MICROWAVE THEORY AND TECHNIQUES SOCIETY,
LIFE MEMBER AFFINITY GROUP, EDCAS, AND
AEROSPACE ENGINEERING
BUENA VENTURA SECTION

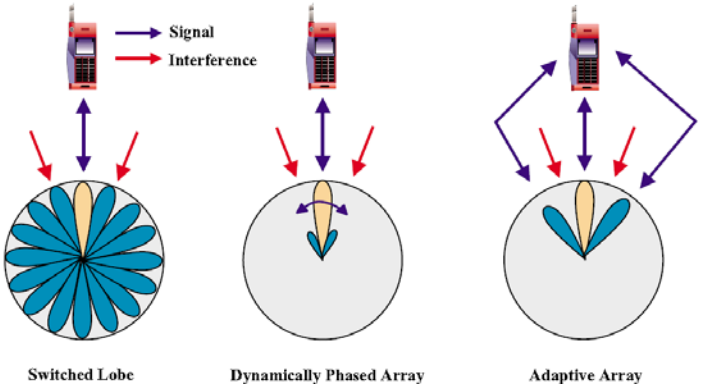
You are invited

Date/ Time: **Wed March 20th, 2013**
6:30 PM Pizza & networking
7:00 PM Presentation

Location: **Ciao Wireless**
4000 via Pescador
Camarillo, CA 93012

Speaker: **Rick Sturdivant, Pres.**
Reliant Lab Systems, Inc.

Title: **Transmit/Receive Module Design for Mil & Comm Applications**



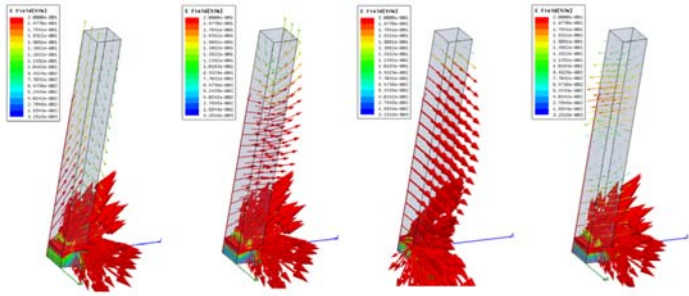


Figure 54: E-field distributions for the 4 first modes of the array under investigation

Abstract: "Applications, Key Components, Design Issues and Manufacturing"

Phased Arrays with T/R modules, ubiquitous in military radar systems, are now entering deployment for numerous commercial systems. The military often uses Active Electronically Scanned Array (AESA) radars for airborne, ground based, & ship borne systems. As the heart of most AESA radars the T/R module can potentially account for 40-70% of the system cost.

Commercial uses for phased arrays include satellite systems, Smart Antennas, and telecom back haul. Driving Smart Antenna demand is mobile phone and data usage. Global mobile device data usage will increase 18 fold by 2016 reaching 10.8 exabytes per month. With a Smart Antenna approach, we hope to meet this exploding need for wireless data. Smart antennas are phased arrays incorporating T/R modules and may replace the existing cell tower infrastructure.

Rick will cover the design trades, packaging, thermal, and electrical interconnects used in phased arrays and T/R modules. Comparisons on brick modules, tile modules, panel arrays & the packaging of MMIC devices for radar systems will be presented. The heart of the talk will be the "10 key elements to a successful T/R module." If you are a designer, manager or executive responsible for the development of phased arrays, these topics will be important to you.

MICROWAVE THEORY AND TECHNIQUES SOCIETY,
LIFE MEMBER AFFINITY GROUP, EDCAS, AND
AEROSPACE ENGINEERING

BUENA VENTURA SECTION

About The Speaker

Rick Sturdivant is President of Reliant Lab Systems, Inc. which develops T/R modules and phased arrays for commercial and military systems. His 22+ years of experience developing products for microwave and mm-wave applications include high volume telecom modules, point-to-point radio systems, modules for radar receiver exciters, and T/R modules for AESAs. He was instrumental in developing the world's first tile array T/R modules in the mid 1990's for which he received the Engineering Excellence Award from Hughes Aircraft Company. Balancing the costly side, Rich has also developed low cost panel phased arrays. He holds 5 U.S. Patents, published over 17 articles on microwave and millimeter-wave circuits, and authored Chapter 1 of the book "RF and Microwave Electronic Packaging", Springer Publishing, 2010. Having earned an MS EE from UCLA, a BS EE from CSULB, and a BA from Vanguard University, worked for Raytheon (Hughes Aircraft Company) and Multilink Technology Company prior to founding his company.

Directions to Ciao Wireless:

4000 Via Pescador
Camarillo Ca. Phone: 805-389-3224

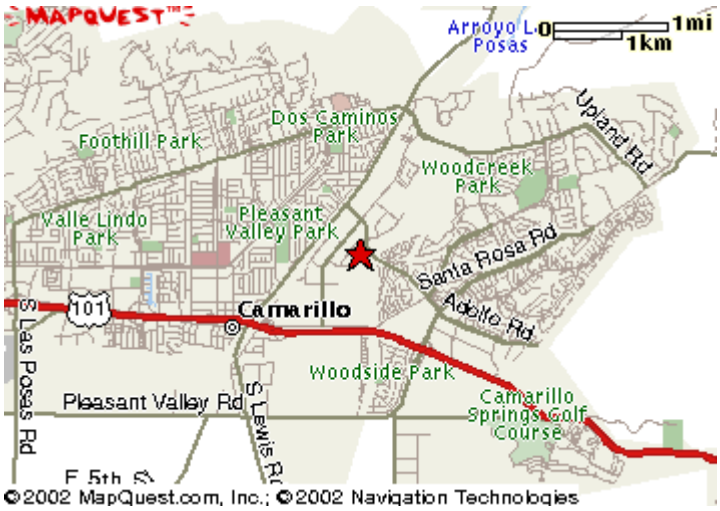
From LA and South

Take the I-405N.

Take the US-101/VENTURA FWY North

Exit FLYNN RD and go straight.

Turn RIGHT onto VIA PESCADOR. (2nd Road on RIGHT)



From Santa Barbara and North:

Take the US-101S/VENTURA FWY towards LOS ANGELES.

Take the DAWSON DRIVE exit and turn RIGHT from the ramp.

Turn RIGHT at the light onto DAWSON DRIVE.

Turn LEFT at the light onto FLYNN ROAD.
Turn RIGHT onto VIA PESCADOR. (2nd Road on RIGHT)