



Auto Non-Contact Tonometer

User's Guide


Reichert
Ophthalmic Instru
A Division of Leica Microsystems Inc.

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Introduction

Congratulations on your purchase of the AT550 Auto Non-Contact Tonometer

The AT550 is an auto-aligning non-contact tonometer used to measure the intraocular pressure of the eye by delivering an air puff to the eye.

This User's Guide is designed as a training and reference manual. We recommend you carefully read and follow the steps in this guide to ensure optimum performance from your new instrument.

Please retain this guide for future reference and to share with other users. This guide should be used with product catalog numbers 13900 and 13901. Additional copies can be obtained from your authorized Reichert Ophthalmic Instruments dealer or contact our Customer Service Department directly at (716) 686-4500, fax (716) 686-4555, or e-mail: info@reichert.com.

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Classification

The AT550 is classified as Class 1 Equipment

Class 1 Equipment is equipment in which protection against electric shock does not rely on basic insulation only. It also includes an additional safety precaution that provides for the connection of the equipment to a protective earth conductor in the fixed wiring of the installation in such a way that accessible metal parts cannot become live in the event of a failure of the basic insulation.

The AT550 is classified as Class B Equipment

Class B Equipment provides an adequate degree of protection against electrical shock, particularly regarding allowable leakage currents and reliability of the protective earth connection.

The AT550 is classified as IPX0 Equipment

IPX0 Equipment is ordinary equipment enclosed without protection against ingress of water.

The AT550 is not suitable for use in the presence of flammable anesthetic mixtures with air or with oxygen or nitrous oxide.

According to the mode of operation, the AT550 is a Continuous Operation instrument.

Symbol Information

The following symbols appear on the instrument:



CAUTION - Indicates that important operating and maintenance instructions are included in this User's Guide.



Type B Product Classification
Class 1 Equipment, Continuous Operation



Alternating Current



Protective Earth

Precautions

- Ensure travel lock is disengaged before you connect instrument to power outlet (see page 9).
- Check dataplate for voltage of instrument before connecting to power outlet.
- The instrument must be plugged into an outlet with a ground receptacle. Do not disable or remove the ground pin.
- Instrument is best situated in a cool, dry, dust-free environment.
- To ensure optimal operation, install instrument on a level, vibration-free surface.
- Do not use alcohol or other cleaning agents to clean the covers, nosepiece or screen, as damage may occur to the surface coatings.
- Do not remove or insert memory cards while instrument is turned on.
- There may be potential electromagnetic interference between this instrument and other electronic devices. If interference is present, turn off electronic devices or remove them from the immediate area while operating this instrument.
- Parts and accessories used must meet the requirements of the applicable IEC601 series. Safety standards and/or the system configuration must meet the requirements of the IEC601-1-1 electrical systems standard.



WARNING:

The area around the AT550's nosepiece may create a "pinch hazard." Do not place your finger into the aperture surrounding the nosepiece.



WARNING:

For continued protection against risk of fire, replace fuses only with the same type and rating.

100/120 Volts use "T 0.63AL 250V" fuses

220/240 Volts use "T 0.315AL 250V" fuses



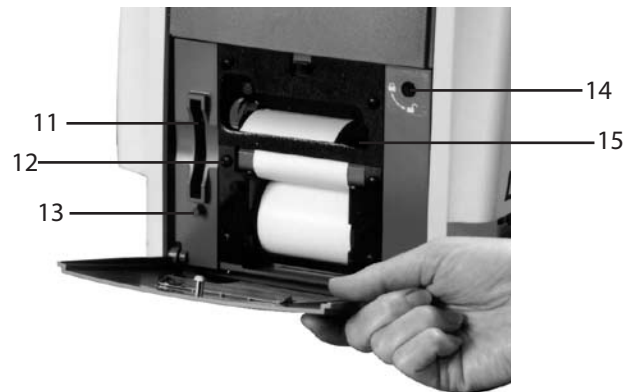
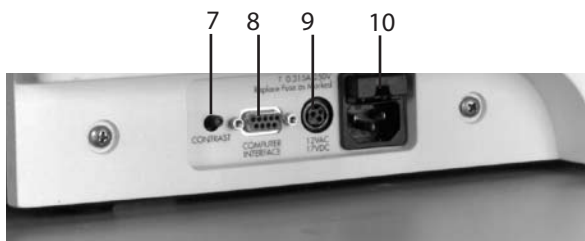
CAUTION:

- To avoid electrical shock, do not remove cover.
- There are no user serviceable parts inside.
- Refer servicing to qualified personnel.

Reichert Ophthalmic Instruments is not responsible for the safety and reliability of this instrument when:

- Assembly, disassembly, repair or modification is made by unauthorized dealers or persons.

Instrument Components



EXTERNAL PARTS

1. Display
2. Control buttons
3. Printer door
4. Headcover
5. Forehead rest
6. Nosepiece objective
7. Display contrast control
8. RS-232C port
9. Low voltage inlet
10. Main power & fuse holder
11. PC Card Slot
12. Printer paper advance
13. Reset button
14. Travel lock
15. Printer

PACKAGE CONTENTS

- AT550 Auto Non-Contact Tonometer
- Power cord
- Dust cover
- Spare printer paper (2 rolls)
- Cleaning cloth
- Phillips-head screwdriver

Instrument Components

Operating System

The AT550 incorporates a user-friendly icon/menu-based operating system. This system will speed up your training time, since you do not have to memorize many functions before using the instrument.

Instrument functions are initiated by pressing the gray buttons located below the icons displayed on the screen (picture below).

Descriptions of icons are provided on pp. 7-8.



GRAY CONTROL BUTTONS

Instrument Components

Icon Glossary

Listed below are descriptions of the icons used in the operating system.



MEASURE Initiates measurement sequence.



LEFT EYE MEASURE Initiates instrument alignment and measurement process for patient's left eye (appears only if instrument cannot detect eye).



RIGHT EYE MEASURE Initiates instrument alignment and measurement process for patient's right eye (appears only if instrument cannot detect eye).



CLEAR DATA Will clear all data on screen and in memory.



PRINT Data is sent to built-in printer and RS-232C port.



DEMONSTRATION Allows patient to feel demonstration air puff



MODE Allows access to secondary level menus such as setup and help.



TRAVEL LOCK Used to "park" instrument before shipment.



HELP Allows access to user help instructions.



SERVICE Allows access to service menu.

Instrument Components



Icon Glossary (cont.)

SETUP	Allows access to the default settings so that changes can be made.
RETURN	Returns to preceding screen.
RIGHT ARROW	Used in setup menu to move right horizontally.
LEFT ARROW	Used in setup menu to move left horizontally.
UP ARROW	Used in setup menu to move up vertically through options.
DOWN ARROW	Used in setup menu to move down vertically through options.
SELECT	Used in setup menu to select new setting.

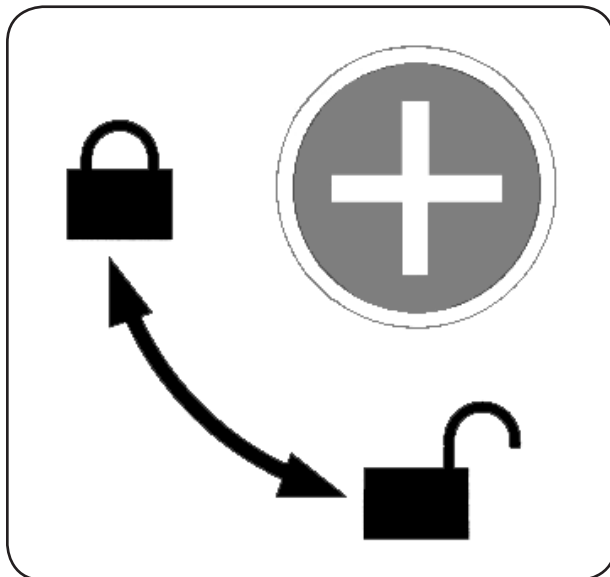
Instructions for Use - Installation

Disengaging the Travel Lock

The AT550 is shipped with the travel lock engaged to prevent damage during shipment. The travel lock is located behind the printer door in the top right-hand corner (see p. 5, No. 14, for location).

To disengage the lock, open the printer door and, using the Phillips-head screwdriver provided, turn the screw head counterclockwise (about four turns) until the screw is disengaged.

Note: The screw is spring-loaded and will remain attached to the instrument.



CAUTION: To prevent damage occurring to the internal mechanisms, ensure travel lock is disengaged before connecting instrument to power outlet.

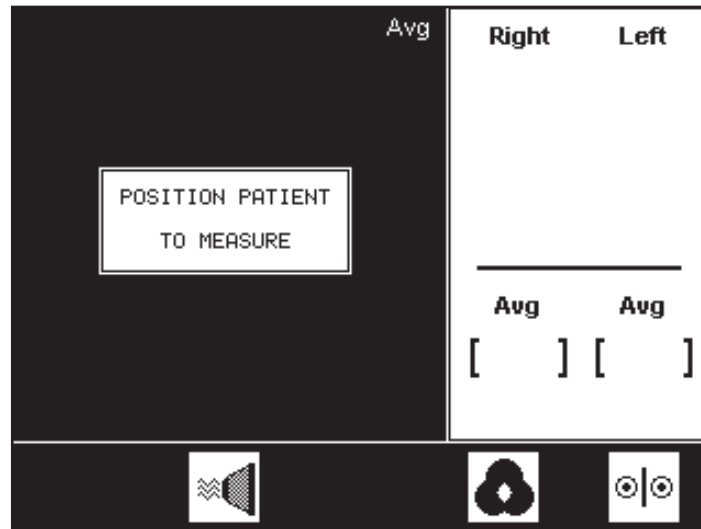


CAUTION: If you need to ship the instrument to another location, be sure the travel lock is engaged before packing. This will prevent damage to the instrument during shipment.

Instructions for Use - Installation

Engaging the Travel Lock

If it is necessary to ship the instrument to another location, engage the travel lock as follows:



Mode

Press the button below the MODE icon. The MODE icon can be found on most operating screens. The screen will change and look similar to the one below:

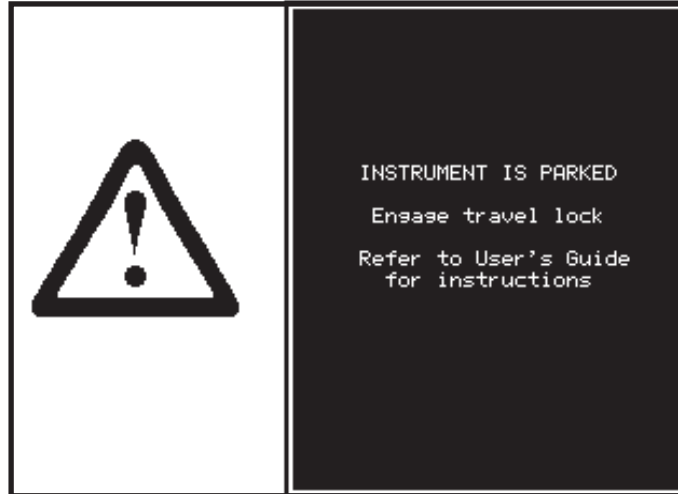


Travel Lock

Now press the button below the TRAVEL LOCK icon — you will hear the instrument's motors moving into the "park" position. The screen will also change to indicate the instrument is in the "park" position.

Engaging the Travel Lock (Cont.)

Instructions for Use - Installation



Once the instrument is “parked,” you can engage the travel lock. Open the printer door and, using a Phillips-head screwdriver, push the screw in and turn it clockwise (about four turns) until you feel the screw tighten fully.

You can now disconnect the instrument from the power outlet and repackage the instrument.



CAUTION: If you are unable to “park” the instrument because of a power supply failure, do the following:

- Pull the dark gray forehead rest off the instrument
- Unscrew securing screws using a Phillips-head screw driver and slide the headcover toward you. Disconnect black wire and lift cover off completely.
- Gently push the aluminum box toward the user’s side of the instrument and then push it down. The instrument is now in the “park” position.
- Pack head area with piece of foam or packing material.
- Engage the travel lock, if possible, as described above.

If you have questions, contact your local Reichert Ophthalmic Instruments dealer or our Customer Service Department directly at (716) 686-4500.

Instructions for Use - Installation

Mounting to Instrument Stand Arm

The AT550 can be installed on a table top or instrument stand arm. For instrument stand arm installation, follow the instructions below:

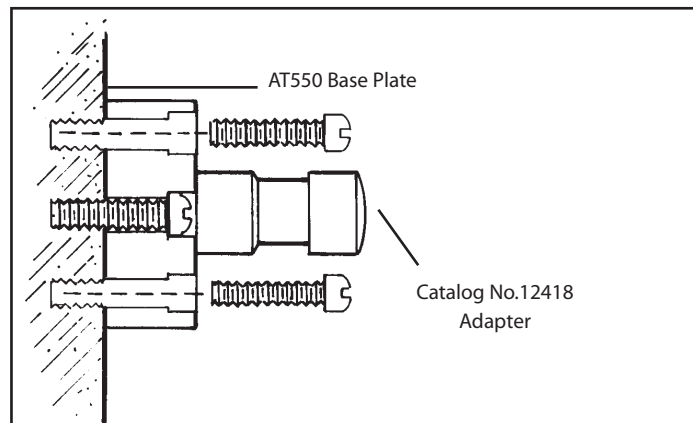
CAUTION: Make sure the travel lock is engaged to prevent damage to internal mechanisms.

- Carefully lay the instrument on its side.
- Attach the adapter (Catalog No. 12418) to the base plate with the three screws provided.

CAUTION: If replacement screws are used, do not use screws longer than 1 inch or 2.5 cm, as this could cause damage to internal components.

- Insert the adapter post into the mounting hole of the stand arm.
- Turn the knob on the instrument arm until the post is stable. The instrument should swivel freely.
- Disengage the AT550's travel lock (see p. 8 for instructions).
- Plug the power cord into the instrument and into the stand arm outlet.

CAUTION: To prevent damage occurring to the internal mechanisms, ensure the travel lock is disengaged before connecting instrument to power outlet.



Low Voltage

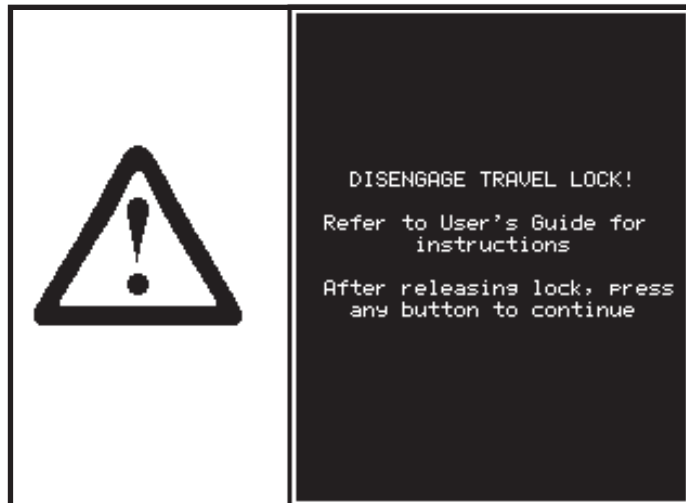
The AT550 can operate at 12 volts AC. This feature is especially useful when the instrument is used in Europe on a translating table instrument stand where high voltages are not always available. Use power cord (Catalog No. 13915) to connect the AT550 to the stand's internal transformer.

Instructions for Use - Installation

Once plugged in, the AT550's screen will illuminate and, after a few seconds, will look similar to that shown below. You are now ready to start using the instrument.



If you have forgotten to disengage the travel lock, the screen will change to that shown below (see Disengaging the Travel Lock, p. 9):



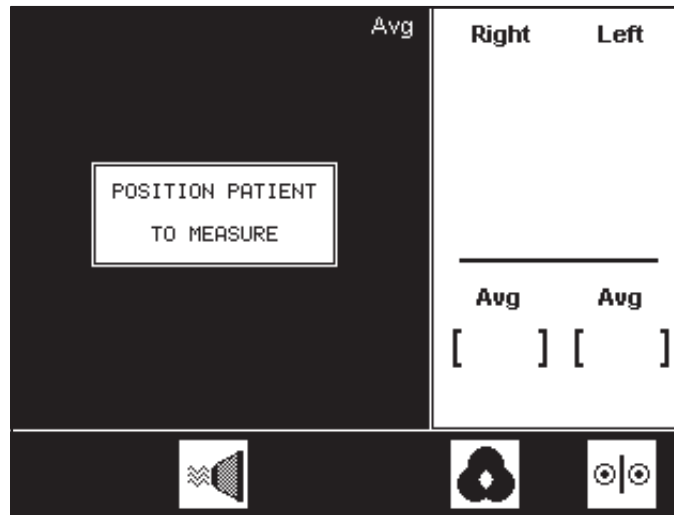
After a period of inactivity, the AT550 will go into a "sleep" mode to conserve energy, causing the screen to go blank. To reactivate the AT550, push any gray button on the control panel located below the screen.

Instructions for Use - Setup

Changing Defaults

The AT550 is shipped to you in the most frequently used configuration. These default settings can be changed using the setup function. Measurement, printer, communication and miscellaneous setting options are listed on pp. 17-20. Once changes have been made, they will remain set until further changes are made.

Follow the steps below if you wish to make changes to the default settings in your instrument:



Mode

To reach the SETUP menu, press the button below the MODE icon. The MODE icon appears on most screens. The screen will change to that shown below:



Setup

Press the button below the SETUP icon. The screen will change to that shown on the

Instructions for Use - Setup

following page:

Changing Defaults (cont.)



Up



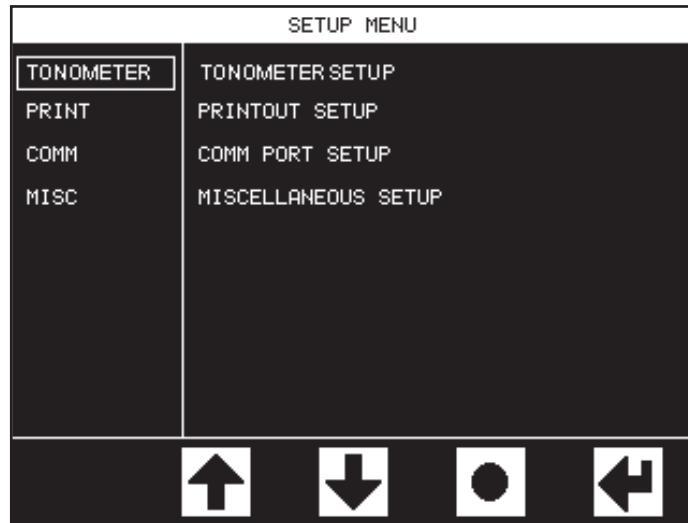
Down



Return



Select



Move to the option you want to change with the UP or DOWN arrow button, then press the SELECT button. The screen will change to show the parameters you can change within that option.

Instructions for Use - Setup



Up



Down

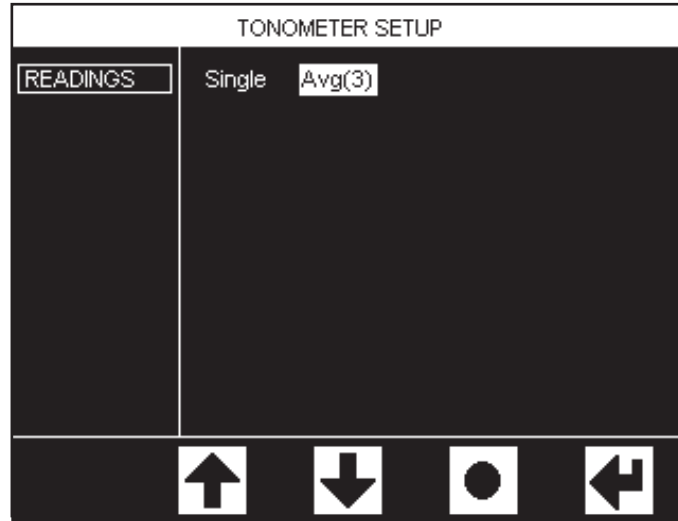


Return



Select

Changing Defaults (cont.)



How to Change Settings

- The current default settings are highlighted with a white box. To change these settings, use the UP or DOWN ARROW button to outline the option in the left column.
- Next, press the SELECT button. The highlighted setting to the right of the option will change and become outlined.
- To move to a new setting, use the LEFT or RIGHT ARROW button to outline your desired setting.
- Finally, press the SELECT button and the new setting will highlight. You have now entered a new default setting.
- To continue to a new option, use the UP or DOWN ARROW and repeat procedure above.
- To change other options, press the RETURN button. The screen will change back to the SETUP menu.

Instructions for Use - Setup



Up



Down

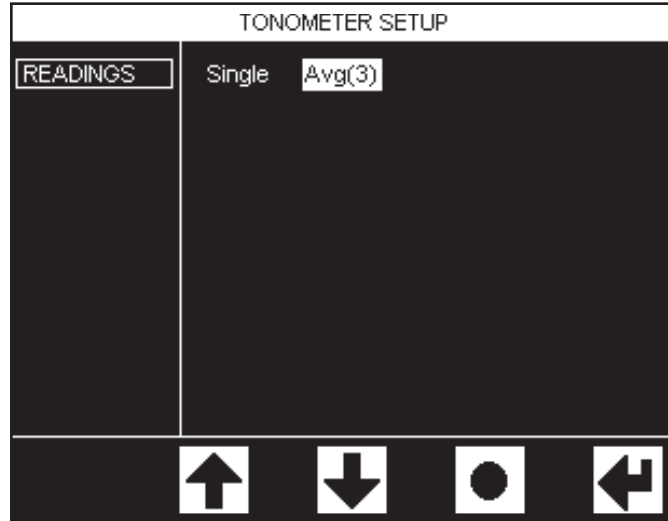


Return



Select

- To exit the SETUP menu, press the RETURN button a second time.
- Measurement Options



The following change can be made to the default settings to alter the measurement parameters:

READINGS Choose one measurement per eye (Single) or three measurements per eye with the average being shown Avg (3).

Instructions for Use - Setup



Up



Down



Return



Select

Printer Options

PRINTOUT SETUP	
DATE FMT	MDY DMY YMD
TIME FMT	AM/PM 24 HR
DATE	04/17/1999
TIME	05:22 PM
PRINTER	On Off
PRACTICE	AT550 AutoTonometer

Navigation icons: Up, Down, Select, Return

The following changes can be made to the default settings to alter the printer parameters:

DATE FMT Choose the printed format. D=Day, M=Month, Y=Year

TIME FMT Choose the time format.

DATE or
press the
Once you have selected the option to be changed, use the PLUS (+) MINUS (-) buttons to increase or decrease the numbers, then
SELECT button.

TIME Change the time following the same instructions to change the date above.

PRINTER Permits the printer to be turned on or off.

PRACTICE Change the
the
the LEFT or
Up to 30 characters can be printed at the end of the printout. characters using the PLUS and MINUS buttons to scroll through alphabet. Once you have found the letter you require, press the RIGHT arrow to move horizontally to change the next

Instructions for Use - Setup

letter to exit, press

the SELECT button.



Up



Down



Return



Select

Communication Options

COMMUNICATIONS SETUP	
BAUD	2400 4800 9600 19200
PARITY	None Odd Even
DATA BITS	7 8
STOP BITS	1 1.5 2
FLOW	None Xon/off
PRINTER	On Off

Navigation icons: Up, Down, Select, Return

The AT550 can transfer data to an external device, such as a computer, through the RS-232C serial port. Make changes to the Communications Setup settings (Baud, Parity, Data Bits, Stop Bits, Flow) to match those of the external device connected to the instrument.

Instructions for Use - Setup

PRINTER You can turn the printer off if you only want to send data to the RS-232C serial port.



Up



Down

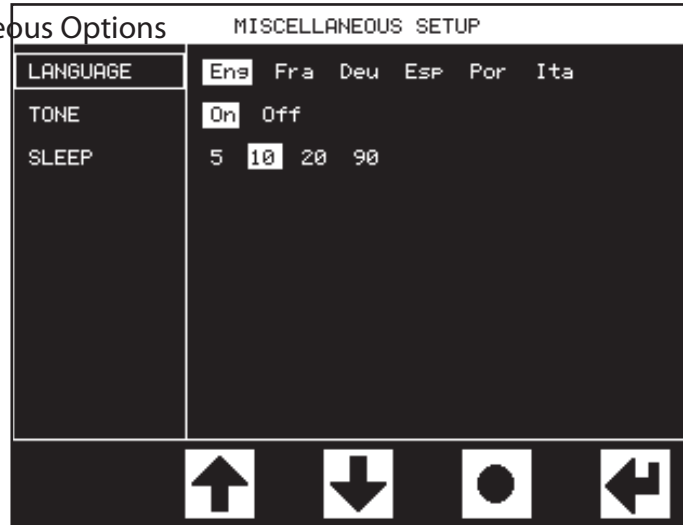


Return



Select

Miscellaneous Options



LANGUAGE Choose the language used on the user screens.

TONE Audible tone indicator can be turned on or off.

SLEEP Choose a period of inactivity: 5, 10, 20 or 90 minutes before the instrument goes to "sleep".

Instructions for Use - Operation

Patient Positioning & Alignment

The AT550 features a unique auto-alignment system that enables the instrument to align itself and follow the patient's eye movement. This innovative system makes the whole measurement process quicker and more comfortable for the patient.

- The patient should be seated comfortably on the patient side of the instrument.
- To facilitate patient alignment during the measurement process, we recommend the instrument be positioned in such a way that it encourages the patient to lean forward and slightly down onto the forehead rest. This will cause the patient to gaze slightly downward, reducing problems associated with eyelids or eyelashes during the alignment and measurement process (see Figures A & B).
- Once the patient is seated in front of the instrument, follow the instructions



Figure A - Proper
below: patient alignment

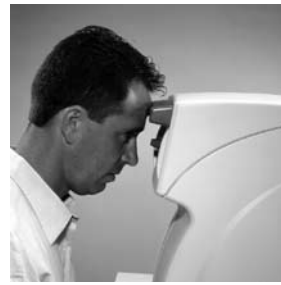


Figure B - Improper
patient alignment

1. Ask the patient to look at the end of the nosepiece and to view the green fixation light.
2. Instruct the patient to lean against the forehead rest while looking at the green fixation light.
3. Point to the side you want the patient to lean against, making sure the patient does not place his/her head in the middle of the forehead rest, because the patient will not see the fixation light properly. Once in the proper position, confirm that the patient can still see the light.

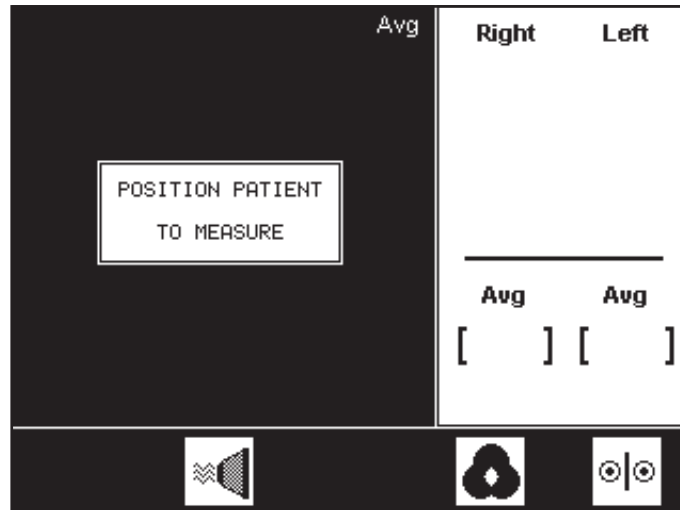
NOTE: If the patient has difficulty finding the fixation light, the patient may need to move up or down on the forehead rest.

Instructions for Use - Operation

Patient Positioning & Alignment (cont.)



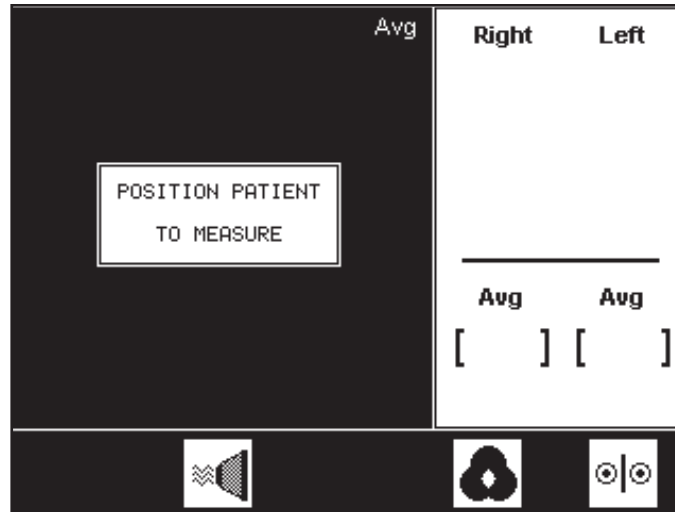
4. Ask the patient to remain as still as possible during the measurement process. Before you push the MEASURE button, ask the patient to blink and open his/her eyes.



5. Press the MEASURE button. You will hear the instrument aligning itself to the patient. Once properly aligned, a measurement will be taken.
6. If the instrument seems to have trouble acquiring the patient's eye during the measurement process (e.g., it keeps aligning but never takes a reading), it may be necessary to ask the patient to: (1) open his/her eyes wider, (2) tilt his/her head toward the instrument, or (3) both instructions.

Instructions for Use - Operation

Measurement Process

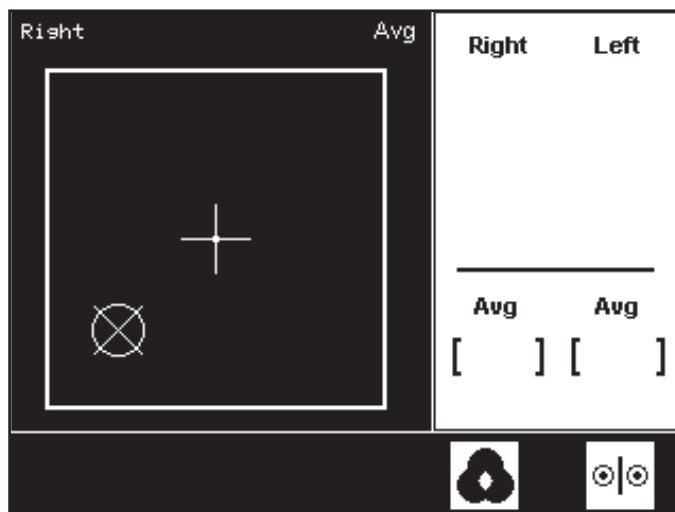


To begin the measurement process, instruct the patient to lean forward onto the forehead rest, keeping the green fixation light in view.



Once the patient is positioned comfortably, press the button below the MEASURE icon to begin the measurement process.

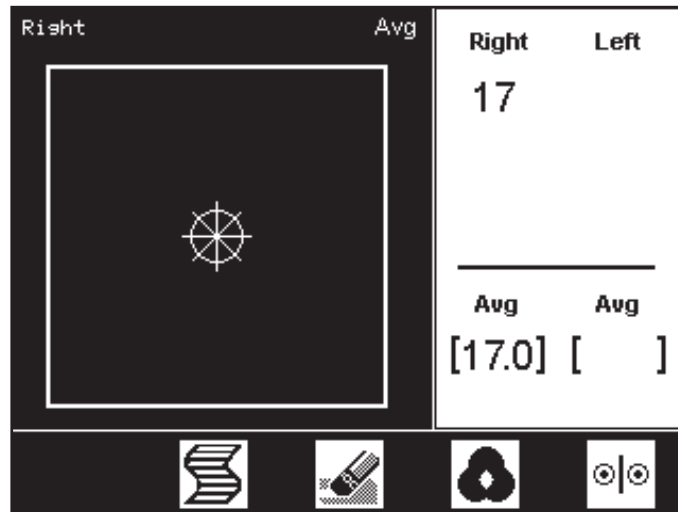
Once the measurement sequence has begun, a circular icon will appear and begin to move around the screen as the instrument aligns itself. If the instrument seems to have trouble acquiring an eye during the measurement process – e.g., it keeps aligning but never takes a reading –, it may be necessary to ask patients to: (1) open their eyes wider, (2) tilt their head in toward the instrument, or (3) both instructions.



Instructions for Use - Operation

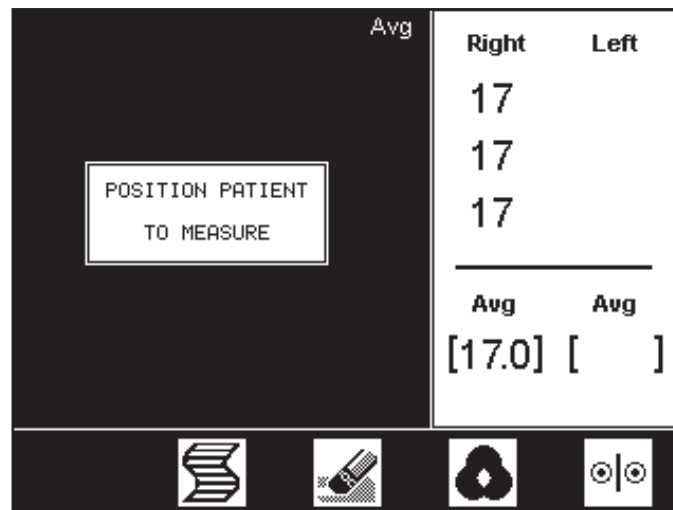
Measurement Process (cont.)

As the alignment continues, you will see the circular icon moving around the screen until it centers. At this point, the icon stops moving and a measurement is taken. The screen will change and display a reading for the eye that was measured. The screen will look similar to that shown below.



You now have several options: 1) you can take further measurements on the same eye; 2) you can take measurements of the opposite eye; 3) you can clear all the data; 4) you can print the data.

Once you have completed the measurement on one eye, the screen will look similar to that shown below. The measurement data and average value is displayed.



Instructions for Use - Operation



Measure



Print



Clear Data

Measurement Process (cont.)

To measure the opposite eye, instruct the patient to move to the opposite side of the forehead rest and view the green fixation light with their other eye. Press the button under the MEASURE icon. This will repeat the measurement process.

Avg		Right	Left
		17	17
		17	16
		17	17
Avg		Avg	Avg
		[17.0]	[16.6]

After completing a set of measurements, the screen should look similar to that shown above. Measurement data for both eyes is displayed. You can now clear all the data or print all the data. Printing the data will clear the instrument's memory. You are now ready for the next patient.

Instructions for Use - Eye Selection



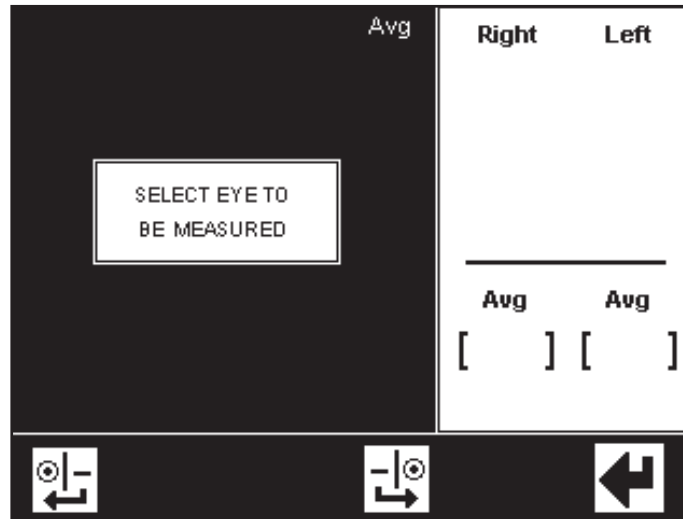
Right Eye Measurement



Left Eye Measurement

The AT550 can detect which eye is being measured automatically. This is displayed in the top left-hand corner of the screen.

If the system fails to detect which eye is being measured, the screen will change to that shown below:



To select an eye and initiate a measurement, press the button below the patient RIGHT EYE MEASURE icon or the patient LEFT EYE MEASURE icon. The measurement process will then proceed as described on pp. 23-25.

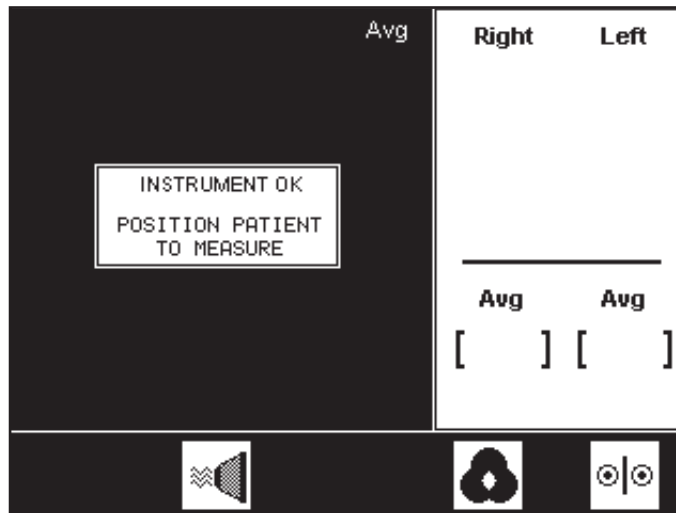
Instructions for Use - Demonstration



Demonstration

Pressing the button under the DEMO icon initiates an air puff. This can be used to demonstrate to a patient how the air puff feels.

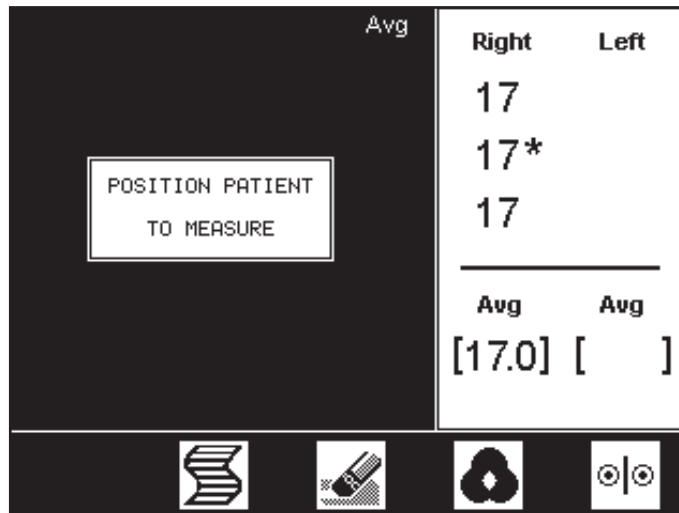
Each time the instrument is demonstrated, an internal check of the AT550's systems is conducted to ensure optimum performance of your instrument.



Instructions for Use - Low Confidence Readings

During the measurement process, the AT550 may detect a condition which could create a low confidence reading or a “flyer.”

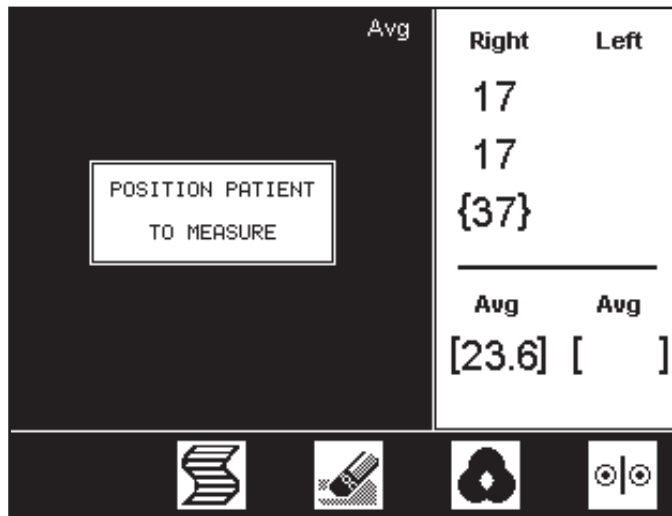
Low confidence readings can result from an untimely blink or interference from a patient’s eyelashes. These measurements are highlighted with an asterisk as shown below.



A low confidence reading is used to compute the average value. When the data is printed, the asterisk will appear on the printout. By taking a fourth measurement, the low confidence reading will be replaced automatically.

Instructions for Use - Low Confidence Readings

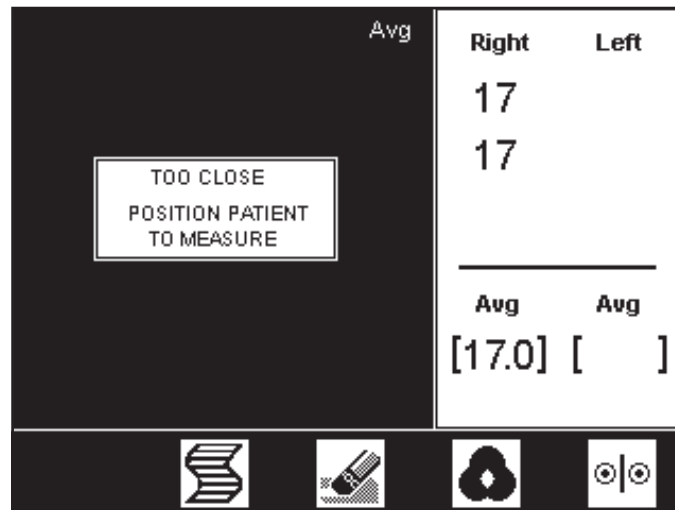
AT550 measurements are made in a few milliseconds and occur at random relative to the ocular pulse. Normal measurement fluctuation of 2 to 4 mmhg should be expected due to the cardiac-related pulse amplitude. Occasionally an erroneously high reading may appear (a "flyer"). The AT550 distinguishes these readings by putting brackets around the value, as shown on the screen below.



A "flyer" is used to compute the average, which would create an erroneously high value. By taking a fourth measurement, the AT550 will automatically replace the "flyer" value.

Instructions for Use - Too Close

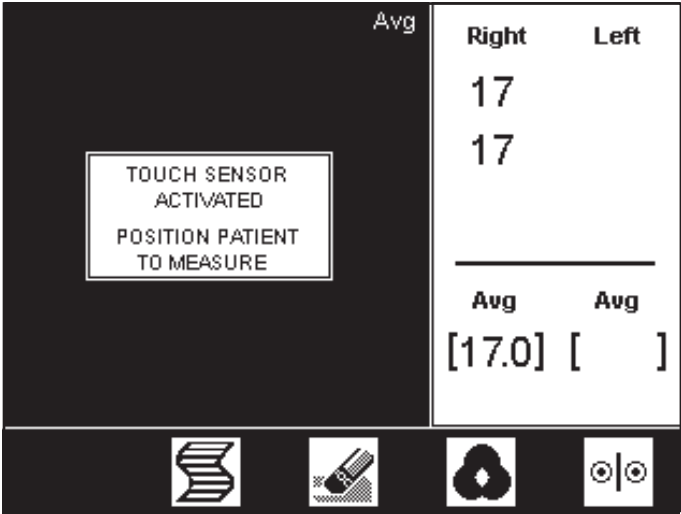
During the measurement process, the AT550 may detect a situation where the patient's eye is too close to the nosepiece. Should this occur, the instrument will back away from the patient's eye and then start aligning and measuring again. After three attempts, the instrument will back away completely, and the screen will change to that shown below.



Should this situation arise, ask the patient to move away from the instrument, then reposition the patient and proceed with the next measurement.

Instructions for Use - Touch Sensor

If a finger is placed inside the open space surrounding the AT550's nosepiece, the unit's screen will change to that shown below.



This is meant to prevent damage to the instrument and/or to prevent the possibility of causing injury to the patient. Should this situation arise, make sure the patient is not touching the AT550 anywhere near its nosepiece. The instrument will not function until the finger is removed.

Instructions for Use - Printing



Print

Printing Measurement Data

To print the measurement data, press the button below the PRINT icon.

A sample of a printout is shown below.

NAME _____				
1-31-99			12:00PM	
(R)	17	17	17	Avg 17.0
(L)	16	16	16	16.0
AT550 Auto Tonometer				



Clear Data

Clearing Data

If you decide not to make a printout, press the button under the CLEAR DATA icon. This will clear all data from the memory and the screen. The instrument is now ready for the next patient.

Instructions for Use - Help Screens



Mode



Help



Up



Down



Return

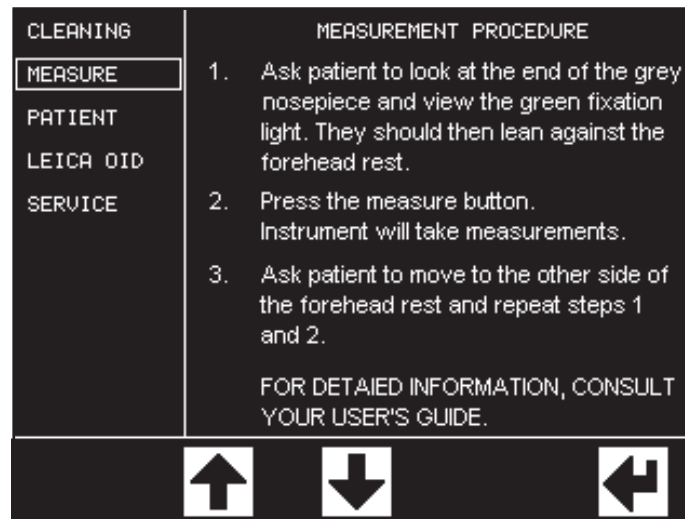
Help Screens

The AT550 includes HELP screens, which provide useful information and tips on the operation of the AT550. These screens are intended to be used as a quick reference to a selection of operations.

To access the HELP menu, press the button below the MODE icon. The screen will change and look similar to that below:



Next, press the button below the HELP icon. The screen will look similar to the one below:



The screen shows a list of subjects in the left column. To access, highlight the subject with the UP or DOWN ARROW. Once selected, the screen will change showing instructions and tips for using the AT550.

Once you have finished reading, use the RETURN icon to return to the normal operating mode.

If at any time you have questions relating to the use of the AT550, contact your local dealer

Instructions for Use - Printer Error Messages

Print-Related Errors

Change the instrument's printer paper when the screen below appears on the screen:



Instructions for changing printer paper are located on the inside of the printer door (see p. 35).

If the printer paper runs out before printing all the measurement data, the data will be stored. Once the printer paper is replaced, a complete version of all measurement data will print out.

After replacing printer paper, if you do not lower the paper release lever, the following screen will appear:



Follow the instructions on the screen.

Maintenance

or our Customer Service Department directly at (716) 686-4500.

The AT550 requires very little routine maintenance due to its advanced design. For instance, there are no bulbs or lamps to change.

If you have questions relating to maintenance, contact your local dealer or our Customer Service Department directly at (716) 686-4500.

Nosepiece

Clean the end of the nosepiece with a dry cotton swab.

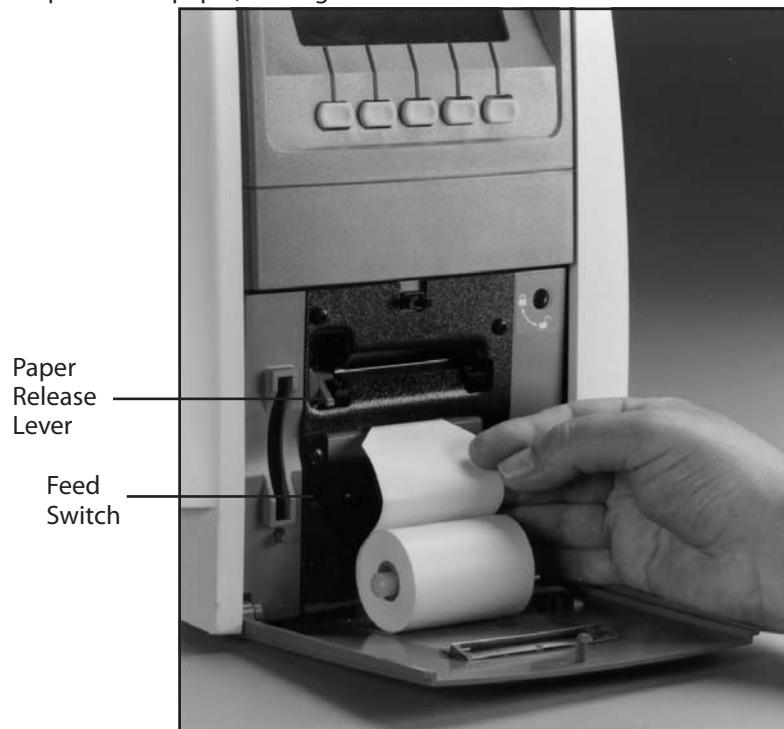
The gray nosepiece cover may be cleaned with a lightly moistened cloth.

DO NOT USE ANY LIQUIDS SUCH AS ALCOHOL OR PROPRIETARY CLEANERS.

DO NOT PUSH ANYTHING INTO THE NOSEPIECE APERTURE

Printer Paper

Instructions for changing printer paper can be found on the inside of the printer door. To order replacement thermal paper, call your local dealer and ask for replacement paper, catalog No. 12441.



RAISE PAPER RELEASE LEVER AND REMOVE USED ROLL. CUT OR TEAR (DO NOT FOLD) END OF NEW ROLL INTO A POINT. FEED INTO LOWER SLOT AS SHOWN AND LOWER PAPER RELEASE LEVER. PRESS FEED SWITCH, PAPER WILL EXIT THROUGH UPPER SLOT. ALWAYS USE THERMAL PRINTER PAPER, CATALOG NO. 12441.

Instructions found inside printer door.

Maintenance

Fuses

Fuses are located above the power inlet. (See p. 5, No. 10 for location.) Only replace fuses with T 0.315 AL 250V @ 230V and T 0.63 AL 250V @ 115V as described on the power inlet panel.

Internal fuse (F1) located on power I/O board replace with T6.3 AL 250V model number 13900 and 13901. Replacement to be performed by qualified service personnel only.

Forehead Rest

For hygienic reasons, after each patient, wipe the forehead rest with a clean cloth or with alcohol wipes.

PC Card

The PC card slot is located behind the printer door. Before removing or installing a PC card, disconnect the AT550 from the power supply and follow installation

Troubleshooting

MESSAGE/PROBLEM		REMEDY
MEASUREMENT	Instrument continually aligns — does not take reading.	Reposition patient. Position instrument away from bright lights.
PRINTER	Will not print. Paper jams in printer.	Out of paper. Printer not turned on in setup (see p. 35). See instructions on inside of printer door.
OTHER	No power. Screen blank. Clock/date incorrect. Instrument “locks up.”	Check fuses and/or power outlet. Adjust contrast control. Instrument in “sleep” mode — push any gray button. Check fuses. Check power outlet. Change settings in setup (see p. 18). Press red reset button. (See p. 5, No. 13 for location.)

If problems still persist, contact your local authorized dealer or call our Customer Service Department at (716) 686-4500.

NOTE: Circuit diagrams, component parts list descriptions and calibration instructions are available only to the appropriately qualified personnel.

Product Specifications

Non-Contact Tonometer

Height:	17 in., 43.0 cm.
Width:	9 1/2 in., 24.0 cm.
Depth:	13 1/2 in., 34.0 cm.
Weight, unpacked:	30 lbs., 13.6 kg.
Voltage	Catalog No. 13900 100V/120V Catalog No. 13901 220V/240V
Current	Model 13900 - 1.0 amp Model 13901 - 0.5 amp
Frequency	50/60 Hz
Measurement Range	0 - 60 mmhg

Transportation & Storage

This instrument can withstand the following conditions while packed for transportation or storage:

- an ambient temperature range of -40°C to + 70°C;
- a relative humidity range of 10% to 90%;
- an atmospheric pressure range of 500 kPa to 1060 kPa.

Exposure to these conditions should not exceed 15 weeks.

Disposal

This product does not generate any environmentally hazardous residues. At end of product life, follow local laws and ordinances regarding proper disposal of equipment.

Ordering Information

Accessories

Catalog	Description
12418	Instrument stand adapter mount
12441	Printer paper
13915	Power cord for low voltage installations
13916	External power supply universal input, 16 VDC out @ 0.0 to 3.12 amps Note: External power supply must be medically approved to UL2601-1, IEC60601-1 and CSA C22.2 NO. 601.1

To order, contact your local authorized Reichert dealer.

Other Reichert Products

To complement your AT550 Auto Non-Contact Tonometer, we invite you to take a look at the other products made by our company:

- Keratometer
- LENSCHEK™ Advanced Logic Lensometer®
- LongLife™ Project-O-Chart
- Selectra™ Project-O-Chart
- Phoroptor® Refracting Instrument
- XCEL® Slit Lamps
- KM250 Auto Keratometer
- AR350 Auto Refractor
- KR450 Auto Keratometer/Refractor
- PL800 Digital PD Meter
- AP250 Auto Projector

For more information, contact your local authorized Reichert dealer.

Warranty

This product is warranted by Reichert Ophthalmic Instruments, a Division of Leica Microsystems Inc. against defective material and workmanship under normal use for a period of one year from the date of invoice to the original purchaser. (An authorized dealer shall not be considered an original purchaser.) Under this warranty, Leica's sole obligation is to repair or replace the defective part or product at Reichert's discretion.

This warranty applies to new products and does not apply to a product which has been tampered with, altered in any way, misused, damaged by accident or negligence, or which has the serial number removed, altered or effaced. Nor shall this warranty be extended to a product installed or operated in a manner not in accordance with the applicable Reichert instruction manual, nor to a product which has been sold, serviced, installed or repaired other than by a Reichert factory, Technical Service Center, or authorized Reichert Ophthalmic Instrument Dealer.

Lamps, bulbs, charts, cards and other expendable items are not covered by this warranty.

All claims under this warranty must be in writing directed to the Reichert factory, Technical Service Center, or authorized instrument dealer making the original sale and must be accompanied by a copy of the purchaser's invoice.

This warranty is in lieu of all other warranties implied or expressed. All implied warranties of merchantability or fitness for a particular use are hereby disclaimed. No representative or other person is authorized to make any other obligations for Reichert. Reichert shall not be liable for any special, incidental, or consequent damages for any negligence, breach of warranty, strict liability or any other damages resulting from or relating to design, manufacture, sale, use or handling of the product.

PATENT WARRANTY

If notified promptly in writing of any action brought against the purchaser based on a claim that the instrument infringes a U.S. Patent, Reichert will defend such action at its expense and will pay costs and damages awarded in any such action, provided that Leica shall have sole control of the defense of any such action with information and assistance (at Reichert's expense) for such defense, and of all negotiation for the settlement and compromise thereof.

PRODUCT CHANGES

Reichert reserves the right to make changes in design or to make additions to or improvements in its products without obligation to add such to products previously manufactured.

CLAIMS FOR SHORTAGES

We use extreme care in selection, checking, rechecking and packing to eliminate the possibility of error. If any shipping errors are discovered:

1. Carefully go through the packing materials to be sure nothing was inadvertently overlooked when the unit was unpacked.
2. Call the dealer you purchased the product from and report the shortage. The materials are packed at the factory and none should be missing if the box has never been opened.
3. Claims should be filed within 30 days.

CLAIMS FOR DAMAGES IN TRANSIT

Our shipping responsibility ceases with the safe delivery in good condition to the transportation company. Claims for loss or damage in transit should be made promptly and directly to the transportation company.

If, upon delivery, the outside of the packing case shows evidence of rough handling or damage, the transportation company's agent should be requested to make a "Received in Bad Order" notation on the delivery receipt. If within 48 hours of delivery, concealed damage is noted upon unpacking the shipment and no exterior evidence of rough handling is apparent, the transportation company should be requested to make out a "Bad Order" report. This procedure is necessary in order for the dealer to maintain the right of recovery from the carrier.

Reichert Ophthalmic Instruments
A Division of Leica Microsystems Inc.
PO Box 123
Buffalo, New York USA 14240 0123
Telephone 716 686 4500
Fax 716 686 4545
e-mail: info@reichert.com
www.reichert.com
ISO-9001 Certified

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