

BuildInstruction (2.0s): Creating Crew Instructions From JMRI Operations

By Jon Schmidt

I'm a great believer in JMRI Operations. I've used it on my own Nicasio Northern Railway for years, and more extensively on Paul Weiss' Central Vermont Railway. My NN is medium size, 13x23, with about 100 cars, 40 industries, 2 yards, 2 staging areas. The Central Vermont, however, is much larger: 30x40, about 600 cars, 125 industries, 2 major yards, 2 large staging areas.

The team on the CV is very serious about doing prototype modelling. We've had lots of discussions about car movement, and I've used JMRI Ops Schedules to create prototypical car movement for each industry. I did a presentation on CV Car Movement at the last PCR meet.

We've also reviewed the paperwork that JMRI produces. The standard manifests and switchlists created by J Ops were not sufficient for our team. I researched and tried the excellent set of manifest creators created by Dan Foltz. They can be found at www.ManifestCreator.Weebly.Com. Still not good enough for our team.

The paper discusses a tool which I built to provide the paperwork we needed in the format we liked. So, what did we need?

- Whatever we created must be understandable by crews new to the railroad.
- It should have only the barest information required to instruct but not confuse the crews.
- It must divide up the instructions for a train into different sheets for different crews doing different jobs: Build the train, move the train, work towns, deliver the train, classify the train.
- It must look good and be able to use an interesting font.
- It must be easy to produce.

Happily, JMRI Ops produces manifest information per train in comma-separated (CSV) format which is readable by Excel. All the information that we needed was there. After lots of experimenting and back-and-forth discussions with the team I arrived at a format for our trains which the team liked. Unfortunately it involved a lot of cut-and-paste. I got tired of all that and wrote the BuildInstruction.xlsm Excel program which is described here.

BuildInstruction relies on a very simple template file to make a set of instructions for the crews. There is a template file per train customized to that train. If you have multiple trains doing the same route the same way, you can copy the template file and the only thing that changes between the templates is the name of the CSV manifest file for the train.

The template keywords tell what type of report is built for each crew or town. A typical train will have a build report for the yard crew; a wheel report, work reports for each town, and a destination wheel report for the train crew; and a classify report for the receiving yard crew.

- *t:name* -- find town *name* in the CSV file
- *build* -- produce a build report for the originating yard crew showing cars, where they are in the yard, and final destinations for each car
- *wheel* -- produce a wheel report for the train crew, car id only

- *wheel* -- produce a wheel report for the train crew with car id and destination town
- *work* -- produce a report for a town showing moves, lifts, and drops
- *workm* -- produce a report for a town showing local moves only
- *workl* -- produce a report for a town showing lifts only typically for building and lifting a block for a through freight
- *workd* -- produce a report for a town showing drops only typically for dropping and classifying a block from a through freight -- or a classification report without final destination
- *classify* -- produce a classification report for the destination crew showing spot tracks and final destinations
- *restart* -- restart the reporting process at the beginning -- useful for producing agent's instructions for local moves and lifts
- *sealrpt* -- produce a wheel report showing loads and seals east/seals west columns
- *com* -- no action, comment line
- *end* -- no action, used to continue comments beyond last report

Why did we need all of this? Let's take a couple of examples.

Example 1:

A transfer run leaves E. New London yard and goes to Fort Yard staging. It only needs two pages: a *build* report for the yard crew and a *wheel* report for the train crew. The template is shown below. Column 1 has the CSV file name and keywords. Column 2 holds comments to be copied to the report. Two instruction pages will be generated.

Template 1:

train (CV transfer to NH 1st).csv	Summary of work
	Transfer of cars from E New London to NHRR New London Fort Yard
	E New London crew build consist with cv engine
	CVR yardmaster E New London contact NHRR yardmaster Fort Yard
	Request permission enter New London Fort Yard at restricted speed
	NHRR yardmaster Fort Yard contacts cvr yardmaster E New London
	Requests permission return E New London at restricted speed
	CV power pushes block and return light to E New London
t: east new london	E New London crew build consist with cv engine
	CVR yardmaster E New London contact NHRR yardmaster Fort Yard
	Request permission enter New London Fort Yard at restricted speed
build	Build train push to New London ft yard and return light
t: NH Fort Yard	NHRR yardmaster Fort Yard contacts cvr yardmaster E New London

	Requests permission return E New London at restricted speed
wheel	CV power return to E New London

The resulting instruction pages follow. It includes comments from the template, and comments from JMRI's CSV manifest file such as train, route, and location comments. The header shows the railroad and train taken from the CSV file. The date at top right is the operation date being simulated. This report would normally be split across two pages, with the first page going to the yard crew, and the second page going to the train crew.

Report 1:

CENTRAL VERMONT RAILWAY
CV TRANSFER TO NH 1ST

MONDAY, 1956-05-21

CV TRANSFER TO NH 1ST
CV TRANSFER ENL-NLNH
CV TRANSFER TO NH FORT YARD; RETURNS LIGHT.
SUMMARY OF WORK

TRANSFER OF CARS FROM E NEW LONDON TO NHRR NEW LONDON FORT YARD
E NEW LONDON CREW BUILD CONSIST WITH CV ENGINE
CVR YARDMASTER E NEW LONDON CONTACT NHRR YARDMASTER FORT YARD
REQUEST PERMISSION ENTER NEW LONDON FORT YARD AT RESTRICTED SPEED
NHRR YARDMASTER FORT YARD CONTACTS CVR YARDMASTER E NEW LONDON
REQUESTS PERMISSION RETURN E NEW LONDON AT RESTRICTED SPEED
CV POWER PUSHES BLOCK AND RETURN LIGHT TO E NEW LONDON

E NEW LONDON CREW BUILD CONSIST WITH CV ENGINE
CVR YARDMASTER E NEW LONDON CONTACT NHRR YARDMASTER FORT YARD
REQUEST PERMISSION ENTER NEW LONDON FORT YARD AT RESTRICTED SPEED
BUILD TRAIN PUSH TO NEW LONDON FT YARD AND RETURN LIGHT

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
DH	18503	XM	CV PIER 9	NH FORT YARD
... ROWS DELETED FOR BREVITY				
SHPX	20612	TA	SOUTH YARD	NH FORT YARD

TRAIN DEPARTS WITH 14 CARS, 5 EMPTY, LENGTH 616 FEET, 808 TONS

NHRR YARDMASTER FORT YARD CONTACTS CVR YARDMASTER E NEW LONDON
REQUESTS PERMISSION RETURN E NEW LONDON AT RESTRICTED SPEED
CV POWER RETURN TO E NEW LONDON

MARKS	NUMBER	TYPE
DH	18503	XM
... ROWS DELETED FOR BREVITY		
SHPX	20612	TA

CV transfer to NH 1st Page 1 built 10/7

The font we are using for these report examples is "TELETYPE 1945-1985".

Example 2:

Train 739 is a northward local extra. It originates in East New London and terminates at Palmer, working many of the towns along the way.

Template 2:

train (Train 739).csv	SUMMARY OF ROUTE AND WORK	
	This is an Extra northward train respect times of superior trains	
	E New London...	Meet with YM to identify train
		Obtain orders and clearance from operator
		Check and sign register; depart northbound
	Montville...	No work
	Norwich...	No work; O/S by
	Yantic...	No work
	Lebanon...	See manifest
	Willimantic...	See manifest; o/s in/out
	S Coventry...	See manifest
	Mansfield...	See manifest
	W Willington...	See manifest
	Stafford ...	See manifest; o/s in/out
	State Line...	No work
	Monson...	See manifest
	Palmer...	Sign register and contact palmer operator
		By radio on arrival palmer yard limit
		Contact palmer operator for additional switching duties
t: east new london	ENL yard crew	
build	build train 739	
	no 739 crew	
	Wheel report at east new london	
wheeld	When complete obtain clearance and orders; O/S out; check and sign Register	
t:lebanon	no 739 crew	
work	AT LEBANON CT.	
	No. 739 crew	
t:willimantic	at WILLIMANTIC CT	
work	MANDATORY O/S IN/OUT POINT CONTACT OPERATOR	
t:s coventry	no 739 crew	
work	AT S. COVENTRY CT	
t:mansfield	no 739 crew	
work	AT MANSFIELD CT.	

t:w willington	no 739 crew	
work	AT W Willington CT	
t:stafford	no 739 crew	
	AT STAFFORD CT	
work	MANDATORY O/S IN/OUT POINT CONTACT OPERATOR	
t:monson	no 739 crew	
work	AT MONSON, MA	
t:palmer	No. 739 CREW	
	AT PALMER MA	
	SIGN REGISTER AND CONTACT PALMER OPERATOR BY RADIO	
	CONTACT AGENT FOR ADDITIONAL LOCAL WORK	
	classify train	
classify	TIE UP POWER AND VAN WHEN COMPLETE	

Report 2:

This set of instructions result from the above template and the CSV manifest being processed by BuildInstruction. In this case we see a page for the yard crew to build the train, and all of the other pages are for the train crew to take the train, work the en route towns, and classify the train upon its arrival in Palmer. Note that the wheel report for the crew, and all of the lift reports show the final destination for the car so that the train crew can keep blocks together if desired.

TRAIN 739

TRAIN 739 LOCAL ENL-PALMER MWF

SUMMARY OF ROUTE AND WORK

THIS IS AN EXTRA NORTHWARD TRAIN RESPECT TIMES OF SUPERIOR TRAINS

E NEW LONDON...	MEET WITH YM TO IDENTIFY TRAIN OBTAIN ORDERS AND CLEARANCE FROM OPERATOR CHECK AND SIGN REGISTER; DEPART NORTHBOUND
MONTVILLE...	NO WORK
NORWICH...	NO WORK; O/S BY
YANTIC...	NO WORK
LEBANON...	SEE MANIFEST
WILLIMANTIC...	SEE MANIFEST; O/S IN/OUT
S COVENTRY...	SEE MANIFEST
MANSFIELD...	SEE MANIFEST
W WILLINGTON...	SEE MANIFEST
STAFFORD ...	SEE MANIFEST; O/S IN/OUT
STATE LINE...	NO WORK
MONSON...	SEE MANIFEST
PALMER...	SIGN REGISTER AND CONTACT PALMER OPERATOR

BY RADIO ON ARRIVAL PALMER YARD LIMIT
CONTACT PALMER OPERATOR FOR ADDITIONAL SWITCHING DUTIES

ENL YARD CREW
BUILD TRAIN 739

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
SSW	77158	LO	YARD 2	LEBANON
DH	23805	XM	YARD 34	WILLIMANTIC
PRR	28850	XM	YARD 34	WILLIMANTIC
CNW	24617	XM	YARD 34	WILLIMANTIC
MP	39130	XM	YARD 34	WILLIMANTIC
SSW	34324	XM	YARD 34	WILLIMANTIC
UTLX	91053	TA	YARD 34	WILLIMANTIC
GTW	107640	HM	YARD 2	WILLIMANTIC
MILW	96453	HM	YARD 2	WILLIMANTIC
NCSTL	48478	HM	YARD 34	WILLIMANTIC
PRR	234005	XM	YARD 34	WILLIMANTIC
CP	183950	XM	YARD 2	S COVENTRY
GTW	516728	XM	YARD 2	S COVENTRY
PRR	257213	LO	YARD 2	S COVENTRY
BO	370853	XM	YARD 2	STAFFORD
LV	50478	LO	YARD 34	STAFFORD
CV	43047	XM	YARD 2	MONSON
PRR	65947	XM	YARD 34	MONSON
CN	116502	HM	YARD 2	MONSON
CN	117625	HM	YARD 2	MONSON

NO 739 CREW

WHEEL REPORT AT EAST NEW LONDON

WHEN COMPLETE OBTAIN CLEARANCE AND ORDERS; O/S OUT; CHECK AND SIGN REGISTER

MARKS	NUMBER	TYPE	DESTINATION
SSW	77158	LO	LEBANON
DH	23805	XM	WILLIMANTIC
... LINES DELETED FOR BREVITY			
CN	116502	HM	MONSON
CN	117625	HM	MONSON

TRAIN DEPARTS WITH 20 CARS, 2 EMPTY, LENGTH 876 FEET, 1407 TONS

NO 739 CREW

AT LEBANON CT.

LIFT CARS

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
MILW	96885	HM	BERKMAN GRAIN	PALMER
ATSF	31394	XM	TEAM	PALMER
PRR	606130	XM	TEAM	PALMER

DROP CARS

MARKS	NUMBER	TYPE	DROP TO
-------	--------	------	---------

SSW 77158 LO TEAM

TRAIN DEPARTS WITH 22 CARS, 3 EMPTY, LENGTH 964 FEET, 1508 TONS

NO. 739 CREW

AT WILLIMANTIC CT

MANDATORY O/S IN/OUT POINT CONTACT OPERATOR

LIFT CARS

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
GTW	516101	XM	WILLIMANTIC COAL	WILLIMANTIC
GTW	516730	XM	WILLIMANTIC COAL	STAFFORD
GTW	516026	XM	AMERICAN SCREW 2	PALMER
NH	45098	XM	AMERICAN THREAD 2	PALMER
CMO	22422	XM	AMERICAN THREAD 1	PALMER
WAB	7006	XM	AMERICAN THREAD 1	PALMER
GARE	802	XI	NHRR IC EAST 1	PALMER

DROP CARS

MARKS	NUMBER	TYPE	DROP TO
DH	23805	XM	AMERICAN SCREW 2
PRR	28850	XM	AMERICAN THREAD 1
GTW	516101	XM	AMERICAN THREAD 2
CNW	24617	XM	FREIGHT HOUSE
MP	39130	XM	FREIGHT HOUSE
SSW	34324	XM	NHRR IC EAST 1
UTLX	91053	TA	TEAM
GTW	107640	HM	YARD 2
MILW	96453	HM	YARD 2
NCSTL	48478	HM	YARD 2
PRR	234005	XM	YARD 2

TRAIN DEPARTS WITH 18 CARS, 2 EMPTY, LENGTH 788 FEET, 1256 TONS

NO 739 CREW

AT S. COVENTRY CT

LIFT CARS

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
AA	1281	XM	CLYDE MILLING	PALMER
ERIE	86767	XM	TEAM	PALMER
MPLX	1547	TA	TEAM	PALMER

DROP CARS

MARKS	NUMBER	TYPE	DROP TO
CP	183950	XM	CLYDE MILLING
GTW	516728	XM	CLYDE MILLING
PRR	257213	LO	TEAM

TRAIN DEPARTS WITH 18 CARS, 2 EMPTY, LENGTH 792 FEET, 1263 TONS

NO 739 CREW

AT MANSFIELD CT.
NO WORK AT THIS STATION

NO 739 CREW
AT W WILLINGTON CT
LIFT CARS

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
CV	20108	HM	TEAM	PALMER

TRAIN DEPARTS WITH 19 CARS, 3 EMPTY, LENGTH 836 FEET, 1288 TONS

NO 739 CREW
AT STAFFORD CT
MANDATORY O/S IN/OUT POINT CONTACT OPERATOR
LIFT CARS

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
MILW	35016	XM	STAFFORD WORSTED	STAFFORD
BO	464842	XM	FREIGHT HOUSE	PALMER
RI	22172	XM	STAFFORD WORSTED	PALMER
SAL	25613	XM	TEAM	PALMER
CP	269421	XM	STAFFORD WORSTED	PALMER
NYC	416551	HM	WATER	PALMER
URTX	35589	RS	WATER	PALMER

DROP CARS

MARKS	NUMBER	TYPE	DROP TO
MILW	35016	XM	CH MOORE LUMBER
GTW	516730	XM	STAFFORD WORSTED
BO	370853	XM	TEAM
LV	50478	LO	TEAM

TRAIN DEPARTS WITH 22 CARS, 7 EMPTY, LENGTH 968 FEET, 1311 TONS

NO 739 CREW
AT MONSON, MA
DROP CARS

MARKS	NUMBER	TYPE	DROP TO
CV	43047	XM	CF CHURCH MFG
PRR	65947	XM	CF CHURCH MFG
CN	116502	HM	SQUIRES COAL OIL
CN	117625	HM	SQUIRES COAL OIL

TRAIN DEPARTS WITH 18 CARS, 7 EMPTY, LENGTH 792 FEET, 1008 TONS

NO. 739 CREW
AT PALMER MA
SIGN REGISTER AND CONTACT PALMER OPERATOR BY RADIO
CONTACT AGENT FOR ADDITIONAL LOCAL WORK
CLASSIFY TRAIN
TIE UP POWER AND VAN WHEN COMPLETE

MARKS	NUMBER	TYPE	DROP TO	FINAL DESTINATION
GTW	516026	XM	BA INTERCHANGE	MONTVILLE
NH	45098	XM	BA INTERCHANGE	MONTVILLE
CMO	22422	XM	BA INTERCHANGE	LEBANON
WAB	7006	XM	BA INTERCHANGE	LEBANON
CV	20108	HM	SLAUGHTER	
BO	464842	XM	WICKWIRE MILL	BRATTLEBORO
AA	1281	XM	YARD 1	ENL CV PIER
ERIE	86767	XM	YARD 2	NH FORT YARD
RI	22172	XM	YARD 2	NH FORT YARD
SAL	25613	XM	YARD 2	NH FORT YARD
GARE	802	XI	YARD 2	NH FORT YARD
MILW	96885	HM	YARD 3	BRATTLEBORO
ATSF	31394	XM	YARD 3	BRATTLEBORO
PRR	606130	XM	YARD 3	BRATTLEBORO
MPLX	1547	TA	YARD 3	BRATTLEBORO
CP	269421	XM	YARD 3	BRATTLEBORO
NYC	416551	HM	YARD 3	BRATTLEBORO
URTX	35589	RS	YARD 3	BRATTLEBORO

Example 3:

Train 429 is a northward extra. It originates in East New London and terminates in staging at Brattleboro. At Palmer it drops and lifts blocks of cars. There must be associated instructions for Palmer crews to build and classify those blocks, respectively.

Template 3:

train (Train 429 Rocket).csv	Summary of route and work	
	This is an Extra train respect times of scheduled superior trains	
	E New London...	Meet with ym to identify train
	E New London...	Obtain orders and clearance from operator
	E New London...	Check and sign register prior to departure
	Montville...	No work
	Norwich...	No work; O/S by pink form
	Yantic...	No work
	Lebanon...	No work
	Willimantic...	No work; O/S by pink form
	S Coventry...	No work
	Mansfield...	No work
	W Willington...	No work
	Stafford ...	No work; O/S by pink form
	State Line...	No work
	Monson...	No work

	Palmer...	Sign register and contact palmer operator
		By radio on arrival palmer yard limit
		Proceed at restricted speed
		Drop block of Palmer cars and lift outgoing block
		Contact palmer operator when work done
		O/S out and proceed northward
	Brattleboro...	Train terminates at mileage 123
t: east new london	ENL yard crew	
build	Build no. 429	
	Train 429 crew	
	Wheel report at enl	
wheeld	When complete obtain clearance and orders; O/S out; check and sign Register	
t: palmer	Agent-operator at Palmer	
	If today is:	
		Monday/Wednesday/Friday - 739's crew
		Tuesday/Thursday/Saturday - 740's crew
	Lift the following cars and build the block	
workl	For train 429 on the north end of the Car track	
	Train 429 crew	
	At palmer	
workd	Drop Block to car track only, do not deliver	
	LIFT north end of car track	
workl	On completion o/s out northbound	
	Agent-operator at Palmer	
	If today is:	
		Monday/Wednesday/Friday - 739's crew
		Tuesday/Thursday/Saturday - 740's crew
workd	Deliver the cars from train 429	
t: brattleboro	Train 429 crew	
	AT Brattleboro gateway to Montreal	
	Crew change point, train terminates mileage 123	
wheel	Wheel report	

Report 3:

This set of instructions result from the above template and the CSV manifest being processed by BuildInstruction. I have bolded in the report below where page breaks would be placed, such that the pages could be distributed among the E New London yard crew, the train crew, and the Palmer agent/operator to give to the crew working Palmer.

TRAIN 429 ROCKET

ROCKET 429 ENL-MONTREAL

SUMMARY OF ROUTE AND WORK

THIS IS AN EXTRA TRAIN RESPECT TIMES OF SCHEDULED SUPERIOR TRAINS

E NEW LONDON...	MEET WITH YM TO IDENTIFY TRAIN
E NEW LONDON...	OBTAIN ORDERS AND CLEARANCE FROM OPERATOR
E NEW LONDON...	CHECK AND SIGN REGISTER PRIOR TO DEPARTURE
MONTVILLE...	NO WORK
NORWICH...	NO WORK; O/S BY PINK FORM
YANTIC...	NO WORK
LEBANON...	NO WORK
WILLIMANTIC...	NO WORK; O/S BY PINK FORM
S COVENTRY...	NO WORK
MANSFIELD...	NO WORK
W WILLINGTON...	NO WORK
STAFFORD ...	NO WORK; O/S BY PINK FORM
STATE LINE...	NO WORK
MONSON...	NO WORK
PALMER...	SIGN REGISTER AND CONTACT PALMER OPERATOR
	BY RADIO ON ARRIVAL PALMER YARD LIMIT
	PROCEED AT RESTRICTED SPEED
	DROP BLOCK OF PALMER CARS; LIFT BLOCK OF NORTHWARD CARS
	CONTACT PALMER OPERATOR WHEN WORK DONE
	O/S OUT AND PROCEED NORTHWARD
BRATTLEBORO...	TRAIN TERMINATES AT MILEAGE 123

ENL YARD CREW

BUILD NO. 429

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
CV	43094	XM	STATE PIER 3 LEAD	PALMER
... LINES DELETED FOR BREVITY				
CEI	65593	XM	STATE PIER 3 LEAD	BRATTLEBORO

TRAIN 429 CREW

WHEEL REPORT AT ENL

WHEN COMPLETE OBTAIN CLEARANCE AND ORDERS; O/S OUT; CHECK AND SIGN REGISTER

MARKS	NUMBER	TYPE	DESTINATION
CV	43094	XM	PALMER
... LINES DELETED FOR BREVITY			
CEI	65593	XM	BRATTLEBORO

TRAIN DEPARTS WITH 9 CARS, 3 EMPTY, LENGTH 396 FEET, 525 TONS

AGENT-OPERATOR AT PALMER

IF TODAY IS:

MONDAY/WEDNESDAY/FRIDAY - 739'S CREW

TUESDAY/THURSDAY/SATURDAY - 740'S CREW

LIFT THE FOLLOWING CARS AND BUILD THE BLOCK
FOR TRAIN 429 ON THE NORTH END OF THE CAR TRACK
NO WORK

TRAIN 429 CREW

AT PALMER

DROP BLOCK TO CAR TRACK ONLY, DO NOT DELIVER

DROP CARS

MARKS	NUMBER	TYPE	DROP TO
CV	43094	XM	HOME GAS
... LINES DELETED FOR BREVITY			
CV	43054	XM	SLAUGHTER

LIFT NORTH END OF CAR TRACK
ON COMPLETION O/S OUT NORTHBOUND
NO WORK

AGENT-OPERATOR AT PALMER

IF TODAY IS:

MONDAY/WEDNESDAY/FRIDAY - 739'S CREW

TUESDAY/THURSDAY/SATURDAY - 740'S CREW

DELIVER THE CARS FROM TRAIN 429

DROP CARS

MARKS	NUMBER	TYPE	DROP TO
CV	43094	XM	HOME GAS
... LINES DELETED FOR BREVITY			
CV	43054	XM	SLAUGHTER

TRAIN DEPARTS WITH 3 CARS, 3 EMPTY, LENGTH 132 FEET, 75 TONS

TRAIN 429 CREW

AT BRATTLEBORO GATEWAY TO MONTREAL

CREW CHANGE POINT, TRAIN TERMINATES MILEAGE 123

WHEEL REPORT

MARKS	NUMBER	TYPE
NP	38229	XA
NYOW	6419	RS
CEI	65593	XM

How to run BuildInstruction:

Within the operations folder where you find the JMRI Operations files and folders for your railroad, make a directory. I called it aaCrewInstrs but you can name it anything. Place BuildInstruction.xlsm in that folder.

In JMRI, go to Operations/Settings/Options and select Generate CSV Manifest, then Save. Build a train or two and make sure that the files for those trains appear in operations/csvManifests.

In Excel create a template for one of those trains. You can name the template anything, but it should relate to that train. The first position (A1) must be the exact name of the train found in csvManifests, with the ".csv" suffix. Build the rest of the template with comments and with keywords starting with the *t:name* town identifier. *name* must match exactly with the town name in the CSV file.

Open BuildInstruction. You will see the screen below. Fill in the operations date in column 2. Fill in Pull/Spot/Load in the next row with the text you would like to have appear in the instructions for pulling and spotting cars. The third text is optional and determines whether the car contents will appear in the report. Leaving it blank or empty will suppress car contents. Putting a title there (such as *Contents* or *Lading*) will cause the load info to appear in the report. Fill in the Font field with the exact name of the font you would like for the report.

Then click on the *Build* button. It will ask you which template file you want to open. Open it.

Build Instruction	
Version 2.0d 10/7/2020	
Globals:	
Railroad name:	Optional. Will be taken from CSV data.
Operations date:	Monday, 1929-05-06
Pull/Spot/Load	Pull/Spot/Contents
Font:	TELETYPE 945-1985
Place this macro into a folder within operations, such as operations\aaCrewInstrs	
Clicking the "Build" button will ask you to open a file which contains the template for the train.	
<div>Build</div>	

BuildInstruction will then do its work, and the next thing you will see is the *out* sheet within the template workbook. The *out* sheet has the resulting set of reports for that train based on the template and the CSV manifest file. The *out* sheet is displayed in Page Break Preview mode so you can directly adjust where you want the page breaks to occur. Set the page breaks you want, and then print the sheets. You can then save the template if you wish, or just exit Excel. There is also a csv sheet in the workbook which comes from the csvManifests file for your info and for my debugging purposes.

You are welcome to download a copy of BuildInstruction.xlsm from <https://github.com/joneschmidt/BuildInstruction>

Revised 11/27/2022