
INSTRUCTION MANUAL

EICO

667

DYNAMIC CONDUCTANCE
TUBE & TRANSISTOR TESTER

The logo features the word "EICO" in a bold, italicized, sans-serif font. The letters are white with a thick black outline. The logo is centered between two horizontal lines that extend outwards from the left and right sides of the text.

131-01 39th Ave., Flushing, N. Y. 11352

MODEL 667 ADDENDUM - TRANSISTOR

(For Instruction Manual)

An improved procedure has been developed for transistor testing, which is described in the following revision of steps 5 to 8 on page 7 of the Instruction Manual. No transistor chart is provided, as it is not required when using the revised test procedure. With the great number of transistors now available, a transistor handbook would be needed, in any case, to determine the type (p-n-p or n-p-n) and basing of all the transistors to be encountered.

Revised Steps 5 to 8, Page 7 of the INSTRUCTION MANUAL:

5. Refer to a transistor handbook for the type (p-n-p or n-p-n) and basing of the transistor to be tested. Note that only signal transistors can be tested with the instrument and the criteria described below apply only to signal transistors (not power transistors).
6. Insert the emitter (E), base (B), and collector (C) lead of the transistor in the corresponding terminals of the transistor socket located immediately above the TRANSISTOR TEST selector.
7. Turn the TRANSISTOR TEST selector from "TUBE" to position 1 (first position away from "TUBE") on the p-n-p or n-p-n side depending on the type of transistor under test. The indication on the meter will be proportional to the collector current with emitter grounded and no base signal. On this test, transistors in good condition should preferably read in the "Ico GOOD" area between 0 and 40 on the 0 to 140 meter scale, but are acceptable with readings up to 80 on this scale. Reject transistor that reads above 80 on this test.
8. Turn the TRANSISTOR TEST selector to position 2 (second position away from "TUBE"), and read the DC Beta (ratio of collector current to base current). The minimum acceptable DC Beta reading depends on the Ico reading obtained in step 7. The higher the Ico reading (up to the maximum acceptable limit of 80), the higher the minimum acceptable DC Beta reading is, in direct proportion. Numerically, the minimum acceptable DC Beta reading is slightly more than 60% of the Ico reading on the 0 to 140 meter scale. Examples: If the Ico scale reading is 80, the minimum acceptable DC Beta reading is 50; if the Ico scale reading is 40, the minimum acceptable DC Beta reading is 25.

Page 9 of the INSTRUCTION MANUAL:

Delete the following material from the text:

"In some cases, the range of Beta given in the chart has been taken directly from the transistor manufacturer's specification; in other cases Beta has been calculated from the grounded base Alpha, Alpha ce, according to the relationship:

$$\text{Beta} = \frac{\text{Alpha ce}}{1 - \text{Alpha ce}} \quad "$$

MODEL 667 ADDENDUM (Continued)

Revise the remaining text as follows:

"These simple tests, when related to each other as described in the test procedure, will determine if the transistor is good or bad. They do not, of course, duplicate the factory tests of frequency response, input resistance, output resistance, collector capacitance, and other electrical characteristics that are necessary for a specific grade of transistor."

Page 12 of the Instruction Manual:

In Figure n) TRANSISTOR TEST 1, add a shunt resistor R5 across meter M1.

In Figure o) TRANSISTOR TEST 2, add a shunt resistor R6 across meter M1.

I. E. 1495 EICO Electronic Instrument Co. Inc., 131-01 39th Ave., Flushing, N. Y., 11352

CONTINUE PROCEDURE FOR TRANSISTOR TESTING (From Step 4, Page 4)

5. Locate the type number of the transistor to be tested on the transistor chart. Note whether the transistor is a n-p-n or p-n-p type and the specified allowable range of Beta. Make sure that the TRANSISTOR TEST selector is set at "TUBE".

6. Insert the emitter (E), base (B), and collector (C) lead of the transistor in the corresponding terminals of the transistor socket located immediately above the TRANSISTOR TEST selector.

7. Turn the TRANSISTOR TEST selector from "TUBE" to position 1 on the p-n-p or n-p-n side depending on the type of transistor under test. The indication on the meter will be proportional to the collector current with emitter grounded and no base signal. On this test, transistors in good condition should read in the "I_{CEO} GOOD" area (between 0 and 40 on the 0 to 140 scale). Reject transistors that read outside the "I_{CEO} GOOD" area (higher than 40 on the 0 to 140 scale), unless note has been made on the chart that a higher reading is acceptable.

8. Turn the TRANSISTOR TEST selector to position 2 and read the current amplification factor or Beta (change in collector current caused by a change in base current) on the 0 to 140 Beta Scale. A good transistor will read within the allowable range of Beta as given on the chart for the particular transistor type. Transistors which do not give a reading within the specified allowable range of Beta may still be useable; see data sheet.

9. Turn the TRANSISTOR TEST selector back to "TUBE" and then remove the transistor from the transistor socket.

10. Proceed with testing another transistor by beginning with step 5. If there are no more transistors or tubes to be tested, turn the tester off by turning the LINE ADJ. control to its AC-OFF position. If there is a tube to be tested, proceed directly to step 5 of TUBE TESTING after completing step 9 of TRANSISTOR TESTING.

NOTE: The only controls having any effect in transistor testing are the TRANSISTOR TEST selector, the LINE ADJ. control, and the LINE push-button. Provided that a tube has not been left inserted in any of the tube sockets, the settings of any other lever switches, push-buttons or potentiometers on the panel have no effect and are immaterial.

CIRCUIT DESCRIPTION

It may be of assistance in understanding the functioning of the instrument to examine the following typical partial schematics, each of which indicates the voltages applied and the placement of the meter circuit when performing the tests provided (in accordance with the detailed operating instructions) for tubes and transistors.

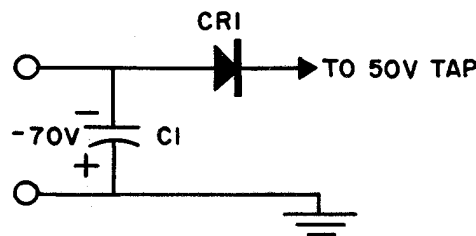
NOTE: R_s denotes the meter shunt resistance selected by S29 (Lever S). Φ 1, Φ 2, and Φ 3 denote various a-c voltages taken from taps on the high voltage secondary winding of the power transformer and selected by S28 (Lever V). An asterisk denotes the function of current-limiting.

The functioning of the Model 667 in each of the various tests furnished is as follows:

INTER-ELEMENT LEAKAGE: A filtered dc test voltage of -70 volts is obtained by rectifying and filtering (CR1 and C1) the 50 volts ac obtained from filament winding tap. This voltage is applied between the tube element isolated by its transfer switch and the remaining tube elements whose lever switches are set at the plate, screen, and grid voltage busses which are grounded through the MERIT and H-K switches at their normal positions. The current through this circuit is read in ohms on the meter. Note that the polarity of the test voltage is evidently such as to eliminate cathode emission from the reading and that resistor R8 and LEAK CAL. rheostat R7 restrict the total current to 200ua (full scale) even with a dead short. For heater-to-cathode leakage testing, the connection of the "remaining" elements to ground is broken by depressing the H-K push-switch to remove them from the circuit and leave in the test circuit the cathode and heater only. This is necessary because the cathode is placed at a negative voltage with respect to the "remaining" elements when it is selected by its transfer switch and the consequent cathode emission current would also register on the meter to give a false low reading of cathode-heater leakage resistance.

LINE ADJ: For the adjustment, resistor R19 and LINE CAL rheostat R18 (identical to R8 and R7 respectively) are inserted in the leakage test circuit by depressing the LINE push-switch to exactly double the total resistance in the circuit and reduce the meter indication to exactly half scale. The condition for full-scale and half-scale reading, set in initial calibration with the LEAK CAL. and LINE CAL. rheostat R7 and R18, is that the LINE ADJUST potentiometer be set to give 130 volts across the full transformer primary (or 105 volts across the low end of the primary and the primary tap). The LINE ADJUST potentiometer permits duplication of this condition over a $\pm 10\%$ variation of the actual line voltage from the nominal value (117 volts).

MERIT TEST: Several of the many configurations that occur in MERIT testing are shown above. In general, each test furnish a composite indication of cathode emission capability and the ability of each grid to control the plate current in accordance with the design of the tube, plus the ability of the plate to receive the regulated current. For diodes and rectifiers, the measurement is simply an emission test. To properly test a great variety of tube types, several plate, screen and ranges of grid voltage are available from taps on the plate secondary winding of the transformer for selection by switch S28 (lever V). These voltages are applied through switch S34 (MERIT) to the plate, screen, and grid bus bars inter-connecting corresponding terminals on switches S15 through S27 (lever switches 1 through 12 & C). The grid voltage is variable by R16 (GRID potentiometer) from zero to maximum of the range selected. Note that the plate, screen, and grid voltage contacts on switches S15 through 27 are grounded at the normal position of S34 and that plate screen, and grid voltages are only applied when S34 is pulled down.

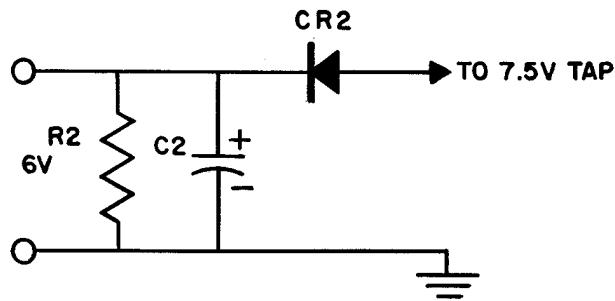


LEAKAGE TEST POWER SUPPLY — Also used for Line Adjust

TRANSISTOR TESTS: At the P-N-P 1 or N-P-N 1 test positions of the TRANSISTOR TEST selector, a measurement is made of the collector current that flows when the emitter is grounded and no signal is applied to the base. This current is a function of the temperature, the resistivity of the germanium and, most important, becomes quite large if there is contamination of the surface of the germanium or if the transistor has been damaged by a short circuit. At the P-N-P 2 or N-P-N 2 position, a small current is put into the base via the 200KΩ resistor R3 to permit measurement of the collector-to-base amplification factor Beta, sometimes called Alpha cb. In some cases the range of Beta given in the chart has been taken directly from the transistor manufacturer's specification; in other cases Beta has been calculated from the grounded-base Alpha, Alpha ce, according to the relationship.

$$\text{Beta} = \frac{\text{Alpha ce}}{1 - \text{Alpha ce}}$$

These simple tests will determine if the transistor is good or bad, but will not, of course, duplicate the factory tests of frequency response, input resistance, output resistance, collector capacitance and other electrical characteristics that are necessary for a specific grade of transistor.



TRANSISTOR TEST POWER SUPPLY

entering chart 5 at the maximum allowable diode plate current and reading off the corresponding PLATE control setting. The GRID control remains at the setting previously developed for the triode or pentode section (if any) in the same envelope. (Actually the GRID control setting has no effect in this test provided that it is set above 7; it is left at the previously developed setting to avoid unnecessary re-setting.) The V lever is set first at position 1 and the meter reading observed with the MERIT lever held down. Note that the voltage applied to the diode in this test is the grid voltage selected by the V lever; namely 5 volts at position 1, 15 volts at positions 2 and 3, and 45 volts at position 4 (all in volts rms, 60 cps). Refer to these voltages to determine whether the maximum voltage that can be applied to the diode is exceeded at any V lever position. If the meter reading at the V lever position 1 is substantially less than 100 on the 0-140 scale, proceed to positions 2 and 4 successively (position 3 is identical to 2 as regards grid voltage) if need be, observing the limitation of maximum allowable applied voltage. If and when you come to a position of the V lever for which the meter reading does appreciably exceed 100, return the V lever to the next lower position and adjust the PLATE control for a meter reading of 100. If this does not occur even at V lever position 4, adjust the PLATE control for a meter reading of 100 at this position; the current drawn will normally be sufficient for a good test. Completion of the procedure is covered in steps j and k above, except that instead of finding an average GRID control setting (step j), find an average PLATE control setting.

- n) The foregoing applies only to single triodes, pentodes, light-duty diodes included in the same envelope with a triode or pentode, and half-wave rectifiers. For dual triodes or triode-pentodes, both sections of the tubes should have the correct operating voltages applied simultaneously. For a triode-pentode, connect the triode plate lever to position 3, the pentode plate lever to position 4, and the pentode screen lever to position 3; both control grid levers may be set at position 5. Refer to the roll chart settings for the 6U8 and 12AU7 for this type of operation. In the case of full-wave rectifiers, only the section under test has the operating voltage applied. Refer to the roll chart settings for the 5U4 as a typical full-wave rectifier.

REPLACEMENT PARTS LIST FOR 667

SYM. #	STOCK #	AM'T.	DESCRIPTION
C1	23010	1	capacitor, elec., 10mf-150V
C2	23001	1	capacitor, elec., 10mf-25V
CR1	93003	1	rectifier, 50ma
CR2	95000	1	rectifier, diode
F1	91002	1	fuse, 1 amp
I1	92006	1	pilot lamp
M1	72015	1	meter, 200ua, 1K Ω
R1	19012	1	potentiometer, WW, 200 Ω , 25W, w/SPST
R2	10406	1	resistor, 680 Ω , 1/2W, 10%
R3	11026	1	resistor, 200K, 1/2W, 1%
R4	10432	1	resistor, 1K, 1/2W, 10%
R5	11062	1	resistor, 129 Ω , 1/2W, 1%
R6	11061	1	resistor, 50 Ω , 1/2W, 1%
R7	18023	1	potentiometer, 100K, (LEAKAGE CAL.)
R8	10544	1	resistor, 270K, 1/2W, 5%
R9	19010	1	potentiometer, 3K, 4W, 5%
R10	11056	1	resistor, 683W, 1/2W, 1%
R11	11057	1	resistor, 171 Ω , 1/2W, 1%
R12	11058	1	resistor, 42.7 Ω , 1/2W, 1%
R13	11059	1	resistor, 10.7 Ω , 1/2W, 1%
R14	11060	1	resistor, 3.57 Ω , 1/2W, 1%
R15	10774	1	resistor, 24K, 1W, 5%
R16	19011	1	potentiometer, 5K, 4W, 5% w/SPST
R17	14504	1	resistor, 400 Ω , 5W, 10%
R18	18023	1	potentiometer, 100K, (LINE CAL.)
R19	10544	1	resistor, 270K, 1/2W, 5%
R20	14505	1	resistor, 3K, 5W, 10%
SA1	65006	1	switch assembly, push button (S1-S14)
SA2	65005	1	switch assembly, lever (S15-S29)
S30	60042	1	switch, rotary 22 pos. (FILAMENT)
S31	60046	1	switch, rotary, 5 pos. (TRANSISTOR)
S32			switch, (part of R1) (AC-OFF)
S33	64001	1	switch, push button (LINE)
S34	63000	1	switch, lever (MERIT)
S35			switch (part of R16)
T1	30017	1	power transformer
XF1	97802	1	fuseholder
XI1	97709	1	pilot lite assemble
XTR1	97043	1	socket, transistor
XV1	97029	1	socket, 7 pin sub-miniature
XV2	97072	1	socket, 5 pin NUVISTOR
XV3	97073	1	socket, 7 pin NUVISTOR
XV4	97024	1	socket, 7 pin miniature
XV5	97030	1	socket, 8 pin sub-miniature
XV6	97068	1	socket, 10 pin
XV7	97003	1	socket, OCTAL
XV8	97074	1	socket, NOVAR w/bulb socket
XV9	97064	1	socket, 12 pin COMPACTRON
XV10	97001	1	socket, LOCTAL
	40000	22	nut, hex, No. 6-32
	40001	6	nut, hex, 3/8"
	40004	2	nut, hex, No. 2-56

STOCK#	AM'T.	DESCRIPTION
40007	6	nut, hex, No. 4-40
40016	1	nut, hex, 1/2"
40017	8	nut, Tinnerman, No. 8
40019	4	nut, Tinnerman, No. 6
40021	4	clip, Tinnerman, push on
40023	1	nut, push on (8 pin sub-miniature)
40024	1	nut, push on (7 pin sub-miniature)
41003	8	screw, No. 8-32 x 3/8
41035	14	screw, No. 6-32 x 1/4 self-tapping
41086	20	screw, No. 6-32 x 5/16
41089	1	screw, No. 6-32 x 3/16 Rd. Hd.
41090	8	screw, No. 4-40 x 5/16
41106	2	screw, No. 2-56 x 3/8
42001	5	washer, flat, 3/8"
42002	26	washer, lock, No. 6
42007	6	washer, lock, No. 4
42029	1	washer, rubber, 1/2"
42053	2	washer, lock, No. 2
46001	1	grommet, rubber, 1/4"
53011	5	knob, control, round bar
53012	15	knob, push, black
53013	1	knob, push, red
53072	16	knob, lever type, black
57000	1	linecord, black
80139	1	panel
81081	1	bracket, transformer
81083	1	bracket, roll chart
81959	1	bracket, left
81960	1	bracket, right
82101	1	strain relief
87002	1	handle, plastic folding
88028	1	cabinet
88029	1	cover
89726	1	roll chart
89565	4	gear, roll chart drive
89566	2	roller, roll chart drive
89567	2	rod, roll chart drive
89568	1	damper, roll chart drive
89569	2	window, plastic
98501	1	cap, grid, black, insulated
89727	1	supplement, roll chart
66120	1	Instruction Manual
66367	1	Construction Manual (Steps & Figures)

EICO

Service Policy

PARTS REPLACEMENT

If it appears that a component is defective, and you desire a replacement, contact your nearest EICO Authorized Service Agency or our Customer Service Department.

If you are claiming the right to a no-charge replacement under the terms and conditions of the warranty, it is required that you shall have sent in the registration card within 10 days of the date of purchase, and that you send back the defective part transportation prepaid. In claiming warranty service or parts, please send or show your original sales slip plus the IBM card from the carton. EICO or its authorized agency will make the necessary replacement at no charge for parts eligible under the terms and conditions of the warranty. In returning tubes, pack them very carefully to avoid breakage in shipment. Broken tubes will not be replaced. Please read the warranty on the subject of parts eligible for replacement.

Further information required on a part returned for a no-charge replacement under the terms and conditions of the warranty is as follows:

- a) Model number and serial number, if any, of unit. Also any code numbers in red under the words INSTRUCTION MANUAL on the cover of the book supplied with the unit.
- b) Stock number and description of part as given on the parts list. If the part is not listed (of itself) in the parts list, it means that the part is integral with a sub-assembly, which we consider replaceable only as an entity. Parts integral with a sub-assembly may be listed in the parts list, so identified, if we consider that some or all of the parts may be individually replaced in the field under appropriate circumstances. If your unit is out of warranty, you are generally advised to order a replacement sub-assembly.
- c) Describe as completely as possible the nature of the defect, or reason for requiring replacement.

REPAIR SERVICE

EICO maintains a national network of authorized service agencies for in-warranty or out-of-warranty repair of EICO equipment. It is intended to serve those customers who are not sufficiently familiar with electronics to make use of the EICO Service Consultation facilities, or whose difficulties cannot be solved by correspondence.

For all out-of-warranty units, there is a minimum labor and handling fee. Charges for parts replaced are additional to the minimum fee.

For in-warranty completed kit units, there is a minimum labor and handling fee. There is no charge for a replaced defective part provided that the terms and conditions of the warranty for no charge replacement are not violated in the judgement of EICO.

For in-warranty factory-wired units, there is no charge for labor or parts if the unit complies with the terms and conditions of the warranty in the judgement

of EICO. However, if the terms and conditions of the warranty are violated there will be a charge for labor plus parts.

In all cases, the unit must be sent to the factory or service agency transportation prepaid, and the unit will be returned to the customer transportation collect.

On kits, the services rendered for the minimum labor and handling fee are the correction of any minor wiring errors (not extensive corrections or rewiring), the labor involved in replacing defective parts, and any adjustments, alignment, or calibration procedures that would normally be performed on a factory-wired unit. Units not wired according to instructions, or modified in any way, or showing evidence of the use of acid core solder, will not be serviced and will be returned to the customer forthwith.

SEE OUR SCHEDULE OF SERVICE CHARGES

Units requiring extensive corrections or rewiring will incur an additional labor charge. An advance estimate will be submitted.

Please note: minimum labor and handling fees and service charges are subject to revision at any time.

LOCAL REPAIR FACILITIES

A list of authorized service stations is provided with this manual. The roster of stations may change from time to time, and if considerable time has elapsed since you purchased your unit, you are advised to contact the station you choose before sending the unit to them for repair. Use of a local service station will often result in faster service, and, usually, lower transportation costs.

It is necessary that you comply with the Shipping Instructions that follow when sending in a unit for service.

SHIPPING INSTRUCTIONS

You are strongly advised to retain the original shipping carton and inserts should reshipment be required for service or any other purpose. The carton may be collapsed for storage in as small a space as possible. In very many cases, the same carton is used for kit and factory-wired units so that the kit carton will serve for reshipment of the completed kit.

When sending a unit for service pack the unit very carefully, preferably in the original shipping carton with the original inserts.

If this is not possible, use a strong oversize carton, preferably wood, and using at least 3 inches of resilient packing material such as shredded paper or excelsior inserted between all sides of the unit and the carton. Seal the carton with strong gummed paper tape or strong twine or both. Attach a tag to the instrument on which is printed your name and address and brief reference to the trouble experienced. Affix "FRAGILE" or "HANDLE WITH CARE" labels to at least four sides of the carton or print these words large and clear with a bright color crayon. Ship prepaid.

Include your name and address on the outside of the carton. Return shipment will be made transportation charges collect. Note that a carrier cannot be held liable for damage in transit, if packing, IN HIS OPINION, is insufficient.



THE EICO WARRANTY



The Electronic Instrument Company, Inc., hereafter referred to as EICO, warrants that, for a period of 90 days from the date of purchase, any EICO kit will be free of defects in parts, and that any EICO factory-wired unit will be free of defects in parts and workmanship. For an EICO kit, EICO's obligation is limited to those parts which are returned transportation prepaid to the factory or authorized service agency without further damage, and in the judgement of EICO are either originally defective or have become defective in normal use. EICO's obligation does not include any labor required to locate trouble in or repair a kit. For an EICO factory-wired unit, EICO's obligation is limited to replacement or repair, at EICO's option, of those parts, sections, or entire units returned transportation prepaid to the factory or authorized service agency without further damage, and in the judgement of EICO are either originally defective or have become defective in normal use.

The warranty does not apply to any parts damaged in the course of handling, assembling, or wiring by the customer, or damaged due to abnormal usage or in violation of instructions or reasonable practice, or further damaged to a consequential degree in return shipment. Furthermore, the foregoing warranty is made only to the original customer, and is and shall be in lieu of all other warranties, whether expressed or implied, and of all other obligations or liabilities on the part of EICO, and in no event shall EICO be liable for any anticipated profits, consequential damages, loss of time, or other losses incurred by the customer in connection with the purchase or operation of EICO products or components thereof.

The registration card, which accompanies each EICO kit or factory-wired unit, must be filled in and returned to the company within 10 days after the date of purchase. This warranty applies only to registered units.

SCHEDULE OF SERVICE CHARGES

- 1. Same prices for wired units or completed kits.
2. Charges are based on the schedule of minimum charges above. Some exceptions are noted below.
3. If the published rate is \$ 5.00-\$ 6.00, this covers up to 1 hour of labor time (minimum \$5.00).
If the published rate is \$ 6.50-\$ 8.00, this covers up to 1 1/2 hours.
If the published rate is \$ 9.00-\$10.00, this covers up to 2 hours.
If the published rate is \$11.00-\$14.50, this covers up to 2 1/2 hours.
If the published rate is \$15.00-\$20.00, this covers up to 3 1/2 hours.
4. Time required in excess of these minimum charges is calculated at \$5.00 per hour.
5. Above prices are for labor only. Parts are additional.
6. Miscellaneous prices not published in manuals are: Probes - \$2.00 RP-100 Playback amp. only or CRA & CRU - \$3.00 Power Supply only or Record amp. only ...\$5.00 2536 Printed Circuit Board - \$5.00.
7. ESTIMATES: An estimate for repairs will be given before repairs are made where repairs will exceed stated minimum charges. If you choose not to have your unit repaired, a charge of \$3.00 for estimating time will be made.
8. All prices are subject to change without notice.

MINIMUM LABOR AND HANDLING FEES

Table with 4 columns: Part Number, Price, Part Number, Price. Lists various parts like AF4, RA6, HF12, etc. with their respective costs.

* Model RP100 and Model 2400 will be billed on the basis of \$10.00 for the first hour and \$5.00 each additional hour, with a maximum unauthorized repair of \$50.00 for the kit and \$25.00 for a wired unit.

AUTHORIZED WARRANTY SERVICE AGENCIES

ALABAMA

Hueytown
Electro-Mechanical Assoc.
1382 Warrior River Rd.

Mobile
Arnold's TV Service
1259 Eslava Drive

ARIZONA

Phoenix
Sigma Electronics
602 N. 3d St.

Tucson
Park Music Shop
1702 E. Speedway

CALIFORNIA

Anaheim
United Sound & TV Co.
2010 W. Lincoln Ave.

Los Angeles
Electronic Instrument Service
8907 So. Vermont Ave.

United Sound & TV Co.
5036 Venice Blvd.

San Mateo
Electro Service Co.
240 Main St.

San Francisco
Prompt Radio & TV Co.
3143 Mission St.
(Hi-Fi & Tape Recorders only)

COLORADO

Denver
A. B. & K. Service, Inc.
1459 South Pearl St.

CONNECTICUT

Norwich
The La Course Radio Electric
184 Franklin St. Service

Windsor
Hickory Electronics Co., Inc.
21 Maple Ave.

DISTRICT OF COLUMBIA

Washington
Sylvan Radio & TV Co.
306 Kennedy St., N. W.

FLORIDA

Miami
Southern Authorized Factory Service
62 N. W. 27th Ave.

North Miami Beach
Southeastern Communications, Inc.
2055 N. E. 151st St.

West Palm Beach
Northwood TV & Service Co.
2317 North Dixie

IDAHO

Twin Falls
TV Tuner Service
P. O. Box 793

ILLINOIS

Chicago
B & S Electronics, Inc.
6326 W. Roosevelt Rd.

Electronic Engineers, Inc.
5615 W. Division St.

INDIANA

Indianapolis
Aid TV & General Appliance
4145 North College Ave.

La Grange
Westview Electronics
R. R. 4

KANSAS

Wichita
Alan Appliance Service, Inc.
339 North Main St.

KENTUCKY

Louisville
Maury's Fluorescent & Appl. Service
962 South 3d St.

LOUISIANA

New Orleans
Industrial Inst. Works
3305 Tchoupitoulas St.

MAINE

South Portland
Air-Tronics
Port O'Maine Airport
Pleasant Hill Rd.

MARYLAND

Baltimore
Clayton Electronics, Inc.
4723 Gwynn Oak Ave.

Bethesda
American Technical & Service
4961 Bethesda Ave.

MASSACHUSETTS

Boston
Park Armature Co.
1218-30 Columbus Ave.

Medford
Electron TV & Hi-Fi
229 Salem St.

MICHIGAN

Detroit
The Audio Clinic
17125 W. McNichols

MINNESOTA

Minneapolis
Andersen Audio Laboratory
4145 Minnehaha Ave. South

MISSOURI

Kansas City
Carroll Electronics
2410 Grand Ave.

Kansas City Calibration Lab.
4034 Broadway
(Instruments Only)

St. Louis
Scherrer Instruments
5449 Delmar Blvd.

A. A. Kelley Radio & Elect. Service
4181 Manchester

NEW JERSEY

Irvington
Audio Service Labs
1422 Springfield Ave.

Riverside
Lou's Electronic Service
727 Baylor St.

NEW MEXICO

Albuquerque
Ed's TV & Hi-Fi
301 Maple Ave. N. E.

NEW YORK

Binghamton
Ross' Radio & TV Service
116 Main St.

Hastings on the Hudson
Central T. V. Hi-Fi Service
543 Warburton Ave.

Huntington Station
Suffolk Sound Repair, Inc.
1671 New York Ave.

New Hyde Park
Ethical Electronic Service
3330 Hillside Ave.

New York City

Brooklyn
Marveltone Recording Service
1168 Flatbush Ave.

Manhattan
Marveltone Recording Service
105 W. 72nd St.

Winters' Radio Laboratory
11 Warren St.

Queens
H & E Clock and Elect. Corp.
144-33 Jamaica Ave.

Schenectady
Wide Enterprises, Inc.
612 Union St.

Vestal
Compton Industries, Inc.
333 Vestal P'kway East

West Hempstead
Audotronic, Inc.
96 Hempstead Turnpike

NORTH CAROLINA

Charlotte
Tryon Repair Service
3125 Tuckasegee Rd.

Raleigh
Speed Instrument Co.
3028 E. Rothgeb Dr.
(For Instruments Only)

Winston-Salem
Electronic Services
150 Woodrow Ave.

OHIO

Cleveland
Bob Whitlow Radio & TV
13914 St. Clair Ave.

Dayton
Far Hills Service Center
45 W. Whipp Rd.

Toledo
Dave's Radio & TV
3112 Upton at W. Central

OKLAHOMA

Oklahoma City
Audio Specialties
1010 North Virginia

OREGON

Portland
Hunter's Video Sonic
4059 N. E. Sandy Blvd.

PENNSYLVANIA

Collegeville
Central Communications
170 First Ave.

Havertown
Michael's TV & Radio Service
1127 West Chester Pike

Lehighton
Lehighton Electronics
P. O. Box 281

Philadelphia
Electronic Servicenter
13 S. 21st St.

Sunshine Scientific
1810 Grant Ave.
(Instruments only)

Woodlyn
Altron Electronics Co.
1309 Jefferson Ave.

SOUTH CAROLINA

Cayce
Cayce Radio-TV, Appliances, Inc.
906 Knox Abbott Dr.

TEXAS

Abilene
Vol's Repair Shop
1417 Marshall

El Paso
Test Equipment Co.
5319 Harlan Dr.

La Feria
La Feria Radio & TV Service

Wichita Falls
Ken Dixon Radio & TV
2612 Grant St.

UTAH

Bountiful
Anderton Electronic Lab.
129 E. 1800 South

VIRGINIA

Arlington
Washington Electronic Service Co.
122 South Wayne St.

Norfolk
Dixie TV Service
1107 W. Little Creek Rd.

WASHINGTON

Seattle
Ron Merritt Co.
1320 Prospect St.

CANADA

Toronto, Ontario
John R. Tilton, Ltd.
51 McCormack St.

Vancouver
National TV Service Co., Ltd.
2145 Commercial Drive