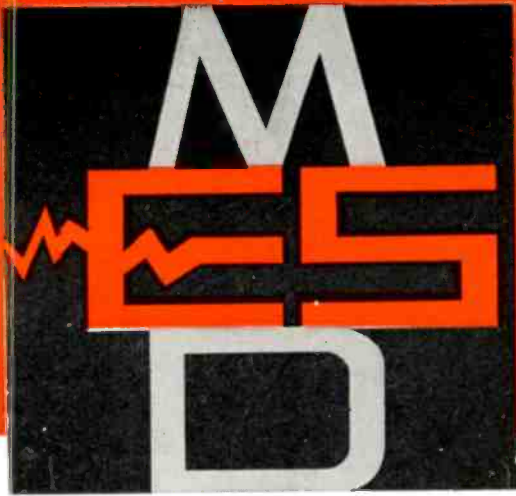


MODERN

1963 "WSBP"
Award Winner



electronic service dealer

THE OFFICIAL PUBLICATION OF THE CALIFORNIA STATE ELECTRONICS ASSOCIATION

VOL. 3, NO. 7

NOVEMBER, 1963

Credit Buying And Collections

page 13



Also In This Issue:

- ELEMENTS OF SWEEP CIRCUITS

page 11

- MORE ON NEW LAWS



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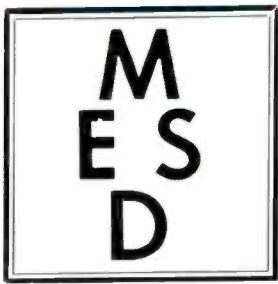
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FEATURE ARTICLES

- 11 Elements of Sweep Circuits . . . by Irving Tjomsland
This is the first in a six part series of articles designed for
the new man.
- 13 Credit Buying and Collections
A special MESD Feature that discusses some of the basic
principals of the issueing of credit, as well as those needed
for collections.

DEALER NEWS

- 7 Operation Santa Claus Gets Undeway This Month
- 7 Registration Law by Zone "B" at Recent Meeting
- 7 CSEA Chapters Meet Jointly
- 7 BBB Issues Informative Report To Service Dealers
- 8 Al Fischer Named As New Zone "F" Executive Secretary
- 8 Zone "B" Recommends Gordon Cole to Governor Brown
- 8 Zone "B" Delegates Discuss Individual Business Policies
- 16 Zone "F" Plans Joint X-Mas Party

INDUSTRY NOTES

- 16 Antenna Accessory Manufacturers Form Organization to
Fight Cable Television
- 17 New Law Effects Repossession and Sale of Goods
- 18 Customer X-Mas Cards Available to Dealers
- 18 SRTT Hears Stan Auerback
- 18 George Figart Passes Away

DEPARTMENTS

- 5 Letters to the Editor
- 6 Editorially Speaking
- 9 President's Message
- 15 Current Literature
- 17 Classified Ads

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brings you the first low cost all-channel UHF antenna amplifier (channels 14 to 83)



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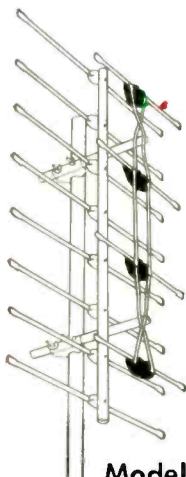
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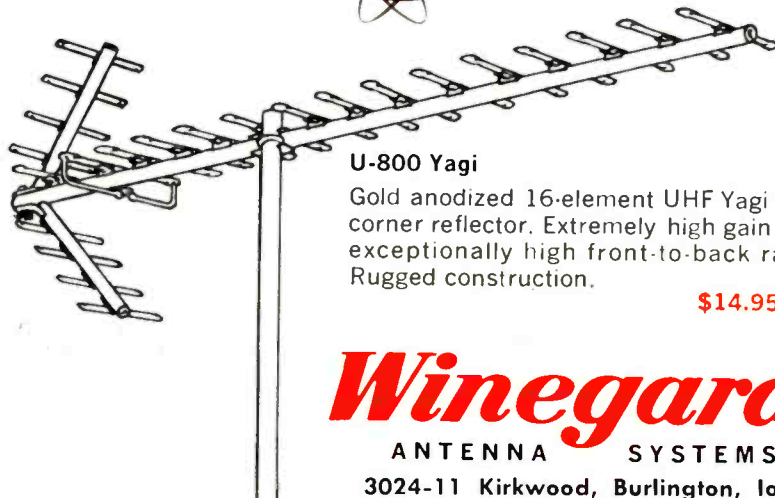


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Letters To The Editor

Dear Don:

Above my new address and phone number—we've moved (obviously)—sold the old farm—and literally got out lock (on the barn door) stock (my old guns) and barrel (loads of barrels of stuff accumulated in 43 years. No money but I got a lot of fun out of giving away my orchids, dwarf trees, greenhouses, tractors, cows and what have you, and we're cooped up in an apartment.

I'd like to continue receiving MESD, I enjoy

it and it keeps me in touch, though as you know, I'm not connected with any endeavor.

Best wishes to you—

Charles Silvey

Dear Charlie:

It would be a pleasure to place you on our complimentary MESD subscription list. Glad to hear that the magazine does aid in keeping you in touch with the industry you served for so long.

Ed. Note

The following letter was forwarded to MESD by Gil Sherman. It is seldom that individuals take time to notice or mention what they actually think of the magazine, however, Carl Roberts of American Video Corp. summed up what we hope to be the feelings of all those receiving MESD.

Dear Gil:

Pursuant to your request for a survey of the distributors who read Modern Electronic Service Dealer Magazine; I wish to pass along the following report:

I was pleasantly surprised to find that the magazine is well read and highly respected for its timely contents. In no instance have I found it necessary to ask the distributor if he reads it, instead, nearly all of them beat me to the punch with complimentary comments concerning your interview and the various advertisements we have placed in the magazine. In view of my findings, I highly recommend that we continue to advertise in Modern Electronic Service Dealer.

Regards,
Carl Roberts

Dear Mr. Martin:

I noticed in the October 1963 edition of your magazine an article on page 7 relating to the television dealers lien law.

I think by inadvertence you have overstated the requirements of the law as it applies to dealers. Your opening paragraph states as follows:

"On September 19 every electronic service dealer in Los Angeles County was required, by law, to submit an estimate to all customers on work duly performed. Any dealer who does not comply with this new law is subject to arrest and prosecution as a misdemeanor."

The law which was passed does not require an estimate for all customers on all work to be performed. It only requires that an estimate be given when a dealer takes a radio or television set out of someone's home. There is, of course, a substantial difference.

Aside from that may I congratulate you on your continuing good job in educating and informing the television service industry.

Sincerely,
Stanley Mosk, Attorney General
by Vincent W. Thorpe
Deputy Attorney General

Dear Mr. Thorpe:

May we take this opportunity to thank you for the time and interest you have shown in correcting the opening paragraph of our article, which did require clarification. It is encouraging to know that MESD is being read thoroughly by men such as yourself and—thank you once again.

Dear Sir:

I picked up one of your magazines recently at my distributor's in Larami, Wyoming and I certainly enjoyed it. I would like to subscribe to your MESD and would also appreciate a copy of the new laws. We sure need something here in Colorado and at least your bill would be a starting point for us.

James Jurgens, owner
R and R Electronics
Denver, Colorado

In today's mail I sent you a free copy of our new California Lanes and hope you will be able to use them. I will also add your name to our subscription list and hope you will enjoy the next 24 issues of MESD.

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DON MARTIN

EDITORIALLY SPEAKING

APPRENTICESHIP DISCUSSED

During a recent meeting of the California State Electronics Association, I was very much concerned with a discussion on apprenticeship in the State.

In this discussion it was brought out that one of the reasons why we were unable to obtain a license law, that required technical testing, was because of the lack of an apprenticeship program that would set up the basic standards for the test itself. It was pointed out that to date the industry didn't seem to desire an apprenticeship program and until it does there will never be a basis for a license requiring technical qualifications.

Yes, there are a few schools in California that have courses in Television and Electronic repairs, but they are few and far between. Many dealers who are now in the profession are successful only because of their own knowledge or ability and the confidence of their customers. There is no one to say what knowledge is necessary in order to open a shop and there won't be until the industry takes the bull by the horns and does something to encourage an apprenticeship program that will not only provide skilled technicians for the shops today but the basis for a professional license in the future.

At the present time there is a two-year course in industrial electronics being conducted by Contra Costa College in Northern California. This course leads directly to an Associate of Arts degree and is a start in the right direction. In Bakersfield they have had an apprenticeship program going for a number of years, but this course is open to everyone as a refresher or beginners course. The course is sponsored by the State of California and as long as there are enough students it will continue to function. During the discussion it was stated that the chief fault of past apprenticeship courses was a lack of students. When Bakersfield found this to be true they opened the doors to all interested persons, regardless of their past experiences and their classes are now never under the 30 mark.

With this very thing in mind, we are starting a series of articles for the new man in this issue of MESD. The material is very basic but may act as a little refresher to many and a starting point for some of the newcomers that enter the industry everyday. We certainly do not want to be to elementary but feel this is the only starting place that makes sense.

An active and stimulating apprenticeship program is the only answer to the future of the electronic service industry. Already many shops are looking for good men and are willing to pay fair wages. The only problem is that industrial firms are the chief competitors and many of the good men are leaning that way instead of into the consumer electronics. The only answer to this type of competition is for the service industry to wake up and begin charging a fair and reasonable price for their services and then attract these men back into this profession. If something is not done soon we are going to find ourselves void of good technicians and will end up with many one man shops. Our future and the future of the industry itself may very well depend on the success of an active apprenticeship program. Without a source of man power there may be no other alternative than more factory service.

ESTIMATES

In last month's issue of MESD I mentioned that an estimate must be given on all work. Many of our readers took me for my word so would like to make a few things clear. First of all, the estimate is only necessary when taking the Television out of the Home and the charges must exceed \$15.

We are still waiting to receive the questions and answers that were obtained at all of the recent meetings on the new laws. As soon as these are available we will print them for your information.

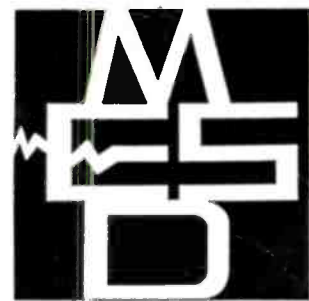
TWO NEW CHAPTERS ADDED

The effect of the recent legislation and the activities of the Executive Secretary of CSEA has continued to stimulate interest in the Association. In Santa Ana a new chapter was formed and received their charter at a special dinner on October 29th. Also in October, we were pleased to learn of the re-issue of a charter to a group of service dealers in San Bernardino. Also, we have recently received word that a group of Northern California Dealers are about to join CSEA as a complete chapter. All of this activity indicates that Dealers are becoming more and more aware of the importance of such a state wide Association as CSEA and it is only a matter of time until much of the service profession will be represented by this group. We certainly want to encourage everyone to, at least, take the time to look in on a chapter meeting in your area and see if there isn't something being offered that will benefit you in your business.

COMMENTS ON USE OF REGISTRATION NUMBER

After my comments last month concerning the use of the dealer registration number, when making purchases from Distributors, I received a number of letters and calls. It seems that the idea of finally having the means to control the sale of electronic supplies and accessories has caused a great deal of interest. First of all, I want to say that this isn't my idea. Actually it came from one of our local distributors and bares out the real interest most of these people have for the dealer. If every distributor would demand a registration number before selling to any customer I feel sure it would go a long way in cleaning up the Industry. Of course, we must remember that this doesn't go into effect until January 1st so there is plenty of time to hear other comments in this regard.

At the same time, we received a letter from former Executive Secretary Kieth Kirstein who stated that there is a possibility that the Yellow Page salesmen will be required to ask for this same registration number before accepting any advertising. This certainly makes sense and indicates just how important the "side effects" of the registration bill might be in the future of our industry.



dates

dealer news

programs

REGISTRATION LAW BY ZONE 'B' AT RECENT MEETING

Eighty-seven dealers from Zone B and their ladies recently heard CSEA's James K. Wakefield give and explain the details of our industry's new "registration" legislation. A dinner meeting was held at the famous Green Mill restaurant, between Petalume and Santa Rosa.

The meeting attracted representatives from Alameda, Marin, Mendocino, Santa Clara and Sonoma counties. It was organized by CSEA director Ralph Lee Hoy of the Marin County Chapter and co-organizers Orval Watkins and Dave Strehel, president and secretary respectively of the Sonoma County RTA, and Ed Avilla and Ted Zimmerman, acting president and secretary respectively of the Petaluma RTA. Immediately assisting Hoy were Oakley Dexter and George A. Klein of his own chapter.

CSEA executive secretary "Jimmie" Wakefield made an excellent presentation of the new legislation, and clarified many points. He stated that it was expected that appointments to the state advisory board of the new state set-up would probably be made after the legislation's effective date, September 21, and that it was possible that registration might be required by January 1st, 1964. The CSEA board, he stated, was recommending Ralph Johannot, Burbank, CSEA vice-president, and John Blackwood, former Bakersfield CSEA director, as the industry's members of the board.

Zone B Council chairman Haury expressed his appreciation for the large attendance, and urged all to join the state body and organize CSEA chapters in their respective areas. In this he was joined by CSEA directors Hoy, Crawford and Petzwall. The stronger CSEA is the more powerful would be our influence in legislative matters, and in administration of the bill itself, was the general theme of these speakers.

CSEA CHAPTERS MEET JOINTLY

A joint meeting of the Los Cerritos, South Bay, Long Beach and San Antonio chapters was recently held at Marc's Restaurant, 457 So. Long Beach Blvd., Compton, Calif.

Al Jones of General Electric presented the program covering color and the 1964 G.E. Line, along with trouble shooting short cuts.

Operation Santa Claus Gets Underway This Month

On November first the Los Angeles Chapter of the California State Electronics Association will inaugurate their 1963 drive "Operation Santa Claus." All member shops will at that time commence to put into operating condition any good used TV sets that they may have in stock plus any of those that the public wishes to donate for this worthwhile cause.

The TV sets will be donated to hospitals, orphanages and any welfare institutions that will be designated by city and county welfare agencies. The TV sets will be brought to a central disbursing depot and from that point will be distributed to prearranged destinations.

The Boy and Girl Scouts of America are co-operating wholeheartedly with the CSEA in this drive to bring some cheer into the lives of those who cannot pursue the normal day to day living that most of us take for granted. Last year's "Operation Santa Claus" with the able assistance of the Girl Scouts managed to distribute almost 100 sets in the Los Angeles area. The average shop owner member of CSEA contributed at least three TV sets. A phone call to OL 5-8090 any time of the day or night will be responded with a follow up call to arrange for an appointment at your convenience.

A CSEA member will be dispatched to any area in Los Angeles proper to pick up any sets that you may wish to donate. The donors name will be attached to the set or sets that you may wish to donate. CSEA requests that the TV sets not be more than ten years old.

BBB Issues Informative Report to Service Dealers

The Better Business Bureau has recently issued an informative report having to do with the charges placed on the customer for services rendered by the service dealer. It is encouraging to see that the BBB is concerning itself with this pertinent information so desperately needed by the servicing industry.

The report on Service Charges read as follows:

"Many appliance and television set owners improperly believe that when a service company is called and "no work" is done on their appliance or television set there should be no charge.

"Anyone who calls a service company to come to his home for repairs, assumes the obligation of paying for the service call. When an estimate is given and is not satisfactory to the owner,



Mr. Floyd W. Cox, president of the Los Angeles Chapter of CSEA is shown here in front of his store. The sign tells the story of "Operation Santa Claus" to his customers.

Any sets that have been unused for a long period of time will not be acceptable as time in this case plays more havoc with electronic equipment than any other type of machinery electronic or mechanical. A TV set that is constantly used will give less trouble than one that is used only for short periods. CSEA member shops will incur all costs of putting the TV sets into condition for "Operation Santa Claus."

CSEA, the Girl and Boy Scouts will be responsible for the distribution of the TV sets.

and another service company is called, the first company has every right to expect to be reimbursed for its time.

"Service call charges are proper when the company sends a representative to your home.

"Before requesting service, ascertain the amount of any service call and/or the estimate charge."

AL FISCHER NAMED AS NEW ZONE "F" EXECUTIVE SECRETARY

At the Zone F Meeting in Los Angeles of the California State Electronics Association, A. H. "Al" Fischer was elected to the post of Executive Secretary for Zone F which comprises Ventura, Los Angeles, San Bernardino, Riverside and Orange counties. The Zone F Office is now located at 1765 W. 27th Street, San Pedro, California, and carries a Los Angeles central district telephone number of SPruce 5-2055. There is also a local phone of TErMinal 2-0625.

Al has been close to electronics most of his life. Coming out of law school in Chicago in 1935, he spent some years with Zenith Radio Corporation. Electing to live in California after World War II, he organized the auto and U-drive industries, engaged in the collection agency field and dispensed financial and business management information to his clients in Southern California. He has been a licensed and active radio "ham" operator, and for the past seven years has served as president of the Western Single Side Band Association Inc., among whose membership can be found some of the outstanding technical men in the field, including many members of CSEA.

Al Fischer has plans of expanding the membership of Zone F by working closely with the chapter officers, and helping them plan their chapter meetings insofar as staffing them with interesting speakers while he himself will offer his services in the field of management, credit, collections, and allied topics as the basis for talks he plans to give before the various chapters

ZONE "B" RECOMMENDS GORDON COLE TO GOVERNOR BROWN

The Zone "B" delegates of the California State Electronics Association have recommended the name of Gordon P. Cole of San Mateo to the Governor for possible appointment to the new Registration Advisory Commission.

In making this recommendation the Zone delegates felt that with only two representatives from the Industry it was important that the two major areas of the State be represented. Further, they felt, that dealer philosophies, area economic situations, customer relations and public acceptance would be broadly increased if this commission was truly representative of the State and Industry as a whole.

throughout Zone F. In fact, Al tells us that the advice and help he can give to any CSEA member, just in the field of collecting his past due accounts would more than pay the annual dues any CSEA member lays out.

Helping Al in the field with contacts will be "Al" Schutt whom many CSEA members of Zone F will remember as a sales representative for a major TV distributor up to 1952, and who understands your problems completely. Any non-members of CSEA reading this column are cordially invited to telephone the new Zone F office and Al Fischer will call on you with more information on membership and the many benefits to be derived therefrom. Why not give him a call now!

ZONE "B" DELEGATES DISCUSS INDIVIDUAL BUSINESS POLICIES

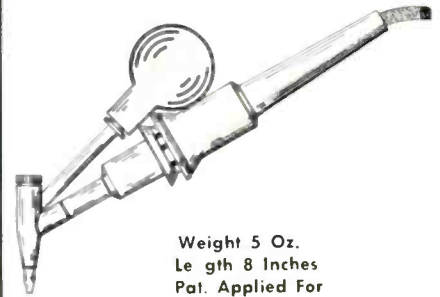
At the recent Zone "B" meeting of the California State Electronics Association in Oakland, the delegates spent over two hours going over individual business problems and policies.

During this discussion it was brought out that all Associations should emphasize mutual help among the members and that a complete re-evaluation should be made of service charges and how they are determined. Many felt that charges should be based on knowledge rather than straight time. Although there is always a chance of pricing your-

self out of the market it is impossible to do so if top service is given.

In discussing the sale of Television it was brought out that dealers should consider, first of all, selling consoles rather than portables since a customer will be more inclined to repair a high price set rather than a portable. It was also suggested that in taking trade-ins you should think about giving it back to the customer. Possibly you could give them an estimate, after the new set is delivered, and turn that trade-in into a service sale. It also makes the customer a two or three set owner.

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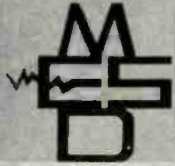
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PRESIDENT'S MESSAGE



By
**EMMETT
MEFFORD**

I am very pleased to hear from various areas in the State that a number of Servicing Dealer Shops are joining the California State Electronics Association. Also a report from Mr. James Wakefield, Executive Director, that there are, or soon will be four or five new chapters formed. Also a couple of old chapters which are being reactivated. This activity to me, means but one thing and that is the men in this Electronics Servicing Industry are awakening to the fact that business planning by group action and working together is one of the first prerequisites of creating a climate within the industry to solve the problems confronting our industry.

Two of the major problems prevalent

in the Electronics Servicing Industry, as I see them today, are the lack of qualified trained technicians and the failure of applying the proper Business Management in most shops, especially the smaller ones, for efficient operation of the business. The need of trained technicians I feel is most urgent so I have, through Committee action, asked that the Apprentice Training Program which has been approved by the State of California be activated so Service Dealers through their local chapters can take advantage of this training for their employees.

Trained or untrained, as technicians the growth and future of a service dealer's shop is dependent primarily on a good Business Management policy.

Proper Business Management will give you answers to a great many perplexing problems confronting the industry today. Service charge rates need to be figured after considering fixed and variable overhead expenses, your employees and your time applied to the business. These and numerous other questions, if properly considered will determine what you must charge for your hourly shop time and home service calls to correctly compensate you for the professional technical services which you perform.

A School of Business Management is being considered to be made available to the members of the California State Electronics Association.

LONGER SERVICE LIFE • BETTER PERFORMANCE • GREATER CUSTOMER SATISFACTION

BE WISE... STANDARDIZE ON

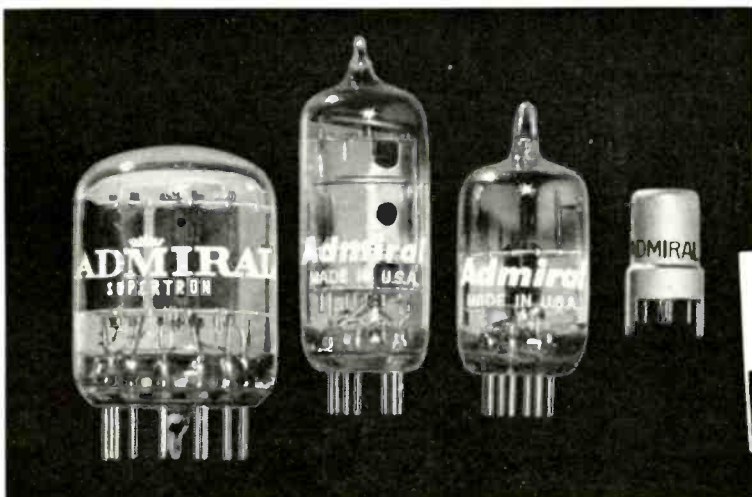
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1A1241 - Saves carrying a full-size caddy when not needed. Made of sturdy, stain-resistant lightweight molded plastic. And it can hold up to 210 receiving tubes at one time.

NUVISTOR PULLER:
Saves time. Grips nuvistors tightly to ease them from sockets quickly and effortlessly. 1A1347

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Saves time and trouble with bent pins on novars, nuvistors, 12-pin tubes and 7-, 9- and 10-pin miniatures. Trim, free-form design, complete with screws for attaching to workbench or tube caddy. 1A1369

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Saves customers' carpets, floors. 3' square with cushioned lining, fully skid and scratch-resistant. Packs easily, resists wrinkles. 1A1044A

NEW RCA FOAM-RUBBER FLOOR MAT:
Saves tired feet when you stand all day at your service bench. Put one at your primary work area, another behind your counter. Bright red RCA monogram dresses up your entire shop. 1A1381

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AC-DC CORDS

U/L APPROVED

12c

HI-FI SPEAKER WIRE

⊗ LOW LOSS FOR STRONG AUDIO

25 FT. COIL **29c** 50 FT. COIL **49c**
 100 FT. COIL **89c** 1000 FT. SPOOL **\$6.95**

NEW BRITISH MONARCH STEREO RECORD CHANGER



Complete with genuine Ronette stereo cartridge

case lot 4 to case **\$18.95** EACH

45 RPM Automatic Spindles for above . . . \$1.89 ea.
 Mounting board 2.25 ea.
 Full wooden finished base 3.95 ea.

HI-FI EQUIPMENT CABINET

MAHOGANY

\$12.95

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TUNG-SOL®

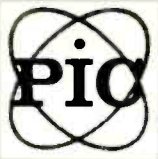
RADIO AND TV TUBES

Tube Type	Assorted			
	1-5	6-49	50-up	100-up
OZ4	1.20	1.08	.96	.86
OZAG	1.30	1.17	1.04	.94
1A3	3.27	2.95	2.62	2.36
1A5GT	2.12	1.91	1.70	1.53
1A7GT	2.87	2.59	2.30	2.07
1AD2	1.50	1.35	1.20	1.08
1AF4	2.65	2.38	2.12	1.91
1AX2	1.52	1.37	1.22	1.10
1B3GT	1.45	1.30	1.16	1.04
1C5GT	2.65	2.38	2.12	1.91
1DN5	1.25	1.12	1.00	.90
1G3GT/1B3GT	1.45	1.30	1.16	1.04
1H5GT	2.07	1.87	1.66	1.49
1I3	1.45	1.30	1.16	1.04
1K3	1.45	1.30	1.16	1.04
1L6	3.40	3.06	2.72	2.45
1LA6	3.10	2.79	2.48	2.23
1LB4	4.32	3.89	3.46	3.11
1LC6	4.15	3.73	3.32	2.99
1LE3	3.50	3.15	2.80	2.52
1LG5	3.40	3.06	2.72	2.45
1LH4	4.02	3.62	3.22	2.90
1LN5	4.07	3.67	3.26	2.93
1NSGT	2.60	2.34	2.08	1.87
1R5	1.52	1.37	1.22	1.10
1S4	2.17	1.96	1.74	1.57
1S5	1.45	1.30	1.16	1.04
1T4	1.45	1.30	1.16	1.04
1U4	1.45	1.30	1.16	1.04
1V5	1.92	1.19	1.06	.95
1V7	2.92	2.64	2.34	2.11
1V2	1.05	.94	.84	.76
1X2A	1.52	1.37	1.22	1.10
1X2B	1.52	1.37	1.22	1.10
2A3	5.25	4.72	4.20	3.78
2AF4B	2.02	1.82	1.62	1.46
2AH2	1.60	1.44	1.28	1.15
2AS2	3.20	2.88	2.56	2.30
2BN4A	1.27	1.15	1.02	.92
2CW4	2.22	2.00	1.78	1.60
2CY5	1.52	1.37	1.22	1.10
2EN5	1.70	1.53	1.36	1.22
2ER5	1.75	1.57	1.40	1.26
2FH5	1.52	1.37	1.22	1.10
2FS5	1.55	1.39	1.24	1.12
2FY5	1.40	1.26	1.12	1.01
2GU5	3.20	2.88	2.56	2.30
2HA5	4.05	3.64	3.24	2.92
3A2	2.42	2.18	1.94	1.75
3A3	1.70	1.53	1.36	1.22
3AF4A	2.02	1.82	1.62	1.46
3AL5	.92	.83	.74	.67
3AU6	1.07	.97	.86	.77
3AV6	4.92	4.43	3.94	3.55
3B2	1.17	1.06	.94	.85
3BC5	1.12	1.01	.90	.81
3BE6	1.52	1.37	1.22	1.10
3BN4A	1.92	1.73	1.54	1.39
3BU8	1.67	1.51	1.34	1.21
3BY6	1.45	1.30	1.16	1.04
3E6	1.15	1.03	.92	.83
3CB6	1.15	1.03	.92	.83
3CE5	1.17	1.06	.94	.85
3CF8	1.35	1.21	1.08	.97
3CS6	1.32	1.19	1.06	.95
3CY5	1.62	1.46	1.30	1.17
3DG4	1.82	1.64	1.46	1.31
3DK6	1.20	1.08	.96	.86
3DT6A	1.10	.99	.88	.79
3EH7 See XF183/4EH7				
3EJ7 See XF184/5EJ7				
3ER5	1.75	1.57	1.40	1.26
3FS5	1.52	1.37	1.22	1.10
3GK5	2.07	1.87	1.66	1.49
3HAS	4.05	3.64	3.24	2.92
3HF4	3.20	2.88	2.56	2.30
3Q4	1.77	1.60	1.42	1.28
3Q5GT	2.82	2.54	2.26	2.03
3S4	1.60	1.44	1.28	1.15
3V4	1.25	1.12	1.00	.90
4AU6	1.17	1.06	.94	.85
4AV6	.82	.83	.74	.67
4BC5	1.17	1.06	.94	.85
4BC8	2.02	1.82	1.62	1.46
4BN6	1.92	1.73	1.54	1.39
6CD6GA	2.90	2.61	2.32	2.08
6CF6	1.27	1.15	1.02	.92
6CG7	1.22	1.10	.98	.88
6CG8A	1.65	1.48	1.32	1.19
6CH8	2.60	2.34	2.08	1.87
6CK4	1.50	1.35	1.20	1.08
6CL6	1.87	1.69	1.50	1.35
6CL8A	1.67	1.51	1.34	1.21
6CM6	1.65	1.48	1.32	1.19
6CM7	1.45	1.30	1.16	1.04
6CM8	2.12	1.91	1.70	1.53
6CN7	1.45	1.30	1.16	1.04
6CQ4	1.50	1.35	1.20	1.08
6CQ8	1.75	1.57	1.40	1.26
6CR6	1.20	1.08	.96	.86
6CS6	1.32	1.19	1.06	.95
6CS7	1.47	1.33	1.18	1.06
6CU5	1.32	1.19	1.06	.95
6CU6 See 6BQ6GTB/6CU6				
6CU8	2.17	1.96	1.74	1.57
6CW4	2.22	2.00	1.78	1.60
6CW5	1.75	1.57	1.40	1.26
6CX8	1.92	1.73	1.54	1.39
6CY5	1.42	1.28	1.14	1.03
6CY7	1.60	1.44	1.28	1.15
6CZ5	2.05	1.84	1.64	1.48
6D6	3.90	3.51	3.12	2.81
6D10	1.87	1.69	1.50	1.35
6DA4	1.45	1.30	1.16	1.04
6DB5	2.65	2.38	2.12	1.91

Tube Type	Assorted			
	1-5	6-49	50-up	100-up
4BQ7A	2.00	1.80	1.60	1.44
4BS8	1.92	1.73	1.54	1.39
4BU8	1.67	1.51	1.34	1.21
4BZ8	1.12	1.01	.90	.81
4BZ7	2.02	1.82	1.62	1.46
4CB6	1.15	1.03	.92	.83
4CS6	1.17	1.06	.94	.85
4CY5	1.42	1.28	1.14	1.03
4DE6	1.32	1.19	1.06	.95
4DT6A	1.12	1.01	.90	.81
4EH7 See YF183/4EH7				
4EJ8 See YF184/4EJ8				
4ES8	2.30	2.07	1.84	1.66
4EW6	1.32	1.19	1.06	.95
4GK5	2.07	1.87	1.66	1.49
5AM8	1.77	1.60	1.42	1.28
5AN8	2.00	1.80	1.60	1.44
5AQ5	1.17	1.06	.94	.85
5AR4	2.25	2.02	1.80	1.62
5AS4A	1.32	1.19	1.06	.95
5AS8	2.07	1.87	1.66	1.49
5AT8	1.82	1.64	1.46	1.31
5AU4	1.70	1.53	1.36	1.22
5AV8	2.02	1.82	1.62	1.46
5AW4	1.40	1.26	1.12	1.01
5AZ4	2.82	2.54	2.26	2.03
5B8	2.65	2.38	2.12	1.91
5BC3	1.15	1.03	.92	.83
5BE8	1.65	1.48	1.32	1.19
5BK7A	1.70	1.53	1.36	1.22
5BQ7A	2.02	1.82	1.62	1.46
5BR8	1.82	1.64	1.46	1.31
5BT8	1.65	1.48	1.32	1.19
5BW8	1.70	1.53	1.36	1.22
5CG8	1.67	1.51	1.34	1.21
5CL8A	1.75	1.57	1.40	1.26
5CM8	1.90	1.71	1.52	1.37
5CQ8	2.02	1.82	1.62	1.46
5CZ5	2.17	1.96	1.74	1.57
5DH8	2.55	2.29	2.04	1.84
5DJ4	1.32	1.19	1.06	.95
5EA8	1.57	1.42	1.26	1.13
5EU8	1.67	1.51	1.34	1.21
5EW6	1.32	1.19	1.06	.95
5FG7	1.37	1.24	1.10	.99
5FV8	1.57	1.42	1.26	1.13
5GM6	1.32	1.19	1.06	.95
5J6	1.42	1.28	1.14	1.03
5T4	6.05	5.65	4.89	4.40
5T8	1.82	1.64	1.46	1.31
5U4G	1.05	.94	.84	.76
5U4GB	1.05	.94	.84	.76
5U8	1.85	1.48	1.32	1.19
5V3A	1.92	1.73	1.54	1.39
5V4GA	1.90	1.71	1.52	1.37
5V6GT	1.20	1.08	.96	.86
5X4G	1.67	1.51	1.34	1.21
5X8	1.72	1.55	1.38	1.24
5Y3GT	.87	.79	.70	.63
5Y4GT	1.32	1.19	1.06	.95
5Z3	1.65	1.48	1.32	1.19
5Z4	4.17	3.76	3.34	3.01
6A7	4.25	3.82	3.40	3.06
6A8	3.42	3.08	2.74	2.47
6A8GT	4.30	3.87	3.44	3.10
6AB4	1.07	.97	.86	.77
6AB5/6N5	4.02	3.62	3.22	2.90
6AB7	4.12	3.71	3.30	2.97
6AC5GT	3.12	2.81	2.50	2.25
6AC7	2.75	2.47	2.20	1.98
6AD7G	4.70	4.23	3.76	3.38
6AF3	1.45	1.30	1.16	1.04
6AF4A	2.00	1.80	1.60	1.44
6AF6G	3.10	2.79	2.48	2.23
6AF11	2.50	2.25	2.00	1.80
6AG5	1.37	1.24	1.10	.99
6AG7	3.10	2.79	2.48	2.23
6AG11	1.77	1.60	1.42	1.28
6AH4GT	1.72	1.55	1.38	1.24
6AH6	2.35	2.11	1.88	1.69
6AK5	2.20	1.96	1.76	1.58
6AL5	.92	.83	.74	.67
6AL7GT	2.87	2.59	2.30	2.07
6AL11	2.20	1.98	1.76	1.58
6AM4A	2.95	2.65	2.36	2.12
6AM4A	1.72	1.55	1.38	1.24
6AN4A	3.27	2.95	2.62	2.36
6FM7	1.72	1.55	1.38	1.24
6FM8	1.50	1.35	1.20	1.08
6FQ5A	2.02	1.82	1.62	1.46
6FQ7	1.15	1.03	.92	.83
6FS5	1.52	1.37	1.22	1.10
6FV8	1.97	1.78	1.58	1.42
6FV8	1.57	1.42	1.26	1.13
6FW5	2.05	1.84	1.64	1.48
6FW8 See 6ES8				
6FY5	1.40	1.26	1.12	1.01
6GE5	2.05	1.84	1.64	1.48
6GF5	1.85	1.66	1.48	1.33
6GH8	1.57	1.42	1.26	1.13
6GJ5	2.27	2.05	1.82	1.64
6GK5	2.02	1.82	1.62	1.46
6GK6	1.45	1.30	1.16	1.04
6GM6	1.45	1.30	1.16	1.04
6GN8	1.97	1.78	1.58	1.42
6GT5	4.20	3.78	3.36	3.02
6GU5	3.10	2.79	2.48	2.23
6GU7	2.85	2.65	2.36	2.12
6GW6	2.07	1.87	1.66	1.49
6CX6	1.15	1.03	.92	.83
6CY8	1.90	1.71	1.52	1.37
6G11	2.17	1.96	1.74	1.57
6H6	2.00	1.80	1.60	1.44
6H85	4.45	4.00	3.56	3.20
6HES	3.95	3.55	3.16	2.84
6HF8	1.97	1.78	1.58	1.42
6HS6	2.50	2.25	2.00	1.80

Tube Type	Assorted			
	1-5	6-49	50-up	100-up
6AN8A	2.00	1.80	1.60	1.44
6AQ5A	1.07	.97	.86	.77
6AQ6	1.90	1.71	1.52	1.37
6AQ7GT	2.00	1.80	1.60	1.44
6AQ8	1.57	1.42	1.26	1.13
6AR5	1.32	1.19	1.06	.95
6AR8	2.57	2.32	2.06	1.85
6AR11	2.17	1.96	1.74	1.57
6AS5	1.45	1.30	1.16	1.04
6AS8	1.90	1.71	1.52	1.37
6AS11	2.50	2.25	2.00	1.80
6AT6	.85	.85	.76	.68
6AT8A	1.90	1.71	1.52	1.37
6AU4GTA	1.80	1.62	1.44	1.30
6AUSGT	2.15			

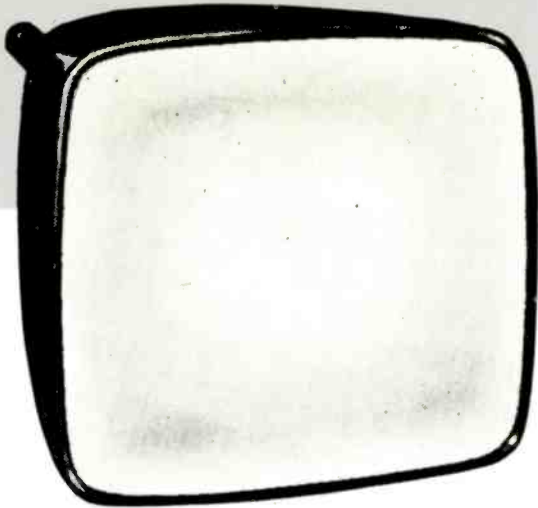
Tube Type	Assorted				Tube Type	Assorted				Tube Type	Assorted			
	1-5	6-49	50-up	100-up		1-5	6-49	50-up	100-up		1-5	6-49	50-up	100-up
6DB6	1.07	.97	.86	.77	6HS8	1.60	1.44	1.28	1.15	7E7	3.35	3.01	2.68	2.41
6DC6	1.70	1.53	1.36	1.22	6HZ6	2.65	2.38	2.12	1.91	7EY6	1.57	1.42	1.26	1.13
6DE4	1.42	1.28	1.14	1.03	6HZ8	2.17	1.96	1.74	1.57	7F7	3.97	3.58	3.18	2.86
6DF6	1.27	1.15	1.02	.92	6IS	1.82	1.64	1.46	1.31	7F8	4.37	3.94	3.50	3.15
6DG6GT	1.27	1.15	1.02	.92	6J5GT	1.82	1.64	1.46	1.31	7H7	3.20	2.88	2.56	2.30
6DJ8	1.67	1.51	1.34	1.21	6J6	1.40	1.26	1.12	1.01	7HG8	1.77	1.60	1.42	1.28
6DK6	1.17	1.06	.94	.85	6J6A	1.40	1.26	1.12	1.01	7K7	4.30	3.87	3.44	3.10
6DN6	3.72	3.35	2.98	2.68	6J7	2.47	2.23	1.98	1.78	7L7	3.20	2.88	2.56	2.30
6DN7	1.75	1.57	1.40	1.26	6J7GT	2.90	2.61	2.32	2.09	7M7	3.77	3.40	3.02	2.72
6DQ5	4.17	3.76	3.34	3.01	6J86	2.27	2.05	1.82	1.62	7Q7	3.10	2.79	2.48	2.23
6DQ6A	2.07	1.87	1.66	1.49	6JC8	1.52	1.37	1.22	1.10	7R7	3.32	2.99	2.66	2.39
6DQ6B	2.07	1.87	1.66	1.49	6JE6	9.00	8.10	7.20	6.48	7V7	2.45	2.20	1.96	1.76
6DR7	1.70	1.53	1.36	1.22	6JH6	2.60	2.34	2.08	1.87	7W7	3.50	3.15	2.80	2.52
6DS4	2.22	2.00	1.78	1.60	6JH8	2.17	1.96	1.74	1.57	7X6	1.65	1.48	1.32	1.19
6DS5	1.75	1.57	1.40	1.26	6JH6	1.67	1.51	1.34	1.21	7X7	4.05	3.64	3.24	2.92
6DTS	1.62	1.46	1.30	1.17	6JZ8	2.95	2.65	2.36	2.12	7Y4	3.57	3.22	2.86	2.57
6DT6A	1.07	.97	.86	.77	6JH6	3.75	3.37	3.00	2.70	7Z4	3.45	3.10	2.76	2.48
6DT9	1.90	1.71	1.52	1.37	6J11	2.17	1.96	1.74	1.57	8AU8A	2.02	1.82	1.62	1.46
6DW5	2.02	1.82	1.62	1.46	6K6GT	1.32	1.19	1.06	.95	8AW8A	1.85	1.66	1.48	1.33
6DX8 See ECL84/6DX8					6K7	2.47	2.23	1.98	1.78	8BA8A	1.82	1.64	1.46	1.31
6E5	2.55	2.29	2.04	1.84	6K7GT	2.47	2.23	1.98	1.78	8BH8	1.77	1.60	1.42	1.28
6EA7	1.90	1.71	1.52	1.37	6K8	3.75	3.37	3.00	2.70	8BN8	1.62	1.46	1.30	1.17
6EA8	1.60	1.44	1.28	1.15	6K11	1.92	1.73	1.54	1.39	8BQ5	1.45	1.30	1.16	1.04
6EB8	2.10	1.89	1.68	1.51	6L6	4.30	3.87	3.44	3.10	8CQ7	1.25	1.12	1.00	.90
6EH5	1.52	1.37	1.22	1.10	6L6GC	2.17	1.96	1.74	1.57	8CM7	1.45	1.30	1.16	1.04
6EH7 See EF183/6EH7					6L7	3.67	3.31	2.94	2.65	8CN7	1.40	1.26	1.12	1.01
6EJ8	1.57	1.42	1.26	1.13	6N7	2.50	2.25	2.00	1.80	8CS7	1.65	1.48	1.32	1.19
6EJ7 See EF184/6EJ7					6N7GT	2.62	2.36	2.10	1.89	8CW5	2.80	2.52	2.24	2.02
6EM5	1.70	1.53	1.36	1.22	6Q7	2.65	2.38	2.12	1.91	8CX8	2.17	1.96	1.74	1.57
6EM7	2.55	2.29	2.04	1.84	6Q7GT	2.62	2.34	2.26	2.00	8EB8	2.00	1.80	1.60	1.44
6EQ7	1.45	1.30	1.16	1.04	6R7	2.72	2.45	2.18	1.96	8ET7	2.20	1.98	1.76	1.58
6ER5	1.90	1.71	1.52	1.37	6S4A	1.22	1.10	.98	.88	8FQ7	1.37	1.24	1.10	.99
6ES5	1.52	1.37	1.22	1.10	6S7	3.60	3.24	2.88	2.59	8GN8	1.97	1.78	1.58	1.42
6ES8	2.90	2.61	2.32	2.09	6S8GT	2.20	1.98	1.76	1.58	8JV8	3.25	2.92	2.60	2.34
6EU7	1.35	1.21	1.08	.97	6SA7	2.15	1.93	1.72	1.55	9A8	2.00	1.80	1.60	1.44
6EU8	1.65	1.48	1.32	1.19	6SA7GT	2.15	1.93	1.72	1.55	9AU7	1.40	1.26	1.12	1.01
6EV5	1.50	1.35	1.20	1.08	6SB7Y	3.15	2.83	2.52	2.27	9CL8	1.57	1.42	1.28	1.13
6EV7	1.45	1.30	1.16	1.04	6SC7	2.25	2.02	1.80	1.62	9EA8	3.20	2.88	2.56	2.30
6EW6	1.25	1.12	1.00	.90	6SF5	1.85	1.66	1.48	1.33	10AL11	4.45	4.00	3.56	3.20
6EW7	2.90	2.61	2.32	2.09	6SFGT	1.60	1.44	1.28	1.15	10C8	2.12	1.91	1.70	1.53
6EY6	1.70	1.53	1.36	1.22	6SF7	3.12	2.81	2.50	2.25	10DE7	1.70	1.53	1.36	1.22
6EZ5	1.80	1.62	1.44	1.30	6SG7	2.30	2.07	1.84	1.66	10EG7	2.30	2.07	1.84	1.66
6EZ8	1.90	1.71	1.52	1.37	6SH7	2.32	2.09	1.86	1.67	10HF9	2.32	2.09	1.86	1.67
6F5	2.30	2.07	1.84	1.66	6SJ7	2.07	1.87	1.66	1.49	10JA8	3.80	3.42	3.04	2.74
6F6	2.92	2.63	2.34	2.11	6SJ7GT	2.07	1.87	1.66	1.49	11CY7	1.62	1.46	1.30	1.17
6F6G	2.92	2.63	2.34	2.11	6SK7	1.97	1.78	1.58	1.42	12ABGT	4.42	3.98	3.54	3.19
6F6GT	2.92	2.63	2.34	2.11	6SK7GT	2.10	1.89	1.68	1.51	12AB5	1.75	1.57	1.40	1.26
6F7	5.85	5.27	4.68	4.21	6SL7GT	1.75	1.57	1.40	1.26	12AC6	1.10	.99	.88	.79
6F8G	4.47	4.03	3.58	3.22	6SN7GTB	1.30	1.17	1.04	.94	12AD8	1.20	1.08	.96	.86
6FA7	1.45	1.30	1.16	1.04	6SQ7	1.87	1.69	1.50	1.35	12A8A	1.20	1.08	.96	.86
6FD7	2.52	2.27	2.02	1.82	6SQ7GT	1.90	1.71	1.52	1.37	12AE7	1.97	1.69	1.50	1.35
6FG5	2.60	2.34	2.08	1.87	6SR7	1.95	1.75	1.56	1.40	12AF3	1.45	1.30	1.16	1.04
6FG6 See EMB4/6FG6					6SS7	2.75	2.47	2.20	1.98	12AF8	1.37	1.24	1.10	.99
6FG7	1.45	1.30	1.16	1.04	6T4	2.72	2.45	2.18	1.96	12AH7GT	2.77	2.50	2.22	2.00
6FH5	1.45	1.30	1.16	1.04	6T8A	1.70	1.53	1.36	1.22	12AL5	.85	.85	.78	.68
6FH8	1.82	1.64	1.46	1.31	6U5	2.77	2.50	2.22	2.00	12AL8	3.27	2.95	2.62	2.36
6FJ7	1.82	1.64	1.46	1.31	6U8A	1.85	1.48	1.32	1.19	12AQ6	1.30	1.17	1.04	.94
12AT6	.92	.83	.74	.67	12SA7GT	2.15	1.93	1.72	1.55	25BQ6GTB	2.30	2.07	1.84	1.66
12AT7	1.52	1.37	1.22	1.10	12SC7	2.75	2.47	2.20	1.98	25C5	1.07	.97	.86	.77
12AU6	1.07	.97	.86	.77	12SF5	2.05	1.84	1.64	1.48	25CA5	1.55	1.39	1.24	1.12
12AU7A	1.22	1.10	.98	.88	12SF7	3.30	2.97	2.64	2.38	25CD6CB	3.05	2.74	2.44	2.20
12AV5GA	2.02	1.82	1.62	1.46	12SG7	2.32	2.09	1.86	1.67	25DN6	3.17	2.86	2.54	2.29
12AV6	.82	.74	.66	.59	12SH7	2.87	2.59	2.30	2.07	25EC6	2.85	2.56	2.28	2.05
12AV7	1.82	1.64	1.46	1.31	12SJ7	2.10	1.89	1.68	1.51	25EH5	1.25	1.12	1.00	.90
12AW6	1.65	1.48	1.32	1.19	12SJ7GT	2.10	1.89	1.68	1.51	25L6	4.42	3.98	3.54	3.19
12AX4GT	1.35	1.21	1.08	.97	12SK7	1.95	1.78	1.58	1.42	25L6GT	1.32	1.19	1.06	.95
12AX4GTB	1.35	1.21	1.08	.97	12SK7GT	1.95	1.78	1.58	1.42	25W4GT	1.35	1.21	1.08	.97
12AX7A	1.27	1.15	1.02	.92	12SL7GT	1.87	1.69	1.50	1.35	25Z5	2.30	2.07	1.84	1.66
12AY7	2.37	2.14	1.90	1.71	12SN7GT	1.35	1.21	1.08	.97	25Z6GT	1.52	1.37	1.22	1.10
12AZ7A	1.37	1.24	1.10	.98	12SN7GTA	1.35	1.21	1.08	.97	27	2.70	2.43	2.16	1.94
12BA4	1.42	1.28	1.14	1.03	12SQ7	1.87	1.69	1.50	1.35	32EC6	1.27	1.15	1.02	.92
12BA6	.82	.74	.66	.59	12SQ7GT	1.87	1.69	1.50	1.35	35A5	3.00	2.70	2.40	2.16
12BA7	2.97	2.68	2.38	2.14	12U7	1.32	1.19	1.06	.95	35B5	1.70	1.53	1.36	1.22
12BD6	1.22	1.10	.98	.88	12V6GT	1.45	1.30	1.16	1.04	35C5	1.07	.97	.86	.77
12BE6	.87	.79	.70	.63	12W6GT	1.60	1.44	1.28	1.15	35EH5	1.15	1.03	.92	.83
12BFB	1.10	.99	.88	.79	12X4	.95	.85	.76	.68	35GL6	1.25	1.12	1.00	.90
12BH7A	1.52	1.37	1.22	1.10	13DE7	1.47	1.33	1.18	1.06	35L6GT	1.20	1.08	.96	.86
12BK5	2.00	1.80	1.60	1.44	13DR7	1.70	1.53	1.36	1.22	35W4	.55	.49	.44	.40
12BL6	1.32	1.19	1.06	.95	13EM7	2.57	2.32	2.06	1.85	35Y4	2.40	2.16	1.92	1.73
12BQ6GTB	2.25	2.02	1.80	1.62	13GB5	3.85	3.46	3.08	2.77	35Z3	2.50	2.25	2.00	1.80
12BQ6GTB/12CU6	2.22	2.00	1.78	1.60	13GF7	4.60	4.14	3.68	3.31	35Z4GT	1.35	1.21	1.08	.97
12BR7	1.65	1.44	1.28	1.15	13J10	5.35	4.81	4.29	3.86	35Z5GT	.92	.83	.74	.65
12BV7	1.75	1.57	1.40	1.26	14A7	2.95	2.65	2.36	2.12	36AM3	.80	.72	.64	.58
12BW4	1.45	1.30	1.16	1.04	14B6	2.80	2.52	2.24	2.02	41	2.90	2.61	2.32	2.09
12BY7A	1.60	1.44	1.28	1.15	14C7	3.30	2.97	2.64	2.38	42	2.57	2.32	2.06	1.85
12BZ6	1.12	1.01	.90	.81	14F7	4.47	4.03	3.58	3.22	43	3.80	3.42	3.04	2.74
12RZ7	2.20	1.98	1.76	1.58	14F8	3.35	3.01	2.68	2.41	47	4.57	4.12	3.66	3.29
12C8	4.85	4.36	3.88	3.49	14GT8	1.60	1.44	1.28	1.15	50A1	3.32	2.99	2.66	2.39
12CA5	1.42	1.28	1.14	1.03	14Q7	3.10	2.79	2.48	2.23	50A5	3.12	2.81	2.50	2.2



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technical section

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Irv Tjomsland, Editor

ELEMENTS OF SWEEP CIRCUITS

1-1. THE ILLUSION OF MOTION.

Motion pictures were made possible when Edison discovered, or at least exploited, the fact that if a sequence of pictures with an object slightly displaced in each view were displaced rapidly the subject would appear to move.

The effect of motion increased as the number of pictures displayed per second increased and the illusion became very evident at about fifteen images per second. At twenty per second flicker and jerkiness were reduced, and at thirty the effect was very natural.

He made use of the factor in human vision known as "retentivity of image." The eye requires a measurable amount of time to resolve a complete image, usually about one sixteenth of a second, and when the rate of change exceeds the ability of the eye to resolve a separate image, the series of images will appear to merge.

1-2. DISSECTION OF THE IMAGE.

If the eye could be deceived by a rapid display of complete pictures pioneers suggested that if a spot of light could be moved to cover an area in less time than the eye could resolve a single image, would the eye see a lighted area, and if the light could be turned on and off to correspond to light and dark portions of a picture would the eye retain the motion in the form of a complete picture? Early experiments proved the idea feasible when suitable light intensities were employed, and the next step was to display a sequence of scanned images at a rate that would create the illusion of motion.

1-3. EARLY EXPERIMENTS.

One of the many directions followed in the early experiments involved the use of a light focused on a magnetically controlled mirror. Some progress was made, particularly in oscillographic applications, but the usefulness of the device was limited because the mirror represented mass, regardless of efforts to reduce size and weight, and inertia inevitably limited the high frequency movement to inadequate values. Other experiments involved scanning discs and drums, fields of miniature lights, and other systems, but all suffered from inability to resolve fine detail, low light output, and synchronization problems.

1-4. IMAGE REQUIREMENTS.

To create the image of light it is obvious that the source of light has to be subject to high speed "on-off" control,

and the problems of early experimenters can be illustrated when characteristics of early light sources are examined. Conventional electric lights are unsuitable because the process of going from dark to light is regulated by the filament warm up time which requires a major part of a second. Early use of neon type lamps was slightly more successful, but the maximum on-off rate was about fifty thousand per second. If this is compared to modern requirements of four million per second the problem can be better understood.

1-5. ENTER THE CATHODE RAY TUBE (CRT).

In one step the Cathode Ray Tube overcame the mechanical and illumination deficiencies of the early experiments. The light output is determined by the energy of the beam (high voltage) and the efficiency of the phosphor screen. The electron beam is not affected by inertia and can be moved in precise patterns by electrostatic or electromagnetic deflection fields to form areas of light.

The tube is a high vacuum type with no ionization delays and the grid can readily change the light output many millions of times per second.

With these resources television as we know it became a possibility.

1-6. NEED FOR STANDARDS.

Even though the television pioneers were quick to realize the potentialities of the Cathode Ray Tube, certain requirements became obvious:

If a beam in a receiver CRT were to reproduce light and dark conditions as sensed by the beam in the image detector it would have to be moved in an identical manner with the beam in the camera tube.

The beam in the camera tube, and the beam in every receiving CRT would have to start each field, frame, and line at the same instant and accomplish these movements in the same length of time. If the time element could be maintained the receiver tube could reproduce a picture of any size even though the original camera image were very much different.

To lock the receiver and camera beams would require a system of synchronizing signals and these signals would have to be included with the light information (video). Certain other information would be helpful if it could be included, so the problem was recognized.

A committee was established to study the subject and after several changes established the present transmission

standards for combining video, blanking, and synchronizing signals. With only minor changes to permit inclusion of color information these standards have remained in force since their adoption in the middle 'forties.

1-7. HORIZONTAL LINE STANDARDS.

A total of 525 lines are scanned 30 times per second to produce a standard black and white image. Multiplying the number of lines by the number of images indicates that a total of 15,750 lines will be produced per second.

To provide a convenient unit of time for measurement, microseconds are employed.

Divide one million microseconds by 15,750 lines and it will be found that $63.49+$ microseconds are devoted to the production of each line.

1-8. VERTICAL DEFLECTION STANDARDS.

Each image, known as a frame, consists of 525 lines. A frame is made up of two fields, each of which is allotted $262\frac{1}{2}$ lines with the first field starting at the upper left and progressing to the bottom of the screen, whereupon the beam is returned to the top of the screen to start the second field. The second field normally starts at the top center of the screen and scans each line between the equivalent lines of the first field in a process referred to as interlace.

Since 30 complete frames are scanned per second, $33,333\frac{1}{3}$ microseconds are devoted to each frame, and it follows that if each frame consists of two fields each field will have a time duration of $16,666\frac{2}{3}$ microseconds.

1-9. SCANNING TIME DIVISION.

Light output of a scanning system will be directly related to the amount of time the raster can be illuminated.

A problem arises because of the obvious fact that whenever a beam scans from left to right (traces) it must return to the left (retrace) before it can start the next line.

Similarly when a field is scanned from top to bottom (traced) it must be returned to the top (retraced) before the second field can be produced.

A little thought will indicate that the beam must be extinguished or blanked during the retrace in both deflection axis.

It will follow that if vertical retrace time is equal to trace time the beam will be extinguished half the time.

But that is not all: If horizontal line retrace time is equal to trace time the beam will have to be blanked 50% of the remaining time and the result will be that the screen will be illuminated only 25% of the time. This would be both impractical and inefficient, and engineers, concerned with the establishment of deflection standards, made provisions which greatly reduced the loss of efficiency.

1-10. HORIZONTAL TIME DIVISION.

Beam movement from left to right was specified to require 56 microseconds, and retrace 7.5 microseconds.

1-11. VERTICAL TIME DIVISION.

Beam movement from top to bottom for each field was specified to require 15,500 microseconds, and retrace was established as 1166 microseconds.

1-12. HORIZONTAL BLANKING.

In Section 1-9 mention is made of the need for beam cut off, or blanking, during retrace to avoid interference with

trace information. Both horizontal and vertical blanking signals are included in the transmitted signal, and while they do not guarantee elimination of retrace information the signals themselves play a very important part in receiver information.

Standards call for the blanking signal to cut off the beam before the end of each line or field, during retrace, and for a short period after each line or field is started.

Standard practice calls for the end of a line to be blanked for about 2 microseconds before retrace is initiated. This will correspond to about $\frac{2}{3}$ of an inch on a 21 inch CRT. The blanked area is blacker than the program material and no light output is visible as the beam is returned from right to left. Blanking is continued for about one microsecond after the new line is started, and will correspond to about $\frac{1}{3}$ inch on the 21 inch CRT.

It should be mentioned at this point that while it is most important that the transmission be held closely to standard, receivers have more leeway. It is possible to operate a receiver with 53.5 microsecond trace and 10 microsecond retrace, but if this is done annoying interference will develop at either side if any drift occurs in the local oscillator system. Blanking from a receiver source can be added to avoid this interference, but if this is done picture information at the edges will be lost.

1-13. VERTICAL BLANKING.

The dark notch in the lower center of the picture is the blacker than the blanking black of the vertical sync pulse. Several lines with the black notch show which proves that blanking starts before the bottom line is scanned, and several lines appear at the top before picture information starts.

Section 1-11 indicates that vertical trace occupies 15,500 microseconds and that 1166 microseconds are allowed for retrace. Transmission standards call for 1250 microseconds of blanking to allow for variations of operation in receivers. Good practice calls for about five lines to be blanked before retrace is initiated, and about 10 to 13 of the top lines to remain blanked before picture information appears.

1-14. BEAM OR SPOT "ON" TIME.

Section 1-9 indicated that if trace and retrace intervals were equal in both vertical and horizontal planes the screen would be blanked 75% of the time. How much better is the standard system?

It can be calculated if the known factors are considered. If 7% of the lines that go to make up a vertical frame are blanked out, about 37 lines will be concerned. Multiplying 37 lines by 63 microseconds equals 2331 microseconds of "off" time for vertical purposes.

If 488 lines remain active, and each active line is blanked 10 microseconds the "off" time will be an additional 4880 microseconds, which added to the vertical "off" time will equal 7211.

7211 microseconds of "off" time out of each $33,333\frac{1}{3}$ allowed per frame equals about 21.4% of "off" time which represents a tremendous gain in efficiency over the 75% which would have been required if equal time made been established for trace and retrace.

1-16. RANGE OF MATERIAL.

The material in the following articles will be devoted to sweep circuit service problems.

Sweep circuits are examples of applications of alternating current power and can be understood and serviced efficiently only if the reader considers the alternating current functions in addition to the more accepted DC voltage and resistance information.

CREDIT BUYING AND COLLECTIONS

- How To Evaluate a Credit Risk
- How Much Credit Should You Allow?
- When and How to Make Collections
- How to Write an Effective Collection Letter



A Special MESD
FEATURE:

The system of credit buying is a relatively new practice and American's seem to have developed and made use of it more than any other nation in the world. The advantages of credit buying are great for both the purchaser and the dealer that sells the goods on credit. It, of course, allows us to run our lives more systematically and adds the more pleasurable things to a home that couldn't be afforded any other way. The technique of buying without cash has raised the country's standard of living and inanced mass production of goods. Mass production itself would be crippled without the mass markets, access which is possible only through installment buying.

Of course in the modern age of credit card buying and the "sign here attitude" of the American public, many abuses have occurred on both sides of the fence. The purchaser is often tempted to live above his tangible means, while there are unscrupulous dealers who take advantage of un-knowing individuals, by making use of ingenious payment plans that could put anyone in a state of financial chaos.

The important point, of course, is to develop more ideal methods of responsibility by both parties concerned. It is up to the service dealer to be able to recognize a "bad credit" risk the moment he applies. How can you determine whether future promises of payment will be upheld?

It's not actually necessary to be a seasoned psychologist, constantly reasoning the inter-meaning of a prospective credit risk—but it is definitely important to be able to simply analyze the basic characteristics, with the aid of a little investigation on your part, this method could simply be called "Everyday Common Sense."

Credit investigation of clients can generally be broken down into what is called the four "C's" of credit, which are: character, capacity, capital, conditions.

That thing called "character" should be picked off right away, as many clients seem to be lacking it when it is time to pay the bills. This is a difficult problem because of the external and internal habits of every individual. It would generally be a good rule to check into this persons reputation with the people he often comes in contact with and the people that could best judge him beyond his surface quality.

(Continued Next Page)

CREDIT BUYING AND COLLECTIONS

(Continued)

Capacity, is another one of the four "C's." It is an established fact that the chronically sick, tired and beaten must be labelled as generally bad credit risks. Even if they have the best intentions of paying due debts, these clients come across problems that they are unable to control.

Capital, of course, is usually the easiest of the four "C's" to determine. It is easily found impersonal information and definitely a tangible item.

It is, of course, important to keep accurate credit records and an Accounts Receivable Register that clearly indicates the payment behavior of each client. This account is therefore a quick guide to your action in the future. Keep separate index card file records, including such information as: Customers age—as persons under 21 may rescind contracts in most states unless the contracts are for necessities; Marital Status—A husband is responsible for his wife's necessities and the extent of these necessities differs with the law in each state; Employment Status—Such information should consist of employer's name, how long the customer has worked for him (steadiness is always a good credit sign, whether it refers to living in the same house or working for the same firm), and how much salary he makes. When both are working, separate cards should be kept on each, including all of the aforementioned; Bank—Find out whether the customer has a saving or checking account. If it is a checking account, determine whether it is a special or regular one. The bank requires that a minimum balance be maintained for a regular checking account; Other Charge Accounts—Current charge accounts with other merchants afford valuable information; Remarks—Ample space should be left for any additional information you might find personally beneficial in developing this character sketch of the individual.

An established method governing the amount of credit allowed a new customer is extremely beneficial. A more or less trial basis is being practiced under such circumstances one by which neither party will lose his proverbial "shirt." It would therefore be a wise practice to distribute more credit on a merit basis.

Every community in the United States has an investigating organization known as the Retail Credit Bureau, whose services can be had for a relatively low rate. Such bureaus were started by businessmen seeking to obtain credit information. These businessmen soon realized that money, effort and time could be saved by establishing a central unit that could spend all of their time simply investigating.

When hired, the Credit Bureau will organize a set of reports pertaining to your own specific needs.

—COLLECTIONS—

Making the collection is oftentimes one of the hardest jobs one might encounter in business, and generally can not be considered the same in every community or town. In the big city, methods of collection are usually a cold blooded business arrangement, while in the smaller town atmosphere the reputation of being a "nice understanding guy" is something that must be upheld. Under such personal conditions it is doubtful that any particular principles could be followed "everytime."

Accuracy, of course, is the foremost key to your success along with a few other points, such as keeping aware of which accounts become overdue? Why don't customers pay on time, especially when they have the money? It is important to establish a method of watching all your accounts to detect an overdue account before it runs too long. Make a system for recording the steps you have taken toward

collection and to remind you when and how to follow-up. The main excuses for delinquent payment usually sound something like the following: The customer honestly doesn't understand when you expect payment; they overlook payments through carelessness; they disregard small bills, deferring payment until they have purchased enough to make bills worth their attention; they usually pay on time, but are occasionally slow; they just plain complain about paying bills, even though there is no question of their ability to pay; they have temporary run of bad luck.

Consistency is a word well worth remembering when it is necessary to take up collection techniques. It is very poor business to ignore an overdue bill for a month or longer and then bombard the customer with threatening tactics. Don't retaliate against the customer, remember that you are working for the ideal situation of collecting your money and in the meantime retaining the good-will of all parties concerned. To accomplish this "good-will" collection plan, it would be wise to proceed in the three following stages: Step 1 — remind customer of the overdue bill; Step 2 — follow-up the account, becoming more insistent with each contact with the customer; Step 3 — begin taking drastic measures when it is evident that the customer is not giving consideration to the situation at hand.

COLLECTION EFFORTS

The collection effort could begin with a letter, a phone call, or a personal visit, depending once again on the circumstances prevailing in your particular town or community. A second copy of the original bill is usually the most effective means of reminding the customers, who just forgot to pay. An assortment of stickers can be purchased that in effect say "Please Remit" or "Please Send us a Check."

If and when the duplicate bill method fails it is then time to start creating an appealing letter that MUST be carefully written for appearance and language. The following are all suggested DON'Ts in the preparation of collection letters: Never be offensive — never injure a customer's pride — don't try to scare a customer unless you are ready to back up your threat — don't put anything on the outside of an envelope that would be slanderous — don't use post-cards as a means of collection.

Letters preceding one another should have general themes appealing to Pride, Self-interest, Sense of fairness, Good will toward others, and Fear if all other means fail. Included in the last fear letter, should be a notation inferring that if the bill is not paid by the specific date indicated in the letter, much to your dismay, it will be necessary for you to turn the matter over to your attorney for collection.



Pride
Self-interest
Sense of fairness
Good will toward others
Fear.

In summation, credit buying, as previously been described, requires taking it upon yourself to understand and analyze your credit practiced as a tv Service Dealer, when and who to give credit to, how and why more and accurate record keeping is necessary, plus details on credit investigation.

As for collecting money for services rendered, it is well to keep in mind basic techniques of watching accounts, follow-up details and correct means and methods of appealing directly to the customer.

Remember that the manner in which you handle situations involving either credit or collection has a great deal to do with not only the customers reputation, but also yours and that of your shop.

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FROM STANCOR . . .

A new 48-page catalog listing 1500 replacement transformers and coils for stereo applications has been published by Stancor Electronics, Inc., Chicago, Illinois.

The book contains complete specifications and additional information to aid the technician in the selection of the proper unit for his application. The Additional information includes a page devoted to step-by-step instructions on selecting the correct power transformer. There are also schematics of Stancor's coil products, and a Stancor Output Transformer Chart. This chart lists 260 home entertainment tubes and specific transformers to use with each. In cases where more than one transformer may be used with a tube, all are listed.

For a copy of the catalog, write Stancor Electronics, Inc., 3501 West Addison Street, Chicago 18, Illinois. Ask for Catalog 1-1063.

FROM CONVAIR . . .

"The Purchasing Agents Electronic Tube Procurement Directory" is an 8-page booklet covering more than 2500 of the most popular types. Prices for various quantity breaks are stated. All standard brands including RCA, Sylvania and Eimac are covered in an integrated listing.

The listed types include all special purpose, transmitting, counter, phototubes, telephony, miniaturs, subminiatures, ignitrons, kylstones, magnetrons, rectifiers, strobes, thyratrons, rockets, industrial CRT, and receiving tubes required for replacement and maintenance in welding and industrial controls, as well as communication equipment.

FROM JERROLD . . .

"RF Test Equipment for Quantitative Measurements," short form catalog, 4-pages, covers wide-band, wide-plus-narrow, and ultra-flat sweep signal generators, slow-speed sweep driver, general purpose sweep generators, video sweep generators, r-f precision log amplifier, and marker generators.

Also described is a high-speed coaxial switch, wide-band comparator, direct-reading tuned r-f volt-meter, variable and fixed attenuators, r-f post amplifiers and r-f bridges.

Request Short Form Catalog IP-C-002 from the Industrial Products Division,

Jerrold Electronics Corporation, 15th and Lehigh Avenue, Philadelphia 32, Pa.

FROM EIA . . .

The Electronic Industries Association's Service Committee will publish a revision of its widely used guide to the servicing of home entertainment electronic devices.

Publication of the revised two-volume guidebook, "Advanced Television Servicing Techniques" and "Advanced Servicing Techniques," is expected in June, 1964. John F. Rider Publisher, Inc., publisher of the first edition, will publish the revision.

FROM SAMS . . .

Incredible as it may seem, there are a number of TV technicians who base their repair procedures solely on memorizing trouble symptoms and the components they've previously found at fault. This is the hard way! The easy way consists of two steps — learning basic television theory and applying a logical technique of trouble analysis. The latter receives particular emphasis in Stuart Hoberman's TV TROUBLESHOOTER'S REFERENCE HANDBOOK.

Prepared as an aid to the television technician in analyzing and repairing television troubles, this handbook not only covers the more common problems likely to be encountered, but also includes those troubles which usually cost the serviceman much time and effort to locate and repair.

Six of the seven Chapters in the book cover troubleshooting in specific sections of the television receiver. Repair techniques are described for low-voltage supply circuits, tuner circuits, video circuits, audio circuits, synchronization circuits, and horizontal- and vertical-sweep circuits. Each of these chapters approach troubleshooting from the same viewpoint. The technician is asked to observe the TV defect, interpret the symptom, and then isolate the trouble to possible defective components or stages. To help in doing this, waveforms and typical circuits shown. By considering all the symptoms associated with a particular trouble, the service technician will be better able to tell which stage is defective. Using this diagnostic approach will help to improve repair techniques in easy sets, as well as "dogs."

FROM G.E. . . .

A new "Television Picture Tube Replacement Chart," including an interchangeability guide and essential characteristics of 575 tube types, now is available through authorized General Electric distributors of Electronic tubes.

The chart is printed on heavy stock and measures 28-x30 inches for ease in wall mounting to serve as a ready reference in television service work. (Publication No. ETR-702H.)

FROM JERROLD . . .

"TV-FM Reception Aids for the Home," (DS-CS-002), 8-pages, 2-colors, profusely described and illustrates Jerrold's family of reception aids for improved home television and listening.

Photos and descriptions cover: Super-Powermate, twin-transistor, mast-mounted TV preamplifier; Powermate; "De-Snow" type VHF preamps; new "Silver-Circuit" UHF preamplifiers; Jerrold's unique "no-drift" Top-Of-The-Set UHF "Ultra-Vista," "SuperVista," and "Vista" UHF Converters; the innovative 2-transistor Indoor Super-Powermate, amplified TV Couples; plus splitters, extenders, multi-set couplers, mixing networks, filters, traps, matching transformers, isolation networks, a TV/FM broad-band amplifier the "Challenger"; and the TV-FM Magic Carpet Antenna.

Photos, descriptions, specifications and prices included.

The Distributor Sales Division of Jerrold Electronics Corporation, 15th and Lehigh Ave., Philadelphia 32, Pa.

FROM SAMS . . .

Different from most books on the subject, COLOR TV SERVICING MADE EASY does not dwell on theory. Rather, it is oriented toward the practical aspects, keeping vector and phase-angle discussion to a bare minimum. Now, in this one volume, technicians and students can find shop-performed service and setup procedures for all major color receivers, according to make and model, from 1957 on. This volume will serve as a handy daily working guide for anyone who services color TV receivers.

As the title implies, the book will serve as a valuable time-saving aid to service technicians. The major portion of the content is devoted to specific setup and servicing procedures for the different makes and models of color receivers. Presented in a step-by-step manner, serviceman's language is used throughout.

**ZONE "F" PLANS
JOINT X-MAS PARTY**

Zone "F" of the California State Electronics Association are once again planning a joint Christmas Party for all members of the Zone.

Under the direction of Ron Kealey, it will once again be held at the Elks Lodge in Alhambra on Saturday evening December 7th.

**ANTENNA, ACCESSORY MANUFACTURERS
FORM ORGANIZATION TO FIGHT CATV**

Cleveland, Ohio—Twelve manufacturers representing the principal elements of the television antenna and accessory industry met at the Hotel Hopkins for the purpose of forming TAME—Television Accessory Manufacturers Institute. This group comprises: Alliance Corporation, Alliance, Ohio; Antennacraft Company, Burlington, Iowa; Antenna Designs, Inc., Burlington, Iowa; Channel Master Corporation, Ellenville, New York; Clear Beam Antenna Corporation, Canoga Park, California; Cornell Dubilier Electronics Division, Fuquay Springs, N. C.; The Finney Company, Bedford, Ohio; JFD Electronics Corporation, Brooklyn, New York; Kay-Townes Antenna Company, Rome, Georgia; S & A Electronics, Inc., Toledo, Ohio; Spaulding Products Company, Frankfort, Indiana, and Winegard Corporation, Burlington, Iowa.

The group was conceived by Morton Leslie of JFD, George Gemberling of Alliance Manufacturing, Sam Schlusel of Channel Master Corporation, L. H. Finneburgh of the Finney Company and Robert Fleming of the Winegard Company for the purpose of organizing a common effort against the uncontrolled growth of community antenna systems throughout the country. It is not that system which serves an unmistakable technical need which is under fire, but the great number which are emerging in areas where good TV reception has been attainable for years with a properly designed TV antenna installation. It is if the group's aim to make known to the public and to the authorities in Washington, D. C. the facts surrounding the community cable systems versus private antenna systems in their own areas. The group has already learned of many cases where cable companies are offering 'inducements' to municipalities for the necessary franchises.

In his remarks to the group, Mr. L. H. Finneburgh, President of the Finney Company stated "the electronics distributor has been lulled to sleep by the supposed large amount of business which cable systems can bring him." Mort Leslie of JFD Electronics contends "up to now CATV has had no major opposing group—only individual campaigns." Sam Schlusel of the Channel Master Corporation maintains "more people should be brought into the fight. Let's get other interested groups in the foray."

TAME, when more formally constituted, will conduct active campaigns in all areas where cable systems are proposed and in operation, and will work in collaboration with all distributors and local dealer groups. TAME, through its Executive Secretary, will fight for controls of cable systems before the proper federal agencies. All television accessory manufacturers are invited to join and participate. Plans are being made for the inclusion, also, of various other broadcasting and entertainment groups.

**Tarzian offers
FAST, DEPENDABLE
TUNER REPAIR
SERVICE (ALL MAKES)**



**ONLY
\$950
INCLUDING**

**ALL PARTS
(except tubes)
and LABOR**

**24-HOUR SERVICE
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TO SERVE YOU BETTER**

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It just makes sense that a manufacturer of tuners should be better-qualified, better-equipped to offer the most dependable tuner repair and overhaul service.

Sarkes Tarzian, Inc. pioneer in the tuner business, maintains two complete, well-equipped Factory Service Centers—assisted by Engineering personnel—and staffed by specialized technicians who handle ONLY tuner repairs on ALL makes and models.

Tarzian-made tuners received one day will be repaired and shipped out the next. Allow a little more time for service on other than Tarzian-made tuners.

Tarzian offers a 12-month guarantee against defective workmanship and parts failure due to normal usage. And, compare our cost of \$9.50 and \$15 for UV combinations. There is absolutely no additional, hidden charge, for ANY parts except tubes. You pay shipping costs. Replacements on tuners beyond practical repair are available at low cost.

Tarzian-made tuners are identified by this stamping. When inquiring about service on other tuners, always give TV make, chassis and Model number. All tuners repaired on approved, open accounts. Check with your local distributor for Sarkes Tarzian replacement tuners, replacement parts, or repair service.



MANUFACTURERS OF TUNERS . . . SEMICONDUCTORS . . . AIR TRIMMERS . . . FM RADIOS . . . AM/FM RADIOS . . . AUDIO TAPE . . . BROADCAST EQUIPMENT

NEW LAW EFFECTS REPOSSESSION AND SALE OF GOODS

Many dealers are not aware of a new law that has just gone into effect concerning the repossession and sale of goods. Actually this new legislation amends the civil code and we felt it was important enough to reprint this material. Since over 70% of the service dealers do sell product it is important that they be aware of these changes.

The act reads as follows:
The people of the State of California do enact as follows:

Section 1. Section 1812.2 of the Civil Code is amended to read:

1812.2. In the event of any default by the buyer in the performance of his obligations under a contract or installment account, the holder, pursuant to any rights granted therein, may proceed to recover judgment for the balance due without retaking the goods, or he may retake the goods and proceed as hereinafter provided. If he retakes the goods, he shall, within 10 days, give notice to the buyer of his intention to sell the goods at public sale or give notice to the buyer of his intention to retain the goods in satisfaction of the balance due. The notice must state the

amount of the overdue payments, that the buyer must pay, if he pays within 10 days of the notice, in order to redeem the goods. In either case the buyer shall have an absolute right to redeem the goods within 10 days after the notice is given by paying or rendering the amount owing under the contract. If the holder gives notice of election to sell the goods the buyer shall also have the absolute right to redeem the goods at any time before sale by paying or tendering the amounts specified above and also any expense reasonably incurred by the seller or holder in good faith in repairing, reconditioning the goods or preparing them for sale. If the holder gives notice of his intention to retain the goods in satisfaction of the indebtedness he shall be deemed to have done so at the end of the 10-day period if the goods are not redeemed; at the time the notice is given, the holder shall furnish the buyer a written statement of the sum due under the contract and the expenses provided for in this section. For failure to render such a statement the holder shall forfeit to the buyer ten dollars (\$10) and also be liable to him for all damages suffered because of such failure.

Sec. 2. Section 1812.5 of said code is amended to read:

1812.5. If the proceeds of the sale are not sufficient to cover items (1), (2) and (3) of Section 1812.4, the holder may not recover the deficiency from the buyer or from anyone who has succeeded to the obligations of the buyer.

DUNBAR PICTURE TUBES

— Manufactured in the West's Newest Most Modern Tube Factory!

BONDED FACE PICTURE TUBES

They said it couldn't be done . . . but DUNBAR is doing it! The first independent tube plant to de-laminate and laminate bonded face picture tubes. Old plates removed, new plates replaced. Tubes processed electrically. 1 YEAR GUARANTEE.

SUMMER SPECIAL ANY 23" BONDED TUBE **\$27.50** EX. REGULAR \$32.50

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USE YOUR
WANT AD
SECTION

HOW TO USE WANT AD PAGE

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BY PHONE: in Los Angeles call AXminster 2-0287. (This is the number of the Classified Dept. only) ask for GRAYCE KENNEDY.

IN PERSON: Come to 4041 Marlton Ave. in the Crenshaw Shopping Center, next to Barker's. (This Address is for the Classified Dept. only.)

BY MAIL: Send your ad to MODERN ELECTRONIC SERVICE Classified Dept., 4041 Marlton Ave., Los Angeles 8, Calif.

RATES
95¢ PER LINE, one time. MINIMUM: 5 lines.

BOX NO.: Add 50¢ service charge, and allow 2 lines for reply address.

RE-RUNS: 2nd and 3rd times, less 10% each, 4th and thereafter less 15% each. Same copy.

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1 day service most tuners. Guaranteed.

Ship to: Valley TV Tuner Service
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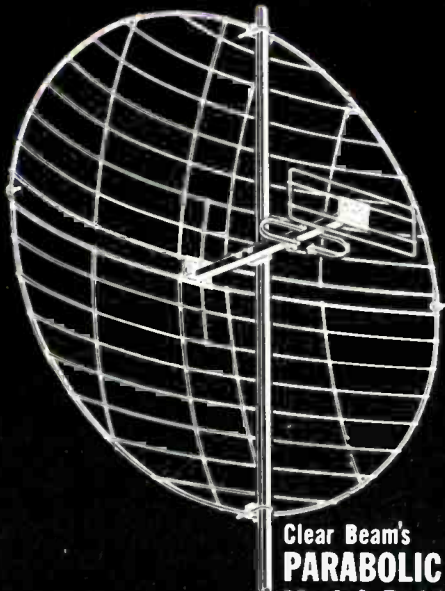
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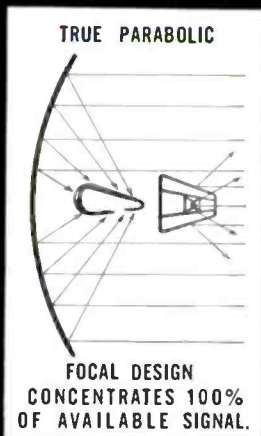
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Through continuing research and nationwide evaluation of problems in UHF areas, Clear Beam brings you the widest selection of proven UHF designs. Clear Beam's UHF antennas have been field tested in every type of UHF reception area to assure you maximum performance, maximum profits!



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CUSTOMER XMAS CARDS AVAILABLE TO DEALERS

Christmas cards to send to customers now are available to radio and television service dealers through authorized General Electric tube distributors.

Featuring a sparkling light touch, and deliberately avoiding commercialism, the cards contain no mention of General Electric. They are offered as a service to dealers with the purchase of electronic tubes.

The cards show Santa Claus adjusting a television set in a series of sketches—until finally the message "Happy Holidays" appears on the face of the picture tube.

SRTT HEARS STAN AUERBACK

The Society of Radio Television Technicians Inc. recently presented a discussion on Color Demodulators with guest speaker Stan Auerback. A short discussion on group insurance also took place at the Skytrails Restaurant, 16435 Sherman Way, Van Nuys, Calif.

All members and non-members were invited to attend the meeting, which included cocktails, dinner, general meeting and the guest speaker program.

George Figart Passes Away

The electronic industry has recently been grieved with the death of Mr. George Figart, who passed away in his Palm Springs home last September 19.

Mr. Figart was a well-known electronic distributor in the area for the past 30 years.

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Your choice of scores of wonderful gifts FREE with your purchases of Philco Parts, Accessories and Tubes included in Philco's Fall Fiesta Catalog! Big savings... as well as wonderful gifts, just in time for Fall and Christmas. Get Your Philco Fall Fiesta Catalog NOW... see your Philco distributor... stock up on parts and accessories you need... AND GET THE GIFTS YOU WANT, TOO!

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AMF Rugger Bowling Bag	\$125
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Daisy Thundercap Tank	\$ 55
Men's Million Miler Luggage	
One Suiter	\$400
Two Suiter	\$450
Three Suiter	\$500
Attache Case	\$275
Ladies' Million Miler Luggage	
16" Hat Box	\$250
21" Overnighter	\$275
26" Pullman Case	\$450
Ladies' Orlon Sweater	\$135
Ladies' Antron Cardigan Sweater	\$175
Ladies' Suburban Coat	\$350
Men's Melton Loden Coat	\$350
Men's Imported Rain Coat	\$350
Men's OuterJac	\$175
Men's Lambs Wool Cardigan	\$175
Men's Runabout Nylon Coat	\$350
Weather Trio (Instruments)	\$130
Outdoor Thermometer	\$ 15
Stanley Ratchet Driver Set	\$ 65
Oneida Dinner Ware	\$350
Oneida Stainless Flatware	\$450
8 Piece Cutlery Set	\$130
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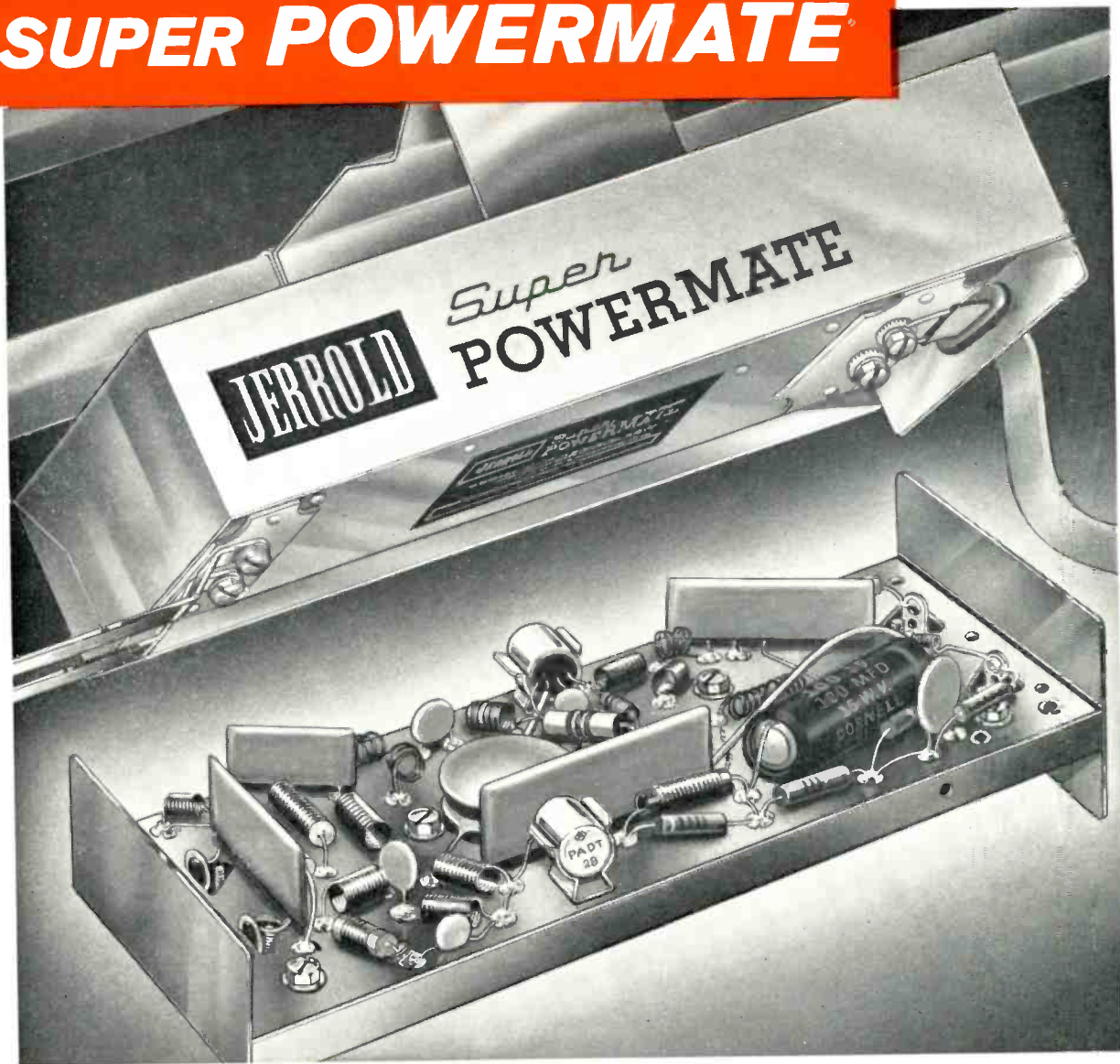
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NEW TWIN-TRANSISTOR SUPER POWERMATE

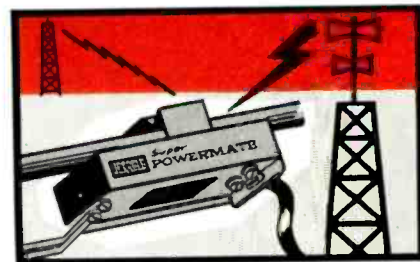


BREAKS THE GAIN/OVERLOAD BARRIER

Servicemen and the public long wanted it, but were told they couldn't have it—a transistorized TV antenna preamplifier with the overload capacity to handle local signals without sacrificing the gain that brings in distant stations.

But Jerrold did what couldn't be done. With the new twin-transistor SUPER POWERMATE, you have, for the first time, a transistor preamplifier with the high gain and low noise figure that made the original Jerrold Powermate famous—plus an unprecedented overload capability for local-signal situations. SUPER POWERMATE offers a gain range from 15.5db with 700,000 μ v max. output at Channel 2, to 11.3db with 200,000 μ v max. output at Channel 13. There are no tubes or nuvistors to replace. And frequency response is fantastically flat—a boon to color TV.

Sell new SUPER POWERMATE, the all-channel antenna preamplifier with G/O—the industry's best Gain/Overload capability. List \$44.95. See your Jerrold distributor or write Jerrold Electronics, Philadelphia 32, Pa.



GAIN to reach far-distant stations, OVERLOAD capability to prevent local-signal interference.

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ST 6-5870

SOUTHLAND ELECTRONIC SUPPLY
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San Diego, Calif.
AT 3-3941

COOK ELECTRONICS
210 E. Hardy St., Inglewood
OR 8-7644

WHOLESALE ELECTRONIC SUPPLY
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MI 8-3163

HURLEY ELECTRONICS
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KI 3-9236

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HI 2-9638