

# ONKYO® SERVICE MANUAL

## Stereo Graphic Equalizer

### MODEL EQ-240

UD	120V AC, 60Hz
UW	120V/220V AC, 50/60Hz
UQ	240V AC, 50Hz

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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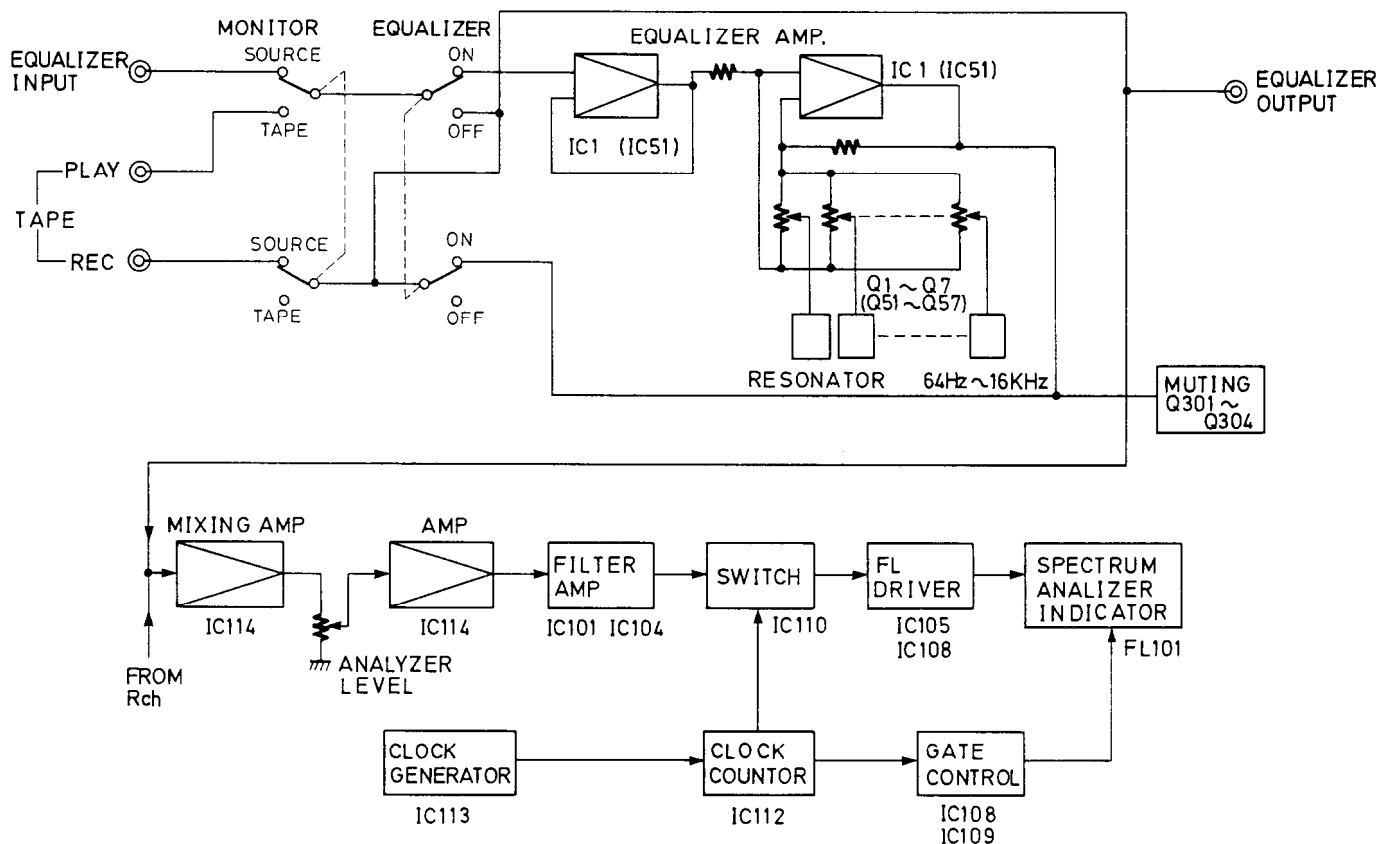
**ONKYO**  
**AUDIO COMPONENTS**

## SPECIFICATIONS

Input:	Input sensitivity (FLAT): 150mV
	Input impedance: 50 kohms
Output:	Output voltage (FLAT): 150mV
	Output impedance: 1.0 kohms
Max. input:	5 volts, 20Hz – 20 kHz, 0.05% THD
Frequency response:	10Hz to 35kHz (+0, –0.5dB)
Total harmonic distortion:	Less than 0.01% at 20Hz-20kHz, 1.5V output (FLAT)
Signal to noise ratio:	100 dB, 1.5V output, IHF-A input short
Adjustable range:	±12 dB
Gain:	0 dB
AC outlet:	200 watts (UNSWITCHED) (USA and Canadian models only)
Power supply:	European models: AC220V, 50Hz Canadian models: AC120V, 60Hz British & Australian models: AC240V, 50Hz Worldwide models: AC120V, 60Hz or AC220V, 50Hz (Switchable)
Dimensions:	435(W) x 71(H) x 257(D)mm 17-1/8" x 2-13/16" x 10-1/8"
Weight:	2.9 kg., 6.4 lbs.

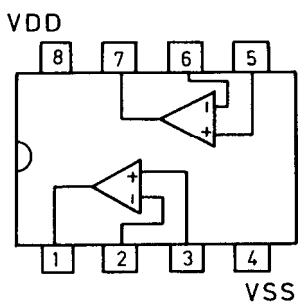
Specifications and features are subject to change without notice.

## BLOCK DIAGRAM

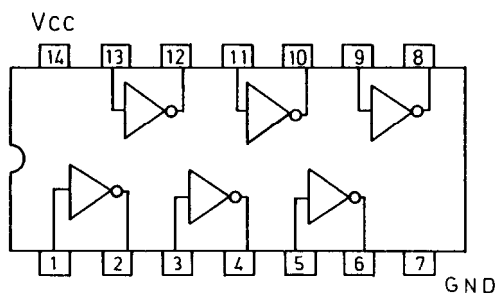


# IC BLOCK DIAGRAM

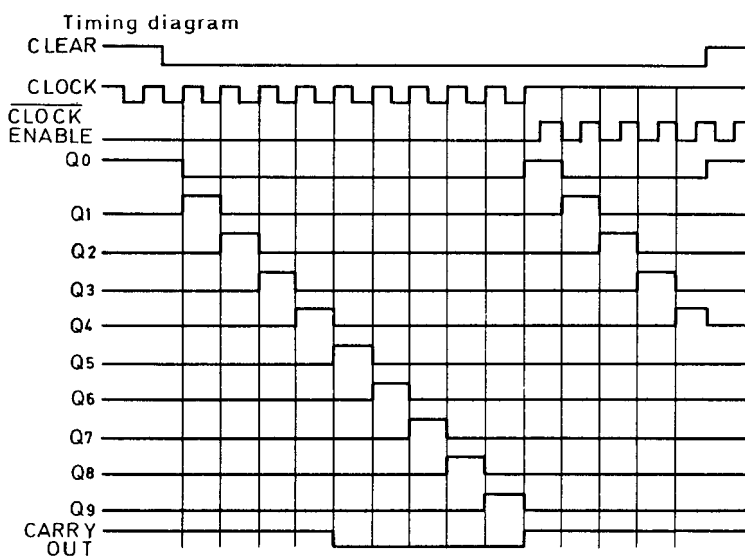
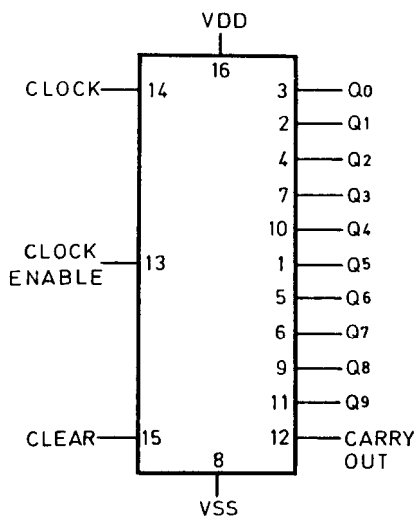
**NJM4558DX (OP. Amp.)**



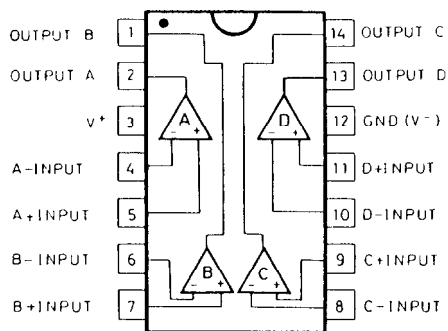
**4069 BP (Inverter)**



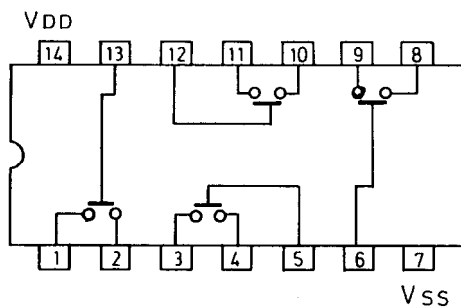
**4017BP (Decade Counter)**



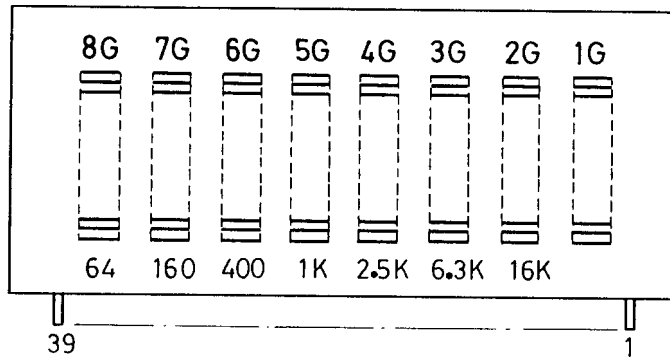
**NJM2901N (Comparator)**



**4066B (Switch)**



**BG-394ZK (Fluorescent indicator tube)**



Pin NO.	1	2	3	4	5	6	7	8	9	10
ELECTRODE	F	-	S1	S2	S3	8G	S4	S5	S6	7G

Pin NO.	11	12	13	14	15	16	17	18	19	20
ELECTRODE	S7	S8	-	6G	-	-	-	5G	-	-

Pin NO.	21	22	23	24	25	26	27	28	29	30
ELECTRODE	-	4G	-	-	-	3G	S9	S10	S11	2G

Pin NO.	31	32	33	34	35	36	37	38	39
ELECTRODE	S12	S13	S14	1G	S16	S17	-	-	F

## PRECAUTIONS

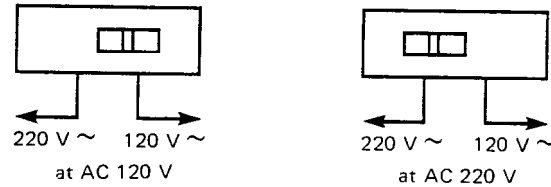
### 1. Insulation resistance measurement (Only U.S.A. model)

Connect the insulating-resistance tester between the plug of power supply cable and the terminal GND on the back panel. Specifications: More than 10 M $\Omega$  at 500V.

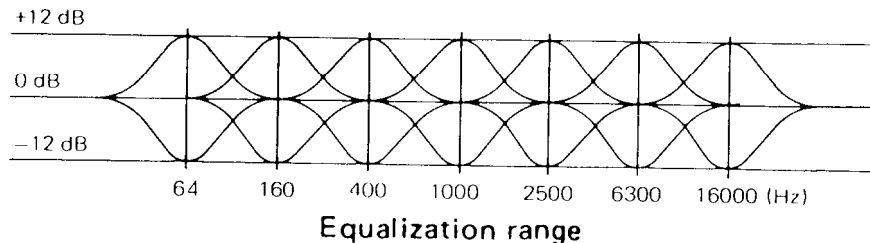
### 2. Voltage selector (rear panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left.

Confirm that the switch has been moved all the way to the right or left before turning the power switch on. Models without a voltage selector can only be used in areas where the power supply is the same as that of the unit.



## USING THE LEVEL CONTROLS



### 64 Hz

This range includes the low rumbling sort of sounds created by a pipe organ or the lowest range of a piano. Lowering this level control eliminates humming noises from electric musical instruments, ventilation systems and other sources.

### 160 Hz

Frequencies around 160 Hz are the standard "bass" tones with which most people are familiar. The position of this level control is very important because it has a major effect on the amount of "richness" or "body" in the music.

### 400 Hz

This frequency range contain most sounds from musical instruments and voices. Consequently, the position of this level control determine the amount of power and warmth in the music.

### 1000 Hz

Sounds in this range seem to strike the face, giving the music a lively feeling that should be emphasized or attenuated according to the music program and listening environment.

### 2500 Hz

This frequency range contains the sounds that seem to pierce the ears to give trumpet notes their strength. Use this level control to adjust the power of this sort of music.

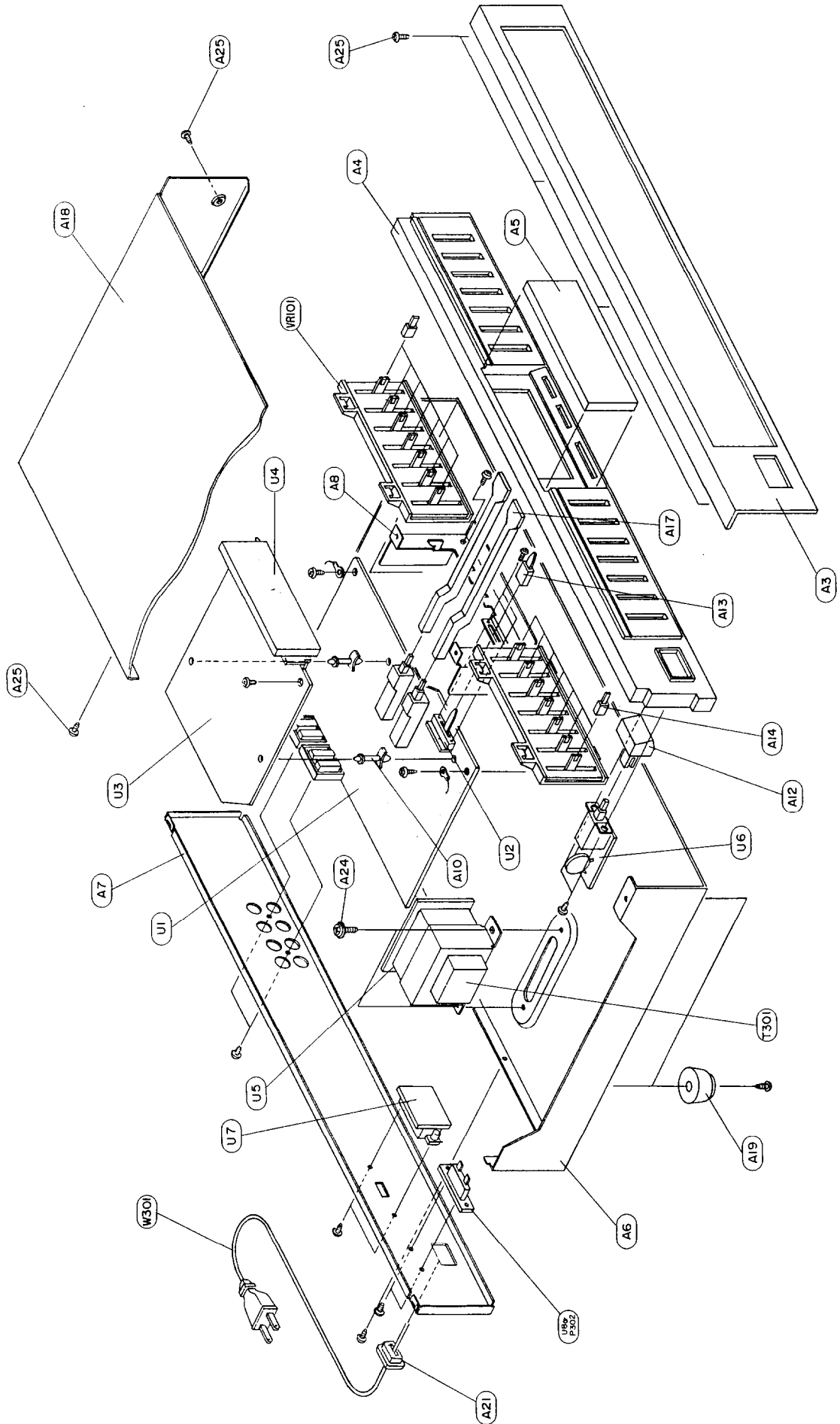
### 6300 Hz

Sounds in this range give music its sparkle. It is particularly important in controlling the clarity of high violin notes and other soft, high range tones.

### 16000 Hz

Frequencies this high are mainly harmonics and overtones of other notes of musical instruments. Adjusting this level control affects the delicacy of the music and the sensation of the music "flowing" or "drifting".

# CHASSIS-EXPLODED VIEW



# CHASSIS-EXPLODED VIEW-PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A3	27210876	FRONT PANEL	U6	1W003513-1A	NASW-3013-1A, POWER SWITCH CIRCUIT PC BOARD ASS'Y [W][Q]
A3	27210877	FRONT PANEL [W]			
A4	27215129	GUIDE PANEL	U7	1W003514-1	NASW-3014-1, SLIDE SWITCH PC BOARD ASS'Y [W][Q]
A5	28191411	CLEAR PLATE	U8	1W003515-1	NAETC-3015-1, AC SOCKET PC BOARD ASS'Y
A6	27100135	CHASSIS			
A7	27120940	BACK PANEL			
A7	27120939	BACK PANEL [W]			
A7	27121012	BACK PANEL [WV]			
A7	27120964	BACK PANEL [Q]			
A8	27141136	BACKET (FL)			
A9	28140752	CUSHION			
A10	27190164	HOLDER			
A12	28322795	KNOB (POW)			
A13	28322768	KNOB			
A14	28323054	KNOB AS (GE)			
A17	28323056	KNOB (PUSH)			
A18	28184350	TOP COVER			
A19	27175155	LEG			
A21	27300750	GUSHING (CORD)			
A24	838440089	TAP-TIGHT SCREW 4TTB+8CBC			
A25	838430088	TAP-TIGHT SCREW 3TTB+8BBC			
VR101	6112005	N30LGLC100KW15ZX7, SLIDE VOLUME			
△ T301	2300235	NPT-964D, POWER TRANSFORMER			
△ T301	2300236	NPT-964DG, POWER TRANSFORMER [W][WV]			
△ T301	2300237	NPT-964Q, POWER TRANSFORMER [Q]			
△ W301	253123 or 253136 or 253140	AC CORD AS-UC-6 #18			
△ W301	253128B or 253130A	AC CORD AS-CEE [W]			
△ W301	253118	AC CORD AS-CEE [W]			
△ P302	25060055	AC CORD AS-SAA [Q]			
U1	1W003508-1	NTM-2PMN22, TERMINAL [W][Q]			
U1	1W003508-1A	NAAF-3008-1, EQUALIZER CIRCUIT & POWER SUPPLY PC BOARD ASS'Y			
U1	1W003508-1A	NAAF-3008-1A, EQUALIZER CIRCUIT & POWER SUPPLY PC BOARD ASS'Y [W]			
U2	1W003509-1	NAETC-3009-1, ANALYZER LEVEL CONTROL PC BOARD ASS'Y			
U3	1W003510-1	NADG-3010-1, SPECTRAM ANALYZER DRIVE CIRCUIT PC BOARD ASS'Y			
U4	1W003511-1	NADIS-3011-1, SPECTRAM ANALYZER INDICATOR PC BOARD ASS'Y			
U5	1W003512-1	NAPS-3012-1, POWER TRANSFORMER PC BOARD ASS'Y			
U5	1W003512-1A	NAPS-3012-1A, POWER TRANSFORMER PC BOARD ASS'Y [W]			
U5	1W003512-1B	NAPS-3012-1B, POWER TRANSFORMER PC BOARD ASS'Y [Q]			
U6	1W003513-1	NASW-3013-1, POWER SWITCH CIRCUIT PC BOARD ASS'Y			

NOTE: [w]: ONLY 120/220V MODEL  
[WV]: ONLY 220V (120V/220V) MODEL  
[Q]: ONLY 240V MODEL

NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

# PRINTED CIRCUIT BOARD PARTS LIST

## EQUALIZER CIRCUIT & POWER SUPPLY PC BOARD (NAAF-3008-1)—PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>ICs</b>		
IC1, IC51	222502	NJM4558DX
IC301	222780151	78M15
IC302	222790151	79M15
<b>Transistors</b>		
Q1~Q7	2212485	JC501Q
Q51~Q57		
Q301, Q302		
Q303, Q304	2212285	2SC2878A
<b>Diodes</b>		
D301	223892	DF02M
D302	223839	IN4002
D303	223172	1SS131
D304	2243630	HSZ7C3
<b>Capacitors</b>		
C1, C4	370133314	330pF, 100V, Film (APS) [W]
C51, C54		
C2, C52	370136814	680pF, 100V, Film (APS) [W]
C5, C55	354780109	1 $\mu$ F, 50V, Elect.
C6, C56	370134714	470pF, 100V, Film (APS)
C7, C57	354780479	4.7 $\mu$ F, 50V, Elect.
C9, C59	354780339	3.3 $\mu$ F, 50V, Elect.
C10, C60	371126835	0.068 $\mu$ F, 50V, Mylar
C11, C61	354780159	1.5 $\mu$ F, 50V, Elect.
C12, C62	371122235	0.022 $\mu$ F, 50V, Mylar
C13, C63	354784799	0.47 $\mu$ F, 50V, Elect.
C14, C64	371121035	0.01 $\mu$ F, 50V, Mylar
C15, C65	354781599	0.15 $\mu$ F, 50V, Elect.
C16, C66	371126825	6800pF, 50V, Mylar
C17, C67	371126835	0.068 $\mu$ F, 50V, Mylar
C18, C68	371122725	2700pF, 50V, Mylar
C19, C69	371122735	0.027 $\mu$ F, 50V, Mylar
C20, C70	371121525	1500pF, 50V, Mylar
C21, C71	371121035	0.01 $\mu$ F, 50V, Mylar
C22, C72	370138214	820pF, 100V, Film (APS)
C302, C303	379121035	0.01 $\mu$ F, 50V, Film (DEW)
C304, C305	354761029	1000 $\mu$ F, 35V, Elect.
C306, C307	354744709	47 $\mu$ F, 16V, Elect.
C308	354780479	4.7 $\mu$ F, 50V, Elect.
C309	354762219	220 $\mu$ F, 35V, Elect.
C310	354761019	100 $\mu$ F, 35V, Elect.
<b>Resistors</b>		
R301, R302	441621024	1k $\Omega$ , 1W, Metal oxide film
<b>Switches</b>		
SW2	25035566	NPS-142-L528
SW3	25035464	NPS-162-L426
<b>Terminals</b>		
	25045167	NPJ-4PDBL61
<b>Heatsink</b>		
	27160169	

## ANALYZER LEVEL CONTROLE PC BOARD (NAETC-3009-1)—PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
VR201	6162002	N20LL100KB25, Slide volume

## SPECTRUM ANALYZER DRIVE CIRCUIT PC BOARD (NADG-3010-1)—PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>ICs</b>		
IC101~IC104	222502	NJM4558DX
IC105~IC109	222908	NJM-2901N
IC110, IC111	222840661	4066B
IC112	222840171	4017BP
IC113	222840692	4069UBP
IC114	222502	NJM4558DX
<b>Diodes</b>		
D101~D115	223172	1SS131
<b>Capacitors</b>		
C101, C102	354782299	0.22 $\mu$ F, 50V, Elect.
C103, C104	371128235	0.082 $\mu$ F, 50V, Mylar
C105, C106	371123335	0.033 $\mu$ F, 50V, Mylar
C107, C108	371121535	0.015 $\mu$ F, 50V, Mylar
C109, C110	371125625	5600pF, 50V, Mylar
C111, C112	371122225	2200pF, 50V, Mylar
C113, C114	371121025	1000pF, 50V, Mylar
C115~C125	354741009	10 $\mu$ F, 16V, Elect.
<b>Socket</b>		
	25050140	NJPS-3P-S

## SPECTRUM ANALYZER INDICATOR PC BOARD (NADIS-3011-1)—PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Fluorescent tube</b>		
FL101	212033	BG-394ZK

## POWER TRANSFORMER PC BOARD (NAPS-3012-1, NAPS-3012-1A)—PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Transformer</b>		
T301	2300235	NPT-964D
T301	2300236	NPT-964DG [W]
T301	2300237	NPT-964Q [Q]

## POWER SWITCH CIRCUIT PC BOARD (NASW-3013-1) —PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Capacitor</b>		
C301	3500065A	0.01 $\mu$ F, AC400V/125V, IS
<b>Cover</b>		
C301a	27300601	SB1925, Cover capacitor
<b>Switch</b>		
SW1	25035262	NPS-111-L226P

## SLIDE SWITCH PC BOARD (NASW-3014-1)—PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Switch</b>		
SW4	25065228	NSS-2299

## AC SOCKET PC BOARD (NAETC-3015-1)—PARTS LIST

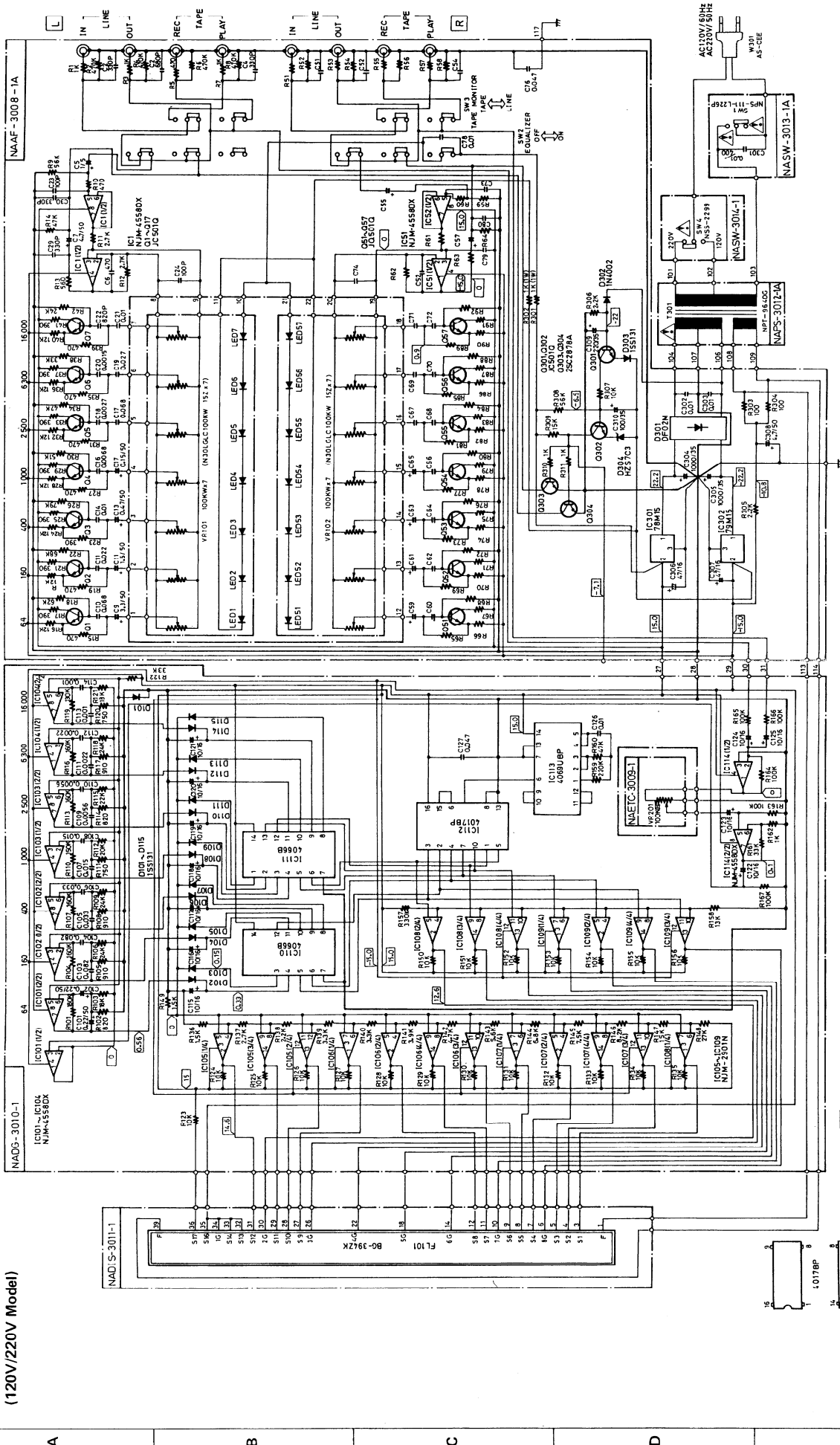
CIRCUIT NO.	PART NO.	DESCRIPTION
<b>Socket</b>		
P301	25050316	NSCT-2P143T

NOTE: [W]: Only 120V/220V model  
[Q]: Only 240V model



# SCHEMATIC DIAGRAM

(120V/220V Model)

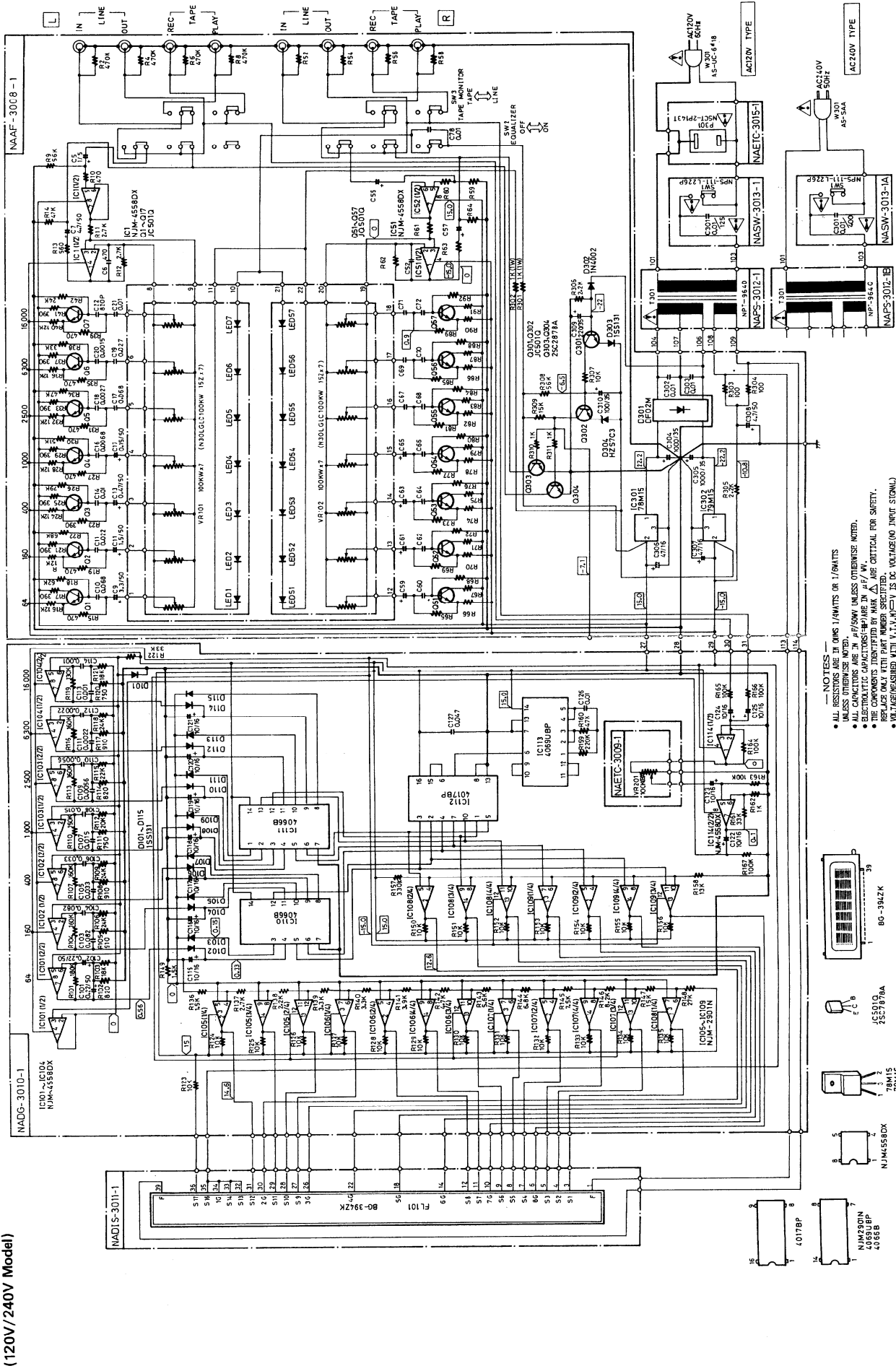


- NOTES —
- ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
  - ALL CAPACITORS ARE IN  $\mu$ F UNLESS OTHERWISE NOTED.
  - IC PART NUMBERS ARE IN PARALLELS UNLESS OTHERWISE NOTED.
  - THE COMPASS SYMBOLS ARE CRITICAL FOR SAFETY.
  - REPLACE ONLY WITH PART NUMBER SPECIFIED.
  - VOLTAGE MEASURED WITH V.A.T.V.M. = V IS DC VOLTAGE (NO INVERT SIGNAL).

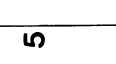
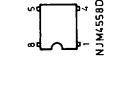
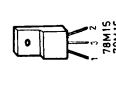
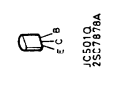
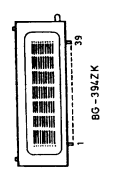


# SCHEMATIC DIAGRAM

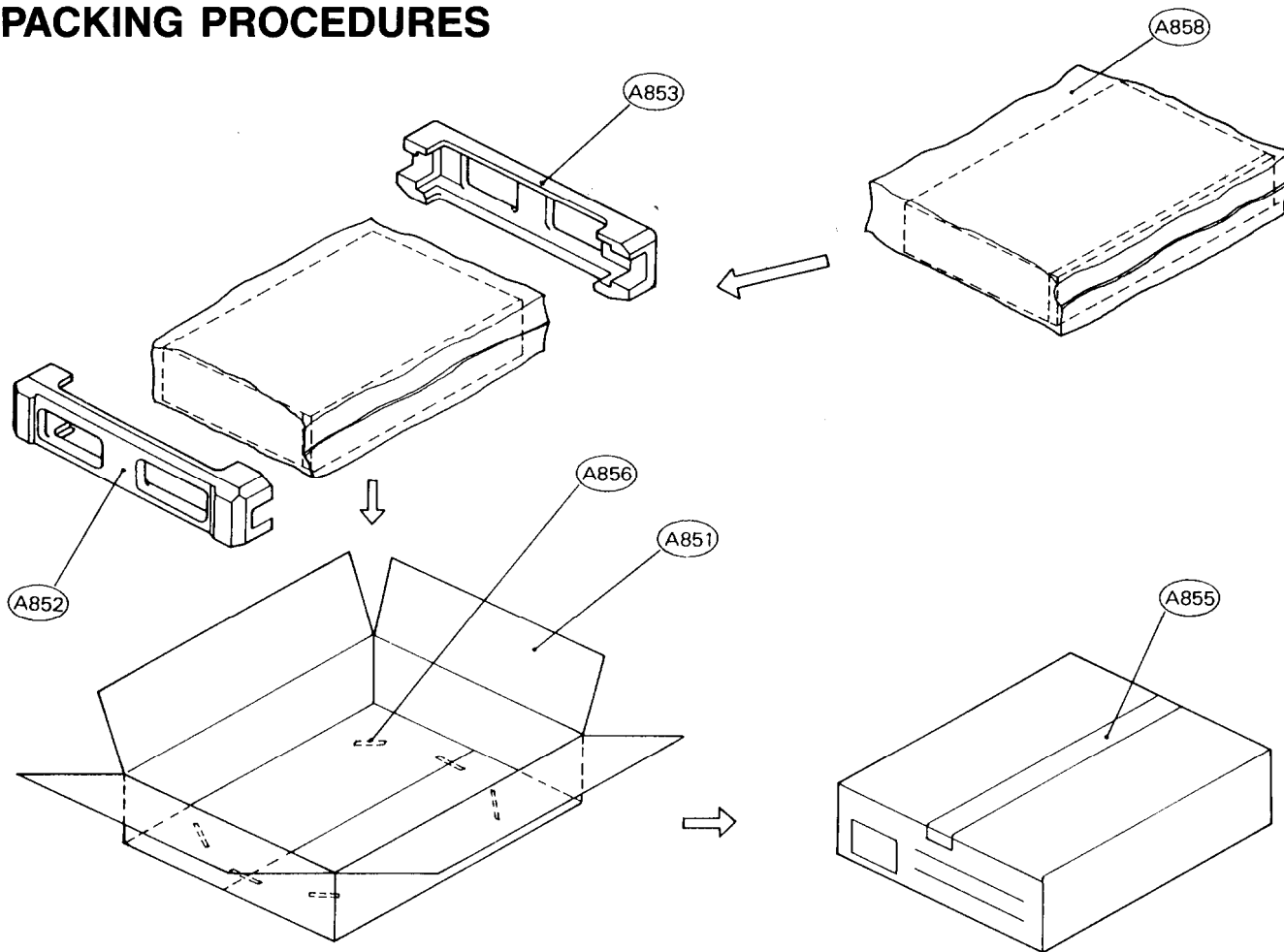
(120V/240V Model)



- NOTES —
- ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE NOTED.
  - ALL CAPACITORS ARE IN μF UNLESS OTHERWISE NOTED.
  - THE COMPARE SYMBOLS ARE CRITICAL FOR SAFETY.
  - REPLACE ONLY WITH PART NUMBER SPECIFIED.
  - VOLTAGE MEASURED WITH V.T.V.M. IN DC VOLTAGE (NO INPUT SIGNAL).



# PACKING PROCEDURES



REF. NO.	PART NO.	DESCRIPTION
A851	29051561	MASTR CARTON BOX
A852, A853	29091168	PAD
A855	260012	Damplon tape
A856	282301	Sealing hook
A858	29100037A	650X500, Poly bag
A880	Accessory bag	
	29341111	Instruction manual
	29341112	Instruction manual [W] [WV]
	29365019	Warranty card [U]
	26365020	Warranty card [WV]
	29358002E	Service station list [U]
	2010112	Connection cable
	29100006A	350X250, Poly bag
	29100094	Poly bag [WV]
	25055040	CV-K-2 Conversion plug [W]

NOTE: [U]: Only U.S.A. model  
 [W]: Only 120V/220V model  
 [WV]: Only 220V (120/220V) model

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