

**STUDIES IN ELECTRICAL AND
ELECTRONIC ENGINEERING 19**

Surface-Wave Devices for Signal Processing

DAVID P. MORGAN

ELSEVIER

Surface-Wave Devices for Signal Processing

**STUDIES IN ELECTRICAL AND
ELECTRONIC ENGINEERING 19**

Surface-Wave Devices for Signal Processing

DAVID P. MORGAN

Plessey Research (Caswell) Ltd., Allen Clark Research Centre, Towcester, U.K.



ELSEVIER

Amsterdam – Oxford – New York – Tokyo 1991

ELSEVIER SCIENCE PUBLISHERS B.V.
Sara Burgerhartstraat 25
P.O. Box 211, 1000 AE Amsterdam, The Netherlands

Distributors for the United States and Canada:

ELSEVIER SCIENCE PUBLISHING COMPANY, INC.
655, Avenue of the Americas
New York, NY 10010, U.S.A.

First Edition 1985
Paperback Edition 1991

Library of Congress Cataloging in Publication Data

Morgan, David P.
Surface-wave devices for signal processing.

(Studies in electrical and electronic engineering;
vol. 19)

Bibliography: p.

Includes index.

1. Acoustic surface wave devices. 2. Signal processing. I. Title. II. Series: Studies in electrical and electronic engineering; 19.

TK5981.M63 1985 621.38'043 85-10-330

ISBN 0-444-42511-X (U.S.)

ISBN 0-444-42511-X (Vol. 19, hard cover)

ISBN 0-444-88845-4 (Vol. 19, soft cover)

© ELSEVIER SCIENCE PUBLISHERS B.V., 1991

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher, Elsevier Science Publishers B.V., P.O. Box 521, 1000 AN Amsterdam, The Netherlands.

Special regulations for readers in the U.S.A. - This publication has been registered with the Copyright Clearance Center Inc. (CCC), 27 Congress Street, Salem, MA 01970, U.S.A. Information can be obtained from the CCC about conditions under which photocopies of parts of this publication may be made in the U.S.A. All other copyright questions, including photocopying outside of the U.S.A., should be referred to the publisher.

Printed in The Netherlands

FCR/hw/nov99.133
23 November 1999



Dr John Vig
US Army Communications – Electronics Command
AMSEL-RD-C2-CS
Fort Monmouth NJ 07703-5602
USA

Fax: 00 1 732 427 4805

Dear Dr Vig

Elsevier Science

The Boulevard
Langford Lane
Kidlington
Oxford OX5 1GB
England

Tel (+44) (0) 1865 813000
Fax (+44) (0) 1865 843010

www.elsevier.nl

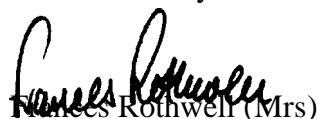
MORGAN, SURFACE- WAVE DEVICES FOR SIGNAL PROCESSING, 1991

As per David Morgan's letter dated 29 October 1999, we hereby grant you permission to reprint the aforementioned material **on CD-ROM and the World Wide Web** at no charge subject to the following conditions:

1. If any part of the material to be used (for example, figures) has appeared in our publication with credit or acknowledgement to another source, permission must also be sought from that source. If such permission is not obtained then that material may not be included in your publication/copies.
2. Suitable acknowledgment to the source must be made as follows:

"Reprinted from (Author(s)/Title), Copyright (year), Pages No., with permission from Elsevier Science"
3. Reproduction of this material is confined to the purpose for which permission is hereby given.
4. This permission is granted for non-exclusive world **English** rights only. For other languages please reapply separately for each one required. Permission excludes use in an electronic form other than as specified above.

Yours sincerely



Frances Rothwell (Mrs)

Subsidiary Rights Manager

**The processing of permission requests for all Elsevier Science (including Pergamon imprint) journals has been centralised in Oxford, UK. Your future requests will be handled more quickly if you write directly to: Subsidiary Rights Department, Elsevier Science, PO Box 800, Oxford OX5 1DX, UK.
Fax: 44-1865 853333; e-mail: permissions@elsevier.co.uk**

Imprints
Elsevier
Pergamon
North-Holland

23 Williton Close,
Weston Favell,
Northampton NN3 3BG.

Tel/Fax: +44 1604 639582
e-mail: dpm@ieee.org
dapmorgan@aol.com

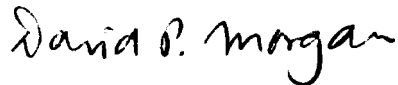
15 December 1999

Dear John,

Book: 'Surface-Wave Devices for Signal Processing'
by D.P. Morgan
Pub. Elsevier, 1991. ISBN 0-444-88845-4

This letter is to confirm that I am happy for the IEEE to copy my book, specified above, on to the planned IEEE CD-ROM's and web site.

Best regards,

A handwritten signature in black ink that reads "David P. Morgan". The script is cursive and fluid, with the first name "David" and last name "Morgan" clearly legible.

David Morgan

Dr. John Vig,
US Army Communications - Electronics Command,
AMSEL-RD-C2-CS, Fort Monmouth,
NJ 07703-5602, U.S.A.

STUDIES IN ELECTRICAL AND ELECTRONIC ENGINEERING

- Vol. 1 Solar Energy Conversion: The Solar Cell (Neville)
- Vol. 3 Integrated Functional Blocks (Novák)
- Vol. 4 Operational Amplifiers (Dostál)
- Vol. 5 High-Frequency Application of Semiconductor Devices (F. Kovács)
- Vol. 6 Electromagnetic Compatibility in Radio Engineering (Rotkiewicz)
- Vol. 7 Design of High-Performance Negative-Feedback Amplifiers (Nordholt)
- Vol. 8 Discrete Fourier Transformation and its Applications to Power Spectra Estimation (Geçkinli and Yavuz)
- Vol. 9 Transient Phenomena in Electrical Machines (P. K. Kovács)
- Vol. 10 Theory of Static Converter Systems: Mathematical Analysis and Interpretation. Part A: Steady-State Processes (Slonim)
- Vol. 11 Power Sources for Electric Vehicles (edited by McNicol and Rand)
- Vol. 12 Classical Electrodynamics (Ingarden and Jamiołkowski)
- Vol. 13 Reliability of Analogue Electronic Systems (Klaassen)
- Vol. 14 Electrets (Hilczner and Małeckı)
- Vol. 15 Graph Theory: Application to the Calculation of Electrical Networks (Vágó)
- Vol. 16 Eddy Currents in Linear Conducting Media (Tegopoulos and Kriezis)
- Vol. 17 Electrical Measurements in Engineering (Boros)
- Vol. 18 Active RC Filters (Herpy and Berka)
- Vol. 19 Surface-Wave Devices for Signal Processing (Morgan)
- Vol. 20 Micromachining and Micropackaging of Transducers (edited by Fung, Cheung, Ko and Fleming)
- Vol. 21 Nonlinear and Environmental Electromagnetics (edited by Kikuchi)
- Vol. 22 Microwave Measurements of Complex Permittivity by Free Space Methods and their Applications (Musil and Žáček)
- Vol. 24 Piezoelectric Resonators and their Applications (Zelenka)
- Vol. 25 Large Power Transformers (Karsai, Kerényi and Kiss)
- Vol. 26 Power Supplies (Ferenczi)
Part A: Linear Power Supplies, DC-DC Converters
Part B: Switched-mode Power Supplies
- Vol. 27 Proceedings of the Eighth Colloquium on Microwave Communication, Budapest, Hungary, August 25-29, 1986 (edited by Berceli)
- Vol. 28 U.R.S.I. International Symposium on Electromagnetic Theory, Budapest, Hungary, August 25-29, 1986 (edited by Berceli)
- Vol. 29 Nonlinear Active Microwave Circuits (Berceli)
- Vol. 30 Power System Stability (Rácz and Bókay)
- Vol. 31 Analysis and Synthesis of Translinear Integrated Circuits (Seevinck)
- Vol. 32 Microwave Measurements by Comparison Methods (Kneppo)
- Vol. 33 Nodal Analysis of Electrical Networks (Fodor)
- Vol. 34 Noise and Vibration of Electrical Machines (edited by Timár)
- Vol. 35 Adaptive Arrays (Nicolau and Zaharia)
- Vol. 36 Transient Stability Analysis of Synchronous Motors (Āemus and Hamata)
- Vol. 37 Electric Drive Systems Dynamics (Szkłarski, Jaracz and Horodecki)
- Vol. 38 Digital Microwave Transmission (Frigyes, Szabó and Ványai)
- Vol. 39 Magnetic Heads for Digital Recording (Ciureanu and Gavrilă)