

*Remote Control Systems*

**2.4 Ghz RADIO CONTROL**

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**# PnP-3s**

**Electronic Speed Controller**

**FULL INSTRUCTION MANUAL FOR  
RCS TX HANDPIECES**

## **INSTRUCTIONS.**

Thank you for purchasing this Microprocessor based **Electronic Speed Control (ESC)** R/C system.

**THIS SYSTEM CAN ONLY BE USED WITH THE ANY DSM2 COMPTIBLE TX.**

**EVERY # PnP-3s SYSTEM IS IN TWO PARTS CONNECTED BY A PLUG IN GREY 4 X WIRE CABLE.**

1. THE POWER IN – MOTOR CONTROL OUT, PCB &
2. THE DECODER PCB, INTO WHICH THE DSM2 RX IS SIMPLY CONNECTED WITH SERVO LEADS.

**USE ONLY OPERATING PROGRAM BV1.**

**DO NOT CONNECT TO MAINS POWER (110 – 240V AC).**

THE # **PnP-3s** CAN BE USED WITH TRACK AND/OR BATTERY POWER.

THE SYSTEM AUTOMATICALLY CHOOSES THE HIGHEST VOLTAGE.

THEY HAVE CONSTANT BRIGHTNESS DIRECTIONAL LIGHTS & 4 SOUND TRIGGERS.

THE FOLLOWING MAXIMUM VOLTAGES MENTIONED ARE THE **NOMINAL** VOLTAGE & TAKE INTO ACCOUNT THE FACT FULLY CHARGED BATTERIES CAN & DO EXCEED THE **NOMINAL** VOLTAGE.

USE 14.4 – 24v FOR THE # **PnP-3s** ESC.

We tested this system three times during manufacture. It was working normally when it left our factory. If damage in transit has occurred, please return to place of purchase for attention.

**THIS ESC IS GUARANTEED FOR ONE YEAR.**

INCLUDED IS ONE TWO PART # **PnP-3s** ESC Plus 1 x plug in pushbutton cable.

You will supply the 2.4 Ghz 4 channel (or more) Digital Proportional SPEKTRUM R/C.

**NB:** To use a 4 ch RX it may be necessary to remove the 4 x ch RX from its case to fit the pcb.

You will also supply a locomotive or trail car, the 14 – 24 volt traction batteries (depending on ESC), a fuse, an ON-OFF switch and wires where necessary to connect the ESC to the battery and motor(s).

Where soldering is necessary, we recommend a low wattage soldering iron and resin core solder.

**THIS BRAND OF R/C HAS BECOME VERY POPULAR. TO AVOID CONFUSION WITH OTHER OPERATORS, WE SUGGEST YOU MARK THE TX TO SHOW WHICH LOCO IT OPERATES.**

## **CAUTION**

**DO NOT ATTEMPT TO ALTER THE TUNING OF THE RADIO EQUIPMENT.**

**DO NOT USE RADIO CONTROL EQUIPMENT IN THUNDERSTORMS.**

**CHILDREN UNDER 12: ADULT SUPERVISION RECOMMENDED DURING USE.**

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PLEASE NOTE. PDF WIRING INSTRUCTIONS ARE HERE:

<http://www.rcs-rc.com/pages/instructions>

## INSTALLING THE # **PnP-3k** ESC.

# **PnP-3k** ESC's uses any DSM2/DSMX 6 x Channel RX's including our own "Auto Binding" DSM2-EM(AB) Rx & **SPEKTRUM** or the **ORANGE** brand from Hobby King. Servo leads are supplied for connecting the ESC to the RX. Always make sure the servo leads are connected to the correct sockets on the RX.

**THESE INSTRUCTIONS REFER TO OUR OWN DSM2 TX HANDPIECES.**

### CONTROL KNOBS.

The TX-3, TX-5 & TX-7 handpieces all use a small knob for selecting direction change & a large knob for speed control.

### USING EXTRA SERVOs.

The #**OMEGA-PnP**s ESC permits the operation of a regular servo using Ch # 5. Simply plug the servo leads the right way around into the Ch # 5 servo header so marked in the RX. See the ESC diagram.

### SOUND TRIGGER CONTROLS.

The **TX-3** has one Ch # 5 pushbutton for triggering a sound system. Plug the Ch # 2 servo lead into the Ch 5 position on the RX. Activates F2 on the trigger outputs. Or use as a mechanical servo action.

The **TX-5** has two knobs for sound triggers although they can be awkward to use. Outputs are F1, F2, F3 & F4. The Ch 5 pushbutton is also available. See TX-3 above.

The **TX-7** has four pushbuttons on the handpiece that are intended to trigger 4 x sound effects or control accessories. They operate F1, F2, F3 & F4 on this ESC. The Ch 5 pushbutton is also available. See TX-3 above.

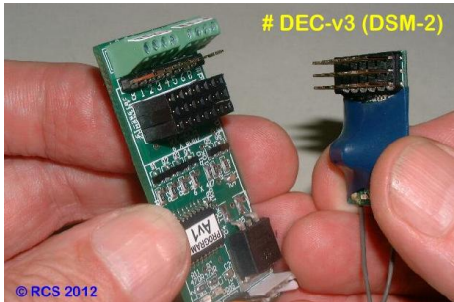
A pushbutton on the ESC pcb is used for initial speed calibration and making system program changes such as Start/Max voltage, default direction start, system reset & sound trigger outputs from momentary to latch ON – OFF. If you need to calibrate the system you must download the full instruction manual from the RCS website. See URL on page # 1.

### LOCOMOTIVE SEPARATION.

2.4 GHz R/C systems are not separated with crystals. Every TX has a unique identifier code. They are all legal for air & ground use. Most SPEKTRUM RX's (and DSM2 clones) can be "**BOUND**" to the TX 20 handpieces.

"**BINDING**" must be done before the system can be used. See page # 4.

You can mount the #**OMEGA-PnP**s PCB with double stick tape or non conductive silicone. Do not allow metal objects to touch the rear of the PCB. Damage to the PCB may result.



Hold one part in each hand. Carefully line up pins # 1 – 6.



Then gently press onto socket.

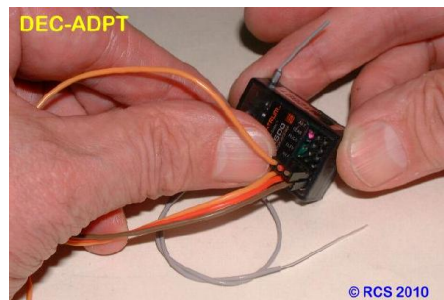


The fit will be tight. Do not force. **The BATTERY – BIND terminals must NOT be connected.**

Alternately, the separately sold # **DEC-ADAPT**" kit permits the RX to be mounted anywhere you wish.



The # **SIG-ADAPT** kit.



Insert the 1 x 3 way servo cable into the # AR600 RX # 1 servo output. The 3 x single wire cables into the Ch #'s 2, 3 & 4.



Carefully line up the # **SIG-ADAPT** pcb with pin #'s 1 - 6 on the # DEC-v3.2 & gently press it home onto the sockets.

### PLACING RX ANTENNA.

Other than with brass locos, it does not matter where you place the antenna(s).

We have at least 200' + range with the system in plastic locos. There is **NO** "glitching" or "Rusty Bolt Effect".

**N.B.** With metal locos the antenna **may** need to be vented externally to maximise range. Although, there is evidence that 2.4 GHz RX's have been successfully used with the **RX & antenna** inside a dummy water tank of a live steam loco.

Turn the 2.4 GHz TX OFF to save the batteries & the loco will "Cruise" along until the TX is turned ON again & manual control resumed.

### INSTALLING THE # **PnP-3s** ESC.

Wiring diagrams follow.

### POWER SOURCES.

You can use Constant track voltage **AND/OR** battery power. See below.

Maximum voltages for a particular ESC are shown on page # 1.

### PnP TRACK POWER.

The # **PnP-3s** is a Plug'n'Play pcb designed to be used with AristoCraft® and Bachmann® locos equipped with the standard PnP socket. It will collect constant track voltage. Filtered DC is recommended. You may be able to use a non DC supply such as DCC. Battery power is available via the end of loco sockets fitted to AristoCraft® locos.

On board battery back up of the track power is available via the fitted screw terminals on the # **PnP-3s**. The system automatically selects the highest available voltage. Make sure the battery pack is fully charged before using the system.

### BATTERY POWER.

There are two ways of powering the system with batteries.

1. Using the regular battery connection through the loco wiring. Absolute minimum voltage will 14.4 volts.
2. Using the battery input terminals on the ESC itself. 12 volts is useable.

For your particular ESC connect the traction battery, which **MUST BE FUSED**, as per the wiring diagram.

**RCS R/C** offers a variety of installation kits for on board use such as the # **BIK-U3/6** which has screw terminals to simplify installations. For trail car installations we also have the # **BIK-TC2/3** and # **BIK-TC5**.

When used with the Bachmann® K-27, we have a special kit, # **BIK-K27** to simplify installation.

### MOTOR CONNECTION.

The # **PnP-3s** is a simple plug in installation. No extra re-wiring to the motors or lights in the loco is needed.

**AristoCraft®** locos. We supply the # # **PnP-3** programmed with the default pre-set to suit AristoCraft® locos.

**Bachmann® Spectrum® Fn3 locos.** You can easily reset the # **PnP-3** default direction to suit the Bachmann® Spectrum® Fn3 locos that have a PnP socket. See page # 6, **3.4 Default Direction**.

### SHORT CIRCUIT & OVERLOAD PROTECTION.

All # **PnP-3s** ESC's are self protecting. Although there is output overload and short circuit protection built into them, it is essential the track power and battery supply be fused for overall system protection. See the wiring diagram pages.

### LOCOMOTIVE LIGHTING.

# # **PnP-3** ESC's have transistor controlled directional lighting. Please note: Maximum current is 100 ma per terminal.

Please do not try and run multiple incandescent bulbs with the outputs. 2 – 3 LED's will be just fine.

The # # **PnP-3** White (**F**) - Yellow (**R**) 2 wire cable needs to be connected to the ESC part. See the wiring diagram.

### DEFAULT START UP DIRECTION.

The # **PnP-3s** ESC's are programmed to be the same as the AristoCraft® on board TE & REVOLUTION.

As such, the default motor direction & lights for Bachmann® PnP socket equipped locos will need to be reset. See page # 6 section **3.4**. You may also need to reverse the **F & R** lighting.

On some AristoCraft® locos the PnP socket & lights are wired backwards. In this case the default direction will also need to be reset. See page # 6 section **3.4**. You may also need to reverse the **F & R** lighting wires.

## SETTING UP THE #**OMEGA-PnPs ESC**.

THESE INSTRUCTIONS REFER TO THE **TX-2s, TX-3, TX-5 & TX-7** 2.4 GHz 5 CHANNEL R/C.  
ALL THE ABOVE TX's USE THE SAME BINDING PROCEDURE.

Prior to using this system there are two procedures that must be carried out by the operator, unless the TX and RX have already been bound and the system calibrated;

### 1. "BINDING".

The 1<sup>st</sup> procedure is to "BIND" the receiver (RX) to the Transmitter (TX).



#### "AUTOMATIC BINDING".

Our # **DSM2-EM(AB)** has this feature.

**1.1** Switch on Rx. LED will flash once every 2 seconds. Wait 20 seconds until Rx LED flashes rapidly.

**1.2** Then press & hold TX bind button & switch TX on. TX LED will flash more slowly for several seconds. When Rx LED starts flashing let go of both TX buttons.

**1.3** Bind is complete when Rx LED stays On.

**1.4** If the system has been calibrated the **ESC** LED & both loco lights will immediately blink three times

If LED does not come on within 10 seconds or continues flashing every 2 seconds (= scanning), the bind has failed. Switch TX and RX off, move them closer together or further apart and retry.

Binding is most reliable when no other 2.4 GHz R/C systems are on. & then go to solid ON.

"**MANUAL BINDING**". Simply insert the binding plug into the bind socket on the regular DSM2 RX. When the RX flashes rapidly follow the RX binding procedure above. Remove the binding plug before commencing operation.

When "BINDING" is complete the RX LED will change to solid ON. If the system has been calibrated the **ESC** LED & both loco lights will immediately blink three times & then go to solid ON.

**N.B. If manually binding, the "BINDING" plug MUST be removed BEFORE the SYSTEM is turned OFF.**

Once the "BINDING" plug is removed & stored safely. The R/C system is now ready for speed calibration. Not necessary if already done.

Please note the LED's on the **ESC** pcb & the front and rear lights (if fitted) will stay OFF until "BINDING" is completed. The loco will always give a very slight jerk at switch ON. This is normal. See Page # 9.

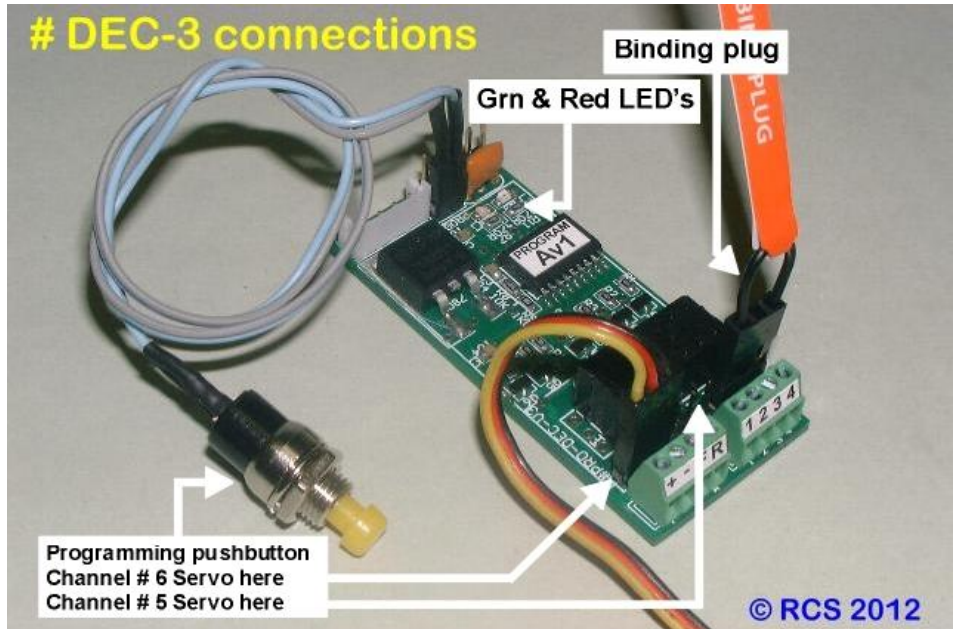
## 2. CALIBRATION.

All RCS TX handpieces with a knob for direction set work exactly the same. The TX-7 is for illustration purposes. RCS # **OMEGA-PnP**s systems are pre-calibrated when sent out. Please test the system before re-calibrating it. Assuming the RX has been correctly plugged into the ESC the system will perform as described later.

The 2<sup>nd</sup> step in system preparation is to calibrate the direction & throttle knobs. Even though this step is only needed once when first setting up an uncalibrated ESC, from time to time it is advisable to run through the procedure to ensure the best possible system performance is achieved.

A pushbutton is mounted on the pcb for both Calibration & system Programming. See 2.2 below right.

You can calibrate & program the system external to the loco by adding the separately available plug in # P-BUTTON.



2.1 Turn the TX ON. Make sure Throttle knob is set to Min. (i.e. fully CCW).

2.2 Press and HOLD ESC push-button down & turn the ESC/Rx ON. Release the pushbutton when LED's light. N.B. Ignore references to Ch # 5, Ch # 6 and binding plug in pic.

**Reaction;** 1. Both ESC LED's & both front & rear lights will turn solid ON. Then, once TX & RX are linked, both ESC LED's & both front & rear lights will immediately flash rapidly.



2.3 Twist the small direction knob right & left full travel a couple of times. Pause briefly each way then return knob to the middle position.

2.4 Rotate throttle knob from Min to Max & back a couple of times. Pause briefly at each extreme then return knob to Min (CCW) setting.

2.5 Press & release the ESC pushbutton to exit Calibration mode.

**Reaction;** Both ESC LED's & both loco lights will blink three times at a slower rate & both lights will go to solid ON. The system is in neutral and ready to operate. Either turn the loco and TX OFF for later use, or proceed to page # 6.

### 3. PROGRAMMING.

Operating features of the # **PnP-3s** system can be programmed from the TX using the supplied pushbutton.

**Programming can only take place when the system is in neutral.**

**3.1 START VOLTAGE.** This feature is designed to equalise the starting voltage of dissimilar locos.

**3.2 TOP SPEED VOLTAGE.** This can limit the top speed available. Either for speed matching locos or, for limiting the top speed of one loco, say, when the system is being operated by children.

**3.3 MOMENTUM.** Toggle momentum control ON or OFF.

**3.4 DEFAULT DIRECTION.** Re-set the direction of a loco when it is to run back to back with another loco.

**3.5 SYSTEM RESET.** This takes # 1 & # 2 back to the factory default if incorrectly set.

**3.6/7/8/9 SET SOUND TRIGGERS 2, 3 & 4 from MOM (Default) to Latch ON - OFF.**

#### HOW TO USE THE PROGRAMMING FEATURE.

Turn the TX & Loco ON. The RX & loco lights will stay OFF until the TX & RX are linked. Then blink 3 x times & go solid ON. The system will then be, & must stay, in neutral. Or, if you have been running, return to neutral before programming. Then press the pcb pushbutton once & the lights will go out. The system is now in Programming Mode.

#### SPEED MATCHING.

If you have two or more locos that have dissimilar starting and top speeds, you can adjust those voltages so the locos will be fairly accurately speed matched across the speed range. It has been our experience that absolutely accurate matching is not really needed for smooth performance. The trade off is, the top speed of a consist of locos controlled by one TX will be limited to the top speed of the slowest loco.

**3.1 START VOLTAGE.** We suggest you test the locos you wish to match one at a time to find out and note the knob setting at which the **slowest** starting locos begin to move.

Then, with the slowest loco stopped and the direction set to neutral:

Move the throttle knob to the loco start speed desired. i.e. to the knob position where the loco started moving.

Then twist the direction knob to the right and back again **ONCE** only. The lights will blink **ONCE** with the twist.

Wait a couple of seconds for the lights to blink **ONCE** again indicating the new start voltage setting has been stored in the system memory. Then move the large throttle knob back to zero (OFF) position. i.e. knob is fully CCW.

Then press and release the pushbutton on ESC. The lights will blink three times and then go to all solid ON. i.e. Neutral.

Repeat the procedure if the setting is incorrect.

**3.2 TOP SPEED VOLTAGE.** If speed matching, we suggest you test the locos you wish to match one at a time to find out the knob setting at which the **fastest** loco matches the top speed of the slowest loco.

Then, with the fastest loco stopped and the direction set to neutral:

Move the throttle knob to the lower top speed desired for the loco. i.e. to the knob position where the fastest loco matched the top speed of the slowest loco.

Then twist the direction knob to the right and back again **TWICE** only. The lights will blink **ONCE** with each twist.

Wait a couple of seconds for the lights to blink **TWICE** again indicating the new top speed voltage setting has been stored in the system memory. Then move the throttle knob back to zero (OFF) position. i.e. knob is fully CCW.

Then press and release the pushbutton on ESC. The lights will blink three times and then go to all solid ON. i.e. Neutral.

Repeat the procedure if the setting is incorrect.

**OR:** When children are using the loco, you can follow the same steps to limit the top speed of any loco.

**3.3 MOMENTUM.** Toggle momentum control ON or OFF.

Twist the direction knob to the right and back again **THREE** times only. The lights will blink **ONCE** with each twist.

Wait a couple of seconds for the lights to blink **THREE** times again indicating the default momentum ON – OFF setting has been stored in the system memory.

Then press and release the pushbutton on ESC. The lights will blink three times and then go to all solid ON. i.e. Neutral.

**3.4 DEFAULT DIRECTION.** To re-set the default direction of a loco to run back to back with another loco:

Twist the direction knob to the right and back again **FOUR** times only. The lights will blink **ONCE** with each twist.

Wait a couple of seconds for the lights to blink **FOUR** times again indicating the default direction setting has been stored in the system memory.

Then press and release the pushbutton on ESC. The lights will blink three times and then go to all solid ON. i.e. Neutral.

**3.5 SYSTEM RESET.** To take # 3.1 & # 3.2 back to the factory default if incorrectly set:

Twist the direction knob to the right and back again **FIVE** times only. The lights will blink **ONCE** with each twist.

Wait a couple of seconds for the lights to blink **FIVE** times again indicating the start & top speed voltage settings have been returned to default in the system memory.

Then press and release the pushbutton on ESC. The lights will blink three times and then go to all solid ON. i.e. Neutral.

**3. 6/7/8/9 SET SOUND TRIGGERS F2, F3 & F4 from MOM (Default) to Latch ON - OFF.**

# **F2**, twist the direction knob to the right and back again **SEVEN** times only. The lights will blink **ONCE** with each twist.

Wait a couple of seconds for the lights to blink **SEVEN** times again, indicating the trigger has toggled to latch ON-OFF.

Then press and release the pushbutton on ESC. The lights will blink three times and then go to all solid ON. i.e. Neutral.

Repeat procedure for trigger # **F3** (**EIGHT** pushes). # **F4** (**NINE** pushes).

Repeat procedure to change either of these 3 x triggers back to MOMENTARY from Latch ON – OFF.

## OPERATING THE # **PnP-3s** ESC.

### 4. HOW TO OPERATE AFTER COMPLETING CALIBRATION & PROGRAMMING.

**THE THROTTLE KNOB MUST BE AT MIN i.e. ALL THE WAY CCW, BEFORE TURNING THE SYSTEM ON.**

Always turn the TX on first. Then turn the loco ON. The loco will give a slight jerk (See page # 8) & the **ESC** & loco lights will stay OFF. After between 2 - 8 seconds the TX & RX will recognise each other. The RX LED and both ESC LED's will come ON & not blink. After another 6 seconds both **ESC** LED's & both front & rear loco lights (if fitted) will blink three times & then all lights will go to solid ON.

**N.B. In order to select a direction the throttle knob must be at MIN and the system must be in neutral.**

#### 4.1 FORWARDS.

To select forwards direction twist the Direction knob fully to the right (CW) & return to neutral.

The Red LED on ESC & rear loco light will go out. The green LED on the **ESC** pcb & the front loco light will stay ON.

If the **OMEGA-3V5s** ESC default motor & lights direction is incorrect please see Page # 6 PROGRAMMING of the full instructions. Use the **3.4 DEFAULT DIRECTION** feature to make changes.

**4.2 SPEEDING UP.** Gently twist the knob clockwise (CW). The loco will accelerate away after slightly turning the knob. The speed is proportional to the knob position with a small amount of momentum built in to prevent sudden jerky movements. Let the knob go once the desired speed has been reached. The speed will stay the same until the knob is rotated CW or CCW. Min - Max speed takes 2 x seconds.

**4.3 SLOWING DOWN.** Turn the knob CCW back to the desired speed. Max - Min speed takes 2 x seconds.

**4.4 STOPPING.** Turn the knob completely CCW back all the way to stop. The **ESC** LED & front light will be ON.

**4.5 REVERSE.** You must completely stop the loco first. The Throttle knob must be at Min. (i.e. fully CCW). Then: Twist the direction knob fully to the left (CCW) & back to the neutral position to reach neutral.

Both **ESC** LED's & both front & rear loco lights (if fitted) will go to solid ON.

Twist the direction knob to the left (CCW) again & back to the neutral position to set reverse.

The Green LED on ESC & front light will go out. The Red LED on the **ESC** pcb & the rear light will stay ON.

To speed up, slow down & stop in reverse see **4.2 SPEEDING UP**, **4.3 SLOWING DOWN** & **4.4 STOPPING** above.

## CONTROLLING SOUND TRIGGERS.

### SOUND SYSTEM TRIGGERS.

For the sound triggers to work there MUST be a common ground (-) connection between the ESC and sound system.

1. Sound powered by a separate battery. Connect the grounds on both the ESC and sound system.

2. Sound powered by ESC. Already has a common ground.

The **#PnP-3s** ESC has 4 x sound triggers controlled by the four small push buttons on the TX-7 handpiece.

The Ch # 2 servo lead must go to Ch # 2 on the RX.

The Ch # 4 servo lead must go to Ch # 4 on the RX.

The two LH pushbuttons F1 (top) and F2 (bottom) control terminals # 1 (Green) & terminal # 2 (Purple).

The two RH pushbuttons F3 (top) and F4 (bottom) control terminals # 3 (Brown) & terminal # 4 (Grey).

You can activate any sound with any trigger depending on which pushbutton you want to operate the sound with.

The default for each is Momentary. **F2, F3 & F4** are programmable for latch ON – OFF instead. See page # 6. **3.6/7/8/9**.

**N.B. With the TX-2s only, the F1 button will control output # 2 and the F2 button will control output # 4.**

**You can also use the two accessory knobs on the TX-5 by twisting to the right or left to activate the sound .**

**Just remember to return the knobs to the middle neutral position.**

When using with Momentary function, press the button until the sound is activated. Release button to turn sound OFF.

When using with a Latch ON – OFF function, press and hold the button for one second until the sound is activated. Then

release the button and the sound will stay ON. Press the same button for one second & release to turn the sound OFF.

They can be used as is with most sound systems such as Sierra<sup>®</sup>, Phoenix<sup>®</sup>, Dalle<sup>®</sup> & MyLocosound<sup>®</sup>.

Sierra will require the additional purchase of one **# SSI-12v5** so that Sierra can function correctly.

### USING PUSHBUTTONS FOR SERVO FUNCTIONS.

With **#PnP-3s** ESC the TX-7 pushbuttons can be used to control servos instead of sound triggers.

F1 & F2 give half servo movements each way from neutral on Ch # 2. Plug servo into appropriate channel on the RX.

F3 & F4 give half servo movements each way from neutral on Ch # 4. Plug servo into appropriate channel on the RX.

### Ch # 5 SERVO FUNCTION.

The **#PnP-3s** ESC has 1 x output available for a mechanical servo function such as Kadee servo uncoupler.

Simply plug the Kadee into the Ch # 5 terminal on the RX. Activate with the large red pushbutton top right on TX. Servo goes from one extreme of travel to the other. Servo goes back to start position when button is released.

## # **PnP-3s** ESC - MU'ing LOCO CONSISTS.

### MULTIPLE LOCOS IN A CONSIST.

The #**PnP-3k** ESC is capable of MU'ing multiple locos into one consist of locos.

The procedure involves swapping locos between Tx hand pieces. So, if you intend to do this often we strongly recommend you use the # DSM2-EM(AB) in all locos. These bind automatically which is much easier to use than a binding plug. It is also a good idea to purchase the optional extra # **LED 3mm-G** so you can observe externally what the RX is doing during re-binding procedures.

Add as many speed matched locos to the loco consist, as you like. Each loco must be bound to the controlling TX. Follow the "BINDING" procedure described above on page # 4. Remember the loco lights will be off during binding.

The lights come on once binding has been completed. This is intended as a confirming reference action.

If the loco to be added has already been speed calibrated, there is no need to repeat the calibration step.

The operating program permits reversing default direction & speed matching of locos. Settings for these features are stored in the **ESC** so that any loco can be acquired by any TX. See page # 6. **3.1/2/4.**

### HOW TO ADD LOCOS TO A CONSIST.

Firstly, make sure the "to be added" helper loco is bound to the main TX handpiece.

Then turn the first loco OFF. Turn the second loco ON & drive it into position. Turn the first loco back ON.

The lock in feature of the system ensures the direction is set positively. Just make sure both locos are at zero output before changing direction. To make sure the direction is set correctly for all locos in the consist, twist the direction knob twice from neutral. Once the direction is set it cannot accidentally change back to neutral when loco is running.

### DELETING LOCOS FROM A CONSIST.

Turn OFF the "to be retained" loco. Leave the "to be deleted" loco ON & drive it away, or, **rebind** it to a different TX for use by another operator. Turn off the main TX whilst rebinding takes place. Then you can turn the main TX handpiece back on and resume operation of the "to be retained" loco. See page # 4.

## THE #**PnP-3s** ESC TROUBLESHOOTING.

### IF NOTHING WORKS AT ALL:

#### WHAT TO EXPECT WHEN FIRST TURNING THE SYSTEM ON.

#### **WHEN THE LOCO IS SWITCHED ON, THE PCB LED'S DO NOT LIGHT OR BLINK.**

This is most likely caused by the throttle knob not being at MIN. Turn the knob fully CCW to MIN.

#### **WHEN THE LOCO IS SWITCHED ON THE LOCO MAY JERK SLIGHTLY.**

This is normal. The slight jerk indicates power is connected to the system, the IC has powered up and output power is connected to the motor..

#### **NEVER PRESS THE ESC PUSHBUTTON WITH THE LOCO TURNED ON UNLESS YOU INTEND TO CALIBRATE OR PROGRAM THE SYSTEM**

**PROBLEM.** You pressed the pushbutton to exit Calibration mode but the lights keep on flashing.

You may have mis-plugged the RX servo leads into the channel sockets.

**SOLUTION.** Turn system OFF. Remove & replace the RX servo leads into the correct channel # sockets.

As odd things can happen if this occurs, we strongly suggest you reset the system. See page # 6. 3.5.

Then re-calibrate the speed and direction settings. See page # 5.

#### **WHEN THE SYSTEM IS FIRST TURNED ON, THE LIGHTS UNEXPECTEDLY BLINK RAPIDLY.**

This is because you actually pressed the ESC pushbutton & the system has entered calibration mode.

**CAUTION: DO NOT PRESS THE ESC PUSHBUTTON . You will lose any previous calibration settings.**

You can proceed with system Calibration. (See page # 5 of the instructions). **OR:**

**SOLUTION** Turn RX OFF & ON again. Normal system control will be restored.

#### **WHEN THE LOCO IS SWITCHED ON, ALL LIGHTS COME ON WITHOUT BLINKING & NOTHING WORKS.**

This can occur when the TX is switched ON after the loco, with the throttle knob not fully OFF (CCW).

**SOLUTION.** Ensure the throttle knob is completely OFF. The lights will then blink to indicate linking.

#### **THE LOCO DIRECTION SET KNOB IS BACKWARDS.**

When the direction is set to forwards the front light must come ON. If the lighting is correct and the speed is backwards, you must reverse the wiring to the motor(s).

#### **WEIRD ESC BEHAVIOUR FOR NO APPARENT REASON, DURING OPERATION.**

If the lights start flashing during operation, stop the loco. Turn it **OFF** and then **ON** again to resume normal operation.

**PLEASE ADVISE US OF ANY OTHER PROBLEMS ENCOUNTERED & WE WILL INCLUDE THEM HERE.**