# Curriculum Vitae


## Dr. Kushal R. Tuckley

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**Current Position** Chairman, Head, R&D, agv systems Pvt Ltd.
1, RK Industrial House, Cama Industrial Estate, Walbhat Rd. Goregaon(E), Mumbai 400 063

**Earlier Affiliation** 1. Sociaty for Applied Microwave Electronics Engineering and Research (SAMEER). I. I. T. Campus, Powai. Mumbai. 400 076

Scientist 'E', Head, Signal Processing and Navigational Electronics Division.
(Sept. 1985 to March 2010)

**Short term attachments** 2.Astra Microwave Products Ltd. ( AMPL), Hyderabad. Dy. General Manager
(April 2010 to Oct 2010)

3. InventyS Research Company (IRCL) BKC, Mumbai, Vice President (Projects) (Nov 2010- March 2011),

**Academic Qualifications**

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| B.Tech | IIT Bombay 1985 |
| M.Tech | Comm. Engg, IIT Bombay,1989 |
| Ph.D | IIT Bombay, 2009 |
| Thesis Title: | *Feature Extraction Techniques for the Echoes from Distributed Radar Targets* |

**Core Expertise** RF Signal Processing, Digital Signal Processing, and RF and Microwave, System Engineering

**TRAINING:**

**(i)UNDP Programme:**

Training on Electronic Packaging at CALCE Centre, University of Maryland, USA. May – Sept 1992.

The training was under the guidance of Dr. Michael Pecht and covered all the aspects like thermal design, mechanical stability and EMI/EMC for Electronic Systems.

**(ii) Short-term training courses:**

(1) on RADARS: By Eli Brookner, Raytheon Co. at Chennai, Dec 1993

(2) on TECHNICAL PROJECT MANAGEMENT: By. Expert Access Australia at Pune 1994

**EXPERIENCE:**

Society for Applied Microwave Electronics Engineering and Research (SAMEER) is a research organization involved in RF and microwave system development and commissioning. I worked as a scientist in SAMEER for 24 years on the development of commissioning of various RF and Microwave systems. Some of the major contributions are listed below.

**MAJOR CONTRIBUTIONS:**

**F**ollowing technical contributions include the work in SAMEER, AMPL, IRCL and agv systems Pvt. Ltd.

**(I) PROJECTS COMPLETED AS 'PROJECT MANAGER':**

Automation of Lighthouses in Saurashtra and Kuchchh region in Gujrat:
This project involved concept to commissioning of a "Supervisory Control and data Acquisition (SCADA)" system for automatic operation and remote control of 42 Lighthouses on the coast-line of Gujarat, India.

The project involved the development of a micro-controller based circuitry with suitable embedded programs and real time clock for the automatic operation of the lighthouses.

And

Establishing a Point to Multi-point (P-MP) communication network with UHF data links, for remote monitoring and control of the lighthouse operations. User friendly Graphical User Interface (GUI) was also an important component of the project.

Commissioning was completed at 42 lighthouses in Saurashtra and Kuchchh region which are operated continuously by the "Department of Lighthopuses and Lightships, Ministry of Shipping" **(Jan 2005)**

Radar Beacon (RACON) for Ship Navigation: An X and S band transponder system is used for ship navigation. The RACON responds to interrogating pulses from the navigational radars. The response appears as a 'coded echo' on the pulse position indicator (PPI) indicator of these radars. These echoes serve as "known markers" for the ship and help her to navigate through shallow channels.

The design and development of a state of art, frequency agile RACON was completed and two units were delivered to the "Department of Lighthopuses and Lightships, Ministry of Shipping" **(Oct. 2005)**

**(II) CO-ORDINATION OF PROJECTS AS DIVISION HEAD.**

*Following projects were executed with scientists working in my division under my co-ordination.*

**(a) Auto-computation of Mark–IV Radiosonde:** India Meteorological Department (IMD) performs upper air monitoring by releasing balloons

from about 40 stations distributed all over India. An Auto-computation system was developed for automatic data acquisition of weather parameters and computations of the weather parameters.

This system was designed developed and commissioned at 40 locations all over India. The locations included remote places like port Blair, Agartala Srinigar, Amiondivi Islands etc. **(June 2005)**

The system is being used on a regular basis by the IMD

**(b) Development of on board electronics for the Radiosonde, Ozonesonde and GPS-radiosond**e: The on-board electronics of the weather balloons consists of sensors and accurate conditioning electronics and UHF transmitter. The sensors and the configuration of the on-board electronic system is different for different application. Three different systems were developed through three different projects sponsored by the IMD. The performance of the systems was proven through flight trials. (**Mar. 2004, May 2009, Testing in progress for Ozonesonde**)

**(c) Estimation of Precipitable Water Vapour (PWV):** Using the GPS signals it is possible to estimate the quantity of precipitable water vapour over a desired location. This complex software was developed through a sponsored project from the Department of Science and Technology (DST). (**August 2008**)

**(d) RF drying systems** : RF dryers of 15 KW 25 KW and 40 KW capacity were developed for various industrial applications. During the year 2000 to 2006, following units were commissioned at various applications.

- RF dryer for Tea processing at Toklai Research Centre, Jorhat. **(April 2009)**
- 25 KW RF Drying system for textile cone drying at Palghar, **(Oct. 2008)**
- RF drying system for food processing at Laxminarayan Institute of Technology (LIT), Nagpur **(June 2007**)
- 25 KW RF Drying system for textile cone drying at Bhivandi**. (Sept 2006)**
- RF dryer for food processing at Central Food technological Research Institute (CFTRI) Mysore: **(Aug 2004)**
- Combination system of three 15 KW RF dryers for Drying of Large Cardamom at Mangan, Sikkim. **(Nov. 2003)**
- RF dryer for Ceramic Drying at BHEL Bangalore. **(Mar. 2002)**

Two more Machines of RF dryers are being installed

1. At Agartala for the processing of Green tea.
2. At Iduki Kerala for processing of Spices.

We have signed an MoU with University of Sasktchewan, Canada, for the application of the RF dryer in preserving the nutritional value in agricultural products.

We have initiated technical collaboration with Jay corp, Malaysia for the application of RF processing of Wood.

**(III) DESIGN AND DEVELOPMENT OF KEY SYSTEM FOR MAJOR PROJECTS:**

*Earlier in the career I have worked on the following systems under leadership of senior colleagues.*

Design of a Receiver System (in C band) for Phased Array Radar: The receiver had multiple receivers modules with fast (at 30 MHz) digital sampling. The receiver processor had capability of active beam forming. **(June 2010)**

Design of receiver phased array (X band) for a surveillance radar: This receiver had 256 (16x16) element array with adaptive beam forming capability. The array was mounted on a rotating platform. The complete system was controlled by an FPGA based processing system. **(Sept 2010).**

Development of Receiver, Exciter and Simulator for Wind Profiler-RASS System (WP-RASS) commissioned at IMD campus Pune: WP-RASS is an atmospheric Radar with very high sensitivity. State of art Frequency stability techniques are required for successful operations. The low power key systems are critical signal processing units of the radar.

**(Radar commissioned in Jan 2001)**

Development of Doppler Sodar: Sodar is an acoustic ranging system used for wind profiling. It operates on pulsed Doppler acoustic ranging principle Main contribution in development of the receiver and contributed in signal processing and integration of the system **(Oct 1999)**

Collision Alarm System: This system is a small gadget based on FMCW Radar principle in X-band used as safety device was developed for "Over Head Transportation (OHT) cranes in heavy industries **(June 1993)**

Development of Hardware signal processing system for the MST Radar: MST Radar is a pulsed Doppler system working at 53 MHz. One of the largest systems of its kind was developed by SAMEER and commissioned at Gadanki, near Tirupati. This is second largest radar in the world and is now operated under National Atmospheric Research Laboratory (NARL) Main contributed in the control systems, signal processing and integration and commissioning of the Radar. **(Jan 1992)**

C-band Radar Altimeter for Project Trishool:

It is FMCW Radar developed for air-borne applications. Main contribution was in the development of receiver, signal processing, system integration and trouble shooting. **(Sept 1889)**

Design of a Receiver System for Phased Array Radar: The receiver had multiple receivers modules with fast (at 30 MHz) digital sampling. The receiver processor had capability of active beam forming. **(June 2010)**

## LIST OF PUBLICATIONS

### International Journals

1. Saurav Mitra, Siddrtha Dattagupta, **Kushal Tuckley**, Samual Ekram, "3D ad-hoc Sensor Networks Based Localization and Risk Assessment of Buried Landfill Gas Source" International Journal of circuits systems and signal Processing, Vol.6 ,1, pp76-86, 2012, ISSN: 1998-4464

2. Swati Sinha, **Kushal R. Tuckley**, "Processing Technique of HF Radar for Disaster Warning and Tsunami Detection", International Journal of Emerging Technology & Advanced Engineering, Vol.3 No.1 Jan 2003. (ISSN 2250-2459)

### International Conferences:

1.'Packaging Inspection By Microwaves' **K.R.Tuckley**, S.Y.Kulkarni, Asia Pacific Microwave conference, 1996, Delhi.

2.'A Practical Method of Measuring the Shield Effectivenessof Data Cable to Predict the Probability of data Link Failure', M.Y.Joshi, **K.R.Tuckley**, S.Y.Kulkarni Asia Pacific Microwave conference, 1996, Delhi.

3. 'Techniques to Achieve Ultra High Accuracy in Level Measurement Radar', **K.R.Tuckley**, Poornima Shrivastava, P.Usha; 6$^{th}$ International Symposium on Recent advances in Microwave Technology. (ISRAMT-97) Beging, Aug.1997, Paper No B4-1

4. Target Simulation System for Wind Profiler', **Kushal Tuckley**, Anil Kulkarni, Jyoti Chande and S.H.Damle. 8$^{th}$ International Workshop on technical and Scientific aspects of MST Radar (MST-8)Bangalore, Dec. 1997. Paper No. ND-19

5. 'Performance Evaluation and Data Validation of Doppler SODAR using Kytoon Experiment' Jyoti Chande, Anil Kulkarni, **Kushal Tuckley**, Ajay Khandare, S.H.Damle, 9$^{th}$ International Symposium on Acoustic Remote Sensing and Associated Techniques of Atmospheric and Oceans, Vienna, Austria (6$^{th}$-10$^{th}$ July 1998)

6. 'Design Considerations In Point To Multipoint Uhf Data Network For Remote Automation Of Lighthouses', **K. R. Tuckley**, P. Shrivastava, Ramesh Powar, Preeti Gajja, Asia Pacific Microwave Conferemnce-2004. Dec. 2004 (Paper No. C-241)

7. 'Impedance Matching Technique on Helical Antenna for Mechanically Rugged Structures', P. Shrivastava, R.Powar, A.Bera, and **K.R.Tuckley**, Asia Pacific Microwave Conferemnce-2004. Dec. 2004 (Paper No. C-384)

8. 'Design and Development of Wind Profiler Receiver' Asia Pacific Microwave',

Tapas Bhuiya, Poornima Shrivastava, **Kushal Tuckley**, Jyoti Chande.
Conference (APMC04) Dec. 2-5, 2004

9. 'Kalman filter technique in the post processing of clear air profilers' **Kushal Tuckley**, Anil Kulkarni, MST-11, *Proceedings of the 11th International Workshop on Technical and Scientific Aspects of MST radar"* p-p December 2006

10. 'Digital Receiver for atmospheric Radars' Ajay Khandare, **Kushal Tuckley**, Anil Kulkarni and J.V. Chande, MST-11, International conference on MST radar and technologies. Dec 2006, Gadanki

National Conferences:

1.'Corrugated Horn Design for Industrial Applications' P. Usha, P.Shrivastava, **K.R.Tuckley**, APSYM-CUSAT-94 Kochi 1994.

2.'Real time frequency Calibration Scheme for Navigational Transponder' Kochi, Dec 15-16 1998 ( APSYM-98/9873)

3. 'Miicrostrip Omni-Directional Antenna For Navigational Transponder'
**K.R.Tuckley**, P.Shrivastava, B.G. Shende and Rajesh Harsh National conference on recent Advances in Microwaves, Antennas and Propagation, Jaipur, Dec 2001

4. 'Hybrid-RF Drying Applicators for the Processing of Tea and Agro-products'
-Sunil Karande, Rajesh Harsh, **Kushal Tuckley**, *Engineering and Manufacturing Symposium* , Tea Research Association, Jorhat Assam. 10-11th Nov 2006.

5. 'Design and Development of the Feed for Parabolic Reflector Tracking Antenna Deployed in Radio Theodolite', Tapas K. Bhuiya, **K. R. Tuckley**, *Antenna and Propagation Symposium*, *(APSYM-2006)*, pp. 245-248, Cochin University of Science and Technology (CUSAT), Kochi, Dec. 14-16, 2006

6. 'Influence of Surface Meteorological Parameters on GPS ZTD estimates'
Balwindersingh Arora, Anil Kulkarni, **Kushal Tuckley**, *Golden Jubilee National Symposium on Role of Meteorology in National Development (TropMet 2006),* IIM Pune, Nov 2006

7. 'Development of Software for Convective Sounding Analysis'
Sopan Kurkute, Anil Kulkarni, **Kushal Tuckley**, Vishnu Konduskar, *Golden Jubilee National Symposium on Role of Meteorology in National Development (TropMet 2006),* IIM Pune, Nov 2006

8. 'Design and Development of the Feed for Parabolic Reflector Antenna Deployed in Radio Theodolite' Tapas Bhuiya, **Kushal Tuckley**, ASSYM 2006, Cochin University of Science and Technology (CUSAT) Kochi, Dec 14-16 2006.

9. 'Pulsed Fm Chirp For Sea State Monitoring Hf Radar Using LabVIEW', Platform', Shubhada Gadgil, Meena Panse, **Kushal R. Tuckley**, National Conference on EC2I, Mumbai.T20-21 March 2009