

OPERATING MANUAL



**MODEL M-420
MODEL M-420R
MODEL M-420B**

DIESEL ELECTRIC ROAD LOCOMOTIVE

RAPIDO TRAINS INCORPORATED
MARKHAM • ONTARIO • CANADA

MLW M420 LOCOMOTIVE PRODUCT GUIDELINES

Thank you for purchasing this Rapido Trains Inc. M420/M420B/M420R locomotive. Our sound-equipped M420 locomotive is powered by an ESU LokSound V5 decoder and can be operated on DC or DCC layouts.

If you have any issues with your model, you can reach us by email: service@rapidotrains.com, by phone (1-855-LRC-6917 or 1-905-474-3314) or by snail mail at the address below. (there is no address below)

Please do not send any models back to us without first speaking to us to get a return authorization, and please be patient when you send something back. When it comes to repairs, it's something we don't rush. We'd rather get it right the one and only time we hope to ever see your model come into our warranty repairs department. If you want to know the status of your warranty return, you have two options: 1) contact us directly and ask, or 2) complain about us on an online forum or Facebook. One of these methods will result in a timely response and maybe a nice chat. The other will result in a decaying radioactive isotope being hidden somewhere in your model before it is returned to you.

If you are reading this and it's the year 2050 or later, what took you so long to read this manual? Of course, we're assuming that you bought this model when it was produced in 2024 (that was a wonderful year, wasn't it?) and that you just threw it on the track and didn't even read this awesome little book. I mean, it's filled with so many great things and notes and information ... you know what, if you're not going to read it, then I'm just not going to write them anymore! There, I said it. Well, I guess I do have to continue writing this manual, for the guys who are reading it in the 2020s.

**CONTACT US!**

**Rapido Trains Inc.
500 Alden Road, Unit 21
Markham, Ontario
L3R 5H5 Canada**

**Tel. (905) 474-3314
Toll Free 1-855-LRC-6917
Fax. (905) 474-3325**

**Email. trains@rapidotrains.com
service@rapidotrains.com**

TABLE OF CONTENTS

Prototype History 4

Break-In 4

Minimum Radius Requirements 5

Front Nose Door 5

Missing or Damaged Parts 6

Checking and Adjusting Your Locomotive 7

Removing the Shell 7

Operation – DC (Silent)..... 8

Installing a Silent DCC Decoder 8

Operation – DC (Sound) 9

Operation – DCC (Sound) 9

- Locomotive Address 10
- Turn On the Sound 10
- Functions 11
- Functions: More Information 11
- Custom Sound Settings..... 14
- Sound Volume Settings 14
- Sound Volume Settings Chart 15
- Factory Reset 16
- More Information 16

Limited Warranty 16

Acknowledgements 17



LOK SOUND
EST. 1999

Sound-equipped Rapido models feature ESU LokSound V5 decoders. For more information, please visit www.esu.eu.

M420 DCC FUNCTIONS

- | | |
|------------------------------------|--------------------------------|
| F0 Front Headlight | F13 Rear Headlight |
| F1 Bell | F14 Radiator Fan |
| F2 Horns | F15 Model Train Mode |
| F3 Flange Squeal | F16 Air Dryer on Shutdown |
| F4 Dynamic Brake (<i>Why???</i>) | F17 Air Compressor |
| F5 Doppler Horn | F18 Track Inspection Lights |
| F6 Ditchlights | F19 Numberboard Lights |
| F7 Dim the Headlights | F20 Air Dryer |
| F8 Startup/Mute/Shutdown | F24 Reverser Centre |
| F9 Drive Hold | F25 Isolation Switch |
| F10 Independent Brake | F26 Manual Notching Up/Run 8 |
| F11 Class Lights | F27 Manual Notching Down/Coast |
| F12 Switching Mode | F28 Manual Notching Logic |

PROTOTYPE HISTORY

The early 1970s were a time of massive change in Canadian locomotive design. CN's mechanical boss, Bob Radford, worked with MLW designers, locomotive crews, and the unions to devise a new cab design for freight road locomotives. This would become known as a (Canadian) Comfort/Safety Cab. The first units to be equipped with this cab was the M420 and it hit the rails in 1973.

The M420 was equipped with the ALCo V12-251c3 prime mover producing 2000 H.P. MLW constructed 103 M420s between May 1973 and February 1977 for four railways including CN (80), BCR (16 including eight B units), Ferrocarriles del Estado (2), and Providence & Worcester (5).

The British Columbia Railway, originally called the Pacific Great Eastern Railway until 1972, was Canada's third largest railroad. In the Fall of 1973, the newly-named BCR purchased their 16-unit M420 fleet, which was delivered in the two-tone green with their new flower logo. They were equipped with extra "rock lights" on the nose to help crews spot any debris that fell onto the tracks in the mountainous terrain they traveled through.

In 1970, the BCR started using mid-train helpers to fight their grueling grades. To control these helpers, they purchased several secondhand remote control cars made from old B-units. By 1975, the BCR was so enamoured with the remote control B-unit concept that they ordered eight brand new B-units from MLW in the form of the M420B. Each one had radio remote control equipment installed from the factory and were meant for mid-train use. They could also be found in a more conventional B-unit role at the head end.

The Providence & Worcester, formed in 1844, was leased by the New York, Providence & Boston in 1889, which was leased by the New Haven in 1892. When Penn Central took over the NH in 1969, the P&W still endured as a paper railroad. When PC wanted to either dissolve the company or abandon the line, the P&W stockholders petitioned the I.C.C. in 1970 to resume independent operation. They did so in February 1973 after not running their own trains for 85 years. The P&W wanted to buy new engines but were shunned by EMD and GE. Having no choice, P&W turned to MLW and bought new M420R locos with trade-in trucks from old RS-3s in two batches in February 1974 and May 1975. These were the first MLWs to be purchased by an American railroad, and the first new "safety cabs" south of the border. Well-liked by crews, three were eventually sold to the Iowa Interstate in 1994 while the other two went to the Maine Coast RR.

BREAK-IN

Don't break into anyone's layout room to steal their M420 locomotives. Or any units for that matter! We'll send some of our front-office staff after you if you do. Don't believe us? You should hear the threats we get from Janet when she doesn't get her way! So just buy more for yourself. LOTS MORE! But this isn't about that kind of break-in.

Every locomotive needs a break-in period. Your M420 is no different and has been tested at our factory for about a minute... maybe. Just long enough to know that everything is assembled and working right. But that is not enough time to get the gears to mesh nicely or to even out any jerky operation in a new motor. We suggest that, after reading this manual, you put your M420 on a test loop and just let it run in each direction for an hour or two. Fast and slow. Actually, don't wait until you're done reading the manual. Put it on the track now! Start running it and let it run while you continue reading the manual. And if it explodes because you didn't read the manual, well...um...sorry. There already should be enough grease in the gearbox so you don't need to add any. Just let the thing run and keep reading.

MINIMUM RADIUS REQUIREMENTS

Being an average sized, 4-axle unit, the M420 will have no problems navigating 18" radius curves and #4 crossovers. If you want to run them on anything smaller, may I suggest switching your modeling to theme park operations?

FRONT NOSE DOOR

You'll note that the front door is removable and can be replaced with an optional "opened" door. Neat, eh? Well it's not just for looks, but we thought your crew should have that fine "Canadian A/C" in the summer. After all, those cabs can get quite warm, just ask Bobby when he was in OC&T's cab for 8 plus hours on a 95-degree day. (Ed.: You can tell Bobby originally wrote these instructions, because he's a Yank and he talks funny. If it were really 95° Celsius in that cab, Bobby would be on the menu for supper.)

You will find the "opened" door in the polybag. Carefully remove the "closed" door (There are three stems that hold the door into place) from the nose. Remember! Place the "closed" door somewhere you will be able to find it later! Winter gets cold and your crew will need that door closed! (And we would rather not get a frantic email or phone call saying how you lost the door or ants carried it away, off of the floor.) The "opened" door will slide right into the three mounts.

WARNING! The door is not meant to be rotated on and off the nose! The pins holding the door can easily break off and you wouldn't want that! (Nor do we want to keep reminding you that you broke the door off.) **ANOTHER WARNING!** DO NOT LEAVE THE OPENED DOOR ON THE LOCOMOTIVE AND PUT IT BACK INTO THE ORIGINAL CLAMSHELL. The door will break off! If you would like to leave the door in the opened position and place the model back into the clamshell, you will need to clip away the plastic around the door. Use a pair of nippers and gently (and carefully) (and more gently) cut away the plastic on the clamshell. CN used to do this all the time on the prototype when they would store it for the winter.

If you forgot to do this... Remove the now broken door, grab an old cereal box – preferably a red one, like Honeycomb – and cut a new door out. Glue it into place. We will gladly send a letter that says, “We told you so.” Rumour has it that Post matched their Honeycomb cereal boxes to our CN red just for this occasion. We think they got it wrong. Please write to them and complain.

MISSING OR DAMAGED PARTS

With over 300 individual detail parts, the M420 is an amazing and complex model. But that’s what we’re known for, isn’t it? To prevent inevitable frustration, we recommend checking your locomotive as soon as possible to ensure that everything is where it should be. We try to catch all potential issues at the factory, but with all 47 locomotives in our production run it is possible that the odd problem may slip past our quality control inspectors. Even after all these years, they still have karaoke nights and can get tired during the day. Please cut them some slack. At least they know all the words to “Wonderwall” by Oasis. (No, please do not send us an email and say, “You’re gonna be the one that saves me” with a list of parts you need.)

A bigger issue is damage in transit. 99% of all models are perfect when they leave our warehouse. But everyone knows that couriers and delivery persons don’t handle packages like they’re filled with glass ornaments, so between our warehouse and your front door there’s a chance that your model may or may not have been bumped, tumbled, kicked or even slap-shotted. We have it on good authority that UPS drops off our models with Les Habitants to use in hockey practice, then picks them up later to deliver to you. No packaging is designed to survive a couple of hours on the ice at Brossard. When the packages were delivered to Etobicoke, none of the boxes was damaged because the Leafs kept fanning on the shot.

If bits come loose in transit, they are easily reattached with white glue, such as Weldbond. We prefer Weldbond over CA because it works just as well for most layout scenarios and is very easy to clean up. There is no risk of damaging the paint job – just wipe it up with a bit of warm water on a paper towel.

If any parts are missing or broken, please call or email us and we’ll do the best we can to take care of you, up to and including replacement parts if needed. And after all, we’re your Wonderwall. OK, OK, I’ll stop. (Ed. Hey Zobby – most of our customers are twenty to thirty years too old for your farkakte Oasis references. Go with some Simon and Garfunkel. You can maybe go as late as Supertramp, but not a minute later.)

We aim for 100% customer satisfaction. Unless you are one of those people who calls us because the bearing cap is sitting askew and you don’t want to gently push it back into the truck. In which case, please go away.

CHECKING AND ADJUSTING YOUR LOCOMOTIVE

We try and make sure that every locomotive is perfectly up to spec before it leaves the factory, but if the karaoke was particularly good the night before your model was assembled there may be a couple of bugs. Doing a quick pre-service check will solve most operational glitches.

- Check to see that all wheelsets are correctly in gauge using an NMRA RP-2 Standards Gauge. Should any of the wheelsets be out of gauge, remove the affected wheelset from the truck by prying off the bottom lid of the gearbox with a small flat screwdriver and then spreading the side frames slightly. The wheelset can be re-gauged by grabbing each wheel and twisting. Reverse the steps to replace the wheelset and ensure the gearbox cover is snapped into place before placing on the track. Don't throw your model at the fridge in frustration.
- Check that all underbody piping and appliances are firmly installed and clear of the track. A small drop of CA-type super glue will sufficiently hold any loose parts securely. Under the body who cares if you spill a bit?
- Make sure that the trucks swivel freely and without binding. If they catch on anything, check to ensure that the sand lines do not interfere with any of the underframe components. If you really don't like underbody detail, return this model and go buy a brass M420 instead. We're told they are very nice.

REMOVING THE SHELL

Removing the shell of the M420 can be a bit tricky, but we're here to help guide you through it. To remove the cab, carefully remove the front nose handrails, the cab side handrails, and the horn air line from the roof of the cab. Turn the engine over, and with a flat screwdriver, gently push the tabs at the rear of the cab forwards while also pushing slightly towards the roof until the snaps release from the chassis. Lift the rear of the cab forwards and the nose latches should pull out freely.

To remove the hood, put the engine back on its wheels. You will need to carefully remove the brass steps at the rear of the battery boxes and separate the stanchions from the battery boxes (which are pinned into the hood). Take your time, as the stanchions can be fragile. The long hood has five small clips that lock the hood into place. **WARNING!** The walkway does not need to be removed! Only the hood! There are catches right behind the battery boxes and below the sixth tall door from the cab. Gently squeeze the long hood down near the walkway at these locations while lifting up with a little wiggling. Eventually you should feel the hood begin to lift from the cab end, then lift up the front to release the end catch. Voila, you're done! (Hopefully no parts took off like a rocket onto the floor like the aforementioned brass steps.) Twisting the engine strongly with both hands is not recommended.

OPERATION – DC (SILENT)

If your M420 locomotive is not equipped with a sound decoder, it should function like most other HO scale locomotives. The gear ratio is 14:1 so it should MU (multiple unit) with your existing fleet. Put it on the track. Give it some juice. Watch it go. Wheeeee!

In DC, none of the class light features work. That's right, none of them. If you want to have the front and rear class lights work, then you might want to consider upgrading to DCC. We know, we know, you are tired of people telling you to upgrade to DCC, telling you to upgrade to a colour television set, or reminding you that the last time a Canadian team won the Cup was in '93. (OK, I know. I'm fired.) (Ed. That is correct.)

But if you want to make all those cool locomotive features work, you will need a DCC system. Don't wait until the Leafs win the Cup to upgrade to DCC, or you will never upgrade to DCC.

INSTALLING A SILENT DCC DECODER

The M420 contains a motherboard which is connected to the track, motor, and lighting outputs. It is located in the long hood. A blind plug is attached to the motherboard using a 21-pin connector. To install a decoder, you will need to open your M420, remove the blind plug and install a 21-pin decoder. You must use a 21-pin decoder rather than an 8-pin or 9-pin decoder. This is clearly written in Rapido's laws and statutes, section 43, subsection 122, paragraph 2175b.

We recommend the following 21-pin decoder:

- ESU #59619 - LokPilot V5 DCC with 21MTC

The necessary resistors are included on our motherboard, so you don't have to futz around with resistors. Just plug in the recommended decoder and you have DCC.

ESU has made an M420 function mapping which can be downloaded into their non-sound decoder so that the function buttons and motor control are the same as our factory-released sound versions. This is available for download on the M420 page in the Support section of our web site. Well, it should be there. If it isn't there, I blame the Boston Bruins. Go ask Jeremy Jacobs for help. You will need an ESU LokProgrammer to write the function mapping to the silent decoder. If you don't have a LokProgrammer, you can adjust CVs in the usual way, just don't ask us how. We use the LokProgrammer because it's so much easier, and so should you!

For those of you reading this manual who have read all our previous manuals, we apologize for reusing some of the text from previous manuals. The following word is completely unique to this manual: sluberdegullion.

OPERATION – DC (SOUND)

Operation of a sound-equipped M420 on a DC layout is very similar to running a silent DC model, except that the model will not move until it has reached sufficient voltage for the sounds to fire up (around 7 volts). You cannot control user-activated sound features like the horn and bell if you are using DC. There are third party controllers that supposedly activate these sounds on DC but after all these years we've still never tested them so we have no idea how well they work or what they will do to your locomotive - for good or for ill. If they cause your M420 to spontaneously combust, contact us for assistance, then contact the third-party controller manufacturer and tell them they wrecked your brand new Rapido M420. Crying is optional but highly recommended to get best results.

– NOTICE –

If you want to run your sound-equipped M420 on a DC layout, the Back-EMF circuit can cause issues when you're trying to bring your M420 to a stop. To turn off Back-EMF, you will need to bring your M420 to a model railroad equipped with DCC and set CV49 to 18. If you want to turn it back on, change CV49 to 19. If you have a large DC layout and you like to operate sound-equipped locomotives, it might be worthwhile to invest in an entry-level DCC system just so you can adjust the motor settings of your sound-equipped fleet off the layout.

OPERATION – DCC (SOUND)

This is the part where we discuss how neat the sound is. After being on an M420 for two 10-hour days, I want to adopt one. (Ed. Bobby, you're out of your mind.) OK, OK, the 1:87th scale model is much easier to acquire. This beautiful locomotive has an Alco 251C, V12 prime mover that ESU has captured down to the signature rattle.

With that said, any locomotive can give off a slightly different sound, depending on maintenance, workload or even what it had for breakfast. Maybe it had... Back Bacon!

Anyway, locomotives sound a lot different when they are actually working. If you have decoders from other manufacturers in your locomotives you might want to check out the available line of Rapido decoders on our web site. All of our decoder sounds were recorded under load and we simply can't stand decoders that don't have this feature.

More detailed decoder instructions, including all sorts of weird CV settings we don't understand, can be found in the ESU LokSound V5 decoder manual. It is available for download from the support section of our web site or directly from the ESU website.



LOCOMOTIVE ADDRESS

Your Rapido M420 comes from the factory with a decoder address of 3. We suggest if you are using DCC control that you first test that the locomotive responds on address 3. Once you have verified that the locomotive is responding you should assign it a unique address (normally the road number of the unit) before going any further. This can be done either on your programming track (recommended) or on the main if your system supports programming on the main. Be aware however that if you do program the locomotive on the main and you have any other locomotives assigned to address 3 (the normal default address for new locomotives) that ALL of them will also be changed to your new address! This is great if you want to simulate a bunch of kids getting into the engine shop, notching the controllers, and then running into the woods.

Note that some DCC systems get a little wonky when programming sound-equipped locomotives on the programming track because of the high current draw. If weird stuff happens, try programming on the main.

— WARNING —

Rapido products are designed to operate safely between 0V and 16V. Voltages in excess of 16V - as well as irregular waveforms, voltage spikes or short circuits - may cause severe and sometimes irreversible damage to the product. "Train set" power packs are known to suffer from any one of these unexpected irregularities, whereas higher-end systems have safeguards in place to prevent this. Rapido always recommends using a power supply system that matches the quality of the models you are running. If you're reading this, you've obviously invested in top-of-the-line, museum-quality motive power and equipment, so we hope you've made the same investment with your model railroad power supply too.

While many power supply systems exist, some are known to have caused problems with model train circuitry in the past. If you have any one of the following systems, **PLEASE DO NOT USE IT** until you contact us for more information: MRC RailPower 1300/1370-series, Bachman Spectrum Magnum, Atlas 313 Universal Power Pack.

TURN ON THE SOUND

Press F8 and you will hear the M420 startup sequence followed by the sound of it idling. You can adjust CVs to prevent the locomotive from moving until the startup sequence has played out. Most of us at Rapido are really impatient so we turned this feature off. Refer to a full ESU LokSound decoder manual for more information. You can download it from the Support section of our web site.

If you press F8 when the locomotive is already moving, it will skip the startup and the sound will just turn on. Press F8 again to turn the sound off.

Note that if you are listening to your M420 idling nicely and then you select another engine, your locomotive still thinks F8 is pressed so it will keep idling along. However, if someone else selects your locomotive's number and F8 isn't pressed on their controller, the M420 will promptly shut down. They will need to press F8 again.

FUNCTIONS

F0	Front Headlight	F13	Rear Headlight
F1	Bell	F14	Radiator Fan
F2	Horns	F15	Model Train Mode
F3	Flange Squeal	F16	Air Dryer on Shutdown
F4	Dynamic Brake (<i>Why???</i>)	F17	Air Compressor
F5	Doppler Horn	F18	Track Inspection Lights
F6	Ditchlights	F19	Numberboard Lights
F7	Dim the Headlights	F20	Air Dryer
F8	Startup/Mute/Shutdown	F24	Reverser Centre
F9	Drive Hold	F25	Isolation Switch
F10	Independent Brake	F26	Manual Notching Up/Run 8
F11	Class Lights	F27	Manual Notching Down/Coast
F12	Switching Mode	F28	Manual Notching Logic

FUNCTIONS: MORE INFORMATION

F0 Front Headlight

Just like the real thing, our headlight is not directional. No matter which way you're going, the front headlight **IS** the front headlight. If you want the headlight facing the opposite way of travel to be on, then read a little further on under the F13 Rear Headlight.

F1 Bell

Ding Ding Ding!

Probably one of the most difficult sounds to master is the bell, because it's such a noticeable feature and no matter what, chances are they all had their own unique tone to them. So it really is up to the user to choose a bell to their liking. Thankfully, these units were produced before the e-bells! No electronic ding, here!

F2 Horns

Who doesn't love the sound of the Canadian K3L? A beautiful D# minor (D#, F# and A#), which was produced by Holden, under license from Nathan Airchime in an early sand cast and later die cast build. (OK Bobby, that's entirely way too much info.) Thankfully, this sound file provides a few versions of the K3L and a few others, in case you're adventurous. (You may also get a lecture from "Dr. Robert Horn" about the incorrectness. We're sorry in advance.) To get a short "toot" just tap F2 or your "HORN" button. If you hear a long tail-off you are tapping for too long. If, no matter what you do, you just can't get the darn thing to make a short "toot," switch to NCE.

F3 Flange Squeal

Let's face it, the curve squeal has been the greatest success we've created in recent years. It's absolutely wonderful. It sounds wonderful and can be easily applied to any train. Since most yards and terminals featured rather tight-radius curves, it was never possible for anything to SILENTLY go around them. Press F3 to wake up the neighborhood, and subsequently press F3 again to turn off the noise and avoid a complaint. Now all we need to do is get Jordan a haircut and we'll consider it our next greatest success.

F4 Dynamic Brake

Press F4 to get dynamic brake sounds. Now listen, we know how modellers think, and while we have included the sound, P&W units DIDN'T HAVE DYNAMIC BRAKES! We just want to get that point across. If you have a P&W engine and you press F4, you have Green Cooties.

F5 Doppler Horn

Press F5 to hear a nice and slow Doppler K3L. Why not a fast Doppler horn? Well, when was the last time you remember an M420 running like a rocket?

F6 Ditchlights

Ditchlights were invented in Canada in the 1960s to illuminate right-of-way ditches for rockslides and other obstructions. They became mandatory in Canada in 1975 and do not alternately flash. They are either both on or both off because their job is just to light up ditches (duh!).

F7 Dim the Headlights

See that oncoming train? Make sure you dim your headlights or ditchlights so you don't blind the crew! Hitting this function a second time will restore the lights back to bright.

F8 Startup/Mute/Shutdown

F8 toggles the primary locomotive sounds on and off. If you're not moving, you'll get a nice startup sequence of the 251C prime mover. If your locomotive is already moving, it'll just go straight to the appropriate throttle step.

If you have a DCC system that only allows eight functions, you can remap the functions following the guidelines in the ESU LokSound manual, which can be downloaded from the support section of our web site. Or you can upgrade to a newer DCC system, which may be less stressful.

F9 Drive Hold

This is ESU's "Full Throttle" feature, that allows you to play the prime mover of your M420 like a musical instrument. When you press F9, you turn on "drive hold." This keeps the speed of the engine constant at whatever speed step your throttle happens to be on. Then as you increase the throttle, you hear the prime mover revving up. This sounds

awesome, whether you're trying to make the grade with a slow freight or revving the prime mover in the middle of the street after an ice storm. (Yes, this really happened to an M420.)

"Full Throttle" is even neater when you throttle down, as it allows you to simulate "coasting" which is such an important part of running a real train. When you press F9 again you turn off "Full Throttle" and the engine will accelerate or decelerate to whatever speed step your throttle happens to be on. For realism it's a good idea to take note of what speed step your throttle was on when you turned on "Full Throttle" and be back at that speed step when you turn "Full Throttle" off. Otherwise your M420 may fly like a twin-prop plane.

F10 Independent Brake

F10 works just like the brakes on a real engine. Press F10 and you put on the brakes. Turn off F10 and the brakes come off, so you start moving again.

F11 Class Lights

When you press F11, your white class lights will turn on. Hitting F11 a second time will cycle the lights to Green, a third hit will turn the lights red and finally, hit F11 again to cycle the lights off. White Class lights were used to signify a train was running as an extra in territory where train orders and schedules still applied. Green Class lights were to signify that there was an additional (usually just a second) section of the same train number, also in train order territory. The Red Markers are just neat! More on the use (and different colors) of classification lights can be found in the Google. Truthfully, you have absolutely no need for green or red class lights on an M420. We just put them there because we think class lights are cool

F12 Switching Mode

If you press F12, the headlight and rear light will both be on dim. This is appropriate for switching operations or for running light on the mainline. Press F12 again to turn off the switching mode lighting.

F13 Rear Headlight

Pressing F13 will simply toggle the rear light 'on' and 'off'.

F14 Radiator Fan

Press F14 to hear the radiator fans whizzzzzzzz. DID YOU HEAR ME SAY HIT F14! I CAN'T HEAR YOU!

F15 Model Train Mode

Pressing F15 changes the front and rear lights on your M420 to operate "the old-fashioned way". When your M420 is set to forward, your headlight will be on. When it is set to backwards, your rear light will be on. Just like the good ole' days of straight-wired DC models, only better!

F16 Air Dryer on Shutdown

Want to hear those air dryers lay down a sick beat? Pressing F16 will activate the air dryers on shutdown. This will sound neat and if you play your cards right, activate it when it's in a yard and the yardmaster has to work right next to it!

F17 Air Compressor

Pump that air up! By pressing F17, this will activate the air compressor, but by default, the sound file will randomly play this feature.

F18 Track Inspection Lights

These lights shine down onto the roadbed. Why did we include them? Because they look neat, of course. Oh, and your engineer will be happy at night when he's making a shove. By default, they are on. Pressing F18 will turn them off.

F19 Numberboard Lights

Toggle the numberboards on or off with a flick of a switch! (I mean "button," unless you have some type of neat DCC Controller or you managed to assemble a whole M420 stand in your basement.)

F20 Air Dryer

To save you from the saliva clean-up should you try to mimic the sound of the spitter valve, we've provided its sporadic sounds on F20. By default it's always on, as the real thing would always be going when the locomotive is running (and for a few minutes after it's shut down). But if you prefer to not hear it at all, just press F20 to silence the spit.

F24 Reverser Centre

When pressing F24 while not moving, the motor will lock so you can throttle through the notches like the prototype in neutral. F24 must be turned off to begin moving.

F25 Isolation Switch

Alternatively, pressing F25 while not moving will lower the prime mover and lock the motor. F25 must be turned off to begin moving.

F26 Manual Notching Up/Run 8

Kind of like the old "Straight to 8" function from several years ago, hitting F26 with F28 OFF will cause the prime mover to notch all the way to Run 8 and stay there. This will not effect loco speed, just the sound it makes. Great for pulling out of a station with a long train. Turn off F26 to return the prime mover sounds to normal operation.

F27 Manual Notching Down/Coast

As a quick way to idle the prime mover sound without losing control of the loco speed, press F27 with F28 OFF to chop the throttle to idle. This is great when used with dynamic braking. Turn F27 off to return the prime mover sounds to normal operation.

F28 Manual Notching On/Off

With F26 & F27 turned OFF, turn F28 ON. Now one can use F26 to manually notch up the prime mover and F27 to manually notch the prime mover down. This will not effect the loco speed, just the prime mover sounds. To go back to normal operation, all three functions must be turned off (F26, F27, and F28).

CUSTOM SOUND SETTINGS

Generally speaking, the M420s had K3Ls. (See above for a lecture by Dr. Robert Horn.)

The default horn on your model is a Nathan K3L. If you wish to change the default horn, you can do so by changing CV 163. For changing the default bell, change the value of CV 164.

Horns

- CV163=0 Nathan K3L #1 (Default)
- CV163=1 Nathan K3L #2
- CV163=2 Nathan K5L #1
- CV163=3 Nathan K3L #3
- CV163=4 Nathan K5L #2
- CV163=5 Nathan K5H

Air Dryer

- CV 166=0 Air Dryer #1 (Default)
- CV 166=1 Air Dryer #2

Bells

- CV 164=0 Steel Bell #1 (Default)
- CV 164=1 Steel Bell #2
- CV 164=2 Steel Bell #3

Brake Squeal

- CV 165=0 Composition Shoe (Default)
- CV 165=1 Cast Iron Brake Shoe

- CV 166=2 Air Dryer #3
- CV 166=3 Air Dryer #4

Changing the default horn automatically changes the Doppler recordings on F5 too.

SOUND VOLUME SETTINGS

The sound volumes on your decoder have been pre-set at the factory to levels that we found comfortable on our test tracks.

Fortunately for those of us that might have hearing troubles, the sound levels can be easily adjusted to best suit your own requirements and we recommend that you experiment with different settings if you don't care for the default levels.

To set the volume levels go into the program mode on your DCC system (refer to your system's manual for instructions on how to do this as each system is slightly different); enter the desired CV number; then enter the desired levels. Note that this can be done either on a programming track or on the main (ops mode) if your DCC system supports programming on the main. We strongly recommend that you keep notes on which settings you have changed, and which values were used, if you ever need to reset your decoder (see "Factory Reset" below).

M420/M420B/M420R SOUND VOLUME SETTINGS

KEY	FUNCTION	SOUND SLOT	CV	DEFAULT	YOUR VALUE
	Master Volume		63	75	
F1	Bell	4	283	70	
F2	Horn	3	275	170	
F3	Curve Squeal	23	435	30	
F4	Dynamic Brake	6	299	99	
F5	Doppler Horn	30	491	255	
F8	Prime Mover	1	259	150	
F10	Independent Brake	11	339	30	
F14	Radiator Fan	8	315	50	
F15	Isolation Switch	21	419	30	
F17	Compressor	7	307	60	
F20	Air Dryer	17	387	60	
F24	Reverser Centre	20	411	50	
F25	Isolation Switch	21	419	30	
F28	Manual Notching Logic	27	467	20	

FACTORY RESET

On your M420, you can perform a factory reset by entering a value of "8" into CV 8. Note that this will cause all your new volume and motor settings to be lost, so you will need to reprogram any settings that you want to keep. What do you mean, you didn't take any notes? WE JUST TOLD YOU TAKE NOTES. You're out of the band. Again!

You can NOT lose all the pre-recorded sounds on your M420 decoder by doing a factory reset. However, after performing a factory reset your M420 may begin to sing "The Hockey Song," by Stompin' Tom Connors. If that happens, you have probably lost your mind. But don't worry. If it's a Saturday night, just sit back, grab some brewski, and enjoy the game. Yes, I might be from the States, but I played hockey growing up, so I'm, like, an honorary Hosehead, eh?

MORE INFORMATION

While addressing the features that most modelers will need for normal operation, these instructions have covered just a small number of the many customizable features of your ESU LokSound decoder. For advanced users who want to explore the capabilities of the decoder more fully we suggest downloading the ESU LokSound V5 decoder manual. This is available in the Support section of our web site.

Or just get a LokProgrammer. No, we will not teach you how to use it!

LIMITED LIFETIME WARRANTY

We will do our best to solve any problems or issues that you may have with your M420 locomotive. If your locomotive has any defects that originate from the factory, we will repair your locomotive using new components or replace it outright should a repair not be possible. However, we can only replace your locomotive while we have additional ones in stock. We normally keep spares for up to six months after a model is released.

There are several things that this warranty cannot cover. If your M420 arrives with a couple of loose grab irons or underbody bits, there is a very good chance that you can do a repair in less time and effort than it would take to contact us. Don't be afraid to do some model railroading! White glue, such as Weldbond, works wonders for securing all sorts of parts and will not mar or damage your paint. However, if parts are missing that is another story – call us or send us an email and we'll send you some replacements.

Of course, damage caused by running your locomotive at full speed off the cliff known as the edge of your 4x8 sheet of plywood, modifying your locomotive to work off diesel fuel, using your locomotive to re-enact the explosive derailment scene from your favourite railway movie (Yes, that one with the BC units carrying the nuclear load), using your locomotive as an actual auxiliary power supply for a town in Quebec after an ice storm (Happy thoughts, think happy thoughts), or any other damage caused by you that we haven't been able to cover here is not covered by the warranty. However, if catastrophe does strike and your locomotive gets damaged, please give us a shout and we'll do our best to help you out.

Keep in mind the following: the most common reasons for Rapido locomotives not working are dirty wheels or carpet fuzz/cat hair in the wheels and gears. Please visit our YouTube channel and watch my helpful video about how to fix both these issues and get yourself up and running again quickly.

ACKNOWLEDGEMENTS

The M420 project is a labour of love, a locomotive that for years was only available in brass or resin. But not only have we pushed the bar to new heights, we also wanted to show off our latest design concepts and features, like the neat nose doors or the incredible detailing of the underframe. Without the help of the following, none of this could have been possible:

Steve Carlson, Andrew Castle, Patrick Gagnon, Ken Goslett, Matt Herman, Cody Lee, Dave Minshall, Rob Dingman and the Oil Creek & Titusville Railroad (We probably have worn our welcome out, so we cannot thank them enough!) and the Ontario Southland Railway.

And we have Richard Longpre to thank once again for yet another masterful attempt at understanding and regurgitating the English language into something potentially more understandable.