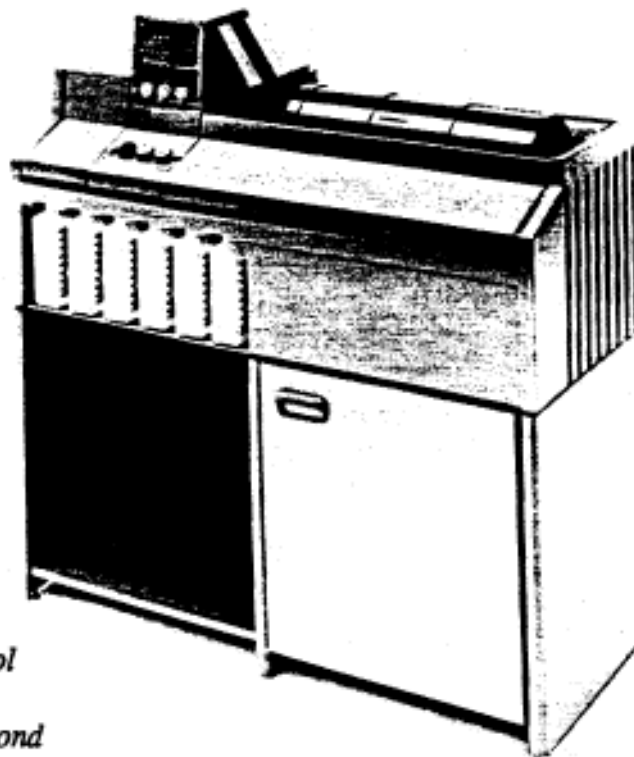


Introducing The Autolab ATL-2 Plus



FEATURING:

QUALITY

- Fully automated via microprocessor control
- Consistent results batch to batch
- Each step of a process accurate to the second

ECONOMY

- Maximum efficiency of chemistry
- Built-in tempering of complete system
- Built-in reclamation capabilities

VERSATILITY

- Immediate transition between different processes
- Every process: C-41, E-6, Ciba™, B&W, EP-2, R-3, RA-4, Litho ...
- Every format : Roll film, long roll film, disc film, sheet
films from 4 X 5" - 16 X 20" and special sizes
- Paper from 3½ X 5 - 20 X 24", including 6-8 X 10" per run

**Correction to instructions
Autolab ATL-2 Plus**

Section 3.4, Page 20, Water Inlet Connections:

To connect tempered water and cold water lines, use the white hoses provided with the processor. Connect the hose directly to the appropriate valve on the processor. When connecting the end of the hose to the water source, an adapter must be installed (provided in accessory bag) on the faucet before the hose can be connected.

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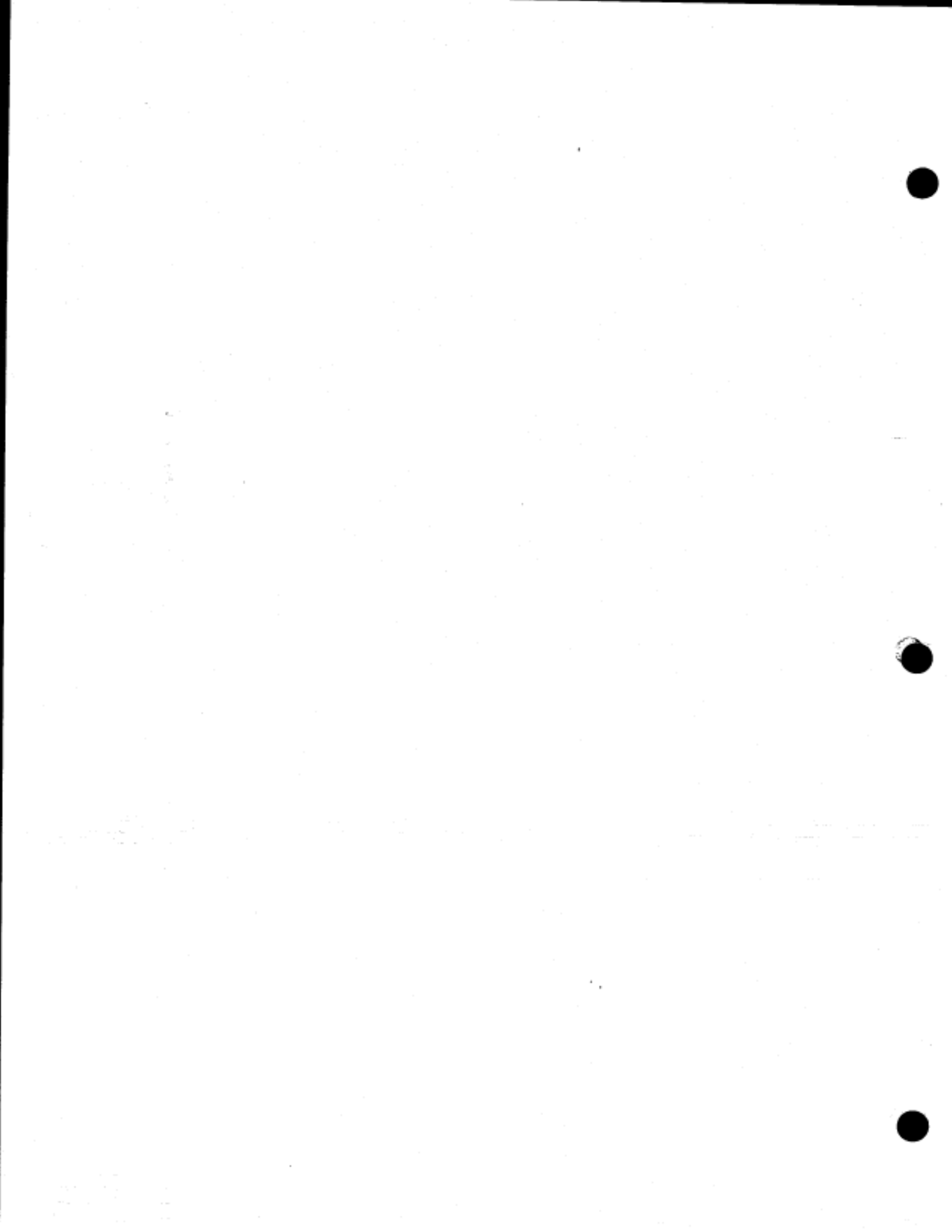
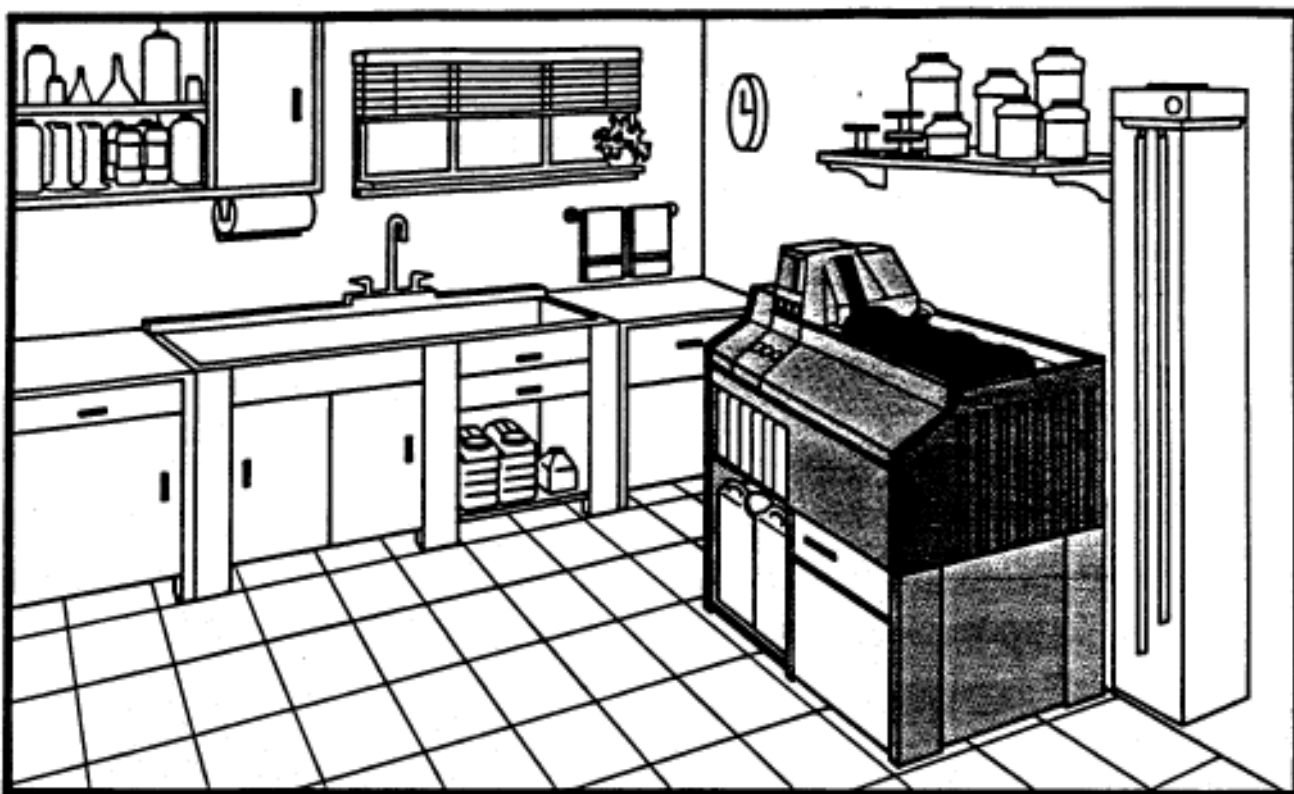


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Welcome to the JOBO System

The Autolab ATL-2 Plus is the smallest, microprocessor-controlled, fully automated processing unit in the JOBO line. With the large variety of tanks and drums available the Autolab is efficient for any size job. Since it's completely user programmable, you can enter processing times and temperatures for up to thirteen different processes into memory and be ready to process in minutes. Combined with tempering of extra solution bottles, you can tailor the ATL for your specific needs.

All the necessary functions (except drying) needed in photographic processing are fully automated with the ATL-2 Plus. The temperature is maintained to within $\pm 0.18^{\circ}\text{F} (\pm 0.1^{\circ}\text{C})$ at all times using a recirculating water bath. The working solution bottles as well as the drum in use are kept at the operating temperature with the water bath. Constant rotary agitation is maintained by the microprocessor-controlled motor. It has four bi-directional speeds and special settings for disc film and CibachromeTM. Tempered chemistry is pumped from the stock bottles to the processing drum via an air pressure system. The on-board computer keeps track of how much chemistry is left in the stock bottles at all times. Consequently, your ATL-2 Plus won't let you start a process if there is insufficient tempered chemistry. The microprocessor also controls the timing of each chemical and rinse step, pumping in and dumping out at the appropriate times by following your programmed input to the second. Finally, the ATL-2 Plus offers you the option of reclaiming each used solution in it's own external container. Reclaiming and replenishing used chemicals makes processing with your ATL-2 Plus even more economical.



Technical Information

Height	24 in. (61cm)
Height with largest drum in emptying position	45½ in. (116cm)
Length	46 in. (117cm)
Width	20 in.(51cm)
Weight (empty)	66 lbs (30 kg)
Voltage	115V, 60hz or 240V, 50hz
Power Consumption	1300 watts
Amps	11 Amp at 115 volts 5.5 Amp at 240 volt
Minimum Water Pressure	15 p.s.i. (1 bar)
Maximum Water Pressure	90 p.s.i. (6 bar)
Water Jacket Capacity	4¼ gallons (16 liters)
Temperature Range	64.4 to 121.8° F (18-49.9° C)



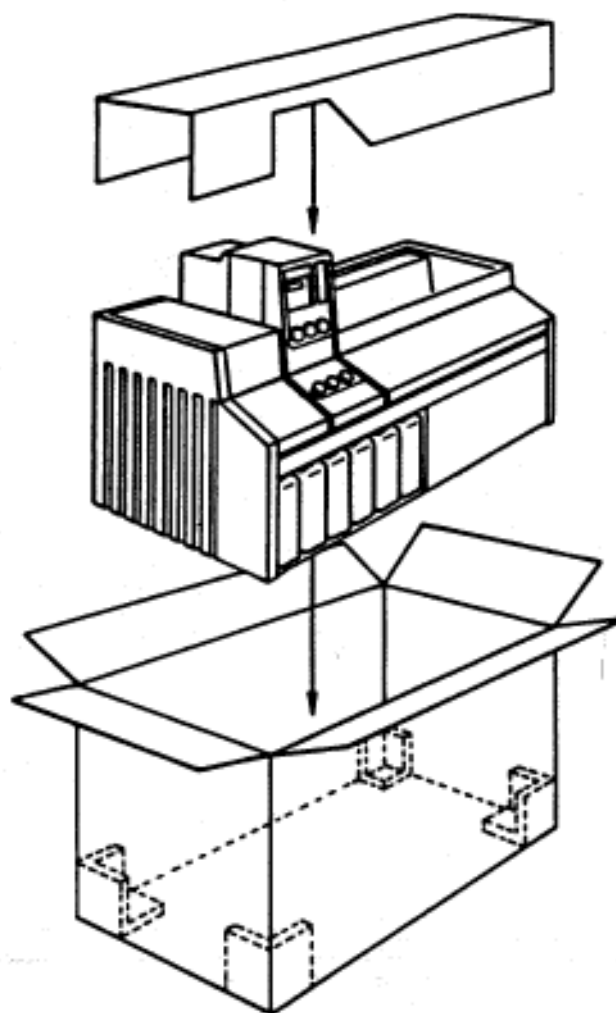
Unpacking

1

1.1 Removal from Carton

The unit will arrive in one carton. The shipping weight is approximately 82 pounds (37 kgs). Unpacking and removal of the ATL-2 Plus from the carton requires two people.

To unpack the ATL-2 Plus, first carefully cut open the top tape sealing the carton. Remove the foam supports from both ends of the carton. Remove the top cardboard support piece (See Figure to right). With one person on each end of the box, carefully lift the processor out of the box.



1.2 Hidden Damage

Check the processor for any damage and, if found, immediately contact the shipping company that delivered the unit or the dealer from whom you purchased the unit.

1.3 Packing Material

It is advisable to retain and store the carton and packing material for future shipping and/or moving of your ATL-2 Plus processor to prevent damage in transit.

Pre-Installation Considerations

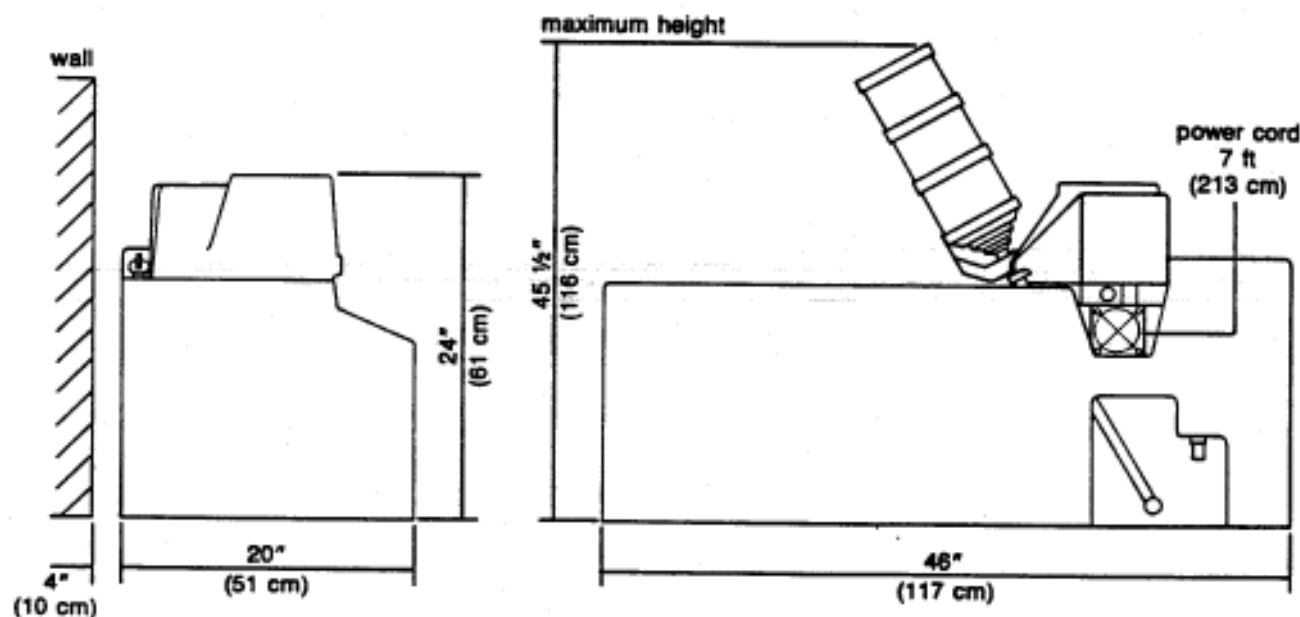
2

2.1 Location

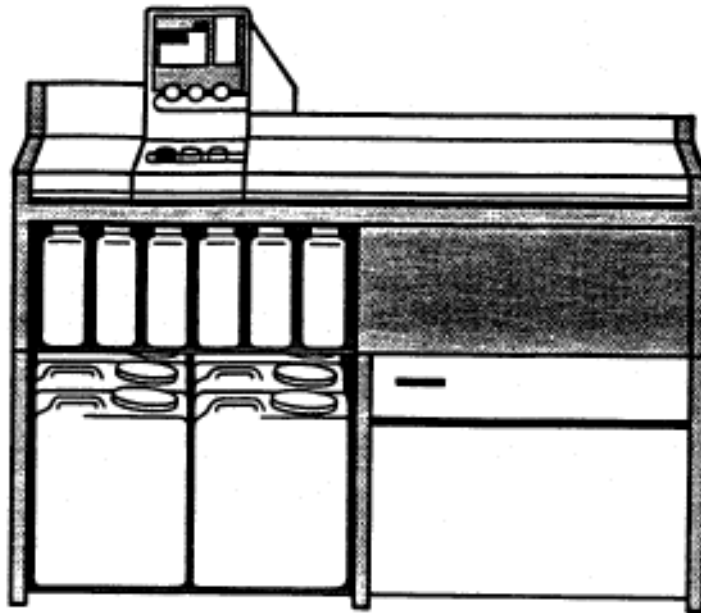
The ATL-2 Plus processor does not need to be located in a darkroom as all tanks and drums used in conjunction with it are light-tight.

The ATL-2 Plus must be located in proximity to adequate drain facilities, hot and cold water sources, and electrical power. Be sure to read the sections in this chapter on each of these items before choosing the location of the processor.

The ATL-2 Plus must be located on a level surface capable of supporting 150 lbs. (68kgs.) Due to the possibility of splashing, this surface should be water proof. The surface must be higher than the intended drain for the processor.



The JOBO ATL-2 Plus processor can be located on a counter-top, in a darkroom sink or in a specially designed JOBO support table (Part #4221). This table provides a convenient operating height for the processor, and storage for either tanks and drums. The #4221 support table can be combined with the #4225 Canister Wagon to provide extra storage capacity for used chemicals. When the ATL-2 Plus is installed on the #4221 Support Table with the #4225 Canister Wagon, used chemicals can be routed to 15 Liter Canisters on the cart instead of to the 1 liter bottles in the front of the ATL-2 Plus.



2.2 Electrical Service

A grounded circuit of an ampere capacity equal or greater to that required by the ATL-2 Plus is required. To determine needed capacity see the Technical Specifications at the beginning of this manual. (It is important to note that while your facility may have circuits rated above the requirements of the ATL-2 Plus, if other devices are on the same circuit the total power consumption of all the devices may exceed the circuit capacity. If you have questions contact your local electrician.)

It is advisable (and in some places required by local electrical code) to attach the ATL-2 Plus to a circuit that is "ground fault protected". (See your local electrician for more information.)

The length of the power cord on the ATL-2 Plus is approximately 7 feet (2.1 meters) long. Make sure an adequately rated electrical outlet is located within 7 feet (2.1 meters) of the proposed location of the ATL-2 Plus.

Do not operate the ATL-2 Plus while connected to underrated extension cords or attached to overloaded circuits.

2.3 Water Pressure

Water pressure between 15 and 90 p.s.i. (1 to 6 bar) is required to fill the processor to the proper levels. Pressure of less than 15 p.s.i. may cause an exceptionally long fill time for the tempering bath and/or inadequate rinsing. Water pressure greater than 90 p.s.i. can damage the processor. (In the U.S.A. a pressure reducer [JOBBO Part #61004] may be ordered from Jobo or your Jobo dealer if necessary.)

The ATL-2 Plus requires two inlet hoses. Standard 3/4", high pressure, washing machine hoses are included with your ATL-2 Processor.

To avoid the possibility of water damage should a hose leak, always have faucets accessible and turn off faucets when the processor is not in use.

2.4 Water Temperature

The ATL-2 Plus requires one cold and one tempered water inlet. The tempered source should be set to within $\pm 1.8^{\circ}\text{F}$ (1°C) of your processing temperature. (In U.S.A. a temperature control panel [Jobo Part #4189] may be purchased from your local JOBBO dealer or directly from JOBBO.)

The cold water inlet fills the water bath and is also the source of cooling for the ATL-2 Plus processor. If processes cooler than the ambient room temperature (ie, 68°F for B&W) are anticipated, the incoming water temperature must be lower than the lowest processing temperature anticipated. If incoming water temperature is too warm, the water can be cooled with an external chiller. Contact your local photographic supplies dealer or JOBO for further information.

2.5 Drain Facilities

The ATL-2 Plus processor has two separate drain outlets; a tempering bath drain, and a combined drain for rinse water and overflow for the tempering bath. (See illustration in Section 3.3)

The ATL-2 Plus can be placed directly into a darkroom sink. With this type of installation no further routing of the two drains is necessary.

The ATL-2 Plus can be placed on a counter-top or in a specially designed support table from JOBO. (JOBO Part #4221) In either case both processor drains must be routed to a drain that is lower than the processor. This can be done with PVC hoses and a "Y" fitting provided with the processor. The output of the "Y" fitting can be placed over or next to a drain or it can be attached directly to PVC plumbing utilizing adapters included with the processor. (Note: The services of a local plumber may be required to attach the drain directly to existing PVC plumbing.)

2.6 Room Temperature

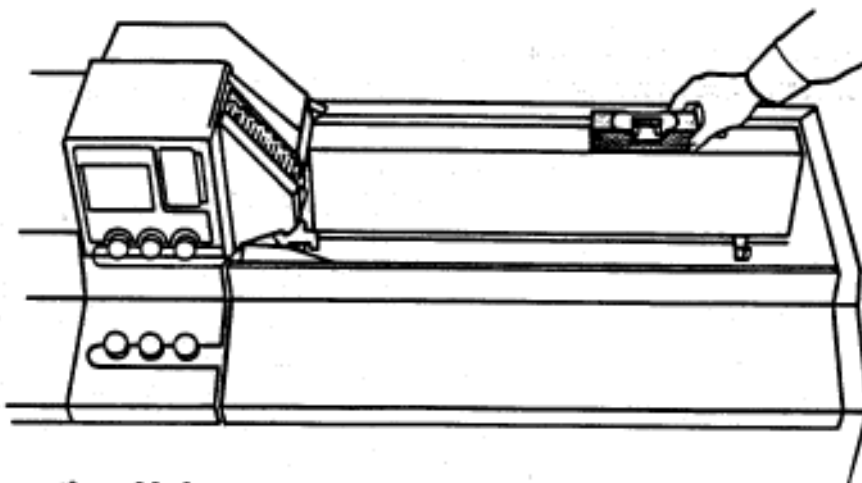
Since the processor always controls the chemistry and processing tank temperature to within 0.18°F (0.1°C) by means of a recirculating water bath, normal variance in room temperature will not affect the processor's ability to temper accurately. It is recommended that the processor not be placed into the direct path of air conditioning or heating ducts.

Installation Instructions

3

3.1 Placement of Processor

Place the ATL-2 Plus in/on the surface chosen for it (See Pre-Installation Considerations). Use the enclosed spirit level, as illustrated in the figure below, to level the unit. Failure to properly level the processor can result in poor processing results.



3.2 Reclamation Unit

The ATL-2 Plus allows reclaiming of used chemicals in bottles or routing them to the drain. (See warning at the end of this section.) The unit is shipped from the factory pre-set for all used chemicals to automatically be routed to the corresponding reclaiming bottles. If desired, some or all chemicals can be discarded down the drain by making a slight change in the ATL-2 Plus.

The ATL-2 Plus can be reconfigured to allow reclaiming of certain chemical steps and routing of others to the drain. This is accomplished by limiting the movement of an internal drain arm with blocking caps supplied with the unit. These caps are placed over the holes in the drain area of the processor to limit movement of the drain arm. (The caps are meant to limit back and forth movement of the drain arm, not stop chemicals from going into certain holes.)

When the cover is removed from the drain area (it is shipped with the cover removed), the processor will look like Illus. #1 on the next page. The six holes in the drain area connect to the six reclaiming bottles recessed in the front of the processor. (See Illustration #2 on next page.) The drain arm (black spigot) moves in conjunction with the program from back to front. As it travels it aligns itself over a hole when the chemicals for the corresponding step will be drained. When the processor dumps rinse water it aligns itself between holes. The ATL-2 Plus can be reconfigured by placing blocking caps over one or two of these holes and thereby limiting the movement of the drain arm.



Illustration #1

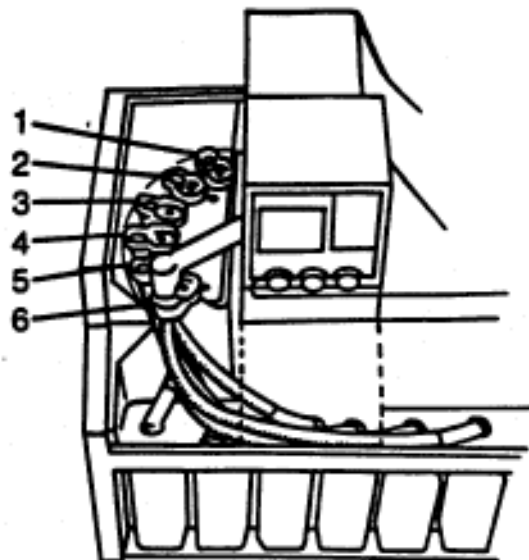


Illustration #2

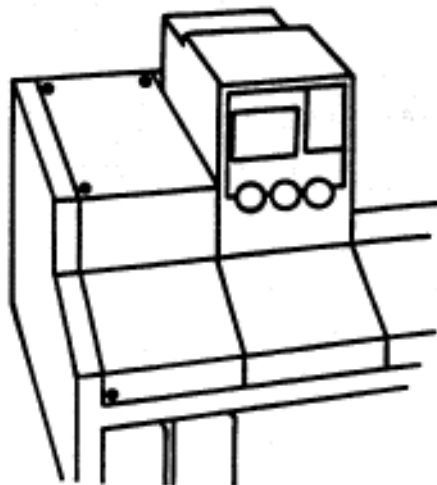


Illustration #3

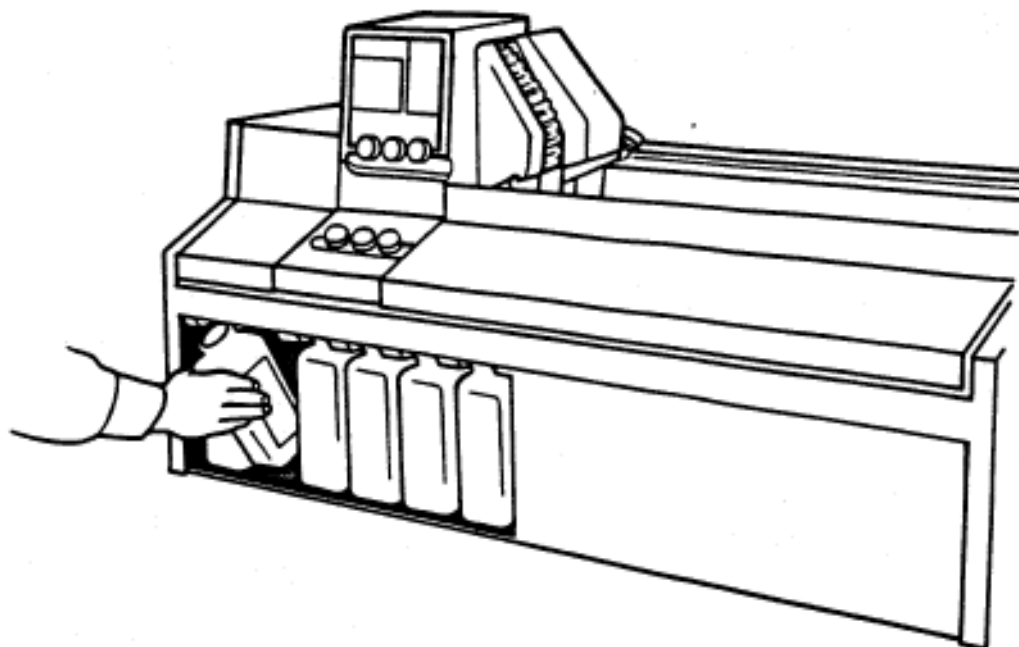


Illustration #4

To change the reclaiming configuration follow the instructions below:

(Note: When first installing a new ATL-2 Plus, the cover and screws for the drain area are shipped not installed. In this case start with step #3.)

1. Remove screws from cover. (See illustration #3 above.)
2. Remove cover from unit.
3. Align the drain arm and place caps over the proper holes (See illustration #4 above) according to chart on the next page.
4. Install cover.
5. Install screws in cover.
6. Place six empty one liter bottles in reclaiming position. (See Illustration on next page.)



Reclaiming Options Chart

<u>Which Bottle(s) to Reclaim</u>	<u>Which Hole to Place Caps Over</u>	<u>Position of Drain Arm</u>
None	One cap over 6	In front of cap.
All	No caps	-----
1	One cap over 2	Behind cap
1 - 2	One cap over 3	Behind cap
1 - 3	One cap over 4	Behind cap
1 - 4	One cap over 5	Behind cap
1 - 5	One cap over 6	Behind cap
2	One cap over 1 One cap over 3	Between caps
2 - 3	One cap over 1 One cap over 4	Between caps
2 - 4	One cap over 1 One cap over 5	Between caps

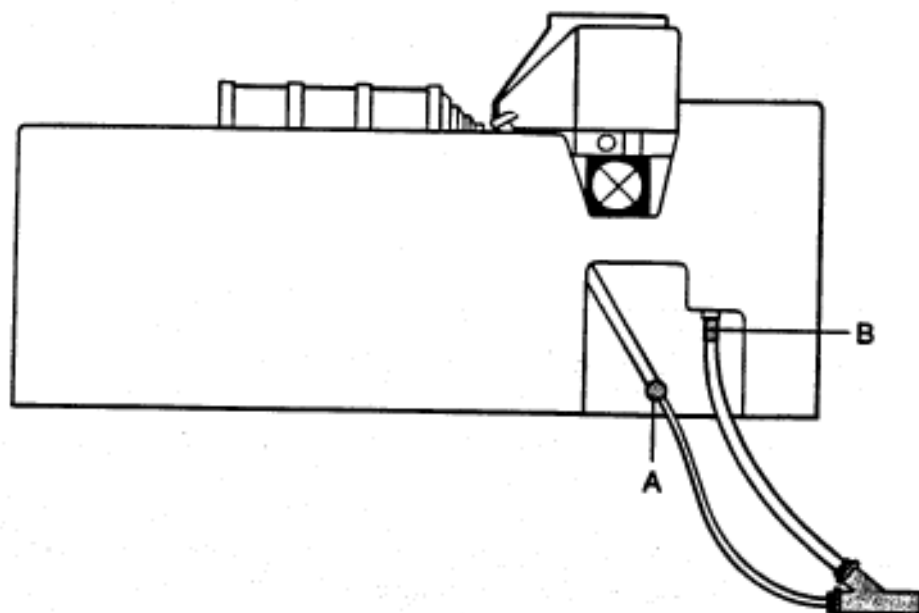
Reclaiming Options Chart Continued

<u>Which Bottle(s) to Reclaim</u>	<u>Which Hole to Place Caps Over</u>	<u>Position of Drain Arm</u>
2 - 5	One cap over 1 One cap over 6	Between caps
2 - 6	One cap over 1	In front of cap
3	One cap over 2 One cap over 4	Between caps
3 - 4	One cap over 2 One cap over 5	Between caps
3 - 5	One cap over 2 One cap over 6	Between caps
3 - 6	One cap over 2	In front of cap
4	One cap over 3 One cap over 5	Between caps
4 - 5	One cap over 3 One cap over 6	Between caps
4 - 6	One cap over 3	In front of cap
5	One cap over 4 One cap over 6	Between caps
5 - 6	One cap over 4 One cap over 6	Between caps
6	One cap over 5	In front of cap

WARNING: Government regulations can affect your right to put photo chemistry into the drains of your facility. Consult the proper authorities for regulations affecting your installation before proceeding.

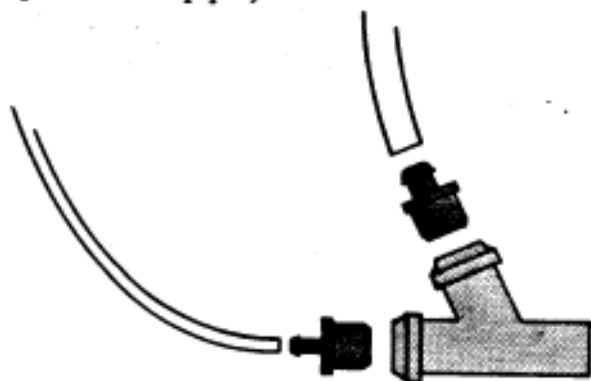
3.3 Drain Connection

There are two drains located on the back side of the ATL-2 Plus. The main trough drain (A) on the left side, and the overflow/rinse water drain (B) on the right side. (See illustration below.)



If the ATL-2 Plus is placed into a darkroom sink these drains do not require further attachments. They can be allowed to drain directly into the sink.

If the ATL-2 Plus is placed on a counter-top or in the #4221 Support Table both drains must be attached to hoses routed to a drain facility. The ATL-2 Plus requires $\frac{1}{2}$ " PVC hose for the main trough drain and 1" inch hose for the overflow drain. A length of each of these hoses is included with the processor. To install the drain hoses push one end of the smaller diameter hose over the outlet to the main trough drain. Push the larger diameter hose over the overflow drain. Both of these hoses can be combined using the two grey adaptors and the "Y" fitting included with the processor. To combine them, push each clear hose over it's corresponding adaptor and then push the large end of the adaptor into one of the openings of the "Y" adaptor. The "Y" fitting can be attached to standard drain pipes. (In North America an adaptor is also included to covert the metric output pipe of the "Y" adaptor to inch pipe.)



3.4 Water Inlet Connections

The ATL-2 Plus requires two water supply lines with $\frac{3}{8}$ inch N.P.T. standard male fittings. (In North America brass adapters to convert $\frac{3}{8}$ inch N.P.T. to $\frac{3}{8}$ inch "hose type" thread are included. Place the brass adapters onto the white plastic valve threads on the back of the processor.) When facing the back of the unit, the inlet on the left, with the red dot, should be attached to a tempered water source, the inlet on the right, with a blue dot, should be attached to a cold water source. Set the tempered water supply to within $\pm 1.8^{\circ}\text{F}$ (1°C) of your processing temperature.

When connecting inlet hoses or adapters to the water valves, be sure hose connectors are not cross threaded on the valves. Tighten the hoses securely by hand. Do not over-tighten as this can strip threads on the water valves. The use of teflon plumbing tape on the threads can help to eliminate leaks.

The pressure of the water supply line must be between 15 and 90 p.s.i. (1 to 6 bar). Pressures lower than 15 p.s.i. will cause insufficient rinsing and pressures higher than 90 p.s.i could cause damage to the ATL-2 Plus. Use a pressure reducer (in U.S.A. order Jobo Part #61004) if necessary.

Note: Depending on the condition of the tap water in your area, you may consider installing a water filtration device. Particles in the rinse water can damage your film.

3.5 Electrical Connection

Observe ALL National Electrical Codes and Local Codes & Ordinances

A grounded, fused electrical supply is required. See Technical Specification in the beginning of this manual for exact parameters. Do not use an extension cord unless it meets all requirements as outlined for grounding, polarizing, and current capacity.

Grounding

Important Safety Precautions

Warning- To prevent unnecessary risk of fire, electrical shock, or personal injury, all wiring and grounding must be done properly. (In U.S.A, all wiring and grounding should be done in accordance with the National Electrical Code ANSI/NFPA and local codes and ordinances.) It is the personal responsibility and obligation of the processor owner to provide adequate electrical service for this processor.

Electrical Ground is Required

Your processor must be grounded. In the event of malfunction or breakdown, grounding will reduce the risk of electrical shock by providing a path of least resistance for electrical current.

The processor is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Do not, under any circumstances, modify the plug provided with the processor. If it will not fit the outlet, have a proper outlet installed by a qualified electrician.

Do not plug in, operate, or test the processor until proper power and ground connections have been made. Consult JOBO or a JOBO Servicing Dealer with any other questions.

Emergency Power Source

If you have purchased an ATL-2 Plus with an emergency back-up power supply refer to the extra instructions supplied with your unit for more information on operation with the back-up power supply. If you are interested in having your ATL-2 Plus retrofitted for use with an emergency back-up power source contact Jobo for further information.

3.6 Installation Check List

- Processor is properly grounded and plugged into a correctly polarized electrical outlet.
- Water is turned on and checked for leaks at faucets and at water valves.
- Drains are properly attached and routed.
- Processor has been leveled.
- Processor operates properly.
- Water inlet temperatures are correct.

10
11
12

● Preparing for Operation

4

NOTE: Numbers in parentheses refer to the legend found in the back of this manual.

4.1 Getting Started

- Turn on the cold water supply.
- Turn on the tempered water supply.

4.2 Filling the Water Bath

- Make sure the drain valve (29) is closed.
- Turn on the power switch (23).
- Turn the Set/Run dial (20) to the "RUN" position.
- Press the Reset Button (12).

● The unit will start to fill automatically within two minutes and maintain the proper water level.

4.3 Adjusting the Water Temperature

The rinse water for the ATL-2 Plus is supplied by the tempered water inlet connected to the rear of the machine. The temperature of this incoming water must be adjusted with an external mixing valve and thermometer. (In U.S.A. a mixing panel specially designed for the ATL-2 Plus is available. Order Part #4189.) The ATL-2 Plus has a coil submerged in the water bath which acts as a heat exchanger. All incoming rinse water passes through the coil so that your incoming water only has to be within $\pm 1.8^{\circ}\text{F}$ (1°C) of the processing temperature. Adjust the rinse water accordingly for each process run.

4.4 Filling the Chemical Bottles

Remove the front bottle cover (28), unscrew the bottle lids, and fill the bottles with the desired amount of chemistry. The maximum fill amount is one liter. This amount should be programmed into the microprocessor in accordance with instructions in section 6.2. The bottle lids should be returned to the bottles and screwed on tightly. Failure to screw the lids on tightly will cause improper chemistry amounts to be delivered during a process run.

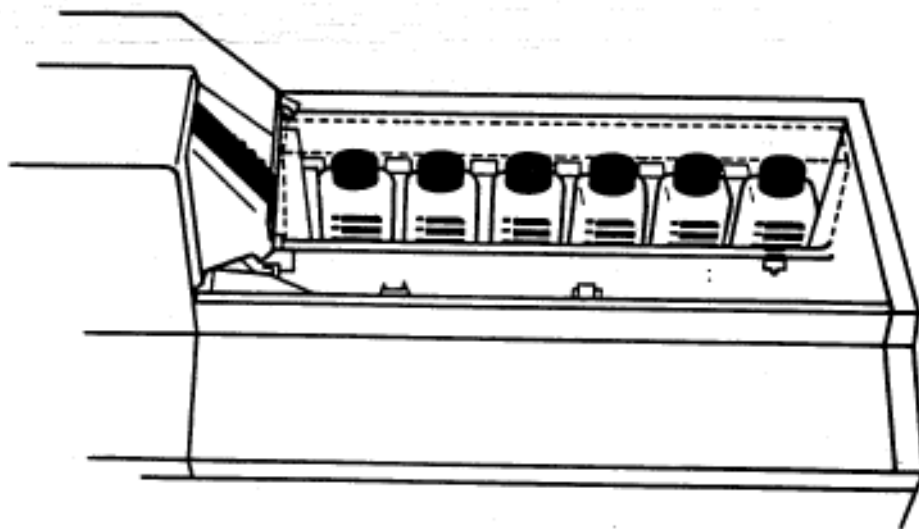
Check that the large and small hoses going to each bottle are attached securely.



4.5 Filling the Rear Tempering Bottles

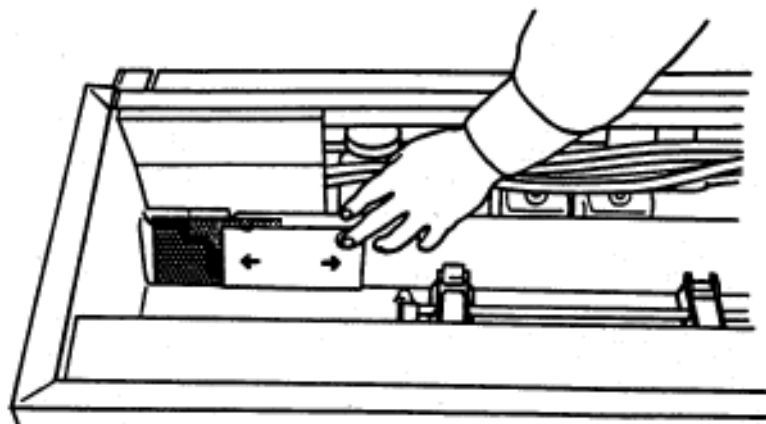
The ATL-2 Plus includes 6 one liter bottles and positions in the processor to place them for pre-tempering.

Remove the rear bottle cover (26), remove the one liter bottles, label the bottles, and fill the bottles with the chemistry you desire to temper and reinsert the bottles in the tempering bath. Replace the bottle cover. Replacement of the bottle cover is important to retain heat and moisture and also to keep the bottles from floating.



4.6 Adjusting the Water Level

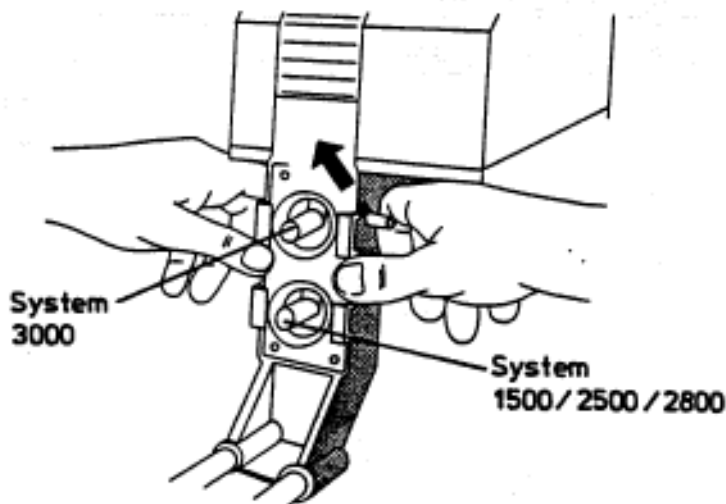
On the right, front side of the rotation trough is a slider (27) in front of a screen. Pushing this slider to the left (toward the controls) lowers the water level in the rotation trough. Pushing it to the right raises the level. Adjust this slider to obtain the highest level of water in the trough without the tank or drum floating off the white rollers. (Note: This needs to be adjusted each time a different tank or drum system is used.) Adjusting this level too high and causing the tank or drum to float causes chemistry to puddle at one end. The result of puddling of chemistry is uneven development. Adjusting the level too low results in poor tempering of the tank or drum.



4.7 Tank System Adjustments

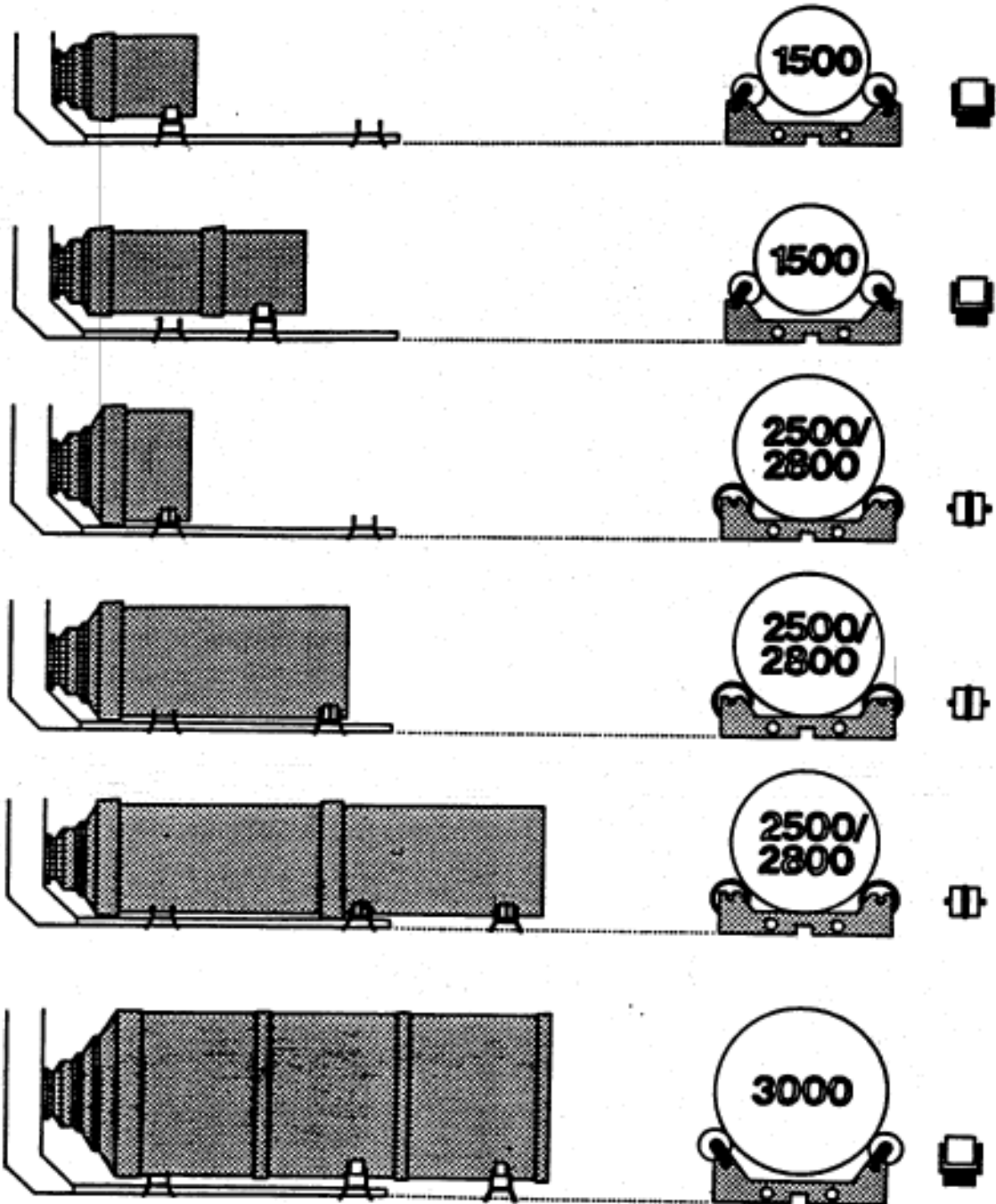
JOBO makes a large assortment of tanks and drums to meet a wide variety of needs. In order to accommodate all tanks and drums the lift arm contains two spigots. It is necessary to make an adjustment to the lift arm to accommodate the system being used. When using the 1500, 2500, & 2800 systems, press down the levers which are on both sides of the arm. When using the 3000 system pull the levers upward. The levers must be fully engaged in order to operate the ATL-2 Plus properly. (See Illustration below.)

Note: The lever may be quite stiff. This is normal and not a cause for concern.



4.8 Roller Block Adjustments

Due to an assortment of tank/drum systems available, the roller blocks in the rotation trough require adjustment. Slide the two black roller bearing blocks to the correct position (see illustration) and insert the two extensions in the correct direction (pointing inward or outward) according to the tank system you are using. Rollers, roller blocks, and extensions are all located in the accessory bag included with your processor.



4.9 Automated Cooling

Cooling of the tempering bath is automatic. When required, the ATL-2 Plus automatically allows cold water to enter the tempering bath, via the cold water hose attached to the unit, until the desired operating temperature is reached. If the water bath temperature is higher than the programmed process temperature, the automatic cooling system is activated. The cold water solenoid valve opens automatically approximately 30 seconds after water bath temperature rises higher than the programmed temperature.

Note #1: The actual temperature of the water bath is slightly warmer than the temperature in the chemistry bottles due to the physics of heating. The temperature probe for the water bath is adjusted for this difference. The temperature probe in the bottles displays the actual temperature.

Note #2: If your cold water source is not cold enough to cool the processor to the temperatures required for the processes you are doing, you may need to purchase a chiller. Contact JOBO for further information.

Helpful Hint: If you want to change from a high temperature, such as 38°C, to a low temperature, such as 20°C, it is fastest to use the following procedure:

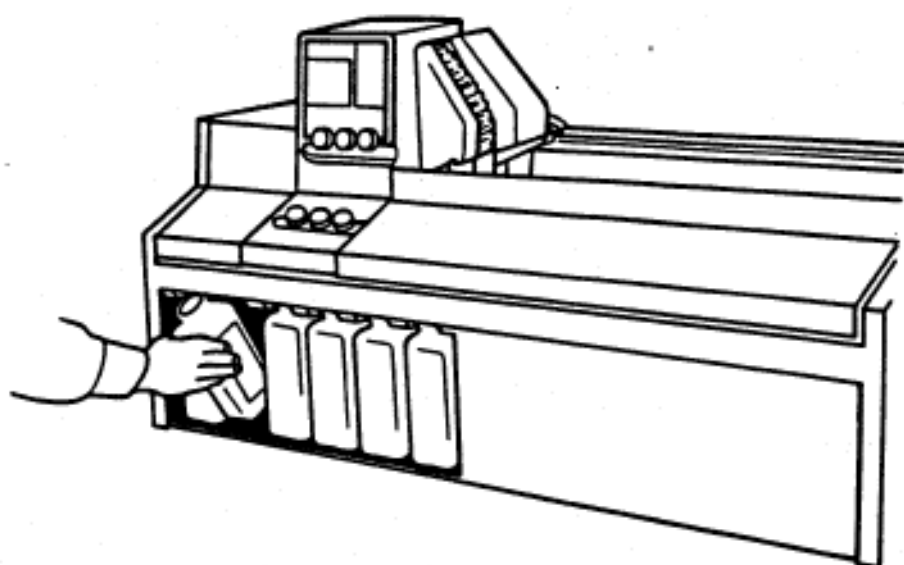
- Turn the power (23) off.
- Open the drain valve (29) and completely drain the water bath.
- Close the drain valve.
- Select the program with the new, lower temperature.
- Turn the unit back on.
- Press Reset (12)

The water bath will immediately begin filling with water from your cold water supply. This procedure saves a considerable amount of time and water.

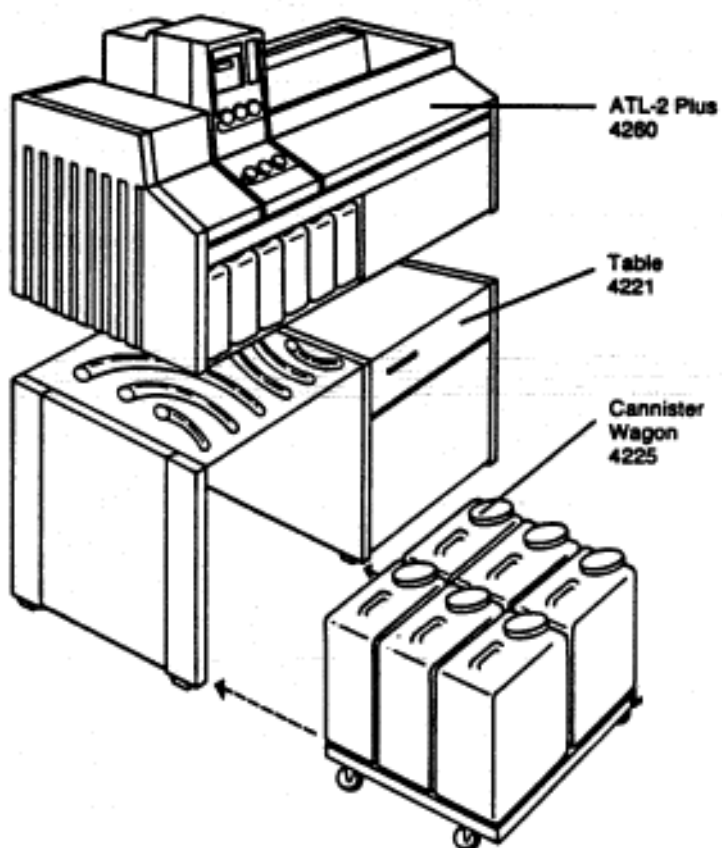
4.10 Chemical Reclaiming Options

The ATL-2 Plus can be set-up to route all chemicals and rinse water to the drain or each of the 6 chemical steps can be routed to its own individual reclaiming bottle or individual bottles or series of bottles can be selected for reclaiming. See section 3.2 for details on how to choose routing of used chemistry.

If the reclaiming method has been chosen place six empty one liter bottles in the proper position to receive the used chemistry. (See Illustration on next page.)



If the accessory support table (Jobo Part #4221) is being utilized along with the #4225 Canister Wagon, used chemistry can be routed to 15 liter canisters on the Canister Wagon.



Programming

5

NOTE: Numbers in parentheses refer to the legend found in the back of this manual.

5.1 Pre-programming Preparations

Enclosed with the ATL-2 Plus are five double-sided magnetic programming data cards which have been provided for use as references. The cards do not program the processor, they are for user reference only. Using the cards will help to verify that the program in memory is set correctly. These cards should be filled out with the programs you enter into your ATL-2 Plus. See the illustration below for examples of how to fill out these cards. (NOTE: We have pre-programmed channels 1 -10 of your ATL-2 Plus for you with our recommended processing times for several popular processes. The temperatures and channels we have entered are listed in Section 9.17. Obviously, since the AutoLab is user programmable, the programs can be altered at any time. Read sections 5.2 through 5.6 if you would like to alter a program.)

Process:	No.		Process: EP-2	No.		Process: B/W	No.	
temp.	20°C	B/W Paper	temp.	38°C	Photocolor II	temp.	20°C	B/W Film
prewarm	—		prewarm	—		prewarm	—	
pre-rinse	1:00	Developer	pre-rinse	1:00	Color Dev	pre-rinse	5:00	Developer
chemistry 1	vary		chemistry 1	—		chemistry 1	vary	
rinse	—	Stop	rinse	—	Bich-fix	rinse	—	Stop
chemistry 2	1:00		chemistry 2	—		chemistry 2	1:00	
rinse	—	Fix	rinse	—	rinse	—	Fixer	
chemistry 3	—		chemistry 3	1:55	chemistry 3	—		
rinse	—	Fix	rinse	—	rinse	—	Fixer	
chemistry 4	—		chemistry 4	0:30	chemistry 4	—		
rinse	—	Fix	rinse	—	rinse	—	Fixer	
chemistry 5	—		chemistry 5	1:30	chemistry 5	—		
rinse	—	Fix	rinse	2:00	rinse	—	Fixer	
chemistry 6	vary		chemistry 6	—	chemistry 6	vary		
rinse	2:00	Fix	rinse	—	rinse	5:00	Fixer	
end	—		end	—	end	—		

Note: To avoid confusion, decide now which process chemicals will go in which bottles and be sure that the program card number corresponds accordingly.

5.2 Programming in General

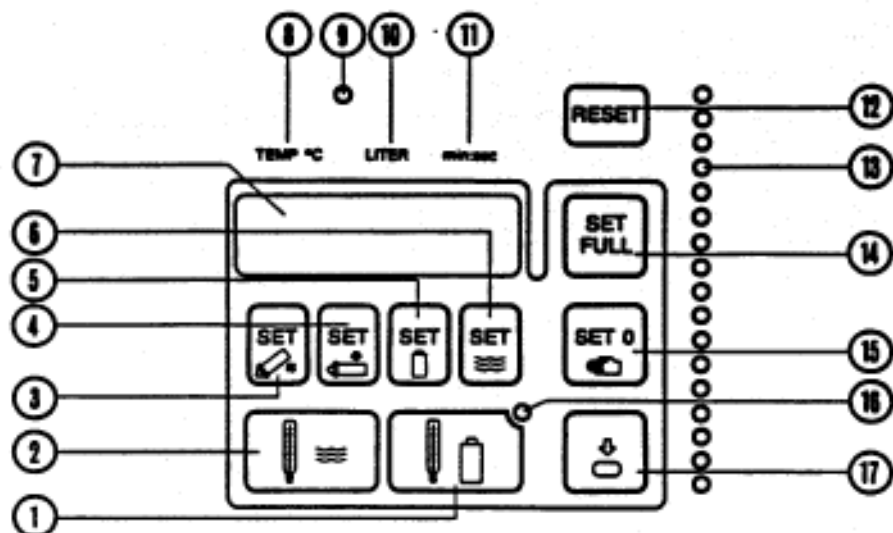
There is a column of LED's to the left of the programming data card. As you step through the program an LED will light up next to the step that is currently being displayed on the digital readout. Enter the appropriate data for that step and move down to the next step by depressing the Step Button (17). Specific details for each step are given in sections 5.3 through 5.6.

Pressing the "Reset" button (12) while programming returns you to the first step of the program. If you identify a mistake in a previous step, you have to press "Reset" (12) and step down to it using the Step Button (17) in order to make the correction.

The program is entered in the following order: chemistry quantity (in liters); temperature (in centigrade); pre-warm and pre-rinse times; six chemical steps with rinse times following each chemical step. More information is given on the programming of each step in the following sections.

For clarity we have used three colors for the LED's indicating process steps.

- Red - Temperature, pre-heat, re-exposure, end
- Green - Rinse steps
- Orange - Chemistry steps



5.3 Begin Programming

- Turn the power switch (23) on and place a prepared process card in the white recessed area of the control head.
- Turn the program selector dial (21) to the channel which corresponds to the number on the program card and press the "Reset" button (12). (See Section 10.2 for explanation of cleaning programs on the Program Selector Dial.)
- Turn the "Set/Run" selector dial (20) to "Set".

Number values are entered for each input by pressing the entry buttons (3, 4, 5 & 6). To increment a digit press the button below that digit. If a lower number is desired, continue pressing the button and after reaching the highest number it returns to zero. Press the "Set 0" button (15) to set all the digits to zero. (Program steps with an entry of 0:00 are skipped during a process run.)

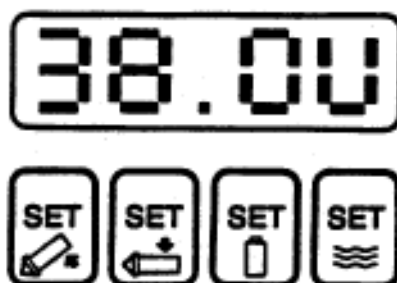
5.4 Entering the Tempered Chemistry Amount

The first programming step is to enter the quantity of chemistry you have filled into the tempering bottles. If you have followed the instructions in section 5.3, three digits will appear in the display with a decimal point between the first and second digit. The number indicates the volume of chemistry in liters. If you have filled the bottles to be used for this particular program with 1.0 liters, press the "Set Full" button (14) and hold it for two seconds. The LED display will change to "1.00" indicating the amount of chemical in liters, and an audible signal is given to acknowledge the entry has been made. (See Section 7.1 for more information.) If you have filled the bottles with a volume of chemistry less than 1.0 liter, use the entry buttons (4, 5 & 6) to enter the amount of chemistry you have filled. When a process is run, the amount of chemistry used is automatically deducted from the total (see variations on this feature in section 7.7).

Note: To convert the chemistry amount to milliliters (ml), drop the decimal point and add a zero to the right of the number. Thus, a display of 0.07 is 70 ml, 0.15 is 150 ml, and 1.00 is 1000 ml (or 1 liter).

5.5 Entering the Process Temperature

The second step in programming the ATL-2 Plus is to enter the temperature at which the process will be run. If the chemistry amount is being displayed, press the Step Down button (17) once to access the temperature setting step. The top red LED (13) will light up. Notice that it corresponds with the word "temp" on the program card. The temperature is displayed as three digits with a decimal point between the second and third digit. The display reads in Centigrade. The highest temperature that can be entered is 49.9°C (121.8°F) and the lowest is 18.0°C (64.4°F). Within this range, the process temperature will be maintained to within $\pm 0.1^\circ\text{C}$ (0.18°F). Using the entry buttons (3, 4 & 5) enter the temperature you want for the process written on the card.



Note #1: Temperatures lower than 18.0°C can be entered into a program but, when the "Set/Run" knob is moved to "Run", lower entries are automatically changed to 18.0°C.

Note #2: A "quick tempering" function can also be programmed at this time. Quick tempering decreases the length of time necessary to bring cool chemistry up to operating temperature. To engage this option, press the right most entry button (6) so that a "U" appears in the display above it. To cancel quick tempering press the button again and the "U" will extinguish. *Temperature accuracy of the ATL-2 Plus is lowered to $\pm 0.3\text{ C}$ when "quick tempering" is enabled.* (See Section 7.5 for more information)

When the Quick Tempering feature is on, the "Temp C" LED (8) flashes (if the "Set/Run" switch is in the "Run" position) to remind you that the feature is engaged.

It is recommended that the Quick Tempering feature only be used for the initial start-up of the processor or after refilling the working solution bottles and not be left on all the time.

5.6 Entering the Individual Process Times

All of the remaining steps to be programmed are timed, meaning you enter times for each step. Four digits appear with a colon in the middle. The length of time you want for each step will be entered in minutes and seconds. For example, two minutes and thirty seconds is displayed as "2:30", forty seconds is displayed as "0:40", and nineteen minutes and fifty-nine seconds is displayed as "19:59".



The first timed step is the "pre-warm" (red LED). It is a dry incubation period before any fluid enters the tank. The pre-warm allows the tank and its contents to stabilize at the pre-selected processing temperature.

The second timed step is the "pre-rinse" (green LED). A pre-rinse also allows the tank and its contents to stabilize at the processing temperature by allowing tempered water to flow in.

Enter the times for each of the incubation steps using the entry buttons (3, 4, 5 & 6). Using the "pre" steps depends on the requirements of the particular process (see Chapter 9 for specific process recommendations on all the common processes). If you wish to skip a particular step, press "Set 0" and it will be bypassed when the program is run.

The chemical step times are programmed in the same manner. Use the step button (17) to move through the program and enter the desired times for each step. The ATL takes into account the length of time it takes to drain the used chemistry so no additional time should be added for draining. The lift arm will raise the tank to drain the used chemistry before the total time has expired. The microprocessor knows how long it takes to completely empty and lower the tank back down so that it's ready for the next step the moment the time elapses.

When running a rinse step, the water is exchanged every thirty to forty seconds so that the film or paper is thoroughly cleaned.

Note #1: The step located after chemistry #2 is called "Re-exposure". For virtually all contemporary processes the step is bypassed (enter "00:00"). See section 7.2 for further explanation.

After entering all the values, go back and check the program and make corrections if necessary. Press "Reset" (12) and then, using the Step button (17), step through the program, checking each step with the data written on the magnetic card. Then press "Reset" again to return to the top. If all the entered values are correct, turn the "Set/Run" switch (20) back to "Run". Entries cannot be changed unless you are in "Set" mode. An internal memory battery will maintain your programs even if the machine is left unplugged for several months.

Note #2: The "Set/Run" switch must be in the "Run" position and Reset pushed for the processor to adjust the water bath to the programmed temperature.

RUNNING A PROCESS

6

NOTE: Numbers in parentheses refer to the legend found in the back of this manual.

6.1 Power-Up

- Turn the power (23) on.
- Turn the "Set/Run" switch (20) to "Run".

6.2 Filling Quantity Selection

Read the label on the tank\drum you will be using for the process and determine the amount of chemistry needed for processing. If you're using a tank with a module connected to it, be sure to add the amounts on both labels. Set the "Filling Quantity" dial (22) to the appropriate position. If the quantity required is not listed on the dial, use the next higher amount.

Note: If you are using the 2500 system of tanks with the 2502 Duo-Set reels, use the "Automatic Filling Quantity Selector" dial (25). Read section 7.6 for details.

6.3 Rotation Speed Selection

The "Rotation Speed" dial (24) can be adjusted to six different settings. Four of them, 25, 50, 75, and 100 are standard bi-directional speeds corresponding to the number of revolutions per minute. The other two, "Quick start" and "Disc" are for special processes. Find the particular process you're performing in Chapter 9 to determine which speed you should use.

Note: The r.p.m. of the rotation motor is calculated as if the drum were turning continuously in one direction. Because the motor slows before reversal and then comes back up to speed the actual number of revolutions per minute will be less than the marked speed. This is normal.

6.4 Final Check List

Couple the tank to the processor and review the following list to verify that you are ready to process:

1. Has the correct program been selected?
2. Has the correct filling amount been set?
3. Has the proper rotation speed been set?
4. Is there a sufficient quantity of solution in the stock bottles?
5. Is the chemistry amount indicated on the display the same as the amount in the bottles to be used?
6. Are the front tempering bottles lids sealed properly and tightly?
7. Have the rollers been set properly for the tank series to be used?
8. Is the water bath level high enough to temper the tank, yet not cause it to float?
9. Have the cold water and tempered water supplies been turned on?
10. Are the chemistry reclaiming bottles in place and do they have sufficient empty space to capture the chemistry from this process run? (Only necessary if chemistry is being reclaimed.)
11. Is the Set/Run Switch in the "Run" position?

6.5 Starting the Process

The display should show the amount of chemistry in the tempering bottles.

- Press the "Start" button once.
The display will indicate the fill quantity you have selected.
- Press the "Start" button again.
If the fill quantity you have selected with the Fill Quantity Dial (22) is greater than the chemical quantity remaining in the bottles (this is the amount displayed after pressing RESET (12)), then the quantity remaining in the bottles is displayed, and the ATL will not allow you to proceed. To proceed, press "Reset" (12), refill the tempering bottles if necessary, and reprogram the new amount.

Note: When using the automatic fill quantity dial (25) an "A" will appear in the left most display along with the amount of chemistry to be pumped. (See Section 7.6 for more detail.)

If the chemical quantity entered in the program is enough to meet the amount specified on the fill quantity dial, the program channel selected will display.

- Press the "Start" button a third time.

The programmed temperature at which you want the process to run will be displayed and the tank will begin rotating slowly. If the water bath and chemistry are at the programmed temperature, the processor will "beep" and the process will start. Otherwise, if the processor has not reached the correct temperature, the red temperature LED (16) will illuminate and the tank will continue to rotate slowly. When the programmed temperature is reached in both the chemistry bottle and the water bath, the temperature LED is extinguished and the process starts. Read section 7.4 for instructions on how to override the temperature delay.

Note: Once a process has started, turning the program dial will not change the program.

The column of LED's to the left of the programming data cards light up in sequence to indicate the step in progress. The display acts as a timer, counting down the time for each step. At the end of the process, a beeper sounds until the "Reset" button is pressed. The display will then show the amount of chemistry remaining in the tempering bottles.

Remove the tank from the processor by grasping it at the bottom and pulling up and toward you. The tank will make a snapping sound when it disengages from the lift. This is normal.



Note: It is recommended that stabilizers or wetting agents not be used in the processor or on the reels. Both chemicals rinse off the tanks and reels with difficulty and create a foam if agitated. When a wetting agent or stabilizer is used at the end of a process, remove the film/prints from the tank and reels before placing them in the agent.

Special Functions

7

7.1 Filling the Front Solution Bottles

In order to update the amount of chemistry in the front solution bottles more conveniently, JOBO has included a feature for resetting the available tempered solution amount to the full 1.0 liter. After completely filling the tempering bottles for a particular program, press the "Set Full" button (14) and hold it for two seconds. When the audible signal ceases, the tempered chemistry amount for that program has been set to "1.00". The new full setting will only affect the program for which the program selector dial (21) is set. (See exception in Section 7.7)

The "Set Full" function can be executed while the ATL is in either "Set" or "Run" mode. Pressing the "Set Full" button (14) while the processor is in "Set" mode will change the setting to the maximum amount immediately. If the processor is in "Run" mode, the "Set Full" button (14) is only operable if a process is not running (i.e. either before pressing the "Start" button (19) or after pressing "Reset"). The "Set Full" button (14) must be held for at least two seconds if the processor is in "Run" mode. At first, "1.00" will flash in the display, then a beep will sound to indicate the new amount has been entered. If the button is released before the two seconds has elapsed, the chemical quantity will remain unchanged.

7.2 Intermediate Exposure (Re-exposure)

Light reversal, as opposed to chemical reversal, can be used when processing certain materials on an ATL. If an intermediate exposure is to be made, enter the exposure time into the program (see section 5.6). During the process run a beep sounds when the re-exposure step is reached. Detach the tank and expose the film manually. Press the "Start" button (19) and the set time for the exposure runs in the digital display. After the time elapses, the beeper will sound again. Re-couple the tank and allow a few minutes for the tank to re-temper then press the "Start" button and the process will continue.

7.3 Manual Operation

In addition to being program entry buttons, buttons 3, 4, 5, 6 & 15 may also be used to perform manual operations. To perform the additional functions, simultaneously press the "Set 0" button (15) and one of the other entry buttons (3,4,5,or 6). Depressing the button in this manner causes certain manual functions to take place. The manual functions are as follows:

- Press buttons (15) & (3) together to raise the lift arm.
- Press buttons (15) & (4) together to lower the lift arm.
- Press buttons (15) & (5) together to pump chemistry from the tempering bottle to the tank. The ATL assumes that the last bottle from which chemistry was pumped is the one you want. Approximately 100 ml of chemistry is pumped per second.
(Note: This feature does not work unless a program is currently running.)
- Press buttons (15) & (6) together to allow tempered rinse water to flow into the tank.

7.4 Overriding the Temperature Check

As stated in section 6.5, once you have pressed the "Start" button three times, the temperature at which you want to start the process will be displayed and the tank will begin rotating. If the temperature of the water bath and chemistry match the programmed temperature, the process will start. Otherwise the ATL waits until the temperatures do match and then starts. If you want to override the pause and start with a less than exact temperature, do the following:

- Press the bottle temperature button (1) and the "Start" button (19) simultaneously and hold them until the red LED (16) above the bottle temperature button goes out and the processor beeps. The process will start and the temperature holding LED (16) will flash throughout the process run.

7.5 Quick Tempering Feature

After refilling the front working solution bottles with chemistry of a lower temperature than that of the tempering bath, a delay is required before again processing. This delay is required to allow the new chemistry to adjust to the proper temperature. To speed this process the "Quick Tempering" feature can be used. When this feature is enabled, the ATL-2 senses the difference in temperature between the bottles (new chemistry) and the tempering bath. If the difference is great the machine "overheats" the tempering bath to speed the heating of the chemistry in the bottles. As the temperature of the bottles begins to approach that of the tempering bath the tempering bath is allowed to cool back to the proper operating temperature.

The Quick Tempering feature should not be continually enabled as tempering accuracy is lowered to ± 0.3 C while it is enabled. (Normal accuracy is ± 0.1 C)

Read the second note from section 5.5. for details on programming this feature.

7.6 Automated Fill Quantity Feature

As stated in Section 6.2, the amount of chemistry required for a particular run is chosen with the "Filling Quantity" dial (22). Another method should be used to choose the filling quantity if you're using the 2500 tank series with 2502 Duo-set reels. This method utilizes the "Automated Filling" dial (25).

To activate this feature, turn the "Filling Quantity" dial (22) to "A" (for automatic). Notice that on one side of the "Auto Fill" dial is the listing of the tanks with a picture of a half-filled tank and on the other half the tank is completely full. The full tank picture is for a double-loaded 120, single-loaded 220 or 35mm film, and a half full tank picture is for single-loaded 120 films which are only loaded on the outside of the reel. Set the "Automated Filling" dial to the appropriate position and the chemistry and rinse volumes are then automatically calculated. When the start button is pressed for the first time in starting a process, an "A" will appear in the left-most display next to the readout for the amount of chemistry to be pumped.

Using the "Automated Filling" dial not only makes running a process easier, but it also assures thorough rinsing by filling the tank completely with water even though only minimal chemistry amounts are used.

7.7 Calculation of the Chemistry Quantity Remaining

The ATL-2 Plus keeps track of the amount of chemistry in each of the tempering bottles. For example: If you put C-41 chemistry in bottles 1-2-3, you would enter the solution quantity into the C-41 program channel. Let's assume it's program #4. Similarly, if you put black and white chemistry in bottles 4-5-6, you would enter that amount in the program number chosen to operate the black and white process, say program #5. When a C-41 run is made with program #4, the unit will deduct the quantity of solution used for the run from the original quantity entered. So if the bottles were full, the display should read "1.00", and after you run a process which required 270ml of chemistry, the display would read "0.73". Hence, if the program selector is turned to channel 4, the display will indicate "0.73", the solution amount remaining in bottles 1-2-3. Likewise, if you turn the program selector to channel 5, the display will show the amount of solution in bottles 4-5-6, which was not affected by the C-41 run.

When desired, the repositioning of a dip switch under the panel (32) will allow the machine to track solution quantities by the bottle set. With this option selected in the above described scenario, pumping chemistry for one program will equally change the amounts for all programs. So after pumping 270ml from program #4 program #5 would also show only 730ml remaining. Since this would be incorrect you would not choose this option when running more than one chemical process in the machine at the same time. This method would be used in a case where the machine had multiple versions of the same chemical process (ie; push or pull processes.) and each program drew chemistry from the same bottles. For example, assume that you are running the Kodak E-6TM process which requires six bottles plus a stabilizer. You could use the same chemistry for several different programs (ie, Standard E-6, Pull 1 stop, Push 1 stop, Pull 2 stops, Push 2 stops). Enter each process in its entirety into its own program channel 1-5 respectively and follow the directions on the next page for keeping one running total for each set of six bottles.

To reconfigure the ATL for one running total per bottle set, **turn the power switch (23) to the off position and unplug the power cord.** Remove the access panel (32) using a Phillips screwdriver. (see Fig. 1 below) Three fuse sockets and a set of dip switches will now be exposed and readily accessible. The #4 switch is set to the off (down) position at the factory. In the "OFF" position the chemistry quantities are calculated by each program independently, while in the "ON" position the one running total is kept for each of the six 1.0 liter bottles. Set the switch to the desired position. (See Fig. 2 below)

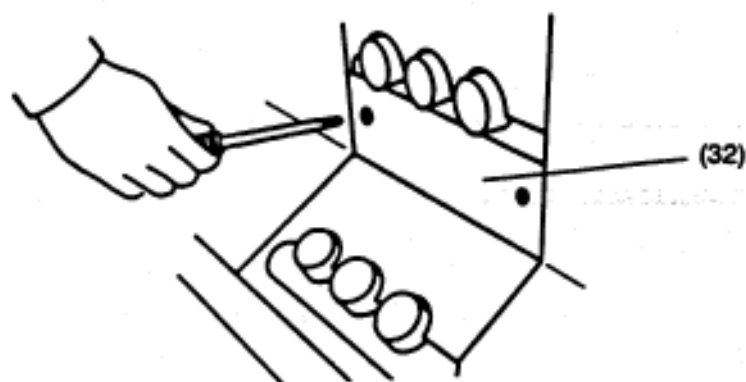


Figure #1

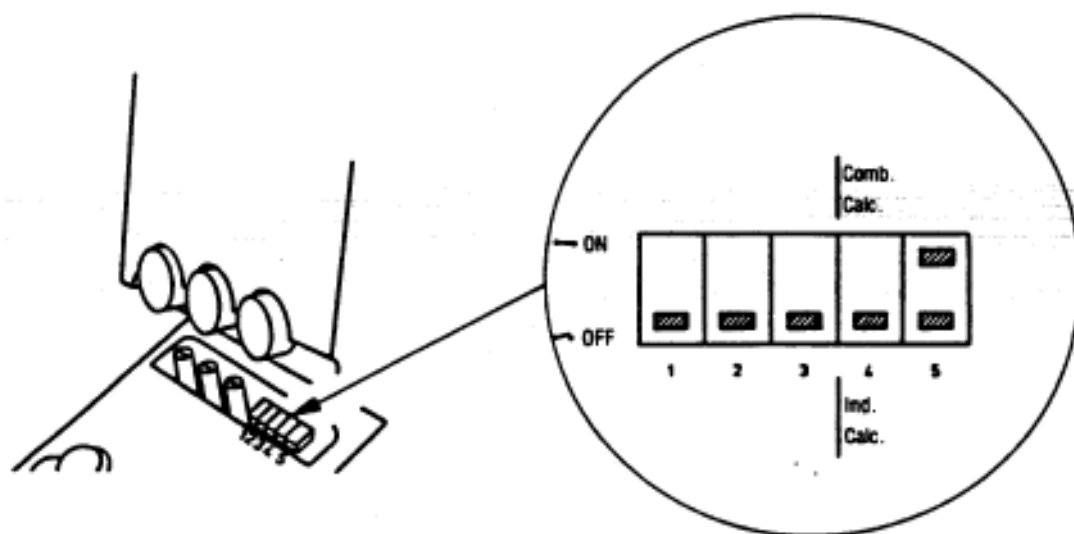


Figure #2

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Trouble-Shooting

8

Fault Indicators

Indication	Cause	Remedy
1. Water bath does not heat up.	"Reset" was not pushed after programming.	Push "Reset" (12).
2. Water bath does not heat up.	"Set/Run" switch position "SET".	Turn switch (20) to "RUN". Push "Reset"(12).
3. Unit does not respond when pressing start button.	Chemical amounts in bottles not sufficient.	Refill bottles, enter new volume in display.
4. Beep & red triangle LED	Rinse water off. Bottles empty. Bottle caps are not tight.	Turn water on. Refill bottles. Tighten the caps.
5. Triangle lit & flashing step button	There was insufficient solution in the bottle specified.	Fill the bottle before starting the next process.
6. Flashing red triangle	There was a momentary loss of power to the unit during operation.	Ignore it, the process will not be affected if it was only for a few seconds. The triangle will turn itself off at the start of the next process. Note: The ATL-2 always flashes the triangle when it is first turned on.

7. Yellow LED	Unit has an internal problem with the microprocessor.	Corrects itself automatically. If the problem persists service will be necessary.
8. A "2" in the display & beeping.	Drum motor stopped.	The motor should automatically reverse in less than 5 seconds. If it doesn't free up, call for service.
9. Motor turns at 50 r.p.m. regardless of motor speed setting.	Motor is overburdened.	It should work normally after it cools for awhile. If problem occurs often, call service.
10. A "3" in the display & beeping.	Air distributor control problem.	Call service.
11. A "4" in the display & beeping.	ATL cannot raise the lift arm.	Empty the drum manually, attach it to the processor and press the start button. Finish the run and call for service.
12. A "5" in the display & beeping.	Defective water temperature sensor.	Call for service.
13. A "6" in display & beeping. (See Note 3 below)	Pumped solution quantity was not sufficient.	Depress keys (15) & (5) together to pump more chemistry. 1 sec = 100 ml.

14. A "7" in the display & beeping.	Defective chemical temperature sensor.	Disengage the quick-tempering feature. (see second note in Section 5.5) Call for service. The unit can be used with the temp. override. (see Section 7.4).
15. A "8" in the display & beeping.	Not enough water in lower trough.	Make sure cold water source is attached and turned on, turn machine off and back on and press then RESET (12).

Notes on filling

Note 1: If the volume set on the "Fill Quantity" switch (22) is greater than the amount in the display, the program will not start.

Remedy: Refill the bottles and reprogram the ATL with the new chemical amount.

Note 2: With volume settings of 140 ml or higher, if the ATL gets substantially less than the fill quantity instructed, a continuous beeping alarm will sound, the yellow triangle (18) will illuminate and the program will pause.

Remedy: Check to see if there is chemistry in that particular bottle or if the hoses for that bottle are kinked or loose or if the cap to the bottle is not sealed properly. Once the problem is located and resolved, press the start button and the unit will attempt to pump the chemistry again.

Note 3: With volume settings of 140 ml or higher, if the ATL gets close to the amount chemistry the fill quantity instructed but not 100%, the alarm will sound, the yellow triangle (18) will illuminate and a "6" will flash in the left most display window. The program will continue running. If no other action is taken the "6" will stop flashing and the alarm will stop when the program moves to the next step. The yellow LED next to the step in question will keep flashing to inform you of the problem in that step. Pushing the Reset button after the process has ended will stop the LED's from flashing.

Remedy: Follow the remedy stated for note #2.

Specific Processing Instructions

9

9.1 Introduction to Processing

This section details the steps involved in running specific processes. JOBO has made every reasonable effort to be sure that this information is accurate, however the various manufacturers can and do change their specifications for these processes. You should always confirm the processing procedure (and mixing instructions) by referencing the instructions packaged with the chemistry. Check for rotary-specific instructions.

Before processing valuable photo materials we strongly suggest that you become familiar and are satisfied with the quality of any process used!

The developer times listed are suggested starting points for proper processing. Due to a great many variables involved in any photo process, these times should only be considered approximately correct. For best results and personal preference, the development times may need to be adjusted. Refer to the section on process control strips (9.2) for further information on adjustments for optimal processing.

Included with the information on the processes to follow are bottle location numbers (from left to right). The order of the chemical steps must be maintained, but the specific bottle locations are only recommendations. These recommendations are helpful when several different processes are run on the machine. They minimize the possibility of cross-contamination and expedite the change of chemistry containers for different processes.

The list of processes covered in this section is not meant to be a complete list. Virtually any photo process may be run on your JOBO processor. This section covers the instructions for Kodak Photocolor, Agfa, Tetenal, and Ilford (Cibachrome™) chemistry. The list is not meant to be exclusive. Unicolor, Hunt, and others make chemistry that will work excellently on your JOBO processor. If the chemistry you wish to use is not listed in this section and rotary instructions are not supplied, contact the chemical manufacturer for rotary specific instructions.

If you are unable to obtain instructions, or are experiencing problems, write or call JOBO for assistance.

9.2 Processing Process Control Strips

The use of the process control strips is not strictly necessary; however, their use is the best assurance of correct processing and is strongly suggested for critical commercial work.

Pre-exposed process control strips are available from Kodak and other manufacturers. They can be purchased through photographic supply dealers. Control strips can be processed in the Autolab and compared against a strip pre-processed by the manufacturer. Variations between a control strip processed on the Autolab, and the manufacturer's pre-processed strip will determine what adjustments (if any) need to be made to the process times or chemistry. Control strips should be stored in a freezer and individually thawed thoroughly before processing.

Use a densitometer, such as the Jobo #6355, to make accurate evaluations of control strips. Read the density steps of each processed control strip. Log the results and compare them to charts provided by the control strips' manufacturer.

If the readings obtained do not vary from the chemistry manufacturer's tolerance specifications, then the process is "in control" and your film will be processed correctly. If readings are out of the chemistry manufacturer's specified range, refer to the chemistry manufacturer's process manual for corrective action(s). After adjustments are made, process another control strip. A control strip should be run periodically to verify an "in-control" process. A control strip should be run when new chemistry is mixed, or any change is made in the process.

Note 1: If you are unfamiliar with the use of a densitometer, see your local industrial photographic dealer.

Note #2: Process control strips are the most accurate system for assuring that all the parts of the process are working to produce the expected final product. Judgment must be used, however, to ensure that the end result is acceptable to the end-user. If you are processing for yourself, then you are the "judge and jury" of what is acceptable. When processing for others, having a process that is documented as standard or "in control" will alleviate potential problems with your customer and will help to determine what may have caused undesirable results in the customer's film. When the process is "in control", other non-processing related areas should be examined for possible cause.

9.3 Color slide film process: Kodak E-6, Beseler E-6, Uni-Color E-6, Tetenal E-6, Agfa AP44

These processes are used to develop E-6 Ektachrome™ (and compatible) films. The following is a brief description of each processing step.

- Use speed 75 with 1500 or 2500 series tanks.
- Use speed 50 with 3000 series tanks.
- Set temperature to 38.0°C.

Pre-warm, 5:00 minutes

First Developer, bottle position 1, 6:30 minutes

The exposed silver salts are converted to metallic silver. This is the most critical step in the process. Errors in time, temperature, agitation, and dilution will adversely affect density, contrast, maximum density, and fog level.

Rinse, 2:30 minutes

The first rinse stops the developing action of the first developer. It also prevents carryover of developer into the reversal bath. Too long or too short a rinse can cause the density and color balance to change.

Reversal Bath, bottle position 2, 2:00 minutes

Reversal Bath contains a chemical fogging agent so that re-exposure to light is not required. Improper reversal bath use will produce partial reversal of the image, and result in loss of density. See Note 1 below.

Color Developer, bottle position 3, 4:00 minutes

The remaining silver salts are converted to metallic silver and the color couplers in the film are converted into the image. Improper color development will adversely affect the color balance, contrast, maximum density, fog level, and evenness of development. See Note 2 below.

Process: E-6	No.	Kodak
temp.	38°C	
prewarm	5:00	
pre-rinse	—	
chemistry 1	6:30	1st Dev
rinse	2:30	
chemistry 2	2:00	Reversal
rinse	—	
chemistry 3	4:00	Color Dev
rinse	—	
chemistry 4	2:00	Condit.
rinse	—	
chemistry 5	6:00	Bleach
rinse	—	
chemistry 6	3:00	Fix
rinse	5:00	
end		

Conditioner Bath, bottle position 4, 2:00 minutes

The metallic silver is prepared for bleaching and the PH of the film is adjusted in preparation for the bleach. Color developer is prevented from contaminating the bleach. Improper conditioning produces silver retention and fog. See Note 3 below.

Bleach Bath, bottle position 5, 6:00 minutes

Metallic silver is converted to silver halide so the fixer can remove it. Improper bleaching produces silver residue, low maximum density in red, yellow fog, and/or high maximum density for blue. See Note 4.

Fixing Bath, bottle position 6, 3:00 minutes

The fixer removes silver halide from the emulsion leaving just the color dyes. Ineffective fixing leaves silver in the film, causing excessive blue density in the highlights, yellow veiling, and spots.

Final Rinse, 5:00 minutes

This rinse removes all remaining chemicals in the film. To be effective it needs to be at least five minutes long.

Stabilizer Bath, (time not critical) 1:00 minute

Stabilizer helps to preserve the color dyes from fungus or mold and contains a wetting agent to promote spot-free drying. This bath should be replaced periodically to prevent scum from forming. See note 5.

Note 1: Kodak recommends diluting their E-6 reversal bath to 60% of the working strength solution (i.e. 1.6 gal. for use from 1 gal. of normal working strength chemistry), when using a rotary processor.

Note 2: Kodak recommends decreasing their E-6 color developer time from 6:00 minutes to 4:00 minutes when using rotary processing.

Note 3: Do not use a rinse between the conditioner and the bleach. Carryover is required for proper processing results.

Note 4: The bleach needs to be aerated to work effectively. Unlike developers which are degraded by too much oxygen, the bleach needs to be fully oxygenated. This is accomplished by making sure that air is introduced while mixing the bleach. This can be accomplished several ways, for example, mixing in a larger container than the volume of bleach and stirring or shaking (while capped) vigorously. On a large scale, air can be bubbled through the bleach with a pump.

Note 5: Stabilizer should always be used outside of the processor to avoid contaminating tanks and reels. Use a separate container for stabilizing film and remove the film from the reel before stabilizing. Stabilizer is very difficult to remove entirely from reels and tanks. If it is carried over into the next process, developing can be affected.

9.4 Color slide film process: Photocolor Chrome-Six 3 Bath

The Photocolor Chrome-Six 3 Bath process is used to develop Kodak E-6 Ektachrome (and compatible) films. The following is a brief description of each processing step.

- Use speed 75 with 1500 or 2500 series tanks.
- Use speed 50 with 3000 series tanks.
- Set temperature to 38.0°C.

Process: E-6	No.	
temp.	38°C	Chrome-Six
prewarm	5:00	
pre-rinse	—	
chemistry 1	6:30	1st Dev
rinse	3:00	
chemistry 2	—	
rinse	—	
chemistry 3	4:00	Color Dev
rinse	1:00	
chemistry 4	—	
rinse	—	
chemistry 5	10:00	Bich-Fix
rinse	5:00	
chemistry 6	—	
rinse	—	
end		

Pre-warm, 5:00 minutes

First Developer, bottle position 1, 6:30 minutes

The exposed silver salts are converted to metallic silver. This is the most critical step in the process. Errors in time, temperature, agitation, and dilution will adversely affect density, contrast, maximum density, and fog level.

Rinse, 3:00 minutes

The first rinse stops the developing action of the first developer. It also prevents carryover of developer into the color developer. Too short a rinse can cause the density and color balance to change (usually a green shift, magenta highlights and low maximum density).

Color Developer, bottle position 3, 4:00 minutes

The color developer contains a fogging agent that chemically "re-exposes" the film so that no additional chemical step or light re-exposure is necessary. The remaining silver salts are converted to metallic silver. At the same time, the color couplers in the film are converted into the image. Improper color development will adversely affect the color balance, contrast, maximum density, fog level, and evenness of development. See Note 1 below.

Rinse, 1:00 minute

Bleach/Fix bath, bottle position 5, 10:00 minutes

Metallic silver is converted to silver halide by the bleach/fix and removed from the film. This leaves only the color dyes. Improper bleach fixing leaves silver residue, producing low maximum density in red, yellow fog, and high maximum density for blue. Silver left in the film causes excessive blue density in the highlights, yellow veiling, and spots. See Note 2 below.

Final Rinse, 5:00 minutes

This rinse removes all remaining chemicals in the film. To be effective it needs to be at least four minutes long.

Stabilizer Bath or Wetting Agent (this is an optional step and the time is not critical) 1:00 minute

Stabilizer helps to preserve the color dyes from fungus and mold, and contains a wetting agent to promote spot free drying. This bath should be replaced periodically to prevent scum from forming. See Note 3 below.

Note 1: Photocolor recommends decreasing their color developer time from 6:00 minutes to 4:00 minutes, when using rotary processing. Use 6:00 minutes only when push processing.

Note 2: The bleach/fix needs to be aerated to work effectively. Unlike developers which are degraded by too much oxygen, the bleach needs to be fully oxygenated. This is accomplished by introducing air while mixing the bleach. This can be done several ways, for example, mixing in a larger container than the volume of bleach and stirring or shaking (while capped) vigorously. On a large scale, air can be bubbled through the bleach with a pump.

9.5 Color slide film process: Tetenal E-6 Three Bath

The Tetenal E-6 Three Bath process is used to develop Kodak E-6 Ektachrome (and compatible) films. The following is a brief description of each processing step.

- Use speed 75 with 1500 or 2500 series tanks.
- Use speed 50 with 3000 series tanks.
- Set temperature to 38.0°C.

Process: E-6	No.	
temp.	38°C	Tetenal
prewarm	5:00	
pre-rinse	—	
chemistry 1	6:30	1st Dev
rinse	2:00	
chemistry 2	—	
rinse	—	
chemistry 3	6:00	Color Dev
rinse	2:00	
chemistry 4	—	
rinse	—	
chemistry 5	6:00	Blich-Fix
rinse	4:00	
chemistry 6	—	
rinse	—	
end		

Pre-warm, 5:00 minutes

First Developer, bottle position 1, 6:30 minutes

The exposed silver salts are converted to metallic silver. This is the most critical step in the process. Errors in time, temperature, agitation, and dilution will adversely affect density, contrast, maximum density, and fog level.

Rinse, 2:00 minutes

The first rinse stops the developing action of the first developer. It also prevents carryover of developer into the color developer. Too short a rinse can cause the density and color balance to change (usually a green shift and low maximum density).

Color Developer, bottle position 3, 6:00 minutes

The color developer contains a fogging agent that chemically "re-exposes" the film so that no additional chemical step or light re-exposure is necessary. The remaining silver salts are converted to metallic silver. At the same time, the color couplers in the film are converted into the image. Improper color development will adversely affect the color balance, contrast, maximum density, fog level, and evenness of development. (See Note #1 after Section 9.3)

Rinse, 2:00 minutes

Bleach/Fix bath, bottle position 5, 6:00 minutes

Metallic silver is converted to silver halide by the bleach/fix and removed from the film. This leaves only the color dyes. Improper bleach fixing leaves silver residue, producing low maximum density in red, yellow fog, and high maximum density for blue. Silver left in the film causes excessive blue density in the highlights, yellow veiling, and spots. (see Note #2 after Section 9.3)

Final Rinse, 4:00 minutes

This rinse removes all remaining chemicals in the film. To be effective it needs to be at least four minutes long.

Stabilizer Bath or Wetting Agent (this is an optional step and the time is not critical) 1:00 minute

Stabilizer helps to preserve the color dyes from fungus and mold, and contains a wetting agent to promote spot free drying. This bath should be replaced periodically to prevent scum from forming. (See Note 3 after Section 9.3)

Note 1: The bleach/fix needs to be aerated to work effectively. Unlike developers which are degraded by too much oxygen, the bleach needs to be fully oxygenated. This is accomplished by introducing air while mixing the bleach. This can be done several ways, for example, mixing in a larger container than the volume of bleach and stirring or shaking (while capped) vigorously. On a large scale, air can be bubbled through the bleach with a pump.

Note 2: Stabilizer (or wetting agent) should always be used outside of the processor to avoid contaminating tanks and reels. Use a separate container for stabilizing film. Remove the film from the reel before stabilizing. Stabilizer is very difficult to remove entirely from reels and tanks. If it is carried over into the next process, the developer will be ruined.

E-6 Film Variations

Color characteristics and contrast vary from one brand of film to another. There are even slight differences between emulsion batches of the same film. If possible, test each batch of film to determine how the film reacts with the processing chemistry. Use of filters on the camera may be required for critical color balancing.

E-6 Push/Pull Processing

Alter the first developer time to change the effective "speed" or "sensitivity" of a film (EI, ASA, DIN, ISO). A 30% change in the time will produce a one stop adjustment. Add 30% to increase the speed (double the ASA or add 3 to DIN). This is known as "push processing". To decrease the speed of the film, subtract 30% from the first developer time. This will divide the ASA by 2, or subtract 3 from the DIN. Lowering the sensitivity of the film is known as "pull processing".

Greater changes in the first development time will produce larger adjustments to the speed of the film. The precise amount of time change required to produce a specific speed change depends on the particular film and chemistry combination.

When Processing Kodak Ektachrome P 800/1600 film specific instructions from Kodak should be followed. Contact Jobo or Kodak for more information.

Note: Tests should be done for any change in the first developer time. The results obtained will show some loss of quality in the image produced. These results may not be acceptable for critical work.

E-6 Processing Faults

Transparency too dark:

Underdevelopment in the first developer. The developer time is too short, the temperature is too low, or the developer is too old.

Transparency too light:

Overdevelopment in the first developer. The developer time is too long or the temperature is too high.

Transparency is too light and blue:

First developer is contaminated with fixing bath.

Transparency with yellow spots and/or high minimum density:

Contamination of chemicals with stabilizer or silver retention. Clean all equipment. Extend bleach and fixer times (approximately 25% to 50%).

9.6

Color negative film process: Kodak C-41, Uni-Color K-2, Agfa AP70, Tetenal C-41

The C-41 process is used to develop Kodacolor™, Vericolor™, and C-41 compatible films. The following is a brief description of each processing step.

- Use speed 75 with 1500 or 2500 series tanks.
- Use speed 50 with 3000 series tanks.
- Set temperature to 38.0°C.

Process: C-41	No.	
temp.	38°C	Kodak
prewarm	5:00	
pre-rinse	—	Color Dev
chemistry 1	—	
rinse	—	
chemistry 2	—	Stop
rinse	—	
chemistry 3	3:15	Bleach
rinse	—	
chemistry 4	1:00	Fix
rinse	—	
chemistry 5	6:30	
rinse	3:00	
chemistry 6	6:30	
rinse	3:00	
end		

Pre-warm, 5:00 minutes

Color Developer, bottle position 3, 3:15 minutes

Contrast, color and density are determined by the color developer.

Stop Bath, bottle position 4, 1:00 minute

Recommended optional step to minimize the possibility of density shifts and staining.
[See note #1 at end of section.]

Bleach Bath, bottle position 5, 6:30 minutes

The bleach bath converts metallic silver to silver halide which can be removed by the fixer. If the bleach is not properly aerated some silver may remain in the film and the cyan layer dyes will not properly couple. (This is called "leuco-cyan failure"). If this happens, the negatives will appear excessively red and prints made from them will have red shadows and cyan colored highlights. Film with the leuco-cyan problem may be corrected by re-bleaching in a good bleach bath.

Intermediate Rinse, 3:00 minutes

Fixing Bath, bottle position 6, 6:30 minutes

Silver halides are removed by the fixer, leaving only dyes in the emulsion. Insufficient fixing will leave silver in the emulsion, increasing the density and decreasing the color saturation and storage life of the film.

Final Rinse, 3:00 minutes

All remaining chemicals are removed in the final rinse. Use at least the recommended time for this step.

Stabilizer Bath, (time not critical) 1:30 minutes

Stabilizer incorporates a wetting agent and dye preservatives with hardening properties. Always use stabilizer outside of the processor. Avoid contact with tank or reels.

Note #1: Use a black and white stop bath, such as Kodak Indicator Stop Bath, Photocolor Indicol, or mix from acetic acid to make a 2% solution.

Disc film process C-41 A

Normal C-41 processing steps and times are unchanged for disc film development. Always use the "DISC" setting for speed on the processor. JOBO makes special tanks for disc film (1517 for up to 17 discs and 1544 for up to 44 discs).

9.7 Color negative film process: Photocolor II

The Photocolor II process is used to develop Kodacolor™, Vericolor™, and C-41 compatible films. The following is a brief description of each processing step.

- Use speed 75 with 1500 or 2500 series tanks.
- Use speed 50 with 3000 series tanks.
- Set temperature to 38.0°C.

Pre-warm, 5:00 minutes

Color Developer, bottle position 3, 3:15 minutes

Contrast, color and density are determined by the color development.

Stop Bath, bottle position 4, 1:00 minute

Recommended optional step to minimize the possibility of density shifts and staining.

Process: C-41	No.	Photocolor II
temp.	38°C	
prewarm	5:00	
pre-rinse	—	
chemistry 1	—	
rinse	—	
chemistry 2	—	
rinse	—	
chemistry 3	3:15	Color Dev
rinse	—	
chemistry 4	1:00	Stop
rinse	—	
chemistry 5	10:00	Blich-fix
rinse	5:00	
chemistry 6	—	
rinse	—	
end		

Bleach/Fix Bath, bottle position 5, 10:00 minutes

The bleach converts metallic silver to silver halide which is removed by the fixer, leaving only dyes in the emulsion. Insufficient fixing will leave silver in the emulsion, increasing the density and decreasing the color saturation and life of the film. If the bleach/fix is not properly aerated, some silver may remain in the film and the cyan layer dyes will not properly couple (this is called "leuco-cyan failure"). If this happens, the negatives will appear excessively red. Prints made from them will have red shadows and cyan colored highlights. Film with the leuco-cyan problem may be corrected by re-bleach/fixing in a good bleach/fix bath and completing the remaining process steps again.

Final Rinse, 5:00 minutes

All remaining chemicals are removed in the final rinse. Maintain at least a five minute time for this step.

Stabilizer Bath or Wetting Agent (this is an optional step and the time is not critical) 1:00 minute

Stabilizer helps to preserve the color dyes from fungus or mold and contains a wetting agent to promote spot-free drying. This bath should be replaced periodically to prevent scum from forming. Always use stabilizer outside of the processor and avoid contact with tank or reels. (Stabilizer is not supplied with Photocolor II and must be purchased separately.)

9.8 Black and white film process: Kodak or Monocolor™

Black and white film development. In general, developer times shorter than five minutes should be avoided to maintain uniformity. A five minute pre-rinse is recommended. Test the chosen developer/film combination to find the correct developer time. As a general guide for determining the correct developer time, use the manufacturer's recommended intermittent agitation time to start your tests. The following is a brief description of each processing step.

- Use speed 75 with 1500 or 2500 series tanks.
- Use speed 50 with 3000 series tanks.
- Set temperature to 20.0°C (or recommended temperature).

Process: B/W	No.	B/W Film
temp.	20°C	
prewarm	—	
pre-rinse	5:00	
chemistry 1	vary	Developer
rinse	—	
chemistry 2	1:00	Stop
rinse	—	
chemistry 3	—	
rinse	—	
chemistry 4	—	
rinse	—	
chemistry 5	—	
rinse	—	
chemistry 6	vary	Fixer
rinse	5:00	
end		

Pre-rinse, 5:00 minutes

Lack of a sufficient pre-rinse will cause excessive contrast and may cause possible unevenness of development.

Black and White Developer, bottle position 1, [time depends on developer and film](if using a diluted developer i.e., D-76 1:1, be sure to have additional quantity of chemistry selected).

Stop Bath, bottle position 2, 1:00 minute

The use of stop bath promotes consistent overall and batch-to-batch density.

Fixer, bottle position 6, [time depends on fixer and film] (use the manufacturers' recommended time)

Excessive fixing will bleach the metallic silver on the film, producing lower density and contrast. Insufficient fixing will allow retention of silver salts resulting in milkiness in the non-image areas and a shortened storage life of the film.

Final Rinse, 5:00 minutes

Insufficient rinsing will not remove all of the fixer. This will eventually cause image staining or fading.

Wetting Agent, 1:00 minute (optional, outside of tank, not on reels)

Use a wetting agent such as Kodak's Photoflo or Photo Technology's Monocolor Wetting Agent 326 to avoid water spots while drying.

Note: Wetting agent should always be used outside of the processor to avoid contaminating tanks and reels. Use a separate container for the wetting agent. Remove the film from the reel before immersing. Wetting agent is very difficult to remove entirely from reels and tanks. If it is carried over into the next process, the development will be affected.

9.9 Color print from slide process: Kodak R-3000, Agfa AP63, Tetenal UK-3

These chemical processes are used to process prints on Ektachrome™ 22 paper (or equivalent) from color slides. The following is a brief description of each processing step.

- Use speed 75 with 1500 and 2800 series drums.
- Use speed 50 with 3000 series drums.
- Set temperature to 38.0°C.

Process: R-3000	No.	
temp.	38°C	Kodak
prewarm	—	
pre-rinse	1:00	
chemistry 1	1:30	1st Dev
rinse	2:00	
chemistry 2	—	
rinse	—	
chemistry 3	2:15	Color Dev
rinse	1:00	
chemistry 4	—	
rinse	—	
chemistry 5	2:30	Blich-fix
rinse	2:30	
chemistry 6	—	
rinse	—	
end		

Pre-rinse, 1:00 minutes

First Developer, bottle position 1, 1:30 minutes

The exposed silver salts are converted to metallic silver. Errors in time, temperature, and dilution will adversely affect density, contrast, and fog level.

Rinse, 2:00 minutes

The first rinse stops the developing action of the first developer. It also prevents carryover of developer into the color developer. Too short a rinse can cause the density and color balance to change (usually a green shift and low maximum density).

Color Developer, bottle position 3, 2:15 minutes

The color developer contains a fogging agent that chemically "exposes" the paper so that no additional chemical step or light re-exposure is necessary. The remaining silver salts are converted to metallic silver. At the same time the color couplers in the paper are converted into the image. Improper color development will adversely affect the color balance, contrast, maximum density, fog level, and evenness of development.

Rinse, 1:00 minute

Too short a rinse will weaken the bleach/fix.

Bleach/Fix Bath, bottle position 5, 2:30 minutes

Metallic silver is converted to silver halide by the bleach/fix and removed from the print. This leaves only the color dyes. Improper bleach/fixing leaves silver residue, yielding low maximum density in red, yellow fog, and high maximum density for blue. Silver left in the print can cause excessive blue density in the highlights, yellow veiling, and spots.

Final Rinse, 2:30 minutes

The rinse removes all remaining chemicals from the print. To be effective it needs to be at least two minutes long.

9.10 Color print from slide process: Photocolor Chrome R

Photocolor Chrome R is used to process prints on Ektachrome 22 paper (or equivalent) from color slides. The following is a brief description of each processing step.

- Use speed 75 with 1500 and 2800 series drums.
- Use speed 50 with 3000 series drums.
- Set temperature to 34.0°C.

Process: (R-3000)	No.	
temp.	34°C	Chrome R
prewarm	—	
pre-rinse	1:00	
chemistry 1	1:50	1st Dev
rinse	2:00	
chemistry 2	—	
rinse	—	
chemistry 3	3:15	Color Dev
rinse	1:00	
chemistry 4	—	
rinse	—	
chemistry 5	2:30	Blch-fix
rinse	2:30	
chemistry 6	—	
rinse	—	
end		

Pre-rinse, 1:00 minute

First Developer, bottle position 1, 1:50 minutes

The exposed silver salts are converted to metallic silver. Errors in time, temperature, and dilution will adversely affect density, contrast, and fog level.

Rinse, 2:00 minutes

The first rinse stops the developing action of the first developer. It also prevents carryover of developer into the color developer. Too short a rinse can cause the density and color balance to change (usually a green shift and low maximum density).

Color Developer, bottle position 3, 3:15 minutes

The color developer contains a fogging agent that chemically "re-exposes" the paper so that no additional chemical step or light re-exposure is necessary. The remaining silver salts are converted to metallic silver. At the same time the color couplers in the paper are converted into the image. Improper color development will adversely affect the color balance, contrast, maximum density, fog level, and evenness of development.

Rinse, 1:00 minute

Too short a rinse will weaken the bleach/fix.

Bleach/Fix Bath, bottle position 5, 2:30 minutes

Metallic silver is converted to silver halide by the bleach/fix and removed from the print. This leaves only the color dyes. Improper bleach/fixing leaves silver residue, producing low maximum density in red, yellow fog, and high maximum density for blue. Silver left in the print can cause excessive blue density in the highlights, yellow veiling, and spots.

Final Rinse, 2:30 minutes

This rinse removes all remaining chemicals in the print. To be effective it needs to be at least two minutes long.

R-3000, Chrome R Processing Problems

If maximum density blacks are blue:

The first developer was either used for too short a time, was too cold, or was exhausted.

If maximum density blacks are blue and colors look gray

The color developer was contaminated with the first developer. Increase the rinse time between developers.

If the print is too blue and too dark, with low contrast

The first developer time was too short, or the rinse between developers was too short.

9.11 Color print from slide process: Ilford Cibachrome P-30

Cibachrome Process P-30 uses an azo dye-destructive process to produce prints from color transparencies, on Cibachrome A II paper.

- Use speed "Quick Start" for all drums (see note 1 below).
- Set temperature to 24.0°C.

Note: Cibachrome P-3 Process may also be used. All times and temperatures and rotation speeds are the same for both processes. When using P-3, extend the final rinse step to 4:30 minutes.

Process: P-30	No.
temp.	24°C
prewarm	—
pre-rinse	1:00
chemistry 1	3:00
rinse	0:30
chemistry 2	—
rinse	—
chemistry 3	—
rinse	—
chemistry 4	—
rinse	—
chemistry 5	3:00
rinse	0:30
chemistry 6	3:00
rinse	3:00
end	

Cibachrome

Developer

Bleach

Fixer

Pre-rinse, 1:00 minute

Uneven development may result if pre-warm is substituted.

First Developer, bottle 1, 3:00 minutes

The first developer is a black and white developer which contains special additives that permit the formation of a positive silver mask.

Intermediate Rinse, 0:30 minute

Bleach Bath, bottle 5, 3:00 minutes

In the bleach bath the unwanted color dyes are removed and the silver is bleached.

Intermediate Rinse, 0:30 minute

Residual bleach is removed.

Fixing Bath, bottle 6, 3:00 minutes

The fixer removes the silver from the print.

Final Rinse, 3:00 minutes

Removes all remaining chemicals from the print.

WARNING! The bleach is a strong acid, handle it carefully!

WARNING! This process can release noxious fumes and should only be done in a well-ventilated area!

Note 1: Insufficient amounts of chemistry will produce streaks. Use at least the manufacturer's recommended quantity of chemistry (75ml per 8 x 10 print). This quantity will probably be larger than the minimum amount specified on the Jobo Drum.

Note 2: Extending the time of the rinse between developer and the bleach steps beyond 30 seconds can cause brown spots on the front and back of the print. Too small a quantity or a short bleach time will produce dark stripes.

9.12 Color Print from Negative Process: Kodak EP-2, Agfa AP92, Tetenal EP-2

EP-2 processes Ektacolor Professional™ and Ektacolor Plus™ papers and their equivalent for prints made from color negatives. The following is a brief description of each processing step. Times or temperatures for the steps may be different from those of other chemical manufacturers.

- Use speed 75 with 1500 and 2800 series drums.
- Use speed 50 with 3000 series drums.
- Set temperature to 38.0°C.

Process: EP-2	No.
temp.	38°C
prewarm	—
pre-rinse	1:00
chemistry 1	—
rinse	—
chemistry 2	—
rinse	—
chemistry 3	2:30
rinse	—
chemistry 4	0:30
rinse	—
chemistry 5	1:30
rinse	2:00
chemistry 6	—
rinse	—
end	

Kodak

Color Dev

Stop

Blich-fix

Pre-rinse, 1:00 minute

This rinse tempers the paper, removes masking dye layers, and promotes even development.

Color Developer, bottle 3, 2:30 minutes

Contrast, color and density are determined by the color development.

Stop Bath, bottle 4, 0:30 minute

Recommended optional step to minimize the possibility of density shifts and staining.

Bleach/Fix Bath, bottle 5, 1:30 minutes

The bleach portion converts metallic silver to silver halides which are removed by the fixer, leaving only dyes in the emulsion. Insufficient bleach/fixing will leave silver in the emulsion, increasing the density, causing yellow highlight stains, and shortening the life of the print. If the bleach/fix is not properly aerated (this may be done while mixing), some silver may remain in the print and the cyan layer dyes do not properly couple ("leuco-cyan dye failure"). If this happens, the prints made will have red shadows and cyan colored highlights.

Rinse, 2:00 minutes

All remaining chemicals are removed in the final rinse.

9.13 Color print from negative process: Kodak RA-4 or Equivalent

RA-4 processes Ektacolor Portra™ and Ektacolor Supra™ and Ektacolor Ultra™ and their equivalent for prints made from color negatives. The following is a brief description of each processing step. Times or temperatures for the steps may be different from those of other chemical manufacturers.

- Use speed 75 with 1500 and 2800 series drums.
- Use speed 50 with 3000 series drums.
- Set temperature to 35.0°C.

Process: RA-4	No.
temp.	35°C
prewarm	—
pre-rinse	0:30
chemistry 1	—
rinse	—
chemistry 2	—
rinse	—
chemistry 3	1:00
rinse	—
chemistry 4	0:30
rinse	0:30
chemistry 5	1:00
rinse	1:30
chemistry 6	—
rinse	—
end	

Kodak

Color Dev

Stop

Bich-fix

Pre-rinse, 0:30 minute

This rinse tempers the paper, removes masking dye layers, and promotes even development.

Color Developer, bottle 3, 1:00 minute

Contrast, color and density are determined by the color development.

Stop Bath, bottle 2, 0:30 minute

Stops the action of Color Developer. Needed to minimize the possibility of density shifts and staining.

Rinse, 0:30 minute

Prevents carry forward of Color Developer to Bleach/Fix bath

Bleach/Fix Bath, bottle 5, 1:00 minute

The bleach portion converts metallic silver to silver halides which are removed by the fixer portion, leaving only dyes in the emulsion. Insufficient bleach/fixing will leave silver in the emulsion, increasing the density, causing yellow highlight stains, and shortening the life of the print. If the bleach/fix is not properly aerated (this may be done while mixing), some silver may remain in the print and the cyan layer dyes do not properly couple ("leuco-cyan dye failure"). If this happens, the prints made will have red shadows and cyan colored highlights.

Rinse, 1:30 minutes

All remaining chemicals are removed in the final rinse.

Solution Quantities for RA-4 Processing

Kodak suggest that a minimum of 110ml/sq. ft. be used. This translates to 61ml/8X10 print. Since this is a greater quantity than the minimum which JOBO specifies on the print drums, the Kodak quantity should be used. Revised quantities for JOBO print drums on the ATL-2 Plus are as follows:

Drum # 1526	60 ml	Drum # 2840	140 ml
Drum # 2830	140 ml	Drum # 2850	240 ml
Drum # 3063	400 ml		

9.14 Color Print from Negative Process: Photocolor II

Photocolor II (when mixed with the print additive) processes Ektacolor Professional™ and Ektacolor Plus™ papers and their equivalent for prints made from color negatives. The following is a brief description of each processing step. Times for the steps, or temperatures may be different from other chemical manufacturers.

- Use speed 75 with 2800 series drums.
- Use speed 50 with 1500 and 3000 series drums.
- Set temperature to 38.0°C.

Process: EP-2	No.
temp.	38°C
prewarm	—
pre-rinse	1:00
chemistry 1	
rinse	—
chemistry 2	—
rinse	—
chemistry 3	1:55
rinse	—
chemistry 4	0:30
rinse	—
chemistry 5	1:30
rinse	2:00
chemistry 6	—
rinse	—
end	

Photocolor II

Color Dev

Stop

Blich-fix

Pre-rinse, 1:00 minute

This rinse tempers the paper, removes masking dye layers, and promotes even development.

Color Developer, bottle 3, 1:55 minutes

Contrast, color, and density are determined by the color development.

Stop Bath, bottle 4, 0:30 minute

Recommended optional step to minimize the possibility of density shifts and staining.

Bleach/Fix Bath, bottle 5, 1:30 minute

The bleach portion converts metallic silver to silver halide which are removed by the fixer portion, leaving only dyes in the emulsion. Insufficient bleach/fixing will leave silver in the emulsion, increasing the density, causing yellow highlight stains, and shortening the life of the print. If the bleach/fix is not properly aerated (this may be done while mixing), some silver may remain in the print and the cyan layer dyes do not properly couple ("leuco-cyan dye failure"). If this happens, the prints made will have red shadows and cyan colored highlights.

Rinse, 2:00 minutes

All remaining chemicals are removed in the final rinse.

9.15 Color print from negative process: Photocolor Printmaster

Photocolor Printmaster rapidly processes Ektacolor ProfessionalTM and Ektacolor PlusTM papers and their equivalent for prints made from color negatives. The following is a brief description of each processing step. Times or temperatures for the steps may be different from those of other chemical manufacturers.

- Use speed 75 with 1500, and 2800 series drums.
- Use speed 50 with 3000 series drums.
- Set temperature to 38.0°C.

Process: EP-2	No.
temp.	38°C
prewarm	—
pre-rinse	0:30
chemistry 1	—
rinse	—
chemistry 2	—
rinse	—
chemistry 3	1:00
rinse	—
chemistry 4	0:30
rinse	—
chemistry 5	1:30
rinse	1:30
chemistry 6	—
rinse	—
end	

Printmaster

Color Dev

Stop

Bleach-fix

Pre-rinse, 0:30 minute

This rinse tempers the paper, removes masking dye layers, and promotes even development.

Color Developer, bottle 3, 1:00 minute

Contrast, color and density are determined by the color development.

Stop Bath, bottle 4, 0:30 minute

Recommended optional step to minimize the possibility of density shifts and staining.

Bleach/Fix Bath, bottle 5, 1:30 minute

The bleach portion converts metallic silver to silver halide which are removed by the fixer portion, leaving only dyes in the emulsion. Insufficient bleach/fixing will leave silver in the emulsion, increasing the density, causing yellow highlight stains, and shortening the life of the print. If the bleach/fix is not properly aerated (this may be done while mixing), some silver may remain in the print and the cyan layer dyes do not properly couple ("leuco-cyan dye failure"). If this happens, the prints made will have red shadows and cyan colored highlights.

Rinse, 1.30 minutes

All remaining chemicals are removed in the final rinse.

EP-2, Photocolor II and Printmaster process problems

The possible causes for blue shadows are: The developer is old, the development time is too short, the process temperature is too low, or the developer is exhausted.

If the prints show low contrast or color shifts (usually cyan), the developer is contaminated by bleach/fix.

If there are muddy yellow areas in the print, silver is being retained in the print.

Note: The color balance of a print should be evaluated only after the print is dry. The colors will change while wet and during drying.

WARNING! For Kodak EP-2 and other manufacturers' compatible products, be very careful to thoroughly mix part A of the developer in the water. Part A contains benzyl alcohol and is very difficult to dissolve. Unless the alcohol is totally dissolved, the developer will precipitate a tar-like substance. This tar will stick to containers and drums. It is difficult to notice and to remove. Spots and streaks on the prints may result. Contamination of the other chemicals is likely.

9.16 Black and white print process: Kodak or Monocolor

Black and white (resin or polyethylene coated) print development is possible in the ATL-2 Plus. The following is a brief description of each processing step. Use the chemical manufacturer's recommended temperature and times for each step. For fiber-based prints see notes below.

- Use speed 75 with 1500, and 2800 series drums.
- Use speed 50 with 3000 series drums.
- Set temperature to 20°C or recommended temperature.

Process:	No.
temp.	20°C
prewarm	—
pre-rinse	1:00
chemistry 1	vary
rinse	—
chemistry 2	1:00
rinse	—
chemistry 3	—
rinse	—
chemistry 4	—
rinse	—
chemistry 5	—
rinse	—
chemistry 6	vary
rinse	2:00
end	

B/W Paper

Developer

Stop

Fix

Pre-rinse, 1:00 minute

Insufficient pre-rinse may cause unevenness of development.

Black and White Developer, bottle 1, time depends on developer and paper.

The developer changes the exposed silver salts to metallic silver.

Stop Bath, bottle 2, 1:00 minute

The use of stop bath promotes consistent overall and batch-to-batch density.

Fixer, bottle 6, time depends on fixer and paper (use the manufacturer's recommended time)

Excessive fixing will bleach the metallic silver, producing lower density and contrast. Insufficient fixing allows retention of silver salts eventually resulting in staining and a shortened storage life.

Final Rinse, 2:00 minutes

Insufficient rinsing will not remove all of the fixer. This will eventually cause image staining or fading.

Note: The final wash time will be significantly longer for fiber-based prints. Use the manufacturer's recommended time. You may use a two minute rinse, and then remove the paper from the drum to continue the wash and/or other optional post-fixers steps (toning, hypo-clearing, print-flattening, or glazing aids) elsewhere.

Note: Toning of both fiber based or resin coated papers may be done in the Autolab. Just add the steps and times to the program. If the last step done on the processor is not a rinse, use a "cleaning" program to rinse the system before another run. (See Section 10.2)

9.17 Pre-Programmed Channels

The following processing steps are installed in your ATL-2 PLUS at the factory. You can easily modify them to meet your individual requirements. (See programming instructions Chapter 5).

Process: E-4	No. 1
temp.	38°C
prewarm	5:00
pre-rinse	--
chemistry 1	5:30
rinse	2:30
chemistry 2	2:00
rinse	--
chemistry 3	4:00
rinse	--
chemistry 4	2:00
rinse	--
chemistry 5	8:00
rinse	--
chemistry 6	3:00
rinse	5:00
end	

Kodak

1st Dev

Reversal

Color Dev

Condit.

Bleach

Fix

Process: E-6	No. 2
temp.	38°C
prewarm	5:00
pre-rinse	--
chemistry 1	5:30
rinse	2:00
chemistry 2	--
rinse	--
chemistry 3	4:00
rinse	1:00
chemistry 4	--
rinse	--
chemistry 5	10:00
rinse	5:00
chemistry 6	--
rinse	--
end	

Chrome-Six

1st Dev

Color Dev

Bich-Fix

Process: C-41	No. 3
temp.	38°C
prewarm	5:00
pre-rinse	--
chemistry 1	--
rinse	--
chemistry 2	--
rinse	--
chemistry 3	2:15
rinse	--
chemistry 4	1:00
rinse	--
chemistry 5	8:30
rinse	2:00
chemistry 6	8:30
rinse	2:00
end	

Kodak

Color Dev

Stop

Bleach

Fix

Process: C-41	No. 4
temp.	38°C
prewarm	5:00
pre-rinse	--
chemistry 1	--
rinse	--
chemistry 2	--
rinse	--
chemistry 3	2:15
rinse	--
chemistry 4	1:00
rinse	--
chemistry 5	10:00
rinse	2:00
chemistry 6	--
rinse	--
end	

Photocolor II

Color Dev

Stop

Bich-fix

Process: R-3000	No. 5
temp.	38°C
prewarm	--
pre-rinse	1:00
chemistry 1	1:30
rinse	2:00
chemistry 2	--
rinse	--
chemistry 3	2:15
rinse	1:00
chemistry 4	--
rinse	--
chemistry 5	2:30
rinse	2:30
chemistry 6	--
rinse	--
end	

Kodak

1st Dev

Color Dev

Bich-fix

Process: (R-3000)	No. 6
temp.	38°C
prewarm	--
pre-rinse	1:00
chemistry 1	1:10
rinse	2:00
chemistry 2	--
rinse	--
chemistry 3	2:15
rinse	1:00
chemistry 4	--
rinse	--
chemistry 5	2:30
rinse	2:00
chemistry 6	--
rinse	--
end	

Chrome R

1st Dev

Color Dev

Bich-fix

Process: P-30	No. 7
temp.	34°C
prewarm	--
pre-rinse	1:00
chemistry 1	3:00
rinse	0:30
chemistry 2	--
rinse	--
chemistry 3	--
rinse	--
chemistry 4	--
rinse	--
chemistry 5	3:00
rinse	0:30
chemistry 6	3:00
rinse	3:00
end	

Cibachrome

Developer

Bleach

Fixer

Process: EP-2	No. 8
temp.	38°C
prewarm	--
pre-rinse	1:00
chemistry 1	--
rinse	--
chemistry 2	--
rinse	--
chemistry 3	2:30
rinse	--
chemistry 4	0:30
rinse	--
chemistry 5	1:30
rinse	2:00
chemistry 6	--
rinse	--
end	

Kodak

Color Dev

Stop

Bich-fix

Rotational Speeds

System	1500	75 rpm
System	2500/2800	75 rpm
System	3000	50 rpm

Process: RA-4	No. 9
temp.	35°C
prewarm	--
pre-rinse	0:30
chemistry 1	--
rinse	--
chemistry 2	--
rinse	--
chemistry 3	1:00
rinse	--
chemistry 4	0:30
rinse	0:30
chemistry 5	1:00
rinse	1:30
chemistry 6	--
rinse	--
end	

Kodak

Color Dev

Stop

Bich-fix

Process: EP-2	No. 10
temp.	38°C
prewarm	--
pre-rinse	0:30
chemistry 1	--
rinse	--
chemistry 2	--
rinse	--
chemistry 3	1:00
rinse	--
chemistry 4	0:30
rinse	--
chemistry 5	1:30
rinse	1:30
chemistry 6	--
rinse	--
end	

Printmaster

Color Dev

Stop

Bich-fix

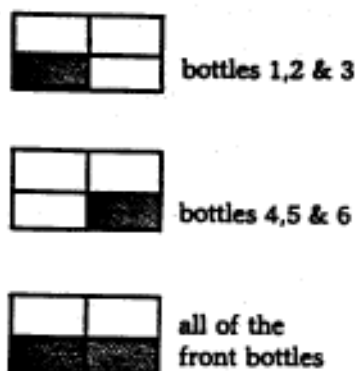
Cleaning & Maintenance 10

10.1 Cleaning Between Processes

The ATL automatically does a thorough rinse of the internal chemical delivery system at the end of every process. Cleaning of the chemical delivery hoses is only necessary if you intend to use different chemicals in the same bottles or store the unit for an extended period. In that case, refer to section 10.2 for instructions on properly cleaning the bottles and chemical delivery lines.

10.2 Cleaning Programs

Cleaning the tempering bottles and chemical delivery hoses is only necessary if you intend to use a set of chemicals in bottles or bottle positions which previously had different chemicals. In order to simplify this task, three programs are available for cleaning the tempering bottles and chemical delivery lines. These programs are selected from the Program Selector Dial (21) An illustration of each setting and the bottles it empties appears below:



To use a cleaning program attach a 2553, 2563, 2830, or 2840 tank/drum to the processor, then turn the program selector dial (21) to the cleaning program you wish. The program is designed to pump long enough at each bottle to empty it even if it is full. It is not necessary to set the fill quantity amount with the Fill Quantity Dial (22). Be sure the SET/RUN switch (20) is in the "Run" position and start the program. After emptying the bottles of remaining chemistry with the first run, fill the bottles with water and run the program again to wash residue from the bottles and hoses. repeat this sequence three times for complete cleaning.

10.3 Long Term Storage

If you don't plan to use it for over a month, drain the trough completely, run a complete cleaning program (see Section 10.2) and empty all chemistry bottles.

10.4 Cold Weather Storage

If the ATL-2 Plus is to be stored where it would be subject to freezing, the following precautions should be taken:

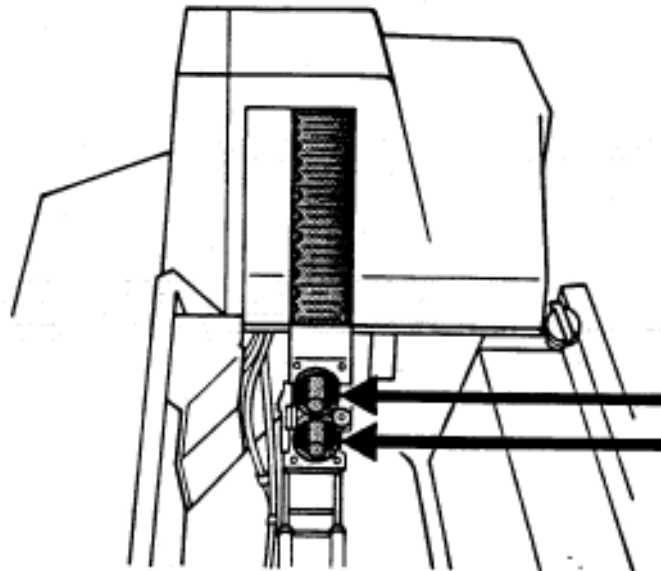
1. Drain water tempering bath by opening drain valve.
2. Turn off water supply, remove and drain water inlet hoses.
3. Remove and drain all drain hoses.
4. Drain all rinse hoses and empty the tempering coil.

10.5 Lubrication

The gears passing through the Lift Arm must be lubricated occasionally. A processor used daily should be lubricated approximately every 3 months. Lubrication of the Lift Arm is done with the lubrication tool #95465. Follow the directions supplied with the lubrication tool.

If a squeak develops, a small amount of vaseline may be placed on the attachment point for tanks and drums where the red seal on the lid makes contact.

No other routine lubrication or adjustments are required to maintain this product. This does not mean the product will never need attention. In the event something does need attention please contact an authorized JOBO Servicing Dealer.



10.6 Finish

All exterior surfaces of the ATL-2 Plus processor are made of plastic. Periodic cleaning is recommended with a damp cloth and mild detergent solution. Do not use caustic or solvent cleaners.

10.7 Algae Control

Do not add bleach or chlorine base chemicals to the recirculating water bath to prevent algae build-up. Chlorine will cause the recirculating pump and heating element to deteriorate and eventually fail. The best method for preventing algae build-up is frequent changing of the tempering bath water.

10.8 Removal of Hoses

It sometimes becomes necessary to remove the tempering bottles from the water bath for cleaning. To make detaching the hoses from the bottles simpler, use the tool provided in the accessories bag. Push the delivery hose from the gray rise tube as shown in the illustration.



10.9 Comments on Filling Quantities

The ATL-2 Plus is designed to operate correctly even though filling quantities can vary from - 5 to + 10%. There is no need to be concerned; this factor has been taken into consideration and your developing will not be adversely affected.

10.10 Dip Switch Adjustment

All AutoLab processors come with the dip switches set to the sequence necessary for normal operation. However, two changes may be made via the dip switches to alter its operation:

1. The method of calculating the quantity of chemistry available can be changed so that the set of six 1.0 liter bottles have one running total. Making this alteration is explained in section 7.7.
2. The chemical/water sensing feature can be disengaged. (See Section 10.11 for details.)

10.11 Disengaging the Chemical/Water Sensing Feature

The AutoLab is equipped with a liquid sensing system which monitors whether or not the desired water or chemical amount you have requested is actually going into the processing tank. With dip switch #3 the activation of the function can be controlled.

To disengage the chemical/water sensor, unplug the ATL-2 Plus, remove the two Phillips screws and access the dip switches behind the panel. Pushing switch #3 up will turn the sensors off. A diagram of the dip switches and front panel removal appears in section 7.7.

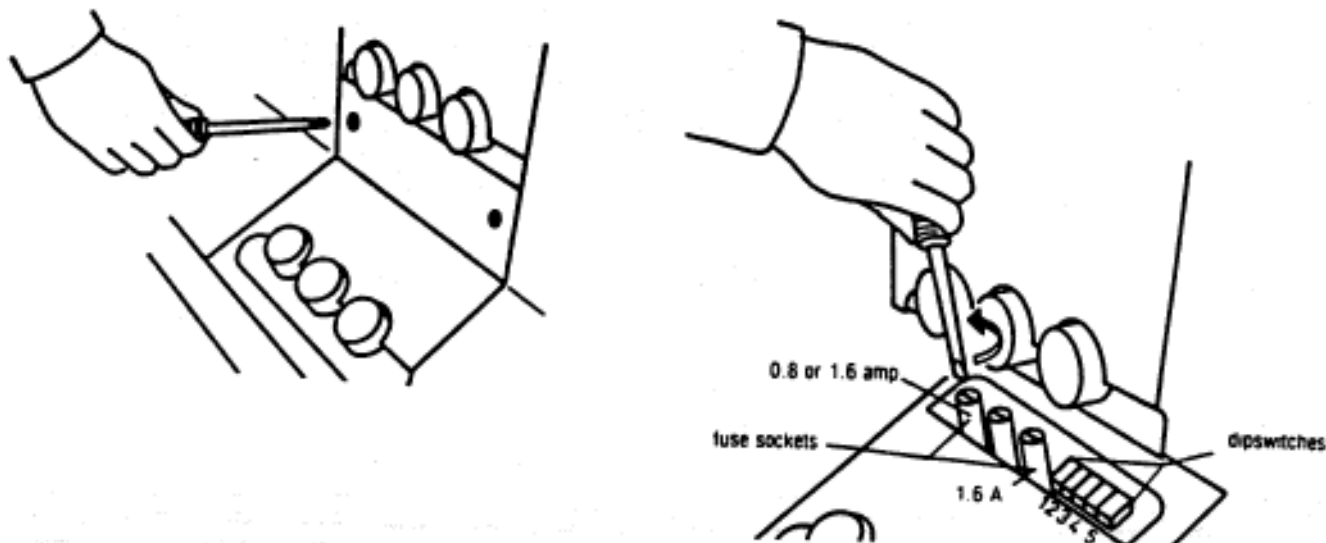
Note: With the Chemical/Water Sensing Feature disabled the ATL-2 Plus will not sound an audible alarm if the chemistry amount pumped is insufficient.

11.1 Fuse Replacement

The AutoLab ATL-2 Plus has two fuses, one fuse protects the entire unit and the other protects all 5 volt devices.

WARNING! Always unplug the unit before replacing fuses.

To replace either fuse, first remove the two Phillips screws securing the panel. You can now access the fuse sockets. Fuse #1 is .8 amp for 220 volt units and 1.6 amp for 110 volt units. Fuse #2 is not used and fuse #3 is 1.6 amps in all units. Fuse #1 protects the entire unit while Fuse #3 is a sub-protection for the 5 volt supply (microprocessor and display).



11.2 JOBO Hot Line

Please refer any other servicing needs to your authorized JOBO AutoLab dealer or call JOBO Fototechnic at 1-800-525-2821, identify yourself as an ATL-2 Plus owner, and ask for the Service Department.

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