

Smart Work by Brighton Semi-Fast Units

By F. S. BOND

THE more spectacular schedules in the Southern electric service on the Brighton line—such as the 30-min. allowed the 4.45 p.m. *ex* Victoria for the 27.5 miles East Croydon to Haywards Heath, the 21 min. for the 19 miles Three Bridges to East Croydon, and the 58 min. for the non-stops to Brighton—are allotted naturally to units of the express type. What is, however, not so well known is that some of the turns entrusted to the semi-fast type of stock are almost if not quite as exacting.

For instance, the 9.35 a.m., 60-min. non-stop from Brighton was until recently composed of two four-coach semi-fast units, and suffers the common delay to up expresses in having to reduce speed to 30 m.p.h. at Coulsdon North for the crossover to the local line, as well as other junction speed restrictions. In the down direction, the 4.28 p.m., 6.28 p.m., and 7.5 p.m. *ex* Victoria, are allowed only 69 min. with five intermediate stops, 68½ min. with four intermediate stops, and 72 min. with six stops, respectively. Such schedules call not only for exceedingly smart running, but also exceptional station work. The running may appear quite ordinary when compared with the express stock performances, but it has to be remembered that the semi-fast units are so designed that they cannot compete in speed with the express units, either uphill or down. They are called on, therefore, to approach much more nearly to the limits of their capabilities than the express units, especially when there are out-of-course delays.

Judging by personal observation, the semi-fasts, though fractionally quicker off the mark in starting and on really steep up grades such as that out of Victoria, are considerably slower than the express stock under all other conditions. Ascending the long 1 in 264 grades on the line to Brighton, the express units daily maintain 63-68 m.p.h. Actually, a sustained 70½ m.p.h. was recorded between Horley and Earlswood with a wartime 5-coach unit, but, in the writer's

experience, six or twelve-coach units seldom if ever exceed 68 m.p.h. up these grades. The semi-fasts, on the other hand, seem incapable of maintaining any speed in excess of 55 m.p.h. on similar gradients. On the 1 in 165 northern approach to Quarry tunnel the respective sustained maxima are 55-58½ and about 49 m.p.h. Downhill, if there is any limit to the capabilities of the express units, it is certainly not much below 80 m.p.h., whereas, only on the hardest schedules do the semi-fasts appreciably exceed 65, and 71-72 m.p.h.—several times recorded—appears to be about their all-out limit in normal working.

It is, therefore, all the more creditable that the semi-fasts can compete on anything like equal terms with the express units, and the records below certainly show that they do.

First, however, in making these comparisons, it is necessary to assess the approximate loss of time in slowing down for and accelerating from a stop. Obviously, this will vary slightly at different stations according to gradients and other conditions. From records to hand, the time lost in stopping and starting at East Croydon with such trains as the 4.28 p.m., compared with the 6.28 p.m. which passes that station, averages 1 min. 17 sec. The corresponding figure for Haywards Heath is 1 min. 34 sec. For two stops near together such as made by the 6.28 at Burgess Hill and Hassocks, the average is 2 min. 36 sec. or 1 min. 18 sec. for each; the same would apply to the Gatwick Airport and Three Bridges stops of the 4.28. The general average loss therefore, works out at about 1 min. 20 sec. The average period scheduled for station work at the intermediate stops of these trains is about ¾ min., which, added to the 1 min. 20 sec. assumed above for stopping and starting, gives a total allowance of 2 min. for each stop, as compared with a non-stopping train, and this is apparently what the timetable allows as standard.

The following are records so far to hand of runs by these trains on various

dates, and their timetable schedules; the figures in brackets are carefully estimated net times in cases where signal or engineering out-of-course delays intervened:—

A few details of these various runs may be of interest, including the maximum and minimum speeds involved at various points. It should be noted, however, that in none of the runs so far recorded* by the

4.28 p.m. ex-VICTORIA

Point-to-point start-to-stop runs.	Schedule		Actual times on four occasions.							
	Miles	Min. Allowed	Run No. 1		Run No. 2		Run No. 3		Run No. 4	
			Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.
Victoria-East Croydon	10.6	14½	14	03	14	25	15	10	14	47
East Croydon stop			1	11	0	41	1	27	0	52
East Croydon-Gatwick Airport	17.2	20½	19	43	19	38	19	48	19	31
Gatwick Airport Stop		0	0	20	0	19	0	35	0	20
Gatwick Airport-Three Bridges	1.8	3½	3	15	3	21	3	24	3	19
Three Bridges stop		1	0	37	0	37	0	58	0	48
Three Bridges-Haywards Heath	8.5	10	11	04	11	45	10	25	9	39
Haywards Heath stop		1	1	03	0	56	0	40	1	05
Haywards Heath-Preston Park	11.5	14	13	09	13	17	14	44	14	36
Preston Park stop		1	0	24	0	28	0	24	0	50
Preston Park-Brighton	1.3	3	3	05	3	09	3	19	3	07
Victoria-Brighton (Actual) †	50.9	69	67	54	68	36	70	54	68	54
“ “ Net			66	42	66	51	67	36	67	16
Standing at Stations		3½	3	35	3	01	4	04	3	55
Net running time			63	07	63	50	63	32	63	21
Approximate non-stop equivalent			56½	min.	57½	min.	56½	min.	56½	min.

Figures in brackets are estimated net times when out-of-course delays occurred
The non-stop equivalent times in the last line are based on the 1 min. 20 sec. figure for retardation and acceleration

6.28 ex-VICTORIA

	Miles	Min. Allowed	Run A		Run B	
			M.	S.	M.	S.
Victoria-Horley	26.0	33	32	31	31	44
Stop at Horley		1				
Horley-Three Bridges	3.5	5	5	14	5	18
Three Bridges Stop		1				
Three Bridges-Burgess Hill	12.2	14	13	18	13	22
Burgess Hill Stop		½				
Burgess Hill-Hassocks	2.1	4	4	09	3	28
Hassocks Stop		0				
Hassocks-Brighton	7.1	10	9	19	9	31
Totals	50.9	68½	64	31	63	23
Running Time			63	51	62	52
Net			58	31	57	32
Equivalent Non-stop time						

The 9.35 a.m. ex Brighton, an eight-coach train, sustained 1½ min. delay from signals near the end of the run, and also was diverted from the main to the local line at Coulsdon North, yet the arrival at Victoria was only 25 sec. over the 60-min. schedule. Time could, therefore, have been kept easily with a clear road. In fact, Quarry summit, 33.4 miles, was breasted in 36 min. 35 sec., leaving nearly 23½ min. for the remaining 17½ downhill miles into Victoria.

writer has any time been lost in running, except where out-of-course checks made point to point timekeeping virtually impossible; even then the delays were very small and time was regained subsequently in almost all instances.

First of all, the 9.35 a.m. actually sustained four signal checks, two of them amounting almost to stops, both too late in the run to allow of subsequent time recovery. The net time was certainly not more than 58½ min. and probably nearer 58 min., inclusive of two 30-m.p.h. junction speed restrictions, carefully observed. A steady 52 m.p.h. was sustained from Preston Park to Clayton Summit and the maximum speed beyond Hassocks was 65 m.p.h., so that Haywards Heath, 12.9 miles, was passed in 14 min. 35 sec., virtually as booked. The passing time at Three Bridges was precisely 24 min. as scheduled for the 21.4 miles; speed here was again 65 m.p.h.

The 32½-min. booking to Earlswood was, however, improved on by over a minute, and the succeeding climb to Quarry, with its 1 in 200-230 grades,

* This remark refers to 1946 or pre-current-reduction

produced a minimum of $49\frac{1}{2}$ m.p.h., the 33.4 miles to the summit having taken 36 min. 35 sec. Adverse signals and the 30-m.p.h. negotiation of the crossover to the local road at Coulsdon North caused the 40.4 miles to East Croydon (passed slowly) to occupy 44 min. 13 sec. The remainder of the run was spoilt by the other three signal checks, but with time so well in hand at Quarry Summit, the arrival at Victoria was only 25 sec. over schedule. The whole performance was a normal everyday effort with no attempt to hurry. The maximum speed attained was $67\frac{1}{2}$ m.p.h. at Horley.

Turning to the four runs of the 4.28 p.m. *ex* Victoria, no particular remarks are called for concerning the Victoria-East Croydon section. The next 17.2 miles to Gatwick Airport begin with a 6.9 mile continuous rise at 1 in 264 for $4\frac{1}{2}$ miles, a short length of 1 in 100, and a final two miles at 1 in 165 to Quarry Summit, some 400 ft. higher than Victoria. The times from the re-start at East Croydon for this all but 7-mile climb were 9 min. 26 sec., 9 min. 20 sec., 9 min. 47 sec. (9 min. 23 sec. net), and 9 min. 24 sec., with steady speeds of 48, 49, 49 and 49 m.p.h. up the final 1 in 165. The succeeding 8.5-mile descent to Horley occupied times varying from 8 min. to 8 min. 24 sec., but in all cases the maximum speed before Horley was 71 m.p.h. The final 1.7 miles to the Gatwick stop were covered in 1 min. 53 sec. to 2 min. 1 sec.

From Three Bridges to Haywards Heath, 8.5 miles, 10 min. is a tight schedule, and on three of the four runs an engineering slack made timekeeping impossible. The initial 2.4 miles up to Balcombe Summit took from 3 min. 33 sec. to 3 min. 40 sec. with final speeds of from 48 to $50\frac{1}{2}$ m.p.h. In run No. 4, unchecked, the remaining 6.1 miles occupied 6 min. 3 sec. with a maximum speed of $69\frac{1}{2}$ m.p.h. before brakes were applied. The 11.5 miles of switchback road from Haywards Heath to Preston Park were covered in times varying only between 13 min. 9 sec. and 13 min. 17 sec., if signal delays are considered. Minimum speeds at Clayton Summit were $54\frac{1}{2}$ (twice), 49 (and still rising after a signal check) and 53 m.p.h.

The runs with the 6.28 are not quite so

spectacular in the earlier stages. The minimum speeds on the 1 in 165 to Quarry were 49 and 47 m.p.h., and maxima before brakes were applied for the Horley stop were 68 and 69 m.p.h. The fastest sprint from Three Bridges to Burgess Hill, 12.2 miles, was completed in 13 min. 18 sec. and 13 min. 22 sec., start to stop, roughly 55 m.p.h. In both runs 49 m.p.h. were attained at Balcombe Summit, but in run A a maximum speed of 72 m.p.h. was recorded at Haywards Heath, whereas run B was content with 67 m.p.h., but whereas the speed of A then eased, that of B continued to rise to 69 m.p.h. before, Wivelsfield. On the final stretch from Hassocks to Brighton, Clayton Summit, 2.0 miles from the start, was passed in 3 min. 37 sec. and 3 min. 25 sec. respectively; maxima before Preston Park were 60 and $65\frac{1}{2}$ m.p.h., as time was then well in hand.

All the runs quoted above were in ordinary everyday service, and the motormen had no idea they were being timed.

Smart station working has already been noted, but the best example of this so far recorded was an aggregate time of 2 min. 58 sec. spent at five intermediate stops, three of them important interchange junctions—44 sec. at East Croydon, 26 sec. at Gatwick Airport, 42 sec. at Three Bridges, 43 sec. at Haywards Heath and 23 sec. at Preston Park—on a more recent 4.28 run, too late for inclusion of details in this article. This aggregate time has since been repeated.