

The design for the cover of this issue was suggested by Dr. Alfred N. Goldsmith.

# PROCEEDINGS OF THE I-R-E®

*Published Monthly by*

The Institute of Radio Engineers, Inc.

## EDITORIAL DEPARTMENT

Alfred N. Goldsmith  
*Editor*

E. K. Gannett  
*Administrative Editor*

Marita D. Sands  
*Assistant Editor*

## ADVERTISING DEPARTMENT

William C. Copp  
*Advertising Manager*

Lillian Petranek  
*Assistant Advertising Manager*

## BOARD OF EDITORS

Alfred N. Goldsmith  
*Chairman*

## PAPERS REVIEW COMMITTEE

George F. Metcalf  
*Chairman*

## ADMINISTRATIVE COMMITTEE OF THE BOARD OF EDITORS

Alfred N. Goldsmith  
*Chairman*

Responsibility for the contents of papers published in the PROCEEDINGS OF THE I.R.E. rests upon the authors. Statements made in papers are not binding on the Institute or its members.

All rights of publication including translation into foreign languages, are reserved by the Institute. Abstracts of papers with mention of their source may be printed. Requests for republication privileges should be addressed to The Institute of Radio Engineers.



VOLUME 42

*January, 1954*

NUMBER I

## THE PROCEEDINGS OF THE I-R-E

Foreword.....	The Administrative Editor	1
William R. Hewlett, President, 1954.....		2
Alfred N. Goldsmith, Editor Emeritus.....		3
W. R. G. Baker, Chairman, NTSC.....		4
4794. The Future of Color Television.....	W. R. G. Baker	5
4795. Basic Concepts and Evolution of Color Television.....	E. W. Engstrom	7
4796. Psychophysical and Electrical Foundations of Color Television.....	A. V. Loughren	9
4797. The NTSC: An Exercise in Technical Co-ordination.....	D. B. Smith	11
4798. National Television System Committee.....		15
4799. NTSC Signal Specifications.....		17
4800. NTSC Color Television Field Test.....	R. DeCola, R. E. Shelby, and K. McIlwain	20
4801. The NTSC Monographs.....	D. G. Fink	43
4802. NTSC Color Television Standards.....		46
4803. Colorimetry in Color Television, Part II.....	F. J. Bingley	48
4804. Colorimetry in Color Television, Part III.....	F. J. Bingley	51
4805. The Choice of Axes and Bandwidths for the Chrominance Signals in NTSC Color Television.....	G. H. Brown	58
4806. The Constant Luminance Principle in NTSC Color Television.....	W. F. Bailey	60
4807. Mathematical Formulations of the NTSC Color Television Signal.....	G. H. Brown	66
4808. Transfer Characteristics in NTSC Color Television.....	F. J. Bingley	71
4809. Choice of Chrominance Subcarrier Frequency in the NTSC Standards.....	I. C. Abrahams	79
4810. The "Frequency Interleaving" Principle in the NTSC Standards.....	I. C. Abrahams	81
4811. Quadrature Cross Talk in NTSC Color Television.....	W. F. Bailey and C. J. Hirsch	84
4812. Narrow-Band Transmission of the NTSC Color Signal.....	J. G. Reddeck	90
4813. System Delay Characteristics in NTSC Color Television.....	R. C. Palmer	92
4814. Effect of Transmitter Characteristics on NTSC Color Television Signals.....	G. L. Fredendall and W. C. Morrison	95
4815. Color-Carrier Reference Phase Synchronization Accuracy in NTSC Color Television.....	Donald Richman	106
4816. The Concept of Transmission Primaries in Color Television.....	P. W. Howells	134
4817. Colorimetric Analysis of the NTSC Color Television System.....	D. C. Livingston	138
4818. Quantitative Spectral Measurements in Color Television.....	J. A. Rado and W. L. Hughes	151
4819. Wide-Range Chromaticity Measurements with Photoelectric Colorimeter.....	John B. Chatten	156
4820. Image Orthicons for Color Cameras.....	R. G. Neuhauser, A. A. Rotow, and F. S. Veith	161
4821. Reproduction of Colors in Outdoor Scenes.....	D. L. MacAdam	166
4822. Brightness Modification Proposals for Televising Color Film.....	W. L. Brewer, J. H. Ladd, and J. E. Pinney	174
4823. The Use of Electronic Masking in Color Television.....	R. P. Burr	192
4824. Matrix Networks for Color TV.....	William R. Feingold	201
4825. The Colorplexer—A Device for Multiplexing Color Television Signals in Accordance with the NTSC Signal Specifications.....	E. E. Gloystein and A. H. Turner	204
4826. Transients in Color Television.....	P. W. Howells	212
4827. Transition Effects in Compatible Color Television.....	John B. Chatten	221
4828. Reproduction of Luminance Detail by NTSC Color Television Systems.....	D. C. Livingston	228
4829. Methods of Verifying Adherence to the NTSC Color Signal Specifications.....	Arch C. Luther, Jr.	235

Contents continued, following page

BOARD OF  
DIRECTORS, 1953

J. W. McRae  
*President*

S. R. Kantebet  
*Vice-President*

W. R. G. Baker  
*Treasurer*

Haraden Pratt  
*Secretary*

Alfred N. Goldsmith  
*Editor*

I. S. Coggeshall  
*Senior Past President*

D. B. Sinclair  
*Junior Past President*

1953

R. D. Bennett  
G. H. Browning (R1)  
W. H. Doherty  
A. W. Graf (R5)  
W. R. Hewlett  
A. V. Loughren  
R. L. Sink (R7)  
G. R. Town  
Irving Wolff (R3)

1953-1954

J. T. Henderson (R8)  
C. A. Priest (R4)  
J. R. Ragazzini (R2)  
J. D. Ryder  
A. W. Straiton (R6)  
Ernst Weber

1953-1955

S. L. Bailey  
B. E. Shackelford

Harold R. Zeamans  
*General Counsel*

George W. Bailey  
*Executive Secretary*

Laurence G. Cumming  
*Technical Secretary*

Changes of address (with advance notice of fifteen days) and communications regarding subscriptions and payments should be mailed to the Secretary of the Institute, at 450 Ahnaip St., Menasha, Wisconsin, or 1 East 79 Street, New York 21, N. Y.



\* Numerals in parentheses following Director's names designate Region number.

# PROCEEDINGS OF THE I-R-E®

*Published Monthly by*  
The Institute of Radio Engineers, Inc.

(Continued)

4830. A Versatile Approach to the Measurement of Amplitude Distortion in Color Television .....	John A. Bauer	240
4831. Test Instruments for Color Television .....	W. C. Morrison, K. Karstad, and W. L. Behrend	247
4832. Delay Equalization in Color Television .....	G. L. Fredendall	258
4833. Alignment of a Monochrome TV Transmitter for Broadcasting NTSC Color Signals .....	Joseph F. Fisher	263
4834. Transmission of Color Over Inter-City Television Networks .....	James R. Rae	270
4835. Improving the Transient Response of Television Receivers .....	J. Avins, B. Harris, and J. S. Horvath	274
4836. Theory of Synchronous Demodulator as Used in NTSC Color Television Receiver .....	D. C. Livingston	284
4837. The DC Quadricorrelator: A Two-Mode Synchronization System ..	Donald Richman	288
4838. Processing of the NTSC Color Signal for One-Gun Sequential Color Displays .....	B. D. Loughlin	299
4839. Compatible Color Picture Presentation with the Single Gun Tricolor Chromatron ..	J. D. Gow and R. Dorr	308
4840. Improvements in the RCA Three-Beam Shadow-Mask Color Kinescope .....	M. J. Grimes, A. C. Grimm, and J. F. Wilhelm	315
4841. The CBS Colortron: A Color Picture Tube of Advanced Design .....	N. F. Fyler, W. E. Rowe, and C. W. Cain	326
4842. A Laboratory Receiver for Study of the NTSC Color Television System .....	C. Masucci, J. J. Insalaco, and R. Zitta	334
4843. Bibliography of Color Television Papers Published by the IRE .....		344
Correspondence:		
4844. Some Russian Terms and Abbreviations .....	George F. Schultz	348
4845. Electrical Units in Russian .....	George F. Schultz	349
4846. Synthesis of One Terminal-Pair Passive Networks Without Ideal Transformers .....	F. M. Reza	349
Contributors .....		350

## I-R-E NEWS AND RADIO NOTES SECTION

News .....	358
Professional Group News .....	360
Technical Committee Notes .....	362
IRE People .....	363
Books:	
4847. "Modulation Theory" by Harold S. Black .....	Reviewed by B. A. Trevor 366
4848. "Luminescence and the Scintillation Counter" by S. C. Curran .....	Reviewed by Alois W. Schardt 366
Professional Groups and Sections .....	366
4849. Abstracts and References .....	369

## ADVERTISING SECTION

Meetings with Exhibits .....	2A	Student Branch Meetings .....	106A
News—New Products .....	10A	Membership .....	114A
Industrial Engineering Notes .....	84A	Positions Open .....	130A
Professional Group Meetings .....	94A	Positions Wanted .....	144A
Section Meetings .....	100A	Advertising Index .....	181A