

## microwave engineers

• The Hughes Research and Development Laboratories are engaged in basic and applied research and development programs in a wide variety of fields, including antennas, radomes, microwave and storage tubes, masers, ferrite devices, microwave circuitry, instrumentation, and other fields.

One of the several interesting problems is the design of feedback loops for locking the local oscillator klystron to an available reference signal. The requirements—good stability and low noise in a very trying environment.

*Your inquiry is invited.  
Please write Mr. John Bailey.*

*the West's leader in advanced electronics*

# HUGHES

RESEARCH & DEVELOPMENT  
LABORATORIES

*Hughes Aircraft Co., Culver City, Calif.*

ENGINEERS

SCIENTISTS

## SYLVANIA'S MOUNTAIN VIEW LABORATORIES

LOCATED ON  
SAN FRANCISCO PENINSULA

... offer unlimited opportunity to engineers and scientists with experience in microwave theory and techniques, to work in advanced research and development in the areas of electronic countermeasures, reconnaissance systems, microwave tubes, gaseous electronics and ferromagnetic materials.

*Openings with 4 laboratories in  
MOUNTAIN VIEW, CALIFORNIA*

Electronic Defense Lab  
Reconnaissance Systems Lab  
Microwave Tube Lab  
Microwave Physics Lab

*For further information write  
Mr. J. C. Richards*



P.O. Box 1296  
Mountain View, California

## NOTICE TO ADVERTISERS

Effective immediately the IRE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES will accept display advertising. For full details contact Tore N. Anderson, Advertising Editor, PGMTT TRANSACTIONS, 1539 Deer Path, Mountainside, N.J.

## AVAILABLE BACK ISSUES OF IRE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES

PUBLICATION	PRICES		
	Group Members	IRE Members	Non- Members
Vol. MTT-2, No. 3, Sept., 1954	\$1.10	\$1.65	\$3.30
Vol. MTT-3, No. 1, Jan., 1955	\$1.50	\$2.25	\$4.50
Vol. MTT-3, No. 4, July, 1955	\$1.60	\$2.40	\$4.80
Vol. MTT-4, No. 1, Jan., 1956	\$1.65	\$2.45	\$4.95
Vol. MTT-4, No. 3, July, 1956	\$1.25	\$1.85	\$3.75
Vol. MTT-4, No. 4, Oct., 1956	\$1.85	\$2.75	\$5.55
Vol. MTT-5, No. 2, April, 1957	\$1.90	\$2.85	\$5.70
Vol. MTT-5, No. 3, July, 1957	\$1.15	\$1.70	\$3.45
Vol. MTT-5, No. 4, Oct., 1957	\$1.20	\$1.80	\$3.60
Vol. MTT-6, No. 1, Jan., 1958	\$2.65	\$3.95	\$7.95
Vol. MTT-6, No. 2, April, 1958	\$2.50	\$3.75	\$7.50
Vol. MTT-6, No. 3, July, 1958	\$2.00	\$3.00	\$6.00

\* Colleges, Universities, Subscription Agencies, and All Libraries may purchase at IRE Member rate.

## INSTITUTIONAL LISTINGS

The IRE Professional Group on Microwave Theory and Techniques is grateful for the assistance given by the firms listed below, and invites application for Institutional Listing from other firms interested in the Microwave field.

AIRTRON, INC., 1101 W. Elizabeth Ave., Linden, N.J.  
Designers and Producers of Complete Line of Microwave, Electronic and Aircraft Components.

COLLINS RADIO CO., Cedar Rapids, Iowa  
Complete Industrial Microwave, Communication, Navigation and Flight Control Systems

LITTON INDUSTRIES, INC., MARYLAND DIV., College Park, Md.  
Development and Production of Microwave Antennas and Waveguide Components

MICROWAVE DEVELOPMENT LABS., INC., 92 Broad St., Babson Park 57, Mass.  
Designers, Developers and Producers of Microwave Components and Assemblies, 400 mc to 70 kmc

SAGE LABORATORIES, INC., 159 Linden St., Wellesley 81, Mass.  
Microwave Engineering Specialists

WEINSCHL ENGINEERING CO., INC., Kensington, Md.  
Attenuation Standards, Coaxial Attenuators and Insertion Loss Test Sets

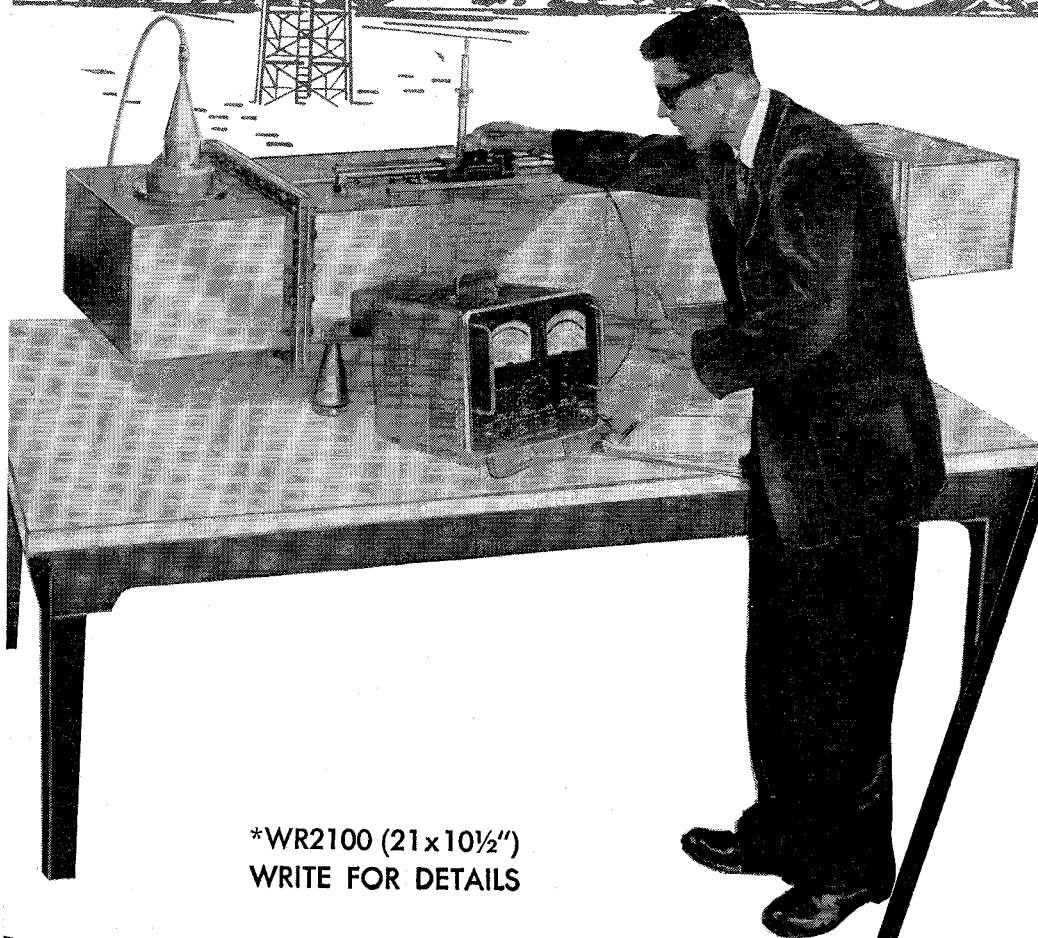
WHEELER LABORATORIES, INC., 122 Cutter Mill Road, Great Neck, N. Y.  
Consulting Services, Research & Development, Microwave Antennas & Waveguide Components

The charge for an Institutional Listing is \$50.00 per issue or \$140.00 for four consecutive issues. Applications for Institutional Listings and checks (made out to the Institute of Radio Engineers) should be sent to Tore N. Anderson, PGMTT Advertising Editor, 1539 Deer Path, Mountainside, N.J.

### NOTICE TO ADVERTISERS

Effective immediately the IRE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES will accept display advertising. For full details contact Tore N. Anderson, Advertising Editor, PGMTT TRANSACTIONS, 1539 Deer Path, Mountainside, N.J.

*Introducing*  
**WR 2100 \* WAVEGUIDE COMPONENTS...**



\*WR2100 (21x10½")  
WRITE FOR DETAILS

**FXR**

**F-R MACHINE WORKS, Inc.**  
Woodside 77, N. Y. • Astoria 8-2800

**REPRESENTATIVES**

**WASHINGTON, D. C.**

A & M ASSOC.  
1145 19th ST., N.W.  
WASHINGTON, D. C.

**WASHINGTON  
OREGON**

AHMC  
BOEING FIELD  
KING CTY. AIRPORT  
SEATTLE 8, WASH.

**MICHIGAN  
OHIO**

W. PENN.  
E. KENTUCKY

J. R. DANNEMILLER ASSOCI.  
3955 LEE ROAD  
CLEVELAND 28, OHIO

J. R. DANNEMILLER ASSOCI.  
384 W. 1st ST.  
DAYTON 2, OHIO

J. R. DANNEMILLER ASSOCI.  
1204 N. WOODWARD ST.  
ROYAL OAK, MICHIGAN

**BOSTON AREA**

ROBERT L. DIAMOND  
69B STRATHMORE RD.  
BROOKLINE 46, MASS.

**COLORADO  
NEW MEXICO**

UTAH  
WYOMING

HYTRONIC  
MEASUREMENTS, INC.  
1295 S. BANNOCK ST.  
DENVER 23, COLORADO

**ILLINOIS  
INDIANA  
WISCONSIN**

KADELL SALES ASSOC.  
5875 N. LINCOLN AVE.  
CHICAGO 45, ILLINOIS

**FLORIDA  
GEORGIA  
ALABAMA  
TENNESSEE  
S. CAROLINA**

J. NEAL CO.  
P. O. BOX 50-438  
MIAMI 50, FLA.

**CANADA**

RADIONICS, LTD.  
8230 MAYRAND STREET  
MONTREAL 9, CANADA

**UPPER NEW YORK STATE**

J. D. RYERSON ASSOC., INC.  
P. O. BOX 1400  
SYRACUSE, NEW YORK

**EXPORT**

SZUCS INT'L CORP.  
50 BROAD STREET  
NEW YORK 4, N. Y.

**CALIFORNIA  
ARIZONA**

VAN GROOS CO.  
21051 COSTANSO ST.  
WOODLAND HILLS, CALIF.

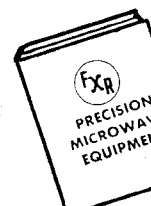
VAN GROOS CO.  
1178 LOS ALTOS AVE.  
LOS ALTOS, CALIF.

**PRECISION  
MICROWAVE  
EQUIPMENT**

**RADAR  
COMPONENTS**

**HIGH-POWER  
MODULATORS**

**ELECTRONIC  
TEST  
EQUIPMENT**



Write Tod  
for your new ca