

SERVICE MANUAL

Closer Relations through "CLARION SERVICE MANUAL"

MAZDA AUTOMOBILE GENUINE RADIO MODEL RT-421

Manufacturer **CLARION CO., LTD.**

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■ SPECIFICATIONS:

Circuit system: Superheterodyne
Tuning system: Manual μ -tuning
5-push button system
Receive range: AM 530kHz to 1,605kHz
FM 88MHz to 108MHz
Intermediate frequency:
AM 262.5kHz
FM 10.7MHz
Maximum sensitivity:
AM Less than 20dB
(at 0.5W output)
FM Less than 10dB
(at 0.5W output)
Quieting sensitivity: AM Less than 30dB
(at 20dB S/N)
FM Less than 20dB
(at 30dB S/N)
Image rejection ratio:
AM More than 57dB
FM More than 40dB
Selectivity: AM More than 25dB
(at ± 10 kHz detune)
A.G.C.: AM More than 45dB

A.F.C.: FM 400kHz to 800kHz
Separation: FM More than 20dB
Stereo indicator lighting sensitivity:
35dB \pm 5dB
Fidelity:
AM 100Hz H -4 ± 3 dB
L $+8 \pm 3$ dB
4,000Hz H -17 ± 5 dB
L -27 ± 5 dB
FM 100Hz H -4 ± 3 dB
L $+8 \pm 3$ dB
7,000Hz H -21 ± 5 dB
L -34 ± 5 dB

Power supply voltage:
DC 13.2V (10.8V to 15.6V)
Negative ground
Load impedance: $4\Omega \times 2$
Power output: More than 4.6W $\times 2$
(at 10% distortion)
More than 6.0W $\times 2$
(at max. volume and 2Ω)
Semiconductors: 7 ICs, 6 transistors, 2 FETs
and 5 diodes
Dimensions: 160mm(W) \times 50mm(H) \times 130mm(D)

COMPONENTS VIEW:

○ RT-421A-51, N-51, N-52

SPA-643-100	Speaker ass'y	2
(090-0170-11)		
380-3693-00	Knob(Small)	2
380-3770-00	Knob(Large)	2
722-0231-00	Hex-nut	2
745-0430-01	Flat washer	2

○ RT-421C-52, C-53

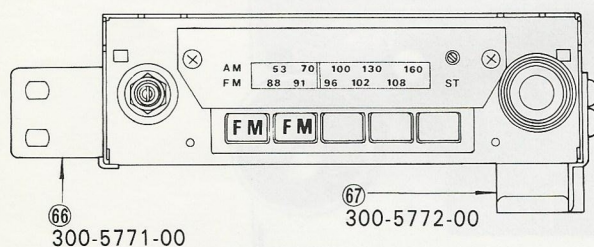
SPA-601-100	Speaker ass'y	2
(090-0050-20)		
851-2250-01	Speaker lead	2
380-3693-00	Knob(Small)	2
380-3770-00	Knob(Large)	2
722-0231-00	Hex-nut	2
745-0430-01	Flat washer	2

○ RT-421D-52

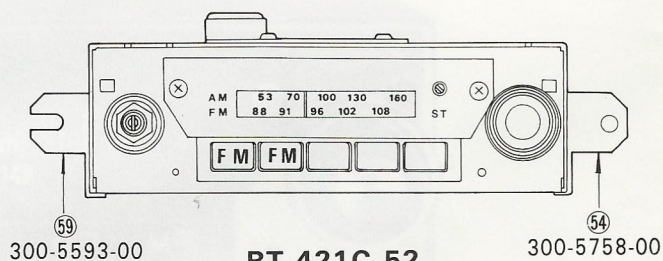
SPA-601-100	Speaker ass'y	2
(090-0050-02)		
851-2250-01	Speaker lead	2
SPA-643-100	Speaker ass'y	2
(090-0170-11)		
380-3693-00	Knob(Small)	2
380-3770-00	Knob(Large)	2
722-0231-00	Hex-nut	2
745-0430-01	Flat washer	2

○ RT-421F-52

PAS-109-103	Antenna ass'y	1
SPA-557-101	Speaker ass'y	2
(090-0050-20)		
851-2014-00	Speaker lead	2
380-3503-02	Knob(Small)	2
380-3279-01	Knob(Large)	2
722-0231-00	Hex-nut	2
745-0430-01	Flat washer	2

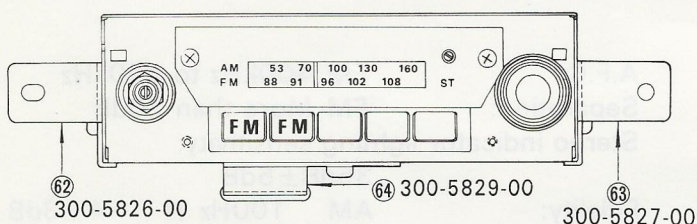


RT-421A-51

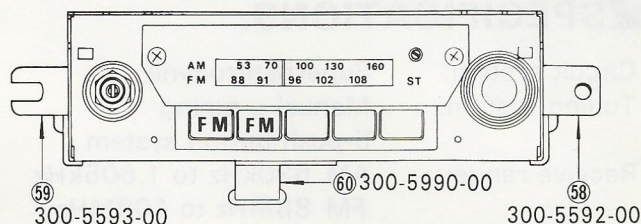


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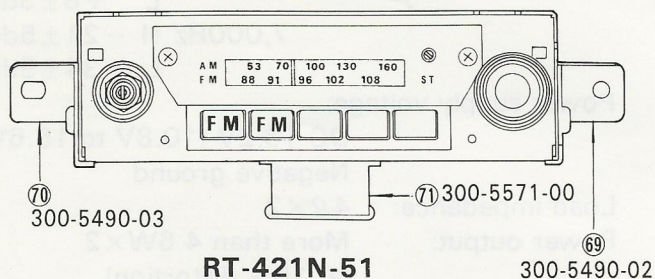
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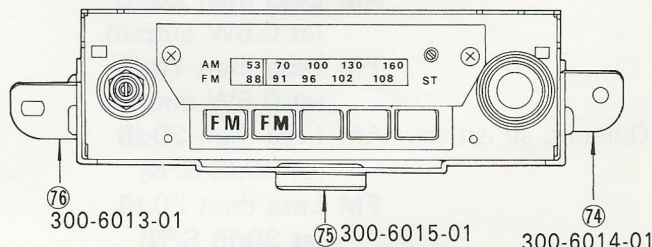
RT-421D-52



RT-421F-52


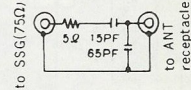
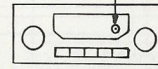


RT-421N-51

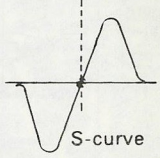
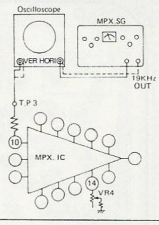
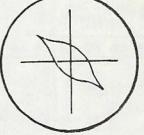


RT-421N-52

■ADJUSTMENTS: ■AM CIRCUIT

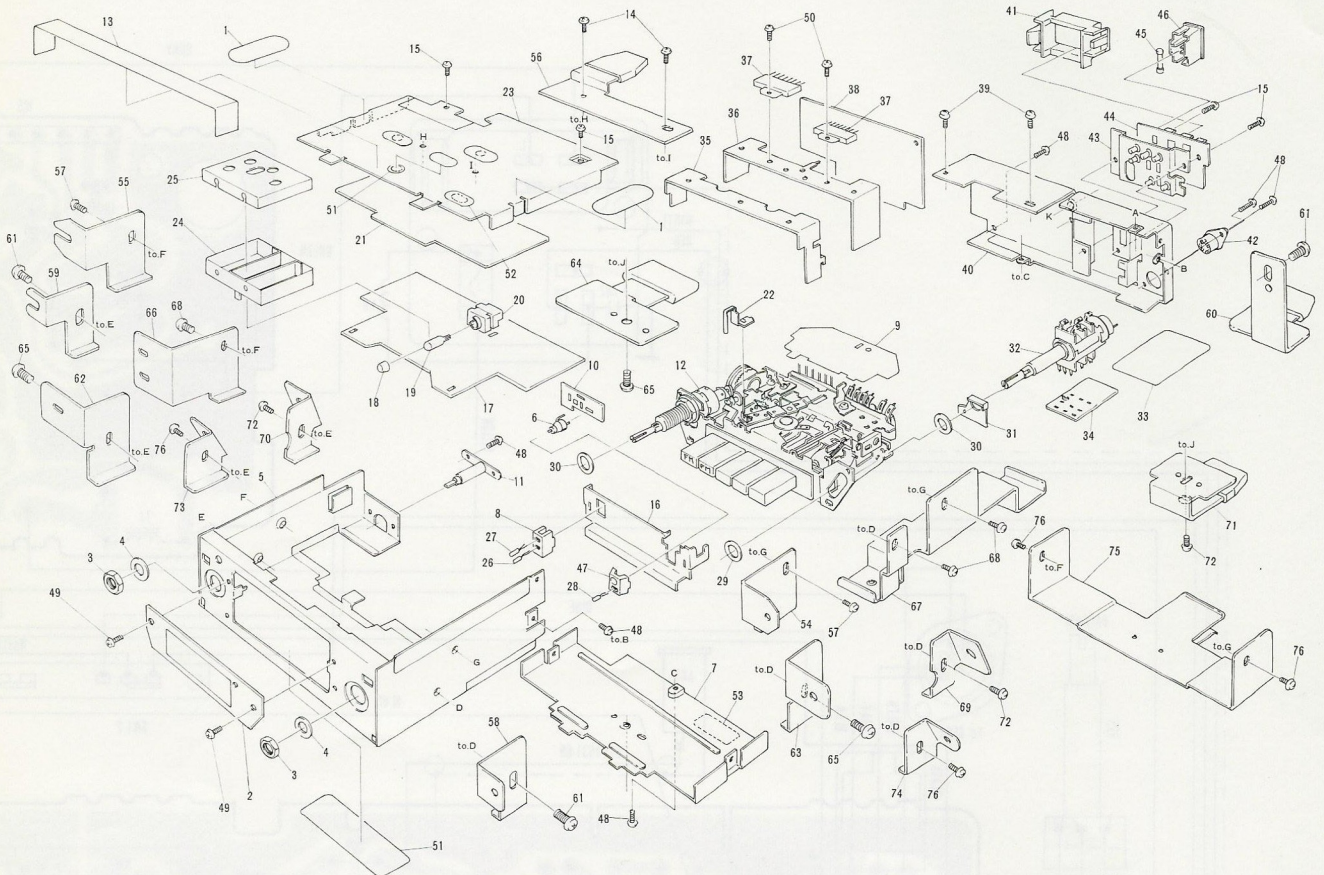
Item	Input section	Frequency	Output section	Method of adjustment		Instruments required	Remark
IFT	TP4	262.5KHz	TP5	IFT5,7	Adjust the core of IFT maximum waveform height with good symmetry.	<ul style="list-style-type: none">● Sweep generator● Oscilloscope● V.T.V.M.	<p>IF curve</p>  <p>Vol: minimum Tone: maximum Balance: center Dial pointer: right end</p>
Tracking	Antenna receptacle	1,620KHz	Meter across the speaker voice coil	<ul style="list-style-type: none">① TC4② TC5③ TC6	Adjust the trimmers for maximum indication of V.T.V.M.	<ul style="list-style-type: none">● SG● Speaker● V.T.V.M.	 <p>Use dummy antenna between SSG and ANT receptacle</p>
Antenna trimmer	<p>Antenna trimmer must be adjusted in the following cases. It helps increasing the sensitivity.</p> <ul style="list-style-type: none">○ After installing or after repairing the set.○ When the antenna or the antenna cable is replaced.○ When the radio sensitivity is poor and noise is prominent. <p>● METHOD OF ADJUSTMENT</p> <p>Set the receiver VOL. control to max., TONE control to high, and the dial pointer to around 1,400KHz to receive white noise (hissing noise) and adjust the antenna trimmer (screw) so that the noise output becomes maximum.</p>						 <p>A antenna trimmer</p>

■FM CIRCUIT

Item	Input section	Frequency	Output section	Method of adjustment		Instruments required	Remark
S curve	TP1	10.7MHz	TP2	IFT 1,4	Adjust the cores of IFT maximum waveform height with good symmetry	<ul style="list-style-type: none"> ● Sweep generator ● Oscilloscope ● V.T.V.M. 	 S-curve
Tracking	Antenna receptacle	87.5MHz	Meter across the speaker voice coil	87.5MHz TC3 98.0MHz ①TC2 ②TC1	Adjust the trimmers for maximum indication of V.T.V.M.	<ul style="list-style-type: none"> ● SG ● Speaker ● V.T.V.M. 	
<MPX> 19KHz Pilot signal (VCO)	TP3	19KHz Pilot signal	TP3	VR4	Adjust the Lissajous figure does not move	<ul style="list-style-type: none"> ● MPX stereo SG 	 after adjusted
Separation	Antenna receptacle	Right or left signal (400Hz)	Meter across the speaker voice coil	VR2	Adjust the VR for maximum separation	MPX stereo SG and SSG	
SASC circuit	Set to the specified modulation (30%), assuming an FM SSG output 55dB, modulation frequency 7kHz. Set the output level to 0dBm (=0.775V) using the volume control. Set the FM SSG output to 35dB and adjust VR1 so that the output level is -3dBm.						
Noise killer circuit	The noise killer system has been perfectly adjusted with the help of special measuring instruments. Therefore, do not touch the core, semiflexed VR. etc. of this circuit. However, if pulse noise is found to be remarkably high in a actual use in car, it means that adjustment of the noise killer system is disturbed. Therefore, in this case, adjust only VR6 and VR7 Noise gets eliminated as VR6 is turned towards the center position and VR7 is turned in the clockwise direction. However do not turn these controls more than necessary. If no change occurs by adjusting these controls, bring the controls back to their original position.						

EXPLODED VIEW: Main section

PRINTED WIRING BOARD



PARTS LIST: Main section

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
1	290-2567-00	Label	2	18	345-2831-04 345-2831-09	P.L (RT-421A,C-52, D,F,N-51) cap (RT-421C-53, N-52)	1
2	372-2919-00	Dial plate	1	19	017-0306-02	Pilot lamp	1
3	722-0231-00	Hexagon nut	2	20	070-0927-01	P.L socket	1
4	745-0430-00	Flat washer	2	21	347-0873-00 347-0873-01 347-0873-02	(RT-421A, C-52,F,N-51) Shade (RT-421D) (RT-421C-53, N-52)	1
5	308-0917-06	Front cover	1	22	376-0803-00 376-0803-01	(RT-421A,D, N-52) Dial pointer (RT-421C-52 C-53,F,N-51)	1
6	004-1516-01	Trimmer	1	23	310-0950-03	Upper case	1
7	304-0307-01	Lower cover	1	24	330-6595-00	Shielded case	1
8	345-2868-02	P.L holder	1	25	330-6596-04	Shielded case	1
9	347-0523-02	Insulator	1	26	017-0314-02	Pilot lamp	1
10	099-5261-01	P.W.B	1	27	017-0314-03	Pilot lamp	1
11	092-0532-00	Antenna receptacle	1	28	017-0324-06	Pilot lamp	1
12	937-0155-54	6 coil push button tuner ass'y	1	29	745-0430-00	Flat washer	1
12-1	013-3388-00	Select switch	1	30	745-0451-00	Flat washer	2
12-2	—	Tuning shaft ass'y	—	31	330-6087-00	V.R fixed plate	1
12-3	680-0069-02	Push button	3	32	012-3737-00	Variable resistor	1
12-4	680-0069-03	Push button (FM)	2	33	347-0577-00	Insulator	1
12-5	965-2509-00 (AM) 965-2160-00 (FM)	Tuner coil ass'y	1	34	099-5597-00	P.W.B	1
12-6	012-3509-01	Variable resistor (Tuning balance)	1	35	313-1040-00	Heat sink	1
13	290-2957-00	Label (RT-421C-52,53)	1	36	330-6594-00	IC holder	1
14	731-3005-80	Taptight (M3x5) (use only RT-421C -52,53)	2	37	051-0181-01	IC (TA-7222P)	2
15	731-3008-80	Taptight (M3x8)	4	38	099-5259-06	P.W.B	1
16	374-0748-03	Back plate	1				
17	099-5683-01	P.W.B	1				





REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
39	714-3006-81	Machine screw (M3x6)	2	60	300-5590-00	Mounting bracket (RT-421F)	1
40	307-0300-01	Rear cover	1	61	714-5008-81	Machine screw (M5x8) (RT-421F)	3
41	335-0979-02	Socket holder	1	62	300-5826-00	Mounting bracket (RT-421D)	1
42	074-0569-00	Outlet socket	1	63	300-5827-00	Mounting bracket (RT-421D)	1
43	944-0467-01	Filter ass'y	1	64	300-5829-00	Mounting bracket (RT-421D)	1
44	074-0572-05	Outlet socket	1	65	714-5008-81	Machine screw (M5x8) (RT-421D)	3
45	120-0020-02	Fuse (2A)	1	66	300-5771-00	Mounting bracket (use only RT-421A)	1
46	335-0837-00	Fuse holder	1	67	300-5772-00	Mounting bracket (use only RT-421A)	1
47	345-3149-00	Pilot lamp holder	1	68	714-5008-81	Machine screw (M5x8) (use only RT-421A)	3
48	731-3006-80	Taptight (M3x6)	6	69	300-5490-02	Mounting bracket (use only RT-421N-51)	1
49	731-3006-40	Taptight (M3x6)	2	70	300-5490-03	Mounting bracket (use only RT-421N-51)	1
50	714-3004-81	Machine screw (M3x4)	2	71	300-5571-00	Mounting bracket (use only RT-421N-51)	1
51	285-0160-00	Guide label	1	72	714-5008-81	Machine screw (M5x8) (use only RT-421N-51)	3
52	290-2567-00	Label	4	73	300-6013-01	Mounting bracket (use only RT-421N-52)	1
53	286-4290-00 286-4303-00 286-4304-00 286-4376-00 286-4394-00	(RT-421C-52, 53) Set (RT-421D-52) plate (RT-421F-52) (RT-421A-51) (RT-421N-51, 52)	1	74	300-6014-01	Mounting bracket (use only RT-421N-52)	1
54	300-5758-00	Mounting bracket (use only RT-421C-52, 53)	1	75	300-6015-01	Mounting bracket (use only RT-421N-52)	1
55	300-5759-00	Mounting bracket (use only RT-421C-52, 53)	1	76	714-5008-81	Machine screw (M5x8) (use only RT-421N-52)	4
56	300-5760-00	Mounting bracket (use only RT-421C-52, 53)	1				
57	714-5008-81	Machine screw (M5x8) (use only RT-421C-52, 53)	2				
58	300-5592-00	Mounting bracket (RT-421F)	1				
59	300-5593-00	Mounting bracket (RT-421F)	1				

◎Electrical section

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
D ₃	001-0072-00	Diode (10DC1)	1	L _{1,2}	010-1570-00	Coil	1
D _{3,6}	001-0099-01	Diode (HZ-7B)	2	L ₈	010-1820-00	Coil	1
D ₂	001-0130-00	Diode (1S2790WT)	1	L ₉	010-1821-00	Coil	1
D ₄	001-0160-16	Diode (RD-10EB)	1	L ₁₀	010-1861-00	Coil	2
D ₅	001-0218-00	Diode (1SV77)	1	VR ₆	012-3249-00	Variable resistor (30k Ω)	1
TC ₄	004-1516-01	Trimmer	1	VR ₇	012-3393-00	Variable resistor (3.3k Ω)	1
TC _{5,6}	004-1512-00	Trimmer	2	VR ₄	012-3394-00	Variable resistor (10k Ω)	1
TC _{1,2,3}	004-1530-00	Trimmer	3	VR _{1,2}	012-3548-01	Variable resistor (33k Ω)	2
IFT _{2,3}	005-0765-00	IF-transformer	2	VR ₃	012-3737-00	Variable resistor	1
IFT ₅	005-0802-00	IF-transformer	1	PL ₅	017-0306-02	Pilot lamp	1
IFT ₁	005-0803-00	IF-transformer	1	PL ₃	017-0314-02	Pilot lamp	1
IFT ₄	005-0804-00	IF-transformer	1	PL ₄	017-0314-03	Pilot lamp	1
IFT ₆	005-0805-00	IF-transformer	1	PL ₁	017-0321-01	Pilot lamp	1
IFT ₇	005-0816-01	IF-transformer	1	PL ₂	017-0324-06	Pilot lamp	1
T ₁	009-0621-01	Choke	1	IC ₄	051-0066-00	IC (HA-1199)	1
L ₄	010-0490-01	Coil	1	IC ₃	051-0086-00	IC (μ PC-1026C)	1
L ₃	010-0820-03	Coil	1	IC ₂	051-0122-00	IC (TA7303)	1

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
IC ₁	051-0123-00	IC (TA7302)	1
IC ₇	051-0159-00	IC (Nois killer)	1
IC _{5,6}	051-0181-01	IC	2
Q _{3,4,5,6,7}	102-0460-02	Transistor (2SC460B)	5
Q ₈	103-0571-12	Transistor (2SD571)	1
Q _{1,2}	124-0073-28	FET (3SK73GR)	2
R ₅₀₆	032-0018-00	Fuse resistor (1Ω)	1
R ₂₈	032-0059-02	Film resistor (1/4 Ws2.2kΩ)	1
R ₂₀₁	032-0059-03	Film resistor (1/4 Ws4.7kΩ)	1
R ₇	032-0059-04	Film resistor (1/4 Ws15kΩ)	1
R ₂	032-0059-06	Film resistor (1/4 Ws33kΩ)	1
R ₃₈	032-0059-07	Film resistor (1/4 Ws47kΩ)	1
R _{10,32}	032-0059-08	Film resistor (1/4 Ws100kΩ)	2
R ₅₀₁	110-1001-42	Solid resistor (1/2 W10Ω)	1
R ₂₀₆	110-4702-31	Solid resistor (1/4 W47Ω)	1
R ₅₀₅	111-1001-32	Film resistor (1/4 W10Ω)	1
R _{12,14,19}	111-1011-22	Film resistor (1/6 W100Ω)	3
R _{1,308}	111-1021-22	Film resistor (1/6 W1kΩ)	2
R _{3,4,5,11,202}	111-1041-22	Film resistor (1/6 W100kΩ)	5
R _{22,33}	111-1231-22	Film resistor (1/6 W12kΩ)	2
R ₁₃	111-1521-22	Film resistor (1/6 W1.5kΩ)	1
R _{26,203,301,401}	111-1531-22	Film resistor (1/6 W15kΩ)	4
R ₂₉	111-1811-41	Film resistor (1/2 W180Ω)	1
R _{17,20,23}	111-2211-22	Film resistor (1/6 W220Ω)	3
R _{24,30,2402}	111-2221-22	Film resistor (1/6 W2.2kΩ)	3
R _{18,27}	111-2241-22	Film resistor (1/6 W220kΩ)	2
R ₄₀	111-2711-42	Film resistor (1/2 W270Ω)	1
R ₃₆	111-2721-22	Film resistor (1/6 W2.7kΩ)	1
R ₃₀₄	111-3311-32	Film resistor (1/4 W330Ω)	1
R ₄₁	111-3311-42	Film resistor (1/2 W330Ω)	1
R ₂₀₅	111-3321-22	Film resistor (1/2 W3.3kΩ)	1
R _{8,37}	111-3331-22	Film resistor (1/2 W33kΩ)	2
R ₄₂	111-3341-22	Film resistor (1/2 W330kΩ)	1
R ₉₉	111-3351-22	Film resistor (1/4 W3.3MΩ)	1
R _{303,403}	111-3931-32	Film resistor (1/4 W39kΩ)	2
R _{9,15,25,306,406}	111-4701-22	Film resistor (1/8 W47Ω)	5
R ₅₀₃	111-4711-32	Film resistor (1/4 W470Ω)	1
R _{34,35,43}	111-4721-22	Film resistor (1/6 W4.7kΩ)	3
R _{304,305,404,405}	111-5631-32	Film resistor (1/4 W56kΩ)	4
R ₄₁₀	111-6811-41	Film resistor (1/2 W680Ω)	1
R ₆	111-8201-22	Film resistor (1/6 W82Ω)	1
R _{16,30}	111-8221-22	Film resistor (1/6 W8.2kΩ)	2
R ₁₀₄	114-1511-52	Film resistor (1W150Ω)	1
C ₃₅	042-0140-00	Electrolytic capacitor (50V0.22μF)	1
C ₉₈	042-0219-00	Electrolytic capacitor (10V220μF)	1
C ₆₁	042-0186-02	Electrolytic capacitor (35V1μF TAN)	1
C ₄₁₃	042-0246-00	Electrolytic capacitor (16V2200μF)	1

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
C ₂₁₂	042-0270-00	Electrolytic capacitor (16V10μF)	1
C _{30,214,316,416}	043-0020-00	Ceramic capacitor (0.2μF Z)	4
C ₄₁₇	043-0039-00	Ceramic capacitor (0.1μF Z)	1
C _{31,209}	141-1023-10	Polyester capacitor (0.001μF)	2
C _{32,201}	141-1033-10	Polyester capacitor (0.01μF)	2
C ₂₀₃	141-1043-10	Polyester capacitor (0.1μF)	1
C _{310,410}	141-1523-10	Polyester capacitor (0.0015μF)	2
C _{33,216}	141-2223-10	Polyester capacitor (0.0022μF)	2
C _{39,40,53}	141-2233-10	Polyester capacitor (0.022μF)	3
C _{401,402}	141-2733-10	Polyester capacitor (0.027μF)	2
C ₂₀₂	141-3323-10	Polyester capacitor (0.0033μF)	1
C ₃₈	141-3333-10	Polyester capacitor (0.033μF)	1
C _{307,407}	141-3933-10	Polyester capacitor (0.039μF)	2
C _{207,211,308,408}	141-4723-10	Polyester capacitor (0.0047μF)	4
C _{57,204}	141-4733-10	Polyester capacitor (0.047μF)	2
C _{306,406}	141-5633-10	Polyester capacitor (0.056μF)	2
C ₅₀₃	141-8233-10	Polyester capacitor (0.082μF)	1
C ₅₁	143-1031-50	Polyester capacitor (0.01μF)	1
C ₅₂	143-2221-50	Polyester capacitor (220pF)	1
C ₂₀₆	144-1112-10	Mica capacitor (110pF)	1
C ₃₆	144-5112-10	Mica capacitor (510pF)	1
C _{49,50}	150-3096-13	Ceramic capacitor (3pFCH)	2
C _{3,9}	150-3302-13	Ceramic capacitor (33pFCH)	2
C _{10,18,29}	159-1007-13	Ceramic capacitor (10pFCH)	3
C _{6,11,208}	159-1502-13	Ceramic capacitor (15pFCH)	3
C ₂₂	159-1502-64	Ceramic capacitor (15pFVK)	1
C ₁	159-2202-13	Ceramic capacitor (22pFCH)	1
C _{15,19}	159-3302-13	Ceramic capacitor (33pFCH)	2
C ₂₁₀	159-3312-64	Ceramic capacitor (330pFVK)	1
C ₂₃	159-4096-13	Ceramic capacitor (4pFCH)	1
C ₄₈	159-4096-57	Ceramic capacitor (4pFUJ)	1
C _{4,12}	159-8097-13	Ceramic capacitor (8pFCH)	2
C _{2,8,17,19}	160-1035-06	Ceramic capacitor (0.01μFYZ)	4
C ₅₄	160-2212-05	Ceramic capacitor (220pFB)	1
C ₁₆	160-2222-05	Ceramic capacitor (0.0022μFB)	1
C _{20,21,24,25,27}	160-2235-06	Ceramic capacitor (0.022μFB)	6
C _{7,13}	160-3312-05	Ceramic capacitor (330pFB)	2
C _{34,37,56,309,409}	180-1054-62	Electrolytic capacitor (50V1μF)	5
C _{5,14,26,47,55,50,62}	180-1064-32	Electrolytic capacitor (16V10μF)	7
C _{213,311,314,411,414,418}	180-1074-22	Electrolytic capacitor (10V100μF)	6
C _{315,415}	180-1084-22	Electrolytic capacitor (10V1000μF)	2
C _{41,42,43,44,215}	180-2254-62	Electrolytic capacitor (50V2.2μF)	5
C ₂₀₅	180-2264-22	Electrolytic capacitor (10V22μF)	1
C ₄₆	180-2274-22	Electrolytic capacitor (10V220μF)	1
C _{501,502}	180-2274-32	Electrolytic capacitor (16V220μF)	2
C _{312,412}	180-4754-42	Electrolytic capacitor (25V4.7μF)	2
C ₆₀	180-4764-22	Electrolytic capacitor (10V47μF)	1