FINNISH RAPID TRANSIT TRAIN

Within a few years Helsinki will have the first urban rapid transit service in Finland. For this service, Helsinki Rapid Transit placed in October 1969 an order for a 6-car trial train with a group of Finnish industrial undertakings. The train consists of three 2-car units, each of which is also the smallest self-contained unit suitable for independant service. The first 2-car unit was completed in November 1971 and hauled to a 2.8 km long test track in Helsinki. The last 2-car unit having been completed in March 1972, tests and trial runs were begun with the 6-car train on the test track.

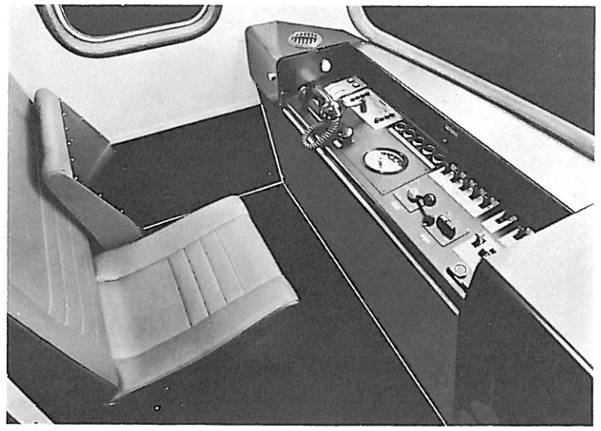
The objective in planning and building the train was to produce a vehicle for mass transportation which would be as light and up-to-date as possible and would meet the requirements set for effective, quick and flexible transportation of large numbers of people in urban circumstances. To attain this objective such technical solutions as

- light-alloy car body
- air suspension
- thyristor chopper control of traction motors

have been incorporated in the trial train.

The trial train was built at Valmet Oy Tampere Works. The share of Valmet in this joint project comprised the car body, interior furnishings and installation. The motors and electronics of the electric drive were supplied by Oy Strömberg Ab and the bogies jointly by Rauma-Repola Oy Lokomo Works and Oy Tampella Ab.

The trial train is designed for full automatic, i.e. driverless, service.



Driver's stand for manual train-control at either end of train unit.

Car with cushioned seats. Fluorescent lamps along centre line of ceiling.

Car with seats of hard, reinforced plastics. Lamps above windows. Route maps above doors and on surface of lamps in the middle of the compartment.

MECHANICAL PART

Both cars of the 2-car unit have the same main dimensions and equipment. They differ only in respect to the location of some devices such as pneumatic devices, compressor, motor-generator and batteries. Owing to the trial train being to some extent experimental, various alternative solutions have been incorporated in the cars.

The extreme ends of a 2-car unit are fitted with automatic couplers for a quick formation of 4- or 6-car trains. The short coupling between the two cars of a 2-car unit is coupled mechanically by means of a screw connection.

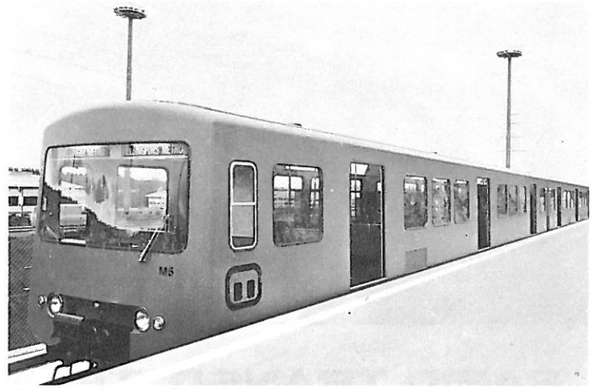
The car body is an arc-welded construction of light-alloy sections and sheets. The material of the sections and thick sheets is A1ZnMg1 and that of the thin sheets A1Mg3. The car bodies are insulated with glass wool except for one car which is sprayed with polyurethan foam. The inside walls are covered with light-alloy sheeting coated with a plastic material. The floor covering is of plastic sheet, with a grooved rubber sheet in front of the doors. The windows have hermetically closed double panes.

The seating arrangement consists of seats for two on one side and seats for three on the other side of the passage. The seats are cushioned and have plastic upholstery with the exception of one 2-car unit in which the seats are hard and for experimental purposes made of reinforced plastic.

The pneumatically operated sliding doors are controlled from the control panel of the train.

Heat energy generated by the braking resistors is used for heating the ventilation air of the car. The air is brought in from under the seats. The air is changed 30 times in an hour.

The bogies are fitted with air cushion bellows. The wheel-sets have rubber springs of Chevron type. Both axles of a bogie are driving axles. The power is transmitted from a hollow armature motor to the driving wheels over a cardan shaft fitted with flexible spring steel link couplings. Braking with full effect is achieved by means of resistance breaking down to a speed of 25 km/h. At speeds lower than this the pneumatically operated disc brake automatically also comes into action. There is one brake disc per axle.



The cars have each three wide entrance passages. The doors are 2-leaved sliding doors, free opening of entrance 1300 mm. The doors are pneumatically operated.