Instruction Manual for the ATL's: 2200, 2300, 2400 and 2500

Index

Introduction to your new ATL-2200/2300/2400/2500

Quality

- Fully automatic, microprocessor controlled system.
- Constant, repeatable results from one process to another.
- Each process step accurate to the second.
- Chemical temperature maintained to within ± 0.1° C.

Economy

- Thorough utilization of chemistry.
- Integrated chemical collection system.
- Versatility
- Switch from process to process quickly and easily.
- Processes: C-41, E-6, Ilfochrome©, B & W, R-3, RA-4, Lithographic, and X-Ray.
- Standard film formats include: 110, 135, 120, 220, 4x5", 5x7", 8x10", 8½x11", 8½x12". We can also custom build sheet film drums for any film size up to 16x20". Our long roll system includes 8mm, 16mm, 35mm, 60mm, 70mm, 126mm, and 127mm.
- Print formats include 4x5", 5x7", 8x10", 16x20", and 20x24".

Notes:

Congratulations on your purchase of a JOBO AutoLab film and print processor. Please take a moment to complete and return the enclosed warranty card. The warranty card will register you as a processor owner. This registration will allow us to notify you of product updates and promotions.

With your new processor, you will be able to take advantage of a variety of tank and drum combinations to process virtually any film or print format. Your new processor is able to quickly switch back and forth between E-6, RA-4, Ilfochrome©, C-41, Black and White, etc... In addition to the processor, you will need a selection of tanks and drums depending on the film and print formats you use. Also, you will need a method of drying your material, and some type of water mixing panel that will control the water temperature of the incoming rinse water. (JOBO has a variety of products to accomplish everything you need).

Your processor will maintain up to twelve different programs depending on your needs. Its lithium battery protects your programs even if the power is disconnected for months. All the functions of processing your film and prints, except stabilizing and drying, are fully automatic.

Your AutoLab uses a recirculating water bath to maintain the temperature of the chemistry, and the tanks, reels, and film or paper to within ± 0.1° C. The rotation of the tank can be set to 25, 50, or 75 R.P.M, depending on the chemical process you are running.

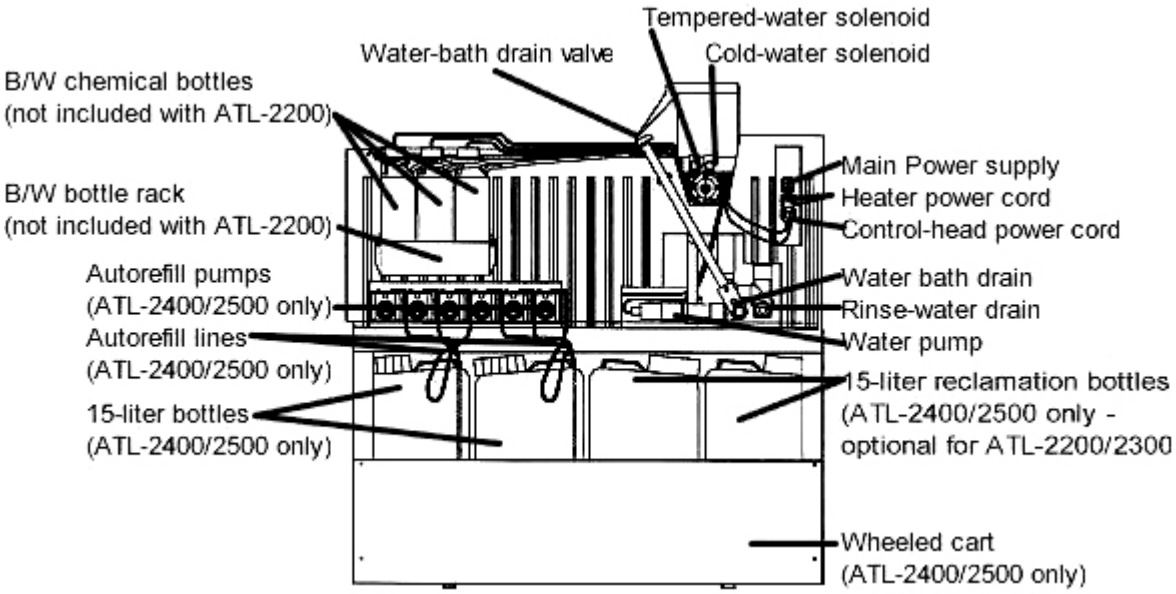
After your chemistry has been pumped, the microprocessor deducts the amount used from the total volume you started with, and will not allow you to start a process with insufficient chemistry. Also, the processor will not start until the chemistry is within ± 0.3°C of the process temperature (unless you decide to override it).

Your new AutoLab, depending on the model, will even allow you to reclaim used chemistry in six separate one- or fifteen-liter containers.

Technical Information

- Height - Models ATL-2200/2300 24" (61cm)
- Height - Models ATL-2400/2500 48" (122cm)
- Height with largest drum in highest position - Models ATL-2200/2300 45½" (116cm)
- Height with largest drum in highest position - Models ATL-2400/2500 69" (176cm)
- Length 46" (117cm)
- Width 20" (51cm)
- Weight - Models ATL-2200/2300 (empty) 78 lbs. (35 kgs)
- Weight - Models ATL-2400/2500 (empty) 223 lbs. (101 kgs)
- Voltage 110V 60hz (or 240V 50hz special order)
- Power Consumption - 115 Volt Processors 1000 Watts (8.7 amps)
- Power Consumption - 240 Volt Processors 1400 Watts (5.9 amps)
- Minimum Water Pressure 15 psi (1 bar)
- Maximum Water Pressure 90 psi (6 bar)
- Water Jacket Capacity 4¼ gallons (16 liters)
- Temperature Range 18.0°-49.9° C (64.4°-121.8° F)

(View from rear)



Operating Instructions

- Version 1.2 (2/18/98)
- Item #66053

Index

1. Unpacking the unit

1.1 Removing the processor from the shipping box(es)

Models ATL-2200/2300 are packaged in a single corrugated cardboard box. Models ATL-2400/2500 are packaged in two cardboard boxes. The total weight for models ATL-2200/2300 is approximately 82 lbs., and models ATL-2400/2500 weigh 230lbs. Two people are required to lift the processor and/or support stand from the box.

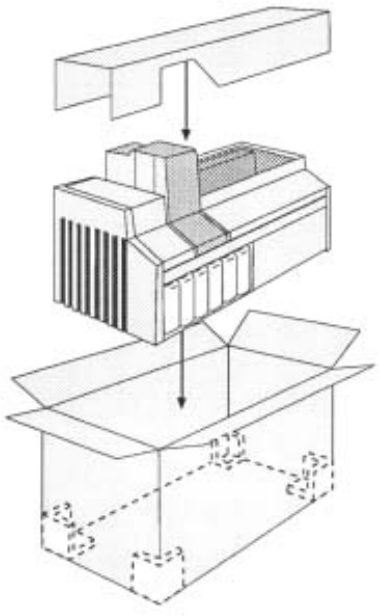
1. Cut the shipping tape on the top and open the lids.
2. Remove the upper support made of corrugated cardboard, and the two foam end pieces.
3. With one person at each end of the box, lift the processor straight up.
4. Place the processor where you intend to install it.

1.2 Shipping damage

Check the processor for any damage caused in shipping. Immediately report any shipping damage to the shipping company or the dealer from which you purchased the processor.

1.3 Packaging

To protect against any damage to the processor, use the original packaging material if the unit is to be transported. We do not accept responsibility for damage due to incorrect packaging.



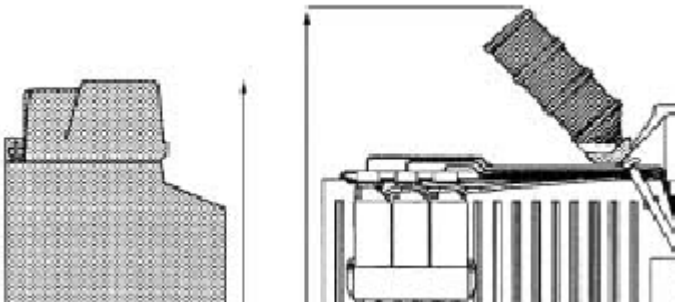
Items supplied with your processor

Article Name	Part Number	ATL-2200	ATL-2300	ATL-2400/2500
Allen key 4mm	#16159	1	1	1
Allen key 3mm	#16227	1	1	1
Bottle, black 1 liter	#3372	2	0	0
Bottle, 1-liter front, *model 2500 1.5 liter*	#3391	6	6	6
Bottle, white 1 liter	#3373	10	6	6
Brass Adapter for 3/4" NPT hose	#61003	2	2	2
Cap For Coupler	#92158	1	1	1
Cog lid washers	#07095	3	3	3
Drain Hose Assembly	#93017	1	1	1
Hose, High-Pressure European Thread	#16171	2	2	2
Reclamation Cover	#10154	1	1	1
Retention Clip Set	#92157	1	1	1
Roller set, black	#92167	1	1	1
Screwdriver, Jeweler's Phillips	#16229	1	1	1
Transfer gears, set of two	#95200	1	1	1
Warranty card	#60015	1	1	1
Washer, 3/4"	#61002	2	2	2

3. Site Specifications

3.1 Installation site

Your new AutoLab does not need to be installed in a darkroom. Once the tanks have been sealed, they are completely light-tight. The dimensions of models ATL-2200/2300 are as follows (models ATL-2400/2500 have the same dimensions except they're 24" taller):



- **45½" Wide**
- **20" Deep**
- **24" High**
- **46" High (with largest drum raised)**

Your new AutoLab should be installed near a drain (check your local codes regarding disposal of photo chemistry), a water supply (the rinse steps require tempered water), and a **dedicated, grounded, GFCI protected** 110V electrical outlet. Please read section 4.2 about water connection before you determine the final location of the processor.

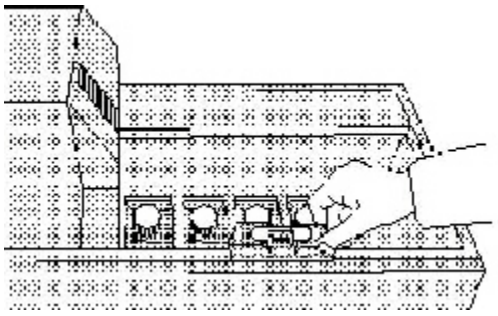
The AutoLab should be installed on a stable, level surface capable of supporting at least 150 lbs for models ATL-2200/2300 and 350 lbs for models ATL-2400/2500. The surface should be waterproof, and higher than the drain (for models ATL-2200/2300).

The installation location should have enough vertical clearance for the processor to empty the largest drum - at least 45½" from the base of the processor for models ATL-2200/2300, 70" for models ATL-2400/2500.

The ATL-2200/2300 can be installed on our special support table #4221, in a sink, or on any generic work table. JOBO's support table provides a convenient, comfortable working height for the processor, and has storage space for your tanks and drums. This support table can be combined with our chemical collecting cart #4225 which provides additional storage for used chemistry.

Level the processor. It is *extremely* important the processor be absolutely level to develop your film and prints properly. Level the processor on the trough casing as indicated in the following graphic.

Then, check that the drums attached to the processor are level.



3.2 Electrical connection

A dedicated, grounded, UL-approved electrical outlet is required. At least a 10 amp circuit breaker is needed to run the processor. The AutoLab draws a maximum of 8.7 amps (240V units draw 5.9 amps), so consider the amperage of any other appliances if you must connect them to the same circuit. It is strongly recommended that you consult an electrician when deciding what rating of circuit you need.

A ground fault circuit interrupter (GFCI) is strongly recommended!

DO NOT OPERATE THE AUTOLAB WITHOUT ELECTRICAL GROUNDING!

3.3 Water pressure

The water pressure must be between 15 and 90 p.s.i. (1-6 bar). Pressure less than 15 p.s.i. will result in an unusually long filling time for the water bath in addition to inadequate rinsing. Water pressure of over 90 p.s.i. may cause damage to the processor. If the water pressure exceeds 90 p.s.i., we recommend you purchase a pressure reducer (#61004). The two hoses (#16171) required to operate the processor are included.

Warning: To avoid the possibility of water damage from water leaking from the Water Mixing Panel always make sure the shut-off valves are accessible and that they're turned off when the processor is not in use.

3.4 Rinse water temperature

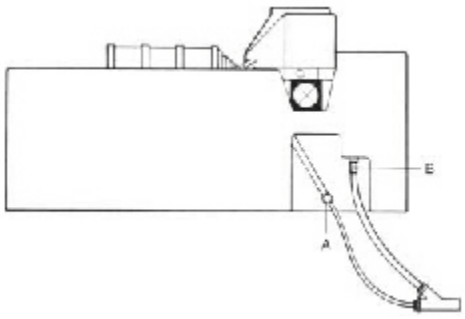
Your new AutoLab uses two water supply lines, one cold and the other tempered. The tempered water line should be adjusted to within ± 0.5°C of the process temperature. To deliver the tempered water JOBO recommends our water mixing panel (#4189). It has a low-flow mixing valve and a trickle line; both are needed for optimum results. Also, the water panel is designed with a special valve to allow you to fill the processor with tempered water to speed the warm-up time before the first run of the day.

If processes are run at temperatures below ambient room temperature, the temperature of the supplied water must be lower than the processing temperature. A water chiller should be used if the supplied water is warmer than that required by the process you intend to run.

3.5 Waste water

Your new AutoLab has two drains: one water bath drain, and one drain for the rinse and chemical steps and water bath overflow. Included with the processor is a drain assembly kit (#93017). Attach the drain lines in the following manner. The drain labeled "B" is for the chemical reclamation area and overflow protection. The drain labeled "A" is for the water bath.

If the processor is installed on a work table, you must run the drain hose for the processor to your drain. Consult your local government code regarding the disposal of photographic chemistry.



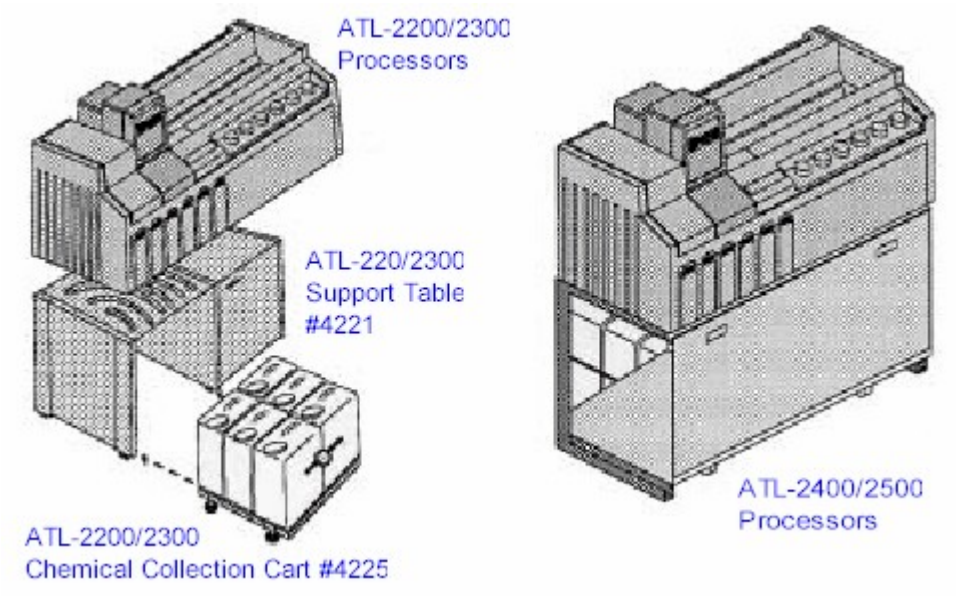
3.6 Room temperature

The processor continually circulates the water bath to maintain the processing temperature. Normal fluctuations in room temperature will have no impact on the processor's ability to maintain the correct temperature (except when running processes below room temperature, see sec. 3.4). Do not install the processor directly in the path of a heating or cooling duct.

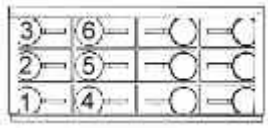
To prevent heat loss, which may cause temperature fluctuations, always keep the rear bottle cover in place when using the processor.

4.1 Chemical reclamation

The ATL-2200/2300 collect the used chemistry in six 1-liter bottles. If you use our support table (#4221), it is possible to purchase the 15-liter chemical collection cart (#4225). It includes six 15-liter bottles designed specifically for the support table. Models ATL-2400/2500 collect the used chemicals in either six 1-liter bottles on the face of the processor or six 15-liter bottles stored below.



Position of reclamation bottles



Chemical Collection Cart #4225

4.2 Water connection

Your new AutoLab uses two water connections with European hose thread. Two washers and two brass adapters are included to convert the threads to standard US threading. The two water connections are located in the rear of the processor above the fan and power cord. Connect the gray hoses to the solenoids, the hoses to the brass adapters, and the adapters to your cutoff valve. Make sure you use the washers at every connection.

The *tempered water* supply connects to the solenoid coded with a *red dot*. The *cold water* supply connects to the solenoid with the *blue dot*. The tempered water supply should always be set to within ± 0.5°C of the processing temperature. Screw the hoses on tightly, but do not strip the threads.

Depending on the condition of your tap water, you may want to install a water filtering system to prevent any contamination caused by particulate matter.

4.3 Electrical connection

Observe your local electrical code!

Plug the processor into a grounded 110-120V UL approved outlet. It is extremely important that the outlet be grounded. JOBO strongly recommends the use of a **ground fault circuit interrupter (GFCI).**

Warning: The correct electrical connection AND grounding of the processor are necessary to avoid the risk of fire, electrical shock, or personal injury. The owner of the processor bears the personal responsibility for ensuring that the electrical connection is safe.

The processor is equipped with a grounded, three-prong plug. Insert the plug into grounded outlets only. Do not alter the plug. If you do not have a proper outlet, consult your local electrician to have one installed. To prevent condensation in the microprocessor, the fan runs continuously when the unit is ON and continues to run for three hours after the processor has been turned OFF.

4.3.1 Emergency power supply

Your new AutoLab comes with a battery system to continue a process if the power has been interrupted when the power is restored (it remembers where it was in the process). However, if the power is off for more than a few seconds your process run could be ruined so we recommend you always use a battery backup system such as our #4268.

4.4 Installation check list

- Processor leveled correctly (sec. 3.1).
- Drain line connected (sec. 3.5).
- Water supply hoses connected and valves open with no leaks (sec. 4.2).
- Processor connected to a grounded outlet (sec. 4.3).

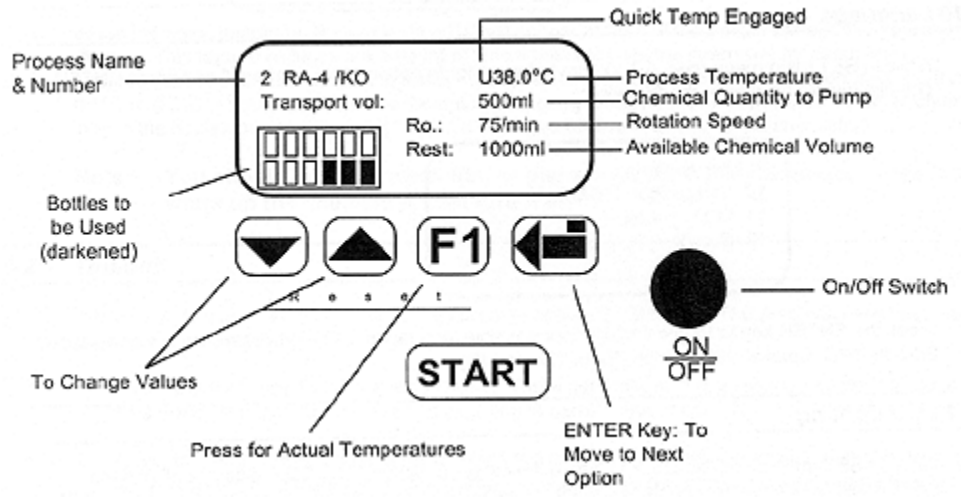
5. Operation

Caution: Perform a trial run with test film before processing any "real" film or paper.

5.1 Water supply

Open the cold and tempered water supply valves feeding the machine.

5.2 Turning on the processor



Switch the processor ON using the ON/OFF button.

The unit starts filling with water within a few seconds, and automatically maintains the correct water bath level.

5.3 Setting the tempered water supply

The temperature of the incoming tempered water must be maintained at the temperature of the process.

Refer to your water panel instructions to set the temperature of the rinse water. JOBO recommends the use of water panel #4189 or #4236 which were specifically designed for the operation of JOBO Autolabs.

5.4 Filling the chemical bottles

Lift the rear lid to access the six in-line bottles (model ATL-2200 does not have rear in-line bottles). Unscrew the bottle caps and pour in your chemistry. The maximum capacity of the bottles is 1 liter each. Do not fill above the air pressure line grommets.

Model ATL-2500 automatically fills the front bank of 1.5-liter bottles with the chemicals stored in the 15-liter bottles below the processor. Model ATL-2400 automatically fills the rear bank of 1-liter bottles from the same 15-liter bottles stored below the processor.

The quantity in the bottles must be entered into the processor's memory as explained in section 7.4. Screw the caps back on to the bottles tightly. If the bottle caps are not tight or cross-threaded too little or no chemistry will be pumped and the film or paper will be improperly developed. (The processor will warn you if no chemicals are pumped on any volume over 140ml.) Make sure the air distribution lines fit snugly into the rubber grommets and the chemical lines are completely on the grey tube coming out of the bottle.

Air
Fill line -
Chem

Warning: *Do not overfill the bottles*. If the bottles are over-filled, chemistry may siphon into the unit. Do not use the top of the AutoLab as a resting place for coffee, chemistry, or any other liquids. If they were to spill, the moisture could damage the electronics.

5.5 Filling the rear storage bottles - Model ATL-2200 only

The ATL-2200 includes six additional 1-liter bottles for pre-tempering chemistry. Lift off the back bottle cover and remove the bottles. Fill the bottles with the chemistry you want to preheat, place them back in the processor, and reposition the bottle cover.

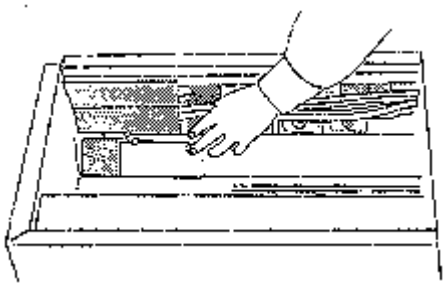
Hint: Write the name of the chemical, who mixed them, and the date they were mixed on the bottles. A grease pencil works well for this.

5.6 Adjusting the water level

On the front, right-hand side of the water trough, there is a sliding panel with a stainless steel screen. Sliding the panel to the left (open) will increase the water drainage and lower the upper trough water level. Sliding it to the right (close) will raise the upper trough water level. Set the water level so the bottom of the drum being used is covered with approximately 1/4" of water.

The water level needs to be changed every time a different tank or drum system is used. If the water level is set too high the tank floats off the rollers, uneven development will occur because the chemistry will pool at one end. If the level is set too low, the tank will not be heated properly.

Clean the stainless steel screen filter as needed. Operating the processor with a clogged filter may cause the water level to be too high. Operating the processor without the filter screen will cause debris to clog the water recirculation pump, and may damage the processor.



View from back side

5.7 Tank and drum systems

JOBO produces a variety of tanks and drums you can use, depending on the format sizes of your film and paper. JOBO tanks and drums are attached to the processor with a coupler on one side of the rotation trough. The coupler uses a ventilation tube, and a cap. If you are using 1500, 2500, or 2800 series tanks, the cap goes on the top tube and the ventilation piece fits in the lower tube. If you are using the 3000 series drums the cap goes on the bottom tube, and the ventilation tube on the top tube.

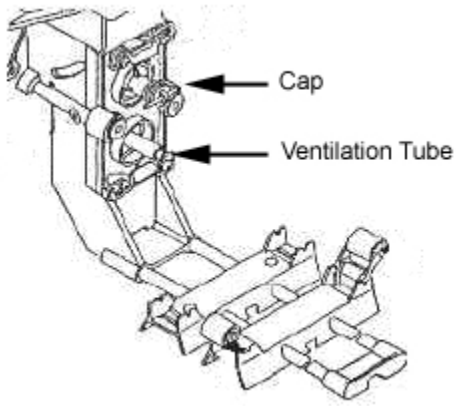
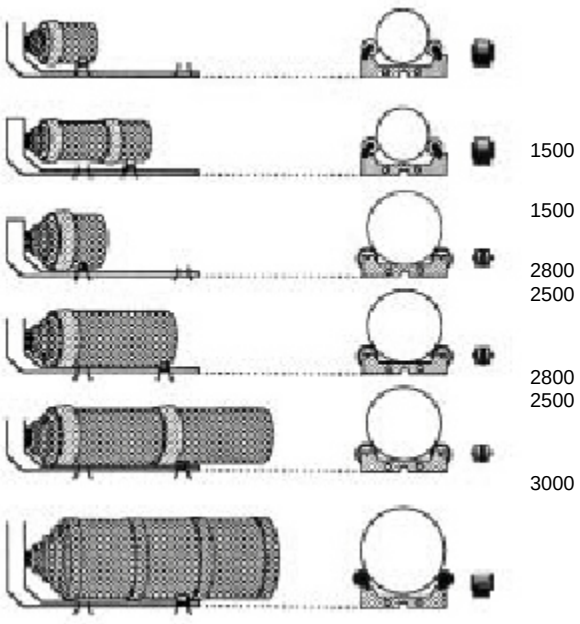


Illustration shows cap and ventilation tube positioned for 1500, 2500, or 2800 series operation.

5.8 Setting the roller supports

The positions of the rollers, roller extensions, and bases are illustrated here. Note that the roller with the black O-ring is only used with the 2500 and 2800 series tanks.



5.9 Automatic cooling

The water bath is cooled automatically until the correct developing temperature is reached. When the water bath temperature rises higher than the selected process temperature the cold water solenoid opens to let in cold water. The cold water solenoid opens approximately 30 seconds after the water bath temperature has exceeded the processing temperature.

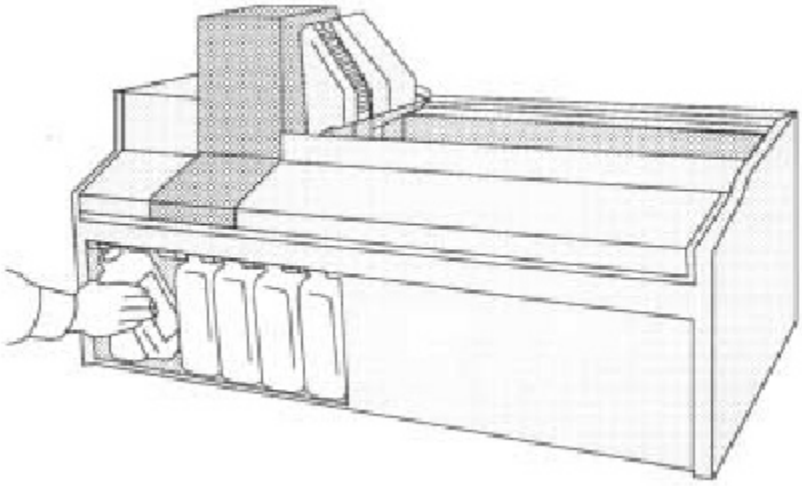
If your cold water supply is warmer than the selected process temperature, you will have to purchase a water chiller. Contact your plumber or local photographic dealer for more information.

Hint: If you want to cool the processing temperature from a high level to a low level you should turn off the machine, drain the water bath, turn on the machine, and select the new process. This procedure will save time and water.

5.10 Collection of used chemistry

Depending on the model of processor you purchased, you have a variety of reclamation options. With all four models, you can collect the chemicals in six 1-liter bottles located at the front of the processor. Models ATL-2400/2500 also allow you to reclaim the chemicals in six 15-liter bottles located beneath the processor. The same 15-liter chemical reclamation for models ATL-2200/2300 is accomplished by purchasing the ATL Support Table #4221 and Chemical Collection Cart #4225.

Note: Model ATL-2500 ships with six 1-liter reclamation bottles but has a maximum pumping capacity of 1.5 liters. When assembling the ATL-2500 you must replace the front six 1-liter bottles with special "funnel" type bottles included with the processor. This will allow the chemicals to pass through the front bottles into the six 15-liter bottles stored below.



Your AutoLab can be configured to reclaim certain chemical steps, and route others to the drain. This setting is accomplished by limiting the movement of the internal drain arm located on the left side of the processor. Two black, mushroom shaped caps (#16247) are included with the processor. The caps are designed to limit the movement of the drain arm when they're placed in the drain holes.

The six holes in the drain area connect to openings over the six bottles recessed in the front of the processor. The black drain arm moves in conjunction with the process steps from back to front. The rinse steps are drained between the holes.

The following table illustrates the different cap formations you can specify:

Which bottle(s) to reclaim	Which hole to cap	Position of drain arm
None	One cap on 6	In front of cap
All	No caps	N/A
1	One cap on 2	Behind cap
1-2	One cap on 3	Behind cap
1-3	One cap on 4	Behind cap
1-4	One cap on 5	Behind cap
1-5	One cap on 6	Behind cap

2	Caps on 1 and 3	Between caps
2-3	Caps on 1 and 4	Between caps
2-4	Caps on 1 and 5	Between caps
2-5	Caps on 1 and 6	Between caps
2-6	One cap on 1	In front of cap
3	Caps on 2 and 4	Between caps
3-4	Caps on 2 and 5	Between caps
3-5	Caps on 2 and 6	Between caps
3-6	One cap on 2	In front of cap
4	Caps on 3 and 5	Between caps
4-5	Caps on 3 and 6	Between caps
4-6	One cap on 3	In front of cap
5	Caps on 4 and 6	Between caps
5-6	One cap on 4	In front of cap
6	One cap on 5	In front of cap

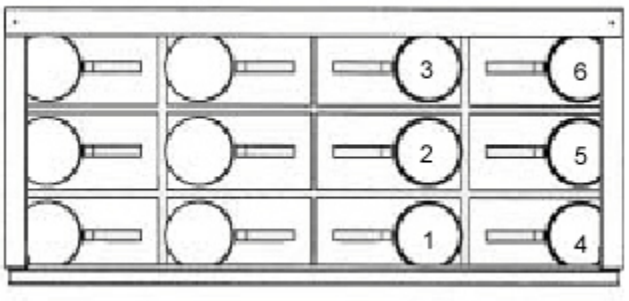
Note: Government regulations can affect your right to put photo chemistry into your drains. Consult the proper authorities for any regulations before draining your chemistry.

5.11 Installing the auto-refill hoses

On models ATL-2400/2500 you have the option of having a bank of bottles filled with an automatic system designed to allow you to process multiple runs of film more quickly (model ATL-2400 fills the rear bank of 1-liter bottles, model ATL-2500 fills the front bank of 1.5-liter bottles). There are six hoses connected to the refill pumps on the right side of the rear of the processor. Route these hoses to the six 15-liter bottles stored below the processor (through the holes in the bottles) then fill the bottles with chemicals. The bottles come with floating lids to prevent oxidation.

It is important that the lids of the bottles be partially unscrewed to allow chemicals to be pumped from them. Do not remove the lids completely or the chemicals will oxidize more rapidly and it will be possible for dust to enter the bottles.

When the processor is in RUN mode, if a program is selected using the front or rear bottles (depending on the model), and the bottles are not full of chemicals, the refill pumps will run. It does not hurt the pumps to run dry temporarily. Use the following positions for the chemicals (so it's the same as the chemical collection bottles to the left).



Front

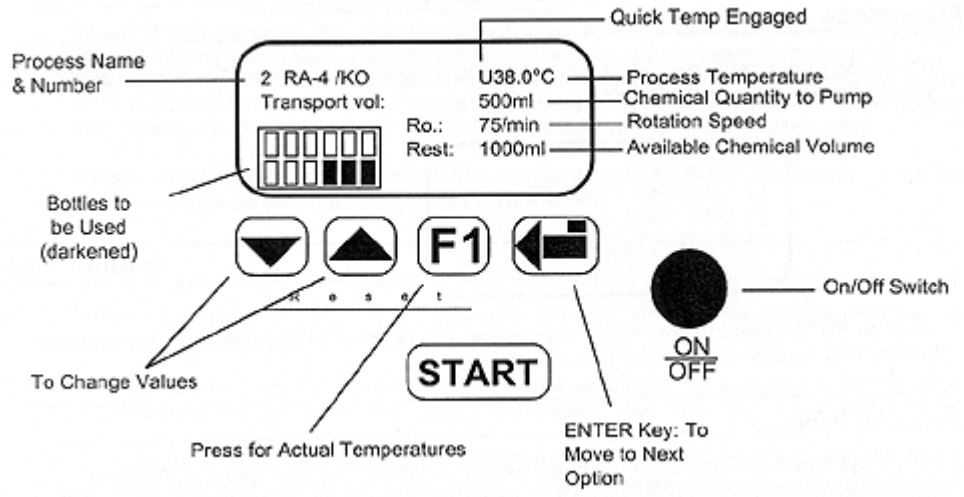
6. Programming in SET mode

6.1 General information on programming

Your AutoLab has been pre-programmed with standard processing times and temperatures for traditional processes. The pre-programmed processes are specified in Section 10.10. The AutoLab is fully programmable, so you can change any of the preset processing parameters at any time.

6.1.1 Altering a process (SET mode)

Items specific to a process (temperature, chemical and rinse times, etc...) can be changed in SET mode. Access SET mode by pressing F1 and ENTER simultaneously.



The display will change to the following:

** SET main menu **

1. Alter proc. data

2. Lift.-arm, manual

3. Auto refill OFF

Press the down arrow key to scroll through the options. The remaining options are:

4. Rinsing Opt. OFF

5. Temp of wash wat.

6. Quick temp OFF

7. Options

8. Standby-T. OFF

9. Alter code no.

10. Language **GB**

11. LCD Lighting 100%

12. Cursor

13. List of Errors

14. Return

All 14 options are explained in the following program sections 6.2.1 - 6.2.14 following.

Note: You can exit SET mode at any time by pressing the F1 button or RESETTING the processor when the cursor is positioned at the beginning of a line. Any changes you've made will be saved.

6.2.1 Altering process information

Select option 1 while in the SET main menu (Alter Process Data) and press the ENTER key. The display will change as follows:

** Alter process data **

1. Process no: 1

2. Pr. name C-41 PHO

3. Bottle batt: FR.

Pressing ENTER here will move the cursor as follows:

** Alter process data **

1. Process no. 1

2. Pr. name C-41 PHO

3. Bottle batt. FR.

You can now use the up and down arrows to choose which program (1-12) to modify. After choosing the program you want to modify, press ENTER again to return to the numbered options at the left.

Press the down arrow one time to move to the process name, and the display will change to the following:

1. Process no. 1

2. Pr. name: C-41 PHO

3. Bottle batt: FR.

4. Pr. temp. 38,0°C

"Pr. name" refers to the process name. The name can be changed to whatever you would like to call it up to eight characters long. All upper and lower case letters, numerals, and punctuation marks can be used.

To change the name press ENTER while at position 2. Using the up and down arrows will change the character, and pressing the ENTER key will advance you through the eight characters. While positioned at option number 2 press the down arrow to move to option 3.

2. Pr. name: C-41 PHO

3. Bottle batt: FR.

4. Pr. temp. 38,0°C

5. Preheat. 5:00

"Bottle batt." refers to whether the chemistry will be pumped from the front set (battery) of bottles or the rear set. To change the bottle battery press ENTER while positioned here (not an option on model ATL-2200). Press the down arrow to advance to option 4. The display will change as follows:

3. Bottle batt: FR.

4. Pr. temp. 38,0°C

5. Preheat 5:00

6. Pre-rinse 0:00

"Pr. Temp." refers to the process temperature. Press the ENTER key to change the temperature. You can specify any temperature between 20.0 and 49.9 degrees centigrade. Pressing the ENTER key will advance you through the digits of the temperature. Use the up and down arrows to change the values of each individual digit (while you are positioned on the digit). While positioned on option 4, press the down arrow to move to option 5. The display will change to the following:

4. Pr. temp. 38,0°C

5. Preheat 5:00

6. Pre-rinse 0:00

7. Chemical 1 6:30

Use the ENTER key to position the cursor under the first digit of the time. You can then use the up and down arrows to change the values, and use the ENTER key to move to the next digit. Any time can be programmed from 00:00 to 99:59. If you specify 00:00 as the time, the step will be skipped. **Refer to section 9 for processing times.**

The rest of the values from "6. Pre-Rinse" to "18. Rinse 6" can be set the same way you set the "5. Preheat" time. In determining the process times you want to use, remember that if a chemical manufacturer specifies "*3-30 second rinses*" you should set the time for the total (*01:30*). The AutoLab accounts for the time needed to drain the chemistry, you should not add any extra time to a process step to try to account for the draining times.

After the final rinse (rinse 6), press ENTER at "19. Return" to return to SET main menu.

6.2.2 Raising and lowering the lift arm

Raising and lowering the lift arm. If you are using the Rinsing Option explained in section 6.2.4 you will need to manually raise and lower the lift arm when a process is completed. Select this option while in SET mode, then raise or lower the lift arm using the up and down arrow keys.

6.2.3 Auto refill

This option is only available on models ATL-2400/2500. Use this option to engage or disengage the auto-refill pumps. The AutoLab will attempt to refill any bottles used in a program with chemicals stored below the processor. The ATL-2400 refills the front bottles only, and the ATL-2500 refills the back bottles only. In the event the bottles haven't been filled within a reasonable amount of time an alarm will sound indicating the storage bottles need to be refilled. If for some reason you do not want the bottles refilled, you disengage the system by changing the value to OFF (by pressing the ENTER key).

6.2.4 Rinsing option

While in SET main mode (sec. 6.1.1), move the cursor to option "4. Rinsing opt." and press the ENTER key. The display will change to the following (the option is turned off and on by pressing the ENTER key):

3. Auto refill: OFF

4. Rinsing opt. ON

5. Vol. leftovr. SEP

6. Vol. transp. AUTO

When the rinsing option is switched on, the water from the last rinse cycle of the final rinse step will not be drained from the tank. Uncouple the tank and manually pour the water down the drain, or, enter SET mode by holding down F1 and pressing ENTER simultaneously, then select option two to raise or lower the lift arm. The function is designed to prevent partial drying of films or prints in the event you are unable to remove the material within ten minutes after the process has finished.

6.2.5 Temperature of wash water (rinse water)

While in main SET mode (sec. 6.1.1), move the cursor to option "5. Temp of wash wat" and press the ENTER key.

Pressing ENTER again will activate the rinse water solenoid to allow you to manually measure the temperature of the rinse water by holding a thermometer in the water stream and make any adjustments necessary. The water will flow for 10 seconds out the spigot on the lift arm. It's important that the temperature of the rinse water be as close to the process temperature as possible.

6.2.6 Quick tempering

While in SET main menu (sec. 6.1.1), move the cursor to option "6. Quick Temp: OFF" and press the ENTER key. The display will change to the following:

5. Temp of wash wat

6. Quick temp: ON

7. Options

8. Standby-T. OFF

When the quick tempering feature is on a "U" will appear in front of the temperature in the operational display. This feature reduces the amount of time it takes to heat the chemistry by about 80%. However, using the quick tempering feature reduces the accuracy of the chemistry temperature from 0.1°C to 0.3°C. You should not use the quick tempering feature if there is less than 800ml of chemistry in the bottles due to a "layering" effect it can have (uneven heating of the chemistry).

Note: You should never process film or paper with the feature engaged. Use it to warm up the chemistry, then turn it off.

6.2.7 Options

While in SET mode (sec. 6.1.1) move the cursor to option "7. Options". The processor will open up a sub menu to allow you to:

1. Check the RAM and ROM of the computer. There generally isn't any reason you want to do this, it's a diagnostic tool. It does not hurt anything to perform the check.

2. Adjust the temperature probe offsets. When the temperature probes are manufactured there are occasional slight variations in their accuracy. It is therefore necessary to offset the probes to reflect the exact temperature. Do not change the values of the offsets without first contacting JOBO.

3. Return to SET menu.

5. Temp of wash wat

6. Quick temp: ON

7. Options

8. Standby-T. OFF

6.2.8 Standby temperature

This option is only available on models ATL-2300/2400/2500. While in SET main mode (sec 6.1.1), move the cursor to option "8. Standby-T." and press ENTER. The processor will now allow you to adjust the standby temperature of the processor.

Your AutoLab incorporates a system called Automatic Temperature Compensation (ATC). With ATC you can process black and white chemicals with the bottles hanging outside the rear of the processor in a special rack that ships with the processor. The advantage of this is the ability to process B/W material while the processor maintains a "standby temperature" for the bottles that remain in the water bath. The temperature has a default of 38.0 C because presumably your non-B/W chemicals are either E-6 or C-41.

See section 8.5 for more information regarding ATC.

6.2.9 Code number

While in SET main menu (sec 6.1.1), move the cursor to option "9. Alter Code no." and press ENTER. You can now select a code number to prevent access to the programming menus. The code number can be set using the up and down arrows to any number from 1-9.

When you have chosen a code number, the processor will prompt you for the number whenever you attempt to enter SET mode.

You do not have to set a code number! If you don't want a code number, set the code to "0".

6.2.10 Language

While in SET main menu (sec. 6.1.1), move the cursor to option "10. Language" and press ENTER. The display will change to the following:

9. Alter code no.

10. Language: **GB**

11. LCD lighting

12 Cursor

Press the ENTER key to toggle through four possible languages. The processor can be operated in English (GB), Spanish (E), French (F), or German (D).

6.2.11 LCD lighting

While in SET main menu (sec. 6.1.1), move the cursor to option "11. LCD Lighting" and use the ENTER key to choose how bright you want the panel to be illuminated. You can choose from OFF (if processor is installed in your darkroom), 10%, 90%, or 100% illumination.

6.2.12 Cursor display

While in SET main menu (sec. 6.1.1), and press the ENTER key. Move the cursor to option "12. Cursor" and press ENTER. You can specify the cursor to be displayed as a solid underline, or a blinking square.

6.2.13 Errors

While in SET main menu (sec. 6.1.1), move the cursor to option "13. List of Errors" and press ENTER. Your AutoLab will display the errors it has encountered during the last process run. The errors are self-explanatory. When you start the next run, the error list will be erased.

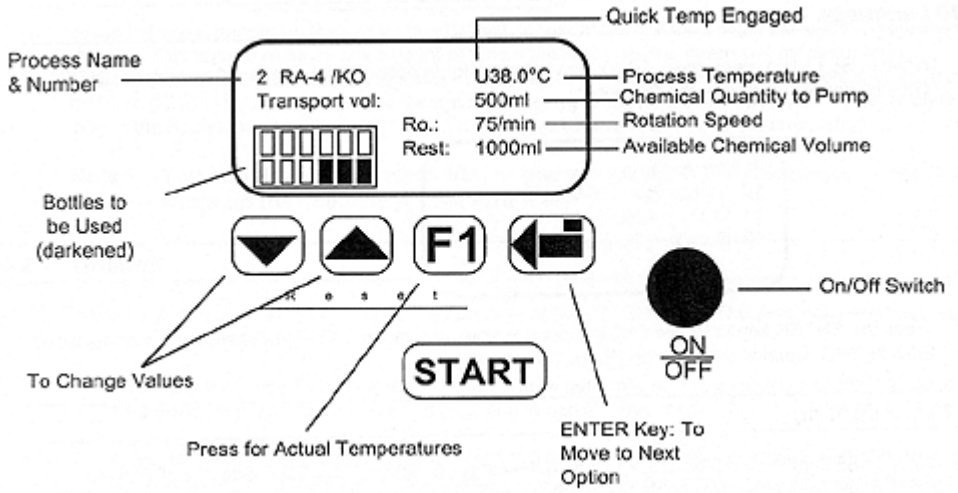
6.2.14 Return

Option 14 of SET main menu is used to end the editing session and proceed to RUN mode.

7. Running a process

7.1 Selecting the correct process

Turn the AutoLab on using ON/OFF switch. The display will appear as follows (RUN mode):



7.2 Selecting the chemical quantity to use

Read the label on the tank or drum to determine the correct amount of chemistry needed to develop the film or paper. When using multiple tank modules, add the quantities for the correct chemical amount. If the chemical amount required does not appear as an option, use the *next highest chemical volume*.

Note: The quantities listed on the tank and drum labels are the *minimum* needed. Some processes may require *higher volumes*for proper results.

Move the cursor to "Transport Vol" by pressing the ENTER key and adjust the level with the up and down arrows. The following page will help you determine the chemical quantity to use: instructions_misc_tank_and_drum_capacities.htm

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7.3 Rotation speed

While in RUN mode, move the cursor to "Ro." by pressing the ENTER key. You can adjust the rotation speed to 25, 50, or 75 R.P.M.. Use the following information to determine the rotation speed:

- 25 rpm Special Processes
- 50 rpm Expert Drums, 3000 series.
- 75 rpm 1500/2500/2800 series tanks and drums.

The R.P.M. settings for the motor are calculated as if the drum were moving continuously in one direction. The processor slows the motor before reversing direction so the net rotation speed will actually be lower than the setting, which is normal.

7.4 Remaining chemical volume

While in RUN mode, move the cursor to "Rest" by pressing the ENTER key. You must reset this number every time you refill the chemical bottles. The volume can be changed by pressing the up and down arrows. All bottles must have the identical amount of chemistry in them. If the bottles are full, you can press the up arrow for two seconds to set the "Rest" volume to 1 liter automatically.

7.5 Final check list

After attaching the tank, please go through this final check list before starting a process:

1. Have you selected the correct program?
2. Have you set the proper chemical volume to be used?
3. Is the rotation speed correct?
4. Is the chemical volume listed under "Rest" correct?
5. Is the unused spout on the lift arm capped, and the ventilation tube on the used spout in place?
6. Are the bottle caps screwed on correctly?
7. Are the rollers and roller extensions set correctly?
8. Is the water bath level set correctly? (It should cover the bottom 1/4 inch of tank.)
9. Are the cold and tempered water supply lines open?
10. Are the reclamation bottles empty enough to collect the chemistry from this process?
11. Are the bottle covers on the processor?
12. For models ATL-2400/2500, are there sufficient chemicals in the 15-liter containers stored below the processor?
13. Is the Front/Back Switch in the correct position (not model ATL-2200)?

7.6 Starting the process

The process can be started from anywhere in the Operation Menu by pressing the START button. The processor will automatically check the following conditions before starting the process to ensure they are correct:

- Sufficient chemistry to run the process (based on the amount displayed in REST).
- Drum motor is functioning normally.
- Level of the recirculating water bath is correct.
- Temperature of chemistry and water bath are within tolerance.

When you press START, the processor will automatically start when all the parameters are correct. Once the process has started, it is not possible to change any of the processing parameters. Should a problem arise in the middle of a process the processor can be RESET by simultaneously pressing down arrow, up arrow, and F1 keys. **This will terminate the current process if running!**

IMPORTANT!

The lift arm is raised and lowered during the course of any process. Do not allow anything to impede the raising or lowering of the lift arm. Failure to comply may cause serious damage or injury. Should something become trapped under the lift arm as it is lowering, do the following:

1. Activate RESET (down arrow, up arrow, and F1 keys simultaneously).
2. Press F1 and ENTER simultaneously and select Option 2 to manually raise the lift arm using the up and down arrows.

If necessary, the processor can be turned off when the lift arm is raised.

In the event of a power interruption, the processor will automatically return to the exact time and step displayed when the power failure occurred. It will then continue with the rest of the process.

7.7 After the process

At the end of a process, an audible beep will sound until ENTER is pressed or the processor is RESET. If any errors have occurred the message "F1 for error list" will appear on the display. Press the F1 key to display the errors recorded during the process run.

You can also access the error list from the SET main menu (sec. 6.2.13).

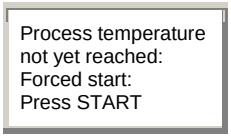
8. Special Functions

8.1 Reading the actual temperatures

When in RUN mode you can press the F1 key to display the current water bath and chemical temperatures. The chemical temperature displayed always reflects the sensor in use for the currently selected program.

8.2 Overriding the temperature setting

If you decide to run a process without the water and/or chemical temperatures being correct, you can override the sensors. Pressing START while the processor is still heating will cause the following message to be displayed:



Pressing START with this message displayed starts the process regardless of the actual temperatures.

Note: Running a photographic process out of the recommended process temperature can ruin paper or film.

8.3 Quick tempering

After the chemical bottles are refilled, the processor will not start a new process until the temperature of the chemistry is within ± 0.3°C of the process temperature. In order to speed the process of heating the chemistry you can cause the processor to heat the water bath beyond the process temperature temporarily. Enter main SET mode (sec. 6.1.1.) and choose option 6 (see sec. 6.2.6), press ENTER to turn Quick Tempering ON. When Quick Tempering is ON the tolerance for maintaining the process is lowered to ± 0.3°C (it's normally ± 0.1°C).

The Quick Tempering feature is only designed to speed the process of heating the photo chemistry. **Disengage the feature before running any process.**

8.4 Automatic chemical quantity use

For the 2500 series tank system, the AUTO chemical volumes are options for selecting the required filling quantity by using the tank number, and the length of the film loaded in the reels. For example: If the reels are loaded with one roll of 120 film on the outer spirals of the reel, they are loaded to "half". If there are two rolls of 120 film per reel they are loaded to "full." To access the AUTO selections, simply scroll through the "required chemical quantity" while in RUN mode (you'll have the option of ML selections or 2500 series tank selections).

Note: When you use an AUTO tank selection the rotation speed is automatically locked at 75 R.P.M.

Any film that loads past the red clip on a #2502 reel needs the "full" setting to provide adequate rinsing. All 2500 series tanks should be filled based on the AUTO tank selections. Due to the reel design, it is necessary to have a wash-water level much higher than the chemical level. Selecting AUTO uses the economical chemical volume for that particular tank but uses a much higher water level for thorough rinsing. Always use the FULL setting when processing 4x5" film on the #2509N Reel. (When processing film in the 1500 series tanks, always use the ML (non-AUTO) chemical volumes).

8.5 Automatic Temperature Compensation (ATC)

The ATC system allows you to run a B/W program at room temperature while tempering the remaining chemicals in the water bath to the Standby Temperature (see section 6.2.8). This allows you to run multiple color and B/W programs without waiting for the temperature of the water bath to adjust.

8.5.1 Mounting the B/W bottle rack

This option is not available with model ATL-2200.

Attach the included black bottle rack to the rear right of the processor (the bottle rack is illustrated in the Technical Information Section on page 6). Then, remove bottles 4, 5, and 6 from the rear set and place them in the bottle rack. Make sure the chemical and air lines are not kinked. When arranged correctly, the hoses will fit through the openings in the bottle cover.

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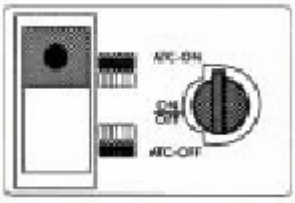
8.5.2 Activating the ATC controls

First, turn the ATC switch on the front panel to "ATC-ON". This will divert the recirculating water bath from the upper processing trough to allow the material to be processed at room temperature.



Then, enter SET mode (as described in section 6.1.1), and select "Alter Process Data". Move down to change the process temperature (option #4). Change the process temperature to either ATC 20.0 or ATC 24.0 by pressing the down arrow until it cycles lower than 18.0ºC.

3. Bottle Batt:	FR.
4. Pr. Temp.	**38.0 C**

5. Preheat	5:00
6. Pre-rinse	0:00

In determining whether to select ATC 20 or ATC 24, it's helpful to know how the processor works. In order to properly develop your B/W film, the processor needs to apply an algorithm to the process times. This algorithm varies depending on the starting temperature, and in order to ensure accuracy, it only works when the temperature is within ± 3.0ºC of the ATC temperature.

Range A	Range B
17	17
18	18
19	19
20	20
21	**21**
22	**22**
23	**23**
24	**24**
25	**25**
26	**26**
27	**27**

The table above is used to determine whether to use ATC 20 or ATC 24. The allowable temperature range is 17.0ºC - 27.0ºC (62.6-80.6ºF). If your room temperature is within Range A as indicated in the diagram, select ATC 20. If your room temperature is within Range B, select ATC 24.

Note: If room temperature is below 17.0ºC or above 27.0ºC the processor will not start (with the ATC option engaged). If the actual temperature of the developer is above or below ±3.0°C of the selected ATC temperature, but within the 17-27°C operational range the display will show the error "**Process temp. 24-ATC (±3.0°C) not in the ATC-range**". The AutoLab will only start if the START button is pressed again. The AutoLab will attempt to calculate the correct development time, but with a higher degree of inaccuracy.

Make sure the processor will continue to temper the chemicals remaining in the water bath correctly. The processor will temper these chemicals to the value set in Standby Temperature as described in section 6.2.8.

9. Specific processing instructions

Introduction to Specific Processes

Please read all the information below about the specific process you are going to use. Doing so will give you valuable insight on the process and rotary specific issues.

There are many 'standard' processes, and many more variations of standard processes. The process procedures listed below are the specific recommendations from JOBO for rotary processing with a JOBO processor. Other processing chemicals, equipment or techniques may require modified instructions for best results. These process procedures should produce optimal processing with your processor. It is unlikely that you will need to significantly modify the times or procedures listed below. If you have questions or concerns about your processing, when using these recommendations with a JOBO processor, contact JOBO for assistance.

JOBO distributes a line of photo chemicals manufactured in Germany by Tetenal, a world-renowned supplier of quality and innovative photo chemicals for over 70 years. Tetenal makes a complete line of color and black and white chemicals. In Germany, Tetenal has been working in close cooperation with JOBO research and development personnel for many years, to produce chemicals that are ideal for rotary processing.

We list in this section the most popular Kodak and Tetenal chemical processes. You may use virtually any brand or type of photo chemicals with your processor. If you are using a color chemical not listed in this section, use the Kodak equivalent process listed below. Nearly all 'clone' or compatible type chemicals will process correctly with the Kodak equivalent times and temperatures. Always test the procedure with non-critical materials before committing irreplaceable materials with an untried process procedure and chemical combination. If a manufacturer's recommendations vary significantly from those listed in this section, contact the manufacturer for rotary-specific instructions.

For information about obsolete processes such as EP-2, C-22, E-2, E-3, or E-4, contact the supplier of the chemicals for assistance.

Note:
All photo processing chemicals and rinse water contain ingredients and by-products from the chemicals and processed materials. These components may be regulated by local, state, or federal agencies. There may be governmental regulations requiring certain procedures for the disposal of photo processing effluent. JOBO, understandably, cannot be aware of all possible requirements or restrictions. We therefore urge you to be informed, and follow any regulations in your specific location. Please check with your local government, or water control authority concerning these requirements. You may get Material Safety Data Sheets (M.S.D.S.) from your photo dealer, or from the chemical manufacturer. These sheets list the ingredients, and contain important information on proper storage and handling of specific chemicals. They also contain emergency phone numbers and information on poisoning and spillage. You may be required by law to have M.S.D.S. for all your chemicals, if used in a business. JOBO urges you to have Material Safety Data Sheets for every photo chemical you use, as reference.

Go To:

Note:
To minimize the risk of cross contamination when changing from process to process, use the following bottles (1-6) to hold your chemistry:

- E-6: Bottle 1 - First developer, bottle 2 - Reversal, bottle 3 - Color developer. bottle 4 - Conditioner, bottle 5 - Bleach, bottle 6 - Fix.
- C-41: Bottle 4 - Color developer, bottle 5 - Bleach, bottle 6 - Fix.
- B&W: Bottle 1 - First developer, bottle 4 - Stabilizer, bottle 6 - Fix.
- RA-4: Bottle 4 - Color developer, bottle 4 - Stabilizer, bottle 5 - Bleach-fix.
- R-3000: Bottle 1 - First developer, bottle 3 - Color developer, bottle 5 - Bleach-fix.
- Ilfochrome©: Bottle 1 - First developer, bottle 5 - Bleach, bottle 6 - Fix.

Note:
Unless specifically instructed for a special processing procedure, you should normally use the rotation speed of 75 RPM for all 1500, 2500 and 2800 series tanks or drums. Use the rotation speed of 50 RPM for all 3000 series drums unless instructed else wise.

Troubleshooting

Introduction

Sometimes you may find that your processing results do not meet your expectations. This section deals with troubleshooting the problems that can occur.

Please note that many errors other than actual processing may appear to be a processing fault. A partial list of these are: Out-of-date or improperly stored film or paper; over- or underexposure; camera, drum or tank, or darkroom light leaks; exposure of the film or paper to X-rays, microwaves, or some chemical fumes; and incorrect identification of the process required for the material you have exposed.

If it is likely that the problem is in the processing, use this section to determine the most likely source. Only test runs should be made until the problem is resolved.

If you are at a loss trying to solve a processing problem, it may be the local water supply. In many locations, the softness level or pH value of the water may not be optimal for photo chemicals. The water may contain dissolved or suspended impurities that may be harmful to the chemicals. Further, the level of these problems may fluctuate seasonally or even more often. If you have any reason to suspect that the water may be contributing to processing irregularities or problems, buy bottled, distilled water to mix your chemicals, and try again. This minimal expense can yield great benefits in quality and consistency of the process.

Note: This information page was prepared for the JOBO manual operating rotary processors (CPE-2 Plus, CPA-2, and CPP-2). Most of this information will apply equally well for the Autolab processors, and to a slightly lesser extent to any processing equipment and procedure.

Troubleshooting Index

Checklists for Troubleshooting With JOBO Customer Service

We urge you to review the following checklists to help solve any problems that might arise. If the problem persists after investigating the lists below, prepare a detailed list including:

Equipment

• Processor model, serial number, accessories (JOBO lift?), how long you have owned the processor.

• Film or paper processed: brand, type, age.

• Model of drum or tank used, reel(s) used.

• Other darkroom equipment used.

Supplies

• Process chemicals type, brand.

• When purchased, when mixed.

• How mixed, type of water used.

• How stored.

• Dilutions used.

Processor Settings

• Temperature set, actual temperature of process.

• Rotation: speed.

The Process

• Volume of chemistries, rinses.

• Names and times of each step.

• Any changes in procedure from instructions.

The Problem

• Full description of problem.

• Frequency of problem: once, several times, random, always.

• Full description of attempts to correct problem.

• Corrections you think may work, but have not tried.

With this list at hand, call JOBO Customer Service at (734) 677-6989 Ext. 4721. We are available to diagnose your problem and present possible solutions.

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Troubleshooting General Checklist

Review Non-Processing Errors or Faults

Film and Paper

• Is the film or paper past its expiration date?

• Was it properly stored?

• Was it properly exposed, or exposed at all, or fogged?

• Was the film or paper loaded in the tank or drum correctly?

Chemical Stock

• Did I use the correct chemicals for this film or paper?

• Is the chemical past its expiration date?

• Was it properly stored?

Chemical Mix

• Dilution correct?

• All components mixed in proper order?

• Stirred after each component added?

• Used all the proper components for each solution?

• Mixed at the proper temperature?

• Used at the proper temperature?

Mixing Contamination

• The graduates or mixing vessels thoroughly washed between the mixing of each step?

• The bottles used for storage thoroughly cleaned before using?

• Water rinse was run through the JOBO Lift after the last process to clean the lift?

• Drum or tank rinsed after the last process?

• Drum or tank dried before use?

Mixed Chemicals Impaired

• Stored properly? (There should be as little air as possible over the developer in the storage bottle. It is best if the bottle is full to the brim with no air space.)

• Stored too long? (Date the bottle of chemical when mixed, to know how old it is when used.)

• Used in the correct order?

Much can be deduced about a problem by using the edge markings printed on 35 mm and 120/220 roll film. The marks generally tell the frame or negative number, type of film, and sometimes the emulsion number. This information is pre-exposed on the film during manufacture, and its exposure is correct.

If edge markings appear properly developed on your film, the problem is generally not with the chemicals. Look for difficulties in exposure (camera or light meter problems).

If the edge markings are dull, appear underexposed, or are not fully visible for the length of the film, the problem can be:

• Loading or unloading of film in camera.

• Loading of film on reel in the darkroom.

• Improper storage of the film (excess heat, radiation, or chemical fumes).

• Age of film (old film develops a high fog level).

• Chemical mixing, or dilution, or contamination problems.

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Mechanical Troubleshooting

Nothing Works

• Unit not plugged in. Plug the processor into a grounded outlet.

• Check the button on your Ground Fault Interrupt to be sure the receptacle is 'reset.'

• On/Off switch not on. Set switch to '1.'

• AC outlet faulty (check fuse box or circuit breaker).

• The fuse has blown. Replace the fuse. See Appendices for details.

WARNING: If you replace the fuse, and it blows again, contact JOBO for servicing of the processor.

Unit Fails To Heat...

Temperature selection is not set properly. The processor will not heat if the selected temperature is lower than actual temperature of the tempering bath.

The Thermal Overload (CPE-2 Plus, CPA-2, CPP-2) has tripped...

This switch may trip from vibrations during shipment. Press the reset button.

Caution: If the processor is turned on without water in the tempering bath (or very hot water is added to the bath), the thermal overload will trip. This is a safety feature, to prevent overheating and damage to the processor. Always fill the tempering bath with water (not over 50°C, or 120°F), even when doing 'room temperature' processing.

Drum Or Tank Floats While Processing...

Lower water level in tempering trough by turning the level control dial.

Check for the proper roller block arrangement, for the tank or drum used. For 2500 and 2800 system tanks or drums use the lower setup. For 1500 series tanks use the higher setup, facing each other. For 3000 system drums the rollers on their supports face away from each other.

Rotation Motor Slows When Coupling Tank, Or Adding Chemicals...

A slight slowing of the rotation speed is normal when coupling a tank or drum, or when adding chemicals or rinse water to a lift equipped processor. If the slowdown is significant, you are probably using more than the recommended amount of chemicals or rinse water. The maximum recommended volume to be used is 600 ml (20 oz.) with the CPE-2 Plus, and 1000 ml (34 oz.) with the CPA-2 and CPP-2. If the volume is not excessive, check the positioning of the tank or drum on the roller block. The lid or locking ring should not ride on the rollers. Check that the supports are set correctly for the series tank or drum in use. If you are using the lift, be sure that the correct coupling position is selected. Be sure that the trough level is not set too high. If the Transfer Gear shaft is worn, it may slow down the rotation in one direction more than the other - replace the Transfer Gear (#95200).

The Temperature Of The Processor Does Not Lower...

The CPE-2 Plus and CPA-2 do not have a cooling mechanism. The processor cools by radiating heat to the air and counter. If the temperature difference is slight, it could take some time to stabilize. If the room temperature is higher than the selected temperature, it will remain at, or slightly above room temperature.

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Processing Faults for Specific Processes

Processing Faults - Color Transparency Film, E-6

Transparency too dark...

• Increase time or temperature of the first developer.

• This effect also could be caused by underexposure of the film.

Transparency too light...

• Decrease time or temperature of the first developer.

• This effect also could be caused by overexposure of the film.

Transparency too light with a color shift toward blue...

• First developer contaminated with fixing bath.

• Clean equipment and mix fresh developer.

Color shift toward blue...

• Be sure to adjust the reversal bath to a 60% solution for Kodak chemicals (Tetenal is already at the correct dilution.)

• For further adjustments, see E-6 manuals from the major chemical manufacturers.

Color shift toward yellow...

• See the JOBO E-6 Handbook, part #4192, or the E-6 Manuals from the major chemical manufacturers.

Strong color shift toward green with insufficient black density...

• Reversal bath is exhausted. Use fresh reversal.

• With three-step chemicals, replace the color developer, as the reversal agent is incorporated in the color developer. Alternately, you may use a reversal exposure, done after the first rinse is completed.

Yellow spots. High minimum density...

• Developer contaminated with stabilizer.

• Clean reels and tanks.

• See comments on stabilizer in the E-6 Process section.

High minimum density...

• Sometimes a gray, muddy appearance to the whole slide (silver residue). Silver has been retained in the film emulsion due to inadequate action of the bleach or bleach-fix. Aerate the bleach, and re-bleach and fix (rinse and stabilize) to remove the retained silver.

• Weak conditioner in six-bath E-6.

Color shift toward magenta...

• Increase the time of the rinse after first developer to a maximum of four minutes.

• Be sure that the temperature of the rinse water is at the processing temperature. Overly cold or hot rinse water can cause color shifts.

• Aerate the bleach or bleach-fix before starting the process.

• Increase the color developer concentration by 10%.

Film end closest to center core of the reel is undeveloped, or streaked...

• Increase the amount of chemicals being used.

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Processing Faults - Color Negative Film, C-41

Negative too light. (Not dense enough)...

• Developer old or exhausted.

• Could be underexposure of the film.

Negative too dark. (Too dense)...

• Developer mixed wrong.

• Could be overexposure of the film.

No image on film - no edge markings...

• Check sequence of processing steps. Developer must come before the bleach step.

• Developer may be old or exhausted.

No image on film - edge markings are present...

• Chemical steps of the process are OK, film unexposed.

Film end closest to the center core of the reel is undeveloped or streaked...

• Increase the amount of chemicals being used.

Negatives more dense toward edges, gradually getting less dense toward center...

• Reels contaminated with stabilizer. Replace reels.

• See comments on stabilizer in the sections on E-6 and C-41 Film processing.

Film image appears dense, base color of film is very reddish. Long exposure time required for prints, which may have red shadows and cyan colored highlights...

• Fault is with the bleach or bleach-fix step of the process. Silver residues remain in the film, which creates the high density. It is also possible that a colorless leuco-cyan dye has formed in the image, resulting in the red shadows or cyan highlights in a print. Both problems, the retained silver, and the leuco-cyan dye, can be corrected by aerating the bleach (bleach-fix). Then re-bleach, fix, rinse and stabilize the film.

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Processing Faults - Black and White Film

Negative too light...

• Check camera or light meter for possible exposure problems.

• Increase the time of developer.

• Increase the amount of developer. (Particularly if image is 'mottled' and low contrast.)

Negative too dark (dense)...

• Check camera or light meter for possible exposure problems.

• Decrease the time of developer.

Film end closest to center core of the reel is undeveloped, or streaked...

• Increase the amount of chemicals being used.

No image on film - no edge markings...

• Check sequence of processing steps. Developer must come before the fixer step.

• Developer may be old or exhausted.

No image on film - edge markings are present...

• Chemical steps of the process are OK, film unexposed.

Density streaks or clouds...

• Developing time is too short. Dilute the developer to a concentration requiring five minutes or more developing time, or change to a different developer.

• Incomplete fixing of the film. Re-fix and wash the film. Increase fixer time.

• Uneven development. Try slower or faster rotation speed. Add or delete pre-rinse. Clean tank and reels.

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Processing Faults - Prints From Transparencies, R-3000

Print is too dark...

• Increase exposure time.

Print is too light...

• Decrease exposure time.

Contrast is excessive, or black areas are green...

• Reduce time or temperature of the first developer.

Dark areas and colors are uneven...

• Processor is not level, or drum is floating. Level the processor (See the section on Installing the Processor). If the drum is floating, lower the water level.

• Insufficient chemicals. As a minimum use the amount recommended by JOBO, or by the chemical manufacturer, whichever is higher.

Print is too dark, and has low contrast and impure blacks....

• Increase time or temperature of the first developer.

Stripes in print from end nearest to end farthest from the processor motor head...

• Use 1 minute pre-rinse. If using the magnet drive, be sure to start the drum in rotation immediately after turning horizontal.

• Dry drum and lid thoroughly.

Print with undeveloped areas (white areas)...

• Processor is not level or drum is floating. Level the processor. Lower the water level if the drum is floating.

• Chemical amount is insufficient. At a minimum, use the amount recommended by JOBO or by the chemical manufacturer, whichever is higher.

Print has light to white spots...

• Paper has been exposed to light.

Black areas of print lack density. The print has a color shift...

• Exposure to safelight.

Black areas of print (borders) appear red or brown.

• Reduce color developer time.

Very light print with strong magenta-purple color shift...

• Contamination of color developer with first developer. Insufficient rinse after first developer. Increase the number of changes of water in rinse after developer. Be sure to drain the drum thoroughly at the end of each change of rinse water.

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Processing Faults - Prints From Transparencies, Ilfochrome

You must be cautious about the rinse after the developer in the Ilfochrome process. It is a 30-second rinse and the quantity of water should be no more than the quantity of chemical being used. The following cautions should be adhered to:

• Do not extend the time of this rinse past 30 seconds.

• Do not change the water during this rinse.

• Do not increase the volume of the water for this rinse.

Brown or yellow spots on back side of print, or red stains on the exposed side of the print...

• Decrease rinse time and/or water volume after developer.

Spots or streaks - light or completely white...

• Paper has been exposed to light.

Gray or black spots on print...

• Processor is not level or drum is floating. Check if processor is level (see section on 'Installing The Processor'). Lower the level of the water bath, if the drum is floating.

• Chemical amount is insufficient. At a minimum use the amount recommended by Ilford.

Print has reverse (left to right) image - too dark, and orange...

• Paper was exposed through the back side. Expose paper with emulsion side up.

Faint, dark print...

• Increase developing time.

Black areas lack density, and a color shift...

• Safelight exposure, or exposure to light.

Yellow spots on the print...

• Developer contaminated by fixer. Rinse and clean drums carefully. You may need to discard developer and mix fresh.

Yellow edges of Print..

• Increase final rinse time or do additional rinse outside of drum.

Gradual diminishing of color and density on the print from end nearest the motor head to end farthest from the motor head...

• Level processor, or increase chemical amounts.

• Check temperatures and process times.

• Drum is floating in the water bath. Lower the water level until drum no longer floats.

Blue streaks on print...

• Emulsion has been scratched. Remove from drum carefully. Use less pressure on the print squeegee.

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Processing Faults - Prints From Color Negatives, RA-4

Print is too dark...

• Use shorter exposure time.

Print is too light...

• Use longer exposure time.

Black areas of the print are dark blue...

• Increase developer time.

• Increase developer temperature.

• Developer is old or exhausted. Mix fresh chemicals.

Dark blotches in print...

• Paper has been exposed to light.

Print has light colored stripes...

• Processor is not level, or drum is floating in the water bath. Check the processor with level. If drum is floating, lower the water level.

• Insufficient chemical amount. As a minimum, use either the amount recommended by JOBO or by the chemical manufacturer, whichever is greater.

Print is light or off-color on the end away from the motor head...

• Chemical volume insufficient or drum not level. Check that processor is level. Be sure drum is not floating.

Print has stripes from end nearest motor head to end farthest from motor head...

• Use 1 minute pre-rinse. Position drum on processor more rapidly after turning horizontal (if using the magnet drive).

• Be sure that the drum and lid are dry before placing paper to start a process. Be sure to remove the beaker or funnel, and dry them with the lid, before using for the next process.

Light spots in print...

• Bleach-Fix contamination. Clean drum and cap assembly carefully.

• If using a JOBO Lift, run water through the lift after processing, or before the next process.

Color shift when switching from larger to smaller drums...

• Increase amount of fresh chemicals being used. If practical, be sure that the diameter of the test drum and the print drum are the same. Different diameters are likely to give different results.

White in print is impure. (Often Cyan)...

• Wrong, or too bright safelight is in use.

• Darkroom is not light-tight.

• Contamination of the developer with bleach-fix. Rinse drum and lid thoroughly between runs.

Magenta-purple swirls in random pattern(s) or overall across the face of the print...

• Most often from a carry-forward of the developer into the bleach-fix. Increase the concentration or time of the stop-bath. Use a 30-second rinse after the stop-bath step.

Yellow-red to brown 'flame-like' appearance particularly noticeable on edge of print...

• Light fog (light strike) on paper. Check paper storage and handling procedures.

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Processing Faults - Prints From Black and White Negatives

Print too dark...

• Use a shorter exposure time.

Print too light...

• Use longer exposure time

Dark blotches or dark edges on print...

• Paper has been exposed to light.

Print has light stripes...

• Processor not level or drum is floating in the water bath. Check the processor with a level. If drum is floating, reduce the amount of water in the bath until the drum rests on the rollers.

• Insufficient amount of chemical being used. As a minimum, use either the amount recommended by JOBO, or the amount recommended by the chemical manufacturer, whichever is greater.

Print is light on the end away from the motor head...

• Make sure drum is not floating in the water bath.

• Chemical volume may be insufficient.

• Processor may not be level. See Section on 'Installing The Processor.'

Print has light stripes running the length of the drum leading away from the motor head...

• Use a 1 minute pre-rinse. Place the drum more rapidly on the drive magnet after turning horizontal.

Print has light stripes that may run lengthwise of the drum, or run around the circumference of the drum...

• Be sure that the drum and the lid are dry before starting a print. Remove the beaker (light trap) from the lid and dry that as well. This type of mark is almost always caused by droplets of water that get on the paper before the pre-rinse. (Even a longer pre-rinse will not eliminate this problem.)

Overall gray appearance, lacking contrast and highlight detail...

• Check safelight. This condition is most often a safelight fog.

Low contrast, lacking deep blacks and highlights devoid of detail...

• Insufficient developer time.

• Developer too dilute or exhausted.

• Higher contrast paper (or printing filter for multi-contrast) needed.

• Old paper (or paper improperly stored).

11. Cleaning and maintenance

11.1 Cleaning at the end of the process

Your AutoLab carries out a thorough cleaning of the internal chemical supply system automatically every time you run a program (it is accomplished by the final rinse step).

The chemical bottles require cleaning only when you intend to use different chemistry in the same bottles, or when the unit will be unused for a prolonged period of time. Please read the instructions in the following section to correctly clean the bottles and chemical lines.

11.2 Cleaning programs

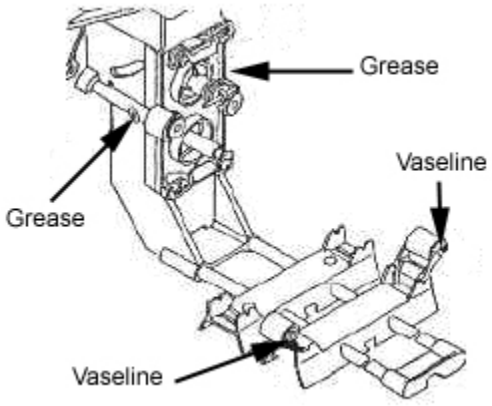
Depending on the model, you AutoLab has either three or six cleaning programs built into the microprocessor (model ATL-2200 has 3, models ATL-2300/2400/2500 have 6). You should run the cleaning programs every time you switch to a different process chemistry, or when the unit has not been or will not be operated for a prolonged period of time.

To run a cleaning program, attach an empty film tank capable of holding 1 liter (or 1.5 liters on model ATL-2500 front bottles) of liquid to the processor. In RUN mode, select which cleaning program you wish to run (13-18), fill the corresponding bottles with water, and press start. No fluids pumped during a cleaning program are reclaimed.

Note: While it appears the cleaning program times and temperature can be changed, the changes will not be stored in memory.

11.3 Lubrication

The two white transfer gears on the lift arm require occasional lubrication. A processor used on a daily basis should be greased every three months. Apply the grease with JOBO's syringe (item #95465) at the points marked in the diagram below.

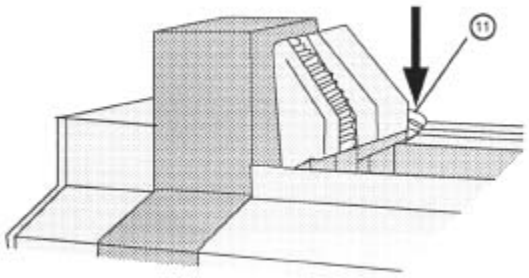


Never apply grease on the coupler. If a squeaking sound occurs, apply a little Vaseline to the connection points of the tanks and drums.

11.4 Cleaning the unit

Drain the water bath at the end of the day to reduce algae buildup and possible corrosion from water contaminated with chemistry. Twist the drain valve to point to the rear of the processor to drain the water bath.

Drain Valve



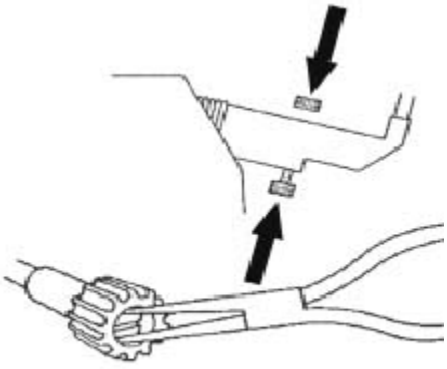
Rinse off the stainless steel screen in front of the water level panel. Do not remove the screen permanently, it protects the water recirculation components from damage.

Regular, monthly cleaning with a damp cloth and a mild detergent is recommended. To help clean the processor use JOBO Processor Clean II (#4135). Processor Clean II is a non-chlorinated powder. At the end of the day, pour in the desired amount of cleaner (after mixing with a little water) as specified on the packet, let run overnight (6 hours minimum). The next morning flush out the processor with water.

Do not use any cleaners containing solvents or chlorine since these will cause the plastic of the trough to become brittle and eventually crack.

11.5 Transfer gears

The gears (#95200) are subject to wear and should be replaced every 6 months or after 500 hours of operation. Two extra gears are included with the processor accessories. If the gears are not replaced on a regular basis, they may break in the middle of a process, causing the loss of your film or paper.



When replacing the transfer gears, please refer to the following instructions:

You will need the following items.

- About 15 minutes.
- A small pair of needle-nose pliers.
- Silicone sealant (JOBO part #90018 or equiv.)
- Grease (JOBO part #95465), or petroleum jelly.

1. Remove the transfer gear by pulling the silicone plug from the end of the gear **(A)**. Then, squeeze the prongs inside the tip of the gear with needle nose pliers and push the prongs through the gear.
2. Liberally lubricate the long shaft of the new transfer gear with grease or petroleum jelly. Be sure to lubricate both the long and the short shaft of the transfer gear set. The lubricant should be applied clear up to the gear on each end.
3. Replace the transfer gear **(B)** by inserting the long shafted end from the front of the coupling (the double spouted part) making sure the washer is on the rear. Snap the small gear on from behind the face plate.
4. Place a drop of silicone sealant into the tip of the transfer gear and allow to dry.

11.6 Preventing algae growth

Do not use any chlorine-based cleaners to control algae growth in the processor. The best way to prevent the growth of algae is to drain the processor water bath every evening. You can also control algae by using Processor Clean II (#4135) or any non-chlorinated algaecide.

11.7 Prolonged periods of inoperation

When you don't intend to use the processor for longer than one month, you should run a cleaning program to wash the bottles out. You should then drain the processor water bath.

11.8 Storage at temperatures below freezing

If your AutoLab will be stored at a temperature below freezing, the following steps should be taken to ensure the processor is not damaged (contact JOBO for help):

1. Drain the water bath.
2. Remove and drain the water supply hoses.
3. Remove and empty the drain hoses.

12. After-Sales Service

12.1 Before contacting the service department

Please ascertain the following:

1. Does the actual temperature correspond to the displayed temperature (press F1)?
2. Does the drum motor rotate?
3. Is there enough chemistry to be pumped?
4. Is the processor draining the tank at the end of each process step?

If the answer to all these questions is "yes" and the film or prints are still not developed properly you should contact your chemical supplier to establish the cause of the problem.

5. Does the "F1 for error list" appear at the end of the process?

Write down the messages that appear when you press the F1 key. If possible, correct the errors yourself. If you are unable to correct the processor, contact your dealer or JOBO. Have your serial number ready, it can be found printed on a silver sticker located on the rear of the processor above the electrical connections.

We recommend having the processor serviced yearly or at the completion of 1,000 operating hours. To remind you of this suggestion, a message will appear at the completion of 1,000 operating hours to prompt you to call for service.