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UNCLASSIFIED

TECHNICAL MANUAL
for
SOLID STATE POWER SUPPLY
MODEL HVRC-2



THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y. OTTAWA, ONTARIO

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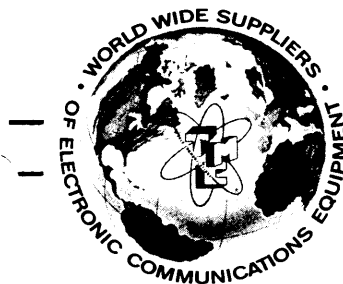
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IN-2802

ISSUE DATE: 8 DEC. 1965
REV. DATE: 29 SEPT. 1966

NOTICE

THE CONTENTS AND INFORMATION CONTAINED IN THIS INSTRUCTION MANUAL IS PROPRIETARY TO THE TECHNICAL MATERIEL CORPORATION TO BE USED AS A GUIDE TO THE OPERATION AND MAINTENANCE OF THE EQUIPMENT FOR WHICH THE MANUAL IS ISSUED AND MAY NOT BE DUPLICATED EITHER IN WHOLE OR IN PART BY ANY MEANS WHATSOEVER WITHOUT THE WRITTEN CONSENT OF THE TECHNICAL MATERIEL CORPORATION.



THE TECHNICAL MATERIEL CORPORATION

C O M M U N I C A T I O N S E N G I N E E R S

700 FENIMORE ROAD

MAMARONECK, N. Y.

W a r r a n t y

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes,*fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes*furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

*Electron tubes also include semi-conductor devices.

PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

PROCEDURE FOR ORDERING REPLACEMENT PARTS

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT

TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION
Engineering Services Department
700 Fenimore Road
Mamaroneck, New York

SUPPLEMENTAL WARRANTY STATEMENT

Certain component parts of this equipment/kit are provided with an exceptional warranty condition. These are, specifically, the high-voltage, silicon diode rectifier assemblies designated as TMC Part Numbers DD-116, DD-117 and DD-118. These component parts are manufactured by the Westinghouse Electric Corporation and bear the following warranty statement:

"The Westinghouse Electric Corporation warrants that it will correct any defect in workmanship by repair or replacement, f. o. b. factory, of any assembly supplied under TMC Part Number DD-116, DD-117 and DD-118, for five years from date of purchase, provided said assembly is used within the manufacturer's published ratings and installed in accordance with good engineering practices. Although the warranty on the complete assembly is five years, the rectifier cells used in the referenced TMC Part Numbers are JEDEC-type diodes, which components are guaranteed by Westinghouse for the life of the equipment in which originally installed. This warranty shall constitute fulfillment of all Westinghouse liabilities in respect to said products. This warranty is in lieu of all other expressed or implied warranties and further, Westinghouse shall not be liable for any consequential damages."

The Technical Materiel Corporation takes the position, in light of the above warranty, that arrangements for return of allegedly defective silicon rectifier assemblies shall be made between the using activity and the Westinghouse Electric Corporation, Youngwood, Pennsylvania. It is to be noted that if any attempt is made to effect repairs of these assemblies in the field, the warranty is null and void unless such repairs are in accordance with the instructions provided by Westinghouse or TMC.

CHANGE NO. 1



INSTRUCTION BOOK CHANGE NOTICE

Date 4/25/67

Manual affected: SOLID STATE POWER SUPPLY IN 2802
(MODEL HVRC-2)

1. Change pg. 1, line 3 to read as follows

power amplifier stage of TMC's Model GPT-10K Transmitter AN/FRT-39, - FRT-52). Model HVRC-2 solid state high voltage rectifier may also be used in the driver section of TMC's Model GPT-40K transmitter (AN/FRT-40, FRT-54) as well as the intermediate power amplifier of TMC's Model GPT-200K transmitter (AN/FRT-62).

2. Delete second sentence on page 1, beginning with the words, "The unit also".

SHOULD ADDITIONAL COPIES OF THIS CHANGE NOTICE BE REQUIRED, PLEASE CONTACT:

THE TECHNICAL MATERIEL CORP., 700 Fenimore Road, Mamaroneck, New York

Attn.: Director of Eng. Services.

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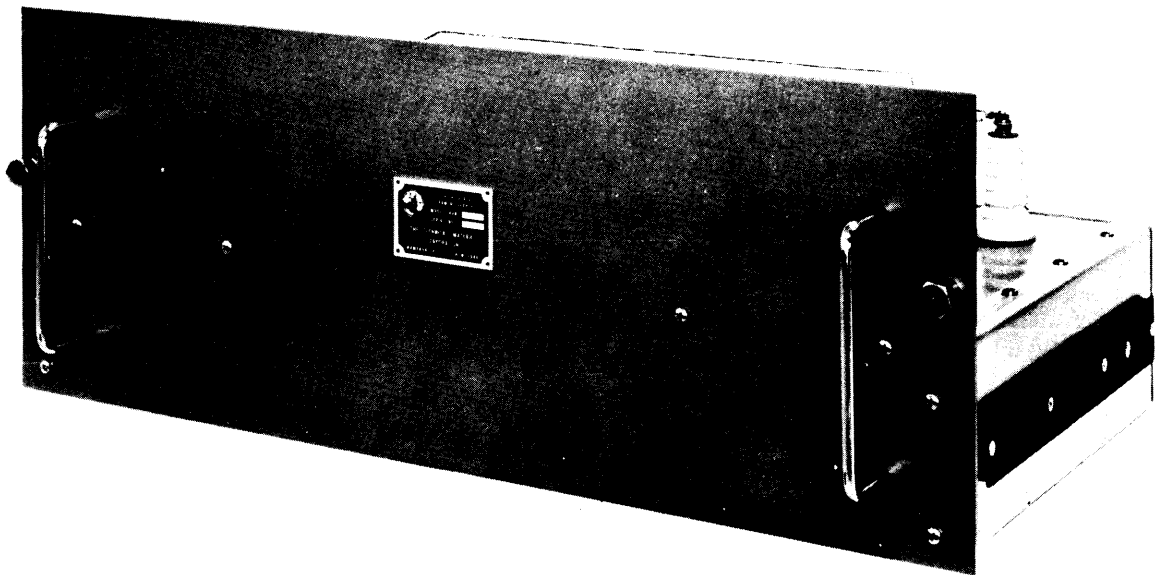


Figure 1. Solid State Power Supply, Model HVRC-2

1. DESCRIPTION OF EQUIPMENT.

Solid State Power Supply, Model HVRC-2 (figure 1) is a three-phase, full-wave, solid-state rectifier that provides plate voltage for the 10-kw power amplifier stage of a transmitter. The unit also provides half-wave rectification for the 3200-volt section of the transmitter's power supply.

The high voltage rectifier is provided with slides for ease of installation and maintenance in the transmitter frame.

Input and output connections are made with button contacts on the rear panel of the unit.

The high voltage rectifier has no operating controls. Control of high voltage a-c input to the unit is accomplished in the transmitter's control circuits.

2. TECHNICAL SPECIFICATIONS.

Input:	1. 6222 vac, 3-phase, 50/60 cps, 1 ampere per phase
Output:	7500 vdc at 2.8 amperes.
Dimensions:	28.75" wide x 16.75" deep x 10.75" high.
Weight:	30 lbs.

3. INSTALLATION.

The high voltage rectifier is shipped in a wooden crate; packing material is included inside the crate to protect the unit against shock and

against the elements. Upon arrival at the operating site, unpack the equipment carefully; inspect the unit for damage that may have occurred during shipment. With respect to equipment damage for which the carrier is liable, The Technical Materiel Corporation will assist in describing methods of repair and the furnishing of replacement parts.

To install the high voltage rectifier, extend the appropriate slides from the transmitter cabinet. Fit the slides on the high voltage rectifier into the slides mounted to the transmitter frame. Push the rectifier toward the transmitter cabinet until the catches in the slides engage. Depress the button catches in the slides and push the rectifier into the transmitter cabinet. Secure the front panel of the rectifier unit to the frame of the transmitter with the captive screws in the front panel of the rectifier.

4. PRINCIPLES OF OPERATION.

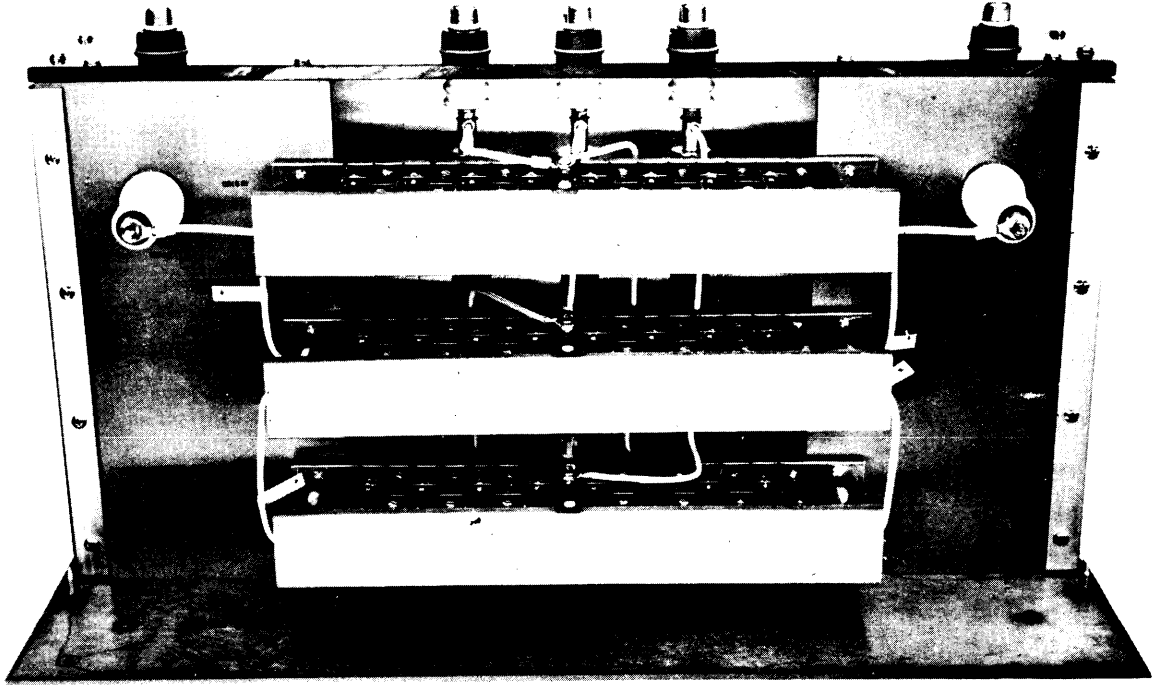
Refer to schematic diagram, figure 3. The HVRC comprises a standard 3-phase, full-wave, bridge rectifier. The unit converts the 6222-volt output from a wye-connected transformer secondary to 7500 volts d-c.

5. MAINTENANCE.

Maintenance of the HVRC consists of keeping the unit clean (forced-air cleaning is preferable) and periodically inspecting the unit for over-heating and charring.

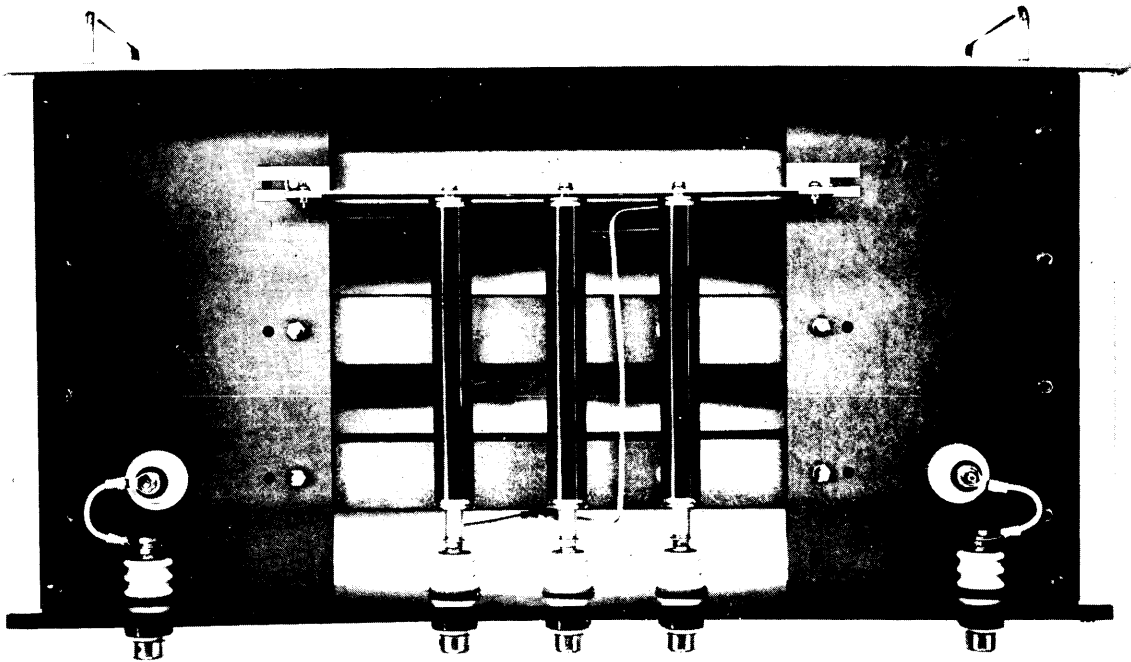
Rectifier assemblies (refer to figure 2) are designed so that failure of up to 20 percent of the diodes in each assembly

6511.23-11



A. Top View

6511.23-12



B. Bottom View

Figure 2. Component Locations, HVRC

will not adversely effect its performance. These assemblies should be treated as electron tubes, and no attempt should be made to repair them; any attempt to repair these assemblies or to check them with external test equipment will automatically void the manufacturer's warranty. A suspected defective assembly should be replaced with a spare assembly and correct operation verified by transmitter performance.

NOTE

For repair or replacement of diode assemblies within the warranty period (see supplemental warranty), refer to TMC's warranty at the front of this manual.

For repair of diode assemblies beyond the warranty period, it is recommended that the assemblies be returned to the factory.

6. PARTS LIST.

The parts list presented in this section is a cross-reference list of parts identified by a reference designation and TMC part number. In most cases, parts appearing on schematic diagrams are assigned reference designations in accordance with MIL-STD-16. Wherever practicable, the reference designation is marked on the equipment, close to the part it identifies. In most cases, mechanical and electro-mechanical parts have TMC part numbers stamped on them.

To expedite delivery when ordering any part, specify the following:

- a. Generic name.
- b. Reference designation.
- c. TMC part number.
- d. Model and serial numbers of the equipment containing the part being replaced; this can be obtained from the equipment nameplate.

For replacement parts not covered by warranty (refer to warranty sheet in

front of manual), address all purchase orders to:

The Technical Materiel Corporation
 Attention: Sales Department
 700 Fenimore Road
 Mamaroneck, New York 10544

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1501	CAPACITOR, FIXED, PLASTIC: .002 uf; 50 Kv; 8-1/4" long x 1-1/8" dia.; tubular with stud terminals.	CX115-1-50-202
C1502	Same as C1501.	
C1503	Same as C1501.	
CR1501	RECTIFIER, SEMICONDUCTOR DEVICE: dual section; max. peak reverse working voltage 20 Kv each leg; max. peak reverse current 1.6 amps at natural convection at 50°C; operating temperature range -55°C to +85°C; storage temperature range -55°C to +71°C*; polyester fiberglass exterior.	DD116
CR1502	Same as CR1501.	
CR1503	Same as CR1501.	
E1501	INSULATOR, FEED-THRU	AX220-1
E1502	NOT USED	
E1503	NOT USED	
E1504 thru E1507	Same as E1501.	
E1508	INSULATOR, FEED-THRU	NS107
E1509	Same as E1508.	
	*The limitation on storage temperature is due to the capacitance included within each assembly.	

NOTE

When the AX-103 is modified in the field, as per Kits 257 and 258 all reference symbols above are in the 600 number series.