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You can read the recommendations in the user guide, the technical guide or the installation guide for PENTAX TOTAL STATION R-300X. You'll find the answers to all your questions on the PENTAX TOTAL STATION R-300X in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual PENTAX TOTAL STATION R-300X
User guide PENTAX TOTAL STATION R-300X
Operating instructions PENTAX TOTAL STATION R-300X
Instructions for use PENTAX TOTAL STATION R-300X
Instruction manual PENTAX TOTAL STATION R-300X

TOTAL STATION **R-300X** SERIES

INSTRUCTION MANUAL

FOR R-300X SERIES BASIC

R-315EX	R-315NX
R-325EX	R-325NX
R-335EX	R-335NX
R-322EX	R-322NX
R-323EX	R-323NX
R-326EX	



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Manual abstract:

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PRECAUTIONS REGARDING SAFETY Safety precautions (Must be followed) The following items are intended to prevent possible injury to the user or other people and/or damage to the instrument before it occurs. These safety precautions are important to the safe operation of this product and should be observed at all times. Distinctive displays The following displays are used to distinguish precautions by the degree of injury or damage that may result if the precaution is ignored. **WARNING** Items indicated by this display are precautions which if ignored would result in serious injury. **CAUTION** Items indicated by this display are precautions which if ignored may result in injury or material.

- Here "injury" refers to injuries such as cuts, burns or electric shock the treatment of which will not likely require hospitalization or long-term attention.
- "Material damage" refers to damage to facilities, buildings, acquired data, etc. Before using this product, be sure that you have thoroughly read and understood this instruction manual to ensure proper operation. © © © © © © They are 1. Basic Procedures, 2.

Power Topo Lite Operating Procedures 3 **PRECAUTIONS REGARDING SAFETY** **WARNING** Do not stare into the laser beam directly as this may result in damage to your eyes. R-300X is a Class II Laser product. (The reflectorless type is a Class IIIa (3R) laser product.) Do not look into the laser radiation aperture directly as this may result in damage to your eyes. Never use the telescope to view intense light such as direct sunlight or sunlight reflected through a prism as this may result in loss of sight.

Do not disassemble, modify or repair this product as there is a risk of laser radiation. Do not aim the laser beam at a person as it is harmful to the eyes and body. Receive the examination treatment by the doctor when the eyesight or body trouble is doubted by any chance. · **Electro-Magnetic Compatibility (EMC):** © © © · Do not use this product in a coal mine, in a location where there is coal dust, or near flammable material as there is a risk of explosion. · Do not disassemble, modify or repair this product as there is a risk of fire, electric shock and burn injury. If you think the product requires repair, contact the retail outlet where you purchased it or an authorized repair site. · Only use the BC03 battery charger intended for this product as the battery charger. Use of another battery charger entails a risk of fire or burn injury from the battery bursting into flames due to possible differences in voltage or polarity. · Do not use a damaged electric cord plug or loose electric outlet when charging as there is a risk of fire or electric shock. · Do not charge the battery while covered by clothes or similar item as there is a risk of fire if the clothes ignite.

- Do not use the battery or charger when wet as there is a risk of fire and burn injury due to short-circuit. · To prevent making short-circuit when removing the battery and charger from the case and storing them, apply electrically resistant tape to the poles of the battery. Storing the battery and charger as-is may result in fire or burn injury due to short-circuit. · Do not throw the battery into fire or expose it to heat as there is a risk of injury if it explodes. 4

PRECAUTIONS REGARDING SAFETY **CAUTION** For security, please do the opening inspection and inspection every a fixed period and adjustment. When the laser beam enters eyes, an unexpected accident might be caused by the blink of eyes. Establish the laser product to avoid the height of eyes of a driving person and walker. Establish an instrument so that laser beam does not hit a reflection thing as a mirror and a glass window. The reflection beam of the laser is also harmful to the human body. Besides the time when you measure the distance, cut off the power supply or shade the beam of aperture with caps. Keep the laser product in the place where the person who does not have the product knowledge such as children does not touch by mistake. Destroy the power supply mechanism of the instrument so as not to emit the laser beam when throwing away it. · Do not remove the handgrip without good reason. If it does come off, be sure to attach it securely to the instrument with screws. If it is not fastened securely, the instrument may fall when you grasp the handgrip, leading to possible injury.

- Do not short the poles of the battery or charger as there is a risk of injury or fire. · Do not touch any fluid which may leak from the battery as there is a risk of chemical burn injury or reaction. · Do not insert or remove the electric plug with wet hands as there is a risk of electric shock. · Do not use the case to stand on as it is slippery and unstable and may cause you to fall, resulting in possible injury. · Be sure the tripod itself and the instrument on the tripod are both installed securely as insecure installation may cause the tripod to fall over or the instrument to drop, resulting in possible injury.
- Do not carry the tripod with the metal shoe pointing toward another person as the person may be injured if they strike him or her. · The instrument contains a rechargeable battery and it is rechargeable. · At the end of its useful life, it may be illegal to dispose of the battery. · Check with your local solid waste officials for details for recycling. 5

PRECAUTIONS REGARDING SAFETY Usage precautions Surveying instruments are high-precision instruments. In order to assure that the Electronic Total Station R-300X series product which you have purchased will provide long-lasting maximum performance, the precautions in this manual must be followed. Be sure to follow these instructions and use this product properly at all times. [Solar observation] **WARNING** Never view the sun directly using the telescope as this may result in loss of sight. Never point the objective lens directly at the sun as this may damage internal components. When using the instrument for solar observation, be sure to attach the special solar filter (MU64) designed for this product to the objective lens.

[Laser beam] Do not stare into laser beam. R-300X is a class-II Laser product. (The reflectorless type is a Class IIIa (3R) laser product.) [EDM axis] The R-300X series EDM is the red visible laser beam and the beam diameter is very small. The beam is emitted from the objective center and the base plate center hole. The EDM axis is designed to coincide with the telescope sight axis but both axes may not sometimes coincide slightly according to the intense temperature change and time lapse.



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[Target constant] Confirm the Target Constant of the instrument before measurement. If a different constant is to be used, use the correct constant of the target. The constant is stored in the instrument's memory when turned off. [Reflectorless and reflector sheet] · Reflectorless: The measurement range and accuracy of Reflectorless are based on the condition that laser beam is emitted perpendicular to the white side of the Kodak Gray Card.

@@@Pay attention to following in case of distance measurement by Reflectorless. In a situation resulting in low accuracy, perform the distance measurement by Reflector sheet or Prism. (R-315NX, R-325NX, R-335NX, R-322NX, R-323NX) There is a possibility that correct distance measurement may be impossible by dispersion or reduction of laser beam when the laser beam comes into the target from diagonal angle. · · 6 PRECAUTIONS REGARDING SAFETY · There is a possibility that the instrument cannot calculate correctly when receiving reflected laser beam from forth and back directions in case of measuring the target on the road. There is a possibility that synthesized values are calculated and the distance may become longer or shorter than the actual one when the operator measure the target of slope or sphere or rugged shape.

There is a possibility that the instrument cannot calculate correctly by collecting the reflected laser beam from a man or a car that comes and goes in front of the target. When using reflector sheet, set the reflector sheet to have its surface be approx. vertical to the aiming line. If it is positioned not to be approx.

@@In the following environments, the distance might not be able to be measured.

There is a reflection things (mirror, stainless board and white wall, etc.) in the direction of the target and under too strong sun light. · · · [Battery & charger] · Never use any battery charger other than the BC03 battery charger as this may result in damage to the instrument. · If water should happen to splash on the instrument or the battery, wipe it off immediately and allow it to dry in a dry location. Do not put the instrument in the case until it is completely dry as this may result in damage to the instrument. · Turn off the power when removing the battery from the instrument as removing the battery while the power is still on may result in damage to the instrument. · The battery mark displayed on the instrument is only an estimate of remaining battery power and is not completely accurate. Replace the battery quickly when it is about to run down as the time a battery lasts on one charge differs depending on conditions of ambient temperature, and the measurement mode of the instrument. · Confirm the battery level remaining before operating. [Auto focus] The Auto focus mechanism is very precise but will not function under every condition.

Focusing depends on brightness, contrast, the shape and size of the target. In such a case, press the AF button and focus on the target by operating the Power focus key or the AF ring. [LD POINT, laser pointer] When you make a correct direction using the "LD POINT" aim the laser beam at the wall and , mark the center and then confirm the discrepancy between the reticle center and the marked point beforehand. 7 PRECAUTIONS REGARDING SAFETY [Storage and operating environment] · To prevent making short-circuit when removing the battery and charger from the case and storing them, apply electrically resistant tape to the poles of the battery. Storing the battery and charger as is may result in fire or burn injury due to short-circuit. Avoid storing the instrument in places subject to extreme high, low or radically fluctuating temperature. (Ambient temperature range during use: 20° C to +50° C) Distance measurements may take longer when atmospheric conditions are poor such as when heat shimmer is present. When storing the instrument, always put it in its case and avoid storage in dusty locatiADJUSTMENTS 10.1 ELECTRONIC VIAL 10.2 CIRCULAR VIAL 10.

3 VERTICAL RETICLE 10.4 PERPENDICULARITY OF LINE OF SIGHT TO HORIZONTAL AXIS 10.5 VERTICAL 0 POINT ERROR 10.6 LASER PLUMMET 10.7 OPTICAL PLUMMET 10.

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APPENDIX 13.1 ERROR MESSAGES 13.2 ATMOSPHERIC CORRECTION 13.3 HPA AND MMHG CONVERSION TABLE 13.4 ERROR WHEN NO ATMOSPHERIC CORRECTION IS MADE 13.5 ATMOSPHERIC REFRACTION AND EARTH CURVATURE CORRECTION 13.6 DISTANCE RANGE 14. NOTICE TO THE USER OF THIS PRODUCT 70 70 71 72 72 73 74 75 11 1. BEFORE USING THE INSTRUMENT 1.1 Names of parts Collimator Focusing knob Power focus key AF button Laser indicator Eyepiece Instrument height mark Battery latch Circular Discharge lamp lights when you push this button, and the discharge of battery begins.

[How to charge] 1 It begins charging automatically when you set the battery packing in the charger which beams the power supply lamp. 2 Leave just as it is until the charge is completed. 3 When the charge is completed, the charge lamp is turned off. 4 Detach the battery packing from the charger when the charge is completed. [Refreshing the battery] The use time shortens gradually by the phenomenon of "Effect of the memory" when the NiMH battery leaves capacity and repeats the charge. The voltage recovers after refreshing and the use time returns normally in such a battery. Please refresh one degree every five times of the charge. [Refreshing] Set the battery in the charger as well as the case of the charge. Push the electrical discharge button. The electrical discharge lamp lights and the electrical discharge begins.

The electrical discharge lamp is turned off when the electrical discharge ends, the charge lamp lights, and the charge starts automatically. Leave just as it is until the charge is completed. When the charge is completed, the charge lamp is turned off. Detach the battery from the charger. [Time of refreshing and charge] Battery BP02 is discharged from the state of a full charge at about 960 minutes and the charge is completed from the electrical discharge at about 130 minutes.

However, the electrical discharge time is proportional to the remainder capacity of the battery. Moreover, the time required for refreshing might be different from the above-mentioned time according to a surrounding temperature and the state of the battery. 17 2. DISPLAY AND KEYBOARD 2.1 Display and keyboard Alphanumeric and +/- key Enter key Power supply key Function key Illumination key ESC key Laser plummet and Electronic vial key 2. 2 Operation key Key [POWER] [ESC] [ILLU] [ENT] [LASER] Description ON/OFF of power supply Returns to previous screen or cancels an operation. Turns the illumination of the LCD display and telescope reticle on and off.



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The laser plummet spot can become difficult to see in bright sunlight which makes it difficult to perform the occasional check. In this case, use your foot or the carrying case to make a shadow over the laser position.

The laser plummet is adjusted to be within $\pm 0.8\text{mm}$ at the instrument height of 1.5m at factory shipping. Please confirm the amount of the gap (direction of X and Y direction) with the laser plummet beforehand compared with plumb bomb etc. when working like accurately putting out a perpendicular direction using the laser plummet function.

Please do not look at the laser source of beam directly. 3.3 Optical plummet (Option) [Detachable type] 1 Look through the optical plummet eyepiece, and rotate the eyepiece knob until the center mark can be seen clearly. 2 Rotate the focusing knob of the optical plummet and adjust the focus to the station on the ground. 3 Rotate the levelling screws and align the center mark to the ground mark.

[Shift type] 1 Look through the optical plummet eyepiece, and rotate the eyepiece knob until the center mark can be seen clearly. 2 Rotate the focusing knob of the optical plummet and adjust the focus on the ground mark. 3 Loosen the centering clamp screw and push the upper plate by finger and stay the center mark on the ground mark. 4 Tighten the centering clamp screw. 5 Loosen the horizontal clamp screw and rotate the instrument every 90° and confirm the Circular vial is centered correctly. If the bubble is not centered, it can be properly set using the leveling screws. 24 3.4 Leveling with circular vial Tripod is adjusted according to the following points by extending or contracting the legs so that the bubble of the Circular vial goes to the center of the circle. · Shorten the leg at the side of the bubble or extend the leg opposite of the bubble to position the bubble in the center of the vial circle. · All three legs are extended or contracted until the bubble is in the center.

During this process, the foot is not placed on the tripod leg point and the position of the tripod points do not change. 3.5 Leveling with electronic vial [Electronic vial screen] ELECTRONIC VIAL T.COMP. 1 If the Laser key is pushed, it becomes a display screen for the Electronic vial. LD POINT PLUM ADJ ON 30"/1DIV SENS. MODE A H.angle 2 15°C S0 85° 39' 40" It returns to the former screen by the [ESC] key. H.dst.

V.dst. MEAS TARGET 0 SET DISP MODE · · · When R-300X instrument is seen at the position of "Left circle position" the screen in , the electronic vial shows the correct movement direction. Please note that the movement of the electronic vial is in the opposite direction when the observing in "Right circle position" . When instrument is within the tilt compensation range, length and sidewise $\pm 3'$, "ON" is displayed at the right screen, "OVER" is displayed beyond the limits of range and "NIL" is displayed at no compensation setting.

With command No "520" or "Initial setting 2" when the [TILT DISP] is selected as ON, the , [F1-TILT] of the vial screen becomes effective. The Vial tilt value is indicated when pushing the [TILT] key. With "TILT DISP.UNIT" of the Initial setting 2, OFF or ON can be selected. 25 [Leveling] 1 Rotate instrument horizontally and make two Leveling screws arbitrarily chosen parallel to the display.

2 Turn on the Electronic vial function by pushing the Laser key. Put the bubble of the Circular vial in the center of the circle when the display shows "TILT OVER" . 3 Turn two Leveling screws arbitrarily chosen in an opposite direction mutually and put the vial of the horizontal Electronic vial in the center.

(Figure A) 4 Put the bubble of the lengthwise Electronic vial in the center by operating the Leveling screw of one remainder. (Figure B) 5 The procedures are different according to the state of the Automatic inclination correction as following. Leveling screw Leveling screw [When using the Automatic inclination correction by 2 axes] Please read procedure 6 because the horizontal angle and the perpendicular angle error by a perpendicular axis are automatically corrected. [When using the Automatic inclination correction by 1 axis] The instrument is horizontally rotated by 180° after the bubble of the Electronic vial is adjusted on the center at a Left circle position side and confirm that the bubble of the vial is at the center at the right circle position. [When using without Automatic inclination correction] Confirm the bubble is at the center even if the instrument is rotated by each 90° . 6 Confirm whether the plummet is on the ground mark. When you confirm it is not on the mark, loosen the center screw and move the instrument over the ground mark correctly and fix the instrument by a center screw.

Repeat from 1 to 6 26 3.6 Eyepiece adjustment [Eyepiece adjustment] The eyepiece adjustment is performed before Vertical line (single) target sighting. 1 Remove the telescope lens cap. Horizontal line 2 Point the telescope at a bright object, and rotate the eyepiece ring full counter-clockwise. 3 Look through the eyepiece, and rotate the eyepiece ring clockwise until the reticle Sight axis appears as its maximum sharpness. · When looking into the eyepiece, avoid an intense Vertical lines (double) look to prevent parallax and eye fatigue. · When it is hard to see the reticle due to poor brightness, press [ILLU] to illuminate it . For adjusting intensity of brightness, refer to "4-4 Adjusting Reticle Illumination" . 3.7 Target sighting [Auto focus] The Auto focus mechanism is very precise but will not function under every condition.

There is a slight possibility of focusing failure owing to brightness, contrast, the shape and size of the target. In such a case, press the AF button and focus on the target by operating the Power focus key or the AF ring. <Target examples which are hard to focus> No contrast like a white wall Bright back light Obstacle in front of a target A wall composed of single horizontal lines 27 [Target sighting by Auto focus] The Auto focus of R-300X series has following two modes. 1 Normal mode: Pressing AF button focuses on the target. 2 Continuous mode: Pressing AF buttons for two seconds beeps, and releasing the key enters into the Continuous mode.

This mode enables you to perform the Auto focus approx. for one minutes only by sighting through the telescope and following the target. Normal mode: Press the AF button. Continuous mode: Press AF buttons for two seconds beeps and release the key. [Auto focus: Target sighting by Normal mode] 1 Loosen the telescope clamp and horizontal clamp screws.

2 Point the telescope at the target using a collimator. 3 Tighten the above two screws. 4 Adjust the eyepiece. 5 Look through the telescope and press the AF button. Move your eye vertically and horizontally to see if the target image moves in relation to reticle.



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6 Align the reticle accurately on the target using telescope and horizontal tangent screws. Collimator Target AF button Collimator Target sighting . . . 28 If the target image does not move, there is no parallax. If it moves, eliminate the parallax. Even when vertical angle measurement is not performed, it is recommended that the target should be placed at the reticle center. Operating the Power focus key rotates the AF ring, so do not touch it while it is rotating.

[Auto focus: Target sighting by Continuous mode] 1 Loosen the telescope clamp and horizontal clamp screws. 2 Point the telescope at the target using a collimator. 3 Tighten the above two screws. 4 Adjust the eyepiece. 5 Look through the telescope and then press the AF button for two seconds to beep, and release the key to enter into the Continuous mode. 6 Align the reticle accurately on the target using telescope and horizontal tangent screws. 7 Point the telescope to the next target as well. Collimator AF button Pressing AF buttons for two seconds beeps and release the key. Target sighting Target Collimator . . . Keep the target close to the reticle center when following it by the Continuous mode. Continuous mode automatically ceases after approx. one minute. Pressing the AF button or operating the Power focus key releases the continuous mode. Operating the Power focus key rotates the AF ring, so do not touch it while it is rotating. [Auto focus: Target sighting by Power focus mode] 1 Loosen the telescope clamp and horizontal clamp screws. 2 Point the telescope at the target using a collimator.

3 Tighten the above two screws. 4 Adjust the eyepiece. 5 Look through the telescope, and then operate the Power focus key and focus on the target. 6 Align the reticle accurately on the target using telescope and horizontal tangent screws. 29 Collimator Target Power focus key Collimator Target sighting . . Tilting the Power focus key "clockwise" makes it possible to focus on closer objects and "counterclockwise" will focus on farther objects.

Tilting angle of the Power focus key makes it possible to perform following three focusing speeds. Low speed: When tilted to middle position by approx. 5 degrees Middle speed: When tilted fully by approx. 10 degrees High speed : When tilted fully by approx. 10 degrees and passed one second Operating the Power focus key rotates the AF ring, so do not touch it while it is rotating. [Target sighting by Manual focus] 1 Loosen the telescope clamp and horizontal clamp screws. 2 Point the telescope at the target using a collimator. 3 Tighten the above two screws. 4 Adjust the eyepiece. 5 Look through the telescope and then rotate the AF ring and stop it where the target can be seen clearly and the target image does not move in relation to reticle even if your eye is vertically and horizontally moved.

6 Align the reticle accurately on the target using telescope and horizontal tangent screws. Collimator Target AF Ring Collimator Target sighting . The AF ring rotation "clockwise" makes it possible to focus on closer objects and "counterclockwise" will focus on further objects. 30 3.8 Attachment and detachment of tribrach The tribrach of R-322EX, 323EX, 325EX, 322NX, 323NX, 325NX, and 326EX are detachable from the instrument if required when replacing the instrument with a target or unit prism for example. [Detachment] First loosen the recessed screw with a screwdriver, then rotate the locking knob until the arrow points upward, and lift the instrument up. [Attachment] Mount the instrument on the tribrach with the guide marks coinciding, and rotate the locking knob until the arrow points downward. The guide and guide mark must be fitted to attach the instrument. When the tribrach does not need to be attached or detached or instrument is to be transported, tighten the recessed screw with a screwdriver to fix the locking knob. Instrument Guide mark Tribrach Recessed screw Tribrach locking lever 31 4. TURNING THE POWER ON 4.

1 Turning the power on and off Pressing the [POWER] key shows the initials screen. (The [POWER] key is also used to turn the power off.) After a few seconds, it turns to Electronic vial screen. Move the vials to center by adjusting the leveling screws. ELECTRONIC VIAL T.

COMP. ON 30"/1DIV SENS. LD POINT PLUM ADJ MODE A 15°C S0 Pressing the [ENT] key views the angle and distance measurement screen. H.angle H. dst. V.dst. 85° 39' 40" MEAS TARGET 0 SET DISP MODE . . . The Auto Power Off function will automatically turn the power off if no operations are performed for approximately 10 minutes. (Factory default setting) The [POWER] key is controlled by software in the instrument while it is working, and this key is valid only when turning off causes no problem. The value displayed when the power was last time turned off will be displayed for the horizontal angle. If this horizontal angle is not needed, please perform horizontal angle 0 SET. For details on resetting the horizontal angle 0 For details on changing the horizontal angle from clockwise to counterclockwise For details on measuring the vertical angle For details on distance measurement For details on the automatic power-off function For details on the Electronic vial See "5.2" See "5.6" See "5.

5" See "6 " See "8.9 12" See "10.1" 32 4.2 Adjusting LCD contrast LCD DENSITY ADJ Press [F4] while holding down the Illumination key to access the screen for adjusting LCD contrast. 7 LOW 0 HIGH 25 LCD DENSITY ADJ Pressing [F1] [] will lighten the contrast, while pressing the [F2] [] will darken the contrast. 7 LOW 0 HIGH 25 MODE A 15°C S0 Press [ENT] to exit adjustment mode and return to the previous screen. H.angle H.dst. V. dst. 85° 39' 40" MEAS TARGET 0 SET DISP MODE . . . Pressing the Illumination key views the F3-RETICLE, F4-LCD and F5-ILLU. LCD contrast may be adjusted as necessary at any time. The contrast may be adjusted to any one of 25 levels. LCD contrast may be unappealing under certain environmental conditions such as high temperature.

Adjust the LCD contrast as described above in such situations. 4.3 Adjusting illumination brightness ILLU INTENSITY ADJ Press [F5] while holding down the Illumination key to access the screen for adjusting illumination brightness. DOWN 0 5 UP 10 ILLU INTENSITY ADJ Pressing the [F1] [] will decrease brightness, while pressing the [F2] [] will increase brightness. DOWN 0 10 UP 10 MODE A 15°C S0 Press [ENT] to exit adjustment mode and return to the previous screen.

H.angle H.dst. V.dst. 85° 39' 40" MEAS TARGET 0 SET DISP MODE 33 . . . Pressing the Illumination key views the F3-RETICLE, F4-LCD and F5-ILLU.



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Illumination brightness of the LCD screen and telescope reticle may be adjusted as necessary at any time. Illumination brightness may be adjusted to any one of 10 levels. 4.4 Adjusting reticle illumination Press [F3] while holding down the Illumination key to access the screen for adjusting reticle illumination.

The procedure to adjust the reticle illumination is the same way as 4.3. Pressing the Illumination key views the F3-RETICLE, F4-LCD and F5-ILLU. 34 5. ANGLE MEASUREMENT 5.1 Measuring an angle MODE A 15°C S0 H.angle H.dst. V.dst.

MEAS TARGET 0 SET MODE A 15°C DISP MODE S0 Aim at the first target, then press [F3] [0 SET] twice in succession to reset the horizontal angle to 0° 00' 00" Aim at the second target, then read the horizontal angle. H.angle H.dst.

V.dst. 60° 30' 20" MEAS TARGET 0 SET MODE A H.angle 15°C DISP MODE S0 Pressing [F4] [DISP] displays the vertical angle. H. dst. V.dst. 60° 30' 20" 87° 05' 40" DISP MODE MEAS TARGET 0 SET . . . The [0 SET] key cannot reset the vertical angle to 0. Pressing the [DISP] key cycles through the sets of display items: "H.angle/H.dst./V. dst.", "H angle/V.

angle/S.dst." and "H.angle/V. angle/H.dst./S.dst./V.dst.

, . Even though you turn the power off during a survey, the horizontal angle displayed last time is saved, so that it is restored when the power is turned on next time. When the restored horizontal angle is not necessary, reset it to 0. 5.2 Resetting the horizontal angle to 0 MODE A 15°C S0 Pressing [F3] [0 SET] twice in succession resets the horizontal angle to 0° 0' 0".

H.angle H.dst. V.dst.

0° 00' 00" MEAS TARGET 0 SET DISP MODE . . . The [F3] [0 SET] cannot reset the vertical angle to 0. Pressing the [F3] [0 SET] accidentally during measurement does not reset the horizontal angle to 0 unless you press it again. Once the buzzer stops sounding, you can go to the next step. You can reset the horizontal angle to 0 any time except when it has been held. 35 5.3 Holding the horizontal angle To hold the horizontal angle currently being displayed, press [F3] [HOLD] twice in succession. The horizontal angle value is displayed in reverse video when being held. MODE B H.angle H.dst.

V.dst. S.FUNC ANG SET HOLD CORR MODE 15°C S0 130° 45' 20" . . . If you want to hold the horizontal angle when you are in mode A, press [F5] [MODE] first to switch to mode B, then press [F3] [HOLD]. The [F3] [HOLD] cannot hold the vertical angle or distance. To release the horizontal angle from being held, press [F3] [HOLD] once. Pressing [F3] [HOLD] accidentally during measurement does not hold the horizontal angle unless you press it again. Once the buzzer stops sounding you can go to the next step. 5.4 Inputting an arbitrary horizontal angle In case of Horizontal angle 123° 45' 20" input MODE B H.

angle 15°C S0 92° 30' 20" Press [F5] [MODE] to enter mode B. H.dst. V.dst.

S.FUNC ANG SET HOLD CORR MODE ANGLE SET 1. ANGLE / %GRADE: ANGLE 2. H. ANGLE INPUT: 092°30'20" 3.

R/L REVERSE: RIGHT Press [F2] [ANG SET] to display the angle setting screen, then press [F4] [] to move the cursor to "2. H. ANGLE INPUT" . SELECT ANGLE SET 1. ANGLE / %GRADE: ANGLE 2. H. ANGLE INPUT: 092°30'20" 3. R/L REVERSE: RIGHT SELECT ANGLE SET Press [F5] [SELECT] to open the horizontal angle input window. [F5] [CLEAR] is used to clear the values. 1.

ANGLE / %GRADE: ANGLE 2. H. ANGLE INPUT: 92°30'20" 3. R/L REVERSE: RIGHT 0 9 2° 30'20" CLEAR 36 ANGLE SET 1. ANGLE / %GRADE: ANGLE 2. H. ANGLE INPUT: 00°00'00" 3. R/L REVERSE: RIGHT 0 0 ° 00'00" CLEAR ANGLE SET Press the numeric key as 123.4520. 1. ANGLE / %GRADE: ANGLE 2. H. ANGLE INPUT: 123°45'20" 3. R/L REVERSE: RIGHT 123° 45'2 0 " CLEAR MODE A 15°C S0 Press the [ENT] key to accept the horizontal angle set to 123° 45' 20" and change the screen to mode A. The former data is called by pressing the [CLEAR] key again. H.angle H.dst. V.dst.

123° 45' 20" MEAS TARGET 0 SET DISP MODE 5.5 Displaying the % slope of the vertical angle Press [F5] [MODE] to enter mode B. MODE B H.angle H.dst. V.dst. 15°C S0 92° 30' 20" S.FUNC ANG SET HOLD CORR MODE ANGLE SET Press [F2] [ANG SET] to display the Angle setting screen. 1.

ANGLE / %GRADE: ANGLE 2. H. ANGLE INPUT: 092°30'20" 3. R/L REVERSE: RIGHT SELECT MODE A H.angle 15°C S0 Press the [F5] [SELECT] to change the screen to display the slope % of Vertical angle. 92° 30' 20" H.dst. V.dst. MEAS TARGET 0 SET DISP MODE MODE A H. angle 15°C S0 Press [F4] [DISP] to display the slope value in %. % grade S.dst. 92° 30' 20" -1.

84% MEAS TARGET 0 SET DISP MODE 37 . . . The 0% represents the horizontal 0, and +100% and -100% represent 45° up and down slopes respectively. To return the screen from the slope (%) display to the 360° scale, also take above same steps by entering mode B. If the slope (%) exceeds [+/-]1000%, "Out of grade range" is displayed, indicating that the current vertical angle cannot be measured. When the telescope returns to a slope within slope [+/-] 1000%, the slope (%) display returns automatically from the "Out of grade range" message to the numeric value. 5.

6 Changing the horizontal angle from clockwise to counterclockwise MODE B 15°C S0 Press [F5] [MODE] to enter mode B. H.angle H.dst. V.dst. 92° 30' 20" S.FUNC ANG SET HOLD CORR MODE ANGLE SET Press [F2] [ANG SET] to display the Angle setting screen. 1. ANGLE / %GRADE: ANGLE 2.

H. ANGLE INPUT: 092°30'20" 3. R/L REVERSE: RIGHT SELECT ANGLE SET Press [F4] [] to move the cursor to "3. R/L REVERSE" . 1. ANGLE / %GRADE: ANGLE 2. H. ANGLE INPUT: 092°30'20" 3. R/L REVERSE: RIGHT SELECT MODE A H.angle 15°C S0 -267° 29' 40" Press [F5] [SELECT] to add a minus sign (-) to the horizontal angle value as a counterclockwise angle.

H.dst. V.dst. MEAS TARGET 0 SET DISP MODE . . To return the horizontal angle from counterclockwise to clockwise, also take the above same procedures, press [F5] [SELECT] to select the clockwise angle.

When the counterclockwise horizontal angle is selected, the order of aiming at the targets becomes the reverse (the right one first, then the left one) of the order for the clockwise angle. 38 6. DISTANCE MEASUREMENT 6.1 Target setting The target mode and its Constant of current setting are shown at the left of the battery mark. For example in case of each Constant 0, Reflector sheet; S 0, Reflectorless (Non-Prism); N 0, Prism; P 0 MODE A H.



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angle 15°C S0 TARGET CHANGED -267° 29' 40" (CONST.: 0mm) SHEET Pressing [F2][TARGET] changes the target mode. H.dst. V.dst. MEAS TARGET 0 SET DISP MODE . . . The target mode is changed sequentially as follows. Reflector sheet - Prism - Reflectorless (reflectorless models), Reflector sheet - Prism (standard models). The selected target mode is stored in the memory even if the power is turned off. So, next time you can use the same mode after turning on.

The target Constant differs according to the selected target mode. @@@@. The CODE number 521 [REF.LESS RANGE] shows 1. REF.LESS RANGE (NORMAL/LONG), 2. LONG RANGE MES(ON/OFF) and 3. LONG RANGE SETUP(EACH TIME/PERMANENT). @@F1-MEAS, F3-NORMAL and F5-LONG are viewed. @@@@There is a possibility that the instrument cannot calculate correctly when receiving reflected laser beam from forth and back directions in case of measuring the target on the road. @@@@right angle when the distance is measured by it.

If it is positioned not to be approx. @@@@Please select a correct target mode and measure. @@@@the distance measurement mark remains displayed. V.dst.

@@@@Pressing the [F1] [MEAS] again terminates both distance measurement and blinking the "MEAS" text. Pressing [F4] [DISP] cycles through the sets of display items: "H.angle/H.dst./V.dst.", "H.angle/V.angle/S.dst." and "H.angle/V.angle/H.dst./S.

dst./V.dst.", Pressing the [ESC] or [F2] [TARGET] or [F5] [MODE] during distance measurement stops it. If the shot count for distance measurement has been set to 2 or more in "Initial Setting 2", the distance is measured for the specified number of times to display the averaged value. If the automatic distance measurement: [AUTO MEAS] in "Initial Setting 2" has been set to "MEAS" the first measurement is started only by aiming at the Target. Press [F1] [MEAS] for each measurement after the first one. If the automatic distance signal: [MEAS SIGNAL] in "Initial Setting 2" has been set to VALUE, a two-digit number representing the AIM value appears as soon as measurement starts (The AIM value varies depending on the distance and atmospheric conditions.) The minimum distance unit : [MEAN. MIN DISP] COARSE or FINE can be selected by the initial setting 2.

. . . 41 Example: "TRACK CONT" at second MEAS (Factory default setting) Collimate the telescope at a Target MODE A and press [F1] [MEAS] twice in succession H.angle to start measuring the distance, H.dst. upon reception of a reflected light from the V.dst.

CONT target, the instrument beeps and displays MEAS TARGET the _ mark to start the TRACK distance measurement. . . 15°C S0 92° 30' 20" ((()) 0 SET DISP MODE . . . If the instrument is in mode B, press [F5] [MODE] to switch to mode A and press [F1] [MEAS] twice. Pressing [F1] [MEAS] twice after collimating the telescope at the Target starts Continuous distance measurement at fast speed with the "MEAS" text blinking. It remains blinking during the measurement. If you press the [F1] [MEAS] again, Distance measurement is completed and the "MEAS" text stops blinking. Pressing [F4] [DISP] cycles through the sets of display items: "H.angle/H.dst./V.dst.", "H.angle/V.angle/S.dst." and "H.

angle/V.angle/H.dst./S.dst./V.dst.", Pressing the [ESC] or [F2] [TARGET] or [F5] [MODE] during fast distance measurement stops it. 6.3 Quick mode The Quick Mode is to shorten the measuring time using prism or reflector sheet.

. The Quick Mode is effective to measure the distance up to 500M using prism or reflector sheet. After selecting Quick Mode from the Quick Mode setting screen, the distance measurement MODE A 15°C S0 is done in Quick Mode. H.angle 92° 30' 20" . If the quick mode is selected, H.dst. the distance measurement mark, V.dst. CONT "<-< ->>", instead of "((())", is displayed MEAS TARGET 0 SET DISP MODE 42 7. CORRECTION MODE 7.1 Changing the target constant Changing the Target Constant can be performed only when the Reflector sheet and Prism Constant settings are "INPUT" in Initial Setting 1.

Example: Prism Constant - 25mm setting Press [F4] [CORR] in mode B. (If the instrument is in mode A, press [F5] [MODE] to enter mode B.) (SHEET CONST: Reflector sheet constant) CORRECTION 1. PRISM CONST : 2. SHEET CONST * 3. TEMP * 4. PRESS * 5.ppm * -30mm 0mm 15°C 1013hPa 0 ppm SELECT Press the [F5] [SELECT] to enable the Prism Constant to be changed. CORRECTION 1. PRISM CONST : 2.

SHEET CONST * 3. TEMP * 4. PRESS * 5.ppm * -3 0 mm 0mm 15°C 1013hPa 0 ppm CLEAR Clear the exiting values by pressing [CLEAR] key. Input 25 by pressing the numeric keys. Press the [ENT] key to accept the Prism Constant to -25mm. CORRECTION 1. PRISM CONST : 2. SHEET CONST * 3. TEMP * 4. PRESS * 5.ppm * -25mm 0mm 15°C 1013hPa 0 ppm SELECT MODE A 15°C S0 Pressing the [ENT] key returns the instrument to mode A. H.angle H.dst. @@@@Example: Setting the temperature to +22°C CORRECTION 1. PRISM CONST 2. SHEET CONST 3. TEMP 4. @@@@PRISM CONST 2.

SHEET CONST 3. TEMP 4. @@Input 22 by pressing the numeric keys. CORRECTION 1. PRISM CONST : 2. SHEET CONST 3. TEMP 4. @@PRISM CONST 2. SHEET CONST 3. TEMP 4.

@@V.dst. 92° 30' 20" MEAS TARGET 0 SET DISP MODE 44 The valid range of Temperature input is from -30°C to +60°C. When "Atmospheric Correction" in "Initial Setting 1" has been set to "1 . AUTO" or "4. NIL" " " is displayed to the left of the temperature value on the correction menu , screen.

When " " is on the screen, the temperature cannot be changed. If "Atmospheric Correction" in "Initial Setting 1" has been set to "3. ppm INPUT" , no temperature is displayed on the correction menu screen. Once set, the temperature is displayed at the center of the top of the measurement screen. The factory initial of temperature is "1. AUTO" . Once set, the temperature remains in memory even after the power is turned off. Temperature correction is based on 15°C. If this instrument is used without correcting the temperature, a distance error per 100m is about -0.

1mm per +1°C as a temperature difference from 15°C. A distance error per 100m is about 0.1mm per -1°C as a temperature difference from 15°C. (For more accurate values, See "13.4 Error when no Atmospheric Correction is made" .

) 7.3 Changing the atmospheric pressure The atmospheric pressure setting can be changed only when "Atmospheric Correction" has been set to "ATM INPUT" in "Initial Setting 1" . Example: Setting the pressure to 900hPa CORRECTION 1.



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PRISM CONST 2. SHEET CONST 3. TEMP 4. PRESS 5. ppm * * : : * 0mm 0mm +15°C 1013hPa 0ppm SELECT Press [F4] [CORR] in mode B. (If the instrument is in mode A, press [F5] [MODE] to enter mode B.) Press [F4] [] to move the cursor to "4.

PRESS" and press the [F5] [SELECT] to enable the temperature to be changed. CORRECTION 1. PRISM CONST 2. SHEET CONST 3. TEMP 4. PRESS 5. ppm * * : : * 0mm 0mm +15°C 1013hPa 0ppm SELECT Clear the exiting values by pressing [CLEAR] key. Input 900 by pressing the numeric keys. CORRECTION 1. PRISM CONST 2.

SHEET CONST 3. TEMP 4. PRESS 5. ppm * * : : * 0mm 0mm +15°C 090 0 hPa 0ppm CLEAR 45 Press the [ENT] key to accept the PRESS to 900hPa. CORRECTION 1.

PRISM CONST 2. SHEET CONST 3. TEMP 4. PRESS 5. ppm * * : : * 0mm 0mm +15°C 090 0 hPa 0ppm SELECT MODE A 15°C S0 Pressing the [ENT] key returns the instrument to mode A.

H.angle H.dst. V.dst. 92° 30' 20" MEAS TARGET 0 SET DISP MODE The valid range of Pressure input is from 600 to 1120hPa. (420 - 840mmHg) When "Atmospheric Correction" in "Initial Setting 1" has been set to "1. AUTO" or "4. NIL", " " is displayed to the left of the pressure value on the correction menu screen. When " " is on the screen, the pressure cannot be changed.

If "Atmospheric Correction" in "Initial Setting 1" has been set to "3.ppm INPUT", no pressure is displayed on the correction menu screen. Once set, the pressure is displayed at the center of the top of the measurement screen. The factory initial of pressure is "1. AUTO". Once set, the pressure remains in memory even after the power is turned off. Pressure correction is based on 1013 hectopascals (hPa). If this instrument is used without correcting the pressure, a distance error per 100m is about -0.3mm per -10hPa as a pressure difference from 1013hPa. (For more accurate values, see "13.

4 Error when no Atmospheric Correction is made" .) 7.4 Changing the ppm value The ppm value can be changed only when "Atmospheric Correction" has been set to "ppm INPUT" in "Initial Setting 1" "TEMP" and "PRESS" are not displayed. . Example: Setting the ppm value to 31 ppm CORRECTION 1.

PRISM CONST 2. SHEET CONST 3. TEMP 4. PRESS 5. ppm * * * * : : 0mm 0mm 0mm 0mm +12ppm SELECT Press [F4] [CORR] in mode B. (If the instrument is in mode A, press [F5] [MODE] to enter mode B.) 46 Press [F4] [] to move the cursor to "3. ppm" and press the [F5] [SELECT] to enable the temperature to be changed. Press the [CLEAR] key. CORRECTION 1. PRISM CONST 2. SHEET CONST 3. TEMP 4. PRESS 5. ppm * * * * : : 0mm 0mm 0mm 0mm +000ppm CLEAR Input 31 by pressing numeric keys.

CORRECTION 1. PRISM CONST 2. SHEET CONST 3. TEMP 4. PRESS 5. ppm * * * * : : 0mm 0mm 0mm 0mm +0 31ppm CLEAR MODE A 15°C S0 Pressing the [ESC] key returns the instrument to mode A. H.angle H.dst. V.

dst. 92° 30' 20" MEAS TARGET 0 SET DISP MODE The valid range of ppm values is from -199 to +199. Once set, the ppm value is displayed at the center of the top of the measurement screen. The factory initial of ppm value is "1. AUTO".

Once set, the ppm value remains in memory even after the power is turned off. 47 8. INITIAL SETTING 8.1 Overview For the R-300X series, you can select and save the desired setting for a variety of prescribed instrument conditions, called Initial Setting. The Initial Setting is saved in five modes, "Initial Setting 1" "Initial Setting 2", "Initial Setting 4" "Initial Setting 5" and "Setting of Date and Time " in which you can select , , and save the instrument conditions described below.

The factory default for each of these conditions is marked by . To change Initial Setting, follow the operating procedures for entering each Initial Setting mode on "8.2" and the operating procedures for changing an Initial Setting on "8.2" . . There is no Date and Time setting with the models R-315EX, R-325EX, R-326EX and R-335EX. 8.2 Entering the mode for initial setting 1 SET 1 1. ATM CORR 2. PRISM CONST 3. SHEET CONST 4.

CRV/REF CORR 5. COMP AXIS : : : : AUTO 0mm 0mm 0.14 NIL SELECT Press the [POWER] key while holding [F1] key down to access the screen for Initial Setting 1. Press [F3] [] or [F4] [] to position the cursor at the item of interest. SET 1 1. ATM CORR 2. PRISM CONST 3. SHEET CONST 4. CRV/REF CORR 5. COMP AXIS : : : : AUTO 0mm 0mm 0.

14 NIL SELECT 8.3 Entering the mode for initial setting 2 SET 2 1. MEAS MIN DISP 2. SHOT COUNT 3. SHEET INPUT 4.

LD PLUM 5. TILT DISP : : : : COARSE 1 TIME 01 TIMES ON ON SELECT Press the [POWER] key while holding [F2] key down to access the screen for Initial setting 2. . . Select the item of interest in the same way as in the mode for Initial setting 1. Pressing [F2] [] scrolls the screen down five items; pressing [F1] [] scrolls it up five items. 48 8.

4 Entering the mode for initial setting 4 SET 4 1. TEMP UNIT 2. PRESS. UNIT 3. DIST. UNIT 4. ANG. UNIT : : : : °C hPa m DEG SELECT Press the [POWER] key while holding [F4] key down to access the screen for Initial setting 4. . Select the item of interest in the same way as in the mode for Initial setting 1. 8.

5 Entering the mode for initial setting 5 SET 5 1. BAUD RATE : 2. DATA LENGHT : 3. PARITY BITS : 4. STOP BITS : 5. SIGNAL CONTROL : Press the [POWER] key while holding [F5] key down to access the screen for Initial setting 5. 1200 8 NIL 1 ON SELECT . . Select the item of interest in the same way as in the mode for Initial setting 1. Pressing [F2] [] scrolls the screen down five items; pressing [F1] [] scrolls it up five items. 8.6 Setting of [date and time] (Except the R-315EX, R-325EX, R-326EX and R-335EX) Turn on the power while pressing the [F3] key.

Then the screen showing date and time appears. DATE-TIME INPUT 1. DATE : 04/12/20 2. TIME : 16:15:32 3. DAY : MON SELECT 49 8.

7 Example of changing an initial setting content (selection of atmospheric correction) This section describes the operating procedures for selecting "1.ATM CORR" in Initial Setting 1 as an example of changing an Initial Setting content. Use this example as a reference when changing other items because it is also applicable to the operating procedures for changing them. Access the screen for Initial Setting 1 by taking procedures "8.2 Entering the Mode for Initial Setting 1" .

SET 1 1. ATM CORR 2. PRISM CONST 3. SHEET CONST 4. CRV/REF CORR 5. COMP AXIS : : : : AUTO 0mm 0mm 0.14 NIL SELECT Press [F5] [SELECT] to open the screen for selecting the atmospheric correction. SET 1 1. ATM CORR 2. PRISM CONST 3.



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SHEET CONST 4. CRV/REF CORR 5. COMP AXIS : : : : 1. AUTO 2. ATM INPUT 3. ppm INPUT 4. NIL NIL SELECT Press [F3] [] or [F4] [] to position the cursor at the desired item, then press [ENT] key to select that item. Pressing the [ENT] key settles the change of selected item. Pressing the [ESC] key invalidates the change of selected item. SET 1 1.

ATM CORR 2. PRISM CONST 3. SHEET CONST 4. CRV/REF CORR 5. COMP AXIS : : : : 1.

AUTO 2. ATM INPUT 3. ppm INPUT 4. NIL NIL SELECT Pressing again the [ESC] key or [ENT] key quits the initial setting screen and usual start screen appears. SET 1 1.

ATM CORR 2. PRISM CONST 3. SHEET CONST 4. CRV/REF CORR 5. COMP AXIS : : : : ATM INPUT 0mm 0mm 0.14 NIL SELECT 8.8 Initial setting 1 1.

Selection of Atmospheric Correction: [ATM CORR] Select whether Atmospheric Correction is to be performed by using the automatic measurement correction function with a atmospheric sensor, by entering the atmospheric temperature and pressure measured with a thermometer and barometer, by entering ppm value, or by fixing the ppm value to 0 (NIL) not to perform Atmospheric Correction. 1. 2.

3. 4. AUTO ATM INPUT ppm INPUT NIL 50 2. Selection of Prism Constant: [PRISM CONST] Select whether the Prism Constant to be input is set to 0mm, 30mm or to an arbitrary value to be entered from the keyboard. 1. -30mm 2. 0mm 3. INPUT 3. Selection of Reflector sheet Constant: [SHEET CONST] Select whether the target constant to be input is set to 0mm, or to an arbitrary value to be entered from the keyboard. 1.

0mm 2. INPUT 4. Selection for Refraction & Curvature Corrections: [CRV/REF CORR] Select whether the correction factor to be input for both differences (Refraction, Curvature) is set to 0.14, 0.2 or none (NIL).

Selecting "3. NIL" results in no correction of both values. 1. 0.14 2.

0.2 3. NIL 5. Selection of Tilt Compensation: [COMP AXIS] Select whether Tilt Compensation is to be single-axis compensation, dual-axis compensation, or disabled (NIL) 1. 2. 3. 4. 3 AXIS 2 AXIS 1AXIS NIL 1. 2 AXES 2. AXIS 3.

NIL · The factory default for each instrument condition is marked by . 8.9 Initial setting 2 1. Selection of Minimum Distance measurement unit: [MEAS. MIN DISP] COARSE or FINE: 1. COARSE 2. FINE 2. Setting of the Quick Mode: [QUICK MEAS] OFF or ON: 1. OFF 2. ON 3.

Selection of the Shot count: [SHOT COUNT] Select whether the shot count for Shot distance measurement is to be 1,3, 5 or an arbitrary count to be entered. 1. 2. 3. 4.

1 TIME 3 TIMES 5 TIMES INPUT 51 4. Setting the Shot input: [SHOT INPUT] Set the shot number for Shot distance measurement. 03 TIMES · The valid range of values for the shot number is from 1 to 99. · This setting is enabled only when the shot number (Above 2.) has been set to "4. INPUT" . 5. Selection of Laser plummet: [LD PLUM.] Laser plumb ON/OFF is selected. 1. OFF 2. ON 6. Selection of Tilting angle display: [TILT DISP.] X and Y tilting values are displayed. 1.

OFF 2. ON 7. Selection for Minimum tilt display: [TILT DISP. UNIT] COARSE or FINE: 1. COARSE 2. FINE 8. Selection of Reflectorless range: [RANGE] If you need the Normal or Long range. 1. NORMAL 2. LONG 9.

Selection of Long range message: [MESSAGE] If you need the long range message. 1. ON 2. OFF 10. Selection of Long range setup: [SET UP] If the above No.

7 selection is required each time or permanent. 1. EACH TIME 2. PERMANENT 11. Selection of primary MEAS setting: [PRIM.

MEAS KEY] Select whether the primary distance measurement is MEAS SHOT or MEAS CONT or TRACK SHOT or TRACK CONT. 1. 2 3. 4. MEAS SHOT MEAS CONT TRACK SHOT TRACK CONT 52 12. Selection of second MEAS setting: [SEC. MEAS KEY] Select whether the second distance measurement is TRACK CONT or TRACK SHOT or MEAS CONT or MEAS SHOT. 1. 2 3. 4.

TRACK CONT TRACK SHOT MEAS CONT MEAS SHOT 13. Selection of Minimum angle display: [MIN UNIT ANG] Select whether to set the minimum angle display mode to "COARSE (5 seconds)" or "FINE (1 second)". 1. COARSE 2. FINE 14. Selection of Vertical angle style: [V. ANG. STYLE] Select whether the 0 point for vertical angle is set to be "Z.0" "H.0", or "COMPAS".

1. Z. 0 2. H. 0 3.

COMPAS 15. Selection for Automatic power-off function: [AUTO OFF] Select the time interval (10, 20 or 30 minutes) for activating the automatic power-off function, or select NIL, disabling the function. 1. 2. 3.

4. 10 MIN 20 MIN 30 MIN NIL · The automatic power-off function automatically turns the power supply off after the specified period of time (in minutes) when no operation for distance measurement or for key entry has been performed with the angle remaining unchanged. 16. Selection for Distance measurement automatic power-off function: [EDM OFF] Select the time interval (3, 5 or 10 minutes) for activating the distance measurement automatic power-off function or select NIL, disabling the function. 1. 2. 3. 4. 3 MIN 5 MIN 10 MIN NIL · The distance measurement automatic power-off function automatically poweroff distance measurement after the specified period of time when no key operation has been performed with the measured value remaining unchanged (over about 0.1m) during measurement.

53 17. Selection for Automatic illumination power-off function: [ILLU. OFF] Select the time interval (3, 5 or 10 minutes) for activating the automatic illumination power-off function or select NIL, disabling the function. 1. 2. 3. 4. 3 MIN 5 MIN 10 MIN NIL 18. Selection for Distance measurement buzzer: [DIST. BUZ] Select whether to enable or disable the beep when the prism receives a light during distance measurement or during repeated distance measurement.

1. ON 2. OFF 19. Selection for H. angle 90° buzzer: [QUAD BUZ] Select whether to enable or disable the beep at every 90° during angle measurement. 1. OFF 2. ON 20. Selection of Distance measurement signal: [MEAS. SIGNAL] Select whether to display a signal indicator or AIM value to be displayed from when distance measurement is started to when measured data is displayed.

1. MARK 2. VALUE 21. Selection of Automatic distance measurement: [AUTO MEAS.] Automatic distance measurement repeats measurement automatically when the telescope has been collimated at the prism. Select NIL, MEAS or TRACK. 1. NIL 2. MEAS 3. TRACK 22.

Selection for priority Display: [PRIORITY DISP] Select the display order of the sets of display items which pressing the [DISP] key cycles through. The set of display items selected here appears first after the power is turned on. 1. HA HD VD 2. HA VA SD 3. HA VA HD SD VD 54 8.10 Initial setting 4 1. Selection of Temperature unit setting: [TEMP. UNIT] Select °C or °F as the unit for Temperature. 1.

°C 2. °F 2. Selection of Pressure unit setting: [PRESS UNIT] Select hPa (hectopascal), mmHg, inchHg as the unit for pressure to be input. 1. hPa 2. mmHg 3. inchHg 3. Selection of Distance unit setting: [DIST.



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