

**ONKYO SERVICE MANUAL****SOLID STATE STEREO RECEIVER  
TX-440****INDEX**

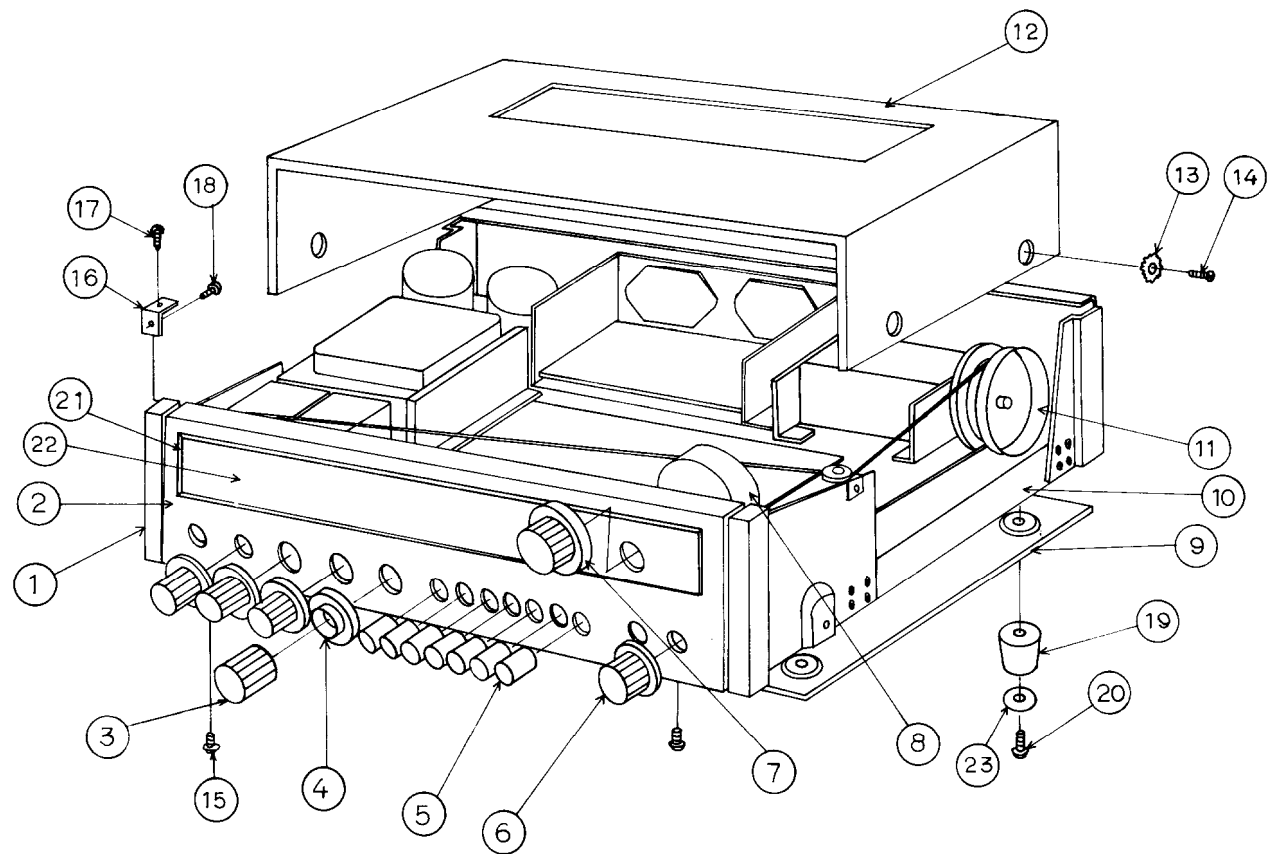
Item	Page
Specifications	1
Component Locations	2
Chassis Layout	3
Dial Cord Arrangement	3
Alignment Procedure	4 ~ 5
Parts List	5 ~ 7
Circuit Board – Component Location	8 ~ 9
Circuit Diagram	10 ~ 11
Circuit Diagram (Universal type)	12 ~ 13
Line Voltage and Fuse	14
Packing Procedure	14

**ONKYO®**  
**AUDIO COMPONENT**

# SPECIFICATIONS

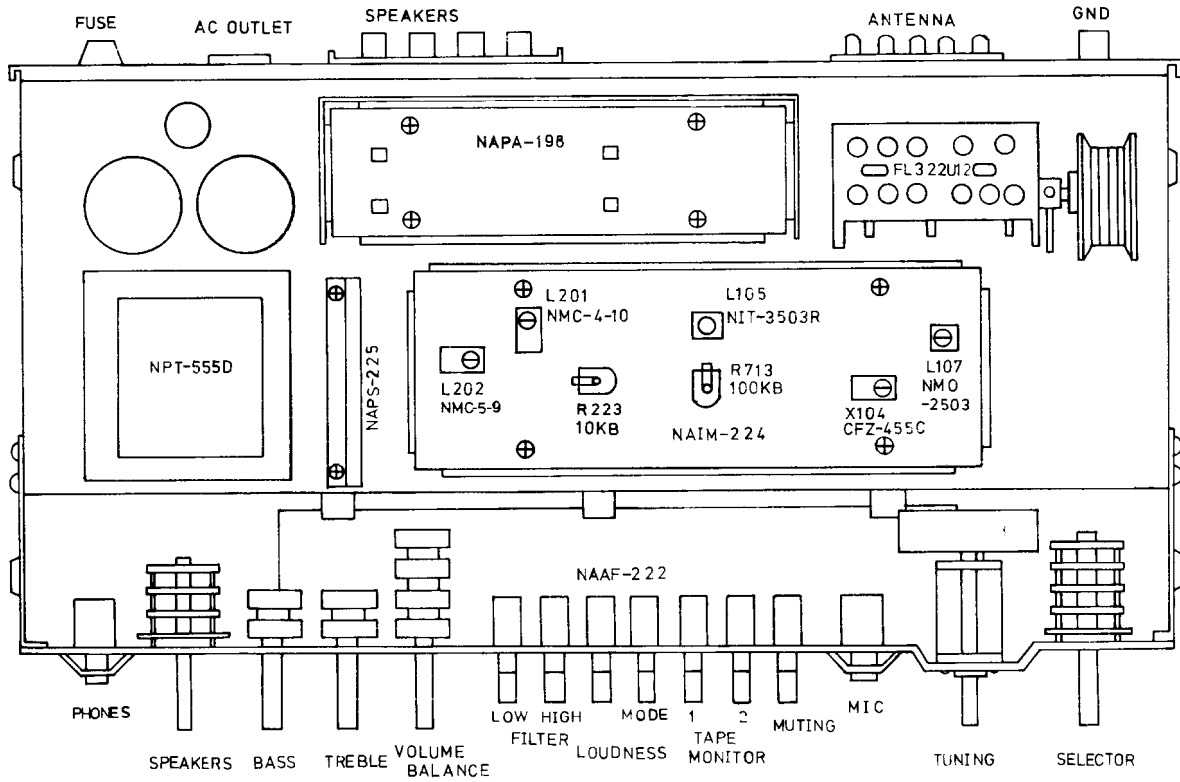
<b>TUNER SECTION</b>		Frequency Response	20–30,000Hz ( $\pm 1$ dB)
Tuning Range	FM:88–108MHZ AM:530–1605kHz	Power Bandwidth	20–20,000Hz ( $-3$ dB THD 0.5%)
Sensitivity	FM:2.0 $\mu$ V(IHF) AM:40 $\mu$ V, 150 $\mu$ V/m	Sensitivity and Impedance	PHONO:2.5mV/50k $\Omega$ , AUX:200mV/50k $\Omega$ , MIC:4mV/50k $\Omega$ , TAPE PLAY-1/-2:200mV/ 50k $\Omega$ TAPE REC-1/-2:200mV/ 100k $\Omega$
Intermediate Frequency	FM:10.7MHz AM:455kHz	Phono Overload	100mV at 1kHz, 420mV at 10kHz 0.3%
Capture Ratio	FM:2dB	Bass Control	$\pm 8$ dB at 100Hz
Image Rejection Ratio	FM:70dB AM:35dB	Treble Control	$\pm 8$ dB at 10kHz
IF Rejection Ratio	FM:90dB AM:40dB	Signal to Noise Ratio	PHONO:65dB (IHF C NETWORK) AUX:75dB (IHF C NETWORK)
Signal to Noise Ratio	FM:70dB AM:40dB	Loudness Control	+7dB at 100Hz, +4.5dB at 10kHz
Alternate Channel att.	FM:65dB	Filter High	6kHz (6dB/oct)
AM Suppression Ratio	FM:50dB	Low	70Hz (6dB/oct)
Harmonic Distortion	FM MONO:0.4% AM:1% FM ST:0.8%	Power Supply Rating	AC 120V 60Hz or AC 110/120/220/240V 50/60Hz
Frequency Response	FM:20–15,000Hz $\pm 1.5$ dB	Semiconductors	FET:1 Transistor:33 Diode:33 IC:3
Stereo Separation	FM ST:40dB at 400Hz 30dB 100– 10,000Hz	Dimensions	18 1/2"W x 14 3/4"D x 5 1/2"H 470W x 375D x 140Hmm
Muting Level	FM:20 $\mu$ V	Weight	10.7kg, 23.5lbs.
Stereo Lamp Level	FM ST:20 $\mu$ V	Specifications and Features are subject to change without notice.	
Tuning Meter	Signal Strength & Center Tuning		
<b>AMPLIFIER SECTION</b>			
Power Output	100W (IHF 4 $\Omega$ )		
Dynamic	80W (IHF 8 $\Omega$ )		
Continuous	32W/32W (8 $\Omega$ Each channel driven) 35W+35W (4 $\Omega$ Both channel driven) 28W+28W (8 $\Omega$ Both channel driven) 21W+21W (8 $\Omega$ In the Range of 20–20,000Hz THD 1%)		
Total Harmonic Distortion	0.5% at Rated Power 0.3% at 10W		
Damping Factor	30 (8 $\Omega$ 1kHz 10W)		

# COMPONENT LOCATIONS

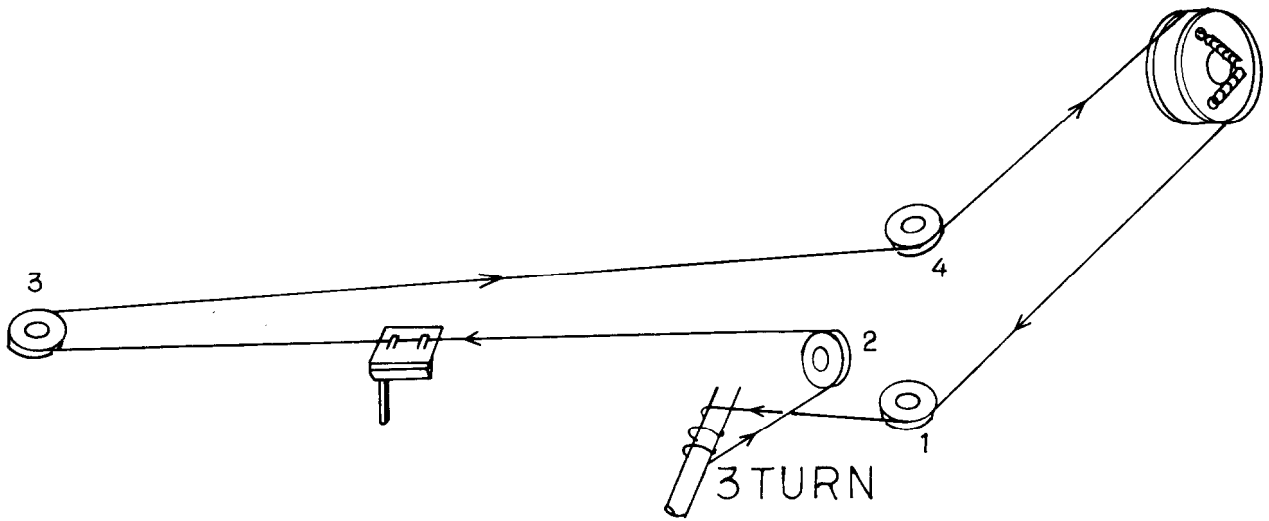


KEY NO.	DESCRIPTION	KEY NO.	DESCRIPTION
1	End Cap	13	Toothed Lock Washer
2	Front Panel	14	Truss Screw
3	Knob-Tone (small)	15	Tapping Screw
4	Knob-Tone (large)	16	Joiner (B)
5	Knob-Push Switch	17	Binder Screw
6	Knob-Speaker	18	Tapping Screw
7	Knob-Tuning	19	Rubber Cushion
8	Drive Shaft	20	Tapping Screw
9	Bottom Cover	21	Dial Flame
10	Chassis	22	Glass Plate
11	Drum	23	Washer
12	Amp Box assembly		

# CHASSIS LAYOUT



# DIAL CORD ARRANGEMENT



# ALIGNMENT PROCEDURE

## INSTRUMENT REQUIRED

1. AM and FM sweep generator
2. AM and FM signal generator
3. Vacuum tube voltmeter (V.T.V.M.) AC/DC
4. Oscilloscope
5. Distortion meter
6. Stereo Modulator

## GENERAL ALIGNMENT CONDITIONS

1. Signal input should be kept low as possible.
2. Standard modulation is 400Hz 30% (AM)  
400Hz 100% (FM.MONO), pilot 10% Sub & Main 90% (FM.ST)
3. Standard output is 500mW (2.0V, 8Ω)

STEP	CONNECT SIGNAL SOURCE TO-	SET SIGNAL TO-	CONNECT OUTPUT INDICATOR TO-	SET RADIO DIAL TO-	ADJUST	ADJUST FOR	REMARKS	STEP
1	Set Radio Selector Switch to "AM"							1
2	AM Sweep Generator to-AM Ant.	455KHz	Oscilloscope to-across "AM" OUT" terminal (NAIM-224)	Quiet Point on Band	X104 CFZ-455C	Maximum Symmetrical response	Usually not necessary to adjust	2
3	AM Signal Generator to-AM Ant. through a standard radiating loop	515KHz (modulated)	V. T. V. M. or oscilloscope to-across "SPEAKER" terminal	Lower end	L107 NMO-2503 (Red)	Maximum	Repeat steps 3 and 4 as necessary to obtain Maximum sensitivity on stations	3
4		1680KHz (modulated)		Upper end	AM Trimmer (OSC. side)	Maximum		4
5	"	600KHz (modulated)	"	600KHz (Tuned to Signal)	L001 NMA-2509 (Coil Antenna)	Maximum	Repeat steps 5 and 6 as necessary	5
6		1400KHz (modulated)		1400KHz (Tuned to Signal)	AM Trimmer (Ant. side)	Maximum		6
7	Set Radio Selector Switch to "FM" Set Muting Switch to "OFF"							7
8	FM Sweep Generator to-"FM IN" terminal	±0.3MHz Sweep Centered at 10.7MHz	Oscilloscope to-across "TP2" terminal (NAIM-224)	Quiet Point on Band	L105 NIT-3503R Top Bottom	Maximum "S" curve Linearity	Not necessary to adjust for Symmetrical response or Zero Voltage	8
9	No Signal		Tuning Indicator may be used as the output indicator	Quiet Point Where FM Signals are not received	L105 NIT-3503R Top	The needle of Tuning Indicator comes to the center		9
10	FM Signal Generator to-across FM Ant. terminal through a matching network	92MHz (100% Mod.)	V. T. V. M to-across "SPEAKER" terminal	92MHz	LO on FM Tuner	Maximum	Repeat steps 10 and 11 as necessary	10
11		104MHz (100% Mod.)		104MHz	TCA on FM Tuner	Maximum		11
12		88MHz (100% Mod.)		Tuned to Signal	LA LR (2 points) on FM Tuner	Maximum	Repeat steps 12 and 13 as necessary	12
13		108MHz (100% Mod.)		"	TCA TCR (2 points) on FM Tuner	Maximum		13
14	FM Signal Generator to-across FM Ant. terminal through a matching network	98MHz (100% Mod.)	Distortion meter to-across "SPEAKER" terminal	Tuned to Signal	L105 NIT-3503R Bottom	Minimum Distortion	Less than 0.3%	14
15	Set Radio Selector Switch to "FM" Set Muting Switch to "ON"							15

STEP	CONNECT SIGNAL SOURCE TO-	SET SIGNAL TO-	CONNECT OUTPUT INDICATOR TO-	SET RADIO DIAL TO-	ADJUST	ADJUST FOR	REMARKS	STEP
16	"	"	Osilloscope to-across "SPEAKER" terminal	Tuned and Detuned to Signal	Variable Resistor R713 (100K $\Omega$ )	No noise when detuned but less effective for Signal Output when tuned	Signals are not necessarily Squelching by turning R713 counter clockwise	16
17	Set Radio Selector Switch to "FM AUTO"		Set Muting Switch to "OFF"					17
18	"	98MHz (Pilot Sig. 19KHz 10%) 1mV input	V. T. V. M. to-across "TP3" terminal (NAIM-224)	Tuned to Signal	L201 NMC-4-10	Maximum		18
19	"	98MHz (Pilot Sig. 19KHz 10%) 1KHz R ch 90%	V. T. V. M. to-across "SPEAKER" terminal (R ch)	"	L202 NMC5-9	Maximum		19
20	"	98MHz (Pilot Sig. 19KHz 10%) Main & Sub Sig. 1KHz L ch 90%	" (R ch)	"	Variable Resistor R223 (10K $\Omega$ )	Minimum	Retouch slightly Repeat Steps 20 and 21 an necessary	20
21	"	" R ch 90%	" (L ch)	"	"	"		21

## PARTS LIST

CIRCUIT NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.	
U1	FM Front End	FL-322U	1	240005	
U2	Power Amp assembly	NAPA-198C	1	13889598C	
U3	Pre-Amp assembly	NAAF-222a	1	13889522A	
U4	IF & MPX assembly	NAIM-224	1	13899524	
U5	Power Supply assembly	NAPS-225	1	13889525	
PL801, PL802	Pilot Lamp	6.3V0.05AW-3	2	210015	
PL803 - PL808	Pilot Lamp	6.3V0.25A	6	210012	
T901	Transformer-Power	NPT-555D	1	230046	
L001	Coil-Antenna	NMA-2508	1	232023	
T001	Transformer-Balloon	NBLN-1	1	233026	
C903, C904	Capacitor-Electrolytic	CE62W35V4700 $\mu$ F	2	3504030A	
C905	Capacitor-Electrolytic	CE62W50V470 $\mu$ FX2	1	3504037A	
C901	Capacitor-Polyester (UL)	UL200V0.01 $\mu$ F(M)	1	3504012	
S801	Switch-Rotary	NRSM-486-30Y-A	1	250106	
S802	Switch-Rotary	NRS-227-30Y-AP	1	250188	
M101	Tuning Indicator	NIND-0500S29	1	243020	Strength meter Tuning meter
M102	Tuning Indicator	NIND-0250S30	1	243021	
	Dial Plate		1	270565	
	Back Plate		1	270211-1	
	Drive Shaft		1	270218	
	Dial Pointer		1	270273	
	Dial Pointer Case		1	270172-2	
	Pointer Holder AS		1	270173	

CIRCUIT NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.
	Amp Box assembly		1	280495
	Front Panel		1	280718
	End Cap		2	280319
	Joiner (L)		2	280352-1
	Joiner (B)		2	280499
	Dial Flame		1	280322
	Glass Plate Holder	(large)	1	280338
	Glass Plate Holder	(small)	2	280323
	Glass Plate		1	280259-1
	Knob Guide		1	280418
	Knob Guide N		1	280710
	Bottom Cover		1	280497
	Rubber Cushion		4	280560
	Knob-Tuning		1	283051
	Knob-Speaker, Selector		2	283056
	Knob-Tone		2	283050
	Knob-Volume		1	283053
	Knob-Balance		1	283054-3
	Knob-Push Switch		7	283069-2
	Master Carton Box		1	290338
	Side Pad		2	290284

NAPA-198c

Q501, Q601	IC	STK 032	2	222003
D909, D910	Silicon Diode	10D1	2	223801
D911	Zener Diode	WZ-240	1	223916
D912	Zener Diode	WZ-120	1	223910
C501, C601	Capacitor-Electrolytic	CE04W16V4.7 $\mu$ F	2	352740471A
C509, C609	Capacitor-Electrolytic	CE04W16V47 $\mu$ F	3	352744701A
C918	Capacitor-Electrolytic	CE04W16V100 $\mu$ F	1	352741011A
C917	Capacitor-Electrolytic	CE04W16V100 $\mu$ F	1	352741011A
C505, C507	Capacitor-Electrolytic	CE04W35V10 $\mu$ F	4	352761001A
C605, C607	Capacitor-Electrolytic	CE04W35V10 $\mu$ F	4	352761001A
C510, C610	Capacitor-Electrolytic	CE04W25V47 $\mu$ F	2	352754701A
C916	Capacitor-Electrolytic	CE04W35V470 $\mu$ F	1	352764711A
	Fuse	3A-T(SS-2) UL	2	252006

NAAF-222a

Q301, Q302	Transistor	2SC632A-81	4	2210208
Q401, Q402	Transistor	2SC632A-81	4	2210208
Q303, Q304	Transistor	2SC632A-71	4	2210207
Q403, Q404	Transistor	2SC632A-71	4	2210207
Q902	Transistor	2SD234(Y)	1	2200020
D913	Zener Diode	WZ-310	1	223909
C302, C402	Capacitor-Electrolytic	CE04W25V220 $\mu$ F	2	352752211A
C303, C403	Capacitor-Electrolytic	CE04W50V22 $\mu$ F	2	352782201A
C304, C404	Capacitor-Electrolytic	CE04W50V0.47 $\mu$ F	2	352784791A
C324, C424	Capacitor-Electrolytic	CE04W50V3.3 $\mu$ F	2	352780331A
C325, C425	Capacitor-Electrolytic	CE04W50V1 $\mu$ F	2	352780101A
C326, C426	Capacitor-Electrolytic	CE04W50V4.7 $\mu$ F	2	352780471A
C305, C405	Capacitor-Electrolytic	CE04W10V33 $\mu$ F	2	352733301A
C920	Capacitor-Electrolytic	CE04W35V470 $\mu$ F	1	352764711A
C922	Capacitor-Electrolytic	CE04W35V220 $\mu$ F	1	352762211A

CIRCUIT NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.
C301, C401	Capacitor-Aluminum Electrolytic	AL04B10V3.3 $\mu$ F	2	392130337
C323, C423	Capacitor-Aluminum Electrolytic	AL04B10V2.2 $\mu$ F	2	392130227
R325, (R425)	Resistor-Variable	N24RJL100KMN 250KBT30.20H	1	5104005
R342, (R442)	Resistor-Variable	N24RGP100KB30-1	2	5172021
R343, (R443)	Push Switch	NPS-122LA3	7	250184

NAPS-225

D901 - D904	Silicon Diode	SR3AM-2B	4	223816
	Fuse	3A-T(ST-2)UL	1	252005

NAIM-224

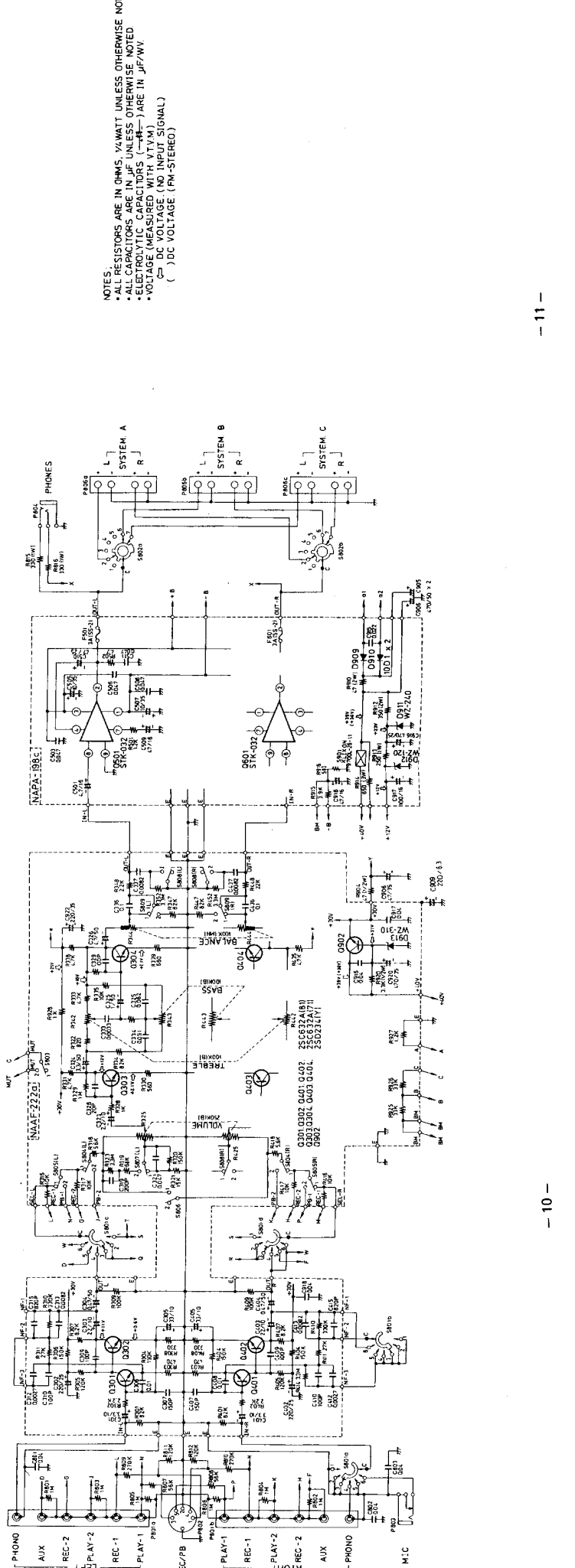
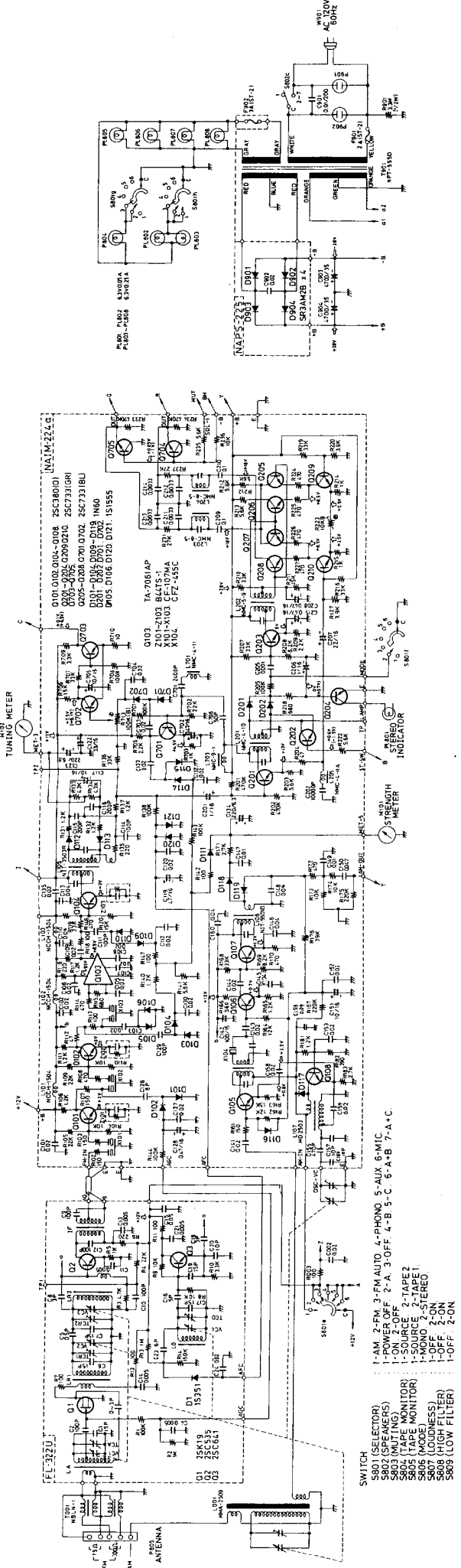
Q101, Q102	Transistor	2SC380(0)	7	2210123
Q104 - Q108				
Q201 - Q203				
Q209, Q210	Transistor	2SC733 (GR)	8	2210085
Q703 - Q705				
Q204	Transistor	2SC734(Y)	1	2210064
Q205 - Q208				
Q701, Q702	Transistor	2SC733(BL)	6	2210086
Q103	IC	TA-7061AP	1	222402
D101 - D104				
D109 - D119	Germanium Diode	1N60(N)FM	19	2231031
D201, D202				
D701, D702				
D105, D106	Silicon Diode	1S1555	4	223105
D120, D121				
L101, L102	Coil-Choke	NCCH-1504	2	233040
L103	Coil-Choke	NCCH-1501	1	233024
L105	Transformer-IF	NIT-3503R	1	233022
L106	Transformer-IF	NIT-5501D	1	232012
L107	Coil-OSC	NMO-2503	1	232013
L201	Coil-MPX	NMC-4-10	1	233017
L202	Coil-MPX	NMC-5-9	1	233019
L203, L204	Coil-MPX	NMC-8-5	2	233021
L701	Coil-MPX	NMC-4-11	1	233018
L703	Coil-MPX	NMC-9-1	1	233031
L205	Coil-MPX	NMC-4-11A	1	233041
C117, C151	Capacitor-Electrolytic	CE04W16V10 $\mu$ F	3	352741001A
C705				
C119	Capacitor-Electrolytic	CE04W16V4.7 $\mu$ F	1	352740471A
C128, C702				
C208, C215	Capacitor-Electrolytic	CE04W16V0.47 $\mu$ F	4	352744791A
C142	Capacitor-Electrolytic	CE04W16V100 $\mu$ F	1	352741011A
C201	Capacitor-Electrolytic	CE04W16V1 $\mu$ F	2	352740101A
C123, C134	Capacitor-Electrolytic	CE04W6.3V220 $\mu$ F	2	352722211A
R223	Resistor-Semi Fixed	R-HK10KB3L	1	5225002
R713	Resistor-Semi Fixed	R-HK100KB3L	1	5225003
X101 - X103	Ceramic Filter	SFE-10.7MA	3	3010003
X104	Ceramic Filter	CFZ-455C	1	3010004
Z101 - Z103	CR Composit	B44TS-1	3	3020001

Universal type

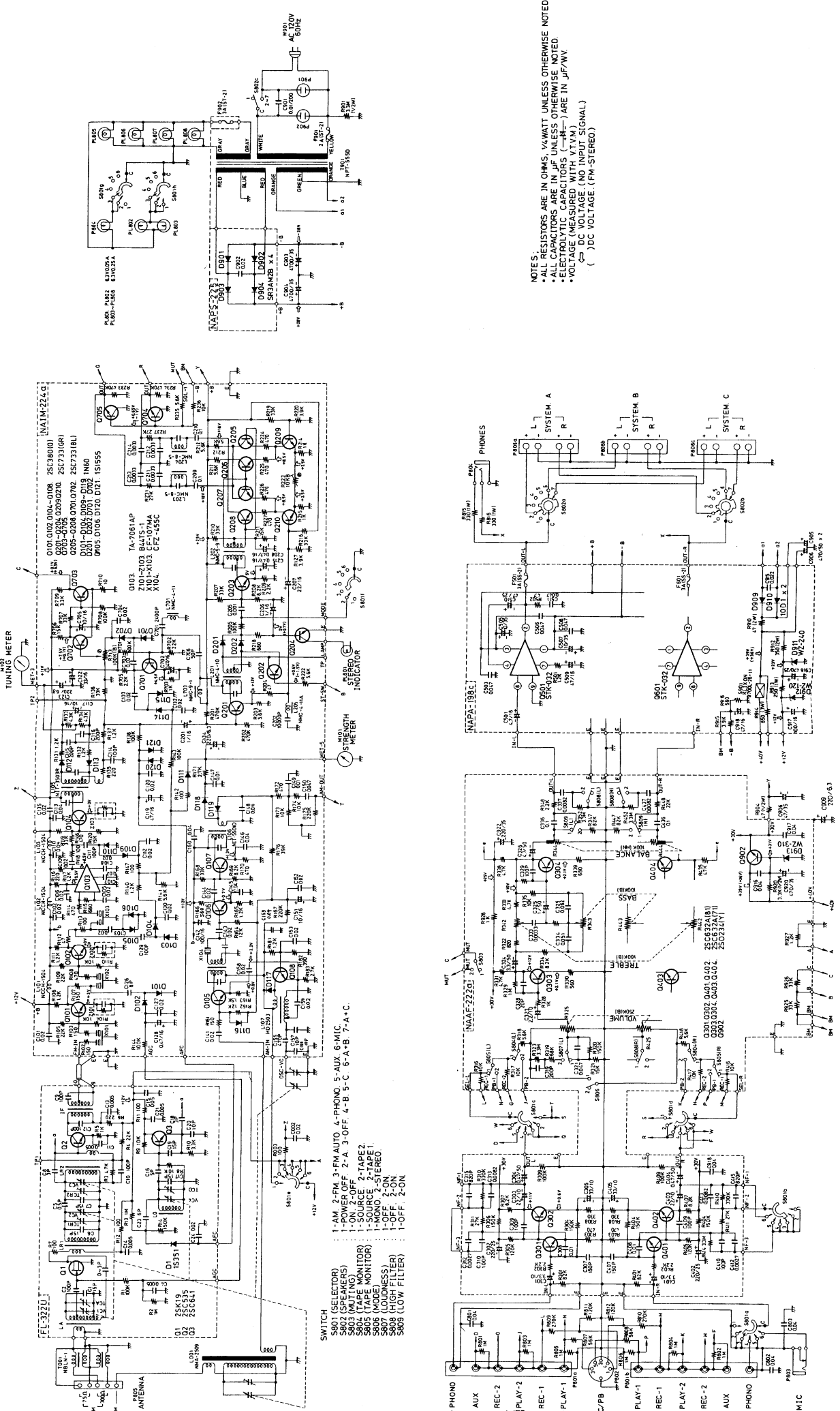
	Transformer - Power	NPT-555ADGQ	1	230058
	Capacitor-Interference Suppressor		1	
	Voltage Selector		1	250186



# CIRCUIT DIAGRAM



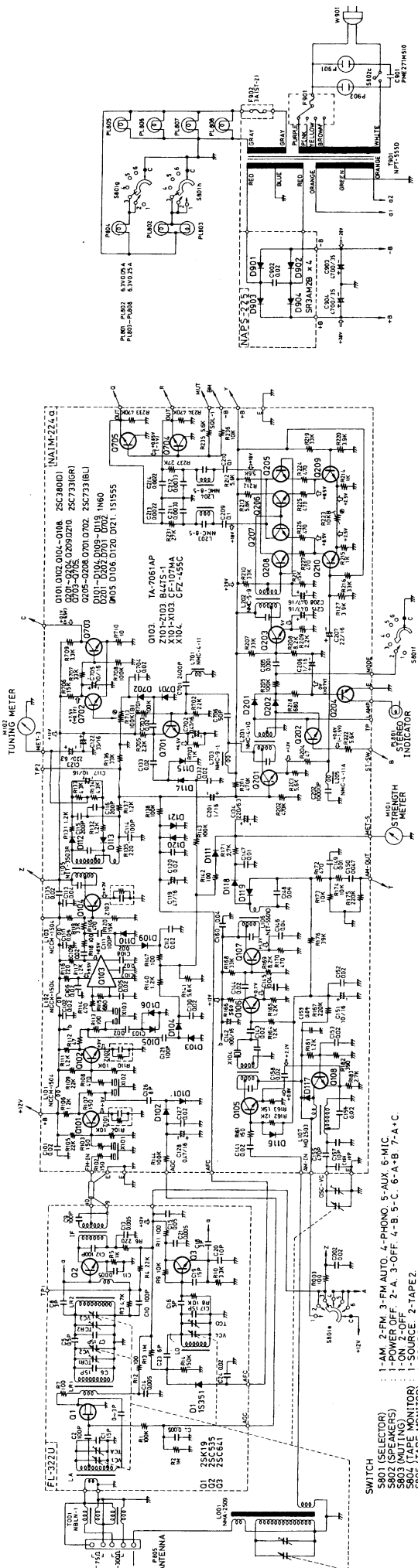
# CIRCUIT DIAGRAM



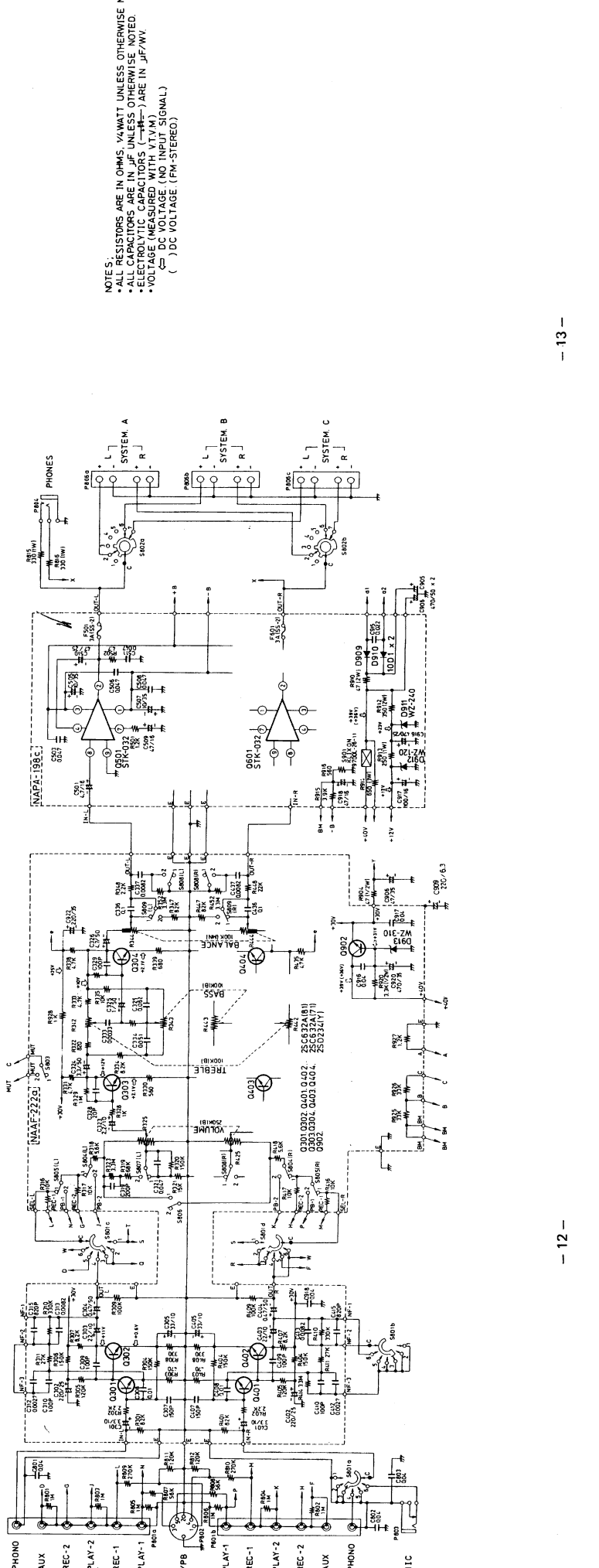
- SWITCH**
- S801 (SELECTOR) 1-AM 2-FM 3-FM AUTO 4-PHONO 5-AUX 6-MIC.
  - S802 (SPEAKERS) 1-POWER OFF 2-A 3-OFF 4-B 5-C 6-A-B 7-A-C.
  - S804 (TAPE MONITOR) 1-SOURCE 2-TAPE 2
  - S805 (TAPE MONITOR) 1-SOURCE 2-TAPE 1
  - S806 (MODE/LESS) 1-MONO 2-STEREO
  - S807 (MODE/LESS) 1-OFF 2-ON
  - S808 (HIGH FILTER) 1-OFF 2-ON
  - S809 (LOW FILTER) 1-OFF 2-ON

- NOTES:**
- ALL RESISTORS ARE IN OHMS,  $\mu$ WATT UNLESS OTHERWISE NOTED
  - ALL CAPACITORS ARE IN  $\mu$ F UNLESS OTHERWISE NOTED
  - ELECTROLYTIC CAPACITORS (—E—) ARE IN  $\mu$ F/WV.
  - VOLTAGE (MEASURED WITH V.T.M.)
  - 100 VOLTAGE (NO INPUT SIGNAL)
  - 700 VOLTAGE (FM-STEREO)

# CIRCUIT DIAGRAM (Universal type)



- SWITCH**
- 1-AM 2-FM 3-FM AUTO 4-PHONO 5-AUX 6-MIC
  - 1-POWER OFF 2-A 3-OFF 4-B 5-C 6-A-B 7-A-C
  - 1-SOURCE 2-TAPE 2
  - 1-SOURCE 2-TAPE 1
  - 1-MONO 2-STEREO
  - 1-OFF 2-ON
  - 1-OFF 2-ON
  - 1-OFF 2-ON



**NOTES:**

- ALL RESISTORS ARE IN OHMS, 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN  $\mu$ F UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (—E—) ARE IN JF/WV.
- VOLTAGE (MEASURED WITH VTVM)
- DC VOLTAGE (NO INPUT SIGNAL)
- ( ) DC VOLTAGE (PH-STEREO)

