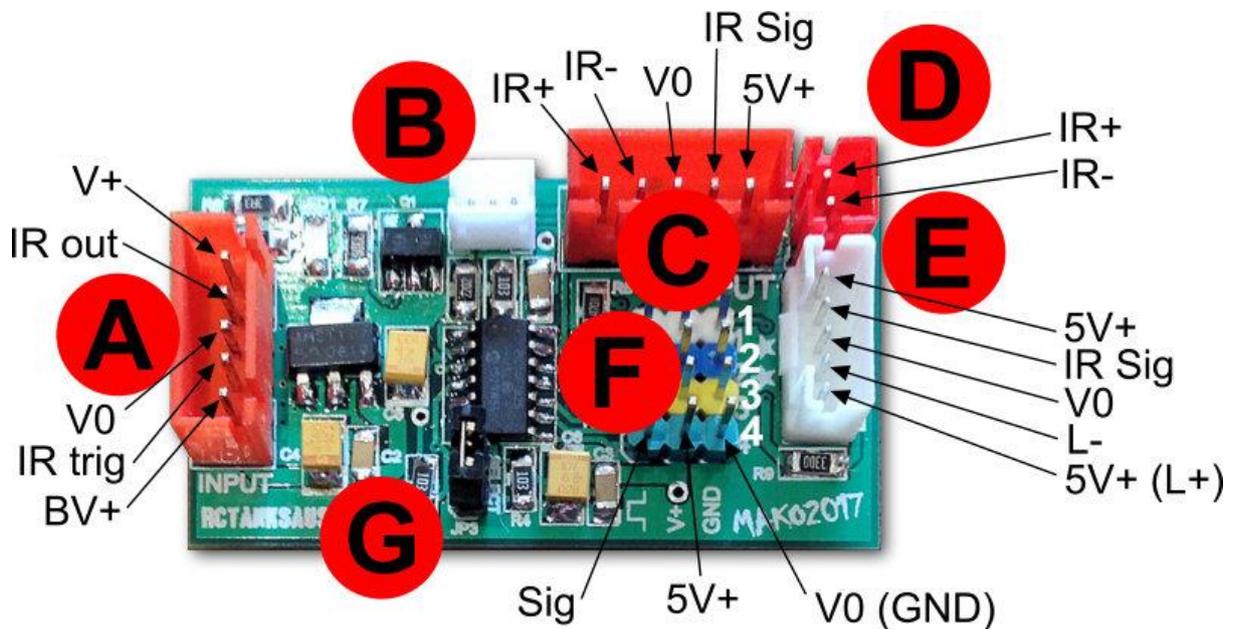


MAKO2017 REFERENCE GUIDE

Thank you for choosing a MAKO. Please read the following guide to help you with your unit.

The MAKO was originally designed as a simple plug and play adapter for Heng Long and Taigen tankers to allow them to battle with Tamiya equipped tanks while **RETAINING** the ability to still fight with other Heng Long/Taigen tanks. MAKO is simply an IR interpreter allowing all the different IR systems to communicate with the MFU the MAKO is attached to.



Basic Installation:

To install MAKO2017 simply connect the provided 5 pin JST-XH cable to the input port **A** of MAKO and connect the other end into the IR port (CN2) of the Heng Long or Taigen Unit. The factory 5 pin cable that may previously connected to CN2 is now re-connected to port **C** on the MAKO. For most users, this is all that is required.

By default, MAKO2017 operates as a Medium Battle Tank (5 hits, 5 sec reload time and a 60 round magazine. To change operating mode a Sony TV compatible remote is required (see Advanced Features).

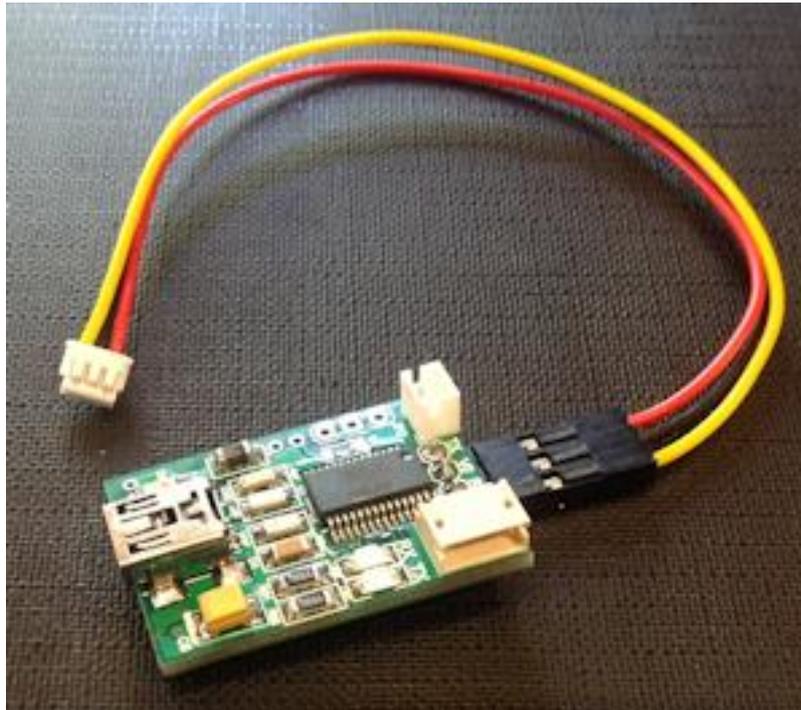
If connecting to an aftermarket Battle Unit such as Piranha use the connection ports **D** & **E** and pay attention to the labelled pinouts. The recommended BlueRing accessory is connected to port **E**.

Heng Long or Taigen Selection:

The selection jumper located at **G** is used to select between operation with a Heng Long or Taigen MFU. When the jumper is in place, the unit operates in Heng Long Mode with the jumper removed operation for the Taigen MFU is selected.

Firmware Update Port:

The MAKO2017 firmware can be updated using a RCTA programmer (sold separately) via the port located at B.



ADVANCED FEATURES

PROGRAMMING

IR Battle Modes

MAKO provides what is possibly the largest variety of IR battle modes and options of any available tank battle system. At the heart of the IR system is the Tamiya standard making **MAKO fully compatible with any Tamiya, Heng Long or Taigen IR tank.** In addition to the Tamiya protocol MAKO features additional IR battle features such as Shell type select, Magazine capacity, Friend or Foe recognition, Unit ID, and Repair IR.

Please see our Youtube channel for programming demonstrations

<http://www.youtube.com/rctanksau>

MAKO2017 is programmed using a universal TV remote set to emulate a SONY TV. Such remotes are readily available on eBay for less than \$5 USD. Do a eBay search for "universal remote control TV 139F". The setup code for these remotes is "005".



To choose battle mode, magazine capacity or assign a unit ID number a **Sony TV remote** is used at the startup of MAKO. When the indicator LEDs are on it is a simple matter of pressing the required key on your remote to set your battle mode. The following 16 battle modes are available on MAKO and the key/s required to access them, shown in the [] brackets are as follows:

Tamiya Battle Tank Modes:

- [1] Light Battle Tank (1) - 3 lives, 3 second reload, 40 shell magazine
- [2] Medium Battle Tank (2) - 5 lives, 5 second reload, 60 shell magazine
- [3] Heavy Battle Tank (3) - 9 lives, 9 second reload, 80 shell magazine

Extra Battle Tank Modes:

- [7] Extra Heavy Tank (4) - 9 lives, 12 second reload, 40 shell magazine (fires Tamiya 2 shot code (Y888))
- [P+] Mobile Artillery (5)- 3 lives, 10 second reload, 60 shell magazine (fires Tamiya 2 shot code (Y888))

Fighting Vehicle Modes:

Press [8] followed by

- [1] Recon Vehicle (21) - 1 life, 1-2 second reload, 2 anti-tank rounds (fires Tamiya 2 shot code (Y888))
- [2] Anti-tank Vehicle (20) - 5 lives, 2 second reload, 30 shell magazine
- [3] Anti-Air Vehicle (22) - 5 lives, fire MG and Flak codes, 160 rounds of Flak

Bergepanzer Modes:

- [4] Light Repair Vehicle (11) - 3 lives, 6 second reload, 10 repairs (fires Repair code)
- [5] Medium Repair Vehicle (12) - 5 lives, 9 second reload, 15 repairs (Repair code)
- [6] Heavy Repair Vehicle (13) - 9 lives, 12 second reload, 20 repairs (Repair code)

Flakpanzer Modes:

Press [9] followed by

- [1] Light Flakpanzer (31) - 3 lives, 200 flak rounds
- [2] Medium Flakpanzer (30) - 5 lives, 150 flak rounds
- [3] Heavy Flakpanzer (32) - 9 lives, 100 flak round

Automatic/Special Modes:

- [V] Invulnerability Mode
- [P-] Automatic Repair Mode (14) - repairs damaged tanks

Test Modes/Options:

[--/-] Test fire
[REPEAT] Test hit
[TV/AV] Test Repair
[CLOCK] Turn/off reload flashes

Friend or Foe & Unit ID

A unique feature of RCTA IR battle boards is the ability to set a Unit ID number. This number can be used to identify which tank has destroyed which tank and thus kill credit awarded. Unit ID is also integral to Friend or Foe recognition.

Setting Unit ID

To set your Battle Unit number:

1. Press [MENU] on the TV remote during the setup programming period.
2. Wait for the indicator LED to turn off and back on again.
3. When the LEDs are on press any number 0-9.
4. Repeat steps 2 & 3
5. Repeat steps 2 & 3
6. You should now have entered a 3 digit number as your unit ID.

This ID will stay in Eeprom until changed or the MAKO IC firmware is updated.

Using Friend or Foe

Friend or foe recognition can be used when tank teams are competing in combat. At close range tanks are not damaged by the IR signals of tanks on the same team. As distance between tanks increases so does 'the fog of war' and the chance of a 'blue on blue' hit increases.

Tanks are assigned to 'teams' according to the Unit ID number. All units with the same first ID number (1-9) are considered to be on the same team. For example tanks with the ID numbers 245 & 297 are on the same team. This allows for 9 teams of 99 tanks each. Any tank with 0 as the first digit is not assigned to a team and therefore may be damaged by any other tank. Hence for 'Free for All' battles Unit IDs of the format 0xx should be assigned as this will still allow up to 99 tanks to battle each other and still be identified by their ID.

NOTES

Repair:

When a tank is repaired, it is returned to the state it was prior to the last hit. The magazine capacity is returned to a 'full' capacity. A tank can only be repaired 5 times. Undamaged tanks are not repaired.

Ghost hits:

As magical as it is the MAKO cannot alter the program that runs on the Taigen or Heng Long MFU. After receiving 5 hits the Taigen or HL MFU will determine the tank is destroyed and shut down. Thus to achieve the 9 hits required for Heavy Tank operation there are 5 'real' hits and 4 'ghost hits'. A ghost hit is a verified IR hit from another battle tank that is processed by the MAKO but NOT passed through to the

MFU. Hence, on a ghost hit the tank will stop and the hit indicating LEDs will flash but there will be no explosion sound from the MFU.

ADDITIONAL OUTPUTS

In addition to the role of IR interpreter, MAKO2017 is also able to trigger a number of other functions via the 4 additional outputs.

Output 1: Xenon Flash/LED Output – A Xenon Flash or LED can be connected to this port to simulate muzzle flash upon firing of the gun.

Output 2: Recoil Servo Output – A servo can be connected to this output which will then provide for a recoil action once the main gun is fired

Output 3: MANTA LCD Output – A MANTA LCD can be connected to this port to provide for a visual indication of MAKO's operational status

Output 4: Relay Control – A Relay module can be connected to this port to disconnect supply to the main motors and hence disable track recoil and other automated track movements associated with IR battle hits.

