



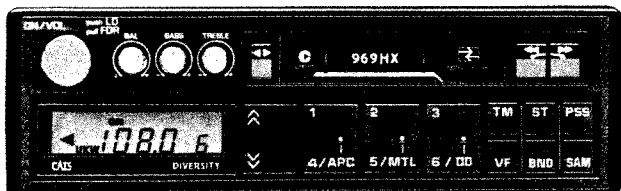
Clarion Co., Ltd.

Export Division—22-3, Shibuya 2-chome, Shibuya-ku, Tokyo, 150 Japan

Tel: 03-400-1121 Fax: 03-400-8679 Telex: J22908, J22152

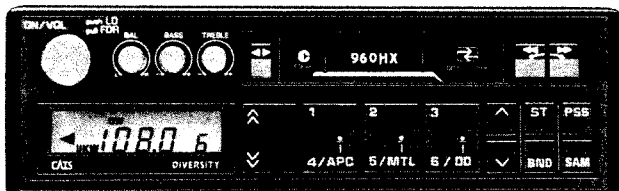
Service Dept.—50 Kamitoda, Toda-shi, Saitama, 335 Japan Tel: 0484-43-1111 Telex: J2962628 CLAFAC-J

Clarion Service Manual



Model 969HX

Model **969HX** (PE-9092A)
960HX (PE-9093A)



Model 960HX

■ SPECIFICATIONS:

Radio section

Circuit system: Superheterodyne
Tuning system: Electronic tuning
Receiving frequency: LW 153kHz to 281kHz
MW 531kHz to 1,602kHz
UKW(FM) 87.5MHz to 108MHz

Intermediate frequency:
LW, MW 459kHz
UKW(FM) 10.7MHz

Tape section

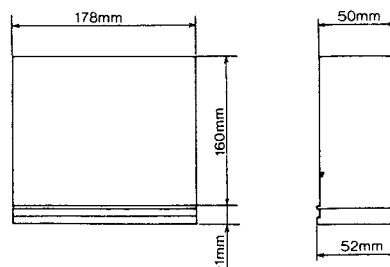
Reproduction system: Auto reversing
4 track, 2 channel stereo
cassette tape playback
(Monaural also capable)
Tape speed: 4.76cm/sec. (1 7/8 ips)

Composite

Load impedance: 4Ω×4
Power output: 4.5W×4
(at 10% distortion TYP.)
More than 8W×4
(at max. output TYP.)

Power supply voltage: DC 14.4V(10.8V to 15.6V)
Negative ground
Power consumption: Less than 5A
(at max. output)

Dimensions:

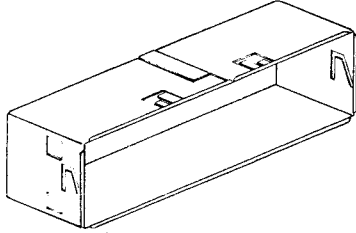



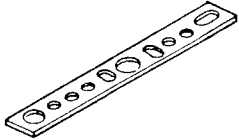
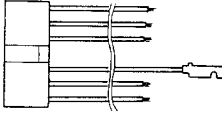
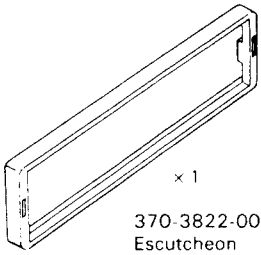
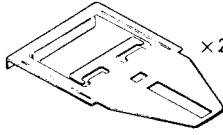
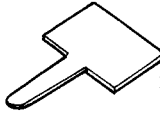
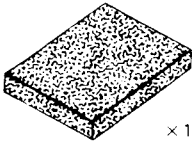




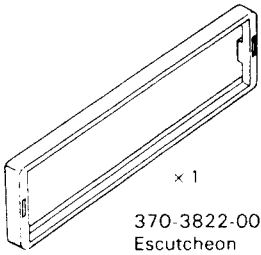
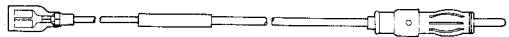


Weight: 1.6kg

- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
- Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

COMPONENTS VIEW:

- 969HX (PE-9092A-A)
- 960HX (PE-9093A-A)

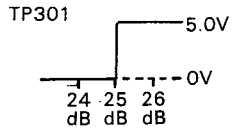
Main unit		Parts bag	921-8203-00(only 969HX)	1
Mounting bracket	300-7110-00			1
		 ×4 073-0649-00 Terminal		
		 ×4 073-0650-00 Terminal		
		 ×4 074-0804-00 Outlet socket		
Mounting bracket	300-6954-00	Extension lead	852-9211-00(only 960HX)	1
				
Parts bag	922-1396-00	Parts bag	921-8022-01	1
		 ×2 330-8216-00 Hook plate		
		 ×2 321-0911-00 Clamp		
		 ×1 345-2934-00 Cushion		
		 ×1 345-3653-01 Spacer		
		 ×1 725-0181-00 Plate nut		
		 ×1 700-5016-10 Tap screw		
		 ×1 722-0314-00 Nut		
Film antenna	089-0004-00	Antenna jumper	093-0846-01	1
				

FEATURES:

- MW/LW/UKW-MPX electronic tuning radio with auto reverse stereo cassette player (FF, REW lock).
- Provided radio traffic information (VF) system. (969HX)
- MTL (Tape selector).
- LD (Loudness).
- Dolby NR (NR).
- ARM-30 mechanism.
- APC (Automatic Program Control).
- UKW diversity tuning system.

ADJUSTMENT:

Adjustment item	Adjustment point	Procedure
S-meter (MAIN)	VR1	1. Connect the digital voltmeter to TP3. 2. Input the 98.0MHz frequency at 15dB (30% MOD./f=400Hz) and adjust the level to $1.6^{+0.1}_{-0.3}$ V by VR1.
OV	IFT2	1. Connect the digital voltmeter to TP1 and TP2. 2. Input the 98.0MHz/40dB signal (30% MOD./f=400Hz) and adjust the reading of digital voltmeter to $0.000V \pm 50mV$ by IFT2.
SD	VR2	1. Input the 98.0MHz/25dB signal (30% MOD./f=400Hz). 2. Adjust VR2 so that the voltage of TP301 is in the range 0V to 5V.
S-meter (SUB)	VR101	1. Connect the digital voltmeter to TP103. 2. Adjust the level by VR101 similar to MAIN.
OV	IFT102	1. Connect the digital voltmeter to TP101 and TP102. 2. Follow the same adjustment steps as MAIN above. (IFT102)
SASC	VR3	1. Input the 98.0MHz/65dB, 7kHz modulation frequency, 30% modulation degree SSG signal, and then turn on ST. SW. 2. Adjust the output level of the volume controller to 0dBm (0.775V). 3. Set the SSG output to 40dB and adjust VR3 so that the output level is -3dBm.
Separation	VR104	1. Input the 98.0MHz, connect the output of a stereo modulator to the external modulation terminal, and input a 65dB SSG signal. 2. Set the stereo modulator to the L or R ch and adjust VR104 so that the maximum separation is obtained.
Pilot canceller	VR102	1. Input the 98.0MHz/65dB, modulation (PL 10%). 2. Adjust VR102 so that output of the set is minimum.
125Hz	VR103	1. Input the 98.0MHz/65dB non-modulated SSG signal, and turn on VF. SW. 2. Connect the frequency counter to TP104 through a 22kΩ resistor and adjust VR103 so that the counter indicates 125Hz. In the case, 25sec. later, seeking occurs.
Dolby NR	VR201 and VR202	Insert a Dolby level test tape (400Hz-200nWb/m), connect the milli-volt meter to TP201 and TP202, and adjust VR201 and VR202 to obtain an output of 300mV.



[NOTE] After the adjustment of frequency range, be sure that:

- (1) Band edge frequency of LW shall be 148.5kHz - 20kHz
- (2) Band edge frequency of UKW shall be 87.5MHz + 100kHz
- 160kHz
at low end. And shall be lower than 108.16MHz at upper end.

- SPECIFICATION - LIMIT - Quieting sensitivity: MW Less than 33dB (at 20dB S/N)
LW Less than 40dB (at 20dB S/N)
UKW Less than 12dB (at 30dB S/N)
- Stereo separation: UKW More than 20dB

ADJUSTMENTS: ● SPECIFICATION - LIMIT - wow & flutter : Less than 0.25%(W.R.M.S.) (TAPE MECHANISM)

1. Head Azimuth Adjustment (See Fig. 1)

○ Improper head azimuth is one of the causes which give rise to poor sound quality, crosstalk, etc. at the time of playback. If azimuth of the head is not proper, adjust as follows. However, to perform this adjustment, load the test tape and use the adjustment use screwdriver, inserting it through the hole in the lever mechanism (frame ass'y).

- 1) Play the test tape (315Hz, -10VU) and adjust the amplifier's volume control and balance control so that the output levels (gains of the playback system) of the left and right channels become equal.
- 2) Then play the test tape (8kHz, -10VU) and adjust the head azimuth adjusting screw so that the output level in both the forward and reverse directions of

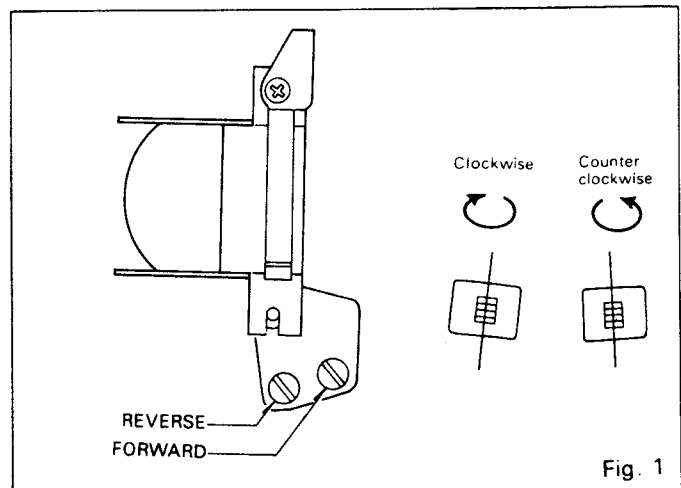


Fig. 1

play becomes close to the respective peak (maximum output level) point. Then lock the head azimuth adjusting screw.

2. Fast Forward, Rewind Gear Alignment

(See Fig. 2)

- If the mechanism does not operate properly and abnormal sound (gear noise) is produced at the time of fast forward and rewind, first of all check whether the sound is produced during fast forward (FF) or rewinding (REW). If it is produced during FF, adjust by bending the claw (A) to the left or right with radio pliers, etc., and if it is produced during REW, adjust by bending the claw (B) in the same manner. Adjust so that the clearance at this time between the flywheel and FF, REW gear becomes about 0.1 to 0.2mm.

- 1) If the gear engagement is loose and the gears produce a large noise, bend the claw away from the center line.

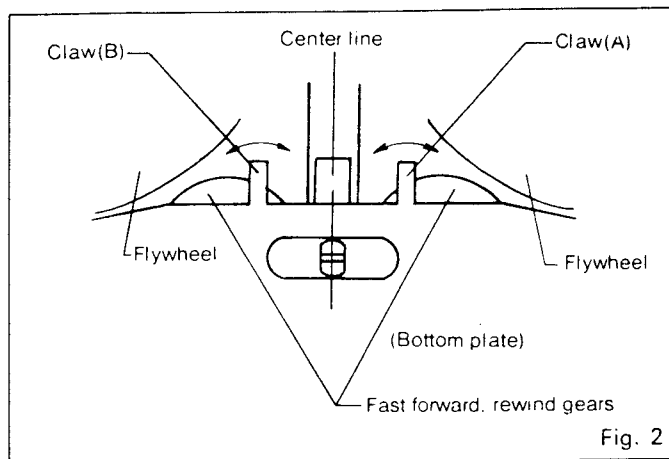


Fig. 2

- 2) If the gear engagement is too hard and there is no clearance between the gears, bend the claw toward the center line.

3. Adjustment of Power Switch (See Fig. 3)

- If power does not turn on when pack is inserted (loaded), or if power does not turn off after ejecting the pack, and the underlying cause is found to be misadjustment of the power switch, adjust the switch at proper position by bending upward or downward the adjusting claw of the guide arm ass'y by means of radio pliers, etc. However, make sure that at the time of ejecting there is a clearance of at least 0.2mm to 0.3mm between the body of the switch and the switch lever.

- 1) If power does not turn on when loading pack, adjust by bending the adjusting claw downward.

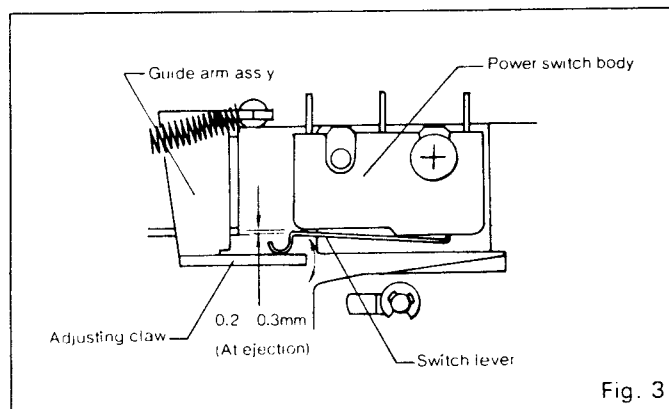


Fig. 3

- 2) If power does not turn off when ejecting pack, adjust by bending the adjusting claw upward.

4. Adjustment of Suction Plunger (See Fig. 4)

- If it is not possible to hold the fast forward and rewind operations due to improper position of the plunger, adjust the position of the plunger.

To adjust, first load cassette. When cassette is loaded, the holding piece (or core plate) will come near the plunger. Now loosen the machine screws with which the plunger ass'y is fixed, adjust the position of the plunger ass'y so that the holding piece touches the plunger core and comes maximum to the right and fix it there by tightening the machine screws. However, at this time take care of the following matters.

- 1) If the plunger core attached to the holding piece is too much separated (lies too much toward the right side), it will not be attached and thus fast forward and rewind operations will not be held.

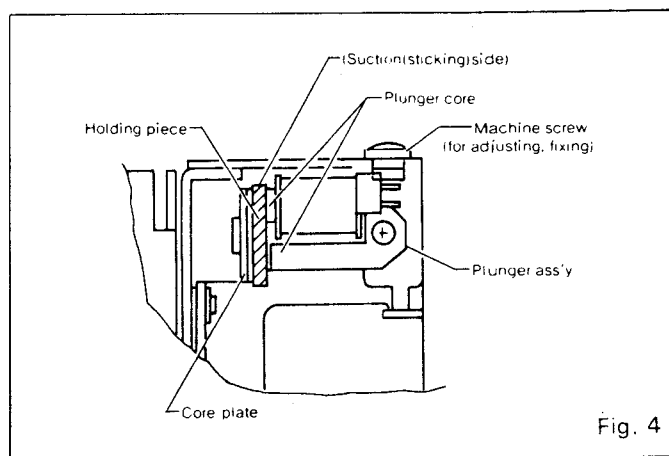


Fig. 4

- 2) On the contrary, if it is too much close (lies too much toward the left side), the holding piece will stick but the fast forward or rewind operation will not be held or if held, will get released upon being subjected to shock.

EXPLANATION OF IC's:

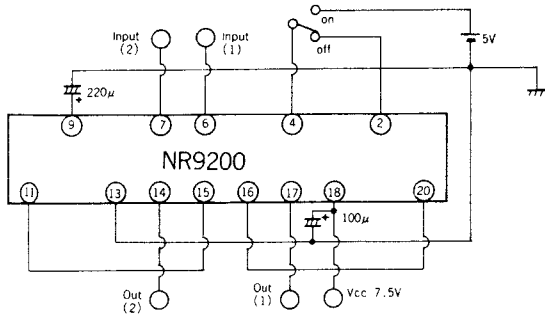
NR9200 051-0523-00 Dolby
NR9200A-1 051-0523-02

Absolute Maximum Ratings

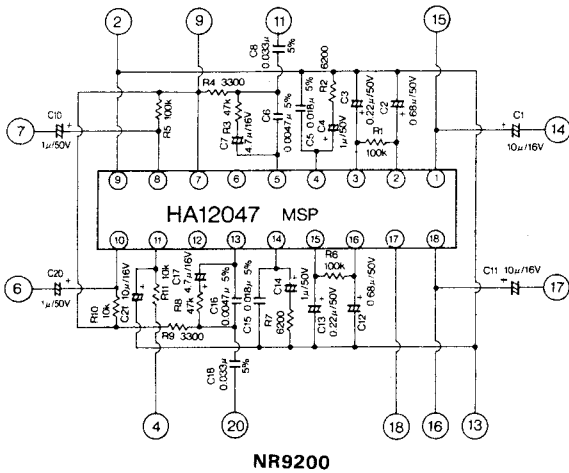
Supply Voltage V_{CC} 15V
Power Dissipation P_D 800mW

Electrical Characteristics (T_a=25°C, V_{CC}=7.5V, 300mV=0dB, f=400Hz, NR OFF V₁₄₍₁₇₎=0dB)

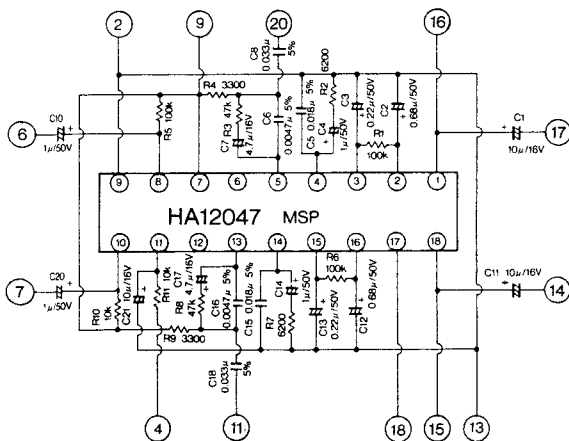
Item	Symbol	MIN	TYP	MAX	Unit	NR	Condition
Operation Voltage	V _{ope}	6.0	7.5	12	V	—	
Voltage Gain	G _{VIA}	20.5	22	23.5	dB	off	20log $\frac{V_{OUT}}{V_{IN}}$, f=400Hz, V _{IN(0)} =0dB
Output Voltage	V _{o max}	14.5	16		dB	on	V _{IN(0)} , f=1kHz, THD=1%
Total Harmonic Distortion (DECI)	THD _(DECI)		0.05	0.3	%	on	f=1kHz, V _{IN(0)} =0dB



Circuit Diagram



NR9200

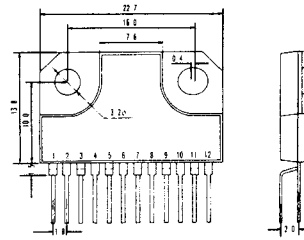


NR9200A-1

Note) Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
Noise Reduction System manufacture under license from Dolby Laboratories Licensing Corporation.

TA7280P 051-0784-00
TA7281P 051-0785-00 22W BTL Power Amp.

Outward Form



Maximum Ratings (T_a=25°C)

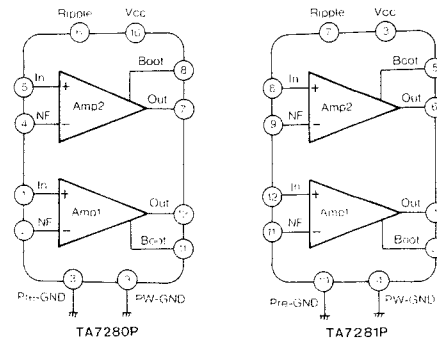
Item	Symbol	Rating	Unit
Momentary supply voltage (0.2sec)	V _{CC surge}	45	V
Static supply voltage	V _{CC DC}	25	V
Operating power voltage	V _{CC opr}	18	V
Output current (Momentary)	I _{o (peak)}	4.5	A
Power dissipation	P _D	25	W

Electrical Characteristics

(V_{CC}=13.2V, R_L=4Ω, R_G=600Ω, f=1kHz, T_a=25°C)

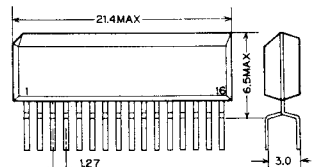
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Zero signal supply current	I _{CC0}	V _{IN} =0	—	80	145	mA	
Output power	P _{OUT(1)}	THD=10%, V _{CC} =14.4V	—	22	—	W	
	P _{OUT(2)}	THD=10%	16	19	—	W	
	P _{OUT(3)}	THD=1%	12	15	—	W	
Total harmonic distortion	THD ₍₁₎	P _{OUT} =4W, G _v =40dB	—	0.03	0.25	%	
Output offset voltage	V _{OFF}	V _{IN} =0	—	0	0.35	V	
Voltage gain	G _{V(1)}	V _{OUT} =0dBm	—	40	—	dB	
Noise output voltage	V _{NO(1)}	R _G =0, DIN45405 noise filter	—	0.14	—	mVrms	
Ripple reduction ratio	R-R ₍₁₎	f _{ripple} =100Hz, V _{ripple} =0dBm	—	-52	-40	dB	
Output power	P _{OUT(4)}	THD=10%	5	5.8	—	W	
DUAL Connection	Total harmonic distortion	THD ₍₂₎	P _{OUT} =1W	—	0.06	0.30	%
	Voltage gain	G _{V(2)}	V _{OUT} =0dBm	50	52	54	dB
	Noise output voltage	V _{NO(2)}	R _G =10kΩ, BW=20Hz-20kHz	—	0.7	1.5	mVrms
Ripple reduction ratio	R-R ₍₂₎	f _{ripple} =100Hz, V _{ripple} =0dBm	—	-52	-40	dB	
Crosstalk	C:T	V _{OUT} =0dBm	—	-57	—	dB	
input resistance	R _{IN}	f=1kHz	—	33	—	kΩ	

Block Diagram



TA7411AP 051-0798-00 FM IF System
TA7411AP-CLA 051-0798-01

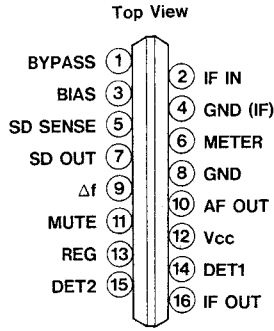
Outward Form



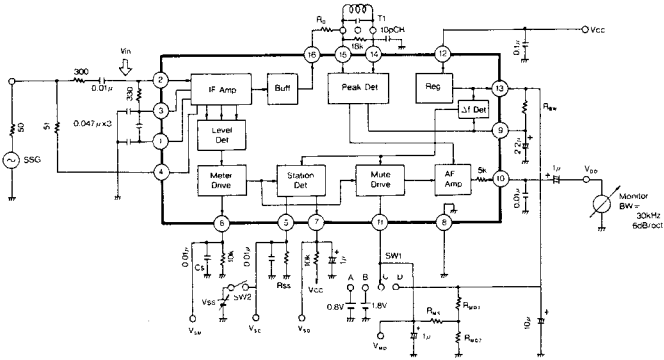
Function

- Differential 6 stage IF limiter amp.
- Signal meter output.
- Differential peak detection.
- Station detection.
- Band muting.
- Signal intensity muting.

Terminal Connection



Block Diagram and Test Circuit



Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage	V _{CC}	16	V
Power dissipation	P _D	750	mW
Tuning indication current	I _T max	20	mA
Outflow current	I _{IS} max	5	mA

Electrical Characteristics

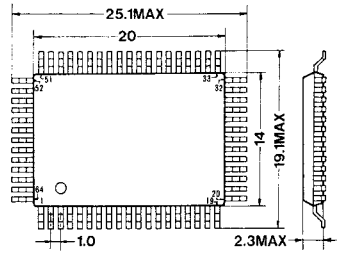
(V_{CC} = 8.5V, f_{in} = 10.7MHz, Dev = ± 75kHz, f_m = 400Hz, V_{in} = 80dBμ, SW1 = A (Mute off), SW2 = off)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply current in no signal state	I _{CC}	V _{in} = 0, SW1 = C	10	13.5	19	mA
Limiting sensitivity	V _{in(lim)}		-	33	35	dBμ
Detection output	V _{DO}		350	430	550	mVrms
Total harmonic distortion	THD	Dev = ± 22.5kHz, R ₀ = 1.3kΩ	-	0.04	0.3	%
Signal to noise ratio	S/N		71	78	-	dB
AM rejection ratio	AMR	AM = 30%	-	50	-	dB
Signal meter output	V _{SM1}	V _{in} = 0dBμ	-	0	0.3	V
	V _{SM2}	V _{in} = 50dBμ	0.5	1.5	2.5	
	V _{SM3}	V _{in} = 70dBμ	2.6	3.8	5.1	
	V _{SM4}	V _{in} = 100dBμ	5.4	6.5	6.8	
Soft muting damping amount	ATT1	SW1 = A	35	40	45	dB
	ATT2	SW1 = B	4	7	11	
Soft muting drive voltage	V _{MD1}	V _{in} = 50dBμ, R _{MD1} = 7.5kΩ	-	3.5	-	V
	V _{MD2}	V _{in} = 80dBμ, R _{MD2} = 2.7kΩ, R _{MS} = 33kΩ	-	6.5	-	
Muting band	BW _M	R _M = 12kΩ, SW1 = C	-	± 70	-	kHz
Station detection sensitivity	V _{SS}	SW2 = ON, V _{DO} = L-H	0.8	1	1.2	V
Station detection control voltage	V _{SC1}	V _{in} = 50dBμ, R _{SS} = 10kΩ	-	1.6	-	V
	V _{SC2}	V _{in} = 80dBμ	-	3.8	-	
Station detection band	BW _{SS}	R _{SS} = 12kΩ	-	± 45	-	kHz
AF output resistance	R _O		-	5	-	kΩ

*TA7411AP.CLA: 3.55 - 4.3(V)

μPD1714G-526-12 051-0794-00 PLL Frequency Synthesizer & Tuner Controller

I Outward Form



II Outline

- This IC, which can receive FM, MW and LW, is a complete 1-chip controller incorporating a prescaler, PLL frequency synthesizer and LCD driver.
- (1) Single power source, 5V ± 10%.
 - (2) Prescaler incorporate (150MHz).
 - (3) PLL frequency synthesizer incorporated.
 - (4) LCD driver incorporated (1/2 duty, 1/2 bias, driven by 5V ± 10%, frame frequency : 100Hz).
 - (5) Preset memory : 24 stations (FM : 12, MW : 6, LW : 6).
 - (6) Preset memory channel display by 7-segment number.
 - (7) One station each of last channel memory FM, FM(SAM), MW and LW. 4 stations in total.
 - (8) With signal auto memory function. Independent call available using 6 stations (auto write enable memory) of the FM preset memory.
 - (9) Music selection by manual tuning (M. UP/DOWN key) and auto tuning (SEEK UP/DOWN key) (saw-tooth wave tuning, with IF counter).
 - (10) With AUTO VF RETUNE function.
 - (11) Auto tuning of the ARI (traffic information) station available.
 - (12) STEREO and SK display available.
 - (13) RADIO/TAPE dual function key (4CH/APC, 5CH/MTL, 6CH/□).
 - (14) With LOUDNESS control terminal.

III Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage	V _{DD}	-0.3 ~ +6.0	V
Input voltage	V _I	-0.3 ~ +V _{DD}	V
Output voltage	V _O	-0.3 ~ +V _{DD}	V
Output sink current	I _O	10	mA

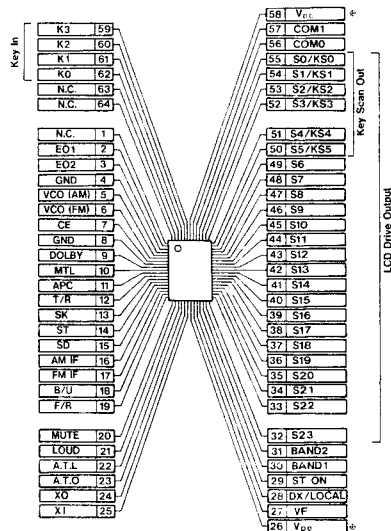
IV Receive Bands

Band	Frequency Range	Channel Space		Comparative Frequency	Intermediate Frequency
		Manual	Auto		
UKW	87.50 ~ 108.00MHz	25kHz	50kHz	12.5kHz	10.7MHz
MW	531 ~ 1602kHz	9kHz	9kHz	9kHz	459MHz
LW	153 ~ 281kHz	1kHz	1kHz	1kHz	459MHz

V Music Select Function

- (1) **Auto tuning**
Auto tuning is done by the SEEK UP/DOWN key. If this key is pressed, a search will be performed first in the LOCAL mode. If the same key is pressed again when reaching a tuning start frequency or halfway, the search will be performed in the DX mode. Once received, that station will be held. When ARI and VF are both ON, if both SD and SK signals are input at the High level in the traffic information station search mode, that station will be received and held.
- (2) **Manual tuning**
Manual tuning is done by the M. UP/DOWN key. Every time this key is pressed, a frequency will be increased or decreased step by step. If it is kept pressed for 500ms or more, fast forwarding will be performed at a speed of 50~80ms per step until the key is released.

VI Terminal Connection



○ Pins 26 and 58 are internally connected.

VII Terminal Description

Pin No.	Symbol	I/O	Function																
1	N.C.	-	Not in use.																
2	E01	O	PLL error output terminals. When divided VCO output is higher than a reference frequency, "H" is output from these terminals, and when it is lower, "L" is output. When they coincide with each other, floating occurs. Use either E01 or E02 because same wave form is output from them.																
3	E02																		
4	GND	-	Ground.																
5	VCO(AM)	I	Inputs VCO output of 0.6 to 15MHz (0.3 Vp-p MIN.).																
6	VCO(FM)	I	Inputs VCO output of 15 to 150MHz (0.5 Vp-p MIN.).																
7	CE	I	Select signal input terminal of a device. Set to "H" when you make the device function normally, and set to "L" when you do not use it.																
8	GND	-	Ground.																
9	DOLBY	O	DOLBY ON/OFF selector output terminal. "H" when DOLBY is turned on, and "L" when turned off. Corresponding to the DOLBY ON/OFF key, DOLBY is turned off("L") when V _{DD} is turned on. (See Momentary Sw. No. ⑥)																
10	MTL	O	METAL ON/OFF selector output terminal. "H" when METAL is turned on, and "L" when turned off. Corresponding to the METAL ON/OFF key, METAL is turned off("L") when V _{DD} is turned on. (See Momentary Sw. No. ⑤)																
11	APC	O	APC ON/OFF selector output terminal. "H" when APC is turned on, and "L" when turned off. Corresponding to the APC ON/OFF key, APC is turned off("L") when V _{DD} is turned on. (See Momentary Sw. No. ④)																
12	T/R	I	Cassette pack-in detect input terminal. Pulls up through a transistor switch. Judges "L" as cassette pack-in.																
13	SK	I	SK station detect input terminal. Judges "L" as the SK station. Displays by LCD when receiving FM.																
14	ST	I	ST station detect input terminal. Pulls up by being connected to the ST IND terminal of MPX IC. Judges "L" as the ST station. Displays by LCD only when executing in the ST ON mode, with FM selected. (See Momentary Sw. No. ⑫)																
15	SD	I	Station select input terminal when auto tuning is performed. Stops when SD=IF count=1. In the VF mode, it stops when SD=IF count =SK=1.																
16	AM IF	I	AM IF signal input terminal.																
17	FM IF	I	FM IF signal input terminal.																
18	B/U																		
19	F/R	I	Tape run direction detect input terminal. Valid when the pin 12(T/R) is "L". "L" in the FOW mode, and "H" in the REV mode.																
20	MUTE	O	Output terminal to eliminate a shock noise when the PLL unit is unlocked. Active "L".																
21	LOUD	O	LOUDNESS ON/OFF selector output terminal. "H" in the LOUDNESS ON mode, and "L" in the LOUDNESS OFF mode. Corresponding to the LOUDNESS ON/OFF key, LOUDNESS is turned off("L") when V _{DD} is turned on. (See Momentary Sw. No. ⑦)																
22	ATL																		
23	ATO																		
24	XO	I	This is a connection terminal for a crystal oscillator. Connect a 4.5 MHz crystal to it. Adjust the oscillation frequency while observing the XO terminal.																
25	XI																		
26	V _{DD}	-	This is the power supply terminal of the device. When the device operates, a voltage of 5V ± 10% will be supplied.																
27	VF	O	VF ON/OFF selector output terminal. "L" in the VF ON mode, and "H" in the VF OFF mode. Corresponding to the VF ON/OFF key, VF is turned off("H") when V _{DD} is turned on. Valid only in case of FM. (See Momentary Sw. No. ⑧)																
28	DX/LOCAL	O	Auto DX/LOCAL terminal in auto tuning such as SEEK, AUTO STORE, and so on. Valid in all bands of FM, MW and LW. "H" in the LOCAL mode, and "L" in the DX (normal reception) mode.																
29	ST ON	O	Stereo/monaural selector output terminal. "H" in the STEREO ON mode, and "L" in the STEREO OFF mode (forced monaural). Corresponding to the STEREO ON/OFF key, the STEREO ON ("H") mode is set when V _{DD} is turned on. Valid only when FM is received.																
30	BAND1	O	Band select signal output terminal. Output is made as follows:																
31	BAND2																		
<table border="1"> <thead> <tr> <th>Band</th> <th>Terminal</th> <th>BAND1</th> <th>BAND2</th> </tr> </thead> <tbody> <tr> <td>FM</td> <td></td> <td>H</td> <td>H</td> </tr> <tr> <td>MW</td> <td></td> <td>L</td> <td>H</td> </tr> <tr> <td>LW</td> <td></td> <td>L</td> <td>L</td> </tr> </tbody> </table>				Band	Terminal	BAND1	BAND2	FM		H	H	MW		L	H	LW		L	L
Band	Terminal			BAND1	BAND2														
FM		H	H																
MW		L	H																
LW		L	L																
32	S23	O	Segment signal output terminal to the LCD panel.																
49	S6																		
50	S5/KS5	O	Terminal which outputs segment signal to the LCD panel and key matrix signal. (See Key Matrix)																
55	S0/KS0																		
56	COM0	O	Common signal output terminal to the LCD panel.																
57	COM1																		
58	V _{DD}	-	See Pin No. 26.																
59	K3	I	Key matrix signal input terminal. (See Key Matrix)																
62	K0																		
63	N.C.	-	Not in use.																
64	N.C.	-	Not in use.																

VIII Key Matrix

OUT \ IN	K3 59Pin	K2 60Pin	K1 61Pin	K0 62Pin
KS0 55Pin		① M3	② M2	③ M1
KS1 54Pin	⑦ LD	⑧ M6/□□	⑤ M5/MTL	④ M4/APC
KS2 53Pin	⑧ VF/M.DN *1	⑨ TM/M.UP *2	⑩ DOWN	⑪ UP
KS3 52Pin	⑬ SAM	⑭ PSS	⑬ BND	⑫ ST
KS5 50Pin	⑰ B.S	⑱ ARI		

□ : Momentary Sw. □ : Diode Sw.

*1 with ARI → VF
without ARI → M.DN

*2 with ARI → TM
without ARI → M.UP

(1) Diode Sw.

No.	Sw. name	Function
⑱	ARI	This switch sets whether the ARI mode is enabled/disabled. Open : ARI mode disabled Short-circuit by diode : ARI mode enabled
⑰	B.S	This switch selects a reception band. (See Momentary Sw. No. ⑬) Open : UKW → MW → LW → UKW Short-circuit by diode : UKW → MW → UKW → MW

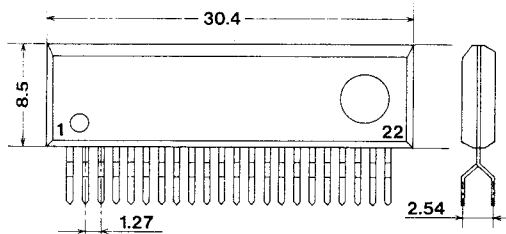
(2) Momentary Sw.

No.	Sw. name	Function
①	M1	Preset memory write/call key. FM, MW and LW can be independently memorized for one key. There are 24 stations in total; 6 channels for FM, 6 for FM SAM, 6 for MW and 6 for LW. Valid only in the RADIO mode. (1) When calling For example, if the M1 key is pressed and it is released within 2 seconds with the FM band selected, a frequency memorized there will be called upon its release. When the key is pressed during auto tuning, the frequency is called upon pressing, because a write action is disabled. (2) When writing For example, if the M3 key is kept pressed for 2 seconds or more with the MW band selected, a frequency being displayed will be written to M3. The SEEK mode and TAPE mode disable a write action.
②	M2	
③	M3	
④	M4	
⑤	M5	
⑥	M6	
④	APC	APC ON/OFF selector switch. (See Terminal Description Pin No. 11)
⑤	MTL	METAL ON/OFF selector switch. (See Terminal Description Pin No. 10)
⑥	□□	DOLBY ON/OFF selector switch. (See Terminal Description Pin No. 9)
⑦	LD	LOUDNESS ON/OFF selector key. If this key is pressed during auto tuning, LOUDNESS ON/OFF can be shifted from ON to OFF and vice versa without stopping tuning (See Terminal Description Pin No. 21)
⑧	VF	(1) If ARI ON is specified in initial setting, this key will become valid only when receiving FM. With the key turned on, a display is made by the LCD only in case of the FM mode. VF is held ON also when the FM mode is set again by changing reception bands after turning VF on in the FM mode. With VF turned on, auto tuning stops when SD=IF count=SK=1. It does not stop by pressing this key during auto tuning. (See Terminal Description Pin No. 27) (2) VF auto retuning is performed (SEEK UP) under the following condition: In the VF ON mode, SK · SD is sampled every 2 seconds (checks 200 times every 10ms, and judges as the Low level when SK · SD=0 in 101 check times or more). If the Low level continues 12 times (24 seconds), auto tuning will start. When SK · SD sampling is at the High level, a Low level count so far is cleared and a new Low level count starts from the next one. (3) a) In the FM mode, if SK · SD=0 when shifting VF from OFF to ON, retuning will be done without counting. Counting will start without retuning, if SK · SD=1. b) In the FM mode, if you return to FM-VF ON mode by calling a preset channel or M.UP/DOWN or by changing bands, PLL lock will be detected. After 500ms, if SK · SD=0, VF retuning will be performed without counting, and if SK · SD=1, counting will start without retuning.
⑨	TM	Tuning mode selector key. By changing over this key, the UP/DOWN key is changed over to the SEEK UP/DOWN key and M.UP/M.DOWN key.
⑩	M. DN	Channel UP/DOWN key. Every time this key is pressed, a frequency is increased (M.UP) or decreased (M.DOWN) by 1 step. If this key is kept pressed for 0.5 second or more, fast forwarding will be performed at the following intervals until the key is released. FM mode : About 52ms MW mode : About 82ms LW mode : About 82ms If the M.UP key is pressed at an upper limit frequency, the frequency will jump to a lower limit one, and if the M.DOWN key is pressed at the lower limit frequency, the frequency will jump to the upper limit one.
⑪	M. UP	

No.	Sw. name	Function
⑩ ⑪	DOWN UP	Every time 1-channel space is increased or decreased (FM : 50kHz, MW : 9kHz, LW : 1kHz), SD and IF counts are detected. When returning to FM by changing bands during SEEK UP/DOWN operation, if CE is set to the Low level once, and then, back to the High level, a search will not stop even if the TAPE mode is put into effect during SEEK UP/DOWN operation. When both ARI and VF are "ON", the traffic information station (VF) is searched. If either of them is "OFF", a normal broad casting station will be searched. If this key is pressed, a search will be performed in the upward (SEEK UP) and downward (SEEK DOWN) directions from the frequency being received in the LOCAL mode. As a result, if no station is found before reaching the frequency where you started a search initially, the station will be searched in the DX mode the next time on, skipping the initial frequency. Once again, when you come to the initial frequency, SD will be detected as to the initial frequency as well this time. If the same key is pressed again during a search in the LOCAL mode, a search will be performed in the DX mode from the frequency next to the initial one. Since the frequency may greatly change in this case, intervals of 250 to 375ms have been provided before detecting SD after outputting an N value (frequency division ratio), same as in changing over from the upper limit frequency to the lower limit frequency and vice versa. When a search is being performed in the DX mode, "DX" is displayed on the LCD panel. On the other hand, in the traffic information station search mode, if any high-level input is made, the SD and SK signals will stop at that frequency. In normal search mode, only the SD signal stops at the High level. When stopped during a search in the DX mode, the "DX" display disappears, and the receive mode is forcibly turned to the DX mode, including when a stoppage occurred during a search in the LOCAL mode.
⑫	ST	STEREO/MONAUROAL selector key for the FM band. Even if this key is pressed during auto tuning, STEREO/MONAUROAL can be changed over without stopping tuning. (See Terminal Description Pin No. 14)
⑬	BND	Reception band selector key. Every time this key is pressed, the reception band changes as follows: (See Diode Sw. No. ⑪) (1) When B.S of the Diode switch is open; UKW → MW → LW → UKW (2) When B.S of the Diode switch is short-circuited; UKW → MW → UKW → MW
⑭	PSS	If this key is pressed, scanning of preset channels will start sequentially from the channel 1. If SD=1 (SD=SK=1 in the VF mode), subsequent channels will be sequentially received after stopping at that channel for about 5 seconds. If the key is pressed again, scanning will stop at that channel. In the SAM mode, a secondary memory is scanned. If this key is pressed during a preset call, scanning will start from the next channel.
⑮	SAM	Normally, the FM station memory has 1 to 6 channels. However, if the SAM mode is set by pressing this key, those channels can be automatically written and called. (only when receiving FM) (1) Calling procedure If the SAM key is pressed and released within 2 seconds, the secondary memory (to be referred to as S.M hereinafter) can be called and the SAM display will light up. At this time, the channel 1 can be called by pressing M1, M2 by pressing M2, thus up to the channel 6 by pressing respective keys. If the SAM key is pressed again and released within 2 seconds, S.M call will be cancelled and you will return to a frequency selected immediately before pressing this key. The last channel in the S.M mode is also held. (2) Writing procedure Regardless of whether it is the SAM mode or not, if the SAM key is kept pressed for 2 seconds or more, the SAM display will flicker and seek-up operation will start (first time in the LOCAL mode, and the second time on in the DX mode). If there is any station existing, the channels will be automatically memorized sequentially from the channel 1 up to the channel 6. After memorizing up to the channel 6, operation stops with the channel 1 called. If the SAM key is pressed again during the seek-up operation, the channel 1 will be called stopping the operation. In DX seek operation, a frequency same as one memorized in the LOCAL mode is skipped.

LA2220 051-0739-00 ARI System SK TYPE
(Tentative Standard)

Figure



Functions

- (1) SK operation : LED display through AND using 57kHz (SK) and 23.75 to 53.98Hz (BK).
Voice output control (Muting) through AND using above frequencies.
- (2) MUTING SW : When Pin 4 is set to GND, signal is put in the through mode regardless existence of SK and BK. LED display is available in the SK and BK operations.
- (3) OSC-STOP SW : When voltage (5V to Vcc -1.4V) is applied to Pin 20, the oscillating circuit stops and signal is put in the through mode. (LED turns OFF).
- (4) DK and BK output : The system contains a 57kHz AM detect circuit to send DK and BK signals. In the OSC-STOP mode, the system stops detect operation.
- (5) SK-STOP : When frequency of 57kHz (SK) exists, voltage at Pin 16 turns LOW. This function is used as the STOP signal in the auto search mode.
(When 57kHz (SK) exists: V16=0V)
(When 57kHz (SK) does not exist: V16=3.6V)
- (6) Turn-ON level control : When voltage is applied to Pin 17, 57kHz (SK) detect level goes upward.
This function is used to prevent LEDs from turning ON with weak signals.

Feature

- (1) The system uses 456kHz ceramic oscillator and 57kHz BPF, which have * materialized no need of adjustment of the freerun frequency and coil.
- (2) The system contains BK signal detect circuit displaying with LED in the AND operations of SK and BK, in order to prevent malfunction when RDS (or PJ system) is received.
- (3) Turn-ON level may be altered by changing C.R installed outside the BPF.
- (4) Only SK can be detected in the auto search mode (through SK-STOP terminal at Pin 16).
- (5) Turn-ON level may be raised by applying DC voltage (through VL-CONT terminal at Pin 17).

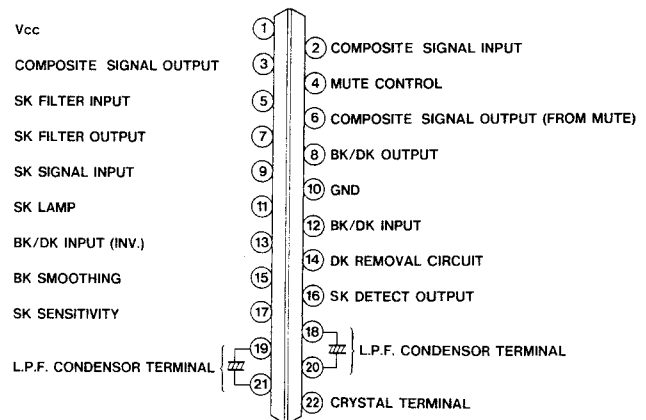
Absolute Maximum Ratings (Ta=25°C)

Supply Voltage	Vcc	$\begin{cases} V_{1-10} & 16V \\ V_{1-11} & 16V \end{cases}$
Input Current	Id	1mA
Lamp Drive Current	Id	30mA
Power Dissipation	Pd	574mW

Electrical Characteristics (Ta=25°C, Vcc=8V, Vin=200mV, L+R=85%, 19kHz=10%, 57kHz=5%, f=1kHz)

Item	Symbol	Condition	SPEC.			Unit
			MIN	TYP	MAX	
Non-signal current	Icco		17	24	34	mA
Input resistance	ri		—	40k	—	Ω
SK detect level	Vsk	f=57kHz, Input Pin 2	2.5	3.6	5.5	mV
SK hysteresis	h.sk	f=57kHz, Input Pin 2	—	5.5	—	dB
BK detect level	Vbk	f=23.75Hz, Input Pin 12	—	17	—	mV
BK hysteresis	h.bk	f=23.75Hz, Input Pin 12	—	3	—	dB
Capture range	C.R.	f=57kHz, Vin=10mV	—	±1.2	—	%
Output level	Vdaf	f=1kHz, Vin=200mV	147	210	294	mV
DK output level	Vdok	f=57kHz, Vin=10mV, 125Hz, 30%mod	27	38	54	mV
Total harmonic distortion	THD	f=1kHz, Vin=200mV	—	0.13	0.5	%
Signal attenuation degree	MUTE	f=1kHz, Vin=200mV, DIN/AUDIO filter	-60	-75	—	dB
Free-run frequency	Fo	Pin2 · C = GND at CSB456F11 (TYP)	451	454.8	458.5	kHz

Terminal Connection



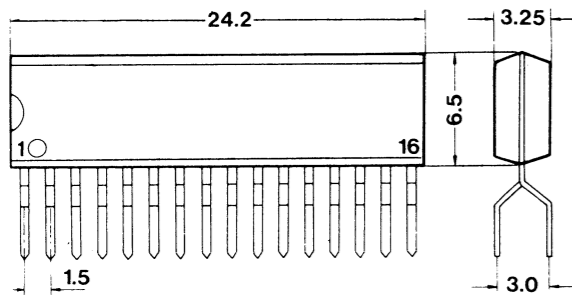
No.	Name of terminal	Function
1	Vcc	Supply terminal. The recommended voltage is 8V.
2	COMPOSITE SIGNAL INPUT	Input of a composite signal.
3	COMPOSITE SIGNAL OUTPUT	Output of a composite signal amplified in the IC.
4	MUTE CONTROL	When no BK/DK signal exists with this terminal set to OPEN, mute is applied to the composite signal output at Pin 6. When this terminal is set to GND, no mute operation is performed.
5	SK FILTER INPUT	Input terminal of filter amplifier for SK signal detection.
6	COMPOSITE SIGNAL OUT (FROM MUTE)	Muting output terminal of composite signal (See description on Pin 4).
7	SK FILTER OUTPUT	Output terminal of filter amplifier for SK signal detection.
8	BK/DK OUTPUT	Output of SK signal detected in the AM mode.
9	SK SIGNAL INPUT	Receives SK signal separated from composite signal.
10	GND	For grounding.
11	SK LAMP	Turns a lamp on when SK and BK signals are detected simultaneously.

No.	Terminal Name	Function
12	BK/DK INPUT	Receives BK and DK signals.
13	BK/DK INPUT (INV.)	Inverted input terminal of BK and DK signals. Normally not used.
14	DK removal terminal	Connects L.P.F. condenser to reject DK signal.
15	BK smoothing	Connects L.P.F. condenser to smooth a rectified BK signal.
16	SK DETECT OUTPUT	Sends "High" when SK signal exists.
17	SK SENSITIVITY	Normally set to OPEN. When voltage is applied, SK signal detect sensitivity drops.
18	L.P.F. condenser terminal	Terminal used to connect a condenser constituting L.P.F. When DC voltage of 5V to Vcc -1.4V is applied to Pin 20, V.C.O. stops.
21		
22	Crystal terminal	Connects crystal or ceramic resonator.

LA3430 051-0733-00 FM MPX (Tentative Standard)

Feature
FM stereo multiplexer built in functions as pilot canceller, stereo noise controller, high frequency cut controller and automatic changer between stereo and monaural.

Figure



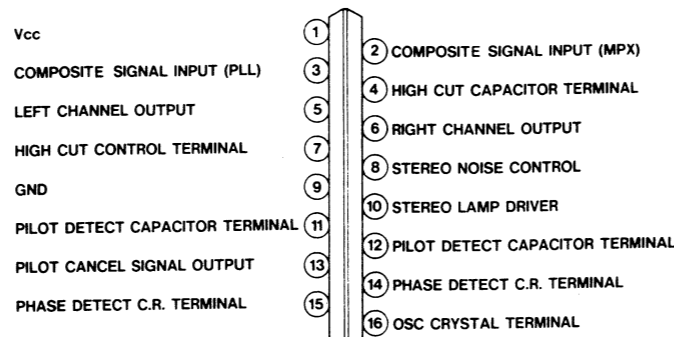
Absolute Maximum Ratings (Ta=25°C)

Supply Voltage	Vcc	16V
Lamp Drive Current	I _D	30mA
Power Dissipation	P _D	520mW

Electrical Characteristics (Ta=25°C, Vcc=10V, Vi=300mV, f=1kHz, L+R=90%, PILOT=10%)

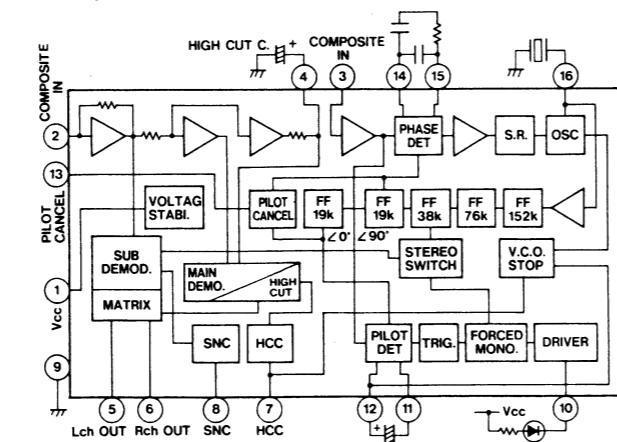
Item	Symbol	Condition	Min	Typ	Max	Unit
Non-signal current	I _{CC}	No input		28	38	mA
Channel separation	Sep		40	50		dB
Total harmonic distortion	THD	Monaural		0.07	0.2	%
		Main		0.07	0.2	%
Lamp turn-ON level	V _L	L+R=90%, PILOT=10%	60	85	120	mV
Lamp hysteresis	hy			3	6	dB
Capture range	CR			±1		%
Output signal level	V _O	sub	150	215	300	mV
Signal/noise ratio	S/N	R _g =20kΩ	68	74		dB
		R _g =10kΩ	70	78		dB
Input resistance (Pin 2)	r _i			20		kΩ
SCA reject ratio	SCA _{rej}			80		dB
Allowable input voltage	V _i	THD=1% R _g =20kΩ	700	900		mV
		THD=1% R _g =10kΩ		450		mV
SNC output attenuation degree	Att SNC	V _B =0.6V, L+R=90%, PILOT=10%	-8.5	-3.0	-0.3	dB
		V _B =0.1V, L+R=90%, PILOT=10%			5	mV
SNC output voltage	V _{O sub}	V _B =0.6V, L+R=90%, PILOT=10%				
		V _B =0.1V, L+R=90%, PILOT=10%				
HCC output attenuation degree	Att HCC(1)	V _B =0.6V, L+R=90%, PILOT=10%	-15.0	-6.0	-0.5	dB
		V _B =1V, L+R=90%, PILOT=10%			0	dB
Supply voltage ripple rejection	R _r	V _B =0.6V, L+R=90%, PILOT=10%		35		dR
		V _B =1V, L+R=90%, PILOT=10%				
VCC STOP voltage				7.3		V
Channel balance				0.5	1.5	dB
Pilot cancelling degree			20	27		dB
Stereo amplifier current		Minimum stereo operating current	1.0			mA
Saturation voltage (Pin 10)		I _L =10mA		1.0		V

Terminal Connection



No.	Name of terminal	Function
1	Vcc	Connected to power supply.
2	Composite signal input (MPX)	Composite signal input terminal to MPX unit.
3	Composite signal input (PLL)	Composite signal input terminal to PLL unit.
4	High-cut condenser terminal	Connects a condenser to improve S/N ratio on audio sensitivity by attenuating high-pass of voice signal in the weak electric field.
5	Left channel output	Generates voice signal in the left channel.
6	Right channel output	Generates voice signal in the right channel.
7	High-cut control (HCC)	When voltage applied to this terminal is dropped down to about 1.0V or less (when Vcc=10V), 7kHz or more of the main signal (Monaural signal) is dropped, so that S/N ratio for the audio sensitivity may be improved. When voltage of 7V or more is applied to this terminal, V.C.O. oscillation is stopped, putting the system in the forcible monaural mode. In this case, HCC and SNC become not operatable.
8	Stereo noise control (SNC)	As voltage applied to this terminal is decreased gradually, output of SUB DETECTOR (differential signal) drops gradually, so that the voice signal output is put nearly in the monaural mode, providing the favourable S/N ratio in the weak electric field.
9	GND	For grounding
10	Stereo lamp driver	Absorbs the stereo lamp drive current of up to 30mA.
11	Pilot detect condenser terminal	Connects a condenser for detection of the pilot signal.
12	Pilot cancel signal output	Generates a false triangular wave of 19kHz to cancel the pilot signal.
13	Phase detect C.R. terminal	Connects C.R. for phase detection.
14	OSC CRYSTAL terminal	Connects a oscillating crystal or ceramic resonator.

Block Diagram



HA12438FP 051-0730-00 FM FRONTEND

Absolute Maximum Ratings

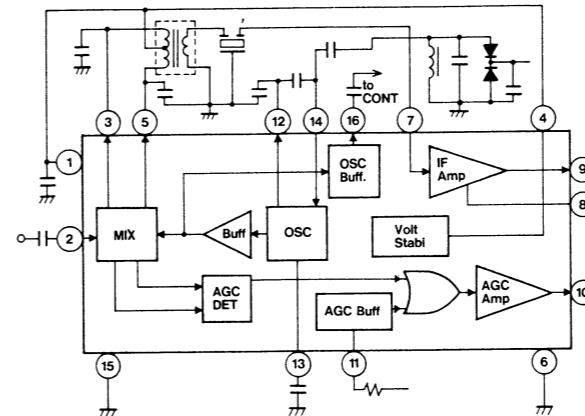
Supply Voltage	Vcc	10V (Ta=25°C)
Power Dissipation	P _D	300mW (Ta=75°C)

Electrical Characteristics

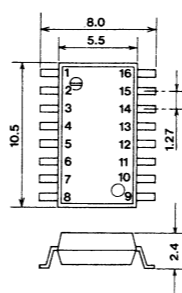
(Vcc=8.2V, f_c=98MHz, f_m=400Hz, Δf=±75kHz, Ta=25°C)

Power Gain	PG	(Input=40dBμ, 75Ω/9pin Load=330Ω)	48.5dB
Signal/Noise <td>S/N</td> <td>(Input=100dBμ, with 400Hz H.P.F.)</td> <td>84.0dB</td>	S/N	(Input=100dBμ, with 400Hz H.P.F.)	84.0dB
OSC Buffer Output <td>V_{OSC}</td> <td>(f_{OSC}=108.7MHz, Load=75Ω)</td> <td>145mV</td>	V _{OSC}	(f _{OSC} =108.7MHz, Load=75Ω)	145mV
AGC In Threshold <td>V_{I(TH)}</td> <td>(Voltage of 11pin when 10pin turns to 6V)</td> <td>2.1V</td>	V _{I(TH)}	(Voltage of 11pin when 10pin turns to 6V)	2.1V
AGC Output High level <td>V_{I(HH)}</td> <td>(No input signal, 11pin=0V)</td> <td>7.4V</td>	V _{I(HH)}	(No input signal, 11pin=0V)	7.4V
AGC Output Low level <td>V_{I(LL)}</td> <td>(No input signal, 11pin=3V)</td> <td>0.05V</td>	V _{I(LL)}	(No input signal, 11pin=3V)	0.05V
AM Reduction Ratio <td>AMRR</td> <td>(Input=60dBμ, 1kHz, 30% mod)</td> <td>50dB</td>	AMRR	(Input=60dBμ, 1kHz, 30% mod)	50dB
Quieting Sensitivity <td>U_s</td> <td>(S/N=40dB)</td> <td>18dBμ</td>	U _s	(S/N=40dB)	18dBμ

Block Diagram



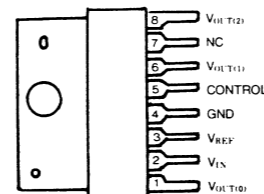
Figure



MB3756 051-0526-00 Constant-voltage Source

MB3756 is a monolithic integrated circuit for a constant-voltage power source. It has 3 output terminals. With these 3 output terminals, it is possible to obtain the stabilized output of an alternate changeover function by an external control signal. Noises, which tend to be generated by changeover, is prevented by an internal circuit, thus making easy the changeover of transmission/reception and AM/FM in CB.

Terminal Layout (Top View)



Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply voltage	V _{IN}	18	V
Power dissipation	P _D	1*	W
		4**	W
Operating temperature	T _{Op}	-20 ~ +75	°C
Storage temperature	T _{stg}	-55 ~ +125	°C

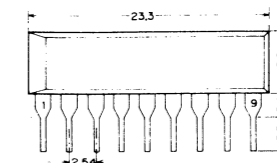
* No Heat Sink Ta=70°C
** Infinite Heat Sink Tc=70°C

Electric Characteristics (Ta=25°C, V_{IN}=14V, R_{L0}=R_{L1}=200Ω, R_{L2}=100Ω)

Item	Symbol	Condition	Min	Typ	Max	Unit
Bias current	I _B	V _{IN} =18V	-	6	10	mA
Ripple suppression		f=100Hz	-	60	-	dB
Output noise voltage		10Hz ≤ f = 100kHz, C _k =10μF	-	40	-	μV
Min. I/O voltage difference	V _{IN} -V _O		-	1.7	-	V
Output voltage (control input at L level)	V _{OUT(L)}	V _{IC} =0.8V	0	-	0.2	V
		V _{IC} =0.8V	7.8	8.2	8.6	V
Output voltage (control input at H level)	V _{OUT(H)}	V _{IC} =2.0V	7.8	8.2	8.6	V
		V _{IC} =2.0V	0	-	0.2	V

AN6262 051-0566-00 AN6262N 051-0566-01 AN6263 051-0561-00 AN6263N 051-0561-01 MUSIC INTERVAL DETECTION IC

Drawing of General View



Terminal Connection Diagram

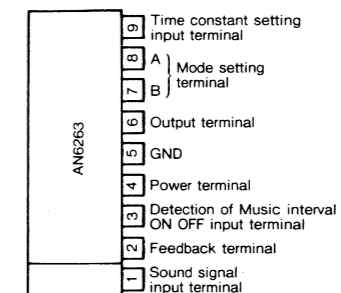


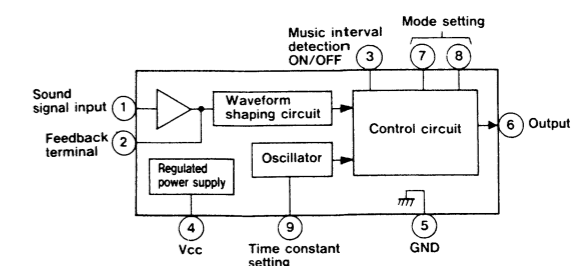
Table of Modes

A	B	Mode	
		AN6262.N	AN6263.N
L	L	OFF	OFF
L	H	PLAY	FF/RWD
H	L	FF/RWD	PLAY
H	H	OFF	OFF

Description of Terminal

1	Sound signal input	Sound signal is input.
2	Feedback terminal	Sound signal amplifier feedback terminal.
3	Music interval detection ON/OFF	When "H" is input, Music interval detecting function is actuated.
4	Power terminal	
5	GND	
6	Output	When the Music interval is detected, "H" pulse is output.
7	Mode setting B	Modes of OFF, PLAY and FF/REW are set. Refer to Table of Modes.
8	Mode setting A	
9	Time constant setting	Sets the oscillation cycle of oscillator which specifies the timing of IC function. Refer to Summary of Functions.

Block Diagram



When the Music interval detection ON/OFF terminal (3 pins) is set to "H", the IC is reset at the "rise" and the output (6 pins) becomes "L". Then, the sound signal is changed into the pulse by the waveform shaping circuit, but when this pulse is input into the control circuit of 3968 * 1 pcs, the IC recognizes the existence of a curve. Then, while 3712 * 2 pcs of output pulses from the oscillator are being output, the IC assumes that there is a music interval, if there is no pulse by the sound signal while 3712 * 2 pcs of output pulse of oscillation are being output, and "H" is output (pin 6) only while 265 pcs of output pulse from the oscillator are being output.

* 1 : 384 pcs in FF/RWD
 * 2 : 128 pcs in FF/RWD
 The period T_{osc} of oscillator is decided as follows by the capacity C of the condenser connected to the time constant setting terminal (pin 9).
 T_{osc} = (8.64 ± 1.9) C (msec)

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating		Unit
		AN6262 AN6263	AN6262N AN6263N	
Power voltage	V _{cc}	16	16	V
Power current	I _a	21.0	28.0	mA
Allowable loss	P _D	420	450	mW
Output current	I _o	150	150	mA

Electrical Characteristics (Unless specified otherwise, V_{cc} = 4.5 ~ 16V, Ta = -30° ~ 80°C)

No.	Item	Symbol	Test circuit	Condition	Allowable value			Unit	Note
					min.	typ.	max.		
1	Power current	I _{cc}			12.5	21.0	mA	DC inspection item	
2	Oscillation frequency	f _{osc}	1	V _{in} = 0mV V ₁ = V ₂ = V ₃ = 0V	0.9	1.2	1.47	kHz	
3	Signal detection level	V _{in}	1	V _{in} = 10kHz V ₁ = V ₂ = 2V, V ₃ = 0V	1.7		2.7	mVrms	
4	Music interval ON/OFF level	V _{1,3}			1.1	1.6	V	DC inspection item	
5	Music interval detection OFF outflow current	I ₁			-1.2	-0.6	mA	-	
6	Mode switching level 7 terminal	V _{1,3}			1.0	1.5	V	-	
7	Mode switching level 8 terminal	V _{1,3}			1.0	1.5	V	-	
8	Mode switching circuit outflow current 7 terminal	I ₁			-1.2	-0.6	mA	-	
9	Mode switching circuit outflow current 8 terminal	I ₁			-1.2	-0.6	mA	-	

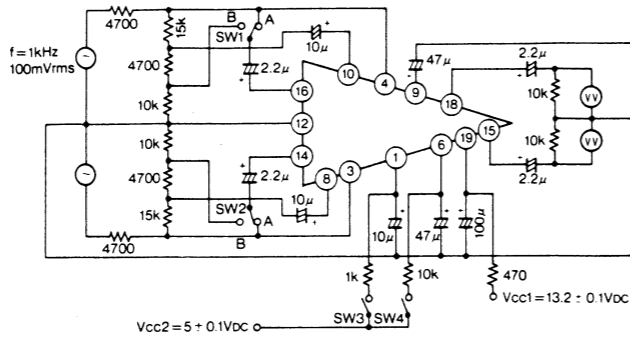
LB0354 051-0619-00 LOUDNESS with MUTING

Absolute Maximum Ratings (Ta = 25°C)
 Supply Voltage V_{cc1} +20V
 V_{cc2} +16V

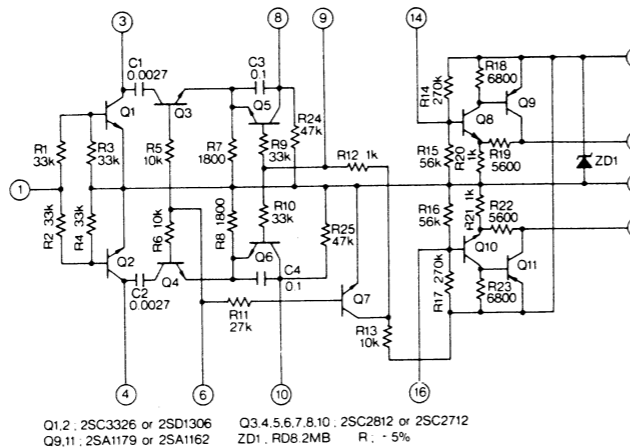
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Condition	Value			Unit
			min.	typ.	max.	
Frequency Range	Vf1	f = 100Hz Vf(1kHz) = 0dB	-0.5	-0.1	+0.5	dB
	Vf2	f = 10kHz Vf(1kHz) = 0dB	-0.5	-0.1	+0.5	dB
Loudness Effect	GL1	f = 100Hz SW1, 2 → B SW3 → OFF SW4 : OFF → ON	+6.0	+12.0		dB
	GL2	f = 10kHz SW1, 2 → B SW3 → OFF SW4 : OFF → ON	+4.0	+5.5		dB
Muting Effect	G _M	f = 1kHz e _i = 100mV SW1, 2 → A SW4 → OFF SW3 : OFF → ON	40	56		dB
Cross Talk	G _c	f = 1kHz e _i = 100mV SW1, 2 → A SW3, 4 → OFF	-50	-63		dB
Tortal Harmonic Distortion	T.H.D.	f = 1kHz V _{OUT} = 400mV		0.05	0.2	%
		f = 1kHz V _{IN} = 1.2V		0.2	1.0	%
Offset Noise	V _s	Input : Short		0.1	0.5	mVrms
Voltage Gain	G _v	f = 1kHz e _i = 100mV SW1, 2 → A SW3, 4 → OFF	400	470		mVrms

Test Circuit



Circuit Diagram



Q1,2: 2SC3326 or 2SD1306 Q3: 4.5, 6.7, 8.10, 2SC2812 or 2SC2712
 Q9,11: 2SA1179 or 2SA1162 ZD1: RD6.2MB R: -5%

PARTS LIST:

Ⓢ Electrical section
 Ⓢ MAIN P.W.B

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
201~204 [209]				Q [209]	125-2003-01	Transistor (RN1201)	1
301~307 314~317 326~330, 332 333, 334, 340	001-0330-00	Diode (1SS119)	25	C270,271,273,291	043-0020-20	Ceramic capacitor (16V0.22μF)	4
D319,320,325	001-0360-00	Diode (S5566B)	3	C99,109	160-5612-05	Ceramic capacitor (560pF B) HD	2
D308	001-0361-00	Diode (1SS198)	1	C15,17,21,201 202	171-1023-06	Ceramic capacitor (0.001μF SR) SC	5
D331	001-0423-19	Diode (MA4056)	1	C2~4,7,8,19,20 [28] 101~103 105,309,309,310 311,312,313,391	171-1033-06	Ceramic capacitor (0.01μF SR) SC	19
D203,321	001-0423-23	Diode (MA4082)	2	C1,27,303	171-1533-06	Ceramic capacitor (0.015μF SR) SC	3
D318	001-0423-25	Diode (MA4100)	1	C25,26,209,211 212,302	171-2233-06	Ceramic capacitor (0.022μF SR) SC	6
TH1	002-0200-00	Thermistor (10kΩ)	1	C238,239,244,245	171-3323-06	Ceramic capacitor (0.0033μF SR) SC	4
IFT2,102	005-0978-00	IF-transformer	2	C6,105,112,130 210 [267] [268] 325,326,328,330	171-4733-06	Ceramic capacitor (0.047μF SR) SC	11
IFT1,101	005-0979-00	IF-transformer	2	C5,104	174-1000-13	Ceramic capacitor (10pF CH) TC	2
L302	009-0642-00	Choke	1	C317,318	174-2200-13	Ceramic capacitor (22pF CH) TC	2
L301	010-2046-16	Coil (4.7μH)	1	C322,323	173-1042-10	Polyester capacitor (0.1μF) S	2
L1	010-2046-17	Coil (5.6μH)	1	C255,261	173-1542-10	Polyester capacitor (0.15μF) S	2
VR1,101	012-3808-00	Variable resistor (330Ω)	2	C253,258,259,265	173-2242-10	Polyester capacitor (0.22μF) S	4
VR2 [21]	012-3808-05	Variable resistor (4.7kΩ)	1	C207,208	173-6821-10	Polyester capacitor (0.0068μF) S	2
VR3	012-3808-06	Variable resistor (10kΩ)	1	C301	042-0201-01	Electrolytic capacitor (16V3.3μF TAN)	1
VR201,202	012-3939-07	Variable resistor (50kΩ)	2	C256,257,262,263 320	042-0356-00	Electrolytic capacitor (10V1000μF)	5
CCT301	050-0077-03	Component circuit	1	C319	042-0358-00	Electrolytic capacitor (10V1000μF)	1
IC204	051-0267-55	IC (μPD4066BG)	1	C216,225,246,247 248,252,254,260 264	179-1073-21	Electrolytic capacitor (10V100μF) S	9
IC304	051-0296-00	IC (TA78L006AP)	1	C248	179-1073-22	Electrolytic capacitor (10V100μF) S	1
IC203,302	051-0478-00	IC (NJD6506S)	2	C218,306	179-1073-32	Electrolytic capacitor (16V100μF) S	2
IC205	051-0523-02	IC (NR9200A-1)	1	C250,251	179-2263-32	Electrolytic capacitor (16V22μF) S	2
IC303	051-0526-00	IC (MB3756)	1	C329,331	179-2273-21	Electrolytic capacitor (10V220μF) S	2
IC2	051-0541-00	IC	1	C324	179-2273-22	Electrolytic capacitor (10V220μF) S	1
IC202	051-0561-01	IC (AN6263N)	1	C271	179-2283-31	Electrolytic capacitor (16V2200μF) S	1
IC206	051-0606-00	IC (BT3S501)	1	C237	179-4773-23	Electrolytic capacitor (10V470μF) S	1
IC207	051-0619-00	IC (LB0354)	1	C221,224	182-1053-62	Electrolytic capacitor (50V1μF) SS	2
IC209	051-0784-00	IC (TA7280P)	1	C9,10,107,222 223,227,228	182-1053-63	Electrolytic capacitor (50V1μF) SS	7
IC208	051-0785-00	IC (TA7281P)	1	C11,108,327	182-1063-32	Electrolytic capacitor (16V10μF) SS	3
IC301	051-0794-00	IC (μPD1714G-526-12)	1	C226,231,232,233 234,240,242,243 244	182-1063-33	Electrolytic capacitor (16V10μF) SS	9
IC1,101	051-0798-01	IC (TA7411AP-CLA)	2	C229,230	182-2243-62	Electrolytic capacitor (50V0.22μF) SS	2
SUP1	060-0122-00	Surge protector	1	C12,111	182-2253-62	Electrolytic capacitor (50V2.2μF) SS	2
X301	061-1053-61	Crystal (4.5MHz)	1	C266	182-3363-22	Electrolytic capacitor (10V33μF) SS	1
Q301,302,318	100-1175-00	Transistor (2SA1175)	3	C235,236	182-4753-53	Electrolytic capacitor (35V4.7μF) SS	2
Q [208] 319	101-0911-00	Transistor (2SB911MPQR)	2	C315,332	182-4763-32	Electrolytic capacitor (16V47μF) SS	2
Q306	102-1846-00	Transistor (2SC1846QRS)	1	C13,23,24,110 112,203,204,213 215,219,220 [269] 307,316	183-1053-62	Electrolytic capacitor (50V1μF) USS	14
Q309	102-2458-25	Transistor (2SC2458Y)	1	C14,22,215,314	183-1063-32	Electrolytic capacitor (16V10μF) USS	4
Q303~305	102-2458-28	Transistor (2SC2458GR)	3	C16,18,217	183-2243-62	Electrolytic capacitor (50V0.22μF) USS	3
C1,202,206,311 313,315,316	102-2458-50	Transistor (2SC2458Y,GR,BL)	7	C390	183-2263-52	Electrolytic capacitor (35V22μF) USS	1
Q204,205	102-2458-51	Transistor (2SC2458GR,BL)	2	C305	183-3343-62	Electrolytic capacitor (50V0.33μF) USS	1
Q201,203,307,308 314,320,321,322	102-3400-00	Transistor (2SC3400AC)	8	C321	183-4743-62	Electrolytic capacitor (50V0.47μF) USS	1
Q2,3 [207]	103-1450-50	Transistor (2SD1450ST)	3	C205,206	183-4763-12	Electrolytic capacitor (6.3V47μF) USS	2
Q310,312	108-0161-28	FET (2SK161GR)	2	C304	183-4763-32	Electrolytic capacitor (16V47μF) USS	1
Q317	125-0003-01	Transistor (RN2201)	1				

□ is use only PE-9092A

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REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
D _{101.201}	001-0368-00	Diode (1SV21)	2	R _{101.109.115.201}	117-3331-10	Chip resistor (1/8W33kΩ) S	5
D ₁₀₃	001-0423-13	Diode (MA4033)	1	R _{108.208}	117-4701-10	Chip resistor (1/8W47Ω) S	2
D _{102.104.105.202}	001-0442-20	Diode (1SV147)	5	R _{104.204}	117-6831-10	Chip resistor (1/8W68kΩ) S	2
TC _{101.201}	004-1567-00	Trimmer (20pF)	2	Q _{103.203}	124-0114-15	FET (3SK114)	2
IFT _{101.201}	005-0966-00	IF-transformer (W-BALANCE)	2	Q ₁₀₁	125-0002-02	Transistor (RN240285R)	1
IFT _{102.103}	005-0967-00	IF-transformer (MS3LK)	4	Q ₂₀₁	125-0002-02	Transistor (RN240285L)	1
L _{104.204}	010-1570-01	Coil (RF)	2	Q ₁₀₂	125-0006-00	Transistor (UN2110)	1
L _{101.201}	010-2046-03	Coil (0.39μH)	2	Q ₂₀₂	125-0006-00	Transistor (UN2110)	1
L _{103.203}	010-2046-14	Coil (3.3μH)	2	C _{112.212}	176-1007-00	Ceramic chip capacitor (10pF CH) TC,S	2
L ₁₀₆	010-2104-00	Coil (OSC)	1	C _{103.106.116.203}	176-1501-00	Ceramic chip capacitor (15pF CH) TC,S	5
L _{102.105}	010-2105-00	Coil (L4.5T)	2	C _{113.115.120}	176-2201-00	Ceramic chip capacitor (22pF CH) TC,S	3
L _{202.205}	010-2106-00	Coil (R4.5T)	2	C _{104.204}	176-5601-00	Ceramic chip capacitor (56pF CH) TC,S	2
IC _{101.201}	051-0730-00	IC (HA12438FP)	2	C _{105.109.110.205}	176-6097-00	Ceramic chip capacitor (6pF CH) TC,S	6
R _{114.213}	117-1011-10	Chip resistor (1/8W100Ω) S	2	C _{102.202}	176-8097-00	Ceramic chip capacitor (8pF CH) TC,S	2
R _{107.110.111.112}	117-1021-10	Chip resistor (1/8W1kΩ) S	7	C _{213.214}	178-1022-05	Ceramic chip capacitor (0.001μF) HD,S	2
R _{113.212}	117-1031-10	Chip resistor (1/8W10kΩ) S	2	C _{101.107.108.114}	178-1032-05	Ceramic chip capacitor (0.01μF) HD,S	9
R _{103.105.203.205}	117-1041-10	Chip resistor (1/8W100kΩ) S	4	C _{111.118.211.217}	178-2232-05	Ceramic chip capacitor (0.022μF) HD,S	4
R _{106.206}	117-2211-10	Chip resistor (1/8W220Ω) S	2	C _{117.216}	183-1053-62	Electrolytic capacitor (50V1μF) USS	2

Note : OM (Oxidized Metal)
 S (Small)
 HD (Higher Dielectric)
 SC (Semi-Conductor)
 SS (Super Small)
 TC (Temperature-Compensating)
 LL (Low Leak)
 USS (Ultra Super Small)

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REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
VR ₁₀₄	012-3707-05	Variable resistor (VR10kΩ)	1	C ₁₃₂	171-2233-06	Ceramic capacitor (0.022μF)	1
VR ₁₀₂	012-3707-08	Variable resistor (VR100kΩ)	1	C ₁₂₃	171-3333-06	Ceramic capacitor (0.033μF)	1
CCT ₁₀₁	050-0099-00	Component circuit (DN1360E)	1	C ₁₃₀	171-4723-06	Ceramic capacitor (4700PF SR)	1
IC ₁₀₄	051-0407-00	IC (LA2110)	1	C ₁₂₈	171-4733-06	Ceramic capacitor (0.047μF)	1
IC ₁₀₅	051-0733-00	IC (LA3430)	1	C _{122.134.136}	182-1053-62	Electrolytic capacitor (50V1μF)	3
CF ₁₀₁	060-0115-01	Ceramic resonator (CBS456F11)	1	C ₁₃₃	182-1063-32	Electrolytic capacitor (16V10μF)	1
Q ₁₀₁	102-2458-25	Transistor (2SC2458Y)	1	C ₁₃₅	182-2243-62	Electrolytic capacitor (50V0.22μF)	1
C ₁₂₀	160-6812-05	Ceramic capacitor (68pF B)	1	C ₁₂₁	182-2263-32	Electrolytic capacitor (16V22μF)	1
C _{125.126}	171-1033-06	Ceramic capacitor (0.01μF)	2	C ₁₂₉	182-4753-52	Electrolytic capacitor (35V4.7μF)	1
C ₁₂₄	171-2223-06	Ceramic capacitor (220pF SR)	1				

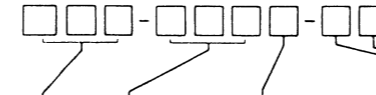
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REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
VR ₁₀₃	012-3707-05	Variable resistor (VR-10kΩ)	1	C _{137.145.149}	182-1063-32	Electrolytic capacitor (16V10μF)	3
CCT ₁₀₂	050-0103-00	Component circuit (TCB06T0006)	1	C ₁₄₆	182-1073-12	Electrolytic capacitor (6.3V100μF)	1
IC ₁₀₃	051-0501-00	IC (LA3365)	1	C ₁₃₉	182-1073-22	Electrolytic capacitor (10V100μF)	1
IC ₁₀₂	051-0739-00	IC (LA2220)	1	C ₁₄₁	182-2263-22	Electrolytic capacitor (10V22μF)	1
CF ₁₀₂	060-0115-01	Ceramic resonator (CBS456F11)	1	C ₁₄₀	182-3343-62	Electrolytic capacitor (50V0.33μF)	1
C ₁₄₄	171-4733-06	Ceramic capacitor (0.047μF)	1	C ₁₅₀	182-4763-02	Electrolytic capacitor (4V33μF)	1
C ₁₃₈	173-6831-10	Polyester capacitor (0.068μF)	1	C ₁₄₂	182-4743-62	Electrolytic capacitor (50V0.47μF)	1
C _{143.152}	042-0249-00	Electrolytic capacitor (16V0.22μF TAN)	2	C ₁₄₈	182-4753-52	Electrolytic capacitor (35V4.7μF)	1
C ₁₄₇	182-1053-62	Electrolytic capacitor (50V1μF)	1	C ₁₅₁	182-4763-22	Electrolytic capacitor (10V47μF)	1

● How to read resistor

Resistors are deleted from the table of electric components, (except metal film resistors and special resistors). They can be converted to product Nos. as follows.

Film resistor (Carbon film resistor)

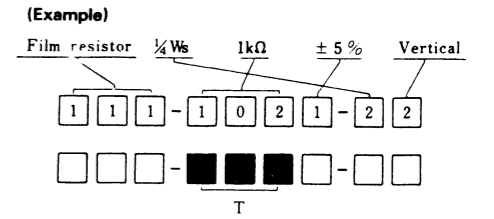


Classification	Resistance *	Tolerance of the value of resistance	Rated power		Shape
111	0	0	0	0	0
	Example	± 5%	1	1/8W	Approx. 3.7mm 1 Horizontal
	33Ω = 330	2	2	1/4Ws	Approx. 6.5mm 2 Vertical
	33kΩ = 333	3	3		3
		4	4	1/2W	Approx. 9mm 4
			7	1/8W	Approx. 3.5mm
			8	1/2Ws	Approx. 6.6mm
			9	1/4Wss	Approx. 3.2mm

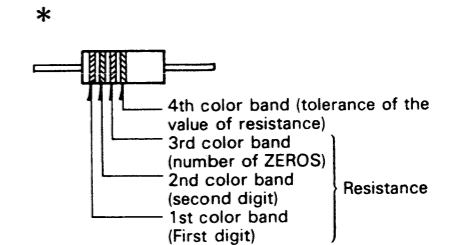
Example of conversion of resistance

R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T
0.1	108	Ω	109	Ω	100	Ω	101	kΩ	102	kΩ	103	kΩ	104	MΩ	105	MΩ	106	MΩ	107
0.15	158	1.5	159	15	150	150	151	1.5	152	15	153	150	154	1.5	155	15	156	150	157

COLOR	BLK	BRN	RED	ORG	YEL	GRN	BLU	PUR	GRY	WHT	GOLD	SILVER	NO COLOR
1st color band	0	1	2	3	4	5	6	7	8	9			
2nd color band	0	1	2	3	4	5	6	7	8	9			
3rd color band	10 ⁰	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶				10 ⁻¹	10 ⁻²	
4th color band											± 5% (J)	± 10% (K)	± 20% (M)

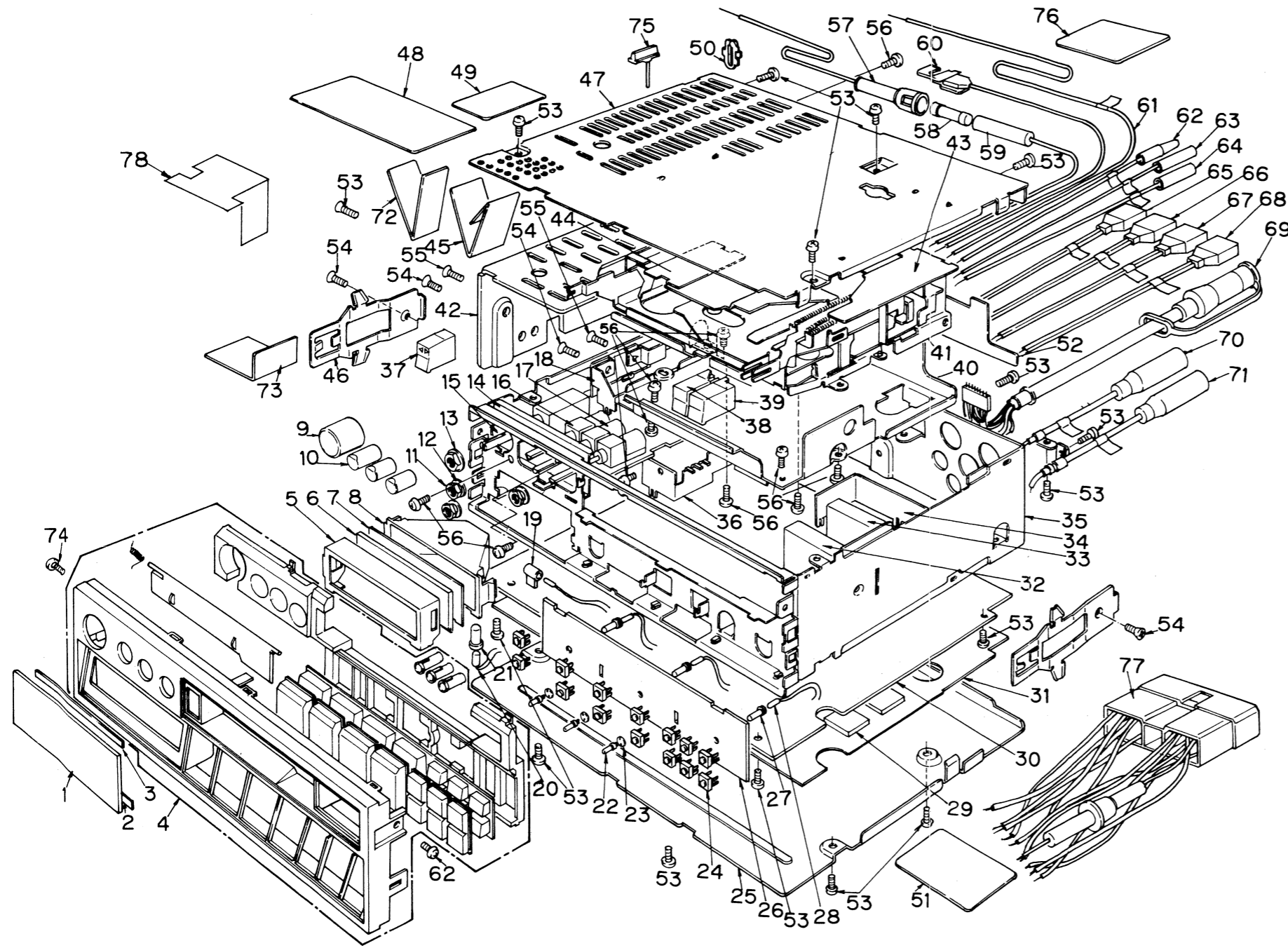


Note 1. The first two of three digits representing resistance are effective digits and the last one represents number of "0" following this. Unit is given in ohm (Ω).



EXPLODED VIEW · PARTS LIST:

©Main section



REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
30	099-7754-00	P.W.B	1
31	347-2165-00	Insulator	1
32	941-0159-00	LW/MW tuner	1
33	880-1408A	FM front end tuner	1
34	330-8431-00	Earth plate	1
35	312-0268-00	Chassis	1
36	944-0723-00	Filter ass'y	1
37	382-1082-00	Button (PRO)	1
38	382-1093-00	Button (REW/EJ)	1
39	382-1094-00	Button (FF/EJ)	1
40	330-8428-00	Mechanism holder	1
41	930-0523-10	Tape mechanism	1
42	313-1269-00	Heat sink	1
43	347-2147-00	Insulator	1
44	347-2146-00	Insulator	1
45	347-2148-00	* Insulator	1
46	750-2486-00	Spring	2
47	303-0334-00	Upper cover	1
48	285-0915-00	Guide label	1
49	285-1000-00	Guide label	1
50	335-1164-00	Lead holder	1
51	286-5833-00	Set plate (PE-9092)	1
	286-5834-00	Set plate (PE-9093)	1
52	347-2145-00	Insulator	1
53	731-3006-80	Tap tight (M3x6)	16
54	714-3006-41	Machine screw (M3x6)	4
55	714-3006-81	Machine screw (M3x6)	2
56	714-3004-81	Machine screw (M3x4)	11
57	850-2258-00	* A-lead (POWER)	1
58	120-0050-00	* Fuse (5A)	1
59	850-2268-02	* A-lead (POWER)	1
60	840-0386-00	* Bonding wire (GND)	1
61	850-2360-00	* A-lead (BACK UP)	1
62	850-2361-00	* A-lead (ILLUMI)	1
63	852-5322-02	* Extension lead (SEEK)	1
64	852-6652-01	* Extension lead (AUTO ANT)	1
65	851-2602-03	* Speaker lead	1
66	851-2602-02	* Speaker lead	1
67	851-2602-01	* Speaker lead	1
68	851-2602-00	* Speaker lead	1
69	852-9245-00	Extension lead	1
70	092-0605-00	Antenna receptacle (SUB)	1
71	092-0604-01	Antenna receptacle (MAIN)	1
72	347-2149-00	* Insulator	1
73	347-2166-00	Insulator	1
74	714-3005-81	Machine screw (M3x5)	2
75	335-1360-00	Lock pin	1
76	285-1254-00	Guide label (PE-9093A)	1
77	852-9210-00	Extension lead (PE-9093A)	1
78	347-2228-00	Insulator	1

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
1	373-0465-00	Dial cover	1
2	347-1105-00	Adhesive tape	1
3	347-1873-00	Adhesive tape	1
4	940-2923-00	Escutcheon ass'y (PE-9092A)	1
	940-2923-01	Escutcheon ass'y (PE-9093A)	1
5	335-2225-00	LCD cover	1
6	379-0125-00 379-0125-01	Indicator	1
7	371-3361-00	Trim plate	1
8	335-2226-00	LCD holder	1
9	380-4762-00	Knob	1

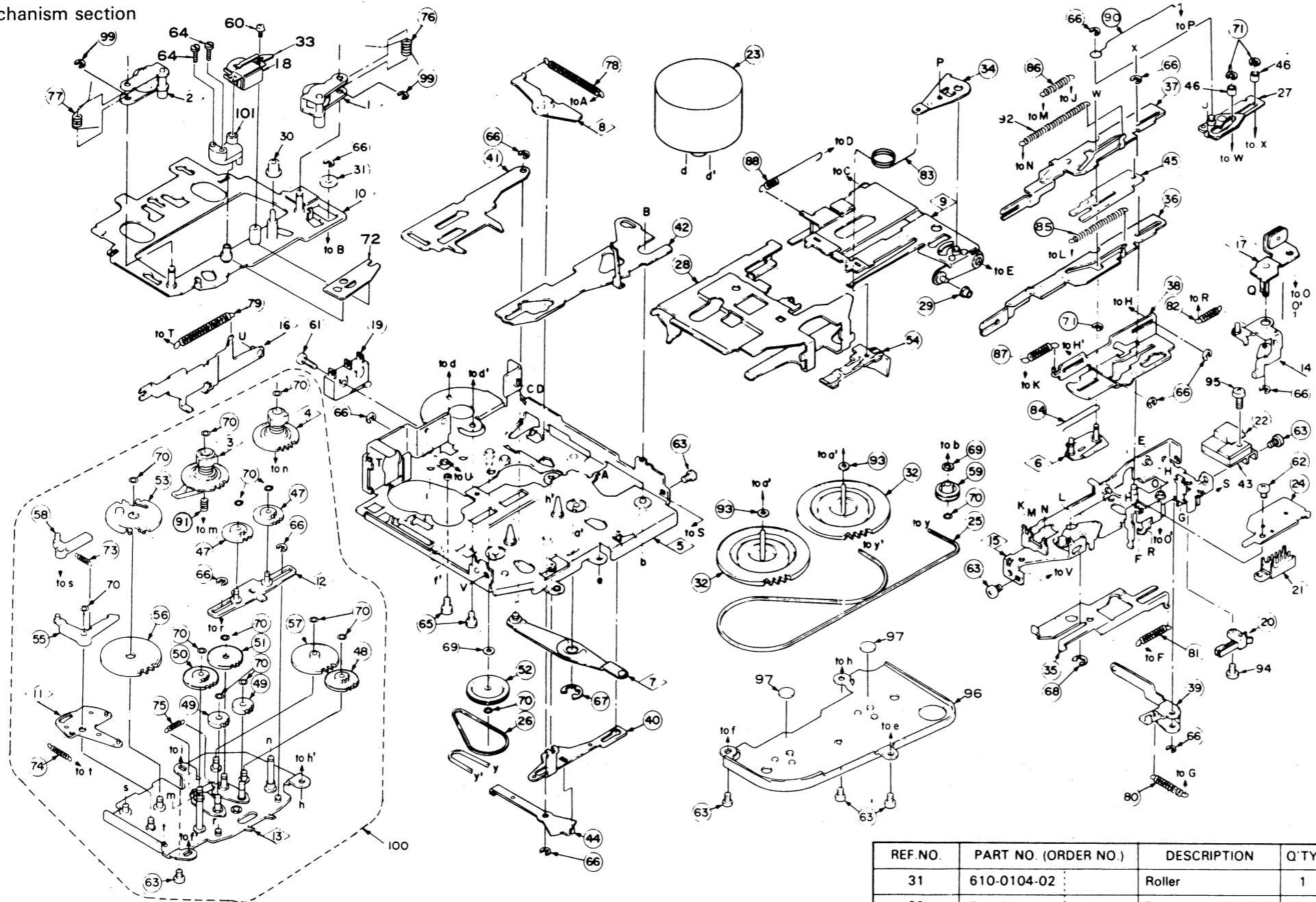
REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
10	380-4763-00	Knob	3
11	722-0332-00	Nut	3
12	745-0560-00	Washer	3
13	722-0368-00	Nut	1
14	330-8429-00	Volume holder	1
15	012-4509-00	Variable resistor (VOL)	1
16	012-4507-00	Variable resistor (BAL)	1
17	012-4508-00	Variable resistor (BASS/TREB)	2
18	330-8430-00	IC holder	1
19	345-3316-01	P.L cap	1

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
20	017-0346-04	Pilot lamp (LCD)	1
21	345-3667-07	P.L cap (LCD)	1
22	001-0369-00	LED lamp (RED)	3
23	353-0268-00	Shade	3
24	013-3694-00	Tact switch	14
25	304-0387-00	Lower cover	1
26	099-7755-00	P.W.B	1
27	345-3436-10	P.L cap	3
28	017-0338-14	Pilot lamp	4
29	345-4162-00	Spacer	2

*Use only PE-9092A

EXPLODED VIEW • PARTS LIST:

©Tape mechanism section



REF NO	PART NO. (ORDER NO.)	DESCRIPTION	Q. TY
1	960-3321-06	Roller F ass'y	1
2	960-3322-06	Roller R ass'y	1
3	960-3323-01	Reel base ass'y	1
4	960-3324-01	Reel base ass'y	1
5	960-3325-08	Deck plate ass'y	1
6	960-3568-02	Spring H ass'y	1
7	960-3328-04	Coupling P ass'y	1
8	960-3329-01	Link ass'y	1
9	960-3330-06	Guide arm ass'y	1
10	960-3562-05	Head plate ass'y	1
11	960-3332-03	Check P-B ass'y	1
12	960-3333-02	FF plate ass'y	1
13	960-3334-06	Bottom P ass'y	1
14	960-3577-03	Lock plate ass'y	1
15	960-3567-04	Frame ass'y	1

REF. NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q. TY
16	960-3338-02	Program lever ass'y	1
17	960-3566-01	Core plate ass'y	1
18	011-0296-10	Head	1
19	013-2690-03	Switch	1
20	013-3470-01	Switch	1
21	013-3646-00	Switch	1
22	015-0232-00	Plunger	1
23	SMA-109-100	D.C. motor ass'y	1
24	099-6942-01	P.W.B	1
25	602-0068-00	Belt-A	1
26	602-0069-00	Belt-B	1
27	960-3565-01	Over plate ass'y	1
28	606-0071-07	Pack guide	1
29	610-0080-00	Roller	1
30	610-0258-01	Head plate roller	1

REF. NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q. TY
31	610-0104-02	Roller	1
32	611-0062-02	Flywheel	2
33	630-1689-01	Head spring	1
34	630-1394-03	Swing plate	1
35	630-1400-04	Off plate-B	1
36	630-1669-04	FF lever-A	1
37	630-1670-02	REW lever	1
38	960-3563-02	Eject plate ass'y	1
39	630-1405-01	Off arm	1
40	630-1407-02	FF plate-B	1
41	630-1410-00	Power plate	1
42	630-1691-01	Change plate	1
43	630-1675-01	Plunger plate	1
44	630-1420-00	FF link	1
45	630-1671-01	Hold plate	1
46	632-1557-00	Roller B	2
47	631-0353-00	FF-REW gear	2
48	631-0354-01	Gear-B	1

REF. NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q. TY
49	631-0355-01	Play idler gear	2
50	631-0356-00	Gear-R	1
51	631-0357-00	Gear-F	1
52	631-0358-02	Gear pulley	1
53	960-3506-01	Power gear ass'y	1
54	631-0455-01	Pack stopper	1
55	631-0361-00	Lock link	1
56	631-0362-01	Cam gear	1
57	631-0363-02	Gear-A	1
58	631-0364-02	Sub lock link	1
59	631-0370-00	Tension pulley	1
60	714-2003-81	Machine screw (M2x3)	1
61	714-2308-81	Machine screw (M2.3x8)	1
62	716-0485-00	Screw	1
63	714-2604-81	Machine screw (M2.6x4)	6
64	716-0654-01	Screw	2
65	716-0690-00	Screw	2
66	743-1500-10	E-ring	12
67	743-4000-10	E-ring	1
68	744-0006-01	E-ring	1
69	745-0645-00	Washer	2
70	746-0628-01	Washer	14
71	744-0024-01	E-ring	3
72	630-1690-00	Adjust plate	1
73	750-2134-00	Spring	1
74	750-2135-01	Spring	1
75	750-2136-02	Spring	1
76	750-2372-01	Spring	1
77	750-2378-01	Spring	1
78	750-2139-01	Spring	1
79	750-2140-02	Spring	1
80	750-2141-01	Spring	1
81	750-2142-02	Spring	1
82	750-2144-00	Spring	1
83	750-2375-00	Spring	1
84	750-2199-00	Spring	1
85	750-2357-02	Spring	1
86	750-2359-00	Spring	1
87	750-2358-00	Spring	1
88	750-2150-00	Spring	1
89	750-2361-00	Spring	1
90	750-2360-01	Spring	1
91	750-2155-00	Spring	1
92	750-2356-02	Spring	1
93	746-0617-00	Washer	2
94	714-2604-11	Machine screw (M2.6x4)	1
95	714-2606-11	Machine screw (M2.6x6)	1
96	630-1415-01	Flywheel plate	1
97	631-0293-00	Thrust washer	2
99	743-2000-10	E-ring	2
100	960-3580-01	Bottom sub ass'y	1
101	631-0456-00	Adjust link	1

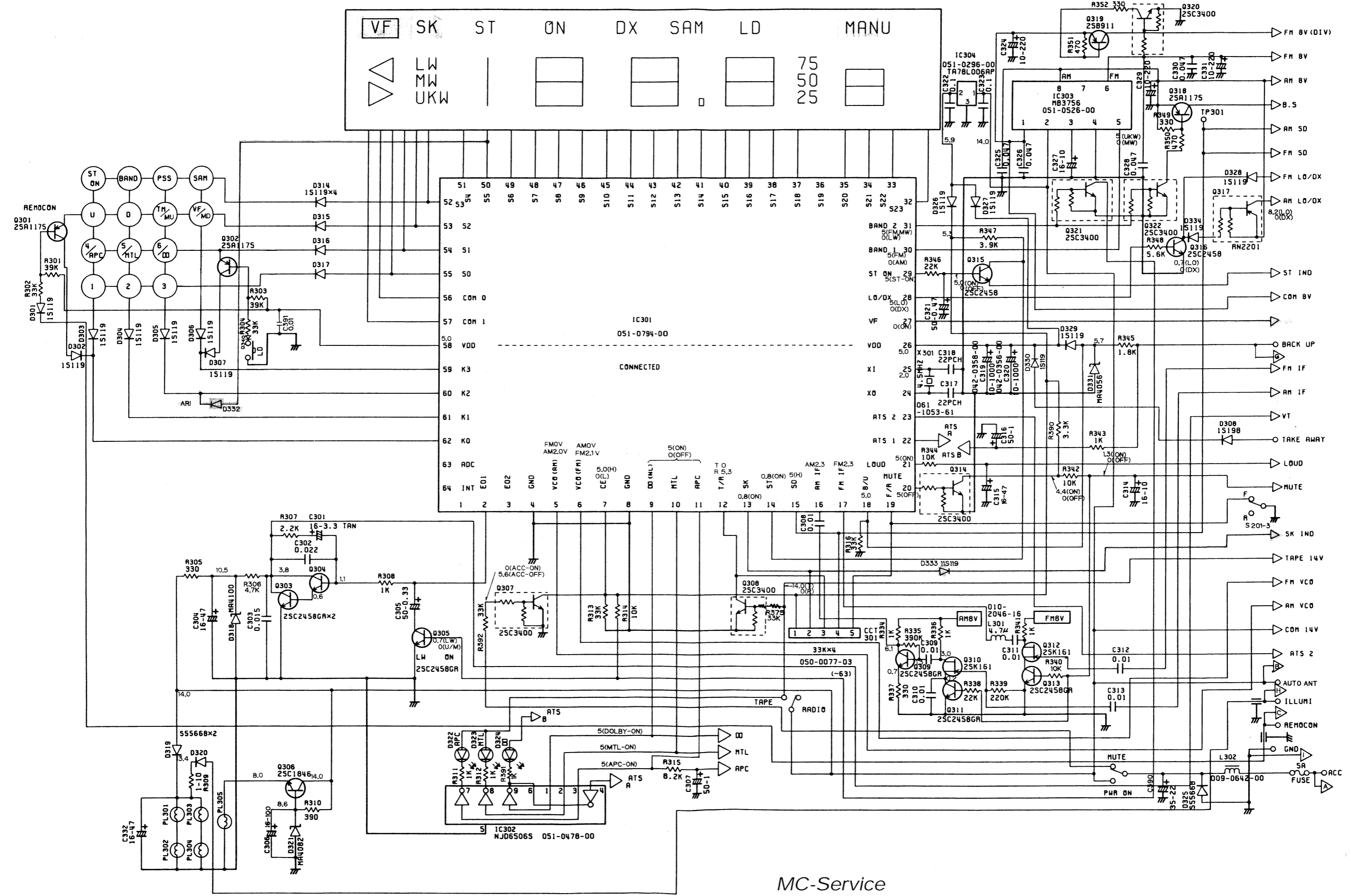
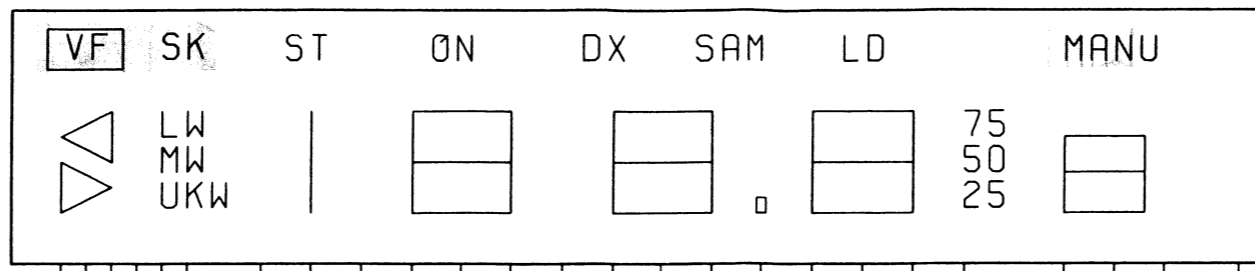
969HX 960HX

969HX 960HX

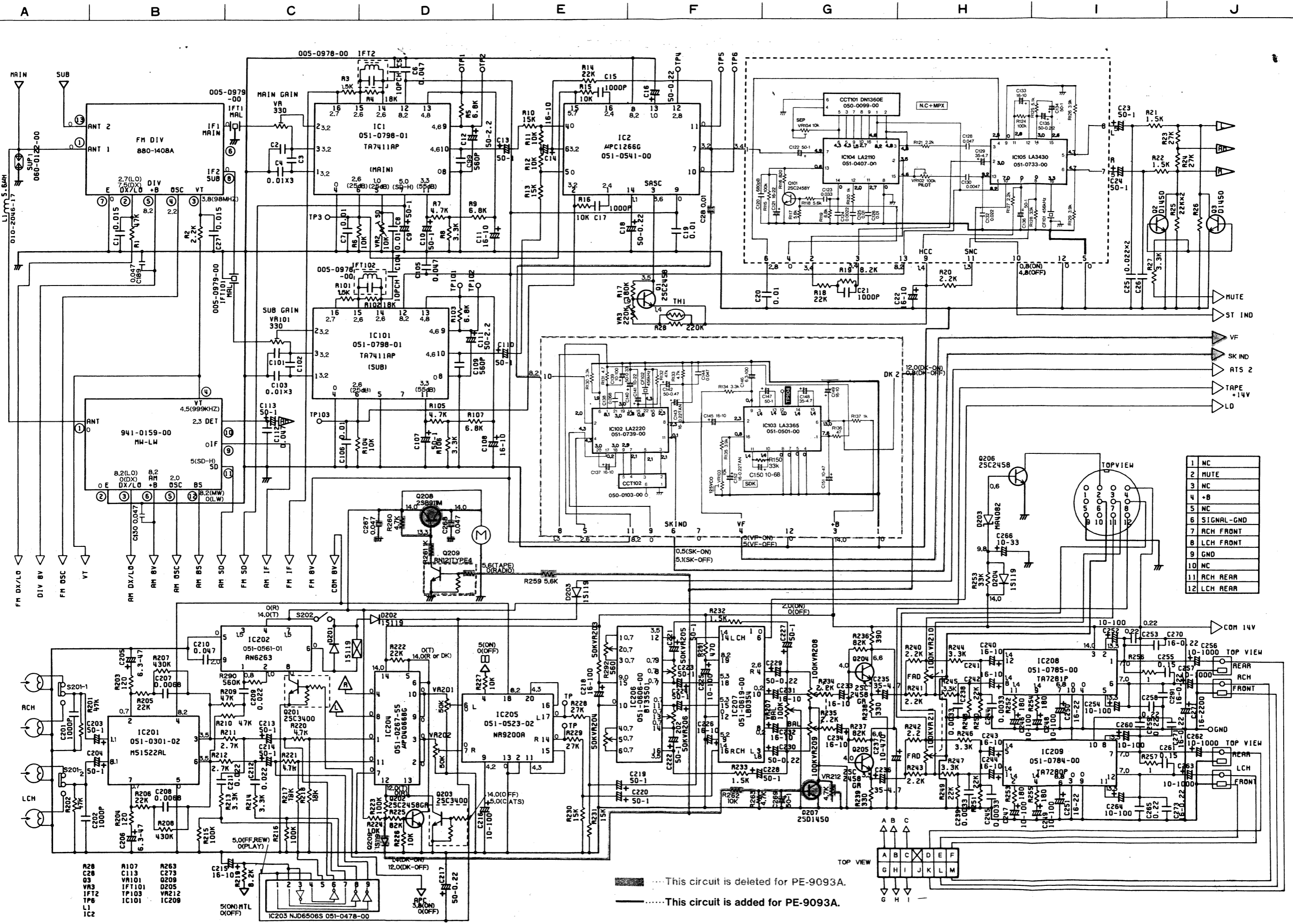
CIRCUIT DIAGRAM:

1
2
3
4
5
6
7

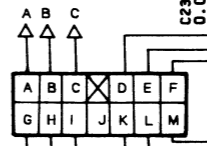
A B C D E F G H I J



MC-Service



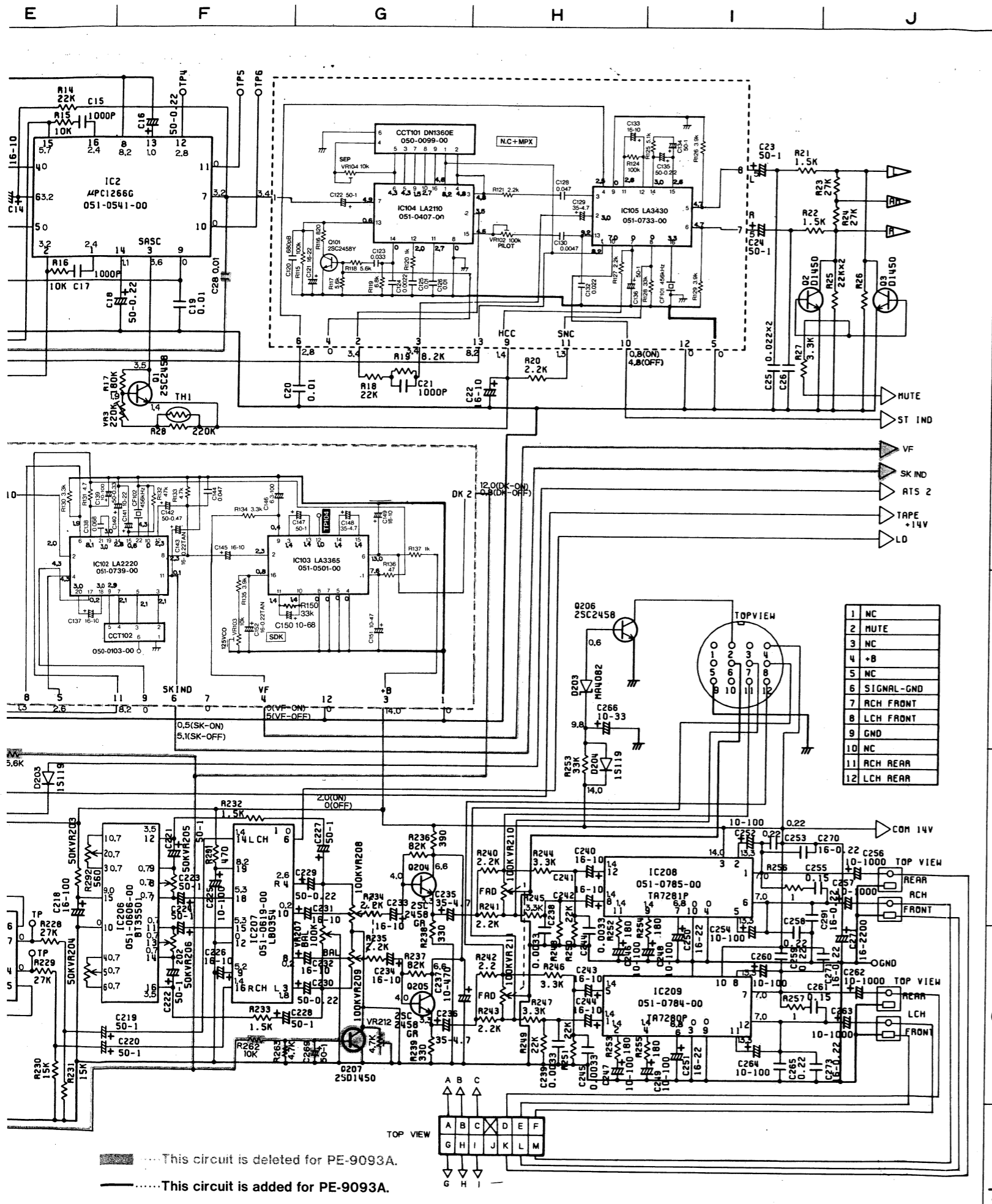
1	NC
2	MUTE
3	NC
4	+B
5	NC
6	SIGNAL-GND
7	RCH FRONT
8	LCH FRONT
9	GND
10	NC
11	RCH REAR
12	LCH REAR



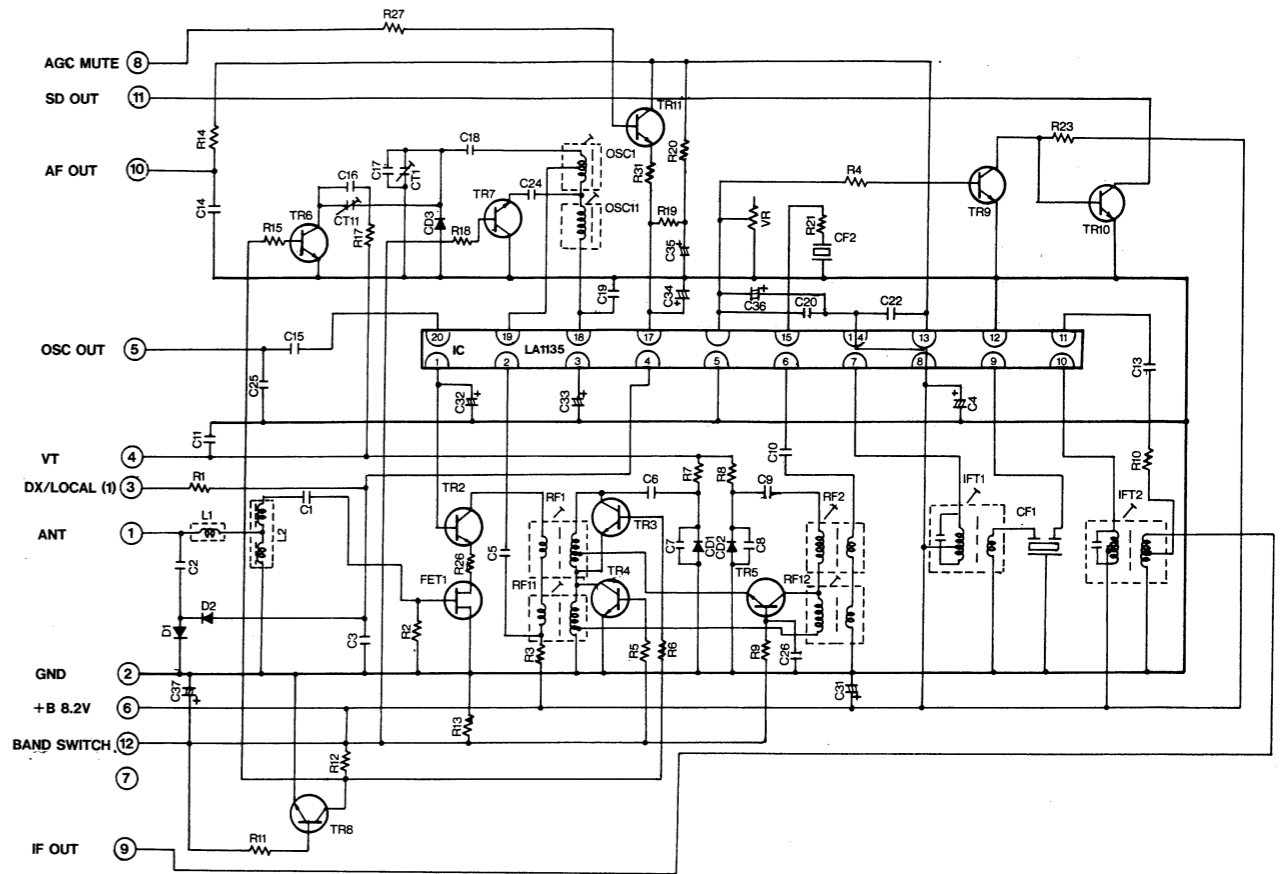
.....This circuit is deleted for PE-9093A.
 ————This circuit is added for PE-9093A.

- A28 C26
- O3 V101
- V13 IFT2
- L1 IC2
- A107 C113
- V101 IFT101
- TP103 IC101
- A263 C273
- O209 IC205
- IC208

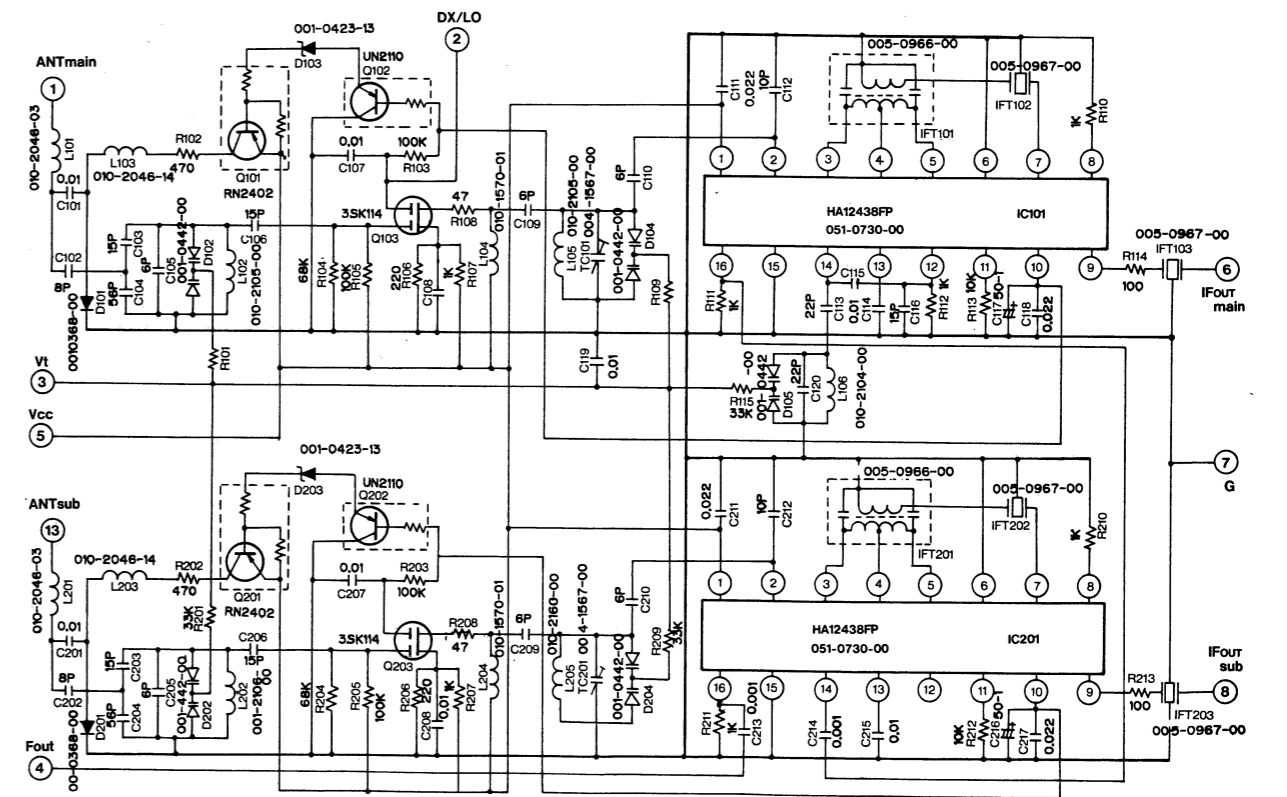
MC-Service



■ MW/LW TUNER PACK: 941-0159-00

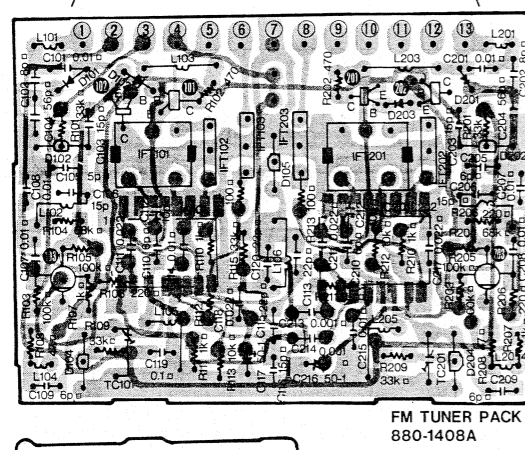


■ UKW TUNER PACK: 880-1408A



PRINTED WIRING BOARD:

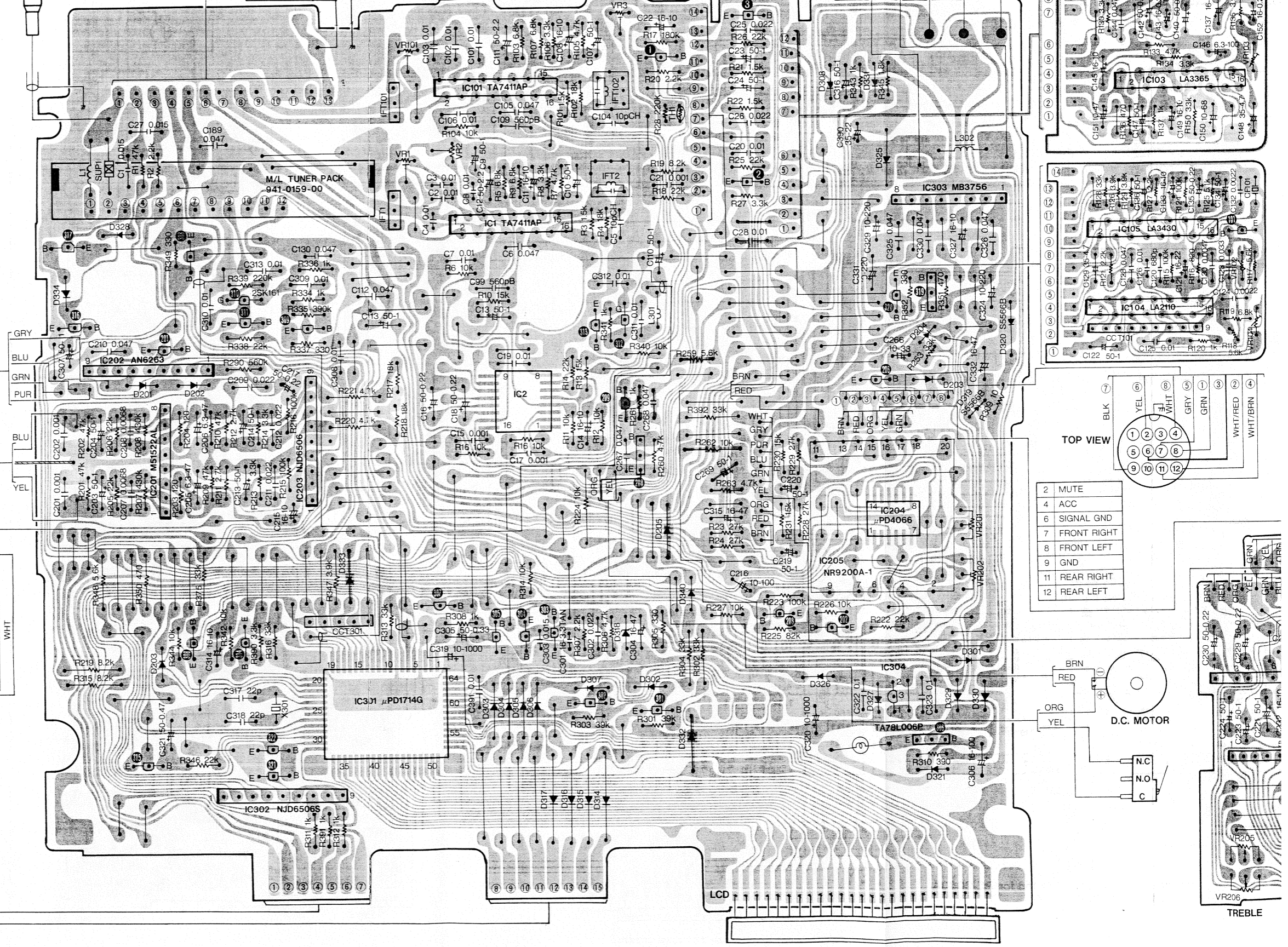
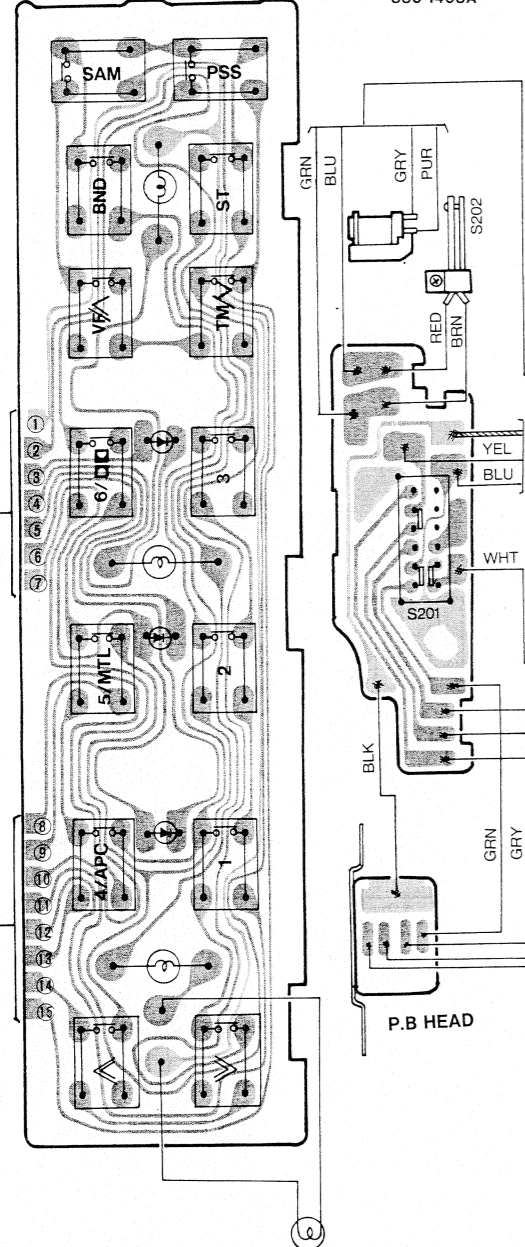
A	+ B	H	ILLUMI
B	AUTO ANT	I	GROUND
C	SEEK	J	NC
D	SP LCH REAR ⊕	K	SP RCH REAR ⊕
E	SP LF LR ⊕	L	SP RR RF ⊖
F	SP LCH FRONT ⊕	M	SP RCH FRONT ⊕
G	BACK UP		



MAIN ANTENNA

SUB ANTENNA

TOP VIEW



2	MUTE
4	ACC
6	SIGNAL GND
7	FRONT RIGHT
8	FRONT LEFT
9	GND
11	REAR RIGHT
12	REAR LEFT

