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# MANAGEMENT

TELEVISION • ELECTRONICS • RADIO • AUDIO

Volume 3 Number 3

December, 1953



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# Service Management

PAUL H. WENDEL, Editor and Publisher

VOLUME 3, NUMBER 3

DECEMBER, 1953

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**HAROLD CHASE, President of TSA**

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## Letters to the Editor

### BUSINESS CONTROL

I am a subscriber to SERVICE MANAGEMENT.

... One of my activities is television service work. I have been investigating business control systems that would be suitable for my operation, and have contacted ... the Markem System and the Chase Television Service, Inc.

... Thank you very much for your assistance, and keep up the good work with SERVICE MANAGEMENT.

Harry D. Gustin

Paterson, N. J.

### INDUSTRIAL TV COURSE

I have now received eight lessons in the Industrial TV Series and would like to congratulate you on the well written and clear instructions in this field. These are by far the best instructions I have received by correspondence. ...

Vincent J. Currie

Armdale, Nova Scotia

### ASSOCIATION DIRECTORY

I have just read with interest your September issue of SERVICE MANAGEMENT. You mention that you are going to publish ... a list of all associations with addresses. When this material is ready, will you kindly send us a copy? Also enclose invoice. Many thanks.

G. Berger

Berger Electronics

Forest Hills, N. Y.

### SIMPLIFIED FILING METHODS

We are extremely interested in your article regarding simplified filing methods and procedures; however, our methods and procedures are so unsimplified that I've already misplaced the two articles ... we think you have a great magazine and we concur wholeheartedly with your policies.

George F. Ebel, Jr.

The Television

Maintenance Company

Massillon, Ohio

### STANDARD LABOR CHARGES

Please find enclosed our check for three dollars. Please send us two copies of your form TVL2, wall chart of your standard labor charges for TV service revised for estimating, and one printing mat for making up mailing pieces.

Also, please be sure and advise us plenty ahead of time when our subscription is to expire. We'd probably expire also if ... we missed some copies!

Francis L. De Bra

Service Engineer

A-1 Radio & TV Service

Galveston, Texas

(Continued on page 11)



**CUSTOMERS EVERYWHERE KNOW  
SYLVANIA TUBES JUST  
CAN'T BE BEAT FOR QUALITY!**



## **WHY SYLVANIA PRODUCTS MEAN BETTER BUSINESS!**

**Y**OU'RE really on board the *better-profit* special when you feature Sylvania Picture Tubes and Receiving Tubes.

Your customers know Sylvania as a pioneer in the development of fine radio and television products. From the very beginning, the name Sylvania has stood for the highest possible quality. And, as the industry has progressed and expanded, Sylvania has taken great care to maintain its recognized leadership.

*Now, due to advanced manufacturing techniques and precision testing methods, Sylvania tubes can point to outstanding records, both in long life and fine performance. Today 7 of the 10 leading set manufacturers use Sylvania Picture Tubes and Receiving Tubes.*

So, if you want *recognized quality* working on your side . . . *sell Sylvania!* Call your local Sylvania Distributor for the latest fall prices and money-making promotion offers, or write to: Sylvania Electric Products Inc., Dept. 3R-1312, 1740 Broadway, New York 19, N. Y.

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SEVERAL recent developments may well be likened to straws that indicate the way trade winds are blowing in the best interests of independent electronic service as a business.

For a number of months we have been pounding away in this department, on the subject of capitalizing on the opportunities that circumstances in the industry have thrust into the laps of the forces of independent service. We have tried earnestly to present, from every angle our ingenuity could envision, the trend of economic forces in order to focus the attention of service businessmen on the favorable combination of circumstances that was presenting independent service with an exceptionally good opportunity to bring about stabilization of its activities.

To get the picture straight, let us briefly summarize the basic elements of the situation as it is developing:

1. The past twelve months have witnessed a sharp attrition in the business of independent servicing that has improved the positions of the good, basically sound service business organizations and gradually culled the inept and the inefficient.

2. Color television with a compatible system will be a reality about the end of this year. The production of color TV receivers will be limited for a long time. Set owners will see—and want—color TV long before most of them will be able to get sets. Present owners of TV sets will sit tight with their monochrome picture until they are able to swap for color receivers. Service needs for electronic tubes and parts is

3. Limited production of color receivers, a dropping off in the manufacture of black-and-white sets and the gradual easing of the defense program needs for electronic tubes and parts is eliminating shortages and making it necessary for parts and tube manufacturers to fight hard for a fair share of the replacement parts business.

4. This puts the independent service business man in a beautiful spot. The service business will be good while set owners wait for color receivers. Manufacturers of replacement products will be trying hard to get service operators to insist on their brands when they buy from parts distributors. And, parenthetically, we would like to say again that any service operator who

does not specify a brand on every tube and replacement item that he orders is doing himself and the independent service industry at large, a serious injustice.

These are the factors that are placing the independent service industry in a dominant spot where it can entrench its position, stabilize its business and firmly establish the activity of servicing as one of the accepted major elements of the over-all electronics industry.

Now the question is—will the forces of independent service take full advantage of this opportunity or will they let it slip through their fingers?

One man or one business working alone in our present economic order is impotent against other organized forces that are constantly working to steer each important type of activity in some direction most favorable to their particular competitive situation. Manufacturers protect their over-all positions through the medium of their trade associations. Distributors discovered years ago that they, too, had a common battle to fight in maintaining an economic climate favorable to the system of distribution that makes them important—even indispensable—so they have their strong trade associations. More lately, retail dealers have had it impressed forcefully upon them that the only way they can keep from being pushed around by other industry elements is to band together in effective trade associations to combine their strength in a potent force.

During the past year there has been a remarkable up-surge in interest in service business association activities. This has been a healthy development because it indicates that service operators are recognizing their work in the light of businesses and less as artisans engaged in a nebulous, misunderstood, highly complex activity.

The tremendous response that SERVICE MANAGEMENT's Standard Charges for TV Labor Charts received from every State in the Union signifies that service business men everywhere are seriously interested in up-grading their positions by getting their service businesses operating on a sound management basis.

Several effective state service business organizations have been formed

(Continued on page 21)



PHILCO TEST EQUIPMENT SPECIFICALLY DESIGNED FOR THE SERVICEMAN

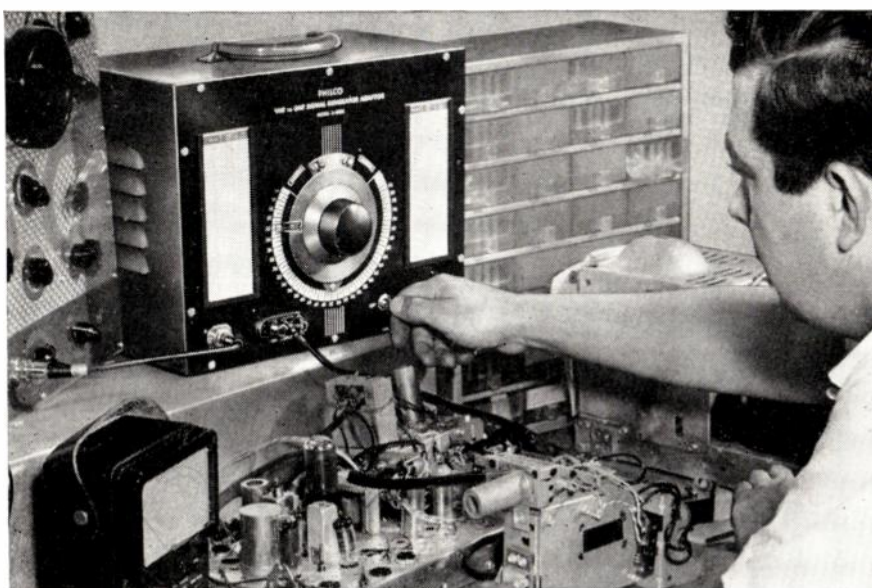
# AGAIN PHILCO LEADS THE INDUSTRY

## *Serviceman's needs seen as Philco's Engineering Goal*

This new Philco VHF to UHF adapter pioneers a whole new approach to service problems and at the same time is the most economical and practical unit ever offered. Servicemen are taking full advantage of the introductory demonstrations of this amazing piece of equipment now offered by Philco distributors coast to coast.

### **The First and Only VHF to UHF Signal Generator Adapter**

Continuing its engineering program designed to provide the serviceman with the best possible test equipment Philco Corporation now offers at a fraction of the usual cost an exclusive highly specialized adapter unit for converting the output of VHF TV servicing test equipment to UHF.



Under the trained eye of a Philco Serviceman the amazing model G-8000 VHF to UHF signal generator adapter is shown in action.



### **One of the Finest Vacuum Tube Voltmeters ever Designed**

Facing up to the task of measuring high impedance circuits where loading effect must be kept to a minimum Philco has again designed a unit which meets the most rigid engineering specifications. All reports indicate this unit is unexcelled for complete and accurate measurements.

### **Practical Portable 3-inch Television Oscilloscope**

The tremendous growth of television requires the most practical and versatile types of equipment to answer service needs. Philco has such equipment, particularly in its 3" scope which is 2½ times smaller than other 3" units, making it adaptable to either bench use or field servicing. High sensitivity and wide response make it ideal for TV work.



"Philco Test Equipment Specifically designed for the serviceman!" That's the theme of Philco's engineering program. A program which you, the serviceman, can depend upon to supply the very finest in service test equipment. Discover how easy it is to own a complete Philco Test Equipment Laboratory. Your Philco Distributor is eager to serve you by offering his new special payment plan to best accommodate your needs. Fill out the attached coupon as shown and mail to Philco Accessory Div.

#### **PHILCO CORPORATION**

Accessory Division

Allegheny Ave. & "A" St., Phila. 34, Pa.

☐ I am interested in the Philco Test Equipment shown here. Please send me details of your SPECIAL PURCHASE PLAN for obtaining these units.

☐ Please send FREE copy of your new booklet on Philco Test Equipment.

NAME .....

ADDRESS .....

CITY ..... STATE .....





# Michigan Television Service Association

By PAUL H. WENDEL, Editor, Service Management

## Progressive Service Business Association Stabilizes TV Service Practices in Nation's Fifth Largest Metropolitan Area

Metropolitan areas have always presented the most serious, and sometimes apparently unsolvable, problems to the orderly development of any new activity or industry. This seems to stem from the strictly impersonal relationships in business dealings that become pronounced in relation to the extent of the concentration of population. This, in turn, results in a lack of acquaintanceship among the better elements of a new business activity and they have a decided inclination to operate on a strictly independent, "I know how to run my own business," basis.

In Detroit, however, television installation and service attracted many progressively-minded business men in the initial days of TV in that area. A substantial group of these men sensed the debacle that could follow the leveling

off of the initial TV service boom if unbridled service gyping was allowed to spawn unchallenged. They formed the Television Service Contractor's Association. The basic motivation of the TSCA was to keep the business of TV service in Detroit on as high a level of business ethics as possible and to encourage the adoption of sound business operating methods on the part of all men engaged in the television service business in that section.

Every member of the TSCA was a willing and hard worker in the interests of TV service and the development of their association. They carefully studied association activities in many other cities and adopted those plans and programs that seemed to best fit into the needs of service in Detroit.

As contract business in TV service

dropped off, members expanded their activities to include other phases of electronic and related service. To eliminate the restriction in service activities implied by the term "contractor" in their name the association was incorporated as the Television Service Association of Michigan.

### Reasons for Progress

The constantly expanding success of TSA of Michigan may be attributed largely to five controlling factors: (1) Association officers who have been willing to give liberally of their time to plan and guide the Association's programs; (2) Willingness of members to accept committee posts and to carry through on committee projects and assignments; (3) Regular monthly dinner-business meetings to keep members of the organization acquainted with extent of activities and inspired through reports of association accomplishments as revealed in committee reports; (4) Well-planned and skillfully executed business meetings and technical forums; (5) The active cooperation and participation of leading parts and set distributors in the Association's programs.

Under the capable leadership of its President, Harold Chase, head of Chase Television Service of Detroit, TSA has implemented and expanded its long-range programs and made its house organ, the TSA News, one of the most pretentious association publications in the industry.

### House Publications

Supported entirely by local advertising, the TSA News normally carries eight pages of well-written news of top interest to service people in the Detroit area and a four-page retail edition that is intended for set owner circulation. The retail edition is available in quantities to TSA members for their individual use as a monthly mailing piece to their service customers. Designed for use as a self-mailer the service copy carries only the name of the individual service company that mails

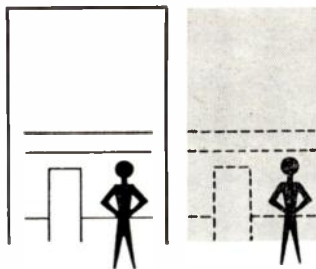
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The Association's booth at the Michigan State Fair was a part of TSA's public relations program which is carried through the retail edition of TSA News.



are you



training your competitor?

By DR. J. H. HAZLEHURST, business consultant

### Manpower management techniques train for profit, public acceptance and industry development

Many service company owners and executives, if they keep turnover records of their shop technicians, are aware of the "fluidity" of their shop force, particularly the field men. In a general way they also realize that they are probably doing a lot of training, but it has been my experience that few business men have a full realization of their training costs unless they have an organized training program and an adequate cost accounting system.

The evaluation of training cost is particularly difficult in service work for a variety of reasons. First, it is impossible to develop full time training programs in a shop unless it is large and even then, the experience of new men coming in varies so greatly that a standard training course cannot easily be devised. Second, the requirements of skill will vary. In some areas UHF experience is desirable but not in others. Some shops are large enough to have specialists. Others must rely on all-around skills. Third, the state of the art is changing to such an extent that constant training even for experienced technicians must be carried on to familiarize them with new circuitry and new variations of old circuits.

Even in large shops, who can say, for example, just how many dollars in profit is lost through sets being pulled into the shop that might have been repaired in the home? Who, today, can be sure where the point of economic crossover is between dollars spent for training and dollars saved by training when we take into account the length of time the average technician stays on one job?

In the light of all these imponderables, it is necessary to look over existing conditions and determine the most reasonable plan to meet current needs.

Several things are certainly true. One is that the service industry must have a continuing and long range training plan. With UHF, color, new circuits, new fabrication methods and the general growing pains of the electronic

art, there will be a continuing need for basic training of new service technicians coming into the field, as well as those already established.

#### Labor Turnover

Another fact that is industry-wise, is the high turnover of service men. Some companies may keep men pretty well, but even there turnover is higher than in comparable companies in other industries.

It is also true that a lot of training is being done in service shops everywhere and that it is training of the most costly type. I say this because it is very inefficient. Any shop foreman or shop owner who is called to look at a problem set, or who sees two or three men in a conference over a "dog," is observing a training program in action. It isn't a good program, but a good cost accountant would charge most of that time to training. When a repaired set bounces, it represents, to a degree, training. The spot checks and call backs on customers are part of a training program or, at least, the evaluation of the state of training.

Finally, it is the truth that we train for our competitors. This, however, needs examination. When we put training time, however informal, into a man and he leaves us, we have trained for a competitor. When we get a man with skill, a competitor has trained for us. The probabilities are that the balance is against us because so many men who want to open their own shops make a practice of working in an established shop for training purposes.

One bad aspect of this phase of the problem is that the shops doing the best training carry the largest share of this burden. This tends to discourage good training programs. It is responsible for the attitude of some shop owners—to exploit their people and get by with as little training investment in a man as possible. Obviously this harms the service industry.

#### Customer Cost

In the final analysis the cost of the

training that is being done, and the cost of the inefficiencies in unplanned, on-the-job trial and error training, is paid for by the set owner. There is much complaint by set owners on the high cost of service work. On the other hand few service shop owners are getting rich. A real effort is being made to educate the set-owning public to a realization that good technical work is not cheap and that the cost of good work spread over the life of the set is not high.

However, to be realistic, the service industry owes it to set owners to do a good enough job across the industry so that the service dollar is efficiently spent. The industry owes it to itself. If the millions of dollars spent annually on service charges went into an efficiently managed industry, service profits across the industry would be many times what they are today. Here lies the opportunity for the individual shop.

In my view two things are paramount in an attack on this problem. First of all, the industry must do some programming. The service industry needs a committee of the nature of the National Television Systems Committee, to study training and its integration with industry problems. At the present there are training schools, both correspondence and resident. In many instances this training is solid, some is spotty and weak. There is a real need for a standard program.

Manufacturers have field men in their service departments who are actually service instructors. However, the greatest weakness, here, is the great duplication of effort and time. There is a very great need for a review and integration of all this individual effort. But the great bulk of training is still done on the bench by trial and error, by conference—and sometimes by prayer. This represents the greatest challenge to the industry committee to organize.

We said that the individual shop had an opportunity. Here it is. Suppose

(Continued on page 20)





**EDWARD A. ALTSHULER** has joined the merchandising staff of Berlant Associates of Los Angeles. . . . **RONALD W. ARGENTA** has been appointed art director and assistant advertising manager for LaPointe Electronics, Inc. . . . **A. W. BERNISOHN**, managing director for NARDA, says "The recent action of the U. S. Supreme Court in refusing to consider the anti-Fair Trade action . . . should prove a valuable contribution to the health . . . of smaller business firms." . . . **STANLEY BLOUNT**, president of the Houston Appliance Dealers Association, says, "The problems of multiple listings in classified business 'phone directories must be cleared up . . . or appliance dealers are going to find themselves spending far more than the budget allows. . . ." . . . **WILLIAM L. CARA**, manager of the 1954 Audio Fair, Los Angeles, has announced its theme: "Audio Fiesta — a Festival of Sound." . . . **FRAN J. CHAMBERLAIN** of Clarostat says that the TV replacement parts business is, at long last, hitting its stride. . . . **STANLEY D. CRANE** has been appointed director of engineering and research for Raytheon's special products division. . . . **EMERSON DOLE**, NARDA director, recently warned: "Appliance dealers are at the point where they have to re-learn basic rules of selling in order to survive." . . . **WILLIAM G. EAVES** has been appointed product manager and assistant to the general manager of the Radell Corporation's Puerto Rico plant. . . . **FRANCIS D. EDES** has been appointed administrative assistant to the vice president and general manager of Raytheon's television and radio division. . . . **M. L. FINNEY, JR.** has been elected vice president of The Finney Company. . . . **WILLIAM W. GARSTANG** has been appointed assistant vice president in charge of manufacturing for Raytheon's television and radio division. . . . **HENRY S. GRAY** has been appointed national credit manager for Raytheon Distributor, Inc. . . . **L. F. HICKERNELL**, chief engineer for Anaconda Wire & Cable, has been appointed chairman of the winter meeting of the American Institute of Electrical Engineers. . . . **THEODORE E. JAMRO** has been named manager of manufacturing for the commercial equipment department, General Electric electronics division. . . . **ROBERT JUSTIS**, NARDA director, recently told a Texas Appliance Dealer's Association meeting: "Easy money isn't found in the appliance business." . . . **JAMES E. KEISTER** has been appointed manager of engineering for the commercial equipment department, General Electric electronics division. . . . **JOHN H. KELLY** has been appointed general sales manager for Raytheon Distributor, Inc. . . . **MARLIN R. KING** has been named quality control and process engineer for the Puerto Rican plant of The Radell Corporation. . . . **DR. BERTRAND KLASS** of Stanford Research Institute says, "Democracy rests on the fundamental belief that people are better off when they think for themselves." . . . **PAUL H. LESLIE**, General Electric television sales manager, recently said: "I know of no other business in which an entire industry seems so completely dedicated to the practice of selling the lowest quality merchandise at the lowest prices and at the lowest profit to all concerned." . . . **ROBERT S. MACARTHUR** has been appointed sales representative for John F. Rider, Publisher, Inc. . . . **S. D. MADDOCK**, president of C.I.T. Corporation, recently stated: "Industry must decide when replacement is economically justified and when failure to replace machinery would weaken competitive standing." . . . **EVAN MOON** of Joske's, San Antonio, Texas, says: "Small retailers and large operators can stand up against their competitors if they will concentrate on a few brands, products and services." . . . **FRANK B. NUELLE** has been named manager of the engineering administration section of General Electric's Carboly department. . . . **DOUGLAS Y. SMITH** has been advanced to manager of marketing operations for RCA's tube department. . . . **MEYER J. SPIRO** of Bluefield, W. Va. is the new president of NEDA's Big Four Chapter. . . . **ROBERT C. SPRAGUE**, chairman of Sprague Electric Co., has been appointed to direct a full-scale study of hydrogen and atomic bomb defense for the Senate Armed Forces Subcommittee on Preparedness. . . . **JAMES H. SWEENEY** has been named manager of marketing for the commercial equipment department, General Electric electronics division. . . . **LAWRENCE S. THEES** has been elevated to general commercial manager of RCA's tube department. . . . **CHARLES G. WEEKS** has joined the Tung-Sol renewal sales force.

## December Sales Tips

The fifth of a series of guest editorials by distinguished sales executives.

By **KARL JENSEN**  
Jensen Industries, Inc.

Finding a record store operator that could boast about an increase in phonograph needle sales was about as tough as finding a needle in a haystack. But ten dealers in the middle west have been locating plenty after a two-week test campaign using merchandising materials including the new "Jenselector" — which has increased sales from 52% to 252%.

Test results found letters pouring in, praising the method that allows record stores to cash in on the dormant gold mine in phonograph needles.

Members of the needle industry have recognized that their phase of the electronic field was not keeping up with the gains being made in the industry. Although we felt we knew why progress was slower than in the rest of electronics, we felt that the real answer could be found through a series of field tests.

Our advertising agency felt that, with the proper in-store selling aids, needle sales could be increased many times. Members of our staff visited record stores to check on the practical problems faced by the retailer at the point-of-sale. We discovered that two reasons exist for lagging sales.

First: the average customer does not realize that a phonograph needle must be replaced after certain periods of normal use, and that there is a misconception of the meaning of "permanent needle." The customer simply has not been made aware of this fact, although he generally is aware of technical points of player equipment.

Second: weakness in stylus sales came with the average salesperson. Faced with a possibility of over 2500 needle choices, many clerks are as confused as the customer. This lack of confidence results in lost sales.

Looking up cartridge numbers, player models and other facts were too time-consuming. Selling a needle came to be regarded as a job for the specialist — a serviceman or a record shop owner with the proper background.

We recognized the need for a two-pronged program: education of the sales



person and the stimulation of consumer interest. We came up with the answer for the sales person in the "Jenselector," a 16-page guide that quickly gives any sales-person the answers to: "what needle do I want?" The system is based on brand name, method of needle changing and the number of speeds it plays.

By following an easy chart, the salesperson immediately has the stock number of the correct needle and can cinch the sale on the spot. The completed 3-color "Jenselector" was tested in small and large shops in Chicago. Salespersons using it were pleased with their ability to find the right needle and make sales.

At this point, we called in sales consultants to plan the point-of-sale campaign and a two-week test in the ten markets. The final program includes colorful window streamers, counter cards, mobiles, audition booth placards and clerk reminder cards. Each was designed to emphasize the theme: "Don't Ruin Your Records with 'Chisel-Point' Needles. Change Now!" Striking illustrations emphasize the damage that a worn needle does to records. The word "gouge" emphasizes the permanent damage a worn needle does to an otherwise good record. Customers are constantly reminded that an investment of many hundreds of dollars can be ruined by not replacing needles.

In a few weeks store reports confirmed that needle sales could be made when the public was aware of the need for new needles.

## Letters

(Continued from page 4)

We are very pleased to have received . . . the mat and labor chart. . . . Enclosed is a money order for \$3.00 for the combination offer.

James V. Lockwood  
Portland, N. Y.

In looking over your issue of **SERVICE MANAGEMENT**, October 1953 copy, I was very interested in Mr. William Leonard's article on page 12. . . . He really hit the nail on the head.

Please find \$1.00 in check for copy of each of your wall price charts. . . .

Carl E. Weiss  
Service Manager  
Roseland Music Shop

Chicago, Illinois

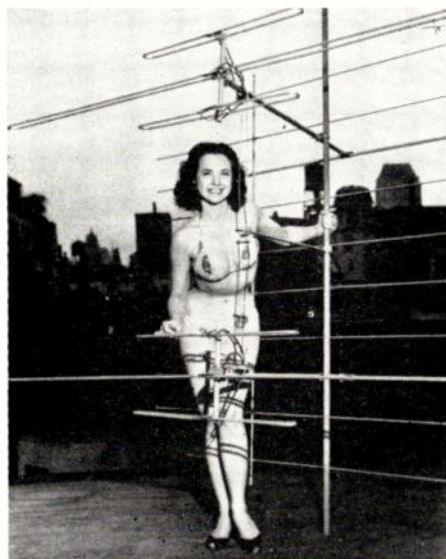
We would appreciate it very much if you would send us as soon as possible the article titled, "Standard Labor Charges for TV Service & Repairs."

Sidney J. Dunn  
American Distributing  
Co., Inc.

Baltimore, Maryland.



**ASTATIC CORPORATION** has announced a new phonograph cartridge described as "a successor to many types of double needle turnover cartridge." . . . **BEAM INSTRUMENTS CORPORATION** held the first public showing of the W/B "quadruplex" speaker system at the New York Audio Fair. . . . **BRACH MANUFACTURING CORP.** recently exhibited its new 3D Antenna Line to the consumer at the Mineola, N. Y. Fair and Exposition. . . . **CHANNEL MASTER CORP.** has announced its new "Champion" antenna with



Miss Channel Master & Champion Antenna

somewhat more than a big smile (see cut). . . . **CLAROSTAT MFG. CO., INC.** has announced that all its jobber orders are being shipped within 24 hours. . . . **THE FINNEY COMPANY** has inaugurated an advertising campaign on WKJG-TV. . . . **GENERAL ELECTRIC** predicts that the future growth of the electronics industry in the West Coast may be several times the growth in the rest of the country; is increasing tube production in a 44,000 square foot addition to its Tell City, Indiana plant; has announced a new GL-6386 high-reliability receiving tube for remote-cutoff cascode applications; reminds us of its promotional aids with a big smile (see cut). . . . **GENERAL INSTRUMENT** board chairman, Abraham Blumenkrantz, predicts that in three or four years, 50 million TV sets will be

in use — and most of them, black and white sets. . . . **JFD MFG. CO., INC.** says that U. S. Patent 2,654,857 and design patent 159,330 protect the design and construction of their lightning arresters with saw-tooth contact washers. . . . **LEADER ELECTRONICS, INC.** has introduced a new antenna rotor for 1 rpm through 360 degrees. . . . **NARDA** will hold its 1954 Convention in the Conrad Hilton Hotel, Chicago, January 10 through 12. . . . **PRECISE DEVELOPMENT CORP.** has announced a low-cost commercial 8½" oscilloscope. . . . **THE RADELL CORPORATION** of Indianapolis has announced a new line of deposited carbon resistors for industrial and instrument applications. . . . **RADIO CITY PRODUCTS CO.** has instituted a new freight allowance policy for all parts distributors. . . . **RADIO MERCHANDISE SALES, INC.** has named its new conical-yagi antenna the "Mugwump" — after the fabled bird. . . . **RAYTHEON, Television & Radio**



Irene Horvath & G. E. Service Aids

**Division**, has announced a new pricing policy, which is reported to reduce cost differential between straight vhf and all-channel vhf-uhf sets; has moved its sales and advertising departments to its main office and plant at 5921 West Dickens Ave., Chicago; has awarded an all-expense tour to Washington and New York to Miss Theodora Panos of Little Rock, Arkansas (see cut). . . .

(Continued on page 23)





# service management

By **RUSSELL C. HANSEN**, manager, Contract Service Department, Motorola, Inc.

**A discussion of the principles of sound management practices and their relation to success in a service operation**

This is the first of a series of articles which will review and discuss service management. The basic need is evident



when we consider the large number of failures of small and large service business ventures. Frank W. Mansfield, in his recent article, August, 1953, **SERVICE MANAGEMENT**, quoted: "There is an old saying: the typical

repairman is a guy who wants, in the worst way, to get into the radio repair business. In general, many did get into the radio repair business in the worst way." This statement includes home and auto radio, phono and Hi-Fi, as well as TV Service operations, since many have not considered the necessity of sound management.

The discussion ties in the principles of sound management practices and their proven relationship to success in a service operation. It is evident and fact that without these considerations and their application it is impossible to maintain or improve business position and standing. We will review management and policy requirements, their applications in hypothetical service business operations, with the intent to help and provide for the success you desire in the long haul ahead.

Your increase in technical skill should raise your potential earning ability. The primary facts involved in your decision to enter the service business were to make use of your technical training and ability to earn an honest and comfortable living.

In the following we will outline and discuss the initial factors so vital to success in the service business.

## Quality

Quality must be the keynote, remember your repeat business, or customer following, depends on the *quality* service you and your people render the customer.

Building a permanent business following, for the long haul, depends on the technical skills and on consumer relations, i.e., the ability to *sell* yourself and your entire operation to the customer. It is imperative that you and your employees must *sincerely* want to be of help and to be of service to people, your customers, during their time of need.

At this point, it is timely to quote Paul T. Babson's definition, "What is a customer?" "A customer is the most important person to enter this office, in person, by phone, or by mail. A cus-

with feelings, prejudices, and biases, just like us. A customer is not someone with whom to argue or match wits. Nobody ever won an argument with a customer. A customer is a person who brings us his wants. It is our job to handle them profitably to him and to ourself."

The *customer*, *quality* and *success* are synonymous. For a moment, let us visualize progress, service, sales, or manufacturing of any kind, without the *customer*. It just can't be and doesn't exist in free enterprise.

## Company Policy

The establishment of basic company policy and practices is vital. It is the road map of your business. It spells out the aims and objectives of your organization, it sets values for services, and the type and degree of service to be rendered. A word of caution: guard against dual standards, what's fair and equitable for one customer must be accorded and given to all your customers. Your established policy are the rules, the laws, which govern your employees' action and handling of service calls, charge practices, accounting, in fact the complete transaction from inception to completion. Policy must be spelled out as regards your convictions and desires, backed by your knowledge and experience of and in the local area you serve. It sets up the practices you intend to follow regarding your employee relationship.

With the above in mind, you can formulate your policy and practices along the following suggested lines:

- a. General Policy, overall statement of company objectives.
- b. Area of service, by definition and description.
- c. Work guarantee provisions or warranties.
- d. Standard and special installation.
- e. Price schedules, i.e.: flat rate, hourly, field and bench pick-up and delivery and specials.
- f. Contract provisions, initial and re-

**Editor's Note: Based upon facts developed from practical experience with and responsibilities for the operation of TV Service Businesses dating back to the beginning of consumer television set servicing, this series of down-to-earth discussions of service management prerequisites should be preserved for continual study.**

**Mr. Hansen's analyses of costs of operation as they are influenced by organizational size, technical proficiency and volume of business, to be covered in the second and third articles in this series, will be welcomed by every man who is earnestly trying to build a stable business in electronic servicing.**

**This series of articles will prove to be an outstanding addition to the available literature on management as applied to a service activity.**

tomers are not dependent on us, we are dependent on him. A customer is not an interruption of our work, he is the purpose of it. We are not doing him a favor by servicing him, he is doing us a favor by giving us the opportunity to do so. A customer is not an outsider to our business—he is a part of it. A customer is not an old statistic, he is flesh and blood, a human being



newal.

- g. Wage scales, wage progressions, employee progress reviews and rules relating to their business conduct, incentive programs or profit sharing, if any, reports procedure i.e.: service data, accident, time and mileage reports, handling of customer property, money, tools and kit inventories.

#### Earning and Work Potential

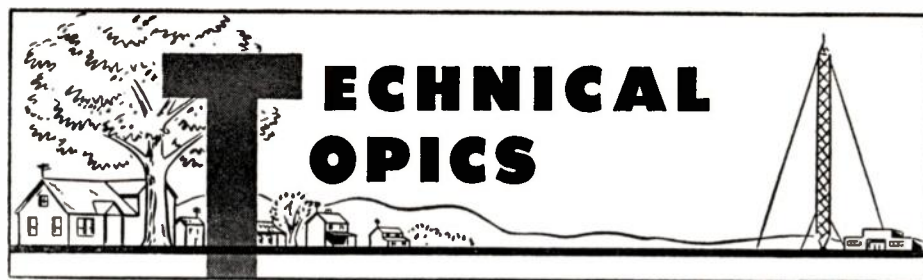
Your potential earning ability as an individual and as a company or corporation, ties in with a number of factors, as follows:

- a. Your investment, business capital, or total worth.
- b. Hours of the day, station coverage and work time.
- c. Ability to complete a maximum quantity of quality jobs per technical individual per day or period of time. Statistics and first hand knowledge of the work rate averages in the area you have or intend to serve.
- d. Charges per call and/or unit of time.
- e. Inefficiency operating factors such as local geography, travel time, check-in and check-out time, as related on a weighted basis to the average call.
- f. Work quality index as indicated by the ratio of call backs to total calls.
- g. Management skill and efficiency of control of your business.
- h. Consumer relations, their needs, their demands.
- i. Local average hourly wage for:
  1. Skilled technical, field and bench personnel.
  2. Clerical and office personnel.
  3. Supervisory and/or management personnel.
  4. Overtime cost averages and local overtime trends.
- j. Cost of and/or availability of rent, lease, ownership of business premises.
- k. Equipment investment and inventory cost, its amortization and turnover.
- l. Local government demands and tax problems or peculiarities.
- m. Vacations, training, incentives, absenteeism, health and hospitalization plan for employees, insurance.

#### Management Control

After reviewing the above and relating the items to your own operation, you are ready to discuss and investigate the mechanics of operating the service business. We have to consider some vital and necessary operating controls and statistics. The following lists these records on a daily, weekly, monthly and yearly basis.

(Continued on page 20)



## The Effect of Technical Developments and Products Upon Your Present and Future Business Activities

By EDWARD M. NOLL

### TENAX PROPOSITI

The service operator and technician can look to a year or more of astounding changes in the electronic art. Changes will affect him directly. The television service industry will really do a flip-flop the next few years. There is to be so much new and different that

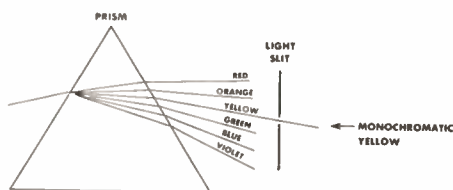


FIG. 1. Formation of Color Spectrum with a Prism.

mental inertia can only be fatal. We will have to shake the gathering cobwebs, after a year or two of reasonable development calm, and begin to study and learn with the same calculated abandon we displayed in 1946-1948.

Remember this is to be the transition years from monochrome to color and from vacuum tube to transistor. Just for a moment reflect on the possible design changes in a 1956 receiver as compared to a 1953 model. Actually, we should not even say what will be added or different but rather — just how little is the same.

Color represents a major addition to our television system. The television receiver must retain in better design what it now possesses plus facilities for color signal detection, control, and reproduction. This operation is contained in circuits not now used in television receivers and about which we will be expected to know much in the next few years.

The evolution from vacuum tubes to transistors is just as significant. Although the transistor can be made to perform the same basic functions of a vacuum tube, the basic circuit design and arrangement is entirely different. For example, we know how a vacuum tube circuit can be made to generate a sawtooth, but we will have to learn

how the transistor can be applied to the same function.

Added to the above we have closed-circuit television and new VHF-UHF techniques to study in idle moments. Translated our Latin phrase means, "Tenacious of Purpose" which we can apply with wisdom to our resolution to study diligently in 1954 and keep abreast of the field.

### SOME COLOR FUNDAMENTALS

Just how three colors can be used to convey the impressions of many colors in the first obstacle to overcome in understanding a color system. Light is a variation and has a frequency just like sound and radio-television waves. It is an extremely high frequency that stimulates the eye. Its wavelength is very much shorter than that of the very highest VHF-UHF wave and even much higher than our microwave transmission band. For example, the visual frequency extends from  $400 \times 10^{-7}$  to  $700 \times 10^{-7}$  centimeters. Its short wavelength

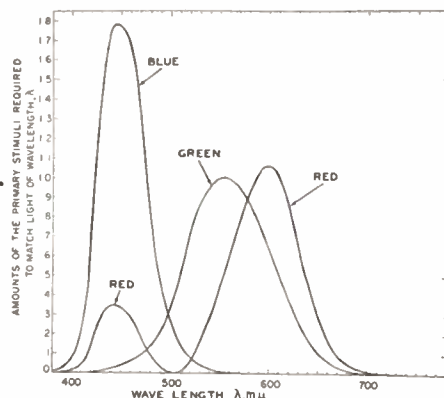


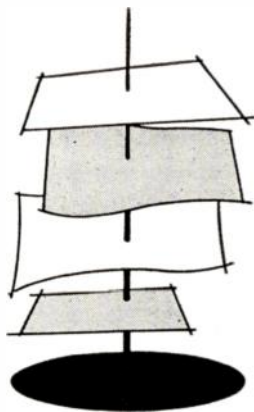
FIG. 2. CIE Standard Observer Primary Color Chart

and high frequency is evident when we compare it with the 300 centimeter wavelength of a 100 megacycle frequency.

True white light (sunlight) contains all these frequencies while each individual color has its specific wavelength beginning with red at the longest wavelength and ending with violet at

(Continued on page 19)





# air conditioning service business control

By **LAWRENCE KANOVER**, management consultant

## Servel New York Corporation Extends Service to Air Conditioning

"But my problems are different and my men just won't do clerical work." This is the opening statement of most service company owners who have a paper control problem. The answer is to lessen the amount of paper work to be done by service men in the field and to make paper work so effective in aiding the service man that he will respect the system as an assist from management.

General appliance servicing is becoming the job of the television service company because of the income it can supply during the lull in summer months. The problem came when it appeared that the television service company has to take on additional work or be forced to lay off help.

White goods distributor organizations with service departments have been forced to take on the servicing of other than their regular appliances. This has been the case with Servel New York Corporation.

This organization had, for many years, serviced their own electric and gas refrigerators and other heating equipment. Then came the Servel Air Conditioner.

### PEAK SUMMER BUSINESS

Since the peak of trouble in refrigeration is reached during the summer, it seemed that taking air conditioning with it would result in a growth of temporary personnel. This is not a desirable situation and so the work was farmed out.

After the details were worked out on who the contractor was going to be, I was called to arrange the paper work so that the distributor and the contractor could maintain a close relationship and a high degree of paper work efficiency.

### BUSINESS CONTROL

During the first meeting with George Heinz, Jr., Servel New York Corporation service manager, it was decided that we had to eliminate the individual type of service order which they were using, and replace it with a master card system. One other requirement

was the installation record held by the distributor and the records made by the service contractor, and had to be prepared without additional clerical expense. It was agreed that all of the fol-



*George Heinz, Jr., Service Manager, Servel New York Corporation.*

lowing points had to be covered in the paper work:

1. The following records had to be set up in one writing.
  - a. A master card for installation and service.
  - b. An office copy for control while the master card is out with the serviceman.
  - c. An expiration tickler notice which, when filed by date would come forward automatically to notify the telephone clerk for stamping the master card.
  - d. A 3 x 5 installation record for use by the parts department as a warranty check list.
  - e. An extra copy of installation report to be filed by the distributor, showing the contractor who made the installation.
  - f. A receipt form used for C.O.D. business which could be posted at the same time with the master card, to eliminate second writing by the field service man.
2. This record system to be housed to enable calls to be handled by fewer telephone operators.

These requirements were provided by the Markem Service System. The ser-

vice department telephone section functions as follows:

1. Clerks head up the master set from the service department copy of the delivery ticket.
2. An expiration tickler copy is detached and filed by date of termination of first warranty. When this copy falls due, the clerk pulls the master card and stamps it so that the outside service man will have this card and will not make mistakes in the charging of parts.
3. Upon receiving a 'phone service order, the clerk pulls the customer's master card and checks for repeat complaints, then inserts the date of complaint and the day the service man will call. The clerk then places the master card in the schedule rack for the service date and leaves the office master in the file with an out guide of a different



*Servel New York Corporation Telephone Section.*

color for each day of the week. This eliminates the rescheduling of the call. When the service man returns with his filled out master card and the duplicate receipt form, the money if C.O.D., and the receipt go to bookkeeping. The master card is refilled and the out guide is removed. Since the same master card goes out each time, it is possible to zone the card to aid the distribution of cards.

(Continued on page 21)



# budget

# your personal drawing account



By HAROLD J. ASHE

Avoid Drawing on Capital to Maintain Excessive Personal Needs

There's a marked tendency on the part of radio-TV service shop owners to draw net earnings out of their business as fast as these are made and without any regard whatsoever for future earning prospects. While in all other respects, a shop owner may soundly manage his business, he errs seriously in succumbing to this "feast or famine" philosophy in respect to his personal drawing account.

Thus, at best, his personal withdrawals from month to month fluctuate sharply as monthly net earnings rise or fall. At worst, and this is more apt to be the case, his personal drawings every month of the year are geared to the net earnings of the best months. That is, his personal needs get out of hand and are predicated on maximum withdrawals every month, regardless of the poor earnings of slack months.

When this occurs, a serviceman is drawing on his capital to maintain excessive personal needs. He is depleting his inventory to a dangerous level or he is standing off his creditors. In any event, these excessive personal withdrawals, not in line with net earnings, can lead to bankruptcy. Many a shop owner goes to the brink of failure before he becomes aware of what is happening to his business and why.

Weekly or monthly personal drawings from a shop should be determined upon the basis of average weekly or monthly net earnings. Thus, the fact a shop at the moment is earning enough to permit \$1000 a month for the owner's personal account does not warrant such withdrawals if the prospects are that annual earnings will stand at not over \$9000. Yet, surprisingly enough, a substantial number of shop owners increase their personal needs coincident with hitting a high earning period.

Frequently, real hardship is incurred in cutting back to a lower drawing account later, particularly if long-range personal commitments have been made, such as acquisition of an expensive car on time payments or a new home with heavy carrying charges.

## A Realistic Budget

The only safe course for a shop owner to follow is to budget realistically his personal drawing account so that the total amount drawn in a year will not exceed the year's probable net earnings. Pessimism is warranted in estimating such earnings. Weekly or monthly withdrawals in total preferably should be well under the year's estimated net earnings, to allow for a margin of safety.

In failing to budget his personal withdrawals, a shop owner creates personal problems which plague him and add to his business worries. In addition, in attempting to solve his personal financial worries, he brings into effect a whole new string of business problems with which he should not be burdened.

Sound management dictates that considerably less than total net earnings be ear-marked for personal needs. If the business is growing, some net earnings should be plowed back into the business, particularly during an inflationary period with rising values all along the line.

In connection with budgeting a personal drawing account in line with actual or closely estimated net earnings, it cannot be emphasized too strongly that ownership has the last claim on the business for personal needs and not, as some shop owners erroneously assume, the first claim. Under no circumstances does anything in excess of net earnings belong to a shop owner for his personal needs—if his business is to remain solvent and his creditors are to be kept happy.

## Drawing Account Budget

There are several ways in which a personal drawing account can be budgeted. Most obvious is to estimate conservatively the year's net earnings, then take substantially less than this figure and divide it by twelve or fifty-two. The result becomes the monthly or weekly draw regardless of net earnings fluctuations from month to month.

In months of high earnings, the per-

sonal drawing may be only 40 or 50 per cent of the amount available to ownership. In slack months, the personal drawing may exceed the net earnings. But, over the year, the total in personal drawings will be substantially less than what is available.

This puts a shop owner's personal needs on an even keel. He is not under pressure to adjust his personal needs downward as the slack periods hit his business. It reduces his outside worries, and right at a time when he needs to use all of his energies in the shop.

An adaptation of the foregoing is to hold down weekly or monthly withdrawals to an absolute bare minimum. Then, periodically as net earnings accumulate, an additional distribution is made, but always retaining a reserve against slack periods.

Thus, a shop owner on a calendar year basis might make an additional draw against net earnings on July 1 on the basis of accumulated earnings, and a final draw after year-end. Or a quarterly withdrawal may be employed to supplement monthly minimum withdrawals. Such supplemental withdrawals represent a lag but one in favor of solvency. It reduces the likelihood of overdrawing on the basis of a year's net earnings which does not come up to expectations.

## Business and Pleasure

A good many shop owners mingle personal and business accounts, dipping into business funds as needed for personal purposes, and without respect to whether money is available for personal use. Even though they attempt to limit such personal demands on the business, the very fact there is no arbitrary limit makes control difficult if not impossible.

Other shop owners, using a personal budget, draw an arbitrary amount each week or month and deposit it in a personal bank account. They do not let their personal needs exceed the amount available in this bank account.

(Continued on page 24)



# Industry News Pictures



**L**ITTELFUSE, Inc., of Desplaines, Illinois was founded in a twelve-foot workshop by president, E. V. Sundt, in 1927. Today, Littelfuse employs about 500 people and does an annual business of nearly \$3½ million. Littelfuse has pioneered many developments in the small fuse field including internal soldering and locked cap construction.

The photograph at upper left on this page shows the exterior of the Desplaines plant. At lower left is a view of the tool room that provides production equipment and maintenance. A close-up view of a die maintenance operation is shown at left, center. Above at right, operators are assembling the very fine wires used in instrument fuses. At right, below, special fuses and fuse assemblies are being produced.

On the following page, at upper left, circuit breakers are being assembled. At upper right, mandrels of filament are being removed from the plating operation before being put into fuses. At lower left is a view of continuity testing and calibration operations are shown at right, center. Life test is being performed in the operation shown at the lower right.









# OUACHITA SERVICE PHILOSOPHER



*Talks about the importance of  
keepin' a-smilin'*

By JACK DARR

Well, sir, I guess that every business is about the same, but it seems to me, and I know it does to the rest of you, that this business of ours is about as hard to keep your temper in as any I know of. Now, the syntax might be a mite mixed up in that last, but you know what I mean.

Not only do we have to contend with the sometimes infuriatin' vagaries of assorted electronic equipment, than which nothin' can be more infuriatin', but we also have to contend with the still more infuriatin' vagaries of that great institution, the American Public! Now, you put two like that together, and Bud, you've had it.

Of course, everybody thinks *his* troubles are the worst. I know beyond a doubt that *I* have more trouble than all the rest of you fellers put together. Bound to. But, there's this much to be said about it: t'ain't often that you can't find someone whose actual troubles aren't a little bit worse than yours. That kinda makes you feel better, although you feel sorta ashamed of yourself for makin' such an almighty fuss over 'em.

Well, anyhow, as I started out to say, there ain't a business in the world that is more apt to make you lose your temper, nor one that'll give you more immediate and disastrous results from the loss thereof! You an' me both, in our more lucid moments, know for a fact that there is nothin' more harmful than lettin' a hunk of electronic equipment git th' better of our temper while we're workin' on it. Anger destroys entirely whatever little ability our brain might have had to *think* correctly and constructively.

## FROM THE SYMPTOMS

And, when you git right down to it, that's what's required of us. The ability to do pure analytical thinkin', when

you're tryin' to make any kind of repairs to an electronic circuit. You must be able to reason out the nature of the trouble from the symptoms presented to you, and draw a set of correct conclusions from them. You can't do that if your error circuits are blocked by anger. Same thing as tryin' to git a hi-fi recording through an amplifier with an open grid resistor! Jist don't come through in recognizable form, that's all.

Got a remedy for that? I have. When you find yourself gittin' mad, just git up. Walk away from the job, the shop and the whole shootin' match, and run around the corner. Git yourself a cuppa cawfee, argue about the football team with the rest of the fellers that are there, doin' the same thing from *their* business. Shoot a few games on the pin-ball machine.

In other words, relax: git the whole thing off'n your mind for about ten or fifteen minutes. Chances are you'll go back to the shop and whip the problem right away.

## A CASE HISTORY

I did, jist 'tother day. Had a blamed little ACDC FM/AM set: Jist set there and refused to work! Couldn't find a frazzlin' thing wrong with it. Set an' looked at it fer a while, then got up and dashed out. Went through the process just described, and come back. Set down and looked at it and thought, "Say, maybe that cathode resistor ain't jist what you'd call perfect." Checked it, and sure enough, there it was.

Now, a man in what you might call full possession of his analytical faculties would have thought of the resistor in jist a little while. However, I wasn't: I was mad at it, 'cause I couldn't find it right away, and because it was so simple. 'Twas, too, after I'd once found it. I jist allowed myself to git upset and mad, and had to go and take a

coolin'-off period, like th' Taft-Hartley Law says.

Howsomever, there ain't no law that says you have to take it, in this business. Henceforth, some of us'll set there and beat out our brains hour after hour, when a little rest-up and a coolin'-off period woulda solved the problem in a short time.

## THE HUMAN RELATIONS END

The discussion up to now has been mostly aimed at the technical end of our business. The same thing applies to the human relations end. Out of the two, the electronic equipment and the customers, the customers'd win hands down in a race to see who could be th' most annoyin'! Reasons bein', as stated, that our customers, or the majority of 'em, are human. The greatest percentage of us are also human: when you git two human beings together, there's bound to be little differences crop up here and there.

As Confucius didn't say, "Difference of opinion is what makes football games and divorces." The guy that comes in and says, "can you fix this?" in a loud voice, implyin' that you can't do it in the first place, and will probably overcharge him for it if you do; the bird that rushes in with his set while you're busy as all git-out with a shop full of customers — and wants to be waited on before anyone else; the lady customer with a perfectly good TV set, in first-class shape, which you put a rectifier tube in three weeks ago, who says you don't know your business, or words to that effect, because she's troubled with some vertical roll on a station over 200 miles away, and "it never did that in California!!" And lastly but not leastly, the guy who can git much better merchandise at a much lower price from Sears-Roebuck or his cousin in Oklahoma City who works next door to a wholesale house!

## THAT COLLECTION OF DILLIES

Now, in that collection of dillies, you've got an assortment of types that would try the patience of Job! Reason I say "you've got 'em" is because *you* have; *I* have, and, so apparently, does every one else who operates a radio-TV store. Incidentally, I left one out, who infests mostly the sales end of the business. He wants to buy a TV set from you, including antenna and installation; he wants the brand you've got because he knows it's good; but! He wants you to sell it to him at cost, install the set and antenna, show him how to run it, and take care of the warranty service free, and then let him keep the whole setup for three or four weeks while he tries it out to see if it's going to be satisfactory!

For the benefit of some of the newer



members of our little discussion group, don't laugh; this is serious! It happens in real life; you'll find these characters who'll go ahead and let you set up a whole installation, like they were going to pay cash on the barrel-head, then pull this line on you. Then, after this, he comes down to your shop and raises Old Ned, not because of the performance of the set, but because he don't like the *programs*!! Bud, if there ever was an incitement to mayhem, that's it!

### GRIN AND BEAR IT

Only one sour note in all this: much as you'd like to slay somebody like this, and much as it'd improve the human race genetically, you cain't. Not only because there's laws ag'in it, though there ought to be a bounty on 'em, but because pure economic logic says you can't mistreat your customers, physically.

Nope, there's only one thing to do; grin and bear it! I know it's hard; sometimes it's almost impossible. But you've got it to do, and there it lays. I've found one way of dealin' with 'em, when they come in mad at you for something that ain't your fault, but which they think is; just be very calm and very polite. Don't let *your* temper git out of hand. It'll make them feel very foolish, indeed, no matter how mad they are. It'll take 'em a few minutes to cool down, but if *you* can keep your temper, they'll begin to feel foolish in a minute, and pretty soon relations will be restored to an amazin' degree. I got a method for doin' that; while somebody's standin' there yellin' their fool head off at me, I just watch 'em with an attentive look on my ugly face, like I was listenin' to every word they're sayin'. However, what I'm doin' is rememberin' all the ridiculous accusations they're makin', so's I can repeat 'em to others later, and git a big laugh out of 'em.

They'll do it, too. When people git mad, they say lots of things they'd never thing of sayin' otherwise. One thing you must never do, though; laugh at 'em, or even laugh at all, while they're blowin' off! Save that till later; otherwise, they are dang near sure to think you're laughin' at 'em, instead of *with* 'em, and your goose is cooked. Save your guffawin' for later on when there'll be more to laugh at.

Point I was tryin' to make is this: Feller comes in mad. He just *might* have something to be mad about! Maybe something *you* did has gone wrong. In that case, he's justified in bein' just a little irritated, and deserves a respectful hearin'. Give him that. Then make an honest effort to adjust his

grievance, and the chances are he'll go away happy.

### ABOUT LEGITIMATE BEEF

If he has got a legitimate beef, he's entitled to an adjustment; if he hasn't, he's still entitled to an explanation of why he ain't. Lots of times this is where your job records come in awful handy. Just as a f'rinstance, you fix an ACDC, and it quits again the next day, which can happen with astonishin' regularity in my shop, your shop, and all the rest of 'em. He's got one new tube and four old ones in the set. When it stops, does he suspect the four old tubes? Nope. It's always the one you just put in that didn't last. Will he believe it, if you tell him? He's unusual, if he does. You'll have to show him, by testing all the tubes right in front of him, then showing him the one you put in yesterday, with the date written on the chassis right by it. You hope, if you or your helpers didn't forget it! This will settle a lot of arguments before they start. Of course, then he says, "Why do those tubes go out like that so quick? We've had it four years and never had to put in a tube before!" Well, you've got the job of explainin' diplomatically to him that these things do happen, that an old tube is likely to go out at any time, even a new one, but that you'll be only too happy to replace any that go out within the guarantee period for free, because they're guaranteed to you.

### SEEMS LIKE SOME PEOPLE

If you can do this right, without makin' him mad, you probably will get his repeat business. If you do it wrong, and antagonize him, he goes to Joe across the street next time, and spends all that time between now and then telling all his friends and neighbors what a schnook you are! Seems like some people never pass on a good word, but delight in passing on the bad ones! Also, think of this: maybe Joe across the street sells him that new TV set you've been working on him for. You can't afford to deliberately antagonize a dern one of your customers; not only for the sake of their present business, but for the business you'll get out of them in the future.

That's what we've got to think about, not just winning an argument, but the future results of these arguments. If you win the argument and lose the customer, you've lost the argument! The total possible loss is much greater than the few minutes it'll take to explain just what's goin' on, and leave him happy.

So, although this demands that the electronics technician not only be an expert in one of the most complicated

(Continued on page 24)

## Technical Topics

(Continued from page 13)

the shortest wavelength. When white light is passed through a prism, Fig. 1, it is bent because of the differing velocity of light in glass as compared to its velocity in air. Thus at the entrance and exit points of the prism, various color will be bent different amounts because of separate wavelengths. The low frequency colors are bent less than the high frequency ones and the white light in passing through the prism is spread out into a band of colors or spectrum. Then it is possible to view the entire spectra of colors between violet and red or, with a very narrow slit, observe each individual color. Color wavelength is measured in millimicrons — one millimicron equals  $10^{-7}$  centimeter.

Human vision is not fully understood because of the complex activity of eye and brain in the perception of color. Nevertheless much information about color vision has been obtained by experimental, if not by fundamental knowledge. When an observer views the colors of the spectrum through the narrow slit one color may be separated from another and the viewer sees a single or monochromatic color.

For example, if the slit is viewing the color at a wavelength of 578 millimicrons the viewer sees a pure or monochromatic yellow. However, it is a characteristic of the eye to be able to take other colors in proper relationship and match a true monochromatic color. An equal mixture of red and green will also reproduce, in terms of human vision, as a yellow. Thus the eye has the ability to not only see a monochromatic yellow but also, and more important from the standpoint of television, is able to see a yellow with a proper mixture of other colors. In fact, with the use of three basic, so called primary colors, any color of the spectrum is able to be produced with suitable fidelity.

Taking the average of many normal observers, the International Committee on Illumination has standardized a set of color mixture curves, Fig. 2. These standard curves give the relative amounts of three primary colors, red, blue, and green, required to match a unit amount of radiant light having a specified color wavelength. For example, the chart indicates to produce yellow, wavelength of 578 millimicrons, it is necessary to match equal levels of red and green (intersection point of red and green curves).

(Continued on page 21)



## SELLING SERVICE By HAROLD CHASE

We have been discussing a positive type of selling service. There is a type used to the industry's detriment. Honest



TV technicians and service dealers often ask how it is applied. An interview with an honest technician has revealed how the \$3.00 call is possible. Here's how:

The man interviewed had worked a week but his conscience bothered him. So he quit. In describing the operation, to protect the honest technician, let's call the operation Hi-jack. The Hi-jack schedule of compensation for their help is as follows: On C.O.D. calls, the man gets 25% of the whole bill. They want their men to do well so they must sell, sell and sell. Here is a typical way: with a dead 5U4, replace, but as you are replacing the 5U4 with *one hand*, pull out a video tube with the *other*.

Now you have raster but no pix. So you replace the video tube with the "replacement" hand while you pull an audio tube with the "selling" hand. Now you have raster and pix but no audio, so you replace the audio tube. — Stop here? Oh, no!

As you replace the audio pull an i-f tube. The audio is there but it is weak — so you "sell" another tube. The average home service call is \$16.00, making \$4.00 for the tube puller (I can't bring myself, by this time, to call him a technician). Of course, if this is too much trouble, and he wants to make the \$4.00 quickly, he just pulls the set and takes it to the shop as that's the Hi-jack compensation for that operation.

Another Hi-jack call is the return home service; that is, of course, if the set isn't right on the first call. On RHS the man gets 50% of what he "sells." One of the features of this call is the picture tube brightener at \$9.95 (net cost \$1.70) — with additional tubes. Often this call is more profitable than the original. If it is necessary to pull the set on this call the man gets only \$3.00.

RSS at Hi-jack means return shop service. On this call the man gets 50% of sales and \$2.00 if he satisfies the sucker. The whole Hi-jack operation is also subsidized by taking back the old tubes to be reboxed and reused.

This is only one of the methods used by a small minority in the industry, to line their pockets. Technicians should

be educated to understand that any infraction from the Golden Rule is degrading their chances to make a profession out of a great industry.

## Management (Continued from page 13)

### a. DAILY

1. Total service and/or installation request received.
2. Total jobs completed.
3. Backlog of work.
4. Call-backs, and reasons why.
5. Daily cash and sales receipts, deposits and balances.

### b. WEEKLY

1. Accumulative backlog summary.
2. Productivity index averages, field and bench.
3. Audit and analysis of work backlogs as to age and reasons for overage backlog items. Decisions and course of action to eliminate overage conditions.
4. Review of income schedule.
5. Review of consumer feelings and reaction.

### c. MONTHLY

1. Profit and loss, summary and review.
2. Balance sheet, review.
3. Accounts receivable, review.
4. Review of realization of past objectives, previous budget.
5. Budget and objectives for the coming month, specific future objectives.
6. Relation of salary cost to income or sales.
7. Cost analysis study.

### d. YEARLY

1. Recap and review of — YEAR END — profit and loss and balance sheet. The study of and measurement of your management success is indicated in the year-end balance sheet profit and loss statement. It clearly indicates the effectiveness of and the application of judgment and corrective measures to the daily, weekly and monthly items of control, above outlined.
2. Budget for the coming year.

A budget should be realistic, based upon past performance, and at the same time must be of a requiring nature to fit your increased business plans. This is sometimes called a key or master budget.

In the next article we will have a general discussion and show some typical operating tables, suggested control forms, computation of hypothetical rates and general operating hints.

## Training (Continued from page 9)

you had a shop of well-trained, competent bench men who were experts at diagnosis; fast workmen and steady operators. Suppose your field men all were fine public relations men, never pulled a chassis that could be fixed in the home and were efficient enough to make a full quota of calls a day. At current service prices, how much more profit could you make than you are now making? The fact is, acceptable service charges actually carry enough loading to cover inefficient work that a competent shop can make a good profit.

### The Old Business Problem

What I have outlined is the ideal. But even an approximation is profitable. The real problem is to keep the men you want. If you cannot keep a good man there is always the temptation to do as little training as possible. With poorly trained men profits go down. Too little attention has been given to the problem of making the individual shop a desirable place not only to work but also to have a career. This is an old business problem.

Those who have met it in other industries know the formula. First, you must meet the current market in wages. This is fundamental. Second, it must be a good place to work. This is generally a reflection of the philosophy of the ownership. Competition gives a clue. Not just competition from other service shops but from other industries. Is your vacation or sick leave policy in line? Will a man have his job all year or is he likely to be out during the summer months? Do you furnish the equipment you should? Does a man feel he is learning and growing in your shop? What opportunities are there for advancement? These are the questions that all personnel men in industry constantly ask about their organizations.

I do not mean to imply that the shop should become a country club. Those companies with the best personnel policies still expect a full day's work for a day's pay. How many of you who represent shop management have exit interviews — a common industrial technique — with those who leave, to try to determine the *real* reason for leaving — not just the glib excuse generally given when a man wants to quit. Finally, the older and more seasoned men — the key men in your shop, want security. They are the men who have jumped around, perhaps tried a shop of their own. They want to settle down to a secure future. These men are the wheel-horses of the organization — the ones you can least afford to lose. Business ownership and management today is more and more aware of the impor-



tance of stability in this key group in a company. A lot of study is going into the problem of stabilizing such keyman groups. It is particularly difficult, with today's tax structure, for such men to obtain the security they need. Many companies are meeting this problem through deferred compensation programs.

Once a stabilizing program is operating, training becomes a powerful tool because the company itself, and not the competitor, gets the benefit of the training time and dollars. Under these circumstances, more formalized and more forceful training programs can be undertaken because they will pay their way.

It is an established principle that training cannot be divorced from good techniques in hiring and good techniques of maintaining men on the job. The three *must* go together or money on any one is wasted.

In this rapid period of growth of the service industry and its constant technical advances, the problem of training has been seen, but sight has been lost of the allied problems that must be answered with it.

The shop owners who apply these techniques of manpower management need not fear that it will carry its competitor's training burden. It will be training for itself and its own profit and public acceptance. It will be doing its share in the development of a great industry.

## Technical Topics

(Continued from page 19)

The levels represent intensity of each primary required to match the same intensity of monochromatic color at same wavelength. In other words, if we observe a monochromatic yellow with a certain brightness and we want to match it with red and green primaries, the red and green primaries must have equal intensities with each having an intensity of 0.88 of monochromatic brightness to be matched. It is interesting to note that despite the equal measured intensity (lumens) of the red and green the human eye itself shows an apparent brightness sensitivity that causes the green to appear more than twice as bright as the red if each were viewed alone.

In fact, in the formation of a white with equal intensity red, blue, and green—if we observed the component green by itself it would appear to us twice as bright as the red and perhaps twenty times as bright as the blue to the average observer. This non-linear relationship between brightness and color in human vision led to the con-

stant luminance method of color transmission in the NTSC system.

With the choice of three suitable primary colors (no two of which can match the third) any color can be observed by using the proper relative level of two or three primary colors. The most common primaries are red, blue, and green which spots a primary at each end and center of the spectrum. Furthermore, with the use of equal levels of red, blue, and green it is possible to produce an apparent white. Consequently, a color television system based on the three primary colors is able to synthesize any color and permits the conveyance of white-to-black grey scale as well.

## Our Opinion

(Continued from page 6)

and there are a lot of local associations doing a swell job in the communities where they function.

The big task now is to bring all of these activities together so their programs can be brought into common focus through a national association that will truly represent the will of independent service and through its constructive, forward-looking programs find its rightful place in the controlling pattern that will influence the direction in which the vast electronics industry will move in the years ahead.

The months ahead will give the service industry's present leaders a golden opportunity to demonstrate their right to acknowledged leadership through their application of diplomacy, humility and courage in erasing the many small, differences of opinion that, in essence, are not important to the attainment of the objectives of electronic service as a basic, independent business entity.

## Air Conditioning

(Continued from page 14)

4. In the case of a new account, for a C.O.D. call, the same master set is headed and stamped C.O.D., so that a case history is maintained on C.O.D. accounts.
5. The two telephone clerks who are responsible for receiving calls take an average of 290 calls per day.

### ADVANTAGES

The decrease in duplicate calls, unnecessary calls, wrong addresses and insufficient customer records paid for the cost of the Markem Service System within four weeks of installation.

The contractor who does the air con-  
(Continued on page 24)

more  
and more  
replacement  
problems  
are being  
solved  
this way



for complete  
information  
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# ASSOCIATION NEWS

TRANSCRIPTS FROM SERVICE MANAGEMENT'S PARTY LINE.

BY PENNY MARTIN

Last month I told you about NARDA's suggestion of offering a "bounty" for doors and/or hinges and locks from abandoned ice boxes. The Alle-Kiski Valley Chapter of NARDA is following through with this suggestion and has been slightly amazed at the stir it is creating.



As Secretary of this group I was going to bring up the suggestion at the next meeting. When an editorial on the need of legislation to prevent abandonment of ice boxes appeared in the local paper—I telephoned the members and received 100% cooperation. Boy Scout leaders put their whole organization behind the project, and now the whole community is buzzing.

Tarentum and New Kensington, Pa. papers gave the project front page notice. Two Pittsburgh newspapers carried feature stories. Three radio stations announced it on news Broadcasts and WDTV, Pittsburgh, not only used it on their news broadcast, but called me to ask what we planned for a climax—to be photographed for their newsreel.

Tarentum and New Kensington are small towns about 125 miles northeast of Pittsburgh on the Allegheny River. Other small towns will appreciate how much "big town" notice adds to their prestige. Since the project is still running, I'll report the full results next month. If other organizations have carried through with this idea or a similar one . . . let me know. It will be interesting to see the reactions across the country.

The Alle-Kiski Valley Chapter of NARDA is also making plans for spring. Toward the end of winter they plan an "appliance auction" to get rid of their "dogs" . . . left-overs of lines they no longer carry, trade-ins, '53 models. Profits from this auction will

go toward maintenance of the organization.

## UTAH TIP FOR RAISING MONEY

The Utah Association of Radio and Television Servicemen has worked a deal with their distributor members to offer an added discount on quantity tube purchases. For example, the distributor will give a discount of fifty, plus two, *plus five to twelve*, on tube purchases. The "five-to-twelve" is turned over to the Association for advertising expenditures only. Dues from the membership take care of office and administrative expenses.

## 1954 NARDA CONVENTION

January 10, 11 and 12 have been set as the dates for the 1954 annual convention of the National Appliance and Radio-TV Dealers Association, with convention headquarters at the Conrad Hilton Hotel in Chicago, according to announcement by A. W. Bernsohn, managing director.

Keynote speaker at the convention will be Evan Moon of Joske's San Antonio. Tentative program arrangements are being keyed to the two main components of any profitable business: Sales and Management.

The rapidly expanding program of regional meetings throughout the country, with NARDA leaders taking active part, has done much to awaken keen interest in the actions and campaigns of the national group, and is expected to produce the largest convention attendance in NARDA's history.

## NARDA ASKS DELAY OF FCC COLOR TV ANNOUNCEMENT

Mort Farr, Chairman of NARDA's Government Relations Committee, sent a letter to FCC Chairman Rosel Hyde asking for a delay of FCC's announcement of their approval of the NTSC color system. NARDA's object isn't to try to delay the start of color TV, which has already had too many artificial blocks thrown at it, but simply to keep the economic impact of the announcement from coming at a time when it could have maximum negative effect on employment and business in the TV industry.

Mr. Farr wrote, in part: "The day your decision is made and published by the newspapers, we can expect a marked decline in demand for black-and-white sets in many, if not most, of our principal markets, no matter how ably we present facts about higher cost, smaller images, limited availability and few programs. The effect could mean a sharp decline in employment and serious economic problems. Traditionally, we sell 36 per cent of the year's volume during the fourth quarter of the year.

"If your decision were announced around December 24, unemployment in our industry based on the advent of color would be minimized, the economic penalty of the announcement . . . would be minimized and the start of color would in no way be delayed.

"On behalf of the membership of the National Appliance and Radio-TV Dealers Association, I urge you to release the announcement of your approval of the National Television Systems Committee color television system as close to Christmas, 1953, as circumstances permit."

## NEDA REGIONAL CONFERENCES

When the Fourth Quarterly Meeting of the Northwest Chapter of the National Electronic Distributors Association met in Spokane, Wash., chapter director Tory Horn told the group of the decision of NEDA to sponsor regional conferences with educational programs to take the place of annual convention-conferences sponsored heretofore.

Director Horn stated that the May Show Corporation would forego educational programs in Chicago but would contribute \$15,000 to be matched by an additional sum from NEDA for the regional seminars sponsored by NEDA.

Glenn A. Reeves was appointed program chairman for the Chapter's January 16 meeting to be held in Seattle. Election of officers will be held at that time.



## NEBRASKA-IOWA RETAIL APPLIANCE DEALERS HOLD CONVENTION

An all-dealer program discussed creative selling, financial control, profitable trade-ins and specialty selling at the Retail Appliance Dealers Convention sponsored by the Nebraska-Iowa Electrical Council, according to Don Rosenthal, secretary-manager of the association.

NARDA president Wallace Johnston spoke on "Controlling Your Business Finances." Evan Moon of San Antonio, Texas, delivered the keynote address, "Creative Selling"; Emerson Dole, Wichita, Kansas, discussed "Specialty Selling and Demonstrations"; Robert D. O'Callaghan, Des Moines, Ia., spoke on "Trade-Ins Can Be Profitable." James A. Broadhurst, Wichita, Kans., was the banquet speaker. His topic was "Appliance Men Are the Smartest People on the Face of the Earth."

Over 500 dealers, many of whom brought their wives, attended the successful convention.

### News Briefs

(Continued from page 11)



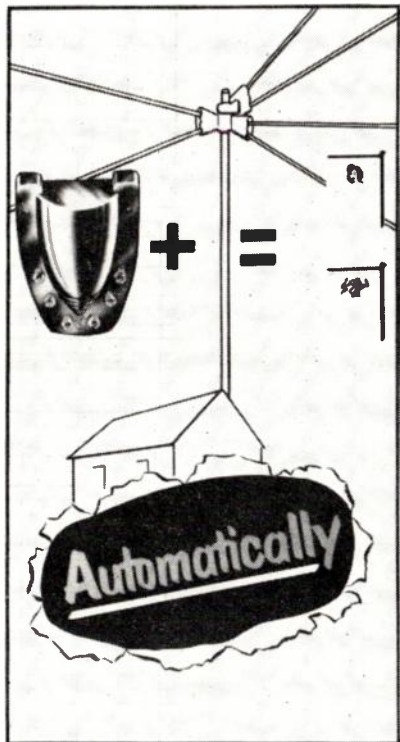
Theodora Panos Leaves Little Rock

RCA VICTOR reports that room air conditioner unit sales will approach the million mark during 1953; has announced an overall marketing operation to unify sales and commercial activities; through spokesman H. G. Baker, estimates that high fidelity will stimulate phonograph sales with increases between \$200 million and \$300 million during 1954; has announced a new crystal-calibrated marker generator, type WR-89A; has announced a new r-f signal generator, type WR-49A; has announced the smallest TV camera tube, RCA-6326, which is only one inch in diameter and six inches long; has demonstrated three methods for telecasting film in color; is continuing its campaign to promote TV receiver sales in the hotel-motel market; has announced a battery shaver kit for hunt-

ing, fishing or camping trips (see cut). . . . **JOHN F. RIDER PUBLISHER** has reduced the price of Tek-File to \$1.50 per pack. . . . **HOWARD W. SAMS & CO., INC.** has announced plans for a new 38,000 square foot plant in Indianapolis, for consolidation of operations at five points in the city; has declared a fifth cash dividend on its common stock. . . . **F. W. SICKLES DIVISION** of General Instrument Corporation has announced a new line of toroi-



RCA Battery Shaver Kit



Snyder Envelope Stuffer

dal coils. . . . **1954 SIGHT & SOUND EXPOSITION** will be held at the Palmer House, Chicago, September 30, October 1 and 2, 1954. . . . **SNYDER** (Continued on page 24)

Let this practical  
guidebook show you

## 7 steps to successful leadership

This down-to-earth book systematically explains 7 vital elements in the art of leadership, gives you a *systematic plan* for successfully leading others that you can use no matter what your job or responsibilities. Step-by-step it shows you how to rate, develop, and make dynamic use of ALL your leadership abilities. It will help you understand the people under you, win their loyalty and cooperation, assign and schedule their work, cope with their many different temperaments, and get them to put extra effort into the job!



Just Published!

## How to Be a SUCCESSFUL LEADER

By Auren Uriis

Editor, Human Relations Division,  
Research Institute of America

239 pages, 4½ x 8, \$3.50

Included in the book are 7 unique self-rating tests for leadership. By using them you will be able to determine your strengths and weaknesses when you lead, find out how you can improve your methods, get concrete answers to your specific leadership problems. Whatever your position, whether you are in charge of 2 people or 2,000, this book will give you practical guidance to master all the essentials of leading others — besides stepping up your own chances for recognition, better pay, and promotion.

## Service Management

161 Luckie Street, N. W.  
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# WIRE WARNING!

## WHY

pay more for questionable quality\* tubular TV lead-in wire?

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## LOOK

for highest quality license-labeled\* Tubular TV Wire...

\*JSC Tubular Wire is manufactured under license of Amphenol Pat. 2543696.

## DEMAND

the most for your wire dollar... get BOTH Quality\*\*! AND Low Price\*\*!

\*\*JSC—Highest in Quality...Lowest in Price!

### JSC NEW Twin Tubular TV Lead-In Wire...

The best low loss, low cost 300 ohm lead-in for UHF and VHF television.

Rain, snow, dirt or salt deposits do not materially affect impedance and electrical efficiency. JSC tubular construction contains and protects the concentrated field of energy and reduces to a minimum high ratio signal losses.

Always Look for Orange & Blue Disc of Quality



## Air Conditioning

(Continued from page 21)

ditioning installation and service uses the identical system and office procedure, and sends to the distributor an installation record which the distributor files by customer name, providing a cross file for everybody concerned.



Servel School is taught by A. M. Lutz.

## TECHNICIAN TRAINING

The Servel School trains each service man who must pass an oral, written and mechanical test before he can become authorized to service gas appliances. The school is under the direction of Mr. George Heins, Jr. Mr. A. M. Lutz is the instructor.

## Drawing Account

(Continued from page 15)

### Personal Budget Example

How can a personal budget be drawn up? Let's take an example. Suppose a shop owner, on the basis of his previous year's net earnings and present prospects, estimates he should have an absolute minimum net earnings of \$12,000, or an average of \$1000 a month. His business is growing and he wants to reinvest part of his profits in the shop. Here's how he might determine his personal withdrawals:

Estimated net earnings .....	\$12,000
Less estimated income tax; standard deductions and five exemptions, joint return .....	1,872

Net earnings after income tax	\$10,128
Reserves for year-end distribution and/or reinvestment in business .....	4,000

Available for personal draw ..	6,128
Safe weekly drawings, allowing for drop in estimated earnings and reinvestment .....	115

In setting up a budget for personal withdrawals from a shop it is much wiser to limit, voluntarily, personal withdrawals than to have unpleasant events force such limitations.

## News Briefs

(Continued from page 23)

MFG. CO. has announced a new three-color envelope stuffer to promote its 2-Set Coupler, model AC-800 (see cut). . . . **UNIVERSITY LOUDSPEAKERS** solved the problem of poor acoustics in New York's Grand Central Palace during the National Home Furnishings Show (see cut). . . . **WALDOM ELECTRONICS, INC.** has broken ground for a modern 34,000 square foot plant.



University Speaker Cluster

## Ouachita

(Continued from page 19)

and scientific businesses in the world, but also a practicing expert in Applied Psychology, that's what it's gotta be!

The man who can make a pretty good stab at being an expert in both lines is gonna have a lot less trouble than the guy who is an expert technician but a poor psychologist! Incidentally, lest some of you get me wrong, lemme say this: the assorted crumbs that I've been talking about form the lunatic fringe of our customers, and not the main body, by a heck of a large percentage, thank goodness!

If they was in the majority, I don't know what we'd do. I know what I'd do: go back to raisin' rhubarb! I know it's tough, fellers, but we gotta do it! We've got to make the effort to get along with 100% of our customers, no matter how mean and ornery they can git at times. To do so is good business. If you can do it, you can give yourself a pat on the back for being able to restrain your tempers! Feller with my pure Irish ancestry gits a little frustrated at times doin' it, but it can be done!

I gotta do a little of it right now. It's bill collectin' time, and you know what that means. Y'all come see us.

## New Taco VHF Hi/Low Magi-Mix Coupler Announced

A new Taco VHF antenna coupling device providing best impedance matching and maximum signal transfer is announced by Technical Appliance Corporation, Sherburne, N. Y. A companion unit to the now famous UHF/VHF Magi-Mix, the new device, known as the Taco Cat. No. 1425 VHF Magi-Mix, is enclosed in a plastic housing with straps attached for quick, positive mounting. Newly developed electronic circuitry comprises standard electronic components to assure this efficiency. The unit is not adversely affected by moisture or the elements.

The Taco VHF Hi/Low Magi-Mix has been designed for use with broad-band Yagis such as the new Taco Triple Driven Broad-Bend Yagis. The Magi-Mix may be employed in any combination of high band and low-band antennas to feed a single transmission line to the receiver — eliminating separate transmission lines and switching devices.



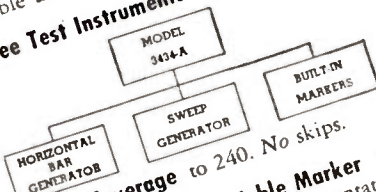
# TRIPLET

## SWEEP GENERATOR MARKER 3434-A

Harmonics sufficient for UHF servicing.  
Sweep Output better than 1 volt.

Three Markers (pip) variable oscillator, (dip) variable absorption, and plug-in crystal.

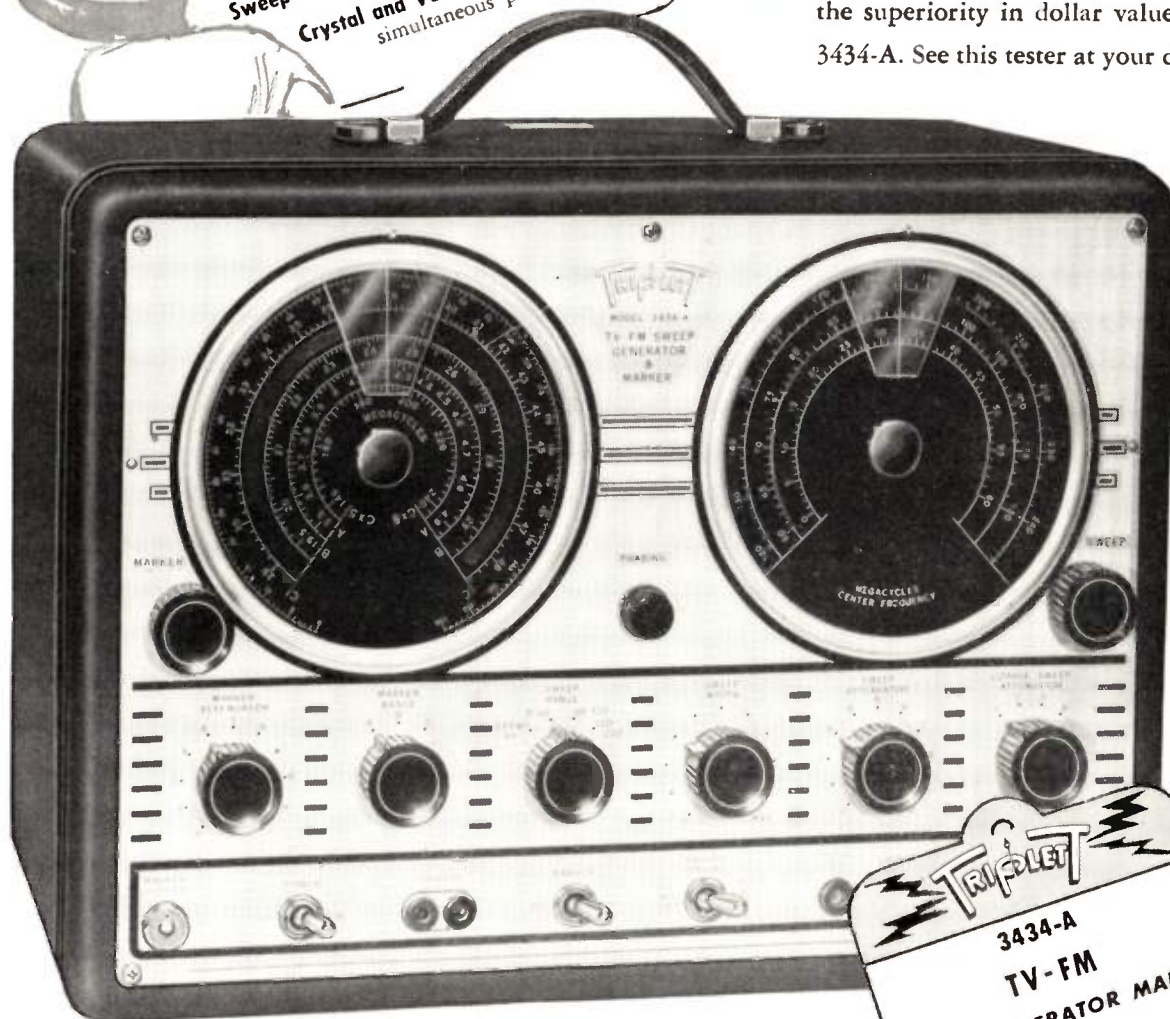
Three Test Instruments in one.



Sweep Coverage to 240. No skips.  
Crystal and Variable Marker for simultaneous presentation.

# COMPARE THESE FEATURES WITH ANY SWEEP GENERATOR

There are 16 additional features incorporated, which make it a "must" for the radio technician. All, together, emphasize the superiority in dollar value of Triplett 3434-A. See this tester at your distributor's.



**And now compare the  
Quality per dollar**

TRIPLETT ELECTRICAL EQUIPMENT CO., BLUFFTON, OHIO





## Television Service Association

(Continued from page 8)

it but at the same time, it identifies the company as a member of the Television Service Association.

### Technical Meetings

With the cooperation of Detroit parts and set distributors, TSA sponsors technical meetings and technical clinics that are open to all service personnel who care to attend. They cooperate



The crowd that filled the Detroit Edison Auditorium to hear TTLB's presentation on UHF installation and servicing is typical of response to programs sponsored by TSA and local parts and set distributors.

closely with the technical service associations in Detroit and other Michigan cities and in many instances have

helped the officers of technical associations to set up and promote TV receiver service clinics.

### National Projects

On national projects TSA has always been interested in working with other associations whose programs are designed to raise the level of electronic service as an essential business activity. Mr. Chase is chairman of the Service Committee of the National Appliance and Radio-TV Dealers Association (NARDA) and many members of TSA are also members of the national dealers association.

Recently in launching a new and more determined drive to establish better industry relations between the forces of service and other elements of the electronics industry, TSA engaged the services of H. R. Marien, Jr., an experienced public relations counsel, to function as the full-time executive director for the Association.

In addition to Messrs. Chase and Marien, present officers include Charles Nutting, Jr., vice-president; Malcolm Wright, secretary, and Clayton Hibbert, treasurer. Board membership includes Russ Vogt, Ed Brown, Al Longton, Al Weiss and Jack Barton.



Monthly dinner-business meetings of TSA feature outstanding business and industry leaders like Mort Farr, former president of NARDA.

## Transistor Notes

### BASIC TRANSISTOR TYPES

The introduction of these RCA transistors, point-contact and junction, is the result of a broad program of research initiated at the David Sarnoff Research Center and carried into commercial practicality at the RCA Tube Department's Harrison plant.

Point-contact and junction type transistors have different characteristics and constructions, and are suitable for different electronic applications.

The RCA point-contact type has a current amplification factor greater than unity and can be operated at relatively high frequencies. Accordingly, it has application possibilities in oscillator and triggering service, in switching circuits, and in such radio circuits as i-f amplifiers, r-f oscillators. The RCA junction transistor has a current amplification factor approaching unity, good stability even under short-circuit conditions, a high operating power gain, and can operate with extremely low values of input power — features which are of primary importance in oscillator and amplifier applications in the audio-frequency ranges.

The point-contact transistor is built around a miniature block of germanium crystal and two wire "cat whiskers" which serve as contact points. The junction transistor is constructed around a tiny sandwich of two kinds of germanium crystal, positive and negative. The sandwich usually has three layers, n-p-n or p-n-p, with connecting wires touching each layer. They will operate with as little as a millionth of a watt. In fact, some 20,000 junction transistors could be operated on the power needed for one subminiature electron tube.

### GERMANIUM IS "HEART"

Heart of the RCA point-contact and junction type transistors — is the element germanium. Although fairly plentiful, it must be extracted, at heavy cost, from such germanium-bearing materials as zinc and the residual products of coal. In processed form, it is germanium dioxide, a snow-white powder, which costs about \$140 a pound.

RCA transistor production at Harrison begins with germanium dioxide. The power, in molds, is placed in a special hydrogen furnace which converts it to metal at temperatures up to 1050 degrees centigrade. The result is a cigar-shaped, silvery ingot which has

(Continued on page 30)





## ...before it TALKS

... is the way our doctors put it—"Our chances of curing cancer are so much better when we have an opportunity to detect it *before it talks*."

That's why we keep urging you to make a habit of having periodic health check-ups, no matter how well you may *feel* ... check-ups that *always* include a thorough examination of the skin, mouth, lungs and rectum and, if you are a woman, the breasts and generative tract. Very often doctors can detect cancer in these areas long before the patient has noticed any symptoms in himself.

The point to remember is that most cancers are curable if properly treated before they begin to spread, or "colonize" in other parts of the body. . . For other life-saving facts about cancer, phone the American Cancer Society office nearest you or write to "Cancer"—in care of your local Post Office.

**American Cancer Society**





# PRODUCT REVIEWS

## Hi-Fi CONVERSION AMPLIFIER

Video Corporation of America, 229 W. 28th St., New York 1, N. Y. has announced a new amplifier for converting radios, phonographs or TV sets to Hi-Fi. Model VC-6 amplifier measures a compact 1 3/8" x 3 3/8" x 11" and weighs only three pounds. It supplies six watts of push-pull power with a frequency response of 50 to 30,000 cycles.



## COMBINATION Hi-Fi CABINET

G & H. Wood Products Co., 75 North 11th St., Brooklyn 11, N. Y. has announced a new model 11 Cabinart that provides necessary space for a complete Hi-Fi music system and five cubic feet of record storage space. The cabinet is 35" high, 35 1/2" wide and 17 1/2" deep; record changer and radio compartments measure 14 1/4" x 16 5/8" x 15". Available finishes include hand-rubbed French Mahogany, Lined Oak, Honey Walnut and Black Lacquer.

## NEW UTL PRODUCTS

The United Technical Laboratories, Morristown, N. J. have announced five new products for radio and television servicemen. They include a new TV Cross Over Network to permit the use of UHF and VHF antennas with a single lead-in and the elimination of antenna controls or switches for all-channel TV reception; an Interference Filter of the three-section, high-pass type for use between the transmission line and the TV receiver, to cut-off frequencies below 50 megacycles; a new two receiver coupler for operation of two TV receivers from a single antenna; a Variable Inductance Kit consisting of eight

permeability tuned coils, calibrated within 5% limits; and Klipzon Points for Panel Mounting for production or life testing of components.

## TV ALIGNMENT TOOL

General Cement Mfg. Co., 904 Taylor St., Rockford, Illinois has announced a new plastic TV set alignment tool

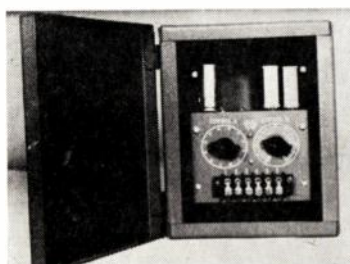


that is extra-long, extra-slim with high dielectric value. The tip of the tool is said to be tougher than those made of nylon or fibre. The tool may be used in alignment operations without removal of the chassis from its cabinet.

## RMS BROAD BAND YAGIS

Radio Merchandise Sales, 2016 Bronx-dale Ave., New York 62, N. Y. has announced six new 10-element broad band Yagi antennas that may be easily installed without bag-hardware. Cross-arm sections couple together and all elements swing out and are tightened. Elements are made of 3/8" aluminum with pinched ends. All low band models are held securely at top and bottom in formed, rivet-free steel sections. These "Panoramic" Yagis are available as follows:

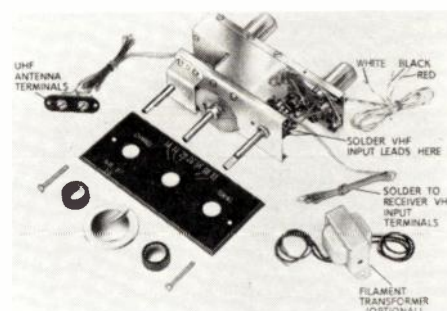
Model	Channels
STY1024	2-3-4
STY1025	2-3-4-5
STY1026	2-3-4-5-6
STY1036	3-4-5-6
STY1046	4-5-6
STY10713	7 through 13



## ENCLOSED ELECTRONIC TIMER

G. C. Wilson & Co., 1950 Eighth Ave., Huntington, W. Va., has announced a new electronic timer that is particularly well-suited for dependable industrial and laboratory services, that requires timed intervals, time delay periods or other programming. The type 60 MC timer was designed to provide operation by foot switch, push button, pressure switch or any other momentary or sustained contact closing device. Accurate setting of the time interval is obtained by fine and coarse controls. Timing intervals are unaffected

by variations in line voltage or line frequency.



## UHF CONVERSION KIT

The Allen D. Cardwell Mfg. Corp., 97 Whiting St., Plainville, Conn. has announced a UHF Conversion Kit for installation in existing TV sets to provide all-channel UHF tuning. The kit is factory aligned and assembled with attractive escutcheon plate, knobs and pointer. Only soldering and drilling with a template are required. The tuner is said to tune from channels 14 to 83 continuously, with high sensitivity and low noise level. A printed circuit is used to provide stable tuning with no drift. The conversion unit uses channel 5 or channel 6 as intermediate frequency and does not affect tuning or reception of UHF stations.

## CAPACITOR TEST INSTRUMENT

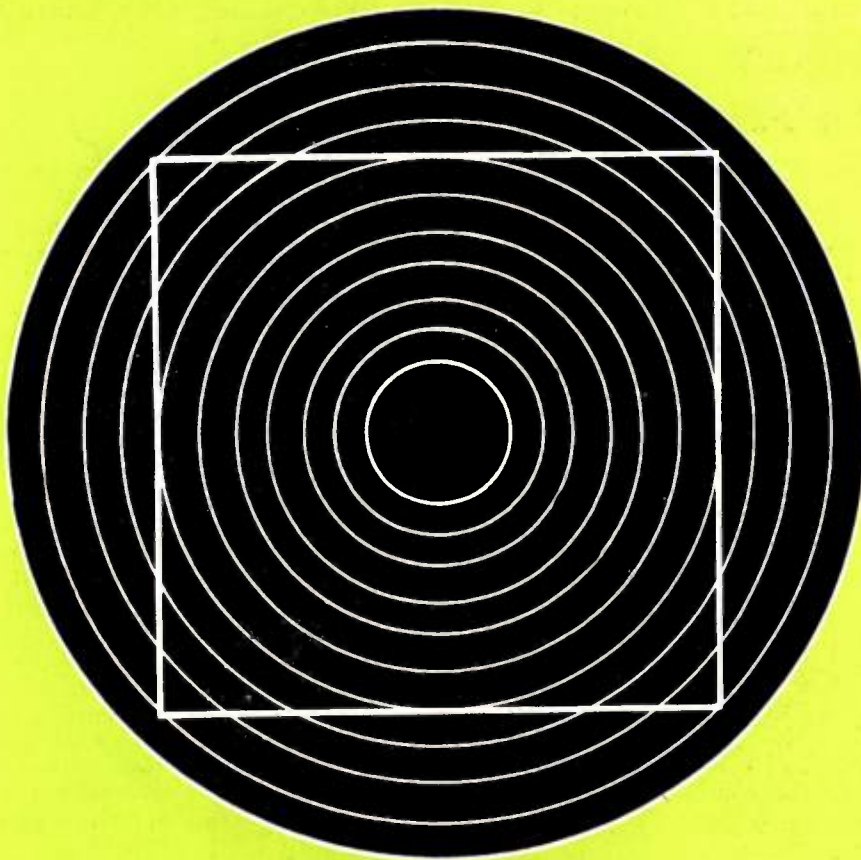
Sprague Products Co., 331 Marshall St., North Adams, Mass. has announced a new instrument for testing capacitors without unsoldering them. The service technician merely flips two switches to detect opens, shorts or intermittents in bypass, coupling or filter capacitors



with values ranging from 30 mmf to 2000 mf. Capacitors of .1 to 2000 mf may be tested for shorts and intermittents with parallel resistances as low as 2 ohms. The Sprague "Kwik-Test" will work on all capacitors in tuned circuits of less than 10 mc. It is housed in a medium gray, wrinkle-finish steel case, 8 1/4" high, 5 1/2" wide and 5" deep.

(Continued on page 30)





*things are NOT as they seem...*

This is a perfect square within the circle  
— it is an optical illusion that the sides bend.



Things are not as they seem ...  
These two fuses look alike ...  
*But they are not.*



This fuse may burn out anywhere along the length of the filament even in the cap—this blown fuse is impossible to detect visually.



This Littelfuse has a controlled blowing point—the filament is plated throughout its length except in the very center—the fuse will always blow here. A blown Littelfuse can be detected immediately—a Littelfuse feature.

*Littelfuse holds more design patents on fuses than all other manufacturers combined.*

**LITTELFUSE**

DES PLAINES, ILLINOIS



## Product Previews

(Continued from page 28)

### AUTOMOTIVE SOUND SYSTEM

Electronics Division, Z & W Machine Products, Inc., 5100 St. Clair Ave., Cleveland 3, Ohio has announced a new complete sound amplifying system for busses, trucks and cars including public



transportation, sightseeing busses, police fleets, industrial fleets, utility trucks, fire departments, ambulances and civil defense vehicles. The model 31-A mobile amplifier includes microphone, remote control head, cables, speakers or reflex trumpets and a shock-mounted amplifier. It operates on 6 or 12 volts d-c and is reported to provide fast action, low noise and high output. It may be factory modified for custom use.

### VHF-TV CASCADIAN BOOSTER

Mark Simpson Mfg. Co., Inc., 32 49th St., Long Island City 3, N. Y. has announced a new tunable VHF-TV cascadian booster



that is designed to bring noise-free reception to new low-noise, high-gain receivers and improved reception to older receivers. It is reported to have been field-proven to successfully solve the "snow" problem in fringe areas. Rack and pinion permeability tuning are provided for precise, stable operations for channels 2 to 13. This cascadian booster is automatically switched on and off by the TV set.

### RETRACE ERASER

Tele-Matic Industries, Inc., 1 Joralemon St., Brooklyn, N. Y. has announced a plug-in electronic network that permits the set owner to increase brightness and contrast control for improved TV reception without interference from annoying lines. The "Retrace Eraser," model CR-59, is easily installed by plugging into the back of the cathode ray tube with one connection to the yoke. Time required is said to be less than two minutes.

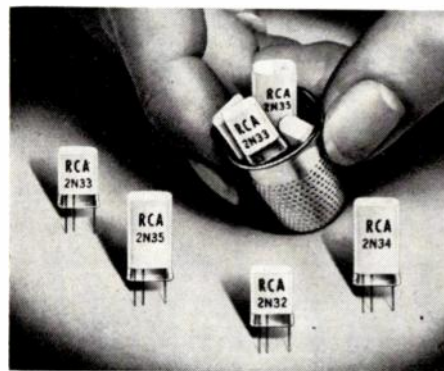
## Transistor Notes

(Continued from page 26)

one part impurity in ten million. The ingot is subjected to further heat treatments until the material has only one foreign atom for each billion atoms. At this point, the germanium is in a virtually pure state. However, germanium in its purest state behaves like an insulator. Its conductivity is increased with the addition of exact but infinitesimal amounts of specified impurities. This doping of the crystal with selected impurities is one of the critical operations in crystal processing. The manner in which the germanium crystal will conduct can be changed by the choice of impurity. The trace of impurity in any one transistor is microscopic, yet it provides some one hundred billion excess electrons for transistor action.

### TRANSISTORS ASSEMBLED

The germanium crystal is now ready for a slice-and-dice process. For use in point-contact transistors, the germanium crystal is sawed into pellets the size of a pinhead. For use in junction transistors, it is cut into wafers not



much thicker than the human hair.

Skilled workers mount the wafers and pellets on glass stems and affix the contact wires. The working parts are then encased in plastic for protection against shock, vibration, and the effects of moisture.

At this stage the plastic-encased transistors are placed in special ovens where they bake for a specified number of hours. The baking hardens and "cures" the plastic cases. The transistors are then ready for a variety of rigorous electronic tests which determine their conformity with quality specifications.

### RCA "FIRSTS"

RCA transistor research, begun in 1948, has resulted in several significant "firsts." Last June, RCA disclosed development of the first VHF transistors. Previously, transistors had been regarded as relatively low-frequency devices, and the highest operating frequency, according to published reports, has been 50 megacycles. The June announcement disclosed that RCA de-

velopmental transistors had been made to oscillate at frequencies as high as 225 megacycles. Since then, an RCA developmental type has operated at frequencies above 300 megacycles, into the UHF region.

An RCA developmental transistor was also involved in what is believed to be the first use of a transistor in VHF radio transmission. Last December, an RCA engineer, using a tiny transmitter built around a single RCA point-contact transistor, made a regular amateur radio transmission and contacted a "ham" station some 25 miles away.

### ADVANCES IN CIRCUITRY

Certain technical problems which have been slowing the practical application of transistors in commercial electronic equipment were "solved" at San Francisco recently with the disclosure of advances in transistor circuitry.

These advances, which widen the application range of transistors were outlined in a technical paper delivered by Robert M. Cohen, RCA transistor engineer at the Western Electronic Convention.

Of particular interest to circuit design engineers, Mr. Cohen's paper covered the performance of four types of RCA commercial transistors with regard to interchangeability characteristics, effects of temperature and humidity, life expectancy and other factors which influence the success of transistorized devices.

The RCA paper outlined typical electronic circuits for radio amplifiers, r-f amplifiers and oscillators, multivibrators and "flip flops" using RCA point-contact and junction-type transistors. Performance variations which may develop from deviations in transistor characteristics and laboratory-tested methods for stabilizing operating conditions were also blueprinted.

Mr. Cohen pointed out that the refinement of the RCA n-p-n junction transistor will make available a long-desired device which produces output current flowing in a direction opposite to that generated by a similar but electrically opposite counterpart — in this case, the RCA p-n-p junction transistor. Because of this unusual characteristic, such transistors give promise of a wide variety of new circuits employing so-called "complementary symmetry" operation.

Elaborating "complementary symmetry" operation, he described and experimental three-stage phonograph amplifier which employs this principle in the output stage. The application of a positive voltage to the input of one of the n-p-n junction transistors in this stage causes an increase in output current. The same positive voltage applied to the input of a p-n-p junction transistor in the stage causes a decrease in its output current.



# S.P.A.\*

## Snyder

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PHASING ELEMENT**

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- Two 3-Section Staffs
- Gold Tone Brass Staffs
- Brass Plated Phasing Bar

**\* SALES PROMOTION APPEAL**

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ON EVERY CHANNEL

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NO WAITING**

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1	12AV7	2	
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**FIRST PRIZE:  
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- Ninth Prize: 50 in Savings Bonds
- Tenth Prize: 25 in Savings Bonds

Remember, your CBS-Hytron distributor's salesman can also win other big prizes. Be sure to write his name, too, on your Contest entry. Entry blanks are available in your CQS Kit . . . or from your CBS-Hytron distributor. Beat the closing date, Dec. 15, 1953.

**PROVE** to your customer he can put his confidence in you.

Lay all the facts before him. Hand him this *Certified Quality Service Tag*. The Tag he has been reading about in *LIFE-POST* ads sponsored for you by CBS-Hytron. The same ads (and there'll be more) that are prompting him to ask where he can find you, his *Certified Quality Service* dealer.

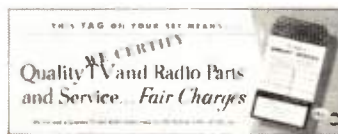
With this simple, easy-to-use Tag, *do what your customer wants*. *Certify* that your itemized charges are fair. *Certify* that your service . . . your ability . . . and your equipment guarantee him dependable, top-quality TV and radio repairs. Give your customer *tangible proof* that you are giving him his money's worth. Win *his* confidence. And *you* will gain more business . . . more profits. Put your convincing *Certified Quality Service* Tags to work right away.

**GO A STEP FURTHER**

Tie in with the whole *Certified Quality Service Plan* as advertised in *LIFE* and the *POST*.



Use your decal.



Use your window streamer.



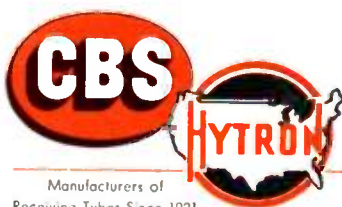
Use your LIFE-POST display.

They are all part of the *Certified Quality Service Kit*. This Kit, including 250 CQS Tags imprinted with *your* name and address, is available on a special offer from your CBS-Hytron distributor. Or you can write for details on how to order direct. You can order more CQS Tags from your distributor, whenever you need them.

**GO STILL FURTHER**

Keep in close touch with your CBS-Hytron distributor. Watch soon for additional supporting material to identify you as a *Certified Quality Service* dealer:

1. CQS illuminated window sign
2. CQS metal flange sign
3. CQS direct-mail postal cards
4. CQS newspaper mats, etc.



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