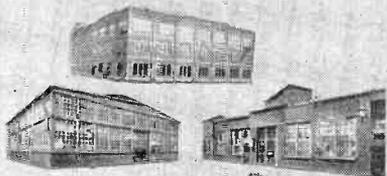
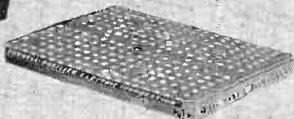


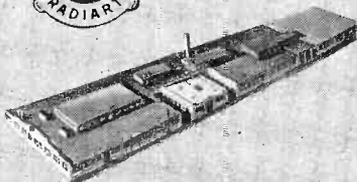
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C-D Fuquay Springs Division, N. C.



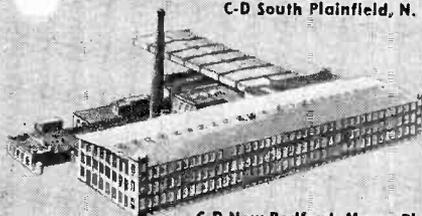
C-D Indianapolis, Ind., Plant



C-D Providence, R. I., Plant



C-D South Plainfield, N. J., Plant



C-D New Bedford, Mass., Plant



C-D Worcester, Mass., Plant



C-D Cambridge, Mass., Plant

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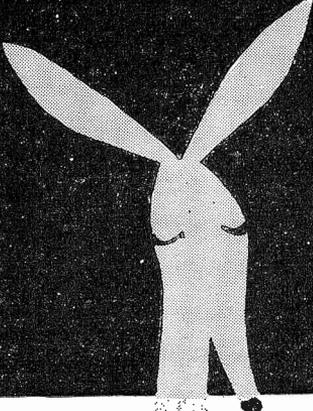
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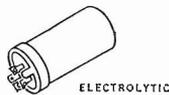
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# MINIATURE COMPONENTS FOR TRANSISTOR CIRCUITRY

From its inception, the transistor has offered attractive possibilities in equipment subminiaturization. The largest standard transistor is smaller than the smallest vacuum tube. At the time the first commercial transistors appeared in 1949, however, considerable frustration resulted from the comparatively large size of most circuit components, as compared to the tininess of the transistor. The reduction in size of an amplifier stage, for example, through transistorization was a much smaller ratio than the somewhat exciting ratio between tube and transistor volumes. Here indeed was a classic example of a 1-foot dog wagged by a 9-foot tail.

It is interesting to note at this writing that developmental programs have yielded a respectable number of subminiature and sub-subminiature components applicable to transistor circuitry. We have assembled together the specifications and brief descriptive material on a number of such components, both of recent and earlier development, and present them herewith for ready reference. It is believed that the transistor equipment engineer will find these data of practical value when working out the dimensions of proposed subminiature devices. Heretofore, such information has not been available in one convenient listing.

## Audio Transformers

Gramer.<sup>1</sup> Transformer and choke series. Each unit  $11/32 \times 3/8 \times 3/8$ , except No. M10 which is  $21/64 \times 3/8 \times 3/8$ . Weight 0.005 lb.

No.	Type	Match Imp.		D. C. Resistance	
		Pri.	Sec.	Pri.	Sec.
L1	Interstage	20K	1K	1150	175
M1	Interstage	20K	1K	930	95
M3	Output	600	50	66	7.7
M5	Output	400	50	70	9.3
M6	Input	200K	1K	2600	135
M7	Output	1K	50/60	160	9
M10	Choke	12 hy 0 d. c.		830	

Microtran.<sup>2</sup> Sizes: all types  $\frac{7}{8}$  diameter. "Miniature"  $1\frac{1}{8}$  high, "Sub-miniature"  $\frac{11}{16}$  high, "Microminiature"  $\frac{3}{8}$  high.

No.	Application	Pri. Imp.	Sec. Imp.
T1	Line to emitter	500	500
T2	High-imp. mike to emitter	50K	500
T3	Interstage (collector to emitter)	50K	500
T4	Collector to line	50K	500
T5	Collector to speaker,	50K	6

Stancor.<sup>3</sup> Type UM-11G interstage: 20,000 ohms primary, 1000 ohms secondary. Type UM-111 output or matching: 1000 ohms primary, 60 ohms secondary. Type UM-112 high-impedance microphone to emitter: 200,000 ohms primary, 1000 ohms secondary. Each type  $\frac{1}{4} \times \frac{3}{8} \times \frac{3}{8}$ , 0.07 ounce.

U. T. C.<sup>4</sup> Subouncer transformer and choke series. Each type  $\frac{1}{8} \times \frac{5}{8} \times \frac{7}{8}$ , 0.03 lb.

Type	Use	Level	Pri. Imp.	Pri. DC	Sec. Imp.	Pri. Res.	Sec. Res.
SO-1	Input	+4VU	200 500	0	250K 62.5K	16	2650
SO-2	Inter-stage 3:1	+4VU	10K	0	90K	225	1850
SO-3	Output to Line	+20VU	10K 25K	3ma. 1.5	200 500	1300	30
SO-4	Output	+20VU	30K	1.0	50	1800	4.3
SO-5	Choke	50 hy at 1 ma. d. c. 3000 ohms d. c. resistance					
SO-6	Output	+20VU	100K	0.5	60	3250	3.8

Sub-Subouncer transformer and choke series. Each type  $\frac{1}{8} \times \frac{3}{4} \times \frac{3}{8}$ , 0.02 lb.

Type	Use	Level	Pri. Imp.	Pri. DC	Sec. Imp.	Pri. Res.	Sec. Res.
SSO-1	Input	+4VU	200 50	0	250K 62.5K	13.5	3700
SSO-2	Inter-stage 3:1	+4VU	10K	0	90K	750	3250
SSO-3	Output to Line	+20VU	10K 25K	3ma. 1.5	200 500	2600	35
SSO-4	Output	+20VU	30K	1.0	50	2875	4.6
SSO-5	Choke	50 hy at 1 ma. d. c. 4400 ohms d. c. resistance					
SSO-6	Output	+20VU	100K	0.5	60	4700	3.3

### Resistors

Electra.<sup>5</sup> Rated  $\frac{1}{8}$  watt, 250 v. maximum. Size:  $\frac{9}{32}$  long,  $\frac{5}{64}$  wide. Values: 4 ohms to 0.25 megohm.

Daven.<sup>6</sup> Type 1106. Rated 0.10 watt. Size:  $\frac{7}{16}$  long,  $\frac{3}{16}$  diameter. Values up to 10,000 ohms, plus or minus 0.05% tolerance.

### Capacitors

Cornell-Dubilier. (A) Molded midget mica

Type	Size—Inches	Cap. Range—ufd.	D. C. Working Voltage
1D	13/16 x 13/16 x 5/16	0.0056-0.01	500
1W	13/16 x 13/16 x 1/4	0.00056-0.0051	500
5W	51/64 x 15/32 x 7/32	0.000005-0.00051	500

(B) Molded midget silvered mica.

Type	Size—Inches	Cap. Range—ufd.	D. C. Working Voltage
1DR	13/16 x 13/16 x 5/16	0.005-0.01	500
1R	13/16 x 13/16 x 1/4	0.00056-0.0047	500
5R	11/16 x 7/16 x 3/16	0.00027-0.00051	500
22R	1/2 x 19/64 x 3/16	0.000002-0.00025	500

(C) Miniature disc ceramic.

Type	Size—Inches		Cap. Range—uufd.	D. C. Working Voltage
	Dia.	Thick.		
GO11 to GO28	1/4	5/32	5-30	500
GO29 to GO42	3/8	5/32	33-100	500
GO43 to GO67	19/32	5/32	110-820	500
GO68 to GO71	3/4	5/32	910-1500	500

(D) Metalized-paper tubular.

Type	Body Size (DxL)—Inches	Capacitance—ufd.	D. C. Working Voltage
MP 2S5	3/8 x 5/8	0.05	200
MP 2P1	3/8 x 5/8	0.1	200
MP 2P25	15/32 x 5/8	0.25	200
MP 2P5	15/32 x 1-1/8	0.5	200

(E) Miniature electrolytic.

Type	Can Size (DxL)—Inches	Capacitance—ufd.	D. C. Working Voltage
BBR-1-50	3/8 x 1-1/16	1.0	50
BBR-2-50	3/8 x 1-1/16	2.0	50
BBR-4-50	3/8 x 1-1/16	4.0	50
BBR-5-50	3/8 x 1-1/16	5.0	50
BBR-10-50	3/8 x 1-1/16	10.0	50
BBR-25-50	1/2 x 1-1/16	25.0	50

Rheostats and Potentiometers

Centralab.<sup>7</sup> "Dime-size", carbon-type,  $\frac{5}{8}$  diameter without knob —  $\frac{23}{32}$  diameter with knob,  $\frac{1}{4}$ " thick including knob. Rated 1/10 watt. Supplied with or without switch.

Plain Type	Switch Type	Max. Resistance	Taper
B16-118	B16-218	500,000	Semi-log (audio)
B16-120	B16-220	1 meg.	Semi-log (audio)
B16-122	B16-222	2 megs.	Semi-log (audio)
B16-124	B16-224	3 megs.	Semi-log (audio)
B16-128	B16-228	5 megs.	Semi-log (audio)

Miniature Diodes and Rectifiers

Raytheon.<sup>8</sup> Germanium diodes. Size:  $\frac{25}{64}$  long,  $\frac{9}{64}$  diameter. Weight: 1 ounce. CK705 general purpose, CK706 video detector, CK707 50-volt d. c. restorer, CK708 100-volt d. c. restorer, CK710 UHF mixer, CK713 computer, 1N66 general purpose, 1N67 high back resistance, and 1N68 100-volt d. c. restorer.

Hughes.<sup>9</sup> Germanium diodes. Size: 0.265" long, 0.098" diameter. 1N55B, 1N68A high peak; 1N67A, 1N89, 1N97, 1N98, 1N99, 1N100, 1N116, 1N117, 1N118 high back resistance; 1N90, 1N95, 1N96 general purpose; 1N126, 1N127, 1N128 JAN types.

General Electric.<sup>10</sup> Germanium power rectifiers. Body size: 0.240" long, 0.250" diameter. RMS input voltage: 120 v. 50-kc. maximum frequency.

Type	D. C. Output Current	Peak Inverse Voltage	Full-Load Voltage Drop
1N91	150 ma.	100 v.	0.5 v.
1N92	100 ma.	200 v.	0.5 v.
1N93	75 ma.	300 v.	0.5 v.

#### Miniature Indicating Meters

International Instruments.<sup>11</sup> D. C. d'Arsonval-type instruments in case sizes of 1-inch and 1½-inch diameter and ¾ inch depth. Available in the following ranges: 0-100 microamperes (110 ohms); 0-200 ma. (700 ohms); 0-1 ma. (25 ohms); 0-5 ma. (2.6 ohms); and 0-10 ma. (1.9 ohms). Accuracy: plus or minus 2%.

#### REFERENCES

1. Gramer Transformer Corporation. 2734 N. Pulaski Road; Chicago 39, Illinois.
2. Microtran, Affiliate of Crest Laboratories, Inc. Whitehall Bldg.; Far Rockaway 91, N. Y.
3. Chicago Standard Transformer Corporation. 3572 Elston Avenue; Chicago 18, Illinois.
4. United Transformer Corporation. 150 Varick Street; New York 13, N. Y.
5. Electra Manufacturing Company. 2537 Madison. Kansas City, Missouri.
6. Daven Company. 191 Central Avenue; Newark, N. J.
7. Centralab, Division of Globe-Union, Inc. 900 E. Kefe Avenue; Milwaukee 1, Wisconsin.
8. Raytheon Manufacturing Co. 55 Chapel Street; Newton 58, Massachusetts.
9. Hughes Aircraft Co., Semiconductor Sales Dept.; Culver City, California.
10. General Electric Company, Electronics Division; Syracuse 1, N. Y.
11. International Instruments, Inc. 331 East Street; New Haven 11, Connecticut.

# OSCILLOSCOPE MAINTENANCE

Oscilloscopes no longer gather dust on stock shelves. Regarded as something of a curiosity ten years ago, most service technicians today rely upon the oscilloscope as a general-purpose test instrument of wide utility. Unlike other indicating instruments, the scope is capable of showing details of waveform as well as signal amplitude and phase. This instrument is an essential tool of television servicing.

Because the oscilloscope receives almost continuous usage in modern service shops, its maintenance has become important. Like any other fine tool, it must be kept in top shape if it is to be reliable. Every technician should devote an hour or so every few months to checking his scope and doing whatever is required to restore its peak performance.

Listed in the following paragraphs are a few of the important items which should receive attention in periodic oscilloscope maintenance

## Maintenance Items

**Linearity.** A pattern which crowds from top to bottom or from side to side on the screen is unsatisfactory for accurate observations. A good check on linearity of the vertical deflection can be made in the following manner: (1) Switch-off the internal sweep. (2) Set the horizontal gain to zero. (3) Apply a sine-wave signal voltage to the vertical amplifier input terminals. (4) Advance the vertical gain control slowly. (5) A vertical line trace should increase equally in length up and down from the center of the screen. If the line grows faster in one direction than the other, the vertical response is non-linear. This usually can be corrected

by (a) changing tubes in the vertical amplifier, (b) replacing defective resistors or capacitors, or (c) correcting operating voltages to the correct values. Horizontal non-linearity is checked in the same manner: (1) Switch-off the internal sweep. (2) Turn the vertical gain control to zero. (3) Turn the horizontal gain control to zero. (4) Apply a sine-wave signal voltage to the horizontal amplifier input terminals. (5) Slowly advance the horizontal gain control. The horizontal line trace should grow out in equal lengths on each side of the center of the screen. If the line moves faster in one direction than the other, horizontal non-linearity exists. The remedy is similar to that specified above for the vertical channel. Correct the condition by replacement of tubes or components, or adjustment of operating voltages.

**Tubes** Tubes should be changed throughout the circuit before they go bad. The real criterion of tube condition is operation in the circuit itself. While a tube tester certainly is a helpful instrument, its indications should not be accepted as final. We strongly advise using the tester to spot tubes which have dropped in transconductance, but by all means try substitution methods. Actually try a brand new tube in each position in the circuit, and leave the new tube in place when operation unquestionably is improved by its addition.

**Sweep Non-Linearity.** This fault results in a crowding of the pattern to one side or the other on the screen even when a check of non-linearity in the horizontal channel gives a clean bill of health. Older oscilloscopes using gaseous sweep tubes are notable

offenders. Replace the tube. When sweep non-linearity shows up in scopes using hard tube oscillators or multivibrators, the trouble usually is (a) defective tubes, (b) off-value resistors, or (c) shifted circuit voltages.

**Screen Calibration.** Both the vertical and horizontal scales should receive a voltage calibration every few months. This is particularly important if the technician is in the habit of reading peak voltage values from the displayed waveforms. The correct procedure is to apply a number of accurately-known sine-wave a. c. voltages to each channel (vertical and horizontal) and to plot the deflections (inches or divisions, as convenient) against known input voltage values. The procedure should be repeated at several settings of the vertical and horizontal gain controls. Where the technician customarily uses a scope voltage calibrator of the square wave type, the periodic sine-wave voltage calibration is not as important as when this instrument is not regularly used.

**Hum Interference** With the vertical gain control set to zero, the internal sweep should be switched-on to give a plain horizontal line trace. The horizontal gain control should be advanced to spread the line over most of the screen. The line should be clear and sharp, and perfectly straight. Any tendency toward "worming" is an indication of power supply hum interference. Hum arises from faulty tubes, especially those in which heater to cathode leakage is high, and from the power supply. A defective power transformer, or bad shielding of the transformer or filter choke can be responsible. In some oscilloscopes the wiring to the cathode ray tube is critical in dress and should be bent or pushed to one side or the other to

minimize hum pickup. Occasionally the cathode ray tube shield becomes disturbed in position or loosened, and this also is a contributing factor.

**Loss of Focus.** This is a troublesome difficulty often experienced as the scope becomes older. The trouble is shifting of the values of resistors along the high-voltage string, especially the limiting resistors on each side of the focus control. The remedy is to replace these resistors with new ones of correct value.

**Loss of Intensity Control.** Like loss of focus, loss of brilliance control is the fault of shifting values in the resistors in the high-voltage bleeder string, especially those resistors directly adjacent to the intensity control potentiometer. The remedy is to replace those resistors with new ones of correct value. Generally, when one or two resistors must be replaced in the high-voltage string, others also need attention. This is because the faulty ones often cause increased current to be drawn by the entire string. The resultant overheating causes other resistors to shift value.

**High Voltage Leaks.** Because the high-voltage d. c. power supply in an oscilloscope operates at a potential which can be dangerous, the technician must always be on the alert that none of the input terminals accidentally become energized as a result of short circuits or leakage in the instrument. Most oscilloscopes are of excellent design and precautions have been taken to protect users of the instruments. However, accidents are unpredictable. The technician should check between each terminal and the instrument case with a 20,000 ohms-per-volt d. c. voltmeter at regular intervals, and the presence of any d. c. at all should be investigated at once. There is no substitute for safety first!

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**WANTED** — Experienced TV and Radio Service Technician, capable of assuming management with owner of an established and successful service business. Good salary to the right man. Fred's Radio Clinic, 732 - 14th St., Paso Robles, Calif.

**WANTED**—Mobile 152-163 mc. FM rcvr., having 6 v. working system. in good cond., State make, model, No. of tubes, and price. Robert L. Link, 621 S. McKenzie St., York, Pa.

**FOR SALE**—Portable RCA radio with self-charging battery, never used floor samples; used TV 7" and 10" consoles. Peter's Music, 1719 Mass. Ave., Lexington 73, Mass.

**SELL OR TRADE**—RCA model 155A 3" scope. Need Eico Resistor-Condenser Tester, battery eliminator, and 10BP4 tube. Karl Nester, Box 76, Van Meter, Pa.

**SELL OR TRADE**—Electro-Voice model 3000 TV booster, in orig. box, \$25, or trade for ham gear. Dave Schmidtke, Route 1, Faribault, Minn.

**FOR SALE**—1940 Buick auto radio, all mountings. Wm. K. Lacy, 135 Alice Ave., Syracuse 9, N. Y.

**WANTED**—Short wave transmitter and rcvr. for 16 foot fishing boat. Cash or will trade any type of camera, projector or photo equip. I. Allen Hanover, 47 Bay 26th St., Brooklyn 14, N. Y.

**FOR SALE** — Rider Manuals 1 to 13 incl; Sprague TO-3 Tel-ohmike; Jackson model 648 Dynamic Tube Tester; Precision sig. gen. series E-200; Heathkit VTVM; RCA scope. Going out of business. No reasonable offer refused. H. S. Bennage, Marionville, Mo.

**TRADE**—National SW rcvr., model N.C.33 for civil defense radio, 30 to 50 mc. band or 152 to 160 mc. band. Hy Knoller, 1590 East 22nd St., Brooklyn, N. Y.

**WANTED**—Aircraft radio, for cash or trade for new or used TV (no surplus). H. M. Love, 20108 Detroit Rd., Rocky River 16, Ohio.

**SELL OR TRADE**—National cash register, model 124(4), exc. cond. for Hallicrafter's SX-42, of what have you? Ted Watrak, 58 South 8th St., Kansas City, Kan.

**WANTED**—TS-2 Heath Sweep gen.; will sell Rider Chanalyst, 162C. Thomas O'Connor, Box 243, Cass City, Mich.

**FOR SALE**—Royal Air Force rcvr., R1155 with power pack and loudspkr. A Glass, 9401 - 64 Rd., Forest Hills, New York 74, N. Y.

**FOR SALE**—Vol. 1 to 7 incl., Riders TV manuals, perf. cond., \$60, McMurdo-Silver AM-FM Sig. Gen. model 906, \$40, McMurdo-Silver Sweep Gen. model 909 with absorption meter and complete set seven coils, \$25, hardly used. Marcus H. Moses, 35 Hamilton Pl., New York 31, N. Y.

**WANTED** — 12" or 16" recording turntable and overhead lathe. All letters answered. George F. Hoyt, 824 Walnut St., Red Bluff, Calif.

**FOR SALE** — Echophone Commercial comm. rcvr. in perf. working order. Resembles Hallicrafter S-38. Best offer over \$20 plus postage. Joseph DiTucci, 234 Parkway, Rochester 6, N. Y.

**TRADE** — Tape recorder, with built-in radio and phono., portable, for musical instruments, radio equip., parts, etc. Walt Bartell, 1107 N. Western Ave., Chicago 22, Ill.

**FOR SALE** — 10" Motorola, mahogany console, model 10VK9, 23 tubes, good cond., \$48 express charges collect. Jones Radio Co., 1115 Rambler Ave., Pottstown, Pa.

**SELL OR TRADE** — Slightly used Heath VTVM, \$5 or anything of comparable value. W. Skleba, 1441 S. Pulaski Rd., Chicago 23, Ill.

**FOR SALE** — Webster model 56, 78 RPM record changer, exc. cond., original instructions and packing. Best offer, postpaid and insured. D. Walker, 111 Bridge St., Metuchen, N. J.

**WANTED** — 25 RCA TV sets, 17" or 21" with or without cabinets, tubes, in repairable cond. State model and price. Victor Kozma, 1665 Stadium Ave., New York 61, N. Y.

**FOR SALE** — Model 612 Precision tube tester, like new. A. L. Friel, 151 Chestnut St., Watertown, N. Y.

**SELL OR TRADE** — Signal Corps Code Training set AN-GSC-T1. Can be operated on 6, 12, 24, or 115 v. DC, 115 or 230 v. AC. Want public address system, photographic equip., cash, what have you? Stanley Kaufman, 266 Martin St., Hartford, Conn.

**SELL OR SWAP** — Dejur Citation 8 mm. movie camera with 12.5 lens and Elgeet f3.5 telephoto, National 5886 power supply for HFS prewar Deforest course, used microphone connectors. D. C. Harrington 2508-B 36th St., Los Alamos, New Mexico.

**SELL OR SWAP** — Two 5BP4 Sylvania Cathode ray tubes, in original cartons, for radio or TV tubes or toward small oscilloscope (2" or 3"). C. Gabler, 1307 Merriam Ave., New York 52, N. Y.

**FOR SALE** — Retiring from business — Complete radio repair shop equip., and parts. Four Precision Test Instruments, 5" Cathode Ray Oscillograph, Supreme 542 Multimeter. Sell separately or as unit. Write for list. Best offer. Mrs. Russell Ward, Waggoner, Ill.

**FOR SALE** — 20 Philco 1B3GT in original carton \$90 each COD or best offer. Stephen Barniak, 2426 Perot St., Phila. 30, Pa.

**WANTED** — 1937 Plymouth auto radio new or used. Newhall Yee, 153 West 99th St., New York 25, N. Y.

**SELL OR SWAP** — NRI Prof. Model 33 sig. tracer; Revere 88 8 mm. camera. Want comm. rcvr. used TV rcvr. or what have you? George G. Lau, 147 N. 3rd Rear, Hamburg, Pa.

**SWAP** — Collins model 45D AM and FM tuner, needs slight readjustment, de luxe model, 19 tubes, for late model quality tube tester in good cond. H. D. Stone, 2449 W. Cortez St., Chicago 22, Ill.

**SELL OR TRADE** — Riders manuals 1 thru 5 abridged, 6 thru 14; partially built XMTR; 100 w. NRI Multitester; ham gear; used parts and tubes. Joe Anderson, 909 W. Nevada Ave., St. Paul 13, Minn.

**FOR SALE** — Approved field strength meter model A460, perf. cond., just overhauled at factory, \$50. Will ship COD. Precision Service Co., 2 N. Quincy St., Brockton 58, Mass.

**FOR SALE** — Precision tube tester model 10-12P, used only 5 times, \$60. Harry E. Rensing, 68 Fourth Avenue, East Orange, N. J.

**FOR SALE** — Rider manuals 1 to 17, 1 to 5 condensed \$110. Want Precision tube checker model 10-12. William Fenell, 5723 Parson's Blvd., Flushing 65, N. Y.

**FOR SALE** — Eico push-pull scope model 425 with crystal low capacity probes; Heathkit peak to peak calibrator, complete \$45. Precision sweep gen. model E400, \$100 original carton, like new, used part-time servicing only. C. Soest, 12092 Kelbourn, Detroit 13, Mich.

**WANTED** — Issues of radio TV, electronics, mechanics, and technical magazines back to 1940; also diagram manuals. State titles, number, cond., and price. Louis Duval, C.P. 99, S. Pascel, Kam., Que., Canada.

**SELL OR SWAP** — Revere 8 mm. roll, turret with 2 lens, Weston Photometer, both with cases. Want good scope, VTVM or make offer. Peter Koss, 121 S. Glasgow, Inglewood 1, Calif.

**SWAP** — BC 221-B Cardwall Freq. Meter, with regulated power supply, for Supreme 665 composite video ger. Tony Owsiany, 511 Arthur Ave., Kalamazoo 62, Mich.

**WANTED** — Mon-Key, Micromatch. Lettine 240, Lampkin test equip., any FCC-approved comm. equip. Have BC-604D 30-30 mc. rcvr. with power supply, other items. J. E. Howell, Box 126, Lumberton, N. C.

**SELL OR TRADE** — S-40B receiver in good shape for an HQ129X or HQ123X and extra cash. Don Jensen, 3529 Dunn Ave., Cheyenne, Wyoming.

**FOR SALE** — 150 w. amp. modulator. P.P. 811 with 836 rect. Portable Beachmaster made by "Bogen." Complete with mike input, \$100, shipped express collect. J. R. Blundin, 214 W. 2nd St., Mt. Carmel, Pa.

**FOR SALE** — RCA scope model I55A in very good cond. Give offer. P. N. Sansosti, 2229 Kentucky Ave., Baltimore 13, Md.

**SWAP** — Tube tester, EMC tests latest tube with manual; Riders PA manual; Riders vol. 17; Sprague Telomike 16. Want Million test gear, Heath 05 or other scope, Philco test gear, comm. rcvr., ham freq. meters, etc. M. Orange, 11 Brooklyn Ave., Westbury, N. Y.

**FOR SALE** — NRI radio and TV course, complete with lessons and booklets., less experiment kits. \$25. Issued in 1951. Donald Walker, 125 Guess St., Greenville, S. C.

**FOR SALE** — BC 929A 3' radar scope, \$20; John Meck No. 20 tube checker, \$12; oil gear and motor \$30. Soroka, 5341 Cordelia Ave., Baltimore 15, Md.

**FOR SALE** — Heathkit model 08 5" scope, used one month, perf. cond., \$50. Otto P. Wong, 514 Frederick St., San Francisco, Calif.

**WANTED** — Rek-O-Kut transcription turntable model "G-Standard" 16" for 33 and 78 RPM or model "B-16H", 3-speed 16". Must be reasonable and in perf. operating cond. L. J. Schredorf, 610 Monroe Ave., River Forest, Ill.

**TRADE** — Perflex 44, 35 mm. camera, f2.8 lens in perf. cond., for tape recorder, or sell for \$49, guaranteed George Neuschafer, Ingram, Tex.

**SWAP** — Burroughs bookkeeping adding machine, all electric, cost \$1,200, in A-1 cond., for good transmitter all bands CW and phone. Fred W. Rudolph, Box 516, Stryker, Ohio.

**SELL OR SWAP** — Carter Dynamotor 6 v. DC input, 600 v. output at 200 MA, like new; Carter Dynamotor 6 v. DC input 300 v. output 200 MA, A-1 cond. R. W. Metke, 511 Oak St., Roseville, Calif.

**WANTED** — Superior test equip., prewar or postwar models. State cond. and lowest cash price. H. R. Ringold, 132 N. Doherty Dr., Beverly Hills, Calif.

**WANTED** — Hallicrafters radio S38C or 5R10A. State cond. and lowest price. A. A. Lewis, 37 Bay 26 St., Brooklyn 14, N. Y.

**SWAP** — Riders Vol. 5 manual for Audels Carpenters and Builders Guide No. 1 and No. 2. H. R. Bailey, Box 296, Drayton, S. C.

**TRADE** — Univex model C8 movie camera f3.5 and 3.5 Telephoto lens and Dejur Lite meter \$60; 250 v., 80 MA, 5 v., GE Dynamotors. Want outboard motor, boating equip., or what have you? R. Peck, 2538 S. Robinson St., Philadelphia 42, Pa.

**FOR SALE** — Precision E200C sig. gen. A-1 cond. \$45; RCA model WV97 Senior Volt-hmist with demodulator crystal probe \$55. Guaranteed or your money back. Soundcraft Products Co., 9 Kelley Square, Worcester 4, Mass.

**FOR SALE** — Hallicrafters SX-42 rcvr. and R-42 spkr. First \$155 takes it. E. J. Blasic, 1814 "A" Drive, Erie, Pa.

**WANT** — SCR625 Army mine detector in trade for 6x50 binoculars, table saw, radio parts, post card duplicator, large size duplicator. John Haynes, Doe Run, Mo.

**SWAP** — Synchros, Selysns, unused 3" CRT tubes. Urgently need good scope and electric portable power tools. S. Consalvo, 2507 Southern Ave. SE, Washington 20, D. C.

**FOR SALE** — Riders manuals 1 to 9; 8 volumes perf. shape, all for \$30 cash or COD. Dick Miller, 1934 E. Broadway, Muskegon, Mich.

**SELL OR TRADE** — Heath V-1 vacuum tube meter; 5BP4 tube cathode ray; microscope; Radio Cyclopedica, Manly; selenium rectifiers. S. Wellenc, 256 12th Ave., N. Tonawanda, N. Y.

**WANTED** — Hearing aid for Mother. Have good auto radio Universal under-dash type with tuning head and cables. What do you need? C. B. Kelley, 7204 Clovernook Ave., Cincinnati 31, Ohio.

**WANTED** — 9001 and 9003 tubes, .85 kc IF input transformer, Sickle transformer M-7472239, 564654, 200 kc. and 50 kc. Have cash or tubes to swap. Leo W. Brandt, Box 92, The Heights, Mich.

**FOR SALE** — Like new TV booster, 13 channel; PE 101C Dynamotor; Atwater-Kent table radio. L. D. Cinci, Clarksburg, W. Va.

**WANTED** — Hallicrafters SX-28 rcvr., good cond. Donald V. Coyne, 11 Hughes St., Hartford 6, Conn.

**FOR SALE** — Janelle Rotary Converter with filter, DC to AC, 110 v., 300 w., exc. cond., \$50. Irene Dion, 209 Nassau St., New Brunswick, N. J.

**SELL OR TRADE** — Pilotuner exc. cond.; Radio Technics laboratory tube checker; 40 w. Aireon Amp. with spkr. Want Heathkit scope in working cond. Robert Pack, 513 Tayco St., Menasha, Wis.

**WANTED** — Heath scope kit in any cond. Must have essential parts, chassis, panel power trans. and CRT holder, diagram if possible. S. Lonigro, 52 Willowdale Ave., Montclair, N. J.

**FOR SALE** — Stromberg-Carlson AM-FM radio phonograph, model 1210, 10 w. output, 2 FM bands, 78 RPM Webster record changer, dark walnut, period cabinet \$85. Morris Barron, 7556 Woodbine Ave., Philadelphia 31, Pa.

**SELL OR TRADE** — 55 issues Radio News from 1944-48 \$5 FOB. V. Johannes, 1541 Metropolitan Ave., Bronx 62, N. Y.

**FOR SALE** — Heathkit 0-7 scope in perf. cond., \$40. Paul Richter, 1446 Webster Ave., Bronx 56, N. Y.

**FOR SALE** — Precision E200 sig. gen. \$20; Astatic Model G mike stand \$5; Pilot T601A FM tuner \$15; National type N vernier dial \$2.50; 1950 NRI radio course \$12.50. Phil Hurst, Box 63, Lamar, Mo.

**WANTED** — Used instructograph with tapes, either hand wind of electric type. Must be in running cond. C. K. Eser, 3810 Mt. Pleasant Ave., Baltimore 24, Md.

**FOR SALE** — Hallicrafter S-38 rcvr. \$28; Precision 900 combination tube tester and meter tester \$25, both \$50, good as new; Radio Troubleshooting Handbook and Radio Servicing, A-1 cond., \$5 for both. Harry Schwartz, 29 Compton St., Boston, Mass.

**SELL OR SWAP** — RCA console radio phono. combination, in hand-rubbed cabinet. Want tape recorder, sewing machine (prefer Singer) or what have you? Nathan Goldstein, 2160 Caton Ave., Brooklyn, N. Y.

**TRADE** — 16 mm. Eastman movie proj., model A Kodascope in good shape. Want table model TV set 14" tube or what have you? Prefer Emerson or Motorola. John Arnold, Box 84, Bluffs, Ill.

**FOR SALE** — Model YTW-1 GE up-to-date tube checker; Model 221 Eico VTVM; 950A Eico resistance-capacitor checker, both factory checked; RTTA radio sig. gen. All for \$85, plus shipping charges. L. C. Lust, 3 Sauquoit St., Whitesboro, N. Y.

**TRADE** — Vibroples Bug chrome plated deluxe A-1 cond. for model 132XC Master body mount and type AB/75 mobile antenna with 75 meter coil. Also trade S38B for Gonset Tri-band converter. W4YPC, 1008 Willbanks Ave., East Gadsden, Ala.

**WANTED** — Diagram for scope using 7JP4 CR tube, will swap 7JP4 for it or ham gear. B. F. Brooks, Dahlgren, Va.

**WANTED** — Sept., Oct., Dec. '52 and Feb., '53 issues of TV Electronic Technician. O. D. Mann, 2202 - 7th Ave., Troy, N. Y.

**SWAP OR SELL** — Good 16AP4 tube for grid dip meter with coils, prefer Heathkit GD-1A, or ?? Also Cascade tuner, radio mags, phono. Xtals, Motorola custom auto radios, and 0-500-1000-5000 Wattmeter. C. Elgasser, Jr., 1920 Fern St., San Diego 2, Calif.

**FOR SALE** — SX-71 Hallicrafters revr. Best offer around \$200 takes, used only 10 or 20 hours, no spkr., perf. cond. H. L. Bryant, Route 2, Grandview, Mo.

**SELL OR SWAP** — VTVM, 7" scope, audio osc., and other radio and TV equip. Want old and unusual cars, 25 years and older, model T's, etc. R. Schill, 1400 Poulson St., Wantagh, L. I., N. Y.

**FOR SALE** — Old QSTs, Radio News, Electronics, Break In, Radio, etc. List for stamp. Set QST, issue one to 1950 less 9 issues of 1916, clean, with indexes, \$200. Murray J. Douglas, 1401 Amador St., Concord, Calif.

**SELL OR TRADE** — Heath 5" scope \$40, car radio \$20, Riders TV, manuals 1 to 5 \$18 each, two Philco TV sets \$65 each, assortment radio and TV tubes. Want 25 HP outboard motor, typewriter, VTVM. Anthony Wilczynski, 3223 Unruh Ave., Philadelphia 24, Pa.

**FOR SALE** — Jackson Dynamic tube tester model 103, seldom used, \$25. John Brennan, 129-36 135 Place, S. Ozone Park 20, N. Y.

**WANTED** — RCA, Sylvania or similar 5" or 7" scope in exc cond.; Riders 15 thru 20. R. A. Hinshaw, Bloomfield Road, New Concord, Ohio.

**WANTED** — Oscilloscope any cond., Dumont 304H or 7" Sylvania 400 only. R. Rebsch, 6 Dusenbury Place, White Plains, N. Y.

**FOR SALE** — Supreme deluxe Analyzer model 333 complete with instructions. Also Audels Radioman's Electronic and TV Guide. Both for \$20. Harry Steinberg, 2200 Tiebout Ave., New York 57, N. Y.

**WANTED** — For cash or trade, GE sweep gen. ST-4A and/or Marker gen. type ST-5A. Have large assortment of test equip and ham gear. G. E. Howarth, 216 1st Ave. E., Oskaloosa, Iowa.

**FOR SALE** — Williamson UTC amp; two chokes, 2 7N7, 2 KT66, 5U4G, Acrosound TO-300 output transformer, de-layed plate voltage, oil-filled condensers, \$80; Rider 162C Chanalyst, \$75; Revere T-100 tape recorder, dynamic mike, \$100, all FOB. V. R. Hein, 4181/2 Gregory, Rockford, Ill.

**FOR SALE** — Meissner Deluxe Sig. Shifter \$25; Bud 78 Wavemeter \$4.50; 6J5-6V6 C.W. Rig, Pinet tuning \$5, and many other parts. Send for list. Alfred Freitag, 1437 Patapsco St. Baltimore 30, Md.

**FOR SALE** — Back copies QST, other radio magazines. Send your want list. David F. Causey, Box 1, University Station, Urbana, Ill.

**WANTED** — PE103 Armature also Elmac mobile transmitter. H. I. Griffiths, 39 - 82 65 Place, Woodside 77, L. I., N. Y.

**SELL OR SWAP** — Transmitter, power supply parts, tubes, meters, diathermies, neon transformer, radios, crystals, B-eliminators, phones and spers. Radio books, photo and chemical equip., bargains. A. Zambakian, 1259 Gaylord St., Denver 6, Colo.

**SELL OR SWAP** — ART-13 modulation and driver transformer \$15; BC696 100 m. meter \$17; Mosberg Z2 bolt action rifle, 4X scope, case, ramrod \$25. Want desk telephone, handset, prop motor, selsyns. Bill Gettman, 213 S. 13 Place, Norfolk, Neb.

**FOR SALE** — PE-103 dynamotor with cables, extra brushes, in like-new cond. Had only few hours use. Best offer near \$20. George B. Driessen, 168 West 86th St., New York 24, N. Y.

**FOR SALE** — ARC-3 complete with exception of power plugs, slightly used, \$50. M. B. Hall, Box 168, Hollister, Calif.

**FOR SALE** — NRI Professional Sig gen., model 88, 170 kc., 60 mc. Exc. cond., never used, \$25 takes it. G. W. Arhart, 618 N. Dewey, Thief River Falls, Minn.

**FOR SALE** — Sprague Tel-Ohm-ke, model TO-4, used only a few times. Clarence Hein, Route 4, Box 247, Manheim, Pa.

**FOR SALE** — Receiver, SX71, with sprk., equal to new, \$145; condenser checker, Solar CB-1-60, 110 v., 60 cy., \$25; tube tester, RCP 308 Dyn., 7" slooping meter, counter model, \$24. A. C. Livingstone, 12-01 Ellis Ave., Fair Lawn, N. J.

**WANTED** — Good BC-638-A Freq. Meter need not be in perf. working cond. State lowest price or will trade surplus. Frank A. Law, Box 487, Loomis, Calif.

**FOR SALE** — Neon sign with transformer, skeleton window type 11" x 34", "Radio Repairing" \$25 FOB. Harry Star, 2020 Honeywell Ave., Bronx 60, N. Y.

**FOR SALE** — Motorola control heads, R and D series, manual and auto., \$2.50 each. Have most cars from 1937 to 1951. Curtis Radio, 4321 West 35 St., Cleveland 9, Ohio.

**FOR SALE** — Clarkstan 213 pick-up arm, and needle gauge, astatic FLC pick-up, two diamond stylus crystal cartridges, Shure 710 crystal mike, other items. J. Holloway, Cent. YMCA, Philadelphia 2, Pa.

**FOR SALE** — National SW3 rcvr. in good cond., 10-20 meter coils schematic diagram \$20, power supply for same \$6; Ampro tape recorder used 3 hours, \$69.50. Edward Hartman, 2401 Fourth Ave. South, St. Petersburg, Fla.

**FOR SALE** — Never used phonograph drawer slides, four pairs, heavy gauge steel with corrosion resistant finish. Exc. large size 18" track length, 14" channel length, \$1.75 pair. D. Cuomo, 3023 Radcliff Ave., New York 69, N. Y.

**FOR SALE** — Radio and TV News magazine, June '48, May '49, all of 1950, Jan. to Oct. '51, Jan., Feb., April, May, Oct., Nov., Dec., '52, Feb. to Aug., 1953 38 copies for \$3. Will not sell separately. Daniel Seidler, 4825 S. Wolcott, Chicago 9, Ill.

**FOR SALE** — Sams 1-40 in binders, 41-44 and 76, \$50, power trans, output trans, coils (IF RF) chokes, over 40 in all, \$15. List of tubes parts available, low prices. John H. Cox, Jr., RD 1, Box 28, Saugerties, N. Y.

**SWAP** — Complete course in watch repair, for a radio and TV course. Henry Ranison, 13 W. 128 St., New York 27, N. Y.

**SWAP** — T54 7" Hallicrafters rcvr. for scope. Good cond. Ray Julian, 337 S. 3rd St., Steelton, Pa.

**FOR SALE** — VOM with 9" meter, 1K % volt, W.W. precision resistors and condenser multiplied to 70 mids., case 21 x 11 x 3. Make offer. Model VTMV Heath V5 like new, \$25. W. F. Onder, Route 2, Box 193, Arnold, Mo.

**SWAP** — Heathkit sig gen., model SG-6 for battery elim. Prefer late model Heathkit or Eico. Leo W. Satterfield, 3605 S. Selby St., Marion, Ind.

**FOR SALE** — Meissner-Analyst with instructions, A-1 cond., \$60; Precision sig. gen., series E-200 with instructions, A-1 cond., \$25. Scott's Radio Service, 20 Cherry St., Oneonta, N. Y.

**SELL OR SWAP** — Radio, TV and Comm. Course by DeForest's Training Institute, about 60 lessons, \$20, or what have you? H. V. Nyland, 3151 Briarwood Road NE, Atlanta 6, Ga.

**TRADE** — Typewriter and 17-jewel wrist-watch for radio test equip. Collins TCS and Bendix TA-12 both \$100. K. H. Stello, 823 Chillum Rd., Hyattsville, Md.

**WANTED** — Eico tube tester, Rider's TV 1-3 manuals. Sell 14" TV \$60; 16" \$75. Charles E. Spitz, 1420 S. Randolph St., Arlington, Va.

**WANTED** — Late model scope in A-1 cond. and good FM tuner. Will swap antique Edison "Amberola" cylinder machine and 50 records, model 905 Sprax sig. tracer, model 425 Eico scope, etc. O. V. Howell, Box 463, Mars Hill, N. C.

**FOR SALE** — Model 180 Chicago-Webster recorder like new, with 3 1/2 hour spools. Cost \$150. Anthony Badagliacco, 623 Fernon St., Philadelphia 48, Pa.

**FOR SALE** — Complete Station: 35 w. CW phone, 80 thru 10, Hammerlund 4-20 transmitter, 4-11 model rcvr., S40, Pre-selector, control panel, desk, included, like new. \$165 takes all. Vincent P. Ternullo, 43 Robolee Ave., San Francisco, Calif.

**FOR SALE** — About 150 old type tubes including 26's, 27's, 76's, 56's, 39 44's and 01A's. No reasonable offer refused. Fred Levitt, 119 - 53 - 230 St., Cambria Heights 11, N. Y.

- FOR SALE** — Radio and TV books: Radio Engineering Handbook — Henney \$6, Radio Engineering — Terman \$5.50, Elements of Radio Servicing — Marcus and Levy \$4, TV Servicing — Heller and Shulman \$4.50, Radio and TV Mathematics — Fisher \$4.50. Berman Distributing Co., 1188 Broadway, Brooklyn 21, N. Y.
- FOR SALE** — 75 meter Fone Xmtr, 150 w., VFO, gray cabinet. Rig and transformers built by Ron Frampton. Best offer over \$100 takes rig complete with spare tubes express collect. C. E. Maupin, 909 N.W. 23, Oklahoma City, Okla.
- WANTED** — One or two midget radios, RCA-45X1 in fair cond. M. L. Grant, Box 1034, Charlotte, N. C.
- WANTED** — National Select-O-ject model SOJ1 for National NC-57 rcvr. Murry Asilowitz, 2695 Bryant St., San Francisco, Calif.
- FOR SALE** — Radio tubes — some obsolete. Send for list. Will Davies, 415 West North, Lebanon, Ind.
- FOR SALE** — Limited number complete manuals for Radio Compass AN/ARN-7, \$2.50 postpaid. W. B. Williams, 914 S. Franklin St., South Bend 18, Ind.
- SWAP** — National cathode-ray scope, type CRM with operating manual, 60 w. multimatch mod. xfmr. Roland Slatkoff, 3834 Southern Cross Drive, Baltimore 7, Md.
- FOR SALE** — Triplett 6364 sig. gen.; Precision 250 sig tracer; Simpson 260 VOM, with case; Simpson 305 tube tester. All in new cond. NRI xmtr. Best offer takes misc. radio equip. Frank Giudice, 1413 East Evergreen St., Wheaton, Ill.
- SPEAKERS RECONED** — 12-hours service on all mail orders. Waldom cones and voice coils used and guaranteed for six months. C. Bernard Smith, 920 South Euclid Ave., Pasadena 5, Calif.
- SWAP** — Machinist Tools for 14" or 16" table model TV set as long as it works. Louis Travers, 424 Gr. Concourse, Bronx 51, N. Y.
- SELL OR TRADE** — Hallicrafters S-22R \$50, or trade for ham rcvr. Ray E. Kohler, 26 Front St., Topsham, Me.
- FOR SALE** — Weston portable tube tester model 682, with meter, 14 test sockets, chart; 78 rpm portable phonograph; Magna-Vue Projector, enlarges and projects about 50 times. Highest bidder. Armen Hanjian, 102 Floral St., Roselle, N. J.
- SELL OR SWAP** — Receiver National 1830 with spkr., NBFM adapter 17 tubes, used only 6 months. Cost \$420, name your price or want good make tube tester or what have you? Bill Pollock, 7738 Salt Lake Ave., Bell, Calif.
- WANTED** — Books on TV servicing and use of TV test equip. A. Adams, 719 Park Ave., Williamsport, Pa.
- FOR SALE** — McMurdo-Silver model 909 TV sweep gen. \$15. Peter Donneau, 26 Monty St., Woonsocket, R. I.
- WANTED** — Audio oscillator. Send details and price. W. E. Fuller, 4820 Stafford Rd., Lansing, Mich.
- FOR SALE** — TV Projection Lens made by Bausch and Lomb Optical Co., over 3x4 feet projection. Bargain \$20. M. McNamara, 1583 E. 96th St., Brooklyn 36, N. Y.
- WANTED** — Schematic of rcvr. for 2 meter band covering 145 to 147 mc. Rudo's Radio and TV, 7293 Lane Ave., Detroit 9, Mich.
- SELL OR SWAP** — S-11-A Waterman Industrial 3" pocket scope \$75; Eico sig. tracer \$20; Eico VTVM \$25; BC-211 instruction book, spare, xtal, tubes \$80. All like new. Interested in Hi-Fi gear. R. G. Streeter, 15 Hillside Ave., Summit, N. J.
- FOR SALE** — Heathkit scope model 0-8 exc. cond., \$40 complete with instruction manual and test leads. Will ship express COD. Norbert Fitz, 961 Seneca Ave., Ridgewood 27, N. Y.
- FOR SALE** — Speco sig. tracer, 5 months old \$32; C-D condenser checker, BN Wien Bridge type 8 months old \$18; both in exc. cond. Manes Katz, 4024 Fairfax Road, Baltimore 16, Md.
- FOR SALE** — Riders manuals 1 thru 14; Sylvania 3" scope; Spax 90S sig tracer; 2 7JP4 CRT, all like new. Best offer. Bud's Radio and TV Service, 5912 Hampton Ave., St. Louis, Mo.

**FOR SALE** — SX-28 \$89; S-27 \$79 with matching spkrs.; separate 10" matching speakers \$8.50; Riders vol. 1, 2 \$1 each; OR-5 freq. shift exciter \$25. All FOB. Prefer local. Swap for foreign antiques. Bert Greene, 5 Elmira St., SE, Washington 20, D. C.

**SELL OR TRADE** — 10" Farnsworth TV rcvr.; Supreme radio and set tester 0-1400 v., AC-DC, 0-1400 MA and 0-4 meg. resistance; NRI Radio Servicing Course, less kits. Want outboard motor or woodworking tools. N. Y. area only. Fred Hellauer, 4135 DeReimer Avenue, Bronx, N. Y.

**FOR SALE** — NC-125 rcvr. and spkr., in new cond. \$125. Harold C. Clancy, 22 Cumberland Ave., Portland, Me.

**FOR SALE** — HQ 129X rcvr. with spkr. \$120; Ultra Skyrider rcvr. 5.5-76 mcs \$30; Abbott TR-4 2 meter transceiver \$10; Like new 832A tubes \$6 each, 813s \$8. Eugene Adams, 755 Delafield Ave., Staten Island 10, N. Y.

**FOR SALE** — Motorola auto M45C record player used but like new, plugs into radio. Cost \$18 best offer \$8 takes it. Stanley Strangle, Box 6, Trout Creek, Mich.

**FOR SALE** — Knight Vacuum Tube Voltmeter almost new, with R.F. and hi-v. probes; used Heath scope, good cond. Robert Fellows, Caledonia, N. Y.

**FOR SALE** — Pentron tape recorder, 5 reels tape, 2 microphones, floor stand, sig. gen. 100 kc. to 75 mc., Heathkit: TS2 TV gen., 0-8 scope, VTVM. Best offer. Ray Ridgewell, 133 Rankin St., Rockland, Me.

**SWAP** — TV Schematic and Service notes for 20 Raleigh "903" coupons. Selcraft, Box 394, Spring Valley, N. Y.

**WANTED** — FM converter or rcvr. capable of receiving 152-162 mc. Will trade ham gear or pay cash. Henry A. Galbraith, 1101 East Franklin, Evansville, Ind.

**SELL OR SWAP** — Supreme VOM 25,000 ohms per volt tester, miniature scope, VHF sig. gen., tubes, transformers, meters, etc. F. D. Bornman, 19491 Lowell Drive, Detroit 3, Mich.

**WANTED** — Used Precision tube checker series 10-12 in wooden case. Royall Smith, 71 Congressional Walk, Buffalo 15, N. Y.

**SWAP OR SELL** — NRI Servicing Course, complete with experimental kits and multimeter. Want FM tuner, ham gear, cash or ?? S. A. Campbell, Mohawk Rd., Schenectady 9, N. Y.

**FOR SALE** — Riders Chanalyst in perf. cond., \$75; Ghirardi's Radio Troubleshooters Handbook \$3.50. All Crispo, 85-02 133rd Avenue, Ozone Park, N. Y.

**SELL OR TRADE** — 3 Collins fixed freq. rcvrs. 110 v. AC, 1.5 to 20 mc.; Collins 32 RA transmitter perf. shape, 12 v. DC, easily converted to 110 v. AC. Want Sams, Riders, or test equip. N. L. Dean, 1729 W. Haskell Place, Tulsa, Okla.

**SELL OR TRADE** — Minerva Tropic Master BC-SW rcvr., Emerson 5 tube AC-DC set, Weston 50 Micro Amp. meter 6" scale and model GI-R90L Dual Speed Home Recording Assembly. C. B. Davis, 1468 Citadel Drive NE, Atlanta, Ga.

**SELL OR TRADE** — RME-153, Gonset 2-6-10, Morrow 3br converter, PE-103 with plug and cables, all new cond. L. H. Kephart, 842 Santa Rosa, Tucson, Ariz.

**FOR SALE** — Riders TV Manuals, complete volumes, 1 to 5 inclusive. Never used, like new, worth \$14 ea., will sell all for \$25. Adrien R. LeBlond, 471 Elm St., Biddeford, Me

**WANTED** — By collector: Commercial radio rcvrs. and transmitters. Must be over 30 years old. Will pay highest prices. A. C. Budenkaye, R D 1, Box 544-C, Red Bank, N. J.

**TRADE** — Hallicrafters model S-41G and GE model B Diathermy-Inductotherm, many parts including FP-265 tube, lo: good 20 gauge automatic pump or double shotgun, or 22 Hornet rifle. Holland Radio and Electric, Story City, Iowa.

**SELL OR TRADE** — Bendix MRT-16 Transceiver 152-162 mcs., now on 160.41 mcs. Complete installation including dynamotor, xtals, cables, 25 or 50 w. Also BC-453, low freq. xtals, DY9-ARC1. Best offer, cash or XMTR. Lmil Kalar, Box 11, S. International Falls, Minn.

**SWAP** — 3-VR-150, 715B, 811, 15E, 3-162b, 2-955 and 2-162E tubes, for Hickok model 209-A. Must be in good cond. with test leads. Will ship prepaid via railway express. William J. Levy, 3935 N. Eighth St., Philadelphia 40, Pa.

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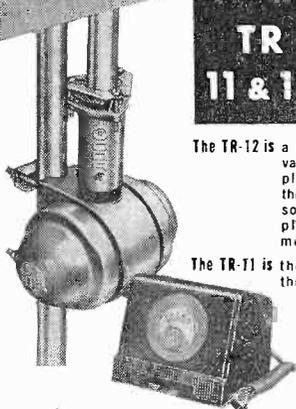
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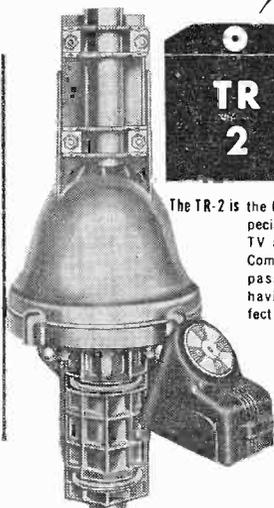
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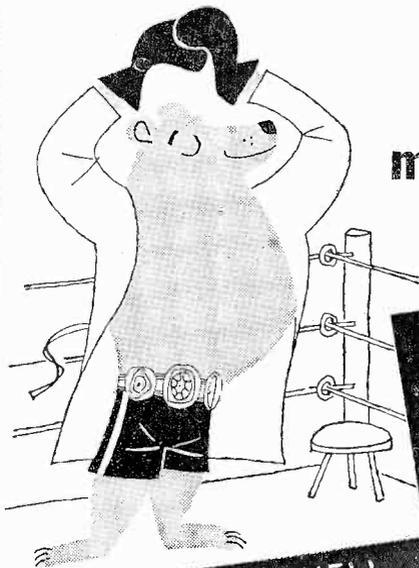


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