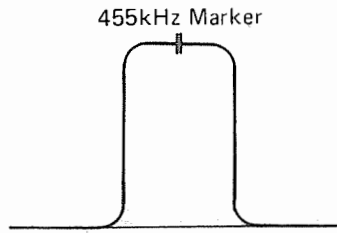


6. AM/FM MPX ALIGNMENT PROCEDURE

Step	Signal Source	Output Indicator	Set Signal to	Set Radio Dial to	Adjust-	Adjust for
1	Set function switch to MW and local-DX switch to DX.					
2	Sweep Gen. connected to TP5, (Fig. 6) & chassis placed nearest to TP5.	Sweep Gen. connected to TP4 (R418) & chassis placed nearest to TP4.	455 kHz	Quiet point on band	Adj 1	Fig. 10
3	Signal Gen. or Sweep Gen. connected to antenna terminal through dummy antenna. (Fig. 11)	VTVM or Sweep Gen. connected to TP4 & chassis placed nearest to TP4	515 kHz	515 kHz Turning knob fully counterclockwise	Adj 2	Maximum
4			1 650 kHz	1 650 kHz Turning knob fully clockwise	Adj 3	
5			1 400 kHz	1 400 kHz	Adj 4	
6	Repeat steps 2 through 5 if necessary to obtain maximum sensitivity.					
7	Set function switch to FM and local-DX switch to DX.					
8	Sweep Gen. connected to TP1 (Fig. 6) & chassis placed nearest TP1.	Sweep Gen. connected to TP2 (R324) & chassis placed nearest to TP2	10.7 MHz	Quiet point on band	Adj 5	Fig. 12
9					Adj 6	Fig. 13
10	Sig. Gen. or Sweep Gen. connected to antenna terminal through dummy antenna. (Fig. 14)	Sweep Gen. connected to TP2 & chassis placed nearest to TP2.	87.5 MHz	Turning knob fully counter-clockwise.	Adj 7	Maximum
11			106 MHz	106 MHz (Mark between 104 MHz & 108 MHz)	Adj 8 Adj 9	Maximum
12	Repeat steps 8 through 11 if necessary to obtain maximum sensitivity.					
13	Sig. Gen. connected to antenna terminal through dummy antenna (Fig. 14)	Frequency counter connected to TP3 & chassis placed nearest to TP3.	98 MHz	98 MHz	Adj 10	Frequency 19.05 kHz \pm 20 Hz
14	Sig. (stereo signal) connected to antenna terminal through dummy antenna.	VTVM & oscilloscope connected to output.	98 MHz	98 MHz	Adj 10	Separation Maximum



Adjust to obtain the maximum waveform with a flat top. The marker is not always centered.

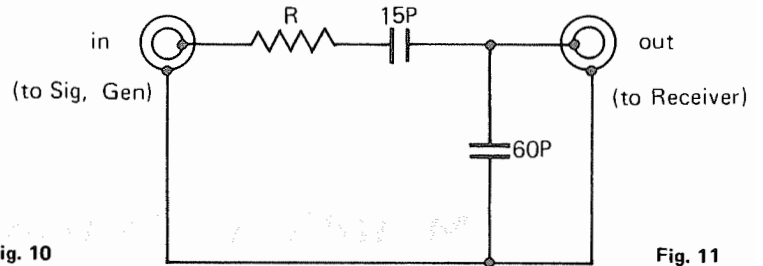


Fig. 10

Fig. 11

Dummy Ant.

$$R = (80 - \text{Generator Impedance}) \Omega$$

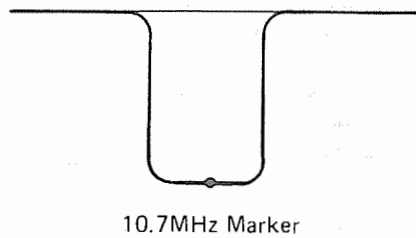


Fig. 12

Turn the orange color core clockwise to maximum and adjust the black color core to obtain a maximum waveform. Note that the 10.7 MHz Marker is not always centered because of the ceramic filter used.

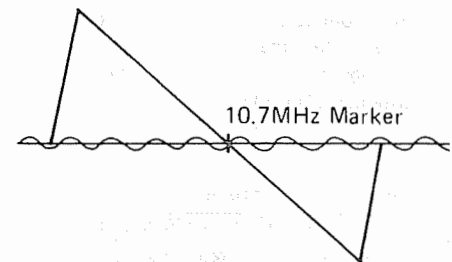


Fig. 13

Turn the black color core to obtain a maximum waveform and the orange color core to minimize noise. Repeat these two operations if necessary to obtain symmetry.

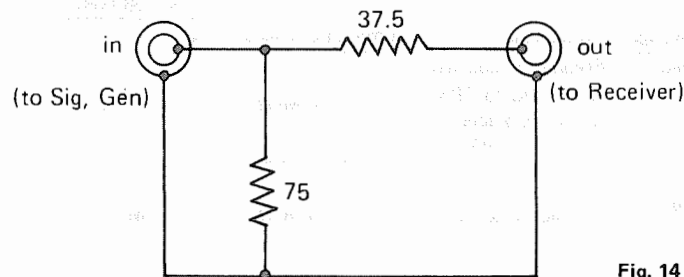


Fig. 14

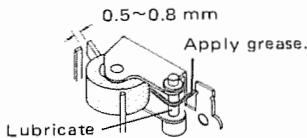
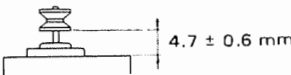
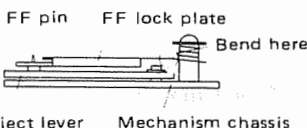

A) Adjusted sections (Symbol: Adj)
Adj 1 – Adj 13

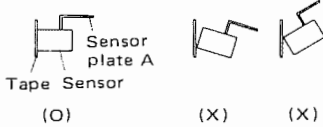
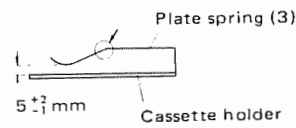
B) Testing points (Symbol: TP)
TP 1 – TP 11

8. TROUBLESHOOTING

Sankyo SCS-222

8.1 Tape section

Symptom	Cause	Correction
<ul style="list-style-type: none"> ● Tape doesn't rotate. ● Motor doesn't rotate. ● Motor rotates, (but tape does not rotate.) 	<ol style="list-style-type: none"> 1. Switch S3 2. Power fuse 1. Slippage of a soiled belt (19) (20) and pinch roller (21). 2. Belt (19) (20) disengaged. 3. Motor pulley unsoldered. 4. Lack of pinch roller pressure due to defect in pinch roller arm. 5. Lack of pinch roller pressure due to poorly positioned head plate (2). 6. Cassette tape defective. 	<p>Replace. Replace. Clean.</p> <p>Reengage Resolder</p>  <ul style="list-style-type: none"> ● Adjust sag of head leads. ● Wire amp leads freely from head plate (2). <p>Replace.</p>
Tape speed is too fast	<ol style="list-style-type: none"> 1. Defect of pinch roller arm. 2. Lack of pinch roller pressure due to poorly positioned head plate (2). 3. Motor defective 	<p>Same as 4 in "Motor rotates." Same as 5 in "Motor rotates."</p> <ul style="list-style-type: none"> ● Replace. ● Motor pulley change. <ol style="list-style-type: none"> i) Unsolder motor pulley. ii) Unsolder adjusting pulley. *  <p>* Use screw bond "Super 5M".</p>
Fast forward is impossible.	<ol style="list-style-type: none"> 1. FF plate can not be locked. 2. Slippage of soiled fly wheel (16) and reel disc. 3. Lack of reel disc (22) friction torque 4. Motor defective. 5. Cassette tape defective. 	<ul style="list-style-type: none"> ● FF lock plate is not horizontal.  <ul style="list-style-type: none"> ● Bend FF lock plate downward as indicated.  <p>Clean.</p> <p>Replace. Replace. Replace.</p>
Excessive wow and flutter	<ol style="list-style-type: none"> 1. Slippage of belt, flywheel, capstan. 2. Expansion of belt (19) (20). 3. Excessive or lack of take up torque 4. Lack of pinch roller pressure 5. Defect of flywheel (16). 6. Motor defective. 7. Cassette tape defective. 	<p>Clean. Replace. Replace reel disc (22). See "4 in Motor rotates". Replace. Replace. Replace.</p>

Symptom	Cause	Correction
Mechanical noise	1. Pinch roller and capstan bearing wanting lubrication. 2. Motor defective 3. Reel disc defective	Lubricate. Replace. Replace.
Auto stop mechanism inoperable.	Cassette sensor position defective.	Adjust so that the sensor is in complete contact with the tape face. 
Head plate return defective.	1. Eject lever bend defective. 2. Head plate bend defective 3. Head roller does not turn.	Replace. Replace. • Replace. • Lubricate head roller.
Cassette can't be loaded normally.	1. Cassette holder plate spring (3) poorly positioned. 2. Cassette sensor excessively enters into the cassette holder. 3. Cassette tape defective.	Adjust at the place indicated by the arrow.  Adjust cassette sensor. Replace.
Cassette can't be ejected normally.	1. Door () deformed. 2. Cassette holder plate spring (3) poorly positioned. 3. Cassette tape defective.	Repair. Same as 1 in "Cassette can't be loaded normally." Replace.
Tape lamp does not light.	1. Lead wires to lamp are broken. 2. Auto stop switch defective. 3. Warning P.C.B. defective.	Check. Adjust or replace. Check.
Tape lamp does not light at tape end.	1. Auto stop switch defective. 2. Warning P.C.B. defective.	Check. Check.

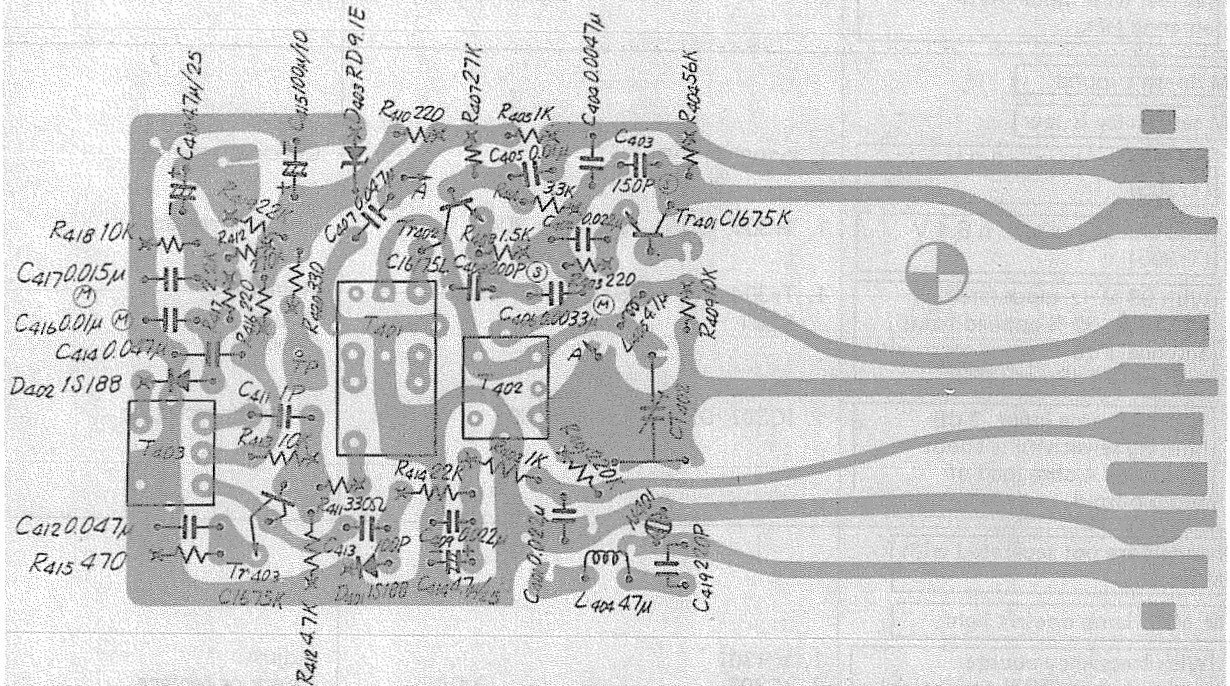
8.2 Amplifier section

Symptom	Cause	Correction
Lack of sound volume and/or distortion of sound.	1. Head is dirty or damaged. 2. Head position is improper. 3. R107 (207) or 105 (205) is defective. 4. Preamp. or power amp. is defective.	Clean or replace. Adjust. Replace. Check or replace.
High notes are lost.	1. Head is dirty or damaged. 2. Head position is improper. 3. R106 (206) or C107 (207) is defective.	Clean or replace. Adjust. Check and replace.

8.3 Radio section

Symptom	Cause	Correction
<p>No sound</p> <ul style="list-style-type: none"> Tape works normally Dial scale lamp lights Output at (A) and (B) are normal with input from antenna jack. 	<p>1. Switch S5 (S1)</p> <p>1. Switch S6 (S302)</p> <p>1. Switch S302, S303 Lead ①, ② disconnected.</p>	<p>Check or replace.</p> <p>Check or replace.</p> <p>Check or replace.</p>
<p>FM doesn't sound</p> <p>FM sensitivity is low</p> <ul style="list-style-type: none"> Q40 base voltage is 9.0 V (Tr305) Q40 emitter voltage is 8.4 V (Tr305) With 98 MHz modulated by 400 Hz at 30 % applied from antenna 3 dB limiting sensitivity is about 20 dBμ at (TP2). With the same input, 3 dB limiting sensitivity is about 20 dBμ at 4 ohm load of audio output. 	<p>1. D302, Tr305</p> <p>1. Tr305, IC301, IC302, Tr 304</p> <p>1. Tr304, F301, F302, T302, SW301, R301</p> <p>1. IC302, D304, 305, 306, 307</p>	<p>Check or replace.</p> <p>Check or replace.</p> <p>Replace. Adjust. Check.</p> <p>Check or replace.</p>
<p>Channels are not separated with FM stereo.</p> <p>FM MPX lamp doesn't light.</p> <ul style="list-style-type: none"> With frequency counter connected at (TP3) oscillation frequency is 19.05 kHz ± 20 Hz. With 98 MHz modulated by 19 kHz at 10 % applied and when 20 dBμ input is applied to the above-mentioned signal, the MPX lamp does not light. 	<p>1. VR301</p> <p>2. IC302</p> <p>1. T302, IC302</p> <p>2. Lead wire to stereo lamp is broken.</p>	<p>Adjust. Check or replace.</p> <p>Check or replace. Replace.</p>
<p>MW doesn't produce sound.</p> <p>MW sensitivity is low.</p> <ul style="list-style-type: none"> Voltage at Tr401 base is 0.7 V. When 455 kHz modulated by 400 Hz at 30 % applied through 0.01 μF to (M1) from SG, output is normal at (TP4). With same input, output (A) (B) are normal. Output and frequency of local oscillation are normal across lead (flexible lead). With 1 000 kHz modulated by 400 Hz at 30 % applied from antenna socket, output is normal. 	<p>1. Tr401, D403</p> <p>1. Tr402, Tr403, T401</p> <p>1. D304, 305, 306, 307</p> <p>1. Lead (flexible lead ③, ④ disconnected.</p> <p>2. T402, L402</p> <p>1. Lead ⑤, ⑥, ⑦, ⑧ and/or (flexible lead) disconnected.</p> <p>2. SW301</p>	<p>Check or replace.</p> <p>Check & replace.</p> <p>Check & replace.</p> <p>Connect. Check & replace.</p> <p>Connect.</p> <p>Check or replace.</p>

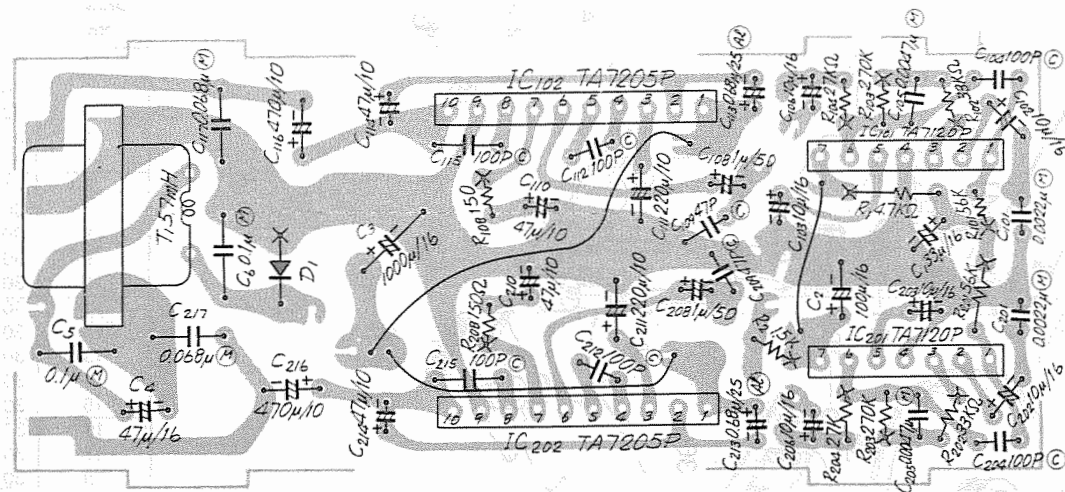
9.6 AM circuit board mounting diagram



Note: 1. A~A is a jumper wire (brown)

2. R₄₁₈ should be mounted by bending the SR resistor
3. Leads should be soldered cut to less than 2mm after being soldered.
4. Test points should extend between 4~8mm.
5. Parts should be mounted less than 2mm above the board
6. C₄₁₈ should be soldered onto the P. board.

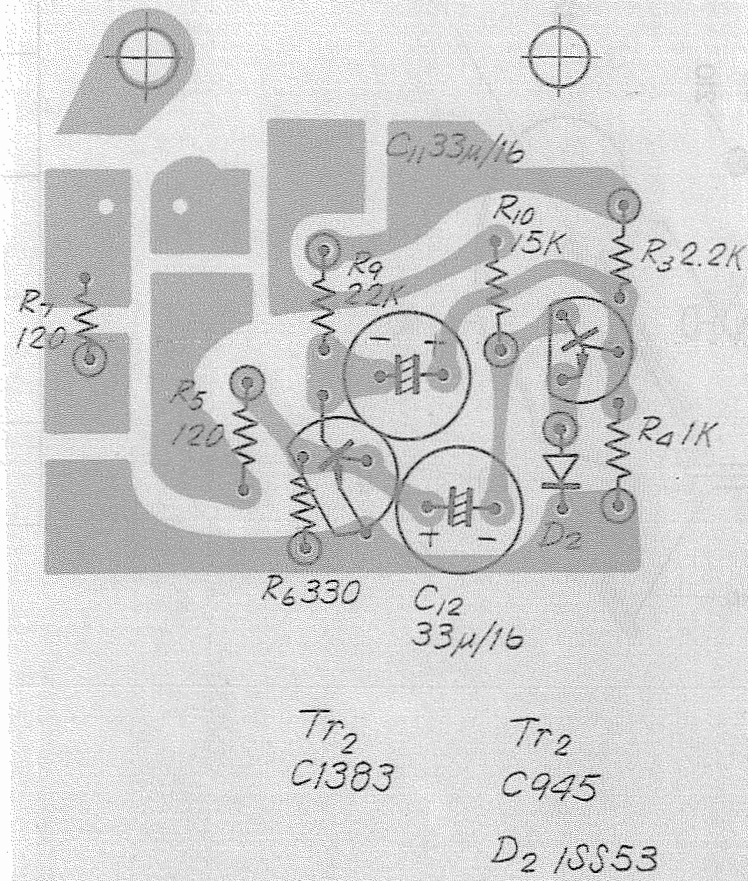
Amplifier circuit board mounting diagram



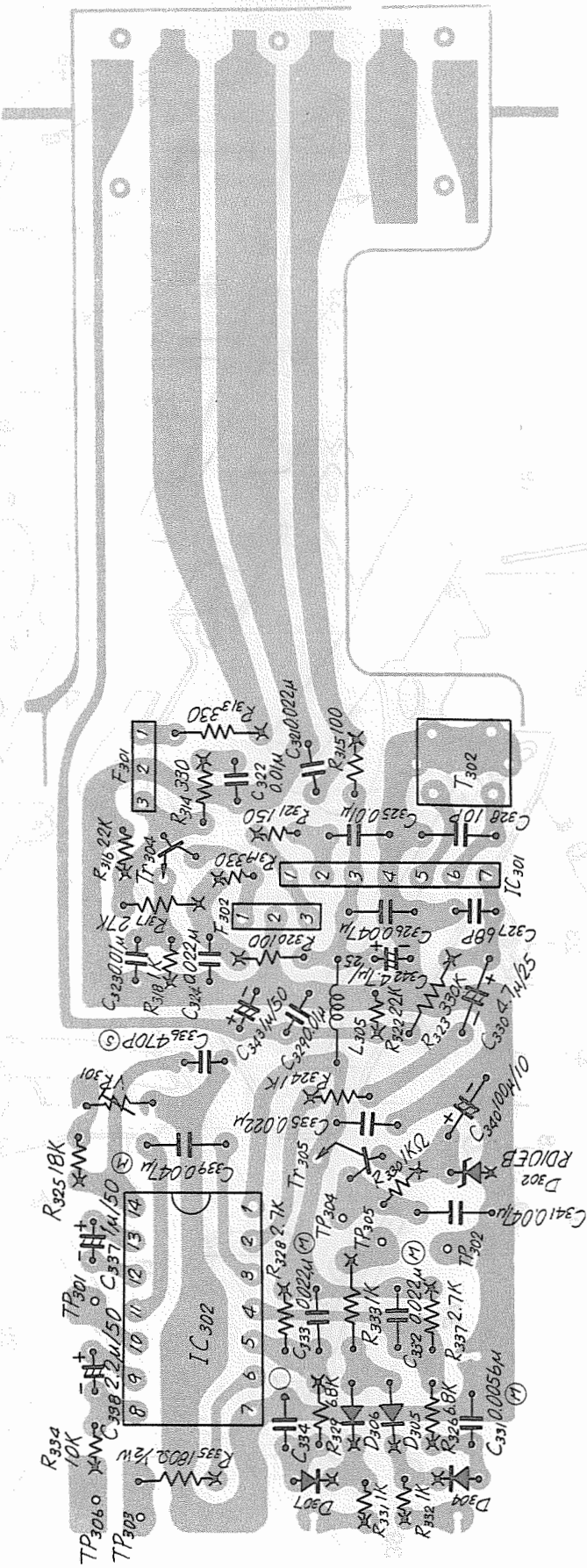
Note:

1. X indicates the resistor itself.
2. Capacitor marks: M: Mylar C: Ceramic Al: Aluminium solid.
3. C116, C216 should be soldered onto the P. board.
4. Parts should be mounted less than 2mm above the board.

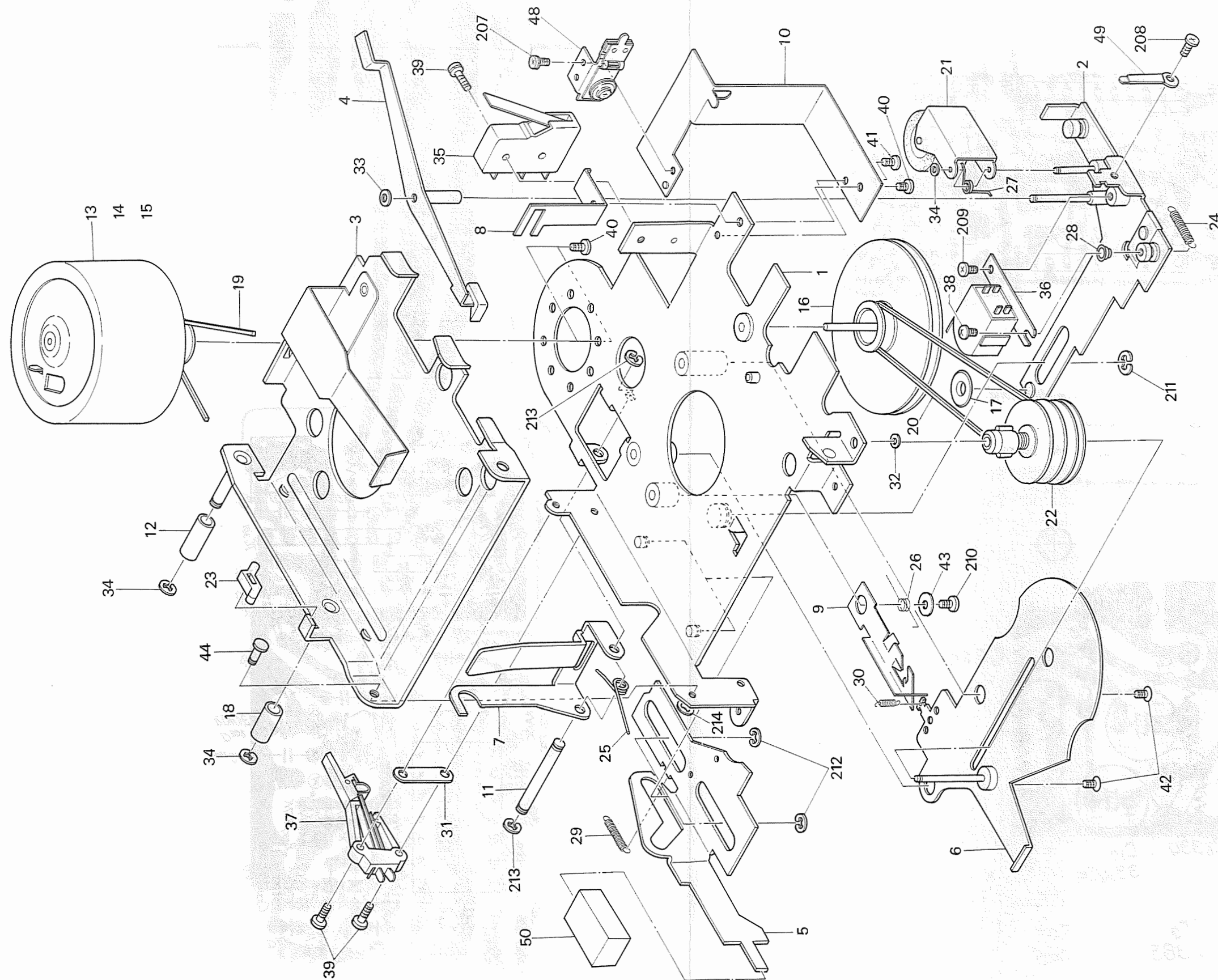
9.8 Auto-stop warning circuit board mounting diagram



FM circuit board mounting diagram



Sankyo SCS-222



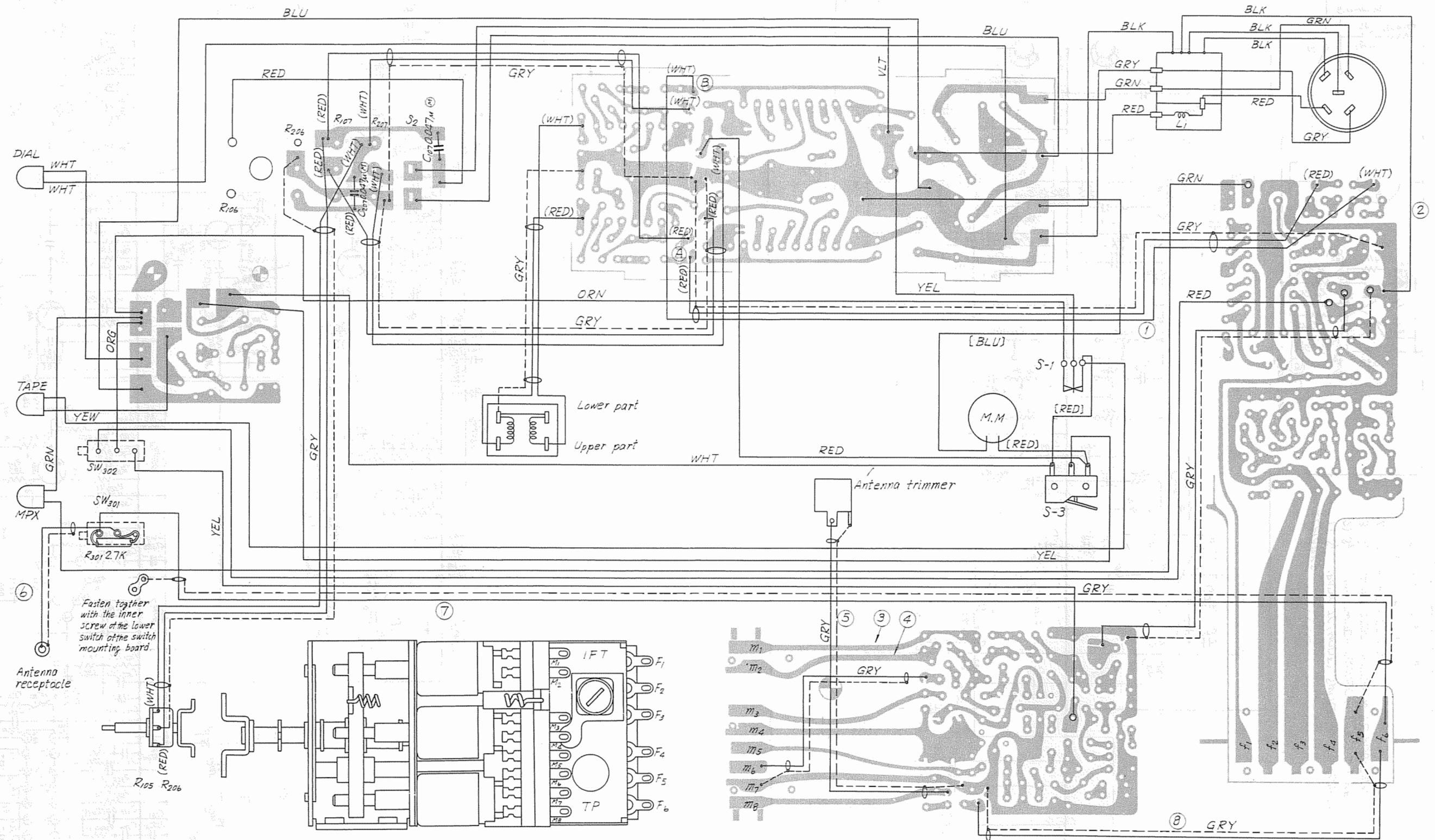
Drawing No.	Part No.
1	307-003H
2	307-010
3	307-147
4	307-020
5	307-126
6	307-109B
7	307-026M
8	307-028
9	307-030B
10	307-136
11	307-031W
12	307-194
13	307-034A
14	307-034B
15	307-034C
16	307-035
17	307-144
18	307-033W
19	307-148
20	307-148B
21	307-038
22	307-039
23	307-071
24	307-042W
25	307-044
26	307-045
27	307-046
28	307-047
29	307-125
30	307-055
31	307-153
32	307-100
33	307-101
34	307-102
35	307-105
36	307-106
37	307-108
38	307-301
39	307-302
40	307-303
41	307-304
42	307-305
43	307-306
44	307-192
48	KGE 30092
49	KGE 0356
50	KGE 99150
207	19034
208	14536
209	14380
210	14572
211	22147
212	22140
213	22136

11. MECHANICAL PARTS LIST

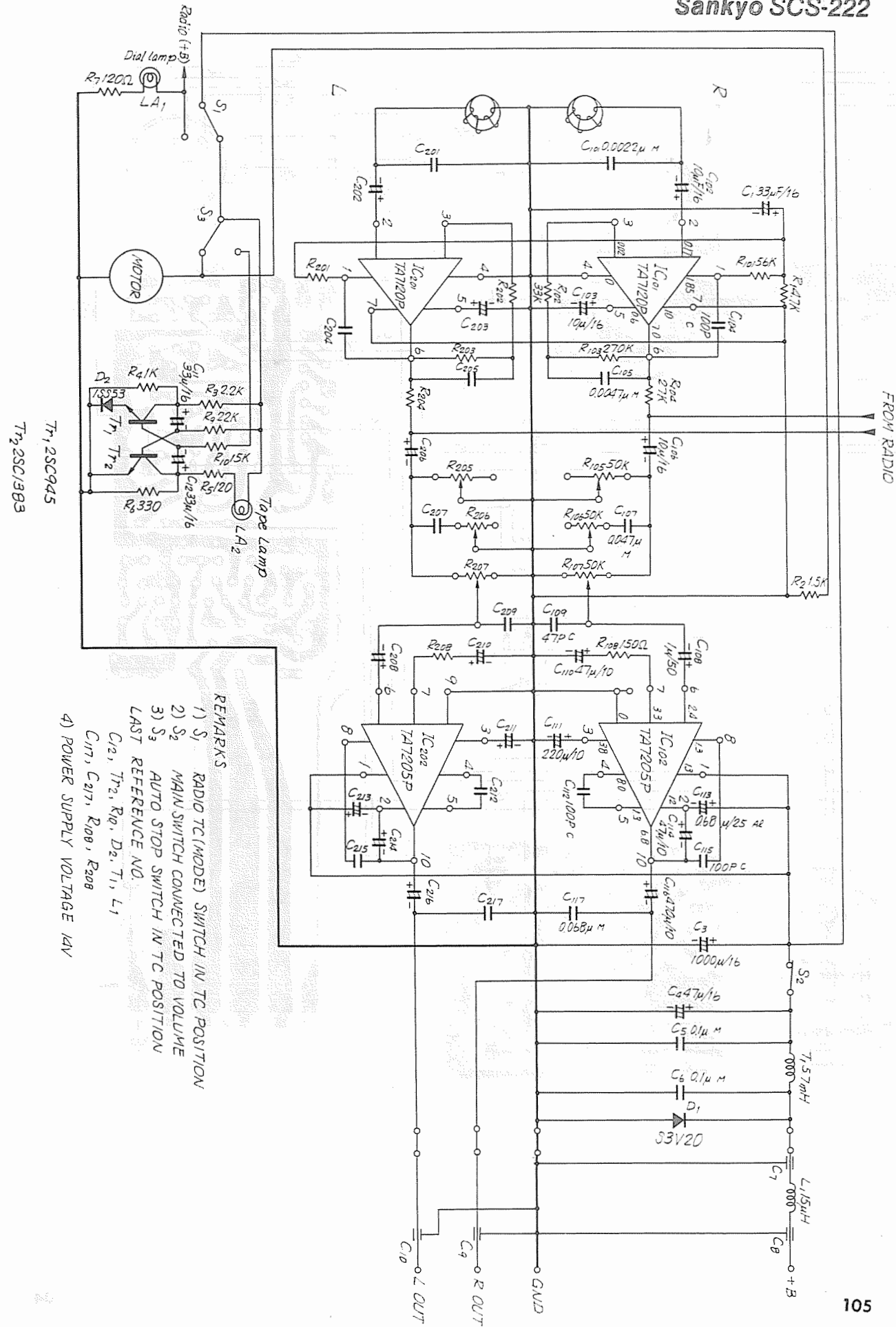
Drawing No.	Part No.	Part Name	Q'ty	Remarks
49	KGE 0356	Wire clamp	3	
109	KGE 0357	"	1	
81	KGE 011399	Mounting plate ass'y A	1	
100	KGE 011401	Pulley bracket ass'y	1	
102	KGE 011402	Mounting plate ass'y C	1	
92	KGE 011440	FM/IF base ass'y	1	
95	KGE 011441	MW base ass'y	1	
59	KGE 011564	Filter case ass'y	1	
89	KGE 011731	Mechanical unit	1	
88	KGE 011872	5P socket ass'y	1	
66	KGE 011904	String ass'y	1	
65	KGE 011905	Pulley mounting plate ass'y	1	
101	KGE 011906	Mounting plate ass'y B	1	
54	KGE 011909	Auto stop base ass'y	1	
77	KGE 012160	AU amp. ass'y	1	
53	KGE 012286	Upper case ass'y	1	
87	KGE 012437	Nose piece ass'y	1	
1	307-003H	Mech. chassis ass'y	1	
2	307-010	Head chassis ass'y	1	
4	307-020	Auto stop ass'y	1	
7	307-026M	Lock plate M	1	
8	307-028	Stopper plate	1	
9	307-030B	Stopper plate F.F.	1	
11	307-031W	Locker stud W	1	
18	307-033W	Roller	1	φ 4.3
13	307-034A	Motor pulley ass'y A	0 ~ 1	φ 11 (For standard)
14	307-034B	" B	0 ~ 1	φ 10.95 (For adjusting)
15	307-034C	" C	0 ~ 1	φ 11.05 (For adjusting)
16	307-035	Flywheel	1	
21	307-038	Pinch roller ass'y	1	
22	307-039	Reel crutch ass'y	1	
24	307-042W	Head chassis spring	1	
25	307-044	Lock spring	1	
26	307-045	F.F. lock spring	1	
27	307-046	Pinch roller spring	1	
28	307-047	Azimuth spring	1	
30	307-055	Case spring	1	
23	307-071	Plastic holder	1	
32	307-100	Teflon washer	1	φ 1.2
33	307-101	"	1	φ 1.7
34	307-102	"	3	φ 2
35	307-105	Micro switch	1	
36	307-106	Cassette head	1	
37	307-108	Power switch	1	
6	307-109B	Flywheel support ass'y	1	
29	307-125	Eject spring B	1	
5	307-126	Eject lever ass'y	1	
10	307-136	Antenna plate	1	
17	307-144	Head roller	1	φ 10
3	307-147	Cassette chassis ass'y	1	
19	307-148	Drive belt	1	
20	307-148B	Crutch belt	1	
31	307-153	Switch plate	1	
44	307-192	Left pin	1	
12	307-194	Roller S	1	
38	307-301	Mushroom head screw	1	M2 x 8

Drawing No.	Part No.	Part Name	Q'ty	Remarks
39	307-302	⊕ P.H.N.S. with spring washer	3	M2 x 8
40	307-303	Bind screw	3	M2.6 x 3.5
41	307-304	"	1	M2.6 x 5
42	307-305	Flat screw	2	M2.6 x 5
43	307-306	Washer	1	φ 3
61	KGE 3505	Wire holder	1	
52	KGE 13841	FCC label	1	
56	KGE 13850	Cushion	1	
93	KGE 19002	"	1	
79	KGE 20608	Tri-shaft volume	1	
97	KGE 20640	Tuning shaft with VR	1	
48	KGE 30092	Trimmer condenser	1	
62	KGE 42488	Push switch	2	
70	KGE 49249	Lamp (For MPX)	1	
69	KGE 49250	" (For Tape)	1	
94	KGE 49273	Tuner	1	
98	KGE 49299	Antenna holder	1	
72	KGE 49334	Lamp (For Dial)	1	
90	KGE 50737	Cover plate	1	
71	KGE 95643	Lamp holder	1	
96	KGE 95653	Joint slider	1	
78	KGE 98168	Heatsink	1	
63	KGE 98194	Push button	2	
58	KGE 98197	Filter cover	2	
57	KGE 98198	Filter clumper	1	
80	KGE 98259	Volume basse plate	1	
99	KGE 98572	Separator	1	
60	KGE 98662	Shield plate	1	
76	KGE 98867	"	1	
106	KGE 98977	Nut	4	
105	KGE 98978	Washer	6	
67	KGE 99013	Indicator	1	
86	KGE 99028	Volume holder	2	
84	KGC 99067	Front panel A	1	
85	KGD 99068	" B	1	
83	KGD 99071	Gasket	1	
108	KGD 99069	Inner knob	2	
107	KGD 99070	Outer knob	2	
51	KGE 99130	Model name plate	1	
103	KGC 99136	Bottom case	1	
91	KGD 99138	Front chassis	1	
104	KGD 99139	Bottom plate	1	
64	KGD 99140	Switch mounting plate	1	
82	KGE 99141	Side bracket	2	
55	KGE 99142	Auto stop base mounting plate	1	
68	KGE 99143	Lamp holder	1	
73	KGE 99147	Indicator guide	1	
74	KGE 99148	Back plate	1	
50	KGE 99150	Eject button	1	
75	KGE 99151	Dial plate	1	
203	14250	⊕ P.H.M.S.	4	M2 x 3
205	14255	"	3	M2.6 x 4
209	14380	"	1	M2 x 6
208	14536	"	1	M2.6 x 3
210	14572	"	1	M3 x 4
206	19012	⊕ P.H.N.S. with spring washer	4	M2.6 x 8

9.4 Wiring diagram

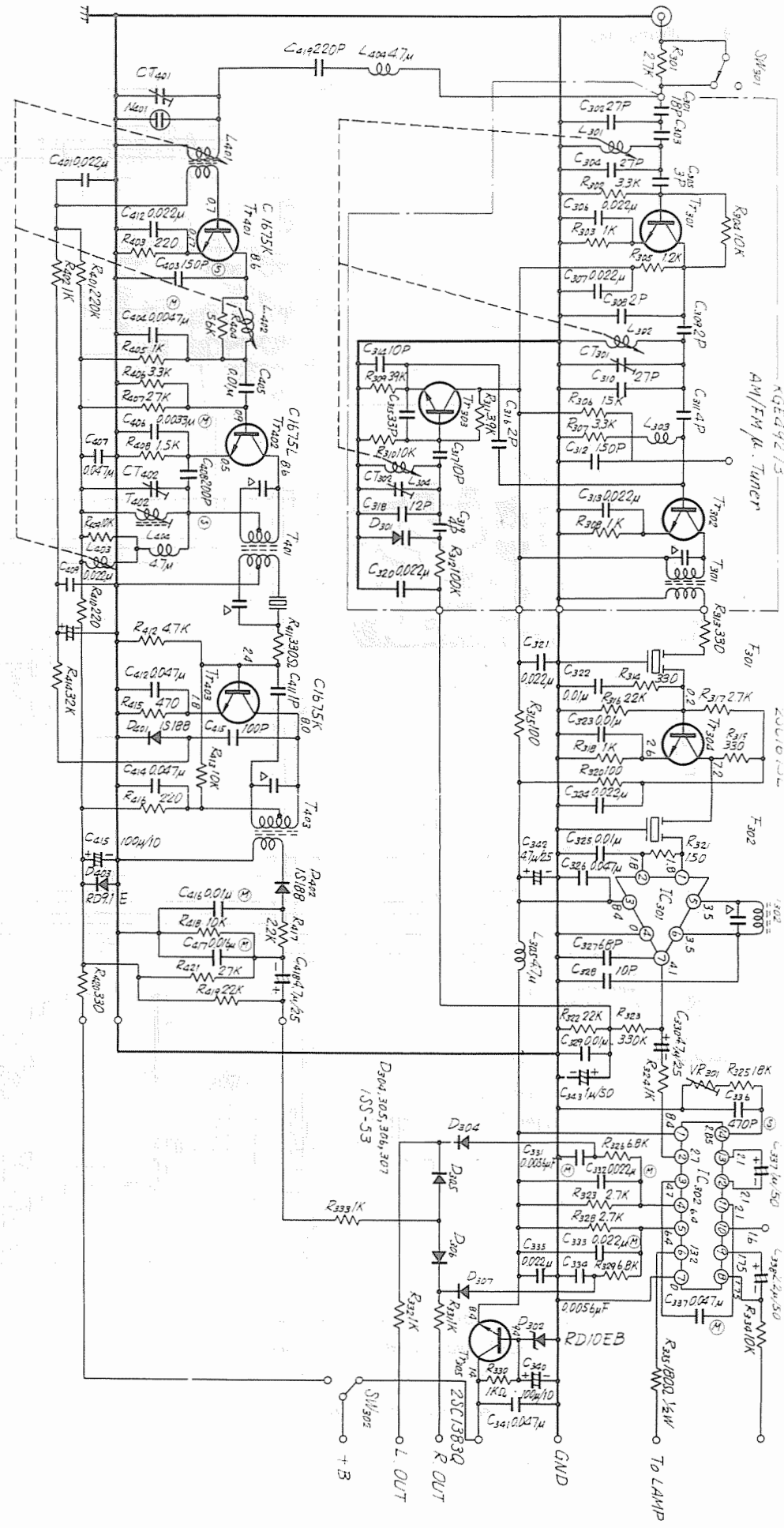


Sankyo SCS-222



REMARKS

- 1) SW301 LOC-DX CHANGE SWITCH IN DX POSITION
- 2) SW302 FM-MW CHANGE SWITCH IN FM POSITION
- 3) CAPACITORS MARKED WITH Δ ARE INCLUDED IN TRANSFORMER
- 4) M MYLAR CAPACITOR
- 5) LAST REFERENCE NO R335 R421 C343 C419
- 6) POWER SUPPLY VOLTAGE 14V



9.3 Electrical parts list

Amplifier section

Ref. No	Part No.	Description	Remarks	Q'ty
IC101, 201	KGE 46441	IC	TA7120P	2
IC102, 202	KGE 46259	IC	TA7205P	2
C1	KGE 46435	Diode	S3V20	1
D2	KGE 46465	"	1SS53	1
Tr1	KGE 46147	Transistor	2SC945 (K)	1
Tr2	KGE 41414	"	2SC1383	1
T1	KGE 47120	Chock Coil	5.7 mH	1
L1	KGE 47053	Inductor	15 mH	1
LA1	KGE 49334	Lamp	(Dial Lamp)	1
LA2	KGE49250	"	(Tape Lamp)	1
S1	307 - 108	Power Switch		1
S2			Included in KGE20608	
S3	307 - 105	Micro Switch		1
C1, 11, 12	KGE 34771	Electrolytic	33 μ F/16	3
C2	KGE 34773	"	100 μ F/16	1
C3	KGE 34777	"	1000 μ F/16	1
C4	KGE 34772	"	47 μ F/16	1
C5, 6	KGE 31148	Mylar	0.1 μ F/50	2
C7, 8, 9, 10	KGE 35474	Feed-thru Cap.	1000 PF/50	4
C101, 201	KGE 10125	Mylar	0.0022 μ F/50	2
C102, 103	KGE 34769	Electrolytic	10 μ F/16	6
106, 202				
203, 206				
C104, 112	KGE 33401	Ceramic	100 pF/50	6
115, 204				
212, 215				
C105, 205	KGE10559	Mylar	0.0047 μ F/50	2
C107, 207	KGE 10577	"	0.047 μ F/50	2
C108, 208	KGE 34800	Electrolytic	1 μ F/50	2
C109, 209	KGE 33393	Ceramic	47 pF/50	2
C110, 114	KGE 34762	Electrolytic	47 μ F/10	4
210, 214				
C111, 211	KGE 34764	Electrolytic	220 μ F/10	2
C113, 213	KGE 33722	Aluminium Fixed	0.68 μ F/25	2
C116, 216	KGE 34813	Electrolytic	470 μ F/10	2
C117, 217	KGE 3243	Mylar	0.068 μ F/50	2
R1	KGE 10146	Carbon	4.7 k Ω RD1/4UR	1
R2	KGE 11260	"	1.5 k Ω "	1
R3	KGE 5066	"	2.2 k Ω "	1
R4	KGE 11258	"	1 k Ω "	1
R5	KGE 26174	"	120 Ω RD1/2SR	1
R6	KGE 3226	"	330 Ω RD1/4UR	1
R7	KGE 26174	"	120 Ω RD1/2SR	1
R9	KGE 5068	"	22 k Ω RD1/4UR	1
R10	KGE 2532	"	15 k Ω "	1
R101, 201	KGE 10149	"	56 k Ω RD1/4UR	2
R102, 202	KGE 6265	"	33 k Ω "	2
R103, 203	KGE 21131	"	270 k Ω "	2
R104	KGE 5067	"	27 k Ω "	1
R105, 205	KGE 20640	Variable Resistor	50 k Ω	1
R106, 107	KGE 20608	"	50 k Ω	1
206, 207				
R108, 208	KGE 10141	"	150 Ω RD1/4UR	2

Tuner section

Ref. No	Part No.	Description	Remarks	Q'ty
Tr304	KGE 46338	Transistor	2SC1675L	1
Tr305	KGE 41414	"	2SC1383Q	1
Tr401, 403	KGE 46339	"	2SC1675K	2
Tr402	KGE 46338	"	2SC1675L	1
IC301	KGE 46442	IC	TA7130P	1
IC302	KGE 46278	"	SN76115N	1
D301			Included in KGE49273	
D302	KGE 46297	Diode	RD10EB	1
D304, 305	KGE 46465	"	1SS-53	4
D401, 402	KGE 41959	Diode	1S188FM-1	2
D403	KGE 46296	"	RD9.1EB	1
N401	KGE 49220	Neon Lamp	NE-38	1
T301			Included in KGE49273	
T302	KGE 47080	FM. I.F.T	119 ACS-13107Z	1
T401	KGE 40677	MW, Ceramic Filter	CFZ-455C	1
T402	KGE 40951	MW, Oscillator Trans	7BR-3104N	1
T403	KGE 47040	MW, I.F.T	159GC-1009	1
L301 – 304			Included in KGE49273	
L401 – 403			"	
CT301, 302			"	
L305, 404, 405	KGE 40080	Micro Inductor	4.7 μ H	3
CT401	KGE 30092	Trimmer	68 pF	1
CT402	KGE 30069	"	65 pF	1
F301, 302	KGE 47032	FM, Ceramic Filter	SFE 10.7MA5Z (A.B)	2
VR301	KGE 20191	Semi Variable Resistor	6.8 k Ω (B)	1
C301 – 320			Included in KGE49273	
C321, 324, 335	KGE 33564	Ceramic	0.022 μ F/50	3
C322, 323	KGE 33563	Ceramic	0.01 μ F/50	4
C325, 329				
C326, 341	KGE 33565	Ceramic	0.047 μ F/50	2
C327	KGE 33462	"	68 pF/50	1
C328	KGE 33442	"	10 pF/50	1
C330, 342	KGE 34779	Electrolytic	4.7 μ F/25	2
C331, 334	KGE 3118	Mylar	0.0056 μ F/50	2
C332, 333	KGE 3224		0.022 μ F/50	2
C336	KGE 34641	Polystyrene	470 pF/50	1
C337, 343	KGE 34800	Electrolytic	1 μ F/50	2
C338	KGE 34801	"	2.2 μ F/50	1
C339	KGE 10577	Mylar	0.047 μ F/50	1
C340	KGE 34763	Electrolytic	100 μ F/10	1
C401, 402, 409	KGE 33564	Ceramic	0.022 μ F/50	3
C403	KGE 34629	Polystyrene	150 pF/50	1
C404	KGE 10559	Mylar	0.0047 μ F/50	1
C405	KGE 33563	Ceramic	0.01 μ F/50	1
C406	KGE 5071	Mylar	0.0033 μ F/50	1
C407, 412, 414	KGE 33565	Ceramic	0.047 μ F/50	3
C408	KGE 34632	Polystyrene	200 pF/50	1
C410, 418	KGE 34779	Electrolytic	4.7 μ F/25	2
C411	KGE 33367	Ceramic	1 pF \pm 0.25 pF	1
C413	KGE 33401	"	100 pF \pm 5 %	1
C415	KGE 34763	Electrolytic	100 μ F/10	1
C416	KGE 1181	Mylar	0.01 μ F/50	1
C417	KGE 3223	"	0.015 μ F/50	1
C419	KGE 33409	Ceramic	220 pF \pm 5 %	1