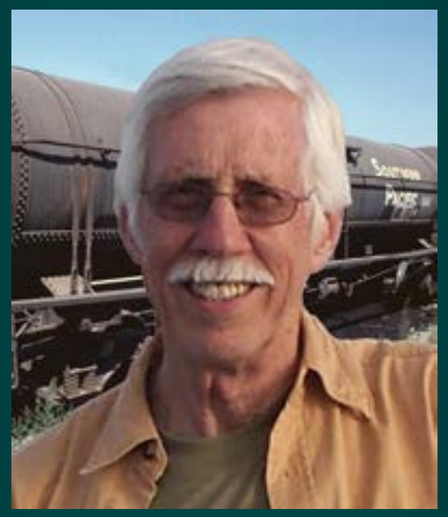
About this issue's prototype modeling columnist



Tony Thompson is a long-time modeler in HO. He's interested in Southern Pacific history and has published magazine articles and books on this subject. He writes the modeling column in the Southern Pacific Historical and Technical society's magazine, "Trainline", and served five years as the Society's president.

For more information, go to: signaturepress.com/awt.html

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GETTING REAL: A More Prototypical Waybill for Model Railroads

Adventures in Prototype Modeling – Freight Paperwork Tips

Making frieght car routing paperwork look and act more like the real thing ...

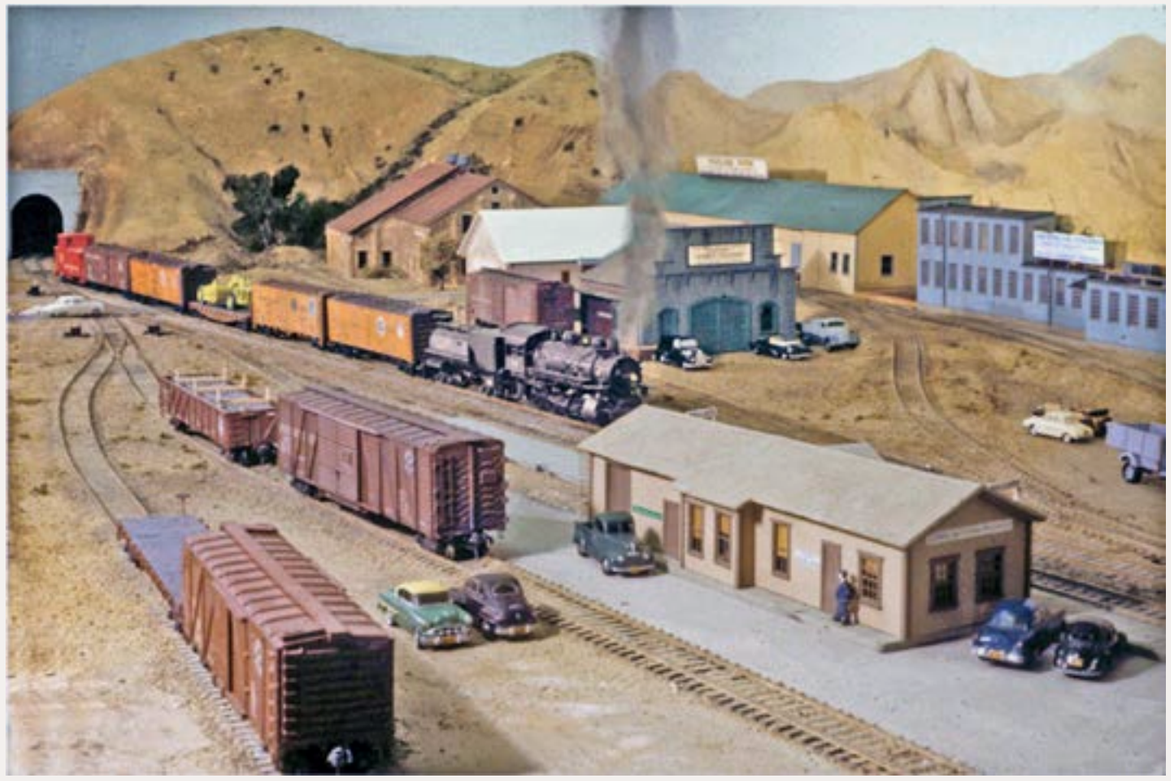

Figure 1: As this local train approaches the Ballard, California depot on my layout, set along a mythical branch line of Southern Pacific's Coast Division in 1953, its freight cars all have associated Waybills. In addition, upon reaching the depot the conductor will consult with the agent to find out what newly loaded or empty cars need to be picked up. Thus the crew of this train has well-defined work to do, in accord with realistic freight car paperwork.

Model railroad operation has long been recognized as an important goal in the hobby, because it gives a purpose to the layout and to the rolling stock. In this column, I want to discuss one part of making operation of freight cars realistic. That part is the paperwork.

Paperwork to move model freight cars realistically has been part of the hobby from its earliest years. Al Kalmbach (writing as "Boomer Pete") and Frank Ellison in the 1940s described methods that, though primitive by modern standards, had goals much like ones we have today. (Recommendations for Further Reading are presented at the end of this article.) I would summarize these goals today as creating realistic paperwork that contributes to realistic operation, and generates realistic car movements and, within reason, resembles prototype paperwork.

"Realistic paperwork?" Yes, and although the first thought one might have would be a desire to *avoid* recreating bureaucratic procedure, realistic paperwork actually is something many of us already do for other hobby purposes. We often work hard to construct realistic timetables, and then to design our layout timetable document to look and work very much like the prototype. Freight car paperwork has the same genesis and the same goal.

Freight car paperwork is like any other aspect of railroad realism: its obvious starting point is the prototype, and I will describe prototype Waybills as a starting point in a moment. But first, let's make sure we understand the role this paper plays in prototype car

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movements. I will describe typical procedure for the steam-diesel transition era. (See the Further Reading section for more sources on the prototype procedures.)

The Waybill Cycle

Consider the usual cycle of freight car movement, starting with a shipper who needs an empty car to load. How does he arrange to get that car? He calls his local railroad agent or, in a city, the railroad's freight agent or car distributor. To get the empty on its way to him, all that is needed is the car type required and its destination. The agent or clerk who takes the call forwards the information to the nearest yard office which will supply the car. Yard forces identify a suitable car and arrange for its movement to the shipper's location.

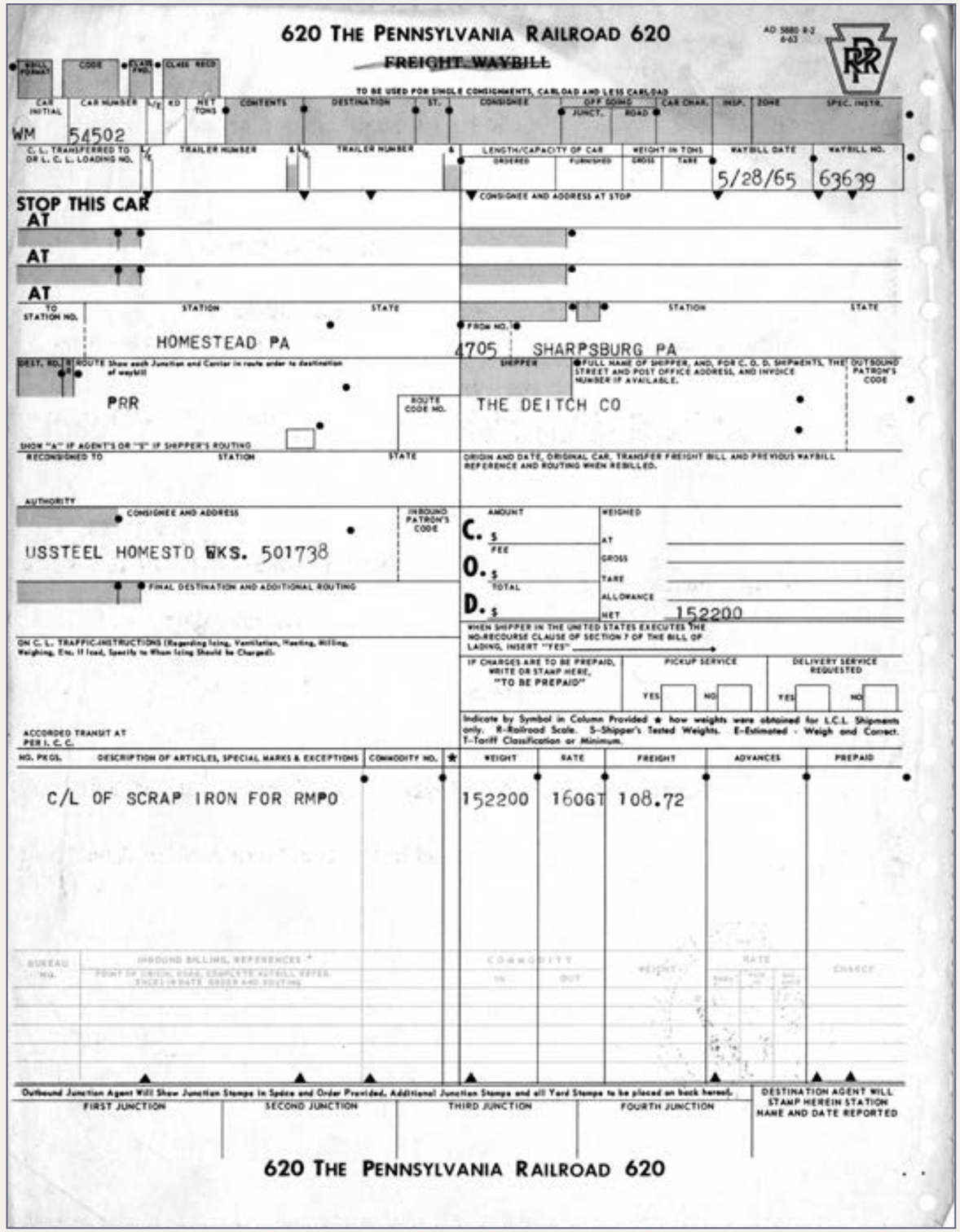
Meanwhile, the shipper makes out a Bill of Lading, with many particulars about the shipment, including a detailed destination, and of course a cargo description, which may or may not conform to a tariff category. This Bill of Lading is provided to the agent or car clerk, who makes out a Waybill using the information. This may happen while the car is being loaded, or after it is loaded. The two documents have a number of differences but do contain much of the same information.

The Waybill has to be completed by the time the car is picked up, because the conductor of the local train or switch job that picks up the car will take the Waybill with him. When he arrives at his destination yard, his accumulated Waybills are turned over to car clerks, who log the information. Each Waybill then travels in each of its car's trains, in the custody of each conductor, over the entire route to destination, perhaps involving a number of different conductors over a long journey.

The local agent at the destination may know of the arrival of a car in advance, if he has received a Waybill copy via U.S. Mail, but his first awareness of it may occur when the local comes to town with that car in tow. The conductor's first move is to stop at the depot and consult with the agent, both to hand over each Waybill for a loaded car which is going to be spotted, and to collect the Waybill for each loaded car which will be picked up.

The Waybill then becomes the basis for billing the freight shipment, either by the local agent or by clerical forces. At that point, of course, its relevance to model railroad operation has ended.

What can we learn from this? First, of course, cars are moved with Waybills for direction. Second, the agent plays a pivotal role in the prototype situation, and although it may not be practical to have a person play this role in layout operation, there are ways to mimic the agent's role (discussed below). Third, local train crews did carry and use Waybills, even though some "operations gurus" in recent


620 THE PENNSYLVANIA RAILROAD 620

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

AD 5880 8-2 6-63

CAR INITIAL: WM CAR NUMBER: 54502

CONTENTS | DESTINATION | ST. | CONSIGNEE | OFF GOING JUNCT. | OFF GOING ROAD | CAR CHAR. | INSP. | ZONE | SPEC. INSTR.

WAYBILL DATE: 5/28/65 WAYBILL NO.: 63639

STOP THIS CAR AT

AT

AT

TO STATION NO. | STATION | STATE: HOMESTEAD PA

FROM NO.: 4705 | STATION | STATE: SHARPSBURG PA

DEST. RD. | ROUTE Show each Junction and Carrier in route order to destination of waybill: PRR

SHIPPER: FULL NAME OF SHIPPER, AND, FOR C. O. D. SHIPMENTS, THE STREET AND POST OFFICE ADDRESS, AND INVOICE NUMBER IF AVAILABLE: THE DEITCH CO

OUTBOUND PATRON'S CODE

ROUTE CODE NO.

SHOW "A" IF AGENT'S OR "S" IF SHIPPER'S ROUTING

RECONSIGNED TO | STATION | STATE

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

AUTHORITY

CONSIGNEE AND ADDRESS: USSTEEL HOMESTD WKS. 501738

INBOUND PATRON'S CODE

FINAL DESTINATION AND ADDITIONAL ROUTING

AMOUNT: C. $ FEE; O. $ TOTAL; D. $

WEIGHED: AT; GROSS; TARE; ALLOWANCE; NET: 152200

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

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

IF CHARGES ARE TO BE PREPAID, WRITE OR STAMP HERE, "TO BE PREPAID"

PICKUP SERVICE: YES NO

DELIVERY SERVICE REQUESTED: YES NO

ACCORDED TRANSIT AT PER I. C. C.

Indicate by Symbol in Column Provided ★ how weights were obtained for L.C.L. Shipments only. R-Railroad Scale. S-Shipper's Tested Weights. E-Estimated - Weigh and Correct. T-Tariff Classification or Minimum.

NO. PKGS.	DESCRIPTION OF ARTICLES, SPECIAL MARKS & EXCEPTIONS	COMMODITY NO.	★	WEIGHT	RATE	FREIGHT	ADVANCES	PREPAID
	C/L OF SCRAP IRON FOR RMPO			152200	160GT	108.72		

BUREAU NO. | INBOUND BILLING REFERENCES | COMMODITY IN / OUT | WEIGHT | RATE | CHARGE

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 HEREIN STATION NAME AND DATE REPORTED

620 THE PENNSYLVANIA RAILROAD 620

Figure 2: Original PRR Waybill, 8.5 x 11 inches exclusive of pin-feed edge.

Getting Real column, page 2
Tell a friend ... Contents Index

years have stated that crews should not handle Waybills. Fourth, it may be evident that empty cars don't have Waybills, so what paperwork directs their movement? I will address that point as part of describing realistic Waybills.

Creating a Waybill for Modelers' Use

Let's begin with the Waybill. The immediate question that a modeler might ask is whether there was a standard or typical document. In fact, the AAR adopted standard Waybills at least as early as the 1930s, and essentially every railroad used the standard forms without change. (All the standard AAR forms are shown in the various editions of *Railway Accounting Rules*; see Further Reading.) There are obvious advantages to everyone using the same paperwork for loads that could travel over widely different railroads, and it's also an advantage to the modeler, who only has to consider a standard form. Here's a prototype Waybill (figure 2 previous page), somewhat arbitrarily chosen from 1965.

Much of this prototype bill has space for information which modelers either don't use, or would need less space to fill out. So my approach to this problem is simply to scan the prototype bill, thereby creating a digital version of it, and in an application like Adobe Photoshop, cut and discard all the parts not wanted (shown in pink in figure 3), and then paste the remaining parts together into a whole.

With some rearrangement, here is that reassembled information from the same PRR document (figure 4 next page).

This is not yet a finished model Waybill, and needs further rearrangement. But before going any further there are some points to note here. First, the prototype bill is divided down the center between shipper information on the right, and consignee information on the left. It was very common practice for those working with Waybills to fold them in half the long way, and some modelers, as I discuss shortly, have even gone to the extreme of omitting entirely the right-hand side of the bill. So that centerline division is important.

Next up is probably the question of what size bill you want to make, and therefore how much of the prototype format can be retained. I will describe three different kinds of Waybill formats that various people are using, to illustrate how these formats vary. The first model Waybill is the one I use on my layout, and is 2.5 x 3.5 inches in size (the reasons for the size and for the blank area at the bottom will be discussed in a moment). Here is how it looks, as derived from the Pennsylvania document shown above, as figure 5 next page.

A second waybill design was created to match the size of many modelers' existing "mini-bills" and car cards, namely 2 x 4 inches. This size match, of course, permits continued use of

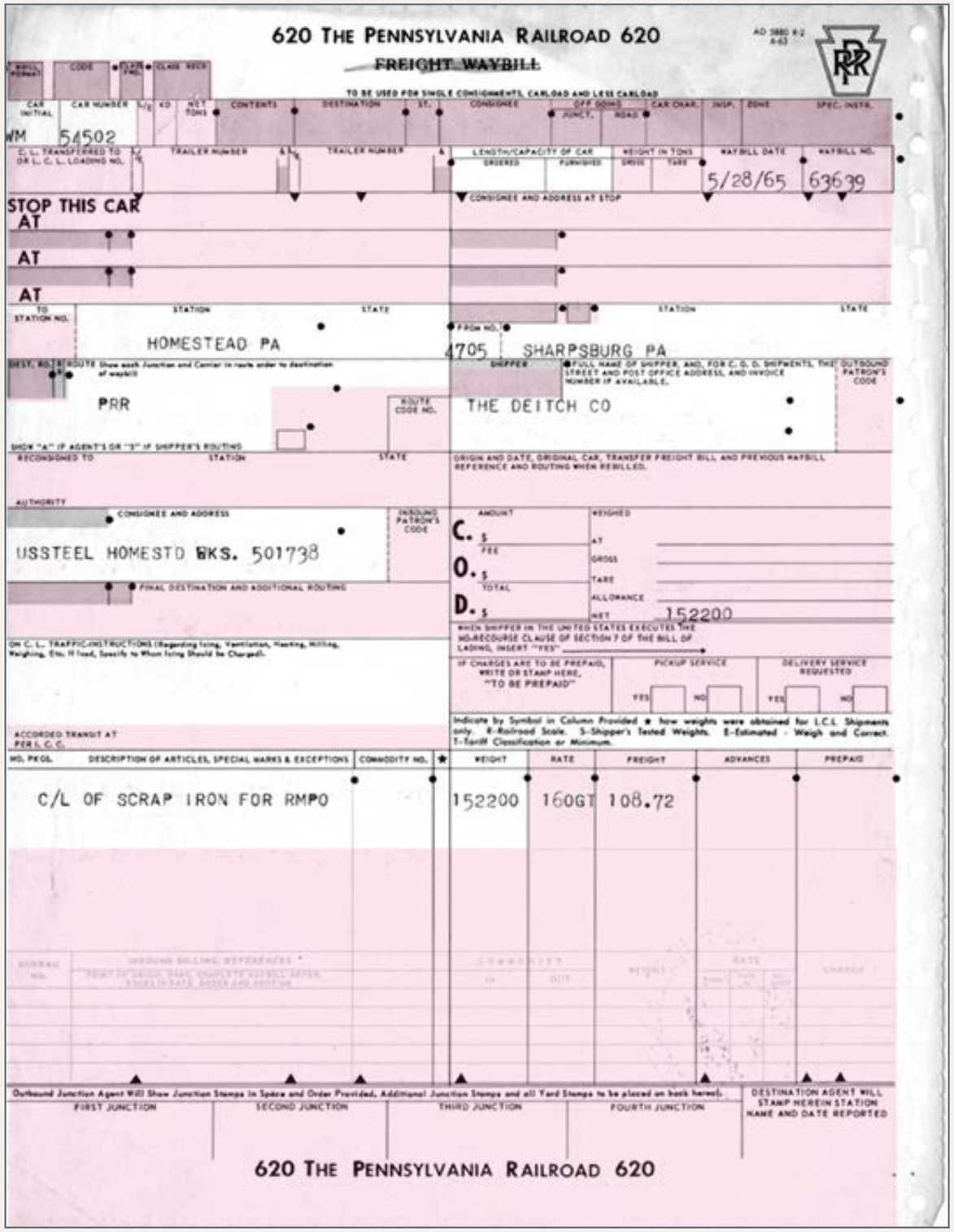


Figure 3: PRR Waybill of Figure 1, highlighted in pink to show parts to be removed.

Getting Real column, page 3
Tell a friend ... Contents Index

various accommodations for these documents on layouts, such as bill files or slots. The preparation process is identical to the first example, but the arrangement is somewhat different because more space is available. figure 6 next page is an example, again sticking with the PRR prototype source, note that there was space to include the "stop this car" directions, for partial unloadings or LCL.

Third, there are modelers who either prefer a larger bill so more information can be included, or whose eyesight is better served by a bigger format. One example of a large bill is from Frank Hodina, whose bill is 4.25 x 5.5 inches in size, because Frank wanted to present a more complete bill. This bill is illustrated in figure 7 next page, shown here as a Nickel Plate document and is filled out. I will comment below on the railroad name headers for Waybills, and about how the Waybill is filled out.

In addition to size, there is a decision to make as to whether the waybill will serve as a single document, or whether an additional component, playing the role of a "car card," will be used. Two of the three Waybill designs just shown do indeed intend that no car card function will be implemented, and the car initials and number are to be shown on the

620 THE PENNSYLVANIA RAILROAD 620 AD 5880 R-2 6-63

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER	LENGTH/CAPACITY OF CAR ORDERED	LENGTH/CAPACITY OF CAR FURNISHED
WM	54502		

TO STATION STATE	FROM STATION STATE
HOMESTEAD PA	SHARPSBURG PA
ROUTE Show each Junction and Carrier in route order to destination of waybill: PRR	SHIPPER: THE DEITCH CO
CONSIGNEE AND ADDRESS: USSTEEL HOMESTD WKS. 501738	ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If Iced, Specify to Whom Icing Should be Charged).
NO. PKGS. DESCRIPTION OF ARTICLES & EXCEPTIONS: C/L OF SCRAP IRON FOR RMPO	

620 THE PENNSYLVANIA RAILROAD 620

Figure 4: PRR Waybill parts which were retained, and pasted back together.

AD 5880 R-2

620 THE PENNSYLVANIA RAILROAD 620

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION STATE	FROM STATION STATE
CONSIGNEE AND ADDRESS	SHIPPER
ROUTE Show in route order	AAR CLASS OF CAR ORDERED LENGTH/CAPY OF CAR ORDERED WEIGHED E–Estimated S–Shipper's Tested Weights R–Railroad Scale T–Tariff Classification
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS	
NO. PKGS. DESCRIPTION OF ARTICLES	

Figure 5: PRR Waybill sized for 2.5 x 3.5 inch design.

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AD 5880 R-2

620 THE PENNSYLVANIA RAILROAD 620

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER
AAR CLASS OF CAR ORDERED	LENGTH/CAPY OF CAR ORDERED
TO STATION STATE	FROM STATION STATE
CONSIGNEE AND ADDRESS	SHIPPER
ROUTE Show in route order	Indicate how weights were obtained for L.C.L. Shipments only. S–Shipper's Tested Weights. T–Tariff Classification or Minimum. R–Railroad Scale. E–Estimated.

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If Iced, Specify to Whom Icing Should be Charged).
& EXCEPTIONS

STOP THIS CAR
AT

AT

NO. PKGS.	DESCRIPTION OF ARTICLES

Figure 6

Waybill itself, just as on the prototype. This is visible in figures 6 and 7. The first design shown, figure 5 (previous page), is intended to be placed in a clear plastic sleeve with car number and initials on it, thus acting like a car card. Here is that bill type, completed by inserting it into a clear sleeve, figure 8 (next page). (This idea comes from Bill Neale, see Further Reading, who suggested these baseball-card-collector sleeves.) Now it should be evident

SPECIAL SERVICE: 4-114-1

NICKEL PLATE ROAD

541-THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY-541

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

CAR INITIALS AND NUMBERS	KIND	LENGTH OF CAR ORDERED	LENGTH OF CAR FURNISHED	CAPACITY OF CAR ORDERED	CAPACITY OF CAR FURNISHED
NKP 26047	XM				

STOP THIS CAR | C.L. Transferred to | DATE: AUG. 17 | WAYBILL No.: 2322

CONSIGNEE AND ADDRESS AT STOP

AT
AT
AT

TO No.	STATION	STATE	FROM No.	STATION	STATE
4-114	KINCAID	ILL		LIMA	OHIO

ROUTE (Show in route order to destination of waybill): NKP-P&PU(PEORIA)-CIW

FULL NAME OF SHIPPER: LIMA HEAVY EQUIPMENT

RECON. TO STATION STATE

ORIGIN AND DATE

CONSIGNEE AND ADDRESS: KINCAID MINING SUPPLY

FINAL DESTINATION AND ADDITIONAL ROUTING

ON C.L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Milling, Weighing, Etc.)

AMOUNT: C. FEE; O. TOTAL; D.

PICKUP SERVICE

DELIVERY SERVICE REQUESTED YES NO

WEIGHED: AT; GROSS; TARE; ALLOWANCE; NET

IF CHARGES ARE TO BE PRE-PAID, WRITE OR STAMP HERE "TO BE PREPAID"

WHEN SHIPPED IN THE UNITED STATES EXECUTED THE NO-RECOURSE CLAUSE OF SECTION 7 OF THE BILL OF LADING, UNLESS "YES".

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

No. PKGS.	DESCRIPTIONS OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	WEIGHT	RATE	FREIGHT	ADVANCES	PREPAID
CL	MINING SHAFT EQUIPMENT					

FIRST JUNCTION | SECOND JUNCTION | THIRD JUNCTION | FOURTH JUNCTION | DESTINATION AGENT WILL STAMP HEREIN STATION NAME AND DATE REPORTED

541 - THE NEW YORK, CHICAGO AND ST. LOUIS RAILROAD COMPANY - 541

Figure 7

Figure 6: PRR Waybill sized for 2 x 4 inch design.

Figure 7: Nickel Plate Waybill, 4.25 x 5.5 inch design. The green box is operational coding.

Getting Real column, page 5

why the blank bill of this design, figure 4 (previous pages), has the empty space at the bottom: it is to accept the car information on the car sleeve.

Another important point to recognize is that Waybills with car initials and numbers printed on them cannot provide the flexibility of "this load, any car" which is obtained with classic car cards/sleeves and Waybills. This is the downside to their more prototypical appearance. Each modeler can choose which aspect of a Waybill system is more important.

The 2.5 x 3.5-inch Waybill, which uses the readily available baseball-card sleeve, need not have car sleeve information at the bottom; Jeff Aley has devised a somewhat different Waybill, shown in figure 8, which has

AD 5880 R-2

620 THE PENNSYLVANIA RAILROAD 620

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION	STATE	FROM STATION	STATE
SHUMALA	CA	PITTSBURGH	PA

CONSIGNEE AND ADDRESS	SHIPPER
B&B FOREMAN, SP. SHOP TK.	PITTSBURGH PAINT COMPANY

ROUTE Show in route order	AAR CLASS OF CAR ORDERED: XM
PRR-ST L-SSW-COR-T&NO-ELP-SP	LENGTH/CAPY OF CAR ORDERED
	WEIGHED: S (E-Estimated, R-Railroad Scale, S-Shipper's Tested Weights, T-Tariff Classification)

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS: SHIPPER LOAD & COUNT

NO. PKGS.	DESCRIPTION OF ARTICLES
48	DRUMS BRIDGE PAINT

BOX CAR

RI 146765

AAR XM

Figure 8: Completed 2.5 x 3.5 inch Waybill, for bottom-information type of car sleeve.

the car initials and number in the prototype location. Note, however, that Jeff omits shipper information (the Waybill is imagined as folded to conceal it), and he is typographically somewhat limited by producing this document in Microsoft Excel.

But a clear sleeve need not be only for the purpose of making a car card. Sleeves help keep paperwork together and permit multiple Waybill placements for a single car. There is a very convenient side-loading sleeve which will hold the 2 x 4-inch Waybill, and Frank Hodina has located a clear sleeve which can be cut down to fit his 4.25 x 5.5-inch form. Sleeves are widely available. The 2 x 4-inch and Hodina's 4-5/8 x 5.5-inch sizes are from Everyday Plastics (visit their web site at: www.everydayplastics.com).

802 - UNION PACIFIC - 802

FREIGHT WAY-BILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

CAR INITIALS	CAR NUMBER
UP	127889

AAR	DESCRIPTION	LENGTH / CAPY
XM	BOX	40 FT

ROUTE (Show each Junction and Carrier in Route order)

UP-OOB-ONW-OHI-DTI

TO (STATION)	(STATE)
DETROIT	MICH

CONSIGNEE AND ADDRESS

MOTOR CITY ELECTRICAL

INSTRUCTIONS (Regarding Spotting, Icing, Ventilation, Etc.)

NO. PKGS.	DESCRIPTION OF ARTICLES
O/L	ALTERNATORS

Figure 9: Completed 2.5 x 3.5 inch Waybill, for top-information type of car sleeve.

L-710-B

721 SOUTHERN PACIFIC COMPANY 721

PERISHABLE FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER
PFE	41354
AAR CLASS OF CAR ORDERED: RS	LENGTH/CAPY OF CAR ORDERED:
TO STATION: PORTLAND STATE: OR	FROM STATION: SHUMALA STATE: CA
CONSIGNEE AND ADDRESS: BLUE SHIELD FOODS	SHIPPER: PHELAN & TAYLOR PACKING
ROUTE Show in route order: SP	Indicate how weights were obtained for L.C.L. Shipments only. S–Shipper's Tested Weights. T–Tariff Classification or Minimum. R–Railroad Scale. E–Estimated.

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If Iced, Specify to Whom Icing Should be Charged).
& EXCEPTIONS

RECONSIGNED TO

RECONSIGNED TO

PRE-ICE	INITIAL ICE	CPS
YES	YES	2

NO. PKGS.	DESCRIPTION OF ARTICLES
462 CRATES	ORANGES

Figure 10

A. A. R. Form 101

840-THE WESTERN PACIFIC R.R. CO.-840

LIVESTOCK FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER
WP	76058
AAR CLASS OF CAR ORDERED: SM	LENGTH/CAPY OF CAR ORDERED:
TO STATION: K. FALLS STATE: OR	FROM STATION: OROVILLE STATE: CA
CONSIGNEE AND ADDRESS: C. B. JACKSON STOCK SALES	SHIPPER: FEATHER RVR. LIVESTOCK
ROUTE Show in route order: WP-SAC-SP	Time Loaded 8A M. SECTION 3 OF THE LIVE STOCK CONTRACT EXECUTED (Yes or No) N Was Car Bedded by Carrier? (Yes or No) Y Has 36 Hour Request been Signed and Filed at Point of Origin? (Yes or No) N

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If Iced, Specify to Whom Icing Should be Charged).
& EXCEPTIONS

STOP THIS CAR AT

AT

NO. HEAD	DESCRIPTION OF STOCK
36 HD.	BREEDER CALVES

Figure 11

Additional Points About Waybills

Having made the foregoing points about format, it's worth addressing some further details about prototype Waybills. First, the bills shown above are derived from the standard Waybill of the AAR. But there were also other AAR forms, in particular for perishables, for livestock, and for LCL.

Those standard forms can, of course, be cut down to model size and shape, just as described above. The AAR recommended that perishable Waybills be printed on pink stock, and this can of course be done with model bills too. Here are examples of model-form perishable (figure 10) and livestock (figure 11) bills. There are a number of details in the livestock bill relating to transit regulations for livestock, which can be a source of further operational points for those interested.

Further, it is important to recognize that prototype empty cars usually moved on separate documents, often called Empty Car Bills, which were quite different in appearance from Waybills.

Figure 10: Pink perishable Waybill, 2 x 4-inch format.

Figure 11: Livestock Waybill, 2 x 4 inches.

Getting Real column, page 7

Usually they were about 4 x 11 inches in size, to match the lengthwise-folded waybills in a stack. Shown as figures 12 and 13 are two examples of prototype Empty Car Bills. These Bills were in effect only on the issuing railroad and were not used after interchanging to another road, so at every interchange point, the receiving railroad would issue a new Empty Car Bill to move the car onward—or perhaps confiscate that empty car for loading.

These Empty Car Bills may be white, yellow or manila in color. Empty Car Bills, unlike Waybills, were not only not standardized, but no two even seem to be alike. To be accurate, a modeler would want to locate a prototype example for the road being modeled. The example I had seen of an SP version was yellow, so that was what I followed in making up a 2 x 4-inch version, shown as figure 14.

This bill is filled out in its lower section for a car headed toward a location where it is expected to be loaded. In this type of Empty Car Bill, a car being moved toward its home rails (or to an intermediate yard which needs

Figure 12

FORM 1304 1-65-500M

EMPTY CAR BILL

No. Date 19

Initial No.

From

To

Class or Suitability

AUTHORITY FOR MOVEMENT

REMARKS

These Bills to be used only for movement of empty cars without charges.

If car is ordered loaded while en route, Conductor will make notation under "Remarks" showing point at which empty run ceased, and leave Bill with Agent, who will change destination accordingly, and send Bill to Division Superintendent.

Figure 13

5MM 12-56 ARB
(Printed in U. S. A.)

NEW YORK CENTRAL SYSTEM

NYCS
HR-2
Revised
I.C.C. 1003(a)—3 Yrs.

COMBINATION HOME ROUTE CARD AND EMPTY CAR BILL

Part 1

INITIAL	NUMBER	KIND

HOME ROUTE INFORMATION

(Form HR-2 Revised (Parts 1 and 2) MUST be prepared on all loaded cars, also empty cars on orders, received from connecting lines, except:

Private Line Tank Cars—any mark; Live Poultry Cars—any mark; System Cars marked B&A, CCC&StL, MC, NOR, NYC, P&E; also cars marked P&LE, PMcK&Y, B&O, Erie and PRR.)

Part 2

ROAD REC'D FROM	STATION	DATE
(a)		

On arrival at destination or junction point where delivered to connecting line, if road received from (Item a) is not proper route under Car Service Rules secure proper route in usual manner and insert information in Item (b) crossing out Item (a).

ROAD	STATION	AUTHORITY
(b)		

EMPTY CAR BILL

(Form HR-2 Revised (Parts 1 and 3) MUST be prepared for all empty car movements on Foreign, System and Private Line Cars, except Tank and Live Poultry Cars.)

Part 3

EMPTY CAR MOVEMENT

DESTINATION FOR
FROM DATE
AUTHORITY OR ORDER NO.

EMPTY CAR MOVEMENT

DESTINATION FOR
FROM DATE
AUTHORITY OR ORDER NO.

EMPTY CAR MOVEMENT

DESTINATION FOR
FROM DATE
AUTHORITY OR ORDER NO.

EMPTY CAR MOVEMENT

DESTINATION FOR
FROM DATE
AUTHORITY OR ORDER NO.

When spaces for empty movements have all been used transfer home route information to new card and destroy old card.

For complete instructions on handling empty cars see Booklet NYCS MFT-110A.

APPLY YARD STAMPS ON BACK

J-62-48 Form 1304

SOUTHERN PACIFIC COMPANY

EMPTY CAR BILL

CAR INITIAL	CAR NUMBER
SP	90873
AAR CLASS OF CAR ORDERED: LO	LENGTH/CAPY OF CAR ORDERED

FOR HOME

Billed from

To or Via R.R.

FOR LOADING

Billed from WEED CA

To BAKERSFIELD CA

Shipper Spot

INSTRUCTIONS—This form must accompany all empty foreign cars and must be used in billing private line cars under General Order Ten.

Figure 14

Figure 12: Union Pacific Empty Car Bill.

Figure 13: New York Central Empty Car Bill.

Figure 14: Empty Car Bill for Southern Pacific, 2 x 4 inches.

Getting Real column, page 8

empties) would be filled out in the upper part of the bill instead.

My own feeling is that use of Empty Car Bills is a real improvement in prototypical practice, compared to the usual "four-cycle waybill" usage of having the paperwork look about the same.

Additional Points About Waybills

There is one important exception to the use of Empty Car Bills: privately owned tank cars, when empty, were moved with regular freight bills, though their cargo was marked as "L/C," meaning "last contained," so that any safety issues with residue or fumes of the previous cargo could be recognized. A pair of Waybills for this situation are shown as figures 15a and 15b.

Several of the Waybill examples already given illustrate an important point about prototype bills: every railroad issued its own form, with its name styled as it preferred, even though the balance of the form was pure AAR standard. Since Waybills are issued by the road originating the shipment, this means that a satisfactory model Waybill system has to have a wide range of railroad names as headings.

My approach has been to try and collect actual Waybill examples, primarily from modelers of other roads, and in the absence of an actual Waybill, to use related documents such as freight bills or Bills of Lading to acquire headers. I now have such headers for about 75 railroads. One also needs to add the AAR number code, assigned to each railroad, to the header. A complete list of assigned numbers can be found in Railway Accounting Rules. An abbreviated list of major roads is shown below as Table 1.

Filling Out Waybills

Every car on an operating layout should have some paperwork moving it as an empty or a load (except, say, maintenance cars on a siding). The Empty Car Bill in figure 14 (previous page) presumably corresponds to a loaded move in the other direction, and since it is a cement hopper (as were the vast majority of covered hoppers in 1953, when I model), there is one logical load in the opposite direction. That is what is shown in the corresponding Waybill for this car when loaded, figure 16.

A.A.R. Form 104

759 TEXAS & NEW ORLEANS RAILROAD COMPANY 759

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER
SHPX	5605
AAR CLASS OF CAR ORDERED: TPI	LENGTH/CAPY OF CAR ORDERED:
TO STATION STATE: KLAM. FLS. OR	FROM STATION STATE: LK. CHARLES LA
CONSIGNEE AND ADDRESS: MODOC FARM SUPPLY	SHIPPER: OLIN-MATHIESON CHEMICAL CO.
ROUTE Show in route order: T&NO-ELP-SP	Indicate how weights were obtained for L.C.L. Shipments only. S-Shipper's Tested Weights. T-Tariff Classification or Minimum. R-Railroad Scale. E-Estimated.

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If Iced, Specify to Whom Icing Should be Charged). & EXCEPTIONS

STOP THIS CAR AT

AT

NO. PKGS.	DESCRIPTION OF ARTICLES
C/L	ANHYDROUS AMMONIA

Figure 15a

721 SOUTHERN PACIFIC COMPANY 721

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER
SHPX	5605
AAR CLASS OF CAR ORDERED: TPI	LENGTH/CAPY OF CAR ORDERED:
TO STATION STATE: EL PASO TX	FROM STATION STATE: KLAM. FLS. OR
CONSIGNEE AND ADDRESS: OLIN-MATHIESON CHEMICAL CO.	SHIPPER: MODOC FARM SUPPLY
ROUTE Show in route order: SP-ELP-T&NO	Indicate how weights were obtained for L.C.L. Shipments only. S-Shipper's Tested Weights. T-Tariff Classification or Minimum. R-Railroad Scale. E-Estimated.

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If Iced, Specify to Whom Icing Should be Charged). & EXCEPTIONS

RECORD RIGHTS, REVERSE ROUTE

STOP THIS CAR AT

AT

NO. PKGS.	DESCRIPTION OF ARTICLES
L/C	ANHYDROUS AMMONIA

Figure 15b

721 SOUTHERN PACIFIC COMPANY 721

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER
SP	90873
AAR CLASS OF CAR ORDERED: LO	LENGTH/CAPY OF CAR ORDERED:
TO STATION STATE: WEED CA	FROM STATION STATE: 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. S-Shipper's Tested Weights. T-Tariff Classification or Minimum. R-Railroad Scale. E-Estimated.

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Heating, Milling, Weighing, Etc. If Iced, Specify to Whom Icing Should be Charged). & EXCEPTIONS

STOP THIS CAR AT

AT

NO. PKGS.	DESCRIPTION OF ARTICLES
C/L	CEMENT

Figure 16

Figure 15a: Waybill for a tank car load, 2 x 4-inch format. "C/L" means "carload."

Figure 15b: Waybill for returning empty tank car, paired with the load Waybill of Figure 15a, 2 x 4 inches. Notation "Record rights . . ." directs car to return on its service route when loaded; "L/C" means "last contained."

Figure 16: Waybill for loaded car, opposite movement of that shown in Figure 14, 2 x 4 inches.

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Table 1

AAR Code Number, for Selected Railroads

3 - Akron, Canton & Youngstown
10 - Ann Arbor
22 - ATSF (Santa Fe)
28 - Atlantic Coast Line
50 - Baltimore & Ohio
56 - Bangor & Aroostook
69 - Boston & Maine
103 - Canadian National
105 - Canadian Pacific
125 - Chesapeake & Ohio
129 - Chicago & Eastern Illinois
131 - Chicago & North Western
133 - Chicago, Burlington & Quincy
140 - Chicago, Milwaukee, St. Paul & Pacific
145 - Chicago, Rock Island & Pacific
195 - Delaware & Hudson
196 - Delaware, Lackawanna & Western
197 - Denver & Rio Grande Western
208 - Detroit, Toledo & Ironton
238 - Elgin, Joliet & Eastern
263 - Florida East Coast
299 - Georgia
308 - Grand Trunk Western
310 - Great Northern
317 - Gulf Mobile & Ohio
351 - Illinois Central
400 - Kansas City Southern
444 - Louisville & Nashville
479 - Minneapolis & St. Louis
490 - Missouri-Kansas-Texas
494 - Missouri Pacific
540 - New York Central
541 - Nickel Plate Road
543 - New York, New Haven & Hartford
550 - Norfolk & Western
558 - Northern Pacific
620 - Pennsylvania
626 - Pittsburgh & Lake Erie
623 - Reading
693 - St. Louis-San Francisco
694 - St. Louis Southwestern
712 - Seaboard Air Line
724 - Southern
721 - Southern Pacific
728 - Spokane, Portland & Seattle
749 - Texas & New Orleans
760 - Texas & Pacific
802 - Union Pacific
823 - Virginian
825 - Wabash
839 - Western Maryland
840 - Western Pacific. ■

This brings us to the matter of how Waybills are filled out. An important point in the transition era is that most Waybills were filled out with what were known as billing typewriters, and these machines only had uppercase letters. Thus practically all Waybills one can find prior to 1960 were filled out in all capitals.

But naturally not every make of billing typewriter had the same typeface, and other methods of prepartion and transmittal were used, such as Teletype. Accordingly, realistic Waybills should have a range of typeface appearances. After looking carefully at SP documents I have seen, I concluded that a fairly close match to the appearance was a typeface called Bell Gothic. That is the typeface used to fill out figures 14 through 16 (previous pages), as well as figures 8 and 10 (previous pages). A digital Teletype font was used for figure 11 (previous pages).

One possible criticism of these and many other typefaces in electronic form is that they are far too clean and pristine. Typewriters in service develop worn or even broken letters, and accumulate dirt on the keys. There happen to be a fair number of digital typefaces based on "in service" typewriters, and I have found a couple of these to be very realistic.

One of the best is called "Mom's Typewriter" (the fellow who digitized it claims it really is from his mom's typewriter). It is available free at fontspace.com and an example of its appearance is in figure 17 (next page). Other typical typewriter faces might include the widely available face called "American Typewriter," shown in figure 18 (next page).

More examples of "working" typewriter faces can be suggested, and many are available cheap or free on the Internet, but beware the so-called "grunge" faces, which are heavily distorted or disrupted, as these go beyond what is credible in a working typewriter.

While on the subject of typefaces, I have been asked what typeface I used on my waybills for the form itself, in the AAR portion of the document. My answer is that I didn't choose any typeface; what you see in these Waybills is simply the scanned appearance of the actual Waybills themselves.

Given a group of suitable typefaces for this task, how are the model waybills (still in electronic form as Photoshop files at this point) filled out? I simply use the Type tool in Photoshop to type in whatever is needed in each Waybill. All right, you say, but what do I write?

There was considerable formality in the various types of information which were filled in on a Waybill, and I won't take space here to discuss the various parts of the document. However, I did publish awhile back a magazine article on that exact topic, in the Operations SIG (NMRA) magazine, *The Dispatcher's Office* (see Bibliography).

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A corrected version of the printed article is available at: modelingthesp.blogspot.com/2011/09/my-article-in-dispatchers-office.html.

A major point about Waybill content is the identity of shippers and consignees, which you can think of as pairs of locations. One option is to use layout business names as one half of each pair, and some off-layout name, perhaps made up, such as "Acme Steel," as the second half. But many modelers may prefer to try and use actual industries.

I personally enjoy research on this topic, and have located many industrial concerns in my modeled area through old telephone books (available at local libraries) and some railroad documents such as the very useful "Shipper Guides" issued by many railroads. One source of reprinted versions of these is the Rails Unlimited shop, which can be visited at: railsunlimited.ribbonrail.com/Books/shippers.html.

A major source of this information is the OpSIG industry database, accessible on-line at: opsig.org/reso/inddb. It contains around 40,000 entries, but be careful with this information: it may be from an era ranging from 1935 to 1995, and thus some information in the database may not fit your modeling. As my research continues, I maintain a "pairs list" of shipper-consignee pairs I have identified. It is sometimes useful to be able to review the pairs so far used, to help see what may still be needed.

Once the individual Waybills are filled out, I save each one with a name corresponding to its industry, and maintain these in a file. Next they will be printed out, which I will discuss in a moment, but I like to retain the original files so a damaged or lost bill can be easily replaced.

There are further considerations about the documentation for some specialized kinds of freight handling, such as LCL, or mine tickets for coal loading. The latter has been very well described in a recent article by Ted Pamperin, listed under Further Reading, and for those interested in that topic, I highly recommend Ted's article.

Producing the Physical Waybills

Now that you have a set of electronic files, in Photoshop or some application (some modelers are using Microsoft Excel), what is next? In my case, I lay out the waybill files in a page layout application (I use Adobe InDesign, but there are several others which will work), placing as many on an 8.5 x 11-inch page as possible. I use heavy paper, a bit short of what would be light cardstock, but there are those who prefer a little sturdier material like the cardstock.

I show such a layout in figure 19 (next page) for the 25 x 3.5-inch Waybill

626—THE PITTSBURGH & LAKE ERIE RAILROAD COMPANY—626

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION	STATE	FROM STATION	STATE
BALLARD	CA	MUNHALL	PA

CONSIGNEE AND ADDRESS	SHIPPER
JUPITER PUMP & COMPRESSOR	MESTA MACHINE CO.

ROUTE Show in route order	AAR CLASS OF CAR ORDERED: XM
P&LE-YNGS-NYC-BI-RI-CO BL-UP-OG-SP	LENGTH/CAPY OF CAR ORDERED
	WEIGHED T (E–Estimated R–Railroad Scale S–Shipper's Tested Weights T–Tariff Classification)

ON C.L. TRAFFIC - INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS

NO. PKGS.	DESCRIPTION OF ARTICLES
2	PUNCH PRESS, COMPLETE

BOX CAR
SP 30366
AAR XM

Figure 17

69 - BOSTON AND MAINE RAILROAD - 69

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION	STATE	FROM STATION	STATE
BALLARD	CAL	S. BOSTON	MASS

CONSIGNEE AND ADDRESS	SHIPPER
JUPITER PUMP & COMPRESSOR	BOSTON GEAR COMPANY

ROUTE Show in route order	AAR CLASS OF CAR ORDERED: XM
B&M-ALB-NYC-CHI-RI-CO BL-UP-OG-SP	LENGTH/CAPY OF CAR ORDERED
	WEIGHED (E–Estimated R–Railroad Scale S–Shipper's Tested Weights T–Tariff Classification)

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS: SL&C - EWIB

NO. PKGS.	DESCRIPTION OF ARTICLES
124 BOXES	GEAR TRAIN ASSYS.

BOX CAR
NP 29563
AAR XM

Figure 18

Figure 17: P&LE bill filled out with Mom's Typewriter face, 2.5 x 3.5-inch format.

Figure 18: Boston & Maine Waybill filled out with American Typewriter face, 2.5 x 3.5-inch format.

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format. You can see that there is very little waste material in this arrangement. With the 2 x 4-inch format turned to run across the sheet, two five-high columns of bill images can be placed, making a total of 10 Waybills per sheet for that format.

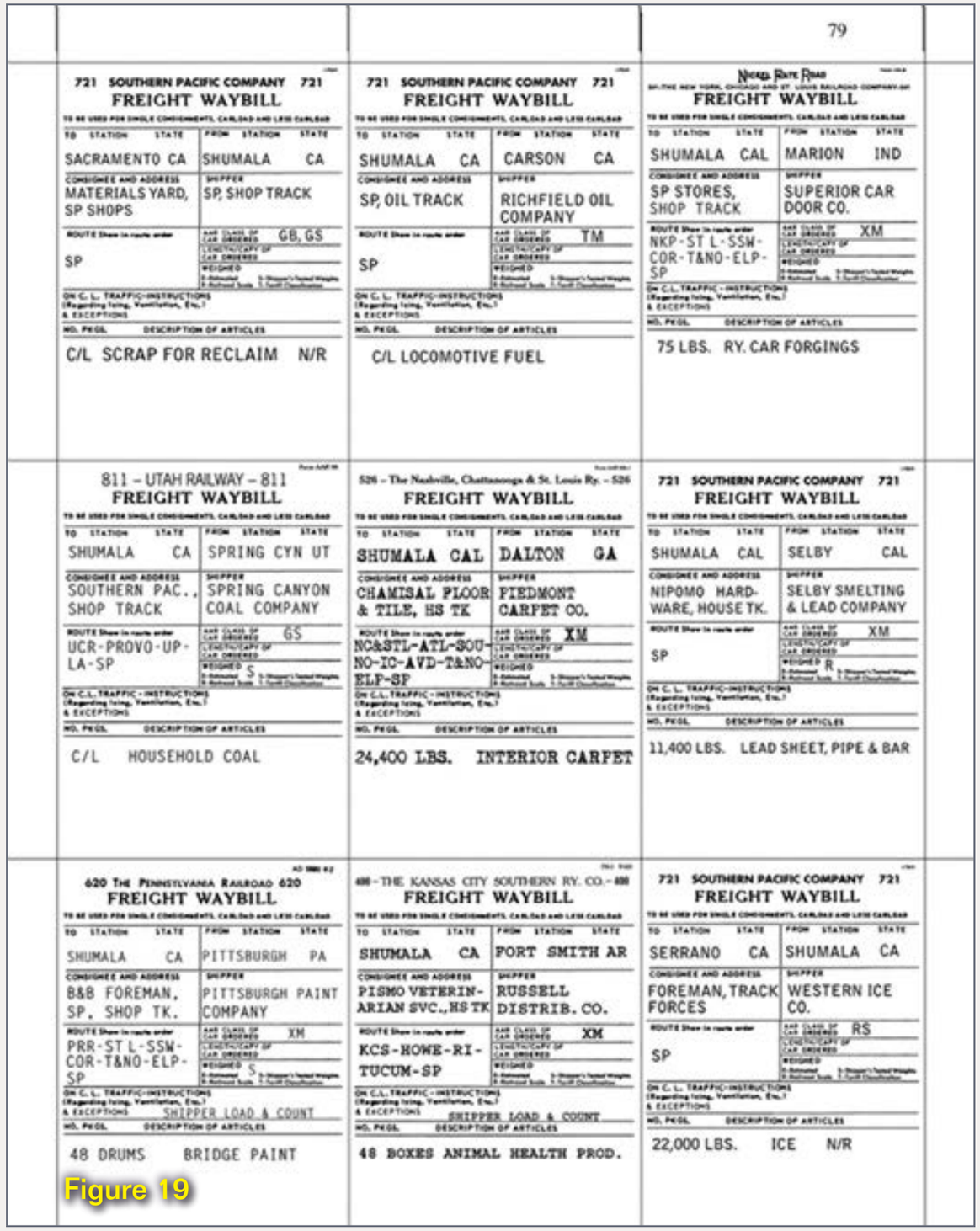

Figure 19

Once printed, these are cut out with a good quality paper cutter. (I like the acccuracy of the rolling-trimmer type of cutter, instead of the traditional guillotine style; one good brand is Dahle.)

For any clear sleeves which need to receive car information labels, I use clear Avery labels. These are intended to be printed on either inkjet or laser printers. I use the No. 5660 labels for my 2.5 x 3.5-inch sleeves. Their appearance when attached to the sleeve is shown in figure 20. The labels are easy to apply, and the sleeves are easy to work with when complete.

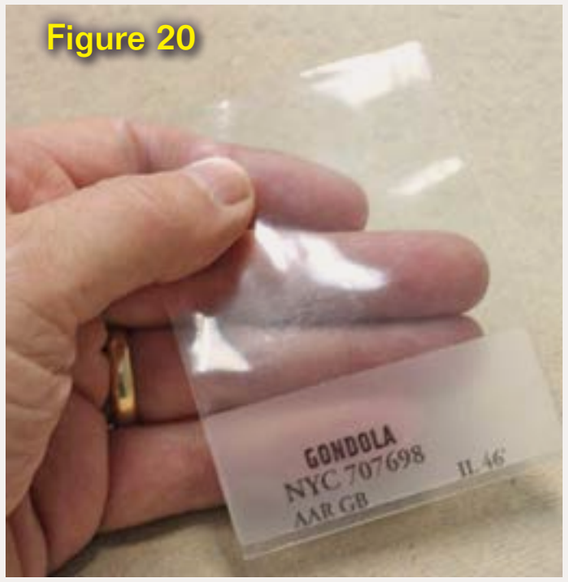

Figure 20

Figure 19: Example of a nine-up layout of Waybills to be printed on 8.5 x 11-inch sheet. These are 2.5 x 3.5-inch format bills. The horizontal and vertical guidelines help position the individual items but are removed prior to printing.

Figure 20: The clear plastic baseball-card sleeve, with clear Avery label attached to show car information. This then functions as a "car sleeve."

For any type of sleeve or waybill, there are a variety of options for filing and storing the bills. I like to use hardwood filing boxes of the type familiar for use with 3 x 5 index cards, but larger to accommodate these various Waybill designs. One good source on line is at this link: successimage.com/cat--Card-Files--CardFiles.

Operating with These Waybills

Operation, of course, proceeds much as it would with any type of car card or waybill system, but it is useful to observe that multiple inclusions in a sleeve can pay dividends. Obviously, a car with a load-empty cycle, such as the covered hopper of figures 14 and 16, or the tank car of figures 15a and 15b (all previous pages), might as well have both bills in the same sleeve, and they can be reversed from session to session.

Inserting an Empty Car Bill behind a load bill works equally well in any of these formats. figure 21 (next page) shows this for the 2.5 x 3.5-inch format, and the convenient side-entry sleeve for the 2 x 4-inch format is shown in figure 22 (next page). Of course, additional cycles, expressed as pairs of load Waybills in two directions, or pairs of Empty Car Bills, or simply paired Waybill-Empty Car Bill

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sets, can be added to the sleeve for further variety.

A point often raised in connection with the Waybill designs shown here is that the Empty Car Bill does not specify where the empty is to be spotted, only its destination town. On the prototype, the conductor would consult with the agent upon arrival at a town, to find out what switching was to be done.

In layout operation without an agent position at a particular town, the communication can be accomplished with messages left for the crew, exactly as was done on the prototype when agents were not on duty when a local arrived. A bill box or comparable receptacle was provided on the outside of the depot, locked with a switch lock, for both agent and conductor to leave Waybills and Empty Car Bills for each other.

Finally, I depict an example of a model Waybill doing its job, with the corresponding load being delivered to the correct siding on my layout. This is shown in figures 23 and 24 (next page). For me, with my core enthusiasm for freight cars and freight operations, these two figures encapsulate what can be achieved with more prototypical Waybills in model form.

Concluding Remarks

The various Waybill designs shown in this article are really only illustrations of different approaches which are possible toward a more prototypical Waybill for model operations. Size and details of content can be varied to suit the individual modeler's needs and desires. And best of all, these documents really look like the Waybills used by the prototype, not like some variety of game cards which might suit a board game of one kind or another.

Recommendations for Further Reading

Prototype Waybills and Freight Operations

John H. Armstrong, The Railroad: *What It Is, What It Does* (Revised Edition), Simmons-Boardman, Omaha, 1982.

E.W. Coughlin, *Freight Car Distribution and Handling in the United States,* Car Service Division, Association of American Railroads, Washington, 1956.

John A. Droege, *Freight Terminals and Trains* (2nd Edition), McGraw-Hill, New York, 1925. [NMRA reprint, 1998]

Grover G. Huebner, *The Fundamentals of Traffic,* The Traffic Service Corporation, Chicago, 1926.

Railway Accounting Rules, Accounting Division, Association of American Railroads, Washington, 1950. [numerous editions]

Lawrence W. Sagle, *Freight Cars Rolling,* Simmons-Boardman, New York, 1960.

Text continues on page 46.

Figure 21: Inserting an Empty Car Bill, which will move a refrigerator car after it carries the load shown in the pink Perishable Waybill on top, with the 2.5 x 3.5-inch format. The car involved is shown by the label on the sleeve. The pink bill directs the car off-layout to Pittsburgh, PA, which means staging, and the Empty Car Bill returns it from staging to the layout to be loaded.

Figure 22: The same kind of process shown in Figure 19 is equally easy in the 2 x 4-inch format, with the side-entry sleeves, which are more convenient than top entry, given this relatively long and slender document.

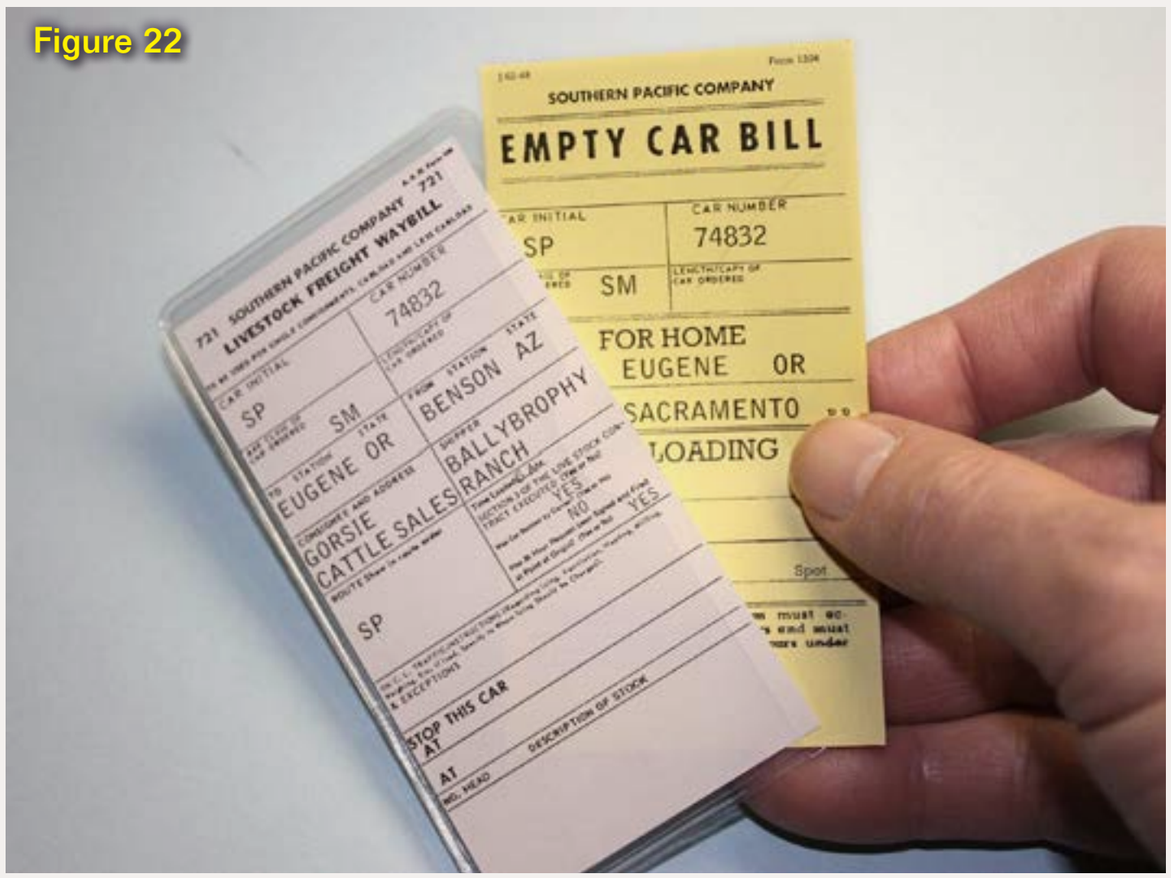

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Figure 23

Figure 23: Here is that lumber load, being spotted at the team track in my town of Shumala.

Figure 24

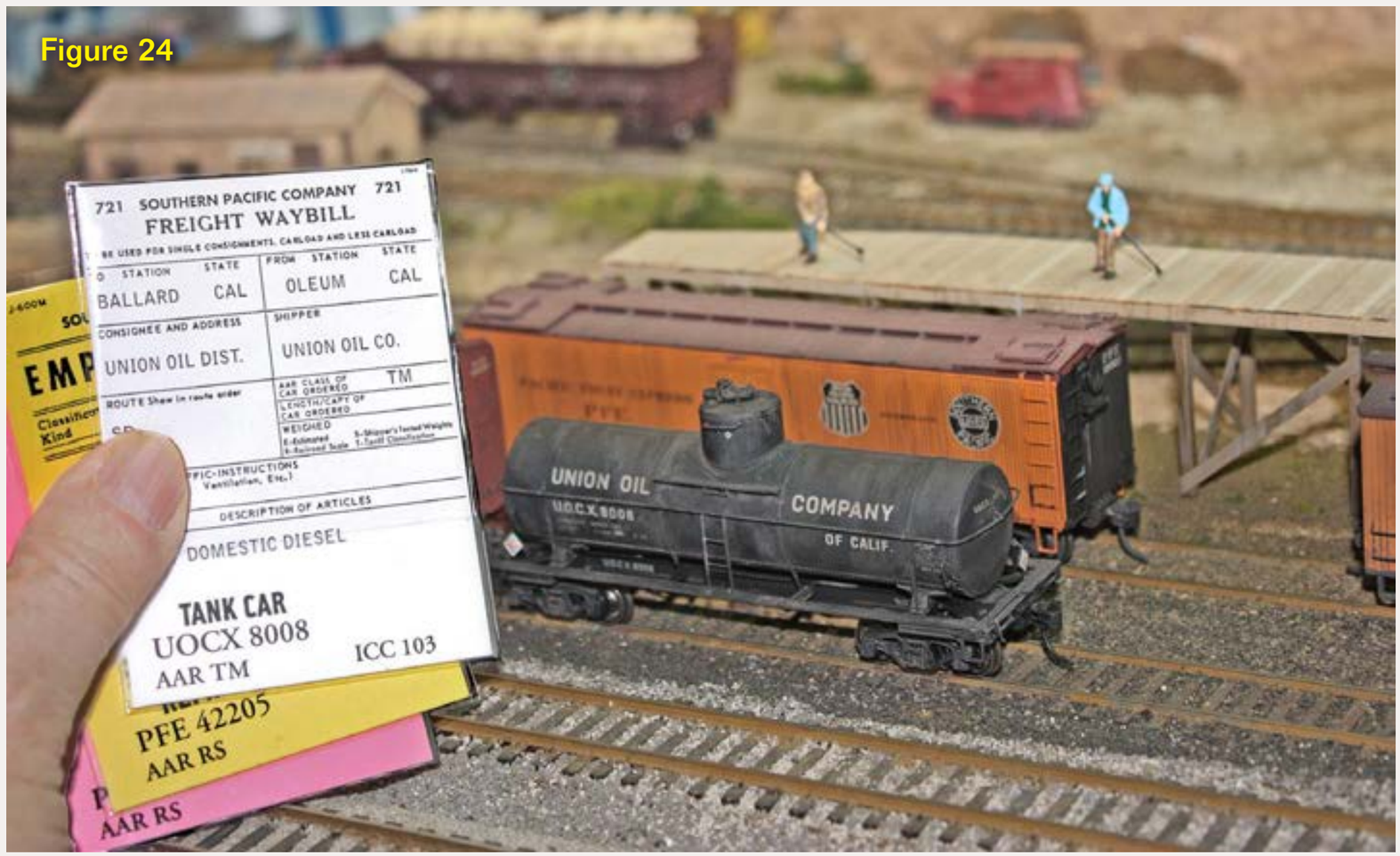


Figure 24: Waybills in the 2.5 x 3.5-inch format are shown here in use, to determine the next move for this Union Oil Company tank car on the author's layout.

Article continues on the next page.

Text continuesd from page 44.

Model car cards and waybills: history

"Boomer Pete," *Model Railroader,* May 1940, p. 264.

Frank Ellison, "The Art of Model Railroading: Part 6," *Model Railroader,* August 1944; reprinted January 1965, p. 52.

Many articles in the 1950s, primarily in *Model Railroader;* reviewed by:

Douglas Smith, *Model Railroader,* Oct. 1957, p. 24; and "Card Operations," *Model Railroader,* Dec. 1961, p. 52.

Model Car Cards and Waybills: Modern

George Berisso, "Prototype Car Forwarding Practice with Car Card Applications," *Layout Design Journal,* Nov. 1988, p. 20.

Bruce Chubb, *How to Operate Your Model Railroad,* Kalmbach, 1977 [out of print; available used].

Byron Henderson, "Variations on a Waybill Theme," *The Dispatcher's Office* (Operations SIG), July 2007, p. 13.

Dan Holbrook, *Model Railroader,* July 1987, p. 91.

Steve King, "Car Cards and Waybills," *Railroad Model Craftsman,* February 1968, p. 68.

Tony Koester, "Enhanced Car Forwarding on the Midland Road," *Model Railroader,* March 1993, p. 75.

Tony Koester, *Realistic Model Railroad Operation,* Kalmbach, 2003.

Don McFall, *Model Railroading,* Vol. 13, Fall 1982; see also "Pre-printed Car Cards," Model Railroading, April 1987, p. 14.

Bill Neale, "Plastic pocket car cards," *Model Railroader,* February 2009, p. 62.

Ted Pamperin, "Upgrade your car routing with Realistic Waybills," *Model Railroader,* February 2012, p. 45.

Anthony Thompson, "Prototypical Waybills for Car Card Operation," R*ailroad Model Craftsman,* December 2009, p. 71.

My follow-on articles: "Contents of a Waybill," *The Dispatcher's Office* (Operations SIG): April 2010, p. 17 (corrected version available on line at: modelingthesp.blogspot.com/2011/01/waybills-2.html).

also:"Freight Car Handling and Distribution," *The Dispatcher's Office* (Operations SIG): October 2011, p. 28 (corrected version available on line at: modelingthesp.blogspot.com/2011/09/my-article-in-dispatchers-office.html).

Extensive discussions of waybills are part of my blog, at: modelingthesp.blogspot.com. ☑

Contents of a Waybill

Anthony Thompson

Waybills are important to Operations. That shouldn't be news. They tell the railroad, and by extension the modeler, where cars go and how to handle them. But too often model waybills are incomplete or non-prototypical in appearance. I wrote an article that appeared in the December 2009 issue of *Railroad Model Craftsman* (RMC) describing how I chose to improve my waybills and showing a number of examples of my model waybills.

This article provides further information about the content of prototype waybills, and how that information can be used in modeling. The subject of waybill content is potentially quite complex and there is great formality about some parts of the waybill, but as modelers we don't need all of those features.

Car initial and number

This is probably one of the most important, and most viewed, parts of a prototype waybill, and is always located in the upper left corner of the prototype bill. It's desirable to use this location in a model bill, but with a car card or equivalent in an operating scheme, this doesn't work so well.

I did experiment with waybills having blank upper sections, so that the car initials and number could be on the upper part of a clear sleeve. As explained below under "Alternative Versions," this turned out to be difficult, and I reluctantly decided that this distinctive prototype arrangement was not going to work well for me. But it's one of the things I'd like to be able to do.

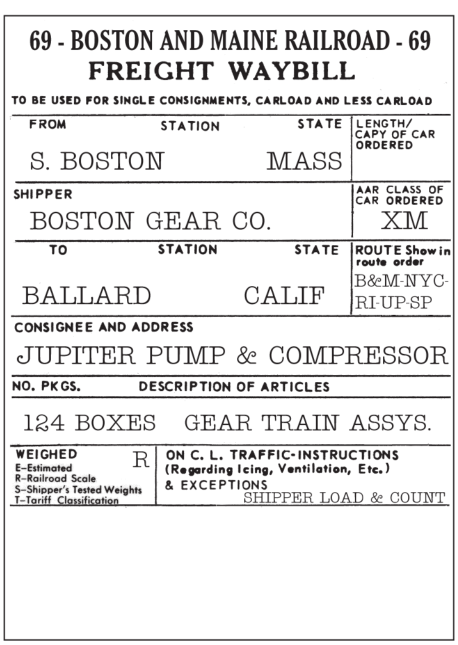
Addresses

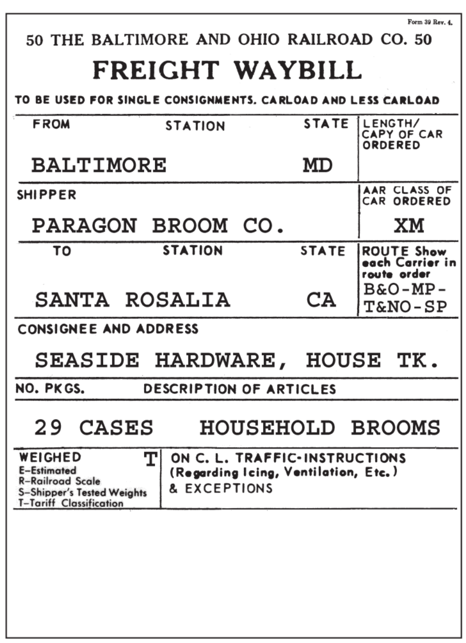
The prototype waybill provides large spaces for addresses of both shippers and receivers. This can be for billing purposes, or to identify the exact part of a large industrial plant at which the car is to be loaded or unloaded. Most model industries are small enough that this need not be quite so specific. I do identify specific track spots or door spots for industries where it matters. I would also point out that waybills for loads destined for team tracks should so specify; likewise for freight agents (usually specified as "house track") who handle freight in a depot, or as "freight house" if a particular town has one.

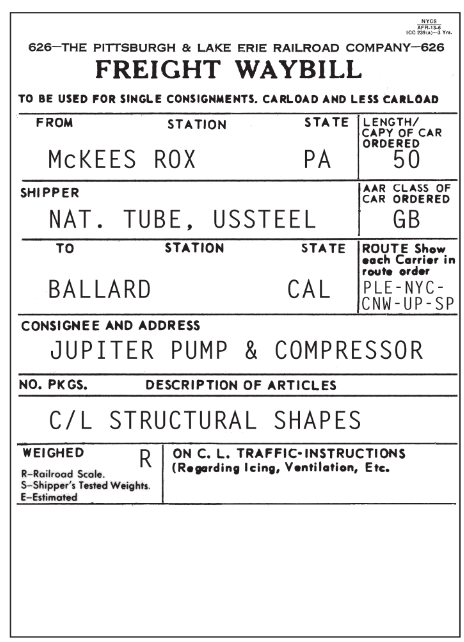
AAR car type

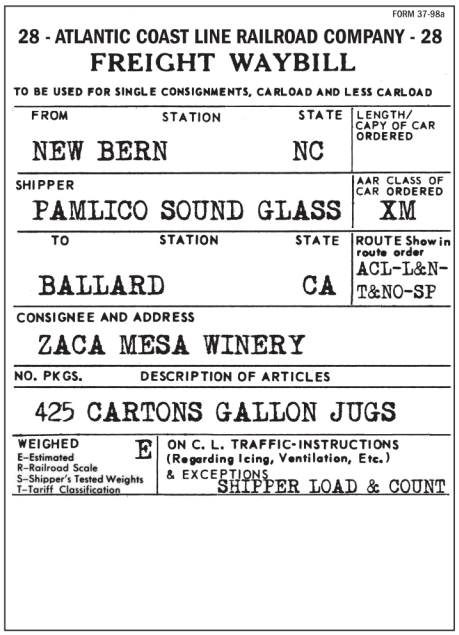
The prototype does not call out the car types on waybills, because that is the job of the car distributor or car clerk, to check the *Official Railway Equipment Register* (ORER) to make sure the available empty matches the shipper's car request. On a layout, if the owner or an experienced operator always matches empties to ship-

(Below) Examples of model waybills, somewhat reduced in size. Fig. 1 (left). This inbound waybill, with "Shipper Load & Count' notation under "Instructions,"uses the American Typewriter typeface. Fig. 2 (center). An inbound waybill, filled out with the Courier typeface, specifies spotting at the house track. Fig. 3 (right). An inbound waybill with local abbreviations for McKees Rocks and for the shipper name. Letter Gothic typeface.


69 - BOSTON AND MAINE RAILROAD - 69
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD
FROM STATION STATE: S. BOSTON MASS — LENGTH/CAPY OF CAR ORDERED:
SHIPPER: BOSTON GEAR CO. — AAR CLASS OF CAR ORDERED: XM
TO STATION STATE: BALLARD CALIF — ROUTE Show in route order: B&M-NYC-RI-UP-SP
CONSIGNEE AND ADDRESS: JUPITER PUMP & COMPRESSOR
NO. PKGS. DESCRIPTION OF ARTICLES: 124 BOXES GEAR TRAIN ASSYS.
WEIGHED (E–Estimated, R–Railroad Scale, S–Shipper's Tested Weights, T–Tariff Classification): R
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS: SHIPPER LOAD & COUNT


Form 39 Rev. 4
50 THE BALTIMORE AND OHIO RAILROAD CO. 50
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD
FROM STATION STATE: BALTIMORE MD — LENGTH/CAPY OF CAR ORDERED:
SHIPPER: PARAGON BROOM CO. — AAR CLASS OF CAR ORDERED: XM
TO STATION STATE: SANTA ROSALIA CA — ROUTE Show each Carrier in route order: B&O-MP-T&NO-SP
CONSIGNEE AND ADDRESS: SEASIDE HARDWARE, HOUSE TK.
NO. PKGS. DESCRIPTION OF ARTICLES: 29 CASES HOUSEHOLD BROOMS
WEIGHED (E–Estimated, R–Railroad Scale, S–Shipper's Tested Weights, T–Tariff Classification): T
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS


626—THE PITTSBURGH & LAKE ERIE RAILROAD COMPANY—626
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD
FROM STATION STATE: McKEES ROX PA — LENGTH/CAPY OF CAR ORDERED: 50
SHIPPER: NAT. TUBE, USSTEEL — AAR CLASS OF CAR ORDERED: GB
TO STATION STATE: BALLARD CAL — ROUTE Show each Carrier in route order: PLE-NYC-CNW-UP-SP
CONSIGNEE AND ADDRESS: JUPITER PUMP & COMPRESSOR
NO. PKGS. DESCRIPTION OF ARTICLES: C/L STRUCTURAL SHAPES
WEIGHED (R–Railroad Scale, S–Shipper's Tested Weights, E–Estimated): R
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.


FORM 37-98a

28 - ATLANTIC COAST LINE RAILROAD COMPANY - 28

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/CAPY OF CAR ORDERED
NEW BERN	NC	

SHIPPER	AAR CLASS OF CAR ORDERED
PAMLICO SOUND GLASS	XM

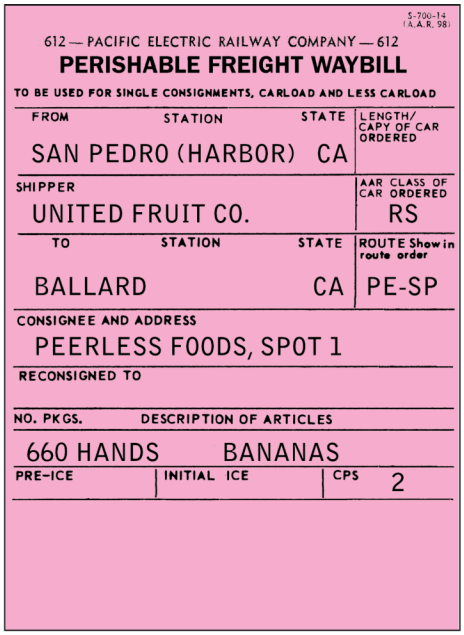
TO STATION	STATE	ROUTE Show in route order
BALLARD	CA	ACL-L&N-T&NO-SP

CONSIGNEE AND ADDRESS: ZACA MESA WINERY

NO. PKGS.	DESCRIPTION OF ARTICLES
425	CARTONS GALLON JUGS

WEIGHED: E (E-Estimated, R-Railroad Scale, S-Shipper's Tested Weights, T-Tariff Classification)

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS: SHIPPER LOAD & COUNT


5-700-14 (A.A.R. 98)

612 — PACIFIC ELECTRIC RAILWAY COMPANY — 612

PERISHABLE FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/CAPY OF CAR ORDERED
SAN PEDRO (HARBOR)	CA	

SHIPPER	AAR CLASS OF CAR ORDERED
UNITED FRUIT CO.	RS

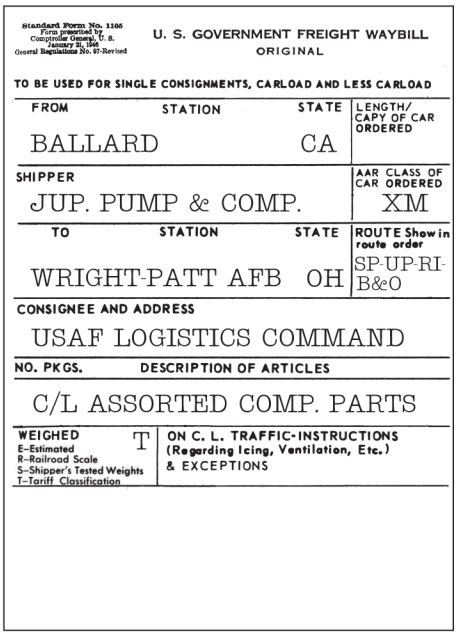
TO STATION	STATE	ROUTE Show in route order
BALLARD	CA	PE-SP

CONSIGNEE AND ADDRESS: PEERLESS FOODS, SPOT 1

RECONSIGNED TO

NO. PKGS.	DESCRIPTION OF ARTICLES
660 HANDS	BANANAS

PRE-ICE	INITIAL ICE	CPS
		2


Standard Form No. 1106 Form prescribed by Comptroller General, U. S. January 31, 1955 General Regulations No. 97-Revised

U. S. GOVERNMENT FREIGHT WAYBILL

ORIGINAL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/CAPY OF CAR ORDERED
BALLARD	CA	

SHIPPER	AAR CLASS OF CAR ORDERED
JUP. PUMP & COMP.	XM

TO STATION	STATE	ROUTE Show in route order
WRIGHT-PATT AFB	OH	SP-UP-RI-B&O

CONSIGNEE AND ADDRESS: USAF LOGISTICS COMMAND

NO. PKGS.	DESCRIPTION OF ARTICLES
C/L	ASSORTED COMP. PARTS

WEIGHED: T (E-Estimated, R-Railroad Scale, S-Shipper's Tested Weights, T-Tariff Classification)

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS

More examples. Fig. 4 (left). This waybill includes a "Shipper Load & Count" notation and is filled out with Mom's Typewriter face. Fig. 5 (center). A Pacific Electric perishable waybill, specifying a particular door spot at the consignee, and identifying Section 2 rules of Carriers Protective Services (CPS). The waybill is on pink stock. Fig. 6 (right). An example of a U.S. government waybill, made out with American Typewriter.

per requests, the same approach can be taken and the "AAR type" box omitted. I have inserted it because I think it helps crews understand what they are doing.

Car length

This is definitely part of the prototype waybill and of course in certain instances is essential. I have the impression from waybills I've examined, and from conversations with railroaders, that this box is left blank if the car to be supplied is the "usual car" of that type, such as a 40-foot box car in the steam era. Thus only exceptional car lengths would be placed on the waybill. That is what I've done in my waybills too. For those interested in tariffs, the rates varied with car size, and this detail could be implemented if desired.

Routing

Prototype routing instructions are quite important, not only for delivery of a load but also for return of an empty on its reverse routing (if the car is not confiscated for loading). The waybill space for this information on the prototype form is fairly large, because not only the connecting railroads, but also the junctions at which the car is interchanged, have to be listed.

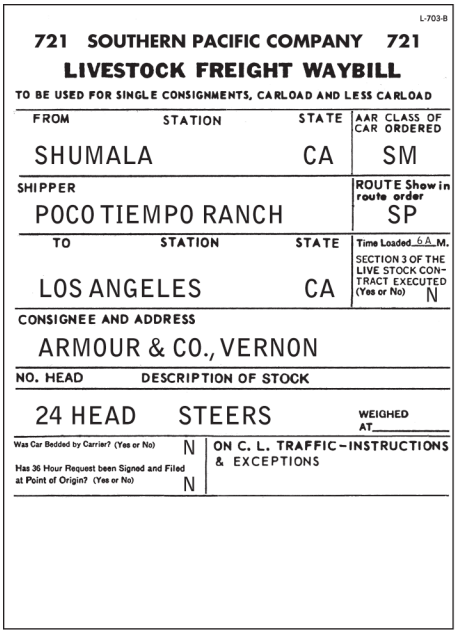
To me, this is an interesting part of the waybill, and with a good railroad map of North America and the interchange points called out in individual railroad entries in the ORER, one can readily assemble a complete list on a particular waybill of junctions and railroads. But this becomes a lengthy entry in many cases, even with abbreviations, and on my layout, has very little effect on operation, so I decided, reluctantly, to omit the junctions. If there is one part of the prototype waybill I most regret omitting, it is this part.

In customizing your own waybill, if you find the routing of cars interesting, or if it's important to your operations, by all means enlarge this part of the bill to permit a more detailed entry. And if you model a western railroad, that part of the country had some complex routing rules, enshrined in routing guides, another opportunity to introduce prototype complexity if you wish.

Cargo description

On a prototype waybill, the load is described by its article type, under tariff categories, of which there are many thousands, or in plain English along with the item number assigned to that tariff category, to avoid any confusion. Here the modeler has considerable latitude unless one wishes to follow tariffs rigorously. The quantity is also expressed, either as a carload (C/L or CL), by a number of units such as cartons, barrels, boxes, or whatever they might be, or just by pounds weight, though the weight also has to be shown in the weight column of a prototype bill.

I will turn to weight issues in a moment, but in the



L-703-B

721 SOUTHERN PACIFIC COMPANY 721

LIVESTOCK FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

FROM STATION	STATE	AAR CLASS OF CAR ORDERED
SHUMALA	CA	SM

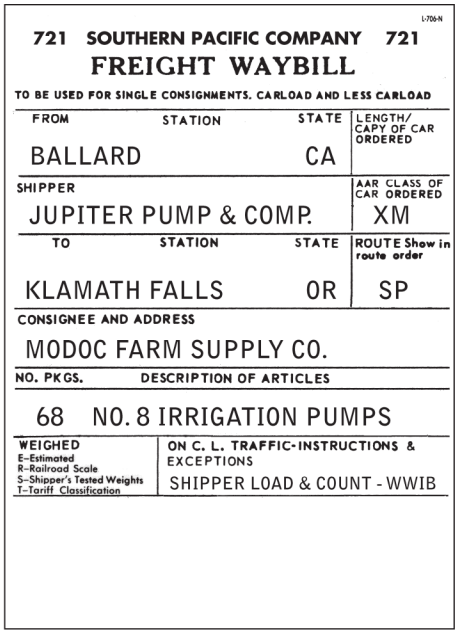
SHIPPER	ROUTE Show in route order
POCO TIEMPO RANCH	SP

TO STATION	STATE	Time Loaded 6 A M. / SECTION 3 OF THE LIVE STOCK CONTRACT EXECUTED (Yes or No)
LOS ANGELES	CA	N

CONSIGNEE AND ADDRESS: ARMOUR & CO., VERNON

NO. HEAD	DESCRIPTION OF STOCK	WEIGHED AT
24 HEAD	STEERS	

Was Car Bedded by Carrier? (Yes or No)	ON C. L. TRAFFIC-INSTRUCTIONS & EXCEPTIONS
N	
Has 36 Hour Request been Signed and Filed at Point of Origin? (Yes or No) N	



L-706-N

721 SOUTHERN PACIFIC COMPANY 721

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/ CAPY OF CAR ORDERED
BALLARD	CA	

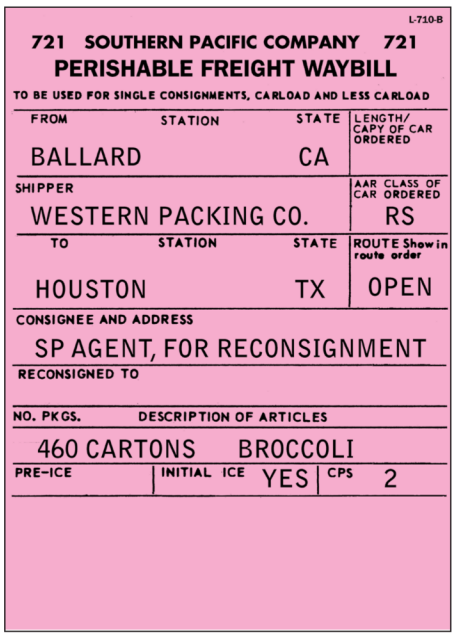
SHIPPER	AAR CLASS OF CAR ORDERED
JUPITER PUMP & COMP.	XM

TO STATION	STATE	ROUTE Show in route order
KLAMATH FALLS	OR	SP

CONSIGNEE AND ADDRESS: MODOC FARM SUPPLY CO.

NO. PKGS.	DESCRIPTION OF ARTICLES
68	NO. 8 IRRIGATION PUMPS

WEIGHED E–Estimated R–Railroad Scale S–Shipper's Tested Weights T–Tariff Classification	ON C. L. TRAFFIC-INSTRUCTIONS & EXCEPTIONS
	SHIPPER LOAD & COUNT - WWIB



L-710-B

721 SOUTHERN PACIFIC COMPANY 721

PERISHABLE FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/ CAPY OF CAR ORDERED
BALLARD	CA	

SHIPPER	AAR CLASS OF CAR ORDERED
WESTERN PACKING CO.	RS

TO STATION	STATE	ROUTE Show in route order
HOUSTON	TX	OPEN

CONSIGNEE AND ADDRESS: SP AGENT, FOR RECONSIGNMENT

RECONSIGNED TO

NO. PKGS.	DESCRIPTION OF ARTICLES
460 CARTONS	BROCCOLI

PRE-ICE	INITIAL ICE	YES	CPS	2

Three more waybill examples, all filled out with Bell Gothic type. Fig. 7 (left). A livestock waybill, again reduced from the prototype form and with relevant sections thereof. Fig. 8 (center). This SP waybill shows the "Shipper Load & Count" and also notes the WWIB agreement. Fig. 9 (right). An outbound perishable waybill (printed on pink stock per AAR recommendation) specifies initial icing (the first icing after loading) but not pre-icing (icing before loading). Note that the load is expected to be reconsigned before or upon reaching Houston.

area of quantity, "C/L" only means a more or less full car—it is not a billing quantity in most cases. So for example a gondola loaded with steel I-beams may be called a carload, regardless of whether the car is actually full, but the billable aspect is the weight of that cargo.

A full set of prototype tariffs and approved routings would fill a long bookshelf, but those are the foundation for correct entries of prototype waybill information. I've chosen to omit tariff item numbers as too arcane, essential as they are to prototype cargo descriptions.

Weights

On the prototype, the great majority of cargoes are billed by weight. The weight can be determined several ways, which I'll come to in a moment. But it's important to realize that there are cargoes not billed by actual weight. One is liquids, which are typically billed by gallonage. Another is bulk cargoes like coal or sand, for which the car capacity *can* be used to set the billable weight; still another is any cargo for which a tariff category defines the billed weight (without the need for the car to be weighed).

The waybill contains a section, which I've placed at the bottom left of my waybill, to identify how the cargo weight is determined. There are codes to be used: R = railroad scale, S = shipper (tested or certified) scale, T = tariff classification or minimum, E = estimated. On the prototype, if a shipper's certified scale is used, the certificate number is usually stamped on the waybill, but that's another of the many details I omit. Many tariff categories had minimum weights, corresponding to the minimum billed amount for any shipment below or equal to that weight.

We are all familiar with the idea that a loaded car is weighed on a scale, and the light weight of the car subtracted to obtain the net or cargo weight. That can be done on a scale operated by the railroad, or by a shipper, if the shipper's scale has been inspected and certified. Sometimes the weight is estimated, and in that case, it is expected that an actual weight will be obtained as soon as the car can be placed on a scale.

But many if not most car weights are determined through weight agreements. These are an interesting topic. To illustrate how they work, imagine a shipper of floor wax, which ships its wax in gallon bottles. A carton of six of these weighs, let us say, 32 pounds and obviously will be consistent for every shipment.

The shipper obtains a weight agreement from the regional Weighing and Inspection Bureau or WIB, permitting a count of cartons loaded, times unit weight of the carton, to make up the total cargo weight. This is indicated on the prototype waybill by the presence of the "agreement stamp" of the shipper, which gives the

agreement number. I haven't tried to reproduce such stamps on my waybills (the Illinois Central waybill included here shows such a weight stamp near right center).

Often there will also be a notation to indicate which WIB is involved (WWIB = Western WIB, EWIB = Eastern, SWWIB = Southwestern, etc.), and the load description will often have the notation "shipper load and count," which of course is the basis for the billed weight. I do add this notation to my bills.

The tariff classification is interesting for certain bulk cargoes. For heavy (or dense) cargoes like coal, sand and grain, the billable amount for cars not weighed is ten percent *above* the stenciled weight capacity of the car. For medium-density cargoes, it is the actual stenciled capacity. Thus a hopper of coal can be and usually is loaded as full as possible, with the heap standing above the sides, since it may be billed that way anyway.

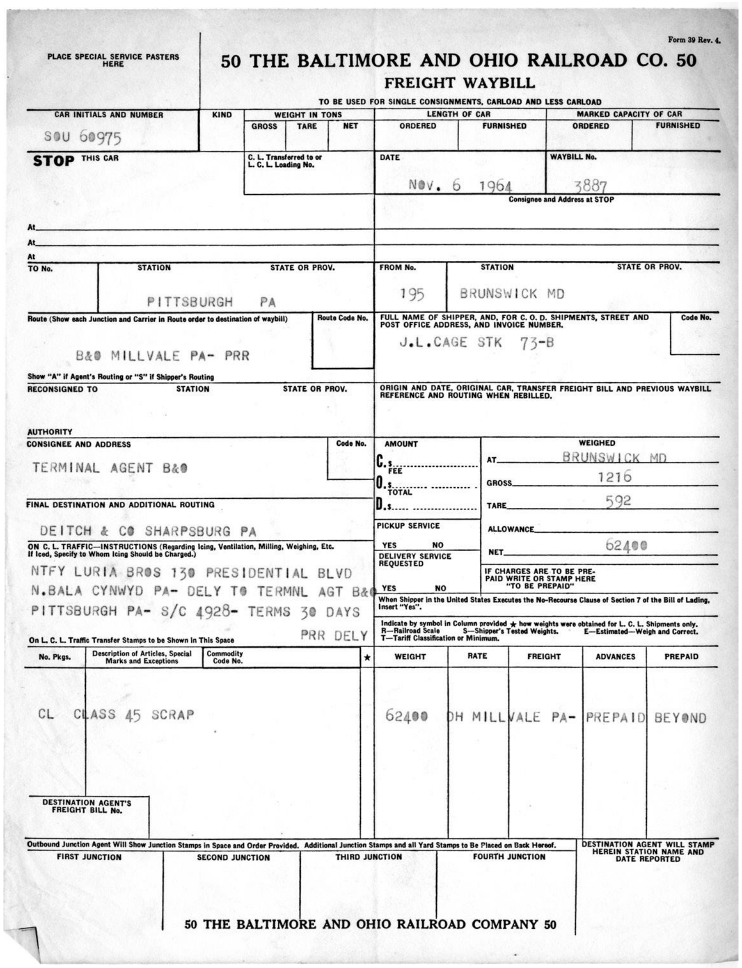
The usual waybill notation for such cars, in addition to quantity noted as C/L, is "loaded to visible capacity," or in shorthand, often "LTVC" or just "viz capy," to confirm that the car is as full as possible.

The railroad always has the option to weigh such a car and see if it is overweight relative to the tariff quantity, and bill accordingly. Many coal shippers simply weighed the cars (or had the railroad weigh them) rather than be billed on the basis of capacity.

The most commonly observed overweight cars are traditionally cars of metal scrap. Certain scrap dealers would overload cars; when this was detected at a railroad scale, the car would be sent back to the dealer to correct the load amount—and the freight bill for the round-trip journey to the scale, as well as a scale charge, would of course be at the expense of that dealer.

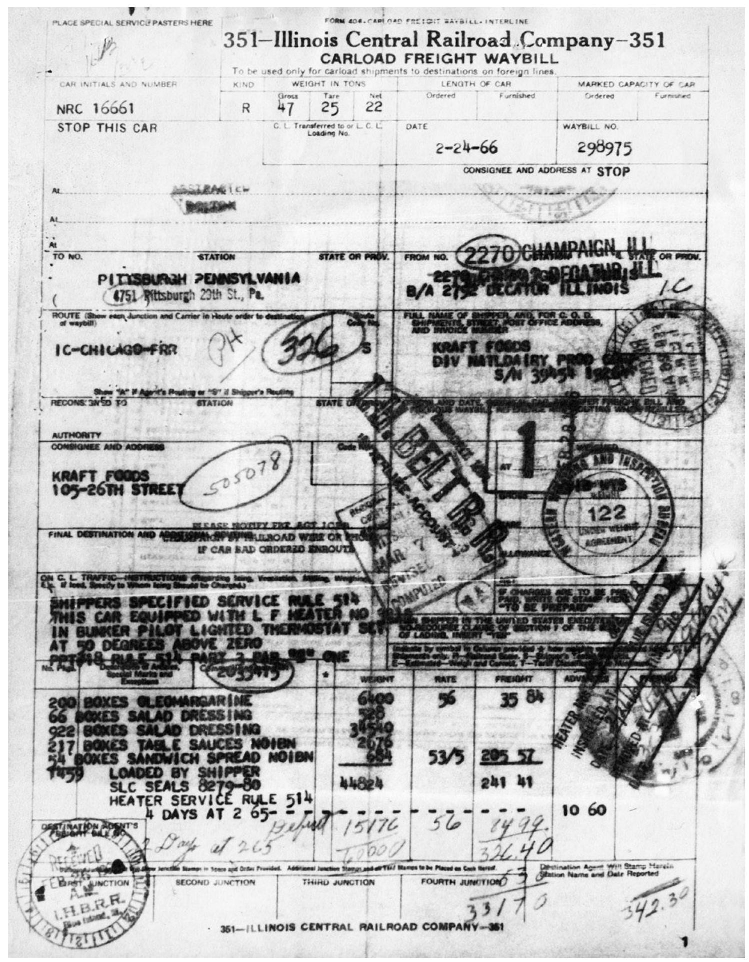
Instructions

As on the prototype, this is where any miscellaneous comments or directions are put. I use it for the



50 THE BALTIMORE AND OHIO RAILROAD CO. 50
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

Car initials and number: SOU 60975
STOP THIS CAR
Date: NOV. 6 1964 — Waybill No. 3887
To: PITTSBURGH PA
From No. 195 — Station: BRUNSWICK MD
Route: B&O MILLVALE PA- PRR
Shipper: J.L.CAGE STK 73-B
Consignee and address: TERMINAL AGENT B&O
Weighed at: BRUNSWICK MD — Gross 1216 — Tare 592 — Net 62400
Final destination and additional routing: DEITCH & CO SHARPSBURG PA
NTFY LURIA BROS 130 PRESIDENTIAL BLVD
N.BALA CYNWYD PA- DELY TO TERMNL AGT B&O
PITTSBURGH PA- S/C 4928- TERMS 30 DAYS
PRR DELY
CL CLASS 45 SCRAP — 62400 — OH MILLVALE PA- — PREPAID — BEYOND
50 THE BALTIMORE AND OHIO RAILROAD COMPANY 50



351—Illinois Central Railroad Company—351
CARLOAD FREIGHT WAYBILL
NRC 16661 — R — 47 25 22
STOP THIS CAR
Date: 2-24-66 — Waybill No. 298975
PITTSBURGH PENNSYLVANIA
4751 Pittsburgh 29th St., Pa.
From No. 2270 CHAMPAIGN, ILL
B/A 2732 DECATUR ILLINOIS
IC-CHICAGO-FRR
KRAFT FOODS
DIV NATLDAIRY PROD CORP
KRAFT FOODS
105-26TH STREET
SHIPPERS SPECIFIED SERVICE RULE 514
THIS CAR EQUIPPED WITH L F HEATER NO
IN BUNKER PILOT LIGHTED THERMOSTAT SET
AT 50 DEGREES ABOVE ZERO
200 BOXES OLEOMARGARINE
66 BOXES SALAD DRESSING
922 BOXES SALAD DRESSING
217 BOXES TABLE SAUCES NOIBN
54 BOXES SANDWICH SPREAD NOIBN
LOADED BY SHIPPER
SLC SEALS
HEATER SERVICE RULE 514
4 DAYS AT 2 65
122
351—ILLINOIS CENTRAL RAILROAD COMPANY—351

Fig. 10 (left). An original B&O waybill for a Southern gondola of scrap, routed via Millvale, PA to its Pennsylvania Railroad destination. Fig. 11 (right). Here's another frontier in realistic model paperwork: a waybill after delivery, covered with junction and other stamps, scribbled computations, and various other marks. One might question whether many of us want to go this far to produce "realistic" waybills, but this is certainly reality. Note the WWIB stamp at right center for this load in an NRC reefer. Original bills are 8½ x 11 inches.

721 SOUTHERN PACIFIC COMPANY 721
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

FROM	STATION	STATE	LENGTH/CAPY OF CAR ORDERED
OLEUM		CAL	
SHIPPER			AAR CLASS OF CAR ORDERED
UNION OIL CO			TM
TO	STATION	STATE	ROUTE Show in route order
BALLARD		CAL	SP

CONSIGNEE AND ADDRESS
UNION OIL DIST

NO. PKGS. DESCRIPTION OF ARTICLES
C/L KEROSENE

WEIGHED
E–Estimated
R–Railroad Scale
S–Shipper's Tested Weights
T–Tariff Classification

ON C. L. TRAFFIC-INSTRUCTIONS & EXCEPTIONS

TANK CAR
UOCX 8008
AAR TM ICC 103

Fig. 12 An inbound load of kerosene is spotted at the Union Oil dealership in Ballard. Oil companies and their tank cars, appropriate to the region and era modeled, are great scene-setters for any model railroad.

items which on the prototype bill are often in the (very large) space for cargo description, such as the "shipper load and count, EWIB" and similar notations.

Perishable, livestock, and government waybills

The AAR recommended, and most railroads followed the suggestion, that a different waybill for perishables be used. A separate livestock waybill was also used. I have modeled these in the same way as the general freight waybill, by starting from the AAR form and cutting down to model size, trying to retain the vital parts of the prototype forms. My *Railroad Model Craftsman* article showed color examples of the perishable form. Accompanying this article are examples of model versions of both perishable and livestock forms.

The U.S. government considered many purchased items to be its property at the point of sale, and therefore arranged to move the items on a government waybill (in many parts of the country, at reduced or free freight rates). In the way of governments, the form used conforms only partly to the AAR standard, but fortunately for us, the parts modelers use largely do conform.

The best reference for the standard AAR forms (and there are many, many more than I've mentioned) as well as the U.S. government form, is the AAR's own book, *Railway Accounting Rules*, issued every several years. It is readily available on-line at reasonable prices from used book dealers.

Empty cars

As I explained in my *RMC* article, most prototype railroads moved empty cars with a special Empty Car Bill, not a freight waybill, so for modeling this Bill needs to be a different document. The primary exception was privately owned tank cars, which *were* returned empty on freight waybills.

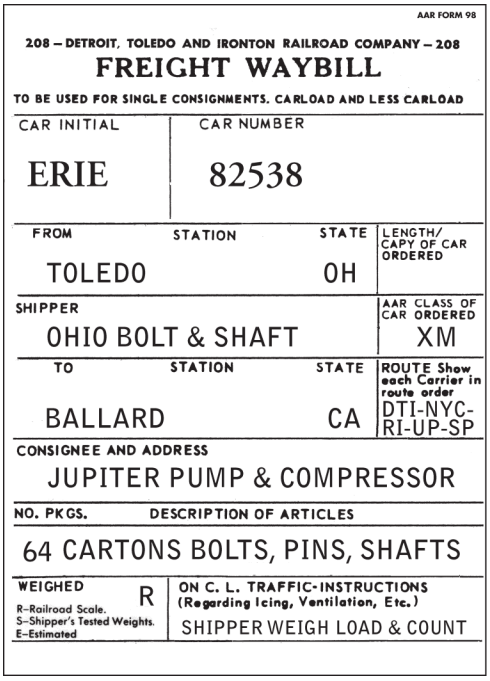
Appearance

As is evident upon examining batches of prototype waybills, they were always filled out using capital letters only. Some billing typewriters, in fact, only were capable of capitals. Moreover, these typewriters had different styles of type, from Teletype-like type to a variety of other commercial typewriter faces, usually of the fixed-character-width (monospace) variety. Abbreviations and acronyms are common and often not dignified with periods.

Naturally, some of the typewriters used had uneven, worn or dirty type and this shows up in many prototype waybills. In an effort to capture both the variety of typefaces and the less-than-pristine quality of many, I've experimented with a variety of digital typefaces, which are readily available on line (many for free, at sites such as fontspace.com).

One face which resembles that used on the SP bills I've seen is Bell Gothic. There is a "Teletype" face available, though it is terribly pristine compared to working examples from actual teletypes; another credible one is American Typewriter. There are plenty of "dirty" versions of typewriter faces out there. One I've found to have a realistic but readable look is called "Mom's Typewriter," which is available free at fontspace.com.

Each originating railroad naturally used its own type style for the road name at the top of the bill. I've


AAR FORM 98

208 – DETROIT, TOLEDO AND IRONTON RAILROAD COMPANY – 208

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER
ERIE	82538

FROM STATION	STATE	LENGTH/ CAPY OF CAR ORDERED
TOLEDO	OH	

SHIPPER: OHIO BOLT & SHAFT — AAR CLASS OF CAR ORDERED: XM

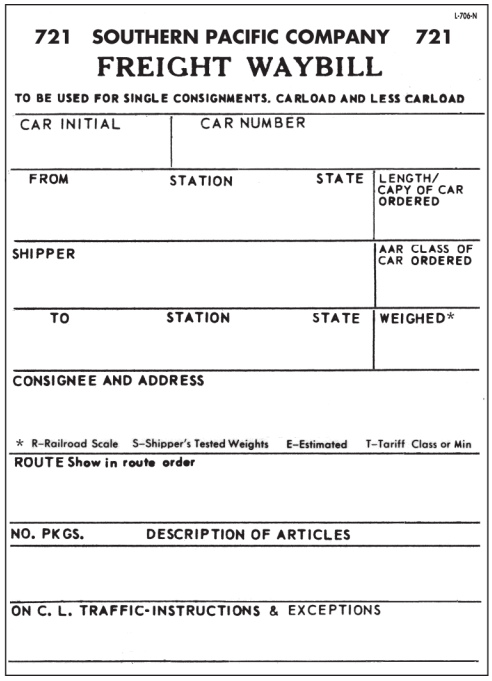
TO STATION	STATE	ROUTE Show each Carrier in route order
BALLARD	CA	DTI-NYC-RI-UP-SP

CONSIGNEE AND ADDRESS: JUPITER PUMP & COMPRESSOR

NO. PKGS. DESCRIPTION OF ARTICLES: 64 CARTONS BOLTS, PINS, SHAFTS

WEIGHED: R (R–Railroad Scale. S–Shipper's Tested Weights. E–Estimated)

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.): SHIPPER WEIGH LOAD & COUNT


L-706-N

721 SOUTHERN PACIFIC COMPANY 721

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

CAR INITIAL	CAR NUMBER

FROM STATION	STATE	LENGTH/ CAPY OF CAR ORDERED

SHIPPER — AAR CLASS OF CAR ORDERED

TO STATION	STATE	WEIGHED*

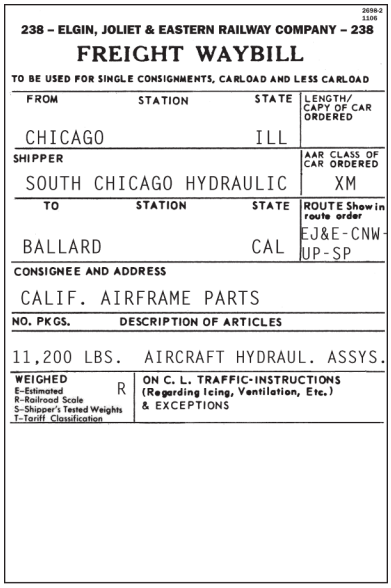
CONSIGNEE AND ADDRESS

* R–Railroad Scale S–Shipper's Tested Weights E–Estimated T–Tariff Class or Min

ROUTE Show in route order

NO. PKGS. DESCRIPTION OF ARTICLES

ON C. L. TRAFFIC-INSTRUCTIONS & EXCEPTIONS


2698-2
1106

238 – ELGIN, JOLIET & EASTERN RAILWAY COMPANY – 238

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/ CAPY OF CAR ORDERED
CHICAGO	ILL	

SHIPPER	AAR CLASS OF CAR ORDERED
SOUTH CHICAGO HYDRAULIC	XM

TO STATION	STATE	ROUTE Show in route order
BALLARD	CAL	EJ&E-CNW-UP-SP

CONSIGNEE AND ADDRESS: CALIF. AIRFRAME PARTS

NO. PKGS. DESCRIPTION OF ARTICLES: 11,200 LBS. AIRCRAFT HYDRAUL. ASSYS.

WEIGHED (E–Estimated R–Railroad Scale S–Shipper's Tested Weights T–Tariff Classification): R

ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS

Here are some experimental waybills, full size. Fig. 13 (top left) A waybill with space for car initial and number to be present on the car sleeve, positioned to fit the waybill location. (The initial and number shown are on the sleeve, not on the waybill.) This proved fussy to do, as placement of sleeve labels, and cutting of waybill cards, had to be quite precise. Fig. 14 (top center) A waybill optimized for pre-printing of car initial and number, with some spaces expanded and rearranged. Note additional space to show car routing. Fig. 15 (top right) Waybill changed in size and shape to fit mini-bill car cards.

tried to collect prototype waybills, freight bills, and related paperwork to obtain examples of these styles for use on my own waybills. Some examples may be seen in the accompanying model waybills.

In addition, railroads used their AAR number codes before and, usually, after their name at the top of the bill. A complete list of these codes is presented in the AAR book, *Railway Accounting Rules*. I also gave a partial list in my *Railroad Model Craftsman* article.

Alternative versions of model waybills

The waybill I use is sized to fit the baseball card collectors' clear plastic sleeves. But many who have already invested in the "mini" waybill and car card system would like a waybill to fit that format. This is readily accomplished by simply shrinking the waybill I use to fit. (It could also be redesigned, though I haven't worked on that problem since I don't have that need.)

Another possibility is to place the car initial and number on the clear sleeve at the right location so that a waybill inside the sleeve will line up with these features at the top of the waybill. This, however, requires both precise sizing of waybills, and very precise placement of car labels on the clear sleeves. After experimenting with this approach, I found it too fussy for convenience.

Over the years, some have expressed interest in making, or being able to generate, waybills that contain the car initial and number (this would be a very prototypical process!) thus obviating the need for car cards or sleeves at all. This would certainly be a step in the prototype direction, and can readily be accomplished for cars that have limited possible load cycles.

Such cars include tank cars in private ownership, which often cycle repeatedly on the same routing and with the same cargo; private-owner reefers in specialized service, such as meat cars; auto parts cars in pools or assigned service; and any other private or railroad owned cars which have assigned service. The same waybill (and Empty Car Bill) can be used over and over for such cars.

But for free-running cars like box cars, most gondolas and many flat cars, this does *not* work. A very wide variety of car initials and numbers could carry the cargoes appropriate to them, and this requires an unmanageable quantity of "ready-made" or pre-existing waybills.

A solution might be to devise a way to generate waybills for each operating session, drawing waybills

721 SOUTHERN PACIFIC COMPANY 721
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/CAPY OF CAR ORDERED
BALLARD	CA	
SHIPPER		AAR CLASS OF CAR ORDERED
CALIF. DIV. HIGHWAYS		TMI
TO STATION	STATE	ROUTE Show in route order
SANTA MARIA	CA	SP

CONSIGNEE AND ADDRESS: WESTERN ASPHALT CO.

NO. PKGS.	DESCRIPTION OF ARTICLES
L/C	ROAD ASPHALT

WEIGHED (E-Estimated, R-Railroad Scale, S-Shipper's Tested Weights, T-Tariff Classification): T
ON C. L. TRAFFIC-INSTRUCTIONS & EXCEPTIONS: RECORD RIGHTS, REVERSE ROUTE

TANK CAR
CDLX 1068 Western Asphalt
AAR TMI ICC 104

Fig. 16 (above) This empty tank car, CDLX 1068, is being returned to its lessee on a freight waybill, with the previous cargo noted as L/C (last contained). All waybills accompanying photos are reduced to fit.page size.

Fig. 17 (below) This car has been loaded with avionics at Nocturnal Aviation and is ready for pickup.

721 SOUTHERN PACIFIC COMPANY 721
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/CAPY OF CAR ORDERED
BALLARD	CA	
SHIPPER		AAR CLASS OF CAR ORDERED
NOCTURNAL AVIATION		XM
TO STATION	STATE	ROUTE Show in route order
WICHITA	KS	SP-UP

CONSIGNEE AND ADDRESS: CESSNA AIRCRAFT COMPANY

NO. PKGS.	DESCRIPTION OF ARTICLES
220	CARTONS ELECTRONIC ASSEMBLIES

WEIGHED (E-Estimated, R-Railroad Scale, S-Shipper's Tested Weights, T-Tariff Classification): T
ON C. L. TRAFFIC-INSTRUCTIONS & EXCEPTIONS: SHIPPER LOAD & COUNT

BOX CAR
SP 27300
AAR XM

via random numbers in a spreadsheet application like Excel, or in a database, then applying car initials and numbers available for cars in staging. I've experimented a bit with this approach, and found that it can work. My own layout size is not sufficient to require such measures, but for large layouts or clubs, this might be a viable approach.

Acknowledgements

I have to thank two experienced railroaders whose knowledge of freight operations and paperwork was of great help to me, Jerry Stewart and Paul Koehler. But any errors which remain in this article are my responsibility, not theirs.

Suggestions for further reading

E.W. Coughlin, *Freight Car Distribution and Handling in the United States,* Car Service Division, Association of American Railroads, Washington, 1956.

John A. Droege, *Freight Terminals and Trains* (2nd Edition), McGraw-Hill, New York, 1925. [NMRA reprint, 1998]

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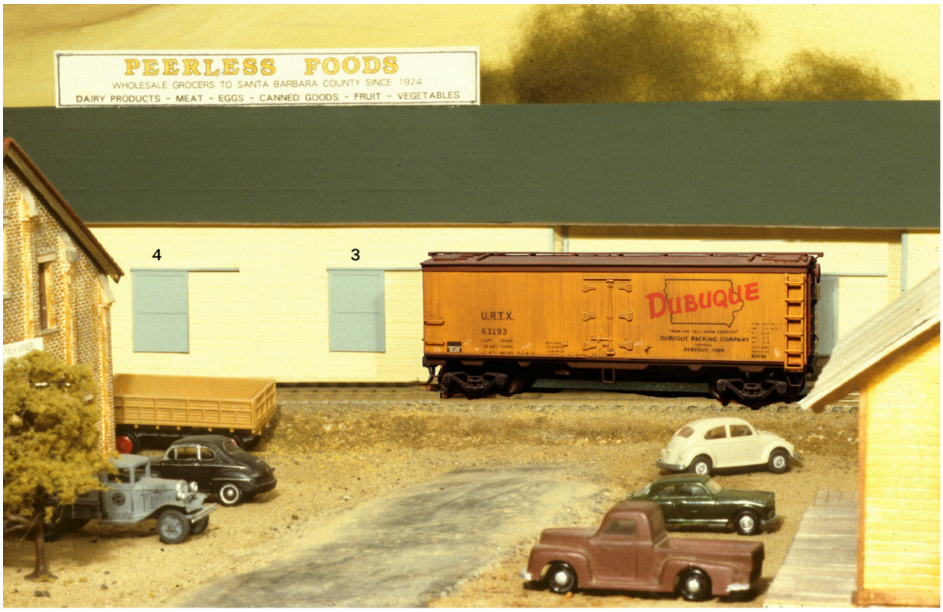
Uniform Freight Classification, Uniform Classification Committee, Chicago, numerous editions.



351—Illinois Central Railroad Company—351
PERISHABLE FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS, CARLOAD AND LESS CARLOAD

FROM STATION	STATE	LENGTH/CAPY OF CAR ORDERED
DUBUQUE	IA	
SHIPPER		AAR CLASS OF CAR ORDERED
DUBUQUE PACKING CO		RSM
TO STATION	STATE	ROUTE Show in route order
BALLARD	CA	IC-UP-SP

CONSIGNEE AND ADDRESS: PEERLESS FOODS, SPOT 2
RECONSIGNED TO:
NO. PKGS. DESCRIPTION OF ARTICLES: 16,450 LBS. PKG. HSE. PROD.
PRE-ICE: NO | INITIAL ICE: YES | CPS: 2

REFRIGERATOR
URTX 63193
AAR RSM Dubuque Packing

Fig. 18 (above) This load of packing house products is spotted at Peerless Foods for unloading, at Door 2 per the instructions on the waybill. Note CPS Section 2 notation.
Fig. 19 (below). A loaded covered hopper of cement is on route to Ballard for delivery to the California Division of Highways district yard. (CDH was a predecessor of today's CalTrans agency.)

721 SOUTHERN PACIFIC COMPANY 721
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

FROM STATION	STATION	STATE	LENGTH/CAPY OF CAR ORDERED
COLTON		CA	70T
SHIPPER			AAR CLASS OF CAR ORDERED
COLTON CEMENT CO.			LO
TO STATION	STATION	STATE	ROUTE Show in route order
BALLARD		CA	SP

CONSIGNEE AND ADDRESS: CALIF. DIV. HIGHWAYS
NO. PKGS. DESCRIPTION OF ARTICLES: C/L CEMENT
WEIGHED: E-Estimated, R-Railroad Scale, S-Shipper's Tested Weights, T-Tariff Classification
ON C. L. TRAFFIC-INSTRUCTIONS & EXCEPTIONS

COVERED HOPPER
SP 165079
AAR LO

Freight Car Handling and Distribution

by Anthony Thompson

Freight trains of loaded and empty cars, freight yards with a variety of cars among the yard tracks, local freight switching at industries, and freight cars standing at loading or unloading spots: all these are familiar images to railfans and modelers. Much has been written about train makeup and blocking, cars needed by particular industries, and about paperwork such as waybills—I've been guilty of the latter myself (see "Further Reading," below). But how does it all get started? How does a shipper get the car he wants? Who does all the paperwork, and how is it handled? This article is a brief summary of those features.

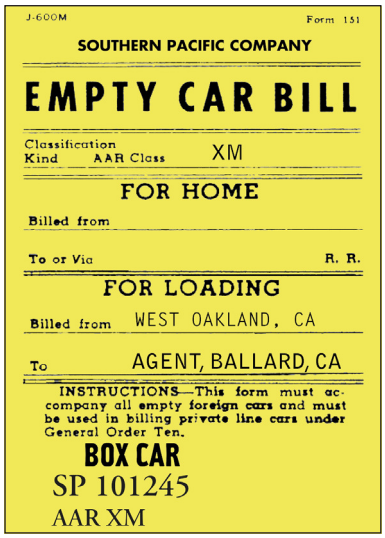
For many shippers and receivers who use freight cars, the contact with the railroad is the local agent. He is the one they call to request an empty car; he is the one who makes up the original waybill and initiates the billing process for the shipment; and he is the one they call when the car is loaded and ready to go. Likewise, the agent gets a call when a delivered load has been removed from a car and the empty car is ready for pickup. For priority loads, the agent may notify the receiver (or consignee) when the car is about to be delivered.

In a larger town or city, this role is played by a car distributor or car clerk at the nearest yard, or a freight agent at a freight house. There would be many more shipper requests than could be handled by an agent and a clerk or two, and a car distributor at a sizeable yard may have a whole force of clerks to handle all the work. Moreover, paperwork may well be prepared by a separate clerical force in the yard office. But the basic process is the same.

When a shipper calls for an empty car, the agent will need to know its destination. This will be part of the request forwarded to the appropriate yard for fulfillment, so that Car Service Rules can be obeyed if possible. This is not the place to examine those Rules in detail, but the majority of car requests were filled according to requirements of the Rules. (A compact summary of the Rules is included in this article, taken from Coughlin's book—see "Further Reading.") A sidebar on the Rules is also appended (next page) to expand on Coughlin's graphic.

For example, a shipper may need a tight-bottom (mill) gondola, 48 feet long, destined to St. Louis.

Obviously the gondola supplied for this request has to be no less than 48 feet, but tariff rates depend to some extent on car size, so in this example, furnishing a 65-foot car (and its higher tariff rate) would not be acceptable to the shipper unless he can pay the rate only for the car he actually needs. The waybill would note something like "railroad convenience" so that others viewing the waybill will know why the freight charges are for a different size car than the one supplied. The same considerations


J-600M Form 151

SOUTHERN PACIFIC COMPANY

EMPTY CAR BILL

Classification
Kind AAR Class XM

FOR HOME

Billed from

To or Via R. R.

FOR LOADING

Billed from WEST OAKLAND, CA

To AGENT, BALLARD, CA

INSTRUCTIONS—This form must accompany all empty foreign cars and must be used in billing private line cars under General Order Ten.

BOX CAR
SP 101245
AAR XM

This empty SP box car was requested by an industry at Ballard, California for loading. It is about to be switched to the loading spot upon direction from the agent. Empty Car Bills were often yellow, as is this SP one.

626—THE PITTSBURGH & LAKE ERIE RAILROAD COMPANY—626

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION	STATE	FROM STATION	STATE
BALLARD	CA	PITTSBURGH	PA

CONSIGNEE AND ADDRESS	SHIPPER
JUPITER PUMP & COMPRESSOR	J&L STEEL SOUTH SIDE WORKS

ROUTE Show in route order: P&LE-YNGS-NYC-BI-RI-CO BL-UP-OG-SP

AAR CLASS OF CAR ORDERED: GB

LENGTH/CAPY OF CAR ORDERED: 42

WEIGHED: S (E-Estimated R-Railroad Scale S-Shipper's Tested Weights T-Tariff Classification)

ON C.L. TRAFFIC - INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS

NO. PKGS.	DESCRIPTION OF ARTICLES
C/L	STEEL SHEET

GONDOLA

NYC 707698

AAR GB IL 46'

(Above) This load of steel sheet is en route to its destination in a 46-foot gondola. Car length ordered is 42 or more feet long, so this car meets that requirement. Routing includes interchanges; the abbreviations are: P&LE—Youngstown—NYC—Blue Island—RI—Council Bluffs—UP—Ogden—SP. Transfer runs, such as Indiana Harbor Belt delivering cars from the NYC yard to the Rock Island's separate yard, are not usually included in these routings, and would be at the discretion of Chicago-area yardmasters.

would apply for larger or differently equipped box cars or any other car type, when the car request is effectively filled with "more car than is needed."

Whether the needed car is on hand at the supplying yard, or has to be requested from elsewhere, it will be handled with an Empty Car Bill and directed from its location to the agent in the shipper's town (Empty Car Bills are described in my *RMC* article). Sometimes the specific industry is identified on this Bill, but usually the agent is expected to direct the switching crew as to the car's destination.

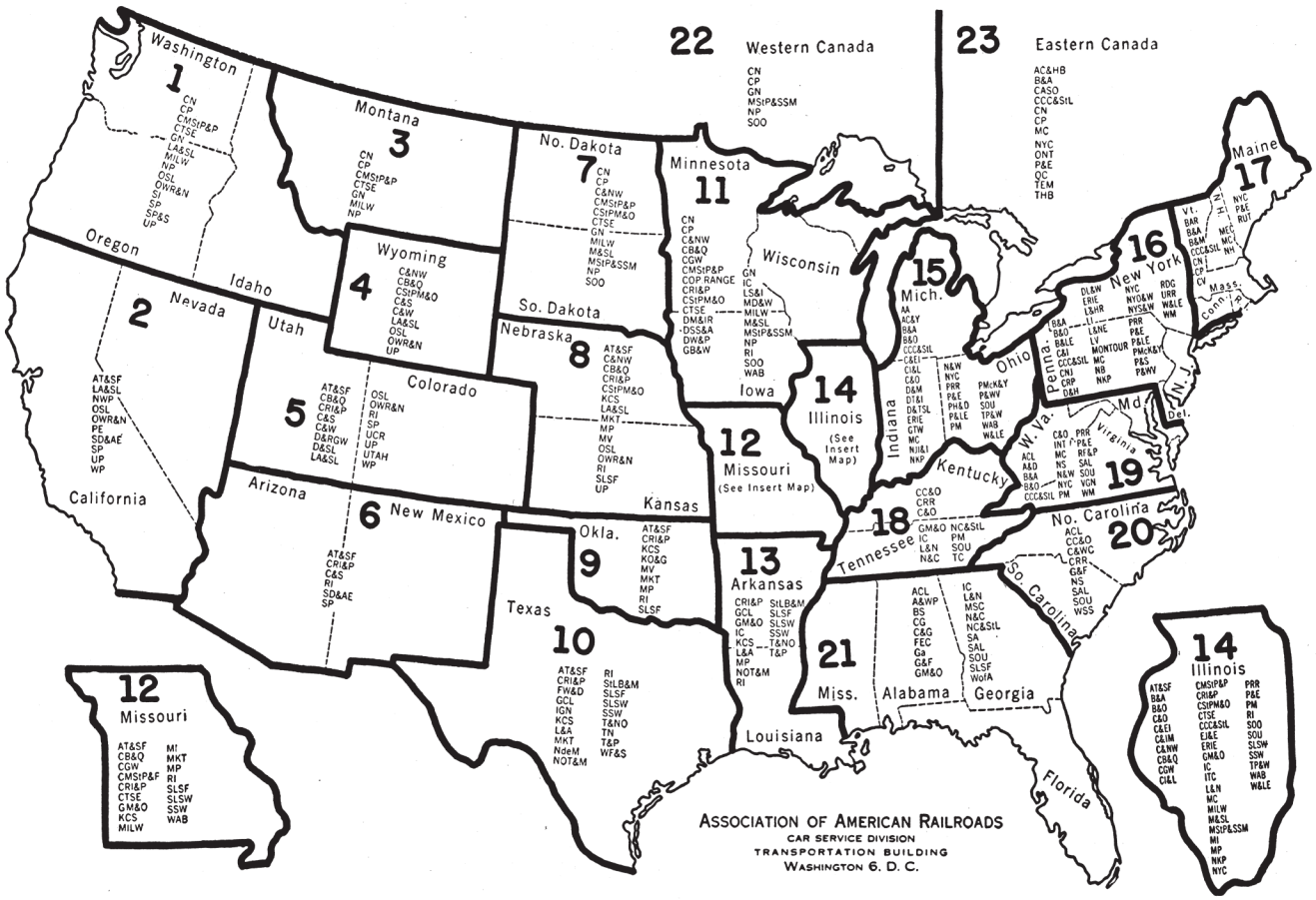
The shipper fills out a railroad form, the bill of lading (similar to but different from the waybill), with all particulars of the shipment, and provides it to the agent or car distributor. The bill of lading serves as the contract between shipper and railroad for movement of the load. Once the agent knows the empty car initial and number, the waybill can be prepared for the outgoing load, awaiting only the scale weight if that will be the basis for charges.

Under the common circumstance of a weight agreement being in force for the cargo being loaded, it only requires a count of the cartons, barrels, crates, or other containers, since their unit weight is provided in the agreement. (Weight agreements are described in more detail in my article in the April 2010 *Dispatcher's Office*.) The agent computes the freight charges and adds those to the waybill.

A copy of the waybill then travels with the load. The normal arrangement was for the waybills to be in the custody of each conductor along the route, who used them for his wheel report and any other documentation, usually prepared in the caboose. At

A Note on Car Service Rules

The attached graphic and rules summary by E.W. Coughlin is largely self-explanatory, and many modelers have become aware of the implications of these Rules for the empties which are loaded on *their* layout. But modelers often fail to realize how the Rules affect incoming loads. A yard clerk on the Southern in Atlanta, for example, does *not* choose "just any local car" (other than Southern) to load; on the contrary, unneeded empties of that kind would go home on direct connections. Instead, that clerk tries to use empties from the region of *your* railroad, since those are the first choices under the Rules. Of course cars from the region of origin will be used if none others are convenient, but these are *exceptions* to the Rules and should be modeled in that light.



LOAD CARS AS FOLLOWS (In order of preference)

1—Do not load a car off home line if suitable foreign car of proper ownership is available or can reasonably be obtained.

2—Load foreign cars via owner roads, whenever possible, including points reached by owner and points beyond. Foreign cars at a junction point with owner should be loaded via owner's rails.

3—Load foreign cars to a Home District (as defined herein) even when not possible to route via owning line.

4—Load foreign cars to a District intermediate between loading point and a Home District so that cars will be advanced as directly as possible toward the owning roads.

5—Load foreign cars to a District beyond or adjoining a Home District; but, generally, this should not be farther than a District next adjacent thereto, except that when routing provides for a movement of a car over owner's rails there would be no restriction as to destination.

6—Between suitable cars available for loading, give preference to cars most distant at loading point from the owner.

Do Not Load High Class Box Cars With Commodities That Will Damage or Taint the Interior.

Observance of the above principles in selecting empty cars for loading will greatly contribute to more efficient car utilization and better car supply by preventing unnecessary empty mileage. The use of a foreign car for loading to home territory instead of loading a local car away from home is most important, since this will often prevent the movement of cars empty in both directions.
Fullest possible advance notice by shippers in the form of written car orders, specifying routing and destination, will greatly aid the railroads in furnishing prompt and satisfactory car supply to shippers.

DEFINITIONS: **Home Car—A car on the road to which it belongs. Foreign Car—A car on a road to which it does not belong.**

—from Coughlin, *Freight Car Distribution and Handling in the United States*

each switching location along the route, the waybills would visit the yard office for inspection and recording.

The waybill is stamped with a junction stamp at each point where one railroad hands off the car to the next carrier, and an interchange report is prepared, documenting the end of one road's per diem responsibility and the start of another. A report also goes to the car owner to document car location.

In the last step before delivery, the local switching crew would take the waybill to the local agent for the particular receiver's location. Sometimes the waybill had been sent by U.S. mail to that agent in advance of the arrival of the shipment.

Incidentally, most railroads provided "bill boxes" on the exterior of depots or freight sheds so that paperwork could be picked up or dropped off by conductors when an agent was not on duty. These were usually locked with a switch padlock. For modelers, such a box can be a solution to the problem of needing agents on duty at all towns in which switching occurs.

The agent would mark the delivery time and forward a copy of the waybill to the office which handles freight billing. Sometime the agent may collect COD freight charges, depending on the arrangement between shipper and receiver, but usually the waybill goes to a railroad office where experts on freight rates check and correct the bill; a lot of waybills just moved with an estimated freight charge on them.

At the time of delivery, the grace period begins

721 SOUTHERN PACIFIC COMPANY 721
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION	STATE	FROM STATION	STATE
BALLARD	CA	MEDFORD	OR

CONSIGNEE AND ADDRESS	SHIPPER
SOUTH COUNTY LUMBER, TM. TK.	ROGUE RIVER LUMBER

ROUTE Show in route order: SP
AAR CLASS OF CAR ORDERED: XM
LENGTH/CAPY OF CAR ORDERED: 50
WEIGHED: R (E-Estimated R-Railroad Scale S-Shipper's Tested Weights T-Tariff Classification)
ON C. L. TRAFFIC-INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS

NO. PKGS.	DESCRIPTION OF ARTICLES
C/L	MILLED LUMBER, MIXED

AUTOMOBILE CAR
SP 64996
AAR XM IL 50'6"

(Above) Though classed as an automobile car by AAR, this double-door box car is in general service, and is seen here about to arrive at Shumala, on its way to the Ballard team track with a load of lumber. Finished lumber was usually shipped in box cars, while flat cars normally carried rough lumber.

(Below) This inbound load of fruit box labels from Portland, Oregon has just been spotted at Coastal Citrus.

728 – Spokane, Portland & Seattle Ry. Co. – 728
FREIGHT WAYBILL
TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION	STATE	FROM STATION	STATE
SANTA ROSALIA	CA	PORTLAND	OR

CONSIGNEE AND ADDRESS	SHIPPER
COASTAL CITRUS ASSOCIATION	MULTNOMAH LITHO CO.

ROUTE Show in route order: SP&S-PORT-SP
AAR CLASS OF CAR ORDERED: XM
LENGTH/CAPY OF CAR ORDERED:
WEIGHED: T (E-Estimated R-Railroad Scale S-Shipper's Tested Weights T-Tariff Classification)
ON C.L. TRAFFIC - INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS: SHIPPER LOAD & COUNT-WWIB

NO. PKGS.	DESCRIPTION OF ARTICLES
525 CTNS	LEMON BOX LABELS

BOX CAR
T&NO 53489
AAR XM

in which no demurrage or "rent" is charged to the receiver for the use of the car, usually 48 hours (depending on railroad-shipper agreement). At the end of that time, an additional charge begins to be levied. The car receiver thus is anxious to unload the car, and his phone call or other notification to the agent, that the empty car is ready for pickup, terminates his responsibility for potential demurrage, regardless of when the railroad physically picks up the car.

The empty will now return to the nearest yard, unless that local agent has already arranged to confiscate it for loading at another shipper. It will move on the reverse of the route it followed when loaded (if not confiscated along the way), so that the roads which benefited from the freight charges on the load will equally share the cost of returning the empty.

It should also be mentioned that when an empty car is spotted for loading, the same demurrage process takes place: a free period such as 24 hours is followed by a daily charge for the car, until the agent is notified that it is ready to be picked up.

Example

To illustrate the above description, I'll follow a single car through the process. Let's imagine a shipper in Houston, Texas, who manufactures wire rope. He requests a box car to be delivered to his siding on the Texas & New Orleans, for a shipment to a marine supply house in Seattle, Washington.

The car distributor at Englewood Yard in Houston has a Burlington box car available which is suitable (Seattle is in an adjoining District to a CB&Q Home District), and the car is routed to the shipper with an Empty Car Bill. Upon loading, the waybill is prepared, the car is picked up, and starts on its way.

At El Paso, the car is handed off to Southern Pacific, and the junction report ends the per diem charges to T&NO and starts those to SP; and CB&Q is notified of the place and time of interchange.

The shipper has specified the routing via Oakland, California to Western Pacific, and up the Inland Gateway to Bieber, California and the Great Northern. Accordingly the SP interchanges the car to WP at Oakland, and again the junction report, and interchange report to CB&Q, document the event.

(Right) This waybill might be the one accompanying the CB&Q box car described in the text example. Routing shown is that described in the text, with interchange junction points abbreviated.

A. A. R. Form 101

759 TEXAS & NEW ORLEANS RAILROAD COMPANY 759

FREIGHT WAYBILL

TO BE USED FOR SINGLE CONSIGNMENTS. CARLOAD AND LESS CARLOAD

TO STATION	STATE	FROM STATION	STATE
SEATTLE	WASH	HOUSTON	TEX

CONSIGNEE AND ADDRESS	SHIPPER
ELLIOT BAY MARINE SUPPLY	GULF ROPE & CABLE

ROUTE Show in route order	AAR CLASS OF CAR ORDERED: XM
T&NO-ELP-SP-OAK-WP-BBR-GN-BEND-SP&S-VAN-GN	LENGTH/CAPY OF CAR ORDERED
	WEIGHED (E-Estimated R-Railroad Scale S-Shipper's Tested Weights T-Tariff Classification)

ON C.L. TRAFFIC - INSTRUCTIONS (Regarding Icing, Ventilation, Etc.) & EXCEPTIONS: SHIPPER LOAD & COUNT

NO. PKGS.	DESCRIPTION OF ARTICLES
14 REELS	WIRE ROPE, VARIOUS SIZES

BOX CAR
CB&Q 130258
AAR XM

At Bieber, the process is repeated; then the GN exchanges the car to the Spokane, Portland and Seattle in Bend, Oregon, and receives it back at Vancouver, Washington, and finally the GN delivers the car in Seattle. The GN's freight agent in Seattle handles the waybill upon delivery of the load.

The documentation of all the interchange points readily permits returning empties to be verified as having previously moved through that point. Another source of that information is the "jumbo" or car ledger at each interchange point, a book in which every interchanged car is recorded for possible future reference. If the empty was not in fact interchanged at that point when received under load, the receiving railroad of the empty is entitled to refuse to accept the car, since it didn't benefit from the loaded journey of the car.

The model waybill shown encapsulates the interchange points for this shipment, abbreviated as was common with often-used junctions.

Model Operations

So what do we learn from this information that can help in modeling waybill operations? First, the central role of the agent is evident, and layout operating jobs such as agent-operator make sense in many situations. If operators are too busy or not well located to carry out agent duties, simply providing a "bill box" for each town or large industry can work well.

Most layouts are not complex enough to feature

multiple interchanges with the same neighbor railroad, but if those are present, waybill information about arriving-car interchange points can be used to route unconfiscated empties back through that interchange.

It has long been the practice in some car-card systems to provide a "hold" period, during which a spotted car remains on an industrial siding, in effect for multiple operating sessions. This is prototypical for some but not all industries. This practice needs to be refined so that industries which would ordinarily load cargo rapidly, such as packing houses, do not experience hold periods. Other industries should not ordinarily have hold times exceeding free time under the demurrage rules.

Waybill Appearance

The waybills shown in this article are modified from the ones shown in my two previous articles (cited below). The prototype's characteristic vertical division between shipper and consignee information has been adopted, and more space for routing information, particularly junction points, has been gained. My previous article in *The Dispatcher's Office* provides information about the type faces used to fill out the waybills, and about achievement of prototype railroad appearance and code numbers.

The waybills for this article are accompanied by model photos of the cars identified on the car sleeves, to illustrate a few of the points made in this article. After spending some time operating with this new waybill design, I'm convinced it's an improvement over my original version.

To Learn More

This entire waybill process is described and discussed in far more detail than is practical here, in a book published by the AAR and written by a long-time employee of its Car Service Division, E.W. Coughlin (see "Further Reading," below). That book also contains a fine description of implementing Car Service Rules, including a summary of a training course used by one railroad to acquaint clerks and agents with the finer points of those Rules. I believe most modelers interested in operation would benefit from at least a cursory examination of that material.

Also listed below are a number of references which explain and expand upon some of the background for this article. I found them useful as sources of prototype information.

Acknowledgements

I have to thank two experienced railroaders whose knowledge of freight operations, people, and paperwork was of great help to me, Jerry Stewart and Paul Koehler. But any errors which remain in this article are my responsibility, not theirs.

Further reading

John H. Armstrong, *The Railroad–What It Is, What It Does,* Simmons-Boardman Publishing, Omaha, 1982.

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