COLLINS CR-18A/U CRYSTAL SPECIFICATIONS FOR THE KWM-2 & S-LINE RADIOS

(AMATEUR BANDS)

290-9009-00 (for 3400 – 3600 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	6.555 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	50 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	10 mW +/- 2 mW
Holder type	HC-6/U

290-9010-00 (for 3600 – 3800 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	6.755 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	50 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	10 mW +/- 2 mW
Holder type	HC-6/U

290-9011-00 (for 3800 – 4000 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	6.955 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum

Equivalent resistance	25 ohms maximum
Aging in first 30 days	5 ppm maximum
Drive level rating	10 mW +/- 2 mW
Holder type	HC-6/U

290-9027-00 (for 7000 – 7200 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	10.155 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	25 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

290-9028-00 (for 7200 – 7400 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	10.355 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	25 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

290-9042-00 (for 10000 – 10200 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	13.155 MHz
Frequency tolerance	+/- 50 ppm

Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	25 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

290-9062-00 (for 14000 – 14200 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	8.5775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	24 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	10 mW +/- 2 mW
Holder type	HC-6/U

290-9063-00 (for 14200 – 14400 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	8.6775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	-55.0 to 105.0 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	24 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	10 mW +/- 2 mW
Holder type	HC-6/U

290-9066-00 (for 14800 – 15000 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental

Type of resonance circuit	Antiresonance
Specified frequency	8.9775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	-55.0 to 105.0 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	22 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	10 mW +/- 2 mW
Holder type	HC-6/U

290-9097-00 (for 21000 – 21200 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	12.0775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	-55.0 to 105.0 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	22 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

290-9098-00 (for 21200 – 21400 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	12.1775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	25 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

290-9099-00 (for 21400 – 21600 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	12.2775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	25 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

290-9132-00 (for 28000 – 28200 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	15.5775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	25 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

290-9133-00 (for 28200 – 28400 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	15.6775 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	20 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW

Holder type	HC-6/U

290-9201-00 (for 28500 – 28700 kHz):

CHARACTERISTIC	SPECIFICATION
Mode of oscillation	Fundamental
Type of resonance circuit	Antiresonance
Specified frequency	15.8275 MHz
Frequency tolerance	+/- 50 ppm
Operating temperature range	0 to 60 degrees in Celsius
Loading capacitance	32 pF
Shunt capacitance	7 pF maximum
Equivalent resistance	20 ohms
Aging in first 30 days	5 ppm maximum
Drive level rating	5 mW +/- 1 mW
Holder type	HC-6/U

(SPECIFICATIONS ACCORDING TO THE MIL-STD-683 & MIL-C-3098)

FOR TO ORDERING OF NEW CRYSTALS:

What is need to keep in mind when ordering a new crystal units for the Collins KWM-2/A and S-line radios is a rated drive level as vacuum tube radios tend to drive crystals with higher power.

Most of the modern day crystal manufacturers offer their products only for drive level of 1000 µW maximum or so, but there are still factories who can make 5 mW crystals without special efforts.

The original Collins crystals was designed to use in both military and amateur radio products and it is obvious reason why their specifications was not published in operation manuals.
In amateur radios like KWM-2/A transceivers, 75S receivers and 32S transmitters these crystals are used in same local oscillator circuitries so we may can assume to use 5 mW units in all positions.

For making a new properly working crystal the factory needs at least these basic specifications:

- Specified frequency (stated usually in megahertz, look from the specifications)
- Frequency adjustment tolerance at +25 degrees in Celsius*
- Frequency temperature stability (choose +/- 10 to 50 ppm at 0 to +70 degrees in Celsius or better)
- Load capacitance CL: 32 pF
- Drive level: 5 mW
- Crystal enclosure: HC-48/U**

*The Frequency adjustment tolerance can be taken direct from the original crystal specifications but there are same series crystal units like # 290-9053-00 used for the maritime mobile service band with a better tolerance of +/- 10 ppm and it is advisable to choose that value or even better.

**The old HC-6/U crystal casing is no more manufactured but it has been replaced by HC-48/U.

(Compiled by OH5FED)