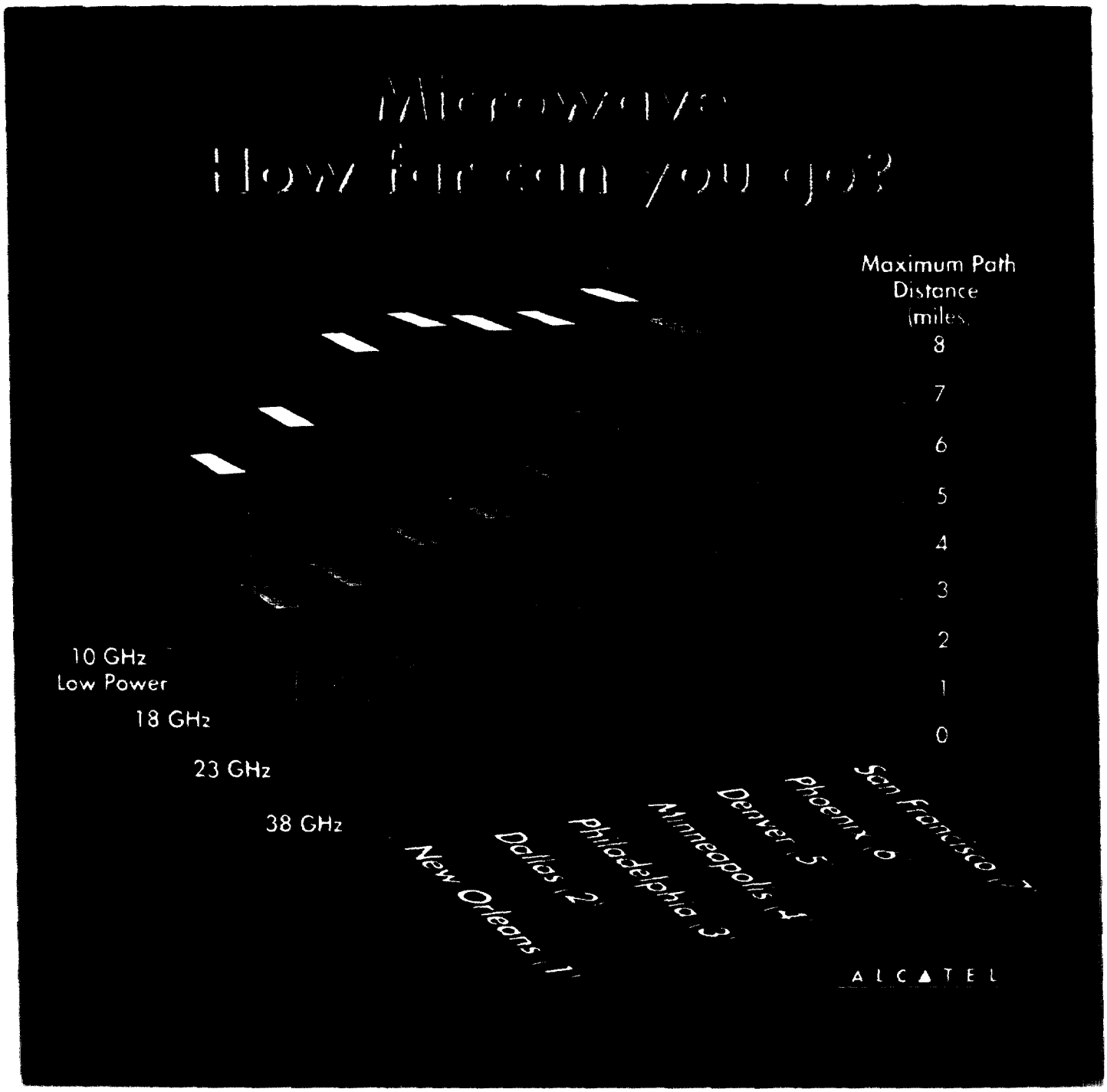
RELOCATION (cont.)

- 10 GHz Minimum dish size is 4'. Conditional license cannot be obtained currently without a waiver, which extends licensing period substantially. Much more congested, therefore frequency availability is non-existent in some areas.
- 11 GHz Minimum dish size is 4'. Frequency congestion problems exist in many areas.
- 6 GHz Minimum dish size is 6' which is unacceptable on many building applications as well as towers which are structurally loaded. Equipment cost higher. Congested Bandwidth throughout Massachusetts. Many frequencies have never relinquished making it extremely difficult to obtain 6 GHz microwave links in the Boston area.



Courtesy of Alcatel's Microwave Transmission Engineering Department

18 GHz Microwave and CMRS

- 18 GHz Relocation Costs
  - Depending on the specific plan selected relocation could be accomplished with as little work as changing the frequency on the front panel display or as much work as re-building the entire microwave system.
  - Loss of the 340 MHz split (and associated 5 MHz channels) will require replacement of at least the outdoor units.

18 GHz Microwave and CMRS

- 18 GHz Relocation Costs
  - Best Case (Same Band, Same T/R Split): Frequency Coordination, FCC Application Fees, 2 person site visit - $ 5,000.
  - Medium Case (Same Band, Different T/R Split): Best Case + install new outdoor units : $15,000 - $25,000 per link.
  - Worst Case (6 GHz Option): Best Case + 2 new towers + 2 buildings to house 6 GHz radios + 2 new dehydrators + 2 runs of waveguide + 2 new 6 GHz radios: $150,000 - $200,000.

18 GHz Microwave and CMRS

- Relocation Costs Should be Paid by New Entrants
  - PCS Precedent
  - Faster transition
  - Costs borne by those who benefit

18 GHz Microwave and CMRS

- Fixed Microwave Service Spectrum Needs
  - Fixed Microwave Services provide reliable communications for a wide variety of businesses and organizations. These include common carriers, utilities, public safety organizations, state and local governments, rail roads, etc.
  - The relocation of the 1850-1990 MHz band involved over 4,500 microwave links. The 2.1 GHz band relocation will involve over 14,000 microwave links. Congestion is building in the 6 GHz band in many areas.

18 GHz Microwave and CMRS

- Fixed Microwave Service Spectrum Needs
  - Fixed Microwave Services should not be the spectrum reserve of first resort.
  - Globalization, as seen in the LEO Satellite services, has an unintended consequence for US operators of fixed microwave services. The US has had different frequency allocations than the Europeans and others for many years. Global frequency allocations are made based on what most countries use, this makes the US fixed microwave services vulnerable for reallocation.

18 GHz Microwave and CMRS

- Fixed Microwave Service Spectrum Needs
  - In order to accommodate global satellite systems, the US should begin to open the 7 and 15 GHz bands for fixed microwave services.
  - This will allow equipment manufacturers to standardize domestic and export product lines and offer spectrum congestion relief.

18 GHz Microwave and CMRS

- Conclusion
  - 18 GHz is an important band for providing reliable, cost effective back haul for wireless subscribers.
  - Spectrum sharing on a co-channel basis with satellite services will be extremely difficult.
  - Band segmentation could provide the necessary frequency separation. However, the number of terrestrial fixed service users needs to be considered.
  - Relocation costs for any move should be paid by new entrants.
  - Opening 7 and 15 GHz bands would replace lost spectrum