

Pages 15-28 Courtesy of AUTOMATIC RADIO MFG. CO., INC.

SERVICE NOTES

1. Make certain the power lead is connected properly to power source, otherwise damage to radio may result. If a battery eliminator is used as a power source in place of a battery, it must be filtered and regulated (A power supply capacity should be more than 2 amps.)
2. Integrated circuits (IC) are used in this unit. Because the ICs are direct-coupled devices, voltage readings at the element normally indicate stage performance. As to all electronic equipments, reading within 10% of the indicated values are acceptable. Allowance must also be made for variations in supply voltage. It is expected that any breakdown within the IC results in drastic changes of the operating voltages at the terminals.
3. When replacing a power output IC, remember to use the IC specified in the parts list; Coat both side of the IC insulator with silicon grease and securely tighten the IC mounting screw.

WARNING

In using meters, signal generators and any tools in servicing IC's, extreme care is needed. DO NOT SHORT THE IC TERMINALS TO THE PC BOARD OR TO EACH OTHER. THE IC WILL BE INSTANTANEOUSLY DESTROYED.

ALIGNMENT PROCEDURE

Alignment is performed at factory with laboratory equipment. Therefore before alignment is attempted, the unit should be thoroughly checked for circuit troubles.

NOTES

1. Check for specified source voltage —DC, 14.4 Volts—
2. Connect an AC voltmeter (VTVM) across speaker or dummy load (8 ohms, 10W, wirewound resistor)...See fig. 11
3. Signal input must be kept as low as possible to avoid overload and clipping (use highest possible sensitivity of output indicator)
5. Non-metallic alignment tools must be used (especially at FM alignment)
6. Alignment location details; See fig. 15, 18, 19.

AM IF & RF ALIGNMENT USING AM SIGNAL GENERATOR

Set the radio for AM reception. AM signal generator should be coupled with antenna receptacle (J1) through dummy (See fig. 10)

Set volume control to maximum and tone to treble.

Attenuate signal generator output to maintain 0.5 watts (2.0 volts across 8 ohms load) on AC volt meter.

STEP	GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT INDICATOR	ADJUST	REMARKS
1	455KHz 400Hz, 30% mod.	Around 1000KHz of non-interference.	AC VTVM across voice coil (L or R) or 8 ohms load.	T105 T106	Adjust for maximum.
2	1630KHz	High frequency end stop.	"	C151	"
3	1400KHz	Tune to signal	"	C144 C2	"
4	600KHz	"	"	L103	Adjust L103 for maximum output in rotating radio dial slightly back and forth.
5	Repeat Steps 2, 3 and 4 until no further increase. Step 3 should be last step.				

With radio installed in car and antenna extended to desired height, tune in a weak station around 1400KHz and adjust antenna trimmer (C2) for maximum output.

FM IF ALIGNMENT USING FM SWEEP GENERATOR

Set the radio for FM reception. High side of sweep generator through 0.01 mfd. to test point Δ low side to ground
Use only enough marker signal for indication. Set volume control to minimum and tone to treble.

STEP	GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT INDICATOR	ADJUST	REMARKS
1	10.7MHz (sweep)	Point of non-interference	Vert. amp of scope to point Δ low side to ground.	T104 (PURPLE)	Adjust T104 to obtain symmetry of response similar to fig. 3 or 4 or 5 according to the colour of Ceramic filter used.
2	"	"	"	T103 T102 T101	Adjust T103, T102 T101 and for maximum amplitude and straightness of line.
3	Repeat above steps 1 and 2 two or three times.				

NOTE:

1. FM SWEEP GENERATOR should be definitely required for FM IF alignment, because ceramic filters are used in IF circuit. Five kinds of ceramic filters are used and they are different in their center frequencies as shown below:
RED: 10.7MHz, BLUE: 10.67MHz, ORANGE: 10.73MHz, BLACK: 10.64MHz, WHITE: 10.76MHz.
2. If the ceramic filters except RED are used, 10.7MHz marker will not appear at the center of "S" curve (See fig. 4 or 5) In these cases, disregard 10.7MHz marker.
3. The colour of ceramic filters used is different according to the production lots, but, the same colour-dotted ceramic filters should be replaced as one pair on the individual units.
4. Be carefull of static coupling between output lead of sweep generator and input lead of scope. The leads must be as short as possible and carefully shielded.

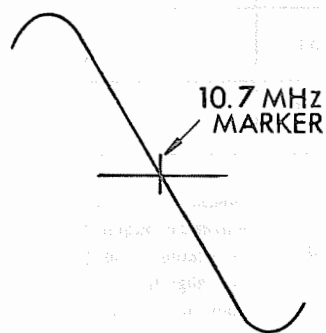


Fig. 3
RED

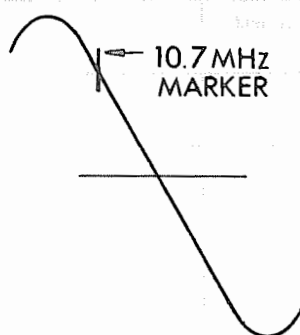


Fig. 4
(WHITE, ORANGE)

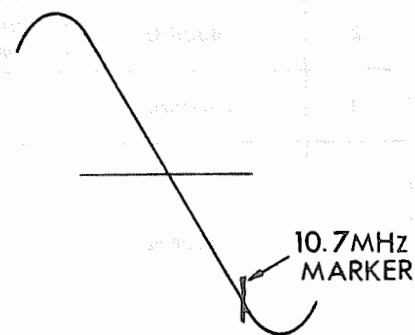


Fig. 5
(BLACK or BLUE)

FM RF ALIGNMENT USING FM SIGNAL GENERATOR

Set the radio for FM reception. Connect FM signal generator with antenna receptacle (J1) through FM dummy antenna. FM S.G. output level; 5-10 microvolts. Set volume control to 0.5 watts output (2.0 volts at 8 ohms load) and tone to treble.

STEP	GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT INDICATOR	ADJUST	REMAKS
1	87MHz (400Hz 22.5KHz dev)	Low frequency end stop	Output meter across 8 ohms load.	C118 (OSC)	Adjust for maximum.
2	88MHz (400Hz, 22.5KHz dev)	Tune for Signal	"	C103(ANT) C109(RF)	"



MULTIPLEX ALIGNMENT USING FM SIGNAL GENERATOR MODULATED BY FM STEREO SIGNAL GENERATOR.

FM signal generator should be modulated by FM STERFO signal generator.

Modulation level : 19KHz.....10%(7.5KHz dev)
1000Hz.....30%(22.5KHz dev)

FM signal generator output level; 1mV, frequency: 98MHz

Set the radio for FM reception and tune to signal. Adjust volume control to provide 0.5 watts(2.0 volts across 8 ohms load) on AC VTVM and tone to treble. Set balance control for equal at each channel.

STEP	MODULATION FREQUENCY	OUTPUT INDICATOR	ADJUST	REMARKS
1	19KHz(pilot signal)	Vert amp of scope to test point  low side to ground.	L105(YEL)	Adjust for maximum. 19KHz response.
2		Vert amp of scope to test point  low side to ground.	L106(GRN)	Adjust for maximum. 38KHz response. Check for firing of STEREO INDICATOR.
3	19KHz & 1000Hz (modulated LEFT CHANNEL)	AC VTVM across RIGHT speaker or RIGHT channel load.	L203 L204	Adjust for MINIMUM. This step should require only slight adjustment.
4	19KHz & 1000Hz (modulated RIGHT CHANNEL)	AC VTVM across LEFT speaker or LEFT channel load.	L203 L204	Check for MINIMUM. If necessary make compromise adjustment of L203 & L204

TAPE PLAYER ALIGNMENT USING TEST CARTRIDGE

STEP	ITEM	ADJUSTMENT
1	Head height	Play a test cartridge, follow instructions with cartridge, and adjust head height adjustment screw for proper response.
2	Head Azimuth	Play a test cartridge, monitor RIGHT channel output and adjust Azimuth adjustment screw for maximum.
Repeat Step 1, 2 until no further improved.		

NOTE:

For test cartridge, use RCA tape No. 321

Select No. 2 channel

PROFESSIONAL SERVICE INFORMATION

All service and internal adjustment of this unit should be performed only by a qualified service technician equipped with the proper tools and instruments.

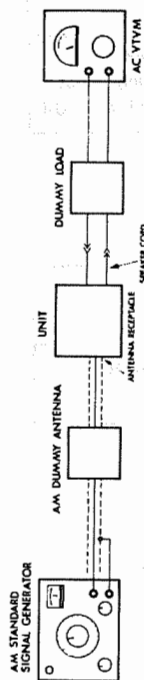


Fig. 6

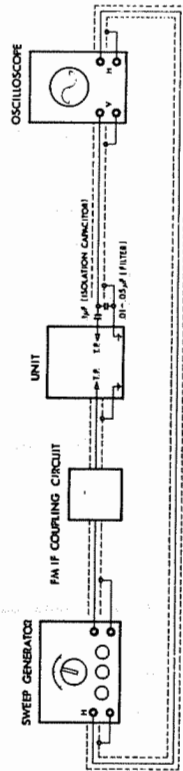


Fig. 7

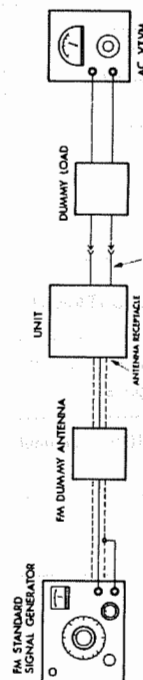


Fig. 8

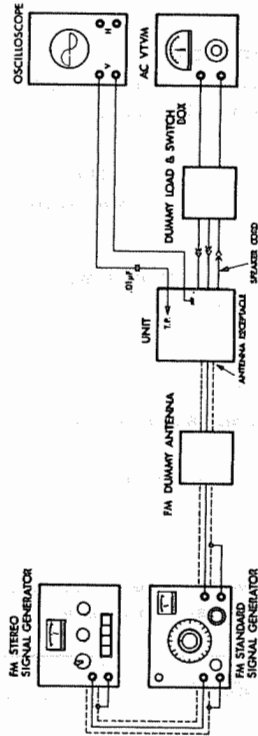


Fig. 9

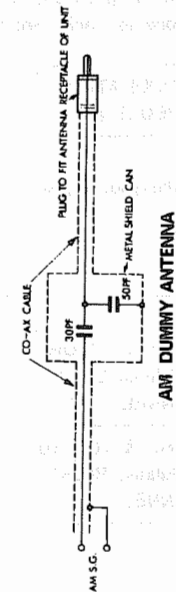


Fig. 10



Fig. 11

Fig. 12



Fig. 13

Fig. 14

CONNECTION INSTRUCTION IN ALIGNMENT

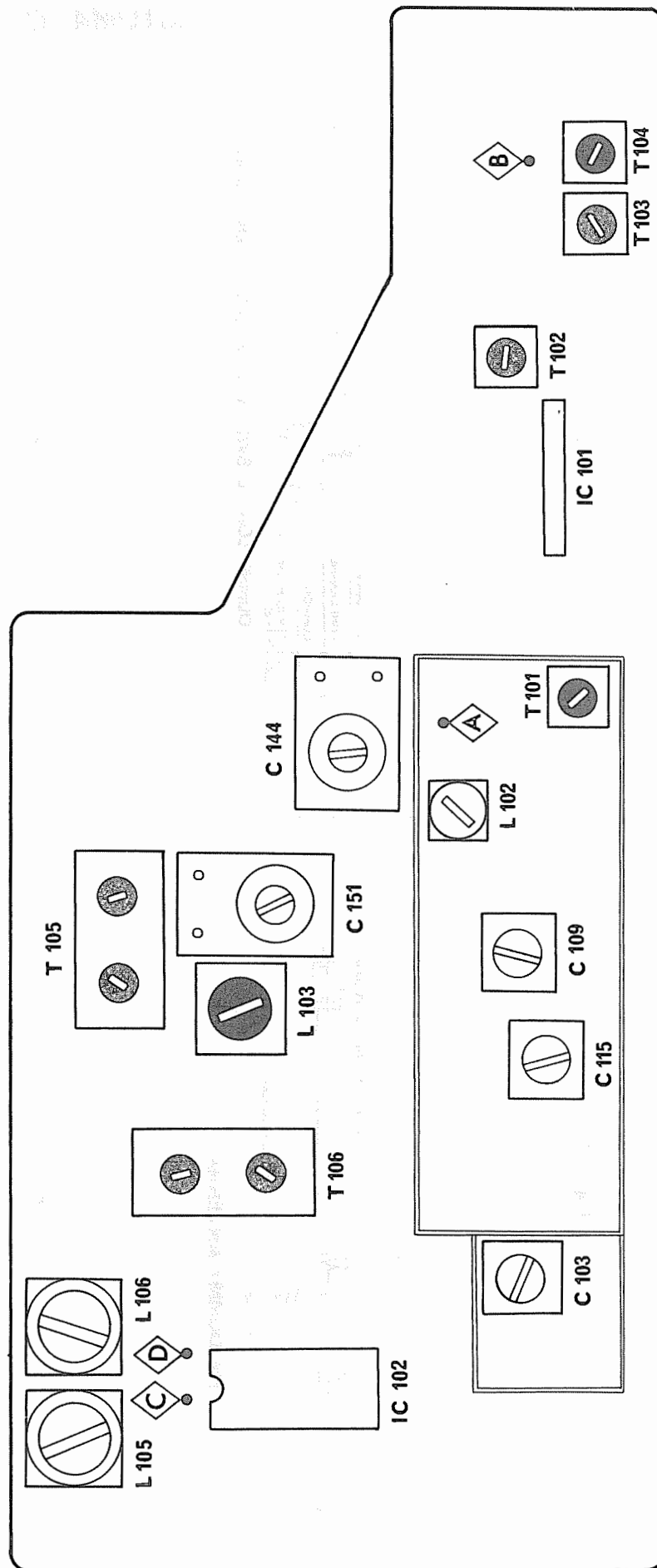


Fig. 15

ALIGNMENT LOCATION DETAIL

MAINTENANCE

TAPE HEAD AND CAPSTAN CLEANING

Turn on the motor by pushing the motor switch (located at the top side of the tape slot) with the eraser end of a pencil, then clean the capstan shaft with a cotton swab damped with alcohol on stick.

LUBRICATING

Motor shaft: None

Capstan shaft: One drop light oil at slot in shaft bearing.

(CAUTION: Be sure oil remains on capstan surface)

CAM ASS'Y (cam surface): Light silicon grease.

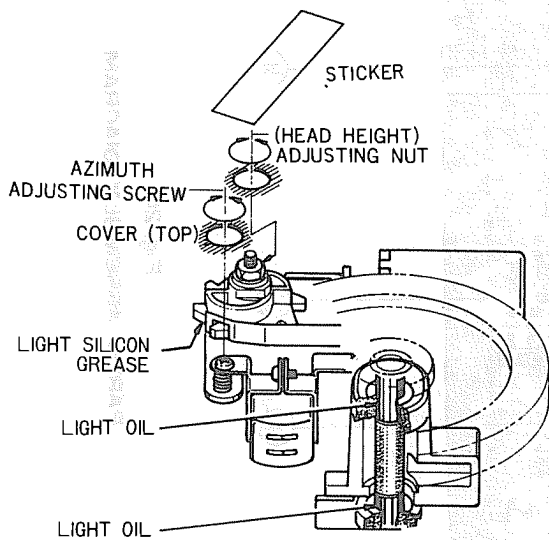
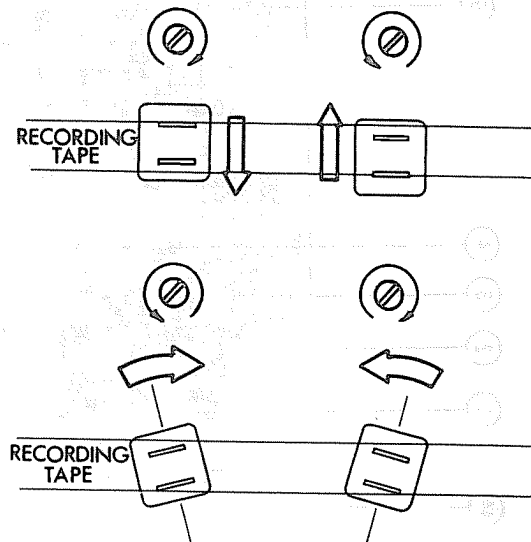


Fig. 18

HEAD HEIGHT ADJUSTMENT



AZIMUTH ADJUSTMENT

Fig. 19

HEAD DEMAGNETIZING

Demagnetize head when unit is serviced. Avoid using magnetic materials near head.

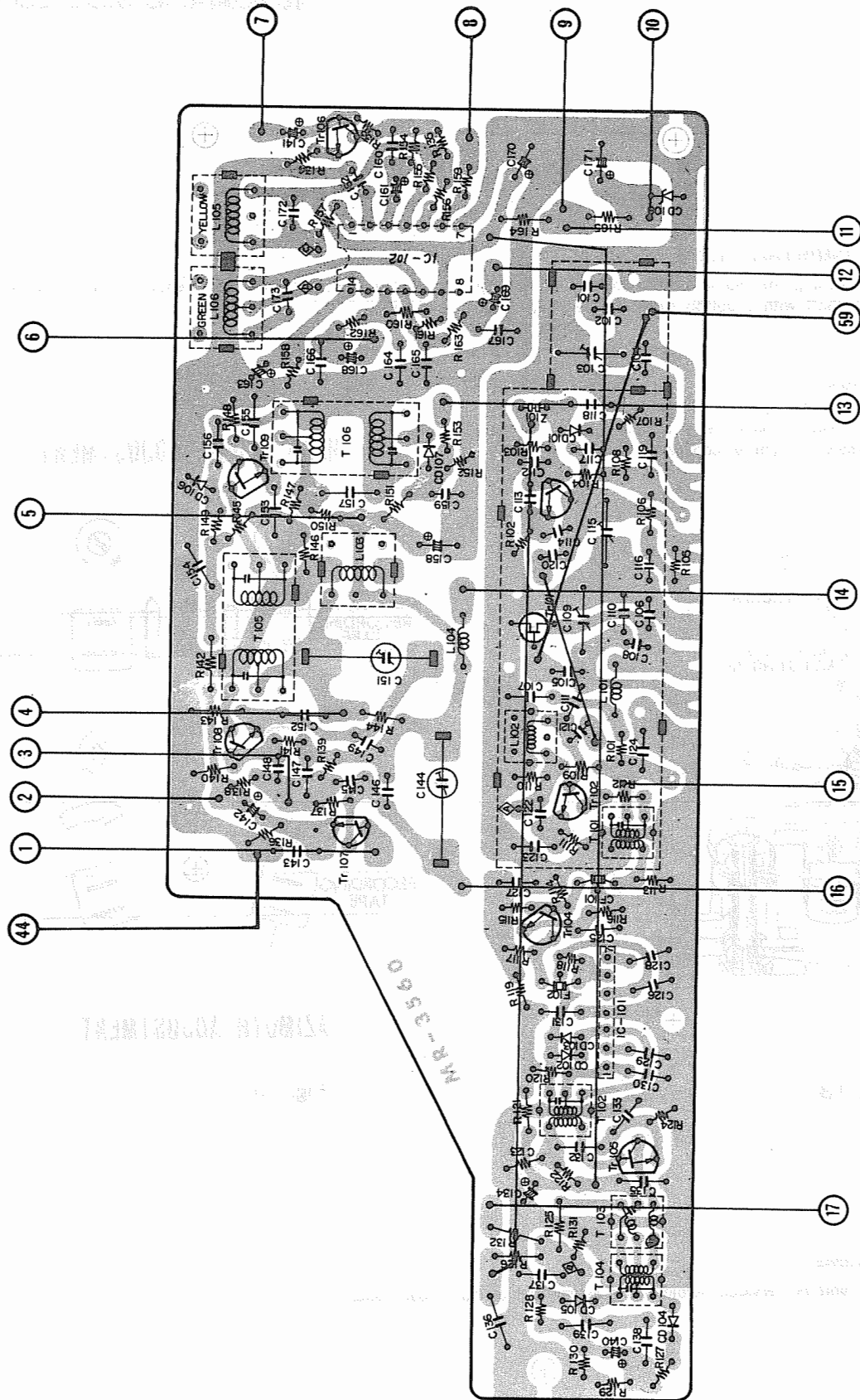


Fig. 20
PARTS ASSEMBLY DIAGRAM

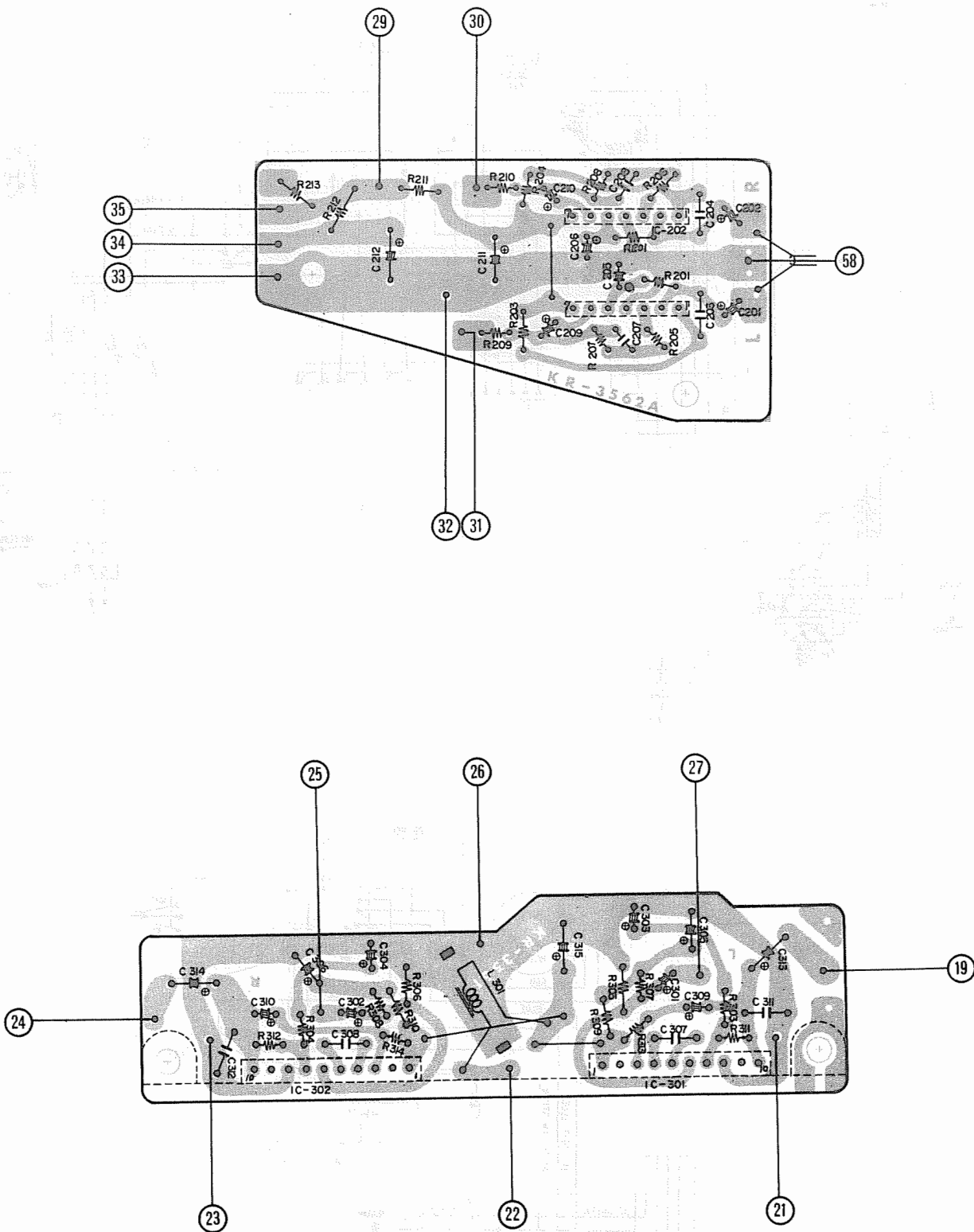


Fig. 22

PARTS ASSEMBLY DIAGRAM

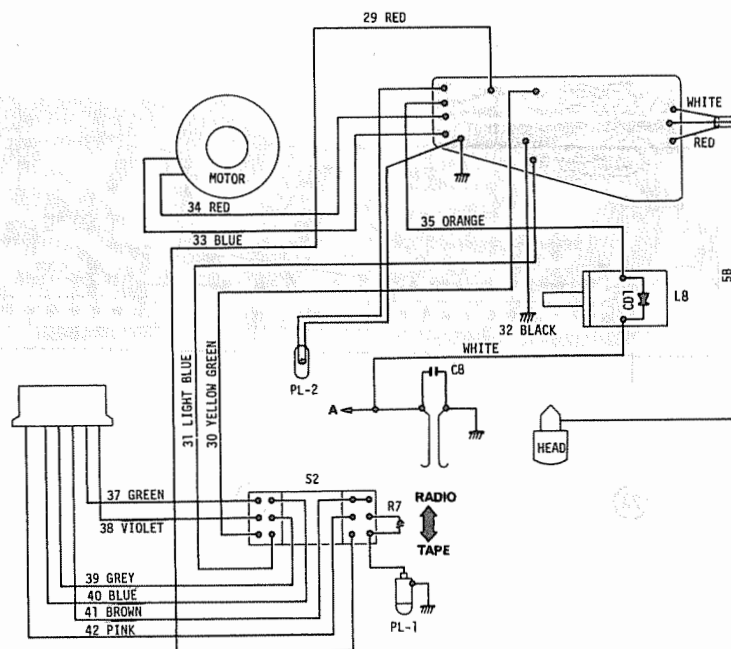
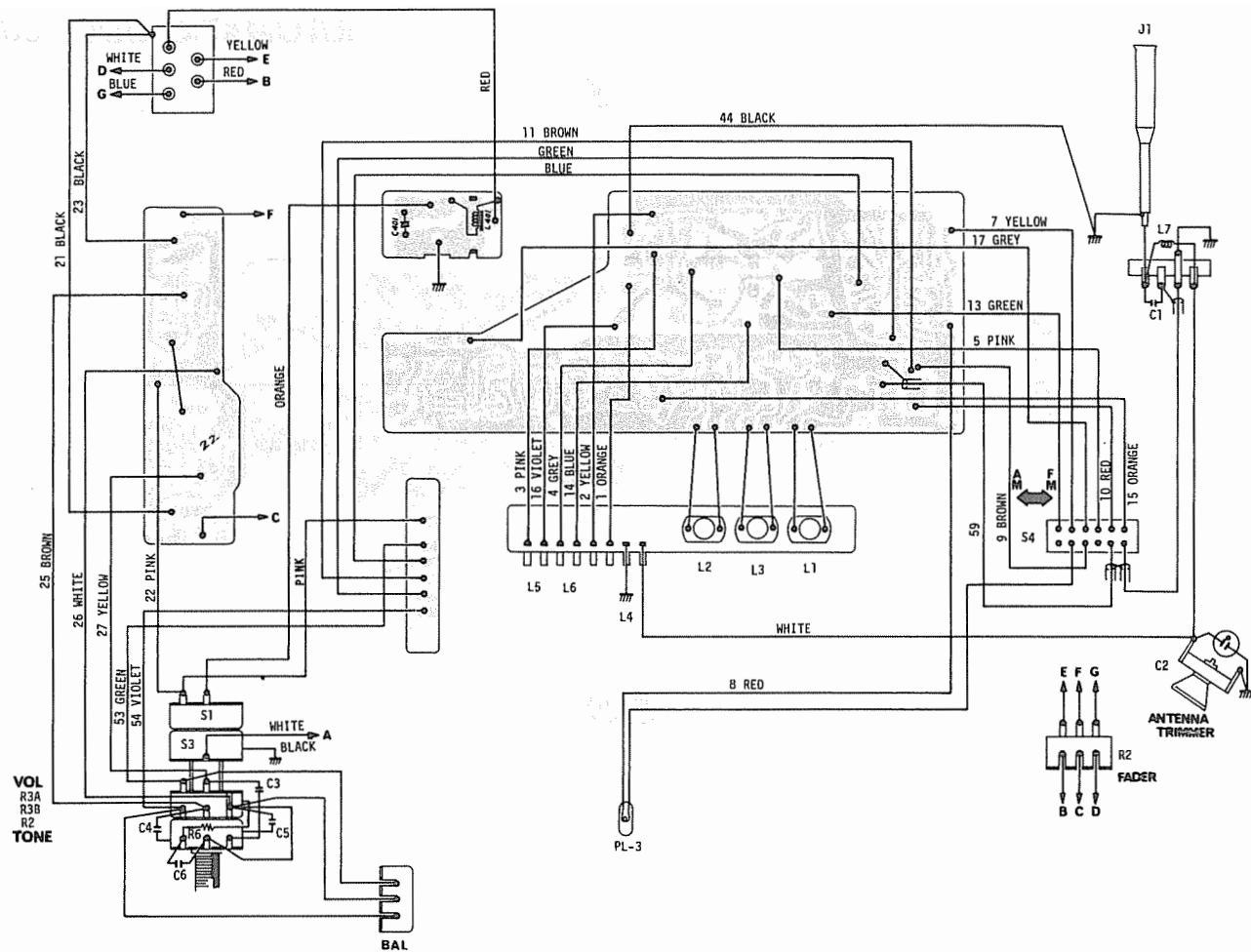


Fig. 23

WIRING DIAGRAM

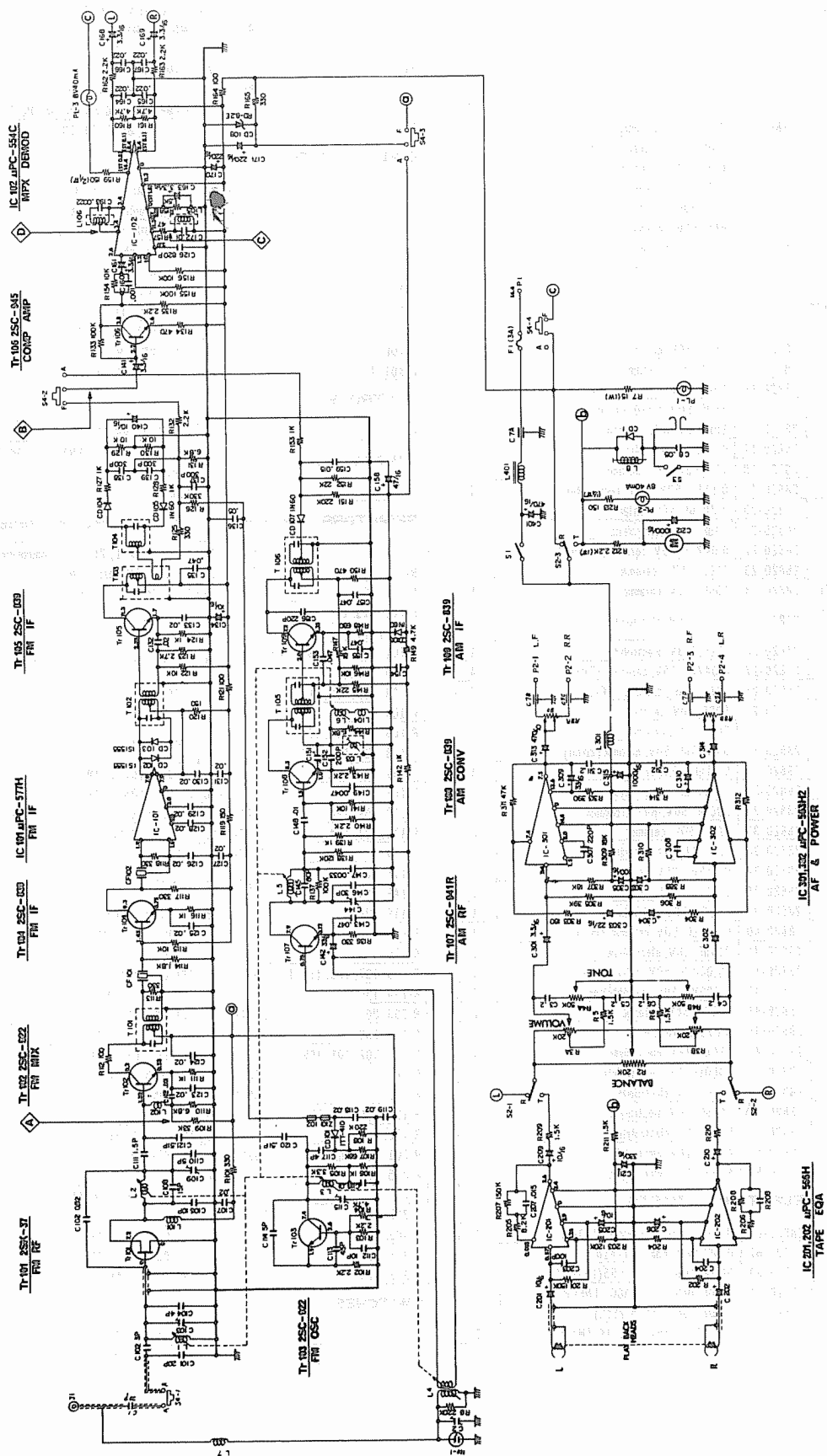


Fig. 24
WIRING DIAGRAM

Reference No.	Part No.	Description	Q'ty
ELECTRICAL PARTS			
CAPACITORS			
C-1, 101	28820-1	20PF, 50V, ceramic	2
C-2	28820-2	120PF, max., trimmer: TC-18	1
C-3, 4, 5, 6, 154, 311, 312	28820-3	0.2uF, 12V, ceramic	7
C-7A, B, C, D, E	28820-4	1.000PF \times 5, feed-through: KC-405	1
C-8, 136	28820-5	0.05uF, 50V, ceramic	2
C-102, 110	28820-6	3PF, 50V, ceramic	2
C-103, 109, 115	28820-7	8PF, max., trimmer: TC-20	3
C-104	28820-8	4PF, 50V, ceramic	1
C-105	28820-9	0.82PF, 50V, fixed composition	1
C-106	28820-10	10PF, 50V, ceramic	1
C-107, 118, 119, 123, 124 125, 126, 127, 218, 129 130, 131, 132, 133	28820-11	0.02uF, 50V, ceramic	14
C-108	28820-12	15PF, 50V, ceramic	1
C-111	28820-13	1.5PF, 50V, ceramic	1
C-112	28820-14	10PF, 50V, N750, ceramic	1
C-113	28820-15	45PF, 50V, N750, ceramic	1
C-114	28820-16	5PF, 50V, NPO, ceramic	1
C-116	28820-17	0.01uF, 50V, mylar	1
C-117	28820-18	4PF, 50V, NPO, ceramic	1
C-120, 121	28820-19	0.51PF, 50V, fixed composition	2
C-122	28820-20	0.001uF, 50V, mylar	1
C-134, 209, 210	28820-21	10uF, 16V, electrolytic	3
C-135	28820-22	0.047uF, 25V, ceramic (MURATA)	1
C-137, 138, 139	28820-23	300PF, 50V, ceramic	3
C-140, 201, 202, 205, 206	28820-24	10uF, 6.3V, ceramic	5
C-141, 161, 163, 168, 169 301, 302	28820-25	3.3uF, 35V, electrolytic	7
C-142	28820-26	33uF, 6.3V, electrolytic	1
C-143, 153, 155, 157	28820-27	0.047uF, 25V, ceramic (TDK)	4
C-144, 151	28820-28	70PF, max., trimmer: TC-1	2
C-145	28820-29	80PF, 50V, ceramic	1
C-146	28820-30	30PF, 50V, ceramic	1
C-147	28820-31	0.0033uF, 50V, ceramic (mylar)	1
C-148	28820-32	0.01uF, 25V, ceramic	1
C-149	28820-33	0.0047uF, 50V, mylar	1
C-152	28820-34	200PF, 50V, N470, ceramic	1
C-156, 307, 308	28820-35	22PF, 50V, ceramic	3
C-158	28820-36	47uF, 16V, electrolytic	1
C-159	28820-37	0.015uF, 25V, ceramic	1
C-160	28820-38	0.001uF, 50V, ceramic	1
C-162	28820-39	820PF, 50V, polyethylene	1
C-164, 165, 166, 167	28820-40	0.022uF, 50V, ceramic (mylar)	4
C-170, 171	28820-41	220uF, 16V, electrolytic	2
C-172	28820-42	10,000PF, 50V, polyethylene	1
C-173	28820-43	2,200PF, 50V, polyethylene	1
C-203, 204	28820-44	100PF, 50V, ceramic	2
C-207, 208	28820-45	0.015uF, 50V, mylar	2
C-211	28820-46	330uF, 16V, electrolytic	1
C-212, 315	28820-47	1000uF, 16V, electrolytic	2
C-303, 304	28820-48	22uF, 16V, electrolytic	2
C-305, 306	28820-49	100uF, 16V, electrolytic	2
C-309, 310	28820-50	33uF, 16V, electrolytic	2
C-313, 314	28820-51	470uF, 10V, electrolytic	2
C-401	28820-52	470uF, 16V, electrolytic	1
MISCELLANEOUS ELECTRICAL PARTS			
CD-1	28820-61	DIODE, spark suppressor: F-14A	1
CD-101	28820-62	DIODE, vari-cap: ITT-410	1
CD-102, 103	28820-63	DIODE, limiter: IS-1555 (IS-2473)	2
CD-104, 105, 106, 107	28820-64	DIODE, detector & AGC: 1N60P	4
CD-108	28820-65	DIODE, zener: RD-8.2E(C)	1
CF-101, 102	28820-66	FILTER, ceramic: SFE-10.7MA-5	2
F-1	28820-67	FUSE: 3A	1

Reference No.	Part No.	Description	Q'ty
H-1	28820-68	TAPE HEAD: TH-2082	1
M-1	28820-69	MOTOR: MYT-5AD	1
Ne-1	28820-70	NEON bulb: NE-2	1
PL-1	28820-71	LAMP, pilot: PL-1C	1
PL-1-A	28820-72	SOCKET, semi-ass'y: PLH-7	1
PL-2, 3	28820-73	LAMP, tape and stereo ind.: PL-4S	2
Z-101, 102	28820-74	FERRITE BEAD: FB-108	2
COILS & CHOKES			
L-1, 2, 3, 4, 5, 6	28820-81	TUNER ASS'Y: PT-3038	1
L-7	28820-82	CHOKE, antenna: SL-4.7	1
L-8	28820-83	SOLENOID, track shift: SNO-7	1
L-101	28820-84	COIL, RF choke: LH-2.2	1
L-102	28820-85	COIL, IF trap: FL-830	1
L-103	28820-86	COIL, OSC: OL-181	1
L-104	28820-87	COIL, OSC: LH-4.7	1
L-105	28820-88	COIL, MPX: ML-554B	1
L-106	28820-89	COIL, MPX: ML-554C	1
L-301, 401	28820-90	CHOKE, DC: NL-6	2
CONTROLS			
R-2	28820-101	BALANCE: VR-211	1
R-3A, B, 4A, B, S-1	28820-102	VOLUME, TONE, CHANNEL & ON-OFF switch: VR-66	
R-8A, B	28820-130	FADER: VR-234	1
RESISTORS: All resistors are insulated carbon type unless otherwise specified.			
R-5, 6	28820-111	1.500 10% 1/2W fixed composition	2
R-7	28820-112	15 10% 1W metal film	1
R-108, 151	28820-113	220,000 10% 1/4W	2
R-101, 113, 117, 118, 125 136, 165	28820-114	330 10% 1/4W	7
R-102, 103, 132, 135, 140 143, 162, 163	28820-115	2,200 10% 1/4W	8
R-104, 149, 160, 161	28820-116	4,700 10% 1/4W	4
R-105	28820-117	1,000 10% 1/4W	1
R-106, 111, 116, 124, 127 128, 139, 142, 153	28820-118	1,000 10% 1/4W	9
R-107	28820-119	68,000 10% 1/4W	1
R-109	28820-120	33,000 10% 1/4W	1
R-110, 131, 144	28820-121	6,800 10% 1/4W	3
R-112, 121, 164	28820-122	100 10% 1/4W	3
R-114	28820-123	1,800 10% 1/4W	1
R-115, 122, 129, 130, 141 146, 154	28820-124	10,000 10% 1/4W	7
R-119, 120	28820-125	150 10% 1/4W	2
R-123	28820-126	2,700 10% 1/4W	1
R-126	28820-127	330,000 10% 1/4W	1
R-133, 137, 138, 155, 156	28820-128	100,000 10% 1/4W	5
R-134, 150	28820-129	470 10% 1/4W	2
R-203, 204	28820-130	120,000 10% 1/4W	2
R-145, 152	28820-131	22,000 10% 1/4W	2
R-147, 307, 308, 309, 310	28820-132	18,000 10% 1/4W	5
R-148	28820-133	680 10% 1/4W	1
R-157	28820-134	47 10% 1/4W	1
R-158, 209, 210, 211	28820-135	1,500 10% 1/4W	4
R-159, 213	28820-136	150 10% 1/2W	2
R-201, 202, 207, 208	28820-137	150,000 10% 1/4W	4
R-205, 206	28820-138	8,200 10% 1/4W	2
R-212	28820-139	2.2 10% 1W metal film	1
R-303, 304	28820-140	180 10% 1/4W	2
R-305, 306	28820-141	39,000 10% 1/4W	2
R-311, 312	28820-142	47,000 10% 1/4W	2
R-313, 314	28820-143	390 10% 1/4W	2
SWITCHES			
S-2	28820-151	TAPE-RADIO: SW-112	1
S-4	28820-152	AM-FM: SW-7A	1

Reference No.	Part No.	Description	Q'ty
TRANSFORMERS			
T-101, 102	28820-161	FM IFT : IT-830B	2
T-103	28820-162	FM DISCRIMINATOR : IT-830D	1
T-104	28820-163	FM DISCRIMINATOR : IT-830E	1
T-105	28820-164	AM IFT : IT-501A	1
T-106	28820-165	AM IFT : IT-501B-1	1
TRANSISTORS & ICS.			
Tr-101	28820-171	FM RF AMP : 2SK-37	1
Tr-102, 103	28820-172	FM MIX, OSC : 2SC-922	2
Tr-104	28820-173	AM RF AMP : 2SC-941	1
Tr-105, 107, 108, 109	28820-174	FM IF, AM Conv & IF : 2SC-839	4
Tr-106	28820-175	COMPOSITE AMP : 2SC-945	1
TC-101	28820-176	FM IF AMP : uPC-577H	1
IC-102	28820-177	MPX DEMODULATOR : uPC-554C	1
IC-201, 202	28820-178	TAPE EQUALIZER : uPC-556H	2
IC-301, 302	28820-179	POWER AMP : uPC-563H2	2
MECHANICAL PARTS			
	28820-181	Bearing, flywheel : MR-12414	1
	28820-182	Belt : 89.3 × 6 × 0.6	1
	28820-183	Bracket antenna trimmer : KR-13381	1
	28820-184	Bracket ass'y, with ratchet : KR-11719	1
	28820-185	Bracket, P.C.B. : KR-12932	1
	28820-186	Bracket, Volume : KR-13382	1
	28820-187	Bracket, 6P connector : KR-12933	1
	28820-188	Bracket, switch (AM/FM) : KR-12905	1
	28820-189	Bracket, Lamp holder (TAPE) : KR-13127	1
	28820-190	Bracket, lamp holder (STEREO) : KR-13019	1
	28820-191	Bracket, tuner : MR-12886	1
	28820-192	Cable, battery & speaker : QS-617	1
	28820-193	Cam : KR-11677	1
	28820-194	Chassis base : PR-12884	1
	28820-195	Chassis, deck : PR-12883	1
	28820-196	Chassis front : PR-13018	1
	28820-197	Connector, tape head (with cord) : QS-570	1
	28820-198	Connector, tape radio : S-12504	1
	28820-199	Cover, bottom : MR-12888	1
	28820-200	Cover, cartridge : MR-12887	1
	28820-201	Cover, top : MR-12889A	1
	28820-202	Cushion, lamp holder : KR-30093	1
	28820-203	Dial pointer : KR-12947	1
	28820-204	Dog washer : Volume & tuning shaft : KR-12549	2
	28820-205	Driving pawl ass'y track shift : KR-12423	1
	28820-206	Dust cover ass'y : with dial plate : SSR-2882	1
	28820-207	Escutcheon ass'y : ESC-27 (SSR-2882)	1
	28820-208	Flywheel : KR-12892	1
	28820-209	Heat sink : power transistor : MR-12885	1
	28820-210	Holder ass'y, cartridge : KR-11033	1
	28820-211	Holder, head : KR-11725	1
	28820-212	Holder, indicator lamp (TAPE) : KR-30100	1
	28820-213	Holder, indicator lamp (STEREO) : KR-30099	1
	28820-214	Insulator, fiver : KR-11803	1
	28820-215	Insulator, fiver : KR-2763	2
	28820-216	Insulator, fiver : KR-30080	1
	28820-217	Insulator, fiver : KR-30090	1
	28820-218	Insulator, fiver (switch) : KR-2924	1
	28820-219	Insulator, nylon : KR-30082	1
	28820-220	Knob, band selector switch : KN-95T	1
	28820-221	Linkage, band switch (joint) : KR-12899	1
	28820-222	Linkage, band switch (switch side) : KR-12902	1
	28820-223	Nut, head height adjust : N3 AUDY	1
	28820-224	Nut, hex : N3	4
	28820-225	Nut, volume & tuning shaft : KR-11508	2

Reference No.	Part No.	Description	Q'ty
	28820-226	P.C. Board, AM/FM/MPX : MR-3560	1
	28820-227	P.C. Board, Filter : KR-3563	1
	28820-228	P.C. Board, power AMP : KR-3561	1
	28820-229		
	28820-230	P.C. Board, TAPE EQA : KR-3562	1
	28820-231	P.C. Board, Terminal : KR-3564	1
	28820-232	Plate, AM/FM band indicator : KR-30101	1
	28820-233	Plate, shield (p.c.d.) : MR-12956	1
	28820-234	Plug, tape radio : 48-0007	1
	28820-235	Pulley, motor (with screw) : KR-12479	1
	28820-236	Receptacle, antenna : AJ-5	1
	28820-237	Retainer, antenna receptacle : KR-12285	1
	28820-238	Retainer, battery & speaker cord : KR-11874	1
	28820-239	Screw, machine : P.B. 2 × 3	2
	28820-240	Screw, machine : P.B. 2.6 × 4	2
	28820-241	Screw, machine : P.B. 3 × 6	10
	28820-242	Screw, machine : P.B. 3 × 8	4
	28820-243	Screw, tapping : hex 3 × 6	28
	28820-244	Screw, tapping : hex 3 × 6 (Black)	4
	28820-245	Screw, tapping : P.B. 2.6 × 10	1
	28820-246	Screw, tapping : P.S. 3 × 6	5
	28820-247	Shaft, band selector lever : KR-12900	1
	28820-248	Shaft, dust cover : KR-12893	1
	28820-249	Specer, head holder : KR-11804	1
	28820-250	Spring, azimuth : KR-11805	1
	28820-251	Spring, area : KR-11806	1
	28820-252	Spring, band selector switch : KR-13021	1
	28820-253	Spring, dust cover : KR-12952	2
	28820-254	Spring, track shift (taper) : KR-12376	1
	28820-255	Stay, P.C. Board : KR-12935	1
	28820-256	Stay, P.C. Board : KR-12936	1
	28820-257	Sticker, antenna trimmer : 003	1
	28820-258	Sticker, azimuth & area : 031	1
	28820-259	Sticker, caution : 030	1
	28820-260	Sticker, FCC : SR	1
	28820-261	Sticker, model No. SSR-2882	1
	28820-262	Sticker, patent : 079	1
	28820-263	Sub Chassis ass'y : head height : KR-12418	1
	28820-264	Tape guide ass'y : KR-11722	1
	28820-265	Washer, lock : LW-9	2
INSTALLATION & ACCESSORY			
	28820-271	Capacitor, generator & voltage regulator : AC-4	1
	28820-272	Ground cord : QS-165	1
	28820-273	Ground cord, speaker : QS-405	4
	28820-274	Nut, hex : N5	1
	28820-275	Nut, hex (shoulder) : KR-11382	2
	28820-276	Nut, hex (volume & tuning shaft) : KR-11508	2
	28820-277	Owner's Guide : SSR-2882	1
	28820-278	Quick bolt : KR-12834	2
	28820-279	Resistor, distributor : S-15	1
	28820-280	Speaker cord, speaker side : QS-399	1
	28820-281	Washer lock : LW4	2
	28820-282	Washer, plane : W5	1
	28820-283	Washer, spring : SW5	1

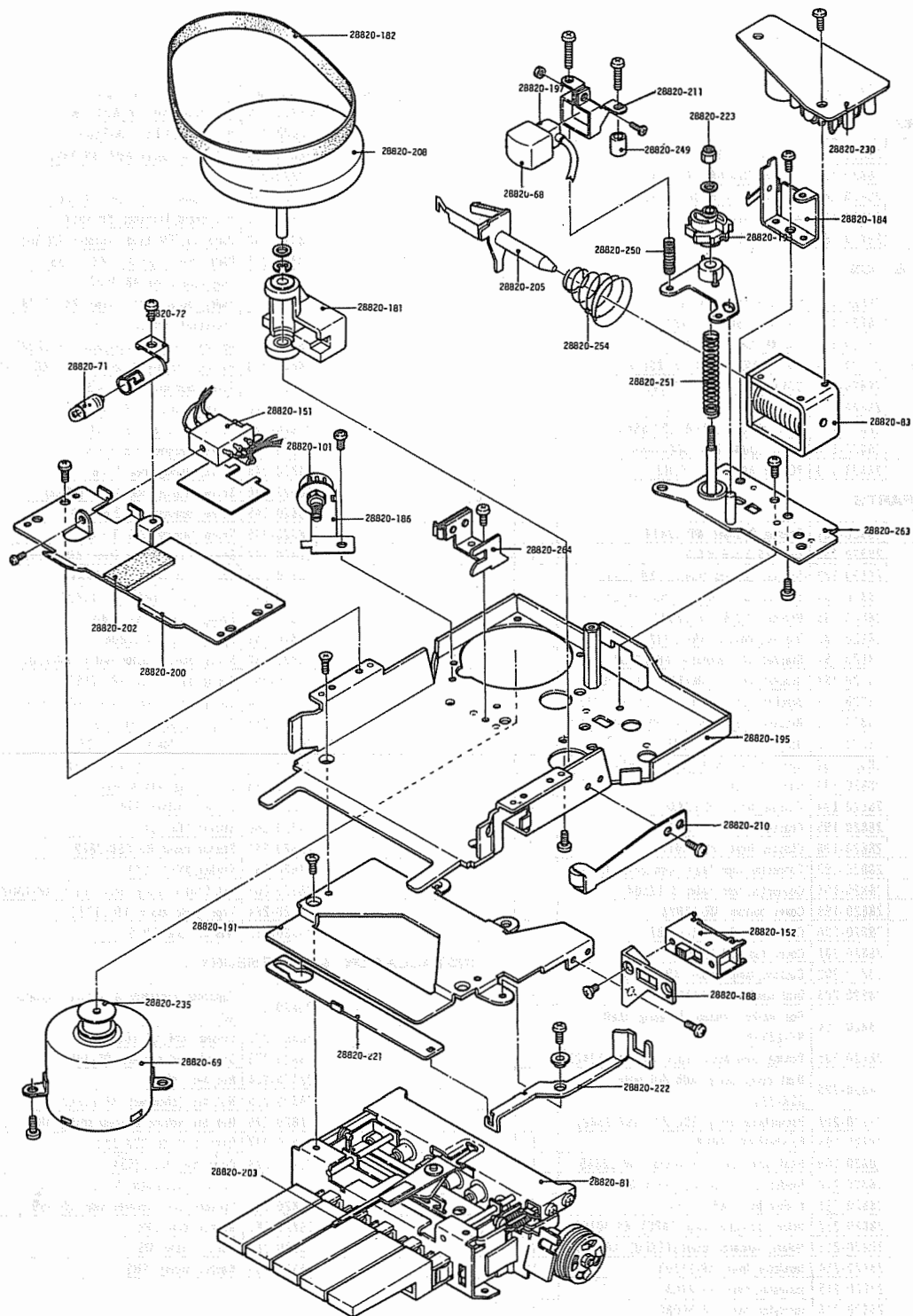


Fig. 17
PARTS COMPONENT LAYOUT
(DECK CHASSIS)