VALUE ANALYSIS TEN YEARS OF PROGRESS 1947-1957

Additional copies of this brochure may be obtained by writing to Value Analysis Service, Bldg. 32-G, General Electric Co., Schenectady, N. Y.

Contents

LOWER COST. Savings of more than a million dollars yearly are represented by the "before and after" examples of Value Analysis shown on the board. They represent only a fraction of the value improvement work being carried on throughout General Electric.

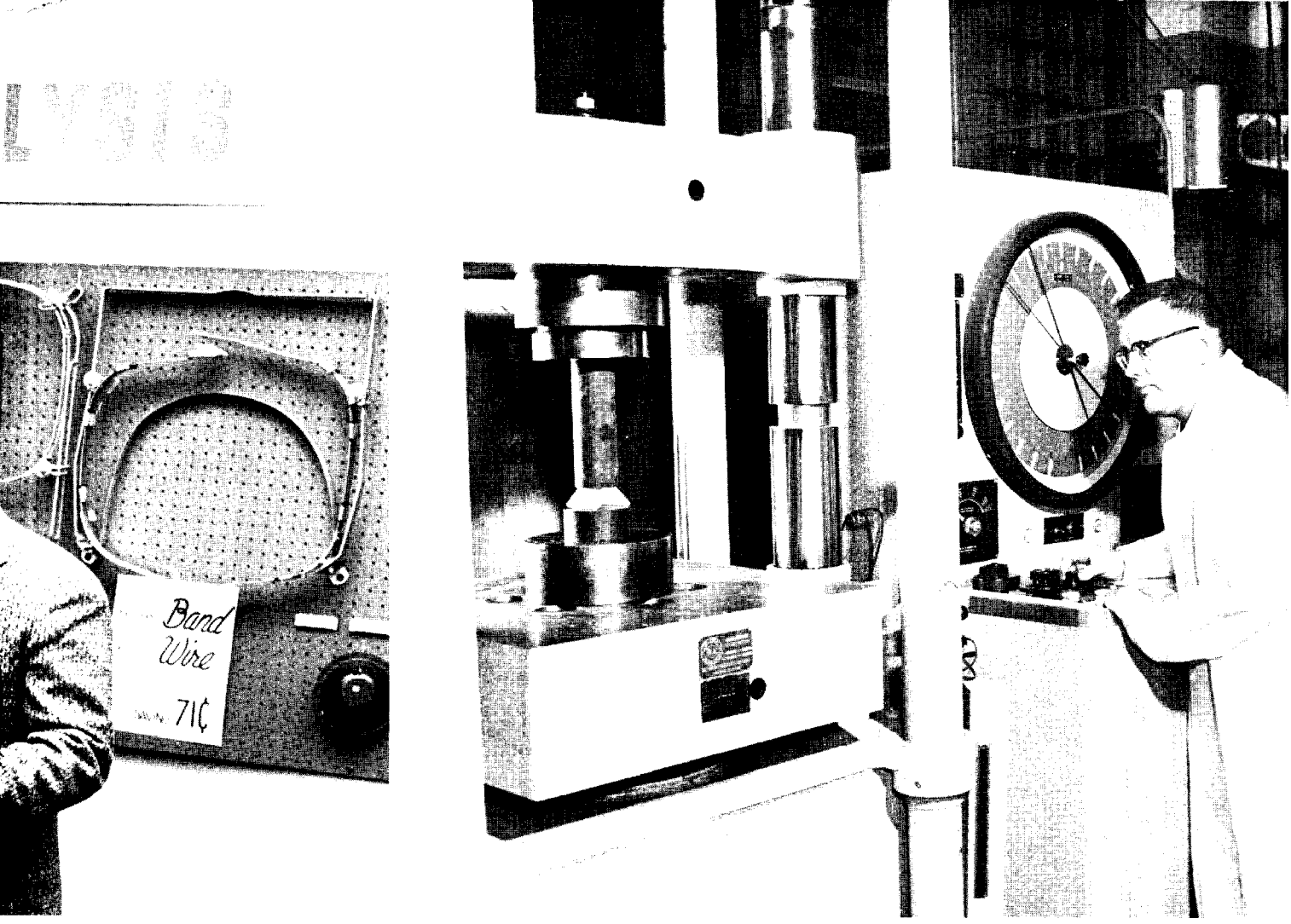
Value Analysis: A New Technique

TEN YEARS AGO General Electric began a broad study of value . . . how to analyze it, how to measure it, how to incorporate it to the fullest in General Electric products. From that study a body of knowledge is evolving —the science of value analysis and control—that can be used in the manufacture of any type of product to improve its value and thus to better its competitive status in the market.

Many philosophers over the ages have searched for the true meaning of value and have become lost in abstractions. Even Webster skirted its definition: he called it "a fair return in money, goods or services for something exchanged." By what yardstick do we measure a fair return?

From the economist's viewpoint there are four elements that determine the worth of goods or services to an individual: use, esteem, cost and exchange value. The professional value analyst takes an objective look. He is mainly concerned with use-value and seeks the lowest cost at which a function can be satisfactorily performed. This lowest cost may be arrived at by comparison with other means of performing the same function, or through the use of new concepts which permit the actual mathematical calculation of the value of functions.

The Value Analysis creed of "the same performance at vastly lower cost" has been applied successfully in thousands of cases, both before and after original tooling. In today's tightly competitive market Value Analysis can, and often does, mean the difference between making a profit or going out of business.



EQUAL PERFORMANCE. A new field coil support is compression-tested in the laboratory. The part was formerly machined from stock, bored and counterbored; the new one is cast. The price dropped from $1.72 to 36¢.

for Reducing Product Cost

how it began

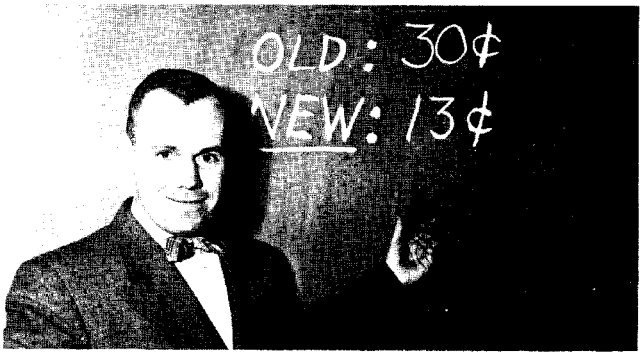
Following World War II many new processes, new materials, new engineering techniques were available. The year 1947 was an opportune time for Value Analysis to get its start. It began modestly, as a one-man project instigated by Harry L. Erlicher, then vice president of the Purchasing Department, and his assistant, William A. Sredenschek. The engineer assigned to the job was Lawrence D. Miles. He envisioned Value Analysis as an intensive study by Engineering, Manufacturing and Purchasing to determine all possible ways of eliminating costs which did not contribute toward making the product work or sell.

Today the Value Analysis Program has expanded into a Companywide activity that is cutting millions of dollars out of product cost. The "one-man" team is now 117 strong. Value Analysis techniques, pioneered and proven in General Electric, have spread beyond our Company to other industries and to branches of the military service.

the human value

As in any enterprise, the progress of Value Analysis has been sparked by the men behind it—by their imagination, their enthusiasm, their determination to improve General Electric profits. These men have had the courage to take chances, the judgment and experience to make few mistakes. In recording ten years of Value Analysis growth, this brochure is a tribute to the value specialists, both past and present, who have made that growth possible.

How Value Analysis Works:



Value Analyst Davis and the Size 3 Starter.

WHEN JIM DAVIS, of General Purpose Control in Bloomington, Ill., finished his analysis of the Size 3 Starter he had achieved what every value analyst aims for: at least a 50 per cent reduction in cost on the part studied. Lowering the cost on the interlock support from 30¢ to 13¢ meant a yearly saving of $5,800—on one part alone.

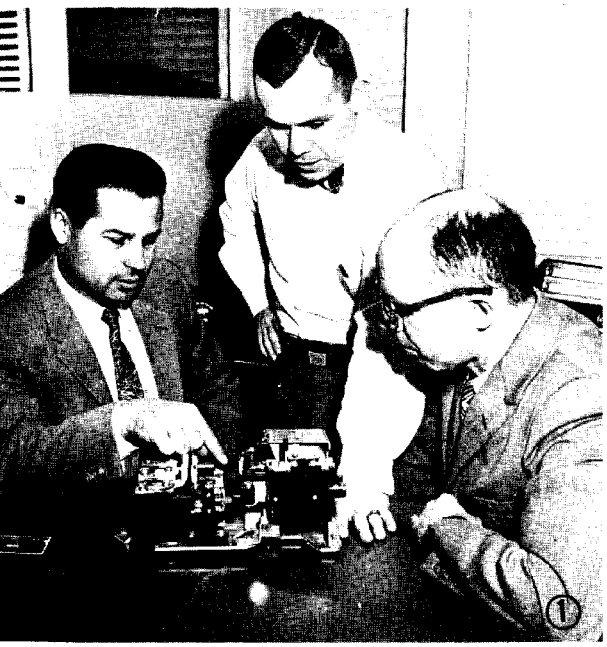
In analyzing a product the value specialist scrutinizes every part, every operation involved in its manufacture. He learns all he can about the necessary functions as established by Engineering—and then forgets all the standard practices used in obtaining these functions. He starts from scratch with such questions as: "Does the use of this part contribute to value? Is its cost proportionate to its usefulness? Does it need all its features? Will another dependable supplier provide it for less?"

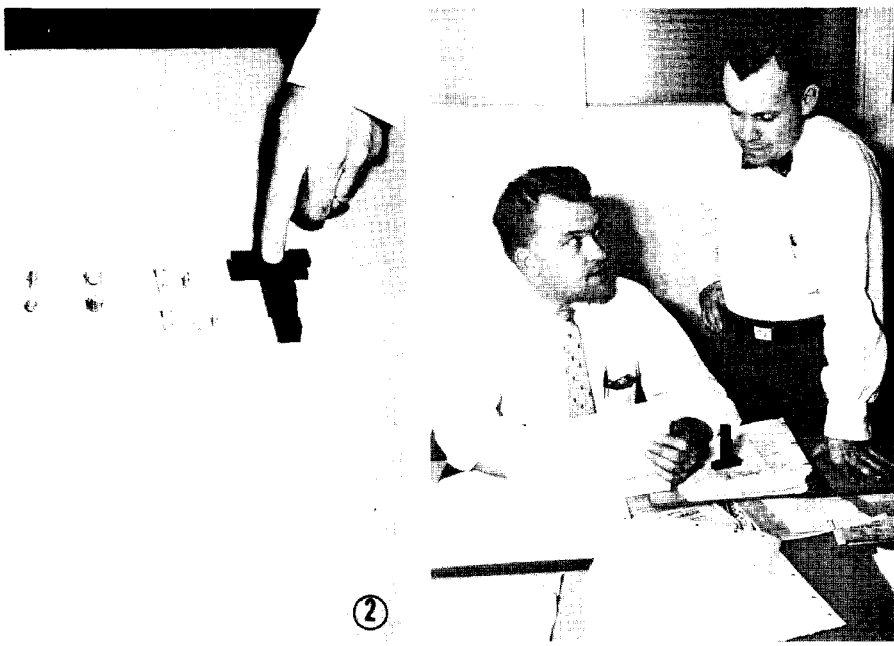
He talks to scientists and engineers to learn what new, low-cost material can be substituted without sacrificing quality. He enlists the ideas of specialty vendors or helps them develop ways of reducing their own production costs. He meets with manufacturing men to investigate new tools and processes, and to make sure that the improvements he is suggesting are practicable from a manufacturing standpoint. When the job is finished he drops his proposals in the lap of his management—and hurries on to another project.

Jim Davis considered the Size 3 Starter a fairly simple project compared to many he had done and agreed to re-enact the work on the subassembly for the photographer. The picture sequence appearing on these pages illustrates a typical value analysis routine.

4. Plastics specialist Ken Wokeck explains that because of many advances in molding, the part can be molded accurately to eliminate machining. 5. A vendor agrees to consult with his engineers on molding the part, also suggests that adding more cavities to the mold may reduce cost still more. 6. Jim and value analyst Bob Siler review the vendor's quote. They suggest a slight design

A Case History





1. From design engineer Jim Burch and product engineer Jack Kilcoin, Jim Davis learns about the operating conditions of the Size 3 Starter. 2. Breaking down the interlock assembly, Jim finds the plastic interlock support costs 30¢, seemingly high for the function it performs. 3. Joe Mortimer, buyer, says that the part is made in a single cavity die—a die built seven years ago.

modification to maintain the perpendicularity of the part. 7. Jim then goes back to confer with product engineer Kilcoin, who agrees with the suggestion made in step *6. 8. The proposal is approved by Pete Proctor, of Planning & Methods, Kilcoin, and Dick Fowler, of Finance. Blueprints are changed, planning altered, mold modifications ordered, and the saving is achieved.

Highlights in the Ten-Year History of

IF THE EYE OF A CAMERA could be turned back upon the past ten years, seeking out the events that spelled progress for Value Analysis, the photos shown here are among the scenes that would come into focus. These were milestones along the way, but of equal significance are the events that can't be pictured—the slow breaking away from old attitudes and habits, a sudden clear vision in a man's mind, the thoughts and decisions of a farsighted leader.

As we review the past we find that the course of Value Analysis was shaped by such things as these:

1947 . . . the first study—an incredible cost reduction ("It's an accident, it won't happen again")—and the quick follow-up of half a dozen successful projects removed all doubt . . .

1948 . . . "This is the best method yet found to help engineers remove unnecessary cost"—and from these words by Engineering's Vice President Harry Winne came requests from product managers asking to be shown . . .

1952 . . . "A thousand men a year should be trained in Value Analysis"—and it was this decision by Nicholas M. DuChemin, Manufacturing's Vice President, that brought Companywide Value Analysis seminars into being . . .

1957 . . . "You *can* evaluate function"—and on this revolutionary premise a ten-year search for the basic meaning and measurement of value began to assume the stature of science.

THE FIRST SEMINAR. Following the decision of Manufacturing's Vice President Nicholas M. DuChemin to train 1000 men a year in Value Analysis, the first seminar, with 60 men in attendance, was held in Schenectady, N. Y. in October, 1952.

THE 2500TH GRADUATE. By 1956 the number of men trained had reached 2500. Here Philip Folger, of D-C Motor & Generator, is congratulated by Harry Erlicher, a staunch supporter of Value Analysis. In the background is Harold Mullins, Seminar manager.

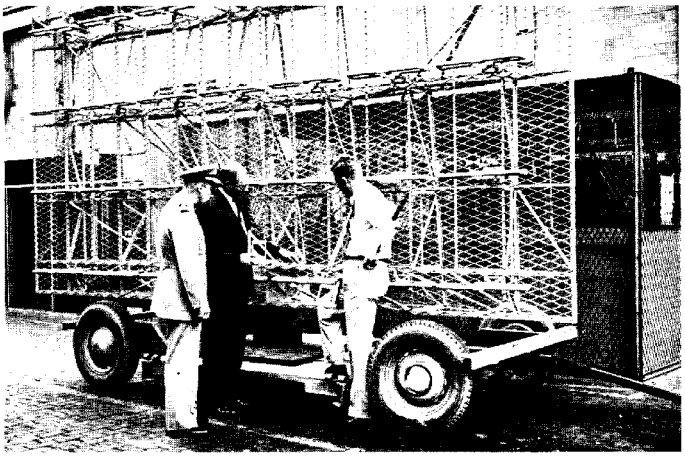
THE FIRST ORGANIZED COMPONENT. The Locomotive & Car Equipment Department in Erie organized a Value Analysis component in 1952. Its members, Donald Carlson, Harold Hagle and Bruce Petersen are shown studying the parts of brush holder for a large traction motor.

ENTER THE VENDOR. Inviting vendors to contribute ideas on Value Analysis projects was the beginning of mutually beneficial teamwork.

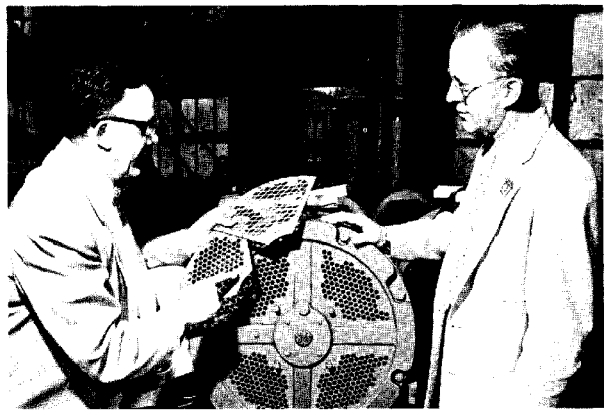
Application Unlimited

METERS . . . MOTORS . . . DISHWASHERS . . . RADAR ANTENNAS—the products illustrated here point up the fact that Value Analysis can be used to advantage in any product line. For products new or old, of any size or quantity, the manufacturing methods suggested by the value specialist can provide at the lowest cost the functions specified by the engineer. And opportunities for value improvement exist in virtually every device.

The presence of poor value doesn't signify inefficiency in management or methods; it simply indicates the truth of the statement that today's thinking is generally based on yesterday's knowledge. The natural impulse is to follow accepted patterns and habits of thought. Value Analysis is an objective, creative approach that brings to light unnecessary costs wherever they may exist in the entire cycle of product design and manufacture.

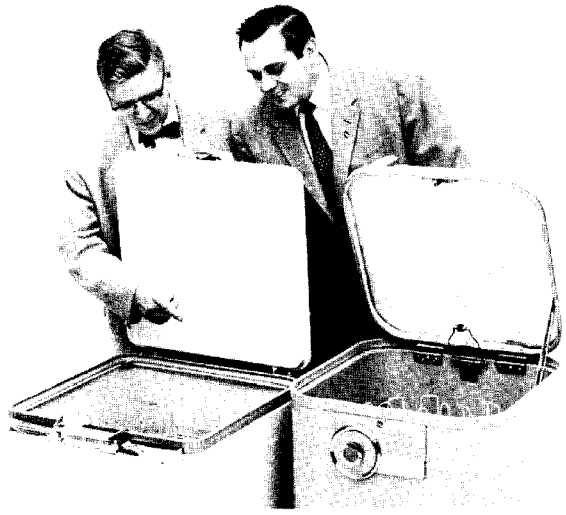


The contract costs of a Navy order were reduced by $11,571 through the modification of the dipole support on a radar antenna. Value analyst J. H. Martin (center) and design engineer E. I. Sohl, of Missile & Ordnance Systems, discuss the saving with Commander M. D. Voorhees, Inspector of Naval Materials.



Old-type motor screen (spot-welded, $6.00) is compared with the new one (one-piece, $1.62) by value analyst John DiMarco (left) and Bob Smith, superintendent—Final Assembly in the Medium AC Motor & Generator Department.

Value Analysis work in the Dishwasher & Disposall Dept. resulted in replacing the porcelain enamel, double-wall dishwasher tub with a vinyl-coated, single-wall unit, at an initial cost saving of approximately $400,000 a year. Looking at the new model are M. R. Kauffman, the designer, and value analyst D. S. Cushing. Old model is at right.



Although the I60 Class 200 meter represented an outstanding job of engineering, members of a recent Value Analysis Seminar offered suggestions for value improvement that could add up to an annual cost saving of $296,210. L. to R.: J. G. Landry (who designed the meter), W. F. Studley (foreman—manufacturing), P. L. Brunnelle (cost analyst) and W. A. Cavagnaro (design engineer), all of the Meter Department in Somersworth, N. H.

L. KOLB
Production Engine
Cincinnati, Ohio

The Value Analysis Team

This listing is correct as of September 1, 1957. The names of those whose photos were unavailable appear on page 12.

A. AERNI
Production Engine
Cincinnati 15, Ohio

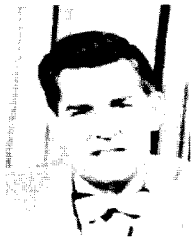
E. ALBIN
Home Laundry
Louisville, Ky.

H. ANDERSON
Instrument
40 Federal St.
West Lynn, Mass.

R. ANTON
Low Voltage Switchgear
Philadelphia, Pa.

G. BABCOCK
Power Transformer
Pittsfield, Mass.

D. BARLOW
Value Analysis Service
Schenectady, N. Y.



B. BARNES
Light Military
Elec. Equip.
Johnson City, N. Y.

P. BINDER
Industrial Heating
Shelbyville, Indiana

N. BOURGET
Distribution Assemblies
Plainville, Conn.

C. BRAY
Distribution Assemblies
Norwood Plant
Cincinnati, Ohio

F. BREHOB
Production Engine
Cincinnati 15, Ohio

J. BRENTON
Dishwasher,
Water Heater &
Custom Appliance
Milwaukee, Wisconsin

R. BUYS
Circuit Protective
Devices
Plainville, Conn.

D. CARLSON
Locomotive &
Car Equipment
Erie, Pa.

P. CREWS
Production Engine
Cincinnati 15, Ohio

D. CUSHING
Dishwasher & Disposall
Louisville, Ky.

J. CZIMBAL
Production Engine
Cincinnati 15, Ohio

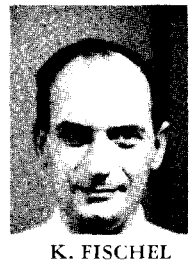
J. DAVIS
General Purpose Control
Bloomington, Illinois

J. DiMARCO
Medium AC
Motor & Generator
Schenectady, N. Y.

R. DOTY
Aircraft Accessory Turbine
Lynn, Mass.

R. DYER
Apparatus
Peterborough,
Ont., Canada

D. FINK
Dishwasher,
Water Heater &
Custom Appliance
Milwaukee, Wisconsin



K. FISCHEL
Light Military Elec. Equip.
Utica, N. Y.

J. FITZSIMMONS
Large Steam
Turbine-Generator
Schenectady, N. Y.

E. FLYNN
Meter
Somersworth, N. H.

J. FOLEY
Instrument
40 Federal St.
West Lynn, Mass.

E. FOOTE
Rectifier
Lynchburg, Va.

W. FOSTER
Large Steam
Turbine-Generator
Schenectady, N. Y.

R. FOUNTAIN
Value Analysis Service
Schenectady, N. Y.

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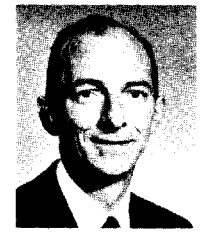
G. FRANKENSTEIN
Small Aircraft Engine
West Lynn, Mass.

H. FRANSZEN
Light Military
Elec. Equip.
Utica, N. Y.



A. GANZ
Production Engine
Cincinnati 15, Ohio

F. GELSLEICHTER
Specialty Control
Waynesboro, Va.

E. GRAHAM
Light Military Elec. Equip.
Utica, N. Y.

M. GREENE
Small AC Motor
& Generator
Schenectady, N. Y.

H. HAGLE
Locomotive &
Car Equipment
Erie, Pa.

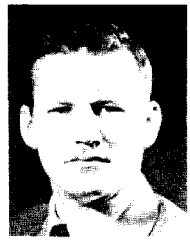
W. HALLADAY
Motor & Control
Peterborough,
Ont., Canada

H. HARKE
Circuit Protective Devices
Plainville, Conn.

G. HART
Missile &
Ordnance Systems
Pittsfield, Mass.

J. HASHEK
Appliance &
Television Recvr.
Montreal, Quebec, Canada

W. HELSTOWSKI
Missile &
Ordnance Systems
Burlington, Vermont



J. HENDERSON
Outdoor Lighting
Hendersonville, N. C.

A. HOFFMAN
Light Military
Elec. Equip.
Johnson City, N. Y.

H. HOLLIDAY
Production Engine
Cincinnati 15, Ohio

K. HOUSER
Room Air Conditioner
Louisville, Ky.

S. HVAMB
Value Analysis Service
Schenectady, N. Y.

R. JECKEL
High Voltage
Switchgear
Philadelphia, Pa.

R. JENNINGS
Wiring Devices
Providence 7, R.I.

F. JOHNSON
Technical Products
Syracuse, N. Y.

H. JONES
Industry Control
Roanoke, Va.

R. KANE
Clock & Timer
Ashland, Mass.

R. KELLY
Missile &
Ordnance Systems
Pittsfield, Mass.

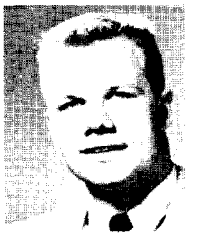
F. KING
Large Steam
Turbine-Generator
Schenectady, N. Y.

L. KOLB
Production Engine
Cincinnati, Ohio

S. KRATZERT
Light Military
Elec. Equip.
Utica, N. Y.

H. LESLIE
Value Analysis Service
Schenectady, N. Y.

H. LONGFELLOW
Industrial Heating
Shelbyville, Indiana



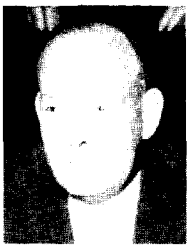
P. MANN
Light Military Elec. Equip.
Johnson City, N. Y.

H. MARTIN
Missile &
Ordnance Systems
Pittsfield, Mass.

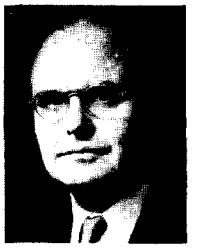
J. McCARTHY
Small Aircraft Engine
West Lynn, Mass.

J. McNISH
Apparatus
Peterborough,
Ont., Canada

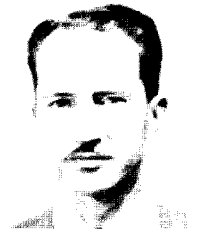
S. MEIER
Production Engine
Cincinnati 15, Ohio



E. MERRITT
Production Engine
Cincinnati 15, Ohio



L. D. MILES, Manager
Value Analysis Service
Schenectady, N. Y.



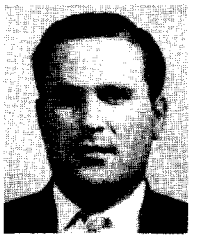
K. MILLER
Production Engine
Cincinnati 15, Ohio

L. MONROE
Missile &
Ordnance Systems
Burlington, Vermont

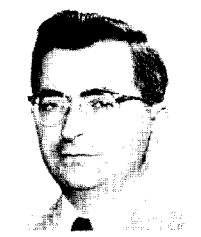
H. MONTGOMERY
Light Military Elec. Equip.
Utica, N. Y.

A. MUDGE
Distribution
Transformer
Pittsfield, Mass.

H. MULLINS
Value Analysis Service
Schenectady, N. Y.



G. NICHOLAS
Light Military
Elec. Equip.
Utica, N. Y.



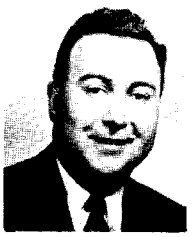
L. NICHOLAS
Small Aircraft Engine
Everett, Mass.

C. O'GRADY
Value Analysis Service
Schenectady, N. Y.

L. PETRIEL
Accessory Equipment
Bridgeport, Conn.

R. POWELL
General Purpose
Comp. Motor
Ft. Wayne, Indiana

R. POWER
Small Aircraft Engine
West Lynn, Mass.



J. PRENDERGAST
Light Military
Elec. Equip.
Utica, N. Y.

L. PRUEHS
Household
Refrigerator
Louisville, Ky.

H. RATH
Power Transformer
Pittsfield, Mass.

W. REGER
Value Analysis Service
Schenectady, N. Y.

L. RHEAUME
Industrial Products
Quebec, P. Q., Canada

J. ROSENFIELD
Aircraft Accessory
Turbine
Lynn, Mass.

W. RUGGLES
Hotpoint Company
Chicago, Illinois

L. SAMUEL
Meter
Somersworth, N. H.

E. SCHNELLE
Technical Products
Utica, N. Y.

F. SCHNOOR
Television Receiver
Syracuse, N. Y.

F. SHERWIN
Small Aircraft Engine
Lynn, Mass.

J. SHREENAN
Power Transformer
Pittsfield, Mass.

J. SHUTE
Small Aircraft Engine
West Lynn, Mass.

R. SILER
General Purpose Control
Bloomington, Illinois

S. SKALSKI
Value Analysis Service
Schenectady, N. Y.

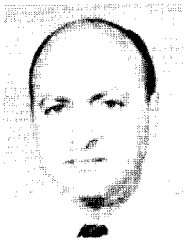
P. SPINELLI
Large Motor
& Generator,
Schenectady, N. Y.

C. STEVENS
Small Aircraft Engine
West Lynn, Mass.

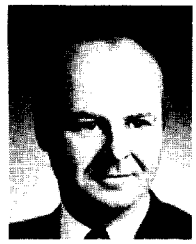
R. STRODE
DC Motor &
Generator
Erie, Pa.

E. STRONG
Atomic Power
Equipment
San Jose, California

G. THOMSON
Apparatus
Peterborough,
Ont., Canada

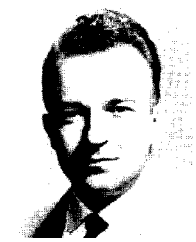


S. TOSCHER
Power Transformer
Pittsfield, Mass.

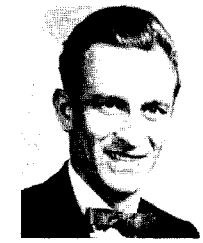


C. WATT
Electronic Equip. & Tube
Toronto, Ont., Canada

G. WEHRY
Production Engine
Cincinnati 15, Ohio



W. WHITE
Industrial Heating
Shelbyville, Indiana



R. WILL
Locomotive &
Car Equipment
Erie, Pa.

J. WILLIAMS
Medium Transformer
Rome, Georgia

A. WILSON
Light Military
Elec. Equip.
Utica, N. Y.

C. WINSTEAD
Small AC Motor
& Generator
Schenectady, N. Y.

L. WOOD
Large Motor & Generator
Schenectady, N. Y.

W. WOOD
Instrument
West Lynn, Mass.

G. WOODWARD
Aircraft
Accessory Turbine
West Lynn, Mass.

W. WYCKOFF
Specialty Transformer
Ft. Wayne, Indiana

D. CLEVELAND
General Purpose Comp. Motor
Ft. Wayne, Indiana

A. GREENFIELD
Power Transformer
Guelph, Ont., Canada

W. MAILLARD
Instrument—40 Federal St.
West Lynn, Mass.

J. DROZD
Radio Receiver
Utica, N. Y.

W. KENNEDY
Apparatus
Peterborough, Ont., Canada

P. NOY
Small Appliance
Barrie, Ont., Canada

J. DUNN
Knolls Atomic Power Lab.
Schenectady, N. Y.

R. LaBELLE
Missile & Ordnance Systems
Burlington, Vermont

F. ZOELLNER
Production Engine
Cincinnati 15, Ohio

Looking Toward the Next Ten Years....

A message by Lawrence D. Miles, Manager of Value Analysis Service

WE who are engaged in Value Analysis work feel an honest satisfaction as we review the progress of the past ten years. Yet we are convinced that these accomplishments have been only a preparation for the advances to be made in the next ten years—we have not yet achieved one-tenth of the potential of a Value program.

Analyzing and controlling value is passing from an art to a science. In a sense, the study of value has reached a stage comparable to chemistry when it was suddenly discovered that water is hydrogen and oxygen.

Already most functions can be evaluated in terms of dollars and cents.

Research has just shown us that we can scientifically evaluate many functions in terms of fundamental laws and precise mathematical calculation. For the first time we can begin to hang an indisputable price tag on function.

As an example, a chart shows that the value of conducting 30 amperes at 50° C rise is 1/3 cent per foot.

Analyzing value was a necessary first step, but price and profit leadership in our product lines will result from controlling value. Research is providing us with a workable system of Value Control based upon "Value Standards." Just as we now control shipments, control performance, and endeavor to control quality, we will control value.

This new science, when fully used, will give General Electric product departments an opportunity for healthy, profitable development in their chosen product areas during the next ten years.

Materials Service
Manufacturing Services

GENERAL ELECTRIC