

# EICO

## EICO—LEADER IN CREATIVE ELECTRONICS

For over 23 years, EICO has been designing and manufacturing electronic products and is now the world's largest producer of electronic kits and factory wired equipment marketed exclusively through dealers and distributors throughout the world.

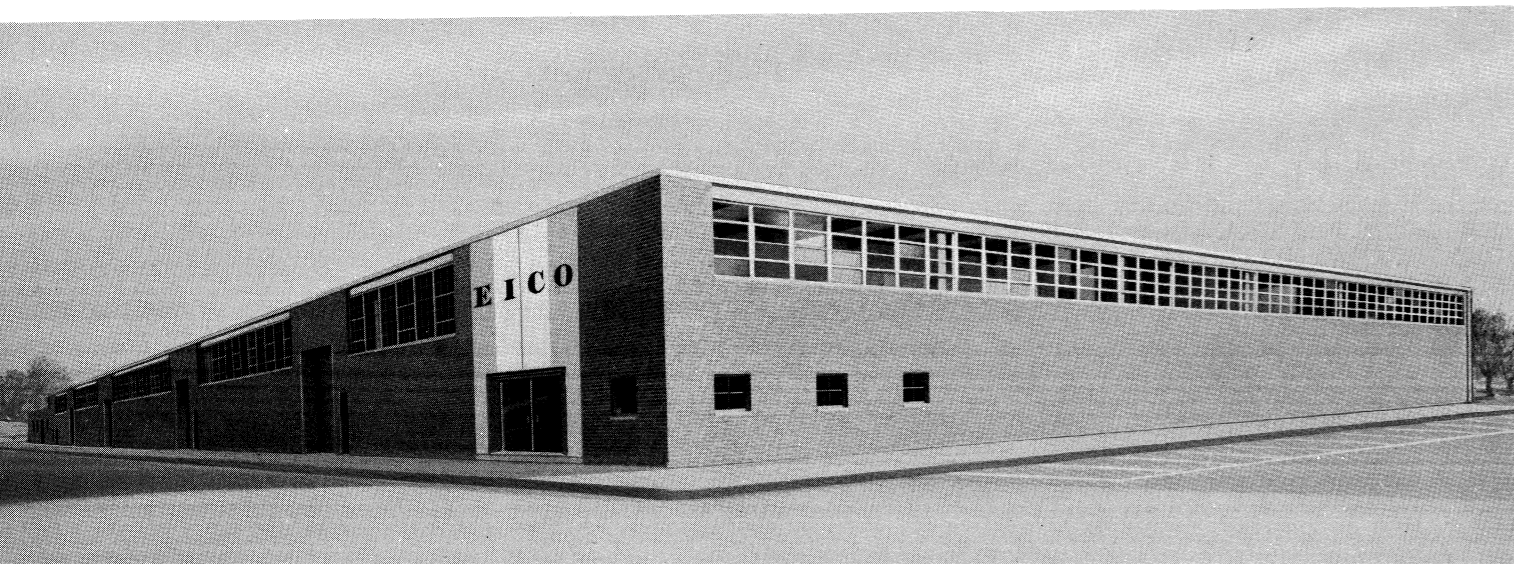
Whatever your electronics interest, there's a wide range of versatile, professional EICO products for you to choose from, and each designed to provide you with the most pleasure and quality performance for your money.

The fact that more than 3 million EICO products are in use throughout the world attests to their quality and performance. EICO kits are so popular because they represent the best value and are available for inspection and immediate over-the-counter delivery at more than 2500 EICO dealers and distributors.

Should you have any questions about the selection or applications of any EICO product, you may at any time consult by mail with our technical correspondence staff. There's no charge for this service.

For your added convenience — EICO has set up a network of 200 service stations to make available to you on a local neighborhood basis the same high-quality technical service competence and replacement parts you get from our factory, should you ever need them.

The EICO Catalog is available to you Free for the asking. The catalog describes Eico's complete line of 200 "Best Buys" in Electronics. Cortina® Stereo Components, EICOCRAFT® Solid State electronic projects, Citizens Band 2-Way Radios, Automotive electronics, Amateur Radio equipment, Visutronic® Educational Training Aids, TRUVOHM® professional Multimeters and the famous EICO line of Test Instruments for home, shop, factory, laboratory and school.



EICO Electronic Instrument Co., Inc., 283 Malta Street, Brooklyn, N. Y. 11207



## 3070/"Cortina" Solid State Stereo Amplifier



# OPERATING MANUAL



**PARTS REPLACEMENT**

If it appears that a component is defective, and you desire a replacement, contact your EICO Distributor, the 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 or Revision number, such as Rev. 1, Rev. 2, etc.
- 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, in addition to repair facilities at the factory, 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 repaired at the factory there is a minimum labor and handling fee. Charges for parts replaced are additional to the minimum fee.

For in-warranty completed kit units repaired at the factory 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 by the factory 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 anyway, or showing evidence of the use of acid core solder, will not be serviced and will be returned to the customer forthwith.

SEE SCHEDULE OF FACTORY 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 your 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. Be sure to place the bottom plate, cover, and supporting bracket, if any, on the unit before shipping.

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.

**AUTHORIZED WARRANTY SERVICE AGENCIES**

ALABAMA

Birmingham  
Nelco Service Co.  
2900 - 4th Ave. S.

Mobile  
Universal Electronics & Instr. Svce.  
3058 Brookline Dr. W.

Montgomery  
Audio Service Center  
319 Fleming Rd.  
(Hi-Fi Only)

G & T Electronics  
18 Davis Dr.  
(CB Only)

ARIZONA

Phoenix  
ABC-2-Way Radio Comm.  
1844 E. Indian School Rd.  
(CB Only)

Tucson  
Park Music Shop  
1702 E. Speedway

CALIFORNIA

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

Barstow  
Roy's Communications Svce.  
615 E. Main St.

Los Angeles  
Electronic Instruments Service  
8921 S. Vermont Ave.

United Sound & TV Co.  
5036 Venice Blvd.

Orange  
Electro Tech Svce. Co.  
417 S. Main St.

San Diego  
Lewton's Radio & TV  
4251 University Ave.  
(High Fidelity Only)

San Francisco  
California Sound Engineers  
475 Barneveld Ave.  
(Hi-Fi, CB & Ham Only)

Guaranteed Electronics Repair  
5822 Mission St.

COLORADO

Colorado Springs  
Clyde N. Still  
2630 W. Kiowa St.

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

CONNECTICUT

Groton  
Francis Electronics, Inc.  
565 Long Hill Rd.

CONNECTICUT (cont'd)

Hartford  
Herbert Electronics  
1081 Capitol Ave.

New Haven  
Baltimore Electronics  
546 Whalley Ave.  
(Hi-Fi Only)

Norwich  
La Course Radio-Electric Svce.  
184 Franklin St.

DISTRICT OF COLUMBIA

Bethesda  
American Technical Services  
4925 Bethesda Ave.

FLORIDA

Miami  
Spire Audio-Visual Co.  
24 N. W. 36th St.

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

Orlando  
Electronics Service Labs.  
1024 N. Mills

Tampa  
Maurice Wood  
1949 W. Buffalo

Sylvania Service Center  
1602 Florida Ave.

GEORGIA

Atlanta  
S. A. Sparks Communication Svce.  
1052 Memorial Drive S. E.

IDAHO

Twin Falls  
TV Tuner Service  
P. O. Box 793

ILLINOIS

Chicago  
Banks Electronics  
5107 W. Division St.

Electronic Engineers, Inc.  
1639 W. Evergreen (1300 N.)

Oak Park  
B. & S. Electronics  
6326 W. Roosevelt Rd.

Peoria Heights  
Put's Radio-Sales  
737 E. Marietta  
(CB Only)

IOWA

Cedar Rapids  
Gene's Radio & TV  
503-8th Ave. S. E.

Sioux City  
Mar-Bon, Inc.  
Route 2, Box 138  
(CB & Ham Only)

KENTUCKY

Louisville  
Maury's Fluorescent & Appl. Svce.  
962 South 3rd St.

A & T Two-Way Radio  
2339 Rockford Lane  
(CB Only)

LOUISIANA

New Orleans  
Transistor Electronics Svce. Co.  
Room 5, Bldg. 17  
Foreign Trade Zone  
Foot of Napoleon Ave.  
(Phone: 899-9505)

Shreveport  
Audio & Instrument Assoc.  
5511 Sussex Street

MAINE

Portland  
Bartlett Radio Co.  
181 Brackett St.

MARYLAND

Baltimore  
Clayton Electronics, Inc.  
5940 York Rd.

Bethesda  
American Technical Services  
4925 Bethesda Avenue

MASSACHUSETTS

Boston  
Park Armature Co.  
1218-30 Columbus Ave.

Worcester  
Audio-Visual Associates  
8 Boylston St.

MICHIGAN

East Detroit  
Sealand Electronics, Inc.  
23043 Gratiot

Lincoln Park  
Lincoln Park Sound Svce.  
2884 Fort Street

**EICO THE EICO WARRANTY EICO**

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 FACTORY SERVICE CHARGES**

(Consult your local EICO authorized service agency for THEIR charges.)

**THESE CHARGES SUPERCEDE CHARGES WHICH MAY BE INDICATED IN YOUR MANUAL OR PREVIOUS SCHEDULES.**

1. Same prices for wired units or completed kits.
2. Charges are based on the schedule of minimum charges above.
3. All labor charges are calculated at \$7.50 per hour. For example, if the minimum labor and handling fee is \$15.00, this covers up to 2 hours. Any labor time (in this example only) required over 2 hours is charged for at \$7.50 per hour.
4. Above prices are for labor only. Parts are additional.
5. 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 \$4.00 for estimating time will be made.
6. All prices are subject to change without notice.

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**MINIMUM LABOR AND HANDLING FEES**

CRA & CRU	\$ 3.50	488	\$ 7.50
Probes	3.50	495	7.50
AF4	11.50	526	7.50
RA6	7.50	536	7.50
HF12	11.50	540	7.50
HF14	7.50	555	7.50
HF20	15.00	556	7.50
HF22	7.50	565	7.50
HF30	7.50	566	7.50
HF32	14.50	567	7.50
HF35	7.50	584	7.50
ST40	22.50	610	7.50
HF50	7.50	612	7.50
HF52	15.00	615	7.50
HF60	7.50	625	9.00
HF61	9.00	628	10.50
HF61A	9.00	630	7.50
HF65	10.00	632	10.50
HF65A	10.00	636	7.50
ST70	22.50	666	15.00
HF81	20.50	667	15.00
ST84	15.00	680	9.00
HF85	12.00	706	7.50
HF86	13.50	710	7.50
HF87	13.50	711	10.50
HF89	13.50	712	15.00
HFT90	11.50	715	7.50
HFT92	13.50	717	11.50
HFT94	11.50	720	20.50
ST96	20.50	722	13.50
ST97	20.50	723	15.00
MX99	11.50	730	15.00
RP100	45.00	740	13.50
Playback Amp only	11.50	751	16.50
Power Supply only	11.50	752	16.50
Record Amp only	11.50	753	37.50
Head Alignment only	15.00	760	13.50
145	7.50	761	13.50
145A	7.50	762	13.50
147	7.50	770	18.00
214	9.00	771-2	18.00
221	9.00	777	30.00
222	10.50	779, A	25.50
232	9.00	791	7.50
235	10.50	803	7.50
249	9.00	888	9.00
250	10.50	902	37.50
255	10.50	944	7.50
260/261	10.50	950	7.50
315	9.00	955	9.00
320	7.50	965	22.50
322	7.50	1020	7.50
324	7.50	1030	15.00
342	22.50	1040	11.50
352	7.50	1050	7.50
360	7.50	1055	7.50
368	19.00	1060	7.50
369	19.00	1064	9.00
377	9.00	1073	7.50
378	10.50	1078	7.50
380	24.00	1100	7.50
425	9.00	1120	7.50
427	19.00	1140	7.50
430	19.00	1171	7.50
435	22.50	1180	7.50
460	22.50	2036	20.50
470	22.50	2050	20.50
		2080	20.50
		2200	15.00
		2400	30.00
		2510	18.00
		2536	26.50
		2715/16	15.00
		3070	18.00
		3200	18.00
		3566	37.50
		3570	39.50
		4000	30.00
		7923	28.50

**MISSOURI**

St. Louis  
Scherrer Instruments  
5449 Delmar Blvd.  
  
A. A. Kelley Radio & Elect. Svce.  
4181 Manchester

**NEBRASKA**

Lincoln  
Electronics Associates  
2238 "O" St.

Omaha  
Hi-Pix Stereo Service  
3427 S. 42nd St.

**NEW HAMPSHIRE**

Manchester  
Roland Demers Svce. Co.  
436 Maple St.

Wholesale Electronics Corp.  
40 Bridge St.

**NEW JERSEY**

Riverside  
Dixey-Bonas TV  
52 Scott St.

Singac  
Hosica Laboratories  
715 Main St.

**NEW MEXICO**

Albuquerque  
The Audio Clinic  
1510 Eubank Blvd., N. E.

**NEW YORK**

Albany  
Baker Electronics  
514 Second St.

Binghamton  
Ross' Radio & TV Service  
116 Main St.

Hastings on the Hudson  
(Westchester County)  
Central TV & HI-FI Service  
543 Warburton Ave.

Huntington Station  
Suffolk Sound Repair, Inc.  
1671 New York Ave.  
(Hi-Fi & Test Fqpt. Only)

Mineola  
Ethical Electronic Service  
468 Jericho Turnpike

**NEW YORK CITY**

Manhattan  
Winters' Radio Laboratory  
11 Warren St.

Brooklyn  
G. M. T. V.  
252 Prospect Park West

Queens  
Electronic Servicenter  
65-37 Queens Blvd.  
Woodside  
  
Great Northern Tronics, Inc.  
145-04 Jamaica Ave.

**NEW YORK CITY (cont'd)**

Syracuse  
Radio & Electronic Svce.  
401 N. Townsend St. at Willow

Syracuse Communications, Inc.  
2180 Erie Blvd. East  
(CB & Ham Only)

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

West Hempstead  
Audotronic, Inc.  
96 Hempstead Turnpike  
(Hi-Fi & Test Equipt. Only)

**NORTH CAROLINA**

Charlotte  
Tryon Repair Service  
3125 Tuckaseegee Rd.

Raleigh  
Speed Instrument Co.  
3028 E. Rothgeb Dr.

**O H I O**

Cleveland  
Electronic Instrument Labs. Corp.  
3617 Detroit Ave.  
(Instr. & Test Eqpt. Only)

Dayton  
Audio Labs.  
3470 Salem Avenue

East Cleveland  
Whitlow Electronic Corp.  
2150 Noble Road

Toledo  
Don's Electronics  
1682 Belmont Ave.  
(Hi-Fi & Tape Recorders Only)

**OREGON**

Portland  
Mote's Communications  
2927 S. E. 21st Ave.  
(CB & Ham Only)

**PENNSYLVANIA**

Harrisburg  
H. L. Crossley  
549 S. 19th Street  
(CB & Ham Only)

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

Philadelphia  
Electronic Servicenter  
13 S. 21st St.

Sunshine Scientific Inst.  
1810 Grant Ave.  
(Inst. & Test Eqpt. Only)

Transistor Eqpt. Service Ctr.  
2212 Glendale St.  
Woodlyn  
(Suburban Philadelphia)  
Altron Electronics Co.  
1309 Jefferson Ave.

**PENNSYLVANIA (continued)**

Pittsburgh  
John's Radio & TV Svce.  
917 Freeland Street

**RHODE ISLAND**

Pawtucket  
Unique Radio Co.  
736 Central Ave.

**SOUTH CAROLINA**

Charleston Heights  
Custom Audio Lab.  
2202 Meeting St.  
(Hi-Fi & CB Only)

Greenville  
Cantrell Whlsl. Prod., Inc.  
2570 N. Pleasantburg Dr.  
(CB Only)

**TENNESSEE**

Chattanooga  
Edwin Bohr/Electronics  
5880 Dayton Blvd.  
(Instr. & Test Eqpt. Only)

**TEXAS**

El Paso  
Test Equipment Co.  
5319 Harlan Dr.

Ft. Worth  
Knight's TV & Audio  
1127 S. Main

La Feria  
La Feria Radio & TV Service  
Lubbock

Edwards Communications Svce., Inc.  
1821 Avenue M  
(CB Only)

Texas City  
Ham's Communication Svce.  
3001 Somerset Ave.

**U T A H**

Bountiful  
Anderton Electronic Lab.  
129 E. 1800 South

Provo  
Brickey Electronics  
1408 North 1750 West

Salt Lake City  
Radio Electronics TV Svce.  
1876 E. 2990 South

**VIRGINIA**

Arlington  
Washington Electronic Service Co.  
4112 Wilson Blvd.

Hampton  
Central Electronics  
4327 Kecoughtan Rd.

Virginia Beach  
Hi-Fi Clinic  
242 First Colonial Rd.

**WASHINGTON**

Seattle  
Ron Merritt Co.  
1320 Prospect St.

C A N A D A  
Toronto, Ontario  
John R. Tilton, Ltd.  
51 McCormack St.

Weston, Ontario  
EICO Canada, Ltd.  
20 Millwick Drive

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Seattle  
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1320 Prospect St.

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

Weston, Ontario  
EICO Canada, Ltd.  
20 Millwick Drive

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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.

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**SCHEDULE OF FACTORY SERVICE CHARGES**

(Consult your local EICO authorized service agency for THEIR charges.)

**THESE CHARGES SUPERCEDE CHARGES WHICH MAY BE INDICATED IN YOUR MANUAL OR PREVIOUS SCHEDULES.**

- 1. Same prices for wired units or completed kits.
- 2. Charges are based on the schedule of minimum charges above.
- 3. All labor charges are calculated at \$7.50 per hour. For example, if the minimum labor and handling fee is \$15.00, this covers up to 2 hours. Any labor time (in this example only) required over 2 hours is charged for at \$7.50 per hour.
- 4. Above prices are for labor only. Parts are additional.
- 5. 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 \$4.00 for estimating time will be made.
- 6. All prices are subject to change without notice.

IE 1371-358

**MINIMUM LABOR AND HANDLING FEES**

CRA & CRU	\$ 3.50	488	\$ 7.50
Probes	3.50	495	7.50
AF4	11.50	526	7.50
RA6	7.50	536	7.50
HF12	11.50	540	7.50
HF14	7.50	555	7.50
HF20	15.00	556	7.50
HF22	7.50	565	7.50
HF30	7.50	566	7.50
HF32	14.50	567	7.50
HF35	7.50	584	7.50
ST40	22.50	610	7.50
HF50	7.50	612	7.50
HF52	15.00	615	7.50
HF60	7.50	625	9.00
HF61	9.00	628	10.50
HF61A	9.00	630	7.50
HF65	10.00	632	10.50
HF65A	10.00	636	7.50
ST70	22.50	666	15.00
HF81	20.50	667	15.00
ST84	15.00	680	9.00
HF85	12.00	706	7.50
HF86	13.50	710	7.50
HF87	13.50	711	10.50
HF89	13.50	712	15.00
HFT90	11.50	715	7.50
HFT92	13.50	717	11.50
HFT94	11.50	720	20.50
ST96	20.50	722	13.50
ST97	20.50	723	15.00
MX99	11.50	730	15.00
RP100	45.00	740	13.50
Playback Amp only	11.50	751	16.50
Power Supply only	11.50	752	16.50
Record Amp only	11.50	753	37.50
Head Alignment only	15.00	760	13.50
145	7.50	761	13.50
145A	7.50	762	13.50
147	7.50	770	18.00
214	9.00	771-2	18.00
221	9.00	777	30.00
222	10.50	779, A	25.50
232	9.00	791	7.50
235	10.50	803	7.50
249	9.00	888	9.00
250	10.50	902	37.50
255	10.50	944	7.50
260/261	10.50	950	7.50
315	9.00	955	9.00
320	7.50	965	22.50
322	7.50	1020	7.50
324	7.50	1030	15.00
342	22.50	1040	11.50
352	7.50	1050	7.50
360	7.50	1055	7.50
368	19.00	1060	7.50
369	19.00	1064	9.00
377	9.00	1073	7.50
378	10.50	1078	7.50
380	24.00	1100	7.50
425	9.00	1120	7.50
427	19.00	1140	7.50
430	19.00	1171	7.50
435	22.50	1180	7.50
460	22.50	2036	20.50
470	22.50	2050	20.50
		2080	20.50
		2200	15.00
		2400	30.00
		2510	18.00
		2536	26.50
		2715/16	15.00
		3070	18.00
		3200	18.00
		3566	37.50
		3570	39.50
		4000	30.00
		7923	28.50

# CAUTION

SOME OF THE DIODES USED IN THIS UNIT MAY BE SIMILAR TO EACH OTHER IN SIZE AND SHAPE, ALTHOUGH DIFFERING IN CIRCUIT APPLICATION. TO AVOID CONFUSING ONE TYPE WITH ANOTHER, DO NOT COMBINE ENVELOPES WHILE CHECKING COMPONENTS AGAINST THE PARTS LIST.

LEAVE ALL COMPONENTS IN THE ENVELOPES ORIGINALLY SUPPLIED. MAKE ALL ADDENDUM CORRECTIONS TO THE MANUALS, CONSTRUCTION FIGURES, AND "KIT PACKAGE BREAKDOWN VS KIT STEPS" SHEET BEFORE BEGINNING THE KIT ASSEMBLY.

THE "KIT PACKAGE BREAKDOWN VS. KIT STEPS" SHEET SPECIFIES THE ENVELOPE IN WHICH THE REQUIRED COMPONENT FOR A PARTICULAR ASSEMBLY STEP MAY BE LOCATED. USE THIS GUIDE ESPECIALLY FOR LOCATING AND IDENTIFYING DIODES.

3070

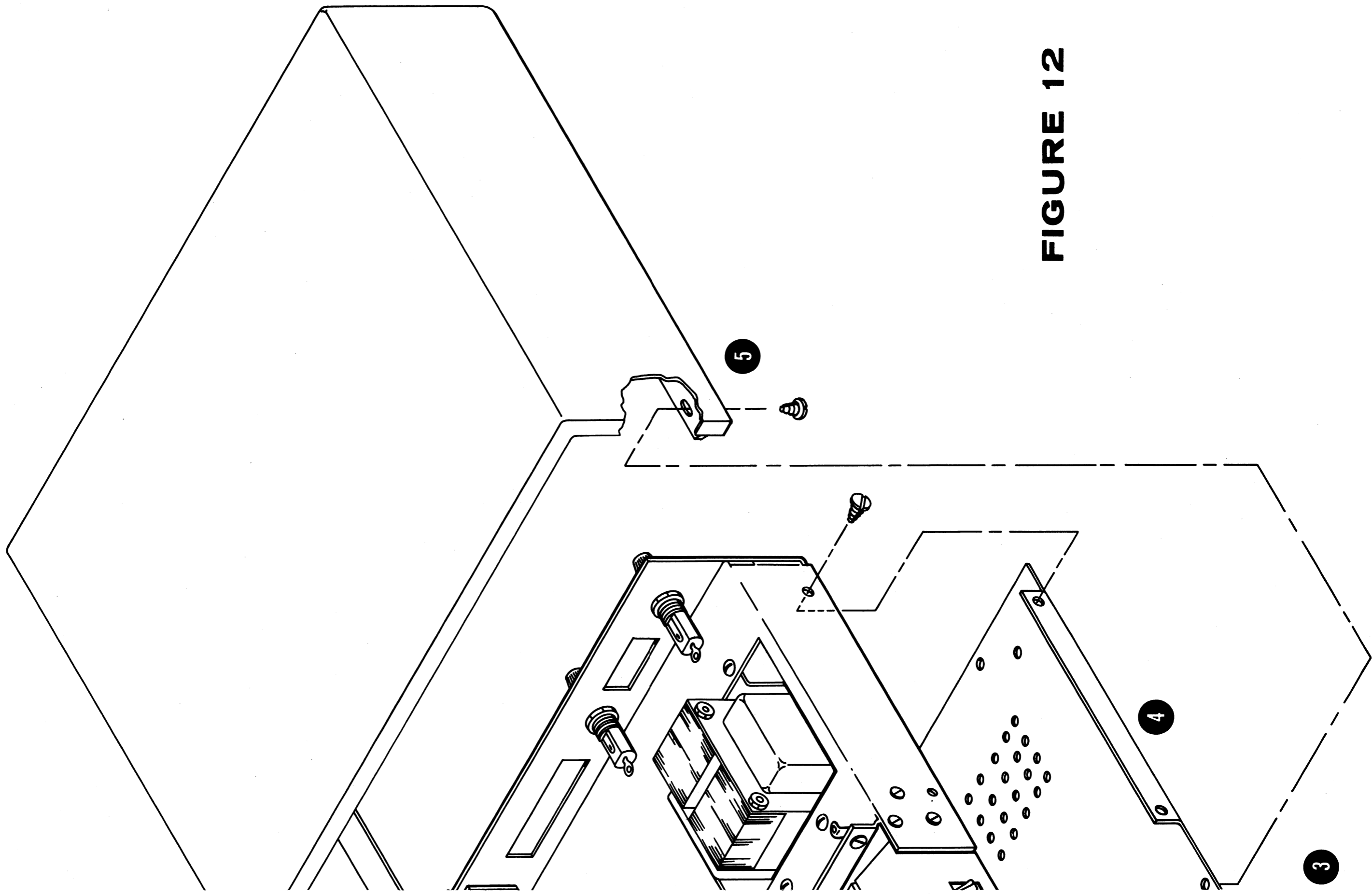
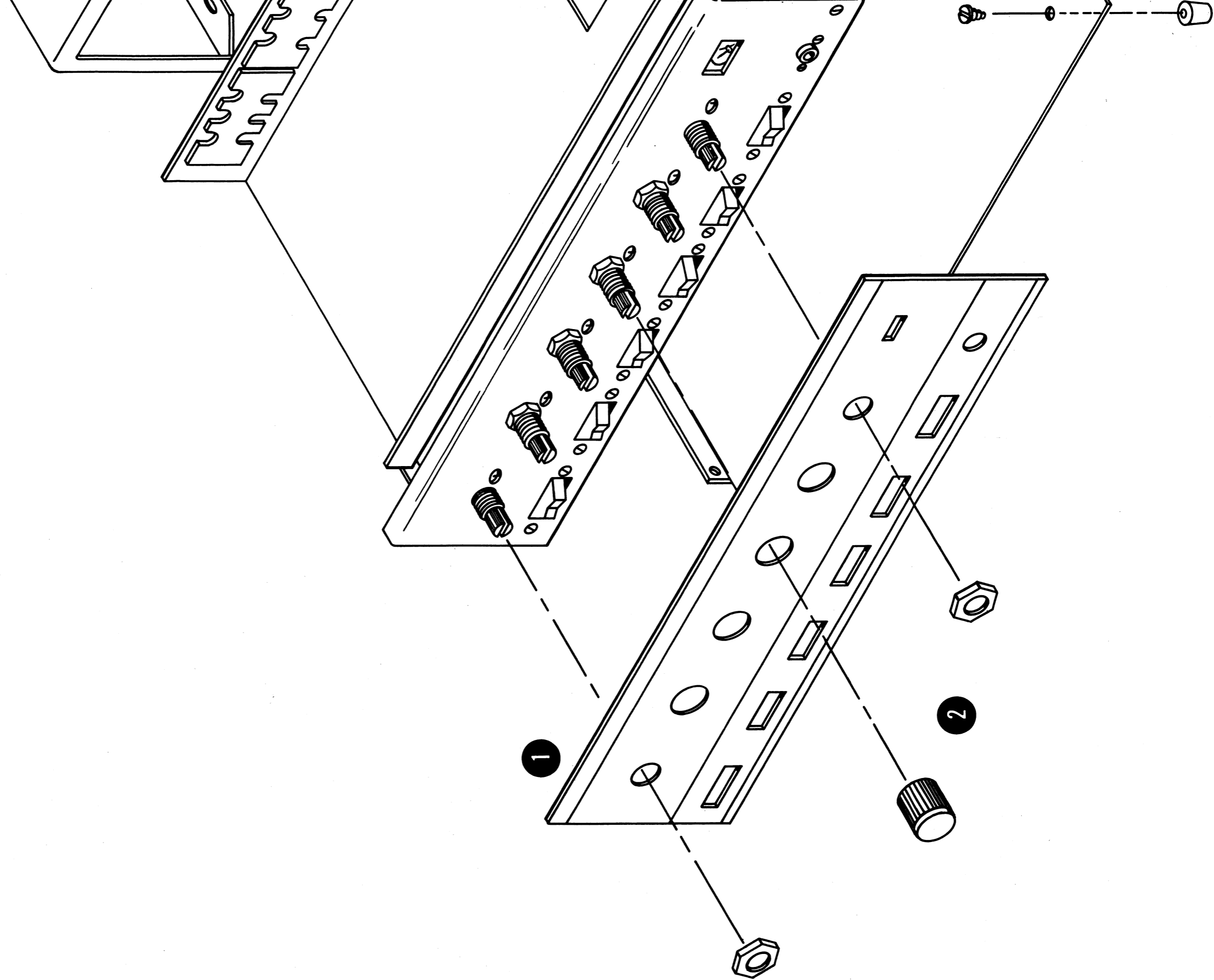
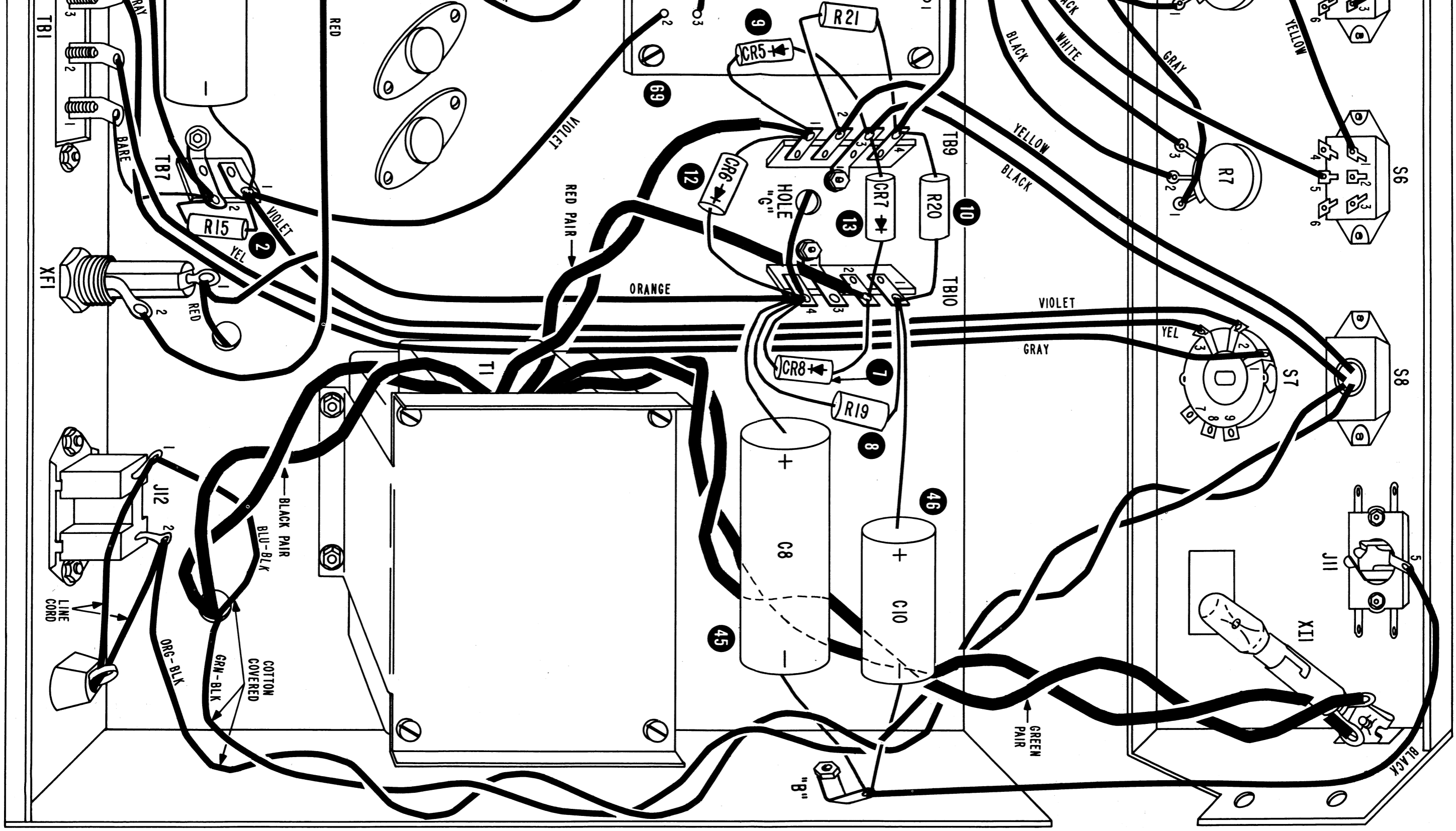
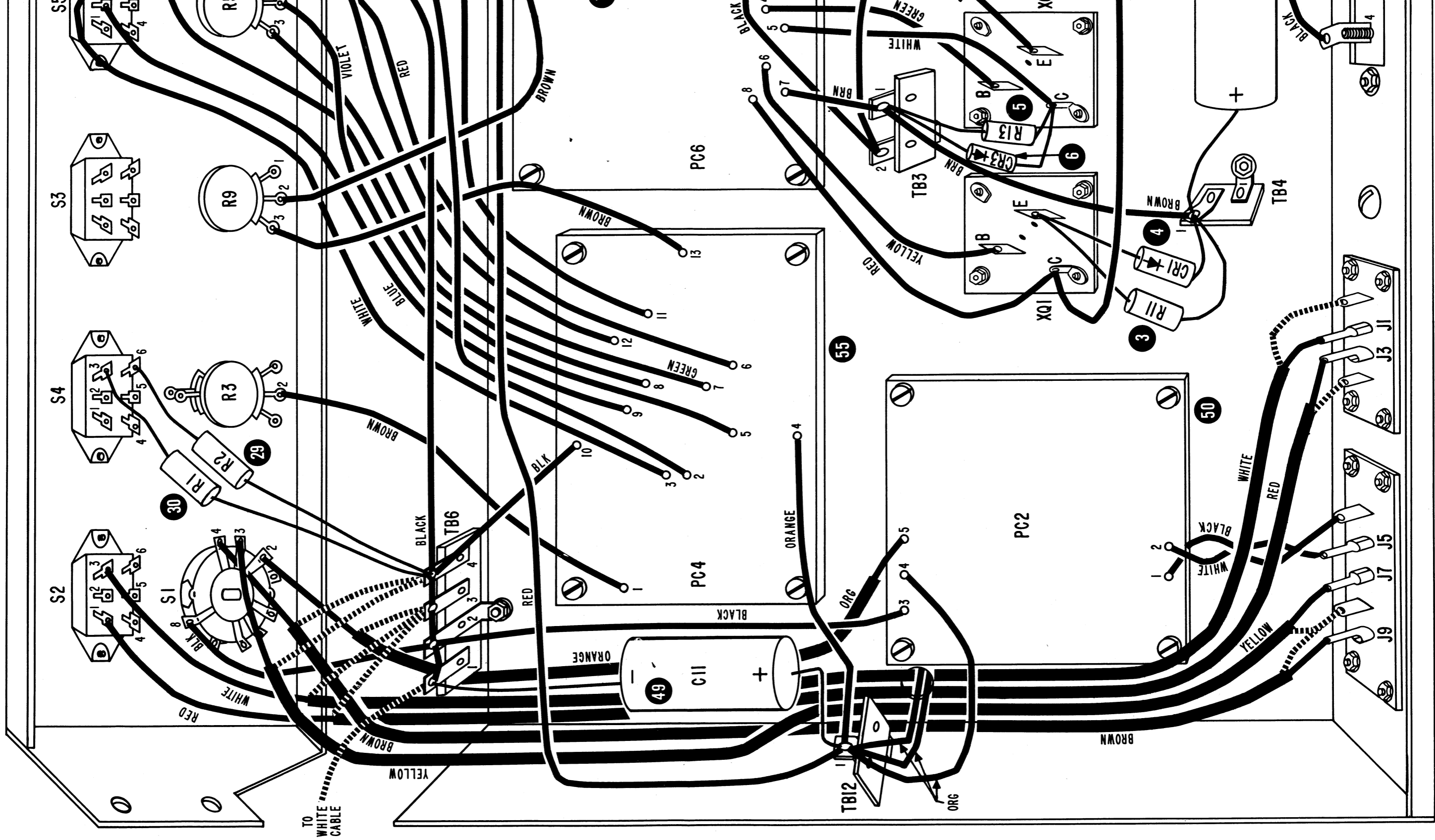


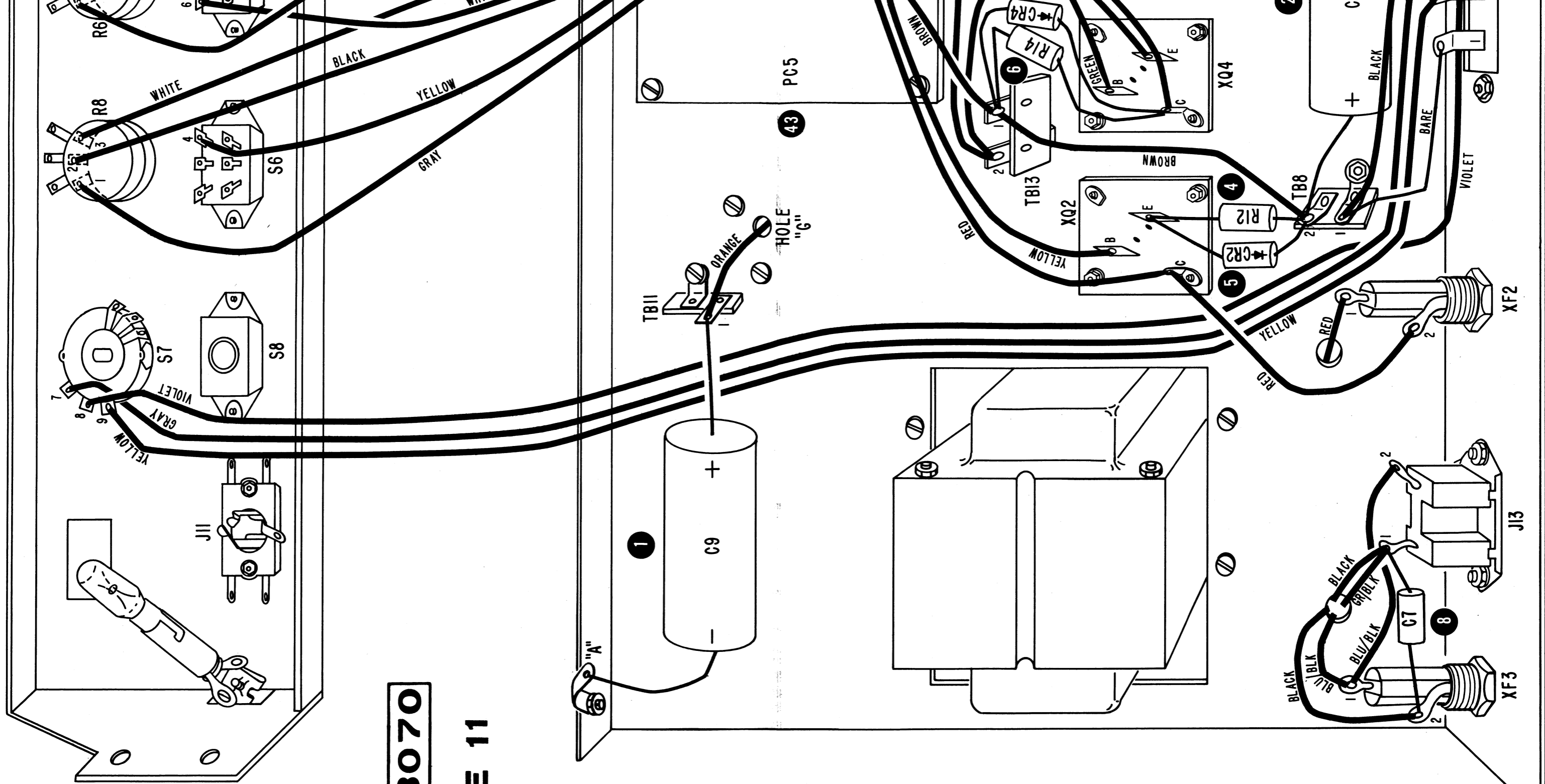
FIGURE 12





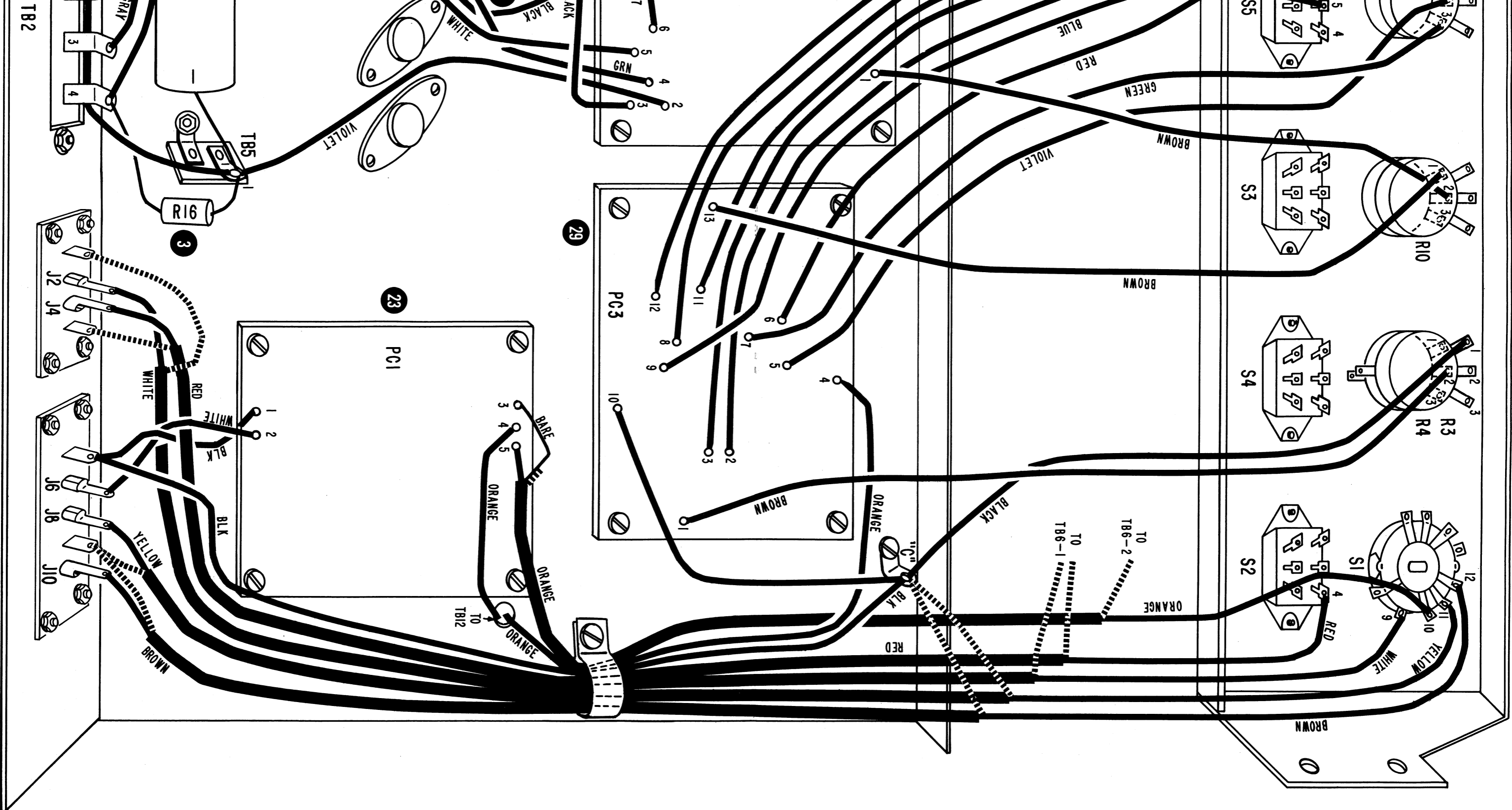


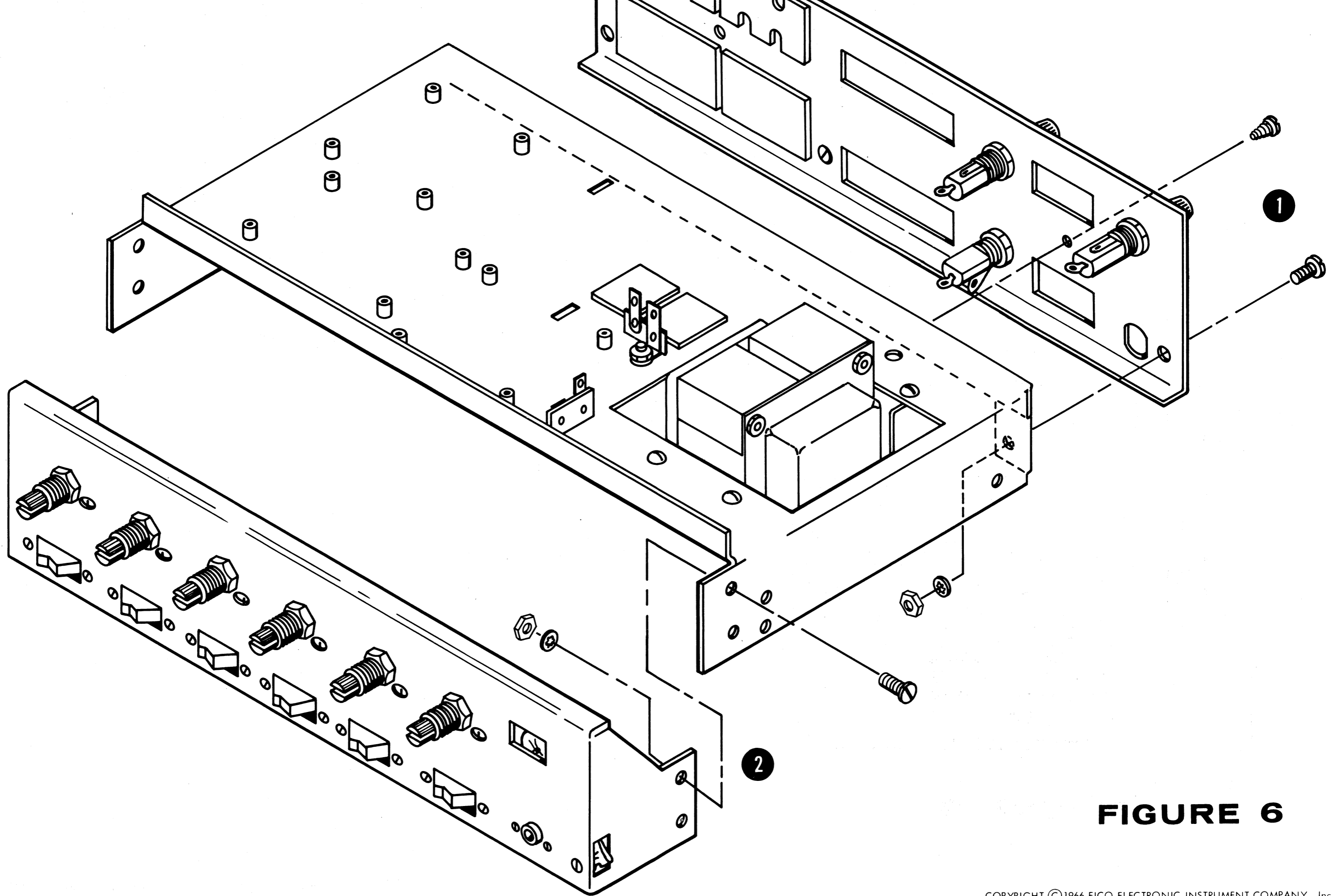




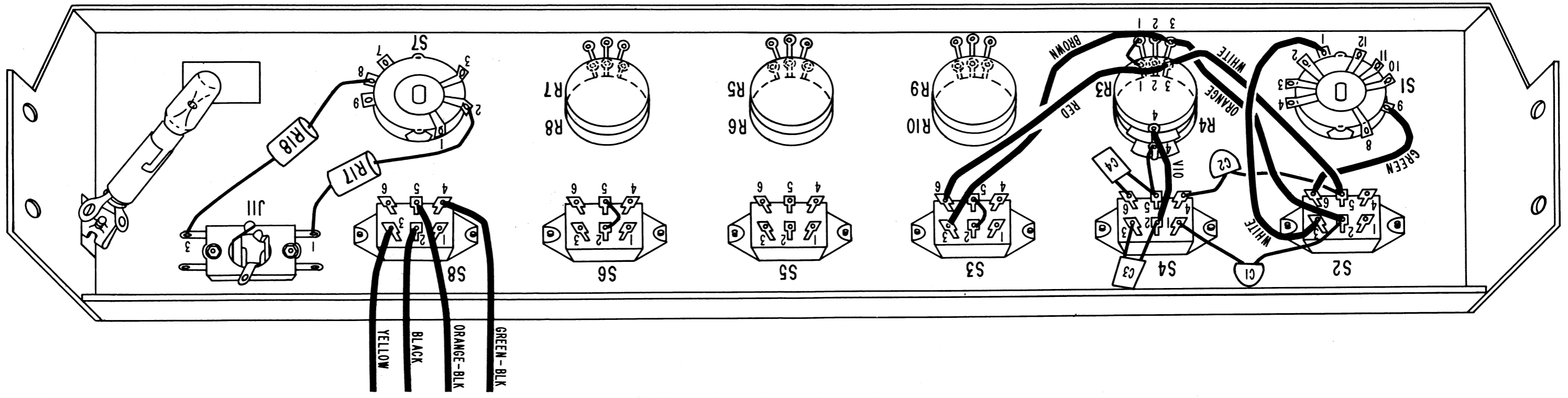
**EICO 3070**

**FIGURE 11**





**FIGURE 6**



**FIGURE 5**

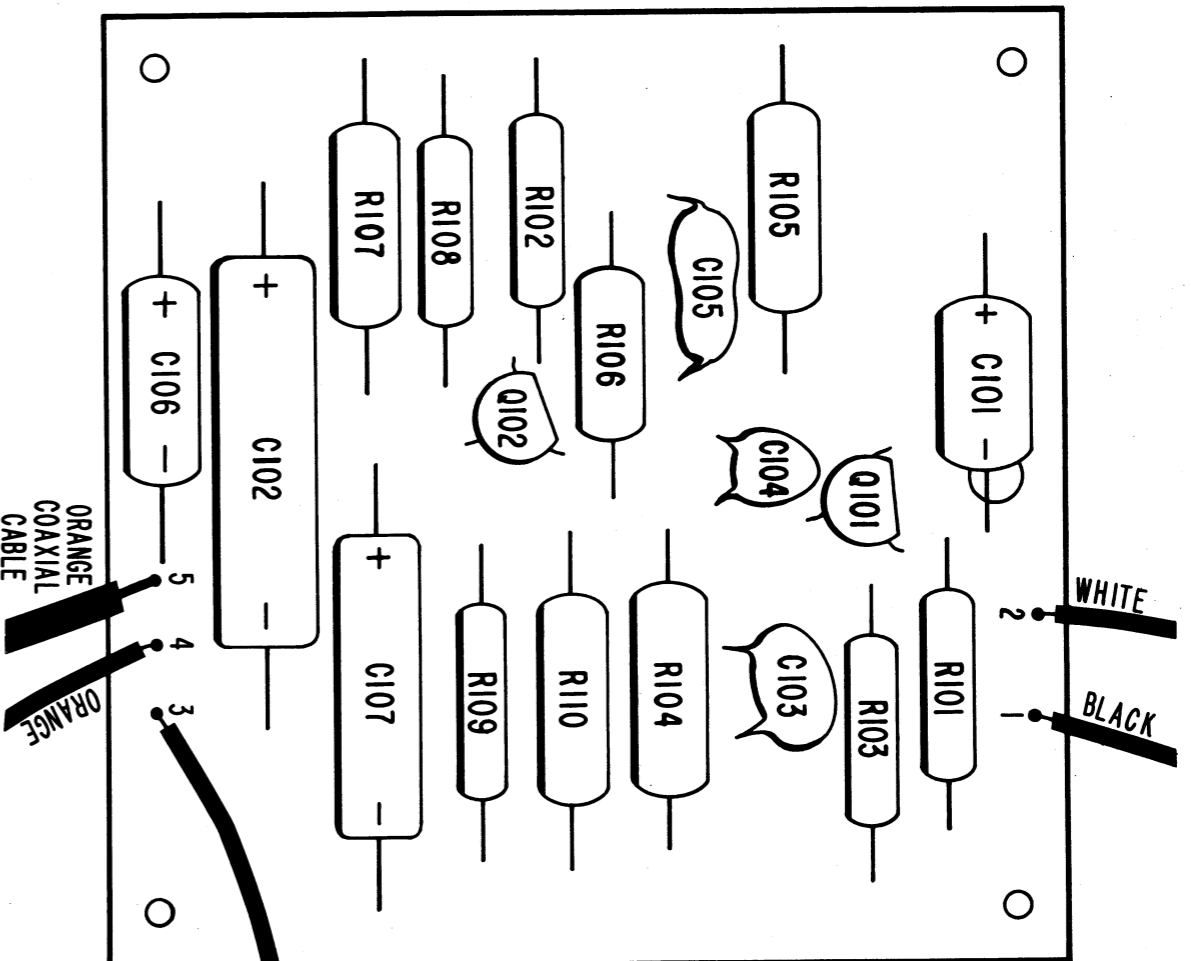
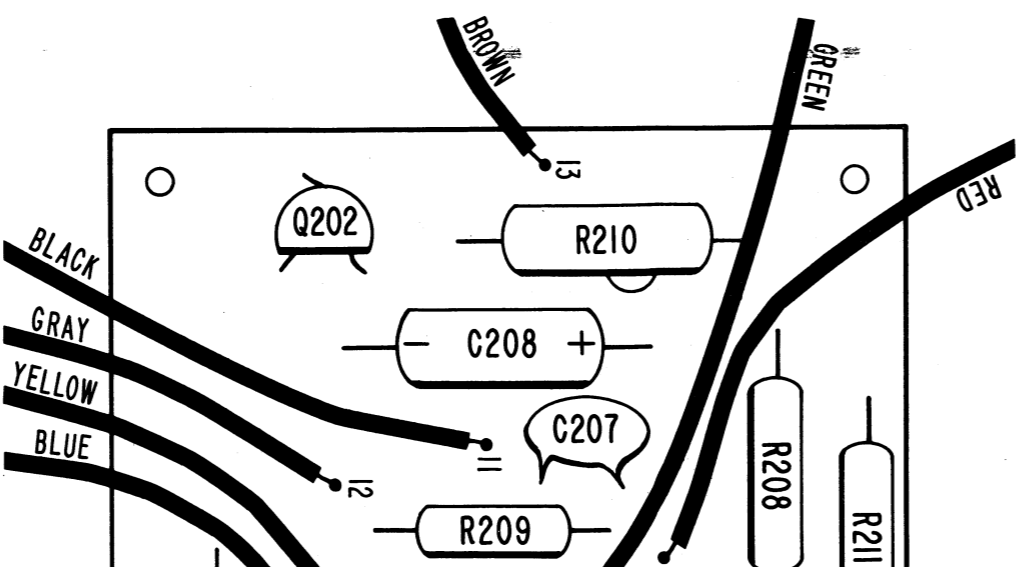
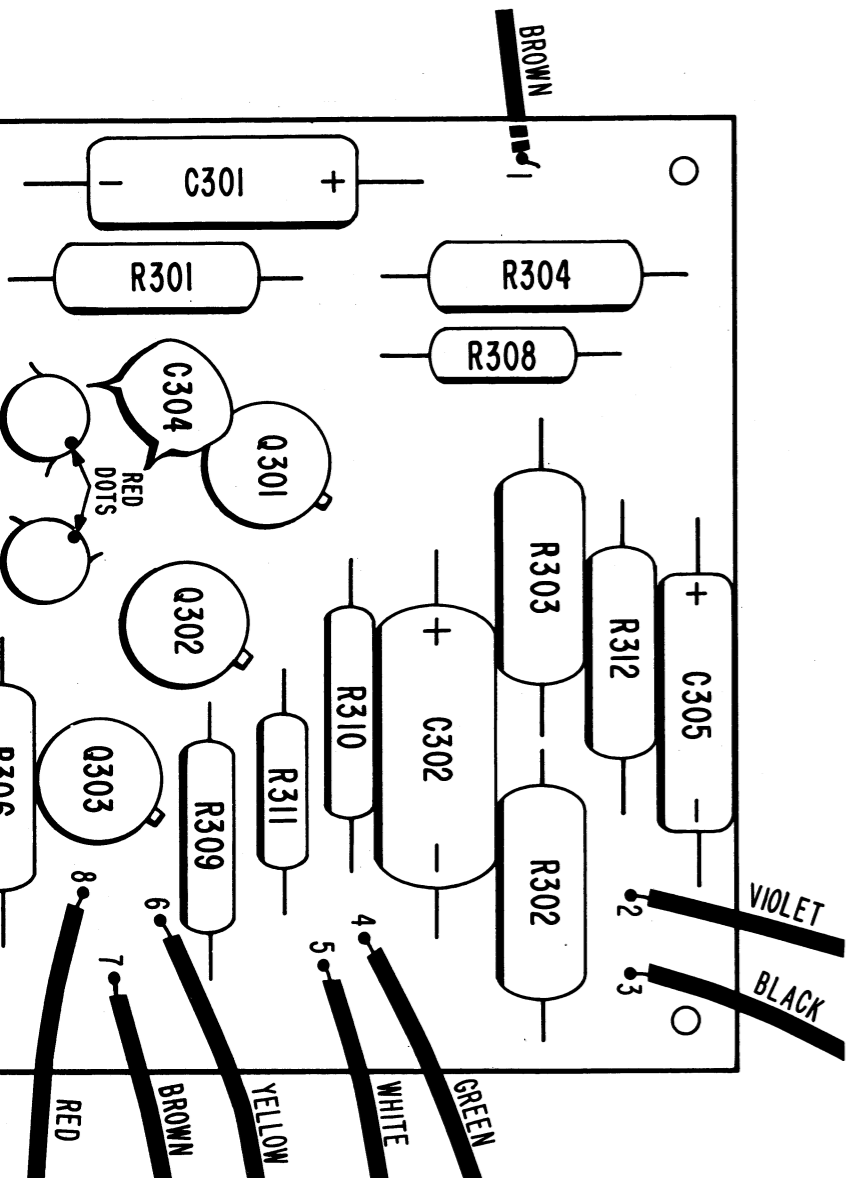
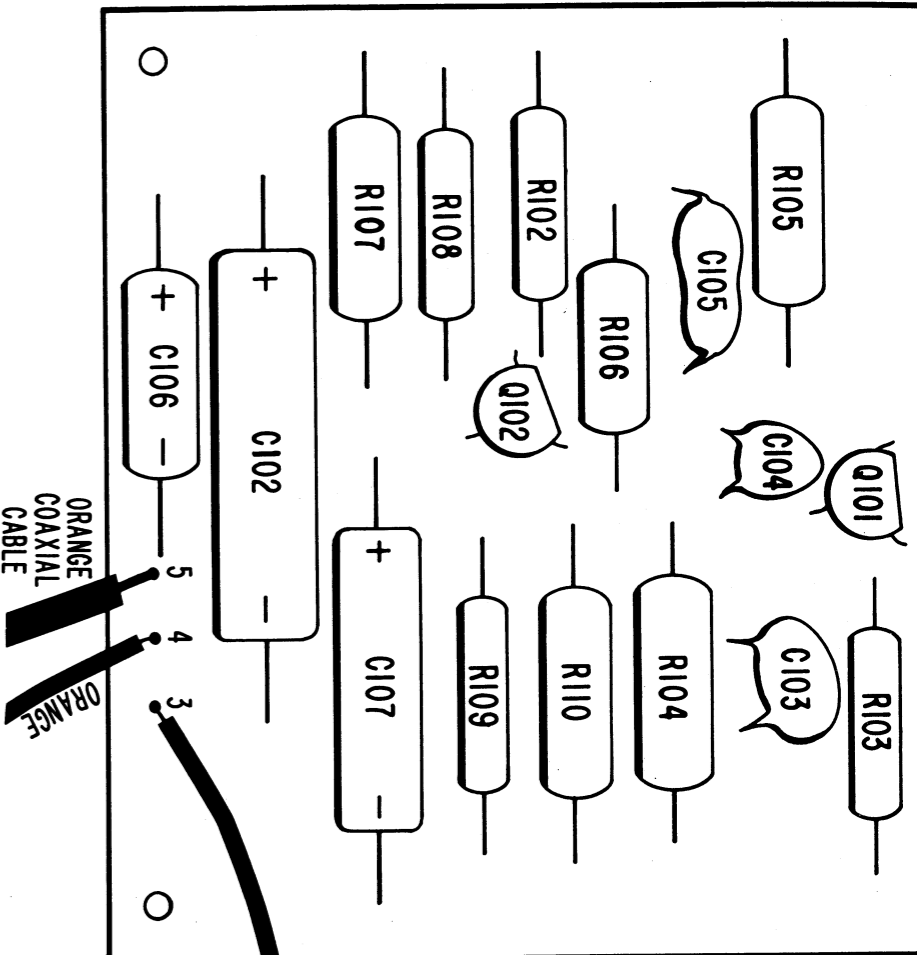


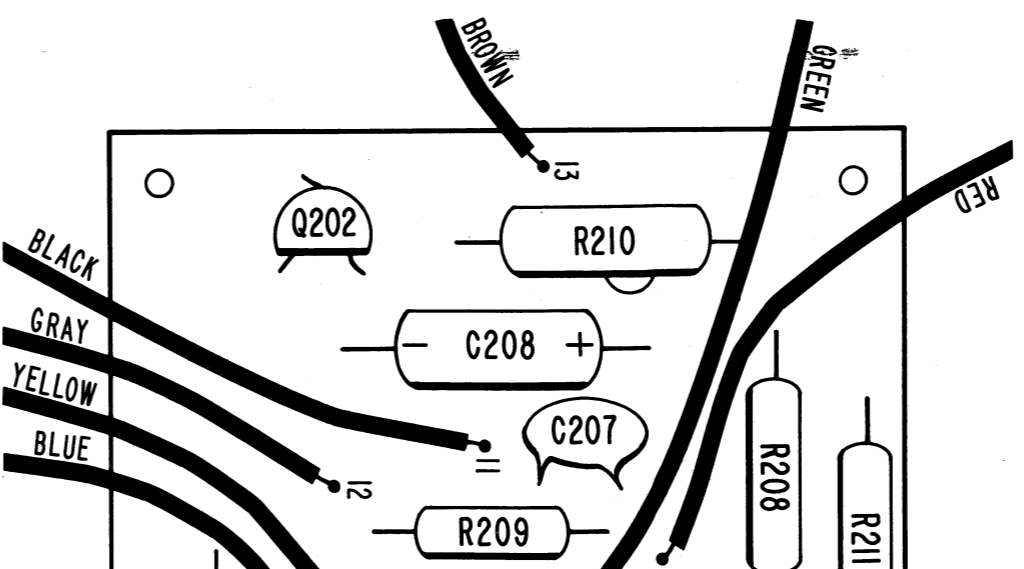
FIGURE 7





BARE WIRE FOR PCI,  
BLACK WIRE FOR PC2

FIGURE 7



F

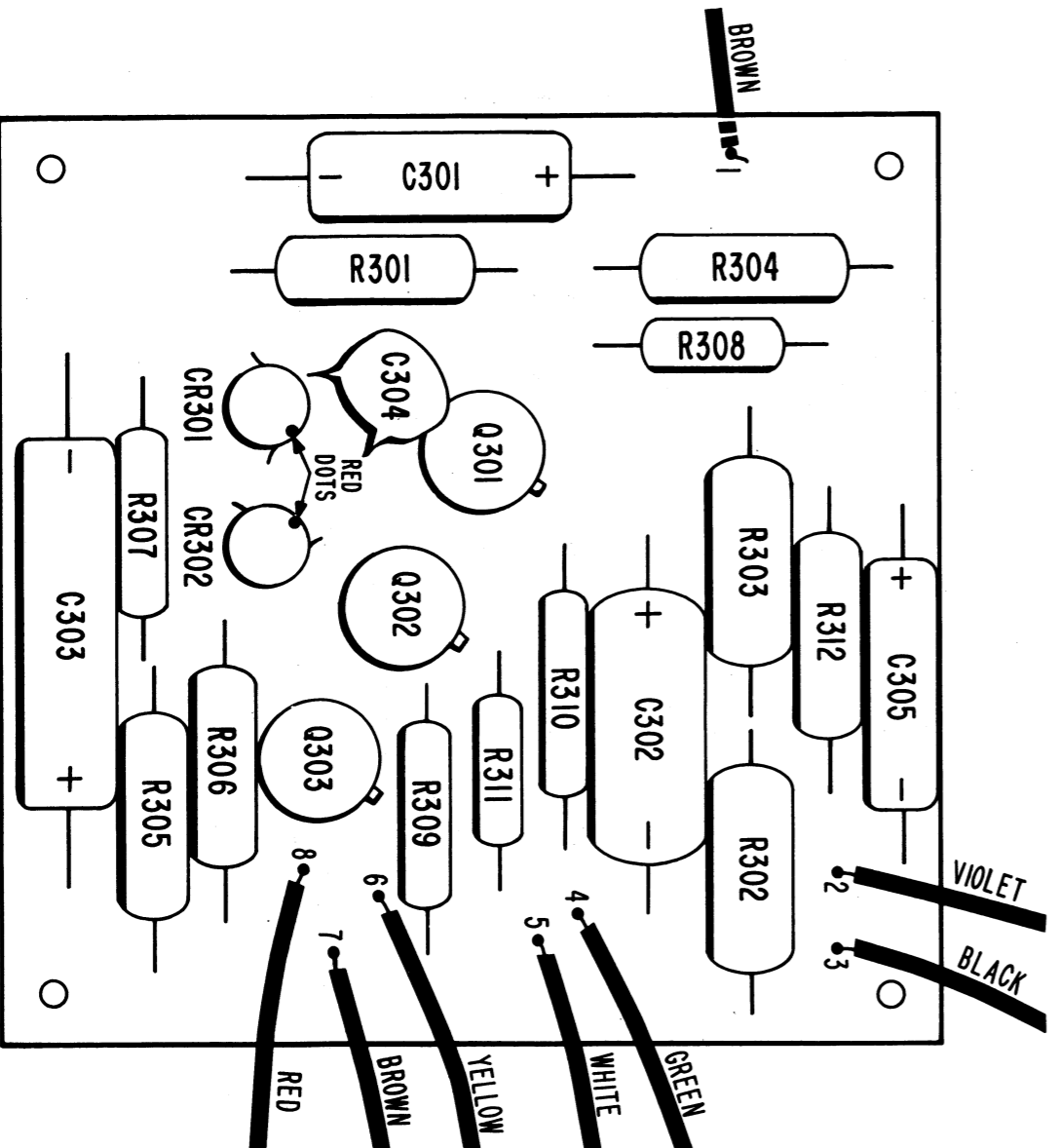
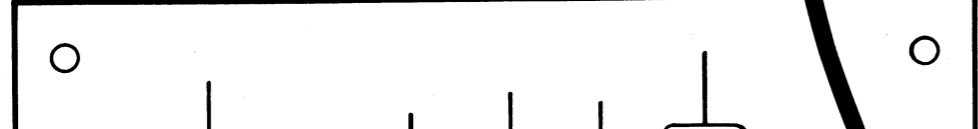
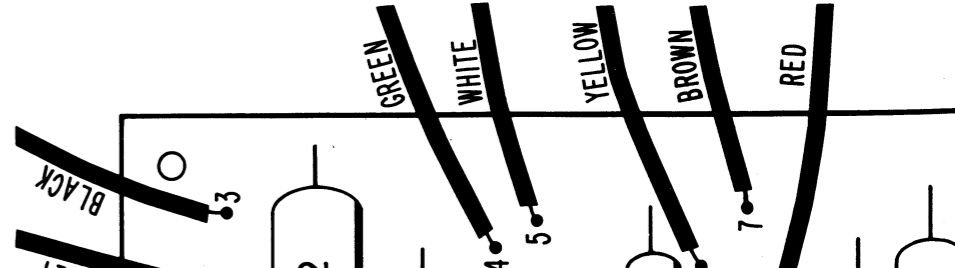
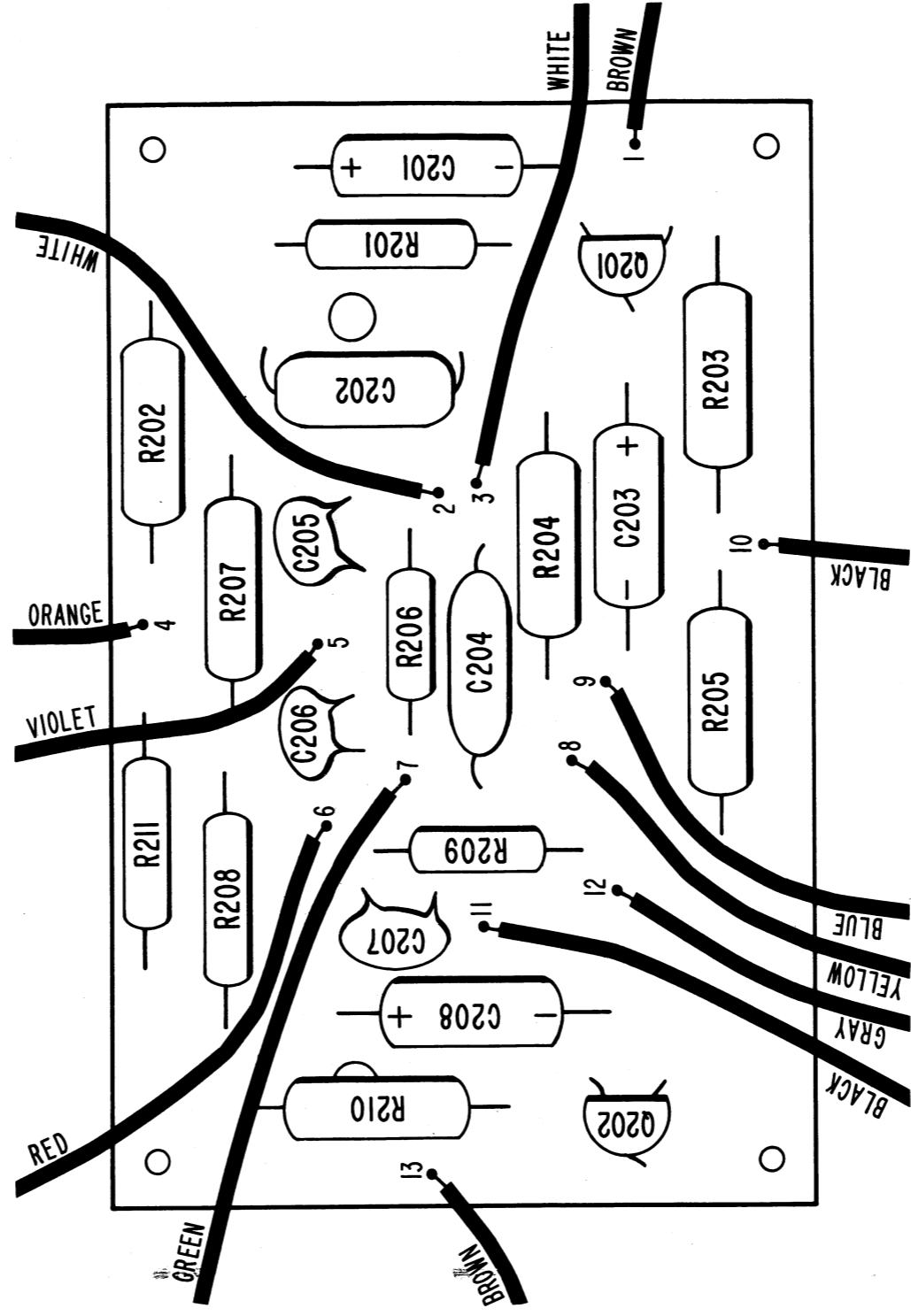


FIGURE 9

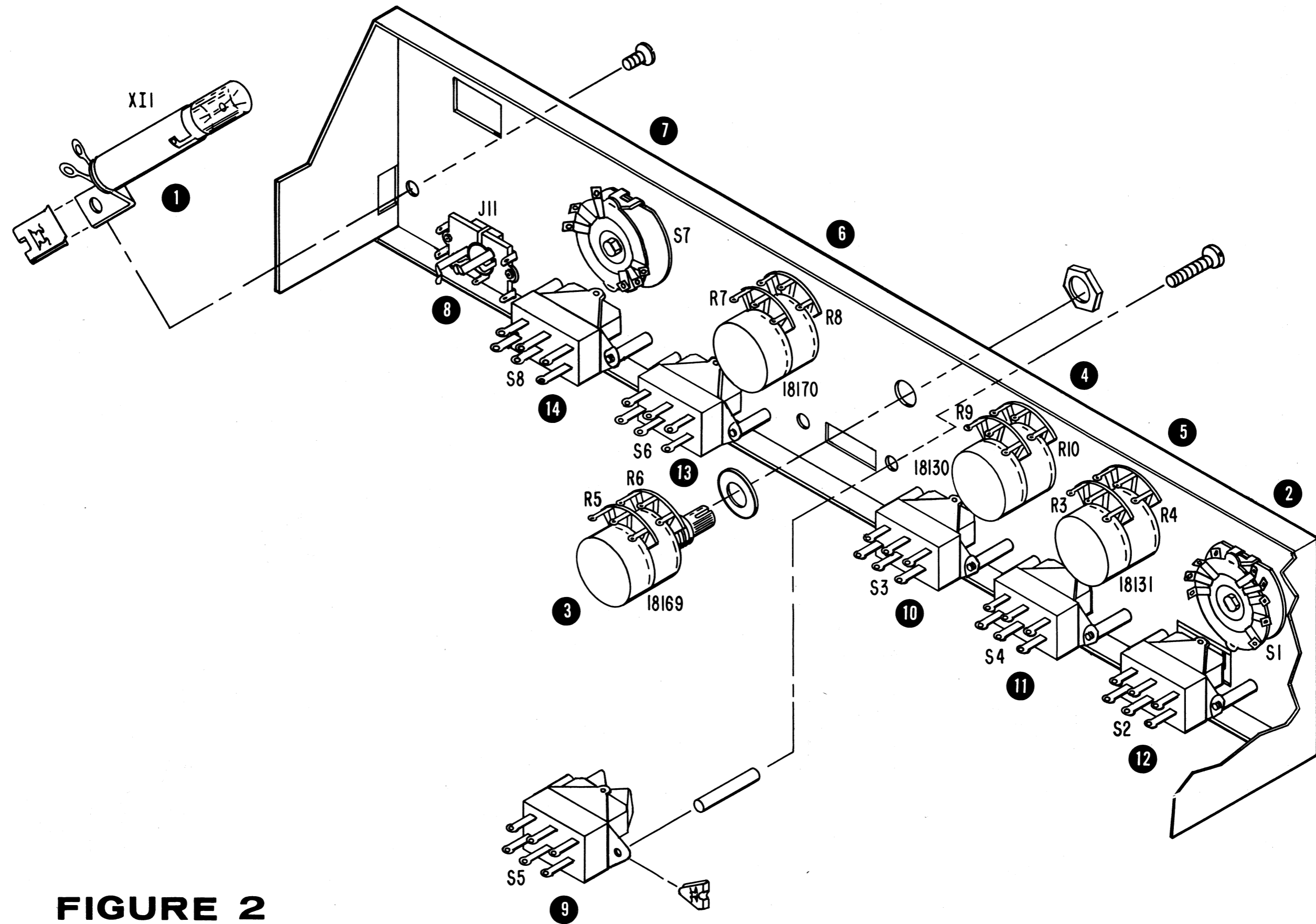


BARE WIRE FOR PCI,  
BLACK WIRE FOR PC2



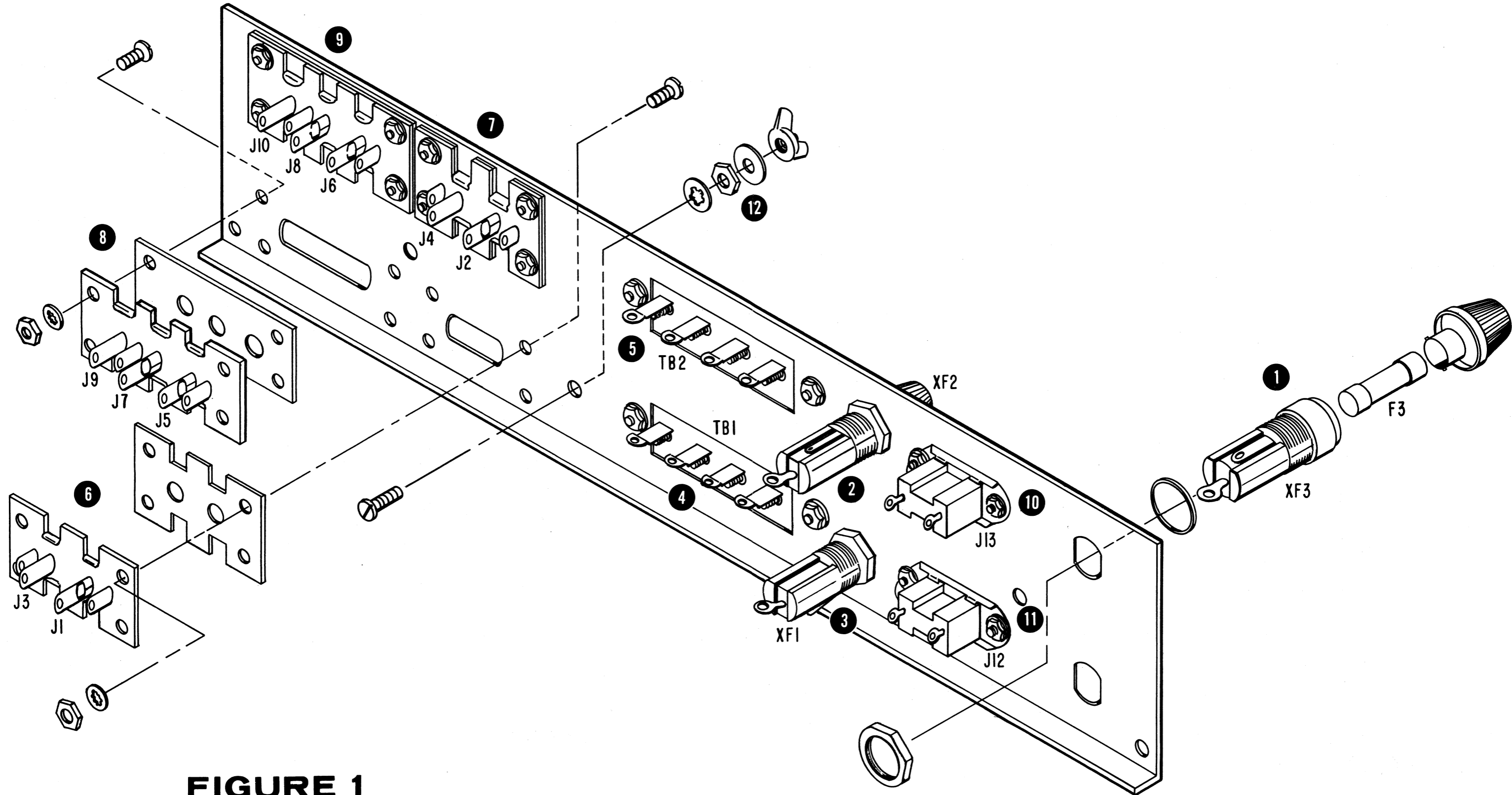
**FIGURE 8**



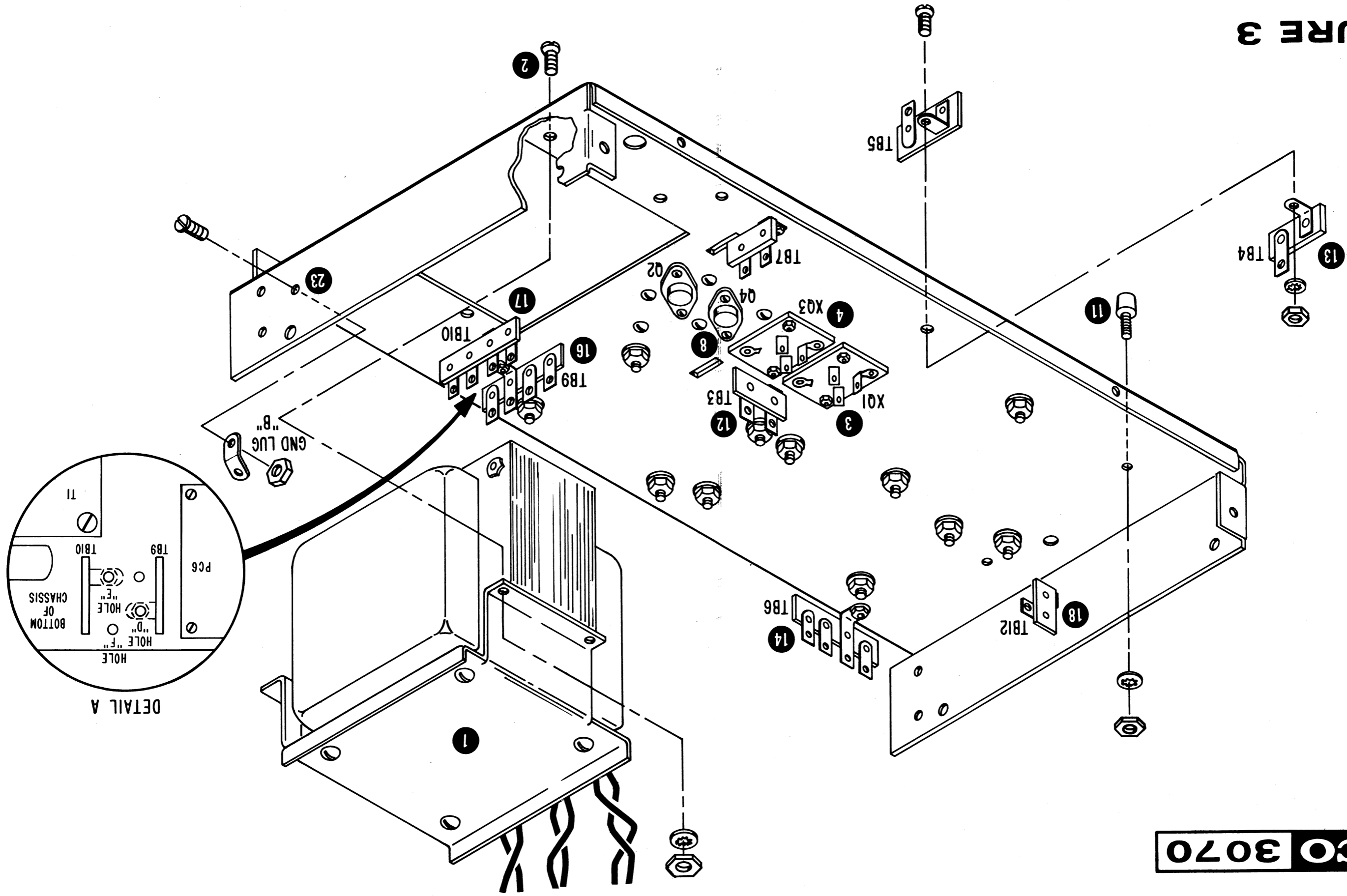


**FIGURE 2**

# EICO 3070

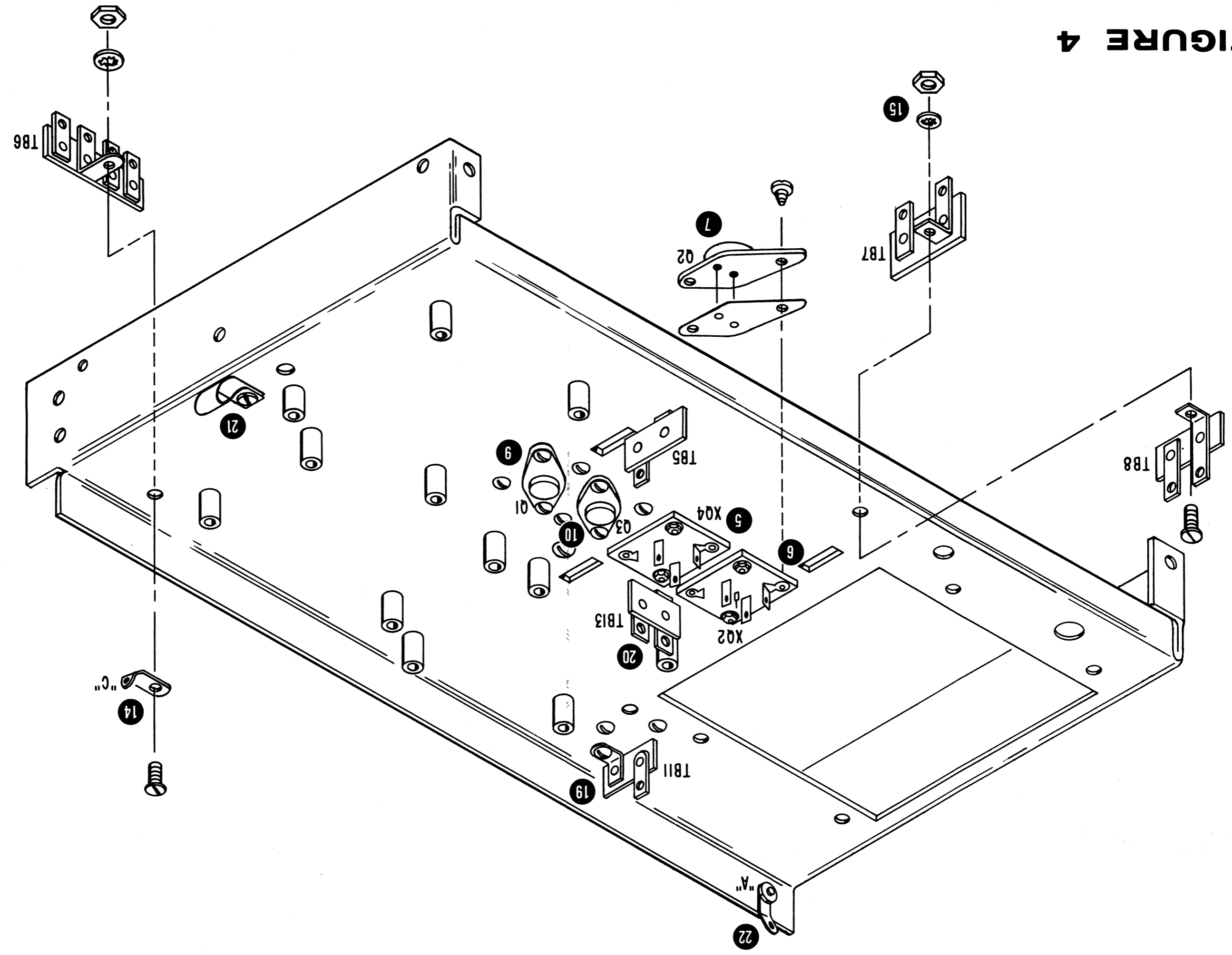


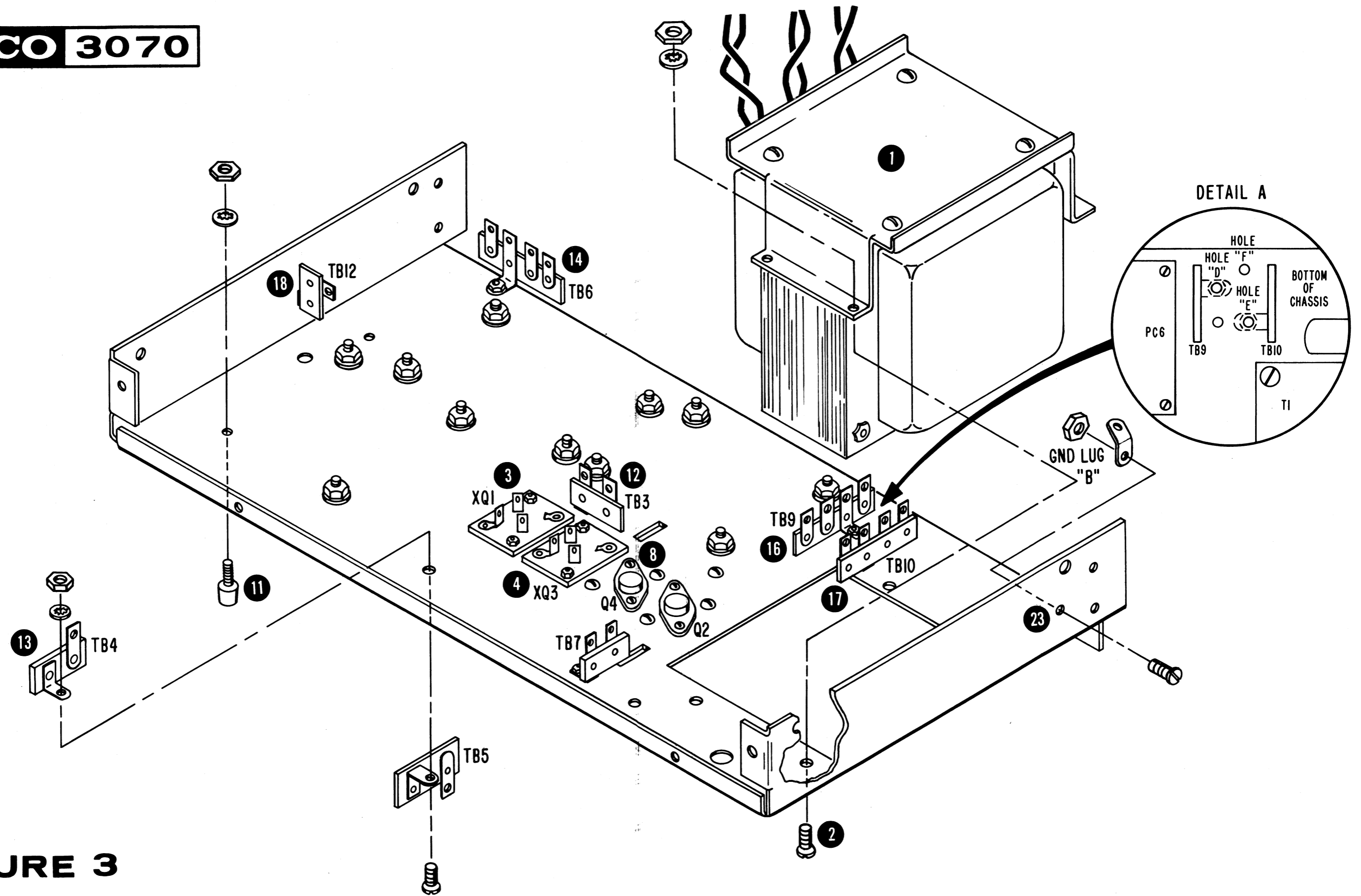
**FIGURE 1**



**FIGURE 3**

FIGURE 4





**FIGURE 3**

# EICO

## EICO—LEADER IN CREATIVE ELECTRONICS

For over 23 years, EICO has been designing and manufacturing electronic products and is now the world's largest producer of electronic kits and factory wired equipment marketed exclusively through dealers and distributors throughout the world.

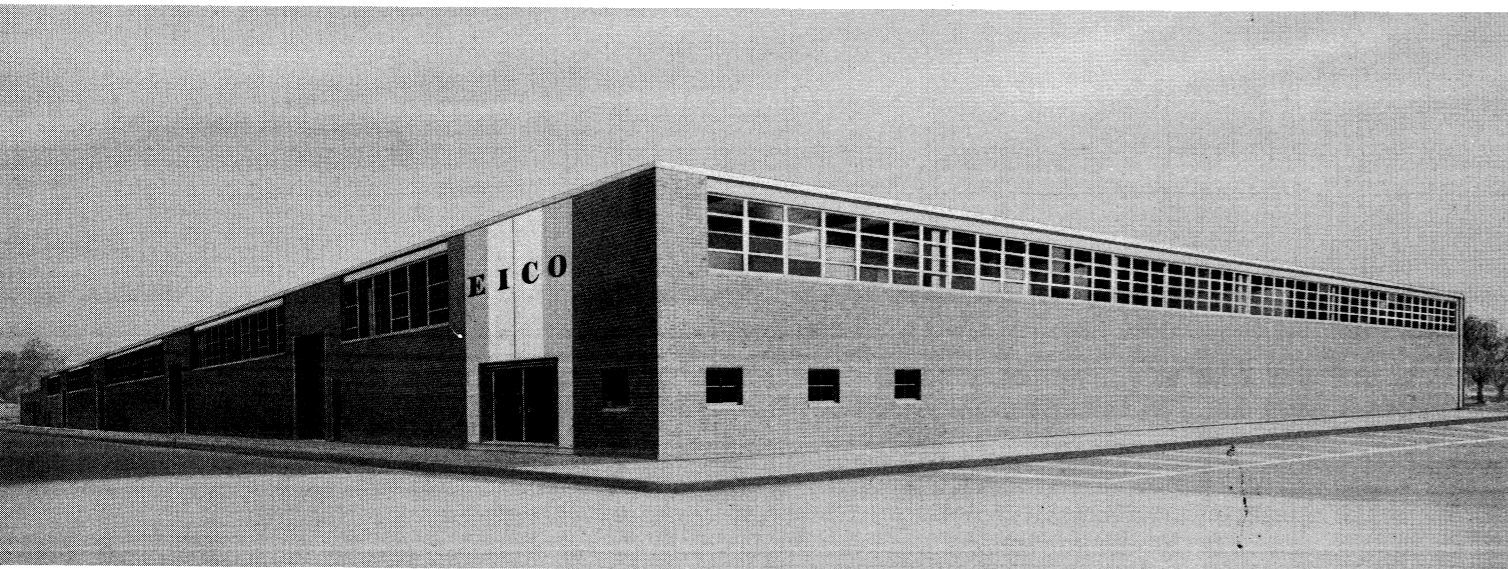
Whatever your electronics interest, there's a wide range of versatile, professional EICO products for you to choose from, and each designed to provide you with the most pleasure and quality performance for your money.

The fact that more than 3 million EICO products are in use throughout the world attests to their quality and performance. EICO kits are so popular because they represent the best value and are available for inspection and immediate over-the-counter delivery at more than 2500 EICO dealers and distributors.

Should you have any questions about the selection or applications of any EICO product, you may at any time consult by mail with our technical correspondence staff. There's no charge for this service.

For your added convenience — EICO has set up a network of 200 service stations to make available to you on a local neighborhood basis the same high-quality technical service competence and replacement parts you get from our factory, should you ever need them.

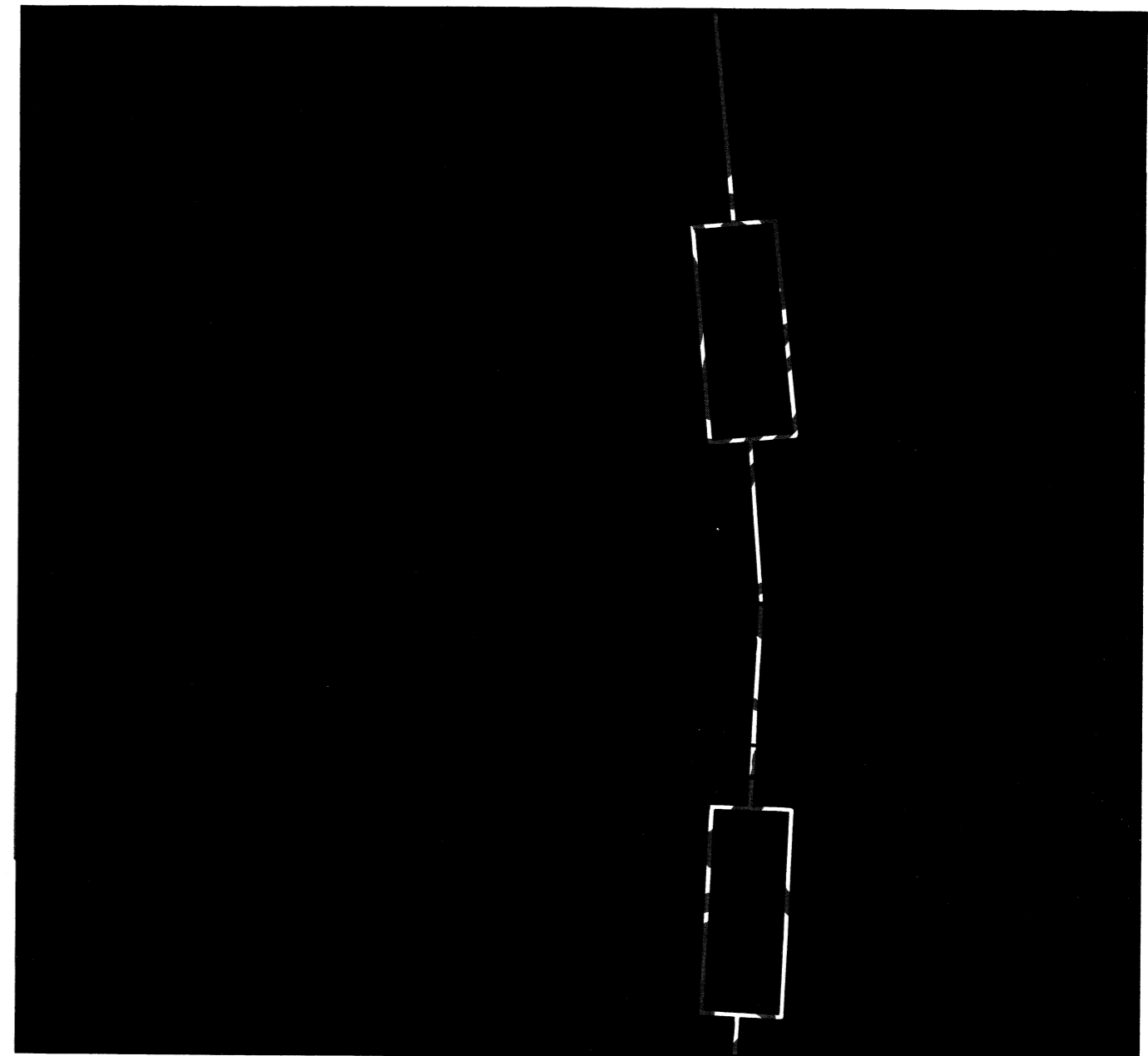
The EICO Catalog is available to you Free for the asking. The catalog describes Eico's complete line of 200 "Best Buys" in Electronics. Cortina® Stereo Components, EICOCRAFT® Solid State electronic projects, Citizens Band 2-Way Radios, Automotive electronics, Amateur Radio equipment, Visutronic® Educational Training Aids, TRUVOHM® professional Multimeters and the famous EICO line of Test Instruments for home, shop, factory, laboratory and school.



EICO Electronic Instrument Co., Inc., 283 Malta Street, Brooklyn, N. Y. 11207



## 3070/"Cortina" Solid State Stereo Amplifier



# ASSEMBLY MANUAL

Several basic tools are required to construct this kit. They are:

1. SCREWDRIVER - (1/16" x 1/4" wide blade)
2. SCREWDRIVER - (1/8" wide blade)
3. LONGNOSE PLIERS - (5" or 6" long)
4. GAS PLIERS
5. DIAGONAL WIRE CUTTERS
6. SMALL SOLDERING OR PENCIL IRON (35 watts or less)
7. LARGE SOLDERING IRON (100-150 watts)
8. HIGH QUALITY 60-40 ROSIN CORE RADIO SOLDER

### CAUTION

Do not under any circumstances use acid core solder or acid flux in constructing this instrument. Use only the best grade of rosin core solder. When in doubt about the solder you have, do not use it; instead buy a new roll which is plainly identified as "ROsin CORE RADIO SOLDER." All performance and service guarantees are voided by the use of acid flux. Furthermore, EICO will not service and we will return unrepai red any instrument in which acid core solder or acid flux is used.

A soldering gun is not recommended for use in assembling this kit. There is danger in overheating components and making cold solder connections, especially in the PRINTED CIRCUIT BOARDS. All connections can be properly made with conventional (35 watt and 100 watt) soldering irons.

### PARTS IDENTIFICATION

To enable rapid identification of electronic parts, each part has been assigned one or two letters of the alphabet called a "reference designation." These "reference designations" are nothing more than an initial letter or two representing the part. For example, a capacitor has been assigned the "reference designation" letter "C" and a resistor the letter "R."

#### CAPACITORS

Capacitors of all types are designated "C."

The unit of capacitance is the "farad." One millionth of a farad is a microfarad (abbreviated uf, ufd or MFD).

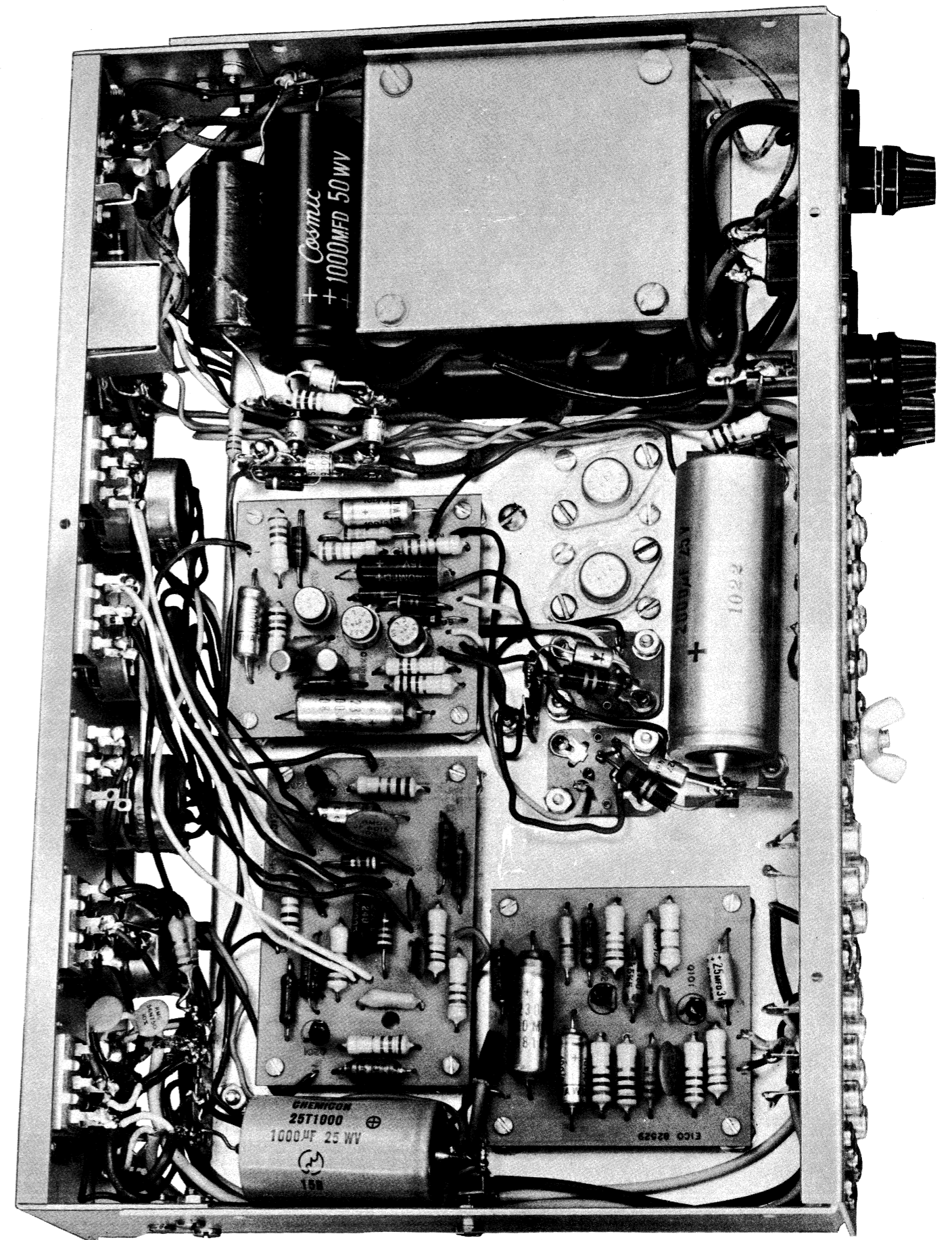
At the ends of some capacitors, such as electrolytics, the outer case is marked with a plus (+) or a minus (-). These are the only capacitors that must be mounted in a specific direction. Follow the direction for mounting, as described in the appropriate steps.

The peak or working voltages are important capacitor characteristics. A capacitor of the same capacitance value but marked with a higher voltage rating may be substituted for a lower voltage unit. Thus a 50 volt capacitor may be used in place of a 10 volt unit. The reverse is not true. You cannot use a 10 volt capacitor as a substitute for a 50 volt capacitor. Where more than one capacitor of identical value but different breakdown voltages are used, the unit you are to use is indicated in the appropriate construction step.

#### RESISTORS

Resistors are all designated "R."

The unit of resistance is the "OHM." The letter "K" indicates multiplication by 1000 and the letter "M" indicates multiplication by 1,000,000. Thus 1000 ohms = 1K or 1 kilohm. 1,000,000 ohms = 1M or 1 megohm.



UNDER CHASSIS VIEW

## THE ASSEMBLY MANUAL

The EICO kit you are about to assemble and wire has been designed to meet the highest standards of performance. It is a high quality instrument to be constructed from the finest components available anywhere.

The Assembly Manual has been written to carefully guide you through the construction of your kit. If you follow all the instructions implicitly, and work carefully without haste, you will be rewarded with many years of fine performance and a personal inner satisfaction from a job well done.

After you have completed the wiring and construction of the kit and have reviewed all of the steps for possible errors, you no longer need the ASSEMBLY MANUAL. DO NOT throw the manual away, however, for you may need it at some future time for reference.

The Operating Manual has been printed as a separate book. It contains vital information on adjustments, installation and operation, as well as maintenance information that may be necessary in the future.

### ADDENDA SHEETS

From time to time it may be necessary to correct your Operating and/or Assembly Manual. If there are any corrections to be made, they will be listed on loose addenda sheets included in the Manuals. If there are no addenda sheets, your manual is correct.

Enter corrections or additions, if any, before checking your components or constructing the kit.

### IMPORTANT

Should you, for any reason, need any information pertaining to the unit or the book, please use the page number in question and the manual revision number (noted on the front cover), if any, when corresponding with EICO.

### UNPACKING YOUR KIT

To ascertain if you have received all of the parts required to build this kit, you may check the parts against the PARTS LIST found in your Operating Manual.

When unpacking the kit, handle all the parts carefully so that you will not damage any delicate components. DO NOT throw any packing material away until you have completely checked all the components. In some cases, there may be a loose component contained within the packing. In any case, whether you check the components against the parts list or not, it is advisable that you keep the container and the packing material stored some place until you have fully completed the kit.

### CHOOSING A WORKBENCH AND TOOLS

To avoid accidental loss or misplacement of components, choose a convenient workbench before unpacking your new kit.

Choose a work location, if possible, that will not be used for any other purpose until after you have completed the construction of your kit.

Proper precautions should be taken to prevent damage to any table top from a soldering iron or heavy tools.



## JACKS/RECEPTACLES

Jacks or receptacles are designated "J," whether they are phone jacks (headphones), phono jacks (phono inputs, tape inputs and outputs, etc.), or a convenience receptacle (for providing 120 VAC power to auxiliary equipment). The different types of jacks and receptacles used are illustrated in the construction figures. In the case of phono jacks, two or three jacks are mounted on one bakelite strip and are so referred to when this is appropriate.

## TERMINAL BOARDS

Terminal boards are designated "TB," whether they are lug terminal strips or screw terminal strips for speaker connection. The lug terminal strips included in this kit are further identified by number of insulated posts, with indication of position. For example, the notation "3 post 2 left w/gnd" indicates that the terminal strip has 3 insulated posts, 2 to the left and 1 to the right of the mounting lug. The suffix "w/gnd" indicates that the mounting lug also serves as a ground post.

## PRINTED CIRCUITS/CIRCUIT BOARDS

Printed circuit boards, such as the driver, preamplifier or phono board are all designated "PC."

## TRANSFORMERS

Transformers are designated "T."

## TRANSISTORS & TRANSISTOR SOCKETS

Transistors are all designated "Q." Transistor sockets are all designated "XQ."

NOTE: The transistor types used in this kit are identified in the parts list by manufacturer and type no. (such as RCA 40317). Should it ever become necessary to replace a transistor, one can easily be purchased locally.

## FUSES & FUSEHOLDERS

Fuses are designated "F." Fuseholders are designated "XF."

## INDICATOR LAMPS & INDICATOR LAMP HOLDERS

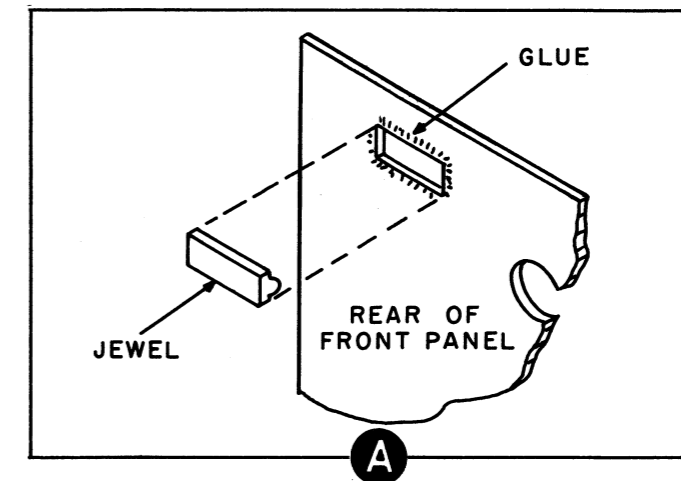
Indicator lamps are designated "I." Indicator lamp holders are designated "XI."

NOTE: Please review and check all the preceding steps before continuing with the next figure.

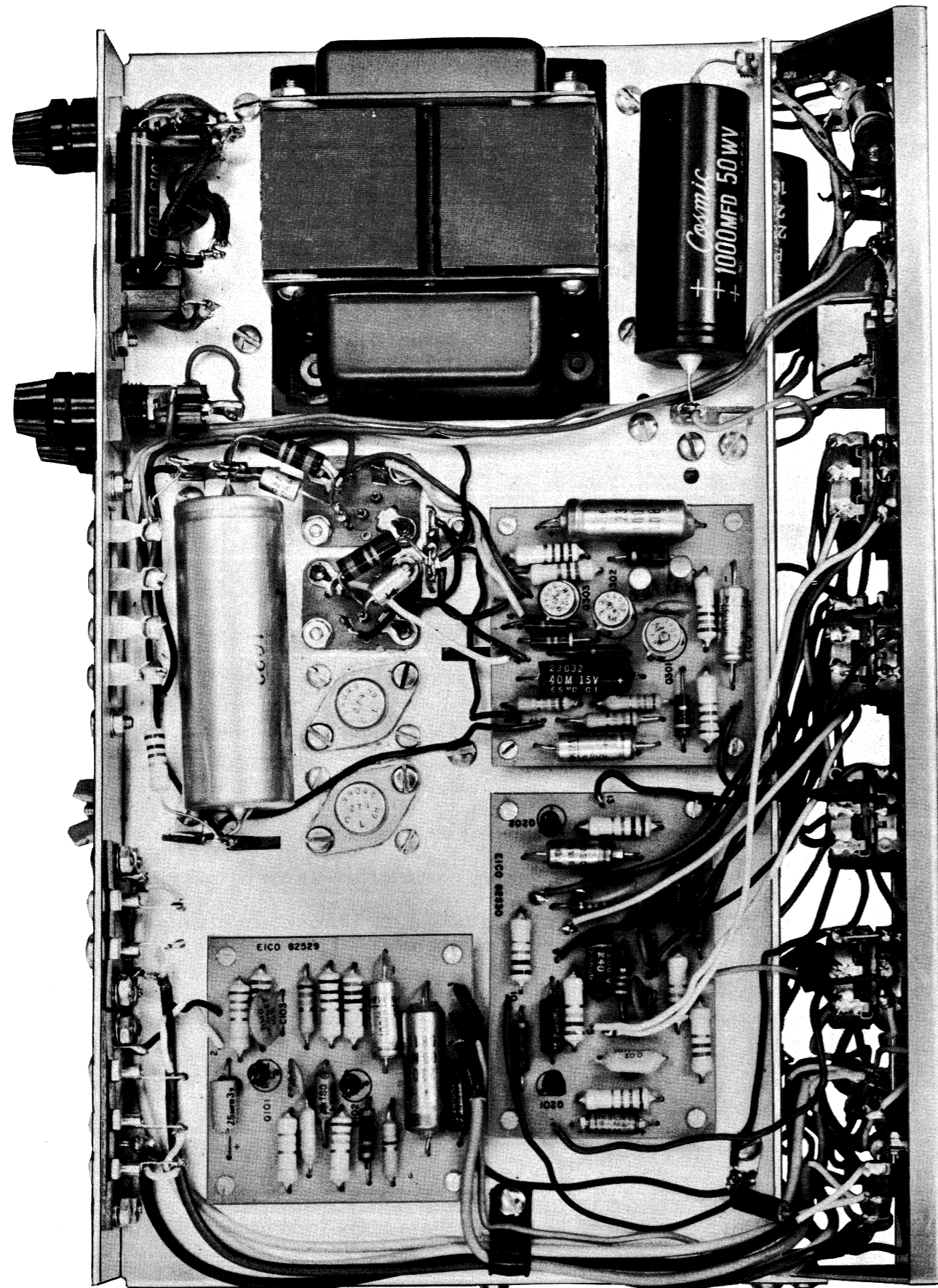
FIGURE 12

1. ( ) Spread a small amount of (89627) glue behind the edges of the lamp cut-out on the rear of (80189) front panel, as shown in detail "A". Insert narrow face of (97729) red glass jewel into lamp cut-out.

CAUTION: Allow sufficient time for glue to harden before proceeding with step 2.



2. ( ) Remove the hex nuts holding S1 and S7 on the subpanel.  
( ) Mount the front panel on the subpanel, securing it with the hex nuts removed in step 2.  
CAUTION: Make certain that the switches have their locating tabs in their respective locating holes before tightening hex nuts.  
( ) Turn controls and switches to their fully counterclockwise positions. Install the six (53105) knobs on the shafts, matching each pointer to the first panel marking at that location.
3. ( ) Install four (46022) PLASTIC FEET to the (81483) BOTTOM PLATE, securing them with four (41002) No. 6 x 3/8" SHEET METAL screws. Hold each foot with a pliers gripping the top edge while tightening screws.
4. ( ) Attach bottom plate to chassis with seven (41035) No. 6 x 1/4" SHEET METAL screws.
5. ( ) Secure (88142) METAL CABINET to bottom plate with four (41035) No. 6 x 1/4" SHEET METAL screws. Be sure to push the cabinet close to the front panel before tightening screws.



TOP CHASSIS VIEW

On some resistors, the resistance value is stamped on the surface of the resistor body. However, other fixed resistors are coded with color bands which indicate their value. The actual color code of these resistors is noted in the parts list. In some instances, even when the color code is noted in the book, the actual resistor value, rather than the color code, may be stamped on the body. A color code for resistors is given below.

**RESISTOR COLOR CODE IDENTIFICATION CHART**

A = First digit	C = Multiplier (number of zeros to follow B)	Black = 0	Blue = 6
B = Second digit	D = Tolerance	Brown = 1	Violet = 7
		Red = 2	Gray = 8
		Orange = 3	White = 9
		Yellow = 4	Gold = 5%
		Green = 5	Silver = 10%

Examples: A = Blue B = Gray C = Red and D = Silver. Answer = 6800Ω ±10% tolerance  
 A = Orange B = Yellow C = Black D = Gold. = 34Ω ±5% tolerance

The tolerance of a resistor is the amount the resistance can vary around its marked value. Thus, if a 1K (1000 ohms) resistor has a ±10% tolerance, its actual value can be between 900 and 1100 . If the same resistor has a ±5% tolerance, its actual value can be between 950 and 1050 . In all cases, the tolerance is always stated or given as part of the color code when the resistor is listed. If the resistor is marked with a number rather than a color code, the tolerance is stamped on the body. In your kit, 5% resistors may be substituted for 10% components and 10% resistors substituted for the 20% ones. However, be certain that you do not use a 10% resistor when a 5% resistor is required or a 20% resistor when a 10% or 5% resistor is specified.

Resistors are capable of dissipating power. Large resistors handle more power while smaller ones handle less. A 1/4 watt resistor is usually smaller than a 1/2 watt unit, while a 1/2 watt resistor is usually smaller than a 1 watt unit. If like valued resistors are used in the kit, differing in power rating, the proper resistor to use is designated in the particular construction step.

Besides the fixed resistors discussed, there are also variable resistors known as potentiometers. They may be equipped with shafts on which a control knob may be mounted. In many instances, ganged potentiometers are used. In a ganged arrangement, two potentiometers are placed one behind the other on a single control shaft. Such potentiometers are referred to by a dual designation such as R102/103.

### SWITCHES

Switches are designated "S," whether rotary or slide type.

Both rotary switches in this instrument have a single wafer. The front of the wafer (looking from the knob end) is designated "A" on the schematic diagram, while the rear of the wafer is designated "B." To simplify construction, the "A" and "B" designations are not used in this manual. Rotary switches are viewed from the rear and the lugs are numbered in a counter-clockwise manner. It is important to note that when two lugs appear, one on each side of the wafer, they are mechanically inter-connected. In this case, BOTH lugs are wired to simultaneously with a single wire. Applicable steps in this manual will include specific instructions to wire to both lugs.

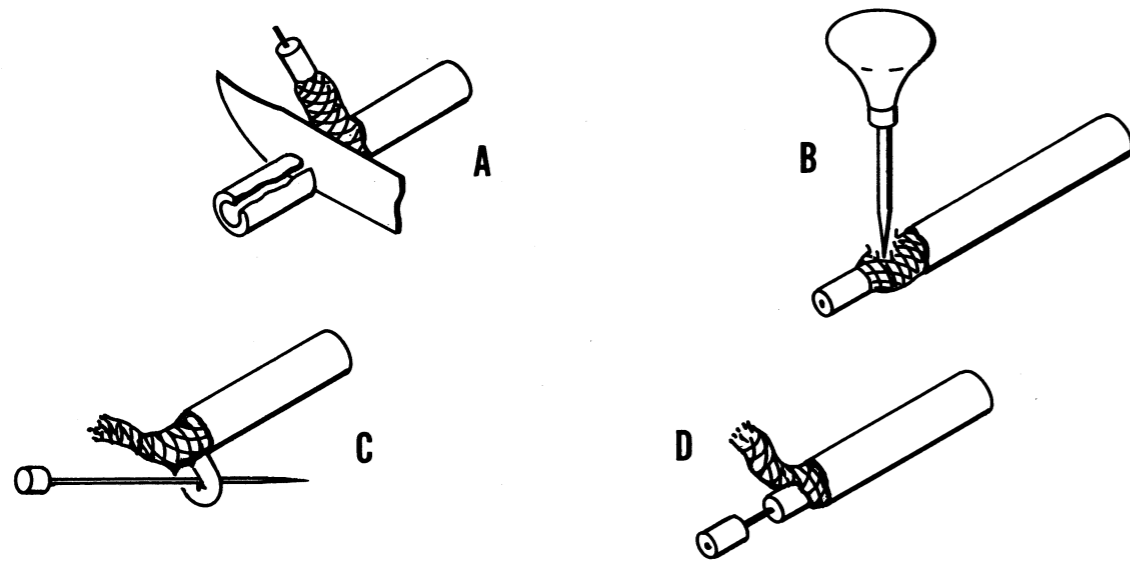
Washers and nuts are sized in accordance with the diameter of the screws they are used with.

Various types of washers are supplied. A lockwasher may have internal or external teeth. A flatwasher is made out of flat metal or plastic.

Sheet metal screws are used where it is not desirable to hold the screws to the chassis by a nut. The screw actually taps the threads in the metal into which it is screwed. The sizes are designated by numbers similar to those used for machine screws, with the smaller number indicating a smaller diameter screw.

#### PREPARATION OF RG-174U CABLE

RG-174U low-capacity cable (of various colors) is used exclusively in this kit, wherever a shielded cable is required. Ordinary audio cable may not be substituted for the RG-174U because the much higher capacitance per foot of ordinary cable will seriously degrade performance. The stripping and preparation of this cable is shown in the figure below. It is essential that care be taken in the preparation and connection of this cable, or faulty connections will result. These rules must be followed:



- a. DO NOT attempt to tin the braided shield.
- b. DO NOT solder the shield until the connection is made and you are so instructed. A heat sink of some type (alligator clip, etc.) must be used to prevent heat from travelling to the insulation of the inner conductor and melting it.

Most of the other component parts used with the kit are self-evident and require little further explanation or description.

9. ( ) Cut a 12" piece of WHITE COAXIAL cable. Strip off 1" of outer insulation from one end and 3/4" from the other end, exposing the braid. DO NOT CUT the braid. Using a sharp pointed tool, carefully make an opening in the braid and pull inner conductor out of the braid at each end. Twist each braid to prevent it from fraying, then remove 1/4" of insulation from the conductors. Connect the longer inner conductor to S1-9(S2) and its braid to TB6-1(C) on the bottom of the chassis. Pull the other end of the cable through the cable clamp, then connect the inner conductor to J2(S1) and its braid to the J2 ground lug (S1). Be sure that braid does not touch other ground or hot lead.
10. ( ) Cut an 11" piece of RED COAXIAL cable and prepare ends as described in step 9. Connect the longer inner conductor to S2-4(S1) and its braid to TB6-1(S4). Pull the other end of the cable through the cable clamp and connect conductor to J4(S1) and its braid to J4 ground lug (S1).
11. ( ) Cut a 9" piece of YELLOW COAXIAL cable and prepare ends as described in step 9. Connect the longer inner conductor to BOTH LUGS of S1-11(S1) and its braid to ground lug "C"(C). Pull the other end of the cable through the cable clamp and connect inner conductor to J8(S1) and its braid to the J8-J10 ground lug (C).
12. ( ) Cut an 8" piece of BROWN COAXIAL cable and prepare ends as described in step 9. Connect the longer inner conductor to BOTH LUGS of S1-12(S1) and its braid to ground lug "C"(C). Pull the other end of the cable through the cable clamp and connect inner conductor to J10(S1) and its braid to the J8-J10 ground lug (S2).
13. ( ) Cut an 11" piece of VIOLET wire. Connect from TB5-1(C) to S7-8(S2).
14. ( ) Cut a 9" piece of YELLOW wire. Connect from TB2-2(S1) to S7-9(S1).
15. ( ) Cut a 3" piece of BLACK wire. Connect from TB8-1(C) to TB2-4(S2).
16. ( ) Cut a 1-1/4" piece of BARE wire. Connect from TB8-1(S2) to TB2-1(S1).
17. ( ) Cut a 9-1/2" piece of GRAY wire. Connect from S7-7(S1) to TB2-3(S1).
18. ( ) Cut a 2-1/2" piece of BLACK wire. Connect from emitter terminal of XQ4(S1) to TB13-2(C).
19. ( ) Cut a 3-1/4" piece of RED wire. Connect from XF2-2(S1) to the collector of XQ2(C).
20. ( ) Cut a 3-1/2" piece of BLACK wire. Connect from R3-1(S2) to ground lug "C"(C).
21. ( ) Cut a 4" piece of BLUE with BLACK tracer cotton-covered wire. Connect from J13-2(S1) to XF3-1(S2).
22. ( ) Cut a 3" piece of BROWN wire. Connect from TB8-2(S4) to TB13-1(C).
23. ( ) Mount (82529) PRINTED CIRCUIT BOARD, PC1, using four (41095) No. 2-56 x 1/4" BINDING HEAD screws. Mount the board so that the BLACK and WHITE wires face the rear panel.
24. ( ) Run ORANGE shielded lead (from terminal 5 of PC1) through cable clamp to BOTH LUGS of S1-10(S1) and its braid to TB6-2(S4).
25. ( ) Run ORANGE wire from terminal 4 of PC1 through hole in chassis, as shown, then connect to TB12-1(C) at the bottom of the chassis (C).

26. ( ) Cut an 8-1/2" piece of BLACK wire. Connect from J6 ground lug (C) through cable clamp to ground lug "C"(C).
27. ( ) Twist together BLACK and WHITE leads from terminals 1 and 2, respectively, of PC1 then connect WHITE lead to J6(S1).
28. ( ) Connect BLACK lead in twisted pair to J6 ground lug (S2).
29. ( ) Mount (82530) PRINTED CIRCUIT BOARD, PC3, using four (41095) No. 2-56 x 1/4" BINDING HEAD screws. Mount board with BLACK wire at terminal 10 near PC1, as shown.
30. ( ) Connect BLACK wire from terminal 10 of PC3 to ground lug "C"(S5).
31. ( ) Connect BROWN wire from terminal 1 of PC3 of R4-2(S1).
32. ( ) Connect ORANGE wire from terminal 4 of PC3 through hole in chassis, as shown, to TB12-1(S6) at bottom of chassis. (See figure 10.)
33. ( ) Connect WHITE wire from terminal 3 of PC3 to S5-6(S1).
34. ( ) Connect VIOLET wire from terminal 5 of PC3 to R6-2(S1).
35. ( ) Connect BLUE wire from terminal 9 of PC3 to S5-5(S1).
36. ( ) Connect RED wire from terminal 6 of PC3 to R6-1(S1).
37. ( ) Connect GREEN wire from terminal 7 of PC3 to R6-3(S1).
38. ( ) Connect BROWN wire from terminal 13 of PC3 to R10-1(S1).
39. ( ) Connect YELLOW wire from terminal 8 of PC3 to S6-4(S1).
40. ( ) Connect WHITE wire from terminal 2 of PC3 to R8-3(S1).
41. ( ) Connect BLACK wire from terminal 11 of PC3 to R8-2(S1).
42. ( ) Connect GRAY wire from terminal 12 of PC3 to R8-1(S1).
43. ( ) Mount (82531) PRINTED CIRCUIT BOARD PC5, using four (41095) No. 2-56 x 1/4" BINDING HEAD screws. Mount the board with terminals 2 through 8 facing XQ2 and XQ4.
44. ( ) Connect BROWN wire from terminal 1 of PC5 to R10-2(S1).
45. ( ) Connect BLACK wire from terminal 3 of PC5 to TB13-2(S2).
46. ( ) Connect BROWN wire from terminal 7 of PC5 to TB13-1(S4).
47. ( ) Connect WHITE wire from terminal 5 of PC5 to collector terminal of XQ4(S3).
48. ( ) Connect YELLOW wire from terminal 6 of PC5 to base terminal of XQ2(S1).
49. ( ) Connect RED wire from terminal 8 of PC5 to collector terminal of XQ2(S2).
50. ( ) Connect GREEN wire from terminal 4 of PC5 to base terminal of XQ4(S1).
51. ( ) Connect VIOLET wire from terminal 2 of PC5 to TB5-1(S4).

## DIODES & RECTIFIERS

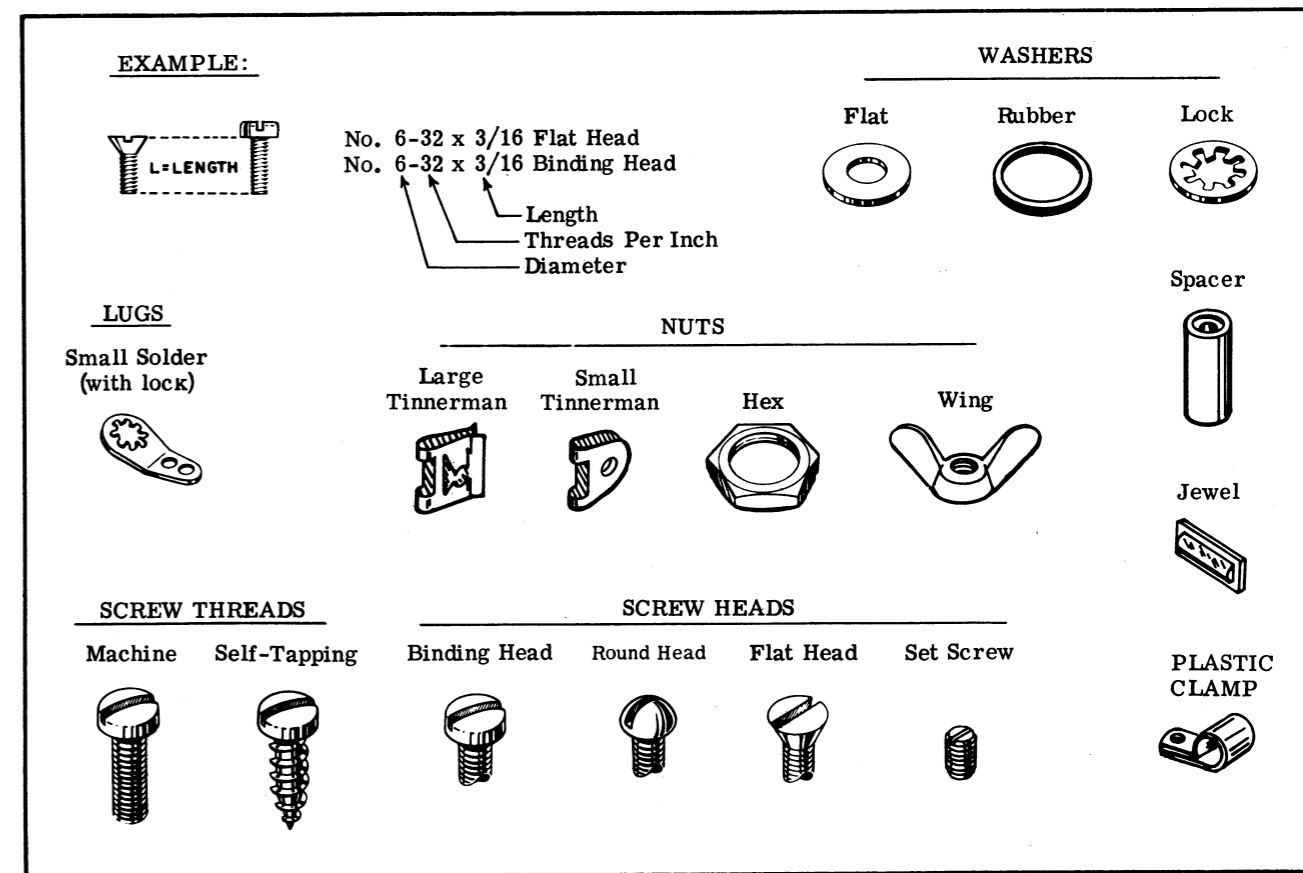
Diodes and rectifiers are designated "CR". These components must be wired in a specific direction. In each case, the cathode side will be clearly indicated in the wiring figure and in the steps. Wherever special techniques are required in soldering of diodes to prevent damage by excessive heat, such information will be given in the steps.

## HARDWARE

Hardware is a general term for mechanical parts used in the assembly of EICO kits. Such items are usually screws, nuts and washers. Machine screws are sized in accordance with the diameters of the threaded portion (No. 2, No. 3, No. 4, No. 6, No. 8, No. 10), with the smaller number denoting the smaller diameter. The second number indicates the number of threads to an inch.

Thus, a No. 6-32 screw has a No. 6 diameter with 32 threads per inch. The final number indicates the length of the threaded portion. A No. 6-32 x 3/8 screw has a 3/8" long threaded portion.

The figure below shows the various screw head types supplied with the kit. Use the type specified in the particular step.



- ( ) 7. Remove the solder after a reasonable amount has been applied to the connection.
- ( ) 8. Keep the iron on the connection until all of the solder has flowed thoroughly over the connection, then remove the iron.  
Use only enough solder to cover the wire at the connecting points.

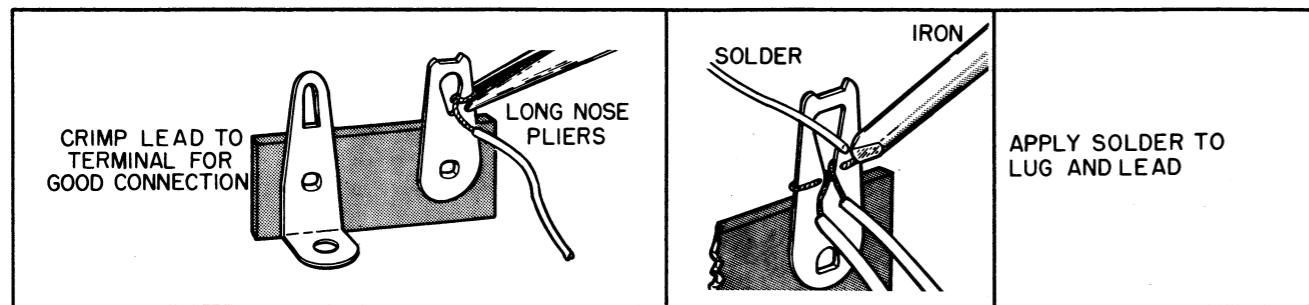


FIGURE A

FIGURE B

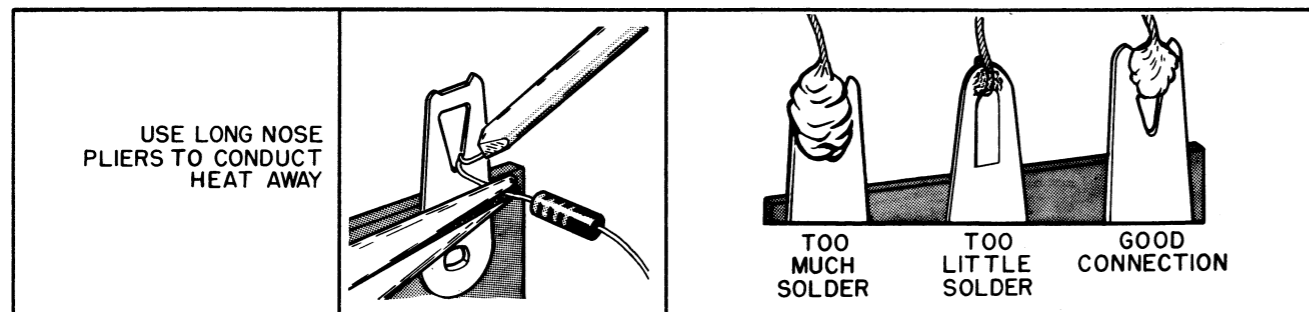


FIGURE C

FIGURE D

The following refers to Figure "C."

- ( ) 9. In some cases, where diodes, light components, or RG-174U cable are soldered, it may be necessary to provide a heat conductor to carry away the excess heat that may damage the component or cable insulation.

In these instances it is best to place an alligator clip, paper clip, pliers, etc., on the lead between the CONNECTION and the BODY of the component to be soldered.

The following refers to Figure "D."

A poor solder connection is obvious by its appearance. A grainy or pitted joint is a poor connection due to insufficient heat. Solder should flow as a result of the heated lug and wire. DO NOT solder by applying solder to the iron tip and then wiping the hot solder onto the joint. A well-soldered joint is indicated by a smooth shiny finish on the soldered connection.

### IMPORTANT READ CAREFULLY

#### CONSTRUCTION HINTS

The various lengths of wire to be used in this kit are specified in the construction steps. After cutting the wire to the length specified, strip off 1/4" of insulation from each end. The exposed wire will be used to make the actual connection to the solder lug.

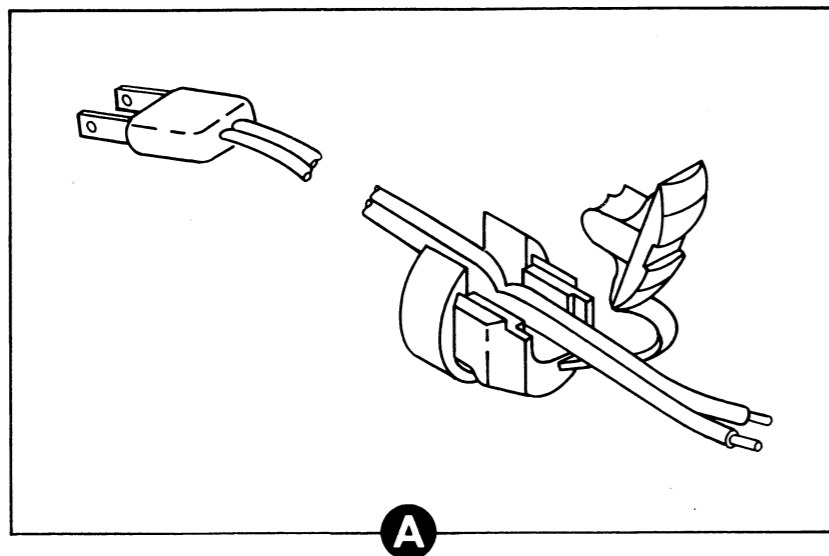
Components such as resistors and capacitors, may have longer leads than specified. Cut the leads to the length indicated in the particular construction step. This length is to be measured from the body of the component. In the case of insulated leads, strip 1/4" of insulation off from the ends and twist the strands (if any) of the wire together.

60. ( ) Connect BLACK wire from terminal 11 of PC4 to R7-2(S1).
61. ( ) Connect RED wire from terminal 6 of PC4 to R5-1(S1).
62. ( ) Connect GRAY wire from terminal 12 of PC4 to R7-1(S1).
63. ( ) Connect YELLOW wire from terminal 8 of PC4 to S6-1(S1).
64. ( ) Connect GREEN wire from terminal 7 of PC4 to R5-3(S1).
65. ( ) Connect VIOLET wire from terminal 5 of PC4 to R5-2(S1).
66. ( ) Connect BLUE wire from terminal 9 of PC4 to S5-2(S1).
67. ( ) Connect WHITE wire from terminal 2 of PC4 to R7-3(S1).
68. ( ) Connect WHITE wire from terminal 3 of PC4 to S5-3(S1).
69. ( ) Mount (82531) PRINTED CIRCUIT BOARD, PC6, using four (41095) No. 2-56 x 1/4" BINDING HEAD screws. Mount the board so that terminals 2 through 8 face XQ1 and XQ3.
70. ( ) Connect BROWN wire from terminal 1 of PC6 to R9-2(S1).
71. ( ) Connect VIOLET wire from terminal 2 of PC6 to TB7-1(S4).
72. ( ) Connect BLACK wire from terminal 3 of PC6 to TB3-2(S2).
73. ( ) Connect GREEN wire from terminal 4 of PC6 to base terminal of XQ3(S1).
74. ( ) Connect WHITE wire from terminal 5 of PC6 to collector terminal of XQ3(S3).
75. ( ) Connect YELLOW wire from terminal 6 of PC6 to base terminal of XQ1(S1).
76. ( ) Connect BROWN wire from terminal 7 of PC6 to TB3-1(S4).
77. ( ) Connect RED wire from terminal 8 of PC6 to collector terminal of XQ1(S2).
78. ( ) Place the (57006) LINE CORD in the (82102) LINE CORD CLAMP, as shown in Detail "A". Leave about 3-1/2" from the clamp to the tinned ends. (Make certain that the tinned ends are facing as shown.)

Bend the smaller section of the clamp over the line cord and position it into the channels of the larger section.

Compress the two sections together with a pliers, pass the soldered ends of the line cord through the hole in the rear of the chassis, then force clamp into hole until it snaps into chassis.

79. ( ) Connect one tinned end of the line cord to J12-1(S2).
80. ( ) Connect second tinned end of the line cord to J12-2(S2).



NOTE: Please review and check all the preceding steps before continuing with the next figure.

FIGURE 11

1. ( ) Cut the positive (+) lead on a (23035) 1000 UF 50V ELECTROLYTIC CAPACITOR, C9, to 1" then connect it to TB11-1(S2). Cut the negative (-) lead as required and connect it to ground lug "A" (S1).
2. ( ) Cut the positive (+) lead on a (23089) 2000 UF 25V ELECTROLYTIC CAPACITOR, C6, to 3/4", then connect this lead to TB8-2(C). Cut the negative (-) lead as required, then connect it to TB5-1 (C).
3. ( ) Cut both leads of a (11566) 1K $\Omega$ , 1/2W, 5% (brown, black, red, gold) RESISTOR, R16, to 1". Connect from TB2-4(C) to TB5-1(C).
4. ( ) Cut both leads on a (15902) 1 $\Omega$ , 1W, 5% (brown, black, gold, gold) RESISTOR, R12, to 3/4". Connect from TB8-2(C) to emitter terminal of XQ2(C).
5. ( ) Cut both leads on a (93027) RECTIFIER, CR2, to 7/8". Connect the lead to which the arrow points to TB8-2(C) and the other lead to the emitter terminal of XQ2(S2).
6. ( ) Cut both leads on a (15902) 1 $\Omega$ , 1W, 5% (brown, black, gold, gold) RESISTOR, R14, to 3/4". Connect from TB13-1(C) to collector terminal of XQ4(C).
7. ( ) Cut both leads on a (93027) RECTIFIER, CR4, to 7/8". Connect the lead to which the arrow points to the collector terminal of XQ4(C) and the other lead to TB13-1(C).
8. ( ) Cut both leads on a (20078) 0.015 UF 600V 20% CAPACITOR, C7, to 3/4". Slip a piece of 1/2" tubing over each lead and connect between XF3-2(S2) and J13-1(S3). Push the capacitor close to rear panel.

If after having checked all your components against the parts list, you find that you cannot identify or are missing a component, please write us at:

Customer Service  
EICO Electronic Instrument Co., Inc.  
283 Malta Street  
Brooklyn, N. Y. 11207

Include the inspection slip with your letter, should there be a shortage. If there is a slight hardware shortage, you can expedite matters by purchasing these pieces at your local jobber or hardware store.

#### SOLDERING TECHNIQUES

To get a good, clean connection, use the soldering techniques described below.

USE THE BEST GRADE OF ROSIN CORE RADIO SOLDER ONLY. UNDER NO CIRCUMSTANCES SHOULD ACID CORE SOLDER OR ACID FLUX BE USED. The use of acid core solder or acid paste fluxes can cause serious corrosion and will VOID ALL THE REPAIR AND SERVICE GUARANTEES.

The soldering and wiring techniques described should be practiced several times before attempting to wire or solder components in the actual kit.

PRACTICE SEVERAL CONNECTIONS with a spare piece of wire and a socket or terminal strip that can be purchased at your local distributor.

The following refers to Figure "A."

- ( ) 1. Remove 1/4" of insulation from the end of the wire.
- ( ) 2. Feed the wire through the lug opening so that the insulation on the wire is approximately 1/64" away from the lug.
- ( ) 3. Bend the wire lead around the lug and crimp using a longnose pliers.

The following refers to Figure "B."

- ( ) 4. To solder the connection, place the tip of a hot soldering iron on the lug (terminal) at a point close to the wire being soldered.
- ( ) 5. Apply the solder to the connection of the lug and wire. DO NOT apply the solder to the soldering iron.
- ( ) 6. When the lug and wire has been heated sufficiently, the solder will flow into and over the joint.

## FIGURE 1

The following components, in steps 1 through 12, are to be mounted on the (81484) rear panel.

1. ( ) Mount the (97805) FUSEHOLDER XF3 with lug facing up, as shown. SECURE with (42029) RUBBER WASHER and (40016) 1/2" x 24 hex nut, then install (91006) 1-ampere slo blow FUSE F3 in fuseholder.
2. ( ) Mount the (97805) FUSEHOLDER XF2 with lug facing up, as shown. SECURE with (42029) RUBBER WASHER and (40016) 1/2" x 24 hex nut, then install (91002) 1-ampere FUSE F2 in fuseholder.
3. ( ) Mount the (97805) FUSEHOLDER XF1 with lug facing down, as shown. SECURE with (42029) RUBBER WASHER and (40016) 1/2" x 24 hex nut, then install (91002) 1-ampere FUSE F1 in fuseholder.

In the following eight steps, SECURE each component with two (41086) No. 6-32 x 5/16 BINDING HEAD screws, two (42002) No. 6 lockwashers, and two (40000) No. 6-32 hex nuts.

4. ( ) INSTALL (54500) 4-screw TERMINAL BOARD TB1, as shown.
5. ( ) INSTALL (54500) 4-screw TERMINAL BOARD TB2, as shown.
6. ( ) Place (50012) INSULATOR over (50011) DUAL PHONO INPUT JACK J1-J3 and INSTALL as shown.
7. ( ) Place (50012) INSULATOR over (50011) DUAL PHONO INPUT JACK J2-J4 and INSTALL as shown.
8. ( ) Place (50019) INSULATOR over (50018) TRIPLE PHONO INPUT JACK J5-J7-J9 and INSTALL as shown. Be sure that J5 ground lug is near J3.
9. ( ) Place (50019) INSULATOR over (50018) TRIPLE PHONO INPUT JACK J6-J8-J10 and INSTALL as shown. Be sure that J6 ground lug is near J4.
10. ( ) INSTALL (50016) AC RECEPTACLE J13 as shown.
11. ( ) INSTALL (50016) AC RECEPTACLE J12 as shown.
12. ( ) INSTALL hardware for external ground as shown. INSERT (41051) No. 10-32 x 1/2" ROUND HEAD screw in panel, then add (42004) No. 10 lock washer and (40012) No. 10-32 hex nut. Tighten hardware then add (42011) No. 10 flat washer and (40011) No. 10-32 wing nut.

The line cord is not installed until later.

NOTE: Please review and check all the preceding steps before continuing with the next figure.

16. ( ) Cut a 10" piece of BROWN COAXIAL cable and prepare ends as described in step 15. Connect the longer inner conductor to BOTH LUGS of S1-4(S1) and its braid to TB6-4(C). Connect the shorter inner conductor to J9(S1) and its braid to the J7-J9 ground lug(S2).
17. ( ) Cut an 11" piece of RED COAXIAL cable and prepare ends as described in step 15. Connect the longer inner conductor to S2-1(S1) and its braid to TB6-3(C). Connect the shorter inner conductor to J3(S1) and its braid to the J3 ground lug(S1).
18. ( ) Cut a 12" piece of WHITE COAXIAL cable and prepare ends as described in step 15. Connect the longer inner conductor to S2-3(S2) and its braid to TB6-3(C). Connect the shorter inner conductor to J1(S1) and its braid to the J1 ground lug(S1).
19. ( ) Cut a 1-1/4" piece of BARE wire. Connect from TB1-1(S1) to TB7-2(C).
20. ( ) Cut a 3" piece of BLACK wire. Connect from TB1-4(S1) to TB7-2(S3).
21. ( ) Cut a 9-1/2" piece of GRAY wire. Connect from S7-1(S1) to TB1-3(S1). Dress leads as shown.
22. ( ) Cut an 8" piece of YELLOW wire. Connect from S7-3(S1) to TB1-2(S1).
23. ( ) Cut a 7-1/2" piece of VIOLET wire. Connect from S7-2(S2) to TB7-1(C).
24. ( ) Cut a 5" piece of ORANGE wire. Connect from TB10-4(C) to XF1-1(C).
25. ( ) Cut a 2-1/2" piece of BLACK wire. Connect from emitter terminal of XQ3(S1) to TB3-2(C).
26. ( ) Cut a 6" piece of BLACK wire. Connect from S6-5(S2) to TB6-4(C).
27. ( ) Cut a 3" piece of BROWN wire. Connect from TB3-1(C) to TB4-1(S4).
28. ( ) Cut a 5" piece of RED wire. Connect from XF1-2(S1) to collector terminal of XQ1(C).
29. ( ) Cut one lead of a (11552) 27K, 1/2W, 5% (red, violet, orange, gold) RESISTOR, R2, to 3/4". Cover this lead with 1/2" piece of TUBING and connect to S4-6(S2). Cut other end as necessary and connect to TB6-4(C).
30. ( ) Cut one lead on a (11552) 27K, 1/2W, 5% (red, violet, orange, gold) RESISTOR, R1, to 3/4". Cover this lead with 1/2" of TUBING, and connect to S4-3(S2). Cut other lead as necessary and connect to TB6-4(C).
31. ( ) Cut a 2" piece of BLACK wire. Connect from S1-8(S1) to TB6-2(C).
32. ( ) Twist together the ORANGE with BLACK tracer and GREEN with BLACK tracer cotton-covered wires from S8, then connect ORANGE with BLACK tracer wire to J12-2(C).
33. ( ) Route GREEN with BLACK tracer cotton-covered wire from S8 through hole in chassis as shown, and connect it to J13-1(C). (See figure 11.)
34. ( ) Connect YELLOW wire from S8 to TB9-2(S2).
35. ( ) Connect BLACK wire from S8 to TB9-3(S3).
36. ( ) Twist RED wires from T1. Connect one RED wire to TB9-1(S3).
37. ( ) Connect second RED wire from T1 to TB10-2(S3).

38. ( ) Twist GREEN wires from T1. Connect one GREEN wire to either terminal of XI1(S1).
39. ( ) Connect second GREEN wire from T1 to remaining terminal of XI1(S1).
40. ( ) Twist BLACK wires from T1, then carefully push them through the hole in the chassis, as shown. Connect one BLACK wire to XF3-2(C). (See figure 11.)
41. ( ) Connect second BLACK wire from T1 to J13-1(C). (See figure 11.)
42. ( ) Cut a 4" piece of BLUE with BLACK tracer cotton covered wire. Connect from J12-1(C) through hole in chassis to XF3-1(C). (See figure 11.)
43. ( ) Cut a 4" piece of BLACK wire. Connect from J11-5(S1) to ground lug "B"(C).
44. ( ) Cut a 10" piece of RED wire. Connect from TB9-4(S3) to TB12(C).
45. ( ) Cut positive (+) lead on (23035) 1000 UF 50V ELECTROLYTIC CAPACITOR, C8, to 1". Cover this lead with a 3/4" piece of TUBING, then connect it to TB10-4(C). Connect negative (-) lead to ground lug "B"(C). Cut off excess lead.
46. ( ) Cut positive (+) lead on (23074) 250 UF 35V ELECTROLYTIC CAPACITOR, C10, to 1-1/2". Cover this lead with a 1-1/4" piece of TUBING, then connect it to TB10-1(S3). Connect negative (-) lead to ground lug "B"(S3). Cut off excess lead.
47. ( ) Cut a 4" piece of ORANGE wire. Connect from TB10-4(S6) on bottom of the chassis, through hole (as shown), to TB11-1(C) on top of chassis. (See figure 11.)
48. ( ) Cut a 3" piece of RED wire. Connect from XF1-1(S2) through hole in chassis, as shown, to XF2-1(S1). (See figure 11.)
49. ( ) Cut the positive (+) lead of a (23022) 1000 UF 25V ELECTROLYTIC CAPACITOR, C11, to 1" and connect it to TB12(C). Connect negative (-) lead to TB6-1(C). Cut off excess lead.
50. ( ) Mount (82529) PRINTED CIRCUIT BOARD, PC2, using four (41095) No. 2-56 x 1/4" BINDING HEAD screws. Mount the board so that the WHITE and BLACK wires are near J5, as shown.
51. ( ) Connect inner conductor of ORANGE COAXIAL cable from terminal 5 of PC2 to BOTH LUGS of S1-2(S1) and the braid to TB6-3(S4).
52. ( ) Connect BLACK wire from terminal 3 of PC2 to TB6-2(C).
53. ( ) Connect ORANGE wire from terminal 4 of PC2 to TB12-1(C).
54. ( ) Twist BLACK and WHITE wires on PC2 (from terminals 1 and 2, respectively) together, then connect WHITE wire to J5(S1) and BLACK wire to J5 ground lug (S1).
55. ( ) Mount (82530) PRINTED CIRCUIT BOARD PC4, using four (41095) No. 2-56 x 1/4" BINDING HEAD screws. Mount the board so that the ORANGE wire is near PC2.
56. ( ) Connect BLACK wire from terminal 10 of PC4 to TB6-4(S7).
57. ( ) Connect BROWN wire from terminal 1 of PC4 to R3-2(S1).
58. ( ) Connect BROWN wire from terminal 13 of PC4 to R9-3(S1).
59. ( ) Connect ORANGE wire from terminal 4 of PC4 to TB12-1(C).

AS AN EXAMPLE, one step may specify that each lead on a resistor be cut to 1/2". A 1/4" of each lead is used to make a mechanical connection to the solder lug. The other 1/4" is left between the terminal board and the component so that the component will not be overheated when soldering.

When a connection is required, a (C) or an (S) will appear next to the lug involved. The (C) indicates that the connection should be simply mechanical, NOT SOLDERED, since other leads are to be connected to this same lug. The (S) indicates that the connection should be made and SOLDERED IMMEDIATELY. However, the (S) is always followed by a number, such as (S1), (S2), (S3), etc. This number indicates the NUMBER OF CONNECTIONS made and soldered to the lug. It is a check on the accuracy of your work.

AS AN EXAMPLE, (S3) means that there should be three leads going to the lug to be soldered. If there are less than three leads at this particular lug, you will know that you have forgotten one or more leads, or connected them to the wrong lugs. If there are more than three leads, you can be certain you have connected an extra wire to this lug, which should probably go elsewhere.

WHEN YOU ASSEMBLE the parts in your unit, mark the symbol of each component on the chassis near the part, with a crayon. This will facilitate your wiring operation.

#### WIRING

WHEN WIRING, lay the component in close to the chassis and dress it as shown in the drawing. BE CAREFUL to avoid shorts at the lugs. The order of steps is such that the wiring that should be closest to the chassis is done first. In each case, DRESS THE LEADS AND COMPONENTS AS CLOSE TO THE CHASSIS AS POSSIBLE, except if otherwise specified.

NOTE: Although the pictorials are correct insofar as the connections made, DO NOT ATTEMPT TO USE THEM FOR CORRECT COMPONENT LEAD OR WIRE LENGTHS.

We may, in some cases, distort the actual component or lead placement to provide the kit builder with a clearer illustration. YOU MUST READ THE STEPS to obtain the correct component lead or wire lengths and any specific instructions on placement or lead dress.

Refer to the photographs in this manual as an additional aid in assembling and wiring this instrument.

#### THE STEPS

A white number in a black circle adjacent to a component in a figure is the number of the corresponding step in which the component is wired.

After you have completed each step, make a check mark or cross out the number next to the step so that you will have a complete record of your work.

Follow the steps in the sequence given in the book. DO NOT skip steps or pages unless instructed.

NOTE: One of the most common errors that people make occurs when a step is not completely read BEFORE attempting any work on it. Please read the ENTIRE step first.

Once more, if any addenda sheets have been included with your manuals that specify additions, deletions, or substitutions, be sure to make these corrections first, before you start to assemble your kit. It is best to arrange your parts numerically by part number so that you can find them more easily.

You are now ready to proceed with the construction.



## FIGURE 3 - FIGURE 4

### COMPONENT MOUNTING

The following components, in steps 1 through 23, are to be mounted on the (81482) chassis.

1. ( ) Mount (30085) POWER TRANSFORMER T1 to (81513) TRANSFORMER BRACKET, securing it loosely with four (41066) No. 8-32 x 5/16 BINDING HEAD screws, four (42008) No. 8 lockwashers, and four (40055) No. 8-32 hex nuts. See figure 3.
2. ( ) Mount transformer bracket to bottom of chassis using four (41086) No. 6-32 x 5/16 BINDING HEAD screws, four (42002) No. 6 lockwashers and four (40000) No. 6-32 hex nuts, then tighten hardware securing power transformer to transformer bracket.

NOTE: Be sure that transformer is mounted with leads facing INSIDE of chassis, as shown in figure 3.

In steps 3 through 6, SECURE each (97087) transistor socket with two (41090) No. 4-40 x 5/16 BINDING HEAD screws, two (42007) No. 4 lockwashers, and two (40007) No. 4-40 hex nuts.

3. ( ) Mount and secure (97087) transistor socket XQ1 to bottom of chassis. See figure 3.
4. ( ) Mount and secure (97087) transistor socket XQ3 to bottom of chassis. See figure 3.
5. ( ) Mount and secure (97087) transistor socket XQ4 to top of chassis. See figure 4.
6. ( ) Mount and secure (97087) transistor socket XQ2 to top of chassis. See figure 4.
7. ( ) Spread a small amount of (89749) SILICON GREASE to both of sides of a (42069) MICA WASHER. Select a pair of (94049) transistors (Q2 and Q4) that are identically color coded. (If all four transistors supplied in the kit have the same color code, any pair can be used.) Place mica washer over transistor Q2 and insert into transistor socket XQ2 as shown in figure 4. SECURE the assembly with two (41002) No. 6 x 3/8" SHEET METAL screws.
8. ( ) Repeat step 7, using (94049) transistor Q4 and installing it into transistor socket XQ4. See figure 3.
9. ( ) Repeat step 7, using the third (94049) transistor Q1 and installing it into transistor socket XQ1. See figure 4.
10. ( ) Repeat step 7, using the fourth (94049) transistor Q3 and installing it into transistor socket XQ3. See figure 4.
11. ( ) Install 12 (45026) STANDOFFS, securing each with a (42004) No. 10 lockwasher and a (40012) No. 10-32 hex nut, as shown in figure 3.

NOTE: In steps 12 through 21, secure each item with one (41086) No. 6-32 x 5/16" BINDING HEAD screw, one (42002) No. 6 lockwasher, and one (40000) No. 6-32 hex nut.

12. ( ) Mount one (54013) 1 post LEFT w/gnd TERMINAL STRIP, TB3, to the bottom of the chassis, as shown in figure 3.
13. ( ) Mount one (54001) 1 post RIGHT TERMINAL STRIP, TB4, to the bottom of the chassis, together with (54000) 1 post LEFT TERMINAL STRIP TB5 on the top of the chassis, as shown in figure 3.

2. ( ) CONNECT the leads to PC5 as directed in TABLE 8. STRIP 1/4" of insulation from both ends of each wire. ONLY ONE END will be connected at this time.

TABLE 8. CONNECTING LEADS TO PRINTED CIRCUIT BOARD PC5

CHECK	COLOR	LENGTH	CONNECT TO TERMINAL
( )	BROWN	2-3/4"	1
( )	VIOLET	4"	2
( )	BLACK	3"	3
( )	GREEN	2-1/4"	4
( )	WHITE	2-1/4"	5
( )	YELLOW	3"	6
( )	BROWN	1-1/4"	7
( )	RED	4"	8

3. ( ) CONNECT the leads to PC6 as directed in TABLE 9. STRIP 1/4" of insulation from both ends of each wire. ONLY ONE END will be connected at this time.

TABLE 9. CONNECTING LEADS TO PRINTED CIRCUIT BOARD PC6

CHECK	COLOR	LENGTH	CONNECT TO TERMINAL
( )	BROWN	4-1/2"	1
( )	VIOLET	4"	2
( )	BLACK	4"	3
( )	GREEN	2-1/4"	4
( )	WHITE	2-1/4"	5
( )	YELLOW	3-1/2"	6
( )	BROWN	1-1/4"	7
( )	RED	4"	8

NOTE: Before going on with the next figure, recheck all the steps in this figure for possible errors. Examine boards PC5 and PC6 carefully to make sure that the component leads are properly soldered and are not shorting. Inspect the transistors, diodes, and electrolytic capacitors for proper installation.

FIGURE 10

CHASSIS CONNECTIONS

1. ( ) Cut the positive (+) lead of a (23089) 2000 UFD 25V ELECTROLYTIC CAPACITOR, C5, to 3/4", then connect this lead to TB4-1(C). Cut the negative (-) lead as necessary, then connect it to TB7-1(C).
  2. ( ) Cut both leads on a (11566) 1K $\Omega$ , 1/2W, 5% (brown, black, red, gold) RESISTOR, R15, to 3/4". Connect from TB7-1(C) to TB7-2(C).
  3. ( ) Cut both leads on a (15902) 1 $\Omega$ , 1W, 5% (brown, black, gold, gold) RESISTOR, R11, to 3/4". Connect from TB4-1(C) to emitter terminal of XQ1.
  4. ( ) Cut both leads on a (93027) RECTIFIER, CR1, to 3/4". Connect the lead to which the arrow points, to TB4-1(C) and the other lead to the emitter terminal of XQ1(S2).
  5. ( ) Cut both leads on a (15902) 1 $\Omega$ , 1W, 5% (brown, black, gold, gold) RESISTOR, R13, to 3/4". Connect from TB3-1(C) to collector terminal of XQ3(C).
  6. ( ) Cut both leads of a (93027) RECTIFIER, CR3, to 3/4". Connect the end to which the arrow points, to the collector terminal of XQ3(C) and the other lead to TB3-1(C).
  7. ( ) Cut both leads on a (93020) RECTIFIER, CR8, to 3/4". Connect the end to which the arrow points, to TB10-4(C) and the other end to TB10-2(C).
  8. ( ) Cut both leads on a (11566) 1K, 1/2W, 5% (brown, black, red, gold) RESISTOR, R19, to 3/4". Connect from TB10-1(C) to TB10-4(C).
  9. ( ) Cut both leads on a (93020) RECTIFIER, CR5, to 3/4". Connect the end to which the arrow points, to TB9-1(C) and the other end to TB9-3(C).
  10. ( ) Cut both leads on a (10529) 680 $\Omega$ , 1/2W, 5% (blue, gray, brown, gold) RESISTOR, R20, to 1/2". Connect from TB10-1(C) to TB9-4(C).
  11. ( ) Cut both leads on a (10454) 10 $\Omega$ , 1/2W, 10% (brown, black, black, silver) RESISTOR, R21, to 3/4". Connect from TB9-4(C) to TB9-2(C).
  12. ( ) Cut both leads on a (93020) RECTIFIER, CR6, to 5/8". Connect the end to which the arrow points, to TB10-4(C) and the other end to TB9-1(C).
  13. ( ) Cut both leads on a (93020) RECTIFIER, CR7, to 5/8". Connect the end to which the arrow points to TB10-2(C) and the other end to TB9-3(C).
  14. ( ) Using a 2" piece of BARE wire, interconnect TB6-1 through TB6-4. DO NOT SOLDER these terminals at this time.
- CAUTION: In steps 15 through 18 that follow, be careful not to short the inner conductor of the coaxial cable with the braid. DO NOT OVERHEAT when soldering. Also make sure that the braid does not touch any other ground or hot lead.
15. ( ) Cut a 10" piece of YELLOW COAXIAL cable. Strip off 1" of outer insulation from one end and 3/4" from other end, exposing the braided shield. DO NOT CUT the braid. Using a sharp pointed tool, carefully make an opening in the braid and pull inner conductor out of the braid at each end. Twist each braid to prevent it from fraying, then remove 1/4" of insulation from the conductors. Connect the longer inner conductor to BOTH LUGS of S1-3(S1), and its braid to TB6-4(C). Dress the cable as shown. Connect the shorter inner conductor to J7(S1) and its braid to the J7-J9 ground lug(C).

FIGURE 2

The following components, in steps 1 through 14, are to be mounted on the (81481) sub-panel.

1. ( ) Snap a (40019) No. 6-32 Tinnerman nut over the hole of the (97712) bulb socket XI1, with the threaded side of the nut facing the socket terminals, and install the socket as shown. SECURE with (41088) No. 6-32 FLAT HEAD screw, but do not tighten. INSTALL (92000) No. 47 pilot bulb, turn socket so that bulb is directly behind cut-out in sub-panel, then tighten screw.
- NOTE: In steps 2 through 7 place a (42001) 3/8" flat washer over the shaft of the component BEFORE INSTALLING in sub-panel, insert the component so that its locating tab locks into the oblong hole, then SECURE to panel with (40001) 3/8-32 hex nut.
2. ( ) Mount (60153) ROTARY INPUT SELECTOR SWITCH, S1.
  3. ( ) Mount (18169) DUAL 1M POTENTIOMETER, R5-R6.
  4. ( ) Mount (18130) DUAL 25K POTENTIOMETER, R9-R10.
  5. ( ) Mount (18131) DUAL 500K POTENTIOMETER, R3-R4.
  6. ( ) Mount (18170) DUAL 250K POTENTIOMETER, R7-R8.
  7. ( ) Mount (60186) ROTARY SPEAKER SELECTOR SWITCH, S7.
  8. ( ) Carefully bend back terminals on (50040) STEREO HEADPHONE JACK J11, then install with center ground lug facing down as shown. SECURE with two (41022) No. 2-56 x 3/8" FLAT HEAD screws, two (42053) No. 2 lockwashers, and two (40004) 2-56 hex nuts.

In steps 9 through 14, INSTALL two (40034) No. 4-40 TINNEMAN NUTS over the two mounting holes of the (62034) DPDT rocket switches. BE SURE THAT THE THREADED SIDE OF EACH TINNEMAN NUT FACES THE SWITCH TERMINALS. SECURE each switch with two (41164) No. 4-40 x 5/8" FLAT HEAD screws and two (44001) SPACERS.

9. ( ) Mount (62034) DPDT ROCKER SWITCH, S5.
10. ( ) Mount (62034) DPDT ROCKER SWITCH, S3.
11. ( ) Mount (62034) DPDT ROCKER SWITCH, S4.
12. ( ) Mount (62034) DPDT ROCKER SWITCH, S2.
13. ( ) Mount (62034) DPDT ROCKER SWITCH, S6.
14. ( ) Mount (62034) DPDT ROCKER SWITCH, S8.

NOTE: Please review and check all the preceding steps before continuing with the next figure.

6. ( ) Cut both leads on a (22546) 56PF 500V CAPACITOR, C1, to 3/4". Cover leads with 1/2" of tubing, then connect from S2-2(S2) to S4-1(S1). Position C1 so that it lies in the same line as the lugs to which it is connected.
7. ( ) Cut a 1-1/4" piece of BARE wire. Cover with 3/4" of tubing. Connect from R4-4(S1) to S4-5(C).
8. ( ) Cut both leads on a (20102) 0.015 UF 200V CAPACITOR, C4, to 1/2". Connect from S4-5(S2) to S4-6(C).
9. ( ) Cut a 2" piece of VIOLET wire. Connect from R3-4(S1) to S4-2(C).
10. ( ) Cut both leads on a (20102) 0.015 UF 200V CAPACITOR, C3, to 1/2". Connect from S4-2(S2) to S4-3(C).
11. ( ) Cut a 3/4" piece of BARE wire. Connect from S3-2(S1) to S3-5(S1).
12. ( ) Cut a 4" piece of RED wire. Connect from R4-3(S2) to S3-6(S1). Push this wire close to the panel.
13. ( ) Cut a 4" piece of BROWN wire. Connect from R3-3(S2) to S3-3(S1). Push this wire close to the panel, but space away from the RED wire of step 12.
14. ( ) Cut a 3/4" piece of BARE wire. Connect from S6-2(S1) to S6-5(C).
15. ( ) Cut a 3/4" piece of BARE wire. Connect from R4-1(S1) to R3-1(C).
16. ( ) Cut both leads on a (10863) 220Ω 1W 10% (red, red, brown, silver) RESISTOR R18 to 1". Slide a 3/4" length of tubing over each lead, then connect from J11-3(S1) to S7-8(C).
17. ( ) Cut both leads on a (10863) 220Ω 1W 10% (red, red, brown, silver) RESISTOR R17 to 7/8". Slide a 5/8" length of tubing over each lead, then connect from J11-1(S1) to S7-2(C).
18. ( ) Cut an 11-1/2" piece of ORANGE with BLACK tracer cotton-covered wire. Connect one end to S8-5(S1). The other end will be connected later.
19. ( ) Cut a 12" piece of GREEN with BLACK tracer cotton-covered wire. Connect one end to S8-4(S1). The other end will be connected later.
20. ( ) Cut a 4" piece of YELLOW wire. Connect one end to S8-3(S1). The other end will be connected later.
21. ( ) Cut a 4" piece of BLACK wire. Connect one end to S8-2(S1). The other end will be connected later.
22. ( ) Cover switch S8 with a (97304) slide switch cover, carefully pulling the four wires on the switch through the hole in the cover. Push cover against switch until cover snaps into place.

NOTE: Please review and check all the preceding steps before continuing with the next figure.

TABLE 5. CONNECTING LEADS TO PRINTED CIRCUIT BOARD PC3

CHECK	COLOR	LENGTH	CONNECT TO TERMINAL
( )	BROWN	4"	1
( )	WHITE	6"	2
( )	WHITE	6-1/4"	3
( )	ORANGE	6-1/4"	4
( )	VIOLET	4-1/2"	5
( )	RED	5"	6
( )	GREEN	4"	7
( )	YELLOW	6-1/4"	8
( )	BLU	5-1/2"	9
( )	BLACK	4"	10
( )	BLACK	5-1/2"	11
( )	GRAY	6"	12
( )	BROWN	3-1/2"	13

TABLE 6. CONNECTING LEADS TO PRINTED CIRCUIT BOARD PC4

CHECK	COLOR	LENGTH	CONNECT TO TERMINAL
( )	BROWN	4"	1
( )	WHITE	8"	2
( )	WHITE	5-1/4"	3
( )	ORANGE	3"	4
( )	VIOLET	6-1/2"	5
( )	RED	6"	6
( )	GREEN	5-1/4"	7
( )	YELLOW	5-1/2"	8
( )	BLUE	4-3/4"	9
( )	BLACK	2"	10
( )	BLACK	5-1/2"	11
( )	GRAY	6-1/2"	12
( )	BROWN	3-1/2"	13

NOTE: Before going on with the next figure, recheck all the steps in this figure for possible errors. Examine boards PC3 and PC4 carefully to make sure that the component leads are properly soldered and are not shorting. Inspect the transistors and electrolytic capacitors for proper installation.

**FIGURE 9**

**DRIVER PRINTED BOARD COMPONENT MOUNTING**

Mark one (82531) printed circuit board PC5 and the other PC6, then assemble components to these boards as follows:

- ( ) INSTALL RESISTORS, CAPACITORS, DIODES, and TRANSISTORS on the two (82531) PRINTED CIRCUIT BOARDS as directed in TABLE 7. SCRAPE the COMPONENT leads LIGHTLY. BEND the leads DOWN and INSTALL RESISTORS and CAPACITORS FLUSH with the board over the applicable reference designation. Bend leads on each component so that it stays on the board. OBSERVE POLARITY WHEN INSTALLING CAPACITORS AND DIODES. CONNECT EACH DIODE SO THAT RED DOT ON DIODE FACES DIRECTION SHOWN IN FIGURE 9. DO NOT try to install DIODES or TRANSISTORS FLUSH with the board. ALIGN KEY ON EACH TRANSISTOR WITH KEY ON APPLICABLE BOARD MARKING. Be sure to match up the three leads from each transistor with the proper terminal board holes. If improperly connected, the transistor may burn out when power is applied. Hook the transistor leads so that the transistor stays in place on the board. USE HEAT AND SOLDER SPARINGLY TO AVOID DAMAGE TO THE BOARDS OR COMPONENTS. AFTER SOLDERING, CUT the leads AS CLOSE AS POSSIBLE to the CONDUCTOR side of the board. As each component is installed, CHECK IT OFF on TABLE 7.

**TABLE 7. INSTALLING COMPONENTS ON (82531) PRINTED CIRCUIT BOARDS**

CHECKS PC5 PC6	PART NUMBER	NAME	DESCRIPTION	COLOR CODE	REFERENCE DESIGNATION
( ) ( )	23054	CAPACITOR	100 MF, 3V		C305
( ) ( )	11552	RESISTOR	27K, 1/2W, 5%	RED-VIO-ORG-GOLD	R312
( ) ( )	11552	RESISTOR	27K, 1/2W, 5%	RED-VIO-ORG-GOLD	R303
( ) ( )	11552	RESISTOR	27K, 1/2W, 5%	RED-VIO-ORG-GOLD	R302
( ) ( )	23032	CAPACITOR	40 MF, 15V		C302
( ) ( )	10546	RESISTOR	220Ω, 1/2W, 5%	RED-RED-BRN-GOLD	R310
( ) ( )	10542	RESISTOR	4.7Ω, 1/2W, 5%	YEL-VIO-GOLD-GOLD	R311
( ) ( )	10546	RESISTOR	220Ω, 1/2W, 5%	RED-RED-BRN-GOLD	R309
( ) ( )	94051	TRANSISTOR	RCA 40317		Q301
( ) ( )	94052	TRANSISTOR	RCA 40362		Q302
( ) ( )	94050	TRANSISTOR	RCA 40361		Q303
( ) ( )	22607	CAPACITOR	22 PF, 500V, 5%		C304
( ) ( )	93028	RECTIFIER	1A 200V PIV		CR301
( ) ( )	93028	RECTIFIER	1A 200V PIV		CR302
( ) ( )	11569	RESISTOR	4.7K, 1/2W, 5%	YEL-VIO-RED-GOLD	R306
( ) ( )	10546	RESISTOR	220Ω, 1/2W, 5%	RED-RED-BRN-GOLD	R307
( ) ( )	11566	RESISTOR	1K, 1/2W, 5%	BRN-BLK-RED-GOLD	R305
( ) ( )	23040	CAPACITOR	100 MF, 25V		C303
( ) ( )	23054	CAPACITOR	100 MF, 3V		C301
( ) ( )	11543	RESISTOR	1.8K, 1/2W, 5%	BRN-GRAY-RED-GOLD	R301
( ) ( )	11570	RESISTOR	6.8K, 1/2W, 5%	BLU-GRAY-RED-GOLD	R304
( ) ( )	10528	RESISTOR	270Ω, 1/2W, 5%	RED-VIO-BRN-GOLD	R308

- ( ) Mount the (54007) 3 post 2 RIGHT w/gnd TERMINAL STRIP, TB6, to the bottom of the chassis, together with a (43000) No. 6 GROUND SOLDER LUG "C" on the top of the chassis, as shown in figures 3 and 4.
- ( ) Mount one (54013) 1 post LEFT w/gnd TERMINAL STRIP, TB7, to the bottom of the chassis, together with a (54002) 1 post RIGHT w/gnd TERMINAL BOARD TB8 on the top of the chassis, as shown in figure 4.
- ( ) Mount a (54015) 3 post, 2 LEFT w/gnd TERMINAL BOARD TB9, to the bottom of the chassis. Use hole "D," shown in figure 3.
- ( ) Mount a (54015) 3 post, 2 LEFT w/gnd TERMINAL BOARD, TB10, to the bottom of the chassis. Use hole "E," as shown in figure 3.
- ( ) Mount a (54001) 1 post RIGHT TERMINAL STRIP, TB12, to the side of the chassis bottom, as shown in figure 3.
- ( ) Mount a (54000) 1 post LEFT TERMINAL STRIP, TB11, to the top of the chassis, as shown in figure 4.
- ( ) Mount a (54013) 1 post LEFT w/gnd TERMINAL STRIP, TB13, to the top of the chassis, as shown in figure 4.
- ( ) Mount an (82100) cable clamp to the top of the chassis, as shown in figure 4.
- ( ) Mount and secure (43000) No. 6 GROUND SOLDER LUG "A" to the top lip of the chassis, using one (41086) No. 6-32 x 5/16" BINDING HEAD screw and one (40000) No. 6-32 hex nut. See figure 4.
- ( ) Mount and secure (43000) No. 6 GROUND SOLDER LUG "B" to the bottom side wall of the chassis, using one (41086) No. 6-32 x 5/16" BINDING HEAD screw and one (40000) No. 6-32 hex nut. See figure 3.

NOTE: Please review and check all the preceding steps before continuing with the next figure.

**FIGURE 5**

**SUB-PANEL WIRING**

NOTE: In each step that a covered wire is cut, strip off 1/4" of insulation from each end of the wire before making connections.

- ( ) Cut a 2-1/2" piece of GREEN wire. Connect from S1-9(C) to S2-6(S1).
- ( ) Cut a 3-1/2" piece of ORANGE wire. Connect from S2-2(C) to R3-3(C).
- ( ) Cut a 3-1/2" piece of WHITE wire. Connect from S2-5(C) to R4-3(C).
- ( ) Cut a 3-1/2" piece of WHITE wire. Connect from S2-3(C) to S1-1(S1).
- ( ) Cut both leads on a (22546) 56PF 500V CAPACITOR, C2, to 3/4". Cover leads with 1/2" of tubing, then connect from S2-5(S2) to S4-4(S1). Position C2 so that it lies in the same line as the lugs to which it is connected.

TABLE 1. INSTALLING COMPONENTS ON (82529) PRINTED CIRCUIT BOARDS

CHECKS PC1 PC2	PART NUMBER	NAME	DESCRIPTION	COLOR CODE	REFERENCE DESIGNATION
( ) ( )	23061	CAPACITOR	25 MFD, 3V		C101
( ) ( )	11523	RESISTOR	68K, 1/2W, 5%	BLU-GRAY-ORG-GOLD	R101
( ) ( )	11591	RESISTOR	560Ω, 1/2W, 5%	GRN-BLU-BRN-GOLD	R103
( ) ( )	94047	TRANSISTOR	GE 2N3391A		Q101
( ) ( )	11531	RESISTOR	470K, 1/2W, 5%	YEL-VIO-YEL-GOLD	R105
( ) ( )	22509	CAPACITOR	100 PF, 500V, 10%		C104
( ) ( )	22518	CAPACITOR	0.0027 UF, 500V, 10%		C103
( ) ( )	20087	CAPACITOR	0.01 UF, 400V, 10%		C105
( ) ( )	11552	RESISTOR	27K, 1/2W, 5%	RED-VIO-ORG-GOLD	R104
( ) ( )	11537	RESISTOR	180K, 1/2W, 5%	BRN-GRAY-YEL-GOLD	R106
( ) ( )	11566	RESISTOR	1K, 1/2W, 5%	BRN-BLK-RED-GOLD	R110
( ) ( )	11523	RESISTOR	68K, 1/2W, 5%	BLU-GRAY-ORG-GOLD	R102
( ) ( )	11500	RESISTOR	10K, 1/2W, 5%	BRN-BLK-ORG-GOLD	R108
( ) ( )	94047	TRANSISTOR	GE 2N3391A		Q102
( ) ( )	11589	RESISTOR	82Ω, 1/2W, 5%	GRAY-RED-BLK-GOLD	R109
( ) ( )	11585	RESISTOR	3.3K, 1/2W, 5%	ORG-ORG-RED-GOLD	R107
( ) ( )	23054	CAPACITOR	100 MF, 3V		C107
( ) ( )	23040	CAPACITOR	100 MF, 25V		C102
( ) ( )	23042	CAPACITOR	2 MF, 15V		C106

TABLE 2. CONNECTING LEADS TO PRINTED CIRCUIT BOARD PC1

CHECK	COLOR	LENGTH	CONNECT TO TERMINAL
( )	BLACK	2"	1
( )	WHITE	2"	2
( )	BARE WIRE	1/2"	3
( )	ORANGE	5"	4

TABLE 3. CONNECTING LEADS TO PRINTED CIRCUIT BOARD PC2

CHECK	COLOR	LENGTH	CONNECT TO TERMINAL
( )	BLACK	2"	1
( )	WHITE	2"	2
( )	BLACK	4"	3
( )	ORANGE	2"	4

NOTE: Before going on with the next figure, recheck all the steps in this figure for possible errors. Examine boards PC1 and PC2 carefully to make sure that the component leads are properly soldered and are not shorting. Inspect the transistors and electrolytic capacitors for proper installation.

FIGURE 8

TONE PRINTED BOARD COMPONENT MOUNTING

Mark one (82530) printed circuit board PC3 and the other PC4, then assemble components to these boards as follows:

- ( ) INSTALL RESISTORS, CAPACITORS, and TRANSISTORS on the two (82530) PRINTED CIRCUIT BOARDS as directed in TABLE 4. SCRAPE the component leads LIGHTLY, BEND the leads DOWN and INSTALL RESISTORS and CAPACITORS FLUSH with the board over the applicable reference designation. Bend leads on each component so that it stays on the board. OBSERVE POLARITY AS SHOWN WHEN INSTALLING CAPACITORS. ALIGN FLAT SIDE OF EACH TRANSISTOR WITH FLAT SIDE OF TRANSISTOR MARKING, bending center lead of transistor SLIGHTLY BACK to fit leads into terminal board holes. DO NOT try to install TRANSISTORS FLUSH with the board. Be sure to match up the three leads from each transistor with the proper terminal board holes. If improperly connected, the transistor may burn out when power is applied. Hook the transistor leads so that the transistor stays in place on the board. USE HEAT AND SOLDER SPARINGLY TO AVOID DAMAGE TO THE BOARDS OR COMPONENTS. AFTER SOLDERING, CUT the leads AS CLOSE AS POSSIBLE to the CONDUCTOR side of the board. As each component is installed, CHECK IT OFF on TABLE 4.

TABLE 4. INSTALLING COMPONENTS ON (82530) PRINTED CIRCUIT BOARDS

CHECKS PC3 PC4	PART NUMBER	NAME	DESCRIPTION	COLOR CODE	REFERENCE DESIGNATION
( ) ( )	11500	RESISTOR	10K, 1/2W, 5%	BRN-BLK-ORG-GOLD	R211
( ) ( )	11569	RESISTOR	4.7K, 1/2W, 5%	YEL-VIO-RED-GOLD	R202
( ) ( )	11500	RESISTOR	10K, 1/2W, 5%	BRN-BLK-ORG-GOLD	R208
( ) ( )	11511	RESISTOR	560K, 1/2W, 5%	GRN-BLU-YEL-GOLD	R207
( ) ( )	22562	CAPACITOR	0.005 MF, 25V		C206
( ) ( )	22562	CAPACITOR	0.005 MF, 25V		C205
( ) ( )	10521	RESISTOR	47K, 1/2W, 5%	YEL-VIO-ORG-GOLD	R206
( ) ( )	10521	RESISTOR	47K, 1/2W, 5%	YEL-VIO-ORG-GOLD	R209
( ) ( )	20095	CAPACITOR	0.008 UF, 200V, 10%		C204
( ) ( )	11511	RESISTOR	560K, 1/2W, 5%	GRN-BLU-YEL-GOLD	R204
( ) ( )	23042	CAPACITOR	2 MF, 15V		C203
( ) ( )	11533	RESISTOR	1.2K, 1/2W, 5%	BRN-RED-RED-GOLD	R203
( ) ( )	11548	RESISTOR	1 MEG, 1/2W, 5%	BRN-BLK-GRN-GOLD	R205
( ) ( )	23038	CAPACITOR	2 MF, 6V		C201
( ) ( )	11592	RESISTOR	1.5 MEG, 1/2W, 5%	BRN-GRN-GRN-GOLD	R201
( ) ( )	20083	CAPACITOR	0.02 MF, 200V, 10%		C202
( ) ( )	94047	TRANSISTOR	GE 2N3391A		Q201
( ) ( )	22532	CAPACITOR	0.0015 MF, 500V, 10%		C207
( ) ( )	23014	CAPACITOR	10 MF, 6V		C208
( ) ( )	11548	RESISTOR	1 MEG, 1/2W, 5%	BRN-BLK-GRN-GOLD	R210
( ) ( )	94047	TRANSISTOR	GE 2N3391A		Q202

- ( ) CONNECT leads to PC3 as directed in TABLE 5. STRIP 1/4" of insulation from both ends of each wire. ONLY ONE END will be connected at this time.
- ( ) CONNECT leads to PC4 as directed in TABLE 6. STRIP 1/4" of insulation from both ends of each wire. ONLY ONE END will be connected at this time.

FIGURE 6

REAR PANEL AND SUB-PANEL MOUNTING

- ( ) Attach (81484) rear panel to (81482) chassis, securing it at each end with a (41086) No. 6-32 x 5/16" BINDING HEAD screw, a (42002) No. 6 lockwasher and a (40000) No. 6-32 hex nut. Also secure panel to lip of chassis with two (41035) No. 6 x 1/4" SHEET METAL screws.
- ( ) Attach (81481) subpanel to (81482) chassis, securing it with four (41086) No. 6-32 x 5/16" BINDING HEAD screws, four (42002) No. 6 lockwashers, and four (40000) No. 6-32 hex nuts.

FIGURE 7

PHONO PREAMP PRINTED BOARD COMPONENT MOUNTING

Mark one (82529) printed circuit board PC1 and the other PC2, then assemble components to these boards as follows:

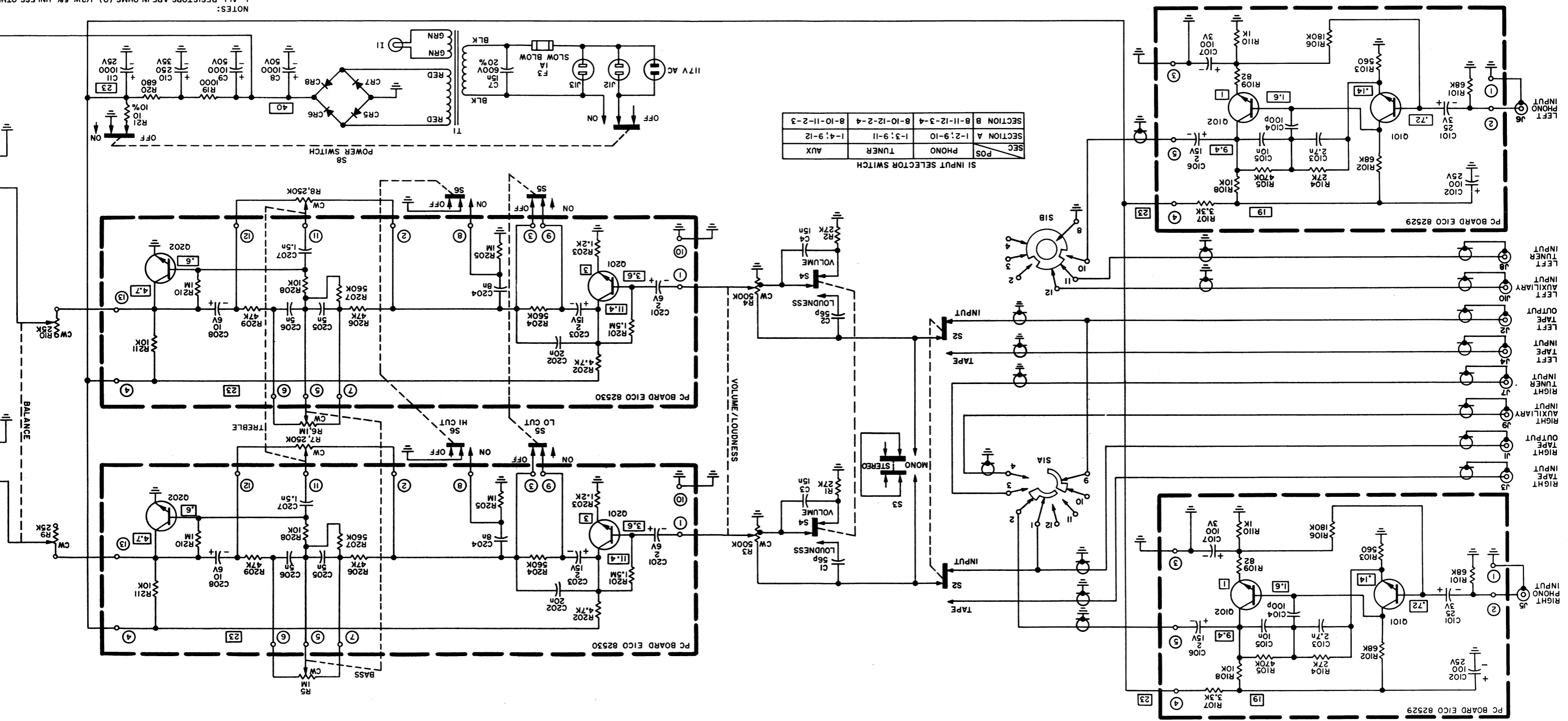
- ( ) INSTALL RESISTORS, CAPACITORS, and TRANSISTORS on the (82529) PRINTED CIRCUIT BOARDS as directed in TABLE 1. SCRAPE the component leads LIGHTLY. BEND the leads DOWN and INSTALL RESISTORS and CAPACITORS FLUSH with the board over the applicable reference designation. Bend leads on each component so that it stays on the board. OBSERVE POLARITY AS SHOWN WHEN INSTALLING CAPACITORS. ALIGN FLAT SIDE OF EACH TRANSISTOR with FLAT SIDE OF APPLICABLE TRANSISTOR MARKING, BENDING center lead of transistor SLIGHTLY BACK to fit leads into terminal board holes. DO NOT try to install TRANSISTORS FLUSH with the board. Be sure to match up the three leads from each transistor with the proper terminal board holes. If improperly connected, the transistor may burn out when power is applied. Hook the transistor leads so that the transistor stays in place on the board. USE HEAT AND SOLDER SPARINGLY TO AVOID DAMAGE TO THE BOARDS OR COMPONENTS. AFTER SOLDERING, CUT the leads AS CLOSE AS POSSIBLE to the CONDUCTOR side of the board. As each component is installed, CHECK IT OFF on TABLE 1.

NOTE: If the voltage rating of any capacitor is HIGHER than the value listed in Table 1, (or in any of the tables that follow) it is still acceptable.

- ( ) CONNECT leads to terminals 1 through 4 of PC1 as directed in TABLE 2. STRIP 1/4" of insulation from both ends of each wire. ONLY ONE END will be connected at this time.
- ( ) Strip off 5/8" of OUTER insulation from one end of a 7" length of ORANGE coaxial cable. Pull INNER conductor out of the braid, then twist the braid to prevent the strands from fraying. (Refer to the paragraph titled "PREPARATION OF RG-174U CABLE" in the introductory portion of this manual.) Connect the braid to the bare wire from terminal 3 of PC1(S2). Connect the INNER conductor to terminal 5 of PC1(S1). Strip off 1-1/4" of outer insulation from the other end of lead, then pull INNER conductor out of braid, twisting the braid to prevent the strands from fraying.
- ( ) CONNECT leads to terminals 1 through 4 of PC2 as directed in TABLE 3. STRIP 1/4" of insulation from both ends of each wire. ONLY ONE END will be connected at this time.
- ( ) Strip off 5/8" of outer insulation and shield from one end of an 8" piece of ORANGE coaxial cable. Connect this end to terminal 5 of PC2. Slip a 1/2" piece of insulated tubing over the soldered end of this lead. Strip off 1-1/4" of outer insulation from other end of lead, then pull inner conductor out of braid, twisting the braid to prevent the strands from fraying.

# EICO 3070 SCHEMATIC DIAGRAM

NOTES:  
 1. ALL RESISTORS ARE IN OHMS (Ω), 1/2W, 5% UNLESS OTHERWISE SPECIFIED.  
 2. ALL CAPACITORS ARE IN μF, 10% (EXCEPT ELECTROLYTIC WHICH ARE IN MFD).  
 3. ROTARY SWITCHES ARE SHOWN FROM KNOB END WITH SWITCH POSITIONS INDICATED BY DASHES.  
 4. □ INDICATES DC VOLTAGES.  
 5. ○ INDICATES SOLDER POINTS ON PC BOARDS.  
 6. M=MEG OHMS (1MΩ=1000000Ω), K=KIL OHMS (1KΩ=1000Ω).

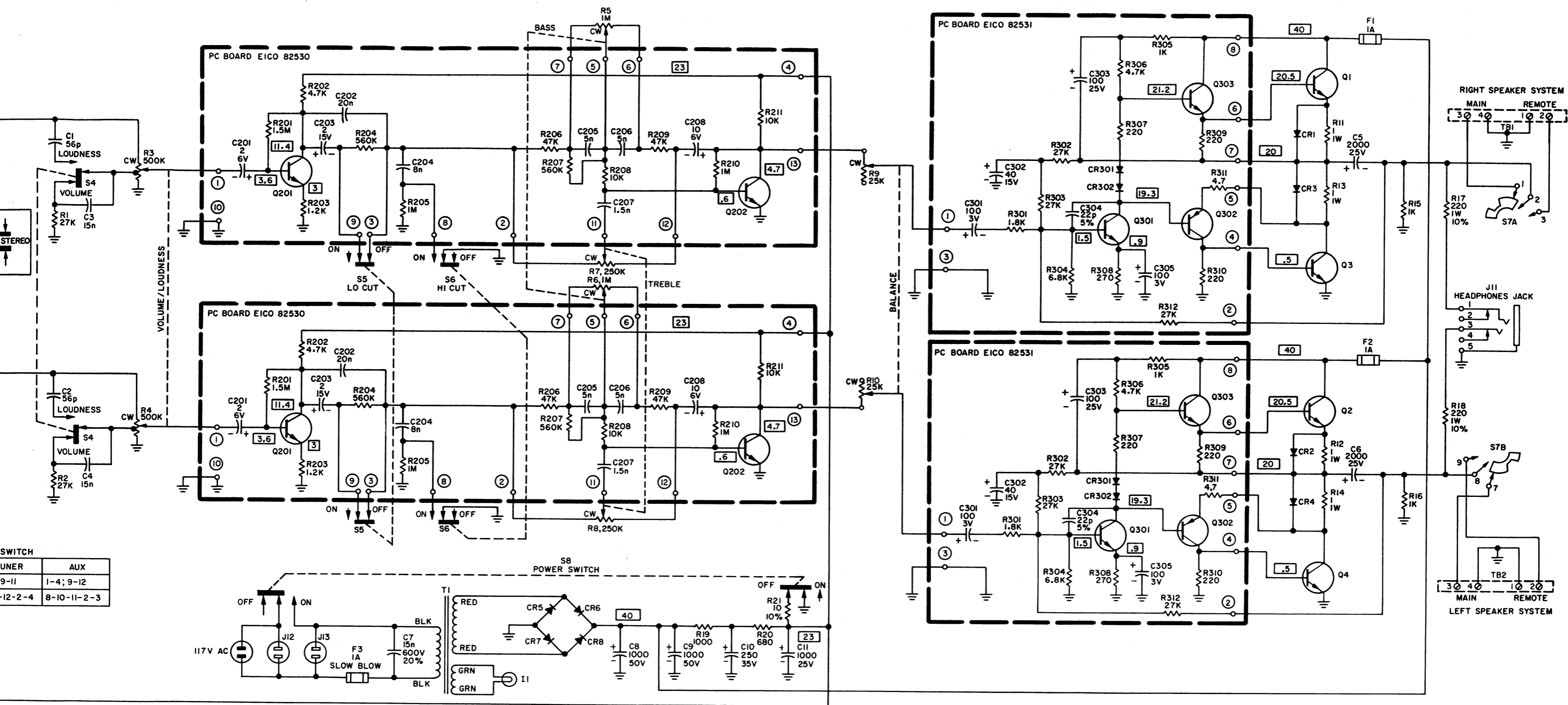


SEC	POS	PHONO	TUNER	AUX
SECTION A	1-2; 9-10	1-3; 9-11	1-4; 9-12	
SECTION B	8-11-12-3-4	8-10-12-2-4	8-10-11-2-3	

BALANCE

VOLUME/LOUDNESS

RIGHT PHONO INPUT  
 RIGHT TAPE INPUT  
 RIGHT AUXILIARY INPUT  
 RIGHT TUNER INPUT  
 LEFT TAPE INPUT  
 LEFT TAPE OUTPUT  
 LEFT AUXILIARY INPUT  
 LEFT TUNER INPUT  
 LEFT PHONO INPUT



SWITCH	
UNER	AUX
9-11	1-4; 9-12
12-2-4	8-10-11-2-3

- NOTES:
1. ALL RESISTORS ARE IN OHMS ( $\Omega$ ), 1/2W, 5% UNLESS OTHERWISE INDICATED.
  2. ALL CAPACITORS ARE IN  $\mu$ F, 10% (EXCEPT ELECTROLYTICS) UNLESS OTHERWISE INDICATED.
  3. ROTARY SWITCHES ARE SHOWN FROM KNOB END WITH SWITCH IN THE EXTREME COUNTERCLOCKWISE POSITION.
  4.  $\square$  INDICATES DC VOLTAGES.
  5.  $\circ$  INDICATES SOLDER POINTS ON PC BOARDS.
  6. M = MEGOHMS ( $1M\Omega = 1000000\Omega$ ), K = KILOHMS ( $1K\Omega = 1000\Omega$ ), p = PICOFARADS ( $1pF = 1\mu\mu F$ ), n = NANOFARADS ( $1nF = 1000pF = 1000\mu\mu F = .001\mu F$ )

S7 SPEAKER SYSTEM SELECTOR SWITCH

SEC	POS	PHONES	MAIN	REMOTE	ALL
SECTION A	-	-	1-2	2-3	1-2-3
SECTION B	-	-	7-8	8-9	7-8-9

EICO 3070 SCHEMATIC DIAGRAM



**PARTS LIST**

DESCRIPTION	QUANTITY	PRICE EACH	STOCK#	SYM.#	DESCRIPTION	QUANTITY	PRICE EACH	STOCK#	DESCRIPTION	QUANTITY	PRICE EACH	STOCK#	DESCRIPTION	QUANTITY
<b>SEMICONDUCTORS</b>														
capacitor, molded, .015uf, 50V, 20%	1	1.60	93020	CR5,6, CR7,8	rectifier, 1A, 200V PIV	4	1.35	82529	PC board phono amplifier	2	.19	82100	cable clamp	1
capacitor, mylar, .02uf, 50V, 10%	2	.88	93027	CR1,2, CR3,4	rectifier, RCA, 1N3193 or equivalent	4	1.72	82530	PC board preamplifier	2	.12	82102	line cord clamp	1
capacitor, mylar, .01uf, 50V, 10%	2	.76	93028	CR301, CR302	rectifier, RCA, 1N3754 or equivalent	4	1.35	82531	PC board driver	2	4.90	88142	cabinet, metal	1
capacitor, mylar, .008uf, 50V, 10%	2	.99	94047	Q101, Q102	transistor, GE 2N3391A or equivalent	4					n/c	89349	caution label	1
capacitor, mylar, 5uf, 10%, 100V	2	.99	94048	Q201, Q202	transistor, GE 2N3391 or 2N3391A or equivalent	4					n/c	89394	label, power consumption	1
capacitor, disc, 100pf, 50V, 10%	2	2.19	94049	Q1,2, 3,4	transistor, RCA 40312 matched or equivalent	4					.10	89627	capsule, glue	1
capacitor, disc, .0027uf, 50V, 10%	2	1.41	94050	Q303	transistor, RCA 40361 or equivalent	2					.12	89749	capsule, silicon grease	1
capacitor, disc, .0015uf, 50V, 10%	2	1.41	94051	Q301	transistor, RCA 40317 or equivalent	2					.20	97087	transistor socket	4
capacitor, disc, 56pf, 50V, 10%	2	2.40	94052	Q302	transistor, RCA 40362 or equivalent	2					.14	97304	switch cover	1
capacitor, disc, .005uf, 50V, 10%	4										.34	97712	socket for pilot bulb	1
capacitor, disc, 22pf, 50V, 5%	2	.14	91002	F1,2	fuse, 1A	2					.27	97729	jewel, red glass	1
capacitor, elec., 10uf, 6V	2	.58	91006	F3	fuse, slow blow, 1A	1					.42	97805	fuseholder, short	3
capacitor, elec., 1000uf, 25V	1	.23	92000	I1	pilot bulb, #47	1								
capacitor, elec., 40uf, 15V	2													
capacitor, elec., 1000uf, 50V	2	.18	50011	J1,2, 3,4	phono, input, jack, dual	2								
capacitor, elec., 2uF, 6V	2	.02	50012		insulator for 50011	2								
capacitor, elec., 100uF, 25V	4	.26	50016	J12,13	AC receptacle	2								
capacitor, elec., 2uF, 15V	4	.21	50018	J5,6,7, 8,9,10	phono input jack, triple	2								
capacitor, elec., 100uf, 3V	6	.02	50019		insulator for 50018	2								
capacitor, elec., 25uf, 3V	2	.96	50040	J11	stereo headphone jack	1								
capacitor, elec., 250uf, 35V	1													
capacitor, elec., 2000uF, 25V	2	.10	54000		terminal strip, 1 post left	2								
transformer	1	.10	54001		terminal strip, 1 post right	2								
		.10	54002		terminal strip, 1 post right w/gnd.	1								
		.10	54007		terminal strip, 3 post 2 right w/gnd.	1								
		.10	54013		terminal strip, 1 post left w/gnd.	3								
		.10	54015		terminal strip, 3 post 2 left w/gnd.	2								
		.25	54500	TB1,2	terminal board, 4 screw	2								
<b>PRINTED CIRCUIT BOARDS</b>														
<b>HARDWARE</b>														
		.01	40000		nut, hex, #6-32	46								
		.02	40001		nut, hex, 3/8-32	6								
		.01	40004		nut, hex, #2-56	2								
		.01	40007		nut, hex, #4-40	8								
		.04	40011		nut, wing, #10-32	1								
		.01	40012		nut, hex, #10-32	13								
		.07	40016		nut, hex, 1/2 x 24	3								
		.04	40019		nut, Tinnerman, #6-32	1								
		.04	40034		nut, Tinnerman, #4-40	12								
		.02	40055		nut, hex, #8-32	4								
		.01	41002		screw, #6 x 3/8, sheet metal	12								
		.02	41022		screw, #2-56 x 3/8, Fl. Hd.	2								
		.01	41035		screw, #6 x 1/4" sheet metal	13								
		.03	41051		screw, #10-32 x 1/2, Rd. Hd.	1								
		.01	41066		screw, #8-32 x 5/16, B.H.	4								
		.01	41086		screw, #6-32 x 5/16, B.H.	46								
		.01	41088		screw, #6-32 x 3/8, Fl. Hd.	1								
		.01	41090		screw, #4-40 x 5/16, B.H.	8								
		.01	41095		screw, #2-56 x 1/4, B.H.	24								
		.01	41164		screw, #4-40 x 5/8, Fl. Hd.	12								
		.01	42001		washer, flat, 3/8"	6								
		.01	42002		washer, lock, #6	44								
		.01	42004		washer, lock, #10	13								
		.01	42007		washer, lock, #4	8								
		.01	42008		washer, flat, #8	4								
		.01	42011		washer, flat, #10	1								
		.05	42029		washer, rubber, 1/2"	3								
		.01	42053		washer, lock, #2	2								
		.04	42069		mica insulating washer	4								
		.02	43000		lug, ground, #6	3								
		.05	44001		spacer	12								
		.70	45026		standoffs	12								
<b>MISCELLANEOUS</b>														
		.14	46022		foot	4								
		.87	53105		knob	6								
		.99	57006		line cord	1								
		1.50	66184		manual, operating	1								
		2.50	66427		manual, assembly	1								
		11.30	80189		panel, front	1								
		3.45	81481		subpanel	1								
		5.75	81482		chassis	1								
		3.45	81483		bottom plate	1								
		2.60	81484		rear panel	1								
		1.45	81513		transformer bracket	1								

To order replacement parts, specify description and part number. Remittance must be made with order and include \$1.00 for mailing and handling with each order (\$1.50 if the order includes the power transformer). Prices subject to change without notice.

NOTE: All components with symbol numbers from 100 to 400 appear in the amplifier twice.

PARTS LIST

PRICE EACH	STOCK#	SYM. #	DESCRIPTION	QUANTITY	PRICE EACH	STOCK#	SYM. #	DESCRIPTION	QUANTITY	PRICE EACH	STOCK#	SYM. #	DESCRIPTION	QUANTITY	PRICE EACH	STOCK#	
<u>RESISTORS</u>					<u>CAPACITORS</u>					<u>SEMICONDUCTORS</u>					<u>PRINTED CIRCUIT</u>		
.09	10454	R21	resistor, 10Ω, 1/2W, 10%	1	.23	20078	C7	capacitor, molded, .015uf, 600V, 20%	1	1.60	93020	CR5,6, CR7,8	rectifier, 1A, 200V PIV	4	1.35	82529	
.27	10521	R206, R209	resistor, 47K, 1/2W, 5%	4	.25	20083	C202	capacitor, mylar, .02uf, 200V, 10%	2	.88	93027	CR1,2, CR3,4	rectifier, RCA, 1N3193 or equivalent	4	1.72	82530	
.22	10528	R308	resistor, 270Ω, 1/2W, 5%	2	.22	20087	C105	capacitor, mylar, .01uf, 400V, 10%	2	.76	93028	CR301, CR302	rectifier, RCA, 1N3754 or equivalent	4	1.35	82531	
.22	10529	R20	resistor, 680Ω, 1/2W, 5%	1	.25	20095	C204	capacitor, mylar, .008uf, 200V, 10%	2	.99	94047	Q101, Q102	transistor, GE 2N3391A or equivalent	4	.01	40000	
.30	10542	R311	resistor, 4.7Ω, 1/2W, 5%	2	.21	20102	C3,4	capacitor, mylar .015uf, 10%, 100V	2	.99	94048	Q201, Q202	transistor, GE 2N3391 or 2N3391A or equivalent	4	.02	40001	
.22	10546	R307, R309, R310	resistor, 220Ω, 1/2W, 5%	6	.09	22509	C104	capacitor, disc, 100pf, 500V, 10%	2	2.19	94049	Q1,2, 3,4	transistor, RCA 40312 matched or equivalent	4	.01	40004	
.18	10863	R17, R18	resistor, 220Ω, 1W, 10%	2	.15	22518	C103	capacitor, disc, .0027uf, 500V, 10%	2	1.41	94050	Q303	transistor, RCA 40361 or equivalent	2	.01	40007	
.14	11500	R108, R208, R211	resistor, 10K, 1/2W, 5%	6	.15	22532	C207	capacitor, disc, .0015uf, 500V, 10%	2	1.41	94051	Q301	transistor, RCA 40317 or equivalent	2	.04	40011	
.14	11511	R204, R207	resistor, 560K, 1/2W, 5%	4	.12	22546	C1,2	capacitor, disc, 56pf, 500V, 10%	2	2.40	94052	Q302	transistor, RCA 40362 or equivalent	2	.07	40012	
.14	11523	R101, R102	resistor, 68K, 1/2W, 5%	4	.15	22562	C205, C206	capacitor, disc, .005uf, 25V, 10%	4						.04	40016	
.14	11531	R105	resistor, 470K, 1/2W, 5%	2	.15	22607	C304	capacitor, disc, 22pf, NPO, 500V, 5%	2						.04	40019	
.14	11533	R203	resistor, 1.2K, 1/2W, 5%	2	.63	23014	C208	capacitor, elec., 10uf, 6V	2	.14	91002	F1,2	fuse, 1A	2	.04	40034	
.14	11537	R106	resistor, 180K, 1/2W, 5%	2	2.20	23022	C11	capacitor, elec., 1000uf, 25V	1	.58	91006	F3	fuse, slow blow, 1A	1	.01	40055	
.14	11543	R301	resistor, 1.8K, 1/2W, 5%	2	.58	23032	C302	capacitor, elec., 40uf, 15V	2	.23	92000	I1	pilot bulb, #47	1	.01	41002	
.14	11548	R205, R210	resistor, 1M, 1/2W, 5%	4	2.50	23035	C8,9	capacitor, elec., 1000uf, 50V	2						.01	41035	
.14	11552	R1,2, R104, R302, R303, R312	resistor, 27K, 1/2W, 5%	10	.26	23038	C201	capacitor, elec., 2uF, 6V	2	.18	50011	J1,2, 3,4	phono, input, jack, dual	2	.01	41051	
.14	11566	R15, 16,19, R110, R305	resistor, 1K, 1/2W, 5%	7	.55	23040	C102, C303	capacitor, elec., 100uF, 25V	4	.02	50012		insulator for 50011	2	.01	41066	
.14	11569	R202, R306	resistor, 4.7K, 1/2W, 5%	4	.26	23042	C106, C203	capacitor, elec., 2uF, 15V	4	.21	50016	J12,13	AC receptacle	2	.01	41086	
.14	11570	R304	resistor, 6.8K, 1/2W, 5%	2	.52	23054	C107, C301, C305	capacitor, elec., 100uf, 3V	6	.02	50018	J5,6,7, 8,9,10	phono input jack, triple	2	.05	41088	
.14	11585	R107	resistor, 3.3K, 1/2W, 5%	2			C101	capacitor, elec., 25uf, 3V	2	.02	50019		insulator for 50018	2	.01	41090	
.17	11589	R109	resistor, 82Ω, 1/2W, 5%	2	1.15	23074	C10	capacitor, elec., 250uf, 35V	1	.96	50040	J11	stereo headphone jack	1	.02	41095	
.17	11591	R103	resistor, 560Ω, 1/2W, 5%	2	2.25	23089	C5,6	capacitor, elec., 2000uF, 25V	2						.01	41164	
.17	11592	R201	resistor, 1.5M, 1/2W, 5%	2											.01	42001	
.61	15902	R11, 12,13, 14	resistor, 1Ω, 1W, 5%	4											.01	42002	
<u>POTENTIOMETERS</u>					<u>TRANSFORMERS</u>					<u>JACKS &amp; RECEPTACLES</u>					<u>MISCELLANEOUS</u>		
2.44	18130	R9,10	potentiometer, dual, 25K, special	1	13.92	30085	T1	power transformer	1	.10	54000		terminal strip, 1 post left	2	.14	46022	
3.12	18131	R3,4	potentiometer, dual, 500K, CT, linear	1	3.34	60153	S1	switch, rotary, input selector	1	.10	54001		terminal strip, 1 post right	2	.87	53105	
2.00	18169	R5,6	potentiometer, dual, 1M, linear	1	2.04	60186	S7	switch, rotary, speaker selector	1	.10	54002		terminal strip, 1 post right w/gnd.	1	.99	57006	
2.30	18170	R7,8	potentiometer, dual, 250K, linear	1	.96	62034	S2,3, 4,5, 6,8	switch, rocker, DPDT, brown	6	.10	54007		terminal strip, 3 post 2 right w/gnd.	1	1.50	66184	
										.10	54013		terminal strip, 1 post left w/gnd.	3	2.50	66427	
										.10	54015		terminal strip, 3 post 2 left w/gnd.	2	11.30	80189	
										.25	54500	TB1,2	terminal board, 4 screw	2	3.45	81481	
														5.75	81482		
														3.45	81483		
														2.60	81484		
														1.45	81513		

NOTE: All components with symbol numbers from 100 to 400 appear in the amplifier twice.

## MODEL 3070 ADDENDUM

Please make the following changes in your Operating Manual:

### PARTS LIST - RESISTORS

Remove 10454 R21 Resistor, 10 ohm, 1/2W, 10% (1)  
Add 10439 R21 Resistor 100 ohm, 1/2W, 10% (1)  
Change R308 Resistor, 270 ohm, 1/2W, 5%, 10528 (2)  
to R308 Resistor, 330 ohm, 1/2W, 5%, 11549 (2)  
Change 11552 Resistor, 27K, 1/2W, 5% to 10565 (10)  
Change 11566 Resistor, 1k, 1/2W, 5% to 10566 (7)  
Change 11569 Resistor, 4.7K, 1/2W, 5% to 10567 (4)

### PARTS LIST - CAPACITORS

Remove 23038 C201 Capacitor, elec., 2UF, 6V (2)  
Add to 23042 Capacitor, elec., 2UF, 15V: C201. Quantity is now (6)  
Remove C303 from 23040 Cap., 100UF, 25V quantity is now (2)  
Add 23007 C303 from Capacitor, elec., 50UF, 25V quantity (2)  
Remove 23089 C5, 6 Capacitor, elec., 2000UF, 25V (2)  
Add 23099 C5, 6 Capacitor, elec., 2500UF, 25V (2)

### PARTS LIST - SEMICONDUCTORS

Remove reference to 94048. Q201 & Q202 are supplied as 94047 as is Q101 & Q102 (RCA 3391A or equiv.).

### PARTS LIST - MISCELLANEOUS

Remove 97304 switch cover (1)

### SCHEMATIC DIAGRAM

Change value of R21 to 100 ohm, 10%  
Change value of C201 to 2, 15V (2 places)  
Change value of C303 to 50, 25V (2 places)  
Change value of R308 from 270 to 330 (2 places)  
Change value of C5 & C6 from 2000 (mfd) to 2500 (mfd)

If you have a kit, please make the following changes in your Assembly Manual:

Page 11, Introduction to Steps 9 thru 14 second line: Change "DPDT rocket switches" to "DPDT rocker switches".

Page 14, Figure 5, Steps 8 & 10: Change "(20102) 0.015UF, 200V, Capacitor" to "..... 100V Capacitor".

Page 14, Figure 5, Step 22: Delete entire step

MODEL 3070 ADDENDUM (Cont'd)

Page 18, Table 4: For C201 change 23038 - 2MF, 6V to 23042 - 2MF, 15V.

Page 20, Table 7: For CR301 & CR302 change description to .1A, 100PIV  
For R308 change part number to 11549 Resistor 330 ohm, 1/2W, 5% ORG-ORG-BRN-GOLD.  
For C303 change part number to 23007 Capacitor, 50MF, 25V.

Page 22, Fig. 10, Step 1: Change "(23089) 2000 UFD, 25V"  
to "(23099) 2500 UFD, 25V".

Page 22, Fig. 10, Step 11: Change (10454) 10 ohm, 1/2W, 10% (brown, black, black, silver) to (10439) 100 ohm, 1/2W, 10% (brown, black, brown, silver).

Page 22, Fig. 10, Steps 7, 9, 12 & 13: The (93020) rectifiers supplied with your kit may be marked with a colored band instead of an arrow described in the above steps. If your rectifiers have a colored band, then consider the lead closest to the band equivalent to the lead TO which the arrow points (cathode end).

Page 26, Fig. 11, Step 2: Change "(23089) 2000UF, 25V..."  
to "(23099) 2500 UF, 25V..."

In the following places change stock #11566 to 10566:

Page 16, Fig. 7, Table 1 (R110)  
Page 20, Fig. 9, Table 7 (R305)  
Page 22, Fig. 10, Steps 2 & 8 (R15 & R19)  
Page 26, Fig. 11, Step 3 (R16)

In the following places change stock #11552 to 10565:

Page 16, Fig. 7, Table 1 (R104)  
Page 20, Fig. 9, Table 7 (R302, 303, 312)  
Page 23, Fig. 10, Steps 29 & 30 (R1 & 2)

In the following places change stock #11569 to 10567:

Page 18, Fig. 8, Table 4 (R202)  
Page 20, Fig. 9, Table 7 (R306)

Assembly Fig. 10 Printed Circuit Board PC6: The physical positions of terminals 2 and 3 are reversed. The instructions on Table 9, Page 21 are correct. Change 3 to 2 (Violet wire connected to 2) and change 2 to 3 (black wire connected to 3). Disregard picture of slide switch cover on S8.

Kit Package Breakdown VS Kit Steps

Fig. 9, CR301 & CR302: Change location A3070-09 to A3070-07.

MODEL 3070 ADDENDUM

Please make the following changes in your Operating Manual:

PARTS LIST:

For C202 change stock # and description to 20086 .022 mfd, 400V, 10%  
(2 req'd)

Schematic Diagram:

On P.C. Boards (2) 82530 change C202 from 20n to 22n.

If you have a kit, please correct your Assembly Manual as follows:

Page 18, Table 4 (P.C. Boards PC3 & PC4 - 82530)

Change C202 to 20086 .022 mf, 400V, 10%

I.E. 1978

EICO ELECTRONIC INSTRUMENT CO., INC.  
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## GENERAL INFORMATION

Symptom	Cause	Remedy
Scratch filter (HI-CUT) not working properly.	Defective switch S6.	Check and repair or replace if necessary.

The following parts of the trouble-shooting chart are given with the assumption that both channels of the amplifier between the INPUT SELECTOR switch S1 and the output are functioning satisfactorily, and a signal fed into the auxiliary or tuner inputs is being amplified and properly reproduced at the outputs.

No signal is coming through on one or both channels when signal is fed into the tape inputs and the TAPE-INPUT switch is at TAPE.	One or both coaxial cables between the tape input jacks and the TAPE-INPUT switch is shorted.	Check and remove the short.
	Defective TAPE-INPUT switch S2.	Check and repair or replace if necessary.

### Defective Phono Preamplifier

Signal fed into the input of the phono preamplifier does not come through the amplifier.	Shorted coaxial cable between the output of the preamplifier and the INPUT SELECTOR switch S1.	Check and remove the short.
	Defective transistors Q101 or Q102 in the affected channel.	Check and replace if necessary.
No voltage or very low supply voltage.	Short or excessive leakage in C102 in the affected channel.	Check and replace if necessary.
	Defective Q101 or Q102 in the affected channel.	Check and replace if necessary.
Very high distortion.	The level of signal being fed into the input is too high.	Check and decrease the level of the signal to within the range given in the SPECIFICATIONS.
High hum level.	Poor lead dressing.	Check and correct if necessary.

### Introduction

The Model 3070 "Cortina" stereo integrated preamplifier-power amplifier is an all solid-state audio amplification system that does not use any performance-limiting transformers (excluding the power transformer) in its design. Its complement of 18 silicon transistors and 12 diodes makes it one of the finest examples of what can be done when modern semiconductor technology is combined with the best in audio circuit design.

Designed to give genuine high fidelity quality performance, with the greatest versatility and operating simplicity, your "Cortina" amplifier will give you many years of satisfying, troublefree operation. The clean, undistorted audio power delivered by this amplifier is sufficient to drive any type of loudspeakers, even the low-efficiency types. The excellent rise time, enables this amplifier to respond to all the transients present in a musical score.

This advanced audio circuitry is mounted within a physically small package that enables placing the amplifier in a bookcase, on a standard shelf, on a small table, or almost any other limited space.

### Installation

Read and follow carefully the INSTALLATION PROCEDURE section of this manual to make sure that no damage is done to the unit because of improper handling or installation and to assure the best possible performance.

### Unpacking

This amplifier has been thoroughly tested and inspected before packing. If you find visible damage upon unpacking, notify the dealer at once. If the unit was shipped, you must file a claim with the carrier, since only you can be reimbursed for shipping damages. Your dealer and EICO will cooperate.

### Warranty Policy

Please read the EICO WARRANTY, and note that the registration card accompanying each unit should be filled in and returned to the company within 10 days of the date of purchase. The warranty applies only if we have your registration card on file.

## SPECIFICATIONS

The detailed specifications for the Model 3070 are as follows:

Total IHF music power: 70 watts into a 4Ω load, 50 watts into an 8Ω load.

Frequency response: 5Hz - 100kHz ±1.5db, 8Hz - 60kHz ±0.5db

Harmonic distortion: less than 0.8% between 50Hz and 10kHz at 15 watts continuous per channel  
 " " " " 20Hz and 20kHz at 10 watts " " "

Hum and noise: 72db below rated output

Channel separation: 50db

Input sensitivity: 4.2mV magnetic phono input, 270mV at all other inputs

Power bandwidth: 10Hz to 40kHz at 1% distortion

Damping factor: minimum 30 with 8Ω load

Rise time: 4uS

Tone control range: Treble  $\pm 15$ db at 10kHz, Bass  $\pm 15$ db at 50Hz, Lo-Cut (rumble filter) -6db at 50Hz, Hi-Cut (scratch filter) -7db at 10kHz

Range of balance control: 23db

RIAA equalization:  $\pm 0.5$ db, 30Hz - 15kHz

Total continuous output power (RMS): 40 watts into 4 $\Omega$ , 30 watts into 8 $\Omega$ , 16 watts into 16 $\Omega$

IM distortion: less than 2% at full power, less than 1% at 8 watts per channel with 8 $\Omega$  load

Input impedance: 47K $\Omega$  on magnetic phono input, 110K $\Omega$  minimum on all other inputs

Outputs: Two stereo speaker systems with impedances of 4 $\Omega$ , 8 $\Omega$ , or 16 $\Omega$   
Tape recorder output (not affected by control settings)  
Stereo headphone jack on front panel for all low-impedance headphones.

Inputs: Magnetic phonograph, Tuner, Tape, Auxiliary

AC receptacles: one switched, one unswitched

Power requirements: 105-130 VAC, 50-60Hz, 20 watts no signal, 75 watts full output, 100W full output with 4 $\Omega$  speakers

Size: 3-1/8" high, 12" wide, 7-3/4" deep

Weight: 7-1/2 lbs.

## INSTALLATION PROCEDURE

### Ventilation

Your Model 3070 is designed for self ventilation provided that there is space around it for air to circulate freely. There are holes in the bottom plate to admit cool air, and openings in the rear through which the air can exit. In order to take full advantage of these provisions, the following rules must be observed when installing the unit:

1. Do not locate the Model 3070 near a heat vent or radiator which would cause abnormally high surrounding air temperature.

2. Do not fill the area behind the unit. The protruding fuseholders and connectors should determine the minimum distance between the rear panel and any object behind it.

3. Do not place any objects on top of the unit which may obstruct ventilation or damage the cabinet.

4. The molded plastic feet space the bottom away from the supporting surface and permit the cooling air to enter the bottom perforations. These feet can be replaced by shorter ones, if desired, down to 1/4" (e.g. for upright installation between books on a shelf). Nevertheless, at no time can any solid object be put flat against the bottom plate as this would almost completely eliminate any air circulation.

5. If the unit is installed in a cabinet or a bookcase, leave the rear of the cabinet or bookcase open if possible. If the back is closed, provide several ventilating holes in the bottom and top of the back panel.

Symptom	Cause	Remedy
	Defective SPEAKERS switch S7.	Check and repair or replace if necessary.
	Defective power transistors Q1 & Q3 or Q2 & Q4 in the inoperative channel.	Check and replace if necessary.
	Collectors of Q1, Q2, Q3 or Q4 shorted to chassis because of wrong mounting or lack of insulating washers.	Check and correct mounting if necessary.
	Defective preamplifier.	See the following section.
Balance control not working.	Defective R9 or R10 or both.	While checking, remember that these potentiometers represent a short for 50% of rotation and increasing resistance for the remaining 50%; each in opposite direction.
No output on either "MAIN" or "REMOTE" or both speaker output terminals.	Defective SPEAKERS switch S7.	Check and repair or replace if necessary.
No output on the headphones.	Poor contact between jack and the plug.	Check and if necessary bend blades slightly to assure proper contacts.

### Defective Preamplifier (all inputs)

No voltage or very low supply voltage in stages involving Q201 and Q202 (right channel or left channel).	Short or excessive leakage in C10 or C11. Defective Q201 or Q202 in the affected channel.	Check and replace if necessary. Check and replace if necessary.
Signal fed into the input does not come through the preamplifier (with volume control at mid-rotation).	Shorted coaxial cable between the input jack and the INPUT SELECTOR switch S1 or between S1 and the TAPE OUT jack. Defective transistor Q201 or Q202 in the affected channel. Defective volume control R4 if left channel, R3 if right channel.	Check and remove the short. Check and replace if necessary. Check and replace if necessary.
Bass control not working properly.	Defective potentiometer R6 if left channel, R5 if right channel.	Check and replace if necessary.
Rumble filter (LO-CUT) not working properly.	Defective switch S5.	Check and repair or replace if necessary.
Treble control not working properly.	Defective potentiometer R8 if left channel, R7 if right channel.	Check and replace if necessary.

Symptom	Cause	Remedy
No pilot light regardless of the condition of the rest of the amplifier.	Bulb I1 defective.	Check and replace if necessary.
No voltage or very low supply voltage in the driver amplifiers involving Q301, Q302, and Q303.	Short or excessive leakage in C5, C6, C8, C9 or C303. Defective one or more of transistors, Q1, Q2, Q3, Q4, Q301, Q302 or Q303. Defective fuse F1 or F2. Defective CR5, CR6, CR7 or CR8.	Check and replace if necessary. Check and replace if necessary. Check and replace if necessary. Check and replace if necessary.
Excessive DC voltage at the speaker terminals with speakers removed (to be checked with the volume control in the extreme counter-clockwise position. If this voltage is below .5 VDC, the voltage is not considered excessive. This voltage should be measured not sooner than 1 minute after the unit is switched on.)	A defective power transistor, Q1, Q2, Q3 or Q4. Short or excessive leakage in C5, C6 or C303. A defective biasing diode CR301, or CR302.	Check and replace if necessary. Check and replace if necessary. Check and replace if necessary.
Very high distortion.	Defect in the feedback loop of the particular channel (also causing high power output at abnormally low volume control settings). Mismatch in output transistors Q1 & Q3 and Q2 & Q4. The two transistors in each pair should have identical color marks.	Check R312 and replace if necessary. Check color marks and rearrange or replace if necessary.
No output on one channel. (If the above steps were followed with both channels inoperative and without success, continue with this step).	Defective speaker or shorted speaker line. Blown output amplifier fuse F1 or F2.	Check and correct. Check and replace with a proper type fuse only. Fuse may be blown by continued excessive drive, in which case only replacement is required. Fuse may also be blown as a result of short circuit in the speaker leads.

#### NOTE

Whenever connecting anything to or disconnecting from the amplifier always have the POWER-OFF switch in the OFF position and the VOLUME control in the fully counterclockwise position. Failure to obey this rule may cause damage to the amplifier or the speaker systems.

#### LOUDSPEAKER CONNECTIONS

##### Speaker Placement

The two loudspeaker systems used should be placed along the wall across the room from the usual listening area, or favorite chair. The spacing between the speakers is limited by the room available, but should not be less than 6 feet for good stereo effect. Avoid too large a spacing, as this may cause the "hole-in-the-middle" effect. Avoid having obstructions in front of the loudspeakers as these may seriously affect their frequency response.

##### Speaker Impedance

The most common loudspeaker impedance is 8Ω. Therefore, the output circuit protection fuses are selected for 8Ω loudspeakers. For 4Ω speakers, replace the 1-ampere fuses (F1 and F2) with 1-1/2-ampere types (obtained locally) to permit full possible power output on peaks without the fuses blowing. No change in fusing is required for 16Ω speakers.

If remote speakers are used in conjunction with the main speakers, the total impedance per channel should not be less than 4Ω. For example: you can use a pair of 8Ω speakers in parallel (total 4Ω), but not an 8Ω and a companion less-than-8Ω speaker (total impedance less than 4Ω). If main and remote speakers of 8Ω each are used they represent a total impedance of 4Ω and should be treated as 4Ω speakers as described above.

##### Left and Right Speakers

The loudspeakers are connected to the amplifier as shown in Figure 1. Note that the terminals are arranged so that all connections made to the upper row of terminals are for the LEFT channel, while all connections made to the lower row are for the RIGHT channel. In every case the speaker should be connected between the terminals either LEFT or RIGHT, MAIN or REMOTE and the GROUND terminal next to it.

##### Speaker Phasing

If the polarity of connections to one speaker is reversed with respect to the other speaker, the speakers are said to be improperly phased. As a result, bass tones will be severely weakened, and the stereo sound will tend to jump from one speaker to the other. To avoid improper phasing, examine the connection terminals on your speaker system. One, or both terminals should be marked in some way to indicate polarity (+ and -; 1 and 2; red dot and no dot; high and low; etc.). Connect similarly marked terminals on both speaker systems to similarly marked terminals on the amplifier. For example: if the "+" terminal of the left speaker system is connected to the upper MAIN speaker terminal, then connect the "+" terminal of the right speaker system to the lower MAIN speaker terminal. Both the other speaker connections are made to the adjacent GROUND terminals.

##### Speaker Connections

The loudspeakers should be connected to the amplifier with ordinary two-conductor flexible lamp wire such as used for most electrical appliances. Strip the insulation from the ends of the wires no more than 3/8 inch. If possible, solder the ends of the wire to spade lugs with the insulation running right up to the lugs. Otherwise, twist the strands of wire tightly together (tinning is highly advised)





If there is any disturbance similar to "howling" in the system at loud listening levels, place the phonograph system on a soft sponge rubber, or plastic foam mat to isolate it from vibrations.

#### Tuner Connections

Stereo FM tuners, such as EICO 3200, are provided with output jacks labeled RIGHT and LEFT. These are connected to the TUNER jacks on the rear panel of the amplifier with the tuner left channel going to the upper TUNER input, and the tuner right channel connected to the lower TUNER input. Low-loss shielded audio cables of minimum length are to be used. Other connections to the tuner are detailed in the tuner's operating manual. A monophonic tuner can be connected to either TUNER input or to both inputs connected externally in parallel.

#### Tape Recorder Connections

The TAPE IN jacks on the rear panel of the amplifier permit the connection of a stereo or mono tape recorder that includes its own preamplifier. Please note that these inputs are not designed to be used for connection of a tape deck that is simply a tape transport with heads but without preamplifiers.

Connect the tape recorder's right channel output to the lower TAPE IN jack, and the left channel to the upper TAPE IN jack. Low-loss shielded audio cables of minimum length should be used to make these connections. Refer to the tape recorder operating manual for further tape recorder connections.

If the recorder is of the monophonic type, connect the playback cable to either of the TAPE IN jacks or to both of them connected externally in parallel.

The TAPE OUT jacks on the rear of the amplifier permit connection to the inputs of a stereo tape recorder. See the tape recorder operating manual for details of making this connection. If the tape recorder permits stereo recording connect the LEFT (upper) channel TAPE OUT jack to the recorder left channel input, and the RIGHT (lower) channel TAPE OUT jack to the recorder right channel input. If the tape recorder permits only mono recording, connect either TAPE OUT jack to the high level input of the tape recorder. Low-loss shielded audio cables should be used in making these connections. If the cable lengths must exceed 2-1/2 feet, use RG-174U cable to make the connections.

The signals from both TAPE OUT jacks are not affected by the front panel BALANCE, VOLUME, BASS, or TREBLE controls.

#### Auxiliary Connections

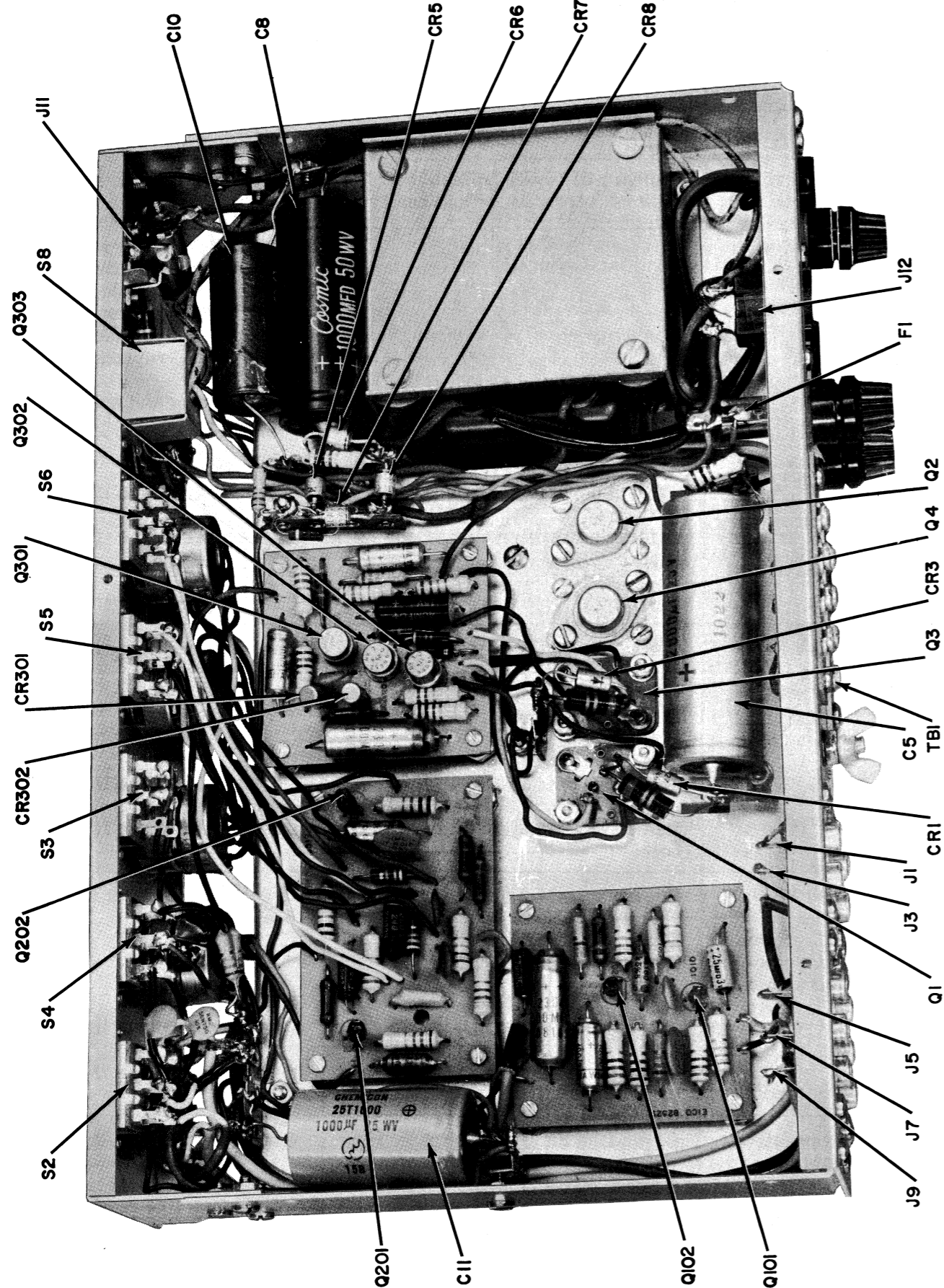
The AUX jacks on the rear of the unit are for connection of any stereo or mono program source, provided the signal level is sufficient. Such sources include electric guitar, TV, AM radio, SW radio, electronic organ, some types of phonograph cartridges (ceramic or crystal), etc. If the source does not have an external amplifier output, it often has an earphone jack that can serve this purpose, or an external amplifier output can be built in. When using a stereo source, connect the right and left channels to the respective LEFT and RIGHT AUX inputs using low-loss shielded audio cables. Connect a mono auxiliary source to either AUX jack or to both of them connected externally in parallel.

#### POWER CONNECTIONS

The line cord of the amplifier should be connected to a source of 117 VAC at 50-60 Hz. Do not connect the amplifier to a power source of other frequency, or higher voltage, and do not connect it to a DC source.

The Model 3070 provides two power outlets on the rear apron. The upper one, marked SWITCHED, provides AC power for a tuner and any other device which should be turned on and off by the POWER-OFF switch on the amplifier's front panel. The total maximum consumption must not exceed 200W.

Symptom	Cause	Remedy
<b>Power Supply and Amplifier Section</b>		
Line fuse F3 blows when power is switched on with volume control in the extreme counter-clockwise position.	Primary of power transformer T1 shorted internally or externally (wiring).	Check for T1 primary resistance of about 4Ω through line cord plug with the POWER-OFF switch at POWER, and the line fuse in place and nothing plugged into the convenience outlets. If a short is found, first check and correct wiring if necessary and if wiring o.k., replace T1.
	Secondary of the power transformer shorted internally or externally.	Check wiring and correct if necessary.
	Shorted capacitor C8 or C9.	Check and replace if necessary.
	Defective rectifier CR5, CR6, CR7 or CR8.	Check and replace if necessary.
Right channel fuse F1 blows when power is switched on with volume control in the extreme counter-clockwise position.	Shorted C7.	Check and replace if necessary.
	Collectors of Q1 or Q3 or both shorted to chassis because of wrong mounting or lack of insulating washers.	Check the mounting and correct if necessary.
	Shorted capacitor C5.	Check and replace if necessary.
Left channel fuse F2 blows when power is switched on with volume control in the extreme counter-clockwise position.	Defective transistor Q1 or Q3 or both.	Check and replace if necessary.
	Collectors of Q2 or Q4 or both shorted to chassis because of wrong mounting or lack of insulating washers.	Check the mounting and correct if necessary.
Amplifier is inoperative and the pilot light does not go on.	Shorted capacitor C6.	Check and replace if necessary.
	Defective transistor Q2 or Q4 or both.	Check and replace if necessary.
Blown line fuse.	Defective line cord or defective POWER-OFF switch.	Check and replace if necessary.
		Check for primary resistance of T1 through line cord plug with the POWER-OFF switch in the POWER position and the LINE fuse in place. Replace, or repair, if possible, the defective component.



UNDER CHASSIS VIEW

so that loose ends cannot cause a short. Connect the wires to each loudspeaker and to the appropriate loudspeaker output terminals on the rear panel (see Figure 1). Make sure that the speakers are phased properly by inspecting the lamp wire. In most cases, one of the leads will have an identifying color code. Otherwise use an ohmmeter to identify leads.

Do not drive tacks or nails into the center of the loudspeaker leads, as this may short the two conductors. Before switching the amplifier on inspect the speaker connections carefully for accidental shorts. While the output transistors in this unit will resist abuse, and short periods of overloads or even shorted outputs will not destroy the transistors, it is highly advisable that any such abuse be avoided as far as possible lest a deterioration of quality of performance should occur. The 1A fuses on the rear apron are protecting the output transistors and will disconnect the output amplifiers of a particular channel in case of prolonged overloads. The fuses will act before the transistors are destroyed but there is no substitute for proper and careful speaker installation.

INPUT CONNECTIONS

General

It is important that all sources connected to the amplifier (except the phonograph) be either battery or transformer operated. This will assure isolation from the power line and prevent appearance of an AC potential on the ground lead which could impair the performance of the amplifier and present a danger to the operator.

Phonograph Connections

The MAG. PHONO jacks on the rear panel are inputs to the stereo preamplifier-equalizer which provides the gain and standard RIAA equalization for a magnetic stereo phonograph cartridge, or a stereo ceramic cartridge converted to constant-velocity response by adaptors included with the particular cartridge. Insert the left channel shielded lead from the phonograph into the upper MAG. PHONO jack, and the right channel shielded lead into the lower MAG. PHONO jack. The phonograph leads should be dressed away from the speaker leads. If other than the cartridges just described are used, refer to the section on auxiliary input.

When a monophonic magnetic cartridge is used, and it is desired to have both speakers operating for best reproduction, the two input jacks should be connected externally in parallel. This can be accomplished by a wire connection or using a commercially available "Y" adaptor. When the tone arm is wired for stereo and has two cables coming out, it is best to connect these cables in parallel inside the tone arm head near the output from the monophonic cartridge.

To minimize hum when a magnetic cartridge is used, the ground wire that is usually provided with such phonograph systems should be connected to the GND screw on the rear panel of the amplifier. Phonograph systems using a ceramic cartridge do not require such a connection. For the lowest hum level, in addition, connect the amplifier's GND screw to a nearby metal conduit which goes directly to ground. Do not use the electrical system ground.

The length of the phonograph input leads, using ordinary shielded audio cable, should not exceed about 2-1/2 feet in length with most magnetic cartridges if some loss of high-frequency response is to be avoided. If longer cables are necessary, then RG-174U low-capacitance shielded cable should be used with allowable cable lengths then extending to about 8 feet. The phonograph input cables used with magnetic cartridges should be as short as possible, regardless of cable capacitance, to minimize the risk of picking up hum from stray AC fields.

The phonograph system should not be located directly adjacent to the amplifier where hum may be induced in the magnetic cartridge by the amplifier's power transformer. Also, do not place a magnetic phonograph system too close to any other electrical device that has a large power transformer or electric motor.

be permanently connected in parallel — connection of a monophonic tape recorder to either one would result in an "out of center" recording when a stereo program is recorded. In these cases the MONO-STEREO switch should be set at MONO, with the TAPE-INPUT switch in the INPUT position. A stereo transmission from a tuner should be recorded in this case with the MONO-STEREO switch in the amplifier set to STEREO and the corresponding switch in the tuner set at mono.

The BASS control is actually two identical controls in tandem, one in each channel. This control has no effect at the marked mid-rotation setting. Turning in the "+" direction boosts the bass frequencies, while turning in the "-" direction cuts the bass response. Maximum bass boost or cut is obtained at the extreme positions.

The OFF-LO-CUT switch when placed in the LO-CUT position introduces a frequency response shaping network often called "rumble filter". This filter reduces the gain of the amplifier at lower frequencies which helps to reduce any rumble noise that might be present in a signal coming directly or indirectly from a phonograph system.

The TREBLE control is actually two identical controls in tandem, one in each channel. Like the BASS control, this control has no effect at the marked mid-rotation position. Turning in the "+" direction boosts the treble frequencies, while turning in the "-" direction cuts the treble response. Maximum treble boost or cut is obtained at the extreme positions.

The OFF-HI-CUT switch, when placed in the HI-CUT position introduces a frequency response shaping network often called "scratch filter". This filter reduces the gain of the amplifier at higher frequencies which helps to reduce any "hiss" that might disturb listening.

The SPEAKERS switch is used to select the corresponding output. In the PHONES position only the headphones jack is supplied with the output signal while the speakers are switched off. In the remaining three positions of the switch, the headphones jack is also supplied with the output signal but simultaneously one or both speaker systems are receiving the program. In the MAIN position, the amplifier output is fed to the main set of speakers. In the REMOTE position, the remote speakers are supplied with the signal. In the ALL position, both main and remote speakers as well as the headphones are operating.

The PHONES jack is used for private listening with stereo headphones of the high-fidelity type. Protective resistors for low impedance stereo headphones are provided internally by the amplifier to limit the power that can be applied to these headphones. When using headphones, always turn the VOLUME control to the minimum volume (maximum counterclockwise) position before inserting the headphones plug into the jack. Then turn the VOLUME control clockwise for the desired volume level. To protect the headphones from possible damage due to excessive input power, make it a strict rule never to leave the headphones plugged in when not in use.

## MAINTENANCE

### General

The Model 3070 integrated amplifier is a fully solid state instrument and, excluding cases of deliberate or accidental abuse, most parts including all semiconductors should not require replacement. The amplifier does not require any alignment or adjustment at any time.

The above applies to all wired units as well as to those built up from kits by customers, providing the construction and wiring were made correctly and no parts were damaged in the course of constructing the kit.

With this in mind, the following information is provided primarily for assistance to those kit builders who for some reason find their completed units defective and desire to do their own troubleshooting.

This information is deliberately included into the operating manual to make it available for all owners of this amplifier, including those attempting repairs on units bought in wired form, in case any future difficulty should develop. The limitations of the company's responsibility in such a case are stated in the "Service Policy" and "Warranty" information.

### DC Voltage Chart

#### NOTE

DC operating voltages for all the transistors and some reference points are indicated on the schematic diagram. These voltages are expected in a unit supplied from a 117 VAC line with both outputs loaded with  $8\Omega$  resistive loads, a signal fed in and the amplifier driven for full nominal output. These conditions may quite often be impossible to achieve in a defective amplifier. The following voltage chart is therefore given for a "no load - no signal" condition which would be normally encountered when making voltage checks while trouble-shooting a defective amplifier.

Before taking any voltage readings the following conditions should be established:

1. All inputs and outputs disconnected.
2. All wiring checked and found correct and in good condition.
3. All transistors checked for correct type in each location and proper insertion into the printed circuit board or socket.
4. All diodes and rectifiers checked for correct type and polarity of connection.
5. All other components checked and found to be of proper values and in good condition.
6. All solder joints checked and found in good condition.
7. VOLUME control at extreme counter-clockwise position (minimum).
8. BALANCE, BASS and TREBLE controls at center of rotation.
9. INPUT SELECTOR in AUX position.
10. POWER-OFF rocker switch in the POWER position.
11. Remaining rocker switches with left side depressed.
12. Line cord plugged into an 117 VAC outlet.

The measurements should be performed using a VTVM, such as the EICO VTVM 232, with at least 10 megohms input impedance on the DC ranges expected to be used.

The readings are given for 117 VAC line voltage. The actual readings can vary from given values up to  $\pm 15\%$ , depending on line voltage variations, differences in components and accuracy of the VTVM used. Note that Q101 in the right channel is independent of the Q101 in the left channel. The voltage readings on these two transistors may differ from each other and still be considered correct as long as they are within specified limits. The same applies to each pair of Q102, Q201, Q202, Q301, Q302 and Q303.

All readings are in volts DC and all voltages are positive with respect to chassis.

### VOLTAGE CHART

Transistor	Emitter	Base	Collector
Q1	22	22.6	44
Q2	22	22.6	44
Q3	0	0.6	22
Q4	0	0.6	22
Q101	0.15	0.75	1.7
Q102	1.1	1.7	10.4
Q201	3.3	3.9	12.3
Q202	0	0.6	5.4
Q301	1.0	1.6	21.3
Q302	22	21.3	0.6
Q303	22.6	23.2	44

#### Resistance Measurements

In servicing, it may be desired to make resistance measurements after the trouble has been localized by voltage measurements or other means to a particular stage. However, in circuits using transistors certain readings may not be meaningful because the ohmmeter's battery supply may activate the transistors connected by a dc path to the test points. Finally, readings in circuits employing diodes are ambiguous unless the polarity of the ohmmeter connections is specified. For these reasons, a resistance chart for the unit is not given. Nevertheless, there are occasions when resistance measurements in a particular stage are helpful. On these occasions, the normal resistance reading value can easily be determined by inspection of the schematic diagram. Before making the measurement, remove all power from the unit and allow time for capacitors to discharge. If there are diodes or transistors in the dc paths between the test points, their presence and polarities must be taken into account in selecting the polarity of the ohmmeter connections and in determining the expected value of the resistance reading.

### TROUBLESHOOTING CHART

This chart is given with the assumption that the wiring of the instrument, solder joints, switch contacts, input connections, output connections as well as all components were checked and found correct and in good order.

NOTE: The components located on the printed circuit boards use the same symbols for identical components in both channels. It should be understood that whenever a reference to any such component is made in the following trouble-shooting chart, only the component located in the channel being analyzed should be taken into consideration.

The lower power outlet, marked UNSWITCHED, provides a source of power for a turntable, record changer, tape recorder or any other external device. Total maximum consumption should be less than 400 watts. This outlet remains "alive" at all times as long as the amplifier is plugged in, and is not affected by the POWER-OFF switch, which is necessary with record changers, turntables, tape recorders, etc.

The insertion positions of the line cord plugs are determined by listening for the lowest hum. (Note that hum may also be caused by faulty connecting cables, or running of these cables too close to a power line, transformer or motor).

### OPERATION

Before operating the unit, make sure that all necessary connections have been made to both loudspeakers, and the required input signals are available. Plug the Model 3070 into the 117 VAC, 50-60 Hz power line.

Place the SPEAKERS switch in the appropriate position. Rotate the VOLUME control to the maximum counterclockwise position, and place the POWER-OFF switch in the POWER position. A front-panel indicator lamp will come on.

The INPUT SELECTOR switch selects the corresponding sources as inputs. These are the sources that will be heard when the TAPE-INPUT switch is set at INPUT. If the TAPE-INPUT switch is set at TAPE, the tape recorder is supplying the program for the amplifier. The source selected by the INPUT SELECTOR switch in this case is the source that feeds the TAPE OUT jacks. This is useful with certain tape recorders having separate record and playback heads, and separate record and playback pre-amplifiers (such as the EICO RP-100 4-track Stereo Tape Recorder). These recorders can play back a tape recording while it is being recorded. In this situation, setting the TAPE-INPUT switch at TAPE permits you to hear (or monitor) the tape playback during recording regardless of the recording source chosen with the INPUT SELECTOR switch. The source signal will then be heard through the amplifier as it returns through the TAPE IN jacks, after being recorded on the tape.

Once the source has been selected and is operating rotate the VOLUME control clockwise until the signal is heard. Set the desired volume. The VOLUME control is a pair of identical controls in tandem, one in each channel, that permits varying the loudness of both channels simultaneously.

The VOL. -LOUDNESS switch when set into the LOUDNESS position introduces a frequency response correcting network which changes the frequency response contour relative to the position of the VOLUME control. This arrangement approximates the frequency response of the human ear which varies with the listening level.

The BALANCE control is a convenient means of achieving equal output levels in both stereo channels which is important for correct stereo reproduction. This control is actually two controls in tandem, one in each channel. At the marked mid-rotation position, neither channel is favored. When the control is rotated in the clockwise direction from the mid-rotation position the output level from the left channel decreases. Rotation in the opposite direction will lower the output level from the right channel. If the source has output controls, these should be set for equal levels in both channels (see the source operating manual for these instructions) with the Model 3070 BALANCE control set at the marked mid-position and the VOLUME control set for the desired volume.

The MONO-STEREO switch determines whether the amplifier is operating in the mono or stereo mode. The MONO position should be used when a monophonic source is supplied to only one of the input jacks and an output is desired on both speakers or when a monophonic record is played with a stereo cartridge in order to eliminate any vertical rumble interference. For monophonic operation of a stereo tuner, such as the EICO 3200, it is highly advisable for best quality reproduction to use the MONO-STEREO switch normally found in such tuners. When a monophonic magnetic cartridge is used refer to PHONOGRAPH CONNECTIONS. This switch should be used also when a monophonic tape recorder is permanently connected to one of the TAPE OUT jacks. Since the two TAPE OUT jacks should not