

102.4L - 26/01

MEMORANDUM

APRIL 26, 1986

TO: D. Greenstein, Chairman, Subcommittee 802.4L
FROM: C. A. Rypinski
RE: Radio Medium Token Bus - First Effort on System Design

PURPOSE AND GENERAL CONSIDERATIONS

It has been proposed that the 802.4 TOKEN BUS protocol could be used on a radio system, and that the wireless service would be useful. It is immediately recognized that a radio system is inherently identical in the broadcast characteristic to the cable medium. The head-end on the broadband cable is equivalent to the mountain-top repeater in land mobile radio. The value of bandwidth and the degradation from multipath propagation are quite different. To better illustrate the considerations involved, a (duplex, then simplex) sample system design is described.

The use of TOKEN BUS protocol means that the system can be either simplex (fixed transmitters collectively, and one mobile transmitter use the frequency space alternately) or duplex (as is required for undelayed mobile-to-mobile messages). A choice must be made in which there will be significant economy if the traffic is assumed to be predominantly between fixed and mobile points with retransmission of mobile-mobile traffic.

TABLE I - PREMISES

Data Rate:	1 Mbs
Operating Frequency:	Above 900 MHz
Path length:	3 to 2000 mtr
Data Signaling Protocol:	Token Bus

There are a number of relevant facts (which are familiar to radio system designers, but which may not be obvious to those in other fields), which are recited for reference. Other premises are shown below, that are the result of experience and familiarity on the cost and limits of power output, antenna directivity, binary spectral density, information bandwidth to operating frequency ratio, and the accuracy of fundamental oscillators.

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