

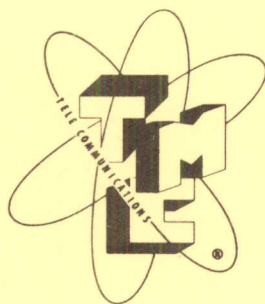
TUCKER ELECTRONICS  
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UNCLASSIFIED

TECHNICAL MANUAL

*for*

PASSIVE  
VOLUME CONTROL  
MODELS PVC



THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N. Y.

OTTAWA, ONTARIO





# 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

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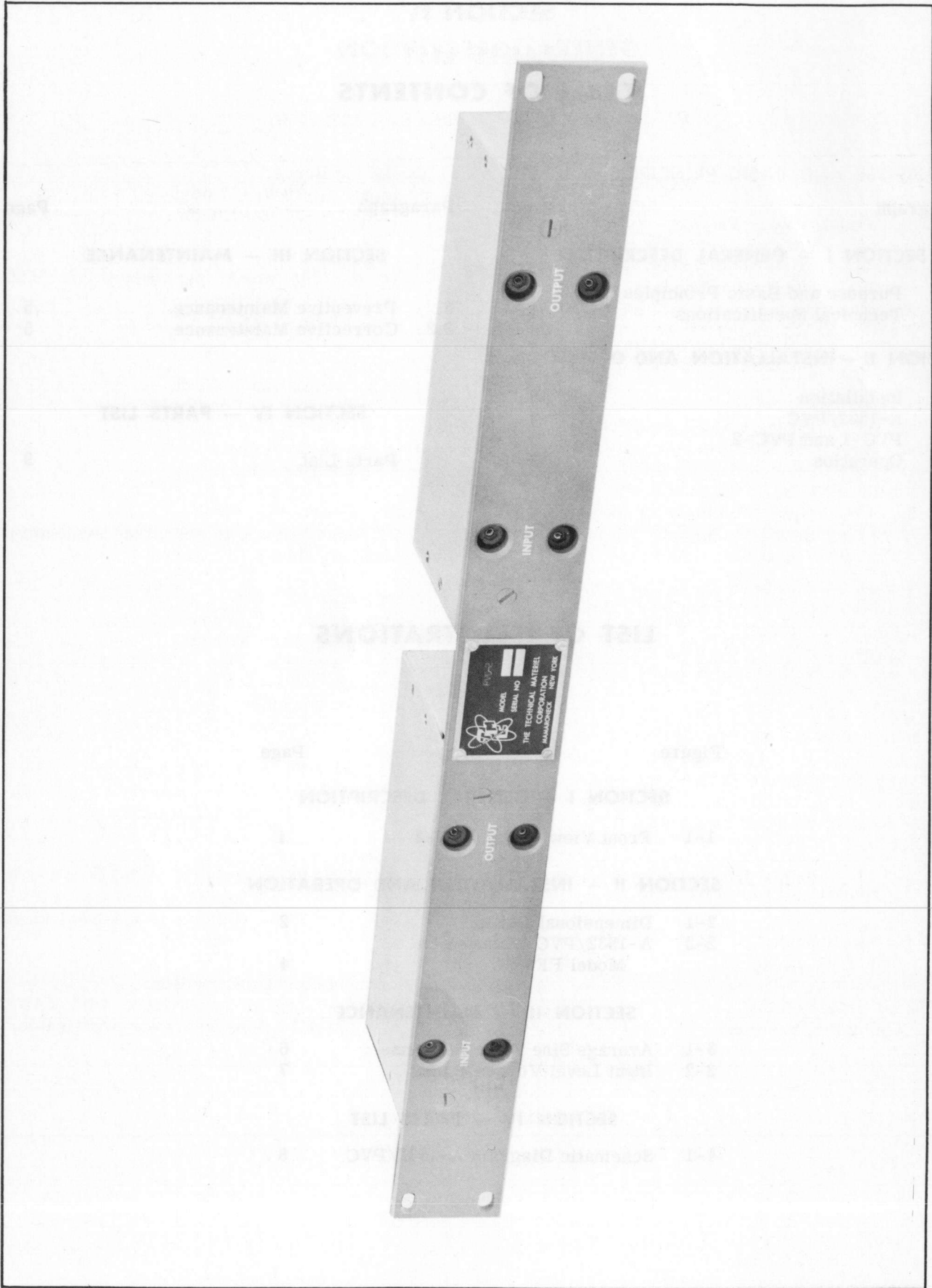


Figure 1-1 Front View Model PVC-2

# SECTION I

## GENERAL DESCRIPTION

### 1. PURPOSE AND BASIC PRINCIPLES

1.1 The Model PVC, Passive Volume Compressor, is a compact, versatile audio power limiting device which requires no power supply for operation. Installed between a receiver or other audio source and a headset, telephone line, etc., it will hold its output level constant within 1.5 db, for an input range of 2 to 55 volts (better than 20 db excursion).

1.2 The PVC functions without connection to the internal circuits of the receiver or amplifier. Two wires are connected from a 600 ohm audio source to the PVC input terminals, and two wires from the PVC output terminals to the 600 ohm input of the associated equipment.

1.3 Provisions have been made for mounting the A-1532/PVC on the rear of the TMC Model FFR, Communications Receiver. Compact size and ability to operate in any position make it possible for this unit to be used with many other equipments.

1.4 Models with one or two PVC units (A-1532/PVC) mounted on a 1-3/4 x 19 inch relay rack panel are designated PVC-1 and PVC-2 respectively. The numerical suffix indicates the number of units mounted on a panel.

### 1.5 TECHNICAL SPECIFICATIONS

Input Impedance:  
600 ohms, balanced

Output Impedance:  
600 ohms, balanced

#### Operating Range:

Input - -18 to +37 dbm  
Output - -27 to +1.0 dbm

#### Keying Speed:

Up to 1250 words per minute or 1000 Bauds at 2 watts input.  
(See Figure 3-2).

#### Distortion:

Intermodulation- -43 db  
2nd Harmonic- negligible

#### Rise and Decay Time:

75 microseconds

#### Attack Time:

0.5 seconds max. to operating level, after first syllable.

#### Terminals:

Pin Jacks (Front)  
Terminal Strip (Rear)

#### Mounting:

See Illustrations

#### Weight:

A-1532/PVC	1-1/2 pounds
PVC-1	2 pounds
PVC-2	3-1/2 pounds

#### Dimensions:

A-1532/PVC	1-11/16 x 7-1/4 x 3-1/4 inches o/a
PVC-1, 2	3-1/2 x 19 x 1-3/4 inches o/a

#### Components and Construction:

Manufactured in accordance with JAN/MIL specifications wherever practicable.

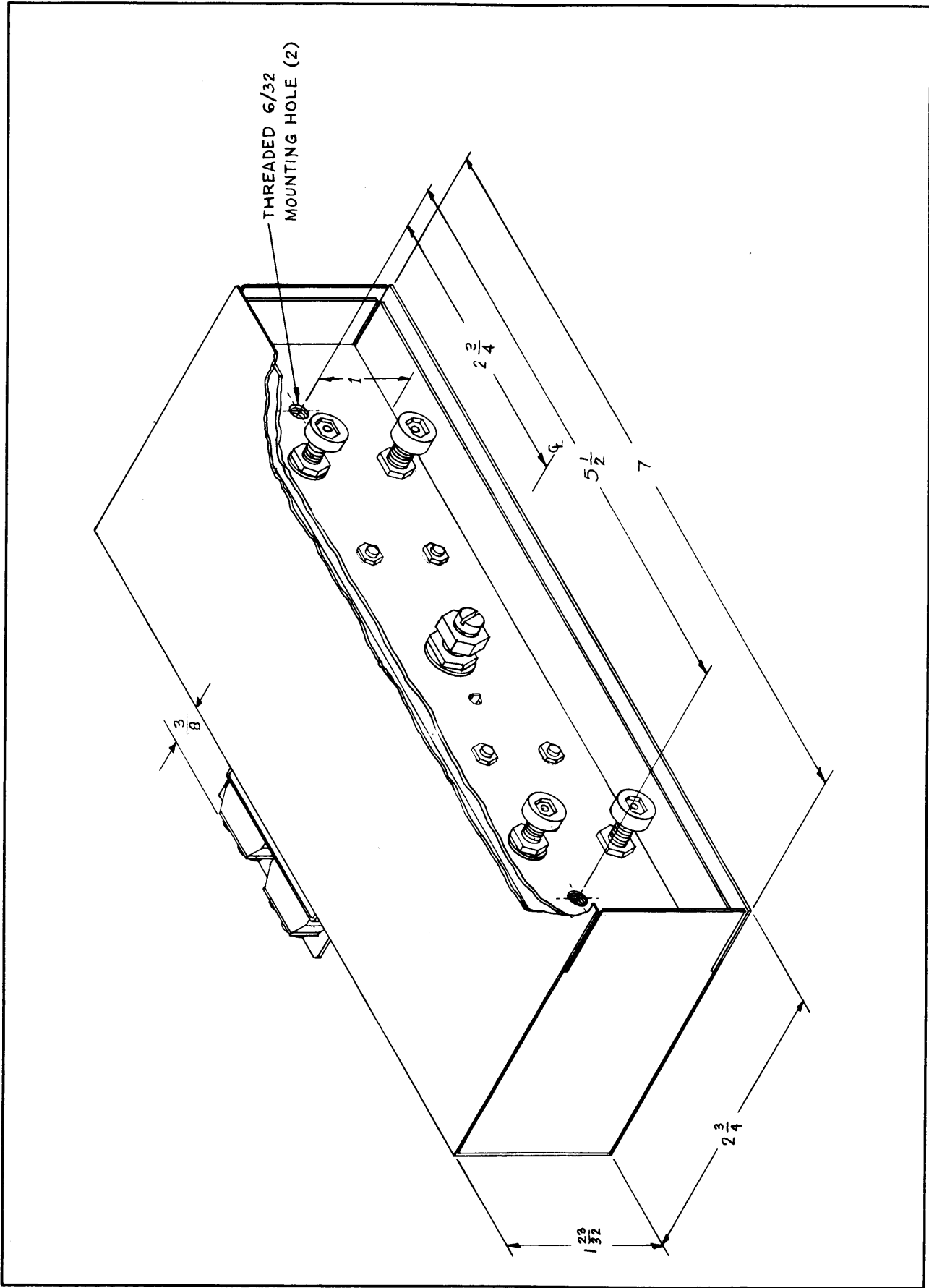


Figure 2-1 Dimensional Outline A1532/PVC



## SECTION II INSTALLATION AND OPERATION

### 2. INSTALLATION

#### 2.1 A-1532/PVC

2.2 The A-1532/PVC when used with the Model FFR is mounted by means of two 6-32 x 7/8 inch long machine screws.

##### 2.2.1 PROCEDURE

- A. Remove the top cover from the FFR receiver.
- B. Place a lockwasher under the head of each screw and pass each from inside the FFR through the holes provided in the rear panel.
- C. Hold the A-1532/PVC so that the mounting screws address the respective tapped holes in the PVC. Tighten screws securely.
- D. Connect from terminal "C" of terminal board E101 on the rear of the FFR to one of the input terminals of E1 on the PVC.
- E. Connect from the terminal marked 600 OHMS on E101 on the rear of the FFR to the remaining input terminal on E1 of the PVC.

- F. Connect from E2 of the PVC to the telephone lines or other 600 ohm load to be used.

#### 2.3 PVC-1 and PVC-2

2.3.1 The Models PVC-1 and PVC-2 are on standard relay rack panels and are rack mounted in any convenient location.

##### 2.3.2 CONNECTIONS

- A. Connect from receiver or other device to E1 input terminal board on the rear of the PVC.
- B. Connect from telephone lines or other 600 ohm load to E2 the output terminal board on the rear of the PVC.

#### 2.4 OPERATION

2.4.1 Operation of the Models PVC is recommended only for those power levels specified on the performance graphs (Figures 3-1 and 3-2) at audio frequencies; and with 600 ohm balanced input and output impedances. If equipments not compatible with these impedance requirements are to be used, transformers or other appropriate matching devices should be employed.

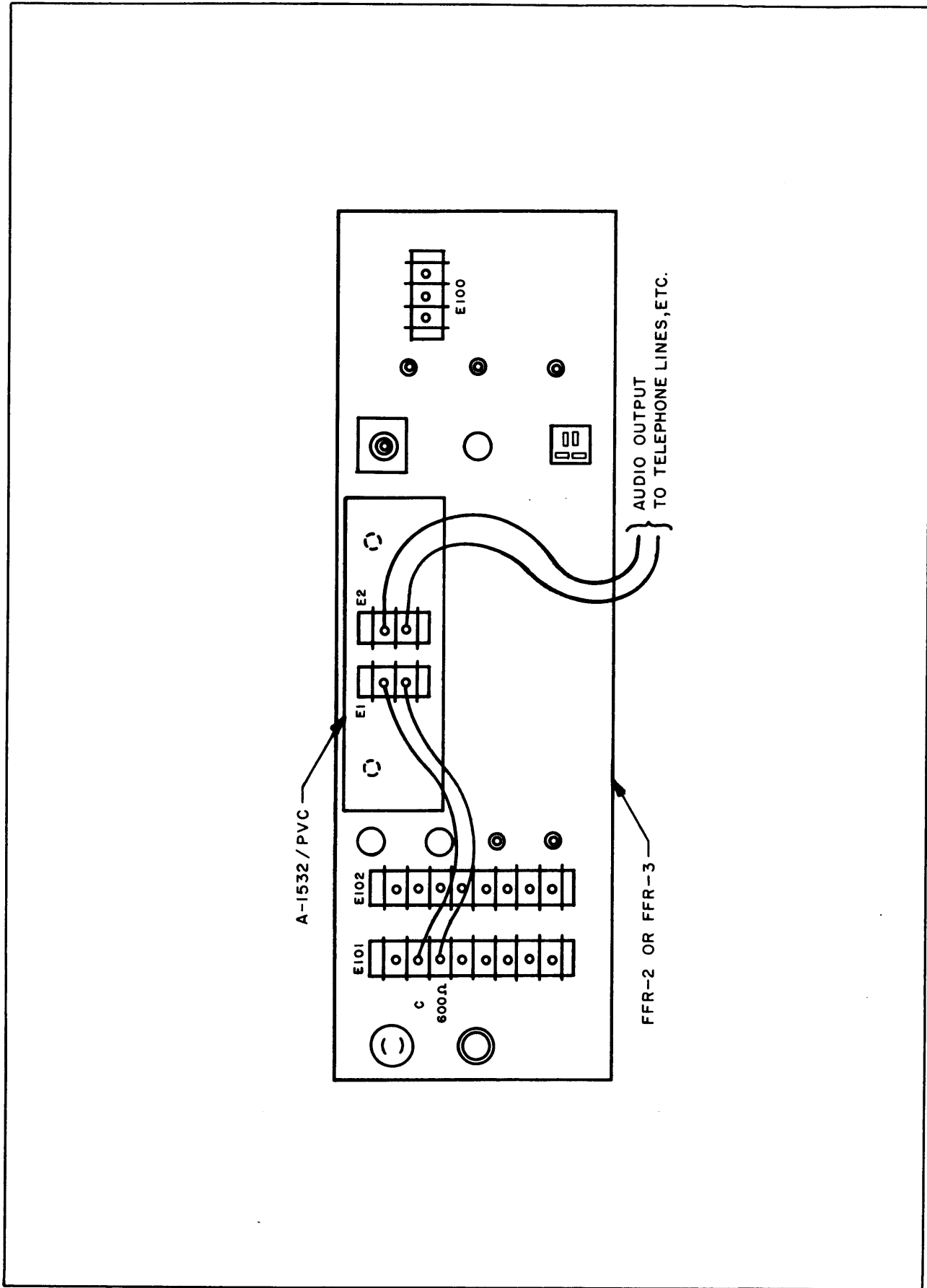


Figure 2-2 A-1532/PVC Installed on Model FFR

## **SECTION III MAINTENANCE**

### **3. PREVENTIVE MAINTENANCE**

3.1 Preventive maintenance of the Models PVC is limited to the most basic procedures employed for such equipment. See that excessive moisture, dust and other foreign materials do not accumulate in the case.

### **3.2 CORRECTIVE MAINTENANCE**

3.2.1 Potentiometer R3 has been properly adjusted at the factory and normally will not require further adjustment. However, in the event that adjustment should be required or corrective maintenance requires the replacement of parts, it will be necessary to readjust R3.

#### **3.2.2 EQUIPMENT REQUIRED**

- A. Audio generator with 600 ohms output impedance.
- B. Vacuum Tube Volt Meter
- C. 600 ohm, 1/2 watt Resistor

#### **3.2.3 PROCEDURE**

- A. Connect the 600 ohm resistor across the output terminals of the PVC.

- B. Connect the audio generator to the input terminals of the PVC.
- C. Connect the VTVM across the input terminals of the PVC.
- D. Turn the audio generator ON and adjust it for an output of 1000 cps at a measured level of 35.0 volts.
- E. Disconnect the VTVM and connect it across the 600 ohm resistor at the output terminals.
- F. Adjust R3 until the VTVM reads 0.72 volts.

Note: The voltages above apply only when adjustments are made at normal room temperature.

- G. When R3 is properly adjusted, tighten the shaft lock-nut while observing the VTVM to see that no change in the 0.72 volt reading takes place.
- H. Remove resistor from output terminals.
- J. Replace normal PVC connections and resume operations.

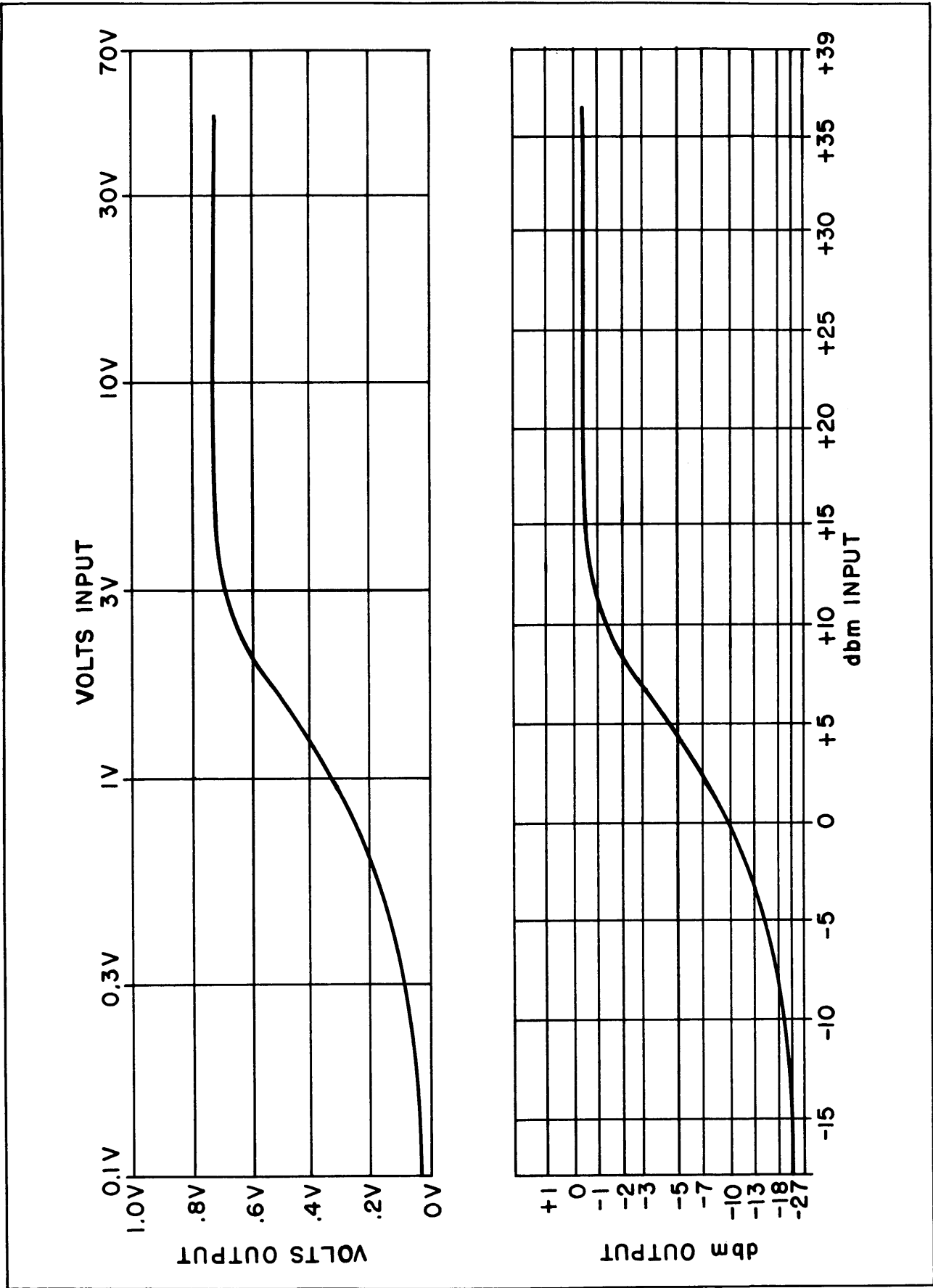


Figure 3-1 Average Sine Wave Response

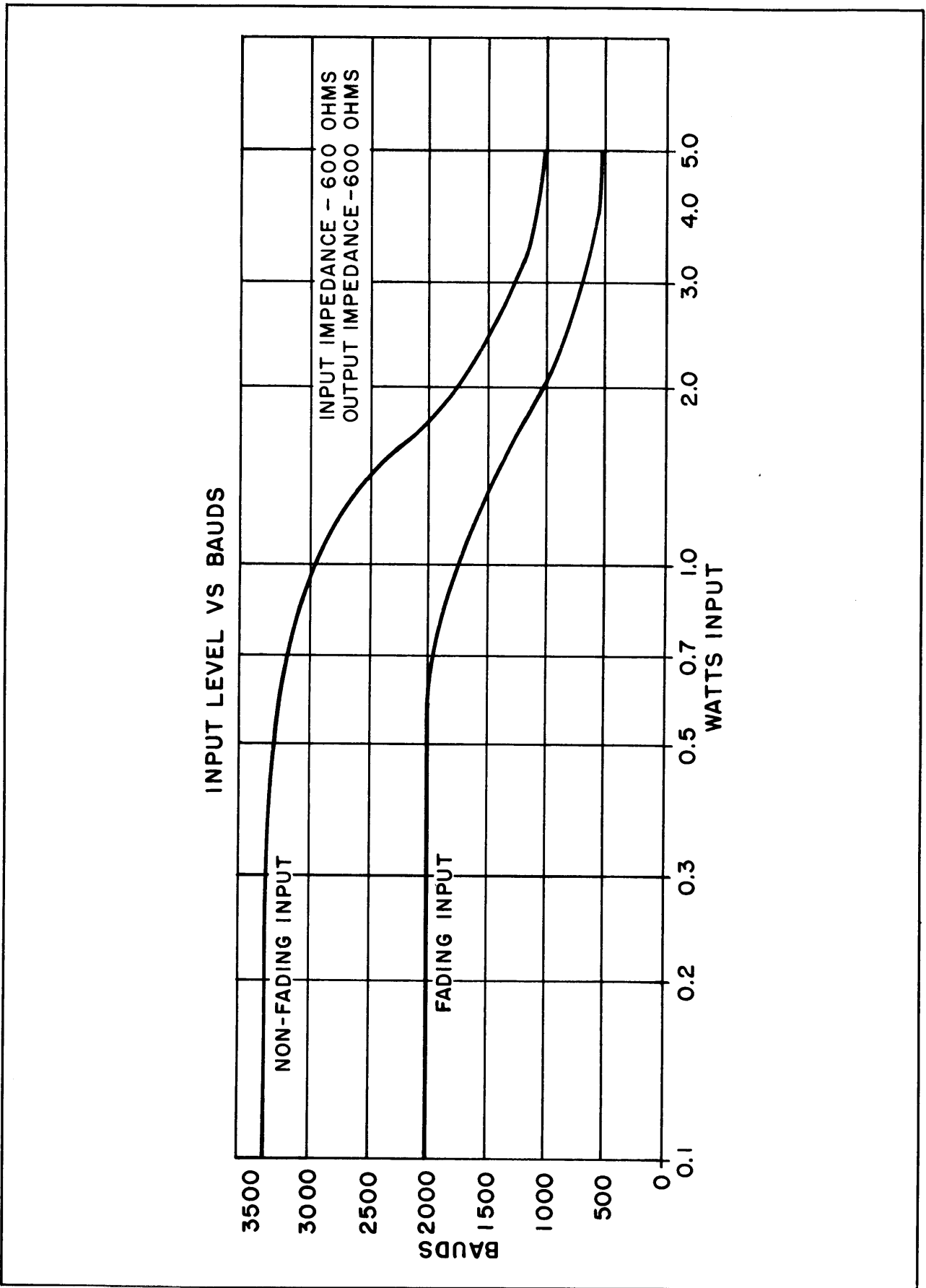


Figure 3-2 Input Level versus Bauds

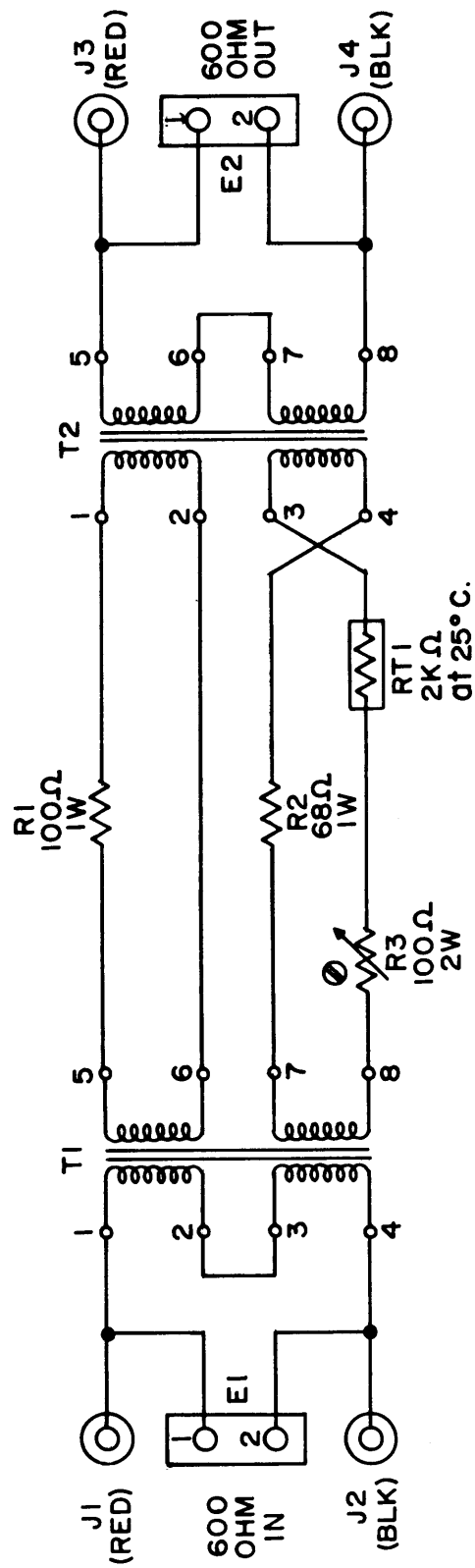


Figure 4-1 Schematic Diagram A-1532/PVC

## SECTION IV

### PARTS LIST

PASSIVE VOLUME CONTROL, A-1532/PVC

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
E1	TERMINAL STRIP, barrier type; two 6-32 binding head machine screws, moulded phenolic body.	Input Terminal Board	TM-100-2
E2	TERMINAL STRIP, barrier type: two 6-32 binding head machine screws, moulded phenolic body. (Same as E1)	Output Terminal Board	TM-100-2
J1	JACK, tip: red body; silver plated contact; for .081 in. dia. pin, 7/8 in. long x 3/8 in. dia o/a; current rating 10 amps.	Input Jack	JJ-114-2
J2	JACK, tip: black body, silver plated contact; for .081 in. dia. pin, 7/8 in. long x 3/8 in. dia. o/a; current rating 10 amps.	Input Jack	JJ-114-3
J3	JACK, tip: red body; silver plated contact; for .081 in. dia. pin, 7/8 in. long x 3/8 in. dia o/a; current rating 10 amps. (Same as J1)	Output Jack	JJ-114-2
J4	JACK, tip: black body; silver plated contact; for .081 in. dia. pin, 7/8 in. long x 3/8 in. dia o/a; current rating 10 amps. (Same as J2)	Output Jack	JJ-114-3
P1	PLUG, tip: red body; silver plated contact; .081 in. dia. pin; 1-7/16 in. long x 3/8 in. dia. o/a, current rating 10 amps. (Furnished as Loose Item)	Mating Plug J1	PL-163-2
P2	PLUG, tip: black body; silver plated contact; .081 in. dia. pin; 1-7/16 in. long x 3/8 in. dia. o/a, current rating 10 amps. (Furnished as Loose Item)	Mating Plug J2	PL-163-3
P3	PLUG, tip: red body; silver plated contact; .081 in. dia. pin; 1-7/16 in. long x 3/8 in. dia. o/a, current rating 10 amps. (Furnished as Loose Item) (Same as P1)	Mating Plug J3	PL-163-2
P4	PLUG, tip: black body; silver plated contact; .081 in. dia. pin; 1-7/16 in. long x 3/8 in. dia. o/a, current rating 10 amps. (Furnished as Loose Item) (Same as P2)	Mating Plug J4	PL-163-3

SYM.	DESCRIPTION	FUNCTION	TMC PART NO.
R1	RESISTOR, fixed: composition; 100 ohms, $\pm 5\%$ , 1 watt.	Current Limiting	RC30GF101J
R2	RESISTOR, fixed: composition; 68 ohms, $\pm 5\%$ , 1 watt.	Current Limiting	RC30GF680J
R3	RESISTOR, variable: composition; 100 ohms, $\pm 10\%$ , 2 watts.	Cal. Adjust	RV4ATXA101A
RT1	RESISTOR, thermal.	Level Sensing Element	RR-125
T1	TRANSFORMER, audio: 500 ohms impedance; $\pm 2$ db response from 30 to 20,000 cps., matched to T2.	Input Transformer	TF-191
T2	TRANSFORMER, audio: 500 ohms impedance; $\pm 2$ db response from 30 to 20,000 cps., matched to T1.	Output Transformer	TF-191