

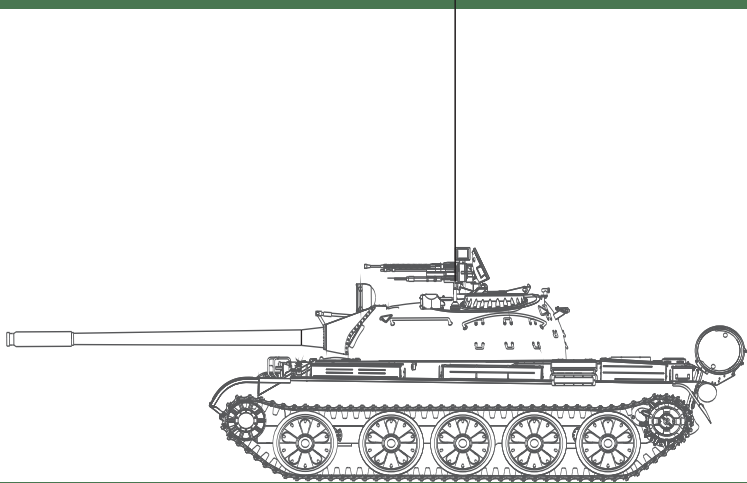
T-55A

蘇聯中型坦克
SOVIET MEDIUM TANK

1/16 全功能遙控戰車模型
RADIO CONTROL FULL FUNCTION AFV



組裝說明書 ASSEMBLE INSTRUCTION



这是一个神话，这是不可能再被复制的奇迹……

总产量70000辆，使用国家60多个，参加过几乎战后所有的战争，它的履带碾过撒哈拉炙热的沙漠，也挤压着北极冻土之上的冰层。从1950年一直服役到今天，这个超过半个世纪的神话，似乎永远不会结束！

这是一个复制的神话，这是一个将被复制的奇迹……

1/16高仿真车体，细节逼近每一个螺钉，每一条焊缝。坚固的金属驱动系统，精确的电子控制装置，它在荒野上疾步如飞，它的主炮能锁定对手送去死神，你简直可以驾驶它去战斗！不过在这之前，请别忘记你首先是一个坦克工程师，把这个家伙制造出来！让我们动手干吧！

It is a mythology that will never happen for a second time. . .

The total number of its production has been 70000. It has served in more than 60 countries and nearly all the battles after WWII, of which the tracks grinded the scorching Sahara Desert and crushed the Arctic ice layers. Since 1950, it seems there is no ending for this mythology which has sustained for more than half a century.

It is a mythology of clone and on the way of copying. . .

With a scale of 1/16, details are down to bolts and weld joints. With a solid metal driving system and accurate electric control device, its main gun blows its enemy into pieces while running on the wildness. It is your weapon, go fighting. However, you have to be a tank engineer before stepping with it into the battlefield. So, Let's create a mythology right now.

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T-54/55系列主战坦克

T54/55型坦克是由原苏联设计的主战坦克。其原型于二战结束前的1945年3月问世，量产则开始于1947年。其后，T-54/55型坦克迅速成为苏联及华约国家的装甲主力，并被输出到众多国家（主要是社会主义各国和第三世界国家）。因而，T-54/55型坦克几乎参加了20世纪后半叶的几乎所有武装冲突。T-54/55系列坦克也是有史以来产量最大的坦克，其总数据估计高达86000-100000辆。

在苏联，T-54/55型的主力地位很快被后继的T-62和T-72所代替，但在其他很多国家，T-54/55系列被沿用多年。直到今天，仍有50多个国家在使用T-54/55及其种类繁多改型。

T-54/55系列坦克从未真正与其西方假想敌真正交锋过，但这一型号与它的装备促成了美国第一种主战坦克——M60的诞生。

发展史

前代：T34与T44

苏联T-34中型坦克是二战期间苏军装甲部队中的绝对主力，并且生命力极强——一直到现在仍有少数国家在使用。T-34型在火力、防护和机动几方面上所达到的平衡在当时无可匹敌。设计人员在战争期间一直在做关于改良T-34型的研究，以期获得更好的作战效果。但由于战时生产对连续性的要求，很多新的设计和技术都未能真正用于实车。



1943年，莫洛佐夫设计局在战前T-34M型坦克的基础上研制出了T-44型坦克。这种坦克安装了新型扭杆悬挂装置及横列引擎，并去除了车体机枪，使得其在拥有与T-34同等的性能基础上有效增加了装甲防护。不过T-44型也有一个重大弱点，那就是炮塔太小，只能容下与T-34/85型一样的85mm坦克炮。于是，装备口径为100mm的坦克炮就成为了设计T-54、T-55坦克的初衷。

原型

T-54型的最初设计开始于1944年10月，由OKB-520设计局（第183斯大林乌拉尔坦克工厂）进行。原型设计于当年12月便告完成，原型车也于1945年2月制造出来。原型车于1945年

3、4月间进行了测试并通过，被苏联军方定名为T-54型。这一原型的车体结构与动力装置与T-44相同，区别是装甲更厚（前装甲：上部120mm，下部90mm，侧面90-150mm，顶部30mm），炮塔底座直径增加到1800mm，并且拥有新设计的驾驶室和观察窗。

这一原型的主要武装是一门100mmD-10T坦克炮，并有两挺7.62mmGW机枪。其动力是V-54型12缸水冷柴油发动机，输出功率388kW。该型坦克的储油量大有增加，主油箱载油530升，附加油箱（与燃油系统相连）载油165升。改进型坦克全重35.5吨，最大时速43.5千米（略慢于T44），最大航程360千米。

1945年7月，又有一种有所改进的原型被制造出来。这一原型装有新型炮塔，炮台一门同是100mm口径的LB-1型坦克炮以及两挺SG7.62mm同轴机枪、两挺SG-43型7.62mm机枪（平时收纳于柜板上箱子中，各备弹500发，可由驾驶员操纵），一挺DSK型12.7mm防空机枪。这一原型的炮塔拥有更厚的装甲（正面200mm，侧面125-160mm），而且燃油量再度增加（内部油箱545升，外置油箱180升）。但由于其全重增加到39.15吨，因而航程没有增加，仍是360千米。该原型车于1945年7月至11月之间接受了测试。

虽然T-54仍然存在很多问题和缺陷，但仍然在1946年4月29日正式宣布入侵，并于1947年开始了量产。

T-54

T-54型在最初的量产过程中进行了1490项改进，因而其生产相对缓慢。当时，苏军确信T-54型可以说优于绝大部分二战时期的坦克。最初的原型T-54-1是由第二种原型车发展而来的，但由于生产过程中凸显的诸

多问题，T-54-1型很快被T-54-2型取代。在此基础上还有一种指挥型T-54，装有2部R-113电台。

T-54A与T-54B

在50年代初，改进型坦克按照原有的D-10TG指标改进了设计以便装入T-54的炮塔。新坦克上还安装了驾驶员夜视仪。T-54A型于1954年入役并于次年进入生产。在此基础上还有一种少量生产的T-54AK指挥坦克。

1955年，在T-54A的基础上又衍生出了T-54B。其上装备100mmD-10T2S坦克炮，配备STP-2型稳定器。T-54B型于1957年开始量产。在其生产的最后四个月中生产的坦克都装有L-2型红外探照灯、TPN-1-22-11型炮长红外装置、OU-3 IRFS系列红外探照灯。而且新开发的APFSDS系列弹药使得T54坦克有能力挑战北约装备的最新装甲车辆。T-54B型相对应的坦克指挥车是T-54BK型，与T-54AK型使用相同的附加装置。



T-55坦克

1956年，T-54型又一次进行了改进，换装V-55型12缸冲程水冷柴油机，功率488kW，油路系统压力被提高以获取更高的动力。为了简化维修过程，引擎盖也被修改。此外，改型



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的油箱再次被加大，总载油量达到680升。主炮弹药数量从34发增加到45发，其中包括高爆破片弹和穿甲弹，并且计划使用BK5M型炮弹，可穿透390mm厚的钢装甲。同时，车长的TPKU观瞄装置也预计被TPKUB或TPKU-2B型观瞄装置所取代。炮手位将安装TNP-165型观瞄镜，装填手则由完全无力应付已然大行其道的喷气式战机而被移除。新型坦克也将的装甲炮塔铸件以及夜视镜。为了使得炮塔不至于大大加重，炮塔后部的装甲被略为减少。此时的T55已经在几乎所有方面上大大超越了苏军在二战时使用的



T-55A

1961年，针对坦克用核生化三防系统的改进开始，其目标是使成员免受中子辐射伤害，而对伽马射线防护则用装甲和PAZ基本防护装置完成。新的POVO型铅衬需要安装在车板内，因此车长舱盖被加大，舱口栏板辐射，还能防止成员被破片所伤，此外



该坦克还安装了PAZ/FVU型化学过滤装置。其他变化包括：同轴SGMT机枪换成7.62mmPK机枪；车体从6.04m增长到6.2m；车体机枪被移除，换成6枚主炮弹。以上改进使得全重增加到38吨，这种改型就是T-55A。T-55A之上亦有一种指挥坦克，T-55AK。

T-54/55系列的升级改造

对于T-54/55系列的改进并不是由一家设计局和制造厂进行的。这一系列产量极高，又出口至甚多国家，因此很多国家都希望通过改进T-

54/55系列来获得更强的装甲战力。于是乎各种设备和武器都先后出现在T-54/55上，包括120mm或125mm的主炮、主动防护系统、热成像火控系统等等。直至今日，T-54/55仍是许多国家制造廉价主战坦克的基础。

描述

T-54/55系列的布局与多数坦克没有太大区别。它的成员座舱在车体正中部，引擎舱在后，车体正中部装有一座半球状炮塔。其驾驶员座位在车体左前方，而后车长坐于左边，炮手在于其前，装填手在于其右，行走部分，驱动轮在后，路轮排在两轴前，而第一个路轮与后四个的距离大。排气管位于左挡泥板上。

T-54与T-55在外型上极为相似（因为本质上就是同一种东西），十分难以辨认。很多T-55就是由T-54改装而来的。之所以这两种坦克常常被我、我中有你、你中有我的复杂状况。

早期的T-54在炮塔右前部装有一个半球状通风装置，并且在炮塔前部正中有一孔，这是给SGMT机枪使用正射击孔。而且T-54的炮口没有抽烟器，还有一个“猪嘴”状防盾。这提供了一种相对简单的辨认方法。

优势与不足

T-54/55的机械结构简单可靠，与西方坦克相比更易操作，对乘员水平的要求也要低。T-54/55是一种对较小的主战坦克，也就意味在战场上提供给敌坦克的目标也小。这一坦克重量较轻、履带宽大、低温条件下启动性能好，而且还可以潜渡，这使得T-54/55的机动性属于上佳。T-54/55庞大的生产数量和经久不衰的服役状况使得备件从来都不缺乏，而且相当便宜。T-54/55虽然与现代主战坦克相比十分老旧脆弱，但是如果加以改造，仍然可以显著提升战斗力和生存能力。

T-54/55坦克也拥有一些致命的弱点。较小的体型牺牲了内部空间使乘员操作碍手碍脚，减慢了操作的速度。中东战争中以色列坦克兵就对缴获的T-55坦克窄小的活动空间颇有微词，而且这一缺陷根本无法通过改进来解决。炮塔太矮，使炮塔最大仰角仅为5°（西方坦克多为10°），对于高炮目标常常无能为力。由于T-54/55型的火炮没有稳定装置，因此这些坦克只能在停车时进行稳定有效的射击。原装的100mm火炮与后来大量装备的120mm或125mm火炮相差甚远，面对现代坦克时难以拥有胜算。车内的火炮备弹缺乏防护，使得坦克在被击中后易发生二次爆炸。在海湾战争或伊拉克战争期间，常可见被击毁的T-54/55坦克炮塔被炸掉，就是因为这一原因。早期T-54的状况更加糟糕：没有乘员防护系统、火炮缺乏

稳定、内部结构也不合理。总之，T-54/55坦克到现在已然全面过时，无论再怎么改进，也难以挑战当今的主战坦克了。

生产史



54系列（T-54-1，T-54-2，T-54（T-54-3），T-54A，T-54B，T-54AK1，T-54AK2，T-54BK1及T-54BK2）生产于1946-1958年间，共制造35000辆以上；T-55系列（T-55，T-55A，T-55K1，T-55K2，T-55K3，T-55AK1，T-55AK2，T-55AK3）于1955到1981年间制造，共约27500辆。

波兰

波兰T-55坦克于1956到1979年间制造了3000辆T-54与5000辆T-55。

捷克斯洛伐克

捷克斯洛伐克于1957到1983年间共制造了2700辆各型T-54与8300辆T-55。

服役史

苏联与俄罗斯

T-54/55与T-62是苏联装备最多的两种坦克，在70年代中期它们占苏联坦克总数的8%。苏军的T-54参加过1956年对匈牙利暴动的干预，有一些被匈牙利人用燃烧瓶和反坦克炮击毁[9]。有人将一辆缴获的T-54送至英国驻布达佩斯使馆，英国根据对T-54的研究开发了T-72坦克。

现在俄军的T-54/55和T-62坦克基本都处于封存状态，当今俄军的主力坦克是T-72、T-80和少量T-90主战坦克。

中东

1967年六日战争中，T-55曾与美制M48、英制“百人队长”和改装过



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的二战坦克M4谢尔曼交战过。期间以军拥有良好的指挥与配合，并具有绝对空中优势，使得T-55面对略逊于自己的装甲力量时并没有占到什么便宜。

1973年“赎罪日战争”中与装备105mm L-7坦克炮的百人队长Mk V和M-60A1坦克遭遇，期间埃及与叙利亚装备的T-54/55被以色列缴获者甚众。以色列改装并使用了其中的一部分。这些车辆的苏制D-10坦克炮被换成北约制式105mm L-7或M-68型坦克炮，苏制发动机也被更换为通用汽车制造的柴油机。以色列将这种坦克称为“Tiran-5”型并一直使用到90年代初其主要由被出售给第三世界国家，余者改造为重型Achzarit装甲运兵车。

越南战争

越南战争中南越与越共装甲部队的首次交锋发生于1971年2月。在这一战中，南越的17辆美制M41型坦克以零损失击毁了2辆北越坦克，其中有6辆T-54和1辆PT-76水陆坦克。1972年

4月2日，新组建的南越第20坦克团（相当于营）侦测到了北越坦克部队的大规模移动。在午后的作战中，M48迅速开火击毁了打前阵的9辆PT-76和两辆T-54，其余的北越坦克随后撤退。

1972年4月9日的作战中，M48坦克在2800米距离上对上来袭的北越坦克开火，打乱了北越坦克的阵型。当日，北越共有16辆T-54被击毁，一辆59式被擒，南越方面没有损失。

北越T-54坦克也有击退南越坦克夺取阵地的胜利。

其他冲突

波兰军管期间在大街上的T-55L斯洛文尼亚T-55。File:Type 69 Iraq Iraq伊拉克战争中被击毁的伊拉克T-55柬埔寨内战中，交战方使用过T-54坦克。

1971年印巴战争中，印度使用T-55坦克对付巴基斯坦的M48、M24及中国制59式坦克。

在1978-79年发生的乌干达-坦桑尼亚战争中，利比亚曾提供给乌干达

独裁者阿明将军数十辆T-54/55坦克，其中一些被用于与坦桑尼亚的冲突中。

波兰在80年代末曾以T-54/55坦克镇压反共产主义政府的暴乱。

安哥拉战争中曾有T-54/55投入战斗。

南斯拉夫解体后的内战中有T-54/55坦克投入使用。这些坦克面对携带反坦克武器的步兵时显得十分脆弱，而且也被证明不适宜于在巷战中使用。

中国曾在两伊战争中向交战双方出售了数千辆69式坦克，其中伊拉克军装备的那些在海湾战争和伊拉克战争中仍有使用。

斯里兰卡军队使用T-54/55坦克打击猛虎组织恐怖分子。这一行动至今都没有结束。猛虎组织也使用该型坦克。这些坦克据称来自捷克斯洛伐克。



基本规格 (T-55)

总重量 39.7 吨

全长 6.45 m

宽度 3.37 m

全高 2.40 m

操作人数 4

装甲厚度、类型 炮塔203毫米、车底99毫米

主要武器 D-10型100 mm 线膛炮

次要武器 2×7.62 mm SGM7机枪

(12.7 mm DShK重机枪)

发动机 V-55 12缸柴油机

输出功率 433 kW

悬挂系统 扭杆悬挂

底盘高度 0.425 m

燃料箱容量 961 升

最大行动距离 501 km, 600 km (有副油箱)

最高速度 55 km/h

Specifications (T-55)

Weight 39.7 tonnes

Length 6.45 m

Width 3.37 m

Height 2.40 m

Crew 4

Armour 203 mm turret, 99 mm hull, LOS = -200 mm

Primary

armament D-10T 100 mm rifled gun

Secondary

armament 2×7.62 mm SGM7 machine gun,

(12.7 mm DShK heavy machine gun)

Engine Model V-55 12-cyl. 38.88-l diesel

581 hp (433 kW)

Power/weight 14.6 hp/tonne

Suspension Torsion bar

Ground clearance 0.425 m

Fuel capacity 961 l (254 gal)

Operational

range 501 km (311 mi), 600 km (373 mi) with extra tanks

Speed 55 km/h (34 mph)

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T-54/55

The T-54 and T-55 tanks were a series of main battle tanks designed in the Soviet Union. The first T-54 prototype appeared in March 1945, just before the end of the Second World War. The T-54 entered full production in 1947 and became the main tank for armored units of the Soviet Army, armies of the Warsaw Pact countries, and others. T-54s and T-55s were involved in many of the world's armed conflicts during the late twentieth century.

The T-54/55 series eventually became the most-produced tank in history. Estimated production numbers for the series range from 86,000 to 100,000.

T-54/55 tanks were replaced by the T-62, T-72, T-64 and T-80 in the Soviet and Russian Armies, but many remain in use by up to 50 other armies worldwide, some having received sophisticated retrofitting.

Soviet tanks never directly faced their NATO Cold War adversaries in Europe. However, the T-54/55's first appearance in the west in 1960 spurred the United States to develop the M60.

Predecessors: T-34 and T-44

The Soviet T-34 medium tank of 1940 is considered by many to have the best balance of firepower, protection and mobility for any tank of its time in the world. [2] Its development never stopped throughout the Second World War and it continued to perform well; however, the designers could not incorporate the latest technologies or major developments as vital tank production could not be interrupted during wartime.



In 1943, the Morozov Design Bureau resurrected the pre-war T-34M development project and created the T-44 tank. Thanks to a space-efficient torsion-bar suspension, a novel transverse engine mount, and the removal of the hull machine-gunner's crew position, the T-44 performed at least as well as the T-34, but with substantially superior armour. The T-44's main drawback was the small turret which remained incapable of mounting more powerful armament than its predecessor's 85 mm tank gun. A tank mounting a 100 mm gun was desired.

Prototypes

Development of the first T-54 prototype started in October 1944 at the OKB-520 design bureau, at the Stalin Ural Tank Factory No. 183 (Uralvagonzavod), located in Nizhny Tagil. The initial design was completed in December, with a prototype completed in February 1945.

It was decided to modernize the tank before production started. The new tank's turret was tried on two modified T-44 tanks.

Another T-54 prototype was built in July 1945 which received the alternative designation Ob'yekt 137. The tank was equipped with a new turret armed with 100 mm LB-1 tank gun and 7.62 mm SG medium coaxial machine gun. The turret armour was thickened (200 mm on the front, between 125 mm and 160 mm on the sides). The tank was armed with two 7.62 mm SG-43 medium machine guns mounted inside fixed boxes on the fenders, each with 500 rounds of ammunition and operated by the driver. The turret was fitted with a 12.7 mm DShK anti-aircraft heavy machine gun. The fuel capacity was increased to 545 litres in internal fuel tanks and 180 litres in external fuel tanks. Because of this, the road range remained 360 km despite the increased weight of 39.15 tonnes. This prototype went through trials between July and November 1945.

Although there were numerous drawbacks which required correction and many alterations which had to be made to the vehicle's design, it was decided to begin serial production of the new vehicle and the vehicle officially entered service on 29 April 1946. It would go into production in Nizhny Tagil and Kharkiv in 1947.

T-54

Production of the initial series of T-54s began slowly as 1,490 modifications were made. The Red Army received a tank which was superior to World War Two designs and theoretically better than the newest tanks of potential opponents. [citation needed] The 100 mm gun fired BR-412 series full-calibre APHE ammunition which had inferior penetration capability compared to Simlar ammunition fired by 88 mm KwK 43 on the Tiger II, but superior to those fired by the shorter-barrel 88 mm KwK 36 of the Tiger I and only slightly inferior in penetration to the KwK 36's PzGr.40/43 high-velocity tungsten-core round. The 100mm OF-412 HE fragmentation was 60% heavier in both total weight and bursting charge than the equivalent 8.8 cm Sprgr.43.

Due to its revolutionary design, this gun was mounted in a tank weighing four-fifths that of

the Panther, two-thirds that of the Tiger I, and only just more than half that of the Tiger II. The light weight, powerful engine, and robust suspension gave it excellent cross-country mobility. The exploitation trials went without any breakdowns. [citation needed]

The serial production version, designated T-54-1, differed from the second T-54 prototype. It had thicker hull armour (80 mm on the sides, 30 mm on the roof and 20 mm on the bottom) which surpassed that on the German Tiger tank. As production ramped up, quality problems emerged. Production was stopped and an improved T-54-2 (Ob'yekt 137R) version was designed. Several changes were made and a new turret was fitted. The new dome-shaped turret with flat sides was inspired by the turret from the IS-3 heavy tank; it is similar to the later T-54 turret but with a distinctive overhang at the rear. It also had a shorter bustle. The fender machine guns were removed in favour of a single bow-mounted machine gun. The transmission was modernized and the track was widened to 580 mm. The T-54-2 entered production in 1949 at Stalin Ural Tank Factory No. 183 (Uralvagonzavod). In 1951, a second modernization was made, designated T-54-3 (Ob'yekt 137Sh), which had a new turret without side undercut, as well as the new TSh-2-22 telescopic gunner's sight instead of the TSh-20. The tank featured the TDA smoke generating system. A command version was built, the T-54K (komandirskiy), with a second R-113 radio.

T-54A and T-54B

In the beginning of 1950s, the new tank gun received the designation D-10TG and was fitted into the T-54's turret. The new tank received night vision equipment for the driver and was designated T-54A (Ob'yekt 137G). A new version based on T-54A, designated T-54B (Ob'yekt 137G2), was designed in 1955. It was equipped with a new 100 mm D-10T2S tank gun with STP-2 "Tsyklon" 2-plane stabilizer. It entered production in 1957. During the last four months of production the new tanks were equipped with an L-2 "Luna" infrared searchlight and TPN-1-22-11 IR gunner's sight, and OU-3 IR commander's searchlight. Modern APFSDS ammunition was developed, dramatically enhancing the penetrative



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performance of the gun to keep it competitive with NATO armor competitive with NATO armor developments. T-54B served as the basis for T-54BK command tank which had exactly the same additional equipment as the T-54AK command tank.

T-55

The documentation was sent to Uralvagonzavod. It was decided to increase the tank's battle capabilities by changing the tank's construction and introducing new production technologies. Many of those changes were earlier tested on the T-54M (Ob'yekt 139). The tank was fitted with the new V-55 12-cylinder 4-stroke one-chamber 38.88 litre water-cooled diesel engine developing 581 hp (433 kW).



Greater engine power was accomplished by increasing the pressure of fuel delivery and charging degree. The designers planned to introduce a heating system for the engine compartment and MC-1 diesel fuel filter. The engine was to be started pneumatically with the use of an

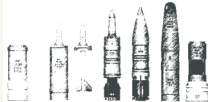


AK-150S charger and an electric starter. This eliminated the need for the tank to carry a tank filled with air. To allow easier access during maintenance and repairs, it was decided to change hatches over the engine compartment. To increase the operational range, 300 litre fuel tanks were added to the front of the hull, increasing the overall fuel capacity to 680 litres. The ammunition load for the main gun was increased from 34 to 45, with 18 shells stored in so called "wet containers" located in hull fuel tanks (the concept for which came from Kartsev's cancelled Ob'yekt 140 tank). The ammunition load included high explosive-fragmentation and anti-tank rounds and designers also planned to introduce the BK5M HEAT rounds which penetrated 390 mm thick armour. The TPKU commander's vision device was supposed to be replaced by either the TPKUB or TPKU-2B. The gunner was supposed to receive a TNP-165 vision device. The loader's hatch-mounted 12.7 mm DShK anti-aircraft heavy machine gun was dropped, because it was deemed worthless against high-performance jets. The tank was supposed to be equipped with "Rosa" fire protection system. The tank had a thicker turret casting and the improved

the armour on the back of the hull was thinned slightly. The T-55 was significantly superior to the IS-2 Heavy Tank in all respects, including the rate of fire of the gun (at least four compared to less than three rounds per minute). Despite somewhat thinner frontal turret armour (200 mm rather than 250 mm), it also compared favourably with the IS-3, thanks to its improved anti-tank gun and better mobility. Heavy tanks soon fell from favour, with only 350 IS-3s produced and future Soviet heavy tank designs remaining as prototypes. The old Model of highly mobile medium tanks and heavily armoured heavy tanks was replaced by a new paradigm: the "main battle tank". Parallel developments in the West would produce similar results. Although the T-55 was simply a modernized T-54, it received a new designation for political reasons. It entered production at Uralvagonzavod in 1958 and entered service with the Red Army on 8 May 1958.

T-55A

In 1961, development of improved NBC protection systems began. The goal was to protect the crew from fast neutrons; adequate protection against gamma radiation was provided by the thick armour and a PAZ basic NBC protec-



tion system. The POV plasticized lead antiradiation lining was developed to provide the needed protection. It was installed in the interior, requiring the driver's hatch and the coamings over the turret hatches to be

noticeably enlarged. This liner had the added benefit of protecting the crew from fragments of penetrated armour. The tank was equipped with a full PAZ/FVU chemical filtration system. The coaxial 7.62 mm SGMT machine gun was replaced by a 7.62 mm PKT machine gun. The hull was lengthened from 6.04 m to 6.2 m. The hull machine gun was removed, making space for six more main gun rounds. These changes increased the weight of the vehicle to 38 tonnes. The design work was done by OKB-520 design bureau of Uralvagonzavod under the leadership of Leonid N. Kartsev. The T-55A served as the basis for the T-55AK command tank.

T-54/T-55 upgrades

A wide array of upgrades in different price ranges are provided by many Manufacturers in different countries, intended to bring the T-54/55 up to the capabilities of newer MBTs, at a lower cost. Upgrades include new engines, explosive reactive armour, new main armament such as 120 mm or 125 mm guns, active protection systems, and fire control systems with range-finders or thermal sights. These improvements make it a potent main battle tank (MBT) for the low-end budget, even to this day.

Description

Like many post-World War II tanks, the T-54 and T-55 have a conventional layout with fighting compartment in the front, engine compartment in the rear, and a dome-shaped turret in the centre of the hull. The driver's hatch is on the front left of the hull roof. The commander is seated on the left, with the gunner to his front and the loader on the right. The tank's suspension has the drive sprocket at the rear, and dead track. Engine exhaust is on the left fender. There is a prominent gap



two-plane gun stabilization system from the T-54B as well as night vision fighting equipment. To balance the weight of the new equipment,

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between the first and second road wheel pairs, a distinguishing feature from the T-62, which has progressively larger spaces between road wheels towards the rear.

The T-54 and T-55 tanks are outwardly very similar and difficult to distinguish visually. Many T-54s were also updated to T-55 standards, so the distinction is often downplayed with the collective name T-54/55.

Advantages and drawbacks

The T-54/55 tanks are mechanically simple and robust. They are very simple to operate compared to Western tanks, and don't require a high level of training or education in their crew members. The T-54/55 is a relatively small main battle tank, presenting a smaller target for its opponents to hit. The tanks have good mobility thanks to their relatively light weight (which permits easy transport by rail or flatbed truck, and allows crossing of lighter bridges), wide tracks (which give lower ground pressure and hence good mobility on soft ground), a good cold-weather start-up system, and a snorkel which allows river crossings. The T-54/55 tanks have together been manufactured in the tens of thousands, and many still remain in reserve, or even in front-line use among lower-technology fighting forces. Abundance and age together make these tanks cheap and easy to purchase. While the T-54/55 is not a match for a modern main battle tank, armour and ammunition upgrades can dramatically improve the old vehicle's performance to the point that it cannot be dismissed on the battlefield. (Gelbart 1996:75-78).

T-54/55 tanks have many serious defects. Small size is achieved at the expense of interior space and crew comforts. This causes practical difficulties, as it constrains the physical movements of the crew and slows operation of controls and equipment. Israelis who crewed T-54/55s captured during the 1967 and 1973 wars constantly complained about this, and it remains a problem that cannot be remedied by any upgrades. The low turret profile of the tanks prevents them from



depressing their main guns by more than 5° (the average for Western tanks is 10°), which limits the ability to cover terrain by fire from a

hull-down position on a reverse slope. While both tanks have stabilized guns, in practice they can only fire accurately when the vehicles are at rest (this problem may have been solved with more recent upgrades). The 100 mm gun is less effective than newer tank guns of 120 and 125 mm calibre, and only has a chance at being effective against heavily armoured tanks when firing special ammunition (such as missiles). The internal ammunition supply is not shielded, increasing the odds that any enemy penetration of the fighting compartment could cause a catastrophic secondary explosion. And while the T-54/55 tanks can be upgraded, the stunning losses suffered by upgraded Iraqi T-55s against American M1 Abrams tanks during Operation Desert Storm showed the inescapable limitations of the design. The T-54/55 tanks are simply outdated and cannot be expected to have much of a chance against modern opponents. The T-54 is especially defective: It lacks NBC protection, a revolving turret floor (which complicated the crew's operations), and early models lacked gun stabilization. All of these problems were corrected in the T-55 tank, which is otherwise largely identical to the T-54.

Production history

T-54-1 production was slow at first as only 3 vehicles were built in 1946 and 22 in 1947. 285 T-54-1 tanks were built in 1948 by Stalin Ural Tank Factory No. 183 (Uralvagonzavod), located in Nizhny Tagil. By that time it completely replaced T-44 in production at Uralvagonzavod (UVZ) in Nizhny Tagil, and Kharkov Diesel Factory No. 75 (KHPZ). Production was stopped because of a low level of production quality and frequent breakdowns. The T-54-2 entered production overall in 1949 (at Stalin Ural Tank Factory No. 183 (Uralvagonzavod) the production started in 1950 and until the end of the year it produced 423 tanks). It replaced the T-34 in production at the Omsk Factory No. 183 in 1950. In 1951 over 800 T-54-2 tanks were produced. The T-54-2 remained in production until 1952. The T-54A was produced between 1955 and 1957. The T-54B was produced between 1957 and April 1959. The T-55 was produced by Uralvagonzavod between 1958 and 1962. The T-55K command tank was produced from 1959. The TO-55 (Ob'yekt 482) flamethrower tank was produced until 1962.

Overall 35,000 T-54-1, T-54-2, T-54 (T-54-3), T-54A, T-54B, T-54AK1, T-54AK2, T-54BK1 and T-54BK2 tanks were produced between 1946 and 1958 and 27,500 T-55, T-55A, T-55K1, T-55K2, T-55K3, T-55AK1, T-55AK2 and T-55AK3 tanks were produced between 1955 and 1981.

Poland

Poland produced 3,000 T-54, T-54A, T-54AD and T-54AM between 1956 and 1964 and 7,000 T-55 (between 1964 and 1968), T-55L, T-55AD-1 and T-55AD-2 (between 1968 and 1979).

Czechoslovakia

Czechoslovakia produced 2,700 T-54A, T-54AM, T-54AK, T-54AMK between 1957 and 1966 and 8,300 T-55 and T-55A between 1964 and 1983 (T-55A was probably produced since 1968) (most of them for export).



Service history

Soviet Union to Russian Federation

The T-54/55 and the T-62 were the two most common tanks in Soviet inventory—in the mid-1970s the two types together comprised approximately 85% of the Soviet Army's tanks. T-54 tanks served in the 1956 invasion of Hungary, and a few were knocked out by Molotov cocktails and Hungarian antitank guns. The revolutionists delivered one captured T-54A to the British Embassy in Budapest, the analysis of which spurred the development of the Royal Ordnance L7 tank gun.

The T-62 and T-55 are now mostly in reserve status; Russian active-duty units mainly use the T-80 and T-72, with a smaller number of T-90 tanks in service.

Middle East

During the 1967 Six-Day War, U.S.-supplied M48 Patton tanks, Centurion tanks, and even upgraded World War II era Sherman tanks, were faced against T-55s. This mix of Israeli tanks, combined with superior planning of operations and superior airpower, proved to be more than capable of dealing with the T-54/T-55 series.

By the 1973 Yom Kippur War, the T-54A and T



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-55's gun was starting to lose its competitive effectiveness to the 105 mm Royal Ordnance L7 gun mounted in Israeli Centurion Mk V and M60A1 tanks. Israel captured many T-55s from Syria and mostly Egypt in 1967, and kept some of them in service. They were upgraded with a 105 mm NATO-standard L7 or M68, a US version of the L7, replacing the old Soviet 100 mm D-10, and a General Motors diesel replacing the original Soviet diesel engine. The Israelis designated these Tiran-5 medium tanks, and they were used by reserve units until the early 1990s. Most of them were then sold to assorted Third World countries, some of them in Latin America, and the rest were heavily modified, converted into heavy armoured personnel carriers; the Achzarit.

Vietnam War

In the Vietnam War, the North Vietnamese NVA used T-54s against the South Vietnamese ARVN and US forces. The NVA and ARVN engaged each other for the first time during Operation Lam Son 719, in February 1971. During that battle, 17 M41 light tanks of the ARVN 1st Armored Brigade destroyed 22 Communist tanks, 6 T-54 and 16 PT-76, at no loss to themselves.



On Easter Sunday, 2 April 1972, the newly-activated ARVN 20th Tank Regiment, consisting of approximately 57 M48A3 Patton tanks (ARVN regiments were equivalent to US battalions, and ARVN squadrons were equivalent to US companies or troops)[14] received reports of a large NVA tank column moving towards Dong Ha (the largest South Vietnamese city near the DMZ at the 17th parallel). At about noon, the crewmen of the ARVN 1st Squadron observed enemy armour moving south along highway 1 towards Dong Ha, and concealed their tanks on high ground with a good vantage point. Waiting for the NVA column to close to between 2,500 and 3,000 meters, the 90-mm guns of the Pattons opened fire, quickly destroying nine PT-76

light tanks and two T-54 medium tanks. The remaining NVA armour, unable to see their enemy, turned about and withdrew.

On 9 April 1972, all three squadrons of the 20th Tank Regiment fought enemy armour, firing upon tanks accompanied by infantry, again while occupying the high ground. The Pattons opened fire at approximately 2,800 meters. A few answering shots from the T-54's fell short, and the NVA tanks began to scatter. By the end of the day, the 20th had destroyed sixteen T-54 and captured one Type 59, at no loss to themselves.

NVA armour units equipped with the T-54 tank achieved one of their greatest victories in April 1972, when the NVA 203rd Armored Regiment attacked the ARVN 22nd Infantry Division at Tan Canh, which dominated a main route into the city of Kontum. After a two-day artillery barrage, eighteen T-54 tanks from the 203rd regiment attacked the 22nd Division at dawn from two directions, breaking the ARVN unit, which quickly abandoned its positions.

On 30 April 1975, T-54 tank no. 844 of the NVA 203rd Armored Regiment went crashing through the gates of the South Vietnamese presidential palace, signalling the end of the war.

Other conflicts

T-54 tanks were used during the Cambodian civil war. During the Ugandan-Tanzanian War of 1978-79, Libya sent an expeditionary force to aid Uganda dictator Idi Amin which included a few dozen T-54/55 tanks. Some of these tanks saw action against Tanzanian forces.

Polish T-55L tanks were also deployed during Martial law in Poland to intimidate the population and suppress overt displays against the Communist government. The T-54/T-55 saw action against South African and UNITA forces during the war in Angola. This Soviet tank's reliability and ruggedness matched the demanding African operational environment. However, several numbers of T-54/T-55 tanks were lost to South African Olifant MBTs, artillery fire, and wire-guided missiles in several engagements.



The T-55 was the most numerous tank of the Yugoslav People's Army (JNA). It was the mainstay of armoured combat units during the Yugoslav Wars, where it proved vulnerable to infantry equipped with anti-tank rockets, and to misemployment in urban areas and unfriendly terrain. But there were too many of them in service for them to be replaced. During the battle of Vukovar, where the JNA grouped a large part of its tank force, a number was destroyed, almost exclusively by infantry-carried anti-tank weapons. The T-55 tank remained the most common tank in the armies of the Yugoslavian successor states until recently, and it was the most used tank by all armies during the wars. T-55s were used by Yugoslavia and Macedonia in Kosovo and the 2001 Macedonia conflict.

China sold thousands of Type 69 tanks to both Iran and Iraq during the Iran-Iraq War of 1980-1988 (known as the Persian Gulf War prior to 1991). Some saw action during Operation Desert Storm in Iraq and Kuwait in January/February 1991, and during the 2003 US invasion of Iraq (Operation Iraqi Freedom).

The T-55 has been used by Ethiopia in conflict with the Islamic Courts Union in Somalia.

The Sri Lanka army used T-55s in the Sri Lankan Civil War, which concluded in May 2009, against the LTTE (Tamil Tigers). A T-55 belonging to the LTTE was destroyed on 6 April 2009; according to media reports, it was a model produced in Czechoslovakia and obtained by the LTTE in 2001 or 2002.



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Best wishes,
Sincerely yours.

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2. 电池和开关等按照正确的线路连接方式连接。如果不按照说明书正确的连接电子产品的线路，坦克可能会忽然启动而造成意外事故。所以请务必遵守以下条例。

a) 不要在坦克上安放其他物体，它们可能会压坏或者损伤坦克本身。

b) 打开遥控器的开关。

c) 连接电池。

d) 打开接收机的开关。

当结束使用坦克时，请按以下步骤操作。

A) 关闭接收机开关。

B) 断开坦克电池的连接。

C) 关闭遥控器的开关。

3. 坦克行驶时不能用手去触碰履带或者轮子。

4. 重新设置CPU时，务必断开和电机的连接。

5. 避免在同一场合有其他相同频率的模型在使用。若与其他坦克，飞机，直升机，船等模型的无线电频率发生冲突时，会造成操作失控，导致意外事故发生。所以当附近有人使用遥控模型时，务必确认频率以避免造成相互干扰。

6. 当坦克行驶一段时间后，电池、电机、CPU、CESC等会发热，当停止操作时需等待一段时间以便它们温度降低，然后再对这些电子产品进行重新设置。

7. 使用刀具或者其他工具时要注意安全，不要伤害到自身和身旁的人。

8. 本说明书推荐使用的粘合剂有特殊的气味，请在通风处制作，请不要擅自使用其他的粘合剂。

9. 本模型在制作过程中和制作完成后存在不可避免的尖角部分，请注意安全。

10. 本模型适合14岁以上的人士制作。

Matters need attention:

1. Choose a safe place.

Model needs to be used according to the local law and with the permission of the local government. Do not run the model in the streets or in a place where there has passerby and children. Do not run the model in a narrow or hermetic room. If running the model, under age player needs to be in the company of adult. Our company does not assume the responsibility for the damage or loss which is caused by the player's misuse.

2. Battery and switch need to be connected in a certain and correct way. Make sure that connected the parts according to the instruction book we offered in case the tank may start up in a sudden and make some damage. The suggestions are followed:

a). Do not put other objects on the tank which may squash or harm the tank.

b). Turn the on the remote control.

c). Connect the battery.

d). Turn on the receiver.

Steps for finishing up using the tank:

a). Turn off the receiver.

b). Disconnect the battery from the tank.

c). Turn off the remote control.

3. Do not touch the tracks or wheels with your fingers when the tank is running.

4. Make sure that you've disconnected the motor from the tank before resetting the CPU.

5. To avoid playing at a place where there is a same frequency to your model. If the model were interfered by other similar frequency, it may be out of control and causes accidents. In order to avoid such case, you need to make sure that there is no same frequency when someone is playing models beside.

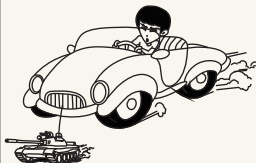
6. During running, accessories such as batteries, motor, CPU and CESC will warm. Before resetting, you need to wait for a moment so as to cool the accessories.

7. Focus on using the tool like knife and other things for the avoidance of hurting yourself and others.

8. Because the adhesive suggested in this instruction book smells peculiarly, please make the model at a ventilated place and don't choose another type of adhesive which is not suggested.

9. There will be closed angles both on the semi-finished and finished models. Please watch out.

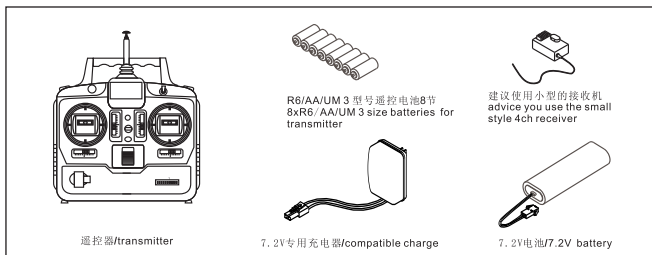
10. The person making the model would better be older than 14 years old.














必配电子配件/Required equipment

ITEM:6602



使用工具/required tools

 模型刀/modeling knife	 镊子/pliers	 1mm和1.5mm小手钻/ Pin vise(1&1.5mm spiralbohrer)
 尖嘴钳/slid cutters	 小钢锉和细砂纸/ file and sand paper	 电烙铁/soldering iron
 溶剂胶/solvent glue	 螺丝胶/snail glue	 剪刀/forfex



漆料和涂装工具/paint colors and tools

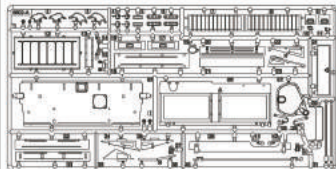
本模型使用的为田宫模型漆色号，在涂装前先用细砂纸打掉零件的合模线。某些小零件在装备前应先完成涂装。坦克的细节处可用模型画笔进行涂色，大面积涂装可配合气泵和模型喷笔。This model use the TAMIYA panit colorscode. Parting lines and cemented areas should be smoothed and roughed out with abrasives before painting. Some small parts should be painted before assemble. Use of spray paints is recommended for painting large areas, and brush paint for detailed areas.



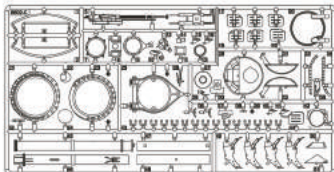
图例/ICON

 溶剂胶/solvent glue	 选择/option	 焊接/weld	 钻孔/drill
 瞬间胶/Instant glue	 打磨/file	 上色/paint	 镜像/mirror
 不用胶合/no glue	 水贴纸/decals	 切除/cut	

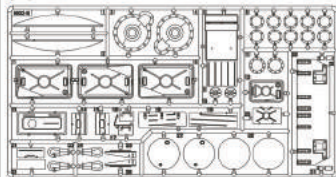
A PART x1



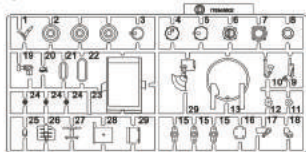
G PART x1



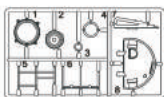
B PART x1



D PART x1



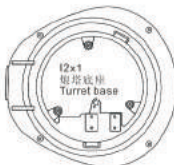
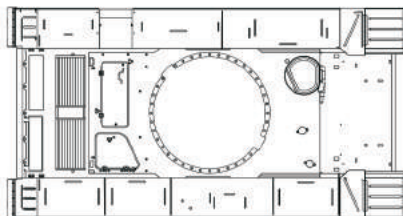
E PART x1



F PART x1



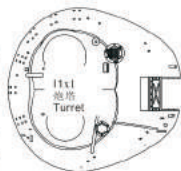
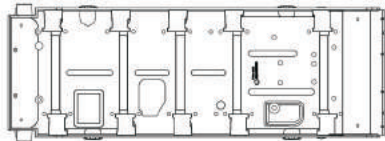
H1x1 上车体/upper hull



J1x2
油桶
Fuel drums a

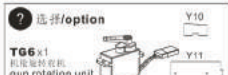
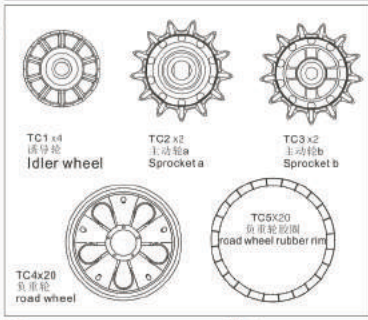
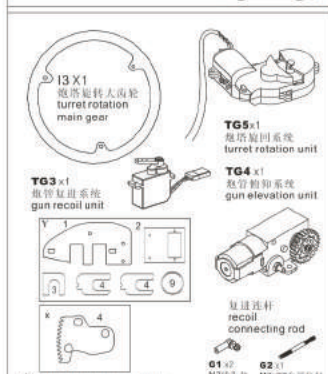
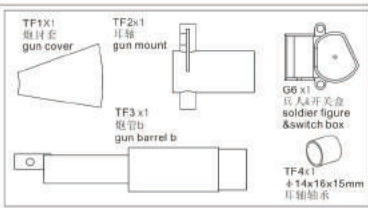
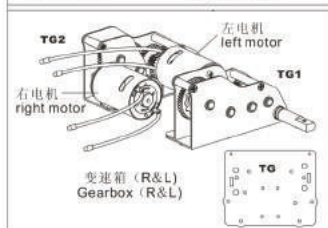
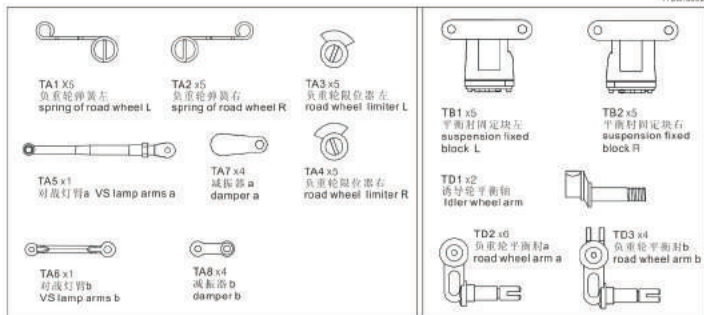


H2x1 下车体/lower hull

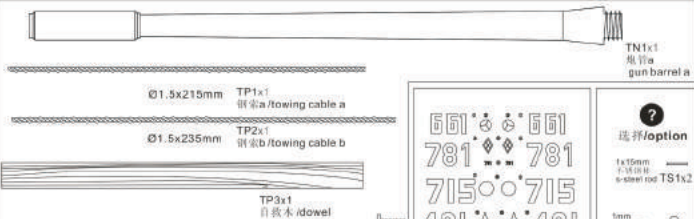
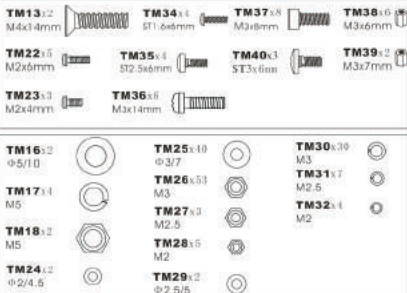
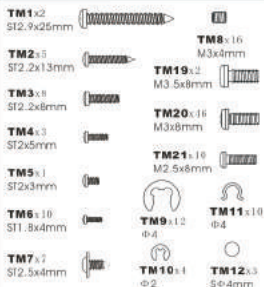
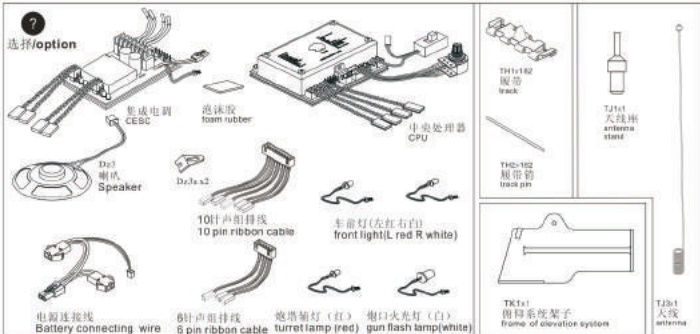


J2x2
油桶
Fuel drums b

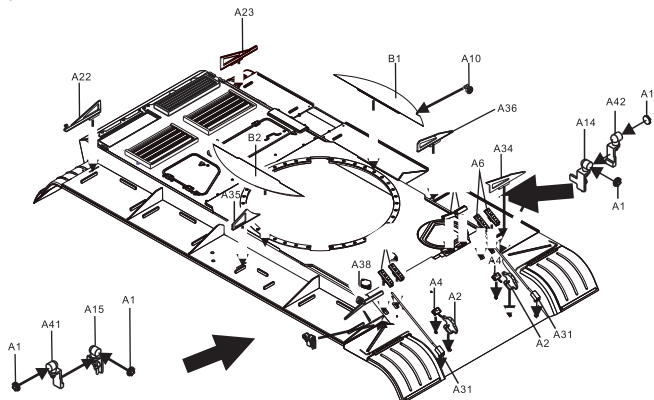




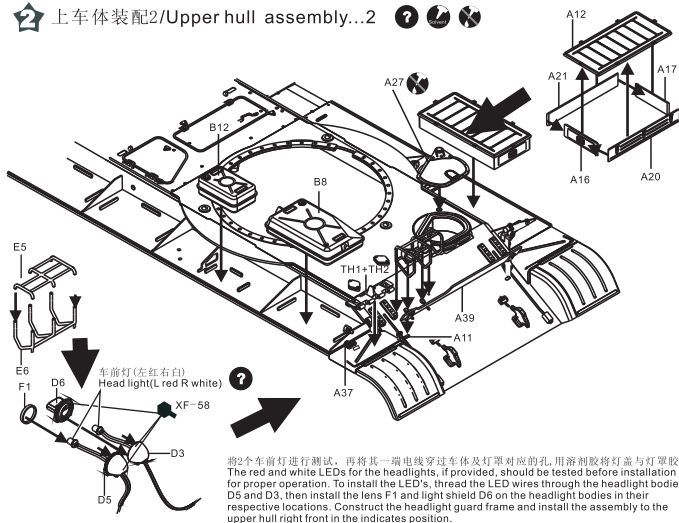
▲ 零件或制图与电子设备配套时
All electronic devices comes with the associated interconnecting cables



1 上车体装配1/Upper hull assembly...1

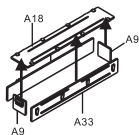


2 上车体装配2/Upper hull assembly...2

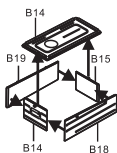


将2个车前灯进行测试，再将其一端电线穿过车体及灯罩对应的孔，用溶剂胶将灯盖与灯罩胶合
The red and white LEDs for the headlights, if provided, should be tested before installation for proper operation. To install the LED's, thread the LED wires through the headlight bodies D5 and D3, then install the lens F1 and light shield D6 on the headlight bodies in their respective locations. Construct the headlight guard frame and install the assembly to the upper hull right front in the indicates position.

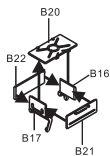
3 杂物箱的装配/Storage box assembly



杂物箱a/Storage box a

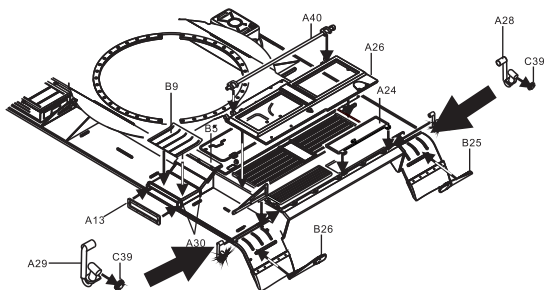


杂物箱b/Storage box b

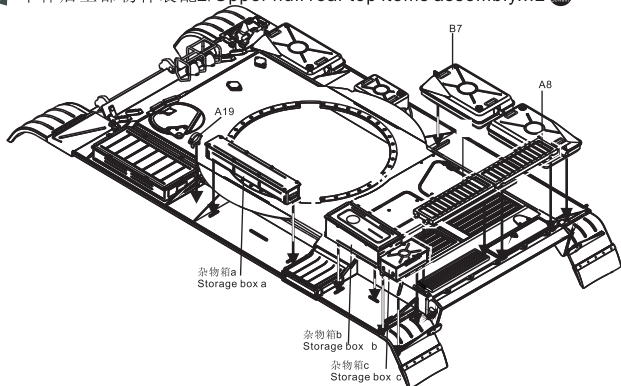


杂物箱c/Storage box c

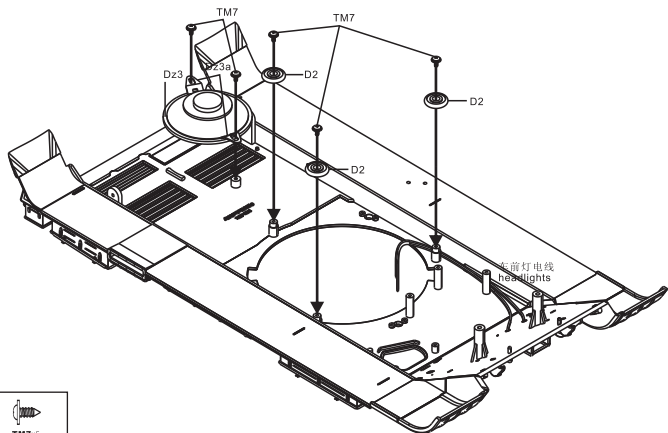
4 车体后上部物件装配1/Upper hull rear top items assembly...1



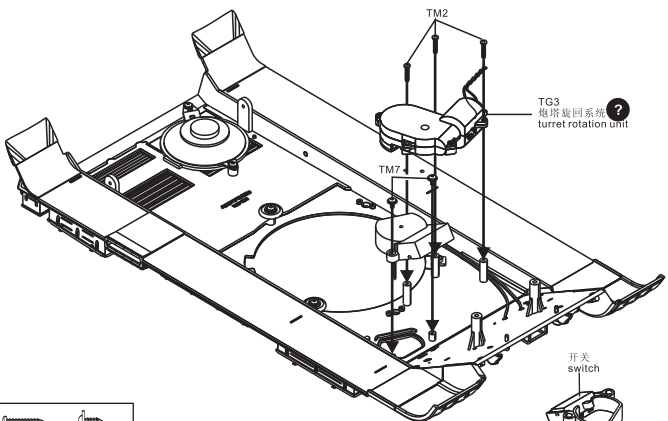
5 车体后上部物件装配2/Upper hull rear top items assembly...2



6 上车体内部装配/Upper hull internal parts assembly...1 ?



TM7×5
ST2.5×5mm



TM2×3
ST2.2×13mm



TM7×2
ST2.5×5mm



开关
switch

G6

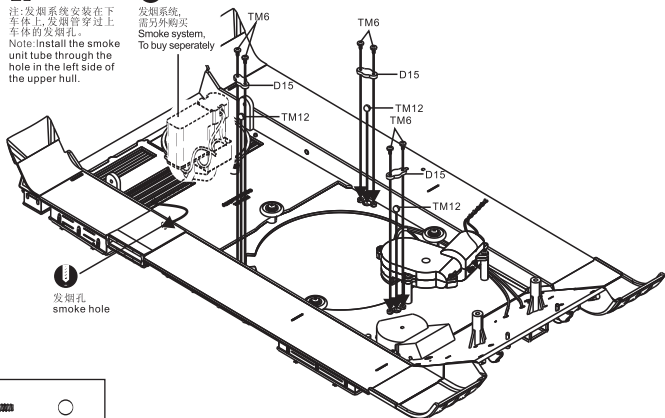
7 上车体内部装配/Upper hull internal parts assembly...2 ?



注:发烟系统安装在下车体上,发烟管穿过上车体的发烟孔。
Note: Install the smoke unit tube through the hole in the left side of the upper hull.



发烟系统,需另外购买。
Smoke system, To buy seperately

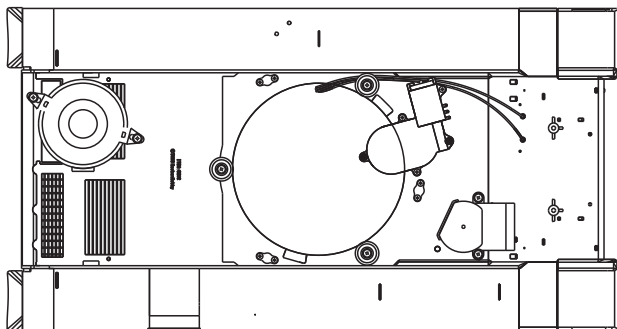


TM6 x6
5T1.8x4mm



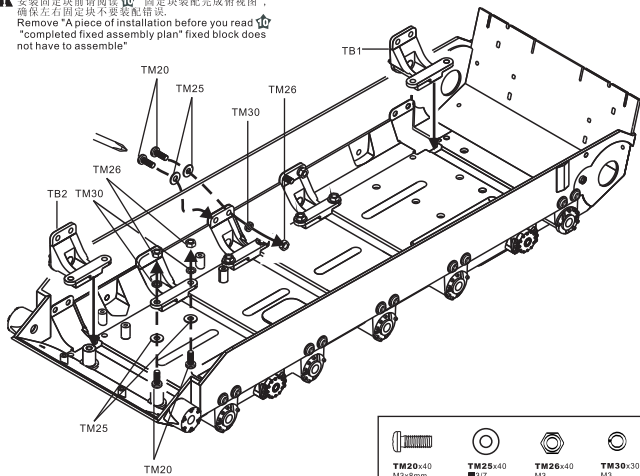
TM12 x3
5mm

8 上车体内部装配俯视图/Upper hull internal assembly plan

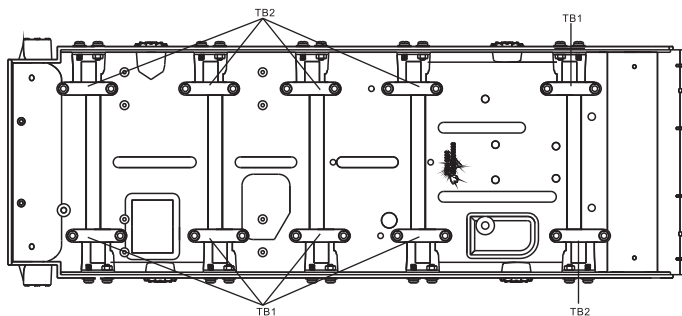


9 固定块的装配1/Suspension system assembly

▲ 安装固定块前请阅读“固定块装配完成俯视图”，
确保左右固定块不要装配错误。
Remove "A piece of installation before you read"
"completed fixed assembly plan" fixed block does
not have to assemble"

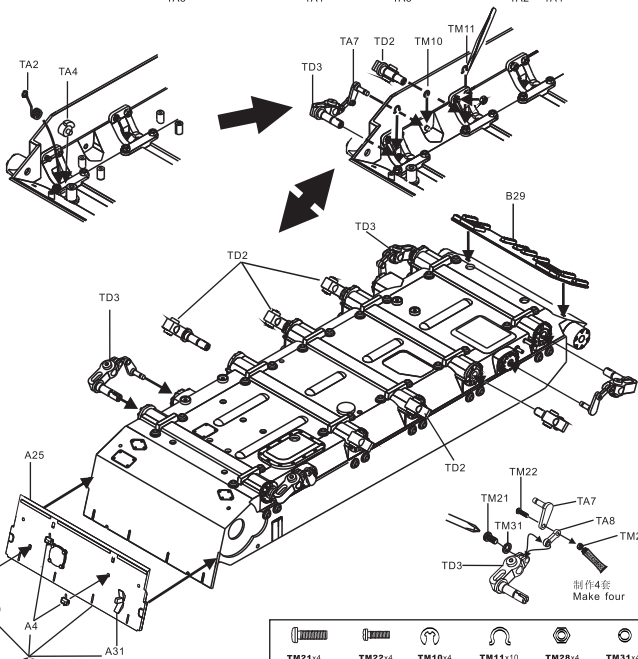
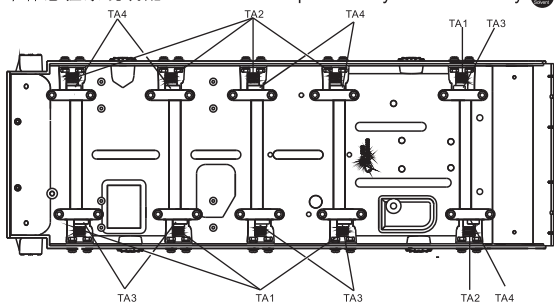


10 固定块装配完成俯视图/Installation plan for section 8





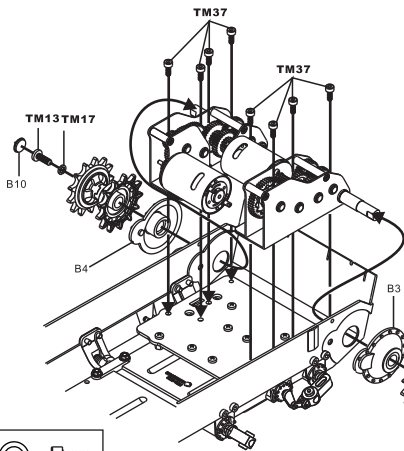
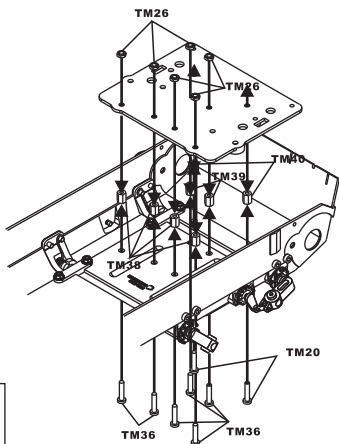
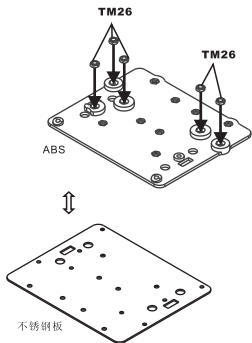
下车体悬挂系统装配 / Lower hull suspension system assembly



TM21 ×4 M2.5×8mm	TM22 ×4 M2×6mm	TM10 ×4 Φ2	TM11 ×10 Φ4	TM28 ×4 M2	TM31 ×4 M2.5

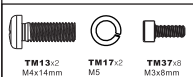


齿轮箱与下车体的装配/Transmission and lower hull assembly

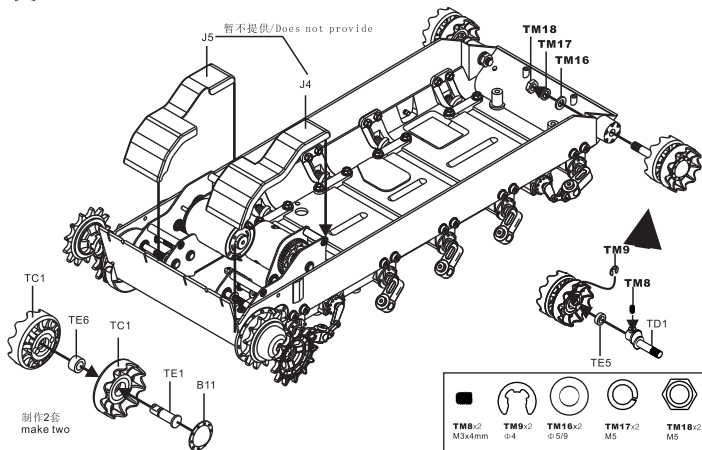


制作2套
make two

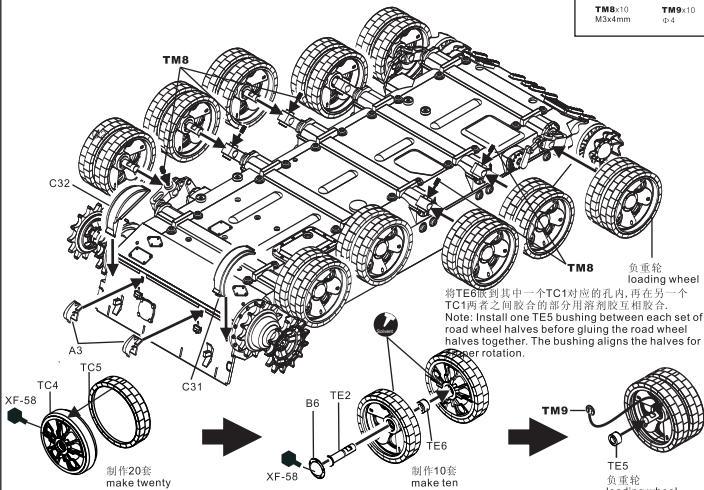
▲ 安装主动轮时请确保
两边的齿在同一直线上。
Install axle round please
ensure that both sides of
the same lines.



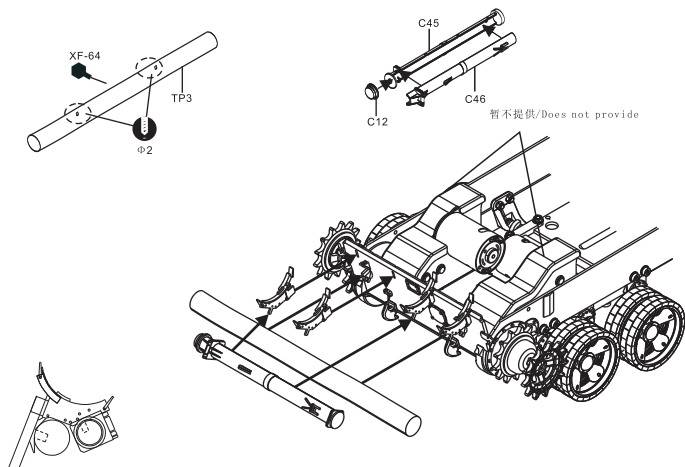
13 轮的装配/Drive sprocket and idler wheel assembly...1



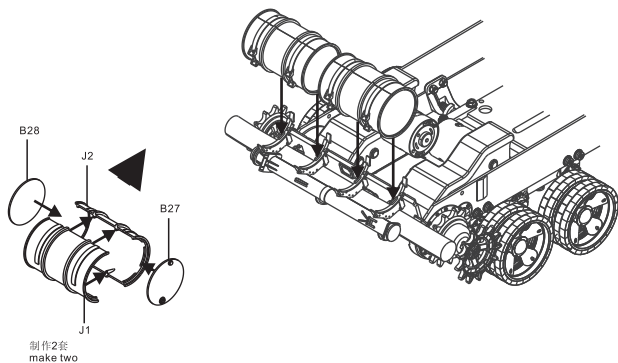
14 轮的装配2/Road wheel assembly...2



15 尾部的装配/Rear hull plate parts assembly

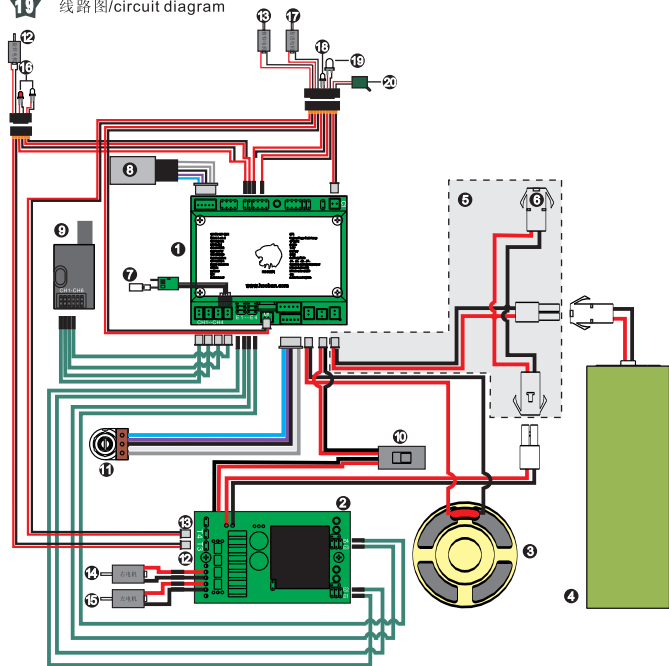


16 燃料桶的装配/Fuel drum assembly





线路图/circuit diagram



- | | | | |
|-----------------------|---------------------------|-------------------------------|------------------------|
| ① 中央处理器/CPU | ⑥ 电源充电口/Charge sockets | ⑪ 音量调节器/volume control | ⑯ 车前灯/headlight |
| ② 集成电调/CESC | ⑦ 发烟系统/SMG | ⑫ 旋转系统电机/turret rotation unit | ⑰ 复进电机/gun recoil unit |
| ③ 喇叭/speaker | ⑧ 红外对战系统/IR battle system | ⑬ 俯仰系统电机/gun elevation unit | ⑱ 炮塔辅灯/turret lamp |
| ④ 电源/battery | ⑨ 接收机/receiver | ⑭ 右左电机/right motor | ⑲ 炮口火光灯/gun flash lamp |
| ⑤ 电源连接线/battery cable | ⑩ 开关/switch | ⑮ 左电机/left motor | ⑳ 限位开关/Limit switch |

注：— 此线有三股线组成 —，在插接的时候注意正负极，红色接正极，黑色接负极，白色为信号线。

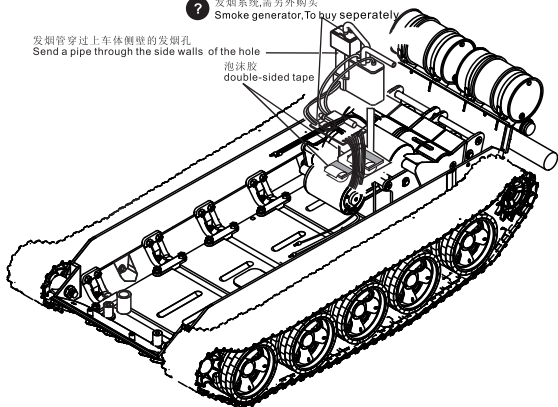
NOTE: — This cable consists of three wires: — Red = Positive, Black = Negative and White = Signal.

20 发烟系统的安装/smoke generator assembly ?

? 发烟系统,需另外购买
Smoke generator, To buy seperately

发烟管穿过上车体侧壁的发烟孔
Send a pipe through the side walls of the hole

泡沫胶
double-sided tape

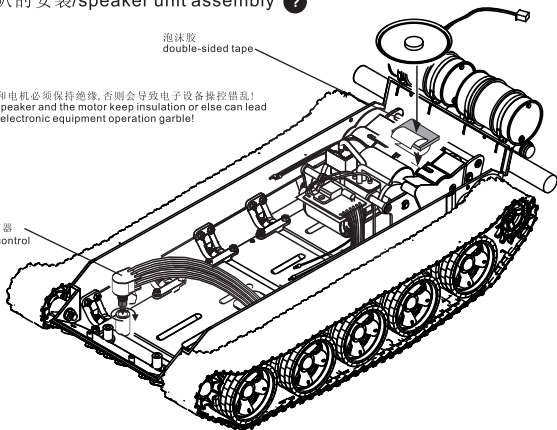


喇叭的安装/speaker unit assembly ?

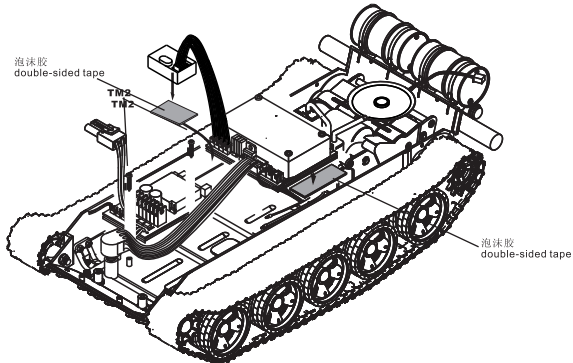
! 喇叭和电机必须保持绝缘,否则会导致电子设备操控错乱!
The speaker and the motor keep insulation or else can lead to an electronic equipment operation garble!

泡沫胶
double-sided tape

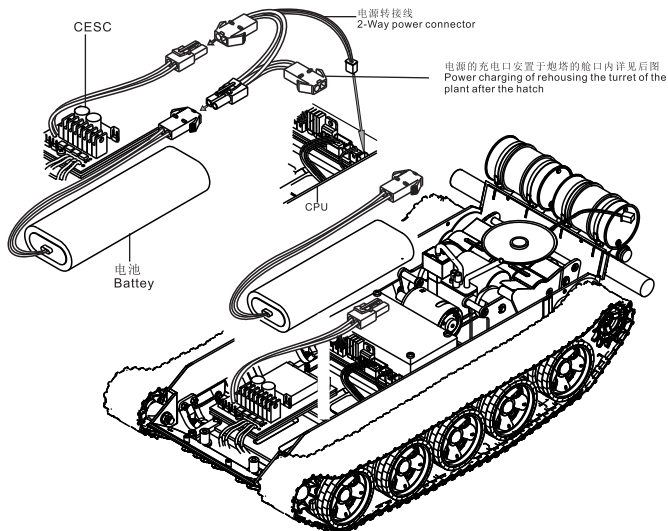
音量调节器
volume control



21 CPU和CESC的安装/CPU and CESC assembly

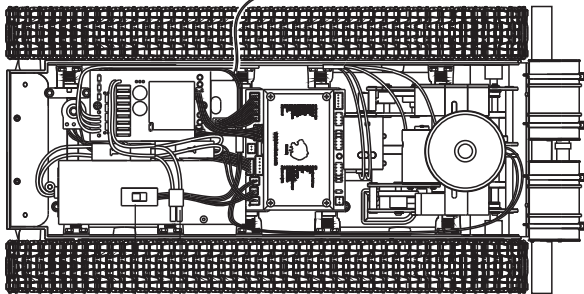


22 电池、CPU、CESC的连接/Battery、CPU、CESC connecting



🛠️ 下车体电子设备装配/lower hull electronic equipment assembly

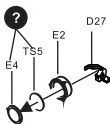
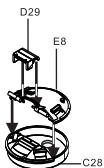
接收机线, 插入天线转接线的一端
Receiving line, the antenna to the end of the connecting thread



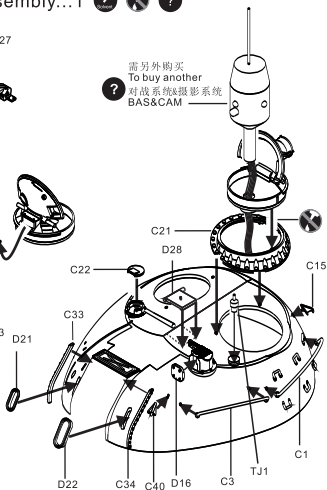
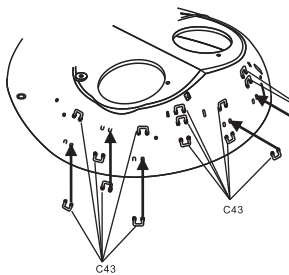
开关
Switch

充电插口, 穿过上车体及炮塔底座放至TG6槽内, 以便充电时通过炮口盖取放。
Charging jack sockets, through the turrets and put to the bast TG6 and so on through the turretop pick-place.

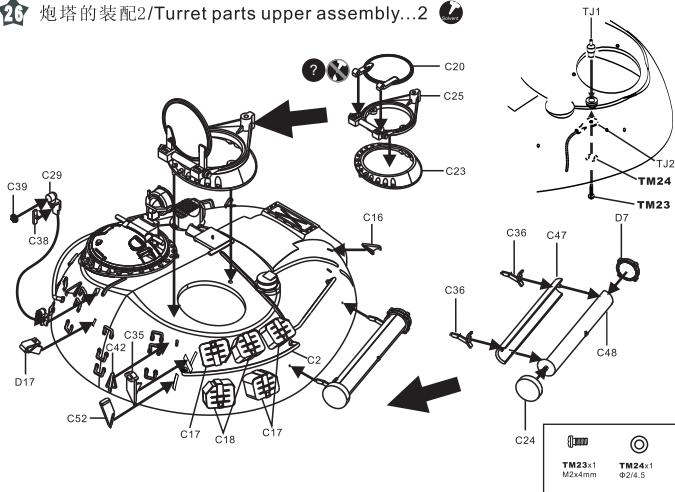
🛠️ 炮塔的装配1/Turret parts upper assembly...1



需另外购买
To buy another
对战系统摄影系统
BAS&CAM

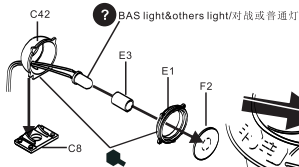


26 炮塔的装配2/Turret parts upper assembly...2



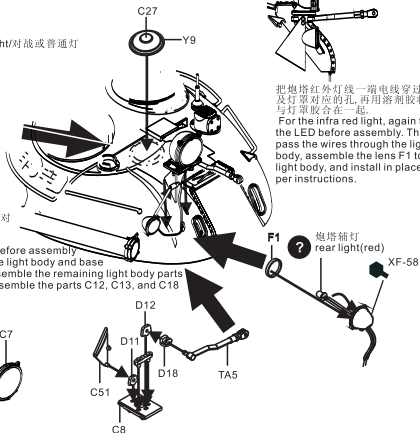
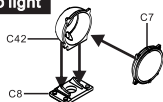
27 炮塔的装配3/Turret parts upper assembly...3

A. 有灯光/have light



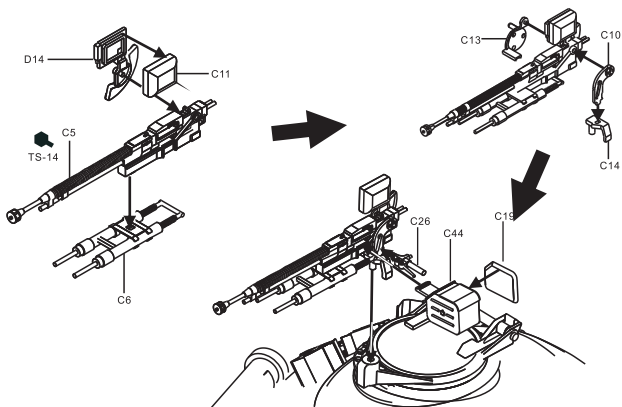
用溶剂胶将E3胶合在F2中心位置, F2与E1胶合; 把对战灯线一端电线穿过炮塔及灯罩对应的孔, 再用溶剂胶将灯盖与灯罩胶合在一起。
 Check the light LED (if supplied) for operation before assembly in the light body. Pass the LED wires through the light body and base C18, then through the hull mount C13. Then assemble the remaining light body parts as per instructions. If no LED is used, simply assemble the parts C12, C13, and C18 together

B. 无灯光/no light

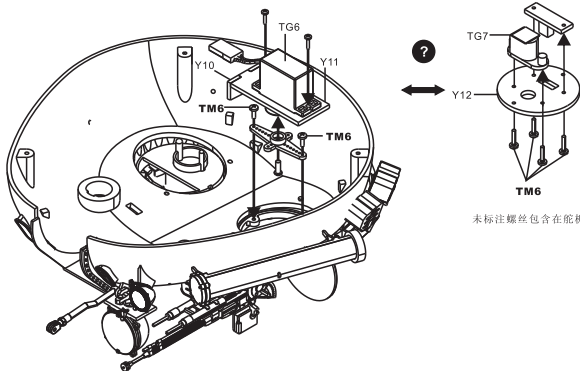


把炮塔红外灯线一端电线穿过炮塔及灯罩对应的孔, 再用溶剂胶将灯盖与灯罩胶合在一起。
 For the infra red light, again test the LED before assembly. Then pass the wires through the light body, assemble the lens F1 to the light body, and install in place as per instructions.

28 对空机枪的装配/ Anti-aircraft machine gun assembly



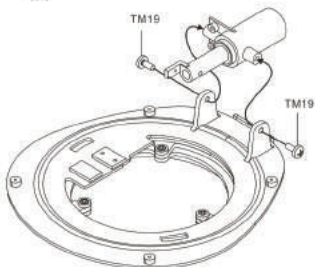
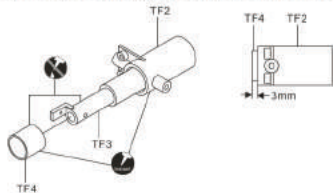
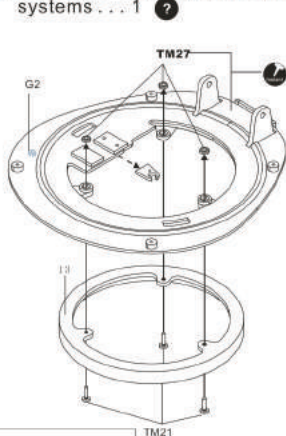
29 机枪旋转或开关的安装/Turret base plate assembly



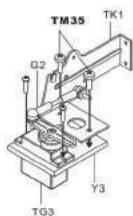
未标注螺丝包含在舵机包里


TM6x4
ST1.8x4mm

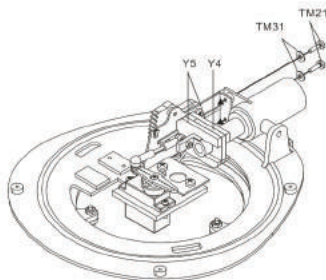
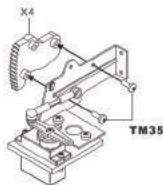
30 炮管俯仰、复进的装配1/Turret base plate assembly, elevation and recoil systems ... 1 ?



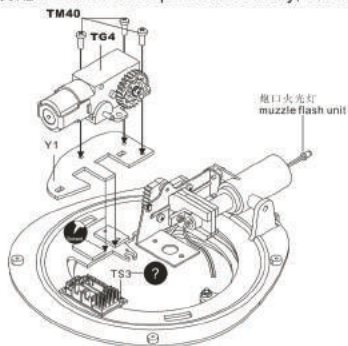
31 炮管俯仰、复进的装配2/Turret base plate assembly, elevation and recoil systems ... 2 ?



未标注螺母包含在舵机包里

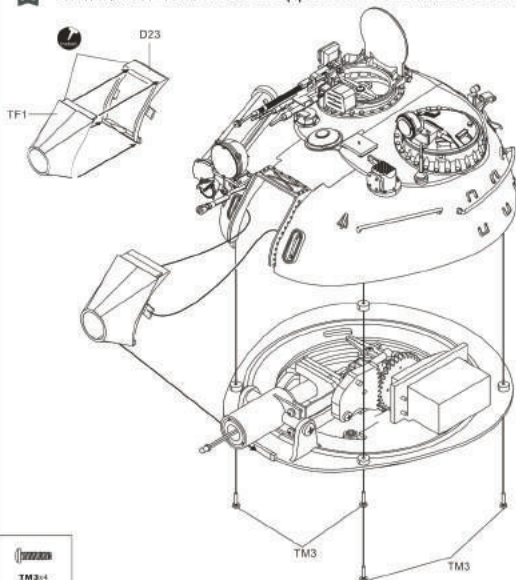


32 炮管俯仰、复进的装配3/Turret base plate assembly, elevation and recoil systems . . . 3 ?

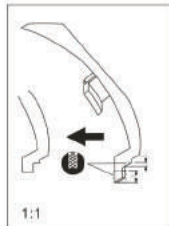


TM40x3
ST3X4mm

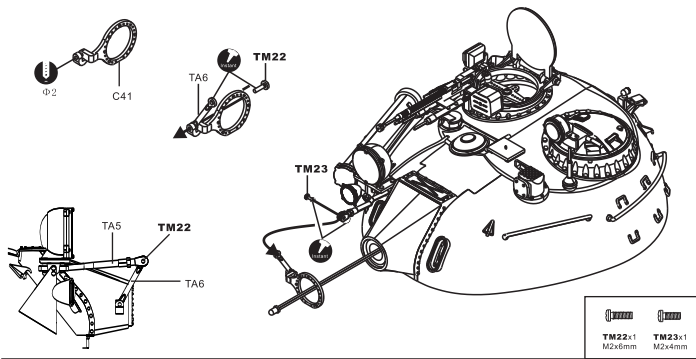
33 炮塔的整体装配1/Turret upper and lower half assembly . . . 1



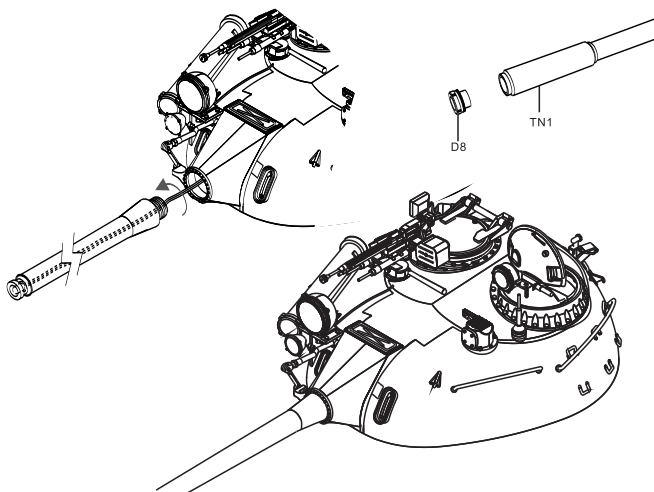
TM3x4
ST2.2x8mm



34 炮管的装配1/Turret upper and lower half assembly . . . 1



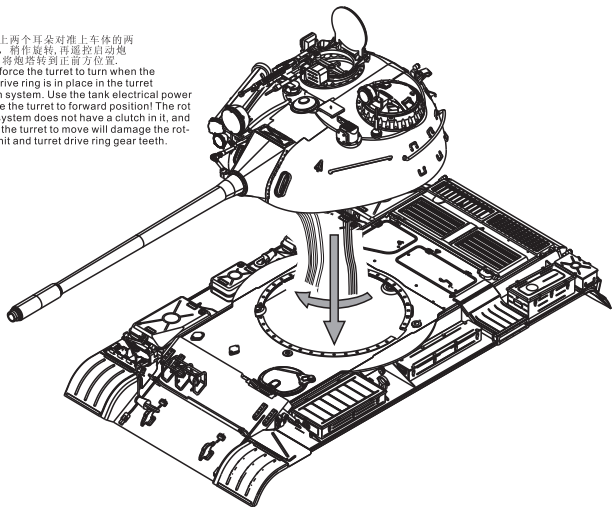
35 炮管的装配2/Turret upper and lower half assembly . . . 2



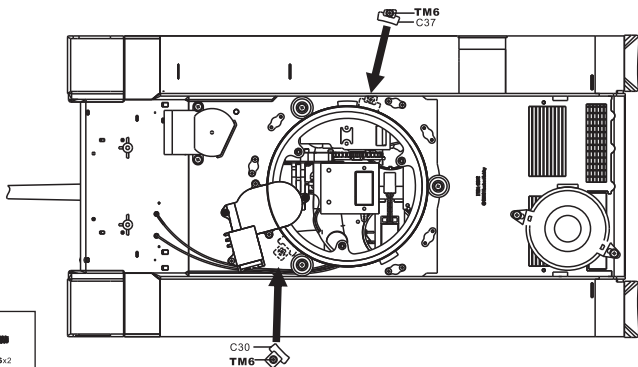
36 炮塔的整体装配1/Threaded main gun barrel installation...1

将炮塔上两个耳朵对准上车体的两个缺口，稍作旋转，再遥控启动炮塔旋转，将炮塔转到正前方位置。

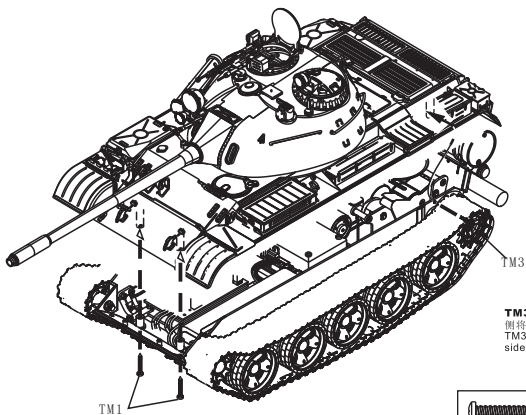
Do not force the turret to turn when the turret drive ring is in place in the turret rotation system. Use the tank electrical power to rotate the turret to forward position! The rotation system does not have a clutch in it, and forcing the turret to move will damage the rotation unit and turret drive ring gear teeth.



37 炮塔的整体装配2/Threaded main gun barrel installation...2



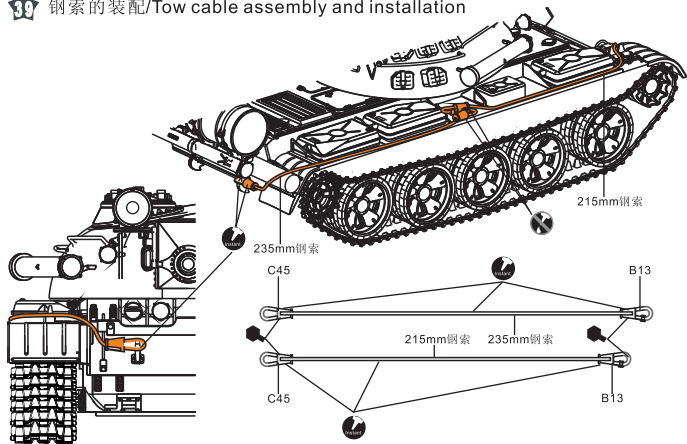
38 整体装配/Threaded main gun barrel installation



TM3穿过车体左右两侧将车体组装起来
TM3 through the hull sides will it assembly



39 钢索的装配/Tow cable assembly and installation



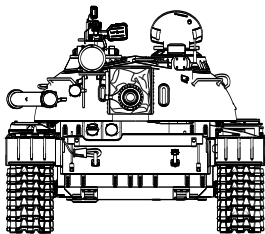
中央处理器, 集成電調, 对战系统, 发烟系统, 摄影系统
WITH CPU. CESC. BAS. SMG. CAM

T-55A 操作指南

OPERATION MANUAL



HOOBEN



1/16 全功能遥控战车模型
RADIO CONTROL FULL FUNCTION AFV



MCU说明/MCU MULTI FUNCTION UNIT

功能概要/FUNCTIONAL OUTLINE

1. 搭配使用4動遙控系統,以可變速的方式控制坦克的前進,後退,轉向,原地迴旋,超原地迴旋,砲塔迴旋及砲身俯仰。
 2. 8位元, 22KHz採樣率的高音質音效及5音軌數位式混音。主砲, 機槍, 砲塔迴轉, 砲管俯仰及引擎音效可以同時產生。
 3. 3.3瓦特音效輸出功率。
 4. 砲身俯仰可獨立控制。
 5. 可連接恆龍BB彈/砲管後縮模組,可連接田宮砲管後縮模組,可以和田宮或恆龍遙控坦克進行紅外對戰。
 6. 內建行進混控器,使用油門搭配方向舵撥桿即可控制坦克的前進,後退,緩迴轉,原地迴轉。
 7. 內建BEC,可以直接供電給接收機,內建自動斷電機制,內建斷訊安全機制,容易組裝免調整,可支援Futaba, JR與2.4G遙控系統。
1. 4 channel remote control system for use with variable speed control tank forward, backward, steering, in-situ cyclotron, ultra-situ roundabout the turret roundabout and gun pitch.
 2. 8-Bit, 22KHz sampling rate of the high-definition audio and 5 tracks digital mix main gun, machine gun, turret rotation, barrel pitch and engine sound can be generated.
 3. 3 watts audio output power.
 4. Gun pitch can be controlled independently.
 5. Heng Long BB shells can be connected / barrel after shrinking module can be connected to the Tamiya barrel reduction module, can Tamiya or Heng Long RC Tank IR Battle.
 6. Built-Mix Controller advancing the throttle with a the rudder lever to control the advance of tanks, rewind, slow rotation situ rotation.
 7. Built-in BEC, can be powered directly to the receiver, built-in automatic power-off mechanism, built-in security mechanisms interruption, easy to assemble free adjustment, Support Futaba, JR 2.4G remote control system.

操作方式/Control Mode and operation



引擎啟動及熄火
Engine sound on/off



砲身俯仰
Cannon elevation



主砲射擊
Booming Cannon



機槍射擊
Fire MG



頭燈開關
Head light control on/off



輔助電源開關
Accessory power supply switch



戰車前進及後退
Tank move forward and backward



戰車左右轉/Right and Left turn:
第三動置中, 第一動撥桿向左或
右撥動/Third moving in, the first
move dial toggle lever to the left
or right



砲塔迴旋/Turret rotation:
第三動置中, 第四動撥桿向左或右撥
動,砲塔迴旋的速度與撥桿角度成正
比./Third moves sets, fourth moves the
work driving arm towards left or moves
right, the turret maneuver speed and the
work driving arm angle are proportional.

電氣規格/ Electrical Specification

型号	項目	數值	單位
	履帶用電子變速器最大額定電流	20	A
	砲塔迴旋及砲身俯仰電子變速器最大額定電流	7	A
	最大額定輸入電壓(鎳鎘或鎳氫電池6顆或7.4V鋰聚電池)	7.4	V
	最小額定輸入電壓(鎳鎘或鎳氫電池6顆或7.4V鋰聚電池)	7.2	V

Part Number	Project	Value	Unit
	Maximum current of track ESC	20	A
	Maximum current of turret and cannon elevation ESC	7	A
	Maximum supply voltage	7.4	V
	Minimum supply voltage	7.2	V

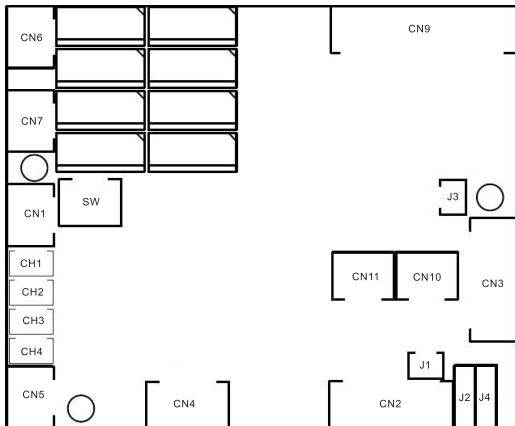
組立與調整/Assembly and adjustment

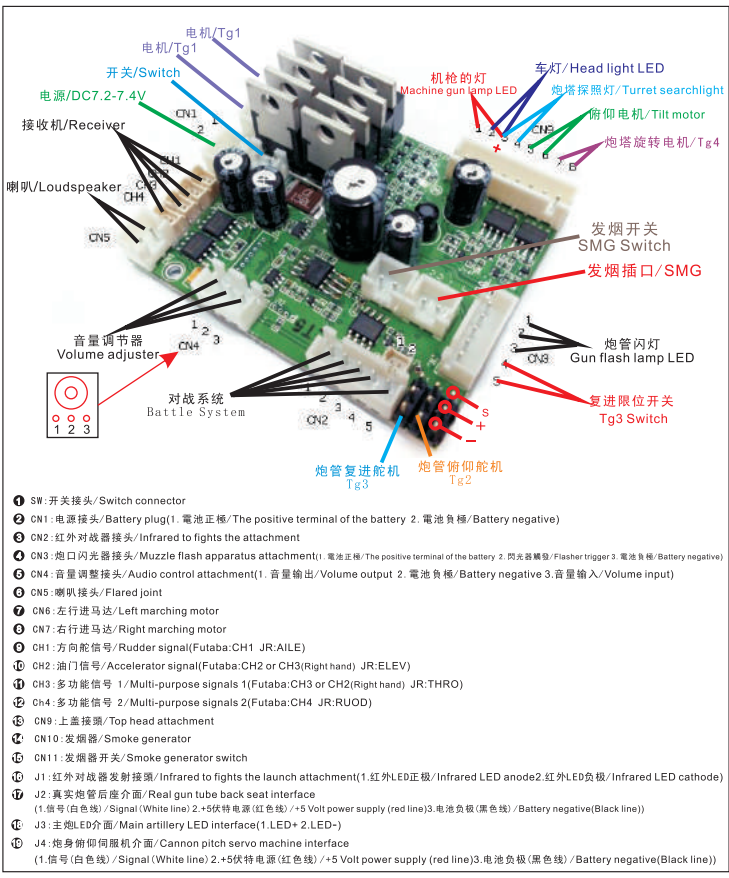
1. 檢查功率晶體金屬部份，經過運送後有無互相接觸到，如果有，請聯絡我們。
2. 根據用途，先設定好炮口閃光器接頭的功能。
3. SW開關接頭是設計給非恆龍車用的，如果是用在恆龍車只要將兩腳直接短路即可，非恆龍車輛則需要連接一開關。
4. 音量旋鈕調至中間。
5. 連接砲管後座伺服機到J2。
6. 將第一、二及三動的微調扭設到中間位置，第四動的微調扭設到最左或最右位置。
7. 打開遙控發射機及TK板電源，此時應該會聽到砲塔迴轉聲。
8. 慢慢將第四動的微調扭向中間調整直到砲塔迴轉聲消失。
9. 如有聽到馬達哼聲，慢慢將第二動的微調扭向中間調整直到馬達哼聲消失。
10. 將第四動撥到最左邊，慢慢將第三動的微調扭調整，直到將第三動撥到最上方可以發射主砲，最下方可以發射機槍。
11. 安裝到此完成。



1. Check power crystal metal part after shipping or without contact with each other, please contact us.
2. According to use, first set up joint function of the muzzle flash.
3. SW switch connector is designed to give non-constant dragon car, if it is used in the Heng Long car feet direct short circuit can non Heng Long vehicles need to connect a switch.
4. The middle of the volume knob is adjusted.
5. Connection barrel rear servo J2.
6. Twist the fine-tuning of the first, second and third move set to the middle position, the fine-tuning of the fourth dynamic torsional set to the leftmost or rightmost position.
7. Open the remote control transmitter and TK-board power, should hear the turret slewing sound.
8. Fine-tune the torsional middle of the fourth move slowly adjusted until the turret slewing sound disappear.
9. If any, to hear the motor hum, slowly fine-tuning of the second dynamic torsional middle adjustment until the motor hum disappear.
10. The fourth move appropriated leftmost slowly twisted to adjust the fine-tuning of the third move, and can launch the main gun until the third move appropriated for the top and the bottom of the can launch a machine gun.
11. The installation is now complete.

連接器圖表/Connector to the chart





安装主炮灯光LED/Install the main gun lights LED

1. 需要如图(1)中的连接线及白光LED (料号为F003) ,
2. 将红线焊到LED的长脚, 黑线焊到短脚,
3. 再将接头插到J3插座即可。

1. Need the cable as shown in the white LED (material No. F003),
2. The red line is welded to the long leg of the LED, the black line is welded to the short legs,
3. Then connector into J3 to socket.

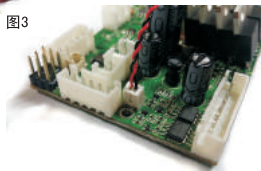
图1



图2



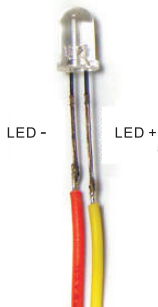
图3



MCU接线图/Wiring diagram

Tamiya 对战器接线图/The Tamiya Battle is wiring diagram

Battle Unit Flasher



CN2
Infrared Port



车种及参数切换功能/Type and parameters of switching function

车种及参数设定,可以透过SONY电视遥控器来设定以符合不同的需求及应用。

Type and parameter setting, can through the SONY TV remote control to set in accordance with different requirements and application.

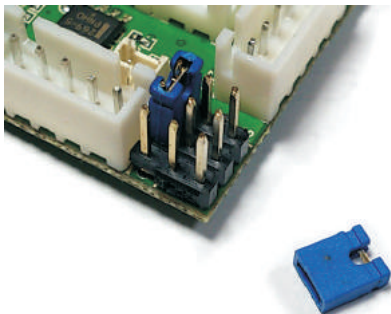
车种是指红外对战时车种的参数/Type is refers infrared to in the wartime vehicle parameter

车种/Type	戰車的機動力, 砲塔迴轉及砲身俯仰速度對應於被彈數(戰損狀態)/Battle damage state		
	受損状态/Damaged state	嚴重受損状态/Badly damaged condition	被击毀状态/Destroyed state
重型战车/Heavy combat tank	1-4	5-8	9
中型战车/Medium combat tank	1-3	4-5	6
轻型战车/Light-duty combat tank	1	2	3

车种/Type	装填时间/Reload time	重生时间/Rebirth time	防护时间/Protection time
重型战车/Heavy combat tank	9s	15s	10s
中型战车/Medium combat tank	5s	15s	12s
轻型战车/Light-duty combat tank	3s	15s	15s

步驟一: 插上红外对战器。/Step 1: Inserts infrared to fights.

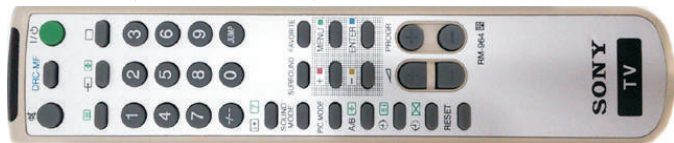
步驟二: 將J2接頭上兩接點用JUMPER短路。/Step 2:The J2 connector on both contact with JUMPER short circuit.



步驟三: 使用SONY電視遙控器指向紅外對戰器, 參考下方功能列表, 按下對應的電視遙控器按鈕。

(SONY電視遙控器參考範例)

Step 3: Use against SONY TV remote controller to the infrared device, refer to the below features list, press the corresponding TV remote control button. (SONY TV remote reference sample)



步驟四: 紅外對戰器上的指示燈會根據所設定的功能閃爍數次。

Step 4: Infrared against on the device will blink several times according to the set function.

步驟五: 將J2接頭上JUMPER接起, 重新開關電源即完成設定。

Step 5: The JUMPER on the J2 connector pull up to switch power setting is completed.

车辆状态显示功能及红外对战测试功能/Vehicle state display function and infrared testing capabilities

將SONY電視遙控器對著紅外接收器按下表列按鈕，即可瞭解車輛狀況或測試紅外對戰功能。

The SONY TV remote control to the infrared receiver list button, can understand the vehicles or test infrared function.

電視遙控器按鈕	說明
數字鍵 '1'	對車輛進行維修，已被彈數減1
數字鍵 '2'	對車輛射擊主砲
數字鍵 '3'	對車輛射擊機槍
數字鍵 '4'	指示燈閃爍次數代表剩餘可被彈數

TV remote control button	Explanation
Numeric key '1'	For vehicle maintenance, has been playing number minus 1
Numeric key '2'	Main cannon shot to a vehicle
Numeric key '3'	Firing machine guns to a vehicle
Numeric key '4'	Lights flicker frequency represents the residual can be play

常見問題/Trouble shooting

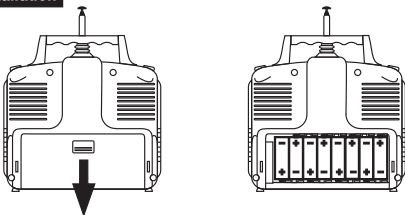
1. 行進混控器：將油門及方向信號轉換為左右履帶轉速信號；透過行進混控器，使用者即可用一般遙控汽車的操控方式來操控坦克的行進及轉向；唯轉向時須搭配油門，非一般遙控飛機混控方式。
2. 斷訊安全機制：當電子變速器接收不到正確控制訊號時，斷訊安全機制會切斷對馬達的供電，紅色指示燈也會同時亮起；唯部份接收機仍然有可能會在無訊號或弱信號時發出短暫的，與正確控制訊號類似之雜訊，造成馬達短暫的誤動作。
3. 自動斷電機制：當電池電壓低於最小額定輸入電壓時，自動斷電機制會切斷馬達的供電，待電池電壓回復，大於最小額定輸入電壓時，自動斷電機制就會重新回復馬達的供電；如果自動斷電機制常常啟動，表示電池的輸出電流過小或馬達所需電流過大，建議增加電池數目以提高電壓或使用電流較小的馬達；自動斷電機制亦可避免鋰電池過度放電，電池使用至無法行走後，請立即更換。
4. 採用數位變速設計，可有效減少虛耗與發熱，唯低速時馬達會產生哼聲，屬正常情況，請安心使用。
5. 通用的遙控系統。

1. Mixed controller: marching to throttle and direction signals converted into left and right track speed; Marching through the mix control device, the user can use general control method to control for the remote control car tanks and marching towards; Is required only to match the throttle. Unusual mix control system with the remote control.
2. Break - security mechanisms: when you can't get a right electronic transmission control signal, the fault security mechanism will cut off the power supply of motor, the red indicator light will light up at the same time; Only part of the receiver is still possible to will send a brief in the absence of signals and weak signals, and right control signal noise, similar cause misoperation of the motor is short.
3. Power automatic mechanism: when the battery voltage is lower than the minimum nominal input voltage, the power mechanism will automatically cut off the motor power supply. The battery voltage reply, is greater than the minimum nominal input voltage, the power system will automatically restore the power supply of the motor; Often start if the power mechanism, according to output current of the battery or motor current is too large, too small suggest that increase the number of cells in order to improve the voltage or the use of current small motor; The power mechanism and avoiding excessive discharge of lithium-ion batteries. The battery after use and cannot walk, please change immediately.
4. Adopting digital variable speed design, can effectively reduce the waste and fever, low speed when the motor will produce hum, belongs to the normal situation, please peace of mind used.
5. Applicable remote control system.

品牌 Brand	频段 Frequency band	型号 Type	测试结果 Test result
Futaba	72M	T4VF	正常 Normal
Futaba	27M AM	4WD	正常 Normal
Futaba	2.4G	T4VF-2.4G	正常 Normal
TURNIGY	2.4G	9X	正常 Normal
PLANET	2.4G		正常 Normal
JR	27M		正常 Normal

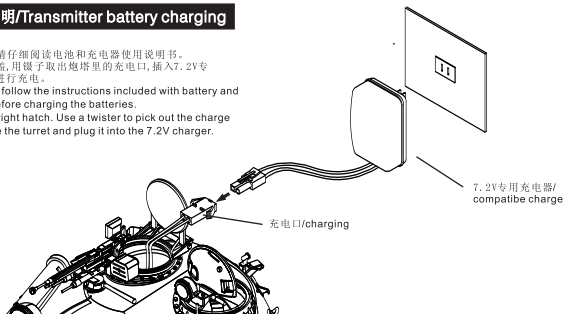
遥控器电池安装方式/Battery installation

1. 使用8枚R6/AA/UM 3 型号电池。
2. 安装电池时注意电池的正负极。
3. 电池安装完毕后，盖上电池盖板。
1. Use 8xR6/AA/UM 3 size batteries.
2. Note polarity direction.
3. Make sure to attach battery case cover after battery installation.

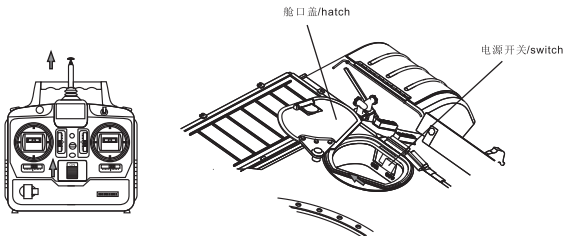


充电说明/Transmitter battery charging

1. 在充电前请仔细阅读电池和充电器使用说明书。
2. 打开右舱盖，用镊子取出炮塔里的充电口，插入7.2V专用充电器进行充电。
1. Read and follow the instructions included with battery and charger before charging the batteries.
2. Open the right hatch. Use a twister to pick out the charge plug inside the turret and plug it into the 7.2V charger.



MCU和遥控接收机开关/Switch of MCU and receiver



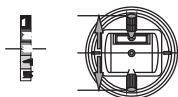
如果MCU开关处于“on”状态，当电子设备按照正确的方法连接好后，坦克会突然启动并可能造成意外事故。
正确方法是：连接各电子设备前，各个开关应处于“off”状态。完成线路连接后，拔出遥控器天线和启动它的开关，然后打开舱口

Make sure all wiring connection are made before operating the tank. On the transmitter, pull out the antenna and turn on the power switch. After turning on the transmitter, open the tank's hatch and turn on the MCU unit and the tank is ready for operation. (Failure to turn on the transmitter before the tank will make the tank started up suddenly causing danger)

遥控器使用说明/How to use transmitter

遥控器上用四个比例通道，其中两个通道用于控制油门和转向，两个通道用于七个操作项目的控制。现在你应该已按照上面接收机连接标题中推荐的连接方法将CPU件和接收机连接好了。如果你改变了连接顺序，则操作方法也不一样。下面说明如何操作你的坦克。现在你通过右手杆的上下位置来选择功能区域，在这个杆的整个上下行程中一共划分了5个操作区域，如下图：

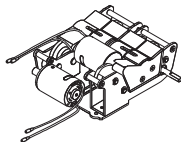
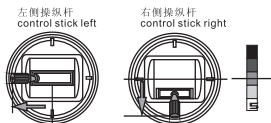
The transmitter has four channels, two channels used to control throttle and steering, the remaining two channels are used to control up to seven operations. Now you should connect the CPU and the receiver in accordance with the above instruction. If you change the connection order, the ways of the operation also change. The following explains describes how to control your tank. Movement of control stick 2 is divided into 5 operational regions:



1. 1号区域：开炮
2. 2号区域：炮管上下仰值
3. 3号区域：炮塔左右旋转
4. 4号区域：车灯遥控开关
5. 5号区域：启动/熄火坦克，打机关枪。

1. Region 1: fire
2. Region 2: Barrel elevation
3. Region 3: turret rotation
4. Region 4: headlight switch
5. Region 5: start or finish using tank, machine gun

操作1. 开关坦克引擎/ Start engine

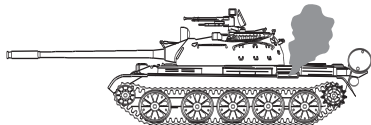


首先将右手杆从中心位置向下推到最底端（5号区域），然后左手杆再向左推杆，操作生效后左手杆回中，在坦克发动的状态下再次进行上述操作作为关闭坦克引擎。

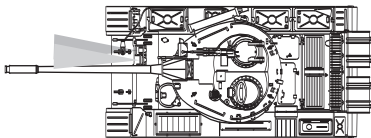
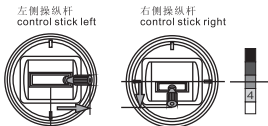
Engine start – Pull the control stick on the right hand side fully back. Push steer control stick to far left and waits for the tank to start. After starting up, move the steer stick back to neutral. (note the same procedure while the tank is in operating mode will shut down the tank)

当打开坦克引擎时，会听到主机转动的声音，烟囱口冒出浓烟，主机转速越高，烟越浓，反之，越淡，直至消失。

After starting up, the engine will roar with smoke coming out, the faster the tank runs, the more smoke will be emitted and vice versa)



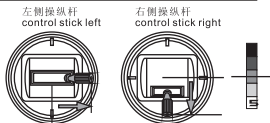
操作2. 灯光控制/Operating the lights



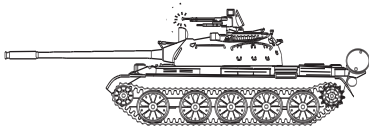
首先将右手杆从中心位置向下推到中心到最底端之间的中间位置（4号区域），然后左手杆再向右推杆，操作生效后（开启车前灯），左手杆回中，第二次向右推杆则关闭车前灯。

Pull the right hand stick half way back into region 4, push the left hand stick to far right to turn on the head light. Release the left hand stick. Repeat to turn the head light off.

操作3. 打机关枪/Firing machine gun

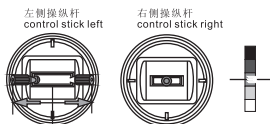


首先将右手杆从中心位置向下推到最低端（5号区域），然后左手杆再向右推杆，你会听到从喇叭里发出打机关枪的声音。

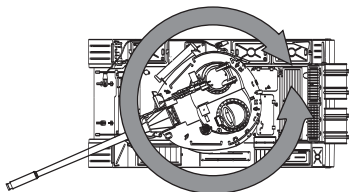


Pull the right hand stick fully back into region 5. Push the left hand stick far right to fire the machine gun.

操作4. 坦克炮塔旋转操作/Turret rotation

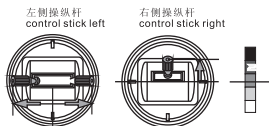


右手杆在中心位置（3号区域），然后保持杆的上下位置不动，左手杆向左推杆炮塔向左旋转，向右推杆炮塔向右旋转。

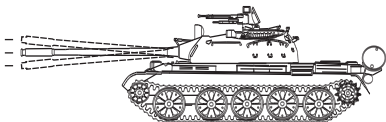


Keep the control stick right in the center position (area 3), push the left hand steer control stick left for turret left and right for turret turning right.

操作5. 坦克炮管俯仰操作/Barrel elevation

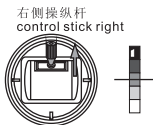


将右手杆从中心位置向上推到中心到最顶端之间的中间位置（2号区域），然后保持杆的上下位置不动，左手杆向左推杆，坦克炮管仰，向右推杆，坦克炮管俯。

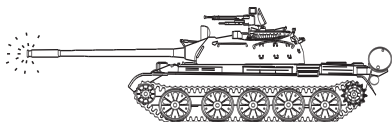


Push right hand stick 2 half way forward, move the left hand steering stick to left to raise the gun barrel and to right to lower it.

操作6. 开炮操作/Main gun Firing

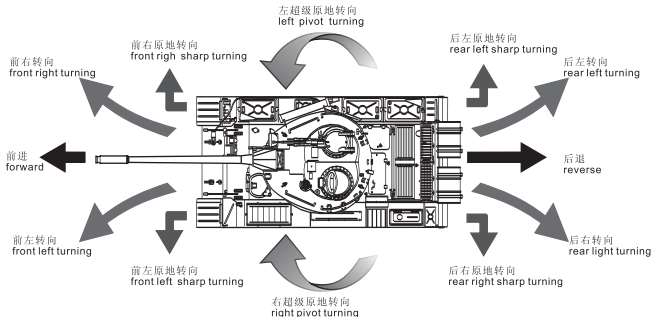


右手杆向上推到最顶端位置（1号区域），你会听到主炮开火的声音，炮口火光闪烁，炮管复进，同时车身有后坐力表现，就像真正的T-55坦克一样。

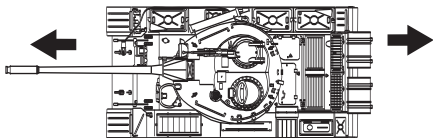


Quickly push the right hand control stick far forward will fire the main gun with flashes and recoil the chassis will pull back too, just like the real T55A.

车体说明/Running the Tank



坦克前进、刹车和倒车/Forward, brake and reverse

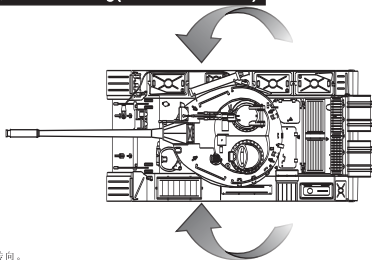
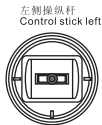


坦克在启动状态下（如果启动操作1），左手杆向前推，则坦克前进。

坦克在启动状态下（如果启动操作1），左手杆向后推，则坦克会刹车并倒车。

After starting up, move the left hand stick forward to move the tank forward, neutral to brake and stick back to move backward.

坦克超级原地转向(以车体轴心转向)/Pivot turning(turn with hull axis)



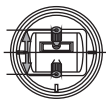
油门杆在中立位置，右手杆向左推，坦克左超级原地转向。

油门杆在中立位置，右手杆向右推，坦克右超级原地转向。

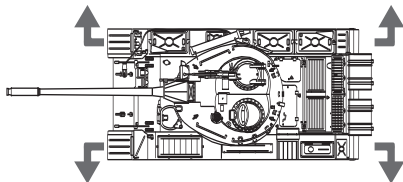
left stick Throttle lever in the neutral position, steer control stick right to left will cause tank to turn left pivotly, steer it to right will cause tank to turn right pivotly.

坦克原地转向(以一側履帶軸心轉向)/Sharp turning(turn with one side track axis)

左側操縱杆
Control stick left



右側操縱杆
Control stick right



油门杆向上推,右手杆向左推到底,坦克前左原地转向,右手杆向右推到底,坦克前右原地转向。

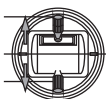
油门杆向下推,右手杆向左推到底,坦克后左原地转向,右手杆向右推到底,坦克后右原地转向。

Push control stick left far forward, move steer control stick right to far left will turn the tank left sharply, move steer control stick right to far right will turn the tank right sharply.

Push control stick left far backwards and the steering control stick to perform reverse sharp turn.

坦克转向/Turning

左側操縱杆
Control stick left



右側操縱杆
Control stick right

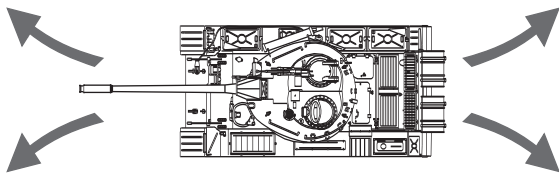


油门杆向上推,右手杆向左推,坦克前左转向,右手杆向右推,坦克前右转向。

油门杆向下推,右手杆向左推,坦克后左转向,右手杆向右推,坦克后右转向。

Push control stick left to the front, steer control stick right to the left, the tank will turn left, steer it to the right, it will turn right.

Push control stick left to the rear, steer control stick right to the left, the tank will reverse and turn left, steer it to the right, it will turn right.



参数设置说明/Setting

1. 坦克跑偏补偿设置方法/Trimming

左側操縱杆
Control stick left



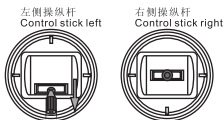
右側操縱杆
Control stick right



1. 打开遥控器发射机的电源。
2. 将左手杆(坦克的油门控制杆)推到最顶端,保持在这个状态下打开CPU的电源开关。如左图。
3. 打开CPU电源后你会听到“咚咚”的两声,说明已进入了跑偏参数设置状态。
4. 将左手杆上下位置回中。
5. 若坦克向左跑偏,左边电机调多输出一点,坦克就可以直线行驶了。具体操作如下,我们可把右手杆向右推一点(若跑偏幅度大,则右手杆向右推幅度相应增大),并保持不动,左手杆向下打到顶端,你会听到“咚”的一声,表示跑偏参数设置已完成。
6. 关闭CPU电源。
7. 坦克向右跑偏补偿设置,重复1-4步骤,然后把右手杆向左推杆到一个位置(若跑偏幅度大,则右手杆向左推幅度相应增大),并保持不动,左手杆向下打到顶端,你会听到“咚”的一声,表示跑偏参数设置已完成。

1. Switch on the transmitter.
2. push control stick left far forward and keep it in the position, Switch on the CPU.
3. You will hear the sound "dong dong" when you switch on the CPU meaning that it has entered the setting mode.
4. Set Steer control left in the neutral position.
5. While the tank is driving wandering to left, slightly move the steering stick right to the left until the tank moves in a straight line. Keep the steering stick and pull the control stick left far backwards. You will hear the sound "dong" and the set up is completed.
6. Switch off the CPU.
7. To set the right driving wandering, set steer control 2 to the right to until the tank moves in a straight line and keep it in this position and at the same time push control stick left to far backwards. You will hear a "dong" means it has completed recoil movement setting up.

2. 后坐力参数设置/Rear recoil movement Setting:



用户可以自定义开炮时后坐力大小。

1. 打开遥控器发射机的电源。
2. 将左手杆（坦克的油门控制杆）推到最底端，保持在这个状态下打开CPU的电源开关。如左图。
3. 打开CPU电源后你会听到“咚”的一声，说明已进入了设置状态。
4. 将左手杆上下位置回中。
5. 先来设置后坐力参数，我们把右手杆向右推杆到一个位置（幅度越大，后坐力表现时后倾力度越大），并保持不动，左手杆向上打到顶端，你会听到“咚”的一声，表示后倾力度参数设置已完成。
6. 关闭CPU电源。
7. 设置后坐力表现时的前倾力度，重复1-4步骤，然后把右手杆向左推杆到一个位置（幅度越大，后坐力表现时前倾力度越大），并保持不动，左手杆向上打到顶端，你会听到“咚”的一声，表示前倾力度参数设置已完成。
8. 恢复出厂时的后坐力参数，重复1-4步骤，右手杆的左右在中立位置时，将左手杆向上打到顶端，你会听到“咚”的一声，表示已经恢复为出厂参数设置。

The tank recoil movement can be adjusted by operator.

1. Switch on the transmitter.
2. push control stick left far backwards and keep it in this position while switching on the CPU.
3. You will hear the sound "dong" when you switch on the CPU, it means it has entered into the setting mode.
4. set Steer control left in the neutral position.
5. To set the rear recoil movement, set steer control right to the right to suit your desire recoil movement and keep it in this position and at the same time push control stick left to far forward. You will hear a "dong" means it has completed recoil movement setting up.
6. Switch off the CPU.
7. To set the front recoil movement, set steer control right to the left to suit your desire recoil movement and keep it in this position and at the same time push control stick 1 to far forward. You will hear a "dong" means it has completed recoil movement setting up.
8. To reset the recoil movement, set steer control right to neutral and keep it in this position and at the same time push control stick 1 to far forward. You will hear a "dong" means it has completed recoil movement setting up.

常见问题/Trouble shooting

问题现象/PROBLEM	解决方法/REMEDY
声音效果差/No sound. 使用过程中（如果突然加速）CPU 声音突然停止 When it runs (if suddenly accelerated) the sound of the CPU is stopped.	电池快没电了，请对电池进行充电/ Battery low, recharge the battery.
某些操作和说明书上写的方式不一样/ Operations differs from that described in the instruction.	请确认是否遥控器的各通道是否按照遥控器校对标题中说明的方法进行了校对。如果某些操作相反：比如发动机启动和关闭的操作和说明书上的相反，请调整相应的通道进行反舵设置。四个接收机输入通道连接到 CPU 的四个接收机输入通道的对应关系也影响到操作的方式。/ Make sure that all channels are properly set up according to the instruction and particularly pay attention to the polarity of the channel movement, reverse if required.
CPU 没有声音/No sound of the CPU.	请检查音量调节器是否在音量最小的位置，音量调节器是否有线断开。/ Check the volume control is properly connected and is not set to the minimum.
调整转向中立后，引起转向灯闪烁/ Steering LED flashing when the steering stick is in the neutral position, reset the CPU by pressing the CPL reset switch.	重新开启 CPU 电源就可以解决此问题，CPU 电路每次上电后会重新记录转向中立。/ Restart the switch of the CPU.
坦克前进时一个电机正转一个电机反转/ One of the motor running in reverse.	请调整反转电机接线，将其与电调的接线进行调换。/ One of the motor connection wire reversed polarity. Change the connecting wire to the ESC.
打开CPL 后喇叭有响声，或是工作指示灯红色或不亮/ When switching on the CPU, the operating LED does not lit up or goes RED or noise coming out from the speaker.	CPU 上电时电压不稳，请关闭 CPU 开关隔 5 秒钟重新开关 CPU 开关/ Shut off the CPU and turn on again after 5 seconds.



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