



In this issue

August 2020

Thunderbird Part 2

Page 2

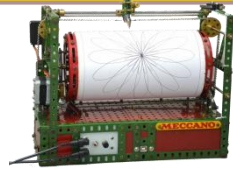


What is this electrickerery

David Couch talks about using Arduino in Meccano

Page 9

2.1 to 2.2V per cell
milliamps
blah blah
series and parallel



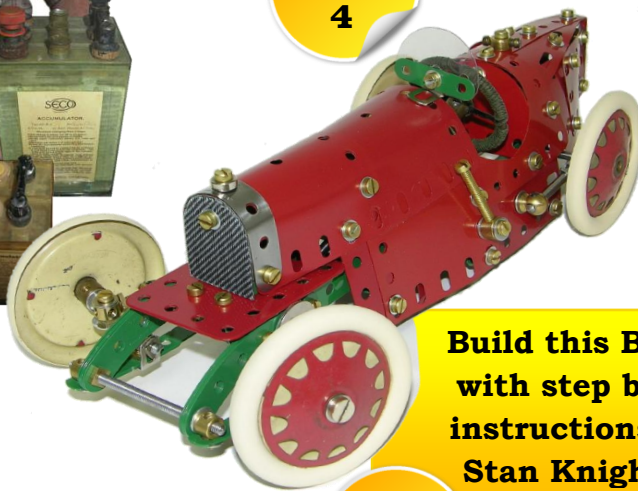
Greg Rahn talks accumutators

Page 4



We test the RPM of some Meccano motors using my new laser tacho

Page 7



Build this Bugatti with step by step instructions from Stan Knight USA

Page 11

Plus all the usual tips and tricks, photos from our readers and of course the ever popular Fireside Fun!



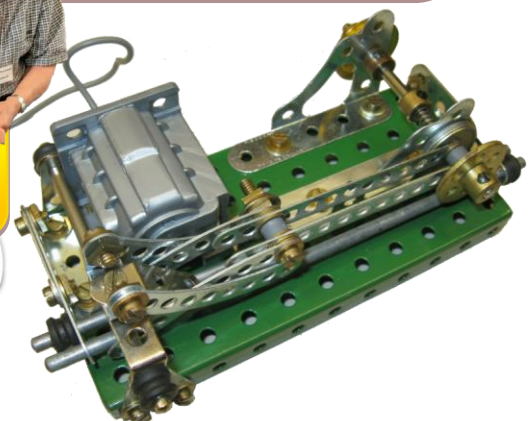
This Month's Meccanoboy is Andrey Kovynev Russia

Page 14



Graham Jost gets perhiperating again

Page 7



Part 2

YouTube https://youtu.be/6czDt_L0zA8

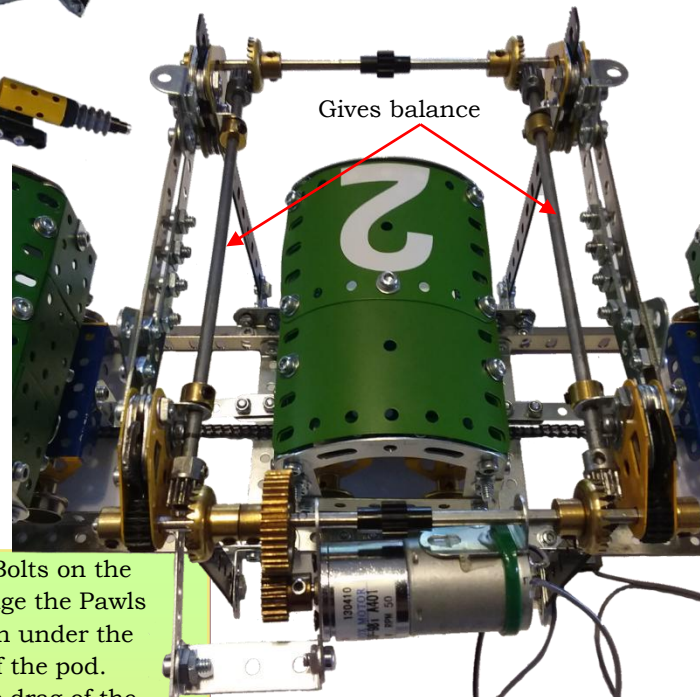
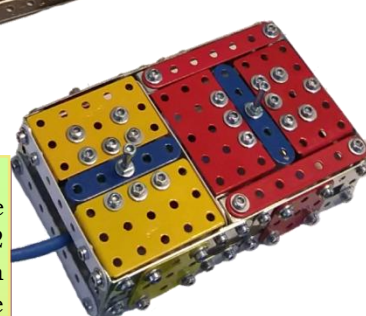
After many months of building and re-building it's finally a working model. Click on the YouTube link to see it working and make sure you have your sound turned on. Alternatively, just click on the photo top right.



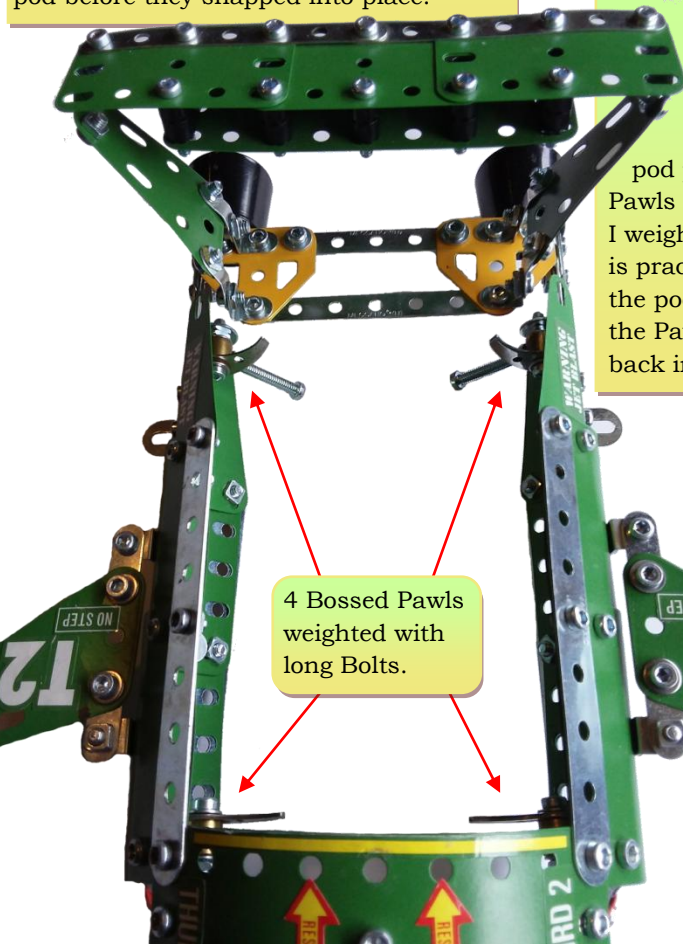
The lifting mechanism shown below had to be modified by adding contrate/pinion drives to both sides. There was too much free play to connect the front and rear drives on one side only and it was causing it to get lopsided and jam.



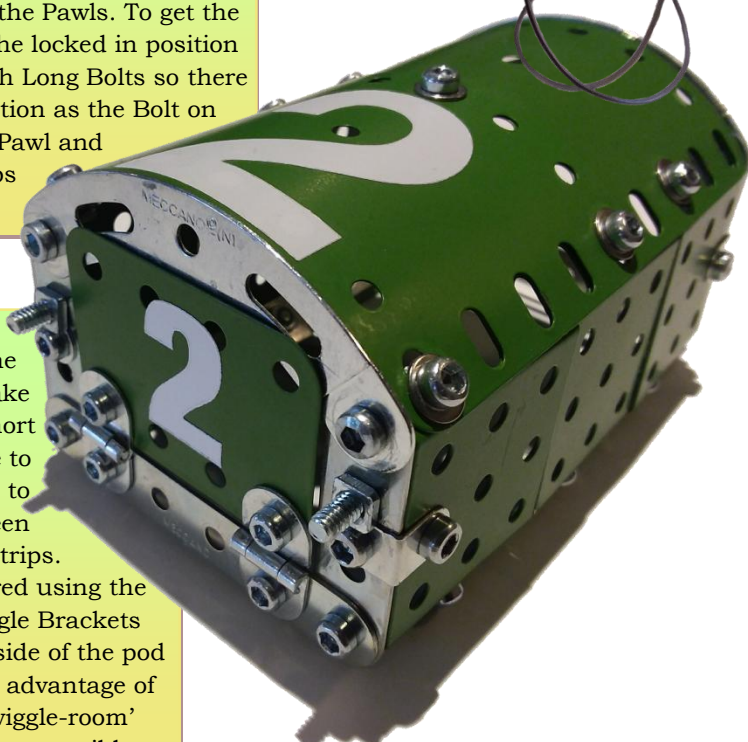
The most difficult part of this build was getting the pod to lock into place automatically when the Thunderbird 2 was lowered onto it. The Compression Springs shown in the last issue were causing too much drag and the previous method had them locking into place underneath the pod which meant they were dragged along the entire face of the pod before they snapped into place.

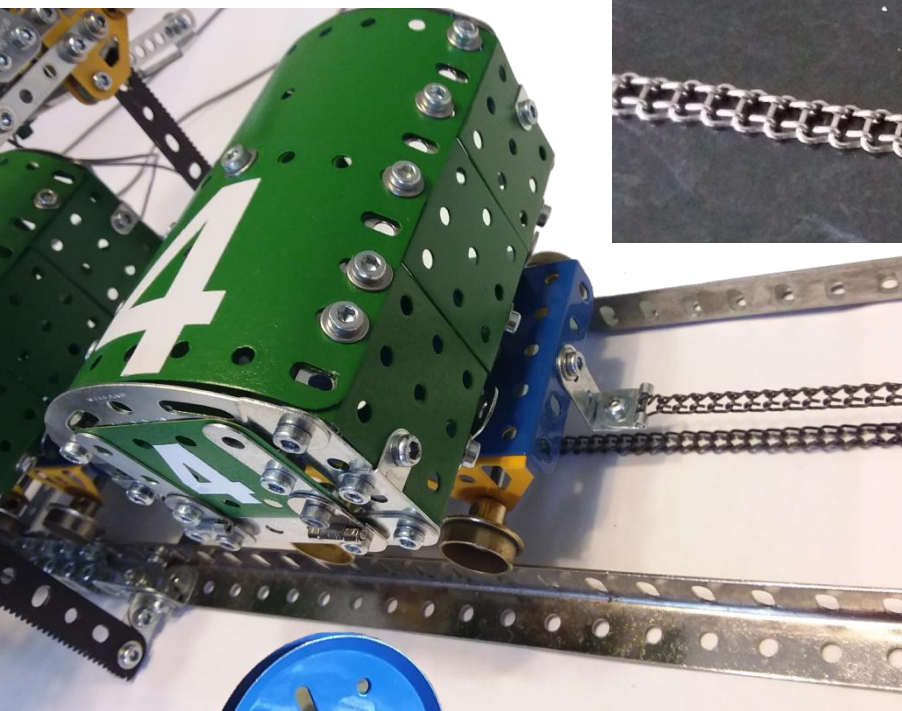


I decided to use Bolts on the pods and rearrange the Pawls so they locked in under the Bolts instead of the pod. This reduced the drag of the pod passing over the Pawls. To get the Pawls to return to the locked in position I weighted them with Long Bolts so there is practically no friction as the Bolt on the pod passes the Pawl and the Pawl easily drops back into place.

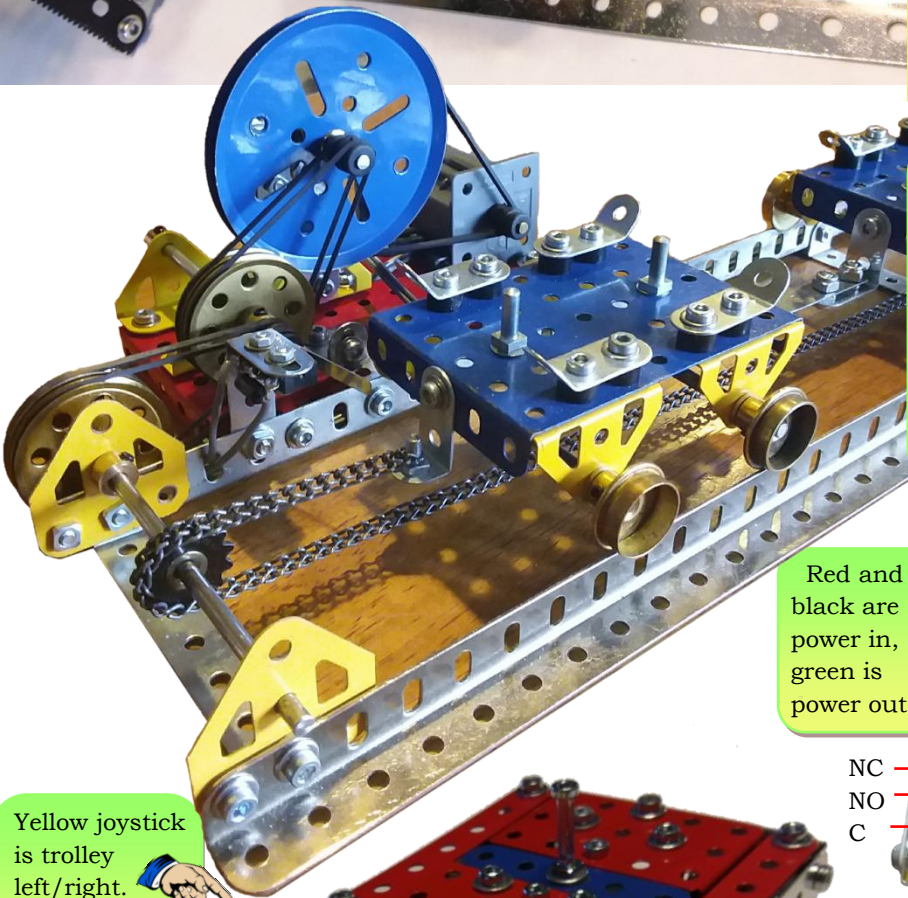


I've had to redesign the pods to make them as short as possible to allow them to pass between the Rack Strips. This required using the Narrow Angle Brackets on the outside of the pod and taking advantage of as much 'wobble-room' as possible.





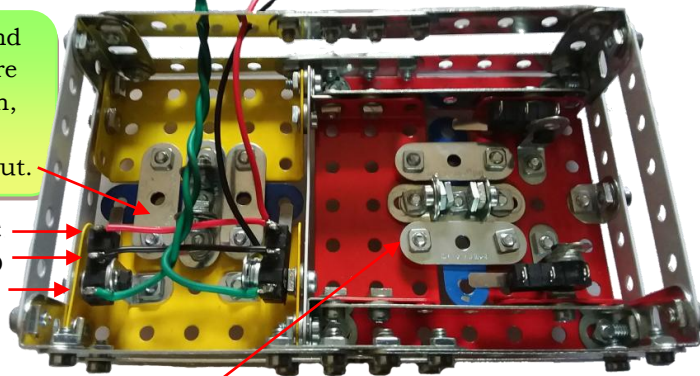
The pod trolleys are made from Flanged Plates with 3/4" Flanged Wheels journalled through Trunnions. The pods are located and held in place with part 12D Obtuse Angle Brackets mounted on Plastic Spacers to raise them high enough for the pod locking mechanism to work. It's important to have the 24.5" Angle Girders to have the slots vertical as shown so that the bolts can be low enough not to foul the Flanged Wheels. The trolleys are connected with 6 hole Narrow Strips with Nylocs to allow some movement. The entire string of trolleys is driven by approximately 72 inches of chain. I came up with a neat way to connect the chain by removing the pin from a Hinge as shown above. The other end is attached with a bolt through the loop in the last link of the chain.



The motor drive unit could have been a Chinese geared motor connected directly to the Sprocket but the spectacle of Pulleys spinning and whirring adds some interest to the model. I doubled up the Pulleys and Pulley Belts to provide some redundancy but doubling up the large 3" Pulley made it squeal with the weight and the tension of the drive belt causing too much pressure where the Rod was journalled through the Strips. Even double thickness Strips didn't help so I ended up journaling the rod through a pair of Cranks.

Red and black are power in, green is power out.

NC
NO
C



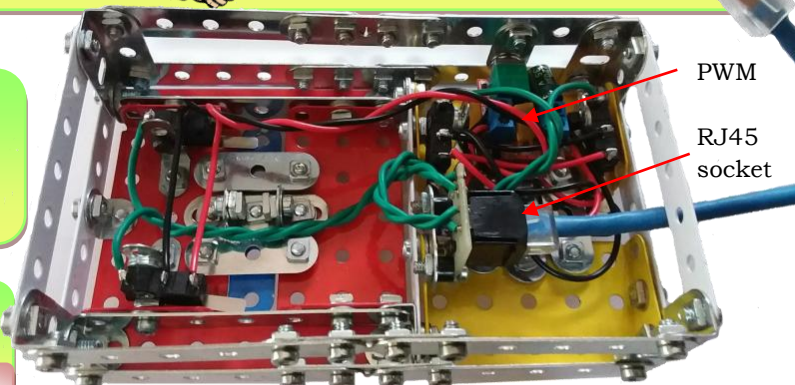
Yellow joystick is trolley left/right.
Red joystick is Thunderbird 2 up/down.

3 Hole Strips are spaced away from the Plates with 3 Washers to allow the blue 5 hole Strips to rock just enough to activate the microswitch lever but not enough to bend or break it.

The wiring is the same as my original joystick controller as detailed in Part 1. Below is shown the additional RJ45 socket used to connect the control box to the model and also the PWM used to control the trolley speed.

Washers needed to allow the blue Strip to clear.

PWM
RJ45 socket



Next issue: I'll show you how to make a revolving warning light for the Thunderbird. So much more realistic that a flashing light!



2.1 to 2.2V per cell
milliamps
blah blah
series and parallel

Greg Rahn talks about Meccano Accumulators

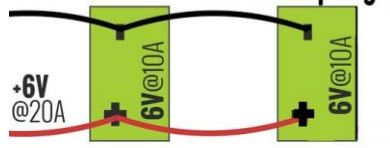


Meccano accumulators (4 volt version introduced 1st quarter of 1920), otherwise known as lead acid storage batteries, are the Holy Grail for collectors. A little chemistry: a charged lead acid battery provides about 2 volts per cell. Depending on the construction and size, it can deliver from milliamps to thousands of amps of current, BUT at roughly 2 volts per cell. For a higher voltage, the cells are wired in series; however (like a single pipeline) the current delivery capacity is unchanged. For higher current (amps) the cells are connected in parallel. This increases the current capability (like parallel pipelines), while the voltage remains the same at 2V per cell. The energy storage capacity, related to the 'amp hour' rating, is determined by the battery cell's size and construction.

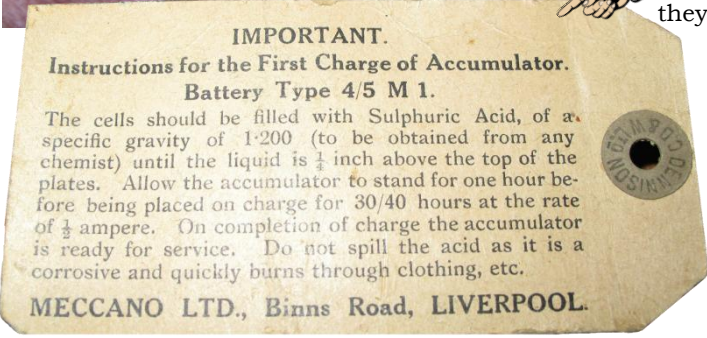
Series - Double Voltage Same Amperage



Parallel - Same Voltage Double Amperage



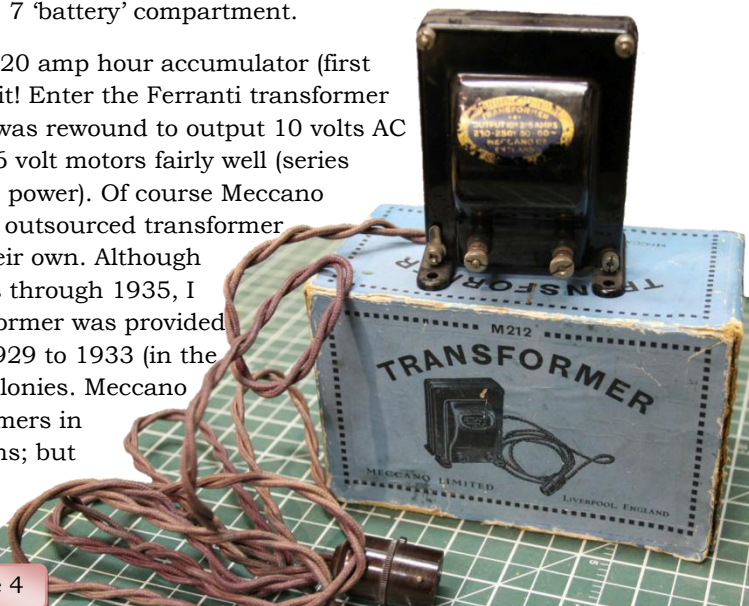
Having worked in the Canadian utility industry, I can tell you that all of our substation equipment and protection are DC powered with large battery banks, continuously charged at 130V DC. The banks are designed to provide power for equipment and control for roughly 8 hours if there is a blackout or interruption of the AC power. Our banks are typically rated at 150 - 2000 amp hour, depending on the substation and application. They contain groups of lead acid 'jars' that consist of individual cells of 2.2 volts connected in series to give us 130V DC. Each 2.2 volts 'jar' is large enough to deliver hundreds to thousands of amps of DC current. Similarly, a 12V DC (nominal voltage) car battery contains six 2 volt lead acid cells connected in series.



The French, not to be outdone by the Pesky English, had their own version of the 4 volt accumulator. The UK version came with a maintenance tag, and considering what was necessary to keep this battery viable, it's no wonder they didn't survive! Around the end of 1927 came the Ferranti Transformer.

It was a lot less messy and needed no maintenance. It could also fit into the accumulator compartment of the No. 7 Outfit cabinet, which is fortunate because by the middle of 1929, the motor in the No. 7 Outfit was upgraded to a 6V version. There was no space in the cabinet for the accumulator in its later/larger 6V form, or even for the original 4V with the 2V add on that was available at that time. It is unlikely (not shown in period price lists) that Meccano ever made a smaller version of the original 8 amp hour accumulator in a 6 volt configuration, to fit in the No. 7 'battery' compartment.

There is no chance the large 6 volt, 20 amp hour accumulator (first shown in a 1929 catalogue) would fit! Enter the Ferranti transformer again. In the same size package, it was rewound to output 10 volts AC or about 7 volts RMS to run the 6 volt motors fairly well (series wound motors work on DC or AC power). Of course Meccano saw this and quickly offered that outsourced transformer in Meccano Ltd. packaging as their own. Although Meccano sold their accumulators through 1935, I am pretty sure the Ferranti transformer was provided in No. 7 Outfits from about mid-1929 to 1933 (in the UK), and as late as 1935 in the Colonies. Meccano started to make their own transformers in about 1932, mostly for Hornby trains; but they were huge compared to the compact Ferranti, and would not fit into a No. 7 Outfit cabinet.

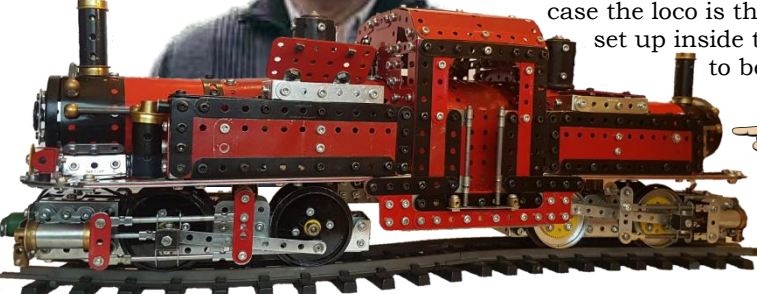


Graeme O'Neill NZ

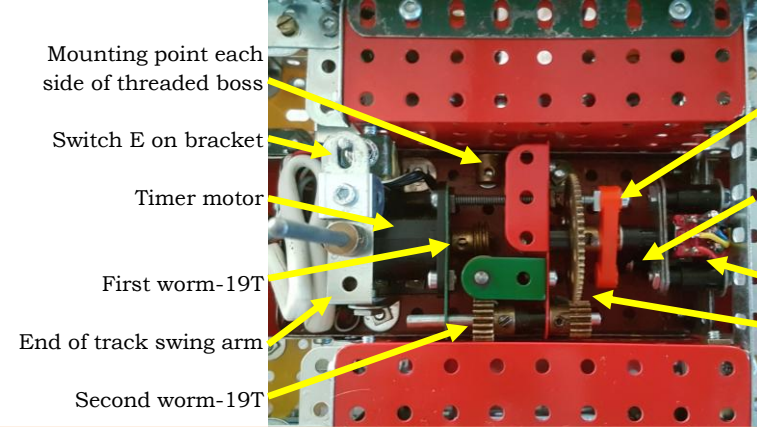
Auto Reversing With Pause for Fairlie Loco



In this project I wanted an on-board device that didn't require electronics or anything fancy attached to the rails – just a small post near each end to operate the end-of-track switch. Thus grew the concept of the automatic process of travel, pause, return travel, pause etc with the following unit installed within the train loco (or tram) running on standard live rail. In my case the loco is the Fairlie Double based on the model plan 164, with the control unit set up inside the firebox section. This of course required the floor area of the cab to be rebuilt, and will be detailed in a separate article.

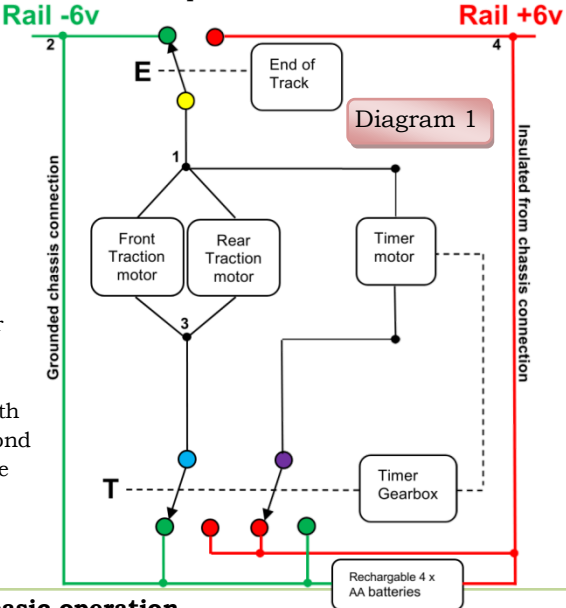


Graeme built this Fairlie Double Loco and shares his idea for a reversing mechanism.



- Mounting point each side of threaded boss
- Switch E on bracket
- Timer motor
- First worm-19T
- End of track swing arm
- Second worm-19T

- First stage cam unit with bolt on 60T gear engaging with bolt on orange arm that then engages with black arm of the second cam that operates the Switch T
- 15T-60T stage



The build of the timer module.

The mounting details should be evident from the photos. Care needs to be taken to ensure the whole runs smoothly in the correct directions and within the space left inside the model before being committed to mounting it. See the commissioning notes below. The whole device is mounted on a #52 flanged plate (flanges UP) and suitable small mounting plates. With a 3-6v standard MO motor*, feeding the timer gearbox of two pairs of worm to 19T pinions and a 15T to 60T gear for a 1444:1 ratio. If 20T pinions are available, a 1600:1 can be achieved, and a longer time. This will give a time delay of about 30secs on 6v supply. **(The motor I used is one of the earlier ones, with a plain base, as I was then able to add four extra 1/4" spaced mounting holes in-line and between the original holes, to allow for closer gear positioning).* I have also used Korean War vintage shortened worms to keep size down. The 60T gear then engages in turn to a pair of free turning A420 plastic strips, using suitable engaging bolts, so that nearly two more rotations of the 60T gear are made. *(that's about 4500 motor revs/time period)* The 60T gear is the only part fixed to this axle to locate all components. For longer time delay this could have extra elements. The final A420 rotates on the end hole, and has an angle bracket mounted on a long bolt at the other end that engages with the toggle switch arm. Switch T is mounted on a bracket made from an old 3H angle girder. The 3 slotted holes are used to mount and adjust the switch operation. The end two holes of the round-hole side are removed – leaving just the centre hole, this is enlarged to mount the switch. Mounting of the switch is on long bolts and spacers and also includes a 3H strip inside the angle girder as a bearing for this end of the axle holding the A420 units. Washers are fitted to stop incorrect grabbing of the arms as they rotate.

Build of the "End of Track" switch.

This unit will of course depend on your own model, but a quick description of mine is included and is also mounted on the above module. The operating arm is made from a pair of #12B angle brackets lock-nutted to the legs of a #46A double angle strip. A 5H strip is bent into a 3H reversed angle bracket with one end hole drilled out to suit the Switch E as can be seen from photos. This is mounted next the motor with a overlaid #12 bracket on the lower bend to lessen switch movement. *Note: the wires fitted to the switch should be sleeved as space is very tight!* A #11, #10, and small spacer on a suitable long bolt are fitted to the DAS with the fishplate slot over the switch toggle. A #179 is used for the mount of the lever – a suitable length axle when it hits the end stops on the track, is used to operate the switch E. A 6H strip and corner bracket is mounted on the #51E flanged plate and under the switch E operating arm. A large spacer is bolted each side of the arm to act as a switch damage control stop.

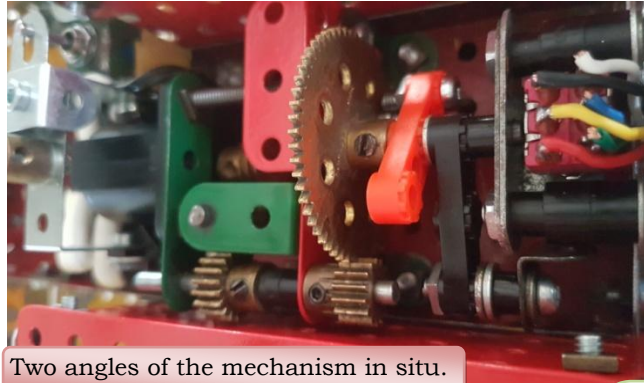
The basic operation.

As the circuit stands in the above the diagram, Switch E supplies negative (ground) and switch T supplies positive to the timer motor. The traction motors are idle as there is ground connection on both sides. Therefore, the timer motor drives the ratio gearbox, (made up to give the desired time taken for the stop), until the arm operates the change-over switch T. This stops the timer motor, as the positive supply has switched to the traction motors. Traction now occurs and the loco travels to the other end of the track. Here the switch E operates – switching the positive to the motors; ie traction now off and timer on – but now the timer motor has reversed! After the time period, the switch T will again operate (timer off) and switch the traction motors on and now they will be reversed. And so the cycle repeats.

Construction extras and hints.

I wired all six terminals of switch T with a 0.5mm² six core flex cable (so any further uses will be covered). The switch E and motor wiring are also pre-wired and I did the connections by twist and sleeve method. This will allow easy reversal of motors during commissioning tests. The power connection from each loco bogie and to the timer module have suitable matching polarised 4 pin plug/sockets, to enable the removal of the bogies and/or timer from the loco, for model maintenance. These plugs carry power from the track to the timer unit then back to the traction motors. The timer unit is also able to be removed from the loco by removal of 2 screws from threaded bosses. Note that these are the only protrusions from the timer unit module on the sides of the flanged plate, so removal is not compromised. The switches used are both mini toggle 5A/230vAC rated style, both without centre off; Switch T, a standard mini DPDT and Switch E, a standard mini SPDT. Remember because the ground connection is used to pickup power from one track, the motors circuits MUST NOT be grounded. I also made provision for a 6v battery pack with rechargeable batteries on board, across the track supply - to take away breaks in connection from the track power supply. This will also allow short runs without mains available. In doing so the polarity MUST be double checked for all elements involved. And I suggest a diode fitted between the sockets, Diagram 2.

Test operation process. This can be simulated by flipping the model upside-down. Simulate the connection of power (as if from the track) taking note of polarity used! When powered up the timer motor should run – it should advance toward the direction of operating switch T toggle. If it didn't start, operate the switch E.



Two angles of the mechanism in situ.

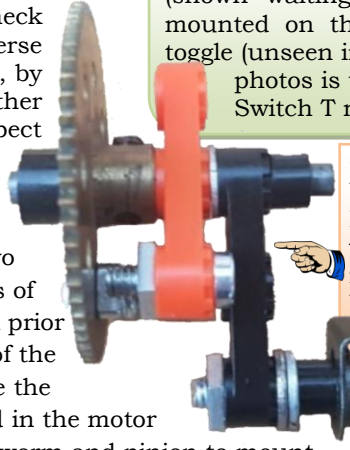


The bolt in the orange arm is engaged with the bolt on the 60T gear. And this engages with the black arm (shown waiting to engage). This has the bracket mounted on the end that will push the switch T toggle (unseen in this photo). On the left top of both photos is the switch E and its operating arm. Switch T mounted on modified 3H angle girder.

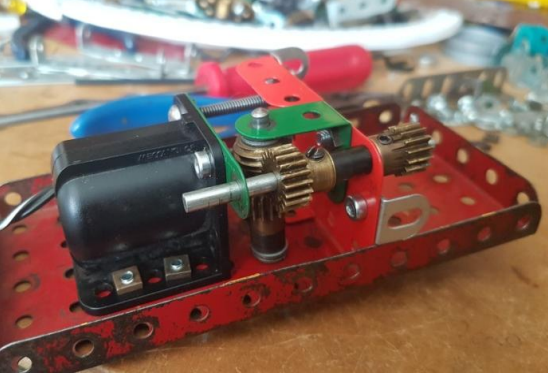
If direction is not right, STOP as timer motor requires reversing the connection. Repeat and check switch T operates at end of time. Timer motor will stop and traction motor(s) will turn on – check traction direction is toward other end of track – if not reverse connections to these motors. Simulate end of track when happy, by operating switch E. Traction will now stop and timer going other way. At the end of the time, the traction motors will reverse. Inspect a couple of cycles and then set up on the track and check ok.

First part of the assembly.

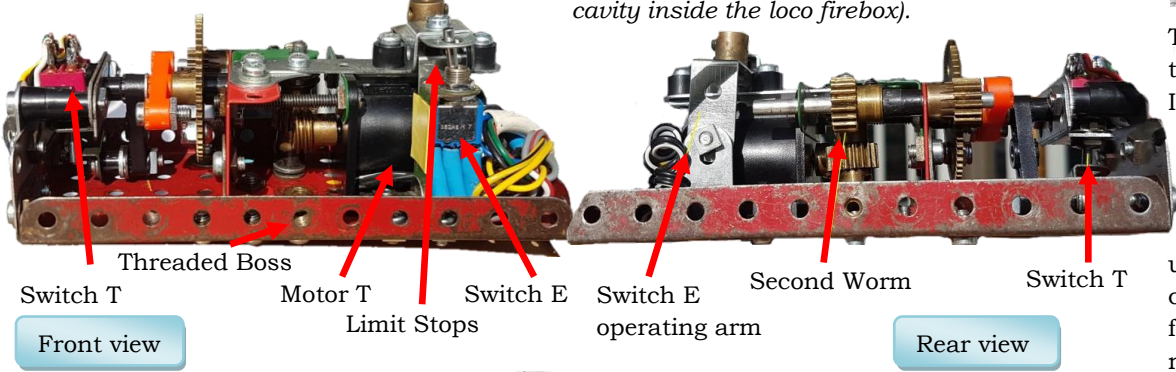
The motor and two worm drive stages of the timer gearbox prior to the mounting of the switch units. Note the extra holes drilled in the motor base to allow the worm and pinion to mount correctly on the motor shaft. (The two angle brackets were later moved down onto the flanged plate base, to allow clean sides to slide into the cavity inside the loco firebox).



Complete cam swing arm unit and bracket to operate Switch T toggle. Note the engaging screws and washers on each arm. The 60T gear rotates nearly twice to swing the black arm right around to operate the toggle.

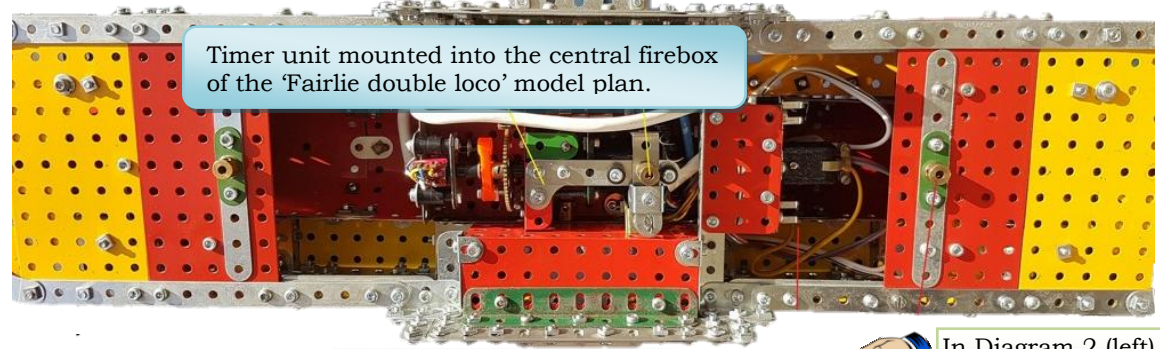


To allow easy removal of the bogie trucks and/or timer unit, I included a four pole plug and socket system on my loco. The connectors I've used are some 30 years old – obsolete 'Jones plugs' from work! One set is used for each function, with the cord from the bogies having female 'plug' end to connect into male 'socket' in the loco, as the power comes from the rail. The timer cord plug, has a male plug to connect into a female socket. All the above sockets are mounted in the loco and are then connected in the same fashion, pin for pin, so that either bogie cord can connect directly into the timer cord outside of the loco for testing.

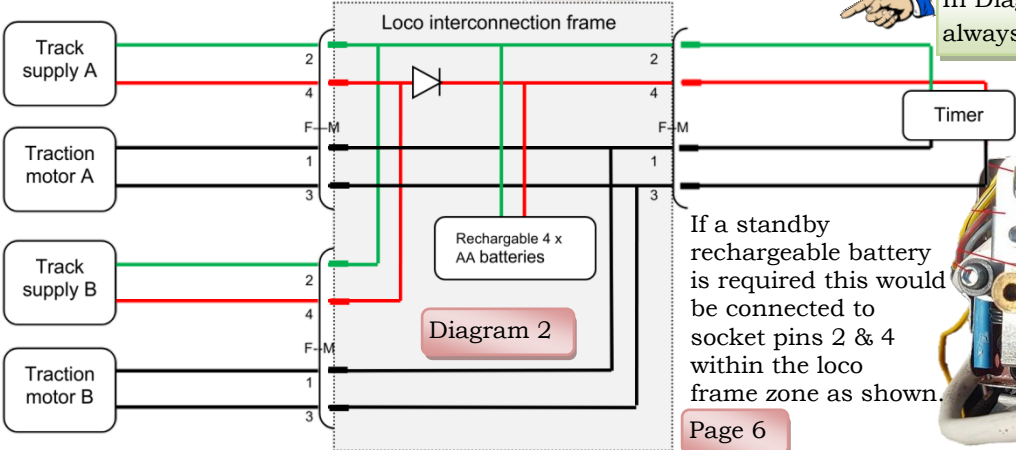


Front view

Rear view

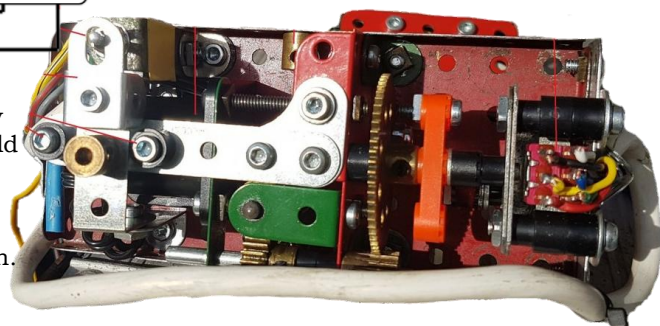


Timer unit mounted into the central firebox of the 'Fairlie double loco' model plan.



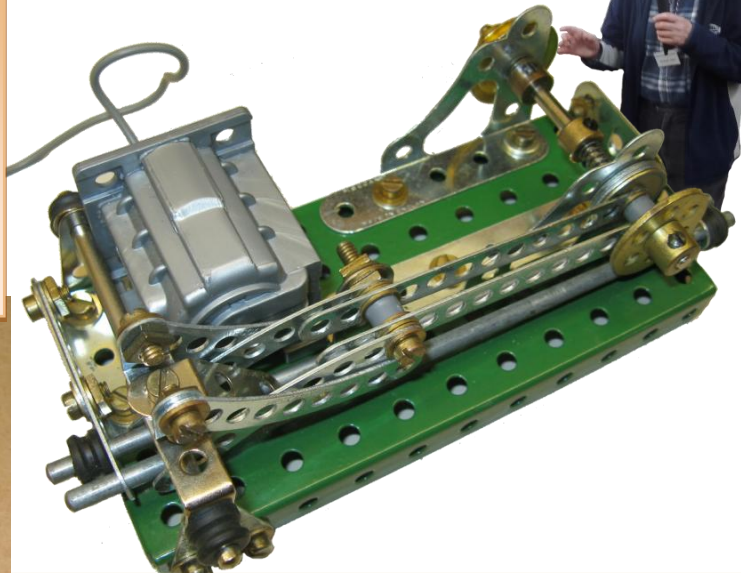
In Diagram 2 (left) the diode makes sure the unit will always work correctly after the commissioning tests.

If a standby rechargeable battery is required this would be connected to socket pins 2 & 4 within the loco frame zone as shown.

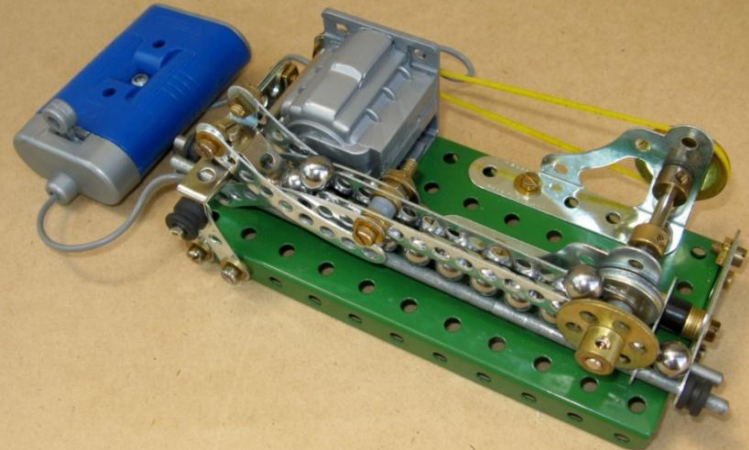


The Ultimate Micro-Peripherator Ball Roller?

asks **Graham Jost**

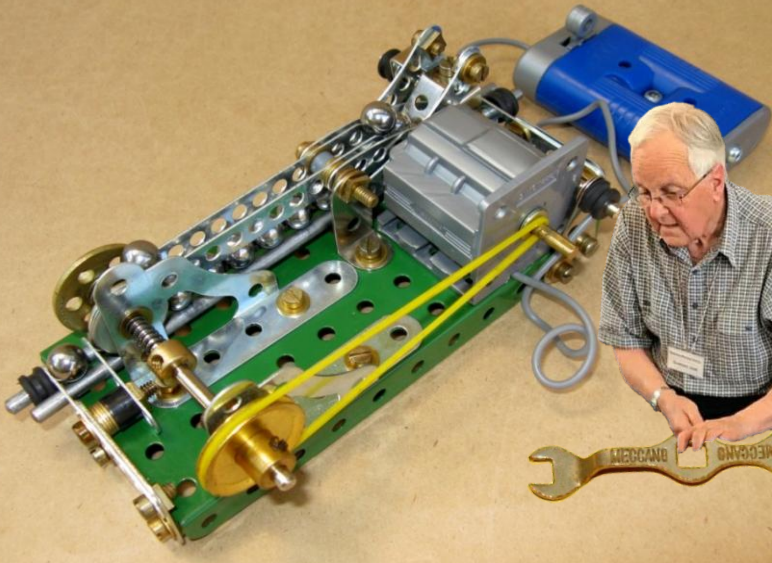


This compact Peripherator, circulating 14 Meccano Balls, was built in 2018, the last of a succession of Peripherator builds using genuine Meccano spheroids. Peripherators use a clever device to raise the Balls. The action is so simple, yet so effective: slightly tilted fixed discs (3/4" Washers here), provide a wider gap at the lower entry point for the Balls than at the exit. An axially spring-loaded revolving disc (1" Bushwheel here) engages Balls at the entry point and rolls them around to the exiting point at the top. The Balls then simply roll away and back down again to begin their travels once more. The speed of circulation is impressive!



As seen by the onlooker (above) and the exhibitor (below)

The lower tracks are 6 1/2" Rods mounted to provide a slight incline downwards towards the entry point below the rotating 1" Bushwheel. The LH Flanged Bracket is opened out slightly to provide a slight tilt to the adjacent 3/4" Washers, these being the "fixed" discs. The 1" Bush Wheel is spring-loaded and located to allow Balls to enter freely at the bottom before they are caught and rolled around to the top, where the upper tracks force them out and away. These tracks are 13-hole Narrow 1/4" spaced Strips. Two 9-hole Narrow 1/4" spaced Curved Strips at the end are spaced apart to allow the Balls to fall down between them onto the lower tracks. Upturned Narrow Curved Strips and a 1" x 1/2" Obtuse Narrow Bracket in the same area prevent Balls from going elsewhere here.



A Meccano motor running on two AA cells drives this model at a suitably hectic speed, as can be seen here:

If you'd like to see more of my Peripherators, they are all on the NZ Meccano site at <http://www.nzmeccano.com/image-117673>

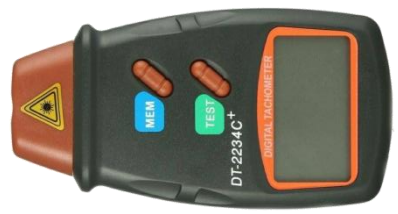
YouTube <https://youtu.be/2r73q9w5zq0>

Black Round	Black Stylised	Silver Stylised
3V 5,070	3V 6,196	3V 5,212
6V 9,820	6V 11,350	6V 11,350
12V 16,952	12V 17,320	12V 17,320

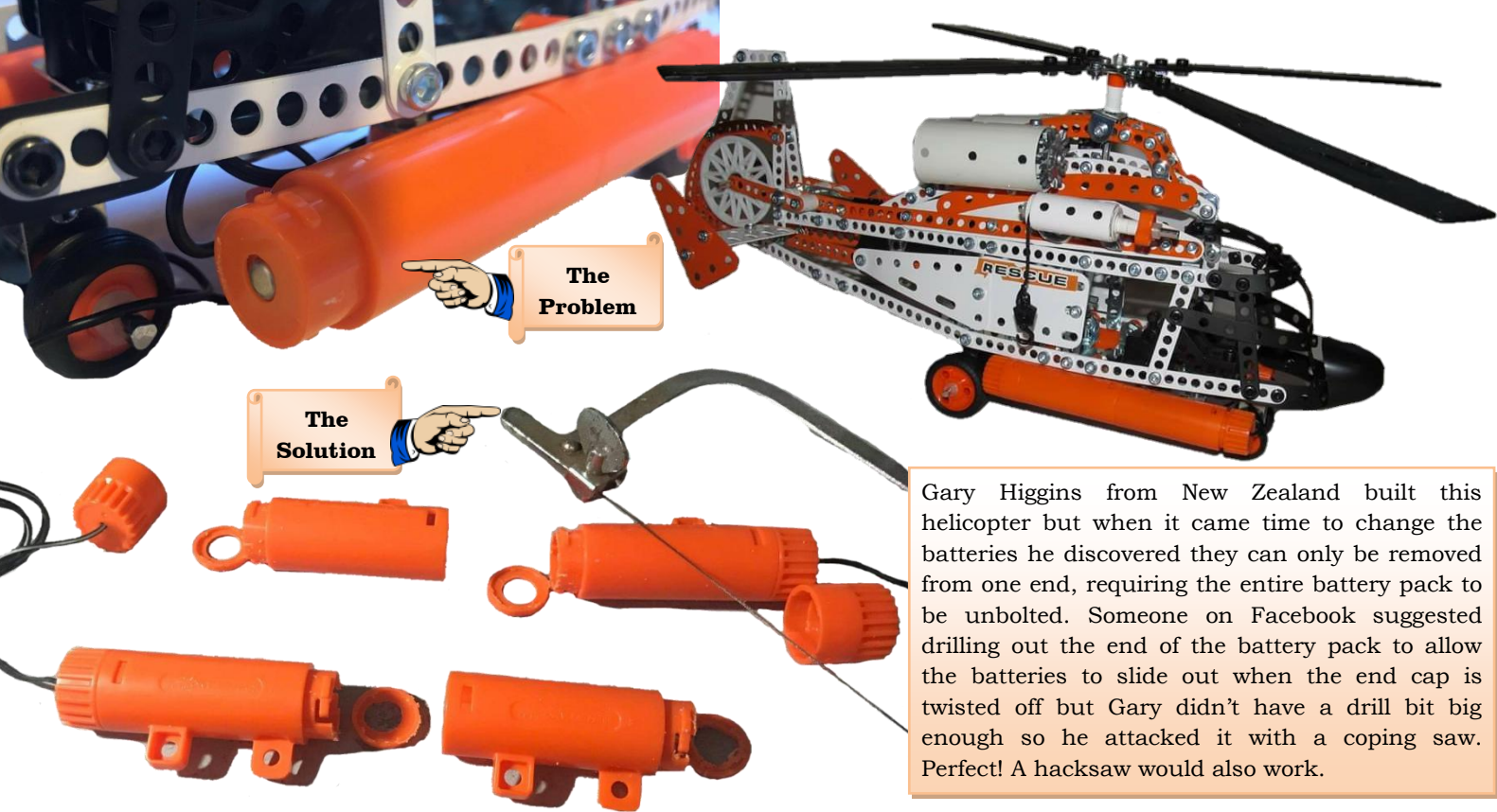


Meccano 6 speed Power Drive Unit
Rated 3-12V No Load 140ma Max Load 1.1A

12V	RPM	3V	RPM
3:1	3950	3:1	980
6:1	2150	6:1	540
12:1	1061	12:1	289
16:1	765	16:1	204
32:1	380	32:1	105
60:1	205	60:1	54
6V	RPM		
3:1	1860		
6:1	1040		
12:1	556		
16:1	406		
32:1	215		
60:1	114		



Note: All these French motors are rated at 3V - 6V



The Problem

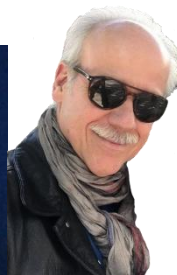
The Solution

Gary Higgins from New Zealand built this helicopter but when it came time to change the batteries he discovered they can only be removed from one end, requiring the entire battery pack to be unbolted. Someone on Facebook suggested drilling out the end of the battery pack to allow the batteries to slide out when the end cap is twisted off but Gary didn't have a drill bit big enough so he attacked it with a coping saw. Perfect! A hacksaw would also work.

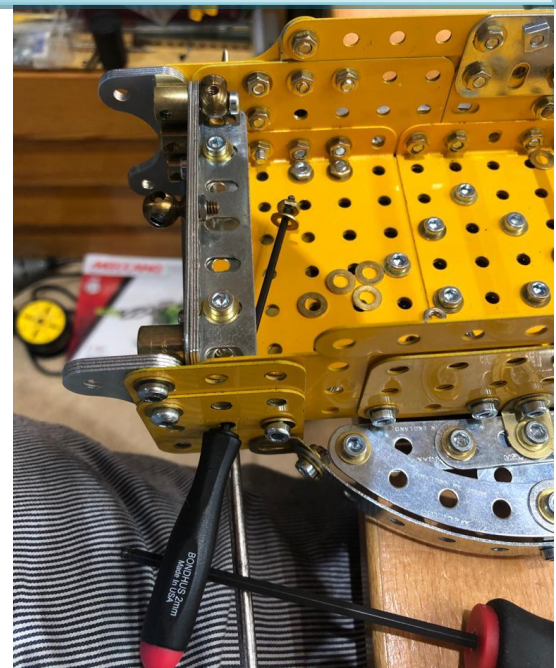


About 2 years ago I started a Meccano project named Project '63 (my birth year). The goal was to build a Meccano model from every set manual around that year. The Bedford lorry appealed to me the most in the number 6 instructions leaflet and that is why I started to build it. I really love the look of the colours of the old Meccano sets a lot more than the newer modern sets. The build was not too difficult, but it took me some time to put it all together. The problem is that I had a very bad copy of the instructions. I did change some things during the build and added some extra detail. Photography is a hobby of mine so when I take a photo of a Meccano model I always try to make it a good one. For this photo I drove around some fields near my home to find the right spot. I had to crawl around some muddy situations but the result was very pleasing and realistic to the eye.

Project '63, Model 6.13 Bedford Type Lorry.
Chris Clinckx - Belgium



Tin Tin
Sea Plane
from
Thierry
Monnier
France



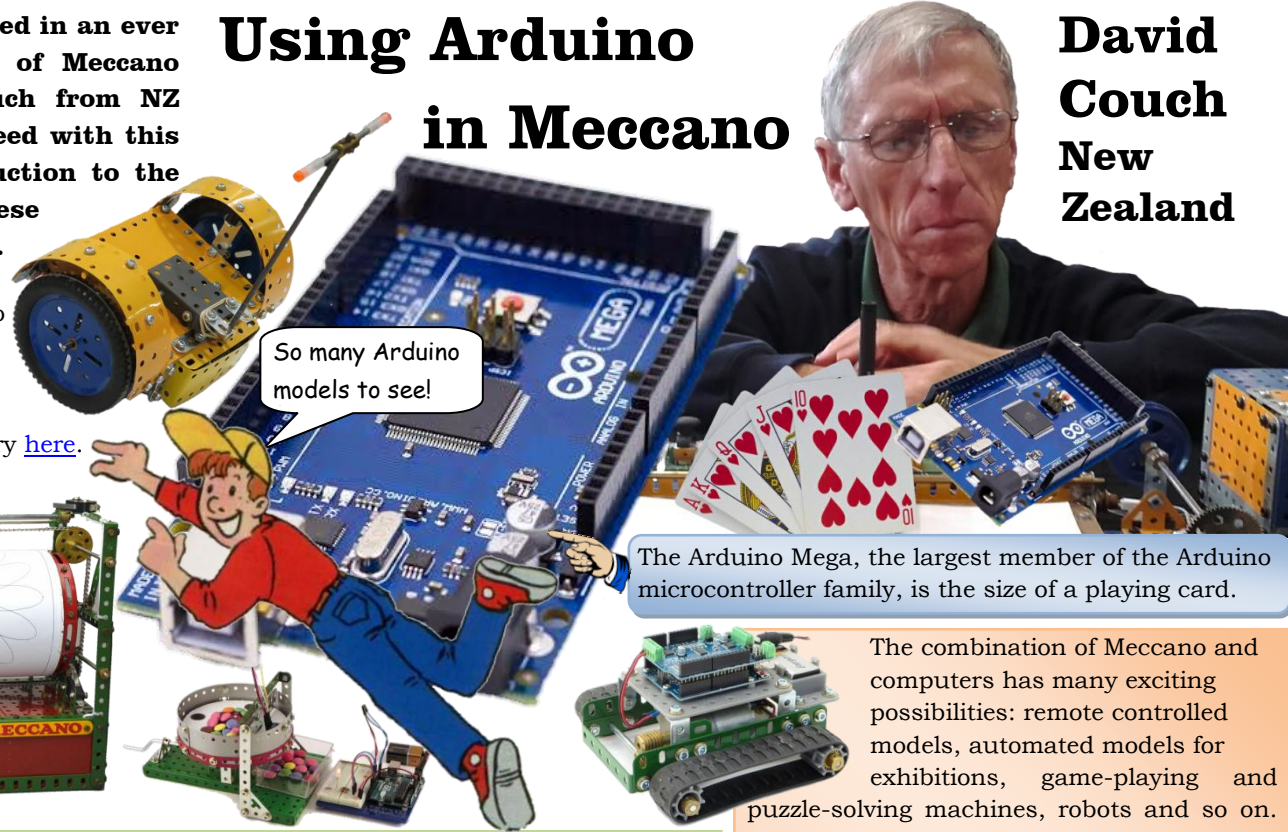
With no disrespect to lolly sticks and Blu-Tac; the above is more often than not for me the simplest way to get a nut and washer into a difficult area. Just add a digit to the end of the hex key as you withdraw it and you will end up with both washer and nut perfectly positioned over the hole ready to accept the bolt. So quick and easy. Tim Gant - UK

Arduino is being used in an ever increasing number of Meccano models. David Couch from NZ brings us up to speed with this informative introduction to the magical world of these handy little devices.

You can see an article showing lots of Arduino in the Aug 2019 issue of [Johnny's Meccano Magazine](#) or visit David's gallery [here](#).

Using Arduino in Meccano

David Couch New Zealand



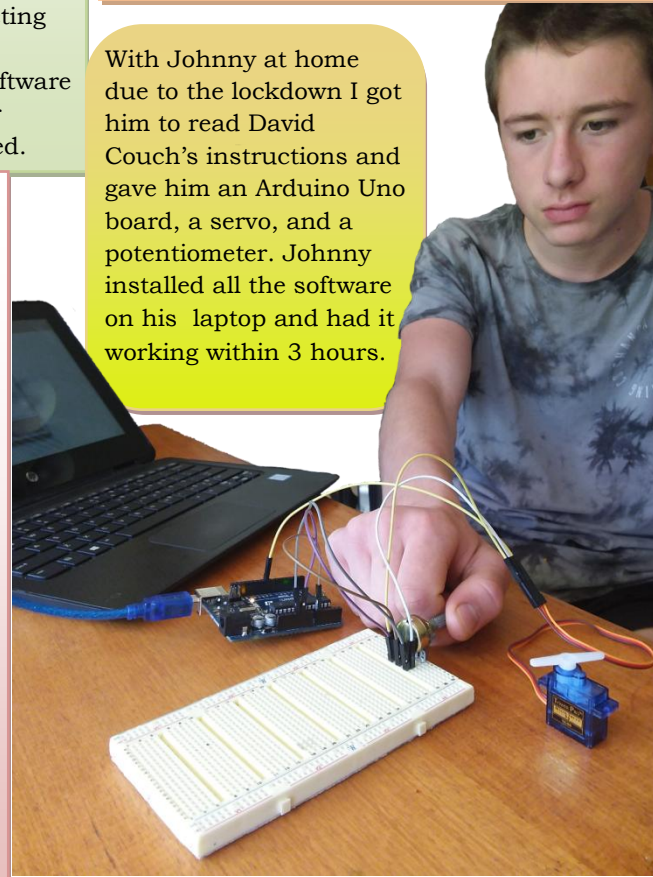
So many Arduino models to see!

The Arduino Mega, the largest member of the Arduino microcontroller family, is the size of a playing card.

The combination of Meccano and computers has many exciting possibilities: remote controlled models, automated models for exhibitions, game-playing and puzzle-solving machines, robots and so on. Unfortunately many Meccano builders have the impression that using computers requires a lot of technical knowledge of electronics and computer programming. That may have been true twenty years ago, but things have changed a lot. In these documents I will explain how you can obtain a computer and use it to control your Meccano models, with no knowledge of electronics and with the programming being much easier than you might have thought.

Complete microcomputer systems are now available in the form of a small board, in size somewhere between a credit card and a playing card. The most suitable kind for use with Meccano are microcontrollers – microcomputers specially designed to connect to motors, switches and many other devices. They have become very inexpensive, with a basic microcontroller costing as little as £3 or NZ\$5 - the price of a cup of coffee. There are several microcomputer systems available which could be used to control models. I recommend the Arduino because it's specifically designed for the job, as a microcontroller, it's inexpensive and there is a large amount of help and support available, in the form of example programs, books, on-line tutorials, forums etc. There are many devices available to connect to the Arduino, providing every imaginable kind of function. These devices provide all the electronics you need. There is no need to build electronic circuits, and connecting the computer to your model is no more difficult than connecting a motor to a battery and a switch. Programming the Arduino is easy. Devices come with software libraries which do all the hard work for you, so that the control of a motor, for example, is reduced to just two simple commands to set its direction and speed.

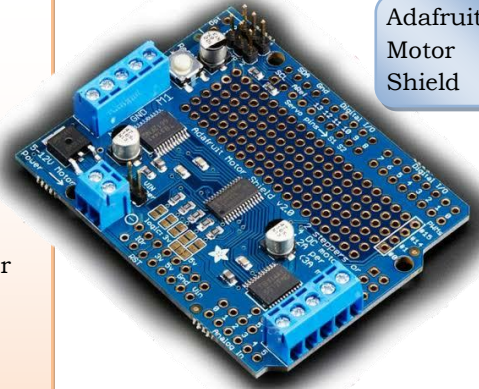
With Johnny at home due to the lockdown I got him to read David Couch's instructions and gave him an Arduino Uno board, a servo, and a potentiometer. Johnny installed all the software on his laptop and had it working within 3 hours.



However much experience you have with computers, a good way to get started with the Arduino is to buy a starter kit or experimenter's kit. The kit contains an Arduino microcontroller and a large collection of devices such as LEDs, light sensors, seven-segment displays, push buttons, and a breadboard for building circuits without soldering. A manual leads you through the construction of simple circuits and the programming of the Arduino to control them. By the time you have finished all the examples you will feel quite confident about installing the Arduino in models and programming it. Although I have a background in information technology, I found that a kit like this was a revelation, as I saw what can be done with the little computer and how easy it is to do it. There is some advantage in buying a kit with an Arduino Mega, as this version of the Arduino provides much more capability for only a small extra cost. You will be able to use the Arduino and several of the other components in future projects. Whether or not you buy a starter kit, the next step is to buy the other components you need and put them together. The Arduino is programmed through a software development environment in the form of a program named Arduino, which you can download from the Arduino web site and install on a Windows PC, a Macintosh or a Linux system. It consists of a text editor for creating and modifying programs, a compiler to convert your program into code that the Arduino can execute, and a loader to load the program into the Arduino via a USB cable. It also provides lots of example programs and a place to store your own and imported programs. A starter kit provides one very gentle way of getting started. Another good way is to load and run some of the example programs provided with the Arduino software, then read, understand and modify them.

To see Johnny controlling the servo click on the photo above or the YouTube link below.

YouTube <https://youtu.be/HxGfU8t26Vk>



This section describes a microcontroller system that is suitable for controlling Meccano models. It consists of an Arduino microcontroller board, a motor control shield and a terminal shield. In the process of designing this system I have bought and tested several components of each type, from several suppliers. I have come to the conclusion that the system described here provides all the functions you are likely to need at the lowest cost. The total cost for parts bought in the UK or USA is around £40 in the UK or \$100 in New Zealand but with AliExpress the price comes down to £11 or \$20 in New Zealand .

What is a shield?

A shield is a circuit board which piggybacks on the Arduino board. It has male headers, or pins, which plug into female headers, or sockets, on the Arduino board, making all the required connections. A large range of shields with many different functions is available.

What is a motor shield?

The Arduino cannot control motors directly, as it cannot provide enough power or reverse the direction of a motor. A motor shield has all the circuitry required to independently control the direction and speed of several DC motors or stepper motors. The motors are connected to the shield through small screw terminals.

What is a terminal shield?

The Arduino has many input and output connectors in the form of pins, which do not make convenient or reliable connections to external devices. A terminal shield or screw shield provides a small screw terminal connector for each pin, so that wires from switches, potentiometers, LEDs etc can be easily and securely connected without soldering.

The Arduino comes in several different formats, with different capabilities. The Uno is the standard entry-level Arduino, and probably the most popular. However, I recommend the Mega, the largest Arduino, because for just a small extra cost it offers much more memory and many more I/O pins.

The current model is called Arduino Mega 2560 R3. A good place to buy it in the UK is Hobby Components. The price, including the required USB A to B cable, is £12.50 including VAT. Alternatively you can buy it from AliExpress.com for about \$US7.50.

Arduino board

The Arduino you buy from any source may be an original, or a clone or “compatible”. You should not be concerned about buying a clone. The Arduino is an open design, which other manufacturers are free to copy. Arduino clones are not pirated or unethical, and as far as I know they are functionally identical to the Arduino originals.

Motor shield

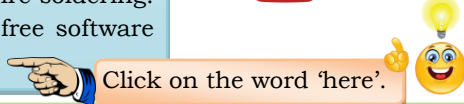
I recommend the Adafruit Motor/ Stepper/ Servo Shield for Arduino version 2, as it is the only shield I have found that can control four DC motors or two stepper motors.

Bargain sites such as eBay offer low-price clones of the motor shield. However many of them are clones of the version 1, which uses the L293D chip and is obsolete and of no use, because the required software library is no longer available. Version 2 clones, which use the TB6612 chip, can be found on eBay and AliExpress, along with a lot of version 1 clones. Pick the cheapest one, as they are all the same. The clone has the headers installed and so it does not require soldering. You will need to download the free software from the Adafruit web site [here](#).



Look at what David can do with Arduino! Click the photo above or the YouTube link below

YouTube <https://youtu.be/RZyVruPyQNo>



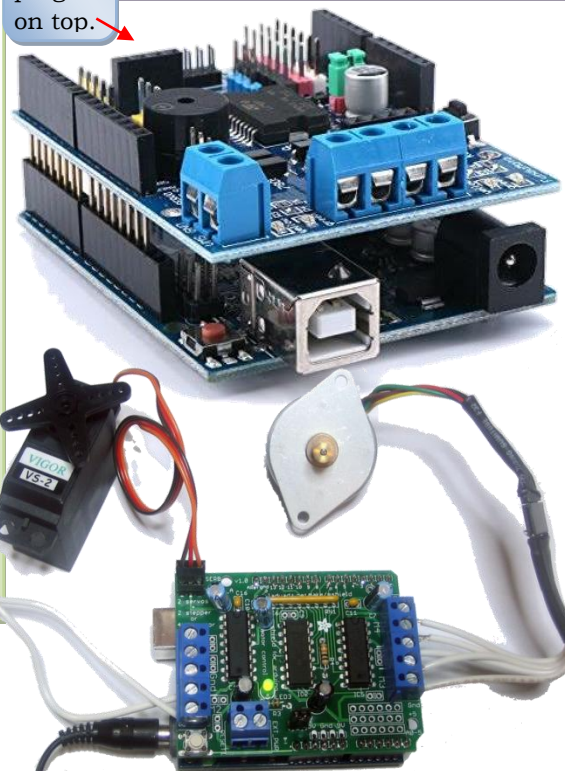
Click on the word 'here'.

The Shields simply plug in on top.

What can I connect to the Arduino system?

If you build the system described here, you can connect all of these:

- Motors:** Four DC motors or two stepper motors can be controlled, with variable direction and speed. More can be added if a second motor shield is installed.
- Servos:** Two standard or continuous rotation servos can be connected through the motor shield. Many more servos can be controlled by the Arduino with some additional circuitry.
- LEDs** (Light Emitting Diodes): up to 12 LEDs can be connected and individually controlled through the terminal shield, with variable brightness if desired. Many more can be connected with additional circuitry. Larger groups can be controlled using the motor connections.
- Switches:** These can be hand-operated toggle or push-button switches, or microswitches, tilt switches or magnetic switches activated by the model. Up to 12 switches can be connected and read through the terminal shield. Many more can be connected with additional circuitry.
- Joysticks and Potentiometers** (variable resistors): up to six potentiometers can be connected and read through the terminal shield. More can be connected with additional circuitry. A joystick usually contains two potentiometers and possibly one or more switches. Up to three joysticks can be connected.
- Relays:** If relays are required to control high-current or high-voltage devices such as lamps, relay modules can be purchased and controlled by the Arduino.

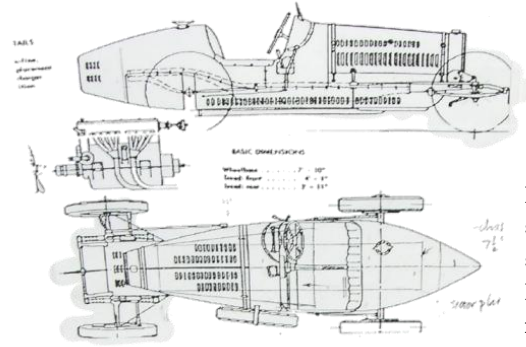


Motors, Servos or Stepper Motors.

This is by no means the full scope of David’s Arduino guides as I’ve only extracted snippets of his write ups which can be found in the documents section of the NZMeccano website. - John

- Introduction <http://www.nzmeccano.com/Documents.php?show=100>
- Buy and Build <http://www.nzmeccano.com/Documents.php?show=101>
- Programming <http://www.nzmeccano.com/Documents.php?show=102>

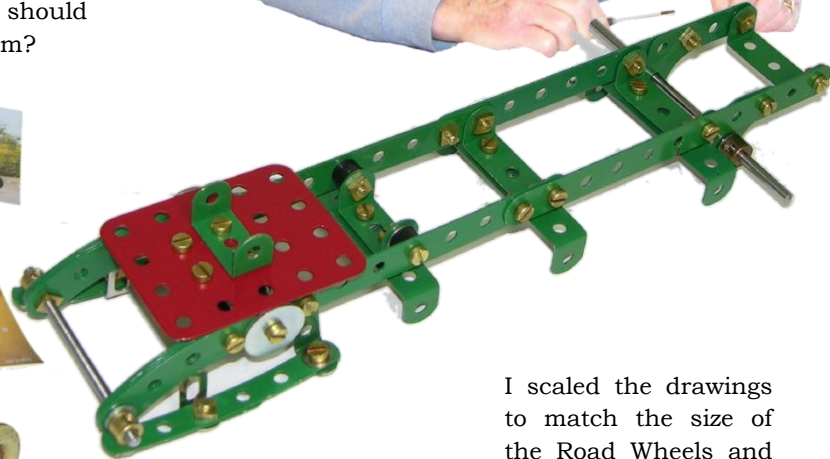
Build a Bugatti by Stan Knight USA



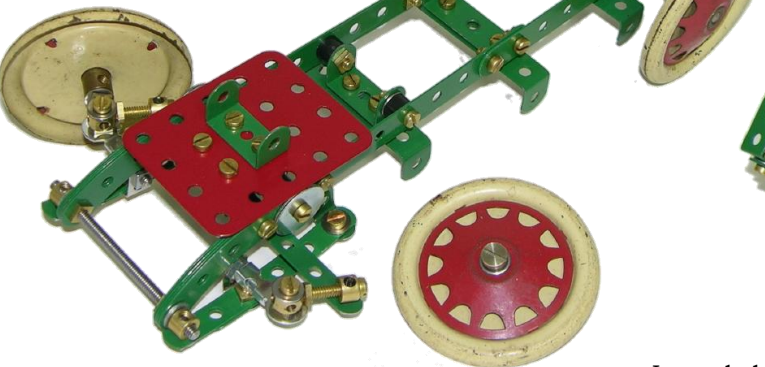
Recently I acquired a set of these rather special French tin Road Wheels, part number 187. Having got them, what should I build with them?



An old racing car was one obvious idea. I had lots of reference for the 1929 Bugatti Type 35C.

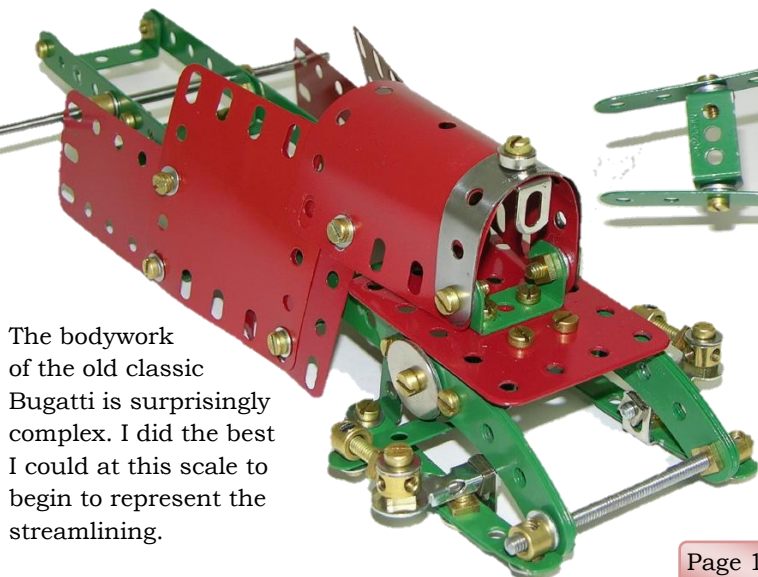
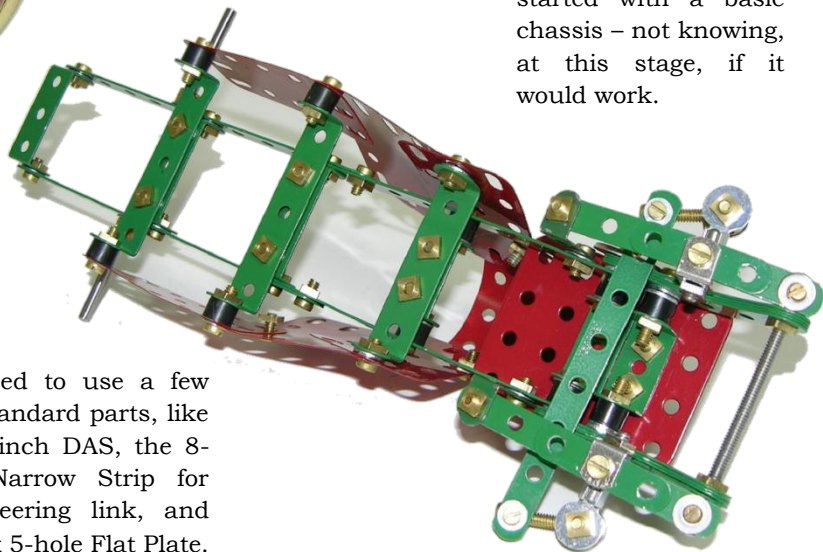


I scaled the drawings to match the size of the Road Wheels and started with a basic chassis – not knowing, at this stage, if it would work.

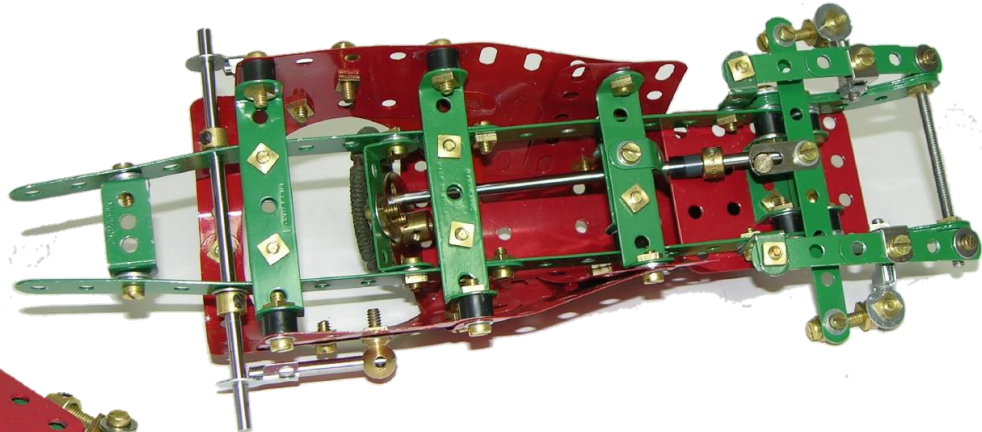


I tried a simple steering idea but couldn't be sure that I would be able to connect it to a steering column. Small models like this seem to require a lot of building/dismantling and later/last-minute changes, especially if you are attempting to work to scale.

I needed to use a few non-standard parts, like the 2 inch DAS, the 8-hole Narrow Strip for the steering link, and the 4 x 5-hole Flat Plate.

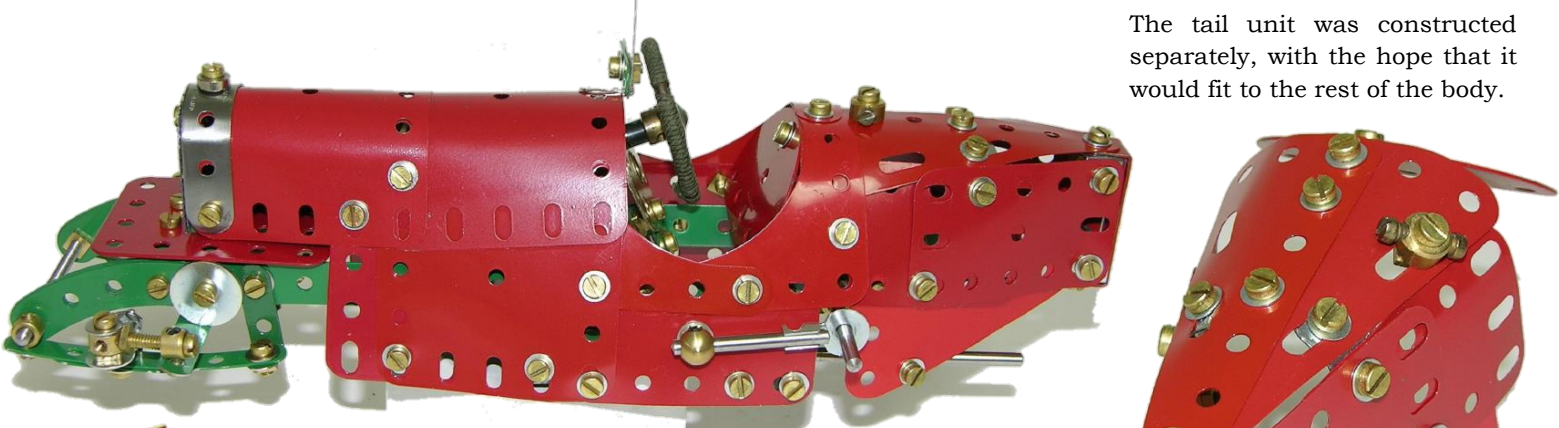


The bodywork of the old classic Bugatti is surprisingly complex. I did the best I could at this scale to begin to represent the streamlining.

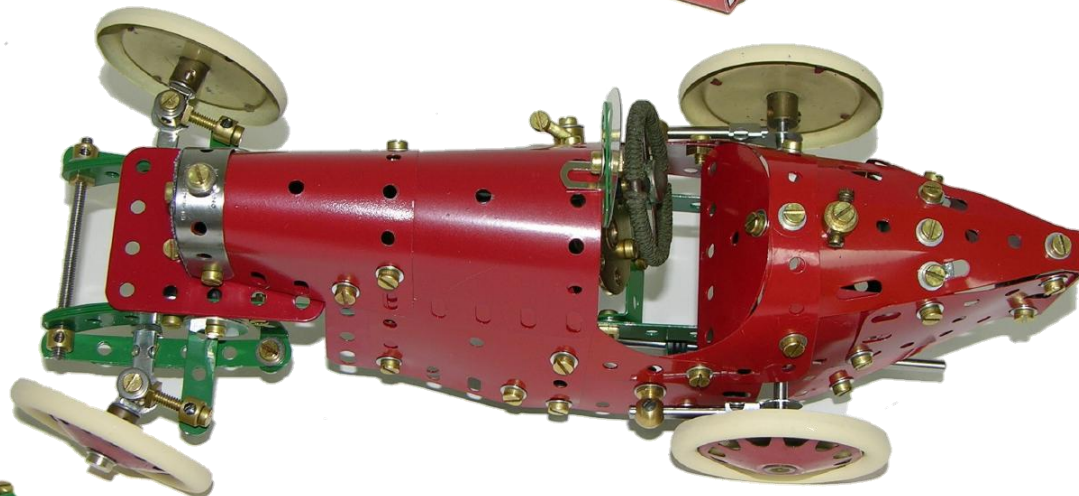
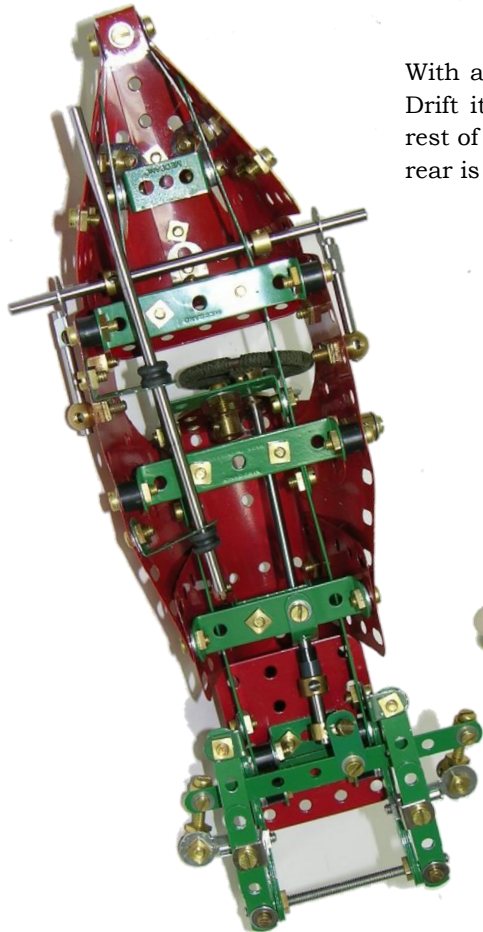


I had to use a lot of Plastic Spacers and Washers to try to keep to the scale width of the bodywork. Somehow a steering column fitted between everything and I was able to add a crude crank mechanism with a doctored Fishplate. Note the altered chassis at the rear, tapered to fit the final shape.

The tail unit was constructed separately, with the hope that it would fit to the rest of the body.

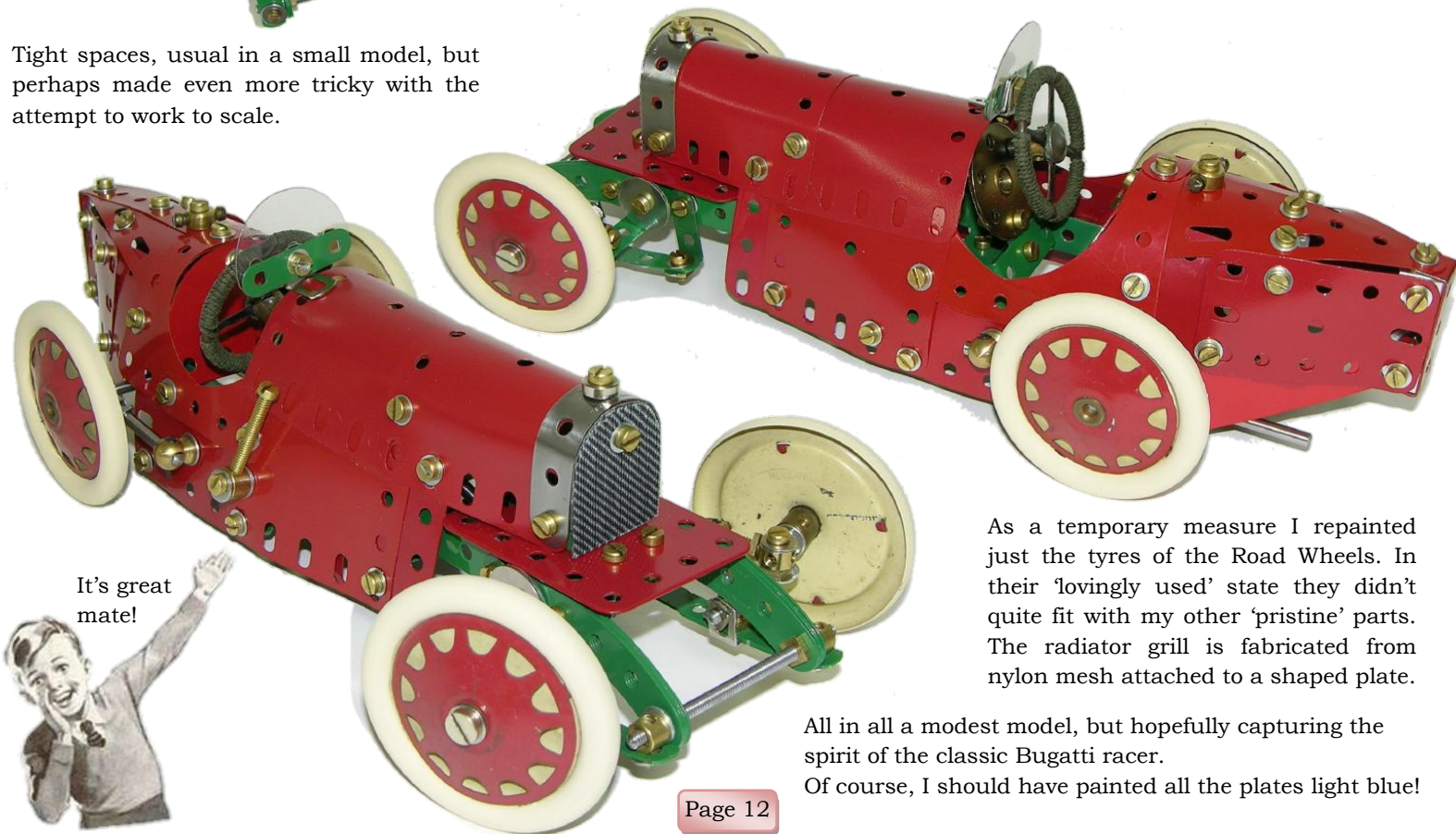


With a bit of jiggling and much use of the Drift it actually attached quite well to the rest of the body. The triangular plate at the rear is an old 'cut to shape' Plastic Plate.



This shows the contoured bodywork quite well. The steering wheel is rather oversized for the scale of this model, but I couldn't resist using this part number 185 which, as a Boy Scout in the 1950s, I had whipped with Meccano Cord! A one inch Pulley with a Rubber Ring would be a better scale.

Tight spaces, usual in a small model, but perhaps made even more tricky with the attempt to work to scale.



It's great mate!

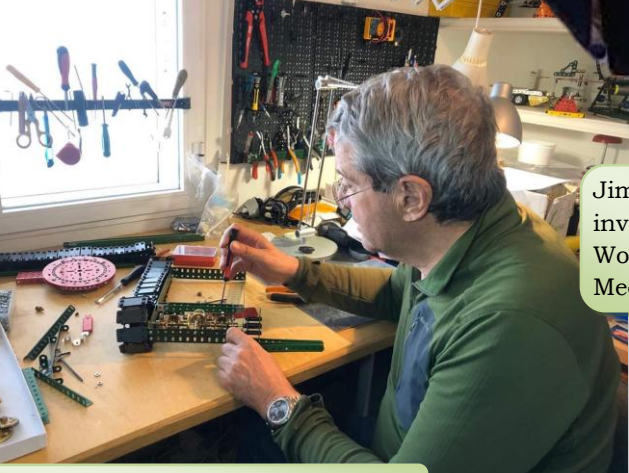
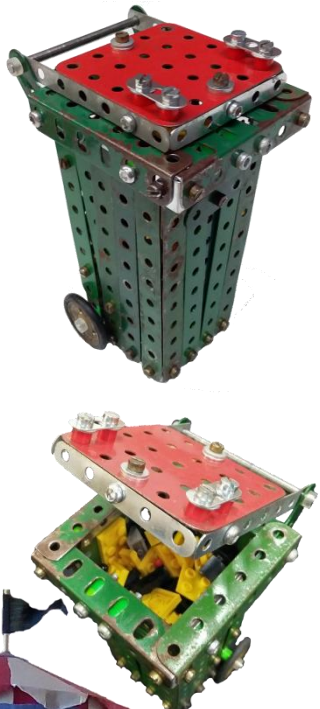
As a temporary measure I repainted just the tyres of the Road Wheels. In their 'lovingly used' state they didn't quite fit with my other 'pristine' parts. The radiator grill is fabricated from nylon mesh attached to a shaped plate.

All in all a modest model, but hopefully capturing the spirit of the classic Bugatti racer. Of course, I should have painted all the plates light blue!

Show us your Meccano room



Master of Meccano Mechanisms
Tim Gant UK.



Eduardo DeAguirre Molina - Spain



Jim is the world renowned
inventor of the Meccano
Wood Plane and the
Meccano Wheelie Bin.



Jim Munro Australia



Jim's
Wheelie
Bin full of
rubbish

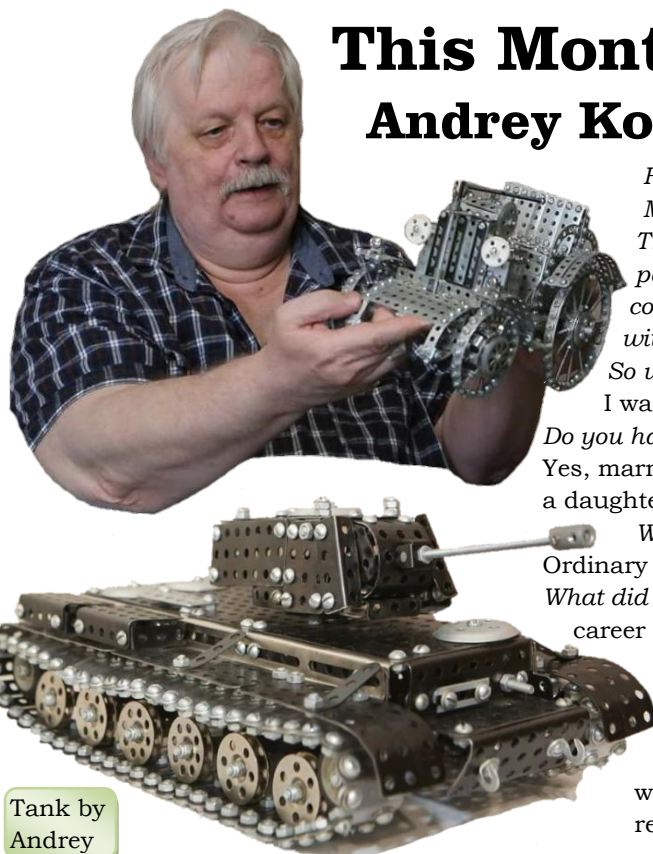


I promise to
clean up my
Meccanoroom
- Gary Higgins



This Month's Meccanoboy

Andrey Kovynev - Russia



Tank by Andrey

Hi Andrey. We have talked about Meccano for years using Google Translate so let's hope we can get past the language barrier and conduct this in depth interview without too many errors.

So when and where were you born?
I was born in Moscow, May 27, 1956.

Do you have a wife and children?
Yes, married. My wife, Lyubov, and we have a daughter 29 years of age, not yet married.

What school did you go to?
Ordinary school in Moscow graduating 1973.

What did you do for a living?
I began my career in 1973 at the Rubin television factory as an ordinary assembly fitter on a conveyor belt.

I graduated from labour to chief engineer in a company that was engaged in the installation and repair of medical equipment.



Andrey ready for action in 1977

I know Meccano is difficult to obtain in Russia and so you use many other metal construction systems. What do you build with?

I mainly use parts of domestic production, as they are affordable. These are metric standard. I use parts of other standards, mainly wheels, hubs, parts for the decor of models. My collection includes Meccano (France), Marklin (Germany), Schefflers Metallbaukasten (Germany), Merkur (Czech Republic), samples of parts from Trix, (but the production of the USSR), and Construction (GDR), Steel World (China) and many sets made in the USSR since 1930 to our time.

Why is Meccano difficult to get in Russia?

There are several reasons. 1 is the rate of the Rouble to the Dollar or Euro. 2 is customs tax. 3 is postage. On average, the purchase price increases by 40 euros. Buying is not profitable. Although when you come to Europe as a tourist and get to any exhibition with Meccano for sale, I would be interested and I think I would leave 1000 Euros with pleasure. The main problem with distribution of Meccano in Russia is practically no companies advertising about Meccano. No clubs were created to popularize this topic so there are not many fans of this hobby and there are no big sales.



Do you remember your first model?

My very first model was in childhood. Then there was a big break. On the advice of a doctor, in order to improve hand mobility and brain function, I bought several sets at an affordable price and began to study a detailed database. I was very disappointed with the lack of information available and wanted to know what details I could collect and document so I started collecting old sets. It started in 2013 and the biggest shock was when I started looking at the Meccano websites. I chose the largest models to build including the Chicken Legs House and the Eiffel Tower. My first models you can see on my page. Models are in the order of their creation.



Wife Lyubov in Moscow at the Chinese Lantern Festival

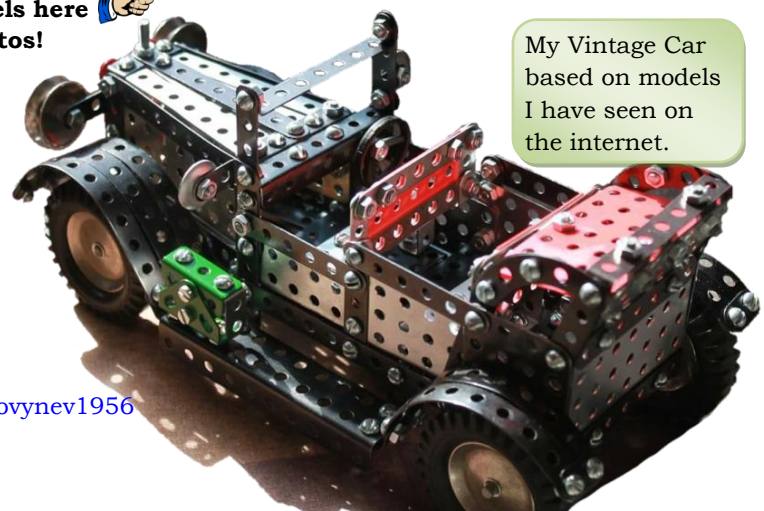
See Andrey's models here
There are 777 photos!



See Andrey's webpage here

<https://vk.com/kovynev1956>

https://vk.com/album259843381_200046446



My Vintage Car based on models I have seen on the internet.

ВЫШЛЕ ОФИЦЕРСКИЕ
ОРДЕНА ПЕНИНА КРАСНОЗНАМЕННЫЕ
КУРСЫ „ВЫСТРЕЛ“
ИМЕНИ
МАРШАЛА СОВЕТСКОГО СОЮЗА
Б. М. ШАПОШНИКОВА
ЛАБОРАТОРИЯ
ТЕХНИЧЕСКИХ СРЕДСТВ
ОБУЧЕНИЯ



Andrey during his stint in the Army in 1977

What was it like growing up in Russia?

A normal life, almost like in Australia. There are no crocodiles and kangaroos but there are many Himalayan bears. It's hard to write about yourself. An ordinary family, not rich, not very educated. My family lived honestly.

Has much changed in your lifetime?

Yes, I made many new friends. It has become more interesting to live.

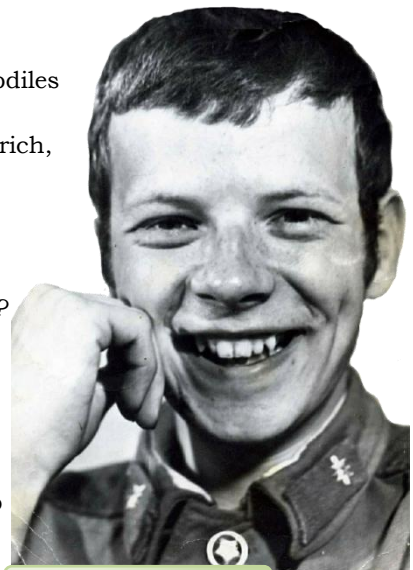
How is your internet in Russia? Are there any restrictions?

Is it fast at your house?

Home Internet, speed 150Mb/s. There is an option to connect wireless internet. (Wi-Fi) The restrictions are only my personal ones.

Has building Meccano helped you in your life?

I think that I still do not know everything about Meccano to apply this in life. This is a hobby, not a source of income. Meccano teaches, and helps to relax, it brings pleasure and enhances good mood.



A very young Andrey

Andrey's apartment in Moscow is circled in red



What do you think of the direction Meccano is heading with its plastic parts and hole punches?

Meccano - plastic, this is a separate type of design and should be called differently. The name should not contain the word Meccano.

“Hole punches” is an optional tool for a metal kit. If it could make holes in metal and different types of holes then maybe then it would be interesting but it's not needed for punching paper.

What was the best model you ever built?

Each model was interesting in its own way. And each new model is a new experience in the construction of models.

How much Meccano do you have?

I didn't count. A lot! Once they asked me to count the number of boxes. I got up to 282 and lost count. Let it be 280. There are only three sets under the name Meccano, then they are not fully equipped and there is one box with individual parts of Meccano from 2-3 small sets. I asked my wife and daughter to take an inventory of the details but they categorically refused. In the topic “Metal Designers” in Vkontakte there are about 190 descriptions of designs that were sold in the USSR and modern Russia.

Where do you keep it all? At home in the closets or on desktops. I try to clean after work. Most of the parts are not in sets but in separate multi-section boxes.

What would you like to see Meccano do in the future?

Additional electronics and software for model management. Mini machines for creating parts of Meccano.

Have you tried the new Steel World models?

Yes, I have several Steel World models and met with a representative of this company in Moscow, at home. There was an interesting conversation.

What do you think of the stainless steel and small size that Steel World use?

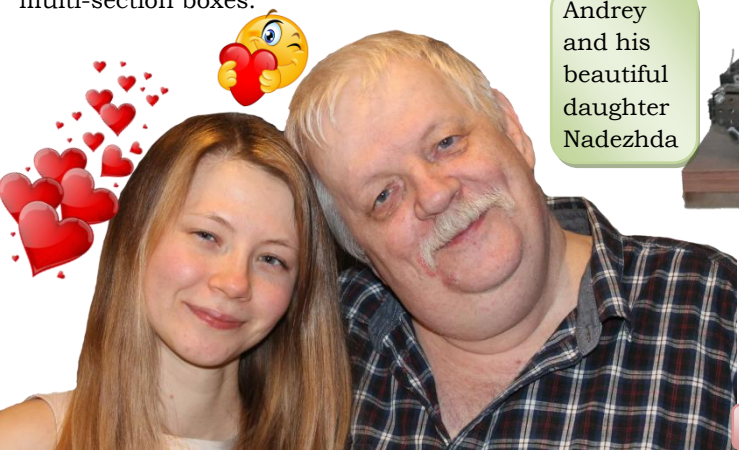
This is a separate type of constructor. Designed for an amateur of this size. There are drawbacks, but they quickly fix their mistakes. They can conquer part of the market.

Would you like to see Meccano in stainless steel? Yes it would be nice. Unless the properties of the metal change after painting.

Have you tried using remote control in any of your models?

Personally, I have not yet made models with radio control other than the Steel World models but I have seen models made of Russian steel with electronics from the Chinese. Everything works well. Officially, there are no such kits on sale. I set goals for myself now like trying to influence manufacturers with new models in the hope they will expand and improve the list of manufactured parts. I would like to see a domestically made version of Meccano in metric.

Andrey and his beautiful daughter Nadezhda



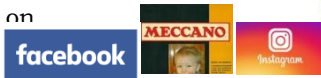
Some of Andrey's Steel World models





A few of my favourite things.

We are John & Johnny. A father and son team who like Meccano. We're nothing to do with Spin Master who own the brand. Contact us at MeccanoNews@gmail.com Follow Johnny Meccano



New Zealand

<http://www.nzmeccano.com>

<http://www.nzfmm.co.nz>

<https://www.facebook.com/MWT-Meccano-Club-1476153515979522/>

Australia

<http://www.mmci.com.au>

<http://www.sydneymeccanomodellers.org.au>

<http://www.webjournalist.com.au/maylands/index.html>

South Africa

<https://www.facebook.com/Meccano-Club-of-South-Africa-464753870326296>

USA and Canada

https://www.spinmaster.com/brand.php?brand=cat_meccano

<https://www.usmeccano.com>

<http://www.meccano.com>

<http://www.cmamas.ca>

<http://www.bcmeccanomodellers.com/meccano-in-canada.html>

<http://www.meccanoquebec.org/index2ang.html>

France

<http://www.meccanogilde.nl>

<http://meccano.free-bb.fr/>

UK

<http://www.internationalmeccanomen.org.uk>

<https://londonmeccanoclub.org.uk>

<https://tims.org.uk>

<http://hsme.org.uk>

<https://nelmc.org.uk>

<https://runnymedemeccanoguild.org.uk>

<https://www.selmec.org.uk>

<http://www.hsomerville.com/wlms>

<http://www.midlandsmeccanoguild.com>

<https://southwestmeccano.org.uk>

<http://www.northwestmeccano.co.uk>

<https://northeastmeccano.org.uk> **NEW!**

<https://www.meccanoscotland.org.uk>

<http://www.corlustmeccanoclub.co.uk>

<https://nmmg.org.uk>

Personal pages

<https://www.alansmeccano.org>

<http://www.users.zetnet.co.uk/dms/meccano>

<http://www.dalefield.com/meccano/index.html>

<http://www.meccano.us>

<https://www.meccanoindex.co.uk>

<http://www.meccanokinematics.net>

Other Countries

<http://club-amis-meccano.net/>

<http://www.meccaninfos.com.ar/> **NEW!**

Meccano suppliers

<http://www.meccanohobby.co.uk>

<http://meccanoman.co.uk/catalog>

<https://www.meccanospares.com>

<https://ralphsshop.com>

<http://www.hsomerville.com/mwmailorder>

<http://www.metalconstructiontoys.com>

<http://www.meerlu.com.au/>

<https://tinyurl.com/AshokBanerjee>



FROM OUR READERS



Paul Dale from Queensland uses PVC tubes to store his 24.5" and 18.5" Angle Girders

Fireside Fun

An engineer dies and goes to hell. Dissatisfied with

the level of comfort, he starts designing and building improvements. After a while, hell has air conditioning, flushing toilets and escalators. The engineer is a pretty popular guy.

One day God calls and asks satan, "So, how's it going down there?" Satan says, "Hey things are going great. We've got air conditioning and flush toilets and escalators, and there's no telling what this engineer is going to come up with next."

God is horrified. "What? You've got an engineer? That's a mistake - he should never have gone down there! You know all engineers go to Heaven. Send him up here!"

Satan says, "No way. I like having an engineer on the staff. I'm keeping him."

God says, "Send him back up here or I'll sue."

"Yeah, right," satan laughs, "and where are you going to get a lawyer?"

This guy goes into the doctor's surgery and exclaims, "Doctor, Doctor, you've got to help me! I keep thinking... I'm a pair of curtains! The doctor replied, "Pull yourself together, man!" - RiotMachineMark5

Wife asks her Meccanoboy husband, "Could you please go shopping for me and buy one carton of milk, and if they have eggs, get 6".

A short time later the Meccanoboy comes back with 6 cartons of milk and his wife asks, "Why did you buy 6 cartons of milk?" He replied, "They had eggs."



I was sitting in my Meccano room working on my model when my wife yelled out from upstairs. "Do you ever get shooting pains in your body like somebody has a voodoo doll of you and they're stabbing it?"

"No" I replied.

"How about now?" she said.