What's New in TELEVISION

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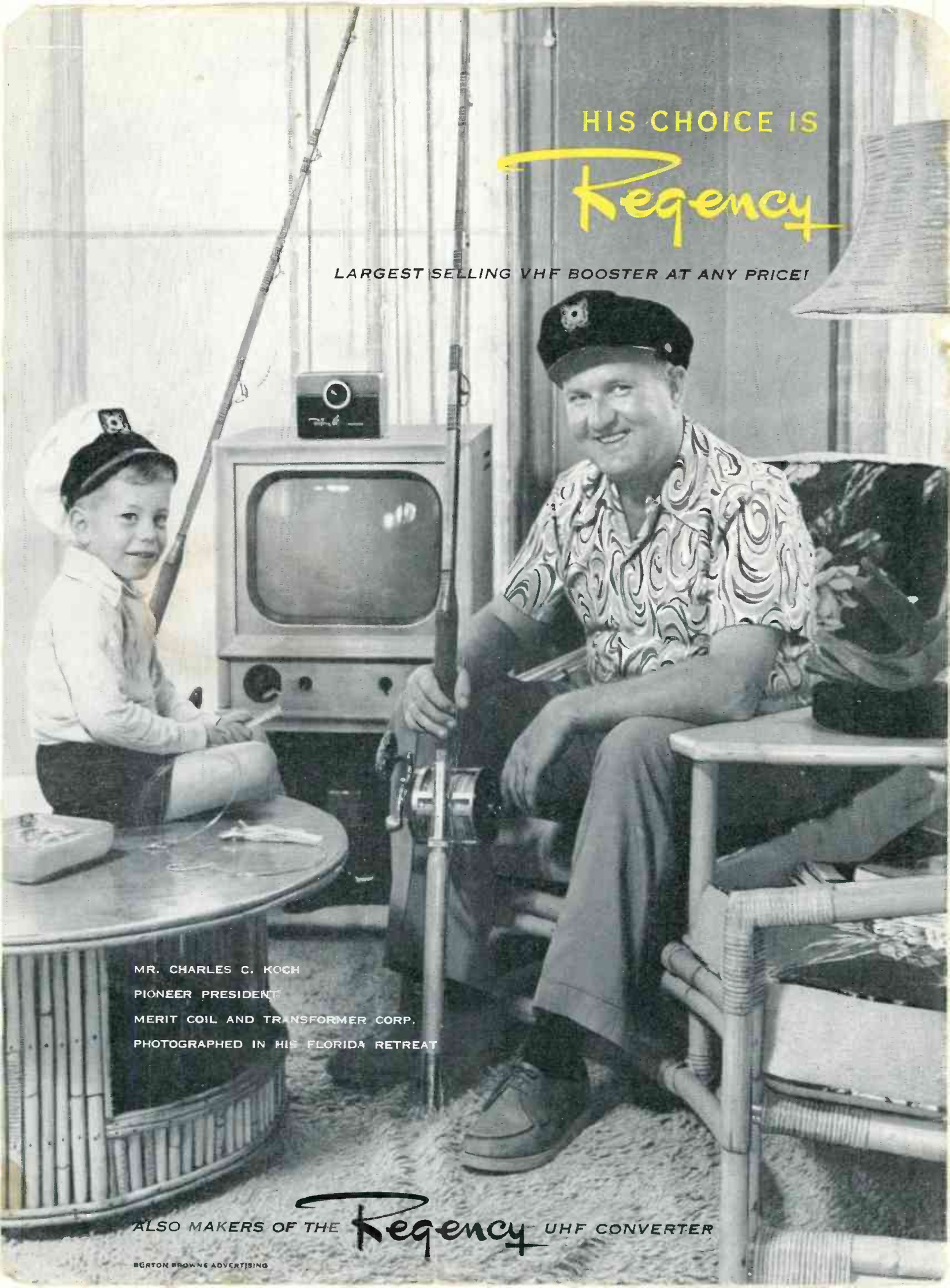
JULY-AUGUST, 1952

BIG SERVICE COMPANIES: Will They Survive? (See page 11)

In This Issue: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BURTON BROWNE ADVERTISING

What's New in TELEVISION

Volume 4, Number 2 **July-August, 1952**

Contents

THE STAFF

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LETTERS

Always Glad to Help, Fellows

Dear Mal:

We, the TV-Radio servicemen here in Waterbury, have at last come to the realization that the abuses and other ills that beset the servicing industry have run rampant long enough. We also realize that if these above cancers are not at least curbed that the damage done to us can only grow worse.

While it is true that at the present time very few of us are feeling any economic pinch, I do not have to look at anyone's bank book to know that their reserve fund is not nearly as big as it appears. I also know that the revenue that is lost by the abuses we suffer can be a very strong bulwark against slack seasons. Poor business is one thing, being deliberately outwitted and not being able to hit back is something else again.

Therefore, Mal, may we call upon you for whatever assistance you may be able to give us in putting together an organization to work for the betterment and advancement of the service men.

Your prompt answer will be appreciated.

Sincerely yours,
William Abrahams
Williams Radio Service
Waterbury 14, Conn.

A Large Order

Dear Mal:

Will you kindly furnish me with the following information, concerning the licensing of television technicians?

In what states are television technicians now licensed and exactly what methods are used in licensing the technicians in the states that require television technicians to be licensed?

What is the general opinion of licensing television technicians? Does it hinder or help the television servicing business?

If we can get this information returned to us via special delivery air mail it will be a great help to us.

Enclosed herein stamps for return mail.

Trusting that you will give this matter your immediate attention, I remain

Yours sincerely,
J. B. Intravia
Television Engineering Co.
New Orleans, La.

Our "Association Activities" Program Is Free to Organized Groups

Dear Mal:

I have been a reader of your Magazine "What's New in Television" since its first issue and think that it is one of the best in the country.

Recently the T.V. service men in Hamilton had a meeting at which time it was decided to form a Television Service Mens Association. The standardize service prices and to purpose of the Association will be to promote better workmanship.

Several of the servicemen are readers of your magazine and since you have had quite a bit of experience in servicemen's associations we decided to write for information in forming such an organization. If you have any information that will help us send it to me as soon as possible.

If there is any charge for this information we will be glad to pay for it.

Thanking you in advance, I remain

Very truly yours,

Hilbert Sapp

Bert's Television Service
Hamilton, Ohio

Here's Another

Dear Mal:

I would appreciate any help you can give us in forming an association in our area, such as copies of constitution and by-laws, etc.

I am a reader of your magazine and it is tops. It contains a goldmine of information.

Yours truly,

Fred W. Rock

Granada Radio Service
Oakland 21, California

Thank You, John!

Dear Mal:

We have been receiving "What's New in Television" for quite some time now but we do not find a record of a subscription having been sent in.

If our subscription has not been paid for please let us know so that it can be mailed immediately as we do not want to miss a single issue of this very worthwhile magazine.

Very truly yours,

John Silbaugh

Duarte TV Shopping Center
Duarte, California

NUMBER OF TV SETS IN USE AND % OF SATURATION AS OF MAY 1st, 1952

INTERCONNECTED CITIES

Area	No. Stations	No. Families	No. Sets	% Penetration	Increase No. Sets Over Last Month
Albuquerque	1	53,700	14,200	26.4	
Ames	1	193,700	83,000	42.9	200
Atlanta	3	325,600	169,000	51.9	2,000
Baltimore	3	477,200	386,000	80.9	2,000
Binghamton	1	93,600	66,000	70.5	6,000
Birmingham	2	264,400	103,000	40.0	6,000
Bloomington	1		(See Indianapolis)		3,300
Boston	2	1,101,300	895,000	81.3	
Brownsville (Matamoros, Mexico)	1		10,700a		9,000
Buffalo	1	352,100	268,000b	76.1	100
Charlotte	1	363,700	143,000	39.3	3,000
Chicago	4	1,707,800	1,155,000	67.6	4,000
Cincinnati	3	425,000	323,000	76.0	20,000
Cleveland	3	796,100	614,000	77.1	3,000
Columbus	3	333,200	210,000	63.0	9,000
Dallas-Ft. Worth	3	397,800	164,000**	41.2	3,000
Davenport-Rock Island	2	203,800	110,000	54.0	4,000
Dayton	2	278,500	188,000	67.5	7,000
Detroit	3	943,200	667,000c	70.7	3,000
Erie	1	89,000	79,700	89.6	17,000
Grand Rapids, Kalamazoo	1	364,000	167,000d	45.9	4,700
Greensboro	1	183,300	83,000	45.3	2,000
Houston	1	328,300	141,000	43.0	3,000
Huntington	1	193,200	79,100	40.9	8,000
Indianapolis, Bloomington	1	433,600	250,000e	57.7	2,400
Jacksonville	1	120,100	56,000	46.6	9,000
Johnstown	1	300,500	152,000	50.6	2,000
Kalamazoo	1		(See Grand Rapids)		3,000
Kansas City	1	473,600	207,000	43.7	5,000
Lancaster	1	216,100	147,000	68.0	4,000
Lansing	1	222,000	93,000	41.9	3,000
Los Angeles	7	1,611,900	1,185,000	73.5	30,000
Louisville	2	258,000	138,000	53.5	4,000
Memphis	1	294,200	130,000	44.2	3,000
Miami	1	189,700	86,000	45.3	1,000
Milwaukee	1	408,700	332,000	81.2	4,000
Minneapolis-St. Paul	2	458,400	316,000	68.9	2,000
Nashville	1	218,200	63,000	28.9	2,000
New Haven	1	404,400	274,000	67.8	12,000
New Orleans	1	284,300	93,000	32.7	3,900
New York	7	4,152,100	2,970,000	71.5	40,000
Norfolk	1	204,600	114,000	55.7	1,000
Oklahoma City	1	244,300	92,300	37.8	—
Omaha	1	210,500	127,000	60.3	2,000
Philadelphia	3	1,385,800	1,042,000	75.2	10,000
Phoenix	1	121,100	39,400***	32.5	1,000
Pittsburgh	1	747,800	428,000	57.2	20,000
Providence	2	401,200	214,000	53.3	4,000
Richmond	3	141,700	124,000	87.5	5,000
Rochester	1	209,700	147,000	70.1	3,000
Salt Lake City	2	88,400	73,000	82.6	1,000
San Antonio	2	177,900	76,400	43.0	3,000
San Diego*	1	181,800	117,000*	64.4	2,000
San Francisco	3	975,800	377,000	38.6	16,000
Schenectady	1	335,900	210,000	62.5	3,000
Seattle	1	441,200	144,000	32.6	4,000
St. Louis	1	568,900	398,000	70.0	7,000
Syracuse	2	226,500	164,000	72.4	2,000
Toledo	1	314,300	180,000	57.3	6,000
Tulsa	1	182,200	77,500	42.5	—
Utica	1	122,600	69,500	56.7	1,000
Washington	4	472,300	364,000	77.1	10,000
Wilmington	1	143,900	102,000	70.9	2,000
TOTAL	109	**27,412,700**	**17,290,800**	**63.1**	**351,700**

SET INSTALLATION NOTES

* Covered by Los Angeles.

a Estimate for Texas area. Estimated 2,500 additional sets in Mexican area.

b Does not include estimated 52,000 sets in Canadian area reached by Buffalo station.

c Does not include estimated 35,000 sets in Canadian area reached by Detroit stations.

d Grand Rapids separately—134,000 — Kalamazoo separately—141,000

e Indianapolis separately—223,000 — Bloomington separately—157,000

** A TV set saturation study by Dr. Ira G. Corn, Jr., Asst. Prof. of Mktg., SMU, (1-15-52) to determine within the known limits of probable error the exact number of TV sets in the 12 county area around Dallas and Ft. Worth qualifying for primary TV reception revealed 64.5% TV sets in Dallas and 35.5% TV sets in Ft. Worth. Applied to NBC figure this would mean 105,780 TV sets in Dallas and 58,220 TV sets in Ft. Worth.

*** Phoenix, Arizona reports a confirmed set count of 55,100 as separately reported to the trade. Substantiation or request to KPHO-TV.

You can double your fall service business with this NEW SYLVANIA CAMPAIGN

Two gorgeous movie stars. Ann Blyth and June Havoc, feature their personal endorsements of your service in this brand new Sylvania advertising campaign for service dealers. On life-like window displays and streamers, they recommend *you* just the way they will in the big Sylvania ads in *Collier's, Life, Look,* and *The Saturday Evening Post,* which will appear this Fall.

In addition, the Sylvania Campaign offers you four sets of personalized mailings imprinted with your name, address and phone number All of the mailing pieces have stamps already attached. You pay *NO POSTAGE!* Radio spot announcements, and reminder stickers for your customers' sets round out this sure business-attracting kit!

And all you pay is *just 2 cents per prospect per month* for the mailers. All the rest is absolutely FREE . . . even the postage on the mailers! Call your Sylvania Distributor today, or mail the coupon below.

SYLVANIA

RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; PHOTOLAMPS; TELEVISION SETS

Sylvania Electric Products Inc.
Dept. R-3807, Emporium, Penna.

Please send me full details on Sylvania's big Fall Campaign for Radio-TV Service Dealers.

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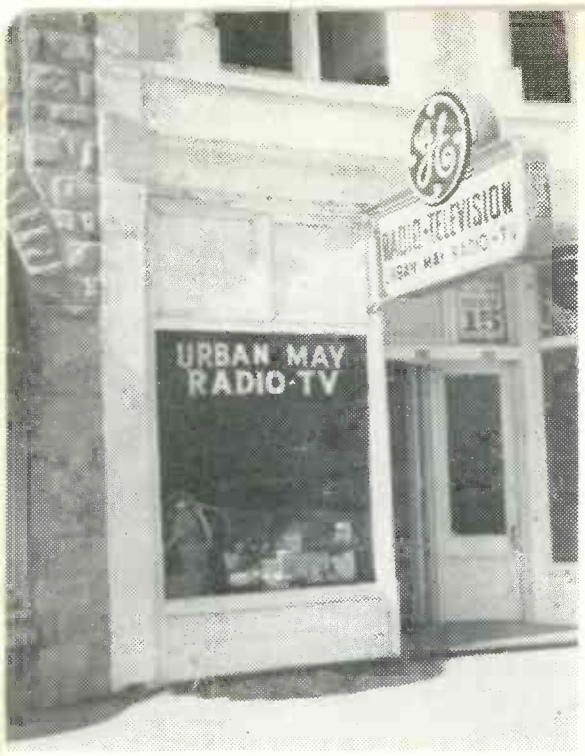
Street_____

City_____ Zone___ State_____



How Urban-May Is Getting Ready For That New Station

Here's the absorbing story of how two forward-looking pioneers in a non-tv area are preparing to get the lion's share of the business in their area when television really hits!

In a city of 30,000 population, Urban May started in the television and radio business three years ago with $330 worth of borrowed parts and today has an established credit rating of five figures. This, in Daytona Beach, Fla., where there is no TV station and poor reception except in perfect weather from the nearest station at Jacksonville, about 100 miles away.

Daytona Beach, like many other cities of its size, has had to depend on larger metropolitan areas for its TV programs owing to the "freeze" on building of new stations. Now that the "freeze" has been lifted, the Florida resort city hopes to be one of those that will be permitted to build a telecasting station. The coaxial cable has been extended that far, but is not in use yet.

Meanwhile, the Urban May Radio-TV has been working toward the day when there will be a wide-open market for television receivers. At present there are an estimated 500 to 600 sets in the entire county (Volusia) which takes in some other towns and a resident population of about 75,000 plus a transient population that at peak periods easily doubles or triples the all-year residents. The potential market for TV receivers in the county is reckoned in thousands of sets as soon as a station is opened.

"We now sell an average of two sets a week," said Urban May. A peak business would be four sets within a week. That should be multiplied many times when local telecasting is available.

"Right now and until we can develop the business this area should produce," he added, "we are making our radio repair department carry our general overhead. "So whatever we make on sales of receivers and TV service is so much gravy."

May's formula for success in building up a successful TV service business is this: "Never make a statement you can't back up." He feels strongly that whatever injury has been done to the television business has come about largely from improper claims and improper service. His three years in business for himself, after a long prior service as radio TV repairman, has been directed toward building a reputation for dependability.

Further than this, he has consistently advertised day and night service. He himself is the night man. His night number (his home) is listed in the classified telephone directory and in all his advertisements. He does not ask his men to answer night calls.

May employs two repair men on straight salary. Though he has no incentive plan, one of his men will be rewarded shortly by being made manager of a second store he will open up and will receive a share of the profits. He operates two trucks, which he owns, and with these his men average about 25 TV calls a week, including the night calls that he himself makes. About a third of all sets have to be brought into the shop for adjustments. No conversion jobs are handled; in fact, it has not been necessary as nothing smaller than 17-in. sets were on the market when May went into business three years ago. At that time there were no network telecasts even from Jacksonville, so about the only small screens in Daytona Beach are those that have been brought in by new residents from other states and the floating tourist population. If any of these people take indoor aerials with them, they soon learn that only a good roof antenna will pick up the weak signals from Jacksonville.

Antenna work has constituted a sizable portion of May's TV service business. The cheapest installation that can be made to bring in enough signal strength requires a 30-ft. mast andc osts about $90.

In a market which is just in the budding stage, other retailers who carry TV sets have found that it does not pay to handle their own service work, so Urban May has developed a sizable business in working for other retailers. Some of the TV set manufacturers that do their own servicing have not yet considered the Daytona Beach market important enough to establish service offices there, but that will undoubtedly come when a TV station is opened.

May's experience with service contracts has convinced him that they do not pay. "Either the customer or the service man gets stuck," he explains. He tried out a coupon deal, but set owners wouldn't go for it, and he discontinued it. Now he supplies the usual 90-days' free service with a new set and charges for all other calls on a time basis plus cost of new parts. He argues that there is no fair basis to arrive at for a service contract. "If we charge $50 a year,"

(Continued on page 22)

ANOTHER STANCOR "FIRST"

NOW...YOU'RE TELLING US!

21 Top Servicemen from All Parts of the United States Will Tell Stancor What's Wanted at your Service Bench

The members of the Serviceman Advisory Board have been chosen from the best men in their locality. They have an average of 4½ years experience in TV servicing (except those in non-TV areas) and over 17 years of practical experience in electronics. Most of them are officers or active participants in local servicing organizations.

They know their business—and they know the serviceman's problems.

These men have been retained to help Stancor do a better job for you. They will work for you by advising Stancor on your replacement transformer problems. As we produce new components and publish new literature, the Serviceman Advisory Board represents YOU in our planning.

When new Stancor transformers are offered, they incorporate the practical suggestions of men like yourself, who are actively engaged in the servicing and maintenance of TV and radio equipment.

Here is another reason for you to "Specify Stancor" for the best in transformers.

STANCOR

STANDARD TRANSFORMER CORPORATION

3576 ELSTON AVENUE • CHICAGO 18, ILLINOIS

NOW— A CUSTOM-TAILORED, BUSINESS-BUILDING HOUSE ORGAN FOR YOU!

ARTICLES LIKE THESE BUILD CUSTOMER-CONFIDENCE, PRE-SELL CUSTOMERS AND PROSPECTS ON THE MERITS OF YOUR SERVICING!

THE biggest problem facing service company executives today is the building of customer-confidence in their own company. No other medium, be it newspaper or TV advertising, personal calls or direct mail, does the job of carrying your story to your own customers and prospects as quickly, inexpensively and efficiently as does "Scan."

For "Scan," and only "Scan," is custom-designed to bring your company's story—and the story of servicing—to the TV set owner in a credible and entertaining manner.

BECAUSE of the outstanding success of the first issue of "Scan," it is now available to service-companies on a no-minimum-quantity basis. Prices are shown in the table below.

Over 100,000 copies of the first issue of "Scan" helped participating service companies build their business. Why not drop us a line, right now, while you're thinking about it, for a sample copy and full details on "Scan's" business-building program.

HERE ARE SCAN'S PRICES

1 to 500 copies	10c each
500 to 1,000 copies	7½c each
1,000 to 2,500 copies	5c each
2,000 to 5,000 copies	4½c each
Over 5,000 copies	4c each

WRITE FOR FULL DETAILS, ON YOUR LETTERHEAD PLEASE, TO

PARKS PUBLISHING CO., INC.

679 N. Michigan Ave. Chicago 11, Illinois

An Interview with

RICHARD SILBERMAN

and

BUD CLOUD

of

VIDEO SERVICE

OF SAN DIEGO, CALIF.

Here's the story of two young partners who have made such an outstanding success of tv servicing under conditions of great difficulty. Even old-timers in the business will learn a lot by carefully studying this exclusive article.

Bud Cloud, left, and Richard Silberman

QUESTION . . . *How did you get into the TV servicing business?*

ANSWER . . . When I got out of college (Ohio State) I went to work for a TV dealer. Bud Cloud, my partner, was already working for this dealer and we both worked for him, running the radio service department.

QUESTION . . . *How long were you with that dealer?*

ANSWER . . . We were with him right until we went into business for ourselves, in January, 1950.

QUESTION . . . *When you opened, where did you open—in the same place?*

ANSWER . . . No.

QUESTION . . . *When you started, did you have servicing contracts with this dealer you used to work for?*

ANSWER . . . Yes.

QUESTION . . . *How many did you have?*

ANSWER . . . Started out with a total of 5 people—Bud and myself and 3 others.

QUESTION . . . *Do you do mostly dealer work?*

ANSWER . . . We started out catering to dealers.

QUESTION . . . *What was the reason you went after dealer work?*

ANSWER . . . 1) To get old customers. 2) If you do good work for dealers you automatically eliminate the possibilities of their organizing their own departments. 3) After we had built up a reputation, one dealer would tell another what a good job we were doing.

QUESTION . . . *Have you had any trouble with dealers?*

ANSWER . . . One dealer folded but he was a fast operator.

QUESTION . . . *What is the basis of your work for dealers?*

ANSWER . . . We sell the dealer two types of contracts. One is a 30-day contract which costs them $7.50 and the other is a 90-day contract which costs them $15.00.

QUESTION . . . *You say "you sell the dealer a contract". Who pays for this—the dealer or the customer?*

ANSWER . . . The dealer is billed direct and he pays us.

QUESTION . . . *When you bill the dealer, do you give him any dealer discount for cash?*

ANSWER . . . No.

QUESTION . . . *In billing the dealer, when do they have to pay?*

ANSWER . . . Some pay weekly and some monthly. The difference is, the dealers who pay weekly are the ones, from our own experience or from local credit information sources, who are maybe a little slow.

QUESTION . . . *What do you do if one of these dealers who is billed weekly doesn't pay?*

ANSWER . . . He is cut off directly.

QUESTION . . . *You say you sell them 30-day and 90-day contracts. Exactly what do you give them in these contracts?*

ANSWER . . . We give them the customers' unconditional service for the term of the contract.

QUESTION . . . *When you say "unconditional service" what does this include?*

ANSWER . . . This includes service as needed. In other words, the dealer is expected to set up the set. If an installation is required the cost of the antenna and other accessories or parts is extra. However, we do not charge for the labor in making an installation. I might add that where an installation is concerned we will also do the setting up.

QUESTION . . *Am I to understand that the $7.50 charge for a 30-day contract includes the labor on an installation?*

ANSWER . . . No. But our flat rate for installation does include the labor. For example, we have a price of $42.00 for a 40-foot installation. This includes mast, antenna, lead-in wire and the labor incident to making the installation.

QUESTION . . . *You say that most of your business is dealer work. How much is C.O.D.? What percentage?*

(Continued on next page)

ANSWER . . . While we do concentrate on dealer work we find that the reputation we have gained from trying to give dealer customers the best possible service, plus our direct mail and other advertising efforts, has resulted in an increased number of calls from customers we have never served. At the present time approximately 25% of our business is C.O.D. business from new customers.

QUESTION . . . *What percentage of the customers on these 30 and 90-day dealer contracts remain with you on a C.O.D. basis?*

ANSWER . . . On the average covered by our experience in the past two years, it is safe to say between 60 and 70% of these customers remain with us.

QUESTION . . . *You say that 60 to 70% of those who have original contracts with you remain as customers. What happens to the other 30 or 40%?*

ANSWER . . . While we make an effort to retain them as customers through direct mail our business has grown so rapidly in the last two years that we have not put in any real effort by telephone or personal solicitation to retain them so we cannot honestly answer the question.

QUESTION . . . *In other words, Mr. Silberman, you do not have any renewal contracts for customers after the original dealer contract has expired?*

ANSWER . . . No, we don't. So far our entire effort has been based on giving the best possible service during the term of the original contract with the idea in mind that this service would retain the goodwill of the customers. However, I will admit there is much to be said for the one and two-year contracts, but so far our experience has been that we have not found it necessary.

QUESTION . . . *How large an organization do you have?*

ANSWER . . . We employ on an average 35 people. We have 19 technicians . . . my partner Bud Cloud, four antenna crews (2 men on each crew), three girls in the office, a full time parts man, a bookkeeper and a porter.

QUESTION . . . *You say you have a full time parts man. Exactly what does he do?*

ANSWER . . . While he is primarily concerned with the in-warranty parts for our customers he also does all our parts purchasing. We maintain a minimum inventory on each item which is in general use. He also checks out parts to technicians and installation crews and to the shop men. He is responsible for all parts and sees that there is no inventory loss or leakage. Since we maintain an inventory never below $10,000, this is an important function and we find that having a full time man has cut down our loss and increased our efficiency.

The Video Service establishment covers 4,000 square feet on one floor. There is a railroad siding and loading docks on both sides of the building. There is a large parking area on one side of the building. The inside space is broken up into one large room which has been partitioned into a completely-equipped, carefully-designed service shop. A large parts stock room is adjacent to the shop. All walls in this area are shelved to accommodate incoming sets. There is a small, private office in connection with the shop. The rest of the space is devoted to the main office which is also the reception room, etc.

QUESTION . . . *You say this man is responsible for the parts inventory. How often do you take inventory?*

ANSWER . . . We take a complete physical inventory once a month which includes our parts stock room, parts in the shop, parts in the trucks—in other words, all inventory. This is rather laborious and costly but we have found it is the only way we can keep an accurate control of all parts.

QUESTION . . . *Where do you buy most of your parts?*

ANSWER . . . We buy the major percentage of our parts from the local parts jobber. We are probably fortunate in that he works closely with us and actually performs the function of a wholesaler. He protects us from obsolescence, price changes and works very closely with us at all times.

QUESTION . . . *How do you pay your technicians?*

ANSWER . . . We have a salary rate rather than an hourly rate. After all, San Diego is a tremendously important Naval base and we have several laboratories and national installations, plus Convair, all hungry for anybody who can solder a joint. This means that we have been forced to be enlightened in our employee relations. However, whether we were forced or not the inclination of both Bud and myself would be to make sure of building a real team by treating our employees the way we would want to be treated. We have a bonus plan based on net profits in which everyone shares from the porter up. This is based percentagewise on their salaries, length of service, etc. We give them two weeks vacation with pay, hospitalization and other benefits.

QUESTION . . . *Because paying on a weekly basis is not general in the industry we would like to ask you how you work this out in the event that, say, a technician reports ill.*

ANSWER . . . We pay him for the time he is away. As long as he has a doctor's certificate he can stay away as long as necessary. However none of our employees take advantage of this because it cuts net profit and the bonus based on our net profits. We find this system relieves us of a lot of details because the employees police each other to see that none of them take advantage.

QUESTION . . . *In other words, you find that this profit sharing plan increases your employee relationship?*

ANSWER . . . It does more than this. It makes every employee work in the company's interest. For example, since putting in the profit sharing plan the percentage of callbacks has dropped so much as to be almost unbelievable. At the present time our callbacks average around 1 to 1½% and we know that we can attribute this to the profit sharing plan.

QUESTION . . . *Do your men wear uniforms and if so, who supplies them?*

ANSWER . . . Yes they do. We pay half the cost of the uniforms but expect the technicians to maintain the cleaning, etc.

QUESTION . . . *Do you own your own vehicles?*

ANSWER . . . We own 9 trucks which are used by installation crews and technicians. But sometimes our technicians use their own cars. We pay them 6c a mile flat. Because of our fleet of trucks we have an arrangement whereby our technicians can buy gas at the same discount as the company.

QUESTION . . . *When you fix a set, what is your guarantee?*

ANSWER . . . 30 days.

QUESTION . . . *What do you charge for house calls?*

ANSWER . . . $4.75 for a house call—$3.50 for pick-up and delivery. We have no limit on the time a technician can spend on a house call. We leave it to each technician's own good judgment as to whether or not he can fix the set. I might elaborate by pointing out that sets which are still in-warranty on the 30 or 90-day contract, it would be too costly to pull the chassis on sets that are still in-warranty and for that reason we are glad to have the technician spend an hour or two, if necessary, to fix an in-warranty set in the home.

QUESTION . . . *On the average, Mr. Silberman, how many calls do your men make a day?*

ANSWER . . . I would say in geieral, our men average close to 10 calls a day. We do not keep as close a check on this as a company would who pays by the hour. In addition we know that our profit sharing plan is working for us because the more profitable calls each of our technicians make the more net profit we are going to have to divide. Approximately 83% of all our jobs are repaired in the customer's home.

QUESTION . . . *When a shop job comes in, how is it handled? Does one man work on it until it is finished?*

ANSWER . . . We have a very loose system—all men work on it.

QUESTION . . . *Have you done any conversions?*

ANSWER . . . No.

QUESTION . . . *On your C.O.D. work, if the customer refuses to pay either for a house call or one of the shop jobs you have just outlined, do you pull the set?*

ANSWER . . . No. We do not pull the set. It is costly and to our mind it creates more customer ill-will than it is worth. We send the customer a couple of statements and if they have not paid within 30 days we put a red flag on their folder. You would be surprised what a large percentage of customers who owe money on previous C.O.D. calls will call in for further service. When they do, the minute the girl picks out the folder and sees the red flag, she informs the lady no more calls can be made until the previous bill is paid. This has worked very well for us and we have been able to collect accounts that are 9 and 10 months old through this method.

Shown above are three of Video Service's nineteen technicians who alternate between outside work and bench jobs. Latest test equipment, a large parts inventory and a controlled system enable Video Service to operate successfully and profitably.

QUESTION . . . *What would you say is your loss on C.O.D. calls?*

ANSWER . . . It averages between 1 and 2%.

QUESTION . . . *You speak of customer's folders. Exactly what are they and just how do you handle your system of customer and job records?*

ANSWER . . . Our filing system is a little different. We maintain a manila folder—9 x 12—for every customer, which contains a complete case history of that customer's dealing with our company. We can best explain how it works by taking one customer for example. First, when the initial order for the contract is received from the dealer, it goes into the folder. If there is an installation, then the installation order goes into the folder. On the outside of the folder beside the customer's name and address, we have a zone number which coincides with a map which is divided into zones. On the outside of the folder is a record of the make of the set, model and serial number and the dealer from whom it was purchased and if there is an antenna. This is for in-warranty service.

These file holders may seem bulky and cumbersome but they are the heart of our entire system of control. There are many advantages in keeping this kind of record, chief among them being the fact that you can detail or outline the entire history of the set in full detail which is not always possible where a card index system is concerned. We find this very valuable when the cus-

tomer calls in. We use girls on the telephone and the minute a customer calls in the girl goes to the file, pulls the folder and has a complete history of the set, number of calls, our relationship with the customer and all other data at her fingertips. It has a psychological effect on customers because we do have this information. For example, a woman may call in and say your man was in two days ago and the set doesn't work. The girl pulls the file and refers to the call ticket and finds the man was there six weeks ago. She is able to tell the customer this immediately and tells the customer the trouble certainly is not the fault of the last technician.

We also use these folders on shop jobs. When a technician makes a house call and finds the set must be pulled his call ticket is returned to the office and put in the folder. When the set reaches the shop the entire folder is pulled and is put in the "incomplete" file in the shop. It remains there until the set is repaired. When the set is repaired the benchman details the work he did on the original house call ticket including labor, parts used, etc. This goes back to the folder which is then put into the "complete" file. We have a very fine intercom system and the minute the set is repaired, the technician calls the office and makes a report. Periodically, during the day the folders from the "complete" file are picked up, taken to the office and bills are made out.

QUESTION . . . *What do you think the future of the TV servicing industry will be?*

ANSWER . . . At the present time it appears that we will have a clear-cut line of demarcation between the large operators and the small operators. I do not believe there is any real opportunity for the medium size operator due to economic conditions and other factors. The large operator has the advantage of close administrative control, volume operation and momentum which a large operation engenders.

QUESTION . . . *When you say this Mr. Silberman, do you mean to imply that the one-man alley operator is through?*

ANSWER . . . There will always be a few sets repaired by part time men and perhaps fellows working out of their homes. But insofar as the future of TV is concerned, that will be a constantly decreasing factor. So far as I can say and I have traveled many thousands of miles talking to service operators, servicing must of necessity be handled by organizations having the management ability, and facilities for constant technical training of their men, etc.

FOLLOW-UP SERVICE PROGRAM INSURES FUTURE SALES

A tour of the modern service department is the final sales-clincher that makes customers buy from Snider's. This is illustrated in the photo at left which shows Darrell Snider, (left) handing the customer his warranty on the set which he has just purchased.

It's follow-up service that counts in winning new business, and according to Darrell Snider, owner of Snider Radio and Television Sales and Service in Beaumont, Texas, there is also no better means of keeping old customers sold.

Dependable service is the answer, says Snider, who firmly maintains that the best promotion for selling new sets is an awareness among customers that service will be available with no loss of time. In order to keep a customer satisfied Snider not only has a technician stay with the buyer until he thoroughly understands the operation of the set, but has this period of instruction followed up three days later to assure that the set is operating to suit the customer.

"Customers in the market for a new TV set shop for it more than formerly," explained Mr. Snider. "When they get around to us, our strongest force for closing the deal is convincing them that we do offer extraordinary service and our ability to maintain their sets in trouble-free condition. We believe that ourselves, and make every effort to impress this upon our prospects.

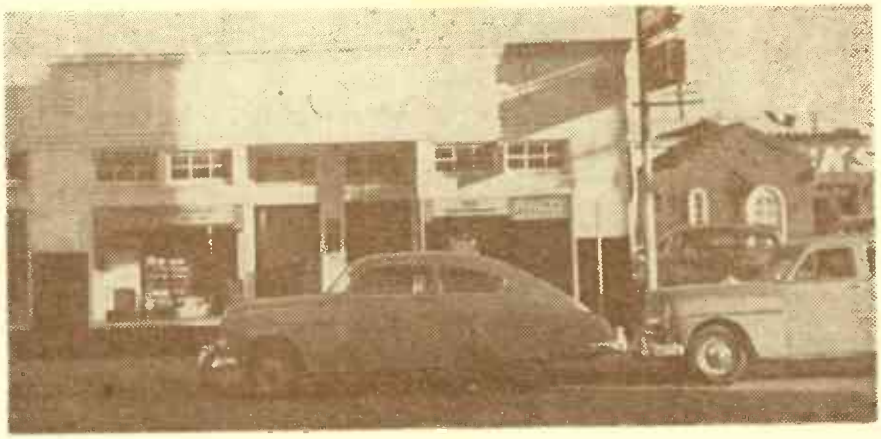
"We find that customers must see and understand the dealer's facilities for service before he is convinced. We make this easy. When the customer shows an interest in a TV set, whether he is a 'drop-in' customer or has been approached by an outside salesman, we don't get very deep into our sales talk without showing him our service section and parts department.

"In the parts and service department the prospect doesn't talk to the technicians. The men are usually busy with repair work. But the prospect doesn't have to talk with the technicians, for the salesman with him is so sales-minded that he can discuss shop routine with authority. The prospect sees trained technicians setting up and testing every set before it is delivered. We stress this point thoroughly, because this service is important. These tours of the service department usually clinch the sale." '

Emergency calls coming in from customers are diagnosed by the shop foreman or Mrs. Snider, who talks directly with the customer owning the set. For example, we find out exactly what the set was doing when it went off and by asking questions we usually can determine what the trouble is. By having someone with know-how make an analysis of the call, the service call is completed quickly.

Snider's serves the greater Sabine trading area, which includes customers in many small towns in the

This is a front view of Snider's . . . the place where customers are invited to drop by for a demonstration of how the service department operates . . . a demonstration that makes sales for this aggressive dealer.



25 mile radius. Two city trucks handle calls in this area with one out-of-town truck calling on customers up to 70 miles distant from the store. Two additional service cars are pressed into service when the need arises.

Three technicians and three truck drivers are employed by the Snider firm. These last three men do a variety of jobs and can handle minor TV repairs. Customers are assured by Mr. Snider that all of his men are hand picked and have been carefully trained to give 24-hour service on all but major repairs.

"It would be extremely difficult to give an exact figure on the number of house calls our field men put in each week," explained Mr. Snider. "One week we will be flooded with calls and the next week there are few and the men work at the benches. About 75 per cent of our work is done on an open 30 day account basis. House calls average 45 minutes for which we charge the $5 minimum, and our shop jobs average $10. About 25 percent of house calls require shop service."

Snider's handle 3 firm's contracts for service for which they charge $18.50 for a 90-day period. They offer their own service contracts free to customers to help sell them on buying their set at the store. About 75 percent of shop service is on sets purchased from the store. The other 25 percent is on shop jobs or house calls for contracts or sets sold by other TV dealers.

"If there is any doubt whether we can repair a TV set in the home, we recommend bringing it to the shop where we can complete the work faster and often at less cost," said Mr. Snider. "Then there is another important consideration. By rushing the set to the shop we can keep our technicians in the shop more of the time, thus eliminating the necessity for an overly-large staff. If we attempted to make major repairs in the home, our shop would be stripped of technicians at times. Such a situation would make it impossible for us to be dependable in answering emergency calls."

In Sniders' opinion the parts department is another real key to sales of new TV sets. He keeps his parts department complete and lets his customers know they can count upon him to supply a needed part so as not to miss their favorite program. About 75 percent of parts are purchased from local houses and the other 25 percent from Houston or the TV parts manufacturers themselves.

"We have never handled any conversion work and would turn it down if it was requested," Mr. Snider declared. "When a customer inquires about a larger screen for his present TV set, we give him the price of the new set and tell him what we will give him as a trade-in. We use the smaller sets accepted on trade-ins to lend to customers while their sets are being repaired."

Advertising for new service contracts is featured daily in the TV section of the two daily newspapers. The ad stresses one day service on all but major repairs.

Many prospective customers of the Snider company want to be absolutely certain that they will get good reception before installing a TV set in their homes. As an added service, Snider purchased an antenna truck equipped with a 50-foot antenna to check a prospective customer's home for TV reception. The truck is so popular that it is kept busy night and day checking reception.

Snider's has found an excelleit business builder in its business card. On the front of the card, the firm's name and address, along with the services they offer, is listed. On the back, all local radio stations are listed, with their network affiliations. Also listed are the five TV channels that can be picked-up in the Beaumont area.

"One thing that always backfires on a TV dealer is his failure to follow up the sale of a new TV set to see that the buyer understands its operation," concluded Mr. Snider. "The importance of this was expressed to me not long ago when a customer came to our store to buy a new set. I was ready to close the sale, when he stated that he had an almost new set that he wanted to trade-in on the new set.

"He had bought the set from a competing dealer whose technician, upon delivering the set, failed to properly instruct the new owner in its use. Consequently, he had been unable to tune-in the set efficiently and had decided the set was no-good. This proved to us that follow-up on a sale can mean the difference in a satisfied customer who will tell his friends where to trade. Our steady increase in sales of new sets when a slow-down is being felt across the country, proves to us that our service program is insuring our future sales."

UHF - TV ADDS NEW MOMENTUM TO A MOMENTOUS INDUSTRY

by
Douglas H. Carpenter
Vee-D-X Engineering Dept.

With the thawing of the freeze by the FCC, actual operation of UHF television stations should be a reality before many months have passed. At the moment there is a shortage of transmitting equipment and trained personnel familiar with operational techniques in this new high frequency range. The processing of station applications by the limited FCC staff will definitely delay the actual on-the-air date of the first commercial UHF telecasting. Taking these problems into consideration, it is fairly safe to say that we should have at least a dozen stations in operation next year.

We have been in an extremely fortunate position during the past two years to evaluate actual performance of UHF antennae and related equipment. The only UHF station in operation to date is that of the National Broadcasting Co. in Stratford, Conn. The purpose of the Stratford installation is to gather data concerning signal propogation at UHF, determine value of different power levels, measforms of antennae and receiving equipment possible. The Stratford station being located practically in the company's backyard has provided an excellent signal source for measurement and design of a complete line of performance proven UHF antennas.

A general misconception about UHF has always been the idea of limited transmission range. During last summer, the Stratford transmitter on UHF and a local VHF station were monitored daily to obtain a clear picture of what actually happened under different atmospheric conditions. The receiving location was some 35 miles from the low channel VHF station, and approximately 55 miles from Stratford UHF transmitter. The effective radiated power of the VHF station was some four times that of the UHF transmitter. The antennas used for both VHF and UHF had equivalent power gain. A standard RCA converter was used for UHF, this being substituted for the front end of the TV set. In both cases, the actual gain was the same, the only difference being the loss in the transmission line which is much more severe at UHF. In every comparison made over this period the UHF transmissions were superior in signal strength, picture detail, and immunity from interference and snow. Don't forget that these tests were made at fifty-five miles from a low-powered transmitter with equipment that could stand a lot of improvement; yet we had saleable TV.

The standard value of 300 ohms has generally been accepted as the design figure of transmission lines and receiver inputs for the UHF range. Standard ribbon line has a long way to go to be considered satisfactory to these higher frequencies. The fixed loss per hundred feet is about 6 db. when dry, and this goes as high as 30 db. during periods of high humidity. Coaxial line doesn't change much when damp, but has such a high fixed loss that it is safe to say that it will not be used at UHF. Unless a new form of transmission line is developed, it is probable that mast-mounted equipment will be used in locations 30 miles or more from the desired stations. This becomes practical at UHF, as a particular area will receive sectional allocations. This means that the frequency assignments will be separated by only one or two channels, and equipment can be designed to amplify the entire section of frequency required.

Initial receiving equipment can be divided into two catagories; internal channel strips and external complete converters. The first idea is a good one as it is simple. All that's required is to stock snap-in UHF turret strips which will replace those of an unused channel in the VHF receiver tuner. Of course, in this case, we have to rely on a circuit that was designed for VHF to go upstairs in frequency and operate efficiently. From what we have seen so far this will operate perfectly alright if you have line of sight to the transmitter. Coupled with a high gain receiving antenna, the range can be extended, but generally speaking, this arrangement will be limited to metropolitan reception. The converter on the other hand makes up for the losses in the transmission line, and allows the set to operate at full efficiency at VHF. The set operates as the i.f. amplifier on an unused channel. This arrangement should prove to be the popular one with the converter moving to the mast position in fringe areas.

The antennas developed by our engineers represent a pretty complete line of what the industry will manufacture, and what the jobber will have on his shelves in the near future. The following is a description of some of the antennas tested, and the type of performance to be expected. It might also be mentioned that the dipole and reflector, popular for metropolitan VHF reception, will find no application at UHF. The serious problem of reflections in cities dictates the use of highly directive arrays, even though there is signal to spare.

The V antenna should find fairly wide application at UHF because of its simple construction, and high power gain and directivity. This will most likely be used in stacked form, as it is cheap to manufacture and gain is limited only by the length of the elements, and the number of stacks. It is not meant to imply that the V antennas currently marketed for VHF will work at UHF. The design angles, etc. are such that this antenna has an essentially circular pattern. Another advantage of the V is that it is broad band covering the whole UHF spectrum. Two disadvantages of the V will probably confine its use to near-fringe areas. During periods of high winds, basic construction provides no means of stabilizing the elements against vibration. Intense vibration of the elements will result in eventual breakage, to say nothing of unavoidable noise. Periodic shifting of the elements can result in signal modulation due to the displacement of the horizontal pattern. The two back lobes of the V limit its use in metropolitan areas because of the reflection problem.

Another form of the V antenna is the Rhombic, much heralded as the ultimate in receiving antennas. The Rhombic is a very good antenna, as it does not have the back lobes of the V, and its mechanical construction is such as to eliminate vibration. To get high power gain and sharp directivity at UHF, the dimensions must be necessarily large making it rather unwieldy by comparison to other types of comparable performance. The vertical pattern of the Rhombic is not particularly favorable from a noise rejection standpoint. This antenna will probably be used in fringe areas where performance is more important than appearance. The Rhombic, like the V, will cover the entire UHF spectrum with uniform gain.

Another antenna that will be used in both metropolitan and fringe areas is the fan dipole. The enlarging of the receiving element permits this an-

tenna to operate over a wide range of frequencies. Various forms both singly and stacked will be used in combination with reflectors in all areas. The fan dipole has no particular disadvantage except weight, and adapts itself to a stamping process which should keep the price down.

The yagi antenna, widely used at VHF, will definitely find application at UHF. Most of you are familiar with the operation of this antenna. There is no other antenna that will deliver equivalent gain for the same amount of material. In fringe areas where the signal is hard to get, there is still no substitute for stacked yagis. The disadvantage of the yagi, of course, is restricted bandwidth. With sectional allocation, it is quite conceivable that yagis will be available that will cover the whole range, and retain the high gain and directivity characteristics.

A form of UHF fringe area antenna that should become popular is the corner reflector type. This antenna has only one disadvantage—it is fairly expensive to produce. The "filled in" reflector increases the power gain of the receiving element, and boosts the signal over the entire UHF range. The vertical angle of this antenna makes it particularly suitable for fringe reception.

Still another antenna formation not used at VHF should become widely used in the new UHF range. The cylindrical slot antenna has the advantage of remaining fairly "flat" over the entire range, and it is simple to produce. Although not essentially a high gain type, when coupled with reflectors and stacked, the gain may be increased without sharpening the bandwidth. This antenna may be used as a single bay, two bay or four depending on signal requirements.

A more familiar type of antenna that definitely will be widely used at UHF is the colinear. The colinear full wave stacked types were pioneered by VEE-D-X for VHF reception, and practically every jobber knows what an effective job they do. Because of the separation of the high and low VHF channels, the colinear never could be designed to cover both with uniform gain. At UHF, however, the colinear type can be designed to cover the entire range, and retain its high gain and excellent horizontal and vertical patterns.

The above antennas represent the types that should soon become commonplace in jobbers' inventories across the country. Other types will, of course, make their appearance as the art progresses, but it is pretty certain that they will be variations of these essential forms. UHF reception and coverage can become nearly equal to that of VHF because of the singular advantage of antenna gain, impossible at lower frequencies. It is hoped that the above information will be helpful in serving as a guide in the selection of antennas when UHF becomes a final reality.

TRANSMISSION LINE PROBLEMS IN UHF

by
Richard Maddox
Belden Mfg. Co.

With the advent of UHF television, we will be entering that part of the radio spectrum that was until recently confined to laboratories and very specialized military equipment.

While much is known about the propagation of radio waves in the UHF spectrum, our interest lies in the frequency range of 470 to 890 megacycles, and more specifically in the transmission and the reception of the UHF television signal.

Whether the receiver operates on the UHF by a change in channel strips, use of converters, or special broad band tuners, there is one factor that remains common to all. That factor is the delivery of the maximum signal for a given location to the receiver input.

Since the length of the wave at the UHF frequencies is relatively small, there undoubtedly will be some very interesting high gain, broad band antennas developed having small physical dimensions. Aside from the high gain, such things as beam tilting and proper orientation of the antenna might be required under certain conditions to obtain maximum signal.

Because height of the antenna becomes increasingly important at the UHF frequencies, many of the UHF antennas will no doubt be installed on top of present VHF antennas. With close spacing there is mutual coupling between the two antennas which can cause a deviation in the horizontal pattern of the UHF antenna. Where antenna rotors are employed this coupling resulting in angular deviation, while undesirable, will not constitute too much of a problem, but where no antenna rotors are used, careful orientation of the antenna will be required. Therefore, a good understanding of antenna theory is desirable if the full capabilities of the antenna systems are to be realized.

One of the most important links in the chain and the one the installer should be most careful of is the transmission line from the antenna to the receiver.

No matter how carefully the antenna has been installed or how efficient it might be, the signal can be greatly attenuated by a poor, high loss transmission line or by a good line improperly installed.

Experience in fringe area VHF reception has taught us things to avoid as well as things to do, and these conditions are even more critical at the UHF TV frequencies.

A good low loss 300 ohm transmission line will have a nominal attenuation of 3.7 db per 100 feet at 600 mc, while the attenuation of a high loss, poorly constructed transmission line has been measured as high as 28 db per 100 feet. Losses of this magnitude cannot be tolerated at UHF frequencies.

A good transmission line will have the flex life required to withstand, without conductor breakage, repeated bending when the antenna is rotated; also to withstand the flexing caused by whipping in the wind. Above all else, it must have an insulation that is uncontaminated and with sufficiently low dielectric constant and power factor if the impedance and attenuation values are to be maintained.

Careful installation practices pay off by increased signal strength and there is plenty of data available on this subject. There is, however, one point to remember in using the same transmission line for both VHF and UHF reception. The length of connecting lead between the UHF antenna and the VHF antenna must be carefully chosen to avoid short circuiting of the VHF antenna. One approach is to use quarter-wave length multiples of connecting lead, taking into account the percentage of velocity of propagation of the transmission line. Another approach is the use of isolation filters for the VHF and UHF antennas.

With separate antenna lead-ins for each antenna, no special problem is involved except to use a low loss switch.

This is only a brief review of a few of the problems that will confront us with the opening of the UHF TV band, but it points up the importance of the transmission line in the installation and the need for reviewing antenna and transmission line theory by management as well as technicians.

(Continued on page 25)

THE MAINTENANCE OF TELEVISION BROADCASTING EQUIPMENT

by Scott Helt

Research Division, Allen B. DuMont Labs., Inc.

One of the greatest bottlenecks to the installation of new UHF stations will be the lack of trained station personnel. In the following article one of the nation's recognized authorities brings you material which you will have to know if you are to take advantage of the *station servicing* opportunities which will be present in most of the smaller UHF channel cities.

In no field of radio engineering is the problem of equipment maintenance more important than in television broadcasting. At the present state of the art there are likely to occur a great many minor cases of trouble throughout the operating day. Although most operating difficulties will not individually result in time off the air, collectively they can result in degradation of picture quality. Each trouble must be promptly cleared. If troubles are allowed to accumulate, the total effect of the minor irregularities will unquestionably lead to complete equipment failure in time. Preventative maintenance will obviate the possibility that these small irregularities may lead to a serious and possibly expensive shutdown. The maintenance technician at the television broadcasting station must day by day seek out and eliminate all possible sources of trouble which give evidence of resulting in equipment failure and time off the air.

A constant source of trouble is small-tube failure. As a matter of fact, tube failures are by far the most frequent source of trouble. This is particularly true of tubes employed in camera chains, picture monitors, synchronizing generatores, and voltage-regulated power supplies. Tubes of the popular miniature type are the prime offenders, and they must be frequently replaced because of microphonic tendencies, an effect not to be tolerated particularly in camera operation. It is good policy to test all tubes operating in video amplifiers at least once weekly in a good dynamic mutual-conductance type of tube tester. Tube testers of the emission type are not to be depended upon for obvious reasons. The operation of voltage-regulated power supplies must be regularly checked to determine if voltage regulator and passing tubes are functioning properly. The most rapid means of effecting such a test is through varying the voltage range potentiometer associated with the power supply, meanwhile sampling the output of the device by means of a high-resistance d-c voltmeter. A serious departure from the normal range through which the supply regulates will ordinarily indicate the presence or inoperative tubes in the regulator portion of the power supply. Ordinarily, the output impedance of such a supply is very low, usually in the order of an ohm or less. Should the impedance be reduced for any reason, motor-boating at video amplifiers in the system is apt to occur. Any indication of motor-boating in a video amplifier should immediately lead to suspicion of the associated voltage-regulated power supply. The difficulty must be isolated and corrected.

The location of noisy microphonic tubes can be quickly determined through gently tapping the envelope of the tube with the eraser end of a lead pencil, meanwhile observing the raster of a picture monitor associated with the equipment under test. The presence of microphonics can be quickly detected through observation of the raster in this manner. The tubes are then replaced in a particular socket until no further microphonics are apparent. Microphonics at tubes in a video amplifier can also be located by shouting loudly at the amplifier while standing in its immediate vicinity. The presence of microphonics will be indicated through observation of the raster of an associated picture monitor. Microphonic noise is particularly troublesome if present in the video preamplifier of a television camera. The high gain of the preamplifier and the low signal-to-noise ratio at the input to the system operate to make such effects more pronounced and troublesome. Therefore, whenever microphonics are noticeable at the system output, the first part of the system to investigate is the camera preamplifier. If microphonics are found not to occur in the preamplifier of the camera, intermediate video amplifiers are next checked; and finally the line amplifier, which drives the transmitter or master control equipment should be checked.

Low-frequency noise in the picture is often the result of operating vacuum tubes in the system with "leaky" cathodes. This refers to leakage at the cathode sleeve of the tube and may be corrected only through replacement of the tube. Low-frequency noise can also be the result of improper filtering at one of the voltage-regulated power supplies or of the presence of a defective tube in one of the regulator circuits. This condition is particularly true of VR types, which are commonly used in such devices.

Hum bars in the picture generally indicate poor or inadequate filtering at one or more of the power supplies, voltage-regulated power supplies not in proper regulation, vacuum tubes evidencing severe cathode leakage, or improper faulty, or

poorly made ground connections. The frequency of the current owing to the hum may be a clue as to the source of the hum. In observing the hum bars present at some convenient picture monitor associated with the camera chain, i.e., the number of wide horizontal black or white bars (depending upon the polarity of the picture signal at the point of inspection), it will be noted that two hum bars will appear if 120-c.p.s. hum is present, and three hum bars will indicate the presence of 180-c.p.s. hum, and so on. If two hum bars are present, any single-phase 60-c.p.s. full-wave rectifier associated with the system should come under suspicion, since the hum frequency present in the output of such a supply will be 120 c.p.s. Improvement of the filtering, replacement of the rectifier tube, or the location and correction of other possible causes within the supply will usually correct the difficulty.

A common source of failure is the electrolytic capacitors. These components dry out after long use, the result being outright rupture or puncture of the dielectric or severe leakage. If such capacitors are not securely grounded, or if their aluminum cases are not in perfect contact with the supporting chassis, they can generate hum bars. When aged dry electrolytic capacitors are operated in camera-equipment power supplies, dielectric leakage is likely to result in bullets shooting horizontally across the reproduced image. These bullets, or bullet-shaped patterns of interference, may be in either the positive or the negative polarity when viewed on the monitor screen, i.e., either black or white in appearance. It is important that electrolytic capacitors be replaced before they have sufficiently aged to dry out and produce electrical interference. They are replaced on regular schedule after one year's service in the equipment of one organization, thereby providing for elimination of any old units before they have an opportunity to result in operating difficulties. Since the organization which has established this policy is a large one and is well recognized for its widely accepted engineering policies, it would seem a wise procedure to follow.

Electrolytic capacitors are also likely to cause trouble if allowed to show excessive temperature rise. Such components should be operated in a well-ventilated chassis, where ambient gradient is not severe. This is particularly true of capacitors associated with critical saw-generating-circuits and deflection amplifiers. In some parts of such circuits, capacitance is critical, and any severe variation in the value of capacitance will result in nonlinear scanning. The capacitance of an electrolytic capacitor has been shown to vary with temperature change. It is unfortunate that the heavy values of capacitance needed in some circuits can be obtained only in small packages through use of the electrolytic type of capacitor. Whenever possible, it is wise to use components utilizing paper, oil, or mica dielectric.

If solenoid-operated relays are employed in camera switching or in master control-room equipment, it is extremely important that contacts be kept scrupulously clean. Dirty contacts are likely to interfere with picture quality to a marked degree, and relay contacts are more likely to cause trouble when used in TV systems than would the same contacts if employed in passing audio frequencies. It is easy to keep contacts sufficiently clean through the careful application of carbon tetrachloride to

(Continued on next page)

MAINTENANCE OF TV BROADCASTING EQUIPMENT

(Continued from page 19)

the contacts each day, wiping the residue off with thin linen tape, the tape being pulled between the contacts. Proper adjustment of relay contacts is also important, so that they cleanly make and break when operated. Of course, all-electronic switching and mixing systems are to be preferred over those employing solenoid-type relays, because of the obvious elimination of relay-maintenance problems. Whatever the mixing or switching system used, it must be so maintained that no interference with picture quality occurs when switching from one camera to another or from one part of the system to another.

The synchronizing generator, which supplies the complete television system with standard R.M.A. driving, and synchronizing signals, must be maintained in a state of optimum operation. It is this unit upon which the entire system depends for properly timed and shaped pulses and waveforms. Ordinarily, tubes are never replaced in the sockets of a synchronizing generator unless one definitely indicates trouble. The reason is that small vacuum tubes are inherently nonuniform as to operating characteristics, and it may be that a replacement tube will have slightly different characteristics from the original, with the result that the generator may evidence trouble after a tube replacement. This is particularly true of tubes used in some timing circuits and in frequency-divider circuits which lack proper stability. It is good practice, however, to check all tubes in the synchronizing generator at least once weekly and through use of a good dynamic mutual-conductance tube tester. Failures can thus be anticipated before they occur in a great many instances, tubes being replaced when suspected of impending failure. Care must be exercised in testing tubes in the synchronizing generator to replace tubes in the same sockets from which they have been removed, provided that they are found to be operative. It is useful to make a record each week of the tube-tester readings as related to operation in a particular unit of equipment. A study of these records from time to time will enable the engineer or maintenance technician to anticipate failures before they occur.

Rosin joints and poorly soldered connections may result in trouble. Badly or poorly soldered connections are particularly annoying when they occur in mobile-operated equipment. The constant vibration and shock to which field equipment is subjected, results in the solder at the joint being fractured. It is good practice to relegate periodically all types of field equipment to the work bench for inspection and test. Here, each soldered connection should be checked by firmly pulling on wires and other leads by means of a pair of needle-nosed pliers, making certain that all connections are tight and electrically capable of passing the required current at the point of connection. Sometimes an inspection of the insulation on leads at the point of connection will indicate poorly soldered joints, the temperature rise due to the high-resistance connection resulting in the insulation becoming charred or burned.

Suspicious soldered joints can be "sweated" through application of a hot soldering iron, and new solder is applied wherever necessary. While the remote equipment is on the workbench, it may also be checkd for any mchanical damage due to shock, nuts and machine screws being tightened, and a general inspection of the unit being conducted in an attempt to uncover sources of possible failure.

Of much importance in the maintenance of studio equipment is the constant effort to avoid geometric distortion of the transmitted picture. Linearization of the horizontal and vertical saw-toothed scanning waveforms will assure proper linearity of the picture, and it is necessary to ascertain daily that the saws at both the horizontal and vertical scanning frequencies are perfectly linear. The linearity of the upward slopes of both saws must be such as to result in negligible "pulling" or "packing" of the picture.

In determining whether the horizontal and vertical saw-toothed waveforms possess proper linearity, it is best to employ a good cathode-ray oscillograph. the vertical amplifier frequency response of which is suitable for passing the horizontal and vertical saws without appreciable frequency distortion. The vertical amplifier input of the oscillograph operating at high impedance is connected across the circuit at the point where it is desired to observe the saw-toothed waveshape.

With the oscillograph Y amplitude, Y attenuation, X amplitude, X attenuation and centering controls so adjusted as to obtain a proper display on the screen of the cathode-ray tube, the sweep range, vernier, and sync controls of the oscillograph are adjusted until a suitable reproduction of the saw-toothed waveform to be inspected is reproduced for observation. It is then possible to make circuit adjustments of R and C in the portions of the circuit developing and amplifying the saw-toothed waveforms and until linearization of the waveforms is achieved.

In checking the presence of geometric distortion in a studio camera chain, it is helpful to employ a test pattern mounted on an easel. The test pattern is suitable illuminated, the camera being trained upon it in such a manner that no error due to camera position (with reference to the principal axis of the optical lens system as related to the center of the test pattern) results in distortion of he reproduced image as viewed at the output of the line amplifier. If a film chain is employed, and is checked for geometric distortion, a test-pattern slide may be used. It can be scanned by means of a slide projector. Test patterns are also available on both 16- and 35-mm. film for projection by means of the station's equipment.

Whatever the source of the test pattern, it can be checked for possible distortion by reproducing it through the camera chain and observing the reproduced image at a suitable picture monitor connected at the line amplifier output. With the test pattern reproduced as the display on the cathode-ray tube screen of the monitor, measurements are made with a translucent scale to determine whether the distance between the outer edges and its center is precisely the same throughout 360 dg. Any difference in the measured separation of the test-pattern center and the outside edges of the outer circle will indicate the presence of geometric distortion. The use of a bar-and-dot generator, which injects suitable markers across the reproduced test pattern, will be helpful in determining just what quadrant or portion of the test pattern evidences distortion. The Du Mont type TA-107-A synchronizing generator provides linearity test signals at 900 c.p.s. (which produces 15 vertical bars across the raster)

(Continued on page 23)

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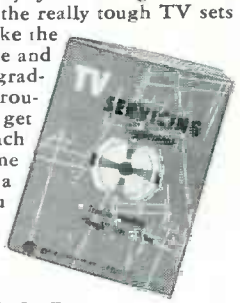

RADIO CORPORATION of AMERICA

ELECTRON TUBES **HARRISON, N.J.**

How Urban May Is Getting Ready For That New Station

(Continued from page 8)

he says, "we may have to do twice that much work. On the other hand, if the set requires very little service, the customer has paid more than he would pay on a time basis. Many of the calls are adjustment calls—the set owner cannot get the set back into synchronization—and the time spent is short.

The Urban May store is on Beach street, the main business thoroughfare of Daytona Beach. He handles four makes of TV sets—General Electric, Admiral, Motorola and Olympic. His parts are bought entirely from jobbers.

During the three years he has been in business, May has experimented with all types of advertising. He has found that classified advertising featuring his service work does not bring appreciable results, and has come to the conclusion, after trying ads of various sizes, that space of less than 24 or 30 inches is not fully effective, also that Sunday newspaper ads bring better results than those run on week days and that there must be a special price or other inducement to bring customers into the store.

In cooperation with one of the set manufacturers, he has a spot radio time at 6:15 p.m. seven days a week immediately following the news broadcast. This has brought results. He recently made a special offer of a 99-cent radio repair job, plus cost of any parts needed. "Naturally we lost money on this," said May, "but we did it for a purpose—to get into the homes of prospects for TV sets." This offer brought substantial results and was made at a time when business was slack, giving May's service men a chance to talk up TV sets on their calls. They get a commission on any sales they make.

"People are more price conscious than ever today," says May. "This is particularly true in a city like Daytona Beach, where there are many retired persons living on fixed incomes. So we stress prices in our advertising in newspapers and on the radio."

Since selling two sets a week in itself would not make a TV store profitable, the Urban May store also carries a line of refrigerators. Special inducements by some of the refrigerator manufacturers, through their retail outlets, have made this

(Continued on page 25)

(Continued from page 20)

and 157.5 kc. (which produces 10 vertical marker bars across the raster). These signals may be injected or mixed with the blanking by means of a switch, thereby providing a means of checking the scanning linearity of the television equipment. With these test bars superimposed upon the test pattern and the display viewed at the screen of a picture monitor, it becomes relatively simple to ascertain to what degree any geometric distortion of the test pattern exists. It may then be corrected circuit-wise, while observing the screen of the picture monitor. The correction usually involves changing the values of circuit components in the particular portion of the system where nonlinearity of scanning has developed.

In the studio, it is important that extraneous noise be kept to the absolute minimum. This dictates that the wheels of camera dollies, microphone booms, and other mobile equipment be kept well lubricated. This maintenance work should be scheduled at least once weekly. If studio lights are controlled by means of cords, the pulleys over which the cords operate must be kept thoroughly oiled and lubricated. The mechanical parts of studio cameras, such as optical focusing control mechanisms, must also be kept well lubricated, for the slightest extraneous noise occurring in the studio may well mar an otherwise perfect program. The same advice holds true for pan and tilt-top mechanisms which provide movement of the camera in either the vertical of horizontal plane. All moving parts must be kept well lubricated.

In the well-organized television broadcasting station, the chief engineer usually sets up a daily and a weekly routine maintenance schedule, assigning specific duties each day or week to regular staff maintenance technicians on a strictly routine basis. A maintenance report form must be filled out at the end of each operating day, wherein the maintenance technician to whom the work has been assigned, certifies that he has satisfactorily completed the assigned work. Any work previously assigned by the chief engineer and not completed by the close of the day's operations is carried over and charged against the engineer's maintenance assignment for the following day. Thus, all necessary routine maintenance is definitely carried out in an orderly and business-like manner. Such preventative maintenance can do much toward eliminating loss of valuable time off the air. Other detailed studio maintenance will occur to the station chief engineer, some dictated by the type of equipment in use, and he will want to include it in the maintenance schedule of the particular station concerned.

The institution of a routine maintenance program at the television transmitter is of the greatest importance and will accomplish much o- ward reducing time off the air. Of primary importance is the care of transmitting tubes. It has been found convenient to carry a 3- by 5-in. card file divided into three sectiois: tubes in spare stock, tubes in the transmitter and actually in operation, and records of tubes that have been dis-

(Continued on next page)

carded. When tubes are received from the supplier, they are first tested in the transmitter in the sockets for which they are intended. Such testing is usually conducted when the statioi is not operating on regular schedule, preferably after midnight when there is no possibility of creating undue interference with other stations or services. Of course, operation into a phantom or dummy antenna is much to be preferred.

After a new tube is tested, the following types of information are entered in the file:

1. The date the tube was received

2. The condition of the packing and the result of preliminary inspection of the tube.

3. Date when the tube was tested in the transmitter

4. The result of the test, together with any appropriate comments as to its behavior under operating conditions

Additional entry space is provided on the card for:

5. The date the tube was placed in active service

6. The socket in which it is to be operated

7. The date the tube was removed from service

8. The reason for the removal of the tube from service

9. The disposition made of the tube after final removal from the transmitter.

On the reverse side of the card, space is provided for a month-by-month record of the number of hours that the tube has been in operation. This information is extremely importait in determining whether a particular type of tube is giving satisfactory operation in the transmitter under a given set of operating conditions. Often, the tube-life record will indicate that some other type of tube will prove more acceptable for a particular application. Then, either a substitution may be made or a report sent to the transmitter manufacturer of the life record obtained with the tube. A guarantee is usually extended by the tube manufacturer covering all types of transmitting tubes in use at the television broadcasting station. The usual practice is to guarantee transmitting tubes for 1,000 hr. of operation. A rebate is made to the station on defective tubes covering the difference between full value of the tube and the actual value of the tube to the station based on failure before 1,000 hr. Thus, if a particular transmitting tube fails at 500 hr. and through no fault of the station, a 50 per cent rebate is allowed upon return of the unsatisfactory tube so it may be tested and inspected by the manufacturer to substantiate the station's claim.

The routine maintenance schedule at the television transmitter must include regular removal of accumulated dust from within the equipment. If dust is allowed to accumulate, high-voltage flashovers and ensuing equipment failure are liable to occur, particularly in circuits carrying high-potential d-c or radio-frequency energy. The dust can be removed by means of a hand bellows, or it may be wiped off with a soft cloth if sufficient care is exercised and all high-voltage equipment is rendered inoperative before being dusted. In this regard, high-voltage capacitors should be momentarily short-circuited at their terminals before being cleaned, even though bleeder resistors are generally believed to provide protection. Dust must also be removed from all accessory equipment operated at the transmitter, with particular attention to regulated high-voltage power supplies associated with such equipment.

It is important that all relays used in operation of the transmitter be regularly cleaned, contacts burnished with a burnishing tool, and the whole mechanism adjusted for proper operation. Failure to do this will result in improper operation of control circuits, when it is desired to start or stop the transmitter quickly. It is highly desirable to check and inspect regularly all overload, underload, and other protective relays to be made a part of routine transmitter maintenance.

The condition of high-voltage capacitors in the transmitting equipment can be ascertained through feeling them with the palm of the hand after a long period of operation of the transmitter. Any excessive temperature rise will indicate dielectric leakage and impending failure of the dielectric material. In such cases the high-voltage capacitors or components of this type which pass heavy radio-frequency currents should be immediately replaced before they result in failure of the transmitter and consequent loss of time off the air.

If water-cooled tubes are employed, the water-cooling system of the transmitter must be regularly inspected for possible accumulation of scale due to excessive carbonates and sulphates in the water. The specific re-

sistivity of any distilled water should be greater than 20,000 ohms per cu. cm. Care must be particularly exercised that all nipples and hose or ceramic tubing connections are kept clean and free of scale or sludge. It is also most important that all air blowers providing forced air on tube seals be kept in proper operating condition. All electric motor bearings must be well and regularly oiled and lubricated. It is a good idea to suspend a small strip of cloth in the air stream of all air blowers providing cooling of tube seals, so as to provide an indication of blower operation. These blowers are usually mounted inside the transmitter frame, which is provided with glass doors or windows in front. It is difficult to check properly on the operation of the blowers during periods of regular operation unless some means of this kind is provided.

Disconnect switches and interlocks should be regularly inspected to determine whether they result in interruption of the high voltage when transmitter access doors and windows are opened. High voltages are present within the transmitter, as well as dangerous radio-frequency potentials, and every means must be provided to ensure the maximum protection to the operating personnel. Rubber gloves and gauntlets should be worn when any work is attempted where dangerous high potentials are present, and rubber blankets would be thrown across transmitter sills and doors when it is necessary to reach inside for parts of the transmitter needing service under operating conditions. It must be remembered that rubber gloves and blankets will not afford protection against radio-frequency voltage, and it is the established practice to make the transmitter high-voltage circuits inoperative when work is attempted on circuits where radio-frequency energy is present.

How Urban May Is Getting Ready for That New Station

(Continued from page 22)

line more competitive. To meet this competition, the May store will offer to fill the deep-freeze meat compartments of each refrigerator sold with beef. In the larger refrigerators this means $45 worth of meat and in the smaller ones $18 worth, but it sold some refrigerators.

May believes that an active interest in sports is a big help in television work. Daytona Beach is his home town; he played football and baseball for the local high school and for some time has been one of the top-notch golfers in the area. This "non-business" contact with people, plus May's experience in TV and his general business philosophy makes it almost certain that when television really hits Daytona Beach, Urban May will be riding on the crest of it.

NOW . . . UNFREEZE *YOUR* BUSINESS

by
Wm. J. Doyle
Vice-President, Sales
Astetic Corp.

Science records that some forms of plant life, frozen into a complete state of suspended animation centuries ago, have been thawed out, properly nurtured, and have proceeded to grow and bloom as though nothing had happened.

This brooks well for the television industry. Not that the TV freeze has been in effect for one or even a half-century. It only seems that way, and, anyhow, that is not the point.

The point is that television's transition from freeze to thaw is going to turn loose a capacity for renewed growth that might even surprise the type of scientist who goes seed hunting in glaciers.

The growth will be great. The business volume in this field for service operators will rapidly become a multiplication of present levels.

Even though the results of the thaw be controlled to a gradual pace, the impact on business volume will be sharply upwards. This is because the thaw will accomplish far more than the eventual creation of millions of new set owners, as good reception becomes a reality in previously poor or blank areas.

One other immediate effect, of course, will be the sizeable market for UHF converters. Accompanying this will be a soaring demand for UHF antennas, UHF boosters and probably other accessories. Existing antennas may be generally satisfactory within UHF service areas, but viewers a little farther from transmitters will doubtless require antennas and boosters designed for the new frequencies. Even then, many within service areas will buy new UHF antennas and boosters for varying degrees of improved reception they will thus accomplish.

The shifting of present VHF assignments and increasing of power will result in a vast new source of new equipment sales. Reduced co-channel interference and increased

(Continued on next page)

ADVERTISERS' INDEX

power will, naturally, improve reception from the VHF stations set owners now enjoy. This will make present set owners much more reception-quality conscious than ever. They will want newer, better receivers for this reason, plus the fact that going for greater distance will become a practical extension of their TV enjoyment.

For the same two reasons, present viewers, and new ones, will more readily change and/or purchase new and better antennas, boosters, interference filters, etc.

Unquestionably, there are other effects to look for which will add to the over-all, tremendous boost in size of the television market. A greatly stimulated demand for large-size, remote viewers for schools will spring from the approximately 200 assignments to non-commercial, educational purposes, for example.

All service operators who would grow with this great expansion, without falling short of its full potential, must keep a constant, sharp eye on each new factor of development. Study and planning now will shortly pay off double, and then some. The demand will be there. The only question is whether you, as service operators, will best meet it, and how promptly.

Parts Jobber - May 1952

Counterman Sales Aid Released By Littelfuse

The first completely illustrated list price sheet on fuses is published by Littelfuse, Inc., 1865 Miner Street, Des Plaines, Illinois. A four-page sheet contains actual-sized drawings of 25 fuse types and blowing characteristics.

By matching the blown fuse to the illustration the jobber counterman or service man can determine, quickly and accurately, the fuse needed.

A companion sheet accurately illustrates and prices various assortments and kits as well as the complete line of fuse mountings for quick, sure identification.

Bakelite In-line Fuse Retainers Assembled with Lead	For SFE		
	For SFE		
	For SFE		
	For SFE 1		
	For SFE 2		
3AG Fuse Extractor Posts	Screwdriv		
	Finger ope		
	Miniature		
	Watertight	342006	2.35
3AG Mountings	Can cover, one pole, one spare	350019	1.00
	Can cover, one pole	351002	.40
	Hinged can cover, one pole	351005	.50
	Can cover, two pole	351007	.65
	Hinged can cover, two pole	351009	.75
	Through panel, one pole	353001	.25
3AG Mountings with Screw Terminals—Type "T"	Last two digits of catalog number indicate number of poles—as 356001, one pole; 356010, ten poles		
356(000) Series	1 Pole to 12 poles (list per pole)		.35
3AG Mountings with Solder Terminals—Type "S"	Last two digits of catalog number indicate number of poles—as 357001, one pole; 357010, ten poles		
357(000) Series	1 Pole to 12 poles (list per pole)		.15
8AG Fuse Extractor Posts	Screwdriver operated	371001	.45
	Finger operated	372001	.45
Fusible Binding Posts	For 1/4—28 thread	373428	1.50
	For 10 —32 thread (.187)	373032	1.50
	For 1/4—32 thread	373432	1.50
	For 8 —32 thread	373832	1.50
	For 1/4—40 thread	373440	1.50
8AG Mountings	Through panel, one pole	383001	.25
	Meter-back	383002	.20
8AG Mountings with Solder Terminals—Type "S"	Last two digits of catalog number indicate number of poles—as 387001, one pole; 387010, ten poles		
387(000) Series	1 Pole to 12 poles (list per pole)		.15
4AG Fuse Extractor Post	Watertight	442006	2.35
4AG Mountings with Screw Terminals—Type "T"	Last two digits of catalog number indicate number of poles—as 456001, one pole; 456010, ten poles		
456(000) Series	1 Pole to 12 poles (list per pole)		.40
5AG Mountings with Screw Terminals—Type "T"	Last two digits of catalog number indicate number of poles—as 556001, one pole; 556010, ten poles		
556(000) Series	1 Pole to 12 poles (list per pole)		.50
5AG Fuse Extractor Post	Watertight	571004	1.50

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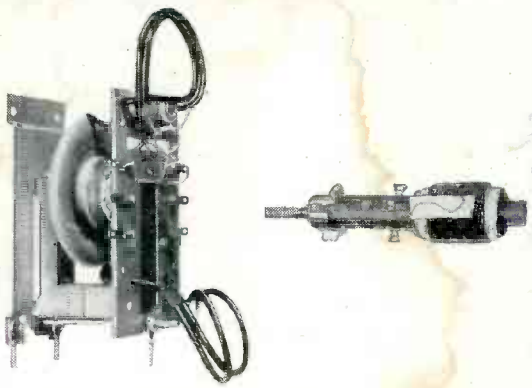

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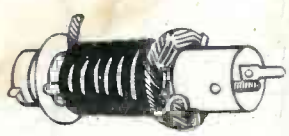

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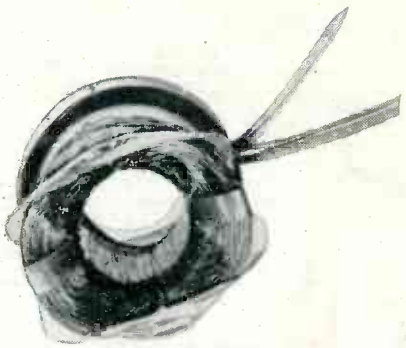

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- TV Repl Guide No. 404, 3500 models & chassis.
- Cross Ref Data, IF-RF Coils, Form No. 14.

See your Jobber or write: Merit Coil and Transformer Corp., 4425 Clark Street, Chicago 40.

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