ClearChart® 3P

Polarized Digital Acuity System

User's Guide



AMETEK®
ULTRA PRECISION TECHNOLOGIES

Reichert®
TECHNOLOGIES

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Caution: Federal Law restricts this device to sale by or on the order of a licensed physician. RX only.

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Warnings and Cautions

Reichert, Inc. (Reichert®) 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 is not used in accordance with this User's Guide.

WARNING: AN INSTRUCTION THAT DRAWS ATTENTION TO RISK OF INJURY OR DEATH

WARNING: UNITED STATE FEDERAL LAW AND EUROPEAN REGULATIONS REQUIRE THAT THIS DEVICE BE PURCHASED ONLY BY A PHYSICIAN OR PERSON ACTING ON BEHALF OF A PHYSICIAN.

WARNING: THIS INSTRUMENT SHOULD BE USED IN STRICT ACCORDANCE WITH THE INSTRUCTIONS OUTLINED IN THIS USER'S GUIDE. THE SAFETY OF THE OPERATOR AND PERFORMANCE OF THE INSTRUMENT CANNOT BE GUARANTEED IF USED IN A MANNER NOT SPECIFIED BY REICHERT TECHNOLOGIES.

WARNING: DO NOT REPAIR OR SERVICE THIS INSTRUMENT WITHOUT AUTHORIZATION FROM THE MANUFACTURER. ANY REPAIR OR SERVICE TO THIS INSTRUMENT MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS WHO ARE TRAINED BY REICHERT OR SERIOUS INJURY TO THE OPERATOR OR PATIENT MY OCCUR.

WARNING: MODIFICATIONS TO THIS INSTRUMENT ARE NOT ALLOWED. ANY MODIFICATION TO THIS UNIT MUST BE AUTHORIZED BY REICHERT OR SERIOUS INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

WARNING: IF THIS INSTRUMENT IS MODIFIED, APPROPRIATE INSPECTION AND TESTING MUST BE CONDUCTED TO ENSURE CONTINUED SAFE USE OF THIS INSTRUMENT.

WARNING: TO AVOID RISK OF ELECTRIC SHOCK, THIS EQUIPMENT MUST ONLY BE CONNECTED TO A SUPPLY MAINS WITH PROTECTIVE EARTH OR DAMAGE TO THIS INSTRUMENT AND/OR INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

WARNING: ENSURE THAT THE VOLTAGE APPLIED TO THE UNIT IS THE SAME AS THE VOLTAGE THAT IS INDICATED ON THE DATA PLATE OR DAMAGE TO THE UNIT MAY OCCUR.

WARNING: THIS INSTRUMENT MUST BE PLUGGED INTO AN OUTLET WITH AN EARTH GROUND. DO NOT REMOVE OR DEFEAT THE EARTH GROUND CONNECTION ON POWER INPUT CONNECTOR OR THE UNIT'S POWER CORD OF THIS INSTRUMENT OR DAMAGE TO IT AND/OR INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

WARNING: THIS INSTRUMENT IS NOT SUITABLE FOR USE IN THE PRESENCE OF FLAMMABLE ANESTHETIC MIXTURES, SUCH AS OXYGEN OR NITROUS OXIDE.

WARNING: THE EQUIPMENT OR SYSTEM SHOULD NOT BE USED ADJACENT TO OR STACKED WITH OTHER EQUIPMENT AND THAT IF ADJACENT OR STACKED USE IS NECESSARY, THE EQUIPMENT OR SYSTEM SHOULD BE OBSERVED TO VERIFY NORMAL OPERATION IN THE CONFIGURATION IN WHICH IT WILL BE USED.

WARNING: DISCONNECT POWER BEFORE ATTEMPTING TO REMOVE THE FUSES OR SERIOUS INJURY OR DEATH MAY OCCUR. REPLACE THE FUSES IN THE POWER INPUT MODULE WITH THE FUSES INDICATED IN THE SPECIFICATIONS SECTION OF THIS MANUAL.

Warnings and Cautions (Continued)

WARNING: THE REMOTE CONTROL BATTERY SHOULD ONLY BE REPLACED WITH THE BATTERY SPECIFIED IN THIS MANUAL. USE OF ANOTHER BATTERY MAY CAUSE FIRE OR AN EXPLOSION.

WARNING: DO NOT PLACE A SHORTING DEVICE BETWEEN THE BATTERY TERMINALS, OR ALLOW THE BATTERY TO BECOME WET. MISUSE OR IMPROPER DISPOSAL OF THIS BATTERY MAY CAUSE IT TO BECOME VERY HOT, IGNITE OR EXPLODE. DAMAGE TO THIS UNIT AND/OR SERIOUS PERSONAL INJURY MAY RESULT.

WARNING: DO NOT RECHARGE THE BATTERIES. THE BATTERY IS NOT DESIGNED TO BE CHARGED BY ANY ELECTRICAL SOURCE. CHARGING COULD GENERATE GAS AND INTERNAL SHORT-CIRCUITING, LEADING TO DISTORTION, LEAKAGE, OVERHEATING, EXPLOSION, OR FIRE.

WARNING: DO NOT EXPOSE THE BATTERIES TO TEMPERATURES ABOVE 60°C (140°F) DISASSEMBLE THE BATTERIES, OR DAMAGE TO THIS UNIT AND/OR SERIOUS PERSONAL INJURY MAY RESULT.

WARNING: NEVER ALLOW LIQUID LEAKING FROM THE BATTERY TO GET IN YOUR EYES OR MOUTH AS THIS LIQUID COULD CAUSE SERIOUS PERSONAL INJURY. IF IT COMES IN CONTACT WITH YOUR EYES OR MOUTH, FLUSH THEM IMMEDIATELY WITH PLENTY OF WATER AND CONSULT A PHYSICIAN.

WARNING: ALWAYS KEEP BATTERIES OUT OF THE REACH OF INFANTS AND YOUNG CHILDREN TO PREVENT THEM FROM BEING SWALLOWED. IF SWALLOWED, CONSULT A PHYSICIAN IMMEDIATELY.

WARNING: THE USE OF ACCESSORIES OR CABLES OTHER THAN THOSE SPECIFIED, WITH THE EXCEPTION OF THOSE SOLD BY THE MANUFACTURER AS REPLACEMENT PARTS FOR THE COMPONENTS, MAY RESULT IN INCREASED EMISSIONS OR DECREASED IMMUNITY OF THE EQUIPMENT OR SYSTEM.



CAUTION: AN INSTRUCTION THAT DRAWS ATTENTION TO THE RISK OF DAMAGE TO THE PRODUCT.

CAUTION: DO NOT USE SOLVENTS OR STRONG CLEANING SOLUTIONS ON ANY PART OF THIS INSTRUMENT AS DAMAGE TO THE UNIT MAY OCCUR. SEE MAINTENANCE SECTION FOR DETAILED CLEANING INSTRUCTION.

CAUTION: USE OF AMMONIA BASED CLEANERS ON THE LIQUID CRYSTAL DISPLAY (LCD) MAY CAUSE DAMAGE TO THE DISPLAY. SEE MAINTENANCE SECTION FOR DETAILED CLEANING INSTRUCTION.

CAUTION: PORTABLE AND MOBILE RF COMMUNICATIONS EQUIPMENT CAN AFFECT MEDICAL ELECTRICAL EQUIPMENT.

CAUTION: THE INTERNAL CIRCUITRY OF THE INSTRUMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (ESDS) THAT MAY BE SENSITIVE TO STATIC CHARGES PRODUCED BY THE HUMAN BODY. DO NOT REMOVE THE COVERS WITHOUT TAKING PROPER PRECAUTIONS.

Warnings and Cautions (Continued)

CAUTION: MEDICAL ELECTRONIC EQUIPMENT NEEDS SPECIAL PRECAUTIONS REGARDING EMC AND NEEDS TO BE INSTALLED AND PUT INTO SERVICE ACCORDING TO THE EMC INFORMATION PROVIDED IN THE ACCOMPANYING DOCUMENTS.

CAUTION: THIS INSTRUMENT IS NOT TO BE USED NEAR HIGH-FREQUENCY EMITTING SURGICAL EQUIPMENT.

CAUTION: THIS INSTRUMENT IS NOT INTENDED TO BE CONNECTED TO EQUIPMENT OUTSIDE THE CONTROL OF REICHERT, INC. OR MUST BE TESTED TO APPLICABLE IEC OR ISO STANDARDS.

CAUTION: DO NOT INSTALL ANY ADDITIONAL SOFTWARE OTHER THAN WHAT WAS SUPPLIED WITH THIS INSTRUMENT. INSTALLATION OF ADDITIONAL SOFTWARE MAY CAUSE UNEXPECTED OPERATION RESULTING MALFUNCTION OF THIS INSTRUMENT.

CAUTION: THE POLARIZED SCREEN CAN BE EASILY DAMAGED BY CLEANERS. USE ONLY DAMP CLOTH. DO NOT USE ALCOHOL OR AMMONIA-BASED WINDOW CLEANERS. DO NOT USE PAPER TOWELS.

Symbol Information

The following symbols appear on the instrument:



Caution symbol indicating important operating and maintenance instructions that are included in this User's Guide



Alternating Current Power



Protective Earth Connection



ON / OFF

REF

Catalog Number

SN

Serial Number



Date Of Manufacture



Waste Of Electrical And Electronic Equipment



Compliance To Medical Device Directive 93/42/Eec



Electrical Safety Compliance Mark by Intertek ETL Semko for Conformance With Electrical Standards



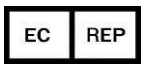
Fragile Contents In Shipping Container - Handle With Care



Keep Dry - package shall be kept away from rain.



This Way Up - indicates correct upright position of package.



Authorized Representative In European Community



Consult Instructions for Use

Introduction

Congratulations on your purchase of the ClearChart® 3P.

The ClearChart 3P is a remote controlled digital acuity system that has been designed to provide a comprehensive, versatile, and convenient system for measuring visual acuity.

This User's Guide is designed as a training and reference manual for operation, maintenance and troubleshooting. We recommend that you read it carefully prior to use and follow the instructions in the guide to ensure optimum performance of your new instrument. Properly trained eye care professionals such as ophthalmologists, optometrists, opticians and eye care technicians should operate this instrument.

Please retain the manual for future reference and to share with other users. For additional copies of this manual or questions related to the ClearChart 3P, contact your local authorized Reichert dealer or contact our Customer Service Department directly at:

Tel: 716-686-4500
Fax: 716-686-4555
E-mail: reichert.information@ametek.com

Indications for Use

The device provides images and charts, including those with letters and symbols in graduated sizes, intended for measuring visual acuity and determining patient subjective refraction.

Contraindications

None

Installation, Features, and Functions

Unpacking and Contents

Great care has been taken to deliver your ClearChart 3P to you. The packaging was specifically designed to transport his instrument. Please retain the packaging for future use in case transportation of the device is required. To remove the ClearChart 3P from its packaging:

1. Remove the boxes with accessories from the top pieces of foam in the box.
2. Remove the four top pieces of foam from the box.
3. Lift the ClearChart 3P out of the box.
4. Remove the foam wrapping from the ClearChart 3P.

There are three different catalog numbers for ClearChart 3P with unique remote controls to address the need for specific acuity notations and optotype size progressions in different parts of the world.

- P/N 13780AG ClearChart 3P and remote control P/N 13781 with Logmar Progression and Decimal Notation (Also Known as Acuity Grade per ISO standard.)
- P/N 13780SE ClearChart 3P and remote control P/N 13782 with Standard progression and Snellen notation
- P/N 13780DL and remote control P/N 13783 with Linear Decimal progression and Decimal Notation

The items listed below should be included in the ClearChart 3P packaging container:

Part Number	Description
13780	ClearChart 3P
Remote Control 13781 or… 13782 or... 13783	 Acuity Grade Remote with logMAR Progression and Decimal Notation Snellen Remote with Standard Progression and Snellen Notation Linear Decimal Remote with Linear Progression and Decimal Notation
13950000-902	Two LR3 (AAA) Batteries
Short Power Cord: RCBL10057 or… RCBL10056	 230V Power Cord, Right Angle, 61 cm (2 ft.) 115V Power Cord, Right Angle, 61 cm (2 ft.)
Long Power Cord: WBCL10027 or… WBCL10018	 230V Power Cord 3.05 m (10 ft.) 115V Power Cord 3.05 m (10 ft.)
13780-005	Wall Mount Bracket with Screws
13780-008	Polarized Glasses
13780-104	Key Card for Pigassou Optotypes
13780-105	Key Card for Sheridan Gardiner Optotypes

If any of these items are missing, please contact the Reichert Customer Service Department. Contact information can be found on the back cover of this manual.

Installation, Features, and Functions

Wall Mounting Instructions

Mount wall mounting bracket PN 13780-005 according to the instructions provided for this accessory. The instructions are enclosed in the box containing the wall mount that is packaged with the ClearChart 3P. These instructions are also summarized below in the section for "Wall Mount Package Instructions"

WARNING: IT IS IMPORTANT TO SAFELY SECURE THE EQUIPMENT. UNSECURED EQUIPMENT COULD POSSIBLY BECOME DISLODGED AND FALL, CAUSING INJURY TO EITHER THE PATIENT OR EXAMINER.

WARNING: CARE MUST BE TAKEN TO ARRANGE THE CABLES FOR THE ACCESSORIES SUCH THAT THEY DO NOT PRESENT A TRIPPING HAZARD TO THE EXAMINER OR A DANGER TO THE PATIENT.

WARNING: POSITION THE CLEARCHART 3P ON THE WALL SO THAT IT IS NOT DIFFICULT TO OPERATE THE DISCONNECTION DEVICE (PLUG).

Note: Make sure the position you choose to mount your ClearChart 3P is within the reach of a power outlet.

Direct-Throw: Your ClearChart 3P must be positioned at patient eye level directly in front of the patient. The minimum test distance is 1.8 meters (6 ft.) with a maximum test distance of 7.5 meters (24.6 ft.). Refer to the Direct Throw illustration in this section.

Mirror Arrangement: A first surface mirror is a useful space-saving device to increase the patient testing distance when the room does not permit a direct-throw arrangement. Typically, your ClearChart 3P will be positioned higher than patient eye level so that the examiner will not interfere with the patient's view of the ClearChart 3P. Arrange the ClearChart 3P and mirror so that the ClearChart 3P can be seen by the patient through the mirror. The line of sight must be perpendicular to the front of the ClearChart 3P.

1. Find an appropriate spot on the wall that will support the ClearChart 3P, which will hang from the VESA compliant Mounting Bracket. Ensure that the refraction distance meets the requirements for either Direct Throw or Mirror Arrangement.

2. Level the supplied Wall Mount Bracket and mark the holes on the wall. The mount should be installed in solid wood stud, brick or concrete wall.

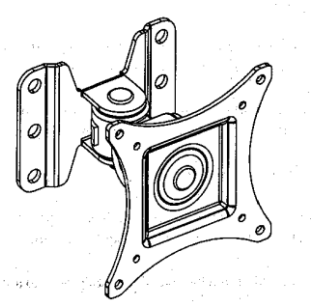
3. Follow all installation instructions enclosed in the box with the mount. These instructions are summarized below.

4. Hang the ClearChart 3P by lining-up the holes on the back of the device with the four holes on the mounting bracket. Secure the ClearChart 3P to the mounting bracket with the 4 screws provided.

Installation, Features, and Functions

Wall Mount Package Instructions

Note: Read the entire instruction sheet before you start installation and assembly.



The wall mount bracket will support a maximum weight of 15kgs (33 lbs.). The object mounted on this bracket should not exceed this weight limit.

The mount can be tilted forward or backward and rotated from side to side. The pitch range (up or down) is 90º and the side to side swivel range is 180º.

WARNING:

Do not begin the installation of the product before you read and understand the instructions and warnings contained in this installation sheet. If you have any questions regarding any of the instructions or warning please contact your local distributor.

Please refer to the installation guide recommendation for the required distance from wall to avoid risk of property damage.

This product should be installed by an experienced service technician.

Make sure the mounting surface will safely support the combined load of the equipment and all attached hardware and components.

Never exceed the maximum load capacity.

When mounting to wood wall studs make sure that the mounting screws are anchored in the center of the studs. Use of an “edge to edge” stud finder is highly recommended.

Always use assistance or mechanical lifting equipment to safely lift and position equipment.

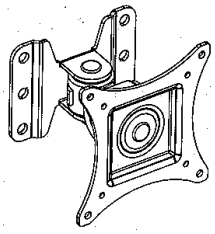
Tighten screws firmly but do not over tighten. Over tightening the screws can damage them and greatly reduce their ability to support the weight of the device.

This product is intended for indoor use only. Using this product outdoors could lead to product failure and personal injury.

Wall Mount Package Instructions (Continued)

Parts Included in the Wall Mount Kit

Make sure you have received all of the parts in the component checklist before installing the mount. If any parts are missing or faulty contact Reichert for a replacement. (Contact information is located on the back page of this User's Guide.)





M4x12 (x4)
M-A



M6x30 (x4)
M-B



iron expansion bolt (x2)
M-C



wrench (x1)
M-D

1a. Wood Stud Wall Mounting

Hardware provided is for attachment of mount in standard thickness drywall or plaster into studs. Installers are responsible to provide hardware for other types of mounting situations.

Make sure that mounting screws are anchored into the Center of the studs. Use a stud finder to locate the Center of the studs. Use of an edge to edge stud finder Is highly recommended. Based on the location of the Edges, draw a vertical line down each stud's center.

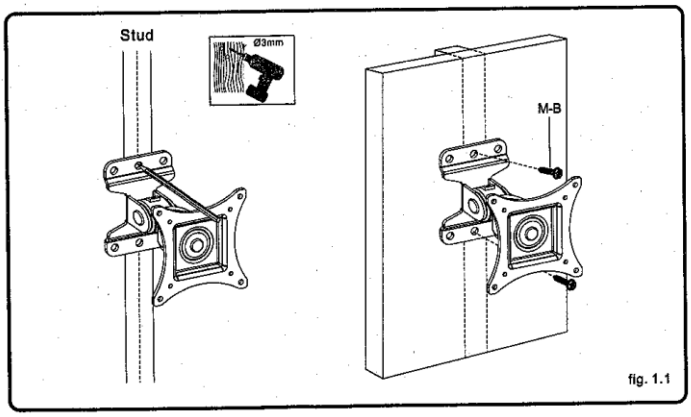


fig. 1.1

Place the wall plate on the wall as a template and mark the center of the two mounting holes. Make sure the mounting holes are on the stud centerline.

Drill two 3 mm (1/8 in.) diameter holes 30 mm (1 1/5 in.) deep. Make sure that the wall plate is level, and secure it using the screws (M-B) as shown in figure 1.1.

1b. Solid Brick and Concrete Block Mounting

WARNING: When installing wall mounts on cinder block, verify that you have a minimum of 35 mm (1 3/8 in.) of actual concrete thickness in the hole to be used for the concrete anchors. Do not drill into the mortar joints! Be sure to mount in a sold part of the block, generally 25 mm (1 in.) minimum from the side of the block. It is suggested using an electric drill on the slow setting to drill the hole instead of a hammer drill to avoid breaking out the back of the hole when entering a void or cavity.

The installer must verify that the supporting surface will safely support the combined load of the equipment and all attached hardware and components.

Wall Mount Package Instructions (Continued)

1b. Solid Brick and Concrete Block Mounting (Continued)

Use the Wall Plate as a template to mark two hole locations on the wall as show in figure 1.2.
Pre-drill these holes with a 10 mm (3/8") masonry bit to at least 35 mm (1 3/8 in.) in depth. Insert an iron expansion bolt into each of these holes. Use two iron expansion bolts (M-C) to firmly fix the wall plate. Make sure the wall plate is level as shown in figure 1.3.

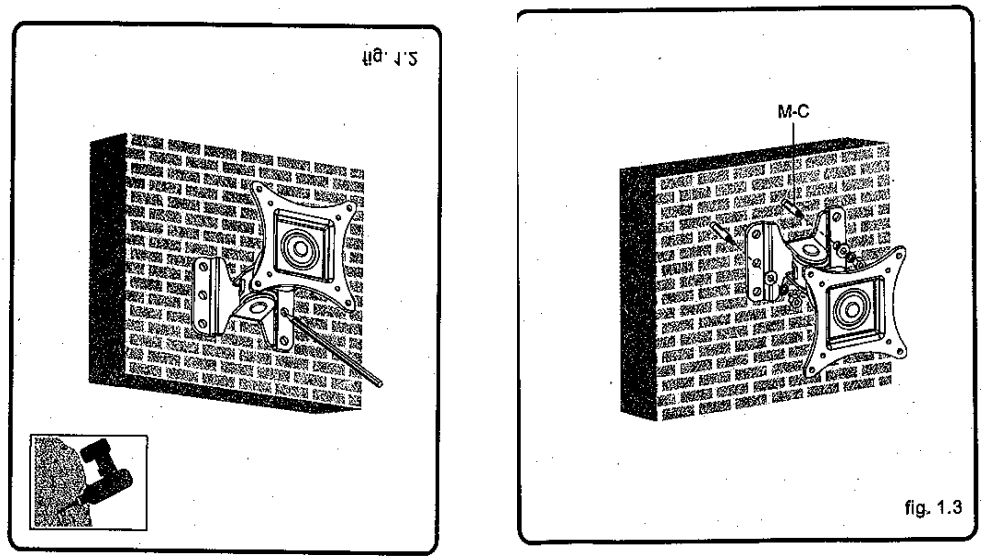


fig. 1.3

Installing ClearChart 3P

WARNING: A minimum of two qualified people are required for this operation.

Using the M-A screw, hand-thread the screw through the adapter plate into the back of the case of the ClearChart 3P as shown in figure 2.1. The screw must make at least three full turns into the mounting hole and fit snugly into place. Do not over tighten. Repeat for the remaining mounting holes. Level the plate and tighten the screws.

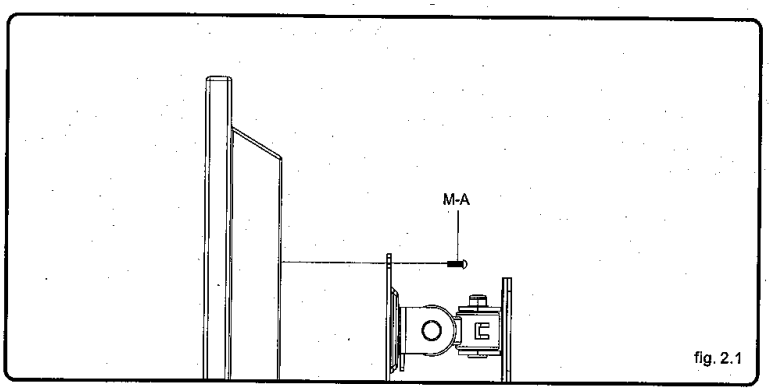


fig. 2.1

Wall Mount Package Instructions (Continued)

Pitching Angle Adjustment

Use the wrench (M-D) to adjust the ClearChart 3P to the desired angle. The mount can be adjusted upward and downward 90º and can be swiveled from side to side 180º as shown in figure 3.1.

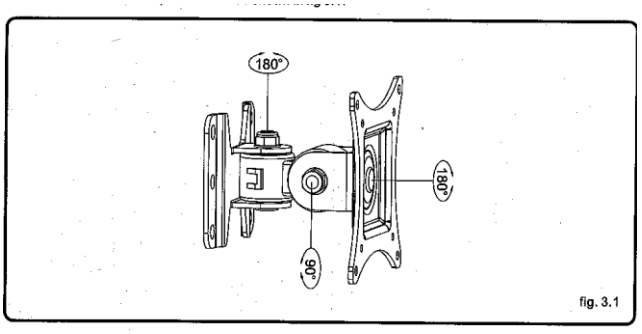


fig. 3.1

Maintenance

Once you have mounted the bracket and the ClearChart 3P, check that they are secure and safe to use. Check that the screws are fixed well every two months. If you have any concerns about the installation contact Reichert Technical Service. Contact information can be found on the back cover of this User's Guide.

Application of Input Power

1. Using the power cord provided, insert the female end into the power input receptacle located at the back of the instrument.
2. Plug the male end of the power cord into a wall outlet of the appropriate voltage. Input voltage must not exceed the range specified on the ClearChart 3P data plate.
3. Set the ON / OFF switch to ON (I).

Disconnection of Input Power

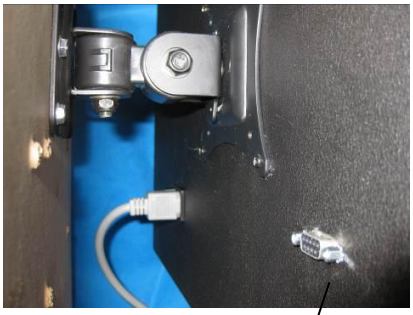
1. At any time, the power switch can be set to OFF. The unit does not have a power down sequence. To terminate operation of the ClearChart 3P, press the ON / OFF switch to the OFF position (O). If the ClearChart 3P is intended to be OFF for an extended period of time, the ClearChart 3P can be disconnected from power by detaching the power cord from the its receptacle.

2. ClearChart 3P does have a power down sequence for the display that begins after the limit of the screen saver time out period is reached. The back-light on the ClearChart 3P display will power down within 30 minutes of the screen saver time out period. The screen will appear completely dark. This power down sequence will significantly increase the life of the device. The display can be re-activated by pressing any button on the remote.

Connection with the Auto Phoroptor RS Auto Refraction System

The ClearChart 3P can be configured for bi-directional communication with the Auto Phoroptor RS automated refraction system. This can be achieved with a hard-wired serial connection or with wireless communication accessories.

Wired Connection
Wired communication between the ClearChart 3P and the Auto Phoroptor RS requires connection of a NULL modem serial cable with 9 pin male connector on one end and 9 pin female connector at the other end. The cable should be connected to the serial port on the ClearChart 3P and the serial port labeled "Projector" on the Auto Phoroptor RS Central Unit.



Serial port located at the back of the metal housing of the ClearChart 3P



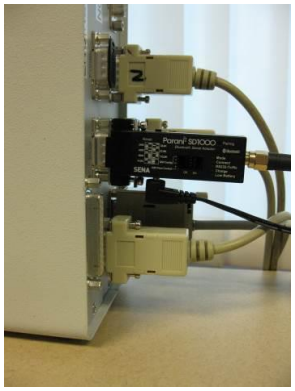
Projector port on the Auto Phoroptor RS Central Unit

Wireless Connection

Wireless connectivity between the ClearChart 3P and the Auto Phoroptor can be achieved with a set of Bluetooth® serial adapters. One serial adapter needs to be connected to the serial port on the back of the ClearChart 3P and can be powered through the USB connection on the side of the device or with a separate AC adapter.

The second serial adapter should be connected to the Projector serial port on the Auto Phoroptor RS Central Unit and powered with an adapter plugged into an outlet. Follow the instructions provided by the manufacturer of the wireless serial adapters to set the devices for the serial port configuration.



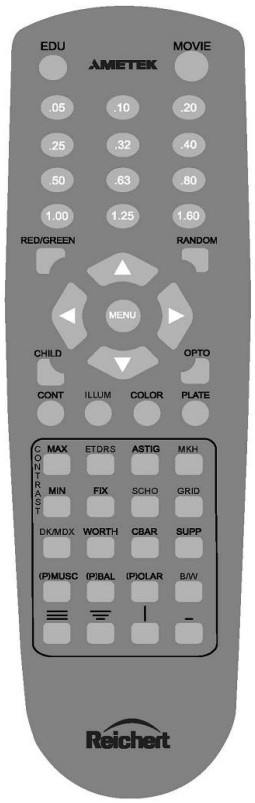


Remote Control

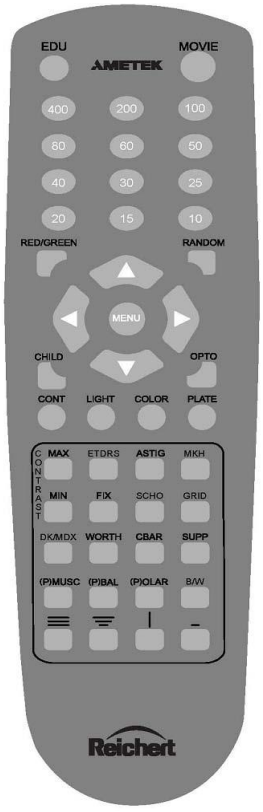
Three different configurations of the ClearChart 3P remote control are available to accommodate preferences for different optotype size progressions and different notations. The type of remote that is packaged with the ClearChart 3P depends on the catalog number of the instrument that was ordered. The numbered buttons at the top differentiate each remote control by presenting a specific optotype size progression and notation.

- ClearChart 3P P/N 13780AG Acuity Grade remote control with LogMAR Progression and Decimal Notation
- ClearChart 3P P/N 13780SE Snellen remote control with Standard progression and Snellen English Notation
- ClearChart 3P P/N 13780DL Decimal Linear with Linear progression and Decimal Notation

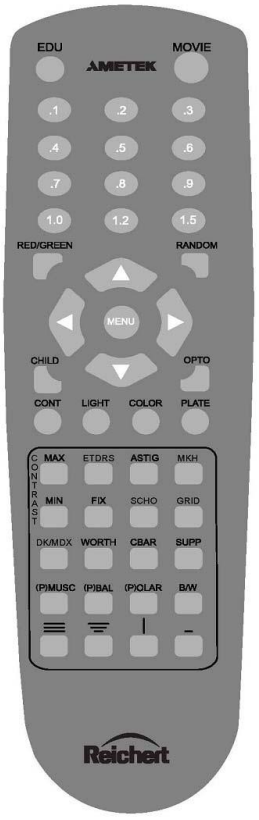
13780AG
Decimal/LogMAR



13780SE
Snellen/Standard



13780DL
Linear/Decimal



Remote Control Power

The remote control is powered by two LR3 (AAA) batteries. Batteries are included in the accessories and need to be installed in order to operate the ClearChart 3P.

1. Remove the door of the battery compartment at the back of the remote control by sliding it in the direction of the arrow.
2. Put in two LR3 (AAA) batteries in the position shown on the remote control.

Installation, Features, and Functions

Remote Control (Continued)

The remote control will operate all the test charts on your ClearChart 3P. The image and chart below indicate the functions of each button. The numbered buttons in the image below represent the Decimal/LogMAR optotype progression. The Snellen and Linear/Decimal remote controls have different numbered buttons at the top of the remote. All other button functions are the same for each remote control.

EDU – Educational Images or other imported images
MOVIE – Children's Video or other imported videos

NUMBERS – Size of Optotypes in Decimal/LogMAR, Standard/Snellen, or Decimal/Linear
RED/GREEN – Red/Green Filters for Optotypes
RANDOM – Randomize Optotypes

▲ **UP ARROW** – Function depends on test chart
► **RIGHT ARROW** – Function depends on test chart
◄ **LEFT ARROW** – Function depends on test chart
▼ **DOWN ARROW** – Function depends on test chart
MENU – Menu options and settings

CHILD – Optotypes for Children
OPTO – Change Optotype Selection

CONT – Contrast Sensitivity Testing (Sine Wave Grating)
ILLUM – Change Background Illumination
COLOR – Color Tests
PLATE – License Plate Tests (U.K. License Plate Style)

MAX – Increase Contrast
MIN – Decrease Contrast
ETDRS – ETDRS Test Charts
ASTIG – Astigmatism Test Charts
MKH – Stereo Tests

FIX – Fixation Test
SCHO – Schober Test
GRID – Cross Grid

DK/MDX – Dark Screen, Maddox Light
WORTH – Worth 4 Dot Test
CBAR – Crowding Bars
SUPP – Suppression Tests

(P)MUSC – Polarized Muscle Balance Tests
(**P)BAL** – Polarized Binocular Balance Tests
(**P)olar** – Other Polarized Charts

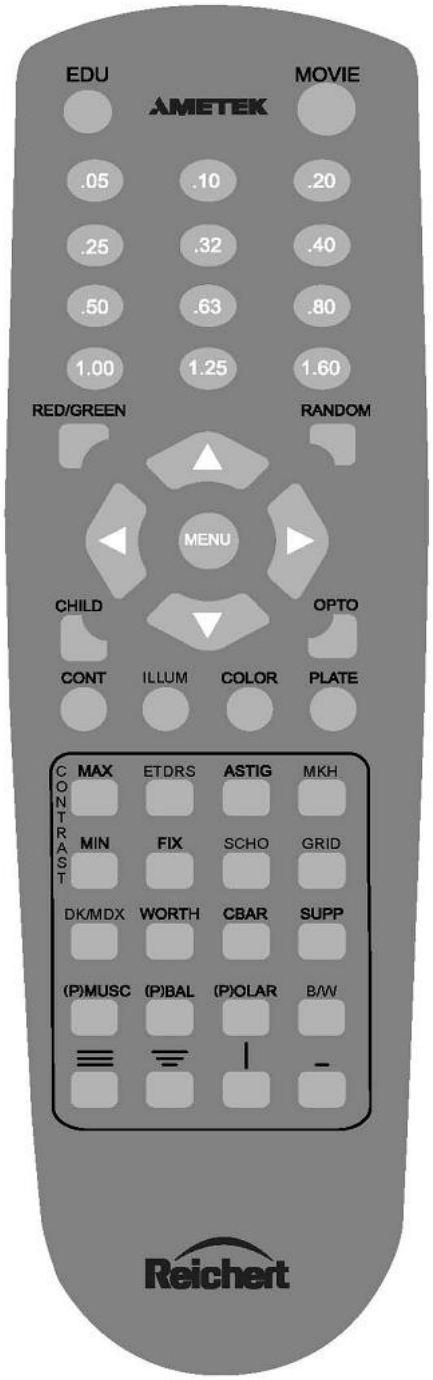
B/W – Change Contrast: White on Black, Black on White

☰ Display multiple lines of optotypes, same size

☰ Display multiple lines of optotypes, descending size

I Display a single vertical line of optotypes

– Display a single optotype



Configuring the ClearChart 3P

Press the **I** position on the ON/OFF switch located on the side of the instrument. The ClearChart 3P will boot-up. When the ClearChart 3P welcome screen appears, press the MENU button on the remote to enter the configuration mode. Use the UP and DOWN arrows to navigate through different options.

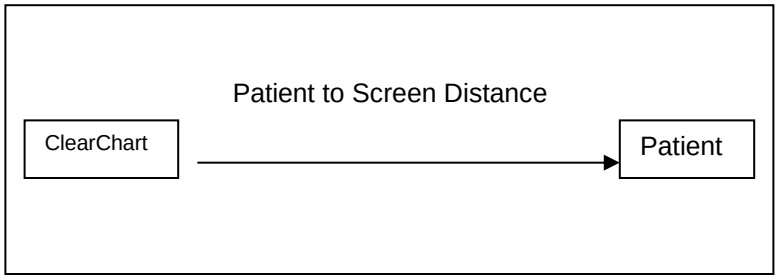
LANGUAGE

Press the RIGHT arrow button to select from English, French, Spanish, Italian, Portuguese, German and Russian. The default language is English. Press the DOWN arrow to advance to the next setting.

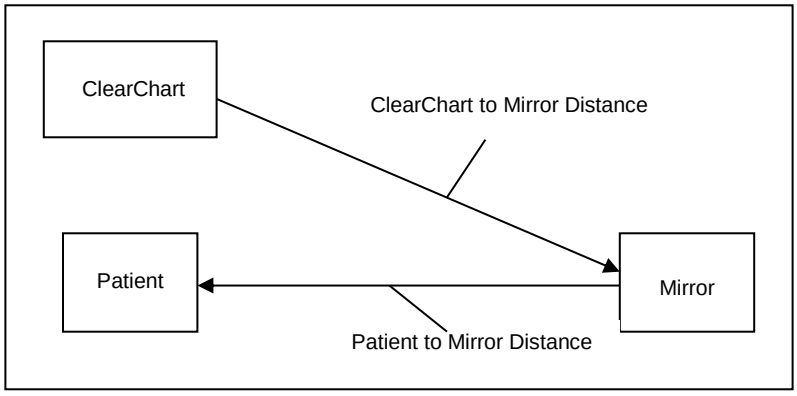
DIRECT THROW OR MIRROR SET-UP

Using the LEFT/RIGHT arrows on your remote, select DIRECT THROW or MIRRORED based on the configuration of your office. When you are finished, press the DOWN arrow.
The default is DIRECT THROW.

Direct Throw



Mirror Set Up



UNITS

Using the LEFT/RIGHT arrows on your remote, select METRIC or ENGLISH units based on which units you use to measure your refraction distance. When you are finished, press the DOWN arrow.

ACUITY NOTATION

Using the LEFT/RIGHT arrows on your remote control, select SNELLEN, METRIC, or DECIMAL for your acuity notation. When you are finished, press the DOWN arrow. The default is DECIMAL.

- Decimal - displayed as the decimal equivalent for the distance in feet / size in mm
- Snellen - displayed as distance in feet / size in mm
- Metric - displayed as distance in meters / size in mm

DISTANCE

Use the MAX and MIN buttons to adjust the testing distance from the patient's eye to the screen. The units are either centimeters or inches depending on whether you chose METRIC or ENGLISH earlier in the setup procedure. When you are finished, press the DOWN arrow. The default is 600 cm.

Note: If MIRRORED was selected in the ROOM setup category entered above, then two distances will be required. First enter the distance from the patient to the mirror, then enter the distance from the mirror to the screen. Press the DOWN arrow after each distance is entered. The defaults are 300 cm and 300 cm for mirror set-up.

OPTOTYPE LIST

Using the LEFT/RIGHT arrows on your remote, select one of the following:
- No Change
- Edit List
- Factory Defaults.

Press the DOWN arrow to select the preferred option.

The EDIT LIST option allows the user to select the Optotypes that will be readily available when pressing the OPTO button on the remote. Use the UP/DOWN arrow buttons to navigate through the list. Press the OPTO button to select or deselect the optotypes that you wish to display. An asterisk will indicate the optotypes that are activated. The order of the optotypes in the list can be changed by highlighting an optotype with the UP or DOWN arrow keys and pressing the MAX or MIN button to move the optotype up or down the list.

The optotype list includes the following:

- Sloan
- Tumbling E
- Landolt C
- O Landolt C
- HOTV
- Numbers
- 17 Letter Set
- 8 Letter Set
- Cyrillic

When you have completed your selection of optotypes press MENU to exit the optotype list.

CHILD OPTOTYPES

Using the LEFT/RIGHT arrows on your remote, select one of the following:
- No change
- Edit List
- Factory Defaults

Press the DOWN arrow to select the preferred option.

CHILD OPTOTYPES (Continued)

The EDIT LIST option allows the user to select the Child Optotypes that will be readily available when pressing the CHILD button on the remote. Use the UP/DOWN arrow buttons to navigate through the list. Use the OPTO button to select or deselect the optotypes that you wish to display. An asterisk will indicate the optotypes that are activated. The order of the optotypes in the list can be changed by highlighting an optotype with the UP or DOWN arrow keys and pressing the MAX or MIN button to move the optotype up or down the list.

The Child Optotype List includes the following:

- Kolt Type Symbols
- Children's Shapes
- Allen Symbols
- Osterberg
- Pigassou
- Sheridan Gardiner
- Lower Case Letters

When you have completed your selection of optotypes press MENU to exit the optotype list.

LINE PRESENTATION

Using the LEFT/RIGHT arrows on your remote, select the default line presentation you would like the ClearChart 3P to display. The default setting is Single Line.

Line Presentation Options:

- Single Line
- Double Same
- Double Decreasing
- Triple Same
- Triple Decreasing
- Quadruple Same
- Quadruple Decreasing
- Single Letter
- Column
- Column Uneven

When you are finished, press the DOWN arrow.

PROGRESSION

Using the LEFT/RIGHT arrows on your remote, select Standard, Decimal or LogMAR for the default size progression you would like the ClearChart 3P to display. The factory default setting is LogMAR.

Select the optotype size progression based on the version of the remote that you are using:
AG = LogMAR
SE = Standard
DL = Decimal

When you are finished, press the DOWN arrow.

DISPLAY OPTOTYPE SIZE

Using the LEFT/RIGHT arrows on your remote, select whether or not you would like the optotype size displayed on the screen at all times. Options are: Display or No Display. The default is No Display. When you are finished, press the DOWN arrow.

MAXIMUM CHARACTERS PER LINE

Using the LEFT/RIGHT arrows on your remote, select the maximum number of characters you would like displayed on any line. Options are: 1, 2, 3, 4, 5, or 6. The default is 5 characters. When you are finished, press DOWN arrow.

RED/GREEN ADJUST

Using the LEFT/RIGHT arrows on the remote, select No Change, Recalibrate or Factory Default. If you choose Recalibrate press the DOWN button to enter the adjustment mode. The R, G and B blocks on the left side of the screen are used for the Red color adjustment. To adjust red (R) use the MIN and MAX buttons to acquire the desired tone. Press the RIGHT arrow key to advance to the next color adjustment which is the green (G) tone in the red and then to the blue (B) tone in the red. The next RIGHT arrow button press will take you to the right side of the screen where the green color adjustment can be done. The R represents the red color hue in the green and the G indicates green adjust. Press the RIGHT arrow button to advance to G and use MIN and MAX to adjust green to the desired tone. Press the RIGHT arrow button to select B and adjust the blue tone in the green color if desired. Press the DOWN arrow to enable adjustment of the red tone for the suppression letters and the Worth 4 Dot chart. MIN and MAX buttons will again change the color tone. Press the RIGHT arrow to advance to G in order to adjust the green tone for the suppression letters. Use MIN and MAX buttons to adjust the color. Press the RIGHT arrow to advance to B for the blue color tone. To exit Red/Green Adjust press the DOWN arrow to re-enter the initial red/green setup screen (No Change will be displayed) and press the DOWN arrow again.

SWAP ODD/EVEN LINES

This menu setting allows for the reversal of left and right images and the direction of stereo displacement. The options using the RIGHT arrow button are “Swap” and “No Change”. This option accommodates the two different sets of polarization lenses with reversed orientation in the Auto Phoroptor RS. The default is No Change.

SCREEN SAVER

Use the MIN and MAX buttons to set the length of time of non-activity you would like to elapse before the screen saver starts. The default is 10 minutes. When you are finished, press the DOWN arrow. ClearChart 3P will initialize and then display your default optotype with your default line configuration and is ready for use.

MADDOX LIGHT ADJUSTMENT

The Maddox LED light intensity can be adjusted by accessing the default settings of the instrument. While in the start-up mode, (blue splash screen with image of the eye), press the EDU and the MENU button in sequence to access the factory default settings. Use the DOWN arrow to advance through the menu selections to reach the Brightness settings. Press the RIGHT arrow button to select Recalibrate and the DOWN arrow to display the Brightness setting screen. Use the two center buttons at the top of the remote (labeled .2 and .5 in Linear Decimal, 200 and 60 in Snellen, and .1 and .32 in Decimal LogMAR) to increase or decrease the brightness of the Maddox light. The number in the left corner of the screen indicates the brightness on a scale of 1 to 128. The default setting is 45. Press the down arrow to exit the factory default settings. CAUTION: DO NOT ADJUST THE BACKGROUND ILLUMINATION. BACKGROUND ILLUMINATION SHOULD BE ADJUSTED ONLY BY A TRAINED TECHNICIAN AND WITH THE USE OF A LIGHT METER TO VERIFY CALIBRATION OF ILLUMINATION LEVELS.

OPTOTYPES

All of the optotypes contained within the ClearChart 3P conform to the American National Standard Institute ANSI 780.21 guidelines for general purpose clinical visual acuity charts. The optotypes are constructed on a 5 x 5 matrix such that their stroke width is one-fifth of their overall size. Letter optotypes are of Letter Gothic typeface. The spacing between optotypes of the same size is equal to the width of that size optotype. The spacing between rows of descending size is equal to the width of the larger optotype.

The letters found in the Seventeen Letter set have been traditionally used in many visual acuity testing situations. This letter set consists of these letters: **A B C D E F G H K L N O P T U V Z.**

The Eight Letter set consists of these letters: **C D E K N P U Z**. The individual letters of this set have been shown to be equivalent to the Landolt 'C'. Each letter is essentially equally legible to patients. Unlike the Seventeen Letter set, no letter is easier or harder to identify than another. Since these letters can be presented in many combinations by the ClearChart 3P, the few letters in the letter set do not pose a problem of memorization.

The Sloan Letter Set consists of these letters: **C D H K N O R S V Z.**

HOTV is an additional letter set offered in the ClearChart 3P.

The **Cyrillic letters** are representative of the characters used in the Golovin-Svitsev Acuity Chart:
Ш Б М Н К Ы И

The tumbling 'E's are presented in four positions: Ε Ǝ Ш Μ

Landolt 'C's are presented in eight positions:
O Landolt C optotypes are also available.

The **number** selection includes **9 6 8 5 3** and are considered to be equally difficult to identify.

CHILD OPTOTYPES

There are several different options for Child Optotypes:

"Kolt" Symbols



The Children's Shape Symbols are four shapes similar to the Kolt symbols. As these symbols begin to blur, they are each perceived as circles.

Children's Shape Symbols



A second set of shapes for Children consists of the following five shapes. These symbols may be more easily recognized and verbalized by some children than the Kolt or Allen Symbols.

Allen Symbols



The Allen Symbols are available only up to size 0.20 (Snellen 100, Metric 6/30).

CHILD OPTOTYPES (Continued)

Pigassou

Set of 7 recognizable images with key card.



Osterberg

Set of 13 recognizable images.



Sheridan Gardiner

T U X H V O A

Seven letter set with key card.

Lower Case Letters

Set of 10 letters. Lower case letters are sometimes considered easier for children to identify.

c a x n s e r z v o

OPTOTYPE SIZE PROGRESSIONS

Optotype sizes are presented in the table below for the LogMAR , Standard and Linear/Decimal Progressions. The default progression is the LogMAR Scale and the default Notation is Decimal. The table below indicates the LogMAR Scale and the equivalent Decimal, Snellen and Snellen Metric optotypes sizes.

LogMAR Scale	Acuity Grade Decimal LogMAR	Snellen	Snellen (Metric)
-0.3	2.00	20/10	6/3.0
-0.2	1.60	20/12.5	6/3.8
-0.1	1.25	20/16	6/4.8
0.0	1.00	20/20	6/6.0
0.1	0.80	20/25	6/6.75
0.2	0.63	20/32	6/9.5
0.3	0.50	20/40	6/12
0.4	0.40	20/50	6/15
0.5	0.32	20/63	6/19
0.6	0.25	20/80	6/24
0.7	0.20	20/100	6/30
0.8	0.16	20/125	6/38
0.9	0.125	20/160	6/48
1.0	0.10	20/200	6/60
1.1	0.08	20/250	6/76
1.2	0.063	20/320	6/96
1.3	0.05	20/400	6/120

OPTOTYPE SIZE PROGRESSIONS (Continued)

The **Standard Progression** presents visual acuity sizes as Snellen fractions.

Snellen	Snellen (Decimal)	Snellen (Metric)
20/10	2.00	6/3.0
2015	1.33	6/4.5
20/20	1.00	6/6.0
20/25	0.80	6/7.5
20/30	0.667	6/9.0
20/40	0.50	6/12.0
20/50	0.40	6/15.0
20/60	0.33	6/18.0
20/70	0.286	6/21.0
20/80	0.25	6/24.0
20/100	0.20	6/30.0
20/200	0.10	6/60.0
20/400	0.05	6/120

The **Linear Decimal** progression is based on a 10/10 scale.

Linear Decimal
0.05
0.10
0.15
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.20
1.50
2.00

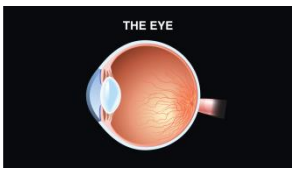
Installation, Features, and Functions

Remote Control Functions

EDU



The EDU button activates the patient education slides or any images that the user imports to an image file list.



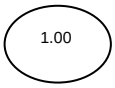
MOVIE



Pressing the MOVIE button will run an animated movie for pediatric focusing, or other videos the user may import into the device. Use the UP/DOWN arrows to adjust the volume. Press the MOVIE button a second time to exit the movie.



SIZE BUTTONS



The optotype size buttons allow the user to quickly display an optotype in a specific size. The buttons represent optotype sizes in Decimal Notation and logMAR progression when using the Acuity Grade remote. The size buttons on the Snellen remote will represent the Snellen Notation and Standard Progression. The size buttons correspond to Decimal Notation and Linear Progression when using the DL remote.

RED/GREEN



This button will initialize RED/GREEN mode. In this mode, you will be able to change optotypes, sizes, lines, and line presentation by pressing other buttons on the remote. To exit the RED/GREEN mode, simply press this button again.
Note: At larger optotype sizes, there will be a limit to how many lines can be displayed.

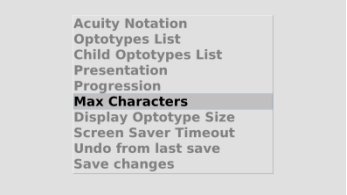




The LEFT ARROW button has multiple functions. It can be used to scroll through a sequence of optotypes (similar to randomization), display a series of charts, scroll through menu selections, and has specific functions for contrast sensitivity testing.

Remote Control Functions (Continued)

▷	The RIGHT ARROW button can be used to scroll through a sequence of optotypes (similar to randomization), display a series of charts, scroll through menu selections, and has specific functions for contrast sensitivity testing.
△	The UP Arrow is used to increase the size of the optotypes displayed, navigate through and select set-up or menu options, change the frequency of the sine waves on the Contrast Sensitivity test chart, and rotate the Astigmatic T and Astigmatic Dial.
▽	The DOWN Arrow button is used to decrease the size of the optotypes displayed, navigate through and select set-up or menu options, change the frequency of the sine waves on the Contrast Sensitivity test chart, and rotate the Astigmatic T and Astigmatic Dial.
MENU ○	The MENU button provides access to chart settings that can be changed quickly and easily. The Menu Items and Options are indicated below.



Once in the menu screen, use the UP and DOWN arrow buttons to select a menu item, and the RIGHT and LEFT arrow buttons to move through the options. Press the DOWN arrow when an option has been selected.

Select SAVE using the RIGHT arrow to save your new default preferences. Press MENU to return to the active display screen.

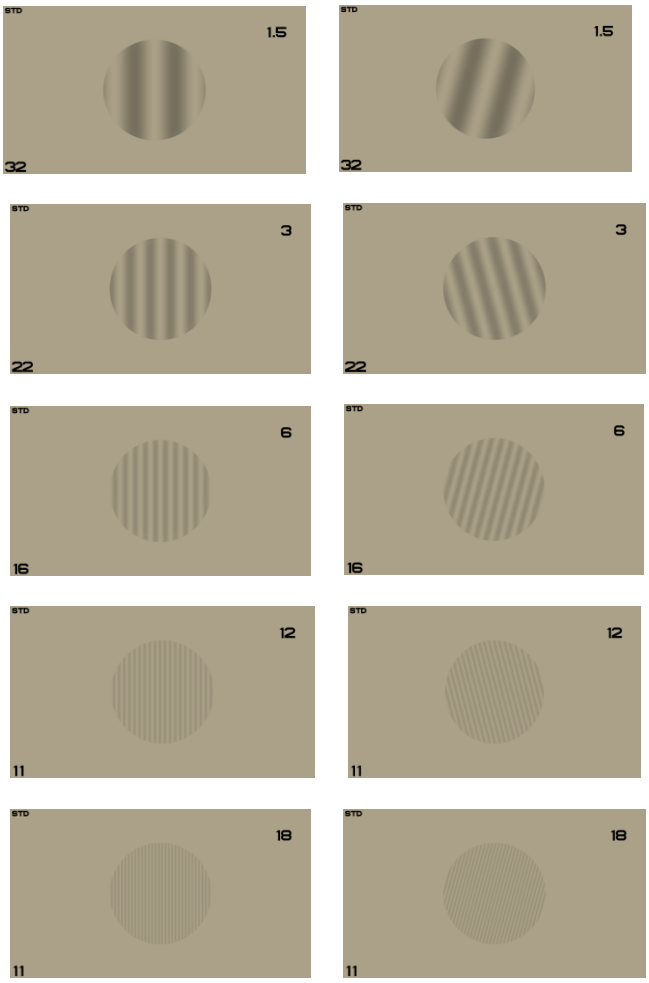
Menu Item	**Options**
1. ACUITY NOTATION	Decimal, Snellen, Metric
2. OPTOTYPES LIST	Sloan, Tumbling E, Landolt C, O Landolt C, HOTV, Numbers, 17 Letter Set, 8 Letter Set, Cyrillic
3. CHILD OPTOTYPES LIST	Kolt Type Symbols, Children's Shapes, Allen Symbols, Pigassou, Osterberg, Sheridan Gardiner, Lower Case Letters
4. PRESENTATION	Single Line, Double/Same, Double Decreasing, Triple Same, Triple Decreasing, Quadruple Same, Quadruple Decreasing, Single Letter, Column, Column Uneven

Remote Control Functions (Continued)

	Menu Item **Options** 5. PROGRESSION LogMAR, Standard, Decimal 6. MAX CHARACTERS 1, 2, 3, 4, 5, 6 7. DISPLAY OPTOTYPE SIZE No Display, Display 8. SCREEN SAVER TIMEOUT 1 TO 30 Minutes 9. UNDO FROM LAST SAVE 10. SAVE CHANGES
CHILD	The CHILD button allows the user to display different optotypes for Children. Press the button repeatedly to scroll through the optotypes selected for the CHILD OPTOTYPE LIST and choose the preferred option for the patient exam.
OPTO	The OPTO button allows the user to display different optotypes. Press the OPTO button repeatedly to scroll through the optotypes selected for the OPTOTYPE LIST and choose the preferred option for the patient exam.
CONT	The CONT button displays the sine wave grating chart for contrast sensitivity testing. This test is intended as a screening tool for patients who may have difficulty discerning contrast. The background illumination defaults to Standard (STD) or photopic at 85 cd/m². In this mode, the UP/DOWN arrows adjust the frequency of the sine wave grating. There are five different frequencies: 1.5, 3, 6, 12 and 18 cycles per degree. The number in the upper right corner displays the frequency. Level of contrast in the sine wave target can be adjusted using the MIN and MAX buttons. Contrast can be adjusted to fifteen different levels: 100, 63, 45, 32, 22, 16, 11, 7.9, 5.6, 4.0, 2.8, 2.0, 1.4, 1.0, 0.7. The lower left number displays the contrast level by percentage. RIGHT/LEFT arrow buttons can be used to rotate the image angle. Pressing the CONT button a second time exits this mode. 

Remote Control Functions (Continued)

CONT (Continued)	At each frequency, find the lowest level of contrast at which that patient can see the sine wave grating on the display. Change the direction of the target using the RIGHT/ LEFT arrow buttons and ask the patient if the sine waves are aligned straight up and down, to the right or to the left. Press the UP arrow to change the target to the next frequency.



When the lowest level of contrast seen at all five frequencies has been determined, press the UP arrow button again and a plot of a contrast sensitivity curve will appear on the display. Contrast Sensitivity is calculated using the Michaelson formula where L(max) represents the highest luminance and L(min) the lowest luminance:

$$CS = \frac{L(max) - L(min)}{L(max) + L(min)}$$

The chart will display a green line that is a reference line for a contrast sensitivity curve and a red line that plots the patient's contrast sensitivity for each sine wave frequency. The frequency and contrast sensitivity data can also be exported to a USB drive.

Remote Control Functions (Continued)

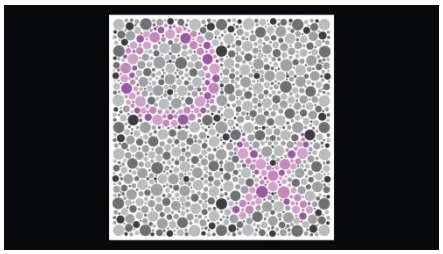
ILLUM

Pressing the ILLUM button changes the background illumination of the display. Three light levels are available for testing: Full illumination (220 cd/m²), Photopic or Standard (85 cd/m²) and Mesopic for low light testing (3 cd/m²).

COLOR

The COLOR button accesses the test charts for color vision testing. A selection of twenty four charts is available for testing color vision deficiencies. These charts are digital renderings of the American Optical H.R.R. Psuedoisochromatic Plates developed by Le Grand H. Hardy, M.D., Gertrude Rand, PH.D., and M. Catherine Rittler, B.A. in 1955. The H.R.R. images can be used as a tool to identify the need for further color vision screening. Press the RIGHT arrow button to display each chart in the sequence. Press the COLOR button again to exit the test.

The first four charts in the sequence, A, B, C and D, are demonstration plates. The fourth chart has no symbols.



The first 6 Plates separate individuals with possible color deficiencies from those with normal vision. Listed below are normal responses to the images seen on each plate.

Any errors in Plates 1 – 6 indicate possible color vision deficiencies. No further errors in Plates 7 – 20 indicate a mild defect unclassified as to type.

Plate 1	Δ X	Plate 4	X
Plate 2	o Δ	Plate 5	X o
Plate 3	o	Plate 6	o Δ

Errors in Plates 7 –11 but not in 12 – 16 indicate a mild Red/Green defect.

	Normal	Protan	Deutan
Plate 7	o Δ	o	Δ
Plate 8	Δ X	Δ	X
Plate 9	Δ X	Δ	X
Plate 10	o X	o	X
Plate 11	X o	X	o

Remote Control Functions (Continued)

COLOR (Continued)

Errors in Plates 12 –14 but not in 15 –16 indicate Medium Red/Green Defect. Errors in Plates 15 –16 indicate Strong Red/Green Defect.

	Normal	Protan	Deutan
Plate 12	Δ o	Δ	o
Plate 13	o Δ	o	Δ
Plate 14	Δ X	Δ	X
Plate 15	X o	X	o
Plate 16	o Δ	o	Δ

Errors in Plagres 17 – 18 but not in Plates 19 –12 indicate Medium Blue/Yellow defect. Errors in Plates 19 –20 indicate Strong Blue/Yellow Defect.

	Normal	Tritan	Tetartan
Plate 17	Δ X	Δ	X
Plate 18	X o	X	o
Plate 19	o Δ	o	Δ
Plate 20	Δ X	Δ	X

PLATE

The PLATE button displays images of License Plates for vision testing. The license plate images follow European standards for letters, fonts, numbers and dimensions. Press the RIGHT arrow button to display the different plate images. Press PLATE a second time to EXIT this mode.



MAX/MIN

MAX and MIN buttons are used during the initial set-up of the ClearChart 3P to enter the refracting distance and adjust red/green colors for filters and suppression tests. These buttons are also used to adjust contrast levels of the sine wave grating chart for contrast sensitivity testing, and to adjust contrast levels of optotypes.

Remote Control Functions (Continued)

ETDRS

The ETDRS button accesses optotypes with sloan letters and logmar progression that meet specific standards for ETDRS testing. Three standard ETDRS charts are available by pressing the RIGHT arrow button. The UP and DOWN arrow buttons will scroll to larger or smaller optotype sizes in the chart. Press ETDRS again to escape the chart sequence.

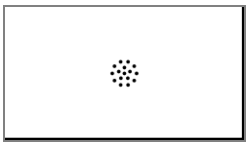






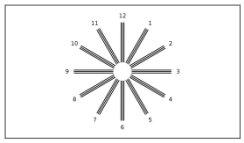
ASTIG

The ASTIG buttons displays four different charts for astigmatism testing. Pressing the RIGHT arrow button displays the charts in sequence. The clock dial and the Astigmatic T can be rotated in either direction by pressing the UP/DOWN arrow buttons. Pressing the ASTIG button again exits the astigmatism tests.









MKH

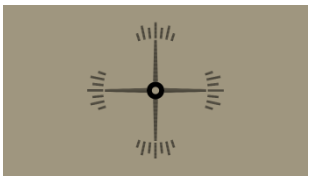
The MKH button displays a series of eleven different test charts used for phoria and stereo vision testing. Two examples of the MKH charts are presented below. Press the RIGHT arrow button to move through the sequence of charts. Press the MKH button again to exit the MKH test charts.



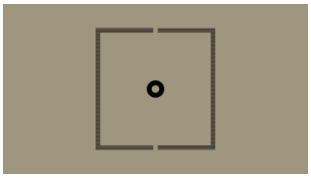
Phoria



Cyclophoria Test



Cyclophoria Test



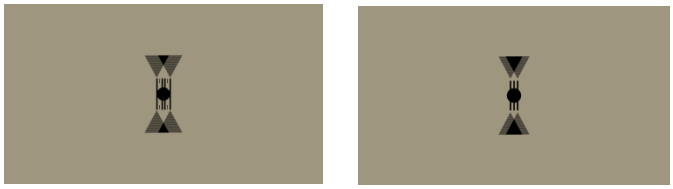
Vertical Coincidence Test

Remote Control Functions (Continued)

MKH (Cont)



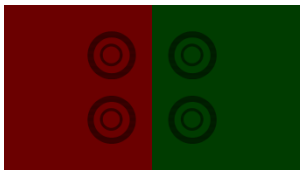
Stereo Tests



Stereo Balance Tests



Stereoscopic Vision Tests



Cowen Red/Green Balance Test

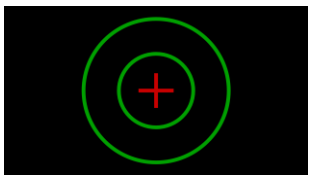
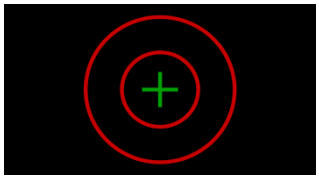
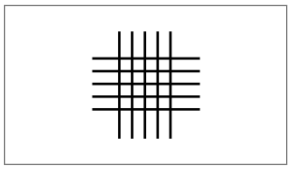
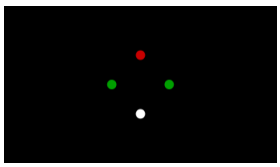
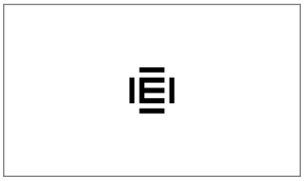
FIX

Pressing the FIX button will display a fixation dot target. Pressing the button a second time will display horizontal and vertical lines surrounding the fixation target. A third button press will exit the test. The test can also be terminated by pressing any of the buttons at the button of the remote that control the number of lines and orientation of the optotypes.



NOTE: It is possible to exit the fixation test and other chart functions that have a sequence of two charts by pressing any of the line presentation buttons at the bottom of the remote. The test charts this feature applies to are Schober, Fixation Dot and Lines, and Crowding Bars.

Remote Control Functions (Continued)

SCHO	The Schober tests for binocular balance and suppression testing can be accessed by pressing the SCHO button. Press the button once to display the first chart in the sequence and press it again to display the alternate chart. A third button press will exit the test.  
GRID	Press the GRID button to display the Cross Grid Chart. Press the button again to exit the test. 
DK/MDX	The DK/MDX button displays a dark screen. A second press of the button will illuminate the Maddox LED. Press the DK/MDX button again to exit the test. 
WORTH	The Worth 4 Dot test is used to test for suppression in the right or left eye. Press the WORTH button to display the chart. Press it again to exit. 
CBAR	The CBAR button places crowding bars around a letter optotype. A second button press moves the crowding bars closer to the optotype. Press the UP/DOWN arrows to increase or decrease the size of the optotype. Press RANDOM to change the optotype. Exit the test by pressing the CBAR button again. 

Remote Control Functions (Continued)

SUPP

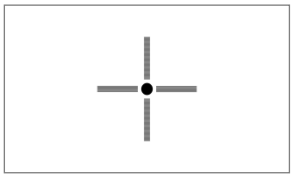
The SUPP button presents an alternative suppression test with white letters on a black background. The first button press will display a line of 5 letter optotypes with the first and last optotypes in red and green, reading from left to right. A second button press will change the position of the red and green opotytpes. Press SUPP again to exit the test.

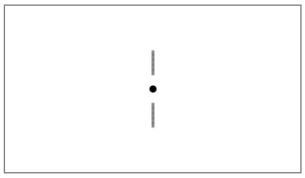


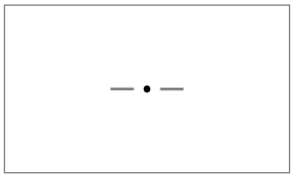


P(MUSC)

The P(MUSC) button displays three different polarized muscle balance tests. Pressing the RIGHT arrow button displays each chart. Press the P(MUSC) button to exit the series of charts.

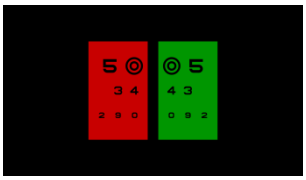




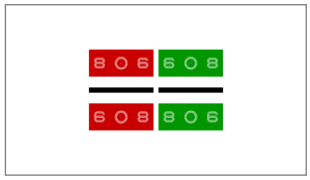


(P)BAL

The (P)BAL button accesses three different polarized binocular balance tests. Press the RIGHT arrow to display each chart. Press the (P)BAL button again will exit the chart sequence.

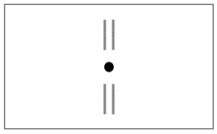




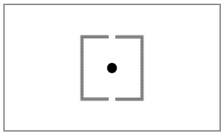


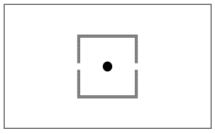
(P)OLAR

Additional polarized test charts can be displayed by pressing the (P)OLAR button. These charts include the Mallet Test and Horizontal and Vertical Coincidence Tests. Press the RIGHT arrow button to display each chart. Press the P(OLAR) button a second time to exit the chart sequence.







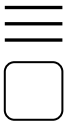


Remote Control Functions (Continued)

B/W

The B/W button reverses the contrast on the display. Press the button to toggle between black letters on a white background and white letters on a dark background.

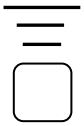




This button will present lines of the same size of optotypes. Multiple presses of this button will change the number of lines presented on the screen from one to four.

Note: At larger optotype sizes, there will be a limit to how many lines can be displayed

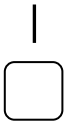




This button will present lines of optotypes descending in size. Multiple presses of this button will change the number of lines presented on the screen from one to four.

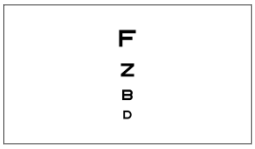
Note: At larger optotype sizes, there will be a limit to how many lines can be displayed.





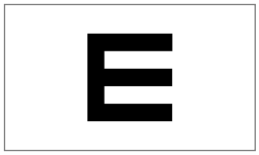
This button will present a single vertical line of optotypes. A second button press displays a single vertical line of optotypes of descending size. A third press of this button will return to the default optotype presentation.

Note: At larger optotype sizes, there will be a limit to how many lines can be displayed.





This button will present a single optotype. A second press of this button will return to the default optotype presentation.



Importing Video and Image Files

Video and Image File Feature

The ClearChart 3P Digital Acuity System currently displays seventeen different educational slides and one children's video with audio for fixation. Additional video and image files of certain formats and file sizes can be imported into the device and displayed on the screen.

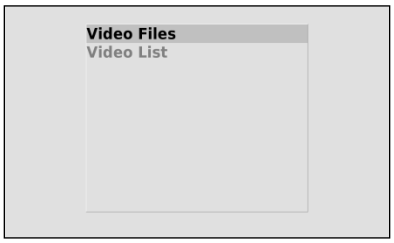
Video and Image File Parameters

ClearChart 3P can accommodate up to 13 additional image files each no greater than 1 MB in size. The image file format required is JPEG or PNG.

Up to 4 additional video files can be accommodated. The file format required is AVI, MOV, MPG or MP4 and the supported video codecs include MPEG-2, MPEG-4, MJPEG, AVC, Sony DV and Sorenson 3. The video file size should not exceed 50 MB, about 1 minute of playing time.

Importing and Accessing Video Files

With the ClearChart 3P powered on, press the MENU button on the remote. Then press the MOVIE button. Two selections will be presented on the display: Video Files and Video List.



To import a video, select "Video Files" using the right arrow button on the remote.
Insert a USB drive with the desired video file in one of the USB ports on the left side of the instrument as you are facing it. Wait several seconds and then press the ☰ button at the lower left corner of the remote control. The video file will start copying to the ClearChart 3P hard drive immediately and a message will appear on the screen: "Copying files. Please wait...."



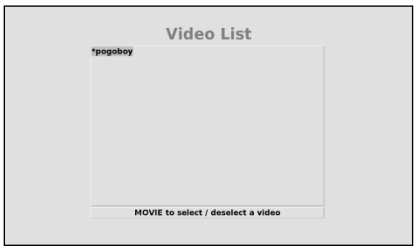
It will take several minutes to copy the video.

Once the copying is complete the "Copying files..." message will disappear from the screen.

Press the menu button to return the screen with the options of Video Files and Video List.

Importing and Accessing Video Files (Continued)

Access the Video List using the UP or DOWN arrow button and open the video list using the RIGHT arrow button. Use the UP or DOWN arrow button to highlight the video in the list you wish to play and press the MOVIE button to select it. An asterisk will appear next to the video name that was selected. The MOVIE button is used to select or deselect a video for display.



Press the MENU button to leave the video list, and press MENU again to get back to the active display. Press the MOVIE button to play the selected videos and scroll through them using the left and right arrow buttons.

Organizing Video Files

The “MAX” and “MIN” buttons on the remote can be used to move the position of a video file in the Video List. Pressing the MAX button will move a video file up in the list and the MIN button will move the video file down the list.

Deleting Video Files

Video files may be deleted by pressing the MENU and MOVIE buttons in sequence to open up the video file management display. Select “Video List” using the up/down arrow buttons and press the right arrow button to open the list. Select the video file you wish to delete using the up/down arrow buttons. Press the '—' button in the lower right corner of the remote control to delete the video file.

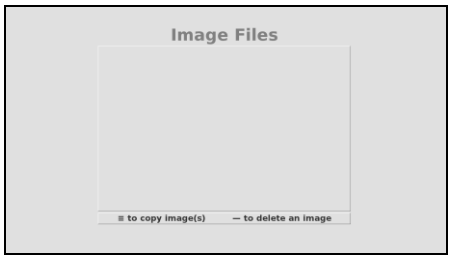
Importing and Accessing Image Files

Press the MENU button and then the EDU button. The display will indicate three options: Image Files, Image List and Screen Saver Logo.



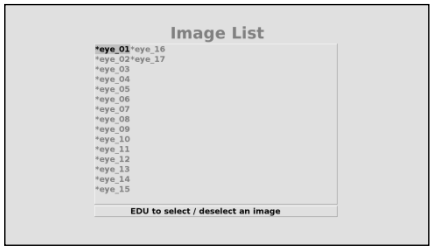
Importing and Accessing Image Files (Continued)

To import new images, select “Image Files” using the right arrow key. Insert the USB drive with the additional images into the USB port. Wait several seconds and then press the ☰ button at the lower left corner of the remote control to copy the new images to the ClearChart 3P. Image file copying takes a few minutes and is much faster than copying video files.



Press the MENU button to return to the screen with the image file management options: Image Files, Image List, Screen Saver Logo

Use the UP or DOWN arrow buttons to scroll to “Image List” and then press the right arrow to open the list. Use the up/down arrows to highlight the image file you wish to display. Press the EDU button to select or deselect an image. An asterisk will appear next to the name of the image files that have been selected for display.



Press the MENU button to leave the image files management screen.
Press MENU twice to get back to the active display.
Press the EDU button to display the selected images and scroll through them using the left and right arrow buttons.

Organizing Image Files

The “MAX” and “MIN” buttons on the remote can be used to move the position of an image file in the Image List. Pressing the MAX button will move an image file up in the list and the MIN button will move the image file down the list.

Deleting Image Files

Image files may be deleted by pressing the MENU and EDU buttons in sequence to open up the image file management display. Select “Image List” using the UP or DOWN arrow and press the RIGHT arrow button to open the list. Select the image file you wish to delete using the UP or DOWN arrow buttons. Press the '—' button in the lower right corner of the remote control to delete the image file.

Changing the Screen Saver

Insert the USB drive that contains the new screen saver logo into the USB port on the left side of the instrument. The screen saver logo file must be in JPEG format and must be named **sslogo.jpg**. Go to the image management menu using the MENU and EDU buttons and select the "Screen Saver Logo" option. Three selections, accessible with the left/right arrow buttons, will be displayed: Image Files, Image List, and Screen Saver Logo.



The "Logo" option displays the screen saver image most recently selected, whether it was a new image that was imported or the ClearChart 3P default screen saver. The "Default" selection displays the ClearChart 3P default screen saver image. The "New" option allows a new screen saver image to be imported into the device. Use the Right arrow button to scroll to the "New" option. The following message will be displayed: "Press down arrow to read logo file from USB device"

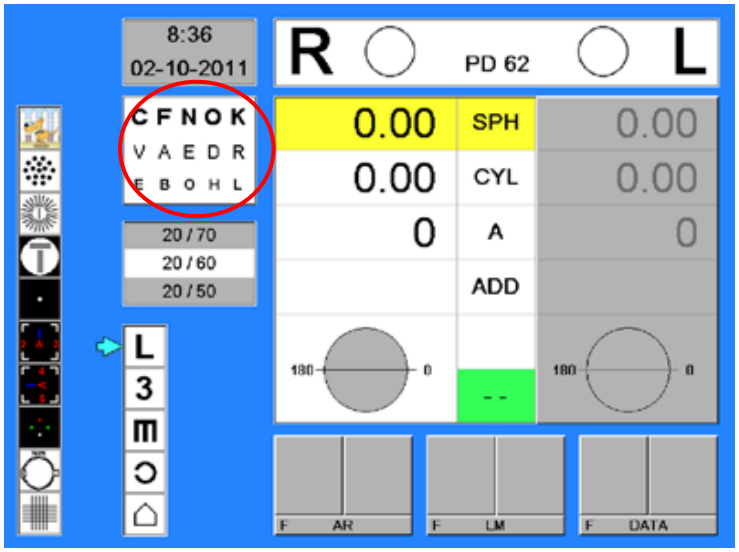


Press the DOWN arrow and the new logo image file will be copied to the hard drive of the ClearChart 3P. After copying the file, you will be returned to the image file management screen. Exit the image file management screen by pressing MENU twice. The new screen saver logo will appear on the display when the screen saver time out period is reached.

ClearChart 3P and AutoPhoroptor RS® Communication Setup

Communication between the ClearChart 3P and Auto Phoroptor RS is bi-directional, allowing for the use of either the ClearChart 3P remote or the scroll wheel on the Auto Phoroptor RS Controller to change the charts presented to the patient.

The chart displayed to the patient on the ClearChart 3P will be visible in a window on the LCD screen of the Auto Phoroptor RS Controller as shown below.



Preferred default settings for Notation (Snellen or Decimal), and size Progression (Standard or Logmar) can be selected in the ClearChart 3P menu using the remote control (refer to Configuring the ClearChart 3P section in this manual). The Auto Phoroptor will recognize and respond to those settings.

Communication between the ClearChart 3P and the Auto Phoroptor RS is immediate once both instruments have been powered on after either a hard wired or wireless connection has been established.

Note: If the Auto Phoroptor RS has established communication with the ClearChart 3P and the ClearChart 3P is turned off and then rebooted, a signal must be sent to the Auto Phoroptor RS to initialize communication between the two instruments. This can be accomplished by pressing the “C” button twice on the Controller of the Auto Phoroptor RS to clear the refraction data and reset the instrument to its default settings. Make sure that any refraction data you need are saved before resetting the instrument.

Optotype Selection

The Auto Phoroptor RS interface includes optotype selections for letters, numbers, tumbling “Es”, Landolt “Cs”, and Child Charts. The optotypes can be changed using the scroll wheel on the Auto Phoroptor RS controller or by using the ClearChart 3P remote.

The Auto Phoroptor RS will accommodate either Snellen or Decimal optotype notation. All available letter sets including the 17 letter set, 8 letter set, Sloan, HOTV and Cyrillic can be displayed by selecting Letter Optotypes with the scroll wheel, and scrolling through all five selections. All Child charts can also be displayed with the Auto Phoroptor interface by selecting Child Charts and scrolling through the options including Osterberg, Pigassou, Reichert Children’s Shapes, Allen Symbols, Kolt-like Symbols, Lower Case Letters, and Sheridan Gardiner.

Optotype size can be changed using the up and down Acuity keys on the Auto Phoroptor RS Controller, or with the remote control using the size buttons or up and down arrows. Red/Green filters can also be applied using either the Auto Phoroptor RS controller or the ClearChart 3P remote control.



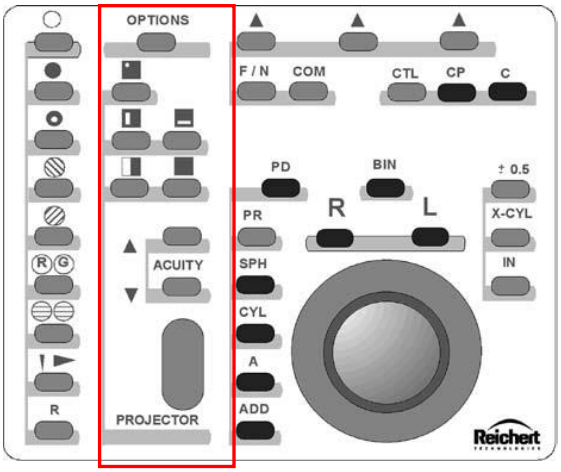
Numbers

Letter Optotypes

Child Charts

Tumbling E

Landolt C



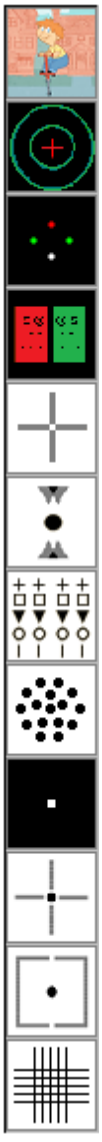
Optotypes can be randomized on the Auto Phoroptor RS interface by repeatedly pressing the filter keys that control presentation of the optotypes (single, horizontal line, vertical line and multiple lines). Refer to the Auto Phoroptor RS User’s Guide for details of the controls.

Special Test Charts

Most of the special test charts can be accessed on the Auto Phoroptor RS Controller interface. Worth 4, Suppression Letters and Schober Charts will activate the Red/Green Lenses. Polarized Charts will initiate the polarized lenses. The Cross Grid chart brings in the fused cross cylinder lenses. The Maddox light will present the Maddox lenses. (Note: The Maddox light can be turned on with the Auto Phoroptor Controller by pressing the CTL and Acuity Down arrow buttons on the Auto Phoroptor RS Controller twice, in sequence, or scrolling to the Cross Grid Test, then scrolling through Dark Screen to the Maddox light.)

Tests that cannot be activated from the Auto Phoroptor RS interface are Contrast Sensitivity, ETDRS Charts and Crowding Bars. If these charts are displayed using the ClearChart 3P remote, the window that displays the charts on the Auto Phoroptor RS controller LCD will be blank.

ClearChart 3P Test Charts Accessible in the Auto Phoroptor RS Interface



Children's Movie

Schober

Worth 4 and Letter Suppression Tests

Red/Green Tests and Polarized Binocular Balance Tests

MKH Chart Sequence – Fusion and Phoria Tests

MKH Chart Sequence – Stereo Tests

MKH Chart Sequence – Stereo Tests and Cowen

Astigmatism Tests

Fixation Dot and Fixation Dot with Lines

Polarized Muscle Balance Tests

Additional Polarized Charts

Cross Grid Test (Activates Fused Cross Cylinder Lenses), Dark Screen, Maddox Light

Cleaning & Maintenance

Cleaning ClearChart 3P

Use a lint-free, soft cloth lightly damped with water to clean the ClearChart 3P screen and the unit. Cleaning of the ClearChart 3P should be performed when the screen has contaminants on it or when visually, there is dust accumulation on the instrument.

CAUTION: THE POLARIZED SCREEN CAN BE EASILY DAMAGED BY CLEANERS. USE ONLY DAMP CLOTH. DO NOT USE ALCOHOL OR AMMONIA-BASED WINDOW CLEANERS. DO NOT USE PAPER TOWELS.

Maintenance

The ClearChart 3P instrument is maintenance free. It is designed with no moving parts or internal batteries to replace or repair.

Replace the two LR3 (AAA) batteries on the remote control as needed by removing the door of the battery compartment at the back of the remote control by sliding it in the direction of the arrow.

Fuse Replacement

WARNING: DISCONNECT POWER BEFORE ATTEMPTING TO REMOVE THE FUSES OR SERIOUS INJURY OR DEATH MAY OCCUR. REPLACE THE FUSES IN THE POWER INPUT MODULE WITH THE FUSES INDICATED IN THE SPECIFICATIONS SECTION OF THIS MANUAL.

1. Remove input power to the instrument and press down on the tab in the middle of the Power Input Module to release the Fuse Holder.
2. Pull the fuse holder out of the input module.
3. Install new fuses that are indicated in the Specifications section of this manual into the Fuse Holder.
4. Push the Fuse Holder into the Power Input Module until it snaps into place.

Specifications

Catalog Number 13780

Physical Dimensions
Size: Weight, unpacked: 4.6 kg (11.6 lbs.)
Height: 38.8 cm (14.9 in.)
Width: 60.5 cm (23.8 in.)
Depth: 7.7 cm (3.1 in.)

Electrical
Voltage: 100 - 240 volts AC 50/60 Hz
Power Usage: 50 VA
Fuse: (T2.5AL), 2.5A 250V 5 X 20 mm

Operational Conditions
Environmental:
The environmental conditions are as follows:

Operating:
Temperature 10° C (50° F) to 35° C (95° F)
Relative Humidity: 30% to 75% (non-condensing)
Atmospheric Pressure: 80 (23.6 in. Hg) to
106 kPa (31.3 in. Hg)

Transportation & Storage:
Temperature -20° C (-4° F) to +50° C (122° F).
Relative Humidity: 10% to 90% (non-condensing)
Atmospheric Pressure: 70 (20.7 in. Hg) to
106 kPa (31.3 in. Hg)

Disposal

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

Software Revision

The software revision can be obtained by contacting Reichert, Inc. or can be viewed during the boot-up process on the Reichert splash screen. The serial number identifies the manufacture date and will provide access to the Software version.

Specifications (Continued)

Classifications

The ClearChart 3P is classified as Class I electrical equipment. Class I electrical equipment provides additional protection against electrical shock beyond basic insulation. The device has no patient contact and is classified as Type B equipment per IEC 60601-1 which provides an adequate degree of protection against electrical shock, particularly regarding allowable leakage currents and reliability of the protective earth connection. (No applied parts per the noted standards.)

The ClearChart 3P is classified as IPX0 Equipment. IPX0 equipment is equipment enclosed without protection against ingress of water. According to the mode of operation, the ClearChart 3P is a continuous operation instrument.

Guidance & Manufacturer's Declarations

Table 201 – Guidance and Manufacturer's Declaration

Electromagnetic Emissions

All Equipment and Systems

Guidance and Manufacturer's Declaration – Electromagnetic Emissions

The ClearChart 3P is intended for use in the electromagnetic environment specified below. The customer or user of the ClearChart 3P should ensure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment - Guidance -
RF Emissions CISPR 11	Group 1 Class B	The ClearChart 3P uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
Harmonics IEC 61000-3-2	Class A	The ClearChart 3P is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies building for domestic power.
Flicker IEC 61000-3-3	Complies	

Table 202 – Guidance and Manufacturer's Declaration

Electromagnetic Immunity

All Equipment and Systems

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The ClearChart 3P is suitable for use in all establishments and is intended for use in the electromagnetic environment specified below. The customer or user of the ClearChart 3P should ensure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment** - Guidance
ESD IEC 61000-4-2	±6kV Contact ±8kV Air	±6kV Contact ±8kV Air	Floors should be wood, concrete or ceramic tile. If floors are synthetic, the R/H should be at least 30%.
EFT IEC 61000-4-4	±2kV Mains ±1kV I/Os	±2kV Mains ±1kV I/Os	Mains power quality should be that of a typical residential, commercial or hospital environment.
Surge IEC 61000-4-5	±1kV Differential ±2kV Common	±1kV Differential ±2kV Common	Mains power quality should be that of a typical residential, commercial or hospital environment.
Voltage Dips/Dropout IEC 61000-4-11	>95% Dip for 0.5 Cycle 60% Dip for 5 Cycles 30% Dip for 25 Cycles >95% Dip for 5 Seconds	>95% Dip for 0.5 Cycle 60% Dip for 5 Cycles 30% Dip for 25 Cycles >95% Dip for 5 Seconds	Mains power quality should be that of a typical residential, commercial or hospital environment. If the user of the ClearChart 3P requires continued operation during power mains interruptions, it is recommended that the ClearChart 3P be powered from an uninterruptible power supply or battery.
Power Frequency 50/60Hz Magnetic Field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be that of a typical residential, commercial or hospital environment.

Guidance & Manufacturer's Declarations (Continued)

Table 203 – Guidance and Manufacturer's Declaration
ELECTROMAGNETIC IMMUNITY
Equipment and Systems that are NOT Life-supporting

Guidance and Manufacturer's Declaration – Electromagnetic Immunity

The ClearChart 3P is intended for use in the electromagnetic environment specified below. The customer or user of the ClearChart 3Pshould ensure that it is used in such an environment.

Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment** - Guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	(E1) = 3 V/m	Portable and mobile RF communications equipment should be no closer to any part of the ClearChart 3P including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended Separation Distance: d=(3.5/V1)(Sqrt P) d=(3.5/E1)(Sqrt P) 80 to 800 MHz d=(7/E1)(Sqrt P) 800 MHz to 2.5 GHz Where P is the max output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed transmitters, as determined by an electromagnetic site survey, should be less than the compliance levels (V1 and E1). Interference may occur in the vicinity of equipment containing a transmitter or market with the following Symbol:
Radiated RF IEC 61000-4-3	80 MHz to 2.5 GHz @ 3V/m	(E1) = 3 V/m	

Note 1: At 80 MHz and 800 MHz, the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

* Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. The measured field strength in the location in which the ME Equipment or ME System should be observed to verify normal operation. If abnormal performance is observed, additional measures many be necessary, such as re-orienting or relocating the ME Equipment or ME System.

* Over the frequency range 150 kHz to 80 MHz, field strengths should be less then [V1] V/m.

Table 204 – Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the ClearChart 3P for ME Equipment and ME Systems that are NOT Life-supporting.

Guidance and Manufacturer's Declaration - Electromagnetic Immunity

Recommended Separation Distances for between Portable and Mobile RF Communications Equipment and the ClearChart 3P

The ClearChart 3P is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the ClearChart 3P can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF Communications Equipment and the ClearChart 3P as recommended below, according to the maximum output power of the communications equipment.

Max Output Power of Transmitter (W)	**Separation (m) 150kHz to 80 MHz** d=(3.5/V1)(Sqrt P)	**Separation (m) 80 to 800 MHz** d=(3.5/E1)(Sqrt P)	**Separation (m) 800MHz to 2.5GHz** d=(7/E1)(Sqrt P)
0.01	0.1166	0.1166	0.2333
0.1	0.3689	0.3689	0.7378
1	1.1666	1.1666	2.3333
10	3.6893	3.6893	7.3786
100	11.6666	11.6666	23.3333

Warranty

This product is warranted by Reichert Technologies® (herein after referred to as Reichert) against defective material and workmanship under normal use for a period of two years from the date of invoice to the original purchaser. (An authorized dealer shall not be considered an original purchaser.) Under this warranty, Reichert'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 that has been tampered with, altered in any way, misused, damaged by accident or negligence, or which has had 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 Dealer.

Lamps, bulbs, charts, cards and other expendable items are not covered by this warranty. All claims under this warranty must be in writing and 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 Reichert 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 must be filed within 30 days of purchase.

Warranty

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.

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