Clarion

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Closer Relations through
"Clarion Service Manual"

Service Manual

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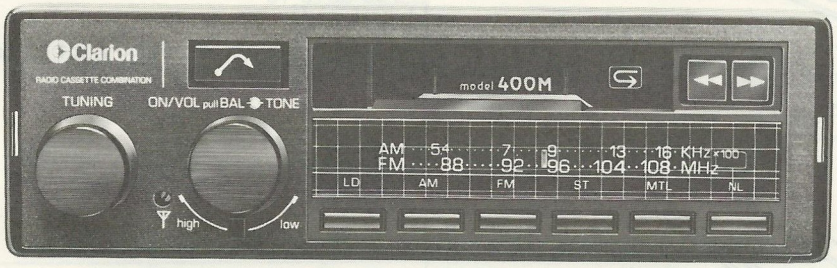
Clarion Shoji (U.K.) Ltd. 4-6, Faraday Road, Dorcan Industrial Estate, Dorcan, Swindon, Wiltshire. SN3.5HQ United Kingdom Tel: (0793) 24081 Telex: 44689

Model 400M



■ SPECIFICATIONS:

Radio section

Circuit system:	Superheterodyne	
Tuning system:	Manual μ-tuning	
Receive range:	AM	531kHz to 1,602kHz
	FM	88MH to 108MHz
Intermediate frequency:	AM	460kHz
	FM	10.7MHz
Quieting sensitivity:	AM	Less than 33dB (at 20dB S/N)
	FM	Less than 18dB (at 30dB S/N)
Selectivity:	AM	More than 20dB (at ±10kHz detune)
AFC:	FM	400 to 900kHz
Separation:	FM	More than 20dB
Fidelity:	AM	100Hz 0±4dB
		400Hz 0dB
		4,000Hz −16±7dB
	FM	100Hz 4±4dB
		400Hz 0dB
		7,000Hz −8±4dB

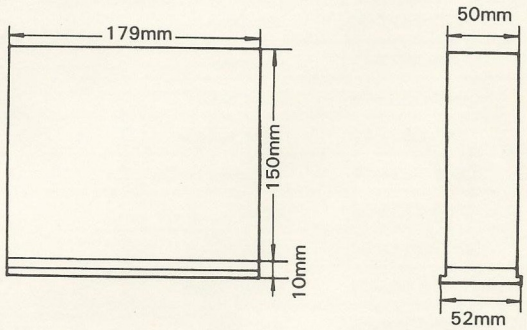
Tape section

Reproduction system:	4 track, 2 channel, stereo cassette player
Tape speed:	4.76cm/s (1-7/8 ips)
Wow and flutter:	Less than 0.2% (W.R.M.S.)
Separation:	More than 30dB
Cross talk:	More than 40dB
S/N ratio:	More than 40dB
FF time:	Less than 150sec. (C-60)

Synthesis

Load impedance:	4Ω×2
Power output:	3.5W×2 (at 10% distortion)
	5.5W×2 (at max. output)
Power supply voltage:	DC 14.4V (10.8V to 15.6V) Negative ground
Current consumption:	Less than 3A (at max. output)
Weight:	1.7kg

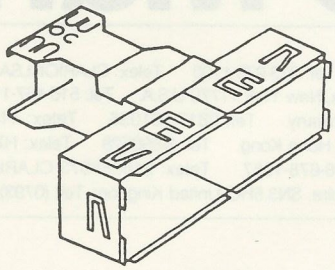
■ DIMENSIONS:

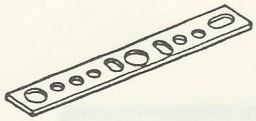


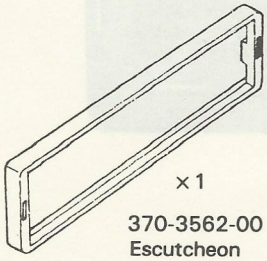
■ COMPONENTS VIEW:

• **400M (PE-6021A-A)**

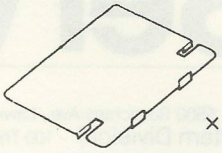
Main unit		1
Mounting bracket	300-6953-00	1
Mounting bracket	300-6954-00	1
Parts bag	922-1247-00	1
Parts bag	921-7554-00	1



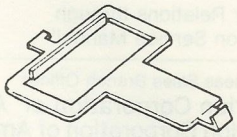




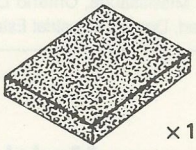
×1
370-3562-00
Escutcheon



×1
330-7672-01
Lock plate



×2
330-7673-00
Hook plate



×1
345-2934-00
Cushion

×1
345-3653-01
Spacer

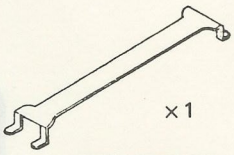
×1
820-0050-04
Vinyl tube

×1
725-0181-00
Plate nut

×1
700-5016-10
Tap screw

×1
740-5000-10
Flat washer

×1
722-0314-00
Nut



×1
330-7759-00
Hold plate

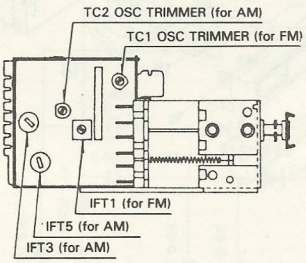
■ FEATURES:

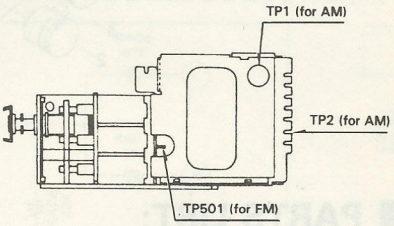
- AM FM-MPX radio with auto replay and key off eject stereo cassette player (F.F., REW lock).
- Loudness circuit built-in.
- SC mechanism.
- NL (Noise Limiter) built-in.
- MTL

■ ADJUSTMENTS:

• AM CIRCUIT

Item	Input	Frequency	Output	Method of adjustment		Instruments required	Remark
IF	TP1	460kHz	TP2	IFT-3,5	Adjust for maximum	• Sweep generator • Oscilloscope	VOL minimum TON high BAL center Dial pointer right end
Tracking	Antenna receptacle	1.620kHz	Meter across the speaker voice coil	TC2		• SSG • V.T.V.M. • Speaker (4Ω) • Dummy ANT	to SSG (75Ω) 5Ω 15p 65p to ANT receptacle Use dummy antenna between SSG and ANT recepatcle
Antenna trimmer	Receive white noise	1.400kHz	Speaker	TC401	Adjust the trimmer so that the noise output becomes maximum	• Speaker	TC401

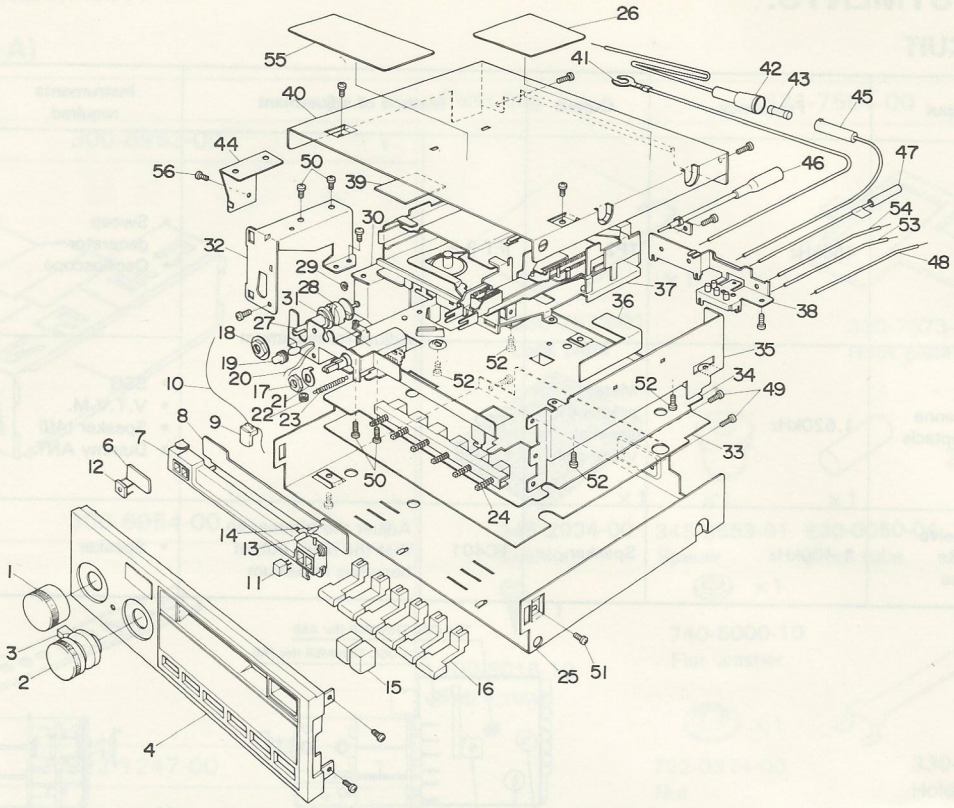




• FM CIRCUIT

Item	Input	Output	Frequency	Method of adjustment		Instruments required	Remarks
S-curve	TP501 (Tuner pack)	TP503	10.7MHz	IFT1 and IFT502	Adjust the cores for wave-form having good symmetry and good linearity.	• Sweep generator • Oscilloscope	•Ground pin 6 of IC501 (LA1140)
Tracking	Antenna receptacle	Meter across the speaker voice coil	109MHz	TC1 (OSC trimmer)	Adjust the trimmer for maximum indication of V.T.V.M.	• Dummy load (4Ω) • V.T.V.M. • S.S.G.	
<MPX> (VCO)		TP505	98MHz 55dB No modulation	Connect a frequency counter to TP505 via a 100kΩ resistor and adjust VR503 to 76kHz		• S.S.G. • Frequency counter	"ST" ON
Separation		Meter across the speaker voice coil	Right or left signal (400Hz)	VR501	Adjust the VR for maximum spearation.	• Streo SG (98MHz, 65dB) • S.S.G.	"ST" ON
SASC circuit	Set to the specified modulation (30%), assuming an UKW S.S.G. output 55dB, modulation frequency 7kHz. Set the output level to 0dBm (=0.775V) using the volume control. Set the UKW S.S.G. output to 38dB and adjust VR502 so that the output level is 3dB down. "ST" ON.						

■ EXPLODED VIEW:



■ PARTS LIST:

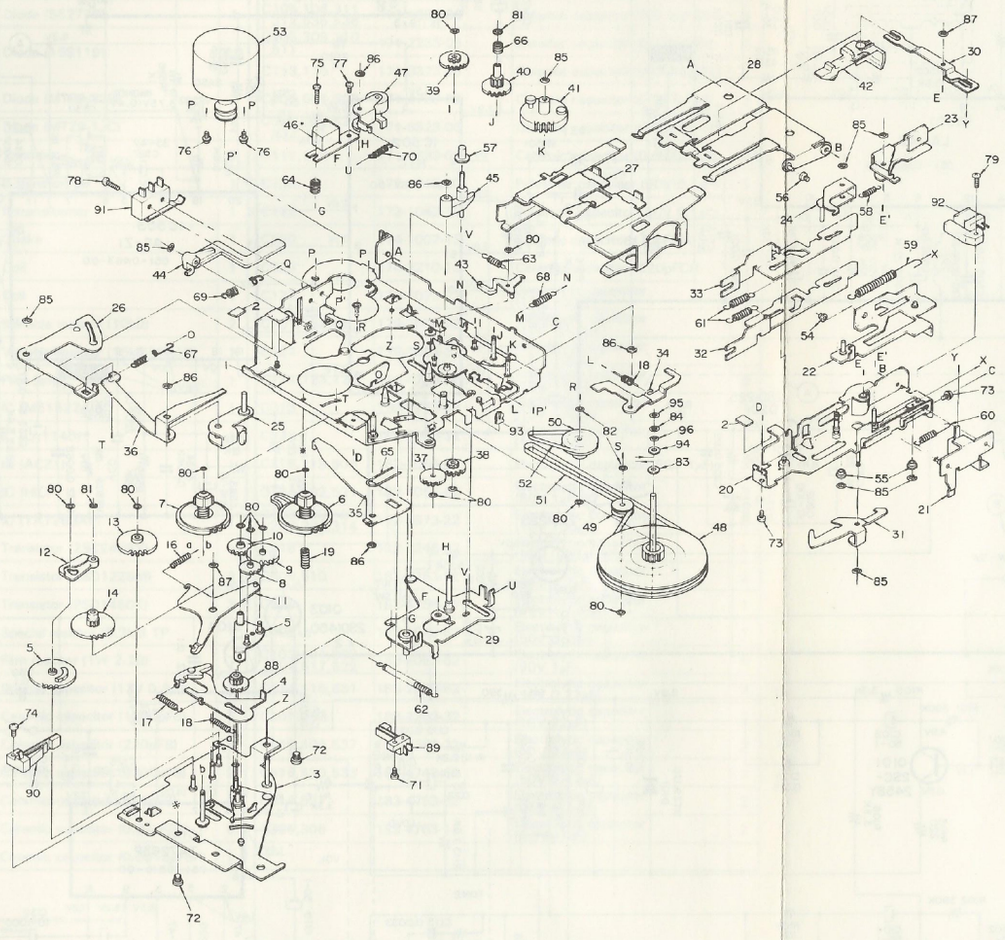
• Main section

Ref. No.	Part No. (Order No.)	Description	Q'ty
1	380-4296-00	Knob	1
2	380-4297-00	Knob	1
3	380-4298-00	Knob	1
4	940-2694-10	Escutcheon ass'y	1
6	099-7139-00	P.W.B	1
7	374-0834-01	Back plate	1
8	099-6802-00	P.W.B	1
9	376-0887-00	Dial pointer	1
10	830-0600-83	Dial cord	1
11	001-0312-01	Diode (RED)	1
12	013-3694-00	Switch	1
13	345-2830-07	P.L. cap	1
14	017-0345-17	Pilot lamp	1
15	382-0506-01	Botton	2
16	382-0513-01	Botton	6
17	722-0231-00	Hexagon nut	1
18	722-0417-00	Hexagon nut	1
19	345-3621-01	P.L. cap	1
20	017-0353-00	Pilot lamp	1
21	745-0635-00	Lock washer	1
22	335-0894-00	Dial cord pulley	1
23	750-2175-00	Spring	1
24	013-3743-00	Switch	1
25	311-1102-02	Lower case	1
26	286-5368-00	Set plate	1
27	961-0116-00	Tuning shaft ass'y	1
28	335-1536-00	Oldham joint	1
29	746-0668-01	Lock washer	1

Ref. No.	Part No. (Order No.)	Description	Q'ty
30	970-0100-02	Tuner	1
31	012-4074-00	Variable resistor	1
32	330-7675-02	Bracket	1
33	347-1219-00	Insulator	1
34	099-7139-00	P.W.B	1
35	312-0232-02	Chassis	1
36	347-1220-00	Insulator	1
37	930-0505-01	Tape mechanism	1
38	944-0652-01	Filter ass'y	1
39	347-1220-00	Insulator	1
40	310-1126-01	Upper case	1
41	840-0345-00	Bonding wire	1
42	850-1844-01	A-lead	1
43	120-0030-00	Fuse (3A)	1
44	330-8036-00	Bracket	1
45	850-1822-00	A-lead	1
46	092-0522-06	Antenna receptacle	1
47	852-5322-03	Extension lead	1
48	851-2406-02	SP lead	1
49	714-3010-81	Machine screw	2
50	714-3004-81	Machine screw	4
51	731-3006-80	Tap tight	13
52	714-3006-81	Machine screw	4
53	851-2406-01	SP lead (GREEN)	1
54	851-2406-00	SP lead (GRAY)	1
55	285-1176-00	Guide label	1
56	714-3003-81	Machine screw	1

■ EXPLODED VIEW · PARTS LIST:

◎Tape mechanism section



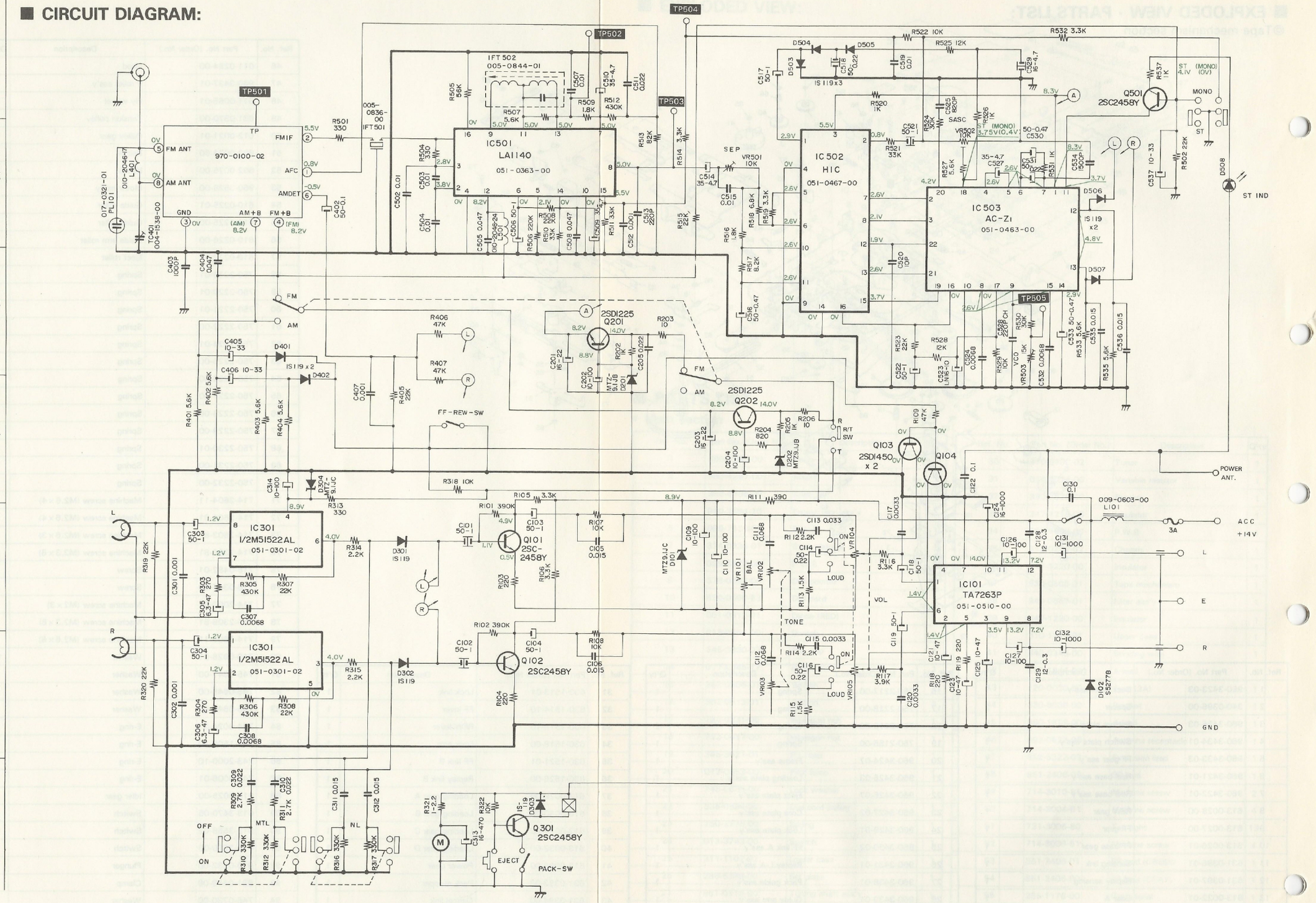
Ref. No.	Part No. (Order No.)	Description	Q'ty
1	960-3423-03	Deck plate ass'y	1
2	340-0398-00	Spacer	2
3	960-3435-03	Bottom plate ass'y	1
4	960-3434-01	Switch plate ass'y	1
5	960-3433-03	FF gear ass'y	1
6	960-3421-01	Reel base ass'y	1
7	960-3422-01	Reel base ass'y	1
8	613-0028-00	REW gear	1
9	613-0027-00	FF gear	1
10	613-0026-01	FF base gear	1
11	631-0396-01	Sensing link	1
12	631-0397-01	Replay sensing	1
13	613-0022-01	Gear A	1
14	613-0023-00	Gear B	1
15	613-0024-01	Cam gear	1

Ref. No.	Part No. (Order No.)	Description	Q'ty
16	750-2217-00	Spring	1
17	750-2218-00	Spring	1
18	750-2219-00	Spring	2
19	750-2155-00	Spring	1
20	960-3424-07	Frame ass'y	1
21	960-3425-03	Loading plate ass'y	1
22	960-3426-07	Eject plate ass'y	1
23	960-3427-02	Core plate ass'y	1
24	960-3429-01	Lock plate ass'y	1
25	960-3430-02	FF link A ass'y	1
26	960-3431-01	Replay L-A ass'y	1
27	960-3438-01	Pack guide ass'y	1
28	960-3439-01	Guide arm ass'y	1
29	960-3440-02	Head plate ass'y	1
30	630-1511-03	Loading link	1

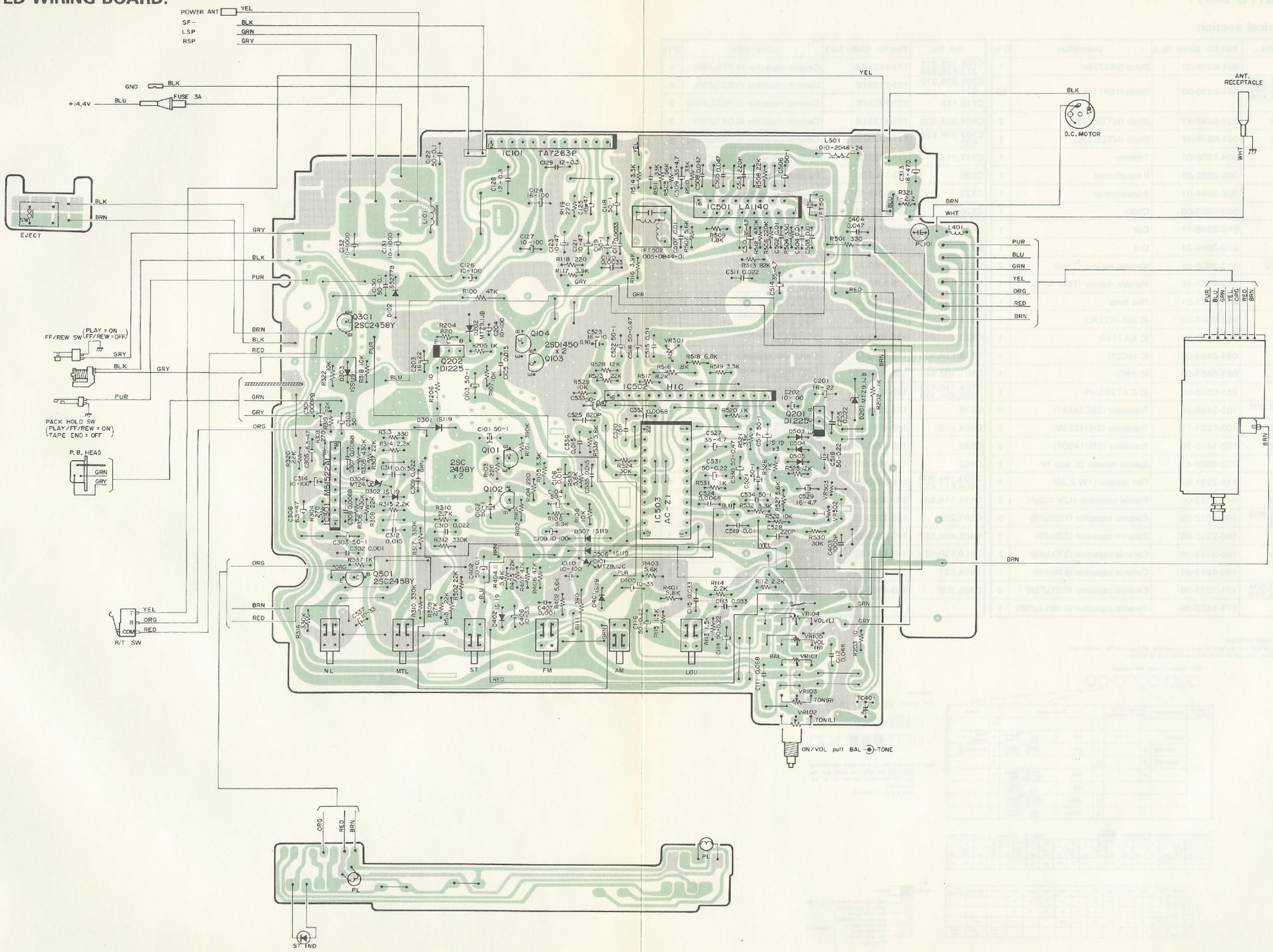
Ref. No.	Part No. (Order No.)	Description	Q'ty
31	630-1513-01	Lock link	1
32	630-1514-10	FF lever	1
33	630-1515-10	REW lever	1
34	630-1518-00	Lock arm	1
35	630-1521-01	FF link B	1
36	630-1526-00	Replay link B	1
37	613-0029-00	Loading gear A	1
38	613-0030-00	Loading gear B	1
39	613-0031-00	Loading gear C	1
40	613-0032-00	Loading gear D	1
41	613-0033-00	Power gear	1
42	631-0392-03	Pack stopper	1
43	631-0394-00	Cancel link	1
44	631-0395-01	SW link	1
45	631-0398-00	Eject link	1

Ref. No.	Part No. (Order No.)	Description	Q'ty
46	011-0284-00	Head	1
47	960-3437-01	P roller ass'y	1
48	611-0065-01	Fly wheel	1
49	631-0370-00	Tension pulley	1
50	613-0021-01	Pulley gear	1
51	602-0074-00	Belt A	1
52	602-0075-00	Belt B	1
53	960-3528-00	Motor ass'y	1
54	610-0225-01	Guide roller	1
55	610-0225-00	Guide roller	2
56	610-0226-00	Guide arm roller	1
57	610-0227-01	Eject roller	1
58	750-2233-01	Spring	1
59	750-2220-01	Spring	1
60	750-2221-01	Spring	1
61	750-2222-00	Spring	2
62	750-2224-01	Spring	1
63	750-2225-00	Spring	1
64	750-2226-00	Spring	1
65	750-2227-00	Spring	1
66	750-2228-00	Spring	1
67	750-2229-00	Spring	1
68	750-2230-01	Spring	1
69	750-2231-00	Spring	1
70	750-2232-00	Spring	1
71	714-2604-11	Machine screw (M2.6×4)	1
72	714-2604-81	Machine screw (M2.6×4)	2
73	714-2603-81	Machine screw (M2.6×3)	2
74	714-2306-81	Machine screw (M2.3×6)	1
75	716-0482-01	Screw	1
76	716-0347-00	Screw	2
77	714-2003-81	Machine screw (M2×3)	1
78	714-2308-81	Machine screw (M2.3×8)	1
79	714-2606-11	Machine screw (M2.6×6)	1
80	746-0628-01	Washer	14
81	745-0647-00	Washer	2
82	745-0645-00	Washer	2
83	745-0646-00	Washer	1
84	744-0024-01	E-ring	1
85	743-1500-10	E-ring	8
86	743-2000-10	E-ring	5
87	744-0006-01	E-ring	2
88	613-0025-00	Idler gear	1
89	013-3470-05	Switch	1
90	013-3558-02	Switch	1
91	013-2690-03	Switch	1
92	015-0232-00	Plunger	1
93	631-0419-00	Clamp	1
94	746-0730-00	Washer	1
95	746-0731-00	Washer	1
96	746-0732-00	Washer	1

■ CIRCUIT DIAGRAM:



■ PRINTED WIRING BOARD:



■ PARTS LIST:

• Electrical section

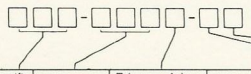
Ref. No.	Part No. (Order No.)	Description	Q'ty
D102	001-0276-00	Diode (S5277B)	1
D301,302,303 401,402,503 504,505,506 507	001-0330-00	Diode (1SS119)	10
D201,202	001-0346-47	Diode (MTZ9.1JB)	2
D101,304	001-0376-48	Diode (MTZ9.1JC)	2
TC401	004-1538-00	Trimmer	1
IFT501	005-0836-00	If-transformer	1
IFT502	005-0844-01	If-transformer	1
L101	009-0603-00	Choke	1
L401	010-2046-17	Coil	1
L501	010-2046-24	Coil	1
VR501,502	012-3808-06	Variable resistor (10kΩ)	2
VR503	012-4101-16	Variable resistor (15kΩ MTL)	1
PL101	017-0321-01	Pilot lamp	1
IC301	051-0301-02	IC (M51522AL)	1
IC501	051-0363-00	IC (LA1140)	1
IC503	051-0463-00	IC (ACZ1)	1
IC502	051-0467-00	IC (HIC)	1
IC101	051-0510-00	IC (TA7263AP)	1
Q101,102,301 501	102-2458-25	Transistor (2SC2458Y)	4
Q201,202	103-1225-17	Transistor (2SD1225M)	2
Q103,104	103-1450-20	Transistor (2SD1450T)	2
R514	032-0059-47	Special resistor (3.3kΩ) TP	1
R321	114-2291-52	Film resistor (1W 2.2Ω)	1
C128,129	043-0122-00	Special capacitor (12V 0.3μF)	2
C301,302,403 407,512	160-1022-05	Ceramic capacitor (1000pFB)	5
C513	160-2222-05	Ceramic capacitor (220pFB)	1
C117,120	160-3322-05	Ceramic capacitor (3300pFB)	2
C525	160-8212-05	Ceramic capacitor (820pFB)	1
C502,503,504 507,515,519	171-1033-06	Ceramic capacitor (0.01μFSR)	6
C534	171-1523-06	Ceramic capacitor (0.0015μFSR)	1

Ref. No.	Part No. (Order No.)	Description	Q'ty
C105,106,311 312,535,536	171-1533-06	Ceramic capacitor (0.015μFSR)	6
C205,309,310 511	171-2233-06	Ceramic capacitor (0.022μFSR)	4
C113,115	171-3323-06	Ceramic capacitor (0.0033μFSR)	2
C404,505,508	171-4733-06	Ceramic capacitor (0.047μFSR)	3
C307,308,524 532	171-6823-06	Ceramic capacitor (0.0068μFSR)	4
C111,112	171-6833-06	Ceramic capacitor (0.068μFSR)	2
C130	172-1042-20	Polyester capacitor (50V 0.1μF)	1
C122	173-1042-10	Polyester capacitor (50V 0.1μF)	1
C520	174-1007-13	Ceramic capacitor (10pFCH)	1
C528	174-2210-13	Ceramic capacitor (220pFCH)	1
C127	179-1073-22	Electrolytic capacitor (10V 100μF)	1
C131,132	179-1083-23	Electrolytic capacitor (10V 1000μF)	2
C124	179-1083-33	Electrolytic capacitor (16V 1000μF)	1
C121,123,125	179-4763-22	Electrolytic capacitor (10V 47μF)	3
C313	179-4773-33	Electrolytic capacitor (16V 470μF)	1
C523	181-1063-32	Electrolytic capacitor (16V 10μF)	1
C118,119,506	182-1053-62	Electrolytic capacitor (50V 1μF)	3
C101,102,521	182-1056-62	Electrolytic capacitor (50V 1μFNP)	3
C109,110,127 202,204,314	182-1073-22	Electrolytic capacitor (10V 100μF)	6
C518	182-2246-62	Electrolytic capacitor (50V 0.22μFNP)	1
C509,510	182-4753-52	Electrolytic capacitor (35V 4.7μF)	2
C529	182-4756-32	Electrolytic capacitor (16V 4.7μFNP)	1
C402	183-1043-62	Electrolytic capacitor (50V 0.1μF)	1
C103,104,303 304,517,522	183-1053-62	Electrolytic capacitor (50V 1μF)	6
C114,116,531	183-2243-62	Electrolytic capacitor (50V 0.22μF)	3
C201,203	183-2263-32	Electrolytic capacitor (16V 22μF)	2
C405,406,537	183-3363-22	Electrolytic capacitor (10V 33μF)	3
C516,530,533	183-4743-62	Electrolytic capacitor (50V 0.47μF)	3
C514,527	183-4753-52	Electrolytic capacitor (35V 4.7μF)	2
C305,306	183-4763-12	Electrolytic capacitor (6.3V47μF)	2

● 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.

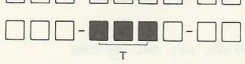
Film resistor (Carbon film resistor)



Classification	Resistance *	Tolerance of the value of resistance		Rated power			Shape	
		0		0			0	
	Example	1	± 5 %	1	⅛W	Approx. 3.7mm	1	Horizontal
	33Ω=330	2		2	¼Ws	Approx. 6.5mm	2	Vertical
1 1 1	33kΩ=333	3		3			3	
		4		4	½W	Approx. 9mm	4	
				7	⅙W	Approx. 3.5mm		
				8	½Ws	Approx. 6.6mm		
				9	¼Wss	Approx. 3.2mm		

(Example)

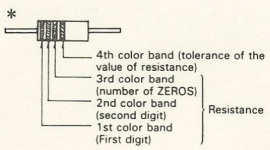
Film resistor ¼Ws 1kΩ ± 5 % Vertical



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).

Example of conversion of resistance T

Note) R : Resistance, T : Converted value

R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T
0.1 Ω	108	1.0 Ω	109	10 Ω	100	100 Ω	101	1.0 kΩ	102	10 kΩ	103	100 kΩ	104	1.0 MΩ	105	10 MΩ	106	100 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)