

## ARRANGEMENT FOR SWITCHING CONCENTRATED TELECOMMUNICATIONS PACKET TRAFFIC

### Abstract

A high capacity metropolitan area network (MAN) is described. Data  
5 traffic from users is connected to data concentrators at the edge of the network,  
and is transmitted over fiber optic data links to a hub where the data is switched.  
The hub includes a plurality of data switching modules, each having a control  
means, and each connected to a distributed control space division switch.  
Advantageously, the data switching modules, whose inputs are connected to the  
10 concentrators, perform all checking and routing functions, while the 1024x1024  
maximum size space division switch, whose outputs are connected to the  
concentrators, provides a large fan-out distribution network for reaching many  
concentrators from each data switching module. Distributed control of the space  
division switch permits several million connection and disconnection actions to be  
15 performed each second, while the pipelined and parallel operation within the  
control means permits each of the 256 switching modules to process at least  
50,000 transactions per second. The data switching modules chain groups of  
incoming packets destined for a common outlet of the space division switch so  
that only one connection in that switch is required for transmitting each group of  
20 chained packets from a data switching module to a concentrator. MAN provides  
security features including a port identification supplied by the data concentrators,  
and a check that each packet is from an authorized source user, transmitting on a  
port associated with that user, to an authorized destination user that is in the same  
group (virtual network) as the source user. The data switching modules each use  
25 a synchronous data ring for transporting data packets between data link handlers  
and a plurality of memory access controllers and their associated memory  
modules.

