

User Manual

Thoma TR3-8 Remote Head System incl. Roll axis

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We recommend not to switch on the power before all components are installed.

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- 1. Remote Head**

The 2 axis Remote Head can carry a camera load of up to 40 kg.
NOTE: When using the roll axis, the camera weight should NOT exceed 25 kg.
- 1.1 Remote head attachments / Mounting of the Remote Head**

The remote head shall be attached to a crane, platform or tripod, using the following accessories: flat back mounting, Mitchel mounting or 150 mm bowl. Bring the head to an upright position using the integrated water level. Please make sure the connection is tightened correctly. Bear in mind that you may encounter a strong turning momentum on this connection, due to motor acceleration and braking.
- 1.2 Camera attachments / Mounting of the Camera**

The camera is attached with two 3/8" thread bolts to the camera angle of the remote head. Please make sure that the camera cannot be shifted or twisted. During shootings with video cameras, problems resulted because the camera assembly was not stable. In the vertical part of the camera angle, milled, elongated slots enable camera height adjustment. They can also be used to stabilize and secure the camera with a belt.
- 1.3 Camera Center of Gravity Adjustment**

Attention: This point is very important. If the camera center of gravity is not adjusted properly, damages may follow.
The camera is mounted correctly as soon as the camera can be turned by hand to any position without moving backwards or forwards.
The center of gravity adjustment can only be effected while the camera head is without power (pull power plug or disconnect mains unit).
All camera parts such as lenses, lens support, zoom, iris and focus motors, film cassettes, matte box, batteries etc. have to be mounted on the camera. Attach the servo electronic for lens motors to the camera angle using a clamp. Attach the connections between the camera, servo electronic and camera head. Longer cables are looped and attached to the lens support.
First step is to turn the camera into a horizontal position and lower the vertical sledge of the head until the camera's center of gravity is approx. 5 - 10 cm below the rotation axis. After releasing the camera, it automatically moves to the approximate center of gravity. By moving the camera back and forwards, the center of gravity is adjusted until the camera symmetrically stops in the horizontal after being moved left or right.
Next the camera is moved upwards with the help of the vertical sledge until the center of gravity is in height of the axis and the camera stops in every position after being turned. All screws that hold the camera and camera angle are fastened (see 1.2 Mounting of the Camera). After this adjustment, all remaining cables can be connected and the power turned on.
- 1.4 Lens Motors for Video Lenses**

The motors are supplied with toothed gears 0.5 and 0.6 and can be used directly on all video lenses without modification. The motors are also supplied with connecting cables to the servo electronic.
The motors are attached to the lens rods of the bridge plate with fastening clamps or directly to the lens through our motor holders.
Please make sure that no bolts, pins etc. prevent the motors from turning. All motors must be able to turn freely. When attaching the motors, please also check that the toothed gears do not jam. Test the function of the toothed gears by manually turning the zoom, iris and focus to their end positions.
Regarding video lenses, please note that the installed drives must be turned off or dismantled.

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1.5 Lens Motors for Film Lenses

The motors are supplied with toothed gears 0.8 and are suitable for use with all film lenses. The cables between the motors and servo electronic are interchangeable. The motors are attached to the lens rods of the bridge plate with fastening clamps. Please make sure no bolts, pins etc. prevent the motors from turning. All motors must be able to turn freely. When attaching the motors, please also check that the toothed gears do not jam. Test the function of the toothed gears by manually turning the zoom, iris and focus to their end positions. Some lenses may be "difficult to operate" if the strength of the motor isn't big enough. For those cases we suggest smaller gears. Some lenses may have problems with lack of space. In this case, we would recommend using an additional fastening clamp with adapter.

1.6 Camera-/ recorder- remote control & return remote change over

For the remote control of cameras, recorder or video signals, a variety of special cables are available. If you have special wishes, please contact your supplier. The cables with the 6-pin plug are connected to the camera head and plugged into the socket "camera". The other end of the cable is connected to the camera accessories socket or lens socket for remote control. (Technical information is to be seen under 4.12)

1.7 Attachment of the roll axis / Mounting of the roll axis

The camera angle has to be disconnected from the remote head. Mount the roll axis where the camera angle was mounted. Please note: the tally light connector should point forward (horizontal). The camera plate of the roll axis must be in the locked position. The bolt of the motor (from the roll axis) should point in the same direction as the tally light. Next connect the roll axis to the remote head with the same screws as was used to connect the camera angle with the remote head. The servo electronic that was mounted on the camera angle is now to be mounted on the bolt (of the motor) from the roll axis. Please connect the servo electronic with the herefore delivered cable, from the iris connector to the roll axis.

1.8 Attachment / Mounting of the camera to the roll axis, Video camera

Preparing; Start by checking if the camera handle, as well as the viewfinder must be disconnected from the camera. In many cases, especially when the camera axis needs to be moved, then these two items may be in the way within the roll axis rings. The camera must have a quick lock plate mounted. First the "Touch-And-Go" plate from Sachtler, (#3051) shall be mounted on the quick lock plate. Next mount the THOMA ENG holders on the lens. Following this attach the THOMA Motor holders for zoom and focus to the ENG holder (see 1.4). Please note; that the motor gears Vs the lens gears should have a small gap/play.

The camera together with the Touch-And-Go plate may now be attached to the roll axis.

1.9 Attaching the Film Camera To The Roll Axis

Preparation; First check to see if the camera handle as well as the optical viewer has to be disconnected from the camera. Depending on which camera type the camera handle may interfere with the roll axis ring especially if the camera has to be moved along the axis. In order to save space the video camera for the optical reflection should be mounted as close as possible to the camera. For the film motors we suggest you to use the THOMA universal plate (#TR30-E-145) or our special sledge plate for the ARRI cameras (#TR30-E-XXX). Mount the zoom- focus motors on to the lens using the 19mm rods / attachment frames (#TR30-E-140/141). The camera together with the Touch-And-Go plate may now be attached to the roll axis

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1.10 Adjusting the camera within the roll axis

There are about three (3) different adjustments that need to be performed:

1.10.1 Center of gravity adjustment in the optical axis

Attention: this point is very important. If the camera center of gravity is not adjusted properly, damages may follow. **The center of gravity adjustment must be done with the entire unit powered off. Adjust the center of gravity** by sliding the camera in the optical axis using the touch and go plate for the sliding. . If this adjustment isn't done, the camera tilts over to the left or right. By moving/sliding the whole camera unit, the horizontal balance point needs to be established. When using the slide plate all you need to do is loosen the clamp, slide the plate into the right position & the tighten the clamp again. When using the universal plate from THOMA, you have to loosen the 3/8" screws, move the camera unit & tighten the screws again.

1.10.2 Adjusting the optical height

The optical height of the camera is adjusted by first releasing the two (2) clamp levers below the "Touch And Go Plate". Next turn the adjacent large wheel associated with the roll axis. Please do not forget to tighten the two (2) clamp levers after the adjustment and have them point inwards to avoid them from getting stuck with other equipment during the shoot.

1.10.3 Adjusting the Optical Camera Side Position.

The complete camera unit can be moved sideward by loosening the four (4) screws located below the Touch and Go Plate of the roll axis. . Don't forget to tighten the screws after the adjustment is made.

Following the above mentioned adjustments you will need to reconnect the cables linked between the Zoom/Focus motors (zoom and focus remote control as well as camera remote control) and the servo electronic. Use the included cable holder. Please make sure that you have plenty of slack in the cables to assure they will not get damaged!

2.0 Control Head

The control head is responsible for remotely controlling the remote head, as well as the camera lens (iris, zoom, focus) and the ON/OFF function of the camera, i.e. VTR or RET.. Additionally there are also two connectors for external pan and tilt control (crank wheels). For tally light test, a switch is installed on the switchboard.

On the front side you will find the control electronics which consists of a 32-bit microprocessor system, triangle code system for pan and tilt axis, the data transmission system, all connections to peripheral installations, hand control units with switches for lens control and starting of the camera, as well as a tally light control for operating cameras. To support the **monitor** there is a carrying plate with a belt as well as power output connection, a video as well as a tally light connection and a test switch available. In addition the tally light can be connected through the direction of the control room. The following **test units** can be connected: zoom handle, focus handle, iris handle, roll axis handle as well as a crank wheel unit for each pan & tilt. A special **remote patch cord** for the communication between the control head & the remote head is available. The **camera on/off** as well as the **VTR function** are controlled through the switches on the focus or iris controls. The switching of the **Ret** for the video signals of ENG cameras is done through the "E" button on the display. Both functions are handled by relays and require that the camera cable between the servo electronic and the camera is connected. For **Software updates** there is an 9-pin connector as a RS232 interface available.

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2.1 Installation of the Control Head

The control head is mounted on a tripod with 150 mm bowl adapter. Using the integrated water level, the head is mounted in an upright position. More mobility can be achieved e.g. with a bazooka base, tripod and studio wheels.

The monitor is placed on the monitor plate and secured with a pressing belt/clamp.

Remote and power cables shall be connected. You should also install a video and power cable from the control head to the monitor.

The zoom hand control is attached to one of the pan bars and connected with a spiral cable to the back of the control head. The hand controls for iris and focus are also attached to the pan bars and are connected to the back of the control head in the same way. The existing spiral cables are interchangeable.

2.2 Installation of Joystick

The joystick has to be placed on a table or another flat surface. Dismount the electronic of the control head and mount in to the allocated place on the joystick.

Connect the remote- and power-cable. A video- and power-cable have to be connected from control-head to the monitor, too. The supply voltage ist +12V with at least 1,8A. The joystick starts with the calibration of Focus and Iris. Both control units (F/I) now turn until they reach the mechanical end stop. This operation shall not be interfered by any outside influences.

After the calibration the display shows "ONLINE". In the right corner of the display the letter "J" (Joystick) appears.

3.0 Online Level

After all components are installed and the electrical connections have been made, the system can be started. The remote head can be operated with one THOMA power unit (14V16A) and a power cable of 20m length. For longer distances a second a second power unit is necessary. The control head is operated with a THOMA power supply (12V1.2A).

After switching on the power unit, the display reads "THOMA REMOTE TR3-8" as well as the date of the software. Simultaneously, a test and calibration program is started. If hand control and lens control motors are connected, then the program will automatically start a calibration to the end points.

If the programs work without problems, the system will show "ONLINE" on the display after a few seconds which indicates it is ready for shooting.

Attention: In case there is separate power supply for the control head and camera head, then the calibration program will only start if the camera head is supplied with power prior to the control head. Otherwise, the display shows "ERROR Line".

4.0 Keyboards and display

If the system is installed and started in the described way, then "ONLINE etc." will be displayed and the remote head is ready for use.

This remote system has a very advanced software which enables many functions to be changed by simply pressing the appropriate keys. The functions are memorized until new figures and orders are programmed.

The software has two main operational levels:

1. OFFLINE-level. The remote head is switched off. This level is reached by pressing the OFF-key or the button on the zoom handset control.
2. ONLINE-level. The remote head is ready for use. This level is reached by pressing the ON-key or the button on the zoom handset control.

The following menus can only be found in the ONLINE-level.

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You may make changes during operation, although there may be short interruptions. Any calibration already in effect will not be influenced by the changes. **NOTE:** only a calibrated & stored modus is functional. The following menus may be accessed by pressing the "Ent" button to go up, and the "3" button to go "down"

4.1 **Adjusting the Pan & Tilt mode of the Control head**

Press the Ent-key until the menu "ONLINE PTmode Head" (control head), or "PTmode Wheels" (crank wheels) appears.

The "PTmode Head" will be activated with the arrow keys. In the 4th row of the display an "H" must appear in the right lower corner. ("PTmode Wheels" is described under item 4.14)

4.2 **Changing transmission velo Pan and Tilt**

PAN = horizontal, TILT = vertical movement.

Press the Ent-key until the menu "ONLINE PTvelo etc.." appears.

Using the arrow keys the transmission ratio may be changed in increments of from 15 %, 25 %, 50 %, 75 %, 100 %, 150 % and 200 %. In the 3rd line of the display you'll see the adjustments numerically. We recommend the following as a guideline: The bigger the focal length the smaller the transmission velo. The opposite is true as well. Normally our clients work with a setting of 100% as the transmission is then 1:1.

4.3 **Changing transmission velo Pan and Tilt at the crankwheel**

PAN = horizontal, TILT = vertical movement

Press the Ent-key until the menu "ONLINE PTvelo etc." appears.

Using the arrow key the transmission ratio may be changed in 15T, 50T, 100T and 200T. The ratio is 15 turn with the crankwheel correspond to 1 turn with the remotehead. In the 3rd line of the display you will see the adjustments numerically. We recommend the following: The bigger the focal length, the smaller the transmission velo and vice versa.

4.4 **Changing transmission velo of Pan and Tilt at the joystick**

PAN = horizontal, TILT = vertical movement

Press the Ent-key until the menu "ONLINE PTvelo etc." appears. Using the arrow key the transmission velo can be changed in increments from 10%, 20%, 30% up to 100%. With the joystick the adjustment depends on the speed and not on the position (control head, crankwheels). In the 3rd line of the display you will see the adjustments numerically. We recommend the following as a guideline: The bigger the focal length, the smaller the transmission velo and vice versa. Normally our clients work with a setting of 50%.

4.5 **Changing transmission velo PAN only**

Press the Ent-key until the menu "ONLINE Pvelo" appears.

Using the arrow keys the transmission velo can be changed in steps from 15 %, 25 %, 50 %, 75 %, 100 %, 150 % and 200 %.

4.6 **Changing transmission velo TILT only**

Press the Ent-key until the menu "ONLINE Tvelo" appears.

Using the arrow keys the transmission velo can be changed in steps from 15 %, 25 %, 50 %, 75 %, 100 %, 150 % and 200 %.

4.7 **PAN change of directions**

Press the Ent-key until the menu "ONLINE Pdir" appears on the display.

With the help of the arrow keys, the turning directions can be changed. The third line of the display shows the alteration with an arrow.

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4.8 TILT change of directions

Press the Ent-key until the menu "ONLINE Tdir" appears on the display. With the help of the arrow keys, the turning directions can be changed. The third line of the display shows the alteration.

4.9 Changing the Motor damping in Pan & Tilt

According to the weight of the camera equipment, the damping can be changed to fit your needs. This will enable you to have smooth movement even by high & goal runs. Press the Ent-key until the menu "ONLINE Damping etc" appears on the display. Using the arrow keys the damping can be changed in 10% steps up to 100%. The objective dampening is to make a better/harder positioning of the Pan & Tilt motors. For heavier cameras a higher % value of the damping is necessary. The numerical value of the adjustments are shown in the 3rd line of the display.

4.10 ZOOM change of speed

Press the Ent-key until the menu "ONLINE ZOOMvelo etc" appears on the display. With the help of the arrow keys, the speed can be changed from 100 % to 10 %, in 10 % steps. The third line of the display shows the % value

4.11 Zoom Motor change of directions

Press the Enter key until the menu "ONLINE ZOOMdir etc" appears on the display. With the help of the arrow keys, the turning directions can be changed. The third line of the display shows the alteration in graphic.

4.12 Iris Motor change of directions

Press the Ent-key until the menu "ONLINE IRISdir etc" appears on the display. With the help of the arrow keys, the turning directions can be changed. The third line of the display shows the alteration in graphic.

4.13 Focus Motor change of directions

Press the Enter key until the menu "ONLINE FOCUSdir etc" appears on the display. With the help of the arrow keys, the turning directions can be changed. The third line of the display shows the alteration in graphic.

4.14 Adjustment of camera switch

There are two different switch functions for remote initiation which are selected depending on the type of film camera used:

1. Permanent function, i.e. the camera is running as long as the switch is pressed (i.e. ARRI 16 BL, 16SR etc.)
2. Pulse function, i.e. the first pulse of the switch starts the camera while the second pulse stops the camera.

Both of the above mentioned functions can be adjusted on the control head with the help of the software. Press the Ent-key until the menu "ONLINE CAMERA etc." appears. With the arrow key, the permanent or pulse function can be chosen. In line 3 & 4, the appropriate switch sign is shown graphically.

4.15 Remote Control Function

The 4th line of the display is occupied with functions for E-key and camera (= C) (see 4.10 Adjustment of camera switch)

By pressing key E, a relay in the servo electronics is activated or deactivated. Functions are ON and OFF. These relay contacts are connected to Pin 5 and 6 of the servo electronics' camera socket and can be used with help of an appropriate cable for functions such as i.e. recorder running.

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The second relay display pertains to camera running or return changeover for the video signal, and it is activated via the ON/OFF buttons on iris and focus controls and crank wheels. Here again, a relay contact in the servo electronics is activated and connected to the camera socket, Pin 3 and 4. Appropriate connection cables for camera and video lenses are available.

The display shows the following switch symbols:
horizontal line = relay on; open line = relay off.

The switching current of the relay contacts may not exceed 0.3 A at max. 30 V.

4.16 Adjusting the Pan & Tilt mode for the crank wheels Function

If you decide to work with the Crank wheels, you'll always need the control head. The Crank wheels are then connected to the control head by the spiral cables into the sockets called "Pan Extern & Tilt Extern" on the control head. Press the Ent- key until the menu "Ptmode" appears in the display. The 3rd line in the display shows you which mode you are in at the moment, i.e. head = control head, wheels = crank wheels. With the help of the arrow keys, the mode can be changed. The 4th line in the display a "W" should be shown in the lower right corner (wheels).

4.17 Changing transmission velo of Pan & Tilt for the crank wheels function

Activate the crank wheels as described under item 4.14

Press the Ent-key until the menu "ONLINE PTvelo etc." appears. With the help of the arrow keys, the transmission velo in the crank wheel turns can now be adjusted in 20T, 50T, 100T, or 200T. The adjustments' numerical value is shown in the 3rd line of the display.. Our suggestion is as follows: The bigger the focal length, the smaller the transmission velo. The opposite holds true.

4.18 Changing the transmission velo of only Pan for the crank wheels function

Activate the crank wheels as described under item 4.14

Press the Ent-key until the menu "ONLINE Pvelo etc." appears. With the help of the arrow keys, the transmission velo in the crank wheel turns can now be adjusted in 20T, 50T, 100T or 200T. The adjustments' numerical value is shown in the 3rd line of the display.

4.19 Changing the transmission velo of only Tilt for the crank wheels function

Activate the crank wheels as described under item 4.14

Press the Ent-key until the menu "ONLINE Tvelo etc." appears. With the help of the arrow keys, the transmission velo in the crank wheel turns can now be adjusted in 20T, 50T, 100T or 200T. The adjustments' numerical value is shown in the 3rd line of the display.

4.20 Roll axis function

If you decide to work with the Roll axis, you always need the control head. The roll axis is controlled by an additional zoom rocker switch. This switch is then connected to the control head by a spiral cable into the connector called "Roll". Press the Ent- key until the menu "ONLINE Axis" appears. With the help of the arrow keys, the iris mode can be changed into roll mode.

Please note: by using the roll mode, an iris operation is not operable !!!

The roll axis function is only operable when the control head is set to control head modus. In the 4th line of the display an "H" should be shown in the lower right corner.

Please note ! Only the adjusted and saved modus is in function. The crank wheels only work in the crank wheel modus. In addition the control head only works in the control head modus. Also shown in the lower right corner of the 4th line of the display (which was reserved for the E and C button) is a W or an H. This is to indicate which modus you are working in.

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If one of the adjusted modus doesn't work, if an error appears, then you have to reset. Through the reset, the power to the head will be disconnected for a short moment.

5.0 Adjustment Process

By this collective name, the following adjustments are defined:

Lens Control Motor Calibration.

Operating Range Adjustment for Pan & Tilt.

Home point adjustment for Pan & Tilt.

These adjustment procedures are all affected in the Adjust-level, which is activated by pressing the Adj-key.

You can exit this Adjust-level by pressing the ON- or the OFF-key.

5.1 Iris, Zoom and Focus Calibration

This calibration of the 3 lens control motors is effected automatically after installation of the system and after power for the remote head is turned on. However, the calibration may be started at any time by pressing the Adj-key and then the display „Servo“ is activated by the Ent- or 3- key. You may start the adjusting procedure using the arrow keys.

5.2 Operating range adjustment for Pan, Tilt

For certain shots, it is advisable to limit the operating range of the camera head in order to avoid damage to the camera, camera head etc. You may adjust the operating range as follows::

Press the Adj-key and then the Ent- or 3- key until the menu displays „Limit>-Select“.

If you wish to erase a memorized operating range limit, press the arrow key.

Using the control head define the total operating range of the remote head that will be used for film- and video recordings.

The range limit can be stored by repressing of the arrow key.

To delete an already memorized operating range limit, the menu „Limits<. Deflt“ has to be activated by pressing the Ent- or 3-key. With the arrow key the deletion can be accomplished. Then the limit for Pan and Tilt is deleted.

5.3 Home point Adjustment for Pan, Tilt and Roll

If necessary, a home point adjustment can be effected. The counters for Pan, Tilt and Roll must be set to zero. By pressing the Adj-key, the Adj- level is activated and with the Ent-key or the 3-key the menu „PTR<Adjust“ can be searched. By pressing the arrow key the home point is set.

5.4 Returning to the home point of the Roll axis

Press the Ent- or the 3-key until the menu display “ONLINE/A Roll>Home” appears. By pressing the arrow key, the Roll axis returns to it's home position. Our suggestion is to keep the display active during work with the roll axis, as you then always can make a quick return to the home point of the roll axis.

6. Testing possibilities

The following menus can only be found in the OFFLINE-level. The following buttons have no function: arrow-, Ent-, 4-Adj & dot buttons.

If the OFFLINE-level is switched on via the OFF-key or the zoom handset, the display reads in line 1-3: "TR3-8 (software-date) 1-TEST".

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6.1 Line-Test

In the OFFLINE-level on the display appears in the 3rd line "Test".

For the Line-Test press the 1-key twice (2*), now a new menu appears. The display shows in the 1st line; "Test", in the 2nd line; "1-Line", in the 3rd line; "2-Power".

By pressing 1 = Line Test, the display shows "Testline Head". After 15 seconds, the display shows „Testline Servo“ and will check the communication between the head electronics and the servo electronics. After approximately 1 minute, the test is completed.

6.2 Power Test

"Test" appears in the 3rd line on the display in the OFFLINE-level

For the power test of the electronics, press the 1-key followed by the 2-key. The display shows now the voltage of the control head electronic, the head electronic & the servo electronic.

These measurements are very useful when using an accumulator.

6.3 Function test of all encoders

"1-Test" is shown in the 3rd line on the display in the OFFLINE level. The function of the sensors of all roll axis and manual control on the control head can be tested by pressing the 1-key and then the 3-key. The regulator may be tested using the arrow key. The digital value of the sensors appears in the 2nd line of the display. The scaled value is shown in the 3rd line on the display. By pressing the ON-key you're returning to the Online level.

6.4 Adjusting of control-head encoders 200k and 1 million with key 4

"Service" is shown in the first line, "Tilt" in the 2nd line of the display and "DG0200k" in the 3rd line on the display in the OFFLINE level. Using the arrow keys the value can be changed to DG1000k. Depending on the mounted encoders change the value to 200.000 or 1.000.000 increments.

7.0 Teach-In Functions

It is possible to record sequences of movements for 5 axis on the Remote-System in 8 minutes. The existing total store can be divided into 8 stores. The Recording time of 8 minutes is separated automatically. This means that the camera man can decide about the recording time of each store.

7.1 Teach-In recording

The dot-key activates the recording level.

"Teachin x" appears on the display, one free store of the 8 possible stores is shown automatically. With the right arrow key, the recording can be started (G=go) and also stopped (S=stop). The time shown informs you about the remaining recording time for the whole store. With the Ent- or 3-key another store can be chosen. When remaining recording time zero is reached at the Teach-In, the system stops the recording and the display shows „ERROR Record Overflow“.

7.2 Repeat mode

When a Teach-In recording is done, the recording can be repeated at any time. Another pressing of the dot-key You may activate the repeat-level by pressing the dot-key one more time. With the Ent- or 3-key the store can be chosen. With the right arrow-key the remote head can be placed in the home position (H). Pressing the right arrow-key again starts the repeat process.

A precondition to work in the Teach-In and in the Repeat Mode is, that the remote head is always placed in the same position in the three-dimensional room. This means either installed or brought to this position.

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7.3 Deletion of recordings

Every store of the mentioned 8 stores can be deleted. Pressing the dot-key activates the delete-level. With the Ent- or 3-key you may choose the store to be deleted. With the right arrow-key the deletion is carried out. Note: just press the dot-key shortly, to avoid that more than 1 store will be deleted !

7.4. Adjusting, change and deletion of fixed positions

Pressing the dot-key you will get to the fixed position level. Up to 8 different fixed positions can be stored. The keyboard assignment is as follows: A=1 B=2 C=3 D=4 after pressing the Ent-key E=1 F=2 G=3 H=4. These positions can be chosen user-defined. By changing the positions all channels (Pan, Tilt, Roll, Zoom, Focus, Iris) are started at the same time. All channels start and stop movement simultaneously. The speed of every single channel is adjusted proportionally. By pressing the Ent-key you can change between the storages (from ABCD to EFGH). Prior to saving the fixed position choose a storage space (A to H) then move the head to the desired position by using the control head, the crankwheels or the joystick. All axis can be set (Pan, Tilt, Roll, Zoom, Focus, Iris). To store the position press the ADJ-key. Then proceed with the next position. E.g. if you press the key 1(A) the remotehead moves to the first position, including all axis. Pressing another key brings the head to the next stored position. Every single position can only be overwritten, not deleted.

8.0 Studio reference position

If you want to use the teach-in recording for a longer time frame, it is important that you bring the camera- as well as the lens positions to a so called "starting position". This goes for the following axis: Pan, Tilt, Roll (only when you're not using Iris), Zoom, Focus & eventually the Iris, if it is adjustable with a THOMA motor controlled by a handle. This reference position should be a place of the studio that is solid & very visible to the camera man. Our suggestion is to put the lens in Tele- & Eternity position, then to search the reference point through the camera viewer. A cross web in the viewer is very useful for this. Putting a cross web by the use of tape on a monitor would also work. **Subsequently the home point adjustment, as described under item 5.3 should be done.** The studio reference position is identical with the home point. **Where all the electronic counters are zeroed.** From now on, the camera can be moved and the recording can start. This reference point is necessary when you are not recording all 8 stores of the teach-in during the same day, or if you're having a power off during your shots. The same procedure is necessary **for the repeat mode.** Through the power off, the electronic counters are zeroed & after the power on they need to be positioned back to the reference position.

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Joystick:

- compact construction in plastic, black
- integrated 32 bit processor electronic
- foil keypad
- LCD-display
- digital-joystick
- Zoom-handle
- Focus-ring
- Iris adjusting knob
- Tally light release and test switch
- digital data transfer to the remotehead
- slip resistant flat base
- operational voltage 12 to 16V (Pin 1 = 0V, Pin 4 = +12V)
- current: ca. 1,8A
- weight: 3,5 kg

Power Supply:

- DC mains power unit
- input 115/230 V 50/60 Hz, output 13 V/16 A
- 2 pieces Cannon socket, 4 pin, Pin 1=0V, Pin 4=+12V
- weight: 2,5 kg

Remote cable:

- bi-directional data transmission 1.5 megabit/s
- integrated video cable
- screw plugs on both ends
- standard length 20 m and 40 m
- special length on request, without video cable, up to 1000 m.
- weight: 2,5 kg (20 m)

Power cable:

- rubber coated, black, 2 x 4 mm²
- 20 m long
- Cannon connection plug, 4 pin, Pin 1=0V, Pin 4=+12V

Remote control cable for ARRI, 11-pin:

- suitable for 16SR, 16SR II, 16BL, 35BL, ARRI III
- with 11-wire Fischer plug S 104 A056-130
Pin 7 & 11 connected

Remote control cable for ARRI, 3-pin:

- suitable for 16SR III, 435, 535, 535B
- with 3-pin Fischer plug S 102 A052-130
Pin 1 & 3 connected

Remote control cable for Moviemat:

- suitable for Superamerica, Compact
- with 2-pin Fischer plug S 102 A051-130
Pin 1 & 2 connected

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Remote control cable for Aaton:

- suitable for XTR 35 II
- with 8-pin Lemo plug FGG.2B.308.CLAD52Z
Pin 1 & 6 connected

Return cable for Fujinon lenses:

- suitable for all designs
- with 12-pin Hirose plug HR 10A-10P-12P
Pin 9,10, 11 & 12 connected

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