

THE IMPORTANCE OF PHASE IN SYSTEMS DESIGN

JEAN DEVELET

Aerospace Corporation, Los Angeles 45, California

ABSTRACT

This paper attempts to illustrate the need for controlling phase shift introduced by components in large systems. The author will draw heavily on recent experience in the communication system field; specifically, the control of phase in the design of long haul microwave relays utilizing frequency modulation, such as the Telstar and Relay satellite systems.

First of all the important features of a phase characteristic will be pointed out followed by the method in which a system input-output performance may be broken down to establish requirements for each item.

It will be shown in the area of communication satellite system design that phase shifts or equivalently differential time delays must be controlled and measured to nanosecond accuracy. Feeder reflections and the resulting phase ripples are particularly disastrous to such systems.

Finally, brief mention will be made of phase control in phased array antennas which have been proposed for use in satellite communication systems.

NOTES

Sage Laboratories, Inc.
3 Huron Drive, Natick, Massachusetts

Manufacturers of a complete line of precision microwave
components. Custom component inquiries invited.