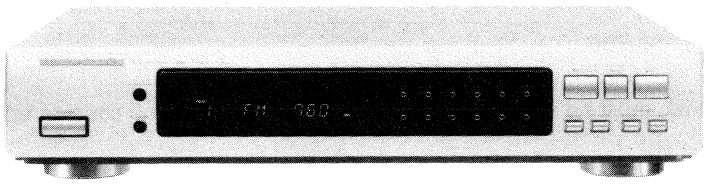
Service Manual

ST-46K

Stereo tuner



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Please use this service manual with referring to the user guide (D.F.U.) without fail.

marantz®

model ST-46

Printed in Japan

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MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

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Parts can be ordered either by mail or by Fax.. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or Fax. must be signed, otherwise such part order will be considered as null and void.

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SHOCK, FIRE HAZARD SERVICE TEST:

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard NO.1492.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

1. MEASURING EQUIPMENT

EQUIPMENTS	DESCRIPTION
AM GENERATOR.	for AM alignment
FM GENERATOR	for FM alignment
FM STEREO SIGNAL GENERATOR	for FM alignment
AUDIO SIGNAL GENERATOR	for Audio signal input
DISTORTION METER	for distortion alignment
DC VTVM (DIGITAL VOLT METER)	for DC voltage measurement
AC VTVM (AUDIO NOISE METER)	for AC voltage measurement
OSCILLOSCOPE	for signal measurement
FREQUENCY COUNTER	for frequency measurement
MULTI METER	for general purpose
TEST LOOP AERIAL	for AM signal transmit

2. TECHNICAL SPECIFICATIONS

FM TUNER SECTION

Mono usable sensitivity ..... 1.0 μV
Sensitivity for 50 dB quieting
  Mono ..... 1.5 μV
  Stereo ..... 25 μV
Sensitivity ..... 65 dB
Signal to noise ratio
  Mono ..... 80 dB
  Stereo ..... 73 dB
Total harmonic distortion (1 kHz)
  Mono ..... 0.1 %
  Stereo ..... 0.2 %
Stereo separation ..... 45 dB
Accuracy of frequency response
across 30 Hz ~ 15 kHz bandwidth ..... +0.5 / -1.0 dB
Output level at 1 kHz 75 kHz deviation ..... 940 mV

AM TUNER SECTION

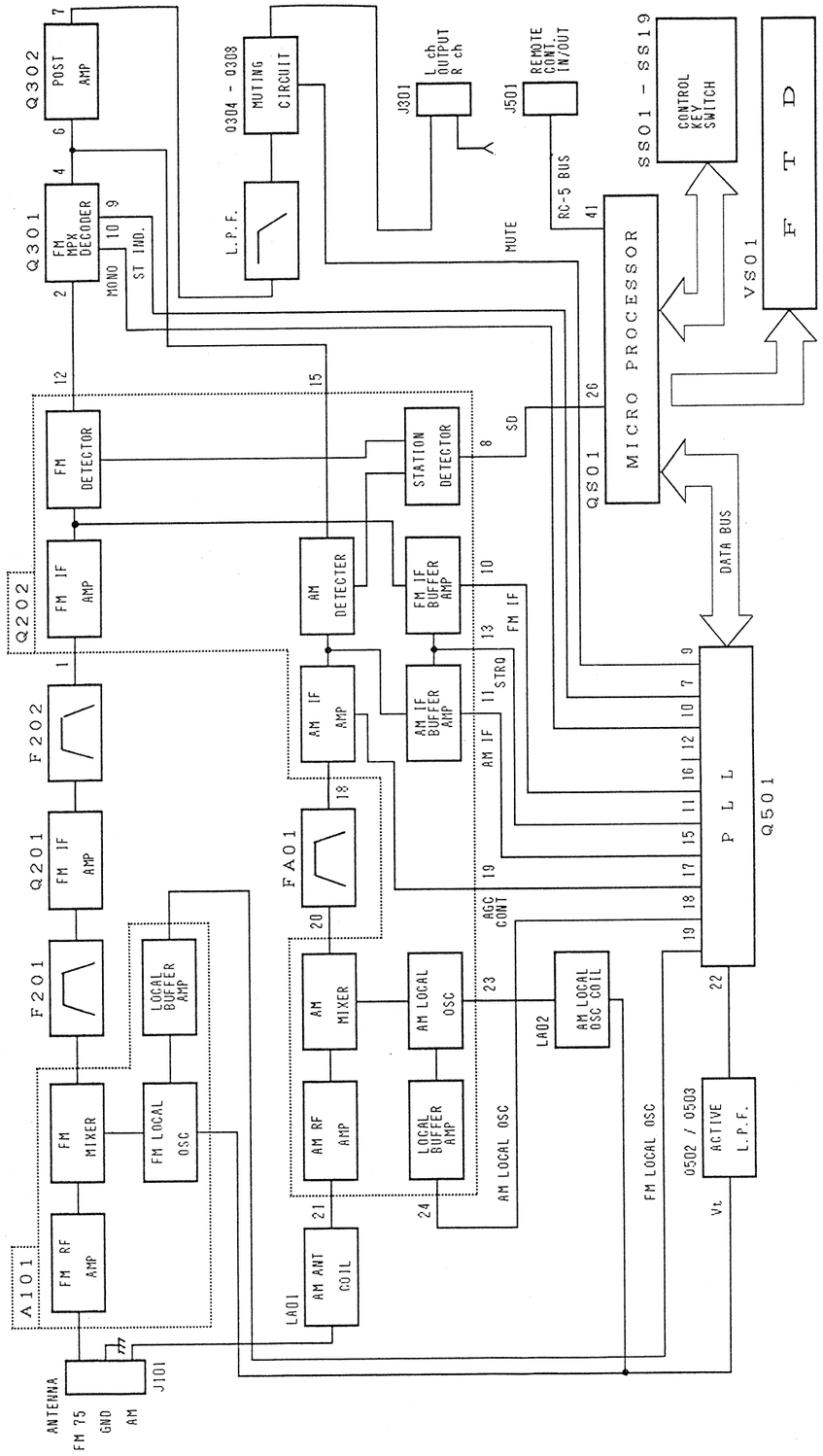
Usable sensitivity ..... 350 μV
Sensitivity ..... 35 dB
Signal to noise ratio ..... 52 dB
Total harmonic distortion ..... 0.5 %

GENERAL

Power requirements supply ..... 110 / 120 / 220 / 240 V AC, 50 / 60 Hz
Power consumption ..... 6 W
Dimensions (MAX)
  Width ..... 426 mm
  Height ..... 86 mm
  Depth ..... 295 mm
Weight ..... 3.2 kg

Specifications subject to change without prior notice.

3. BLOCK DIAGRAM



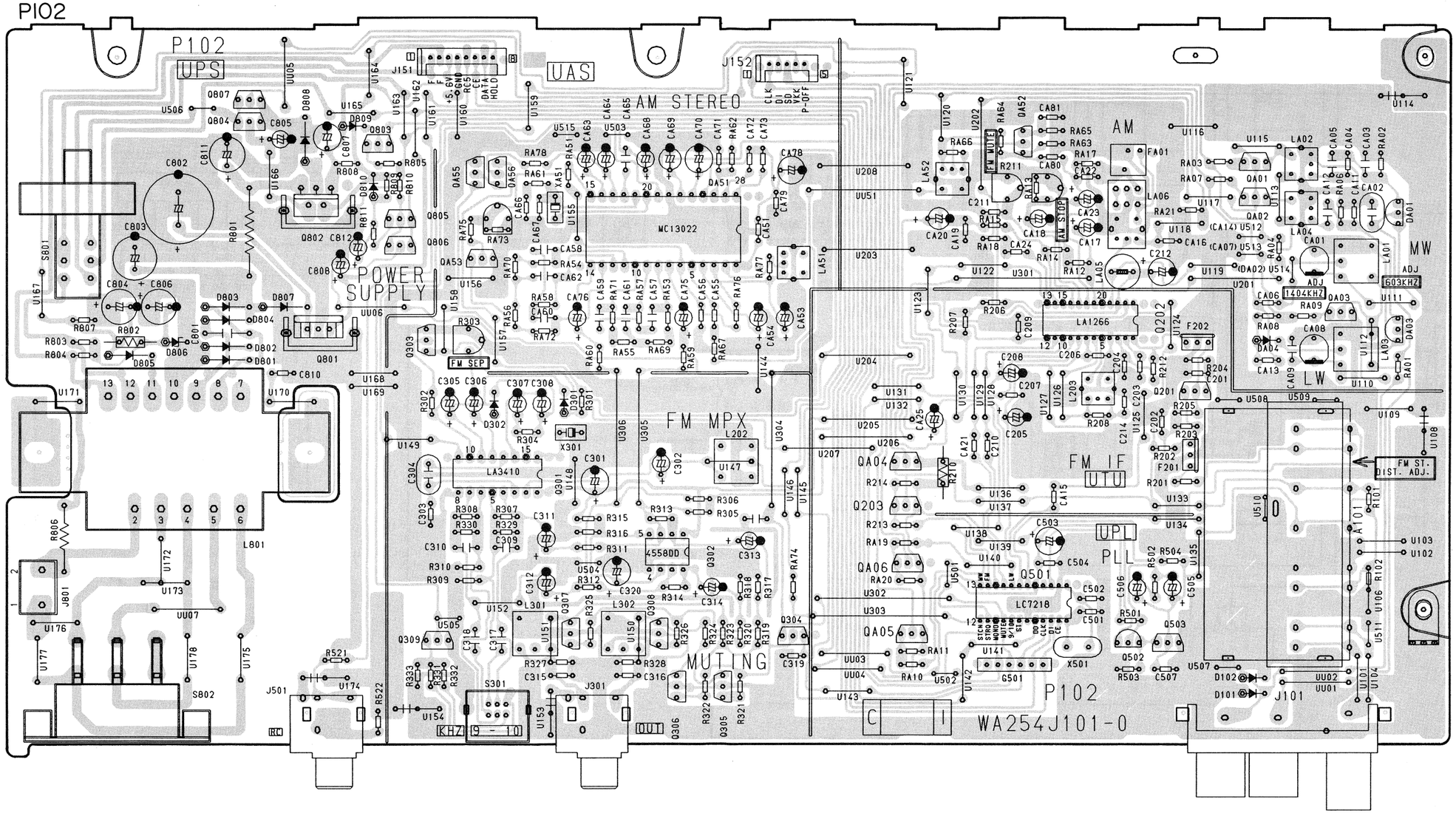
4. SCHEMATIC DIAGRAM AND PARTS LOCATION (Pattern side)

Q202 (LA1266)

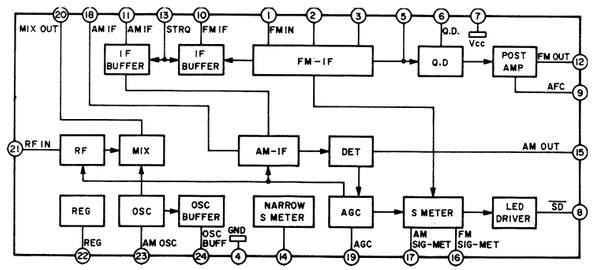
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12
FM (V)	2.4	2.4	2.4	0	9.5	9.5	9.5	0	4.0	2.5	2.8	3.1
AM (V)	1.1	1.1	1.1	0	7.9	7.9	7.9	0	4.3	2.5	2.8	3.1
PIN NO.	13	14	15	16	17	18	19	20	21	22	23	24
FM (V)	0	1.2	1.5	1.8	0	2.4	1.5	0	4.0	4.0	4.0	2.8
AM (V)	0	1.2	2.0	1.3	1.8	1.1	1.7	7.9	3.7	3.7	3.7	2.3

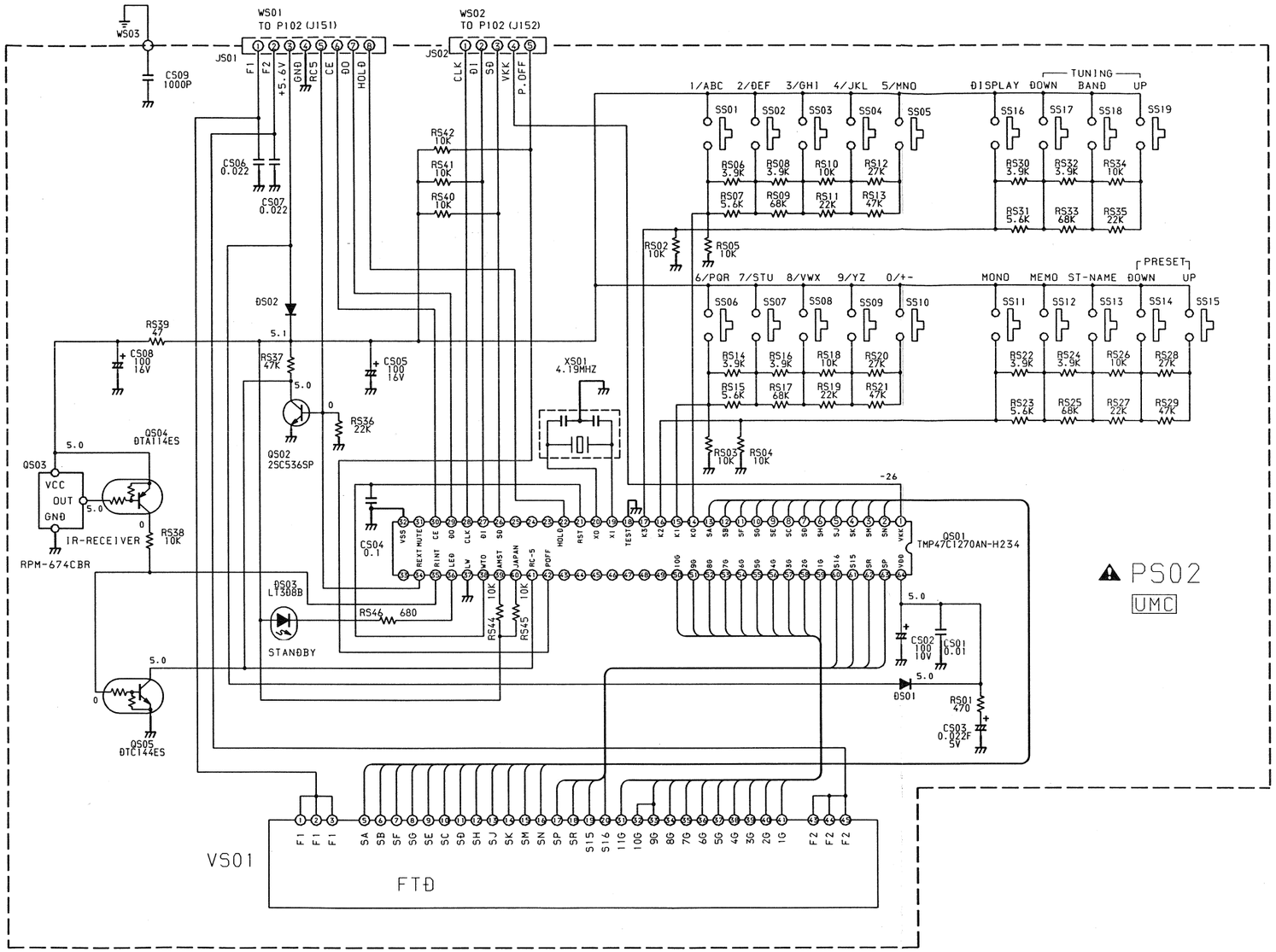
Q807 Q802 Q803 Q805 QA55 QA56 QA51 QA04～QA06 QA52 Q202 QA01
Q804 Q801 Q303 Q806 QA53 Q301 Q302 Q203 Q501 Q201 QA02
Q309 Q307 Q308 Q306 Q305 Q502 Q503 QA03

PI02



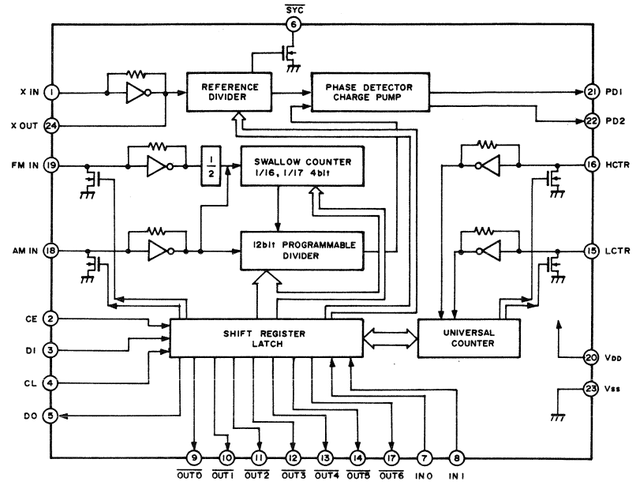
Q202: LA1266



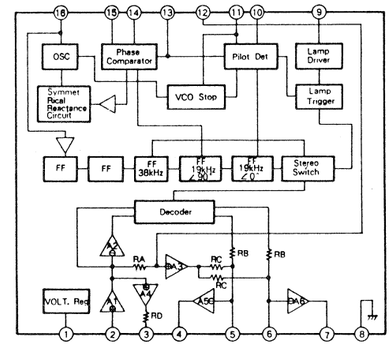


QS03 QS04 QS05 QS02 QS01

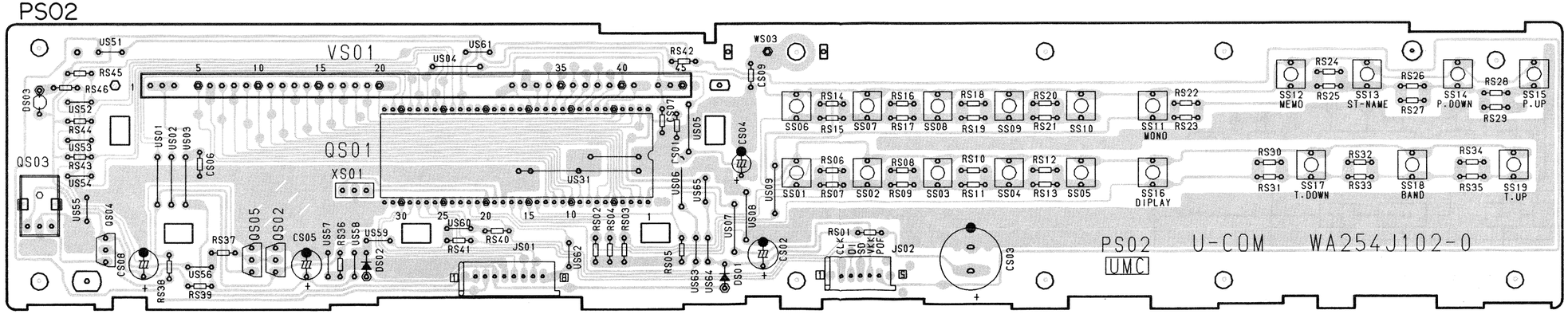
Q501: LC7218



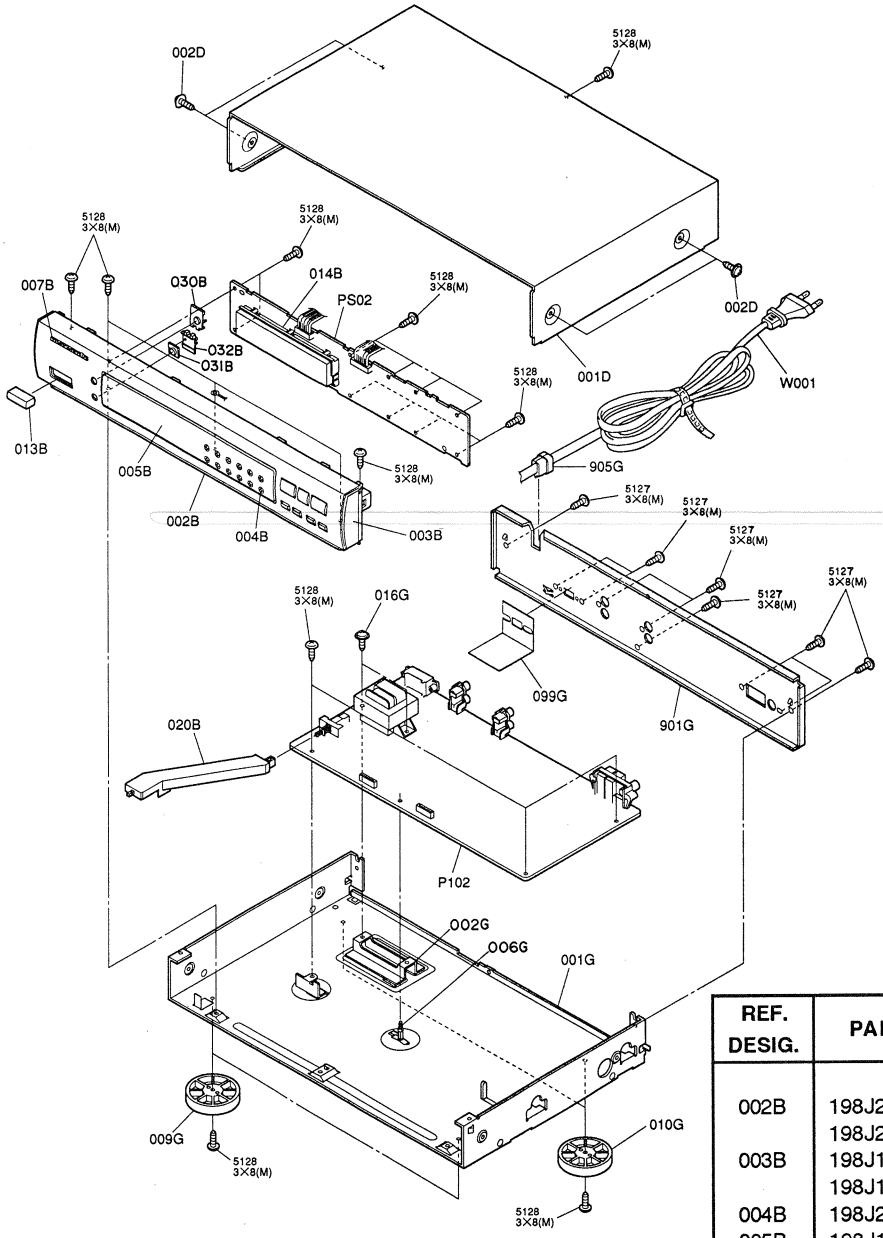
Q301: LA3410



PS02



5. EXPLODED VIEW AND PARTS LIST



REF. DESIG.	PARTNO.	DESCRIPTION
002B	198J248340	FRONT PANEL (BLK)
	198J248350	FRONT PANEL (GLD)
003B	198J105010	CHASSIS, FRONT (BLK)
	198J105030	CHASSIS, FRONT (GLD)
004B	198J270010	BUTTON
005B	198J158210	WINDOW
013B	285K270010	BUTTON, POWER (BLK)
	285K270110	BUTTON, POWER (GLD)
014B	066J271010	HOLDER, FL
020B	198J121010	LINK, POWER SW.
030B	254J355010	LENS, IR
031B	254J355020	LENS, LED
032B	254J355030	LENS, LED
002D	51260308M0	B.T. SCREW (W/W) M3 x 8
009G	183J057010	LEG, FRONT
010G	183J057110	LEG, REAR
905G	450H259010	BUSHING, AC CORD
⚠W001	YC01800610	A.C. POWER CORD
001T	254J851350	USER MANUAL
Z001	ZK254J0010	REMOTE CONTROL, RC-46ST
Z002	LA00055010	ANT. COIL, AM LOOP
Z003	ZD01000330	CONNECTIVE CORD, OUTPUT
Z004	ZA02000070	EXT. ANTENNA
Z005	YP90000310	PLUG, ANT. ADAPTOR
Z007	YJ04001960	PLUG, AC PLUG ADAPTOR

6. SERVICE PROGRAM

6-1. Tracking Point Memory

This service program can be used for measurement of the tuner circuit.

While holding the **MEMO** and **BAND** keys depressed simultaneously, press the **1/ABC** key, the tracking point memory is called. Frequencies to be memorized are as follows.

P1-P3	P4	P5	P6	
87.5	90.0	98.0	106.0	MHz

P7	P8	P9	P10	P11	P12	P13	P14-P30	
603	999	1404	531	←	←	←	NO MEMO.	KHz

To clear the entire memory :

While holding the **MEMO** and **BAND** keys depressed simultaneously, press the **0/+ -** key. It will clear the RAM data entirely.

6-2. FLD Segment Luminous

All segments can be luminous by following step.

While holding the **MEMO** and **BAND** keys depressed simultaneously, press the **2/DEF** key.

Luminous procedure

1) **FL CHECK** indication luminous 2 seconds.
2) All of segments light off.
3) Segments luminous start at **Sa** to **S16** every 0.3 seconds.
4) After all segments luminous, it still luminous 3 seconds at that indication.
5) Press the **MEMO** key while in procedure 4., it still continue until **POWER OFF.**

6-3. Local Oscillator Oscillation Check

This service program can confirm oscillation of each FM and AM oscillators, and also data bus line condition confirmation between the microprocessor and the PLL IC is available.

While holding the **MEMO** and **BAND** keys depressed simultaneously, press the **3/GHI** keys, **SERVICE** indication luminous 2 seconds and one of following indication will appear.

INDICATION	PHENOMENON
TUNER OK	DATA bus, FM and AM oscillation all OK.
TUNER NG	DATA bus OK, but FM and AM oscillation both NG.
FM NG	DATA bus and AM oscillation both OK, but FM oscillation NG.
AM NG	DATA bus and FM oscillation both OK, but AM oscillation NG.
PLL NG	DATA bus line NG or PLL IC working NG.

TUNER OK indication will light off after 2 seconds luminous. Other error indication will not light off until pressing of any keys.

7. TUNER ALIGNMENT PROCEDURES

- Set to T.R point ME mode of the service program.
(P2) to (P9) in the Digital Readout Frequency Setting column shows preset numbers for the above mode.
- Before alignment, connect a dummy resistor of 47 kohms to the tape output terminal.

7-1. FM Alignment Procedures

FM RF Alignment

(Band switch at "FM" position and MONO switch at "ON" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator to FM antenna terminal. Adjust the RF signal output so that slight noise occurs at the upper and lower sides of the output waveform.	98.0 MHz	AC VTVM to L-or R-channel Tape out (J301)	98.0 MHz (P5)	Front end IFT for maximum output and minimum distortion.
2	FM signal generator 500 μV output to FM antenna terminal (75-ohm).	98.0 MHz	Distortion meter to L-or R-channel Tape out (J301)	98.0 MHz (P5)	L203 core for minimum distortion.

FM IF Alignment

(Band switch at "FM" position and MONO switch at "OFF" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 μV output modulated by MPX signal generator to FM antenna terminal (75-ohm).	Stereo L-channel (1.000 Hz)	VTVM to L-channel Tape out (J301 L-channel)	98.0 MHz (P5)	Front end IFT for minimum distortion.
2	Modulation level: IHF 67.5 kHz +9% pilot dev. DIN 40 kHz +8% pilot dev.	Stereo R-channel (1.000 Hz)	VTVM to R-channel Tape out (J301 R-channel)		

Muting Level Alignment

(Band switch at "FM" position and MONO switch at "OFF" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 6.3 μV output to FM antenna terminal (75-ohm)	98.0 MHz	AC VTVM to L-or R- channel Tape out (J301)	98.0 MHz (P5)	R211 to a point at which output appears.

Multiplex Alignment (Band switch at "FM" position and MONO switch at "OFF" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 μV output modulated by MPX signal generator to FM antenna terminal (75-ohm) Modulation level : IHF 67.5 kHz +9% pilot dev. DIN 40 kHz +8% pilot dev.	Stereo L-channel (1.000 Hz)	VTVM to R-channel Tape out (J301 R-channel)	98.0 MHz (P5)	R303 so that channel separation is identical between both channels.
2		Stereo R-channel (1.000 Hz)	VTVM to L-channel Tape out (J301 L-channel)		
3	Repeat steps 1 and 2				

7-2. AM (MW) Alignment Procedures (Band switch at "MW" or "AM" position)

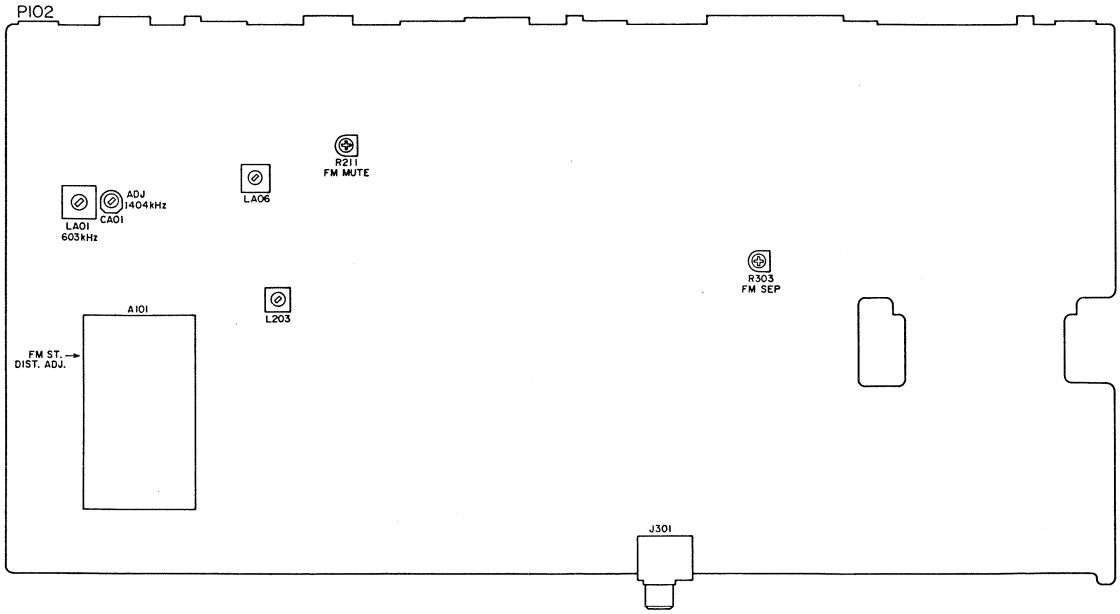
AM IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	Sweep generator to AM antenna terminal.	450 kHz	AC VTVM to L-or R-channel Tape out (J301)	——	LA06 for maximum and symmetrical waveform.

AM (MW) RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	AM signal generator to AM loop antenna in a test loop.	603 kHz	VTVM to L-or R-channel Tape out (J301)	603 kHz (P7)	LA01 for maximum output.
2		1404 kHz		1404 kHz (P9)	CA01 for maximum output.
3	Repeat steps 1 and 2 until sensitivity is maximized.				

8. ALIGNMENT AND TEST POINT



9. MICROPROCESSOR SPECIFICATIONS

Receiving Frequency Range, Channel Space, Reference Frequency and Intermediate Frequency

	Receiving Frequency	Channel Space	Reference Frequency	Intermediate Frequency
FM	87.5 ~ 108.0 MHz	100 kHz	25 kHz	- 10.7 Mhz
AM	531 ~ 1602 kHz	9 kHz	9 kHz	+ 450 kHz

Key description

[1 / ABC] ~ [0 / +-] : **PRESET BUTTONS (0 to 9)**

Use these buttons to preset receiving frequencies in the memory or to recall the preset frequencies from the memory (Preset tuning).

Up to 30 stations in the FM and AM bands can be preset in the memory in a random order.

For operation of the preset memory, refer to "PRESET TUNING".

The PRESET number indicator lights up when a preset button is pressed.

These buttons are also used as the character entry buttons in the station-name input mode.

[MONO] : **MONO BUTTON**

Press to switch the receiving mode between the auto stereo mode and monaural mode.

When the button is pressed to the in position, the receiving mode becomes the monaural mode and muting is turned off.

When the button is pressed again, the receiving mode becomes the auto stereo mode and muting is turned on.

[MEMO] : **MEMO BUTTON**

Press to preset a receiving frequency in the memory. The MEMORY indicator blinks for about 5 seconds when this button is pressed. It is only during this period that a frequency can be preset in the memory.

[ST NAME] : **ST-NAME BUTTON**

Press before manual input of station name.

For details, refer to "MANUAL INPUT OF STATION NAMES".

[PRESET UP] [PRESET DOWN] : **PRESET UP/DOWN BUTTON**

Every time the UP or DOWN side of the PRESET button is pressed, the preset number will advance one step in the upward or downward direction. The unused preset numbers without memory contents are skipped.

This button is also used as the CURSOR button in the station name input mode.

[DIS-PLAY] : **DISPLAY BUTTON**

When this button is pressed while a station name is being displayed, the display is switched to the frequency display.

Pressing the button again returns to the station name display; if no station name has been stored for the station being received, "NO NAME" is displayed when the button is pressed.

[TUNING UP] [TUNING DOWN] : **TUNING UP (▲) / DOWN (▼) BUTTON**

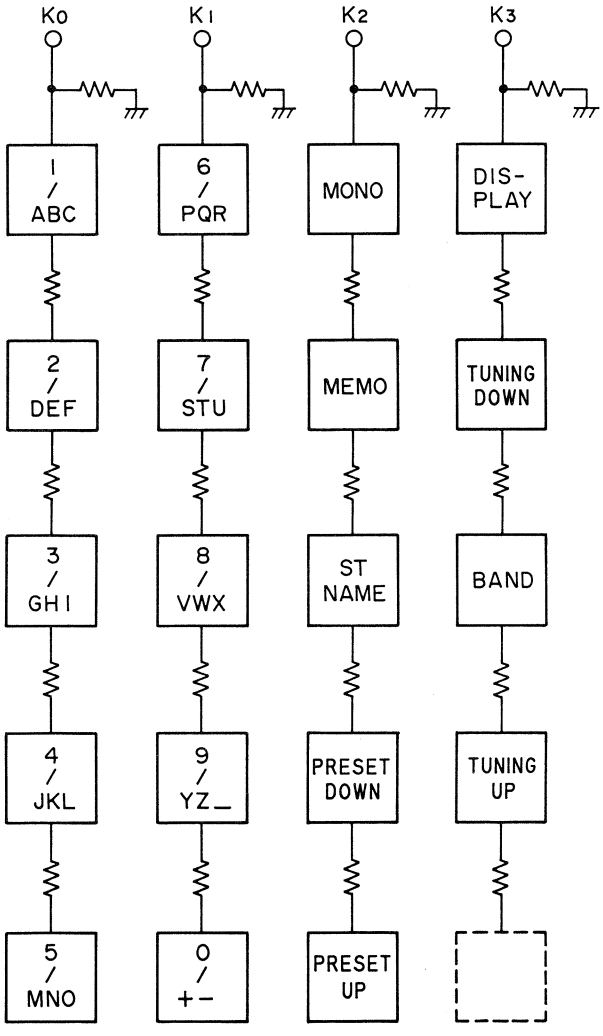
Every time the UP or DOWN side of the TUNING button is pressed, the receiving frequency varies in the upward or downward direction, in the steps of 50 kHz in FM band or 9 kHz in AM band.

When the button is held depressed for more than 0.5 seconds, the receiving frequency varies continuously in the above-mentioned steps until a station is received. Press or hold the button until the desired frequency is displayed on the digital frequency indicator.

[BAND] : **BAND BUTTON**

Use this button to select FM or AM wave bands.

Key Matrix

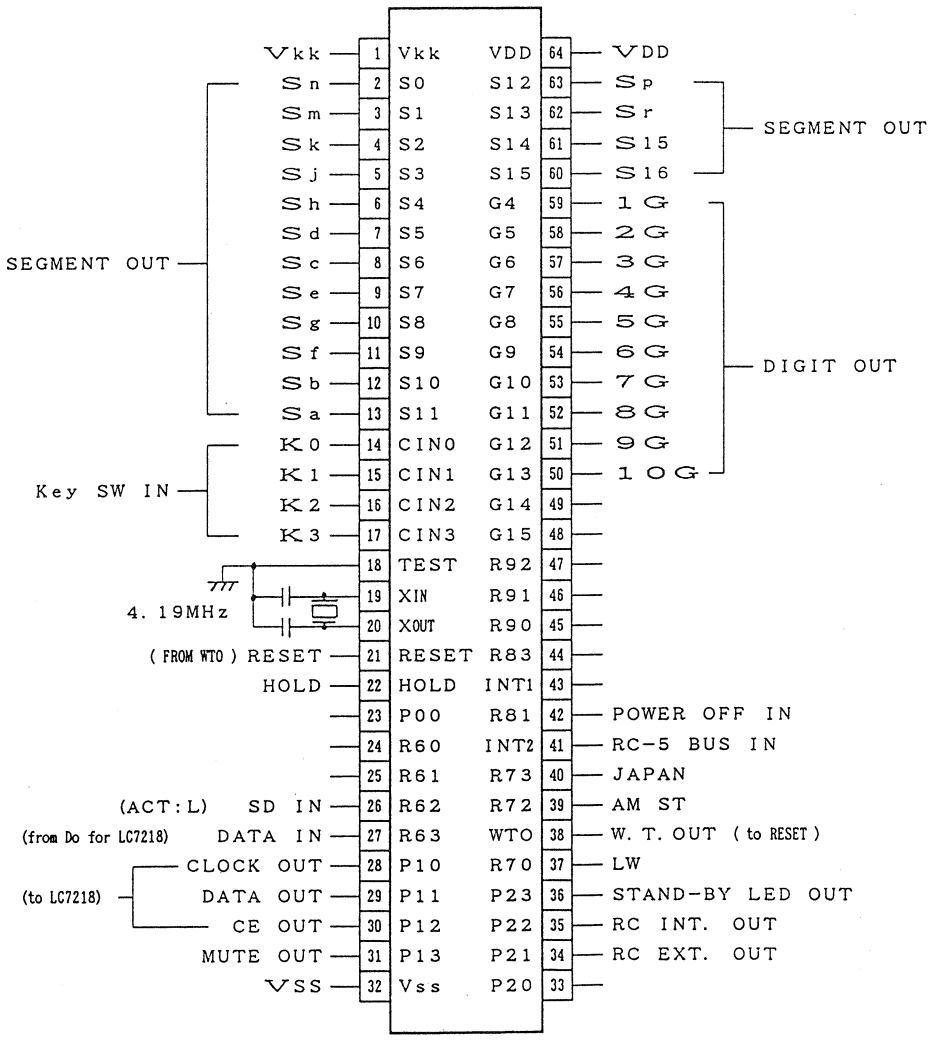


PLL IC I / O DIRECTION

OUT 0 : MUTE Signal output (Active : [L])
OUT 1 : MUTE Signal output (Active : [H])
OUT 2 : STRQ Signal output (Active : [H])
OUT 3 : N.C
OUT 4 : MW (AM) Signal output (Active : [L])
OUT 5 : FM Band selection signal (Active : [L])
OUT 6 : AM AGC CONT. Signal output
IN 0 : STEREO IN Stereo indicator signal input (Active : [L])
FM IN : FM VCO signal input
AM IN : AM VCO signal input
HCTR : FM IF signal input
LCTR : AM IF signal input

Pin No.		Pin Name	FM	AM
OUT0	9	MUTE	1/0	1/0
OUT1	10	MONO	1/0	1/0
OUT2	11	STRQ	1/0	1/0
OUT3	12	ST CON	1	1/0
OUT4	13	AM	1	0
OUT5	14	FM	0	1
OUT6	17	AM AGC	0	1/0

TMP47C1270AN-H234



10. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

R*** : 1) GD05 x x x 140, Carbon film fixed resistor, ±5% 1/4W
R*** : 2) GD05 x x x 160, Carbon film fixed resistor, ±5% 1/6W

① —— Resistance value

Examples ;
① Resistance value

0.1Ω...001	10Ω...100	1kΩ...102	100kΩ...104
0.5Ω...005	18Ω...180	2.7kΩ...272	680kΩ...684
1Ω...010	100Ω...101	10kΩ...103	1MΩ...105
6.8Ω...068	390Ω...391	22kΩ...223	4.7MΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C*** : CERAMIC CAP.
1) DD1x x x x 370, Ceramic capacitor
Disc type
Temp.coeff.P350~N1000,50V
① ② — Capacity value
Tolerance

Examples
① Tolerance (Capacity deviation)
±0.25pF ... 0
±0.5pF ... 1
±5% ... 5
* Tolerance of COMMON PARTS handled here are as follows :
0.5pF~ 5pF...±0.25pF
6pF~ 10pF...±0.5pF
12pF~ 560pF...±5%
② Capacity value

0.5pF...005	3pF...030	100pF...101
1pF...010	10pF...100	220pF...221
1.5pF...015	47pF...470	560pF...561

C*** : CERAMIC CAP.
1) DK16 x x x 300, High dielectric constant ceramic capacitor
① Disc type
Temp.chara. 2B4, 50V
Capacity value

Examples
② Capacity value

100pF...101	1000pF...102	10000pF...103
470pF...471	2200pF...222	

C*** : ELECTROLY CAP.(⏚), FILM CAP.(⫫)
1) EA x x x x x x 10, Electrolytic capacitor
One-way lead type, Tolerance ±20%
① ② — Working voltage
Capacity value

Examples
① Capacity value

0.1μF...104	4.7μF...475	100μF...107
0.33μF...334	10μF...106	330μF...337
1μF...105	22μF...226	1100μF...118
		2200μF...228

② Working voltage

6.3V...006	25V...025	
10V...010	35V...035	
16V...016	50V...050	

2) DF15 x x x 350 } Plastic film capacitor
DF15 x x x 310 } One-way type, Mylar ±5% 50V
DF16 x x x 310 Plastic film capacitor
One-way type, Mylar ±10% 50V
① — Capacity value

Examples
① Capacity value

0.001μF(1000pF)...102	0.1μF...104
0.0018μF.....182	0.56μF...564
0.01μF.....103	1μF...105
0.015μF.....153	

NOTE : 1) The above CODES (R***,R***,C***,C*** and (C***) are omitted on the schematic diagram in some case.
2) On the occasion, be confirmed the common parts on the parts list.
3) Refer to "Common Parts List" for the other common parts(**RI05, DD4, DK4**).

NOTE ON SAFETY FOR FUSIBLE RESISTOR :

The suppliers and their type numbers of fusible resistors are as follows ;

1. KOA Corporation

Part No.	Type No.	Description
NH05 x x x 140	→ RF25S x x x x Ω J	(±5% 1/4W)
NH05 x x x 120	→ RF50S x x x x Ω J	(±5% 1/2W)
NH85 x x x 110	→ RF73B2A x x x x Ω J	(±5% 1/10W)
NH95 x x x 140	→ RF73B2E x x x x Ω J	(±5% 1/4W)

* Resistance value — Resistance value (0.1→10kΩ)

2. Matsushita Electronic Components Co., Ltd

Part No.	Type No.	Description
NF05 x x x 140 / RF05 x x x 140	→ ERD-2FCJ x x x	(±5% 1/4W)
NF02 x x x 140 / RF02 x x x 140	→ ERD-2FCG x x x	(±2% 1/4W)

* Resistance value — * Resistance value

Examples :
* Resistance value

0.1Ω...001	10Ω...100	1kΩ...102	100kΩ...104
0.5Ω...005	18Ω...180	2.7kΩ...272	680kΩ...684
1Ω...010	100Ω...101	10kΩ...103	1MΩ...105
6.8Ω...068	390Ω...391	22kΩ...223	4.7MΩ...475

ABBREVIATION AND MARKS

1	ANT.	: ANTENNA	2	BATT.	: BATTERY
3	CAP.	: CAPACITOR	4	CER.	: CERAMIC
5	CONN.	: CONNECTING	6	DIG.	: DIGITAL
7	HP	: HEADPHONE	8	MIC.	: MICROPHONE
9	μ-PRO	: MICROPROCESSOR	10	REC.	: RECORDING
11	RES.	: RESISTOR	12	SPK	: SPEAKER
13	SW	: SWITCH	14	TRANSF.	: TRANSFORMER
15	TRIM.	: TRIMMING	16	TRS.	: TRANSISTOR
17	VAR.	: VARIABLE	18	X'TAL	: CRYSTAL
19			20		
21			22		
23			24		
25			26		
27			28		
29			30		

NOTE ON SAFETY :

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replaced any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

REF. DESIG.	PARTNO.	DESCRIPTION
		PS02-μ-COM CIRCUIT BOARD
		PS02-CAPACITORS
CS01	DA17103110	CERAMIC 0.01μF ±20% 25V
CS02	EJ10701610	ELECT 100μF 16V
CS03	EX22300510	BIG ELECT 0.022F 5V
CS04	DD38104010	CERAMIC 0.1μF +80% -20% 50V
CS05	EJ10701610	ELECT 100μF 16V
CS06	DA17103110	CERAMIC 0.01μF ±20% 25V
CS07	DA17103110	CERAMIC 0.01μF ±20% 25V
CS08	EJ10701610	ELECT 100μF 16V
		PS02-RESISTORS (COMMON) CARBON FILM FIXED RESISTOR, ±5% 1/6W :
R***		RS01~RS42, RS46
		RS02-SEMICONDUCTORS
DS01	HD20002000	DIODE 1SS176, MA165, 1SS254
DS02	HD20002000	DIODE 1SS176, MA165, 1SS254
DS03	HI10062320	L.E.D. LT3D8B (RED)
QS01	HU254JT000	μ-COM TMP47C1270AN-H234
QS02	HT30001000	TRANSISTOR 2SC536SP, 2SC2458, ETC.
QS03	HW10001210	PHOTO UNIT RPM-670CBR,
QS04	BA10001000	DIGITAL TRANSISTOR DTA114ES, UN4111
QS05	HT30001000	TRANSISTOR 2SC536SP, 2SC2458, ETC.
		PS02-MISCELLANEOUS
SS01 ∫ SS19	SP01011280	PUSH SWITCH, TACT
VS01	HQ31106060	DISPLAY UNIT FIP12BM8R
XS01	FQ04194020	CERAMIC RESONATOR 4.19MHz
		P102-TUNER CIRCUIT BOARD
		P102-CAPACITORS
CA01	CT12000200	TRIMMING 120PF
CA04	DA15470110	CERAMIC 47PF ±5% 50V
CA05	DF15391550	FILM 380PF ±5% 50V
CA06	DA17103110	CERAMIC 0.01μF ±20% 25V
CA15	DA17103110	CERAMIC 0.01μF ±20% 25V
CA16	DA17223110	CERAMIC 0.022μF ±20% 25V
CA17	EJ10505010	ELECT 1μF 50V
CA18	EJ10505010	ELECT 1μF 50V
CA19	DA17103110	CERAMIC 0.01μF ±20% 25V
CA20	EJ22405010	ELECT 0.22μF 50V
CA21	DA15680110	CERAMIC 68PF ±5% 50V
CA22	DA17103110	CERAMIC 0.01μF ±20% 25V
CA23	EJ10601610	ELECT 10μF 16V
CA24	DA17103110	CERAMIC 0.01μF ±20% 25V
CA25	EJ10601610	ELECT 10μF 16V
C201	DA17103110	CERAMIC 0.01μF ±20% 25V
C202	DA17103110	CERAMIC 0.01μF ±20% 25V
C203	DA17223110	CERAMIC 0.022μF ±20% 25V
C204	DA17223110	CERAMIC 0.022μF ±20% 25V
C205	EJ10601610	ELECT 10μF 16V
C206	DA17223110	CERAMIC 0.022μF ±20% 25V
C207	EJ10601610	ELECT 10μF 16V
C208	EJ10505010	ELECT 1μF 50V

REF. DESIG.	PARTNO.	DESCRIPTION
C209	DA16102110	CERAMIC 1000PF ±10% 50V
C210	DA15680110	CERAMIC 68PF ±5% 50V
C211	DA17223110	CERAMIC 0.022μF ±20% 25V
C212	EJ10701610	ELECT 100μF 16V
C214	DA17223110	CERAMIC 0.022μF ±20% 25V
C301	EJ10701610	ELECT 100μF 16V
C302	EJ10601610	ELECT 10μF 16V
C303	DA16102110	CERAMIC 1000PF ±10% 50V
C305	EJ10505010	ELECT 1μF 50V
C306	EJ10601610	ELECT 10μF 16V
C307	EJ33505010	ELECT 3.3μF 50V
C308	EJ47405010	ELECT 0.47μF 50V
C311 ∫ C314	EJ10601610	ELECT 10μF 16V
C319	DA17103110	CERAMIC 0.01μF ±20% 25V
C320	EJ10701610	ELECT 100μF 16V
C501	DA15470110	CERAMIC 47PF ±5% 50V
C502	DA15470110	CERAMIC 47PF ±5% 50V
C503	EJ10701610	ELECT 100μF 16V
C504	DA17103110	CERAMIC 0.01μF ±20% 25V
C505	EJ10405010	ELECT 0.1μF 50V
C506	EJ10505010	ELECT 1μF 50V
C507	DA17103110	CERAMIC 0.01μF ±20% 25V
C801	DK18103560	CERAMIC 0.01μF +80% -20% 500V
C802	OA22803520	ELECT 2200μF 35V
C805	EJ10505010	ELECT 1μF 50V
C807	EJ10701610	ELECT 100μF 16V
C808	EJ10505010	ELECT 1μF 50V
C810	DA17103110	CERAMIC 0.01μF ±20% 25V
C812	EJ10601610	ELECT 10μF 16V
		P102-CAPACITORS (COMMON) CERMIC CAPACITOR, ±5% 50V :
C***		CA03
		HIGH DIELECTRIC CONSTANT CERAMIC CAPACITOR, ±10% 50V :
C***		CA57~CA62, C309, C310
		ELECTROLYTIC CAPACITOR, ±20% :
C***		C803, C804, C806, C811
		PLASTIC FILM CAPACITOR, ±5% 50V :
C***		CA02, CA65, C304
		P102-RESISTORS
⚠R210	GG05101140	100 Ω ±5% 1/4W
R211	RA01040780	100K Ω, TRIMMING
R303	RA04730780	47K Ω, TRIMMING
⚠R801	GA05181020	180 Ω ±5% 2W
⚠R802	GG05681140	680 Ω ±5% 1/4W
G501	BW05103240	10K Ω x 5 ±5% 1/8W ARRAY
		P102-RESISTORS (COMMON) CARBON FILM FIXED RESISTOR, ±5% 1/8W :
R***		RA01, RA02, RA12~RA15, RA17, RA18, RA51, RA53~RA67, RA69~RA75, RA77, R201~R208, R212~R214, R301, R302, R304, R307~R328, R501~R504, R521, R522, R803~R805, R807~R811

REF. DESIG.	PARTNO.	DESCRIPTION
		P102-SEMICONDUCTORS
DA01	HD40009030	VARICAP SVC342
D101	HD20002000	DIODE 1SS176, MA165, 1SS254
D102	HD20002000	DIODE 1SS176, MA165, 1SS254
D301	HD20002000	DIODE 1SS176, MA165, 1SS254
D302	HD20002000	DIODE 1SS176, MA165, 1SS254
⚠D801 ∫ ⚠D805	HD20003000	DIODE RL103E, DSF10C
D806	HD32001000	ZENER RD20JB2, MTZJ20C
⚠D807	HD20003000	DIODE RL103E, DSF10C
⚠D808	HD20003000	DIODE RL103E, DSF10C
D809	HD20002000	DIODE 1SS176, MA165, 1SS254
D810	HD20002000	DIODE 1SS176, MA165, 1SS254
QA04	BA10001000	DIGITAL TRANSISTOR DTA114ES, UN4111
Q201	HT318091P0	TRANSISTOR 2SC1809S (P)
Q202	HC10222030	IC LA1266
Q203	HT113092C0	TRANSISTOR 2SA1309A (Q, R)
Q301	HC10198030	IC LA3410
Q302	HC10008090	IC NJM4558DD
Q303	BA20002000	DIGITAL TRANSISTOR DTA144ES, UN4213
Q304	BA10001000	DIGITAL TRANSISTOR DTA114ES, UN4111
Q305 ∫ Q309	HT30001000	TRANSISTOR 2SC536SP, 2SC2458, ETC.
Q501	HC10221030	IC LC7218
Q502	HF200300B0	F.E.T. 2SK30ATM
Q503	HT30001000	TRANSISTOR 2SC536SP, 2SC2458, ETC.
⚠Q801	HC38912090	IC NJM7812A
⚠Q802	HC10205030	IC 78MR05
Q803	HT30001000	TRANSISTOR 2SC536SP, 2SC2458, ETC.
Q804	BA20002000	DIGITAL TRANSISTOR DTA144ES, UN4213
Q805	BA20002000	DIGITAL TRANSISTOR DTA144ES, UN4213
Q806	HT30001000	TRANSISTOR 2SC536SP, 2SC2458, ETC.
Q807	BA20002000	DIGITAL TRANSISTOR DTA144ES, UN4213
		P102-MISCELLANEOUS
A101	AV01202220	V.H.F. TUNER FE337-A05
F201	FF11070610	CERAMIC FILTER SFE10.7MA8-A
F202	FF11070620	CERAMIC FILTER SFE10.7MS3-A
J101	YT03030020	TERMINAL, ANT
J301	YT02021200	TERMINAL, TUNER OUTPUT
J501	YT02020890	TERMINAL, REMOTE CONT. BUS
LA01	LA10295170	ANT COIL, AM ANT
LA02	LO70013010	OSC COIL, AM OSC
LA05	LC23960710	CHOKE COIL, 39mH
LA06	FF10045330	I.F.T. COIL, AM IFT + CERA. FIL.

REF. DESIG.	PARTNO.	DESCRIPTION
L203	LI70379060	I.F.T. COIL, FM DET
L301	LS10293010	M.P.X. COIL, FM MPX LPF
L302	LS10293010	M.P.X. COIL, FM MPX LPF
⚠L801	TS14823090	POWER TRANSFORMER
S301	SS02021470	SLIDE SWITCH, SCAN STEP DE-EMPHASIS SW
⚠S801	SP02011000	PUSH SWITCH, POWER / STANDBY
⚠S802	SS02021240	SLIDE SWITCH, VOLTAG SELECTOR
X301	FQ04563010	CERAMIC RESONATOR, CSB456F11
X501	JX07001260	CRYSTAL, 7.2MHz