

The Times

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A journal of transport timetable history and analysis



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Timetable below is courtesy of "Airline timetable images"
<http://www.timetableimages.com/ttimages/south.htm>



The Significance of North American Employees' Timetables

by VICTOR ISAACS

THIS ARTICLE IS AN ATTEMPT to explain the significance of North American Employees' Timetables (hereafter abbreviated to ETTs) and their former importance in the operation of North American railroads.

The first thing that must be emphasised about ETTs is this: Forget absolutely everything you know about how trains are run in Australia, Britain or British-influenced countries. Put what you know about this out of your mind. There is no correlation whatsoever between the British/Australian methods of train control on single-track lines and North American methods.

American Railroads are divided into Divisions. Historically, each Division had its own ETT. In 2002, Geoff Lambert estimated that to that date, about 110,000 ETTs would have been published. Today, it is common for one ETT to cover an entire railroad, even the giant companies.

Until a few decades ago ETTs were the prime object controlling how trains operated in North America. That is to say, in general, trains had authority to run because they appeared in the ETT. The basic rule was: A train ran because it was in the ETT; if it was not in the ETT it did not run. But, as we shall see later, there were enormous exceptions to this rule. In addition, no train may ever leave an initial station without a "clearance", that is, a compendium of Train Orders (see below) applicable to its run.

Trains in ETTs were set out so that all trains running could be ascertained at a glance. The stations were set out in the middle of the table. Trains running on one direction were set out running down the page on one side. Trains running in the opposite direction were set out from bottom to top on the opposite side. On busy lines, this often was a double page spread. On very busy lines, a very large page size was required so that all trains on both directions could be shown on a double page spread. These Employee Timetables were colloquially referred to as "horse blanket timetables".

So, trains ran because they were in the ETT. But it was more complicated than this. Trains were designated into either Northbound and Southbound, or into Westbound and Eastbound. The ETT stated which was the Superior direction. More often than not, Northbound trains were Superior to Southbound trains and Westbound trains were Superior to Eastbound trains – but not always.

That is just the first step. Then all trains

"Forget absolutely everything you know about how trains are run in Australia, Britain or British-influenced countries. Put what you know about this out of your mind."



1. Typical front covers of US Employee Timetables

were usually divided into four classes: First Class, Second Class, Third Class and Fourth Class. A First Class train was Superior to Second, Third and Fourth Class trains. A Second Class train was Superior to Third and Fourth Class trains. A Third Class train was Superior to a Fourth Class train. So, a First Class train in the Superior direction (say Northbound) was superior to every other train on the line. At the opposite extreme, a Fourth Class in the Inferior direction (say Southbound) was Inferior to all other trains, and had to give way to all other regular trains.

Typically a First Class train would probably be an express passenger train, a Second Class train a local passenger train, rail motor, milk train or express freight, a Third Class train might be a Mixed train or a through freight train, and a Fourth Class

train would probably be a wayside freight train. In the 1960s and 70s, the Southern Pacific and the Seaboard Coast Line, ran some very hot freight trains as First Class trains.

Many railroads operated only two classes of trains, First and Second. In this case, First Class were passenger trains, Second Class trains on these railroads were freight trains. Some railroads had three classes. Most had four classes. The Chesapeake and Ohio Railway had five classes.

Most major carriers did not run their freight trains on schedules, preferring to run them as Extras. Freights – believe it or not – are very difficult to keep on schedule. In the steam days when Timetable and Train Order was the usual method of control, they often had to stop for water, set

2 Westbound-- BETWEEN COLUMBUS AND GREENVILLE--Eastbound												
SECOND CLASS				TIME TABLE No. 25				SECOND CLASS				
51		15		Car Capacity	Miles from Columbus	Effective December 4, 1949		Station Numbers	16		52	
Through Freight		Through Freight				STATIONS			Through Freight		Through Freight	
Daily		Daily						Daily		Daily		
L 3 00PM		L 7 15AM		314	0.0	DNWG.....	COLUMBUS.....	SXY	0	A 4 20PM		A 11 50PM
3 13		7 30		15	7.9		WAVEBLY.....	8		3 54		11 33
3 35 1/2		8 30		243	17.8	D.....	WEST POINT.....	18		3 35 1/2		11 15
4 15												
4 33		8 48		35	28.9		CEDAR BLUFF.....	29		2 51		10 41
4 44		9 00		53	35.7		PREDA.....	38		2 40		10 30
5 03		9 20		58	43.9	D.....	MADEN.....	44		2 27		10 15
5 25		9 40		75	48.7	D.....	MATHISTON.....	47		2 20		10 10
5 45		10 10		115	55.1	DW.....	EUFORA.....	55		1 55		9 40
5 58		10 22		30	61.6		TOMNOLEN.....	62		1 34		9 13
6 07		10 32		56	68.7		STEWART.....	67		1 25		9 01
6 21		10 47		38	74.8	D.....	KILMICHAEL.....	75		1 10		8 50
6 30		10 55		39	78.9		HENDRIX.....	79		12 56		8 42
7 15		11 35		386	84.8	DNWG.....	WINONA.....	85		12 45		8 30
7 19		11 40		12	86.2		CRESSONA.....	86		12 03PM		8 01
7 30		11 51 1/2		44	92.6		MCCARLEY.....	93		11 51 1/2		7 49
7 40 1/2		12 05PM		155	97.5	DY.....	CARROLLTON.....	97		11 35		7 40 1/2
7 51		12 16		50	103.5		MALMAISON.....	103		11 15		7 18
8 30		12 55		487	113.0	DNWO.....	GREENWOOD.....	113		10 55		7 00
8 49		1 20		84	121.5	D.....	ITTA BENA.....	121		10 15		5 40
8 54		1 25		38	124.6		BERCLAIR.....	125		10 06		5 34
9 15		1 45		77	133.1	D.....	MOORHEAD.....	133		9 50		5 18
9 25		1 54		47	137.9		BAIRD.....	138		9 34		5 08
9 50		2 15		199	142.3	D.....	INDIANOLA.....	142		9 25		5 00
9 59		2 23		43	146.6		HEATHMAN.....	147		8 57		4 27
10 10		2 33		29	152.6		DUNLEITH.....	153		8 46		4 16
10 30		2 55		51	156.2	D.....	ELIZABETH.....	156		8 40		4 10
10 35		3 00		11	158.5		STONEVILLE.....	159		8 20		3 50
10 50		3 13		100	166.0		HUNTINGTON JUNCTION.....	166		8 07		3 35
A 11 00PM		A 3 30PM		323	167.7	DWO.....	GREENVILLE.....	168		L 8 00AM		L 3 30PM 1/2
Daily		Daily								Daily		Daily

ALL WEST-BOUND Trains are SUPERIOR to Trains of the SAME CLASS in the OPPOSITE Direction, in Accordance with Rule No. 72

2. A very simple example of an Employees' Timetable. This is the Columbus and Greenville Railway for 4 December 1949. There are only four trains, all Second Class. As always, crosses are shown with bold times. The times of train no. 51 for the cross at West Point is shown with both arrival and departure times. This was not usual, but was sometimes done. Usually only departure times were indicated.



out and pick up cars, and so forth. It was very difficult to write a schedule that could take all of that into account – some engineers took water at every tank, if you included time for that in the schedule and then a new engineer came on the run and took water at only every second tank, the train would be doing a lot of waiting. Even worse if the schedule was written for stopping at every second tank but the engineer stopped at them all.

And once a train gets late, every inferior train will be waiting for it. The dispatcher (controller) would quickly become

very busy, trying to help inferior trains along the railroad. So running freights on schedules usually just was not done.

That said, however, some roads did publish freight train schedules in the ETT. A railroad would show freight trains in one direction only, usually the superior direction. This was for operational convenience – it is easier to run extra trains in one direction only.

Note this, because it is central to understanding how North American railroads once operated: Originally there was no central control. So, it was the responsibility

of the Conductor and Engineer of each and every train to work out for themselves the relative position of their trains in relation to every other train on the line. The safety of their trains depended upon this. The safety of the possibly hundreds of passengers on their trains, and on other trains, depended upon each and every Conductor correctly computing where their trains were in relation to all the other trains on the line. That is, they had to determine according to whether their trains were operating to time as to where their trains had to enter sidings at stations and wait for other trains that were Superior to their trains. Superior trains, remember, did not wait for Inferior trains. It was the responsibility of the Conductors and engineers of those Inferior trains to get their trains off the mainline safely and in time.

But wait, there is more! What if a train is running late? Then the Conductor and Engineer had to adjust their calculations accordingly. Woe betide them, and all their passengers, if they did not calculate correctly! Conductors and Engineers of late running trains had to adjust their calculations according to where their trains were in reality, and to get into sidings accordingly.

Which is why Train Orders were developed, and a central authority assigned. When everything works without problems, nobody gets late and/or nothing special happens, the timetable works fine. When it doesn't, a railroad can quickly get tied into knots.

What if a train was very, very late? If a train was more than twelve hours late, it lost all rights to run. If it was to proceed, it could only do so as an Extra (more on this later).

But wait, there is more, much more! A train could run in more than one section. At every crossing point, the Conductor and Engineer of a train had to identify the train(s) they were crossing. If the Superior train(s) they were crossing passed through flying two green flags by day or displaying green lights by night – one each side of the front of the locomotive – this meant the other train was running in more than one section. So, they had to wait some more, for the next section of the train to arrive, and, if that also had green flags or lights, the one after that, and the one after that, and so on until a train passed through that was not flying green flags or lights. That meant the opposite train was now complete, had no more sections, and therefore they could now proceed.

But consider this: Say #1 and #3 (two passenger trains) are scheduled over the same territory one hour apart. You are in a siding, clear of the main track, waiting

for #1. You have no train orders saying anything about sections. At the expected time, a passenger train in the opposite direction to you shows up - but it's displaying green signals. Section following, so you wait. One hour later, another passenger train shows up, no signals, and crosses your train. Can you proceed?

However, this is only the start of the complications. Firstly, the running of any train could be altered by the Train Controller ["Dispatcher"]. When this happened, the Train Controller had to advise the crew of the altered train, as well as, of course, also advising the crews of all the other trains that would be affected.

Now, the biggest complication of all: In addition to the trains in the ETTs, Extra trains could also run. These ran according to whatever level of Superiority the Train Controller assigned to them. Extra trains were identified by the fact that they flew white flags by day and displayed white lights by night - one each side of the front of the locomotive. This explains all the white flags you saw on locomotives in Cowboy movies.

(Perhaps you also saw locomotives in the movies flying American flags. These have no significance in train operation or in designating the level of train superiority. The flags, of course, do have significance as a demonstration of patriotism, never, ever to be under-estimated in the US.)

An extra has no rights, other than what the dispatcher gives it. And since it has no schedule, it has no class, and cannot be assigned one. The dispatcher can give it the equivalent of class by making it superior to ("RIGHT OVER") certain trains. If train 434 is in the timetable, by rule it already has a class assigned to it, and needs only a clearance from the dispatcher. Once it has that clearance it may proceed on its schedule, keeping clear of superior trains as required by the rules.

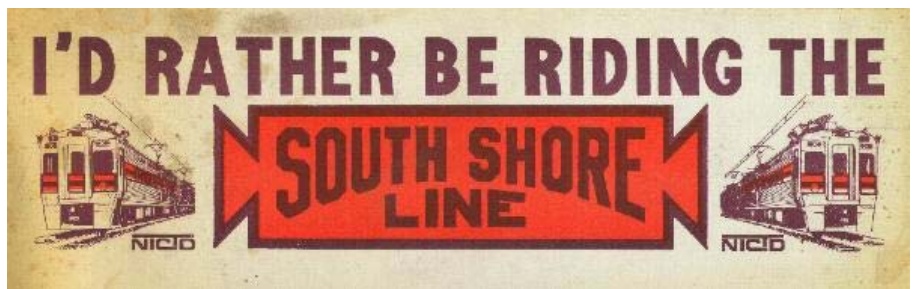
So, an Extra train's Train Orders might read something like this: "ENGINE 567 RUN EXTRA BILLINGS TO CHARLIE". Note the designation of the locomotive number. This was vital, because this was how the crews of other trains identified the Extra train. Now, the Conductor of this train, and the Conductor of every other train on the line, had to work out from the running times of the Extra, where it was in relation to them, and their relative level of Superiority/Inferiority.

This train runs, whenever it is ready, clearing all regular trains. (In actual practice, many roads relieved extra trains of the requirement to clear second / third class trains moving in the same direction.) There is no mention made of any opposing extra trains, so there cannot be any already authorized between Charlie and Billings.

If it is desired that the extra not leave be-

		WESTWARD TRAINS								11
		FIRST CLASS								
Miles from South Bend	STATIONS	26	126	28	428	128	30	130		
		Chicago Limited	Chicago Express	Chicago Limited	Chicago Express	Chicago Express	Chicago Limited	Chicago Express		
		PM	PM	PM	PM	PM	PM	PM		
89.9	(RANDOLPH ST.) CHICAGO	A 4 25	A 5 05	A 5 31	A 6 35	A 6 08	A 6 31	A 7 05		
		Daily	Day Ex. Sat-Su	Day Ex. Sat-Su	Sat-Sun & Hol.	Day Ex. Sat-Su	Day Ex. Sat-Su	Day Ex. Sat-Su		
75.7	KENSINGTON	S 4 04 PM	S 4 43 PM	S 5 10 PM	S 5 14 PM	S 5 47 PM	S 6 10 PM	S 6 43 PM		
74.6	124th STREET	F 4 01	F 4 40	F 5 07	F 5 11	F 5 45	F 6 07	F 6 40		
72.9	CALUMET HARBOR	S 3 59	F 4 37	F 5 04	F 5 08	F 5 42	F 6 04	F 6 37		
70.9	HERGIVISCH	S 3 57	S 4 34	S 5 02	S 5 05	S 5 39	S 6 02	S 6 34		
69.9	HAMMOND	S 3 54	S 4 30	S 4 59	S 5 01	S 5 35	S 5 58	S 6 30		
66.2	EAST CHICAGO	S 3 50	S 4 25	S 4 54	S 4 56	S 5 30	S 5 54	S 6 25		
61.8	CLARK X-OVER	DD 3 46	F 4 20	F 4 50	F 4 51	F 5 25	F 5 50	F 6 20		
60.6	AMBRIDGE	DD 3 44	F 4 19	F 4 48	F 4 49	F 5 23	F 5 48	F 6 19		
59.6	BUCHANAN ST.	DD 3 43	F 4 17	F 4 47	F 4 47	F 5 23	F 5 47	F 6 17		
58.9	GARY	S 3 41	L 4 15 PM	S 4 43	L 4 45 PM	S 5 21	S 5 45	L 6 15 PM		
58.1	END DOUBLE TRACK	3 37	Will not Operate on Holidays	4 41		5 17	5 41	Will not Operate on Holidays		
55.2	MILLER	3 34		4 38		5 14	5 38			
	WAGNER	3 32		4 36		5 12	5 36			
54.0	WAGNER	3 31		4 35		5 10	5 35			
52.8	OGDEN DUNES	DD 3 30	F 4 34	F 4 34	F 5 08	F 5 08	F 5 34	F 6 08		
50.9	OGDEN DUNES	DD 3 28	F 4 32	F 4 32	F 5 06	F 5 06	F 5 32	F 6 06		
49.3	WILSON	F 3 25	F 4 29	F 4 29	F 5 02	F 5 02	F 5 29	F 6 02		
48.8	BAILY	DD 3 23	F 4 28	F 4 28	F 5 01	F 5 01	F 5 28	F 6 01		
45.6	DUNE ACRES	DD 3 22	F 4 27	F 4 27	F 5 00	F 5 00	F 5 27	F 6 00		
	PORT CHESTER		C 4 25	C 4 25	F 4 59	F 4 59	F 5 25	F 6 00		
	TREMONT SIDING	3 20		4 24		5 00	5 24			
43.4	TREMONT	F 3 19	F 4 24	F 4 24	L 4 55 PM	F 5 24	F 5 24	F 6 00		
40.2	KEISER	3 16		4 21		5 21	5 21	6 00		
39.4	BEVERLY SHORES	F 3 15	F 4 20	F 4 20	Will not Operate on Holidays	F 5 20	F 5 20	F 6 00		
38.4	TAMARACK	3 13		4 18		5 18	5 18	6 00		
	LAKE SHORE			4 15		5 15	5 15	6 00		
35.4	SHERIDAN	3 10		4 15		5 15	5 15	6 00		
34.0	MICHIGAN CITY	S 3 05		4 10		5 10	5 10	6 00		
32.4	SHOPS	3 00		4 05		5 05	5 05	6 00		
30.2	DAVIS	2 55		4 00		5 01	5 01	6 00		
	SPRINGVILLE			3 58		4 58	4 58	6 00		
28.6	ANDRY	2 51		3 56		4 56	4 56	6 00		
	LALIMERE	2 49						6 00		
	TEE LAKE							6 00		
22.2	SMITH	2 47		3 52		4 55	4 55	6 00		
18.6	BIRCHIM	F 2 44	F 3 49	F 3 49		4 52	4 52	6 00		
15.8	LAKE PARK	DD 2 40	F 3 46	F 3 46		4 49	4 49	6 00		
15.2	HUDSON LAKE	F 2 38	F 3 44	F 3 44		4 47	4 47	6 00		
	NEW CARLSLE	F 2 36	F 3 42	F 3 42		4 46	4 46	6 00		
13.6	CARLSLE	F 2 35	F 3 40	F 3 40		4 44	4 44	6 00		
10.4	OLIVE	2 32	F 3 37	F 3 37		4 41	4 41	6 00		
	LYDIK	F 2 29	F 3 35	F 3 35		4 37	4 37	6 00		
	CHAIN LAKES					4 38	4 38	6 00		
5.4	FISHER	2 27		3 31		4 35	4 35	6 00		
2.2	BENDIX	C 2 24	C 3 28	C 3 28		4 32	4 32	6 00		
0.9	CUMMINS	2 20		3 24		4 28	4 28	6 00		
0.0	SOUTH BEND STA.	S 2 17		3 20		4 25	4 25	6 00		
0.0	SOUTH BEND TERM.	L 2 14 PM		L 3 17 PM		L 4 20 PM	L 4 20 PM	6 00		

3. A busier line: Passenger trains in an ETT of the Chicago, South Shore and South Bend Railroad dated 29 April 1962. Note that the days of the week are jumbled up. Trains were usually listed by time only, unless on a very busy line, in which case separate weekday and weekend timetables might be issued, or weekday pages followed by weekend pages. Some roads in the Northeastern US did this.



fore 125pm, that can be added to the order:

AFTER 125PM ENGINE 567 RUN EXTRA BILLINGS TO CHARLIE

If there is an opposing superior train, but the Extra is more important, you would have two orders: EXTRA 567 WEST HAS RIGHT OVER NO 2 BILLINGS TO CHARLIE and AFTER 125PM ENGINE 567 RUN EXTRA BILLINGS TO CHARLIE

As regards clearing regular trains, the dispatcher could issue orders changing their

schedules. "NO 1 RUN ONE HOUR LATE ACME TO CHARLIE". That makes No 1's schedule one hour later than what is printed in the timetable, and an inferior train could use that time to make a better meet (cross) with No 1.

All the alterations to running of trains by Train Controllers were set out in Train Orders. There are two types of Train Orders. Form 19 and Form 31. In recent times, Form 31 orders restricted a train; and Form 19 orders helped a train. All could be a matter of life and death. Disre-

		SECOND SUBDIVISION					EASTWARD	
Time-Table No. 24 April 27, 1958		FIRST CLASS					SECOND CLASS	
STATIONS		116 Streamliner Passenger	10 Passenger	108 Streamliner Passenger	104 Streamliner Passenger	6 Passenger	256 Time Freight	260 Time Freight
DN-R	YERMO YL BN	103.2	A 11.48AM	A 3.45PM	A 5.38PM	A 8.20PM	A 3.00AM	A 4.30AM
DN	DAGGETT	156.6	11.40AM	3.35PM	5.30PM	8.11PM	2.50AM	
	BARSTOW	150.1	11.30	3.25	5.20	8.01	2.35	
	SAN BERNARDINO	67.3	9.40	1.15	3.29	5.08	12.35	10.45AM
	COLTON	94.5	9.37	1.02	3.20	5.55	12.15	10.00
	S. P. and A. T. & S. F. Crossings							
	RIVERSIDE JCT. YL	58.2	9.17AM	12.52PM	3.10PM	5.45PM	12.03AM	
	RIVERSIDE YL	57.5	9.15	12.50	3.07	5.43	11.59PM	
	P. E. CROSSING	55.2						
	STREETER	53.3						
	ARLINGTON	53.0						
	ELY	48.3						
	MIRA LOMA	45.6						
	S. P. CROSSING	38.1						
	ONTARIO YL RA	37.8				11.30		
	MONTEVISTA	35.5						
	S. P. CROSSING	33.0						
	POMONA YL PO	32.0	8.45	12.20PM	2.43	5.15	11.20	
	SPADRA	28.9						
	WALNUT	24.4						
	PUEBLO JCT.	17.8						
	INDUSTRY BG	17.0						
	BARTOLO	11.3						
	WHITTIER JCT.	10.9						
	PICO	10.3						
	MONTBELLO MR	8.3						
	EAST LOS ANGELES YL	5.7	8.20	11.50	2.20	4.50	10.50	
	DN-R EAST YARD YL	5.8					7.00AM	8.00PM
	DOWNEY ROAD YL	2.8						
	NINTH ST. JCT. YL	1.7						
	FIRST ST. YL	0.0						
	PASADENA JCT. YL							
	A. T. & S. F. Csg. (Mission Tower)							
	DN-R LOS ANGELES (Union Station)		8.00AM	11.30AM	2.00PM	4.30PM	10.30PM	
	165.2		Daily	Daily	Daily	Daily	Daily	Daily
Thru Time		(3.48)	(1.15)	(3.38)	(3.50)	(4.30)	(8.10)	(8.30)
Average speed per hour		43.1	33.9	42.5	43.0	36.7	19.1	18.3

Time shown at Colton, San Bernardino and Barstow is for information only. Trains are governed by A. T. & S. F. Ry. time-table and rules while using their tracks between Daggett and Riverside Jct. and are governed by L. A. U. P. T. rules while using their tracks between Los Angeles and terminal limits, 200 feet west of A. T. & S. F. Csg. (Mission Tower). Movement of trains and engines between Pasadena Jct. and Los Angeles is governed by interlocking signals.
For conditional stops to discharge or pick up revenue passengers.—See Page 3.
For stations not shown on schedule pages.—See Page 11.

4. Another busy passenger line: A Union Pacific ETT of 27 April 1958. Times are shown, but in fact, it does not matter, because the line is controlled by Centralised Traffic Control. In fact, it says, "Time shown at Colton, San Bernardino and Barstow is for information only." Below: One of these trains, No 104, the "City of St Louis" ascends Cajon Pass at Sullivan's curve



garding any train order could result in catastrophe, and was a firing offence.
Say you have two trains, #1 running from Acme to Zebra and #2 from Zebra to Acme. No 2 is superior by direction. They are scheduled to meet (cross) at Midway.

However, today #2 is late and the dispatcher determines they should cross at Piffle, so he puts out an order: NO 2 MEET NO 1 AT PIFFLE
No 2 formerly had authority to run past Piffle, to Midway, to meet No 1. Now he

does not; he is being restricted, and would get this order on Form 31. No 1 formerly had authority to run as far as Midway; now he can go beyond, to Piffle. He is being helped, and would get this order on Form 19.

The Train Orders were telegraphed to Train Order stations where they were received by the depot operator. He set signals accordingly. If a train had to receive Form 19 Train Orders, the signal at the depot was set at 45° angle. The train slowed. The Train Orders were collected as the train passed through. Form 31 Train Orders were handled much more carefully. The depot signals were set at 90°. The train had to stop. The Conductor and Engineer collected the Train Orders and had to read them back to the Operator. Then they had to sign that the Train Orders had been received. Then the operator sent the order number and the signatures to the dispatcher, who would make the order "Complete" and issue a clearance, after which the train could proceed on its rights.

Train Orders would also be issued if a scheduled train was annulled. This, of course, was important, because otherwise, other trains would have to wait forever (well, actually for 12 hours) for it to arrive at crossing stations.

Consider this problem: You are a Conductor of a train which is running on a schedule set out in your railroad's Employees' Timetable. It is now midnight. At 12.01 am a new ETT comes into effect. It does not include your train. What happens? There were various ways this was handled depending upon the railway concerned. The most common was that at midnight your train lost its rights to run and it was annulled. For your train to complete its journey, it now had to run as an Extra train as per a Train Order.

Now consider this problem: You are the Conductor of a Second Class train, say a Rail Motor operating Eastbound, the Inferior direction, on a branch line. When you get to the terminus of the branch, after an hour you are scheduled to return Westbound. But you are running two hours late. That means that when you get as far as the penultimate station you can proceed no further, because a Superior train is now due in the opposite direction. But it is your own train coming back the other way. In theory, you can not proceed any further! Railroad timetable compilers got around this problem in various ways:

Stating "Westbound trains are Superior to Eastbound trains, except [say] no. 4 is Superior to no. 3."

Designating the Eastbound train concerned as [say] Second Class, but the equivalent Westbound train as Third Class.

Mile Post	WEST	CP No.	STATIONS	EAST	Station Nos.	Sidings Feet	Maximum Speed MPH
-0.4		B901			NX001		70
0.6		B000	COUNCIL BLUFFS				
0.9		B001	1.9				
2.0		B002					
2.5		B003	7th STREET				
3.4		B004	TOWER B		NX003		
3.8		B005	20th STREET				
5.1		B007	SUMMIT		NX005		
6.9		B008	48th STREET				
7.7		B009	57th STREET				
10.9		B011	95th STREET				
17.4		B017	PACIFIC ST				
21.5		B026	ELKHORN		NX022	c3654	
26.0		B026	(WWD HOLD SIG)			n6356	
28.0		B035	VALLEY		NX028	44533	
34.5		B035	(EWD HOLD SIG)				
37.4		B039	MERCER		NX034		
39.2		B039	FREMONT		NX039	n4196	
40.0		B040	⊗ BN		NX040	96520	
49.3		B049	BEST				
53.7		B053					
57.8		B058	McGINN				
66.7		B067	SHELL CREEK		N6778		
68.7		B072	SCHUYLER		NX069	45991	
71.9		B072	(EWD HOLD SIG)				
76.6		B072	RICHLAND		NX077		
80.2		B084	BEHLEN		NX080	n2164	
83.6		B084	(WWD HOLD SIG)				
84.5		B094	COLUMBUS		NX085	n7062	
92.6		B094	DUNCAN		NX092	c5765	
93.6		B094	(EWD HOLD SIG)				
100.5		B094	SCHAFER		NX100		
102.3		B112	SILVER CREEK		NX102		
112.1		B112	(WWD HOLD SIG)				
113.1		B114	CLARKS		NX114	40609	
114.2		B114	(EWD HOLD SIG)				
117.9		B123	THUMEL		NX118		
123.0		B123	(WWD HOLD SIG)				
124.3		B123	⊗ BN				
124.9		B126	CENTRAL CITY		NX125	45611	
126.2		B136	(EWD HOLD SIG)				
135.0		B136	(WWD HOLD SIG)				
144.6		B145	CHAPMAN		NX135	c7976	
146.2		B145	GRAND ISLAND		NX147		
146.5		B147	⊗ BN		NX148		
146.6		B150	(EWD HOLD SIG)				
149.9		B150	ALDA		NX155		
154.5		B166	WOOD RIVER		NX162	s2424	
162.3		B166	CORY				
166.3		B168					
175.1		B175	GIBBON JCT.		NX176		
183.8		B184	BUDA		NX184		
191.5		B191	ALFALFA CENTER		NX194		
199.9		B200	ODESSA		NX198		
208.1		B208	SIMONDS		NX208		
212.7		B213	OVERTON		NX213	n9092	
215.4		B215					
221.0		B221	SPRING CREEK		NX233		
232.6		B233	DARR		NX238		
238.2		B238	COZAD		NX238	n14800	
240.7		B241					
243.9		B244	WILLOW ISLAND		NX243		
254.4		B254	VROMAN		NX254		
255.6		B256	FARR		NX256	n10028	
257.7		B258				s10020	
261.4		B261	BRADY		NX262		

Maximum speed for loaded coal and grain trains not exceeding 120 cars and not exceeding 134 tons per operative brake (T/OB) is 60 MPH; if either the total car limit or average T/OB limit is exceeded the maximum speed is reduced to 50 MPH (see Special Instructions Item 5-A).

TIMETABLE NO. 1

Mile Post	WEST	CP No.	STATIONS	EAST	Station Nos.	Sidings Feet	CCS Test Loops located:
261.4		B261	BRADY		NX262		Westco Valley Fremont Columbus Central City
274.0		B274	KEITH		NX275	s10611	Grand Island Kearney Lexington Gothenburg
276.0		B282			NX276		ACS in effect between MP 5.1 and MP 146.5; MP 146.65 and MP 283.4.
282.0		B282					Rule 13.1.4 Exception: Non-Equipped Yard Engines and Locals may be operated between the following locations on both main tracks: MP 79.0 and MP 86.5 MP 144.0 and MP 150.0 MP 281.0 and MP 283.4
283.4		B283					
284.5		B284					
285.5		B285					
285.4		B286					
286.0		B287	NORTH PLATTE		NX284		
286.5							
			286.6				

CPB 283 is end of CTC westward. CPW 291 is start of CTC westward. ABS in effect CPB 283 to CPW 291 — Permission must be obtained from control operator N. Platte before entering main track.

At locations shown below, Rules 247(B) and 9.12.4 do not apply to trains moving with the current of traffic. Movement from Stop signals at these locations may be made only upon verbal authority of train dispatcher. Trains and engines may move against the current of traffic after verbal authority has been granted at restricted speed without being preceded by a flagman except when moving over public crossings protected by crossing signals or gates, or when moving through interlocking and conditions that require movement be preceded by a flagman.

VALLEY, between hold indicators MP 26.1 and MP 34.6.
CENTRAL CITY, westward signal 1231 and eastward signal 1262.
GRAND ISLAND, between east remote control switch MP 144.0 and hold indicator located at MP 148.8.

Train Defect Detectors located at:

No. 1 Only	No. 2 Only	Both tracks
@MP 74.6	%MP 285.5	@MP 10.0
@MP 103.9	@MP 157.3	@MP 20.0
@MP 128.2	@MP 121.8	@MP 45.0
@MP 160.1	@MP 100.1	@MP 60.3
	@MP 81.0	@MP 137.0
		@MP 183.0
		%MP 278.2

Acoustical Bearing Detector No. 1 Only MP 269.5
HIGH WIDE SHIFTED LOAD DETECTOR located at: MP 34.0.
40 MPH dual control switch turnouts: CPB 017; CPB 049; CPB 058; CPB 166; CPB 175; CPB 184; CPB 191; CPB 200; CPB 208; CPB 221; CPB 233; CPB 244; CPB 254; CPB 256 No. 1 only; CPB 258 No. 2 only; CPB 261; CPB 274; CPB 276; CPB 283; CPB 285 Eastward departure yard & Eastward main track MP 285.5.
15 MPH dual control switch turnouts: Council Bluffs; Omaha except at MP 3.4 between Nos. 1, 2 & 3 main tracks; Summit; Grand Island except at MP 144.6 between main tracks; CPB 286 eastward departure yard & eastward main track MP 286.2; North Platte westward classification yard area MP 286.7 & Balloon area MP 288.8.
Speed frater switches 15 MPH.

When moving against the current of traffic over the following public crossings protected by automatic crossing signals or by gates, crew member must be on the ground at the crossing to warn traffic until crossing is occupied, unless a crossing watchman is on duty. This does not modify requirements of Rule 6.32.2.

Location	Description	Location	Description
MP 98.4	County Road	MP 161.7	County Road
MP 149.1	Webb Road	MP 162.4	Wood River, Ne.
MP 152.0	County Road	MP 162.7	Wood River, Ne.
MP 154.9	County Road	MP 169.2	Shelton, Ne.

Millard Industrial Lead: Lane to end of track MP 17.6, 8.10 miles. Maximum speed 10 MPH.
FRA excepted track. Business tracks: Millard MP 22.6 NM023. At the following locations, movements must ascertain crossing warning devices have been operating long enough to provide warning and crossing warning gates, if equipped, are fully lowered:
Q Street MP 22.0; Cottour Street MP 22.4; Millard Street MP 22.5; L Street MP 22.7; 144th Street MP 23.7; and 156th Street MP 24.9.

If it is not known such device is providing warning, a crew member must be on the ground at the crossing to warn traffic until crossing is occupied.

Abbott Drive Crossing, Omaha: Movements must not foul crossing until automatic warning devices have operated long enough to provide warning to traffic. A crew member must be on the ground at the crossing until crossing is occupied.

River Industrial Lead: Grand Island to River MP 18.4 KG 119, 3.9 Mi. Max Speed 20 MPH.
Kearney Industrial Lead: Kearney to MP 3.75—3.75 Miles. Max. Speed 10 MPH.

At Council Bluffs and Omaha.
No. 1 Track extends from end of block sign located MP—0.4 to CNW Conn. MP—80.
No. 2 Track extends from end of block sign located MP—0.4 to Spring Switch MP—50.
Trains or engines must not enter these tracks unless authority received from UP Council Bluffs Yard.
CTC in effect on Main Tracks No. 3 and No. 4 Falls City Sub between CPB 004 and CP 2472.

SPEED RESTRICTIONS:
Fox Park: Tracks 1, 2, 3, 4 and 5 to hump lead switch 5 MPH

RAILROAD CROSSINGS—JUNCTIONS:
COUNCIL BLUFFS: On No. 1 track at CCP Jct. MP—70 CCP ⊗;
On No. 2 Track at BN connection MP 0.18 BN ⊗.
OMAHA: Between Hall Ave. and Burdette St., at 11th Street, Omaha ⊗ CCP ⊗.
Eastbound trains delivering to CNW Council Bluffs must not proceed beyond 9th Ave. MP—25 until contact has been made with CNW Council Bluffs yardmaster for movement instructions.

Refer to General Code of Operating Rules 7.6. In the application of paragraph 1 at locations listed, the following minimum requirements apply:

Location	Minimum Requirements
Between 20th St. and Summit.	Not less than six hand brakes must be applied on east end of cuts of cars left standing on any track.
Summit	Not less than three hand brakes must be applied on east end of cuts of cars left standing on all tracks.
Council Bluffs	All coal trains enroute connecting lines must have a sufficient number of hand brakes to hold train regardless of the number of units attached to train. However, not less than six hand brakes must be set. All other tracks in the yard must have sufficient hand brakes, but not less than 3 hand brakes, to hold the cut.

TIMETABLE NO. 1

5. Look Ma, no times! This is an example of a modern Employees Timetable, i.e., a timetable without times. It is an extract from Union Pacific's System Employee Timetable of 10 April 1994. It provides a description of the line and local instructions — but no times.

Stating something like “Westbound trains are Superior to Eastbound trains, except that no. 4 will await the arrival of no. 3.”

More rarely, stating something like “Westbound trains are Superior to Eastbound trains, except for Eastbound trains worked by the same locomotive

and crew as Westbound trains.”

Examples of all these methods can sometimes be found in old ETTs.

AMTRAK		Zone Speeds		Mile Post	Zone Speeds	Station Number	UTAH DIVISION		Siding	Capacity of	AMTRAK	
5	Passenger	Westward	Eastward				Subdivision 6	Stations			MPH	MPH	6	Passenger
Leave Daily	MPH	MPH	MPH				E	W	MPH	MPH	Arrive Daily	
S 1920	30	626.4	25	9032	HELPER	0.9	...	...	Yard	...	S 0935
		627.3			W HELPER KOVER	1.5	...	...	30	30	
		628.8		9038	UTAH RY JCT KOVER	1.6	...	...	15	15	
		630.4		9044	CASTLE GATE	2.3	...	...	...	Yard	
		632.7		9047	LYNN KOVER	2.6	...	...	30	30	
		638.9		9050	KYUNE	3.2	...	...	15	15	5200
		644.8		9054	COLTON KOVER	3.7	...	...	30	30	Yard
	60	650.1	60		E SUMMIT KOVER	4.3	...	...	30	30	
		651.4		9056	SUMMIT	4.8	...	...	30	30	8300
		651.9			W SUMMIT KOVER	5.3	...	...	30	30	
	25	661.0	30	9060	GILLULY	6.0	...	...	30	30	7900
		665.6		9062	DETOUR KOVER	6.6	...	...	15	15	
	40	672.3	45	9066	NARROWS KOVER	7.2	...	...	30	30	
		676.7		9069	RIO KOVER	7.8	...	...	30	30	
	35	682.0	35		CASTILLA KOVER	8.4	...	...	30	30	
		684.7		9070	W 11.1 E 12.1	9.0	...	...	50	50	
		695.8		9302	SPRINGVILLE KOVER	9.6	...	...	30	30	
	50	698.6	50	9306	IRONTON KOVERS	10.2	...	...	30	30	
S 2125		701.1		9310	PROVO	10.8	...	...	...	Yard	S 0735
		702.0			LAKOTA UP JCT	11.4	...	...	30	30	
		705.7		9317	GENEVA KOVER	12.0	...	...	30	30	
		707.1		9319	PIPE MILL	12.6	...	...	30	30	
		715.0		9321	AMERICAN FORK	13.2	...	...	30	30	8700
		720.3		9325	MESA	13.8	...	...	30	30	7100
		728.6		9328	RIVERTON	14.4	...	...	30	30	6500
		734.9		9332	MIDVALE JWY	15.0	...	...	12	12	E 6600
		735.9			MIDVALE KOVER	15.6	...	...	30	30	
		740.8		9348	EAST KOVER	16.2	...	...	30	30	
		742.0		6000	ROPER BKWY	16.8	...	...	...	Yard	
	30	743.5	30		13TH SOUTH KOVER	17.4	...	...	20	20	
		744.2		9354	UP 9TH SO XING	18.0	...	...	...	...
S 2255	12	745.1	12	6000	SALT LAKE CITY	18.6	...	...	...	Yard	0653

Exceptions: MPH

Zone speeds:

Pasgr Trains Light Loco or Loco & cab only with Operative Dynamic Brake:

MP 638.9 - Spring Glen (Eastward) 30

MP 651.4 - MP 665.6 (Westward) 30

MP 665.6 - MP 680.0 (Both Directions) 45

MP 688.1 - MP 692.3 (Eastward Track Both Directions) 70

MP 688.1 - MP 692.7 (Westward Track Both Directions) 70

Westward Main Track MP 702.0 to Pipe Mill 60

"Bulk" Trains: (See Rule 4)

MP 651.4 - MP 665.6 (Westward) 20

MP 665.6 - MP 682.0 (Westward) 25

MP 638.9 - Spring Glen (Eastward) 20

Turnout Speeds:

Spring Glen - End of Two Main Tracks 30

Colton Junction Switch MP 644.8 20

Springville Junction Switch MP 695.8 20

Lakota UP Jct. MP 705.7 (Eastward) 30

Lakota UP Jct. MP 705.7 (Westward) 15

Pipe Mill-End of Two Main Tracks 35

Midvale-End of Two Main Tracks 70

All other turnout speeds 15

City Ordinances:

Provo 48

Salt Lake City, 1st North-5th North 25

Geneva Steel Plant Yard 5

Union Pacific Coal Tracks 1 & 2, Ironton 15

UPRR and DRGW Running Tracks (Roper to Grant Tower) Restricted Speed

All Other Yard Tracks 10

NOTE: Distance between Mile Post Sign 684 and Mile Post Sign 685 is 3,658 feet.

Zone Speeds		Mile Post	Zone Speeds		Station Number	UTAH DIVISION		Siding & other turnout speeds	Capacity of	
Westward	MPH		Westward	Eastward		Subdivision 7	Stations		E	W	Siding	Other
MPH	MPH		MPH	MPH			Sw.	Sw.	in feet	in feet
20	745.1	20	6000	SALT LAKE CITY	0.4	B	...	...	...	Yard
15	745.5	15	9808	GRANT TOWER	3.2	M	...	...	...
	745.9		9812	UP BECKS XING	1.8	M	...	...	...
	748.7			D&RGW-UP NO. SALT LAKE KOVER	1.8		30	30		
60	750.6	60		NORTH SALT LAKE CP788	3.5					
	787.7		9814	WOODS CROSS	2.2					
	791.0		9824	CENTERVILLE (Spur W) CP793	2.1					
	793.2		9826	CP302	6.7					
	802.5			KATYSVILLE	1.0					
	803.2		9827	LAYTON CP804	3.0					
	804.2		9840	CP807	1.3					
	807.2			CLEARFIELD CP809	2.8					
	808.7		9847	CP811	5.7					
	811.5			BRIDGE JCT. CP817	1.0					
	817.2		9885	CP818	1.0					
	817.5		9886	OGDEN	(36.2)					

D&RGW Rules of the Operating Department govern train and locomotive movements from Bridge Junction to Ogden.

A train must not enter Union Pacific Centralized Traffic Control without a clearance, unless authorized by:

- (1) Train Order
- (2) Verbal instructions from Train Dispatcher; or
- (3) Special instructions or general order.

D&RGW trains arriving Bridge Junction - Ogden must contact UP 30th Street Tower for instructions to enter yard.

NOTE: D&RGW crews will be governed by Union Pacific General Code of Operating Rules while working in UP territory except when D&RGW Time-Table rule is more restrictive.

Exceptions: MPH

All Yard Tracks	10
City Ordinances:	
Salt Lake City, 1st North - 5th North	25



California Zephyr Passes Coal Creek Canyon

Photo: Kevin Morgan

6. An ETT of the Denver and Rio Grande Western Railroad of 15 May 1988. This was a busy mainline. But the times of only one train are shown - the daily Amtrak passenger trains, because these times were fixed. All other trains ran as Extras. And anyway the entire line is controlled by Centralised Traffic Control (CTC). Inset: No 5, the California Zephyr, in Coal Creek Canyon on this line.

There were no hard and fast practice as to which trains were scheduled in the ETT and which ran as Extras. On many single track railroads, for example, the practice was to schedule freight trains in one direction, but run them as Extras in the other direction. (This actually made sense, because - believe it or not - freight trains often run late.) Some railways always ran, for example, coal trains as Extras; other, or at other times, scheduled them.

There was a standard operating code of rules promulgated by the American Association of Railroads. However, (there is always a "however"), each of the many railroads also issued their own rule books which could and many times did vary from the standard code to deal with that road's own operating conditions. Therefore if one dives deep enough into rules, one will see conflicts between railroads. The key thing was that everyone on the same railroad

followed the same Rules. (The uniform rule book started with the next convention of railroads after the convention which had established standard time in the early 1880s.)

All of this was a vast subject. A classic and very large book on this subject is *The Rights of Trains: A Complete Examination for Employees on the Standard Code and Other Recommended Train Rules* by Harry W. Forman, first published in 1904. A

MONTANA RAIL LINK

WESTWARD ↓		3rd Subdivision				↑ EASTWARD		
Speed Zone	Mile Post	STATIONS	Rule 4.3	Siding Length	Miles			
19	0.0	HELENA	JTY	2MT ABS	119.3			
25	3.0	HELENA JCT (BN Jct)	JT		116.3			
45	4.2	FORT HARRISON (Spur)		2MT CTC	115.1			
	5.2	TOBIN			114.1			
35	7.7	BIRDSEYE			111.6			
	13.0	AUSTIN			106.3	6825		
25	15.8	WEED			103.5			
	18.4	SKYLINE			100.9			
45	20.5	BLOSSBURG			98.8	7951		
60	28.9	ELLISTON			90.4	9468		
	33.0	* Detector "Elliston"						
45	37.7	AVON			81.6	6213		
35	43.5	BRADLEY			75.8			
45	50.5	GARRISON (MWRR Jct)	J		68.8	9401		
	54.7	PHOSPHATE			64.6	14660		
	58.2	GOLD CREEK (Spur)			61.1			
60	61.6	JENS		CTC	57.7	10355		
	64.6	* Detector "Jens"						
	70.7	DRUMMOND	T		48.6	10365		
	75.7	BHADMAN			43.6			
45	80.1	BEARMOUTH			39.2	12996		
35	89.7	NIMROD			30.6	8995		
	94.3	* Detector "Nimrod"						
60	95.4	BONITA (Spur)			23.9			
	102.5	CLINTON			16.8	10996		
35	106.2	MCDONALD			13.1	7839		
60	113.2	BONNER			6.1	14455		
25	119.3	MISSOULA	JTY	2MT ABS	0.0	Yard		
Channel		Frequency	Channel ID	District				
	5656	160.950	West Dispatcher	Helena-Missoula				
	1919	160.395	Yard Channel	Helena, Missoula				
		160.380	Dispatcher's Link	Mullan Tunnel				
MRAS frequencies: Channel 4-160.620 Blossburg (Helena-Garrison); Channel 6-161.490 TV Mountain (Drummond-Missoula); Channel 9-160.815 Drummond, (Garrison-Bonner).								
Maximum speed: 60 MPH.								
Rule 1.14: BN trains use MRL track between Helena and Helena Jct.								
Tunnels:								
	20.4	Mullan Tunnel	3697	90.9	Nimrod Tunnel #4	909'		
	52.4	Garrison Tunnel #3	1394	94.6	Bonita Tunnel #5	896'		
Helper District: Helena-Elliston.								
Additional Tracks:								
	0.3	PHOSPHATE LOWER DOCK (On Spur 0.3 from Phosphate)						
	113.7	STIMSON LUMBER COMPANY (Spur)						

WESTWARD ↓		10th Subdivision				↑ EASTWARD	
Speed Zone	Mile Post	STATIONS	Rule 4.3	Siding Length	Miles		
25	0.0	DeSMET	JY	2MT TWC	64.2		
	6.4	NAGOS			57.8		
	19.6	VARO			53.6	2161	
35	21.1	ARLEE		TWC	49.1		
	30.8	RAVALLI			33.4		
	33.7	* Detector "Dixon"					
	37.9	DIXON	JT		26.3	4489	
	44.5	MCDONALD			19.6		
40	51.6	PERMA			12.6		
35	64.2	PARADISE	JTY	CTC	0.0	12307	
Channel		Frequency	Channel ID	District			
	5656	160.950	West Dispatcher	DeSmet-Paradise			
	1919	160.395	Switching	DeSmet-Paradise			
MRAS frequencies: Channel 6-161.490 TV Mountain (DeSmet-Dixon); Channel 9-160.815 Plains (Dixon-Paradise).							
Maximum speed: 49 MPH.							
Helper District: DeSmet-Arlee.							



MONTANA RAIL LINK

WESTWARD ↓		4th Subdivision				↑ EASTWARD	
Speed Zone	Mile Post	STATIONS	Rule 4.3	Siding Length	Miles		
20	119.3	MISSOULA	JTY	2MT ABS	Yard		216.6
35	123.8	RAINGLOW	JTY	2MT			213.9
	125.9	DeSMET	J	CTC			212.0
60	132.2	SCHILLING				5005	205.7
50	136.6	FRENCHTOWN				11661	201.3
	145.7	NINE MILE (Spur)					192.2
45	150.2	* Detector "Lothrop"					
	150.8	LOTHROP				8883	187.1
40	156.8	PLATEAU		CTC			181.1
45	161.2	CYR				4834	176.7
30	167.6	RIVULET				8360	170.3
35	171.9	* Detector "Rivulet"					
	176.2	WESTFALL				9547	161.7
40	179.6	CEDARS (Spur)					158.3
	183.6	SUPERIOR				8280	154.3
35	188.8	SPRING GULCH				4109	150.1
40	193.2	* Detector "St Regis"					
	197.2	ST REGIS		TWC		4084	140.7
60	198.7	ROYAL LOGGING (Spur)		ABS			139.2
	201.9	TOOLE		M		5422	136.0
40	214.2	QUINNS				6188	123.7
50	219.2	PARADISE	JT			12307	118.7
	0.0	* Detector "Paradise"					
55	3.0	PLAINS				11360	112.7
50	6.0	WEEKSVILLE (Spur)					105.2
	13.5	EDDY				11227	98.2
60	20.5	WOODLIN (Spur)					91.0
	27.7	WOODLIN PIT (Spur)					90.6
	28.1	WOODLIN					
	28.5	* Detector "Woodlin"					
	30.3	BROWNMANN (Spur)					88.4
45	31.5	THOMPSON FALLS		CTC		11430	87.2
	46.4	CHILDS				7820	72.3
	64.0	* Detector "Trout Creek"					
60	54.0	TROUT CREEK	T			4560	64.8
	61.6	TUSCOR				8990	57.1
	72.5	NOXON				10820	46.2
50	77.4	* Detector "Heron"					
	80.1	HERON, MT.				11232	38.6
60	91.1	COLBY, ID				12256	27.6
	93.8	CLARK FORK					24.9
50	103.5	HOPE				8845	15.2
55	111.8	* Detector "Kootenai"					
60	117.0	KOOTENAI				16670	1.7
	118.7	SANDPOINT JCT (BN Conn.)	J				0.0
For MRL trackage rights to Spokane, see Pacific Northwest Region Timetable							
Channel		Frequency	Channel ID	District			
	5656	160.950	West Dispatcher	Missoula-Sandpoint Jct			
	1919	160.395	Missoula Yard	Missoula			
MRAS frequencies: Channel 4-160.620 St Regis (Superior-Paradise); Channel 6-161.490 TV Mountain (Missoula-Superior); Tuscor (Thompson Falls-Clark Fork); Channel 9-160.815 Cyr (Schilling-St Regis); Clark Fork (Clark Fork-Sandpoint); Plains (Paradise-Thompson Falls).							
Maximum speed: 60 MPH.							
Tunnels:							
	157.1	Philemon Tunnel #5.5	305'	213.0	Donlan Tunnel #9	1121'	
	170.7	Quertz Tunnel #6	110'	215.3	Quinns Tunnel #10	570'	
	211.8	Donlan Tunnel #8	192'	85.9	Cabinet Tunnel	365'	
Additional Tracks:							
	124.6	ROSCOE STEEL				1082	
	132.1	STONE CONTAINER (On spur 1.0 from Schilling)				Lead	
	198.7	TRICON TIMBER				Lead	
	27.7	THOMPSON RIVER LUMBER				Lead	
	30.3	CROWN PACIFIC				Lead	

WESTWARD ↓		11th Subdivision				↑ EASTWARD	
Speed Zone	Mile Post	STATIONS	Rule 4.3	Siding Length	Miles		
	0.0	DIXON	JT		4489	33.4	
	1.6	AGENCY (Spur)				31.8	
	13.0	CHARLO			2382	20.4	
25	19.9	RONAN		TWC		1875	13.5
	25.0	PABLO			1495	8.4	
	25.6	DUNHAM			990	7.8	
	31.3	DUPUIS				2.1	
10	33.4	POLSON	ET			0.0	
Channel		Frequency	Channel ID	District			
	5656	160.950	West Dispatcher	Dixon-Polson			
	1919	160.395	Switching	Dixon-Polson			
Maximum speed: 25 MPH.							

Figure 7 An example of a rail fans' Timetable published by Altamont Press. This shows lines of Montana Rail Link from their Intermountain Region Timetable of 16 July 1995 Below: on the Fort Harrison Spur



digitised copy is on Google. The latest edition by Peter Jossarend was published in 1995. It is 459 pages and is still in print.

A newer book, much easier for the beginner, is *19 East, Copy Three: The Art and Practice of Timetable & Train Order Operations for the Railroad Historian and Modeller*, by David Sprau and Steve King, 160 pages. Published in 2013 by Operations Special Interest Group Inc., PO Box 67, Wood Dale Illinois 60191 for \$US30, but currently out of print.

There is a lot of useful information on www.opsig.org/reso

The complications of this system for controlling trains, and the imprecision of a system which was in the hands and minds of a myriad of employees - mainly the Conductors and Engineers on every individual train - not surprisingly led to accidents on North American railroads. Never-

WESTWARD PENDLETON BRANCH EASTWARD				WESTWARD WALLACE BRANCH		EASTWARD	
Car Capacity of Stages, etc. See Rule 6(A).	SECOND CLASS	Time-Table No. 54	SECOND CLASS	SECOND CLASS	Time-Table No. 54	Mile Post	SECOND CLASS
	365 Freight Daily Except Sunday	April 26, 1970	366	387 Mixed Daily	April 26, 1970		388 Mixed
STATIONS				STATIONS			
20 Y		ALTO 63.1		JY	1:30 ^{AM} R	MANITO 19.8	A 9:55 ^{AM}
17		7.5 MENOKEN 75.6		BETWEEN MANITO AND PLUMMER JCT., TRAINS ARE GOVERNED BY OPERATING RULES, TIME-TABLE AND SPECIAL INSTRUCTIONS OF CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC R. R. CO. Time shown at Manito is for information only.			
20 JPY	12:50 ^{PM}	BOLLES 71.3					
19 PY	1:10	4.6 PRESCOTT 66.7		JPY	2:10 ^{AM} C-R	PLUMMER JCT. 16.2	A 9:15 ^{AM}
15	1:55	13.1 VALLEY GROVE 53.6		15 PY	2:40	CHATCOLET 22.8	8:45
U		8.5 B. N. CROSSING 47.2			3:10	HARRISON 30.5	8:15
U		0.6 W. W. V. RY. CROSSING 46.6		14 P	3:20	SPRINGSTON 34.0	8:05
BJKPT WYZ	A 2:25 ^{PM}	1.9 W. W. V. RY. CROSSING 44.2	B 3:30 ^{PM}	14 P	3:55	LANE 45.3	7:30
M		4.3 SPOFFORD 39.9		17	4:10	ROSE LAKE 49.1	7:15
21		3.6 W. W. V. RY. CROSSING 36.3		23	4:40	CATALDO 57.7	6:45
M		0.1 MILTON-FRESHWATER 36.2		3 T	4:55	ENAVILLE 62.5	6:30
30 JPY		9.5 BLUE MOUNTAIN 26.7		5	5:05	PINE CREEK 64.1	6:20
14		3.3 DOWNING 23.4		JY	5:15	BRADLEY 67.2	6:10
57 PY		2.5 WESTON 20.9		17 BJKPQ WY	A 5:30 ^{PM}	KELLOGG-WARDNER 69.2	6:00 ^{AM}
15 PY		3.7 ATHENA 17.2		23		OSBORN 75.8	
31		4.6 ADAMS 12.6		JPYZ		WALLACE WC 80.2	
10		2.6 BLAKELEY 10.0		U		B. N. CROSSING 80.4	
BJKTWYZ		10.0 PENDLETON 0.0		U		B. N. CROSSING 80.6	
		(83.0)		JY		WALLACE JCT. 80.7	
				2 JY		BURKE 86.9	
						(90.5)	Daily
	(1.35)	Thru Time			(4.00)	Thru Time	(3.55)
	15.9	Average speed per hour			17.3	Average speed per hour	17.7

WESTWARD DAYTON BRANCH EASTWARD				WESTWARD SIERRA NEVADA BRANCH EASTWARD	
Car Capacity of Stages, etc. See Rule 6(A).	SECOND CLASS	Time-Table No. 54	SECOND CLASS	Time-Table No. 54	Mile Post
	365 Freight Daily Except Sunday	April 26, 1970	366	April 26, 1970	
STATIONS				STATIONS	
24		TURNER 24.6		JY	BRADLEY 0.0
18		9.6 WHETSTONE 22.7		Y	END OF TRACK 2.0
10 JPTY	11:50 ^{AM}	0.09 DAYTON 13.1			(2.0)
U		0.09 B. N. CROSSING 13.1		This branch shown for information as to distances only. It will be operated as a switching spur lying within Bradley-Kellogg-Wardner yard limits.	
U		0.01 B. N. CROSSING 13.1			
JY	A 11:55 ^{AM}	0.1 DAYTON JCT. 12.9		Eastward trains are superior to trains of the same class in the opposite direction, except that No. 387 is superior to No. 388.— See Rule S-71. No. 365 arriving at Bolles on Dayton Branch will run as No. 365 Bolles to Walla Walla. No. 366 arriving at Bolles on Pendleton Branch will run as No. 366 Bolles to Dayton. For stations not shown on schedule pages, see page 16.	
BETWEEN WAITSBURG JCT. AND DAYTON JCT., TRAINS ARE GOVERNED BY OPERATING RULES, TIME-TABLE AND SPECIAL INSTRUCTIONS OF BURLINGTON NORTHERN INC.					
JY	12:25 ^{PM} R	WAITSBURG JCT. 5.2	A 10:30 ^{AM}		
18 PY	12:35	3.5 WAITSBURG 5.7	10:20		
20 JPY	A 12:50 ^{PM}	BOLLES 0.0	10:05 ^{AM}		
		24.5			
	(1.00)	Thru Time			
	13.1	Average speed per hour			
No. 366 arriving Dayton will run as No. 365 Dayton to Bolles.					

Figure 8 This ETT of the Union Pacific Railroad (26 April 1970) shows two interesting things on the Wallace branch (picture below). First, it appears that Mixed train no. 387 formed the return journey as Mixed train no. 388. Therefore, there is an exception to the Superiority rule applying to these trains. It is set out near the bottom of the page. Secondly, trains often operated over lines of other companies or joint lines. These UP trains operated over the track of the CMS&P Railroad between Manito and Plummer Junction. Hence, their schedule is not shown for this section. Rather their operation there was "Governed by operating rules, Time-table and special instructions of the CMS&P & PRR".



theless, considering the amount of traffic moved, the accident rate wasn't all that great. There was therefore a trend away from including train schedules in Employee Time Tables. Instead, more and more trains were run as "Extras", even when they ran regularly.

In the longer term, there was an even bigger trend towards scrapping ETT schedules altogether and to introduce Centralised Traffic Control, where signals and

BETWEEN BIRMINGHAM AND CHATTANOOGA

SOUTHBOUND					Station Numbers Miles from Chattanooga	TIMETABLE No. 16 EFFECTIVE OCTOBER 27, 1969	Capacity of Trains in Crew Other Tracks Sliding	NORTHBOUND				
SECOND CLASS			FIRST CLASS					FIRST CLASS	SECOND CLASS			
59 Daily	63 Daily		153 Daily	17 Daily				18 Daily	56 Daily	152 Daily	154 Daily	
P. M.	A. M.		P. M.	A. M.		Lv.	Ar.	P. M.	A. M.	A. M.	P. M.	
2 00 ¹⁵⁴	8 05 ¹⁵²		11 00	7 30	240A	XW	CHATTANOOGA	N Yrd	10 05	4 00	8 15 ⁶³	2 00 ⁵⁹
2 25	8 30		11 25	7 40 ¹⁵²	A341	5.5	WAUHATCHIE	N	9 25	3 30	7 40 ¹⁷	1 30
2 50	8 45		11 40	a 7 59	A353	17.9	TRENTON, GA.	D	9 10	3 10	7 15	1 10
3 05	8 55		11 50	8 07	A361	25.7	RISING FAWN		9 02	2 59	6 55	1 00
3 20	9 10		12 05 ^{AM}	8 15	A369	33.9	BATTELLE, ALA.		8 52	2 45	6 40	12 45
3 40	9 20		12 20	s 8 22	A375	40.2	VALLEY HEAD	D	8 44	2 35	6 30	12 35
3 55	9 45		12 34	s 8 35	A386	50.7	FORT PAYNE	D	8 31	2 15	6 10	12 20
4 10	10 00		12 46	8 47	A396	61.0	PORTERVILLE		8 20	1 58	5 53	12 01 ^{PM}
4 25	10 10		12 51	s 8 57	A401	65.6	COLLINSVILLE	D	8 16	1 50	5 45	11 40
4 40	10 25		12 56	9 02	A406	70.1	FLANDERS		8 11	1 40	5 35	11 15
4 55	10 40 ¹⁵⁴		1 07	9 12	A415	79.7	CRUDUP		8 02	1 26	5 22	10 40 ⁶³
5 10	10 55		1 16	s 9 25	A422	87.2	ATTALLA	N Yrd	7 55	1 16 ¹⁵³	5 07	10 15
5 30	11 15		1 35	a 9 41	A437	102.5	WHITNEY		7 37	12 47	4 47	9 55
5 40	11 30		1 42	9 47 ¹⁵⁴	A443	108.3	CALDWELL		7 31	12 40	4 40	9 47 ¹⁷
5 50	11 50		1 52	a 9 55	A450	114.9	SPRINGVILLE	D	7 24	12 30	4 30	9 25
6 10	12 10 ^{PM}		2 10	a 10 10	A464	128.6	TRUSSVILLE	D	7 06	12 15	4 15	9 10
6 20	12 30		3 00		791	135.1	XOBW NORRIS YARD	N Yrd		12 01	4 00	9 00
				10 18	793	135.5	X IRONDALE JCT.			6 58		
				10 40	791	143.0	XOW BIRMINGHAM	N Yrd		6 45		
							(Terminal Station)					
P. M.	P. M.		A. M.	A. M.			Ar.	Lv.	P. M.	A. M.	A. M.	A. M.
Daily	Daily		Daily	Daily					Daily	Daily	Daily	Daily
59	63		153	17					18	56	152	154

Central Standard Time shown on this page at Wauhatchie and Chattanooga is for information only; Chattanooga Terminal Time Table governs between these points.

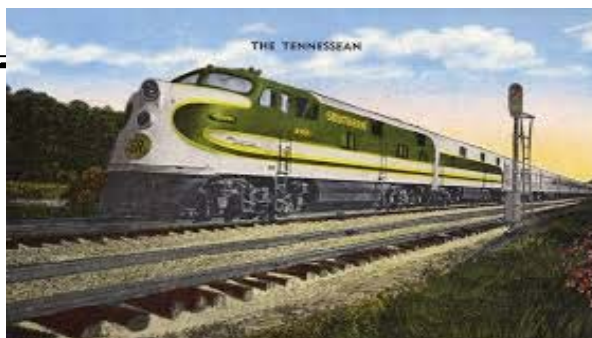


Figure 9 From a Southern Railway ETT of 27 October 1969 showing examples of time-tabled freight trains. Train 153 is superior to 152 by Class . No 18 is the Tennessean, shown at right..

WESTWARD SECOND SUBDIVISION EASTWARD 3

Route (A) Stops	Capacity of Sidings	Station Numbers	FIRST CLASS		Distance from Sandpoint	MAIN LINE Spokane Divn		FIRST CLASS	
			25	29		STATIONS		30	26
			Daily	Daily		Telegraph Offices and Calls		Daily	Daily
PZQJWOB	135	01803	10:09 AM	12:54 PM	0.0	SA	SANDPOINT	5:45 AM	12:55 AM
P	209	01810			7.2		ALGOMA		
P	206	01817			13.9		COCOLALLA		
PQ	210	01830		1:24	26.6		ATHOL	5:15	
P	173	01843			39.6		RATHDRUM		
JPTO		01850			46.5	AT	HAUSER		
P	190	01855			52.4		OTIS ORCHARDS		
P		01861	11:11	1:55	58.3		IRVIN	4:47	11:56
FBCKQRP TWXYZ		01866	11:17	2:00	63.1	Two Main Tracks	YARDLEY	4:41	11:50
BCRQR XWYZ		01870	11:27	2:10	66.6	DOUBLE TRACK	SPOKANE	4:33	11:44
CJRTYI	105	63007	11:51	2:30	75.6		MARSHALL	4:02	11:17
OJTYP	108	63014	12:01	2:41	82.9		CHEYEN	3:52	11:07

EXCEPT ON DOUBLE TRACK AND IN CTC TERRITORY, WHEN IN SERVICE, EASTWARD TRAINS ARE SUPERIOR TO WESTWARD TRAINS OF THE SAME CLASS.

CONDITIONAL STOPS

Nos. 29 and 30 stop at Athol to pick up or leave revenue passengers to and from Missoula and East or Pasco and West where scheduled to stop.
No. 29 stops at Cheney to pick up revenue passengers only destined Pasco and beyond or to detrain revenue passengers only from stations east of Spokane.

Northern Pacific Ry. signal aspects as contained in the 1967 edition Consolidated Code of Operating Rules are in effect on this Subdivision.

NINETEENTH SUBDIVISION

Route (A) Stops	Capacity of Sidings	Station Numbers	Distance from Fruitland	BRANCH LINE Spokane Divn	
				STATIONS	
				Telegraph Offices and Calls	
PIWU		01001	0.0	STRYKER	0.0
P	130	01004	4.3	TREGG	0.0
OPW	130	02000	11.2	FORTYNE	0.0
P	127	02009	17.4	TOBACCO	0.0
OPW	140	03071	28.2	EUREKA	0.0
		03074	34.5	MP COLLS	0.0
OPW	100	03094	42.1	SELFORD	0.0
P	128	03095	43.6	STONEHILL	0.0
P	128	03099	54.1	ORAL	0.0
OPW	128	04000	64.1	VOLCOUR	0.0
P	127	04007	69.9	YARBELL	0.0
P		04010	69.8	LIBBY DAM	0.0
PT		04010	74.2	RIVERVIEW	0.0

Great Northern Railway signal aspects as contained in the 1967 Consolidated Code of Operating Rules is in effect on this subdivision.

Figure 10 A Burlington Northern ETT of 25 October 1970. Trains 25 and 26 cross at Spokane, but this is not shown in bold figures, because this section of line is double track.



points are controlled by the Train Controller electronically at a central point, often hundreds of miles away. Indeed US and Canadian railroads embraced CTC eagerly as soon as the technology became available from the 1920s/30s onwards. This is a major reason – in addition to the density of traffic – why CTC is so common in North America.

Economics was also a factor. It cost money to have operators every 20-30 miles along a subdivision who were needed around the clock. CTC also meant decisions could be made much closer to the action. The dispatcher didn't have to allow time to issue and deliver train orders that might not be acted upon for an hour or more. With CTC, operators can wait until the last minute to make decisions.

Train Orders were also often replaced by Track Warrant Control and Direct Traffic Control. These are really just computerised Train Orders – without paperwork .

This did not result in the demise of Employee Timetables, despite the declining number of schedules appearing in them. Indeed ETTs were still important documents, because of the instructions they contain, especially instructions relating to specific stations and sidings. In fact Employee Timetables on freight railroads have become more and more just a compendium of these instructions. In other words, these ETTs have become similar to what in Australia we usually call General

Appendices or Local Appendices. So, in North America today, Employee Timetables are still issued to cover all lines – but on freight railways, they contain no times in them! They are “timetables” without times.

The disappearance of times from the ETTs was also a consequence of train planning changes – scheduling the movements of carloads rather than trains – the trains just became the mode of shifting product and this was so flexible and variable, the idea of a schedule was unnecessary.

This is not to say that present-day American railroads do not have schedules of their freight trains. They usually do. But they are not published in Employee Timetables but in other documents.

Passenger railroads in North America – commuter lines, Amtrak and Via – also publish train times in Employee Timetables. In recent years, however, there has been somewhat of a trend for commuter railroads to use modified Public Timetables as their Employee Timetables. (As is also the case with Sydney Trains' staff reference timetables.)

A publisher, Altamont Press of California, took this current ETT trend even further. They published a series of what they called “Employee Timetables” for rail fans. They cover all regions of the Western and Midwest US and described in detail the railway infrastructure. However, it is a few years

since the last was published, and it is believed they are now selling off their stock.

Footnotes:

1. I am most grateful for major assistance and advice from Dean Ogle, Kent Hannah and Geoff Lambert.
2. North American operating procedures were taught to me by the late Jack McLean, the ATA's founder, but neither he nor the people above are responsible for my mistakes.
3. A lot has been written about ETTs - some of which is comprehensible. Two articles which are and which appeared in this esteemed journal are “Anatomy of an employee timetable” by Steve Paris in the *Times*, February 2014, pages 10-16; and “Horse blankets and lickem ‘n’ stickems” by Geoff Lambert in the *Times*, March 2002, pages 10-16.
4. The Train Order system of train control used in New Zealand, South Australia, Commonwealth Railways and a few branches in Victoria was but a mere fragment of the North American system of train control.
5. The ETTs used to illustrate this article came from ATA auctions and “grab tables”.
6. Americans use railway and railroad interchangeably; so too employee and employee.





Gladys Berejiklian MP

Minister for Transport
Minister for the Hunter

MEDIA RELEASE

Wednesday 1st April 2015

NEWCASTLE BY TRAIN NOW FASTER THAN IN THE STEAM DAYS

The Minister for Transport, Gladys Berejiklian, this morning announced a revamp of NSW train timetables had achieved the impossible, by introducing a 2-hour transit time from Sydney to Newcastle.

Ms Berejiklian said the NSW Liberals & Nationals Government was committed to providing quicker public transport services where and when they're needed and this latest investment will be a welcome boost for the Newcastle community.

"I am pleased to announce new train timetables, commencing immediately, which will see a 50-year old record broken. Previously the record was held by the famous steam locomotive 3801, which set the standard back in 1964." Ms Berejiklian said.

"I said, when 3801's new boiler arrived back in NSW on Australia Day this year, that this magnificent machine would have a part to play in a startling upgrade of our services. This morning, at 8 AM precisely, 3801 will steam out of Central on the inaugural run of the *"Newcastle Flyer"*, once again to be the premier train in NSW.

From tomorrow, a regular "red carpet" service will commence, with hourly trains to Newcastle, run by our Oscar car-sets. The doomsayers and Dismal Jimmys of the ALP have said it couldn't be done – but Mike Baird's Liberal Government has put them to shame again. Customers will be able to choose from 100 weekly trips Monday to Friday, with a service running around every hour in the morning and afternoon peak periods, and every two hours during the middle of the day.

"The new service has been made possible thanks to a \$292 million investment by the NSW Government for track upgrading and new passing lanes near Gosford to get freight trains out of the way of our Newcastle express service.

"The NSW Liberals & Nationals have introduced more than 10,500 extra weekly public transport services since coming to government and these latest new train services for Newcastle are proof we are listening to customers and not slowing down."

At the end of 2014, the dilapidated Newcastle railway station was closed. Initially moved to Hamilton, not very far away, the station has now been relocated to Dora Creek. "The NSW Department of Planning and Infrastructure have estimated that this area will have become the demographic centre of Newcastle by 2020 and hence the destination of our fast-running express", Ms Berejiklian said smiling slyly.



TRAIN N21 / N26 - SYDNEY - NEWCASTLE: SUN 28TH JUNE 1964
3801 + LOAD 6/240 (HFN2200, FN2203, FN2189, FN2196, FN2210, HFN2207)

	run notes			run notes (ref sect ahead)
	(ref sect ahead)			(ref sect ahead)
syd	new	syd	new	new
h. m. s	h. m. s	h. m. s	h. m. s	h. m. s
Sydney		Newcastle		
Redfern		Civic		
Mac'town		Wickham		
Newtown		Hamilton		
Stanmore		Broadmeadow	15:47:30	
Petersham		Adamstown		TSR 5
Lewisham		Kotara		
Summer Hill		Cardiff		
Ashfield		Sulphide Jn		
Croydon		Cockle Ck		
Burwood		Teralba		
Strathfield	09:09:00	Booragul		
Nth Strath'		Fassifern	16:05:00	
Concord West		Awaba	16:08:30	
Rhodes		Dora Ck		TSR 30 (bridge)
Meadowbank		Morrisset	16:19:30	
West Ryde	09:14:30	Wyee	16:25:00	
Denistone		Warnervale		
Eastwood		Wyong	16:31:30	
Epping	09:17:30	Tuggerah	16:33:00	new line
Cheltenham		Ourimbah	16:37:30	
Beecroft		Lisarow		
Pennant Hills		Niagara Pk		
Thornleigh		Narara		
Normanhurst		Gosford	16:43:30	
Hornsby	09:26:30	PtClare		
Asquith		Tascott		
MtColah		Koolewong		
MtKuringai		Woy Woy	16:49:30	
Berowra		Wondabyne		
Cowan	09:37:00	Hawkesbury Riv	17:00:30	
Hawkesbury Riv	09:46:00	Cowan	17:12:00	
Wondabyne		Berowra		
Woy Woy	09:57:00	MtKuringai		tunnel 74.5 sec
Koolewong		MtColah		
Tascott		Asquith		
PtClare		Hornsby	17:22:30	
Gosford	10:03:00	Normanhurst		
Narara		Thornleigh		
Niagara Pk		Pennant Hills		
Lisarow		Beecroft	17:28:00	
Ourimbah	10:09:30	Cheltenham		via new line
Tuggerah	10:14:30	Epping	17:31:00	
Wyong	10:16:00	Eastwood		
Warnervale		Denistone		
Wyee	10:23:30	West Ryde	17:34:00	
Morrisset	10:29:00	Meadowbank		TSR 30
Dora Ck		Rhodes		
Awaba	10:40:00	Concord West		
Fassifern	10:43:30	Nth Strath'		
Booragul		Strathfield	17:40:00	
Teralba		Burwood		
Cockle Ck		Croydon		
Sulphide Jn		Ashfield		
Cardiff		Summer Hill		
Kotara		Lewisham		TSR 10
Adamstown		Petersham		
Broadmeadow	11:01:30	Stanmore		
Hamilton		Newtown		sigs trn ahead
Wickham		Mac'town		sigs trn ahead
Civic		Redfern		
Newcastle	11:07:00	Sydney	17:51:00	sigs 18 secs dwell
ELAPSED TIME	02:09:00		02:09:00	02:02:30

Log courtesy of Max Michell

Letter

ALBERT ISAACS

I WISH TO COMMENT ON A NUMBER of things in the extremely interesting February 2015 issue of *The Times*. Firstly, let's look at the cover illustration of the fascinating wheel TT. There appears to have been a number of different designs utilised by NSWGR, presumably in different years. However, during the period that I was involved in the auctioning of TTs and other railway material, I only handled one such wheel; so it is safe to say that they are comparatively rare. From memory, the TT sold for \$95.

Steven Haby's fascinating article "*Read all about it!*" – timetables in Australian newspapers, is of great interest to me because it combines my interest in TTs and my passion for newspapers. I collect papers and, in particular, first editions and those with historical headlines.

Let me make a couple of comments on the Geelong Advertiser TTs. In talking about the Geelong TT that appeared in the Advertiser's 18 August 1891 edition, Steven says: "Interestingly the frequency of the Ballarat to Geelong service was almost as good as the service to Melbourne". It must be remembered that in 1891, the direct Melbourne-Ballarat line had only been opened for some two years. Prior to 1889 all services to Ballarat went via Geelong. Yes, I

mean Geelong not North Geelong – before the opening of the North Geelong loop in late 1903, all Ballarat bound services went into Geelong, reversed and returned to North Geelong to then take the Ballarat line. As is shown in Steven's 1891 illustration, many Melbourne-Ballarat trains continued to travel via Geelong and this remained the case until early in the 20th century.

As far as the direct Ballarat line is concerned, the line from Ballarat to Ballan was opened in 1886 and that from Melbourne to Bacchus Marsh in 1887; but, as we have seen, it wasn't until 1889 that the 28.6 km gap through the hilly country west of The Marsh was completed. [Another possible reason for this was that the VR was, until the end of steam, rather afraid of the Inglis-ton Bank—Editor]

I was most intrigued to see the 1955 TT for the South Geelong-Geelong-Corio service. Jack MacLean, founder of the ATA, had a particular interest in this extremely short-lived service and often spoke to me about it. Steven is correct in saying that the service only lasted three days, on account of poor traffic. I recall Jack telling me that only one lady travelled in the three days that the train did operate. Steven is also correct in saying that the consist of the train was a rake of PL cars. Jack used to say that the service failed due to lack of publicity but Steven has, to some extent, put the lie to that by unearthing an advertisement in the Geelong Advertiser, the paper that would have then been read by the majority

of Geelong residents! Sure, the advert is small but, even so, it's there – VR did advertise its Cinderella Geelong suburban train!

Steven asks why VR didn't use their new, prestigious Walker rail cars on the Geelong suburban service, rather than a rake of PL cars. Personally, I would venture to suggest that the railways thought that the demand for the local train would be so great that all the passengers offering wouldn't fit into a rail car. Now, there's a sad irony!

Of course, another paradox is that the current TT gives Geelong residents a service that is many, many times more frequent than they had with the short-lived 1955 local service; and today, all trains also serve Melbourne, rather than, in part, having a neighbourhood service.

The Times for February 2015 also includes an article, Is your wait short enough?, in part of which author Jim Wells compares the new Gold Coast light rail with the also recently-constructed Edinburgh light rail. Let me take a moment to compare all of Australia's single light rail/tram systems with another recently opened single-line light rail; that of Jerusalem. Jerusalem's Light Rail was constructed between 2002 and 2010 when it officially opened. It supplements Jerusalem's suburban bus network.

PS For more on the Jerusalem network, see the following article by Albert—Editor.

Israel Railways.

ALBERT ISAACS

IN THE MAIN, THIS ARTICLE is based on observations made by the author during a short trip to Israel in May/June 2014. The primary reason for this trip was eight days spent in Jerusalem as part of JJJ (Joint Jerusalem Journey) the first interfaith journey from Melbourne, with four Muslims, four Christians and four Jews. After JJJ, I made Tel Aviv my base for four days that were mainly spent on the Israel Railways system.

Much of the historical background in this article was provided by various Wikipedia sites. The three accompanying maps are also courtesy of either Wikipedia or www.mapsofworld.com. Thanks also go to Victor Isaacs for the provision of some of the earlier timetables referred to below.

When discussing Israel, keep in mind that we're looking at an extremely small geographical area. The whole of the State of Israel is no bigger than a third of Tasmania!

A brief history. As early as 1839, Sir Moses Montefiore proposed a rail system for the projected Jewish state in Palestine. However, the first line was not opened until 26th September 1892, when a line from Jaffa to Jerusalem was opened. This line had been built by French interests.

During the Ottoman Empire era, a rail system was gradually developed in Palestine. Some early lines were of 1 m and 1.05 m gauge but, by 1918, all lines that were not of standard gauge (1,435 mm – 4' 8½") were abandoned.

During the British Mandate of Palestine, Palestine Railways was established in 1920. In 1936-39 the railways became a target for sabotage by Palestinian Arabs opposed to mass Jewish migration. When the British withdrew from the region in May 1948, Palestine Railways ceased to exist and with the establishment of the State of Israel, Israel Railways was formed, using the Palestine Railway system based on Haifa and quickly building up a small system. Most of the lines in Transjordan, Lebanon and Syria (including Palestine Railways lines) were abandoned, although some were later rebuilt.

Despite Israel Railways' promising start,

about 25 years' ago the IR was extremely rundown. The Public Timetable for 2nd July 1989 shows:

- 15 passenger trains daily, Tel Aviv-Haifa;
- Seven of these services were extended to/from Nahariya;
- One of the Haifa-Tel Aviv trains was extended to/from Jerusalem.

That was it – 15 trains – the complete passenger service!

Rolling stock and infrastructure was also in very bad condition. Buses were king and hardly anyone used the Cinderella rail system. However, over the last two decades, billions of shekels (1A\$ = about 3.3 ISH) have been spent on revitalising the system. Today's railway bears little resemblance to the system of the past, as we will later discuss.

The newly-built Sderot station includes a mural along the pedestrian subway wall, which tells the year-by-year history of railways in what is now the State of Israel. Very interesting!

The future As Australian readers know, it is currently 40 years since the first real proposals for a Very Fast Train

along the east coast of Australia were mooted; the discussions continue but nothing practical has yet happened. However, in Israel talks began in the 1990s regarding a Jerusalem-Tel Aviv VFT (or should we say SFT, Somewhat Faster Train); planning commenced in 2000 with construction initiated as quickly as 2001. Work on this completely new, 160 km/h track is proceeding and will be finished by 2017. The journey will take 30 minutes compared with the present 75 minute rail journey. The line will also serve Ben Gurion International Airport. The station at Jerusalem is being resited in the centre of the city, next door to the bus terminal. (The present station is a considerable distance south of the city – see below.)

The VFT construction is typical of ongoing plans to continue to improve the rail system and make it even more attractive to both locals and tourists.

Jerusalem. Changes within Jerusalem are analogous to the positive and negative modifications that have, and still are taking place across the country. As in so many cities across the world, the convenient main station in the Jerusalem city centre was closed and, as we will discuss later, there is now a Jerusalem station tucked far away in the inaccessible southern suburbs. (Adelaide, Auckland and Christchurch are classic Australasian examples of this silly trend of a few years' ago, and, of course, sadly, they are now joined by Newcastle.) Jerusalem's original station operated near the heart of town from 1892 until 1998, when the Jerusalem line was closed beyond Beit Shemesh, some 30 kms west of Jerusalem; this being on account of poor track condition and of a number of derailments. At this time the former Jerusalem station was abandoned but the site was reopened in May 2013 as HaTakhana HaRishona (The First Station), a cultural and entertainment venue. The 4,000 sq.m rail yard has been covered over with wooden planks but, intriguingly, the original tracks are still in place between the planks. The site houses restaurants, takeaway food vendors, souvenir shops, entertainers of various types, etc. Your author visited HaTakhana HaRishona on the eve of Jerusalem Day 2014 and the place was popping and full of life,

In the meantime, in 2005 the Jerusalem railway line was reopened, but only as far as a new terminus in the Mahla region, which is hard to get to by public transport (I caught the Light Rail [see below] to the Mount Herzl terminus, from whence I used a taxi for the last couple of kilometres). At the present time, rail cannot really compete with the two Jerusalem-Tel Aviv bus companies, both of which use the bus station in the centre of Jerusalem but, obviously, this will change when

the VFT opens in 2017 (see above). There is currently a bus service Jerusalem-Tel Aviv every 10 to 20 minutes, taking a little less than an hour for the journey. Buses take the freeway which means that all one really sees is freeway. On the other hand, the 1¼ hour rail journey operates every two hours and is most scenic. Therefore, in general, locals using public transport catch the bus and tourists take the train.

A major recent innovation is Jerusalem's Light Rail which was constructed between 2002 and 2010 when it officially opened. It supplements Jerusalem's suburban bus network.

As the map shows, it operates on a 13 km route from the north-east to the south-west. The route is somewhat indirect so as to serve the city centre, the bus station, the Old City at Damascus Gate and a number of shopping centres. There are 23 stops. (My hotel [Beit Shmuel Hotel] was about a kilometre south-east of the City Hall stop.) From my experience, the Light Rail tends to be quite busy, particularly at peaks when there are many standees.

Most of the infrastructure is along reserved track, much of it in the median of old or newly constructed roads. There are plans to extend the Light Rail.

The service was originally jointly owned by the French Veolia Transport and the local Dan Bus Company but it is now owned and operated by Egged (Egged Israel Transport Cooperative Society Ltd). The service is operated by 46 Citadis 100% low-floor, five-module units, which look quite familiar to Melbourne and Adelaide tram riders. With five modules the Jerusalem trams are of a similar size to Adelaide's Citadis 302s which were purchased second-hand from Madrid. However, they are bigger than the Melbourne three-section Citadis, albeit a similar size to Melbourne's D2 Combino trams.

Jerusalem's 46 large, five-section trams, operating over a 13 km route make an extremely positive comparison with Australia's three single-line systems: Adelaide – 21 modern vehicles for 15 km (excluding the preserved H trams); Gold Coast – 14 vehicles for 13 km; Sydney – 17 vehicles for 12.8 km.

The current national rail system As previously noted, there have been considerable recent improvements to the nationwide Israel Railways system. Your author would summarise the current system as follows.

There are passenger services on nine intercity lines. A few current lines follow earlier alignments in parts, but most lines are either new or have been

partly rebuilt. Much of the new construction has been in the medians of freeways and highways. There are numerous freight lines and sidings. The system has dual track on six of the nine main lines.

All stations are modern and have recently been rebuilt. A few former stations were noted near the new ones, always in derelict condition (think, Watergardens/Sydenham).

Modern, computerised signalling is utilised throughout the system.

There are concrete sleepers on virtually all of the lines, including on sidings which don't appear to have recently seen much traffic (although teensy, weensy sections of wooden sleepers were noted on just a few presumably unimportant sidings).

Regarding the scenery seen from the line, the area around Jerusalem is extremely rugged and hilly and very scenic, but the rest of the country is comparatively flat. Surprisingly, much of the countryside looks like some of the flatter parts of Australia. This is particularly so because in the early part of the 20th century, eucalypts were imported from Australia so as to dry up much of the Israeli swampland and, today, a good deal of the railway system passes through forests of gum trees.

Nevertheless, Israeli cities and towns are the complete opposite to their spread-out Australian counterparts – Israeli cities are geographically concentrated – one will suddenly leave the countryside and will be in a small area of high rise buildings, including tall apartments blocks.

For obvious reasons, security is a high priority in Israel and the railway system is certainly no exception. To enter any railway station, one must pass through security gates including scanners similar to those at airports. Having said that, it is ironical that Israel Railways seem less concerned with people taking photos of infrastructure and rolling stock than many of their Australian counterparts. I was pulled up only once, when taking a photo which accidentally included an Israeli soldier at the side of the photo.

Passenger services All passenger rolling stock is comparatively modern. The earliest cars are single deck but, since 1996, two types of double deck carriages have been introduced. All cars (single and double deck) feature single class, spread-out two-by-two seating with two seats facing each other with a table in-between. All seats are most comfortable. Compared with Australia, the only things missing are drinking water and on-train refreshments (but every station includes a kiosk). It should be noted that the history mural at Sderot station (see above) confirms that Israel Railways did once use buffet cars.

Rolling stock (single and double deck) consists of an unusual push-pull arrange-

ment with a diesel loco at one end and a driver's cabin at the end of the far passenger carriage. All trains have four extremely long, articulated carriages, which would probably equate in length to eight or 10 Australian carriages. Double deck trains have seating for 800+ persons, plus many standees.

Most of the passenger locos I sighted were from Alstom, although I did see one Swedish Kalmar loco. However, a Google search revealed that there are currently about a dozen different types of loco in service (including goods locos and shunters).

Train crews consist of a driver and a conductor in each of the four cars. Stations are also well staffed and there are ticket offices, as well as ticket vending machines, at all stations. These are placed in a sort-of no-man's-land between the security-gated entry and exit barriers and the ticket-checking machines that provide entry into the main area of the stations.

Most trains that I travelled on were full, and some had many standees. One of the reasons for this is that members of the IDF (Israel Defense Force) are given free rail travel. There are so many soldiers travelling that one sometimes got the feeling that one was on a mobile army base, along with a few other token civilians. (The majority of readers would know that most Israelis, male and female, are called up for three years military service at the age of 18. This means that most soldiers are extremely young. It is disconcerting that most of these young people always carry automatic sub-machine guns, even on trains and in the streets.)

Because of the imbalanced influence of the Haredi Party and of the minority Ultra-Orthodox Jewry that it represents in the Knesset (Parliament), all public transport closes for Shabbat (the Sabbath) which

goes from sunset Friday to sunset Saturday. Therefore trains operate to a daily timetable Sundays-Thursdays. There are special timetables for Friday mornings and afternoons and again for Saturday night.

At first glance the maps on page 19 look a little confusing but the system is really quite simple. Today, there are nine long-distance passenger rail routes, most with hourly services that are supplemented by short-distance runs in the Tel Aviv suburban area and between Haifa and Nahanya. Tel Aviv (Savidor Center) is at the centre of the system, although for operational purposes, most long-distance trains run through Tel Aviv, thus combining what are really two routes. At the bottom of this page is a list of the long-distance services:.

The line to Sderot was opened as recently as December 2013. Sderot is only 3 km from the Gaza border and one can see the Gaza City buildings from Sderot station. This line is being extended to Be'er Sheva via Ofakim, which is even closer to Gaza than Sderot. At Be'er Sheva it will, of course, link up with an existing line. This construction explains why the track beyond Sderot was concrete sleepers and quite shiny, and appeared to be well used. I have to admit that I didn't realise just how new the line was until well after I returned home to Melbourne and did some Google searching. At first, I thought that the excellent track condition may have been explained by some sort of military base, served by rail, beyond Sderot. (Of course, this may still be a possibility.)

Public timetables have been issued every year or so but are hard to find. When your author was planning his trip, he even found it difficult, nay impossible, to get any train times on the internet.

Paradoxically, I found a public timetable being sold for 3 shekels (about A90¢), at the very first station that I visited

(Jerusalem). Strangely, it was not a current timetable but one for the major time changes that were to be introduced a few days after I had left Israel, that is, on the 7th June 2014. I soon found that most trains running in late May had similar train numbers to those found in the June timetable, but that virtually no train times were the same, times varying from three to 20 minutes!

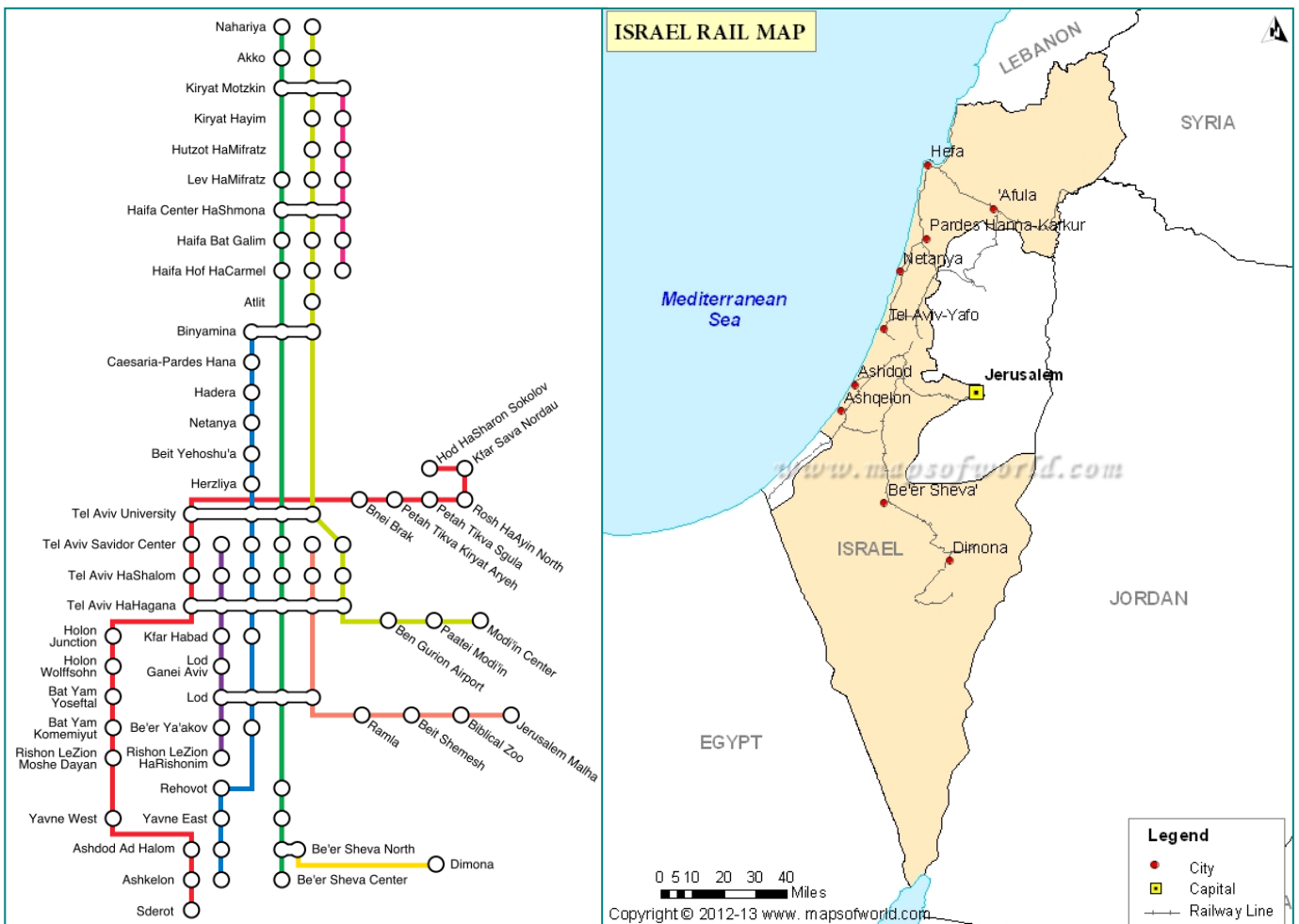
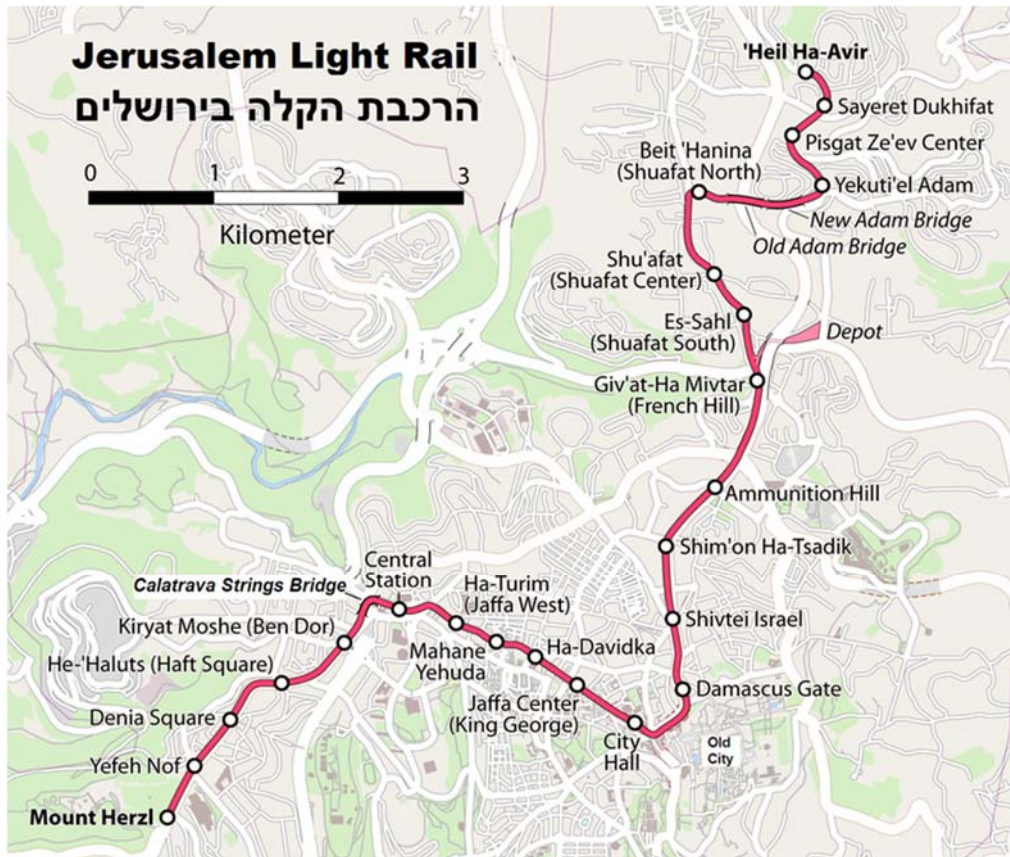
Freight and ancillary services As explained earlier, there are numerous freight lines and sidings and many industrial sites and mines, etc, are served by the railways. Most of the rail on these lines appears to be shiny and well used. Therefore, it is with amazement that I report that in all my journeys on the Israel Railways, I only passed one freight train. That was a load of containers, crossed at 1049 on 29th May between Hadera West and Caesaria on the Nahariya line. One must therefore assume that most freight trains run at night, so as not to interfere with passenger services.

When I was at Sderot on 1st June (see above), I saw Plasser & Theurer track cleaning car No.903 appear from the Ofakim end of the line and rest at Sderot from 1201 to 1206½ before going back again in the direction from whence it came!

Conclusion

In summary, I was very impressed with the efficiency and sophistication of the current Israel Railway system, and of the regularity of passenger services. This is particularly so when one remembers the dire state the system was in just 25 years ago. The up side of this is that Israel Railways is well used by soldiers, local civilians and tourists. Long may the improvements to the system continue!

• To Nahanya	Hourly service	Double track.	
• To Hod HaSharon Sokolov	Hourly service	Double track.	
• To Modi'in Center	Hourly service	Single track	Serves Ben Gurion Airport.
• Be'er Sheva	Hourly service	Double track.	
• Sderot	Hourly service	Double track	Via Bat Yam.
• Ashkelon	Hourly service	Double track	Via Lod.
(Ashkelon is in fact the penultimate station on the Sderot line and, therefore, the line via Lod actually provides an alternative loop service.)			
• Rishon LaZion HaRishonim	Hourly service	Double track	
The town of Rishon LaZion is actually served by two different lines – Rishon LaZion Moshe Dayan is a wayside station on the Sderot line, and Rishon LaZion HaRishonim is a terminal station on a separate line. Rishon LaZion HaRishonim station is built in the median of a freeway and there is no other infrastructure in this part of town other than the railway station car park.			
• Jerusalem	Two-hourly service	Single track.	
• Dimona	Three trains per day	Single track	
Dimona is the only long-distance service on which I did not travel. It would have been difficult to visit during my short stay because the shortest turn-around time at Dimona appears to be about four hours.			



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PERTH	Dep. Tues. & Sat.	10.00 a.m.
Geraldton	Arr. " " "	12.35 p.m.
" " " " "	Dep. " " "	1.05 p.m.
Carnarvon	Arr. " " "	3.55 p.m.
" " " " "	Dep. Wed. & Sun.	7.00 a.m.
Onslow	Arr. " " "	9.25 a.m.
" " " " "	Dep. " " "	9.55 a.m.
Roebourne	Arr. " " "	11.25 a.m.
" " " " "	Dep. " " "	11.40 a.m.
Whim Creek	Arr. " " "	12.05 p.m.
" " " " "	Dep. " " "	12.15 p.m.
Port Hedland	Arr. " " "	12.55 p.m.
" " " " "	Dep. " " "	1.35 p.m.
Broome	Arr. " " "	4.45 p.m.
" " " " "	Dep. Thurs. & Mon.	6.30 a.m.
Derby	Arr. " " "	7.30 a.m.
" " " " "	Dep. " " "	7.50 a.m.
Noonkanbah	Arr. " " "	9.05 a.m.
" " " " "	Dep. " " "	9.50 a.m.
Fitzroy	Arr. " " "	10.20 a.m.
" " " " "	Dep. " " "	10.30 a.m.
Halls Creek	Arr. " " "	12.05 p.m.
" " " " "	Dep. " " "	12.15 p.m.
Ord River	Arr. " " "	1.20 p.m.
" " " " "	Dep. Fri. & Tues.	6.00 a.m.
" " " " "	Time change plus 1 hr. 30min.	
Wave Hill	Arr. Fri. & Tues.	8.55 a.m.
" " " " "	Dep. " " "	9.05 a.m.
Victoria	Arr. " " "	9.50 a.m.
" " " " "	Dep. " " "	10.10 a.m.
Daly Waters	Arr. " " "	12.00 noon

South-bound

Daly Waters	Dep. Fri. & Tues.	1.00 p.m.
Victoria	Arr. " " "	2.40 p.m.
" " " " "	Dep. " " "	3.00 p.m.
Wave Hill	Arr. " " "	3.45 p.m.
" " " " "	Dep. " " "	3.55 p.m.
" " " " "	Time change minus 1 hr. 30min.	
Ord River	Arr. Fri. & Tues.	3.50 p.m.
" " " " "	Dep. Sat. & Wed.	6.00 a.m.
Halls Creek	Arr. " " "	7.05 a.m.
" " " " "	Dep. " " "	7.15 a.m.
Fitzroy	Arr. " " "	8.50 a.m.
" " " " "	Dep. " " "	9.00 a.m.
Noonkanbah	Arr. " " "	9.30 a.m.
" " " " "	Dep. " " "	10.15 a.m.
Derby	Arr. " " "	11.30 a.m.
" " " " "	Dep. " " "	11.50 a.m.
Broome	Arr. " " "	12.50 p.m.
" " " " "	Dep. Sun. & Thurs.	6.30 a.m.
Pt. Hedland	Arr. " " "	9.40 a.m.
" " " " "	Dep. " " "	10.20 a.m.
Whim Creek	Arr. " " "	11.00 a.m.
" " " " "	Dep. " " "	11.10 a.m.
Roebourne	Arr. " " "	11.35 a.m.
" " " " "	Dep. " " "	11.50 a.m.
Onslow	Arr. " " "	1.20 p.m.
" " " " "	Dep. " " "	1.50 p.m.
Carnarvon	Arr. " " "	4.20 p.m.
" " " " "	Dep. Mon. & Fri.	6.30 a.m.
Geraldton	Arr. " " "	9.20 a.m.
" " " " "	Dep. " " "	9.50 a.m.
PERTH	Arr. " " "	12.25 p.m.

NOTE.—Times are approximate only and 'planes may depart slightly before schedule.

ORD RIVER-WYNDHAM AIR SERVICE

Wyndham	Dep. Mon. & Thurs.	1.30 p.m.
Ivanhoe	dep. " " "	2.15 p.m.
Argyle	dep. " " "	3.00 p.m.
Ord River	arr. " " "	4.00 p.m.
Ord River	dep. Wed. & Sat.	7.00 a.m.
Argyle	dep. " " "	8.15 a.m.
Ivanhoe	dep. " " "	9.00 a.m.
Wyndham	arr. " " "	9.30 a.m.

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