SERVICE MANUAL SR360

marantz®

model SR360

Stereophonic Receiver

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3. Complete description of parts.
4. Model number for which part is required (indicate MARANTZ).
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MODEL SR360 STEREOPHONIC RECEIVER

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INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model SR360 Stereophonic Receiver.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of the operation of the receiver.

The parts list furnishes information by which replacement parts may be ordered from the Marantz Company. A simple description is included for parts which can usually be obtained through local suppliers.

1. P.W. BOARDS

1. MAIN (TUNER/AMP) P.W.B ASS'Y . . **(P100)**
2. CONTROL P.W.B ASS'Y . . . . . **(P500)**
   - 2-1. GRAPHIC EQ/VOLUME FLT DRIVER ASS'Y . . . . . **(P500)**
   - 2-2. SPEAKER SWITCH ASS'Y . . . **(P503)**
   - 2-3. POWER SWITCH ASS'Y. . . . . **(P502)**

2. TEST EQUIPMENT REQUIRED FOR SERVICING

This table lists the test equipment required for servicing the Model SR360 Receiver.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment
Test Loop		Use with AM Signal Generator
FM Signal Generator MPX Signal Generator	Sound Technology Model 1000A	Signal source for FM alignment Stereo separation alignment and trouble shooting
Distortion Analyzer Audio Oscillator AC VTVM	Sound Technology MODEL 1701A	Distortion measurements Sinewave and squarewave signal source Voltage measurements (AC)
Oscilloscope	Tektronix Model T932 Philips Model 3232	Waveform analysis and trouble shooting and ASO alignment
Frequency Counter	Fluke Model 1900A	MPX Oscillator adjustment (VCO)
Circuit Tester		Trouble shooting
DC VTVM	Fluke Model 8000 "Digital" Simpson Model 313, Triplet Model 801	Voltage measurements (DC)
AC Wattmeter	Simpson Model 1379	Monitors primary power to amplifier
AC Ammeter	Commercial Grade (1-10A)	Monitors amplifier output under short circuit condition
Line Voltmeter	Simpson Model 1359	Monitors potential of primary power to amplifier
Variable Autotransformer		Adjusts level of primary power to amplifier
Shorting Plug	Use phono plug with 600-ohm across center pin and shell	Shorts amplifier input to eliminate noise pickup
Output Load (8 ohms, ±0.5%, 100W)	Commercial Grade	Provides 8-ohm load for amplifier output termination

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3. FREQUENCY SYNTHESIZER RADIO TUNING SYSTEM

3.1 Construction of Synthesizer System

This frequency synthesizer is composed of a micro computer (TC 9147BP), PRESCALER (TC 6104) pass FILTER, crystals and FIP Dymamic Driver (TC 9158P), fluorescent indication tubes, as shown in Fig. 1.

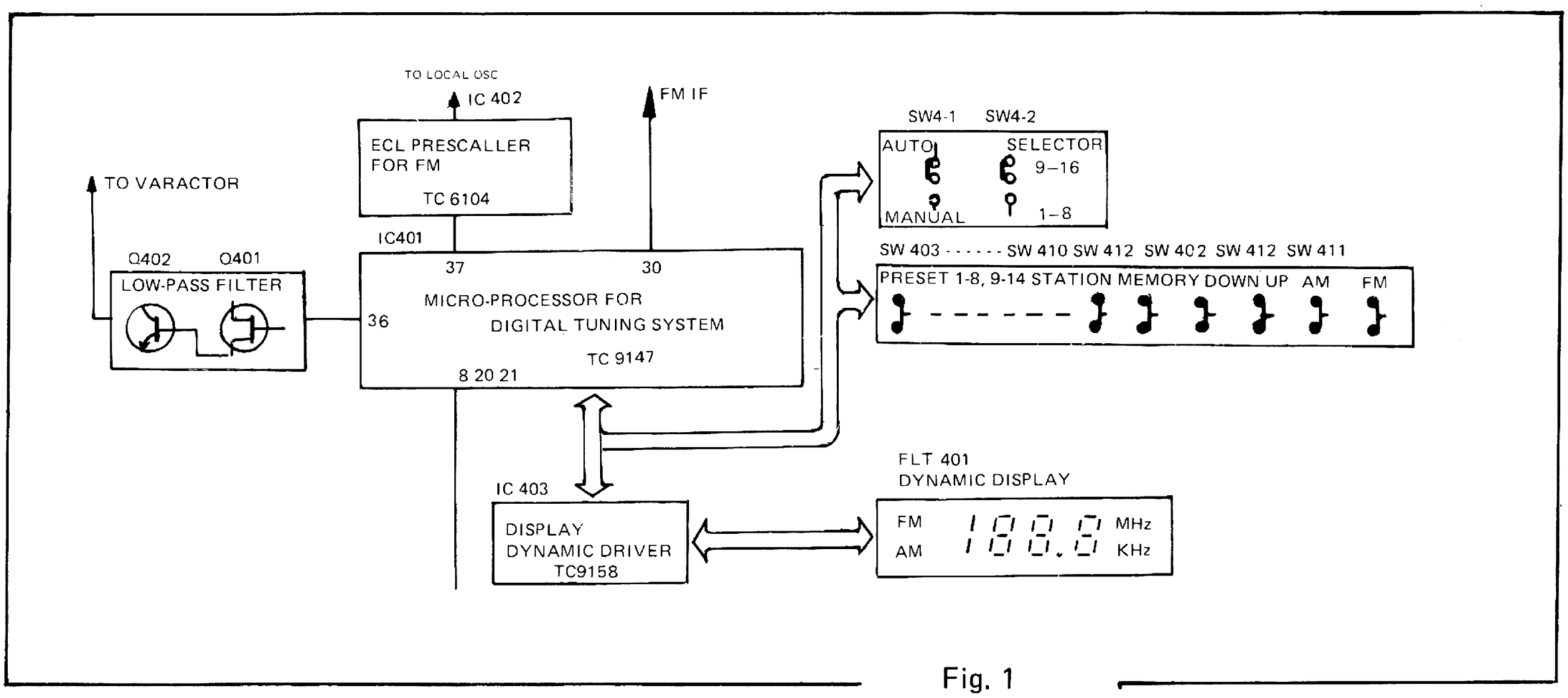
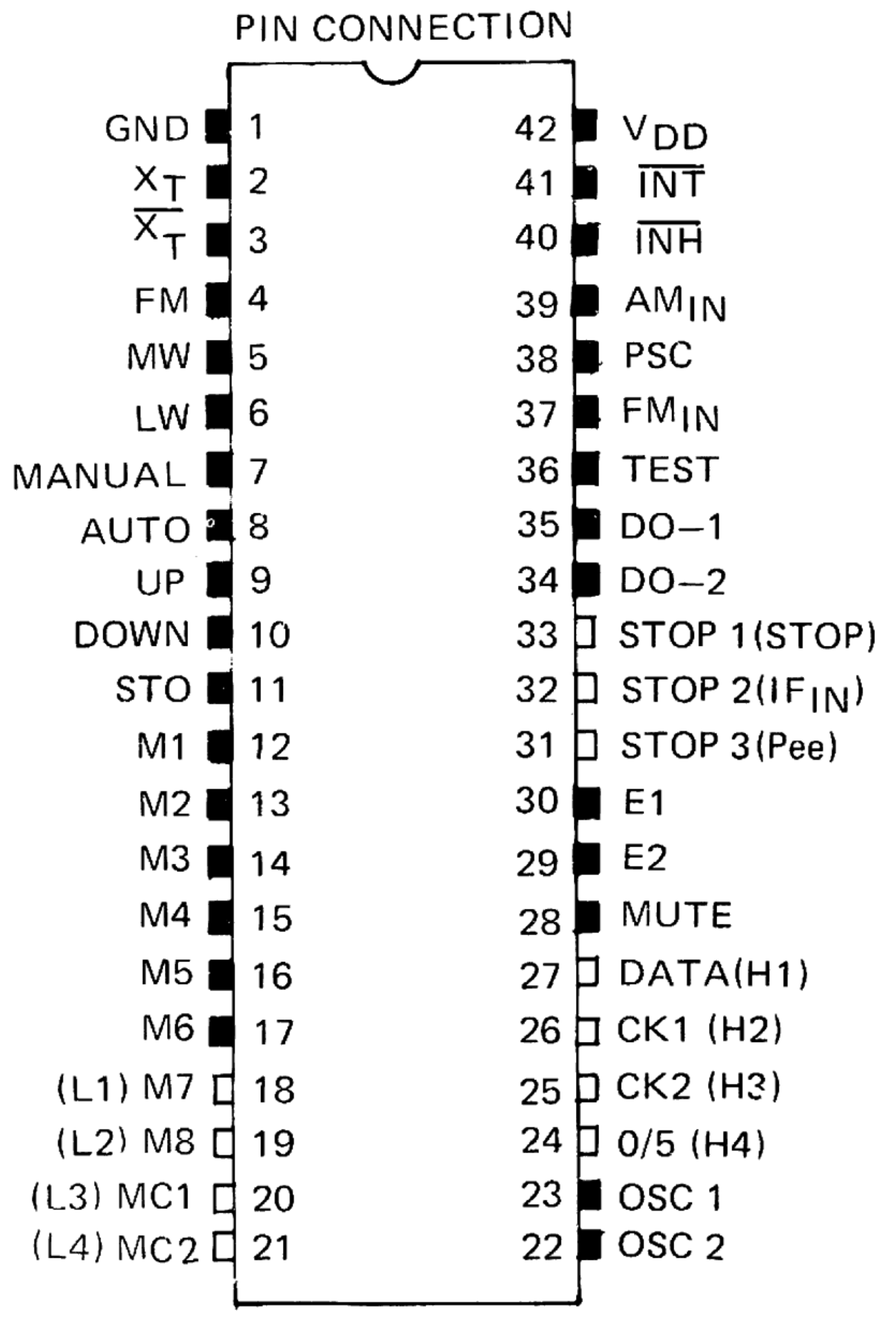


Fig. 1

3.2 Microcomputer TC9147

(1) Terminal Connections



▬ TERMINAL IS COMMON TO TC9146AP, TC9147P

⊔ TERMINAL: ( )DENOTES TERMINAL NAME OF TC9146

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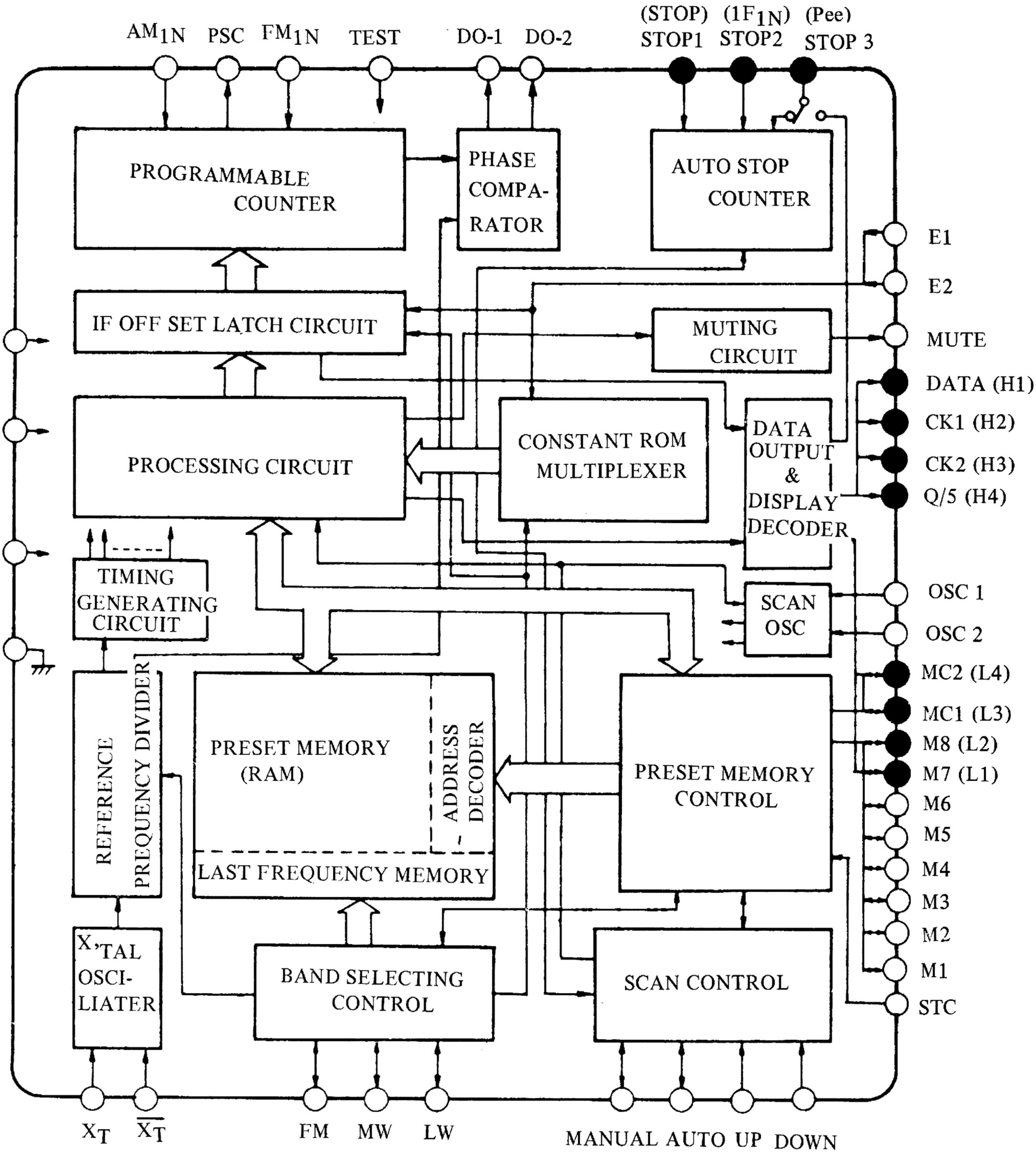
(2) Block Diagram-TC 9147

BLOCK DIAGRAM



● ( ) of ● denotes terminal name of TC9146AP

○ denotes terminal common to TC9146AP/TC9147P

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(3) Specification

MAXIMUM RATINGS (Ta=25°C)

Characteristic	Symbol	Ratings	Unit
Supply Voltage	V_{DD}	0~6	V
Input Voltage	V_{IN}	-0.3~V_{DD}+0.3	V
Output Voltage	V_{OUT}	-0.3~V_{DD}+0.3	V
Output Current (Note)	I_{OUT}	30	mA
Power Dissipation	P_D	800	mW
Operating Temperature	T_{opr}	-30~75	°C
Storage Temperature	Tstg	-55~125	°C

(Note) Bipolar transistor output current.

ELECTRICAL CHATACTERISTICS (Unless otherwise specified, Ta=25°C, V_{DD}=5.0V)

CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage			V_{DD}		— *	4.5	5.0	5.5	V
Supply Current			I_{DD}		FM Band, f_{IN}=4MHz, No-Load	—	4.0	7.0	mA
Memory Backup Voltage			VDD B		INH=OV *	2.0	~	5.5	V
Inhibit Supply Current			I_{DD} I_1		V_{DD}=5.0V, INH=OV	—	—	15	μA
			I_{DD} I_2		V_{DD}=2.0V, INH=OV	—	—	5	
X tal Oscillation Frequency			f X'tal		— *	—	7.2	—	MHz
FM_{IN}	Operating Frequency		$f_{IN(FM)}$		VIN=0.5V p-p, AC coupled *	2.0	~	5.5	MHz
	Input Amplitude		$V_{IN(FM)}$		f_{IN}=2.0~4.0 MHz, AC coupled *	0.5	~	V_{DD}-0.5	Vp-p
AM_{IN}	Operating Frequency		$f_{IN(AM)}$		V_{IN}=0.5Vp-p, AC coupled *	0.5	~	2.2	MHz
	Input Amplitude		$V_{IN(AM)}$		f_{IN}=0.5~2.2 MHz, AC coupled	0.5	~	V_{DD}-0.5	Vp-p
STOP 3 (IF_{IN})	Operating Frequency		$f_{IN(IF)}$		V_{IN}=0.5Vp-p, AC coupled	400	~	500	kHz
	Input Amplitude		$V_{IN(IF)}$		f_{IN}=400 ~ 500 kHz, AC coupled	0.5	~	V_{DD}-0.5	Vp-p
PSC	FM_{IN} Propagation Delay Time		t_{pd}		C_L=15pF, V_{IN}=0.5Vp-p	—	—	200	nS
	Max. Load Capacity		C_L		← *	—	—	15	pF
$\overline{INH}$ $\overline{INT}$	Input Voltage	"H" Level	V_{IH1}		—	4.2	~	V_{DD}	V
		"L" Level	V_{IL1}		—	0	~	3.0	
Other All Input I/O Terminals	Input Voltage	"H" Level	V_{IH2}		—	3.5	~	V_{DD}	V
		"L" Level	V_{IL2}		—	0	~	1.5	
UP, DOWN, TEST Input Pull-Down Resistance			R_{IN}		—	15	30	60	kΩ
FM_{IN}, AM_{IN}, STOP3 Feedback Resistance			R_f		—	200	400	800	kΩ
F1, 2, STOP1, 2, INH INT Input Leak Current			I_L		—	—	—	1.0	μA

FM, MW, MANUAL, AUTO, STO, (TC9147P: M1~M8)

Output Current	"H" Level	HO_I		V_{OH}=4.0V	15	20	—	mA
	"L" Level	I_{OL}		V_{OL}=5.0V	70	140	280	μA

OSC, MUTE, (TC9147P: DATA, CK1, 2, 0/5)

Output Current	"H" Level	I_{OH}		V_{OH}=4.0V	0.6	1.0	—	mA
	"L" Level	I_{OL}		V_{OL}=1.0V	0.6	1.0	—	mA

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CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
DO-1, DO-2								
Output Current	"H" Level	I_{OH}		V_{OH}=4.0V	0.6	1.0	—	mA
	"L" Level	I_{OL}		VOL=1.0V	0.6	1.0	—	
Try state Leak Current		I_{TL}		—	—	—	0.1	μA
MC1, MC2 (TC9147P only)								
Output Current	"H" Level	I_{OH}		V_{OH}=4.0V	0.6	1.0	—	mA
	"L" Level	I_{OL}		V_{OL}=5.0V	70	140	280	μA

Note: Parameters with * mark are guaranteed at all conditions of V_{DD}=4.5~5.5V
Ta= -30~75°C.

(4) Function of Terminals

FUNCTIONAL EXPLANATION OF TERMINALS

Fin No.	Symbol	Terminal Name	Function	Remarks
2	X_T	Crystal Oscillator terminal	Connect a 7.2 MHz crystal for reference frequency.	With a built in feedback resistor
3	$\overline{X_T}$			
4	FM	FM band designating input	Mutual reset type for selecting FM/MW/LW bands	
5	MW	MW band designating input		A
6				
7	MANUAL	Manual tuning mode designating input	Mutual reset type for selecting manual and auto search operating modes at time of UP/DOWN tuning	A
8	AUTO	Auto search tuning mode designating input		
9	UP	Up operating key input	For UP/DOWN tuning with the push key connected	B
10	DOWN	DOWN operating key input		
11	STO	Memory store command input	The preset memory is set to write state by this input	A
12 ~ 19	M 1 ~ M 8	Preset memory channel designating input	In combination with MC1 and MC2 inputs, controls write/read of the internal 16 channel preset memory.	A
20	MC1	Memory control input	Used for setting the 16 channel preset memory either to FM/AM (MW+LW) 8 channel fixed system or FM+MW+LW 3 bands 16 channel random system	C
21	MC2			
22	OSC2	AM oscillator terminal	C.R terminal for oscillator that decides SCAN speed at time of AM search.	—
23	OSC1	FM oscillator terminal	C.R terminal for oscillator that decides SCAN speed at time of FM search.	—

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Fin No.	Symbol	Terminal Name	Function	Remarks
24	0/5	FM 50kHz output for Europe	50kHz step output in FM band in European region. Become "H" level at 50 kHz	D
25	CK2	Receiving frequency data serial outputs	Transmits serial data and timing clock to be sent to Receiving Frequency Digital Display Driver TD6301AP. CK1 output also serves for pee sound transmission.	D
26	CK1			
27	DATA			
28	MUTE	Muting signal output	This terminal is placed at "H" level at time of muting output	D
29	E2	Region Designating output	For designating Japan, U.S.A and Europe.	E
30	E1			
31	STOP3	AM-IF signal input	Stops auto search by counting IF 450 kHz signal at time of AM.	F
32	STOP2	Auto search stop signal input	When a "H" level signal is input under the state where a "H" level signal is being given to stop1 Input, stops Auto search.	E
33	STOP1	SCAN speed slow input	When a "H" level signal is input, reduce auto search scan speed to 1/2.	E
34	DO-2	Phase Comparator output	2 try state buffers are transmitted parallelly from one phase comparator.	G
35	DO-1			
36	TEST	Test Terminal	When a "H" level signal is input, this terminal is placed at test mode.	B
37	FM_{IN}	FM Programmable counter input	Output from prescaler TD6104P is connected.	F
38	PSC	Prescaler control output	Controls selection of 1/30 and 1/32 division of prescaler TD6104P	D
39	AM_{IN}	AM programmable counter input	AM local oscillation signal is applied	F
40	$\overline{INH}$	Inhibit input	Normal operation at "H" level and inhibit status at "L" level.	E
41	$\overline{INT}$	Initialize input	Normal operation at "H" level, and internal state is initialized at "L" level.	E
42	V_{DD}	Power terminals	Apply 5±0.5V. Backup is possible up to 2V.	—
1	GND			

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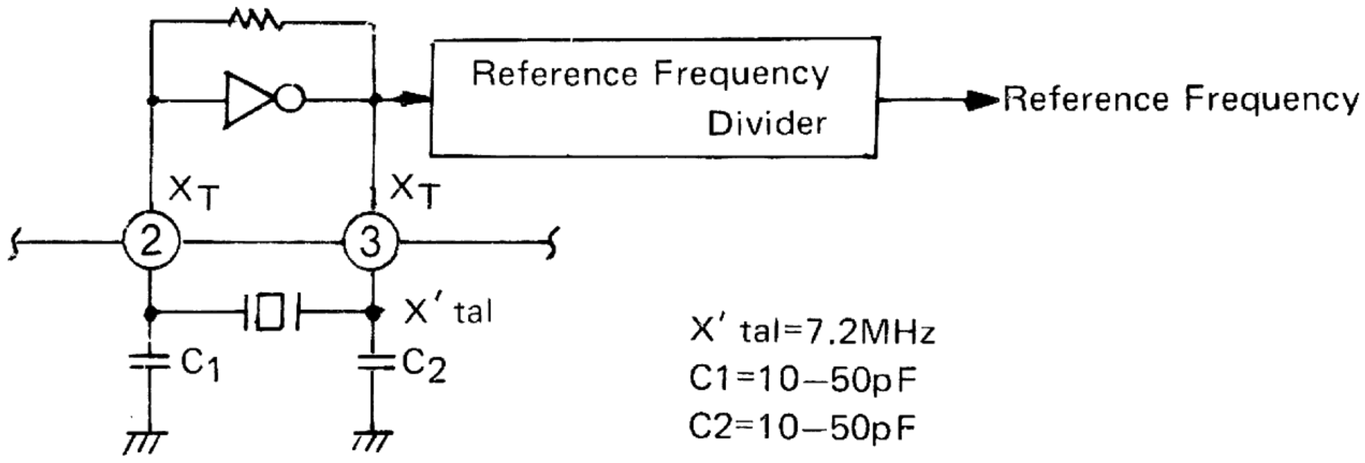
3.3 Explanation of Operation

PLL UNIT

1. REFERENCE FREQUENCY AND CRYSTAL OSCILLATOR

Oscillation frequency from the crystal oscillator is divided to generate reference frequency of 25kHz at time of FM, 9 or 10kHz at MW.

- Crystal oscillation frequency is 7.2 MHz
- The crystal oscillator has a built-in self-bias amplifier and can be composed easily only by connecting a crystal and a capacitor as shown in the following diagram. Further, oscillation is stopped under the inhibit state.



* A crystal that has a low CI value and excellent starting

Mode	Reference Frequency	Remarks
FM	25 kHz	at FM band
MW 9	9 kHz	at MW 9kHz separation
MW 10	10 kHz	at MW 10kHz separation

2. PROGRAMMABLE COUNTER

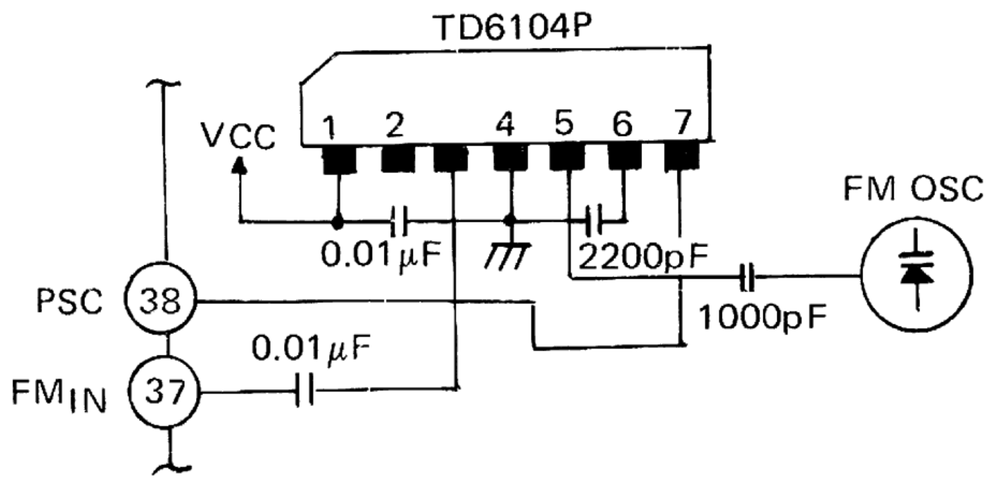
The programmable counters for FM and AM (MW) are in different circuit configuration.

1) FM Programmable Counter

The FM programmable counter is of swallow count type in combination with TD6104P. As a result, reference frequency 25 kHz is obtained and performance is improved.

The following diagram shows the connection with prescaler TD6104P.

In this case, the transmission delay time of PSC output for controlling TD6104P is limited.
Therefore, wiring for this PSC output should be as short as possible. PSC transmission delay time td<250 ns.



2) AM Programmable Counter

The AM (MW) programmable counter is of direct division type.

The signal transmitted from AM channel can be directly input to AM_{IN} terminal.

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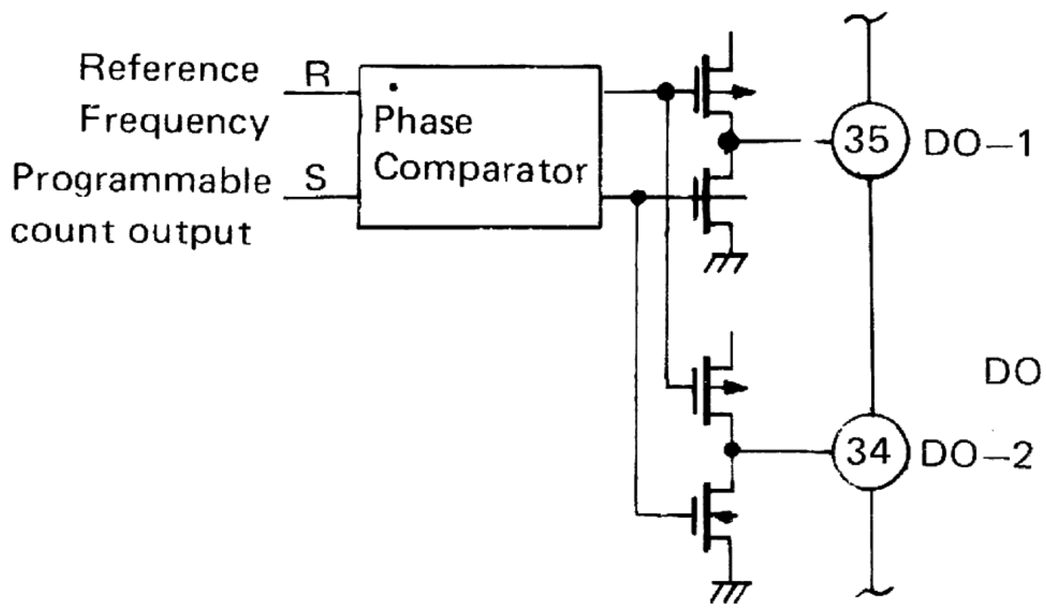
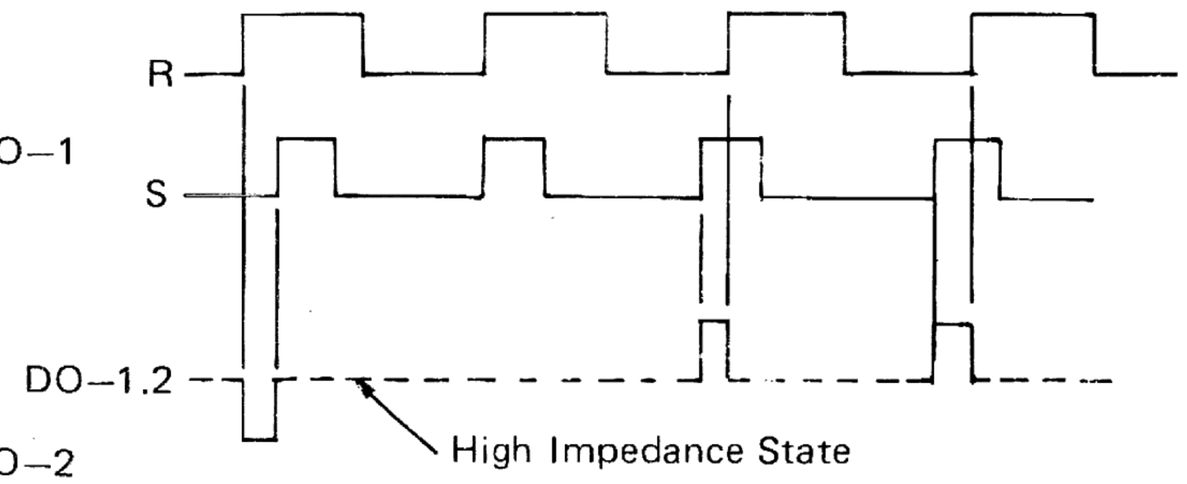
3. PHASE COMPARATOR

The phase comparator is a unit that compares phases of reference frequency and programmable counter output and controls V_{CO} through the low pass filter so that thus two signal frequencies and phases agree each other.

- Two tri-state buffers DO-1 and DO-2 are transmitted parallely from one phase comparator. Because of this, two sets of low-pass filter can be used without necessity for switching them.
- Under the inhibit state, both DO-1 and DO-2 outputs are kept at "L" level.





DO Output timing chart

* DESIGNATION OF DESTINATION BY JAPAN, U.S.A.AND EUROPE

Regional designation by U.S.A. and Europe is made by E1 and E2 terminals.

E1	E2	Destination	
1	0	Korea	
1	0	Europe	
0	1	U.S.A.	MW 9 kHz separation
1	1		MW 10 kHz separation

- For U.S.A region designation, AM(MW) band 9kHz/10 kHz separation can be selected.
- When the INH terminal is placed at "L" level, E1 and E2 Inputs inhibit read operation and keep the previous state.

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3.4 Dynamic Display Driver (TC 9158)

TC9158P is a dynamic driver for receiving frequency display developed for Model DTS-6/8.

This unit latches serial data transferred from system controller and dynamically displays the data by per forming compensation operation of intermediate frequency.

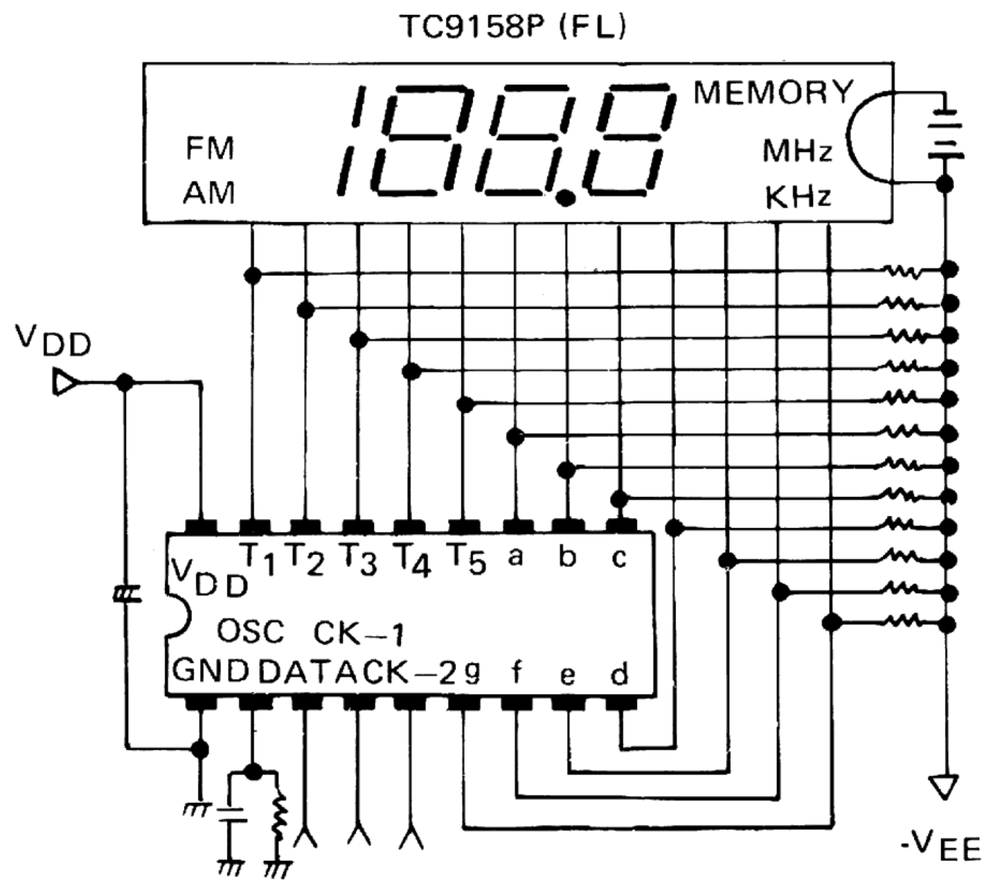
Since the output circuit contains a driver, no external transistors are required.

- Display of dynamic system affords simplification of wire.
- TC9158P contains transistor for high resisting voltage, therefore, this unit can drive FL directly.
- Numbers of display digits are 4 digits and a half up to 19995 at maximum and mark display (FM, MW) are possible.
- Data transfer from system controller can be made through connection of three wires because of serial system.
- Outline is a 18 pin DIP.

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage Range	V_{DD}		4.0	–	6.0	V
Operating Supply Current	I_{DD}	$V_{DD=5V}$ open load	–	–	1.0	mA
Driver Output Voltage	V_{OL}	TC9158P All output pins	–	–	–40	V
Driver Output Current	I_{OH}	TC9158P Digit output $V_{DS=2V}$	5	–	–	mA
		TC9159P All output pins $V_{CE=1V}$	30	–	–	

APPLICATION CIRCUIT



form CONTROLLER

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4. FM Alignment Procedures (Selector switch in the "FM" position and mode/mute switch in the "Mute OFF" position)

4.1FM Local Oscillator Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Read out Frequency to:	Adjust:
1			DC Volt meter in 11.5V and 3.9V range to Point (TP6) (TP7;GND)	108.00MHz	Not Adjustable 11.5V
2				87.50MHz	L 3 for 3.9V
3	Repeat steps 1 and 2				

4.2 FM RF and Muting Circuit Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Read out Frequency to:	Adjust:
1	RF generator to FM antenna terminals through matching network (300 ohms balanced) (Maintain RF level below limit)	106.10MHz	VTVM to L or R Channel output (TAPE output)	106.10MHz	Not Adjustable
2		90.10MHz		90.10MHz	T1, L1, L2 for maximum output and minimum distortion
3	Repeat steps 1 and 2				
4	RF generator to FM antenna terminals through matching network (300 ohms balanced) (Maintain RF level below limit)	98.10MHz	VTVM to L or R Channel output (TAPE output)	98.10MHz	T2 for maximum output and minimum distortion
5		98.10MHz	"O" Center Meter or DC current meter in 100uA range to point (TP1 and TP2)		T501 Core so that the meter indicates center or may read "O"
6	RF generator 1mV output to FM antenna terminals through maching network (300 ohms, balanced)	98.10MHz	Distortions meter to L or R Channel output (TAPE OUT)	98.10MHz	T502 core for minimum distortion
7	RF generator 300uV				VR501 so that TUNE LED may light. MUTE ON

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4.3 Multiplex Alignment Procedures ("FM" Position, Mute on Position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Read out Frequency TO:	Adjust:
1	RF generator to FM antenna terminals through matching network (300 ohms balanced) with 1mV FM Stereo Generator RF level and Pilot 9% modulation	No modulation & Pilot off	Frequency counter to point (TP 5)	98.10MHz	VR601 so that Frequency counter may precisely read 38KHz
2	RF generator to FM antenna terminals through matching network (300 ohms balanced) with 1mV FM Stereo Generator RF level and 100% modulation (Pilot 9%)	Stereo left (1,000Hz)	VTVM to right channel output (TAPE OUT)	98.10MHz	VR601 for maximum output and same separation in both channels
3		Stereo right (1,000Hz)	VTVM to left channel output (TAPE OUT)		
4	Repeat step 2 and 3				

4.4 AM ALIGNMENT Procedures (Selector Switch in the "AM" Position)
AM Local Oscillator Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Read out Frequency TO:	Adjust:
1			DC Volt meter in 8.6V and 1V range to point (TP6, TP7; GND)	1710KHz	TC501 for 8.5V
2				520KHz	T505 for 1V
3	Repeat seep 1 and 2				

4.5 AM IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Read out Frequency TO:	Adjust:
1	Sweep generator to point (C527)	450KHz marker	Oscilloscope to point (TP3)	Quiet point on band	T503 for maximum and symetric response

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4.6 AM RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Read out Frequency TO:	Adjust:
1	Apply the signal to the AM loop antenna from the RF generator	1400KHz	VTVM to L or R channel output	1400KHz	TC502 for maximum output
2	Using the test loop. As per Figure 2. (with 3mV/M)	600KHz	(TAPE OUT)	600KHz	T504 for maximum output
3	Repeat step 1 and 2 necessary to obtain maximum sensitivity.				
4		1000KHz		1000KHz	VR502 so that TUNE LED may light

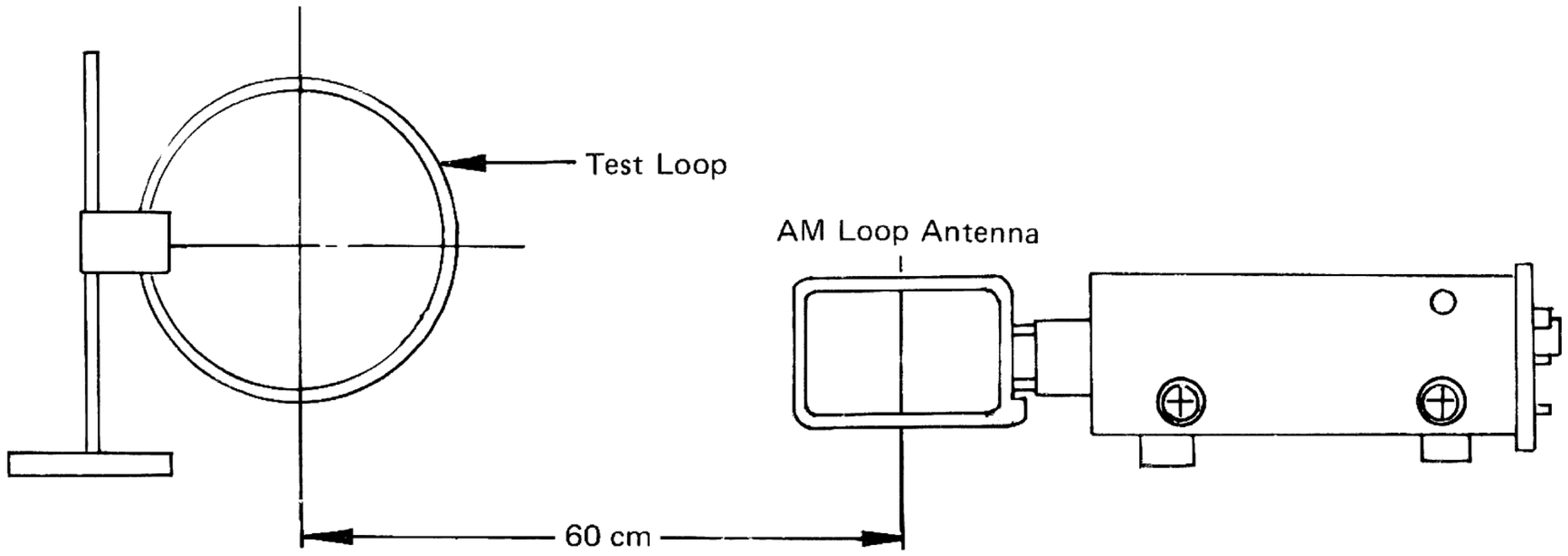

Figure 2

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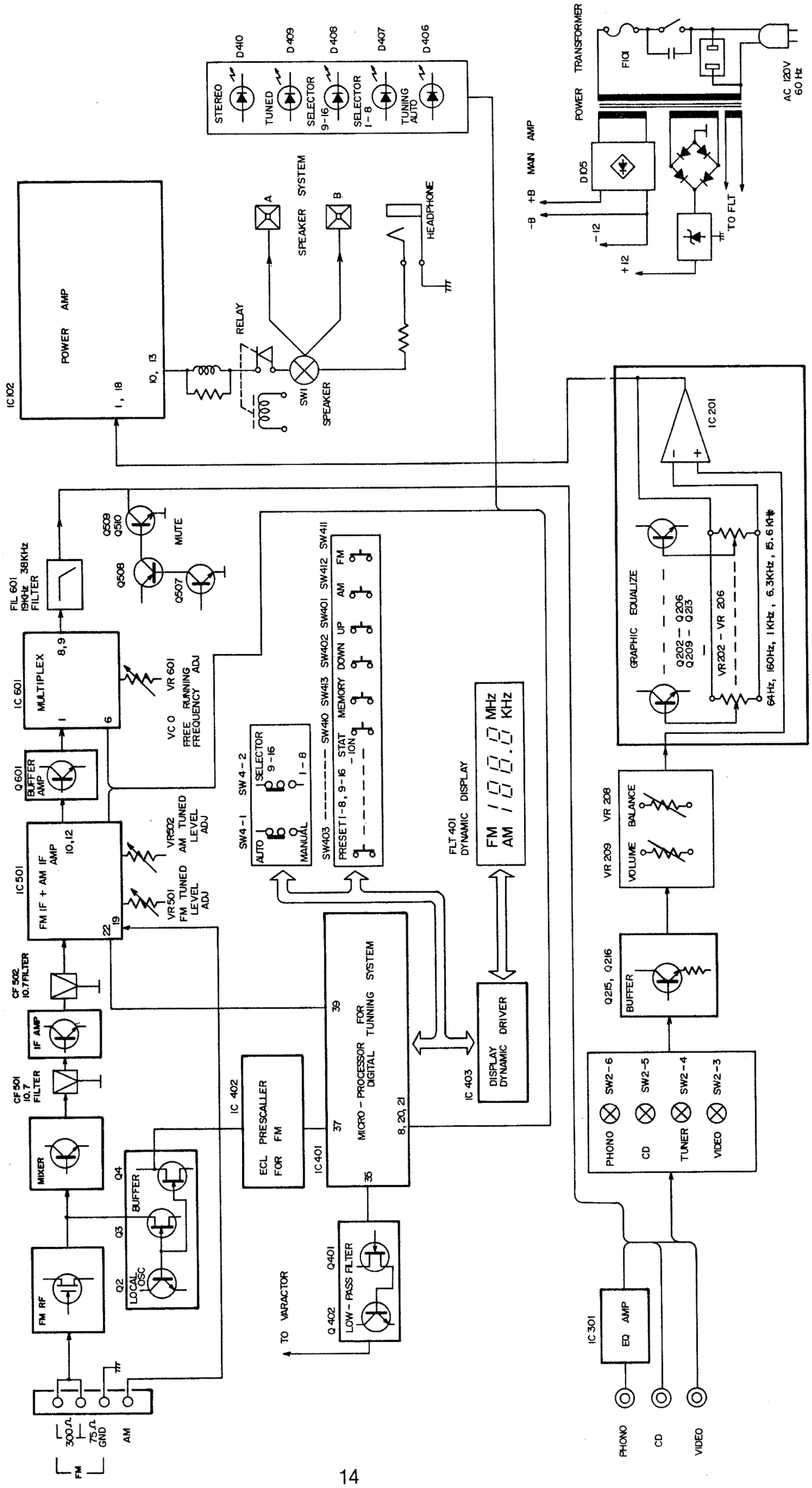
5. FUNCTIONAL BLOCK DIAGRAM



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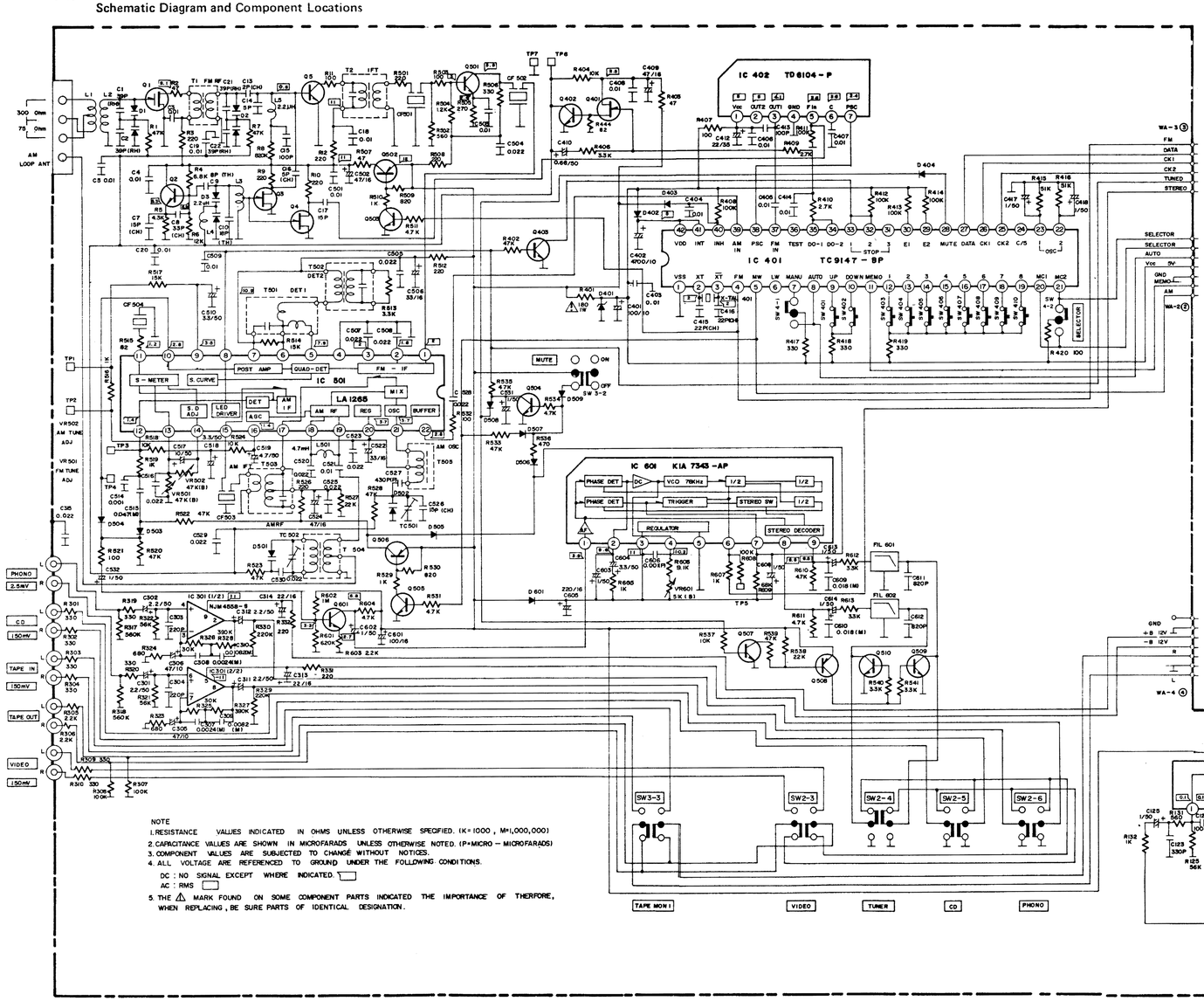
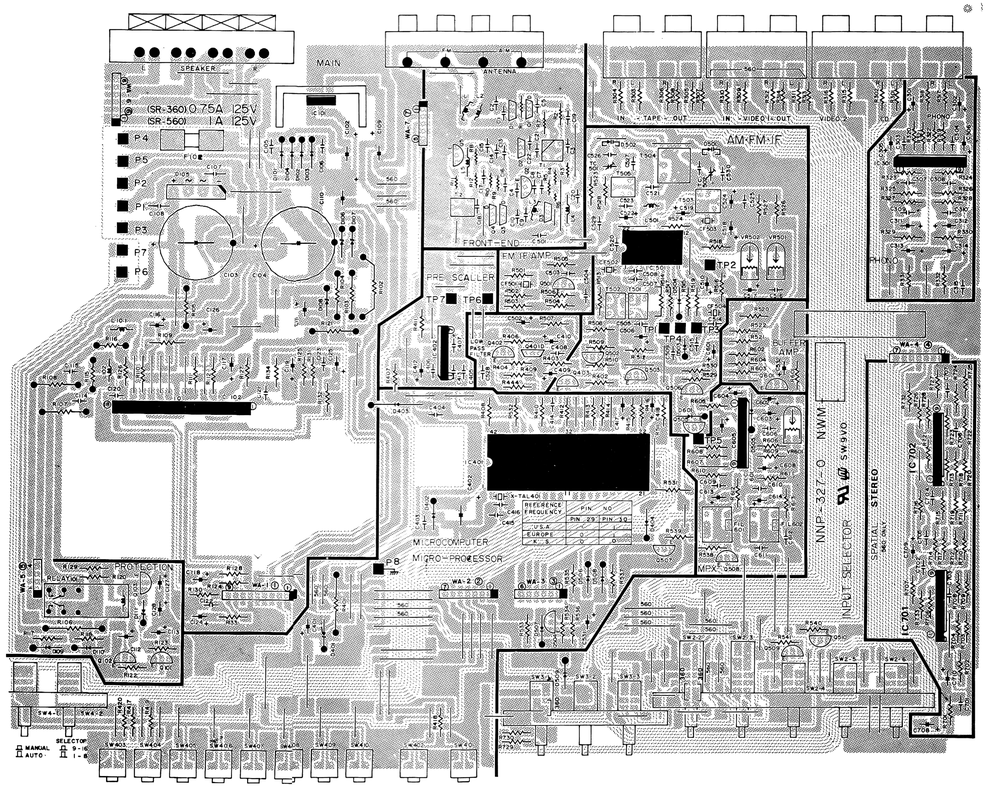
6. DIAGRAM AND COMPONENT LOCATIONS

6-1. MAIN (TUNER/AMP) P.W.B ASS'Y (P100)

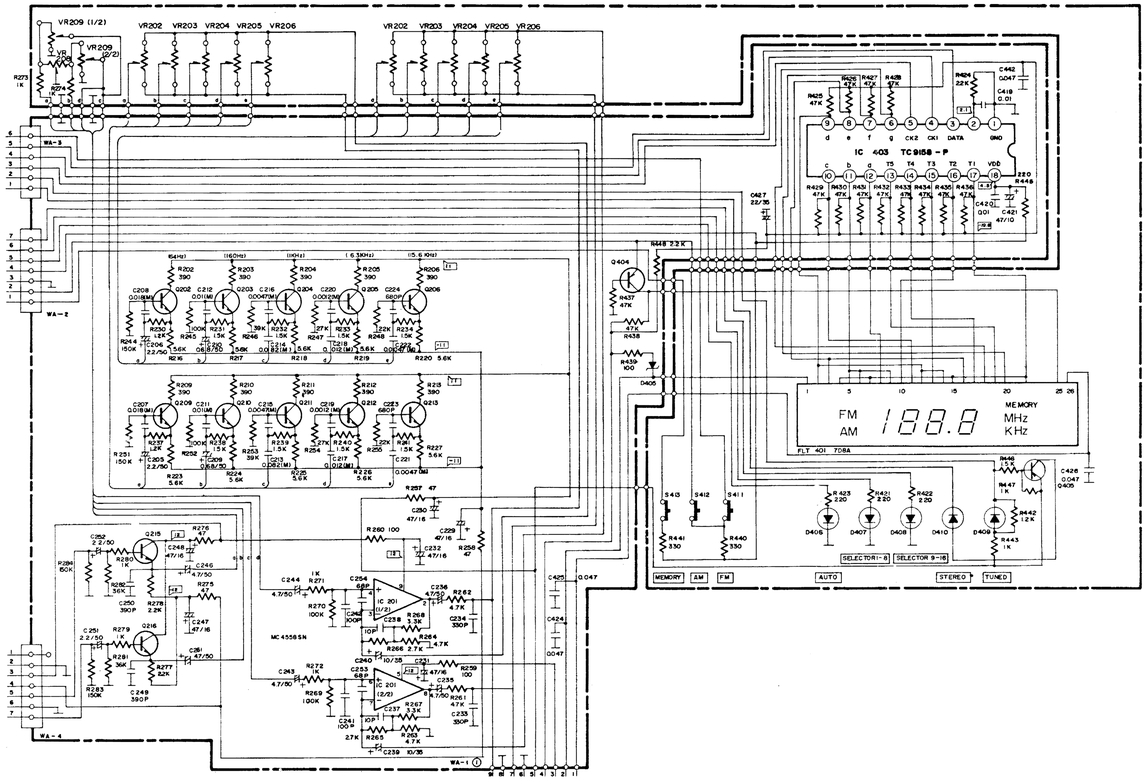
Schematic Diagram and Component Locations

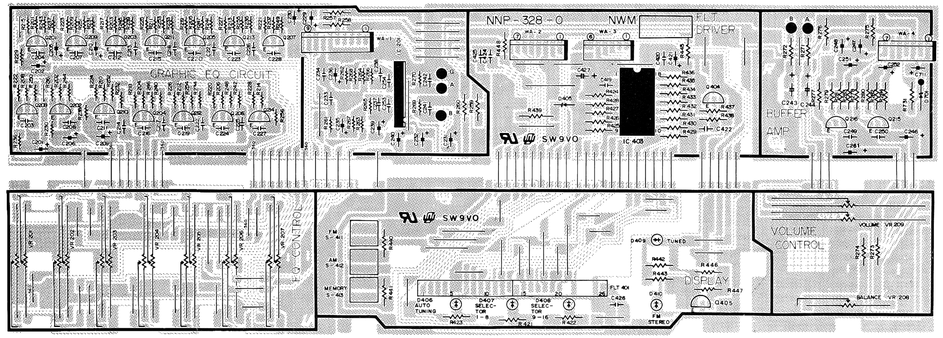




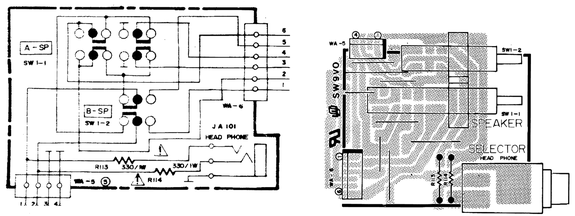
6-2. CONTROL P.W.B ASS'Y (P500)
Schematic Diagram and Component Locations

6-2-1. *GRAPHIC EQ/VOLUME/FLT DRIVER ASS'Y (P500)
Schematic Diagram and Component Locations

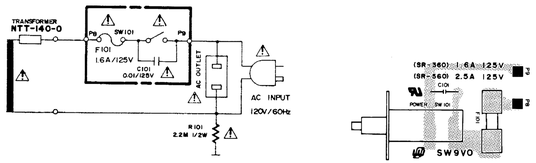




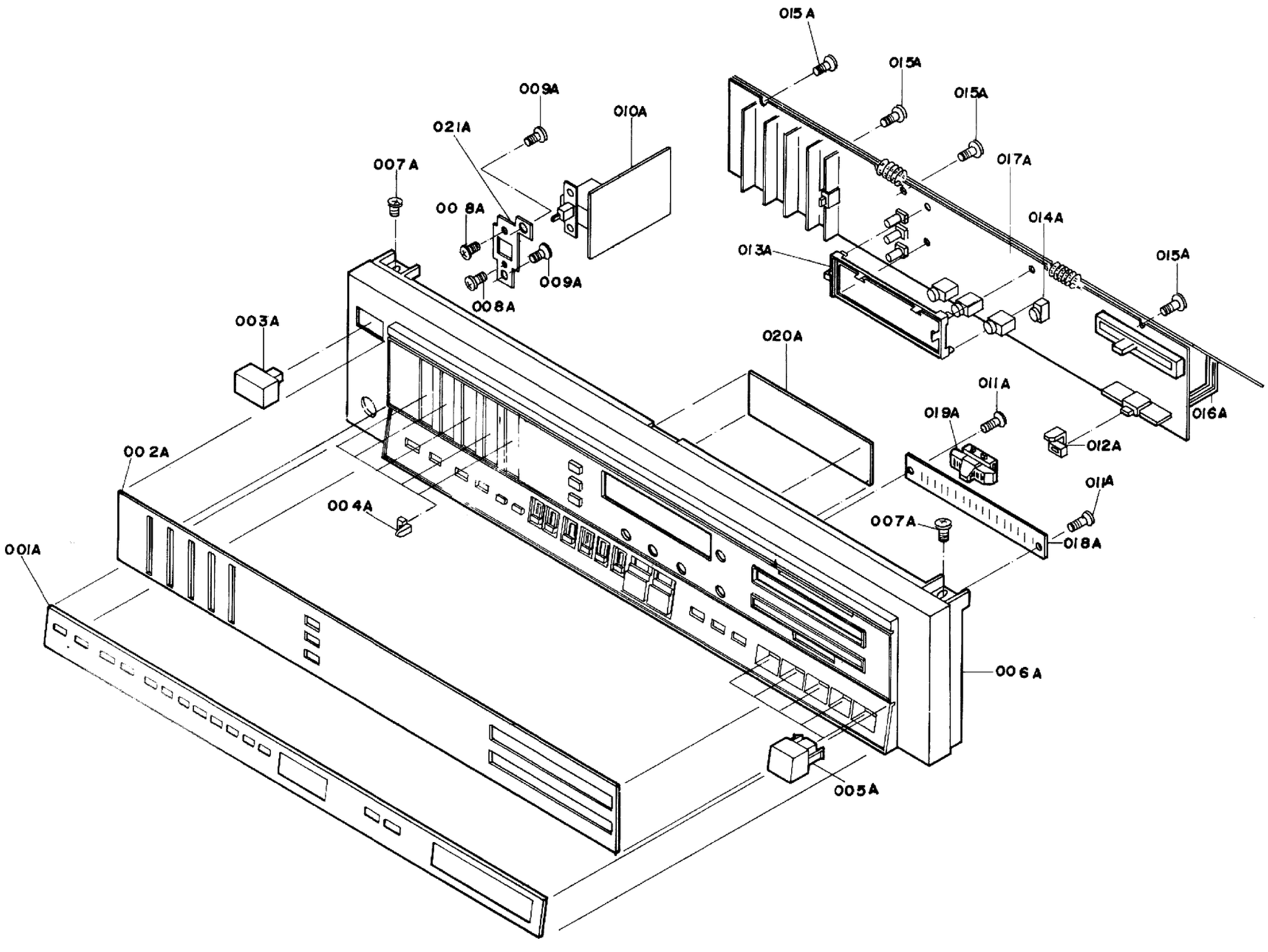
6-2-2. *SPEAKER SWITCH ASS'Y (P503)
Schematic Diagram and Component Locations



6-2-3. *POWER SWITCH ASS'Y (P502)
Schematic Diagram and Component Locations



7. EXPLODED VIEW AND PART LIST
7.1 FRONT PANEL



REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
A	1	NNW-1071-B	Front Panel Ass'y
001A	1	NNC-097	AL Plate
002A	1	NNA-314	Front Window
⚠003A	1	NNW-995	Power Knob
⚠004A	5	NNW-1001	EQ Knob
⚠005A	4	NNW-1000	Function Knob
⚠006A	1	NNW-1071	Front Panel
007A	2	VBZ30P060K	Screw
008A	2	VMZ30P060K	Screw
009A	2	VBZ30P060K	Screw
010A	1	NNA-321	Power S/W Ass'y
011A	2	BRZ26P060K	Screw
012A	1	NNW-1002	Balance Knob
013A	1	NNW-997	F.L.T Holder
014A	5	NNW-994	L.E.D Holder

REF. DESIG.	Q'TY	PART No.	DESCRIPTION
015A	4	VBZ30P060K	Screw
⚠016A	3	NNW-993	P.C.B Joint
017A	1	NWM-139	Control P.C.B. Ass'y
⚠018A	1	NNW-996	V.R Guide
⚠019A	1	NNW-992	V.R Knob
020A	1	NNM-060	Filter-Blue
021A	1	NNA-321	Power S/W Brk't

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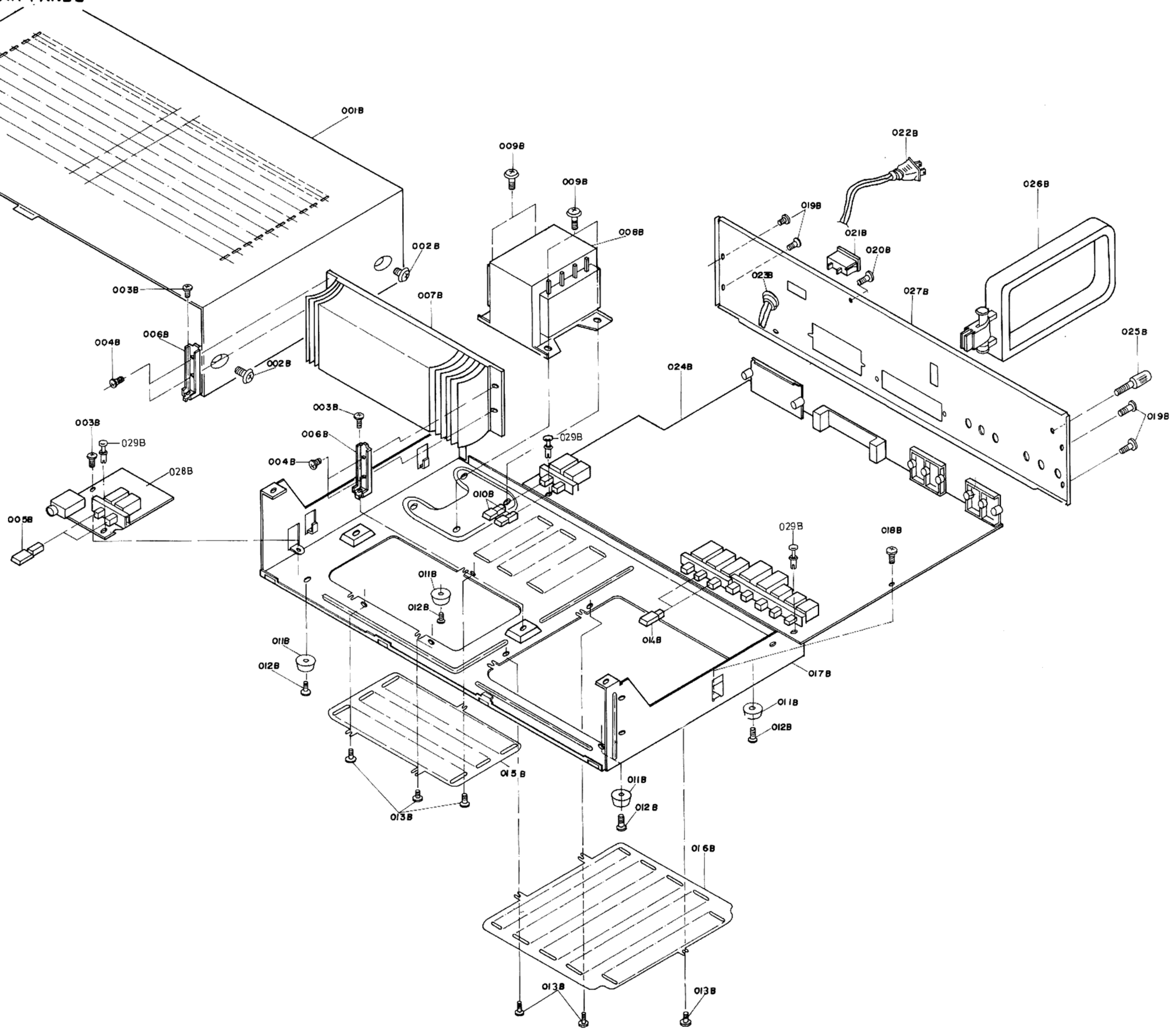
7.2 MAIN CHASSIS AND REAR PANEL



REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
B		NNA-317-C	Main Chassis Ass'y
001B	1	NNA-316	Bonnet Case
002B	4	ATX40P060K	Screw
003B	3	VBZ30P060C	Screw
004B	4	VBZ30P060K	Screw
⚠005B	2	NNW-1003	Push Knob (S)
006B	2	NNA-315	Heat Sink Brk't
007B	1	NNA-318	Heat Sink
⚠008B	1	NTT-141	Power Trans
009B	2	VBZ40P060C	Screw
⚠010B	2	NNW-998	Push Knob A
011B	4	NNV-005	Foot
012B	4	VBZ30P080K	Screw
013B	6	VBZ30P040C	Screw
⚠014B	3	NNW-999	Push Knob B
015B	1	NNA-320	Bottom Plate-B

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
016B	1	NNA-319	Bottom Plat-A
017B	1	NNA-317	Main Chassis
018B	1	VBZ30P060C	Screw
019B	4	VBZ30P060C	Screw
020B	1	VBZ30P060C	Screw
⚠021B	1	NKP-062	AC OUTLET
⚠022B	1	NDG-023	Power Supply Cord
⚠023B	1	311340101	Strain Relief Bushing
024B	1	NWM-138	Main P.C.B. Ass'y
025B	1	NKE-005	Earth Terminal
026B	1	NDH-44	Loop Antenna Ass'y
027B	1	NNA-311	Rear Panel
028B	1		Speaker S/W Ass'y
029B	3	NEC-040	NYLON RIVET

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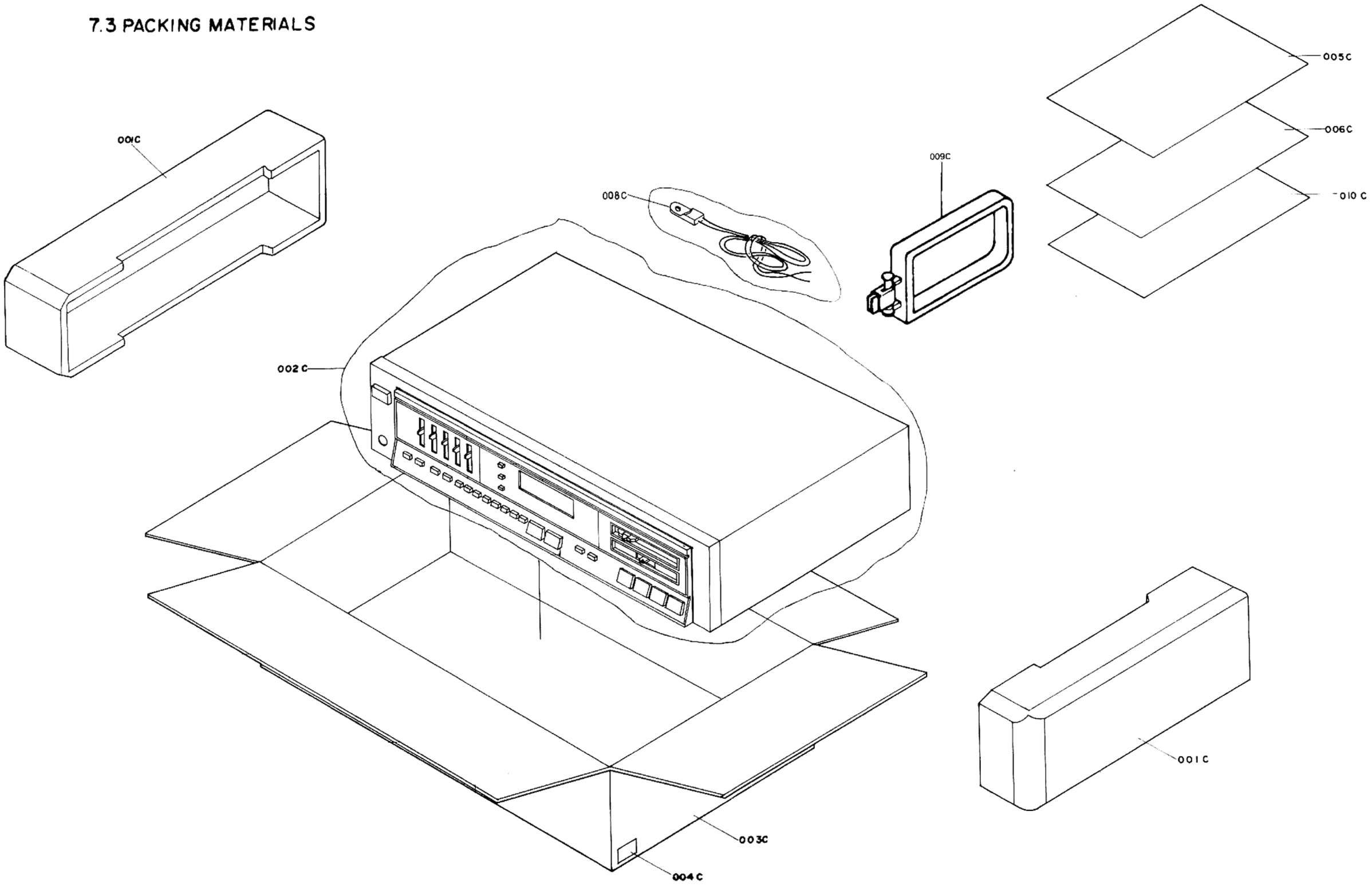
7.3 PACKING MATERIALS



REF. DESIG.	Q'TY	PART NO.	DESCRIPTION
001C	2	NHA-278	Side PAD
002C	1	NEG-001	Poly Sheet
003C	1	NHG-267	Packing Case
004C	1		Serial No
005C	1	NRY-013	Warrant Card
006C	1	NRB-017	Operation Manual
008C	1	NDH-005	FM Antenna
009C	1	NDH-044	Loop Antenna Ass'Y
010C	1	364032901	Technical Specification

REF. DESIG.	Q'TY	PART NO.	DESCRIPTION

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REF. DESIG.	PARTS NO.	DESCRIPTION
		P100-TUNER/PHONO AMP CIRCUIT BOARD
P100	NNP-327-01 NWM-138-01	P.W. Board Tuner/Phono Amp P.W. Board Assembly
		P100-CAPACITORS
C1	184639041	Ceramic 39 pF ±5%
C2	184639041	Ceramic 39 pF ±5%
C3	175610395	Ceramic 0.01 μF +80% −20%
C4	175610395	Ceramic 0.01 μF +80% −20%
C5	175610395	Ceramic 0.01 μF +80% −20%
C7	180615045	Ceramic 15 pF ±5%
C8	180633045	Ceramic 33 pF ±5%
C9	186608041	Ceramic 8 pF ±5%
C10	186618041	Ceramic 18 pF ±5%
C13	180602045	Ceramic 2 pF ±5%
C14	188605045	Ceramic 5 pF ±5%
C15	188610145	Ceramic 100 pF ±5%
C16	180605045	Ceramic 5 pF ±5%
C17	188615045	Ceramic 15 pF ±5%
C18	175610395	Ceramic 0.01 μF +80% −20%
C19	175610395	Ceramic 0.01 μF +80% −20%
C20	175610395	Ceramic 0.01 μF +80% −20%
C21	184639041	Ceramic 39 pF ±5%
C22	184639041	Ceramic 39 pF ±5%
C102	142422161	Elect 220 μF 25V
⚠ C103	142633261	Elect 3300 μF 50V
⚠ C104	142633261	Elect 3300 μF 50V
C105	150922341	Film 0.022 μF ±5%
C106	150922341	Film 0.022 μF ±5%
C107	150922341	Film 0.022 μF ±5%
C108	150922341	Film 0.022 μF ±5%
C109	142347165	Elect 470 μF 16V
C110	142447161	Elect 470 μF 25V
C111	142410165	Elect 100 μF 25V
C112	142247165	Elect 470 μF 10V
C113	142310165	Elect 100 μF 16V
C114	150647341	Film 0.047 μF ±5%
C115	150647341	Film 0.047 μF ±5%
C116	142647065	Elect 47 μF 50V
C117	142647065	Elect 47 μF 50V
C118	142410165	Elect 100 μF 25V
C119	142410165	Elect 100 μF 25V
C120	188610145	Ceramic 100 pF ±5%
C121	188610145	Ceramic 100pF ±5%
C122	188633145	Ceramic 330 pF ±5%
C123	188633145	Ceramic 330 pF ±5%
C124	142601065	Elect 1 μF 50V
C125	142601065	Elect 1 μF 50V
C126	142610165	Elect 100 μF 50V
C127	142633965	Elect 3.3 μF 50V
C128	142633965	Elect 3.3 μF 50V
C301	142622965	Elect 2.2 μF 50V
C302	142622965	Elect 2.2 μF 50V
C303	188622145	Ceramic 220 pF ±5%
C304	188622145	Ceramic 220 pF ±5%
C305	142247065	Elect 47 μF 10V
C306	142247065	Elect 47 μF 10V
C307	150624241	Film 0.0024 μF ±5%
C308	150624241	Film 0.0024 μF ±5%
C309	150682241	Film 0.0082 μF ±5%
C310	150682241	Film 0.0082 μF ±5%
C311	142622965	Elect 2.2 μF 50V
C312	142622965	Elect 2.2 μF 50V
C313	142322065	Elect 22 μF 16V
C314	142322065	Elect 22 μF 16V
C315	175622395	Ceramic 0.022 μF +80% −20%
C401	142210165	Elect 100 μF 10V
C402	142247261	Elect 4700 μF 10V
C403	175610395	Ceramic 0.01 μF +80% −20%
C404	175610395	Ceramic 0.01 μF +80% −20%
C405	175610395	Ceramic 0.01 μF +80% −20%
C406	175610395	Ceramic 0.01 μF +80% −20%
C407	175610395	Ceramic 0.01 μF +80% −20%
C408	175610395	Ceramic 0.01 μF +80% −20%
C409	142347065	Elect 47 μF 16V
C410	142601065	Elect 1 μF 50V
C412	142522065	Elect 22 μF 35V
C413	188610145	Ceramic 100 pF ±5%
C414	175610395	Ceramic 0.01 μF +80% −20%
C415	180622045	Ceramic 22 pF ±5%
C416	180622045	Ceramic 22 pF ±5%
C417	142601065	Elect 1 μF 50V
C418	142601065	Elect 1 μF 50V
C501	175610395	Ceramic 0.01 μF +80% −20%
C502	142347065	Elect 47 μF 16V
C503	175610395	Ceramic 0.01 μF +80% −20%
C504	175622395	Ceramic 0.022 μF +80% −20%
C505	175622395	Ceramic 0.022 μF +80% −20%
C506	142333065	Elect 33 μF 16V
C507	175622395	Ceramic 0.022 μF +80% −20%
C508	175622395	Ceramic 0.022 μF +80% −20%
C509	175610395	Ceramic 0.01 μF +80% −20%
C510	142633965	Elect 3.3 μF 50V
C514	171610255	Ceramic 0.001 μF ±10%
C515	150647341	Film 0.047 μF ±5%
C516	175622395	Ceramic 0.022 μF +80% −20%
C517	142610065	Elect 10 μF 50V
C518	142633965	Elect 3.3 μF 50V
C519	142647965	Elect 4.7 μF 50V
C520	175622395	Ceramic 0.022 μF +80% −20%
C521	175610395	Ceramic 0.01 μF +80% −20%
C522	142333065	Elect 33 μF 16V
C523	175622395	Ceramic 0.022 μF +80% −20%
C524	142347065	Elect 47 μF 16V
C525	175622395	Ceramic 0.022 μF +80% −20%
C526	180615045	Ceramic 15 pF ±5%
C527	153643141	Styrol 430 pF ±5%
C528	175622395	Ceramic 0.022 μF +80% −20%
C529	175622395	Ceramic 0.022 μF +80% −20%
C530	175622395	Ceramic 0.022 μF +80% −20%
C531	142601065	Elect 1 μF 50V
C532	142601065	Elect 1 μF 50V
C601	142310165	Elect 100 μF 16V
C602	142601065	Elect 1 μF 50V
C603	142601065	Elect 1 μF 50V
C604	142633965	Elect 3.3 μF 50V
C605	142322165	Elect 220 μF 16V
C606	153610241	Styrol 1000 pF ±5%
C608	142601065	Elect 1 μF 50V
C609	150618341	Film 0.018 μF ±5%
C610	150618341	Film 0.018 μF ±5%
C611	171682155	Ceramic 820 pF ±10%
C612	171682155	Ceramic 820 pF ±10%
C613	142601065	Elect 1 μF 50V
C614	142601065	Elect 1 μF 50V
		P100—RESISTORS (All Resistors are ±5% and ¼W)
R1	111847325	47KΩ 1/8W
R2	111847025	47 Ω 1/8W
R3	111822125	220 Ω 1/8W
R4	111868225	6.8KΩ 1/8W
R5	111843225	4.3KΩ 1/8W
R6	111812325	12KΩ 1/8W
R7	111847325	47KΩ 1/8W
R8	111882425	820KΩ 1/8W
R9	111822125	220 Ω 1/8W
R10	111822125	220 Ω 1/8W
R11	111810125	100 Ω 1/8W
⚠ R12	111822125	220 Ω 1/8W
⚠ R102	113282123	820 Ω 2W
⚠ R103	113215223	1.5KΩ 2W
R104	113282123	820 Ω 2W

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REF. DESIG.	PARTS NO.	DESCRIPTION
R105	111510121	100 Ω 1/2W
⚠ R106	113156123	560 Ω 1W
⚠ R107	113110023	10 Ω 1W
⚠ R108	113110023	10 Ω 1W
R109	111522221	2.2KΩ 1/2W
R110	111522221	2.2KΩ 1/2W
R111	111522221	2.2KΩ 1/2W
R112	111522221	2.2KΩ 1/2W
⚠ R115	112410021	10 Ω
⚠ R116	112410021	10 Ω
R117	111447325	47KΩ
R118	111468325	68KΩ
R120	111410325	10KΩ
R121	111401025	1 Ω
R122	111422225	2.2KΩ
R123	111410125	100 Ω
R124	111456325	56KΩ
R125	111456325	56KΩ
R126	111456325	56KΩ
R127	111456325	56KΩ
R128	111482125	820 Ω
R129	111410325	10KΩ
R130	111456125	560 Ω
R131	111456125	560 Ω
R132	111410225	1KΩ
R133	111410225	1KΩ
R134	111482125	820 Ω
R301	111433125	330 Ω
R302	111433125	330 Ω
R303	111433125	330 Ω
R304	111433125	330 Ω
R305	111422225	2.2KΩ
R306	111422225	2.2KΩ
R307	111410425	100KΩ
R308	111410425	100KΩ
R309	111433125	330 Ω
R310	111433125	330 Ω
R317	111456425	560KΩ
R318	111456425	560KΩ
R319	111433125	330 Ω
R320	111433125	330 Ω
R321	111456325	56KΩ
R322	111456325	56KΩ
R323	111468125	680 Ω
R324	111468125	680 Ω
R325	111430325	30KΩ
R326	111430325	30KΩ
R327	111439425	390KΩ
R328	111439425	390KΩ
R329	111422425	220KΩ
R330	111422425	220KΩ
R331	111422125	220 Ω
R332	111422125	220 Ω
⚠ R401	113118123	180 Ω 1W
R402	111447325	47KΩ
R403	111447025	47 Ω
R404	111410325	10KΩ
R406	111433225	3.3KΩ
R407	111410125	100 Ω
R408	111410425	100KΩ
R409	111427225	2.7KΩ
R410	111427225	2.7KΩ
R411	111410425	100KΩ
R412	111410425	100KΩ
R413	111410425	100KΩ
R414	111410425	100KΩ
R415	111451325	51KΩ
R416	111451325	51KΩ
R417	111433125	330 Ω
R418	111433125	330 Ω
R419	111433125	330 Ω

REF. DESIG.	PARTS NO.	DESCRIPTION
R420	111410125	100 Ω
R444	111482025	82 Ω
R501	111422125	220 Ω
R502	111456125	560 Ω
R503	111410125	100 Ω
R504	111412225	1.2KΩ
R505	111427125	270 Ω
R506	111433125	330 Ω
R507	111447025	47 Ω
R508	111422125	220 Ω
R509	111482125	820 Ω
R510	111410225	1KΩ
R511	111447225	4.7KΩ
R512	111422125	220 Ω
R513	111433225	3.3KΩ
R514	111415325	15KΩ
R515	111482025	82 Ω
R516	111410225	1KΩ
R517	111415325	15KΩ
R518	111410325	10KΩ
R519	111410225	1KΩ
R520	111447325	47KΩ
R521	111410125	100 Ω
R522	111447325	47KΩ
R523	111447325	47KΩ
R524	111410325	10KΩ
R526	111422125	220 Ω
R527	111422325	22KΩ
R528	111447325	47KΩ
R529	111410225	1KΩ
R530	111482125	820 Ω
R531	111447225	4.7KΩ
R532	111410125	100 Ω
R533	111447225	4.7KΩ
R534	111447225	4.7KΩ
R535	111447325	47KΩ
R536	111447125	470 Ω
R537	111410325	10KΩ
R538	111422325	22KΩ
R539	111447325	47KΩ
R540	111433225	3.3KΩ
R541	111433225	3.3KΩ
R601	111462425	620KΩ
R602	111410525	1MΩ
R603	111422225	2.2KΩ
R604	111447225	4.7KΩ
R605	111410225	1KΩ
R606	111491225	9.1KΩ
R607	111410225	1KΩ
R608	111410425	100KΩ
R609	111468325	68KΩ
R610	111447225	4.7KΩ
R611	111447225	4.7KΩ
R612	111433225	3.3KΩ
R613	111433225	3.3KΩ
VR501	NCP-035-0	47KΩ (B), Trimming
VR502	NCP-035-0	47KΩ (B), Trimming
VR601	NCP-016-0	5KΩ (B), Trimming
		P100-SEMICONDUCTORS
D1	1SV147	FM Varactor
D2	1SV147	FM Varactor
D3	1SV147	FM Varactor
⚠ D101	1N4002	Diode
⚠ D102	1N4002	Diode
⚠ D103	1N4002	Diode
⚠ D104	1N4002	Diode
⚠ D105	RS403L	Diode
⚠ D106	1N753A	Zener
⚠ D107	1N753A	Zener

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REF. DESIG.	PARTS NO.	DESCRIPTION
⚠ D108	1N968B	Zener
D109	1N4148	Diode
D110	1N4148	Diode
⚠ D111	1N963B	Zener
⚠ D401	1N752A	Zener
D402	1N4148	Diode
D403	1N4148	Diode
D404	1N4148	Diode
D501	SVC321SP-D	AM Varactor
D502	SVC321SP-D	AM Varactor
D503	1N4148	Diode
D504	1N4148	Diode
D505	1N4148	Diode
D506	1N4148	Diode
D507	1N4148	Diode
D508	1N4148	Diode
D509	1N4148	Diode
D601	1N4148	Diode
Q1	2SK241	F.E.T. (Y)
Q2	KTC1923	Transistor (O)
Q3	2SK161	F.E.T (Y)
Q4	2SK161	F.E.T (Y)
Q5	KTC1923	Transistor (O)
Q101	KTC1815	Transistor (GR/Y)
Q102	KTC1815	Transistor (GR/Y)
Q103	KTC1627	Transistor (Y)
Q401	2SK161	F.E.T (Y)
Q402	KTC2240	Transistor (GR)
Q403	KTC1815	Transistor (GR/Y)
Q501	KTC380	Transistor (Y/O)
Q502	KTA1015	Transistor (GR/Y)
Q503	KTC1815	Transistor (GR/Y)
Q504	KTC1815	Transistor (GR/Y)
Q505	KTC1815	Transistor (GR/Y)
Q506	KTA1015	Transistor (GR/Y)
Q507	KTC1815	Transistor (GR/Y)
Q508	KTA1015	Transistor (GR/Y)
Q509	KTC1815	Transistor (GR/Y)
Q510	KTC1815	Transistor (GR/Y)
Q601	KTC1815	Transistor (GR/Y)
⚠ IC101	UPC78M12	I.C
⚠ IC102	STK4142II	I.C
IC301	NJM4558S	I.C
IC401	TC9147-BP	I.C
IC402	TD6104-P	I.C
IC501	LA1265	I.C
IC601	KIA 7343-AP	I.C
		P100—MISCELLANEOUS
L1	NTC-035-0	Antenna Coil, FM-A
L2	NTC-034-0	Antenna Coil, FM-B
L3	NTC-036-0	OSC Coil, FM
L4	NTH-050-0	Coil, 2.2μH
L5	NTH-050-0	Coil, 2.2μH
L101	NTH-043-0	Choke Coil, 1μH
L102	NTH-043-0	Choke Coil, 1μH
L501	NTH-030-0	Coil, 4.7mH
T1	NTC-037-0	RF Coil, FM
T2	NTE-012-0	IFT Coil, FM
T501	NTE-016-0	Coil, FM DET-A
T502	NTE-017-0	Coil, FM DET-B
T503	NTE-018-0	IFTCoil AM
T504	NTB-043-0	Antenna Coil, AM
T505	NTB-035-0	OSC Coil, AM
CF501	NTF-017-A	Ceramic Filter, FM
CF502	NTF-017-A	Ceramic Filter, FM
CF503	NTF-028-0	Ceramic Filter, AM
CF504	NTF-029-0	Ceramic Filter, AM
TC501	NCM-006-0	Ceramic Trimmer
TC502	NCM-006-0	Ceramic Trimmer
FIL601	NTF-032-0	MPX Filter
FIL602	NTF-032-0	MPX Filter
TAL401	NSS-002-0	X-TAL OSC, 7.2MHz
⚠ RY101	NSR-017-0	Relay
SW2	NSG-109-0	Push Switch
SW3	NSG-099-0	Push Switch
SW4	NSG-099-0	Push Switch
SW401	NSG-095-0	Tact Switch
SW402	NSG-095-0	Tact Switch
SW403	NSG-095-0	Tact Switch
SW404	NSG-095-0	Tact Switch
SW405	NSG-095-0	Tact Switch
SW406	NSG-095-0	Tact Switch
SW407	NSG-095-0	Tact Switch
SW408	NSG-095-0	Tact Switch
SW409	NSG-095-0	Tact Switch
SW410	NSG-095-0	Tact Switch
F102	NEK-095-0	Fuse (0.75A, 125V)
⚠ J101	NKB-003-0	Pin Jack (4P)
J103	NKB-004-0	Pin Jack (6P)
J104	NKA-003-A	Terminal, Antenna
J105	NKE-013-0	Terminal, Antenna (8P)

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REF. DESIG.	PARTS NO.	DESCRIPTION
		P500 CONTROL CIRCUIT BOARD
P500	NNP-328-11	P.W. Borad Control
	NWM-139-11	P.W. Borad Assembly
		P500-CAPACITORS
C205	142622961	Elect 2.2μF 50V
C206	142622961	Elect 2.2μF 50V
C207	150618341	Film 0.018μF ±5%
C208	150618341	Film 0.018μF ± 5%
C209	142668861	Elect 0.68μF 50V
C210	142668861	Elect 0.68μF 50V
C211	150610341	Film 0.01μF ±5%
C212	150610341	Film 0.01μF ±5%
C213	150682341	Film 0.082μF ±5%
C214	150682341	Film 0.082μF ±5%
C215	150647241	Film 0.0047μF ±5%
C216	150647241	Film 0.0047μF ±5%
C217	150612341	Film 0.012μF ±5%
C218	150612341	Film 0.012μF ±5%
C219	150612241	Film 0.0012μF ±5%
C220	150612241	Film 0.0012μF ±5%
C221	150647241	Film 0.0047μF ±5%
C222	150647241	Film 0.0047μF ±5%
C223	171668151	Ceramic 680pF ±10%
C224	171668151	Ceramic 680pF ±10%
C229	142347061	Elect 47μF 16V
C230	142347061	Elect 47μF 16V
C231	142347061	Elect 47μF 16V
C232	142347061	Elect 47μF 16V
C233	188633141	Ceramic 330pF ±5%
C234	188633141	Ceramic 330pF ±5%
C235	142647961	Elect 4.7μF 50V
C236	142647961	Elect 4.7μF 50V
C237	188610041	Ceramic 10pF ±5%
C238	188610041	Ceramic 10pF ±5%
C239	142510061	Elect 10μF 35V
C240	142510061	Elect 10μF 35V
C241	188610141	Ceramic 100pF ±5%
C242	188610141	Ceramic 100pF ±5%
C243	142647961	Elect 4.7μF 50V
C244	142647961	Elect 4.7μF 50V
C246	142647961	Elect 4.7μF 50V
C247	142347061	Elect 47μF 16V
C248	142347061	Elect 47μF 16V
C249	188639141	Ceramic 390pF ±5%
C250	188639141	Ceramic 390pF ±5%
C251	142622961	Elect 2.2μF 50V
C252	142622961	Elect 2.2μF 50V
C253	188668041	Ceramic 68pF ±5%
C254	188668041	Ceramic 68p F ±5%
C261	142647961	Elect 4.7μF 50V
C419	175610391	Ceramic 0.01μF +80% −20%
C420	175610391	Ceramic 0.01μF +80% −20%
C421	142247061	Elect 47μF 10V
C422	175647391	Ceramic 0.047μF +80% −20%
C424	175647391	Ceramic 0.047μF +80% −20%
C425	175647391	Ceramic 0.047μF +80% −20%
C426	175647391	Ceramic 0.047μF +80% −20%
C427	142522061	Elect 22μF 35V
		P500—RESISTORS (All Resistors are ±5% and ¼W)
R202	111839125	390 Ω 1/8W
R203	111839125	390 Ω 1/8W
R204	111839125	390 Ω 1/8W
R205	111839125	390 Ω 1/8W
R206	111839125	390 Ω 1/8W
R209	111839125	390 Ω 1/8W
R210	111839125	390 Ω 1/8W
R211	111839125	390 Ω 1/8W
R212	111839125	390 Ω 1/8W
R213	111839125	390 Ω 1/8W
R216	111856225	5.6KΩ 1/8W
R217	111856225	5.6KΩ 1/8W
R218	111856225	5.6KΩ 1/8W
R219	111856225	5.6KΩ 1/8W
R220	111856225	5.6KΩ 1/8W
R223	111856225	5.6KΩ 1/8W
R224	111856225	5.6KΩ 1/8W
R225	111856225	5.6KΩ 1/8W
R226	111856225	5.6KΩ 1/8W
R227	111856225	5.6KΩ 1/8W
R230	111812225	1.2KΩ 1/8W
R231	111815225	1.5KΩ 1/8W
R232	111815225	1.5KΩ 1/8W
R233	111815225	1.5KΩ 1/8W
R234	111815225	1.5KΩ 1/8W
R237	111812225	1.2KΩ 1/8W
R238	111815225	1.5KΩ 1/8W
R239	111815225	1.5KΩ 1/8W
R240	111815225	1.5KΩ 1/8W
R241	111815225	1.5KΩ 1/8W
R244	111815425	150KΩ 1/8W
R245	111810425	100KΩ 1/8W
R246	111837325	37KΩ 1/8W
R247	111827325	27KΩ 1/8W
R248	111822325	22KΩ 1/8W
R251	111815425	150KΩ 1/8W
R252	111810425	100KΩ 1/8W
R253	111837325	37KΩ 1/8W
R254	111827325	27KΩ 1/8W
R255	111815425	150KΩ 1/8W
R257	111447025	47 Ω
R258	111447025	47 Ω
R259	111410125	100 Ω
R260	111410125	100 Ω
R261	111847225	4.7KΩ 1/8W
R262	111847225	4.7KΩ 1/8W
R263	111847225	4.7KΩ 1/8W
R264	111847225	4.7KΩ 1/8W
R265	111827225	2.7KΩ 1/8W
R266	111827225	2.7KΩ 1/8W
R267	111833225	3.3KΩ 1/8W
R268	111833225	3.3KΩ 1/8W
R269	111827325	27KΩ 1/8W
R270	111827325	27KΩ 1/8W
R271	111410225	1KΩ
R272	111410225	1KΩ
R273	111410225	1KΩ
R274	111410225	1KΩ
R275	111447025	47 Ω
R276	111447025	47 Ω
R277	111422225	2.2KΩ
R278	111422225	2.2KΩ
R279	111410225	1KΩ
R280	111410225	1KΩ
R281	111436325	36KΩ
R282	111436325	36KΩ
R283	111415425	150KΩ
R284	111415425	150KΩ
R421	111422125	220 Ω
R422	111422125	220 Ω
R423	111422125	220 Ω
R424	111422325	2.2KΩ
R425	111447325	47KΩ
R426	111447325	47KΩ
R427	111447325	47KΩ

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REF. DESIG.	PARTS NO.	DESCRIPTION
R428	111447325	47KΩ
R429	111447325	47KΩ
R430	111447325	47KΩ
R431	111447325	47KΩ
R432	111447325	47KΩ
R433	111447325	47KΩ
R434	111447325	47KΩ
R435	111447325	47KΩ
R436	111447325	47KΩ
R437	111447325	47KΩ
R438	111447325	47KΩ
R439	111410125	100 Ω
R440	111433125	330 Ω
R441	111433125	330 Ω
R442	111412225	1.2KΩ
R443	111410225	1KΩ
R445	111422125	220 Ω
R446	111415225	1.5KΩ
R447	111410225	1KΩ
R448	111422225	2.2KΩ
VR202	NCW-031-0	250KΩ (B)
VR203	NCW-031-0	250KΩ (B)
VR204	NCW-031-0	250KΩ (B)
VR205	NCW-031-0	250KΩ (B)
VR206	NCW-031-0	250KΩ (B)
VR208	NCW-027-0	200KΩ (W)
VR209	NCW-028-A	100KΩ (A)
		P500-SEMICONDUCTORS
⚠ D405	1N747A	Zener
D406	SLR54GC	L.E.D (Green)
D407	SLR54GC	L.E.D (Green)
D408	SLR54GC	L.E.D (Green)
D409	SLR54GC	L.E.D (Green)
D410	SLR54VRC	L.E.D (Red)
Q202	KTC1815	Transistor (GR/Y)
Q203	KTC1815	Transistor (GR/Y)
Q204	KTC1815	Transistor (GR/Y)
Q205	KTC1815	Transistor (GR/Y)
Q206	KTC1815	Transistor (GR/Y)
Q209	KTC1815	Transistor (GR/Y)
Q210	KTC1815	Transistor (GR/Y)
Q211	KTC1815	Transistor (GR/Y)
Q212	KTC1815	Transistor (GR/Y)
Q213	KTC1815	Transistor (GR/Y)
Q215	KTC1815	Transistor (GR/Y)
Q216	KTC1815	Transistor (GR/Y)
Q404	KTA1015	Transistor (GR/Y)
Q405	KTA1015	Transistor (GR/Y)
IC201	MC4558SN	I.C
IC403	TC9158-P	I.C
		P500-MISCELLANEOUS
S411	NSG-096-A	Tact Switch
S412	NSG-096-A	Tact Switch
S413	NSG-096-A	Tact Switch
FLT401	NEL-028-0	F.L.T
WA1	NKP-034-0	Connetor (9P)
WA2	NKP-032-0	Connetor (7P)
WA3	NKP-031-0	Connetor (4P)
WA4	NKP-032-0	Connetor (7P)
		P502-POWER SWITCH CIRCUIT BOARD
P502	NNP-328-31	P.W Borad Power Switch
	NWM-139-31	P.W. Borad Assembly
⚠ SW101	NSG-108-A	Push Switch
⚠ C101	NCG-003-0	Ceramic 0.01μF 125V
⚠ F101	NEK-094-0	Fuse (1.6A, 125V)
		P503-SPEAKER SELECTOR CIRCUIT BOARD
P503	NNP-328-41	P.W. Borad Speaker Selector
	NWM-139-41	P.W. Borad Assembly
⚠ R113	113133123	330Ω 1W
⚠ R114	113133123	330Ω 1W
⚠ SW1	NSG-098-A	Push Switch
JA101	NKN-033-0	Phone Jack
WA5	NKP-029-0	Connector (4P)
WA6	NKP-031-0	Connector (6P)

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8. TECHNICAL SPECIFICATIONS

AMPLIFIER SECTION:

Rated Power Output, Minimum Continuous Watts per channel from 40Hz to 20kHz, both channels driven into 8 ohms 25W

Total Harmonic Distortion
into 8 ohms 0.3%

I.M. Distortion
at 8 ohms 0.09%

Damping Factor 42

Phono
Input Overload at 1kHz 115mV
Input Sensitivity (Input Impedance, 47 kohms) 2.5mV
Frequency Response (RIAA 20Hz to 20kHz) ..... ±1.5dB
Signal to Noise Ratio (IHF) 73dB

CD, AUX, VIDEO
Input Sensitivity (AUX, VIDEO) 150mV
Input Sensitivity (CD) 150mV
Frequency Response (15Hz-45kHz) ..... ±1dB
Signal to Noise Ratio (IHF) 90dB

FM TUNER SECTION:

Sensitivity
IHF Usable 12.1dBf
IHF 50dB Quieting
(Mono) 16.8dBf
(Stereo) 39.2dBf

Signal to Noise Ratio at 65dBf (98MHz)
(Mono) 72dB
(Stereo) 67dB

Distortion (Mono) at 65dBf
100Hz 0.25%
1000Hz 0.2%
6kHz 0.4%

Distortion (stereo) at 65dBf
100Hz 0.45%
1000Hz 0.3%
6kHz 0.6%

Stereo Separation
100Hz 28dB
1000Hz 40dB
10kHz 25dB

Capture Ratio at 98MHz 1.5dB

Frequency Response
40Hz to 15kHz Mono and Stereo ..... ±1.5dB
Alternate Channel Selectivity 50dB
Spurious Response Rejection 65dB
Image Response (Rejection) 47dB
I.F. Rejection (Balanced) 80dB
A.M. Suppression 50dB
Sub carrier Rejection 30dB

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AM TUNER SECTION:

IHF Usable Sensitivity	300uV/m
Signal to Noise Ratio	45dB
Alternate Channel selectivity	25dB
Image Rejection	40dB
Spurious Response Rejection	30dB
I.F. Rejection	60dB

GENERAL:

Power Requirements	120V AC, 60Hz
Power Consumption at rated output, both channels operating	128W
Idling power (Volume Control at minimum)	20W
Dimensions	
Panel Width	420mm (16.5 inches)
Panel Height	93mm (3.66 inches)
Depth	256mm (10 inches)
Weight	
Unit alone	4.4kg (10lbs)
Packed for Shipment	5.4kg (12lbs)

Specifications and apperance are subject to change for modification without notice.

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SECTION AMPLIFICATION DE PUISSANCE:

Puissance de sroite nominale, Pusissance minimum Continue Par canal, 40Hz-20kHz less deux canaux entrainés
en 8 ohms 25W
Distorsion harmonigue total
en 8 ohms 0.3%
Distorsion dinter modulation
a 8 ohms 0.09%
Facteur d'amortissement 42
Phono
Surcharge d'entrée (1 kHz) 115mV
Sensibilite d'entrée (Impédance d'entrée, 47 k ohms) 2.5mV
Réponse en fréquences, RIAA 20Hz á 20 Hz ..... ± 1.5dB
Rapport signal/bruit (IHF) 73dB

CD, AUX, VIDEO
Sensibilité d'entrée (AUX, VIDEO) 150mV
Sensibilité d'entrée (CD) 150mV
Réponse en fréquences (15Hz-45 kHz) ..... ± 1dB
Rapport signal/bruit (IHF) 90dB

SECTION TUNER FM:

Sensibilité
Sensibilité d'usage(IHF) 12.1dBf
Sensibilité pour un rapport signal/bruit de 50dB
(Mono) 16.8dBf
(Stereo) 39.2dBf
Rapport signal/bruit á 65dBf (98MHz)
(Mono) 72dB
(Stereo) 67dB
Distorsion (Mono) á 65dBf
100Hz 0.25%
1000Hz 0.2%
6kHz 0.4%
Distorsion (Stéreó) a 65dBf
100Hz 0.45%
1000Hz 0.3%
6kHz 0.6%
Séparation stéreó
100Hz 28dB
1000Hz 40dB
10kHz 25dB
Rapport de Capture à 98MHz 1.5dB

Reponse en fréquences
40Hz á 15KHz Mono et Stéreó ..... ± 1.5dB
Sélectivité (porteuse alternative) 50dB
Elmination des parasites 65dB
Réjection d'image 47dB
Réjection IF 80dB
Suppression AM 50dB
Réjection de la sous-porteuse 30dB

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SECTION TUNER AM:

Sensibilité d'usage	300uV/m
Rapport signal/bruit	45dB
Sélectivité (Porteuse alternative)	25dB
Réjection d'image	40dB
Réjection des parasites	30dB
Rejection d'IF	60dB

GENERALITES:

Source d'alimentation	120V AC, 60Hz
Consommation avec 2 canaux à pleine charge	128W
Puissance réactive (réglage de puissance á minimum)	20W
Dimensions	
Largeur du panneau	420mm
Hauteur du panneau	93mm
Profondeur	256mm
Poids	
Poids net	4.4kg
Poids bruit (avec emballage)	5.4kg

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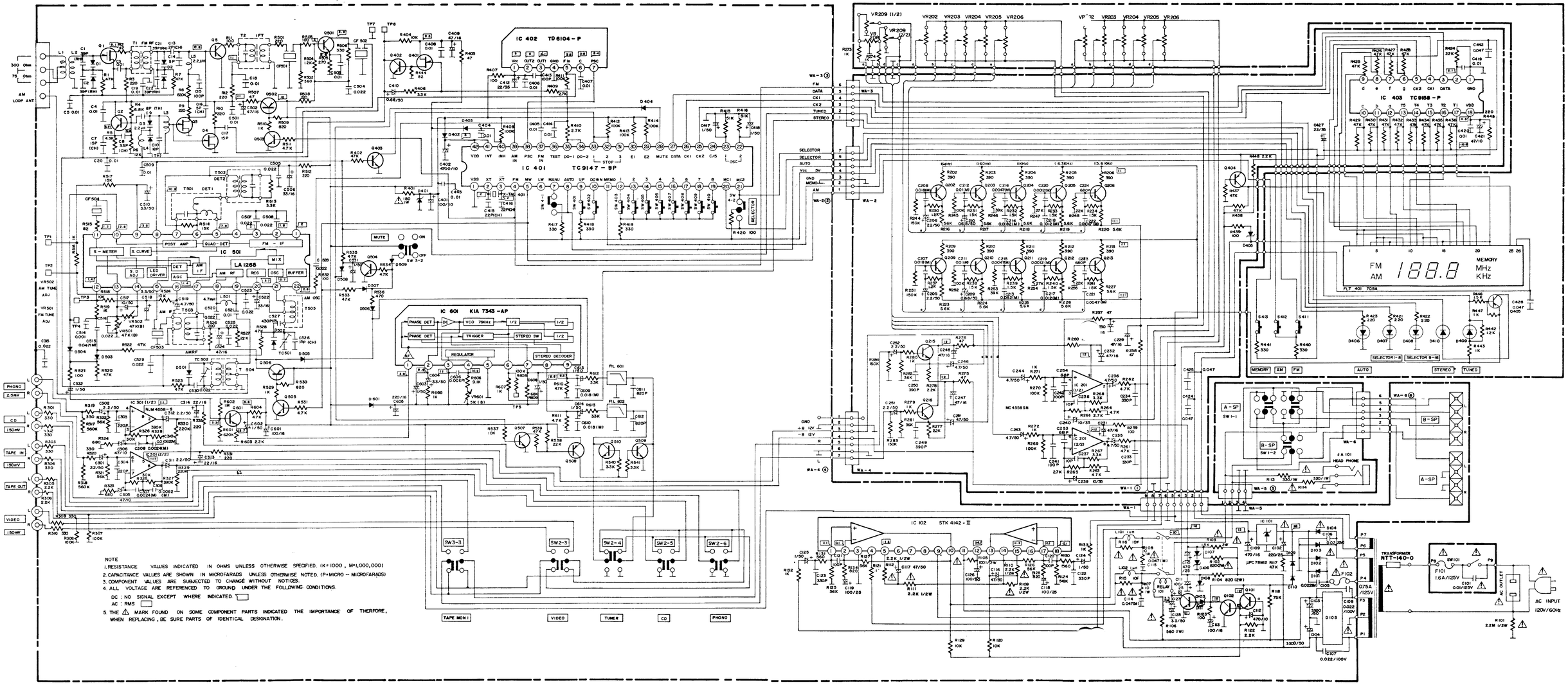
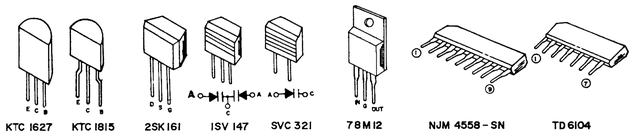
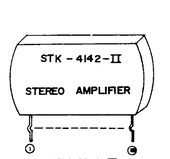
9. SCHEMATIC DIAGRAM

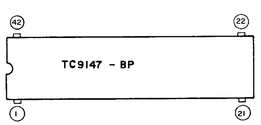


SYMBOL NO	DISCRIPTION / USE	SYMBOL NO	DISCRIPTION / USE	SYMBOL NO	DISCRIPTION / USE
Q101, Q102 Q202 – Q206 Q26, Q35 Q403, Q503 Q504, Q505 Q507, Q509 Q209 – Q213	TRANSISTOR KTC 1815 –GR/Y	D105	DIODE BRIDGE RS 403–L	T504	COIL AM ANT
		D109, D110 D402, D405 D404, D505 D506, D507 D508 D509 D601	DIODE SWITCHING IN4148	T505	COIL AM OSC
Q404, Q502 Q506, Q508 Q403	TRANSISTOR KTA1015 –GR/Y			CF501, CF502	FILTER CERAMIC 10.7 MA8HA
				CF502	FILTER CERAMIC SFE 10.7 MA8HA
Q2, Q5	TRANSISTOR KTC 1923 –O			CF504	FILTER CERAMIC BFU 450 B
Q103	TRANSISTOR KTC 1627 –Y	D406, D407 D408, D409	DIODE L.E.D SLR 540C	FIL601 FIL602	FILTER MPX SFU 450C 4N
Q501	TRANSISTOR KTC 380 –O	D410	DIODE L.E.D SLR 54UPC	X-TAL 401	X-TAL OSC 7.2 MHz
Q402	TRANSISTOR KTC2240 –GR	L1	COIL FM ANT (A)	SW1	SWITCH POWER
Q1	FET 2SK 241 – Y	L2	COIL FM ANT (B)	SW2	SWITCH FUNCTION
Q3, Q4 Q401	FET 2SK 161 – Y	L3	COIL FM OSC	SW3	SWITCH MUTE / MONITOR
D501, D502	DIODE VARACTOR SVC – 321 – SP	L4, L5	COIL INDUCTOR 2.2 UH	SW4	SWITCH TUNING MANUAL / AUTO
D1, D2, D3	DIODE VARACTOR 1SV – 147	L101, L102	COIL INDUCTOR 1UH		
D401	DIODE ZENER IN752A				
D106, D107 D701	DIODE ZENER IN 753A	T1	COIL FM RF		
D108	DIODE ZENER IN 968A	T2	COIL FM IFT		
D111	DIODE ZENER IN 963 B	T501	COIL FM DET (A)		
D405	DIODE ZENER IN 747 A	T502	COIL FM DET (B)		
D101, D102 D103, D104	DIODE IN4002	T503	COIL AM IFT		

Extenal Appearance of Transistor and IC







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