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GETTING REAL

column

Model Railroad Hobbyist | January 2018 | #95

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TONY THOMPSON OPERATES
 WITH PROTOTYPICAL WAYBILLS
 TO ACHIEVE A BALANCE BETWEEN
 REALISM AND SIMPLICITY ...

OVER THE YEARS, THERE HAS BEEN A STEADY INCREASE among model railroaders in increased fidelity to prototype, everything from more accurate models of locomotives and cars, to more realistic structures and scenery, and – the subject here – more prototypical operation.

Of these, operation is in some ways the most challenging. We have extensive photographic evidence and considerable engineering documentation of most of the other aspects I mentioned, but often operational information is lacking. Especially for the more distant periods, few if any people are still with us who actually performed those operations. They are the only ones who could tell us from experience the “how and why” of those days.

But even if we can't talk to such individuals, there still exist many interviews and articles about actual prototype operation, and these are vital documents for those desiring to emulate the

► **MODELING REAL RAILROADS AND WHAT THEY DO**

prototype. Narrowing this down to a single point, this column is concerned with the paperwork used to move freight cars, whether loaded or empty, and what we know about how it was done.

I should hasten to say that practically no one among modelers wants to reproduce the full panoply of railroad paperwork and accounting, especially that of the pre-computer age when vast amounts of data were managed by employing armies of clerks. But many of us do wish to be as prototypical as is practical, compacting the documentation to achieve a balance between realism and simplicity [1].



1. Paul Weiss, background, and Jim Providenza, foreground, operate with prototype waybills at my layout town of Ballard. In this 2015 operating session, Paul was the conductor on the Santa Rosalia Branch local and is about to uncouple a car. Jim was the engineer and is holding a throttle. These are the circumstances in which prototypical operating paperwork can add value to layout operation.

Background

The topic of realistic operation has a long history in model railroading. As early as 1939, some authors, such as Al Kalmbach (writing under the pseudonym “Boomer Pete”), were describing ways to accomplish more realistic freight car movement (see Bibliography for citations). The first system using car cards and waybills was described by Frank Ellison in 1944.

By 1961, when Doug Smith wrote his extensive review of previous work, along with recommendations for ways forward, the hobby literature (thoroughly cited by Smith) was already extensive on this topic. I attempted to bring some of this up to date, in an overview fashion, in my 2009 article in *Railroad Model Craftsman (RMC)*.

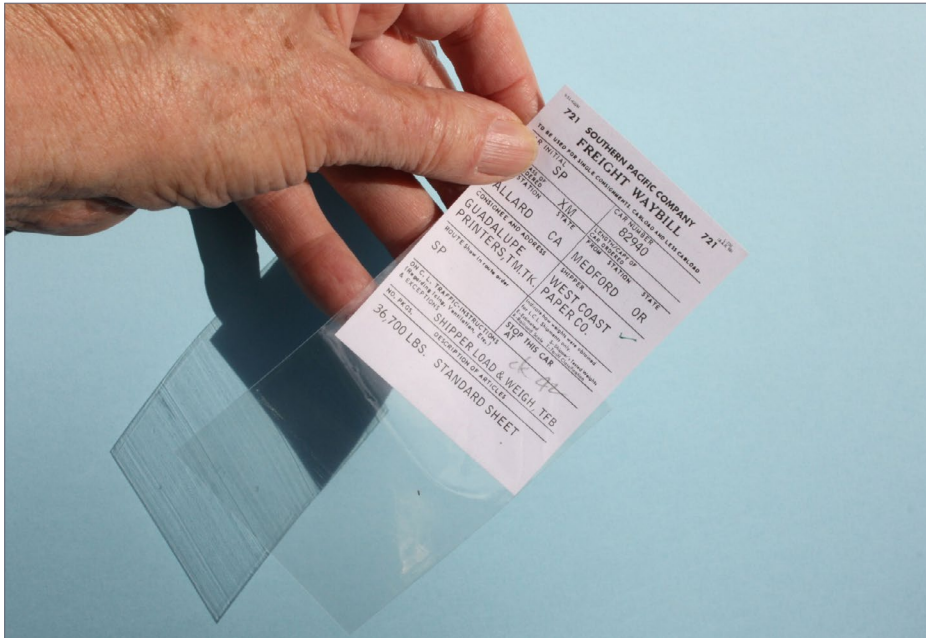
Since the Boomer Pete days, numerous books on model railroad operation have been published, usually with extensive information on methods of freight car movement. These range from Paul Mallery’s work to the currently available Kalmbach book by Tony Koester. Probably the most detailed and complete coverage of freight car forwarding is Bruce Chubb’s book (all cited in the Bibliography).

Some methods used by modelers reflect the prototype, as Doug Smith eloquently urged us to do. There have been a number of most informative books on prototype practices, from John Armstrong to Larry Sagle to E.W. Coughlin. These contain considerable insight into not only the how, but the why, of waybill procedures. To my knowledge, the first modeler to really start with the prototype waybill, and reduce it to a convenient size for modelers’ use, was Dan Holbrook. But at least in the early versions, the reduced size was hard to read.

Inspired by Bill Neale’s 2009 magazine article describing the use of clear plastic sleeves for waybill documents, I made an attempt at a prototypical design, as I showed in my RMC article of 2009.

The core of this idea is to put waybills into these sleeves [2]. That in turn causes the waybill shown here to be about 2.5×3.5 inches.

My own 2009 design of the waybill itself began with the AAR standard form [3]. It and several companion prototype forms are covered extensively in the AAR book, *Railway Accounting Rules*. But one needs more than a blank form to move freight cars. After research into the prototype publications just mentioned, and others, I summarized what comprises the content of a filled-out waybill, in an article for the NMRA OpSIG magazine, *The Dispatcher's Office*, in 2010. That was followed by another article in the same magazine in 2011, describing the entire sequence of events in prototype movement of freight cars. Corrected, digital versions of both articles are now available (see Bibliography).



2. Here is one of my completed waybills being inserted into the clear plastic sleeve, a protective sleeve sold for baseball cards.

PLACE SPECIAL SERVICE PASTERS HERE

544—NEW YORK, ONTARIO AND WESTERN RAILWAY—544

LEWIS D. FREEMAN, Trustee

FORM ST-200-REV. 2
AAR Std. Form No. AD-98

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

STOP THIS CAR AT	WEIGHT IN TONS			LENGTH OF CAR		MARKED CAPACITY OF CAR	
	Gross	Tare	Net	Ordered	Furnished	Ordered	Furnished

FOR CAR INITIALS AND NUMBER KIND C.L. Transferred to or L.C.L. Loading No. DATE WAYBILL No.

TO STATION STATE FROM No. STATION STATE

ROUTE (Show each Junction and Carrier in route order to destination of waybill) Show "A" if Agent's Routing or "S" if Shipper's Routing FULL NAME OF SHIPPER, AND, FOR C. O. D. SHIPMENTS, THE STREET AND POST OFFICE ADDRESS, AND INVOICE NUMBER IF AVAILABLE.

RECONSIGN TO STATION STATE ORIGIN AND DATE ORIGINAL CAR, TRANSFER FREIGHT BILL AND PREVIOUS WAYBILL REFERENCE AND ROUTING WHEN REBILLED.

AUTHORITY CONSIGNEE AND ADDRESS

C.	AMOUNT	WEIGHED
O.	FEE	AT
D.	TOTAL	GROSS
		TARE
		ALLOWANCE
		NET

FINAL DESTINATION AND ADDITIONAL ROUTING

PICKUP SERVICE YES NO DELIVERY SERVICE REQUESTED YES NO

WHEN SHIPPER IN THE UNITED STATES EXECUTES THE NO-RECOURSE CLAUSE OF SECTION 7 OF THE BILL OF LADING, INSERT "YES".

Indicate by symbol in Column provided *how weights were obtained for L.C.L. Shipments only. R—Railroad Scale, S—Shipper's Treated Weights, E—Estimated—Weigh and Correct, T—Tariff Classification or Minimum.

ON C. L. TRAFFIC—INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If lost, Specify to Whom Icing Should be Charged.)

ON L. C. L. TRAFFIC TRANSFER STAMPS TO BE SHOWN IN THESE SPACES

No. Pkts.	DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS *	WEIGHT	RATE	FREIGHT	ADVANCES	PREPAID

DESTINATION AGENT'S FREIGHT BILL No.

Outbound Junction Agent Will Show Junction Stamps in Space and Order Provided. Additional Junction Stamps and All Yard Stamps to be placed on back hereof.

FIRST JUNCTION SECOND JUNCTION THIRD JUNCTION FOURTH JUNCTION

DESTINATION AGENT WILL STAMP BEGIN STATION NAME AND DATE REPORTED

S ORIGINAL

544—NEW YORK, ONTARIO AND WESTERN RAILWAY—544
LEWIS D. FREEMAN, Trustee

3. An example of an original railroad waybill form, from the New York, Ontario and Western. Nearly every detail of the form matches AAR Form AD-98 (as noted at upper right), as was the case for all major railroads. An original Form AD-98 can be found in *Railway Accounting Rules* (see Bibliography). It was the basis for my own waybill design.

Others have continued with development of the same kind, aiming at more prototypical waybills while keeping them practical for model railroad use. Important among these have been Ted Pamperin and Tony Koester, some of whose articles are cited in the Bibliography.

I tried to summarize some of those ideas, along with extensions of my own, in a previous column in *Model Railroad Hobbyist*, in the issue for May 2012. That article also showed in detail my method of creating the waybills.

Because that 2012 MRH article described the creation process, I won't repeat it here; but it may be helpful to examine the final product, in the form of a particular waybill. This is shown with explanatory notes as [4], and the corresponding load is shown as [5]. Comparing this diagram [4] to the prototype in [3], you can see that typefaces which are part of the form itself are identical in both because the model form was scanned from the prototype, and that the vertical division between consignee information on the left, and shipper information on the right, has been maintained.

Choosing cargo descriptions in filling out waybills can be done in several ways. The *Uniform Freight Classification* book (or UFC) allows use of prototype designations for various kinds of freight, though sometimes in a rather bureaucratic form. Or, simple everyday language can be used. This was somewhat true in the prototype, where the key information was the product code (also found in the UFC), and those who might wish to use those codes can readily do so.

Finally, I wrote a "progress" article for *The Dispatcher's Office* that was published in 2016, conveying a number of improvements in the making and use of prototype waybills for model railroad use. In sum, all the foregoing (along with the various citations in the Bibliography) provide ample background in how the prototype managed waybills, and how prototypical ones can be designed,

The image shows a model freight waybill form with several fields and arrows pointing to them. The form is titled 'FREIGHT WAYBILL' and includes the following fields:

- RAILROAD INITIALS:** 728-SPOKANE, PORTLAND AND SEATTLE RAILWAY COMPANY--728
- RAILROAD HEADER:** 728-SPOKANE, PORTLAND AND SEATTLE RAILWAY COMPANY--728
- CAR NUMBER:** 57255
- AAR CAR TYPE:** UP
- CONSIGNEE INFORMATION:** SHUMALA CA
- SHIPPER INFORMATION:** DESCHUTES TIMBER CO
- ROUTE WITH ALL JUNCTIONS SHOWN:** SP&S-BEND-GN-K FALLS-SP
- CARGO (C/L MEANS FULL CARLOAD):** C/L POLES, CREOSOTED

Other fields include 'CONSIGNEE AND ADDRESS', 'SHIPPER', 'ROUTE Show in route order', 'STOP THIS CAR AT', 'NO. PKGS.', and 'DESCRIPTION OF ARTICLES'. Handwritten notations like 'OK' and '42' are also present.

4. A model waybill with contents identified. The railroad name in the header is taken from an actual document of the prototype railroad (SP&S), along with its AAR code number, 728. Examples of these code numbers are in my 2012 MRH column. Routing is included, with junctions identified. There were no standard abbreviations for these, so different clerks might abbreviate place names differently. Note that this load is destined to a team track, not an industry siding. Some hand-written notations of various kinds are also present, as was common on prototype bills.

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GETTING REAL | 8

produced and put into use for model railroading. But the latter part, about use of these waybills in the model environment, has not been described in much detail.

Model operations: Produce

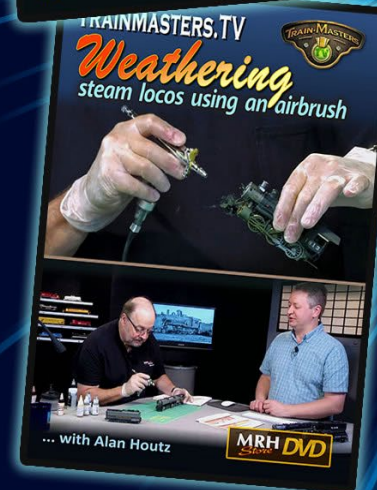
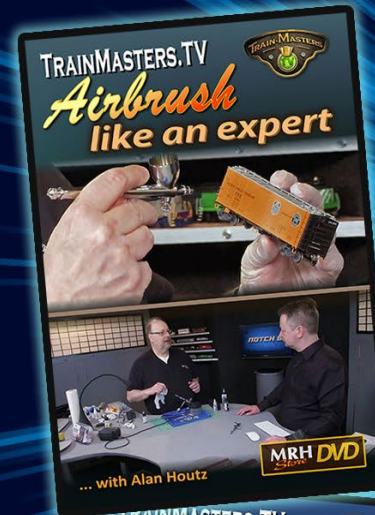
The purpose of the present column is to turn away from issues of waybill design and construction, and address some of the ways these waybills are used in operation.

The clear plastic sleeves are an important part of the design. In addition to protecting the waybills in use, they also allow multiple documents in each sleeve. An Empty Car Bill can readily be added to complement each loaded-car waybill with the paperwork for its empty move [6].



5. The Union Pacific flat car, and the load for which the waybill in [4] was written, are spotted at the team track in my layout town of Shumala. Pismo Dunes Road is in the foreground. The model, including load, was built by Richard Hendrickson.

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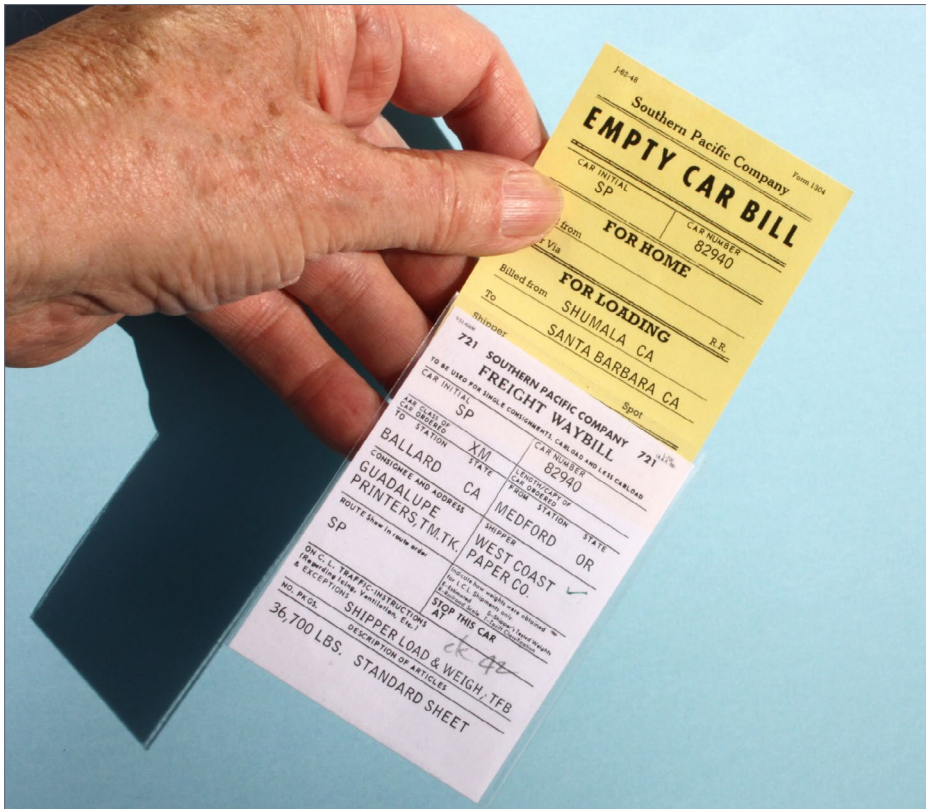
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An even more important function of the sleeve is to facilitate the use of “short” or “overlay” bills. The idea here is to provide only the information below the uppermost part of a regular waybill, where car initials and number are shown. Then, when placed atop a regular waybill, an entirely different destination and even a different load can be implemented.

An example of an inbound overlay bill is shown as [7]. Any of the covered hopper cars (AAR class LO) in my fleet that are of the



6. The Empty Car Bill for the reverse movement of a particular loaded waybill can readily be inserted into the plastic sleeve behind the waybill. Empty Car Bills were discussed at some length in my 2012 MRH article.

AAR CLASS OF CAR ORDERED LO		LENGTH/COPY OF CAR ORDERED	
TO STATION	STATE	FROM STATION	STATE
BALLARD	CA	MONOLITH	CA
CONSIGNEE AND ADDRESS CALIF. DIV. OF HIGHWAYS		SHIPPER MONOLITH PORTLAND CEMENT	
ROUTE Show in route order SP		Indicate how weights were obtained for L.C.L. Shipments only. E—Estimated S—Shipper's Tested Weights R—Railroad Scale T—Tariff Classification STOP THIS CAR AT	
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS			
NO. PKGS.		DESCRIPTION OF ARTICLES	
		C/L CEMENT	

7. An example of a “short” or “overlay” bill, in this case describing a carload of cement, sent from an on-line SP industry to a consignee on my layout. It can be paired with the full SP waybill for any covered hopper in cement service, from any railroad in the far west. Note in comparison to [4] that it would cover everything below the reporting marks.

cement type, and already have an SP waybill for any cargo, can receive this overlay to create a shipment of cement. You can see how this would fit atop a full waybill by comparing to the waybill in [4].

These overlay bills can extend the flexibility of loads for any particular car, as well as creating flexibility of cargoes from any particular industry. The example of [7] is for a somewhat specialized car, a covered hopper. For free-running cars, such as box cars, gondolas, and flat cars without any special equipment, this is even more appropriate and realistic.

But an important use of “overlay” bills in my layout operation is for perishables. These are an ideal shipping category for use of these bills. All my outgoing loads will have Southern Pacific waybills [8] because any refrigerator car that will be used for produce shipment (that is, cars other than meat cars) can accept such bills. Of course, outgoing loads on any railroad will have home-road waybills.

I use this flexibility in my operating sessions, because any particular operating day is regarded on the layout as that same date in my modeling year, 1953. So a recent October session would be treated as October 15, 1953, and all outbound produce from packing houses should conform to that season.

So how do “overlay” bills support this idea? Let me offer an example. The waybill here [8] is for a PFE car, no. 98478, and its load is shown as celery, one of the categories of produce grown in the locale of my layout. But quite a few other vegetable types are also grown.

Presented in [9] is an extract from a Pacific Fruit Express chart of harvesting seasons in the Santa Maria plain, near where I model. You will note that there is a year-round harvest among all the various kinds of vegetables. A table like this could be made up for any growing area in the country, using state or federal crop data.

L-710-B

721—Southern Pacific Company—721
PERISHABLE FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

CAR INITIAL PFE	CAR NUMBER 98478
AAR CLASS OF CAR ORDERED RS	LENGTH/COPY OF CAR ORDERED
TO STATION STATE SCRANTON PA	FROM STATION STATE BALLARD CA
CONSIGNEE AND ADDRESS GREAT A&P TEA CO. WAREHOUSE	SHIPPER WESTERN PACKING CO.
ROUTE Show in route order SP-OG-UP-CO BL-C&NW-CHI-PRR	Indicate how weights were obtained for L.C.L. Shipments only. E—Estimated S—Shipper's Tested Weights R—Railroad Scale T—Tarriff Classification STOP THIS CAR AT
RECONSIGNEED TO	
PRE-ICE	INITIAL ICE YES CPS SEC. 2
NO. PKGS.	DESCRIPTION OF ARTICLES
410 BOXES	CELERY

8. A full waybill for a shipment of celery from one of my on-line packing houses, in this case using the AAR-recommended pink stock for a perishable waybill.

Depending on the season, the table [9] shows that harvested crops may include broccoli, cabbage, carrots, cauliflower, lettuce and tomatoes. Do I need to make a new waybill for each of these vegetables for car 98478 (or for any particular PFE car)? No, I only need to make one perishable waybill for this car, such as shown in [8]. Then I make sets of “overlay” bills for other crops, examples of which you see in [10].

So a particular packing house, such as the Phelan & Taylor house in my layout town of Shumala [11], ships seasonally correct produce with the aid of overlay bills. Just to emphasize the final result, the waybill shown in [12] is the same waybill as in [8] but with the overlay for cauliflower, shown in the overlay assortment [10], added as the top sheet in the sleeve.

The same approach to seasonal produce harvests can apply for fruit shipment. In [13] is a table, made the same way as [9], showing the corresponding harvesting seasons for various fruits. With

this information, once again, a set of “overlay” bills permits my packing house for tree fruit, Guadalupe Fruit Company, to ship the right produce for each season. But unlike the vegetables in this district, at least one type of which ships in any month, all the non-citrus tree fruit has a very short season, two or three months, and moreover is concentrated from spring to fall. My Guadalupe Fruit packer accordingly does not ship any of that fruit during any operating session that occurs from October to April.

Still, there are several crops in [13] that ship in summer, if briefly, and deserve overlay waybills to permit correct matches with a

9. Growing and shipping seasons for vegetables in one part of Southern Pacific territory, the Santa Maria–Guadalupe district. This table is simply cut and pasted from a six-page table, pp. 442–447, in the *Pacific Fruit Express* book (see Bibliography), abstracting only the data for this particular district. The darker parts of each bar represent peak seasons.

Normal Growing and Shipping Seasons in Southern Pacific Territory

Commodity	Producing District	Producing State	Month													
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Broccoli	Guadalupe-Santa Maria	CA														
Cabbage	Guadalupe-Santa Maria	CA														
Cauliflower	Santa Maria-Guadalupe District	CA														
Celery	Santa Maria-Guadalupe District	CA														
Lettuce	Guadalupe-Santa Maria	CA														
Peas-Green	Guadalupe-Santa Maria District	CA														
Potatoes-Irish (White)	Guadalupe-Santa Maria District	CA														
Tomatoes	Santa Maria-Guadalupe	CA														

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10. Six different vegetable crops, harvested in the seasons shown in [9], can be moved in reefers with these overlay bills. Two packing houses, in two layout towns, are shown here.



11. Switcher SP 1423 is spotting an empty reefer, PFE 2095, for loading at the Phelan & Taylor packing house in my layout town of Shumala. Just to the right of the locomotive can be seen a stack of shipping boxes, ready to go into the car for today's load of vegetables. The structure was built from a Showcase Miniatures kit.

PERISHABLE FREIGHT WAYBILL			
TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD			
CAR INITIAL		CAR NUMBER	
PFE		98478	
AAR CLASS OF CAR ORDERED	RS	LENGTH/COPY OF CAR ORDERED	
TO STATION	STATE	FROM	STATION STATE
BOISE	IDA	BALLARD	CA
CONSIGNEE AND ADDRESS JENKINS FRUIT & VEG.		SHIPPER WESTERN PACKING CO.	
ROUTE Show in route order SP-PORT-UP		Indicate how weights were obtained for L.C.L. Shipments only. E-Estimated S-Shipper's Tested Weights R-Railroad Scale T-Tariff Classification STOP THIS CAR AT	
RECONSIGNEED TO			
PRE-ICE	INITIAL ICE	YES	CPS SEC. 2
NO. PKGS. DESCRIPTION OF ARTICLES			
440 CARTONS CAULIFLOWER			

12. The original waybill for PFE 98478, shown in [8], overlaid with a short bill for cauliflower, part of the assortment shown in [10], to make up a different waybill. This overlay bill for cauliflower, of course, could be overlaid on a waybill for any PFE car.

summer operating date. I show some of the overlay bills for Guadalupe Fruit in [14]. These also could readily be used with a full bill like [8].

Note, in addition, that in [14] is one overlay bill for an express reefer, AAR type BR, for late winter strawberries, a California product always bringing a premium price in eastern markets and thus justifying use of an express reefer. These do ship in March and April.

But not all the fruits in [13] have such short seasons. I also have a lemon packing house on the layout, and the table shows that lemons are shipped pretty much year-round. Accordingly, the lemon packer on my layout is about as busy year-round as the vegetable packers, with shipments departing most any day of the year [15].

Agent instructions

Note in the caption to [15] the mention of agent instructions. Prototype switch crews would be informed by the local agent which cars needed to be picked up and which industries would receive empty cars, maybe with spotting specified. When an agent was on duty, this would be verbal, but if the agency was closed,

13. Growing and shipping seasons for fruit in one part of Southern Pacific territory, with the table constructed the same way as for the accompanying vegetable table [9], from a six-page table, pp. 442–447, in *Pacific Fruit Express* (see Bibliography). The darker parts of each bar represent peak seasons. A table like this could be constructed for any growing area in the country.

Normal Growing and Shipping Seasons in Southern Pacific Territory

Commodity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Apricots					■	■	■					
Cherries					■	■						
Grapes								■	■			
Plums						■	■	■				
Lemons	■	■	■	■	■	■	■	■	■	■	■	■
Oranges	■	■	■	■							■	■

a message could be left by the agent in the bill box outside the depot. I've discussed this at some length in a series of blog posts (see Bibliography).

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14. These four overlay bills show the fruit that is shipped when seasonally appropriate from my layout's fruit packing house in the town of Ballard. Note the bill at far right is for an express refrigerator, AAR class BR.



15. The shipping building of the citrus packing house on my layout at Santa Rosalia. Field boxes of lemons can be seen in the open doorway and PFE reefer 64739 is spotted for loading at Door 3 per the instructions from the agent.

Because the Central Coast area that I model is also an area in which wine grapes are grown, and in which wine is produced, my layout has a couple of wineries, or at least their shipping operations. The wine business has its complex aspects, including those touching on rail shipments. I have discussed "wine as an industrial commodity" in moderate detail in a blog post (see Bibliography).

One of my layout wineries, Zaca Mesa Wines, ships bulk wine, both in tank-containing box cars (AAR type XT) and in insulated tank cars. A local freight picking up such a car is shown in [16]. Tank cars like this were often destined to the eastern U.S., where local companies would bottle the wine under their own label. The car shown in [16], like many cars converted by General American from one to three compartments, has unequal dome sizes. Construction of this tank car was described in a blog post (see Bibliography).



16. Consolidation SP 2829, the power for today's branch local, is picking up a three-compartment tank car of bulk wine at the loading rack of the Zaca Mesa winery in Ballard. The car is likely destined to wine brokers or packagers in other parts of the country.

A shipment like this might be waybilled as shown in [17]. As was common for privately owned tank cars, the empty movement was on a regular freight waybill, because a railroad's own Empty Car Bill would only be valid to the boundary of that railroad. By contrast, a freight waybill could move the car all the way back to its originating location on a single document. Owners of leased cars such as General American also believed that empty cars moved more promptly on waybills. Lastly, a waybill also has the feature that the prior load can be shown for safety reasons, though of course that is not an issue for wine cargoes.

<small>1-51-400M</small> 721—Southern Pacific Company—721 FREIGHT WAYBILL <small>L-700 (A,B,R,96)</small> TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD		<small>1-51-400M</small> 721—Southern Pacific Company—721 FREIGHT WAYBILL <small>L-700 (A,B,R,96)</small> TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD	
CAR INITIAL GATX	CAR NUMBER 1392	CAR INITIAL GATX	CAR NUMBER 1392
AAR CLASS OF CAR ORDERED TLI	LENGTH/CAPY OF CAR ORDERED	AAR CLASS OF CAR ORDERED TLI	LENGTH/CAPY OF CAR ORDERED
TO STATION STATE BALLARD CA	FROM STATION STATE FRESNO CA	TO STATION STATE WELLESLEY MA	FROM STATION STATE BALLARD CA
CONSIGNEE AND ADDRESS ZACA MESA WINES	SHIPPER SP AGENT	CONSIGNEE AND ADDRESS WELLESLEY WINE CO.	SHIPPER ZACA MESA WINES
ROUTE Show in route order SP	Indicate how weights were obtained for L.C.L. Shipments only. E—Estimated S—Shipper's Tested Weights R—Railroad Scale T—Tariff Classification STOP THIS CAR AT	ROUTE Show in route order SP-OG-UP-COB-C&NW-CHI-NYC-ALB-B&A	Indicate how weights were obtained for L.C.L. Shipments only. E—Estimated S—Shipper's Tested Weights R—Railroad Scale T—Tariff Classification STOP THIS CAR AT
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS		ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS	
RECORD RIGHTS, REVERSE ROUTE			
NO. PKGS.	DESCRIPTION OF ARTICLES	NO. PKGS.	DESCRIPTION OF ARTICLES
L/C	WINES, VARIOUS	A 2105 GALS.	PORT
		B 2101 GALS.	PREMIUM PORT
		C 3102 GALS.	RED TABLE WINE

17. The pair of waybills for moving the tank car shown in [16]. The car had been moved empty from Fresno (where it was probably unloaded from a previous move) by order of the owner, General American, for loading at Ballard with a cargo going to Massachusetts. The bill at right could be overlaid with a "short bill" to another destination if desired.

Overlay bills are practical for tank cars like this also, such as shown in [18]. But this overlay can only be used with the bill shown in [17], unless another model in the fleet has the same capacities of its individual compartments.

AAR CLASS OF CAR ORDERED TLI	LENGTH/CAPY OF CAR ORDERED
TO STATION STATE HARBERT MI	FROM STATION STATE BALLARD CA
CONSIGNEE AND ADDRESS MOLLY PITCHER WINERY	SHIPPER ZACA MESA WINES
ROUTE Show in route order SP-OG-UP-CO BL-C&NW-PROVISO-PM	Indicate how weights were obtained for L.C.L. Shipments only. E—Estimated S—Shipper's Tested Weights R—Railroad Scale T—Tariff Classification STOP THIS CAR AT
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS	
NO. PKGS.	DESCRIPTION OF ARTICLES
A 2105 GALS.	PREMIUM PORT
B 2101 GALS.	RED WINE
C 3102 GALS.	RED TABLE WINE

18. An example of a tank car overlay bill, in this case for the three-compartment car shown in [16], and to be used with the loaded bill in [17].

Note also that each compartment of the car has its contents separately listed.

In the 1950s, which I model, most wine consumed in the United States was fortified wine (such as port and sherry). For more on that topic, interested readers can consult my blog post about “wine as an industrial commodity.”

That post also includes some information about wine grapes as a commodity. These too are shipped from place to place, as different vineyards and wineries buy and sell grapes to balance the product they intend to produce from a particular harvest. Accordingly, wine grapes are also shipped in the fall [13] from my layout wine

AAR CLASS OF CAR ORDERED		RS		LENGTH/COPY OF CAR ORDERED	
TO STATION	STATE	FROM STATION	STATE	FROM STATION	STATE
SEATTLE	WA	BALLARD	CA		
CONSIGNEE AND ADDRESS		SHIPPER			
POMMERELLE WINE CO.		WINE-GROWERS COOPERATIVE			
ROUTE Show in route order		Indicate how weights were obtained for L.C.L. Shipments only.			
SP-PORT-NP		E-Estimated S-Shipper's Tested Weights R-Railroad Scale T-Tariff Classification			
RECONSIGNEED TO		STOP THIS CAR AT			
PRE-ICE	NO	INITIAL ICE	NO	CPS	SEC. 3
NO. PKGS.	DESCRIPTION OF ARTICLES				
C/L	BLENDING WINE, BARRELS NOT ICED				

AAR CLASS OF CAR ORDERED		RS		LENGTH/COPY OF CAR ORDERED	
TO STATION	STATE	FROM STATION	STATE	FROM STATION	STATE
HEALDSBURG CA		BALLARD	CA		
CONSIGNEE AND ADDRESS		SHIPPER			
NORTH COAST GRAPE BROKERS		WINE-GROWERS COOPERATIVE			
ROUTE Show in route order		Indicate how weights were obtained for L.C.L. Shipments only.			
SP-SCHEL-NWP		E-Estimated S-Shipper's Tested Weights R-Railroad Scale T-Tariff Classification			
RECONSIGNEED TO		STOP THIS CAR AT			
PRE-ICE	YES	INITIAL ICE	YES	CPS	SEC. 2
NO. PKGS.	DESCRIPTION OF ARTICLES				
480 LUGS	GRAPES, WINE, WHITE				

19. Additional overlay perishable bills. One is for blending wine in barrels, still shipped in a refrigerator car, that could be used with [8]. Note that the car will not be iced, and is under CPS (Carrier Protective Services) Section 3, which covers ventilation service. Such a car might or might not have ice hatches open upon departure from the packing house. At right is an example of an overlay bill for wine grapes being shipped.

industries, often to brokers in other districts, and like other produce categories, can use full and overlay bills as a way to accomplish flexible destinations [19]. Included in [19] is an example of blending wine being shipped in barrels [20], as was commonplace as late as the 1950s.

Model operations other than produce

Flexibility of produce shipments is conveniently realized with overlay bills, and the same is true for any layout industry which is a shipper. For a clear example of my own, I have an industry named Jupiter Pump & Compressor [21], envisioned as a large manufacturer of water pumps and air compressors, and which ships product all over the country. Again, all originating or outbound waybills will be Southern Pacific, and so box cars, gondolas and flat cars departing with loads from Jupiter can share an array of overlay bills.



20. Preparing wine barrels for loading at the Wine-Growers Cooperative in Ballard. This load will move in ventilator service under CPS Sec. 3 (see left bill in [19]), and PFE 95740 accordingly has its ice hatches latched open.

As an example, I show a trio of such overlay bills [22], suitable for box cars and gondolas. This same approach can work for any shipper on the layout, because they are all located on Southern Pacific tracks and thus will have Southern Pacific outbound waybills.

But any “foreign” freight car, meaning one not owned by the Southern Pacific, may have arrived inbound with a load from a shipper located on some other railroad, and of course with a waybill from that railroad. So any suitable foreign cars must already also have outbound SP waybills if they are to accept the overlay bills in [22]. Such a waybill is shown as [23], and it is one which could accept the boxcar overlay bills in [22].



21. Jupiter Pump & Compressor in my layout town of Ballard receives a lot of materials for manufacturing, such as pump parts, castings, and steel sheet. The B&O gondola at right has been switched out from the plant by the plant switcher (background) and the next SP local can pick up the empty car on the plant lead. This is only the edge of the Jupiter plant.

With all the options described above, it is evident that setting up an operating session involves a certain amount of structure (for example, with produce seasons), and also a considerable amount of choice. But as I carry out that process there is more structure than might appear, in the way I make choices. These arise from my method of planning of car flow, as described in the following section.

Managing car flow

The question naturally arises, how car flow is managed in this (or any) waybill system? Waybills direct movement of loaded (and some empty) cars, and most empty cars are moved on Empty Car Bills. But how are these selected for use? What determines which industries receive or load cars in a particular operating session?

Similarly to the history of car card and waybill systems, described in the Background section of this column, the issues associated with management of car flow also have a long history. Rather than

AAR CLASS OF CAR ORDERED	XM TO STATION STATE	LENGTH/COPY OF CAR ORDERED	FROM STATION STATE	AAR CLASS OF CAR ORDERED	GB TO STATION STATE	LENGTH/COPY OF CAR ORDERED	FROM STATION STATE	AAR CLASS OF CAR ORDERED	XM TO STATION STATE	LENGTH/COPY OF CAR ORDERED	FROM STATION STATE
	CLIFTON AZ		BALLARD CA		WALSENBURG CO		BALLARD CA		BERNALILLO NM		BALLARD CA
CONSIGNEE AND ADDRESS		SHIPPER		CONSIGNEE AND ADDRESS		SHIPPER		CONSIGNEE AND ADDRESS		SHIPPER	
ARIZONA COPPER COMPANY		JUPITER PUMP & COMPRESSOR		MORNING GLORY MINE, TEAM TK.		JUPITER PUMP & COMPRESSOR		SANDOVAL DISTRIBUTING CO.		JUPITER PUMP & COMPRESSOR	
ROUTE Show in route order		STOP THIS CAR AT		ROUTE Show in route order		STOP THIS CAR AT		ROUTE Show in route order		STOP THIS CAR AT	
SP		AT		SP-OG-D&RGW		AT		SP-DEMING-ATSF		AT	
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding icing, Ventilation, Etc.)				ON C. L. TRAFFIC-INSTRUCTIONS (Regarding icing, Ventilation, Etc.)				ON C. L. TRAFFIC-INSTRUCTIONS (Regarding icing, Ventilation, Etc.)			
& EXCEPTIONS				SHIPPER LOAD & COUNT, WWIB				& EXCEPTIONS			
NO. PKGS. DESCRIPTION OF ARTICLES				SL&C -- WWIB				NO. PKGS. DESCRIPTION OF ARTICLES			
26 DEEP SUBMERSIBLE PUMPS				6 FULL FLOW AIR COMPRESSORS, CRATED				68 NO. 8 IRRIGATION PUMPS			

22. Three overlay bills for shipments from Jupiter Pump & Compressor, two in box cars and one for crated loads in a gondola. The boxcar loads could move in any free-running boxcar, from any railroad in the U.S., and the same would be true for AAR class GB gondolas. The only requirement would be the existence of a full SP waybill for that car.

1-51-400M		L-706-N	
721—Southern Pacific Company—721 FREIGHT WAYBILL			
TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD			
CAR INITIAL NYC		CAR NUMBER 154679	
AAR CLASS OF CAR ORDERED XM		LENGTH/COPY OF CAR ORDERED	
TO STATION STATE PUEBLO CO		FROM STATION STATE BALLARD CA	
CONSIGNEE AND ADDRESS AIRFLOW ENGINEERING CO.		SHIPPER JUPITER PUMP & COMPRESSOR	
ROUTE Show in route order SP-OG-D&RGW		Indicate how weights were obtained for L.C.L. Shipments only. E—Estimated S—Shipper's Tested Weights R—Railroad Scale T—Tariff Classification STOP THIS CAR AT	
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS SL&C -- WWIB			
NO. PKGS.		DESCRIPTION OF ARTICLES	
27		DEEP FLOW AIR COMPRESSORS	

23. An example of a foreign-road box car, NYC 154679, which already has an outbound waybill from Jupiter Pump & Compressor. It could readily accept an overlay bill from this shipper.

review the extensive literature on the topic, I will simply show the system I use. Much of the history can be found in the references cited in the Bibliography.

I begin, as many authors have advocated, by analyzing the industries on the layout. Determining what kind of cars they will receive and dispatch, and with what frequency, allows construction of a pattern of operation. One way to do this is simply to start making a table, something like the one shown in [24]. Represented here is a single industry, a produce shed or packing house.

In this example [24], open or hollow letters indicate an empty car to be delivered, chosen here to be every odd-numbered day. Of course during the even-numbered days, loaded cars will be picked up at this industry; but there is no need to indicate that here, as this schedule is only for deliveries. The waybill cycle will then naturally lead to pickup of the load.

The same process is then followed for as many industries as you wish to schedule. Obviously the details of such plans could be quite different from layout to layout. With information about each particular type of industry, these plans can be made quite realistic.

Distribution Schedule										
Example										
	Day									
Industry	1	2	3	4	5	6	7	8	9	10
Produce shed	RS		RS		RS		RS		RS	

24. Starting a distribution schedule for a single industry, a packing house. The open letters indicate empty cars (refrigerator cars, AAR class RS) to be spotted for loading.

When a number of industries are added, as I show in an extended example in [25], a good variety of car movements are indicated. You may note that no two days are alike. Again, these are only deliveries. Spotting inbound loads, the solid or filled letters, would naturally be followed by the unloaded empty car or the loaded car, being picked up on a following day.

This process has been described in much more detail in a three-part blog post from 2011, cited in the Bibliography, so I won't go into more detail here.

In my original version of this table, I began by making 31 columns instead of the ten you see in [25], with the idea of having the day of the month of each operating session be chosen as the column

Industry	Day									
	1	2	3	4	5	6	7	8	9	10
Shumala										
Produce shed	RS		RS		RS		RS		RS	
Team track			XM							FM
Oil dealer		TM					TM			
Ballard										
Peerless Foods		RS			XM		RS			RS
Zaca Winery			TMI				RS	TMI		
Team track		XM				FM				
Guadalupe	RS		RS		RS		RS		RS	
"Random"	2B	1S	1SR	2B	1SR	2S	1B	2SR	1S	2B

25. An extended version of the table in [24], with seven industries chosen in two towns, Shumala and Ballard. The cars are indicated by AAR car class symbols. The "random" row at bottom is explained in the text.

number of the table. But this destroys the sequencing that had been planned in preparing the table. I soon changed the system to one of regarding the column numbers as simply sequence numbers of operating sessions.

One additional feature of this table [25] is the row across the bottom of the table, for what are called "random" additional movements. They are shown for different towns each day, such as 2B in the first column. This means two "random" waybills chosen for Ballard. The other two towns are Shumala (S) and Santa Rosalia (SR).

But in fact the pool of waybills to be chosen here is limited, so that the choices are not really "random," and thus this may be a poor name. The actual intent is to include rare or even one-time car-goes. They are simply not part of a repeating pattern as the other industries would have.

The idea was to go to the waybill file for the town identified and draw from a separate set of waybills for rare loads. That's the original reason for calling them "random." This process kind of worked when I first used it, but I now try to use the "random" waybills simply as less frequent events. For that approach, returning to a 30-column or even 50-column table might be the best way to implement the idea.

At one time I maintained a paper copy of such a table, so that it could be used in the layout room. Each successive operating session was marked by moving a paper clip along the top of the table, to indicate what "day" was next. That process makes a perfectly workable system, especially if operation is frequent. At the time I used the paper system, the layout was formally operated once a week.

But with less frequent and more complex operating sessions, as is now true for my layout, that doesn't work as well. I have added a number of industries, compared to the previous situation, and

have become more specialized in the application of “sure spots,” that is, particular tracks, or loading doors, or unloading equipment, at which particular cars must be spotted. Accordingly, a different system is now in use.

Layout survey

I still begin with my “industries” Distribution Schedule, but there is no need to mark sessions with a paper clip. For any upcoming session, I first survey the layout, making note of the status at each industry, whether and which cars are spotted. This makes a starting point, and that survey is then compared to the industries schedule. Cars can be quickly identified as ready to pick up, whether loads or empties. For demurrage reasons, it is unlikely that a car would remain on any industry siding for very long, and most cars are picked up in the following session.

In the same way, needs for incoming cars also emerge from the Distribution Schedule. Then, one needs to select two things: the specific car, and, for outbound cars, the load. To do so means in turn that one has to have a filing system for waybills and overlay bills, and a system for retrieving waybills from the system in order to re-use them.

I now file all unused waybills by industry. When a waybill has been used in an operating session, it goes to the back of the stack for that industry, ensuring that it won't be repeated anytime soon. Of course, filing by industry means that a specific car's waybills are not directly findable, because they are sequenced primarily by date of use. Instead, I maintain a separate electronic “pairs list,” of all the pairs of shippers and consignees, inbound and outbound, for which I have waybills, and of course the list includes the car reporting marks on each waybill (or no marks, for overlay bills).

It is quick and easy on the computer to use the pairs list to find what is wanted. Let's say I want to get a particular freight car back into use, that hasn't operated for a while, let's say T&NO 60928, a

box car that would be a free-runner. I simply use those marks as the search terms in the computer file, and go right to the industry where that waybill is filed.

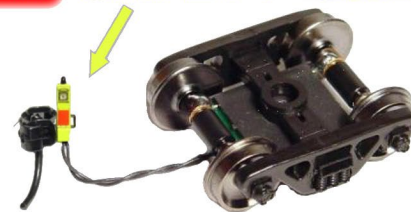
Looked at this way, it might seem easier to file the waybills by car number, making it easy to find a particular car's waybill. But since my Distribution Schedule for car flow is by industry, it would then be a task to find where the waybills for that industry were located in the file, as they would be scattered through the car sequences.

But in that method too, the pairs list would still be the tool of choice. I would of course enter the industry name as the search term, and would again immediately find the waybills for desired cars. But this is no simpler than filing by industry, so I have retained that system.

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Note that the Distribution Schedule only sets a framework for operating sessions. It isn't a rigid specification, just an overall pattern. And it doesn't call for specific freight cars for any particular slots in the schedule, only the car type. I still choose the individual cars.

Pulled all together, this system of using the waybills for operation performs smoothly and generates all the variety I could want in car movements, while retaining some pattern in determining which cars go to which industries, and how often. I have been modifying and perfecting it for some years now, testing it against dozens of different layout visitors and operators, and it continues to do what I want.



Concluding remarks

The idea of waybills for model railroad operation which move cars as desired, and have the general appearance of the prototype waybills, is now in use on a number of layouts around North America. A number of refinements can be pursued in such systems, and I have only tried to indicate one such set of refinements, as I use them on my own layout. The waybills are put into action with the help of the Distribution Schedule, which structures the frequency and kind of cars that are directed to each industry.

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26. This view shows the Santa Rosalia Branch local, with Consolidation 2763 as today's power, switching at Ballard. The caboose has been spotted where it won't be part of any switching moves, as most conductors prefer. All the cars in this photo are moving or will move in accord with prototype waybills or messages from the Ballard agent.

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