

Frequency Control University



Corning
Frequency
Control

CORNING
Discovering Beyond Imagination

Purpose

Corning Frequency Control University (FCU) is designed to provide both commercial and technical personnel with a comprehensive overview of the manufacturing process for crystals, crystal oscillators (clocks, VCXOs, TCXOs, and OCXOs), and crystal filters. A technical and applications overview of frequency control products will also be presented. As the focus is product training, we will use our frequency control components for training examples where necessary, though there will be no sales pitch for Corning products.

Registration

The training session is free and you will be provided with all reference material required. To reserve your place, or to request any additional information, please phone (717) 486-3411, or email us at marketing@ofc.com.

Accommodations

For lodging, we suggest the Days Inn in Carlisle, PA (717-258-4147); ask for the Corning Frequency Control rate (currently \$51 plus tax). Other options are available nearby. We'll be happy to assist with your travel logistics.

About Corning Frequency Control

Corning Frequency Control is a leading supplier of quartz crystals, crystal oscillators and crystal filters used within the communications, test and instrumentation, position location, automotive, and military/aerospace electronic markets.

A Division of Corning Incorporated

Established in 1851, Corning Incorporated (corning.com) creates leading-edge technologies for the fastest-growing markets of the world's economy. Corning manufactures optical fiber, cable and photonic products for the telecommunications industry; and high-performance displays and components for television, information technology and other communications-related industries. The company also uses advanced materials to manufacture products for scientific, semiconductor and environmental markets.

Locations

Corning Frequency Control University is held at our Mount Holly Springs, PA location. We have additional manufacturing facilities in Mercersburg, PA; Kansas City, KS; Whitby, Ontario; Shanghai, China; Pudong, China; Neckarbischofsheim, Germany; and Piestany, Slovakia.

*Join us for a two-day
comprehensive overview
of Frequency Control Products
at our campus in beautiful
Mount Holly Springs, PA*

Corning Frequency Control
100 Watts Street
Mount Holly Springs, PA 17065
tel (717) 486-3411
fax (717) 486-5920
sales@ofc.com

2002 University Schedule

March 11-12

May 13-14

September 9-10

December 9-10

Presenters

Debbie Bobb, *VCXO/Hybrid Product
Manager*

Vladimir Brajovic, *Crystal Design
Engineer*

David Chandler, *VCXO/Hybrid
Design Engineer*

Dan Fry, *VCXO/Hybrid Design
Engineering Manager*

Jeff Garstecki, *OCXO Product
Manager*

Jim Hare, *TCXO Product Manager*

Bruce Paisley, *Crystal Design
Engineer*

David Petersen, *Marketing
Manager*

Harry Wilson, *TCXO Design
Engineer*



Our Technology

Corning Frequency Control designs and manufactures precision crystals and oscillators that serve as stable frequency references for a variety of applications.

Our Markets

Applications for Corning Frequency Control's products include cellular, personal communications systems (PCS), paging and specialized mobile radio base stations, test instrumentation, satellite communications, and other applications where precision timing is required.

Our Products

- Oven Controlled Crystal Oscillators (OCXOs)
- Temperature Compensated Crystal Oscillators (TCXOs)
- Voltage Controlled Crystal Oscillators (VCXOs)
- Quartz crystals, resonators and filters
- Crystal clock oscillators (PXOs)
- Component ovens
- Custom hybrid microcircuits

Our Customers

Corning Frequency Control has strategic partnerships with key OEM manufacturers and offers standard products for a broad range of technologies, including CDMA, TDMA, GSM, ATM, SDH, NAMPS, TACS, PDC, and TETRA. Customers are served by regional sales offices and a worldwide network of sales representatives.

Directions

Our Mount Holly Springs facility is located in Southcentral PA, five miles from Interstate 81 exit 47, approximately 40 minutes southwest of Harrisburg, PA. The closest airports are Harrisburg International, BWI, and Washington Dulles. Maps and Directions are available on our web site at www.corningfrequency.com. FCU sessions are scheduled throughout the year. We reserve the right to add or change dates. Please call to confirm your participation and to reserve your training date.

Agenda

Sunday Evening

7:00 pm Informal Dinner (optional)

Monday (Crystal Day)

8:15 am Introductions/Overview

8:30 am Depart for crystal plant

9:45 am Crystal Manufacturing Tour

11:30 am Crystal Tutorial / Lunch

3:30 pm Return to Mount Holly Springs

4:30 pm Close of Day 1

6:00 pm Dinner

Tuesday (Oscillator Day)

8:15 am OCXO Tutorial

9:30 am OCXO Manufacturing Tour

10:15 am TCXO Tutorial

11:00 am TCXO Manufacturing Tour

11:30 am Filter Tutorial

12:15 pm Lunch

12:45 pm VCXO Manufacturing Tour

1:15 pm VCXO Tutorial

2:30 pm Graduation

Course Outline

- I. Crystal Tutorial
 - A. Basic Crystal Orientation
 - Piezoelectric Effect
 - Crystal Cuts
 - B. Manufacturing of Crystals
 - Cutting
 - Lapping
 - Contouring
 - Finishing
 - Testing
 - C. Design and Application
 - D. Quality Considerations
- II. OCXO Tutorial
 - A. Oscillator Type Definitions
 - Clocks (PXOs)
 - TCXOs, OCXOs, VCXOs
 - Ovens
 - B. Design and Application
- III. TCXO Tutorial
 - A. Definitions
 - B. Design and Application
- IV. Filter Tutorial
 - A. Filter Types
 - B. Design and Application
- V. Hybrid Oscillator / VCXO Tutorial
 - A. History
 - Product Lines
 - Definition
 - B. Package Considerations
 - C. Clock Oscillators
 - D. VCXOs
 - E. Testing