Missabe Northern Railway Operation

By Jeff Otto – March 2015

Introduction

The purpose of this document is to introduce and level-set guest operators to the HO scale Missabe Northern Railway and its operating practices. Reading this in advance will let me greatly shorten the "briefing" at the beginning of the operating session so that a higher percentage of your time in my basement will be doing rather than listening.

The challenge for me is that some of you reading this may be relatively new to railway operations, some experienced but new to the Missabe Northern, and others returning occasional operators that will benefit from reminders and perhaps new points since your last visit. It also serves to indicate things you may already know that are part of the practices here as well as nuances perhaps a bit different.

Most jobs are designed to be interesting and fun with minimal time pressure. There also certainly are more challenging jobs for those with more experience and desiring to grow in railroad experience. 2/3 of the jobs are within terminal areas where you don't need to deal with dispatcher train orders. But there is also plenty of over-the-road action, and lots of switching for all including the passenger trains.

I am a life-long model railroader and railfan, and retired from a 31-year career in the railroad industry with three Class 1 railroads. The Missabe Northern design is a blend of those three character flaws. The large size of the Missabe Northern lets me include a wide variety of railroad experience and reflects that I enjoy trains running on sweeping curves on open track as much as I like a variety of switching opportunities. It is built obviously to share with a major goal to make it as straightforward as possible for guests to quickly start having fun while capturing the flavor of full size railroading as realistically as practical with realistic performance to match.

The Setting

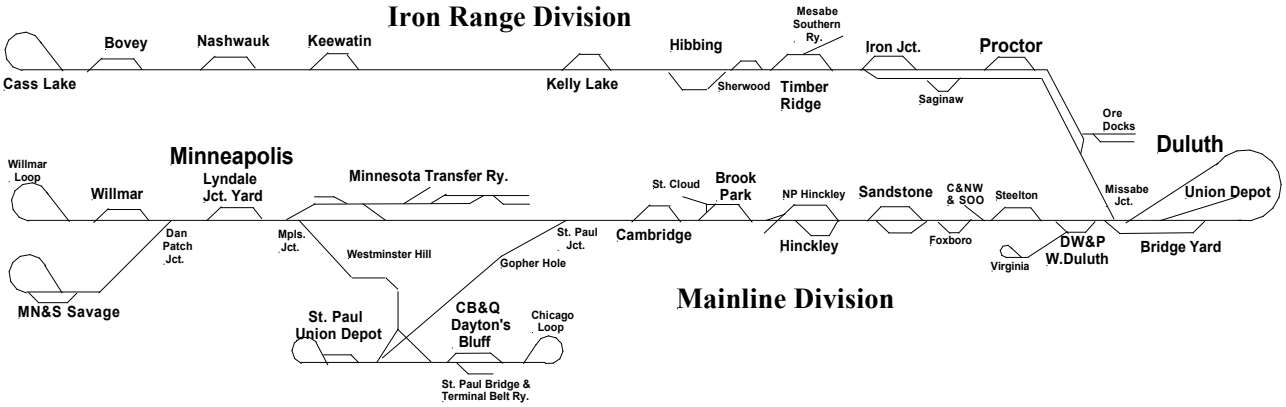
The Missabe Northern Railway is a fictitious operating company jointly owned by the Great Northern Railway and the Duluth, Missabe and Iron Range Railway. Mainline train movements are controlled by dispatcher authority. A dispatcher phone circuit and yard intercoms facilitate communications around the railroad.

The time period is early '40's so that favorite steam power may be represented. A full roster of diesels for 1963 (I like GP-30s, too) is available, but usually kept out of reach of polite society and operators…. The operating day runs from 6 am to 6 pm with a 4:1 fast clock. No daylight headlights in this era.

The Missabe Northern Railway is essentially two railroads joined at the hip, Duluth. The main deck route runs railroad-west from Duluth to the Twin Cities Terminals of Minneapolis and St. Paul. The other route climbs Proctor Hill west out of Duluth to an upper deck that represents running from Proctor railroad-west to the Mesabi

Iron Range. The railroad is built "map oriented", meaning you are looking north at the railroad with east to the right toward Duluth for both decks. The only exceptions are the dock peninsulas at Duluth that offer a 300-degree view of the docks from the harbor. GN's east-west designation is used (rather than DM&IR's north-south) to avoid confusion on the Iron Range, since the route is a "morphed" hybrid of the two railroads.

Missabe Northern Railway



Operating Mechanics

Missabe Northern (DMIR and GN) Main Track has Pink Lady quartzite ballast. Secondary track and other railroads are other colors. This is helpful when running in a terminal complex to know which track is the main.

The only double track is DM&IR double track on both approaches to Proctor, so it follows the DM&IR practice of **left-hand running** for visual accuracy and to match the functional layout of Proctor Yard's sub-yards.

A design goal is to minimize the need to reach into a scene, spoiling the railfan scene of operation. Turnout control rods on the fascia, as with interlocking towers, are "in" for the normal position, pulled out for the reverse or thrown position. When pulled out, the dowel rod will display **red if the turnout affects main track** and yellow if not. Black knobs control track at the back of a scene – "black in back". This reduces the possibility of two operators working on parallel leads moving the wrong switch points and derailing the other movement.

Many under-track uncoupling magnets are controlled using dowel rods with no knobs where **"in" is off (normal)** and pulled out positions the magnet for use. Magnets with a white-marked tie are moveable, yellow denotes fixed such as for spurs and yard body tracks. Many of the markings on the upper deck are carried up onto the side of the rail for easier spotting.

Return turnouts and magnets to Normal position (push rod pushed in) when you finish at a location.

Return your throttle to where you got it and remove the battery when done. **Do NOT zero out the address.** This just wears out the throttle twice as fast.

Let ME re-rail my brass steam engines if a derailment accidently occurs. Most have track wipers that can snag on the rail during re-railing, some have missing screws, and none like being grabbed by the side rods and valve gear.

Do not suffer with a miss-behaving engine, car, or track. I will fix or replace it on the spot whenever possible.

Operation

One-person crews are utilized (serving as both engineer and conductor or footboard yardmaster). The major yards of Lyndale, Duluth, and Proctor have true full-time yardmasters, each coordinating and managing 3-4 switch engines. Those three yardmasters and the dispatcher are the only jobs without a throttle in their hands.

All trains including passenger trains have at least some switching to perform.

Mainline train movement is controlled by a dispatcher with simplified yard limit rules applying in terminal areas due to model railroad compactness. The size of the railroad and the relatively few through trains provides a relaxed, low-key operation friendly to introducing modelers to the team sport of realistic railroad operation. 4:1 fast clocks are used to add to the illusion of time and distance and of course are essential when passenger trains are moving.

The Dispatcher controls mainline movements (outside of Yard Limits):

Mpls. Jct. to W. Sandstone and E. Sandstone to Missabe Jct. on the Mainline subdivision.
Cass Lake to W. Hibbing and E. Hibbing to Saginaw on the Iron Range subdivision.

Yard Limit signs indicate Absolute Stop UNLESS specific authority to proceed beyond the sign (in either direction) has been issued by the person in charge of that track. There is no Main Track designated in Sandstone Yard Limits, which means 1st class trains hold no special authority over other classes of trains at that location. This is done because the depot is on the North Pass, not the main line. It also gives the Sandstone switcher freedom to make its frequent moves from the south side to the north side and back, thereby reducing dispatcher work load.

Yard Limits controlled locally:

Willmar – Lyndale – Mpls. Jct.	(Lyndale Yardmaster control)
Sandstone	(no Main track, Sandstone footboard yardmaster control)
Duluth	(Duluth Yardmaster control)
Saginaw - Proctor - Missabe Jct.	(Proctor Yardmaster control)
Hibbing	(Hibbing footboard yardmaster control)

Work locations have printed Work Plans to guide you on the goals of that job. In most cases the priorities are left to you based on the traffic and situation you face at the time. Work Plans dispersed to the work site keep the timetable size compact and everyone doesn't need to flip through pages of special instructions to find what each only needs for the current location they need to work.

The marked magnet locations represent the safe clearance point for industrial and yard tracks. There should NEVER be any portion of a car left occupying any space between the safe clearance point and the associated turnout. NO exceptions, period. This is a life and death safety rule for full size railroading. (Passing sidings may have more than one magnet to serve multiple industry spurs and so are a different situation.)

If an "extra" car is billed into a full industry track, you may turn the waybill of a car in place so it becomes a pickup. Then do the switching so the track is left in a safe condition. This is because many locations do not have the track space to leave cars "off spot" and long passing sidings are NOT to be used for off-spot cars.

Administration

A "train pack" includes a large clip, a Train Header card describing the work locations the train serves and your engine card. Freight trains will also have a red caboose card whose pocket is a convenient place to store the engine card. Car cards should match all cars in the train. Passenger trains are similar except instead of a caboose card there will be a Consist card specifying the order certain car types are to be placed in the train if present in today's version of the train (as indicated by waybills). Passenger cards and waybills are white.

Any trains going to staging or visible staging (crew change points) will have specific instructions at the bottom of the Train Header describing how the train is to be parked. This orients it properly for its next use.

Locals switch town industries, through freights do not. But through freights may have "block swaps" to make at designated locations. This is a simple hand-off. A local or a town switcher will then actually spot the cars at the industries. The written clue on the Train Header will be the term "block swap" on through trains, which are low 400-series freight trains. Locals will use the abbreviations SO and PU for industry setouts and pickups or simply "Switch".

Car forwarding is based on the "car card and waybill" concept adapted to Missabe Northern needs. Waybills contain only essential movement information so the type can be as large as possible and so the reader doesn't need to skim over boiler plate to find it. Card box slots exist for every track where cars are placed for ease of keeping inventory properly by track. Waybills set for the current location are holds, all others are pick-ups. Passenger equipment also has individual car cards and waybill information, as some trains need to be made up before departure and need to be switched out at final terminal and sometimes in route.

Ore cars all move in "mine blocks" of 5 cars. A single car card lists the 5 cars of a mine block, so a 60-car road ore train is only 12 car cards.

Caboose cards are red and have a simple schematic of the railroad on the back identifying locations.

Switch List forms and clipboards are available at the Dispatcher's desk if desired. Two-man crews should be used so that the extra paperwork does not unduly slow the work of the job. Inventory of car placement and pickups still needs to be maintained with the car cards before you leave a location.

Keep car card inventory from front to back as cars stand. For train, this is engine to caboose. For a track, this is from switch to bumper or lead into body. Miss-matched or orphaned cars and cards should be brought to the "orphan table".

Clip a train pack at the bottom of the cards, not top. This reduces wear on printing at top and concave curling of cards (won't stand straight for easy reading in card box). **Do not turn car cards or train packs backwards** in box slot when you complete a task. 50% of car cards are double sided with a 2-move waybill printed on the card, so you'd mess up the billing if you turned a train pack as a unit instead of waybills individually.

Ore Operations

There are three general types of car fleets on the Missabe Northern: passenger, freight, and ore. Ore is recognized separately because that fleet is 50% of all cars and they are handled differently than general freight traffic.

All ore movements between Proctor and the Iron Range mines and yards are handled ONLY in dedicated ore trains and mine turns. (These aren't unit trains in the modern sense of staying intact throughout their cycle, hence the term dedicated.) Only the occasional mine block or two destined to the steel mill at Steelton is handled in freight service from Proctor down to Duluth and out to Steelton.

The larger mine and washer facilities are switched differently than typical smaller industries. They have separate dedicated tracks for empties (Mtys) and loads from the tipples. In such situations, the Mtys are spotted first before gathering loads. If not done this way, you will quickly find yourself tied to long cuts of cars making you needlessly poke out onto and tying up main track for head room. Follow the printed guidelines. There is also a smaller mine and one mine interchange where the loads are pulled out first to make room to spot the Mtys.

Missabe Northern Jobs

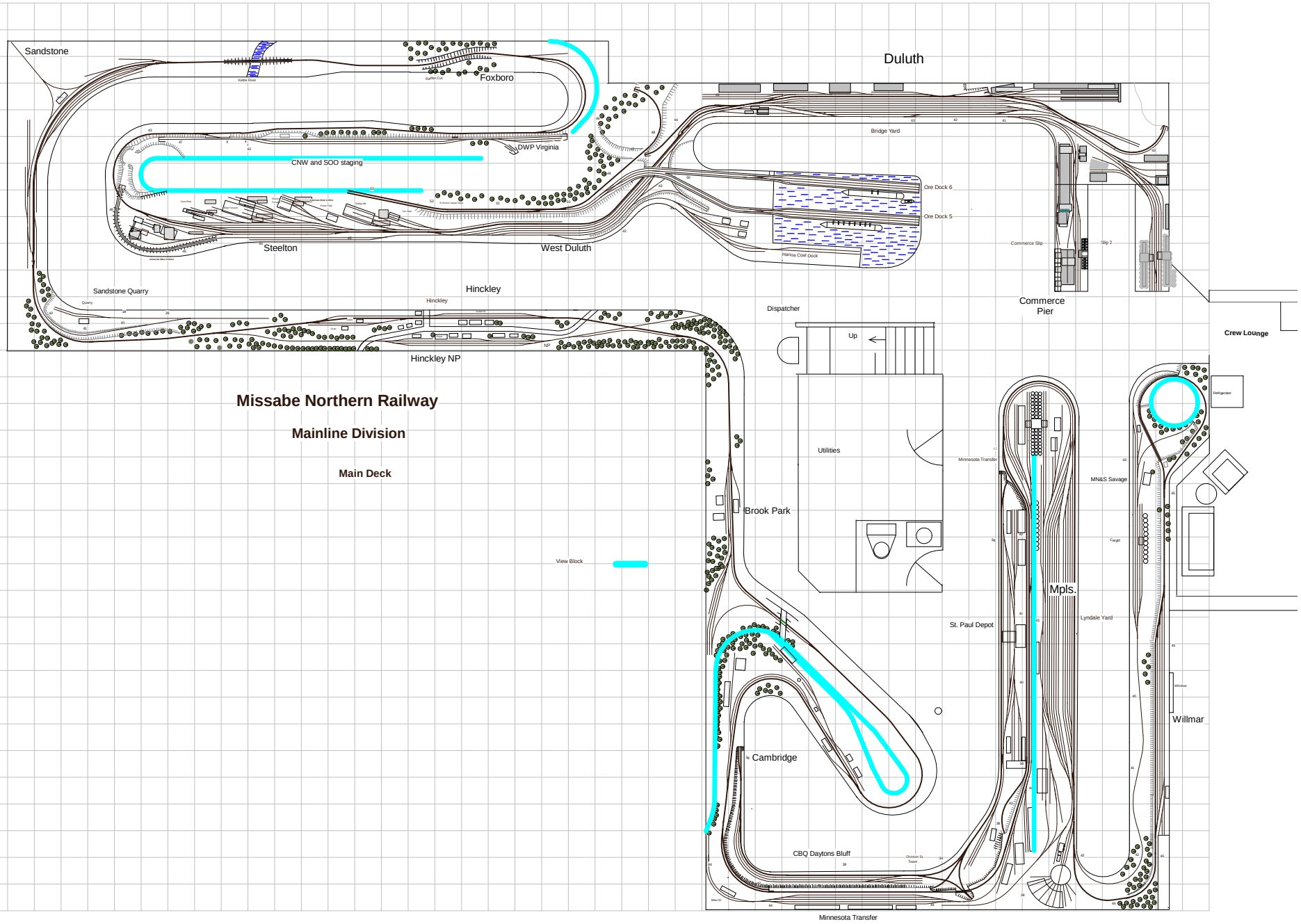
Service

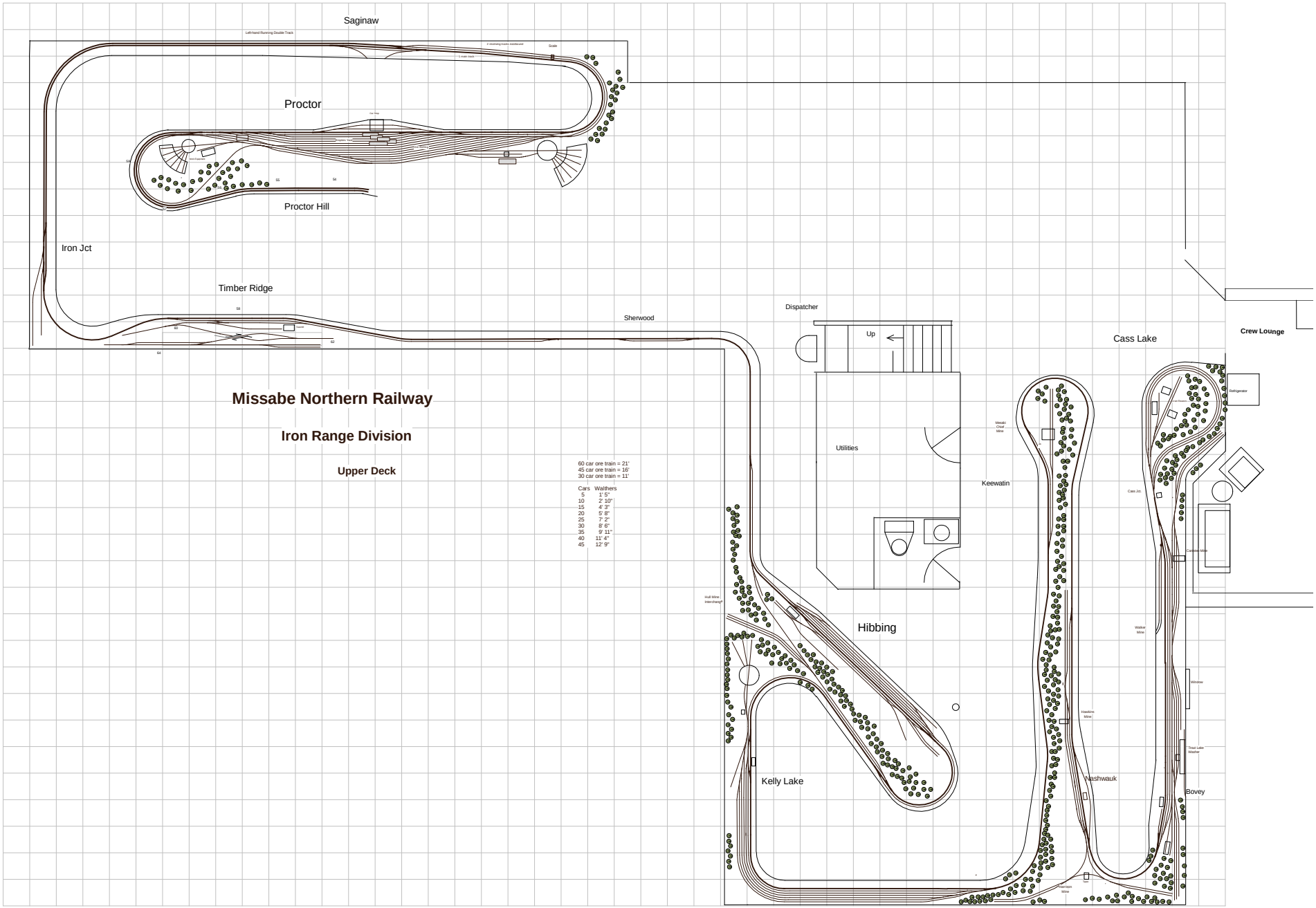
Job Type	Road	Job Location	Train	Name	Job Description
***Supervisor**					
Dispatcher					
	MNRy	Disp. Desk	Disp	Dispatcher	Provide mainline movement authority
Yardmaster					
	DMIR	Proctor	YM-PR	Proctor Yardmaster	Manages 2 switchers and 2 dock turns
	GN	Duluth	YM-DU	Duluth Yardmaster	Manages 4 switch engines
	GN	Lyndale	YM-M	Lyndale Yardmaster	Manages 2-3 switch engines
.Ore					
Multiple					
	DMIR	Bovey	M102	Missabe Ore	Road to Proctor, dock turn, road to Bovey, yard and mine switching at Bovey
	DMIR	Proctor	M101	Missabe Mtys	Road to Bovey, yard & mine switching at Bovey, road to Proctor, dock turn
	GN	Kelly Lake	471	Mine Turn W	Mine turn to Nashwauk, road Kelly Lake to Proctor, Dock turn, road Proctor to Kelly Lake
	GN	Proctor	462	GN Ore	Dock turn, road Kelly Lake to Proctor, road Proctor to Kelly Lake, mine turn to Nashwauk
Switcher					
	DMIR	Proctor		Proctor Class	Ore yard switcher
Switcher & Transfer					
	DMIR	Proctor		Proctor Trim	Switch Mtys, ore dock turn, misc.
.Ore & Freight					
Switcher					
	GN	Kelly Lake		Kelly Lake Switcher	Split duty to assist Hibbing when time available
.Passenger					
Passenger					
	GN	Duluth	19	Gopher	Build consist, run to St. Paul, switch out consist
	GN	Duluth	23	Badger	Build consist, run to St. Paul, switch out consist
	GN	St. Cloud	32	St. Cloud Motor	Gas electric turn to Sandstone, reefer swap
	GN	St. Paul	20	Gopher	Build consist, run to Duluth, switch out consist
	GN	St. Paul	24	Badger	Build consist, run to Duluth, switch out consist

Missabe Northern Jobs

Service

Job Type	Road	Job Location	Train	Name	Job Description
Freight					
Local					
	DMIR	Duluth	M301	DMIR Local West	Local to Hibbing
	DMIR	Hibbing	M302	DMIR Local East	Local to Duluth
	GN	Duluth	591	Foxboro Local	Local turn to Sandstone
	GN	Hibbing	421	Range Local WB	Local turn to Cass Lake
	GN	Lyndale	582	Cambridge Local Eas	Local turn to Brook Park
	GN	St. Cloud	584	St. Cloud Local	Local turn to Sandstone
Switcher					
	DWP	W. Duluth		Peg Switcher	Yard switcher
	GN	Hibbing		Hibbing Switcher	Yard and industry switcher
	GN	Lyndale		Lyndale Trim	Yard switcher and hostler
	GN	Lyndale		Lyndale Class	Yard switcher
	GN	Lyndale		Lyndale Industry	Industry switcher split with CB&Q job
	GN	Sandstone		Sandstone Switcher	Industry switcher
	NP	Duluth		W Class Switcher	Yard switcher West End
	NP	Duluth		E Class Switcher	Yard switcher East End
	NP	Duluth		Commerce Pier	Industry switcher
	NP	Duluth		Grain Pier	Industry switcher
Switcher & Transfer					
	CB&Q	Daytons Bluff		Q	Industry switching, transfer turns to Lyndale, Lyndale industry
	DMIR	Steelton		Steelton Switcher	Switch steel mill
	DWP	W. Duluth		Peg Utility	Industry switcher and transfer turns to Superior staging
	MNS	Savage		Dan Patch	Industry switcher, transfer turns, Willmar staging transfers
	MT	Minn. Transfer		Minnesota Transfer	Industry switcher and transfer turns
	NP	Hinckley		NP	Industry switcher and transfer turn to Duluth
Through					
	GN	Cass Lake	414	Great Lakes	Cass Lake-Hibbing-Proctor-Duluth
	GN	Cass Lake	416	Duluth Grain	Cass Lake-Hibbing-Proctor-Duluth
	GN	Duluth	2/407	Mpls Time	Duluth to Lyndale w/block swaps enroute
	GN	Duluth	407	Mpls Time	Duluth to Lyndale w/block swaps enroute
	GN	Duluth	411	WB Forwarder	Duluth to Lyndale w/block swaps enroute
	GN	Duluth	413	Northern States	Duluth-Proctor-Hibbing-Cass Lake
	GN	Duluth	415	Dakota Box	Duluth-Proctor-Hibbing-Cass Lake
	GN	Lyndale	2/408	Duluth Time	Lyndale to Duluth w/block swaps enroute
	GN	Lyndale	408	Duluth Time	Lyndale to Duluth w/block swaps enroute
	GN	Lyndale	412	EB Forwarder	Lyndale to Duluth w/block swaps enroute


Sandstone
Foxboro
Duluth
DWP Virginia
CNW and SOO staging
Bridge Yard
Ore Dock 6
Ore Dock 5
Steelton
West Duluth
Commerce Slip
Slip 2
Sandstone Quarry
Hinckley
Commerce Pier
Crew Lounge
Dispatcher
Up
Hinckley NP
Missabe Northern Railway
Mainline Division
Main Deck
Utilities
Brook Park
View Block
Minnesota Transfer
MN&S Savage
Mpls.
St. Paul Depot
Lyndale Yard
Willmar
Cambridge
CBQ Daytons Bluff
Minnesota Transfer


Saginaw
Proctor
Proctor Hill
Iron Jct
Timber Ridge
Sherwood
Dispatcher
Up
Utilities
Hibbing
Kelly Lake
Keewatin
Nashwauk
Cass Lake
Crew Lounge
Refrigerator
Bovey
Missabe Northern Railway
Iron Range Division
Upper Deck
60 car ore train = 21'
45 car ore train = 16'
30 car ore train = 11'
Cars Walthers
5 1' 5"
10 2' 10"
15 4' 3"
20 5' 8"
25 7' 2"
30 8' 6"
35 9' 11"
40 11' 4"
45 12' 9"