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## Double-Deck IC Coaches

by A.E.Hauser-Gubser

### Swiss Federal Railways (SBB)

#### Criticisms

Of late the SBB management has been under media attack. Whilst, in my opinion, some of the criticisms are justified, others are not. As always, when our public transport system is battling with problems, the powerful road lobby chants the evergreen refrain of inefficiency, waste of taxpayer's money, etc, etc, but carefully avoids discussion of the real problem, that cars and lorries do not bear the full costs they incur. Whenever disaster strikes and roads are cut by avalanches or floods, the railways are criticised by the same lobby for their inefficiency in not being able to immediately provide additional car transport trains.

Unfortunately the SBB management has damaged its own image with some faulty decisions. One was certainly the resolution to eliminate conductors on regional lines, which led to the threat of a strike by the rail union, an even unheard of since 1918! A compromise has been found by not replacing conductors as they retire and by pruning the oversized administration staff over the next few years. The closing of the toilets on Zürich S-Bahn trains due to vandalism is another decision that has been criticised. Management has now agreed to appoint two-man patrols who will not only cover normal conductor's duties, but will also safeguard the security of passengers and prevent vandalism. They are jointly instructed by the Cantonal police and the SBB, but the problem remains that there are only a limited number of men available for these duties.

On the other hand one has to admit that the change in attitude towards regional line abandonment is welcome. Let me give two examples of this.

The Monthey - St-Gingolph line (Table 100.2), originally threatened with abandonment and replacement by bus services, will be maintained. This is after interested citizens collected over 30.000 signatures on a petition against closure within a few days. After some

negotiations with Canton Vaud, it has been decided that only those trains that are very lightly used, principally late evening services, will be replaced by buses.

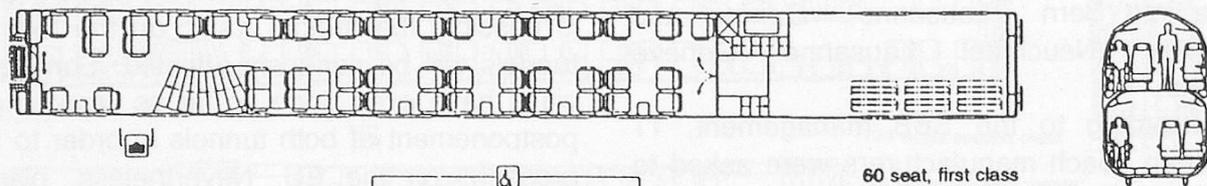
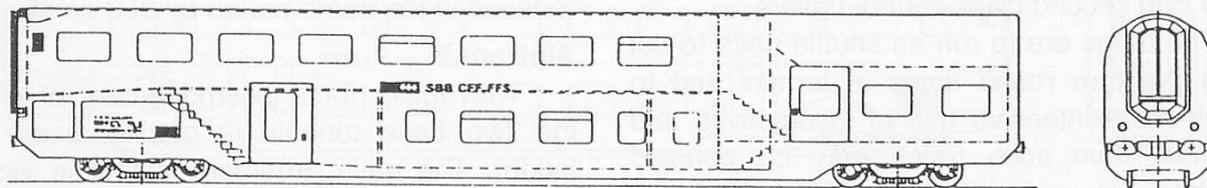
On the Winterthur - Schaffhausen route, the Marthalen commune has stubbornly refused to accept the proposals for the 1994 timetable because of the poor connections provided at Winterthur with the S-Bahn services. The SBB and Zürich traffic association has proposed the construction of an island platform with passing loop on the line to enable S-Bahn services to be extended, with a half-hourly interval service during rush hours, with partial direct connections to Zürich at other times.

It also seems that the possible loss of feeder traffic to IC trains from the regional services is now seen as a serious threat.

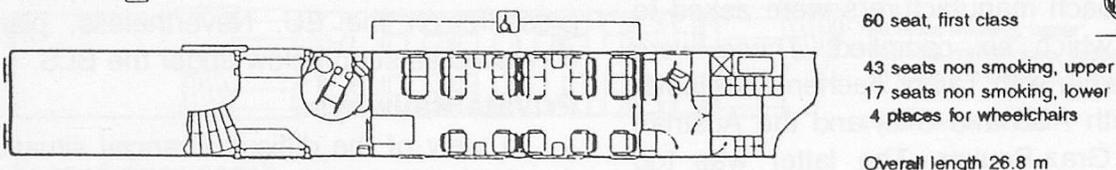
The Class 460 locomotives have also been heavily criticised by the press. In my opinion there has been a failure by both the SBB and the Industry to explain fully what is precisely behind the so-called faults. It is a fact that under heavy loadings or very high speeds problems have arisen in the electrical and mechanical components of these machines, for example, in the gate turn off thyristors, the permanent magnet brakes and seepage from the gear housings. These are, of course, minor teething problems which have been corrected. As members have been reporting over the past year, these locomotives have been undergoing extensive tests on SBB tracks precisely to identify these problems and not only to rectify them, but to optimise the performance of the locomotives. As reported in previous issues, the initial performance specifications have been exceeded during these tests. Both partners, the SBB and Industry have an enormous interest in the successful conclusion of these tests. The SBB's reasons are obvious, the Industry is keen to exploit the export potential of these fine machines, as reported later in this article.

## First class double-deck coaches for IC 2000 trains

*Drawings courtesy SBB*



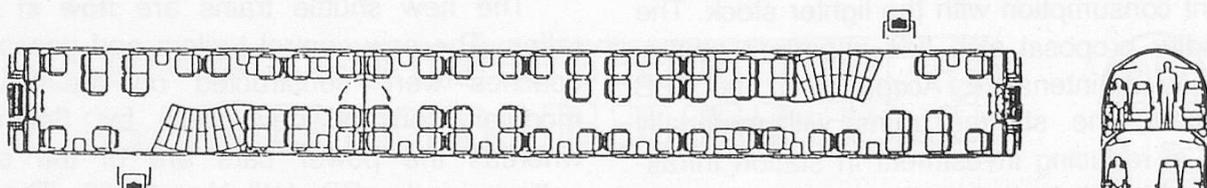
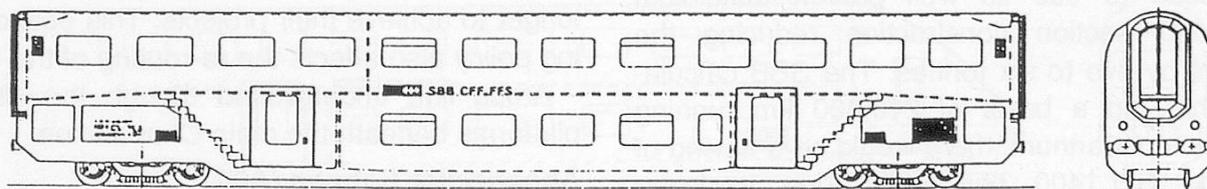
60 seats, first class



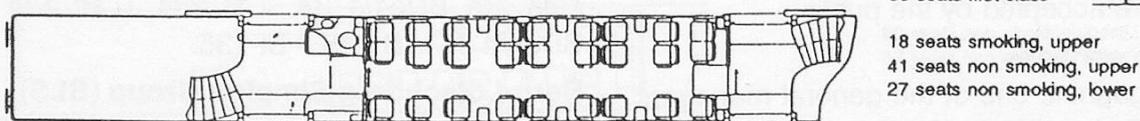
43 seats non smoking, upper  
17 seats non smoking, lower  
4 places for wheelchairs

Overall length 26.8 m

## Combined first class/luggage coach



86 seats first class



18 seats smoking, upper  
41 seats non smoking, upper  
27 seats non smoking, lower

Overall length 26.8 m

## First class coach

### Double-deck coaches

The SBB management has voted a credit of SFr.157,040,000 for 58 IC 2000 double-deck coaches. A standard IC train of the future will consist of a Re4/4 460 locomotive, one combined ADm first class and baggage coach (60 seats), one Apm first class coach (86 seats), four Bpm second class coaches (124 seats)

and one Btm second class control trailer (113 seats), giving a total of 755 seats and four places for disabled passengers in wheelchairs. The accompanying SBB drawings show the general appearance and proposed seating arrangements of these coaches. The proposed train will be 206 m long, including the locomotive, with a tare weight of 317 tonnes. The

order comprises:

- 8 Apm first class coaches
- 33 Bpm second class coaches
- 8 ADm first class/baggage coaches
- 9 Btm second class control trailers

The trains are to run as shuttle units to cut down the turn round times at termini and to permit more intensive use of locomotives and coaches. Two such trains may be coupled together. For example, a combined set could run from St.Gallen to Olten where it would divide into Bern - Lausanne - Genève and Solothurn - Neuchâtel - Lausanne - Genève portions.

According to the SBB management, 11 European coach manufacturers were asked to tender, of which six complied. These were Görlitz (together with Talbot Aachen), Schindler Waggon (with ABB and SIG) and the Austrian Simmering Graz-Pauker. The latter was too expensive while the Görlitz and Schindler proposals differed in one important point: Görlitz offered an all-steel body whereas Schindler proposed to use its well proven aluminium extruded section construction reducing the weight by five to six tonnes. The SBB calculated that, on a basis of 270,000 km running distance per annum, there would be a saving of around SFr.1400 per coach due to lower current consumption with the lighter stock. The Schindler proposal also has important advantages for maintenance. According to the SBB statement, the shorter trains will materially assist in reducing investment in station infrastructure. It will be interesting to see how the coaches are accepted by the public.

### **Pendolino services**

Mr Fagagnini, one of the general managers of the SBB, has announced that the introduction of Pendolino trains on the Gotthard route, possibly Basel - Milano and Stuttgart - Zürich - Milano is being studied.

### **Revenue**

During the first six months of 1993 the SBB earned SFr.3086.53 million, a reduction of 0.8% from the same period in 1992. Over the same period expenditure rose to SFr.3251.71 million, 2.3% more than the previous year, resulting in a shortfall of SFr.166.20 million, an increase of SFr.98.16. While there was a slight

improvement of 1.9% in passenger traffic, goods traffic receipts were down by 13.3%. 5868 million passenger/km and 3616 million freight ton/km was generated. The staff was reduced in the same period by 858 employees.

### **Alptransit**

The outcry for a postponement of one of the two base tunnels is getting louder and louder. The main argument is that in view of the constant pressure from the EU to give way to 40 tonne lorries, despite the Transit Treaty, it is possible that freight traffic on the two base tunnels will be seriously affected. Some politicians have even gone so far as proposing the postponement of both tunnels in order to bring pressure on the EU. Nevertheless, planning continues as seen below under the BLS.

### **Private Railways**

In view of the difficult financial situation of the Confederation, the subsidies given according to the Private Railway Act are not refused, but are being stretched over a longer period. As a result, most railways will have to wait longer to achieve their projects. This economising policy also affects the re-routing of the Chur - Arosa line underground through the city to platforms beneath the main Chur station.

### **Appenzeller Bahnen (AB)**

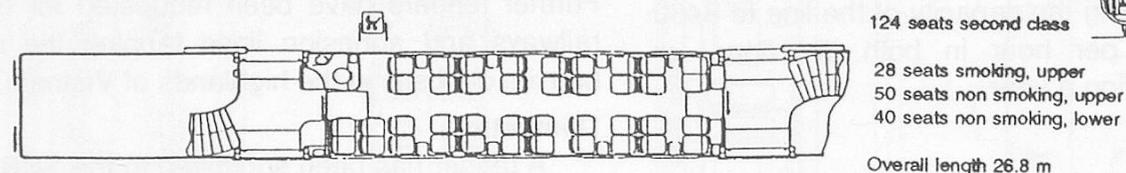
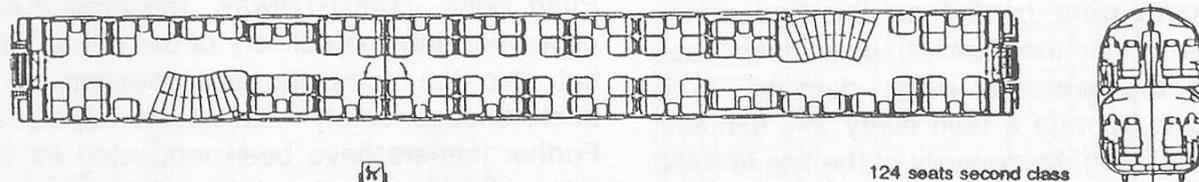
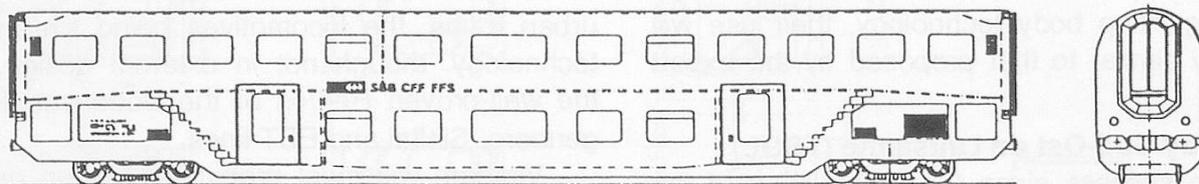
The new shuttle trains are now in operation. The new control trailers and passenger coaches were constructed on the PA 90 modular concept developed by Schindler, whereas the power cars are of the same pattern as the BDe4/4<sup>II</sup> Nos 31-33. The two sets are BDe4/4 34 + B 234 + Bt 134 and BDe4/4 35 + B 235 + Bt 135.

### **Bern-Lötschberg-Simplon Group (BLS)**

140 construction companies from Great Britain, Germany, Austria, France, Italy and Switzerland have applied for tender documents for the exploration tunnel for the Lötschberg base tunnel. This bore will be 9.5 km long with a diameter of 5 m. (Editor's note, this is close to the BR load gauge). The bore will run parallel to the proposed main twin tunnel and at a distance of 30 m. It will investigate the exact geological conditions to be met and may possibly serve as a means for attacking the main tunnelling at various points as well as providing transport of miners, material,

## Second class double-deck coaches for IC 2000 trains

Drawings courtesy SBB

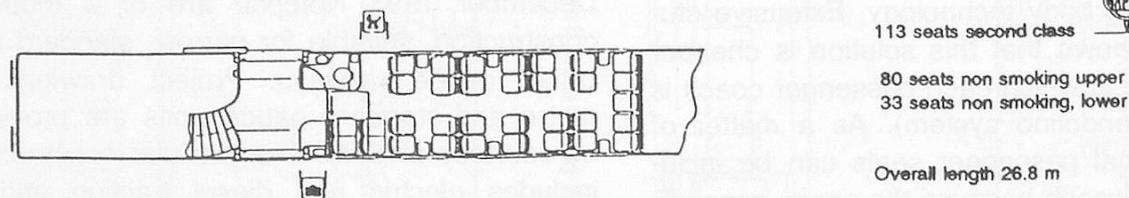
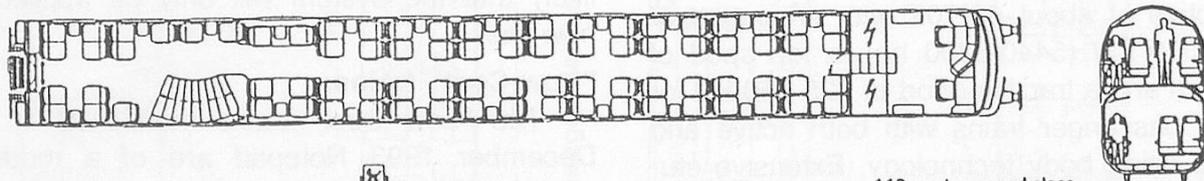
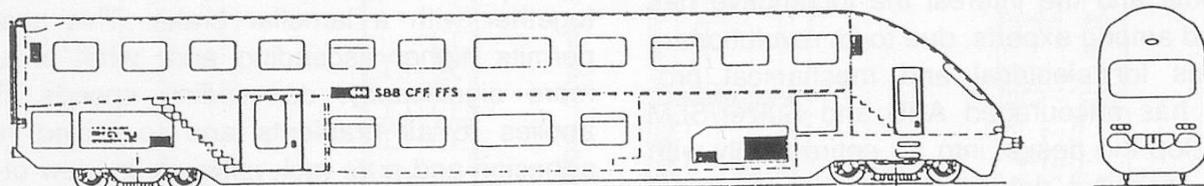


124 seats second class

28 seats smoking, upper  
50 seats non smoking, upper  
40 seats non smoking, lower

Overall length 26.8 m

### Second class coach



113 seats second class

80 seats non smoking upper  
33 seats non smoking, lower

Overall length 26.8 m

### Second class control trailer

machines, tools and removing spoil. The cost is estimated at SFr.80 million at current prices and the estimated construction time is three years. Many applicants were dismayed by the severe conditions set concerning precision, completion dates and the high penalty clauses in case of faulty construction.

### Bodensee Toggenberg (BT) and Mittel-Thurgau-Bahn (MThB)

These companies will, as reported in the December 1993 *Swiss Express*, be taking delivery of eight NPZ trains (2 for BT, 6 for MthB), which will be diverted from the existing order for the SBB, which in turn will be increased by eight units. The trains for the

MthB will be used on the Schaffhausen - Romanshorn line which was the subject of analysis in my article on Regional Lines in the December *Swiss Express*. Whilst not incorporating tilting body technology, their use will be very similar to that proposed by the expert group.

### **Tramway Sud-Ost de Lausanne (TSOL)**

The success since the introduction of the *Metro Ouest* has been considerable. 8.2 million passengers were carried on this line during 1992. A further five Bem4/6 units have been ordered to meet the rising demand. It is planned to operate a train every 7½ minutes, which will bring the capacity of the line to 8480 passengers per hour in both directions, or about 12 million a year.

## **Industry**

### **Exports**

The successful trials in Norway with a class Re4/4 460 locomotive, the orders from Finland and India and the interest the locomotive has aroused among experts, due to its revolutionary solutions for electrical and mechanical problems, has encouraged ABB and Sulzer/SLM to develop the design into an entire family with similar technical details. At present the most interesting type under development of a BoBo locomotive of about 68-70T with an output of 4000-5000 kW (5440-6800 hp), a top speed of 250 km/h and a tractive effort of 225-250 kN for hauling passenger trains with both active and passive tilting body technology. Extensive studies have shown that this solution is cheaper than the one in which each passenger coach is powered (Pendolino system). As a matter of fact, additional passenger seats can be included in each coach because the space-consuming tilting mechanism can be simplified. Control and command of all tilting functions are placed centrally on the locomotive. Since the axle load of the locomotive will be reduced to 17.5 T, the admissible lateral acceleration can be increased to 2 m/s<sup>2</sup>, which means that the curve speed at an angle of 8-10% is even somewhat higher than with the present Pendolino trains.

Offers will be submitted for 70 class 460 locomotives for Belgium and 30 for Luxembourg. Eastern US electrified railways have

expressed considerable interest in this design, because the rectifier locomotives supplied by ABB Sweden will have to be replaced.

Taiwan is interested in ordering 32 inter-urban trains, the locomotives being similar in technology, though not in external design, to the well-proven Re4/4s of the Bodensee-Toggenberg, Sihltal and EBT lines.

Vietnam will most probably pass an order for the complete reconstruction of the 84 km Phan Rang - Dalat railway. The project comprises not only the delivery of the rolling stock, but also the complete reconstruction of the track, bridges, safety installations, depots, etc. Further tenders have been requested for rack railways and adhesion lines tapping the rich bauxite deposits in the highlands of Vietnam.

### **Domestic**

A tender has been submitted to the SBB for 50 diesel locomotives for shunting and maintenance duties.

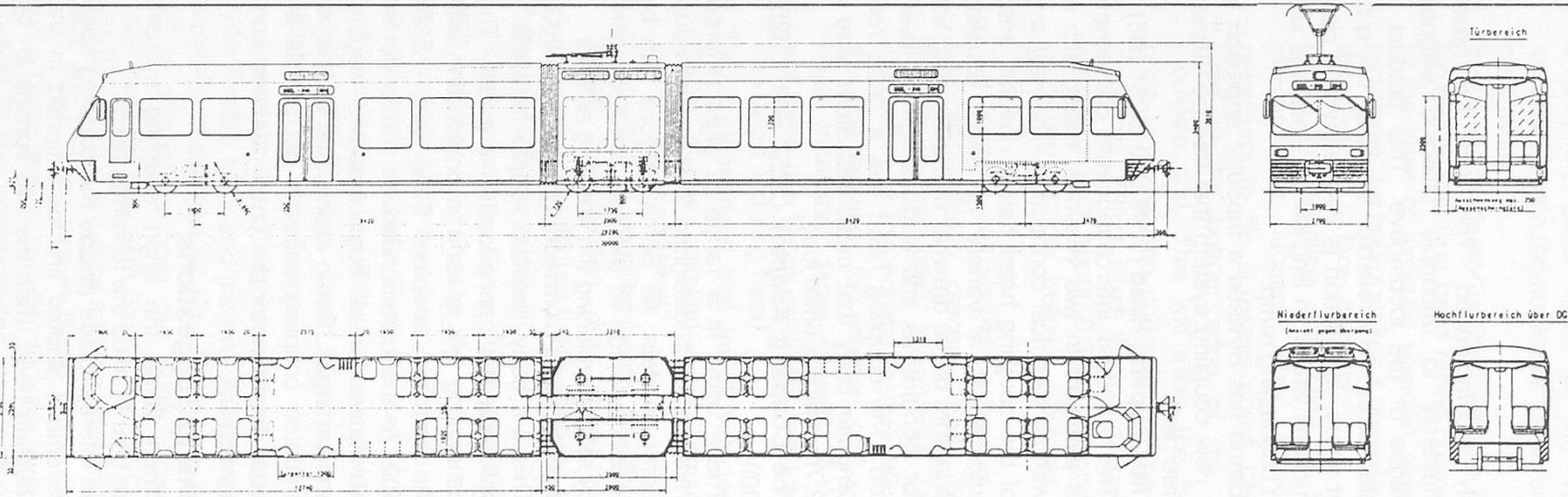
### **Rack railways**

SLM has developed a new rack system together with a lamellar brake. This system permits higher ascending and, what is even more significantly, descending speeds. This applies to all gradients and to mixed rack/adhesion and pure rack railways. In view of the high infrastructure cost of a rack railway, it is likely that the system will only be applied to new lines.

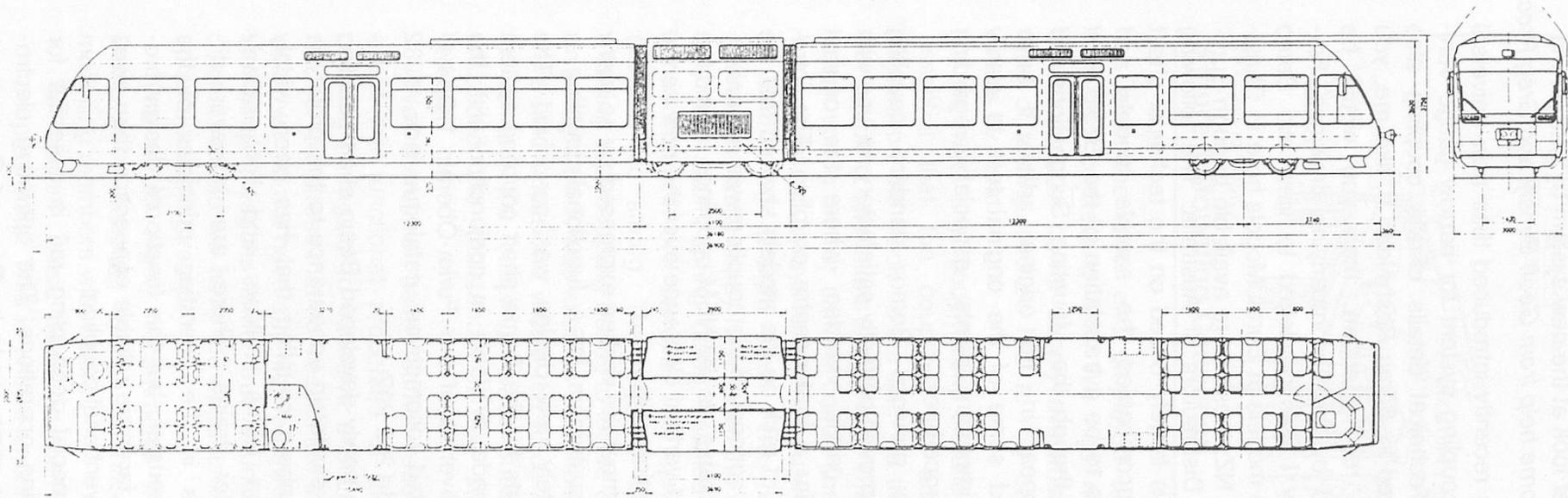
### **"Low-Cost" trains.**

The "Low Cost" trains mentioned in the December 1993 Notepad are of a modular construction, suitable for narrow, standard and broad gauge railways. Project drawings of metre and standard gauge units are provided by courtesy of SLM. The modular construction includes electric and diesel traction and is adaptable to almost all of a customer's requirements.

One of its main advantages is that a complete overhaul of the central driving section of the articulated unit can be carried out in approximately half a day and as a consequence no reserve units need be provided. The SBB and many foreign railways are interested in this project in order to reduce the cost of operating their regional services.



Low-cost articulated train for metre gauge, electric traction. *Courtesy SLM, Winterthur*



Low-cost articulated train for standard gauge, diesel-electric traction. *Courtesy SLM, Winterthur*