

2 PROCESSOR DESCRIPTION

Description

The KODAK K-LAB Processor for KODACHROME Film, Process K-14M, is designed to process 35 mm KODACHROME Film using specially packaged chemicals.

This processor is a white-light, continuous magazine feed, floor-standing machine with the following components/modules:

- Host Computer
- Processor
- Replenisher Rack
- Splicer (stand-alone)

A feed magazine of exposed film is assembled at the splicer. After it is spliced onto a leader, the film magazine contents are transported into the feed elevator. Then the film is transported through a series of tanks containing the film processing solutions. After development, the film goes through the drying chamber and onto a reel in the take-up section of the machine. The film is ready for mounting or finishing.

The K-LAB Processor has 4 main modes of operation:

1. Power Off
2. Sleep
3. Standby
4. Processing

Features

The KODAK K-LAB Processor for KODACHROME Film, Process K-14M, is characterized by the following attributes:

- White-light operation
(must be installed in a room that can be made dark, quickly)
- Continuous magazine feed
- Floor standing with a connected Replenisher Rack
- 2 reexposure printers to reexpose the silver-halide layers
- Feed elevator at the front end of the processor
- Equipment that fits through a 32-in. doorway
- Splicer cabinet with an external leader supply
- Static eliminator, housed within the feed elevator cabinet
- Rem-jet remover dip-and-rinse tanks

- Six distinct wet sections:
 1. First developer and wash
 2. Cyan developer and wash
 3. Yellow developer and wash
 4. Magenta developer and wash
 5. Conditioner and bleach
 6. Fix, wash, and final rinse
- Dryer tank similar in construction to the wet section tanks, with the temperature controlled at 105°F ± 5°F (41°C ± 3°C)
- Developer tanks designed to hold 17.5 to 18.5 liters
- Uses air to regenerate the bleach
- Tanks are a tube-within-a-tube construction with the inner-tube easily removed for service
- Magazine shoe design compatible with the 400-ft Source Two, Inc. magazine
- High-velocity impingement agitation in the developers
- Drive design is a “demand” system with a center pacer:
 1. Specification: ± 2% of set transport speed
 2. Film tension: 0.5 to 1.0 lbs
- A chiller system achieves temperature specifications within the developer tanks
- *Intellifaucets* that mix house water to provide 85°F (29.5°C) and 100°F (38°C) water
- A system of switches that is used to monitor, alarm, and maintain the process
- Push and pull processing capability from -1½ to +3 stops in ¼ or ⅓ stop increments is built into the system

Processor Modules

The K-LAB Processor, host computer, and replenisher rack are connected electronically. The main electronic subsystems are:

- Host Computer
- Processor Single Board Computer (PSBC)
- Replenisher Rack Single Board Computer (RSBC)
- Internal/external electronics under the supervision of the K-LAB Processor Management System (KPMS)
- Temperature Controller
- Reexposure Printer Single Board Computer

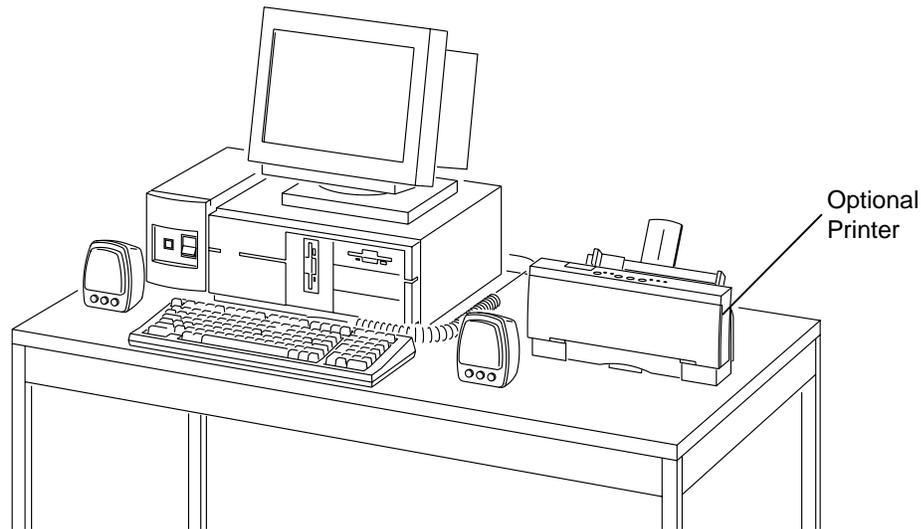
Host Computer

The host computer is the “brain” of the processor and displays all aspects of its operation. It is separated from the processor (up to 50 ft), and is an IBM-compatible computer system running a Microsoft Windows software-based machine-control program.

Through the host computer, you can:

- Start up/power down the processor
- Monitor all electronic and mechanical subsystems through a network of sensors
- Gather and analyze data (chemical, mechanical, and sensitometric) acquired during film processing
- Respond to emergencies such as film breaks

An uninterruptible power supply allows the host computer to continue operating in the event of a power failure.



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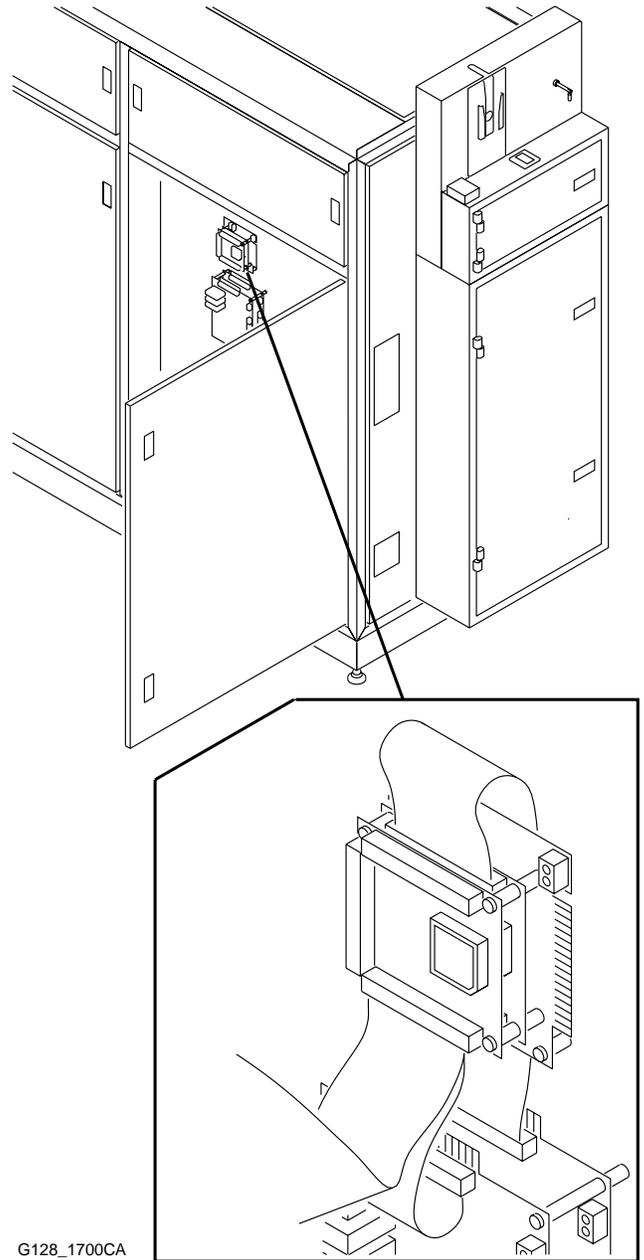
Processor Single Board Computer (PSBC)

The processor single board computer is located inside the processor electrical cabinet.

The PSBC monitors and controls the individual sensors and components located in the processor and reports their status to the K-LAB Processor Management System (KPMS). It also alerts KPMS when a sensor or component malfunctions or does not respond as anticipated.

The PSBC receives commands for data and control from the K-LAB Processor Management System through a serial connection between the processor and the host computer. The PSBC passes the appropriate commands to the replenisher rack single board computer (RSBC) through a serial connection.

The PSBC is a small IBM-compatible single-board computer with *MS-DOS* programmed into a ROM chip. The program it runs is contained on another chip on the circuit board and is executed automatically when the RSBC is powered up.

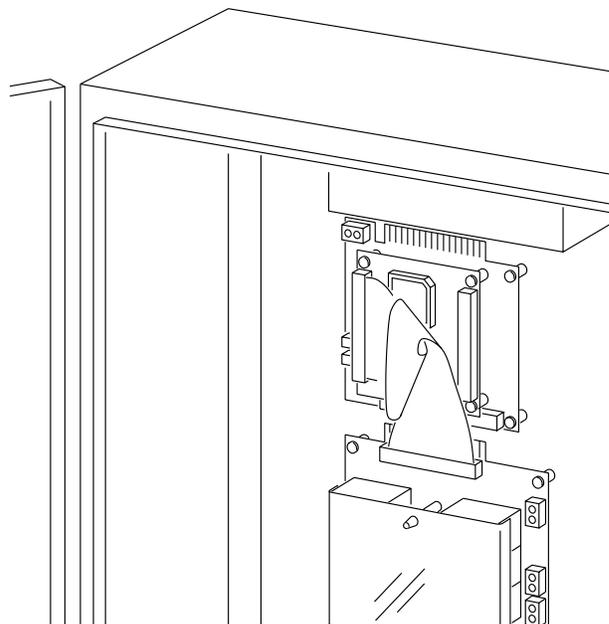


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Replenisher Rack

The replenisher rack is a module that is connected to the K-LAB Processor with plastic tubing for automatic chemical replenishment. The replenisher rack assembly consists of several pumps, a rack frame assembly for holding BIBs, holding tanks, *Intellifaucets*, and the associated electronics to accomplish the replenishment task. The electronics are controlled by the replenisher rack single board computer (RSBC).

Physically, the RSBC is identical to the PSBC, but runs a different program that monitors the replenisher rack's sensors and components. When a malfunction occurs in the replenisher rack or the PSBC requests a sensor's status, the RSBC transmits its data to the PSBC through a serial port connecting them.



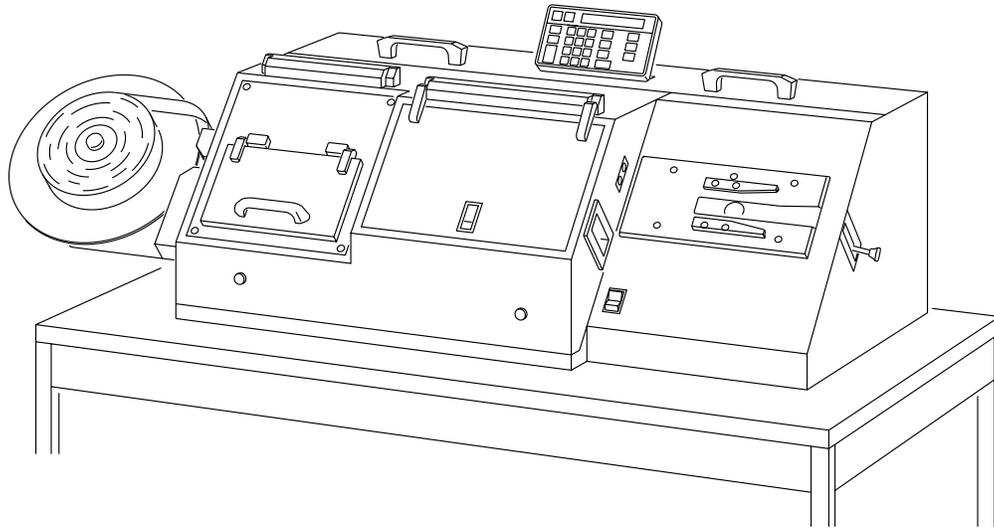
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Splicer

The optional splicer is manufactured by Source Two, Inc., and must be purchased separately. Separate rolls of film are spliced together in a specific sequence to provide the quickest batch processing time. The splicing tape is a 1-in. wide heat-seal splicing tape.

The recommended temperature for splicing is 340°F (170°C).

Oil-free air is required on-site to operate the splicer (80 to 100 psi). A 120 Volt outlet is required for power.



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Processor Modes of Operation

The K-LAB Processor has four modes of operation. The following is a brief description of these modes of operation.

Power Off Mode

The host computer, processor, and replenisher rack are inactive. Typically, the processor is in this mode during installation or when all chemicals have been removed for a long shutdown.

Sleep Mode

In this mode, only the host computer, the processor electrical cabinet, and the replenisher rack are supplied with power. All mechanical components of the process are turned off.

It takes approximately 5 minutes to reach Sleep Mode after being in Power Off Mode.

Standby Mode

Between batches, the processor is put into Standby Mode. All components of the processor are energized and monitored. All chemicals are at a stable temperature.

It takes approximately 30 to 45 minutes to reach Standby Mode after being in Sleep Mode.

Processing Mode

This is the state in which the processor is actively processing film or is awaiting the mounting of a new batch reel. All chemicals are at a stable temperature. The processor should be set back to Standby Mode if no additional batches are waiting for processing. You select Processing Mode to process film or a control/scratch film strip.

It takes approximately 2 minutes to reach Processing Mode after being in Standby Mode.

Note: *The host computer will not allow the processor to be placed in Processing Mode if any BIB or tank on the replenisher rack is empty.*

K-LAB Processor Management System (KPMS)

The K-LAB Processor Management System (KPMS) controls all aspects of the processor's operation. KPMS allows you to start-up and shutdown the processor, monitor the status of the processor and its components, gather processing data, and respond to emergencies (film breaks, etc.).

KPMS runs the host computer, processor single board computer (PSBC), replenisher rack single board computer (RSBC), temperature controller, and reexposure printer single board computer. These computers are connected to a set of electronics and mechanical devices. As you use KPMS, it sends instructions to these computers which then control the devices that help process the film.

K-LAB uses a set of sensors throughout the processor to monitor its status, gather data, and respond to emergencies. These sensors continually send information to the secondary computers which then pass it on to KPMS for processing and display.

When you follow the start-up procedures for K-LAB, KPMS automatically displays an initialization screen. After initialization, KPMS automatically enters the Sleep Mode and displays the Operator Actions main screen.

Three main KPMS screens allow you to control K-LAB and review the status of the processor.

- Operator Actions main screen
- Processor Status main screen
- Replenisher Status main screen

All KPMS screens have the following elements in common.

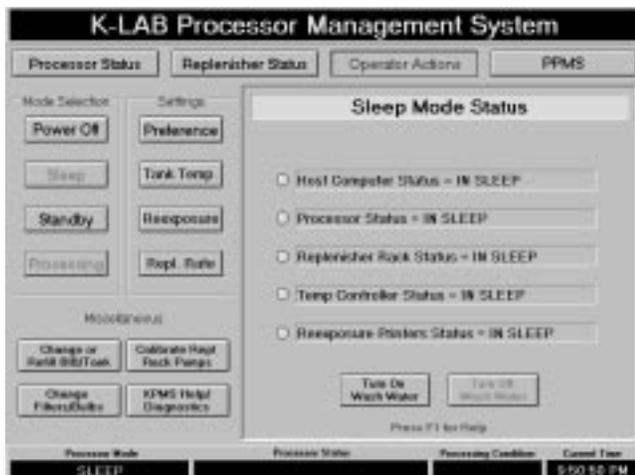
Title Bar—Displays the K-LAB Processor Management System name.

Status Bar—Displays the current processing mode, processing status, processing condition, and time.

Main Screen Buttons—Allow you to select one of the three main KPMS screens, or to enter the Process Production Monitoring System (PPMS) process control program.

Operator Actions

The Operator Actions main screen contains the Mode Selection buttons, Settings buttons, and the Miscellaneous buttons.



The Mode Selection buttons allow you to change the mode of operation (Power Off, Sleep, Standby, and Processing).

The Settings buttons allow you to change a variety of K-LAB settings including the default film type and processing condition, date and time, system password, chemistry temperature setpoints, and the replenisher rates.

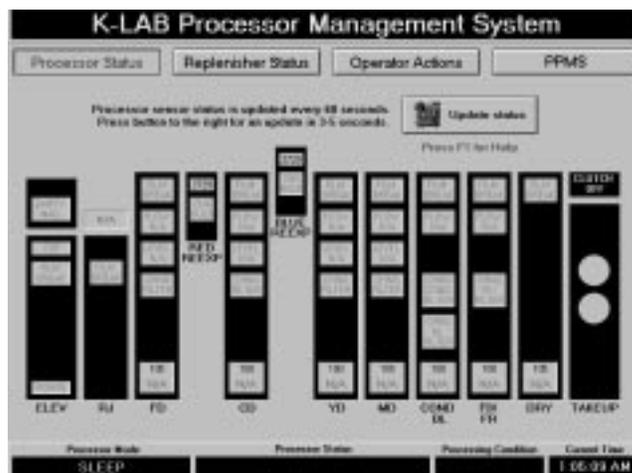
The Miscellaneous buttons allow you to change or refill chemistry BIBs and tanks, change reexposure printer lamps and solution filters, calibrate the replenishment pumps, and access the KPMS help screens and diagnostics functions.

The right side of each Operator Actions screen contains information and additional buttons for the screen you are viewing.

Grayed-out text on a button indicates that the KPMS software has disabled the button to prevent you from accessing inappropriate functions or performing procedures out of sequence.

Processor Status

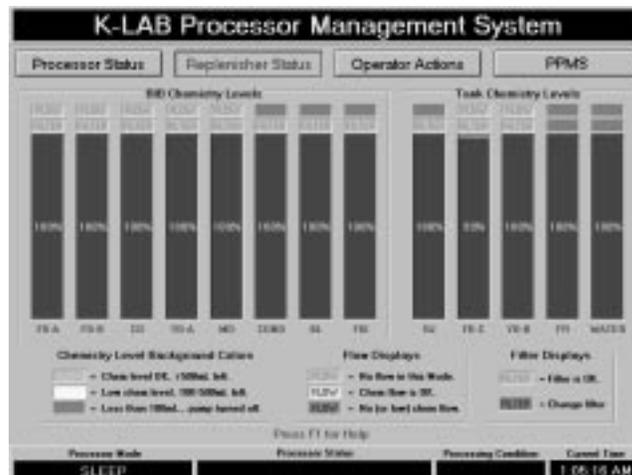
The Processor Status main screen displays the status of the processor mechanisms and sensors, the temperature of the chemistry tanks, and the setpoints for temperature and reexposure printers.



The screen uses colors to indicate status. Green means the system is within limits. Red means you should correct the situation immediately. The display is updated every 60 seconds.

Replenisher Status

The Replenisher Status main screen displays the status of the flow of chemistry from the replenisher rack to the processor, as well as the levels of chemistry in each of the 12 BIBs and tanks.



The screen uses colors to indicate status. For chemistry flow, green indicates that the flow is okay, and red indicates the flow has slowed or stopped. For chemistry levels, green means the level is okay, and red means the BIB or tank is empty. The display is updated every 60 seconds.

PPMS

The PPMS software is a program residing in the Host Computer with the K-LAB Processor Management System (KPMS) software. For more information, see Chapter 9, *PROCESS AND PRODUCTION MONITORING SYSTEM (PPMS)*.

KPMS Help

There are two ways to access KPMS help.

- Press the F1 key on the keyboard for context sensitive help on the current screen.
- Press the KPMS Help/Diagnostics button on any KPMS Operator Actions screen to display the main screen for KPMS Help.

KPMS Help/Diagnostics

KPMS Help/Diagnostics provides explanations of the functions of every KPMS screen.

KPMS Help/ Diagnostics

When you select KPMS Help/Diagnostics, KPMS displays a number of informative and support functions.



KPMS Quick Help: KPMS Help provides explanations of the functions of every KPMS screen.

A row of buttons across the top of each KPMS Help screen allows you to navigate your way to any part of KPMS Help. You can go to the main help screen, search for specific words, go back one help screen, view a list of all the help screens viewed, view the next or previous help screen, view a glossary of K-LAB terms, or return to the KPMS software.

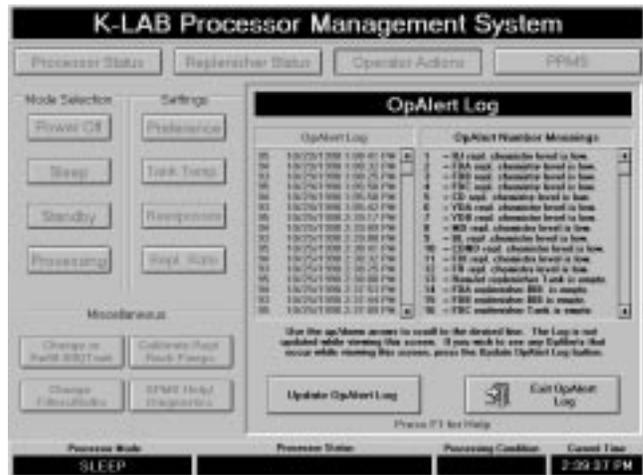
K-LAB Learning Center: Displays a series of lessons providing background and training. Use this section's self-paced lessons to learn about the film, process and processor.

Backup/Restore KPMS Data: Allows you to create a backup of your KPMS settings. You should create a fresh backup at least weekly.



Backups of PPMS data are created from within the PPMS program. It is recommended that you make backups of both programs at the same time (daily, but no less than once a week).

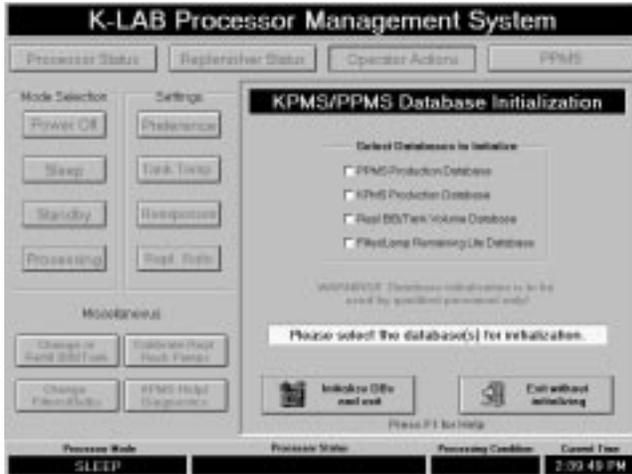
OpAlert Log: The OpAlert Log main screen displays the past 99 operator alerts (OpAlerts). It is updated every time you display the screen or press the Update OpAlert Log button.



OpAlerts are warnings that KPMS displays when it detects a situation that requires your immediate attention. The OpAlert Number Meanings list provides an explanation of each of the OpAlert Codes used in the OpAlert Log.

Start PC Anywhere: This opens your computer for outside access by Kodak service personnel. Only use *Start PC Anywhere* when specifically requested to do so by Kodak service personnel.

Initialize Databases: This function is used by authorized personnel during initial set-up of the computer or recovery from a computer failure.

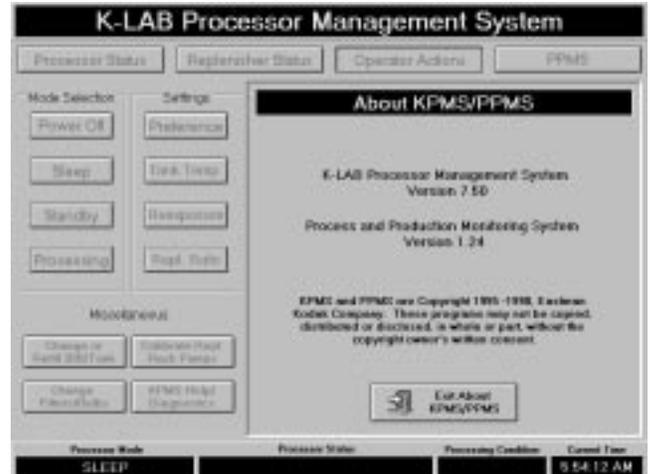


Calibrate Touch Screen: This function allows you to align the touchscreen’s “touch” feature and the visual buttons. This is useful for operators who experience difficulty “hitting the buttons” the first time.

Start K-LAB Port Monitor: This troubleshooting tool provides maintenance personnel with the ability to query the host computer, the processor SBC, and the replenisher rack SBC.



About KPMS/PPMS: This function displays version numbers and copyright information for the KPMS and PPMS software.



Exit Help and Diagnostics: Allows you to return to the main KPMS screen.

