

# Operating Instructions

**PROFESSIONAL POWER AMPLIFIER**

**MODELS.**

**MA-320**

**MA-420**

**MA-620**

**MA-920**

 **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.

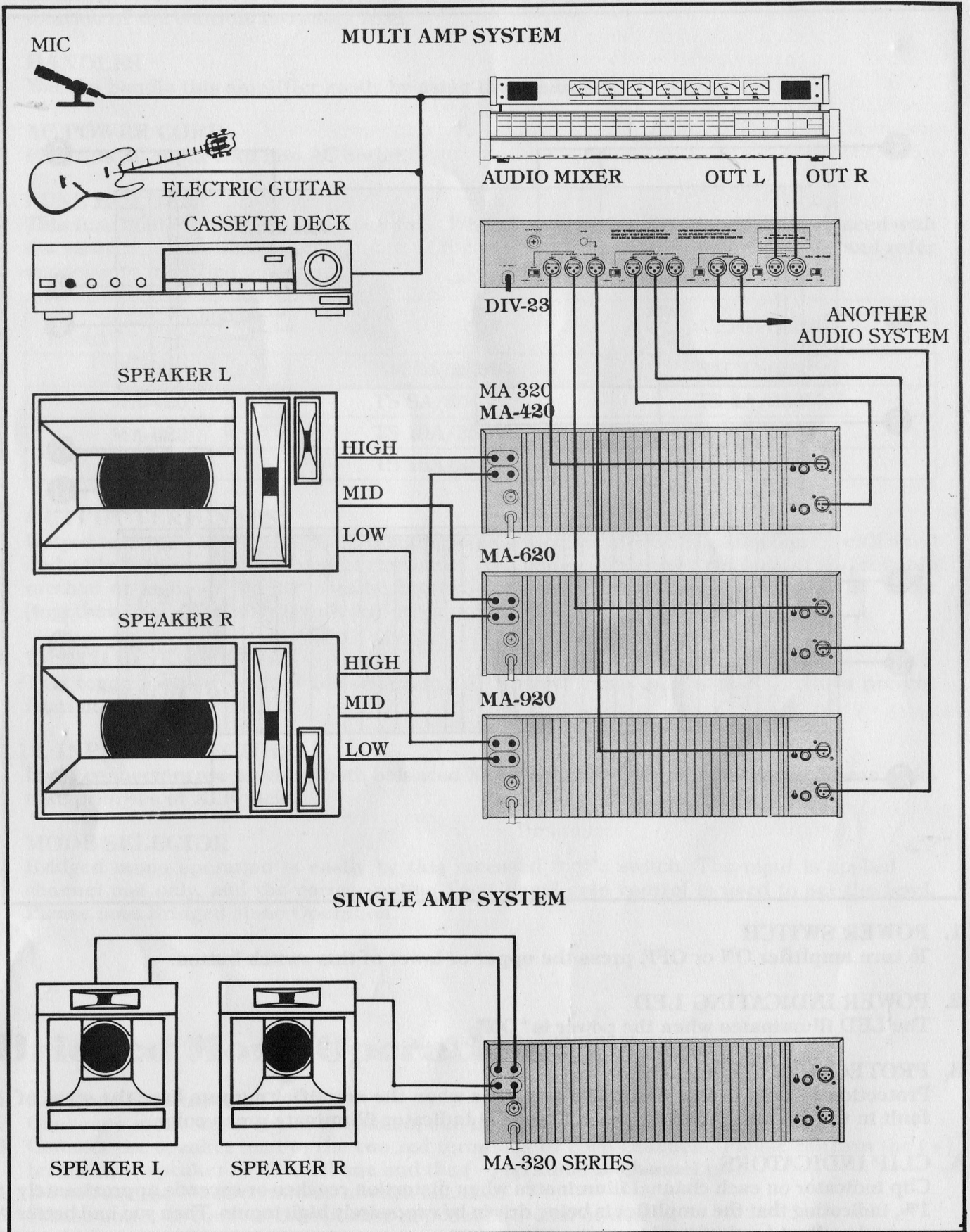
Connect your complementary components as illustrated in the following page.

## Features

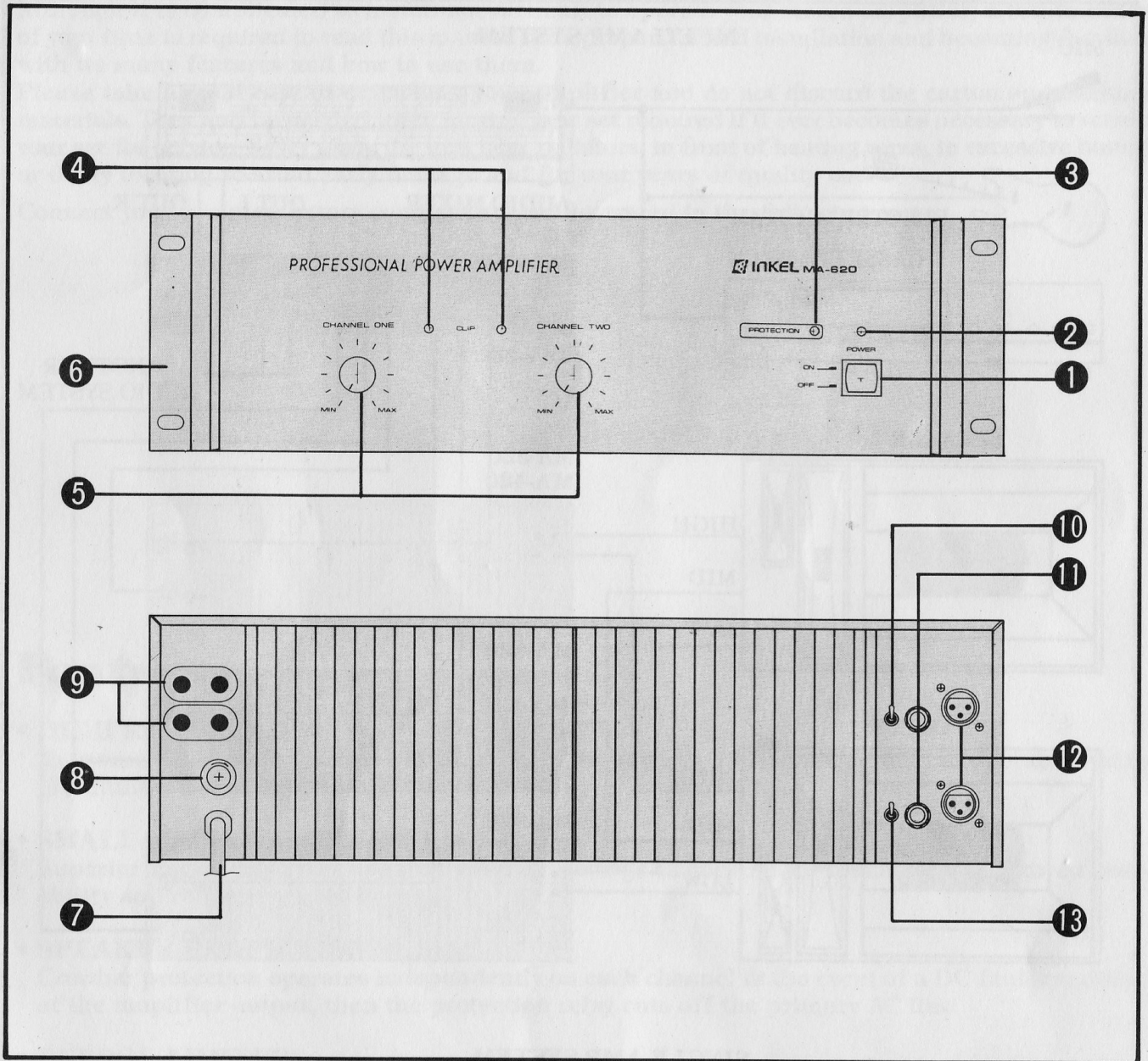
- **HIGH RELIABILITY**  
To assure absolute long-term reliability, the output section of each channel incorporates Multiple Emitter Power Transistor.
- **SMALL SIZE AND LOWER WEIGHT**  
Superior engineering has enabled valuable savings in rack space resulting in improved portability and reduced transport 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.

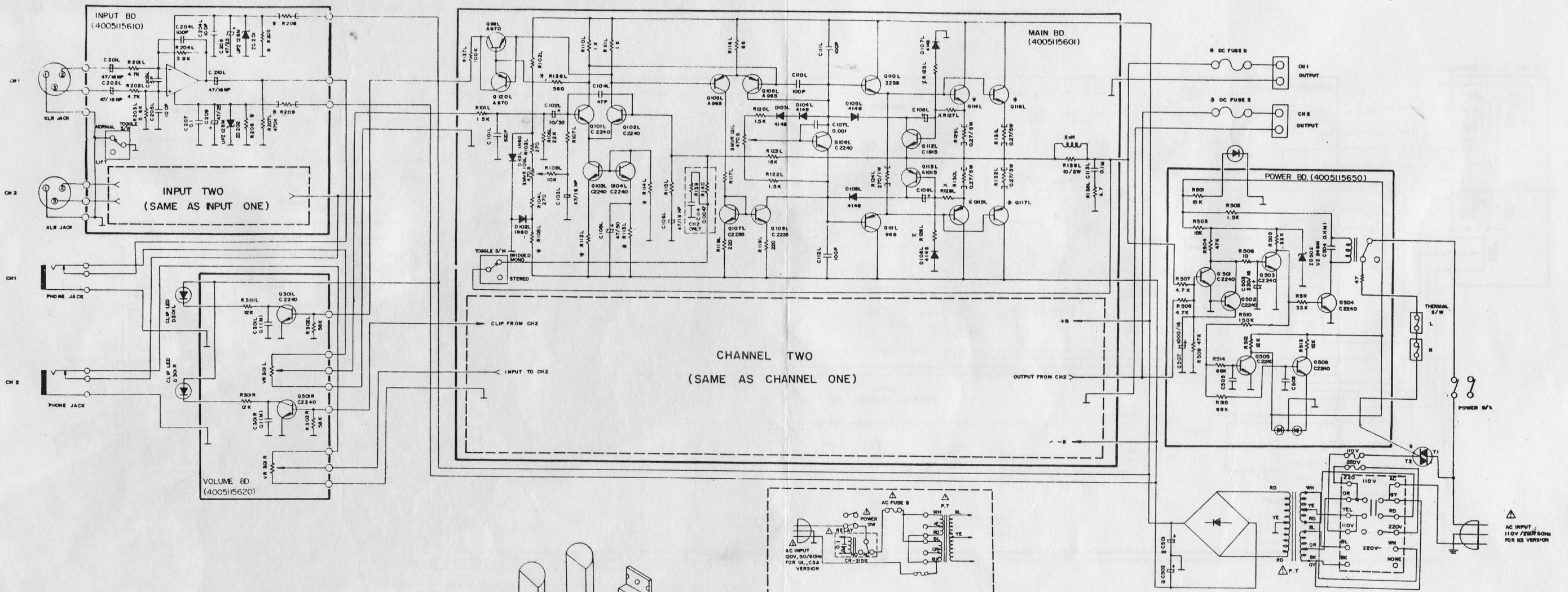
## Specifications

MODEL	MA-320	MA-420	MA-620	MA-920
Rated Output Power at 8 ohm, 1 KHz (Bridged Mono) at 8 ohm, 1 KHz (Stereo per CH) at 4 ohm, 1 KHz	200W 72W 100W	300W 100W 150W	600W 200W 300W	800W 300W 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) mm		483(W) × 133(H) × 385(D) 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.

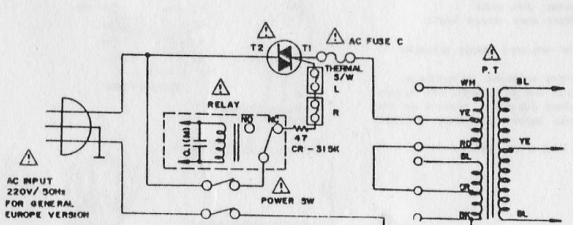
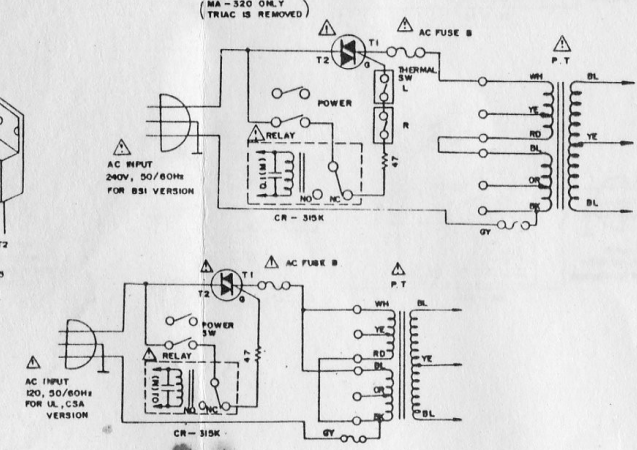
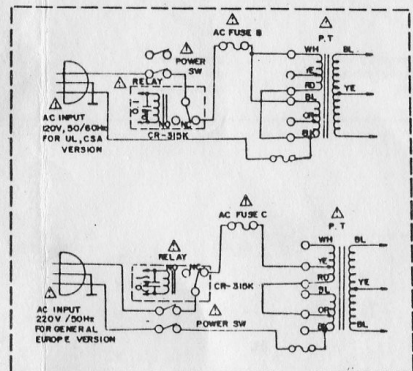
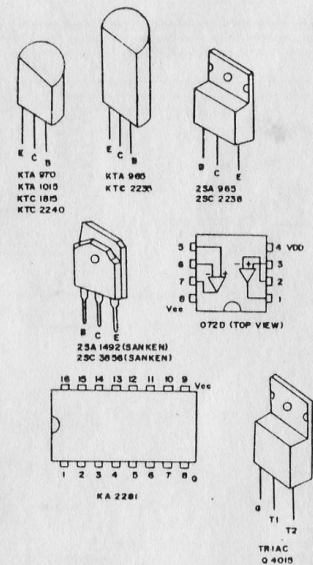


# MA-320/420/620 Schematic Diagram



### SERVICE INFORMATION

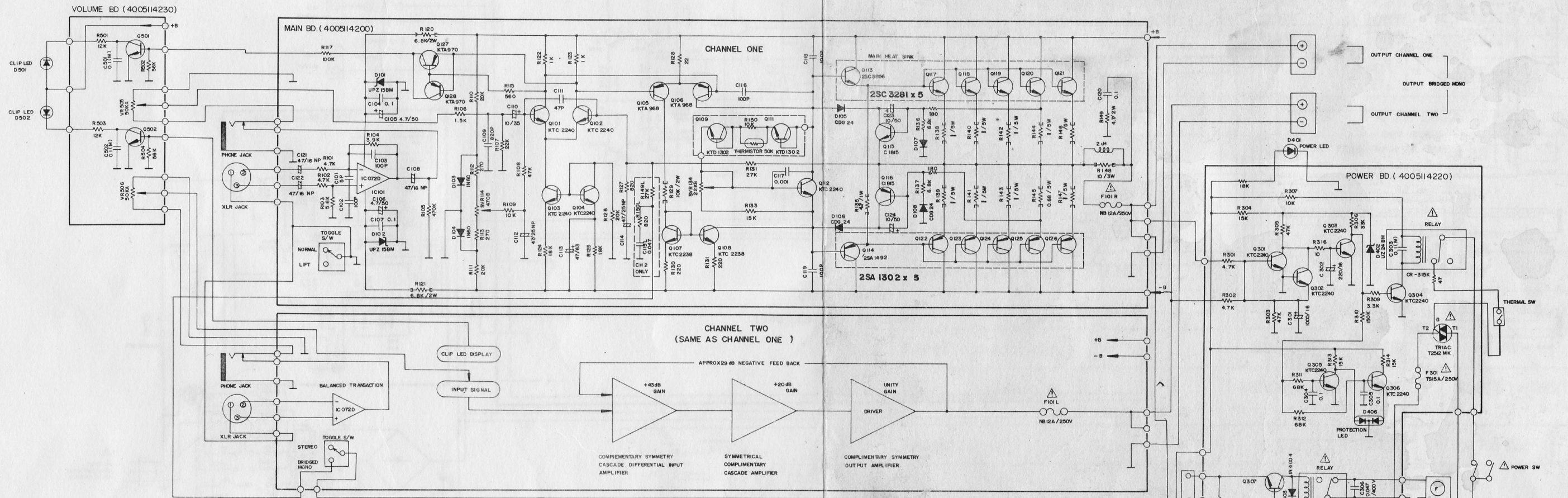
- 1 RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED  
(K=1,000, M=1,000,000)
- 2 CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED  
( $\mu$ =MICRO - M=1000)
- 3 ALL VOLTAGES ARE REFERRED TO GROUND UNDER THE FOLLOWING CONDITIONS  
DC NO SIGNAL EXCEPT WHERE INDICATED  
AC RMS
- 4 PRECAUTION
  - A) ALL COMPONENTS MARKED MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER. DO NOT WIG PA 200ND 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 WHITE RESINE CORE ONLY
  - C) ALL COVERS, SHIELD AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER
  - D) A DAMAGE POWER SUPPLY CORD MUST BE REPLACED BEFORE RETURNING TO CUSTOMER
  - E) DIELECTRIC TEST CONSISTING OF 1200V AC 60HZ IS TO BE APPLIED BETWEEN BOTH BLADES OF THE POWER SUPPLY CORD ATTACHMENT PLUS THE EXPOSE CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING APPLIANCE TO CUSTOMER
  - F) THE  $\text{---}\text{W}\text{---}$  MARKED RESISTORS ARE MOUNTED THE P.C.B ON SLEEVES



NO	MODEL	A 300	A 600
R205, R206		1.2K 1/4W	2.2K 1/4W
R208, R209		10K 2.2K 2W	10K 5K 2W
R102, R103		15K 1/4W	18K 1/4W
R112, R113		10K 1/4W	18K 1/4W
R114		5K 1/4W	18K 1/4W
Q14, Q18		250 9A8	250 9A8
Q15, Q17		250 750	250 1A4
FUSE AC A, B		T5 8A	T5 10A
FUSE AC C		T5 4A	T5 8A
FUSE DC D, E		H5 6A	H5 8A
POWER TRANS		2028088801	2028082800
C53, C502		880V 1/2 80V	1000V 1/2 100V
B15		820	880
R17, C8		12.0	180
R105, C8		7.5K	5.8K

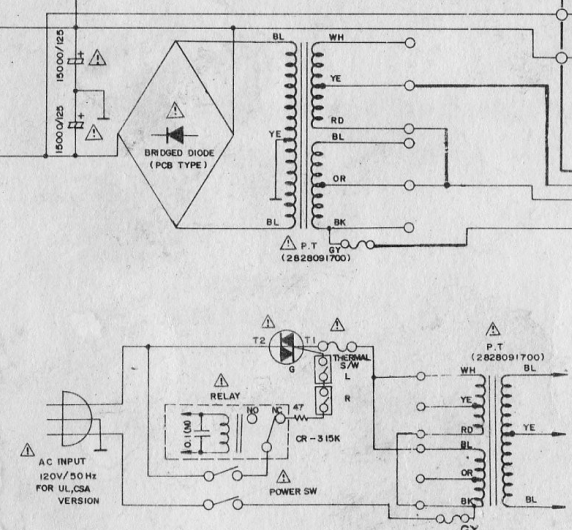
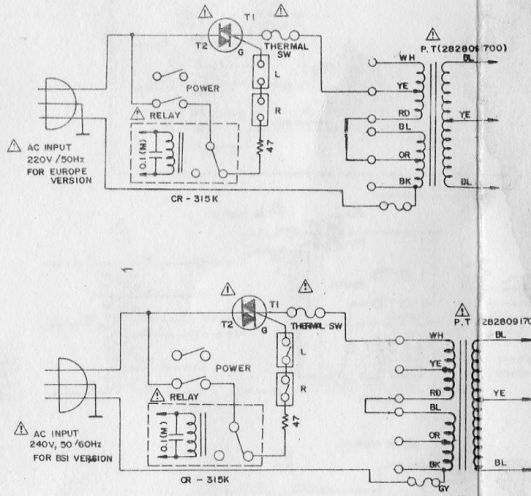
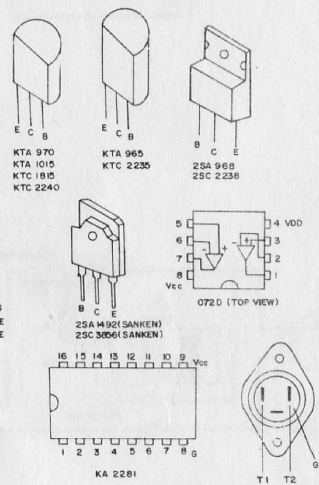


# MA-920 Schematic Diagram



### SERVICE INFORMATION

- RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED. (K = 1,000, M = 1,000,000)
- CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED. (P = MICRO - MICRO FARADS)
- ALL VOLTAGES ARE REFERRED TO GROUND UNDER THE FOLLOWING CONDITIONS:  
DC - NO SIGNAL EXCEPT WHERE INDICATED.  
AC - R.M.S.
- PRECAUTION
  - ALL COMPONENTS MARKED WITH A TRIANGLE MUST BE REPLACED ONLY WITH ORIGINAL TYPE SPECIFIED BY THE MANUFACTURER, DOWN WORN PA SOUND AND INSTALLED AS THE ORIGINAL SPACERS AND POSITIONED AWAY FROM ADJACENT COMPONENTS WHERE APPLICABLE.
  - ALL SOLDERING MUST BE DONE IN A PROFESSIONAL MANNER USING SOLDER WHITE RESINE CORE ONLY.
  - ALL COVERS, SHIELD AND INSULATING SPACERS MUST BE REPLACED BEFORE RETURNING APPLIANCE TO CUSTOMER.
  - A DAMAGE POWER SUPPLY CORD MUST BE REPLACED BEFORE RETURNING TO CUSTOMER.
  - DIELECTRIC TEST CONSISTING OF 1200V AC 60Hz IS TO BE APPLIED BETWEEN BOTH BLADES OF THE POWER SUPPLY CORD ATTACHMENT PLUS THE EXPOSE CONDUCTIVE SURFACE OF THE APPLIANCE FOR A PERIOD OF NOT LESS THAN ONE SECOND BEFORE RETURNING APPLIANCE TO CUSTOMER.
  - THE 3-W-E- MARKED RESISTORS ARE MOUNTED THE P.C.B ON SLEEVES.



NOTE: Q308 : KTD 880Y  
 Q101 - Q104, Q112, Q301 - Q307, Q501, Q502 KTC 2240BK  
 Q127, Q128 : KTA 970 BL  
 Q109 - Q111 : KTD 1302  
 Q105, Q106 : KTA 968 Y  
 Q107, Q108 : KTC 2238 Y  
 Q113, Q117 - Q121 : 25C 3886Y  
 Q14, Q122 - Q126 : 25A 1492 Y  
 D101, D102 : UPZ - 159M  
 D103, D104 : IN 60  
 D105 - D108 : CDG 24  
 D402, D403 : UZ - 24 BM  
 D403, D404, D406 : 1N 4004