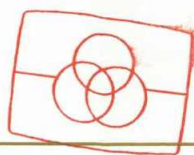


Service Manual

74 ST53/01B/02B/05B/01G/02G

74 ST63/01B/02B/05B/01G/02G

Stereo tuner

Free service manuals
Gratis schema's

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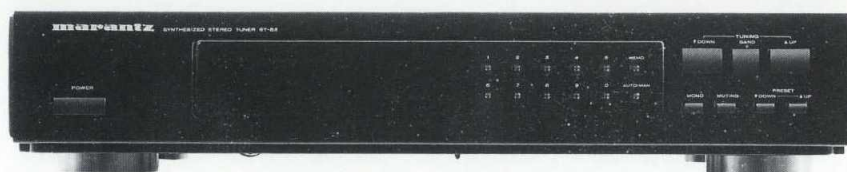


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marantz®

model ST-53/ST-63

4822 725 51033

First issue : 1993

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 at our National Marantz Subsidiary or Agent.

MARANTZ EUROPE B.V.
P.O. Box 80002
Building SFF 2
5600 JB Eindhoven
The Netherlands
Phone : +31-40-732241
Fax : +31-40-735578

ORDERING PARTS

Parts can be ordered either by mail or by telex. 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 the part is required
5. Way of shipment
6. Signature: any order form or telex must be signed, otherwise such part order will be considered as null and void.

ADDRESSES

AUSTRALIA
MARANTZ AUSTRALIA
Figtree Drive
Australia Centre
Homebush, NSW 2140
AUSTRALIA

FINLAND
MARANTZ
Kuortanegatan 1
00520
Helsingfors 52
Finland

ITALY
MARANTZ ITALIANA SPA
Piazza IV Novembre 3
20124 Milano
Italy

NORWAY
MARANTZ
Postboks 7034
Assiden
3007 Drammen
Norway

SPAIN
MARANTZ SPAIN
Martinez Villergas 2
Apartado 2065
Madrid 28027
Spain

AUSTRIA
MARANTZ
Hietzinger Kai 137a
1130 Wien
Austria

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France

JAPAN
MARANTZ JAPAN INC.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

PORTUGAL
COREL
Av. da Liberdade
211-2 Esq.
1200 Lisboa
Portugal

SWEDEN
MARANTZ
Box 1324
17125 Solna
Sweden

BELGIUM
MARANTZ EUROPE B.V.
Div. Benelux
P.O.Box 80002
Building SFF 2
5600 JB Eindhoven
The Netherlands

GERMANY
MARANTZ GERMANY GmbH
Kleine Heide 12
Postfach 4802
Halle-Westfalen
Germany

KUWAIT
AL ALAMIAH ELECTRONICS
P.O.Box 8196
Salmiah
22052 Kuwait

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia

SWITZERLAND
MARANTZ SWITZERLAND
Postfach
8010 Zürich-Müllingen
Switzerland

CHILE
MARANTZ DIVISION OF
PHILIPS S.A.
Av. Santa Maria 0760
Casilla 2687
Santiago
Chile

GREAT BRITAIN
MARANTZ HiFi UK Ltd.
Kingsbridge House
Padbury Oaks
575-583 Bath Road
Longford Middlesex UB7 OEH,
U.K.

NETHERLANDS
MARANTZ EUROPE B.V.
Div. Benelux
P.O.Box 80002
Building SFF 2
5600 JB Eindhoven
The Netherlands

SOUTH AFRICA
MARANTZ S.A.
10 Bond Street
Randburg 2194
P.O. Box 7703
Johannesburg 2000
South Africa

TRADING
MARANTZ TRADING
P.O.Box 20008
Building SFF 2
5600 JB Eindhoven
The Netherlands

DENMARK
MARANTZ
Horsvinget 5
2630 Tastrup
Denmark

GREECE
ADAMCO ELECTR. SA
P.O.Box 21025
Hippocratus Str. 188
Athens 11471
Greece

All of the above locations are fully equipped to take care of your total service needs or can advise you. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please contact the nearest facility for the necessary assistance.

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

1. TECHNICAL SPECIFICATIONS

FM Stage 87.5~108 MHz

Sensitivity	
DIN mono (s/n 26 dB 75 Ohms)	0.9 μ V
DIN stereo (s/n 46 dB 75 Ohms)	25 μ V
Selectivity adjacent channel 98 MHz	65 dB
Tuner output (1 kHz 75 kHz Deviation)	940 mV

Signal to noise ratio	
S/N DIN weighted mono	80 dB
S/N DIN weighted stereo	73 dB
Total harmonic distortion mono	0.1 %
Total harmonic distortion stereo	0.2 %

Accuracy of frequency response across 30 Hz~15 kHz bandwidth	+0.5 / -1.5 dB
---	----------------

Stereo separation	45 dB
-------------------------	-------

MW Stage (531~1602 kHz)

Sensitivity (s/n 20 dB 30% mod. 999 kHz)	400 μ V
Selectivity 999 kHz 9 kHz	35 dB
Signal to noise ratio at 999 kHz	52 dB

LW Stage (152~282 kHz)

Sensitivity (s/n 20 dB 30% mod. 207 kHz)	800 μ V
Signal to noise ratio at 207 kHz	50 dB

General

Power Requirements

/01 version (4 voltages)	110 / 120 / 220 / 240 V AC, 50 / 60 Hz
/02 version	230 V AC, 50 Hz
/05 version	240 V AC, 50 Hz

Dimensions

Panel Width	420 mm
Panel Height	87 mm
Depth	280 mm

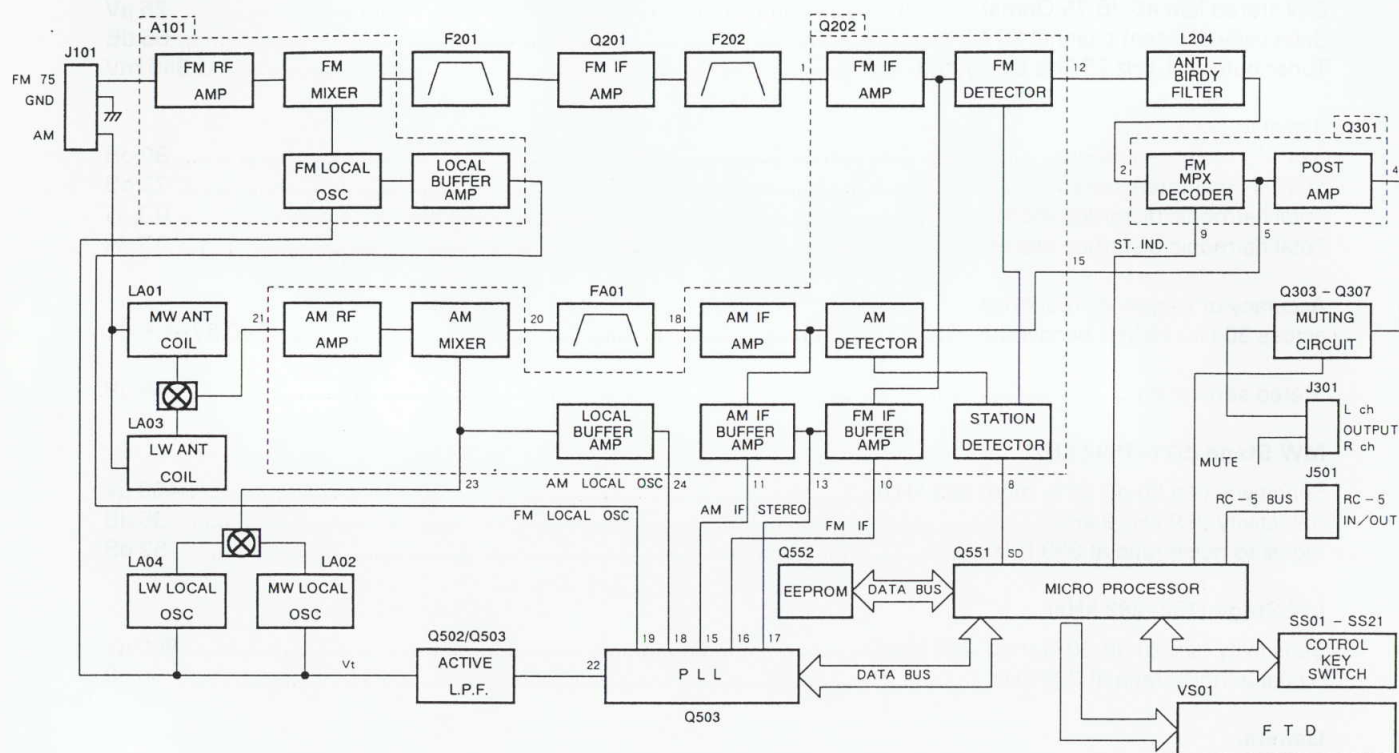
Weight

Unit Alone	3.2 kg
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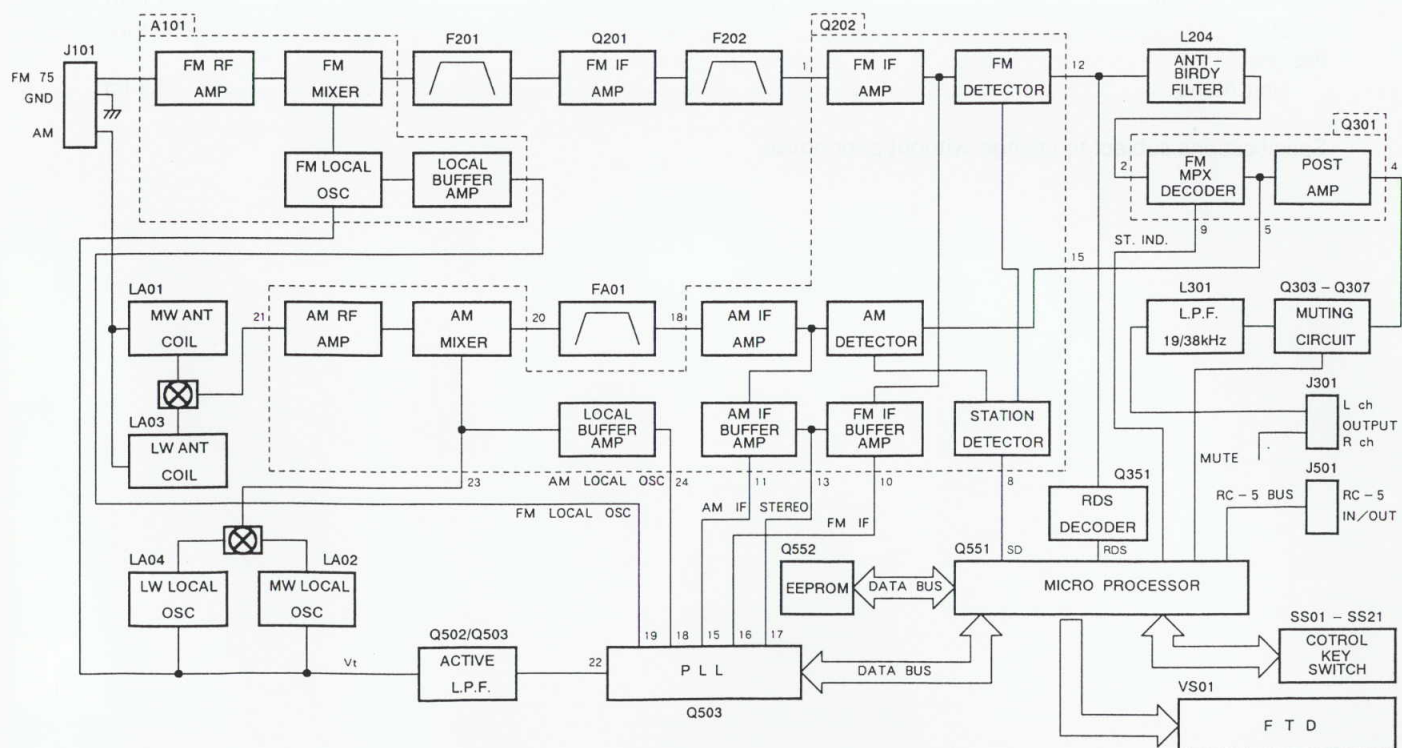
Specifications subject to change without prior notice.

2. BLOCK DIAGRAM

ST-53 BLOCK DIAGRAM



ST-63 BLOCK DIAGRAM



3. TUNER ALIGNMENT PROCEDURES

Before alignment, connect a dummy resistor of 47 kohms to the tuner output terminal.

3-1. FM Alignment Procedures

(Function switch at "FM" position and MUTE switch at "OFF" position)

● FM RF Alignment

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 output (J301)	98.0 MHz	Front end IFT for maximum output and minimum distortion.
2*	FM signal generator 500 μ V output to FM antenna terminal (75-ohm). Modulation Level DIN 40 kHz DEV. IHF 75 kHz DEV.	98.0 MHz	DC VM between both sides of R207.	98.0 MHz	L201 core to 0 $\pm$ 5 mV.
3			Distortion meter to L- or R-channel output (J301)		Core for minimum distortion. L202 (ST-63) L203 (ST-53)

* 2 ONLY FOR ST-63

● FM IF Alignment

(Function switch at "FM" position and MONO switch at "AUTO STEREO" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 μ V 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 L-Channel output (J301 L-channel)	98.0 MHz	Front end IFT for minimum distortion.
2		Stereo R-channel (1,000 Hz)	VTVM to R-Channel output (J301 R-channel)		

● Muting Level Alignment

(Function switch at "FM" position and MUTE switch at "ON" position)

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

● Multiplex Alignment

(Function switch at "FM" position and MONO switch at "AUTO STEREO" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 μ V output modulated by MPX signal generator to FM antenna terminal (75-ohm).	Stereo L-channel (1,000 Hz)	VTVM to R-channel output (J301 R-channel)	98.0 MHz	R303 so that channel separation is identical between both channels.
2	Modulation level : IHF 67.5 kHz +9 % pilot dev. DIN 40 kHz +8 % pilot dev.	Stereo R-channel (1,000 Hz)	VTVM to L-channel output (J301 L-channel)		
3	Repeat steps 1 and 2.				

● 57 kHz BPF Alignment (ONLY for ST-63)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Digital Readout Frequency Setting	Adjust
1	FM signal generator 500 μ V output modulated by MPX signal generator to FM antenna terminal (75-ohm). Modulation level : RDS signal 1 kHz dev.	98.0 MHz	AC VM and Oscilloscope between U358 and GND.	98.0 MHz	R356 for maximum output.

3-2. MW/LW Alignment Procedures

(Function switch at "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 output (J301)	—	FA01 for maximum and symmetrical waveform.

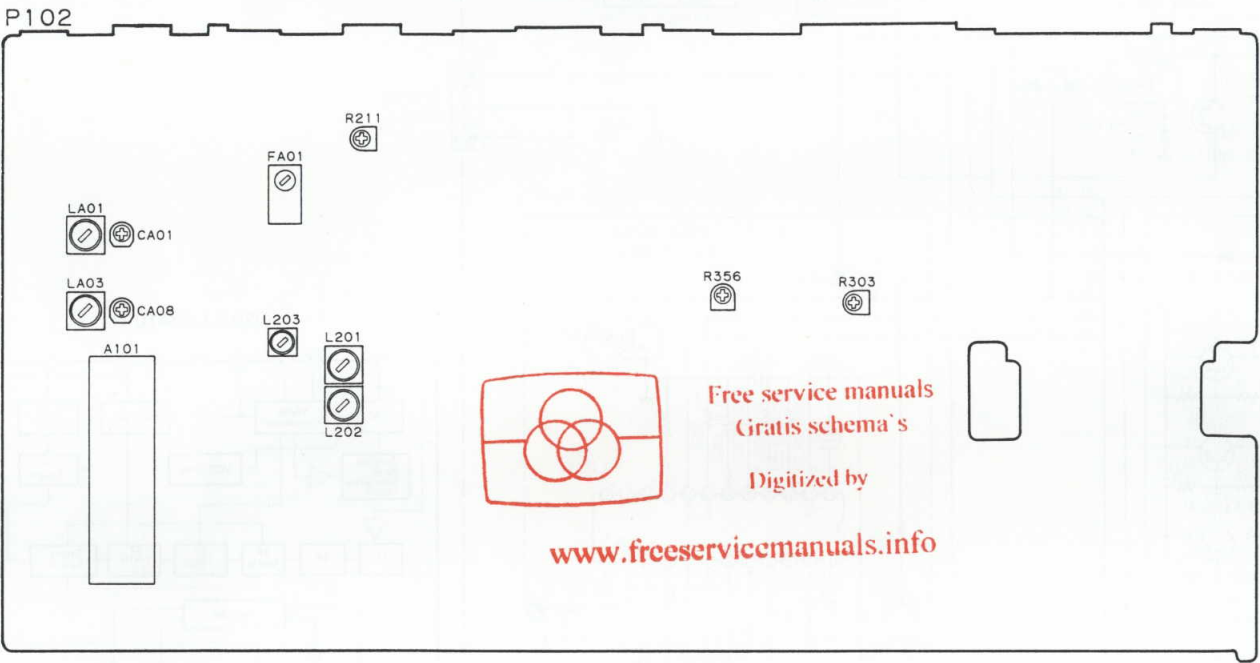
● MW RF Alignment

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 (600 kHz)	VTVM to L - or R - channel output (J301)	603 kHz (600 kHz)	LA01 for maximum output.
2		1,404 kHz (1,400 kHz)		1,404 kHz (1,400 kHz)	CA01 for maximum output.
3	Repeat steps 1 and 2 until sensitivity is maximized.				

• LW 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	171 kHz	VTVM to L - or R - channel output (J302)	171 kHz	LA03 for maximum output.
2		270 kHz		270 kHz	CA08 for maximum output.
3	Repeat steps 1 and 2 until sensitivity is maximized.				

4. ALIGNMENT POINTS AND TEST POINT



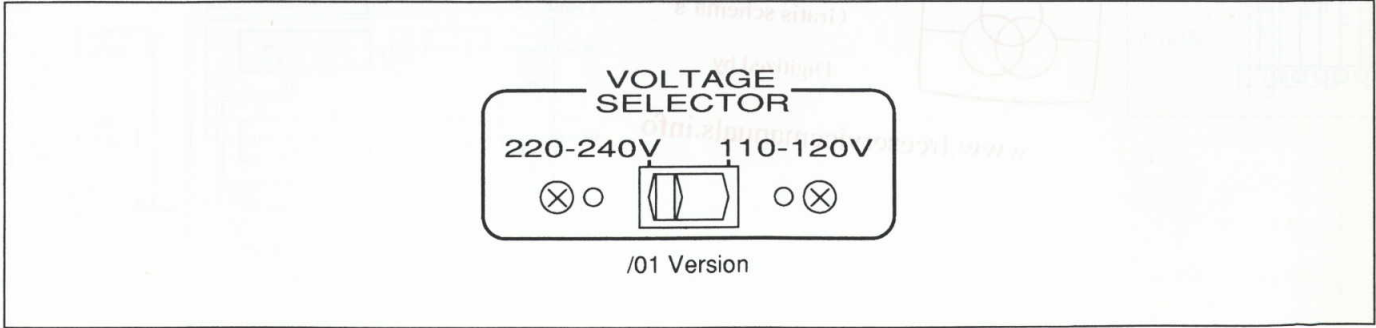
5. VOLTAGE CONVERSION

• EUROPEAN MODEL ONLY

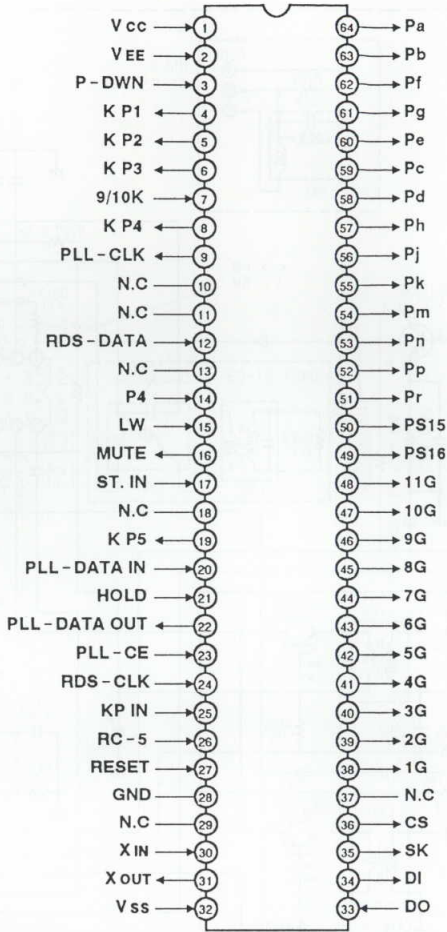
To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

CAUTION
DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.

Voltage Conversion Chart



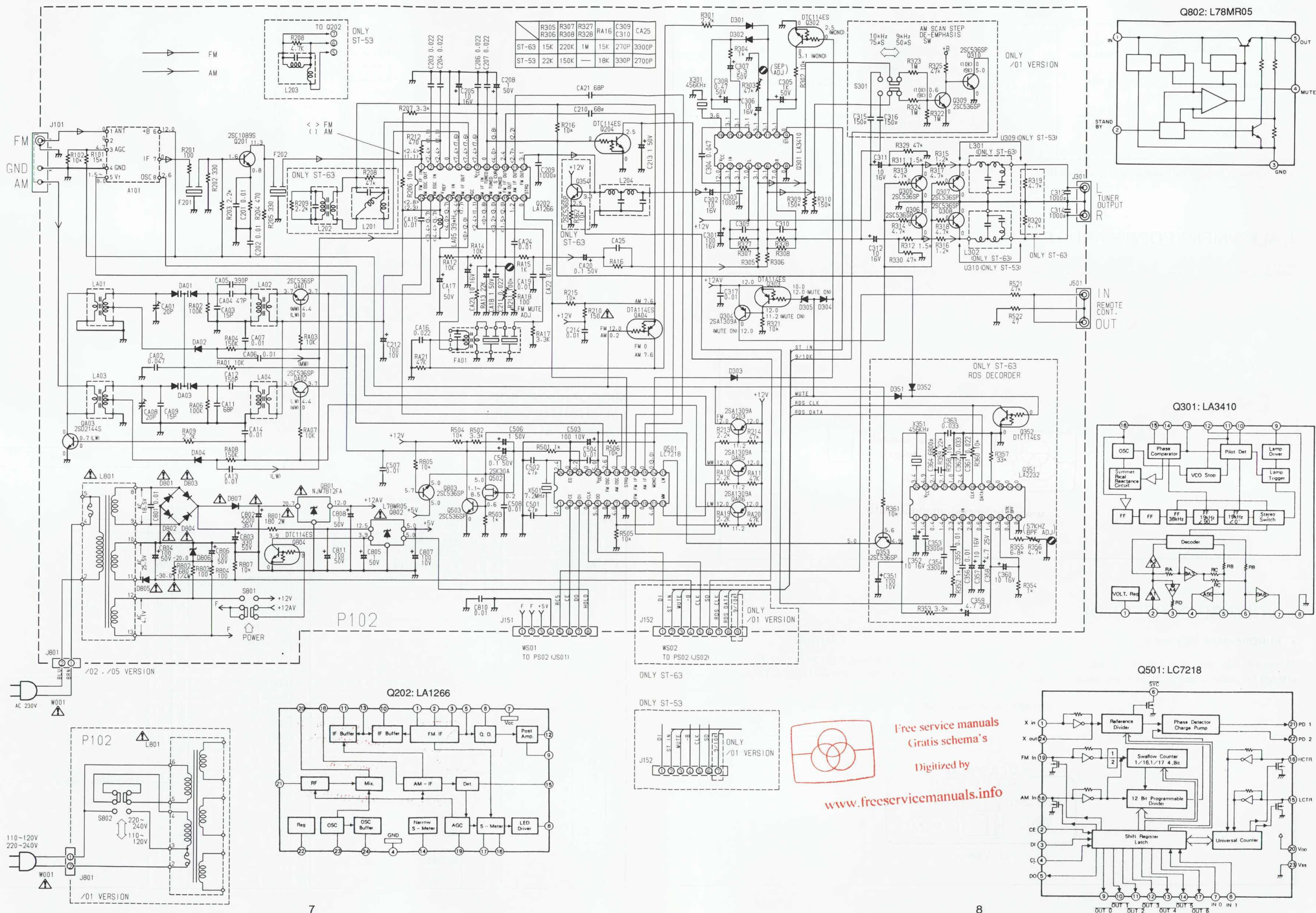
6. MICROPROCESSOR DATA

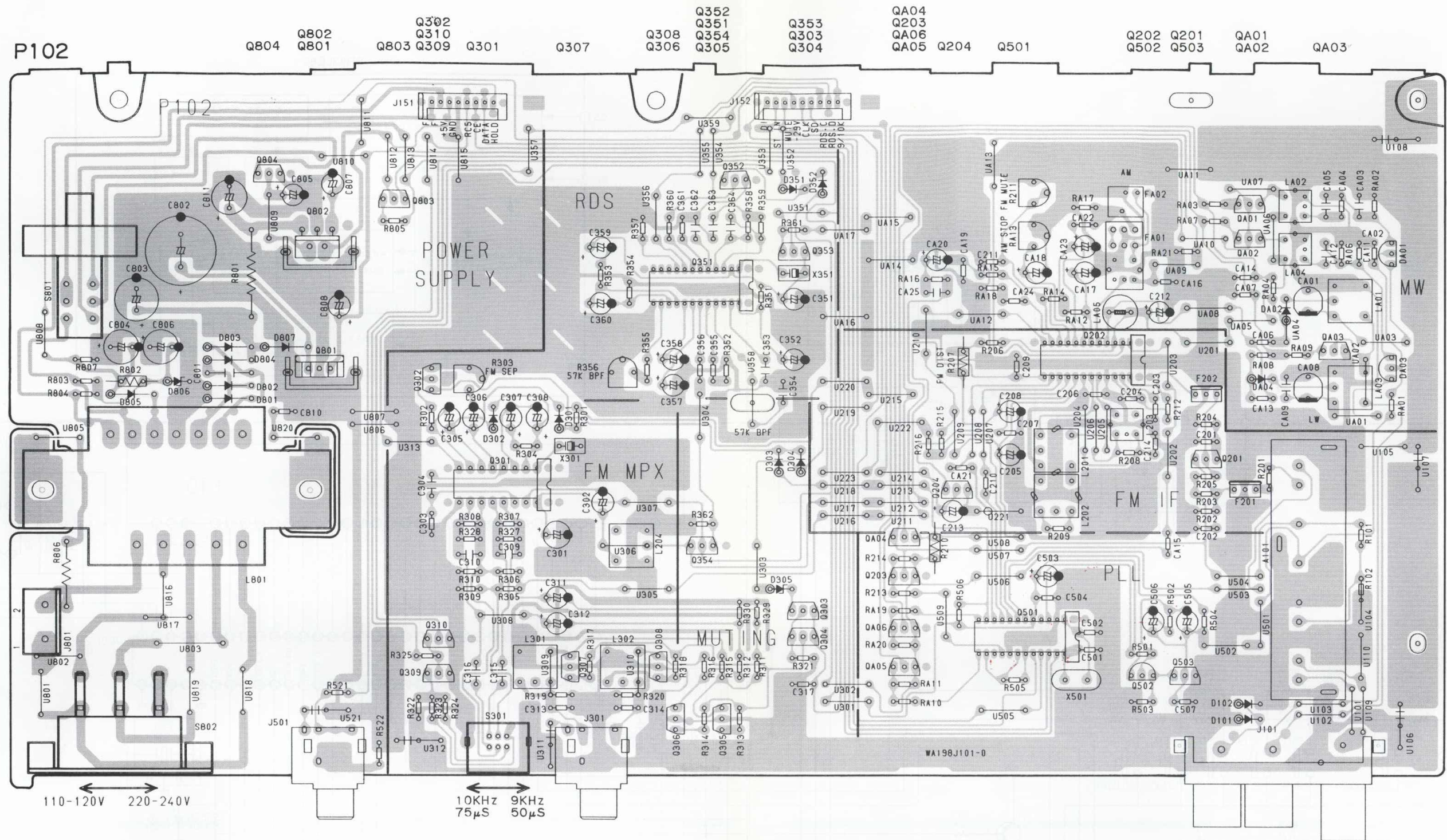


MICROPROCESSOR
(M381124M4-153SP)
POS.NO. : Q551

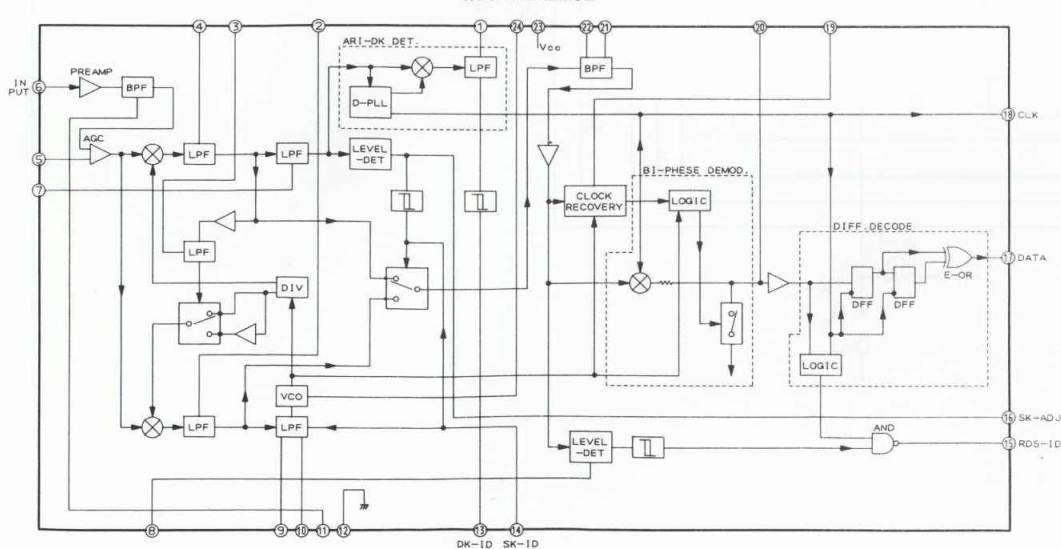
PIN NO.	PORT NAME		I/O	ACT	FUNCTION	PIN NO.	PIN NAME		I/O	ACT	FUNCTION
1	VCC	VCC	—	—	POWER SUPPLY PIN +5V	33	P27	DO	I	H	EEPROM DATA BUS
2	VEE	VEE	—	—	POWER SUPPLY PIN -30V	34	P26	DI	O	H	
3	P67	P-DWN	I	L	PRESET DOWN KEY INPUT	35	P25	SK	O	H	
4	P66	K P1	O	H	KEY PULSE OUT 1	36	P26	CS	O	H	
5	P65	K P2	O	H	KEY PULSE OUT 2	37	DIG19	N.C	—	—	— — —
6	P64	K P3	O	H	KEY PULSE OUT 3	38	DIG18	1G	O	H	FTD DIGIT OUTPUT
7	P63	9/10 K	I	—	AM SCAN STEP, H : 9kHz, L : 10kHz	39	DIG17	2G	O	H	
8	P62	K P4	O	L	KEY PULSE OUT 4	40	DIG16	3G	O	H	
9	P61	PLL -CLK	O	H	PLL CLOCK OUTPUT	41	DIG15	4G	O	H	
10	P60	N.C	—	—	— — —	42	DIG14	5G	O	H	
11	P57	N.C	—	—	— — —	43	DIG13	6G	O	H	
12	P56	RDS - DATA	I	H	RDS - DATA INPUT (ONLY ST - 63)	44	DIG12	7G	O	H	
13	P55	N.C	—	—	— — —	45	DIG11	8G	O	H	
14	P54	P4	I	L	PRESET KEY NO.4 INPUT	46	DIG10	9G	O	H	
15	P53	LW	I	—	L : WITH LW, H : WITH OUT LW	47	DIG9	10G	O	H	
16	P52	MUTE	O	H	AUDIO MUTE OUTPUT	48	DIG8	11G	O	H	FTD SEGMENT OUTPUT
17	P51	ST.IN	I	L	MPX STEREO IND. OUT. INPUT	49	SEG15	PS16	O	H	
18	P50	N.C	—	—	— — —	50	SEG14	PS15	O	H	
19	P47	K P5	O	H	KEY PULSE OUT 5	51	SEG13	Pr	O	H	
20	P46	PLL - DATA IN	I	H	PLL DO INPUT	52	SEG12	Pp	O	H	
21	P45	HOLD	I	H	HOLD INPUT	53	SEG11	Pn	O	H	
22	P44	PLL - DATA OUT	O	H	PLL DI OUTPUT	54	SEG10	Pm	O	H	
23	P43	PLL - CE	I	H	PLL CE OUTPUT	55	SEG9	Pk	O	H	
24	P42	RDS - CLK	I	H	RDS - CLOCK INPUT (ONLY ST - 63)	56	SEG8	Pj	O	H	
25	P41	KP IN	I	H	KEY PULSE INPUT	57	SEG7	Ph	O	H	
26	P40	RC - 5	I	L	REMOTE CONTROL INPUT	58	SEG6	Pd	O	H	
27	RESET	RESET	I	L	RESET INPUT	59	SEG5	Pc	O	H	
28	X CIN	GND	—	—	— — —	60	SEG4	Pe	O	H	
29	Xc OUT	N.C	—	—	— — —	61	SEG3	Pg	O	H	
30	X IN	X IN	I	—	SYSTEM CLOCK (4.19MHz)	62	SEG2	Pf	O	H	
31	X OUT	X OUT	O	—		63	SEG1	Pb	O	H	
32	VSS	VSS	—	—	POWER SUPPLY PIN GND.	64	SEG0	Pa	O	H	

7. SCHEMATIC DIAGRAM AND PARTS LOCATIONS (PATTERN SIDE)





Q351: LA2232

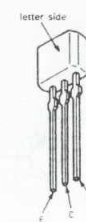


2SC536SP
2SC2458, ETC
QA01, QA02
Q305 - Q310,
Q353, Q354,
Q503, Q803

2SD2144S (U,V)
QA03

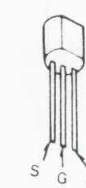
DTC114ES
Q204, Q302,
Q352, Q804

DTA114ES
QA04, Q303

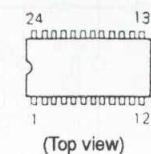


2SA1309A (Q, R)
QA05, QA06,
Q203, Q304

2SC1809S (P)
Q201

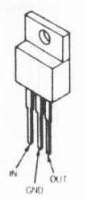


2SK30A (Y)
Q502

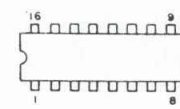


(Top view)

LA1226
Q202
LA2232
Q351
LC7218
Q501

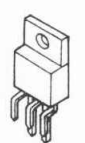


NJM7812A
Q801

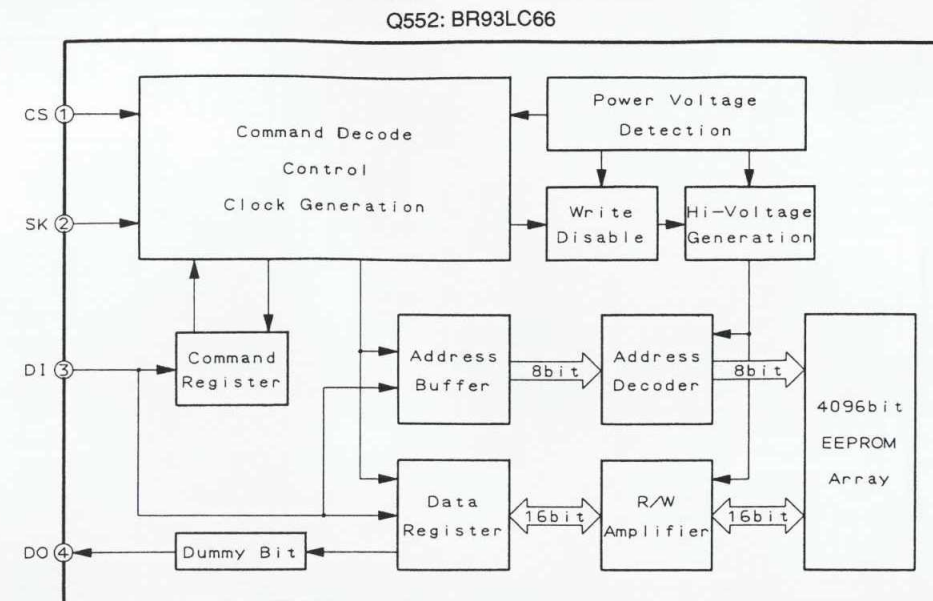


(Top view)

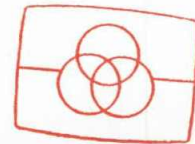
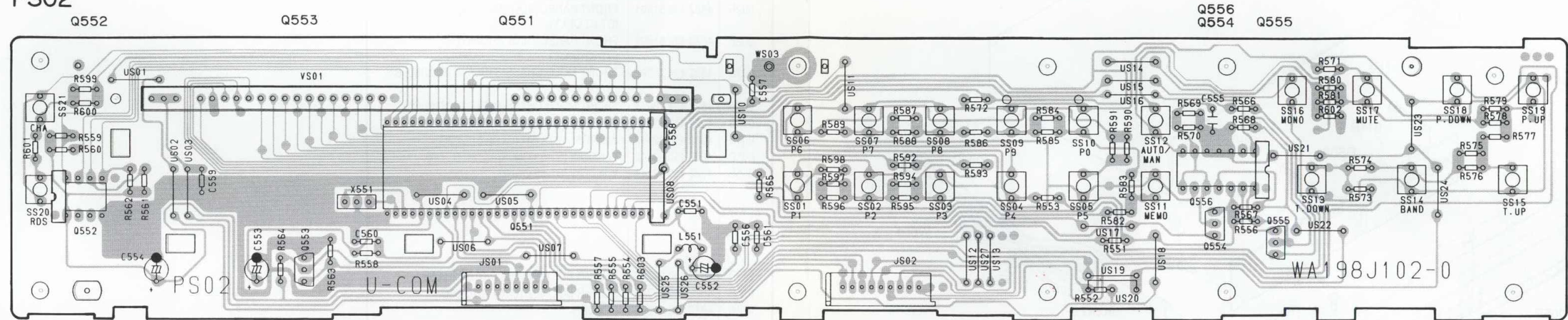
LA3410
Q301



L78MR05
Q802



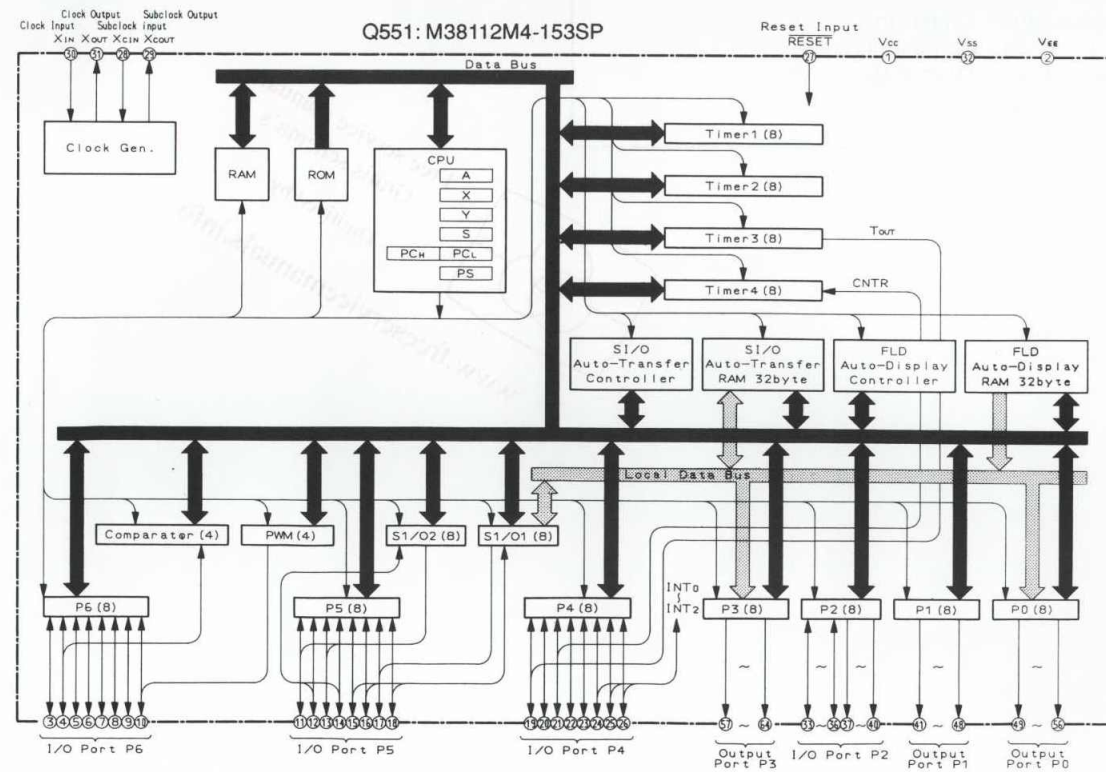
PS02



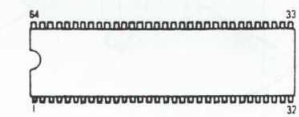
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2SC536SP
2SC2458, ETC
Q553, Q555

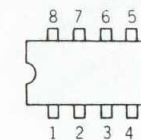


M38112M4-153SP
Q551

(Top view)

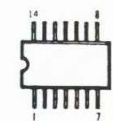


2SA1309A (Q,R)
Q554



BR93LC66
Q552

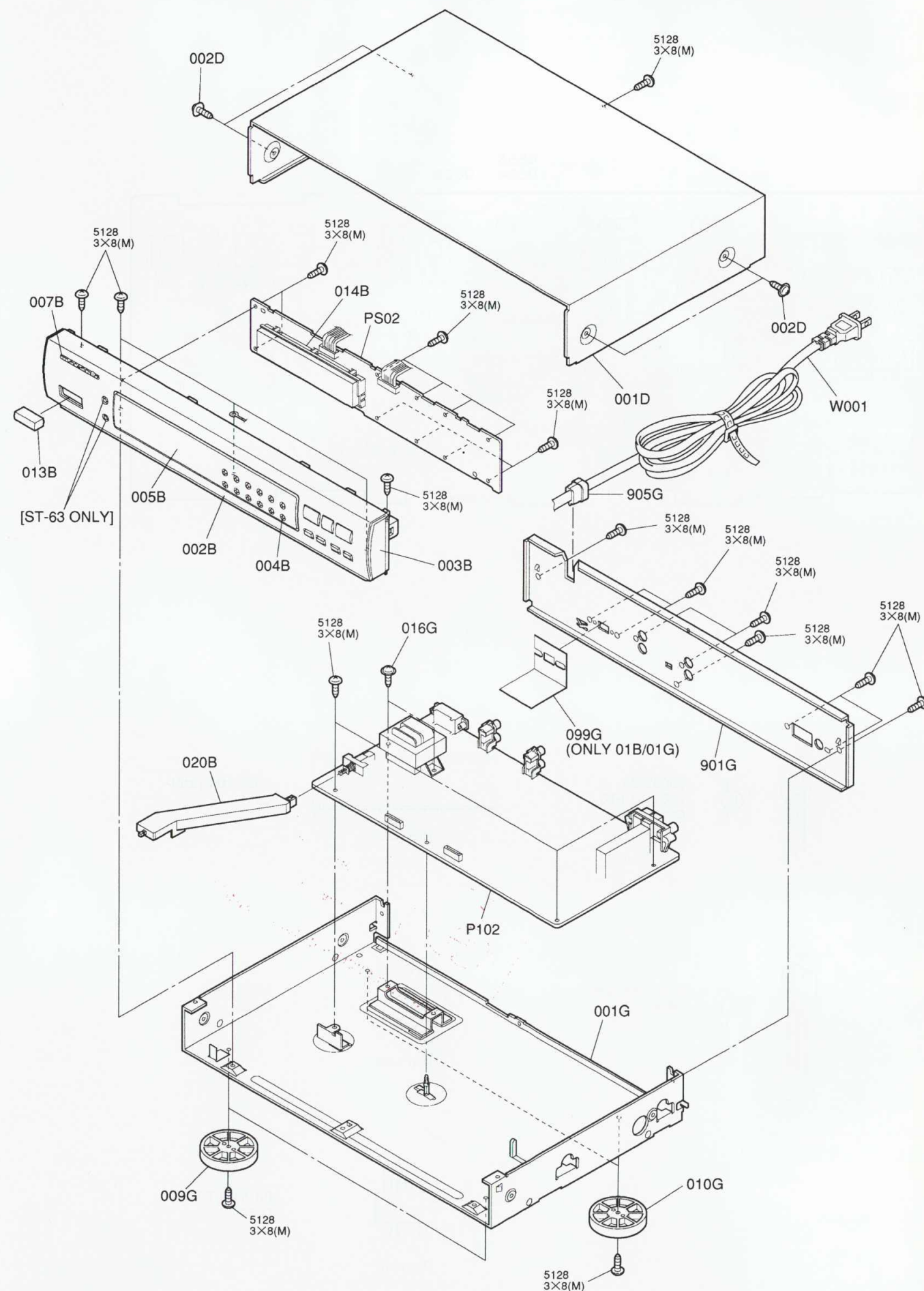
(Top view)



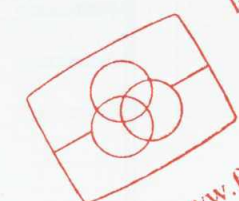
BA10339, ETC
Q556

(Top view)

8. EXPLODED VIEW AND PARTS LIST



POS. NO.	PART NO.	DESCRIPTION
002B	4822 426 51693	FRONT PANEL (BLK) /01B/02B/05B [ST-53 ONLY]
002B	4822 426 51694	FRONT PANEL (GLD) /01G/02G [ST-53 ONLY]
002B	4822 426 51691	FRONT PANEL (BLK) /01B/02B/05B [ST-63 ONLY]
002B	4822 426 51692	FRONT PANEL (GLD) /01G/02G [ST-63 ONLY]
003B	4822 464 70622	FRONT MOLD CHASSIS (BLK) /01B/02B/05B
003B	4822 464 70623	FRONT MOLD CHASSIS (GLD) /01G/02G
004B	4822 410 62861	BUTTON, 12 PUSH (BLK) /01B/02B/05B
004B	4822 410 62862	BUTTON, 12 PUSH (GLD) /01G/02G
005B	4822 450 62142	WINDOW [ST-53 ONLY]
005B	4822 450 62141	WINDOW [ST-63 ONLY]
013B	4822 410 62744	POWER BUTTON (BLK) /01B/02B/05B
013B	4822 410 62745	POWER BUTTON (GLD) /01G/02G
014B	4822 255 41068	HOLDER
020B	4822 404 21274	LINK
009G	4822 462 42045	LEG
010G	4822 462 42048	LEG
905G	4822 532 60948	BUSHING
002D	4822 502 12511	B.T.SCREW(W/W) 3x8 (M)
001T	4822 736 21854	USER MANUAL [ST-53 ONLY]
001T	4822 736 21855	USER MANUAL [ST-63 ONLY]
Z001	4822 303 50079	EXT FM ANT
Z002	4822 321 21438	OUTPUT CORD
Z003	4822 157 63083	AM LOOP ANT
▲ Z004	4822 265 10092	JACK /01B/01G



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9. ELECTRICAL PARTS LIST

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

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

① — Resistance value

Examples :

① Resistance value

0.1 Ω ...001	10 Ω ...100	1k Ω ...102	100k Ω ...104
0.5 Ω ...005	18 Ω ...180	2.7k Ω ...272	680k Ω ...684
1 Ω ...010	100 Ω ...101	10k Ω ...103	1M Ω ...105
6.8 Ω ...068	390 Ω ...391	22k Ω ...223	4.7M Ω ...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 — Capacity value
 ② — Tolerance

Examples

① Tolerance (Capacity deviation)
 $\pm 0.25\text{pF}$... 0
 $\pm 0.5\text{pF}$... 1
 $\pm 5\%$... 5

* Tolerance of COMMON PARTS handled here are as follows:

0.5pF~ 5pF... $\pm 0.25\text{pF}$
 6pF~ 10pF... $\pm 0.5\text{pF}$
 12pF~ 560pF... $\pm 5\%$

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
 Disc type
 Temp.chara. 2B4, 50V

① — Capacity value

Examples

② Capacity value

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

C*** : ELECTROLY CAP. (E), FILM CAP. (F)

(1) EA x x x x x 10, Electrolytic capacitor
 One-way lead type, Tolerance $\pm 20\%$

① — Working voltage
 ② — Capacity value

Examples

① Capacity value

0.1 μF ...104	4.7 μF ...475	100 μF ...107
0.33 μF ...334	10 μF ...106	330 μF ...337
1 μF ...105	22 μF ...226	1100 μF ...118
		2200 μF ...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
 One-way type, Mylar $\pm 5\%$ 50V

① — Capacity value

Examples

① Capacity value

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

NOTE : The above CODES (R***, R***, C***, C*** and C***) are omitted on the schematic diagram in some case.
 On the occasion, be confirmed the common parts on the parts list.

POS. NO.	PART NO.	DESCRIPTION			
PS02 - U-COM CIRCUIT BOARD					
PS02 - CAPACITORS					
C551	4822 122 40586	CERAMIC	0.01 μF	25V	
C553	4822 124 23053	ELECT	1 μF	50V	
C555	4822 126 11241	FILM	0.01 μF	$\pm 2\%$ 100V	
C556	4822 122 40586	CERAMIC	0.01 μF	25V	
C557	4822 122 33639	CERAMIC	1000 pF	50V	
C558	4822 122 40588	CERAMIC	0.022 μF	25V	
C559	4822 122 40588	CERAMIC	0.022 μF	25V	
C560	4822 122 40588	CERAMIC	0.022 μF	25V	
C561	4822 122 40586	CERAMIC	0.01 μF	25V	
PS02 - CAPACITORS (COMMON)					
		Electrolytic Capacitor, $\pm 20\%$: C552, C554			
PS02 - RESISTORS					
R569		20.5K $\Omega \pm 1\%$ 1/6W			
PS02 - RESISTORS (COMMON)					
R***		Carbon Film Fixed Resistor, $\pm 5\%$: R551-R568, R571-R598, R602 (R599 - R601 [ST-63 ONLY])			
PS02 - SEMICONDUCTORS					
Q551	4822 209 32707	MICROPROCESSOR M38112M4-153SP			
Q552	4822 209 52449	IC	BR93LC66		
Q553	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC		
Q554	4822 130 60495	TRANSISTOR	2SA1309A Q,R		
Q555	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC		
Q556	4822 209 60045	IC	BA10339 ETC.		
PS02 - MISCELLANEOUS					
L551	4822 157 53585	CHOKE COIL	47 μH		
SS01					
2	4822 276 20508	PUSH SWITCH			
SS19					
SS20	4822 276 20508	PUSH SWITCH	[ST-63 ONLY]		
SS21	4822 276 20508	PUSH SWITCH	[ST-63 ONLY]		
VS01	4822 130 91282	DISPLAY UNIT	FIP12BM8R		
X551	4822 242 72194	SERAMIC VIB.	EFO-GC4194T3	4.19MHz	
P102 - TUNER CIRCUIT BOARD					
P102 - CAPACITORS					
CA01	4822 125 60185	TRIMMING	20 pF	RED	
CA02	4822 122 40588	CERAMIC	0.022 μF	25V	
CA04	4822 126 10513	CERAMIC	47 pF	J	50V
CA05	5322 121 54128	FILM	390 pF	J	50V
CA06	4822 122 40586	CERAMIC	0.01 μF	25V	

POS. NO.	PART NO.	DESCRIPTION				
CA07	4822 122 40586	CERAMIC	0.01 μ F		25V	
CA08	4822 125 60185	TRIMMING	20PF	RED		
CA11	4822 126 10363	CERAMIC	68 pF	J	50V	
CA12	4822 122 10367	CERAMIC	150 pF	J	50V	
CA13	4822 122 40586	CERAMIC	0.01 μ F		25V	
CA14	4822 122 40586	CERAMIC	0.01 μ F		25V	
CA15	4822 122 40586	CERAMIC	0.01 μ F		25V	
CA16	4822 122 40588	CERAMIC	0.022 μ F		25V	
CA17	4822 124 23053	ELECT	1 μ F		50V	
CA18	4822 124 23053	ELECT	1 μ F		50V	
CA19	4822 122 40586	CERAMIC	0.01 μ F		25V	
CA20	4822 124 41604	ELECT	0.1 μ F		50V	
CA21	4822 126 10363	CERAMIC	68 pF	J	50V	
CA22	4822 122 40586	CERAMIC	0.01 μ F		25V	
CA23	4822 124 21894	ELECT	10 μ F		16V	
CA24	4822 122 40586	CERAMIC	0.01 μ F		25V	
C201	4822 122 40586	CERAMIC	0.01 μ F		25V	
C202	4822 122 40586	CERAMIC	0.01 μ F		25V	
C203	4822 122 40588	CERAMIC	0.022 μ F		25V	
C204	4822 122 40588	CERAMIC	0.022 μ F		25V	
C205	4822 124 21894	ELECT	10 μ F		16V	
C206	4822 122 40588	CERAMIC	0.022 μ F		25V	
C207	4822 122 40588	CERAMIC	0.022 μ F		25V	
C208	4822 124 23053	ELECT	1 μ F		50V	
C209	4822 122 33639	CERAMIC	1000 pF		50V	
C210	4822 126 10363	CERAMIC	68 pF	J	50V	
C211	4822 122 40588	CERAMIC	0.022 μ F		25V	
C213	4822 124 23053	ELECT	1 μ F		50V	
C214	4822 122 40588	CERAMIC	0.022 μ F		25V	
C302	4822 124 21894	ELECT	10 μ F		16V	
C303	4822 122 33639	CERAMIC	1000 pF		50V	
C305	4822 124 23053	ELECT	1 μ F		50V	
C306	4822 124 21894	ELECT	10 μ F		16V	
C307	4822 124 21982	ELECT	3.3 μ F		50V	
C308	4822 124 23054	ELECT	0.47 μ F		50V	
C311	4822 124 21894	ELECT	10 μ F		16V	
C312	4822 124 21894	ELECT	10 μ F		16V	
C313	4822 122 33639	CERAMIC	1000 pF		50V	
C314	4822 122 33639	CERAMIC	1000 pF		50V	
C315	4822 122 10367	CERAMIC	150 pF	J	50V	
C316	4822 122 10367	CERAMIC	150 pF	J	50V	
C317	4822 122 40586	CERAMIC	0.01 μ F		25V	
C352	4822 124 21894	ELECT	10 μ F		16V	
C355	4822 122 40586	CERAMIC	0.01 μ F		25V	
C356	4822 122 40586	CERAMIC	0.01 μ F		25V	
C357	4822 124 21894	ELECT	10 μ F		16V	

POS. NO.	PART NO.	DESCRIPTION			
C358	4822 124 21899	ELECT	4.7 μ F	25V	
C359	4822 124 21899	[ST-63 ONLY] ELECT	4.7 μ F	25V	
C360	4822 124 21894	[ST-63 ONLY] ELECT	10 μ F	16V	
C361	4822 122 40588	CERAMIC	0.022 μ F	25V	
C501	4822 126 10513	[ST-63 ONLY] CERAMIC	47 pF	J 50V	
C502	4822 126 10513	CERAMIC	47 pF	J 50V	
C504	4822 122 40586	CERAMIC	0.01 μ F	25V	
C505	4822 124 41604	ELECT	0.1 μ F	50V	
C506	4822 124 23053	ELECT	1 μ F	50V	
C507	4822 122 40586	CERAMIC	0.01 μ F	25V	
C801	4822 126 12453	CERAMIC	0.01 μ F	500V	
C802	4822 124 22695	ELECT	2200 μ F	35V	
C805	4822 124 23053	ELECT	1 μ F	50V	
C808	4822 124 23053	ELECT	1 μ F	50V	
C810	4822 122 40586	CERAMIC	0.01 μ F	25V	
P102 - CAPACITORS (COMMON)					
C***		Ceramic Capacitor, 50V: CA03, CA09			
C***		High Dielectric Constant Ceramic Capacitor, 50V: C309, C310			
C***		Electrolytic capacitor, $\pm 20\%$ C212, C301, C503, C803, C804, C806, C807, C811 (C351 [ST-63 ONLY])			
C***		Plastic Film Capacitor, $\pm 50\%$ 50V CA25, C304 (C351, C353, C354, C362, C363, C364 [ST-63 ONLY])			
P102 - RESISTORS					
R207	4822 050 23322	3.3K Ω J	1/4W	[ST-63 ONLY]	
▲ R210	4822 050 21501	150 Ω J	1/4W		
R211	4822 100 11471	TRIMMING	100K Ω FM MUT ADJ		
R303	4822 100 11372	TRIMMING	47K Ω FM MPX SEP ADJ.		
R356	4822 100 11373	TRIMMING	4.7K Ω , 57KHz BPF ADJ		
		[ST-63 ONLY]			
▲ R801	4822 053 11181	180 Ω J	2W		
▲ R802	4822 050 26801	680 Ω J	1/4W		
P102 - RESISTORS (COMMON)					
R***		Carbon Film Fixed Resistor, $\pm 5\%$: RA01-RA04, RA06-RA21, (R101, R102 [02B/02G/05B]), R201-R206, R208, R212-R216, R301, R302, R304-R318, R321, (R322-R325 [01B/01G]), R329, R330, R501-R506, R521, R522, R803-R805, R807, (R207[ST-53 ONLY]) (R209, R319, R320, R327, R328, R352-R355, R357-R362 [ST-63 ONLY])			

POS. NO.	PART NO.	DESCRIPTION	
		P102 - SEMICONDUCTORS	
DA01	4822 125 50416	VARICAP	SVC342
DA02	4822 130 33697	DIODE	1SS135
DA03	4822 125 50416	VARICAP	SVC342
DA04	4822 130 33697	DIODE	1SS135
D301	4822 130 33305	DIODE	1SS176,MA165,1SS254
z			
D304			
D305			
D351	4822 130 80321	ZENER DIODE	10V ZENER EQUIVALENT
	4822 130 33305	DIODE	1SS176,MA165,1SS254 [ST-63 ONLY]
D352	4822 130 33305	DIODE	1SS176,MA165,1SS254 [ST-63 ONLY]
D801	4822 130 32508	DIODE	RL103E(RECTRON)/DSF10C
z			
D805	4822 130 82474	ZENER DIODE	20V ZENER EQUIVALENT
D806			
D807	4822 130 32508	DIODE	RL103E(RECTRON)/DSF10C
QA01	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC
QA02	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC
QA03	4822 130 61892	TRANSISTOR	2SD2144S U,V
QA04	4822 130 60766	TRANSISTOR	DIGITAL DTA114ES
QA05	4822 130 60495	TRANSISTOR	2SA1309A Q,R
QA06	4822 130 60495	TRANSISTOR	2SA1309A Q,R
Q201	4822 130 62294	TRANSISTOR	2SC1809S P
Q202	4822 209 71785	IC	LA1266 FM/AM IF
Q203	4822 130 60495	TRANSISTOR	2SA1309A Q,R
Q204	4822 130 60588	TRANSISTOR	DIGITAL DTC114ES
Q301	4822 209 70261	IC	LA3410 FM MPX
Q302	4822 130 60588	TRANSISTOR	DIGITAL DTC114ES
Q303	4822 130 60766	TRANSISTOR	DIGITAL DTA114ES
Q304	4822 130 60495	TRANSISTOR	2SA1309A Q,R
Q305	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC
z			
Q308			
Q309	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC /01B/01G
Q310	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC /01B/01G
Q351	4822 209 32706	IC LA2232	RDS DECODER [ST-63 ONLY]
Q352	4822 130 60588	TRANSISTOR	DIGITAL DTC114ES [ST-63 ONLY]
Q353	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC [ST-63 ONLY]
Q354	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC [ST-63 ONLY]
Q501	4822 209 30178	IC	LC7218
Q502	4822 130 42121	F.E.T.	2SK30A Y
Q503	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC
▲ Q801	4822 209 60826	IC	NJM7812A
▲ Q802	4822 209 70385	IC	L78MR05 REG. W/RESET
Q803	4822 130 42298	TRANSISTOR	2SC536SP, 2SC2458 ETC
Q804	4822 130 60588	TRANSISTOR	DIGITAL DTC114ES

POS. NO.	PART NO.	DESCRIPTION	
		P102 - MISCELLANEOUS	
FA01	4822 242 71509	CERAMIC FILTER SFL450J3	
F201	4822 242 71135	CERAMIC FILTER SFE10.7MS3-A	
F202	4822 242 71135	CERAMIC FILTER SFE10.7MS3-A	
J101	4822 290 81632	ANT TERMINAL , YKD31-0215A	
J301	4822 290 81634	TUNER OUTPUT TERMINAL	
J501	4822 267 41009	REMOTE CONT.BUS TERMINAL	
LA01	4822 157 63084	MW ANT COIL	
LA02	4822 157 70779	MW OSC COIL	
LA03	4822 157 52714	LW ANT COIL	
LA04	4822 157 70781	LW OSC COIL	
LA05	4822 157 53589	CHOKE COIL 39 mH	
L201	4822 157 70921	I.F.T. FM DET COIL,BROWN [ST-63 ONLY]	
L202	4822 157 70922	I.F.T. FM DET COIL,WHITE [ST-63 ONLY]	
L203	4822 148 81096	I.F.T. FM DET COIL [ST-53 ONLY]	
L204	4822 156 10794	M.P.X.COIL ANTI-BIRDE FILTER /02B/02G/05B	
L301	4822 157 70021	M.P.X.COIL FM MPX LPF 19/38 KHz [ST-63 ONLY]	
L302	4822 157 70021	M.P.X.COIL FM MPX LPF 19/38 KHz [ST-63 ONLY]	
▲ L801	4822 146 21553	POWER TRANSF. 115V / 230V /01B/01G	
▲ L801	4822 146 30803	POWER TRANSF. 230V /02B/02G/05B	
S301	4822 277 21712	SLIDE SWITCH SCAN STEP/DE-EMPHASIS SW /01B/01G	
▲ S801	4822 276 11682	PUSH SWITCH POWER/STANDBY SW.	
▲ S802	4822 277 21465	SLIDE SWITCH VOLTAGE SELECTOR 115V/230V /01B/01G	
X301	4822 242 71511	RESONATOR CSB456F11 FOR LA3410	
X351	4822 242 81608	RESONATOR CSB456F33 FOR LA2232 [ST-63 ONLY]	
X501	4822 242 72333	CRYSTAL 7.2 MHz	
A101	4822 210 10372	V.H.F.TUNER FE415-G09 /02B/02G/05B	
A101	4822 210 10397	V.H.F.TUNER FE337-A05 /01B/01G	

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.