No. 166, March/April 2020 US $5.95
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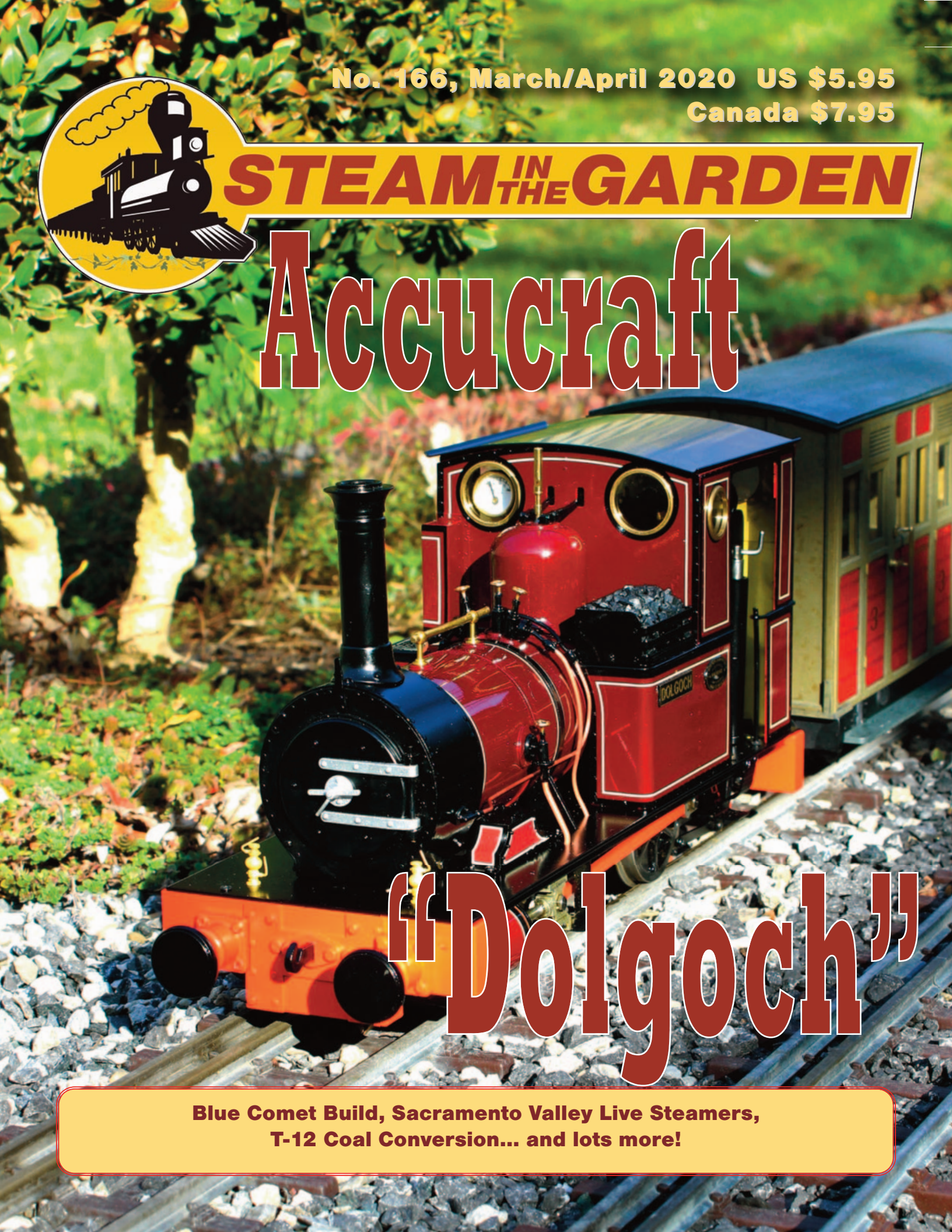
STEAM IN THE GARDEN

Accucraft



"Dolgoch"

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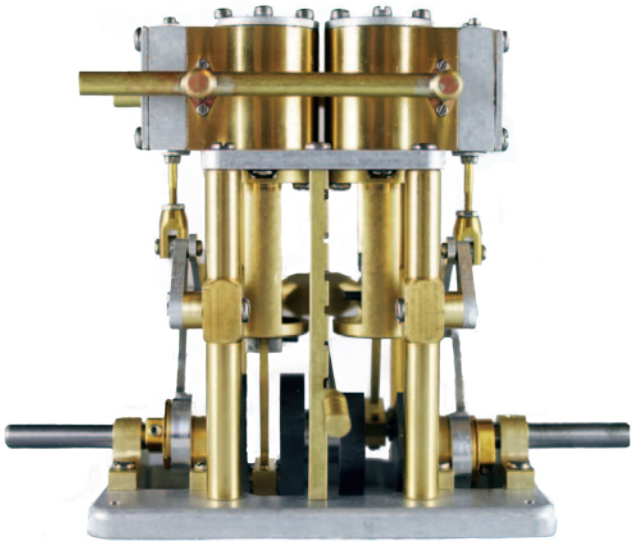

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Double acting, twin cylinder
Hackworth reversing gear
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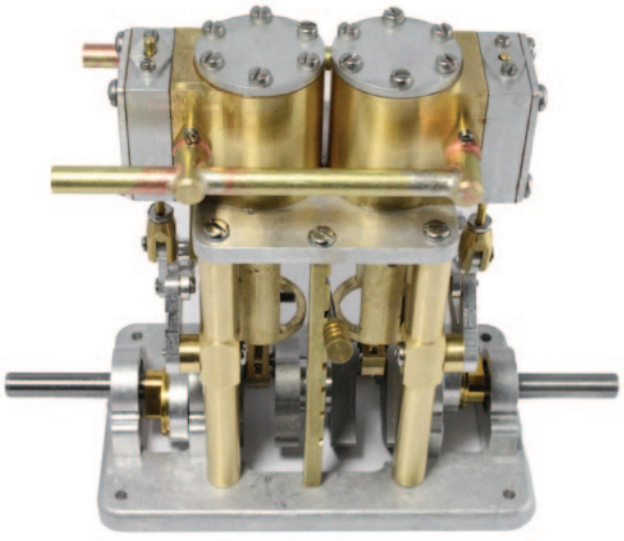
Dimensions:
Base: 3.000" x 1.844"
Crankshaft end-to-end: 4.344"
Height: 3.375"
Weight: 327 g



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Ready to assemble steam engine kit: $295
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Includes all hardware
SAME AS TVR1A but with shielded ball bearings
Includes full-color assembly manual
Dimensions: Same as TVR1A
Weight: 323 g

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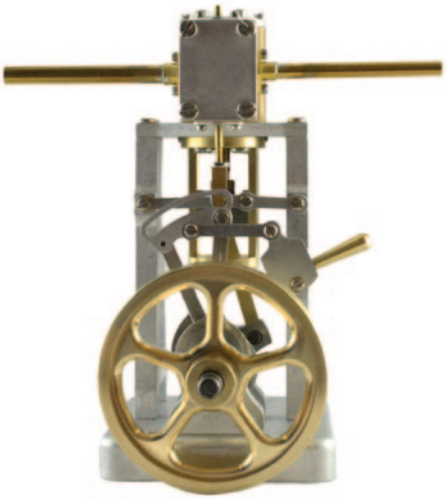
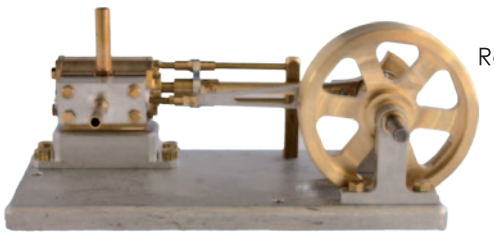
1 3/4" DIA (5 Spoke)

BFLY2: $30
1 3/4" DIA (6 Spoke)





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Ready to assemble steam engine kit: $95
Fully Assembled and Tested: $145
Kit includes all hardware
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Includes full-color assembly manual

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Ready to assemble steam engine kit: $119
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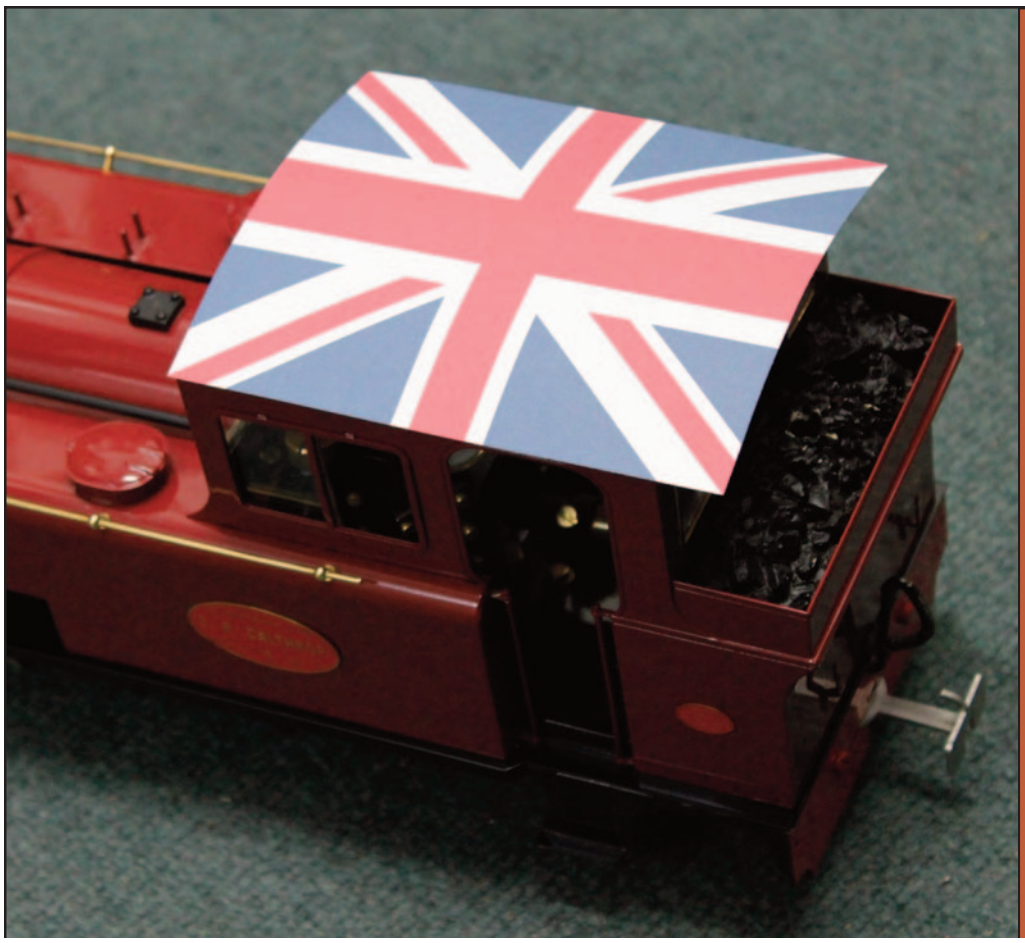

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Vol. 29 No. 6; Issue No. 166; March/April 2020

STEAM IN THE GARDEN

Gather friends, while we inquire,
into trains, propelled by fire ...

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POSTMASTER: Send Form 3579 to Steam in the Garden, P.O. Box 335, Newark Valley, N.Y. 13811-0335.

Subscriptions for the United States, Canada or overseas should be mailed to Steam in the Garden, P.O. Box 335, Newark Valley, N.Y. 13811-0335. Phone, fax and e-mail subscriptions are gladly accepted and we take VISA, Discover and MasterCard. PayPal payments are also available. Phone: (607) 642-8119; fax: (253) 323-2125.

Hobby retailers: Contact Kalmbach Publishing Co. at (800) 588-1544, ext. 818, if you wish to stock Steam in the Garden in your store.

Steam in the Garden LLC
A Utah corporation

Dan Pantages, **President** — Howard Freed, **Secretary/Treasurer**

Marie Brown, Scott McDonald, Paul Scheasley, Sonny Wizelman

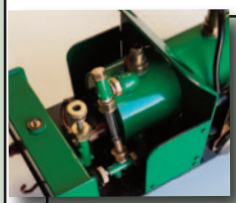
Editorial: P.O. Box 1539, Lorton, VA 22199 USA

Advertising: 10321 Northvale Road Los Angeles, Calif. 90064-4330 USA

Circulation: P.O. Box 335 Newark Valley, N.Y. 13811-0335.

Steam in the Garden (USPS 011-885, ISSN 1078-859X) is published bimonthly for $35 (Canada: $US42; Overseas: $US72) per year (six issues) by Steam in the Garden LLC, P.O. Box 335, Newark Valley, N.Y. 13811-0335. New subscriptions, please allow six-eight weeks for delivery. Periodical postage paid at Newark Valley, N.Y., and additional mailing offices.

http://www.steamup.com/



Cover: An Accucraft "Dolgoch" is ready for a run. See the review starting on Page 10.
Photo by Jeff Young

LATEST WAYBILL

In Memoriam
Paul Brink
1939 - 2019

Rick Parker Photo

Our close-knit train community lost a champion last Thanksgiving Day when Paul Brink passed away. Paul was a frequent attendee at Diamond Head, Mississippi, and the National Summer Steamup in Sacramento, California. His "On the Brink" steam table was always available at the Summer Steamup, as well as at regular steamups at his home. He had been a member of the Sacramento Garden Railway Society since its inception in 1997, and had developed a 'sparky' garden railroad as well, which he was happy to host for conventions and other public events.

Paul was interested in live steam even before joining SGRS, and bought his first Roundhouse locomotive while on a trip to England. He was also a member of the Sacramento Valley Live Steamers Railroad Museum, where he was involved in building the permanent G gauge layout. He also enjoyed riding on the seven and one-half inch gauge trains.

Paul was known for being especially helpful to 'newbies' in the hobby, and would help gauge wheels, adjust lubricators and the like. For instance, he once fixed a newbie's balky engine by wrapping the burner in nichrome that he 'just happened' to retrieve from his wife's dead hair dryer, and turned it into a more efficient radiant burner. In 2015 Steam Events, the organizers of the N.S.S., awarded Paul the Ron Brown Memorial Award in recognition of his contributions to the hobby.

Paul was a member of the ROTC at American River College and afterward served in the US Air Force. When he returned from service he went to work for Pac Bell Phone Co. He retired early and continued to do some fiber optic work on the space shuttle with Pac Bell. When not working he traveled extensively with his wife Janet. Their holiday weeks always included a train ride with family. He was preceded in death by his wife Janet Brink. He is survived by three daughters, Bonnie Vanschoiack, Joyce O'Connor and Annette Wing, ten grandchildren, and thirteen great-grandchildren.

Paul Brink traveled on the train of life.

— Stephanie Huntingdale

Accucraft Announces Narrow Gauge 1:20.3 D&RGW C-18, Live Steam & Electric for 2020

Union City, CA - Accucraft recently announced the planned mid-2020 release of the D&RGW Class C-18 2-8-0 Consolidation Type in both live steam butane fired and electric. Of the several C-18s made by Baldwin, the #315 and #318 are only ones to survive to today thanks to restoration efforts. Both were originally built for the Florence & Cripple Creek Railroad by Baldwin Locomotive Works.

Planned Specifications

- 1:20.3 Scale / 45 mm Gauge
- Brass & Stainless Steel Construction
- 48 in. (1.2 M) Mini. Radius
- Length: TBD
- Width: TBD
- Height: TBD

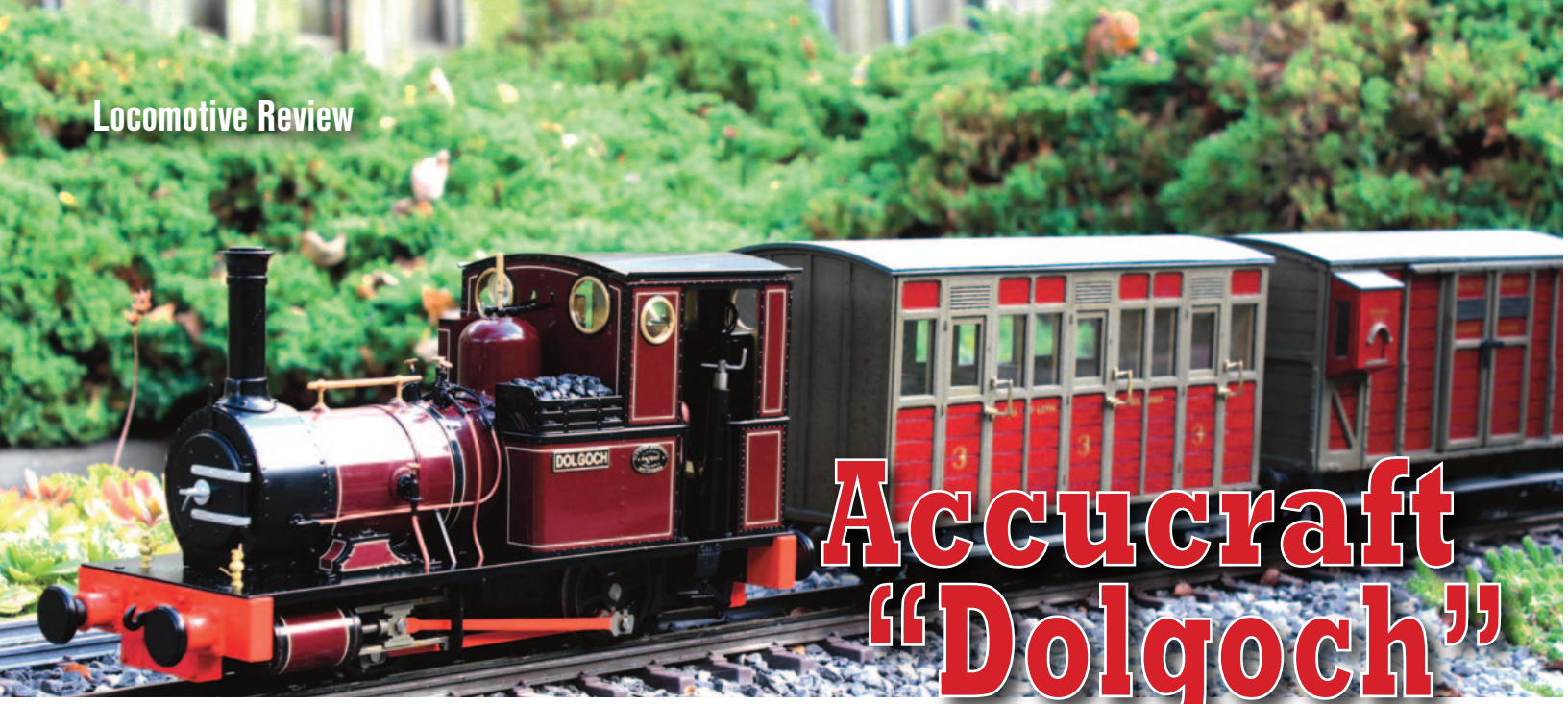
Live Steam Features:

- Butane fired
- Stephenson valve gear
- Water level gauge
- Ceramic butane burner
- Safety valve
- Pressure gauge
- Lubricator
- Goodall valve
- Hand pump and axle pump sold separately

Numbers: Undecorated, #315, #318. Preorder to have the axle pump and hand pump factory installed.

Planned MSRP: $2495.00 Electric, $2595.00 Live steam standard, $2895.00 Axle Pump & Hand Pump Installed

The production batch will be heavily dependent on preorders and expressions of interest. No deposits required.



Accucraft "Dolgoch"

Text and Photos by Jeff Young

Introduction

It has always occurred to me that one of the great mysteries of the small scale live steam hobby was why the Talyllyn Railway locomotives seemed to be overlooked by the major manufacturers. As the world's first preserved railway, the Talyllyn Railway is known far and wide and in particular, its two original locomotives No. 1 "Talyllyn" and No. 2 "Dolgoch" exist and are in operation to this day. Added to this was the fact that both locomotives are small (even by narrow gauge standards), something that would appeal to those modellers looking for a live steamer on the smaller side. A number of years ago, I had a discussion with Bing Cheng and Ian Pearse of Accucraft about the possibility of doing such a model of "Dolgoch" in 16mm scale, based on the recent success of their 7/8ths scale Groudle Glen locomotive "Sea Lion", which had roughly the same overall dimensions. Unfortunately, there was no interest at that time.

Fast forward a number of years and a shiny, new Accucraft 16mm scale live steam model of "Dolgoch" sits here on my desk as I write this. In releasing "Dolgoch", Accucraft decided to donate a percentage of the retail profit from each sale to the Talyllyn Railway for a future overhaul of "Dolgoch", with a slightly higher percentage if the model was bought direct from Accucraft UK Ltd. (Which I chose to do in purchasing mine, being a long time member of the Talyllyn Railway Preservation Society).

"Dolgoch" is offered by Accucraft in three paint schemes: Crimson Lake (a deep maroon, thought to be the paint scheme supplied by Fletcher Jennings in 1865), Apple Green (as it was repainted in 1945 during its rebuild by Atlas Foundry) and finally Talyllyn Railway Preservation Era dark green. As the original production run of "Dolgoch" quickly sold out in mid-2019, a further batch was announced. This includes an additional version in the Indian Red paint scheme the prototype currently wears. The various paint schemes are supplied in either 32 mm (Gauge O) or 45 mm (Gauge One) versions but the model is not gauge adjustable.

The Model

My "Dolgoch" example is a Crimson Lake version in 32mm gauge. The quality of paint and lining is very commendable, particularly on what is the probably the most complex of the liveries produced. The level of detail is remarkable, with all the piping, valves and details reproduced accurately. Because of this, a bit of care is needed in handling of the locomotive to preserve them. The detail on the etched name and builder's plates are crisp. The model has working spring buffers and a center hook coupling as per the prototype. Accucraft indicates that the center hook can be replaced with their standard chopper couplers if so desired.

The locomotive's cab roof is hinged in now what has been become typical fashion for Accucraft locomotives. Tucked in the right side of the cab is the

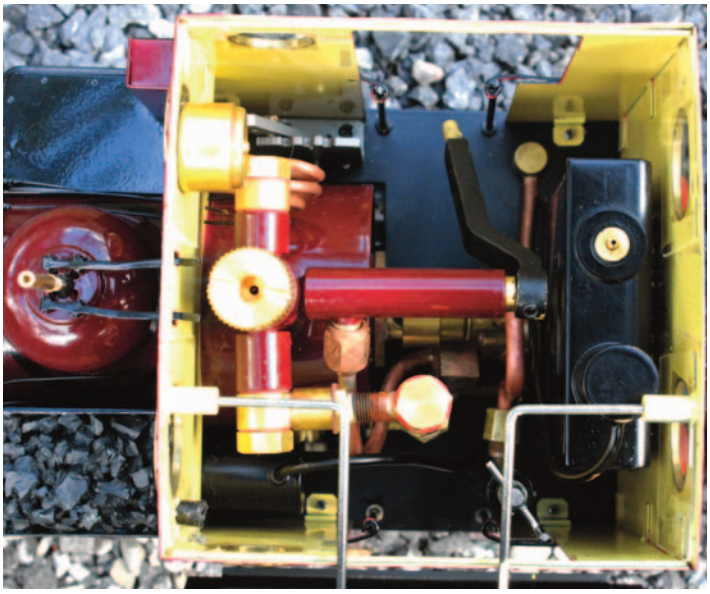
Specifications

Scale:	16mm to 1 foot (1:19.1)
Gauge:	Either Gauge 0 (32 mm) or Gauge One (45 mm)
Min Radius:	24” (600 mm)
Length:	11” (280 mm) over buffers
Width:	3.5” (88 mm)
Height:	5.5” (136 mm)
Boiler:	Center flue
Working Pressure:	60 psi (4.1 bar)
Valve Gear:	Piston type, reversed by lever in cab
Fuel:	Butane
Boiler Fittings:	Safety valve, pressure gauge, Goodall valve, sight glass

Livery: Talyllyn Railway Preservation Era Green, Atlas Foundry Preservation Green, TR Fletcher Jennings Crimson Lake (Maroon), and TR Indian Red (Second Batch Only)

Price: MSRP US$1600

reverser. It should be noted that is quite close to the side of the cab wall. I had no problem operating it. However, those with plus-size digits might want to take a suitable piece of K&S brass tube and slip it over the handle to assist in operating it. There is a Goodall valve for filling the boiler as well. The throttle is operated via a large cast brass lever which is easily accessed through the right hand cab door. A sight glass (clearly visible through the left-side cab door opening) has a drain valve below the cab deck. The pressure gauge is set up such that it can be viewed through the right hand side front porthole cab window. The gas tank is in the cab, fitted to a baseplate that also contains the gas valve, which is hidden as a hand brake standard. The gas valve can be operated through either the left side cab door or the top of the cab when the roof is open. The lubricator is tucked into the left side tank, cleverly accessed by removing the coal basket. It should be noted that there is no bottom drain on the lubricator and a syringe must be used to drain the condensate. The smokebox door opens as per usual on Accucraft locomotives, with a noticeable improvement. Instead of the usual spring clip, the smokebox door is held shut with a rare



The cab with its fittings. This is a tight fit and some extra tools my be needed to be able to reach some items, depending on the size of your fingers!

earth magnet.

Although the model is intended for manual operation it can be adapted for after-market radio control, and I have seen a couple of examples completed. It requires a bit of shoehorning to fit it all in, but it is achievable. The reverser servo can fit in the right hand tank, the throttle servo in the cab, and the receiver below the footplate behind the rear axle. The batteries may be attached to the underside of the cab roof.

Operation

With much anticipation, I prepared the locomotive for its first run in the garden on a warm (70 degrees Farenheit/21 degrees Celsius) early fall afternoon. The chassis was first lubricated with machine oil from a needle point oiler. The lubricator was topped up with steam oil and the boiler filled up to three-quarters full on the sight glass by means of a pump bottle and the Goodall fitting.

The gas tank was then filled with butane. The instructions were consulted, which advised to open the gas valve slightly to ignite the fire via the open smokebox door, let the fire stabilize, then turn up the gas a bit more, and after two minutes, close the smokebox door. The burner lit quickly and immediately flashed back into the flue. At this point, I realized how much the previous typical Accucraft gas firing system had been improved. The gas filler valve on the tank was located lower on the tank

than the gas take off line. On previous models it was opposite, and the system would initially pull off liquid butane instead of gas. This resulted in the characteristic eyebrow-removing fireball emerging from the front of the locomotive as the liquid butane burned off (unless you remembered the suggested procedure of opening the gas valve for seven to ten seconds to clear the liquid before trying to light the locomotive). Thankfully, that spectacular phenomenon is now a thing of the past. Also, the burner is very quiet, perhaps the best I have encountered on an Accucraft locomotive to date. I found the gas valve was very controllable as well. All in all, much needed and welcomed improvements to the gas system design.

It took about six minutes to come up to operating pressure, followed by some back-and-forth with the reverser to clear the condensate from the cylinders. I opened the throttle and backed the locomotive to couple up to its prototypically correct pre-preservation Talyllyn train of four coaches and the brake van. A bit of adjustment of the gas valve before departure saw the locomotive trundle happily around the garden for over 20 minutes without the safety valve blowing off. I added water once during the run, more out of the desire to check the Goodall valve function rather than the necessity to add water. In a subsequent run, I started with the glass half full of water, which resulted in less fiddling to clear cylinders; but I then found it necessary to add water during the run.

Prior to running my example, I had heard from others that the throttle was sensitive and they tended to be a bit speedy. I found this not to be the case, as it seemed to be capable of sedate running with a minimum amount of running in. Runs of twenty minutes or more were typical while hauling a prototypically-sized Talyllyn train (either the railway's four coaches and the brake van or a mixed train consist of a coach, brake van and a few slate wagons).

Assessment

All in all, Accucraft's "Dolgoch' is a very good model with just a few minor quibbles. Firstly, as supplied, the gas tank and valve assembly lacked nuts on the threaded rods protruding down through the cab floor to hold them in place. They are quite close to the rear buffer beam, so standard hex nuts would not fit. While running, the gas tank assembly rattled annoyingly. In discussion with Graham Langer, the quick fix was to shove a short piece of silicone tube over each protruding piece of threaded rod. That, along with putting a 1/16th-inch thick piece of rubber between the rear cab wall and the back of the gas tank, cured the problem. A few weeks later, Accucraft UK supplied me with two slotted pieces of brass rod with the appropriate internal threading, (see photo below). This permanent solution was quickly installed with a screw-

A view of each side of the model.

History of Dolgoch

The 2' 3" gauge Talyllyn Railway was built in North Wales in 1865 to haul slate from the Bryneglwys quarry for transhipment to the standard gauge railway at Tywyn. As well as slate, it hauled passengers and a limited amount of goods up the Fathew Valley. The railway continued to carry slate until 1946 and passengers until 1950. Since 1951, a group of enthusiasts known as the Talyllyn Railway Preservation Society has run it as a heritage railway, with both original locomotives and the passenger stock in operation. Other locomotives (from the Corris Railway and elsewhere) and additional passenger stock have been added to the railway over the years in preservation.

Talyllyn's two locomotives were initially supplied to the railway by Fletcher Jennings, No. 1 "Talyllyn" (0-4-2) in 1864 and No. 2, "Dolgoch" (0-4-0) in 1865. "Dolgoch" is characteristic in that it's rear axle behind the firebox and has an unusual form of Allan valve gear. "Dolgoch" has been rebuild several times over its life, making speculation of how much of the original locomotive still exists a great pub debate among Talyllyn enthusiasts. "Dolgoch" has worn a variety of paint schemes throughout its long life (some repeated in preservation) and was briefly named "Pretoria" during the Boer War.

driver. A little bit of black paint hid the shiny brass. If you own a "Dolgoch" and are in need of these fasteners, get in touch with Accucraft.

Another issue found early on was that on a some examples, if the cosmetic whistle (installed by the owner) was screwed too far into the steam dome, it would interfere with the proper lifting of the safely valve. I understand that this was caught early and most were inspected and remedied before shipping to customers. Nevertheless, it is something to be aware of when installing the cosmetic whistle. I found the large cast brass throttle handle a bit too distracting, so it received a lick of black paint. While I had the paint brush in my hand, I also painted the ends of the stainless steel axles. As well, the red on the buffer beams looks a tad orange to my eyes.

Interesting to note is that Accucraft has changed its packaging for this locomotive from the previous "locomotive taped to a piece of plywood" method. "Dolgoch" came in a hard fold-down thick wall cardboard box with custom foam inserts, held together by three bands of Velcro strapping (making it reusable). This hard cardboard box was placed in a larger foam-lined Accucraft red cardboard box. I can attest to the satisfactory quality of the new packing, as due to an error with the shipper, my "Dolgoch" crossed the Atlantic four times (!) without sustaining damage. It is up to the owner to install the decorative whistle and safety valve arms to the steam dome. Also supplied with the locomotive was an assortment of Allen keys, 2mm and 3mm hex nut wrenches, two syringes and a pair of cotton gloves.

Conclusions

I am quite favorably impressed with how "Dolgoch" has turned out. Its accuracy and level of detail are remarkable. It is a good runner to boot—something that has always been a bit of challenge when producing such a small live steam locomotive. Added to this are the aforementioned improvements to the gas firing system. In my opinion, Accucraft seems to have turned a corner with this model and the improvements over previous models are significant in my books. I dare say this is perhaps due in part to the Aster influence (and supply of components) resulting from their joint venture. I look forward with much anticipation to the delivery of the railway's other locomotive "Talyllyn" from Accucraft, which is expected in the first quarter of 2020.

Researching the real deal! - The Author, along with some live steamer cohorts recently visited the Talyllyn Railway for some up close and personal research on "Dolgoch". From l - r; Jeff Young, Ryan Bednarik, and Paul Hagglund.

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Text & Construction Photos by Bill Allen

Part 1 Wheels & Cylinders

The Blue Comet was a 4-6-2 Pacific which ran passenger service on the Central New Jersey Line from the New York Metro area to Atlantic City. With its 79-inch drivers, it was capable of 100 miles per hour and regularly ran at 70 miles per hour. It was the subject of a Sopranos episode named "The Blue Comet" where Bobby got whacked in a train shop and a great train crash followed. A short clip of this can be found on YouTube.

The model in the Sopranos episode was a tinplate Lionel, which is a highly sought after collectors item. Aristocraft made a complete set with the heavyweight cars that were fairly well detailed. The engine was just a conversion of their Pacific with a few changes.

When a friend approached me about doing one in live steam with the cars, I researched things and found that the Aristocraft cars could be fitted with diaphragms and Kadee body mount couplers, and would look great behind a scratch-built prototypical engine and tender. As the cars, like all Aristocraft models, were done in 1/29th scale, I decided to do the engine in that scale, and ended up making two of them.

WHEELS

I started with the wheels. The 79-inch drivers scaled down to 2.724 inches, which is even larger than the 84-inch drivers I had done at 1/32nd in the past.

I got the rough castings from Walsall Industries and turned them on the lathe. I start by mounting the wheel in the outside jaws of the three jaw chuck, clamping it on the rough tread surface. Though it is rough, it is fairly true and the best place to start.

I turn the back side of the wheel till I expose the

Building the Blue Comet

Rick Parker Photo

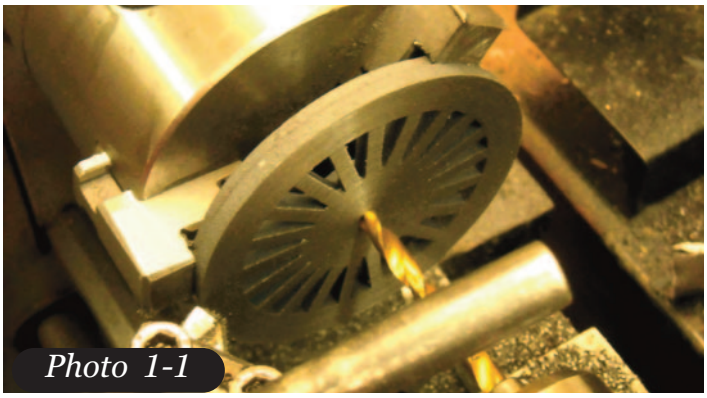

Photo 1-1

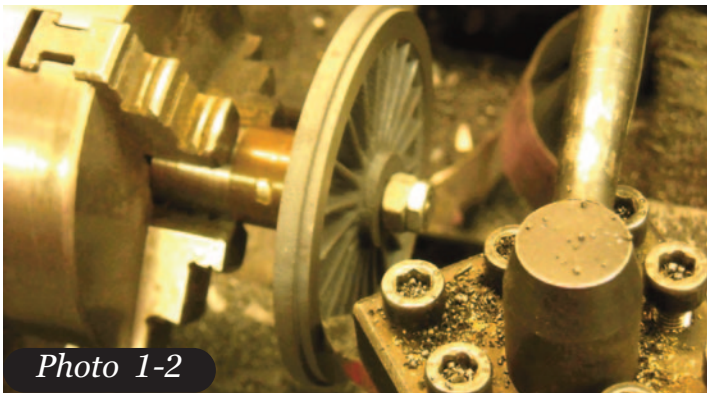

Photo 1-2

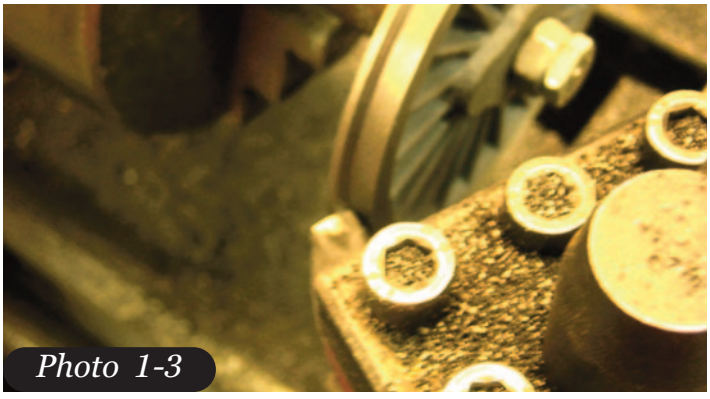

Photo 1-3

Photo 1-4


Photo 1-5

spokes and drill and ream the center hole to 5mm. I will be using 5mm axles and 5x10mm ball bearings in the axle boxes (**Photo 1-1**). I then turn the wheel around and mount it in my home-made arbor to turn the rim down to 6mm (**Photo 1-2**). The tread profile is cut to within a few thousands of the final dimensions (**Photo 1-3**). The wheel then goes back on the outside jaws to turn the hub to 0.250-inch (**Photo1-4**).

The tread needs to be cut at a three degree angle with a radius between the tread and the flange, and the flange should be tapered and rounded at the top. This is best done by making a plunge cut profile tool. Since all live steam Gauge One wheels have a similar profile, once the tool is made, it can be used for future projects

However, my 7x14 lathe is not rigid enough to do a plunge cut into cast iron that wide. Cast iron has a hard crust which is best cut with a carbide tipped cutting tool. That is why I roughed out the tread profile. I then took the wheels to Dennis Mead's house and we turned the treads on his large lathe.

The spoked pilot and pony wheels were done the same way, except the center hole is 4mm as 4x7mm ball bearings are used here.

Finally, the wheels were painted blue and striped with One Shot gold paint with a bow pen striping tool (**Photo1-5**).

CYLINDERS

The prototype had very large cylinders which were necessary with the large wheels to pull a full consist at speed. Since my ceramic burner boilers produce more than enough steam, I decided to go with 0.750-inch (three-quarter inch) cylinders.

The outside dimension of the cylinders scales down to one and one-eighth inches. As my supplier only had one and one-quarter inch square stock, I


Photo 1-6

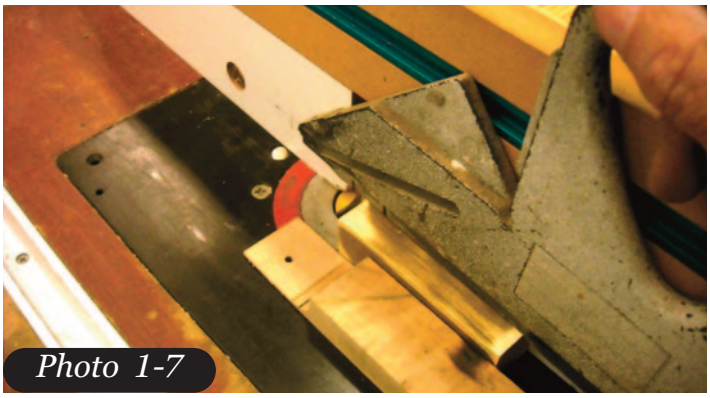
Photo 1-7

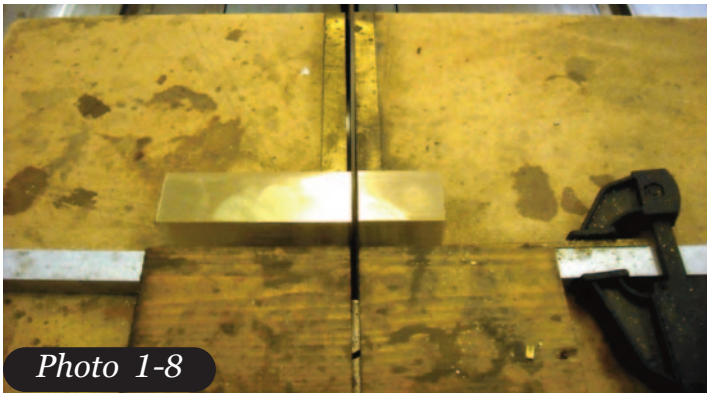
Photo 1-8

trimmed it down on the table saw using the rip fence and a metal cutting blade. Any carbide tipped blade will work but the new metal cutting ones which cut steel also seem to do a more precise cut (**Photo1-6**).

I leave two sides square, the inside for mounting to the frame, and the top for mounting the valve body. The outside lower corner is rounded off on the router table using a round over bit. I set the router for a medium speed and take three or four small cuts at a time (**Photo1-7**). Then on the table saw cross cut sled, I cut the cylinder length to slightly oversize (**Photo1-8**). I mount each cylinder in the four jaw self centering chuck and trim to size (**Photo 1-9**). I then bore them out to 0.750-inch and clean them up with 600 sand paper wrapped around a wood dowel .

In the mill, I drilled the six end cap mounting

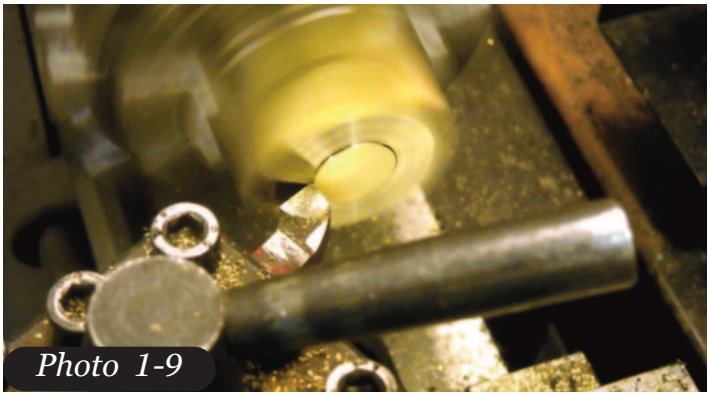
Photo 1-9

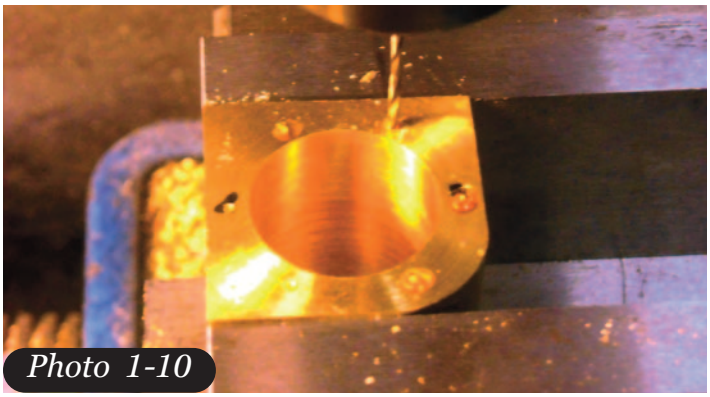
Photo 1-10

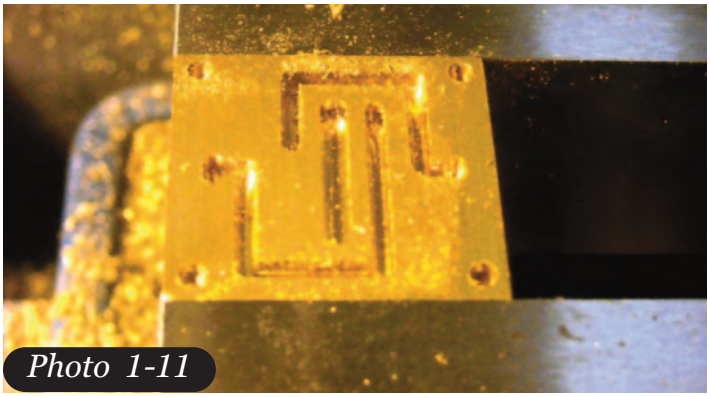
Photo 1-11

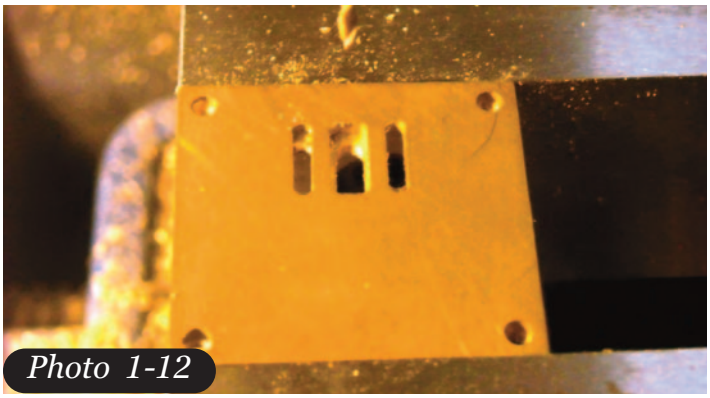
Photo 1-12

holes using the circle function of the digital read out (DRO). The end caps use the same settings and Dennis cut the gaskets on the laser using the same coordinates. This ensures perfect alignment of everything. You can see this and the considerable cylinder bore size in **Photo 1-10**.

The prototype had piston cylinders but slide (D)

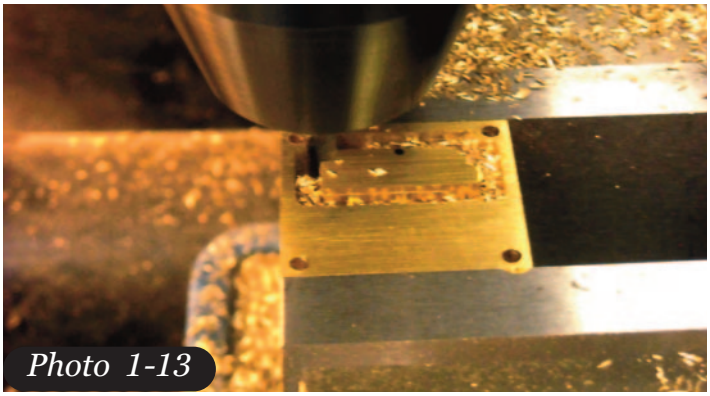
Photo 1-13

valves work better for me. In order that the valve gear operates in a manner consistent with the prototype, a few changes needed to be made. A piston valve engine can work with either inside or outside admission, but they are almost always done with inside admission. This results with the eccentric crank following the forward rotation, and the position of the reversing arm in the lower position when the engine is going forward.

In contrast, a slide valve engine can only be used with outside admission, as the outside admission enters on the top of the valve forcing it down against the ports, but an inside admission would push the valve off the ports. To get around this, a cross porting plate was made which reverses the front and back ports of the cylinder so that when the front valve port is uncovered the steam actually goes the rear of the cylinder. In **Photo 1-11** you can see where the cylinder ports are on the outside, left and right, and the valve ports are in the center with the exhaust port in the dead center. **Photo 1-12** shows the top side of the plate where the ports go through to the channels below. This is what the D valve slides back and forth on.

The valve body is formed from a piece of three-eighth-inch by one and one-eighth-inch brass bar cut to length. The center portion which holds the valve is carved out with a one-eighth-inch end mill taking 0.050-inch cuts at a time. The four mount holes are done using the same coordinates as used on the cylinder. Note how the piece is lined up with the edge of the vise so that it will line up with the cylinder (**Photo1-13**).

Photo 1-14 shows the cylinder and valve parts. In the lower right corner is a cylinder with the 4-40 threaded holes used for mounting to the frame on top. The larger hole in the left center is the exhaust port. Above that is the other cylinder, with the four 2-56 valve body holes facing up. The other

hole is connected to the exhaust port. Right to left are the rear cylinder covers, the front covers, the valve body, the cross port plate, and the valve body cover.

The cylinder front end has covers which need to be the same outside diameter as the rear end caps but have an inside diameter large enough for the cap bolts to clear. To machine something like that in a chuck would not work as the chuck jaws would crush and distort the piece. The ideal thing would be to mount it in a collet but I don't have one that big. So I do the next best thing, which is to make a pot chuck. This is a thin cylinder with the inside diameter equal to the outside diameter of the machined part, with a slit cut in it so it can compress and hold the piece. **Photo 1-15** shows the pot chuck in the upper left with machined pieces in various states of completion. A piece is then set in the pot chuck to see how it fits (**Photo 1-16**). And seen mounted for machining in **Photos1-17** and **1-18**; the hole in the center is where the cover is attached to the end cap.

Photo 1-19 shows the cylinder covers along with the faux valve covers which will give the cylinders the appearance of a piston type valve gear. The rear cover has an offset hole to give the entire unit the proper and prototypical valve offset.

The side cylinder cover is formed by copying drawings and photos to get the proper shape and rivet pattern on a card stock sheet, and then transferring it to brass sheet stock which has been colored with red layout dye, (**Photo1-20**). It is then bent to shape using various round bars to get the proper fit, shown in **Photo1-21**.

Finally, a flat sheet is cut to cover the front of the cylinder and soldered on to the side cover. It now slips over the cylinder from the front and is held in place with the valve front cover. It is then primed and painted in the Blue Comet "Packard" blue (**Photo1-22**).

In the next installment, we will create the frames for the chassis and install the items we built in this part onto the chassis.

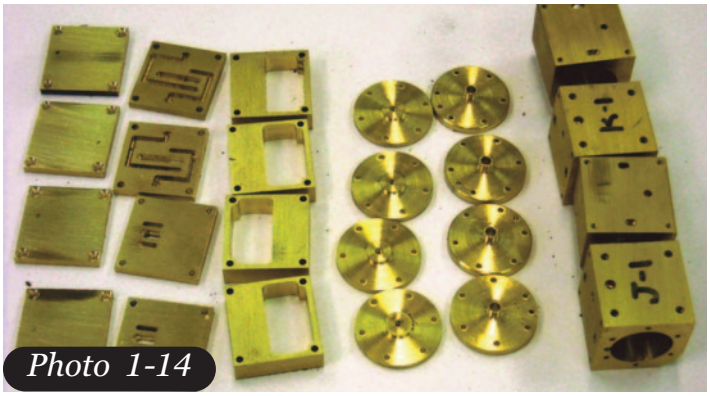

Photo 1-14

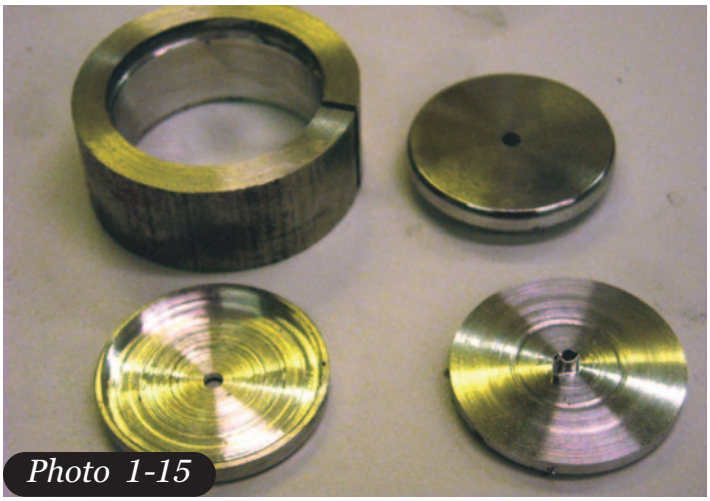
Photo 1-15

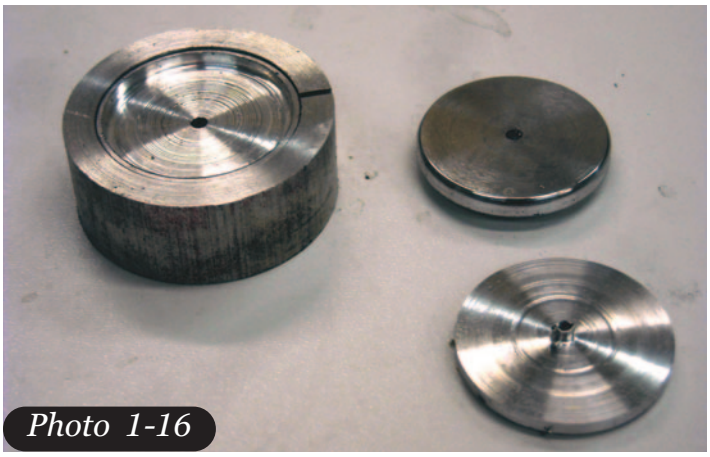
Photo 1-16

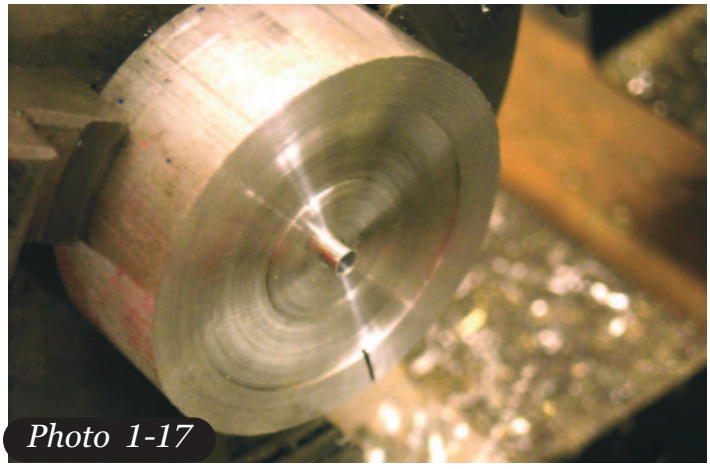
Photo 1-17

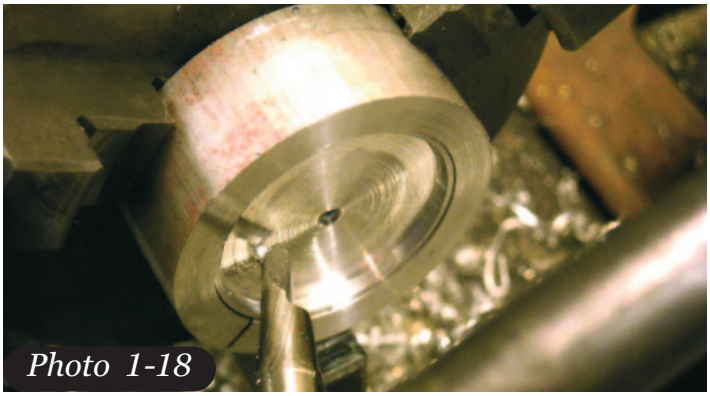

Photo 1-18

Photo 1-19

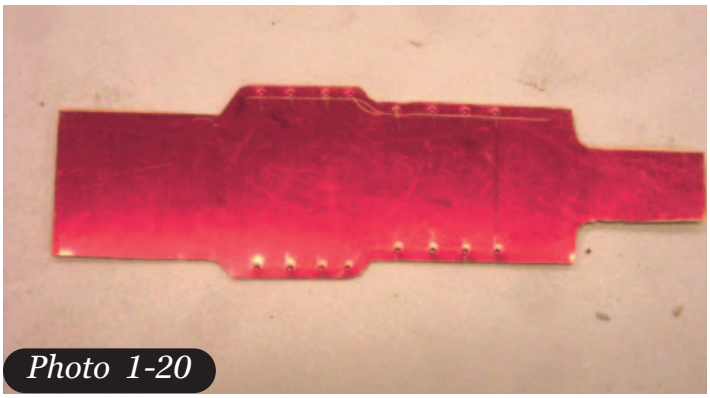

Photo 1-20

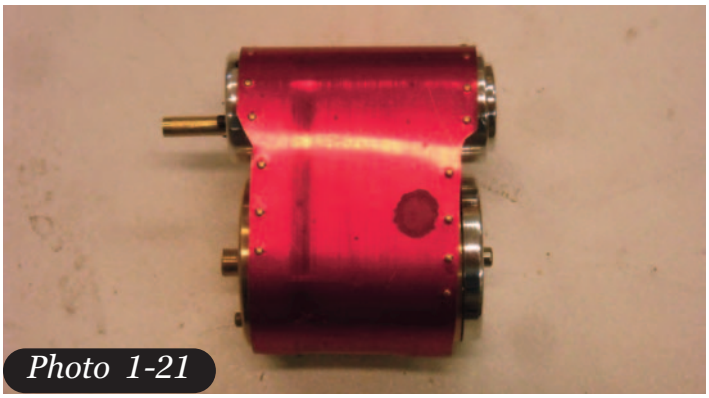

Photo 1-21

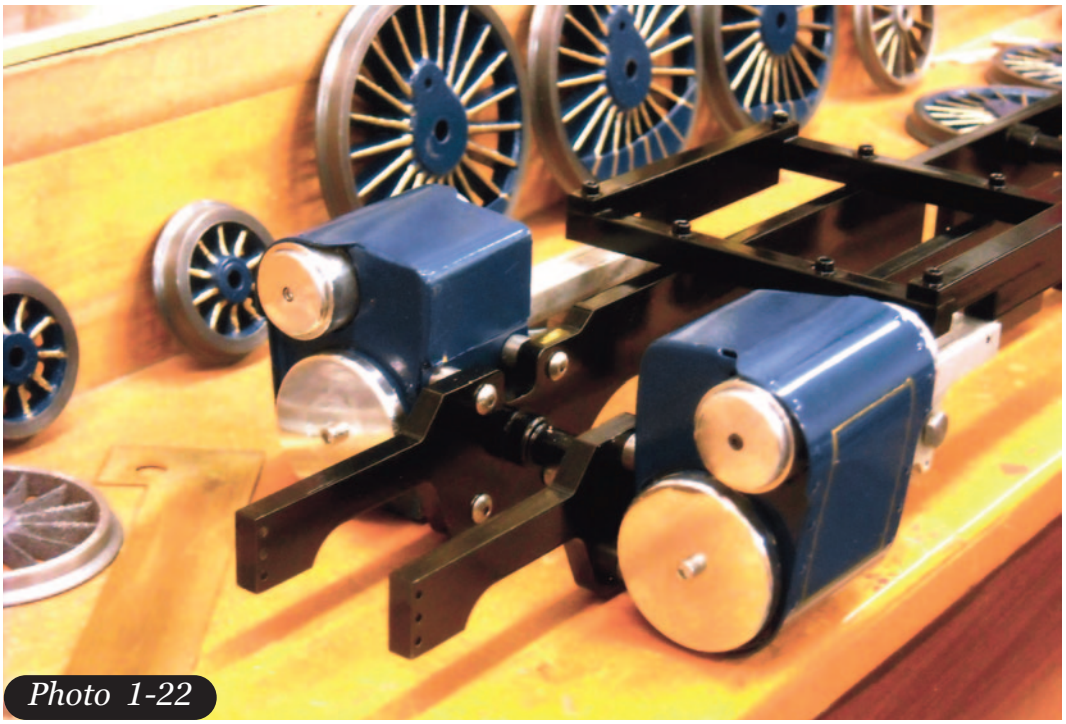

Photo 1-22

The "Blue Comet" making its debut at the National Summer Steamup 2019.
Photo by Carla Brand Breitner

Workshop Project

Coal Conversion of a Narrow Gauge Speedster

Photos and Text By Rob Lenicheck

Photo by Mike Martin

Having grown up in Colorado I make no excuses about being a died-in-the-wool Denver and Rio Grande narrow gauge devotee. The line used many types of engines over the years, as many other railroads did; their sizes growing bigger with the years and ability of the manufacturers to produce more sophisticated designs. Twenty five of the class 47 T-12s, the D&RG designation for a ten-wheeler with 12,000 pounds of tractive effort, were built by Baldwin in 1883-1884. Two still exist and one, No.168, has been recently resurrected by the Cumbres and Toltec Scenic Railway, from a being a static display model in front of the Antlers Hotel in Colorado Springs since 1938, to being a completely restored and unique piece of railroad history.

Being a narrow-gauge, mountain railroad it's a bit unusual the Rio Grande would have had engines like the T-12, obviously built for fast passenger service with its large drivers. But they

Photo 1 *Photo by Mike Martin*

were well suited for the flat sections of the railroad on the east side of the mountains. When Accucraft built their run of only twenty five of the T-12s I regretted not getting my hands on one. So, when a friend came across one several years later at an estate sale I jumped. Provided I could design and convert it, this would make a unique addition to my stable of coal-fired engines. The biggest challenge with this conversion is having to deal with an inside-frame firebox. The boilers are hard to build and tricky to fire. But experience, both good and bad, is a successful teacher and I am always willing to chance it.

If you look at the side view of the T-12 in **Photo 1**, you will notice that there is a large gap between the second and third driver sets. This is where the firebox sits, and this configuration needs to be replicated. The other big change which must happen between the frames is the addition of an axle pump. Every coal-fired engine must have one, unless you like to exercise your wrist by constantly having to pump water into the boiler. **Photo 2** shows the water pump I installed in the T-12.

In the past I have relied on a book which I consider the "bible" for the design of coal fired boilers: "Model Boilers and Boilermaking" by K.N. Harris. It is a superb source for the parameters needed to build the boiler such as grate area to gas area through the tubes, length of the tubes, etcetera. (To the uninitiated most traditional small-scale coal boilers are built like their full-sized brethren. They have tubes which carry the byproducts from the burning coal away from the firebox and forward to the smokebox and out the stack.) It must be stated that designing a coal boiler is still a bit of a black art – there are no hard and fast rules, only design projections based on empirical data collected over many years.

I still rely on the empirical data the Harris book has summarized but I have since found another source of design parameters which provides a different viewpoint. It was originated by John Baguley, who I believe is a British modeler. He has gathered empirical data from various sources and compiled it into relevant design points. His approach has been put on the web: *http://www.modeng.johnbaguley.info/Loco design/design1.htm*.

(Note the space in the URL between Loco and design. If you don't want to type all this in, do a search on "John Baguley loco design", or scan the QR code in **Figure 1**.)

http://www.modeng.johnbaguley.info/Loco design/design1.htm

Figure 1

There is considerable overlap in Mr. Baguley's approach to that of Mr. Harris, so a comparison is easily obtained. Baguley has even developed an Excel speadsheet for checking your design, available on his web page. Now, all this being said, none of these results are hard and fast design parameters. They only point in the general direction (see **Photo 3**).

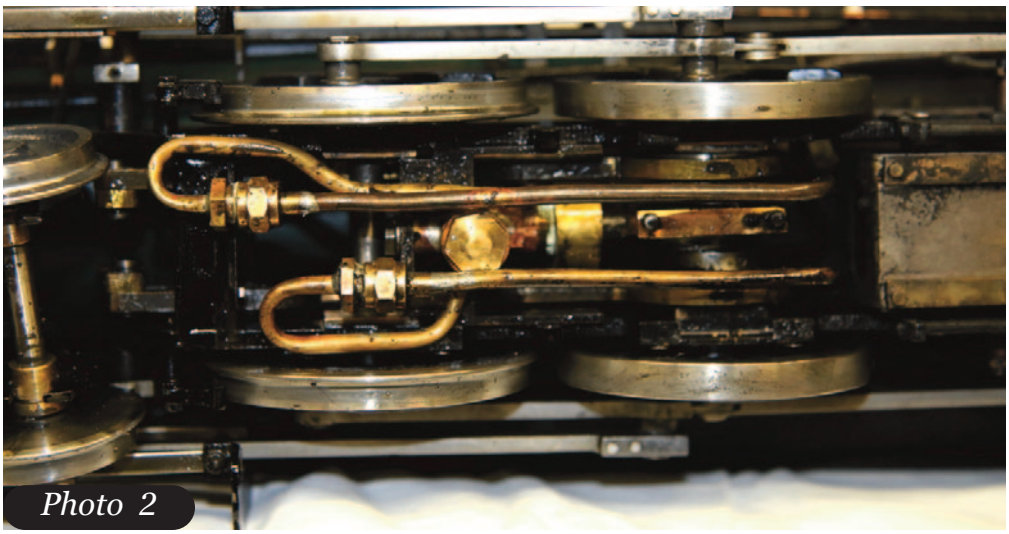

Photo 2

Several experienced coal firing folks I have talked to over the last few years have commented that they thought a long, narrow firebox design was difficult to fire. While it seems true that a square-ish

firebox makes it relatively easy to maintain a decent fire, a long and narrow one works just as well provided that a few parameters are followed. I have found that coal size is critical in these types of fireboxes. I pulverize and screen my coal to about quarter-inch cubes to be successful. Moreover, I don't overload the coal on the grate, adding only a layer of coal when the top of the coal already there is burning well. Adding too much will smother the fire and cause it to stop burning. This is a rather embarrassing predicament. See **Figures 2** and **3** for my grate and ashpan designs. I elected to permanently attach the ashpan to the frame with screws. When cleaning the ashes out a bottom cover can be slid out, which then allows the ashes to follow the force of gravity to an awaiting tablecloth or other such treasure your wife cherishes. (**Photo 4**.)

Photo 3

Figure 2

Figure 3

Figure 4

As you can see from **Figures 4 and 5,** the boiler has been designed with four tubes and one flue, the latter allowing the superheater tube to pass through it. Although this configuration is the one on which both the Harris book and the Baguley software agree, you can see that the outward flare of the upper part of the crownsheet and front tubesheet make a difficult though not impossible build. It does, however, takes a lot of patience and

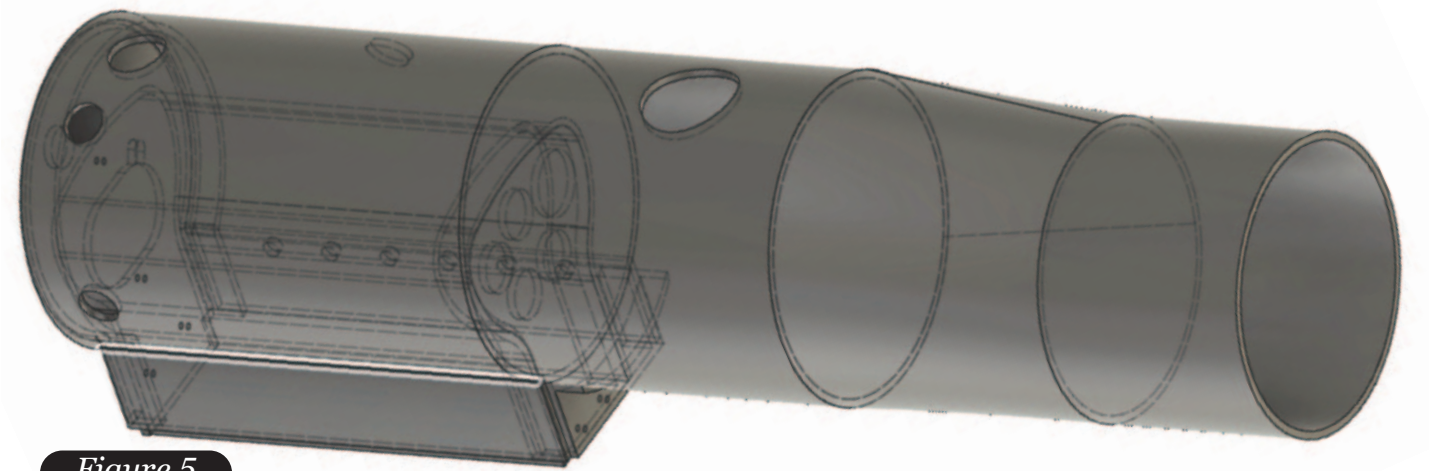

Figure 5

persistence.

One of the several things which can be addressed while doing this conversion is the lubricator design. Accucraft favors a passthru type of lubricator which sends the steam oil down the superheater tube and into the cylinders along with the steam. Reports are mixed as to whether or not this approach will lead to the clogging of the steam line. As an alternative you can turn the lubricator into a quasi-hydrostatic type of design by stubbing off a 1/16th-inch tube from the steam line between the throttle takeoff and where the steam line enters the firebox. This tube, in turn, is soldered into the bottom of the lubricator. This pressurizes the lubricator. The top of the lubricator is then fitted with a takeoff valve which allows you to meter the amount of oil going into another 1/16th-inch line which is delivered to the steam chest fitting. A bit of work but well worth the effort in my opinion. See **Figure 6**.

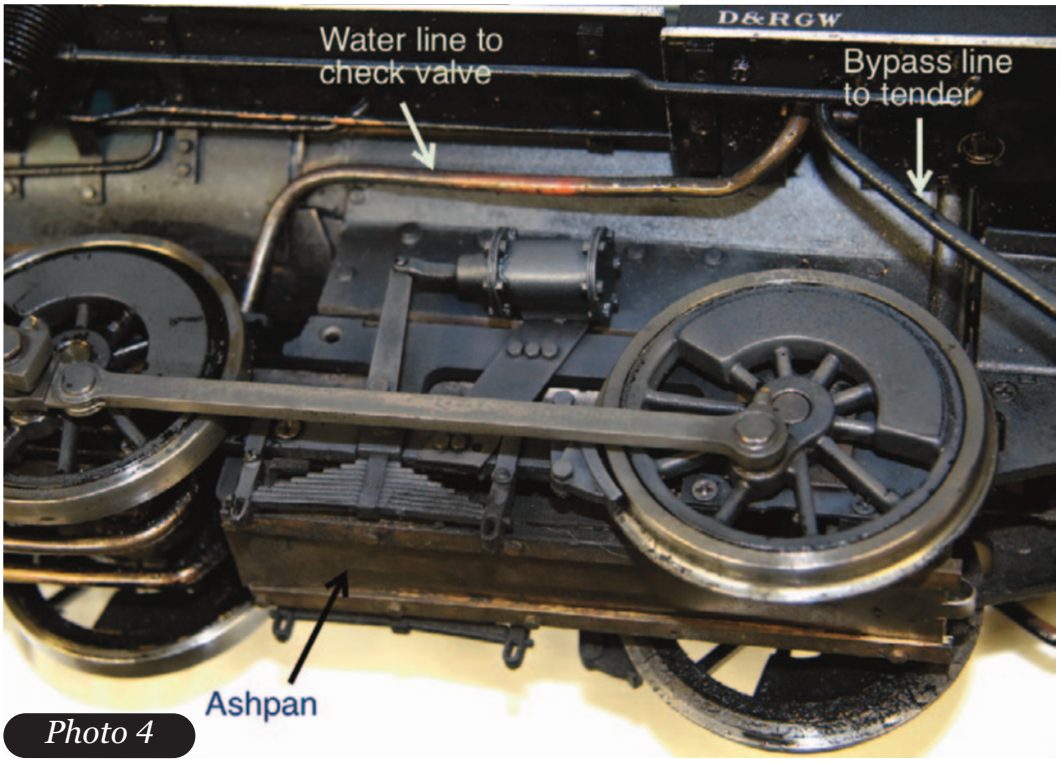

Photo 4

Since I've not figured out how to fit an axle pump into a frame setup using the existing Accucraft valve gear, I simply removed the gear and fitted the engine with slip eccentric gear (**Figure 7**). Slip eccentric valve gear is an underrated and yet elegant valve gear which cannot be controlled from the cab via a reverse lever – to reverse the engine it is pushed by hand 180° in the desired direction. Relying on the 0-5-0 move is perfectly fine since with a coal engine you must be with it most of the time anyway.

The final thing to address in the conversion is the tender. My engines have all been configured with a "serial" type of water delivery system and that has served me well. The setup is simple; water is drawn


Figure 6

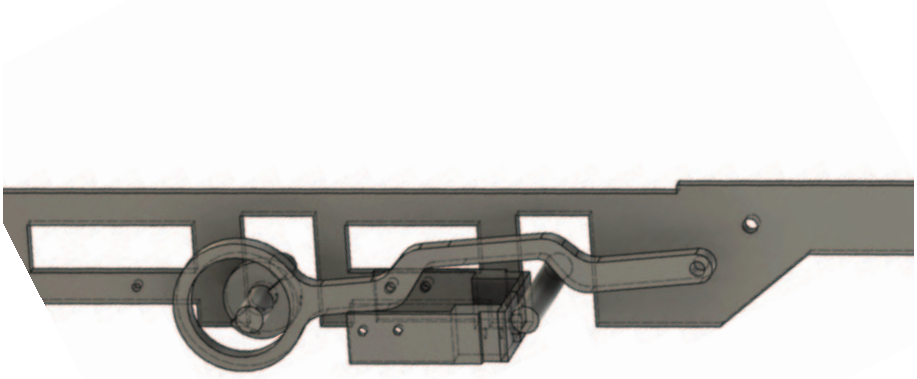
Figure 7

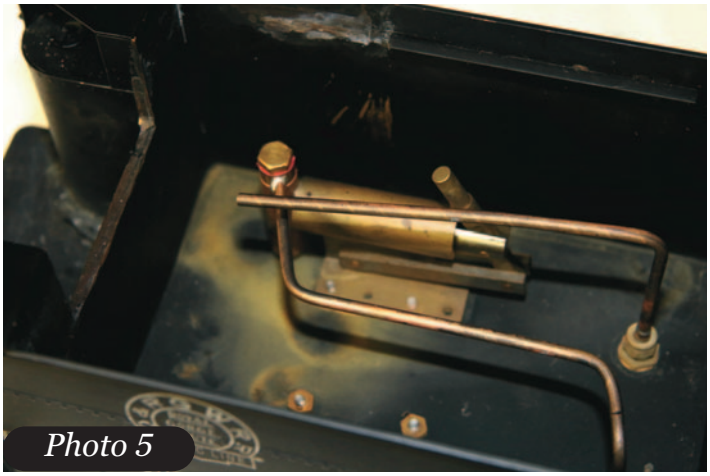

Photo 5

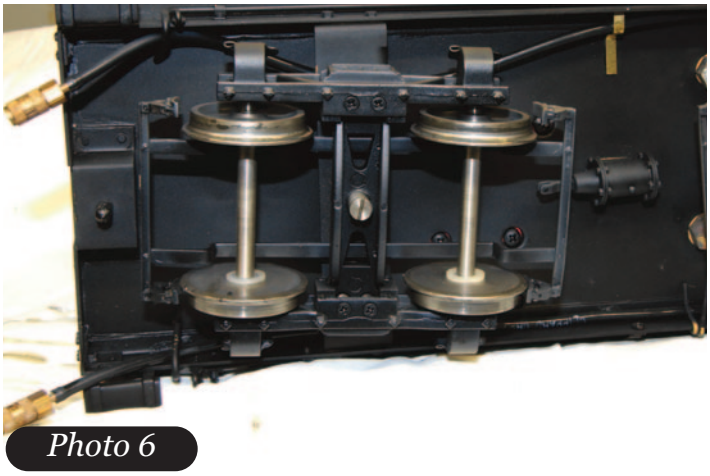

Photo 6

from the tender which initially passes through the hand pump in the tender, either actively or passively, by the axle pump in the engine. Thus, the tender pump is plumbed in series with the axle pump. When the bypass valve is opened the water then takes the path of least resistance and flows back into the tender. (The bypass valve, as the name implies, allows the water to flow back into the tender, "bypassing" the insertion into the boiler.) I also follow the practice of most other builders and provide a bypass return line in the tender itself so it's easy to see if the axle pump is working and to know when you've primed the line prior to running. See **Photo 5**.

One final detail: IMHO it's really nice to have quick disconnects on the tender water lines. Yeah, they're definitely not prototypical but I prefer form to follow function, within reason. So I use one-eighth-inch OD flexible tubing with Rectus model 02KA TF02 MPX quick disconnects. The latter can be hard to find but a good search on the Web comes up with companies such Teesing.com which does carry them. See **Photo 6**.

And that's all it takes to convert an Accucraft T-12 butane engine to coal. Time to smoke up the room!

Conversion completed, the locomotive is put through its paces at the Staver Spring Steamup in Portland, Oregon.

Photo by Mike Martin

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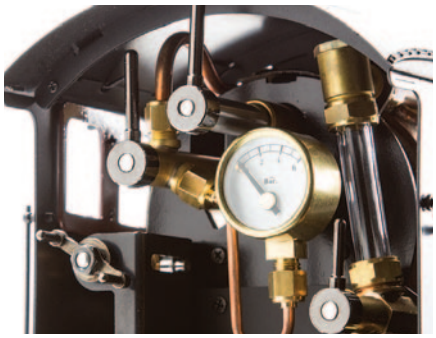

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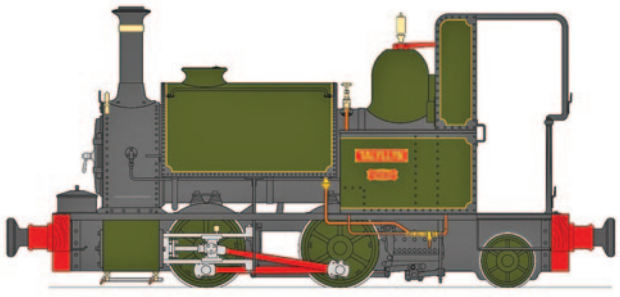

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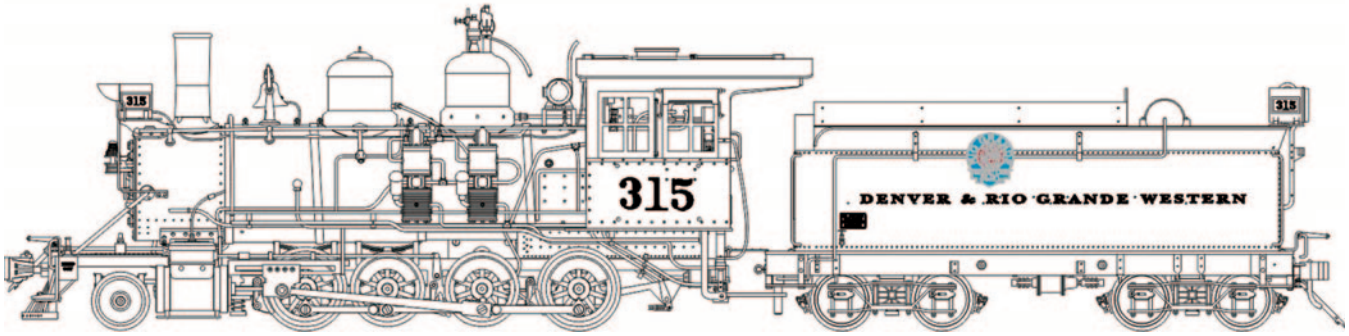

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Sacramento Valley Live Steamers Railroad Museum Gauge One Track

Text and Photos by
Phil and Stephanie Huntingdale

For many years the Sacramento Valley Live Steamers Railroad Museum (SVLSM), located in Hagan Community Park, Rancho Cordova, Ca. had a vision to include a Gauge One permanent layout within their seven and one-half inch railroad park. In the fall of 2018, club members Jim and Peter Welch purchased track from a train estate sale and donated it to the club. This got the whole project started. Andy Berchelli, SVLSM president, asked Phil Huntingdale for assistance in developing a plan.

The track was to be within a specified general area bounded by two existing seven and one-half inch main lines. It would be elevated, durable, and usable by live steam, electric, battery, and other propulsion methods in all the scales appropriate to Gauge One track, and have some landscape features. Layout began by defining the area, establishing the location of existing trees, and preparing an accurate layout plan. The initial plan was a dog bone shaped layout. It included 203-feet of double mainline track, and sidings (staging areas) (**Figure 1**). An alternate layout was included that utilized only one end of the dog bone by installing a temporary tie with 110-feet of double track. Both proposals were presented to the SVLSM Board and approved. Because of cost constraints, the project was separated into two phases. Phase One of the project was built in 2019. The complete project will be included in Phase Two, and should be completed in 2020.

Several optional table construction methods and materials were evaluated. It was agreed that a steel framed bolt together method was preferred since it allowed for greater ease of construction (**Figure 2**). In February 2019 the complete project was laid out by Phil Huntingdale and Craig Griffin, fitting within the allotted area without interfering with the seven and one-half inch main lines. Club member Tom Reece brought out his compact tractor with attached fence post hole auger, along with two-inch steel posts that he precut to five-foot lengths. The footings are spaced about five-feet on centers. With the pipes in place and set to a level elevation, concrete was poured along with a Sonotube collar top to clean up the exposed concrete appearance (**Photo1**). In order to connect the channel strut metal deck framing, two half-inch all-thread studs needed to be welded in a vertical alignment at the top outside face of the pipe columns (**Photo 2**). Craig Griffin set the all-thread studs with temporary tie wire and Bill Yoder did the welding. Then the table framing began, with solid channel strut used for the continuous edge beams and slotted strut for the cross members (**Photo 3**). We bought the solid strut, and the slotted cross struts

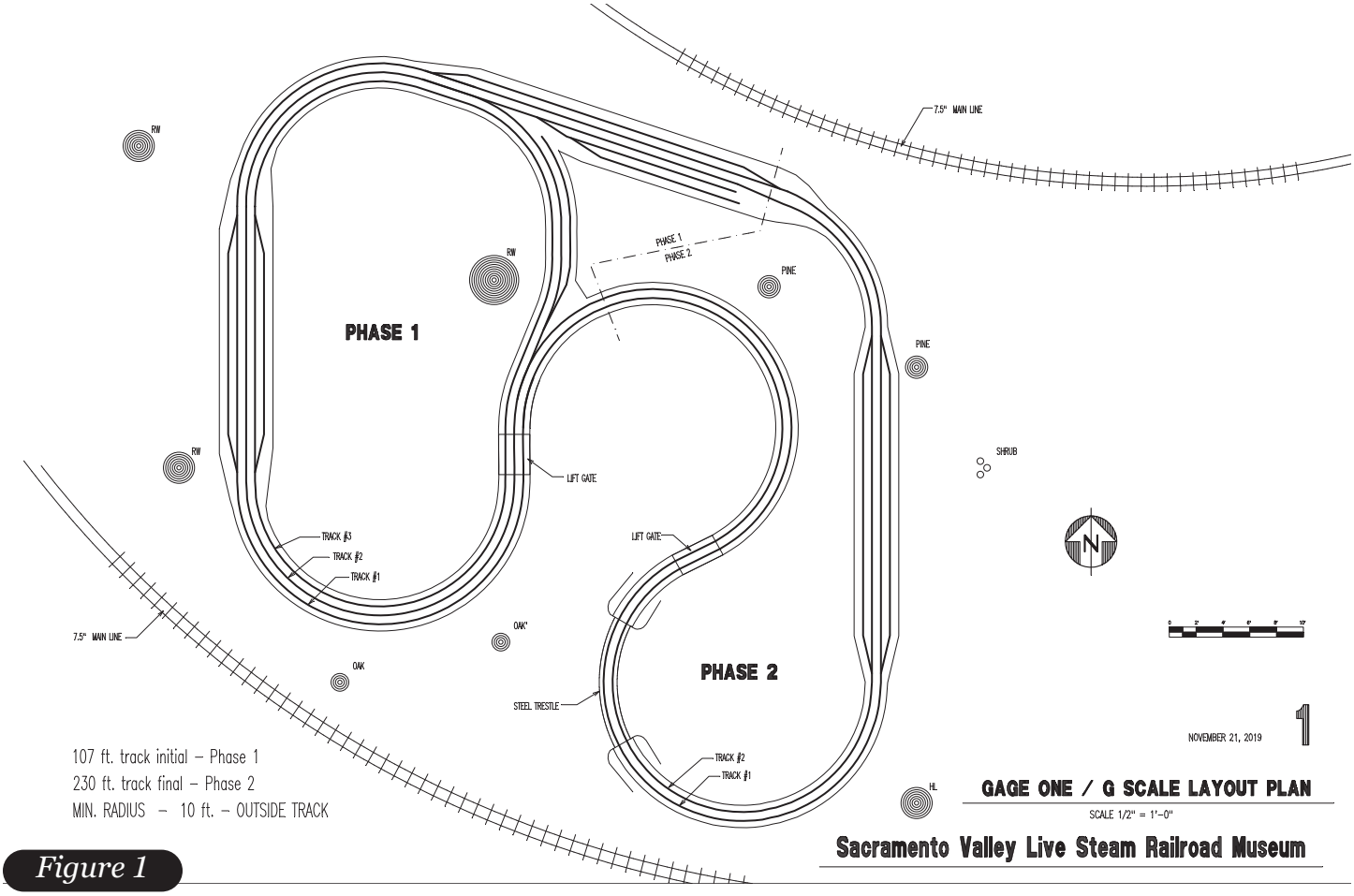


Figure 1

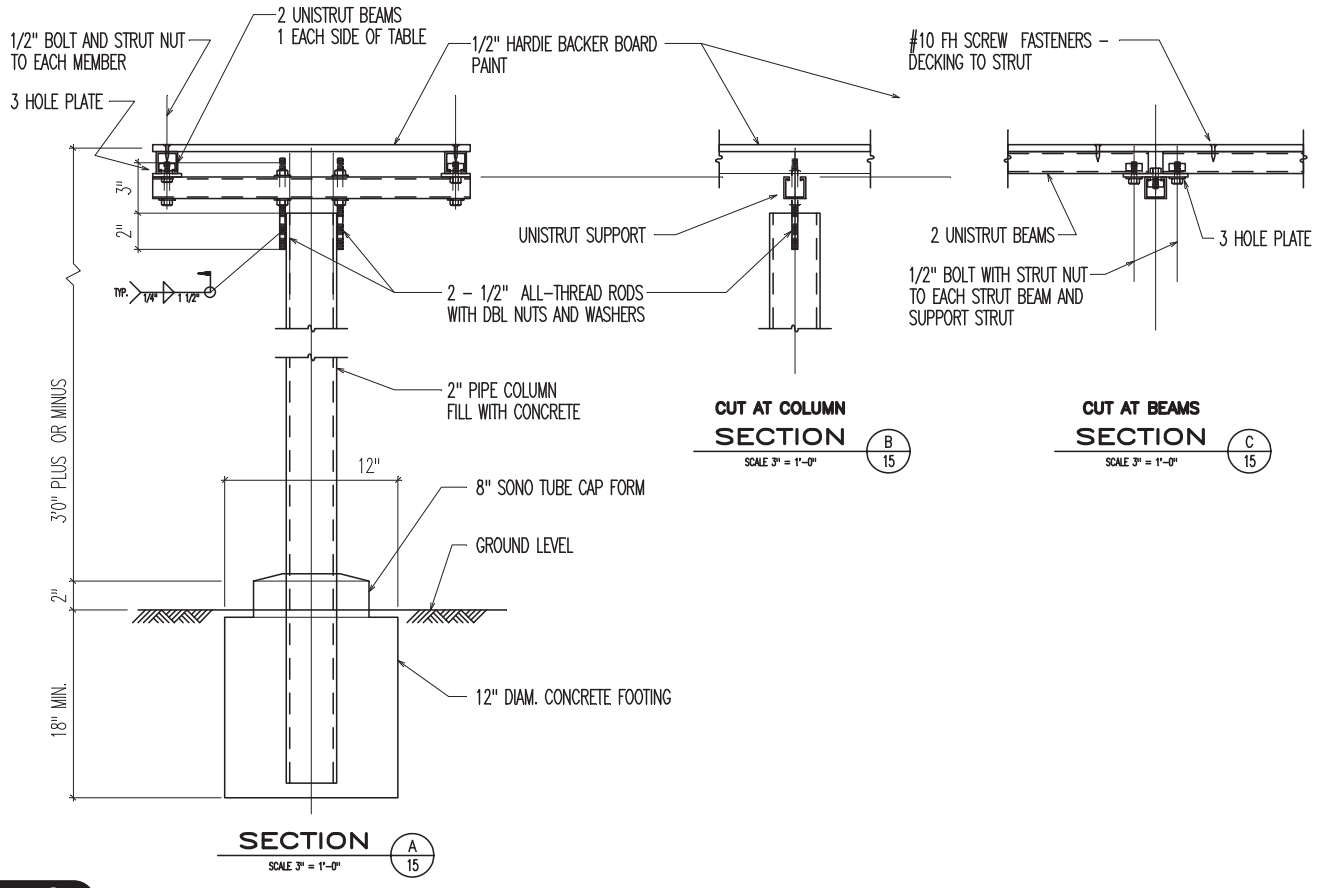


Figure 2

were donated. We thought the slotted strut would work with the all-thread spacing; however this was not the case, so precisely located holes were drilled in the strut. The previously set nuts were raised with washers and the cross strut added along with nut fasteners above (**Photo 4**). Strut could be leveled for the completed anchor to the post. The main channel strut beams were installed using three-hole plates with nuts and bolts; one bolt to each of the continuous rim members and cross strut supports. Additionally, there are several cross strut ties to provide support at the deck panel joints.

Cement backer board was used for the top deck panels (three feet by five feet and one-half inch thick) which were installed and fastened to the strut with screws (**Photos 5 & 6**). The edges on the curves were cut with a saber saw (many skill saw and saber blades were used). Much credit goes to Craig Griffin who assembled most of the table top using his own tools. The backer board was sealed with several coats of paint, including Kilz —a moisture blocking paint, enamels, and sponge camouflage (**Photo 7**). The steel posts and strut edges were painted.

Through this build changes were always being made. We realized that there was much more interest in the scale hobby than we previously assumed, and since we had adequate space we decided to add a third track to the layout. Now that the Phase One table was done, it was time to put down track (**Photo 8**). The track is code 332 rail with 10 -foot radius curves, and main line siding switches are number 6. It is screwed down with fender washers, thru bolts, washers on the bottom, and lock nuts. Some opportunity for movement was provided. A steel hinged lift bridge was fabricated by Nate Polen and is located on the table to permit access to the interior (**Photo 9**). The decision was made that only the inner track would initially be electrified. This is because of the many turnouts and crossings related to the greater complexity of Phase Two.

Decomposed granite was used to level the ground and allow for drainage. It also makes raking and cleanup easier.

The track continues to be a work in progress. Phase two of the project started in January 2020 and should be complete for the Spring Meet in May. When Phase Two is completed it will have


Photo 1


Photo 2


Photo 3


Photo 4


Photo 6


Photo 5


Photo 7


Photo 8

230 feet of main line. A curved trestle, 10-feet long, is being built to go over a landscaped canyon. Plans also include finishing landscaping planters around Phase One. Other considerations are safety fencing to keep people away from the seven and one-half inch track and access points from the Oasis area.

SVLSM took on this project with the intention that it was to be built with donations. Money is still needed to finish the project. Many members have been generously donating material, money and time; including Jim and Peter Welch, Chuck Sanfillipo, Mike Falkenstein, Bob and Mary Dean, Paul Brink, Phil and Stephanie Huntingdale, Craig Griffin, Kevin and Andrew Sach, Bill and Butch Floyd, Colton Snell, Dennis Gramith, Bill Yoder, Andy Berchelli, Chris Roberts, Glenn Wilson, Gordon Moser, Alison Berry, Gordon Dunham, Bart Cook, and Harry Voss. We apologize if anyone was missed.

The elevated track has been in use for almost a year, and has drawn many club members to par-

Photo 9

ticipate. The club membership has grown. The first run was on a temporary track for the Rotary Club of Rancho Cordova;"Cordova Cares Funfair," an event to raise funds for a community support vehicle for the Sacramento Law Enforcement Chaplaincy Program. Jerry and Jane Bohlander from Annapolis, Maryland were attending the National Narrow Gauge Convention. They travel with their G Scale trains and spent time on the track. Several members have brought equipment out to run and the track is kept busy. Others have indicated they will be bringing out their mantel pieces to run again. In 2019 Phase One of the table was in full operation during the Fall Meet, Narrow Gauge Convention, public run days and the December Santa Train event. This has been a great addition to the museum.

For further information, please check the club's website, http://*www.svlsrm.org* we'd love for you to bring your Gauge One trains for a visit!

http://www.svlsrm.org

An Accucraft SPng 4-6-0 takes a lap on a newly installed loop of track.

Stephanie Huntingdale Photo

Live steamers from all over enjoyed running on the new track during the 2019 Narrow Gauge Convention.

Jerry Bohlander Photo

Examples of each end of the live steam modelling spectrum pass by each other during the Narrow Gauge Convention Steamup.

Jerry Bohlander Photo

Paul Brink prepares his Accucraft Mich-Cal Shay for a run during the Narrow Gauge Convention Steamup.

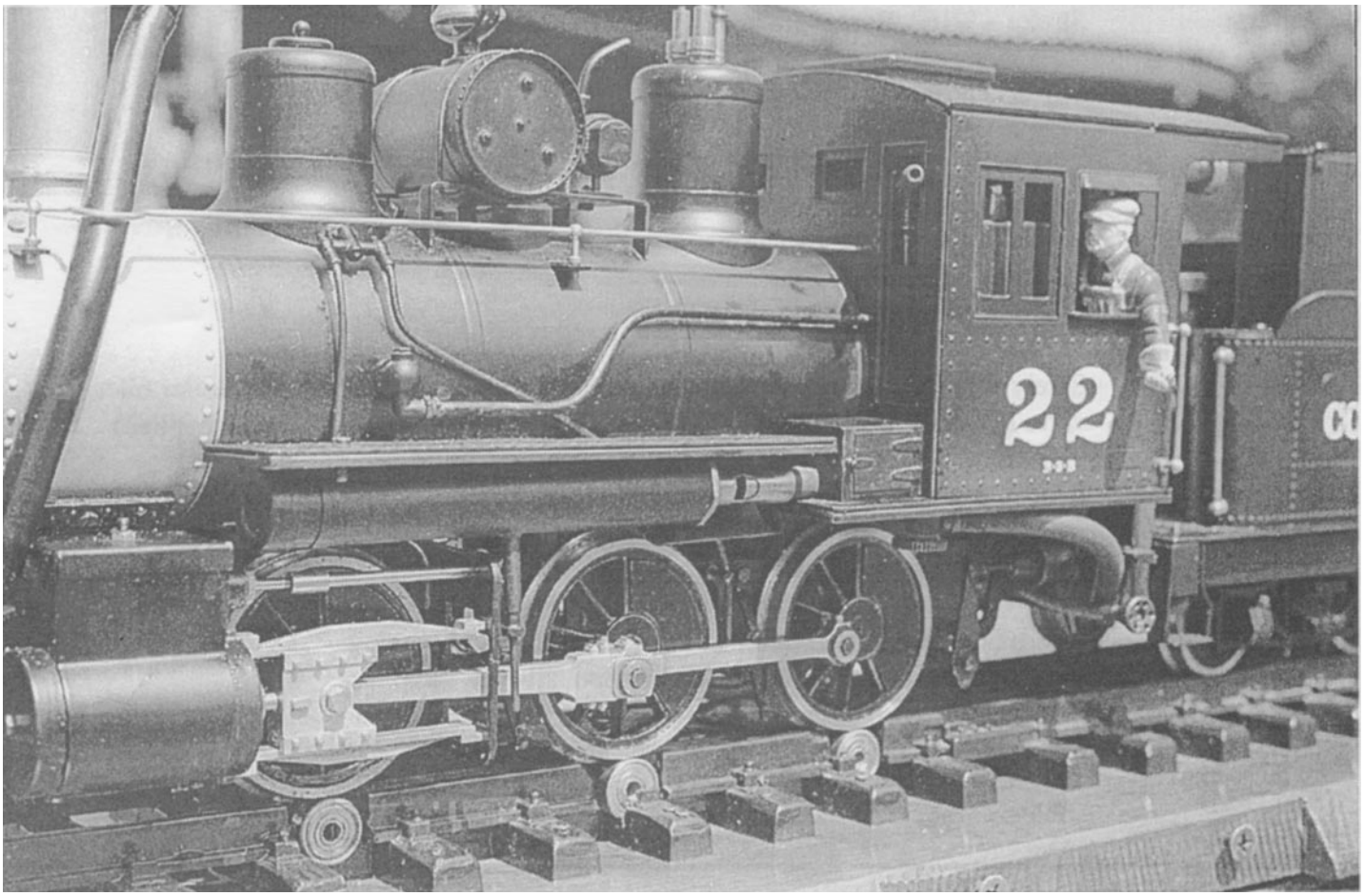
Jerry Bohlander Photo

THE HARMONIC STEAM WHISTLE
a big sound for little engines

By Larry Bangham
article, photo and drawings by the author

Small scale steam locomotives, by virtue of their size, have traditionally been limited to high pitched whistles. Now, however, it appears that steam can be coaxed to provide bigger sounds in these small packages. The principle involved has to do with a change in the cross sectional area at the inlet of the chime tube. We have all blown into a pop bottle and admired the deep tone produced. The principle involves the change in diameters between the neck and the body. To produce the low tone of the whistle depicted in Figure 1 would require a conventional whistle of approximately 1.5 inches in diameter and 12 inches long. Why hasn't this phenomenon been exploited before now? I can only guess. Perhaps it is because most of the technical research in small scale steam has been in Europe, and the principle was not pursued because their full scale steam also uses peep-peep whistles.

My interest in this area was primed by Peter Jones after reading "Gazing into the Fire" (*SitG Sept.-Oct. 1995*), where he mentions a circular whistle for mounting in the smoke box. I went to the shop looking for a curved tube to blow into, and the only thing I could find was a mantle tube out of an old gas lantern. It had a nice 180° bend in it, but was faired from 1/2-inch to 3/8-inch diameter at the other end. Serendipity strikes again. Blowing into the small end produced the most



Editor's Note: *From the Archive* presents older articles from issues of *Steam in the Garden* no longer available in print. There may have been references that are out of date. Article has been edited to convey key information relevent to the hobby today.

beautiful low tone, and I had to find out why.

The whistle pitch is proportional to the difference between the chime tube diameter and the inlet diameter. The greater the difference the lower the tone. In addition to the area change, if the front part of the tube is made into a separate piece, which I call the supply tube, and allowed to penetrate into the chime tube the tone will be even lower. So the four things that govern pitch are: chime tube length, supply tube diameter relative to the chime tube, supply tube length, and supply tube penetration. On steam the fundamental frequency of the chime tube (**See Figure 1**) in musical terms is high `B' (988 Hz), almost two octaves above middle 'C' (262 Hz). The 3rd harmonic frequency of the chime tube as achieved by the whistle is high 'A' (440 Hz). This represents more than an octave drop in pitch.

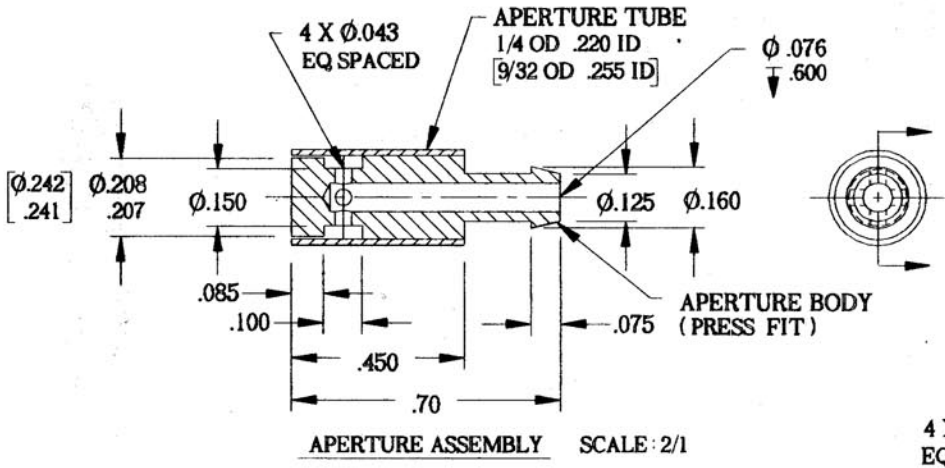
On compressed air I was able to achieve a reliable tone with a pitch drop of almost two octaves. On a normal whistle the aperture diameter is the same as the chime tube diameter. On large whistles this can result in high steam consumption. The Harmonic Whistle has a small aperture compared to the chime tube diameter, thus using less steam. The trade off for the lower power consumption is less volume, and the lower the pitch, the less the volume. However, the volume is adequate for gauge 1, especially if you consider the scale factor. The smaller aperture also makes it difficult to over-blow, which on a normal whistle can result in much distortion.

My first three whistles were built by trial and error. Some combinations worked, most didn't. After much tube trimming and frustration I decided I had to try to find the underlying principle that would take the guesswork out of determining the proper supply tube length. My feeling was, if the chime tube and the supply tube were going to play together, they had to be in tune with each other. That sounded reasonable. I broke out a long neglected physics book and proceeded to read up on vibrating air columns in pipes. I will spare you many of the details, but when I got to the part about nodes and antinodes it got real interesting. (Nodes are critical points within a standing wave.) The harmonic whistle is made of two different types of tubes. The chime tube is closed on one end and the supply tube is open on both ends. Sound waves react differently in open and closed tubes. An open tube has an antinode at each end, but a closed tube has a node at the closed end. The distance between a node and an antinode is 1/4 wave. I felt that this was the critical clue. If the tubes were going to talk to each other, they had to be tuned by trimming their lengths to 1/4 wave multiples. In other words, if the chime tube is four inches long, then a harmonic should be produced when the supply tube is 1 inch, 2 inches or 3 inches long, which are all 1/4 multiples of 4 inches; 1/4, 2/4 and 3/4. The 1st harmonic is produced by omitting the supply tube. Anticipating success at my discovery, I checked the tube lengths in my three whistles, and sure enough, they were all very close to 1/4 multiples. I then made new supply tubes for two of the whistles (one big whistle and one small whistle), three for each of them so I could try out all the multiples. Eureka! They all worked. Where I previously had one high whistle and one low whistle, I now had a high whistle with four optional pitches and a low whistle with four optional pitches, just by changing the supply tubes. Fortunately, the tube ratios do not have to be exact to work, but the closer the better. I have not been able to produce a fifth harmonic on steam. On air it's no problem. Steam is a much less forgiving medium than air when it comes to sound. I believe it has to do with aspect ratios of tubes. The ratio of the length to the diameter of the tube, on steam, should be somewhere between 2.5:1 and 8:1. As you approach either extreme the intensity drops and the tone degrades. This applies, to both the chime tube and the supply tube. **Figure 1** is a cross section of the whistle I am presently running on my Aster C & S Mogul. The chime tube diameter and length were chosen for esthetic reasons, being the largest that would com-fortably fit in the area. The aperture assembly is my third attempt, the first two being larger and thus using more steam. The present aperture is about the smallest practical for this size chime tube. Any smaller would reduce the volume excessively. In **Figure 1**, the aperture and collet dimensions shown in brackets will result in a louder but slightly higher pitched whistle, and would also be suitable for a somewhat larger whistle. I adapted the cab-mounted safety valve to provide the steam supply for the whistle. It started out as a test setup, but it has worked out so well that I will continue to run it. When I began this project I was using compressed air for whistle tests, which will get you into the ball park, but is a long way from the physics of steam. Steam being denser than air, more pressure is required to push it through small orifices. The pitch of a tube being blown by air will be about 25% lower than the same tube blown by steam. This is because the speed of sound in steam is faster than in air, with a resulting higher frequency. In the photograph, just below the aperture assembly, it is possible to see the deflector. This isn't shown in the drawing, but is soldered to the chime tube and keeps steam from being blown down in between the frame rails. I found that 1/8-inch neoprene

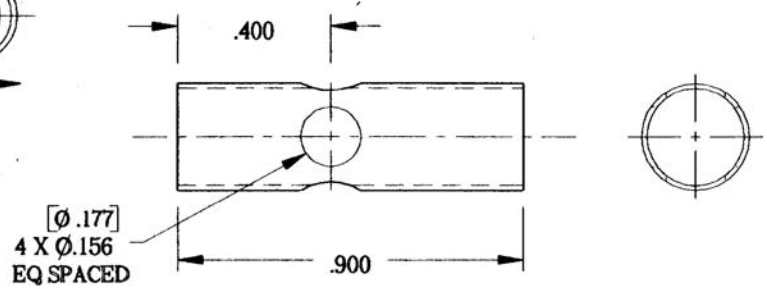
...continued on page 54

REDRAWN ON CAD 7-20-96

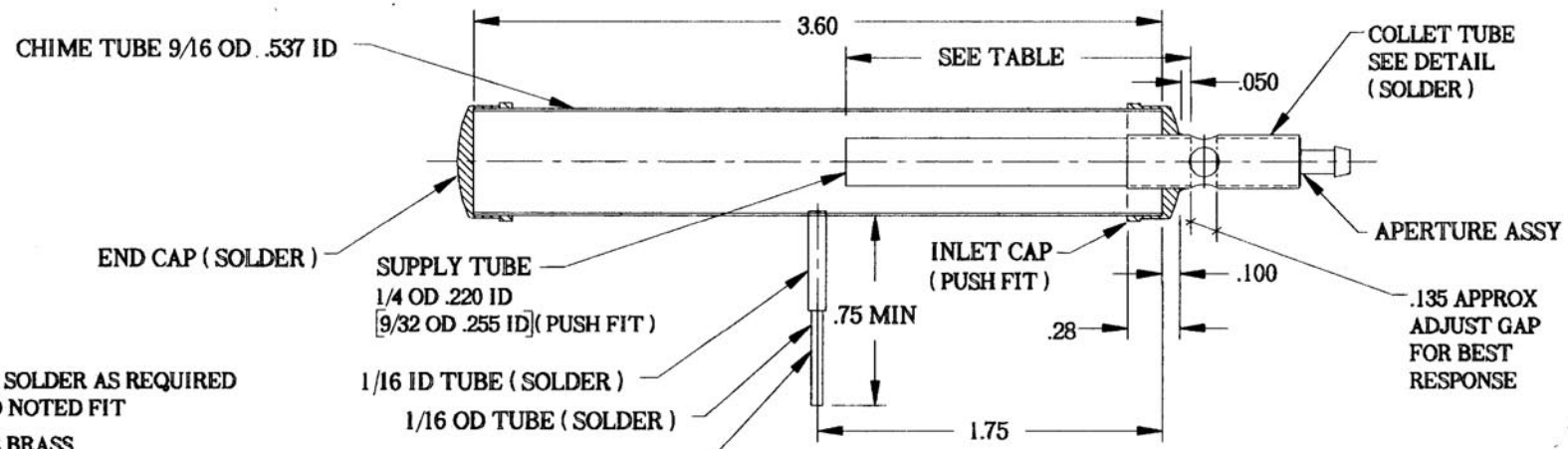
SUPPLY TUBE	
HARMONIC	LENGTH
1ST	OMIT SUPPLY TUBE
2ND	.900
3RD	1.800
7 4TH	2.700



APERTURE ASSEMBLY SCALE : 2/1



DETAIL COLLET TUBE SCALE:2/1
9/32 OD .255 ID [5/16 OD .285 ID]



NOTE :

1. TIN JOINTS WITH SOLDER AS REQUIRED AND MACHINE TO NOTED FIT
2. ALL MATERIAL IS BRASS
3. ASSEMBLY TO BE CO-AXIAL WITHIN PRACTICAL LIMITS
4. TUBE ENDS TO BE NORMAL TO AXIS
5. SYMBOLS PER ANSI Y 14.5M-1982
6. DIMENSIONS ARE IN INCHES
7. DIMENSIONS IN BRACKETS ARE FOR A LARGER APERTURE ASSY- RECOMMENDED FOR 4TH HARMONIC WHISTLE

HARMONIC STEAM WHISTLE

Fig .1

L. BANGHAM 3-5-96

SCALE : 1/1 & NOTED

Bob's Bit's

Weekend Projects for Steamers
by Bob Sorenson
CAD by Dan Pantages

Water Gauge

Today's project is the fabrication and installation of a water gauge on an existing locomotive. The water gauge is a mostly brass and silver solder fabrication using common bar stock. This gauge features a blow down valve to ensure accurate readings in the water glass. The water glass is standard 5/32-inch or 4mm diameter glass tube. The design is attributed to the great locomotive designer and builder Lillian "Curly" Lawrence, a.k.a. "LBSC" . LBSC used this water gauge successfully on many of his Gauge One locomotives.

Since this is an existing locomotive, there are some placement considerations. First is whether to mount the gauge on the back head of the boiler, or on the side. This depends on room available in the cab. Second is the height of the gauge on the boiler. The bottom edge of the gauge glass should be well above any flues or firebox inside the boiler. This way, any water observed in the gauge glass is at least at a minimum safe level.

Photo 1 is the example engine. The cab area is fairly cluttered with gas line piping. The gas valve is right in the middle and pretty much blocks the back head. It appears the only option is to mount the gauge on the engineer's side at an angle. Take a few measurements and try to visualize how the water gauge will fit in. Then take the boiler off the engine, soak in paint stripper, and remove all paint. Unfortunately there is a silver soldering operation on the boiler shell, so all the paint has to come off.

Lay out and mark the center location of the water gauge on the boiler shell, as in **Photo 2**. Turn two boiler bushings from bronze bar stock per **Drawing 1.** Drill two holes, 5/16-inch diameter into the boiler shell as shown in **Photo 3**. Silver solder the bushings into the boiler shell. Install two quarter-inch x 40 street ell fittings into the bushings, (**Photo 4**.) Very nice machined street ell castings are available from PM Research — (https://www.pmmodelengines.com/). As an alternative, fabricate from bar stock.

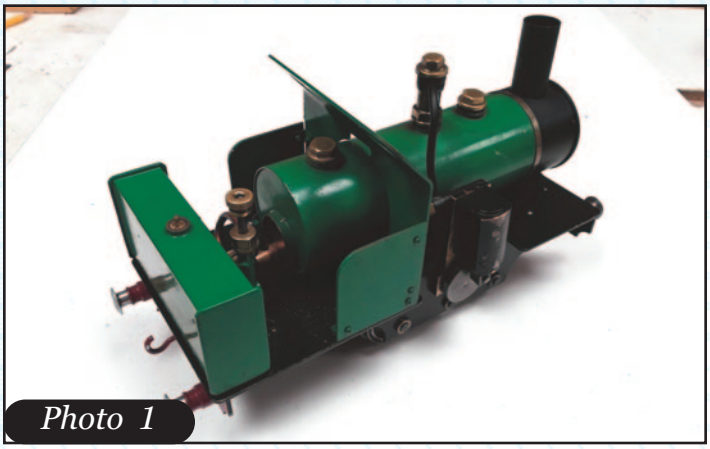


Photo 1

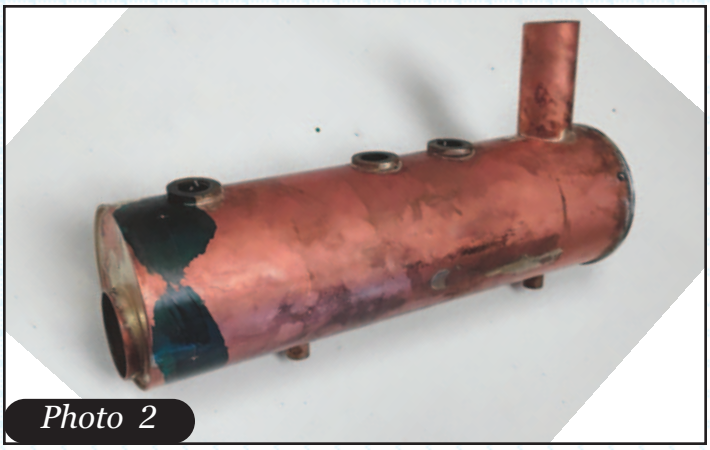


Photo 2

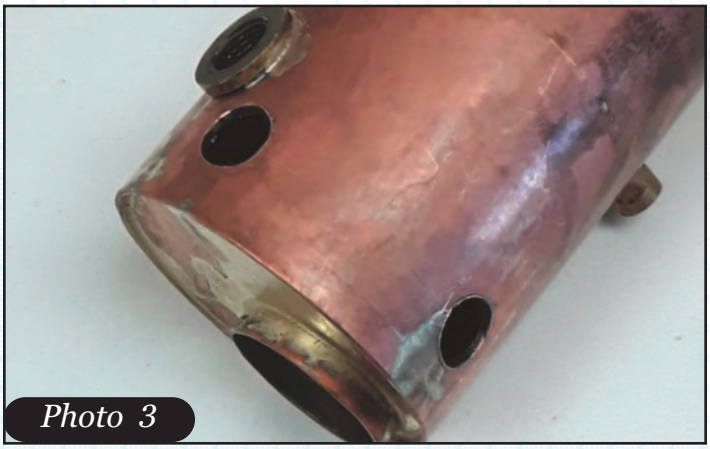


Photo 3

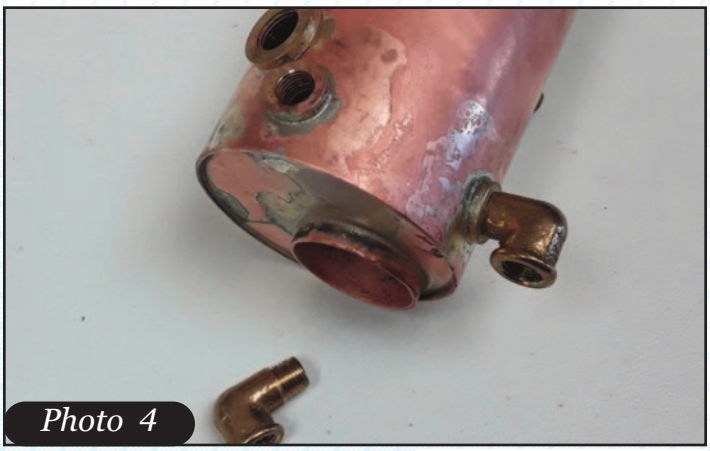


Photo 4

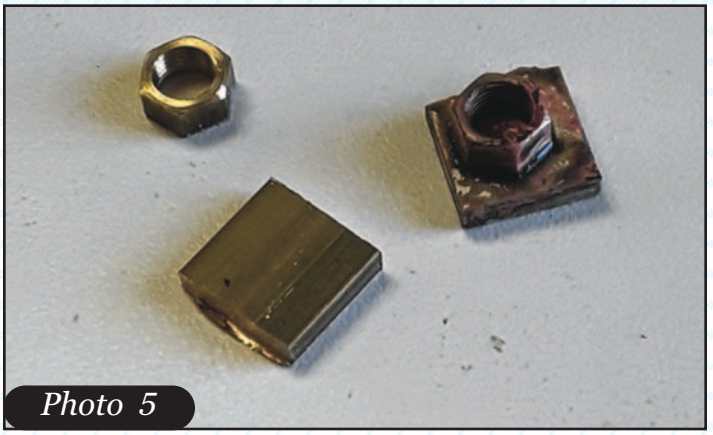


Photo 5

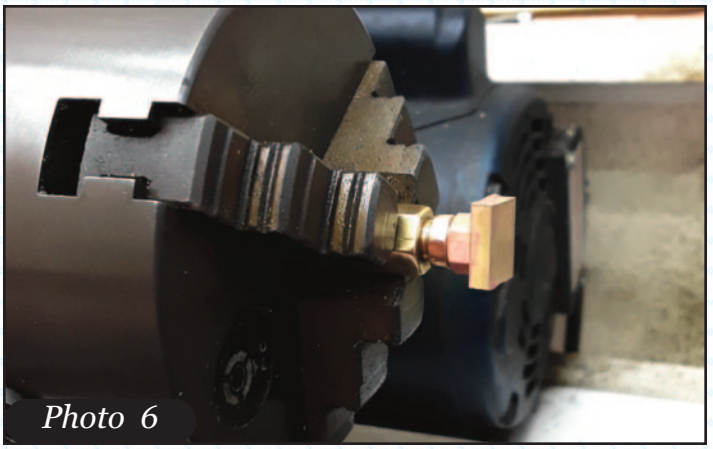


Photo 6

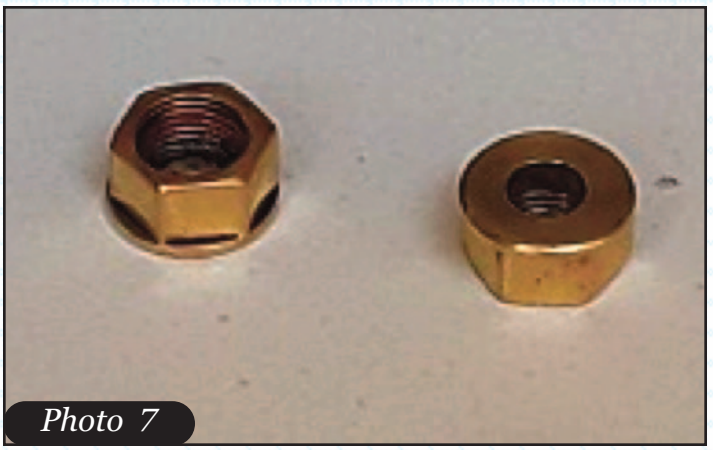


Photo 7

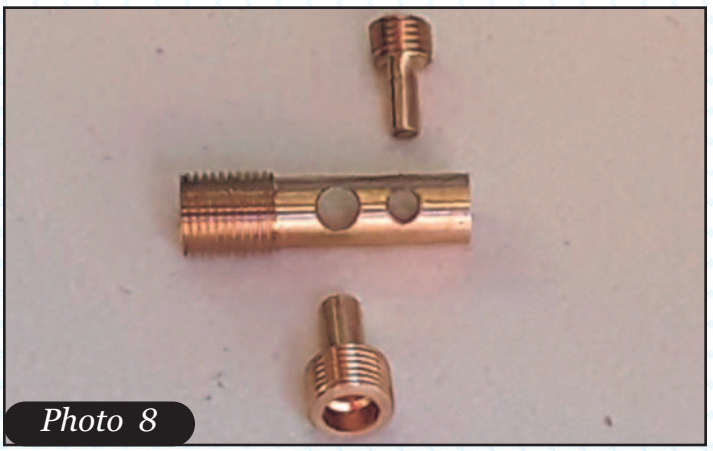


Photo 8

Start off the water gauge by making all the small parts. The jams nuts, (**Drawing 2**), are from 5/16-inch hex brass. Drill and tap the stock quarter-inch x 40 in the lathe and part off to a length of 3/32-inch. The packing nuts, (**Drawing 3**), are silver soldered fabrications. First, drill and tap some 5/16-inch hex brass with quarter-inch x 40 and part to a length of 5/32-inch. Cut a length of one-eighth-inch thick brass flat bar for the nut flange. Silver solder together as shown in **Photo 5**. To finish the packing nuts, make a quarter-inch x 40 threaded fixture and turn/drill the nut to final dimensions as in **Photo 6**. **Photo 7** shows the finished packing nuts. These little fabricated nuts come in handy for gas and steam compression fittings, valve stem glands and other plumbing tasks. The blow down needle valve, (**Drawing 4**), is silver soldered from stainless steel and a knob as desired. The top cap, (**Drawing 5**) is turned from 1/4-inch hex brass.

The water gauge lower end, (**Drawing 6**), is a three-piece silver solder fabrication. **Drawings 7, 8 & 9** show the blank parts of the lower end. The drawings specify a number of drilled holes. These are pilot holes that assist in finishing the lower end. After soldering together, finish drilling and tapping as shown in **Drawing 6**. **Photo 9** shows the water gauge lower end with a jam nut, packing nut and the blow down needle valve. At this point, screw the blow down needle valve into the lower end rather tightly. This will make a good water tight seat.

The water gauge upper end, (**Drawing 10**), is a two piece fabrication, using the same methods as the lower end. **Drawings 11 & 12** detail the blank parts. **Photo 10** shows the finished upper end with its jam nut and top cap. Fabrication of the water gauge is done.

Mock up the water gauge on the boiler using a #21 drill bit for alignment, as in **Photo 11**. Determine the length of the gauge glass. The glass fits in the lower end recess and about 3/16-inch into the upper end. Ensure the gauge glass does not block the #32 drilled hole in the upper end. Cut the gauge glass by scoring around the tube with an abrasive wheel on a rotary tool. While wearing gloves, snap the glass tube at the score line.

Clean the boiler thoroughly and mask off all bushings in preparation for paint. Prime, paint and let dry completely. Paint the upper and lower ends, or polish as desired. Polish

the jam nuts, packing nuts and blow down valve knob. I use "rattle can" paint, it seems to work fine. Most of them claim to be ready to handle in five to nine hours, but it's better to wait two or three days.

Photo 12 shows all the parts ready to install with the upper and lower ends installed. Installation is probably better done with the boiler off the engine, so there is plenty of room to work. To assemble, feed the gauge glass through the upper end, slide on the packing nuts and into the lower end recess. Pack the gauge glass with regular plumber's teflon tape. Twist a three-inch length into a tight string, wrap around the gauge glass and poke into the packing nuts with a needle. Tighten the packing nuts finger tight.

Note also in **Photo 12**, a short length of brass tube between the packing nuts. During the mock up, I noticed that the lower end of the gauge glass was below the top of the flue. This means that the water level in the boiler could be low enough to uncover the top of the flue, yet the gauge still shows water. The brass tube masks off the lower portion of the gauge glass to a point above the flue.
Photo 13 shows the locomotive reassembled and back in service.

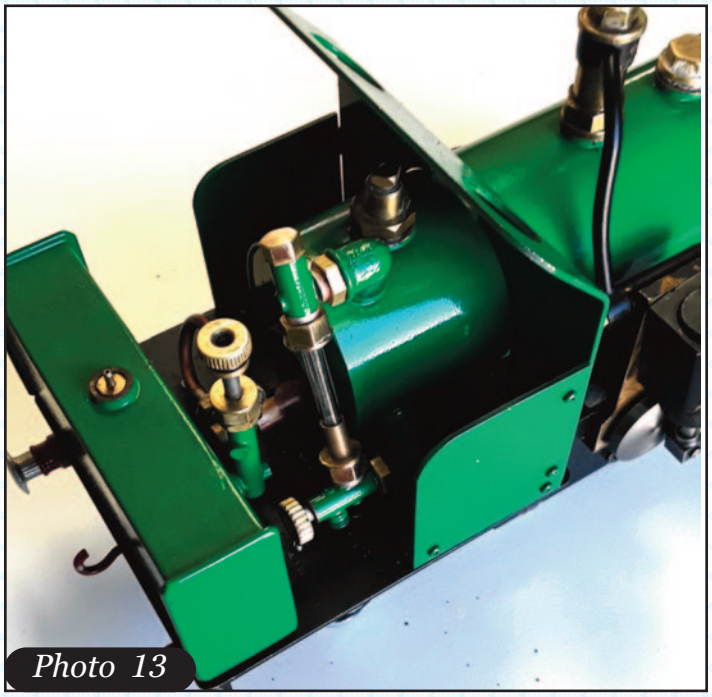


Photo 13

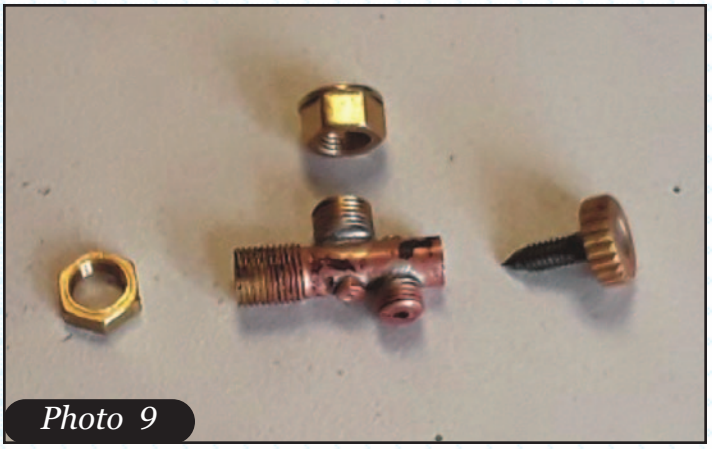


Photo 9

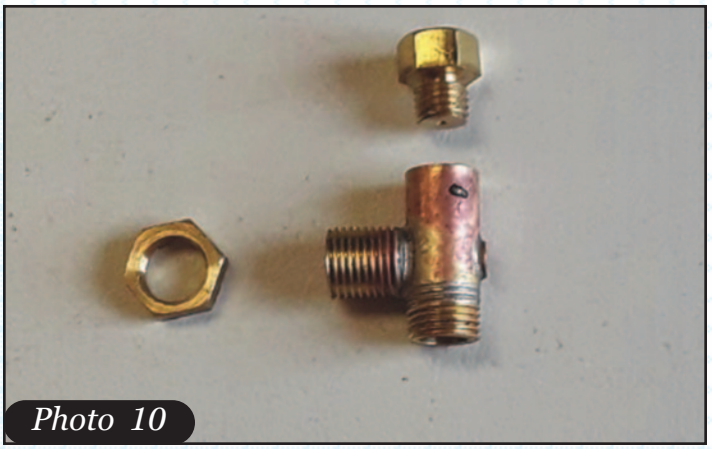


Photo 10

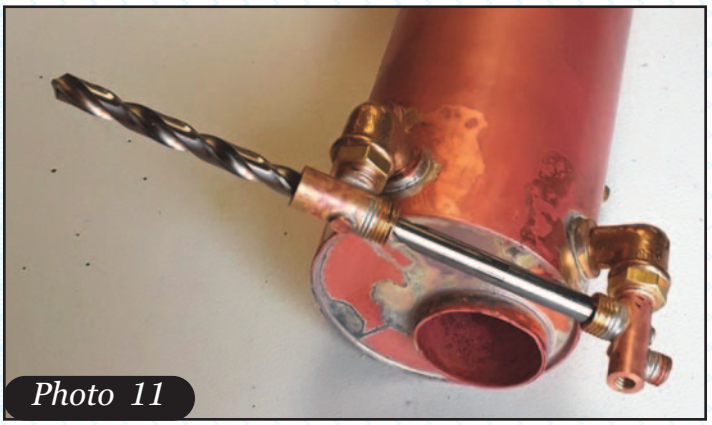


Photo 11

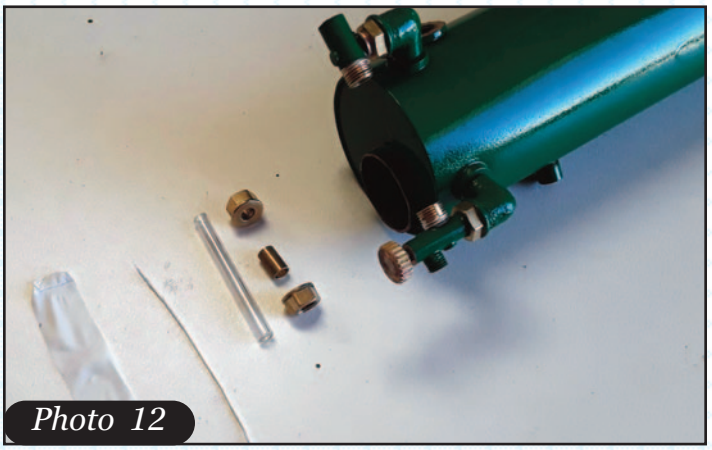
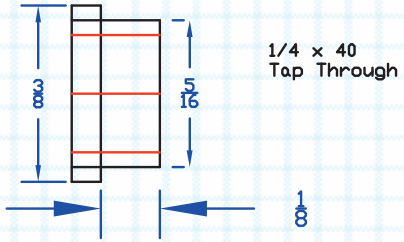
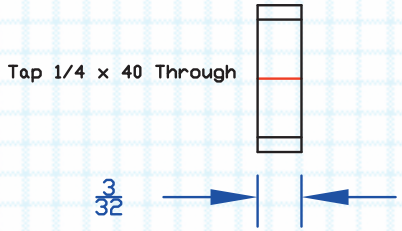


Photo 12

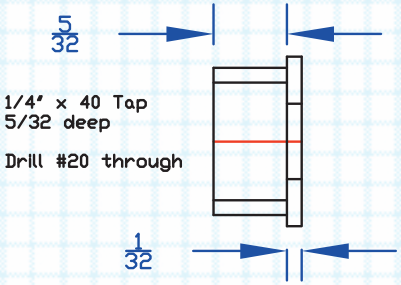
#1
Boiler Bushing
Brinze, 2 req.



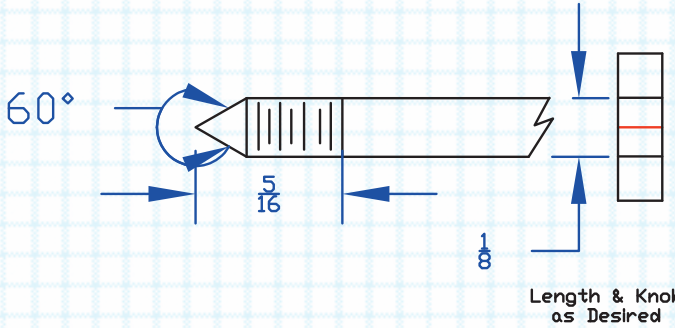
#2
Jam Nut - 5/16" Hex Brass



#3
Packing/Compression Nut - 2 req.
5/16" Hex Brass

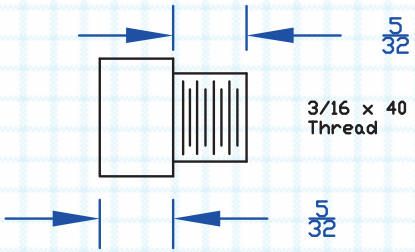


#4
Blow Down Needle valve
Stainless Steel



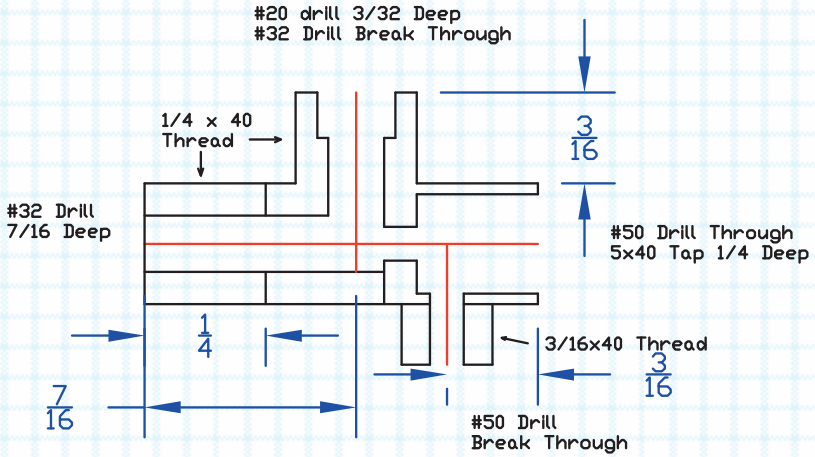
Glass Tube
5/32 or 4mm Dia.
Length as Needed

#5
Top Cap
1/4 Hex Brass

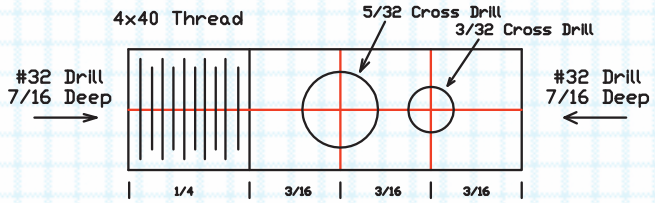


Dan Pantages
November 2019

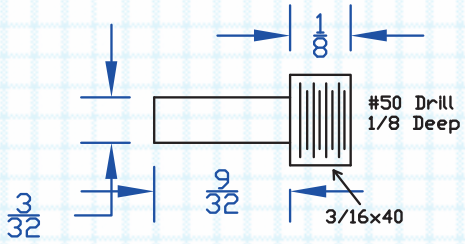
#6
Lower End - Brass



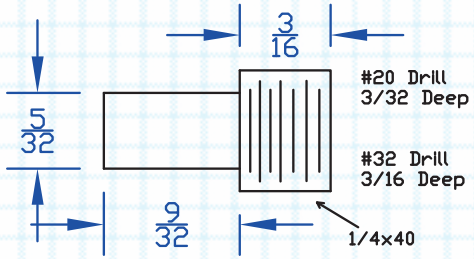
#7
Lower End Body Blank
1/4" Brass



#8
Blow Down Nipple Blank

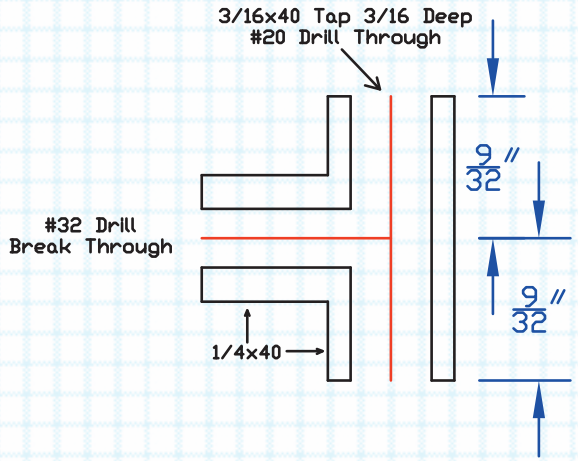


#9
Lower Glass Blank

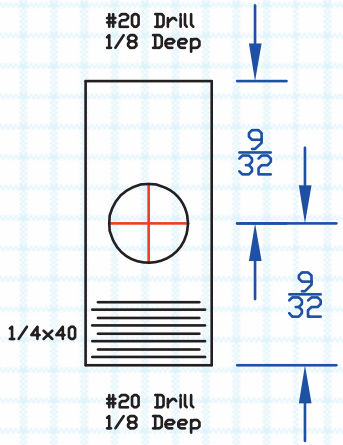


Dan Pantages
November 2019

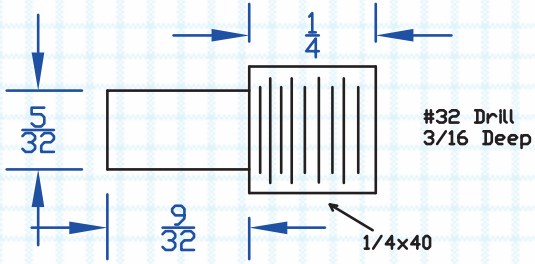
#10
Upper End - Brass



#11
Upper End Body Blank
1/4" Brass



#12
Upper End Nipple
1/4 Dia. Brass



Dan Pantages
November 2019

Centurion Society Model Engineers Fair

By David Cairns
Photos as noted

By way of introduction for those not familiar with Centurion Society of Model Engineers, the Society can trace its roots back to 1961 and the formation of the Pretoria Live Steam Club/ Pretoria Stoomtrekkragklub, which basically operated from the garages of the members. Twenty-four years later the then Verwoerdburg Municipality announced it was making available on lease a 13 hectare (32 acres) site to the club adjacent to the Hennops river, so that the club could pursue its hobby and entertain the public. Eight years later the site was officially opened.

The club, now known as the Centurion Society of Model Engineers (CSME), is located in beautiful, extensive park-like grounds with prolific birdlife. Owing to the propensity of the Hennops to flood it is extremely unlikely the site would ever be developed for residential or business purposes, which gives the club a degree of security in the face of relatively short term leases. This has encouraged the CSME to erect excellent facilities on the site. Not only are there 900 metres (3000 feet) of three and one-half-inch, five-inch, and seven and one-quarter-inch tracks for running locos through tunnels and over bridges and with a covered station, but a club with its own premises sails boats on the lake. The radio controlled truckers are also present with a dedicated area for operating their model trucks etcetera. Finally there are excellent facilities in the 'station' building which provides catering, toilets and showers. While the setting of the Durban Society of Model Engineers is attractive and the Pietermaritzburg Model Engineers Society site is also set in park-like grounds, arguably it is eclipsed by Centurion. Those interested in finding out more about CSME should consult the website: http://www.centuriontrains.com/

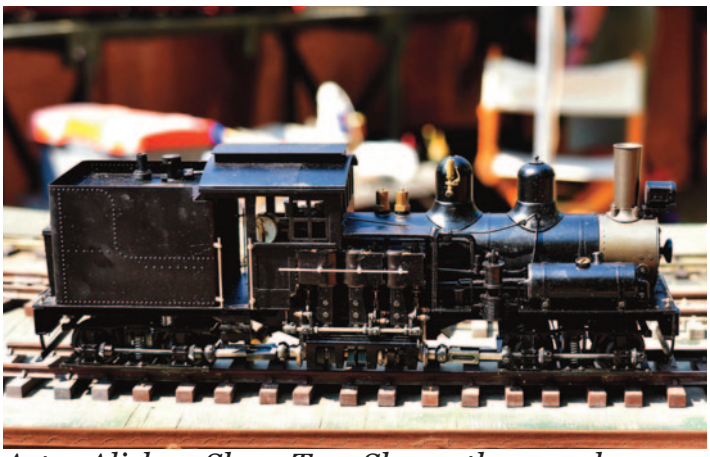
http://www.centuriontrains.com/

CSME has been running an annual 'fair' since 2017. The highpoint this year was the opening of a Gauge One track. While the track base is permanent, to deter theft and vandalism the rails have to be lifted after each operating session.

The entire project was conceived and largely built by Carel Janse van Rensburg. Family members and other specialists assisted from time to time and an informal 'go fund me' scheme assisted with the financing. The result is outstanding. While far from finished, the layout will do a lot to promote large scale, (Gauge One and its associated variety of scales), modelling in South Africa. The other development over the weekend was the showcasing of correct scale to gauge models of Cape gauge (three-foot six-inch) SAR diesels and coaches. The visionary for this project was Riekus

van der Westhuizen who runs a local model train shop specializing in Marklin. The builder of the models was Jan Gouws of SARM who is based in Somerset West. I had no idea that models of this quality could be constructed in South Africa and can only hope the enterprise of the two gentlemen concerned will be rewarded if not locally then in the export market.

In order to provide an opportunity for live steam equipment also to be exhibited, I brought my portable dual gauge layout – Umkhulu Modules – up from Durban. Hopefully in view of the physical effort involved I will not have to do so again. Carel has undertaken to add a third rail on one of the circuits to create a 32mm track. That is something to look forward to! In the meantime let's have a look at some photos from the weekend.



Aster Alishan Shay. Two Shays, the one above and Accucraft's Mich Cal did the 'heavy lifting' over the weekend on the 45mm track.

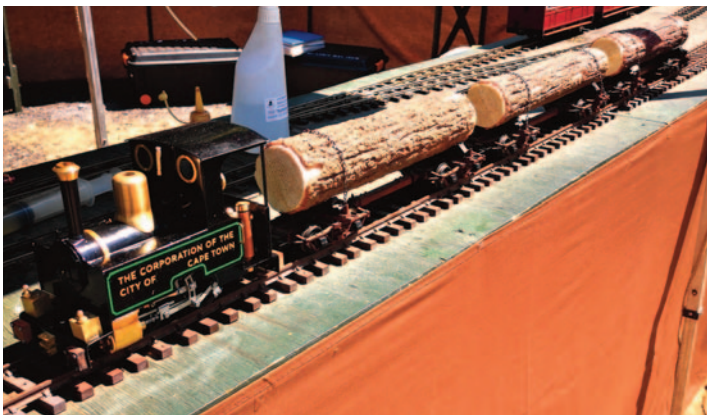
Photo - Hannes Paling

The Umkhulu Modules portable Gauge One and SM32 layout. With temperatures reaching 35 degrees centigrade (95 F) in the middle of the day, the gazebo was a vital piece of equipment.

Photo - David Cairns

Accucraft UK's latest offering – Talyllyn 'Dolgoch" pulling a rake of Brandbright coaches built from kits. It was appropriate that this loco had its first run at Centurion because between 1901 and 1904 "Dolgoch" carried the name of Pretoria to mark the relief of Pretoria during the Boer War/Second War of Independence, (depending on your political persuasion). Centurion is effectively a suburb of Pretoria.

Photo - Hannes Paling



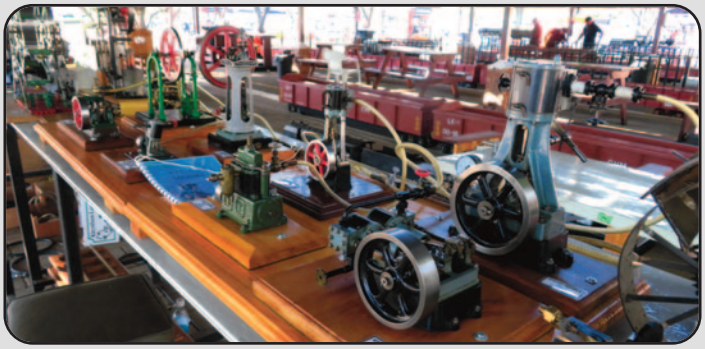
James Cunningham's, Graham Duncan Smith built, model of the loco that sits in the Waterworks Museum on northern side the top of Table Mountain in Cape Town also made its first public appearance. The 2'6" gauge prototype, works no 826, was built in Scotland by Andrew Barclay, Sons & Co Ltd in 1898. The loco was dismantled and re-erected on Table Mountain to assist with the building of reservoirs. When the work was completed the loco was abandoned there.

Photo - David Cairns

Cape Gauge One

The recent history of large scale modelling in South Africa is largely restricted to the engineering gauges of three and one-half-inch, five-inch, and seven and one-quarter-inch gauges although it is interesting that as long ago as the 1930s some SAR employees based at Kimberley built an operating layout to 1:24 scale running on one and three-quarter-inch (44.45mm) track (source The Meccano Magazine). As an aside it is also interesting what emerges at events such as the Centurion Fair. This included two locos for 45mm track, one clockwork and the other coal fired! But things are changing.

Here's a look around the grounds of other model engineering activities:



Some of the exquisite Stuart stationery engines built by Colin Baytoff on display.
Photo - David Cairns

Class 34-200 diesel with a rake of Blue Train coaches crosses the bridge on the electric Gauge one tracks.
Photo - Hannes Paling

The park lake and model boat basin at sunset.
Photo - David Cairns

Live steam tug boat. This was built by George and Ken Boss and is powered by two vertical Stuart engines.
Photo - David Cairns

THE CUPOLA VIEW

Searching through History

For this issue we dug back into our archives to bring an article back for another go around. The original issue is no longer in print, and I think its a nifty solution to add to a live steamer. Larry Bangham provided *Steam in the Garden* with a whole series on whistles all with excellent drawings. We have done some very minor re-editing to remove some archaic references and some of our "style guide" formatting, but that is about all. The article after twenty four years still holds up and shows the progression of research done to find a solution. Personally, I find that part the most interesting.

I hope you enjoy this look back and maybe you will find some inspiration to add a whistle to one of your projects.

Until then,

Happy Steaming!

Scott

'Cupola view' is written by Editor Scott E. McDonald: you can contact him at sitgeditor@gmail.com or P.O. Box 1539, Lorton, VA 22199.

TIMETABLE

Special or Annual Meets

Staver Locomotive Spring Steamup - April 23-26, 2020. Staver Locomotive, Portland, Oregon. Visit *www.staverlocomotive.com* for latest information.

Sacramento Valley Live Steamers Spring Steamup - May 15 - 17, 2020, Sacramento, CA. We have room for trailers and overnight camping. Visit http://www.svl-srm.org for more information .

National Summer Steamup 2020 - July 8-12, 2020. McClellan Conference Center, McClellan, California. Visit *www.steam-events.org* for more information.

Fourth Annual Gathering of North American Members of the Association of 16mm Narrow Gauge Modellers - September 18-20, 2020. Hazlet, NJ. Visit *www.northamerican16mmmodellers.org* for more information.

Cabin Fever Model Engineering Show January 15-17, 2021 - Lebanon Valley Expo Center & Fairgrounds, Lebanon, PA. Gauge One Tracks available for steaming. Visit *www.cabinfeverexpo.com* for more information.

International Small Scale Steam Steamup. January 17-23, 2021. 103 Live Oak Drive, Diamondhead, Mississippi. Visit *www.diamondhead.org* for more information.

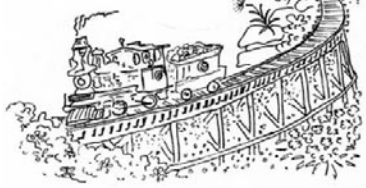
Regular steamups

Crescent City High Iron. Steamups as necessary on an elevated backyard layout on Northern California's upper coast. Info: Don Cure, diamondd1947@msn.com.

Greater Baton Rouge Model Railroad Club Open House and Gauge One Steamup. Info: Ted Powell, (225) 236-2718 (cell), (225) 654-3615 (home), *powell876@hotmail.com*.

Puget Sound Garden Railway Society. Two steamups per month, one at the Johnsons' on the second Saturday and a steamup at a member's track on the fourth Saturday.
Info: *http://psgrs.org/* or call Pete Comley at (253) 862-6748.

Southern California Steamers. Contact Jim Gabelich for dates, places and other pertinent information. (310) 373-3096. *jfgabelich@msn.com*



CONTRIBUTOR BIOS

The magazine couldn't exist if it were not for the dedicated individuals who take time from the hobby to chronicle their endeavors, interests, and joy of live steam. If you get a chance to meet any of our contributors at a steamup, please thank them for their contribution.

Bill Allen - Bill lives in Woodside, California and first became interested in live steam in 2008 when he saw Richard Murray's layout at a BAGRS open house. He proceeded to buy a Ruby, C16 and Forney before deciding to start building his own. He bought a mill and lathe and with the help of some BAGRS members learned to use them and was soon making chips. Since then he has completed 20 projects some of which have been featured in Steam in the Garden and currently has a multi part article running in Live Steam. All of his builds are one-of-a-kind as he only builds those which have never been done before and probably will never be done again in G gauge live steam. Bill's prior hobby was building fine furniture and he uses some of those skills and tools in hie engine building.

Phil & Stephanie Huntingdale - Phil and Stephanie Huntingdale are members of the Sacramento Valley Live Steamers Railroad Museum (SVLSRM). They also belong to Sacramento Garden Railway Society and Train Mountain. They attend the National Summer Steam Up in Sacramento on a regular basis. Stephanie has the writing background and has written articles for several publications. Phil contributed the details of the table build and he runs trains. "We enjoy trains of all sizes, but especially have a fondness for our G scale Live Steam Engines. We were very pleased when SVLSRM asked for Phil's assistance in designing and building the permanent table at the park."

Rob Lenicheck - Being a Colorado native, Rob Lenicheck was born with narrow gauge steam in his blood. He started modeling in HO in junior high, thanks to a suggestion from a "friend", moving on to HOn3 in high school, and finally to On3 in his early twenties. Unknown to Rob at the time, the Ga1 live steam hook was set deeply about 20 yrs ago when that same "friend" revealed his collection. Rob now spends much of his time scratch building engines. He has degrees in Music Education and Mechanical Engineering.

Jeff Young - Jeff Young is retired Professional Engineer, having worked in the rail transportation industry in academia, government and private sector consulting. As a life-long model railway enthusiast, he has been involved in small scale live steam since 1980. Jeff's back yard line, the Algonquin Light Railway, has been in operation for thirty years. As well as models, he enjoys running full size narrow gauge locomotives whenever possible.

***Your Name Can be on this Page!* -** The whole world is waiting to hear from you! We are always looking for Live Steamers to share their thoughts, experiences, projects, latest acquisition... The list goes on!

We need Locomotive Reviews, Tips & Hints, Steamup Reports, etc. All contributors are compensated for their submissions. Submitting is easy. Just e-mail your idea to sitgeditor@gmail.com and we'll work with you to bring your article to our pages. Visit www.steamup.com to view our Contributor Guidelines to see how easy it is to show the world your small scale live steam interests!

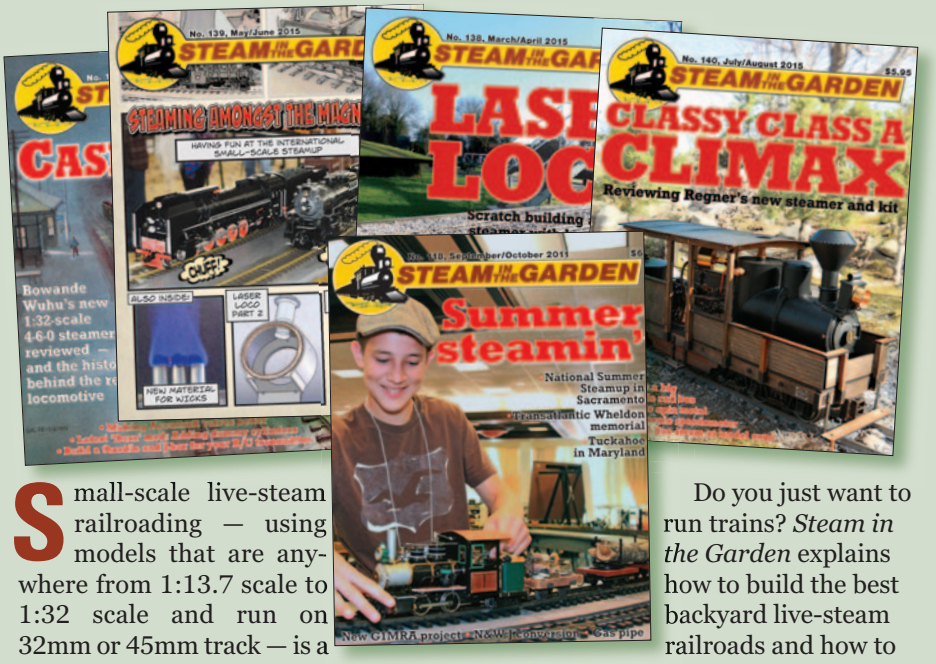
Advertiser Index

Coming Soon!
Issue #167
May/June 2020

Building the Blue Comet
Part 2 of the series by
Bill Allen

Rick Parker Photo

Steam ... it's the real thing!



Small-scale live-steam railroading — using models that are anywhere from 1:13.7 scale to 1:32 scale and run on 32mm or 45mm track — is a fun hobby that has room for rivet counters and freelancers, prototype purists and lovers of whimsy.

Steam in the Garden is the only magazine devoted entirely to covering the small-scale live-steam hobby. Since 1990 the magazine has taken readers inside the railroads and inside the workshops of the leading modelers and shown how fun and easy live steam model railroading can be. Six times a year, *Steam in the Garden* gives subscribers a look at the current trends in the hobby and reviews the latest products available.

Are you a builder of live-steam models (or do you want to be)? *Steam in the Garden* has detailed articles that explain how experienced builders create those once-in-a-lifetime projects that can't be found anywhere else.

Do you just want to run trains? *Steam in the Garden* explains how to build the best backyard live-steam railroads and how to build portable layouts as well.

Want to make improvements on your locomotive? *Steam in the Garden* has dozens of articles every year that show you in detail how to add features to your small-scale loco or make your rolling stock run better.

Want to know what's happening at the leading live-steam events? *Steam in the Garden* will take you there, to give you a flavor of what's happening, both on the track and in the clinic rooms, as well as the latest products shown by exhibitors.

Steam in the Garden is sticking to its 20-year history of giving hobbyists the best information, illustrated profusely, in an easy-to-read format. Fill out the form below and subscribe today to *Steam in the Garden*.

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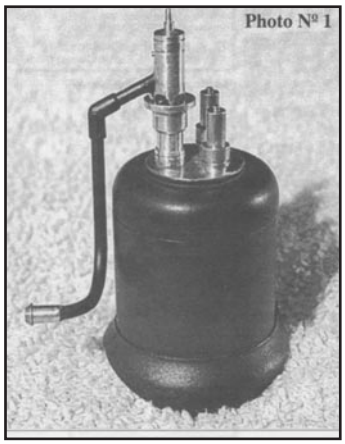
...continued from page 36

tubing works fine for plumbing the whistle to the valve. Less condensation and easier to route than copper tube. I routed the tubing from the valve down to the floor close to the boiler and out through the cab on the fireman's side by notching the front wall and slotting the toolbox that sits on the running board. I left about 1/2-inch of tubing sticking out of the toolbox. The whistle slips into this and is secured at the front end with a clamp and a screw going through the running board. The manual valve lever can be seen sticking out of the cab win-dow. Regardless of what your whistle size constraints are, lam sure there is a combination that will fit your application. If you are prone to experiment you may find some combinations that I have over-looked. I've not yet figured out a formula for predicting the final pitch. And not being a physicist, my explanations for the deep tone, and determining the correct tube length may be all wet, but it works! Knowing what works and why it works are two different things. Maybe there is a scientific-type steam buff out there who can fill us in on what is really happening in these little tubes. If you decide to build a whistle you will find it helpful to purchase the brass tube assortments that nest together, available at hobby stores. Also, I found it helpful to pre-tin the tube ends and then machine them for a press fit where adjustments are necessary. If you want to forego the harmonic feature, the aperture design in **Figure 1** will also work fine for a straight Peep-Peep whistle. Just eliminate the chime tube. That's about it for now. I hope this information will prompt some of you to design that man-sized whistle for your Big Boy. Happy Quilling!

More on Harmonic Whistles in the next Issue!



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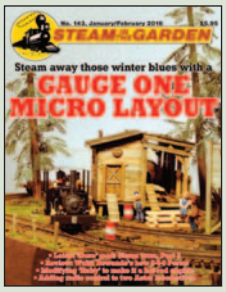

Vol. 26, No. 1; Issue 143; Jan./Feb. 2016
Micro layout: Building an indoor Gauge One track • Review of Wuhu Bowande Porter • Hot-rod 'Ruby': Hopping up a 1:20.3-scale engine • Rolex Asters: Adding radio control • Learning to model in tinplate with a 'Dora' modification, Part III • Latest waybill: Llagas Creek Railways sold, U.K. distributors merge.

Vol. 25, No. 6; Issue 142; Nov/Dec 2015
In memoriam: Andre Anderson, Wuhu G5: Locomotive review — 1:32-scale, 4-6-0 , Topaz: Alchemy, building an Accucraft 'Ruby' kit, Tram: Learn to model in tinplate, Sacramento stationaries: NSS 2015 highlights miniature machinery. WWI car: Creating a 7/8ths-scale Fort Benning railroad observation car.

Vol. 25, No. 5; Issue 141; Sept./Oct. 2015
Mamod's latest: 'Brunel' • Learning to model in tinplate with a 'Dora' modification, Part I • Live-steam group makes sixth appearance at Maker Faire • Adding mesh to Accucraft burner • Salute to Tom King • New products: Aster 0-4-0, Wuhu Bowande German 2-6-2T, Train Dept. with two 7/8ths-scale.

Vol. 25, No. 4; Issue 140; July/August 2015
Classy Class A Climax — Regner steamer and kit review • Big 'Dora' — Making it a 1:13.7-scale rail bus • Spinning metal • Cabin Fever • Speedometer • Latest waybill: Garratt from Roundhouse; in memoriam — Peter Jobusch; Accucraft UK goes with an African steamer; Mamod saddle-tank loco.

Vol. 25, No. 3; Issue 139; May/June 2015
Steaming amongst the magnolias: Diamondhead 2015 • Laser Loco: Aspinall 0-6-0 (series Part Two) • Workshop: sample tools and equipment • Wicks: A new material • Open cab 'Dora' • Latest waybill: Swiss, U.S. locomotives on the way; a new version of Saxonian in 1:20.3 scale.

Vol. 25, No. 2; Issue 138; March/April 2015
Laser Loco: Scratch building with laser-cut brass. Part 1 • How steamers in Seattle created a community • Getting an LED onto the front of Accucraft's C-19 • Two former ride-on live steamers decide to go to Gauge One • Romance, realism of coal firing: factors to consider before taking the plunge.

Vol. 25, No. 1; Issue 137; January/February 2015
Expand Accucraft cylinder ports • Casey Jones: a new 10-wheeler from Wuhu and the engineer's history • R/C J-bar: adding steam controls to transmitter • Dummy cylinders: Give 'Dora' a more realistic look • Railroad librarian: 'Great American Railroad Stories'; 'The State Belt.'

Vol. 24, No. 6; Issue 136; November/December 2014
Sacramento steams. The 2014 National Summer Steamup provides a fun time for more than 150 steamers • Replacing axles • Scratch-building the four-cylinder Heisler, Part Three • The backyard Rivendell & Midland Railroad, Part Two • 'Dora' gets a snow plow (and a bell and a ...).

Vol. 24, No. 5; Issue 135; Sept./Oct. 2014
A big little locomotive: Accucraft's 7/8ths-scale 'Fairymead' • Scratch-building the four-cylinder Heisler, Part Two • The backyard Rivendell & Midland Railroad, Part One • Build a train barn • Review: Regner's 'Otto' • Latest Waybill: Accucraft 1:32-scale rolling stock; end of boiler detection; new wheels..

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