YOU LEARN A LOT IN FIFTY YEARS...

1965
Mechtronics, Inc.
starts in Yankton SD
Piezo Technology, Inc.
starts in Orlando FL

1967 – DPL MIL-PRF-55310 Crystals
1973 – First: space monolithic crystal filters
1980 – Tactical miniature XO
1985 – First: chemical milled crystal resonators over 1 GHz
1987 – Acquires Motorola’s external frequency control devices business
1990 – First VCXO and Wash proof LC filters
1993 – First: US ISO-9001 certified crystals and oscillator manufacturer
2004 – M-Tron acquires Piezo Technology, Inc.

2006 – QiK Chip™, XO, VCXOs and TCXOs to 1.4 GHz
2007 – MIL-PRF-55310 oscillators
G-Cavity filters to 300 Watts
7 GHz space filters
26 pole diplexer

2010 – Down hole drilling XO to 225 °C
M610 Stratum 3 TCXO
AS9100 Rev C certification
Digitally tuned frequency hopping filters
High stability HPO for flight control applications

2014 – Ultra low phase noise OCXOs
Solid State High Power Amplifiers

2015
Harsh environment / wide temp range TCXOs
Power Amps expand into K / Ka bands
Switched filter array line expansion
Multi-band digitally tuned filters
Vibration immune OCXOs ... AND MORE!

mtronpti.com/history

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Fax: 91.120.256.3242

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Kwun Tong, Kowloon
Hong Kong
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Fax: 852.2529.1822

Over thirty local representative firms worldwide. Supply line management through hubs, portals and channel partners.

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mtronpti.com/find-sales-rep-or-distributor

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mtronpti.com/history
CUSTOM AND STANDARD COMPONENTS
AND SUBSYSTEMS FOR COMMUNICATION,
MEASUREMENT, COMMAND AND CONTROL

Fifty years experience working with aerospace, defense and wireless communication OEMs builds an expert point of view to shorten development time, improve performance and reduce risk on point-to-point and point-to-multi-point RF, microwave and millimeter wave radio projects.

The same fifty years in systems keeping troops and aid workers safe, helping engineers make better measurements and bringing the Internet everywhere teaches high accuracy and high reliability under harsh environments increasing confidence for flight control, guidance, radar, high bandwidth data link and LTE applications.

mtronpti.com
Managing co-site interference or picking an important signal out of the noise, MtronPTI Spectrum Control Solutions make the world’s communication more reliable.

Starting with radar filters in 1965, MtronPTI continues to design and manufacture standard and custom solutions for harsh environment and high performance. Thorough electronic and thermal modeling followed by aging, stress and rigorous electrical test ensures a long and maintenance-free operating life in military communications, avionics, electronic warfare, test equipment, public safety and wireless backhaul.

With tunable and switched filter arrays, millimeter wave management and solid state power amplifiers, MtronPTI now offers stand-alone and integrated module solutions for the entire RF signal chain.
MtronPTI Low Loss Frequency Hopping and High Power Switched Filter Arrays ensure inter/intra team communication in harsh electromagnetic environments. COTS analog and digital tuned filters are available and custom amplifier, switched filter array modules can be designed to meet your multiband radio RF path objectives, freeing engineering to focus on higher value system level capabilities.
CAVITY / MILLIMETER WAVE FILTERS

CAVITY FILTERS

WATTS TO KILOWATTS
HARSH ENVIRONMENT
HIGH RELIABILITY
100 MHz – 20 GHz
1% - 80% bandwidth

LASER WELDED PACKAGE

cavity filters continue to perform in harsh environments. UF9382 is a 9.9 GHz filter with less than 1.5 dB pass band attenuation.

EVANESCENT MODE

in the 8906 Link 16 cavity/combline filter brings 300 Wattpeak in a 2.75” x 1.3” x 0.6” sealed package, ideal for airframe or portable applications.

MILLIMETER WAVE FILTERS AND DIPLEXERS

>60 dB isolation, no tuning required Metal Insert technology custom mechanicals and frequency ranges from 20 - 90 GHz

E-BAND DIPLEXER

71.0 - 76.0 GHz low, 81.0 - 86.0 GHz high
5 GHz bandwidth
> 15 dB return / 0.65 dB (typ.) insertion loss

V-BAND DIPLEXERS

58.5 - 59.5 GHz low, 61.0 - 62 GHz high
1 GHz or 2 GHz bandwidth
> 15 dB return / 1.0 dB (typ.) insertion loss

mtronpti.com/filter/bandstop • mtronpti.com/filter/diplexer
LUMPED (LC) / CERAMIC / TUBULAR

LUMPED ELEMENT (LC) FILTERS

WASH-PROOF SEALED HARSH ENVIRONMENT

No open corners allow true surface mount wash-proof assembly. Solder seal or laser weld prevents performance shifts during pre and post wash.

SMALL SIGNAL TO OVER 500 WATTS.
DC - 5 GHz
3% - 180% bandwidth

A wide variety of packages are available from Hermetic thru-hole to connectorized versions for space and high power applications.

MONOBLOCK CERAMIC BANDPASS FILTERS AND DUPLEXERS
300 MHz to 6 GHz
40% to < 0.5% bandwidth

TUBULAR / COAXIAL FILTERS
30 MHz to 5 GHz, Watts to kiloWatts
Broad stopband and very high rejection levels

Available to support legacy applications. Often an LC or cavity filter will perform better.

mtronpti.com/filter
CRYSTAL FILTERS

MOST ACCURATE Fc
VERY NARROW BAND

MONOLITHIC, DISCRETE, HIGH FREQUENCY FUNDAMENTAL
5 MHz – 220 MHz,
0.01% - 2% bandwidth

MTRONPTI CRYSTAL FILTERS
Perfect for narrow bandwidth, low distortion.

VERY LOW INTERMODULATION (IM)
prevents nonlinearities which can confuse receiver demodulation.

HIGH FREQUENCY FUNDAMENTALS
with wide bandwidth and low insertion loss for data communications applications.

FIFTY YEARS OF CRYSTAL FILTER EXPERIENCE
and customized test methods ensure initial technical performance and lifetime service.

PHASE AND AMPLITUDE MATCHED SETS
are available for applications like AESA (active electronically scanned array) radar,
EW and missile guidance – two to eight filters, matched and temperature compensated.
**SOLID STATE POWER AMPLIFIERS**

**GaN, GaAs FET, LDMOS & CHIP and WIRE, 10 W to 10KW**

RELIABLE RF POWER AT THE RIGHT PLACE ... RIGHT TIME.
Critical when lives are at stake. Ruggedized, fully protected RF PA solutions use state-of-the-art technology backed by decades of field experience.

MtronPTI SOLID STATE POWER AMPLIFIERS are available from 100 kHz to 40 GHz, narrowband, wideband or ultra-wideband. With full protection from VSWR, over and under power supply and excess input power. Perfect for satellite data terminals, electronic countermeasures, EMC testing or electronics lab applications. Available from 10 Watts CW to 10 kiloWatts PULSED and in modules or custom integrated filter/amplifier solutions with remote web-based monitoring.

mtronpti.com/poweramplifiers
FREQUENCY CONTROL

MtronPTI offers timing and frequency reference solutions from very low phase noise OCXOs for radar, satellite internet terminals and lab bench equipment to tight stability oscillators and TCXOs for SyncE and Stratum 3 timing.

MtronPTI oscillators provide shock, vibration and temperature resistance for reliable information transfer, whether in the air, on water or underground.

Check the tables for examples of COTs solutions. Contact MtronPTI to extend your reach further with a variation or full custom design.

Reducing lab instrument noise for finer measurements, quieting radar returns for clearer images, syncing with satellites for the latest social media updates or suppressing vibration and temperature effects for precise flight control...

50,000 G compressed air shock cannon
Constantly improving oscillator technology for trusted performance under harsh environmental conditions.

mtronpti.com/products/Oscillator
OVEN CONTROLLED CRYSTAL OSCILLATORS

HIGH STABILITY
LOW PHASE NOISE

Very low phase noise improves signal-to-noise ratio in EW, RF ATE, lab instruments and RADAR systems.

Examples only. See http://www.mtronpti.com/products/Oscillator/OCXO for complete listing.

mtronpti.com/products/Oscillator/OCXO
## TCXO

**TEMPERATURE COMPENSATED CRYSTAL OSCILLATORS**

**LOW AGING**

**LOW G SENSE**

**HIGH FREQUENCY**

### Twenty year specified aging, temperature stable timing: perfect for flight control and aircraft engine monitoring.

### Application

<table>
<thead>
<tr>
<th>Package</th>
<th>Frequency (MHz)</th>
<th>Output</th>
<th>Temp. stability (ppm)</th>
<th>Supply (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M617x</td>
<td>3.2 x 5 mm</td>
<td>8</td>
<td>38.88</td>
<td>CMOS or Clipped sine</td>
</tr>
<tr>
<td>M615x (Stratum 3)</td>
<td>5 x 7 mm</td>
<td>8</td>
<td>38.88</td>
<td>CMOS or Clipped sine</td>
</tr>
<tr>
<td>M610x (SyncE)</td>
<td>5 x 7 mm</td>
<td>10</td>
<td>38.88</td>
<td>CMOS or Clipped sine</td>
</tr>
<tr>
<td>M618x</td>
<td>5 x 7 mm</td>
<td>8</td>
<td>52</td>
<td>CMOS or Clipped sine ±0.1</td>
</tr>
<tr>
<td>M6153</td>
<td>3.2 x 5 mm</td>
<td>10</td>
<td>52</td>
<td>CMOS or Clipped sine ±0.2</td>
</tr>
<tr>
<td>M6084</td>
<td>3 x 2.5 mm</td>
<td>10</td>
<td>52</td>
<td>Clipped sine ±0.5</td>
</tr>
<tr>
<td>M6055</td>
<td>2.5 x 3.2 mm</td>
<td>10</td>
<td>52</td>
<td>Clipped sine ±0.5</td>
</tr>
<tr>
<td>M6029/M6030</td>
<td>5 x 7 mm</td>
<td>12.6</td>
<td>26</td>
<td>Clipped sine ±1.5</td>
</tr>
</tbody>
</table>

### Low noise, low aging

<table>
<thead>
<tr>
<th>Package</th>
<th>Frequency (MHz)</th>
<th>Output</th>
<th>Temp. stability (ppm)</th>
<th>Supply (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M612x</td>
<td>0.84&quot; x 0.46&quot;</td>
<td>8</td>
<td>52</td>
<td>CMOS or Clipped sine ±0.2</td>
</tr>
<tr>
<td>M613x</td>
<td>9 x 14 mm</td>
<td>8</td>
<td>130</td>
<td>CMOS or Clipped sine ±0.2</td>
</tr>
<tr>
<td>XC0030</td>
<td>1” x 0.25”</td>
<td>10</td>
<td>100</td>
<td>CMOS or Sine ±0.25</td>
</tr>
<tr>
<td>XC0070</td>
<td>1” x 1”</td>
<td>10</td>
<td>100</td>
<td>CMOS or Sine ±0.25</td>
</tr>
<tr>
<td>XC0080</td>
<td>1.1” x 0.7”</td>
<td>10</td>
<td>125</td>
<td>CMOS or Sine ±0.25</td>
</tr>
<tr>
<td>M6049/M6050</td>
<td>14 Pin DIP</td>
<td>8</td>
<td>52</td>
<td>CMOS or Clipped sine ±0.5</td>
</tr>
<tr>
<td>XC0280</td>
<td>0.7” x 0.5”</td>
<td>10</td>
<td>25</td>
<td>CMOS</td>
</tr>
</tbody>
</table>

All TCXOs are available with voltage control as VCTCXOs.

Examples only. See http://www.mtronpti.com/products/Oscillator/TCXO for complete listing.

Testing for wander generation, holdover and drift ensures reliable Stratum 3 data link performance.
VCXO

VOLTAGE CONTROLLED CRYSTAL OSCILLATORS

LOW NOISE TO 1.4 GHZ
HARSH ENVIRONMENT

Wide frequency range with tunability to track the data clocks in server, base station and military communication applications.

Examples only. See http://www.mtronpti.com/products/Oscillator/VCXO for complete listing.


**XO/XTAL**

**Application**

<table>
<thead>
<tr>
<th>Package</th>
<th>Frequency (MHz)</th>
<th>PPM</th>
<th>Temperature range (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XR Series</td>
<td>Low g-sensitivity, low aging</td>
<td>3</td>
<td>200</td>
</tr>
<tr>
<td>PP</td>
<td>3.5 x 6 mm</td>
<td>10</td>
<td>180</td>
</tr>
<tr>
<td>PM</td>
<td>5 x 7 mm</td>
<td>8</td>
<td>150</td>
</tr>
<tr>
<td>ATSM-49</td>
<td>HC-49/S</td>
<td>3.58</td>
<td>72</td>
</tr>
<tr>
<td>M1253</td>
<td>2.5 x 3.2 mm</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>M1325</td>
<td>3.2 x 5 mm</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>M1262</td>
<td>2 x 2.5 mm</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>M1620</td>
<td>1.6 x 2.0 mm</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>QPL</td>
<td>MIL-PRF-3098-QPL HC-49/U</td>
<td>1</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>MIL-PRF-3098-QPL HC-49/S</td>
<td>2.4</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>MIL-PRF-3098-QPL HC-50/U</td>
<td>2.2</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>MIL-PRF-3098-QPL HC-51/U</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>REAL TIME CLOCK</td>
<td>MMCC-2</td>
<td>1.5 mm diameter</td>
<td>32.768 KHz</td>
</tr>
<tr>
<td></td>
<td>MMCC-3</td>
<td>2 mm diameter</td>
<td>32.768 KHz</td>
</tr>
<tr>
<td>THROUGH HOLE</td>
<td>ATS-49</td>
<td>HC-49/S</td>
<td>3.58</td>
</tr>
<tr>
<td></td>
<td>UM-1</td>
<td>UM-1</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>UM-5</td>
<td>UM-5</td>
<td>12</td>
</tr>
</tbody>
</table>

**Examples only. See http://www.mtronpti.com/products/Crystals for complete listing**

**CRYSTAL OSCILLATORS**

Very precise and stable frequencies from 10 MHz to 1.4 GHz.

For avionics and flight control, the HPO offers 25 or 50 ppm 20-year stability.

The M2052 with 225 °C operation and 1000 G shock survival is perfect for down hole drilling.

**PRECISION CRYSTAL RESONATORS**

Designed for high-reliability applications and as the key element in reference oscillators and crystal filters.

mtronpti.com/products/Oscillator/XO • mtronpti.com/products/Crystals
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1987 - Acquires Motorola's external frequency control devices business
1990 - First VCXO and Wash proof LC filters
1993 - US ISO-9001 certified crystals and oscillator manufacturer
1995 - Small package VCXO for OC-48 and OC-192 SONET networks
1995 - India manufacturing plant opens
2002 - Acquires Champion assets with industry-leading VCKO technology

2004
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MtronPTI formed
2006 - QiK Chip™ - XO's, VCXOs and TCXOs to 1.4 GHz
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MIL-STD-790 Certified
RoHS Compliance

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