

Ordering the Reference Crystal

Run through several multiplication schemes for the complete source. Pick a crystal frequency that falls in the middle of the cavity range when multiplied. Reference crystal frequencies from 95-113 MHz are common for the brick style oscillators.

All of the units I've seen use a TO-5 style crystal case. These have gotten rather expensive from many vendors, about \$50 each. A recent order to International Crystal resulted in a \$13 price for a TO-5 packaged crystal, however. An HC-18 style crystal holder can be used with a little extra effort. The cost of this style crystal holder typically ranges from \$12-20. To use holder, you have to unsolder the machined oven from the oscillator printed circuit board. You also have to remove the lip at the bottom of the hole the crystal fits in, by drilling it out (first remove the ceramic disk with the socket pins for the TO-5 type case). Then install the crystal directly on the board and reinstall the oven over the crystal.

The Collins sources use a plug-in oven. The crystal leads can be plugged directly into the socket pins on the board. Placing the oven over the HC-18 style case is awkward, but will provide some temperature control.

Crystal specifications (ideal) are:

Mode: Fifth overtone

Oven: 75° C

Shunt capacitance: 4.5 ± 0.75 pF

ESR: 60 Ω max

Frequency tolerance: $\pm 0.0005\%$ @ 75° C

Temperature stability: $\pm 0.002\%$ from 70-89° C

Spurious response ratio: 2:1

Sources for crystals include:

Bliley (814) 838-3571 (TO-5)	EG&G Cinox
2545 W. Grandview	(513) 542-5555 (TO-5)
P.O. Box 3428	4914 Gray Road
Erie, PA 18508	Cincinnati, OH 45232

International Crystal (both)	JAN Crystals (HC-18)
10 North Lee	P.O. Box 06017
Oklahoma City, OK 73102	Fort Myers, FL 33906-6017

Crystek (HC-18)
2351/2371 Crystal Drive
P.O. Box 06135
Fort Myers, FL 33906-6135

FREQUENCY MANAGEMENT INTERNATIONAL
15302 Bolsa Chica Street
Huntington Beach, CA 92649
800-800-9825
www.frequencymanagement.com

Standard Crystal Corporation
9940 East Baldwin Place
El Monte, CA 91731
(626) 443-2121
(800) 423-4578
www.standardcrystalcorp.com