

Quartz Crystals
for Electrical Circuits

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By

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subject: **Copyright Permission**

date.: **May 19,1999**

from: **Nancy J. Miller**

Roger Ward
Quartzdyne, Inc.
120 Atherton Drive
Salt Lake **City**, UT 84123

Mr. Ward:

Thank you for your letter of 12 April 1999 addressed to AT&T, forwarded to Lucent Technologies, requesting permission to publish a book, entitled ***Quartz Crystals for Electrical Circuits*** by Raymond A. Heising of Bell Labs, on the Institute of Electrical and Electronic Engineers (IEEE) Web site.

Lucent Technologies has no objections to publication of the **book** in the manner described in the aforementioned letter. Lucent would expect that the version of the work as posted on the Web site will contain no changes to the 1978 version of the work, except perhaps your addition of references to more recent literature.

Sincerely,

A handwritten signature in black ink, appearing to read 'Nancy J. Miller'. The signature is fluid and cursive, with the first and last names being more prominent.

Nancy J. Miller
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Preface

THE author takes pleasure in presenting this book on the development and manufacture of quartz plates for electrical circuits. Its chapters were written by men who have engaged in piezoelectric research or its engineering applications. Some of them made momentous discoveries in this art and all of them contributed importantly to the developments that made quartz crystals so useful to the radio industry prior to the war, and to our Armed Services during the war. Except for Chapter XVI all of the authors are Members of the Technical Staff of Bell Telephone Laboratories; those of that chapter are Members of the Manufacturing Engineering Department of the Western Electric Company, Incorporated, the manufacturing associate of those Laboratories.

Some of the chapters have appeared as articles in the Bell System Technical Journal but the rest appear for the first time in this book.

The purpose of each chapter is not to present the individual work of the author of that chapter, but instead to present the technical art, whatever its source, pertaining to the chapter's subject, as summarized by an engineer who has specialized in that particular phase. Each chapter, therefore, contains not only improvements and discoveries which its author has contributed but also improvements and discoveries of others, together with the pertinent classical science that is to be found in textbooks. No effort is made to assign all credits to the various originators, as that would contribute nothing to the reader who is primarily interested in the use of the material.

In presenting this volume the author expresses his sincere thanks to the writers of its several chapters for their cooperation.

July, 1945

R. A. HEISING