

TeleMotion 3.2

Magnetek Material Handling

Radio Control System

Installation and Users Manual



Telemotive

TC10K3.2-0 Rev. E January 2006

Part Number: 25727T

©Copyright 2006 Magnetek Material Handling

This page intentionally left blank.

Table of Contents

1-	Service Information	1
2-	Radio Controlled Crane Safety	2
	1. Introduction	2
	2. General	2
	3. Persons Authorized To Operate Radio Controlled Cranes	2
	4. Training Checklist For Crane Operators	2
	5. Operating Area	2
	6. Transmitter Unit	3
	7. Operating The Crane	3
	8. Boarding The Crane	4
	9. Crane Repair	4
	10. Using The Crane As A Work Platform	5
	11. Condition Of The Radio Controlled Crane	5
	12. Battery Disposal	5
3-	General System Information	6
	1. General System Information	6
	2. Signaling	6
	3. Transmitter Unit	6
	4. Receiver Unit	6
	5. Receiver Housing	6
	6. System Specifications	6
	7. Time Multiplex Shared (TMS) System Software	6
4-	Installation Procedure	7
	1. Pre-Installation Considerations	7
	2. Receiver Unit Mounting Location Considerations	7
	3. Line Input Considerations	7
	4. Wiring Considerations	7
	5. Receiver Cabinet Mounting	7
	6. Receiver Installation	8
	Figure 4-2. Mounting Template	9
5-	Wiring Diagram	11
	1. Wiring Diagrams	11
	2. Installation Wiring	11
	3. Relay Sequencing	11
	4. Wiring Legend	11
	Figure 5-1. Dome Transmitter Wiring Diagram	13
	Figure 5-2. Pendant Transmitter Wiring Diagram	14
	Figure 5-1D. Dome Transmitter Wiring Diagram (Duplicate)	15
	Figure 5-2D. Pendant Transmitter Wiring Diagram (Duplicate)	16
6-	Operation	17
	1. Pushbutton Function Dome and Pendant Transmitters	17
	2. Transmitter LED Indicator	17
	3. Operation	17
	4. Battery Replacement	17
7-	Programming	18
	1. Programming Access Codes	18
	2. Changing Transmitter Access Codes	18
	3. Dome Transmitter	18
	4. Pendant Transmitter	18
	5. Receiver Unit Access Code Setting	19
	6. Transmitter Programming (Other)	19
8-	Troubleshooting	20
	Table 8-1 Receiver Board Diagnostic LED Functions	20
	1. Test Points	22
	2. Wave Forms on an Oscilloscope	22
9-	Spare Parts	23

This page intentionally left blank.

Section 1 - Service Information

U.S. Service Information

For questions regarding service or technical information contact:

**1-866-MAG-SERV
(1-866-624-7378).**

Magnetek Material Handling
N49 W13650 Campbell Drive
Menomonee Falls, WI 53051

Telephone: 800-288-8178

Website: www.magnetekmh.com

e-mail: info@magnetekmh.com

Fax Numbers:

Main: 800-298-3503

Sales: 262-783-3510

Service: 262-783-3508

Canada Service Information:

2610 Dunwin Drive
Mississauga, Ontario
L5L 1J5 Canada
Phone: 1-800-792-7253
Fax: 1-905-828-5707

Section 2 – Radio Controlled Safety

2-1. Introduction.

The safety rules in this section are not intended to replace any rules or regulations or any applicable local, state, or federal governing organizations. The following information is intended to be used in conjunction with other rules or regulations already in existence. It is important to read all of the safety information contained in this section before operating the Radio Control System.

2-2. General.

Radio controlled overhead cranes and other material handling equipment operate in several directions. They are large, bulky pieces of equipment that handle heavy loads efficiently at high speeds. Quite frequently, the equipment is operated in areas where people are working on the floor below. The crane operator must exercise extreme caution at all times. Workers must constantly be alert to avoid accidents. The following rules have been included to indicate how your careful and thoughtful actions may prevent injuries, damage to equipment, or even save a life. If radio controlled material-handling equipment is operated from the cab, special care must be taken to secure the transmitter. Refer to section titled [Section 2-9. Boarding The Crane](#) for specific safety rules.

2-3. Persons Authorized To Operate Radio Controlled Cranes.

Only properly trained persons designated by management should be permitted to operate radio-controlled cranes.

Radio controlled cranes should not be operated by any person who cannot read or understand signs, notices and operating instructions that pertain to the crane.

Radio controlled cranes should not be operated by any person with insufficient eyesight or hearing or by any person who may be suffering from a disorder or illness or is taking any medication that may cause loss of crane control.

2-4. Training Checklist For Crane Operators.

Anyone being trained to operate a radio-controlled crane should possess the following knowledge and skills before operating the crane:

Knowledge of hazards peculiar to crane operation.

Knowledge of safety rules for radio controlled cranes.

Ability to judge distance or moving objects.

Knowledge of the radio transmitter.

Limit switch test procedure.

Where authorized, instructions for plugging motions.

Observing crane signal lights.

Avoid striking any obstructions.

Proper clearance of lifts or hooks before moving bridge or trolley.

Proper storage space for radio control box when not in use.

Transferring radio control box to another person.

Reporting unsafe or unusual operating conditions.

Caution in approaching bridge or trolley bumpers.

Equipment capacity.

Making lifts below floor level.

Making side pulls.

Keeping body clear of lifts and avoiding "pinch" points.

Cable and hook inspection.

Procedures for testing hoist, trolley, and bridge brakes.

2-5. Operating Area.

Aisles between equipment, stock, etc., should be free of obstructions so the crane operator can move freely. These aisles should be a minimum of a three feet (one meter) wide or meet local regulations.

Crane operators should always position themselves for the best view of the crane they are controlling. The crane should never be operated blindly. The operator should stay as close to the crane load as possible. Operators should never position themselves in a "pinch" point.

Section 2 – Radio Controlled Safety (Continued)

2-6. Transmitter Unit.

Transmitter switches should never be mechanically blocked ON or OFF for any crane motion. When not in use turn the transmitter OFF. A secure storage space should be provided for the transmitter unit and the transmitter unit should always be placed there when not in use. This precaution will prevent unauthorized people from operating the crane.

2-7. Operating The Crane.

The crane limit switches should be checked at the beginning of each shift or when a new operator takes control of the crane. When checking limit switches the hoist should be centered over an area free of personnel and equipment.

The limit switches should never be used as a regular stopping device. They are intended to be protective devices.

The bridge and trolley brakes should be tested at the beginning of each shift or when a new operator takes control of the crane. On transmitter units equipped with two speeds, use the "low" speed when testing braking devices.

When lifting maximum loads, the crane operator should test the hoist brakes by raising the load a few inches from the floor. If the brakes do not hold, the load should immediately be lowered to the floor and a report made to the supervisor.

Do not make lifts in excess of the equipment rated capacity.

The bridge and trolley should be centered directly over the load when the load is raised to prevent swinging when making lifts.

Side pulls should be made by a crane designed for this purpose and only with supervisor permission. When a lift is being made, the crane operator should not be positioned in the line of travel. The crane or hoist should be operated from a position either to the side or opposite from the direction of travel.

When raising or lowering a load, proceed slowly and make certain the load is under control. Tag lines should be used for handling unusual lengths or bulky loads. Remove slack from chains or slings gradually. Make certain all personnel are clear before making a lift.

The crane operator should keep all body parts away from the lift and should never be positioned under the lift.

Do not make a lift or move a load if anyone is in a location where they could be struck by the crane or the load.

If the crane operator is being helped, the crane should not be moved until the helper signals they are clear of the crane and its load.

When a load is hanging from the crane hook and the crane is being moved, the crane operator should sound all warning devices frequently.

Loads should not be carried over workers heads. If a worker is in the path of crane travel, the crane operator should stop the crane and clear the area before proceeding.

Runway stops or other cranes should never be bumped into.

When moving the crane, the crane operator should be sure that the hook block and attachments or cables would not catch on nearby equipment. Slings, chains, or cables should never be dragged along the floor.

Unless required for operator safety, gloves should not be worn when operating the transmitter unit.

All loose materials or parts should be removed from the load before starting the lift.

The crane operator should always hoist lifts high enough to clear all equipment and workers.

The crane operator should never permit anyone to ride on the load or hook except when authorized by the supervisor.

When another crane on the same runway is stationary with a load hanging, the crane operator should maintain a safe distance between the stationary crane and the one under their control.

If power to the crane is removed, the crane operator should turn the transmitter unit OFF and keep it OFF until power is restored.

If the crane fails to respond properly, the crane operator should stop operation, turn the transmitter unit OFF and immediately report the condition to their supervisor.

Section 2 – Radio Controlled Safety (Continued)

Outdoor cranes, which are subject to movement by wind, should be securely anchored when left unattended. If the crane is equipped with bridge brakes, the parking brake should be set immediately.

2-8. Boarding The Crane.

The crane should not be boarded without permission of the supervisor.

The crane operator should turn off the transmitter and take it with them when boarding the crane.

If more than one person is boarding the crane, one person should be made responsible for ensuring all personnel are off the crane before the system is returned to operation.

2-9. Crane Repair.

Minor repairs include routine maintenance and repairs such as greasing, cleaning and control troubleshooting. All other repairs should be considered major. If the repair crew consists of more than one person, one person should be designated as the repair crew leader with the following responsibilities. If the repair crew consists of only one person, that person has the following responsibilities:

Warning signs should be placed on the floor beneath the crane or suspended from the crane. For major repairs, the floor area below the crane should be roped off.

When major repairs are to take place, all persons operating other cranes on the same or adjacent runways, if any, must be notified prior to starting repairs. Notification should include the nature of the repair, safeguards provided, and movement limitations while repairs are in progress.

When practical, radio controlled cranes which cannot be moved during repairs must be protected against being bumped by other cranes on the runway. Bumpers should be installed on the exposed side or sides of the crane under repair. They should be placed as far away as possible. The location of these bumpers should be indicated by red lights placed so that they are clearly visible to other crane operators traveling on the same runway. When it is not possible to use bumpers, red lights must be placed so they are clearly visible to other crane operators traveling on the same runway to indicate the restricted travel zone. All crane operators on the

same runway must be informed of the repair effort and thoroughly instructed to what their operations are limited to and informed they will be notified when repairs are completed.

If any hazard involving the repairmen exists when there is a runway adjacent to the crane under repair, the adjacent runway should be blocked off as described above. When it is necessary to continue crane operation on the adjacent runways warning lights must be installed and be visible to operators of cranes on those runways. All cranes should come to a complete stop prior to entering the restricted area and should proceed through this area only after receiving permission from a signal person designated for this purpose. Access of persons to and from the crane being repaired should be under control of the repair crew leader.

When boarding the crane, the transmitter should be turned OFF and the transmitter should remain with the repair crew leader. The leader should board the crane first, open and lock out the main switch, and then signal the other members of the crew it is safe to board the crane.

If work on the crane is to be done in areas not protected by standard handrails, the repair crew should wear approved safety belts.

All tools and equipment should be moved onto the crane by the use of hand lines. The tools and equipment should be adequately secured to the hand lines.

If it is necessary to have the crane control circuits energized, all power circuits for crane movement must be opened prior to energizing the control circuits.

All personnel and tools should be moved to a safe spot before moving the crane during repairs.

Headroom is at a minimum in some crane cabs and on some crane walkways. Caution should be exercised when boarding or working on cranes. Hard hats should be worn whenever possible.

When repairs are finished, all personnel, tools and repair equipment should be removed before energizing the crane circuits.

Section 2 – Radio Controlled Safety (Continued)

2-10. Using The Crane As A Work Platform.

When the crane is to be used as a stationary work platform, follow all rules provided in [Section 2-9. Crane Repair](#).

When it is necessary for the crane to be moved from time to time, the crane operator should board the crane with the transmitter unit. The crane operator should ensure all personnel working on the crane are in a secure position before moving the crane to the next workstation. It should also be the crane operators responsibility to ensure the main switch is open and locked down before work is resumed.

WARNING

THE CRANE OPERATOR SHOULD NOT ATTEMPT TO MAKE ANY OF THE REPAIRS STATED BELOW. THE CRANE CONDITION SHOULD BE REPORTED TO THE SUPERVISOR.

2-11. Condition Of The Radio Controlled Crane.

If the crane fails to respond properly, the crane operator should notify their supervisor. When serious conditions are noticed (conditions that make the crane unsafe to operate), the crane should be shut down immediately and the supervisor notified. The following is a list of what should be included in the report:

Condition of hoisting cable and hook block (broken strands, clipped sheave wheels, etc.).

Condition of brakes (hoist, trolley, and bridge).

Alignment of bridge (screeching or squealing wheels indicate bridge is out of line).

Broken, cracked, or chipped rails on trolley or runway.

Condition of limit switches.

Condition of electrical and mechanical control (electrical or mechanical defects which cause faulty operation such as un-commanded stopping or starting of any crane motions, warning devices, lights, or auxiliary functions).

Condition of gears (grinding or squealing may indicate foreign materials in gear teeth or a lack of lubrication).

Frequent relay tripping of power circuits.

Mechanical parts loosened by vibration (loose rivets, covers, bolts, etc.).

Uneven riding (worn wheels).

Condition of collector shoes or bars.

Condition of warning or signal lights (burned out or broken).

2-12. Battery Disposal.

Consult local requirements for disposal.

Section 3 – General System Information

3-1. General System Information.

The TeleMotion Radio Control System (system) provides remote control of overhead cranes using radio signals. The system consists of a hand held portable battery operated transmitter unit and a fixed station receiver unit.

A unique 16bit code (Access Code) for each system is preset in every transmitter and receiver. The receiver considers any received signal, which does not match the receiver access code setting, invalid. The Access Code is made up of 16bits (65,000 combinations) and no two similar codes are assigned to any two TeleMotion systems.

Since each system has its own access code, up to four transmitters may be used with the same frequency in the same area. Each transmitter operating on the same frequency may be operated in close proximity, not less than six feet (2 meters) to each other.

3-2. Signaling.

These systems have low power pulsed signaling, no license is required. The transmitter unit is frequency modulated, low power and is certified under the appropriate regulations. A license is not required for the transmitter or operator.

3-3. Transmitter Unit.

The transmitter unit is frequency modulated, low power and is certified under the low power intentional radiator rules and regulations. A license is not required for the transmitter or operator.

A power down feature turns the transmitter unit OFF if no keys are pressed for approximately 15 minutes. The transmitter unit must again be turned ON. The unit uses pulsed operation for extremely long battery life.

An LED mounted on the front panel provides battery voltage, ON/OFF indication and data transmission status.

3-4. Receiver Unit.

The receiver unit consists of an RF receiver module, built in antenna with filter, integral power supply and microprocessor controlled output relays.

A power down feature turns the receiver unit OFF if no commands are received for approximately 15 minutes. The transmitter unit must again be turned ON to reactivate the receiver.

3-5. Receiver Housing.

Size: 10.95” high x 7.5” wide x 5.12” deep
(280mm x 190mm x 130mm).

Housing rating:

USA: NEMA 4, 4X, 12, 13; UL 94-HB

EURO: IP67, IEC 529

3-6. System Specifications.

Channel Designation: AK10: 438.0 MHz.

Antenna: Internal with built in band pass filter.
(optional external available).

Operating Temperature: -22°F to +158°F
(-30°C to +70°C) ambient.

Humidity: up to 95% (non-condensing).

Typical Operating Range: 200 feet (60 meters).

Rating of output relays (including Master Relay):
16Amp 277VAC/24VDC, 1HP 240VAC.

3-7. Time Multiplex Shared (TMS) System Software.

The system software is structured to minimize "on the air" transmission time of any transmitter. This allows for multiple transmitters to share a common frequency. The TMS system is designed so that a transmitter will send a signal for a predetermined ON time, and then will turn OFF. The length of transmitter ON time is referred to as data burst or packet. The packet length is a function of the quantity of data to be sent, and the data rate (baud). Once the packet is sent, the transmitter will turn OFF. This allows for other transmitters to time-share the same frequency when a transmitter has turned OFF. The TMS system software determines the OFF period and repetition rate of the ON period. This allows up to 4 transmitters to share and have equal access to the same frequency, and also allows for reduced battery consumption and extended battery life.

Section 4 – Installation Procedure

4-1. Pre-Installation Considerations.

To ensure reliable and safe operation of the system, the following items must be considered before installing the receiver unit.

WARNING

NO MORE THAN 4 TELEMOTION UNITS SHOULD BE MOUNTED WITHIN 600 FEET (120 METERS) OF EACH OTHER.

CAUTION

THE RECEIVER UNIT OR RELAYS ARE NOT RATED AS EXPLOSION PROOF. THE RECEIVER UNIT MUST NOT BE INSTALLED IN EXPLOSIVE ENVIRONMENTS UNLESS APPROPRIATE SECONDARY ENCLOSURE MEASURES ARE TAKEN.

4-2. Receiver Unit Mounting Location Considerations.

Ensure the mounting location is as far as possible from exposed trolley wires and sources of electromagnetic or radiated noise.

If possible, avoid installing receiver unit to a surface where high vibration or shock is present. If this cannot be avoided, use appropriate shock mounts.

Ensure mounting location is as far as possible from exposed trolley wire and sources of electromagnetic or radiated noise. Antenna should be at top of unit.

4-3. Line Input Considerations.

WARNING

THE UNIT MUST BE WIRED TO THE CORRECT VOLTAGE, FAILURE TO DO SO MAY DAMAGE THE SYSTEM.

The receiver unit has direct connection provisions for operation from 120 VAC (nominal), 50-60 Hz power.

For applications where line voltage deviation exceeds 20% of nominal values or if 220VAC or 440 VAC power is used, a step up or step down transformer must be used.

NOTE

The receiver unit should not be connected to lines containing excessive power up transients or continuous commutator noise. A line conditioner may be necessary in some installations.

4-4. Wiring Considerations

1. Read this manual before installation.
2. Please observe appropriate local and National Electrical Codes when wiring electrical devices.
3. Do not connect or disconnect wiring, or perform circuit checks while the power is turned on.
4. The motor wiring should be in a separate metal conduit from the power wiring, which should also be in metal conduit.
5. Low voltage wires shall be wired with proper low voltage class wiring procedures.
6. Control wiring as well as antenna wiring shall be in separate conduit and shall be kept as short as possible.
7. All terminals shall be tightened to specified terminal torque 4.4 IN-LBS (.5 N·m). unless otherwise specified
8. Remove excess metal screws, metal filings and wire clippings from inside of unit.
9. Inspect to make sure no exposed wire has contact with any other wiring or terminals.
10. Suppressors are strongly recommended on all contactors.
11. Do not drill through the top of the cabinet of the TeleMotion 3.2, the internal antenna is located there.

4-5. Receiver Cabinet Mounting.

Mounting hardware is provided. See next page [Figure 4-1A. Installation Hardware](#). The door is not attached when the unit is shipped to make it easier to install the mounting screws. After the unit is mounted the door should be attached.

Mount receiver unit cabinet securely to mounting surface. Actual cabinet mounting dimensions and

Section 4 – Installation Procedure (Continued)

a mounting template are shown on page 9 [Figure 4-2](#). A is also provided in [Figure 4-2](#).

4-6. Receiver Installation.

1. Copy Access Codes from door of the receiver on to the diagram on page 18 ([Section 7-1](#)), for future reference. Note in the box provided in [Section 7-1](#), the crane number.
2. Position the receiver. Locate as far as possible from exposed trolley wire and sources of electromagnetic or radiated noise. Cabinet mounting dimensions and mounting template is on page 9 [Figure 4-2](#). Antenna at top of unit should be kept as clear as possible of any metal object.
3. Mount the receiver. Through the four deep mounting holes in corners of the receiver housing use quantity four #10-24 slotted round head screws 1" in length, four #10 lock washers and four #10-24 hex nuts. Lock washers should be used in front of hex nuts. (Five sets of mounting hardware are provided; one set is a spare). See Figure 4-1A. Installation Hardware on this page.
4. Attach door. Put two door screws in door. (Included in your TeleMotion unit are two pairs of door screws. One pair slotted and one pair wing head.) Pick the screws that are preferred, line up the slots in the door holes with the tapered part of the screw tip and firmly press the screws through the holes in the door until they snap through. (Lightly tapping them with a hard object will help to snap them in). Use the special door hinge screwdriver provided to screw in the door hinges to the main box. See Figure 4-1A. Installation Hardware on this page.
5. Wire the unit using the appropriate electrical drawings for the specific transmitter and crane orientation selected on pages 13 or 14 [Section 5 – Wiring Diagrams](#). To check if it is a dome or pendant transmitter see page 17 [Figure 6-1](#). For crane orientation determine if the direction pair East - West or North - South better describes the bridge movement. Use this pair to wire the bridge motor directionals respectively and the other pair to wire the trolley. For single speed motors do not use 2nd speed relays K3, K6, and K9. (The wiring terminals plug in and may be removed for ease in wiring. Make sure to replace connectors in the correct locations).

6. Wire the power to J1 input power connector. The connections are Ground (GND), Neutral (N) and 120VAC 50-60 Hz (120V). See Figure 4-1B. Input Power Connections.
7. Wiring of the TeleMotion system should now be complete.
8. Stand clear of the crane and apply AC power to receiver unit. Check to see if three green LEDs are lit (DS15, DS17 and DS18). If none are lit check AC power and fuse.
9. Turn transmitter ON. Check to see if two red LEDs are now lit (DSMR1 and DSMR2 indicating the MR is closed). Check function and direction by jogging each motion. Installation should now be complete.
10. If there are any problems see page 20 [Section 8 – Troubleshooting](#).

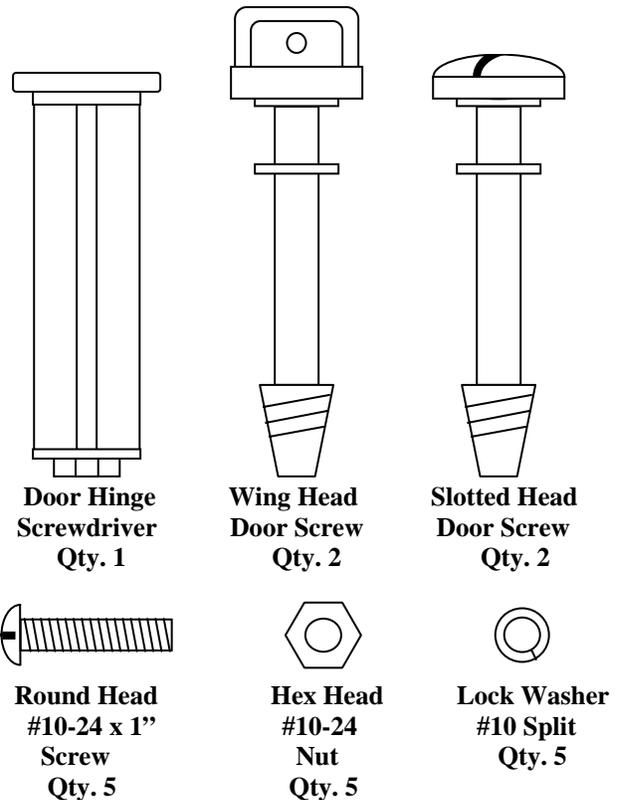


Figure 4-1A. Installation Hardware.

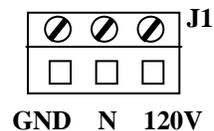


Figure 4-1B. Input Power Connections.

Figure 4-2. Mounting Template

Ø .25" 4X
(Ø 7mm 4X)

7.40"
(188mm)

6.46"
(164mm)

10.00"
(254mm)

Box Size:
10.95" x 7.40" x 5.12"
(278mm x 188mm x 130mm)

(This page is blank on the other side so it may be removed for use in mounting).

CAUTION: If printing this mounting template locally from a disk or the Internet, recheck template dimensions before drilling. Some printers may distort the dimensions.

Figure 4-2. Mounting Template (Continued)

This page intentionally left blank.

Section 5 – Wiring Diagrams

5-1. Wiring Diagrams.

This section has two different wiring diagrams one for the Dome Transmitter and one for the Pendant transmitter. There are two copies of each diagram in the manual so that one page can be removed and taken to the crane for wiring. Both diagrams are on either side of one page.

Terminal designators are marked on the Receiver Board. For specific terminal locations: See [Figure 8-1. Receiver Board Layout](#). (Page 20).

The designators on the left hand side of the wiring diagram match pushbutton locations on transmitters. The number after the text indicates switch position. The **-1** means the first speed (first switch position). The **-2** means speed two (second switch position).

The proper connections to use for the bridge and for the trolley are best determined by which pair of directional designators (North/South or East/West) describes the crane's movement. Does the bridge travel East/West or North/South? The trolley would use the other directional pair as the bridge. Care should be taken after a directional pair is selected to make sure the specific motor directional inputs match the desired direction of the bridge or trolley, i.e., if North/South is picked for the bridge make sure the South traveling bridge motor directional is wired to the South terminal of the TeleMotion unit.

5-2. Installation.

Follow [Section 4 – Installation Procedure](#) page 7 for instructions on how to install the TeleMotion receiver.

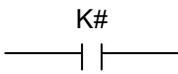
5-3. Relay Sequencing

When the second speed position is activated the appropriate directional relay is still engaged.

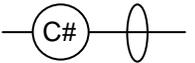
5-4. Legend

The following is the legend for the wiring diagrams:


An input with the terminal number # matching the connector in the receiver.


Matching relay contacts in radio receiver panel by number.


An output with the terminal number # matching the connector in the receiver.

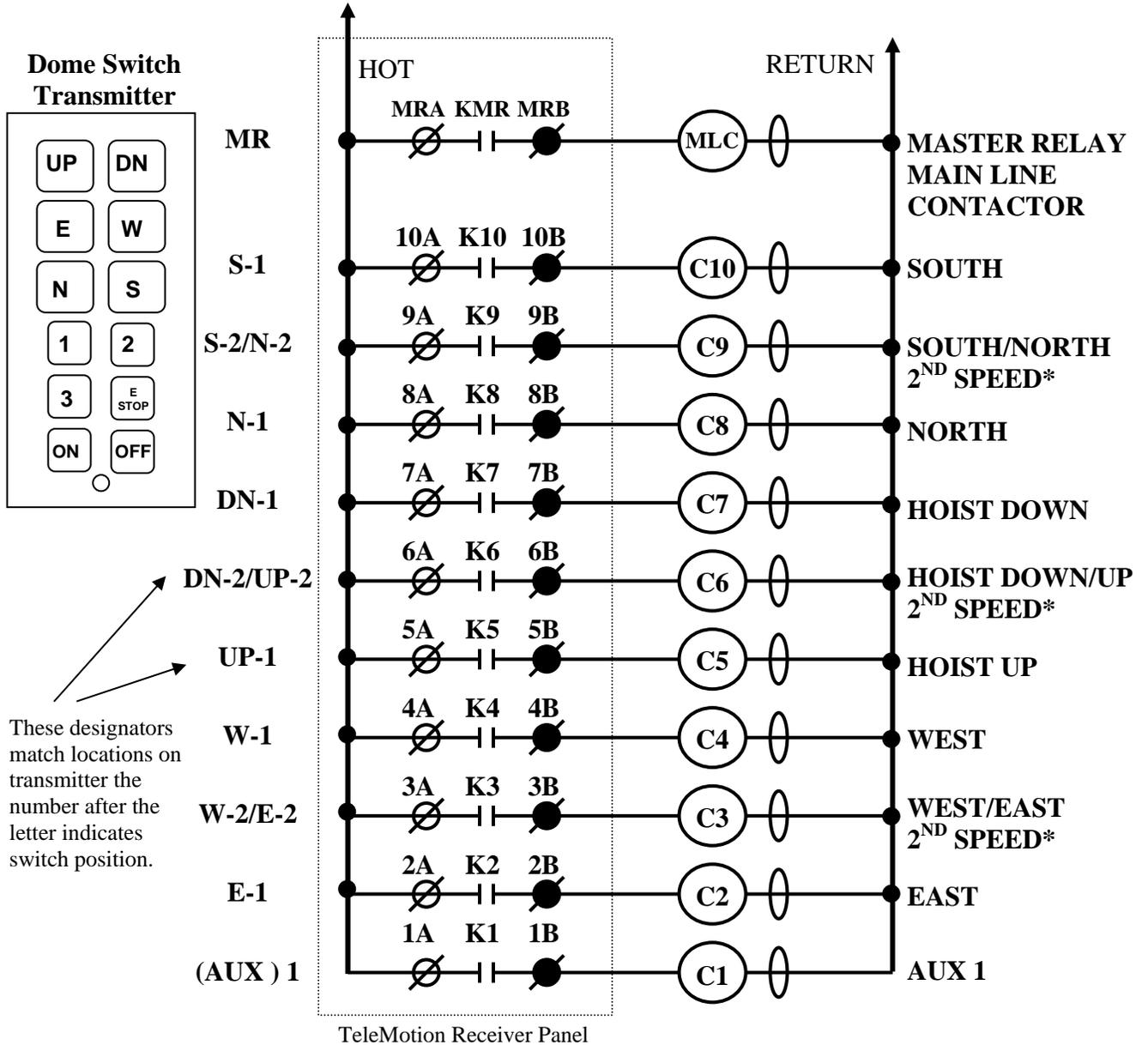

Customer supplied contactor coil with arc suppressor in parallel.

Section 5 – Wiring Diagrams (Continued)

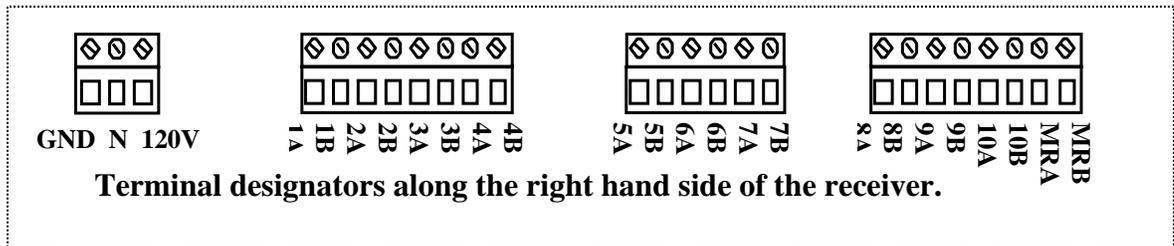
This page intentionally left blank.

Section 5 – Wiring Diagrams (Continued)

Figure 5-1. Dome Transmitter Wiring Diagram.



*** NOTE:** When the second speed position is activated the appropriate directional relay is still engaged.

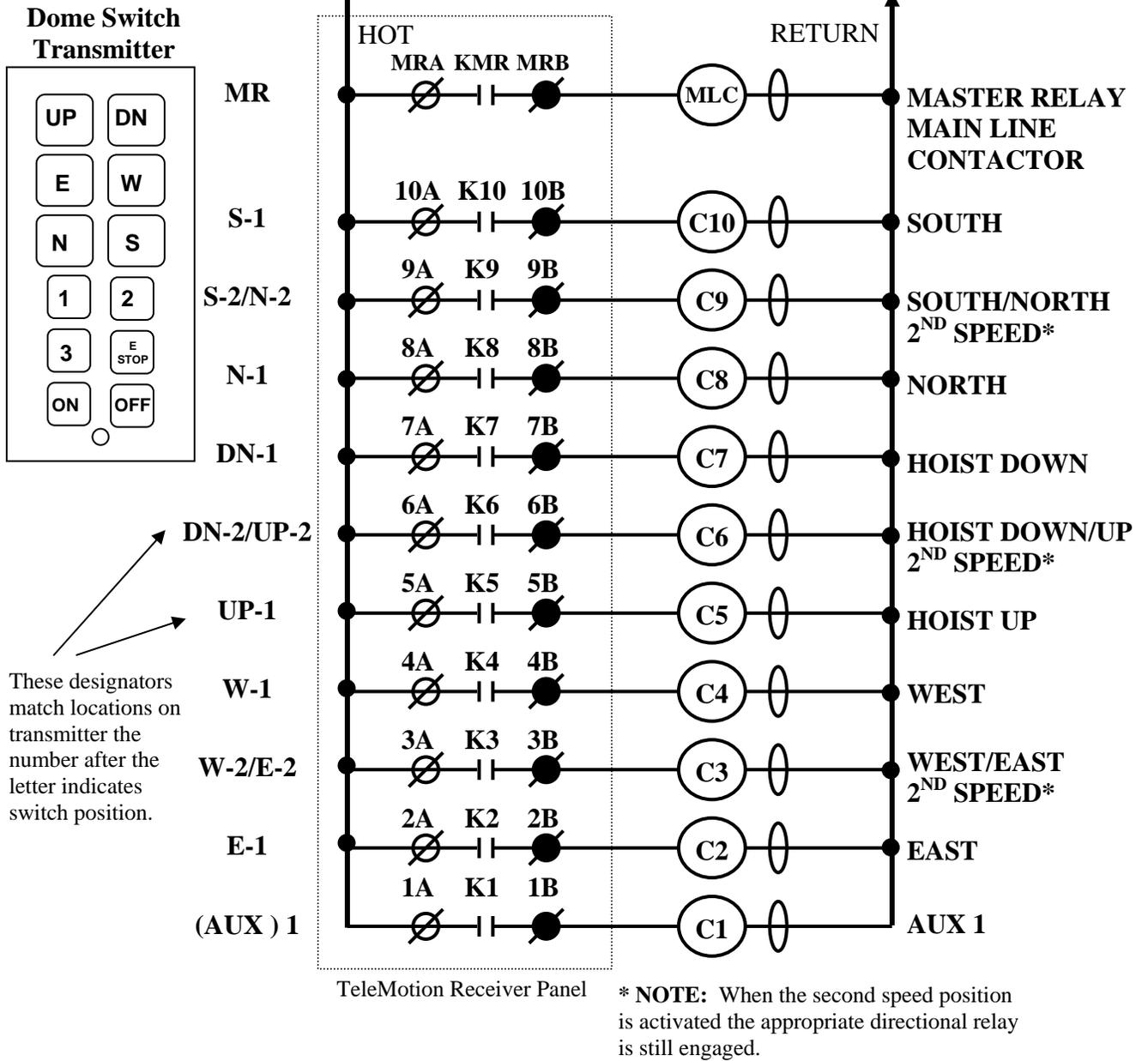


This page and the page on the other side are duplicated so that this page may be removed from the manual for use in installation.

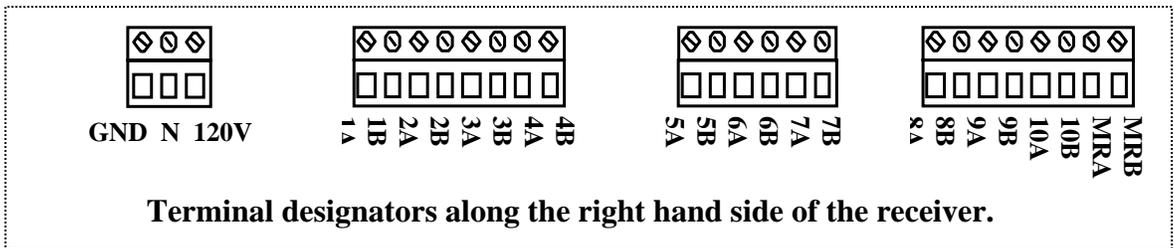
Section 5 – Wiring Diagrams (Continued)

Figure 5-1D. Dome Transmitter Wiring Diagram.

Duplicate of
Page 13.



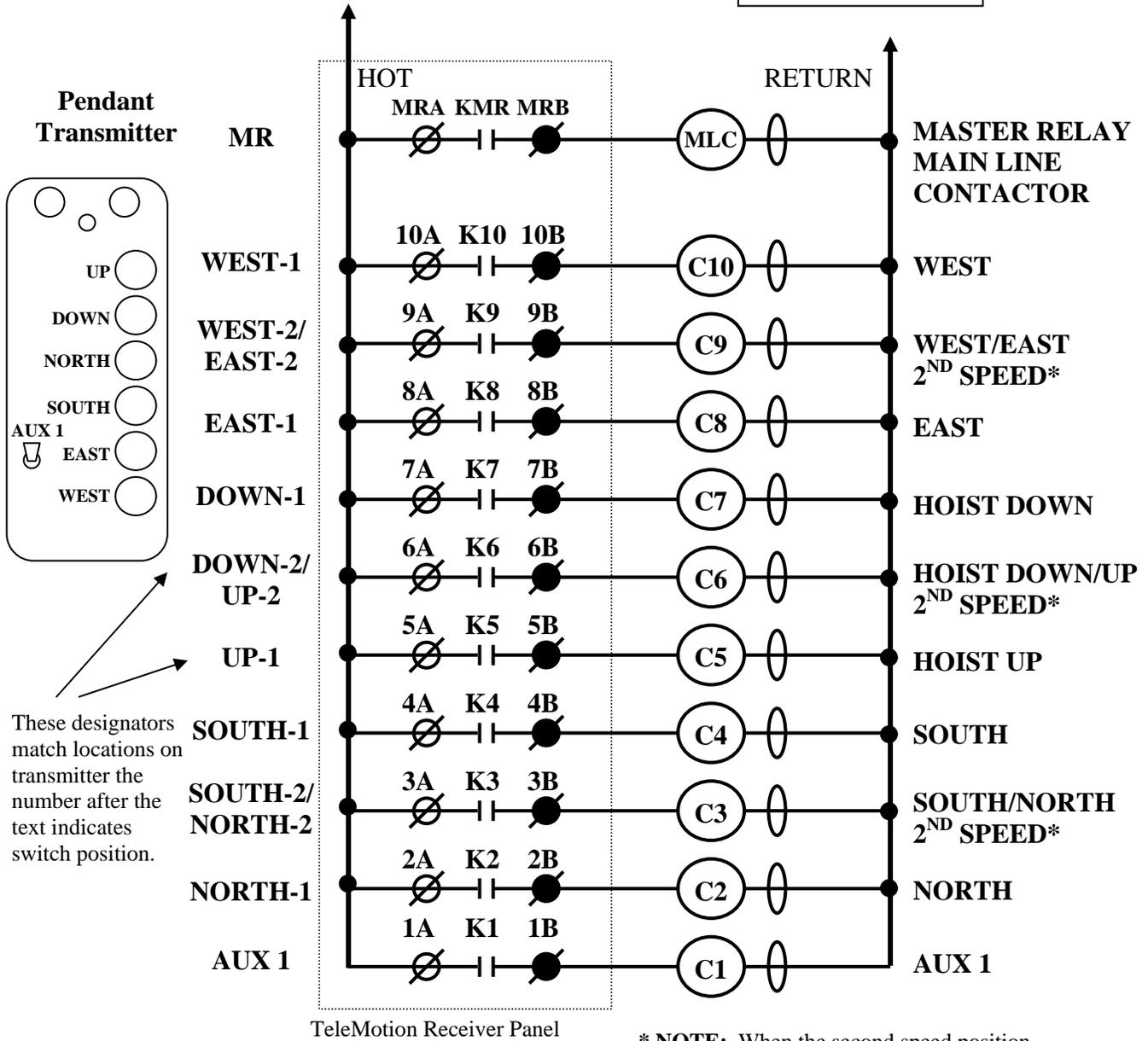
These designators match locations on transmitter the number after the letter indicates switch position.



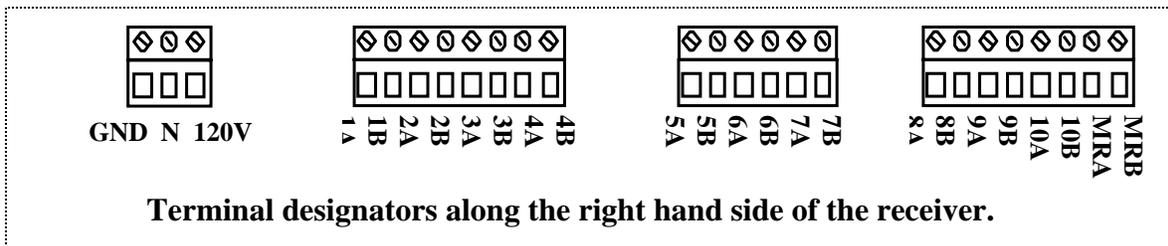
Section 5 – Wiring Diagrams (Continued)

Figure 5-2D. Pendant Transmitter Wiring Diagram.

Duplicate of
Page 14.



*** NOTE:** When the second speed position is activated the appropriate directional relay is still engaged.



Section 6 – Operation

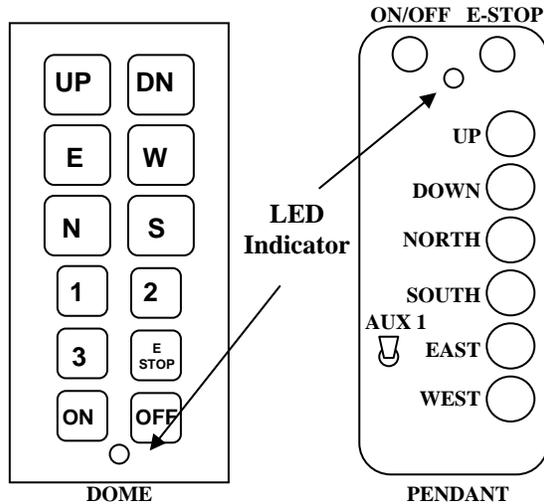


Figure 6-1. Dome and Pendant Transmitter

6-1. Pushbutton Dome and (Pendant) Function.

ON – Turns the transmitter ON and then sends the ON command to the receiver.

OFF – Sends the OFF command to the receiver and then turns the transmitter OFF. On the pendant ON and OFF is the same button.

E-STOP – Stops all equipment movement and disables all functions. Reset the system for normal operation by turning the transmitter “OFF” then “ON”. Use for emergencies only. (NOT FOR NORMAL SHUT DOWN).

UP – Selects hoist movement in the UP direction speed one (first switch position) or speed two (second switch position).

DN (DOWN) – Selects hoist movement in the DOWN direction speed one (first switch position) or speed two (second switch position).

E (EAST) – Selects East direction of the bridge or trolley (depending how unit is wired at installation) speed one (first switch position) or speed two (second switch position).

W (WEST) – Selects West direction of the bridge or trolley (depending how unit is wired at installation) speed one (first switch position) or speed two (second switch position).

N (NORTH) – Selects North direction of the bridge or trolley (depending how unit is wired at

installation) speed one (first switch position) or speed two (second switch position).

S (SOUTH) – Selects South direction of the bridge or trolley (depending how unit is wired at installation) speed one (first switch position) or speed two (second switch position).

1 (AUX 1) – Selects the Auxiliary relay, which may be used for a warning device as a horn or other function.

6-2. Transmitter LED Indicator.

When the transmitter is ON the LED flashes slowly. When the unit transmits the LED flashes rapidly. No LED indicator after turning ON at all indicates low batteries, please replace. See Section 6-4. on this page for battery replacement.

6-3. Operation.

Turn unit ON by pressing the ON button.

Press and hold the desired function button to maintain operation. Press the directional buttons harder to second position to engage second speed for those cranes having two speed motors.

Always turn system OFF by pressing the OFF button on the transmitter when done with crane operation.

The receiver will time-out after approximately 15 minutes if there is no activity.

The transmitter is programmed to time-out if not used for 15 minutes also.

NOTE

IN AN EMERGENCY HIT “E-STOP” TO STOP ALL CRANE MOVEMENT. WHEN EMERGENCY HAS CLEARED TURN THE TRANSMITTER OFF THEN ON AGAIN TO RESUME NORMAL OPERATION.

6-4. Battery Replacement.

Turn transmitter over to access back cover twist half moon shaped battery latch to remove cover. Take out old batteries; replace ALL batteries with new cells. Replace cover and turn transmitter ON to use. See page 23 [Section 9 - Spare Parts](#) for battery part numbers.

Section 7 – Programming

7-1. Programming Access Codes.

Crane #

(Copy Access Code settings from door of receiver to the diagram below and write crane number above for future reference).

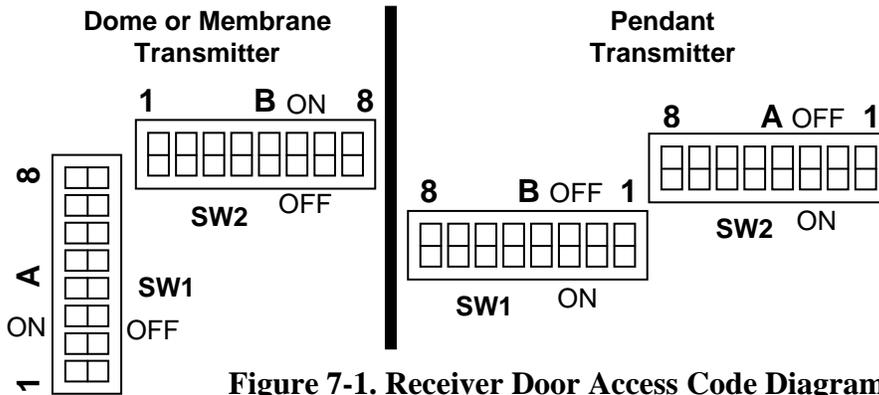


Figure 7-1. Receiver Door Access Code Diagram.

The access code is set at the factory and should not be changed unless absolutely necessary. If you are reprogramming a spare or “Minuteman” transmitter make sure the other transmitter is securely taken out of service.

WARNING

TWO OPERATIONAL TRANSMITTERS WITH THE SAME ACCESS CODES OPERATING AT THE SAME TIME IS A DEFINITE SAFETY HAZARD.

TeleMotion receivers are shipped with the access code settings for the transmitter marked on the receiver door for both styles of transmitters.

Also a label on the transmitter lists the access code settings inside. The positions on the transmitter label match the switch settings. The “1” by A1 means the switch position A1 should be “ON” and “0” means A1 should be “OFF”.

7-2. Changing Transmitter Access Codes.

WARNING

AFTER CHANGING THE ACCESS CODES ON THE TRANSMITTER, TEST THE UNIT BY TURNING IT ON AND OFF NEAR THE APPROPRIATE RECEIVER. IF THE RECEIVER DOES NOT RESPOND, DO NOT ACTIVATE A FUNCTION BUTTON! THE TRANSMITTER MAY HAVE THE WRONG ACCESS CODE, WHICH COULD MOVE ANOTHER CRANE. RE-CHECK THE ACCESS CODE IN THE TRANSMITTER AND RETEST.

7-2.1. Dome Transmitter.

Open the back battery door and take out the batteries as a safety precaution.

Remove the 6 screws on the front cover. Lift out switch-pad, logic board and turn logic board over.

Locate the dipswitches marked “A” and “B”. With a pen or pointed object toggle the switches to match the Dome Transmitter Code Diagram on the door of the receiver. A dot on the switch diagram means that switch position is ON.

CAUTION

DO NOT USE A PENCIL TO TOGGLE THE SWITCHES. THE LOOSE GRAPHITE FROM THE PENCIL CAN DAMAGE THE SWITCH.

Reassemble unit; replace the batteries and test.

7-3. Pendant Transmitter.

Open the back battery door and take out the batteries as a safety precaution.

Remove the 8 screws on the front cover. Turn transmitter over and remove back cover.

Locate the dipswitches marked “A” and “B”. With a pen or pointed object toggle the switches to match the Pendant Transmitter Code Diagram on the door of the receiver. A dot on the switch diagram means that switch position is ON.

Reassemble unit; replace the batteries and test.

Section 7 – Programming (Continued)

7-5. Receiver Unit Access Code Setting.

The access code is preset at the factory and should not be changed unless absolutely necessary. There are two separate microprocessors in the TeleMotion unit. Each microprocessor has its own pair of access code switches for additional reliability. The two pairs of access code switches are labeled “A1, B1” and “A2, B2”. A1 must match the settings of A2 and B1 must match the settings of B2 or the unit will not work. See Figure 7-2. Access Code Setting.

The programming in the receiver must match the transmitter. If looking at the label on the outside of the transmitter, take note that positions “A” and “B” number from the left 1 through 8. In the receiver 8 is closer to the bottom of the unit and 1 is closer to the top.

NOTE

IN EVENT PROGRAMMING OF ACCESS CODES IS REQUIRED, TAKE SPECIAL CARE TO CORRECTLY LOCATE ACCESS CODE SWITCHES A AND B. LOOK FOR THE LABELS A AND B ON THE PRINTED CIRCUIT BOARD NEAR THE RESPECTIVE SWITCHES. DETERMINE THEIR ORIENTATION. THE SWITCHES MAY NUMBER FROM LEFT TO RIGHT OR RIGHT TO LEFT. LOOK FOR THE NUMBERING ON THE SWITCHES. MATCH ACCESS CODES A1, A2, -- B1, B2 ETC.

After changing the access code test the receiver with a matching transmitter. (If only one of the two red LEDs DS12 and DS20 come on, then check the access code settings on the receiver. (Check A1-B1 if DS20 is lit or A2-B2 if DS12 is lit). If both LEDs are lit, both sets of access codes do not match the transmitter.

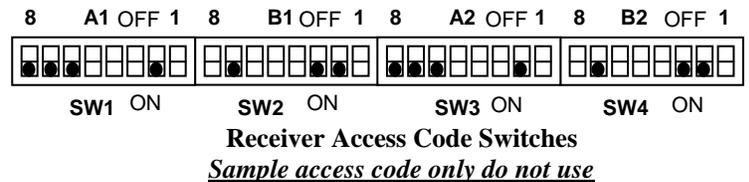
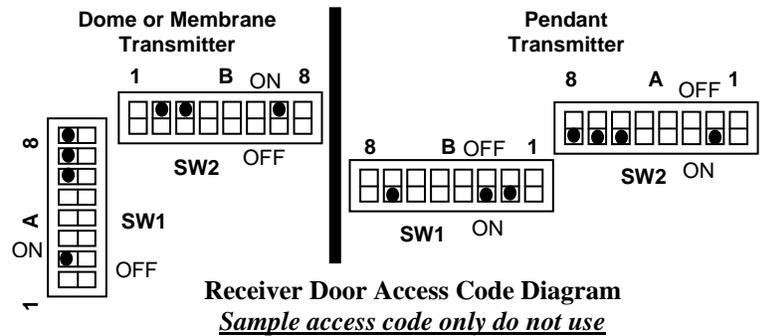
7-6. Transmitter Programming (Other).

This applies to Dome and Pendant transmitter dipperswitches SW3 and SW4. These are transmitter-programming switches (not the access code switches) in both types of transmitters these should always all be in the “OFF” position for use with a TeleMotion unit. These switches are used for other Telemotive receivers.

If replacing a Dome transmitter with a Pendant transmitter on an existing installation or making

them interchangeable and keeping the existing receiver wiring, open the Pendant transmitter, find dip switch SW3 and move position 1 (SW3) to “ON”. The Pendant transmitters labeling and functions North and South, East and West will match the Dome transmitter.

If replacing a Pendant transmitter with a Dome transmitter on an existing installation or to making them interchangeable and keeping the existing receiver wiring, open the Dome transmitter, find dip switch SW3 and move position 1 (SW3) to “ON”. The Dome transmitters labeling and functions North and South, East and West will match the Pendant transmitter.



MODEL # - TELEMOTION32
S/N=XXXXXXXXXXXXXXXXXXXX
ACCESS CODE SETTING
1 A 8 1 B 8
0 1 0 0 1 1 1 0 1 1 0 0 0 1 0
FREQ := AK10 J# = XXXXX

Sample Transmitter Access Code Label
Sample access code only do not use

Figure 7-2. Access Code Setting.
(A dot on a switch position or a “1” in the label is an indication that the respective switch position should be ON).

Section 8 – Troubleshooting

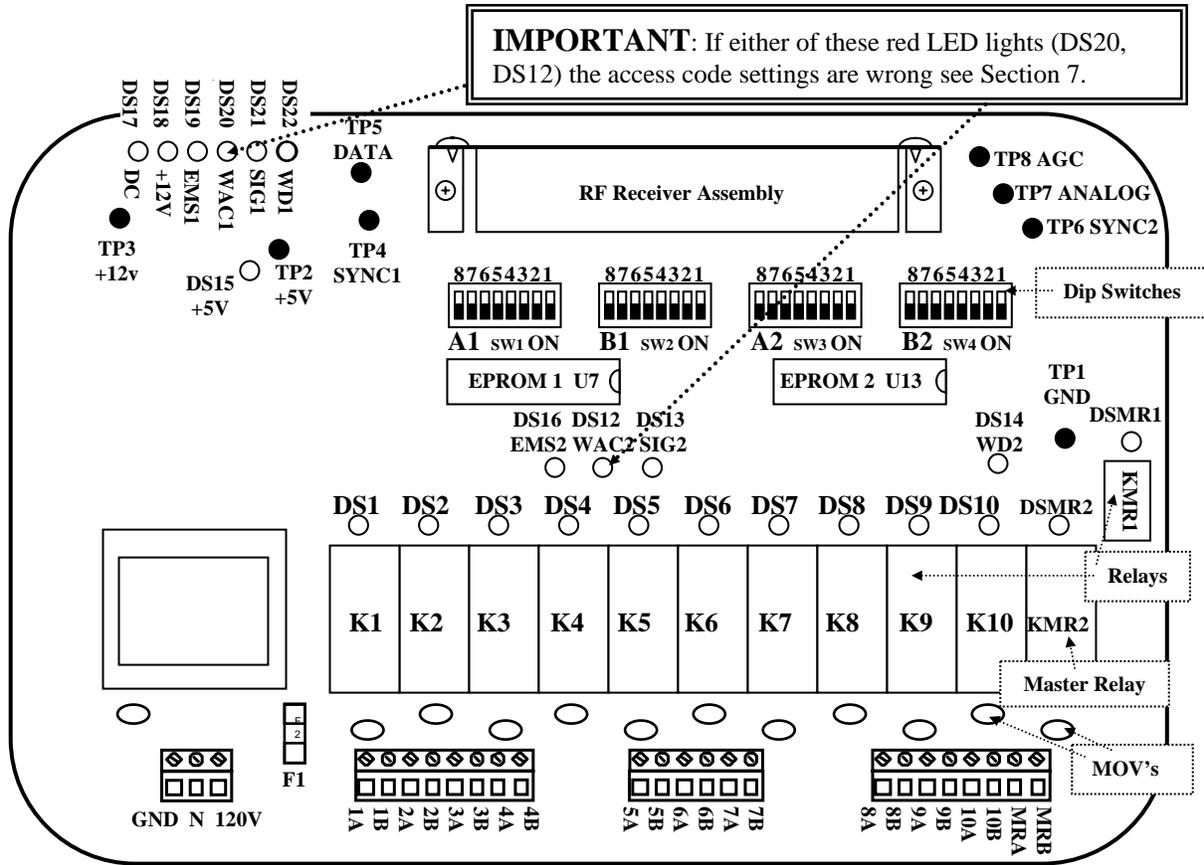


Figure 8-1. Receiver Board Layout.

NOTE: If the system stops working check the LED indicator on the transmitter. If it does not come ON with pushing the ON button replace the transmitter batteries (five AA cells on the Dome Transmitter, see [Section 9 – Spare Parts](#) page 23 for Pendant Transmitter batteries).

Table 8-1. Receiver Board Diagnostic LED Functions.

LED	COLOR	FUNCTION
DS1-DS10	Red	Monitors closure of the output relays (K1-K10). Normally ON for a function when that specific function is enabled. The LED will be illuminated when a specific relay has been enabled by the respective command received from the Transmitter Unit. The LED will extinguish, when the command is no longer detected.
DSMR1, DSMR2	Red	Monitors closing of Master Relay (KMR2) and driver relay (KMR1). Normally both ON when the Transmitter turns ON the receiver. These two LEDs are illuminated when the MR relay has been enabled by an ON command received from the Transmitter. The LEDs will extinguish, when an OFF command has been transmitted, or an E-STOP condition is present. The output relays are not functional if the MR is not engaged. KMR2 is the actual MR relay itself KMR1 switches the power to KMR2. KMR1 is controlled by microprocessor 1 and KMR2 is controlled by microprocessor 2 and KMR1. If KMR1 is lit and not KMR2, only microprocessor 1 has detected an ON command. Check to see if both access codes agree.

(Continued on next page).

Section 8 – Troubleshooting (Continued)

DS17	Green	<p>Monitors the unregulated DC power to the 12 volt regulator</p> <p>Normally ON when AC line is present.</p> <p>If AC Power is present and the AC to DC converter is working then the LED is illuminated. The LED is off if DC power is not present. Check power supply, fuses and if power is applied to the receiver.</p>
DS18	Green	<p>Monitors the regulated 12 VDC power to the Board (receiver board).</p> <p>Normally ON when AC line is present.</p> <p>If 12 VDC power is present then the LED is illuminated. The LED is off if 12 VDC power is not present. Check the 12 VDC regulator and for shorts on the Board.</p>
DS15	Green	<p>Monitors regulated 5 VDC power to the Board.</p> <p>Normally ON when AC line is present.</p> <p>If 5 VDC power is present then the LED is illuminated. The LED is off if 5 VDC power is not present. Check the 5 VDC regulator and for shorts on the Board.</p>
DS12, DS20	Red	<p>Wrong Access Code (WAC) microprocessors 1(DS20) and 2(DS12).</p> <p>Normally OFF.</p> <p>Both LEDs flashing during data transmission usually means the receiver access codes does not match the transmitter. If only one LED of the two lights, only one pair of switches does not match the transmitter access code (DS20 lit means A1-B1 and DS12 lit means A2-B2). See page 18 Section 7 to program the access codes. (If there are other TeleMotions in the area this light will flash when they transmit because they are on the same frequency with a different access code. This in itself does not indicate a problem).</p>
DS16, DS19	Red	<p>Emergency Stop (EMS) on microprocessors 1(DS19) and 2(DS16).</p> <p>Normally OFF.</p> <p>One or two of these LEDs ON continuously means the transmitter sent an E-STOP command. Send an “OFF” command from the transmitter followed by an “ON” command to clear the EMS condition.</p>
DS14, DS22	Red	<p>Watch Dog (WD) for microprocessors 1(DS22) and 2(DS14).</p> <p>Normally OFF.</p> <p>If one or two of these LEDs is flashing the 5 volts to the unit is too low. Look for shorts on the Board. If one of the LEDs is ON continuously the respective microprocessor has failed. Reseat the respective EPROM chip in its socket; if this does not fix the problem replace it.</p>

(Continued on next page).

Section 8 – Troubleshooting (Continued)

DS13, DS21	Yellow	<p>Signal present to microprocessors 1(DS21) and 2(DS13).</p> <p>Flashes while the transmitter is sending commands. (After the receiver has been turned on by the transmitter hold down a function button on the transmitter).</p> <p>When a TeleMotion transmitter is sending data these LEDs should flash indicating the reception of data. If one of the two red LEDs DS12 or DS20 comes on at the same time the access code does not match. If the receiver is ON and no new lights come on during transmissions by the transmitter (holding a button down) check to see if the transmitter light is flashing. If the transmitter LED is not flashing then replace the batteries, turn transmitter ON again and retest. If the transmitter LED is rapidly flashing when a button is pressed and there are no new LEDs lit in the receiver, the RF Receiver Module should be replaced.</p>
------------	--------	--

8-2. Test Points.

The receiver board has the following test points:

TP1 – Ground for monitoring other test points.

TP2 – Monitors regulated 5VDC.

TP3 – Monitors regulated 12VDC.

TP4 – Monitors sync signal from good data to microprocessor 1.

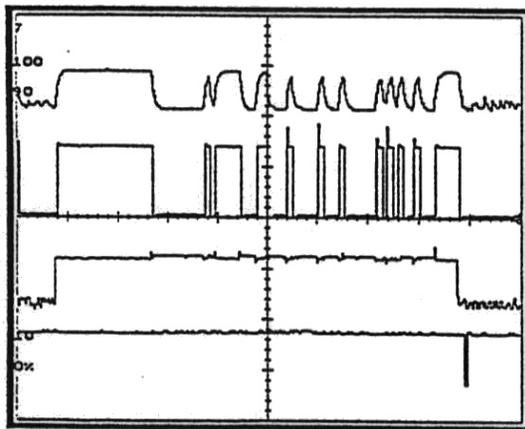
TP5 – Monitors received data from RF Receiver module.

TP6 – Monitors sync signal from good data to microprocessor 2.

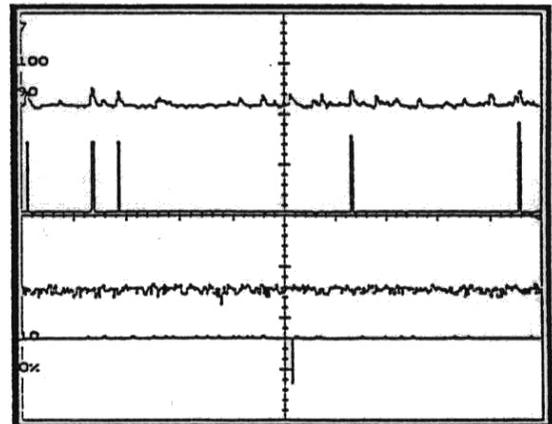
TP7 – Monitors analog signal from RF Receiver module.

TP8 – Monitors AGC (Automatic Gain Control) from RF Receiver module.

8-3. Typical Wave Forms on an Oscilloscope.



Receiving Data



Not Receiving Data

Scope Settings:

- Sweep – 1 millisecond per division.
- Sensitivity – TP7 and TP8 1volt per division 10X probe.
- TP3 2volts per division 10X probe.
- TP4 and TP6 5volts per division 10X probe.

Section 9 – Spare Parts

PART NUMBER	DESCRIPTION
10K3.2R-0	RECEIVER
AN102-0	EXTERNAL ANTENNA (OPTIONAL)
F2711-4	FUSE 5 AMP SLO BLO 250V
FW2824-1T	EPROM 1 AND EPROM 2
E13151-3.2-10	RF RECEIVER MODULE ASSEMBLY
H310-0	RF RECEIVER MODULE ASSEMBLY MOUNTING SCREWS (4)
MP18005-0	RF RECEIVER MODULE MOUNTING BRACKET TOP SIDE (LEFT)
MP18005-1	RF RECEIVER MODULE MOUNTING BRACKET TOP SIDE (RIGHT)
H906-0	RF RECEIVER MODULE MOUNTING BRACKET BOLT (2)
H934-0	RF RECEIVER MODULE MOUNTING BRACKET NUT (2)
E10195-0	MAIN BOARD
H1224-1	MAIN BOARD MOUNTING SCREWS (5)
E10197-0	ANTENNA ASSEMBLY (INTERNAL)
	CONNECTOR PLUG IN:
TS1060-3	3 POSITION
J4655-0	6 POSITION
TS1060-8	8 POSITION (2)
CR260-0	MOV
K1304-0	RELAY (OUTPUT) (11)
S2721-8	DIP SWITCH (ACCESS CODE) (4)
MP10267-0	HOUSING ASSEMBLY, CASE DOORS, SCREWS
E10196-0	FILTER ASSEMBLY
H1223-0	SCREW ROUND HEAD #10-24 X 1"
H1226-0	HEX NUT #10-24
H2079-0	LOCK WASHER #10 SPLIT
TC10K3.2-0	INSTRUCTION MANUAL
10K12SM02MT-3.2	DOME TRANSMITTER
A9654-1	STRAP ASSEMBLY
A10662-1	TRANSMITTER CASE ASSEMBLY
E10640-2	BEZEL ASSEMBLY (TWO-SPEED TRANSMITTER)
S2805-0	DOME SWITCH PAD (TACTILE)
MP9656-0	VINYL POUCH
A9665-0	RUBBER BOOT ASSEMBLY
AA CELL 1.5 VOLTS	BATTERY (5)
10K12SS02P7	PENDANT TRANSMITTER
E10668-11	CASE, TOP PENDANT, COMPLETE WITH SWITCHES, DECALS, BOOTS
MP10668-0	CASE ONLY, TOP PENDANT
H634-0	BOOT, GRAY (PUSHBUTTON)
H635-0	BOOT, RED (PUSHBUTTON)
H2055-3	LENS/MOUNT, LED W/SPACER, RED
S1058-0	SWITCH, PUSHBUTTON, 2-SPEED SBRU-SD
S1026-0	SWITCH, PUSHBUTTON, MOM N/O
S1041-0	SWITCH, TOGGLE, SPDT, CTR OFF
MP10666-0	KNOB, ROTARY 1/2" DIA., BLACK
MP10675-0	BOOT, TOGGLE SW., BLACK
MP10667-1	CASE ONLY, BOTTOM
A10667-1	BOTTOM CASE W/O BATTERY DOOR
A10669-1	BATTERY DOOR W/FOAM, W/O SCREWS AND LATCH
MP10676-0	FOAM, BATTERY DOOR
MP10677-0	GASKET FOR BOTTOM CASE
H1047-0	COVER SCREWS (8)

Section 9 – Spare Parts (Continued)

PART NUMBER	DESCRIPTION
10K12SS02P7	PENDANT TRANSMITTER (CONTINUED)
A1011-X	BOOTS (6) (SEE *NOTE 1 BELOW FOR THE PROPER SUFFIX)
MP10650-1	LATCH FOR BATTERY DOOR
H251-0	SCREW FOR BATTERY DOOR LATCH
H252-0	WAVE WASHER FOR BATTERY DOOR LATCH
H2034-0	FLAT WASHER FOR BATTERY DOOR LATCH
N13653-2	ACCESS CODE LABEL
E10688-0	FCC LABEL
A10670-0	BATTERY HOLDER ASSEMBLY, W/CABLE
H1049-0	SCREW, BATTERY BRACKET
MP10680-0	O'RING
MP10678-0	SHOULDER STRAP
BT10KP-0	BATTERY, ALKALINE
BT10KP-1	BATTERY, NICAD
E10670-1	BATTERY CHARGER
A10669-1	BATTERY DOOR

*NOTE 1	<u>UP</u>	<u>DOWN</u>	<u>EAST</u>	<u>WEST</u>	<u>NORTH</u>	<u>SOUTH</u>
Yellow	23	24	31	32	29	30

Section 9 – Spare Parts (Continued)

This page intentionally left blank.