



SERVICE MANUAL

Closer Relations through "CLARION SERVICE MANUAL"

MAZDA AUTOMOBILE GENUINE RADIO MODEL RT-445

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H. & I. V. HUGHES



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)
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)
Current consumption: Less than 2A
Semiconductors: 7 ICs, 8 transistors, 2 FETs
and 9 diodes
Dimensions(WxHxD): 160mm \times 50mm \times 130mm
Weight: 1.3Kg

COMPONENTS:

RT-445D-51

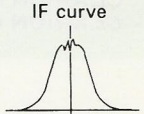
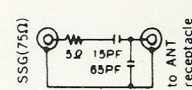
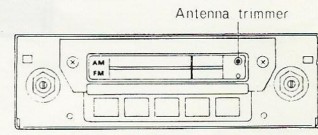
SPA-601-100 (090-0050-20)	Speaker ass'y (10cm/4Ω)	2
SPA-643-100 (090-0170-11)	Speaker ass'y (13cm/4Ω)	2
745-0430-01	Flat washer	2
722-0231-00	Hexagon nut	2
380-4047-00	Knob (Small)	2
380-4048-00	Knob (Large)	2

RT-445F-51

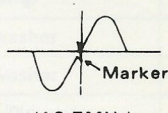
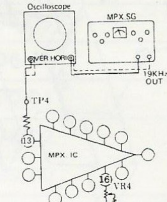
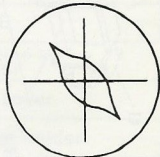
SPA-717-100 (090-0080-93)	Speaker ass'y (12cm/4Ω)	2
745-0430-01	Flat washer	2
722-0231-00	Hexagon nut	2
380-3693-01	Knob (Small)	2
380-3770-01	Knob (Large)	2

ADJUSTMENTS:

AM CIRCUIT

Item	Input section	Output section	Frequency	Method of adjustment		Instruments required	Remark
IFT	TP6	TP7	262.5KHz	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	Meter across the speaker voice coil	1,620KHz	①TC4 ②TC5 ③TC6	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>						

■ FM CIRCUIT

Item	Input section	Output section	Frequency	Method of adjustment		Instruments required	Remark
S-curve	TP1	TP2	10.7MHz	IFT1, 4	Adjust the core for waveform having good symmetry and good linearity.	<ul style="list-style-type: none"> ● Sweep generator ● Oscilloscope ● V.T.V.M. 	 (10.7MHz)
Tracking	Antenna receptacle	Speaker lead	87.5MHz	TC3 (OSC trimmer)	Adjust the trimmers for maximum indication of V.T.V.M.	<ul style="list-style-type: none"> ● Speaker ● V.T.V.M. ● SG 	
			98MHz	TC1 (ANT trimmer) TC2 (RF trimmer)			
<MPX> 19KHz Pilot signal (VCO)	TP4	TP4	19KHz Pilot signal	VR4	Adjust the Lissajous figure does not move	<ul style="list-style-type: none"> ● MPX stereo SG 	 after adjusted
Separation	Antenna receptacle	Speaker lead	Right or left signal (400Hz)	VR5	Adjust the VR for maximum separation	MPX stereo SG and SSG	
SASC	Receive a 98MHz FM signal. Set the ANT input to 55dB, MOD to 7KHz and the VOL control to a suitable position. Consider this point as 0dB. Next adjust VR3 so that the output becomes 3dB down when the ANT input is dropped to 35dB.						
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 VR2 and VR1. Noise gets eliminated as VR2 is turned towards the center position and VR1 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.						

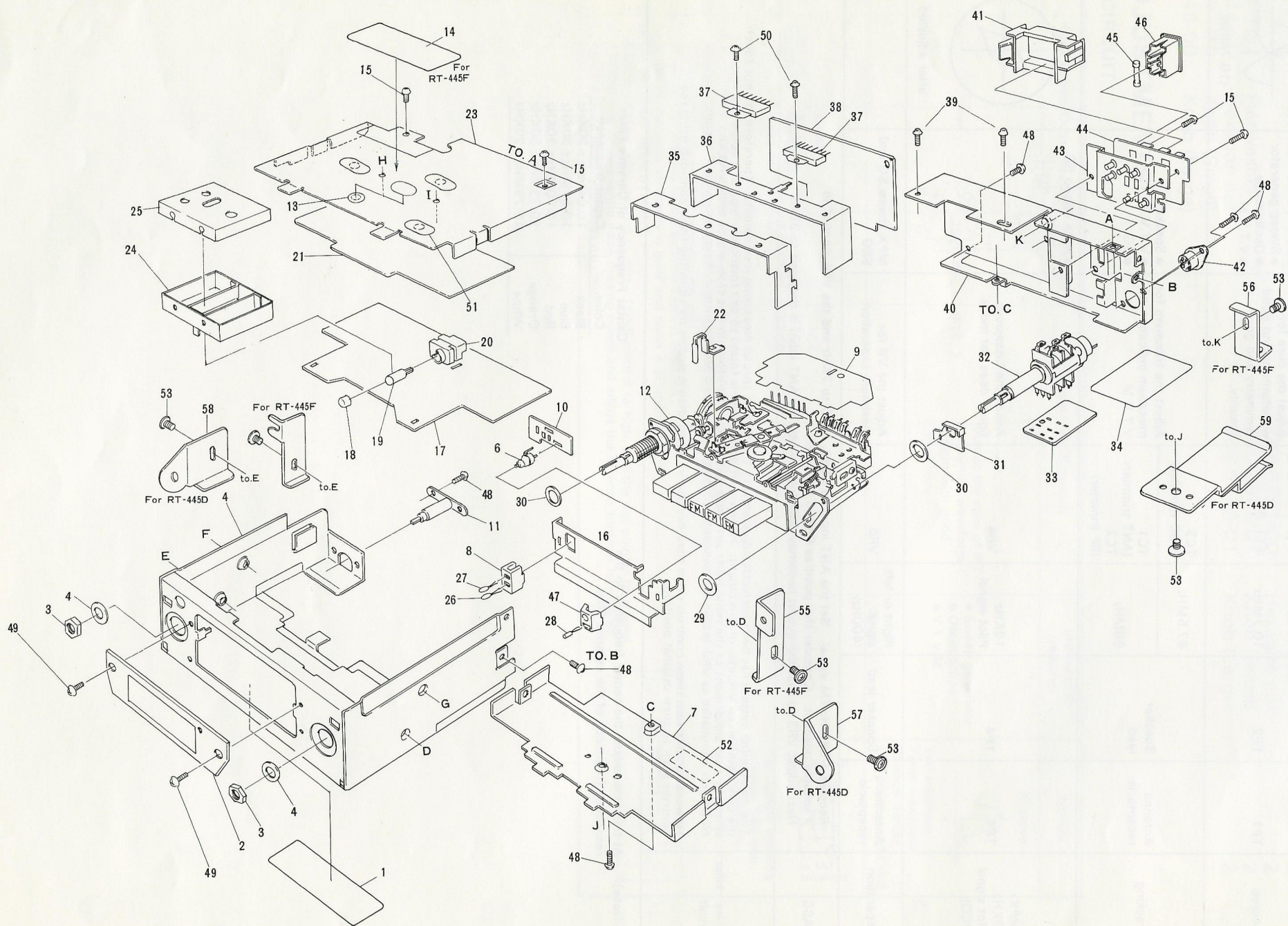
[Note] At this time, adjust the center frequency to the resonance frequency of the ceramic filter.

Center Frequency of Ceramic Filter

Color	Center frequency
Black	10.64MHz±30KHz
Blue	10.67MHz±30KHz
Red	10.70MHz±30KHz
Orange	10.73MHz±30KHz
White	10.76MHz±30KHz

EXPLODED VIEW:

© Main section



PARTS LIST:

©Main section

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY	REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
1	285-0160-00	Guide label	1	28	017-0324-06	Pilotlamp	1
2	372-2921-01 372-2962-00	Dial plate (F) (D)	1	29	745-0430-00	Flat washer	1
3	722-0231-00	Hexagon nut	2	30	745-0451-00	Flat washer	2
4	745-0430-00	Flat washer	2	31	330-6087-00	V.R fixed plate	1
5	308-0917-06	Front cover	1	32	012-3737-00	Variable resistor	1
6	004-1516-01	Trimmer	1	33	347-0577-00	Insulator	1
7	304-0307-01	Lower cover	1	34	099-5597-01	P.W.B	1
8	345-2868-02	P.L holder	1	35	313-1040-00	Heat sink	1
9	347-0523-00	Insulator	1	36	330-6594-00	IC holder	1
10	099-5261-01	P.W.B	1	37	051-0181-11	IC (TA-7222AP)	2
11	092-0532-00	Antenna receptacle	1	38	099-5259-06	P.W.B	1
12	937-0155-70	6 coil push button tuner ass'y	1	39	714-3006-81	Machine screw (M3x6)	2
12-1	013-3388-00	Select switch	1	40	307-0300-01	Rear cover	1
12-2	673-0060-00	Tuning shaft	1	41	335-0979-02	Socket holder	1
12-3	680-0069-02	Push button	2	42	074-0569-00	Outlet socket	1
12-4	680-0069-03	Push button (FM)	3	43	944-0467-12	Filter ass'y	1
12-5	965-2160-00 965-2509-00	Tuning coil (FM) ass'y (AM)	1	44	074-0572-12	Outlet socket	1
12-6	012-3509-01	Variable resistor	1	45	120-0020-02	Fuse (2A)	1
13	290-2438-01	Label	1	46	335-0837-00	Fuse holder	1
14	290-3177-00	Label(RT-445F)	1	47	345-3149-00	Pilotlamp holder	1
15	731-3008-80	Taptight (M3x8)	4	48	731-3005-80	Taptight (M3x5)	6
16	374-0748-03	Back plate	1	49	731-3006-40	Taptight (M3x6)	2
17	099-5942-00	P.W.B	1	50	714-3004-81	Machine screw (M3x4)	2
18	345-2831-04	P.L cap	1	51	290-2567-00	Label	4
19	017-0306-01	Pilotlamp	1	52	286-4526-00	Set plate	1
20	070-0927-01	P.L socket	1	53	716-0417-00	Machine screw	3
21	347-0873-00	Shade	1	54	300-6136-00	Mounting bracket (RT-445F)	1
22	376-0803-00	Dial pointer	1	55	300-6137-00	Mounting bracket (RT-445F)	1
23	310-0950-03	Upper case	1	56	300-6149-00	Mounting bracket (RT-445F)	1
24	330-6595-00	Shielded case	1	57	300-6171-00	Mounting bracket (RT-445D)	1
25	330-6596-04	Shielded case	1	58	300-6172-00	Mounting bracket (RT-445D)	1
26	017-0314-02	Pilotlamp	1	59	300-6174-00	Mounting bracket (RT-445D)	1
27	017-0314-03	Pilotlamp	1				

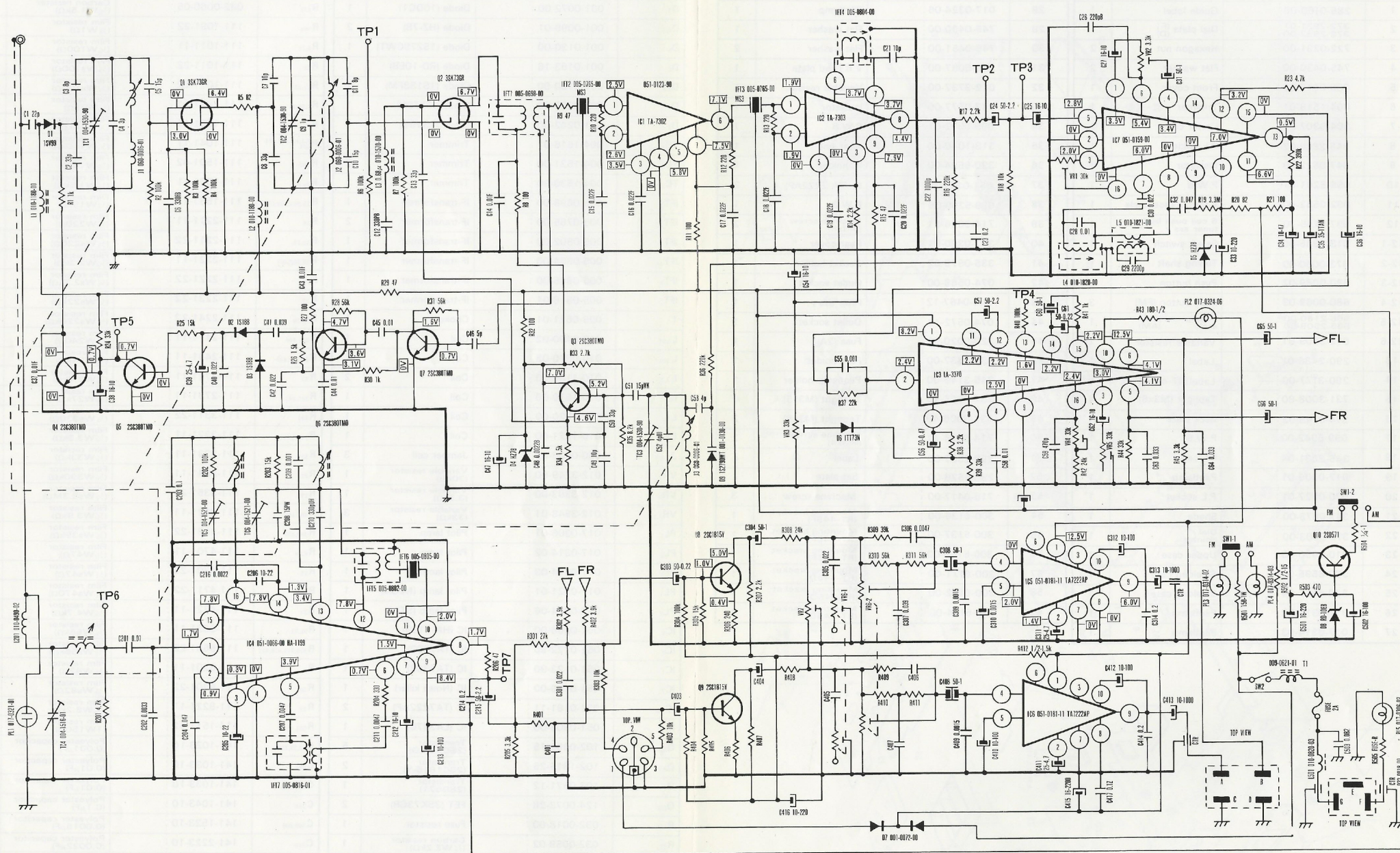
PARTS LIST:

◎Electrical section

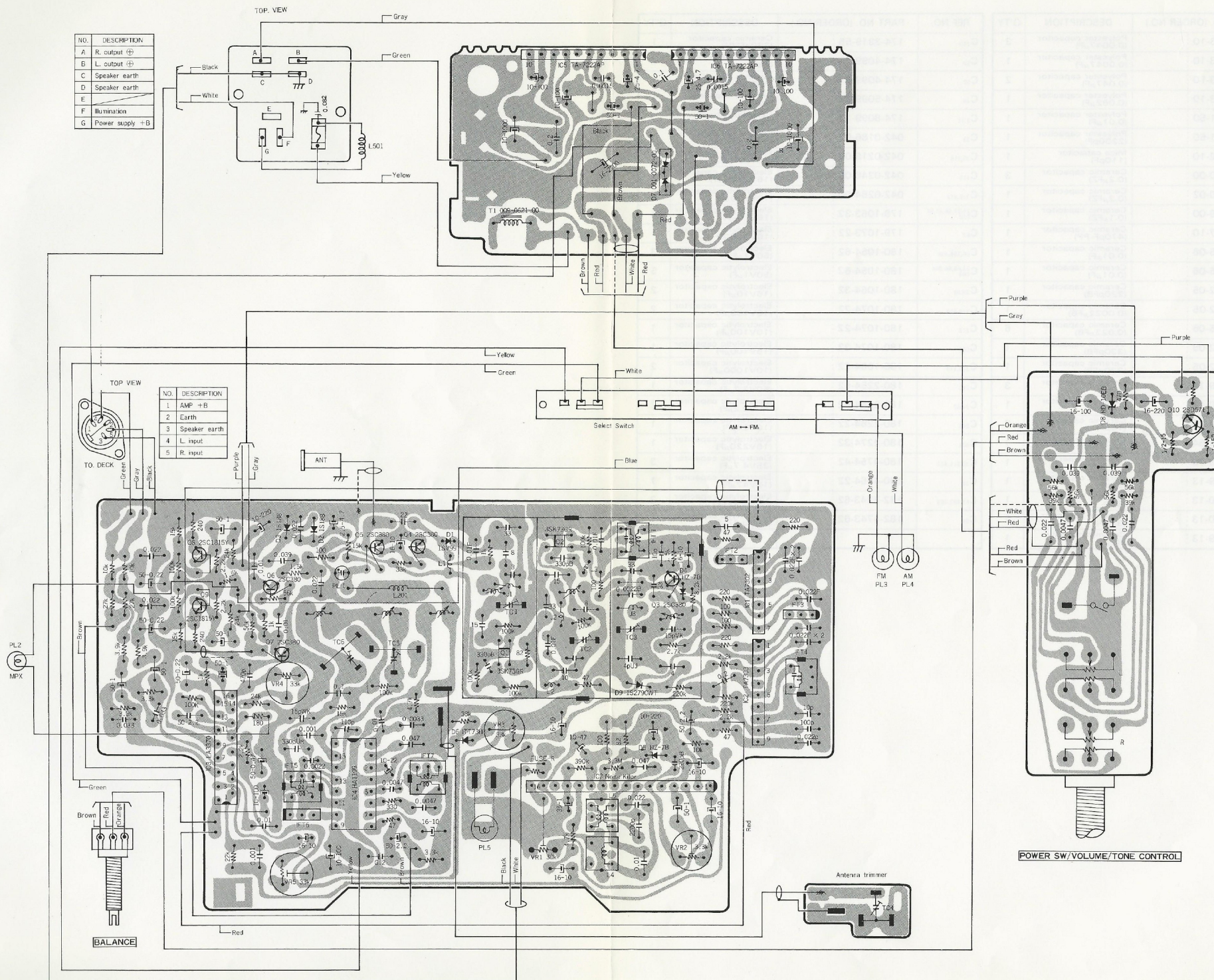
REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
D ₇	001-0072-00	Diode (10DC1)	1
D _{4,5}	001-0099-01	Diode (HZ-7B)	2
D ₉	001-0130-00	Diode (1S2790WT)	1
D ₈	001-0163-16	Diode (RD-10EB)	1
D _{2,3}	001-0180-00	Diode (1S188FM)	2
D ₆	001-0208-00	Diode (ITT73N)	1
D ₁	001-0242-00	Diode (1SV99)	1
TC ₄	004-1516-01	Trimmer	1
TC _{5,6}	004-1521-00	Trimmer	2
TC _{1,2,3}	004-1530-90	Trimmer	3
IFT ₁	005-0698-00	IF-transformer	1
IFT _{2,3}	005-0765-00	IF-transformer	2
IFT ₅	005-0802-00	IF-transformer	1
IFT ₄	005-0804-00	IF-transformer	1
IFT ₆	005-0805-00	IF-transformer	1
IFT ₇	005-0816-01	IF-transformer	1
T ₁	009-0621-01	Choke	1
L ₂₀₁	010-0490-02	Coil	1
L ₅₀₁	010-0820-03	Coil	1
L _{1,2}	010-1180-00	Coil	2
L ₃	010-1570-00	Coil	1
L ₄	010-1820-00	Coil	1
L ₅	010-1821-00	Coil	1
J _{1,2,3}	060-0006-01	Jamper coil	3
VR ₁	012-3249-00	Variable resistor (30kΩ)	1
VR ₂	012-3393-00	Variable resistor (3.3kΩ)	1
VR _{3,4,5}	012-3548-01	Variable resistor (33kΩ)	3
PL ₅	017-0306-01	Pilot lamp	1
PL ₃	017-0314-02	Pilot lamp	1
PL ₄	017-0314-03	Pilot lamp	1
PL ₁	017-0321-01	Pilot lamp (NEON)	1
PL ₂	017-0324-06	Pilot lamp (ST)	1
IC ₄	051-0066-00	IC (HA-1199)	1
IC ₂	051-0122-90	IC (TA7303)	1
IC ₁	051-0123-90	IC (TA7302)	1
IC ₇	051-0159-00	IC (Noise killer)	1
IC _{5,6}	051-0181-11	IC (TA7222AP)	2
IC ₃	051-0308-00	IC (LA3370)	1
Q _{3,4,5,6,7}	102-0380-15	Transistor (2SC380-O)	5
Q _{8,9}	102-1815-25	Transistor (2SC1815-Y)	2
Q ₁₀	103-0571-12	Transistor (2SD571)	1
Q _{1,2}	124-0073-28	FET (3SK73GR)	2
R ₅₀₅	032-0018-00	Fuse resistor	1
R ₁₇	032-0059-02	Carbon resistor (1/4W2.2kΩ)	1
R ₂₀₁	032-0059-03	Carbon resistor (1/4W4.7kΩ)	1
R ₂₄	032-0059-06	Carbon resistor (1/4W33kΩ)	1
R _{6,40}	032-0059-08	Carbon resistor (1/4W100kΩ)	2
R ₂₀₆	032-0059-09	Carbon resistor (1/4W47Ω)	1
R ₁₈	032-0059-10	Carbon resistor (1/4W10kΩ)	1
R ₄₃	032-0060-01	Carbon resistor (1/2W180Ω)	1

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
R ₄₁₂	032-0060-05	Carbon resistor (1/2W1.5kΩ)	1
R ₅₀₄	111-1091-22	Film resistor (1/4W1Ω)	1
R _{8,27}	111-1011-11	Film resistor (1/4W100Ω)	2
R ₂₁	111-1011-22	Film resistor (1/4Ws100Ω)	1
R _{11,32}	111-1011-22	Film resistor (1/4Ws100Ω)	2
R _{1,30,41}	111-1021-11	Film resistor (1/4W1kΩ)	3
R _{303,403}	111-1031-11	Film resistor (1/4W10kΩ)	2
R _{2,3,4,7,202,304,404}	111-1041-11	Film resistor (1/4W100kΩ)	7
R ₅₀₂	111-1501-42	Film resistor (1/2W15Ω)	1
R _{26,34}	111-1521-11	Film resistor (1/4W1.5kΩ)	2
R _{25,203,305,405}	111-1531-11	Film resistor (1/4W15kΩ)	4
R ₁₀	111-2211-11	Film resistor (1/4W220Ω)	1
R _{12,13}	111-2211-22	Film resistor (1/4Ws220Ω)	2
R _{38,307,407}	111-2221-11	Film resistor (1/4W2.2kΩ)	3
R ₁₄	111-2221-22	Film resistor (1/4Ws2.2kΩ)	1
R ₃₇	111-2231-22	Film resistor (1/4Ws22kΩ)	1
R _{16,36}	111-2241-22	Film resistor (1/4Ws220kΩ)	2
R _{306,406}	111-2411-11	Film resistor (1/4W240Ω)	2
R _{42,308,408}	111-2431-11	Film resistor (1/4W24kΩ)	3
R ₃₃	111-2721-11	Film resistor (1/8W2.7kΩ)	1
R _{301,401}	111-2731-11	Film resistor (1/8W27kΩ)	2
R ₂₀₄	111-3311-22	Film resistor (1/4Ws330Ω)	1
R _{44,45,205}	111-3321-11	Film resistor (1/8W3.3kΩ)	3
R ₃₉	111-3331-11	Film resistor (1/8W33kΩ)	1
R ₂₂	111-3941-11	Film resistor (1/8W390kΩ)	1
R ₁₉	111-3351-22	Film resistor (1/4Ws3.3MΩ)	1
R _{302,402}	111-3921-11	Film resistor (1/8W3.9kΩ)	2
R _{309,409}	111-3931-22	Film resistor (1/4Ws39kΩ)	2
R _{9,29}	111-4701-11	Film resistor (1/8W47Ω)	2
R ₁₅	111-4701-22	Film resistor (1/4Ws47Ω)	1
R ₅₀₃	111-4711-22	Film resistor (1/4Ws470Ω)	1
R ₂₃	111-4721-11	Film resistor (1/8W4.7kΩ)	1
R _{28,31}	111-5631-11	Film resistor (1/8W56kΩ)	2
R _{310,311,410,411}	111-5631-22	Film resistor (1/4Ws56kΩ)	4
R ₅	111-8201-11	Film resistor (1/8W82Ω)	1
R ₂₀	111-8201-22	Film resistor (1/4Ws82Ω)	1
R ₃₅	111-8221-11	Film resistor (1/8W8.2kΩ)	1
R ₅₀₁	114-1511-52	Film resistor (1W150Ω)	1
C _{22,55,209}	141-1023-10	Polyester capacitor (0.001μF)	3
C ₂₀₁	141-1033-10	Polyester capacitor (0.01μF)	1
C _{44,45,58}	141-1033-10	Polyester capacitor (0.01μF)	3
C ₂₀₃	141-1043-10	Polyester capacitor (0.1μF)	1
C _{309,409}	141-1523-10	Polyester capacitor (0.0015μF)	2
C ₂₁₆	141-2223-10	Polyester capacitor (0.0022μF)	1
C _{301,305,405}	141-2233-10	Polyester capacitor (0.022μF)	3
C _{30,40,42,401}	141-2233-10	Polyester capacitor (0.022μF)	4
C ₂₀₂	141-3323-10	Polyester capacitor (0.0033μF)	1
C ₆₃	141-3333-10	Polyester capacitor (0.033μF)	1
C ₆₄	141-3333-10	Polyester capacitor (0.033μF)	1
C _{41,307,407}	141-3933-10	Polyester capacitor (0.039μF)	3

■CIRCUIT DIAGRAM:



PRINTED WIRING BOARD:



REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
C _{207,306,406}	141-4723-10	Polyester capacitor (0.0047 μ F)	3
C ₂₁₁	141-4723-10	Polyester capacitor (0.0047 μ F)	1
C _{32,204}	141-4733-10	Polyester capacitor (0.047 μ F)	2
C ₅₀₃	141-8233-10	Polyester capacitor (0.082 μ F)	1
C ₂₈	143-1031-50	Polyester capacitor (0.01 μ F)	1
C ₂₉	143-2221-50	Polyester capacitor (220pF)	1
C ₂₀₆	144-1112-10	Mica capacitor (110pF)	1
C _{23,314,414}	043-0020-00	Ceramic capacitor (0.2 μ FZ)	3
C ₂₁₄	043-0020-02	Ceramic capacitor (0.2 μ FZ)	1
C ₄₁₇	043-0039-00	Ceramic capacitor (0.1 μ FZ)	1
C ₅₉	043-0147-10	Ceramic capacitor (470pF-PP)	1
C ₃₇	160-1035-06	Ceramic capacitor (0.01 μ F)	1
C ₁₄	160-1035-06	Ceramic capacitor (0.01 μ F)	1
C ₂₆	160-2212-05	Ceramic capacitor (220pFB)	1
C ₄₈	160-2222-05	Ceramic capacitor (0.0022 μ FB)	1
C _{15,16,17,18,19,20}	160-2235-06	Ceramic capacitor (0.022 μ FB)	6
C ₆	160-3312-05	Ceramic capacitor (330pFB)	1
C ₁₂	160-3312-05	Ceramic capacitor (330pFB)	1
C _{7,21,49}	174-1009-13	Ceramic capacitor (10pF)	3
C ₉	174-1090-13	Ceramic capacitor (1pF)	1
C _{5,10}	174-1509-13	Ceramic capacitor (15pF)	2
C ₅₁	174-1509-64	Ceramic capacitor (15pFVK)	1
C ₂₀₈	174-1509-70	Ceramic capacitor (15pFWK)	1
C ₁	174-2209-13	Ceramic capacitor (22pF)	1
C ₄	174-3090-13	Ceramic capacitor (3pF)	1
C _{13,50}	174-3300-13	Ceramic capacitor (33pF)	2
C ₂	174-3309-13	Ceramic capacitor (33pF)	1

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
C ₂₁₀	174-3319-56	Ceramic capacitor (330pFUH)	1
C ₅₃	174-4099-13	Ceramic capacitor (4pF)	1
C ₅₂	174-4099-57	Ceramic capacitor (4pFUJ)	1
C ₄₆	174-5099-13	Ceramic capacitor (5pF)	1
C _{3,11}	174-8099-13	Ceramic capacitor (8pF)	2
C ₃₅	042-0186-02	Electrolytic capacitor (35V1 μ FTAN)	1
C _{33,416}	042-0219-00	Electrolytic capacitor (10V220 μ F)	2
C ₄₁₅	042-0246-00	Electrolytic capacitor (16V2200 μ F)	1
C _{312,412}	042-0264-00	Electrolytic capacitor (10V100 μ F)	2
C _{25,27,36,47,54,212}	179-1063-32	Electrolytic capacitor (16V10 μ F)	6
C ₆₇	179-1073-22	Electrolytic capacitor (10V100 μ F)	1
C _{60,308,408}	180-1054-62	Electrolytic capacitor (50V1 μ F)	3
C _{31,65,66,304,404}	180-1054-62	Electrolytic capacitor (50V1 μ F)	5
C _{38,62}	180-1064-32	Electrolytic capacitor (16V10 μ F)	2
C _{310,410}	180-1074-22	Electrolytic capacitor (10V100 μ F)	2
C ₂₁₃	180-1074-22	Electrolytic capacitor (10V100 μ F)	1
C ₅₀₂	180-1074-32	Electrolytic capacitor (16V100 μ F)	1
C _{313,413}	180-1084-22	Electrolytic capacitor (10V1000 μ F)	2
C ₂₁₅	180-2254-62	Electrolytic capacitor (50V2.2 μ F)	1
C _{24,57}	180-2254-62	Electrolytic capacitor (50V2.2 μ F)	2
C ₂₀₅	180-2264-22	Electrolytic capacitor (10V22 μ F)	1
C ₅₀₁	180-2274-32	Electrolytic capacitor (16V220 μ F)	1
C _{39,311,411}	180-4754-42	Electrolytic capacitor (25V4.7 μ F)	3
C ₃₄	180-4764-22	Electrolytic capacitor (10V47 μ F)	1
C _{61,303,403}	182-2243-62	Electrolytic capacitor (50V0.22 μ F)	3
C ₅₆	182-4743-62	Electrolytic capacitor (50V0.47 μ F)	1