

KARTROL EXE

The **Kartrol EXE** was developed in response to the ever-changing needs of track operators. It incorporates all the features of the **Kartrol EX** system and goes way beyond in its flexibility and capability.

The most significant features of the **EXE** system are:

- the ability to control either gas or electric karts with the same kart receiver
- the ability of the operator to program the kart receiver number and the track number, meaning a single spare can be programmed in the field to any track and any kart number
- the ability to control individual karts in all modes, most notably the reset mode, allowing a single kart to be reset without resetting any others
- the provision for wired remote switches for the main functions, including turning on and off of the pit loop
- three speeds for gas karts: stop, slow and medium plus full throttle
- the actual rpm of all three modes, stop, slow and medium, can be varied from the factory presets by the operator to allow for different track variables
- the ability to remotely control other devices such as traffic lights, message systems or even the pit loop.
- new more accurate pit loop system, allowing for control of karts without affecting karts on adjacent lanes or elsewhere on the track.

All of these features combine to make the **Kartrol EXE** the most flexible and user friendly go-kart control system.

OPERATIONS

The **KARTROL EXE** is very easy to use right out of the box. However, certain steps must be followed to enjoy all the features.

Most **EXE** systems have the transponders already mounted on the karts by the kart manufacturer. The transponders may be programmed to the correct kart number and track, if this information was conveyed to the manufacturer before or during installation. If this was not done, all **KARTROL EXE** receivers will come pre-programmed to respond to Kart #1, Track #1. If they are mounted on an electric kart they should also have been set to electric operation.

The following procedures will guide you through the programming and operations of the **EXE** system.

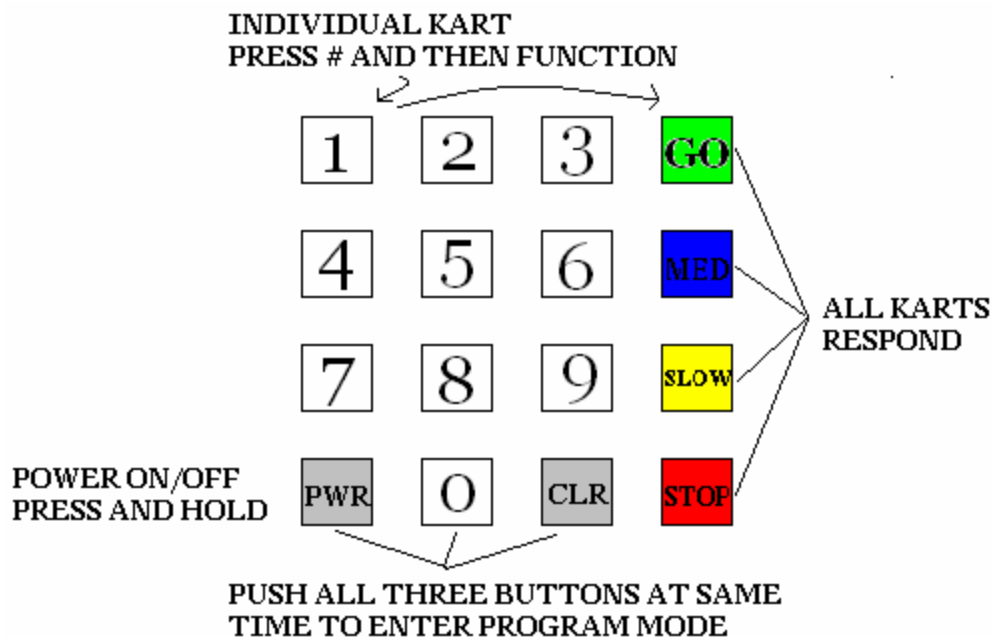
I. Programming the Hand Held or Table Top Console

- Power **ON** – push and hold **PWR** button for 2 seconds.
- Programming must be done when more than one track at one location will be using the Kartrol EXE, and also if batteries are removed or discharged completely in the Hand Held or Table Top Console. The Hand Held transmitters are generally shipped with batteries removed and therefore will need to be programmed upon arrival.
- With power on, enter programming mode by simultaneously pressing the bottom left three buttons (**PWR**, **O** and **CLR**). This may take a few attempts as it was designed to be such that accidental access would not occur. When successful, the LCD screen will read:

Software version

1.1.1

(Stop continues)



- Pressing the **STOP** button will change the screen to the next screen where a different track number can be set. The screen will appear as:

Enter Track #
(stop sets)
01

- If only one track is one the site and no other tracks are within the effective radio area, it can be left at **Track #1**. **If so, simply push Stop to advance to next screen.**
To change the track number, press **CLR** and then the track number desired, e.g. “2” *It is not necessary to enter the zero before numbers 1 thru 9.*
Then press the **STOP** button to set this track # into memory. It will also change to the next screen.

Select Mode
Go= Gas
Stop= Electric

- This screen allows you to select for Gas or Electric kart. Press **GO** to program for Gas Karts and **STOP** to program Electric Karts. Pressing either one will enter that setting into memory and advance to the next screen.
- If Electric operation was selected then programming is complete and the transmitter is ready for operation. The Track # is displayed and a letter “**E**” for Electric is also displayed in the upper right of the screen.

Track 01 E
Enter Kart /Func:

This is the general operation screen and you have left the programming mode. If you made an error, simply repeat the process.

- If Gas was selected, the next three screens allow the operator to vary the actual rpm that the karts will be slowed to at each of the speed settings, beginning with the **Medium** Speed. The factory presets are in the middle of the range, and should be correct for most locations.. If no change to the preset speed is desired, simply press **STOP** and the next screen will be the rpm for the **SLOW** speed. Again pressing Stop will advance to the next screen which is the Stop rpm speed. It is recommended that you try the karts at the factory set speeds first and only if you see a need, modify these settings.
- To change the rpm of the speed, you press the **MEDIUM** button to increase the speed or the **Slow** button to decrease the speed. Each press changes the rpm by about 25 rpms, and one bar will be added or subtracted from the bar graph. When you have adjusted speed to where you want to try it on the karts, press **STOP** to set into memory.

Note- when you make a change to the RPM settings this change is sent to the receiver from the transmitter. In order for it to be locked into the memory in the receiver, you must cycle through all the functions once. Then the next time the receiver gets the signal it will respond to the new RPM. If you are changing the RPM on one unit to try, all transponders that are turned on will receive this information. Those that are not on will not hear that change until they are cycled through the functions one time.

- The screen will advance to the **SLOW** speed. If desired, adjust the settings for the **SLOW** speed and press **STOP**. The screen will now move to the **STOP** speed rpm settings. Adjust as desired and press **STOP** to set it into memory. This will complete programming and will enter normal operation mode.
The track number is displayed and the letter “**G**” for **GAS** is displayed in the upper right corner.

Track 01 G
Enter Kart #/Func:

—
If any mistake has been made, simply re-enter the programming mode and reprogram.

- Now that the transmitter, either Hand Held or Main Console version, is programmed, it is necessary to program the receiver units to match that transmitter. If no changes were made on the programming this may not be necessary. The information such as Track # and Gas or Electric is transferred to the receivers from the transmitter when programming the receivers, therefore it is necessary to program the transmitter **first** and then the receivers.
- If two transmitters are to be used on the same track, it is necessary for them to be programmed exactly the same.

PROGRAMMING KART TRANSPONDER/RECEIVER

- To program the kart receiver/transponder it is necessary to use the transmitter that you will be using on that track. This transmitter should be programmed to the Track #, and mode of Gas or Electric, that you require. The information from the transmitter is transferred to the transponder which will lock this into memory. On Gas karts the RPM speed settings are changed on the transmitter and then sent to the receiver.
- Connect the transponder to the **Programmer/Shop Tester**. Be sure connection is secure. It is a good idea to gently twist the connector back and forth as you push the connectors together. There is a raised mark on both halves of the connector that must be aligned. Failure to properly connect the two halves will make it impossible to program the unit.
- Press the **Power** button and turn on the **Program**. The green LED will flash. Wait until flashing stops. The light should be on in the **SLOW** mode. If not, check the connection between the connector halves.
- Turn on the **Program** mode button. This causes the red LED to light up, and again, wait for the green LED to stop flashing. The **STOP** LED light should be lit.
- Turn on the transmitter, either Hand held or Table Top model.
- If you do not want, or desire, to have the ability to address karts individually by kart number, simply push **#1** button then **GO** button. This will program the unit to Kart 1. If programming was received by the transponder the tester will change to **GO**.
- Turn off the program mode button and wait for the green LED to stop flashing.
- Using the transmitter, test the transponder by pushing the **GO**, **MEDIUM**, **SLOW** and **STOP** buttons and watch that the LED's on the tester change accordingly.
- Select a kart number different than the one you programmed, enter that number, and then push a function that is different from the current mode.

Example: Kart #1 was programmed, push #2 and then **GO** if the tester showed **STOP**. The tester should not respond.

- Select the kart # you programmed, enter it, and then push a function that is different from what is showing on the tester. The tester should respond to the function you selected.
Example: Tester shows **STOP**. Enter #1, then push **GO**. Tester should change to **GO**, confirming that the signal was understood.
- Turn off Programmer/Tester and disconnect the transponder. It is now ready for installation on the kart. This can also be done while the transponder is mounted on the kart simply by disconnecting the kart harness and connecting the Programmer.
- Repeat this programming to all receivers to be used on that track. If individual control of karts is not desired, program all of them to Kart #1.

***CAUTION:** The Programmer/Tester has a fairly significant draw on the batteries, and if they become low, the programming or testing may not work. The power LED should go to yellow when the batteries are low, but it may be possible for the tester to begin malfunctioning just before this happens. If you detect any problem in either testing or programming, put a fresh set of batteries into the tester and retry.

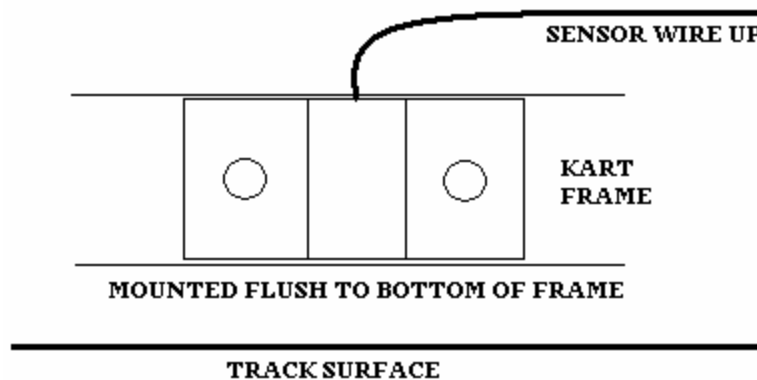
TRANSPONDER INSTALLATION

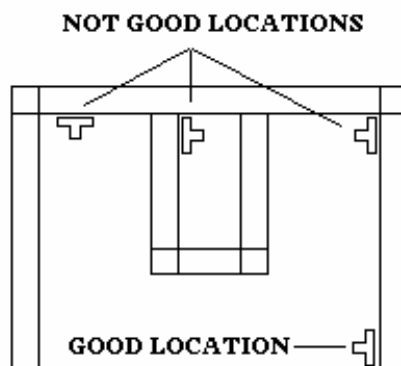
Location of the transponder may be critical to reliable operation and longevity of the unit. The transponder should be mounted in a relatively dry and safe location on the kart, away from the motor or batteries and motor controller on electric karts. Some possible locations for mounting transponders are:

- On the roll bar or headrest
- On the steering support column
- Under the body along the side by the seat
- Near the front of the kart frame under the body

The black wire is the antennae and should be stretched out as much as possible, preferably away from motor, motor controllers, and batteries. It is wise to mount **one** transponder and then test on the track for proper range and function. If it is not satisfactory, change the antennae routing and retest. Once you are satisfied the unit operates correctly, mount the remaining units the same way.

If the kart transponder has the optional pit loop sensor, it must be mounted on the frame away from motor, motor controller, and batteries. A good location is in the front half of the kart as close to the outside of kart as is safely possible. It is also a good idea to stay out from a corner between two frame members. The wire coming out of the sensor must be to the top and the sensor button should be as close to the bottom of the frame rail without hanging below the frame. Again, a single unit should be mounted and tested on the track to ensure correct operation with the pit loop before installing the remainder of the units.

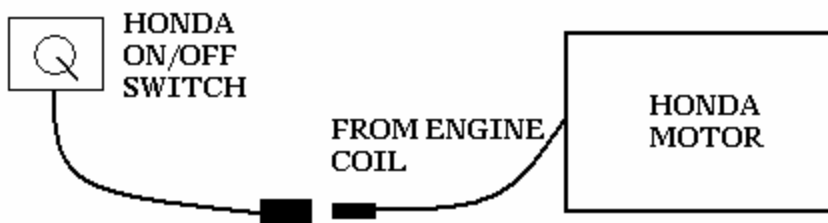




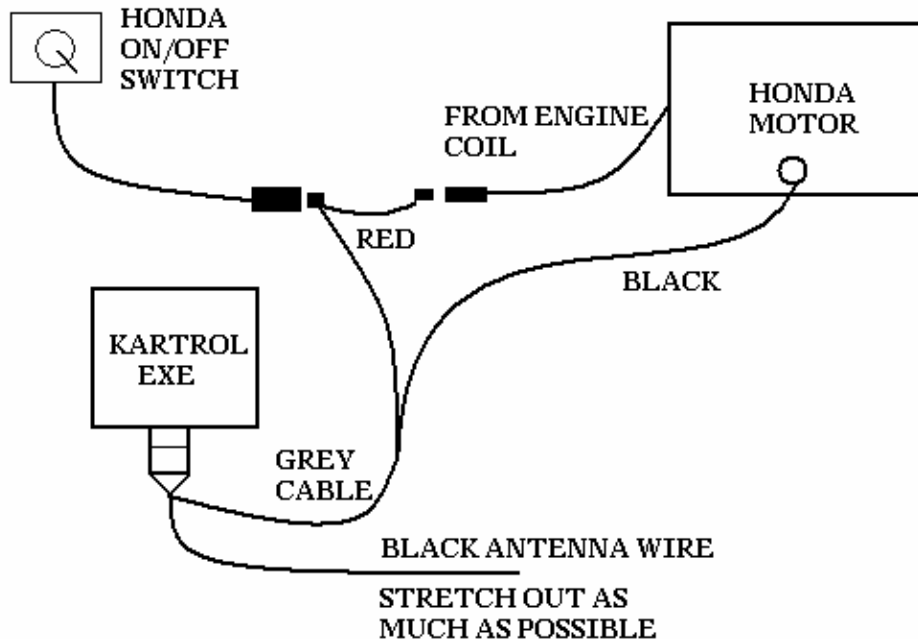
- During kart maintenance do not pressure wash the transponder boxes.
- The wiring harness should be routed and secured such that it will not get damaged.
- The transponder must be securely mounted and protected from damage when removing kart body.
- A little care in good solid installation will go a long way

Wiring Diagrams-Gas

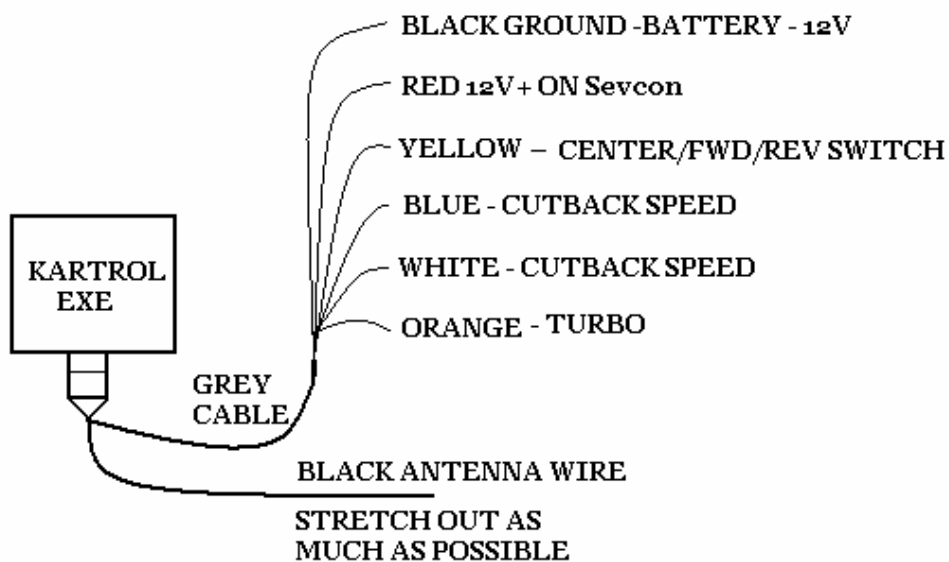
Step 1- disconnect the HondaOn/Offswitch



Step 2- connect the red wire from the transponder to both Honda connectors, and mount the black wire hoop to a good engine ground such as a carb bolt or gas tank bolt



Wiring Diagrams- Electric



The actual wiring will be slightly different depending on engine, motor controller, and kart model. You must follow the kart manufacturer's exact wiring diagram.

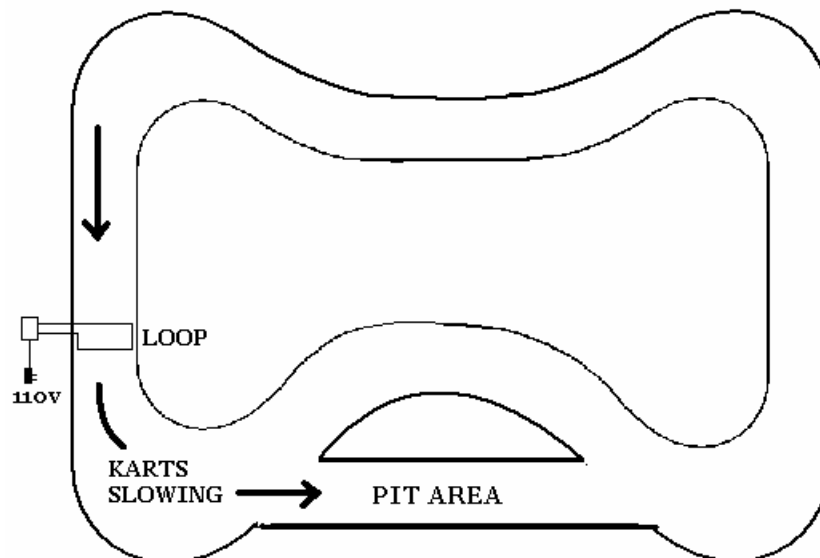
PIT LOOP INSTALLATION

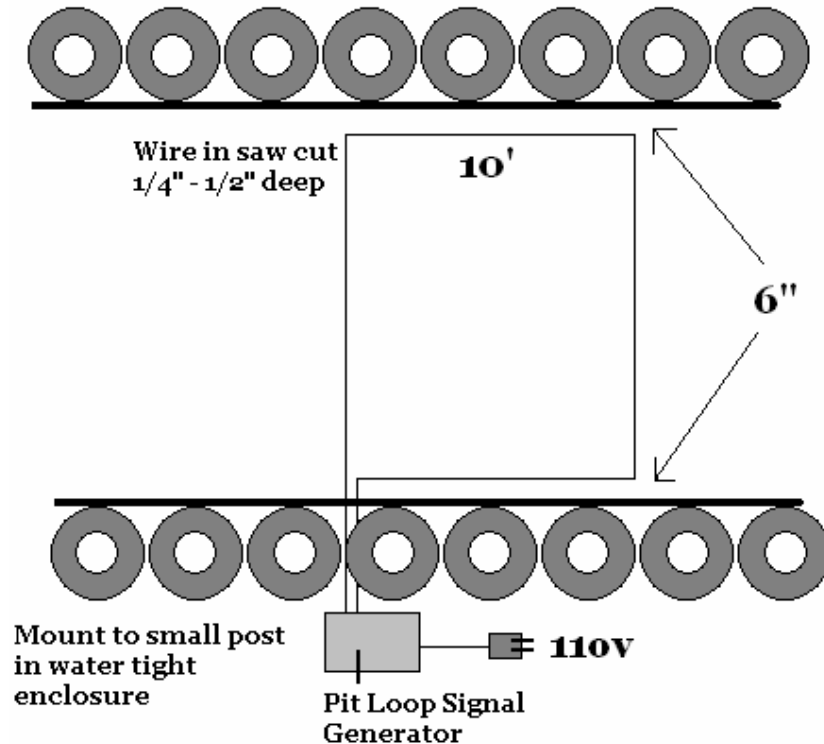
The Pit Loop is intended to slow karts to a safe speed before entering the pit area. It requires the Optional pit loop sensor installed on each kart, connected to the kart transponder.

The Pit Loop Transmitter generates a coded signal that is picked up by the kart sensor when it drives across the Pit Loop wire embedded in the track. The actual location of the Pit Loop wire, is the point on the track where you want the karts to begin slowing. By using duct tape to hold the Pit Loop wire on the track, you can experiment to find the correct location for the pit wire, such that the kart will be at the desired speed as it enters the pit area. Generally the Pit Loop transmitter is set to the SLOW speed, so as to allow karts to propel themselves all the way to the front of the Pit area. Once all karts are in the Pit area, the attendant can push the STOP button to make loading safer.

Once the ideal location of the Pit Loop wire is determined, it should be installed in a saw cut in the track surface and sealed with a sealer or caulking. The Pit Loop wire runs from the Pit Loop transmitter, across the track, along the other side of the track for 10 feet, and then back across the track to reconnect to the pit transmitter.

It is recommended that the wire be cut into a saw cut of approximately $\frac{1}{4}$ to $\frac{1}{2}$ -inch deep. It is best if the wire is run approximately 6 inches out from the guardrail on the far side of the track (see diagram).





The Pit Loop transmitter should be mounted on a short post in a waterproof enclosure.

The Pit Loop transmitter has an AC adaptor that is plugged into a 110V outlet.

The Pit Loop Transmitter can be programmed to output any of the main functions: **STOP**, **SLOW**, **MEDIUM**, or **GO**. The **SLOW** speed is the most common for pit speed, but other codes may be used for additional track operations. Programming is done using dip switches inside the Pit Loop transmitter box.

To turn the Pit Loop ON and OFF there are a number of options:

- 1) Switch the 110V power ON and OFF to turn on and off the pit transmitter. This also could be done by connecting the 110V outlet into the traffic light system if equipped. In this way the Pit Loop would turn on when the red light is activated.
- 2) A switch could be put in the low voltage line from the AC adaptor to the Pit Transmitter

- 3) Using the optional remote switch box on the Main Console.
- 4) By radio signal from the Hand Held Transmitter or Main Console. In order to use this feature the radio receiver inside the Pit Loop Transmitter must be activated. This is done by selecting **Switch #4** on the dipswitch bank inside the Pit Loop Transmitter.

Then to activate the Pit Loop, push **#91** and then **GO** to activate the Pit Loop.

To deactivate the Pit Loop, push **#91** then **STOP**.

For other programming and operation features of the Pit Loop see the *Advanced Features* section.

MAIN CONSOLE INSTALLATION

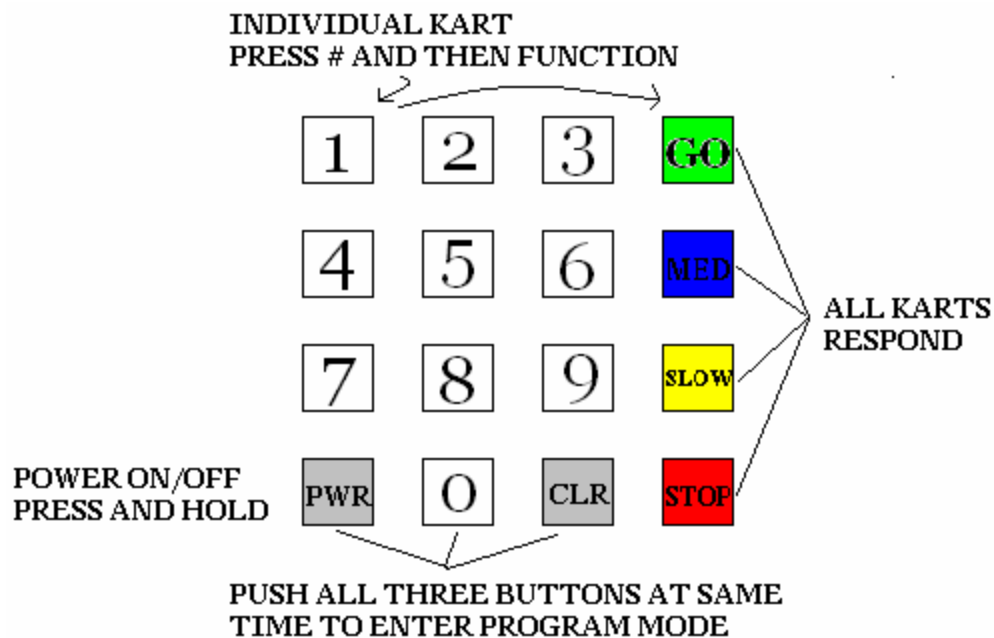
The Main Console is intended to be used at a track attendant station. It requires a 110V outlet to power the AC adaptor to the console. It should be positioned where the attendant has good track visibility of all areas.

The optional remote switch boxes connect to the main console. Any number of remote switch boxes can be connected. They can be mounted at additional track attendant stations or at critical areas of the track, making it easy to safely operate the track from many positions. The remote switch boxes allow the operator to address the STOP, SLOW, MEDIUM and GO functions as well as turn on and off the Pit Loop Transmitter. These boxes should be mounted securely in a dry safe location such as on a light pole. It is low voltage in the wires so while it must be protected from damage, it is not a voltage hazard.

The Main Console is weather-resistant but **NOT** waterproof.. It should be protected from rain. Direct sunlight may reduce the life of the Mylar covering.

MAIN CONSOLE/HAND HELD OPERATION

Both Hand Held and Main Consoles have the ability to control all karts, individual karts, and may control other devices such as the Pit Loop, a message system, or traffic lights. The Transmitters are capable of controlling 89 karts individually and up to 99 different tracks. Unlimited numbers of karts can be controlled at a time if they are numbered the same.



To control all karts on the track, simply push the function you want to activate. e.g. **SLOW**. All karts will respond to these four functions.

To address a single kart, push the kart # and then the function. Only **that** kart will respond.

* **CAUTION:** It can be dangerous to slow an individual kart down on the track. It should only be done when attendant has total track visibility and can determine it is safe to do so. Many tracks do not allow attendants to slow individual karts. It is far safer to slow **all** karts to deal with a problem driver or accident.

Below is a chart of the additional functions that can be accessed on the Hand Held or Main Console.

#	GO	STOP
91	Activates Pit #1	Deactivates Pit #1
92	Activates Pit #2	Deactivates Pit #2
93	Activates Pit #3	Deactivates Pit #3
94	Activates Pit#4	Deactivates Pit#4
95	Activates Rookie	Deactivates Rookie
96	Turns on lights	Turns OFF lights
97	Starts Timer	Stops Timer
98	Aux 1 ON	Aux 1 OFF
99	Activates TURBO	Deactivates Turbo

Some of these features require an additional receiver or control to activate.

The Main Console has battery backup in case of power failure. The AC adaptor keeps these batteries charged.

The power must be turned off or disconnected once per day to reactivate the battery charging circuit. If left powered on continually, the charging circuit may turn off and the unit will run on the batteries until they run down.

*** Only use rechargeable batteries in both Main Console and Hand Held. Use of alkaline batteries could cause fire or explosion if put on charge!***

Trouble Shooting and Diagnostics

When troubleshooting a transponder, it is important to carefully review the symptoms and confirm them. This is especially important when the information was relayed to the mechanic by an attendant. Not having all the information may make diagnostics very difficult and time consuming. Methodically testing all functions and noting under what circumstances the symptoms are occurring, will give valuable information for determining exact cause.

For example: the attendant says the kart won't slow down. Does this mean it will not slow down when all Slow is pushed, or when it crosses over the pit loop? Does it function off the hand held transmitter, but not off the pit loop?

One of the advantages of the Kartrol EXE transponders is the ability to use the Kartrol Programmer/Tester. The use of the tester will immediately confirm if the problem is in the transponder or the harness and installation.

To test a Kartrol transponder, unplug the unit from its harness right at the transponder. It is not necessary to remove the transponder. Then plug the unit into the Programmer/tester, being careful to get a good secure connection. Turn the power On and wait for the LED to stop blinking. If the programmer does not light up in the Slow mode, check the connections. It is possible that pins in the connector are pushed in, preventing a good connection. Inspect both sides of the connector and if needed, gently push the pins back into position using a fine screwdriver, being careful not to damage the wire.

If the tester still will not boot up in the Slow mode, try plugging a known working transponder in to the tester. If that also does not boot up in Slow mode, change the batteries in the programmer.

With the transponder plugged in to the tester and the Slow light is on, push each one of the all kart functions and if the corresponding LED lights come on, then the unit is working. If you have the optional Pit Loop, you can walk over to the Loop with the tester and wave the sensor over the loop wire. It should make the tester change to whatever mode the pit loop is set to.

If the transponder does not respond to the testing, you can try to reprogram the transponder and retest. It is possible that something has caused the programming to be corrupt, and following the procedures in the Programming Transponder section will correct this.

If you do not have a Programmer/Tester, the easiest way to begin diagnostics is to plug a spare or known working transponder into the kart harness on the problem

kart. If the new transponder works, recheck the suspect transponder, being sure to inspect the pins in the connector. If it still does not work, send it in for repair.

If the spare transponder also does not work, then the problem is in the harness or installation. Check all wiring and connectors. It may require a continuity meter to properly verify connectors are working.