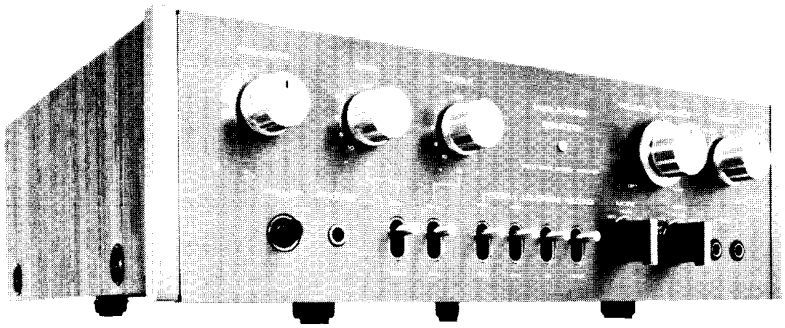
SERIAL NO. 3006

ONKYO SERVICE MANUAL

SOLID STATE STEREO PRE MAIN AMPLIFIER

model A-7022



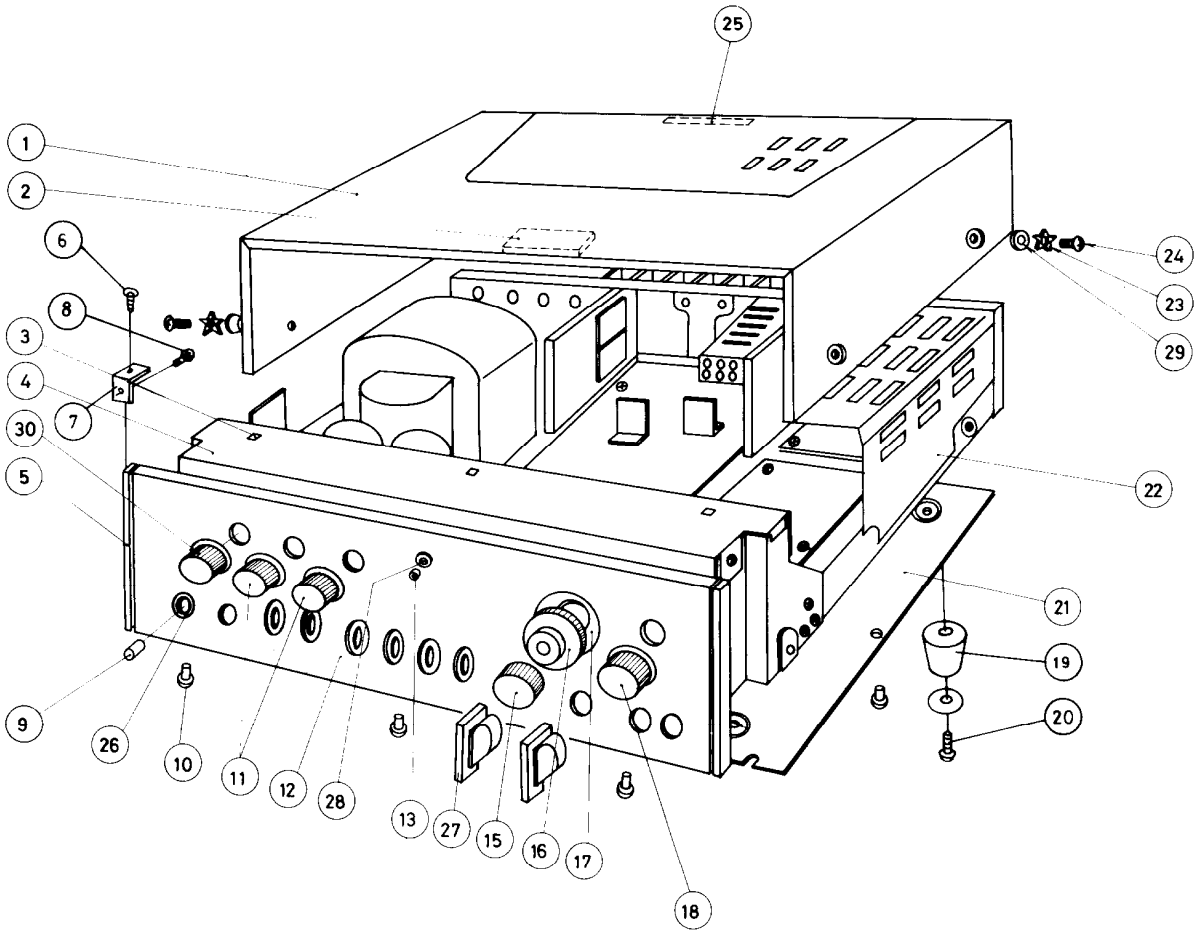
INDEX

ONKYO®
AUDIO COMPONENT

SPECIFICATIONS

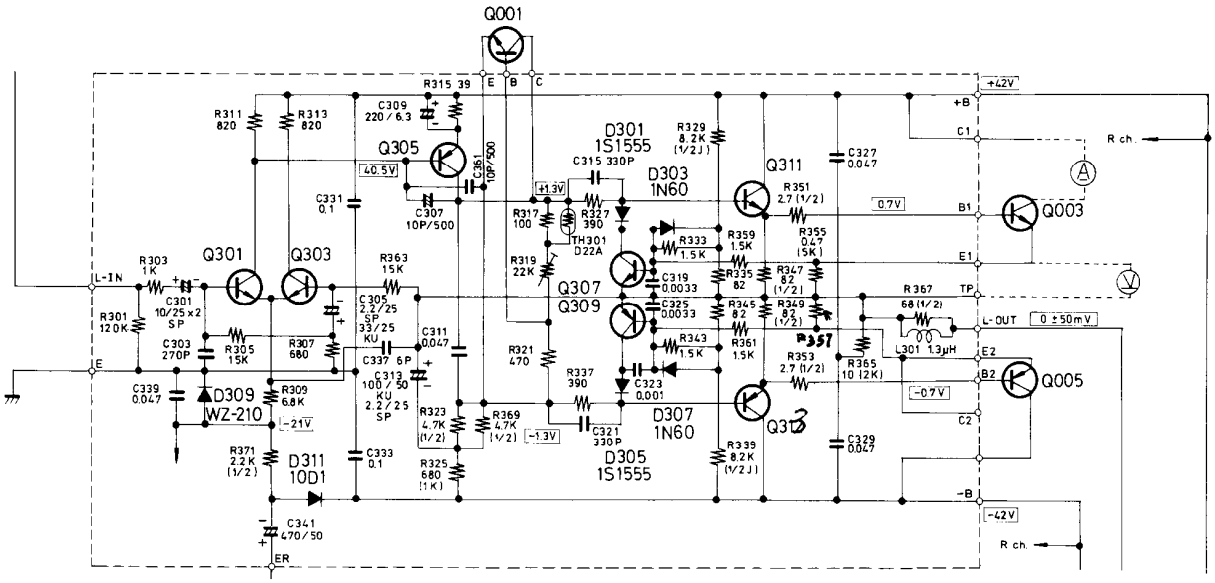
Main Amplifier Section	
Power Output Dynamic	200W (IHF 4Ω) 150W (IHF8Ω)
Continuous	72W+72W (4Ω both channel driven)
	65W/65W (8Ω each channel driven)
	52W+52W (8Ω both channel driven)
Total Harmonic Distortion	0.1% at Rated Output
	0.03% at 10W Output
Inter Modulation Distortion	0.05% at Rated Output
Power Bandwidth	10–100,000Hz (–3dB THD 0.2%)
Signal to Noise Ratio	110dB (IHF A NETWORK)
Damping Factor	80 at 8Ω
Rated Input and Impedance	1V/100kΩ
Load Impedance	4–16Ω
Pre Amplifier Section	
Input Sensitivity	PHONO-1/-2: 1.2/2.4/4.8mV (50kΩ)
	TUNER, AUX, TAPE PLAY: 100mV (100kΩ)
Total Harmonic Distortion	0.03% at Rated Output
Intermodulation Distortion	0.05% at Rated Output
RIAA Deviation	±0.5dB (30–15,000Hz)
Phono Overload	300mV RMS at 1kHz, 1.4V RMS at 10kHz
Signal to Noise Ratio	PHONO-1/-2: 75dB (IHF A NETWORK)
	TUNER/AUX: 90dB (IHF A NETWORK)
Output Voltage	1V
Tone Control with 2dB/step Switch and Frequency Shift type	
Frequency Shift	BASS: 400/125Hz
	TREBLE: 2k/8kHz
Bass Control	±5 steps Boost and Cut
Treble Control	±5 steps Boost and Cut
Filter HIGH	8kHz (6dB/oct.)
LOW	30Hz (6dB/oct.)
Muting	-20dB
Loudness	+5dB at 70Hz, +5dB at 10kHz
Controls	POWER
	SPEAKERS (OFF, A, B, A+B)
	SELECTOR (AUX, TUNER, PHONO 1, PHONO 2, MIC)
	TAPE MONITOR (PRINT 1-2, TAPE-1, SOURCE, TAPE-2, PRINT 2-1)
	MODE (REV, NORM, R+L, L, R)
	VOLUME/BALANCE
	TREBLE
	BASS
	FREQUENCY SHIFT SWITCH
	BASS (400Hz, 125Hz)
	TREBLE (2kHz, 8kHz)
	MUTING
	LOUDNESS
	FILTER HIGH
	LOW
	PHONO SENSITIVITY (1.2/2.4/4.8mV)
	PRE MAIN SEPARABLE SWITCH (UNITE-SEPARATE)
Inputs	PHONO-1, PHONO-2, TUNER, AUX, MIC L/R
	TAPE PLAY-1, TAPE PLAY-2, MAIN IN
Outputs	SPEAKER-A, SPEAKER-B
	TAPE REC-1, TAPE REC-2
	PRE OUT
	AC OUTLET UNSWITCHED, SWITCHED×2
	PHONES
Features	2 Phono inputs
	2 Tape Monitor and Printing
	2dB Step Tone Controller
	2 Choice of Turn over Frequency
	ASO type protection circuit
	Transient Killer circuit
	Main Amplifier incorporating OCL circuit
	MIC input
	Big Phono Overload
Power Supply Rating	ac 110/120/220/240V 50/60Hz
Semiconductors	44 Transistors, 30 Diodes, 2 Thermistors
Dimensions	16 5/8"W x 53/8"H x 14 3/4"D
	423mm W x 136mm H x 373mm D
Weight	10.5kgr, 23lbs

1. COMPONENT LOCATIONS



KEY NO.	DESCRIPTION	KEY NO.	DESCRIPTION
1	Amp Box assembly	17	Knob Sheet
2	Soft Block	18	Knob−Selector
3	Front Fiber Board	19	Rubber Cushion
4	Front Cover	20	Tapping Screw(4+12)
5	End Cap	21	Bottom Cover
6	Flat Screw(3S+5F)	22	Chassis
7	Joiner	23	Toothed Lock Washer
8	Pan head Screw(3P+8F)	24	Truss Screw(4+20)
9	Knob−Push Switch	25	Soft Block
10	Binder Screw(3+6)	26	Knob Guide
11	Knob−Tone	27	Knob−Tape
12	Front Panel	28	Facet Ring
13	Facet	29	Concave Washer
15	Knob−Volume	30	Knob−Speaker
16	Knob−Balance		

2. ADJUSTMENT OF THE IDLING CURRENT



Instrument required : DC Ammeter 50mA or 100mA.
DC Voltmeter 50mV or VTVM.

When replacing the POWER transistor (Q003, Q004, Q005, Q006) or the DRIVER transistor (Q311, Q312, Q313, Q314), check the idling current of the POWER transistor.

To adjust to normal value (40±5)mA, proceed as follows.

(Lch) (1) Cut the connection between +B and collector of Q003 on MAIN Amp assembly, and connect a DC Ammeter.

(2) Adjust the current to (40±5)mA, with R319(2.2kΩ) after switching on for 10 minutes.

(3) After adjusting, connect original wiring.

If a DC Voltmeter (50mV) or VTVM is available, connect the Voltmeter between E1 and TP terminals. Adjust the voltage to (20±2.5)mV with R319(2.2kΩ).

(Rch) Using R320(2.2kΩ), adjust in the same manner as indicated above.

* Note: Volume—Minimum. Open Load.

3. PARTS LIST

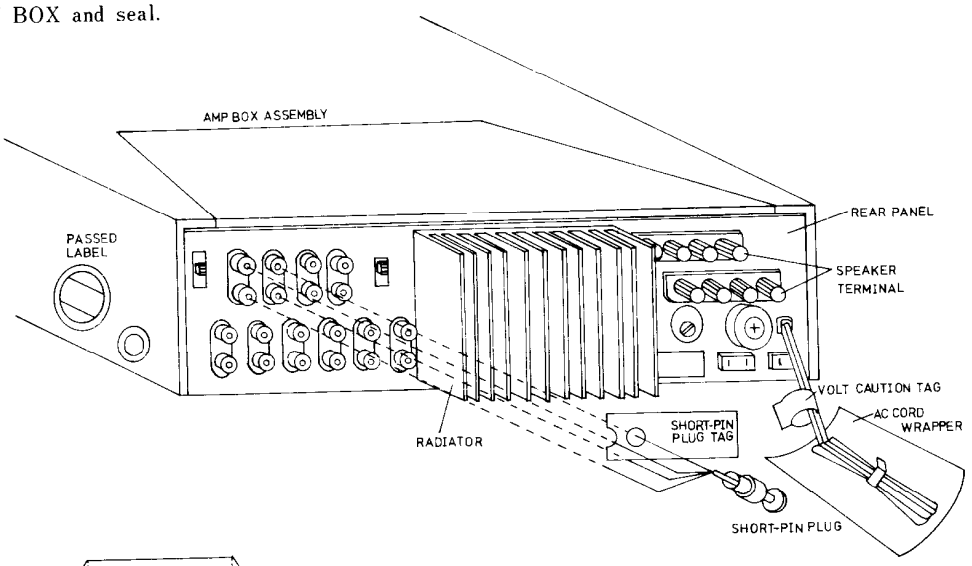
PARTS NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.	
U001	Equalizer Amp ass'y	NAEQ-206	1	12939506	
U002	Tone Amp ass'y	NATC-186b	1	12939586B	
U003	Main Amp ass'y	NAMA-187a	1	12939587A	
U004	Power Supply ass'y	NAFI-207	1	12939507	
U005	Protector ass'y	NAPC-208	1	12939508	
Q001 Q002	Transistor	2SC945(P)	2	2210353	
Q003 Q004	〃 2SD427	2SD218(M)	2	2200042	
Q005 Q006	〃 2SB557	2SA649(M) 2SB541A	2	2200142	

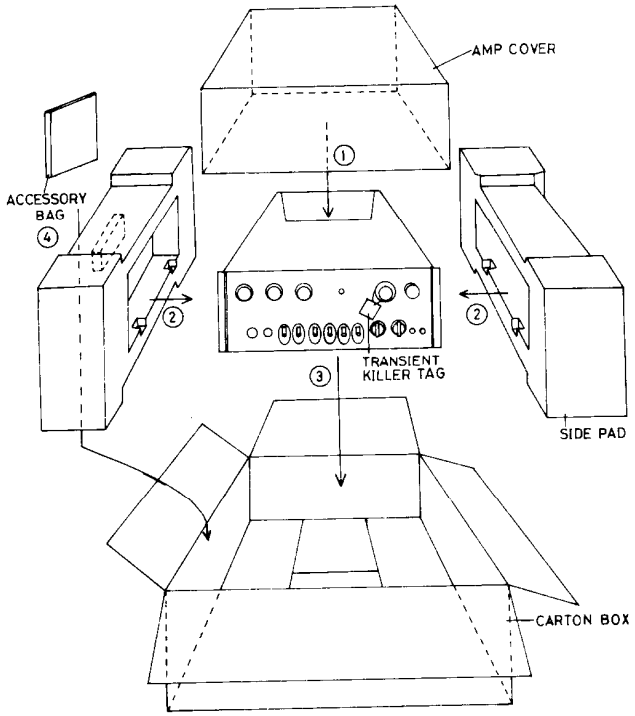
PARTS NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.	
PL001	Pilot Lamp	6.3VO.15A	1	210003	
T001	Transformer-Power	NPT-552ADGQ	1	230056	
C007 C009	Capacitor-Electrolytic	CE62W50V8200μF	2	3504035A	
		CE04W50V33μF	2	325783301A	
C305, 306	Capacitor-SP	SP04C25V2.2μF	4	392250229	
C033 C044	〃	SP04C25V10μF	2		
R015	Variable Resistor	N24RDG500KMN250KB2T	1	5104006	Volume Balance
S001	Switch-Rotaly	NRS-385-20Y	1	250165-1	Selector
S003	〃	NRS-465-15Y	1	350175-2	Tape Monitor
S004	〃	NRS-125-15Y	1	250180-1	Mode
S008, S009	〃	NRS-2211-20Yb	2	250117	Tone
S013	〃	NRS-124-20Y	1	250118-1	Speakers
S002	Switch-Slide	NSS-2323	1	250121	Phono Sens
S012	〃	NSS-4224	1	250122	Pre-Main
S005, 010 011, 017	Switch-Lever	NLS-122-29SL	4	250119-1	Muting Filter Loudness
S006, 007	〃	NLS-142-29SL	2	250120-1	Frequency Shift
S014	Switch-Power	NPS111LA2	1	250157	
S015	Klixon	9700L-26-11	1	252009	
S016	〃	9700L-21-11	1	252011	
	Jack-Stereo Head Phone	3P64M	1	250126	
	Jack-Microphone	HJ-631S-H-3	2	250176-1	
F001	Fuse	1.5A-T	1	252015	
F002	〃	2A-T	1	252002	
	Amp Box ass'y		1	280762	
	Front Panel		1	280759	
	End Cap		2	280367	
	Facet		1	280556	
	Joiner		4	280376	
	Knob-Tone		2	283085	
	Knob-Selector		1	283086	
	Knob-Volume		1	283087	
	Knob-Balance		1	283088	
	Knob-Speaker		1	283096	
	Knob-Tape ass'y		2	283103	
	Knob-Power		1	283071	
	Bottom Cover		1	270295	
	Rubber Cushion		4	280379	
	Master Carton Box		1	290378	
	Side Pad		2	290203-1	
NATC-186b					
Q201～Q204	Transistor	2SA493(GR)	4	2210235	
Q205, Q206	〃	2SC1000(0-1)	2	2210280	
Q207, Q208	〃	2SC733(GR)	2	2210085	
Q209	〃	2SC734(0-1)	1	2210060	
D201, D203	Silicon Diode	1S1554	2	223106	
C201, C202	Capacitor-Electrolytic	CE04W25VO.47μF	2	352754791A	
C205, C206	〃	CE04W6.3V100μF	2	352721011A	
C203, C204	〃	CE04W35V220μF	1	352762211A	
C229～C232	Capacitor-SP	SP04C25V2.2μF(M)	4	3500023	

PARTS NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.	
C233～C234	Capacitor-SNP	SNP04C25V22μF(M)	2	3500027	
	〃	〃 2.2μF(M)	2	3500025	
NAMA-187a					
Q301～Q304	Transistor	2SC1000(0-1)	4	2210280	
Q305, Q306 Q313, Q314	〃	2SA706(52)	4	2200032	
Q307, Q308	〃	2SC735(GR)	2	2210245	
Q309, Q310	〃	2SA562(GR)	2	2210255	
Q311, Q312	〃	2SC1124(2)	2	2200016	
D301, D302 D305, D306	Silicon Diode	1S1555	4	223105	
D311	〃	10D1	1	223801	
D303, D304 D307, D308	Germanium Diode	1N60(N)FM	4	2231031	
D309	Zener Diode	WZ-210	1	223921	
L301, L302	Coil-Load Compensation	S-1.3B	2	231001	
C309, C310	Capacitor-Electrolytic	CE04W6.3V220μF	2	352722211A	
C341	〃	〃 50V470μF	1	352784711A	
R319, R320	Resistor-Semi Fixed	R-HK2.2KB	2	5225005	
TH301, TH302	Thermistor	D-22A	2	4000003	
NAEQ-206					
Q101, Q102	Transistor	2SA493(GR)	2	2210235	
Q103, Q104	〃	2SC1000(0-1)	2	2210280	
Q105, Q106	〃	2SC1124(3)	2	2200101	
D101, D102	Silicon Diode	1S1555	2	223105	
	Capacitor-Electrolytic	CE04W16V47μF	2	352744701A	
	〃	〃 6.3V220μF	2	352722211A	
	〃	〃 25V100μF	3	352751011A	
C101, C102	Capacitor-SP	SP04C25V2.2μF	2	3500023	
C125, C126	〃	〃 10μF	2	3500024	
NAFI-207					
Q401, Q407	Transistor	2SD234(O)	2	2200113	
Q403	〃	2SA561(O)	1	2210073	
Q405	〃	2SC945(P)	1	2210353	
D403	Silicon Diode	10DC2R	1	223813	
D405	〃	10D1	1	223801	
D401	Zener Diode	WZ-270	1	223922	
NAPC-208					
Q501	Transistor	2SC945(P)	1	2210353	
Q503	〃	2SC945(Q)	1	2210354	
Q505	〃	2SD235	1	2200013	
Q507, Q509	〃	2SC634A(70)	2	2210187	
D509, D511 D515, D517	Silicon Diode	10D1	4	223801	
D519, D521 D523, D525	〃	SR3AM-6B	4	223815	
D501, D503 D505, D507	Germanum Diode	1N60(N)FM	4	2231031	
D513	Zener Diode	BZ-120	1	223918	
C501	Capacitor-Electrolytic	CE04W25V1μF	1	352750101A	
C503	〃	〃 16V100μF	1	352741011A	
C505	〃	〃 1000μF	1	352741021A	
C513, C515	〃	CE04W50V 47μF	2	352784701A	
C521, C523	〃	〃 25V220μF	2	352752211A	
S501	Relay	NRSP5A-DC12	1	250166	

4. PACKING PROCEDURE

1. Tighten SPEAKER terminals by a hand.
2. Clean an AMP BOX assembly, attending to your fingerprints.
3. Set a SENSITIVITY SWITCH to center(2.4mV).
4. Clean a REAR PANEL and a RADIATOR.
5. Insert SHORTED PIN into PHONO－1, 2 terminals.
6. Wrap a POWER CORD with a AC CORD WRAPPER and bind it with a rubber band.
7. Wrap unit with a AMP COVER and attach a SIDE PAD to both sides.
8. Put in a CARTON BOX and make sure the front marks of the carton matches the unit front.
9. Put an ACCESSORY BAG including an INSTRUCTION BOOKLET, WARRANTY CARD etc. in the box.
10. Close the CARTON BOX and seal.





S001	SELECTOR	AUX. TUNER. PHONO-1. PHONO-2. MIC.(PHONO-1)
S002	PHONO SENS	1.2mV. 2.4mV. 4.8mV.(2.4mV)
S003	TAPE MONITOR	1→2. TAPE-1. SOURCE TAPE-2. 2→1.(SOURCE)
S004	MODE	REV. STEREO. L. L+R. R.(STEREO)
S005	MUTING	0. -20dB.(0)
S006	HIGH FREQUENCY SHIFT	2KHz. 8KHz. (2KHz)
S007	LOW FREQUENCY SHIFT	125Hz. 400Hz (400Hz)
S008	TREBLE	-10-8-6-4-2 FLAT. +2. +4. +6. +8. +10 (FLAT)
S009	BASS	-10-8-6-4-2 FLAT. +2. +4. +6. +8. +10 (FLAT)
S010	LOW FILTER	OFF. ON. (OFF)
S011	HIGH FILTER	OFF. ON. (OFF)
S012	PRE-MAIN	UNITE. SEPARATE. (UNITE)
S013	SPEAKERS	OFF. A. B. A+B. (A)
S014	POWER	OFF. ON. (OFF)
S017	LOUDNESS	OFF. ON. (OFF)

Q101	2SA493(GR)	Q103	2SC1000 (O-2)
Q105	2SC1124(3)	Q201. Q203	2SA493(GR)
Q205	2SC1000 (O-1)	Q207. Q208	2SC733(GR)
Q209	2SC734(O-1)	Q301. Q303	2SC1000(O-1)
Q305	2SA706(52)	Q307	2SC735(GR)
Q309	2SA562(GR)	Q311	2SC1124(2)
Q313	2SA706(52)	Q401	2SD234(O)
Q403	2SA561(O)	Q405	2SC945(P)
Q407	2SD234(O)	Q501	2SC945(P)
Q503	2SC945(G)	Q505	2SD235(O)
Q507. Q509	2SC634(70)	Q001	2SC945(P)
Q003	2SD218(M)	Q005	2SA649(M)

- DC VOLTAGE (V) MEASURED WITH DC VTVM TO CHASIS AT NO SIGNAL INPUT.
- ALL RESISTORS ARE IN OHMS. 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF. UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS ( ) ARE IN μF/WV.

7. LINE VOLTAGE AND FUSE

The model A−7022 operates on one of the four line voltages, 110V, 120V, 220V, and 240V.

Set the unit to the proper line voltage by following the procedure described below.

CHANGING LINE VOLTAGE SETTING AND FUSE

Turn the voltage selector so that the proper line voltage marking can be seen through the slot on the rear panel.

Whenever the position of the selector is changed, check the rating of the fuse.

A 2A fuse is to be used for either 220V or 240V operation and a 4A fuse for 110V or 120V operation.

2SD218
2SA649