IMLEC22

Hosted by Guildford Model Engineering Society

International Model Locomotive Efficiency Competion

GUILDFORD MODEL ENGINEERING SOCIETY

STOKE PARK

RAILWAY

22nd, 23rd and 24th July 2022

Guildford Model Engineering Society
Stoke Park
Guildford
Surrey

www.gmes.org.uk

£2.00

Welcome to IMLEC and Guildford Model Engineering Society

Welcome to *Stoke Park*, Guildford, home of the *Guildford Model Engineering Society* for most of the Club's existence. This corner of the park was originally *Burchatt's Farm*.

We have ground level 5" and 7¼" tracks, raised 3½" and 5" gauge and a short raised test track catering for 2½", 3 ½" and 5". In addition, we have permanent 4mm, 16mm and Gauge One layouts and a 16mm portable exhibition layout.

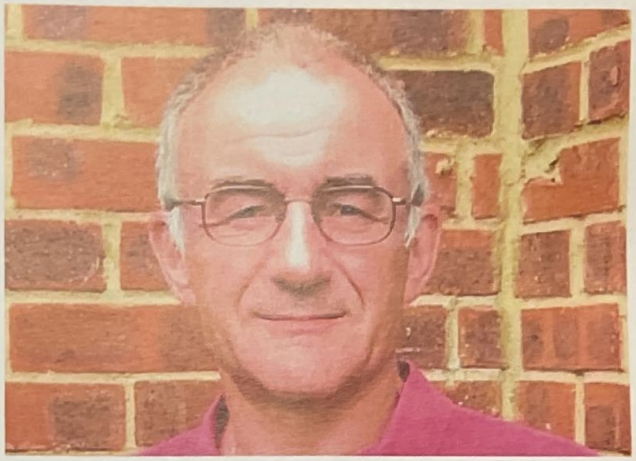
This is the fourth time that Guildford MES have hosted the **International Model Locomotive Efficiency Competition** (IMLEC) that was first run in 1969 by the Birmingham Society with the Winner's trophy donated by Martin Evans, the then editor of *Model Engineer* magazine.

IMLEC has developed over the years and is the major outdoor event in the model engineering calendar that has attracted a large group of followers who attend the event almost every year.

The essence of the competition is to see which locomotive can complete the highest number of laps (within the speed limit!!) in the allotted time while consuming the least amount of coal.

Drivers nominate the size of the load they will haul - the greater the load successfully hauled will have an effect on the results, as the drawbar load (and distance travelled) will be measured during the runs using the GMES Dynamometer car.

Drivers are issued with measured quantities of the same coal and any unused coal will be weighed at the end of their run. Unlimited water



top ups are permitted, but clearly the more water that is used means more coal added to the fire to turn the water into steam! As with all steam locomotives, getting the best out of them is a real skill and miniature locomotives of 3½" and 5" gauges can be quite temperamental.

After each run, the Dynamometer car results and the amount of coal (of known average calorific value) used are combined to calculate the thermal efficiency of the locomotives.

Nobody can confidently say before the event who will be declared the winner - there are too many variables and *Lady Luck* will often play a part - but many of the competitors are regulars and the competition will be fierce but friendly!

So regardless of whether this is your first IMLEC or you're a regular competitor, I wish you best of luck and I hope you enjoy the weekend.

Bill Read
GMES Chairman

And a Welcome from the GMES CME

IMLEC represents a challenge to the driver and how he interacts with his locomotive. To win, they must both be performing near their peak performance.

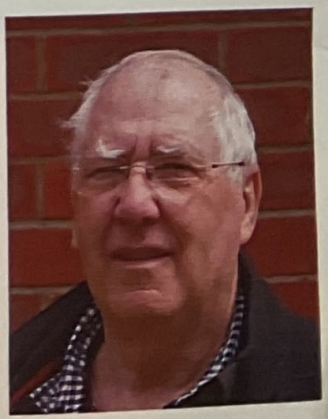
It is an honour for Guildford Model Engineering Society to host IMLEC and to see, first hand, some of the finest locomotives our hobby has to offer.

Our track will fully test the driver's competence with its gradients and curves and skillful driving will be required at all times.

The winner will truly deserve their award.

Andrew Clayton

GMES CME



Stoke Park Railway and IMLEC

The **Guildford Model Engineering Society** started in 1954 and met at various location in Guildford. In 1959 the Society leased five acres of land from the *Guildford Borough Council* on which members built a club house and a raised 3½" and 5" gauge track, oval in shape. With the site being on a slope it was necessary even then to build a cutting on the southern boundary. as this old photograph depicts.

In 1976 this track was extended into the kidney shape it is today. By 1990 the 7" gauge railway had been added around the site.

More recently two engine sheds have been built, together with a large workshop and integrated toilets in the club house. We are currently re-signalling the site; the first stage having resulted in a new enlarged signal box for all gauges. We also have extensive 16mm and Gauge 1 permanent layouts that are becoming ever more popular.

Our annual Rally, commenced over sixty years ago, has changed into a Gala weekend in early July and remains as popular as ever, attracting a wide variety of engineering and craft skills.

Recently, the Society took the decision to name the site as **Stoke Park Railway**, to reflect the growing interest by the public in our activities and the important amenity we offer to the surrounding area.

So it is with confidence that we again host the annual IMLEC, which we have done on three occasions in the past, the last being over thirty years ago.

Much has changed since it was first proposed by Martin Evans and implemented in 1969 when he was editor of *Model Engineer*.

Yet the intentions of IMLEC have remained consistent over the years and in particular the skill of drivers of small locomotives to steam them to maximum efficiency for a full thirty minutes, which demands fine judgement, great ability and not a little luck.

Normal running of small locomotives usually demands haulage capacity with little regard for fuel consumption. Efficiency, however, demands a delicate balance between boiler and motion that can be contained within a scale holding gauge.

No successful designer can ignore IMLEC. The slowly mounting efficiency figures are a sure indication that designers and builders have got the message and are striving to do what real life CMEs did in the past.

IMLEC is not a speed contest or a maximum load demonstration. So what type of locomotive will do well? That is the surprise of the event. Winners over the years have varied between Edwardian single wheelers and BR eight coupled freight locomotives.

This is the appeal of IMLEC – it remains a competition open to all types of locomotives, whilst giving pleasure to those who particiate as well as the many who attend the event.

Extract from IMLEC rules

3. Preparation for the Run

3.1 The host club shall prepare a suitable timetable for the duration of the competition.

3.2 The steaming bay Marshal's instructions with regard to movements shall be obeyed during steam raising.

3.3 Competitors should arrive at the track at least one and a half hours before their run and report to the steaming bay reception. At this point the competitor shall :-

a. Present the necessary documentation including boiler certificate

b. State the amount and grade (size) of coal required for the run. The coal will be weighed and allocated in the presence of the Driver. Additional coal will not be available during the run.

3.4 Ample preparation time shall be allocated to the competitor and the competitor shall be ready to run at his or her allocated time. Failure to run on time may be regarded as a retirement. The Judge shall use discretion and make the final decision.

3.5 The Driver shall use his or her discretion with regard to the appropriate time to light up. (The Driver will be notified of any foreseeable delay to the running time before lighting up.)

3.6 The Driver will be provided with as much dry, or paraffin soaked, charcoal and wood as is required to raise steam. The Driver may use his own wood for lighting up purposes but this must be approved by the steaming bay Marshal.

3.7 Any coal used during steam raising will be from the measured allocation.

3.8 The Driver may decide when to start to use coal but the locomotive must be burning coal before leaving the steaming bay

3.9 The train will be prepared for the Driver with the dynamometer car at the front and sufficient passenger cars to carry the number of passengers he or she requires. (For practical reasons it may be necessary to limit the load or number of carriages pulled in the contest.) The train will be made ready before the locomotive leaves the steaming bay.

3.10 The Driver will be allocated an Observer. The Observer will oversee all procedures between and including raising steam and completing the run.

3.11 The Observer shall give an instruction to move to the start line at an appropriate time. The Driver shall advise the Observer of the number of passengers he/she wishes to take.

3.12 All coupling and uncoupling of the locomotive must be carried out by the host club Marshals, to the Driver's satisfaction.

3.13 The Observer will record the initial dynamometer car readings in the presence of the Driver.

3.14 The Driver shall inform the Observer when he is ready to start the run and the Timekeeper shall give the Driver permission to start.

3.15 If the Driver is unable to commence the run within a reasonable time of the designated start time, he/she will be deemed to have retired.

4. The Run

4.1 The run length is nominally 30 minutes.

- The Timekeeper shall inform the Driver when he has been running for a) 15 minutes and b) 20 minutes.

- The Driver will be notified when he/she has completed 25 minutes of the run, at which point the Driver can either finish the run at the finish line or continue for one (or more, if time permits) further lap(s) but in any event the Driver must start the last lap no later than 30 minutes after the start time.

- The run shall finish before 35 minutes has elapsed, after this point the driver will be deemed to have retired.

Extract from IMLEC rules (concluded)

- Recording will commence and conclude at the Start/Finish Line. (A slight over-run at the finish line will be disregarded.)

4.2 In the event that the Driver does not complete his/her run, he/she shall be deemed to have retired. ('Completing the Run' means bringing the train to a stand upon reaching the Finish Line, the locomotive having reached the Finish Line entirely under its own steam.)

4.3 The total period the train may be stationary during the run will be eight minutes. If this is exceeded then the competitor will be deemed to have retired.

4.4 Water will be provided in suitable containers during the run to enable locomotive water tanks to be topped up without stopping. The amount of water used shall not be recorded or limited in any way.

4.5 Additional coal will NOT be available to the Driver during the run.

4.6 Unused coal will be weighed and recorded in the presence of the Driver upon completion of the run. This will be debited to the recorded coal consumption.

4.7 Only the total weight of coal burnt will be used in the calculations. No allowance will be made for any unburnt coal in the firebox.

4.8 Maximum speed – The host club shall have discretion in respect of safe operational speed limits and make them known to each Driver. Max permitted will be 8mph. The dynamometer car shall provide a speed indication at the Driver's position. The Observer will issue a warning to the Driver of the speed limit if necessary. Three such warnings may result in disqualification. The Observer will have the power to end the run should the Driver be considered to be driving unsafely. In the event of a disagreement the Judge's decision will be final.

4.9 The use of a hand or electric pump is not permitted once the run has commenced. However, it may be used in emergencies when all other means of water feed have failed and in which case the locomotive must be retired and the run terminated immediately.

4.10 The Driver may elect to set down passengers during the first 25 minutes of the run but only when the train is stationary and it is safe to do so. Passengers may not be picked up at any time. In the interests of safety, the Guard may, at his discretion, instruct that passengers be redistributed throughout the train. After 25 minutes, passengers may not be unloaded until the end of the run, otherwise the driver will be deemed to have retired.

4.11 No external assistance is to be given to the train in any way whatsoever, at any time during the run.

4.12 The Driver shall have access to a train brake for emergency use only. Any use of the brake under non-emergency conditions may result in disqualification. This includes use of the brake to slow the train at any point. The brake may be used to stop the train at the end of the run.

4.13 ~~The use of sand to improve adhesion will be at the discretion of the host club. Any Driver may request that the track be sanded. (If the host club has a strict policy on the use of sand on the track, this shall be made clear on the application form.) However, any locomotive fitted with working sanders shall be allowed to use them for the purpose of sanding the track.~~

For the 2022 IMLEC, GMES will not allow any form of sanding on the track during the competition.

4.14 The host club will endeavour to post the results of each run as soon as possible following the end of the run.

4.15 In all matters relating to the competition, the decision of the Judge is final.

Friday 22nd July 2022

Nick Jackson — *Start time: 12.00* — Speedy *1501* — 5"

Based on F. W Hawksworths' *15xx* pannier tank class which was designed for heavy shunting work on the Western Region of British Railways, LBSC designed the 5" gauge model *Speedy*. This example *1501* is owned by Bruce Davey and was completed in 1979 by Jim Griffin.

Visiting from her home club just up the road in Leatherhead at the *Surrey Society of Model Engineers Railway,* she has recently undergone recommissioning work this year to bring back into operating condition after a number of years of storage.

Tom Parham — *Start time: 12.45* — Peppercorn A1 *Tornado* — 5"

Edgar Playfoot has kindly let me run his loco this year. Edgar said 'Following the completion of my 5"g B1 in the guise of the full-size *Mayflower*, which won me a gold medal, I decided to build a Peppercorn A1 and chose Michael Breeze's design.

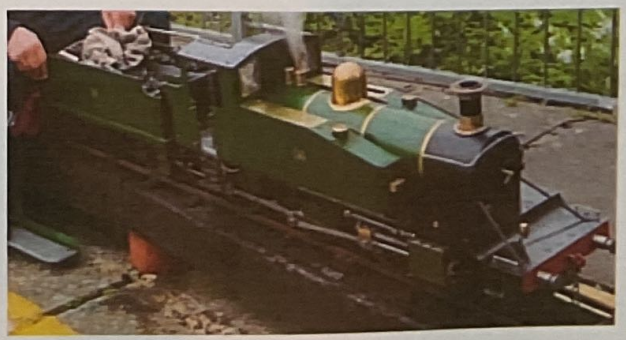
In 2008 I was able to acquire a set of castings from a chef in Hull who many years earlier had purchased them direct from the designer. My enthusiasm waned somewhat during the build. I eventually completed it during 2012 in the guise of the full-size *Tornado* modifying the tender to suite. Martin Parham kindly created the nameplates for me. I am currently building a 5" Duchess but my enthusiasm continues to wane'.

David Shepheard — *Start time: 13.30* — Polly 5 — 5"

I built my *Polly* about twenty years ago.

She has been very reliable over the years and completed three previous IMLECs at Bournemouth, Birmingham and Maidstone, as well as most of our club running days.

I am also a member of the *Polly* owners group and we have meetings twice a year at different tracks.

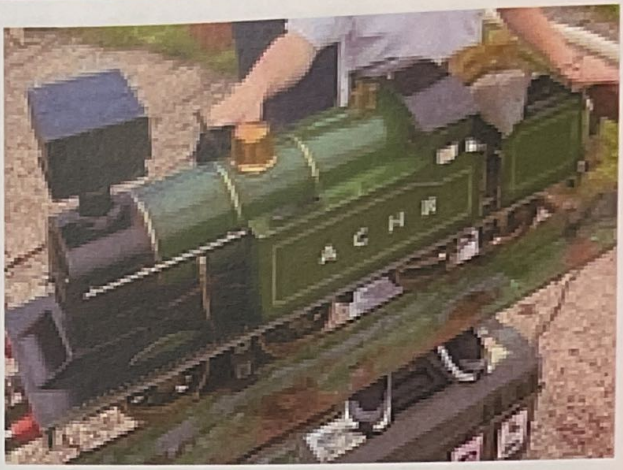


Les Pritchard — *Start time: 14.15* — 0-6-0 Tank *Mona* — 3½"

Mona was built by the late Alan Hall and was given to me by his wife, along with his B1 *Springboc* Locomotive and his model boat.

Mona was his first locomotive and is a 0-6-2 inside cylinder locomotive in 3½" gauge based on a L.C and D.R radial tank engine number 99.

Designed by LBSC and described in the original *Model Maker* series magazine, the loco was constructed in the mid 1970s. It has a silver solder boiler with soft solderstays, it has been in several *LittleLecs* since I've had it.



Danny Hayward — *Start time: 15.00* — 2-8-2 *Mustang* — 3½"

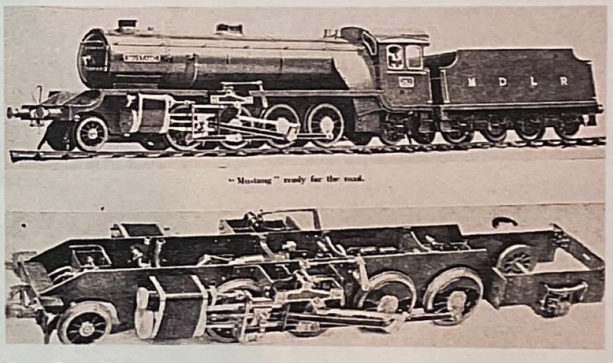
Mustang was built in 1944 by Mr R.C.Marshall.

The locomotive came into my possession in 2021 and was in a stripped down state with an unfinished boiler.

So I set myself the task of having *Mustang* ready to ride the railes for IMLEC 2022.

The chassis has been completely rebuilt, the new boiler finished off and the tender given a once over. All topped off with a fresh coat of paint in her new livery, but that won't be seen until she arrives.

I would like to say a big thanks to Mr Chris Lyal for finishing the boiler, Mr Peter Ridgeway for help on the chassis and Mr Ben Pavier for the use of his workshop and advice.



Matt Butler — *Start time: 15.45* — LNER *B1* — 5"

The loco was bought as a well advanced chassis from it's previous owner, the boiler was made by Paul Tompkins, and then was finished off as a complete loco.

The loco has run at two previous IMLECs under its former owner.

The loco is now owned by *Guildford Model Engineering Society* which required an additional passenger hauling locomotive to supplement its running fleet on open afternoons.

John Williams — *Start time: 16.30* — Nigel Gresley 2-8-0 — 5”

This a Martin Evans 5” gauge *Nigel Gresley* 2-8-0. It is pretty much to the design.

It was bought last year as an almost complete engine but has been taking apart and put back together with some parts being modified or completely remaking on the way.

Some of it was just clean up, painted and put back together.

It will be interesting to see how it does as it will be the first time with a decent load behind.

This will be my 5th entry into IMLEC

Saturday 23rd July 2022

Glen Davies — *Start time: 09.30* — 0-6-0 Simplex *Janine* — 5”

I built this locomotive from castings kindly given to me by my father. They had been sat in a box for over forty years.

This is my first locomotive and the build time was approximately four years.

I have modified the tanks and cab to give the locomotive a victorian feel. I have also redesigned the water pump giving it two opposed cylinders, making it smooth in operation.

The remaining parts are totally standard and to Martin Evans drawings.

The locomotive has successfully run at the Bracknell track for the last two seasons.

Robert Hurst — *Start time: 10.15* — S&D 7F *53807* — 5”

The 7F was designed by Henry Fowler for the *Midland Railway*, for use on mineral freight trains over the challenging Mendip hills of the *Somerset & Dorset Joint Railway.*

Built in 1925 at Robert Stephenson Doncaster works, 53807 was the last of the class to be withdrawn in 1964.

This 5” gauge model was built by Ivan Hurst over a period of four years and was completed in 2010. Displayed at the GMES Rally that year, it went on to win the *Comben Cup.*

After several seasons of public passenger hauling, 53807 received heavy overhaul in 2020.

Competing in IMLEC 2021 hosted by Maidstone MES, 53807 came a creditable 5th place with an overall efficiency of 1.172%

Simon Batten — Start time: 11.00 — 0-6-0ST *Jack* — 5"

This rare completed example of Don Young's *Jack* is one of three locomotives built by the late Dennis Mortimer of *Romney Marsh* and *Maidstone* clubs.

The loco was purchased in a partly dismantled state, with some parts missing after Dennis sadly passed away. Since then the loco has been completely rebuilt and repainted. The loco is fairly close to the published design. Working pressure 90 psi, cast iron cylinders with slide valves and silicon piston O rings. Twin copper radiant superheaters. It's easily capable of passenger duties on public running days.

Roger Holland — Start time: 11.45 — Gresley A4 *Wild Swan* — 5"

The owner built *Wild Swan* over a period of four years using Michael Breeze drawings with several amendments. The only castings used were for the six coupled wheels. Bogie wheels and trailing wheels were machined from solid as were the three cylinders. Everything else was fabricated by the owner.

Over the last eight months the engine has been stripped down, overhauled and repainted in deep Brunswick green.

The owner has driven the engine in eight previous IMLECs, his best result being 5th at Bournemouth in 2014 and the worst half a lap at Leyland. The main problem is with the driver - not the engine.

George Winsall — Start time: 12.30 — Hunslet *Lilla* — 3½"

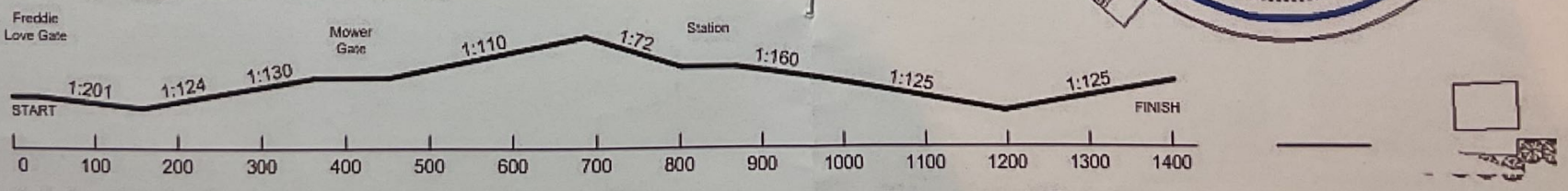
The locomotive is a model of the Quarry Hunslet *Lilla* which worked at the Cilgwyn and Penrhyn Quarries and can now be found preserved on the Ffestiniog Railway.

It was built by my grandfather and previous IMLEC winner (1974) Fred Winsall in the 1990s to the design by Ross Harrison, and only ran a few times before being sold.

I had the opportunity to bring to loco back into the family in December 2021 and decided to enter her in IMLEC to celebrate! This will be my 9th IMLEC, with a previous best of 3rd place at Nottingham (2015).

IMLEC Weekend
22nd, 23rd & 24th July 2022

GMES Raised Track Profile
(exaggerated vertical scale)



Andy Nash — *Start time: 13.15* — Gresley A4 *Spitfire* — 3½"

Originally named *Flying Scotsman*, rebuilt by Stewart Christenssen and renamed *Spitfire* in 2014 to look more like the 'pacific' No 8 *Hurricane* running on the *Romney Hythe & Dymchurch Railway*.

She is two cylinder with a copper, superheated boiler. One injector, single ram axle pump and a hand pump. It is painted in British Railways style experimental blue livery of the late 1940s, with *Romney Railways* on the tender in the style of 'British Railways'.

This photo shows Nigel Gresley (Chief Engineer of the LNER) and designer of *Flying Scotsman* driving what appears to be this loco in 1937.

She can be seen running on the club tracks of the *Romney Marsh Model Engineering Society* at New Romney & at Mote Park Maidstone (Maidstone MES).

Nick Feast — *Start time: 14.00* — Q1 0-6-0 — 3½"

This locomotive was completed in 2006 and was built to my own design, based very much on Don Young's Derby 4F.

It uses Joy inside valve gear and two inside cylinders of 30mm diameter.

A construction series was published in the *Model Engineer* during 2009/10 and drawings are still available from *Polly Model Engineering*.

I have completed two further models to the design including a 'might have been' 0-6-4 tank.

I competed in the Guildford OMLEC in 2007 and achieved an efficiency of 0.315%, hoping to improve this time!

Tom Taylor — *Start time: 14.45* — Derby 4F — 3½"

This engine was acquired from a well respected model engineer in South Wales as a running and working project to finish and detail. After running for a couple of years I realised the engine required some modifications to suit my style of driving. Since it was ready for a new Hydraulic in 2021, I have made some improvements to detail and bodyworks, new steps, injectors and pipework before it has been recently certified again for another 4 years. The number is based on a 4F based in Warrington before they were scrapped which is a good fit for its short chimney and big dome.

Andy Healey — Start time: 15.30 — Britannia *Apollo* — 5"

This is my nephew's locomotive and I am driving it in memory of him.

It took Karl fourteen years to build, in between attending university at Rotherham for five years, coming home just at weekends and then working as an engineer at Littlebrook Power Station.

Karl has entered three IMLECs with this loco and has been a competitor since 2004 driving grandad Ben's engines.

The picture is of Karl and Ben and his beloved Britannia *Apollo*.

Alan Crossfield — Start time: 16.15 — Ex LMS Patriot — 5"

Built primarily as an exhibition model, the locomotive was completed in time for the 2013 Harrogate M.E. exhibition where it was awarded the *Myford Trophy* for best locomotive, plus the *Barry Jordan Shield* for 'Best exhibit in show'.

Later that year it was shown at the National M.E. exhibition at Sandown Park where it took 'Gold' plus the *Bradbury Winter Cup*. One year later, at the same exhibition, it was awarded the *Duke of Edinburgh Trophy*.

In 2016, the locomotive made its one and only IMLEC appearance so far, at Urmston, where it took third overall place.

Ben Pavier — Start time: 17.00 — LNER Q5 — 5"

Based on LBSC's *Netta* design.

The only castings used are the wheels and eccentric straps. She's fitted with balanced slide valves, radiant superheaters and an exhaust helix (takes the turbulence out of the flow and reduces back pressure).

I've entered three times previously with this engine. Her highest placing has been 6th with 2.033%.

This is my 15th IMLEC, won once, second twice and have got the best 3½" gauge once. I love it, and the crowd that comes with it.

Sunday 24th July 2022

David Mayall — Start time: 09.30 — 0-6-0 Speedy — 5"

This is the sixth locomotive I have built and was completed in 2001. It has been entered into a few IMLECs over the years and managed 2nd place at Southport in 2017, and again 2nd at Maidstone 2021, maybe this is the year.

Due to the fitting of cladding the boiler barrel is smaller. The consequences of this is that it has eight less tubes and one flue less than the original design, but has not been detrimental to its steaming, it also four radiant stainless super heaters.

The blast pipe arrangement has been modified to an article in *ME* and has been a great success, fitted with a GWR safety valves as per Gordon Smith design and it also has Don Young modified valve gear.

Luke Bridges — Start time: 10.15 — Polly Trojan — 5"

After building a *Polly 6*, which ran very well for a number of years, it was decided to build another.

Seeing the prototype *Polly Trojan* at *Ally Pally*, a decision was made and a deposit made.

My dad works for the Port of London Authority and so it was decided to build her as one of their docks shunters from the Isle of Dogs, *PLA No 53*, to which she bore a close resemblance anyway.

She is lightly modified from standard and has been running regulaly into her 5th year with only minor work needed for her heavy workload.

Chris Dore — Start time: 11.00 — LNER B1 Nyala — 5"

This model was bought from *Station Road Steam* in 2019 as a new build un steamed locomotive. It was also seized in the cylinders/piston valves.

It is built to Martin Evans *Springbok* design although the boiler has tubes arranged the same as Martin's later *Enterprise* design. It is fitted with two radiant super heaters.

A number of jobs were required to commissioning it to running order including revised injector steam valves, twin mechanical lubricators (one for each cylinder), revised safety valves, balancing the weight distribution and springing. It is now a reliable and regular club working loco.

John Cottam — Start time: 11.45 — LNER P2 *Wolf of Badenoch* — 5"

The 5" gauge 2006 *Wolf of Badenoch* was built by me from January 2007 to Michael Breeze's drawings and the *National Railway Museum's* full size drawings, with my own adaptations.

The locomotive, boiler and tender to seven and a half years to make, using my Bridgeport milling machine, Colchester Student and Myford lathe, including painting, spraying and lining in a walk-in greenhouse in my workshop.

The locomotive finished 3rd in 2014, 1st at Nottingham in 2016, 3rd at Maidstone in 2021 and I am now experimenting with a *rosebud* grate as it improves with my *Merchant Navy*.

Steve Eaton — Start time: 12.30 — German DB 2-8-0 — 5"

Locomotive was designed and built by me with the outline of the German DB locomotives.

It has a combustion chamber boiler, slide valve cylinders, axle pump, donkey pump and injector.

I built the locomotive with the idea that I could experiment with different things so parts were made so they can be changed without to much hassle, the cylinders can be sleeved for different bore size for example.

The engine has entered the competition before but suffered an airlock in the water pump.

It still finished but made for a frustrating run, hopefully this won't happen again!

David Kerry — Start time: 13.15 — BR 9F — 5"

This locomotive was built by me to Les Warnett's design with more details: steam operated drain cocks to full size design; two injectors large and small (no other pumps full size).

The boiler was built by me with help from my wife. Painted by me BR Green and lined.

Tender altered as full size with would be working water scoop.

Built over about fifteen years with a house move and building a workshop of some three to four years in the middle.

Run in about six IMLECs.

Best finish: 5th at Nottingham.

Billy Stock

Start time: 14.00 Britannia *William Wordsworth* 5”

This 5” gauge Britannia *William Wordsworth* was built by Barrie Purslow from a *Winson* kit and was completed in 2000.

The following ten months were used to modify and improve the locomotive, including machining and fitting a pair of new cylinders.

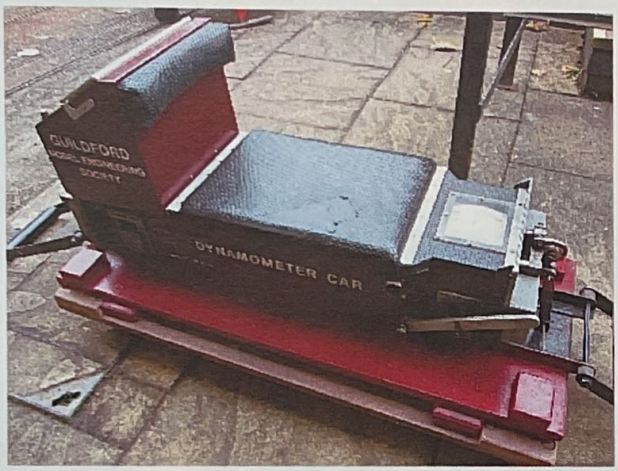
Billy purchased the locomotive in 2018 and will be driving in the competition. Since purchasing the locomotive, Billy has made a few modifications, including fitting steel tyres, changing the valve gear geometry to improve valve timing and adding some weight.

Where this year’s competitors have come from

The GMES Dynamometer Car

The GMES Dynamometer Car is a "transmission dynamometer" in that it measures the work done in moving an attached load, rather than applying a load within the dynamometer as is the case with

an absorption dynamometer. It was designed and built in the early 1980s by GMES Members Ed Pitkethly and David Neish, and used for the 1983 IMLEC held at Guildford MES



Work done is defined as force applied times distance travelled, and at the centre of the vehicle is a disc and ball type mechanical integrator which is used to measure the work done from the drawbar pull force and the distance travelled.

The integrator was obtained from a Government Surplus RAF navigation system, and thought to be part of an Air Position Indicator.

The drawbar is stainless steel and has a superfinished surface and is supported in Teflon bushes. It is fitted with calibrated springs and has an extension coupled directly to the ball cage in the integrator to provide the drawbar force input in lbs. Two pairs of calibrated springs give full scale deflection of the drawbar pull indicator for loads of 50lbs, or 100lbs, and with both pairs, 150lbs.

The dynamometer can be used with both 3½" and 5" gauge locomotives and incorporates a selectable 2:1 lever in the front coupling for use with smaller engines if required.

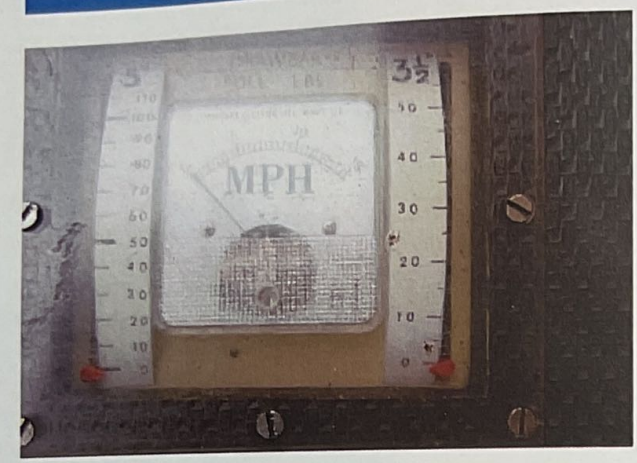
The disc in the integrator is driven by a toothed belt from the rear axle whose wheels have a flat tyre profile ie no coning, and they are one foot in circumference. This provides the distance input in feet. The belt drive layout allows full axle box spring movements without affecting the belt tension.

Bevel gears then transmit the integrator's roller output in ft lbs vertically to the work done counter in the Observer's instrument panel at the rear of the vehicle.

Also driven by the gearing from the disc input shaft are a distance counter in the Observer's panel and a tacho-generator supplying a voltage signal to the speedometer.

Speed and drawbar pull measurements on the Observer's panel are repeated on the small front panel for the driver.

The GMES Dynamometer Car (concluded)



The Driver rides on the Dynamometer Car, and the Observer rides at the front of the following passenger carriage.

Calibration is achieved by moving the Dynamometer over a measured 100ft distance with a known constant load applied to the drawbar by the use of a spring balance and jack screw to apply the load.

The Dynamometer Car weighs about 80lbs and its maximum design speed is 13.6 mph (20ft/sec) which is limited by the counter speed.

A fuller description can be found in the 20 May 1983 edition of Model Engineer.

Acknowledgements

Guildford Model Engineering Society would like to thank the ***Model Engineer*** magazine for sponsoring the Competition and providing the prize monies presented to the winners.

Guildford Model Engineering Society would also like to acknowledge the generosity of **Owl Castings** (https://www.owlcastings.co.uk) who have designed and provided the souvenir cast badges for all the contestants, plus special ones for the winners.

Scan for details of Owl Castings

For more information about their design and manufacturing services for many business sectors including model engineering please scan the QR code.

The GMES Council of Management would like to say a massive thank you to all the GMES members and volunteers who have helped with every aspect of organising and running the Competition over the weekend, and thank you to all the Competitors without whom there would be no competition, and finally to all the spectators who have come along too.

Previous IMLEC Winners

1969 Birmingham
John Drury 5" Royal Scot
1970 Witney
Len Labram 5" Firefly
1971 Southampton
A Haydon 5" GWR Dean Single
1972 Tyneside
Norman Spink 5" GWR 57XX
1973 Chingford
Pat Killian / B Longstaff 5" LNER L1
1974 Bristol
Fred Winsall 5" Nigel Gresley
1975 Tyneside
Laurie Joyce 3½" GWR King
1976 Kinver
Bill Perret 5" Speedy
1977 Chingford
Bill Perret 5" Speedy
1978 Guildford
Percy Wood 5" Maid of Kent
1979 Bristol
David Morris 5" Sterling Single
1980 Bedford
Percy Wood 3½" BR Class 7
1981 Bournemouth
Percy Wood 5" LNER J39
1982 Leyland
Roy Armsbury 5" GWR de GLEN
1983 Guildford
Les Pritchard 5" Royal Scot
1984 Bristol
Les Pritchard 5" Royal Scot
1985 Urmston
Alan Crossfield 5" Nigel Gresley
1986 Bournemouth
Alan Crossfield 5" Nigel Gresley
1987 Birmingham
Kelvin Moonie 5" LSWR Adams
1988 Leeds
Lionel Flippance 5" BR Proposed 2-8-2
1989 Leyland
Lionel Flippance 5" BR Proposed 2-8-2
1990 Guildford
Lionel Flippance 5" BR Proposed 2-8-2
1991 Bristol
Kevan Ayling 5" BR Proposed 2-8-2
1992 Leeds
Dave Sutcliffe 5" S&D 7F
1993 Leyland
John Heslop 5" Stanier
1994 Gravesend
John Heslop 5" Stanier
1995 Kinver
John Heslop 5" LNER Class P2
1996 Northampton
Alan Crossfield GWR Manor
1997 Llanelli
Len Steel 5" Britannia
1998 Kinver
Kevan Ayling BR Proposed 2-8-2
1999 Northampton
Jim Elliot 5" Speedy
2000 Leyland
Lionel Flippance 5" BR Proposed 2-8-2
2001 Cancelled
2002 Leeds
Geoff Moore 5" B1
2003 Bristol
Geoff Moore LSBC Minx
2004 Kinver
Glyn Winsall 5" 01 2-8-0
2005 Northampton
Ballan Baker 5" K1
2006 Fareham
Les Pritchard 5" L&Y 0-6-0
2007 Llanelli
Steve Eaton 5" Britannia
2008 Southport
Brian Remnant 5" N.G. 0-4-2ST
2009 Bristol
Neil Mortimer Freelance Polly III
2010 Bournemouth
Steve Eaton 5" Britannia
2011 Bromsgrove
Ben Pavier 5" Britannia
2012 Nottingham
Lionel Flippance 5" BR Proposed 2-8-2
2013 Leyland
Steve Eaton 5" Black Five
2014 Bournemouth
John Cottam 5" LNER P2
2015 Nottingham
John Cottam 5" LNER P2
2016 Urmston
Lionel Flippance 5" BR Proposed 2-8-2
2017 Southport
Paul Tompkins 5" Britannia
2018 Birmingham
Lionel Flippance 5" BR Proposed 2-8-2
2019 Leyland
Marcus Peel 5" B1
2020 Cancelled
2021 Maidstone
Billy Stock 5" Britannia

Results Table for your completion

Run number	Name	Work done	Running time	Coal used	Distance travelled	Load	Overall thermal efficiency
1	Nicholas Jackson	991200		2.54	6,230	5	0.342 RET
2	Tom Parham	2468800		1.85	12 650	9	1.185
3	Dave Shepherd	2 1010		1.12	2230	6	0.174 RET