

Remote Control Systems

2.4 Ghz RADIO CONTROL

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ALPHA-3v2

Electronic Speed Controller

TX-2, TX-4, TX-6 or TX8 for Centre OFF control.

or:

TX-1, TX-3, TX-5 & TX-7 For Low OFF control

Ch # 5 (Bind button on TX) triggers terminal # 5.

F1, F2, F3 & F4 on TX = terminals 1-4 on # LT-SW4

TABLE OF CONTENTS PROVIDED IN INSTRUCTIONS.

Page # 1 Introduction.

Page # 2 Installing the # **ALPHA-3v2** ESC.

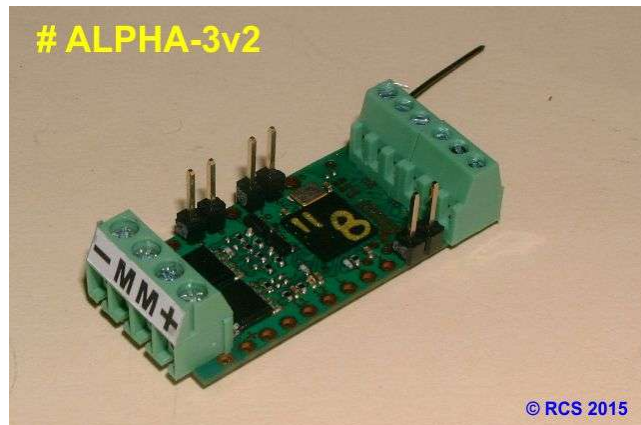
Page # 3 Binding & Operating the # **ALPHA-3v2**.

Page # 4 Programming the # **ALPHA-3v2** ESC.

Page # 5, 6, 7 & 8 = wiring diagrams.

N.B. COLOUR PDF WIRING INSTRUCTIONS ARE HERE:

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



INSTRUCTIONS.

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

THIS NEW SYSTEM CAN USE ANY DSM2 R/C WITH 4 OR MORE CHANNELS.

**THE # ALPHA-3v2 SYSTEM IS IN ONE PART. THERE IS A BUILT IN 2.4 Ghz RX.
SERVO LEADS ARE NOT NEEDED.**

2 x 2.5 AMP POLYSWITCH FUSES ARE SUPPLIED & MUST BE USED TO PROTECT ESC WIRING.

THE # **ALPHA-3v2** IS A REPROGRAMMED & ENHANCED DELTANG R/C Rx65b.

THE SYSTEM IS READY TO USE AS IS, ONCE THE RX PART IS "BOUND" TO THE TX.

THE # **ALPHA-3v2** IS SUPPLIED SET FOR EITHER THE "LOW OFF" CONTROL METHOD,
OR THE "CENTRE OFF" CONTROL METHOD. THIS CAN BE CHANGED. SEE PROGRAMMING PAGE # 4.

THIS IS ONE OF THE MANY FEATURES WITHIN THE SYSTEM WHICH CAN BE RE-PROGRAMMED.
USERS CONTEMPLATING ALTERING THE OPERATING CHARACTERISTICS SHOULD THOROUGHLY
READ UP ON HOW TO DO SO ON PAGE # 4 **BEFORE** ATTEMPTING TO MAKE CHANGES:

IF YOU MESS IT UP WE CAN FIX IT FOR THE COST OF POSTAGE.

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

THE # **ALPHA-3v2** CAN BE USED WITH BATTERY and/or TRACK POWER WITH EXTRA COMPONENTS.

THE STANDARD ESC HAS CONSTANT BRIGHTNESS DIRECTIONAL LIGHTS & 1 x SOUND TRIGGER.

A PLUG IN OPTIONAL EXTRA # LT-SW4v2 PERMITS FOUR EXTRA SOUND TRIGGERS.

USE 7.2v – 18v **ABSOLUTE MAXIMUM** = Nominal 14.8 volts.

TAKE INTO ACCOUNT FULLY CHARGED BATTERIES CAN & DO EXCEED THE **NOMINAL** VOLTAGE.
VOLTAGE DROP FROM IN – OUT IS ABOUT ½ A VOLT UNDER A LIGHT LOAD.

We tested this system three times during manufacture. It was working normally when it left the factory.

If damage in transit has occurred, please return to place of purchase for attention.

THIS ESC IS GUARANTEED FOR ONE YEAR.

You will supply the DSM2 2.4 Ghz 4 channel (or more) Digital Proportional R/C TX handpiece.

You will also supply a locomotive or trail car, the 7.2 – 14.8 volt traction batteries,

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.

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.

INSTALLING THE # **ALPHA-3V2** ESC.

The # **ALPHA-3V2** ESC uses DSM2/DSMX 2.4 Ghz digital proportional R/C's only with four (4) or more servo channels. Unlike other Deltang based ESC's, this ESC is not covered with clear heat shrink. Keep away from moisture.

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. The # **ALPHA-3v2** has a built in 2.4 GHz RX and can be bound to any DSM2/DSMX TX. You can bind as many # **ALPHA-3v2** ESC's to one DSM2/DSMX TX hand piece as you wish.

"**BINDING**" must be done before the system can be used. See below for the "**BINDING**" procedure. There is no binding plug used and binding is fully automatic. Once bound to a TX the RX/ESC will stay bound to that particular TX. It is possible to bind the RX's inside a loco from the outside. The front headlight output is also tied to the RX/ESC LED and will give a visual indication that binding is taking place and when binding is complete.

MOUNTING THE ESC.

You can mount the # **ALPHA-3v2** PCB with double stick tape. For this ESC we do not recommend non-conductive silicone. Do not allow metal objects to touch the PCB. Damage to the PCB may result.

PLACING RX ANTENNA.

After some years of using 2.4 Ghz we are now confident that it does not matter where you place the RX and antenna. We have at least 150' + range with the system in plastic locos. There is **NO** "glitching" or "Rusty Bolt Effect". 2.4 GHz RX's have been successfully used for some years with the RX & antenna inside a dummy water tank of a live steam loco and inside expensive brass electric locos. In these instances range may be slightly reduced.

CRUISE CONTROL.

If you turn the 2.4 Ghz TX OFF to save the batteries the loco will cruise on until the batteries go flat. You can "Cruise" along until the TX is turned ON again & manual control resumed. The operating program ignores DSM2 TX Fail safe. See page # 4 for how to turn ON the "Fail safe" which will slow down then stop the loco after a few seconds signal loss.

POWER SOURCES.

As is, the # **ALPHA-3v2** can only be used with battery power. Ensure the battery pack is fully charged before use. Connect the traction battery, We have supplied a 2.5 amp Auto reset Polyswitch fuse which **MUST BE FITTED**, as per the wiring diagram. **POLARITY IS IMPORTANT.**

If a full wave bridge rectifier with adequate filtering is employed, it is possible to use a constant track voltage as power. **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**.

MOTOR CONNECTION.

With # **ALPHA-3v2** connect the motor(s) as per the wiring diagrams to **M & M**. The Orange wire **M +** motor output is positive (+) in a forward direction. The **Grey M-** motor output is negative. Our extensive testing has shown the system doesn't need any motor "Noise" suppression.

SHORT CIRCUIT & OVERLOAD PROTECTION.

RCS ESC's have some self protection. It is essential the battery supply be fused for overall system protection. See the wiring diagram pages. We have supplied a 2.5 amp Auto reset fuse which must be installed inline on the Orange wire.

LOCOMOTIVE LIGHTING.

The **RCS** # **ALPHA-3v2** ESC's have two open drain terminals for constant brightness head/tail lights. Marked F & R. Front light is terminal # 1 WHITE wire. Rear light is terminal # 2 YELLOW wire.

Please note:

These outputs can switch incandescent bulb wiring as well as LED's.

Maximum current is 2 Amps per terminal. A 470R – 1kR resistor must be used in conjunction with the LED you will use.

N.B. Any larger load than 2 amps will kill the switching IC pins. Such damage is not covered by warranty.

If you do wish to run more lights, trigger more sound effects or control a relay, then you must use our plug in # LT-SW4 pcb. These have four open collector transistors that can handle up to 500 ma each.

The instructions assume the operator has used the available front & rear transistor lighting outputs or # **RELAY-1v3**.

If you do not have any lighting outputs connected you **MUST** be able to observe the LED on the ESC.

IT IS MOST IMPORTANT THAT THE LED LIGHTS BE COMPLETELY ISOLATED FROM ANY OTHER WIRING.

SOUND SYSTEM TRIGGERS.

The # **ALPHA-3v2** ESC has 1 x sound trigger pre-set on Terminal # 5 to be controlled by the Ch # 5 button on all TX's.

With the optional extra plug in # **LT-SW4v2** there are 4 x more sound triggers. See programming on page # 4.

Using with Phoenix P8 – PB11. Set triggers in sound system to High only.

All five of the trigger outputs are designed to simply connect with the latest version MyLocosound with screw terminals. How to wire sound systems is supplied with the # LT-SW4v2 interface pcb and shown on page # 8.

“BINDING” THE **ALPHA-3v2 ESC**.

Prior to using this system Binding must be carried out by the operator. Unless already bound.

The loco front headlight is set up internally to follow what the RX/ESC LED is doing.

HOW TO “BIND”.

1. Turn on the RX/Loco. The RX LED & headlight will blink slowly waiting to go into “BINDING” mode. Wait 20 seconds until the RX LED & headlight flicker rapidly indicating the RX is ready to be bound. Then:
2. Press & hold the Binding button (Above hexagon symbol) & turn the TX power switch to ON and hold both TX buttons.
3. The TX button and RX LED & headlight will blink slowly a few times. Then release both TX buttons. Then RX/ESC & Front H/Light will both go solid ON. The headlight only will flash once and then go out.
4. Binding is complete.

OPERATING THE **ALPHA-3v2 ESC**.

CENTRE OFF: THE THROTTLE KNOB MUST BE CENTERED BEFORE TURNING THE SYSTEM ON.

LOW OFF: THE THROTTLE KNOB MUST BE SET FULLY LEFT (CCW) BEFORE TURNING THE SYSTEM ON.

The following directions refer to the RCS TX series hand pieces.

When operating always turn the TX on first. (Not binding) Then turn the loco ON. The **ESC** & loco lights will stay OFF. After between 1 - 2 seconds the RX will recognise the TX. The RX LED on ESC will come ON & not blink. Both front & rear loco lights (if fitted) will stay OFF until a direction is selected and speed ramped up.

ALPHA-3v2 CENTRE OFF CONTROL. (TX-2, TX-4, TX-6 & TX-8 on CH # 1). The big knob has centre click.

FORWARDS - SPEEDING UP.

To select forwards direction twist the knob from neutral slowly clockwise (CW) to the right. The Front LED will come on just as the loco speeds up following the knob setting.

SLOWING DOWN. Turn the knob back to the left (CCW) to set desired speed.

STOPPING. . Completely stop the loco by bringing the knob back to neutral.

REVERSE - SPEEDING UP.

To select reverse direction twist the knob slowly to the left (CCW). The Rear LED will come on just as the loco speeds up following the knob setting.

SLOWING DOWN. Turn the small knob back to the right (CW) to set desired speed.

STOPPING. . Completely stop the loco by bringing the small knob back to neutral.

SHUTTING DOWN. When you have finished operating, turn off the loco(s) before the TX. If you leave the loco(s) turned on the headlight will start blinking to indicate the loco is not receiving a TX signal.

ALPHA-3v2 LOW OFF CONTROL. (TX-1, TX-3, TX-5 & TX-7). ESC will require resetting to LOW OFF.

FORWARDS.

Both lights will be out. To select forwards:

TX-1, TX-3, TX-5 & TX-7, twist the direction knob fully to the right. (CW).

TX-2, TX-4, TX-6 & TX-8 on CH # 1. Set the direction by pressing the direction switch up and releasing.

SPEEDING UP.

Gently twist the knob clockwise (CW). The front light will come on just as the loco starts to 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.

SLOWING DOWN.

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

STOPPING.

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

REVERSE.

You must completely stop the loco first. The Throttle knob must be at Min. (i.e. fully CCW).

TX-1, TX-3, TX-5 & TX-7, then twist the direction knob fully to the left (fully CCW) to select reverse. No neutral.

TX-2, TX-4, TX-6 & TX-8 on CH # 1. Set the direction by pressing the direction switch down and releasing.

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

As you speed up in reverse the appropriate directional light will illuminate.

PROGRAMMING THE **ALPHA-3v2** ESC.

We have set up the # **ALPHA-3v2** with features we think will be the most useful for average Large Scalers. The system is infinitely programmable but the instructions are too detailed to publish here in their entirety. Please visit <http://www.deltang.co.uk/rx65b-v611-p.htm> for information on how to invoke programming mode and how to actually change the various features.



STEP # 1 Turn TX handpiece ON.



STEP # 2 Press and hold both F2 & F4 buttons.

STEP # 3

Turn ALPHA-3v2 RX/ESC ON. Wait for RX/ESC LED to flicker fast then release F2 & F4 buttons. (return TX-5 Aux knobs to (neutral). RX/ESC is now ready for programming.

The small direction change (Ch # 3) knob or switch is used for making & confirming programming changes. We strongly recommend programming only one ESC at a time only.

STEP # 4

TO MAKE A MENU ITEM LEVEL CHANGE:

Twist direction knob CCW (Left) and return enough times to equal required setting. If TX has a switch, press it down.

If a lower # is required from a higher # keep twisting the direction change knob to the left. It will eventually go back to the start. i.e 1 x blink. LED will count total required blinks then:

STEP # 5

TO ACCEPT A MENU ITEM LEVEL CHANGE:

Twist direction knob CW (Right) & return. If TX has a switch, press it up and release.

Once LEVEL change has been accepted Next LEVEL follows. (i.e. Back to STEP # 4).

Once changes to all LEVELS have been accepted the ESC LED will go solid ON.

If other MENU items are to be changed START at STEP # 1 and repeat. The system is then ready to operate.

Once programming mode has been invoked here are some examples of what you might like to change.

Centre OFF operation.

If the **ALPHA-3v2** ESC is set to "CENTRE OFF" operation it will have 150° speed & direction control on Ch # 1 from Centre OFF to full speed each way.

You can opt for "LOW OFF" control on the throttle knob with this code = **1, 1, 2, 1, 3.**

Low OFF operation.

If the **ALPHA-3v2** ESC has been set to "LOW OFF" operation, you can opt for "CENTRE OFF" control on the throttle knob with this code = **1, 1, 1, 1.**

Fail Safe. This is supplied turned **OFF** in case you wanted the loco to continue running with the TX turned OFF:

If you want to reactivate fail safe use **5, 4, 1** and then sleep mode use **5, 3, 1** depending on the settings you wish to use.

To disable the fail safe again use **5, 4, 5.** and then sleep mode use **5, 3, 7.**

You might like to reverse the default start direction so you can add a loco back to back with another.

To do so use **1, 1, 6, 2.** To go back to the default use: **1, 1, 6, 1.**

Maybe you want to switch a cab light ON and OFF. Perhaps using terminal # 2 on a # LT-SW4v2.

To change from momentary to latch ON - OFF. Use **3, 4, 2, 4, 1.** Back to momentary use: **3, 4, 1, 4, 1.**

It is possible to make any of the four extra functions latch ON – OFF. Contact RCS for specific codes.

Ch # 5 Bind button: This is the default for a sound trigger on terminal # 5.

We advise you not to tamper with the switching codes.

Contact RCS if you have any other requests and we can send you the programming codes for the particular feature you wish to change.

If you have trouble programming please call RCS and we will walk you through the steps.

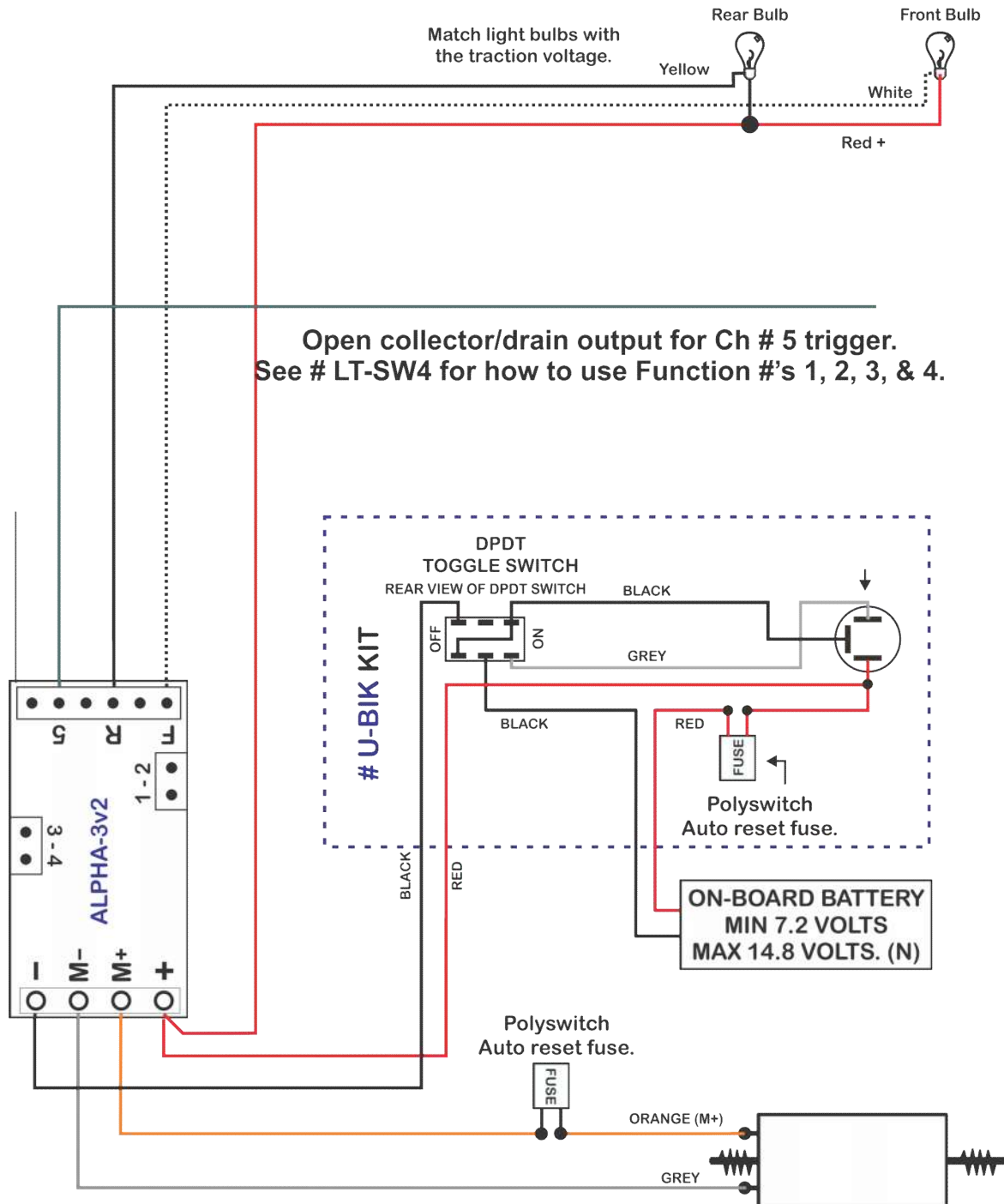
TROUBLE SHOOTING.

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

WIRING THE RCS # ALPHA-3v2 ESC with Battery power. How to wire incandescent lighting.

N.B. Maximum current on each output is 2 amps.

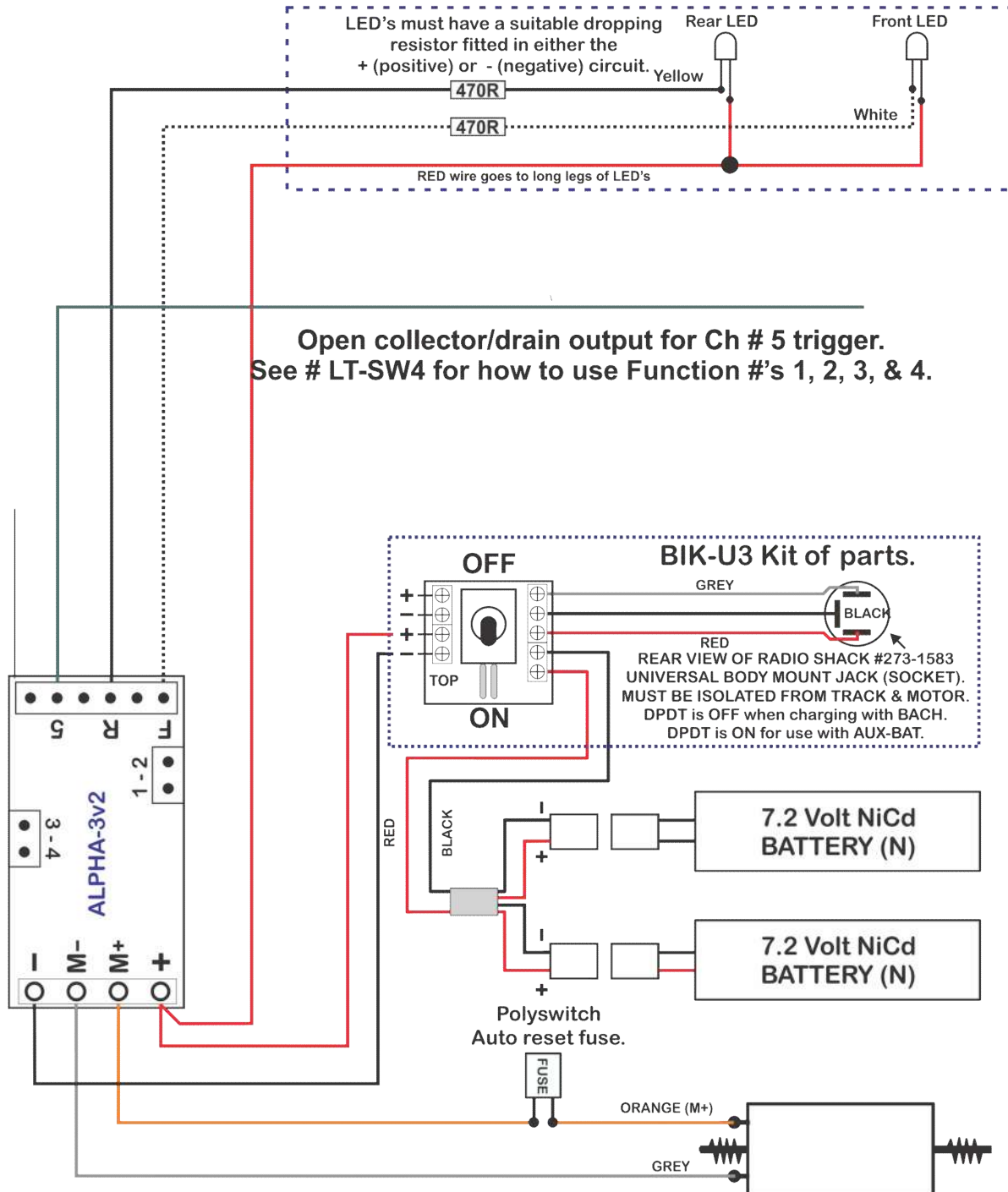
The ● symbol indicates where wires are joined.



WIRING THE RCS #ALPHA-3v2 ESC with Battery power using # BIK-U3. How to wire LED lighting.

N.B. Maximum current on each output is 20 ma.

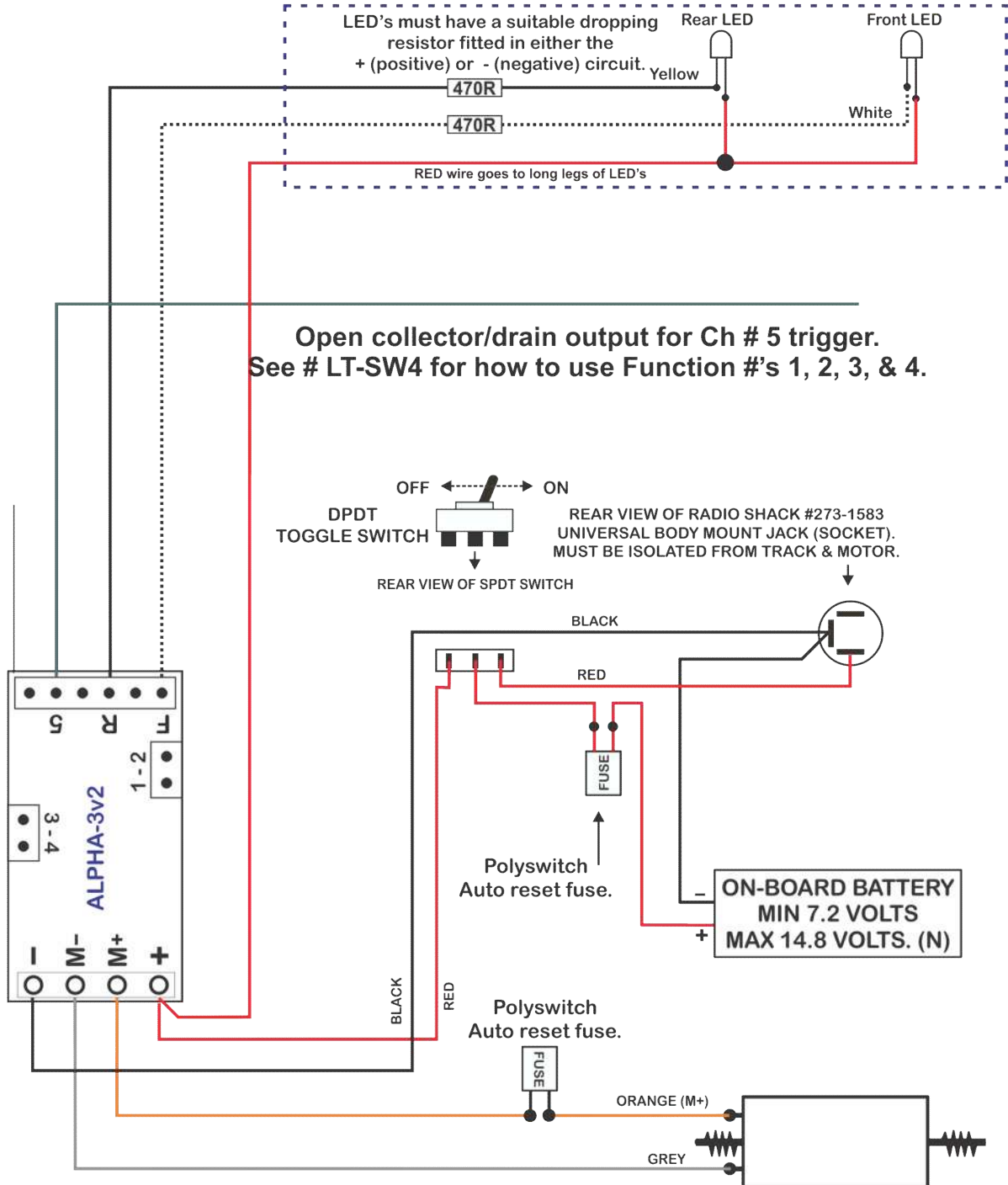
The ● symbol indicates where wires are joined.



WIRING THE RCS # ALPHA-3v2 ESC with Battery power using an SPDT switch. Cannot use AUX-BAT.

N.B. Maximum current on each output is 20 ma.

The ● symbol indicates where wires are joined.



How to wire LED lighting.



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LT-SW4v2.
 PLUG IN 4 x WAY TRIGGER OUTPUTS
 FOR THE # ALPHA-3v2 ESC.

This simple plug in 4 output interface goes between the # ALPHA-3v2 and most of the after market sound systems available. There is nothing to service or adjust.

