

City of International Falls

REQUEST FOR PROPOSALS (RFP)

February 19, 2019

To provide professional services to design, install, and train in the use of

HIGH AND STANDARD DEFINITION AUDIO/VISUAL COMMUNICATIONS EQUIPMENT



CITY OF INTERNATIONAL FALLS, MINNESOTA

600 4th Street

International Falls, MN 56649

Proposal due date March 12, 2019 at Noon

Award contract April 1, 2019 at 4:30 P.M.

TABLE OF CONTENTS

I.	REQUEST FOR PROPOSAL NOTICE	3
II.	INTRODUCTION	4
	a. Purpose	4
	b. Community Overview	4
III.	PROJECT SUMMARY	6
IV.	SCOPE OF WORK	6
	a. Option 1	7
	b. Option 2	7
V.	TENTATIVE PROJECT SCHEDULE	8
VI.	PROPOSAL FORMAT AND SUBMISSION.....	8
	a. Proposal Submission Requirements	8
	b. Proposal Format	8
	c. Additional Submittal Information	10
VIII.	EVALUATION AND CONSULTANT SELECTION.....	10
	a. Evaluation Criteria	10
	b. Selection Process	11
	c. Supplementary Information.....	12
	i. Conditions and Limitations	12

Attachments – Exhibit A

REQUEST FOR PROPOSAL NOTICE

Notice is hereby given that the City of International Falls will accept proposals for professional services with a listing of qualifications for the design, installation, and training on the use of high and/or standard definition audio/visual communications equipment in the City Council Chambers of the Municipal Building, 600 4th Street, International Falls, MN 56649. The Request for Proposals (RFP) must describe the equipment specifications and labor costs with a not-to-exceed fee to install improved audio and video equipment in the Council Chambers. The goal for upgrading the current equipment is to allow for better quality of City Council Meeting videos for broadcast and viewing online and on KCC-TV, the local cable access channel provider (MIDCO Channel 7). The equipment may also be utilized for broadcast or recording of other meetings and presentations. The consultant shall also train staff to use and maintain the installed equipment. The RFP may be found at www.ci.international-falls.mn.us

All proposals shall be submitted ***not later than Noon, Tuesday, March 12, 2019*** in a sealed container that is clearly identified as the ***"Proposal for Professional Services"*** to update the Council Chambers A/V Communication Equipment for the City of International Falls, Minnesota. The submittal shall consist of eight (8) hard copies of the proposal, one (1) electronic copy in pdf format, and one (1) electronic copy in Microsoft Word format. The proposals should be forwarded to the City at the respective U. S. mail and e-mail addresses listed below:

Kenneth R. Anderson
City Administrator
City of International Falls
600 4th Street
International Falls, MN 56649
E-mail: kena@ci.international-falls.mn.us

At the discretion of the City of International Falls, firms submitting proposals may be requested to make oral presentations as part of the evaluation process. An invitation to present the proposal may be provided by March 20, 2019 to those firms selected to interview with the City Council. Presentations of proposals will then be made to the City Council during the week of March 25, 2019. The award of a contract will be made by the City Council at the April 1, 2019 meeting. The City reserves the right to reject any or all proposals, waive nonmaterial irregularities or deviations from RFP instructions, negotiate terms and conditions, and to select the consultant with the proposal that represents the best approach to meet City needs.

Prior to the submission of proposals to the City Council, the City of International Falls reserves the right, where it may serve the City's best interests, to request additional information or clarifications from consultants, or to allow corrections of errors or omissions. Inquiries or clarifications should be directed in writing via e-mail to the following City contact:

Kenneth R. Anderson, City Administrator
kena@ci.international-falls.mn.us

INTRODUCTION

PURPOSE

The City of International Falls, Minnesota (the “City”) is requesting proposals and qualifications from qualified consultants to design, install, and train staff on the use of high and/or standard definition audio/visual communications equipment in the City Council Chambers of the Municipal Building, 600 4th Street, International Falls, MN 56649. The Request for Proposals (RFP) must describe the equipment specifications and labor costs with a not-to-exceed fee to install improved audio and video equipment in the Council Chambers. The goal for upgrading the current equipment is to allow for better quality of City Council Meeting videos for broadcast and viewing online and on KCC-TV, the local cable access channel provider (MIDCO Channel 7). The equipment may also be utilized for broadcast or recording of other meetings and presentations. The consultant shall also train staff to use and maintain the installed equipment.

COMMUNITY OVERVIEW

The City of International Falls is established as a Home Rule Charter city under authority of Minnesota Statutes and is governed by a Mayor and four Councilors. The City of International Falls consolidated with the City of South International Falls in 1989.

Location

The City of International Falls is located on the border between the United States and Canada, directly across the Rainy River from the Town of Fort Frances, Ontario, Canada. The natural boundary between these two “Sister Cities” is the Rainy River, a waterway that flows 80 miles west to Baudette, Minnesota. The two communities are connected by the International Bridge and cooperate in event planning and by providing mutual support services as available and as needed.

Transportation

The City of International Falls is an official port of entry city with United States Customs and Immigration services on the International Bridge, at Falls International Airport, and at the seaplane base on Rainy River.

Falls International Airport: The Falls International Airport is a key airport facility within North America as it serves as an official United States Port of Entry. The Falls International Airport is serviced by SkyWest Airlines, an affiliate of Delta Airlines, and offers daily flights to and from the Minneapolis - St. Paul International Airport (MSP).

Airport Amenities:

- Free parking
- Rental cars

- Wi-Fi service
- Convenient check-in and baggage claim
- United States Port of Entry with Customs and Border Protection services

Major Highways: The City of International Falls is served by -

- United States Highway 53
- United States Highway 11/71
- In addition, the area is served by County State Aid Highway 332 which is an industrial truck route that bypasses the developed portions of the City and is a connecting link to Highways 53 and 11/71.
- Canadian Highway 11 East and West link up in Fort Frances at the International Bridge border crossing.

History

On August 10, 1901, the Village of Koochiching was incorporated and two years later its name was changed to International Falls, in recognition of the river's role as a border between the United States and Canada.

Realizing the potential for water power and mills in the area, industrialist E.W. Backus, President of the Minnesota and Ontario Paper Company in the early 20th century, built a dam on the Rainy River to power the company's mills. The mill was purchased in 1965 by Boise Cascade Corporation and sold to an investment group in 2003. In 2013, it was sold to Packaging Corporation of America and continues to sell product under the name of "Boise Paper." The company remains the largest business and employer in the area.

Voyageurs National Park

In 1975, Congress created the Voyageurs National Park, a 218,000-acre island-water National Park, in which the City of International Falls serves as the full-service community and northern gateway to the Park. Tourism is the area's second largest economic activity.

Population

According to the 2010 United States Census, the City population was 6,424. The City of International Falls is the county seat for Koochiching County. The County's population was 13,311 in the 2010 Census. The most recent population estimate from the Minnesota State Demographer is 6,151 people in the City of International Falls.

Size and Elevation

The City of International Falls encompasses 6.53 square miles and is at an elevation of 1,122 feet above sea level.

Education

The City of International Falls area offers a wealth of learning opportunities, beginning with preschool and extending into college, including St. Thomas Aquinas Catholic School, Independent

School District # 361, and Rainy River Community College (RRCC). RRCC works with local business to customize workforce training.

Minnesota Workforce Center

RRCC houses the local Minnesota Workforce Center office. The Workforce Center engages closely with people seeking employment and also with businesses searching for talent.

Health Care

The City of International Falls serves as a regional medical center offering patients both primary and secondary levels of health care services from two service providers as well as care in multiple senior housing options. Service providers include Rainy Lake Medical Center (RLMC), Essentia Health Clinic, and the Evangelical Lutheran Good Samaritan Society.

PROJECT SUMMARY

The consultant will be expected to coordinate all the tasks necessary to design, install, and train personnel on the use of high and/or standard definition audio/visual communications equipment in the City Council Chambers of the Municipal Building. The RFP must describe the equipment specifications and labor costs for two options, with a not-to-exceed fee for each option, to install improved audio and video equipment in the Council Chambers. The goal for upgrading the current equipment is to allow for better quality of City Council Meeting videos. The videos are recorded and broadcast for viewing online and on KCC-TV, the local cable access channel provider (MIDCO Channel 7). The equipment may also be utilized for display, broadcast or recording of advisory boards and committee meetings and other organizations meetings or presentations. The consultant shall also train staff to use and maintain the installed equipment.

SCOPE OF WORK

This RFP is not intended to be totally and absolutely prescriptive in nature. Rather, the consultant should incorporate its professional and technical expertise to design and install an affordable, reliable, and modern communications system that effectively functions for public education and monitoring of meetings and events held in the City Council Chambers. In preparing a scope of work for this proposal, the consultant should be comfortable in offering independent, creative approaches and methodologies to this work. The consultant must design a system to meet our need for viewers to clearly observe and comfortably listen to events held in this venue, and thus promote public interest and understanding of local government and other organizations in action.

The proposal should be framed to respond to two basic design and communication concepts that are outlined below. Additionally, the consultant should advise whether the lighting system and/or room acoustics need to be altered to maximize audio and visual broadcast quality. The proposals

should identify the features and costs for a high definition and standard definition system for each option. Costs, warranty information, training, and technical support services should be identified. The proposal should be all-inclusive and identify required appurtenances and hardware to be installed. Quantities, product descriptions and part numbers should also be identified as well as labor hourly fees and travel and other miscellaneous expenses. Proposals shall be valid for at least 60 days. Photographs of the room and equipment and existing equipment specifications are attached to this RFP for consultant review. Meeting videos are available for review at the City web page – <https://www.ci.international-falls.mn.us/category/city-council/city-council-meeting-videos/>

Option 1

Request: Upgrade or replace the existing Council Chambers audio system only.

Current system: The current system in the Council Chambers consists of a tabletop system of combined speakers, cough or mute button, and microphones for each seat at the City Council front table (5), two tabletop speakers/microphones for each of two side tables (2), and one tabletop speaker/microphone (1) for the table mid-room in front of the fixed pews for audience seating. There is a speaker facing the audience seating area that is mounted and hanging from the ceiling near the mid-room table.

Proposed system: The City wishes to improve sound quality to be more audible during re-broadcast and to meeting attendees. Further, the system should offer continuous sound without cutout or cutoff of sound or meeting discussion. The capability to amplify and record sound from audience member questions/comments while seated in audience seating areas should be included.

Option 2

Request: Upgrade audio and camera video system.

Current system: The Council Chambers currently has one camera mounted on a tripod in the back end of the room with a fixed view from about shoulder height. This is a distant view of the City Council table, each side table (2), and the mid-room table (also see Option 1).

Proposed system: The City wishes the proposal to expand on the Option 1 audio proposal to complement the system with improved resolution and/or upgraded general visual/camera capabilities for the room configuration, i.e., wall mount versus tripod, elevated view versus ground level, zoom or wide angle features, etc.

TENTATIVE PROJECT SCHEDULE

RFP available/sent	February 20, 2019
Proposals due	Noon, March 12, 2019
Evaluation period	March 13, 2019
Consultant interviews (Optional)	March 20+, 2019
Award contract	April 1, 2019
Project completion	June 28, 2019

PROPOSAL FORMAT AND SUBMISSION

PROPOSAL SUBMISSION REQUIREMENTS

The Consultant shall submit one (1) original, eight (8) hardcopies, and (1) electronic copy (via e-mail) of the proposal. Hardcopies shall be bound or stapled. The deadline for proposal submission is Tuesday, March 12, 2019, at Noon, Central Time. Proposals submitted after this time will not be considered. The proposal and any associated materials shall be submitted in a sealed container labeled "Proposal for Professional Services" to:

Kenneth R. Anderson, City Administrator
City of International Falls
600 4th Street
International Falls, MN 56649

PROPOSAL FORMAT

Title Page - Provide the name of your firm, address, telephone number, and name of contact person.

Tab #1 Letter of Transmittal

- 1.1 Briefly state your firm's understanding of the services to be performed and express a positive commitment to provide the services as specified.
- 1.2 Provide the name(s), title(s) and contact information of the person(s) authorized to make representations for your firm.
- 1.3 The letter of transmittal shall be signed by an individual who has the authority to legally bind the firm. Include the printed name and title of the individual signing the proposal immediately below their signature.

Tab #2 Table of Contents - Clearly identify the materials by tab and/or page number.

Tab #3 Project Team Experience

- 3.1 Identify the project team including assisting consultants (“subs”) and provide a statement of qualifications for each individual to include credentials.
- 3.2 Identify the Project Manager, as well as the role of each individual team member, including subs and the relative percentage each team member is expected to spend on the overall project.

Tab #4 Available Resources and Consultant Location

- 4.1 Provide information on the size, location, available resources, and business history of your firm.
- 4.2 Provide a brief description of the general project approach and processes to be employed. If there are items that the firm/team feels should be included in the scope of work, but are not identified herein, please also include those items, with an explanation of why they should be included.

Tab #5 Timeline

- 7.1 Provide a proposed preliminary schedule for the complete project as described in this RFP.

Tab #6 Cost Proposal

- 8.1 Provide a not-to-exceed fee schedule to include product costs, labor, training, and travel and material expenses for the project
- 8.2 Provide a fee schedule for additional services which should include, at a minimum, the hourly rate for each team member and sub, reimbursable costs, and any other costs that may be required to complete the additional services.
- 8.3 Fees shall be invoiced monthly based on the actual costs incurred to date. Final payment will be made upon satisfactory completion of the work and training of staff personnel.

Tab #7 References

- 9.1 Provide a list of at least three (3) references along with their contact information for similar project work.

Tab #8 Supporting Information (Optional)

- 10.1 Provide additional supporting information not otherwise requested.

ADDITIONAL SUBMITTAL INFORMATION

Failure to provide the information requested may be sufficient reason to disqualify the Proposal from consideration. To the extent permitted by law, all documents pertaining to the Proposal will be kept confidential until a proposal is approved/contract awarded. No information about any proposal will be released to the public until the selection process is complete.

EVALUATION AND CONSULTANT SELECTION

EVALUATION CRITERIA

Proposals that comply with the instructions set forth in this document will be evaluated by the City; however, the City reserves the right to reject any or all proposals. At its discretion, the City may waive nonmaterial irregularities or deviations from the RFP instructions. The evaluation process may reveal additional information that may also be considered.

All proposals received may be evaluated based upon the quality of the proposal and on the best value for the City. In determining best value, the City may consider:

1. Project team qualifications and experience;
2. Responsiveness and proposed approach to work scope and project needs;
3. Demonstrated experience and technical competence in similar projects;
4. Capacity and capability of the firm/team to perform the work in question, including specialized services;
5. Proposed approach to the project;
 - Although the City has identified the general nature of services to be provided, the consultant is given flexibility in their approach to provide the requested services. Innovation and creativity are encouraged to reduce costs and ensure good quality audio and visual services.

6. Available resources and consultant location;
7. Qualifications of key personnel assigned;
8. Performance record (references);
9. Past record of performance of the firm with respect to such factors as working relationship with subs or peer consultants on the same project, control of costs, quality of work, and ability to meet schedules;
10. Past working relationship with City, if any;
11. Completeness of submittal; and
12. Any relevant criteria specifically listed in the solicitation.

SELECTION PROCESS

The results of the review and evaluation of the responses to the criteria outlined herein will be used to select a consultant or perhaps multiple consultants to meet with the City for interviews. Upon completion of successful interviews, if desired, the City will rank the responses and select a firm with which the City will award the work.

This RFP does not commit the City to award a contract or to pay any costs incurred in the preparations or submission of proposals.

Selection of the successful proposal for interview or award of work will be made based up on the following criteria:

- Responsiveness and proposed approach to work scope and project needs.
- Past record of performance of the firm with respect to such factors as working relationship with sub-consultants or peer consultants on the same project, control of costs, quality of work, and ability to meet schedules.
- Demonstrated experience and technical competence in similar projects.
- Cost-effectiveness.
- Capacity and capability of the firm/team to perform the work in question, including specialized services.
- Qualifications of key personnel assigned.
- Understanding of local conditions related to the completion of the improvements.
- Other factors the City deems desirable.

Questions regarding the RFP must be submitted in writing to Kenneth R. Anderson, City Administrator, via e-mail at kena@ci.international-falls.mn.us.

SUPPLEMENTARY INFORMATION

Conditions and Limitations:

1. Proposals that do not include all of the submittal requirements outlined herein may not be considered.
2. At the City's sole discretion, the City may choose to republish this RFP.
3. Until such time as the project work is awarded, there are no express or implied obligations or commitments on the part of either the City or the consultant concerning either this RFP or any proposal associated with it.
4. At the City's sole discretion and with notice being provided to the consultants, the City may amend the selection process and/or tentative project schedule at any time.
5. By submitting materials for the City's consideration pursuant to this RFP, the consultant is waiving any claim of confidentiality, trade secrets, or privilege with respect to materials submitted. All submittal materials may be subject to disclosure under the Minnesota Data Practices Act.
6. Any changes resulting from the questions submitted affecting specifications, the scope of work, or which may require an extension to the proposal due date will be reduced to writing in the form of an addendum to this RFP.
7. The selection of a consultant and the execution of a contract or approval of project work, while anticipated, shall not be guaranteed by the City. The City reserves the right to determine which proposal is most favorable to the City and in its best interest and to award the contract on that basis. Additionally, the City may award a contract for completion of components of the scope of work and not all work specified.
8. The City of International Falls promotes affirmative action and, therefore, the consultant selected shall not discriminate under this engagement against any person in accordance with federal, state and local regulations. The City of International Falls does not discriminate on the basis of race, color, national origin, sex, religion, age, sexual preference, disability or any other basis protected by law in the admission or access to, or treatment or employment in, its programs, activities, or services.
9. The RFP may also be found on the City website at www.ci.international-falls.mn.us

Consultants responding to this RFP are encouraged and welcome to view the facility to assist in preparing a responsive proposal.

- Attachments:
1. Council Chambers room and equipment photos
 2. Current equipment specifications

RFP Attachments

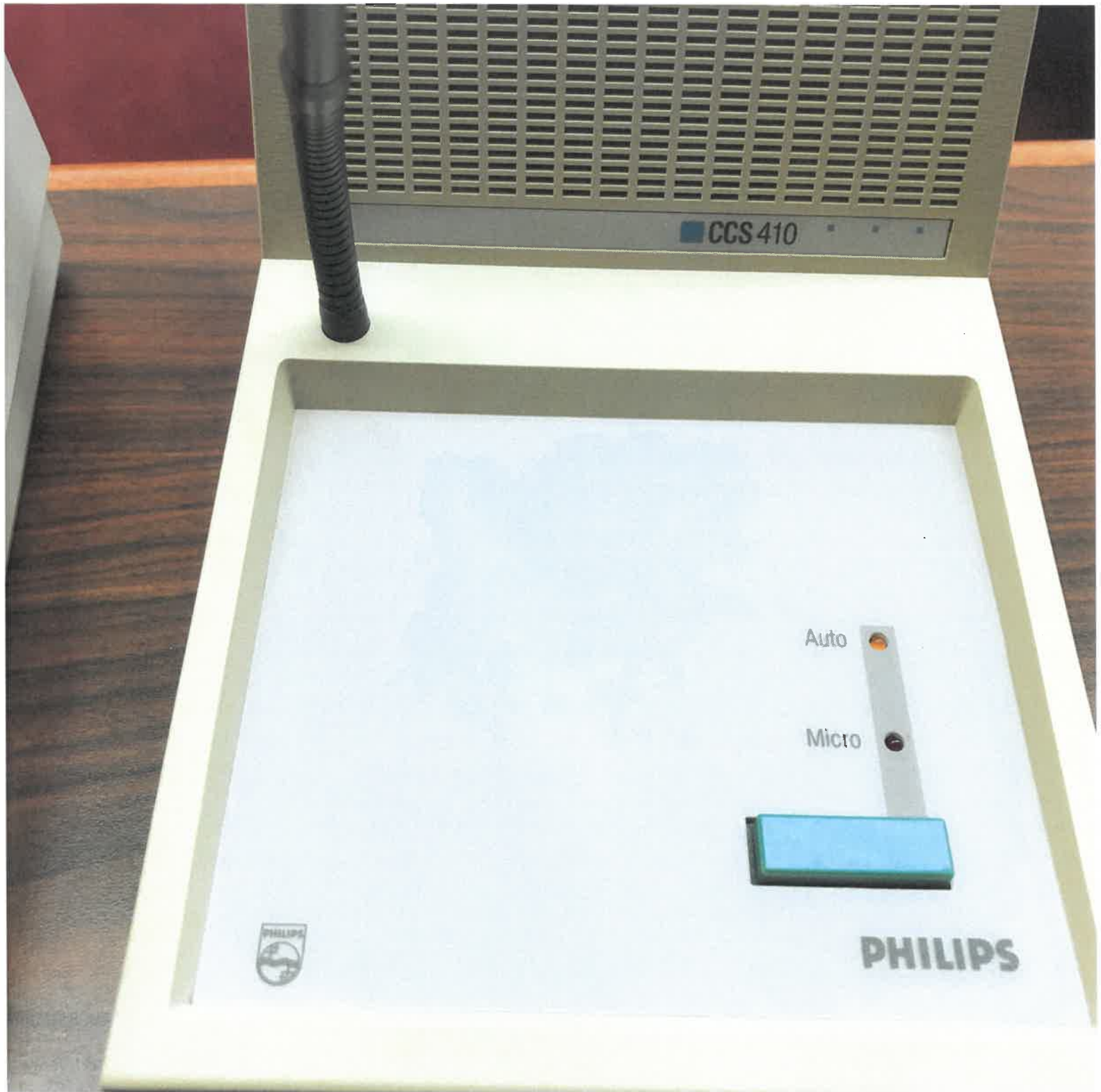




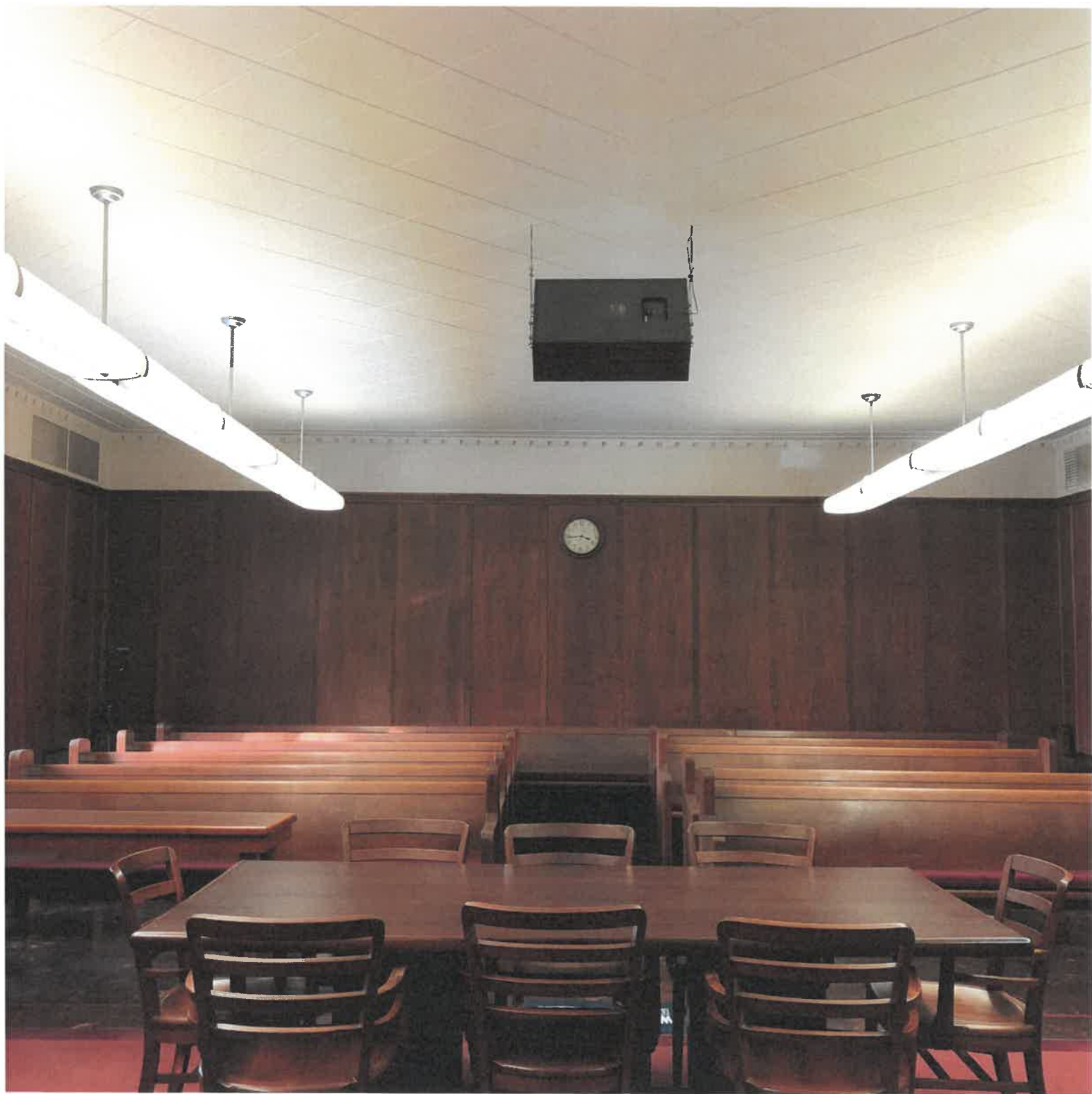


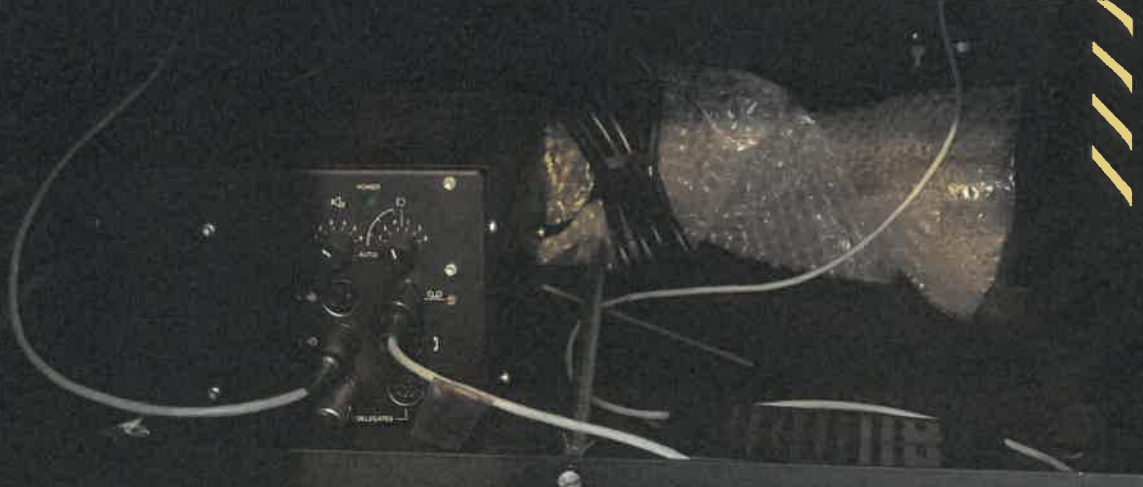
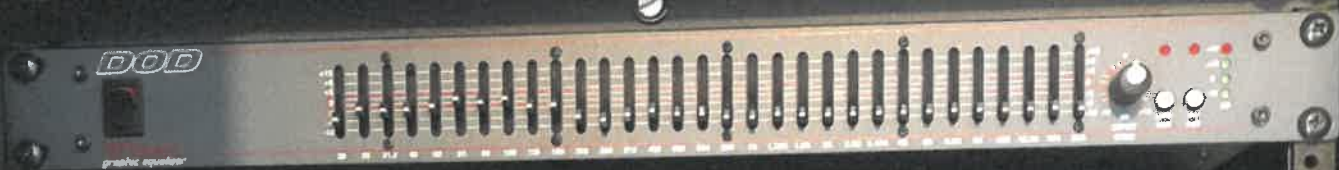






EY FR12-2

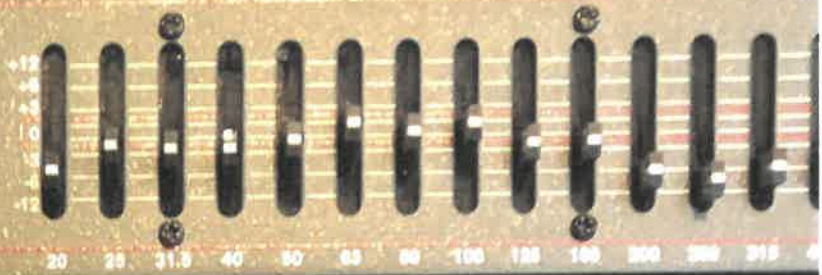




DOD



431 series 2
graphic equalizer



15
A
M
P



← main power

SERIES 3000 INTEGRATED AMPLIFIER

1 0 1 1 0 1 5 6 4 5 6 7 3 4 5 6 7 3 4 5 6 7

Camera – Canon VIXIA HF M500

Microphones – Philips Conference Microphone System CCS410

Speaker – Electro-Voice FR12-2

Sound System – Paso Series 3000 Integrated Amplifiers

Canon VIXIA HF M500

Standard Definition or High Definition
High Definition

Television System
NTSC

Video Recording system
AVCHD/MPEG-4

Image Sensor
1/3-inch HD CMOS PRO, RGB Primary Color Filter

Total Pixels
Approx. 2.37 Megapixels

Effective Pixels
Video: Approx. 2.07 Megapixels (1920 x 1080)
Photo: Approx. 2.07 Megapixels (1920 x 1080)

Maximum recording Time
Recording times are based on one 64 GB SDXC Memory Card (not supplied). LP (5Mbps):
24 hours 30 minutes SP (7Mbps):
19 hours 10 minutes XP+ (12Mbps):
11 hours 30 minutes FXP (17Mbps) - Allows 1920 x 1080 recording:
8 hours 20 minutes MXP (24Mbps) - Allows 1920 x 1080 recording:
5 hours 55 minutes MP4:
4Mbps: 33 hours 55 minutes 9Mbps: 15 hours 25 minutes

Lens
Zoom Ratio:
10 Optical/200x Digital* Focal Length:
6.1-61mm 35mm Film Equivalent:
Optical Zoom: 43.4-436mm (in both movies and photos) Zoom Speed:
Variable / 3 Fixed Zoom Speeds
Max F/Stop: f/1.8-3.0 * Movie mode only

Focusing System
TTL (Through The Lens) + Instant AF

Manual Exposure
Yes

Programmed AE

Auto, Manual*¹, Cinema Mode*² *1 P, Tv, Av, SCN*³

*2 P, Tv, Av

*3 Portrait, Sports, Snow, Beach, Sunset, Night, Low Light, Spotlight, Fireworks, Underwater, Surface

Max Shutter Speed

Movie: 1/2000 sec.

Still Image: 1/500 sec.

Minimum Focusing Distance

When tele macro is in effect: 10 mm to ∞ (wide end), 1 m to ∞ (intermediate zooming range), 40 cm to ∞ (tele end) When tele macro is not in effect: 10 mm to ∞ (wide end), 1 m to ∞ (entire zooming range)

All figures given are for the distance from the lens front.

White Balance

Auto, Daylight, Shade, Cloudy, Tungsten, Fluorescent H, Fluorescent

Minimum Illumination

NTSC: 1.2 lx

0.1 lx in Low Light Mode (shutter speed 1/2 sec.)

Image Stabilization

Optical System (Lens-shift system): - Intelligent IS in Auto mode

- Dynamic IS (default)

- Powered IS

- Macro IS

- Tripod Mode IS Modes other than Intelligent IS; Dynamic IS and Powered IS settings can be made manually in Manual/Cinema Mode: - Standard IS

- IS Off

Filter Diameter

43mm P0.75

Viewfinder

Not Available

LCD Screen

3.0-inch Widescreen Color Touch Panel LCD (Approx. 230,000 dots)

Recording Media

1 SD/SDHC/SDXC memory card slot*

USB Terminal

mini-AB: Hi-Speed USB supported

Video Terminal

Composite (output)

Audio

AVCHD: Dolby Digital AC3 (2 Channel)

MP4: MPEG-2 AAC-LC (2 Channel)

Sampling Frequency: 48 KHz

Accessory Shoe

Mini Advanced Accessory shoe available.

However, only the video light function is provided by the VFL-2 video light flash.

Supplied Video Editing Software

Video Browser Editing Disc

ImageBrowser Disc

Transfer Utility Disc

HDMI Terminal

Available; Mini connector, CEC, x.v. Color supported

Microphone Terminal

3.5 mm dia. stereo mini-jack

AV Mini Terminal/Headphone Terminal

3.5 mm dia. 4 pole mini-jack (video/audio output only)

Operating Temperature range

23° to 113° F, 60% relative humidity 32° to 104° F, 85% relative humidity (performance)

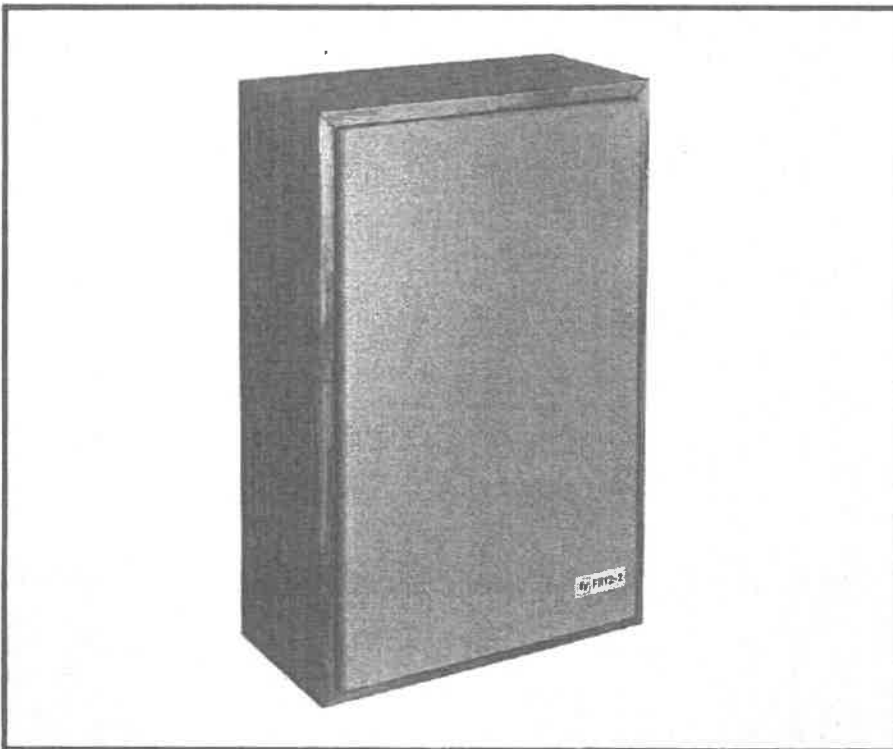
Dimensions

(W x H x D) 2.7 x 2.5 x 4.8 in / 68 x 64 x 121 mm (Not including the grip belt)

Weight

Approx. 10.9 oz. / 310g (Not including grip belt)

Approx. 12.9 oz. / 365g (Including BP-718, memory card and grip belt)



Electro-Voice®

◻ MARK IV company

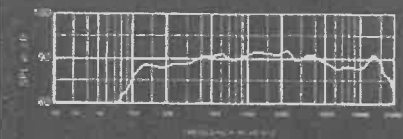


FIGURE 1 — Axial Frequency Response 4 Volts/10 Feet

Model FR12-2

Two-Way Constant-Directivity Speaker System

SPECIFICATIONS

Frequency Response, 10 Feet on Axis,
Swept Sine Wave, Half-Space Anechoic
Environment (see Figure 1):

80-18,000 Hz

Low-Frequency 3-dB-Down Point:

80 Hz

Usable Low-Frequency Limit
(10-dB-down point):

50 Hz

Half-Space Reference Efficiency:

2.3%

Long-Term Average Power Handling
Capacity per EIA Standard RS-426A (see
Power Handling Capacity section):

100 watts

Maximum Woofer Acoustic Output:

2.3 watts

Sound Pressure Level at 1 Meter, 1 Watt
Input, Anechoic Environment, Band-Limited
Pink Noise Signal, 300 to 2,000 Hz:

96 dB

Dispersion Angle Included by 6-dB-Down
Points on Polar Responses, Horizontal and
Vertical Planes, Indicated One-Third-Octave
Bands of Pink Noise,

250-20,000 Hz:

150° ± 30°

500-10,000 Hz:

100° ± 20°

10,000-20,000 Hz:

60° ± 12°

Directivity Factor R_0 (Q), 800-16,000 Hz
Median (see Figure 4):

10 (+12.5, -4.5)

Directivity Index D_i , 800-16,000 Hz Median
(see Figure 4):

10 dB (+3.5 dB, -2.5 dB)

Phase Variation, 300-3,000 Hz:

± 30°

Distortion, 0.1 Full Power Input
(see Figure 5),

Second Harmonic,

100 Hz: < 1%

1,000 Hz: 4%

10,000 Hz: 3%

Third Harmonic,

100 Hz: 1%

1,000 Hz: < 1%

10,000 Hz: < 1%

Distortion, 0.01 Full Power Input
(see Figure 6),

Second Harmonic,

100 Hz: < .5%

1,000 Hz: 1%

10,000 Hz: 1.5%

Third Harmonic,

100 Hz: < 1%

1,000 Hz: < 1%

10,000 Hz: 1%

Transducer Complement,

High-Frequency:

12-inch woofer

1½-inch Super-Dome™ tweeter coupled
to 9-inch Direktor™

Box Tuning Frequency:

48 Hz

Crossover Frequency:

1,500 Hz

Crossover Slope:

12 dB per octave

Impedance,

Nominal:

8 ohms

Minimum:

6.5 ohms

Input Connections:

Screw terminals (#8-32) on barrier strip

Enclosure Materials and Colors:

Oak-grain vinyl on particle board with
beige cloth grille

Mounting:

Hanging via twelve ¼-20 threaded inserts
or optional WCB-1 wall/ceiling U-bracket

Dimensions:

64.8 cm (25.5 in.) high

41.9 cm (16.5 in.) wide

22.2 cm (8.75 in.) deep

Optional Accessories:

WCB-1 wall/ceiling U-bracket;

TK60-watt 25-volt/70.7-volt line
transformer kit

Net Weight:

20.4 kg (45 lb)

Shipping Weight:

21.3 kg (47 lb)

DESCRIPTION

The Electro-Voice FR12-2 is an unusually compact, two-way, medium- to high-efficiency, constant-directivity speaker system design for indoor sound reinforcement in commercial installations, such as churches, meeting halls and small auditoriums. The FR12-2 components — including a 100° × 100° Direktor™ plus Super-Dome™ tweeter are of a quality normally associated with separate professional components. However, the FR12-2's oak-grain vinyl enclosure with detachable beige grille avoids a "utility" appearance by using colors and styling that complement most interiors. The depth of the Direktor element closely matches the depth of the woofer, providing a strong degree of time-alignment.

The high-frequency section of the FR12-2 utilizes a 100° × 100° Direktor™ coupled to a Super-Dome™ wide-bandwidth tweeter for the frequency range of 1500 Hz to 18,000 Hz. A unique combination of crossover and equalizer is used with the Super-Dome to give flat response without the need for an external equalizer.

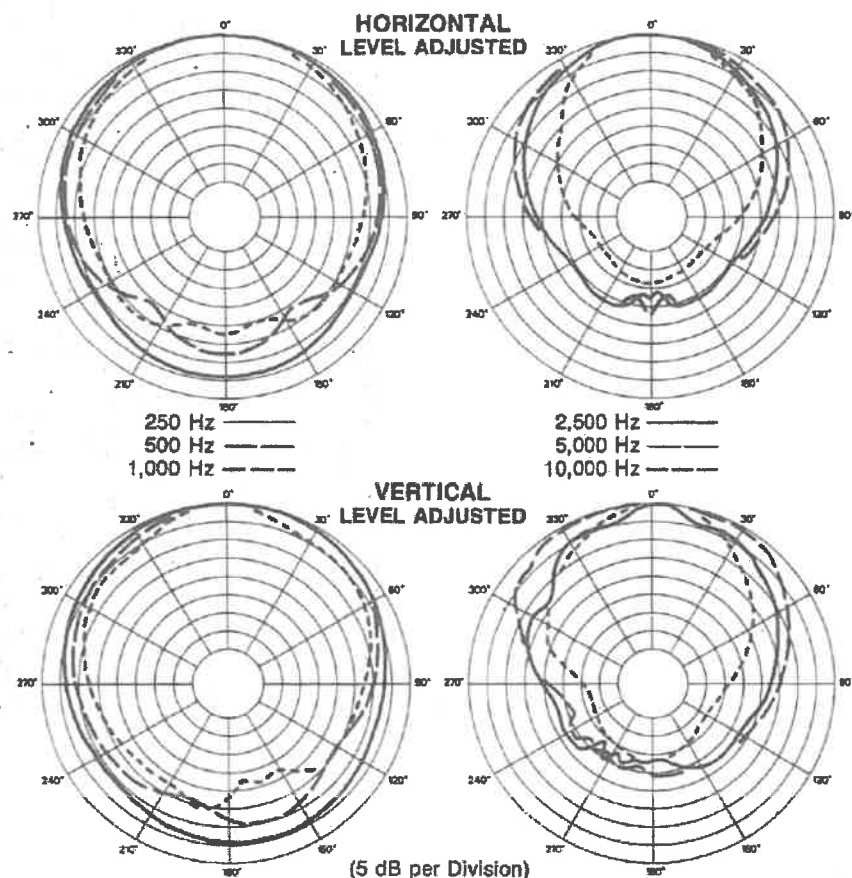


FIGURE 2 — Polar Response (1/3-octave pink noise 4 volts/10 feet)

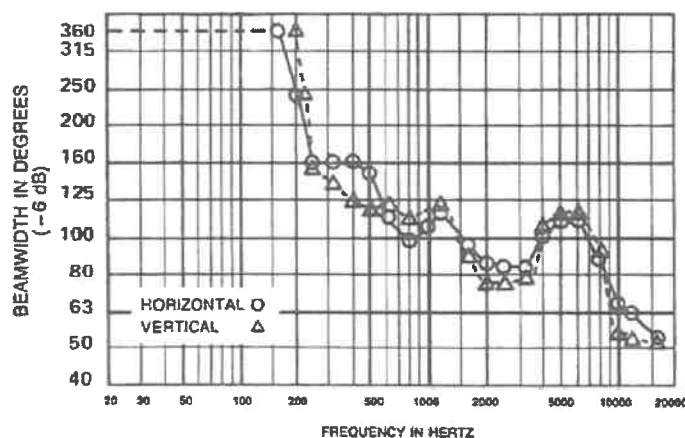


FIGURE 3 — Beamwidth vs. Frequency Whole Space (anechoic)

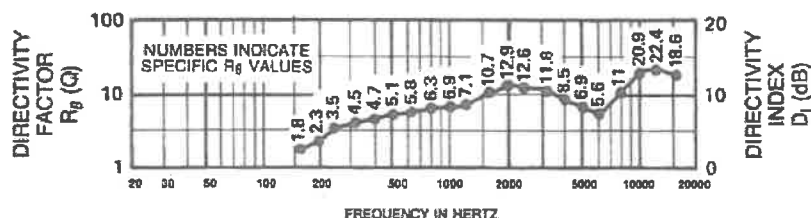


FIGURE 4 — Directivity vs. Frequency Whole Space (anechoic)

The bass section of the FR12-2 is designed using Thiele-Small parameters for efficient low-frequency performance extending to frequencies in the 50 to 80 Hz region. The 12-inch woofer used in the system is a specially designed variant of the FORCE® 12 speaker. It features a laminated polyimide coil form and a large (10 lb) magnetic structure.

CONSTANT-DIRECTIVITY SPEAKER SYSTEM

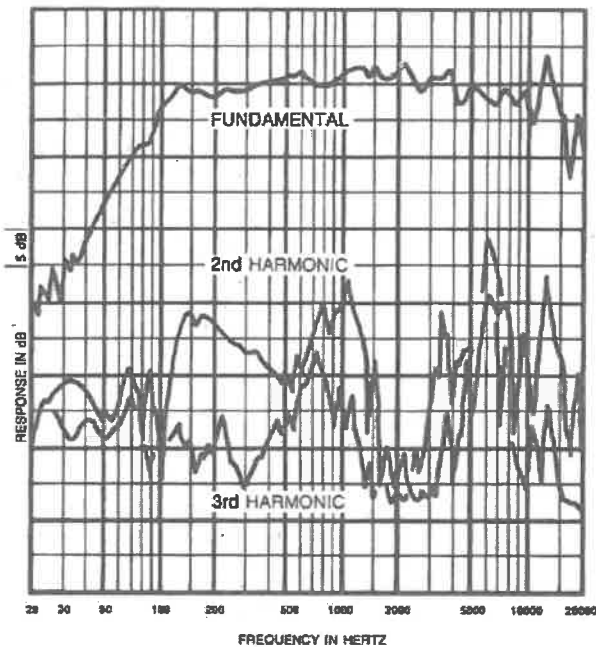
The crossover frequency and speaker component geometries have been carefully selected so that the directional characteristics of the woofer and Direktor match at the crossover frequency (approximately 100 degrees circular coverage patterns for each) to create a special system type — the constant-directivity system. At higher frequencies the horizontal and vertical coverage pattern remains essentially constant. Response within the 100° x 100° rated coverage angle is uniform, which means dependable audience coverage without "hot spots" or dead zones at certain frequencies. The 100° x 100° dispersion characteristic permits this small system to be used horizontally or vertically to aesthetically best suit the environment it is placed in without basically changing the coverage angles. The controlled directivity of the high- and low-frequency transducers also eliminates response irregularities caused by diffraction off enclosure edges and, in combination with an essentially flat on-axis frequency response, produces a total acoustic power output that is uniform with frequency.

FREQUENCY RESPONSE

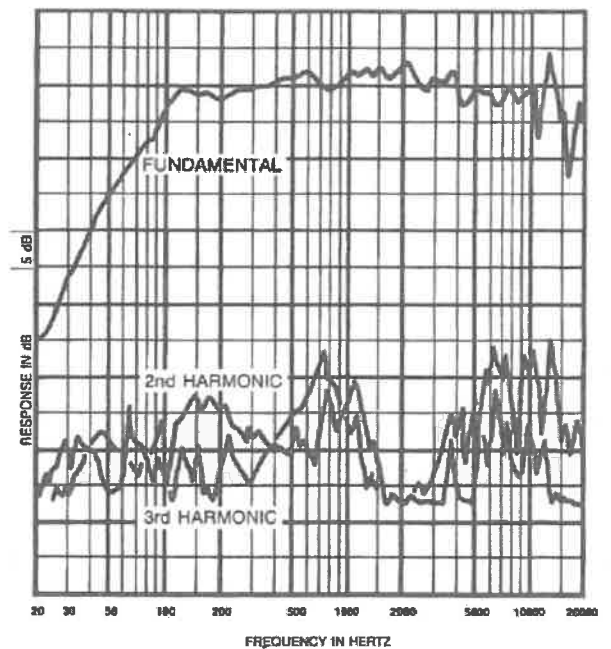
The combination of a 12-inch woofer, wide-bandwidth, high-frequency Super-Dome tweeter plus Direktor and an equalized crossover results in the wide and smooth overall response shown in Figure 1. This response was measured at 10 feet, using a 4-volt input in an anechoic chamber. The response is 1/3 octave averaged. No external equalization was used.

DIRECTIVITY

A unique feature of the FR12-2 is the constant-directivity dispersion provided by the 100° x 100° Direktor. The polar response of the system at selected 1/3-octave bandwidths is shown in Figure 2. These polar responses were measured in an anechoic environment at 10 feet using 1/3-octave pink noise inputs. The frequencies selected are fully representative of the polar response of the system. Beamwidth of the system utilizing the complete 1/3-octave polar data is shown in Figure 3. R_0 (Q) and directivity index (DI) are plotted in Figure 4.



**FIGURE 5 — Harmonic Distortion,
0.1 Rated Power Input (10 watts)**



**FIGURE 6 — Harmonic Distortion,
0.01 Rated Power Input (1 watt)**

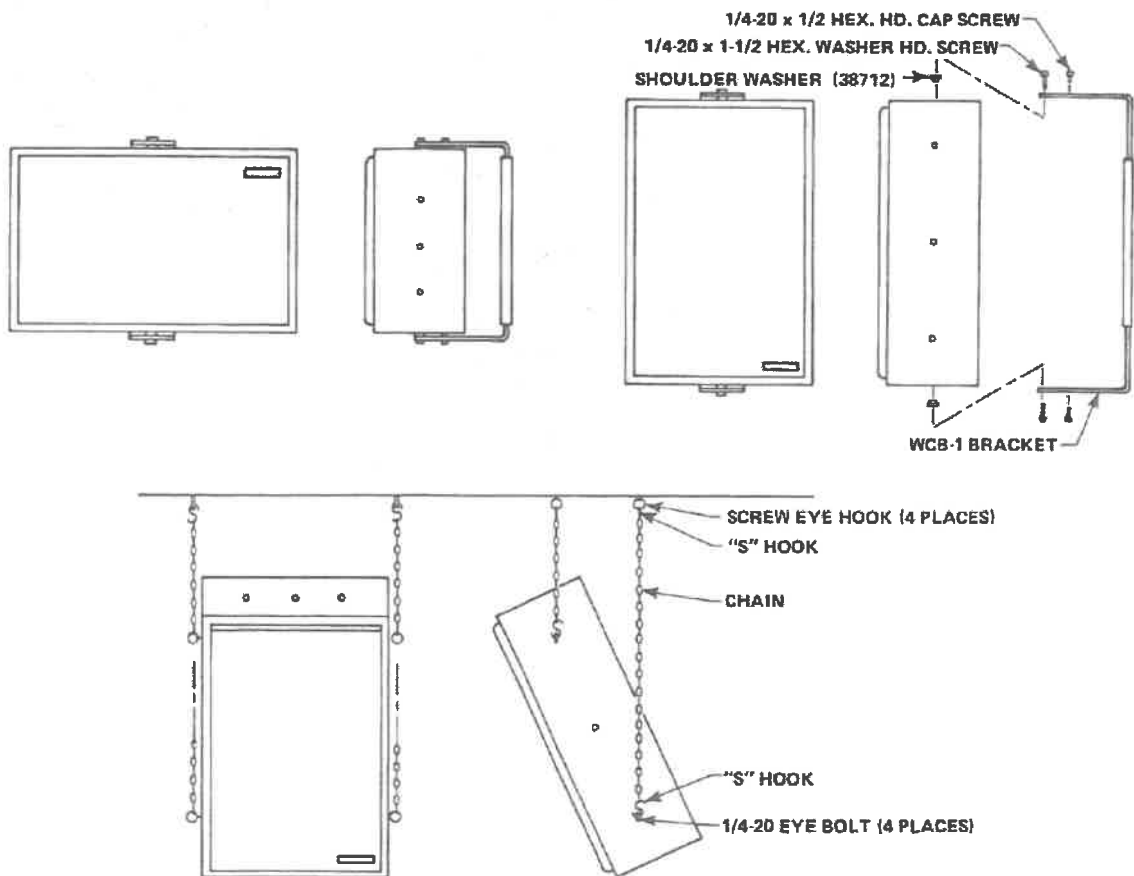


FIGURE 7 — System Mounting

DISTORTION

Following AES (Audio Engineering Society) recommended practice, plots of second and third harmonic distortion for 0.1 rated power (10 watts) are shown in Figure 5. Additionally, plots are shown for 0.01 rated power in Figure 6. In the important mid-band frequencies between 300 and 3,000 Hz where voice and music energy is usually the highest, the median values for any component of distortion are at or below approximately 1% for the input powers measured.

POWER HANDLING CAPACITY

To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test closely related to real-life conditions. First, we use a random noise input signal because it contains many frequencies simultaneously, just like real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than typical actual program, adding an extra measure of reliability. Third, the test signal includes not only the overall "long-term average" or "continuous" level — which our ears interpret as loudness — but also short-duration peaks which are many times higher than the average, just like actual program. The long-term average level stresses the speaker thermally (heat). The instantaneous peaks test mechanical reliability (cone and diaphragm excursion). Note that the sine wave test signals sometimes used have a much less demanding peak value relative to their average level. In actual use, long-term average levels exist from several seconds on up, but we apply the long-term average for several hours, adding another extra measure of reliability.

Specifically, the FR12-2 is designed to withstand the power test described in the revised EIA Standard RS-426A. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white noise generator (white noise is a particular type of random noise with equal energy per bandwidth in Hz) is fed to a shaping filter with 6-dB-per-octave slopes below 40 Hz and above 318 Hz. When measured with the usual constant-percentage bandwidth

analyzer (one-third-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1200 Hz with a 3-dB-per-octave slope above 1200 Hz. This shaped signal is sent to the power amplifier with the continuous power set at 100 watts into the 6 ohms EIA equivalent impedance, (24.5 volts true RMS). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 400 watts peak (49 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

MOUNTING

The cabinet is supplied with threaded inserts which will allow horizontal or vertical mounting from chains. (Note that the nameplate rotates for proper orientation in any mounting position.) The user must supply eyelet bolts, "S" hooks and chains.

An optional U-bracket is available, the WCB-1 wall/ceiling mounting bracket. The WCB-1 may be affixed between the ends or sides of the FR12-2 and allows a great degree of angular adjustments of the system. Figure 7 illustrates a ceiling mount using eyebolts and chains, and two positions using the WCB-1 bracket.

The FR12-2's grille is snapped snugly into position. However, the grille has pilot holes for screw fasteners (not provided) if permanent grille security is required.

LINE-TRANSFORMER KIT

The TK60 (25/70.7-volt) line-transformer kit is an option available for high-impedance systems, generally desired in multi-speaker distributed designs and some smaller systems where long speaker-wire runs are necessary. The TK60 consists of an Electro-Voice TM60 transformer mounted on an input panel that is substituted for the direct (8 ohms) input panel supplied with the system. The TK60 allows direct input to the system or access to any of the seven transformer taps covering 7.5, 15, 30, and 60 watts at 25 and 70.7 volts. Connections are made on barrier strips with #8-32 screws.

WARRANTY (Limited)

Electro-Voice Speakers and Speaker Systems (excluding active electronics) are guaranteed for five years from date of original purchase against malfunction due to defects in workmanship and materials. If such malfunction occurs, unit will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not extend to finish, appearance items, burned coils, or malfunction due to abuse or operation under other than specified conditions, including cone and/or coil damage resulting from improperly designed enclosures, nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

A list of authorized warranty service agencies is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-695-6831); Electro-Voice, Inc., 3810 148th Avenue N.E., Redmond, WA 98052 (AC/206-881-9555); and/or Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

Specifications subject to change without notice.



ELECTRO-VOICE, INC., 600 Cecil Street, Buchanan, Michigan 49107

MANUFACTURING PLANTS AT ■ BUCHANAN, MI ■ NEWPORT, TN ■ SEVIERVILLE, TN ■ REDMOND, WA ■ GANANOQUE, ONT.
©Electro-Voice, Inc. 1988 ■ Litho In U.S.A. Part Number 530341—340

— a MARK IV company —



VIXIA HF M500

DRIVERS & DOWNLOADS

MANUALS

NEED SERVICE?
(/INTERNET/PORTAL/US/HOME/SUPPORT/SERVICE-REPAIR)

Contact Support

1-800-OK-CANON (1-800-652-2666)

Monday-Friday: 9:00 am to 9:00 pm ET, excluding holidays

Want to register this product?

VIXIA HF M500

Specifications

(/internet/portal/us/home/support/details/camcorders/support-high-definition-camcorders/vixia-hf-m500/vixia-hf-m500#cdb8dd27-f547-4092-a157-e5d64b647cd8_tab)

Drivers & Downloads

(/internet/portal/us/home/support/details/camcorders/support-high-definition-camcorders/vixia-hf-m500/vixia-hf-m500#e082de97-c006-465e-aaf2-a27589cf7010_tab)

Manuals

(/internet/portal/us/home/support/details/camcorders/support-high-definition-camcorders/vixia-hf-m500/vixia-hf-m500#8c9ca914-a942-4605-9d03-994512b6debf_tab)

FAQs

(/internet/portal/us/home/support/details/camcorders/support-high-definition-camcorders/vixia-hf-m500/vixia-hf-m500#d43d4014-9e53-4c5e-b46f-32a2c4d71323_tab)

What's in the Box

(/internet/portal/us/home/support/details/camcorders/support-high-definition-camcorders/vixia-hf-m500/vixia-hf-m500#c3e32a01-97e5-4f17-b81c-7537a4d30af5_tab)

Warranty

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Supplies & Accessories

(/internet/portal/us/home/support/details/camcorders/support-high-definition-camcorders/vixia-hf-m500/vixia-hf-m500#4d68e2cc-db21-4eea-92d8-0b1addf8e97d_tab)

Main Unit Specs

Standard Definition or High Definition

High Definition

Television System

NTSC

Video Recording system

AVCHD/MPEG-4

Image Sensor

1/3-inch HD CMOS PRO, RGB Primary Color Filter

Total Pixels

Approx. 2.37 Megapixels

Effective Pixels

Video: Approx. 2.07 Megapixels (1920 x 1080)
Photo: Approx. 2.07 Megapixels (1920 x 1080)

Maximum recording Time

Recording times are based on one 64 GB SDXC Memory Card (not supplied). LP (5Mbps):
24 hours 30 minutes SP (7Mbps):
19 hours 10 minutes XP+ (12Mbps):
11 hours 30 minutes FXP (17Mbps) - Allows 1920 x 1080 recording:
8 hours 20 minutes MXP (24Mbps) - Allows 1920 x 1080 recording:
5 hours 55 minutes MP4:
4Mbps: 33 hours 55 minutes 9Mbps: 15 hours 25 minutes

Lens

Zoom Ratio:
10 Optical/200x Digital* Focal Length:
6.1-61mm 35mm Film Equivalent:
Optical Zoom: 43.4-436mm (in both movies and photos) Zoom Speed:
Variable / 3 Fixed Zoom Speeds
Max. F/Stop: F/1.8-2.0*Movie mode only

Manual Exposure	Yes
Programmed AE	Auto, Manual* ¹ , Cinema Mode* ² *1 P, Tv, Av, SCN* ³ *2 P, Tv, Av *3 Portrait, Sports, Snow, Beach, Sunset, Night, Low Light, Spotlight, Fireworks, Underwater, Surface
Max Shutter Speed	Movie: 1/2000 sec. Still Image: 1/500 sec.
Minimum Focusing Distance	When tele macro is in effect: 10 mm to ∞ (wide end), 1 m to ∞ (intermediate zooming range), 40 cm to ∞ (tele end) When tele macro is not in effect: 10 mm to ∞ (wide end), 1 m to ∞ (entire zooming range) All figures given are for the distance from the lens front.
White Balance	Auto, Daylight, Shade, Cloudy, Tungsten, Fluorescent H, Fluorescent
Minimum Illumination	NTSC: 1.2 lx 0.1 lx in Low Light Mode (shutter speed 1/2 sec.)
Image Stabilization	Optical System (Lens-shift system): - Intelligent IS in Auto mode - Dynamic IS (default) - Powered IS - Macro IS - Tripod Mode IS Modes other than Intelligent IS; Dynamic IS and Powered IS settings can be made manually in Manual/Cinema Mode: - Standard IS - IS Off
Filter Diameter	43mm P0.75
Viewfinder	Not Available
LCD Screen	3.0-inch Widescreen Color Touch Panel LCD (Approx. 230,000 dots)
Recording Media	1 SD/SDHC/SDXC memory card slot*
USB Terminal	mini-AB: Hi-Speed USB supported
Video Terminal	Composite (output)
Audio	AVCHD: Dolby Digital AC3 (2 Channel) MP4: MPEG-2 AAC-LC (2 Channel) Sampling Frequency: 48 KHz
Accessory Shoe	Mini Advanced Accessory shoe available. However, only the video light function is provided by the VFL-2 video light flash.

Editing Software

ImageBrowser Disc
Transfer Utility Disc

HDMI Terminal

Available; Mini connector, CEC, x.v. Color supported

**Microphone
Terminal**

3.5 mm dia. stereo mini-jack

**AV Mini
Terminal/Headphone
Terminal**

3.5 mm dia. 4 pole mini-jack (video/audio output only)

**Operating
Temperature
range**

23° to 113° F, 60% relative humidity 32° to 104° F, 85% relative humidity (performance)

Dimensions

(W x H x D) 2.7 x 2.5 x 4.8 in / 68 x 64 x 121 mm (Not including the grip belt)

Weight

Approx. 10.9 oz. / 310g (Not including grip belt)
Approx. 12.9 oz. / 365g (Including BP-718, memory card and grip belt)

* Prices and specifications subject to change without notice. Actual prices are determined by individual dealers and may vary.

Operating Instructions and Service Manual



5 Channel - 2 Zone - Phone Interface

T3040MOH - 40 Watt RMS

T3060MOH - 60 Watt RMS

T3120MOH - 120 Watt RMS

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 WATER, RAIN OR MOISTURE

**MOH
VOX**

Series 3000



REV. 2.0

Innovation through technology since 1931

DESCRIPTION AND APPLICATIONS

☐ **5 Channel Inputs - 2 Zone Outputs**

☐ **Wide Frequency Response**

Very Low Distortion

☐ **4 Balanced Microphone Inputs**

☐ **Multi-Level Mic Inputs Priority**

☐ **Phantom Power on 4 MIC Inputs**

☐ **600 ohm Balanced**

Telephone Paging Input

☐ **EQ Link and Mix Buss**

☐ **Independent Auxiliary 1 Input**

☐ **Mic 4/Aux 2 Balanced Input**

☐ **Separate CD Player Input**

☐ **Independent Input Controls**

Bass and Treble Controls

☐ **VOX - Voice Activated Muting**

☐ **Direct Precedence/Muting**

☐ **600 ohm and 8 ohm 1 Watt**

Music on Hold Amplifier

☐ **MOH Amplifier Source Selector**

☐ **Zone 2, 1 Watt - 8 ohm Output**

with Separate Control

☐ **AC Accessory Outlet**

☐ **8 ohm, 25 Volt & 70 Volt**

☐ **Automatic Overload Protection**

☐ **High Reliability Operation**

☐ **Rack Mounting with Optional Kit**

UNPACKING

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.

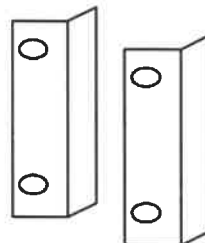
IN TRANSIT DAMAGES ARE NOT COVERED BY THE PASO WARRANTY.

SPECIFICATIONS

T3040 Power Output:	40 Watt RMS
T3060 Power Output:	60 Watt RMS
T3120 Power Output:	120 Watt RMS
Distortion:	Less than 0.5% THD
Frequency Response:	20 - 20,000 Hz \pm 1 db
Inputs:	
Input 1	Bal. 250 ohm MIC 1/Phone-600 ohm
Input 2	250 ohm balanced MIC 2
Input 3	250 ohm balanced MIC 3
Input 4	Bal.250 ohm MIC4/AUX 2-10 K ohm
Input 5	47 K ohm AUX 1/CD
Phantom Power:	MIC 1-2-3-4 with Selector (16VDC)
Sensitivity:	
Input 1	Mic=1.5 Mv/Tel=100 Mv
Input 2	Mic=1.5 Mv
Input 3	Mic=1.5 Mv
Input 4	Mic=1.5 Mv/Aux 2=1 Volt
Input 5	Aux 1=100 Mv/CD=360 Mv
Hum & Noise:	Mic -70 db, Aux/CD -75 db
Telephone Input:	600 ohm balanced
Music on Hold Output:	600 ohm-1 Volt Transf. balanced
Zone 2 Output:	1 Watt-8 ohm
Output Impedance:	8 ohm, 25 Volt and 70 Volt line
Controls:	
Front Panel:	MIC1/Phone Volume, MIC2-3 Volume, MIC 4/AUX 2 Volume, AUX1/CD Volume, Bass, Treble
Rear Panel	MOH & ZONE 2 Level Control
Phantom Power:	On 4 MIC Inputs w/internal jumper
MOH Source:	AUX1 or AUX2 w/internal jumper
Tone Control Action:	+/-10 db at 100 Hz and 10 K hz
VOX:	Voice Activated Muting MIC/PHONE mutes AUX 1 or AUX 2 with internal jumper
Direct Muting:	With Contact Closure
Rack Mounting:	Optional Rack Kit
Power Requirement:	117 Volt, 50-60 Hz
Power Consumption:	T3040=120 VA, T3060=170 VA, T3120=350 VA, 300 W Max. Unswitched
AC Accessory Outlet:	Screw Terminals, RCA Jacks
Terminations:	Black
Housing Finish:	Black
Dimensions:	17" W., 9½" D., 3½" H. (432X242X89 mm)
Net Weight:	T3040=13 Lbs (6 Kg), T3060=16 Lbs (7.2 Kg), T3120=19 Lbs (8.7 Kg)

ACCESSORIES

27/3501 - Standard 19" Rack Mounting Kit. Black finish. Complete with hardware



IMPORTANT SAFETY INSTRUCTIONS

READ BEFORE OPERATING

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

- 1) **Read these instructions carefully.**
- 2) **Keep these instructions.**
- 3) **Heed all Warnings.**
- 4) **Follow all instructions.**
- 5) **DO NOT** use this apparatus near water.
- 6) Clean **ONLY** with a damp cloth.
- 7) **DO NOT** block any of the ventilation openings. Install in accordance with the instructions provided.
- 8) **DO NOT** install near any heat sources such as radiators, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) **DO NOT** mount amplifier into a container or a closed unventilated closet while operating.
- 10) **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.
- 11) **DO NOT** defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade and or the third prong is provided for your safety. When the provided plug does not fit into your

READ BEFORE OPERATING

outlet, consult an electrician for replacement of the obsolete outlet.

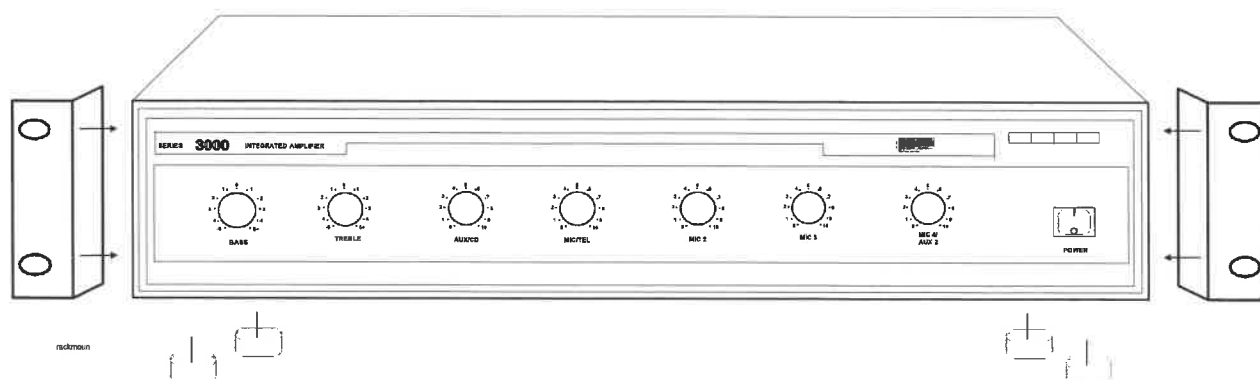
- 12) Use only the attachments and accessories specified in this manual.
- 13) If a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 14) Unplug this apparatus during lighting storms or when unused for long periods of time.
- 15) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- 16) **DO NOT** replace fuses unless power cord is removed from the AC wall outlet.
- 17) **DO NOT** install accessories unless the power cord is removed from the AC wall outlet.

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS APPLIANCE TO WATER, 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



FRONT PANEL CONTROLS

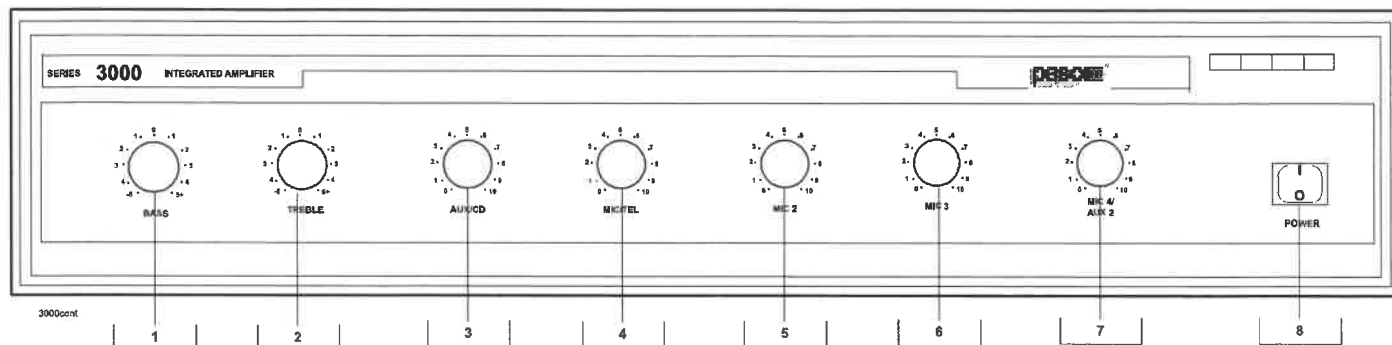


Fig. 4 - Front Panel Controls

- | | |
|---------------------------------|---------------------------------|
| 1) Bass Control | 5) MIC 2 Volume Control |
| 2) Treble Control | 6) MIC 3 Volume Control |
| 3) AUX/CD Control | 7) MIC 4 - AUX 2 Volume Control |
| 4) MIC/TEL Input Volume Control | 8) On-Off Power Switch |

REAR PANEL INPUTS - OUTPUTS

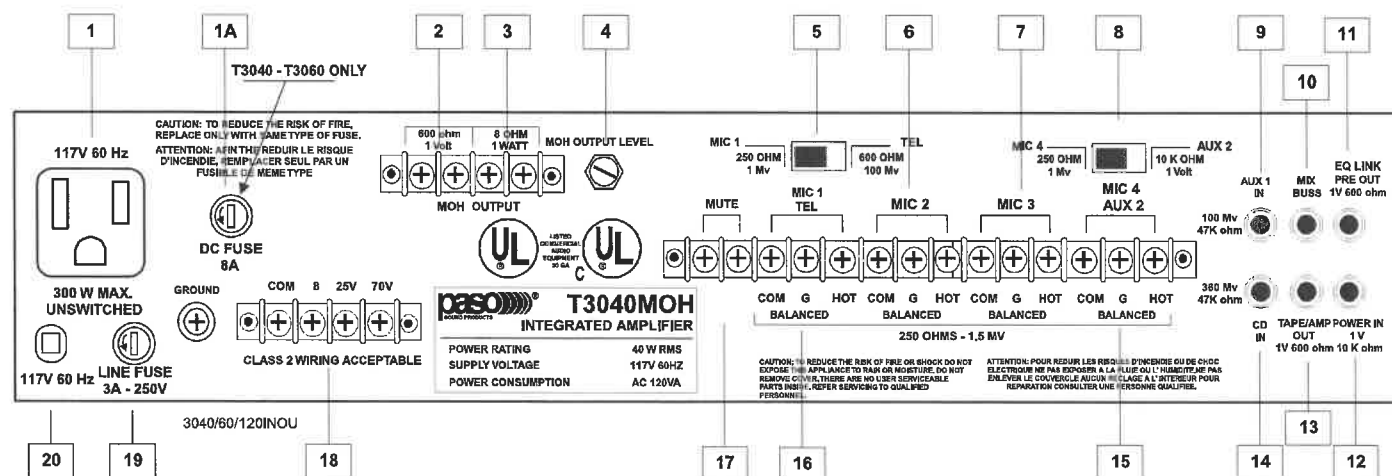


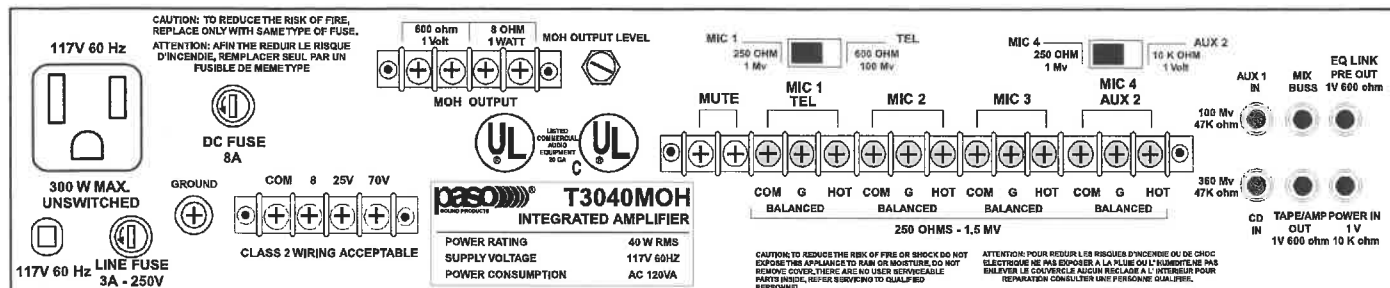
Fig. 4A - Rear Panel Inputs and Outputs

- | | |
|---|--------------------------------|
| 1) AC Auxiliary Socket | 11) EQ LINK Preamp Output |
| 1A) DC Fuse Models T3040MOH and T3060MOH only | 12) EQ LINK Power Amplifier In |
| 2) 600 ohm MOH Output | 13) Tape/Booster Output |
| 3) 1 Watt 8 ohm Output (2nd zone or MOH) | 14) CD Input |
| 4) MOH Output Level | 15) Balanced MIC 4/AUX 2 Input |
| 5) MIC/TEL Input Switch Selector | 16) Balanced MIC 1/TEL Input |
| 6) Balanced MIC 2 Input | 17) Direct Muting Terminals |
| 7) Balanced MIC 3 Input | 18) Speaker Output |
| 8) MIC 4/AUX 2 Input Selector Switch | 19) AC Line Fuse |
| 9) AUX 1 Input | 20) AC Power Cord |
| 10) MIX BUSS Input/Output | |

INSTALLATION AND WIRING

INPUT CONNECTIONS

Fig. 5 Amplifier Rear Panel View



MICROPHONE INPUTS

MICROPHONE TYPE

The Microphone Inputs accept 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).

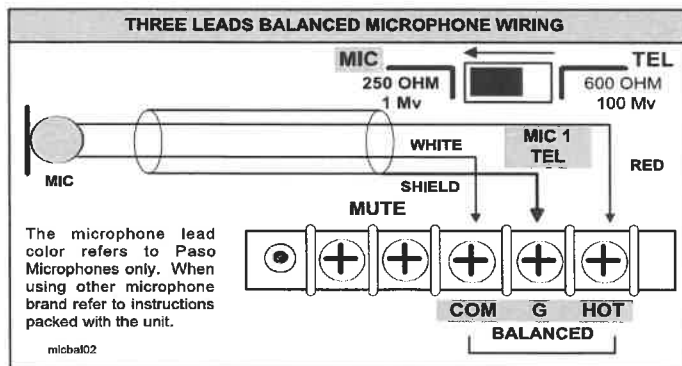


Fig. 5A - Rear Panel MIC 1/TEL Input Terminals

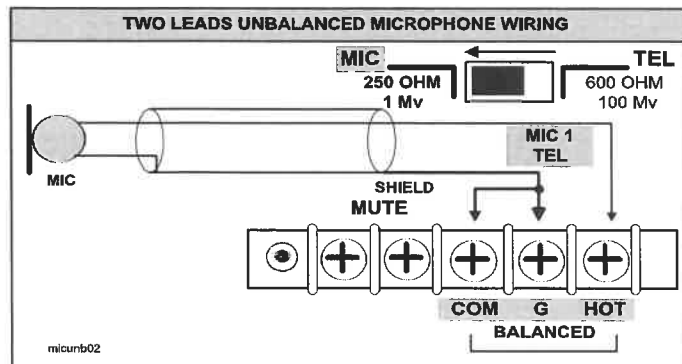


Fig. 5B - Rear Panel MIC 1/TEL Input Terminals

CAUTION

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

WIRING

MIC 1 - TELEPHONE INPUT SWITCH SELECTOR

Locate the MIC 1 - TEL Selector Switch above the Input Terminals and Set Switch to the MIC position.

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

INPUT CONNECTIONS

MICROPHONE INPUTS

USING A PUSH-TO-TALK DESK BASE MICROPHONE

Microphone paging and precedence over the AUX 1 or AUX 2 channels may be accomplished by using a Desk Base or a Gooseneck Microphone. Wire the Microphone output leads to the MIC 1/TEL terminals as per Fig. 6A.

MUTING: The Amplifier is equipped with two independent Muting Circuits:

- **Direct Muting by shorting the MUTE Terminals**
- **Automatic Muting with VOX - Voice Activated Muting**
For additional information on the Muting operation refer to the Muting Functions section of this Manual.

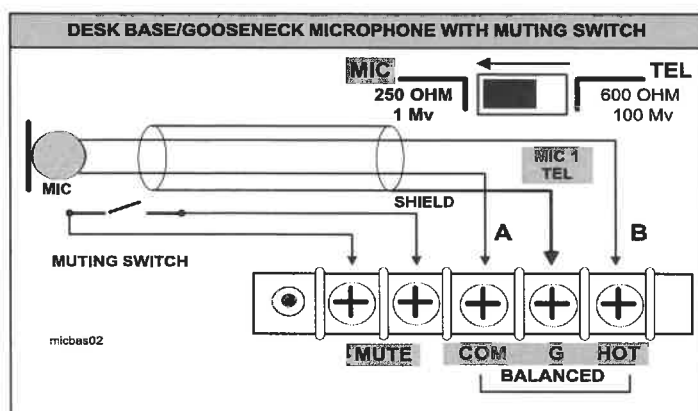


Fig. 6A - Rear Panel MIC 1/TEL Input Terminals

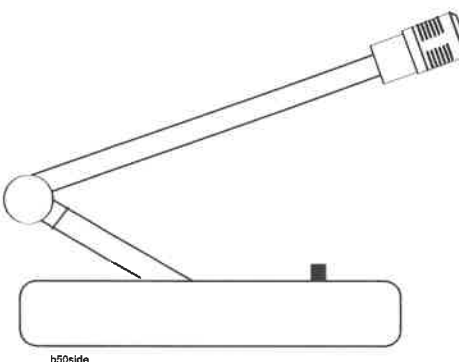


Fig. 6C - Desk Base Microphone

CONNECTING TO THE TELEPHONE PAGING SYSTEM

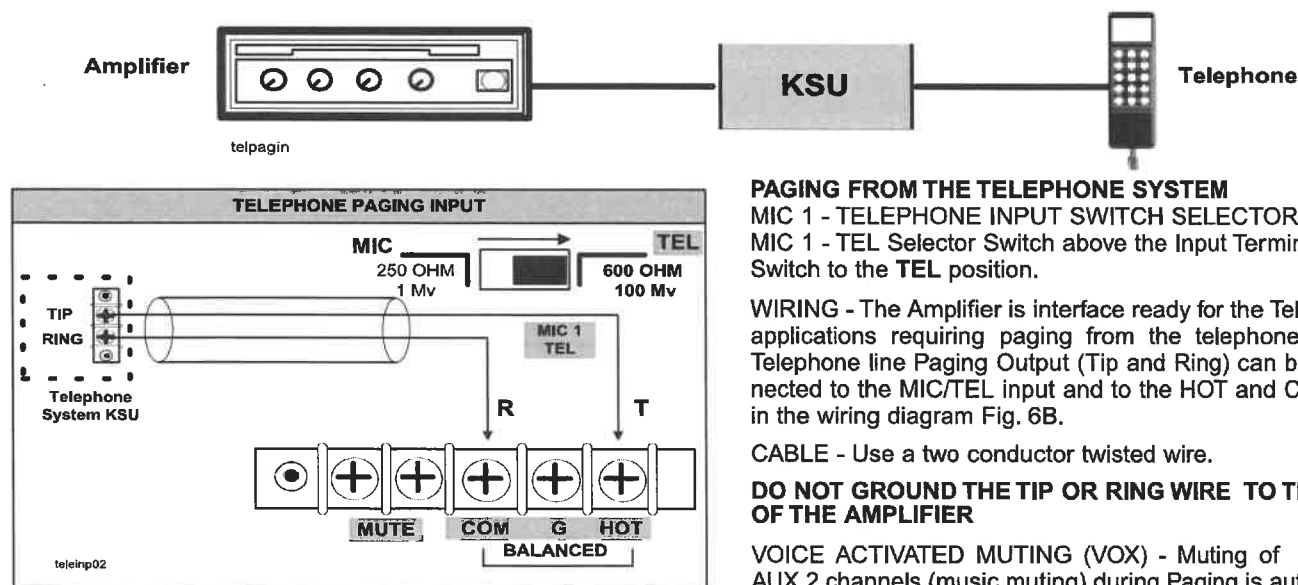


Fig. 6B - Rear Panel MIC 1/TEL Input Terminals

WIRING

MIC 1 - TELEPHONE INPUT SWITCH SELECTOR

Locate the MIC 1 - TEL Selector Switch above the Input Terminals and Set Switch to the **MIC** position.

Attach the microphone leads to the terminal strip as per diagram in Fig 6A.

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

PAGING FROM THE TELEPHONE SYSTEM

MIC 1 - TELEPHONE INPUT SWITCH SELECTOR - Locate the MIC 1 - TEL Selector Switch above the Input Terminals and Set Switch to the **TEL** position.

WIRING - The Amplifier is interface ready for the Telephone line in applications requiring paging from the telephone system. The Telephone line Paging Output (Tip and Ring) can be directly connected to the MIC/TEL input and to the HOT and COM as shown in the wiring diagram Fig. 6B.

CABLE - Use a two conductor twisted wire.

DO NOT GROUND THE TIP OR RING WIRE TO THE CHASSIS OF THE AMPLIFIER

VOICE ACTIVATED MUTING (VOX) - Muting of the AUX 1 or AUX 2 channels (music muting) during Paging is automatic via the Voice Activated Muting System. No contact closure for the Muting Circuit is required from the Telephone system. For additional information on the Muting operation refer to the Muting Functions section of this Manual.

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.

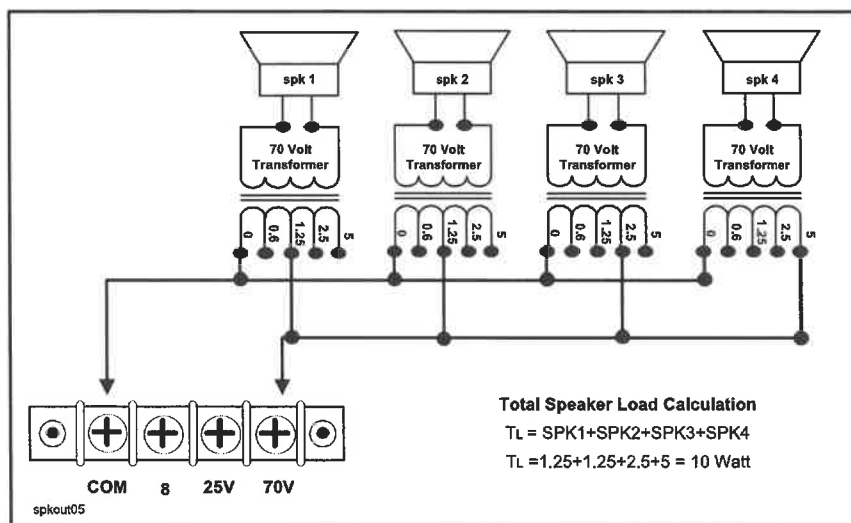


Fig. 13 - 70 Volt Constant Voltage System Diagram

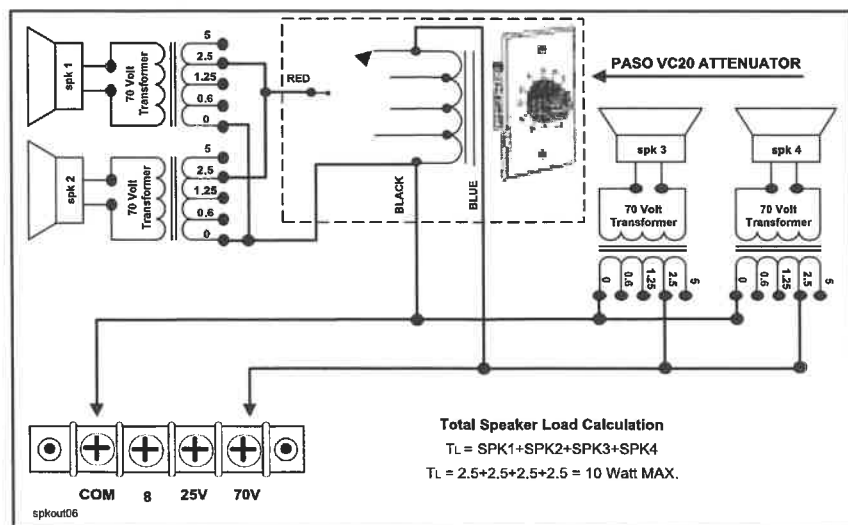


Fig. 13A - Using a Line Attenuator Diagram

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. 13) 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. 13A 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 affected.

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.

INSTALLATION AND OPERATION

FRONT PANEL CONTROLS

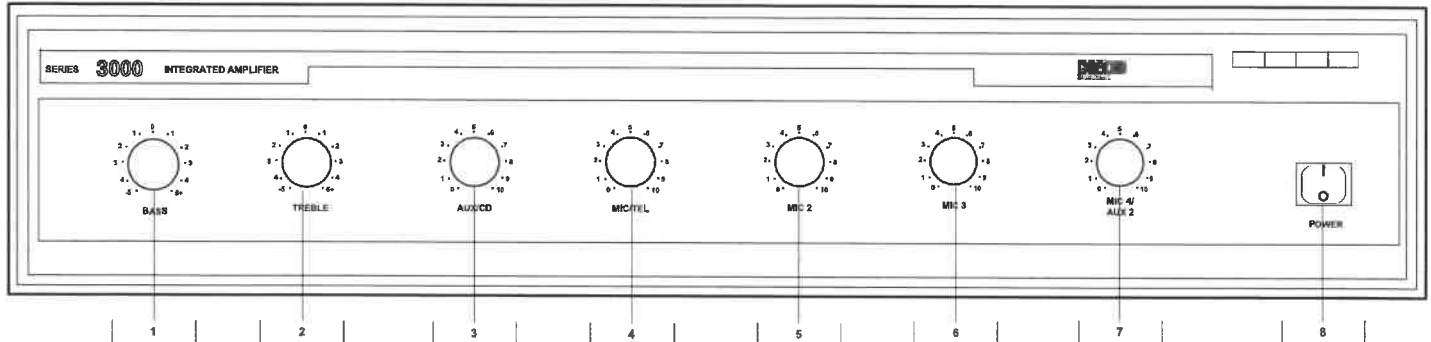


Fig. 18 - Front Panel Controls

- | | |
|---------------------------------|---------------------------------|
| 1) Bass Control | 5) MIC 2 Volume Control |
| 2) Treble Control | 6) MIC 3 Volume Control |
| 3) AUX/CD Control | 7) MIC 4 - AUX 2 Volume Control |
| 4) MIC/TEL Input Volume Control | 8) On-Off Power Switch |

INPUT CONTROLS

MICROPHONE INPUT CONTROLS

Four separate microphone volume controls are provided to adjust the level of the respective microphone inputs. Rotate control clockwise to increase volume. Set the controls to "0" position when the microphone inputs are not in use.

TELEPHONE PAGING LEVEL CONTROL

Microphone Input 1 can be switched to Telephone Paging Input by setting the MIC/TEL Switch, located on the rear panel, to the TEL position. The telephone Paging level can be adjusted by using the front panel control marked MIC 1/TEL.

AUX 1/CD INPUTS CONTROL

A front panel Volume Control is provided to adjust the level of the Aux 1/CD inputs. Rotate control clockwise to increase volume. This control adjusts the level of both the AUX 1 and the CD inputs. Only one input at the time should be used. Set this control to "0" position when the inputs are not in use.

MIC 4/AUX 2 CONTROL

Microphone Input 4 can be switched to AUX 2 by setting the MIC 4/AUX 2 Switch, located on the rear panel, to the AUX 2 position. The Microphone Input 4 and the AUX 2 level can be adjusted by using the front panel control marked MIC 4/AUX 2.

ACOUSTIC CORRECTION

CAUTION: EXCESSIVE BOOST SETTING OF EITHER BASS OR TREBLE CONTROLS, MAY DAMAGE SPEAKERS.

BASS CONTROL

Use this control to set the tonal balance of the amplifier. The control center position, indicated by a "0", provides a flat response. To reduce the Bass response (bass cut) rotate control counterclockwise. To increase the Bass response (bass boost) rotate control clockwise.

Use this control to minimize Acoustic Feedback (howling) by setting the control in the CUT range 0 to -5. ALWAYS set control in the BASS-CUT position when using horn type speakers. Excessive bass response may damage the speaker's driver diaphragm.

TREBLE CONTROL

Use this control to set the tonal balance of the amplifier. The control center position, indicated by a "0", provides a flat frequency response. To reduce the High Frequency response (high cut) rotate control counterclockwise. To increase the High Frequency response (high boost) rotate control clockwise. USE this control to minimize possible white or hiss noise by setting control in the HIGH-CUT range 0 to -5.

TURNING THE AMPLIFIER ON

PRECAUTIONS

POWER SWITCH

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

MAKE SURE that all volume controls are in the "0" position before turning the amplifier On. Excessively high setting of the volume controls may damage the speakers. Turn amplifier ON by setting the front panel POWER SWITCH to the ON position. The pilot light on the front panel should glow normally.

MAINTENANCE 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: 5 X 20 MM

**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.

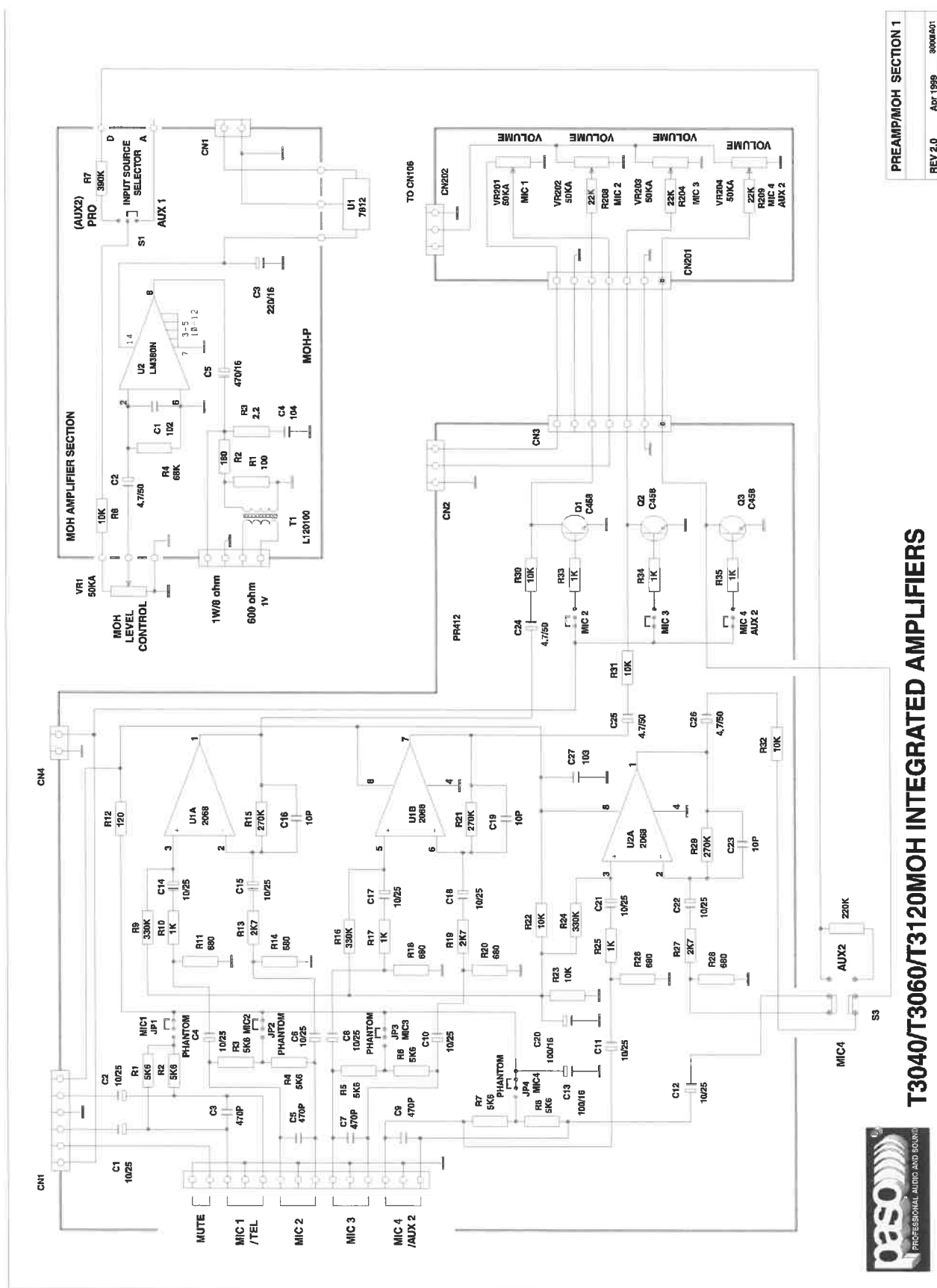
DC FUSE REPLACEMENT

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

NOTE: THE POWER CORD MUST BE REMOVED BEFORE THE FUSE CAN BE REPLACED

Procure a Fuse Type: AG

Turn amplifier power switch to the Off position. Remove power cord from AC outlet. Insert the tip of a cross screwdriver inside the Fuse Holder Cross screw, turn screw counterclockwise and remove the fuse by pulling outwardly. Replace Fuse in fuse holder.



PREAMP/MOH SECTION 1

REV 2.0 Apr 1999 3008401

T3040/T3060/T3120MOH INTEGRATED AMPLIFIERS

Fig. 21 - Schematic Diagram Section 1

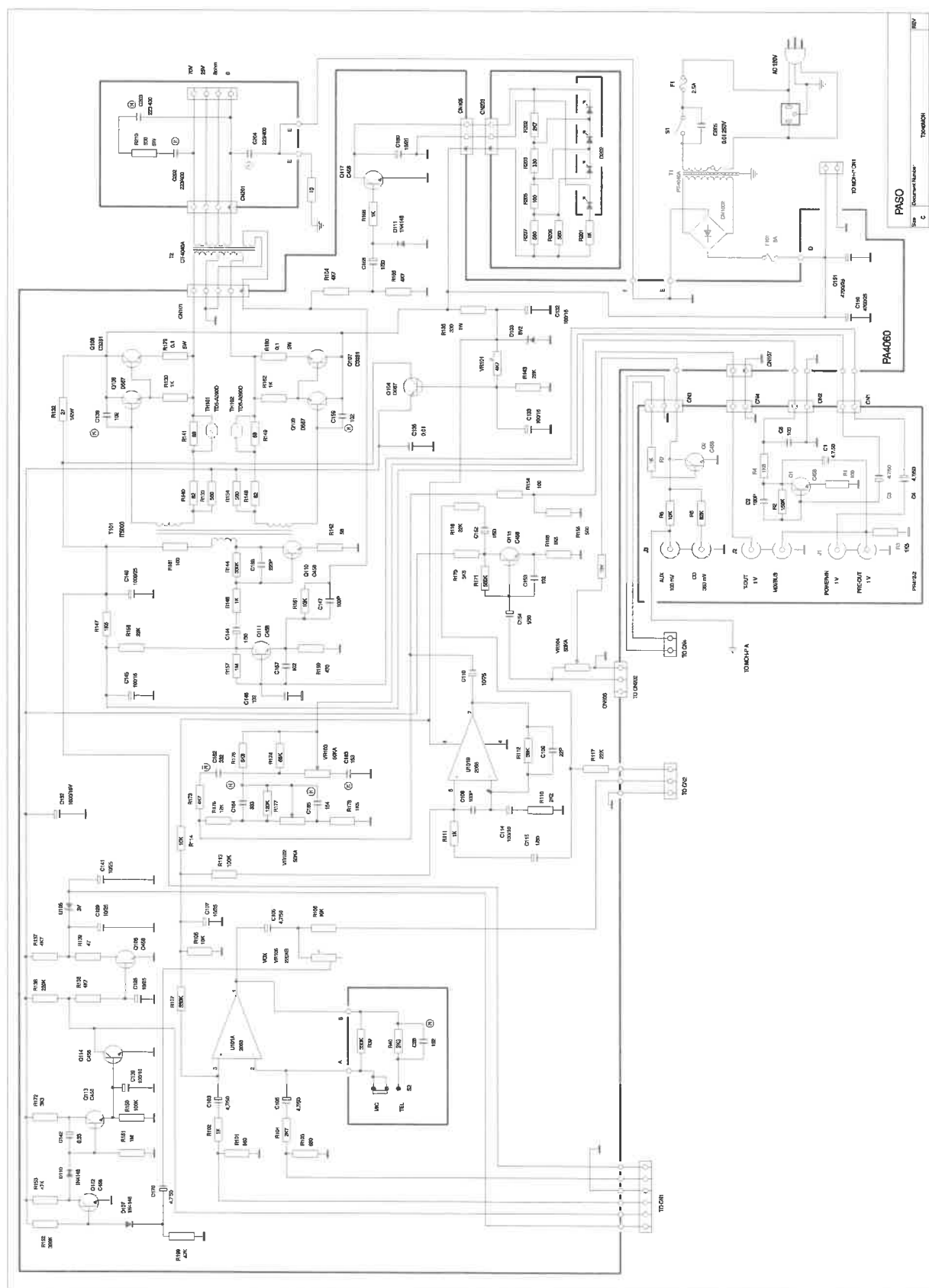


Fig. 22 - Schematic Diagram Model T3040MOH Section 2

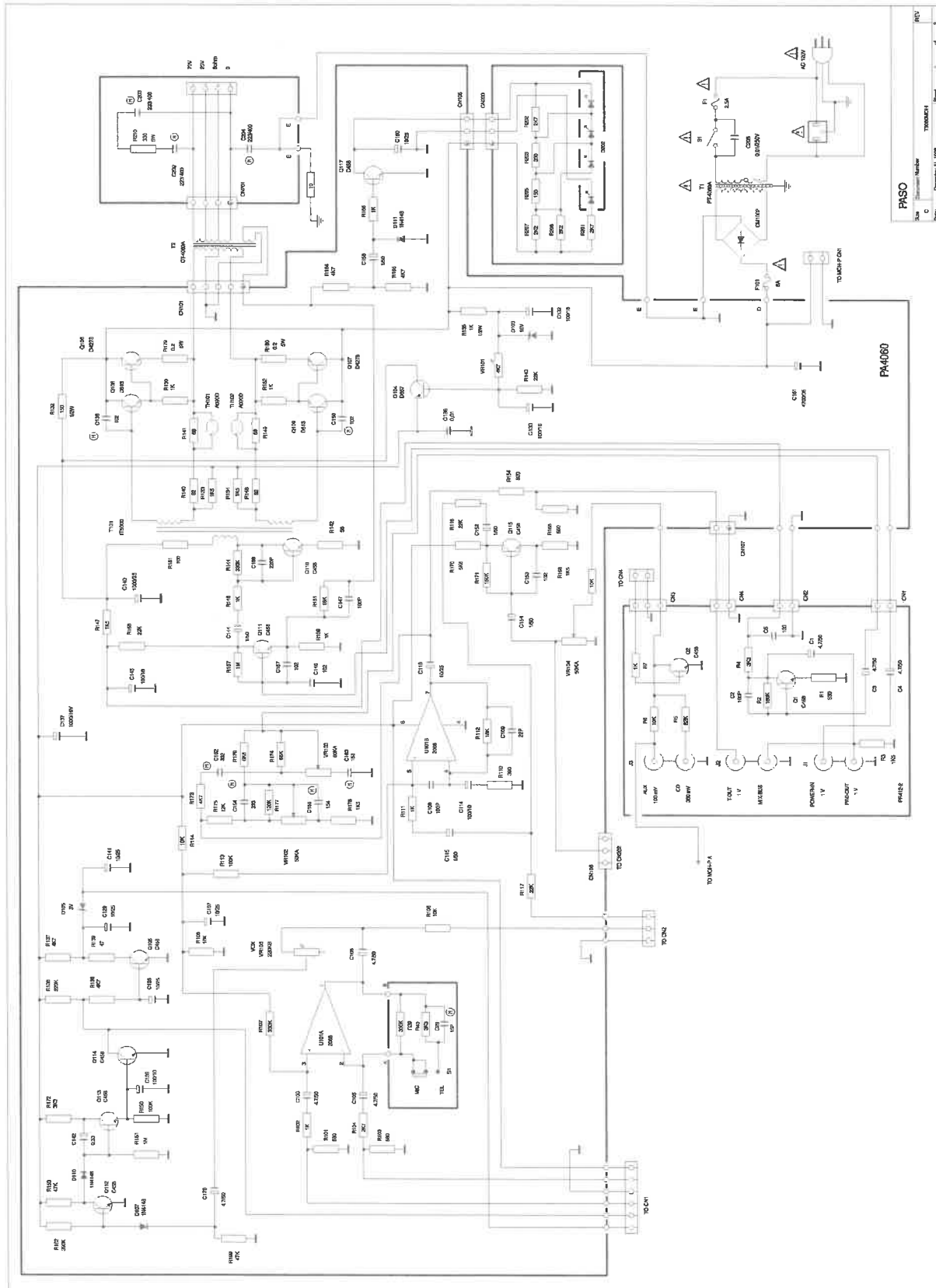


Fig. 23 - Schematic Diagram Model T3060MOH Section 2

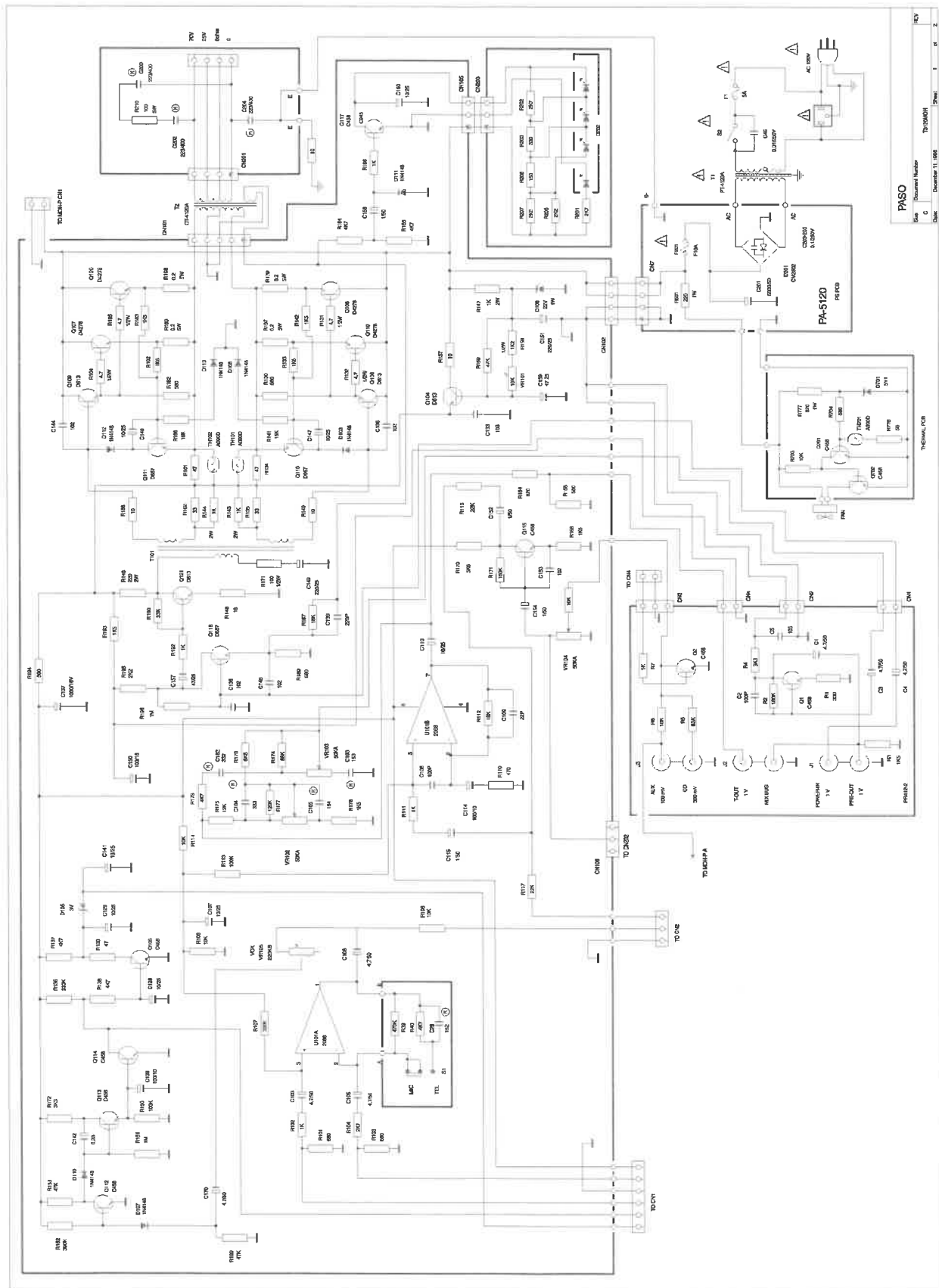


Fig. 24 - Schematic Diagram Model T3120MOH Section 2

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 from 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.