PROFESSIONAL AUDIO AND SOUND

Series **DMS**

Digital Music Amplifiers

Manual

OM 156

Operating Instructions and Service Manual

LISTED 20 GA

30 Watt - 3 Channel - 3 Zone Digital Music Amplifier

MOH - DUAL VOX
Active Matrix Switching

DMS DIGITAL MUSIC SERIES

IMPORTANT NOTE: *THIS OPERATING MANUAL IS PROVIDED AS AN INSTALLATION AND AS AN OPERATING AID. PASO SOUND PRODUCTS, INC. DOES NOT ASSUME ANY RESPONSIBILITY AS TO ITS ACCURACY AND SHALL NOT BE LIABLE IN TORT OR CONTRACT FOR ANY DIRECT CONSEQUENTIAL OR INCIDENTAL LOSS OR DAMAGE ARISING FROM THE INSTALLATION, USE OR INABILITY TO USE THIS PRODUCT.*

CAUTION !

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE

T3030DMA

Innovation through technology since 1931

T3030DMA

REV. 1.0

Specifications are subject to change without notice

DIGITAL MUSIC AMPLIFIERS

DESCRIPTION AND APPLICATIONS

- 3 Channel Inputs - 3 Zone Outputs
- Wide Frequency Response
  Very Low Distortion
- Microphone/Program Input
- Microphone/Telephone Input
- Transformer Balanced Phone Paging Input
- Satellite Receiver Input
  With Variable Attenuator
- Rear Panel Port Accepts Standard Module
- Auxiliary or CD Input with Stereo Summing
- Independent Input Controls
  Bass and Treble Controls
- Input/Output EQ Link/Mix Buss
- Remote Master Volume
- Addressable Dual Vox System
- Separate Dual Vox Selector
- Direct Muting with Selector
- 600 ohm and 8 ohm 1 Watt
  Music on Hold Amplifier
- Zone 1 Amplifier, 1 Watt with Control
- Zone 2 Amplifier, 1 Watt with Control
- NO/NC VOX Relay Terminals
- 24 V DC Regulated Utility
  Power Supply Output
- Optional Pre-Paging Chime
- AC Accessory Outlet
- 8 ohm, 25 Volt & 70 Volt Outputs
- Rack Mounting with Optional Kit

Immediately upon receipt of the amplifier, inspect the unit and shipping container for indications of improper handling or in transit damage. The equipment was carefully inspected and tested before leaving the factory. Notify the Transportation Company immediately if any damage is found. ONLY THE CONSIGNEE CAN FILE A CLAIM WITH THE CARRIER FOR DAMAGE DURING SHIPMENT. Be sure to save the carton and packing material as evidence of damage for the shipper inspection. DO NOT SHIP the unit back to the factory unless authorized by the factory.

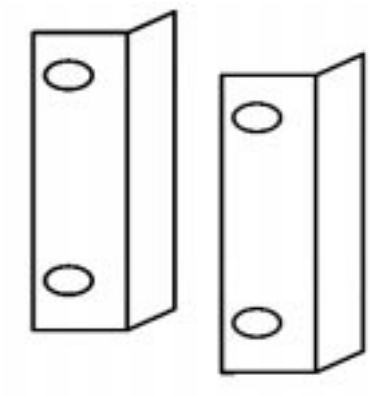
IN TRANSIT DAMAGES ARE NOT COVERED BY THE PASO WARRANTY.

SPECIFICATIONS

Power Output:	30 Watt RMS
Distortion:	Less than 0.5% THD
Frequency Response:	20 - 20,000 Hz ± 1 db
Inputs:	
Input 1	Microphone/Telephone
Input 2	Microphone/Program
Input 3	Auxiliary/CD
Sensitivity:	
Input 1	*Mic*=1 Mv, *Tel*=100 Mv
Input 2	*Mic*=1 Mv, *Program*=1 Volt
Input 3	*Aux*=200 Mv, *CD*=360 Mv
Hum & Noise:	*Mic* -65 db, *Aux* -75 db
Telephone Input:	600 ohm Transformer Balanced
Input Impedance:	*Mic*= 250 ohm Bal., *Tel*= 600 ohm Xfmer Bal., *Aux/CD*= 47 K ohm, *Program*= 10K ohm Bal.,
Music on Hold Output:	1 Volt-600 ohm Balanced, 1 Watt-8 ohm
Zone 1 Output:	600 ohm-1 Volt, 8 ohm-1 Watt
Zone 2 Output:	8 ohm-1Watt
Output Impedance:	8 ohm, 25 Volt and 70 Volt line
Controls:	Input 1 Volume, Input 2 Volume, Input 3 Volume, Module Level, Bass, Treble, Input 2 Attenuator, Zone 1 and Zone 2 Level Controls
VOX Relay:	Normally Open and Normally Closed Contact Terminals
Utility Power Supply:	24 Volt DC - 100 MA Regulated
Accessory Port:	Accepts Standard Module
EQ Link/Mix Buss:	Preamp out, Power Amp in
Tone Control Action:	+/-10 db at 100 Hz and 10 K hz
Muting/Precedence:	Dual Vox (Voice Activated) System Direct Muting with Selector, Inputs Priority Selector
Power Requirement:	117 Volt, 50-60 Hz
Power Consumption:	AC=100 VA
Terminations:	Screw Terminals, RCA Jacks
Housing Finish:	Black
Dimensions:	10.5"W., 9.5"D., 3.5"H. *(267X242X89 mm)*
Net Weight:	11 Lbs *(5.0 Kg)*

ACCESSORIES

27/3500 - Standard 19” Rack Mounting Kit. Black finish. Complete with hardware



INSTALLATION AND OPERATION

OPERATING PRECAUTIONS

BEFORE OPERATING THE AMPLIFIER, BE SURE YOU FULLY UNDERSTAND ALL INSTRUCTIONS AND FEATURES OF THE UNIT.

DO NOT assume anything, read all instructions carefully.

DO NOT connect the amplifier to any power source other than 120 volts 60 hz. (unless otherwise specified).

DO NOT turn on the amplifier until all input and output connections have been made.

MOUNTING
ALWAYS PROVIDE GOOD VENTILATION FOR THE AMPLIFIER.

Good ventilation allows air to flow under, around and through the amplifier.

DO NOT mount amplifier into a container or a closed unventilated closet while operating.

DO NOT place any object or accessory equipment such as Tuners, Mixers, Cassette Decks, etc. on top of the amplifier. Obstructing or closing the cabinet ventilation openings may cause overheating.

SAFETY NOTES

POWER AND GROUNDING
The amplifier is furnished with a three-prong plug as a standard equipment. Connect the line cord to a three-wire grounded outlet supplying 120 volts 60 Hz.. If a three-wire grounded outlet is not available, use a standard two wire adapter. Be sure that the adapter grounding pigtail is connected to the screw securing the outlet wall plate.

NEVER defeat the grounding feature of the AC line cord.

NEVER replace fuses unless power cord is removed from the AC wall outlet.

NEVER install accessories unless the power cord is removed from the AC wall outlet.

CAUTION

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE

RACK MOUNTING

A) Procure the optional accessory Rack Mount Kit.
B) Turn amplifier up side down and remove the four rubber feet by unscrewing the four holding screws.
C) Remove three screws on each side of the amplifier holding the amplifier cover.
D) Install the rack kit brackets by using the self-tapping screws provided and the screws removed as per C.

Fig. 3 - Rack Kit Mounting

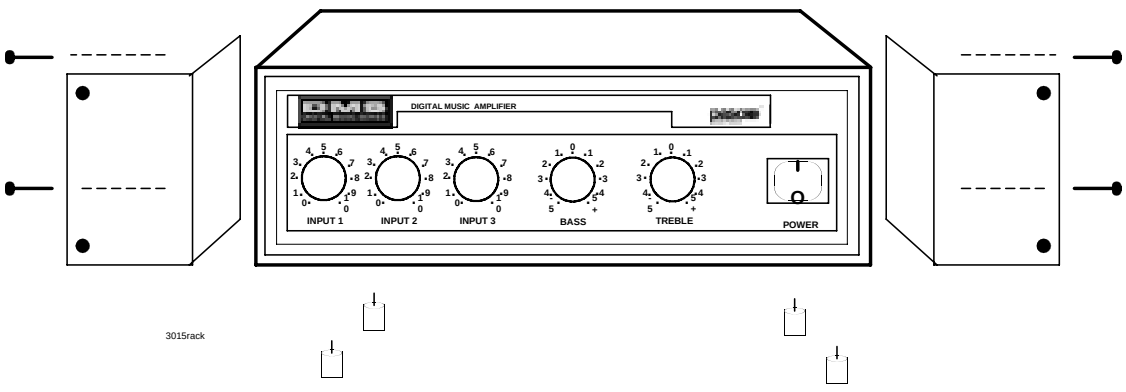
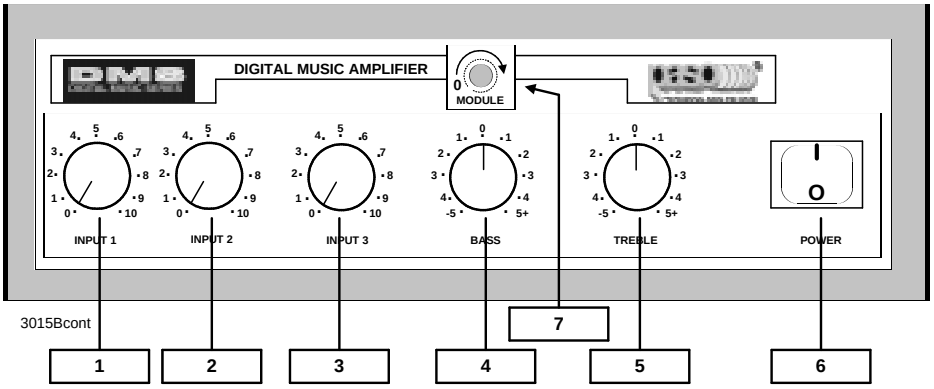
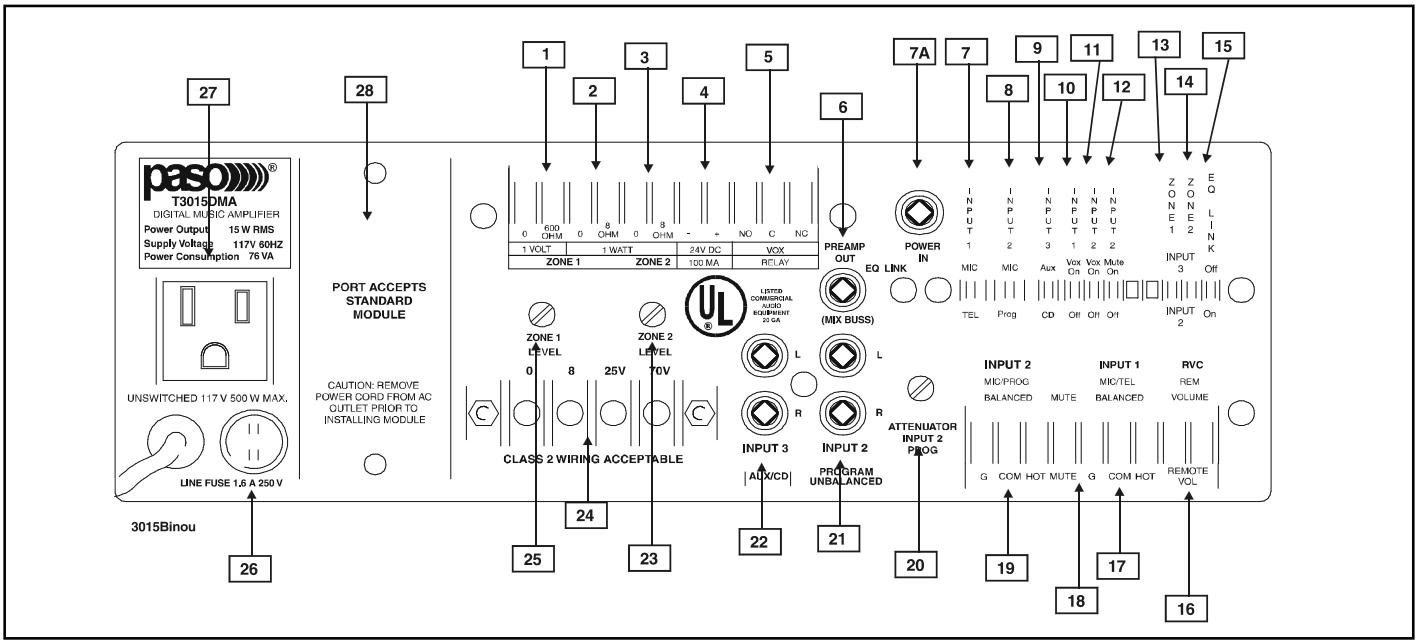


Fig. 4A - FRONT PANEL CONTROLS



1) **INPUT 1 Volume Control**
2) **INPUT 2 Volume Control**
3) **INPUT 3 Volume Control**
4) **Bass Control**
5) **Treble Control**
6) **On-Off Power Switch**
7) **Input Module Level Control**

Fig. 4B - REAR PANEL INPUTS - OUTPUTS

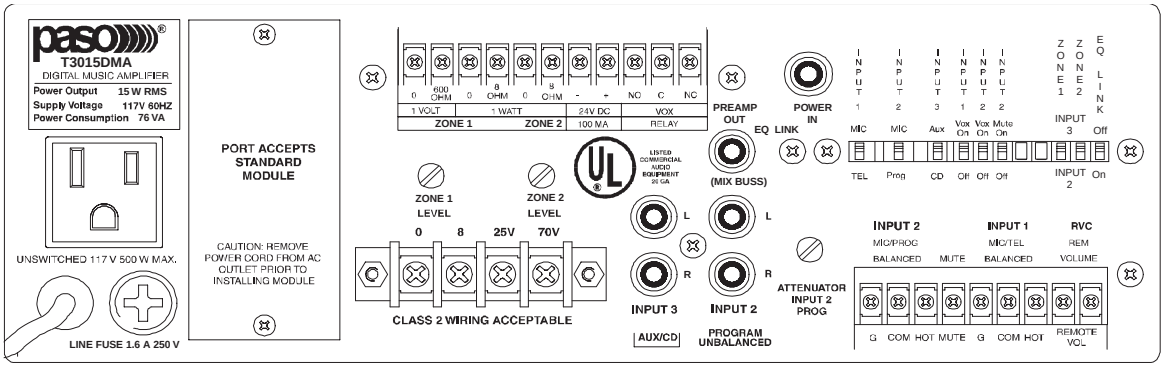


1) Zone 1 MOH - 600 ohm, 1 Volt Output
2) Zone 1 - 8 ohm, 1 Watt Output
3) Zone 2 - 8 ohm, 1 Watt Output
4) 24 Volt DC Regulated Power Supply Output
5) VOX Relay NO/NC Contact Terminals
6) PREAMP OUT/MIX BUSS
7) INPUT 1 - Microphone/Telephone Selector
7A) POWER AMP IN
8) INPUT 2 - Microphone/Program Selector
9) INPUT 3 - Auxiliary/CD Selector
10) INPUT 1 - VOX ON-OFF Selector
11) INPUT 2 - VOX ON-OFF Selector
12) INPUT 2 - MUTE ON-OFF Selector
13) ZONE 1 - AUX/Program Source Selector
14) ZONE 2 - AUX/Program Source Selector
15) EQ LINK Switch ON-OFF
16) Remote Volume Control Terminals
17) INPUT 1 - Balanced MIC/TEL Terminals
18) MUTE Terminals
19) INPUT 2 - Balanced MIC/PROGRAM Terminals
20) Attenuator Input 2 Program
21) INPUT 2 - Stereo Summing Jacks
22) INPUT 3 - Stereo Summing Jacks
23) ZONE 2 - Output Level Control
24) Speaker Output Terminals
25) ZONE 1 - Output Level Control
26) AC LIne Fuse
27) Unswitched AC Auxiliary Socket
28) Standard Module Port

INSTALLATION AND WIRING

INPUT CONNECTIONS

Fig. 5 Amplifier Rear Panel View



INPUT 1 SETTING AS A MICROPHONE INPUT

CAUTION: *TO PREVENT POSSIBLE DAMAGE TO SPEAKERS OR THE AMPLIFIER ALL INPUT CONNECTIONS MUST BE MADE WITH THE AMPLIFIER OFF (POWER OFF).*

MICROPHONE TYPE

The Microphone Input accepts Low Impedance (250-600 ohm) Microphones. The Microphone may be a balanced output type (three wire) or an unbalanced output type (two wire).

PASO MICROPHONES

All PASO low impedance Microphones have a balanced output for best performance. Connect the RED lead to terminal HOT, the WHITE lead to terminal COM and the SHIELD to terminal G (see Fig. 5A).

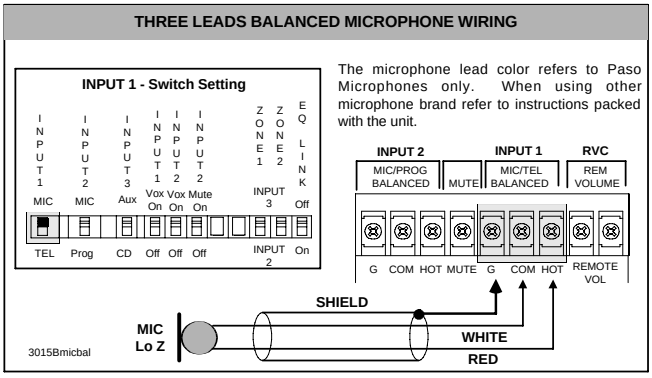


Fig. 5A - Balanced Microphone Input 1 Wiring

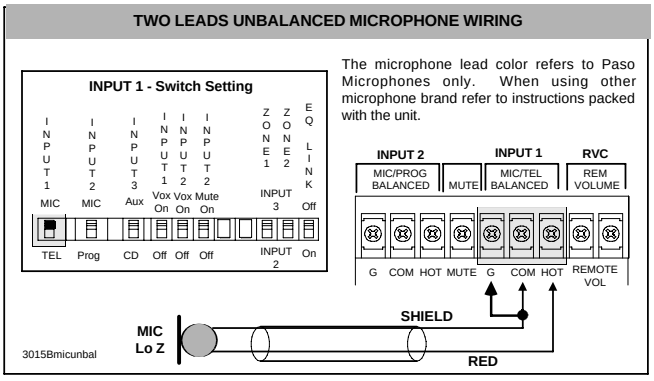


Fig. 5B - Unbalanced Microphone Input 1 Wiring

INPUT SWITCH SETTING

SET INPUT 1 SWITCH TO MIC

WIRING

MICROPHONE INPUT

Attach the microphone leads to the terminal strip as per diagram in Fig 5A or Fig. 5B.

DO NOT GROUND THE MICROPHONE CABLE SHIELD TO THE CHASSIS OF THE AMPLIFIER

CABLE

BALANCED MICROPHONE

IMPORTANT NOTE: The use of an unbalanced Microphone (two leads) is not recommended. For best results in a PA Application always use a Unidirectional, Low Impedance, Balanced Microphone (three leads).

CABLE LENGTH - If the distance between the Microphone and the Amplifier Input is greater than 15 ft (4.5 m) a Balanced Microphone must be used. Use a two conductor shielded wire and connect Microphone to Amplifier as per Diagram in Fig. 5A.

MICROPHONE CABLE ROUTING - The Microphone Cable should be carefully routed. Improper Cable routing will cause spurious oscillations, regenerative noises, hum, etc. that may permanently damage the Amplifier.

- **Do not route cable next to power lines.**
- **Do not route cable near or over Fluorescent Fixtures.**
- **Do not route cable next to Speaker Wires.**
- **Do not install cable inside Power Line Conduits.**
- **Avoid the use of staples that may penetrate the cable.**

UNBALANCED MICROPHONE

Attach the Microphone leads to the terminal strip as per diagram in Fig 5B.

Be sure the cable length does not exceeds 15 Ft. (4.5 m).

INSTALLATION AND WIRING

OUTPUT CONNECTIONS

CONSTANT VOLTAGE DISTRIBUTION SYSTEMS

25 VOLT AND 70 VOLT CONSTANT VOLTAGE DISTRIBUTION SYSTEMS - In applications requiring a large number of speakers that are located at a far distance from the amplifier a 25 Volt or a 70 Volt Constant Voltage method is most widely used.

MAIN ADVANTAGES IN USING THE HIGH IMPEDANCE METHOD

1) All speakers are connected in parallel usually on to a single speaker line.
2) The Amplifier Output Voltage is constant over a very wide range of load impedance.
3) The Amplifier Output Voltage remains practically constant if loudspeakers are connected or disconnected from the line.
4) Different acoustic power can be allocated in each area as required by using the power taps on the speaker line transformer.
5) Since the system provides a higher voltage at a lower current, resistive loss in the cable is reduced resulting in a higher efficiency.
6) Calculations of the output power needed and the speaker power requirements are simple and easily accomplished.

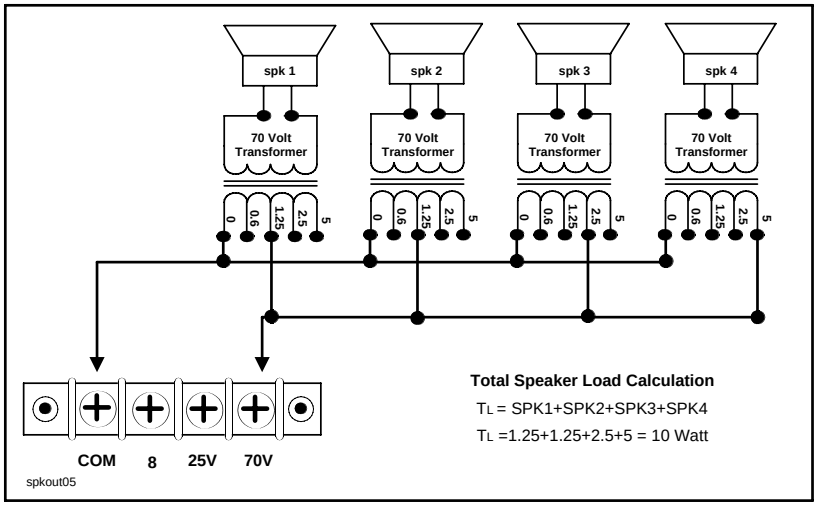


Fig. 11 - 70 Volt Constant Voltage System Diagram

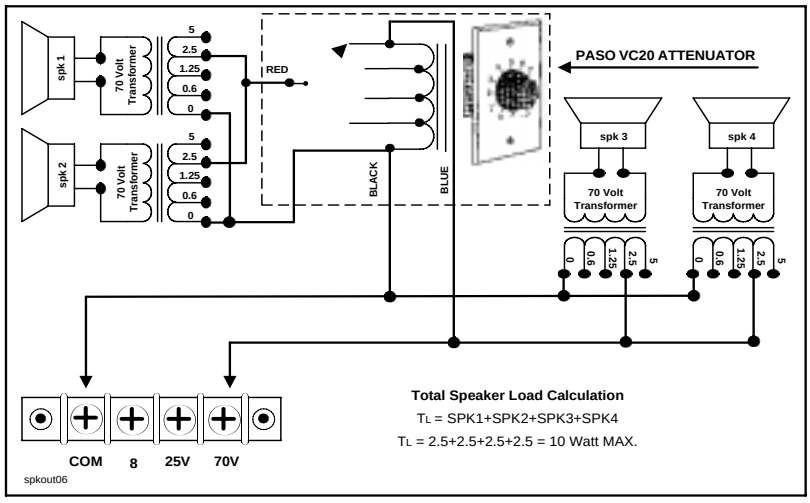


Fig. 11A - Using a Line Attenuator Diagram

WIRING

INSTALLATION TIPS

1) Determine the amount of speakers required for the installation and their location.
2) Choose the power output needed for each speaker (typically 1.25 Watt for background music applications and 5-10 Watt for paging horns).
3) Add all the speaker taps wattage (see Fig. 11) and be sure that the total power needed does not exceed the Rated RMS Power Output of the Amplifier
4) Procure a jacketed, two conductor cable of at least 18 gauge.
5) Carefully route cable starting with the farthest speaker in the system and until all speakers are reached by the cable and terminating at the Amplifier location. The best cable route is determined by the individual application.
6) Connect each speaker in accordance to the power output required by selecting the corresponding Power Tap.
IMPORTANT NOTE: Make sure that the unused stripped power tap wires are INDIVIDUALLY INSULATED and do not touch each other or an amplifier overload will occur.
7) Connect the speakers cable to the *25 Volt* or *70 Volt* and *COM* output terminals of the Amplifier, turn the system on and balance the various speakers accordingly. The selection of the Constant Voltage (25 Volt or 70 Volt) is determined by the speakers used. All speakers must operate at the same constant voltage and cannot be mixed.

LINE ATTENUATORS

In installation requiring that one or a group of speakers have an independent level control a Line Attenuator can be utilized. The Fig. 11A shows the use of a PASO model VC20 - 20 Watt Attenuator used to control two speakers simultaneously. The wire colors pertain to the VC20, if other types are used follow the directions supplied with the unit.

By turning the stepped switch of the VC20 the level of speakers SPK 1 and SPK 2 can be adjusted, up or down, from 0 (no output) to the maximum output determined by the tap utilized on the speakers (in this example 2.5 Watt max.). Speakers SPK 3 and SPK 4 are not effected.

NOTE: The total power required for all the speaker or speakers to be controlled should not exceed the Power Handling rating of the Attenuator. Example: the maximum load for the VC20 is 20 Watt.

MAINTENACE AND SERVICE

CAUTION ! REMOVAL OF THE AMPLIFIER COVER PRESENTS AN ELECTRICAL SHOCK HAZARD ALWAYS REMOVE THE POWER CORD FROM THE AC WALL OUTLET

THE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID ELECTRIC SHOCK DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

TROUBLESHOOTING CHART

This Troubleshooting Chart is provided to the installer as an aid in locating and correcting possible problems that may arise during installation or after use. This chart should only be used by qualified personnel trained in repair and maintenance of electrical apparatus.

PROBLEM SYMPTOMS	PROBABLE CAUSE
AMPLIFIER IS COMPLETELY DEAD. **POWER INDICATOR DOES NOT GLOW.**	**1) NO VOLTAGE PRESENT AT AC OUTLET.** **2) AC LINE FUSE OPEN.** **3) DEFECTIVE OR OPEN POWER CORD.** **4) POWER SWITCH INOPERATIVE.** **5) POWER TRANSFORMER WINDING OPEN.** **6) POWER INDICATOR DEFECTIVE OR DISCONNECTED.**
POWER INDICATOR GLOWS BUT THERE IS NO OUTPUT FROM THE AMPLIFIER.	**1) INPUT CONTROLS SETTING NOT ADJUSTED PROPERLY.** **2) SPEAKER WIRES SHORTED.** **3) SPEAKER(S) LINE INTERRUPTED.** **4) MICROPHONE OR PROGRAM SOURCE INTERRUPTED.**
LOUD HUM OR CRACKLING SOUND FROM THE SPEAKERS.	**1) MICROPHONE INPUTS INCORRECTLY WIRED.** **2) OPEN GROUND OR SHIELD IN INPUT CABLES.** **3) SPEAKER TERMINALS SHORTED TO CHASSIS GROUND.**
OUTPUT LEVEL LED'S GLOW CYCLICALLY **SOUND IS INTERMITTENT.** **SOUND IS DISTORTED AND SCRATCHY.**	**1) SPEAKER LINE SHORTED.** **2) ONE OR MORE SPEAKER OR LINE TRANSFORMER SHORTED.** **3) OUTPUT IMPEDANCE LOAD MISMATCHED WITH AMPLIFIER OUTPUT IMPEDANCE SETTING (OVERLOAD).** **4) IN CONSTANT VOLTAGE SYSTEMS (25-70 V) THE TOTAL LOAD POWER REQUIREMENT EXCEEDS THE AMPLIFIER POWER RATING (OVERLOAD).** **5) EXCESSIVELY HIGH SETTING OF ONE OR MORE VOLUME CONTROLS.**
ACOUSTIC FEEDBACK OR LOUD SQUEAL OCCURS WHEN AMPLIFIER IS TURNED ON.	**1) MICROPHONE IS LOCATED TOO CLOSE OR IS FACING SPEAKERS.** **2) VOLUME CONTROL SETTING TOO HIGH.** **3) TONE CONTROLS SHOULD BE SET IN THE CUT RANGE.**

AC LINE FUSE REPLACEMENT

CAUTION: TO REDUCE THE RISK OF FIRE REPLACE ONLY WITH THE SAME TYPE OF FUSE

Procure a Fuse Type: 5mm Diameter

Model T3015DMA FUSE RATING = 1.6 A 250 V
Model T3030DMA FUSE RATING = 2 A 250 V

Turn amplifier power switch to the Off position. Remove power cord from AC outlet. Insert the tip of a screwdriver inside the Fuse Holder Cap and remove the fuse by unscrewing the cap. Replace Fuse and screw the cap back onto Fuse Holder.

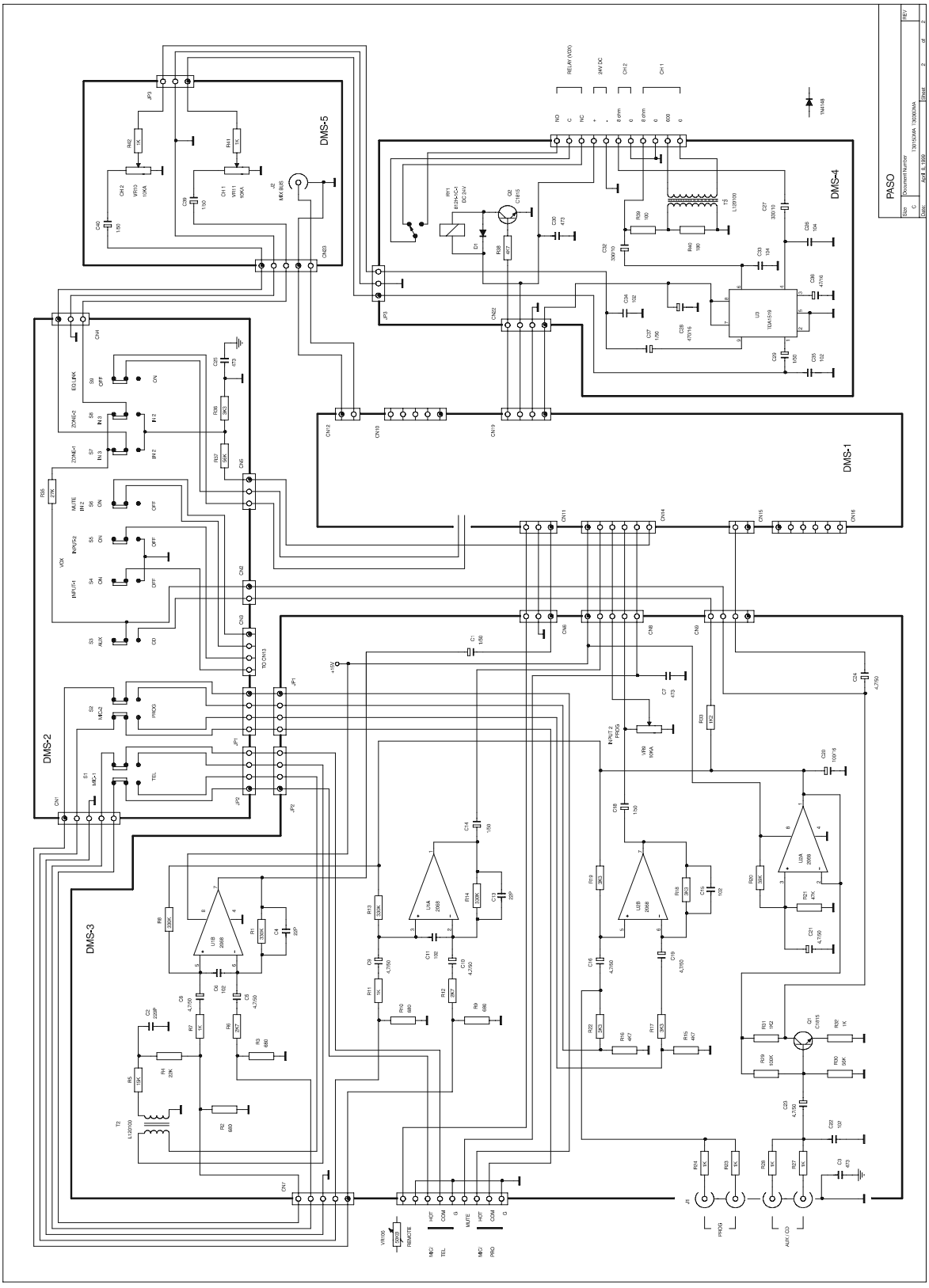


Fig. 20 - Schematic Diagram Section 1

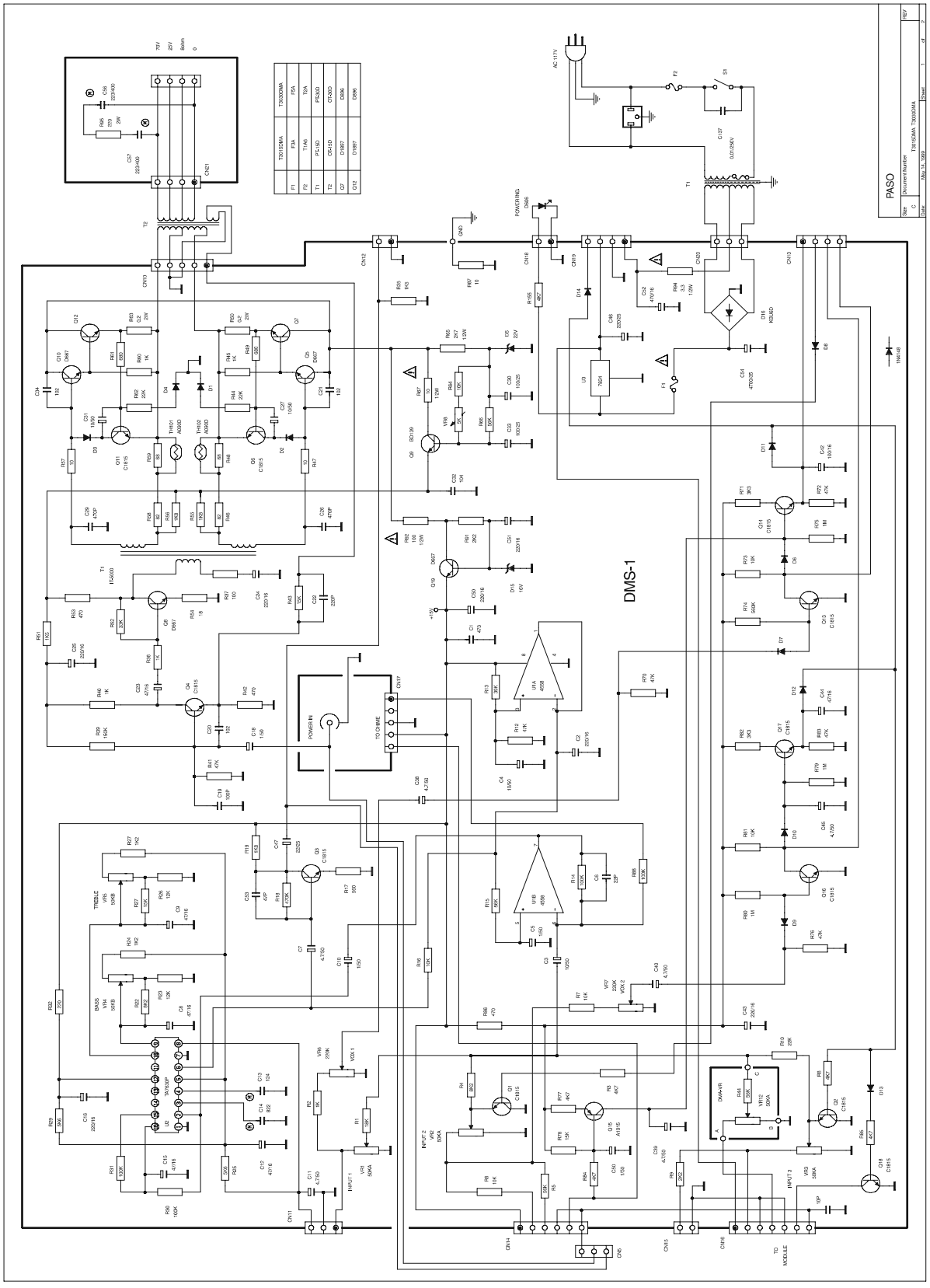


Fig. 21 - Schematic Diagram Section 2

CUSTOMER SERVICE

REPLACEMENT PARTS

REPLACEMENT PARTS
Please provide complete information when you request replacement parts from either the Factory or a Paso Authorized Distributor. Be certain to include the Part Number and Description as it appears on the parts list, the Model Number of the unit and if possible the Serial Number and the date of purchase of the unit. Replacement parts inventory is maintained specifically to repair Paso products. Part sales for other reasons or applications will be declined.

ORDERING FROM THE FACTORY
Print all information on a purchase order form and mail to:
PASO SOUND PRODUCTS, INC.
4750 Goer Drive - Building F
NORTH CHARLESTON, SC 29406

Be sure to include the following:
- Paso part number
- Part description
- Quantity required
- Model number of the unit
- Serial number of the unit
- Your payment or your authorization for COD shipment for parts not covered by the Warranty or if your company has a current account with the factory

RETAIN ORIGINAL IN WARRANTY PARTS UNTIL YOU RECEIVE REPLACEMENTS. PARTS THAT SHOULD BE RETURNED TO THE FACTORY WILL BE LISTED ON YOUR PACKING SLIP.

For your convenience replacement parts are also available through Paso Authorized Distributors and Dealers nation wide. Obtain a location list directly from the Factory or your regional Paso Representative.

TECHNICAL CONSULTATION
- Need help with your installation ?
- Need help with the operation of the unit ?
- Need help with a repair ?

Call or write for assistance. You will find our Technical Dept.. eager to help or assist you with any technical problem you may have encountered except "`Customizing" for a unique application.

The effectiveness of our consultation service depends on the accuracy of the information you furnish.
Be sure to tell us:
- The Model and Serial number of the unit
- The date of purchase
- An exact description of the difficulty
- All you have done in attempting to correct the problem

Call our toll-free phone number:

1-800 231 3034

REPAIR SERVICE

REPAIR SERVICE
Repair service for out of warranty Paso products may be obtained form your local Paso distributor or any other qualified repair station.

In warranty repairs must be returned to the Factory.
Prior authorization must be obtained from the Factory.
Products received without authorization will be refused by our Receiving Dept..

IN WARRANTY REPAIR SERVICE
Call or write the Factory to obtain an authorization to return the product for repairs.

Pack the equipment in the original carton or in a strong carton with at least THREE INCHES of resilient packing material on all sides, top and bottom. Seal the carton with reinforced tape and mark it FRAGILE on at least two sides. Remember, the Carrier will not accept liability for shipping damages if the unit is improperly packed.

EQUIPMENT RECEIVED IN DAMAGED CONDITION DUE TO POOR PACKING WILL BE REFUSED AND THE WARRANTY COVERAGE IS AUTOMATICALLY VOIDED.

The Paso Sound Limited Warranty provides:

The examination of the returned product must disclose in our judgement, a manufacturing defect. The warranty does not extend to any product that has been subject to misuse, neglect, accident, improper installation or where the serial number of the product has been removed or defaced.

Ship via insured prepaid United Parcel Service or Parcel Post to:

PASO SOUND PRODUCTS, INC.
4750 Goer Drive - Building F
NORTH CHARLESTON, SC 29406
ATT. SERVICE DEPARTMENT
The equipment will be returned freight prepaid after repairs.

Be sure to include the following:
- Your name and address
- Date of purchase and copy of invoice
- A brief description of the difficulty
- A return address shipping label
-

OUT OF WARRANTY REPAIR SERVICE
Follow return instructions as per in warranty repair service. Prior to performing all necessary repairs, you will be advised of the charges and at that time a written authorization by you will be required including authorization to return the equipment COD for the service and shipping charges. This will avoid unnecessary delays in returning the equipment to you.