

PHOTO PROCESSOR KS-14778

REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the KS-14778 photo processor which automatically develops, stabilizes, and dries the paper on which photographs of message registers were made with the KS-14593, List 1 message register camera.

1.02 This section is reissued to incorporate material from the addendum in its proper location.

1.03 Reference shall be made to Section 020-010-711 covering General Requirements and Definitions for additional information necessary for the proper application of the requirements listed herein.

1.04 The quality of finished photographs depends not only on the adjustment of the photo processor but also on a number of other factors such as types of registers photographed, camera voltage, proper use of camera filter, as well as the condition of the chemical solutions in the photo processor. Therefore, before making any adjustments on the photo processor involving the thermostats controlling the temperature of the processing solutions or the dryer drum, it is recommended that a roll of test photographs be taken and processed as covered in Section 030-335-501. The probable cause of defects in the photographs should then be determined by reference to the information on the analysis and correction of defects in photographs in Section 030-301-701.

1.05 In connection with checking requirements in this section it is necessary to remove the end and tank covers from the processor. To remove the end cover, loosen the two mounting screws using the 5-inch regular screwdriver and lift the cover from the processor. To remove the tank cover, disengage the cover latches, remove the cover, and stand it in an upright position on the rollers.

1.06 In checking requirements in this section which necessitate passing a roll of paper through the processor, use a KS-16148 loaded cassette. If there are developer and stabilizer solutions in the processor these may be used. Otherwise, it is permissible to use water in both cans for checking the requirements. However, make sure that the water is replaced with developer and stabilizer solutions before processing any photographs.

2. REQUIREMENTS

2.01 *Cleaning*

(a) The tank, developer and stabilizer cans, and all rollers shall be cleaned after each day's use of the photo processor. See Notes 1 and 2.

(b) The dryer drum shall be cleaned each time the solutions in the photo processor are changed and at the end of each day's use of the processor. See Note 1.

Note 1: Cleaning at the intervals specified in requirements (a) and (b) is necessary to prevent formation of chemical deposits on parts of the processor which if not removed promptly would cause discoloration of photographs.

Note 2: It is desirable that processing of photographs be scheduled so that, at the end of a day's use of the processor, full use (processing of paper from five cassettes) will have been made of the solutions in the processor.

(c) Other parts of the photo processor shall be cleaned when necessary.

2.02 *Freedom of Rotation of Rollers and Dryer Drum:* All rollers and the dryer drum shall rotate freely.

Gauge by feel.

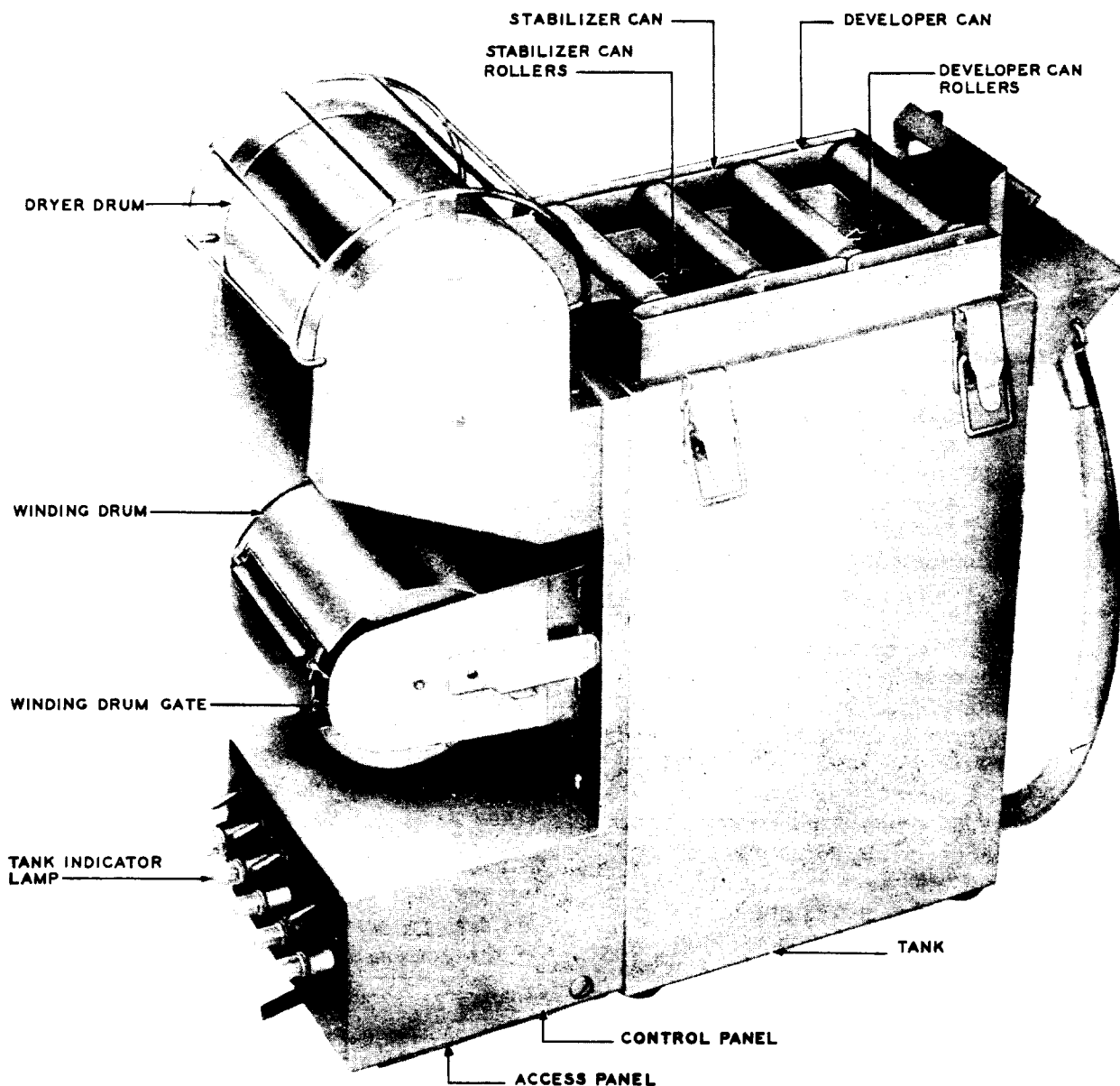


Fig. 1 — KS-14778 Photo Processor End and Tank Covers Removed

2.03 Freedom of Movement of Winding Drum:

The winding drum when driven by the motor shall turn without binding.

Gauge by eye.

2.04 Travel of Paper Through Photo Processor

- (a) The winding drum shall pull the paper from a KS-16148 loaded cassette through the processor in

Max 7-1/2 minutes.

Use a watch or clock having a second hand.

- (b) The paper shall travel through the processor without being torn, creased, or wrinkled.

Gauge by eye.

- (c) The squeegee blade shall exert an appreciable and approximately uniform drag on the paper as it is drawn through the photo processor.

Gauge by feel.

To check this requirement, cut a piece of bond paper approximately 1 by 8 inches. Remove

the tank cover from the photo processor. Lay the strip of paper over one end of the stabilizer can roller which is nearer the dryer drum. The outer end of the strip should project toward the dryer drum just far enough to be grasped with the fingers after the tank cover has been mounted on the processor. Mount and latch the tank cover. Pull the strip of paper out from between the squeegee blade and the roller on the stabilizer can. Repeat this check with the paper at the other end of the roller. There should be an appreciable and approximately equal drag on the paper at both ends of the roller.

2.05 Heating of Processing Solutions

- (a) The tank heater shall heat the processing solutions from an initial temperature of approximately 75° to at least 100° F in

Max 45 minutes.

Use the Fisher Scientific Company No. 14-990 thermometer and a watch or clock and check as covered in (c).

- (b) The tank heater under control of the tank thermostat shall maintain the solution in the processor at a temperature of

Min 104 F

Max 108 F

Use the Fisher Scientific Company No. 14-990 thermometer and check as covered in (c).

- (c) To check the requirements proceed as follows. With the liquids in the processor, (including the water) at approximately room temperature and power connected to the processor, turn the main and tank switches to the ON position. With a clock or watch, check the elapsed time until the tank indicator lamp lights. Unlatch and remove the tank cover. Immerse the thermometer in the liquid in the developer can to the 3-inch immersion mark on the stem of the thermometer. Hold the thermometer in this position and check the temperature for requirement (a). Remount the tank cover and, at 5 minute intervals, repeat

the measurement four times. The temperature readings should be within the limits specified in requirement (b).

2.06 Heating of Dryer Drum

- (a) The dryer drum heater shall heat the drum from an initial temperature of approximately 24° (75 F) to 135 C (275 F) in

Max 25 minutes.

Use the Fisher Scientific Company No. 14-985 thermometer and a watch or clock and check as covered in (c).

- (b) The drum heater under control of the drum thermostat shall function so that the temperature of the drum immediately after the paper from a KS-16148 loaded cassette is passed through the processor shall be

Min 135 C (275 F)

Max 177 C (350 F)

Use the Fisher Scientific Company No. 14-985 thermometer and check as covered in (c).

- (c) To check the requirements proceed as follows. With the dryer drum at room temperature and power connected to the processor turn the main and drum switches to the ON position. With a clock or watch check the elapsed time until the drum indicator lamp lights. Then hold the thermometer bulb against the dryer drum and cover the part of the bulb not in contact with the drum with a small asbestos pad or equivalent. Check the temperature reading for requirement (a). Pass the paper from a KS-16148 loaded cassette through the processor and again measure the temperature of the dryer drum. The temperature reading should be within the limits specified in (b).

3. PROCEDURES**3.001 List of Tools, Gauges, and Materials**

CODE OR SPEC. NO.	DESCRIPTION
TOOLS	
48	Combination 7/32-inch and 1/4-inch Hex Double-end Socket Wrench and Screwdriver
KS-14250, List 1	Flashlight (with two 1W13A cords equipped with KS-6278 connecting clips insulated by No. 108 cord tips (insulating tubing)
KS-14510, List 1	Volt-ohm-milliammeter
—	3-inch Cabinet Screwdriver
—	4-inch Regular Screwdriver
—	5-inch Regular Screwdriver
—	Screwdriver, Stanley Tools No. 2012
GAUGES	
—	Thermometer, Fisher Scientific Company, No. 14-985, 1-degree Graduations, -10° to +400C.
—	Thermometer, Fisher Scientific Company, No. 14-990, 2-degree Graduations, 0° to 230F.
MATERIALS	
KS-2423	Cloth
KS-7860	Petroleum Spirits
KS-14666	Cloth
KS-16148	Loaded Cassette
—	Asbestos Pad
—	Cotton Work Gloves
—	Crocus Cloth
—	Steel Wool

3.01 Cleaning (Rq 2.01)

(1) Rinse the developer and stabilizer cans with warm water and wipe them with a clean KS-14666 cloth. Clean the tank with a damp KS-14666 cloth and rinse the tank with water if necessary.

(2) Clean all rollers with a damp KS-14666 cloth. If there are chemical deposits at the ends of the rollers which cannot be removed with the cloth, hold the roller under running warm water while turning the roller on its shaft. If there is an insoluble black deposit on a metal roller, this may be removed by rubbing the roller with crocus cloth and then wiping with a damp cloth. If this does not remove the deposit, rub the roller lightly with steel wool exercising care not to scratch the roller unduly, and then wipe with a damp cloth.

(3) Clean the dryer drum with a wet KS-14666 cloth as follows. Saturate the cloth with cold water and lightly wring it. Fold the cloth in quarters and wipe the drum with the cloth. If the drum is hot use two KS-14666 cloths folded together in quarters to give eight thicknesses of cloth. When cleaning a hot drum wear cotton work gloves to prevent burning the hands.

Caution: In cleaning a hot drum take care to avoid touching the drum with the hands. Use two cloths and cotton work gloves as covered above in order to protect the hands.

3.02 Freedom of Rotation of Rollers and Dryer Drum (Rq 2.02)

(1) **Rollers:** If a roller does not rotate freely on its shaft, clean the roller and shaft as covered in 3.01. If this does not clear the trouble replace the roller and/or shaft.

(2) **Dryer Drum:** If the dryer drum does not rotate freely on its spindle, check that there is clearance between the drum and the drum thermostat and between each end of the drum and the adjacent bracket. If the drum binds at any of these points, loosen the

drum bracket mounting screws using the 5-inch regular screwdriver and shift the bracket slightly to obtain the required clearances. If necessary to obtain clearance between the drum and drum thermostat loosen the thermostat bracket mounting screws using the 4-inch regular screwdriver and slightly shift the thermostat bracket. Check that the thermostat is approximately parallel to the drum and that there is approximately 1/16-inch clearance between the thermostat and drum in all positions of the drum. Check that the drum rotates freely, and securely tighten all screws. If the drum does not bind at any of the above points, remove the drum from the processor and the heater and spindle from the drum as covered in Section 030-320-801. If there is a deposit of dirt on the drum bearings or spindle, remove it with a KS-14666 cloth. If the bearings are worn, replace the drum.

3.03 Freedom of Movement of Winding Drum (Rq 2.03)

(1) If the motor does not drive the winding drum with the power on, check for blown fuses in the main and motor circuits. If the fuses are not blown, check the motor circuit as follows. To gain access to the circuit without emptying the processor, disconnect the power cord and place the processor on a table so that the control panel overhangs the edge of the table and the processor stands on the four feet on the tank. Remove the access panel mounting screw using the 3-inch cabinet screwdriver and remove the access panel. Check for closure of the main and motor switch contacts by operating each switch with the test leads of the KS-14250, List 1 flashlight applied to the switch terminals. Replace either switch if defective. If the switches are not defective connect the test leads of the KS-14510, List 1 volt-ohm-milliammeter to the ends of the motor leads and check for power across the motor by reconnecting the power cord and moving the main and motor switches to the ON position. If there is power across the motor, refer the matter to the supervisor for consideration of replacement of the motor.

(2) If the motor drives the winding drum but there is binding of the drum, check for distorted or damaged parts and replace parts as necessary. Clean the bearing pin on the winding drum gate and the corresponding hole in the winding drum using a KS-2423 cloth moistened with KS-7860 petroleum spirits.

3.04 Travel of Paper Through Photo Processor (Rq 2.04)

(1) If the winding drum does not pull the paper through the processor within the required time, check requirements 2.02 and 2.03 and adjust, if necessary, as covered in 3.02 and 3.03. Also check requirement (c) and reposition the squeegee blade, if necessary, as covered in (3). If this does not clear the trouble, the motor may be running below normal speed due to a defect in the motor or gearing. Refer the matter to the supervisor.

(2) Creasing, wrinkling, or tearing of the paper may be due to improper positioning of the squeegee blade. Check requirement (c) and reposition the blade, if necessary, as covered in (3).

(3) If requirement (c) is not met loosen the squeegee blade bracket mounting screws using the 3-inch cabinet screwdriver and the No. 418A wrench, and reposition the bracket. After positioning the bracket recheck the requirement.

3.05 Heating of Processing Solutions (Rq 2.05)

(1) If the heater fails to heat the liquids in the processor check for a blown fuse in the main circuit. If the fuses are not blown, check the heater circuit as follows. Place the processor on a table so that the control panel extends over the edge of the table and the processor stands on the four feet on the tank. Remove the access panel mounting screw using the 3-inch cabinet screwdriver and remove the access panel. With power connected to the processor and the main and tank switches in the ON position check for power across the heater terminals using the

KS-14510, List 1 volt-ohm-milliammeter. If there is power across the terminals replace the heater. If there is no power across the terminals turn all switches to the OFF position, disconnect the power cord and check for loose or open connections in the circuit. Check for continuity through the thermostat contacts by applying the test leads of the KS-14250, List 1 flashlight to the ends of the thermostat leads. If the thermostat contacts are open replace the thermostat. Check for closure of the main and tank switch contacts by operating each switch with the test leads of the flashlight applied to the switch terminals. Replace the switch if defective.

(2) If the liquids in the processor are heated but fail to reach the specified temperature in the required time the trouble is due either to improper adjustment of the tank thermostat or to a defective heater. Adjust the thermostat as covered in (3). If this fails to clear the trouble replace the heater.

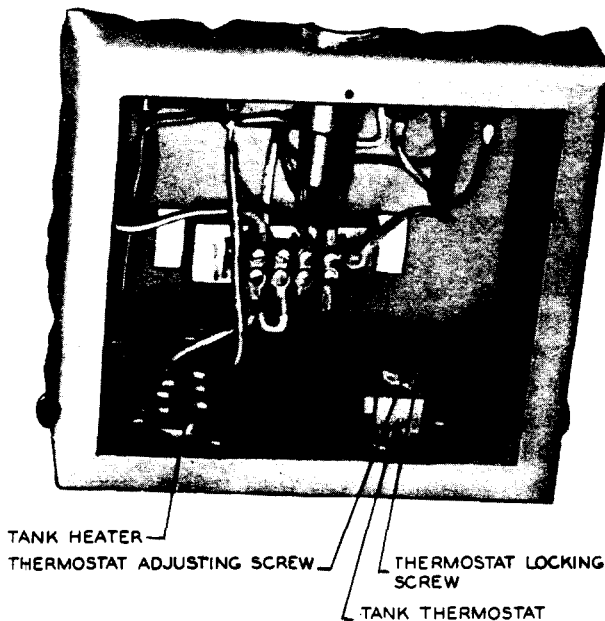


Fig. 2 — KS-14778 Photo Processor—Bottom View of Control Panel—Access Panel Removed

(3) If the heater heats the liquids, but the temperature is outside the required limits, adjust the tank thermostat as follows. Disconnect the power cord and remove the access panel as covered in (1). Referring to Fig. 2, loosen the thermostat locking screw using the screwdriver of the No. 48 combination wrench and screwdriver. With the Stanley No. 2012 screwdriver, turn the thermostat adjusting screw as required to increase or decrease the temperature setting. One eighth turn of the screw changes the temperature setting approximately 10F. Because of differences in the thermostats which have been furnished on the photo processors, turning the adjusting screw clockwise in some cases increases and in other cases decreases the temperature setting. After changing the temperature setting, recheck the requirement.

3.06 Heating of Dryer Drum (Rq 2.06)

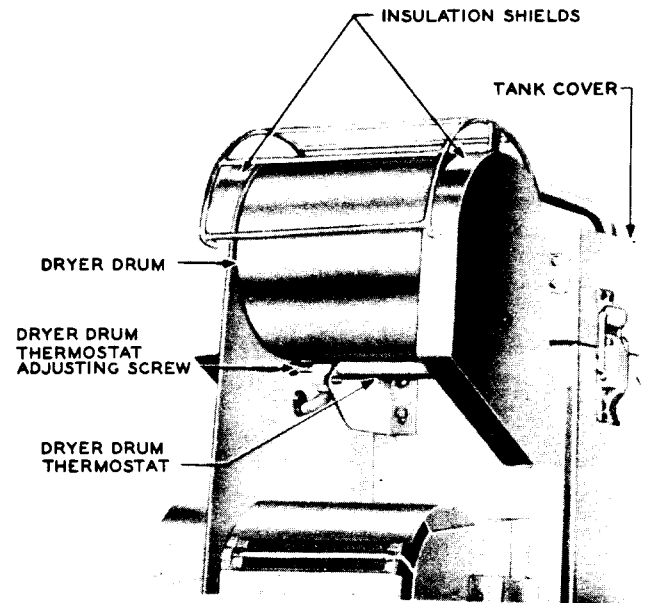
(1) If the heater fails to heat the drum check for a blown fuse in the main circuit. If the fuses are not blown, remove power from the processor. Remove the mounting screws of the insulation shield at the left end of the dryer drum with the 4-inch regular screwdriver, remove the insulation shield, and carefully remove the insulation. Identify the heater leads and the thermostat leads. Unscrew the wire connectors from the leads, remove the connectors, and free the leads. Check for continuity through the heater and through the thermostat contacts by applying the test leads of the KS-14250, List 1 flashlight across the heater and thermostat leads respectively. Replace the heater or thermostat if defective.

(2) If the heater and thermostat are not defective, reconnect the leads using the wire connectors. Place the processor on a table so that the control panel extends over the edge of the table and the processor stands on the 4 feet on the tank. Remove the access panel mounting screw using the 3-inch cabinet screwdriver and remove the access panel. Check for loose or open connections in the circuit. Check for closure of the main and drum switch contacts by operating each switch with the test leads of the KS-14250, List 1 flashlight applied to the switch terminals. Replace the switch if defective.

(3) If the drum is heated but fails to reach the required temperature in the specified time, the trouble is due either to improper adjustment of the drum thermostat or to a defective heater. Adjust the thermostat as covered in (4). If this fails to clear the trouble replace the heater.

(4) If the temperature is outside the required limits, adjust the dryer drum thermostat as follows. To gain access to the thermostat adjusting screw (Fig. 3) remove the mounting screws of the insulation shields at the left end of the dryer drum with the 4-inch regular screwdriver. Remove the insulation shield and carefully remove the insulation.

(5) Using the 4-inch regular screwdriver turn the thermostat adjusting screw as required to increase or decrease the temperature setting. Because of differences in the thermostats which have been furnished on the photo processors, turning the adjusting screw clockwise in some cases increases and in other cases decreases the temperature setting. After adjusting the temperature setting, recheck the requirement.



**Fig. 3 – KS-14778 Photo Processor — Partial View
Showing Dryer Drum Thermostat**