

CURRENT APPLICATIONS OF ANALOG FIBER OPTICS IN THE NASA/JPL DEEP SPACE NETWORK*

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*** This work represents the results of' one phase of' research carried out at the Jet Propulsion Laboratory. California Institute of Technology, under contract with the National Aeronautics and Space Administration.**

INTRODUCTION

- **THIS PAPER WILL:**

- **DESCRIBE THE NASA/JPL DEEP SPACE NETWORK (DSN)**

- **DESCRIBE THE GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX**

- **DESCRIBE ANALOG FIBER OPTIC CAPABILITIES AND APPLICATIONS AT GOLDSTONE AND OTHER DSN COMPLEXES**

- **DISCUSS FUTURE FIBER OPTIC APPLICATIONS IN THE DSN**

THE NASA/JPL DEEP SPACE NETWORK

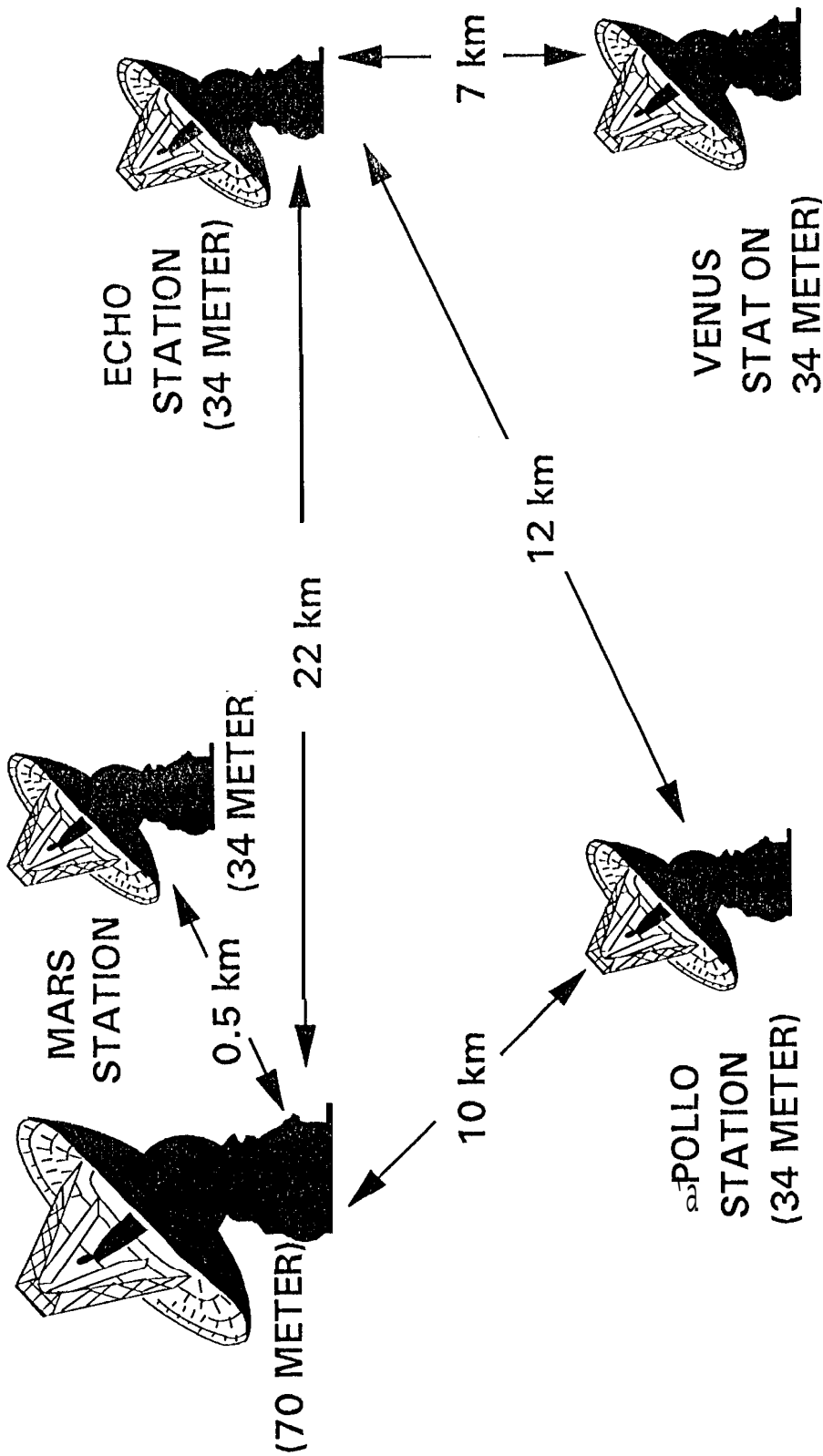
JPL



DEEP SPACE COMMUNICATIONS COMPLEX

GOLDSTONE

JPL

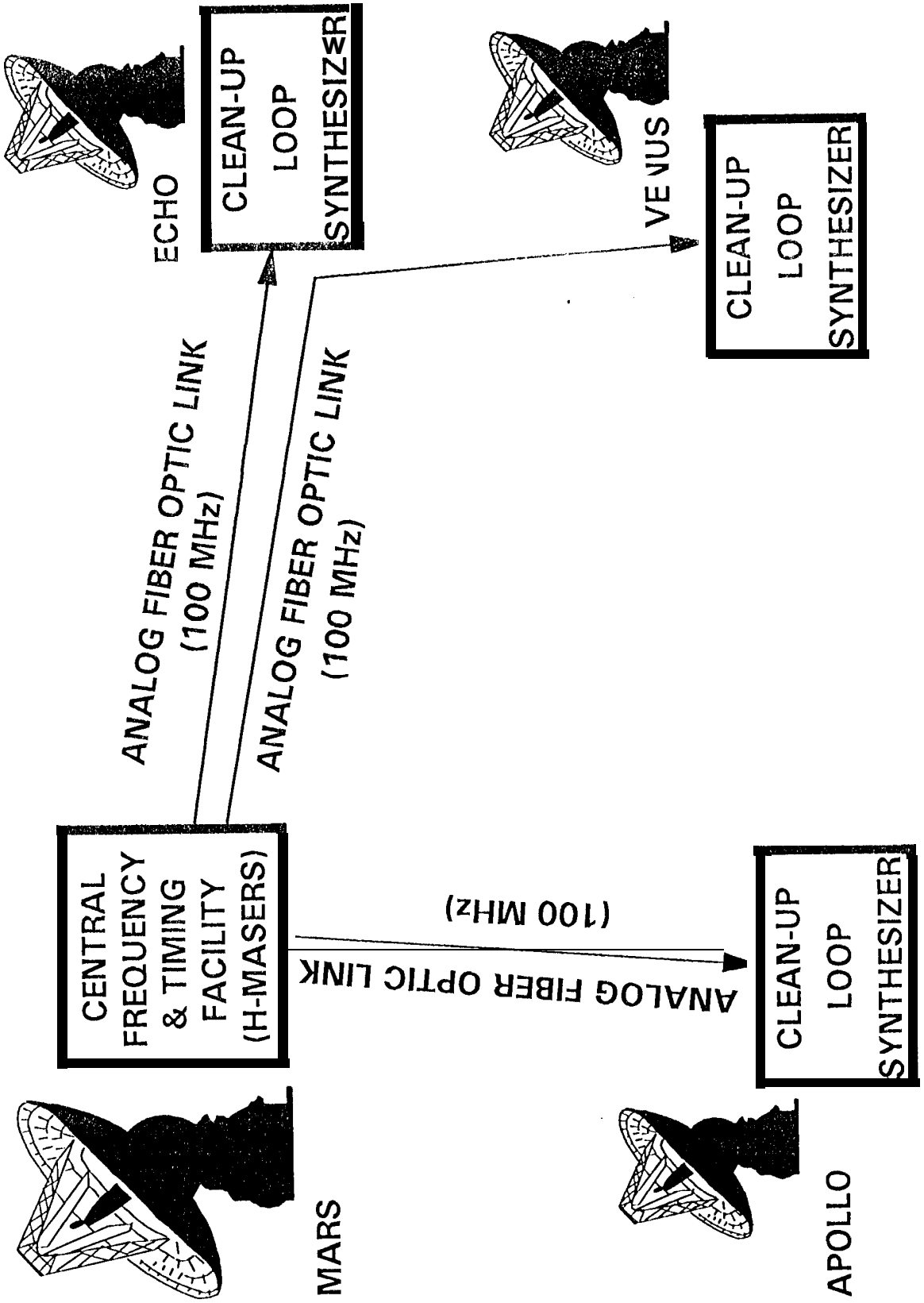


ANTENNA

FIBER OPTIC INTERSTATION FREQUENCY REFERENCE DISTRIBUTION

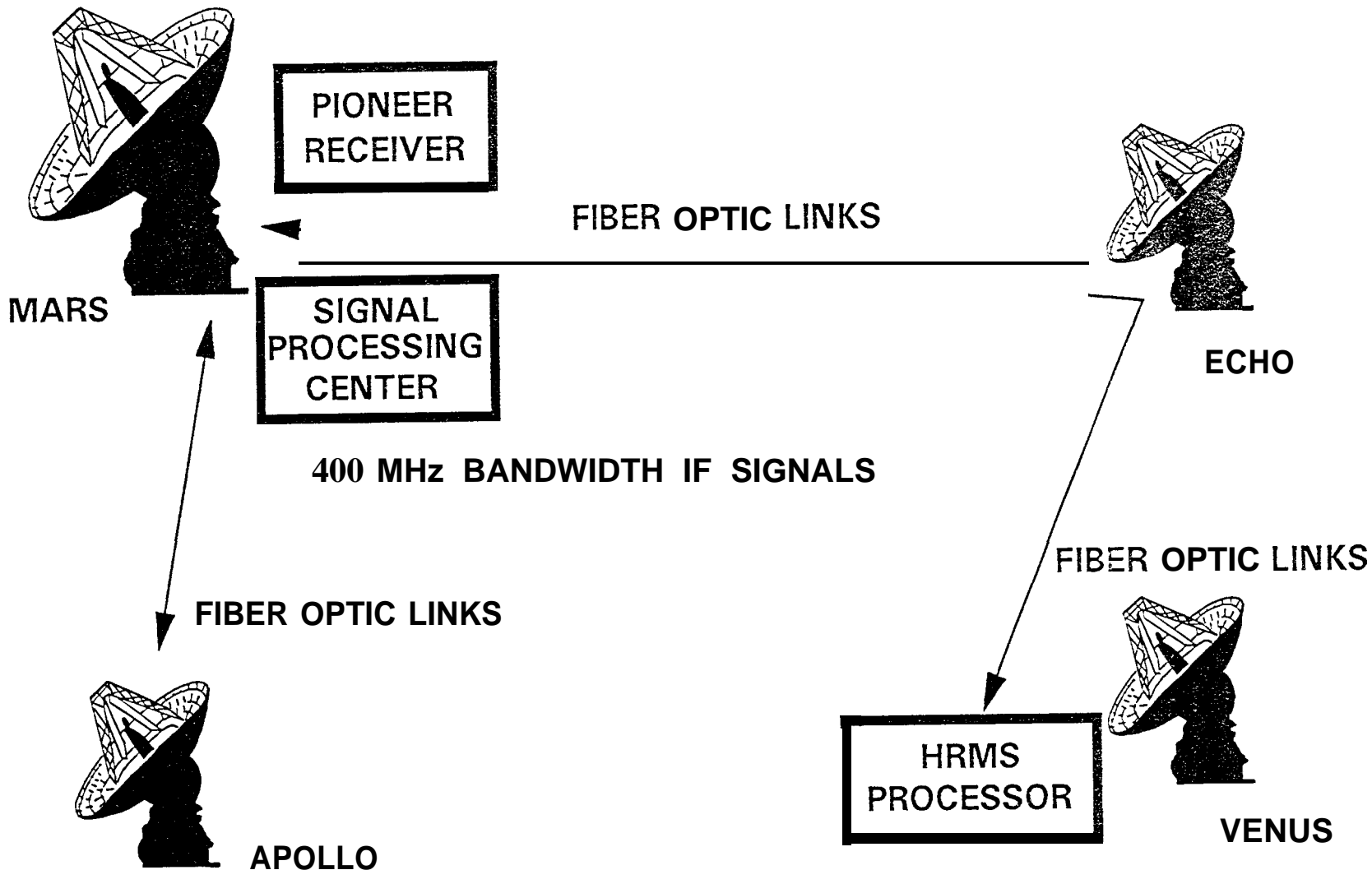


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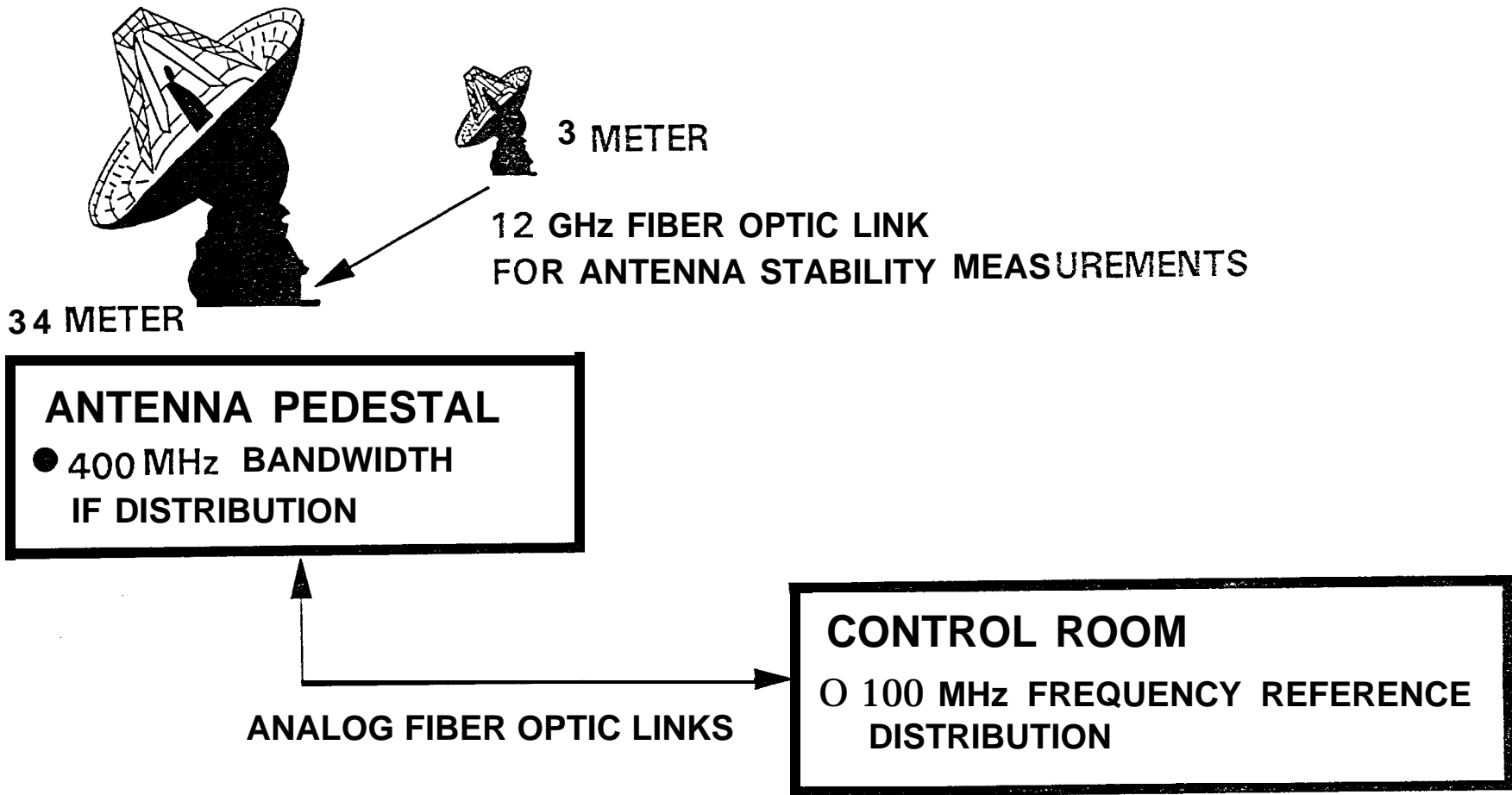
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FIBER OPTIC INTERSTATION WIDEBAND IF DEITHBUTION



FIBER OPTIC INTRASTATION ANALOG SIGNAL DISTRIBUTION VENUS STATION

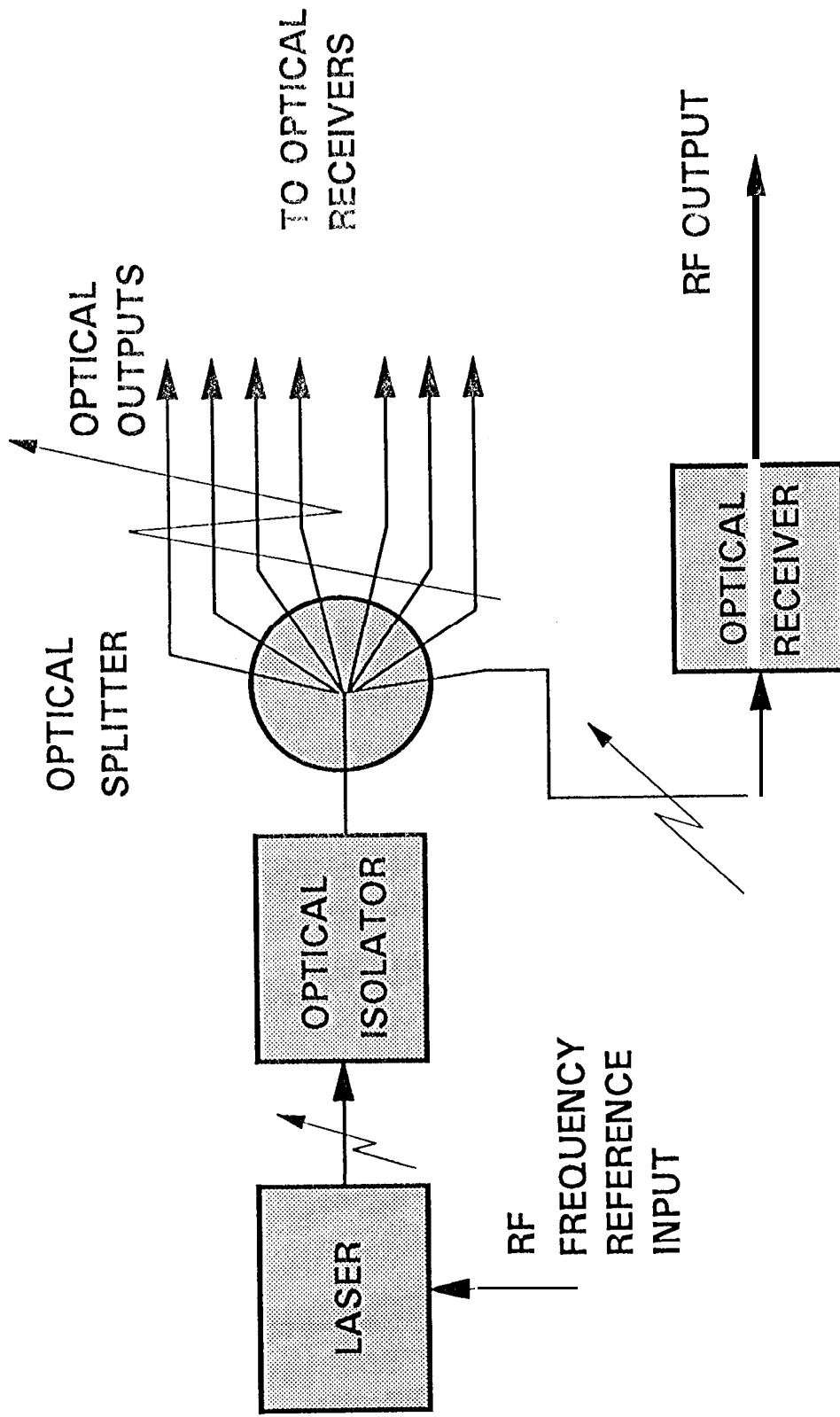
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DSS-13 FREQUENCY AND TIMING 100 MHz DISTRIBUTION SYSTEM

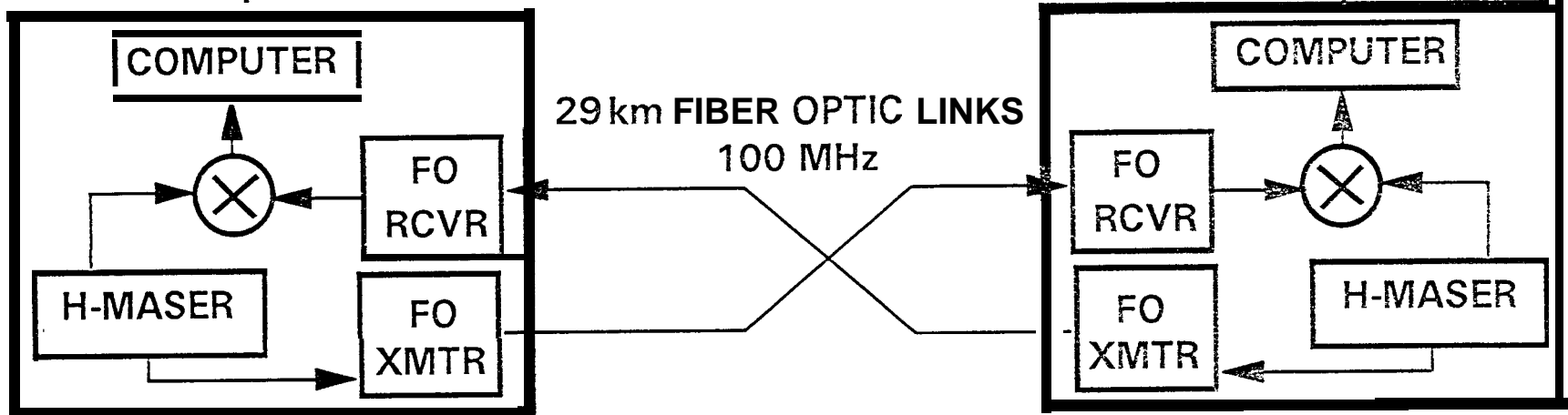


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TEST OF THE ISOTROPY OF THE ONE WAY SPEED OF LIGHT



KRISHER, ETC. 1990

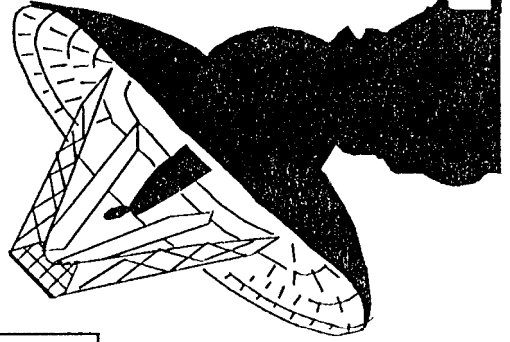
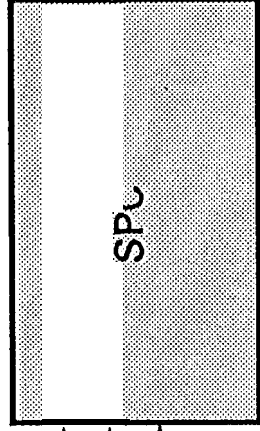
CENTRALIZED SIGNAL PROCESSING CENTER



JPL



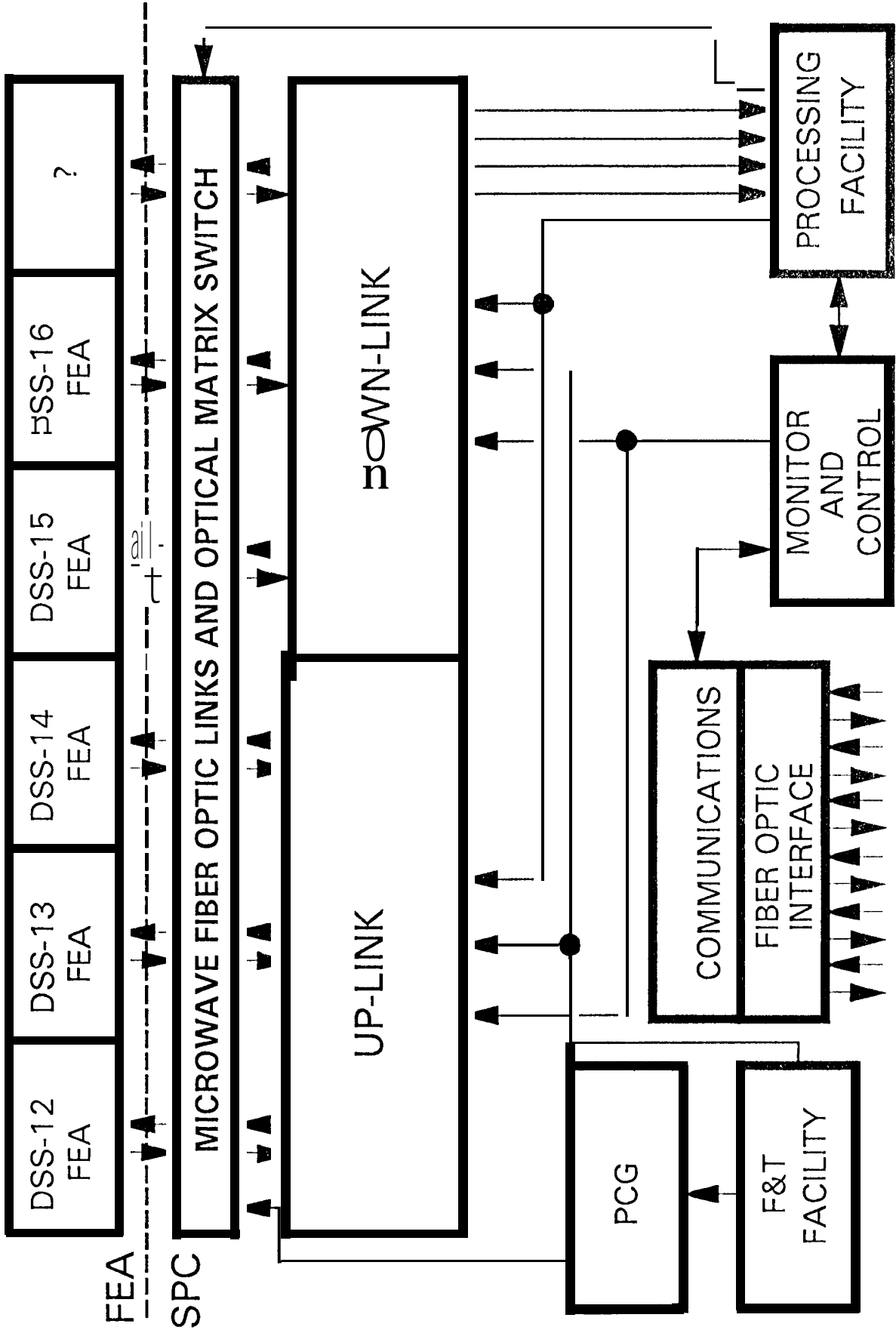
FIBER OPTIC MICROWAVE
TRANSMISSION LINKS



ANTRAY



CENTRAL COMMUNICATIONS COMPLEX



TO/FROM FEA's AND WORLD-WIDE NET

SPCADV1

CONCLUSIONS

- ANALOG FIBER OPTIC TECHNOLOGY
- ENABLES A FULLY INTEGRATED DEEP SPACE COMMUNICATIONS COMPLEX
- ENABLES SHARING OF EXPENSIVE SUBSYSTEMS
- ENABLES RF CARRIER ARRAYING OF ANTENNAS SEPARATED BY TENS OF KILOMETERS
- PROVIDES IMPROVED COMPLEX RELIABILITY AND FLEXIBILITY
- ENABLES IMPROVED PERFORMANCE
- PROVIDES SIGNIFICANT COST REDUCTIONS