F40PHM-2

OPERATOR'S MANUAL

Metra

Locomotive Nos.
185 thru 214

EMD GM Rapido Trains Inc.

EMD F40PHM-2 LOCO PRODUCT GUIDELINES

Thank you for purchasing a model of the Electro-Motive Division locomotive, the F40PHM-2.

If this is your first Rapido locomotive, we must ask – why is this your first Rapido locomotive? No, seriously, we've been around now for 20 years now and we're not just a Canadian company, eh? We've produced an imperial ton of US products, like the U25B, FA-1, B36-7, GP38, F40PH, E8A, Comet car, RTL TurboLiner, F30 flatcar, X-3 tank, etc. So just for that, we're going to make sure you LOVE your F40PHM-2. And then you'll say to yourself, "What have we missed out on all these years? We need to find and buy every Rapido model that has ever been released, in every scale! Especially the UK ones!"

If you are a returning customer, welcome back! Just put your engine on the track. All we ask is you don't intentionally set it on fire, don't try to put real diesel fuel in it, and don't MU it to anything with pizza cutter flanges. Oh, and REALLY keep it away from cheap DC "train set" controllers. Poor-quality power packs can quickly and easily give any Rapido loco a melted makeover.

If this is your first Rapido Manual, we should warn you up front – there's usually a good amount of humor through these manuals. Well, at least we think so. We have gotten some comments from people that don't agree, but we suspect that they have had their sense of humor surgically removed (we think it's near the spleen). After all, model railroading is supposed to be fun!

As always, if there is anything amiss with your F40PHM-2, please do not hesitate to contact us. We stand by our products 100%. The best way to contact us is through email (service@rapidotrains.com) but you can also try to reach us by phone, the postal service, or subspace transmitter (you must provide the krellide power cell). Our contact info is near the back of this manual.

However, PLEASE do not send a faulty model back to us without first getting authorization. You wouldn't believe how many times we get a delivery of a broken locomotive with only a name inside (sometimes only the FIRST name), meaning we have no idea what's wrong with it! (Hey Rick – your package of pantographs is still sitting on the shelf in our bathroom.) If the issue with your model is something simple – like a loose grab iron – then we'll likely tell you how to fix it yourself. While we generally will support repairs to your F40PHM-2 for a considerable length of time, please realize that eventually the parts supply will run out. That, or da Bears will actually win a playoff game, whichever comes first. Unfortunately, that will dictate when we can no longer help you. Again, please make sure you contact us first so we can tell you whether there's enough parts (or footballs going through goal posts) left to do your repair.

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PROTOTYPE HISTORY

Despite being responsible for sidelining the fan favorite ex-BN E9s, the F40PHM-2s have created a similarly iconic look for themselves hauling commuters in the Windy City for the past 30 years. Nicknamed "Winnebagos" for their similar appearance to the venerable recreational vehicle, these were the last 30 F40PHs that Metra ordered new in 1991 and numbered 185 to 214. Like Amtrak, they use the prime mover to provide the Head End Power (HEP). Towards the end of 2016, the first F40PHM-2s were sent out to Progress Rail for rebuilding and application of the new faded scheme that was already applied to the MP36s and older 100-series F40PHs. Of the 30 locos, only one has been retired on account of a wreck off-line. The locos that returned from rebuild featured a redesigned cab door window, front snowplow, single rooftop APU strobe, PTC antenna arrays and the new faded scheme.

BREAK-IN

Just so we're clear, that doesn't mean break into anyone's layout room to steal their F40PHM-2. And don't break into a hobby shop either because that is really frowned upon. Just buy more for yourself. But this isn't about that kind of break-in.

Every locomotive needs a break-in period. Your F40PHM-2 has been tested at our factory for about two minutes…maybe…just to make sure everything functions as it should. That is certainly 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 F40PHM-2 on a test loop and just let it run in each direction for an hour or two. Fast and slow. Don't have it pulling anything either while you're breaking it in.

There already should be enough lubrication in the gearbox so you don't need to add any. Just let the thing run. If you are running this thing on track on the carpet, please vacuum first. You have no idea how many models come back to us with gearboxes full of carpet fluff and pet fur. Our models are not cat-proof.

HOW TO HOLD YOUR LOCOMOTIVE

Hold your F40PHM-2 gently, and with much love, care, and attention. Your model has numerous delicate parts, especially on the roof and underframe. If you want to back date it to be the quality of a model produced in the 1970s, then rip all the parts off and pick it up wearing a baseball glove…on both hands. We're assuming you don't want to do that, so the model should be picked up carefully. It is best to pick it up with your fingers along the bottom edge of the F40PHM-2 fuel tank (but

for the love of Pete, avoid the air tank piping!). That way you won't leave greasy fingerprints on the sides and you also won't stress any of the delicate parts. Always make sure your hands are free of shmutz before touching your engine, otherwise you'll shmutz up your loco. Hey – if your hands have enough oil on them that could be realistic weathering.

If you are taking your F40PHM-2 to the club all the time and regularly handling it, stuff will likely break off. Sorry. The little bits are made of plastic and metal and attached with glue, which is all a bit fragile. We wanted to make the small parts out of unobtainium and use Steady-State Micro Welding to install them. Unfortunately, with the current global supply crisis, unobtainium has become unobtainable.

We suggest wrapping your F40PHM-2 in a plastic bag before placing it in the packaging or in your loco holder so you can catch bits that fall off. White glue is the recommended adhesive for reattaching the bits, although you are welcome to use CA but only if you are very careful – or very brave. Remember to apply the CA to just the part and not the model (don't ask us how we know this).

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 it was a Monday morning and our factory workers were up late the night before placing bets on the big Mahjong game between Xiao Hong from engineering and Zhang San from accounting, 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, then remove the affected wheelset from the truck by prying off the bottom lid of the gearbox with a small flat screwdriver and then spreading apart the sideframes. The wheelset can be regauged by grabbing each wheel and twisting. Reverse the steps to replace the wheelset and ensure the gearbox cover is snapped into place before placing it on the track.

- Check that all underbody piping and appliances are firmly installed and clear of the track. Of particular note are the air hoses on the ends of the locomotive and both coupler trip pins. Bend up any low coupler trip pins so they don't interfere with your switches and crossings. We recommend using Kadee part #237 (Trip Pin Pliers) or Micro-Mark part #80600 (Trip Pin Bending Plier). If your track transitions from flat to a 12% grade in three inches, you might also want to cut off the pilots and the fuel tank as they will foul the rails.

- Make sure that the trucks swivel freely and without binding. If they catch on anything, check to ensure that the sides of the trucks don't bind against the steps. If they do, see that everything is firmly installed.

MISSING OR DAMAGED PARTS

If you open your F40PHM-2 box and discover that something has obviously been bumped in transit and is damaged, please contact us. We know that some of you don't like the idea of human beings touching your models, but if it is a matter of gluing an exhaust stack back on you can do it yourself in less than a minute with a drop of white glue. If you really want to send your model back to us for us to install that, we would be happy to. But if you do send it back for us to put that one part back on and other stuff falls off when we send it back to you, then tough tooties. We're not fixing it again.

We try to make our models courier- and mail-proof, but there really is no way to protect a model from damage when it is used in a game of football at the UPS or FedEx distribution center. Model trains generally don't survive well after being "spiked" because Billy scored a touchdown near the warehouse receiving doors.

If you see some grab irons are missing and they are not floating around the packaging, let us know and we will send you replacements. More information about our warranty can be found toward the end of this manual.

REMOVING THE SHELL

If you need to open your F40PHM-2 to install a crew or a decoder, things should be pretty straightforward. To get inside your F40PHM-2, you will need to follow these steps:

- Remove the screws from the coupler boxes and slide the coupler boxes out from the frame. Set these aside. Now carefully spread the body sides out away from the chassis. There are four body slots (two on each side) that engage tabs on the chassis just above the #2 and #3 axles. It may help to install toothpicks or stiff paper (such as a business card) at each tab location to unlock them. Now wiggle the shell off. *Very* carefully. **NOTE:** The piping around the airtanks is insanely delicate, so no touchy! The fuel tank may be the best option to pull on, but if that doesn't feel like a good idea, try putting one of the coupler screws halfway back into the chassis, and then use needlenose pliers to pull on this screw while wiggling the body clear. If you are working in a zero-gravity environment, then the chassis will slowly

drift away from the shell. On the other hand, if you are not in a zero-gravity environment, remember – gravity sucks. If you hold your loco upright by the body, the chassis will now plummet to the nearest solid object. You may want to do this carefully over a workbench with some thick foam on top of the bench.

- If you wish to install a crew inside your F40PHM-2, the cab floor is secured to the body shell by two clips – one on each side. With a little manipulation the cab floor should come free after spreading the sides of the shell and maybe using a small prying tool. Patience will be key here as the clips are also the clear window material. Don’t jam a tool in there too hard or you might scratch the glass (it will not buff out).
- If you wish to change out the decoder, then just follow the previous steps about removing the shell. It will expose all the wonders that lie within.

At this point you should have the entire shell off the frame, as long as you followed our super simple instructions. We don’t know how to put it back together, so from here you’re on your own. Just read the instructions backwards and you should be OK. If you find a cryptic message while reading backwards, !tluaf ruo ton s’ti.

Any requests for replacement bodies because you broke the little clips will be met with laughter, followed by sadness, then laughter again, and then a very polite suggestion that you should model a locomotive rebuilder and use your recently broken body as scenery. We did warn you after all. If we can assist, then all joking aside we’ll make every effort to do so. But note that we don’t have a warehouse full of shells and cabs to replace the broken ones.

OPERATION – DC (SILENT)

If your F40PHM-2 locomotive is not equipped with a sound decoder, it should function like most other HO scale locomotives. Put it on the track. Give it some juice. Watch it go. Going forwards in DC, the front headlights, ditch lights, Gyralite (but only non-flashing), and number boards are on. In reverse, instead of the rear headlight, the front red markers will turn on and the front headlights, ditch lights, and Gyralite will go out. All other lights are wired, but they will not work in DC.

If you are new to the hobby (or just like to occasionally “play trains”) and you have a DC-powered train set, please contact us before operating your F40PHM-2 as it may not be safe (for your engine and/or your wallet) for you to use your controller.

Some train set throttles put out a very high maximum voltage that is not suitable for scale model trains. The maximum recommended voltage is 15 volts DC. Similarly, controllers designed for large scale trains put out a much higher voltage than your F40PHM-2 can handle. Please see the highlighted warning not too much further in this manual.

If you use a train set throttle or a throttle designed for large scale trains, your locomotive's circuitry may end up looking like a bag of popcorn forgotten in the microwave after you accidentally punched in an extra digit into the timer. In such situations, we'll try our best to fix it for you, but it may be beyond salvaging. Please note we may have to charge you for the replacement parts and/or the labor involved in restoring it to its former self. That's because you didn't read this bit of the manual. For those of you who are reading this, hi! How's it going? You in the mood for pizza? No, not that bread cassarole with marinara sauce on top of the cheese and cooked in an iron skillet, *real* pizza!

INSTALLING A DCC DECODER

The F40PHM-2 contains a motherboard specially designed for our decoders. This is connected to the track, motor and lighting outputs. A blind plug is attached to the motherboard using a 21-pin connector. To install a decoder, remove the blind plug and install a 21-pin decoder. Your chosen decoder should have eight function outputs.

At the time of writing, we recommend only the following non-sound 21-pin decoders:

- ESU #59029 - LokPilot 5 Basic with 21MTC
- ESU #59629 - LokPilot 5 DCC with 21MTC

We feel the 21-pin connectors are superior because there are enough pins to ensure that all your lighting functions are connected. The necessary resistors are included on our motherboard so you don't have to futz around with resistors. Just plug in one of the recommended decoders and you have DCC. We know some of you prefer a different brand of decoder, but we honestly can't help you install it or map the functions.

We have made a F40PHM-2 function map so that you can make the function buttons and motor controls exactly the same as our factory-released sound versions. This should be available for download from the Support section of our web site. If it isn't, bug us. We recommend an ESU LokProgrammer to write the function mapping to the ESU decoders. If you don't have a LokProgrammer, you can adjust CVs in the usual way but we hope you like lots of button pushing. If you have a large fleet of

F40PHM-2s like everyone should, remapping multiple units on a LokProgrammer (after the first one) takes just one button click. Remapping using a throttle? Clicks. So. Many. Clicks.

We will be selling F40PHM-2 sound decoders separately, if they aren't on our website by the time you read this, call our office, pick a random number between 1 and 75, divide by ¾, multiply by √π, and then take the second to last number. Call that extension and you'll be directed to someone whom you can yell at. Or just e-mail us.

If you want to install a decoder other than the one we suggest, it's more than just plugging in the decoder and then playing trains if you want everything to work. You will have to custom map all the functions. It's just how it is. We won't apologize for that. Sorry, eh?

OPERATION – DC (SOUND)

To operate your sound-equipped F40PHM-2 locomotive on a DC layout, just give the throttle some juice. The engine will start up once sufficient voltage has been reached (around seven volts). See the note above (in Operation – DC (Silent)) about using train-set or large-scale throttles. With DC layouts, you have very little control over the sounds of your model.

– 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.

The DC lighting is limited. Some throttle manufacturers produce special gadget-like thingies which are meant to trigger the sounds in locomotives on DC layouts. As we have no involvement in the development of those gadget-like thingies, we have absolutely no idea how they will affect your F40PHM-2, for good or for ill, for richer or poorer, in sickness and in…sorry, wrong transcript. As always, we'll try to help you fix your F40PHM-2 if one of these gadget-like thingies turns your locomotive's circuitry into something akin to glowing magma, but we can't guarantee we'll be able to.

It is usually at this point in the manual that Jason inserts a gentle dig at his fellow modelers who won't switch from DC to DCC. The rest of the staff continue to repeatedly remind him what happened the last time he did that. Something about being chased down the county highway by a group of townsfolk wielding transformers and potentiometers. As long as we can keep reminding him of this event, he'll be nice to DC modelers. Not that *we're* calling DC modelers Luddites – No, sir, not us!

OPERATION – DCC (SOUND)

We go to extreme lengths for accuracy, in sounds as well as in looks. Our sound decoders are LokSound V5 decoders by ESU. The sounds are about as bang-on accurate as we can make them. An F40PHM-2 masses about 265,000 lbs. in working order. Therefore a certain amount of starting momentum has been pre-programmed into the decoder to replicate that massive weight. If you want to eliminate the delay to speed up, program CV3=00, but when passengers complain about their spilled coffee, don't blame us!

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 directly from the ESU website.

LOCOMOTIVE ADDRESS

Your Rapido F40PHM-2 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 to all functions – motor, lights, sounds, everything. 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 heading for the hills before the railroad police arrive.

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 or use a programming track booster.

— ESU PROGRAMMER USERS —

To successfully program your locomotive using an ESU LokProgrammer or an ESU ECoS DCC system, our onboard Rapido MoPower capacitors must be fully discharged. Until a software patch and/or a hardware fix is available, please allow your ESU-equipped loco to discharge a full five minutes before using an ESU programming track, or allow to discharge one minute before using the ESU Ops Mode (on-the-main programming).

The reason is due to the long duration of our MoPower capacitors that are built into each locomotive's motherboard. There can be a software conflict between a still-powered-up ESU decoder and the ESU LokProgrammer (or ECoS system) where they fight for control, resulting in a failed programming attempt. We expect a fix to be coming soon from ESU, but until then, please follow the suggestions above to successfully program using ESU programming systems. If it doesn't work, wait a little longer and try again.

While waiting around like an impatient Spaniard while a man in black freeclimbs the Cliffs of Insanity is kinda boring, we say take advantage of this newly found free time! Wrestle a giant, pour some wine, or tour a fire swamp (avoid the ROUSes). To speed-a-things up, try using your loco like a flashlight to read freight car numbers, look for that knuckle spring you lost last week, or search for the Pit of Despair...as you wish!

NOTE: This does not apply to *any* other DCC system or controller, just ESU.

TURN ON THE SOUND

Press F8 and you will hear the F40PHM-2 startup sequence followed by the sound of it idling. By default, the locomotive will not move until the startup sequence has played out. If you are really impatient, you can turn this feature off. For information on how (plus a bunch of other things), refer to the full ESU LokSound V5 decoder manual which can be downloaded from ESU's web site. This specific feature is called the “Prime Mover Startup Delay” and is Section 13.2 on Page 95 of the ESU LokSound V5 manual as of this writing.

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.

Robert Allard photo.

Note that if you are listening to your F40PHM-2 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 F40PHM-2 will promptly shut down. They will need to press F8 again.

FUNCTIONS

F0 Headlight/Ditch Lights/Gyralite/Markers
F1 Bell
F2 Horn
F3 Flange Squeal
F4 HEP: Into/Out of "Standby"
F5 HEP: Into/Out of "Run"
F6 Ditch Lights Off
F7 Dim the Headlights
F8 Startup/Mute/Shutdown
F9 Doppler Horn
F10 Independant Brake
F11 Rotary Beacon
F12 Switching Mode
F13 Gyralite Off
F14 Red Warning Light
F15 Metra Station Announcement
F16 Layover System Alarm Light
F17 Dynamic Brake
F18 Coupler Clank
F19 Numberboards Off
F21 Sarco (Spitter) Valve Off
F22 Cab Door
F27 Alarm Bell

FUNCTIONS: MORE INFORMATION

F0 Headlight/Ditch Lights/Gyralite/Markers

An F40PHM-2 has a lot of lights and a lot of light switches. To make things simpler for Metra engineers, there is a "Master" lighting switch which turns on full headlight, gyralight, and ditch lights out of Union Station. To recreate this, F0 works the same way – all of the front lights come on together [one switch to rull them all!]. However, when F0 is on and the engine is in *reverse*, those lights shut off and the two red marker lights illuminate. Remember, it's not officially a train without red markers.

F1 Bell

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. We have provided slightly different bell sounds (even those E-bells that only Jason likes) so that you can add a little variety to your fleet. You can choose between bells by changing CV164 to a value that's from 0 to 5. Ever notice that the ditch lights seem to always be flashing on Metra F40PHM-2s? The bell (or horn) makes them flash but often the bell is ringing for the whole run. So it seems like the ditch lights are always flashing but it's just a deaf ding-a-ling that left the bell on.

F2 Horn

We love our horns. Like really! Seriously, who doesn't love a good sounding horn? So, we've provided a variety of horns for you to apply to your locomotive as

appropriate or as you see fit (even if it's not appropriate). 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. Refer to the "Custom Sound Settings" section below for the CV163 options on the different horns we've included. When you press F2, the horn sounds and the ditchlights flash. Running a Southwest Service train? Do a loud blast as you pass 35th St. and the White Sox will commit another error.

F3 Flange Squeal

Just as you're easing into a sharp curve on your layout, press F3 to hear the metal-on-metal squealing sound all trains are known for. It may also cause dogs to bark and children to cry, but those are the risks you take.

F4 HEP: Go Into/Out of "Standby"

We've tried our best to simulate the Head End Power Mode Switch with the F4 and F5 function buttons on your DCC controller. Once the F40PHM-2 model is on the track, press F8 to turn on the sounds and put your locomotive into Idle. Press F4 to put it into Standby. The prime mover will rev up to 720 RPM. If you don't press F4, the locomotive operates like a freight engine.

Note that when you turn the sound on, your F40PHM-2 will be idling on "Normal Idle" (460 RPM). This is the equivalent of Notch 3. So if you are operating your F40PHM-2 in freight service, you will not hear a transition until you go into Notch 4. In previous F40 models, we had the default idle speed to be "Low Idle." We have since learned that you can't go into Standby from Low Idle. So your F40PHM-2 sounds more accurate than any other Rapido F40 model. Isn't that a peach? Somebody is going to ask if we have Low Idle on the F40PHM-2. No, we don't. Somebody else is going to ask why our F40 doesn't sound like an F7, which is how it is "supposed" to sound. He's out of the band.

IN STANDBY, YOUR LOCOMOTIVE WILL NOT MOVE, EVEN IF YOU ADVANCE THE THROTTLE.

F5 HEP: Go Into/Out of "Run"

With your F40PHM-2 in Standby mode, you can put it into Run by pressing F5. If you don't need to go to Standby, then just hit F4 and F5 in rapid succession. The prime mover will rev right up to 893 RPM and your locomotive will be in Run. It will move when you advance the throttle. This simulates turning the Head End Power Mode Switch directly to Run.

IMPORTANT: IF YOU DON'T FIRST PRESS F4, PRESSING F5 WILL HAVE NO EFFECT.

To go back down to Standby, press F5 again – you are essentially "turning off" the Run mode on the decoder. Then press F4 again to "turn off" the Standby mode and go back down to idle. If you are in Run and you don't need to go into Standby, press F5 and F4 quickly, in that order. The locomotive will skip Standby and go straight down to idle.

When two or more F40PHM-2 locomotives are operating in a consist, only the rear locomotive is providing HEP so only the rear locomotive should be operated in F5 Run mode. This applies whether the locomotives are running elephant style or back to back. The remaining locomotives are operated like a freight engine.

F6 Ditch Lights Off

The ditch lights come on automatically with F0 and the engine is in forward. However, what if you don't want to have the ditch lights on for some strange reason? Press F6 and they will go out. To make them illuminate again, press F6 once more but F0 will need to be on and the engine in forward for them to work.

F7 Dim the Headlights

When approaching an oncoming train at night, press F7 to dim your lights and turn off your Gryalite and ditch lights – you don't want to blind an oncoming train's engineer (but bright lights are still required near grade crossings). Not dimming your lights is a direct violation of what's commonly referred to as "Rule 17." The internet can answer all your questions about said rule.

F8 Startup/Mute/Shutdown

While your locomotive is stationary, pressing F8 will begin the startup sequence of the engine sounds. If your locomotive is silent but already in motion, pressing F8 will skip the startup sequence and simply turn on the sound. If the sound is already on, press F8 to mute the sounds. If your locomotive is stationary, then you will hear the engine shut down sequence before the sound turns off.

> *If you have a DCC system that only allows eight functions, you can remap the following functions following the guidelines in the ESU LokSound V5 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 Doppler Horn

Hit F9 to play a recording of the horn blowing two longs, a short, and a long as legally required when approaching grade crossings or a whistle post. The Doppler effect of getting louder and changing tone as it passes the listener is nicely timed for

a moderately paced train. The ditch lights will flash until you turn off F9, and then for six seconds after that. If you are wondering why your ditch lights have been flashing for the last 20 minutes, you forgot to turn off F9.

F10 Independant Brake

F10 works just like the brakes on a real engine. Press F10, the brakes apply, and your engine will gradually come to a stop. Turn off F10, the brakes release, and the engine gradually accelerates. The default brake sound is based on composite brake shoes but if you hate your eardrums, you can change it to cast iron brake shoes and writhe in pain every time the train stops. Change CV165 from 0 to 1 to hear the glory that is a cast iron brake shoe. **NOTE:** If your loco makes sounds but won't move, make sure F10 is off because it acts like a parking brake, too.

F11 Rotary Beacon

Metra equipped their F40PHM-2 units with a rotary beacon, replicated on our model by using function F11. This light fixture moves a beam of light around in a circular pattern all around the loco. In addition to warning pedestrians and cars along the right of way, it also signals to low-flying aircraft and possibly UFOs.

F12 Switching Mode

Are you one of those folks who models a large yard or engine terminal, like, say 14th Street Yard in Chicago or Eola Yard in Aurora, Illinois? Do you have lengthy light engine moves between engine storage and the coach yard? Then this function is for you! It turns on both front and rear headlights but only on dim so as not to blind your trainmen on the ground. It doesn't affect the speed of the loco, just the lights.

F13 Gyralite Off

Like the ditch lights, the Gryalite light comes on automatically with F0 and the engine is in forward. But what if you don't like Gyralites? [Are you nuts? Gyralites are awesome!] Or what if you want to simulate a burned out bulb? Press F13 and it will shut off. To make it go again, press F13 again but F0 will need to be on and the engine in forward. Otherwise, it won't work.

F14 Red Warning Light

In the same housing as the Gyralite is a red lens that shares the flashing mechanism with the regular white light. The only way to turn it on is with a manual switch in the cab which some engineers do for kicks every once in a while. This light does not come on automatically if the train goes into emergency, unlike Amtrak units.

F15 Metra Station Annoucement

This is verbal warning for waiting passengers that your Metra train is an express train and won't be stopping at the station. In other words, *GET OUT OF THE WAY!*

F16 Layover System Alarm Light

Metra used an engine block heating system that allowed engines to be shut-down to save fuel yet still maintain enough heat in the engine so they don't freeze during Chicago winters. If the system fails, this light alerted someone to the problem. It usually only came on when someone turns on the layover alarm test switch in the cab, or, in our case, when someone hits F16. However, video evidence shows them lit during commuter runs from time to time, so we've included it just in case.

F17 Dynamic Brake

Press F17 to get dynamic brake sounds. Why would commuter engines need dynamic brakes? Well, it does save on brake pads as it changes the traction motors to generators. The resulting electrical power runs through a variable resistor grid on the roof and is dissipated as heat by way of a large cooling fan. Pressing F17 will result in a whirring fan sound but won't actually slow down the model.

F18 Coupler Clank

A 130 ton engine colliding however gently with a string of 60 ton passenger cars will make some noise. So just as you're easing into a standing cut of passenger cars, hit F18 and through the miracle of modern electronics, you'll hear the couplers clank together.

F19 Numberboards Off

When you put your model on the track, the numberboards are on by default. To turn them off, press F19. This is useful if it is the second engine in a "double burner" consist or in an engine storage facility. The numberboard lights aren't that bright to begin with, so you have to be really *machmir* to want to turn them off.

F21 Sarco (Spitter) Valve Off

No, this isn't about the local baseball team's junkball pitcher, this is about water condensation in air tanks. This moisture is removed automatically by air dryers made by Sarco opening the drain valve in the tank every so often, which results in a little "spitting" sound. To silence the spit, press F21.

F22 Cab Door

Our cab doors don't actually open, but you can hear the doors by pressing F22. No, not The Doors, but if you press F22 and hear Jim Morrison singing "Light my Fire," please make an appointment with a nearby mental health professional.

Robert Allard photo.

F27 Alarm Bell

It's a bell that's very alarmed. What is it alarmed about? You don't want to know. Probably something about the engine is about to blow up or something; *blah, blah, blah*. Who knew that you needed coolant and oil pressure to run a 3000Hp engine? To increase your engineer's blood pressure, press F27.

CUSTOM SOUND SETTINGS

The default horn on your model is a Nathan P-5A Old Cast. We have justified doing this because all F40PHM-2s had a Nathan P-5A Old Cast horn. But if you don't like the sound of the one we picked, you can change the default horn by changing the value of CV163. We've also chosen defaults in the remaining categories because someone had to make the important decisions. They can all be changed by adjusting the value of their respective CVs.

Horns

- CV163=0 Nathan P-5A-OC *(default)*
- CV163=1 Nathan P-5A
- CV163=2 Nathan P-2
- CV163=3 Nathan K-5LA (Metra)

Air Dryer

- CV 166=0 EMD Air Dryer #1 *(default)*
- CV 166=1 EMD Air Dryer #2
- CV 166=2 EMD Air Dryer #3
- CV 166=3 EMD Air Dryer #4

Bells

- CV164=0 EMD Steel Bell
- CV164=1 EMD Bronze Bell
- CV164=2 UKM Steel Bell *(default)*
- CV164=3 Graham-White E-Bell
- CV164=4 Transtronic E-Bell
- CV164=5 WC Hayes M-Bell

Brake Squeal

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

MoPower

This model is equipped with MoPower, our capacitor-based temporary energy storage system that lets a locomotive travel over dirty (or dead) rail spots without stopping. The length each loco can move without track power varies by condition of both track and model; your mileage my vary; long-distance rates may apply. **NOTE:** *You will not have control of the loco* when running on MoPower energy, and if you're used to a loco stopping when it shorts at a mis-aligned switch, forget it. Like the prototype, it's not going to stop just because the points are thrown against you (at least until the capacitors are drained). The lengths we go to for more realism!

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.

Sound levels are very much a matter of personal taste, and what sounds great in one layout environment may sound too loud or too soft in another. Fortunately, 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. This can be done either on a programming track or on the main (Ops mode) if your DCC system supports programming on the main. **NOTE**: If you're using an ESU ECoS DCC system or an ESU Programmer, please see our special notice about draining the MoPower capacitors on Page 11 of this manual before trying to change any of the volume settings.

We strongly recommend that you keep notes on which settings you have changed, and which values were used. If you ever need to do a reset on the decoder (see "Factory Reset" below) then having good notes will allow you to easily re-enter any changes that you wish to keep.

Robert Allard photo.

— VERY IMPORTANT —

Before you change any of the volume control CVs (except for the master volume), please make sure that CV 32 is set to 1. CV 32 is used as an index selection register and if you don't set it first then we are not responsible for your resulting rage and the fact that you will probably throw your model against the wall in frustration.

For example, to set the horn volume, first set CV32=01, then CV275=1–255.

EMD F40PHM-2 SOUND VOLUME SETTINGS

KEY	FUNCTION	SOUND SLOT	CV	RANGE	YOUR VALUE
	Master Volume		63	0-192	
F1	Bell	4	283	0-255	
F2	Horn	3	275	0-255	
F3	Flange Squeal	23	435	0-255	
F4	HEP: Standby	13	355	0-255	
F5	HEP: Run	15	371	0-255	
F8	Diesel	1	259	0-255	
F9	Doppler Horn	5	291	0-255	
F10	Independent Brake	29	483	0-255	
F15	Metra Station Announcement	30	491	0-255	
F17	Dymanic Brake	31	499	0-255	
F18	Coupler Clank	9	323	0-255	
F22	Cab Door	14	363	0-255	
F26	Isolation Switch/Low Idle	21	331	0-255	
F27	Alarm Bell	22	427	0-255	
F30	Air Compressor	7	307	0-255	
F31	Short Air Let Off	32	507	0-255	

FACTORY RESET

On your F40PHM-2, you can perform a factory reset by entering a value of "8" into CV 8. Note that this will cause all of 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! If we had a band, you'd be kicked out of it. Again!

You can NOT lose all the pre-recorded sounds on your F40PHM-2 decoder by doing a factory reset. However, after performing a factory reset, your F40PHM-2

may begin to binge watch episodes of *Bozo's Circus* or hum along with Harry Caray's *Take Me Out To The Ballgame* (because it doesn't know the words). If that happens, you have probably lost your mind. But don't worry. Just sit back, grab some popcorn, and enjoy the show.

By the way, pay no attention to the person breaking into your layout room attempting to steal your Rapido F40PHM-2 because they misread the instructions on Page 4.

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 more fully explore the capabilities of the decoder we suggest downloading the ESU LokSound V5 decoder manual from the manual section of ESU's website. For all the different exploded view drawings showing the stupendous number of detail parts for each version of this loco (along with their part numbers), see the Product Support section of our website. There's just too many parts and variations to get them all on one sheet of paper. By the time you read this, the drawings should be there.

LIMITED WARRANTY

We will do our best to solve any problems or issues that you may have with your F40PHM-2 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. While we would love to have an infinite supply of spare parts and do our best to keep as many on hand as possible, eventually these will run out too. In some cases, future productions of the same locomotive may result in a parts supply being restocked, but that is not always guaranteed. If you are like most of us and – after purchasing this locomotive – you put it on the collection shelf under the darkest corner of your layout and are now just discovering it 30 years later after your friend at the club ran theirs, then you are on your own if there are any issues. Jason is long retired and probably touring the country on our restored sleeping car, *Edmundston*. The rest of us have also retired but probably don't have the luxury of our own private rail car. And we're not bitter at all. Really. Not…at… all…

There are several things that this warranty cannot cover. If your F40PHM-2 arrives with a couple of loose grab irons or underbody bits, there is a very good chance

that you can affect 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 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 – contact us directly through our website or give us a call and we'll send you some replacements.

Of course, damage caused by running your locomotive at full speed around a 15" radius curve along the edge of your 60" high layout, weathering it with canola oil, or any other unique damage caused by you and that we haven't been able to cover here is not covered by the warranty. If catastrophe does strike – even as the result of your own actions (or possible inactions) – and your locomotive gets damaged, please give us a shout and we'll do our best to help you out if possible. Don't be shy.

ACKOWLEDGEMENTS

The EMD F40PHM-2 project was very much a labor of love as many of us on the Rapido team also love these locomotives. However, this project would not have been possible without the extensive help and expertise provided by the following folks:

Jeron Glander, Joe Malson, Tom Murray, Ale Reinsmith, Alex Stroshane, and others.

2024

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