injury to personnel or damage to the copper, do not open the copper for at least 10 minutes after firing a heat unit.
- (b) Do not hold the copper near the hands or face to test its temperature as serious burns may result. Use rosin core solder to check

whether the copper has reached soldering temperature.

- (c) Do not place a heated copper on the floor, on equipment, or in any place other than a suitable holder such as the 504A soldering copper holder. Do not remove the copper from its holder to store it, as in a tool kit, until the copper has thoroughly cooled and the expended heat unit has been removed. When the copper is not in use, make sure the heat unit chamber is empty.

- (d) To prevent losing or damaging parts, make sure the copper is assembled before storing it.

- (e) Never heat the copper over an open flame to bring it to soldering temperature as this would damage the copper.

- (f) ♦Make certain that the tip is properly screwed into the copper body before firing the tool. Failure to completely seat the tip may result in ejection of the tip and heat unit activation outside the combustion chamber.♦

#### **1.06 *Precautions To Be Observed With Heat Units:***

- (a) Use only standard heat units equipped with a protective cap stamped KS-14768. Do not use commercially available nonstandard heat units.
- (b) A heat unit should be fired only in the copper and never by any other means.
- (c) Do not store heat units near very hot objects.
- (d) Do not remove heat units from the carton until they are to be used.

**Warning:** ♦Ignited outside soldering copper, the units become white hot. Molten thermite may splatter. Adhere to operating

*instructions given in Sections 075-190-811  
and 081-330-100A*

**2. LIST OF TOOLS AND MATERIALS**

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
504A	Soldering Copper Holder (or other suitable holder)
AT-7582X	Combination Pliers
KS-14164	Brush
R-1482	File
R-5850	5/8- and 3/4-Inch Open Double End Offset Hex Wrench
—	BR-34 Brush } Kemode Manu- RM-12 Reamer } facturing Co.
—	
—	Carborundum Unfinished Stick, 4 by 1/2 Inch Square, Grading C60-P-VUF, Carborundum Co. or Equivalent
<b>MATERIALS</b>	
KS-2423	Cloth
KS-7470	Oil
—	Pipe Cleaners (obtain locally)
—	Standard Rosin Core Wire Solder
—	"Dag" Dispersion No. 41, Acheson Colloids Corp.

**3. DESCRIPTION OF SOLDERING COPPERS**

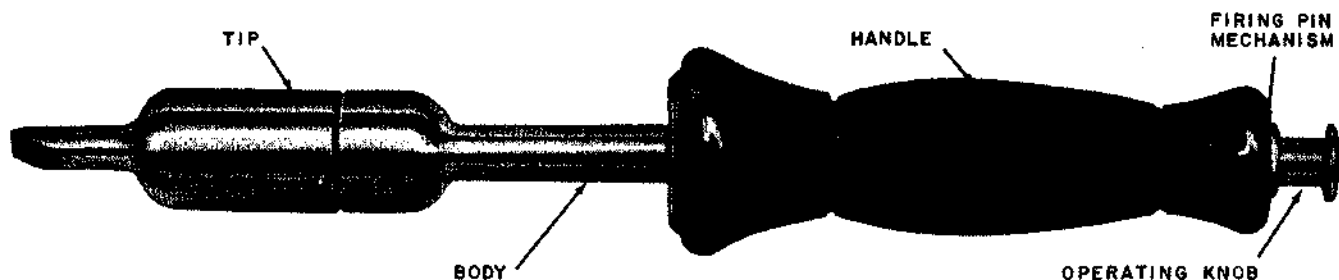
**3.01** The KS-14582 L1 and L2 (see Fig. 1) soldering coppers are conventional appearing

soldering coppers which are heated by means of a chemically charged heat unit (KS-14768) placed in a chamber in the tip of the copper. The heat unit is actuated by a firing pin mechanism mounted in the handle of the copper. The handle is similar to that of the KS-8740 electric soldering copper so that the copper may be stored in the 504A soldering copper holder.

**3.02** A section view of the KS-14582 L2 soldering copper is shown in Fig. 2. The body of the copper consists of a tube having a cup-shaped section at one end. The heat unit chamber of the tip screws into this cup and a small hole in the bottom of the cup permits entrance of the firing pin to fire the heat unit. The threaded core of the handle screws on the tube and the handle is positioned by a disc secured to the tube. The handle is locked in place against this disc by the hexagonal head of the threaded bushing which screws into the outer end of the tube.

**3.03** The firing pin mechanism consists of a rod with the firing pin and inertia collar at one end. The loose-fitting, recessed operating knob with a safety spring is mounted on the other end of the rod. A washer fastened to this end keeps the knob and spring on the rod. Adjacent to the knob is the threaded bushing having a hexagonal head which screws into the body of the copper. The main spring of the firing pin mechanism is assembled on the rod between the inertia collar and the threaded bushing. With the firing pin mechanism in its normal position, the main spring is not under compression and the safety spring in the knob holds the rod so the firing pin cannot protrude into the heat unit chamber.

**3.04** When the knob of the firing pin mechanism snaps back after being pulled out and released, the springs force the firing pin rod



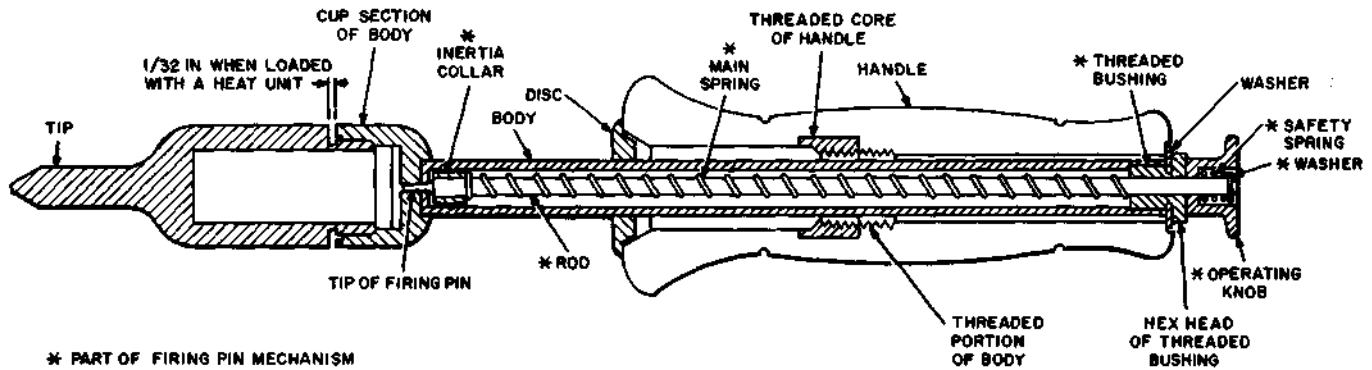


Fig. 2—Section View of KS-14582 L1 Soldering Copper with L5 Tip

forward. Near the end of this movement, the inertia of the rod and inertia collar overcome the pressure of the safety spring and the firing pin enters the heat unit chamber to fire the heat unit. The safety spring then restores the rod to its normal position, withdrawing the firing pin from the chamber. If the loaded copper is accidentally dropped, the safety spring prevents the firing pin from entering the heat unit chamber and firing the unit.

#### 4. DESCRIPTION OF HEAT UNIT

4.01 A carton of twelve KS-14768 heat units is shown in Fig. 3. A heat unit consists of a cylindrical metal shell with a primer at one end. The primer is covered by a protective cap which is readily indented by the firing pin mechanism of the copper. The chemical mixture, sealed in the shell, is ignited when the primer is actuated by the firing pin. As the chemical mixture burns without generating or releasing gases, the unit is entirely safe for use within the copper. However, should the unit be ignited outside the copper, contact with the air would cause it to become white hot and therefore, a fire hazard.

#### 5. LOADING OF SOLDERING COPPER

5.01 While the tool is cold, check that the firing pin mechanism and body are securely tightened against the handle before loading the tool. If necessary, tighten the body manually, and use the R-5850 wrench to tighten the threaded bushing of the firing pin mechanism.

**Note:** When inserting a KS-14768 Heat Unit into a KS-14582 L1 or L2 soldering copper,

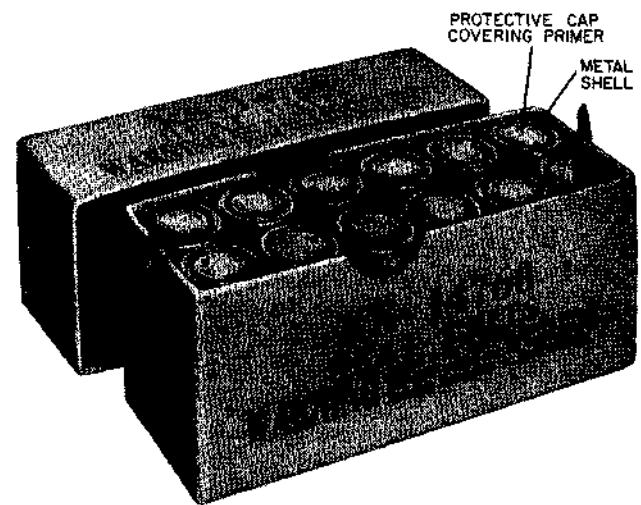


Fig. 3—KS-14768 Heat Units

make certain the heat unit is firmly clamped between the bottom of the heat unit chamber (L4 or L5 tip) and the inside top of the cup section of the body and that there is a space between the shoulders of the two of at least 1/32-inch as shown in Fig. 2.

5.02 To load the copper when it is cold, unscrew the tip and place the KS-14768 heat unit into the hollow chamber of the tip with the primer end of the unit facing outwards. Remount the tip on the copper fingertight.

5.03 If it is necessary to reload the copper when it is hot in order to continue soldering operations, allow the copper to cool for at least 10 minutes after firing (2 or 3 minutes after the

heat unit is expended). Earlier removal of the tip may cause the heat unit to expand to such an extent on contact with the air that it will be difficult to remove. To remove the tip while hot, proceed as follows: While holding the handle firmly in one hand, grasp the tip just behind the wedge-shaped end with the combination pliers, and loosen the tip. Then, hold the tip stationary with the pliers and unscrew the body of the copper from the tip by turning the handle manually. While doing this, take care to hold the copper with the tip pointed downwards to prevent the heat unit from dropping out. When the tip is free of the body, invert the tip over a metal receptacle so the heat unit drops out of the chamber.

**Caution:** *Do not discard the hot heat unit on or near flammable materials.*

**5.04** Place the body of the copper in a suitable holder such as the 504A soldering copper holder. While holding the tip with the pliers, insert a fresh heat unit into the chamber of the tip with the primer end of the unit facing outward. Screw the body of the copper on the tip. Take care not to tighten the tip excessively as this would make it difficult to remove if necessary to again reload the hot copper to continue soldering.

**Caution:** *Exercise care to avoid touching the hot tip or body of the copper while replacing the heat unit as serious burns may result.*

## 6. **FIRING SOLDERING COPPER**

**6.01** To fire the copper, hold the handle firmly in one hand and grasp the knob of the firing pin mechanism between the thumb and forefinger of the other hand. Pull the knob out as far as it will go and allow it to snap back.

**Caution:** *When firing a heat unit, the copper should be held at about an arms length and pointed so that no injury or damage will occur if there is an isolated discharge from the handle under some abnormal condition.*

The firing pin will actuate the primer in the heat unit and the copper will be ready for operation in about twenty seconds. The copper may then be used for soldering for a period of 4 to 6 minutes

with the L4 tip and 6 to 8 minutes with the L5 tip.

**Note:** When the firing pin hits there will *not* be an explosive sound but the heat unit will very likely have ignited and started to approach the white hot state. If the firing pin is pulled back again or the copper is opened while the unit is heating, molten thermite may splatter.

**6.02 Failure of Copper to Fire:** If the copper fails to become hot in approximately 20 seconds, repeat the firing procedure covered in 6.01. If the copper does not fire after three or four attempts, the heat unit may be defective. Remove the unfired heat unit and try a new heat unit. If the copper still fails to fire, the firing pin hole in the body of the copper may be blocked or the firing pin mechanism may be worn. Clean the body of the copper and firing pin mechanism as covered in 7.08 through 7.14. If, after cleaning, the copper frequently fails to fire, the firing pin mechanism should be replaced as covered in Section 075-191-812.

**Note:** Defective heat units should be disposed of along with other metallic trash. They should not be thrown away with paper trash or other combustible material.

## 7. MAINTENANCE OF SOLDERING COPPER

### Tiping Soldering Copper

**7.01** When necessary, tin the tip of the copper as covered in 7.02 through 7.04.

**7.02** With the copper cold, file the surface of one side of the tip until it is bright and clean for a distance of approximately 1/4-inch from the end, using the R-1482 file.

**7.03** Load the copper as covered in 5.02.

**7.04** Fire the copper as covered in 6.01. When the copper reaches soldering temperature, quickly file the side of the point which was previously cleaned, and apply rosin core solder, spreading the solder by means of the wiping pad of the 504A soldering copper holder or similar tin plate surface. Repeat this operation until the filed surface is well tinned. Only one side of the copper tip should be tinned. This tends to keep the hot solder in contact

with the surface to be soldered and prevents the solder from collecting on the under side of the copper when working on vertical terminals.

#### **Cleaning Tip Chamber**

**7.05** In order to permit easy removal of the KS-14768 heat unit, clean the inside of the tip chamber when soldering operations have been completed and the copper has cooled.

**7.06** To clean the chamber, unscrew the tip from the body of the copper and dispose of the expended heat unit. Hold the tip firmly in one hand and insert the BR-34 brush into the chamber as far as it will go. Turn the brush in a clockwise direction several times. Remove the brush and shake the loosened foreign matter out of the chamber. Repeat this procedure until the chamber is clean. Check the threads on the tip and, if necessary, clean them using the brush. After cleaning and before remounting the tip, lubricate the threads of the tip as covered in 7.07.

*Note:* Thorough cleaning of the tip chamber is essential to prevent difficulty in removing a spent heat unit.

#### **Lubricating Threads of Tip**

**7.07** Periodic lubrication of the threads of the tip will facilitate removal of the tip. When necessary to apply the lubricant, remove all traces of old lubricant using the BR-34 brush and apply "Dag" Dispersion No. 41 to the threads with the KS-14164 brush. If the tip is worn so it is not held securely to the body of the copper, replace the tip.

#### **Cleaning Body and Firing Pin Mechanism**

**7.08** Clean the body and firing pin mechanism at the end of each day if the copper has been used continuously. However, if the copper is used intermittently, that is, only several times a day, clean the parts at least once a week to obtain proper operation of the firing mechanism. Clean the parts only when the copper is cold.

**7.09** Manually unscrew the tip. Remove the firing pin mechanism using the R-5850 wrench taking care that the washer in the recessed end of the handle is not lost. To clean the body, fully insert the RM-12 reamer into the tube opening at

the handle end. Turn the reamer clockwise several times. Remove the reamer and shake out any loosened foreign matter from the tube. Repeat this procedure until no more foreign matter can be shaken out. Clean the firing pin hole using a pipe cleaner. Check the threads in the cup and if necessary, clean them using the BR-34 brush.

*Note:* Thorough cleaning of the body as described above is essential as an accumulation of foreign matter at the firing pin hole end may not allow proper penetration of the firing pin into the heat unit chamber.

**7.10** Brush the accessible parts of the firing pin mechanism thoroughly with the BR-34 brush, paying particular attention to the turns on the main spring, the firing pin, and the threads of the bushing. Observe whether the tip of the firing pin has become excessively flattened so there are sharp corners at the periphery, round them as covered in 7.15. After brushing, wipe all parts with a clean KS-2423 cloth.

**7.11** Place one end of the firing pin mechanism on a flat surface, and while holding it in a vertical position, manually compress the main spring. While holding the spring compressed with one hand, clean the exposed part of the rod using the BR-34 brush and then wipe with a clean KS-2423 cloth. Invert the mechanism and repeat the procedure to clean the other part of the rod.

**7.12** Hold the firing pin mechanism with the knob pointing downward. Hold the firing pin end with one hand and with the other, raise the knob compressing the main spring until about an inch of the rod is exposed. If the safety spring has not dropped free of the knob, shake the spring out of the knob onto the exposed part of the rod. Hold the mechanism with the knob cocked against the rod to prevent the safety spring from slipping back into the knob. Clean the safety spring with the BR-34 brush and wipe with a clean KS-2423 cloth.

**7.13** After the firing pin mechanism has been cleaned, apply a film of KS-7470 oil to the main and safety springs using a KS-2423 cloth. Obtain access to the safety spring by following the procedure covered in 7.12. Wipe off any excess oil with a clean KS-2423 cloth.

**7.14** After cleaning and oiling the firing pin mechanism, remount it in the copper. Remount the tip.

**Rounding Periphery Around Tip of Firing Pin**

**7.15** Round the corners at the periphery of the tip of the firing pin using the Carborundum

stick to obtain a uniform radius of approximately 0.010 inch as gauged by the eye around the periphery. Do not round the flat on the tip as this will shorten the tip and may result in failure of the copper to fire.