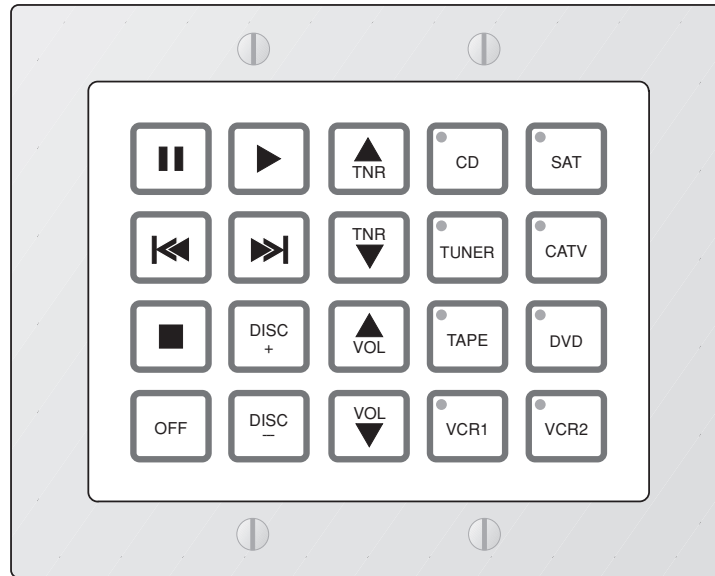# *INSTALLATION INSTRUCTIONS*

WPK1, 4, 6 and 8
THE WATERPAD™

WATERPROOF PROGRAMMABLE KEYPAD SYSTEM

INTRODUCTION

THE WATERPAD™, an adaptation of the original Smart Pad$_2$™ keypad system, is the world's first wall mounted, fully programmable and configurable waterproof keypad. Now, outdoor, pool side, bathroom, sauna and other high moisture installations can be handled with confidence. With the ease of the Dragon Drop-IR™ software system, the Waterpad is fully programmable into four basic keypad configurations. In addition, a large selection of button icon labels permits configurations to match the IR source and function commands of virtually any A/V system.

FEATURES

• Operates in high moisture environments in humidities up to 100% over a temperate range of 0° F (-18°C) to 140° F (60° C).

• Unit is submersible in pure water in depths up to 6 inches or so. (The pressure of additional depths may close the keys, preventing proper operation). See **CAUTION** note below.

• To maximize flexibility, the Waterpad is available in one, four, six and eight bank versions.

• A selection of 128 icon labels are included for affixing to source and function button locations.

• The membrane pad has 20 embossed buttons to which the icons are affixed, by the installer, with no noticeable seam. Icons are peeled off a paper backing exposing an attaching adhesive.

• Icon color is black on white. Volume and Mute are also available in blue, if it is desired to highlight these basic functions.

• The 4, 6 and 8 memory bank versions have LED indicators on each source button.

- Two tiers of memory per button. Applies to both source select and control function buttons.

- Sequence commands, including 1 to 30 second delays, can be programmed under any button (including the 2nd tier) without using up button spaces anywhere else on the keypad.

- Status input permits source buttons to light with +12V representing a system power ON condition as well as the selected source.

- Intelligent Power Management. The first command in a sequence, normally a power command, will not be sent if the status input is high (+12V). This prevents the sending of an unintended power command when the system or zone is already on, thus preventing unintended shutdown when switching sources.

- All Waterpad programming is done using Xantech's exclusive Dragon Drop-IR™ software system (available separately as Model DD4). It is a Windows® based program that permits rapid configuring of Xantech Smart Pad$_{2\,or\,3}$ derivative keypad systems. It allows the use of Xantech and/or installer prepared command libraries.   It also permits the installer to keep computer files of all the client's keypad configurations.

   NOTE: IR commands *cannot* be "learned" directly from hand held remotes into the Waterpad.

- Memorized contents are stored in an advanced E^2 PROM within the Waterpad learning module.   No backup batteries are used or needed!

- Memory size is 64k Bits (8k Bytes)

- Xantech IR Receivers and other keypads can be used on the same IR bus with the Waterpad.

- The Waterpad mounts into standard 2-gang wall "J" boxes, for either new or retrofit applications.

   CAUTION: While the WATERPAD™ is submersible, it was primarily designed to withstand high humidity or wet areas where water may be splashed on it frequently. If you have an application where you wish to place it under water, be sure the water is free of any corrosive agents such as chlorine. Also, do not submerse it deeper than 6 inches.

WATERPAD™ VERSIONS

To maximize the number of possible system applications, the Waterpad is supplied in four basic versions. Each are defined and illustrated below with typical button icons applied. You may choose the icons and place them in any arrangement you wish, to best fit taste and application. The only exception to this are the source buttons. These are always in the right two columns and are identified by the small LED (source) indicators in the upper left corner of each button. Each version includes an internal learning module, an 8-terminal block, hardware, and an assortment of 128 button icons.
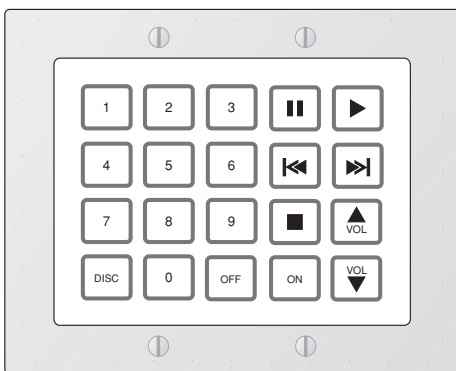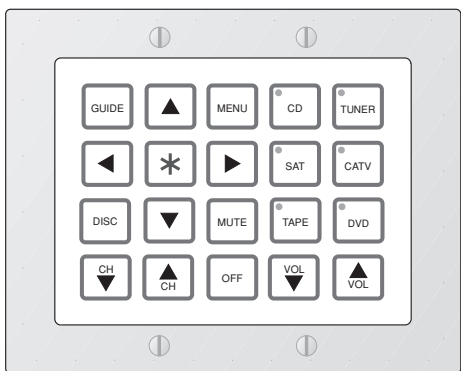

WPK-1

This version has **20 function** buttons (no source buttons). Use this when you have only one source to control, such as a high capacity CD changer.
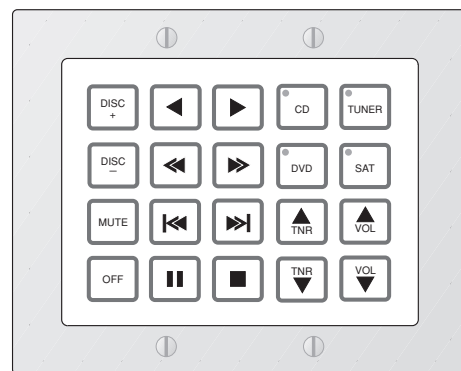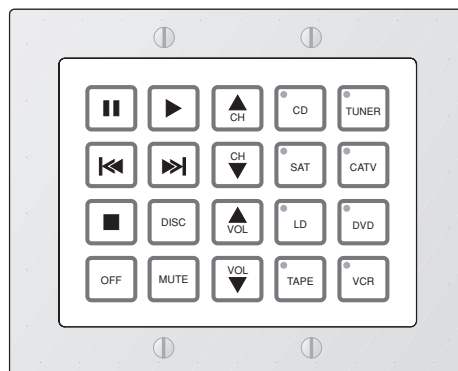

WPK-4

This version has **16 function** buttons and **4 source** buttons. Use this when you wish to control two, three or four source components.

WPK-6

This version has **14 function** buttons and **6 source** buttons. Use this when you wish to control five or six source components.

WPK-8

This version has **12 function** buttons and **8 source** buttons. Use this when you wish to control seven or eight source components.

INSTALLATION

When installing the Waterpad, we suggest that you proceed with the following order of events:

1. Determine the client's system components and needs in detail.

2. Determine the number of **source** components and **function** commands needed.

3. Pick the Waterpad version that best suits these needs, e.g. **WPK-1**, **WPK-4**, **WPK-6** or **WPK-8**.

4. Using Dragon Drop IR™, place the button Icons in the desired locations on the virtual Waterpad and program all buttons.

5. Transfer the program to the actual Waterpad and test all button commands for proper operation *before* affixing the real button Icons.

6. Affix the icons to all buttons.

7. Attach the inter-room cable to the terminal strip and test all button commands again for proper operation.

8. Mount the keypad to the wall surface.

A Typical 4-Source Configuration

The following example will serve to illustrate this process. Suppose a client wants to control an AM/FM stereo system with a Waterpad, as in **Fig. 3**, from an outdoor location and that he has the following equipment and system requirements:

Fig. 1   *4-Source Waterpad - Model WPK-4*

1. An AM/FM receiver and 4 sources: **TUNER** (AM/FM), two **CD** changers and a cassette **TAPE** deck.

2. When a **source** button is pressed, it turns on the AM/FM receiver and the associated source.

3. The Waterpad must have the following **function** commands for each source:

   TUNER: Tuner Up/Down (scroll of preset stations), AM/FM (select).

   CD 1 and CD 2: Play, Track Forward/Reverse, Pause, Stop, Disk+, Disk– (select).

   TAPE: Play Forward, Play Reverse, Fast Forward/Rewind, Pause, Stop.

This is the basic client specification for this application of the **Waterpad**™.
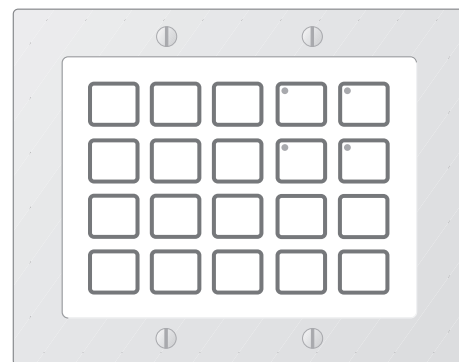
The next step is to determine which **Waterpad version** and keypad **button icons** are required to perform this job, as follows:

1. Since there are 4 **sources**, 4 banks will be required. We will need the **WPK-4** Waterpad version as shown in **Fig. 1**.

   PLEASE NOTE: *All four versions of the Waterpad appear the same before the button Icons are applied. That is, all the buttons in the right 2 columns have a small dark circle in their upper left corner where LEDs are located for bank (source) indicators. These LEDs are programmed at the factory to operate depending on the Waterpad version you ordered. That is, on the WPK-1 none operate, on the WPK-4, the upper 4 operate, on the WPK-6 the upper 6 operate and on the WPK-8, all 8 operate. On the versions where the LEDs do not operate, the buttons work as normal function keys. When you apply function icons to them, the unused LEDs are covered up as in Fig. 2.*
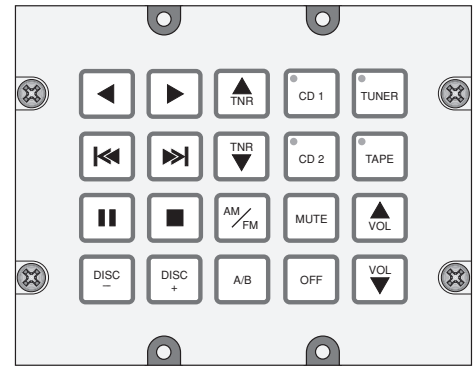

Fig. 2 *Typical 4-Source Button Assignment*

2. The next step is to determine exactly what **button icons** are required to identify the **source** and control **functions** needed.

3. We begin this process by assigning the **source** buttons first; **CD1, TUNER**, **CD2** and **TAPE**. See **Fig. 2**. We do this by using Dragon Drop IR™. You may also pencil out your button designations on the blank Waterpad illustrations at the end of this manual prior to using Dragon Drop if you wish.

4. Next, we assign the **function** control buttons based on the list of functions given in the client specification, in the same manner.

5. Now that all the buttons have been assigned (as shown in **Fig. 2**), it is necessary to memorize the IR commands and do the programming. Refer to the Dragon Drop IR™ Installation and Programming Instructions for this process.

   NOTE: In this example, the button assignments are placed in what is considered an ergonomically pleasing arrangement. You may, however, assign the buttons in any arrangement you wish, to best fit taste and application. The only exception to this is the 4 source buttons. These are permanently assigned to the upper positions in the two right columns.

   PROGRAMMING THE WATERPAD™ - The Waterpad series was designed to be programmed entirely using the Dragon Drop IR™ system with software DD3 ver. 3.0 and higher. ***It cannot be programmed directly!*** Refer to the Dragon Drop IR™ DD4 Installation and Programming Instructions for details.

Up to this point, the Waterpad exists only as a virtual keypad in Dragon Drop-IR™. For the final steps, we would proceed as follows:

6. All commands are tested, while still in Dragon Drop-IR™, to see that they actually operate all system functions.

7. The programmed data is then transferred to the "real" Waterpad, using Dragon Drop-IR™.
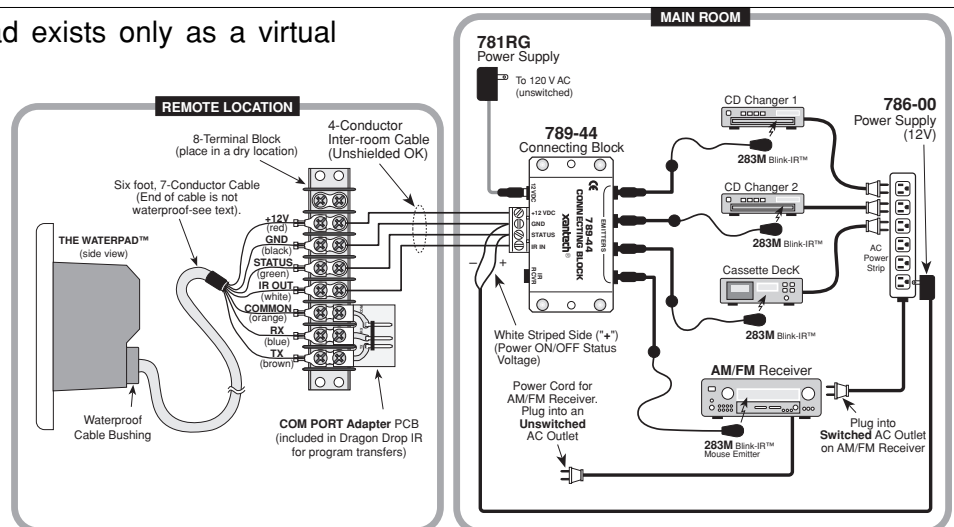

Fig. 3 *Typical 4-Source Waterpad Controlled System*

8. The Waterpad is now wired into the final system (refer to **Figs. 3 & 5**) and all commands tested again -- **before** applying the button icons.

9. If the system functions correctly, the button icons can then be applied, as shown in Fig. 4. Finally, the Waterpad is mounted to the wall as shown in Fig. 6, 7, 8 & 9.

   NOTE: The needed button icons are included with the Waterpad.

Applying Icons To The Waterpad Buttons

Each version of the Waterpad is supplied with 128 button icons on two mylar sheets. An assortment of both **source** and **function** icons are provided and were chosen to cover practically any conceivable installation. You will note that an extra set of Volume and Mute icons are provided in blue. Also, an extra set of function symbol icons (play, stop, pause, etc.) are provided in grey. Use these icons to enhance visibility under low light conditions or for color coding of functions or taste considerations. For indoor applications, you would normally use the more sedate white icons.

CAUTION: Before applying the icons, be sure to do the following first:

a) Complete all configuring and programming using the Dragon Drop IR software system.

b) Transfer the programmed data to the "real" Waterpad.

c) Print out a copy of the virtual programmed Waterpad from Dragon Drop and keep it nearby for reference.

d) Test each button on the "real" Waterpad (without the icons attached) and be sure it executes all desired commands.

e) Be sure the membrane surfaces of the Waterpad, your hands and the icon sheets, are completely dry and free of any grease or dirt.

1. Carefully peel off a desired icon from the sheets. Try not to touch too much of the adhesive surface.

2. Align it very carefully within the rectangular embossed button area on the membrane of the Waterpad and press it into place. See **Fig. 4**.

   Be sure you have the correct button location. Use the printed virtual Waterpad as your guide.

   CAUTION: You must be very certain that you have the correct location and that the icon is aligned correctly. The adhesive is a waterproof type and is very aggressive. If you have to pull it up to reposition it, it may not bond well enough to hold properly the second time. You would have to purchase a spare set of icons in order to replace the damaged one(s).

3. Affix the remainder of the icons in the same manner.

   CAUTION: *If you damage the membrane (e.g. by trying to dig out an icon with a knife, etc.) so that it loses its watertight seal, it will void the warranty!*
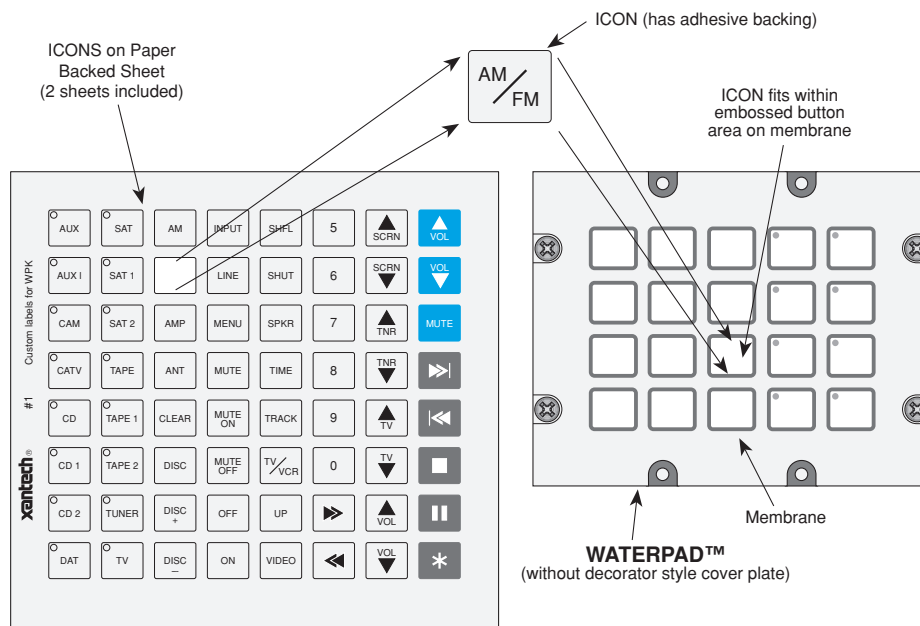

Fig. 4 *Icon Application*

Fig. 5 illustrates the terminal block, COM PORT adapter & the lead termination legend for the Waterpad. The 8-terminal block is included with each Waterpad. The COM PORT adapter is included with each DD4 Dragon Drop-IR software package.

• Four of the seven leads are for the standard Xantech IR bus, consisting of **+12V**, **IR OUT** (IR -signal), **STATUS** and **GND**.

• The remaining three leads are for the **COM PORT**. The COM PORT Adapter PCB allows direct plug-in connection of the interface cable that connects the PCIR-1 to the Waterpad for program transfers from Dragon Drop IR™. Refer to the Waterpad portion of the Dragon Drop IR™ instructions for details.
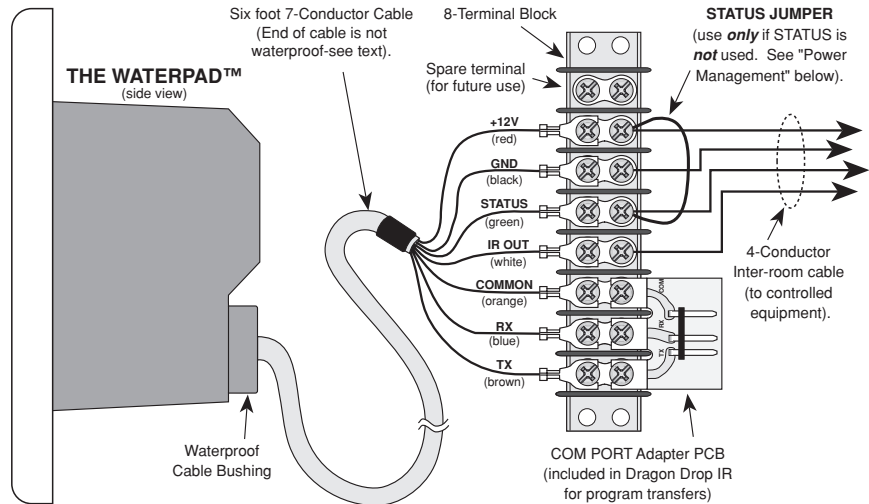

Fig. 5 Cable Terminations

CAUTION: The end of the cable, where the leads emerge from the sheath, is not water tight. To prevent seepage of water up the interior of the cable to the inside of the Waterpad, ***do not allow the end to be placed under water or in a wet location***. The 6-foot cable allows sufficient length to pull the cable end to a compartment or room area where it can be connected to the 8-terminal block in a dry environment.

Power Management

Like the Smart Pad$_{2\ or\ 3}$, the Waterpad™ has the ability, via the STATUS terminal, to prevent unintended power turnoffs when power commands are sequenced with source commands.

• The Waterpad stops the first command in a sequence (the power command) when the STATUS terminal is high (+12V DC = **ON**).

• Conversely, when the system is **OFF**, the first command (power) will be sent since the STATUS terminal is low (0V).

• This assumes that +12V and 0V, representing a system **ON** and **OFF** condition, is applied to the STATUS terminal (see **Fig. 5**)

• See **Fig. 3** for STATUS connections in a typical system.

NOTE: If power management is **not** used (i.e. 3-wire hookups), a short jumper **must** be connected between the **STATUS** and **+12V** terminals (see **Fig. 5**).

This powers the source button LEDs so they will come on with the selected bank. In this case, you **must** put the system power command under an ON/OFF button (**not** under the source buttons). Also, source commands must be placed **twice** under each source button in a 2-command sequence. ***The user will then need to make two initial button presses to start the system, one for ON and one to select the source***.

Also, when programming the Waterpad for control of the ZPR68, you will need to place the source select commands twice under each source button so that the sources can be selected after zone turn-on.

MOUNTING

The Waterpad is designed to mount into most standard 2-gang "J" boxes in basically the same way as other wall mounted decorator style components. The "J" boxes may be either of the new construction or retrofit varieties. Consider the following when planning the mounting of the Waterpad:

• The Waterpad requires considerable room in the J-box.

- For retrofit (existing construction) applications, use high volume boxes, such as the 2-gang Slater Retrofit 32 cu. inch box.

- Most high volume new construction J-boxes will work. A "P" ring could also be used.

- **NOTE:** Be sure to check fit *before* buying large quantities of J-boxes for the job.

- Since the Waterpad is fully enclosed, it may be possible, with some types of sturdy wall materials, to mount it directly to the wall surface. See **Fig. 9**.
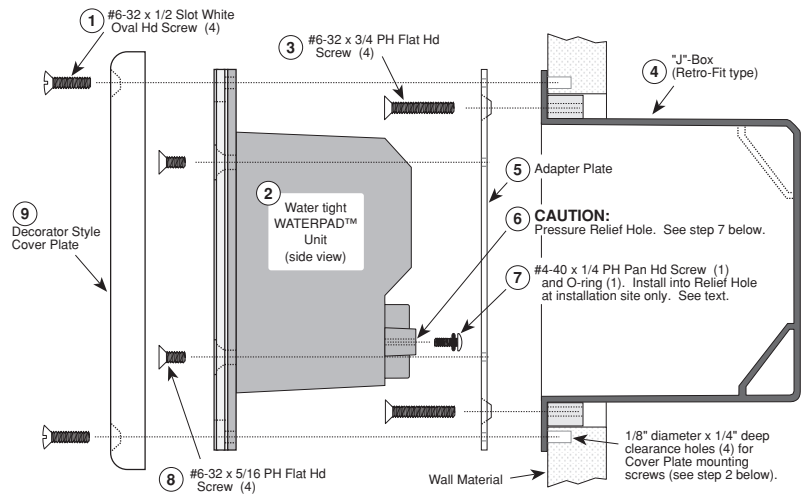

Fig. 6 Mounting the Waterpad into a Retrofit type J-box.

Mounting Procedure - Retrofit J-Box

To mount the Waterpad using a retrofit J-box, refer to **Fig**. **6** and proceed as follows:

1. Temporarily mount or hold the J-box ④ to the wall opening.

2. Using the Adapter Plate ⑤ (supplied) as a template, mark, then drill four 1/8" x 1/4" holes in the wall material to allow clearance for the ends of the #6-32 x 1/2" cover plate screws ①. This allows the cover plate to be pulled down flush to the wall in step 9. See **Figs. 6** & **8**.

3. Thread the 6-foot cable from the Waterpad through the Adapter Plate ⑤ and through a knockout hole in the back of the J-box ④.

4. Run the 6-foot cable from the back of the J-box to a dry location in an adjacent compartment or room and make connections to the 8-terminal block and the 4-conductor inter-room cable. Refer to **Figs. 3** & **7**.
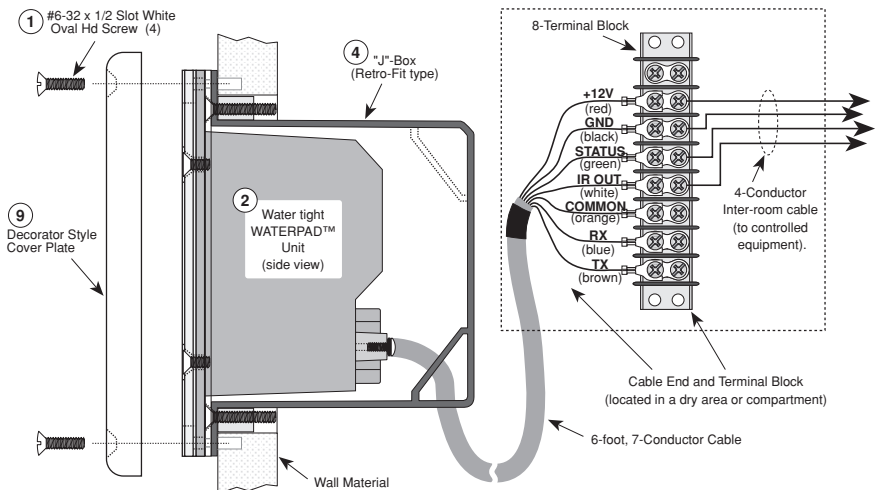

Fig. 7 Installed Waterpad - Using a Retrofit type J-box.

5. Attach the J-box ④ to the wall.

6. Attach the Adapter Plate ⑤ to the J-box ④ using the four #6-32 x 3/4" Flat Hd screws ③ (supplied).

7. Install the #4-40 x 1/4" Pan Hd screw and O-ring ⑦ (supplied) into the Pressure Relief Hole ⑥. Tighten until you see some compression of the O-ring.

   CAUTION: A Pressure Relief Hole ⑥ is provided to prevent the buildup of internal pressure that could damage the membrane during"storage and shipping conditions. When the Waterpad is installed at the final site, however, *the screw and O-ring must be installed prior to exposure to moisture! Failure to do so will void the warranty!*

8. Using the four #6-32 x 5/16" PH Flat Hd screws ⑧ (supplied), attach the Waterpad ② to the Adapter Plate ⑤. See **Figs. 6** & **7**.

Controllers

9. The final step is to attach the Decorator Cover Plate ⑨ (supplied) to the front of the Waterpad assembly using the four #6-32 x 1/2" Slot White Oval Hd screws ① (supplied).

Mounting into a New Construction J-Box

The procedure to mount the Waterpad into a new construction type J-box is essentially the same as that for a retrofit J-box.

1. The main difference is that you will need to have access to the rear of the new construction J-box so that the 6-foot, 7-conductor cable can be pulled through the knockout hole and run to a dry location in an adjacent compartment or room.

2. You would then make connections to the 8-terminal block and the 4-conductor inter-room cable and carry out all the remaining steps as described for retrofit J-box mounting. Refer to steps 1 through 9 previous and **Fig**. **8**.
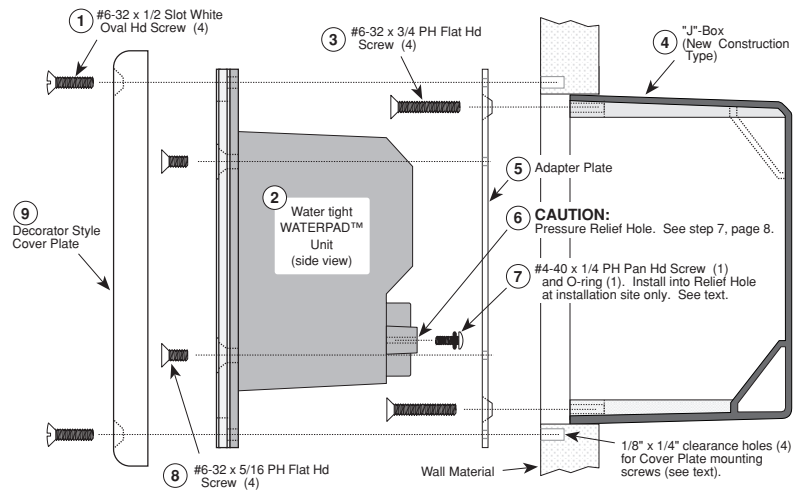

Fig. 8 *Mounting the Waterpad into a New Construction type J-box.*

Mounting Directly to a Wall Surface

If the wall material is sufficiently strong so that it will hold the threads of sheet metal or wood screws, you may be able to mount the Waterpad directly to the wall surface. Refer to **Fig. 9** and proceed as follows:

1. Use the Adapter Plate ⑤ as a template to mark a cutout opening for the Waterpad on the wall and to locate pilot holes for the four Adapter Plate mounting screws ③. Also, mark spots for clearance holes for the ends of the #6-32 x 1/2" cover plate screws ①.

2. Cut the opening for the Waterpad.

3. Using a #32 bit, drill four countersunk pilot holes 3/4" deep for the Adapter Plate and the mounting screws ③.

4. Drill four 1/8" x 1/4" holes in the wall material to allow clearance for the ends of the #6-32 x 1/2" Cover Plate screws ①.

5. Using the four #6 x 3/4" Flat Hd Sheet Metal screws ③ (supplied), attach the Adapter Plate ⑤ to the wall.

6. Run the 6-foot 7-conductor cable from the Waterpad through the wall opening to a dry location in an adjacent compartment or room. Make connections to the 8-terminal block and the 4-conductor inter-room cable. Refer to **Figs. 3** & **7**.

Fig. 9 *Mounting the Waterpad directly onto a wall without a J-box.*

7. Finish by following steps 7 through 9 under "**Mounting Procedure - Retrofit J-Box**".

TROUBLESHOOTING

If you encounter problems, review each of the following items and take corrective action as described. If problems persist, contact Xantech Technical Support.

1. **The Waterpad does not have RESTORE or CLEAR MEMORY buttons as does the SmartPad$_{2\ or\ 3}$. How do I perform these functions on the Waterpad, if needed?**

   a) To perform the **RESTORE** function, simply remove the 12 VDC power from the unit for 10-15 seconds, then reapply. Programmed contents in the memory will not be disturbed.

   b) To **CLEAR MEMORY**, remove power as above, but hold down any button on the keypad continuously while reapplying power. Bear in mind that **this process will erase all keypad contents**.

2. **The Waterpad has problems with the transfer of data from Dragon Drop IR™ or execution of IR commands after data transfer.**

   A corrupted or incorrectly learned IR code has been transferred to the Waterpad or a corrupted code preexists in the Waterpad learning module.

   a) Perform the **RESTORE** or **CLEAR MEMORY** function on the Waterpad, then repeat the transfer procedure from the Dragon Drop IR™.

   b) If the problem persists, test all IR commands per item 1 in the TROUBLESHOOTING section of Dragon Drop IR™, replacing any defective commands. Then repeat step a) above.

   For additional details on troubleshooting IR programming problems, refer to the TROUBLESHOOTING section of Dragon Drop IR™ "Installation and Programming Instructions"

3. **The screws that attach the decorator style cover plate over the Waterpad do not screw in fully, preventing the cover plate from being tightened down.**

   The wall surface is interfering with the ends of the screws, preventing full tightening.

   Clearance holes must be drilled in the wall surface to allow full travel of these screws. Follow the procedure in step 2, under Mounting Procedure - Retrofit J-Box.

SPECIFICATIONS

Memory: 8 kbytes E^2 PROM

IR Carrier Frequency: 31.25 kHz to 71.5 kHz

Power Requirements: 12V DC - 70 mA without Status - 85 mA with Status
(Requires Xantech 781RG or 782 Power Supplies)

Conductors: Normal 3-wire Xantech IR receiver system compatible (4th wire for status indication)

Connections: 6-foot, 7-conductor cable terminated in an 8-screw terminal block: 4-conductors for +12V, STATUS, IR OUT & GND plus 3-conductors for COM PORT leads (RS232 signal compatible).

Cable Requirements: Four-conductor/24 gauge up to 150', 22 gauge up to 400', 20 gauge up to 1500' and 18 gauge up to 4000' (unshielded OK)

NOTE: The Waterpad will not operate in the 2-wire Phantom Power Mode.

STATUS Terminal Power Management Turn-on Voltage: 5 to 20 volts DC (5mA @ 12V DC)

Maximum current output: 100 mA

Depth behind mounting plate: 2-3/8"

Max. Submersible Depth in Pure Water: 6 inches

Max. Temperature Operating Range: 0° F (-18°C) to 140° F (60° C)

*Fits two-gang wall boxes for both new & existing construction •Decorator-style wall cover plate included

PATENT PENDING

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Use these blank Waterpad panels when planning button layouts.