

INSTALLATION
AND
SERVICE MANUAL
AX300 SERIES PROCESSOR
(300SE, 390SE, MAMMO 300)

MANUFACTURED BY:

ALPHATEK CORPORATION

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**AX300 SERIES FILM PROCESSOR
ALPHATEK CORPORATION
INSTALLATION AND SERVICE MANUAL**

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**Alphatek Corporation
2000 S. 25th Avenue
Broadview, IL 60153**

WARRANTY

The Alphatek AX300 Series Film Processor is warranted for a period of one year from the date of installation, for all parts, against defects in material and/or workmanship. Should any such defect appear during the warranty period, notify your Alphatek dealer.

This warranty does not cover damage caused by accident, misuse or neglect.

This warranty is in lieu of, and supersedes all other representations, expressed or implied, by the manufacturer or any representatives.

This warranty is provided for the original purchaser and is not transferable.

This warranty is void if any service or re-installation has been done by any person or persons who are not authorized Alphatek dealers.

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SECTION ONE

INTRODUCTION

The AX300SE and AX390SE are general purpose x-ray film processors, whereas the Mammo 300 is a dedicated mammographic processor. These processors are designed for simplicity of operation over a wide variety of circumstances. There is an "Automatic Standby System" which reduces electrical usage and water consumption. Because of the standby system there is an appreciable reduction of the wear on the processor's component parts. Film transport is accomplished by solid acrylic rollers precisely engineered to provide accurate processing times and an elimination of slippage or excess pressure during transport. Automatic metered replenishment assures consistent high film quality even when used to full capacity. All parts of the processor are manufactured with corrosion resistant material.

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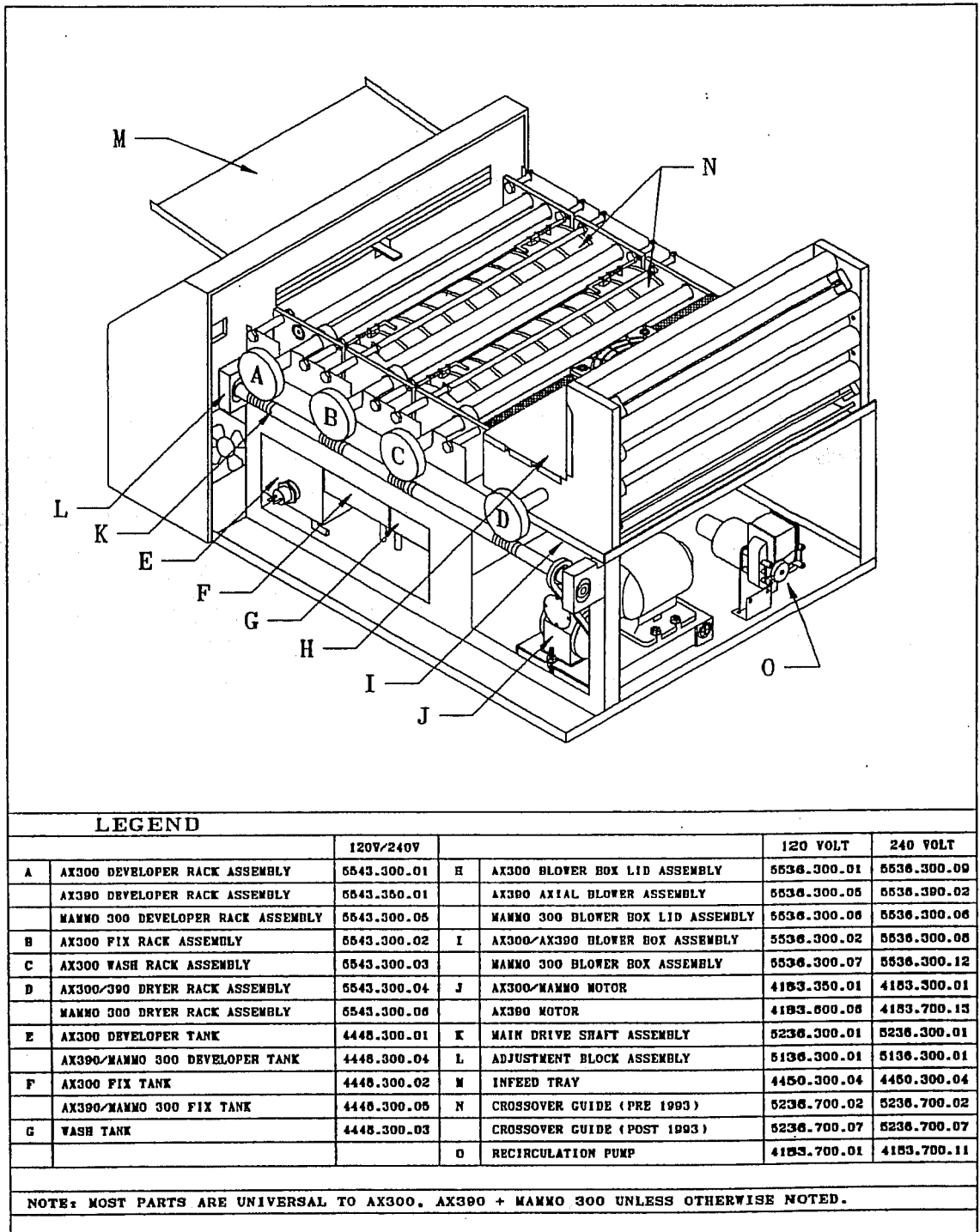


FIGURE 1-1
MAJOR COMPONENTS

SECTION TWO

SITE SPECIFICATIONS AND PREPARATION

NOTE: ALL INSTALLATIONS MUST COMPLY WITH ALL NATIONAL, STATE AND LOCAL BUILDING CODES FOR BOTH ELECTRIC AND PLUMBING. INSTALLATIONS MUST COMPLY WITH E.P.A. AND METROPOLITAN SANITARY DISTRICT REGULATIONS.

2.1 ELECTRIC

- 120 Volts, 15 Amp., 50/60 Hertz
- 240 Volts, 10 Amp., 50/60 Hertz, optional
- 3 prong grounded outlet required
- Power cord length is approximately 90 inches (2.3 M)

2.2 Darkroom Environment

- Room temperature should be maintained between 60°F-80°F (15°-27°C)
- Relative Humidity should be maintained between 40%-75%.
- Heat load from the processor is 5000 BTU's/hr.(maximum)
- Room must have an exhaust fan capable of 10 air changes per hour.

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2.3 PLUMBING

- 2.3.1** Water temperature from the incoming cold water supply should be maintained between 40°-95°F (4°-35°C).
- 2.3.2** Water pressure should be between 40-80PSI.
- 2.3.3** Water filtration may be required depending on local water conditions.
- 2.3.4** A sink with a hot and cold water source close to the processor or darkroom is suggested. The sink should be large enough to accommodate a transport rack.
- 2.3.5** Processor is supplied with a 6' (1.8M) Water Inlet Hose. The hose has a ¾ inch garden hose fitting at each end. Hose washers (supplied) must be installed to prevent leaks. The cold water supply should be provided through a valve in the darkroom. Valve should be located within 4 feet (1.2m) of the "Feed" side of the processor.
- 2.3.6** A floor drain capable of accepting 2 gallons per minute (7.6L/minute) is required. The drain must be vented and must not be higher than 12 inches (30cm) from the floor.
- 2.3.7** Processor is supplied with 4 vinyl drain tubes, 6'(1.8M), long. The tubes are ¾ inch O.D (1.9cm) and attach to the drain lines located inside the electrical section of the processor.
- 2.3.8** Drain lines should be installed with a gradual slope to the floor drain, ensuring there are no kinks or bends. This will provide for efficient drainage and avoid air locks.

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2.4 PROCESSOR DIMENSIONS:

- Length :30.5 Inches (77cm)
:33.5 Inches (85cm) (including feed tray)
- Height :18 Inches (46cm)
- Width :22 Inches (56cm)
- Base Height :26³/₄" to 27¹/₄" (68cm to 69cm)
- Weight :150 LBS. (68kg)
- With Solutions :182 LBS. (83kg)

2.5 ACCESS RECOMMENDATIONS

The processor should be installed in a location where proper servicing is achievable. Listed below are recommendations for proper clearance:

- Complete access to one side of the processor, preferably the "drive side". Minimum clearance of 24 inches (61cm).
- Feed side-30 inches (76cm).
- Top side-15 inches (38cm).

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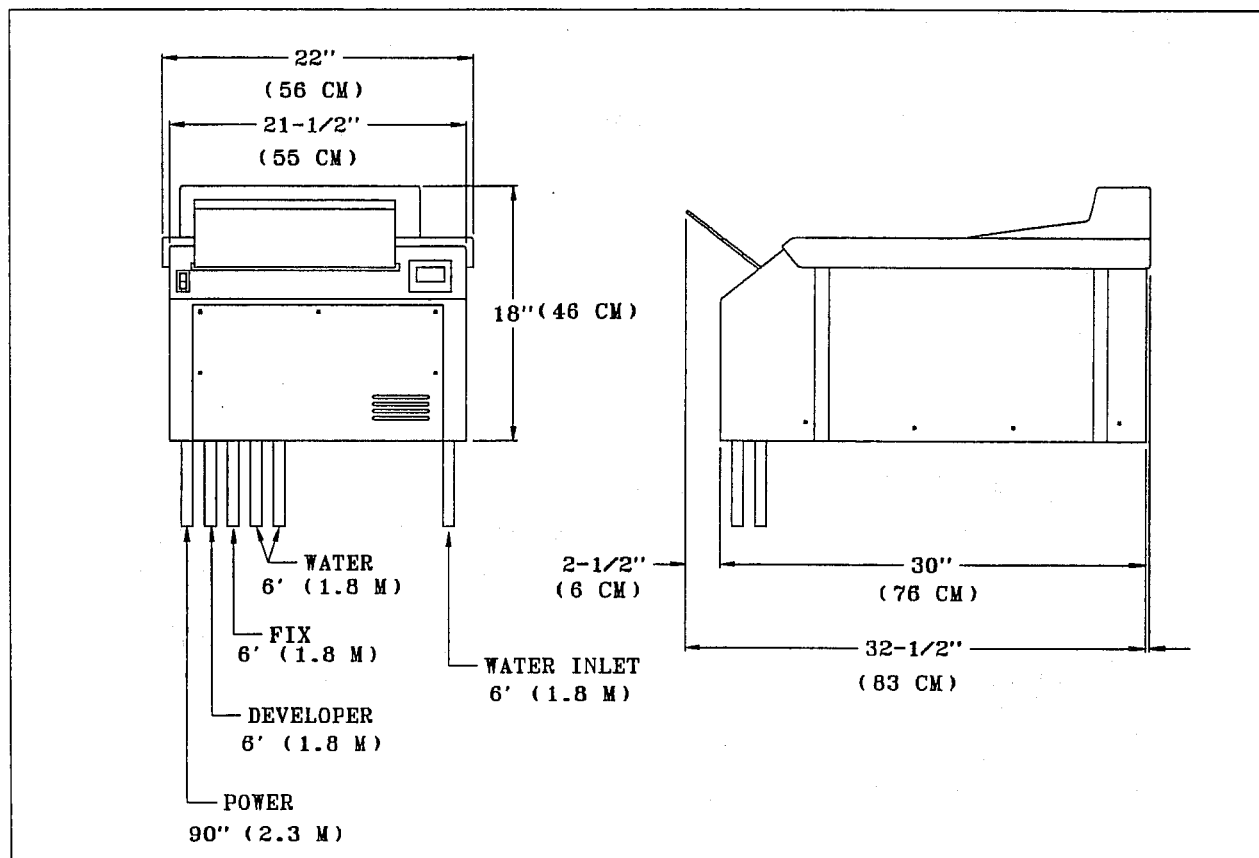


FIG 2-1
PROCESSOR DIMENSIONAL LAYOUT

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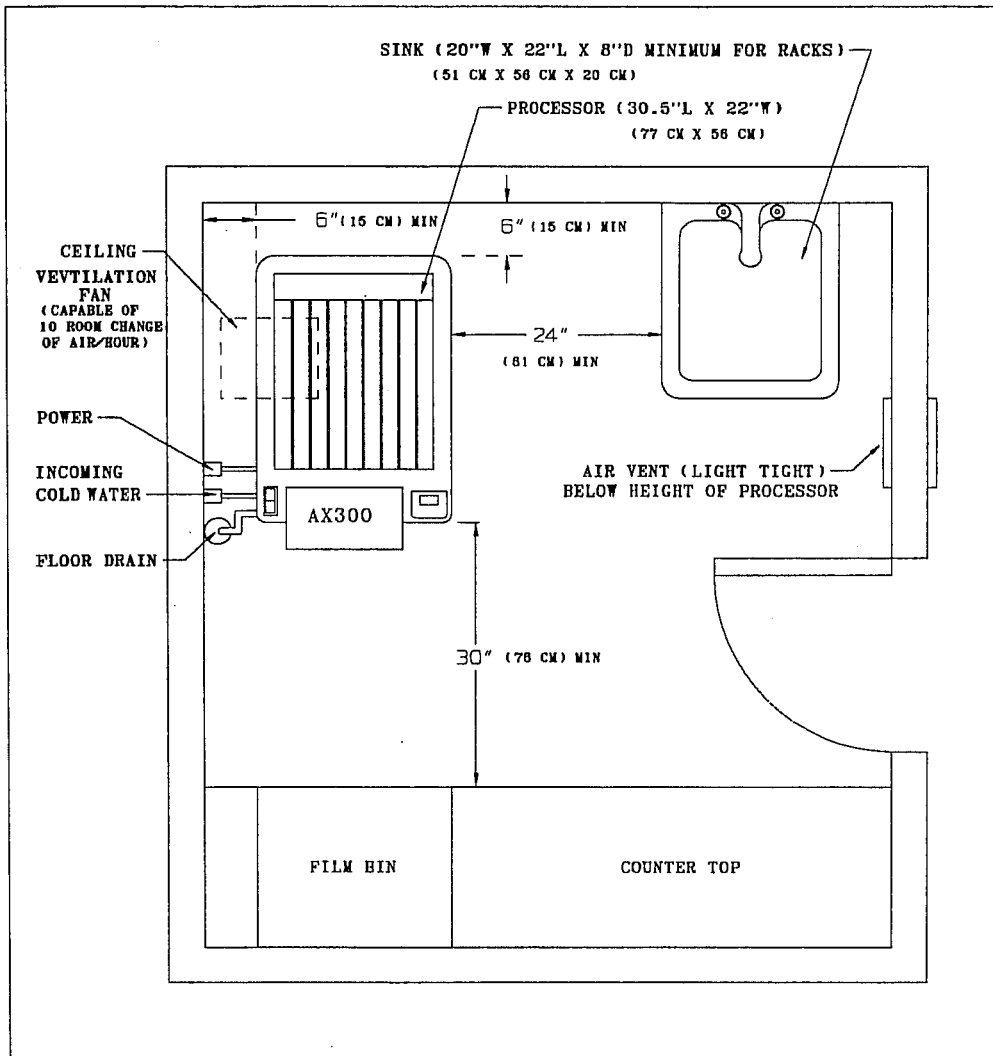


FIGURE 2-2
TYPICAL DARKROOM LAYOUT

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SECTION THREE

INSTALLATION

3.1 TOOLS AND EQUIPMENT

NOTE: THE TOOLS LISTED ARE REQUIRED FOR PROPER SERVICE OF AN ALPHATEK PROCESSOR.

3.1.1 GRADUATE

A graduated beaker marked in cubic centimeters (cc). A photographic graduate or a baby bottle with a capacity of at least 140cc's.

3.1.2 VOLTMETER

A voltmeter with a 0-240 VAC range.

3.1.3 AMMETER

A clamp-on A.C. Ammeter with a 0-20 Ampere range.

3.1.4 DIGITAL THERMOMETER

A calibrated thermometer with a 70°-150° F (20°-65° C) range.

3.1.5 JEWELLER'S SCREWDRIVER

Small "flat-tip" screwdriver with a maximum blade thickness of .020 of an inch (0.5mm) for adjusting the potentiometer on P/C Boards.

3.2 UNPACKING

NOTE: PRIOR TO OPENING ANY CRATES OR BOXES, INSPECT THE EXTERIOR OF ALL SHIPPING CONTAINERS FOR DAMAGE. IF ANY OF THE PACKAGES ARE DAMAGED CALL THE SHIPPING AGENT BEFORE PROCEEDING ANY FURTHER.

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- 3.2.1** Open all boxes and inspect components for any damage.
- 3.2.2** Verify receipt of all items as listed on the packing list.
- 3.2.3** Retain all cartons of the processor in case the unit has to be returned for any reason. This will ensure the processor will be packaged properly.

3.3 INSTALLATION

- 3.3.1 BASE ASSEMBLY (Optional)**
Assemble Base as shown in Figure 3-1.

- 3.3.2 TABLE TOP INSTALLATION**
If the processor is mounted on a counter or table top, you must allow clearance for the drain lines, incoming water and power cord. (Contact Alphatek Engineering Department for hole layout diagram.) Use adjustable feet, supplied, to level processor.

- 3.3.3 PLUMBING CONNECTIONS**

- 3.3.3.1** Attach the 6' (1.8m) Water Inlet Hose to the Water Solenoid using the "gooseneck" fitting. Attach opposite side to cold water supply.

CAUTION

CHECK THAT WATER SUPPLY AND DRAIN SYSTEMS COMPLY WITH ALL NATIONAL, STATE AND LOCAL CODES.

- 3.3.3.2** The processor is supplied with 4 vinyl drain tubes that are 6'(1.8M) long. The tubes are ¾ inch O.D. X ½ I.D. (19mm X 13mm) and attach to the drain lines located inside the electrical section of the processor. (See Figure 3-2).

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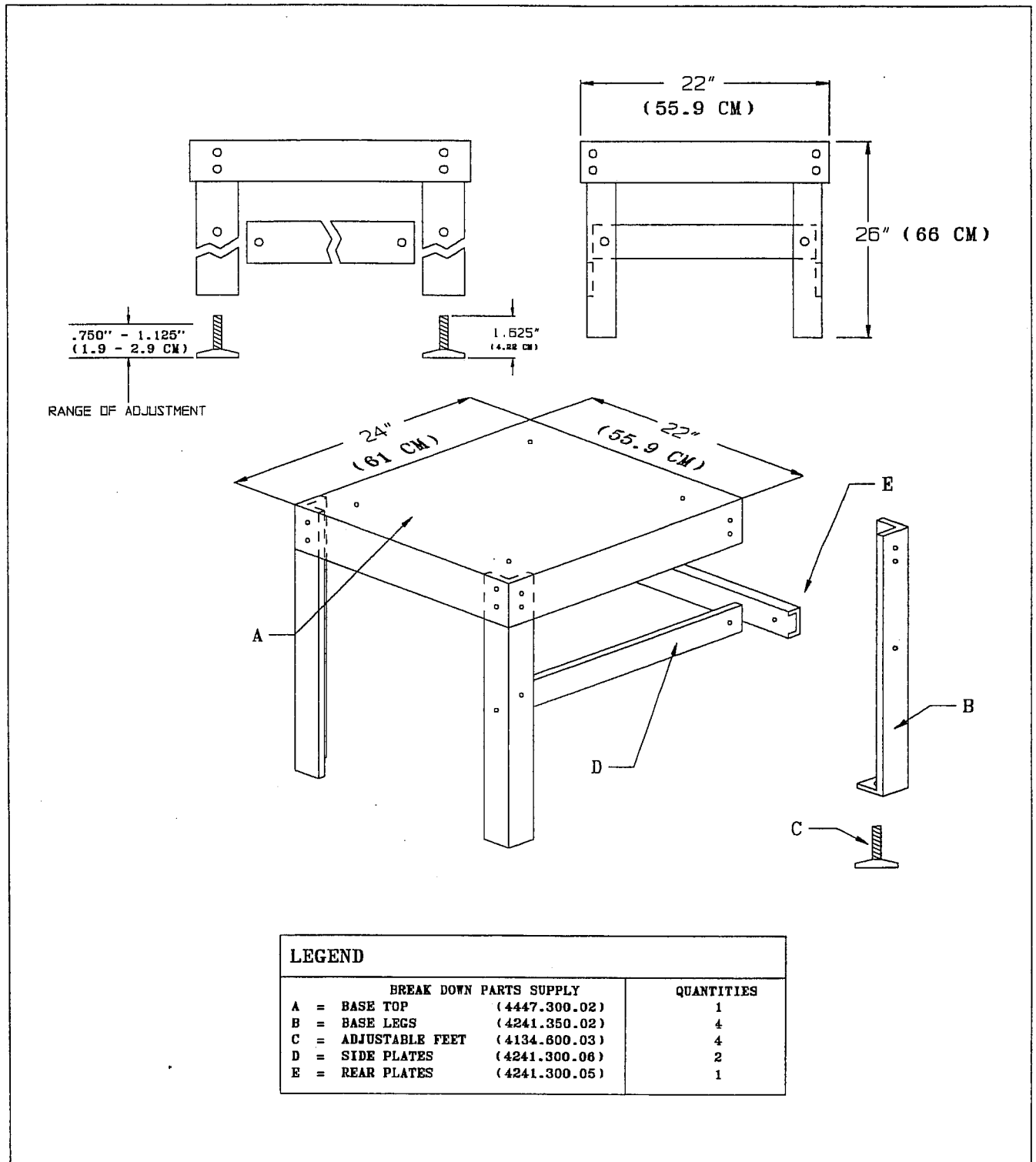


FIGURE 3-1 BASE ASSEMBLY (OPTIONAL)

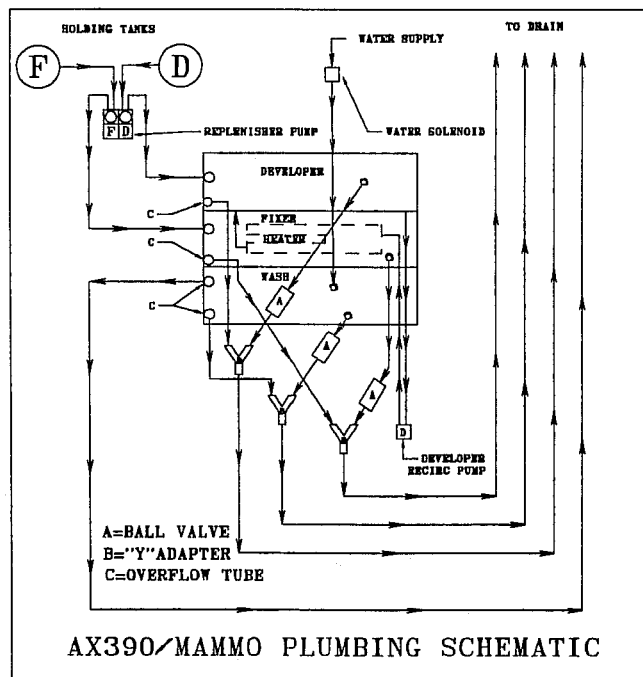
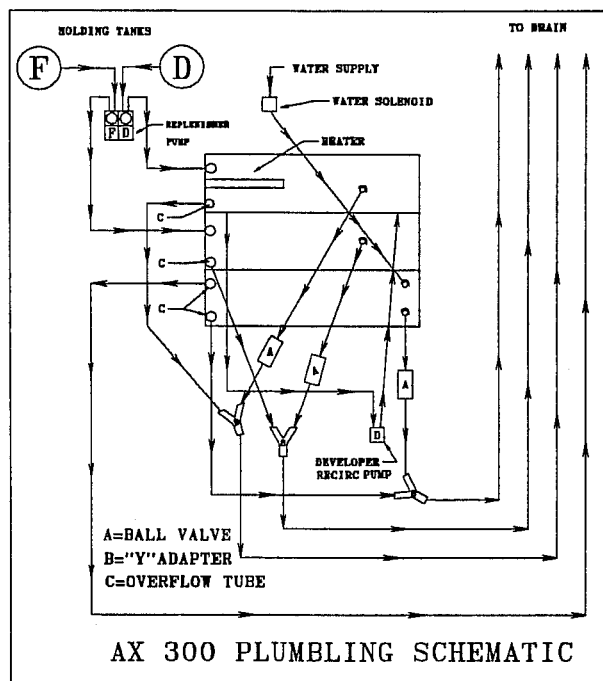


FIGURE 3-2
PLUMBING SCHEMATIC

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- 3.3.3.3** Group all drain lines together and insert into floor drain. (Tubing may be separated and diverted into individual storage tanks for reclamation).

NOTE: DO NOT MERGE TWO WATER DRAIN LINES INTO ONE DRAIN LINE. BACK-UP OF WATER INTO THE PROCESSOR MAY OCCUR.

- 3.3.3.4** Drain lines should be installed with a gradual slope to the floor drain. This will ensure proper drainage and avoid air locks.

- 3.3.3.5** Drain tubing should be installed away from any traffic pattern to ensure the tubes do not get pulled from the floor drain and cause flooding.

3.3.4 REPLENISHMENT SYSTEM CONNECTIONS

- 3.3.4.1** The replenishment system consists of a positive displacement pump, connecting tubing and optional replenisher tanks as shown in Figure 3-2.

- 3.3.4.2** Connect the vinyl tubes (2) from the replenisher tanks to the corresponding side of the pump. The pump is marked "D" for developer and "F" for fixer. Use the clamps that are supplied to secure the tubing from the tanks to the pump.

- 3.3.4.3** Fill replenisher tanks with fresh chemistry and check for leaks.

3.3.5 CLOSED LOOP SYSTEM (Optional)

Any of the 300 Series processors can be purchased with the "Closed Loop System". This package is available in either "Wash Water" only or "Chemical/Wash" configuration. The tubing hook-ups are shown in Figure 3-3. The drain valves should be left slightly opened to allow the solutions to drain back into their respective holding tanks when the unit is shut down for the day. Turning the processor back on will automatically fill the solution tanks inside the processor.

CAUTION

ENSURE THAT THE OSCILLATING PUMP IS FILLING THE DEVELOPER TANK OTHERWISE DAMAGE TO THE DEVELOPER HEATER COULD RESULT.

Because you are utilizing only 5 gallons (19 liters) of chemistry and/or water and not replenishing with fresh solutions eventually the solutions will become exhausted. The time it will take for this to occur is dependent on oxidation of chemicals, film size and film quantity.

As a starting point you should assume the chemical activity will begin to fall off after 70-75 sheets of mixed film sizes. At this point the chemicals should be drained back into their respective 5 gallon (19 liter) holding tanks and set aside. Fresh 5 gallon (19 liter) containers should be inserted into the system. The water should be changed daily to ensure proper washing of film and to prevent the development of algae within the tank.

3.3.6 POWER CONNECTION

The processor is supplied with a 3 prong, polarized power cord. The receptacle should be a grounded 15 Amp, polarized outlet. The processor will draw up to 14 Amps.. These amp ratings are for 120V. operation. For 240V. the the draw should be 50%. It is imperative that this processor be the only draw on this line.

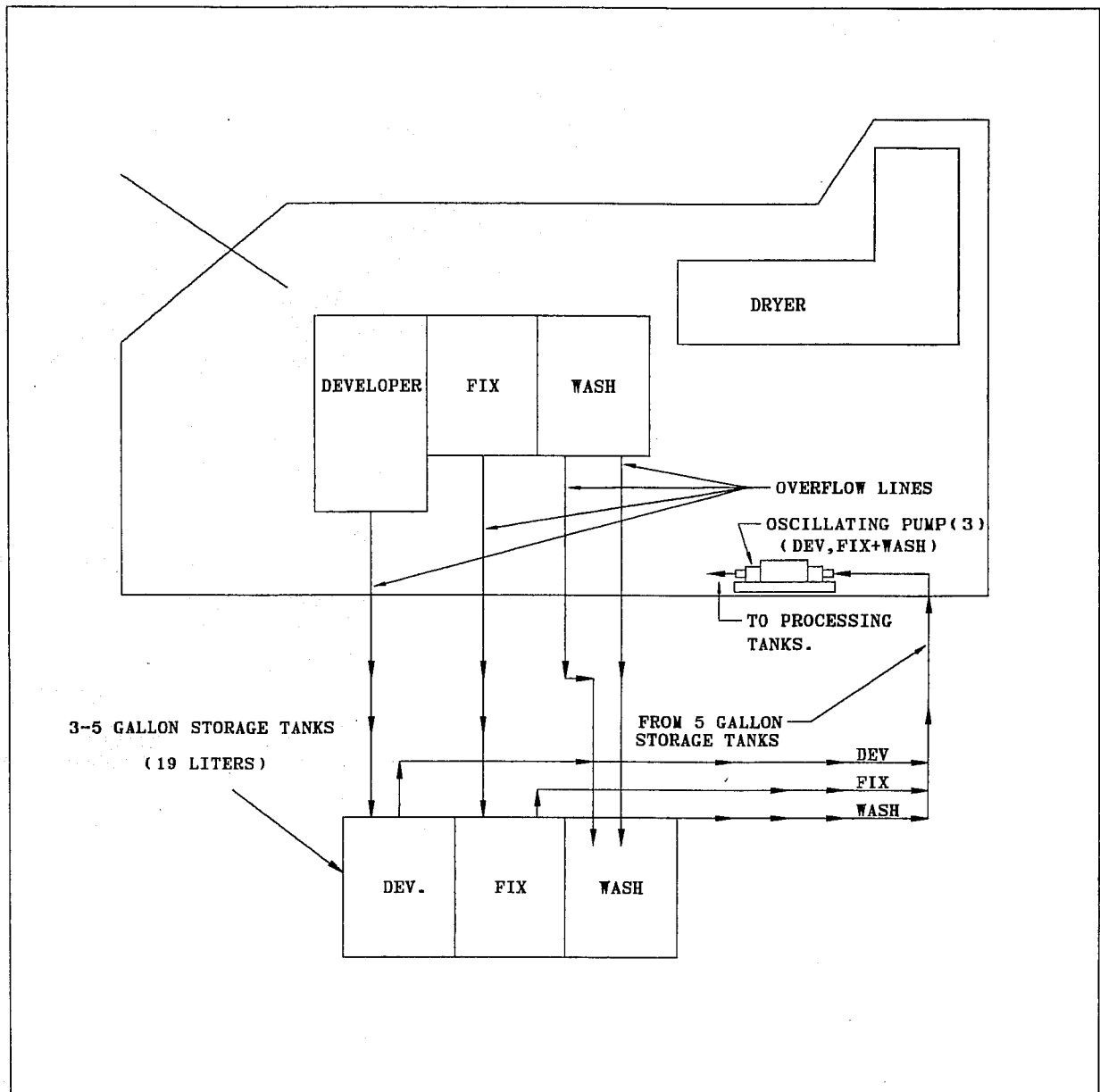


FIGURE 3-3
CLOSED LOOP SYSTEM

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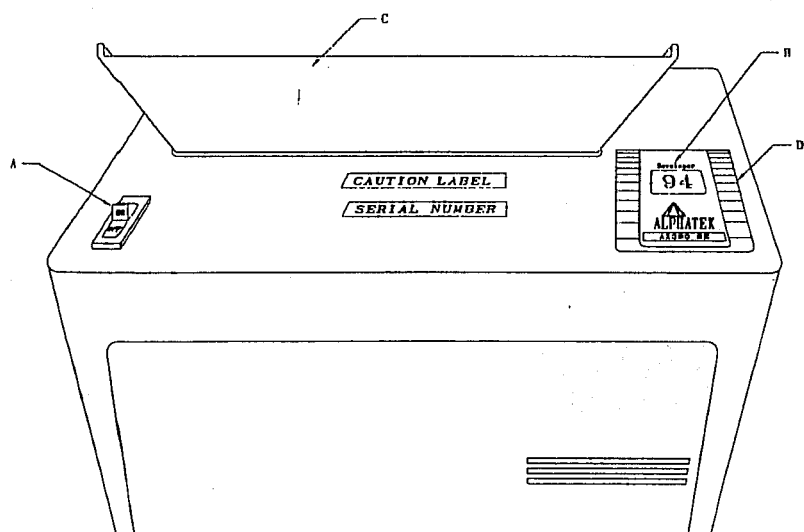
3.3.7 OPERATOR CONTROL

3.3.7.1 15 Amp On-Off Breaker (10 Amp for 240 V Processors)

This component doubles as an on-off switch and circuit breaker (Figure 3-4) To turn the unit on, depress the rocker arm marked "ON". Reverse the procedure to turn the processor "OFF". If the switch (breaker) has been tripped, the rocker arm will "float" between the ON/OFF position. To reset, depress the arm to the "OFF" position and retry. If the switch (breaker) trips again, check for an internal short.

3.3.7.2 Developer Temperature Display

This component doubles as a temperature display and as a "feed indicator" light. When a film is inserted into the processor, the display will extinguish. This advises the operator to wait until the light re-illuminates to feed another film or exit the darkroom. The display should extinguish anytime the "feed" Microswitch arm is depressed. Once the film has cleared the a 8 second time delay to ensure no overlapping or fogging of the films. (Figure 3-4)



LEGEND	120 VOLT	240 VOLT
A = ON/OFF BREAKER	5185.350.34	5185.300.02
B = DEVELOPER THERMOMETER	4189.300.01	4189.300.03
C = INFED TRAY	4450.300.04	4450.300.04
D = AX300SE DECAL	4180.300.04	4180.300.04
= AX390SE DECAL	4180.300.09	4180.300.09
= MAXMO 300 DECAL	4180.300.10	4180.300.10

FIGURE 3-4 OPERATOR CONTROLS

3.3.8 FILLING PROCESSOR WITH CHEMISTRY AND WATER

CAUTION

ALWAYS FILL THE FIXER TANK FIRST. OTHERWISE YOU MAY CONTAMINATE THE DEVELOPER CHEMISTRY.

3.3.8.1 Fixer Chemistry

Ensure the fixer Drain Valve, located under the Wash Tank, is closed (valve handle is perpendicular to the body of the valve). Pour chemistry into the fix tank (fill the tank $\frac{1}{2}$ full). Place the Fixer Rack into its proper position within the tank. Once the rack has been inserted bring level up to the overflow tubes. Raise level in tank to the overflow tube by adding additional chemistry as necessary.

3.3.8.2 Developer Chemistry

Repeat procedure as noted in Section 3.3.8.1. Fill the Developer Tank approximately $\frac{3}{4}$ full. On the AX390 and Mammo 300 there is a thermowell/heat exchanger that is located under the Fix Tank. Before inserting developer rack, turn processor on to fill the thermowell. Developer level in the tank will drop. Refill tank and install rack. Raise level in tank to the overflow tube by adding additional chemistry as necessary.

3.3.8.3 Water

Water will flow from the "source" to the Wash Tank via the Water Solenoid. The solenoid will only allow water into the unit during the "full-on" mode. Within the solenoid is a flow restrictor that allows $\frac{1}{2}$ gallon/minute (1.9L) when processing a film. In the "standby" mode the valve closes and no water is allowed into the processor.

3.3.9 INSTALLATION OF TRANSPORT RACKS

3.3.9.1 Solution Racks

The Developer, Fix and Wash Racks should be installed and removed by holding one finger on the "Support Pins" at the opposite corners of the transport rack. Each rack has corresponding slots on the Main Frame that the Support Pins slide down into. These Support Pins are designed to suspend the racks over the solution tanks. Ensure that the pins seat all the way down in their slots.

Each rack is color coded:

Developer - Yellow

Fix - Green

Wash - Clear

3.3.9.2 Dryer Feed Guide

This guide is shipped loose on the wash rack to prevent possible damage to the guide or the side plates of the rack. For proper alignment see Figure 3-5.

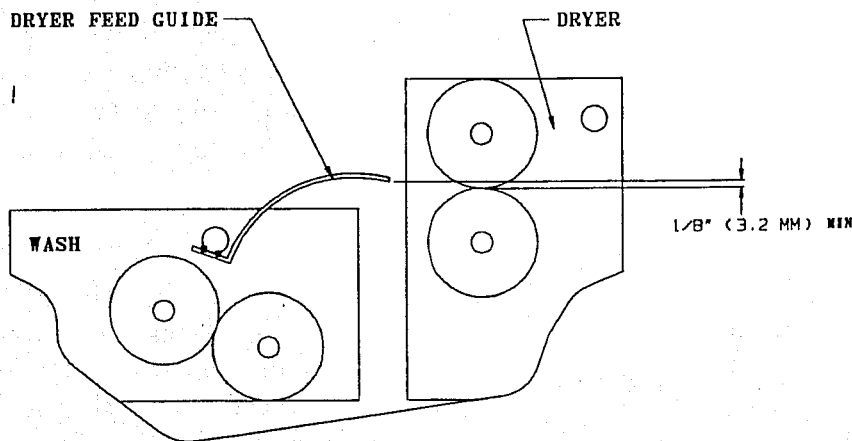


FIGURE 3-5 DRYER FEED GUIDE ADJUSTMENT

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3.3.9.3 Dryer Rack

The Dryer Rack is shipped in place on top of the Lower Blower Assembly. Prior to shipping, the Upper Blower Assembly and Dryer Rack are strapped down to the Lower Blower Assembly. This is to ensure that the rack and blower do not move around during shipping. This packaging also is designed to protect the Dryer Thermostat sensing unit from damage.

3.3.9.4 Crossover Guides (Pre-1993)

The Crossover Guides are designed to transport the film from the developer to the fixer and from the fixer to the wash. Each crossover is marked for easy installation. The developer to the fix crossover has the letter "D" in the center of the guide. The fix to wash has the letter "F" in the center of the guide. These guides are identical to each other but have been tested and marked and should not be switched. To install guides, line up the slots on the guides end plates to their corresponding Support Pins and push down evenly on each side. Ensure that the arrows on the guides are pointed toward the dryer section. To remove the guides, special care must be taken to not twist or knock the guide out of square. Gently pull up on both sides of the guide simultaneously and slide up off the pins. For proper adjustment of guides see Figure 3-6.

3.3.9.5 Crossover Guides (Post-1993)

These guides are an integral part of the Fix and Wash Racks. Pivot the guide down while pulling back the pins for insertion into the positioning holes in the preceding racks. (Figure 3-7)

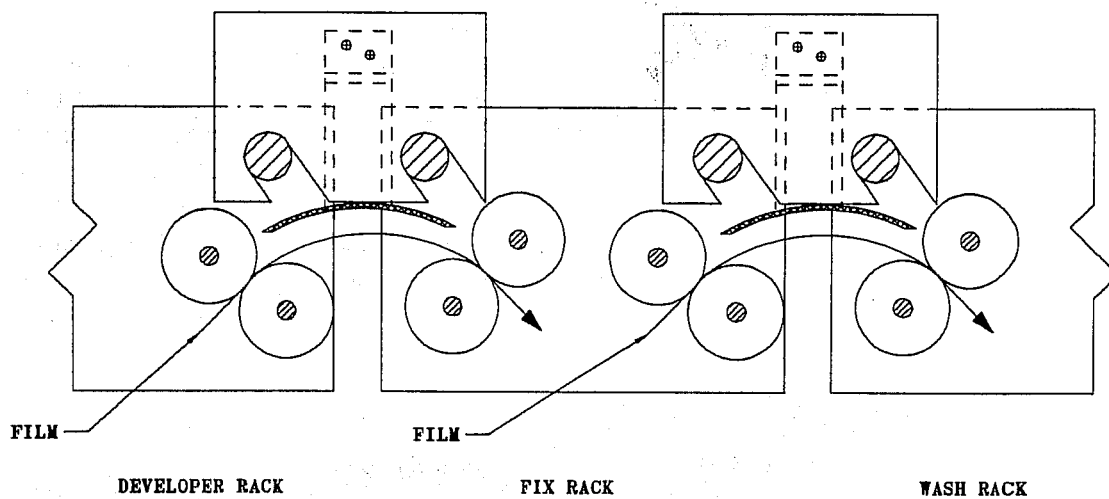


FIGURE 3-6

CROSSOVER GUIDE ALIGNMENT (PRE-1993)

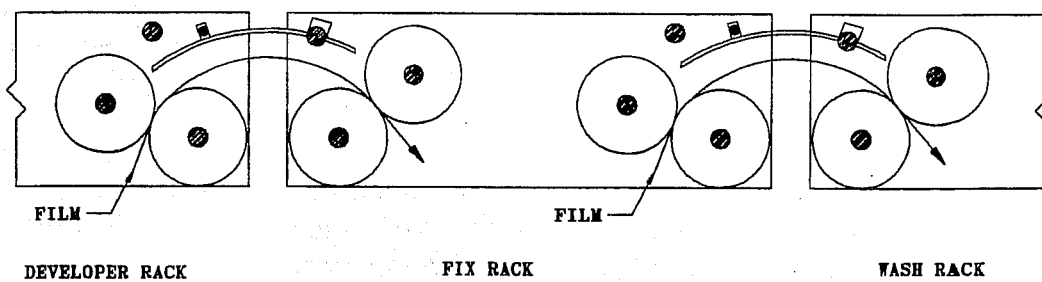


FIGURE 3-7

CROSSOVER SETTING (POST-1993)

SECTION FOUR

CIRCUIT FUNCTION, CALIBRATION AND SETTINGS

4.1 MUFFIN FAN

This fan is installed in the electrical section on the right-hand side of the compartment. The fan is attached to a bracket that is bolted to the back of the Electrical Plate. (See Fig. 4-1). This fan blows air into the processor to assist in keeping the heated dryer air toward the exit of the unit. This airflow is the reactive force that allows control of the developer temperature.

CAUTION

DARKROOM LAYOUT AND INSTALLATION MUST ALLOW FOR A MINIMUM OF 10 AIR ROOM CHANGES PER HOUR. THE AMBIENT ROOM TEMPERATURE MUST NOT EXCEED 80°F (27°C) AS DESCRIBED IN SECTION 2.2. IF THE TEMPERATURE SHOULD EXCEED 80°F (27°C) A RISE IN DEVELOPER TEMPERATURE MAY OCCUR.

4.2 RECIRCULATION

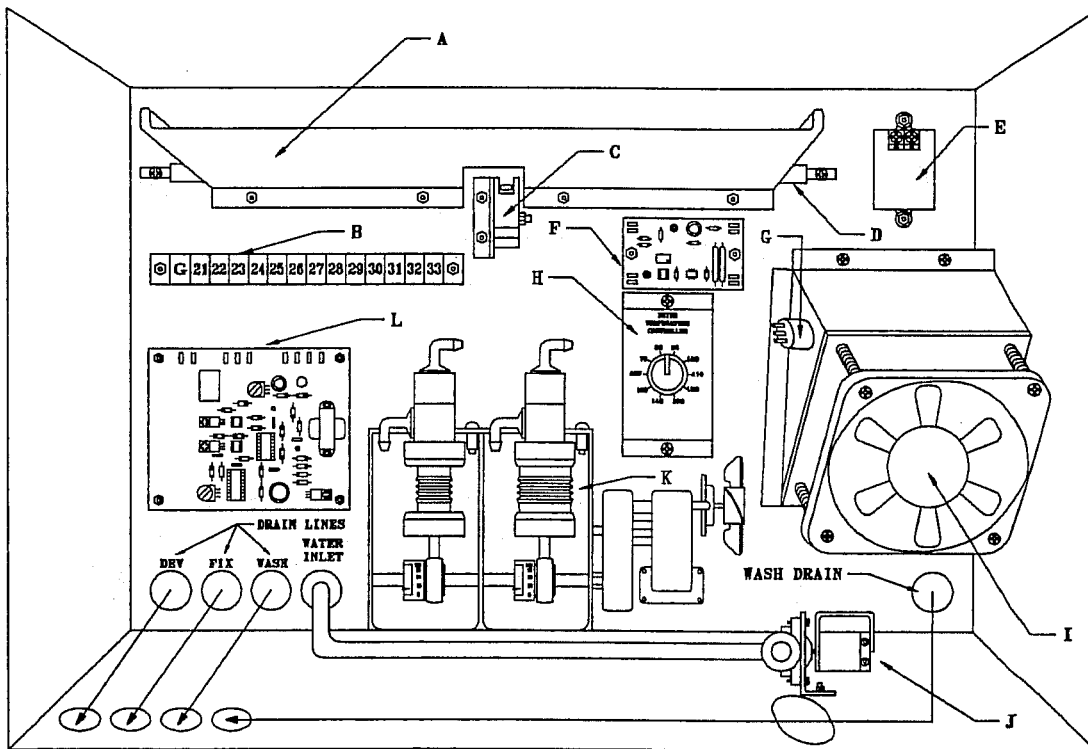
Recirculation of the developer is achieved by a magnetic drive pump which runs constantly while the processor is on. Agitation of fixer chemistry is achieved with a four-spoke paddle inside the Fix Rack. If a Recirculation Pump has failed, first check for air gaps. Secondly, check the internal workings of the pump head to ensure no foreign materials are impeding the movement of the impeller.

4.3 DRYER SECTION

This section is comprised of a Upper Blower Assembly which has a fan and heating element, and a Lower Blower Assembly which has the same components as the Upper Blower.

4.3.1 DRYER THERMOSTAT

Strapped to the Lower Blower is the Dryer Thermostat probe that regulates the dryer temperature.



LEGEND	120 VOLT	240 VOLT
A = INFEED TRAY	4450.300.04 (*)	4450.300.04 (*)
B = TERMINAL STRIP	4189.350.01	4189.350.01
C = MICRO SWITCH	4181.600.09 (*)	4181.600.09 (*)
D = INFEED ROLLER	4157.300.01	4157.300.01
E = LED(DRY TEMP DISPLAY) POWER SUPPLY	4189.300.01	4189.300.03
F = DEVELOPER P/C BOARD	5285.700.14	5285.300.08
G = DEVELOPER TRIAC	5185.700.56 (*)	5185.700.86 (*)
H = DRYER TEMPERATURE CONTROLLER	4188.700.02 (**)	4188.700.02 (**)
I = MUFFIN FAN	4183.600.03	4183.700.14
J = WATER SOLENOID	4180.350.01 (*)	4180.700.03 (*)
K = REPLENISHER PUMP	4183.600.09	4183.700.10
L = AUTOMATIC STANDBY P/C BOARD	5285.300.05	5285.300.08
AUTOMATIC STANDBY WITH JOG CYCLE	5285.300.10	5285.300.11
* - UNIVERSAL PART. MUST SPECIFY PROCESSOR.		
** - DUE TO DESIGN CHANGE. MUST SPECIFY SERIAL NUMBER.		

FIGURE 4-1
ELECTRICAL COMPONENT IDENTIFICATION

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4.3.2 BLOWER FANS

For the AX300SE and the Mammo 300 this component is the same as the Muffin Fan in Section 4.1., while in the AX390SE, the Upper fan is a larger Axial Blower. These fans run continuously while the processor is turned on. When checking operation of either fan be careful to not be misled by airflow from one fan turning the other. Remove Upper Blower from top of Dryer Rack, while still electrically connected to check airflow from either blower.

4.3.3 HEATING ELEMENTS

The Mammo 300 and the AX300SE have 400 watt, 120V heating elements for both the Upper and Lower Dryer Assemblies, whereas the AX390SE has a 600 watt, 120V heater for the Upper Dryer Assembly. You cannot determine their operation by manually sensing the air flow. An unrestricted air flow will cool the heating elements. If there is a drying problem, check the chemistry; not just the fixer but also the developer. Recheck the replenishment rates. Check the heating elements by measuring the amperage and/or the resistance. If 120 volts is being supplied to the 400 watt heater, the draw should be 3.3 amps. The 600 watt heater should have a draw of 5.0 amps. The tolerance on the amp draw is $\pm .5$ amps. Their resistance value in a cold condition is 36 ohms and 24 ohms respectively.

The heating elements have power supplied to them through a mechanical thermostat whenever the processor is turned on. The control portion of the thermostat is located in the electrical section. (See Figure 4-1)

For 240V operation, the amp. values will be half of the 120V and the resistance values will be four times greater.

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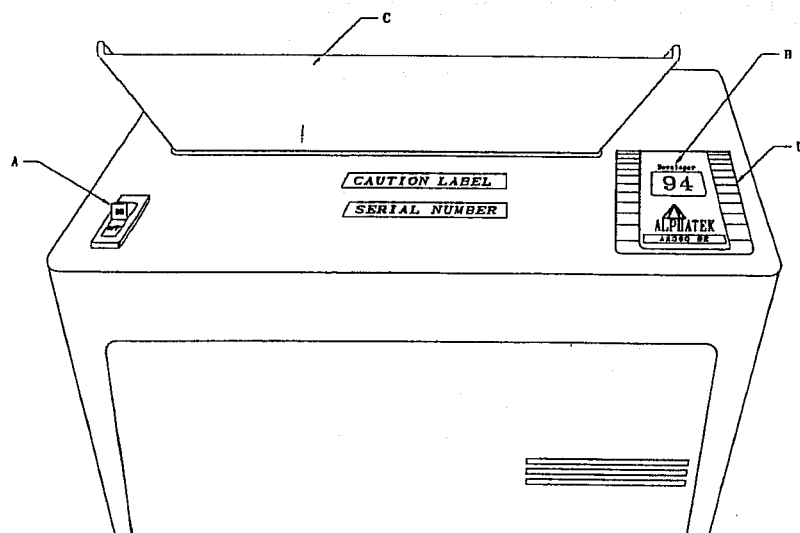
NOTE: The setting of the Dryer Thermostat should always be at the lowest temperature possible while still developing dry films. Each film and chemistry combination have different drying characteristics and may require more heat than others. Due to the uncertainty of different combinations there is no specific temperature where the dryer should be set. To determine the temperature of the dryer section, rotate the control knob back and forth until you hear a "clicking" sound. This sound is the actual closing of the circuit within the thermostat. This indicates the temperature of the dryer section.

4.4 DEVELOPER TEMPERATURE DISPLAY

This digital display has two functions, to show actual developer temperature and to alert the technician when to run another film or to leave the darkroom. When a film is inserted into the processor the display will go off until the film has cleared the entrance switch. The display has its own power source and sensing unit. (See Figure 4-2)

This display reacts to changes in temperature sensed by the thermistor which is located in the developer tank.

NOTE: There are two thermistors located in the developer tank. One is for the developer temperature setting while the other is for the digital readout. See Figure 4-2.



LEGEND	120 VOLT	240 VOLT
A = ON/OFF BREAKER	5185.350.34	5185.300.02
B = DEVELOPER THERMOMETER	4189.300.01	4189.300.03
C = INFED TRAY	4450.300.04	4450.300.04
D = AX300SE DECAL	4160.300.04	4160.300.04
= AX390SE DECAL	4160.300.09	4160.300.09
= MAMMO 300 DECAL	4160.300.10	4160.300.10

FIGURE 4-2 DEVELOPER TEMPERATURE DISPLAY

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The display unit can be adjusted to calibrate the display to the actual developer temperature. The adjustment for the display is located on the back of the display unit. There is a small rubber cap that covers the adjustment screws. The screws are marked "z" and "s". Remove the cap, insert a small "jewelers screwdriver" into the "z" screw. Turning clock-wise will increase the displayed temperature.

4.5 DEVELOPER TEMPERATURE CONTROL SYSTEM

This system consists of the following components:

- Developer Heater (600W)
- Developer Temperature Controller P/C Board
- Developer Triac
- Developer Thermistor
- Developer Indicator Light

The developer temperature is controlled by the P/C board, by comparing voltages based upon the varying resistances from the potentiometer (pot) on the P/C board and the thermistor. The thermistor has a negative coefficient. In other words, as the temperature rises in the developer tank the resistance of the thermistor decreases. The "comparator chip" reads this value versus the potentiometer value and "fires" the developer triac when the resistance from the thermistor is too high, which will then close the circuit for the developer heater. The developer heater has an indicator light that runs parallel to the heater that will illuminate when there is power to the heater. If you wish to increase temperature turn the pot clockwise. To set the controller at a certain temperature, allow the developer temperature to rise to the desired degree and turn the pot counter-clockwise until the light goes off.

4.6 DEVELOPER TEMPERATURE SETTING

The developer temperature is factory set at the following:

AX300SE: 92°F (33°C)

AX390SE: 95°F (35°C)

Mammo 300: 95°F (35°C)

The developer immersion time (leading edge into developer rack to leading edge out) for the 300 Series processors are as follows:

AX300SE: 25 seconds

AX390SE: 23 seconds

Mammo 300: 48 seconds

NOTE: Check with film and chemical manufacturers for recommended developer temperature based on above immersion times.

4.7 STANDBY CONTROLLED COMPONENTS

The Standby P/C Board activates the Main Drive Motor, Water Solenoid and Replenisher Pump. The board also turns off the Digital Developer Thermometer display while a film is being fed. The board receives a signal from the feed Microswitch which then turns on the motor, Replenisher Pump, and Water Solenoid.

4.7.1 DRIVE MOTOR AND WATER SOLENOID

The Main Drive Motor and Water Solenoid will remain on as determined by the setting of the potentiometer on the Standby Board. A clockwise rotation of the "pot" will increase the run time. The Standby Board begins "counting" after the feed Microswitch has been released.

4.7.2 REPLENISHER PUMP

The Replenisher Pump also is activated by the feed Microswitch. The pump will remain on for as long as the Microswitch is depressed by the film, plus an eight second delay allowing the film to submerge in the developer solution. Replenishment rates for the AX390SE and AX300SE are factory set at 70 cc's for Developer, and 120 cc's for Fixer for a 35 x 43cm film. For the Mammo 300, refer to Section 7.

NOTE: Check with film and chemical manufacturers to determine proper rate setting based on processing volume.

4.7.3 DEVELOPER TEMPERATURE DISPLAY

The developer display will remain off for the same length of time the pump is on. This delay time is a fixed 8 seconds set by an R/C circuit. This display also advises the operator when a film is feeding into the processor.

SECTION FIVE

TRANSPORT SYSTEM

5.1 MAIN DRIVE MOTOR

The motor is a capacitor-start, thermally protected motor. If the motor overheats for any reason the motor will shut itself off. If this occurs check for tightness in the transport rack, the Main Drive Shaft, or the Main Drive Chain.

5.2 MAIN DRIVE CHAIN

The Motor Mount is adjustable allowing a determination of the chain tension. The proper setting of the Motor Mount will allow you to almost squeeze the chain together with your thumb and forefinger.

5.3 MAIN DRIVE SHAFT

This shaft is suspended by two adjustable bearing blocks. This adjustment allows you to ensure a proper meshing of the Worm Gears on the Main Drive Shaft with the main Rack Drive Gears. If the meshing is too loose the racks will jump and if the meshing is too tight a squeak will occur. When adjusting the bearing height with the top and bottom set screws do not over-tighten as this will impede the "floating" of the bearing in the block.

5.4 TRANSPORT RACKS (FIGURE 5-1)

Extreme care must be taken in the handling and maintenance of the transport racks. (Refer to the maintenance section and the troubleshooting section if processing problems occur.) The film is guided by a series of rollers and guides through the various solutions and the dryer assembly.

5.4.1 RACK CONFIGURATION

Refer to Figure 5-1 for proper roller placement.

NOTE: Each pair of rollers in the developer, fix and wash racks should be wet except for the entrance pair of the developer rack and the exit pair of wash rack.

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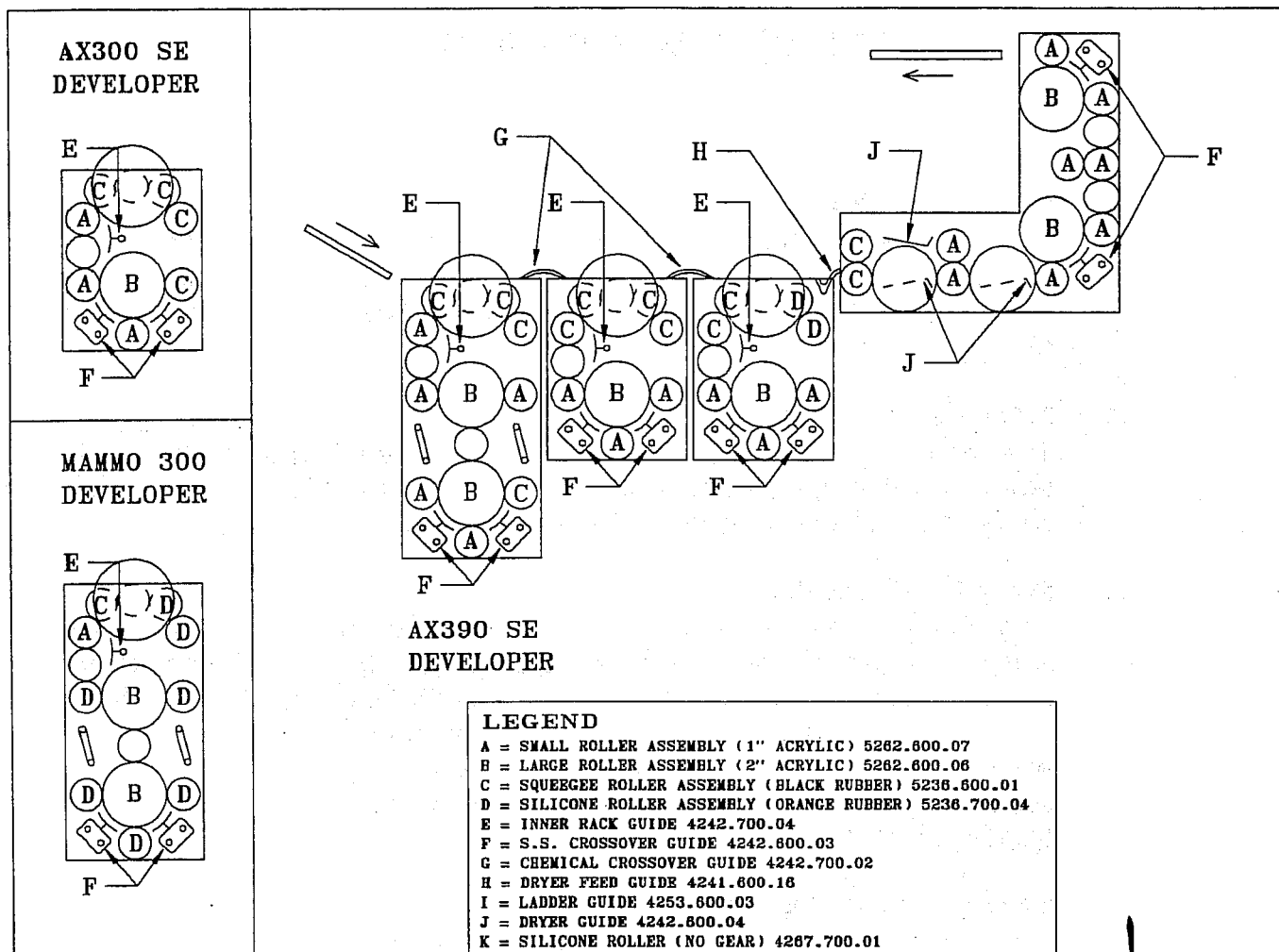


FIGURE 5-1
TRANSPORT SYSTEM

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5.4.2 ROLLER TENSION ADJUSTMENT

The exit and entrance rollers of the Developer, Fix and Wash Racks have set screw adjustments (excluding the entrance of the Developer Rack.) This adjustment helps facilitate proper transportation of film from one rack to another. This adjustment also ensures proper squeegeeing of the film. Proper adjustment is achieved when the rollers are touching one another. Too much tension will create a difficulty in turning the rack. After adjustment, manually turn the rack to determine that it turns freely.

5.4.3 ROLLER SUSPENSION

Each roller is suspended by a bearing which is either mounted in the Rack Side Plate or in a Rubber Grommet. These grommets will absorb the tension created by the passing of a film between two opposed rollers. These grommets should be checked to verify they have maintained their resiliency. Each roller should move freely side-to-side between the side plates. If they do not check the mounting in their bearings, for rollers "out of round", or for some other mechanical obstruction.

5.4.4 RACK DRIVE TRAIN

Each rack is driven by a gear on the Rack Drive Shaft which meshes with a gear on the Main Drive Shaft (Refer to Section 5.3 for proper alignment). All rollers within the racks are gear driven. The exception to this is the outside exit silicone of the wash rack and the entrance top roller of the dryer rack. In addition there are Idler Gears which are mounted on a bearing. When replacing an Idler Gear Do Not over tighten or you might expand its bearing creating tightness in the rack. Check to ensure the rack freely spins by manually turning the Rack Drive Gear after replacement of an Idler Gear.

5.4.5 RACK SIDE PLATES

These plates are transparent which allow for observation of the internal operation of each rack. These plates should be kept clean to allow you to utilize this feature. (For example, guide alignment, checking the gaps between rollers etc.)

5.4.6 GUIDE ALIGNMENTS

These are a number of different guides within the transport system. Some guides correct the film path and some guides determine the film path. The guides that determine the film path are the Dryer Feed Guide, top Crossover Guides, bottom Crossover Guides and Inner Rack Guides. These guides have to be positioned so that when the film is picked up by the next pair of rollers after a guide, the film pulls off the surface of the guide. If the film rides on the ribs of a guide, scratches will occur. If a guide is positioned so the film is fed directly into the junction point of two opposing rollers, the film will not be given the opportunity to pull away from the guide. The guide must be positioned so that only the lead edge of the film rides the ribs of the guide, then contacts the next roller and then pulls into the junction point of these rollers and simultaneously away from the guide. The film path correction guides (plastic Ladder Guides and Dryer Rack Guides) correct the film path if something else is wrong. For example, if one blower has stopped functioning the Dryer Rack Guides will keep the film on its proper path even though there is pressure to move the film in one direction.

5.4.7 INFEEED ROLLER

This roller is mounted above the Infeed Tray prior to the Developer Rack. This roller must spin freely when a film is being fed. Otherwise, a marring of the film surface will occur. See Fig. 4-1 "D".

SECTION SIX

CHEMICALS

All rapid processing chemicals are compatible with any Alphatek processor. Replenishment rates previously mentioned in Section 4.7.2 are merely guidelines. You must check with the film and chemical manufacturer to determine the proper replenishment rates based on processing volume.

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SECTION SEVEN

MAMMO 300

Mammography processing presents some specific differences from general radiographic film processing. This section addresses these differences.

7.1 DEVELOPER TEMPERATURE

The developer temperature is factory set at 95°F (35°C). The Mammo 300 has a developer immersion time (leading edge-to-leading edge) of 48 seconds. You should check with the film and chemical manufacturers for their recommended developer temperature based upon a 48 second immersion time in the developer chemistry.

7.2 DRYER TEMPERATURE

It is extremely important to keep the dryer thermostat as low as possible. The thermostat is factory set at 95°F (35°C).

7.3 FILM FEEDING

Always feed the film with its emulsion side down.

7.4 CLEANLINESS

As with all processing it is extremely important to keep the transport system clean. Any foreign substance on the rollers will be magnified on mammographic film. We recommend semi-monthly cleaning for mammography.

7.5 REPLENISHMENT

The replenisher pump is factory set for 50cc's of Developer and 80cc's of Fixer for a 10" (24cm) long film. Please check with the film and chemical manufacturers for their recommendations based on expected processing volume.

7.6 SENSITOMETRY

A consistent procedure should be followed when processing sensitometric strips. If at all possible our recommendations are as follows:

7.6.1 Turn processor on (same time each day if possible).

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7.6.2 Allow processor to run for one hour before processing any films - Check developer temperature.

7.6.3 Run two cleanup films.

7.6.4 Run test strip after cleanup films have exited from processor.

7.6.5 If quality control numbers are inconsistent refer to Figure 7-1.

NOTE: If there are wide variations in the daily film volume your quality control numbers might be affected.

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Always check developer temperature first. If it is correct use the chart below.

	Rates High	Rates Low	No Starter	Developr Mixed Improper	Developr Contam- inated	
Speed (Mid- Density) High	X		X		X	
Speed Low		X		X	X	
Contrast Low	X		X	X		
Speed and Contrast High	X		X	X	X	
Speed and Contrast Low		X		X		
Speed High Contrast Low		X		X		
Speed Low Contrast High	X					

FIGURE 7-1 SENSITOMETRY TROUBLESHOOTING CHART

Make sure proper procedures for processing sensitometric strip are being followed. If problems appear, run a second strip to confirm numbers.

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SECTION EIGHT

MAINTENANCE

8.1 TRANSPORT SYSTEM

We recommend a monthly cleaning of the transport racks. Systems cleaner or hot water may be used with a synthetic pad to clean any part of the transport system. Never use any material which will mar or scratch the surface of any of the transport roller. Never use any cleaning material outside of systems cleaner on the transport racks.

NOTE: Do Not use "Green Scotch-Brite" pads. These will scratch the roller's surface. Use of the "White Scotch-Brite" pads is acceptable.

8.2 PROCESSING TANKS

Any spilled, splashed or oxidized chemicals should be cleaned on a daily basis.

CAUTION

Never use chlorine or bromide in the cleaning, or for the prevention of algae. These chemicals will adversely affect the integrity of the stainless steel.

8.3 LUBRICATION

Do not lubricate any internal gears of the transport racks. For lubrication of the Main Drive Motor and Main Drive Shaft Bearings, a lubricating oil such as Gulf Harmony #44 or non-detergent SAE-10 or 20 weight oil may be used.

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