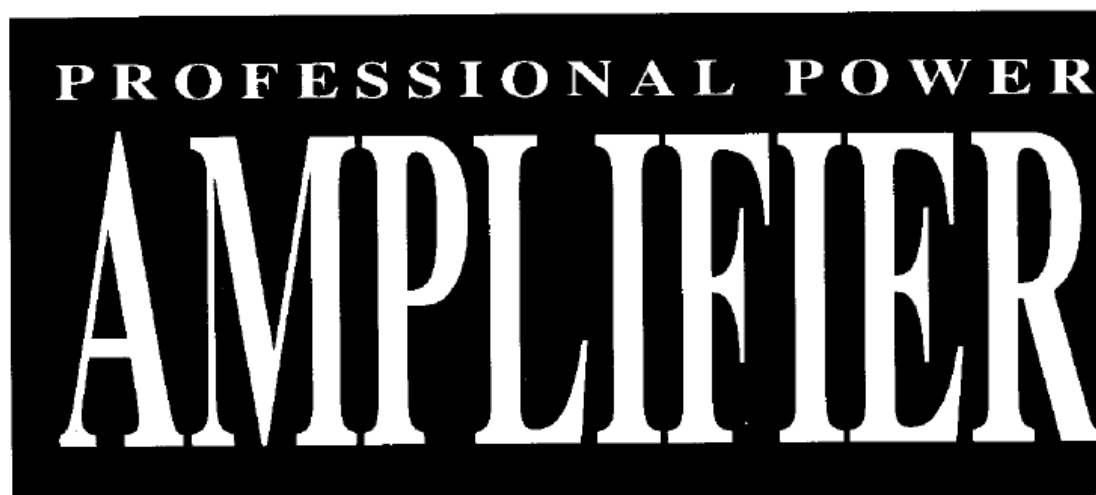


# OPERATING MANUAL



**MA-320/420/620/920**

**interM** by **INKEL**

## Unpacking and Installation

Although it is complicated to install not difficult to operate your stereo amplifier, a few minutes of your time is required to read this manual for a properly wired installation and becoming familiar with its many features and how to use them.

Please take a great care in unpacking your amplifier and do not discard the carton and packing materials. They may be needed when moving your set required if it ever becomes necessary to return your set for service. Never place the unit near radiators, in front of heating vents, in excessive humid or dusty location to avoid early damage and for your years of quality use.

Connect your complementary components as illustrated in the following page.

## Features

- **HIGH RELIABILITY**

To assure absolute long-term reliability, the output section of each channel incorporates Multiple Emitter Power Transistor.

- **SMALL SIZE AND LOWER WEIGHT**

Superior engineering has enabled valuable savings in rack space resulting in improved portability and reduced transport cost.

- **SPEAKER PROTECTION**

Crowbar protection operates independently on each channel in the event of a DC fault condition at the amplifier output, then the protection relay cuts off the primary AC line.

- **ENERGY LIMITERS**

Voltage-current type energy limiters are incorporated for overload protection of the amplifier. Due to the large safe operating area of the output stage, the limiter does not actuate until driving 1.4ohm load at full power.

- **SURGE CURRENT PROTECTION**

These amplifiers provided with output fuses to protect the loudspeakers from surge current.

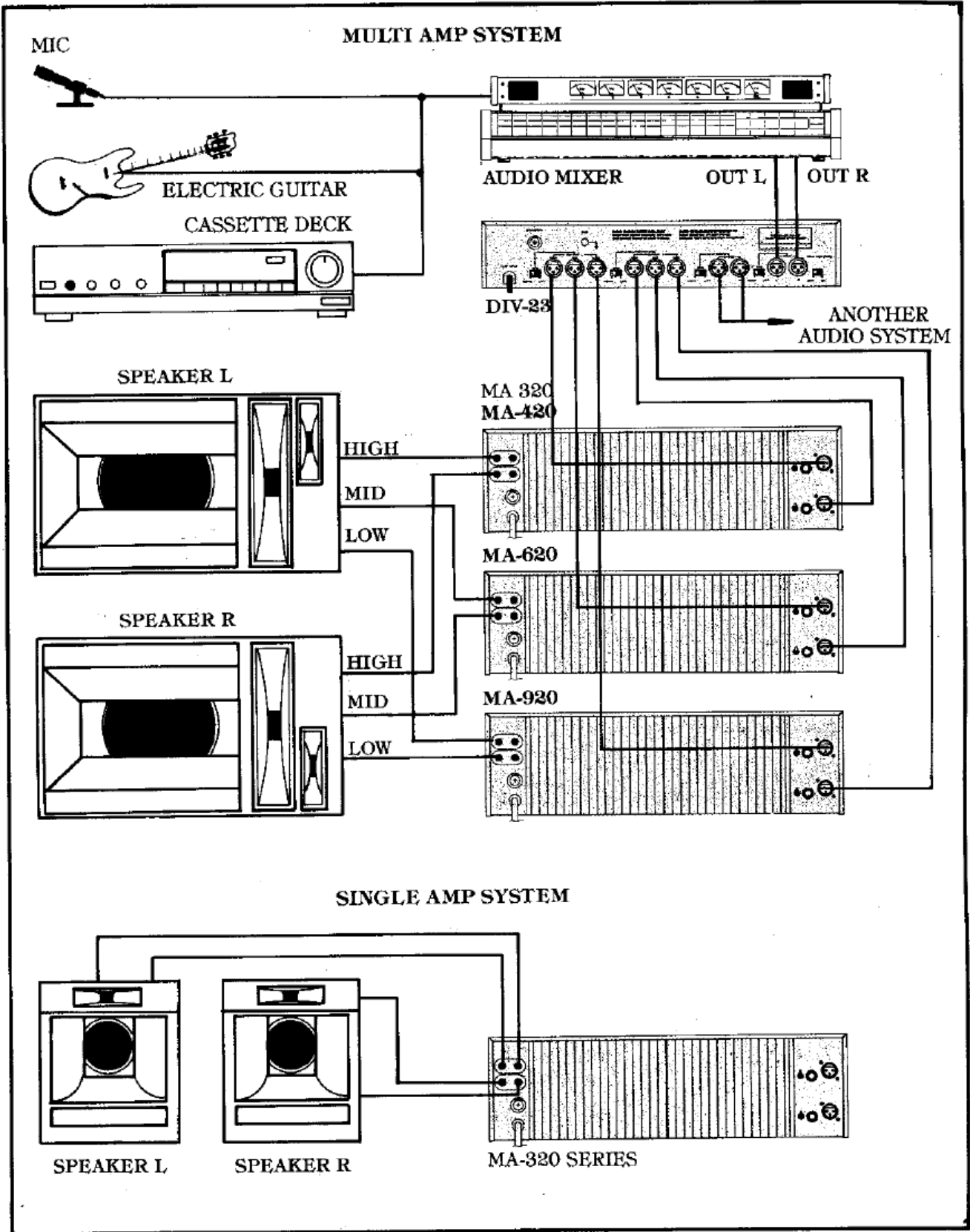
- **BRIDGED MONO FUNCTION**

For more powerful sound, these amplifiers can be used for monoral sound by selecting the mode selector to bridged function. Please refer to BRIDGED MONO operation.

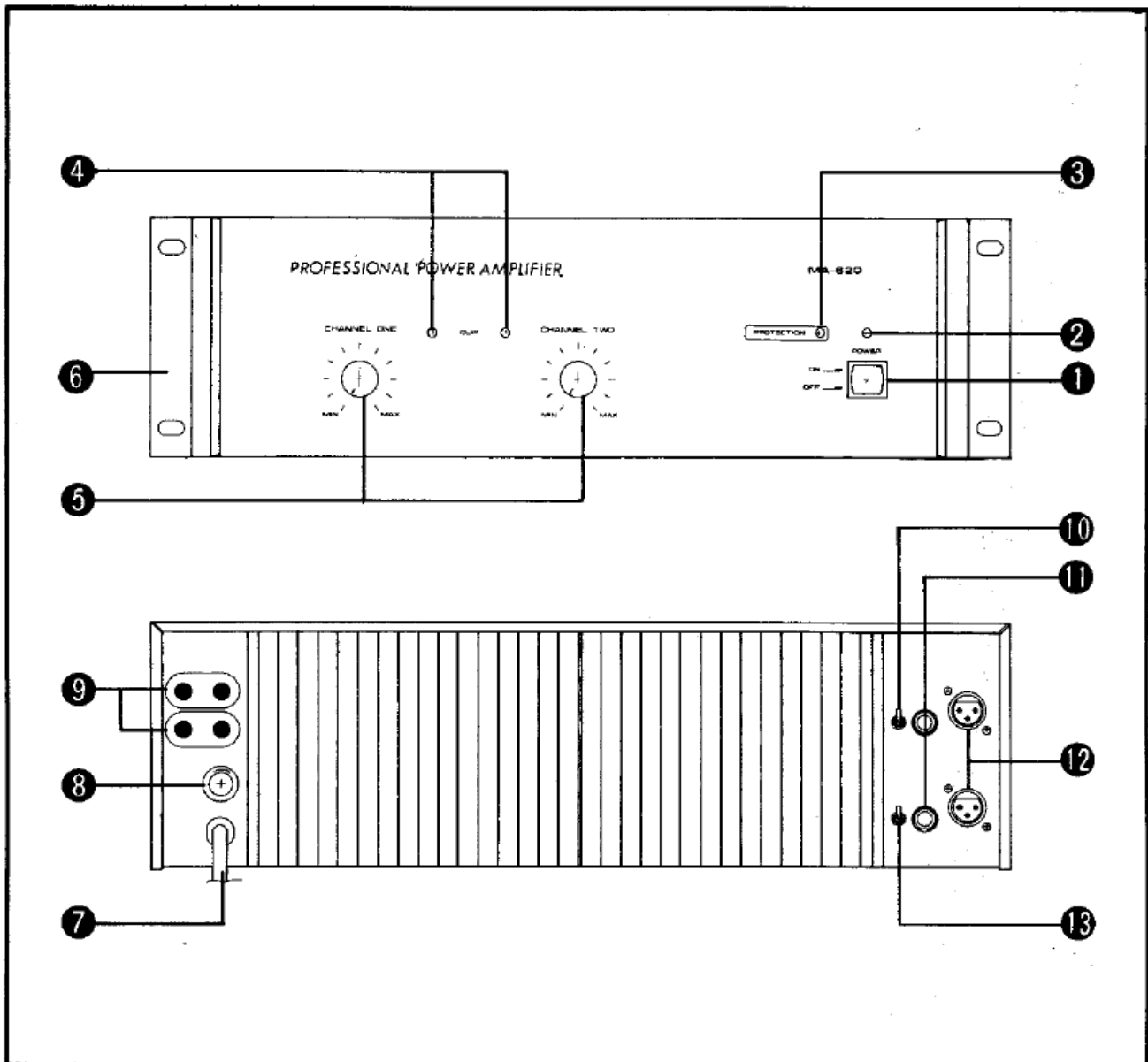
- **SOFT-START SYSTEM (MA-920 ONLY)**

To prevent over current when turn on the amplifier, soft-start circuit is provided on primary power lines.

# Connections



## Front Panel & Rear Panel Controls



### 1. POWER SWITCH

To turn amplifier ON or OFF, press the upper or lower of this switch button.

### 2. POWER INDICATING LED

The LED illuminates when the power is "ON"

### 3. PROTECTION INDICATOR

Protection LED indicator illuminate red color when the amplifier outputs have the state of fault in the circuit. Normally, protection LED indicator illuminate green color.

### 4. CLIP INDICATORS

Clip indicator on each channel illuminates when distortion reaches or exceeds approximately 1%, indicating that the amplifier is being driven by excessively high inputs. Then you had better properly adjust level controls.

**5. LEVEL CONTROLS**

Separate level controls are provided for channel one and channel two input. Clockwise rotation of the controls increases level.

**6. HANDLES**

You can handle this amplifier easily by using these handles.

**7. AC POWER CORD**

Plug this AC input cord into AC outlet.

**8. FUSE HOLDER**

This fuse holder contains AC primary fuse. When fuse is blown out, it should be replaced with the same type just like following table. If it continues to blow, stop replacing fuse and refer servicing to qualified personnel.

| Model \ Condition | AC 110V/120V | AC 220V/240V |
|-------------------|--------------|--------------|
| MA-320            | NM 6A/250V   | NM 3A/250V   |
| MA-420            | TS 8A/250V   | TS 4A/250V   |
| MA-620            | TS 10A/250V  | TS 6A/250V   |
| MA-920            | TS 15A/250V  | TS 8A/250V   |

**9. OUTPUT TERMINALS**

Output terminals are dual five-way binding posts, which are identified as to polarity with a red and a black terminals. We suggest the use of dual banana plugs as a convenient and reliable method of hook-up. Do not parallel the two outputs of each channel by connecting them (together, or parallel them) with any other amplifier output.

**10. EARTH LINK SWITCH**

This toggle switch provides for separation of "safety" earth and "signal" earth to prevent from hum loops.

**11, 12. INPUT CONNECTOR**

Input connectors are provided both balanced XLRs and unbalanced phone jacks. Phone jacks take priorities of XLR jacks.

**13. MODE SELECTOR**

Bridged mono operation is easily by this recessed toggle switch. The input is applied channel one only, and the corresponding front panel gain control is used to set the level. Please note Bridged Mono Operation.

## Bridged Mono Operation

1. Set Mode Selector to MONO.
2. Connect a mono input signal to channel one input jack.
3. Connect the speaker load to the two red terminals of each channels. Please confirm the (+) terminal of speaker to channel one and the (-) terminal to channel two.
4. Do not use the black terminals of each channel.
5. Please notice to connect the speaker impedance 8 ohm or above.
6. And adjust the channel one volume not to illuminate the clip LEDs of front panel.

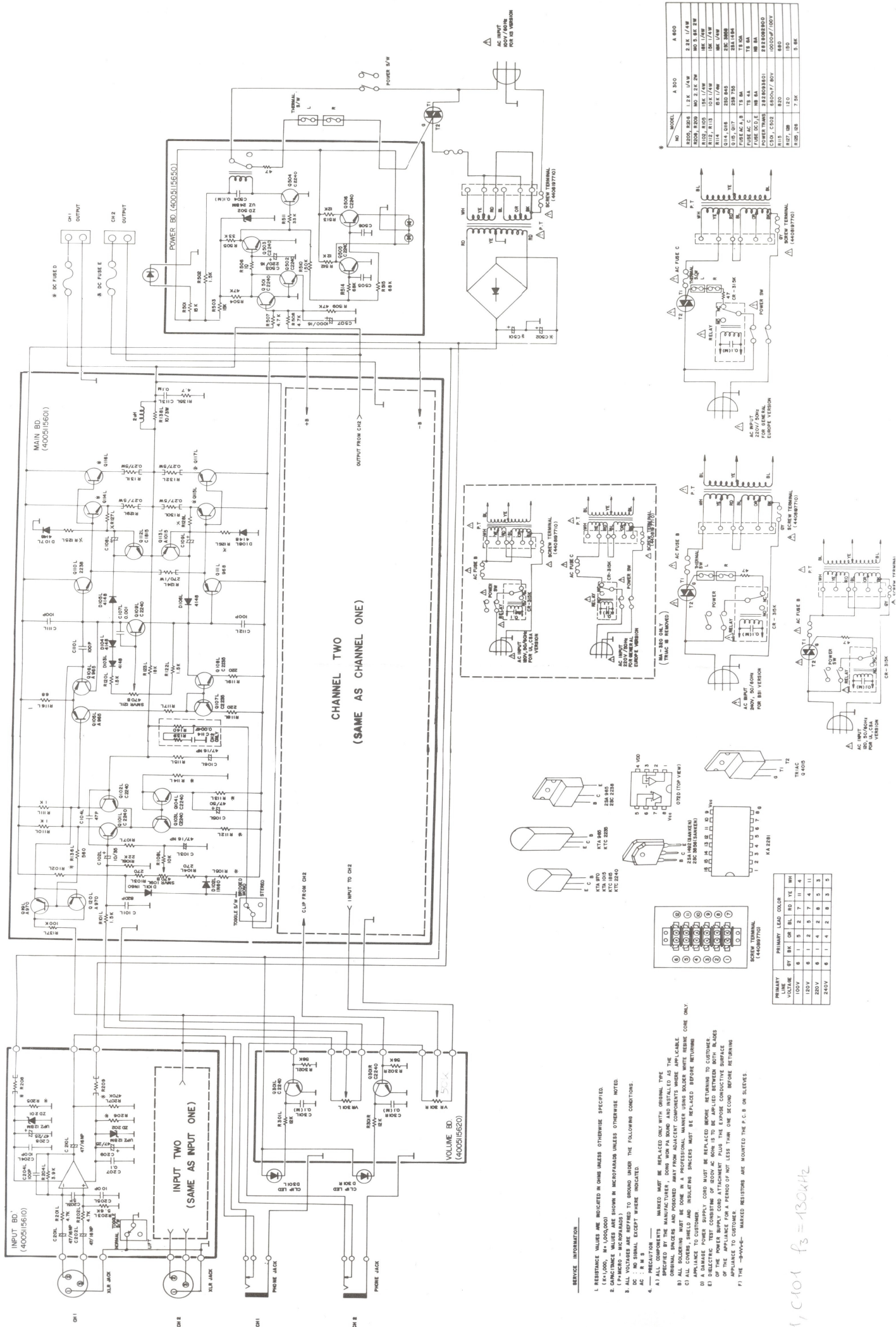
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## Specifications

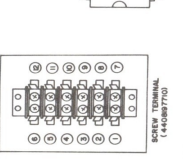
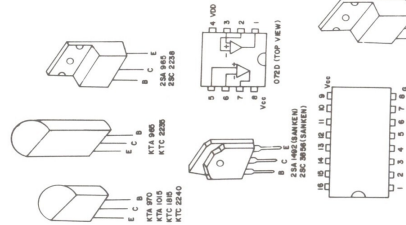
| MODEL  | MA-320                         | MA-420               | MA-620                         | MA-920               |
|--|--------------------------------|----------------------|--------------------------------|----------------------|
| Rated Output Power<br>at 8 ohm, 1 KHz (Bridged Mono)<br>at 8 ohm, 1 KHz (Stereo per CH)<br>at 4 ohm, 1 KHz | 200W<br>72W<br>100W            | 300W<br>100W<br>150W | 600W<br>200W<br>300W           | 800W<br>300W<br>450W |
| Total Harmonic Distortion  | 0.01%                          |                      |                                |                      |
| Frequency Response (-0.5 dB)   | 20 Hz to 20 KHz                |                      |                                |                      |
| Signal to Noise Ratio  | 115 dB                         |                      |                                |                      |
| Input Sensitivity  | 0.775V                         |                      |                                |                      |
| Input Impedance  | 15K ohm                        |                      |                                |                      |
| Channel Separation at 1 KHz  | 88 dB                          |                      |                                |                      |
| Power Requirement (Option)   | AC110V/120V/220V/240V 50/60 Hz |                      |                                |                      |
| Power Consumption  | 270W                           | 420W                 | 830W                           | 1220W                |
| Dimensions   | 483(W) × 89(H) × 385(D)<br>mm  |                      | 483(W) × 133(H) × 385(D)<br>mm |                      |
| Weight (Net)   | 11 Kg                          | 12 Kg                | 17.5 Kg                        | 21.5 Kg              |

NOTE: Specifications and the design subject to change without notice for improvements.

# MA-320/420/620 Schematic Diagram



- REVISION INFORMATION**
- RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED.
  - CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED. (P=PICTO - MICROFARADS)
  - ALL VOLTAGES ARE REFERRED TO GROUND UNLESS OTHERWISE INDICATED.
  - PRECAUTION — MARKED MUST BE REPLACED WITH ORIGINAL TYPE
  - ALL COMPONENTS MARKED WITH A WAVE-SHAPED SYMBOL SHOULD BE REPLACED WITH ORIGINAL PARTS AND INSTALLED AS THE ORIGINAL MANUFACTURER'S SPECIFICATIONS ARE APPLICABLE.
  - ALL SOLDERING MUST BE DONE IN A PROFESSIONAL MANNER USING SOLDER CORE ONLY.
  - ALL COVERS, SHIELD AND INSULATING SPRACERS MUST BE REPLACED BEFORE RETURNING.
  - IF A DAMAGE POWER SUPPLY CORD MUST BE REPLACED, THE ORIGINAL MANUFACTURER'S SPECIFICATIONS FOR THE POWER SUPPLY CORD ATTACHMENT PLUS THE EXPOSED CONDUCTIVE SURFACE SHOULD BE REFERRED TO FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING APPLIANCE TO CUSTOMER.
  - IF THE 8-WAVE- MARKED RESISTORS ARE MOUNTED THE P.C.B. ON SLEEVES



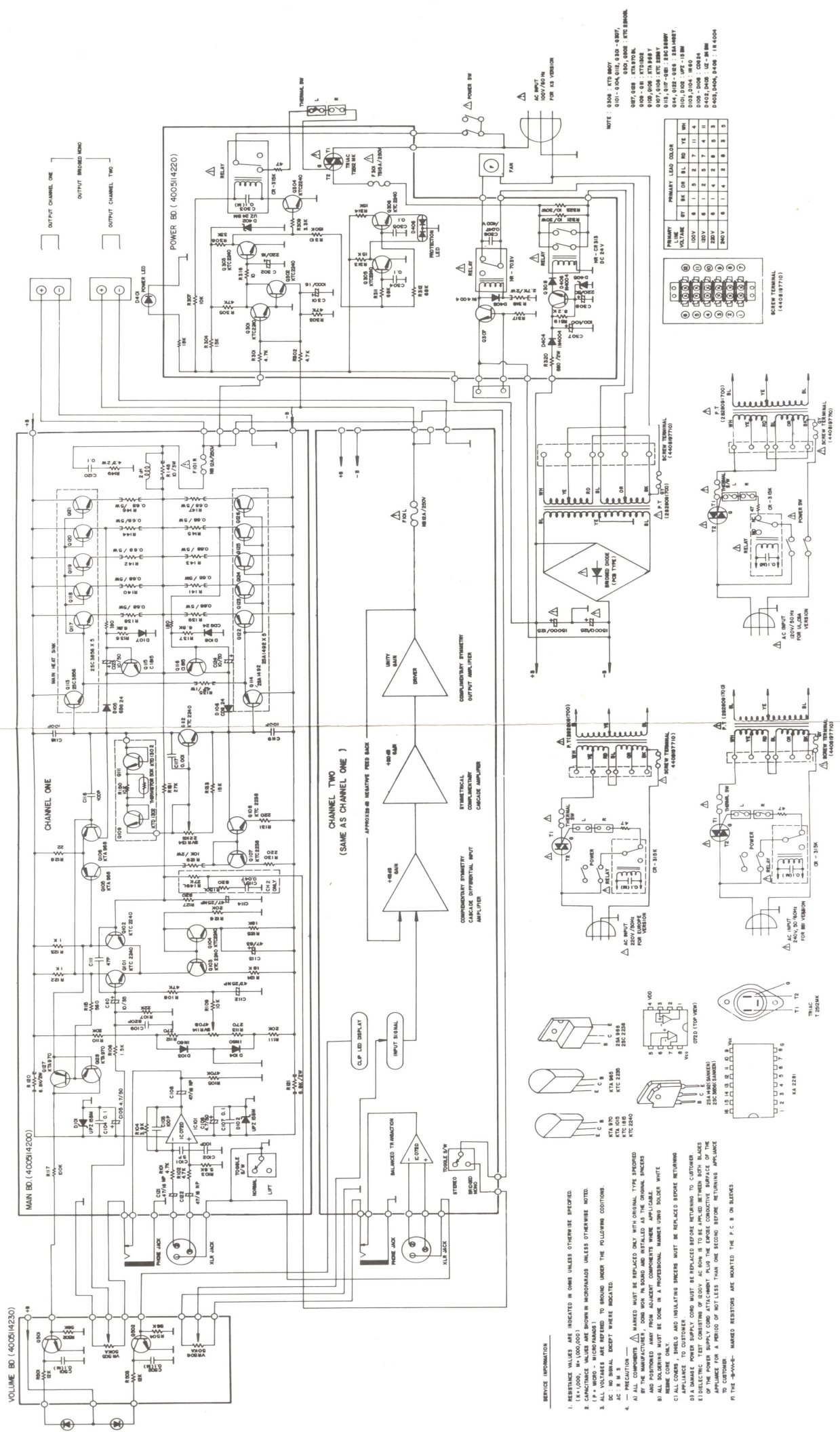
| PRIMARY VOLTAGE | LINE | LEAD | COLOR |
|-----------------|------|------|-------|
| 250V            | 8    | 1    | 4     |
| 250V            | 8    | 1    | 4     |
| 250V            | 8    | 1    | 4     |
| 250V            | 8    | 1    | 4     |
| 250V            | 8    | 1    | 4     |
| 250V            | 8    | 1    | 4     |

| NO.  | MODEL | A 300       | A 600       |
|------|-------|-------------|-------------|
| 2005 | RES   | 1.2K / 1/4W | 2.2K / 1/4W |
| 2105 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2205 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2305 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2405 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2505 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2605 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2705 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2805 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 2905 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3005 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3105 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3205 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3305 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3405 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3505 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3605 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3705 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3805 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 3905 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4005 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4105 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4205 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4305 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4405 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4505 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4605 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4705 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4805 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 4905 | RES   | 10K / 1/4W  | 10K / 1/4W  |
| 5005 | RES   | 10K / 1/4W  | 10K / 1/4W  |

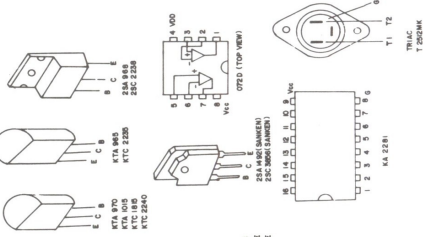
R101, C101  $f_3 = 130\mu\text{Hz}$



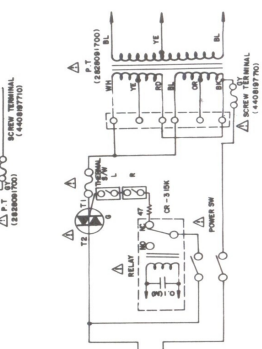
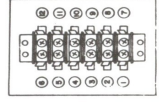
# MA-920 Schematic Diagram



- SERVICE INFORMATION**
1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED. (K=1,000; M=1,000,000)
  2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED.
  3. ALL WIREBONES ARE REFERRED TO AS BRONZE UNLESS OTHERWISE NOTED.
  4. DC: NO SIGNAL, EXCEPT WHERE INDICATED.
  5. PRECAUTIONS:
    - A) THE PRECISION-TYPE WIREBONES MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER, DOWNSIDE PA BOARD AND INSTALLED AS THE ORIGINAL SPACERS AND POSITIONED AWAY FROM ADJACENT COMPONENTS WHERE APPLICABLE.
    - B) ALL SOLDERING MUST BE DONE IN A PROFESSIONAL MANNER USING SOLDER WHICH IS APPLICABLE TO CUSTOMER.
    - C) ALL COVERS, SHIELD AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING TO CUSTOMER.
    - D) A DAMAGED POWER SUPPLY COND MUST BE REPLACED BEFORE RETURNING TO CUSTOMER. PLACE THE POWER SUPPLY COND ATTACHMENT PLUS THE EXPOSED CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING APPLIANCE TO CUSTOMER.
    - E) THE "P" WIREBONES ARE MOUNTED THE P.C.B. ON SLEEVES.



| PRIMARY LINE | VOLTAGE | BY | OR | BL | RD | YE | WH |
|--------------|---------|----|----|----|----|----|----|
| 1            | 100V    | 1  | 2  | 7  | 11 | 4  |    |
| 2            | 220V    | 1  | 2  | 7  | 4  | 11 |    |
| 3            | 220V    | 1  | 4  | 2  | 8  | 5  | 3  |
| 4            | 200V    | 1  | 4  | 2  | 8  | 5  | 3  |



NOTE: Q108: KTD 807Y  
 Q11: 0-04016, 030-087Y,  
 007, 028: KTD703K, 07C 808K,  
 009-58: KTD302Z  
 005-009: KTD983Y  
 013, 017-083: KTD2887Y  
 014, 028-028: 28A487Y,  
 D10, D08: UPE-10 BM  
 D05, D06: 020 F4  
 D05, D06: 020 F4  
 D03, D04: 02: 02-30 BM  
 D03, D04, 0408: 1F 4004