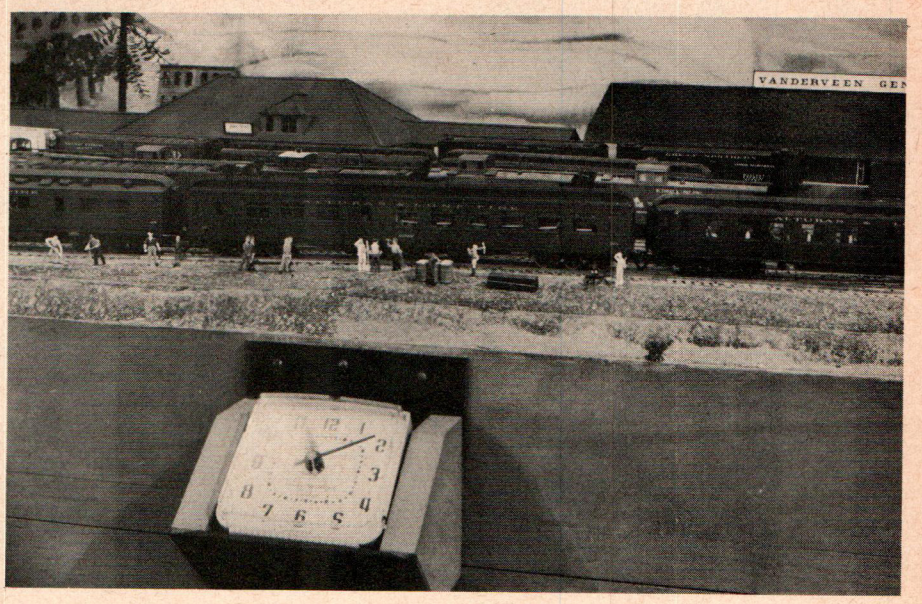
OPERATING your model railroad

by Whit Towers

Many modelers believe that the real fun of model railroading comes after the layout has been completed and the model becomes a miniature of the real thing with full timetable operation.



THE COVER: View on the Alturas & Lone Pine, showing Sonora Jct. and Keeling Mine. Whit Towers names most of his structures after personal friends in the hobby. More color on page 21.

OPERATION CAN be defined as the reproduction of the traffic activities of the prototype on our model railroad empire. This seems deceptively simple at first glance, but actually there are hundreds of subjects which can be covered by the broad term "operation". Between the A.A.R., the I.C.C., the Public Utility Commissions of the various states and the individual railroad's rules, there are reams of paper and millions of words on the subject. In model railroading we are fortunate that we can approach operation with the thought that it is our hobby. We can go into it as deeply as we desire, or with merely a rudimentary knowledge we can still enjoy model railroading.

Many hobbyists never reach the stage in the hobby where the subject of operation becomes of interest to them. The construction phases of the hobby; building locomotives, rolling stock and superstructures keeps them both satisfied and occupied. Some of this group never even build a model railroad while others, the majority of us, do construct a railroad whose size and grandeur is limited only by our ability to wheedle space from the rest of the family.

In the early stages of the hobby we are content to see our equipment run and our physical railroad setting is often no more than roadbed and trackage to which we apply a liberal amount of imagination as we watch our trains circle about. The fact that there is neither scenery nor a solitary structure is easily overlooked in the joy of actually seeing our eqiupment move. As this stage progresses we become interested in scenery and structures in an attempt to add realism to our empires. We continue to build and acquire equipment, but the main stress is towards covering up the bare spots to provide a semblance of realism for our visitors. After all, it is rather difficult to both run the train and provide a running commentary on the scenic beauty of the countryside through which it is passing. The stand pipe becomes a grain elevator or world's tallest smoke stack, the furnace a gigantic barn and the laundry tubs the deepest lake as we paint a glowing word picture of what is yet to come.

As work progresses on the physical railroad the mere running of a train in an endless loop begins to become something of a bore, after all we've seen it many times before. At this stage of our hobby development we begin to notice what others are doing with their railroads, the little tricks which they use to make their train running more true to life. When we first started we were satisfied merely to see the locomotive and cars move, but we notice that starting and stopping by using the reversing switch (while even advocated in print) is a highly unrealistic method of operating a train. The jerk with which it strats, the standing still followed by movement at 35 to 45 MPH just isn't realistic and is seen in real life only at drag racing strips. After all the prototype railroads consider an acceleration of from ½ to 1 MPH per second as highly satisfactory.

Thus the first step in our search for operation is often an attempt to handle the train in a realistic manner. We develop an easy hand on the throttle, gradually increasing the voltage to provide smooth starts and conversely we gradually reduce the voltage in order to stop smoothly. Often we find that the throttle control on the particular power pack which we've been using just won't allow us to start and stop smoothly. The first winding of the rheostat provides enough current to allow our engine to run at breakneck speed. Obviously this is a condition beyond our ability to control through the use of a light hand on the throttle. What's the answer?

Scale time using a fast or scale time clock makes timetable operation simpler, particularly on the smaller model railroad layout.

We can either purchase a larger better quality rheostat from our hobby dealer, one with sufficient wattage to handle and better control our locomotives; or we can become engrossed in a momentum type throttle built up using transistors; or we may even remove the rheostat entirely and substitute a variable transformer (Adjust-A-Volt, Variac, Powerstat, etc.), in the primary side of the power pack transformer to obtain better control. It isn't the purpose of this article to explain how this can be done, or even which is the best system. There have been many articles in the past on the advantages of each method of control, as well as complete explanations of how they may be constructed and installed. N.M.R.A. Data Sheet D7g.1 shows many of the basic circuits used for power supply and voltage control. The important thing to remember is that without good electrical control and voltage regulation it's impossible to obtain satisfactory performance from motive power no matter how good your intentions may be.

It is also quite obvious that the motive power itself must be free running, well broken in, and free from all binds and unnecessary friction. In ancient times when we hobbyists had to build our own motive power this matter of a free running mechanism was a matter of personal pride and we worked hard to make our locomotives run like a watch. Later with the advent of kit assembled motive power we all continued this practice of getting the binds out of the mechanism before we consider a locomotive ready for service. As you know the recent advent of imported locomotives has provided us with motive power more detailed and more beautifully constructed than most of

With its train left on the main, the peddler freight loco goes onto the spur team track to dig out its pick-up S.T.A.R. boxcar before setting out the Pere Marquette flat. Dependable automatic couplers are a must for operating.

us could ever hope to accomplish and they became an instant success.

To many model railroaders the phrase 'Ready To Run' was taken as a literal statement of fact. The late Max Gray always insisted his imports were ready to complete with the thought that along with paint and decals the purchaser should expect to do some tinkering and tuning to get his engine to run perfectly. I'll agree that most of the brass imports do run well, but I seriously doubt that we should expect every one to perform perfectly. We should heed Max's admonition to lubricate and adjust until we obtain the peak of performance.

In lubrication the recent introduction of LaBelle Synthetic Lubricants has been a real boon to the hobby since the lasting power of their #101 oil and #102 grease is far greater than anything previously available to us model railroaders. Speaking from my own experience the viscosity of LeBelle #101 is such that it clings to metal surfaces many times longer than ordinary oils thus keeping valve gear parts, side rods, and axle bearings lubricated for a much longer period of time without re-lubrication being required.

Assuming that the equipment operates to its best advantage and the propulsion power is adequately controlled, it becomes possible to run a locomotive or train in a prototypical manner with slow gradual starts, to couple cars at speeds under 5 MPH, (the prototype insist on easy coupling at 1 to 2 MPH in order to prevent damage to lading), to switch cars at low yard speeds and to bring that

Public Timetable

Station	Arrive	Depart
Able		1:00 PM
Baker	1:15 PM	1:25 PM
Charlie	1:40 PM	1:50 PM
Able	2:00 PM	

FIGURE #1A

Employees' Timetable

Station	Arrive	Depart
Able		1:00 PM
Oil Spur		1:05
Able Yard Limit		1:07
Gravel Pit Spur		1:10
Baker	1:15 PM	1:25 PM
Saw Mill Siding East		1:27
Saw Mill Siding West		1:37
Charlie	1:40 PM	1:50 PM
Charlie Team Track		1:51
Able Team Track		1:59
Able	2:00 PM	

FIGURE #1B

crack passenger train down from its 79 MPH top speed to a smooth gradual stop. The mere running of our model trains not only becomes more enjoyable but appears to our eyes to be much more realistic. This in itself is a great step forward for some model railroaders and even though they own model railroads in accordance with prototypical practices they can enjoy the hobby more by handling their train realistically.

Others, once they've overcome the minor bugs which plague smooth running are so enthralled with this new found facet of realistic running, that they begin to think in terms of conducting their operation according to the real railroads. They bone up on the subject by visiting their local railroad facility for direct observation, they talk with the local crews, yardmasters and dispatchers to find out how their favorite prototype does things. Obviously much can be learned in this manner though the reasons behind the prototype railroad's doing a thing in a particular manner are often the result of law, custom, labor contracts, or safety which so complicate the situation as to remove much of the joy in following this method on our model railroad.

Thus model railroad operation is an attempt to retain the authenticity of the prototype's movement and handling of cars and trains without necessarily becoming involved in all the myriad of paper or reason which force the prototype to handle operation in the manner which they do.

The first type of operation which comes to mind is timetable operation, one of the most interesting types, and one which can be conducted even on the smallest pike by yourself. Timetable operation means that trains are operated according to a pre-determined time schedule. They leave their initial terminal on time, arrive at one line station 'on the advertised', neither early or late, but on time and finally glide to a stop at the end of their run, again, on time. While this may sound simple to execute you'll find it takes some practice to keep on schedule while running the train in a prototypical manner with gradual starts and stops keeping in mind the speed restrictions imposed by local order. The permanent slow orders across the trestle, slowing down for yard limits and grade crossings, or special orders to watch out for the track gang along the right of way are all realistic things which provide interest in operating by timetable.

We are all familiar with the public timetable which we have when we ride a passenger train. The engineer and conductor of this train have a much more detailed timetable called an employees' timetable. It not only only gives the time arrival and departure for the stops which the train makes, but it will also shows departure times for yards, interchange points, stations at which the train doesn't stop, and in some cases even sidings and spurs. All these times give the engineer check points at which he can compare the trains progress along the line with his timetable, Fig. 1.

The times on an employees' timetable serves as more than a mere guide for the engineer as to the running time of his schedule. Since all the other operating trainmen on the same division also carry a copy of the same employees' timetable it tells them when they can expect a scheduled train at a particular point on the line

For example a local switcher working the saw mill knows that the passenger train won't be due at the East end of Saw Mill Siding until 1:27 PM, thus they will be free to continue

COLOR PHOTO OPPOSITE PAGE: Keeling Bridge reverberates as a logging train passes by. Bridge is on the branch line, creating innumerable extra operating opportunities. Layout is featured in 16mm sound color film "ALP Way Freight" filmed recently by Whit Towers and Al Stensvold, ASC.


SOUTHERN PACIFIC
STENSVOLD'S STONE STOMPERS

Digging a specified list of cars out of the garden, a term used in some localities for the railroad yard, can provide hours of entertaining operation. Good power supply, cntrols, and equipment are essential if operation is to be prototypically smooth and slow.

using the main line and the West end of the siding until that time. The track crew repairing the switch points at the ABLE Team Track know the same passenger won't be along until 2:00 PM by which time they'll have the points spiked closed and their equipment out of the way.

You may ask, "How do I apply an employees' timetable to my simple oval track plan?" Figure 2 shows a simple basic plan of a type often used for small model railroads and comparing it with the timetables in Figure 1 you can visualize the points of difference between a public and an Employee's timetable. You can see where the various check points, not necessarily at the stations, will help you judge your progress in meeting the schedule. If your method of timing is by your wrist watch you may find that the check times at the various points will be in a matter of seconds. This hardly seems realistic, though in theory it will work, but actually under such a system of timing operation you might become so frustrated watching the seconds tick off that you wouldn't have time to watch the train arrive at its station.

This is the place where scale time can be used to advantage. Scale time is nothing more than arbitrarily setting a definite proportion of time to represent a real minute and hour much the same as we scale down the size of our model railroad equipment. The proportion can be any convenient ratio thought in general most model railroaders use 12-1, 10-1 or 6-1. Under a 12 to 1 proportion this means that five actual minutes become one scale hour.

According to the National Model Railroad Association's Glossary of Terms:

"SCALE TIME is the time registered by a fast clock.

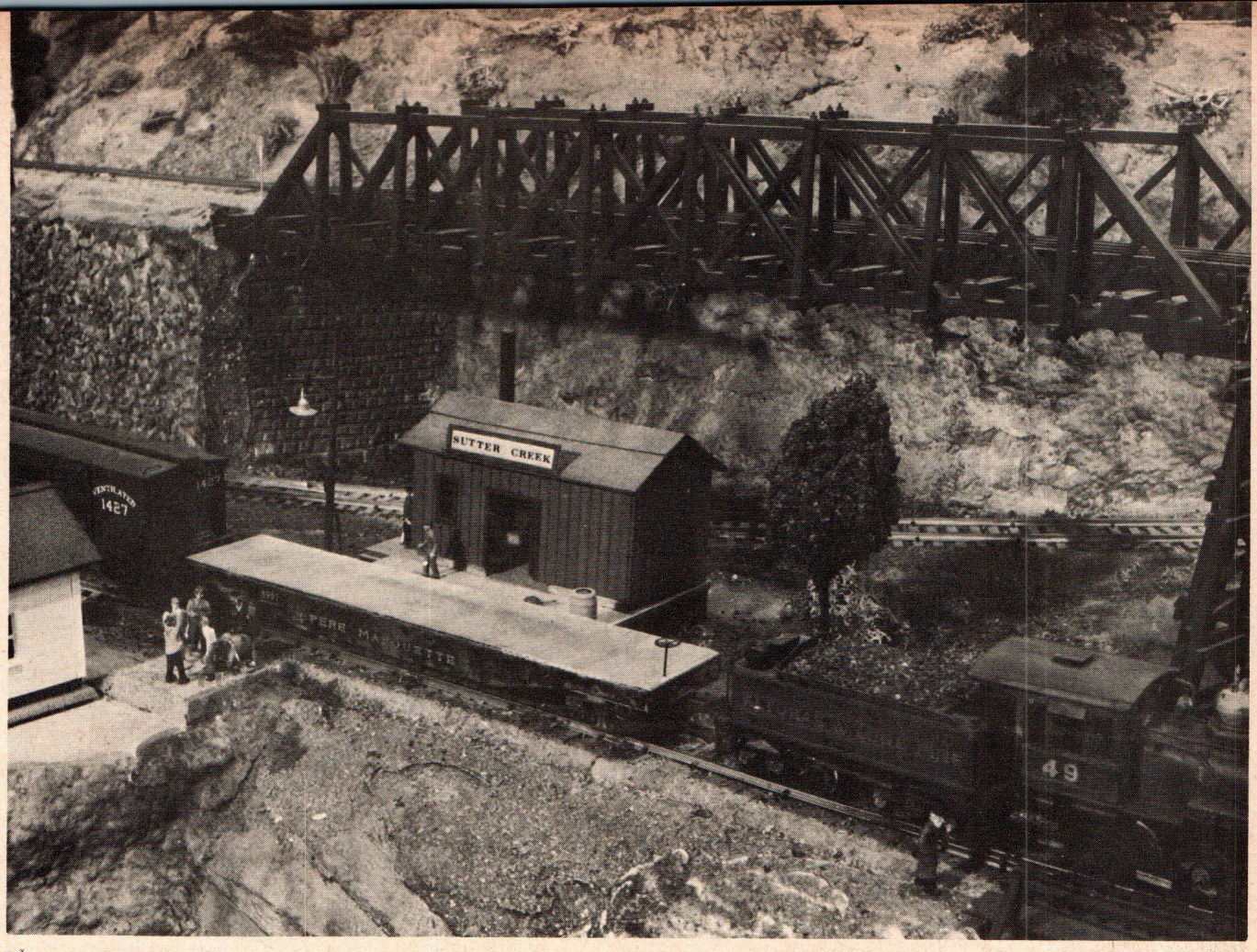
FAST CLOCK is a speeded up clock which does away with the necessity of using seconds in timetable operation."

You can make your own scale or fast clock by changing the gearing in a regular clock, or you can change the motor in an electric clock using one with a faster shaft speed, or perhaps you can purchase one already made up; they've been advertised from time to time in the pages of R.M.C. I obtained my own fast clocks from Bobbye Hall's Hobby House in Dallas, Texas. In addition to making timing easier the fast clock provides another interesting and worthwhile benefit, it effectively lengthens your railroad in direct proportion to the ratio used in the clock. Without the 12 to 1 fast clock the running time for our typical small railroad might be five seconds, between two points, but with the scale time clock it becomes a minute. While the distance travelled hasn't changed it will in your mind. With a fast clock and by using scale time, scheduling becomes an actual possibility, even on the shortest main line, figure 3.

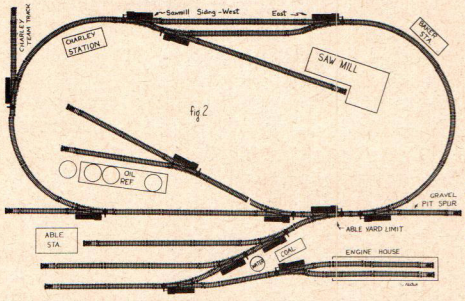
To go back to our simple oval track plan, figure 2, you can now schedule in terms of minutes rather than seconds. However you may well point out that this isn't realistic enough since the train completes its run so rapidly. There is a system called Lap Running, first developed back in the 1930's by Neil Fiske, which is ideally suited where continuous running is possible.

In Lap Running you start out from Able Station passing Baker and Charlie stations without stopping and the second time around you stop at Baker. The next time you skip Able and Baker stopping at Charlie. Of course you can use any number of laps you desire between stops or they can be varied as to the number of laps between stations. Using this technique you can visualize that you most effectively lengthened your main line running time making it possible to work a timetable without starting and stopping every few feet.

Perhaps during the course of your normal days work you have enough problems dealing with time and the and the mere running of trains against a theoretical timetable doesn't interest you. Consider if you will the peddler freight which to many of us is the most interesting type of operation available. Frank Ellison often wrote about the romance of handling the work of this lowly type of train which didn't even have the dignity of a schedule destination. It works as an extra train using the main line only at times when scheduled trains don't have the right of it. It sets out and picks up cars along the way from various industries served by the railroad. On our simple A.B.C. Railroad it might leave Able Yard push-



Correct car blocking will place the car in its proper location in the train for the crew to make the set-out. At Sutter Creek it's obvious that Central Valley 1427 was too far back to clear the switch points. The crew debate a phone call to Alturas Yardmaster Leighton Keeling for his monumental good.



ing an empty drop bottom gondola for the gravel pit spur, drop off a car or two at the saw mill, picking up those two box cars loaded with lumber. When the main line is again clear it would proceed on to Charlie picking up the milk car from the team track and at Able Team drop that flat with the tractors before moving on to the oil refinery to set out a tank car and pick up the two full ones for delivery to Able Yard. This is the real basis of railroad operation, the movement of materials and goods from one industry to another and with adequate imagination you can spend hours on even the simplest track plan setting out and picking up the cars.

It doesn't necessarily have to be the first car on the spur that you pick up either, take that one on the end of track, figure 4. Having to shuffle through the entire string is a form of make work which is most interesting and can be enjoyable if your equipment operates properly. Which means that trucks, couplers, and trackwork must be maintained if you are to enjoy operating a peddler freight. It's no fun to be constantly stopping to rerail a car.

With the peddler freight you face many of the same problems the local freight crew might encounter. The problem of jockeying a car onto a spur and pulling the one ordered out with the least number of moves becomes a challenge to your ingenuity.

Even the simple act of making up a train in the yard can provide plenty of operation, figure 5, as long as you don't grab the first string of cars available, tack on a crummey and head out onto the main. Instead make up a list of the specific cars which are to go into the train and make it up in a definite order, on the prototype they call this blocking. Blocking is the placing of cars in a train in an order which makes the train more easily worked by its crew. This can consist of car placement in the order which they'll be set out at various points on its run either from the caboose forward of the engine back depending upon the rules of your railroad. If you call for car blocking in the train and specific cars in its consist it's apparent that just backing the engine into a cut of cars and taking off down the main isn't going to do the job. It'll require considerable switching around before you're ready to leave the terminal yard. This is a type of activity which can be enjoyed by one person by himself and if you have any type of yard you've probably been doing it for quite a while. You've been operating, perhaps without knowing it, so don't let the word operation and all the talk about operating systems with paper work or cards scare you away from what can be real enjoyment.

Another type of operation is seen at the division point. Just as on the prototype when the train arrives at the division point the crew is changed, and back in the days of steam the locomotive might be changed. On some railroads, particularly in days gone by when a caboose was assigned to an individual crew the caboose would also be changed and then the train would be on its way. With imagination you can see that the loop of track with a yard and engine facility are all that are necessary to participate in this type of operation. Our simple A.B.C. track plan can provide division point operation and when combined with lap running can keep a couple of fellows busy all night, operating.