Nicasio Noodlings: Creating Crew Instructions From JMRI Operations

By Jon E. 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, over 700 cars, 125 industries, 2 major yards, 2 large staging areas.

The core 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 JMRI 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 least information required to instruct but not confuse the crews.
- It must be able to 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 be easy to read, in a realistic prototype format and use a font appropriate to the modeled era.
- 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 that format involved a lot of cut-and-paste. I got tired of all that work 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 on the Central Vermont 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.

Template keywords:

- *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 ids only

- *wheeld* -- produce a wheel report for the train crew with car ids and destination town
- *work* -- produce a report for a town showing car moves, lifts, and drops
- *workm* -- produce a report for a town showing local car moves only
- *workl* -- produce a report for a town showing car lifts only typically for building and lifting a block for a through freight
- *workd* -- produce a report for a town showing car drops only typically for dropping and classifying a block from a through freight
- *classify* -- produce a classification report for the destination crew showing yard tracks and final destinations for each car in the train
- *sealrpt* -- produce a car seal report for each loaded car in the train
- *com* – treat the rest of the row as a comment not to be copied
- *end* – treat the remaining rows as comments not to be copied

A note: You will see “drops” and “lifts” in this article and in the reports. Those phrases are totally configurable and are easily changed to “pulls” or “spots” or “Pull from” or some other phrase.

Why did we need all of this? Let’s look at a couple of examples.

Example 1:

A transfer run leaves E. New London yard and goes to Fort Yard staging with no activity in between. It only needs two reports: a *build* report for the yard crew and a *wheel* report for the train crew. The most basic form of the template to accomplish this is shown below. Column 1 has the CSV file name and keywords. Columns 2-6 hold comments to be copied to the report.

Template 1:

train (CV transfer to NH 1st).csv	<-Required name of file in csvManifests
	<-(override train name)
	<-(override railroad name)
	Comments below (columns B-F) are copied to the report
t:east new london	
build	
t:NH Fort Yard	
wheel	

The resulting instruction pages follow. Lines 1 and 2 are the ‘train manifest description’ and the ‘train comment’ from the JMRI files. They are optional and are controlled within Operations Pro, as are the car types. Following those lines are the two reports, the build report and the wheel report. The build report is intended to be given to the yard crew who is responsible for assembling the train. The wheel report is intended to be given to the train crew so they can identify and confirm the train that they are taking to its destination, Fort Yard.

The font we are using for these report examples is “TELETYPE 1945-1985”. You can configure any font.

Report 1:

CV TRANSFER ENL-NLNH
CV TRANSFER TO NH FORT YARD; RETURNS LIGHT.

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
DH	185Ø3	XM	CV PIER 9	NH FORT YARD
MNS	1Ø35	XM	CV PIER 9	NH FORT YARD
BM	75249	XM	CV PIER 9	NH FORT YARD
NYC	169ØØ4	XM	CV PIER 9	NH FORT YARD
BO	268419	XM	CV PIER 9	NH FORT YARD
RUT	8247	XM	CV PIER 9	NH FORT YARD
SOO	137776	XM	CV PIER 9	NH FORT YARD
NYSW	58	XM	CV PIER 9	NH FORT YARD
CNJ	235Ø3	XM	CV PIER 9	NH FORT YARD
WSRX	238	TA.D	SOUTH YARD	NH FORT YARD
REX	61ØØ	XMS	SOUTH YARD	NH FORT YARD
CNW	2481Ø	XM	SOUTH YARD	NH FORT YARD
URTX	35647	RS	SOUTH YARD	NH FORT YARD
SHPX	2Ø612	TA	SOUTH YARD	NH FORT YARD

TRAIN DEPARTS WITH 14 CARS, 5 EMPTY, LENGTH 616 FEET, 8Ø8 TONS

MARKS	NUMBER	TYPE
DH	185Ø3	XM
MNS	1Ø35	XM
BM	75249	XM
NYC	169ØØ4	XM
BO	268419	XM
RUT	8247	XM
SOO	137776	XM
NYSW	58	XM
CNJ	235Ø3	XM
WSRX	238	TA
REX	61ØØ	XMS
CNW	2481Ø	XM
URTX	35647	RS
SHPX	2Ø612	TA

This output is too minimal to be of use and is not what BuildInstruction is for. BuildInstruction creates a more descriptive set of paper for the various crews involved in handling the train. Its power is in the ability to merge the instructions or comments in the template with the JMRI-produced CSV manifest to produce paperwork that the crews can understand and follow.

Let's enhance the template so that it reflects what we want to tell the crews. The template below has the instructions that we want to appear in the final report to be given to the crews. Note that the keywords in column 1 haven't changed. They have been arranged to align with the instructions in the right-hand columns.

Template 1a:

train (CV transfer to NH 1st).csv	<-Required name of file in csvManifests			
	<-(override train name)			
	<-(override railroad name)			
	Comments below (columns B-F) are copied to the report			
	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			
	CV yardmaster E New London contact NHRR yardmaster Fort Yard			
	Request permission enter New London Fort Yard at restricted speed			
	NHRR yardmaster Fort Yard contacts CV 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			
	CV yardmaster E New London contact NHRR yardmaster Fort Yard			
	Request permission enter New London Fort Yard at restricted speed			
build	Build train and push to New London Fort Yard and return light			
t:NH Fort Yard	NHRR yardmaster Fort Yard contacts CV yardmaster E New London			
	Requests permission return E New London at restricted speed			
wheel	CV power return to E New London			

Report 1a:

The full 2-page report for the train is shown below. The first page goes to the Central Vermont yard crew who builds the train. The second page goes to the train crew who operates the train from E New London to Fort Yard and return. Since this train is a transfer run it could be the same crew, yardmaster's choice. Special instructions on how to interact with the yardmasters are included.

CENTRAL VERMONT RAILWAY 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
CV YARDMASTER E NEW LONDON CONTACT NHRR YARDMASTER FORT YARD
REQUEST PERMISSION ENTER NEW LONDON FORT YARD AT RESTRICTED SPEED
NHRR YARDMASTER FORT YARD CONTACTS CV 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
CV YARDMASTER E NEW LONDON CONTACT NHRR YARDMASTER FORT YARD
REQUEST PERMISSION ENTER NEW LONDON FORT YARD AT RESTRICTED SPEED
BUILD TRAIN AND PUSH TO NEW LONDON FORT YARD AND RETURN LIGHT

MARKS	NUMBER	TYPE	LIFT FROM	FINAL DESTINATION
DH	18503	XM	CV PIER 9	NH FORT YARD
MNS	1035	XM	CV PIER 9	NH FORT YARD
BM	75249	XM	CV PIER 9	NH FORT YARD
NYC	169004	XM	CV PIER 9	NH FORT YARD
BO	268419	XM	CV PIER 9	NH FORT YARD
RUT	8247	XM	CV PIER 9	NH FORT YARD
SOO	137776	XM	CV PIER 9	NH FORT YARD
NYSW	58	XM	CV PIER 9	NH FORT YARD
CNJ	23503	XM	CV PIER 9	NH FORT YARD
WSRX	238	TA.D	SOUTH YARD	NH FORT YARD
REX	6100	XMS	SOUTH YARD	NH FORT YARD
CNW	24810	XM	SOUTH YARD	NH FORT YARD
URTX	35647	RS	SOUTH YARD	NH FORT YARD
SHPX	20612	TA	SOUTH YARD	NH FORT YARD

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

CV transfer to NH 1st Page 1 built 10/12

Note that the header contains the railroad, train name, and operation date. They won't be shown in subsequent examples for space reasons.

```
                                CENTRAL VERMONT RAILWAY                 MONDAY, 1956-05-21
                                 CV TRANSFER TO NH 1ST

NHRR YARDMASTER FORT YARD CONTACTS CV 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
MNS         1035             XM
BM          75249            XM
NYC         169004           XM
BO          268419           XM
RUT         8247             XM
SOO         137776           XM
NYSW        58               XM
CNJ         23503            XM
WSRX        238             TA.D
REX         6100            XMS
CNW         24810            XM
URTX        35647            RS
SHPX        20612            TA
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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:

Here's the complete template filled out with instructions.

train (Train 739).csv	<-Required name of file in csvManifests	
	<-Optional train name	
	<-Optional railroad name	
	Comments below (columns B-F) are copied to the report	
	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 instructions
	Willimantic…	See instructions; o/s in/out
	S Coventry…	See instructions
	Mansfield…	See instructions
	W Willington…	See instructions
	Stafford …	See instructions; o/s in/out
	State Line…	No work
	Monson…	See instructions
	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	East New London 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		
work	AT LEBANON CT.	
t:willimantic	AT WILLIMANTIC CT	
work	Mandatory o/s in/out point contact operator	
t:s coventry		
work	AT S. COVENTRY CT	
t:mansfield		
work	AT MANSFIELD CT.	
t:w willington		
work	AT W Willington CT	

t:stafford	AT STAFFORD CT
work	Mandatory o/s in/out point contact operator
t:monson	
work	AT MONSON, MA
	No. 739 CREW
t:palmer	AT PALMER MA
	Sign register and contact palmer operator by radio
	Contact agent for additional local work
classify	Tie up power and van when complete

Report 2b:

The full report. This set of instructions results 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 the lift reports show the final destination for the car so that the train crew can keep blocks together if desired.

```
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
                   INSTRUCTIONS
WILLIMANTIC…       SEE INSTRUCTIONS; O/S IN/OUT
S COVENTRY…        SEE
                   INSTRUCTIONS
MANSFIELD…         SEE
                   INSTRUCTIONS
W WILLINGTON…      SEE
                   INSTRUCTIONS
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STAFFORD …	SEE INSTRUCTIONS; O/S IN/OUT
STATE LINE…	NO WORK
MONSON…	SEE INSTRUCTIONS
PALMER…	SIGN REGISTER AND CONTACT PALMER OPERATOR
	BY RADIO ON ARRIVAL PALMER YARD LIMIT
	CONTACT PALMER OPERATOR FOR ADDITIONAL SWITCHING DUTIES

EAST NEW LONDON 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
			LINES DROPPED FOR BREVITY	
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
PRR	28850	XM	WILLIMANTIC
			LINES DROPPED FOR BREVITY
PRR	257213	LO	S COVENTRY
BO	370853	XM	STAFFORD
LV	50478	LO	STAFFORD
CV	43047	XM	MONSON
PRR	65947	XM	MONSON
CN	116502	HM	MONSON
CN	117625	HM	MONSON

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

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

Towns dropped for brevity

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

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	8Ø2	XI	YARD 2	NH FORT YARD
MILW	96885	HM	YARD 3	BRATTLEBORO
ATSF	31394	XM	YARD 3	BRATTLEBORO
PRR	6Ø613Ø	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

How to run BuildInstruction:

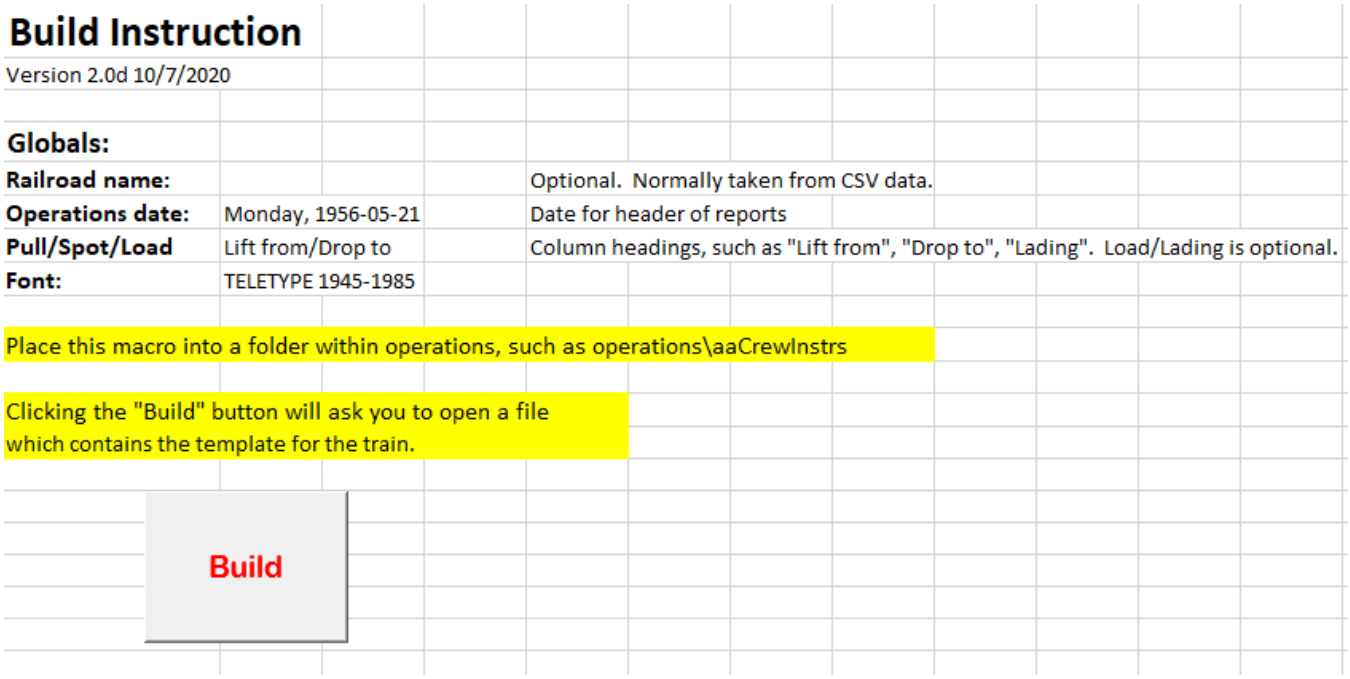
Within the *operations* folder where you find the JMRI Operations files and folders for your railroad, make a directory. I called it *aaCrewInstrs* but you can name it anything. Place BuildInstruction.xlsm in that folder.

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 in the same folder as BuildInstruction. 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 reporting 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.



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 page breaks and column widths if necessary. When you're happy with the look print the sheets. Save the template workbook 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 http://www.trxndesign.com/NNRwy/.