

Romualda Traugutta 5, 45-667 Opole, Poland Phone: +48 77 456 23 53 English and German only: +48 502 771 907 Web: moviebird.com. E-mail: info@moviebird.com

MovieBird 50XL Instruction Manual



Technical Support:

Piotr Czernecki: pcz@moviebird.com, Phone - +48 782479077

Maciej Hełm: mhelm@moviebird.com, Phone +48 513141258

Table of Contents

1. Safety Guideline/Points	3
Safety Guideline	3
Safety Points	5
2. Precautions	6
Safety Straps / how to transport	6
Securing the counterweights	6
Cleaning, Maintenance, Service	7
Protective Covers	7
3. Crane Mechanics	8
3.1. Balance	8
3.2. Arm	12
3.2.1. Drive Cables	12
3.2.2. Counterweight cables and rear shaft	17
3.2.3. Main Chain / Inner Chain	21
3.2.4. Wheels adjustment	23
3.2.5. Motor Belt	26
3.2.6. Rails	27
3.2.7. Rear extension	29
3.3. Yoke	34
3.3.1. Center of gravity	34
3.3.2. Tilt brake	36
3.3.3. Power management	38
3.4. Column	40
3.4.1. Pan brake	40
3.4.2. Lifting the column	41
3.5. Dolly	44
3.5.1. Leveling Jacks	44
3.5.2. Steering	45
4. Troubleshooting	46

1. Safety Guideline/Points

The manufacturer recomends the following safety procedures: in order to reduce the possibility of an accident, every camera crane with arm range above 30 feet (9 meters) should be operated by at least two trained technicians (grips).

In case of MovieBird cranes it concerns models: MB-30, MB-35, MB-45, MB-50XL, MB-52, MB-62.

Safety Guideline

- 1. The assembly instructions **must** be read and understood before setup or operation. The crane may only be assembled in accordance with the manufacturer's instruction manual. The manufacturer's technical specifications and limits must be adhered to at all times and in no way exceeded.
- The MovieBird Telescopic Crane may only be setup or operated by trained and experienced personnel.
- 3. The crane may not be assembled or operated under the influence of alcohol, drugs or any other intoxicating substances.
- 4. The manufacturer accepts no liability for damages, injuries, or accidents occurring due to negligence by the crane operator, misuse of the crane or disregarding the instruction manual.
- 5. The camera crane must be used on the even terrain.
- 6. Make sure there are no electronic cables and electronic appliances within the movement range of the crane arm when it is left unattended in assembled state. If the pan and tilt remote head is higher than the central pivot section the crane system should not be left unsupervised.
- 7. After setup of the crane the pan and tilt remote head should be positioned under the central pivot section. If the pan and tilt remote head is higher than the central pivot section the crane system should not be left unsupervised.
- 8. Make sure that there are no wires with electric power which has a higher voltage than the safety level within the movement range of the whole crane system. The power supply cable should not be pulled when swivelling the crane arm.
- 9. Avoid abruptly swivelling or stopping the crane as it may cause the crane to fall.
- 10. The crane must not be used in environments with wind speed faster than 5.5–7.9 m/s.
- 11. When the camera crane is used during wet weather the pan and tilt remote head, control box and control bar must be protected against the rain as the control box is strictly prohibited from making contact with water.

- 12. When the crane is in operation no one must enter the enclosure of the crane arm. You must avoid anyone standing directly under the crane.
- 13. No loose objects may be stored or placed in or on the crane.
- 14. Ensure the location where the crane is installed can support the double overall weight of the crane, (including the counterweight) and operators.
- 15. When the control system is working the gear of the remote head is not allowed to be turned, if it needs to be adjusted the power supply should be switched off before the adjustment is made.
- 16. In the interest of safety when operating the crane, abrupt or sudden movement of the crane should be avoided.
- 17. Only original accessories manufactured by MovieBird Technologies may be used with the crane.
- 18. Check that there are no objects placed around or on the rail of the moving counterweight trolley.
- 19. The crane arm must not be extended without another person holding the enclosure of the crane arm tightly.
- 20. The first three sections (All moving sections) of the crane arm must not be held.

Safety Points

- 1. MovieBird telescopic crane to be operated and assembled by a trained MovieBird Operator.
- 2. MovieBird telescopic crane not to be left unattended without first securing arm to base with straps provided.
- 3. MovieBird telescopic crane only to be lifted by its own lifting straps using handles provided on cranes.
- 4. Care must be taken when lifting counterweights onto saddle.
- 5. All guards to be left in place on MovieBird during operation (unless removed by MovieBird operator for adjustment only and then to be re-fitted before re-use of MovieBird)
- 6. Electronic & mechanical "stops" to be in full safe working order (to be verified by MovieBird Operator)
- 7. Brake to be operated by MovieBird operator only.
- 8. Base must be maintained horizontally in a level position when in use.
- 9. All personnel in the vicinity of the MovieBird are to be made aware of its scope and speed of movement.
- 10. It is forbidden to operate the crane without all of the safety covers installed.
- 11. To reduce the possibility of injuries, the crane must be operated by at least two persons.
- 12. It is forbidden to remove or add any weight to the crane without permission of the crane operator. Any added/removed weight will cause unbalancing of the crane which may lead to serious accident.
- 13. Any time during operating of the crane, the crane operator must have at least one hand holding the crane. Any hand-free movement of the crane arm is forbidden.
- 14. All of the service points, safety covers, adjustment screws if not stated otherwise in this manual are to be handled only by certified MovieBird technician.
- 15. Any people in the vicinity of the crane must be informed about the intended movement of the crane, it's work characteristics and safety guidelines included in this manual.

2. Precautions

DURING TRANSPORT ALL COUNTERWEIGHTS SHOULD BE TAKEN OFF THE CRANE, ALSO THE RE-MOTE HEAD AND THE LEVELING HEAD MUST BE REMOVED FOR TRAVEL. ON UNEVEN OR MUD-DY/SOFT TERRAIN ADDITIONAL CARE MUST BE TAKEN TO PREVENT CRANE FROM TIPPING OVER.

Safety Straps / how to transport

When not in use, or during transport, the crane should always be secured by two safety straps – one at the front and one at the back. On the dolly, fasten the safety straps with snap hooks at the eyebolts. On the crane, pull the straps through the holes provided. This prevents the straps from slipping off under strain or becoming detached unintentionally. Also one safety strap need to hold the last section to prevent it from jumping while being transported.

During transport, the sections need to be secured by attaching the locking bar to the first and last section, exactly how it's shown at the picture below. Both brakes (pan and tilt) need to be released as well.

Securing the counterweights

The counterweights should always be secured by M16 bolts to prevent them from falling off.



Cleaning, Maintenance, Service

The crane should never be cleaned when the electronic control box is switched on to avoid lethal injuries! Rails and steel wheels should be cleaned from dirty grease as often as possible to maintain best performance of the arm.

The cables should always be checked if they're tightened up properly before working with the arm. If the cables are loose there is a risk that one of them will fall off the drum which can cause heavy damage to the arm and is also very dangerous to the people nearby.

Also it's highly recommended to check:

- If the counterweight cables are tightened up properly;
- If the main chain and inner chain are properly lubricated and tensioned.

Information on the above steps are described deeper in this instruction.

Protective Covers

It is forbidden to operate a crane without the protective covers being fitted. The protective covers should only be removed for servicing and cleaning the rails and steel wheels, and must always be screwed back on afterwards. Operating the crane without side covers may result in serious hand injury. Electronic control box must be always switched off before removing the covers.

3. Crane Mechanics

3.1. Balance

This step guide is showing an example of how to balance the crane.

- 1. Put 25 counterweights on each side of the crane (50 total).
- 2. Remove section lock and release all the brakes (pan/tilt).
- 3. Extract the arm a little manually so the counterweight carriage will move past the front proximity switch.



- 4. Turn on electronics (box, leveling head).
- 5. Retract the arm. This is the 1st position to balance the crane.
- 6. Loosen up the rear strap. 2nd person should be securing the crane. If that person is able to hold the crane then remove both straps.
- 7. Check which side of the crane is heavier. If it's the front then move the counterweight platform to the rear side until we get the balance (similarly if the rear side is heavier) using the screw shown at the picture below (you need to loosen 4 screws from the top before adjusting the carriage).



8. If the crane is still unbalanced after step 7, then use donuts or mounting points shown below to install counterweights.



9





- 9. When there is balance on the 1st position extract the arm until the counterweight platform reach the rear proximity switch (after turning on control box the crane is on learning mode so the speed is very slow). On its way, if the crane is nose- or tail-heavy then remove or add the counterweights depending on which side is heavier. When the arm will be extracted to the end then it's the 2nd position to balance the crane.
- 10. If it's nose-heavy add the counterweights until balance is reached. If the rear is heavier remove the counterweights until balance is reached.

Note: we use all kinds of counterweights if it's necessary to add small values. We need to remember that M16 bolts that secure the counterweights also counts in the balance process.

11. After we got the balance when the arm is extracted – retract to the 1st position to see if the balance isn't lost. If it is then repeat the process from point 3. Otherwise crane is ready to be operated.

3.2. Arm

3.2.1. Drive Cables

IMPORTANT: Electronic control box MUST be switched off before working inside of the arm. It is forbidden to move the sections during adjustment of crane mechanics. MovieBird does not take any responsibility for injuries caused by improper handling of the telescopic camera crane.

Prior to tensioning the cables, side covers must be removed followed by visual assessment of condition of cables.

If any of the cables is damaged, abort the tensioning procedure and call MovieBird service for repair.

Tensioning the cables:

- 1) The crane must be balanced and fully loaded (80 kg with leveling head on).
- 2) Tension check crane arm angled upwards. Tension adjustment crane arm leveled.
- 3) Extract the crane VERY SLOWLY to maximum and lift the arm to the very top.



- 4)Once again, assess the condition of the cables.
- 5)Visually assess the tension of the cables. Cables should be stretched evenly and shouldn't sag. Cables should run in the section parallel to each other and parallel to the section.
- 6) If any of the cables are not parallel to the section or are lose, the tensioning process should start from them.
- 7)Level the crane. Turn off the power. Tension the cable until it is straight in the section. Raise the arm to maximum and check the tension.
- 8)Tighten the cables until the tension is even and the cables are straight without any sag. Verify by extracting and retracting the crane a couple of times with the crane arm angled.
- 9)The crane has cables to pull out and pull in the sections. Both sets must be evenly tensioned. Failure to abide by these guidelines may result in mechanical damage of crane sections.
- In order to tension the cable hold it to prevent from rotating and tighten the cable with a 17 mm wrench.



Position of cable mounting points (section A or 1st is the biggest non telescopic one):

1.Section B/2nd section (left side of the arm).



2. Section C/ 3^{rd} section (right side of the arm).





3. Section D/4th section extracting cable (left side of the arm).

4. Section D/4th section retracting cable (rear side of section D).



5. Section E/5th section extracting cables (located at the rear of section C).



6. Section E/5th section retracting cables – both sides same spot (located at the front of section C).



IMPORTANT: Electronic control box MUST be switched off before working inside of the arm. Also it is forbidden to move the sections during adjustment of crane mechanics. MovieBird does not take any responsibility for injuries caused by improper handling of the telescopic camera crane.

3.2.2. Counterweight cables and rear shaft

Customer receives the crane with properly tensioned counterweight cables. After some time of crane usage it is possible that the cables will get loose. In order to check that, the crane needs to be balanced with a setup that is usually used on the crane. When the crane is balanced – lift it up on the column to maximum. Then the crane needs to be positioned at maximum angle with fully retracted sections.



The cables should not touch the sections in this position. If they do then it means that they need to be tightened. To do that the front cover needs to be removed like on the picture below.

MOVIEBIRD® MovieBird 50XL Instruction Manual



Now with the screws shown start tightening the cables until they are parallel to each other and do not touch the section top side.



Move the shaft evenly on both sides so the spaces shown are even, use a caliper to check the movement.



After tightening process put the cover back.

After some time of crane usage a knocking noise can be heard at the rear side of the arm. In most cases it's the fault of loosened nuts on the rear counterweights shaft. To tight them remove the cover.



It is now possible to access the shaft nuts. To get rid of the knocking noise, they need to be firmly tightened on both sides.





3.2.3. Main Chain / Inner Chain

The main chain is positioned on the left side at the back of the arm.



During normal, 8 man-hours workload, the chain should be cleaned and lubricated every 200 manhours. If the crane is working under heavy load and/or hard conditions (dust, sand, dirt etc.), then condition of the chain should be checked daily and cleaned/lubricated if needed. The "Shell GADUS S2 V220 00" / "Shell Retinax G" / "Klüber Structovis EHD" / "Aral FDP" grease is recommended to be used on this type of chain. **MovieBird does not take any responsibility for chain malfunction if improper grease is used.**

After some time of crane usage the chain can get loose. To adjust it, the back cover needs to be removed and the front cover were the cables go. Underneath there are two adjustments screws that lock the rear shaft in place. Adjust them in even increments on both sides while the crane arm is levelled.

It's important that the shaft is moved evenly on both sides, use a caliper to check the movement.

The inner chain connects both drum shafts together. It should be checked and lubricated at the same time as the main chain. The same type of grease is recommended for inner chain as for main one.

IMPORTANT: Electronics MUST be switched off before working inside of the arm. Also it is forbidden to move the sections during adjustment of crane mechanics. MovieBird does not take any responsibility for injuries caused by improper handling of the telescopic camera crane.

3.2.4. Wheels adjustment

The rear bottom wheels (green color) are in use during the first couple of feet of crane extraction. They wear down during normal crane operation and should be adjusted when needed.

To tune up the green wheels you need to slightly loose the center screw and adjust the wheel using the special tool (provided in toolbox). The wheels are located at the rear side of every section (excluding section A).



The green wheel needs to touch the previous section when the crane is extended to maximum.



There are plastic wheels on cable trolleys that wear down in time, making the cable trolley very noisy.

There is a spare set in the toolbox that was delivered with the crane. Hold the self-locking nut with 8mm socket and use allen key to remove the screw.



Auxiliary wheels are used to guide cables while the sections are in motion. Check the condition of the auxiliary wheels and replace if needed.



The wheels on the picture below (located at the top front of the sections on both sides) are factory adjusted and most of the time don't need to be readjusted.



IMPORTANT: Electronics MUST be switched off before working inside of the arm. Also it is forbidden to move the sections during adjustment of crane mechanics. MovieBird does not take any responsibility for injuries caused by improper handling of the telescopic camera crane.

3.2.5. Motor Belt

The motor belt is located on the right side at the back of the arm. It's possible that after some time of crane usage it will develop a noise. In this case lubricate it with WD40 (or something similar) and the noise will cease. There is no need for the user to do anything more with the belt. Other actions are to be made by MovieBird technicians only.

3.2.6. Rails

The rails and steel wheels should be cleaned as often as possible to maintain best performance of the arm. If the cleaning process will get neglected then the performance will get worse with time. Not cleaned, the rails and steel wheels might get permanently damaged making the movement of the arm shaky instead of smooth.







3.2.7. Rear extension

There's a pair of telescopic rails that extends the back end for approximately 1m for more leverage and easier arm control during maneuvering.





In order to telescope them out, first loosen the knobs on both sides.





Then loose the screw shown on the picture below (both sides).





Now rails can be telescoped out.

Additional link rods are provided (mounted on both sides of the crane) to connect the telescopic rails to the back rails. This will give the rails more rigidity.



MOVIEBIRD® MovieBird 50XL Instruction Manual



Install the link rods with provided knobs.



3.3. Yoke

3.3.1. Center of gravity

In some situations the center of gravity (COG) might not be in line with the crane tilt axis (even after proper balancing) which will result in crane loosing balance when at an angle. That means the COG needs to be adjusted. Yoke is equipped with special 32mm screws that are used to either lower or lift the arm seating. Before using them loose the screws located on both sides of Yoke cradle (pictured below).



And the other side:

Now the 32mm screws can be used to reach the center of gravity. The 32mm socket is located in the toolbox. Keep in mind that whenever the setup of the crane changes (head+camera) the COG may move and additional adjustment may be necessary.





3.3.2. Tilt brake

The tilt brake is located at the left side of the yoke, below the encoder.



It should be used only when the crane is balanced. Otherwise the brake mechanism will wear down fast and it will reach a point where it can fail to engage the arm.

If the brake is too weak for some reasons, you can adjust the brake force by rotating the knob shown on the photo below . Reverse action may help if it's hard to apply the brake.



3.3.3. Power management

The power is distributed to main control box and front power supply directly from the yoke (rear side). It can be used also to power some additional electronic devices chosen by the crane operators.



To power up the yoke, plug the power supply cable to the blue socket which is located at the front. The dials above show the frequency and voltage current.



There's also an emergency stop button that cuts off the power immediately, located on the left side of the yoke next to the tilt brake.



3.4. Column

3.4.1. Pan brake

The pan brake is located at the top left side of the column just beneath the yoke plate. 24 mm wrench or socket is used to apply the brake. Be advised that applying it too firmly can break the screw used for this. If desired, the brake can be moved to the other side of the column by removing two M12 screws and simply rotating it.



3.4.2. Lifting the column

The column is equipped with mechanism allowing it to be lifted approximately 45cm until visible mark appears on the inner one. Extraction of the column should be done only after proper balancing of the crane, both arm straps must be removed to lift the crane arm.



Slightly loosen 4 screws that are tightening the inner column, preventing it from rotating during pan movement of the crane. Be sure to tight them back after column is lifted to desired length.



Then apply the pan brake to prevent the crane from moving horizontally during lifting process.

Use a 750-900W drill (optionally you can use a very strong battery drill - 36V min) with the tools provided in the toolbox for fast and smooth movement.





IMPORTANT: THE COLUMN SHOULD BE LOWERED TO THE POINT WHERE HALF OF THE TOP CONI-CAL SCREWS ARE STILL VISIBLE. OTHERWISE THE LIFTING MECHANISM CAN BE DAMAGED, CAUS-ING THE INNER COLUMN TO STOP FUNCTIONING.

3.5. Dolly

3.5.1. Leveling Jacks

The dolly is permanently equipped with the leveling jacks that always should be used in order to perfectly level the dolly in both axes and for best stability of the crane. Jacks are not connected to the steering system so there is no need to lock it when using them. A special tool is provided with the crane to easily operate the jacks.



After achieving the level on the dolly, the tool should always be taken off. Otherwise, during maximum angle of the crane, the counterweights can hit it which is dangerous for crane operator and the people nearby.

3.5.2. Steering

It is possible to lock the steering on one of the sides of the dolly. In order to do so, the link rod that connects steering mechanisms on both ends of the dolly should be uncoupled and the locking pin must be installed in the location shown on the photo below.



4. Troubleshooting

Symptom	Cause	Solution
After turning on the box, power switch neon is off and system not responds	Fuse blow up	Check fuse and power supply switches
LCD display shows "TERMINAL" after 5 sec from turning on the system	Joystick cable fault or interface electronics in joystick or main board is damaged	Check joystick cable, if cable is ok then check internal communica- tion interface in joystick or main board
LCD display shows "READY" but the motor is not stable	Tachogenerator cable is damaged	Check crane cable, motor cable, brushes. If cable is ok then check connection between cannon con- nector and servo amplifier
LCD display shows "READY" but you can't move the crane with the joystick or manuall	 Motor cable fault, security bridge is open, startup electronics is damaged. 	1. Check motor cable if it's ok then check motor connections and se- curity bridge connection and start up electronics.
	2. Proximity switches connection fault.	2. Check motor cable, if it's ok then check connections on the crane and internal electronics (both proximity switches are normally closed)
Crane doesn't stop on proximity switch	Proximity switches connection fault	Check motor cable, if it's ok then check both proximity switch, if you push them they're opened, if pushing doesn't have any effect then probably cable have short circuit or proximity switch is bro- ken.
LCD display shows "ERROR 01"	2.5V joystick cable is damaged	Check connection between speed potentiometer and joystick PCB.
LCD display shows "ERROR 02"	GND joystick cable is damaged	Check connection between speed potentiometer and joystick PCB.
LCD display shows "ERROR 03"	1.25V joystick cable is damaged	Check connection between speed potentiometer and joystick.
LCD display shows "ERROR 04"	Speed joystick cable is damaged	Check connection between speed potentiometer and joystick PCB.
LCD display shows "ERROR 05"	DAC range error	Check connection between secu- rity voltage check, if it's ok then you have to check internal DAC module

MOVIEBIRD[®] MovieBird 50XL Instruction Manual

LCD display shows "ERROR 06"	DAC check wire fault	Check connection between secu- rity voltage check, if it's ok then check internal DAC module.
LCD display shows "ERROR 07"	DAC feed error	Check connection between secu- rity voltage check, if it's ok then check internal DAC module.
LCD display shows "ERROR 08"	Encoder ADCQAF	Check encoder QAF connection, check motor cable, crane cable and encoder.
LCD display shows "ERROR 09"	Encoder ADCQBF	Check encoder QBF connection, check motor cable, crane cable and encoder.
LCD display shows "ERROR 10"	Encoder XINT	Check encoder connection, check motor cable, crane cable and encoder.
LCD display shows "ERROR 11"	Joystick stop	Turn off and turn on BOX. If this doesn't help then check joystick cable, if it's ok then check internal electronics.
LCD display shows "EROR 12"	Servo inhibit fault	Check connections between main board and servo, if it's ok then check internal electronics on main board and check servo.
LCD display shows "ERROR 13"	DAC Init error	Check connection between secu- rity voltage check, if it's ok then check internal DAC module.
LCD display shows "ERROR 14"	Encoder Init error	Check connections between en- coder and mainboard and supply of the encoder.
Box give a six or seven beeps	Voltage error	Check all power supplies.